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# SV670P Series Servo Drive

## Communication Guide

Industrial Automation

Intelligent Elevator

New Energy Vehicle

Industrial Robot

Rail Transit

Data code 19011871 A02

# Preface

## Introduction

Thank you for purchasing the SV670P series servo drive developed by Inovance.

The SV670P series servo drive is a high-end servo drive designed based on global-leading standards and high-end application needs. It features high speed, high precision, high performance, and tuning-free function.

The servo drive covers a power range from 0.05 kW to 7.5 kW. It carries Modbus communication interfaces to work with the host controller for networked operation of multiple servo drives. The servo drive comes with the ITune function which supports adaptive stiffness level setting, inertia auto-tuning, and vibration suppression for easy use. Together with an MS1 series high-response servo motor (with ultra-low, low, or medium inertia) equipped with a 23-bit single-turn/multi-turn absolute encoder, the servo drive serves to deliver quiet and stable operation and accurate process control through the fully closed-loop function and internal process segment function.

The servo drive also offers dynamic braking, STO (optional), and built-in brake output (no external relay is needed) (optional) for continuous improvement in production safety. The servo drive aims to achieve quick and accurate position control, speed control, and torque control through high-performance solutions for automation equipment in such industries as electronic manufacturing, lithium batteries, manipulators, packaging, and machine tools.

This guide presents functions and parameters of the servo drive, including Modbus communication configuration, parameter descriptions, and communication application cases.

## More Documents

| Name | Data Code | Description |
|---|---|---|
| SV670P Series Servo Drive Selection Guide | 19011852 | Provides instructions on product selection, including the list of supporting components, technical data on the drive and motor, and the cable selection guide. |
| SV670P Series Servo Drive Installation Guide | 19011868 | Presents installation of the servo drive, including installation steps, mechanical installation, and electrical installation. |
| SV670P Series Servo Drive Hardware Guide | 19011854 | Presents the electrical design guidance of the servo drive, descriptions of wiring terminals, certification and standard requirements, and solutions to common EMC problems. |

| Name | Data Code | Description |
| --- | --- | --- |
| SV670P Series Servo Drive Commissioning Guide | 19011856 | Presents commissioning and parameters of the servo drive, covering the operating panel, commissioning software, commissioning procedure, and parameter list. |
| SV670P Series Servo Drive Function Guide | 19011866 | Presents functions and parameters of the servo drive, including function overview, basic servo functions, adjustment, and parameter descriptions. |
| SV670P Series Servo Drive Communication Guide | 19011871 | Presents functions and parameters of the servo drive, including Modbus communication configuration, parameter descriptions, and communication application cases. |
| SV670P Series Servo Drive Troubleshooting Guide | 19011869 | Presents fault levels and categories, troubleshooting processes, descriptions of alarm codes and faults, and lists of fault codes and alarm codes. |
| SV670P Series Servo Drive Maintenance Guide | 19011870 | Provides instructions on maintenance and repair of the servo drive and replacement of parts. |
| SV670P Series Servo Drive Manual Package | PS00005526 | Provides information on selection, installation, wiring, commissioning, function, troubleshooting, and parameters of the servo drive. |

## Revision History

| Date of Revision | Version | Description |
| --- | --- | --- |
| July 2022 | A02 | • Updated some parameter descriptions.<br>• Updated the appearance of the servo drive. |
| May 2022 | A01 | Modified the diagram of communication terminal pin arrangement of the servo drive |
| March 2022 | A00 | First release |

## How to Obtain

This guide is not delivered with the servo drive, but an electronic PDF version is available. To obtain it, visit

- *http://www.inovance.com*.
- Scan the QR code on the product for more information.

# Table of Contents

# General Safety Instructions

## Safety Precautions

- This section explains the safety precautions that need to be observed to use this product correctly. Before using this product, please read the instruction manual and correctly understand the relevant information of safety precautions. Failure to comply with the safety precautions may result in death, serious injury, or equipment damage.
- "CAUTION", "WARNING", and "DANGER" items in the guide only indicate some of the precautions that need to be followed; they just supplement the safety precautions.
- Use this equipment according to the designated environment requirements. Damage caused by improper use is not covered by warranty.
- Inovance shall take no responsibility for any personal injuries or property damage caused by improper use.

## Safety Levels and Definitions

| | |
|---|---|
| DANGER | Indicates that failure to comply with the notice will result in death or severe personal injuries. |
| WARNING | Indicates that failure to comply with the notice may result in death or severe personal injuries. |
| CAUTION | Indicates that failure to comply with the notice may result in minor or moderate personal injuries or equipment damage. |

## General Safety Instructions

- Drawings in the selection guide are sometimes shown without covers or protective guards. Remember to install the covers or protective guards as specified first, and then perform operations in accordance with the instructions. Install the covers or protective guards as specified, and use the equipment in accordance with the instructions described in the user guide.
- The drawings in the guide are shown for illustration only and may be different from the product you purchased.

## Unpacking

WARNING

- Do not install the equipment if you find damage, rust, or signs of use on the equipment or accessories upon unpacking.
- Do not install the equipment if you find water seepage or missing or damaged components upon unpacking.
- Do not install the equipment if you find the packing list does not conform to the equipment you received.

CAUTION

- Check whether the packing is intact and whether there is damage, water seepage, dampness, and deformation before unpacking.
- Unpack the package by following the unpacking sequence. Do not strike the package violently.
- Check whether there is damage, rust, or injuries on the surface of the equipment and equipment accessories before unpacking.
- Check whether the package contents are consistent with the packing list before unpacking.

## Storage and Transportation

WARNING

- Large-scale or heavy equipment must be transported by qualified professionals using specialized hoisting equipment. Failure to comply may result in personal injuries or equipment damage.
- Before hoisting the equipment, ensure the equipment components such as the front cover and terminal blocks are secured firmly with screws. Loosely-connected components may fall off and result in personal injuries or equipment damage.
- Never stand or stay below the equipment when the equipment is being hoisted by the hoisting equipment.
- When hoisting the equipment with a steel rope, ensure the equipment is hoisted at a constant speed without suffering from vibration or shock. Do not turn the equipment over or let the equipment stay hanging in the air. Failure to comply may result in personal injuries or equipment damage.

CAUTION

- Handle the equipment with care during transportation and mind your steps to prevent personal injuries or equipment damage.
- When carrying the equipment with bare hands, hold the equipment casing firmly with care to prevent parts from falling. Failure to comply may result in personal injuries.
- Store and transport the equipment based on the storage and transportation requirements. Failure to comply will result in equipment damage.
- Avoid storing or transporting the equipment in environments with water splash, rain, direct sunlight, strong electric field, strong magnetic field, and strong vibration.
- Avoid storing the equipment for more than three months. Long-term storage requires stricter protection and necessary inspections.
- Pack the equipment strictly before transportation. Use a sealed box for long-distance transportation.
- Never transport the equipment with other equipment or materials that may harm or have negative impacts on this equipment.

**Installation**

DANGER

- The equipment can be operated by well-trained and qualified professionals only. Non-professionals are not allowed.

WARNING

- Read through the guide and safety instructions before installation.
- Do not install this equipment in places with strong electric or magnetic fields.
- Before installation, check that the mechanical strength of the installation site can bear the weight of the equipment. Failure to comply will result in mechanical hazards.
- Do not wear loose clothes or accessories during installation. Failure to comply may result in an electric shock.
- When installing the equipment in a closed environment (such as a cabinet or casing), use a cooling device (such as a fan or air conditioner) to cool the environment down to the required temperature. Failure to comply may result in equipment over-temperature or a fire.
- Do not retrofit the equipment.
- Do not fiddle with the bolts used to fix equipment components or the bolts marked in red.
- When the equipment is installed in a cabinet or final assembly, a fireproof enclosure providing both electrical and mechanical protections must be provided. The IP rating must meet IEC standards and local laws and regulations.
- Before installing devices with strong electromagnetic interference, such as a transformer, install a shielding device for the equipment to prevent malfunction.
- Install the equipment onto an incombustible object such as a metal. Keep the equipment away from combustible objects. Failure to comply will result in a fire.

CAUTION

- Cover the top of the equipment with a piece of cloth or paper during installation. This is to prevent unwanted objects such as metal chippings, oil, and water from falling into the equipment and causing faults. After installation, remove the cloth or paper on the top of the equipment to prevent over-temperature caused by poor ventilation due to blocked ventilation holes.
- Resonance may occur when the equipment operating at a constant speed executes variable speed operations. In this case, install the vibration-proof rubber under the motor frame or use the vibration suppression function to reduce resonance.

**Wiring**

DANGER

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Before wiring, cut off power connections with all equipment. Residual voltage exists after power cut-off. Therefore, wait at least the time designated on the equipment warning label before further operations. Measure the DC voltage of the main circuit and make sure it is below the safe voltage, otherwise there will be the danger of electric shock.
- Do not perform wiring, remove the equipment cover, or touch the circuit board with power ON. Failure to comply will result in an electric shock.
- Check that the equipment is grounded properly. Failure to comply will result in an electric shock.

WARNING

- Do not connect the input power supply to the output end of the equipment. Failure to comply will result in equipment damage or even a fire.
- When connecting a drive to the motor, check that the phase sequences of the drive and motor terminals are consistent to prevent reverse motor rotation.
- Cables used for wiring must meet cross sectional area and shielding requirements. The shield of the cable must be reliably grounded at one end.
- Fix the terminal screws with the tightening torque specified in the user guide. Improper tightening torque may overheat or damage the connecting part, resulting in a fire.
- After wiring is done, check that all cables are connected properly and no screws, washers or exposed cables are left inside the equipment. Failure to comply may result in an electric shock or equipment damage.

CAUTION

- During wiring, follow the proper electrostatic discharge (ESD) procedure, and wear an antistatic wrist strap. Failure to comply will damage the equipment or the internal circuits of the equipment.
- Use shielded twisted pairs for the control circuit. Connect the shield to the grounding terminal of the equipment for grounding purpose. Failure to comply will result in equipment malfunction.

**Power-on**

DANGER

- Before power-on, check that the equipment is installed properly with reliable wiring and the motor can be restarted.
- Check that the power supply meets equipment requirements before power-on to prevent equipment damage or a fire.
- After power-on, do not open the cabinet door or protective cover of the equipment, touch any terminal, or disassemble any unit or component of the equipment. Failure to comply will result in an electric shock.

WARNING

- Perform a trial run after wiring and parameter setting to ensure the equipment operates safely. Failure to comply may result in personal injuries or equipment damage.
- Before power-on, make sure that the rated voltage of the equipment is consistent with that of the power supply. Failure to comply may resulting in a fire. Failure to comply may result in a fire.
- Before power-on, check that no one is near the equipment, motor, or machine. Failure to comply may result in death or personal injuries.

**Operation**

DANGER

- The equipment must be operated only by professionals. Failure to comply will result in death or personal injuries.
- Do not touch any connecting terminals or disassemble any unit or component of the equipment during operation. Failure to comply will result in an electric shock.

WARNING

- Do not touch the equipment casing, fan, or resistor with bare hands to feel the temperature. Failure to comply may result in personal injuries.
- Prevent metal or other objects from falling into the equipment during operation. Failure to comply may result in a fire or equipment damage.

**Maintenance**

DANGER

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Do not maintain the equipment with power ON. Failure to comply will result in an electric shock.
- Before maintenance, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.
- In case of a permanent magnet motor, do not touch the motor terminals immediately after power-off because the motor terminals will generate induced voltage during rotation even after the equipment power supply is off. Failure to comply will result in an electric shock.

**WARNING**

- Perform routine and periodic inspection and maintenance on the equipment according to maintenance requirements and keep a maintenance record.

**Repair**

**DANGER**

- Equipment installation, wiring, maintenance, inspection, or parts replacement must be performed only by professionals.
- Do not repair the equipment with power ON. Failure to comply will result in an electric shock.
- Before inspection and repair, cut off all the power supplies of the equipment and wait for at least the time designated on the equipment warning label.

**WARNING**

- Submit the repair request according to the warranty agreement.
- When the fuse is blown or the circuit breaker or earth leakage current breaker (ELCB) trips, wait for at least the time designated on the equipment warning label before power-on or further operations. Failure to comply may result in death, personal injuries or equipment damage.
- When the equipment is faulty or damaged, the troubleshooting and repair work must be performed by professionals that follow the repair instructions, with repair records kept properly.
- Replace quick-wear parts of the equipment according to the replacement instructions.
- Do not use damaged equipment. Failure to comply may result in death, personal injuries, or severe equipment damage.
- After the equipment is replaced, check the wiring and set parameters again.

**Disposal**

**WARNING**

- Dispose of retired equipment in accordance with local regulations and standards. Failure to comply may result in property damage, personal injuries, or even death.
- Recycle retired equipment by observing industry waste disposal standards to avoid environmental pollution.

## Additional Precautions

### Cautions for the dynamic brake

- Dynamic braking can only be used for emergency stop in case of failure and sudden power failure. Do not trigger failure or power failure frequently.
- Ensure that the dynamic braking function has an operation interval of more than 5 minutes at high speed, otherwise the internal dynamic braking circuit may be damaged.

- Dynamic braking is common in rotating mechanical structures. For example, when a motor has stopped running, it keeps rotating due to the inertia of its load. In this case, this motor is in the regenerative state and short-circuit current passes through the dynamic brake. If this situation continues, the drive, and even the motor, may be burned.

## Safety Label

For safe equipment operation and maintenance, comply with the safety labels on the equipment. Do not damage or remove the safety labels. See the following table for descriptions of the safety labels.

| Safety Label | Description |
|---|---|
|  | • Never fail to connect the protective earth (PE) terminal. Read through the guide and follow the safety instructions before use.<br>• Never fail to connect Protective Earth (PE) terminal. Read the manual and follow the safety instructions before use.<br>• Do not touch terminals within 15 minutes after disconnecting the power supply to prevent the risk of electric shock.<br>• Do not touch terminals with 15 minutes after Disconnect the power. Risk of electrical shock.<br>• Do not touch the heatsink with power ON to prevent the risk of burn.<br>• Do not touch heatsink when power is ON. Risk of burn. |

# 1 Product Information

## Description of the Model Number

SV670 P S 2R8 I - FS

① ② ③ ④ ⑤ ⑥

| | | | |
|---|---|---|---|
| ① **Product Series**<br>SV670: SV670 general-purpose servo drive | ④ **Rated output current** | | ⑤ **Model configuration**<br>I: General-purpose |
| ② **Product type**<br>N: Network type<br>P: Pulse type<br>A: CANlink type<br>C: CANopen type | S: 220 V | 1R6: 1.6 A<br>2R8: 2.8 A<br>5R5: 5.5 A<br>7R6: 7.6 A<br>012: 12.0 A<br>018: 18.0 A<br>022: 22.0 A<br>027: 27.0 A | |
| ③ **Voltage class**<br>S: 220 V<br>T: 380 V | T: 380 V | 3R5: 3.5 A<br>5R4: 5.4 A<br>8R4: 8.4 A<br>012: 12.0 A<br>017: 17.0 A<br>021: 21.0 A<br>026: 26.0 A | ⑥ **Non-standard features**<br>Blank: standard<br>FH: High protection<br>FS: Functional safety models only come with STO<br>PTC: Motor temperature detection |

## Description of the nameplate


Figure 1-1 Description of the nameplate

## Encryption of the production serial number

01050202 4 P 7 00001

① ② ③ ④ ⑤

| | | |
|---|---|---|
| ① **Internal code**<br>Material code | ③ **Year**<br>9: 2009<br>A: 2010<br>...<br>P: 2022<br>...<br>Note: I/L/O/Q is not used. | ⑤ **Lot number**<br>00001: 1st in current month<br>00002: 2nd in current month<br>00003: 3rd in current month<br>...<br>Range: 00001 to 99999 |
| ② **Manufacturer code**<br>4: Suzhou Inovance | ④ **Month**<br>1: January<br>2: February<br>...<br>A: October<br>B: November<br>C: December | |

Example: The S/N 010502024P700001 indicates the drive is manufactured in July, 2022.

# 2 Operating Panel

## 2.1 Components of Servo Drives and Servo Motors

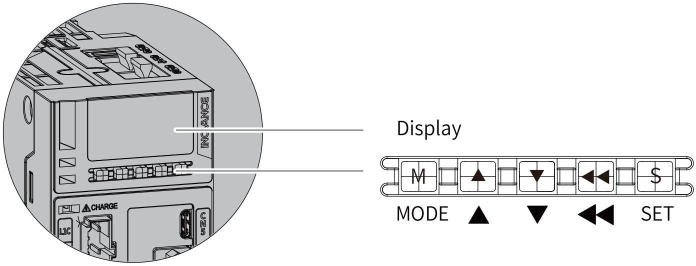



Figure 2-1 Magnified view of the keypad

The operation panel of the SV670P Series servo drive consists of an LED (5-digit, 8-segment) and five buttons. The keypad is used for value display, parameter setting, user password setting and general function execution. The following table takes parameter setting as an example to describe the general functions of the keys.

Table 2–1 Descriptions of keys

| Name | Symbol | Description |
|---|---|---|
| MODE | M | Switches among different modes.<br>Returns to the previous menu. |
| UP | ▲ | Increases the value of the blinking digit for the LED. |
| DOWN | ▼ | Decreases the value of the blinking digit for the LED. |
| SHIFT | ◀◀ | Shifts the blinking digit for the LED.<br>You can view the high digits of the number consisting of more than 5 digits. |
| SET | S | Switches to the lower-level menu.<br>Executes commands such as storing parameter setting value. |

## 2.2 Panel Display

The operating panel can be used to display the servo drive status, parameters, faults, and monitored values.

- Status display: displays current servo drive status, such as servo ready or servo running
- Parameter display: displays parameters and their setpoints
- Fault display: displays faults and warnings that occurred on the servo drive
- Monitored value display: displays values of monitoring parameters

## Display mode switchover

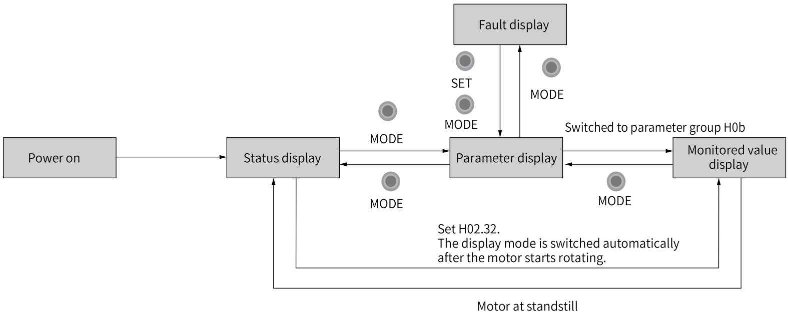



Figure 2-2 Switchover among different display modes

- The operating panel enters status display immediately upon power-on.
- Press MODE to switch among different display modes based on the conditions shown in *"Figure 2–2 " on page 16* .
- In status display, set H02.32 to select the parameter to be monitored. When the motor rotates, the operating panel automatically switches to monitored value display. After the motor stops, the operating panel automatically returns to status display.
- In the parameter display mode, after you select the parameter to be monitored in group H0b, the operating panel switches to monitored value display.
- Once a fault occurs, the operating panel switches to fault display immediately, with all the five LEDs blinking. Press SET to stop the LEDs from blinking, and then press MODE to switch to parameter display.

## Status display

| Display | Name | Scenario | Meaning |
|---|---|---|---|
|  | Reset<br>Servo initializing | At the moment of power-on | The servo drive is in the initialization or reset status.<br>After initialization or reset is done, the servo drive automatically switches to other status. |
|  | Nrd.x<br>Servo not ready | Initialization done, but servo drive not ready | The servo drive is not ready to run because the main circuit is not powered on. For details, see Chapter "Troubleshooting".<br>Meaning of "x"<br>• 1: Control circuit undervoltage<br>• 2: Main circuit power input error<br>• 3: Bus undervoltage<br>• 4: Pre-charge resistor not bypassed<br>• 5: Encoder initialization not done<br>• 6: Short-to-ground detection failed |
|  | Rdy<br>Servo ready | Servo drive ready | The servo drive is ready to run and is waiting for the S-ON signal. |
|  | Run<br>Servo running | Servo ON (S-ON) signal activated (S-ON signal switched on) | The servo drive is running. |
|  | Jog<br>Jogging | Servo drive in jog status | For jog function settings, see section "Jog" in SV670P Series Servo Drive Commissioning Guide. |

## SV670C operating panel display

| Display | Name | Scenario | Meaning |
|---|---|---|---|
|  | First digit: 1 to 9 Communication status | - | Expressed in characters to indicate the status of the slave CANopen state machine<br>• 1: Initializing<br>• 2: Pre-operational<br>• 8: Operational<br>• 9: Stop |
| | Second digit: 0 to 7 Control mode | - | Expressed in hexadecimal to indicate the present operating mode of the servo drive; not blinking<br>• 0: Local mode<br>• 1: Profile position control<br>• 3: Profile velocity mode<br>• 4: Profile torque mode<br>• 6: Homing mode<br>• 7: Interpolation mode |
|  | 81nr.x servo not ready | Initialization done, but servo drive not ready | The servo drive is not ready to run because the main circuit is not powered on. For details, see Chapter "Troubleshooting".<br>Meaning of "x"<br>• 1: Control circuit undervoltage<br>• 2: Main circuit power input error<br>• 3: Bus undervoltage<br>• 4: Pre-charge resistor not bypassed<br>• 5: Encoder initialization not done<br>• 6: Short-to-ground detection failed |

## Parameter display

Parameters of the SV670P series servo are divided into groups H00 to H34 based on their functions. A parameter can be located quickly based on the parameter group it belongs to. For details on parameters, see Chapter "Description of Parameters".

- Parameter display

| Display | Name | Content |
|---|---|---|
| HXX.YY | Parameter | XX: Parameter group number (decimal)<br>YY: Offset within the parameter group (hexadecimal) |

For example, "H02.00" is displayed as follows.

| Display | Name | Content |
|---|---|---|
|  | H02.00 | 02: Parameter group number<br>00: Offset within the parameter group |

- Display of negative numbers and numbers with different lengths
  - Signed number with four or fewer digits or unsigned number with five or fewer digits
    Such numbers are displayed in a single page (five digits). For signed numbers, the highest bit "—" represents the negative sign.

    For example, "—9999" is displayed as follows.

    For example, "65535" is displayed as follows.

  - Signed number with more than four digits or unsigned number with more than five digits
    Such numbers are displayed from low to high bits in multiple pages (5 digits per page) in the format of "number of current page + values on current page", as shown in the following figure. To switch to the next page, hold down ◀◀ for more than 2 seconds.

    For example, "—1073741824" is displayed as follows.

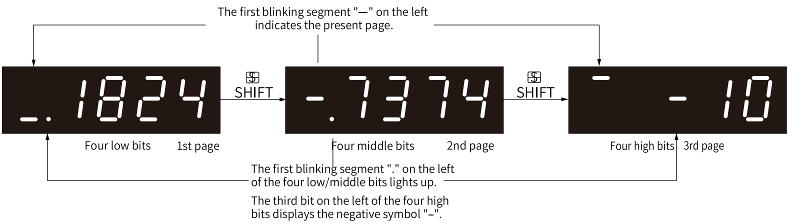



Figure 2-3 Display of —1073741824

Example: 1073741824 is displayed as follows:

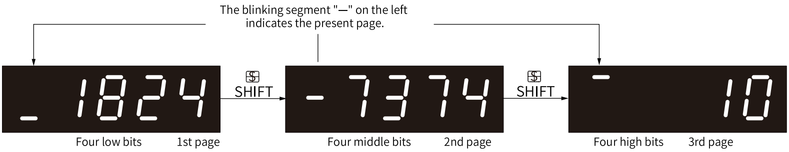



Figure 2-4 Display of 1073741824

- Display of the decimal point
  The "." on the ones segment indicates the decimal point. It does not blink.

| Display | Name | Content |
|---|---|---|
|  | Decimal point | 1000.0 |

- Display of parameter setting status

| Display | Name | Scenario | Meaning |
|---|---|---|---|
|  | Done Parameter setting done | The parameter is set successfully. | The parameter is set and saved to the servo drive (Done). The servo drive can proceed with other operations. |
|  | F.InIt Restoring to default settings | Parameter initialization is in progress (H02.31 = 1). | The servo drive is restoring parameters to default settings. Switch on the control circuit again after initialization is done. |
|  | Error Wrong password | The user password (H02.30) is activated but the password entered is wrong. | An incorrect password is entered. You need to enter the password again. |

**Fault display**

- The panel displays the active or history faults and warning codes. For troubleshooting, see SV670P Series Servo Drive Troubleshooting Guide.
- When a fault or warning occurs, the operating panel displays the corresponding fault or warning code immediately. When multiple faults or warnings occur, the operating panel displays the fault code of the highest fault level.
- You can select the previous fault/warning to be viewed through H0b.33 and view the code of the selected fault/warning in H0b.34.
- You can clear the latest 20 faults or warnings saved in the servo drive by setting H02.31 to 2.

For example, "E941.0" is displayed as follows.

| Display | Name | Content |
|---|---|---|
|  | E941.0<br>Present warning code | E: indicates that a fault or warning occurs in the servo drive<br>941.0: warning code |

## Monitored value display

- Group H0b: displays parameters used to monitor the operating status of the servo drive
- Set H02.32 (Default operating panel display) properly. After the motor starts to operate normally, the operating panel switches from status display to parameter display. The parameter group number is H0b and the offset within the group is the setpoint of H02.32.

For example, if H02.32 is set to 00 and the motor speed is not 0 RPM, the operating panel displays the value of H0b.00.

The following table illustrate the display of the monitored parameter H0b.00.

| Para. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.00 | Actual motor speed | RPM | Displays the rounded-off value of the actual motor speed, which is accurate to 1 RPM. | Display of 3000 RPM:<br><br>Display of −3000 RPM:<br> |

## *Note*

For details of parameters in group H0b, see *"8.1 Display of Monitoring Parameters" on page 545*.

# 3 Modbus Communication

## 3.1 Overview

The Modbus protocol is a common language applied to electronic controllers. Based on this protocol, controllers can communicate with each other and with other devices. This protocol has become a general industry standard. This communication protocol enables control devices produced by different manufacturers to be connected into an industrial network for centralized monitoring.

## 3.2 Hardware Configuration

**Terminal layout**

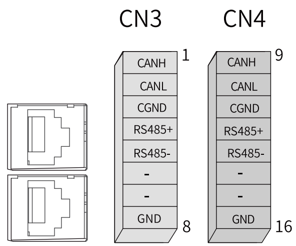



Figure 3-1 Communication terminal pin arrangement of the servo drive

Table 3–1 Description of communication terminal pins

| Pin No. | Name | Description |
|---|---|---|
| 1 and 9 | CANH | CAN communication port |
| 2 and 10 | CANL | |
| 3 and 11 | CGND | CAN communication ground |
| 4 and 12 | RS485+ | RS485 communication port |
| 5 and 13 | RS485— | |
| 6 and 14 | - | - |
| 7 and 15 | - | - |
| 8 and 16 | GND | Ground |
| Enclosure | PE | Shield |

## Description of terminals

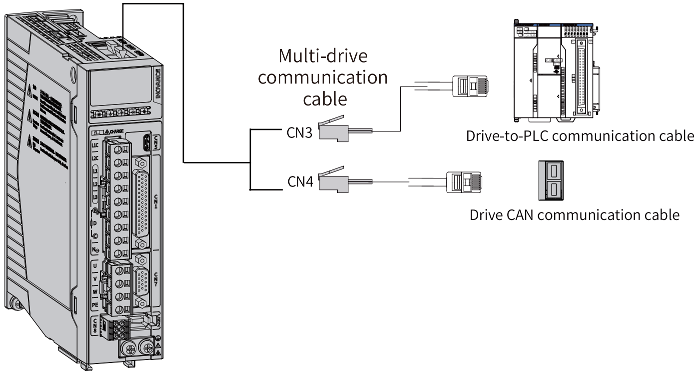



Figure 3-2 Wiring of communication cables

The CN3 and CN4 connectors are identical communication ports connected in parallel in the servo drive.

CN3 and CN4 on the drive are used for communication to the PC, PLC, and other drives. For pin assignment of CN3 and CN4, see *"Figure 3–1 Communication terminal pin arrangement of the servo drive" on page 22*.

## Connection for drive-to-PLC RS485 communication

The following figure shows the cable used for RS485 communication between the servo drive and PLC.

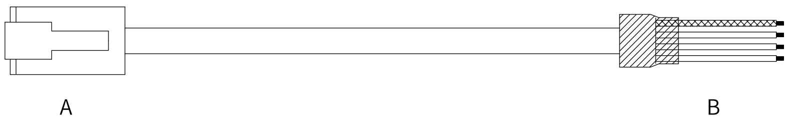



Figure 3-3 Diagram of the drive-to-PLC communication cable

Use three-conductor shielded cables as the RS485 bus. The servo drive comes with three cables for connection to the RS485+, RS485—, and GND (GND is used for non-isolated RS485 circuits) terminals. Connect the twisted pairs to the RS485+ and RS485 — terminals. Connect the third cable to the RS485 reference ground (GND). Connect the shield to the device ground (PE). Connect 120 Ω termination resistors only at the head and tail ends of the bus to prevent RS485 signal reflection.

Table 3–2 Connection of pins of the drive-to-PLC communication cable

| RJ45 on the Drive (A) | | | PLC (B) | | |
|---|---|---|---|---|---|
| Communication Type | Pin No. | Name | Communication Type | Pin No. | Name |
| RS485 | 4 | 485+ | RS485 | 4 | 485+ |
| | 5 | 485− | | 5 | 485− |
| | 8 | GND | | 8 | GND |
| - | Enclosure | PE (shield) | - | Enclosure | PE (shield) |

## Connection for multi-drive RS485 communication

The following figure shows the cable used for multi-drive RS485 communication.

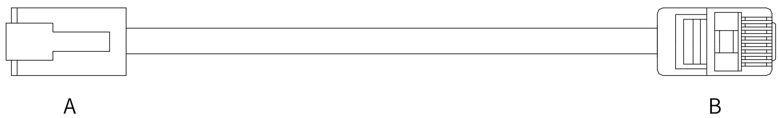



Figure 3-4 Diagram of the multi-drive communication cable

Table 3–3 Connection of pins of the multi-drive communication cable (only RS485 pins used)

| RJ45 on a Drive (A) | | | RJ45 on Another Drive (B) | | |
|---|---|---|---|---|---|
| Communication Type | Pin No. | Name | Communication Type | Pin No. | Name |
| RS485 | 4 | 485+ | RS485 | 4 | 485+ |
| | 5 | 485− | | 5 | 485− |
| | 8 | GND | | 8 | GND |
| - | Enclosure | PE (shield) | - | Enclosure | PE (shield) |

In the case of a large number of nodes, use the daisy chain mode for RS485 communication. Connect the RS485 signal reference grounds of all the nodes (up to 128 nodes) together.

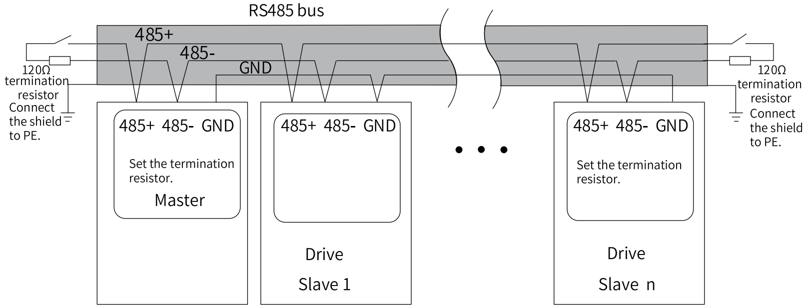



Figure 3-5 RS485 bus topology

**Caution**

Do not connect ⏚ (GND) terminal to the CGND terminal of the drive. Failure to comply may damage the machine.

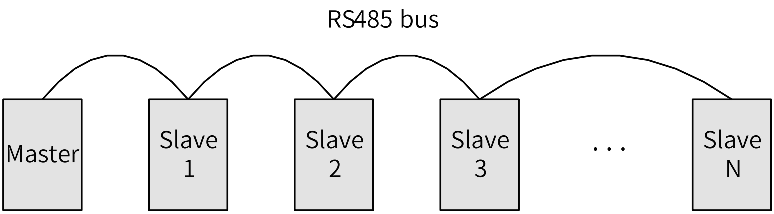



Figure 3-6 Daisy chain mode

The following table lists the maximum number of nodes and transmission distance supported by the standard RS485 circuit at different transmission rates.

Table 3–4 Transmission distance and number of nodes

| No. | Transmission Rate (kbps) | Transmission Distance (m) | Number of Nodes | Cable Diameter |
|---|---|---|---|---|
| 1 | 115.2 | 100 | 128 | AWG26 |
| 2 | 19.2 | 1000 | 128 | AWG26 |

## 3.3 Data Frame Structure

Parameters of the SV670P series servo drive are classified into 16-bit and 32-bit parameters based on the data length. Data read/write for the parameters is implemented based on the Modbus RTU protocol.

The command codes for reading/writing parameters vary with the data length.

| Operation | Command Code |
|---|---|
| Reading 16-bit/32-bit parameters | 0x03 |
| Writing 16-bit parameters | 0x06 |
| Writing 32-bit parameters | 0x10 |

### Command code for reading parameters: 0x03

Based on the Modbus RTU protocol, command code 0x03 is used to read both 16-bit and 32-bit parameters.

Request frame format:

| Value | Description |
|---|---|
| START | Equal to or greater than 3.5-character idle time, indicating the start of a frame |
| ADDR | Servo axis address: 1 to 247<br>**Note: 1 to 247 are decimal values and need to be converted to hexadecimal equivalents.** |
| CMD | Command code: 0x03 |
| DATA[0] | Register start address (high 8 bits): parameter group number of the start register<br>For example, for parameter H06.11, where 06 is the group number, DATA[0] is 0x06.<br>**Note: In this example, 06 is a hexadecimal value and needs no conversion.** |
| DATA[1] | Register start address (low 8 bits): offset within the parameter group of the start register<br>For example, for parameter H06.11, where 11 is the offset within the parameter group, DATA[1] is 0x0B.<br>**Note: In this example, 11 is a decimal value and needs to be converted to its hexadecimal equivalent 0x0B.** |
| DATA[2] | High 8 bits of the number of parameters to be read (hexadecimal), N(H) |
| DATA[3] | Low 8 bits of the number of parameters to be read (hexadecimal), N(L) |
| CRCL | CRC valid byte (low 8 bits) |
| CRCH | CRC valid byte (high 8 bits) |
| END | Equal to or greater than 3.5-character idle time, indicating the end of a frame |

Response frame format:

| Value | Description |
|---|---|
| START | Equal to or greater than 3.5-character idle time, indicating the start of a frame |
| ADDR | Servo axis address, hexadecimal |
| CMD | Command code: 0x03 |
| DATALENGTH | Number of parameter bytes, equal to twice the number of parameters to be read, that is, N x 2 |
| DATA[0] | Data of the first register parameter (high 8 bits) |
| DATA[1] | Data of the first register parameter (low 8 bits) |
| DATA[...] | ... |
| DATA[N x 2 — 2] | Data of the Nth register parameter (high 8 bits) |
| DATA[N x 2 — 1] | Data of the Nth register parameter (low 8 bits) |
| CRCL | CRC valid byte (low 8 bits) |

| Value | Description |
|---|---|
| CRCH | CRC valid byte (high 8 bits) |
| END | Equal to or greater than 3.5-character idle time, indicating the end of a frame |

Based on the Modbus RTU protocol, command code 0x06 is used to write 16-bit parameters. Command code 0x10 is used to write 32-bit parameters.

**Communication example**

- To read two-word data with H02.02 as the start register from the drive whose servo axis address is 01:
  The master sends the following request frame:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01 | 03 | 02 | 02 | 00 | 02 | CRCL | CRCH |

The slave returns the following response frame:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 01 | 03 | 04 | 00 | 01 | 00 | 00 | CRCL | CRCH |

The response frame indicates that the slave returns two-word (four-byte) data, the content of which is 0x0001 and 0x0000.

The slave may return the following response frame:

| | | | | |
|---|---|---|---|---|
| 01 | 83 | 02 | CRCL | CRCH |

The response frame indicates that a communication error occurs and the error code is 0x02. (0x83 indicates an error.)

- To read parameter H05.07 (32-bit) from the drive whose servo axis address is 01:
  The master sends the following request frame:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01 | 03 | 05 | 07 | 00 | 02 | CRCL | CRCH |

The slave returns the following response frame:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 01 | 03 | 04 | 00 | 01 | 00 | 00 | CRCL | CRCH |

The response frame indicates that the value of parameter H05.07 is 0x00000001.

## Command code for writing 16-bit parameters: 0x06

Caution

Do not write 32-bit parameters with the command code 0x06. Failure to comply can result in unexpected error.

Request frame format:

| Value | Description |
|---|---|
| START | Equal to or greater than 3.5-character idle time, indicating the start of a frame |
| ADDR | Servo axis address: 1 to 247<br>**Note: 1 to 247 are decimal values and need to be converted to hexadecimal equivalents.** |
| CMD | Command code: 0x06 |
| DATA[0] | Register start address (high 8 bits): parameter group number of the start register<br>For example, to write data to parameter H06.11, where 06 is the group number, DATA[0] is 0x06.<br>**Note: In this example, 06 is a hexadecimal value and needs no conversion.** |
| DATA[1] | Register start address (low 8 bits): offset within the parameter group of the start register<br>For example, to write data to parameter H06.11, where 11 is the offset within the parameter group, DATA[1] is 0x0B.<br>**Note: In this example, 11 is a decimal value and needs to be converted to its hexadecimal equivalent 0x0B.** |
| DATA[2] | High 8 bits of data to be written to the register (hexadecimal) |
| DATA[3] | Low 8 bits of data to be written to the register (hexadecimal) |
| CRCL | CRC valid byte (low 8 bits) |
| CRCH | CRC valid byte (high 8 bits) |
| END | Equal to or greater than 3.5-character idle time, indicating the end of a frame |

Response frame format:

| Value | Description |
|---|---|
| START | Equal to or greater than 3.5-character idle time, indicating the start of a frame |
| ADDR | Servo axis address, hexadecimal |
| CMD | Command code: 0x06 |
| DATA[0] | Register start address (high 8 bits): parameter group number of the start register<br>For example, to write data to parameter H06.11, where 06 is the group number, DATA[0] is 0x06.<br>**Note: In this example, 06 is a hexadecimal value and needs no conversion.** |
| DATA[1] | Register start address (low 8 bits): offset within the parameter group of the start register<br>For example, to write data to parameter H06.11, where 11 is the offset within the parameter group, DATA[1] is 0x0B.<br>**Note: In this example, 11 is a decimal value and needs to be converted to its hexadecimal equivalent 0x0B.** |
| DATA[2] | High 8 bits of data to be written to the register (hexadecimal) |

| Value | Description |
|---|---|
| DATA[3] | Low 8 bits of data to be written to the register (hexadecimal) |
| CRCL | CRC valid byte (low 8 bits) |
| CRCH | CRC valid byte (high 8 bits) |
| END | Equal to or greater than 3.5-character idle time, indicating the end of a frame |

**Communication example**

To write data 0x0001 to parameter H02.02 in the drive whose servo axis address is 01:

The master sends the following request frame:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01 | 06 | 02 | 02 | 00 | 01 | CRCL | CRCH |

The slave returns the following response frame:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01 | 06 | 02 | 02 | 00 | 01 | CRCL | CRCH |

The response frame indicates that data 0x0001 has been written to parameter H02.02 in the drive whose servo axis address is 01.

The slave may return the following response frame:

| | | | | |
|---|---|---|---|---|
| 01 | 86 | 02 | CRCL | CRCH |

The response frame indicates that a communication error occurs and the error code is 0x02. (0x86 indicates an error.)

## Command code for writing 32-bit parameters: 0x10

Caution

Do not write 16-bit parameters with the command code 0x10. Failure to comply can result in unexpected error.

Request frame format:

| Value | Description |
|---|---|
| START | Equal to or greater than 3.5-character idle time, indicating the start of a frame |
| ADDR | Servo axis address: 1 to 247<br>**Note: 1 to 247 are decimal values and need to be converted to hexadecimal equivalents.** |
| CMD | Command code: 0x10 |

| Value | Description |
|---|---|
| DATA[0] | Register start address (high 8 bits): parameter group number of the start register<br>For example, to write data to parameter H11.12, where 11 is the group number, DATA[0] is 0x11.<br>**Note: In this example, 11 is a hexadecimal value and needs no conversion.** |
| DATA[1] | Register start address (low 8 bits): offset within the parameter group of the start register<br>For example, to write data to parameter H11.12, where **12 is the offset within the parameter group**, DATA[1] is 0x0C.<br>**Note: In this example, 12 is a decimal value and needs to be converted to its hexadecimal equivalent 0x0C.** |
| DATA[2] | High 8 bits of the number of parameters to which data will be written (hexadecimal), M(H)<br>For example, to write data to parameter H05.07 alone, DATA[2] is 00, DATA[3] is 02, and M is H0002.<br>**One 32-bit parameter is counted as two words.** |
| DATA[3] | Low 8 bits of the number of parameters to which data will be written (hexadecimal), M(L) |
| DATA[4] | Number of bytes corresponding to data to be written to the register, that is, M x 2<br>For example, to write data to parameter H05.07 alone, DATA[4] is H04. |
| DATA[5] | High 8 bits of data to be written to the start register (hexadecimal) |
| DATA[6] | Low 8 bits of data to be written to the start register (hexadecimal) |
| DATA[7] | High 8 bits of data to be written to Start register address + 1 (hexadecimal) |
| DATA[8] | Low 8 bits of data to be written to Start register address +1 (hexadecimal) |
| CRCL | CRC valid byte (low 8 bits) |
| CRCH | CRC valid byte (high 8 bits) |
| END | Equal to or greater than 3.5-character idle time, indicating the end of a frame |

Response frame format:

| Value | Description |
|---|---|
| START | Equal to or greater than 3.5-character idle time, indicating the start of a frame |
| ADDR | Servo axis address, hexadecimal |
| CMD | Command code: 0x10 |
| DATA[0] | Register start address (high 8 bits): offset within the parameter group of the start register<br>For example, to write data to parameter H11.12, DATA[0] is 0x11. |

| Value | Description |
|---|---|
| DATA[1] | Register start address (low 8 bits): offset within the parameter group of the start register<br>For example, to write data to parameter H11.12, DATA[1] is 0x0C. |
| DATA[2] | High 8 bits of the number of parameters to which data will be written (hexadecimal), M(H) |
| DATA[3] | Low 8 bits of the number of parameters to which data will be written (hexadecimal), M(L) |
| CRCL | CRC valid byte (low 8 bits) |
| CRCH | CRC valid byte (high 8 bits) |
| END | Equal to or greater than 3.5-character idle time, indicating the end of a frame |

## Error response frame

Error frame response format:

| Value | |
|---|---|
| START | Equal to or greater than 3.5-character idle time, indicating the start of a frame |
| ADDR | Servo axis address, hexadecimal |
| CMD | Command code: 0x80 |
| DATA[0] to DATA[3] | DATA error code |
| CRCL | CRC valid byte (low 8 bits) |
| CRCH | CRC valid byte (high 8 bits) |
| END | Equal to or greater than 3.5-character idle time, indicating the end of a frame |

Error codes:

| Error Code | Description |
|---|---|
| 0x0001 | Invalid command code |
| 0x0002 | Invalid data address |
| 0x0003 | Invalid data |
| 0x0004 | Slave device fault |

## 32-bit parameter addressing

When Modbus commands are used to read/write 32-bit parameters, the communication address is determined by the address of the parameter with the smaller offset number. Two parameters are operated per operation. See the following examples.

## Note

In the following examples, the servo axis address is 01 by default.

- The Modbus command for reading parameter H11.12 (1st displacement) is as follows.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01 | 03 | 11 | 0C | 00 | 02 | CRCL | CRCH |

If the "1st displacement" is 0x40000000 (decimal equivalent: 1073741824), the following response frames apply.

- When H0C.26 is set to 1 (Low 16 bits before high 16 bits), the response frame is as follows.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 01 | 03 | 04 | 00 | 00 | 40 | 00 | CRCL | CRCH |

- When H0C.26 is set to 0 (High 16 bits before low 16 bits), the response frame is as follows.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 01 | 03 | 04 | 40 | 00 | 00 | 00 | CRCL | CRCH |

- The Modbus command for writing 0x12345678 to parameter H11.12 (1st displacement) is as follows.
  - When H0C.26 is set to 1 (Low 16 bits before high 16 bits), the response frame is as follows.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 10 | 11 | 0C | 00 | 02 | 04 | 56 | 78 | 12 | 34 | CRCL | CRCH |

- When H0C-26 is set to 0 (High 16 bits before low 16 bits), the response frame is as follows.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 10 | 11 | 0C | 00 | 02 | 04 | 12 | 34 | 56 | 78 | CRCL | CRCH |

- The Modbus command for writing 0x00100000 (decimal equivalent: 1048576) to the 32-bit parameter H05.07 is as follows.
  When H0C.26 is set to 0 (High 16 bits before low 16 bits), the response frame is as follows.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 10 | 05 | 07 | 00 | 02 | 04 | 00 | 00 | 00 | 10 | CRCL | CRCH |

### CRC check

The host controller and the servo drive must use the same CRC algorithm during communication. Otherwise, a CRC error will occur. The SV670P series servo drive uses 16-bit CRC with low bytes placed before high bytes. The polynomial used for CRC is $X^{16} + X^{15} + X^2 + 1$ (0xA001).

```
Uint16 COMM_CrcValueCalc(const Uint8 *data, Uint16 length)
{
  Uint16 crcValue = 0xffff;
  int16 i;
  while (length--)
  {
    crcValue ^= *data++;
    for (i = 0; i < 8; i++)
    {
      if (crcValue & 0x0001)
      {
        crcValue = (crcValue >> 1) ^ 0xA001;
      }
      else
      {
        crcValue = crcValue >> 1;
      }
    }
  }
  return (crcValue);
}
```

## 3.4 Communication Parameters

| Para. | Default Value | Description | Remarks |
|---|---|---|---|
| H0E.00 | 1 | Drive axis address | - |
| H0E.80 | 9 | Serial baud rate | 9: 115200 bps |

| Para. | Default Value | Description | Remarks |
| --- | --- | --- | --- |
| H0E.81 | 3 | Modbus communication data format | 3: No parity, 1 stop bit (8-N-1) |
| H0E.84 | 1 | Modbus communication data sequence | 0: High bits before low bits<br>1: Low bits before high bits |

# 4 CAN Communication

## 4.1 CANlink Communication

### 4.1.1 Overview

CANlink is a communication protocol developed by Inovance for embedded systems used in automation. CANlink implements layers including the network layer in the OSI model. The underlying protocol implementing the data link layer and the physical layer is typically Controller Area Network (CAN).

CANlink communication supports network management, device monitoring, and node communication. CANlink supports the master/slave mode (one master to multiple slaves). The address of each master/slave must be in the range of 1 to 63 and must be unique.

The SV670P series servo drive can only act as the slave.

### 4.1.2 Communication Parameters

To use the CANlink function of the SV670P series servo drive, set the following parameters.

Table 4–1 Parameters for CANlink system setting

| Para. | Name | Value Range | Default |
|---|---|---|---|
| H0E.00 | Node address | 1 to 127 | 1 |
| H0E.10 | CAN mode selection | 0: Pulse<br>1: Enhanced axis control<br>2: CANopen | 1 |
| H0E.11 | CAN communication rate | 0: 20 kbps<br>1: 50 kbps<br>2: 100 kbps<br>3: 125 kbps<br>4: 250 kbps<br>5: 500 kbps<br>7: 1 Mbps | 5 |

## Note

- To use the function of axis control commands, set H0E.10 to 0.
- To use the function of enhanced axis control commands, set H0E.10 to 1 and H11.00 to 5.
- To use the function of CiA402 motion control in CANopen, set H0E.10 to 2 and H02.00 to 8.
- To execute local control functions through CANopen communication, set H0E.10 to 2 and H02.00 to a value other than 8.

# 4.2 CANopen Communication

## 4.2.1 Overview of CANopen Protocol

CANopen is an application layer protocol of the network transmission system based on CAN serial bus. It complies with the ISO/OSI standard model. Devices in the network exchange data through the object dictionaries or objects. The master node obtains or modifies data in the object dictionaries of other nodes through PDOs or SDOs. The CANopen device model is shown in the following figure.

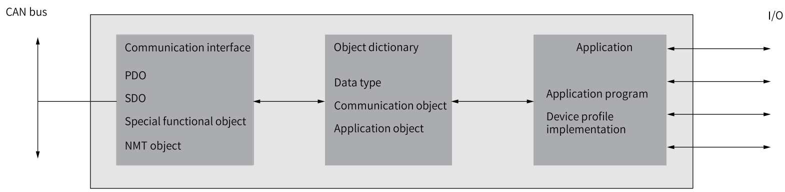



Figure 4-1 CANopen device model

## 4.2.2 Communication Parameters

To connect the SV670P series servo drive to the CANopen fieldbus network, set related parameters of the servo drive properly.

CANopen system setting parameters

See *" H02.00" on page 123* for details.

See *" H0E.00" on page 263* for details.

See *" H0E.01" on page 263* for details.

See *" H0E.10" on page 264* for details.

See *" H0E.11" on page 264* for details.

# 4.3 Hardware Configuration

## Terminal layout

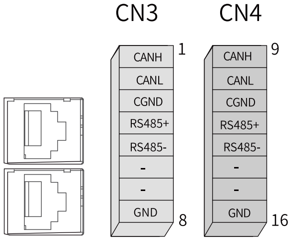



Figure 4-2 Communication terminal pin arrangement of the servo drive

Table 4–2 Description of communication terminal pins

| Pin No. | Name | Description |
|---|---|---|
| 1 and 9 | CANH | CAN communication port |
| 2 and 10 | CANL | |
| 3 and 11 | CGND | CAN communication ground |
| 4 and 12 | RS485+ | RS485 communication port |
| 5 and 13 | RS485− | |
| 6 and 14 | - | - |
| 7 and 15 | - | - |
| 8 and 16 | GND | Ground |
| Enclosure | PE | Shield |

## Connection for drive-to-PLC CAN communication

The following figure shows the cable used for CAN communication between the servo drive and PLC.

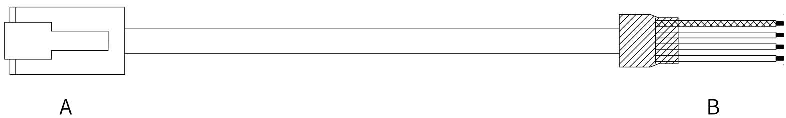



Figure 4-3 Diagram of the drive-to-PLC communication cable

Use three-conductor shielded cables as the CAN bus. The servo drive comes with three cables for connection to the CANH, CANL, and CGND (CGND is used for isolated RS485 circuits) terminals. Connect the twisted pairs to the CANH and CANL terminals. Connect the CGND terminal to the CAN reference ground. Connect the shield to the device ground. Connect 120 Ω termination resistors only at the head and tail ends of the bus to prevent CAN signal reflection.

Table 4–3 Connection of pins of the drive-to-PLC communication cable

| RJ45 on the Drive (A) | | | PLC Side (B) | | |
|---|---|---|---|---|---|
| Communication Type | Pin No. | Name | Communication Type | Pin No. | Name |
| CAN | 1 | CANH | CAN | 1 | CANH |
| | 2 | CANL | | 2 | CANL |
| | 3 | CGND | | 3 | CGND |
| - | Enclosure | PE (shield) | - | Enclosure | PE (shield) |

## Connection for multi-drive CAN communication

The following figure shows the cable used for multi-drive CAN communication.

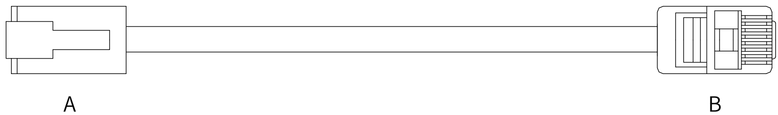



Figure 4-4 Diagram of the multi-drive communication cable

Table 4–4 Connection of pins of the multi-drive communication cable (only CAN pins used)

| RJ45 on a Drive (A) | | | RJ45 on Another Drive (B) | | |
|---|---|---|---|---|---|
| Communication Type | Pin No. | Name | Communication Type | Pin No. | Name |
| CAN | 1 | CANH | CAN | 1 | CANH |
| | 2 | CANL | | 2 | CANL |
| | 3 | CGND | | 3 | CGND |
| - | Enclosure | PE (shield) | - | Enclosure | PE (shield) |

Use the daisy chain mode for CAN bus, as shown in the following figure.

- Use shielded twisted pairs as the CAN bus. Use twisted pairs for CANH and CANL connection.
- Connect 120 Ω termination resistors only at both ends of the bus to prevent signal reflection.
- Connect the CAN signal reference grounds of all the nodes together.
- Up to 64 nodes can be connected.

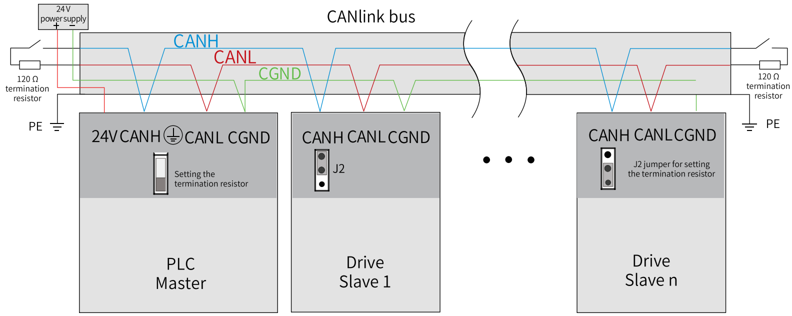



Figure 4-5 CAN bus topology

**Caution**

Do not connect the CGND terminal of the host controller to the GND terminal of the servo drive. Otherwise, the servo drive may be damaged.

# 4.4 Data Frame Structure

## 4.4.1 Network Management (NMT) System

The NMT system is used to initialize, start, and stop the network and devices in the network. It is a type of master-slave system. A CANopen network includes only one NMT master. The CANopen network, including the master itself, can be configured.

### NMT service

CANopen works according to the state machine specified by the protocol. Some states are converted automatically and some must be converted through NMT messages transmitted by the NMT master, as shown below.

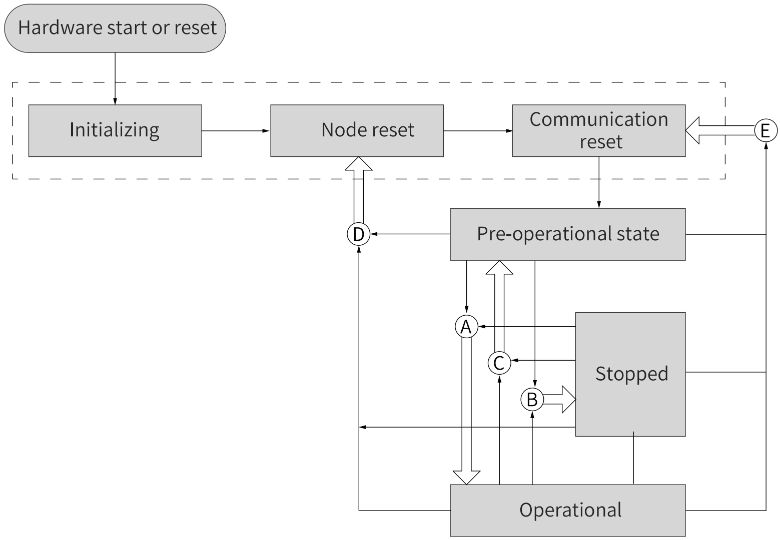



Figure 4-6 Execution process of the NMT state machine

In the figure above, conversion marked with a letter is implemented through NMT messages. Only the NMT master can transmit NMT control messages. The message format is shown in *"Table 4–5 " on page 40*.

Table 4–5 NMT message format

| COB-ID | RTR | Data/Byte | |
|---|---|---|---|
| | | 0 | 1 |
| 0x000 | 0 | Command word | Node_ID |

The COB-ID of an NMT message is always "0x000".

The data segment contains two bytes. The first byte is a command word indicating that this frame is for control purpose. See *"Table 4–6 " on page 40* for details.

The second byte (Node_ID) is the CANopen node address. The byte value 0 indicates that it is a broadcast message to all the slaves in the network.

Table 4–6 NMT message command

| Command Word | Conversion Code | Description |
|---|---|---|
| 0x01 | A | Instruction for starting a remote node |
| 0x02 | B | Instruction for stopping a remote node |
| 0x80 | C | Instruction for entering the pre-operational state |

| Command Word | Conversion Code | Description |
|---|---|---|
| 0x81 | D | Instruction for resetting a node |
| 0x82 | E | Instruction for resetting communication |

After power-on, the device automatically enters the initialization state, including initializing, node reset, and communication reset. During initializing, parameters of each mode are loaded. During node reset, the manufacturer-defined area and profile area of the object dictionary are restored to values saved last time. During communication reset, communication parameters in the object dictionary are restored to values saved last time.

Next, the device sends Boot-up and enters the pre-operational state, which is the main configuration node state.

After configuration is done, the node device can enter the operational state only after the NMT master sends the NMT message. The operational state means that the CANopen is working properly, with every module working properly.

When the NMT master sends a node stop message, the device enters the stop state and only the NMT module is working in CANopen communication.

The following table lists CANopen services available in different NMT states.

Table 4–7 Services supported in different NMT states

| Service | Pre-operational | Operational | Stop |
|---|---|---|---|
| Process data object (PDO) | No | Yes | No |
| Service data object (SDO) | Yes | Yes | No |
| Synchronization (SYNC) object | Yes | Yes | No |
| Emergency (EMCY) message | Yes | Yes | No |
| Network management (NMT) system | Yes | Yes | Yes |
| Error control | Yes | Yes | Yes |

### NMT error control

NMT error control is used to detect whether devices in the network are online and device status, including node guarding, life guarding, and heartbeat.

## Note

- Life guarding and heartbeat cannot be used at the same time.
- Set the node guarding, life guarding, and heartbeat time to large values to prevent excessive network load.

- **Node/life guarding**

  In node guarding, the NMT master periodically checks the status of an NMT slave through remote frames. In life guarding, a slave indirectly monitors the status of the master based on the interval of remote frames the slave receives for slave monitoring. Node guarding complies with the master/slave model. Every remote frame must be responded.

  Objects related to node/life guarding include guarding time 100Ch and life factor 100Dh. The value of 100Ch is the remote frame interval (ms) of node guarding under normal conditions. The product of 100Ch multiplied by 100Dh determines the latest time of master query. Node guarding is available normally. When 100Ch and 100Dh of a node are non-zero values and a node guarding request frame is received, life guarding will be activated.

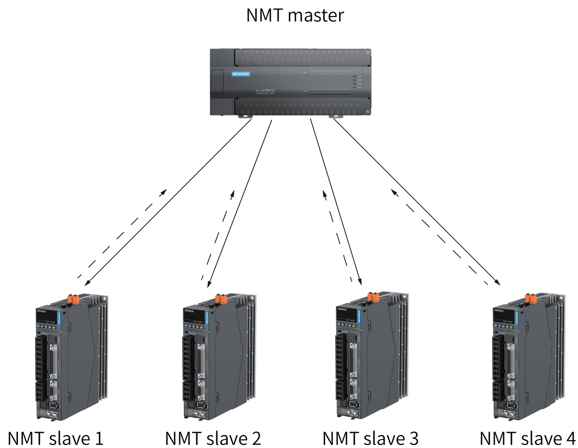



Figure 4-7 Description of node guarding

As shown in the figure above, the master sends node guarding remote frames at the interval defined by 100Ch, and the slave must respond to the remote frames. Otherwise, the slave is considered to be offline.

If the slave does not receive any node guarding remote frame within the time defined by 100Ch × 100Dh, the master is considered to be offline.

The following table describes the remote frame sent by the NMT master.

Table 4–8 Node guarding remote frame message

| COB-ID | RTR |
|---|---|
| 0x700+Node_ID | 1 |

The following table describes the response message returned by the NMT slave. The data segment is a status word consisting of one byte.

Table 4–9 Node guarding response message

| COB-ID | RTR | Data |
|---|---|---|
| 0x700+Node-ID | 0 | Status word |

Table 4–10 Description of response message state

| Data bit | Description |
|---|---|
| Bit 7 | Set to 0 or 1 alternatively. |
| Bit 6 to bit 0 | 4: Stop<br>5: Operational state<br>127: Pre-operation state |

Caution

It is recommended that the guarding time (100Ch) be at least 10 ms. The life factor must be greater than or equal to 2.

- **Heartbeat**

  The heartbeat mode adopts the producer-consumer model. CANopen devices can send heartbeat messages based on the cycle (ms) defined by the producer heartbeat interval object (1017h). A network always includes a node configured with the consumer heartbeat function. Such a node monitors the producer based on the consumer time defined by object 1016h. If the node does not receive any producer heartbeat within the consumer heartbeat time, the corresponding producer is considered to be faulty.

  After the producer heartbeat interval (1017h) is configured, the node heartbeat function is activated and a heartbeat message is generated. After a valid sub-index is configured for consumer heartbeat (1016h) and a heartbeat frame is received from the corresponding node, monitoring starts.

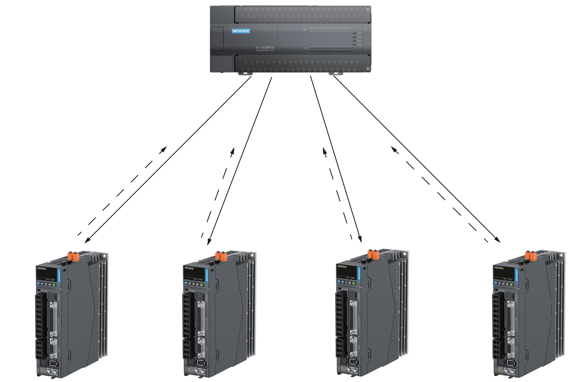



Figure 4-8 Heartbeat diagram

The master sends heartbeat messages based on the producer time. If the slave that monitors the master does not receive any heartbeat message within the time defined by the sub-index of 1016h, the master is considered to be offline. The time of the sub-index of 1016h must be longer than or equal to the master producer time multiplied by 1.8. Otherwise, a false report indicating the master is offline may occur.

The slave sends heartbeat messages at the interval defined by 1017h. If the master (or other slave) that monitors the slave does not receive any heartbeat message within the consumer time, the slave is considered to be offline. If 1017h multiplied by 1.8 is less than or equal to the consumer time of the master (or other slaves) that monitors the slave, a false report indicating the slave is offline may be reported.

The following table describes the format of a heartbeat message. The data segment contains only one byte. The most significant bit is permanently set to 0 and other bits are consistent with the response message status of node guarding, as shown in the following table.

Table 4–11 Heartbeat message

| COB-ID | RTR | Data |
|---|---|---|
| 0x700+Node-ID | 0 | Status word |

The SV670P series servo drive is both a heartbeat producer and a heartbeat consumer. It can serve as the heartbeat consumer for up to five different nodes at the same time. It is recommended that the heartbeat producer time be set to a value not less than 20 ms and the consumer heartbeat time be set to a value not less than 40 ms and greater than 1.8 times the producer heartbeat time.

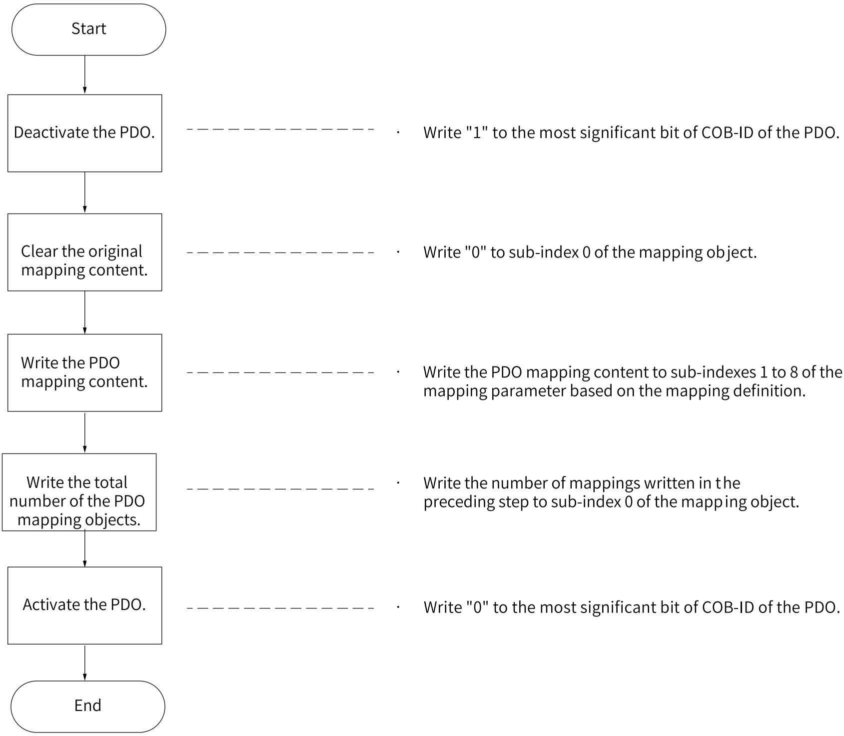
### 4.4.2 Service Data Object (SDO)

The SDO is linked to the object dictionary through the object index and sub-index. Through the SDO, you can view the object content in the object dictionary or modify the object data if allowed.

### 4.4.3 Process Data Object (PDO)

The PDO is used to transmit real-time data. It is the major data transmission mode in CANopen. PDO transmission features high speed as no response is required and the PDO may consist of fewer than eight bytes.

The following figure shows the PDO mapping configuration process.




#### PDO transmission framework

PDO transmission complies with the producer- consumer model. In the CAN bus network, the TPDO generated by a producer may be received by one or multiple consumer RPDOs in the network based on the COB-ID. The transmission model is shown in the following figure.

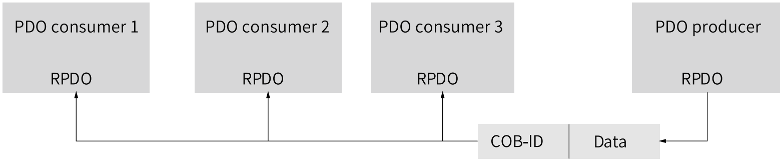



Figure 4-9 PDO transmission model

CANopen communication in SV670P series servo drives only supports point-to-point PDO transmission.

## PDOs

PDOs can be divided into RPDOs and TPDOs. The final PDO transmission mode and content are determined by communication parameters and mapping parameters. The SV670P series servo drive uses four RPDOs and four TPDOs to transmit the PDO. The following table lists the related objects.

Table 4–12 PDOs of SV670P servo drives

| Name | | COB-ID | Communication Object | Mapping Object |
|---|---|---|---|---|
| RPDO | 1 | 200h+Node_ID | 1400h | 1600h |
| | 2 | 300h+Node_ID | 1401h | 1601h |
| | 3 | 400h+Node_ID | 1402h | 1602h |
| | 4 | 500h+Node_ID | 1403h | 1603h |
| TPDO | 1 | 180h+Node_ID | 1800h | 1A00h |
| | 2 | 280h+Node_ID | 1801h | 1A01h |
| | 3 | 380h+Node_ID | 1802h | 1A02h |
| | 4 | 480h+Node_ID | 1803h | 1A03h |

## PDO communication parameters

- **CAN identifiers of PDOs**

  The CAN identifier of a PDO, namely COB-ID of a PDO, includes a control bit and identifier data. It determines the bus priority of the PDO.

  The COB-ID is indicated in sub-index 01 of communication parameters (RPDO: 1400h to 1403h; TPDO: 1800h to 1803h). Its most significant bit decides whether the PDO is valid.

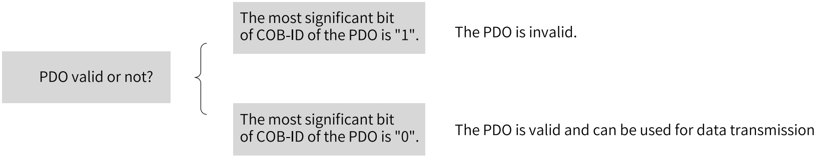



Figure 4-10 Description of PDO states

The SV670P servo drive only supports point-to-point PDO transmission. Therefore, the seven least significant bits of the COB-ID must be the station address of the node.

Example:

For the node whose station No. is 4, when TPDO3 is invalid, its COB-ID is 80000384h. When 384h is written to the COB-ID, it indicates that the PDO is activated.

- **PDO transmission types**

  The PDO transmission type is indicated in sub-index 02h of communication parameters (RPDO: 1400h to 1403h, TPDO: 1800h to 1803h). It determines the mode in which the PDO is transmitted.

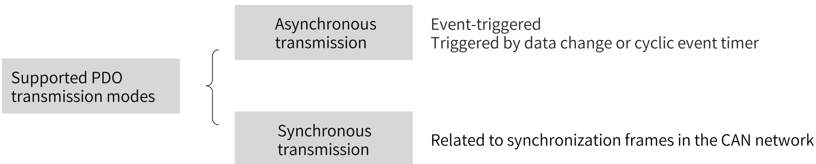



Figure 4-11 Supported PDO transmission modes

Different values of sub-index 02 of communication parameters (RPDO: 1400h to 1403h, TPDO: 1800h to 1803h) stand for different transmission types. This sub-index defines the method of triggering TPDO transmission or processing received RPDOs. The following table lists the specific relationships.

Table 4–13 Methods of triggering TPDOs and RPDOs

| Value of Communication Type | Synchronous | | Asynchronous |
|---|---|---|---|
| | Cyclic | Acyclic | |
| 0 | - | √ | - |
| 1 to 240 | √ | - | - |
| 241 to 253 | - | | |
| 254, 255 | - | - | √ |

- In TPDO transmission type 0, the TPDO is transmitted when the mapping data changes and a synchronization frame is received.
- In TPDO transmission types 1 to 240, the TPDO is transmitted when a specified number of synchronization frames are received.
- In TPDO transmission type 254 or 255, the TPDO is transmitted when the mapping data changes or when the event timer expires.
- In RPDO transmission types 0 to 240, the latest data of the RPDO is updated to the application once a synchronization frame is received. In RPDO transmission type 254 or 255, the received data is directly updated to the application.

- **Inhibit time**

  The inhibit time is set for TPDOs and is saved to sub-index 03h of communication parameters (1800h to 1803h) to prevent the CAN network from being continuously occupied by PDOs with lower priorities. After the inhibit time (unit: 100 us) is set, the transmission interval of one TPDO must be longer than or equal to the inhibit time.

  Example: If the inhibit time of TPDO2 is 300 ms, the transmission interval of TPDOs must not be shorter than 30 ms.

- **Event timer**

  For TPDOs transmitted in asynchronous mode (transmission type 254 or 255), an event timer is defined in sub-index 05 of communication parameters (1800h to 1803h). The event timer can be considered as a trigger event. It also triggers corresponding TPDO transmission. If another event, for example, data change, occurs in the operation cycle of the event timer, the TPDO is triggered and the event timer is reset immediately.

## PDO mapping parameters

PDO mapping parameters include pointers of process data corresponding to PDOs to be sent or received, including index, sub-index, and mapping object length. The length of each PDO data can be up to eight bytes and one or multiple objects can be mapped. Sub-index 00 records the number of objects mapped by the PDO and sub-indexes 01 to 08 are the mapping content.

The following description takes 1600h as an example.

Table 4–14 Description of PDO mapping relation

| Index | Sub-index | Description |
|---|---|---|
| 1600h | 00 | Number of mapping objects |
| | 01 | Content of mapping parameter |
| | ... | |
| | 08 | |

Table 4–15 Definition of PDO mapping parameters

| Bit | 31 | ... | 16 | 15 | ... | 8 | 7 | ... | 0 |
|---|---|---|---|---|---|---|---|---|---|
| Meaning | Index | | | Sub-index | | | Object length | | |

The index and sub-index together define the position of an object in the object dictionary. The object length indicates the bit length of the object and is expressed in hexadecimal, as shown below.

Table 4–16 Relation between object length and object bit length

| Object Length | Bit Length |
|---|---|
| 08h | 8 bits |
| 10h | 16 bits |
| 20h | 32 bits |

Example: The mapping parameter of the 16-bit command word 6040.00h is 60400010h.

The following example describes the PDO mapping relation.

**Example:**

RPDO1 maps the following three parameters.

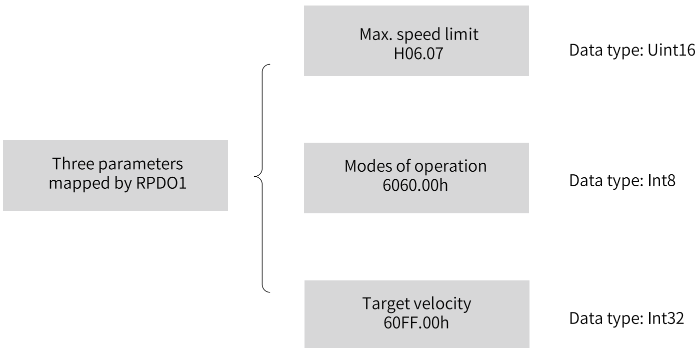



Figure 4-12 Example of PDO1 mapping relation

The total length of mapping is seven bytes (2+1+4), that is, there are seven bytes in the data segment of RPDO1 during transmission. The mapping relation is shown in the following figure.

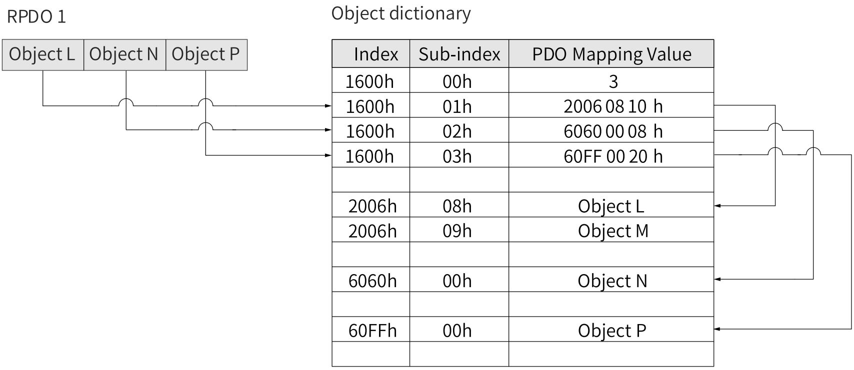



Figure 4-13 Example of RPDO mapping relation

The mapping mode of TPDO is the same as that of RPDO, but in the opposite direction. The RPDO decodes the input based on the mapping relation. The TPDO encodes the output based on the mapping relation.

Example:

TPDO2 maps the following two parameters.

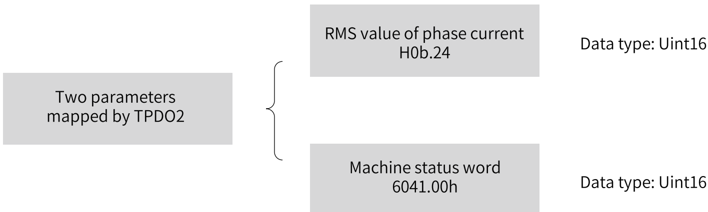



Figure 4-14 Example of TPDO2 mapping relation

The total length of mapping is four bytes (2+2), that is, there are four bytes in the data segment of TPDO2 during transmission. The mapping relation is shown in the following figure.

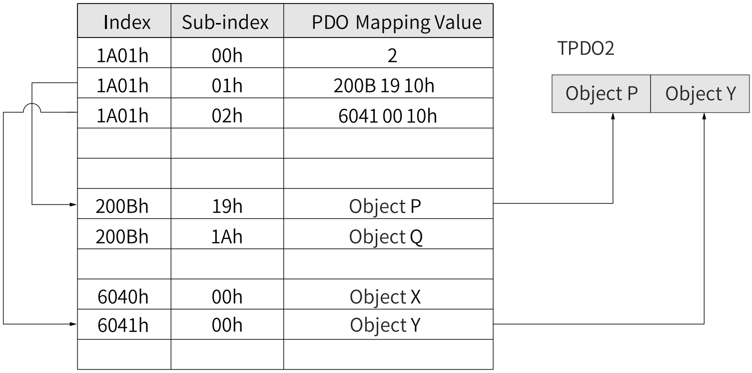



Figure 4-15 Example of TPDO mapping relation

### 4.4.4 Synchronization (SYNC) Object

The synchronization (SYNC) object is a special mechanism used to control harmony and synchronization between transmission and reception of multiple nodes. It is used for synchronous transmission of PDOs.

The following figure shows the process of configuring the SYNC generator.

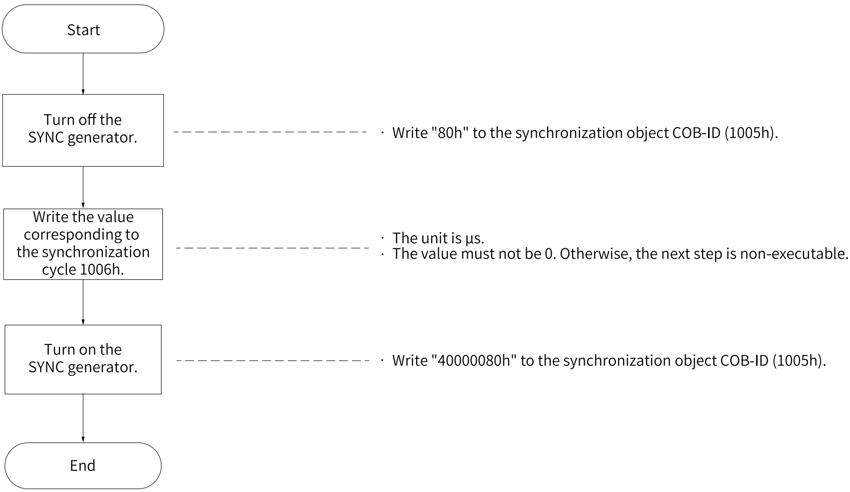



Figure 4-16 SYNC generator configuration process

## *Note*

The SV670P servo drive does not support SYNC generators with a cycle shorter than 500 us. A synchronization cycle shorter than 1 ms is not recommended.

### SYNC generator

The SV670P servo drive is both a SYNC consumer and a SYNC producer. Synchronization-related objects are the SYNC object COB-ID (1005h) and the SYNC cycle (1006h).

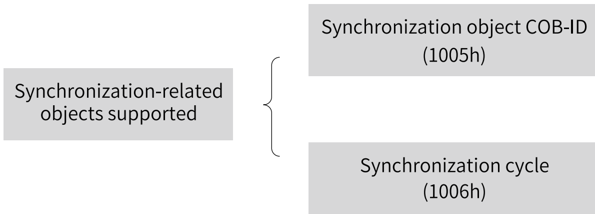



Figure 4-17 Description of synchronization-related objects supported

The second most significant bit of the synchronization object COB-ID determines whether to activate the SYNC generator.

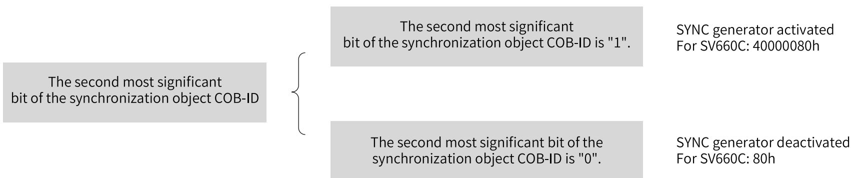



Figure 4-18 Activating the SYNC generator

The SYNC cycle (unit: us) is used for the SYNC generator only. It indicates the interval at which a node generates synchronization objects.

### SYNC object transmission framework

Similar to PDO transmission, SYNC objects are transmitted based on the producer-consumer model. The SYNC producer sends a SYNC frame, and other nodes in the CAN network receive the frame as consumers, without providing any feedback. Only one SYNC generator can be activated in one CAN network. The following figure shows the framework of SYNC object transmission.

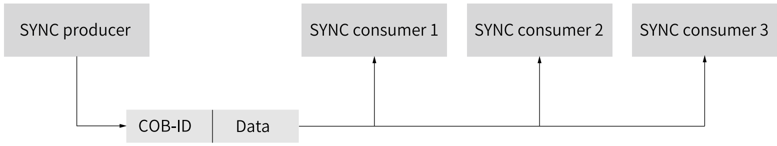



Figure 4-19  Synchronization transmission framework

Transmission of synchronization PDOs is closely related to synchronization frames.

- For a synchronization RPDO, the received PDO, once received, will be updated to the application in the next synchronization.
- A synchronization TPDO can be transmitted in the cyclic/acyclic synchronization mode.

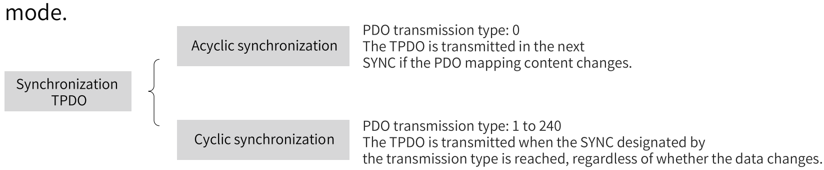



Figure 4-20  Description of synchronization TPDO

The following figure shows the synchronous transmission model.

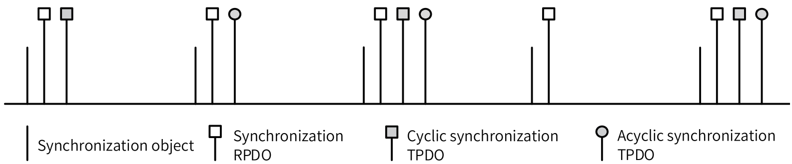



Figure 4-21  Synchronous transmission model

Example:

The transmission types of RPDO1, RPDO2, TPDO1, and TPDO2 are 0, 5, 0, and 20, respectively. Once RPDO1 and RPDO2 receive a PDO, the latest PDO data will be updated to the corresponding application in the next synchronization. In contrast, TPDO1 will be sent in the next synchronization only if the mapping data of TPDO1 changes. PDOs will be sent after TPDO2 experiences 20 SYNCs, regardless of whether the data changes.

### 4.4.5 Emergency (EMCY) Object Service

When an error occurs in a CANopen node, the node sends an EMCY message according to the standard mechanism. The EMCY message complies with the producer-consumer model. After the node fault is sent, other nodes in the CAN network may handle the fault. The SV670P series servo drive only acts as an EMCY message producer, and does not process EMCY messages from other nodes.

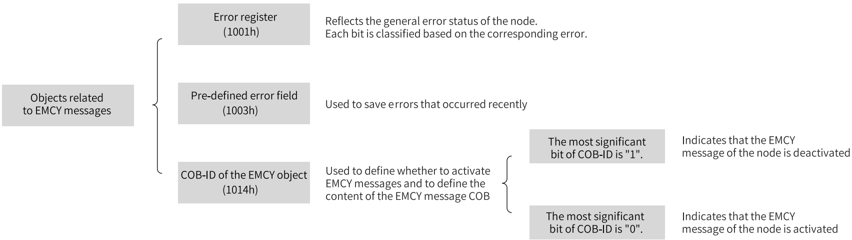



Figure 4-22 Description of objects related to EMCY messages

When a fault occurs on the node, the error register and the pre-defined error field must be updated regardless of whether the EMCY object is activated. The content of the EMCY message follows the following specifications.

Table 4–17 Specifications of the content of an EMCY message

| COB-ID | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 80h+Node_ID | Error code | | Error register | Re served | Auxiliary byte | | | |

- The error register is always consistent with 1001h.
- When a communication error occurs, the error code is consistent with DS301 requirements and the auxiliary byte is 0.
- When an error described in the DSP402 sub-protocol occurs on the servo drive, the error code is consistent with DS402 requirements and corresponds to the object 603Fh. The auxiliary byte shows extra descriptions.
- When an error specified by the user occurs on the servo drive, the error code is 0xFF00 and the auxiliary byte shows the error code specified by the user.

## 4.4.6 SDO Transmission Message

The SDO can be transmitted using data with no more than four bytes or data with more than four bytes. For the former, the expedited SDO transmission mode is adopted. For the latter, the segmented or block transmission mode is adopted.

The SV670P series servo drive supports expedited SDO transmission and segmented transmission.

An SDO transmission message is comprised of a COB-ID and a data segment. As shown in the following table, the COB-ID of T_SDO is different from that of R_SDO.

The data segment adopts the little endian mode (low bits before high bits). Every data segment of an SDO message must consist of eight bytes. The following table describes the format of SDO transmission messages.

Table 4–18 Format of an SDO transmission message

<table>
<tr><th>COB-ID</th><th colspan="8">Data (Data Segment)</th></tr>
<tr><td>580h+Node_ID</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>600h+Node_ID</td><td>Command code</td><td colspan="2">Index</td><td>Sub-index</td><td colspan="4">Data</td></tr>
</table>

The command code specifies the transmission type and transmission data length of the SDO. The index and sub-index indicate the position of the object in the list. The data indicates the value of the object.

## Write message in the expedited SDO mode

Expedited SDO transmission is used for reading/writing object data with no more than four bytes. The transmission message varies the read/write mode and data length. The following table describes the write message in the expedited SDO mode.

Table 4–19 Write message in the expedited SDO mode

<table>
<tr><th colspan="2"></th><th>COB-ID</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td colspan="2" rowspan="4">Client→</td><td rowspan="4">600h+Node_ID</td><td>23h</td><td colspan="2" rowspan="4">Index</td><td rowspan="4">Sub-index</td><td colspan="4">Data</td></tr>
<tr><td>27h</td><td colspan="3">Data</td><td>-</td></tr>
<tr><td>2bh</td><td colspan="2">Data</td><td>-</td><td>-</td></tr>
<tr><td>2fh</td><td>Data</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">←Server</td><td>Normal</td><td rowspan="2">580h+Node_ID</td><td>60h</td><td colspan="2" rowspan="2">Index</td><td rowspan="2">Sub-index</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Abnormal</td><td>80h</td><td colspan="4">Abort code</td></tr>
</table>

## *Note*

"-" indicates that data exists but is not considered. It is recommended that value 0 be written for the data. The same rule applies to the following descriptions in this section.

Example:

Assume that the slave station No. is 4. To use the SDO mode to write a value 1000 (namely 0x3E8) to parameter 60FF.00h (target velocity in the speed control mode), the master sends a message as shown in the following table. (All data are in hexadecimal format.)

Table 4–20 Example of a message sent by the master

| COB-ID | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 604 | 23 | FF | 60 | 00 | E8 | 03 | 00 | 00 |

If the write operation is normal, the servo drive returns the following message.

Table 4–21 Example of a message returned by the servo drive upon normal write operation

| COB-ID | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 584 | 60 | FF | 60 | 00 | 00 | 00 | 00 | 00 |

If the type of the data written does not match, the fault code 0x06070010 is returned. The message is as follows.

Table 4–22 Example of a message returned upon mismatch of the written data type

| COB-ID | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 584 | 80 | FF | 60 | 00 | 10 | 00 | 07 | 06 |

## Read message in the expedited SDO mode

The expedited mode is used for reading object data with no more than four bytes. The following table describes the read message in the expedited SDO mode.

Table 4–23 Structure of the start message in SDO transmission

<table>
<tr><th colspan="2"></th><th>COB-ID</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td colspan="2">Client→</td><td>600h+Node_ID</td><td>40h</td><td colspan="2">Index</td><td>Sub-index</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">←Server</td><td>Normal</td><td rowspan="2">580h+Node_ID</td><td>41h</td><td colspan="2" rowspan="2">Index</td><td rowspan="2">Sub-index</td><td colspan="4">Data length</td></tr>
<tr><td>Abnormal</td><td>80h</td><td colspan="4">Abort code</td></tr>
</table>

During transmission, the trigger bit (bit 6) of the command code transmits 0 or 1 alternatively. This rule must be maintained so that the slave can respond to the message. The message structure during transmission is shown in the following table.

Table 4–24 Structure of a message during SDO transmission

<table>
<tr><th colspan="2"></th><th>COB-ID</th><th>0</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th></tr>
<tr><td colspan="2">Client→</td><td>600h+Node_ID</td><td>60h</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">←Server</td><td>Normal</td><td rowspan="2">580h+Node_ID</td><td>00h</td><td colspan="7">Data length</td></tr>
<tr><td>Abnormal</td><td>80h</td><td>Index</td><td></td><td>Sub-index</td><td colspan="4">Abort code</td></tr>
<tr><td colspan="2">Client→</td><td>600h+Node_ID</td><td>70h</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td rowspan="2">←Server</td><td>Normal</td><td rowspan="2">580h+Node_ID</td><td>10h</td><td colspan="7">Data length</td></tr>
<tr><td>Abnormal</td><td>80h</td><td>Index</td><td></td><td>Sub-index</td><td colspan="4">Abort code</td></tr>
</table>

The response packet for the end frame transmitted in the segmented mode includes the identifier and valid data length of the end frame. The transmission message structure is shown in the following table.

Table 4–25 Structure of the end frame in SDO segmented transmission

| | | COB-ID | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|
| Client→ | | 600h+Node_ID | 60h/70h | Index | | Sub-index | - | - | - | - |
| ←Server | Normal | 580h+Node_ID | 01h/11h | Data | | | | | | |
| | | | 03h/13h | Data | | | | | | - |
| | | | 05h/15h | Data | | | | | - | - |
| | | | 07h/17h | Data | | | | - | - | - |
| | | | 09h/19h | Data | | | - | - | - | - |
| | | | 0Bh/1Bh | Data | | - | - | - | - | - |
| | | | 0Dh/1Dh | Data | - | - | - | - | - | - |
| | Abnormal | | 80h | Index | | Sub-index | Abort code | | | |

## 4.4.7 SDO Transmission Framework

SDO transmission complies with the client-server mode, that is, one initiates a request and the other responds to the request. An SDO client in the CAN bus network initiates a request and the SDO server responds to the request. Therefore, data exchange between SDOs requires at least two CAN messages and the CAN identifiers of the two CAN messages must be different. The SDO transmission model is shown in the following figure.

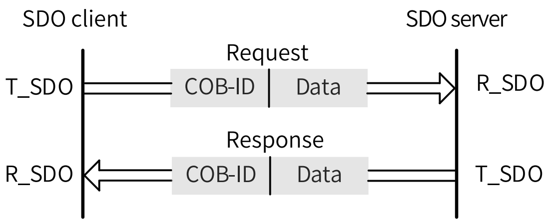



Figure 4-23 An SDO client reading/writing object words from/to an SDO server

# 5 Communication Configuration Instance

## 5.1 Connecting SV670C Servo Drive to Schneider 3S Master

This section takes the position control mode as example. For details on the position control mode, see section "Position Control Mode" in SV670P Series Servo Drive Function Guide.

In the position control mode, objects used as PDOs are allocated as follows.

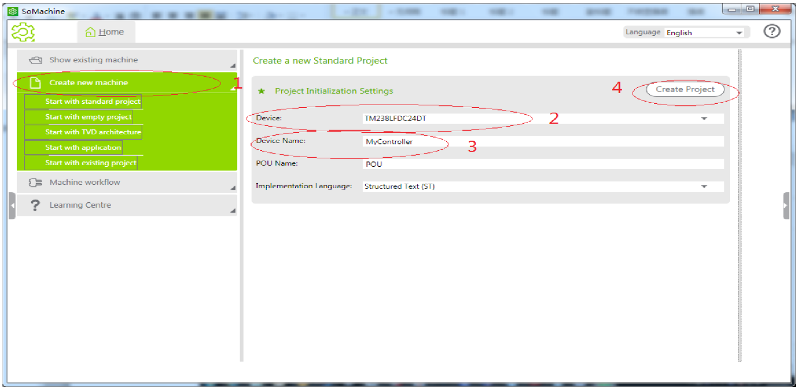
Table 5–1 PDO mapping allocation

| PDO | Object | Meaning | Bit Length |
|---|---|---|---|
| RPDO1 | 6040.00h | Control word | Uint16 |
| | 6060.00h | Modes of operation | Int8 |
| RPDO2 | 6081.00h | Profile velocity | Uint32 |
| | 607A.00h | Target position | Int32 |
| TPDO1 | 6041.00h | Status word | Uint16 |
| | 6061.00h | Modes of operation display | Int8 |
| TPDO2 | 606C.00h | Velocity actual value | Int32 |
| | 6064.00h | Position feedback | Int32 |
| TPDO3 | H0b.26 | Phase current feedback | Uint16 |

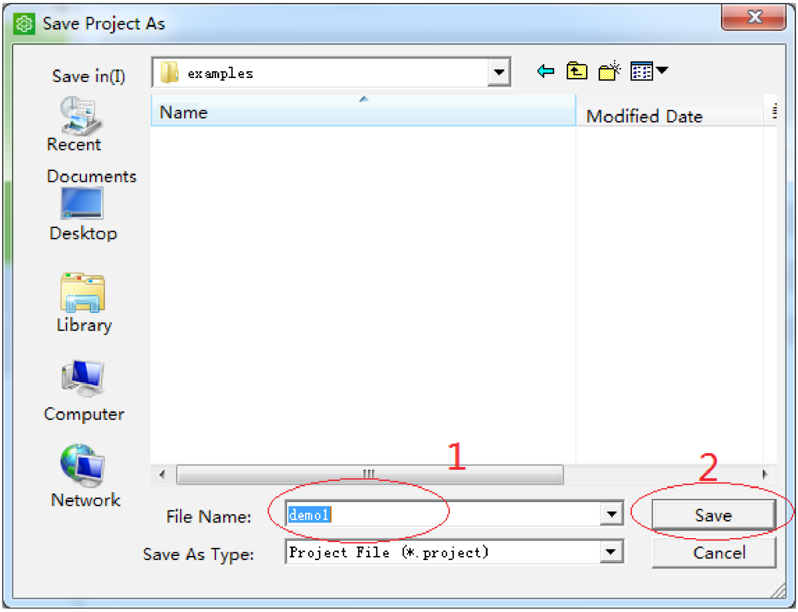
SDOs are used to write 6083h (acceleration), 6084h (deceleration), and 605Ah (emergency stop).

SoMachine is the software tool of Schneider 3S series master. This section describes how to connect the SV670C servo drive to the Schneider M238 master.

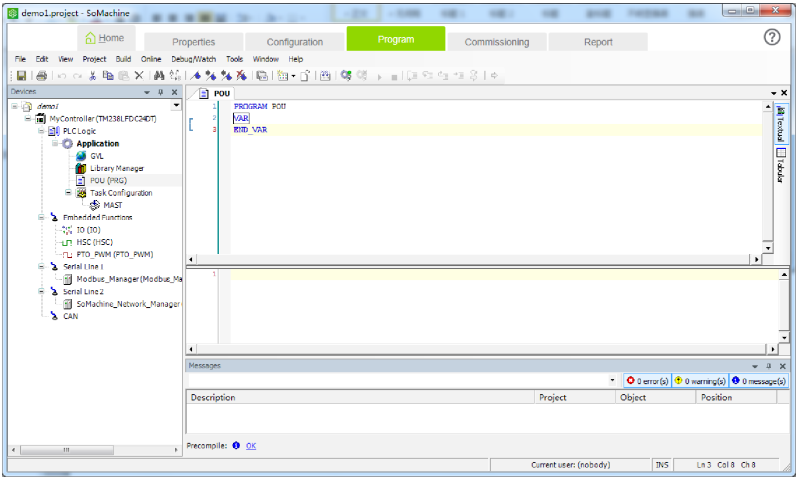
1. Start SoMachine and click "Create new machine" to start with a standard project. Select a master device (TM238LFDC24DT in this example), modify the device name, and click "Create Project", as shown below.



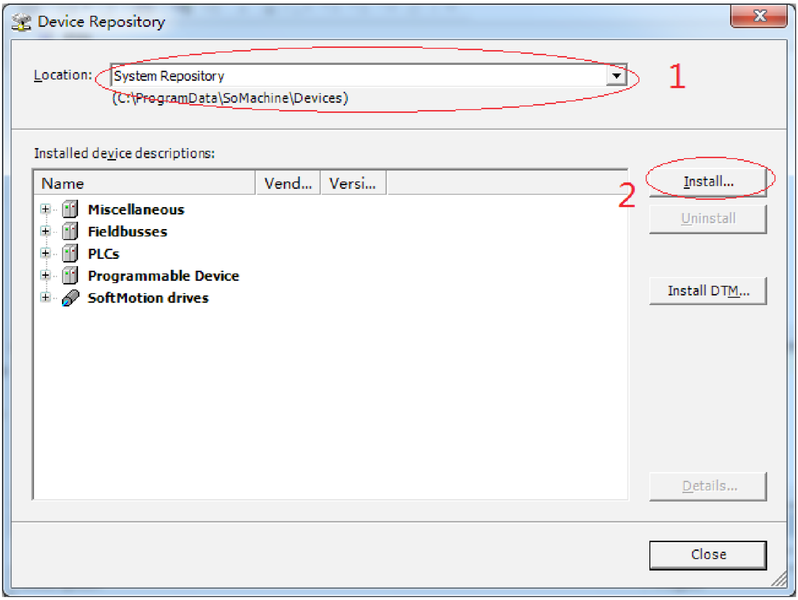

2. In the "Save Project As" dialog box, enter a file name and click "Save".



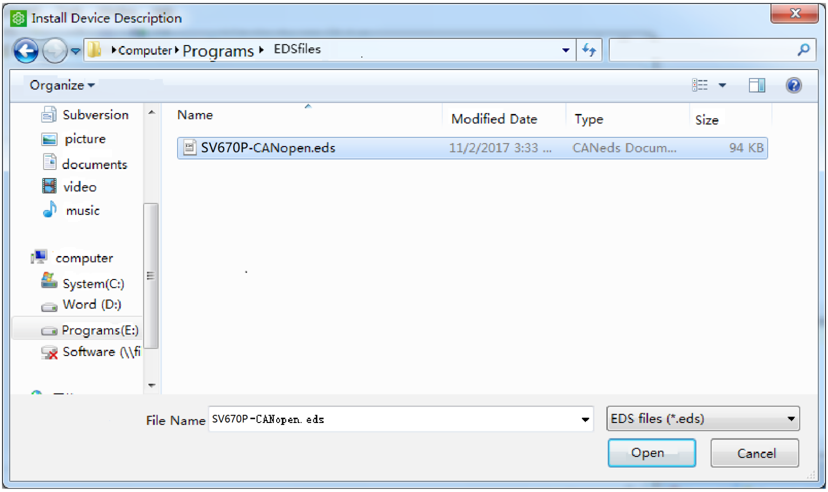

3. The following interface appears.



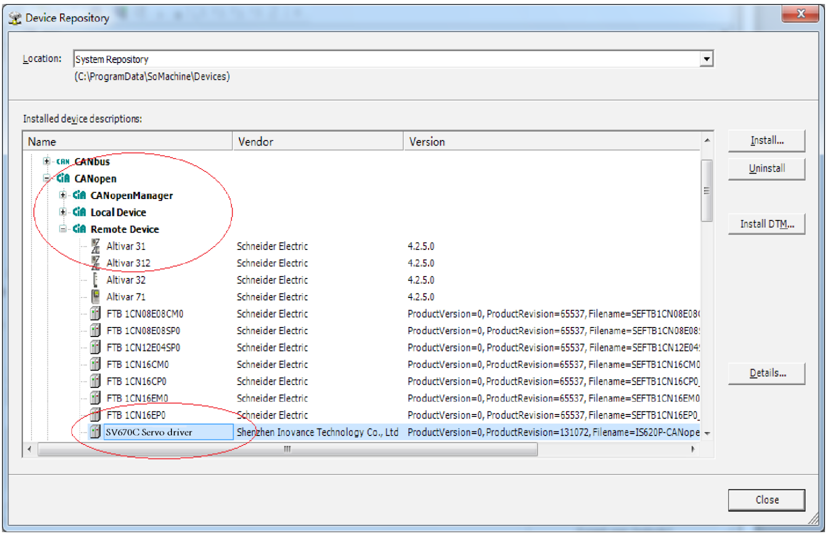
4. In the toolbar, choose Tools > Device Repository to open the "Device Repository" dialog box. (If the target EDS file has been imported, skip steps 4 to 6.)



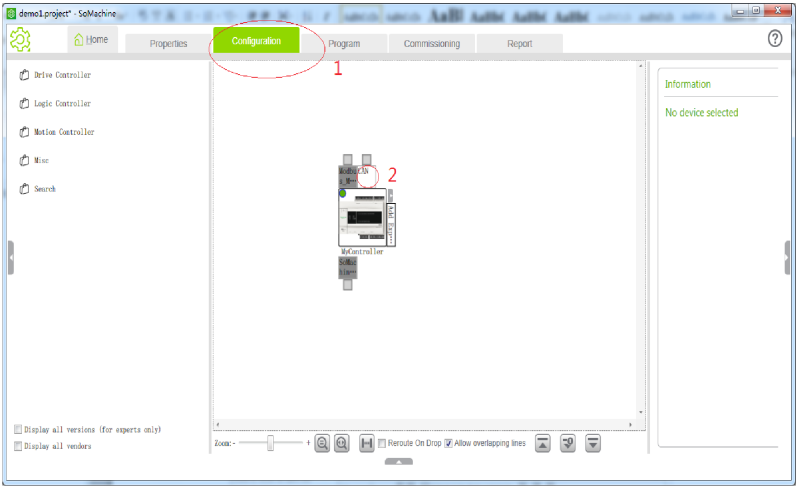

5. In the "Location" field, select "System Repository" and click "Install". In the window displayed, select the directory where the target EDS file is stored.



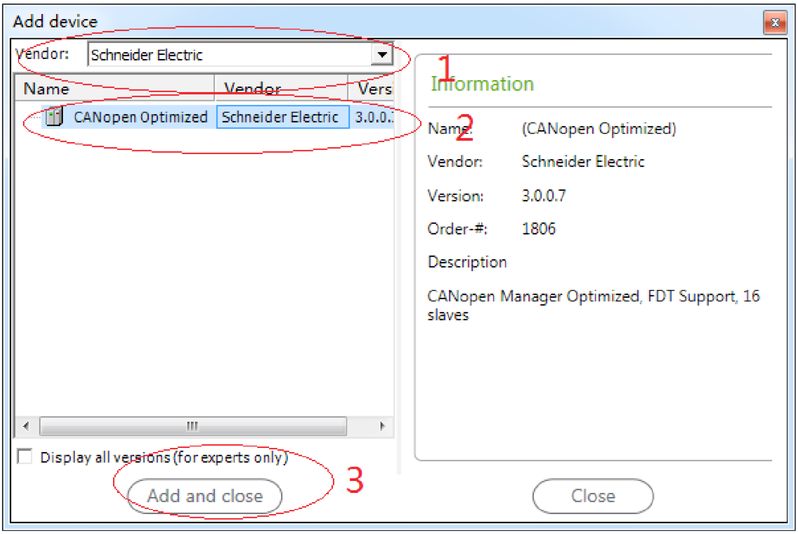

6. Click "Open" and the EDS file of the SV670C servo drive is imported into SoMachine. In the "Device Repository" dialog box, you can choose Fieldbusses > CANopen > Remote Device to view devices.



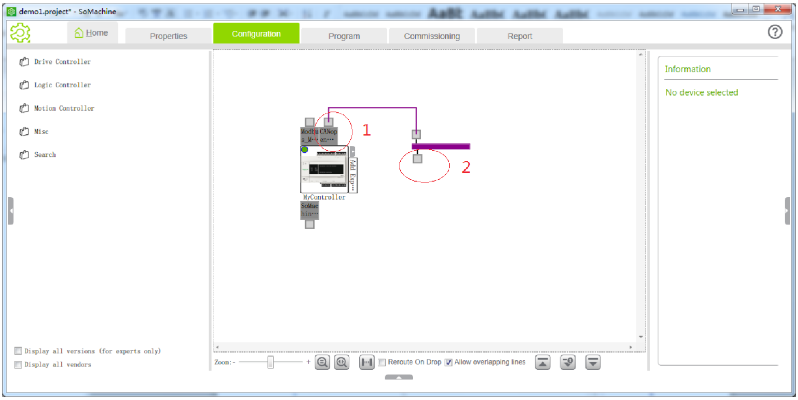

7. Close the "Device Repository" dialog box. Click "Configuration". In the interface displayed, only the M238 master is available. Click "CAN" on the master station.



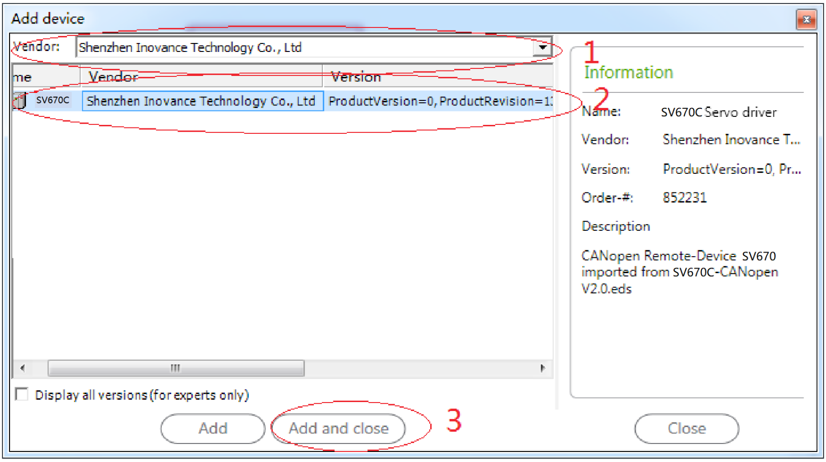

8. The "Add device" dialog box is displayed. Add a CANopen gateway. For this purpose, set "Vendor" to "Schneider Electric", select "CANopen Optimized", and click "Add and close".



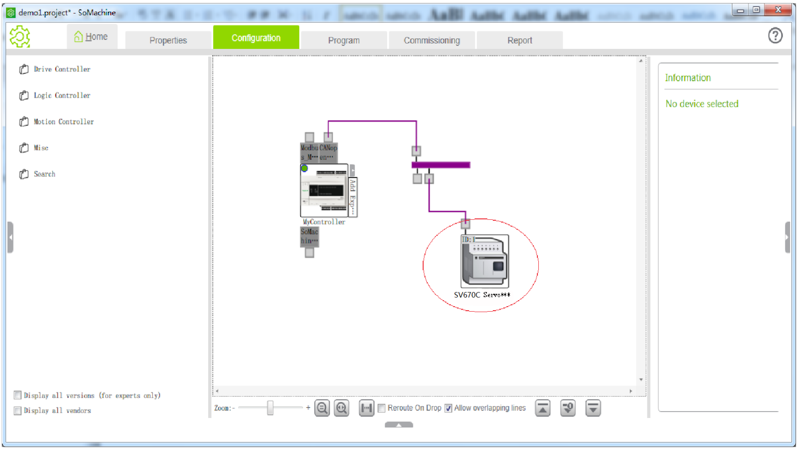

9. Now, the CANopen gateway appears in the interface. Click the position indicated by mark 2.



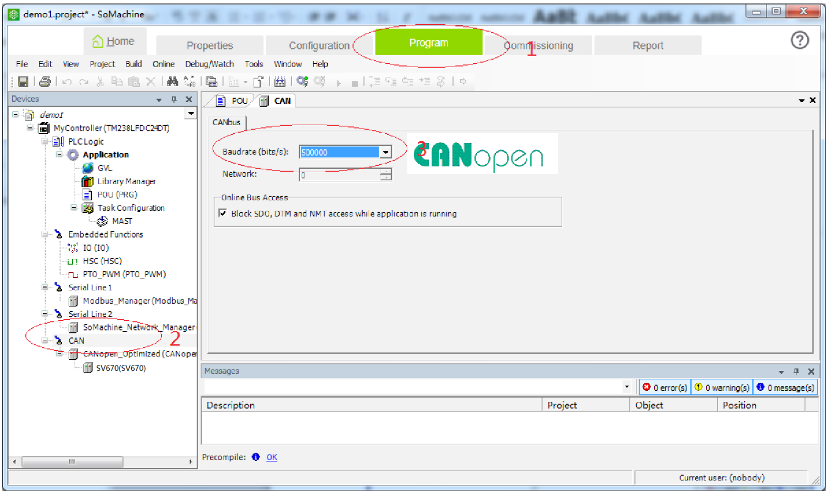

10. The "Add device" dialog box is displayed again. Set "Vendor" to "Inovance", select "SV670C Servo driver", and click "Add and close".



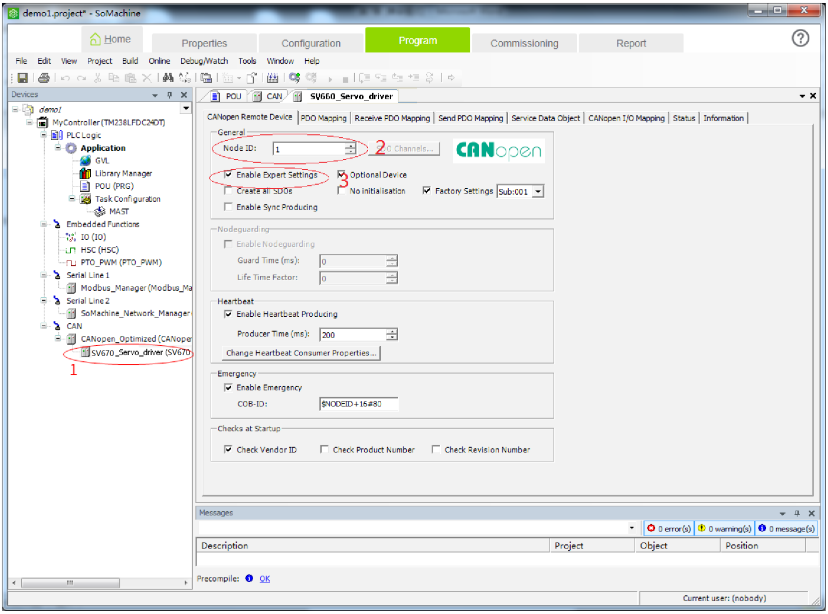

11. Now, the SV670C servo drive appears in the interface.



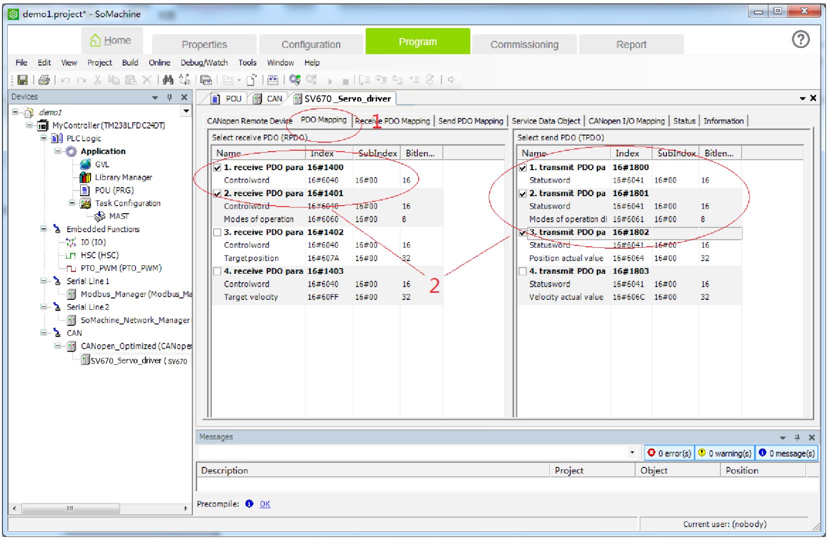

12. Click "Program". Double-click "CAN" on the left, and set the baud rate to an appropriate value (500 kbps in this example).



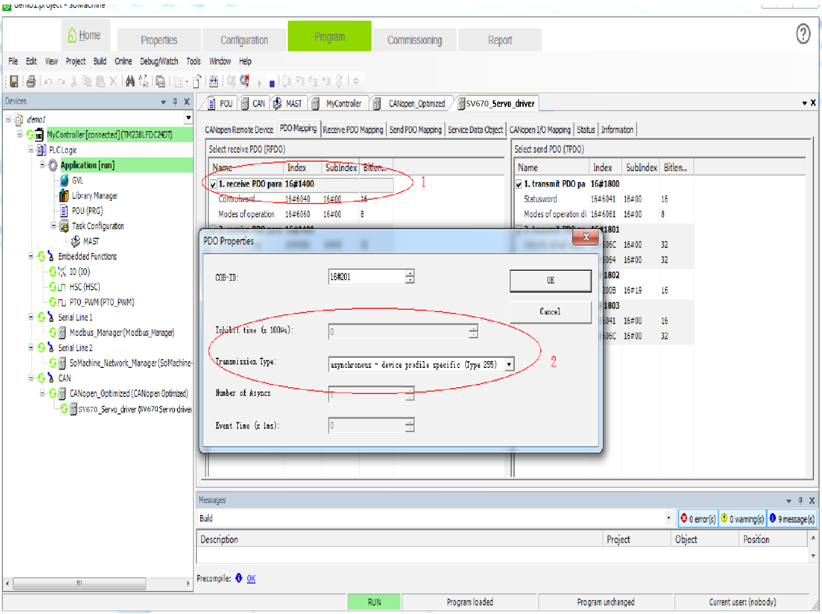

13. Double-click "SV670_Servo_driver" on the left. The node ID can be modified. Select "Enable Expert Settings".



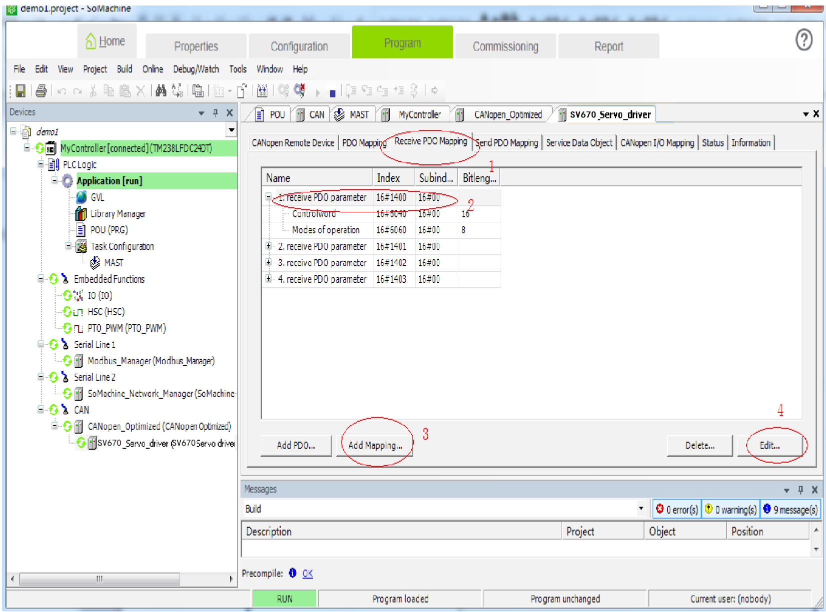
14. Click "PDO Mapping" and select two RPDOs and three TPDOs.



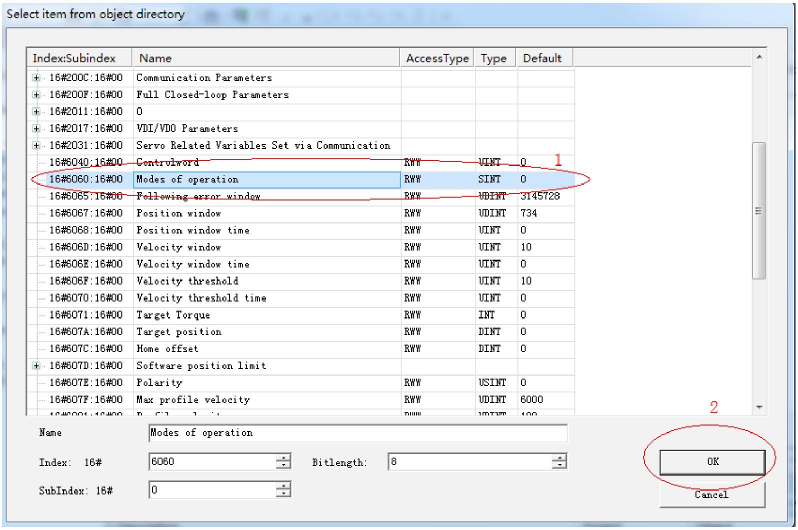
15. Double-click "RPDO1" to open the "PDO Properties" dialog box and set "Transmission Type" to "Type 255". Repeat this operation for other PDOs.



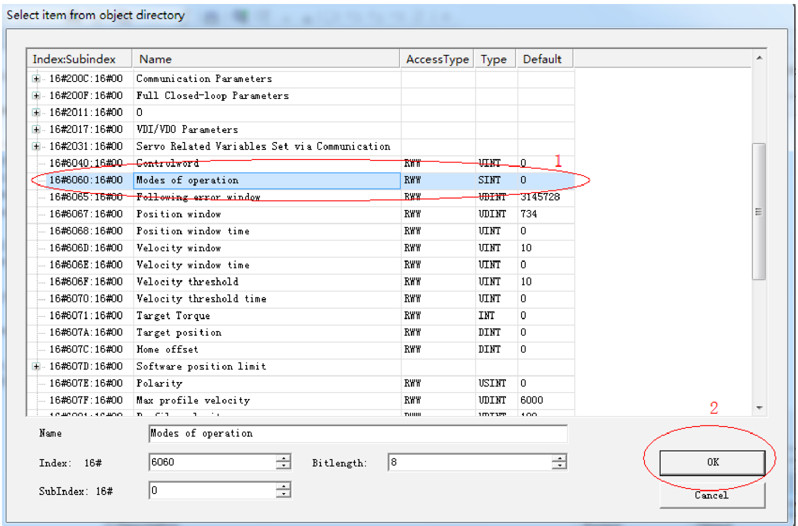

16. Select "Receive PDO Mapping", click "receive PDO parameter", and click "Add Mapping" or select a mapping and click "Edit".



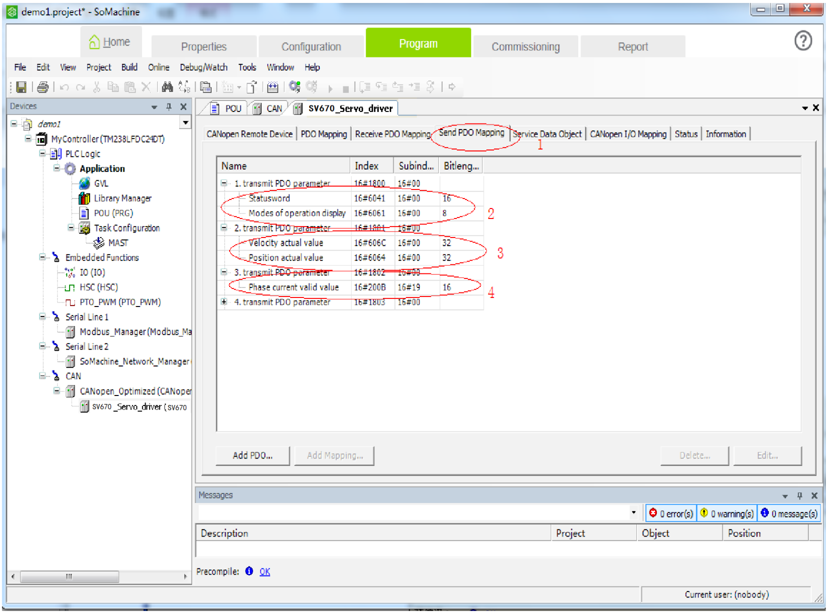
17. In the dialog box displayed, select a proper mapping object according to *"Table 5–1 " on page 58*.



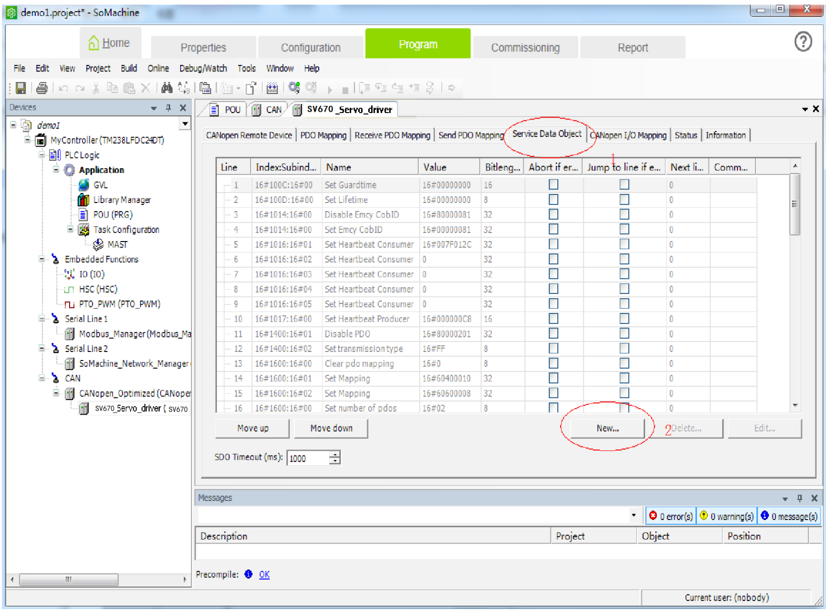

18. After the mapping object is added, the RPDO mapping is shown as below.



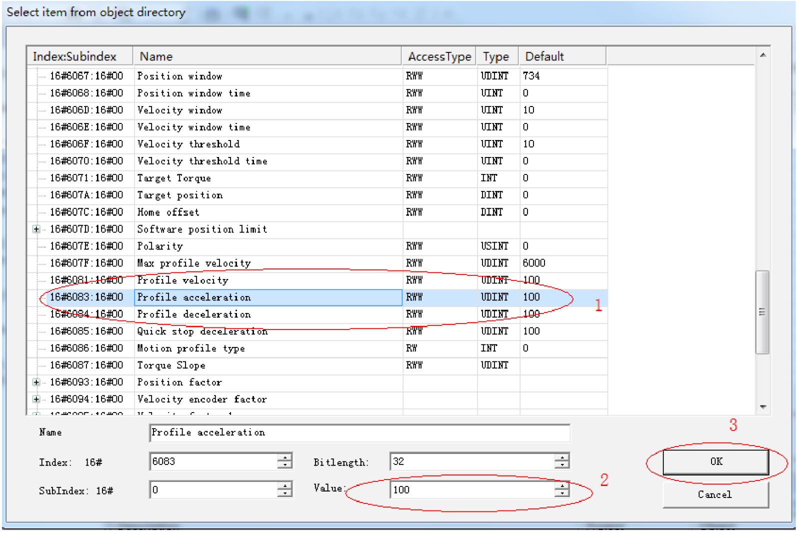

19. Similarly, select "Send PDO Mapping" and configure PDOs according to *"Table 5–1 " on page 58*, as shown below.



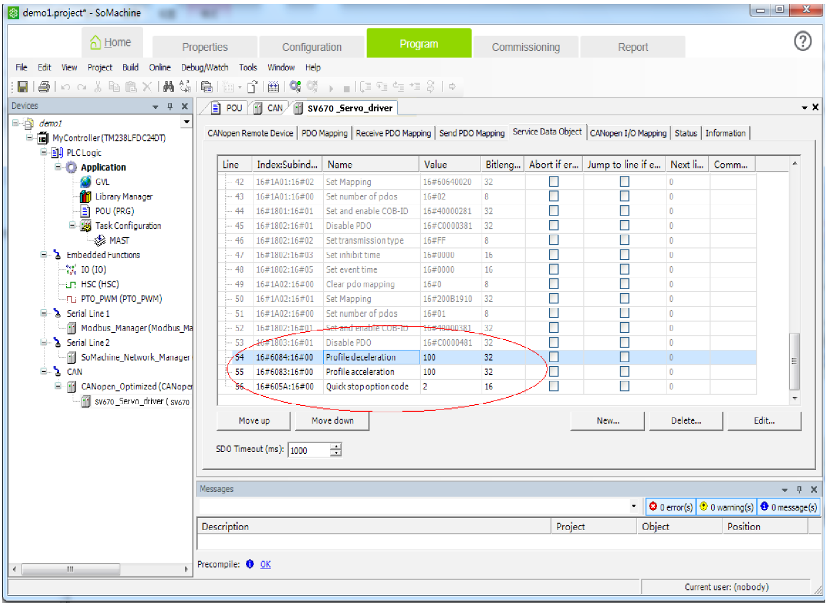
20. Select "Service Data Object" and click "New" to add a required SDO. (Optional) (To use default values, skip steps 20 to 22.)



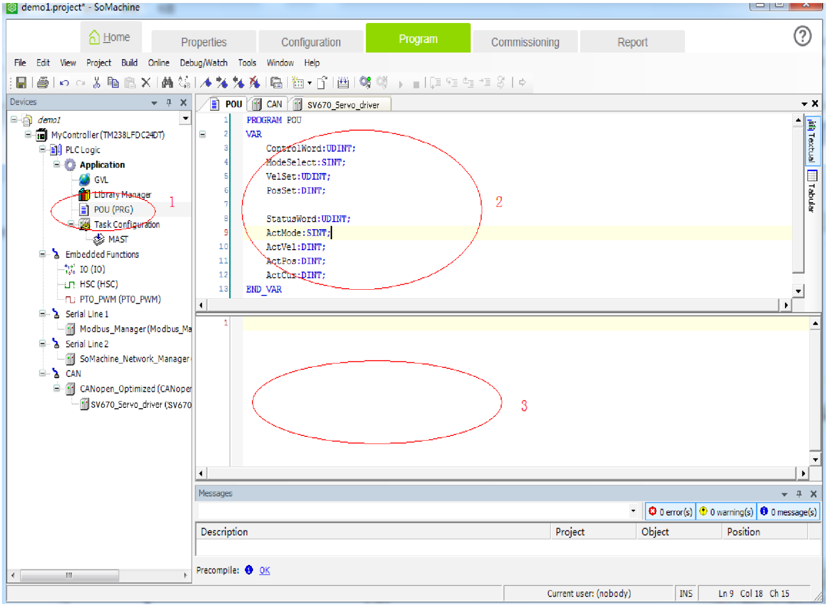
21. In the list displayed, select the target SDO, modify the value (if needed), and click "OK". (Optional)



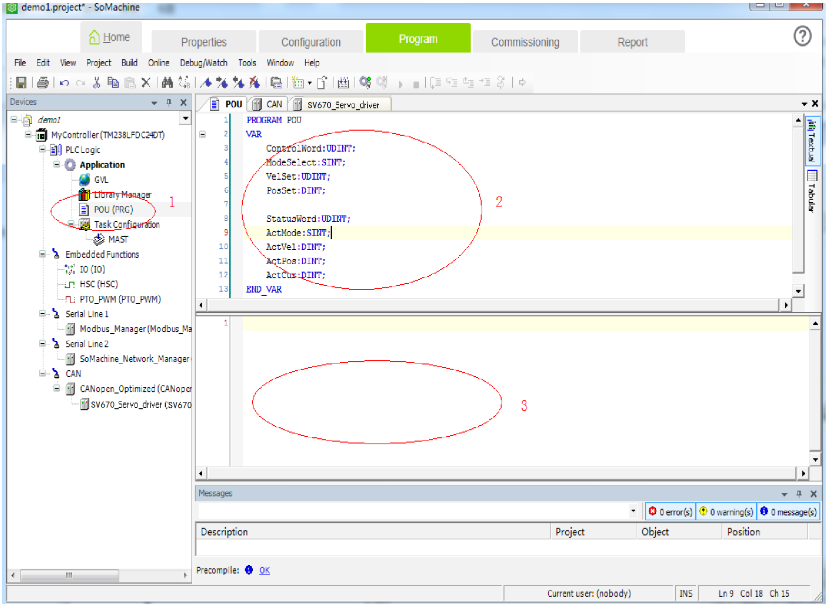

22. The newly added SDO is shown as below. (Optional)



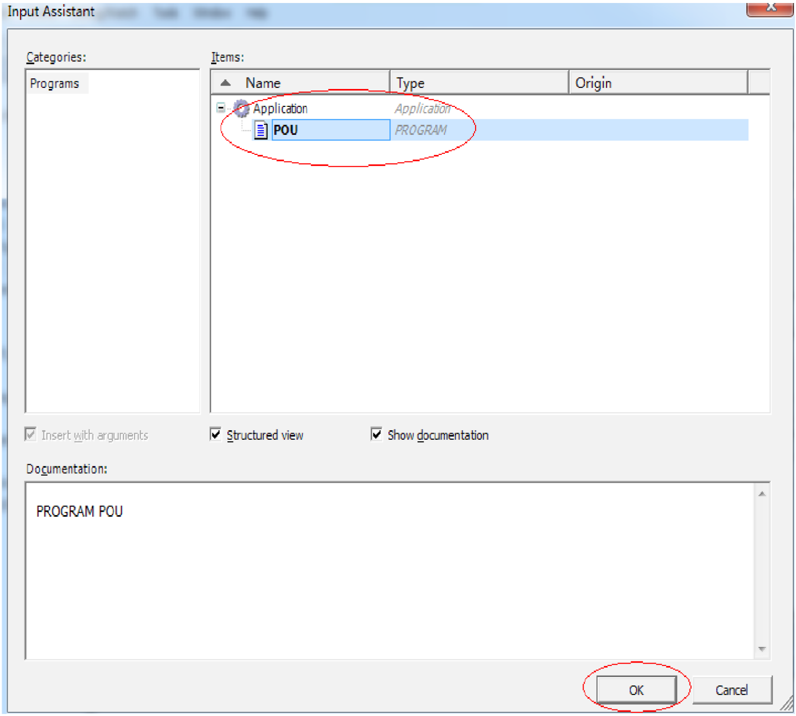
23. Double-click "POU" on the left. You can add variable definitions in the section indicated by mark 2 and add PLC program logic in the section indicated by mark 3. Then, click "Edit" or press F11. If no error occurs, proceed with the next step.



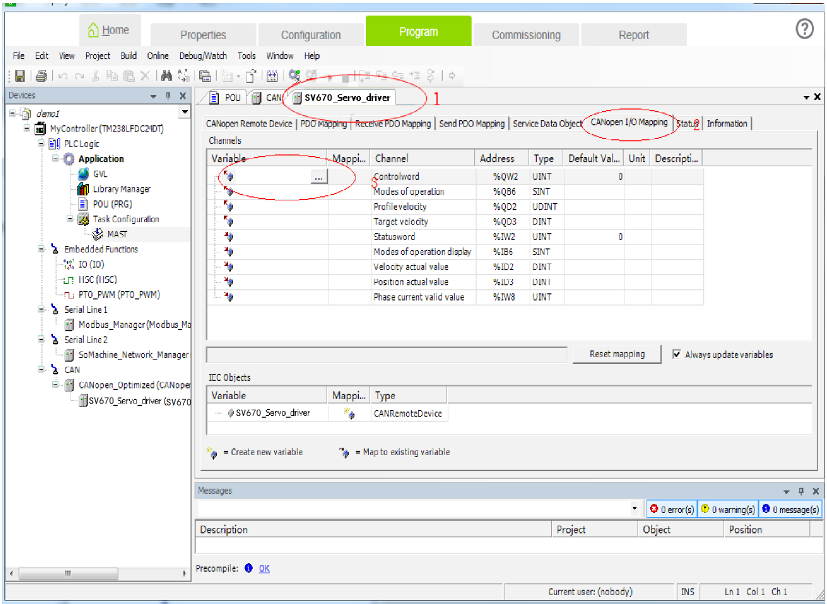

24. Double-click "MAST" to add POU. You can also set the program cycle interval on this page.



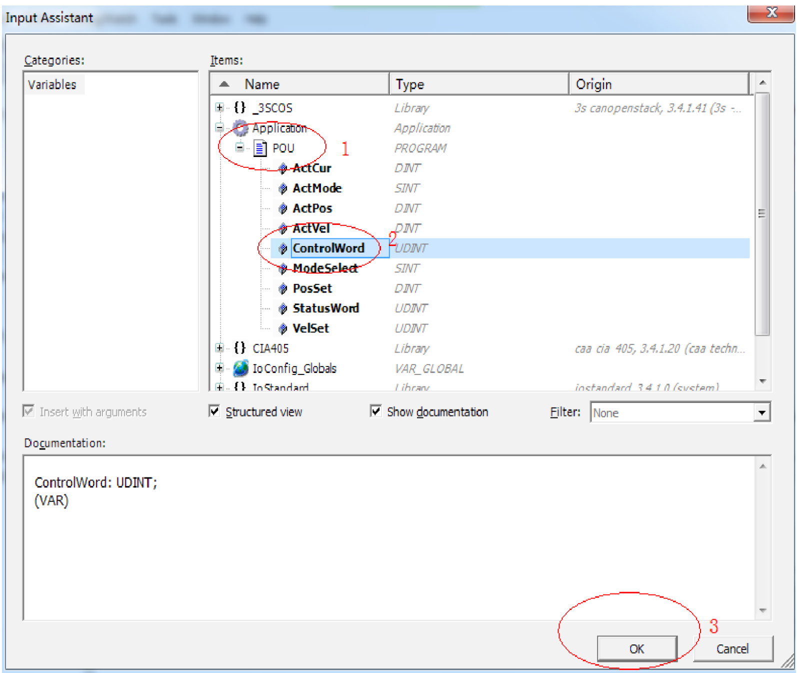

25. Select the POU to be added and click "OK".



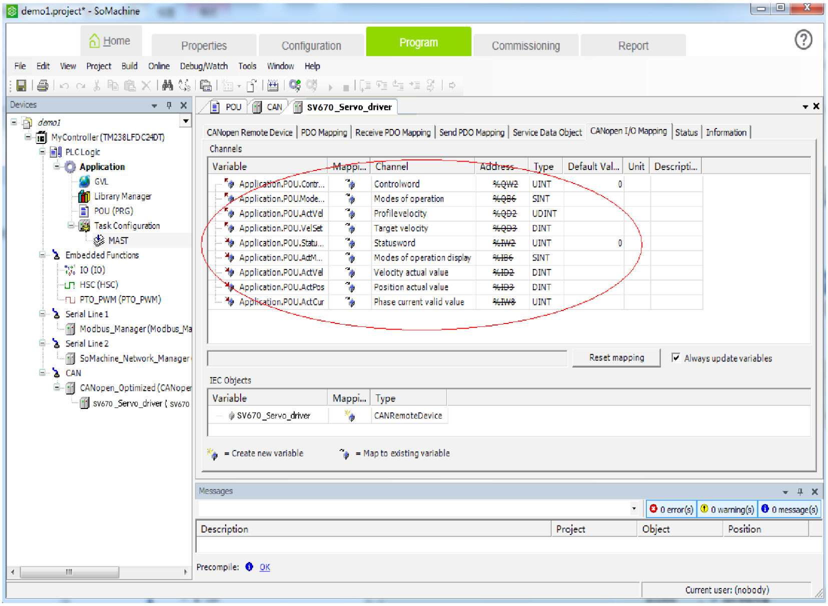

26. Choose SV670C... > CANopen I/O Mapping. Double-click the target variable to show the ... button, and then click the ... button.



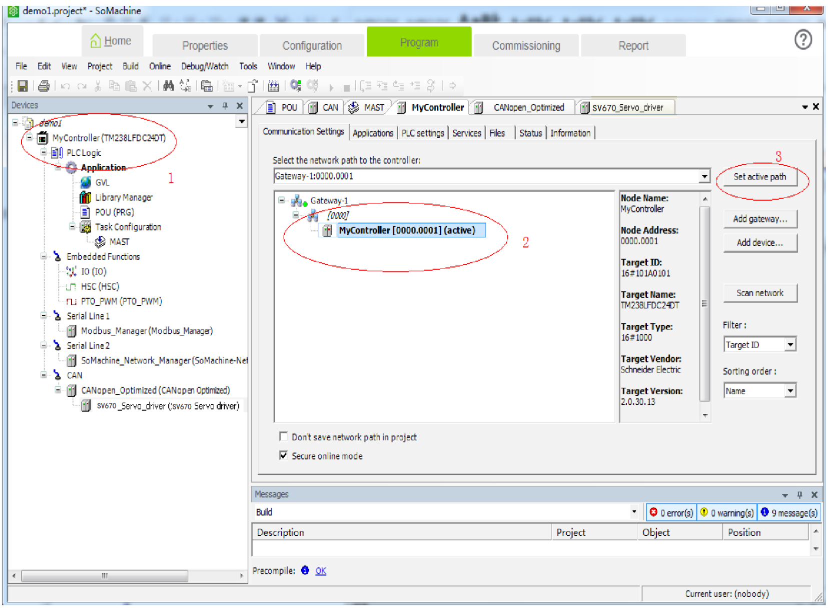
27. Select the PLC-defined variable according to the following steps.



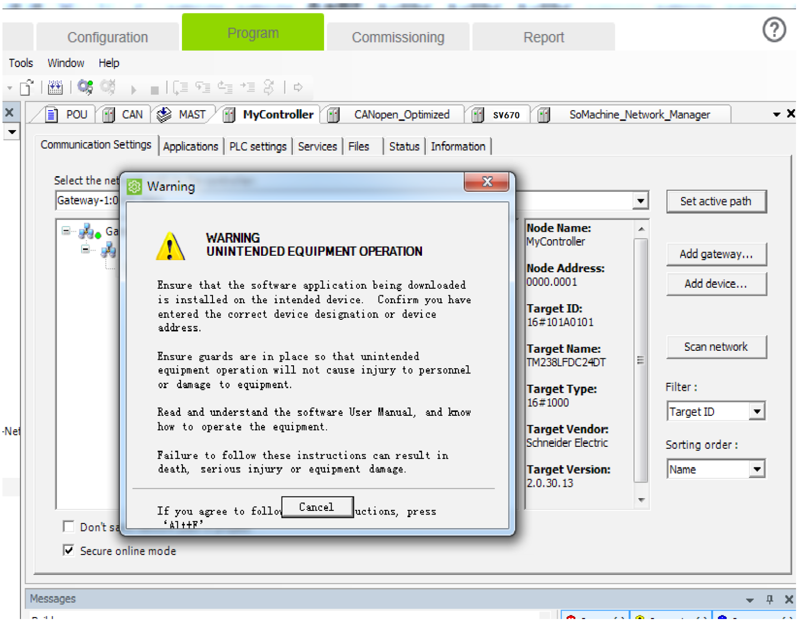
28. Add other variables in the similar way. Finally, the mapping is shown as below.



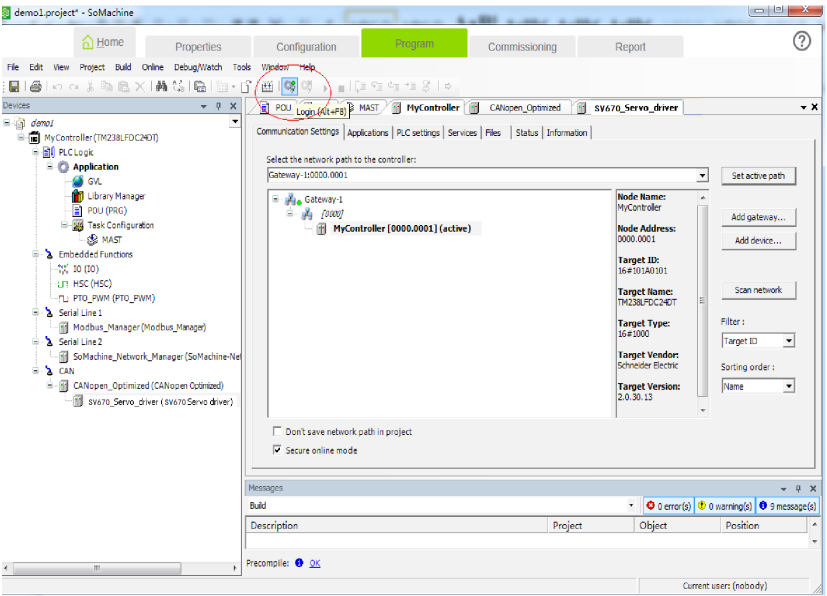

29. Double-click the master name on the left. Select "MyController" and click "Set active path" on the right.



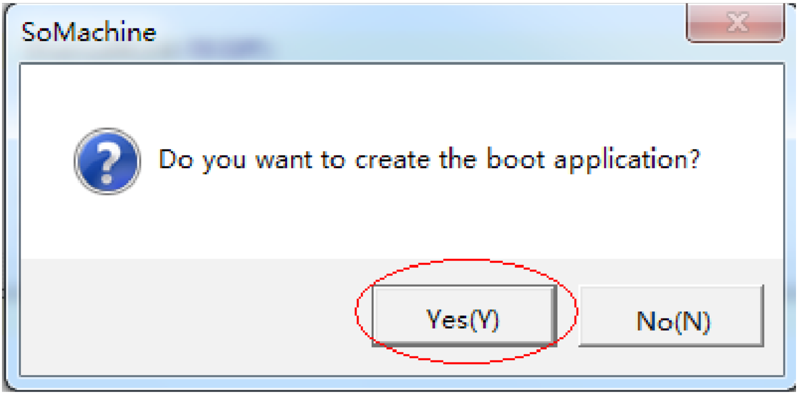
30. The following warning is displayed. Press Alt+F according to the instructions.



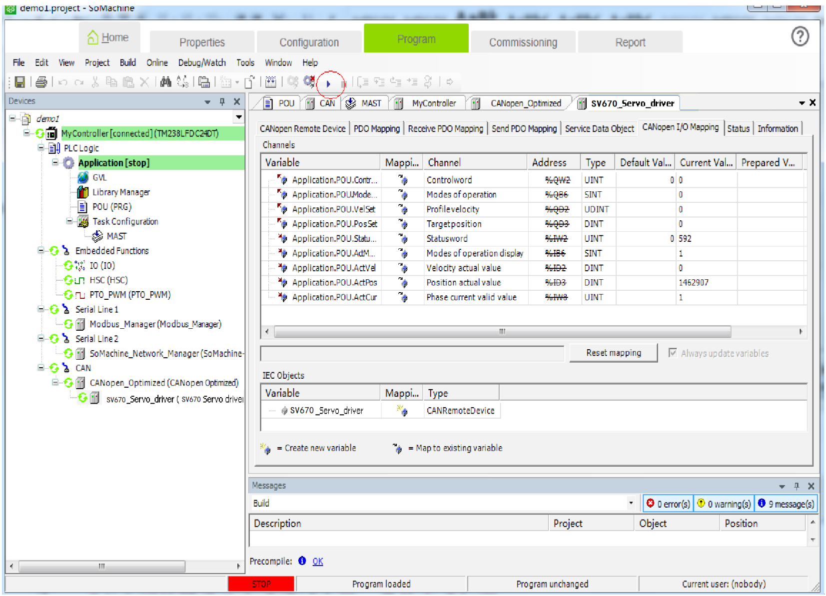

31. Click the icon circled, choose Online > Login, or press Alt+F8.




32. Click "Yes" in the dialog box displayed.



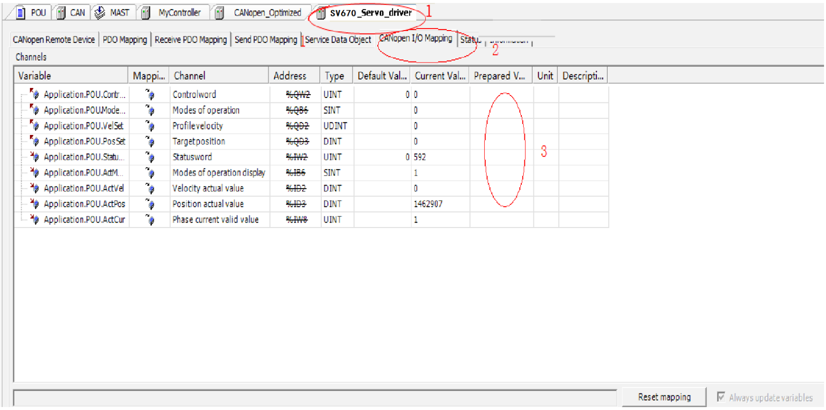

33. After download is done, click the circled ▶, choose Online > Start, or press F5 to start the PLC program written by the user. In this case, the motor operates in the mode defined by the user.




34. You can also perform motor commissioning manually according to the following steps.

Choose SV670C... > CANopen I/O Mapping. Enter the value as needed in the "Prepared V..." column. Then, choose Debug/Watch > Forced value or press F7 to modify the variable manually.

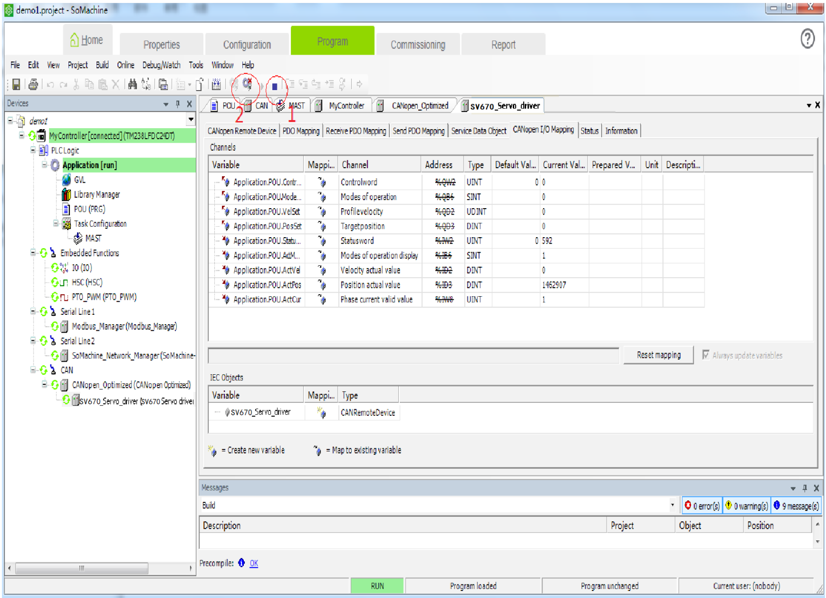
35. Set 6060h (operation mode) to 1, 6081h (speed reference) to 100, 607Ah (position reference) to 10485760 (10 revolutions), and 6040h to 6(0x06), 7(0x07), 47(0x2f), and 63(0x3f) in sequence to make the motor run.



## Note

- When writing multiple values for one variable, execute the "Forced value" command every time a value is written. When writing values for multiple variables, you can execute the "Forced value" command once for all after all the values are written.
- When a new position or speed reference is required, write the new reference and set 6040h to 47(0x2f) and 63(0x3f) in turn. The motor runs to the position according to the new reference regardless of whether the previous reference is executed.
- To stop the motor, set 6040h to 0.
- To terminate manual writing of values, go to the toolbar and choose Debug/Watch > Release Values, or press Alt+F7. Then, variables will be executed according to the PLC program logic instead of manually written values.

36. To stop the PLC program, click the button indicated by mark 1, choose Online > Stop in the toolbar, or press Shift+F8. To exit from the online function, click the button indicated by mark 2, choose Online > Exit, or press Ctrl+F8.




## 5.2 Connecting SV670C Servo Drive to Beckhoff CANopen Master

This section also takes the position control mode as example. Allocate PDOs according to *"Table 5–2 " on page 78*.

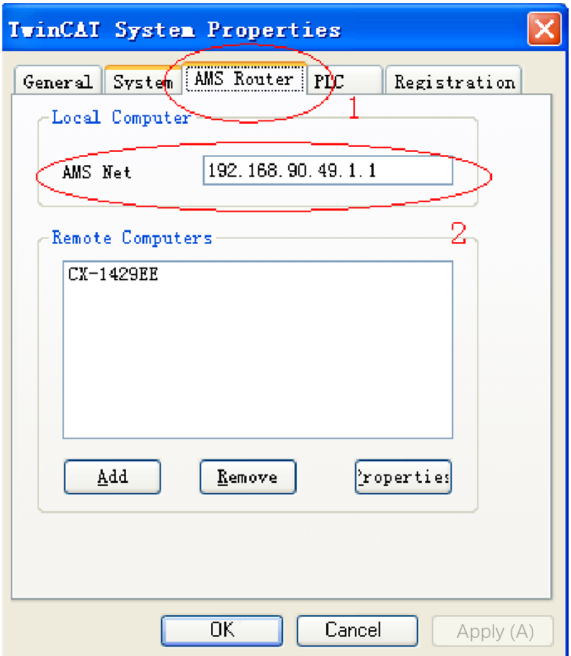
1. Configuring PDO mapping on a Beckhoff master node is complex. Therefore, before connecting the network, manually configure the PDO mapping. You can change the mapping by modifying parameters based on the following table. The parameters to be modified are as follows.

Table 5–2 Example of PDO mapping of Beckhoff master

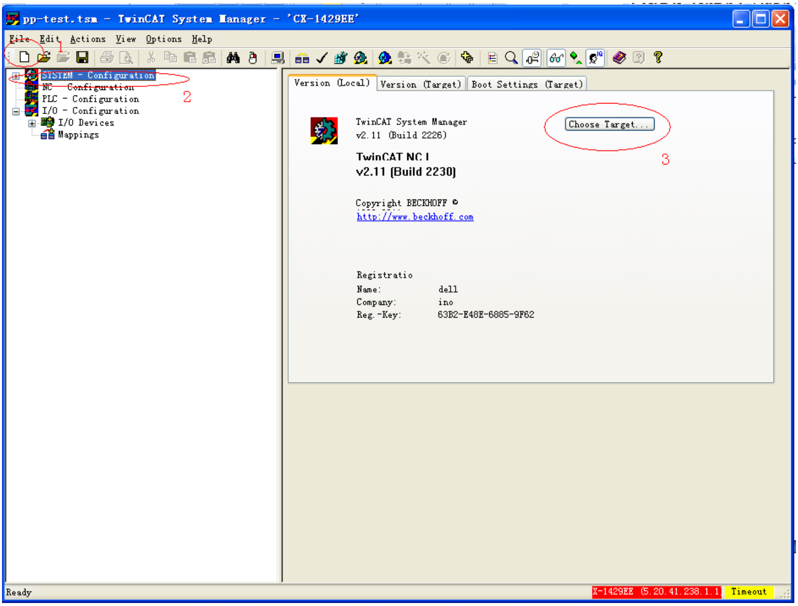
| Para. | Object | Mapping Object | Input |
|---|---|---|---|
| H2d.32 | 1600.00h | Number of RPDO1 mapping objects | 2 |
| H2d.33 | 1600.01h | 6040.00h | 60400010h |
| H2d.35 | 1600.02h | 6060.00h | 60600008h |
| H2d.49 | 1601.00h | Number of RPDO2 mapping objects | 2 |
| H2d.50 | 1601.01h | 6081.00h | 60810020h |
| H2d.52 | 1601.02h | 607A.00h | 607A0020h |
| H2E.20 | 1A00.00h | Number of TPDO1 mapping objects | 2 |
| H2E.21 | 1A00.01h | 6041.00h | 60410010h |
| H2E.23 | 1A00.02h | 6061.00h | 60610008h |

| Para. | Object | Mapping Object | Input |
|---|---|---|---|
| H2E.37 | 1A01.00h | Number of TPDO2 mapping objects | 2 |
| H2E.38 | 1A01.01h | 606C.00h | 606C0020h |
| H2E.40 | 1A01.02h | 6064.00h | 60640020h |
| H2E.54 | 1A02.00h | Number of TPDO3 mapping objects | 1 |
| H2E.55 | 1A02.01h | 200B.19h | 200B1910h |
| H2E.57 | 1A02.02h | - | 0 |

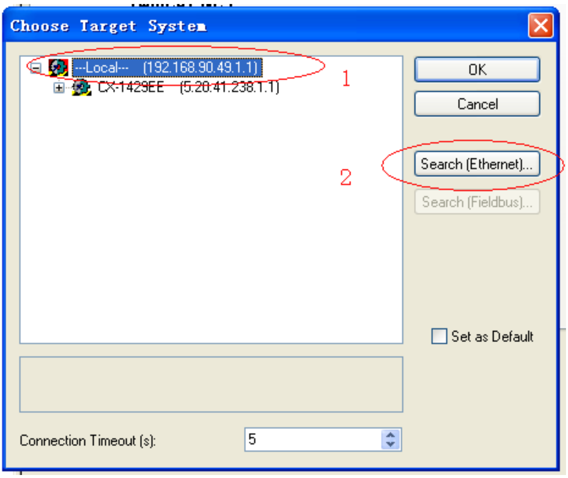
2. Connect Beckhoff CX9020, as a master node, to the CANopen module of EL6751 and perform the test. Ensure that the IP address of CX9020 is in the same network segment as the IP address of the PC. In addition, ensure that the first four digits of AMS Net (Properties > AMS Router > AMS Net) of the Beckhoff TwinCAT system coincide with the IP address of the PC.



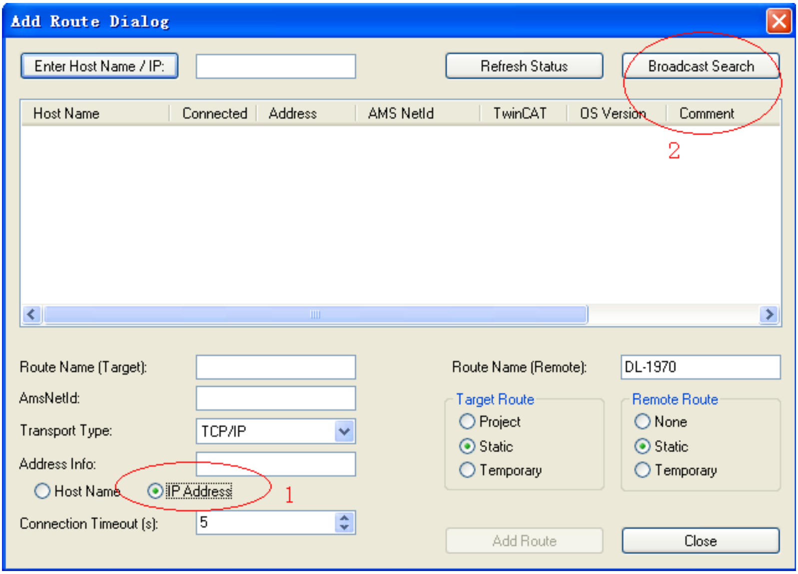

3. Open TwinCAT System Manager and create an empty project. Click "SYSTEM - Configuration" on the left and click "Choose Target..." on the right.



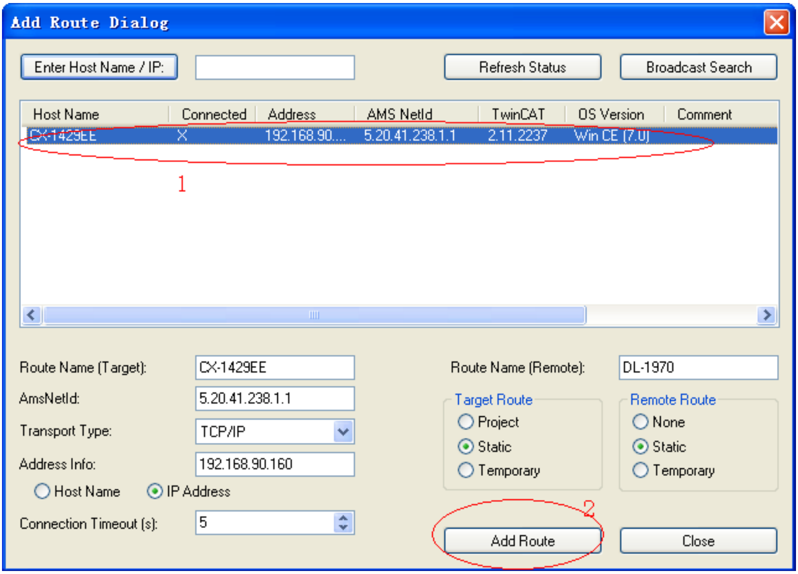

4. In the dialog box displayed, select "…Local…" and click "Search (Ethernet)".



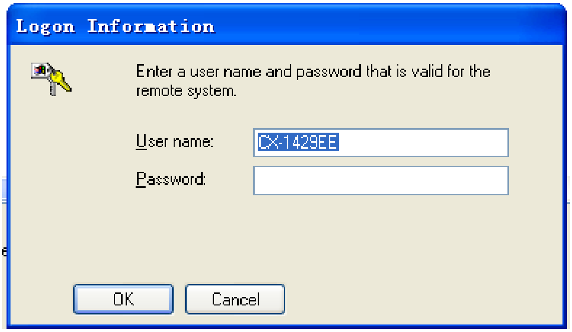

5. In the dialog box displayed, select "IP Address" as indicated by mark 1 and click "Broadcast Search".



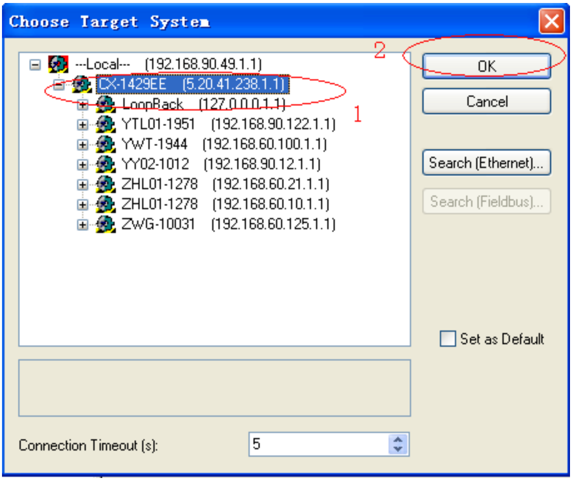

6. The master is displayed. Select the master and click "Add Route".



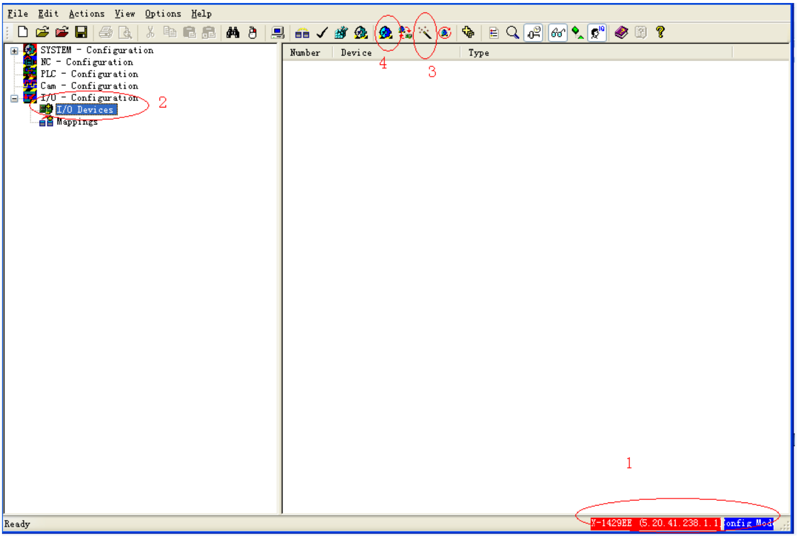

7. In the dialog box displayed, enter the user name, which is the host name of the master, leave the "Password" field blank, and click "OK".



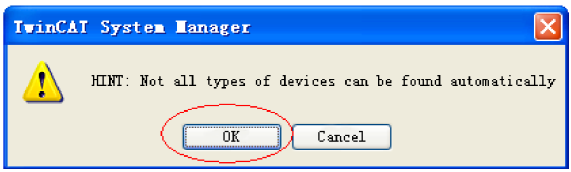

8. Click the Close button on the interface shown in Step 6. In the "Choose Target System" dialog box, click "+" to unfold the list and select the master. Then, click "OK".



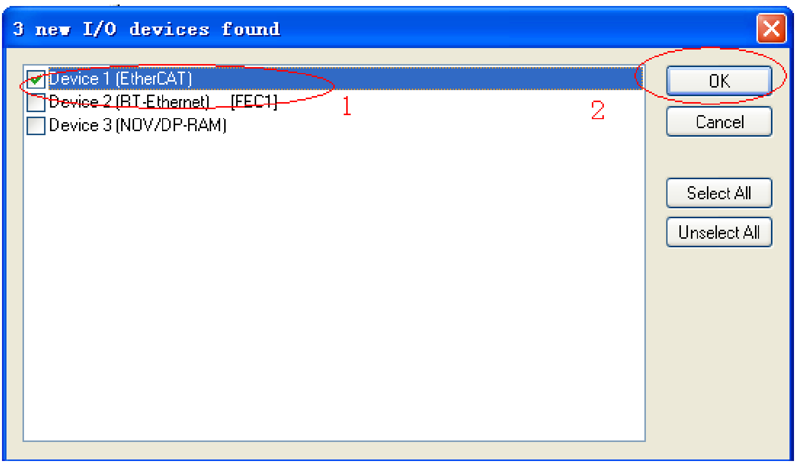

9. As indicated by mark 1 in the following figure, the master (in red) is displayed in the lower right corner of the main screen, and it is in the configuration state (in blue). If the master is in the operating state (in green), click the icon indicated by mark 4 to switch to the configuration state before proceeding with the next step.
   Select "I/O Devices" on the left and click the icon indicated by mark 3 or right-click "I/O Devices" and select "Scan Devices" to start searching devices.



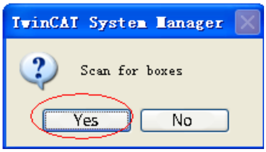

10. Click "OK" in the warning dialog box displayed.



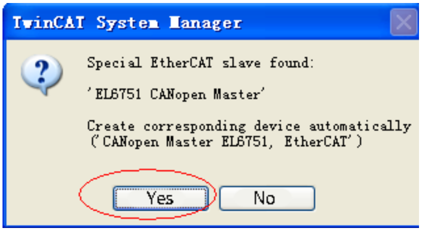

11. Select "Device 1 (EtherCAT)" and click "OK" in the dialog box displayed.



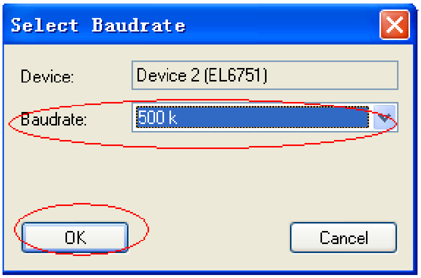

12. Click "Yes" in the dialog box asking whether to scan for boxes.



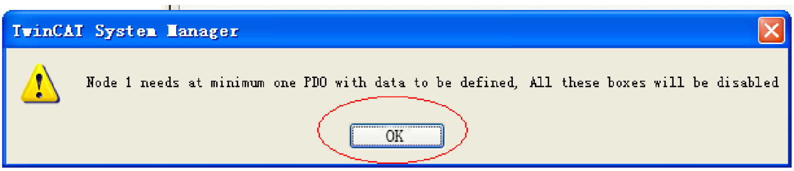

13. Click "Yes" in the dialog box asking whether to create EL6751 master.



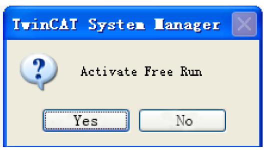

14. Select the baud rate (defaulted to 500 kbps) and click "OK". The master starts device searching, which may take a while.



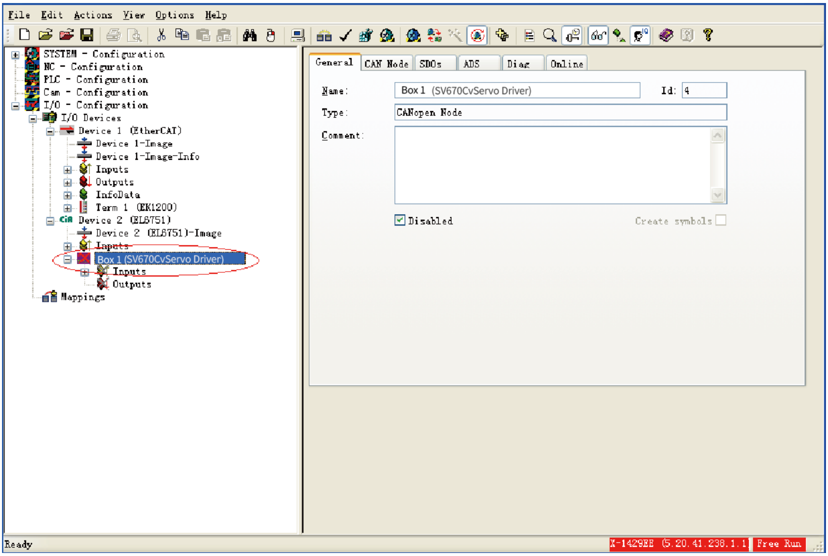

15. After device searching is done, click "OK" in the warning dialog box displayed.




16. Click "Yes" in the dialog box asking whether to activate free run.



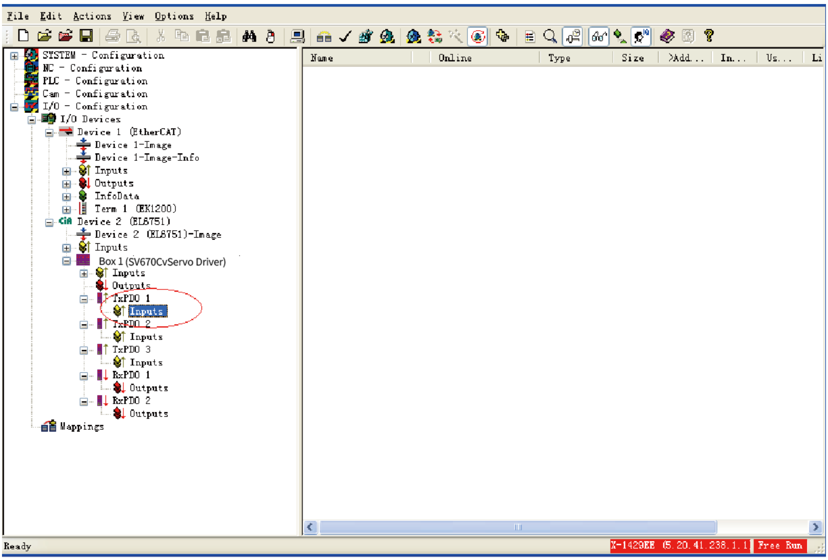

17. The box of SV670C series servo drive is now displayed on the left. Right-click the box to insert three TPDOs and two RPDOs. Then, right-click to deselect "Disabled".



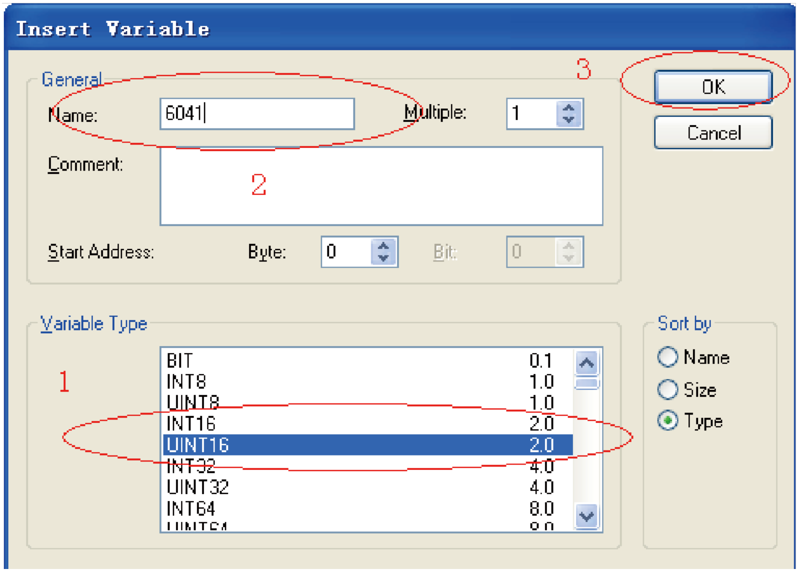
## Note

Only servo drives equipped with termination resistors can be scanned by the master.

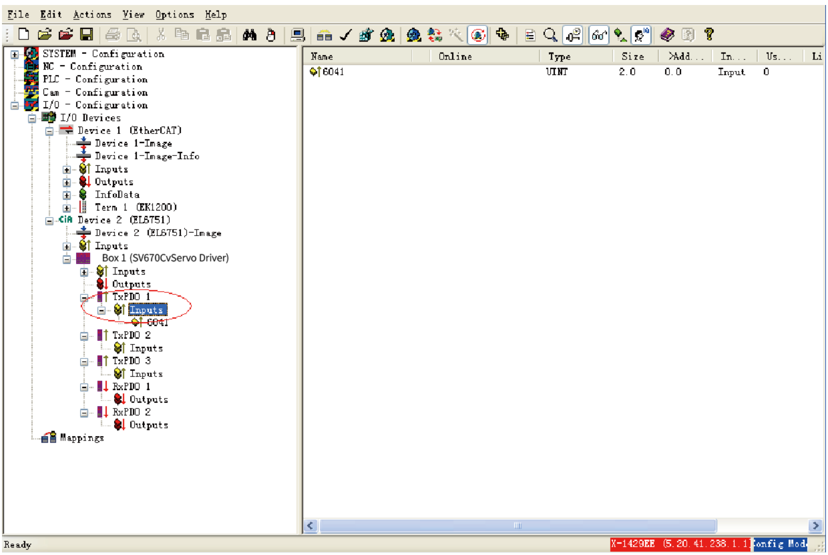
18. The following figure shows the result after the previous operation is complete. Choose TxPDO 1 > Inputs, right-click "Inputs", and choose "Insert Variable".



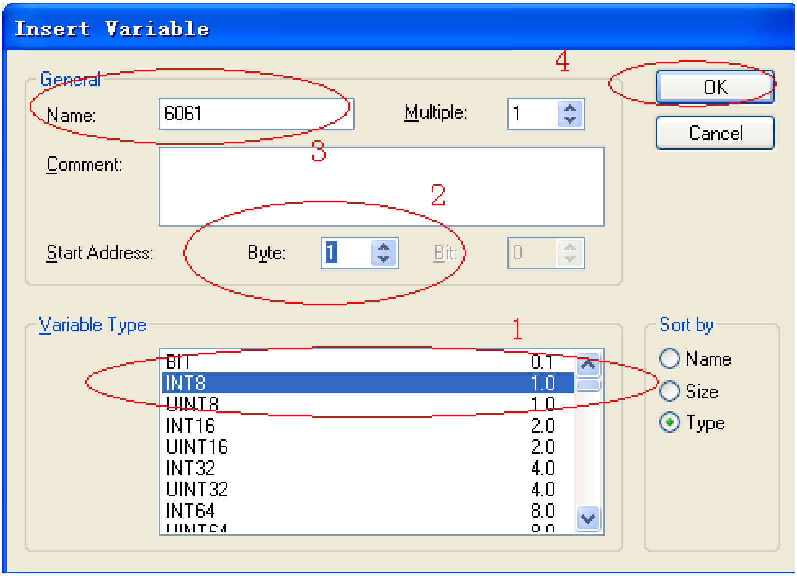
19. Map each PDO to different variables according to *"Table 5–2 Example of PDO mapping of Beckhoff master" on page 78*. Map TPDO1 to 6041.00h and 6061.00h. To insert the first variable 6041h, select "UINT16" in the "Variable Type" section, enter a proper name in the "Name" field, and click "OK".



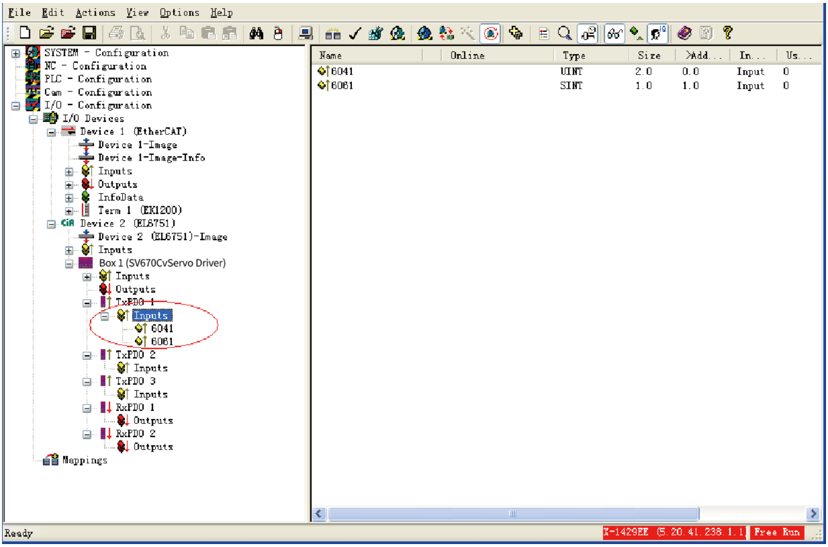

20. Now, 6041h is added to TPDO1. Similarly, right-click "Inputs", and choose "Insert Variable" to insert the second variable.



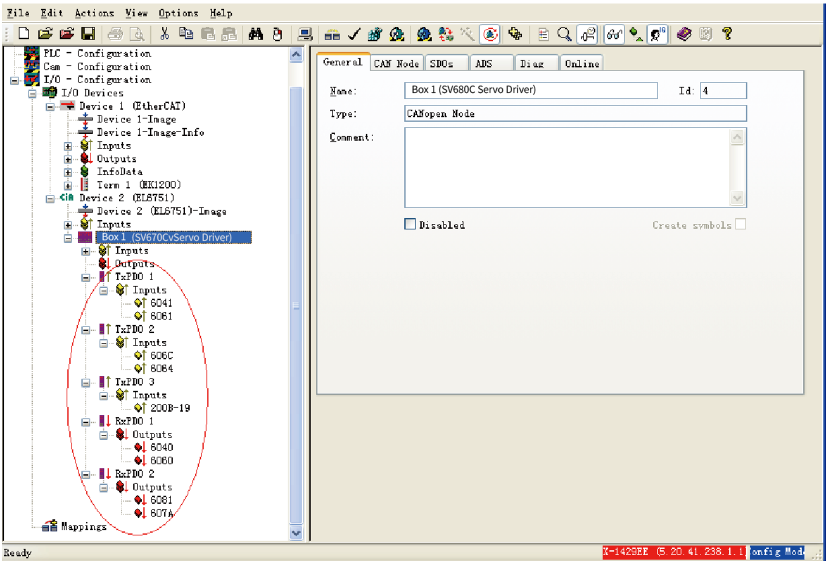
21. For variable 6061h, select "INT8" (see the attribute in the object dictionary) in the "Variable Type" section. In Start Address > Byte, enter a large value to prevent 6061h from being inserted before 6041h. Enter a proper name and click "OK".



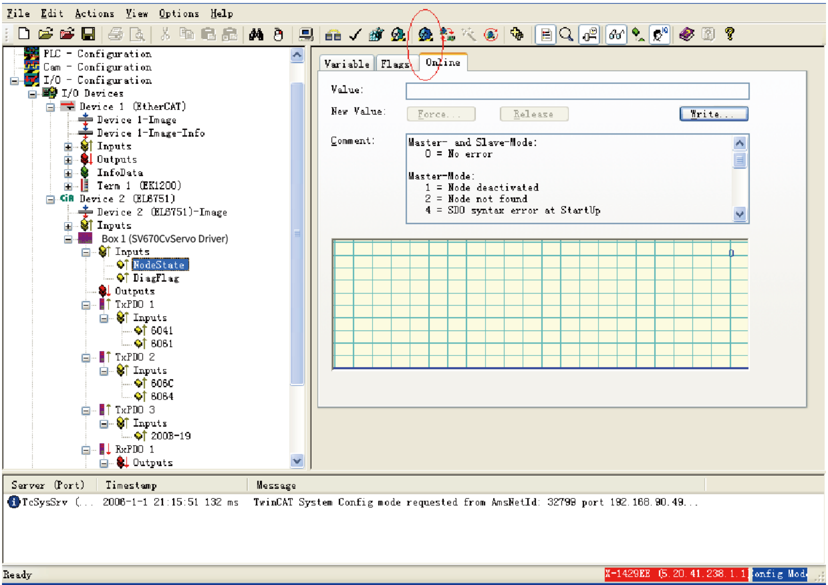

22. Now, two objects are added to TPDO1. Note that the sequence of the two variables must be consistent with *"Table 5–2 Example of PDO mapping of Beckhoff master" on page 78*. Otherwise, delete the second variable, re-insert the variable, and enter a large value in the field indicated by mark 2 in the figure in Step 21. After making sure that the variable sequence is correct, choose TxPDO1 > Inputs, right-click "Inputs", and choose "Recalc Address" to allocate addresses. This step must be performed. Otherwise, address chaos may occur.



23. Repeat steps 18 to 22 for other PDOs. Add corresponding mapping variables according to *"Table 5–2 Example of PDO mapping of Beckhoff master" on page 78*. The interface after variables are added is shown below.

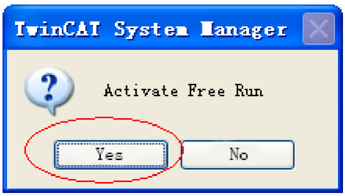


24. Click the icon circled in the following figure or press Shift+F4.

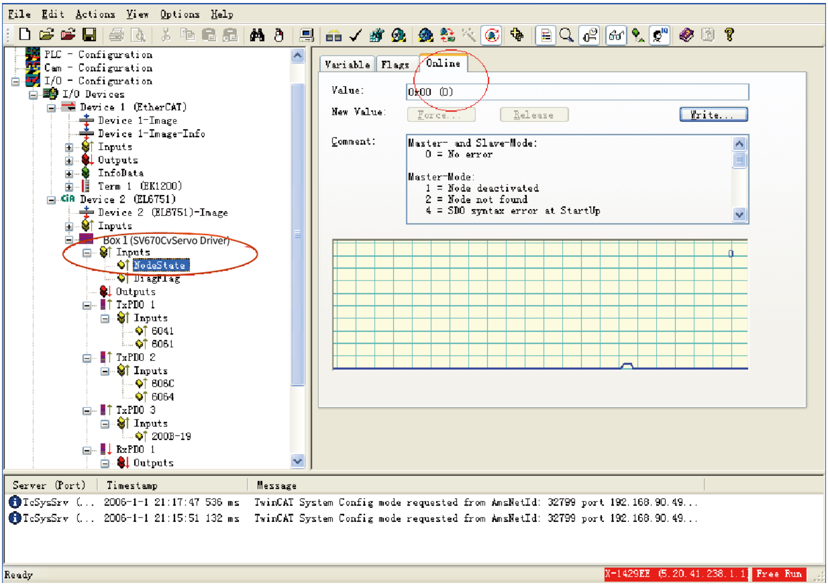



25. Click "Yes" in the dialog box asking whether to load I/O devices.

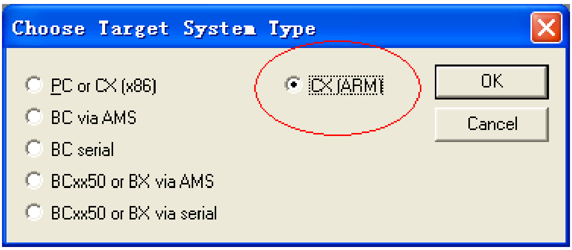

26. Click "Yes" in the dialog box asking whether to activate free run.



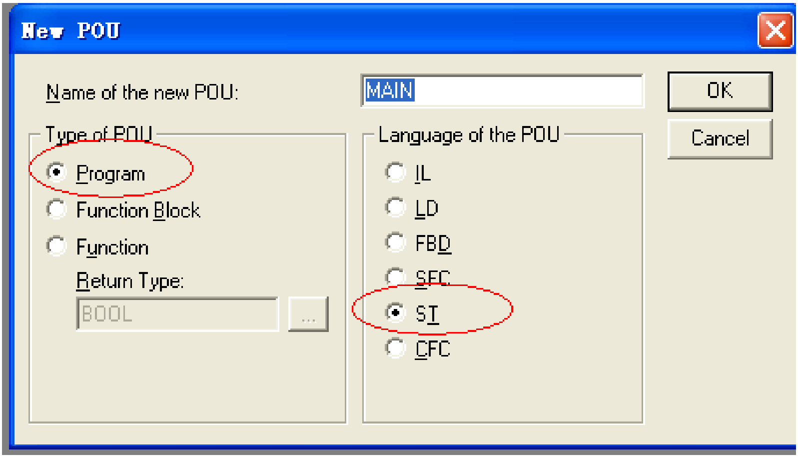

27. Select the box of SV670C and choose Inputs > NodeState. The node state in "Online" is 0, indicating that the node is in a normal state.



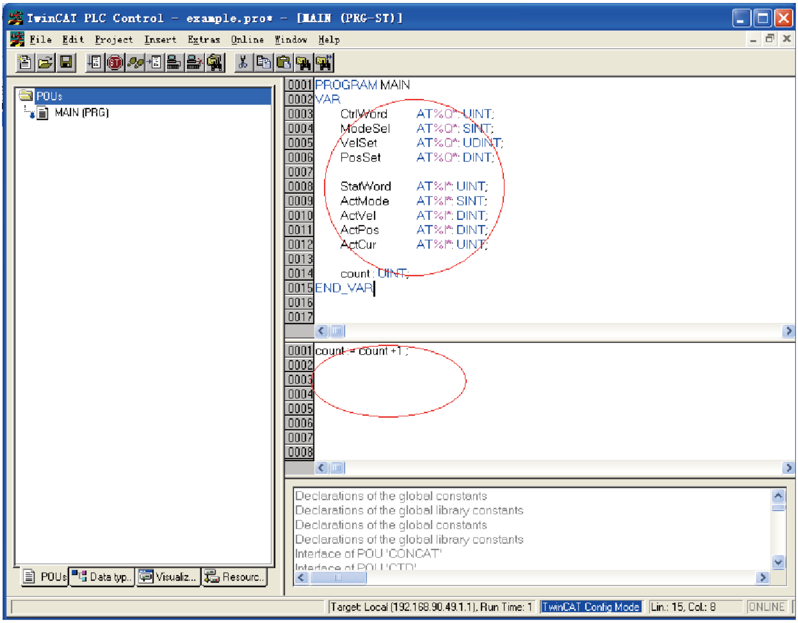

28. Open TwinCAT PLC Control, create a new project, and select "CX (ARM)" in the dialog box displayed.



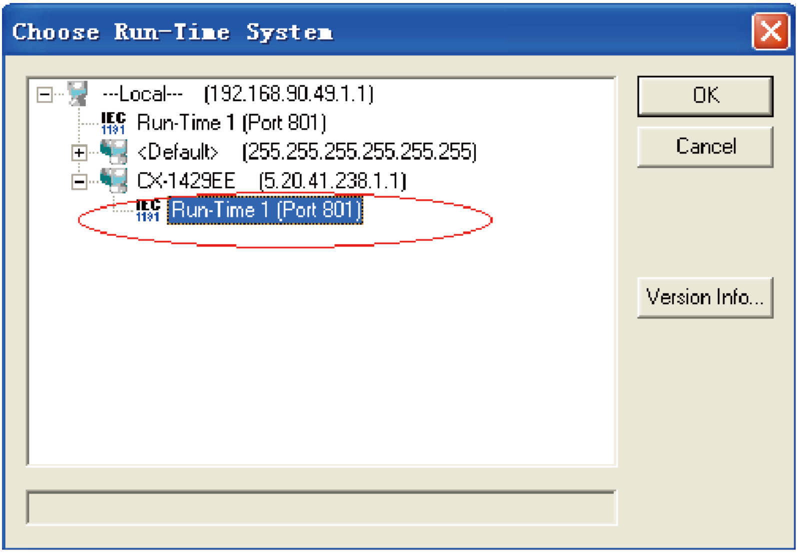

29. In the dialog box displayed, select the following options.



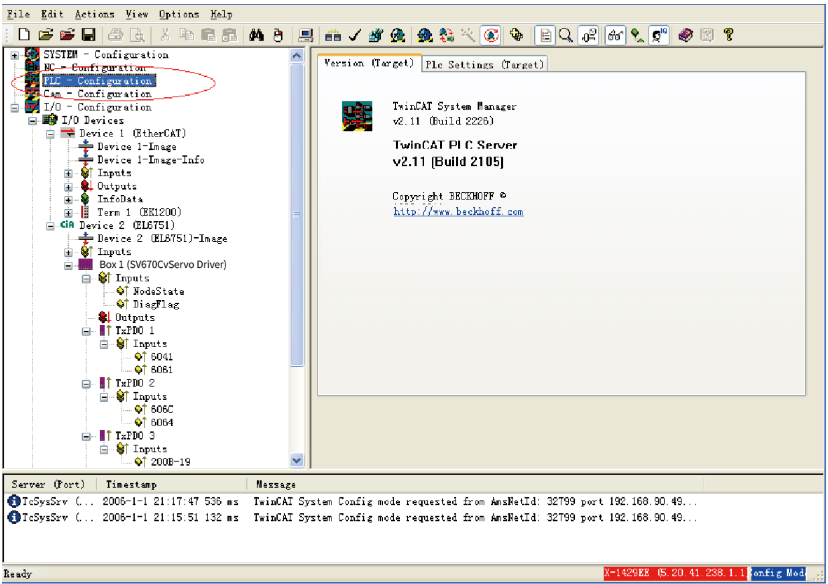

30. Enter corresponding variable definition and the PLC logic.



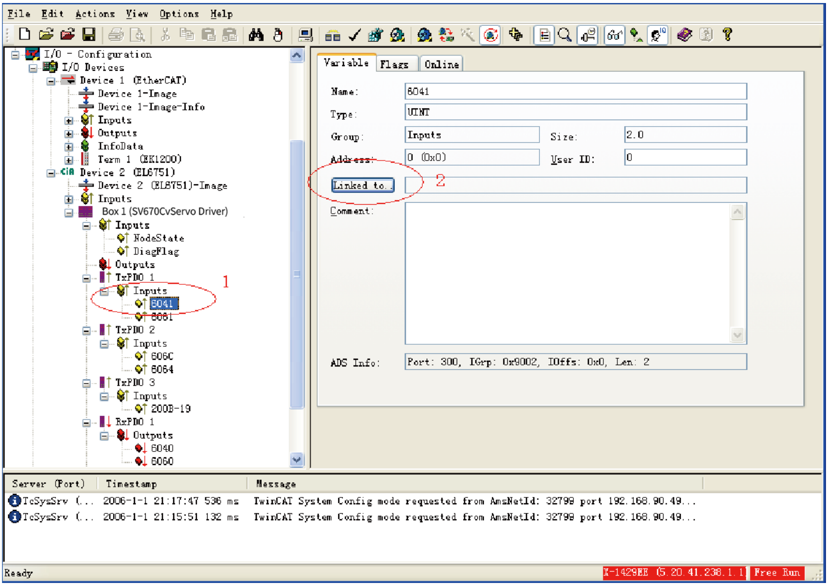

31. In the toolbar, choose Online > Choose Run-Time System. In the dialog box displayed, select the corresponding master port and click "OK".



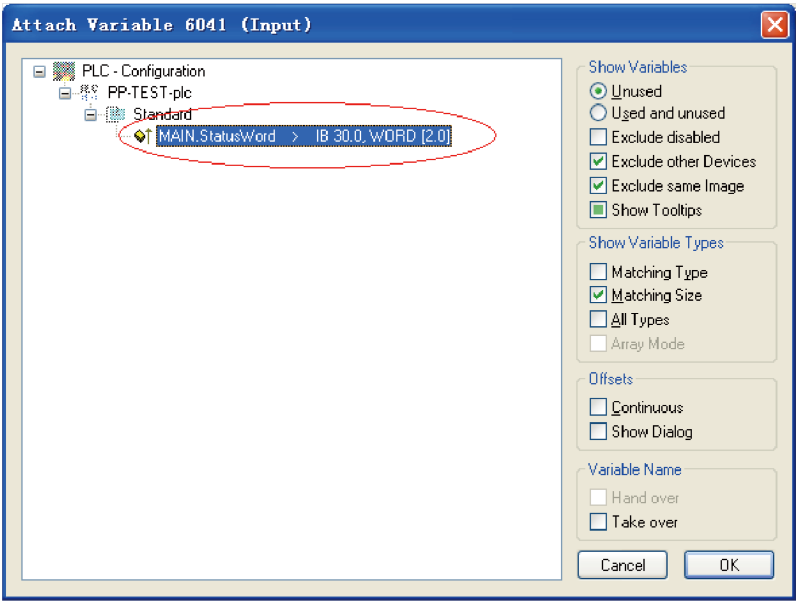

32. In TwinCAT System Manager, select "PLC - Configuration" on the left, right-click "PLC - Configuration", and choose "Append PLC Project..." to select the PLC program (.tpy) created.



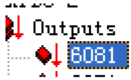

33. After the PLC program is added, select the PDO variable and click "Linked to" or double-click the variable to link the variable to the PLC program.



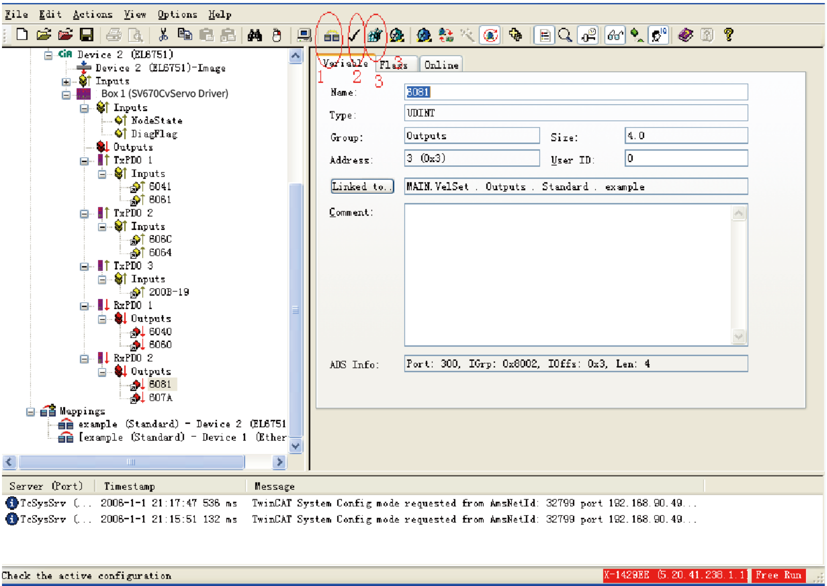

34. Select the corresponding PLC variable and click "OK".



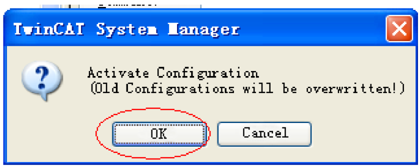

35. After the variable is linked, a small arrow appears at the bottom left of the variable name icon, as shown below.



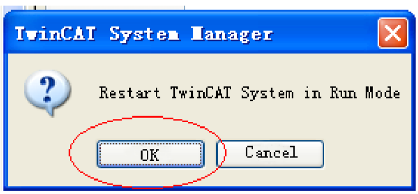

36. Click the Generate Mapping, Check Configuration, and Activate Configuration icons in sequence, as circled by marks 1, 2, and 3 in the following figure.



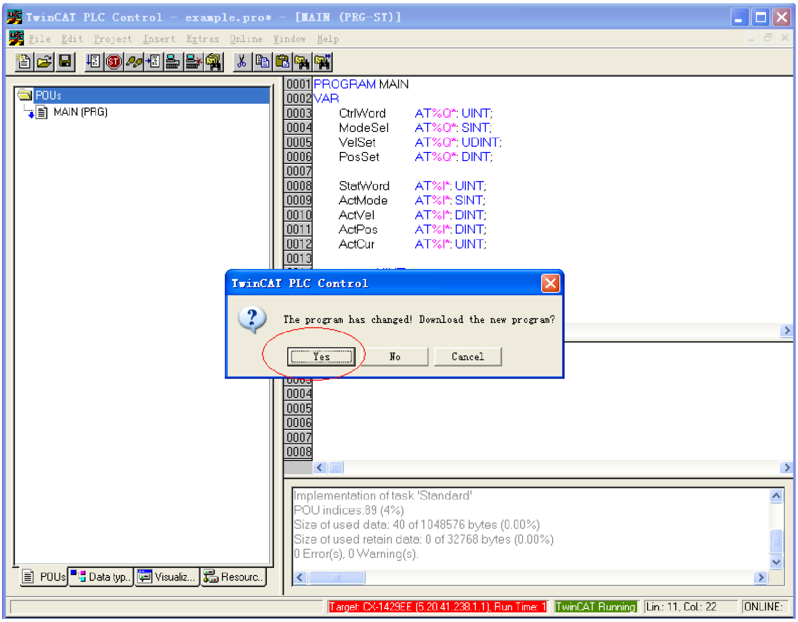

37. Click "OK" in the dialog box asking whether to activate configuration.



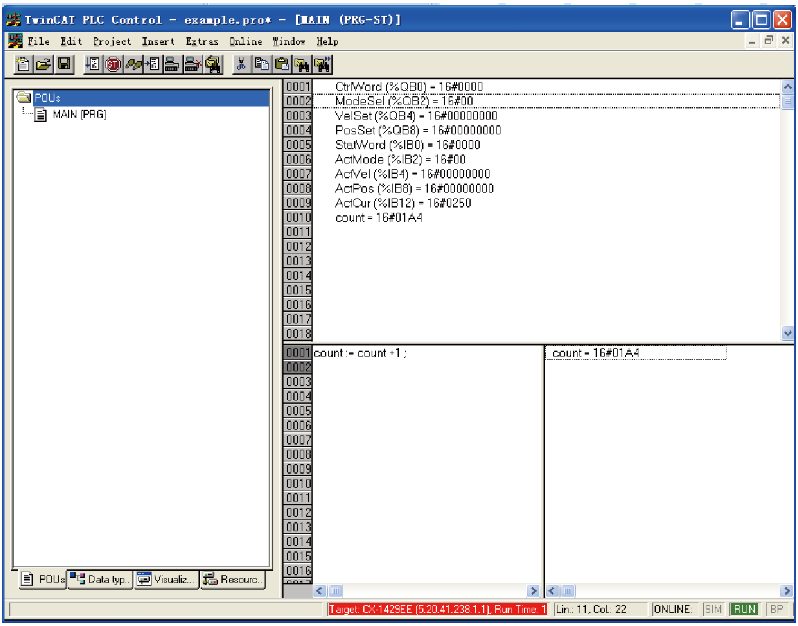

38. Click "OK" to restart the TwinCAT system in the Run mode.




39. Open the project previously created in TwinCAT PLC Control. Choose Online > Login or press F11 to open the dialog box asking whether to download the new program.

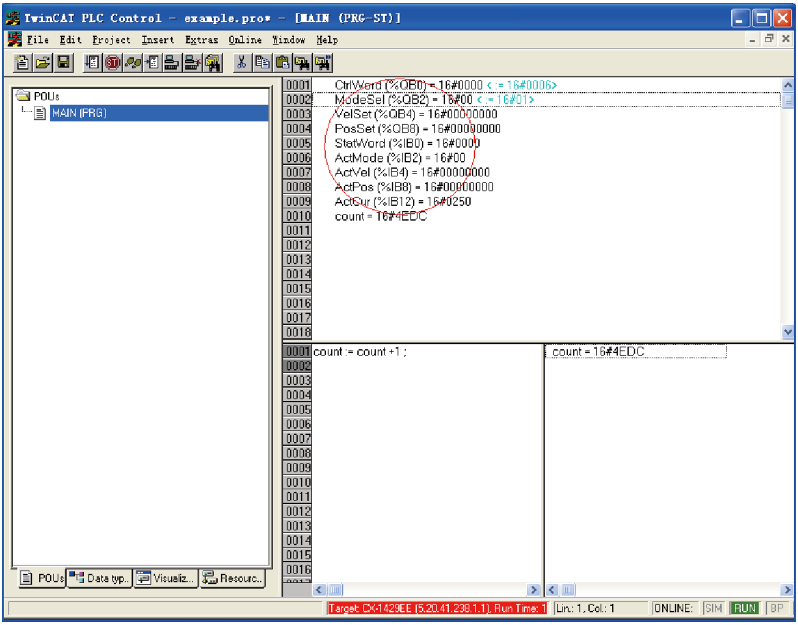



40. Choose Online > Run or press F5 to run the user PLC program.

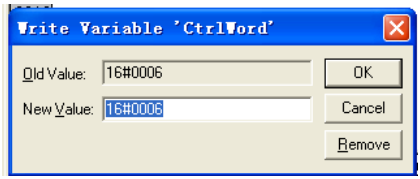



41. You can perform write commissioning through the manual mode. The commissioning method is similar to that of the Schneider master.

Double-click a variable circled in the following figure to enter a value.




42. Enter a value and click "OK".




The value entered is displayed in the square brackets behind the original variable. Choose Online > Force Values or press F7 to write the value.

Set 6060h (operation mode) to 1, 6081h (speed reference) to 100, 607Ah (position reference) to 10485760 (10 revolutions), and 6040h to 6(0x06), 7(0x07), 47(0x2f), and 63(0x3f) in sequence to make the motor run.

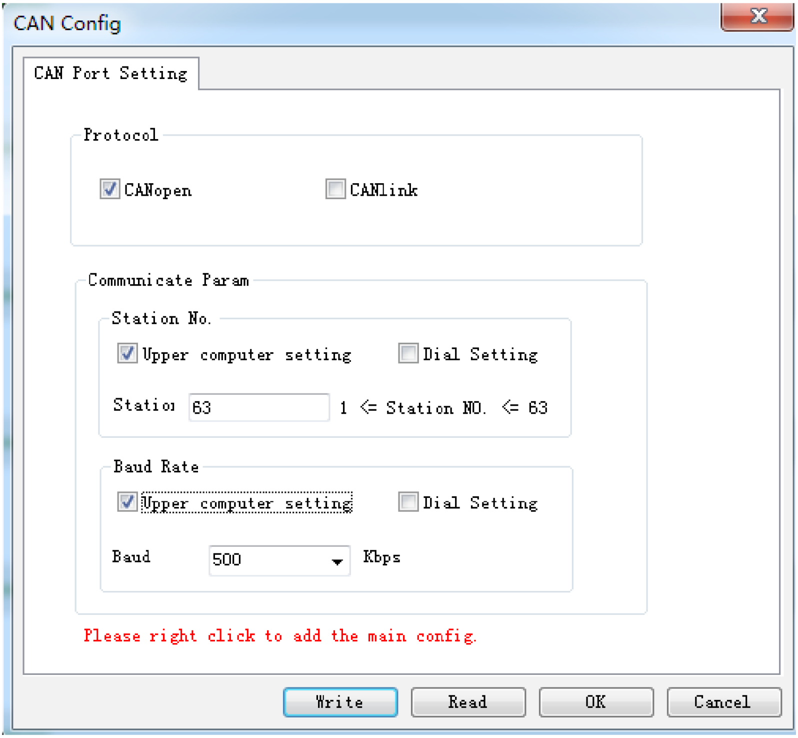
### Note

- When writing multiple values for one variable, execute the "Forced value" command every time a value is written. When writing values for multiple variables, you can execute the "Forced value" command once for all after all the values are written.
- When a new position or speed reference is required, write the new reference and set 6040h to 47(0x2f) and 63(0x3f) in turn. The motor runs to the position according to the new reference regardless of whether the previous reference is executed.
- To stop the motor, set 6040h to 0.
- To terminate manual writing of values, go to the toolbar and choose Online > Release Force, or press Shift+F7. Then, variables will be executed according to the PLC program logic instead of manually written values.

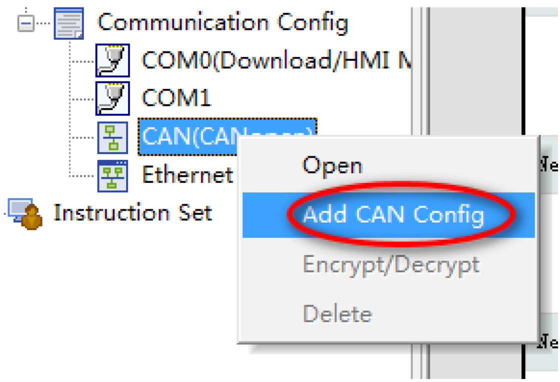
43. To stop executing the PLC program, choose Online > Stop in the toolbar. To continue editing the PLC program or exit, choose Online > Logout.

## 5.3 Connecting SV670C Servo Drive to Inovance H3U CANopen Master

1. Open AutoShop, go to "Communication Port" on the project management interface, and double-click "CAN" or right-click "CAN" and choose "Open". The "CAN Config" window is displayed.
   Set "Protocol" to "CANopen". Set "Station No." and "Baud Rate".



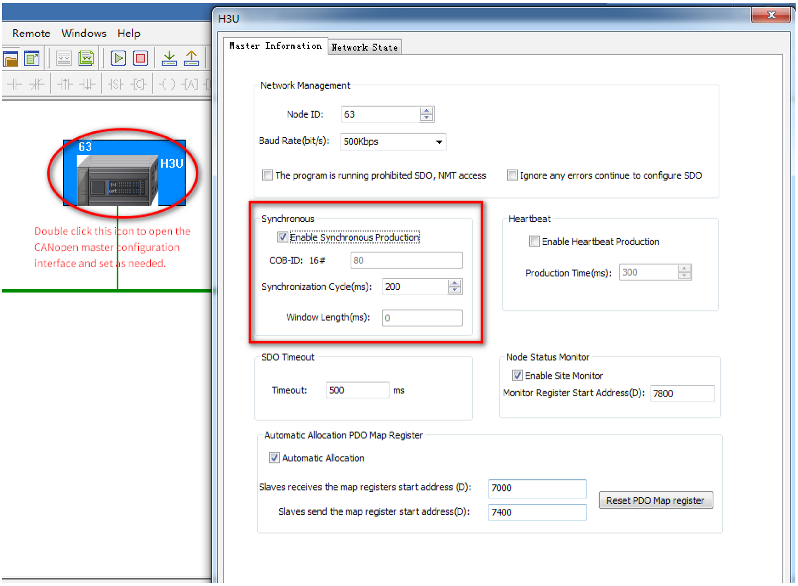

2. Right-click "CAN (CANopen)" and choose "Add CAN Config".




3. Double-click "CANopen configuration".

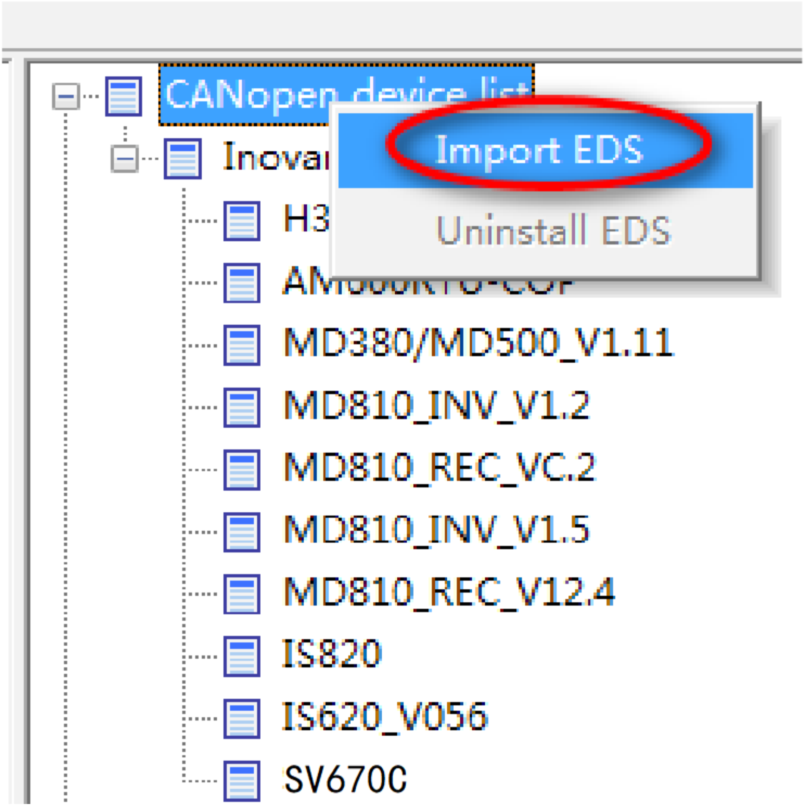
   The "CANopen configuration" window includes an H3U icon. Double-click the icon to open the master configuration interface and set parameters such as synchronization and heartbeat.

H3U axis control commands control the servo drive through PDO communication. The PDO adopts the synchronous mode by default when the SV670C series servo drive is working with an H3U master. Therefore, select "Enable Synchronous Production" on the master configuration interface and set the synchronization cycle as needed (typically 15 ms for 8-axis models). For other servo drive models, select this option if the PDO also adopts the synchronous mode.

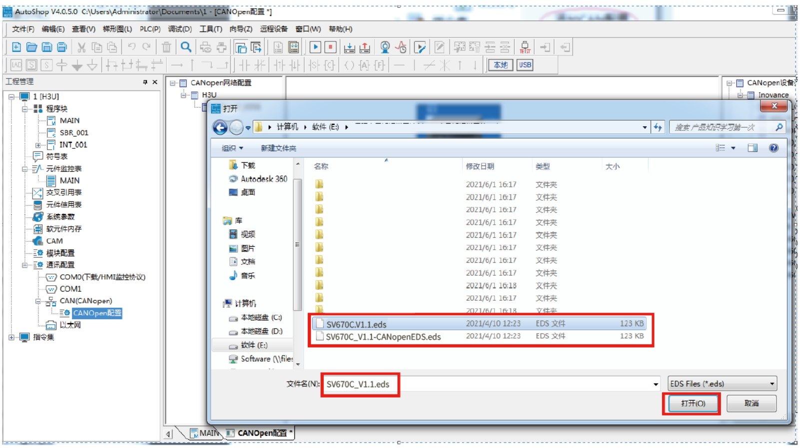



4. If the EDS file needed is not in the CANopen device list, add the device EDS file.

   a. Right-click "CANopen device list". On the short-cut menu displayed, choose "Import EDS".

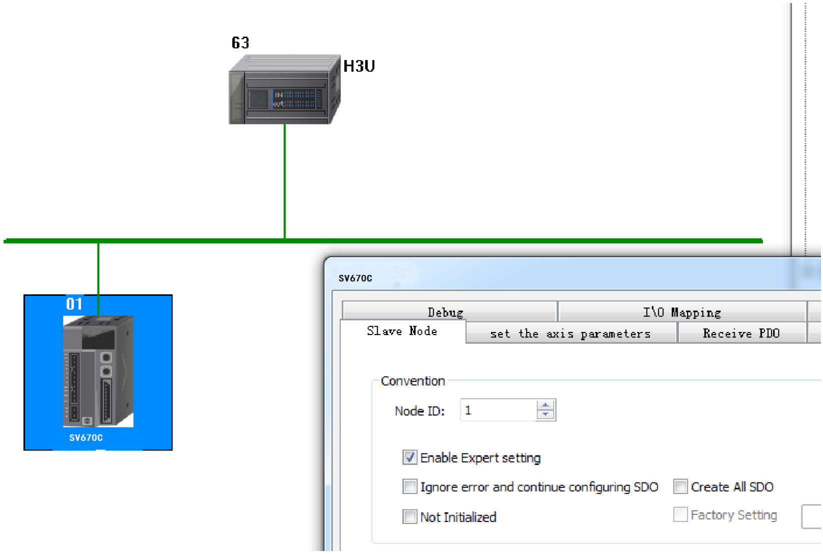



b. In the dialog box displayed, select the EDS file needed and click "Open".



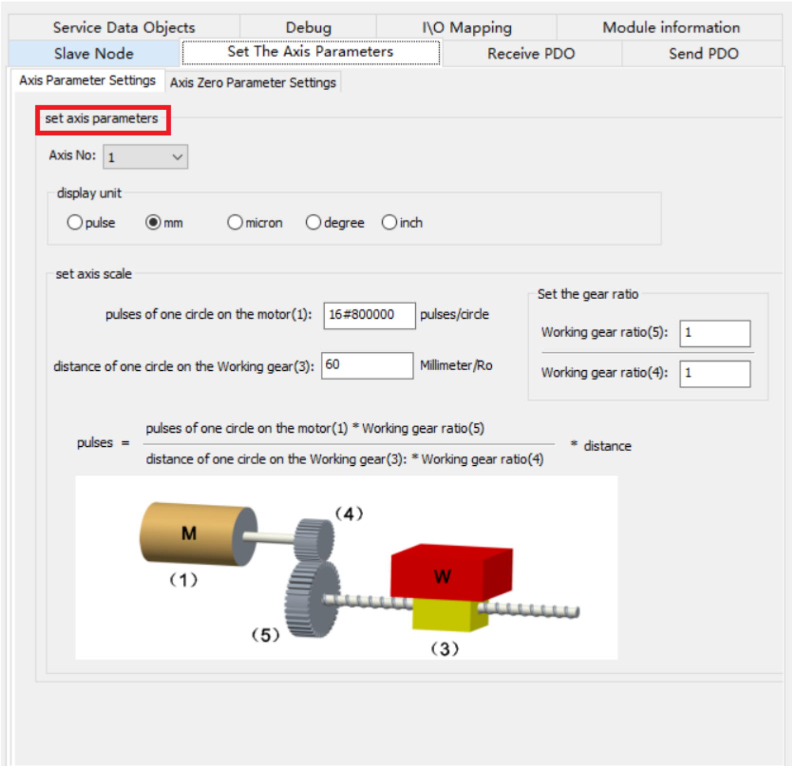

c. The device added is displayed in the CANopen device list on the right.

5. In the CANopen device list, double-click "SV670C" to add CANopen slaves. In the configuration window displayed, double-click the SV670C icon to open the slave configuration parameter list.




6. As shown in the following figure, the "Set The Axis Parameters" interface includes the "Axis Parameter Settings" and "Axis Zero Parameter Settings" tabs.

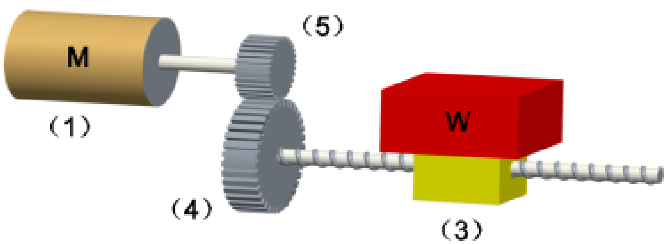
**Axis parameter settings**




- For devices without reducers, set the gear ratio to 1:1. Set the pulses of one circle on the motor and distance of one circle on the motor according to actual device data. The calculation formula is as follows.

$$\text{Pulses} = \frac{\text{Pulses of one circle on the motor (1)}}{\text{Distance of one circle on the working gear (3)}} \times \text{Distance (in displayed unit)}$$

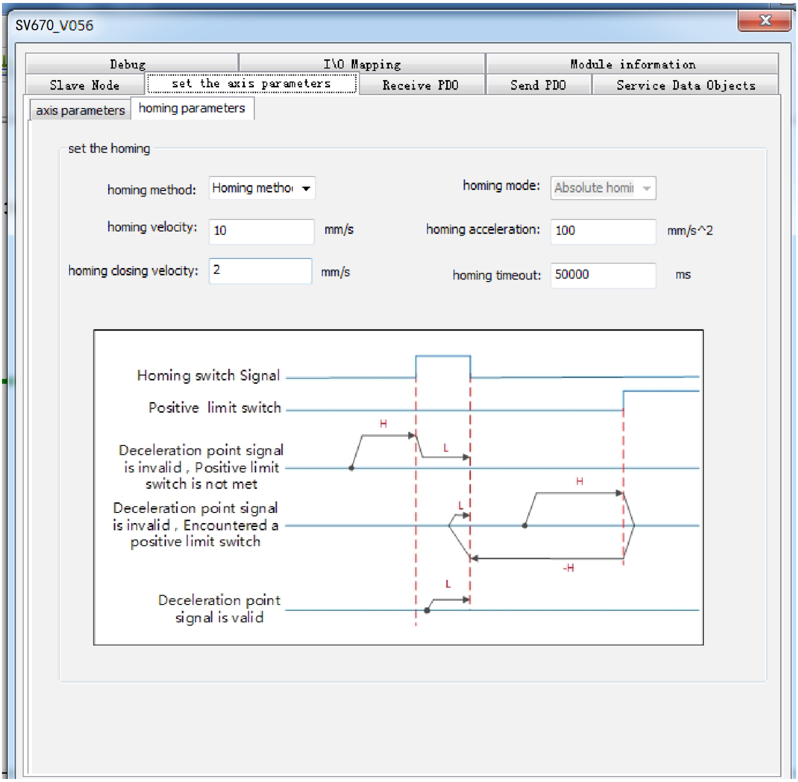
- Applications with reducers are shown as follows.



The calculation formula for devices with reducers is as follows.

$$\text{Pulses} = \frac{\text{Pulses of one circle on the motor (1) x Working gear ratio (5)}}{\text{Distance of one circle on the working gear (3) x Working gear ratio (4)}} \text{ x Distance (in displayed unit)}$$

### Axis zero parameter settings




Homing methods include methods 1 to 35. For the specific implementation of each homing method, see the corresponding servo guide. The object dictionary value can be calculated using the homing velocity, homing acceleration, and homing closing velocity, as follows.

$$\text{Object dictionary value} = \frac{\text{Pulses of one circle on the motor (1) x Working gear ratio (5)}}{\text{Distance of one circle on the working gear (3) x Working gear ratio (4)}} \text{ x Setpoint in the software tool (in displayed unit)}$$

The relationship between the preceding parameters and object dictionary items is summarized in the following table.

| Index | Sub-index | Data Type | Description | Unit |
|---|---|---|---|---|
| 6098h | 00 | SINT | Homing method | - |
| 6099h | 01 | UDINT | Speed during search for switch | Reference unit/s |

| Index | Sub-index | Data Type | Description | Unit |
|---|---|---|---|---|
| 6099h | 02 | UDINT | Speed during search for zero | Reference unit/s |
| 609Ah | 00 | UDINT | Homing acceleration | Reference unit/$s^2$ |
| 60E6h | 00 | USINT | Homing method | - |

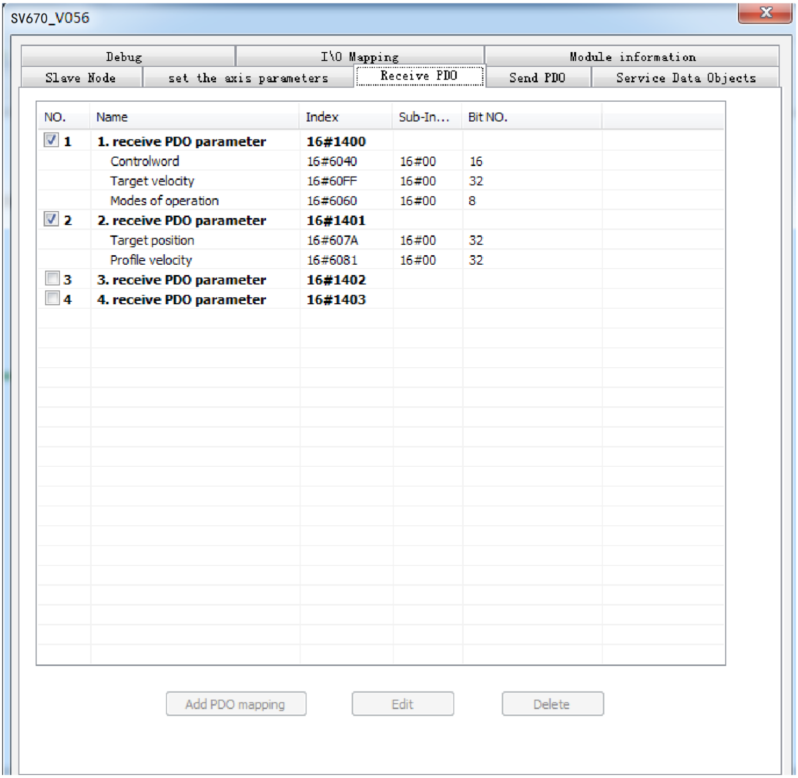
7. In CANopen CiA402 motion control, the object dictionary items that need to be operated in commands interact with the slave through PDO. These items include 6040h (control word), 6041h (status word), 6060h (operation mode selection), 6061h (current operation mode), 6081h (profile position mode target velocity), 607Ah (profile position mode target position), 60FFh (velocity mode target velocity), 6064h (current position), and 606Ch (current velocity). Configure these items following the requirements below to avoid axis configuration failure during calling axis control commands.

## *Note*

It is recommended to configure the PDO communication to synchronous mode to prevent frame loss caused by interference during communication. The synchronous mode requires synchronous production to be enabled in the master configuration. To ensure communication stability, the network load rate must be lower than 70%.

$$\text{Network load rate} = \frac{328 \times \text{Number of axes} + 79}{\text{Baud rate} \times \text{SYNC cycle}} \times 100\%$$

**RPDO configuration**



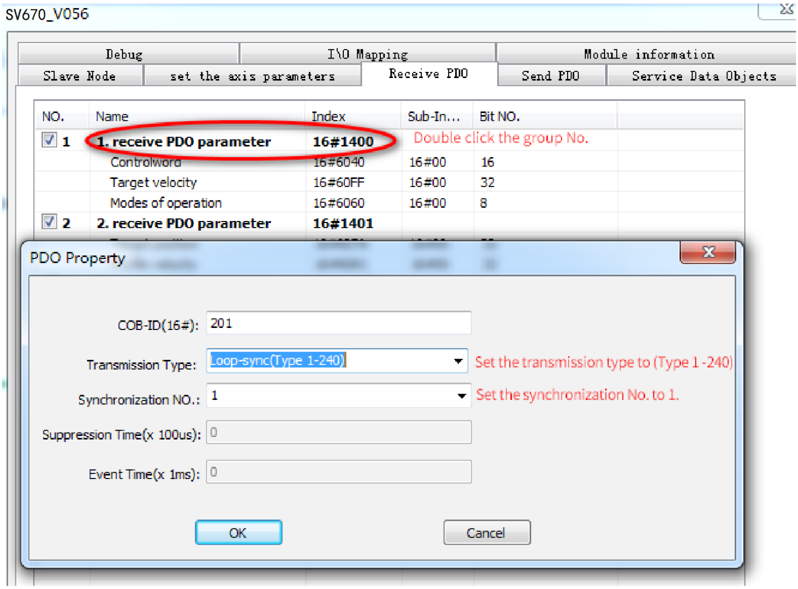

Configure RPDOs in the following sequence.

| Index | Sub-index | Name |
|---|---|---|
| 6040h | 00 | Control word |
| 60FFh [1] | 00 | Target velocity |
| 6060h | 00 | Modes of operation |
| 607Ah | 00 | Target position |
| 6081h | 00 | Profile velocity |

## *Note*

[1]: The object dictionary can be replaced by other object dictionaries with a length of 0x20.

It is recommended to use the synchronous mode for PDO communication. Follow the procedure below to set synchronous PDO communication for the slave.




## *Note*

When MCMOVVEL and MCJOG are not in use, this object dictionary can be replaced by other object dictionaries with a length of 0x20.

Steps:

- 1. Double-click the group No. and a dialog box appears.
- 2. Set "Transmission Type" to "Type1-240".
- 3. Set "Synchronization NO." to "1".

### TPDO configuration

Configure TPDOs in the following sequence.

| Index | Sub-index | Name |
|---|---|---|
| 6041h | 00 | Status word |
| 60FDh [1] | 00 | Digital inputs |
| 6061h | 00 | Modes of operation |
| 6064h | 00 | Position actual value |
| 606Ch | 00 | Velocity actual value |

## *Note*

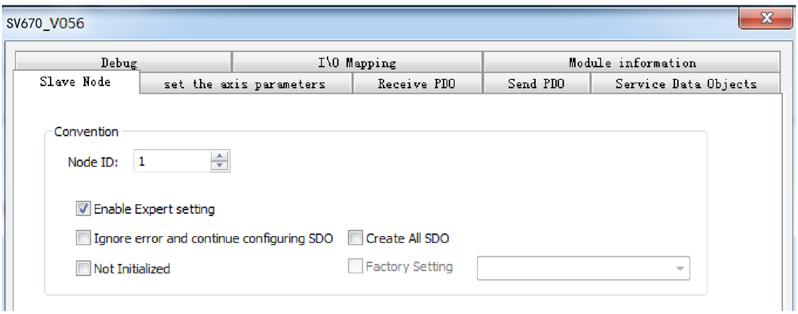
[1]: The object dictionary can be replaced by other object dictionaries with a length of 0x20.

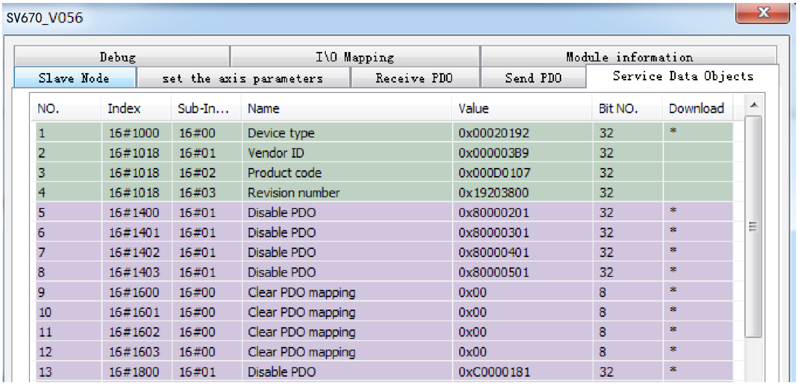
The procedure for setting the synchronous mode of TPDO is similar to that for RPDO.

### Caution

The EDS must be configured based on the preceding sequence by default. Observe the preceding configuration sequence when adding new objects. A wrong sequence will cause failure of H3U axis control commands. The preceding configuration sequence does not necessarily apply to PLCs from other manufacturers.

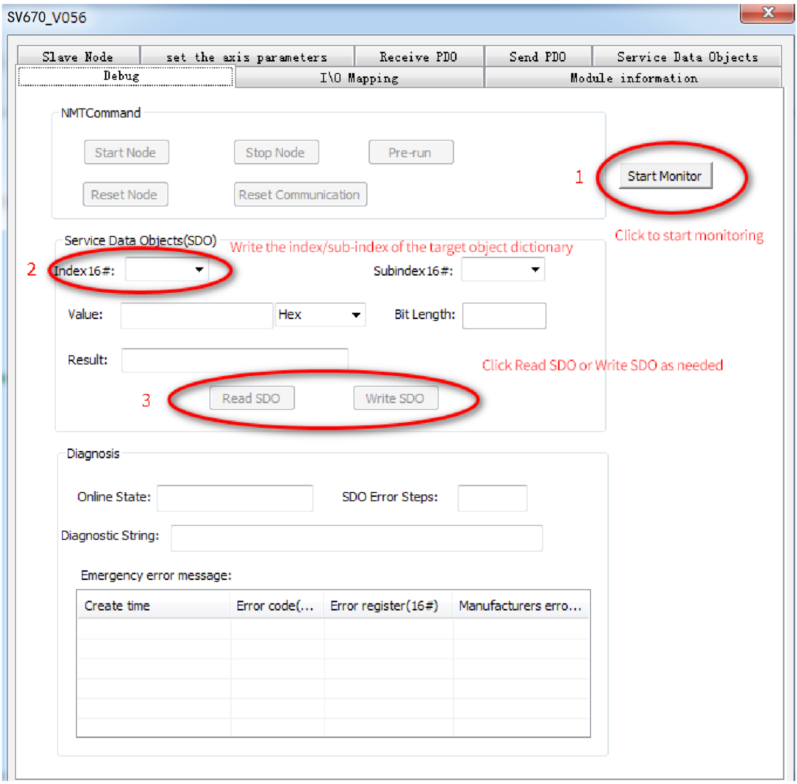
8. Download the CANopen configuration to H3U. The H3U starts to configure the slave based on the preceding configurations. The configuration is performed based on the object dictionary items listed on the "Servo Data Objects" interface. To view the list, select "Enable Expert Settings" on the "Slave Node" interface first.






| NO. | Index | Sub-In... | Name | Value | Bit NO. | Download |
|---|---|---|---|---|---|---|
| 1 | 16#1000 | 16#00 | Device type | 0x00020192 | 32 | * |
| 2 | 16#1018 | 16#01 | Vendor ID | 0x000003B9 | 32 | |
| 3 | 16#1018 | 16#02 | Product code | 0x000D0107 | 32 | |
| 4 | 16#1018 | 16#03 | Revision number | 0x19203800 | 32 | |
| 5 | 16#1400 | 16#01 | Disable PDO | 0x80000201 | 32 | * |
| 6 | 16#1401 | 16#01 | Disable PDO | 0x80000301 | 32 | * |
| 7 | 16#1402 | 16#01 | Disable PDO | 0x80000401 | 32 | * |
| 8 | 16#1403 | 16#01 | Disable PDO | 0x80000501 | 32 | * |
| 9 | 16#1600 | 16#00 | Clear PDO mapping | 0x00 | 8 | * |
| 10 | 16#1601 | 16#00 | Clear PDO mapping | 0x00 | 8 | * |
| 11 | 16#1602 | 16#00 | Clear PDO mapping | 0x00 | 8 | * |
| 12 | 16#1603 | 16#00 | Clear PDO mapping | 0x00 | 8 | * |
| 13 | 16#1800 | 16#01 | Disable PDO | 0xC0000181 | 32 | * |

During commissioning, you can monitor the device status online and read/write the object dictionary of the slave through H3U, as shown below.




Steps:

- 1. Click "Start Monitor".

- 2. Enter the index of the target object dictionary in "Index16#" and the sub-index in "Subindex16#".
- 3. Click "Read SDO" or "Write SDO" as needed.

## 5.4 SV670P Modbus RTU Communication Configuration

### 5.4.1 Communication Overview

The following case illustrates how to establish Modbus RTU communication connection between Inovance H2U and the SV670P series servo drive. The connection can be implemented through the configuration table or programming. In this case, H06.03 (Write speed) and H0b.00 (Read speed) are used for illustration.

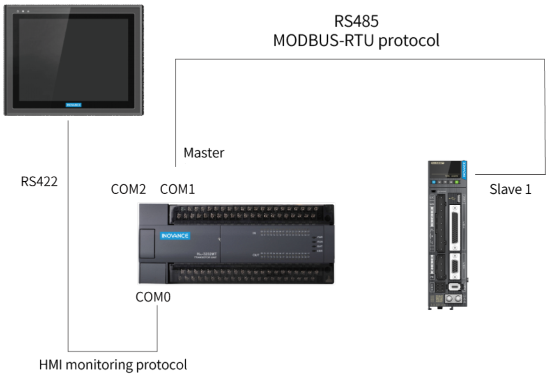



Figure 5-1 Schematic and wiring diagram

### 5.4.2 Wiring for Modbus RTU Communication Between SV670P and Different PLCs

#### Inovance H2U and SV670P

| Name | Model | Quantity | Remarks |
|---|---|---|---|
| PLC | H2U-1616MT/MR | 1 set | - |
| Inovance SV670P series servo drive and applicable motor | SV670PT012I<br>MS1H3-******* | 1 set | - |

| COM1 Terminal Layout on PLC Side | | CN3/CN4 Terminal Layout on Drive Side | |
|---|---|---|---|
| Signal Name | Pin No. | Signal Name | Pin No. |
| RS485+ | 1 | RS485+ | 4 |
| RS485－ | 2 | RS485－ | 5 |
| - | - | PE (shield) | Enclosure |

## Siemens PLC and SV670P

| Siemens S7200 PLC | | CN3/CN4 Terminal Layout on Drive Side | |
|---|---|---|---|
| PLC PORT0-RS485 | Pin No. | Signal Name | Pin No. |
| Data+ | 3 | RS485+ | 4 |
| Data－ | 8 | RS485－ | 5 |
| PE (shield) | Enclosure | PE (shield) | Enclosure |

## Mitsubishi FX3U and SV670P

| Mitsubishi FX3U PLC | | CN3/CN4 Terminal Layout on Drive Side | |
|---|---|---|---|
| FX3U-485-BD | Pin No. | Signal Name | Pin No. |
| SDA | Short | RS485+ | 4 |
| RDA | | | |
| SDB | Short | RS485－ | 5 |
| RDB | | | |
| SG | Enclosure | PE (shield) | Enclosure |

**Setting communication parameters through GX PLC software (initialization of communication port 1)**

1. Communication port 1 parameter setting (RS485, 19200, 7, N, 1)
2. LD M8002
3. Initial ON
4. MOV H0C91 D8120
5. Communication port 1 setting
6. SET M8161
7. Communication format: 8-bit

**Using two major commands (See the user guide for FX3U communication.)**

- RS D100 K8 D120 K8
  - D100: station No. being "?"
  - D120: start address for data receiving (8 bytes)
- CRC D100 D106 K6
  - D100: station No. being "?"
  - D106: CRC checked address

**Omron PLC and SV670P**

| Omron CP1L | | CN3/CN4 Terminal Layout on Drive Side | |
|---|---|---|---|
| PLC PORT0-RS485 | Pin No. | Signal Name | Pin No. |
| SDB+ | - | RS485+ | 4 |
| SDA— | - | RS485— | 5 |
| PE (shield) | Enclosure | PE (shield) | Enclosure |

## *Note*

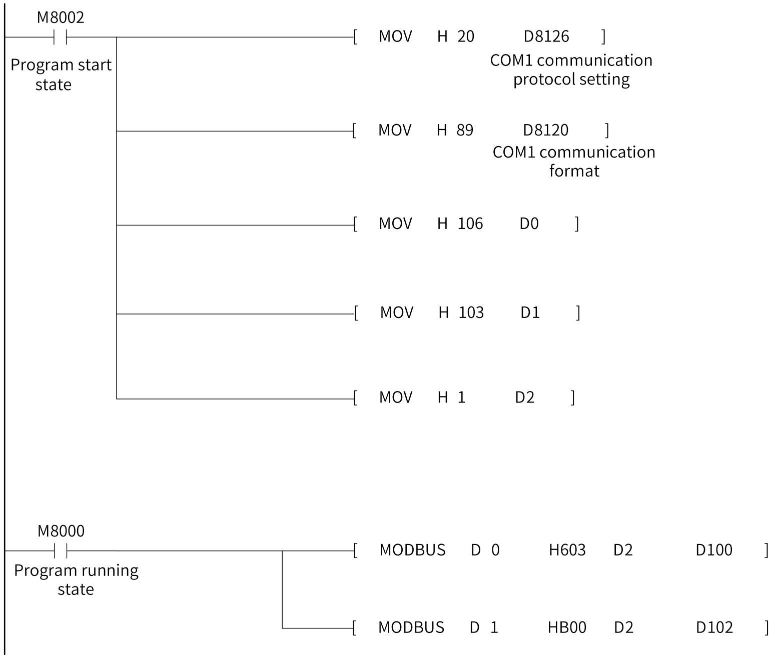
Set 2, 3, 5, and 6 on the DIP switch to ON, and others to OFF. The DIP switch is on the back of PLC communication card.

### 5.4.3 Servo Parameter Settings

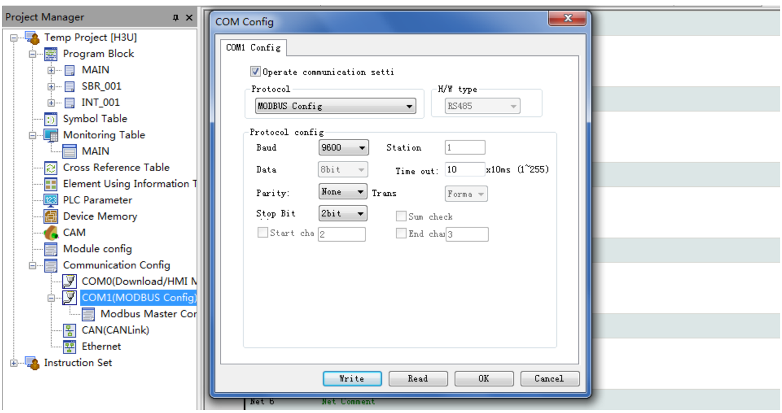
| Para. | Setting | Description | Remarks |
|---|---|---|---|
| H0E.00 | 1 | Drive axis address | - |
| H0E.80 | 5 | Modbus baud rate | 5: 9600 bps |
| H0E.84 | 1 | Modbus communication data sequence | 0: High 16 bits before low 16 bits<br>1: Low 16 bits before high 16 bits |

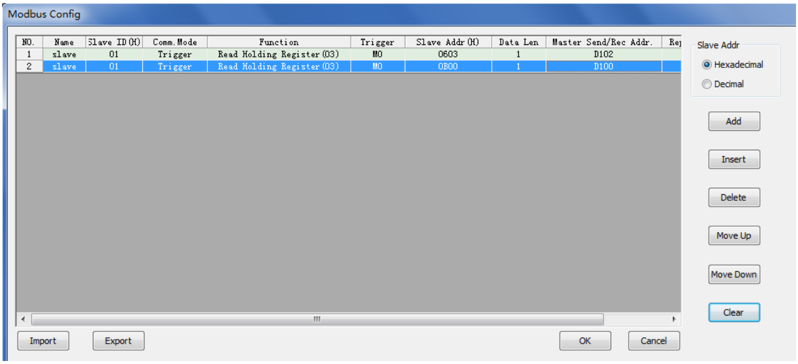
## 5.4.4 PLC Program Examples

### Communication connection implemented through programming




### Communication connection implemented through configuration table






## 5.5 Typical Bus Positioning Control (CANlink 3.0)

### 5.5.1 Project Description

The following case illustrates how to implement control on forward/reverse run, jog, and positioning of the servo drive through H3U series PLC in the CANlink 3.0 bus mode.

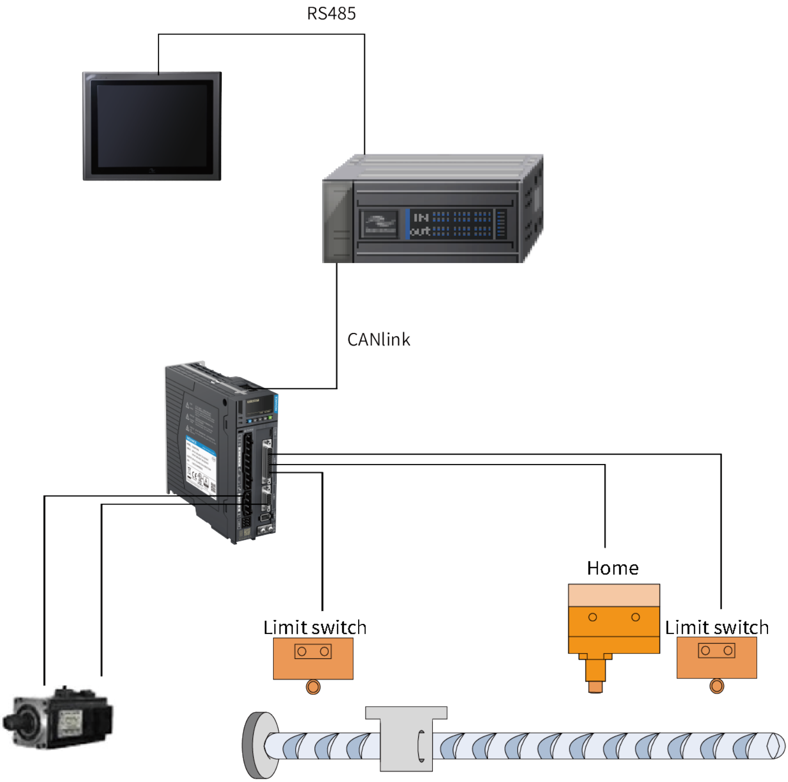



Figure 5-2 Schematic diagram

### 5.5.2 Product Model Selection and Wiring

| Name | Model | Quantity | Remarks |
| --- | --- | --- | --- |
| HMI | IT5070T | 1 set | - |
| PLC | H3U-3232MT | 1 set | - |
| Inovance SV670P series servo drive and applicable motor | SV670PS2R8I-C<br>ISMH1-40B30CB | 16 sets | - |

| CN3/CN4 Terminal Layout on Drive Side | | CAN Card Terminal Layout on PLC Side | |
| --- | --- | --- | --- |
| Signal Name | Pin No. | Signal Name | Pin No. |
| CANH | 1 | CANH | 2 |
| CANL | 2 | CANL | 4 |

| CN3/CN4 Terminal Layout on Drive Side | | CAN Card Terminal Layout on PLC Side | |
|---|---|---|---|
| Signal Name | Pin No. | Signal Name | Pin No. |
| CGND | 3 | CGND | 5 |
| PE (shield) | Enclosure | PE | 3 |

## *Note*

When the PLC station No. is 63, set the DIP switch to 00111111.

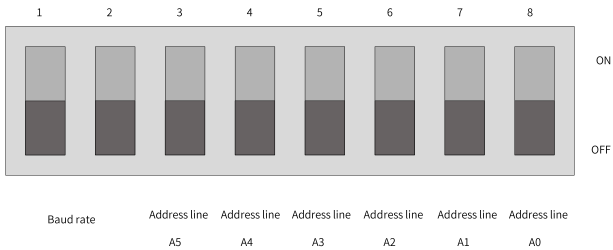



Figure 5-3 DIP switch of H3U

| Switch | Signal | Description |
|---|---|---|
| 1 | Baud rate combination bit 1 | 00: 500 kbps |
| | | 01: 100 kbps |
| 2 | Baud rate combination bit 0 | 10: 1 Mbps |
| | | 11: 50 kbps |
| 3 | Address line A5 | These six switches are grouped to form a 6-bit binary value used to indicate the local station number (you can set the station number through D element in the case of the PLC master module). "ON" means 1 and "OFF" means 0. A5 is a high bit and A0 is a low bit. The digits are combined in the order of A5A4A3A2A1A0.<br>Example:<br>If A0 is ON and other bits are OFF, the binary address is 000001. In this case, the address is K01 in decimal and 0x01 in hexadecimal.<br>If A3 and A4 are ON and other bits are OFF, the binary address is 011000. In this case, the address is K24 in decimal and 0x18 in hexadecimal. |
| 4 | Address line A4 | |
| 5 | Address line A3 | |
| 6 | Address line A2 | |
| 7 | Address line A1 | |
| 8 | Address line A0 | |

## *Note*

The baud rate and address are not activated immediately after a DIP switch change. To activate newly set parameters, a power cycling or STOP → RUN cycle is required.

### 5.5.3 Servo Parameter Settings

| Para. | Setting | Description | Remarks |
|---|---|---|---|
| H02.00 | 1 | Position control mode | - |
| H03.10 | 0 | DI5 function: 0 | - |
| H05.00 | 2 | Position reference source: Multi-position reference | - |
| H05.02 | 10000 | Pulses per revolution | Set as needed. |
| H05.30 | 1 | Homing is enabled (and can be activated by the HomingStart signal). | Set as needed. |
| H05.31 | 1 | Reverse homing is selected, and the home switch acts as the deceleration point and the home. | Set as needed. |
| H11.00 | 5 | The multi-position operation mode is set to 5: axis-controlled continuous operation. | - |
| H11.01 | 1 | Number of displacement references in multi-position mode | - |
| H11.04 | 1 | 0: Relative position reference<br>1: Absolute position reference | - |
| H17.00 | 1 | VDI1 function: S-ON signal | H17-01 is set to 0 by default, indicating that the S-ON becomes active when value "1" is written. |
| H17.02 | 18 | VDI2 function: Forward jog | - |
| H17.04 | 19 | VDI3 function: Reverse jog | - |
| H17.06 | 28 | VDI4 function: Multi-position reference enable | - |
| H17.08 | 32 | HomingStart: Homing enable | - |
| H17.10 | 34 | Emergency stop | - |
| H0E.00 | 1 | Drive axis address | 1 |

| Para. | Setting | Description | Remarks |
| --- | --- | --- | --- |
| H0E.11 | 5 | The CAN communication rate is set to 5: 500 kbps. | - |
| H17.90 | 1 | VDI is enabled. | - |
| H0E.10 | 0 | 0: Pulse/Axis control command<br>1: Enhanced axis control command<br>2: CANopen protocol | - |
| H0E.01 | 0 | Write parameters through communication to EEPROM: No | - |

### 5.5.4 PLC Program Configuration

When creating a new project in AutoShop, set the PLC type to H3U-R. This enables CANlink configuration to be generated automatically after programming and compiling are done, removing the need for manual configuration.

# 6 Description of Parameters

## 6.1 H00 Servo Motor Parameters

**H00.00 Motor code**

| | | | |
|---|---|---|---|
| Address: | 0x0000 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 14101 | Change: | At stop |

**Value Range:**

0 to 65535

**Description**

14000: Inovance motor with 20-bit incremental encoder

14101: Inovance motor with 23-bit absolute encoder

14102: Inovance motor with 26-bit absolute encoder

**H00.02 Customized No.**

| | | | |
|---|---|---|---|
| Address: | 0x0000 | | |
| Min.: | 0 | Unit: | - |
| Max.: | $2^{32}$ - 1 | Data type: | UInt32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.00 to $2^{32}$ - 1.00

**Description**

Used to differentiate the customized MCU software version, which is not applicable to standard models.

**H00.04 Encoder version**

| | | | |
|---|---|---|---|
| Address: | 0x0004 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 6553.5 | Data type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0 to 6553.5

**Description**

Saved in the encoder and used to differentiate the encoder software version

**H00.05 Serial-type motor code**

| | | | |
|---|---|---|---|
| Address: | 0x0005 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Displays the code of the serial-type motor, which is determined by the motor model and changeable.

### H00.06 Customized FPGA No.

| | | | |
|---|---|---|---|
| Address: | 0x0006 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 655.35 | Data type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.00 to 655.35

**Description**

Used to differentiate the customized FPGA software version, which is not applicable to standard models.

### H00.07 STO version

| | | | |
|---|---|---|---|
| Address: | 0x000 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 655.35 | Data type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.00 to 655.35

**Description**

Displays the software version of the STO function.

### H00.08 Serial encoder type

| | | | |
|---|---|---|---|
| Address: | 0x0008 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0 to 65535

**Description**

14100: Multi-turn absolute encoder

Others: Single-turn absolute encoder

## 6.2 H01 Servo Drive Parameters

### H01.00 MCU software version

Address: 0x0100

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0 to 6553.5

**Description**

Displays the MCU software version (with one decimal place).

### H01.01 FPGA software version

Address: 0x0101

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0 to 6553.5

**Description**

Displays the FPGA software version (with one decimal place).

### H01.02 Servo drive series No.

Address: 0x0102

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Displays the servo drive series No. (without decimal place).

### H01.06 Board software version

Address: 0x0106

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 6554 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

Setpoint

0.0 to 6554

**Description**

Displays the board software version (with one decimal place).

### H01.10 Drive series No.

| | | | |
|---|---|---|---|
| Address: | 0x010A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 3 | Change: | At stop |

**Value Range:**

2: S1R6

3: S2R8

5: S5R5

60005: S6R6

6: S7R6

7: S012

8: S018

9: S022

10: S027

10001: T3R5

10002: T5R4

10003: T8R4

10004: T012

10005: T017

10006: T021

10007: T026

**Description**

Displays the drive series No. (without decimal place).

### H01.11 DC-AC voltage class

| | | | |
|---|---|---|---|
| Address: | 0x010B | | |
| Min.: | 0 | Unit: | V |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 220 | Change: | Unchangeable |

**Value Range:**

0 V to 65535 V

**Description**

Displays DC-AC voltage class (without decimal place).

### H01.12 Rated power of the drive

| | | | |
|---|---|---|---|
| Address: | 0x010C | | |
| Min.: | 0 | Unit: | kW |
| Max.: | 10737418.24 | Data Type: | UInt32 |
| Default: | 0.4 | Change: | Unchangeable |

**Value Range:**

0.00 to 10737418.24

**Description**

Displays the rated power of the servo drive (with two decimal places).

### H01.14 Max. output power of the drive

| | | | |
|---|---|---|---|
| Address: | 0x010E | | |
| Min.: | 0 | Unit: | kW |
| Max.: | 10737418.24 | Data Type: | UInt32 |
| Default: | 0.4 | Change: | Unchangeable |

**Value Range:**

0.00 to 10737418.24

**Description**

Displays the maximum output power of the drive (with two decimal places).

### H01.16 Rated output current of the drive

| | | | |
|---|---|---|---|
| Address: | 0x0110 | | |
| Min.: | 0 | Unit: | A |
| Max.: | 10737418.24 | Data Type: | UInt32 |
| Default: | 2.8 | Change: | Unchangeable |

**Value Range:**

0.00 to 10737418.24

**Description**

Displays the rated output current of the drive (with two decimal places).

### H01.18 Max. output current of the drive

| | | | |
|---|---|---|---|
| Address: | 0x0112 | | |
| Min.: | 0 | Unit: | A |
| Max.: | 10737418.24 | Data Type: | UInt32 |
| Default: | 10.1 | Change: | Unchangeable |

**Value Range:**

0.00 to 10737418.24

**Description**

Displays the maximum output current of the drive (with two decimal places).

### H01.40 DC bus overvoltage protection threshold

| | | | |
|---|---|---|---|
| Address: | 0x0128 | | |
| Min.: | 0 | Unit: | V |
| Max.: | 2000 | Data Type: | UInt16 |
| Default: | 420 | Change: | At once |

**Value Range:**

0 to 2000

**Description**

Displays DC bus overvoltage protection threshold (without decimal place).

### H01.75 Current loop amplification factor

| | | | |
|---|---|---|---|
| Address: | 0x014B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 655.35 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0.00 to 655.35

**Description**

Displays current loop amplication coefficient (with two decimal places).

### H01.89 Junction temperature parameter version

| | | | |
|---|---|---|---|
| Address: | 0x0159 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65.535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65.535

**Description**

Displays the junction temperature parameter version.

## 6.3 H02 Basic Control Parameters

### H02.00 Control mode

| | | | |
|---|---|---|---|
| Address: | 0x0200 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Speed control mode

1: Position control mode

2: Torque control mode

3: Torque/Speed control mode

4: Speed/Position control mode

5: Torque/Position control mode

6: Torque/Speed/Position compound mode

7: Process segment

**Description**

0: Speed control mode
1: Position control mode
2: Torque control mode
3: Torque/Speed control mode
4: Speed/Position control mode
5: Torque/Position control mode
6: Torque/Speed/Position compound mode
7: Process segment

### H02.01 Absolute system selection

| | | | |
|---|---|---|---|
| Address: | 0x0201 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Incremental mode
1: Absolute position linear mode 2: Absolute position rotation mode
3: Absolute position linear mode (without encoder overflow warning)
4: Absolute position single-turn mode

**Description**

Used to set the absolute position function.

### H02.02 Direction of rotation

| | | | |
|---|---|---|---|
| Address: | 0x0202 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

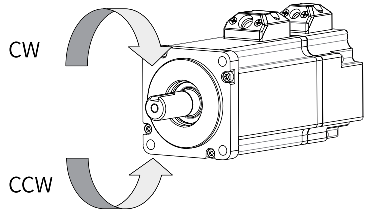
**Value Range:**

0: Counterclockwise (CCW) as forward direction
1: Clockwise (CW) as forward direction

**Description**

Defines the forward direction of the motor when viewed from the motor shaft side.

| Setpoint | Direction of rotation | Remarks |
|---|---|---|
| 0 | CCW direction as forward direction | When a forward command is input, the motor rotates in CCW direction viewed from the motor shaft side, that is, the motor rotates counterclockwise. |
| 1 | CW direction as forward direction | When a forward command is input, the motor rotates in CW direction viewed from the motor shaft side, that is, the motor rotates clockwise. |




## H02.03 Output pulse phase

Address: 0x0203

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

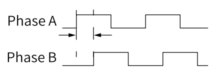
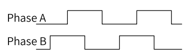
**Value Range:**

0: Phase A leads phase B

1: Phase A lags behind phase B

**Description**

Defines the relationship between phase A and phase B on the condition that the motor direction of rotation remains unchanged when pulse output is enabled.

| Setpoint | Output pulse phase | Remarks |
|---|---|---|
| 0 | Phase A leads phase B. | Phase A leads phase B by 90° in encoder frequency-division output pulses.   |
| 1 | Phase A lags phase B. | Phase A lags behind phase B by 90° in encoder frequency-division output pulses.   |

### H02.05 Stop mode at S-ON OFF

| | | | |
|---|---|---|---|
| Address: | 0x0205 | | |
| Min.: | -4 | Unit: | - |
| Max.: | 2 | Data Type: | Int16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-4: Stop based on ramp 2, keeping dynamic braking state
-3: Stop at zero speed, keeping dynamic braking state
-2: Stop based on ramp 1, keeping dynamic braking state
-1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Stop based on ramp 1, keeping de-energized state
2: Dynamic braking stop, keeping de-energized state

**Description**

Defines the deceleration mode of the motor for stopping rotating upon S-ON OFF and the motor status after stop.

### H02.06 Stop mode at No.2 fault

| | | | |
|---|---|---|---|
| Address: | 0x0206 | | |
| Min.: | -5 | Unit: | - |
| Max.: | 4 | Data Type: | Int16 |
| Default: | 2 | Change: | Real-time modification |

**Value Range:**

-5: Stop at zero speed, keeping dynamic braking state
-4: Stop at emergency stop torque, keeping dynamic braking state
-3: Stop based on ramp 2, keeping dynamic braking state
-2: Stop based on ramp 1, keeping dynamic braking state
-1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Stop based on ramp 1, keeping de-energized state
2: Stop based on ramp 2, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
4: Dynamic braking stop, keeping de-energized state

**Description**

Defines the deceleration mode of the servo motor for stopping rotating and the servo motor status when a No. 2 fault occurs.

### H02.07 Stop mode at overtravel

| | | | |
|---|---|---|---|
| Address: | 0x0207 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Coast to stop, keeping de-energized state
1: Stop at zero speed, keeping position lock state
2: Stop at zero speed, keeping de-energized state
3: Stop based on ramp 2, keeping de-energized state
4: Stop based on ramp 2, keeping position lock state
5: Dynamic braking stop, keeping de-energized state
6: Dynamic braking stop, keeping dynamic braking state
7: Not responding to overtravel

**Description**

Defines the deceleration mode of the servo motor for stopping rotating and the servo motor status when overtravel occurs.

### H02.08 Stop mode at No.1 fault

| | | | |
|---|---|---|---|
| Address: | 0x0208 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 2 | Change: | At stop |

**Value Range:**

0: Coast to stop, keeping de-energized state
1: Dynamic braking stop, keeping de-energized state
2: Dynamic braking stop, keeping dynamic braking state

**Description**

Defines the deceleration mode of the servo motor for stopping rotating and the servo motor status when a No. 1 fault occurs.
For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

### H02.09 Delay from brake output ON to command received

| | | | |
|---|---|---|---|
| Address: | 0x0209 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 250 | Change: | Real-time modification |

**Value Range:**

0 ms to 500 ms

**Description**

Defines the delay from the moment the brake output signal is ON to the moment the servo drive starts to receive commands after power-on.
For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

### H02.10 Delay from brake output off to motor de-energized

| | | | |
|---|---|---|---|
| Address: | 0x020A | | |
| Min.: | 50 | Unit: | ms |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 150 | Change: | Real-time modification |

**Value Range:**

50 ms to 1000 ms

**Description**

Defines the delay from the moment brake output is OFF to the moment when the motor at standstill enters the de-energized status.

For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

### H02.11 Motor speed threshold at brake output OFF in rotation state

| | | | |
|---|---|---|---|
| Address: | 0x020B | | |
| Min.: | 20 | Unit: | rpm |
| Max.: | 3000 | Data Type: | UInt16 |
| Default: | 30 | Change: | Real-time modification |

**Value Range:**

20 rpm to 3000 rpm

**Description**

Defines the motor speed threshold when brake (BK) output is OFF in the rotating state.

For details, see section "Servo ON" in SV670P Series Servo Drive Commissioning Guide.

### H02.12 Delay from S-ON OFF to brake output OFF in rotation state

| | | | |
|---|---|---|---|
| Address: | 0x020C | | |
| Min.: | 1 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 500 | Change: | Real-time modification |

**Value Range:**

1 ms to 65535 ms

**Description**

Sets the delay time from BK OFF to S-ON OFF when the motor is in rotating state.

### H02.15 Warning display on the keypad

| | | | |
|---|---|---|---|
| Address: | 0x020F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Output warning information immediately

1: Not output warning information

**Description**

Defines whether to switch the keypad to the fault display mode when a No. 3 fault occurs.

**H02.17 Stop mode upon main circuit power failure**

| | | | |
|---|---|---|---|
| Address: | 0x0211 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0: Keep present action

1: Stop upon fault as defined by H02.06

2: Stop at S-ON OFF as defined by H02.05

3: Stop quickly as defined by H02.18

**Description**

Defines the stop mode of the motor for stopping rotating upon main circuit power failure.

**H02.18 Quick stop mode**

| | | | |
|---|---|---|---|
| Address: | 0x0212 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0: Coast to stop, keeping de-energized state

1: Stop based on ramp 1, keeping de-energized state

2: Stop based on ramp 2, keeping de-energized state

3: Stop at emergency stop torque, keeping de-energized state

5: Stop based on ramp 1, keeping position lock state

6: Stop based on ramp 2, keeping position lock state

7: Stop at emergency stop torque, keeping position lock state

**Description**

Defines the deceleration mode of the motor for stopping rotating upon quick stop and the motor status after stop.

**H02.21 Permissible minimum resistance of regenerative resistor**

| | | | |
|---|---|---|---|
| Address: | 0x0215 | | |
| Min.: | 1 | Unit: | Ω |
| Max.: | 1000 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 40 | Change: | Unchangeable |

**Value Range:**

1 Ω to 1000 Ω

**Description**

-

### H02.22 Power of built-in regenerative resistor

| | | | |
|---|---|---|---|
| Address: | 0x0216 | | |
| Min.: | 0 | Unit: | W |
| Max.: | 65535 | Data type: | UInt16 |
| Default: | 50 | Change: | Unchangeable |

**Value Range:**

0 W to 65535 W

**Description**

The power of the built-in regenerative resistor is only related to the servo drive model, which is unmodifiable.

### H02.23 Resistance of built-in regenerative resistor

| | | | |
|---|---|---|---|
| Address: | 0x0217 | | |
| Min.: | 0 | Unit: | Ω |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 50 | Change: | Unchangeable |

**Value Range:**

0 Ω to 65535 Ω

**Description**

The resistance of the built-in regenerative resistor is only related to the servo drive model, which is unmodifiable.

Table 6–1 Specifications of the regenerative resistor

<table>
<tr><th rowspan="2">Servo Drive Model</th><th colspan="2">Specifications of Built-in Regenerative Resistor</th><th>External regenerative resistor<br>Min. Allowable Resistance (Ω)<br>(H02.21)</th></tr>
<tr><th>Resistance (Ω)</th><th>Power (Pr) (W)</th><th></th></tr>
<tr><td>SV670PS1R6I</td><td>-</td><td>-</td><td rowspan="3">40</td></tr>
<tr><td>SV670PS2R8I</td><td>-</td><td>-</td></tr>
<tr><td>SV670PS5R5I</td><td>50</td><td>50</td></tr>
<tr><td>SV670PS7R6I</td><td rowspan="2">25</td><td rowspan="2">80</td><td>20</td></tr>
<tr><td>SV670PS012I</td><td>15</td></tr>
<tr><td>SV670PS018I</td><td rowspan="3">20</td><td rowspan="3">100</td><td rowspan="3">20</td></tr>
<tr><td>SV670PS022I</td></tr>
<tr><td>SV670PS027I</td></tr>
<tr><td>SV670PT3R5I</td><td rowspan="2">100</td><td rowspan="4">80</td><td>80</td></tr>
<tr><td>SV670PT5R4I</td><td>60</td></tr>
<tr><td>SV670PT8R4I</td><td rowspan="2">50</td><td>45</td></tr>
<tr><td>SV670PT012I</td><td>40</td></tr>
<tr><td>SV670PT017I</td><td rowspan="3">35</td><td rowspan="3">100</td><td rowspan="3">25</td></tr>
<tr><td>SV670PT021I</td></tr>
<tr><td>SV670PT026I</td></tr>
</table>

### H02.24 Resistor heat dissipation coefficient

Address: 0x0218

| | | | |
|---|---|---|---|
| Min.: | 10 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 30 | Change: | Real-time modification |

**Value Range:**

10% to 100%

**Description**

Defines the heat dissipation coefficient of the regenerative resistor, which is applicable to both external and built-in regenerative resistors.

Defines the heat dissipation coefficient of the regenerative resistor, which is applicable to both external and built-in regenerative resistors.

Set this parameter properly according to actual heat dissipation conditions of the resistor.

Recommendations:

Generally, the value of H02.24 cannot exceed 30% for natural cooling.
The value of H02.24 cannot exceed 50% for forced air cooling.

### H02.25 Regenerative resistor type

Address: 0x0219

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 3 | Change: | Real-time modification |

**Value Range:**

0: Built-in

1: External, natural cooling 2: External, forced air cooling 3: No resistor needed

**Description**

Defines the resistor type and the mode of absorbing and releasing the braking energy.

### H02.26 Power of external regenerative resistor

Address: 0x021A

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | W |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 40 | Change: | Real-time modification |

**Value Range:**

1 W–65535 W

**Description**

Defines the power of external regenerative resistor.

### H02.27 Resistance of external regenerative resistor

Address: 0x021B

| | | | |
|---|---|---|---|
| Min.: | 15 | Unit: | Ω |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 50 | Change: | Real-time modification |

**Value Range:**

15 Ω to 1000 Ω

**Description**

Defines the resistance of the external regenerative resistor.

### H02.30 User password

Address: 0x021E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

**H02.31 System parameter initialization**

Address: 0x021F

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No operation

1: Restore default settings

2: Clear fault records

**Description**

Used to restore default values or clear fault records.

**H02.32 Selection of parameters in group H0b**

Address: 0x0220

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 99 | Data Type: | UInt16 |
| Default: | 50 | Change: | At once |

**Value Range:**

0 to 99

**Description**

Used to set the offset of the parameter to be displayed on the keypad.

For example, the setpoint 0 indicates the value of H0b.00 (Motor speed actual value) is displayed on the keypad.

The setpoint 1 indicates the value of H0b.01 is displayed on the keypad.

**H02.35 Keypad data refresh frequency**

Address: 0x0223

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Hz |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 20

**Description**

-

**H02.41 Manufacturer password**

Address: 0x0229

Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: At once

**Value Range:**

0 to 65535

**Description**

-

## 6.4 H03 Terminal Input Parameters

### H03.00 DI function allocation 1 (activated upon power-on)

Address: 0x0300
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Real-time modification

**Value Range:**

0: Corresponding to null
1: Corresponding to FunIN.1
2: Corresponding to FunIN.2
4: Corresponding to FunIN.3
8: Corresponding to FunIN.4
16: Corresponding to FunIN.5
32: Corresponding to FunIN.6
64: Corresponding to FunIN.7
128: Corresponding to FunIN.8
256: Corresponding to FunIN.9
512: Corresponding to FunIN.10
1024: Corresponding to FunIN.11
2048: Corresponding to FunIN.12
4096: Corresponding to FunIN.13
8192: Corresponding to FunIN.14
16384: Corresponding to FunIN.15
32768: Corresponding to FunIN.16

**Description**

Used to enable a certain DI function (FunIN.1 to FunIN.16) to be activated immediately at next power-on.

### H03.01 DI function allocation 2 (activated upon power-on)

Address: 0x0301
Min.: 0 | Unit: -

| | | | |
|---|---|---|---|
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Corresponding to null
1: Corresponding to FunIN.17
2: Corresponding to FunIN.18
4: Corresponding to FunIN.19
8: Corresponding to FunIN.20
16: Corresponding to FunIN.21
32: Corresponding to FunIN.22
64: Corresponding to FunIN.23
128: Corresponding to FunIN.24
256: Corresponding to FunIN.25
512: Corresponding to FunIN.26
1024: Corresponding to FunIN.27
2048: Corresponding to FunIN.28
4096: Corresponding to FunIN.29
16384: Corresponding to FunIN.31
32768: Corresponding to FunIN.32

**Description**

Used to enable a certain DI function (FunIN.17 to FunIN.32) to be activated immediately at next power-on.

**H03.02 DI1 function**

Address: 0x0302

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 14 | Change: | At once |

**Value Range:**

0: No assignment
1: S-ON
2: Warning reset signal
3: Gain switchover switch
4: Switchover between main and auxiliary commands
5: Multi-reference direction
6: Multi-reference switchover CMD1
7: Multi-reference switchover CMD2
8: Multi-reference switchover CMD3
9: Multi-reference switchover CMD4
10: Mode switchover M1-SEL

11: Mode switchover M2-SEL
12: Zero clamp enable signal
13: Position reference inhibited
14: Positive limit switch
15: Reverse limit switch
16: Positive external torque limit
17: Negative external torque limit
18: Forward jog
19: Reverse jog
20: Step enable
21: Hand wheel override signal 1
22: Hand wheel override signal 2
23: Hand wheel enable signal
24: Electronic gear ratio selection
25: Torque reference direction
26: Speed reference direction
27: Position reference direction
28: Multi-position reference enable
29: Interrupt positioning cancelled
31: Home switch
32: Homing enable
33: Interrupt positioning inhibited
34: Emergency stop
35: Clear position deviation
36: Internal speed limit source
37: Pulse reference inhibited
38: Touch probe 1
39: Touch probe 2
41: Current position as home
42: Axis control command executed immediately
43: Axis control command not exected immediately
44: Positioning and command completed signal clear
45: Interrupt positioning enable
46: Process segment enable
47: Process segment command switchover 1
48: Process segment command switchover 2
49: Process segment command switchover 3
50: Process segment command switchover 4

51: Event trigger process segment 1
52: Event trigger process segment 2
53: Event trigger process segment 3
54: Event trigger process segment 4
55: Process segment pause

**Description**

Defines the function of DI1.

### H03.03 DI1 logic

Address: 0x0303

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open
1: Closed

**Description**

Used to set the level logic of DI1 when the function assigned to DI1 is active.

### H03.04 DI2 function selection

Address: 0x0304

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 15 | Change: | Real-time modification |

**Value Range:**

See *" H03.02" on page 135* for details.

**Description**

Defines the function of DI2.

### H03.05 DI2 logic

Address: 0x0305

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open
1: Closed

**Description**

-

### H03.06 DI3 function selection

Address: 0x0306

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 13 | Change: Real-time modification

**Value Range:**

See " H03.02" on page 135 for details.

**Description**

Defines the function of DI3.

### H03.07 DI3 logic

Address: 0x0307

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H03.08 DI4 function selection

Address: 0x0308

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 2 | Change: Real-time modification

**Value Range:**

See " H03.02" on page 135 for details.

**Description**

Defines the function of DI4.

### H03.09 DI4 logic

Address: 0x0309

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H03.10 DI5 function selection

Address: 0x030A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

See *" H03.02" on page 135* for details.

**Description**

Defines the function of DI5.

### H03.11 DI5 logic

Address: 0x030B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H03.13 DI6 logic

Address: 0x030D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H03.12 DI6 function selection

Address: 0x030C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H03.02" on page 135* for details.

**Description**

Defines the function of DI6.

### H03.14 DI7 function selection

Address: 0x030E

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 45 | Change: Real-time modification

**Value Range:**

See *" H03.02" on page 135* for details.

**Description**

Defines the function of DI7.

### H03.15 DI7 logic

Address: 0x030F

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H03.16 D8 function selection

Address: 0x0310

Min.: 0 | Unit: -
Max.: 55 | Data Type: UInt16
Default: 31 | Change: Real-time modification

**Value Range:**

See *" H03.02" on page 135* for details.

**Description**

Defines the function of DI8.

### H03.17 DI8 logic

Address: 0x0311

Min.: 0 | Unit: -
Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H03.34 DI function allocation 3 (activated upon power-on)

Address: 0x0322

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Corresponding to null
1: Corresponding to FunIN.33
2: Corresponding to FunIN.34
4: Corresponding to FunIN.35
8: Corresponding to FunIN.36
16: Corresponding to FunIN.37
32: Corresponding to FunIN.38
64: Corresponding to FunIN.39
128: Corresponding to FunIN.40
256: Corresponding to FunIN.41
512: Corresponding to FunIN.42
1024: Corresponding to FunIN.43
2048: Corresponding to FunIN.44
4096: Corresponding to FunIN.45
8192: Corresponding to FunIN.46
16384: Corresponding to FunIN.47
32768: Corresponding to FunIN.48

**Description**

Used to enable a certain DI function (FunIN.33 to FunIN.37) to be activated immediately at next power-on.

### H03.35 DI function allocation 4 (activated upon power-on)

Address: 0x0323

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Corresponding to null
1: Corresponding to FunIN.49
2: Corresponding to FunIN.50
4: Corresponding to FunIN.51
8: Corresponding to FunIN.52
16: Corresponding to FunIN.53
32: Corresponding to FunIN.54
64: Corresponding to FunIN.55
128: Corresponding to FunIN.56
256: Corresponding to FunIN.57
512: Corresponding to FunIN.58
1024: Corresponding to FunIN.59
2048: Corresponding to FunIN.60
4096: Corresponding to FunIN.61
8192: Corresponding to FunIN.62
16384: Corresponding to FunIN.63

**Description**

Used to enable a certain DI function (FunIN.49 to FunIN.64) to be activated immediately at next power-on.

### H03.50 Voltage-type AI1 offset

| | | | |
|---|---|---|---|
| Address: | 0x0332 | | |
| Min.: | -5000 | Unit: | mV |
| Max.: | 5000 | Data Type: | Int16 |
| Default: | 0 | Change: | At once |

**Value Range:**

-5000 to +5000

**Description**

Defines the actual AI1 input voltage when the drive sampling voltage is 0 after zero drift correction.

### H03.51 Voltage-type AI1 input filter time constant

| | | | |
|---|---|---|---|
| Address: | 0x0333 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 655.35 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0.00 ms to 655.35 ms

**Description**

Defines the filter time constant of AI1 input current signal.

### H03.53 Voltage-type AI1 dead zone

| | | | |
|---|---|---|---|
| Address: | 0x0335 | | |
| Min.: | 0 | Unit: | mV |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0.0 to 1000.0

**Description**

Defines the AI1 input voltage range when the drive sampling voltage is 0.

### H03.54 Voltage-type AI1 zero drift

| | | | |
|---|---|---|---|
| Address: | 0x0336 | | |
| Min.: | -500 | Unit: | mV |
| Max.: | 500 | Data Type: | Int16 |
| Default: | 0 | Change: | At once |

**Value Range:**

-500.0 to +500.0

**Description**

Zero drift indicates the value of the drive sampling voltage relative to GND upon zero AI voltage.

Set H0d.10 (Automatic adjustment of analog channels) to 1 (AI1 adjustment) to perform automatic adjustment on AI1 zero drift. The AI1 zero drift adjusted will be saved into H03.54.

### H03.60 DI1 filter time

| | | | |
|---|---|---|---|
| Address: | 0x033C | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 3.00 | Change: | Real-time modification |

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI1. The DI function is active only after the effective level is kept within the time defined by H03.60.

### H03.61 DI2 filter time

| | | | |
|---|---|---|---|
| Address: | 0x033D | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 3.00 | Change: | Real-time modification |

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI2. The DI function is active only after the effective level is kept within the time defined by H03.61.

### H03.62 DI3 filter time

| | | | |
|---|---|---|---|
| Address: | 0x033E | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 3.00 | Change: | Real-time modification |

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI3. The DI function is active only after the effective level is kept within the time defined by H03.62.

### H03.63 DI4 filter time

| | | | |
|---|---|---|---|
| Address: | 0x033F | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 3.00 | Change: | Real-time modification |

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI4. The DI function is active only after the effective level is kept within the time defined by H03.63.

### H03.64 DI5 filter time

| | | | |
|---|---|---|---|
| Address: | 0x0340 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 3.00 | Change: | Real-time modification |

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI5. The DI function is active only after the effective level is kept within the time defined by H03.64.

### H03.65 DI6 filter time

| | | | |
|---|---|---|---|
| Address: | 0x0341 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |

Default: 3.00 Change: Real-time modification

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI6. The DI function is active only after the effective level is kept within the time defined by H03.65.

### H03.66 DI7 filter time

Address: 0x0342

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 0.00 | Change: | Real-time modification |

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI7. The DI function is active only after the effective level is kept within the time defined by H03.66.

### H03.67 DI8 filter time

Address: 0x0343

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 3.00 | Change: | Real-time modification |

**Value Range:**

0.00 ms to 500.00 ms

**Description**

Defines the filter time of DI8. The DI function is active only after the effective level is kept within the time defined by H03.67.

### H03.80 Speed corresponding to analog 10 V

Address: 0x0350

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 3000 | Change: | At stop |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the corresponding motor speed when the sampling voltage is 10 V.

Speed reference value = Sampling voltage/10 x H03.80

### H03.81 Torque corresponding to analog 10 V

| | | | |
|---|---|---|---|
| Address: | 0x0351 | | |
| Min.: | 1 | Unit: | Multiplier |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 8

**Description**

Defines the motor torque corresponding to a sampling voltage of 10 V.

Torque reference value = Sampling voltage/10 x H03.81

## 6.5 H04 Terminal Output Parameters

### H04.00 DO1 function selection

| | | | |
|---|---|---|---|
| Address: | 0x0400 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

0: No function

1: Servo ready

2: Motor rotation signal

3: Zero speed signal

4: Speed matching signal

5: Positioning completed

6: Positioning near

7: Torque limited signal

8: Speed limited signal

9: Braking

10: Warning

11: Fault

15: Interrupt positioning completed

16: Home found

17: Electrical homing completed

18: Torque reached signal

19: Speed reached signal

21: Enable completed

22: Internal command completed

23: Writing next command allowed

24: Internal motion completed
25: Comparison output
26: Closed loop state
30: Warning or fault output
31: Communication-forced DO
32: EDM output

**Description**

Defines the function of DO1.

**H04.01** **DO1 logic**

| | | | |
|---|---|---|---|
| Address: | 0x0401 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open
1: Closed

**Description**

Defines the level logic of DO1 when the function assigned to DO1 is active.

**H04.02** **DO2 function selection**

| | | | |
|---|---|---|---|
| Address: | 0x0402 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 9 | Change: | Real-time modification |

**Value Range:**

See *" H04.00" on page 146* for details.

**Description**

-

**H04.03** **DO2 logic**

| | | | |
|---|---|---|---|
| Address: | 0x0403 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open
1: Closed

**Description**

-

### H04.04 DO3 function selection

Address: 0x0404

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H04.00" on page 146* for details.

**Description**

-

### H04.05 DO3 logic

Address: 0x0405

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H04.06 DO4 function selection

Address: 0x0406

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 11 | Change: | Real-time modification |

**Value Range:**

See *" H04.00" on page 146* for details.

**Description**

-

### H04.07 DO4 logic

Address: 0x0407

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H04.08 DO5 function selection

Address: 0x0408

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 16 | Change: | Real-time modification |

**Value Range:**

See " H04.00" on page 146 for details.

**Description**

-

### H04.09 DO5 logic

Address: 0x0409

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Normally open

1: Closed

**Description**

-

### H04.22 DO source selection

Address: 0x0416

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 31 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

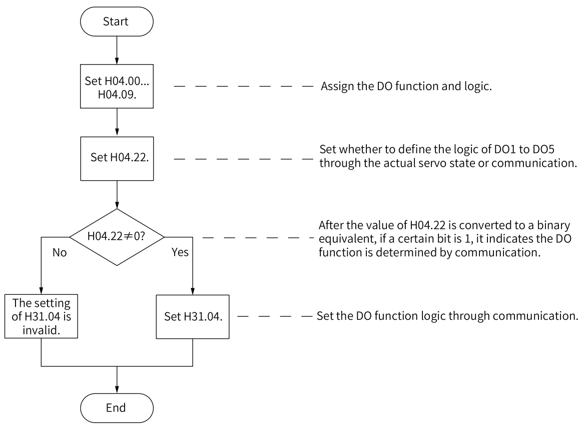
| bit | Name | Function |
|---|---|---|
| 0 | DO1 | 0: DO1 function output |
| | | 1: Bit 0 of H31.04 set through communication |
| 1 | DO2 | 0: DO2 function output |
| | | 1: Bit 1 of H31.04 set through communication |
| 2 | DO3 | 0: DO3 function output |
| | | 1: Bit 2 of H31.04 set through communication |
| 3 | DO4 | 0: DO4 function output |
| | | 1: Bit 3 of H31.04 set through communication |
| 4 | DO5 | 0: DO5 function output |
| | | 1: Bit 4 of H31.04 set through communication |

**Description**

Defines whether the logic of a physical DO terminal is defined by the actual state of the drive or by communication.
The value of H04.22 is displayed in decimal on the keypad. When the value is converted to a binary equivalent: If bit(n) is 0, it indicates the logic of DO(n+1) is defined by the actual state of the drive. If bit(n) is 1, it indicates the logic of DO(n+1) is defined by communication (H31.04).

| Setpoint (decimal) | Setpoint (binary) | | | | | DO logic | |
|---|---|---|---|---|---|---|---|
| | bit4 | bit3 | bit2 | bit1 | bit0 | Defined by the Drive State | Defined by Communication (H31.04) |
| | DO5 | DO4 | DO3 | DO2 | DO1 | | |
| 0 | 0 | 0 | 0 | 0 | 0 | DO1 to DO5 | / |
| 1 | 0 | 0 | 0 | 0 | 1 | DO2 to DO5 | DO1 |
| … | … | … | … | … | … | … | … |
| 31 | 1 | 1 | 1 | 1 | 1 | / | DO1 to DO5 |

Set H04.22 to a value listed in the preceding table.
H31.04 is not displayed on the keypad and can only be modified through communication. For H31.04, "bit(n) = 1" indicates the logic of DO(n+1) is active. "bit(n) = 0" indicates the logic of DO(n+1) is inactive.




## H04.23 Communication-forced DO logic in non-OP status

Address: 0x0417
Min.: 0
Max.: 31
Default: 0
Unit: -
Data Type: UInt16
Change: Real-time modification

**Value Range:**

| bit | Name | Function |
|---|---|---|
| 0 | DO1 | 0: Status unchanged |
| | | 1: No output |
| 1 | DO2 | 0: Status unchanged |
| | | 1: No output |
| 2 | DO3 | 0: Status unchanged |
| | | 1: No output |
| 3 | DO4 | 0: Status unchanged |
| | | 1: No output |
| 4 | DO5 | 0: Status unchanged |
| | | 1: No output |

**Description**

-

### H04.50 AO1 signal selection

Address: 0x0432

Min.: 0 | Unit: -

Max.: 10 | Data Type: UInt16

Default: 0 | Change: At once

**Value Range:**

0: Motor speed (1 V/1000 rpm)

1: Speed reference(1 V/1000 rpm)

2: Torque reference (1 V/100 x rated torque)

3: Position deviation (0.5 mV/1 reference unit)

4: Position deviation (0.5 mV/1 encoder unit)

5: Position reference speed (1 V/1000 rpm)

6: Positioning completed

8: AI1 voltage

10: Defined by H31.05

**Description**

Defines the physical value source of AO1.

### H04.51 AO1 offset voltage

Address: 0x0433

Min.: -10000 | Unit: mV

Max.: 10000 | Data Type: Int16

Default: 0 | Change: At once

**Value Range:**

-10000 to +10000

**Description**

Defines the actual AO1 output voltage after offset when the output voltage is 0 V in theory.

**H04.52** **AO1 multiplier**

| | | | |
|---|---|---|---|
| Address: | 0x0434 | | |
| Min.: | -99.99 | Unit: | - |
| Max.: | 99.99 | Data Type: | Int16 |
| Default: | 1 | Change: | At once |

**Value Range:**

-99.99 to +99.99

**Description**

Defines the actual AO1 output voltage after amplification when the output voltage is 1V in theory.

## 6.6 H05 Position Control Parameters

**H05.00** **Main position reference source**

| | | | |
|---|---|---|---|
| Address: | 0x0500 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Pulse reference

1: Step reference

2: Multi-position reference

**Description**

Defines the position reference source in position control mode.

**H05.01** **Position pulse reference input terminal**

| | | | |
|---|---|---|---|
| Address: | 0x0501 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Low speed

1: High speed

**Description**

Used to select the physical input terminal based on the input pulse frequency when the pulse reference acts as the position reference source in the position control mode.

## H05.02 Pulses per revolution

| | | | |
|---|---|---|---|
| Address: | 0x0502 | | |
| Min.: | 0 | Unit: | PPR |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0 PPR to 4294967295 PPR

**Description**

Defines the number of pulses required per revolution of the motor.

When H05.02 is set to 0, electronic gear ratios 1 and 2 (H05.07 to H05.13) and electronic gear ratio switchover condition (H05.39) are active.

When H05.02 is set to a non-zero value, electronic gear ratio B/A = Encoder resolution/H05.02. In this case, electronic gear ratios 1 and 2 are inactive.

The encoder resolution is 67108864 PPR.

## H05.04 First-order low-pass filter time constant

| | | | |
|---|---|---|---|
| Address: | 0x0504 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

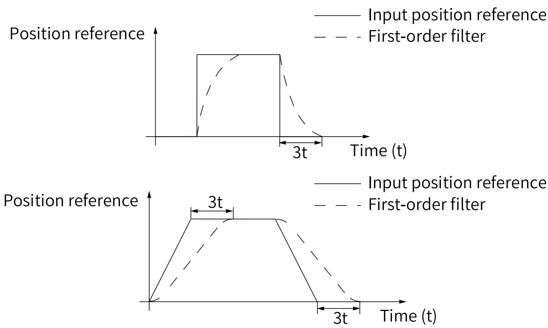
**Value Range:**

0.0 ms to 6553.5 ms

**Description**

Defines the first-order low pass filter time constant of position references.

If position reference P is rectangular wave or trapezoidal wave, the position reference after first-order low pass filtering is as follows:




This function does not affect the displacement value (position reference sum). An excessively high setpoint delays the responsiveness, so set a proper filter time constant based on actual conditions.

### H05.05 Step reference

Address: 0x0505

| | | | |
|---|---|---|---|
| Min.: | -9999 | Unit: | Reference unit |
| Max.: | 9999 | Data Type: | Int16 |
| Default: | 50 | Change: | At stop |

**Value Range:**

-9999 to +9999

**Description**

Defines the position reference sum when the step reference acts as the main position reference source.

### H05.06 Moving average filter time constant 1

Address: 0x0506

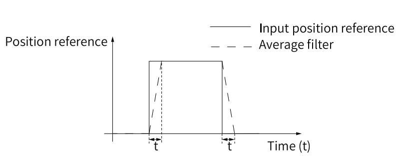
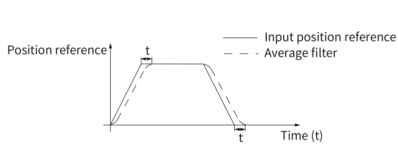
| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 128 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0.0 ms to 128.0 ms

**Description**

Defines the moving average filter time constant of position references. If position reference P is rectangular wave or trapezoidal wave, the position reference after moving average filtering is as follows. This function does not affect the displacement value (position reference sum). An excessively high setpoint delays the responsiveness, so set a proper filter time constant based on actual conditions.

| Position reference being rectangular wave | Position reference being trapezoidal wave |
|---|---|
|   |   |

### H05.07 Electronic gear ratio 1 (numerator)

Address: 0x0507

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | - |
| Max.: | 1073741824 | Data Type: | UInt32 |
| Default: | 8388608 | Change: | Real-time modification |

**Value Range:**

1 to 1073741824

**Description**

Defines the numerator of electronic gear ratio 1.

### H05.09 Electronic gear ratio 1 (denominator)

| | | | |
|---|---|---|---|
| Address: | 0x0509 | | |
| Min.: | 1 | Unit: | - |
| Max.: | 1073741824 | Data Type: | UInt32 |
| Default: | 10000 | Change: | Real-time modification |

**Value Range:**

1 to 1073741824

**Description**

Defines the denominator of electronic gear ratio 1.

### H05.11 Electronic gear ratio 2 (numerator)

| | | | |
|---|---|---|---|
| Address: | 0x050B | | |
| Min.: | 1 | Unit: | - |
| Max.: | 1073741824 | Data Type: | UInt32 |
| Default: | 8388608 | Change: | Real-time modification |

**Value Range:**

1 to 1073741824

**Description**

Defines the numerator of electronic gear ratio 2.

### H05.13 Electronic gear ratio 2 (denominator)

| | | | |
|---|---|---|---|
| Address: | 0x050D | | |
| Min.: | 1 | Unit: | - |
| Max.: | 1073741824 | Data Type: | UInt32 |
| Default: | 10000 | Change: | Real-time modification |

**Value Range:**

1 to 1073741824

**Description**

Defines the denominator of electronic gear ratio 2.

### H05.15 Pulse reference form

| | | | |
|---|---|---|---|
| Address: | 0x050F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

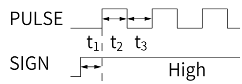
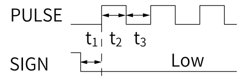
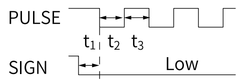
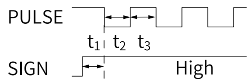
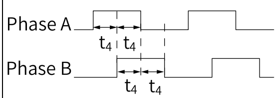
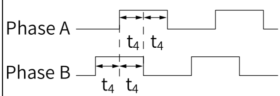
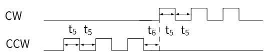
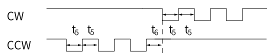
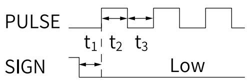
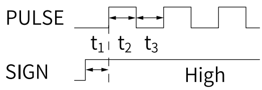
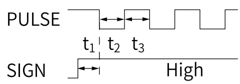
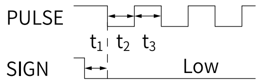
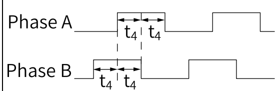
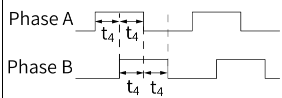
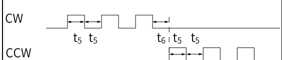
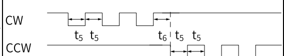
**Value Range:**

0: Direction + Pulse, positive logic
1: Direction + Pulse, negative logic
2: Phase A + phase B quadrature pulse, quadrupled frequency
3: CW + CCW

**Description**

Defines the input pulse form when the pulse reference acts as the main position reference source. See details in *"Table 6–2 " on page 156*.

Table 6–2 Descriptions of the pulse form

<table>
<tr><th>H02.02</th><th>H05.15</th><th>Pulse Form</th><th>Signal</th><th>Diagram of Forward Pulses</th><th>Diagram of Reverse Pulses</th></tr>
<tr><td rowspan="4">0</td><td>0</td><td>Pulse + Direction Positive Logic</td><td>PULSE<br>SIGN</td><td></td><td></td></tr>
<tr><td>1</td><td>Pulse + Direction Negative Logic</td><td>PULSE<br>SIGN</td><td></td><td></td></tr>
<tr><td>2</td><td>Phase A + Phase B Quadrature pulse Quadrupled frequency</td><td>PULSE (phase A)<br>SIGN (phase B)</td><td>Phase A leads phase B by 90°.</td><td>Phase B leads phase A by 90°.</td></tr>
<tr><td>3</td><td>CW+CCW</td><td>PULSE (CW)<br>SIGN (CCW)</td><td></td><td></td></tr>
<tr><td rowspan="4">1</td><td>0</td><td>Pulse + Direction Positive Logic</td><td>PULSE<br>SIGN</td><td></td><td></td></tr>
<tr><td>1</td><td>Pulse + Direction Negative Logic</td><td>PULSE<br>SIGN</td><td></td><td></td></tr>
<tr><td>2</td><td>Phase A + Phase B Quadrature pulse Quadrupled frequency</td><td>PULSE (phase A)<br>SIGN (phase B)</td><td>Phase B leads phase A by 90°.</td><td>Phase A leads phase B by 90°.</td></tr>
<tr><td>3</td><td>CW+CCW</td><td>PULSE (CW)<br>SIGN (CCW)</td><td></td><td></td></tr>
</table>

## Note

The rise time and fall time of position pulse references must be shorter than 0.1 us.

Table 6–3 Specifications of pulse references

| Input Terminal | Maximum Frequency | Minimum Time Width (unit: us) | | | | | |
|---|---|---|---|---|---|---|---|
| | | t1 | t2 | t3 | t4 | t5 | t6 |
| High-speed pulse input terminal | 8 Mpps | 0.125 | 0.125 | 0.125 | 0.25 | 0.125 | 0.125 |
| Low-speed pulse input terminal | 200 kpps | 2.5 | 2.5 | 2.5 | 5 | 2.5 | 2.5 |

**H05.16** **Clear action**

Address: 0x0510

Min.: 0 Unit: -

Max.: 2 Data Type: UInt16

Default: 0 Change: At stop

**Value Range:**

0: Position deviation cleared upon S-OFF or non-operational state

1: Position deviation cleared upon fault or non-operational state

2: Position deviation cleared upon active DI function 35 or non-operational state

**Description**

Defines the condition for clearing the position deviation.

**H05.17** **Number of encoder frequency-division pulses**

Address: 0x0511

Min.: 0 Unit: PPR

Max.: 4194303 Data Type: UInt32

Default: 2500 Change: At stop

**Value Range:**

0 PPR to 4194303 PPR

**Description**

Defines the number of pulses output by PAO or PBO per revolution.

Pulse output resolution per revolution = (H05.17) x 4

### H05.19 Speed feedforward control

| | | | |
|---|---|---|---|
| Address: | 0x0513 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: No speed feedforward

1: Internal speed feedforward

2: External speed feedforward

3: Zero phase

**Description**

Defines the source of the speed loop feedforward signal.

When the external speed feedforward is set, the feedforward source is set by H05.72.

### H05.20 Condition for COIN (positioning completed) signal output

| | | | |
|---|---|---|---|
| Address: | 0x0514 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 10 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Absolute value of position deviation lower than H05.21
1: Absolute value of position deviation lower than H05.21 and filtered position reference being 0
2: Absolute value of position deviation lower than H05.21 and unfiltered position reference being 0
3: Absolute position deviation kept lower than H05.21 within the time defined by H05.60 and unfiltered position reference being 0
4: Absolute position deviation kept lower than H05.21 within the time defined by H05.60 and filtered position reference being 0
5: Absolute value of position deviation lower than H05.21, with zero speed signal being active and unfiltered position reference being 0
6: Absolute value of position deviation lower than H05.21, with zero speed signal being active and filtered position reference being 0
7: COIN signal judged after the change (available→unavailable) of the unfiltered position reference kept active for the period defined by H05.60, with unfiltered position reference being 0 and position deviation lower than H05.21
8: COIN signal judged after the change (available→unavailable) of the filtered position reference kept active for the period defined by H05.60, with filtered position reference being 0 and position deviation lower than H05.21
9: COIN signal judged after the change (available→unavailable) of the unfiltered position reference, with the position deviation kept lower than H05.21 for the period defined by H05.60 and unfiltered position reference being 0
10: COIN signal judged after the change (available→unavailable) of the filtered position reference, with the position deviation kept lower than H05.21 for the period defined by H05.60 and filtered position reference being 0

**Description**

Defines the condition for outputting positioning completed/proximity signal. In the position control mode, if the absolute value of the position deviation during operation is within the setpoint of H05.21, the drive outputs the positioning completed/proximity signal. You can set the condition for outputting the positioning completed/proximity signal in H05.20.

### H05.21 Threshold of positioning completed

Address: 0x0515

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | Encoder unit |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 5872 | Change: | Real-time modification |

**Value Range:**

1 to 65535

**Description**

Defines the threshold of the absolute value of position deviation when the drive outputs the positioning completed signal.

### H05.22 Proximity threshold

| | | | |
|---|---|---|---|
| Address: | 0x0516 | | |
| Min.: | 1 | Unit: | Encoder unit |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 65535 | Change: | At once |

**Value Range:**

1 to 65535

**Description**

Defines the threshold of the absolute value of position deviation when the drive outputs the proximity signal.

### H05.24 Displacement of interrupt positioning

| | | | |
|---|---|---|---|
| Address: | 0x0518 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | Real-time modification |

**Value Range:**

-1073741824 to 1073741824

**Description**

Defines the position reference value during interrupt positioning.

### H05.26 Constant operating speed in interrupt positioning

| | | | |
|---|---|---|---|
| Address: | 0x051A | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the maximum speed during interrupt positioning.

### H05.27 Acceleration/Deceleration time of interrupt positioning

| | | | |
|---|---|---|---|
| Address: | 0x051B | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the time for the motor to change from 0 rpm to 1000 rpm at a constant speed during interrupt positioning.

**H05.29 Interrupt positioning cancel signal**

| | | | |
|---|---|---|---|
| Address: | 0x051D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0: Disable

1: Enable

**Description**

Defines whether to unlock the interrupt positioning signal.

**H05.30 Homing selection**

| | | | |
|---|---|---|---|
| Address: | 0x051E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Disabled

1: Homing enabled through the HomingStart signal input from DI

2: Electrical homing enabled through the HomingStart signal input from DI

3: Homing started immediately upon power-on

4: Homing executed immediately

5: Electrical homing started

6: Current position as home

8: D-triggered position as home

**Description**

Defines the homing mode and the trigger signal source.

**H05.31 Homing mode**

| | | | |
|---|---|---|---|
| Address: | 0x051F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 16 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Forward, home switch as deceleration point and home
1: Reverse, home switch as deceleration point and home
2: Forward, Z signal as deceleration point and home
3: Reverse, motor Z signal as deceleration point and home
4: Forward, home switch as deceleration point and Z signal as home
5: Reverse, home switch as deceleration point and Z signal as home
6: Forward, positive limit switch as deceleration point and home
7: Reverse, negative limit switch as deceleration point and home
8: Forward, positive limit switch as deceleration point and Z signal as home
9: Reverse, negative limit switch as deceleration point and Z signal as home
10: Forward, mechanical limit position as deceleration point and home
11: Reverse, mechanical limit position as deceleration point and home
12: Forward, mechanical limit position as deceleration point and Z signal as home
13: Reverse, mechanical limit position as deceleration point and Z signal as home
14: Forward single-turn homing
15: Reverse single-turn homing
16: Single-turn nearby homing

**Description**

Defines the default motor direction of rotation, deceleration point, and home during homing.

### H05.32 Speed in high-speed searching for the home switch signal

Address: 0x0520

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 3000 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0 to 3000

**Description**

Defines the motor speed for searching for the deceleration point signal during homing.

### H05.33 Speed in low-speed searching for the home switch signal

Address: 0x0521

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 1000

**Description**

Defines the motor speed for searching for the home signal during homing.

### H05.34 Acceleration/Deceleration time during homing

| | | | |
|---|---|---|---|
| Address: | 0x0522 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 1000 | Change: | At once |

**Value Range:**

0 to 1000

**Description**

Defines the time for the motor to accelerate from 0 rpm to 1000 rpm at a constant speed during homing.

### H05.35 Homing time limit

| | | | |
|---|---|---|---|
| Address: | 0x0523 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10000 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the maximum homing time.

### H05.36 Mechanical home offset

| | | | |
|---|---|---|---|
| Address: | 0x0524 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | -2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | At once |

**Value Range:**

-2147483648 to +2147483647

**Description**

Defines the absolute position value of the motor after homing.

### H05.38 Frequency-division output source

| | | | |
|---|---|---|---|
| Address: | 0x0526 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Encoder frequency-division output

1: Pulse reference synchronous output

2: Frequency-division output inhibited

3: Second encoder frequency-division output

**Description**

Defines the output source of the pulse output terminal.

| Setpoint | Output Source | Remarks |
|---|---|---|
| 0 | Encoder frequency-division output | The encoder feedback signal is outputted only after being divided by the value of H05.17 during rotation of the motor.<br>Encoder frequency-division output mode is recommended when the host controller is used for closed-loop feedback. |
| 1 | Pulse reference synchronous output | The input pulse references are outputted synchronously only when H05.00 is set to 0.<br>When the pulses of multi-axis servo is tracked synchronously, synchronous output of pulse references is recommended. |
| 2 | Frequency-division output inhibited | No output is generated from pulse output terminals. In this case, frequeny-division output terminals act as the input terminals of fully closed-loop external scale signals. |
| 3 | Second encoder frequency-division output | The encoder feedback signal is outputted only after being divided by the value of H05.17 during rotation of the motor. |

### H05.39 Electronic gear ratio switchover condition

Address: 0x0527

Min.: 0 | Unit: -

Max.: 1 | Data Type: UInt16

Default: 0 | Change: At stop

**Value Range:**

0: Switched if position reference kept 0 for 2.5 ms

1: Switched in real time

**Description**

Defines the condition for switching the electronic gear ratio.

### H05.40 Mechanical home offset and action upon overtravel

Address: 0x0528

Min.: 0 | Unit: -

Max.: 3 | Data Type: UInt16

Default: 0 | Change: At once

**Value Range:**

0: H05.36 as the coordinate after homing, reverse homing applied after homing triggered again upon overtravel
1: H05.36 as the relative offset after homing, reverse homing applied after homing triggered again upon overtravel
2: H05.36 as the coordinate after homing, reverse homing applied automatically upon overtravel
3: H05.36 as the relative offset after homing, reverse homing applied automatically upon overtravel

**Description**

Defines the offset relationship between the mechanical home and mechanical zero point, as well as the action upon overtravel during homing.

### H05.41 Z pulse output polarity

Address: 0x0529

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

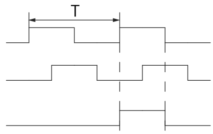
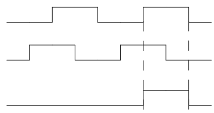
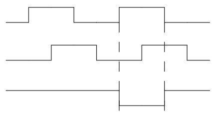
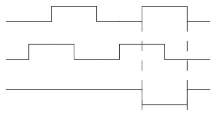
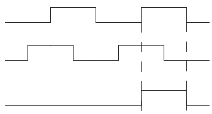
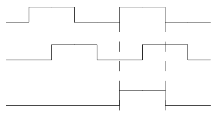
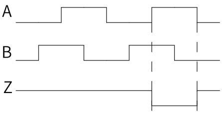
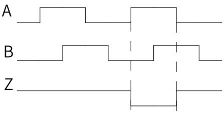
**Value Range:**

| bit | Name | Function |
|---|---|---|
| 0 | Frequency-division Z output polarity | 0: Positive (high level upon active Z pulse) |
| | | 1: Negative (low level upon active Z pulse) |
| 1 | OCZ output polarity | 0: Positive (high level upon active Z pulse) |
| | | 1: Negative (low level upon active Z pulse) |
| 2 | Inner loop probe Z signal source | 0: Motor Z signal |
| | | 1: Frequency-division output Z signal |

**Description**

Defines the output level when the Z pulse of pulse output terminal is active.

Table 6–4 Pulse diagrams of encoder frequency-division output (H05.38 = 0)

| H02.03 (Output pulse phase) | H05.41 (Z pulse output polarity) | Pulse Output Diagram of Forward RUN | Pulse Output Diagram of Reverse RUN |
|---|---|---|---|
| 0 | 0 | Phase A<br>Phase B<br>Phase Z<br><br>Phase A leads phase B by 90°. | Phase A<br>Phase B<br>Phase Z<br><br>Phase B leads phase A by 90°. |
| | 1 | Phase A<br>Phase B<br>Phase Z<br><br>Phase A leads phase B by 90°. | Phase A<br>Phase B<br>Phase Z<br><br>Phase B leads phase A by 90°. |
| 1 | 0 | Phase A<br>Phase B<br>Phase Z<br><br>Phase B leads phase A by 90°. | Phase A<br>Phase B<br>Phase Z<br><br>Phase A leads phase B by 90°. |
| | 1 | Phase A<br>Phase B<br>Phase Z<br><br>Phase B leads phase A by 90°. | Phase A<br>Phase B<br>Phase Z<br><br>Phase A leads phase B by 90°. |

It is recommended to use the active edge outputted by Z signal when a high precision frequency-division output of Z signal is required.

| Setpoint | Z pulse output polarity |
|---|---|
| 0 | Positive (high level upon active Z pulse) |
| 1 | Negative (low level upon active Z pulse) |

H05.41 = 0: Falling-edge triggered; H05.41 = 1: Rising-edge triggered

### H05.43 Position pulse edge

Address: 0x052B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Rising edge-triggered

1: Falling edge-triggered

**Description**

The setpoint 0 indicates calculation starts from the falling edge of pulse input.
The setpoint 1 indicates calculation starts from the rising edge of pulse input.

### H05.44 Numerator of frequency-division output reduction ratio

Address: 0x052C

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | - |
| Max.: | 16383 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 16383

**Description**

Defines the numerator of frequency-division output reduction ratio.

### H05.45 Denominator of frequency-division output reduction ratio

Address: 0x052D

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | - |
| Max.: | 8191 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 8191

**Description**

Defines the denominator of frequency-division output reduction ratio.

### H05.46 DI selection of multi-turn frequency-division Z starting point

Address: 0x052E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: No selection

1: DI1

2: DI2

3: DI3

4: DI4

5: DI5

6: DI6

7: DI7

8: DI8

**Description**

In the absolute position linear mode, the position offset is the difference between absolute position of current encoder and the mechanical position.

### H05.47 Frequency-division Z pulse width

| | | | |
|---|---|---|---|
| Address: | 0x052F | | |
| Min.: | 0 | Unit: | us |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 us to 400 us

**Description**

Defines the minimum output width (us) of frequency-division output PZ.

### H05.50 Mechanical gear ratio (numerator) in absolute position rotation mode

| | | | |
|---|---|---|---|
| Address: | 0x0532 | | |
| Min.: | 1 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 65535

**Description**

Defines the transmission ratio between the mechanical rotary load and the motor in the absolute position rotation mode.

### H05.51 Mechanical gear ratio (denominator) in absolute position rotation mode

| | | | |
|---|---|---|---|
| Address: | 0x0533 | | |
| Min.: | 1 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 65535

**Description**

Defines the transmission ratio between the mechanical rotary load and the motor in the absolute position rotation mode.

### H05.52 Pulses per revolution of the load in absolute position rotation mode (low 32 bits)

| | | | |
|---|---|---|---|
| Address: | 0x0534 | | |
| Min.: | 0 | Unit: | Encoder unit |
| Max.: | 4294967295 | Data Type: | UInt32 |

| | | | |
|---|---|---|---|
| Default: | 0 | Change: | At stop |

**Value Range:**

0 to 4294967295

**Description**

Defines the number of pulses per revolution of the rotary load in the absolute position rotation mode.

### H05.54 Pulses per revolution of the load in absolute position rotation mode (high 32 bits)

Address: 0x0536

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Encoder unit |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0 to 4294967295

**Description**

Defines the number of pulses per revolution of the rotary load in the absolute position rotation mode.

### H05.58 Torque threshold in homing upon hit-and-stop

Address: 0x053A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the maximum positive/negative torque limit during homing upon hit-and-stop.

### H05.59 Positioning window time

Address: 0x053B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 30000 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 ms to 30000 ms

**Description**

If the positioning deviation is less than the time threshold of positioning completed, the positioning completed signal is active only if the set time threshold is exceeded.

**H05.60 Hold time of positioning completed**

Address: 0x053C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 30000 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 ms to 30000 ms

**Description**

Defines the hold time of an active positioning completed signal.

**H05.66 Homing time unit**

Address: 0x0542

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 2 | Change: | At stop |

**Value Range:**

0: 1 ms

1: 10 ms

2: 100 ms

**Description**

Defines the homing time unit. The actual timeout time is H05.35 x H05.66 (ms).

**H05.67 Offset between zero point and single-turn absolute position**

Address: 0x0543

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Encoder unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | At stop |

**Value Range:**

-2147483648 to +2147483647

**Description**

Defines the offset position relative to the home when H05.31 is set to 14, 15, and 16.

**H05.70 Moving average filter time constant 2**

Address: 0x0546

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0.0 ms to 1000.0 ms

**Description**

Defines the moving average filter time constant for the second group of position references.

See *" H05.06" on page 154* for details.

### H05.71 Motor Z signal width

| | | | |
|---|---|---|---|
| Address: | 0x0546 | | |
| Min.: | 1 | Unit: | ms |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 4 | Change: | At once |

**Value Range:**

1 ms to 100 ms

**Description**

Defines the pulse width output upon active motor Z signal.

### H05.72 External speed feedforward source selection

| | | | |
|---|---|---|---|
| Address: | 0x0548 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

0: 60B1

1: AI1

**Description**

External speed feedforward source selection

## 6.7 H06 Speed Control Parameters

### H06.00 Source of main speed reference A

| | | | |
|---|---|---|---|
| Address: | 0x0600 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Digital setting (H06.03)

1: AI1

**Description**

Defines the source of main speed reference A.

### H06.01 Source of auxiliary speed reference B

Address: 0x0601

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 5 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Digital setting (H06.03)

1: AI1

5: Multi-speed reference

**Description**

Defines the source of auxiliary speed reference B.

### H06.02 Speed reference source

Address: 0x0602

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Source of main speed reference A

1: Source of auxiliary speed reference B

2: A+B

3: Switched between A and B

4: Communication

**Description**

Defines the source of speed references.

<table>
<tr><th>Setpoint</th><th>Control mode</th><th>Remarks</th></tr>
<tr><td>0</td><td>Source of main speed reference A</td><td>The reference source is defined by H06.00.</td></tr>
<tr><td>1</td><td>Source of auxiliary speed reference B</td><td>The reference source is defined by H06.01.</td></tr>
<tr><td>2</td><td>A+B</td><td>The reference source is the product of A + B (H06.00 + H06.01).</td></tr>
<tr><td>3</td><td>Switched between A and B</td><td>The reference source is switched between A and B as defined by FunIN.4 (Cmd_SEL).<br><table><tr><th>State of FunIN.4 (Cmd_SEL)</th><th>Reference Source</th></tr><tr><td>Inactive</td><td>Source of main speed reference A</td></tr><tr><td>Active</td><td>Source of auxiliary speed reference B</td></tr></table></td></tr>
<tr><td>4</td><td>Communication</td><td>The speed reference is defined by operating on H31.09 through communication (unit: 0.001 RPM).</td></tr>
</table>

### H06.03 Speed reference set through keypad

| | | | |
|---|---|---|---|
| Address: | 0x0603 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

Defines the speed reference value set through the keypad.

### H06.04 DI jog speed reference

| | | | |
|---|---|---|---|
| Address: | 0x0604 | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 150 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the DI jog speed reference.

### H06.05 Acceleration ramp time of speed reference

| | | | |
|---|---|---|---|
| Address: | 0x0605 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the acceleration ramp time of speed reference.

The acceleration/deceleration time constant of multi-speed references are defined only by parameters in group H12.

H06.05 defines the time for the speed reference to change from 0 rpm to 1000 rpm.

H06.06 defines the time for the speed reference to change from 1000 rpm to 0 rpm.

The formulas for calculating the actual acceleration/deceleration time are as follows:

Actual acceleration time t1 = Speed reference/1000 x Acceleration ramp time of speed reference

Actual deceleration time t2 = Speed reference/1000 x Deceleration ramp time of speed reference

### H06.06 Deceleration ramp time of speed reference

| | | | |
|---|---|---|---|
| Address: | 0x0606 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the deceleration ramp time of speed reference.

### H06.07 Maximum speed limit

| | | | |
|---|---|---|---|
| Address: | 0x0607 | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 7000 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the maximum speed limit.

### H06.08 Forward speed limit

| | | | |
|---|---|---|---|
| Address: | 0x0608 | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 7000 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the forward speed threshold.

### H06.09 Reverse speed limit

| | | | |
|---|---|---|---|
| Address: | 0x0609 | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 7000 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the reverse speed threshold.

### H06.10 Deceleration unit in emergency stop

| | | | |
|---|---|---|---|
| Address: | 0x060A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Multiplied by 1

1: Multiplied by 10

2: Multiplied by 100

**Description**

Defines the deceleration unit in emergency stop.

### H06.11 Torque feedforward control

| | | | |
|---|---|---|---|
| Address: | 0x060B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0: No torque feedforward

1: Internal torque feedforward

**Description**

Define whether to use torque feedforward control.

### H06.12 Jog speed acceleration ramp time

| | | | |
|---|---|---|---|
| Address: | 0x060C | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the acceleration ramp time of jog speed.

### H06.13 Speed feedforward smoothing filter

| | | | |
|---|---|---|---|
| Address: | 0x060D | | |
| Min.: | 0 | Unit: | us |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 us to 65535 us

**Description**

Defines the speed feedforward filter time constant.

### H06.15 Zero clamp speed threshold

Address: 0x060F

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the zero clamp speed threshold.

### H06.16 Threshold of TGON (motor rotation) signal

Address: 0x0610

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 20 | Change: | At once |

**Value Range:**

0 to 1000

**Description**

Defines the motor rotation speed threshold.

### H06.17 Threshold of V-Cmp (speed matching) signal

Address: 0x0611

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 rpm to 100 rpm

**Description**

Defines the speed threshold at which the V-Cmp (speed matching) signal is active.

### H06.18 Threshold of speed reach signal

Address: 0x0612

| | | | |
|---|---|---|---|
| Min.: | 20 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 1000 | Change: | Real-time modification |

**Value Range:**

20 rpm to 10000 rpm

**Description**

Defines the threshold of speed reached signal.

### H06.19 Threshold of zero speed output signal

| | | | |
|---|---|---|---|
| Address: | 0x0613 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

Defines the threshold of zero speed output signal.

### H06.40 Deceleration time of ramp 1

| | | | |
|---|---|---|---|
| Address: | 0x0628 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the deceleration time of ramp 1.

### H06.41 Deceleration time of ramp 2

| | | | |
|---|---|---|---|
| Address: | 0x0629 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the deceleration time of ramp 2.

### H06.50 Speed S-curve enable switch

| | | | |
|---|---|---|---|
| Address: | 0x0628 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Disable

1: Enable

**Description**

0: Accelerate/Decelerate at fixed acceleration rate

1: Accelerate/Decelerate based on the S-curve

### H06.51 Increasing acceleration 1 of speed S-curve acceleration segment

Address: 0x0633

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 50 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

### H06.52 Decreasing acceleration 1 of speed S-curve acceleration segment

Address: 0x0634

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 50 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

### H06.53 Decreasing deceleration 1 of speed S-curve deceleration segment

Address: 0x0635

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 50 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

**H06.54** **Decreasing acceleration 1 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0636 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 50 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

**H06.55** **Increasing acceleration 2 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0637 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

**H06.56** **Decreasing acceleration 2 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0638 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

**H06.57** **Decreasing deceleration 2 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0639 | Effective Time: | Real time |

| | | | |
|---|---|---|---|
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

### H06.58 Decreasing acceleration 2 of speed S-curve deceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x063A | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

### H06.59 Increasing acceleration 3 of speed S-curve acceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x063B | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

### H06.60 Decreasing acceleration 3 of speed S-curve acceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x063C | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

### H06.61 Decreasing deceleration 3 of speed S-curve deceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x063D | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

### H06.62 Decreasing acceleration 3 of speed S-curve deceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x063E | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

### H06.63 Increasing acceleration 4 of speed S-curve acceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x063F | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

### H06.64 Decreasing acceleration 4 of speed S-curve acceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x0640 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

### H06.65 Decreasing deceleration 4 of speed S-curve deceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x0641 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

### H06.66 Decreasing acceleration 4 of speed S-curve deceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x0642 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

**H06.67 Increasing acceleration 5 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0643 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

**H06.68 Decreasing acceleration 5 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0644 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

**H06.69 Decreasing deceleration 5 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0645 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

**H06.70 Decreasing acceleration 5 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0646 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

**H06.71 Increasing acceleration 6 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0647 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference. Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

**H06.72 Decreasing acceleration 6 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0648 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

**H06.73 Decreasing deceleration 6 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0649 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

**H06.74 Decreasing acceleration 6 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x064A | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

**H06.75 Increasing acceleration 7 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x064B | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

### H06.76 Decreasing acceleration 7 of speed S-curve acceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x064C | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

### H06.77 Decreasing deceleration 7 of speed S-curve deceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x064D | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

### H06.78 Decreasing acceleration 7 of speed S-curve deceleration segment

| | | | |
|---|---|---|---|
| Address: | 0x064E | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

**H06.79 Increasing acceleration 8 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x064F | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Increasing acceleration time at acceleration segment: The percentage of motor increasing acceleration time in the selected acceleration time.

**H06.80 Decreasing acceleration 8 of speed S-curve acceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0650 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at acceleration segment: The percentage of motor decreasing acceleration time in the selected acceleration time.

**H06.81 Decreasing deceleration 8 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0651 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing deceleration time in the selected deceleration time.

**H06.82 Decreasing acceleration 8 of speed S-curve deceleration segment**

| | | | |
|---|---|---|---|
| Address: | 0x0652 | Effective Time: | Real time |
| Min.: | 0.0 | Unit: | % |
| Max.: | 100.0 | Data Type: | UInt16 |
| Default: | 50.0 | Change: | At stop |

**Value Range:**

0.0% to 100.0%

**Description**

8 groups of S curve smoothing parameters can be set for each speed reference.
Decreasing acceleration time at deceleration segment: The percentage of motor decreasing acceleration time in the selected deceleration time.

## 6.8 H07 Torque Control Parameters

**H07.00 Source of main torque reference A**

| | | | |
|---|---|---|---|
| Address: | 0x0700 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Keypad (H07.03)

1: AI1

**Description**

Defines the source of main torque reference A.

**H07.01 Source of auxiliary torque reference B**

| | | | |
|---|---|---|---|
| Address: | 0x0701 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Keypad (H07.03)

1: AI1

**Description**

Defines the source of auxiliary torque references.

### H07.02 Torque reference source

Address: 0x0702
Min.: 0 | Unit: -
Max.: 4 | Data Type: UInt16
Default: 0 | Change: At stop

**Value Range:**

0: Source of main torque reference A

1: Source of auxiliary torque reference B

2: Source of A+B

3: Switched between A and B

4: Communication

**Description**

Defines the torque reference source.

<table>
<tr><th>Setpoint</th><th>Control mode</th><th>Remarks</th></tr>
<tr><td>0</td><td>Source of main torque reference A</td><td>The reference source is defined by H07.00.</td></tr>
<tr><td>1</td><td>Source of auxiliary torque reference B</td><td>The reference source is defined by H07.01.</td></tr>
<tr><td>2</td><td>A+B</td><td>The reference source is the product of A+B (H07.00+H07.01).</td></tr>
<tr><td>3</td><td>Switched between A and B</td><td>The reference source is switched between A and B as defined by FunIN.4 (Cmd_SEL).<br><table><tr><th>State of FunIN.4 (Cmd_SEL)</th><th>Reference Source</th></tr><tr><td>Inactive</td><td>Source of main torque reference A</td></tr><tr><td>Active</td><td>Source of auxiliary torque reference B</td></tr></table></td></tr>
<tr><td>4</td><td>Communication</td><td>The torque reference is defined by operating on H31.11 through communication.</td></tr>
</table>

### H07.03 Torque reference set through keypad

Address: 0x0703
Min.: -400 | Unit: %
Max.: 400 | Data Type: Int16
Default: 0 | Change: At once

**Value Range:**

-400.0% to +400.0%

**Description**

Defines the torque reference value set through keypad

### H07.05 Torque reference filter time constant 1

| | | | |
|---|---|---|---|
| Address: | 0x0705 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 30 | Data Type: | UInt16 |
| Default: | 0.5 | Change: | At once |

**Value Range:**

0.00 ms to 30.00 ms

**Description**

Defines the torque reference filter time constant 1.

### H07.06 Torque reference filter time constant 2

| | | | |
|---|---|---|---|
| Address: | 0x0706 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 30 | Data Type: | UInt16 |
| Default: | 0.27 | Change: | At once |

**Value Range:**

0.00 ms to 30.00 ms

**Description**

Defines the torque reference filter time constant 2.

### H07.07 Torque limit source

| | | | |
|---|---|---|---|
| Address: | 0x0707 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Positive/Negative internal torque limit

1: Internal or external limit as defined by DI

2: T-LMT

3: T_LMT or external limit as defined by DI (FunIN.16 or FunIN.17)

4: T_LMT or internal limit (FunIN.16 or FunIN.17) as defined by DI

**Description**

Defines the torque limit source.

### H07.08 T-LMT selection

| | | | |
|---|---|---|---|
| Address: | 0x0708 | Effective Time: | Real time |
| Min.: | 1 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

1: AI1

**Description**

Sets the AI as the torque limit source.

**H07.09 Positive internal torque limit**

| | | | |
|---|---|---|---|
| Address: | 0x0709 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 350 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the positive internal torque limit.

**H07.10 Negative internal torque limit**

| | | | |
|---|---|---|---|
| Address: | 0x070A | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 350 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the negative internal torque limit.

**H07.11 Positive external torque limit**

| | | | |
|---|---|---|---|
| Address: | 0x070B | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 350 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the positive external torque limit.

**H07.12 Negative external torque limit**

| | | | |
|---|---|---|---|
| Address: | 0x070C | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 350 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the negative external torque limit.

### H07.15 Emergency stop torque

| | | | |
|---|---|---|---|
| Address: | 0x070F | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the emergency stop torque.

### H07.17 Speed limit source

| | | | |
|---|---|---|---|
| Address: | 0x0711 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Internal speed limit

1: V-LMT

2: H07.19 or H07.20 as defined by DI

**Description**

Defines the speed limit source.

### H07.18 V-LMT selection

| | | | |
|---|---|---|---|
| Address: | 0x0712 | Effective Time: | Real time |
| Min.: | 1 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

1: AI1

**Description**

Sets the AI as the speed limit source.

### H07.19 Positive speed limit/Speed limit 1 in torque control

| | | | |
|---|---|---|---|
| Address: | 0x0713 | Effective Time: | Real time |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 3000 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the positive speed limit in torque control.

### H07.20 Negative speed limit/Speed limit 2 in torque control

| | | | |
|---|---|---|---|
| Address: | 0x0714 | Effective Time: | Real time |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 3000 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

Defines the negative speed limit in torque control.

### H07.21 Base value for torque reach

| | | | |
|---|---|---|---|
| Address: | 0x0715 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the base value for torque reach.

### H07.22 Threshold of valid torque reach

| | | | |
|---|---|---|---|
| Address: | 0x0716 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 20 | Change: | At once |

**Value Range:**

0.0% to 400.0%

**Description**

Defines the threshold of valid torque reach.

### H07.23 Threshold of invalid torque reach

| | | | |
|---|---|---|---|
| Address: | 0x0717 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |

Default: 10 | Change: At once

**Value Range:**

0.0% to 400.0%

**Description**

Defines the threshold of invalid torque reach.

### H07.24 Field weakening depth

Address: 0x0718

Min.: 60 | Unit: %

Max.: 115 | Data Type: UInt16

Default: 115 | Change: At once

**Value Range:**

60% to 115%

**Description**

Defines the field weakening depth.

### H07.25 Max. permissible demagnetizing current

Address: 0x0719

Min.: 0 | Unit: %

Max.: 3200 | Data Type: UInt16

Default: 100 | Change: At once

**Value Range:**

0% to 300%

**Description**

Defines the maximum permissible demagnetizing current.

### H07.26 Field weakening selection

Address: 0x071A

Min.: 0 | Unit: -

Max.: 1 | Data Type: UInt16

Default: 1 | Change: At stop

**Value Range:**

0: Disable

1: Enable

**Description**

Defines whether to enable field weakening.

### H07.27 Field weakening gain

Address: 0x071B

Min.: 0.001 | Unit: Hz

Max.: 1 | Data Type: UInt16

Default: 0.03 Change: At once

**Value Range:**

0.001 Hz to 1.000 Hz

**Description**

Defines the field weakening gain.

**H07.28 Speed of field weakening point**

Address: 0x071C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Defines the speed of the field weakening point.

**H07.35 Torque non-standard feature enable**

Address: 0x0723

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

bit0: Motor output correction enable

bit1: Shield compensation data enable

**Description**

Torque non-standard feature enable switch.

**H07.36 Time constant of low-pass filter 2**

Address: 0x0724

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 10 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.00 ms to 10.00 ms

**Description**

Defines the time constant of low-pass filter 2.

**H07.37 Torque reference filter selection**

Address: 0x0725

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 0 | Change: | At once |

**Value Range:**

0: First-order filter

1: Biquad filter

**Description**

Defines the torque reference filter used.

### H07.38 Biquad filter attenuation ratio

| | | | |
|---|---|---|---|
| Address: | 0x0726 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 50 | Data Type: | UInt16 |
| Default: | 16 | Change: | At stop |

**Value Range:**

0 to 50

**Description**

Defines the biquad filter attenuation ratio.

### H07.40 Speed limit window in the torque control mode

| | | | |
|---|---|---|---|
| Address: | 0x0728 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 300 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms to 300 ms

**Description**

Defines the speed limit window in the torque control mode.

## 6.9 H08 Gain parameters

### H08.00 Speed loop gain

| | | | |
|---|---|---|---|
| Address: | 0x0800 | | |
| Min.: | 0.1 | Unit: | Hz |
| Max.: | 2000 | Data type: | UInt16 |
| Default: | 40 | Change: | At once |

**Value Range:**

0.1 Hz to 2000.0 Hz

**Description**

Defines the responsiveness of the speed loop. The higher the setpoint, the faster the speed loop response is. Note that an excessively high setpoint may cause vibration.
In the position control mode, the position loop gain must be increased together with the speed loop gain.

### H08.01 Speed loop integral time constant

| | | | |
|---|---|---|---|
| Address: | 0x0801 | | |
| Min.: | 0.15 | Unit: | ms |
| Max.: | 512 | Data type: | UInt16 |
| Default: | 19.89 | Change: | At once |

**Value Range:**

0.15 ms to 512.00 ms

**Description**

Defines the integral time constant of the speed loop.

The lower the setpoint, the better the integral action, and the quicker will the deviation value be close to 0.
Note:
There is no integral action when H08.01 is set to 512.00.

### H08.02 Position loop gain

| | | | |
|---|---|---|---|
| Address: | 0x0802 | | |
| Min.: | 0.1 | Unit: | Hz |
| Max.: | 2000 | Data type: | UInt16 |
| Default: | 64 | Change: | At once |

**Value Range:**

0.1 Hz to 2000.0 Hz

**Description**

Defines the proportional gain of the position loop.

Defines the responsiveness of the position loop. A high setpoint shortens the positioning time. Note that an excessively high setpoint may cause vibration.

The 1st group of gain parameters include H08.00 (Speed loop gain), H08.01 (Speed loop integral time constant), H08.02, and H07.05 (Filter time constant of torque reference).

### H08.03 2nd speed loop gain

| | | | |
|---|---|---|---|
| Address: | 0x0803 | | |
| Min.: | 0.1 | Unit: | Hz |
| Max.: | 2000 | Data type: | UInt16 |
| Default: | 75 | Change: | At once |

**Value Range:**

0.1 Hz to 2000.0 Hz

**Description**

-

### H08.04 2nd speed loop integral time constant

| | | | |
|---|---|---|---|
| Address: | 0x0804 | | |
| Min.: | 0.15 | Unit: | ms |
| Max.: | 512 | Data type: | UInt16 |
| Default: | 10.61 | Change: | At once |

**Value Range:**

0.15 ms to 512.00 ms

**Description**

-

### H08.05 2nd position loop gain

| | | | |
|---|---|---|---|
| Address: | 0x0805 | | |
| Min.: | 0.1 | Unit: | Hz |
| Max.: | 2000 | Data type: | UInt16 |
| Default: | 120 | Change: | At once |

**Value Range:**

0.1 Hz to 2000.0 Hz

**Description**

Defines the second gain set of the position loop and speed loop. The 2nd group of gain parameters include H08.03 (Speed loop gain), H08.04 (Speed loop integral time constant), H08.05, and H07.06 (Torque reference filter time constant 2).

### H08.08 2nd gain mode setting

| | | | |
|---|---|---|---|
| Address: | 0x0808 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0: Fixed to the 1st gain, switched between P and PI as defined by bit26 of external 60FEh

1: Switched between the 1st and 2nd gain sets as defined by H08.09

**Description**

Defines the mode for switching to the 2nd gain set.

### H08.09 Gain switchover condition

| | | | |
|---|---|---|---|
| Address: | 0x0809 | | |
| Min.: | 0 | Unit: | - |

| | | | |
|---|---|---|---|
| Max.: | 10 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Fixed to the 1st gain set (PS)

1: Switched as defined by bit26 of 60FEh

2: Torque reference too large (PS)

3: Speed reference too large (PS)

4: Speed reference change rate too large (PS)

5: Speed reference low/high speed threshold (PS)

6: Position deviation too large (P)

7: Position reference available (P)

8: Positioning unfinished (P)

9: Actual speed (P)

10: Position reference + Actual speed (P)

**Description**

Used to set the condition for gain switchover.

| Value | Gain Switchover condition | Remarks |
|---|---|---|
| 0 | Fixed to the 1st gain set | The 1st gain set applies. |
| 1 | Switched as defined by bit26 of 60FEh | - |
| 2 | Torque reference too large | If the torque reference absolute value exceeds (Level + Dead time) [%] in the last 1st gain set, the drive switches to the 2nd gain set.<br>If the absolute value of the torque reference is lower than (level – Dead time) [%] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. |
| 3 | Speed reference too large | If the speed reference absolute value exceeds (Level + Dead time) [rpm] in the last 1st gain set, the drive switches to the 2nd gain set.<br>If the absolute value of the speed reference is lower than (level - Dead time) [rpm] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set. |
| 4 | Speed reference too large | Active in the control modes other than speed control<br>If the absolute value of speed reference change rate exceeds (Level + Dead time) [10 rpm/s] in the last 1st gain set, the drive switches to the 2nd gain set.<br>If the absolute value of the speed reference change rate is lower than (level – hysteresis) [10 rpm/s] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set.<br>In the speed control mode, the 1st gain set always applies. |

| Value | Gain Switchover condition | Remarks |
|---|---|---|
| 5 | Speed reference high/low-speed threshold | If the speed reference absolute value exceeds (Level - Dead time) [rpm] in the last 1st gain set, the drive starts to switch to the 2nd gain set, with gains changed gradually. When the speed reference absolute value reaches (Level + Dead time) [rpm], the 2nd gain set applies.<br>If the speed reference absolute value is lower than (Level + Dead time) [rpm] in the last 2nd gain set, the drive starts to return to the 1st gain set, with gains changed gradually. When the speed reference absolute value reaches (Level - Dead time) [rpm], the 1st gain set applies. |
| 6 | Position deviation too large | Active only in position control and full closed-loop control.<br>If the position deviation absolute value exceeds (Level + Dead time) [encoder unit] in the last 1st gain set, the drive switches to the 2nd gain set.<br>When the absolute value of the position deviation is lower than (Level - Dead time) [encoder unit] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set.<br>If the drive is not in position control or full closed-loop control, the 1st gain set always applies. |
| 7 | Position reference available | Active only in position control and full closed-loop control.<br>If the position reference is not 0 in the last 1st gain set, the drive switches to the 2nd gain set.<br>When the position reference is 0 and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain, the drive returns to the 1st gain set.<br>If the drive is not in position control or full closed-loop control, the 1st gain set always applies. |
| 8 | Positioning completed | Active only in position control and full closed-loop control.<br>If positioning has not been completed in the last 1st gain set, the drive switches to the 2nd gain set.<br>If positioning is not completed and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the servo drive returns to the 1st gain set.<br>If the drive is not in position control or full closed-loop control, the 1st gain set always applies. |
| 9 | Actual speed too high | Active only in position control and full closed-loop control.<br>If the absolute value of actual speed exceeds (Level + Dead time) [rpm] in the last 1st gain set, the drive switches to the 2nd gain set.<br>If the absolute value of actual speed is lower than (Level - Dead time) [rpm] and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the drive returns to the 1st gain set.<br>If the drive is not in position control or full closed-loop control, the 1st gain set always applies. |
| 10 | Position reference + Actual speed | Active only in position control and full closed-loop control.<br>If the position reference is not 0 in the last 1st gain set, the drive switches to the 2nd gain set.<br>If the position reference is 0 and such status lasts within the delay defined by H08.10 (Gain switchover delay) in the 2nd gain set, the 2nd gain set applies. When the position reference is 0 and the delay defined by (H08.10) is reached, if the absolute value of actual speed is lower than (Level) [rpm], the speed loop integral time constant is fixed to the setpoint of H08.04 (2nd speed loop integral time constant), and others return to the 1st gain set; if the absolute value of actual speed does not reach (Level - Dead time) [rpm], the speed integral also returns to the setpoint of H08.01 (Speed loop integral time constant).<br>If the drive is not in position control or full closed-loop control, the 1st gain set always applies. |

## H08.10 Gain switchover delay

Address: 0x080A
Min.: 0 Unit: ms
Max.: 1000 Data type: UInt16

| | | | |
|---|---|---|---|
| Default: | 5 | Change: | At once |

**Value Range:**

0.0 ms to 1000.0 ms

**Description**

Defines the delay when the drive switches from the 2nd gain set to the 1st gain set.

### H08.11 Gain switchover level

| | | | |
|---|---|---|---|
| Address: | 0x080B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 20000 | Data type: | UInt16 |
| Default: | 50 | Change: | At once |

**Value Range:**

0 to 20000

**Description**

Defines the gain switchover level.

Gain switchover is affected by both the level and the dead time, as defined by H08.09. The unit of gain switchover level varies with the switchover condition.

### H08.12 Gain switchover dead time

| | | | |
|---|---|---|---|
| Address: | 0x080C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 20000 | Data type: | UInt16 |
| Default: | 30 | Change: | At once |

**Value Range:**

0 to 20000

**Description**

Defines the dead time for gain switchover.

Gain switchover is affected by both the level and the dead time, as defined by H08.09. The unit of gain switchover hysteresis varies with the switchover condition.

Note:

Set H08.11 to a value higher than or equal to that of H08.12. Otherwise, the drive forcibly sets H08.11 to the same value as H08.12.

### H08.13 Position gain switchover time

| | | | |
|---|---|---|---|
| Address: | 0x080D | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 1000 | Data type: | UInt16 |
| Default: | 3 | Change: | At once |

**Value Range:**

0.0 ms to 1000.0 ms

**Description**

In position control, if H08.05 (2nd position loop gain) is much higher than H08.02 (Position loop gain), set the time for switching from H08.02 to H08.05.
This parameter can be used to reduce the impact caused by an increase in the position loop gain.

### H08.15 Load moment of inertia ratio

Address: 0x080F

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 120 | Data type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0.00 to 120.00

**Description**

Defines the mechanical load inertia ratio relative to the motor moment of inertia.

When H08.15 is set to 0, it indicates the motor carries no load; if it is set to 1.00, it indicates the mechanical load inertia is the same as the motor moment of inertia.

### H08.17 Zero phase delay

Address: 0x0811

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 4 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0 ms to 4.0 ms

**Description**

-

### H08.18 Speed feedforward filter time constant

Address: 0x0812

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 64 | Data type: | UInt16 |
| Default: | 0.5 | Change: | At once |

**Value Range:**

0.00 ms to 64.00 ms

**Description**

Defines the filter time constant of speed feedforward.

### H08.19 Speed feedforward gain

Address: 0x0813

Min.: 0 | Unit: %
Max.: 100 | Data type: UInt16
Default: 0 | Change: At once

**Value Range:**

0.0% to 100.0%

**Description**

In position control and full closed-loop control, speed feedforward is the product of speed feedforwad signal multiplied by H08.19 and is part of the speed reference.

Increasing the setpoint improves the responsiveness to position references and reduces the position deviation during operation at a constant speed.

Set H08.18 to a fixed value first, and then increase the value of H08.19 gradually from 0 to a certain value at which speed feedforward achieves the desired effect.

Adjust H08.18 and H08.19 repeatedly until a balanced performance is achieved.

Note:

For how to enable the speed feedforward function and select the speed feedforward signal, see H05.19 (Speed feedforward control).

### H08.20 Torque feedforward filter time constant

Address: 0x0814

Min.: 0 | Unit: ms
Max.: 64 | Data type: UInt16
Default: 0.5 | Change: At once

**Value Range:**

0.00 ms to 64.00 ms

**Description**

Defines the filter time constant of torque feedforward.

### H08.21 Torque feedforward gain

Address: 0x0815

Min.: 0 | Unit: %
Max.: 300 | Data type: UInt16
Default: 0 | Change: At once

**Value Range:**

0.0% to 300.0%

**Description**

In control modes other than torque control, torque feedforward is the product of torque feedforwad signal multiplied by H08.21 and is part of the torque reference.

Increasing the setpoint improves the responsiveness to variable speed references and position references and reduces the position deviation during operation at a constant speed.

During parameter adjustment, set H08.20 (Torque feedforward filter time constant) to the default value first, and then increase H08.21 gradually to enhance the effect of torque feedforward. When speed overshoot occurs, keep H08.21 unchanged and increase the value of H08.20. Adjust H08.20 and H08.21 repeatedly until a balanced performance is achieved.

Note:

For how to enable the torque feedforward function and select the torque feedforward signal, see H06.11 (Torque feedforward control).

### H08.22 Speed feedback filtering option

| | | | |
|---|---|---|---|
| Address: | 0x0816 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Inhibited

1: 2 times

2: 4 times

3: 8 times

4: 16 times

**Description**

Defines the moving average filtering times for speed feedback.

The higher the setpoint, the weaker the speed feedback fluctuation, but the longer the feedback delay will be.

### H08.23 Cutoff frequency of speed feedback low-pass filter

| | | | |
|---|---|---|---|
| Address: | 0x0817 | | |
| Min.: | 100 | Unit: | Hz |
| Max.: | 8000 | Data type: | UInt16 |
| Default: | 8000 | Change: | At once |

**Value Range:**

100 Hz to 8000 Hz

**Description**

Defines the cutoff frequency for first-order low-pass filtering on the speed feedback.

Note:

The lower the setpoint, the weaker the speed feedback fluctuation, and the longer the feedback delay will be.

Setting this parameter to 4000 Hz negates the filtering effect.

### H08.24 PDFF control coefficient

Address: 0x0818

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 200 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0.0% to 200.0%

**Description**

Defines the control mode of the speed loop.

When this parameter is set to 100.0, the speed loop adopts PI control (default) with quick dynamic response.

When this parameter is set to 0.0, speed loop integral action is enhanced, which filters out low-frequency interference but also slows down the dynamic response.

H08.24 can be used to keep a good responsiveness of the speed loop, with the anti-interference capacity in low-frequency bands improved and the speed feedback overshoot unaffected.

### H08.27 Speed observer cutoff frequency

Address: 0x081B

| | | | |
|---|---|---|---|
| Min.: | 50 | Unit: | Hz |
| Max.: | 600 | Data type: | UInt16 |
| Default: | 170 | Change: | At once |

**Value Range:**

50 Hz to 600 Hz

**Description**

Defines the cutoff frequency of the speed observer. Note that an excessively high setpoint may incur resonance. Decrease the setpoint properly in case of large speed feedback noise.

### H08.28 Speed observer inertia correction coefficient

Address: 0x081C

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | % |
| Max.: | 1600 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

1% to 1600%

**Description**

Defines the speed observer inertia correction coefficient. If H08.15 is set based on the actual inertia, there is no need to adjust this parameter.

### H08.29 Speed observer filter time

Address: 0x081D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |

| | | | |
|---|---|---|---|
| Max.: | 10 | Data type: | UInt16 |
| Default: | 0.8 | Change: | At once |

**Value Range:**

0.00 ms to 10.00 ms

**Description**

Defines the speed observer filter time. It is recommended to set this parameter to a value equal to the sum of H07.05 plus 0.2 ms.

### H08.31 Disturbance cutoff frequency

Address: 0x081F

| | | | |
|---|---|---|---|
| Min.: | 10 | Unit: | Hz |
| Max.: | 4000 | Data type: | UInt16 |
| Default: | 600 | Change: | At once |

**Value Range:**

10 Hz to 4000 Hz

**Description**

Defines the cutoff frequency of the disturbance observer. Increasing the setpoint improves the responsiveness of the disturbance observer and the compensation effect. Note that an excessively high setpoint may incur resonance.

### H08.32 Disturbance compensation gain

Address: 0x0820

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0% to 100%

**Description**

Defines the compensation gain of the disturbance observer. The setpoint 100% indicates full compensation.

### H08.33 Disturbance observer inertia correction coefficient

Address: 0x0821

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | % |
| Max.: | 1600 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

1% to 1600%

**Description**

Defines the disturbance observer inertia correction coefficient. If H08.15 is set based on the actual inertia, there is no need to adjust this parameter.

### H08.37 Phase modulation for medium-frequency jitter suppression 2

| | | | |
|---|---|---|---|
| Address: | 0x0825 | | |
| Min.: | -90 | Unit: | ° |
| Max.: | 90 | Data type: | Int16 |
| Default: | 0 | Change: | At once |

**Value Range:**

-90° to +90°

**Description**

Defines the compensation phase of medium-frequency jitter suppression 2.

### H08.38 Frequency of medium-frequency jitter suppression 2

| | | | |
|---|---|---|---|
| Address: | 0x0826 | | |
| Min.: | 0 | Unit: | Hz |
| Max.: | 1000 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 Hz to 1000 Hz

**Description**

Set this parameter based on actual resonance frequency. The valid suppression frequency range for medium-frequency jitter suppression 2 is 100 Hz to 1000 Hz.

### H08.39 Compensation gain of medium-frequency jitter suppression 2

| | | | |
|---|---|---|---|
| Address: | 0x0827 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 300 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0% to 300%

**Description**

Defines the compensation gain for medium-frequency jitter suppression 2. Set this parameter to 40%...55% in general cases. Setting this parameter to 0 negates the effect of medium-frequency jitter suppression 2.

### H08.40 Speed observer selection

| | | | |
|---|---|---|---|
| Address: | 0x0828 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Disable

1: Enable

**Description**

Used to set the enable bit for speed observer.

**H08.42** **Model control selection**

| | | | |
|---|---|---|---|
| Address: | 0x082A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Disable1: Enable

2: Dual-inertia model

**Description**

Used to enable model tracking control.

**H08.43** **Model gain**

| | | | |
|---|---|---|---|
| Address: | 0x082B | | |
| Min.: | 0.1 | Unit: | - |
| Max.: | 2000 | Data type: | UInt16 |
| Default: | 40 | Change: | At once |

**Value Range:**

0.1 to 2000.0

**Description**

Defines the single inertia model gain. The higher the gain, the faster the position response. Note that an excessively high setpoint may incur excessive overshoot.

**H08.46** **Feedforward value**

| | | | |
|---|---|---|---|
| Address: | 0x082E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 102.4 | Data type: | UInt16 |
| Default: | 95 | Change: | At once |

**Value Range:**

0.0 to 102.4

**Description**

Defines the speed feedforward gain for single inertia model control. If overshoot occurs, reduce the setpoint properly.

**H08.53** **Medium- and low-frequency jitter suppression frequency 3**

| | | | |
|---|---|---|---|
| Address: | 0x0835 | | |
| Min.: | 0 | Unit: | Hz |
| Max.: | 300 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0 Hz to 300.0 Hz

**Description**

Set this parameter based on actual resonance frequency. The resonance suppression range is 100 Hz to 300 Hz.

### H08.54 Medium- and low-frequency jitter suppression compensation 3

| | | | |
|---|---|---|---|
| Address: | 0x0836 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 200 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0% to 200%

**Description**

Defines the compensation gain for medium- and low-frequency suppression compensation 3. The setpoint 200% indicates full compensation.

### H08.56 Medium- and low-frequency jitter suppression phase modulation 3

| | | | |
|---|---|---|---|
| Address: | 0x0838 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 600 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0% to 600%

**Description**

Adjust this parameter based on the actual compensation effect.

### H08.59 Medium- and low-frequency jitter suppression frequency 4

| | | | |
|---|---|---|---|
| Address: | 0x083B | | |
| Min.: | 0 | Unit: | Hz |
| Max.: | 300 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0 Hz to 300.0 Hz

**Description**

Set this parameter based on actual resonance frequency. The resonance suppression range is 100 Hz to 300 Hz.

### H08.60 Medium- and low-frequency jitter suppression compensation 4

| | | | |
|---|---|---|---|
| Address: | 0x083C | | |
| Min.: | 0 | Unit: | % |

Max.: 200 | Data type: UInt16
Default: 0 | Change: At once

**Value Range:**

0% to 200%

**Description**

Defines the compensation gain for medium- and low-frequency suppression compensation 4. The setpoint 200% indicates full compensation.

### H08.61 Medium- and low-frequency jitter suppression phase modulation 4

Address: 0x083D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 600 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0% to 600%

**Description**

Adjust this parameter based on the actual compensation effect.

### H08.62 Position loop integral time constant

Address: 0x083E

| | | | |
|---|---|---|---|
| Min.: | 0.15 | Unit: | - |
| Max.: | 512 | Data type: | UInt16 |
| Default: | 512 | Change: | At once |

**Value Range:**

0.15 to 512.00

**Description**

Defines the position loop integral time constant.

### H08.63 2nd position loop integral time constant

Address: 0x083F

| | | | |
|---|---|---|---|
| Min.: | 0.15 | Unit: | - |
| Max.: | 512 | Data type: | UInt16 |
| Default: | 512 | Change: | At once |

**Value Range:**

0.15 to 512.00

**Description**

Defines the 2nd position loop integral time constant.

### H08.64 Speed observer feedback source

Address: 0x0840

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |

Max.: 1 | Data type: UInt16
Default: 0 | Change: At once

**Value Range:**

0: Disable

1: Enable

**Description**

-

### H08.65 Zero deviation control selection

Address: 0x0841

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Disable

1: Enable

**Description**

Used to enable/disable zero deviation control.

### H08.66 Zero deviation control position average filter

Address: 0x0842

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 320 | Data type: | UInt16 |
| Default: | 5 | Change: | At once |

**Value Range:**

0.0 ms to 320.0 ms

**Description**

Defines the average filter time of zero deviation control position. It is recommended to increase the setpoint in case of large noise caused by low command resolution.

### H08.68 Speed feedforward of zero deviation control

Address: 0x0844

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0.0% to 100.0%

**Description**

Defines the speed feedforward of zero deviation control.

### H08.69 Torque feedforward of zero deviation control

| | | | |
|---|---|---|---|
| Address: | 0x0845 | | |
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0.0% to 100.0%

**Description**

Defines the torque feedforward of zero deviation control.

### H08.81 Anti-resonance frequency of dual-inertia model

| | | | |
|---|---|---|---|
| Address: | 0x0851 | | |
| Min.: | 1 | Unit: | Hz |
| Max.: | 400 | Data type: | UInt16 |
| Default: | 20 | Change: | At once |

**Value Range:**

1.0 Hz to 400.0 Hz

**Description**

Used to set the anti-resonance frequency of dual-inertia model. You can set this parameter based on the frequency sweeping analysis of mechanical characteristics.

### H08.82 Resonance frequency of dual-inertia model

| | | | |
|---|---|---|---|
| Address: | 0x0852 | | |
| Min.: | 0 | Unit: | Hz |
| Max.: | 6553.5 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0 Hz to 6553.5 Hz

**Description**

Used to set the resonance frequency of dual-inertia model. You can set this parameter based on the frequency sweeping analysis of mechanical characteristics. If accurate resonance frequency is unknown, set H08.84 based on the inertia ratio of the resonance model.

### H08.83 Dual-inertia model gain

| | | | |
|---|---|---|---|
| Address: | 0x0853 | | |
| Min.: | 0.1 | Unit: | $s_{-1}$ |
| Max.: | 300 | Data type: | UInt16 |
| Default: | 60 | Change: | At once |

**Value Range:**

$0.1s_{-1}$ to $300.0s_{-1}$

**Description**

Defines the dual-inertia model gain.

**H08.84 Inertia ratio of dual-inertia model**

Address: 0x0854

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 120 | Data type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0.00 to 120.00

**Description**

If the resonance frequency of dual-inertia model is set accurately, there is no need to set this parameter.

**H08.88 Speed feedforward value of dual-inertia model**

Address: 0x0858

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 6553.5 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0.0 to 6553.5

**Description**

Set this parameter to 100% in general cases.

**H08.89 Torque feedforward value of dual-inertia model**

Address: 0x0859

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 6553.5 | Data type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0.0 to 6553.5

**Description**

Set this parameter to 100% in general cases.

## 6.10 H09 Auto-tuning Parameters

**H09.00 Gain auto-tuning mode**

Address: 0x0900

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 4 | Change: | At once |

**Value Range:**

0: Disabled, manual gain tuning required
1: Enabled, gain parameters generated automatically based on the stiffness level
2: Positioning mode, gain parameters generated automatically based on the stiffness level
3: Interpolation mode+Inertia auto-tuning
4: Normal mode+Inertia auto-tuning
6: Quick positioning mode+Inertia auto-tuning

**Description**

Defines different gain tuning modes. Related gain parameters can be set manually or automatically according to the stiffness level.

### H09.01 Stiffness level

| | | | |
|---|---|---|---|
| Address: | 0x0901 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 41 | Data type: | UInt16 |
| Default: | 15 | Change: | At once |

**Value Range:**

0 to 41

**Description**

Defines the stiffness level of the servo system. The higher the stiffness level, the stronger the gains and the quicker the response will be. But an excessively high stiffness level will cause vibration.
The setpoint 0 indicates the weakest stiffness and 41 indicates the strongest stiffness.

### H09.02 Adaptive notch mode

| | | | |
|---|---|---|---|
| Address: | 0x0902 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data type: | UInt16 |
| Default: | 3 | Change: | At once |

**Value Range:**

0: Adaptive notch no longer updated;
1: One adaptive notch activated (3rd notch)
2: Two adaptive notches activated (3rd and 4th notches)
3: Resonance point tested only (displayed in H09.24)
4: Adaptive notch cleared, values of 3rd and 4th notches restored to default

**Description**

Defines the operation mode of the adaptive notch.

**H09.03 Online inertia auto-tuning mode**

| | | | |
|---|---|---|---|
| Address: | 0x0903 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0: Disabled

1: Enabled, changing slowly

2: Enabled, changing normally

3: Enabled, changing quickly

**Description**

Defines whether to enable online inertia auto-tuning and the inertia ratio update speed during online inertia auto-tuning.

**H09.05 Offline inertia auto-tuning mode**

| | | | |
|---|---|---|---|
| Address: | 0x0905 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Bi-directional

1: Unidirectional

**Description**

Defines the offline inertia auto-tuning mode. The offline inertia auto-tuning function can be enabled through H0d.02.

**H09.06 Maximum speed of inertia auto-tuning**

| | | | |
|---|---|---|---|
| Address: | 0x0906 | | |
| Min.: | 100 | Unit: | rpm |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 500 | Change: | At stop |

**Value Range:**

100 rpm to 1000 rpm

**Description**

Defines the maximum permissible speed reference in offline inertia auto-tuning mode.

During inertia auto-tuning, the higher the speed, the more accurate the auto-tuned values. Use the default setpoint in general cases.

**H09.07 Time constant for accelerating to the max. speed during inertia auto-tuning**

Address: 0x0907

| | | | |
|---|---|---|---|
| Min.: | 20 | Unit: | ms |
| Max.: | 800 | Data Type: | UInt16 |
| Default: | 125 | Change: | At stop |

**Value Range:**

20 ms to 800 ms

**Description**

Defines the time for the motor to accelerate from 0 rpm to the maximum speed of inertia auto-tuning (H09.06) during offline inertia auto-tuning.

### H09.08 Interval time after an individual inertia auto-tuning

Address: 0x0908

| | | | |
|---|---|---|---|
| Min.: | 50 | Unit: | ms |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 800 | Change: | At stop |

**Value Range:**

50 ms to 10000 ms

**Description**

Defines the interval time between two consecutive speed references when H09.05 (Offline inertia auto-tuning mode) is set to 1 (Positive/Negative triangular wave mode).

### H09.09 Number of motor revolutions per inertia auto-tuning

Address: 0x0909

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0.00 to 100.00

**Description**

Defines the motor revolutions per inertia auto-tuning when H09.05 (Offline inertia auto-tuning mode) is set to 1 (Positive/Negative triangular wave mode).

Note:

When using the offline inertia auto-tuning function, check that the travel distance of the motor at the stop position is larger than the value of H09.09. If not, decrease the value of H09.06 (Maximum speed for inertia auto-tuning) or H09.07 (Time constant of accelerating to max. speed during inertia auto-tuning) properly until the motor travel distance fulfills the requirement.

### H09.11 Vibration threshold

Address: 0x090B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |

| | | | |
|---|---|---|---|
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 5 | Change: | At once |

**Value Range:**

0.0% to 100.0%

**Description**

Defines the warning threshold for current feedback vibration.

### H09.12 Frequency of the 1st notch

| | | | |
|---|---|---|---|
| Address: | 0x090C | | |
| Min.: | 50 | Unit: | Hz |
| Max.: | 8000 | Data Type: | UInt16 |
| Default: | 8000 | Change: | At once |

**Value Range:**

50 Hz to 8000 Hz

**Description**

Defines the center frequency of the notch, which is the mechanical resonance frequency.

In the torque control mode, setting the notch frequency to 4000 Hz deactivates the notch function.

### H09.13 Width level of the 1st notch

| | | | |
|---|---|---|---|
| Address: | 0x090D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0 to 20

**Description**

Defines the width level of the notch. Use the default setpoint in general cases.

Width level is the ratio of the notch width to the notch center frequency.

### H09.14 Depth level of the 1st notch

| | | | |
|---|---|---|---|
| Address: | 0x090E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 99 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 99

**Description**

Defines the depth level of the notch.

The depth level of the notch is the ratio between the input to the output at the notch center frequency.
The higher the setpoint, the lower the notch depth and the weaker the mechanical resonance suppression will be. Note that an excessively high setpoint may cause system instability.

### H09.15 Frequency of the 2nd notch

| | | | |
|---|---|---|---|
| Address: | 0x090F | | |
| Min.: | 50 | Unit: | Hz |
| Max.: | 8000 | Data Type: | UInt16 |
| Default: | 8000 | Change: | At once |

**Value Range:**

50 Hz to 8000 Hz

**Description**

-

### H09.16 Width level of the 2nd notch

| | | | |
|---|---|---|---|
| Address: | 0x0910 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0 to 20

**Description**

-

### H09.17 Depth level of the 2nd notch

| | | | |
|---|---|---|---|
| Address: | 0x0911 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 99 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 99

**Description**

-

### H09.18 Frequency of the 3rd notch

| | | | |
|---|---|---|---|
| Address: | 0x0912 | | |
| Min.: | 50 | Unit: | Hz |
| Max.: | 8000 | Data Type: | UInt16 |
| Default: | 8000 | Change: | At once |

**Value Range:**
50 Hz to 8000 Hz
**Description**
-

### H09.19 Width level of the 3rd notch

| | | | |
|---|---|---|---|
| Address: | 0x0913 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**
0 to 20
**Description**
-

### H09.20 Depth level of the 3rd notch

| | | | |
|---|---|---|---|
| Address: | 0x0914 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 99 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**
0 to 99
**Description**
-

### H09.21 Frequency of the 4th notch

| | | | |
|---|---|---|---|
| Address: | 0x0915 | | |
| Min.: | 50 | Unit: | Hz |
| Max.: | 8000 | Data Type: | UInt16 |
| Default: | 8000 | Change: | At once |

**Value Range:**
50 Hz to 8000 Hz
**Description**
-

### H09.22 Width level of the 4th notch

| | | | |
|---|---|---|---|
| Address: | 0x0916 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**
0 to 20

**Description**

-

### H09.23 Depth level of the 4th notch

Address: 0x0917

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 99 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 99

**Description**

-

### H09.24 Auto-tuned resonance frequency

Address: 0x0918

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Hz |
| Max.: | 5000 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 Hz to 5000 Hz

**Description**

When H09.02 (Adaptive notch mode) is set to 3, the current mechanical resonance frequency is displayed.

### H09.26 ITune response

Address: 0x091A

| | | | |
|---|---|---|---|
| Min.: | 50 | Unit: | % |
| Max.: | 500 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

50.0% to 500.0%

**Description**

Defines the ITune response capability. Increasing the setpoint improves the responsiveness but may incur resonance.

### H09.27 ITune mode

Address: 0x091B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Disable1: ITune mode 1

2: ITune mode 2

**Description**

Function: Setting H09.27 to 1 enables the ITune function.

Note: ITune mode 2 is manufacturer commissioning mode, which should be used with caution.

**H09.28 Minimum inertia ratio of ITune**

Address: 0x091C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 80 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0% to 80.0%

**Description**

Inertia ratio range for ITune adjustment: The minimum and maximum inertia ratios of ITune are 0.0 and 30.0 by default.

If the actual maximum load inertia ratio is higher than 30.0, increase the value of H09.29 to prevent positioning jitter.

If the actual load inertia change range is small, set H09.28 and H09.29 based on actual conditions to achieve optimal control effect.

**H09.29 Maximum inertia ratio of ITune**

Address: 0x091D

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | % |
| Max.: | 120 | Data Type: | UInt16 |
| Default: | 30 | Change: | At once |

**Value Range:**

1.0% to 120.0%

**Description**

-

**H09.32 Gravity compensation value**

Address: 0x0920

| | | | |
|---|---|---|---|
| Min.: | -100 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-100% to 100.0%

**Description**

Defines the gravity compensation value. Setting this parameter properly in vertical axis applications can reduce the falling amplitude upon start.

### H09.33 Positive friction compensation value

Address: 0x0921

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0% to 100.0%

**Description**

Defines the positive friction compensation value.

### H09.34 Negative friction compensation value

Address: 0x0922

| | | | |
|---|---|---|---|
| Min.: | -100 | Unit: | % |
| Max.: | 0 | Data Type: | Int16 |
| Default: | 0 | Change: | At once |

**Value Range:**

-100.0% to 0.0%

**Description**

Defines the negative direction friction compensation value.

### H09.35 Friction compensation speed

Address: 0x0923

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0.0 to 20.0

**Description**

Defines the friction compensation speed.

### H09.36 Friction compensation speed

Address: 0x0924

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 19 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Slow speed mode + Speed reference
1: Slow speed mode + Model speed
2: Slow speed mode + Speed feedback
3: Slow speed mode + Observe speed
16: High speed mode + Speed reference
17: High speed mode + Model speed
18: High speed mode + Speed feedback
19: High speed mode + Observe speed

**Description**

-

### H09.37 Vibration monitoring time

Address: 0x0925

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 600 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

The resonance detection suppression function is turned off automatically after the time defined by this parameter elapses. To suppress the resonance suppression function, set this parameter to 65536.

### H09.38 Frequency of low-frequency resonance suppression 1 at the mechanical end

Address: 0x0926

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | Hz |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

1.0 Hz to 100.0 Hz

**Description**

Set this parameter based on the actual jitter frequency.

### H09.39 Low-frequency resonance suppression 1 at the mechanical end

Address: 0x0927

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 2 | Change: | At stop |

**Value Range:**

0 to 3

**Description**

Defines different low-frequency resonance suppression types at the mechanical load. Type 1 features the shortest delay.

### H09.44 Frequency of low-frequency resonance suppression 2 at mechanical load end

| | | | |
|---|---|---|---|
| Address: | 0x092C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 100 | Data type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0 to 100.0

**Description**

Set this parameter based on the actual jitter frequency.

### H09.45 Responsiveness of low-frequency resonance suppression 2 at mechanical load end

| | | | |
|---|---|---|---|
| Address: | 0x092D | | |
| Min.: | 0.01 | Unit: | - |
| Max.: | 5 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0.01 to 5.00

**Description**

Use the default setpoint in general cases. Increasing the setpoin shortens the delay time.

### H09.47 Width of low-frequency resonance suppression 2 at mechanical load end

| | | | |
|---|---|---|---|
| Address: | 0x092F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0.00 to 2.00

**Description**

Use the default setpoint in general cases. Increase the setpoint prolongs the delay time.

### H09.49 Frequency of low-frequency resonance suppression 3 at mechanical load end

| | | | |
|---|---|---|---|
| Address: | 0x0931 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 100 | Data Type: | UInt16 |

Default: 0 | Change: At once

**Value Range:**

0.0 to 100.0

**Description**

-

### H09.50 Responsiveness of low-frequency resonance suppression 3 at mechanical load end

Address: 0x0932

Min.: 0 | Unit: -

Max.: 5 | Data Type: UInt16

Default: 1 | Change: At once

**Value Range:**

0.01 to 5.00

**Description**

-

### H09.52 Width of low-frequency resonance suppression 3 at mechanical load end

Address: 0x0934

Min.: 0 | Unit: -

Max.: 2 | Data Type: UInt16

Default: 1 | Change: At once

**Value Range:**

0.00 to 2.00

**Description**

-

### H09.54 Vibration threshold

Address: 0x0936

Min.: 0 | Unit: %

Max.: 300 | Data Type: UInt16

Default: 50 | Change: At once

**Value Range:**

0.0% to 300.0%

**Description**

If the torque fluctuation exceeds the setpoint, an error will be reported. Setting this parameter to 0 hides the resonance detection function.

### H09.56 Max. overshoot allowed by ETune

Address: 0x0938

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 2936 Change: At once

**Value Range:**

0 to 65535

**Description**

Defines the maximum overshoot value allowed during ETune adjustment.

### H09.57 STune resonance suppression switchover frequency

Address: 0x0939

Min.: 0 Unit: Hz

Max.: 4000 Data Type: UInt16

Default: 900 Change: At once

**Value Range:**

0 Hz to 4000 Hz

**Description**

If the resonance frequency is lower than the setpoint, use medium-frequency resonance suppression 2 to suppress resonance. Otherwise, use the notch to suppress resonance.

### H09.58 STune resonance suppression reset selection

Address: 0x093A

Min.: 0 Unit: -

Max.: 1 Data Type: UInt16

Default: 0 Change: At once

**Value Range:**

0: Disable

1: Enable

**Description**

Used to enable STune resonance suppression reset to clear parameters related to resonance suppression, medium-frequency resonance suppression 2, and notches 3 and 4.

## 6.11 H0A Fault and Protection Parameters

### H0A.00 Power input phase loss protection

Address: 0x0A00

Min.: 0 Unit: -

Max.: 1 Data Type: UInt16

Default: 0 Change: At once

**Value Range:**

0: Enable

1: Disable

**Description**

Servo drives supporting single-phase/three-phase 220 V and three-phase 380 V power supplies are available. When voltage fluctuation or phase loss occurs on the power supply, the drive triggers power input phase loss protection based on H0A.00.

### H0A.01 Absolute position limit

| | | | |
|---|---|---|---|
| Address: | 0x0A01 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Disabled

1: Enabled

2: Enabled after homing

**Description**

Used to set the activation condition for enabling the software position limit.

### H0A.04 Motor overload protection gain

| | | | |
|---|---|---|---|
| Address: | 0x0A04 | | |
| Min.: | 50 | Unit: | - |
| Max.: | 300 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

50 to 300

**Description**

Determines the motor overload duration before E620.0 (Motor overload) is reported.

You can change the setpoint to advance or delay the time when overload protection is triggered based on the motor temperature. The setpoint 50% indicates the time is cut by half; 150% indicates the time is prolonged by 50%. Set this parameter based on the actual temperature of the motor.

### H0A.08 Overspeed threshold

| | | | |
|---|---|---|---|
| Address: | 0x0A08 | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 20000 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 rpm to 20000 rpm

**Description**

Defines the overspeed threshold of the motor.

| Setpoint | Overspeed Threshold | Condition for Reporting E500.0 |
|---|---|---|
| 0 | Maximum motor speed x 1.2 | If the speed feedback exceeds the overspeed threshold several times, the drive reports E500.0 (Motor overspeed). |
| 1 to 10000 | If H0A-08 ⩾ (Maximum motor speed x 1.2):<br>Overspeed threshold = Maximum motor speed x 1.2 | |
| | If H0A-08 < (Maximum motor speed x 1.2):<br>Overspeed threshold = H0A.08 | |

### H0A.09 Max. pulse input frequency in position control

Address: 0x0A09
Min.: 100 Unit: kHz
Max.: 8000 Data Type: UInt16
Default: 8000 Change: At stop

**Value Range:**

100 kHz to 8000 kHz

**Description**

Defines the maximum frequency of input pulses when the position reference source is pulse reference (H05.00 = 0) in the position control mode.

When the actual pulse input frequency exceeds the value of H0A.09, the drive reports EB01.0 (Position reference input error).

### H0A.10 Threshold of excessive local position deviation

Address: 0x0A0A
Min.: 0 Unit: -
Max.: 4294967295 Data Type: UInt32
Default: 27486951 Change: Real-time modification

**Value Range:**

0 to 4294967295

**Description**

Defines the threshold for excessive position deviation in the position control mode.

When the position deviation exceeds this threshold, the drive reports EB00.0 (Position deviation too large).

### H0A.12 Runaway protection

Address: 0x0A0C
Min.: 0 Unit: -

| | | | |
|---|---|---|---|
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0: Disable

1: Enable

**Description**

Defines whether to enable runaway protection.

0: Hide the detection on E234.0 in applications where the motor drives a vertical axis or is driven by the load

1: Enable runaway protection

### H0A.17 Reference pulse selection

Address: 0x0A11

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Pulse unit

1: Reference unit

**Description**

Defines the unit for the position settings in H05.21, H05.22, and H0A.10.

### H0A.18 IGBT overtemperature threshold

Address: 0x0A12

| | | | |
|---|---|---|---|
| Min.: | 120 | Unit: | °C |
| Max.: | 175 | Data Type: | UInt16 |
| Default: | 140 | Change: | At once |

**Value Range:**

120°C to 175°C

**Description**

Defines the threshold for reporting E640.0 (IGBT overtemperature) and E640.1 (Flywheel diode overtemperature).

### H0A.19 Filter time constant of touch probe 1

Address: 0x0A13

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | us |
| Max.: | 6.3 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0.00 us to 6.30 us

**Description**

Defines the filter time of touch probe 1. An active input must last for the time defined by H0A.19.

### H0A.20 Filter time constant of touch probe 2

| | | | |
|---|---|---|---|
| Address: | 0x0A14 | | |
| Min.: | 0 | Unit: | us |
| Max.: | 6.3 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0.00 us to 6.30 us

**Description**

Defines the filter time of touch probe 2. An active input must last for the time defined by H0A.20.

### H0A.23 TZ signal filter time

| | | | |
|---|---|---|---|
| Address: | 0x0A17 | | |
| Min.: | 0 | Unit: | 25 ns |
| Max.: | 31 | Data Type: | UInt16 |
| Default: | 15 | Change: | At stop |

**Value Range:**

0 ns to 31 ns

**Description**

-

### H0A.24 Filter time constant of low-speed pulse input pin

| | | | |
|---|---|---|---|
| Address: | 0x0A18 | | |
| Min.: | 0 | Unit: | 25 ns |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 30 | Change: | At stop |

**Value Range:**

0 ns to 255 ns

**Description**

Defines the filter time constant of low-speed pulse input terminal which is enabled (H05.01 = 0) when the position reference source is pulse input (H05.00 = 0) in the position control mode.

When peak interference exists in the low-speed pulse input terminal, set this parameter to suppress peak interference and prevent motor malfunction due to interference signal inputted to the servo drive.

### H0A.25 Speed display DO low-pass filter time

Address: 0x0538

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 5000 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 5000

**Description**

Defines the low-pass filter time constant of the speed information for speed feedback and position references.

### H0A.26 Motor overload detection

Address: 0x0A1A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Show motor overload warning (E909.0) and fault (E620.0)

1: Hide motor overload warning (E909.0) and fault (E620.0)

**Description**

Defines whether to enable motor overload detection.

### H0A.27 Moving average filter time for speed display DO

Address: 0x0A1B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 50 | Change: | At once |

**Value Range:**

0 ms to 100 ms

**Description**

Defines the low-pass filter time constant of the speed information for speed feedback and position references.

### H0A.29 Fully closed-loop encoder (ABZ) filter time

Address: 0x0A1D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | 25 ns |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 4111 | Change: | At stop |

**Value Range:**

bit0–bit7: Fully closed loop encoder (ABZ) pulse signal filtering time

bit8–bit15: Fully closed loop encoder (ABZ) wire breakage filter time

**Description**

-

### H0A.30 Filter time constant of high-speed pulse input pin

| | | | |
|---|---|---|---|
| Address: | 0x0A1E | | |
| Min.: | 0 | Unit: | ns |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 3 | Change: | At stop |

**Value Range:**

0 ns to 255 ns

**Description**

Defines the filter time constant of high-speed pulse input terminal which is enabled (H05.01 = 1) when the position reference source is pulse reference (H05.00 = 0) in the position control mode.

When peak interference exists in the high-speed pulse input terminal, set this parameter to suppress peak interference and prevent motor malfunction due to interference signal inputted to the servo drive.

### H0A.32 Motor stall over-temperature protection time window

| | | | |
|---|---|---|---|
| Address: | 0x0A20 | | |
| Min.: | 10 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

10 ms to 65535 ms

**Description**

Defines the overtemperature duration before E630.0 (Motor stall) is detected by the servo drive.

H0A.32 can be used to adjust the sensitivity of motor stall over-temperature detection.

### H0A.33 Motor stall overtemperature detection

| | | | |
|---|---|---|---|
| Address: | 0x0A21 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0: Hide

1: Enable

**Description**

Defines whether to enable the detection for E630.0 (Motor stall overtemperature protection).

### H0A.36 Encoder multi-turn overflow fault selection

Address: 0x0A24

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Not hide

1: Hide

**Description**

Defines whether to hide the encoder multi-turn overflow fault in the absolute position linear mode (H02.01 = 1).

### H0A.40 Compensation function selection

Address: 0x0A28

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 15 | Data Type: | UInt16 |
| Default: | 6 | Change: | At stop |

**Value Range:**

| bit | Name | Function |
|---|---|---|
| 0 | Overtravel compensation | 0: Enabled |
| | | 1: Disabled |
| 1 | Probe rising edge compensation | 0: Disabled |
| | | 1: Enabled |
| 2 | Probe falling edge compensation | 0: Disabled |
| | | 1: Enabled |
| 3 | Probe solution | 0: New solution |
| | | 1: Old solution (same as SV660N) |

**Description**

-

### H0A.41 Forward position of software position limit

Address: 0x0A29

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Encoder unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 2147483647 | Change: | At stop |

**Value Range:**

-2147483648 to +2147483647

**Description**

When the absolute position counter (H0b.07) is larger than H0A.41, the servo drive reports E950.0 (Forward overtravel) and stops accordinly.

### H0A.43 Reverse position of software position limit

Address: 0x0A2B

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Encoder unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | -2147483648 | Change: | At stop |

**Value Range:**

-2147483648 to +2147483647

**Description**

When the absolute position counter (H0b.07) is smaller than H0A.43, the servo drive reports E952.0 (Reverse overtravel) and stops accordingly.

### H0A.49 Regenerative resistor overtemperature threshold

Address: 0x0A31

| | | | |
|---|---|---|---|
| Min.: | 100 | Unit: | °C |
| Max.: | 175 | Data Type: | UInt16 |
| Default: | 140 | Change: | Real-time modification |

**Value Range:**

100°C to 175°C

**Description**

Defines the temperature threshold for regenerative resistor overload.

### H0A.50 Encoder communication fault tolerance threshold

Address: 0x0A32

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 31 | Data Type: | UInt16 |
| Default: | 5 | Change: | At once |

**Value Range:**

0 to 31

**Description**

When the numer of communication failures between the encoder and the drive exceeds H0A.50, the communication between the encoder and the drive fails.

### H0A.51 Phase loss detection filter times

Address: 0x0A33

| | | | |
|---|---|---|---|
| Min.: | 3 | Unit: | 55 ms |
| Max.: | 36 | Data Type: | UInt16 |
| Default: | 20 | Change: | At once |

**Value Range:**

3 ms to 36 ms

**Description**

Phase loss fault is reported when phase loss keeps active for a period longer than that defined by H0A.51.

### H0A.52 Encoder temperature protection threshold

Address: 0x0A34

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | 1°C |
| Max.: | 175 | Data Type: | UInt16 |
| Default: | 125 | Change: | Real-time modification |

**Value Range:**

0°C to 175°C

**Description**

Defines the temperature threshold for encoder overtemperature protection.

### H0A.53 Touch probe DI ON-compensation time

Address: 0x0A35

| | | | |
|---|---|---|---|
| Min.: | -3000 | Unit: | 25 ns |
| Max.: | 3000 | Data Type: | Int16 |
| Default: | 200 | Change: | At once |

**Value Range:**

-3000 ns to +3000 ns

**Description**

Used to compensate for the action time when the touch probe is switched on.

### H0A.54 Touch probe DI OFF-compensation time

Address: 0x0A36

| | | | |
|---|---|---|---|
| Min.: | -3000 | Unit: | 25 ns |
| Max.: | 3000 | Data Type: | Int16 |
| Default: | 1512 | Change: | At once |

**Value Range:**

-3000 ns to +3000 ns

**Description**

Used to compensate for the action time when the touch probe is switched off.

### H0A.55 Runaway current threshold

| | | | |
|---|---|---|---|
| Address: | 0x0A37 | | |
| Min.: | 100 | Unit: | % |
| Max.: | 400 | Data Type: | UInt16 |
| Default: | 200 | Change: | At once |

**Value Range:**

100.0% to 400.0%

**Description**

Defines the current threshold for runaway protection detection.

### H0A.56 Fault reset delay

| | | | |
|---|---|---|---|
| Address: | 0x0A38 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 60000 | Data Type: | UInt16 |
| Default: | 10000 | Change: | At once |

**Value Range:**

0 ms to 60000 ms

**Description**

-

### H0A.57 Runaway speed threshold

| | | | |
|---|---|---|---|
| Address: | 0x0A39 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 50 | Change: | At once |

**Value Range:**

1 rpm to 1000 rpm

**Description**

Defines the overspeed threshold for runaway protection detection.

### H0A.58 Runaway speed filter time

| | | | |
|---|---|---|---|
| Address: | 0x0A3A | | |
| Min.: | 0.1 | Unit: | ms |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 2 | Change: | At once |

**Value Range:**

0.1 ms to 100.0 ms

**Description**

Defines the speed feedback filter time for runaway protection detection.

### H0A.59 Runaway protection detection time

Address: 0x0A3B

| | | | |
|---|---|---|---|
| Min.: | 10 | Unit: | ms |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 30 | Change: | At once |

**Value Range:**

10 ms to 1000 ms

**Description**

The runaway fault will be reported when runaway fault keeps active for a period longer than that defined by H0A.59.

### H0A.60 Black box function mode

Address: 0x0A3C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0: Disable

1: Any fault

2: Designated fault

3: Triggered based on designated condition

**Description**

Defines the condition for triggering black box sampling.

### H0A.61 Designated fault code

Address: 0x0A3D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0.0 to 6553.5

**Description**

Defines the fault code for triggering the black box function.

### H0A.62 Trigger source

Address: 0x0A3E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 25 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 25

**Description**

Defines the fault code for triggering the black box function through designated channel.

**H0A.63 Trigger level**

Address: 0x0A3F

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | At once |

**Value Range:**

-2147483648 to +2147483647

**Description**

Defines the level for triggering the black box function through designated channel.

**H0A.65 Trigger level**

Address: 0x0A41

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Rising edge

1: Equal

2: Falling edge

3: Edge-triggered

**Description**

Defines the mode for triggering the black box function through H0A.63.

**H0A.66 Trigger position**

Address: 0x0A42

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 75 | Change: | At once |

**Value Range:**

0% to 100%

**Description**

Defines the pre-trigger position for triggering black box sampling.

**H0A.67 Sampling frequency**

Address: 0x0A43

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Current loop
1: Position loop
2: Main cycle

**Description**

Defines the frequency sampling mode during black box sampling.

**H0A.70 Overspeed threshold 2**

| | | | |
|---|---|---|---|
| Address: | 0x0A46 | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 20000 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 rpm to 20000 rpm

**Description**

Defines the speed threshold for reporting E500.2 (Position feedback pulse overspeed).

**H0A.71 MS1 motor overload curve switchover**

| | | | |
|---|---|---|---|
| Address: | 0x0A47 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 4098 | Change: | Real-time modification |

**Value Range:**

0 to 65535

**Description**

Bit 0:
0: New overload curve
1: Old overload curve
Bit 1:
0: Enable discharging switch upon power failure
1: Hide discharging switch upon power failure
Bit 12:
0: Homing completed flag bit not retentive upon power failure
1: Homing completed flag bit retentive upon power failure

**H0A.72 Maximum stop time in ramp-to-stop**

| | | | |
|---|---|---|---|
| Address: | 0x0A48 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10000 | Change: | At stop |

**Value Range:**

0 to 65535

**Description**

Defines the time for the motor to decelerate from the maximum speed to 0 rpm during ramp-to-stop.

### H0A.73 STO 24V disconnection filter time

| | | | |
|---|---|---|---|
| Address: | 0x0A49 | | |
| Min.: | 1 | Unit: | ms |
| Max.: | 5 | Data Type: | UInt16 |
| Default: | 5 | Change: | At once |

**Value Range:**

1 ms to 5 ms

**Description**

Defines the delay from the moment when 24 V is disconnected to the moment when the STO state applies.

### H0A.74 Filter time for two inconsistent STO channels

| | | | |
|---|---|---|---|
| Address: | 0x0A4A | | |
| Min.: | 1 | Unit: | ms |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

1 ms to 1000 ms

**Description**

Defines the delay from the moment 24 V is inputted to the drive inconsistently through two channels to the moment when the STO state applies.

### H0A.75 Servo OFF delay after STO triggered

| | | | |
|---|---|---|---|
| Address: | 0x0A4B | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 25 | Data Type: | UInt16 |
| Default: | 20 | Change: | At once |

**Value Range:**

0 ms to 25 ms

**Description**

Defines the delay from the moment the STO state is triggered to the moment the S-ON signal is switched off.

### H0A.90 Moving average filter time for speed display values

| | | | |
|---|---|---|---|
| Address: | 0x0A5A | | |
| Min.: | 0 | Unit: | ms |

| | | | |
|---|---|---|---|
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 ms to 100 ms

**Description**

Defines the moving average filter time constant for speed display values.

### H0A.91 Moving average filter time for torque display values

Address: 0x0A5B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 ms to 100 ms

**Description**

Defines the moving average filter time constant for torque display values.

### H0A.92 Moving average filter time for position display values

Address: 0x0A5C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 ms to 100 ms

**Description**

Defines the moving average filter time constant for position display values.

### H0A.93 Low-pass filter time for voltage display values

Address: 0x0A5D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 250 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 ms to 250 ms

**Description**

Defines the low-pass filter time constant for voltage display values.

### H0A.94 Low-pass filter time for thermal display values

Address: 0x0A5E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 250 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 0 | Change: | At once |

**Value Range:**

0 ms to 250 ms

**Description**

Defines the filter time constant for thermal display values.

## 6.12 H0b Monitoring Parameters

**H0b.00 Motor speed actual value**

| | | | |
|---|---|---|---|
| Address: | 0x0B00 | | |
| Min.: | -32767 | Unit: | rpm |
| Max.: | 32767 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-32767 rpm to +32767 rpm

**Description**

Indicates the actual motor speed after round-off, which is accurate to 1 rpm. Set in H0A.25 (Filter time constant of speed feedback display) the filter time constant for H0b.00.

**H0b.01 Speed reference**

| | | | |
|---|---|---|---|
| Address: | 0x0B01 | | |
| Min.: | -32767 | Unit: | rpm |
| Max.: | 32767 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-32767 rpm to +32767 rpm

**Description**

Indicates the present speed reference (accurate to 1 rpm) of the drive in the position and speed control modes.

**H0b.02 Internal torque reference**

| | | | |
|---|---|---|---|
| Address: | 0x0B02 | | |
| Min.: | -500 | Unit: | % |
| Max.: | 500 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-500.0% to +500.0%

**Description**

Displays present torque reference (accurate to 0.1%). The value 100.0% corresponds to the rated torque of the motor.

### H0b.03 Monitored DI status

| | | | |
|---|---|---|---|
| Address: | 0x0B03 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Displays the level status of eight DIs without filtering.

Upper LED segments ON: high level (indicated by "1") Lower LED segments ON: low level (indicated by "0")

### H0b.05 Monitored DO status

| | | | |
|---|---|---|---|
| Address: | 0x0B05 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Displays the level status of five DOs without filtering.

Upper LED segments ON: high level (indicated by "1") Lower LED segments ON: low level (indicated by "0")

### H0b.07 Absolute position counter

| | | | |
|---|---|---|---|
| Address: | 0x0B07 | | |
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Indicates present absolute position (reference unit) of the motor in the position control mode.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

### H0b.09 Mechanical angle

| | | | |
|---|---|---|---|
| Address: | 0x0B09 | | |
| Min.: | 0 | Unit: | ° |
| Max.: | 360 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0° to 360.0°

**Description**

Displays present mechanical angle (encoder unit) of the motor. The setpoint 0 indicates the mechanical angle is 0°.

Actual mechanical angle = 360° x H0b.09/(Maximum value of H0b.09 + 1)

Maximum value of H0b.09 for an absolute encoder: 65535

### H0b.10 Electrical angle

| | | | |
|---|---|---|---|
| Address: | 0x0B0A | | |
| Min.: | 0 | Unit: | ° |
| Max.: | 360 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0° to 360.0°

**Description**

Indicates the present electrical angle of the motor, which is accurate to 0.1°.

The electrical angle variation range is ±360.0° during rotation. If the motor has four pairs of poles, each revolution generates four rounds of angle change from 0° to 359°. Similarly, if the motor has five pairs of poles, each revolution generates five rounds of angle change from 0° to 359°.

### H0b.12 Average load rate

| | | | |
|---|---|---|---|
| Address: | 0x0B0C | | |
| Min.: | 0 | Unit: | % |
| Max.: | 800 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0% to 800.0%

**Description**

Displays the percentage of the average load torque to the rated torque of the motor, which is accurate to 0.1%. The value 100.0% corresponds to the rated torque of the motor.

### H0b.13 Input reference counter

| | | | |
|---|---|---|---|
| Address: | 0x0B0D | | |
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Used to count and display the number of position references not divided or multiplied by the electronic gear ratio during operation. This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

### H0b.15 Position following error (encoder unit)

Address: 0x0B0F

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Used to count and display the position deviation value after being divided or multiplied by the electronic gear ratio in the position control mode.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

Note:

H0b.15 can be cleared when the condition defined in H05.16 (Clear action) is met.

### H0b.17 Feedback pulse counter

Address: 0x0B11

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Used to count the position pulses fed back by the encoder in any control mode.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

### H0b.19 Total power-on time

Address: 0x0B13

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | s |
| Max.: | 429496729.5 | Data Type: | UInt32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0s to 429496729.5s

**Description**

Used to record the total operating time of the servo drive.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

Note:
If the servo drive is switched on and off repeatedly within a short period of time, a deviation within 1h may be present in the total power-on time record.

### H0b.21 AI1 voltage display

| | | | |
|---|---|---|---|
| Address: | 0x0B16 | | |
| Min.: | -12 | Unit: | V |
| Max.: | 12 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-12.000 V to +12.000 V

**Description**

Displays the actual sampling voltage of AI1.

### H0b.24 RMS value of phase current

| | | | |
|---|---|---|---|
| Address: | 0x0B18 | | |
| Min.: | 0 | Unit: | A |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0 A to 6553.5 A

**Description**

Displays the RMS value of the phase current of the motor, which is accurate to 0.01 A.

### H0b.25 Angle obtained upon voltage injection auto-tuning

| | | | |
|---|---|---|---|
| Address: | 0x0B19 | | |
| Min.: | 0 | Unit: | ° |
| Max.: | 360 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0° to 360.0°

**Description**

-

### H0b.26 Bus voltage

| | | | |
|---|---|---|---|
| Address: | 0x0B1A | | |
| Min.: | 0 | Unit: | V |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0 V to 6553.5 V

**Description**

Displays the DC bus voltage of the main circuit input voltage after rectification, which is accurate to 0.01 V.

### H0b.27 Module temperature

| | | | |
|---|---|---|---|
| Address: | 0x0B1B | | |
| Min.: | -20 | Unit: | °C |
| Max.: | 200 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-20°C to +200°C

**Description**

Indicates the temperature of the module inside the servo drive, which can be used as a reference for estimating the actual temperature of the drive.

### H0b.28 Absolute encoder fault information given by FPGA

| | | | |
|---|---|---|---|
| Address: | 0x0B1C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

### H0b.29 Axis status information given by FPGA

| | | | |
|---|---|---|---|
| Address: | 0x0B1D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

### H0b.30 Axis fault information given by FPGA

| | | | |
|---|---|---|---|
| Address: | 0x0B1E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

### H0b.31 Encoder fault information

Address: 0x0B1F

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H0b.33 Fault log

Address: 0x0B21

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Present fault

1: Last fault

2: 2nd to last fault

3: 3rd to last fault

4: 4th to last fault

5: 5th to last fault 6: 6th to last fault

7: 7th to last fault

8: 8th to last fault

9: 9th to last fault

10: 10th to last fault

11: 11th to last fault

12: 12th to last fault

13: 13th to last fault

14: 14th to last fault

15: 15th to last fault

16: 16th to last fault

17: 17th to last fault

18: 18th to last fault

19: 19th to last fault

**Description**

Used to view the lastest 20 faults of the drive.

### H0b.34 Fault code of the selected fault

Address: 0x0B22

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

### H0b.35 Time stamp upon occurrence of the selected fault

Address: 0x0B23

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | s |
| Max.: | 429496729.5 | Data Type: | UInt32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0s to 429496729.5s

**Description**

-

### H0b.37 Motor speed upon occurrence of the selected fault

Address: 0x0B25

| | | | |
|---|---|---|---|
| Min.: | -32767 | Unit: | rpm |
| Max.: | 32767 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-32767 rpm to +32767 rpm

**Description**

-

### H0b.38 Motor phase U current upon occurrence of the selected fault

Address: 0x0B26

| | | | |
|---|---|---|---|
| Min.: | -3276.7 | Unit: | A |
| Max.: | 3276.7 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-3276.7 A to +3276.7 A

**Description**

-

### H0b.39 Motor phase V current upon occurrence of the selected fault

Address: 0x0B27

| | | | |
|---|---|---|---|
| Min.: | -3276.7 | Unit: | A |
| Max.: | 3276.7 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-3276.7 A to +3276.7 A

**Description**

-

### H0b.40 Bus voltage upon occurrence of the selected fault

Address: 0x0B28

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | V |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0 V to 6553.5 V

**Description**

-

### H0b.41 DI status upon occurrence of the selected fault

Address: 0x0B29

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

### H0b.43 DO status upon occurrence of the selected fault

Address: 0x0B2B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

### H0b.45 Internal fault code

Address: 0x0B2D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

**H0b.46 Absolute encoder fault information given by FPGA upon occurrence of the selected fault**

Address: 0x0B2E

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

**H0b.47 System status information given by FPGA upon occurrence of the selected fault**

Address: 0x0B2F

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

**H0b.48 System fault information given by FPGA upon occurrence of the selected fault**

Address: 0x0B30

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

**H0b.49 Encoder fault information upon occurrence of the selected fault**

Address: 0x0B31

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

### H0b.51 Internal fault code upon occurrence of the selected fault

Address: 0x0B33
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

### H0b.52 FPGA timeout fault standard bit upon occurrence of the selected fault

Address: 0x0B34
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

### H0b.53 Position following error (reference unit)

Address: 0x0B35
Min.: -2147483648 | Unit: p
Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Unchangeable

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Indicates the position deviation value which has not been divided or multiplied by the electronic gear ratio in the position control mode.

Position deviation (reference unit) is the value obtained after enoder position deviation calculation. The precision is compromised during division.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

### H0b.55 Motor speed actual value

| | | | |
|---|---|---|---|
| Address: | 0x0B37 | | |
| Min.: | -2147483648 | Unit: | rpm |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 rpm to +2147483647 rpm

**Description**

Indicates the actual value of motor speed, which is accurate to 0.1 rpm.

This parameter is a 32-bit integer, which is displayed as a decimal on the keypad.

H0A.25 (Filter time constant of speed feedback display) can be used to set the filter time constant of the speed feedback.

### H0b.57 Bus voltage of the control circuit

| | | | |
|---|---|---|---|
| Address: | 0x0B39 | | |
| Min.: | 0 | Unit: | V |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0 V to 6553.5 V

**Description**

Displays the bus voltage of the control circuit.

### H0b.58 Mechanical absolute position (low 32 bits)

| | | | |
|---|---|---|---|
| Address: | 0x0B3A | | |
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the low 32-bit value (encoder unit) of the mechanical position feedback when the absolute encoder is used.

### H0b.60 Mechanical absolute position (high 32 bits)

| | | | |
|---|---|---|---|
| Address: | 0x0B3C | | |
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the high 32-bit value (encoder unit) of the mechanical position feedback when the absolute encoder is used.

### H0b.63 NotRdy state

| | | | |
|---|---|---|---|
| Address: | 0x0B3F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

1: Control circuit error

2: Main circuit power input error

3: Bus undervoltage

4: Soft start failed

5: Encoder initialization undone

6: Short circuit to ground failed

7: Others

**Description**

Displays the reason for NotRdy state.

### H0b.64 Real-time input position reference counter

| | | | |
|---|---|---|---|
| Address: | 0x0B40 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to +2147483647

**Description**

Displays the value of the pulse reference counter before being divided or multiplied by the electronic gear ratio. This value is independent of the servo drive status and the control mode.

### H0b.66 Encoder temperature

| | | | |
|---|---|---|---|
| Address: | 0x0B42 | | |
| Min.: | -32768 | Unit: | °C |
| Max.: | 32767 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-32768°C to 32767°C

**Description**

-

## H0b.67 Load rate of regenerative resistor

Address: 0x0B43

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | % |
| Max.: | 200 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0% to 200.0%

**Description**

-

## H0b.70 Number of absolute encoder revolutions

Address: 0x0B46

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Rev |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 Rev to 65535 Rev

**Description**

Indicates the number of revolutions of the absolute encoder.

## H0b.71 Single-turn position fed back by the absolute encoder

Address: 0x0B47

| | | | |
|---|---|---|---|
| Min.: | 2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the position feedback of the absolute encoder within one turn.

## H0b.74 System fault information given by FPGA

Address: 0x0B4A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

## H0b.77 Encoder position (low 32 bits)

Address: 0x0B4D

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the low 32-bit value of the position feedback of the absolute encoder.

**H0b.79 Encoder position (high 32 bits)**

Address: 0x0B4F

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the high 32-bit value of the position feedback of the absolute encoder.

**H0b.81 Single-turn position of the rotary load (low 32 bits)**

Address: 0x0B51

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the low 32-bit value of the position feedback of the rotary load when the absolute system works in the rotation mode.

**H0b.83 Single-turn position of the rotary load (high 32 bits)**

Address: 0x0B53

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the high 32-bit value of the position feedback of the rotary load when the absolute system works the rotation mode.

**H0b.85 Single-turn position of the rotary load (reference unit)**

| | | | |
|---|---|---|---|
| Address: | 0x0B55 | | |
| Min.: | -2147483648 | Unit: | p |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 p to +2147483647 p

**Description**

Displays the high 32-bit value of the position feedback of the rotary load when the absolute system works the rotation mode.

**H0b.87 IGBT junction temperature**

| | | | |
|---|---|---|---|
| Address: | 0x0B57 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 200 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 200

**Description**

-

**H0b.90 Group No. of the abnormal parameter**

| | | | |
|---|---|---|---|
| Address: | 0x0B5A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

**H0b.91 Offset of the abnormal parameter within the group**

| | | | |
|---|---|---|---|
| Address: | 0x0B5B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

-

**H0b.93 Closed loop state**

| | | | |
|---|---|---|---|
| Address: | 0x0B5D | Effective Time: | - |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0: Half closed loop

1: Fully closed loop

**Description**

Displays the closed loop state in position control mode.

**H0b.94 Individual power-on time**

| | | | |
|---|---|---|---|
| Address: | 0x0B5E | | |
| Min.: | 0 | Unit: | s |
| Max.: | 429496729.5 | Data Type: | UInt32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0s to 429496729.5s

**Description**

Display the individual power-on time of the drive.

**H0b.96 Individual power-on time upon occurrence of the selected fault**

| | | | |
|---|---|---|---|
| Address: | 0x0B60 | | |
| Min.: | 0 | Unit: | s |
| Max.: | 429496729.5 | Data Type: | UInt32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.0s to 429496729.5s

**Description**

-

## 6.13 H0d Auxiliary Parameters

**H0d.00 Software reset**

| | | | |
|---|---|---|---|
| Address: | 0x0D00 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No operation

1: Enable

**Description**

Programs in the drive are reset automatically (similar to the program reset upon power-on) after the software reset function is enabled, without the need for a power cycle.

**H0d.01 Fault reset**

| | | | |
|---|---|---|---|
| Address: | 0x0D01 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No operation

1: Enable

**Description**

When a No. 1 or No. 2 resettable fault occurs, you can enable the fault reset function in the non-operational state after rectifying the fault cause, stopping the keypad from displaying the fault and allowing the drive to enter the "rdy" state. When a No. 3 warning occurs, you can enable the fault reset function directly.

**H0d.02 Inertia auto-tuning selection**

| | | | |
|---|---|---|---|
| Address: | 0x0D02 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65

**Description**

Used to enable offline inertia auto-tuning through the keypad. In the parameter display mode, switch to H0d.02 and press the SET key to enable offline inertia auto-tuning.

**H0d.04 Read/write in encoder ROM**

| | | | |
|---|---|---|---|
| Address: | 0x0D04 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No operation

1: Write ROM

2: Read ROM

3: ROM failure

**Description**

-

**H0d.05** **Emergency stop**

| | | | |
|---|---|---|---|
| Address: | 0x0D05 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: No operation

1: Emergency stop

**Description**

-

**H0d.10** **Auto-tuning of analog channel**

| | | | |
|---|---|---|---|
| Address: | 0x0D0A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No operation

1: Adjust AI1

**Description**

When automatic adjustment of the analog channel is enabled, the drive automatically corrects the zero drift voltage of the analog channel to improve signal detection accuracy.

**H0d.12** **Phase U/V current balance correction**

| | | | |
|---|---|---|---|
| Address: | 0x0D0C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Disable

1: Enable

**Description**

-

### H0d.17 Forced DI/DO enable switch

| | | | |
|---|---|---|---|
| Address: | 0x0D11 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

bit 0: Forced DI enable switch

0: Disable

1: Enable

bit 1: Forced DO enable switch

0: Disable

1: Enable

**Description**

Defines whether to enable forced DI/DO.

### H0d.18 Forced DI value

| | | | |
|---|---|---|---|
| Address: | 0x0D12 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 255 | Change: | At once |

**Value Range:**

0 to 255

**Description**

Defines the level logic of the DI functions set in group H03 when forced DI is active (H0d.17 = 1 or 3).

The value of H0d.18 is displayed as a hexadecimal on the keypad. When it is converted to a binary value, "bit(n) = 1" indicates the level logic of DI function is high level; "bit(n) = 0" indicates the level logic of the DI function is low level.

### H0d.19 Forced DO value

| | | | |
|---|---|---|---|
| Address: | 0x0D13 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 31 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 31

**Description**

Defines whether the DO functions assigned in group H04 are active when forced DO is active (H0d.17 = 2 or 3).

The value of H0d.19 is displayed as a hexadecimal on the keypad. When it is converted to a binary value, "bit(n) = 1" indicates the DO function is active; "bit(n) = 0" indicates the DO function is inactive.

**H0d.20 Absolute encoder reset selection**

| | | | |
|---|---|---|---|
| Address: | 0x0D14 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No operation

1: Reset the fault

2: Reset the fault and multi-turn data

3: Reset Inovance 2nd encoder fault

4: Reset Inovance 2nd encoder fault and multi-turn data

**Description**

You can reset the encoder fault or the multi-turn data fed back by the encoder by setting H0d.20.

**H0d.23 Torque fluctuation auto-tuning**

| | | | |
|---|---|---|---|
| Address: | 0x0D17 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0 to 1

**Description**

-

**H0d.26 Brake and dynamic brake started forcibly**

| | | | |
|---|---|---|---|
| Address: | 0x0D1A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No forcible operations

1: Dynamic brake deactivated forcibly

2: Brake released forcibly

3: Dynamic brake deactivated and brake released forcibly

**Description**

-

## 6.14 H0E Communication Function Parameters

### H0E.00 Node address

| | | | |
|---|---|---|---|
| Address: | 0x0E00 | | |
| Min.: | 1 | Unit: | - |
| Max.: | 127 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 127

**Description**

Indicates the slave node address. Ensure this parameter is consistent with the configuration of the host controller.

### H0E.01 Save objects written through communication to EEPROM

| | | | |
|---|---|---|---|
| Address: | 0x0E01 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

0: Not save

1: Save parameters

2: Save object dictionaries3: Save parameters and object dictionaries

4: Save object dictionaries written before communication (OP)

255: Determine through H0E03 and H0E04

**Description**

-

### H0E.03 Save objects written through software (commissioning protocol) to e2prom

| | | | |
|---|---|---|---|
| Address: | 0x0E03 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

0: Do not save

1: Save

**Description**

Saves objects written through software (commissioning protocol) to e2prom, including the parameter and object dictionary.

### H0E.04 Save objects written through communication to e2prom (excluding commissioning protocol)

| | | | |
|---|---|---|---|
| Address: | 0x0E04 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Do not save

1: Save

**Description**

You can use this parameter to determine whether to save communication written data in e2prom (excluding commissioning protocol) (CANOpen, CANLink, Ethernet COE, ModBus485). The data include the function code and object dictionary

### H0E.10 CAN selection

| | | | |
|---|---|---|---|
| Address: | 0x0E0A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Pulse/Axis control command

1: Enhanced axis control command

**Description**

Indicates the CAN application layer:

0: Pulse/Axis control command

1: Enhanced axis control command

### H0E.11 CAN baud rate

| | | | |
|---|---|---|---|
| Address: | 0x0E0B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | UInt16 |
| Default: | 5 | Change: | At stop |

**Value Range:**

0: 20 kbit/s

1: 50 kbit/s

2: 100 kbit/s

3: 125 kbit/s

4: 250 kbit/s

5: 500 kbit/s

7: 1 Mbps

**Description**

It sets the CAN (CANlink or CANopen) communication rate between the servo drive and the host controller. The communication rate set in the servo drive must be the same as that in the host controller. Otherwise, communication will fail. If H0E.11 is set to 6, the baud rate is 1 Mbps.

### H0E.80 Modbus baud rate

| | | | |
|---|---|---|---|
| Address: | 0x0E50 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 9 | Data Type: | UInt16 |
| Default: | 9 | Change: | At once |

**Value Range:**

0: 300 bps
1: 600 bps
2: 1200 bps
3: 2400 bps
4: 4800 bps
5: 9600 bps
6: 19200 bps
7: 38400 bps
8: 57600 bps
9: 115200 bps

**Description**

Defines the communication rate between the servo drive and the host controller. The baud rate set in the servo drive must be the same as that in the host controller. Otherwise, communication will fail.

### H0E.81 Modbus data format

| | | | |
|---|---|---|---|
| Address: | 0x0E51 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 3 | Data Type: | UInt16 |
| Default: | 3 | Change: | At once |

**Value Range:**

0: No parity, 2 stop bits (N-2)
1: Even parity, 1 stop bit (E-1)
2: Odd parity, 1 stop bit (O-1)
3: No parity, 1 stop bit (N-1)

**Description**

Defines the data check mode between the servo drive and the host controller during communication.
0: No parity, 2 stop bits
1: Even parity, 1 stop bit
2: Odd parity, 1 stop bit
3: No parity, 1 stop bit
The data format of the servo drive must be the same as that of the host controller. Otherwise, communication will fail.

**H0E.82 Modbus response delay**

Address: 0x0E52

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**
0 ms to 20 ms

**Description**
Defines the delay from the moment the slave receives a command to the moment the slave returns a response.

**H0E.83 Modbus communication timeout**

Address: 0x0E53

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 600 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**
0 ms to 600 ms

**Description**
-

**H0E.84 Modbus communication data sequence**

Address: 0x0E54

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**
0: High bits before low bits
1: Low bits before high bits

**Description**
Defines the 32-bit data transmission format of Modbus communication.
0: High 16 bits before low 16 bits
1: Low 16 bits before high 16 bits

**H0E.90 Modbus version**

Address: 0x0E5A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 655.35 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0.00 to 655.35

**Description**

-

**H0E.92 CANlink version**

Address: 0x0E5C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 655.35 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-

**Description**

-

**H0E.97 Communication monitoring parameter 1**

Address: 0x0E61

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

**H0E.98 Communication monitoring parameter 2**

Address: 0x0E62

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

## 6.15 H0F Fully Closed-Loop Parameters

**H0F.00** **Encoder feedback mode**

Address: 0x0F00

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Internal encoder feedback

1: External encoder feedback

2: Inner/Outer loop switchover

**Description**

Defines the encoder feedback signal source in fully closed-loop control.

0: Internal encoder feedback: The position feedback signals come from the motor encoder.

1: External encoder feedback: The position feedback signals come from the fully closed-loop external encoder and electronic gear ratio 1 is used.

2: Inner/Outer loop switchover: The DI assigned with FunIN.24 (GEAR_SEL, electronic gear ratio switchover) is switch between inner and outer position closed loops. FunIN.24

: Inactive, internal encoder feedback, with electronic gear ratio 1 used

Active: External encoder feedback, with electronic gear ratio 2 used

**H0F.01** **External encoder operation mode**

Address: 0x0F01

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Standard operating direction

1: Reverse operating direction

**Description**

Defines the feedback pulse counting direction of internal and external encoders when the motor rotates in the fully closed-loop mode.

0: Standard operating direction: The pulse feedback counter of the internal encoder (H0F.18) is in the same direction as that of the external encoder (H0F.20) during rotation of the motor.

1: Reverse operating direction: The counting direction of pulse feedback counter of the internal encoder (H0F.18) is opposite to the external encoder (H0F.20) during rotation of the motor.

**H0F.02 External encoder mode**

| | | | |
|---|---|---|---|
| Address: | 0x0F02 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Incremental mode

1: Absolute linear mode

**Description**

**H0F.03 External encoder feedback type**

| | | | |
|---|---|---|---|
| Address: | 0x0F03 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 0 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Quadrature pulse

**Description**

**H0F.04 External encoder pulses per revolution**

| | | | |
|---|---|---|---|
| Address: | | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 10000 | Change: | At stop |

**Value Range:**

0 to 2147483647

**Description**

Defines the pulses fed back by the external encoder per revolution of the motor. It defines the quantity relationship between feedback pulses from the external encoder and those from the internal encoder.

Calculate the value of this parameter through analyzing mechanical parameters. When rigid connection is applied between the motor and the external encoder (scale), you can also set this parameter using the following method:

1. Manually rotate the motor and observe H0F.18 (Feedback pulse counter of internal encoder) in the meantime. After ensuring that the motor has rotated for a full turn (H0F.18 = Motor resolution), calculate the change of H0F.20 (Feedback pulse counter of external encoder) and use the absolute value of the change as the value of H0F.04.
2. Assume values of H0F.18 and H0F.20 are X1 and Y1 before the motor rotates and X2 and Y2 after the motor rotates, then the following formula applies: H0F.04 = Motor resolution x (Y2 - Y1)/(X2 - X1) The calculated result must be positive; if not, perform step 1 again.

For non-rigid connection, an error may exist in the calculation result.

Note:

Ensure H0F.04 is set properly. Otherwise, EB02.0 (Position deviation too large in fully closed loop) may occur after the drive operates.

### H0F.08 Excessive deviation threshold in compound control mode

| | | | |
|---|---|---|---|
| Address: | 0x0F08 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1000 | Change: | At once |

**Value Range:**

0 to 2147483647

**Description**

Defines the position deviation threshold at which the servo drive reports EB02.0 (Position deviation too large in fully closed-loop mode).

When H0F.08 is set to 0, the drive does not detect EB02.0 and always clears the fully closed-loop position deviation.

### H0F.10 Clear deviation in compound control mode

| | | | |
|---|---|---|---|
| Address: | 0x0F0A | | |
| Min.: | 0 | Unit: | R |
| Max.: | 100 | Data Type: | UInt16 |
| Default: | 1 | Change: | At once |

**Value Range:**

0 R to 100 R

**Description**

Defines the number of revolutions rotated by the motor per clear of the fully closed-loop position deviation during operation. The number of revolutions is reflected by H0F.18 (Feedback pulse counter of internal encoder). The number of motor revolutions will not be cleared when the drive is in the non-oeprational state.

**H0F.13** **Compound vibration suppression filter time**

| | | | |
|---|---|---|---|
| Address: | 0x0F0D | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0.0 ms to 6553.5 ms

**Description**

Defines the time constant for compound vibration suppression in fully closed-loop control when external encoder feedback (H0F.00 = 1 or 2) is used.

Increase the setpoint gradually and check the change in the response.

When the stiffness of the transmission mechanism between fully closed loop and internal loop is insufficient, set H0F.13 properly to improve system stability, which is to generate the effect of internal loop temporarily and form a fully closed loop again after the system is stabilized. When the stiffness is sufficient, there is no need to adjust this parameter.

**H0F.16** **Pulse deviation display in compound control mode**

| | | | |
|---|---|---|---|
| Address: | 0x0F10 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to +2147483647

**Description**

Used to count and display the position deviation absolute value in fully closed loop control.

Pulse deviation in compound control = Absolute position feedback of external encoder - Absolute position feedback conversion value of internal encoder

**H0F.18** **Internal position pulse feedback display**

| | | | |
|---|---|---|---|
| Address: | 0x0F12 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to +2147483647

**Description**

Used to count and display the number of feedback pulses of the internal encoder (after being divided or multiplied by electronic gear ratio, in internal encoder unit).

### H0F.20 External position pulse feedback display

| | | | |
|---|---|---|---|
| Address: | 0x0F14 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to +2147483647

**Description**

Used to count and display the number of feedback pulses of the external encoder (after being divided or multiplied by electronic gear ratio, in external encoder unit).

### H0F.22 External encoder phase Z detection invalid (quadrature pulse feedback)

| | | | |
|---|---|---|---|
| Address: | 0x0F16 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Detected

1: Not detected

**Description**

### H0F.25 Source of touch probe Z signal in fully closed-loop mode

| | | | |
|---|---|---|---|
| Address: | 0x0F19 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Motor Z signal

1: External feedback Z signal

**Description**

-

### H0F.45 Positioning completed/Position deviation threshold in fully closed-loop mode

| | | | |
|---|---|---|---|
| Address: | 0x0F2D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Threshold scaled to outer loop unit

1: Same threshold used for inner and outer loops

**Description**

0: H05.21 or 6067h/H0A.10 or 6065h (scaled to outer loop unit)

1: Same threshold used for inner and outer loops

**H0F.46 Fully closed-loop speed feedback selection**

| | | | |
|---|---|---|---|
| Address: | 0x0F2E | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Internal encoder feedback

1: External encoder feedback

**Description**

## 6.16 H11 Multi-position Parameters

**H11.00 Multi-position operation mode**

| | | | |
|---|---|---|---|
| Address: | 0x1100 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 5 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

0: Single run (number of displacements selected in H11.01)

1: Cyclic operation (number of displacement selected in H11.01)

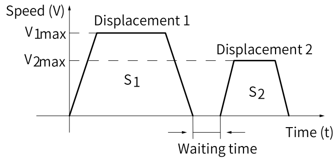
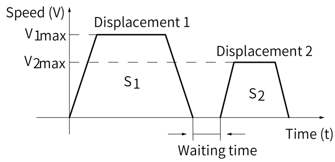
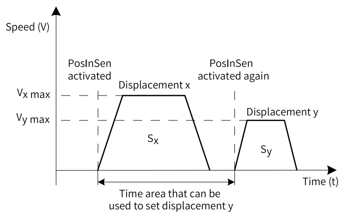
2: DI-based operation (selected by DI)

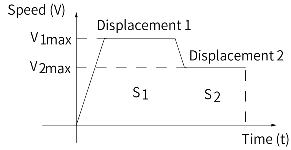
3: Sequential operation

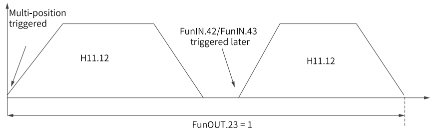
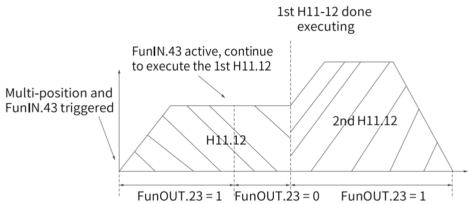
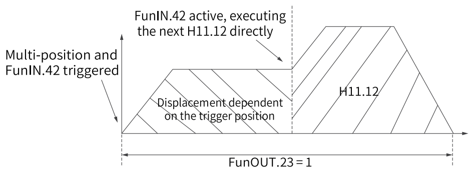
5: Axis-controlled continuous operation

**Description**

Defines the multi-position operation mode when the main position reference source is multi-position references (H05.00 = 2) in the position control mode.

| Set point | Operation Mode | Remarks | Operation Curve |
|---|---|---|---|
| 0 | Individual operation | The drive stops after one cycle of operation.<br>The drive automatically switches to the next speed.<br>You can set the interval time between displacements.<br>The multi-position reference is level-triggered. | <br><br>$V_{1max}$ , $V_{2max}$ : maximum operating speeds in displacement 1 and displacement 2<br>$S_1$ , $S_2$ : displacement 1 and displacement 2 |
| 1 | Cyclic operation | The starting displacement after the first cycle is displacement 1.<br>The drive automatically switches to the next speed.<br>You can set the interval time between displacements.<br>The multi-position reference is level-triggered. | <br><br>$V_{1max}$ , $V_{2max}$ : maximum operating speeds in displacement 1 and displacement 2<br>$S_1$ , $S_2$ : displacement 1 and displacement 2 |
| 2 | DI-based operation | The drive continues operating when the displacement No. is updated.<br>The speed No. is determined by the DI logic.<br>The interval time between displacements is determined by the command delay of the host controller.<br>The multi-position reference is edge-triggered. | <br><br>$V_{xmax}$ , $V_{ymax}$ : maximum operating speeds in displacement x and displacement y<br>$S_x$ , $S_y$ : displacement x and displacement y |

| Set point | Operation Mode | Remarks | Operation Curve |
|---|---|---|---|
| 3 | Sequential operation | The drive stops after one cycle of operation.<br>The starting displacement after the first cycle is defined by H11.05.<br>The drive automatically switches to the next speed.<br>There is no interval time between displacements.<br>The multi-position reference is level-triggered. | <br><br>$V_{1max}$ , $V_{2max}$ : maximum operating speeds in displacement 1 and displacement 2<br>$S_1$ , $S_2$ : displacement 1 and displacement 2 |

| Set point | Operation Mode | Remarks | Operation Curve |
|---|---|---|---|
| 5 | Axis-controlled continuous operation | The drives executes one displacement only.<br>The individual operation mode, sequential operation mode, and interrupted operation mode are included.<br>The PoslnSen (multi-position reference enable) signal is level-triggered. | ● Individual operation<br><br><br>The PoslnSen (multi-position reference enable) signal is triggered only once (FunIN.43/42 triggered later). The drive stops after executing the distance defined by H11.12.<br>● Sequential operation<br><br><br>The PoslnSen (multi-position reference enable) signal is triggered only once. Write H11.12 again and activate FunIN.43 when the distance defined by the first H11.12 is still in progress.After receiving the new distance (or speed), which is the second H11.12, the drive continues executing the first H11.12 until the distance defined by the first H11.12 is done. Then it starts to execute the second H11.12 directly. The travel distance therefore is the sum of the first H11.12 and the second H11.12.<br>● Interrupted operation<br><br><br>The PoslnSen (Multi-position reference enable) signal is triggered only once. Write H11.12 (such as 1000000) again and activate FunIN.42 when the first H11.12 (such as 9000000) is still in progress. After receiving the new distance (or speed), which is the second H11.12, the drive stops executing the first H11.12 and turns to executing the second H11.12. |

To use the multi-position function, assign FunIN.28 (PosInSen, multi-position reference enable) to a DI first. See "Group H03: Terminal input parameters" for the setting mode.

The positioning completed (COIN) signal is activated each time upon completion of a displacement. To determine whether a certain displacement is done executing, use FunOUT.5 (COIN, positioning completed). See "Group H04: Terminal output parameters" for details.

Ensure the S-ON signal is active during operation of each displacement. Otherwise, the drive stops immediately as defined by H02.05 (Stop mode at S-ON OFF) and the positioning completed (COIN) signal in inactive. In modes other than DI-based operation, if the S-ON signal is active but multi-position is disabled during operation of a certain displacement, the drive abandons the unsent displacement reference and stops, with the positioning completed (COIN) signal being active. If the multi-position function is enabled again, the displacement to be executed is defined by H11.02.

### H11.01 Number of displacement references in multi-position mode

Address: 0x1101

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | - |
| Max.: | 16 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 16

**Description**

Defines the total number of displacement references in the multi-position mode. You can set different displacements, operating speeds, and acceleration/ deceleration time for each displacement.

H11.00 ≠ 2: Displacements are switched automatically in a sequence from 1, 2... H11.01.

H11.00 = 2: Assign four DIs (hardware DI or VDI) with DI functions 6 to 9 (FunIN.6: CMD1 to FunIN.9: CMD4) and control the DI logic through the host controller to switch between different displacements. The displacement No. is a 4-bit binary value. Bit 0...bit 3 correspond to CMD1...CMD4.

The displacement No. is a 4-bit binary value. The relationship between the displacement numbers and CMD1...CMD4 is shown in the following table.

| FunIN.9 | FunIN.8 | FunIN.7 | FunIN.6 | Displacemetn No. |
|---|---|---|---|---|
| CMD4 | CMD3 | CMD2 | CMD1 | |
| 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 1 | 2 |
| ... | | | | |
| 1 | 1 | 1 | 1 | 16 |

### H11.02 Starting displacement No. after pause

Address: 0x1102

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |

Default: 0 | Change: At stop

**Value Range:**

0: Continue to execute the unexecuted displacements

1: Start from displacement 1

**Description**

Defines the starting displacement No. when the multi-position operation recovers from a pause.

Pause:

① The servo drive switches to another control mode or the interrupt positioning function is enabled during multi-position operation.

② The internal multi-position enable signal (FunIN.28:PosInSen) changes from "active" to "inactive".

0: Continue to execute the unexecuted displacements: For example, if H11.01 is set to 16 and the drive pauses at displacement 2, after the drive recovers from the pause, it will start from displacement 3.

1: Start from displacement 1: For example, if H11.01 is set to 16 and the drive pauses at displacement 2, after the drive recovers from the pause, it will start from displacement 1.

### H11.03 Interval time unit

Address: 0x1103

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: ms

1: s

**Description**

Defines the unit of acceleration/deceleration time and the interval time during multi-position operation.

Acceleration/Deceleration time: time for the motor to change from 0 rpm to 1000 rpm at a constant speed.

Interval time: interval time that starts from the end of the last reference to the beginning of the next reference

### H11.04 Displacement reference type

Address: 0x1104

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Relative displacement reference
1: Absolute displacement reference

**Description**

Relative displacement: position increment of the target position relative to the current motor position

Absolute displacement: position increment of the target position relative to the motor home.

### H11.05 Starting displacement No. in sequential operation

Address: 0x1105

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 16 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0 to 16

**Description**

Defines whether to perform cyclic operation and the starting displacement No. after the first cycle of operation in the sequential operation mode (H11.00 = 3).

0: The drive executes the displacements defined by H11.01 only once and then stops. The motor is in the locked state.

1–16: The drive operates cyclically, with the starting displacement No. defined by H11.05 after the first cycle of operation. The value of H11.05 should be lower than or equal to H11.01.

### H11.09 Deceleration upon axis control OFF

Address: 0x1109

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 65535 | Change: | At once |

**Value Range:**

0 ms to 65535 ms

**Description**

-

### H11.10 Starting speed of displacement 1

Address: 0x110A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

-

### H11.11 Stop speed of displacement 1

| | | | |
|---|---|---|---|
| Address: | 0x110B | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 rpm to 10000 rpm

**Description**

-

### H11.12 Displacement 1

| | | | |
|---|---|---|---|
| Address: | 0x110C | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

Defines displacement 1 (reference unit) in multi-position operation.

### H11.14 Maximum speed of displacement 1

| | | | |
|---|---|---|---|
| Address: | 0x110E | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

Defines the maximum speed of displacement 1 in multi-position operation.

The maximum speed is the average operating speed when the motor is not in the acceleration/deceleration process. If H11.12 is set to a too low value, the actual motor speed will be lower than H11.14.

### H11.15 Acceleration/Deceleration time of displacement 1

| | | | |
|---|---|---|---|
| Address: | 0x110F | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms to 65535 ms

**Description**

Defines the time for the motor to change from 0 rpm 1000 rpm at a constant speed during displacement 1.

Actual time needed for accelerating to H11.14 (Max. speed of displacement 1):

$$t = \frac{(H11.14) \times (H11.15)}{1000}$$

Note: Ensure the stiffness is proper and the speed loop follows the position reference.

## H11.16 Interval time after displacement 1

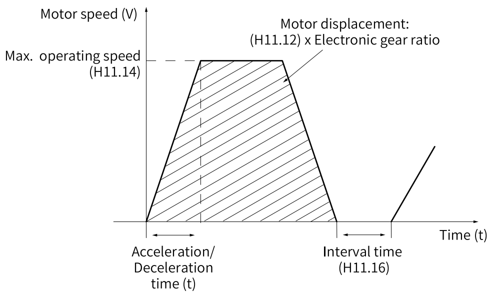
| | | | |
|---|---|---|---|
| Address: | 0x1110 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

Defines the interval time that starts from the end of displacement 1 to the beginning of the next displacement.




## H11.17 Displacement 2

| | | | |
|---|---|---|---|
| Address: | 0x1111 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.19 Max. speed of displacement 2

| | | | |
|---|---|---|---|
| Address: | 0x1113 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

### H11.20 Acceleration/Deceleration time of displacement 2

| | | | |
|---|---|---|---|
| Address: | 0x1114 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.21 Interval time after displacement 2

| | | | |
|---|---|---|---|
| Address: | 0x1115 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.22 Displacement 3

| | | | |
|---|---|---|---|
| Address: | 0x1116 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.24 Max. speed of displacement 3

| | | | |
|---|---|---|---|
| Address: | 0x1118 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.25 Acceleration/Deceleration time of displacement 3

| | | | |
|---|---|---|---|
| Address: | 0x1119 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.26 Interval time after displacement 3

| | | | |
|---|---|---|---|
| Address: | 0x111A | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.27 Displacement 4

| | | | |
|---|---|---|---|
| Address: | 0x111B | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.29 Max. speed of displacement 4

| | | | |
|---|---|---|---|
| Address: | 0x111D | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.30 Acceleration/Deceleration time of displacement 4

| | | | |
|---|---|---|---|
| Address: | 0x111E | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.31 Interval time after displacement 4

| | | | |
|---|---|---|---|
| Address: | 0x111F | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.32 Displacement 5

| | | | |
|---|---|---|---|
| Address: | 0x1120 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.34 Maximum speed of displacement 5

| | | | |
|---|---|---|---|
| Address: | 0x1122 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.35 Acceleration/Deceleration time of displacement 5

| | | | |
|---|---|---|---|
| Address: | 0x1123 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.36 Interval time after displacement 5

| | | | |
|---|---|---|---|
| Address: | 0x1124 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.37 Displacement 6

| | | | |
|---|---|---|---|
| Address: | 0x1125 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

## H11.39 Max. speed of displacement 6

Address: 0x1127

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

## H11.40 Acceleration/Deceleration time of displacement 6

Address: 0x1128

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

## H11.41 Interval time after displacement 6

Address: 0x1129

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

## H11.42 Displacement 7

Address: 0x112A

| | | | |
|---|---|---|---|
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

**H11.44** **Max. speed of displacement 7**

| | | | |
|---|---|---|---|
| Address: | 0x112C | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

**H11.45** **Acceleration/Deceleration time of displacement 7**

| | | | |
|---|---|---|---|
| Address: | 0x112D | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

**H11.46** **Interval time after displacement 7**

| | | | |
|---|---|---|---|
| Address: | 0x112E | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

**H11.47** **Displacement 8**

| | | | |
|---|---|---|---|
| Address: | 0x112C | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.49 Max. speed of displacement 8

| | | | |
|---|---|---|---|
| Address: | 0x1131 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.50 Acceleration/Deceleration time of displacement 8

| | | | |
|---|---|---|---|
| Address: | 0x1132 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.51 Interval time after displacement 8

| | | | |
|---|---|---|---|
| Address: | 0x1133 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.52 Displacement 9

| | | | |
|---|---|---|---|
| Address: | 0x1134 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

## H11.54 Max. speed of displacement 9

| | | | |
|---|---|---|---|
| Address: | 0x1136 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

## H11.55 Acceleration/Deceleration time of displacement 9

| | | | |
|---|---|---|---|
| Address: | 0x1137 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

## H11.56 Interval time after displacement 9

| | | | |
|---|---|---|---|
| Address: | 0x1138 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

## H11.57 Displacement 10

| | | | |
|---|---|---|---|
| Address: | | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.59 Max. speed of displacement 10

| | | | |
|---|---|---|---|
| Address: | 0x113B | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.60 Acceleration/Deceleration time of displacement 10

| | | | |
|---|---|---|---|
| Address: | 0x113C | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.61 Interval time after displacement 10

| | | | |
|---|---|---|---|
| Address: | 0x113D | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.62 Displacement 11

| | | | |
|---|---|---|---|
| Address: | 0x113E | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

**H11.64** **Max. speed of displacement 11**

| | | | |
|---|---|---|---|
| Address: | 0x1140 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

**H11.65** **Acceleration/Deceleration time of displacement 11**

| | | | |
|---|---|---|---|
| Address: | 0x1141 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

**H11.66** **Interval time after displacement 11**

| | | | |
|---|---|---|---|
| Address: | 0x1142 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

**H11.67** **Displacement 12**

| | | | |
|---|---|---|---|
| Address: | 0x1143 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.69 Max. speed of displacement 12

| | | | |
|---|---|---|---|
| Address: | 0x1145 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.70 Acceleration/Deceleration time of displacement 12

| | | | |
|---|---|---|---|
| Address: | 0x1146 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.71 Interval time after displacement 12

| | | | |
|---|---|---|---|
| Address: | 0x1147 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.72 Displacement 13

| | | | |
|---|---|---|---|
| Address: | 0x1148 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.74 Max. speed of displacement 13

| | | | |
|---|---|---|---|
| Address: | 0x114A | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.75 Acceleration/Deceleration time of displacement 13

| | | | |
|---|---|---|---|
| Address: | 0x114B | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.76 Interval time after displacement 13

| | | | |
|---|---|---|---|
| Address: | 0x114C | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.77 Displacement 14

| | | | |
|---|---|---|---|
| Address: | 0x114D | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.79 Max. speed of displacement 14

Address: 0x114F

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.80 Acceleration/Deceleration time of displacement 14

Address: 0x1150

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.81 Interval time after displacement 14

Address: 0x1151

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

### H11.82 Displacement 15

Address: 0x1152

| | | | |
|---|---|---|---|
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

**H11.84 Max. speed of displacement 15**

| | | | |
|---|---|---|---|
| Address: | 0x1154 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

**H11.85 Acceleration/Deceleration time of displacement 15**

| | | | |
|---|---|---|---|
| Address: | 0x1155 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

**H11.86 Interval time after displacement 15**

| | | | |
|---|---|---|---|
| Address: | 0x1156 | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

**H11.87 Displacement 16**

| | | | |
|---|---|---|---|
| Address: | 0x1157 | | |
| Min.: | -1073741824 | Unit: | Reference unit |
| Max.: | 1073741824 | Data Type: | Int32 |
| Default: | 10000 | Change: | At once |

**Value Range:**

-1073741824 to +1073741824

**Description**

-

### H11.89 Max. speed of displacement 16

| | | | |
|---|---|---|---|
| Address: | 0x1159 | | |
| Min.: | 1 | Unit: | rpm |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 200 | Change: | Real-time modification |

**Value Range:**

1 rpm to 10000 rpm

**Description**

-

### H11.90 Acceleration/Deceleration time of displacement 16

| | | | |
|---|---|---|---|
| Address: | 0x115A | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

-

### H11.91 Interval time after displacement 16

| | | | |
|---|---|---|---|
| Address: | 0x115B | | |
| Min.: | 0 | Unit: | ms (s) |
| Max.: | 10000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 ms(s) to 10000 ms(s)

**Description**

-

## 6.17 H12 Multi-Speed Parameters

### H12.00 Multi-speed operation mode

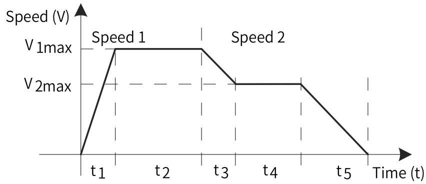
| | | | |
|---|---|---|---|
| Address: | 0x1200 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 1 | Change: | At stop |

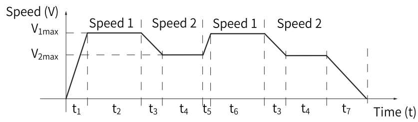
**Value Range:**

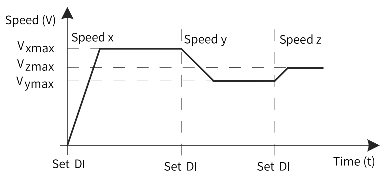
0: Stop after running for one cycle (number of speeds defined by H12.01)
1: Cyclic operation (number of speeds defined by H12.01)
2: DI-based operation

**Description**

Defines the multi-speed operation mode when the speed reference source is multi-speed reference (H06.01 = 5, H06.02 = 1/2/3) in the speed control mode. The S-ON signal must be active during operation of each speed. Otherwise, the drive stops immediately as defined by H02.05 (Stop mode at S-ON OFF). The speed reach signal (FunOUT.19: V-Arr) is activated each time when a speed reference value is reached.

<table>
<tr><th>Set point</th><th>Operation Mode</th><th>Remarks</th><th>Operation Curve</th></tr>
<tr><td>0</td><td>Individual operation</td><td>The drive stops after one cycle of operation.<br>The drive switches to the next displacement automatically.</td><td>

$V_{1max}$ , $V_{2max}$ : reference values of speed 1 and speed 2<br>$t_1$ : actual acceleration/deceleration time of speed 1<br>$t_3$ , $t_5$ : acceleration/deceleration time of speed 2</td></tr>
<tr><td>1</td><td>Cyclic operation</td><td>The drive starts from speed 1 after each cycle of operation.<br>The drive automatically switches to the next speed.<br>The cyclic operation state remains active as long as the S-ON signal is active.</td><td>

$V_{1max}$ , $V_{2max}$ : maximum operating speeds in displacement 1 and displacement 2</td></tr>
<tr><td>2</td><td>External DI signal</td><td>The drive operates continuously as long as the S-ON signal is active.<br>The speed No. is determined by the DI logic.<br>The operating time of each speed is determined only by the interval time of speed switchover.<br>The speed reference direction can be switched through FunIN.5 (DIR-SEL).</td><td>

x, y: speed No. (The relationship between the speed No. and the DI logic is described below.)<br>$V_x$ , $V_y$: speed references for speeds x and y<br>The speed No. determined by DI does not change, which means the speed reference operates continuously regardless of the reference operating time.</td></tr>
</table>

### H12.01 Number of speed references in multi-speed mode

Address: 0x1201

| | | | |
|---|---|---|---|
| Min.: | 1 | Unit: | - |
| Max.: | 16 | Data Type: | UInt16 |
| Default: | 16 | Change: | At stop |

**Value Range:**

1 to 16

**Description**

Defines the total number of speed references in the multi-speed mode. Different speed references, operating time, and acceleration/deceleration time (four groups optional) can be set for each speed.

H12.00 ≠ 2: Speeds are switched automatically in a sequence from 1, 2...H12.01.

H12.00 is 2: Assign four DIs (Hardware DI or VDI) with DI functions 6 to 9 (FunIN.6: CMD1 to FunIN.9: CMD4) and control the DI logic through the host controller to switch between different speeds. The displacement No. is a 4-bit binary value. Bit 0 to bit 3 correspond to CMD1 to CMD4.

| FunIN.9 | FunIN.8 | FunIN.7 | FunIN.6 | Segment No. |
|---|---|---|---|---|
| CMD4 | CMD3 | CMD2 | CMD1 | |
| 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 1 | 2 |
| ... | | | | |
| 1 | 1 | 1 | 1 | 16 |

The value of CMD(n) is 1 upon active DI logic and 0 upon inactive DI logic.

## H12.02 Operating time unit

| | | | |
|---|---|---|---|
| Address: | 0x1202 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: s

1: min

**Description**

Defines the time unit of multi-speed operation.

0: s;

1: min

## H12.03 Acceleration time 1

| | | | |
|---|---|---|---|
| Address: | 0x1203 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.

Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

### H12.04 Deceleration time 1

| | | | |
|---|---|---|---|
| Address: | 0x1204 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.

Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

### H12.05 Acceleration time 2

| | | | |
|---|---|---|---|
| Address: | 0x1205 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 50 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.

Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

### H12.06 Deceleration time 2

| | | | |
|---|---|---|---|
| Address: | 0x1206 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 50 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.
Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

### H12.07 Acceleration time 3

| | | | |
|---|---|---|---|
| Address: | 0x1207 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 100 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.
Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

### H12.08 Deceleration time 3

| | | | |
|---|---|---|---|
| Address: | 0x1208 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 100 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.
Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

### H12.09 Acceleration time 4

| | | | |
|---|---|---|---|
| Address: | 0x1209 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 150 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.
Acceleration time is the time for the motor to accelerate from 0 RPM to 1000 RPM at a constant speed.

### H12.10 Deceleration time 4

| | | | |
|---|---|---|---|
| Address: | 0x120A | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 150 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Four groups of acceleration/deceleration time can be set for each speed reference.
Deceleration time is the time for the motor to decelerate from 1000 RPM to 0 RPM at a constant speed.

### H12.20 1st speed reference

| | | | |
|---|---|---|---|
| Address: | 0x1214 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.21 Operating time of speed 1

| | | | |
|---|---|---|---|
| Address: | 0x1215 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

Defines the operating time of speed 1.

The operating time is the sum of the speed variation time from previous speed reference to present speed reference plus the average operating time of present speed reference.

If the operating time is set to 0, the drive skips this speed reference automatically. As long as H12.00 (Multi-speed operation mode) is set to 2 (DI-based operation) and the speed No. determined by the external DI does not change, the drive continues operating at the speed defined by this speed reference, without being affected by the reference operating time.

### H12.22 1st speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1216 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 256 | Change: | Real-time modification |

**Value Range:**

bit0-bit7: Speed rise and drop time

0: Zero acc and dec time

1: Acc and dec time 1

2: Acc and dec time 2

3: Acc and dec time 3

4: Acc and dec time 4

bit8-bit15: S curve smoothing parameter

1: Smoothing parameter 1

2: Smoothing parameter 2

3: Smoothing parameter 3

4: Smoothing parameter 4

5: Smoothing parameter 5

6: Smoothing parameter 6

7: Smoothing parameter 7

8: Smoothing parameter 8

**Description**

Table 6–5 Selects the acceleration/deceleration time of speed 1.

| Set point | Meaning | Description |
|---|---|---|
| 0 | Zero acceleration/ deceleration time | Acceleration time: 0<br>Deceleration time: 0 |
| 1 | Acceleration/ Deceleration time 1 | Acceleration time: H12.03<br>Deceleration time: H12.04 |
| 2 | Acceleration/ Deceleration time 2 | Acceleration time: H12.05<br>Deceleration time: H12.06 |

| Set point | Meaning | Description |
|---|---|---|
| 3 | Acceleration/ Deceleration time 3 | Acceleration time: H12.07<br>Deceleration time: H12.08 |
| 4 | Acceleration/ Deceleration time 4 | Acceleration time: H12.09<br>Deceleration time: H12.10 |

Table 6–6 S curve smoothing parameter

| Set point | Meaning | Description |
|---|---|---|
| 1 | Smoothing parameter 1 | Increasing acceleration time at acceleration segment: H06.51<br>Decreasing acceleration time at acceleration segment: H06.52<br>Decreasing deceleration time at deceleration segment: H06.53<br>Decreasing acceleration time at acceleration segment: H06.54 |
| 2 | Smoothing parameter 2 | Increasing acceleration time at acceleration segment: H06.55<br>Decreasing acceleration time at acceleration segment: H06.56<br>Decreasing deceleration time at deceleration segment: H06.57<br>Decreasing acceleration time at acceleration segment: H06.58 |
| 3 | Smoothing parameter 3 | Increasing acceleration time at acceleration segment: H06.59<br>Decreasing acceleration time at acceleration segment: H06.60<br>Decreasing deceleration time at deceleration segment: H06.61<br>Decreasing acceleration time at acceleration segment: H06.62 |
| 4 | Smoothing parameter 4 | Increasing acceleration time at acceleration segment: H06.63<br>Decreasing acceleration time at acceleration segment: H06.64<br>Decreasing deceleration time at deceleration segment: H06.65<br>Decreasing acceleration time at acceleration segment: H06.66 |

| Set point | Meaning | Description |
|---|---|---|
| 5 | Smoothing parameter 5 | Increasing acceleration time at acceleration segment: H06.67<br>Decreasing acceleration time at acceleration segment: H06.68<br>Decreasing deceleration time at deceleration segment: H06.69<br>Decreasing acceleration time at acceleration segment: H06.70 |
| 6 | Smoothing parameter 6 | Increasing acceleration time at acceleration segment: H06.71<br>Decreasing acceleration time at acceleration segment: H06.72<br>Decreasing deceleration time at deceleration segment: H06.73<br>Decreasing acceleration time at acceleration segment: H06.74 |
| 7 | Smoothing parameter 7 | Increasing acceleration time at acceleration segment: H06.75<br>Decreasing acceleration time at acceleration segment: H06.76<br>Decreasing deceleration time at deceleration segment: H06.77<br>Decreasing acceleration time at acceleration segment: H06.78 |
| 8 | Smoothing parameter 8 | Increasing acceleration time at acceleration segment: H06.79<br>Decreasing acceleration time at acceleration segment: H06.80<br>Decreasing deceleration time at deceleration segment: H06.81<br>Decreasing acceleration time at acceleration segment: H06.82 |

### H12.23 Speed reference for speed 2

Address: 0x1217

Min.: -10000 Unit: rpm

Max.: 10000 Data Type: Int16

Default: 100 Change: Real-time modification

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.24 Operating time of speed 2

| | | | |
|---|---|---|---|
| Address: | 0x1218 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.25 2nd speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1219 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.26 3rd speed reference

| | | | |
|---|---|---|---|
| Address: | 0x121A | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 300 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.27 Operating time of speed 3

| | | | |
|---|---|---|---|
| Address: | 0x121B | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.28 3rd speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x121C | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.29 Speed reference for speed 4

| | | | |
|---|---|---|---|
| Address: | 0x121D | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 500 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.30 Operating time of speed 4

| | | | |
|---|---|---|---|
| Address: | 0x121E | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.31 4th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x121F | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.32 Speed reference for speed 5

| | | | |
|---|---|---|---|
| Address: | 0x1220 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 700 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.33 Operating time of speed 5

| | | | |
|---|---|---|---|
| Address: | 0x1221 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.34 5th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1222 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.35 Speed reference for speed 6

| | | | |
|---|---|---|---|
| Address: | 0x123 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 900 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.36 Operating time of speed 6

| | | | |
|---|---|---|---|
| Address: | 0x1224 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.37 6th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1225 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.38 Speed reference for speed 7

| | | | |
|---|---|---|---|
| Address: | 0x1226 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 600 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.39 Operating time of speed 7

| | | | |
|---|---|---|---|
| Address: | 0x1227 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.40 7th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1228 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.41 Speed reference for speed 8

| | | | |
|---|---|---|---|
| Address: | 0x1229 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 300 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.42 Operating time of speed 8

| | | | |
|---|---|---|---|
| Address: | 0x122A | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.43 8th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x122B | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.44 Speed reference for speed 9

| | | | |
|---|---|---|---|
| Address: | 0x122C | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 100 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.45 Operating time of speed 9

| | | | |
|---|---|---|---|
| Address: | 0x122D | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.46 9th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x122E | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.47 Speed reference for speed 10

| | | | |
|---|---|---|---|
| Address: | 0x122F | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | -100 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.48 Operating time of speed 10

Address: 0x1230
Min.: 0 | Unit: s (m)
Max.: 6553.5 | Data Type: UInt16
Default: 5 | Change: Real-time modification

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.49 10th speed rise/drop and curve smoothing parameter time

Address: 0x1231 | Effective Time: Real time
Min.: 0 | Unit: -
Max.: 4 | Data Type: UInt16
Default: 0 | Change: Real-time modification

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.50 Speed reference for speed 11

Address: 0x1232
Min.: -10000 | Unit: rpm
Max.: 10000 | Data Type: Int16
Default: -300 | Change: Real-time modification

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.51 Operating time of speed 11

Address: 0x1233
Min.: 0 | Unit: s (m)
Max.: 6553.5 | Data Type: UInt16
Default: 5 | Change: Real-time modification

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.52 11th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1234 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.53 Speed reference for speed 12

| | | | |
|---|---|---|---|
| Address: | 0x1235 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | -500 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.54 Operating time of speed 12

| | | | |
|---|---|---|---|
| Address: | 0x1236 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.55 12th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1237 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

## H12.56 Speed reference for speed 13

| | | | |
|---|---|---|---|
| Address: | 0x1238 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | -700 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

## H12.57 Operating time of speed 13

| | | | |
|---|---|---|---|
| Address: | 0x1239 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

## H12.58 13th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x123A | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

## H12.59 Speed reference for speed 14

| | | | |
|---|---|---|---|
| Address: | 0x123B | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | -900 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.60 Operating time of speed 14

| | | | |
|---|---|---|---|
| Address: | 0x123C | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.61 14th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x123D | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.62 Speed reference for speed 15

| | | | |
|---|---|---|---|
| Address: | 0x123E | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | -600 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.63 Operating time of speed 15

| | | | |
|---|---|---|---|
| Address: | 0x123F | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.64 15th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1240 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

### H12.65 Speed reference for speed 16

| | | | |
|---|---|---|---|
| Address: | 0x1241 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | -300 | Change: | Real-time modification |

**Value Range:**

–10000 RPM to +10000 RPM

**Description**

-

### H12.66 Operating time of speed 16

| | | | |
|---|---|---|---|
| Address: | 0x1242 | | |
| Min.: | 0 | Unit: | s (m) |
| Max.: | 6553.5 | Data Type: | UInt16 |
| Default: | 5 | Change: | Real-time modification |

**Value Range:**

0.0s(m) to 6553.5s(m)

**Description**

-

### H12.67 16th speed rise/drop and curve smoothing parameter time

| | | | |
|---|---|---|---|
| Address: | 0x1243 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 4 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H12.22" on page 303* for details.

**Description**

Same as H12.22.

## 6.18 H17: Virtual DI/DO

### H17.90 Communication VDI enabling

| | | | |
|---|---|---|---|
| Address: | 0x175A | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Disable

1: Enable

**Description**

To use the VDI function:

1. Set H17.90 to enable VDI.
2. Set the default level after power-on through H17.91.
3. Set the DI function of the VDI terminal through parameters in group H17.
4. Set VDI output through H31.00.

### H17.91 VDI default value upon power-on

| | | | |
|---|---|---|---|
| Address: | 0x175B | Effective Time: | Upon the next power-on |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: No default

1: VDI1 default value

2: VDI2 default value

4: VDI3 default value

8: VDI4 default value

16: VDI5 default value

32: VDI6 default value

64: VDI7 default value

128: VDI8 default value

256: VDI9 default value

512: VDI10 default value

1024: VDI11 default value

2048: VDI12 default value

4096: VDI13 default value

8092: VDI14 default value

16384: VDI15 default value

32768: VDI16 default value

**Description**

Configures the initial value of VDI upon power-on.

Bit 0 corresponds to VDI1.

Bit 1 corresponds to VDI2.

…

Bit 15 corresponds to VDI16.

### H17.00 VDI1 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1700 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: No function
1: Servo ON
2: Alarm reset signal
3: Gain switchover switch
4: Main/Auxiliary reference switchover
5: Multi-reference direction
6: Multi-reference switchover CMD1
7: Multi-reference switchover CMD2
8: Multi-reference switchover CMD3
9: Multi-reference switchover CMD4
10: Mode switchover M1-SEL
11: Mode switchover M2-SEL
12: Zero clamp enable
13: Position reference inhibited
14: Positive limit switch
15: Negative limit switch
16: Positive external torque limit
17: Negative external torque limit
18: Forward jog
19: Reverse jog

20: Step enable
21: Hand wheel override signal 1
22: Hand wheel override signal 2
23: Hand wheel enable
24: Electronic gear ratio selection
25: Torque reference direction
26: Speed reference direction
27: Position reference direction
28: Multi-position reference enable
29: Interrupt positioning cancel
31: Home switch
32: Homing enable
33: Interrupt positioning inhibited
34: Emergency stop
35: Clear position deviation
36: Internal speed limit source
37: Pulse reference inhibited
38: Touch probe 1
39: Touch probe 2
41: Current position as the home
42: Axis control command executed immediately
43: Axis control command not executed immediately
44: Positioning and reference completed signal clear
45: Interrupt positioning enable
46: Process segment enable
47: Process segment reference switchover 1
48: Process segment reference switchover 2
49: Process segment reference switchover 3
50: Process segment reference switchover 4
51: Event trigger process segment 1
52: Event trigger process segment 2
53: Event trigger process segment 3
54: Event trigger process segment 4
55: Process segment pause

**Description**

-

### H17.01 VDI1 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1701 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.02 VDI2 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1702 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

### H17.03 VDI2 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1703 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.04 VDI3 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1704 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

### H17.05 VDI3 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1705 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.06 VDI4 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1706 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.00" on page 318* for details.

**Description**

-

### H17.07 VDI4 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1707 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.08 VDI5 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1708 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

### H17.09 VDI5 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1709 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.10 VDI6 function selection

| | | | |
|---|---|---|---|
| Address: | 0x170A | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

### H17.11 VDI6 logic level

| | | | |
|---|---|---|---|
| Address: | 0x170B | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.12 VDI7 function selection

| | | | |
|---|---|---|---|
| Address: | 0x170C | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

### H17.13 VDI7 logic level

| | | | |
|---|---|---|---|
| Address: | 0x170D | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.14 VDI8 function selection

| | | | |
|---|---|---|---|
| Address: | 0x170E | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 45 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

### H17.15 VDI8 logic level

| | | | |
|---|---|---|---|
| Address: | 0x170F | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.16 VDI9 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1710 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.00" on page 318* for details.

**Description**

-

### H17.17 VDI9 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1711 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.18 VDI10 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1712 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.00" on page 318* for details.

**Description**

-

### H17.19 VDI10 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1713 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.20 VDI11 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1714 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 45 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.00" on page 318* for details.

**Description**

-

### H17.21 VDI11 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1715 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.22 VDI12 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1716 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

## H17.23 VDI12 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1717 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

## H17.24 VDI13 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1718 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.00" on page 318 for details.

**Description**

-

## H17.25 VDI13 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1719 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

## H17.26 VDI14 function selection

| | | | |
|---|---|---|---|
| Address: | 0x171A | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.00" on page 318* for details.

**Description**

-

## H17.27 VDI14 logic level

| | | | |
|---|---|---|---|
| Address: | 0x171B | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

## H17.28 VDI15 function selection

| | | | |
|---|---|---|---|
| Address: | 0x171C | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.00" on page 318* for details.

**Description**

-

## H17.29 VDI15 logic level

| | | | |
|---|---|---|---|
| Address: | 0x171D | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.30 VDI16 function selection

| | | | |
|---|---|---|---|
| Address: | 0x171E | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 55 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.00" on page 318* for details.

**Description**

-

### H17.31 VDI16 logic level

| | | | |
|---|---|---|---|
| Address: | 0x171F | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Active when the written value is 1

1: Active when the written value changes from 0 to 1

**Description**

-

### H17.92 Communication VDO enabling

| | | | |
|---|---|---|---|
| Address: | 0x175C | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: Disable

1: Enable

**Description**

To use the VDO function:

1. Set H17.92 to enable VDO.
2. Set the default level after power-on through H17.93.
3. Set the DO function of the VDO terminal through parameters in group H17.

4: Read the output level of the VDO in H17.32.

### H17.93 VDO default value upon power-on

| | | | |
|---|---|---|---|
| Address: | 0x175D | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

0: No default
1: VDO1 default value
2: VDO2 default value
4: VDO3 default value
8: VDO4 default value
16: VDO5 default value
32: VDO6 default value
64: VDO7 default value
128: VDO8 default value
256: VDO9 default value
512: VDO10 default value
1024: VDO11 default value
2048: VDO12 default value
4096: VDO13 default value
8192: VDO14 default value
16384: VDO15 default value
32768: VDO16 default value

**Description**

Configures the initial value of VDO upon power-on.
Bit 0 corresponds to VDO1.
Bit 1 corresponds to VDO2.
…
Bit 15 corresponds to VDO16.

### H17.32 VDO virtual level

| | | | |
|---|---|---|---|
| Address: | 0x1720 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

**H17.33 VDO1 function selection**

| | | | |
|---|---|---|---|
| Address: | 0x1721 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: No function
1: Servo ready
2: Motor rotation signal
3: Zero speed signal
4: Speed matching signal
5: Positioning completed
6: Positioning near
7: Torque limited signal
8: Speed limited signal
9: Braking
10: Warning
11: Fault
15: Interrupt positioning completed16: Homing completed
17: Electrical homing completed
18: Torque reached signal
19: Speed reached signal
21: Enable completed
22: Internal command completed
23: Writing next command allowed
24: Internal motion completed
25: Comparison output
26: Closed-loop state
30: Warning or fault output
31: Communication-forced DO
32: EDM output

**Description**

-

**H17.34 VDO1 logic level**

| | | | |
|---|---|---|---|
| Address: | 0x1722 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

**H17.35 VDO2 function selection**

| | | | |
|---|---|---|---|
| Address: | 0x1723 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

**H17.36 VDO2 logic level**

| | | | |
|---|---|---|---|
| Address: | 0x1724 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

**H17.37 VDO3 function selection**

| | | | |
|---|---|---|---|
| Address: | 0x1725 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.33" on page 330 for details.

**Description**

-

### H17.38 VDO3 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1726 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.39 VDO4 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1727 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H17.33" on page 330 for details.

**Description**

-

### H17.40 VDO4 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1728 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.41 VDO5 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1729 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.42 VDO5 logic level

| | | | |
|---|---|---|---|
| Address: | 0x172A | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.43 VDO6 function selection

| | | | |
|---|---|---|---|
| Address: | 0x172B | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.44 VDO6 logic level

| | | | |
|---|---|---|---|
| Address: | 0x172C | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic
1: Output 0 upon active logic

**Description**

-

**H17.45** **VDO7 function selection**

| | | | |
|---|---|---|---|
| Address: | 0x172D | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

**H17.46** **VDO7 logic level**

| | | | |
|---|---|---|---|
| Address: | 0x172E | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic
1: Output 0 upon active logic

**Description**

-

**H17.47** **VDO8 function selection**

| | | | |
|---|---|---|---|
| Address: | 0x172F | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.48 VDO8 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1730 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.49 VDO9 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1731 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.50 VDO9 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1732 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.51 VDO10 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1733 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

## H17.52 VDO10 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1734 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

## H17.53 VDO11 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1735 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

## H17.54 VDO11 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1736 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.55 VDO12 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1737 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.56 VDO12 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1738 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.57 VDO13 function selection

| | | | |
|---|---|---|---|
| Address: | 0x1739 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.58 VDO13 logic level

| | | | |
|---|---|---|---|
| Address: | 0x173A | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic
1: Output 0 upon active logic

**Description**

-

### H17.59 VDO14 function selection

| | | | |
|---|---|---|---|
| Address: | 0x173B | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.60 VDO14 logic level

| | | | |
|---|---|---|---|
| Address: | 0x173C | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic
1: Output 0 upon active logic

**Description**

-

### H17.61 VDO15 function selection

| | | | |
|---|---|---|---|
| Address: | 0x173D | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.62 VDO15 logic level

| | | | |
|---|---|---|---|
| Address: | 0x173E | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

### H17.63 VDO16 function selection

| | | | |
|---|---|---|---|
| Address: | 0x173F | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 33 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H17.33" on page 330* for details.

**Description**

-

### H17.64 VDO16 logic level

| | | | |
|---|---|---|---|
| Address: | 0x1740 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Output 1 upon active logic

1: Output 0 upon active logic

**Description**

-

## 6.19 H18: Position comparison output

### H18.00 Position comparison output selection

| | | | |
|---|---|---|---|
| Address: | 0x1800 | | |
| Min.: | 0 | Unit: | - |

Max.: 1 | Data Type: UInt16
Default: 0 | Change: At once

**Value Range:**

0: Disable

1: Enable (rising edge-triggered)

**Description**

-

### H18.01 Position comparison output feedback source

Address: 0x1801

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Motor encoder feedback

1: Fully closed-loop position feedback

**Description**

-

### H18.02 Position comparison resolution

Address: 0x1802

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: 24-bit

1: 23-bit

2: 22-bit

3: 21-bit

4: 20-bit

5: 19-bit

6: 18-bit

7: 17-bit

**Description**

-

### H18.03 Position comparison mode

Address: 0x1803

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0: Individual comparison mode

1: Cyclic comparison mode

2: Fixed cyclic comparison mode

**Description**

-

## H18.04 Current position as zero

| | | | |
|---|---|---|---|
| Address: | 0x1804 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0: Disable

1: Enable (rising edge-triggered)

**Description**

Note: This function needs to be used when the comparison state is inactive, otherwise the comparison logic may malfunction.

## H18.05 Position comparison output width

| | | | |
|---|---|---|---|
| Address: | 0x1805 | | |
| Min.: | 0.1 | Unit: | ms |
| Max.: | 204.7 | Data Type: | UInt16 |
| Default: | 0.1 | Change: | At once |

**Value Range:**

0.1 ms to 204.7 ms

**Description**

Defines the effective pulse width of the DO when the comparison point is reached. The value range is 0 to 204.7 (unit: ms).

## H18.06 Position comparison output ABZ port polarity

| | | | |
|---|---|---|---|
| Address: | 0x1806 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

| bit | Name | Function |
|---|---|---|
| 0 | OCZ output logic | 0: Positive, output high level upon active logic |
| | | 1: Negative, output low level upon active logic |
| 1 | Z output logic | 0: Positive, output high level upon active logic |
| | | 1: Negative, output low level upon active logic |
| 2 | A/B output logic | 0: Positive, output high level upon active logic |
| | | 1: Negative, output low level upon active logic |

**Description**

0: Positive, output high level upon active logic

1: Negative, output low level upon active logic

Bit 0: OCZ output logic

Bit 1: Z output logic

bit2: A/B output logic

### H18.07 Start point of position comparison

Address: 0x1807

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 40 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 40

**Description**

-

### H18.08 End point of position comparison

Address: 0x1808

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 40 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 40

**Description**

-

### H18.09 Current status of position comparison

Address: 0x1809

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 1024 | Data Type: | UInt16 |

Default: 0 Change: Unchangeable

**Value Range:**

0 to 1024

**Description**

-

### H18.10 Real-time position of position comparison

Address: 0x180A

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to +2147483647

**Description**

-

### H18.12 Zero offset of position comparison

Address: 0x180C

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | At once |

**Value Range:**

-2147483648 to +2147483647

**Description**

-

### H18.14 Position comparison output delay compensation

Address: 0x180E

| | | | |
|---|---|---|---|
| Min.: | -12 | Unit: | us |
| Max.: | 12 | Data Type: | Int16 |
| Default: | 0 | Change: | At once |

**Value Range:**

-12.00 us to +12.00 us

**Description**

The position comparison output function takes the last motor speed as the reference to generate output after automatic error compensation through serial communication delay of the encoder. The delay caused by hardware output can also be compensated through setting position comparison output delay compensation.

### H18.15 Cycles of fixed mode

Address: 0x180F

Min.: 1 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 1 | Change: At once

**Value Range:**

1 to 65535

**Description**

-

### H18.16 ABZ output function setting

Address: 0x1810

Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Real-time modification

**Value Range:**

| bit | Name | Function |
|---|---|---|
| 0 | OCZ output function | 0: Frequency-division output |
| | | 1: Position comparison |
| 1 | Z port output function | 0: Frequency-division output |
| | | 1: Position comparison |
| 2 | A/B port output function | 0: Frequency-division output |
| | | 1: Position comparison |

**Description**

0: Frequency-division output
1: Position comparison
Bit 0: OCZ port function setting
Bit 1: Z port function setting
Bit 2: A/B function setting

### H18.17 Number of fixed modes completed

Address: 0x1811

Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Unchangeable

**Value Range:**

1 to 65535

**Description**

## 6.20 H19: Target position parameters

**H19.00 Target value of position comparison 1**

Address: 0x1900

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

**H19.02 Attribute value of position comparison 1**

Address: 0x1902

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

| bit | Function |
|---|---|
| 0 | Output DO active signal if current position changes from "less than" to "more than" the comparison point |
| 1 | Output DO active signal if current position changes from "more than" to "less than" the comparison point |
| 2 to 6 | Reserved |
| 7 | DO1 output |
| 8 | DO2 output |
| 9 | DO3 output |
| 10 | DO4 output |
| 11 | DO5 output |
| 12 | Frequency-division A output |
| 13 | Frequency-division B output |
| 14 | Frequency-division Z output |
| 15 | Frequency-division OCZ output |

**Description**

-

### H19.03 Target value of position comparison 2

| | | | |
|---|---|---|---|
| Address: | 0x1903 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.05 Attribute value of position comparison 2

| | | | |
|---|---|---|---|
| Address: | 0x1905 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.06 Target value of position comparison 3

| | | | |
|---|---|---|---|
| Address: | 0x1906 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.08 Attribute value of position comparison 3

| | | | |
|---|---|---|---|
| Address: | 0x1908 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.09 Target value of position comparison 4

Address: 0x1909

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.11 Attribute value of position comparison 4

Address: 0x190B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.12 Target value of position comparison 5

Address: 0x190C

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.14 Attribute value of position comparison 5

Address: 0x190E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.15 Target value of position comparison 6

Address: 0x190F

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |

Max.: 2147483647 | Data Type: Int32
Default: 0 | Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.17 Attribute value of position comparison 6

Address: 0x1911

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Real-time modification

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.18 Target value of position comparison 7

Address: 0x1912

Min.: -2147483648 | Unit: -

Max.: 2147483647 | Data Type: Int32

Default: 0 | Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.20 Attribute value of position comparison 7

Address: 0x1914

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Real-time modification

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.21 Target value of position comparison 8

Address: 0x1915

Min.: -2147483648 | Unit: -

Max.: 2147483647 | Data Type: Int32

Default: 0 Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.23 Attribute value of position comparison 8

Address: 0x1917

Min.: 0 Unit: -

Max.: 65535 Data Type: UInt16

Default: 0 Change: Real-time modification

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.24 Target value of position comparison 9

Address: 0x1918

Min.: -2147483648 Unit: -

Max.: 2147483647 Data Type: Int32

Default: 0 Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.26 Attribute value of position comparison 9

Address: 0x191A

Min.: 0 Unit: -

Max.: 65535 Data Type: UInt16

Default: 0 Change: Real-time modification

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.27 Target value of position comparison 10

Address: 0x191B

Min.: -2147483648 Unit: -

Max.: 2147483647 Data Type: Int32

Default: 0 Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.29 Attribute value of position comparison 10

| | | | |
|---|---|---|---|
| Address: | 0x191D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.30 Target value of position comparison 11

| | | | |
|---|---|---|---|
| Address: | 0x191E | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.32 Attribute value of position comparison 11

| | | | |
|---|---|---|---|
| Address: | 0x1920 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.33 Target value of position comparison 12

| | | | |
|---|---|---|---|
| Address: | 0x1921 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

**H19.35 Attribute value of position comparison 12**

| | | | |
|---|---|---|---|
| Address: | 0x1923 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

**H19.36 Target value of position comparison 13**

| | | | |
|---|---|---|---|
| Address: | 0x1924 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

**H19.38 Attribute value of position comparison 13**

| | | | |
|---|---|---|---|
| Address: | 0x1926 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

**H19.39 Target value of position comparison 14**

| | | | |
|---|---|---|---|
| Address: | 0x1927 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.41 Attribute value of position comparison 14

| | | | |
|---|---|---|---|
| Address: | 0x1929 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.42 Target value of position comparison 15

| | | | |
|---|---|---|---|
| Address: | 0x192A | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.44 Attribute value of position comparison 15

| | | | |
|---|---|---|---|
| Address: | 0x192C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.45 Target value of position comparison 16

| | | | |
|---|---|---|---|
| Address: | 0x192D | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.47 Attribute value of position comparison 16

| | | | |
|---|---|---|---|
| Address: | 0x192F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.48 Target value of position comparison 17

| | | | |
|---|---|---|---|
| Address: | 0x1930 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.50 Attribute value of position comparison 17

| | | | |
|---|---|---|---|
| Address: | 0x1932 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.51 Target value of position comparison 18

| | | | |
|---|---|---|---|
| Address: | 0x1933 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.53 Attribute value of position comparison 18

Address: 0x1935

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.54 Target value of position comparison 19

Address: 0x1936

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.56 Attribute value of position comparison 19

Address: 0x1938

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.57 Target value of position comparison 20

Address: 0x1939

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.59 Attribute value of position comparison 20

| | | | |
|---|---|---|---|
| Address: | 0x193B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

## H19.60 Target value of position comparison 21

| | | | |
|---|---|---|---|
| Address: | 0x193C | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.62 Attribute value of position comparison 21

| | | | |
|---|---|---|---|
| Address: | 0x193E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

## H19.63 Target value of position comparison 22

| | | | |
|---|---|---|---|
| Address: | 0x193F | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.65 Attribute value of position comparison 22

| | | | |
|---|---|---|---|
| Address: | 0x1941 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

## H19.66 Target value of position comparison 23

| | | | |
|---|---|---|---|
| Address: | 0x1942 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.68 Attribute value of position comparison 23

| | | | |
|---|---|---|---|
| Address: | 0x1944 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

## H19.69 Target value of position comparison 24

| | | | |
|---|---|---|---|
| Address: | 0x1945 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.71 Attribute value of position comparison 24

Address: 0x1947

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

## H19.72 Target value of position comparison 25

Address: 0x1948

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.74 Attribute value of position comparison 25

Address: 0x194A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

## H19.75 Target value of position comparison 26

Address: 0x194B

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.77 Attribute value of position comparison 26

Address: 0x194D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.78 Target value of position comparison 27

Address: 0x194E

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.80 Attribute value of position comparison 27

Address: 0x1950

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.81 Target value of position comparison 28

Address: 0x1951

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.83 Attribute value of position comparison 28

Address: 0x1953

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " *H19.02" on page 345* for details.

**Description**

-

### H19.84 Target value of position comparison 29

Address: 0x1954

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.86 Attribute value of position comparison 29

Address: 0x1956

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " *H19.02" on page 345* for details.

**Description**

-

### H19.87 Target value of position comparison 30

Address: 0x1957

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.89 Attribute value of position comparison 30

Address: 0x1959

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.90 Target value of position comparison 31

Address: 0x195A

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.92 Attribute value of position comparison 31

Address: 0x195C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.93 Target value of position comparison 32

Address: 0x195D

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.95 Attribute value of position comparison 32

| | | | |
|---|---|---|---|
| Address: | 0x195F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

## H19.96 Target value of position comparison 33

| | | | |
|---|---|---|---|
| Address: | 0x1960 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

## H19.98 Attribute value of position comparison 33

| | | | |
|---|---|---|---|
| Address: | 0x1962 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

## H19.99 Target value of position comparison 34

| | | | |
|---|---|---|---|
| Address: | 0x1963 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.101 Attribute value of position comparison 34

| | | | |
|---|---|---|---|
| Address: | 0x1965 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.102 Target value of position comparison 35

| | | | |
|---|---|---|---|
| Address: | 0x1966 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.104 Attribute value of position comparison 35

| | | | |
|---|---|---|---|
| Address: | 0x1968 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

### H19.105 Target value of position comparison 36

| | | | |
|---|---|---|---|
| Address: | 0x1969 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.107 Attribute value of position comparison 36

Address: 0x196B

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.108 Target value of position comparison 37

Address: 0x196C

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.110 Attribute value of position comparison 37

Address: 0x196E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.111 Target value of position comparison 38

Address: 0x196F

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.113 Attribute value of position comparison 38

| | | | |
|---|---|---|---|
| Address: | 0x1971 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.114 Target value of position comparison 39

| | | | |
|---|---|---|---|
| Address: | 0x1972 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.116 Attribute value of position comparison 39

| | | | |
|---|---|---|---|
| Address: | 0x1974 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

See " H19.02" on page 345 for details.

**Description**

-

### H19.117 Target value of position comparison 40

| | | | |
|---|---|---|---|
| Address: | 0x1975 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

-

### H19.119 Attribute value of position comparison 40

Address: 0x1977
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Real-time modification

**Value Range:**

See *" H19.02" on page 345* for details.

**Description**

-

## 6.21 H1F Software parameters

### H1F.90 DI function state 1 read through communication

Address: 0x1F5A | Effective Time: Real time
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DI function 1.

Bit 1 corresponds to DI function 2.

Bit 2 corresponds to DI function 3.

…

By analogy

### H1F.91 DI function state 2 read through communication

Address: 0x1F5B | Effective Time: Real time
Min.: 0 | Unit: -
Max.: 65535 | Data Type: UInt16
Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DI function 17.

Bit 1 corresponds to DI function 18.

Bit 2 corresponds to DI function 19.

…

By analogy

### H1F.92 DI function state 3 read through communication

| | | | |
|---|---|---|---|
| Address: | 0x1F5C | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DI function 33.

Bit 1 corresponds to DI function 34.

Bit 2 corresponds to DI function 35.

…

By analogy

### H1F.93 DI function state 4 read through communication

| | | | |
|---|---|---|---|
| Address: | 0x1F5D | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DI function 49.

Bit 1 corresponds to DI function 50.

Bit 2 corresponds to DI function 51.

…

By analogy

### H1F.94 DO function state 1 read through communication

| | | | |
|---|---|---|---|
| Address: | 0x1F5E | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DO function 1.

Bit 1 corresponds to DO function 2.

Bit 2 corresponds to DO function 3.

…

By analogy

### H1F.95 DO function state 2 read through communication

| | | | |
|---|---|---|---|
| Address: | 0x1F5F | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DO function 17.

Bit 1 corresponds to DO function 18.

Bit 2 corresponds to DO function 19.

…

By analogy

### H1F.96 DO function state 3 read through communication

| | | | |
|---|---|---|---|
| Address: | 0x1F60 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DO function 33.

Bit 1 corresponds to DO function 34.

Bit 2 corresponds to DO function 35.

…

By analogy

**H1F.97 DO function state 4 read through communication**

| | | | |
|---|---|---|---|
| Address: | 0x1F61 | Effective Time: | Real time |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Bit 0 corresponds to DO function 49.

Bit 1 corresponds to DO function 50.

Bit 2 corresponds to DO function 51.

…

By analogy

## 6.22 H22 Technology segment parameters

**H22.00 Process segment command trigger**

| | | | |
|---|---|---|---|
| Address: | 0x2200 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 1000

**Description**

Used to trigger the process segment and read the state. The process segment can be triggered through the keypad or communication. The process segment state can be read through H22.00.

When triggering the process segment:

The homing function is triggered when 0 is written to H22.00.

Process segments 1 to 15 are triggered when 1 to 15 are written to H22.00.

The process segment pauses when 1000 is written to H22.00.

E126.0 (Process segment number error) will be reported when 16 to 999 are written to H22.00.

When reading the state of the process segment:

The process segment number will be read back when commands in the positioning mode are not done executing.

The process segment number + 10000 will be read back when commands in the positioning mode are done executing.

The process segment number + 20000 will be read back when commands in the positioning mode are done executing and positioning has been completed.

### H22.01 Process segment triggered by the event rising edge

Address: 0x2201

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

DI: ProceEvTri (OFF to ON, rising edge-triggered)

| bit | Setpoint | Description |
|---|---|---|
| 3 to 0 | 0 | Trigger DI: The motor does not act upon rising edge of ProceEvTri1. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri1. |
| 7 to 4 | 0 | Trigger DI: The motor does not act upon rising edge of ProceEvTri2. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri2. |
| 8 to 11 | 0 | Trigger DI: The motor does not act upon rising edge of ProceEvTri3. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri3. |
| 15 to 12 | 0 | Trigger DI: The motor does not act upon rising edge of ProceEvTri4. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon rising edge of ProceEvTri4. |

### H22.02 Process segment triggered by the event falling edge

Address: 0x2202

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

DI: ProceEvTri (ON to OFF, falling edge-triggered)

| bit | Setpoint | Description |
|---|---|---|
| 3 to 0 | 0 | Trigger DI: The motor does not act upon falling edge of ProceEvTri1. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri1. |
| 7 to 4 | 0 | Trigger DI: The motor does not act upon falling edge of ProceEvTri2. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri2. |
| 8 to 11 | 0 | Trigger DI: The motor does not act upon falling edge of ProceEvTri3. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri3. |
| 15 to 12 | 0 | Trigger DI: The motor does not act upon falling edge of ProceEvTri4. |
| | 1 to 15 | Trigger DI: Process segments 1 to 15 are executed upon falling edge of ProceEvTri4. |

### H22.03 Acceleration/Deceleration time upon process segment pause

Address: 0x2203

Min.: 0 Unit: -

Max.: 7 Data Type: UInt16

Default: 0 Change: At once

**Value Range:**

0: Acceleration/Deceleration time

1: Acceleration/Deceleration time 1

2: Acceleration/Deceleration time 2

3: Acceleration/Deceleration time 3

4: Acceleration/Deceleration time 4

5: Acceleration/Deceleration time 5

6: Acceleration/Deceleration time 6

7: Acceleration/Deceleration time 7

**Description**

When the process segment is paused, the motor ramps to stop based on the deceleration time defined by H22.03. Setpoints 0 to 7 correspond to parameters H22.35 to H22.42.

### H22.04 Positive software position limit

Address: 0x2204

Min.: -2147483648 Unit: Reference unit

| | | | |
|---|---|---|---|
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 2147483647 | Change: | At once |

**Value Range:**

-2147483648 to +2147483647

**Description**

E956.0 can occur when the motor operates forwardly with position reference exceeding the setpoint of H22.04 during positioning in the process segment mode.

### H22.06 Negative software position limit

| | | | |
|---|---|---|---|
| Address: | 0x2206 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | -2147483648 | Change: | At once |

**Value Range:**

-2147483648 to +2147483647

**Description**

E958.0 can occur when the motor operates reversely with position reference exceeding the setpoint of H22.06 during positioning in the process segment mode.

### H22.08 Process segment number

| | | | |
|---|---|---|---|
| Address: | 0x2208 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

Indicates the process segment number in progress in the process segment mode.

### H22.19 Target speed

| | | | |
|---|---|---|---|
| Address: | 0x2213 | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 50 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

Eight groups of target speed are available for each process segment command. Target speed refers to the constant operating speed when the motor is not in the acceleration/deceleration process. If the displacement is too small in the positioning mode, the actual motor speed will be lower than the setpoint of H22.19.

**H22.20 Target speed 1**

| | | | |
|---|---|---|---|
| Address: | 0x2214 | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 200 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

See *" H22.19" on page 371* for details.

**H22.21 Target speed 2**

| | | | |
|---|---|---|---|
| Address: | 0x2215 | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 500 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

See *" H22.19" on page 371* for details.

**H22.22 Target speed 3**

| | | | |
|---|---|---|---|
| Address: | 0x2216 | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 1000 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

See *" H22.19" on page 371* for details.

**H22.23 Target speed 4**

| | | | |
|---|---|---|---|
| Address: | 0x2217 | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 1500 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

See *" H22.19" on page 371* for details.

### H22.24 Target speed 5

| | | | |
|---|---|---|---|
| Address: | 0x2218 | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 2000 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

See *" H22.19" on page 371* for details.

### H22.25 Target speed 6

| | | | |
|---|---|---|---|
| Address: | 0x2219 | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 2500 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

See *" H22.19" on page 371* for details.

### H22.26 Target speed 7

| | | | |
|---|---|---|---|
| Address: | 0x221A | | |
| Min.: | 0.1 | Unit: | rpm |
| Max.: | 6000 | Data Type: | UInt16 |
| Default: | 3000 | Change: | At once |

**Value Range:**

0.1 rpm to 6000.0 rpm

**Description**

See *" H22.19" on page 371* for details.

### H22.35 Acceleration/Deceleration time

| | | | |
|---|---|---|---|
| Address: | 0x2223 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 50 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Eight groups of acceleration/deceleration time are available for each process segment command.

Acceleration/Deceleration time refers to the time for the motor to change from 0 rpm to 1000 rpm at a constant speed.

## H22.36 Acceleration/Deceleration time 1

| | | | |
|---|---|---|---|
| Address: | 0x2224 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 200 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.35" on page 373* for details.

## H22.37 Acceleration/Deceleration time 2

| | | | |
|---|---|---|---|
| Address: | 0x2225 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 500 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.35" on page 373* for details.

## H22.38 Acceleration/Deceleration time 3

| | | | |
|---|---|---|---|
| Address: | 0x2226 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 1000 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.35" on page 373* for details.

## H22.39 Acceleration/Deceleration time 4

| | | | |
|---|---|---|---|
| Address: | 0x2227 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 1500 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.35" on page 373* for details.

### H22.40 Acceleration/Deceleration time 5

| | | | |
|---|---|---|---|
| Address: | 0x2228 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 2000 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.35" on page 373* for details.

### H22.41 Acceleration/Deceleration time 6

| | | | |
|---|---|---|---|
| Address: | 0x2229 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 2500 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.35" on page 373* for details.

### H22.42 Acceleration/Deceleration time 7

| | | | |
|---|---|---|---|
| Address: | 0x222A | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 3000 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.35" on page 373* for details.

### H22.51 Delay after completion of the process segment

| | | | |
|---|---|---|---|
| Address: | 0x2233 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Eight groups of delay time are available for each process segment command. The delay time refers to the delay that starts from the end of current command to the operation of the next command in the prcoess segment. See section "Process Segment Mode" in SV680P Series Servo Drive Function Guide for details.

### H22.52 Delay time 1 after completion of the process segment

| | | | |
|---|---|---|---|
| Address: | 0x2234 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 50 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.51" on page 375* for details.

### H22.53 Delay time 2 after completion of the process segment

| | | | |
|---|---|---|---|
| Address: | 0x2235 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 200 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.51" on page 375* for details.

### H22.54 Delay time 3 after completion of the process segment

| | | | |
|---|---|---|---|
| Address: | 0x2236 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 500 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

See *" H22.51" on page 375* for details.

### H22.55 Delay time 4 after completion of the process segment

| | | | |
|---|---|---|---|
| Address: | 0x2237 | | |
| Min.: | 0 | Unit: | ms |

Max.: 65535 | Data Type: UInt16
Default: 1000 | Change: At once

**Value Range:**

0 to 65535

**Description**

See *" H22.51" on page 375* for details.

### H22.56 Delay time 5 after completion of the process segment

Address: 0x2238

Min.: 0 | Unit: ms
Max.: 65535 | Data Type: UInt16
Default: 1500 | Change: At once

**Value Range:**

0 to 65535

**Description**

See *" H22.51" on page 375* for details.

### H22.57 Delay time 6 after completion of the process segment

Address: 0x2239

Min.: 0 | Unit: ms
Max.: 65535 | Data Type: UInt16
Default: 2000 | Change: At once

**Value Range:**

0 to 65535

**Description**

See *" H22.51" on page 375* for details.

### H22.58 Delay time 7 after completion of the process segment

Address: 0x223A

Min.: 0 | Unit: ms
Max.: 65535 | Data Type: UInt16
Default: 3000 | Change: At once

**Value Range:**

0 to 65535

**Description**

See *" H22.51" on page 375* for details.

### H22.70 Homing mode

Address: 0x2246

Min.: -32768 | Unit: -
Max.: 32767 | Data Type: Int16

| | | | |
|---|---|---|---|
| Default: | -2 | Change: | Real-time modification |

**Value Range:**

-32768 to 32767

**Description**

Defines the default motor direction of rotation, deceleration point, and home during homing.

When H22.70 is set to a value from –2 to +35, 402 homing is used (6098h set to a value from –2 to +35). See section "Homing Function" in SV670P Series Servo Drive Communication Guide for details.

When H22.70 is set to a value lower than or equal to –200, local homing is used (H22.70 set to (–200 + H05.31)). See section "Homing Function" in SV670P Series Servo Drive Function Guide for details.

### H22.71 Speed in high-speed searching for the home switch signal

Address: 0x2247

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 3000 | Data Type: | UInt16 |
| Default: | 100 | Change: | At once |

**Value Range:**

0 to 3000

**Description**

Defines the motor speed for searching for the deceleration point signal during homing.

### H22.72 Speed in low-speed searching for the home switch signal

Address: 0x2248

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 10 | Change: | At once |

**Value Range:**

0 to 1000

**Description**

Defines the motor speed for searching for the home signal during homing.

### H22.73 Acceleration/Deceleration time during homing

Address: 0x2249

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 1000 | Data Type: | UInt16 |
| Default: | 1000 | Change: | At once |

**Value Range:**

0 to 1000

**Description**

Defines the time for the motor to accelerate from 0 rpm to 1000 rpm at a constant speed during homing.

### H22.74 Homing time limit

| | | | |
|---|---|---|---|
| Address: | 0x224A | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10000 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the maximum homing time.

### H22.75 Mechanical home offset

| | | | |
|---|---|---|---|
| Address: | 0x224B | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | At once |

**Value Range:**

-2147483648 to +2147483647

**Description**

Defines the absolute position value of the motor after homing.

### H22.79 Relative/Absolute homing

| | | | |
|---|---|---|---|
| Address: | 0x224F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Defines the offset relationship between the mechanical home and mechanical zero point, as well as the action upon overtravel during homing.

When H22.79 is set to 0, the value of H05.40 is 2.

When H22.79 is set to 1, the value of H05.40 is 3.

## 6.23 H23 Technology segment parameters

### H23.00 Definition of homing

| | | | |
|---|---|---|---|
| Address: | 0x2300 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

For details of each mode, see section "Process Segment Operation Mode" in SV670P Series Servo Drive Function Guide.

### H23.02 Homing data

| | | | |
|---|---|---|---|
| Address: | 0x2302 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Not used.

### H23.04 Definition of process segment 1

| | | | |
|---|---|---|---|
| Address: | 0x2304 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

bit0 to bit3: Mode (process segment operation mode option)

Mode = 1: The fixed speed mode applies.

Mode = 2: The positioning mode applies, which stops after positioning is done.

Mode = 3: The next segment is executed automatically after positioning is done.

Mode = 7: The jump mode applies, which is used to jump to the designated process segment.

Mode = 8: The parameter-write mode applies, which allows you to write specific parameters.

See section "Process Segment Operation Mode" in SV670P Series Servo Drive Function Guide for details.

### H23.06 Data of process segment 1

| | | | |
|---|---|---|---|
| Address: | 0x2306 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Different modes selected in process segment 1 correspond to different process segment data. See section "Process Segment Operation Mode" in SV670P Series Servo Drive Function Guide for details.

### H23.08 Definition of process segment 2

| | | | |
|---|---|---|---|
| Address: | 0x2308 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.04" on page 380*.

### H23.10 Data of process segment 2

| | | | |
|---|---|---|---|
| Address: | 0x230A | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

### H23.12 Definition of process segment 3

| | | | |
|---|---|---|---|
| Address: | 0x230C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.04" on page 380*.

### H23.14 Data of process segment 3

| | | | |
|---|---|---|---|
| Address: | 0x230E | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

### H23.16 Definition of process segment 4

| | | | |
|---|---|---|---|
| Address: | 0x2310 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.04" on page 380*.

### H23.18 Data of process segment 4

| | | | |
|---|---|---|---|
| Address: | 0x2312 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

### H23.20 Definition of process segment 5

| | | | |
|---|---|---|---|
| Address: | 0x2314 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

### H23.22 Data of process segment 5

Address: 0x2316

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as " *H23.06" on page 381*.

### H23.24 Definition of process segment 6

Address: 0x2318

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as " *H23.06" on page 381*.

### H23.26 Data of process segment 6

Address: 0x231A

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as " *H23.06" on page 381*.

### H23.28 Definition of process segment 7

Address: 0x231C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as " *H23.06" on page 381*.

### H23.30 Data of process segment 7

Address: 0x231E

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |

| | | | |
|---|---|---|---|
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

### H23.32 Definition of process segment 8

Address: 0x2320

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

### H23.34 Data of process segment 8

Address: 0x2322

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

### H23.36 Definition of process segment 9

Address: 0x2324

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

### H23.38 Data of process segment 9

Address: 0x2326

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |

Default: 0 Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

**H23.40 Definition of process segment 10**

Address: 0x2328

Min.: 0 Unit: -

Max.: 4294967295 Data Type: UInt32

Default: 0 Change: Real-time modification

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

**H23.42 Data of process segment 10**

Address: 0x232A

Min.: -2147483648 Unit: -

Max.: 2147483647 Data Type: Int32

Default: 0 Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

**H23.44 Definition of process segment 11**

Address: 0x232C

Min.: 0 Unit: -

Max.: 4294967295 Data Type: UInt32

Default: 0 Change: Real-time modification

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

**H23.46 Data of process segment 11**

Address: 0x232E

Min.: -2147483648 Unit: -

Max.: 2147483647 Data Type: Int32

Default: 0 Change: Real-time modification

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

**H23.48 Definition of process segment 12**

| | | | |
|---|---|---|---|
| Address: | 0x2330 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

**H23.50 Data of process segment 12**

| | | | |
|---|---|---|---|
| Address: | 0x2332 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

**H23.52 Definition of process segment 13**

| | | | |
|---|---|---|---|
| Address: | 0x2334 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

**H23.54 Data of process segment 13**

| | | | |
|---|---|---|---|
| Address: | 0x2336 | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

### H23.56 Definition of process segment 14

| | | | |
|---|---|---|---|
| Address: | 0x2338 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

### H23.58 Data of process segment 14

| | | | |
|---|---|---|---|
| Address: | 0x233A | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

### H23.60 Definition of process segment 15

| | | | |
|---|---|---|---|
| Address: | 0x233C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as *" H23.06" on page 381*.

### H23.62 Data of process segment 15

| | | | |
|---|---|---|---|
| Address: | 0x233E | | |
| Min.: | -2147483648 | Unit: | - |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Same as *" H23.06" on page 381*.

## 6.24 H30 Related variables read through communication

### H30.00 Servo status read through communication

Address: 0x3000

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

### H30.01 DO function state 1 read through communication

Address: 0x3001

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

Used to read the state of DO functions 1 to 16 through communication. H30.01 is a hexadecimal which is not displayed on the keypad and must be converted to a binary equivalent when it is being read through communication.

| bit | DO Function | Remarks |
|---|---|---|
| 0 | DO function 1 (FunOUT.1: S-RDY, servo ready) | 0: Servo drive not ready<br>1: Servo ready |
| ... | | |
| 15 | DO function 16 (FunOUT.16: HomeAttain, homing output) | 0: Home not found<br>1: Home found |

### H30.02 DO function state 2 read through communication

Address: 0x3002

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

Used to read the state of DO functions 17 to 20 through communication. H30.02 is a hexadecimal which is not displayed on the keypad and must be converted to a binary equivalent when it is being read through communication.

bit0 corresponds to DO function 17.

bit1 corresponds to DO function 18.

bit2 corresponds to DO function 19.

…

By analogy

| bit | DO Function | Remarks |
|---|---|---|
| 0 | DO function 17 (FunOUT.17: S-ElecHomeAttain, electrical homing output) | 0: Electrical homing not completed<br>1: Electrical homing completed |
| ... | | |
| 4 to 15 | Reserved | - |

**H30.03 Input pulse reference sampling value read through communication**

Address: 0x3003

Min.: 0 | Unit: -

Max.: 65535 | Data type: UInt16

Default: 0 | Change: Unchangeable

**Value Range:**

0 to 65535

**Description**

-

## 6.25 H31 Communication setting parameters

**H31.00 VDI virtual level set through communication**

Address: 0x3100

Min.: 0 | Unit: -

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: At once

**Value Range:**

0 to 65535

**Description**

When H17.90 is set to 1, the VDI state is defined by H31.00.

The VDI logic is determined by H17.91 (Default VDI virtual level value upon upower-on) upon initial power-on. Thereafter, the VDI logic is determined by H31.00.
"bit(n) = 1" of H31.00 indicates the logic of VDI (n+1) is "1". "bit(n)=0" indicates the logic of VDI (n+1) is "0".

### H31.04 DO status set through communication

| | | | |
|---|---|---|---|
| Address: | 0x3104 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | At once |

**Value Range:**

0 to 65535

**Description**

Set H04.22 to define H31.04 as the source of DO state.

### H31.05 AO set through communication

| | | | |
|---|---|---|---|
| Address: | 0x3105 | | |
| Min.: | -10000 | Unit: | mV |
| Max.: | 10000 | Data Type: | Int16 |
| Default: | 0 | Change: | At once |

**Value Range:**

-10000 mV to +10000 mV

**Description**

Set H04.50 to 10 to define H31.05 as the source of AO (unit: mV).

### H31.09 Speed reference set through communication

| | | | |
|---|---|---|---|
| Address: | 0x3109 | | |
| Min.: | -10000 | Unit: | rpm |
| Max.: | 10000 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

–10000.000 RPM to +10000.000 RPM

**Description**

Set H06.02 to 4 to define H31.09 as the source of the speed reference in the speed control mode (unit: RPM).

### H31.11 Torque reference set through communication

| | | | |
|---|---|---|---|
| Address: | 0x310B | | |
| Min.: | -100 | Unit: | % |
| Max.: | 100 | Data Type: | Int32 |

Default: 0 Change: At once

**Value Range:**

-100.000% to +100.000%

**Description**

Set H07.02 to 4 to define H31.11 as the source of the torque reference in the torque control mode. The setpoint 100.000% corresponds to the rated torque of the motor.

## 6.26 1000h Object dictionary

**1000h** **Device type**

| | | | |
|---|---|---|---|
| Address: | - | | |
| Min.: | - | Unit: | - |
| Max.: | - | Data Type: | UInt32 |
| Default: | 0x20192 | Change: | Unchangeable |

**Value Range:**

-

**Description**

-

**1005h** **SYNC message COB-ID**

| | | | |
|---|---|---|---|
| Address: | 0x2D00 | | |
| Min.: | 128 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 128 | Change: | Real-time modification |

**Value Range:**

128 to 4294967295

**Description**

Only 0x80 and 0x40000080 can be written to the SYNC message.

If 0x80 is written, the sync generator does not work.

If 0x40000080 is written, the sync generator is activated.

To activate the sync generator, you must set 1006h to a non-zero value.

**1006h** **Synchronization cycle**

| | | | |
|---|---|---|---|
| Address: | 0x2D02 | | |
| Min.: | 0 | Unit: | us |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0us to 2147483647us

**Description**

Applicable to the synchronization generator only (unit: us).

### 1008h Device manufacturer name

| | | | |
|---|---|---|---|
| Address: | - | | |
| Min.: | - | Unit: | - |
| Max.: | - | Data Type: | UInt32 |
| Default: | SV670P | Change: | Unchangeable |

**Value Range:**

-

**Description**

-

### 100Ch Node guarding time

| | | | |
|---|---|---|---|
| Address: | 0x2D04 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Defines the node daemon running time, in ms.

### 100dh Life factor

| | | | |
|---|---|---|---|
| Address: | 0x2D04 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 255

**Description**

This parameter must be used together with the node daemon function and must be set to a value greater than 1.

### 1014h Emergency message COB-ID

| | | | |
|---|---|---|---|
| Address: | 0x2D06 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

The most significant bit indicates whether to disable the emergency message of the device. Only the data "0x80+Node_ID" can be written for the bit to enable the emergency message of the device.

If the data "0x80000080+Node_ID" is written, the emergency message is disabled. When the emergency message is enabled, the COB-ID must be the same as that of the object.

### 1016.01h Consumer heartbeat time 1

| | | | |
|---|---|---|---|
| Address: | 0x2D06 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Parameters include the address of the monitored node and actual consumer time, which must be longer than the heartbeat producer time (unit: ms) of the corresponding node. Two different consumer time cannot be set for one node.

Bits 0 to 15: Monitoring time

Bits 16 to 23: The monitored address

Bits 24 to 31: Reserved (0)

### 1016.02h Consumer heartbeat time 2

| | | | |
|---|---|---|---|
| Address: | 0x2D0A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1016.01h.

### 1016.03h Consumer heartbeat time 3

| | | | |
|---|---|---|---|
| Address: | 0x2D0C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1016.01h.

**1016.04h Consumer heartbeat time 4**

| | | | |
|---|---|---|---|
| Address: | 0x2D0E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1016.01h.

**1016.05h Consumer heartbeat time 5**

| | | | |
|---|---|---|---|
| Address: | 0x2D10 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1016.01h.

**1017h Producer heartbeat time**

| | | | |
|---|---|---|---|
| Address: | 0x2D12 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Defines the heartbeat production time of the slave, in ms.

**1018.01h Vendor ID**

| | | | |
|---|---|---|---|
| Address: | - | | |
| Min.: | - | Unit: | - |
| Max.: | - | Data Type: | UInt32 |
| Default: | 0x3B9 | Change: | Unchangeable |

**Value Range:**

1

**Description**

-

**1018.02h Device code**

Address: -

Min.: -
Unit: -
Max.: -
Data Type: UInt32
Default: 0xD0117
Change: Unchangeable

**Value Range:**

-

**Description**

-

**1018.03h Device revision**

Address: -
Min.: -
Unit: -
Max.: -
Data Type: UInt32
Default: 0X20001
Change: Unchangeable

**Value Range:**

-

**Description**

-

**1400.01h COB-ID of RPDO1**

Address: 0x2D14
Min.: 0
Unit: -
Max.: 4294967295
Data Type: UInt32
Default: 512
Change: Real-time modification

**Value Range:**

0 to 4294967295

**Description**

Only the most significant bit can be modified. When the most significant bit is 0, the PDO is active. When the most significant bit is 1, the PDO is inactive.

The factory settings are as follows:

1400h: 0x00000200 + Node_ID

1401h: 0x80000300 + Node_ID

1402h: 0x80000400 + Node_ID

1403h: 0x80000500 + Node_ID

**1400.02h Transmission type of RPDO1**

Address: 0x2D16
Min.: 0
Unit: -
Max.: 255
Data Type: UInt16
Default: 255
Change: Real-time modification

**Value Range:**

0 to 255

**Description**

This parameter can be modified only when PDO is inactive.
Different values correspond to different PDO transmission types, as follows:
0: Not circle synchronous data
1 to 240: Circle synchronous data
254 and 255: Not circle asynchronous data

**1401.01h COB-ID of RPDO2**

| | | | |
|---|---|---|---|
| Address: | 0x2D17 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**
0 to 4294967295
**Description**
Same as 1400.01h.

**1401.02h Transmission type of RPDO2**

| | | | |
|---|---|---|---|
| Address: | 0x2D19 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 255 | Change: | Real-time modification |

**Value Range:**
0 to 255
**Description**
Same as 1400.02h.

**1402.01h COB-ID of RPDO3**

| | | | |
|---|---|---|---|
| Address: | 0x2D1A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**
0 to 4294967295
**Description**
Same as 1400.01h.

**1402.02h Transmission type of RPDO3**

| | | | |
|---|---|---|---|
| Address: | 0x2D1C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 255 | Change: | Real-time modification |

**Value Range:**

0 to 255

**Description**

Same as 1400.02h.

**1403.01h COB-ID of RPDO4**

| | | | |
|---|---|---|---|
| Address: | 0x2D1D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as 1400.01h.

**1403.02h Transmission type of RPDO4**

| | | | |
|---|---|---|---|
| Address: | 0x2D1F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 255 | Change: | Real-time modification |

**Value Range:**

0 to 255

**Description**

Same as 1400.02h.

**1600.00h Number of valid mapped objects in RPDO1**

| | | | |
|---|---|---|---|
| Address: | 0x2D20 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

**1600.01h 1st mapped object in RPDO1**

| | | | |
|---|---|---|---|
| Address: | 0x2D21 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614807056 | Change: | Real-time modification |

**Value Range:**
0 to 2147483647
**Description**
The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.
Sub-indexes are written in the following format:
Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

### 1600.02h 2nd mapped object in RPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2D23 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**
0 to 2147483647
**Description**
Same as 1600.01h.

### 1600.03h 3rd mapped object in RPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2D25 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**
0 to 2147483647
**Description**
Same as 1600.01h.

### 1600.04h 4th mapped object in RPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2D27 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**
0 to 2147483647
**Description**
Same as 1600.01h.

**1600.05h 5th mapped object in RPDO1**

| | | | |
|---|---|---|---|
| Address: | 0x2D29 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1600.01h.

**1600.06h 6th mapped object in RPDO1**

| | | | |
|---|---|---|---|
| Address: | 0x2D2B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1600.01h.

**1600.07h 7th mapped object in RPDO1**

| | | | |
|---|---|---|---|
| Address: | 0x2D2D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1600.01h.

**1600.08h 8th mapped object in RPDO1**

| | | | |
|---|---|---|---|
| Address: | 0x2D2F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1600.01h.

**1601.00h Number of valid mapped objects in RPDO2**

Address: 0x2D31

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 2 | Change: | Real-time modification |

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

### 1601.01h 1st mapped object in RPDO2

Address: 0x2D32

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614807056 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

### 1601.02h 2nd mapped object in RPDO2

Address: 0x2D34

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1616904200 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1601.01h.

### 1601.03h 3rd mapped object in RPDO2

Address: 0x2D36

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1601.01h.

### 1601.04h 4th mapped object in RPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2D36 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1601.01h.

### 1601.05h 5th mapped object in RPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2D3A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1601.01h.

### 1601.06h 6th mapped object in RPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2D3A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1601.01h.

### 1601.07h 7th mapped object in RPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2D3E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1601.01h.

### 1601.08h 8th mapped object in RPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2D40 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1601.01h.

### 1602.00h Number of valid mapped objects in RPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2D40 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 2 | Change: | Real-time modification |

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

### 1602.01h 1st mapped object in RPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2D43 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614807056 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

### 1602.02h 2nd mapped object in RPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2D45 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1618608160 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1602.01h.

### 1602.03h 3rd mapped object in RPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2D47 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1602.01h.

### 1602.04h 4th mapped object in RPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2D49 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1602.01h.

### 1602.05h 5th mapped object in RPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2D4B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1602.01h.

### 1602.06h 6th mapped object in RPDO3

Address: 0x2D4D

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1602.01h.

### 1602.07h 7th mapped object in RPDO3

Address: 0x2D4F

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1602.01h.

### 1602.08h 8th mapped object in RPDO3

Address: 0x2D51

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1602.01h.

### 1603.00h Number of valid mapped objects in RPDO4

Address: 0x2D53

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 2 | Change: | Real-time modification |

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

### 1603.01h 1st mapped object in RPDO4

Address: 0x2D54

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614807056 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

### 1603.02h 2nd mapped object in RPDO4

Address: 0x2D56

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1627324448 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1603.01h.

### 1603.03h 3rd mapped object in RPDO4

Address: 0x2D58

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1603.01h.

### 1603.04h 4th mapped object in RPDO4

Address: 0x2D5A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1603.01h.

### 1603.05h 5th mapped object in RPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2D5C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1603.01h.

### 1603.06h 6th mapped object in RPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2D5E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1603.01h.

### 1603.07h 7th mapped object in RPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2D60 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1603.01h.

### 1603.08h 8th mapped object in RPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2D62 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1603.01h.

### 1800.01h COB-ID of TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E00 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Only the MSB and the second MSB can be modified.

When the most significant bit is 0, the PDO is active. When the most significant bit is 1, the PDO is inactive.

The second most significant bit defines whether the PDO can be triggered by a remote frame. You are recommended to set this bit to 1 to disable the remote frame to trigger the PDO.

The factory settings are as follows:

1800h: 0x40000180 + Node_ID

1801h: 0xC0000280 + Node_ID

1802h: 0xC0000380 + Node_ID

1803h: 0xC0000480 + Node_ID

### 1800.02h Transmission type of TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E02 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 255 | Change: | Real-time modification |

**Value Range:**

0 to 255

**Description**

This parameter can be modified only when PDO is inactive. Different values correspond to different PDO transmission types, as follows:

0: Not circle synchronous data

1 to 240: Circle synchronous data

254 and 255: Not circle asynchronous data

### 1800.03h Inhibit time of TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E03 | | |
| Min.: | 0 | Unit: | 100us |
| Max.: | 65535 | Data Type: | UInt16 |

| | | | |
|---|---|---|---|
| Default: | 500 | Change: | Real-time modification |

**Value Range:**

0 us to 65535 us

**Description**

This parameter can be modified only when PDO is inactive.

The unit is 100 μs. The value 0 indicates that the inhibit time is invalid.

### 1800.05h Event counter of TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E04 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

This parameter can be modified only when PDO is inactive.

When the unit is ms, the value 0 indicates that the event counter is inactive.

### 1801.01h COB-ID of TPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2E05 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as 1800.01h.

### 1801.02h Transmission type of TPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2E07 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 255 | Change: | Real-time modification |

**Value Range:**

0 to 255

**Description**

Same as 1800.02h.

### 1801.03h Inhibit time of TPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2E08 | | |
| Min.: | 0 | Unit: | 100us |
| Max.: | 65535 | Data Type: | UInt16 |

Default: 500 | Change: Real-time modification

**Value Range:**

0100us to 65535100us

**Description**

Same as 1800.03h.

**1801.05h Event counter of TPDO2**

Address: 0x2E09

Min.: 0 | Unit: ms

Max.: 65535 | Data Type: UInt16

Default: 0 | Change: Real-time modification

**Value Range:**

0 ms to 65535 ms

**Description**

Same as 1800.05h.

**1802.01h COB-ID of TPDO3**

Address: 0x2E0A

Min.: 0 | Unit: -

Max.: 4294967295 | Data Type: UInt32

Default: 0 | Change: Real-time modification

**Value Range:**

0 to 4294967295

**Description**

Same as 1800.01h.

**1802.02h Transmission type of TPDO3**

Address: 0x2E0C

Min.: 0 | Unit: -

Max.: 255 | Data Type: UInt16

Default: 255 | Change: Real-time modification

**Value Range:**

0 to 255

**Description**

Same as 1800.02h.

**1802.03h Inhibit time of TPDO3**

Address: 0x2E0D

Min.: 0 | Unit: 100us

Max.: 65535 | Data Type: UInt16

Default: 500 | Change: Real-time modification

**Value Range:**

0 us to 65535 us

**Description**

Same as 1800.03h.

### 1802.05h Event counter of TPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2E0E | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Same as 1800.05h.

### 1803.01h COB-ID of TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E0F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Same as 1800.01h.

### 1803.02h Transmission type of TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E11 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 255 | Data Type: | UInt16 |
| Default: | 255 | Change: | Real-time modification |

**Value Range:**

0 to 255

**Description**

Same as 1800.02h.

### 1803.03h Inhibit time of TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E12 | | |
| Min.: | 0 | Unit: | 100us |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 500 | Change: | Real-time modification |

**Value Range:**

0 us to 65535 us

**Description**

Same as 1800.03h.

### 1803.05h Event counter of TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E13 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Same as 1800.05h.

### 1A00.00h Number of valid mapped objects in TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E14 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

### 1A00.01h 1st mapped object in TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E15 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614872592 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

### 1A00.02h 2nd mapped object in TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E17 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A00.01h.

### 1A00.03h 3rd mapped object in TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E19 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A00.01h.

### 1A00.04h 4th mapped object in TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E1B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A00.01h.

### 1A00.05h 5th mapped object in TPDO1

| | | | |
|---|---|---|---|
| Address: | 0x2E1D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A00.01h.

### 1A00.06h 6th mapped object in TPDO1

Address: 0x2E1F

Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

**Value Range:**

0 to 2147483647

**Description**

Same as 1A00.01h.

### 1A00.07h 7th mapped object in TPDO1

Address: 0x2E1F

Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

**Value Range:**

0 to 2147483647

**Description**

Same as 1A00.01h.

### 1A00.08h 8th mapped object in TPDO1

Address: 0x2E23

Min.: 0 | Unit: -
Max.: 2147483647 | Data Type: UInt32
Default: 0 | Change: Real-time modification

**Value Range:**

0 to 2147483647

**Description**

Same as 1A00.01h.

### 1A01.00h Number of valid mapped objects in TPDO2

Address: 0x2E25

Min.: 0 | Unit: -
Max.: 8 | Data Type: UInt16
Default: 2 | Change: Real-time modification

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

### 1A01.01h 1st mapped object in TPDO2

Address: 0x2E26

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614872592 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

### 1A01.02h 2nd mapped object in TPDO2

Address: 0x2E28

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1616969736 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A01.01h.

### 1A01.03h 3rd mapped object in TPDO2

Address: 0x2E2A

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A01.01h.

### 1A01.04h 4th mapped object in TPDO2

Address: 0x2E2C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A01.01h.

### 1A01.05h 5th mapped object in TPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2E2E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A01.01h.

### 1A01.06h 6th mapped object in TPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2E30 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A01.01h.

### 1A01.07h 7th mapped object in TPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2E32 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A01.01h.

### 1A01.08h 8th mapped object in TPDO2

| | | | |
|---|---|---|---|
| Address: | 0x2E34 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A01.01h.

### 1A02.00h Number of valid mapped objects in TPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2E36 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 2 | Change: | Real-time modification |

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

### 1A02.01h 1st mapped object in TPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2E37 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614872592 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index

Bit 8 to bit 15: Sub-index

Bit 0 to bit 7: Object length

### 1A02.02h 2nd mapped object in TPDO3

| | | | |
|---|---|---|---|
| Address: | 0x2E39 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1617166368 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A02.01h.

**1A02.03h 3rd mapped object in TPDO3**

| | | | |
|---|---|---|---|
| Address: | 0x2E3B | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A02.01h.

**1A02.04h 4th mapped object in TPDO3**

| | | | |
|---|---|---|---|
| Address: | 0x2E3D | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A02.01h.

**1A02.05h 5th mapped object in TPDO3**

| | | | |
|---|---|---|---|
| Address: | 0x2E3F | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A02.01h.

**1A02.06h 6th mapped object in TPDO3**

| | | | |
|---|---|---|---|
| Address: | 0x2E41 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A02.01h.

**1A02.07h 7th mapped object in TPDO3**

Address: 0x2E43

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A02.01h.

### 1A02.08h 8th mapped object in TPDO3

Address: 0x2E45

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A02.01h.

### 1A03.00h Number of valid mapped objects in TPDO4

Address: 0x2E47

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 8 | Data Type: | UInt16 |
| Default: | 2 | Change: | Real-time modification |

**Value Range:**

0 to 8

**Description**

This object can be modified only when PDO is inactive. When 0 is written, the mapping objects of other sub-indexes are cleared.

### 1A03.01h 1st mapped object in TPDO4

Address: 0x2E48

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1614872592 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

The total length of a mapping object cannot exceed 64 bits. Mapping based on bytes instead of bits is supported. The indexes and sub-indexes of mapping objects must exist in the object dictionary list. The attribute of mapping objects is readable and the objects can be mapped.

Sub-indexes are written in the following format:

Bit 16 to bit 31: Index
Bit 8 to bit 15: Sub-index
Bit 0 to bit 7: Object length

### 1A03.02h 2nd mapped object in TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E4A | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 1617690656 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A03.01h.

### 1A03.03h 3rd mapped object in TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E4C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A03.01h.

### 1A03.04h 4th mapped object in TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E4E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A03.01h.

### 1A03.05h 5th mapped object in TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E50 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A03.01h.

### 1A03.06h 6th mapped object in TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E52 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A03.01h.

### 1A03.07h 7th mapped object in TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E54 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A03.01h.

### 1A03.08h 8th mapped object in TPDO4

| | | | |
|---|---|---|---|
| Address: | 0x2E56 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 2147483647

**Description**

Same as 1A03.01h.

## 6.27 6000h Description of object dictionary

### 603Fh Error Code

| | | | |
|---|---|---|---|
| Address: | 0x3500 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

When an error described in the DSP402 profile occurs on the servo drive, 603Fh is as described in DSP402.

When an error specified by the user occurs on the servo drive, 603Fh is 0xFF00.

The value of 603Fh is in hexadecimal.

In addition, the object dictionary 203Fh displays auxiliary bytes of fault codes in hexadecimal.

203Fh is a UInt32 value, in which the high 16 bits indicate the internal fault code of the manufacturer, and the low 16 bits indicate the external fault code of the manufacturer.

**6040h Control word**

Address: 0x3502

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 65535

**Description**

See the SV670P Series Servo Drive Communication Guide for details.

**6041h Status word**

Address: 0x3504

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

See the SV670P Series Servo Drive Communication Guide for details.

**605Ah Quick stop option code**

Address: 0x3536

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 7 | Data Type: | Int16 |
| Default: | 2 | Change: | At stop |

**Value Range:**

0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state
6: Ramp to stop as defined by 6085h, keeping position lock state
7: Stop at emergency stop torque, keeping position lock state

**Description**

Defines the quick stop mode.
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
4: N/A
5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state
6: Ramp to stop as defined by 6085h, keeping position lock state
7: Stop at emergency stop torque, keeping position lock state

**605Ch** **Stop mode at S-ON OFF**

Address: 0x353A

| | | | |
|---|---|---|---|
| Min.: | -4 | Unit: | - |
| Max.: | 2 | Data Type: | Int16 |
| Default: | 0 | Change: | At stop |

**Value Range:**

–4: Ramp to stop as defined by 6085h, keeping dynamic braking state
–3: Stop at zero speed, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/ 609Ah, keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/ 609Ah, keeping de-energized state
2: Dynamic braking stop, keeping de-energized state

**Description**

Sets the stop mode at S-ON OFF.
–4: Ramp to stop as defined by 6085h, keeping dynamic braking state
–3: Stop at zero speed, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/609Ah, keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah, keeping de-energized status
2: Dynamic braking stop, keeping de-energized state

**605Dh** **Stop option code**

| | | | |
|---|---|---|---|
| Address: | 0x353C | | |
| Min.: | 1 | Unit: | - |
| Max.: | 3 | Data Type: | Int16 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state
2: Ramp to stop as defined by 6085h, keeping position lock state
3: Stop at emergency stop torque, keeping position lock state

**Description**

Defines the halt mode.
1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state
2: Ramp to stop as defined by 6085h, keeping position lock state
3: Stop at emergency stop torque, keeping position lock state

**605Eh** **Stop mode at No.2 fault**

| | | | |
|---|---|---|---|
| Address: | 0x353E | | |
| Min.: | -5 | Unit: | - |
| Max.: | 4 | Data Type: | Int16 |
| Default: | 2 | Change: | At stop |

**Value Range:**

–5: Stop at zero speed, keeping dynamic braking state
–4: Stop at emergency stop torque, keeping dynamic braking state
–3: Ramp to stop as defined by 6085h, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping dynamic braking state
–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized state
3: Stop at emergency stop torque, keeping de-energized state
4: Dynamic braking stop, keeping de-energized state

**Description**

Defines the stop mode at No.2 fault.
–5: Stop at zero speed, keeping dynamic braking state
–4: Stop at emergency stop torque, keeping dynamic braking state
–3: Ramp to stop as defined by 6085h, keeping dynamic braking state
–2: Ramp to stop as defined by 6084h/609Ah (HM), keeping dynamic braking state

–1: Dynamic braking stop, keeping dynamic braking state
0: Coast to stop, keeping de-energized state
1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state
2: Ramp to stop as defined by 6085h, keeping de-energized stat
3: Stop at emergency stop torque, keeping de-energized state
4: Dynamic braking stop, keeping de-energized state

### 6060h Modes of operation

| | | | |
|---|---|---|---|
| Address: | 0x3542 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 10 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode

**Description**

Defines the servo drive operation mode.
0: N/A (forced to be PP)
1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode
Others: N/A
If an unsupported operation mode is selected through an SDO, an SDO error will be returned.
If an unsupported operation mode is selected through a PDO, the change of the operation mode will be invalid.

### 6061h Operation mode display

| | | | |
|---|---|---|---|
| Address: | 0x3544 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 10 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode

**Description**

Indicates the actual operation mode.
0: Profile position (PP) mode
1: Profile position (PP) mode
3: Profile velocity (PV) mode
4: Profile torque (PT) mode
6: Homing (HM) mode
7: Interpolation (IP) mode

**6062h Position reference**

Address: 0x3546

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to 2147483647

**Description**

Indicates the real-time position reference (reference unit).

**6063h Position actual value**

Address: 0x3548

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Pulse |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

–2147483648 to +2147483647

**Description**

Indicates the absolute position feedback (encoder unit) of the motor in real time.

**6064h Position actual value**

Address: 0x354A

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to 2147483647

**Description**

Indicates the absolute position feedback (reference unit) in real time.

Position actual value in user-defined unit (6064h) x Gear ratio (6091h) = Position actual value in encoder unit (6063h)

### 6065h Following error window

| | | | |
|---|---|---|---|
| Address: | 0x354C | | |
| Min.: | 0 | Unit: | Reference unit |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 27486951 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Defines the threshold of excessive position deviation (reference unit).

When the difference value between position demand value (6062h) and position actual value (6064h) keeps exceeding ±6065h after the time defined by 6066h elapses, B00.0 (Position deviation too large) occurs.

### 6066h Following error time out

| | | | |
|---|---|---|---|
| Address: | 0x354E | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Defines the time lapse to trigger excessive position deviation (EB00.0), which must be used together with 6065h.

### 6067h Position window

| | | | |
|---|---|---|---|
| Address: | 0x3550 | | |
| Min.: | 0 | Unit: | Reference unit |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 5872 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Defines the threshold for position reach.

If the difference between 6062h and 6064h is within ±6067h and the time reaches 6068h, the position is reached. In this case, bit 10 of 6041h is set to 1 in the profile position mode.
This flag bit is meaningful only when the S-ON signal is active in the profile position mode.

### 6068h Position window time

| | | | |
|---|---|---|---|
| Address: | 0x3552 | | |
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 ms to 65535 ms

**Description**

Defines the window time for position reach, which must be used together with 6067h.

### 606Ch Actual speed

| | | | |
|---|---|---|---|
| Address: | 0x355A | | |
| Min.: | -2147483648 | Unit: | Reference unit/s |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

–2147483648 to +2147483647

**Description**

Indicates the velocity actual value.

### 606Dh Velocity window

| | | | |
|---|---|---|---|
| Address: | 0x355C | | |
| Min.: | 0 | Unit: | rpm |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | Real-time modification |

**Value Range:**

0 to 65535

**Description**

Defines the threshold for speed reach.
If the difference value between the target speed 60FFh and the actual speed 606Ch is within ±606Dh and the time reaches 606Eh, the speed is reached and bit 10 of the status word 6041h is set to 1 in the profile velocity (PV) mode.
This flag bit is meaningful only when the servo drive is enabled in PV mode.

## 606Eh Velocity window time

Address: 0x355E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | ms |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

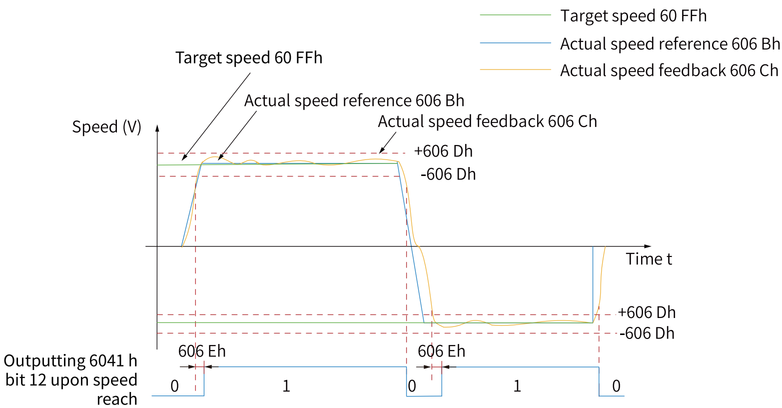
0 ms to 65535 ms

**Description**

Defines the time window for speed reach, which must be used together with 606Dh.

Defines the time window for speed arrival. If the difference value between the target speed 60FFh and the actual speed 606Ch is within ±606Dh and the time reaches 606Eh, the speed is reached and bit 10 of the status word 6041h is set to 1 in the profile velocity (PV) mode.

This flag bit is meaningful only when the servo drive is enabled in PV mode.




## 606Fh Velocity threshold

Address: 0x3560

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | rpm |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 10 | Change: | Real-time modification |

**Value Range:**

0 to 65535

**Description**

Defines the threshold for determining whether the user velocity is 0.

When 606Ch is within ±606Fh and the time reaches the value set by 6070h, the user velocity is 0. When either condition is not met, the user velocity is not 0.

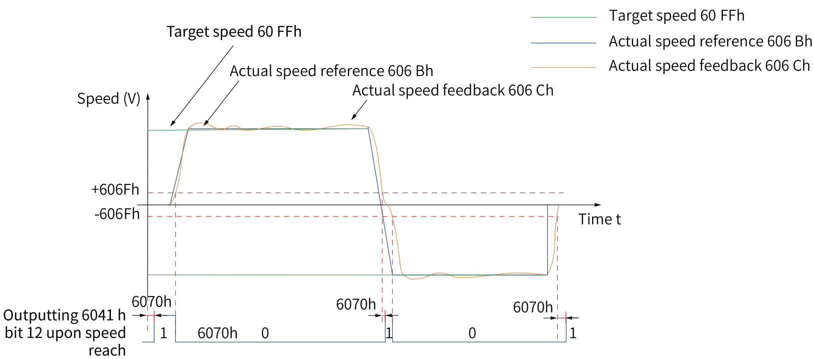
This flag bit is meaningful only in the profile velocity mode.
This flag bit is unrelated to the enable/disable state of the servo drive.

## 6070h Velocity threshold time

Address: 0x3562
Min.: 0 Unit: ms
Max.: 65535 Data Type: UInt16
Default: 0 Change: Real-time modification

**Value Range:**
0 ms to 65535 ms

**Description**
Defines the time window for determining whether the user velocity is 0, which must be used together with 606Fh.
When 606Ch is within ±606Fh and the time reaches the value set by 6070h, the user velocity is 0. When either condition is not met, the user velocity is not 0.
This flag bit is meaningful only in the profile velocity mode.
This flag bit is unrelated to the enable/disable state of the servo drive.




## 6071h Target torque

Address: 0x3564
Min.: -4000 Unit: 0.001
Max.: 4000 Data Type: Int16
Default: 0 Change: Real-time modification

**Value Range:**
-4000.000 to 4000.000

**Description**
Defines the target torque of the servo drive in the profile torque mode.
The value 1000 corresponds to the rated torque of the motor.

**6072h** **Max. torque**

| | | | |
|---|---|---|---|
| Address: | 0x3566 | | |
| Min.: | 0 | Unit: | 0.001 |
| Max.: | 4000 | Data Type: | UInt16 |
| Default: | 3500 | Change: | Real-time modification |

**Value Range:**

0.000 to 4000.000

**Description**

Defines the maximum torque reference limit.

The value 1000 corresponds to the rated torque of the motor.

**6074h** **Torque reference**

| | | | |
|---|---|---|---|
| Address: | 0x356A | | |
| Min.: | -4000 | Unit: | 0.001 |
| Max.: | 4000 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-4000.000 to 4000.000

**Description**

Defines the target torque value.

The value 1000 corresponds to the rated torque of the motor.

**6077h** **Torque actual value**

| | | | |
|---|---|---|---|
| Address: | 0x3570 | | |
| Min.: | -4000 | Unit: | 0.001 |
| Max.: | 4000 | Data Type: | Int16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-4000.000 to 4000.000

**Description**

Indicates the internal torque feedback of the servo drive.

The value 1000 corresponds to the rated torque of the motor.

**607Ah** **Target position**

| | | | |
|---|---|---|---|
| Address: | 0x3576 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Defines the target position of the servo drive in the profile position mode.
When bit 6 of 6040h is set to 0, 607Ah indicates the absolute target position of current segment.
After positioning of current segment is done, the value of 6064h will be the same as the value of 607Ah.
When bit 6 of 6040h is set to 1, 607Ah indicates the target increment displacement of current segment.
After positioning of current segment is done, user displacement increment will be the same as the value of 607Ah.

**607Ch** **Home offset**

| | | | |
|---|---|---|---|
| Address: | 0x357A | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Defines the physical location of mechanical zero that deviates from the home of the motor in position control modes (profile position mode, interpolation mode, and homing mode).
The home offset in active under the following conditions: The device is powered on, the homing operation is complete, and bit 15 of 6041h is set to 1.
After homing is done, the position actual value (6064h) will be the same as the value of 607Ch.
If 607Ch is beyond the value of 607Dh (Software position limit), E09.1 occurs (Home setting error).

**607D.01-h** **Min. position limit**

| | | | |
|---|---|---|---|
| Address: | 0x3700 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | -2147483648 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Defines the minimum software position limit relative to the mechanical zero point.
Minimum software position limit = (607D.01h)

The software position limit is used to judge the absolute position. When homing is not performed, the internal software position limit is invalid.
The condition for activating the software position limit is set in H0A.01 (object dictionary 0x200A.02h).

**607D.02-h** **Max. position limit**

| | | | |
|---|---|---|---|
| Address: | 0x3800 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 2147483647 | Change: | Real-time modification |

**Value Range:**
-2147483648 to 2147483647
**Description**
Defines the maximum software position limit relative to the mechanical zero.
Maximum software position limit = (607D.02h)

**607Eh** **Reference polarity**

| | | | |
|---|---|---|---|
| Address: | 0x357E | | |
| Min.: | 0 | Unit: | - |
| Max.: | 128 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**
0 to 127
**Description**
Defines the polarity of position or speed references.
When bit 7 is 1, it indicates the position reference is multiplied by "–1" and the motor direction is reversed in the standard position mode or interpolation mode.
When bit 6 is 1, it indicates the speed reference (60FFh) is multiplied by "–1" and the motor direction is reversed in the speed mode.
When bit 5 is 1, it indicates the torque demand value (6071h) is multiplied by "–1" and the motor direction is reversed in the torque mode.
Other bits are meaningless.

**607Fh** **Max. profile velocity**

| | | | |
|---|---|---|---|
| Address: | 0x3580 | | |
| Min.: | 0 | Unit: | Reference unit/s |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 838860800 | Change: | Real-time modification |

**Value Range:**
0 to 4294967295

**Description**

Defines the maximum user running speed.
Set a proper gear ratio (8:1 recommended) when using a 23-bit encoder. Otherwise, the motor speed will be limited to 3840 RPM.

**6081h Profile velocity**

| | | | |
|---|---|---|---|
| Address: | 0x3584 | | |
| Min.: | 0 | Unit: | Reference unit/s |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 13981013 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Defines the constant running speed of the displacement reference in the profile position mode.
The set value takes effect after the slave receives the displacement reference.

**6083h Profile acceleration**

| | | | |
|---|---|---|---|
| Address: | 0x3588 | | |
| Min.: | 0 | Unit: | Reference unit/$s^2$ |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 1398101333 | Change: | Real-time modification |

**Value Range:**

0 reference unit/$s^2$ to 4294967295 reference units/$s^2$

**Description**

Defines the acceleration of the displacement reference in the profile position mode.
The following formula applies if a motor equipped with 23-bit encoder needs to run at 400 RPM (6081h: 400 x 8388608/60) with acceleration rate being 400 RPM/s (6083h: 400 x 8388608/60) and deceleration rate being 200 RPM/s (6084h: 200 x 8388608/60) under a gear ratio of 1:1:
Acceleration time $t_{up}$ = Δ6081h/Δ6083h = 1 (s). Deceleration time $t_{down}$ = Δ6081h/Δ6084h=2 (s).

**6084h Profile deceleration**

| | | | |
|---|---|---|---|
| Address: | 0x358A | | |
| Min.: | 0 | Unit: | Reference unit/$s^2$ |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 1398101333 | Change: | Real-time modification |

**Value Range:**

0 reference unit/$s^2$ to 4294967295 reference units/$s^2$

**Description**

Defines the deceleration rate in the deceleration stage of the displacement reference in the profile position mode.

The following formula applies if a motor equipped with 23-bit encoder needs to run at 400 RPM (6081h: 400 x 8388608/60) with acceleration rate being 400 RPM/s (6083h: 400 x 8388608/60) and deceleration rate being 200 RPM/s (6084h: 200 x 8388608/60) under a gear ratio of 1:1:

Acceleration time $t_{up}$ = Δ6081h/Δ6083h = 1 (s). Deceleration time $t_{down}$ = Δ6081h/Δ6084h=2 (s).

### 6085h Quick stop deceleration

| | | | |
|---|---|---|---|
| Address: | 0x358C | | |
| Min.: | 0 | Unit: | Reference unit/$s^2$ |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 2147483647 | Change: | Real-time modification |

**Value Range:**

0 reference unit/$s^2$ to 4294967295 reference units/$s^2$

**Description**

Defines the deceleration rate when the quick stop command (6040h = 0x0002) is active and 605Ah (Quick stop option code) is set to 2 or 5.

### 6087h Torque slope

| | | | |
|---|---|---|---|
| Address: | 0x3590 | | |
| Min.: | 0 | Unit: | 0.1%/s |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 4294967295 | Change: | Real-time modification |

**Value Range:**

0%/S to 4294967295%/s

**Description**

Defines the acceleration (torque increment per second) of the torque reference in profile torque mode, indicating the torque reference increment per second.

In the profile torque mode, if 605Ah is set to 1, 2, 5, or 6, or 605Dh is set to 1 or 2, the servo drive decelerates to stop as defined by 6087h.

If the value of 6087h exceeds the torque reference limit, the limit value will be used.

### 6091.01h Motor revolutions

| | | | |
|---|---|---|---|
| Address: | 0x3714 | | |
| Min.: | 1 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 4294967295

**Description**

Defines the numerator of the gear ratio.

Defines the proportional relation between the load shaft displacement designated by the user and the motor shaft displacement.

The relation between motor position feedback (encoder unit) and load shaft position feedback (reference unit) is as follows.

Motor position feedback = Load shaft position feedback x Gear ratio

The relation between the motor speed (RPM) and the load shaft speed (reference unit/s) is as follows.

Motor speed (RPM) = Load shaft speed x 6091h x 60/Encoder resolution

The relation between the motor acceleration (RPM/ms) and the load shaft acceleration (reference unit/$s^2$) is as follows.

Motor acceleration (RPM/ms) = Load shaft acceleration x 6091h x 1000/Encoder resolution/60

### 6091.02h Shaft revolutions

| | | | |
|---|---|---|---|
| Address: | 0x3814 | | |
| Min.: | 1 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 1 | Change: | At stop |

**Value Range:**

1 to 4294967295

**Description**

Defines the denominator of the gear ratio.

### 6098h Homing method

| | | | |
|---|---|---|---|
| Address: | 0x35B2 | | |
| Min.: | -3 | Unit: | - |
| Max.: | 35 | Data Type: | Int16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

-3 to 35

**Description**

When 6098h is set to 15, 16, 31 or 32, it is meaningless and the servo drive does not perform the homing operation.

Table 6–7 Description of homing method

| Set point | Description |
|---|---|
| -3 | Nearby, Z signal as home |
| -2 | Forward, positive mechanical limit as deceleration point and Z signal as home |
| -1 | Reverse, negative mechanical limit as deceleration point and Z signal as home |
| 1 | Reverse, negative limit switch as deceleration point and Z signal as home, falling edge of the negative limit switch signal must be reached before Z signal |
| 2 | Forward, positive limit switch as deceleration point and Z signal as home, falling edge of positive limit switch signal must be reached before Z signal |
| 3 | Forward, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal |
| 4 | Forward, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal |
| 5 | Reverse, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal |
| 6 | Reverse, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal |
| 7 | Forward, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal |
| 8 | Forward, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal |
| 9 | Forward, home switch as deceleration point and Z signal as home, rising edge on the other side of the home switch signal must be reached before Z signal |
| 10 | Forward, home switch as deceleration point and Z signal as home, falling edge on the other side of the home switch signal must be reached before Z signal |
| 11 | Reverse, home switch as deceleration point and Z signal as home, falling edge on the same side of the home switch signal must be reached before Z signal |
| 12 | Reverse, home switch as deceleration point and Z signal as home, rising edge on the same side of the home switch signal must be reached before Z signal |
| 13 | Reverse, home switch as deceleration point and Z signal on the other side of the home switch signal as home, rising edge on the other side of the home switch signal must be reached before Z signal |
| 14 | Reverse, home switch as deceleration point and Z signal on the other side of the home switch signal as home, falling edge on the other side of the home switch signal must be reached before Z signal |
| 17 to 32 | Similar to setpoints 1...14 except that the deceleration point coincide with the home |
| 33 | Reverse, Z signal as home |
| 34 | Forward, Z signal as home |

| Set point | Description |
|---|---|
| 35 | Current position as home |
| When 6098h is set to 15, 16, 31 or 32, it is meaningless and the servo drive does not perform the homing operation. | |

### 6099.01h Speed during search for switch

Address: 0x371C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Reference unit/s |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 13981013 | Change: | At stop |

**Value Range:**

0 to 4294967295

**Description**

Defines the speed during search for the deceleration point signal. A large setpoint helps prevent E601.0 (Homing timeout).

### 6099.02h Speed during search for zero

Address: 0x381C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Reference unit/s |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 1398101 | Change: | At stop |

**Value Range:**

0 to 4294967295

**Description**

Defines the speed in searching for the home signal. Setting this speed to a low value prevents overshoot during stop at high speed, avoiding excessive deviation between the stop position and the set mechanical home.

### 609Ah Homing acceleration

Address: 0x35B6

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Reference unit/$s^2$ |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 1398101333 | Change: | Real-time modification |

**Value Range:**

0 reference unit/$s^2$ to 4294967295 reference units/$s^2$

**Description**

Defines the acceleration rate in the homing mode.

The setpoint is activated after homing is started.

When a motor equipped with 23-bit encoder runs in HM mode, 605A is set to 1, 609A is set to 0, and the electronic gear ratio is set to 8388608, the acceleration rate is forced to be 1 during acceleration. If the control word is set to 2, the quick stop mode is stop at zero speed and the actual deceleration rate is forced to be $2^{32} - 1$.

**60B8h Touch probe function**

| | | | |
|---|---|---|---|
| Address: | 0x35F2 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 65535

**Description**

For the touch probe function, see Touch Probe Function in the SV670P Series Servo Drive Communication Guide.

**60B9h Touch probe status**

| | | | |
|---|---|---|---|
| Address: | 0x35F4 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

For the touch probe status, see Touch Probe Function in the SV670P Series Servo Drive Communication Guide.

**60BAh Touch probe 1 positive edge**

| | | | |
|---|---|---|---|
| Address: | 0x35F6 | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to 2147483647

**Description**

Indicates the position feedback value (reference unit) latched at positive edge of touch probe 1 signal.

**60BBh Touch probe 1 negative edge**

Address: 0x35F8

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to 2147483647

**Description**

Indicates the position feedback value (reference unit) latched at negative edge of touch probe 1 signal.

**60BCh Touch probe 2 positive edge**

Address: 0x35FA

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to 2147483647

**Description**

Indicates the position feedback value (reference unit) latched at positive edge of touch probe 2 signal.

**60BDh Touch probe 2 negative edge**

Address: 0x35FC

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to 2147483647

**Description**

Indicates the position feedback value (reference unit) latched at negative edge of touch probe 2 signal.

**60C1.01h Interpolation displacement**

Address: 0x3744

| | | | |
|---|---|---|---|
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

-2147483648 to 2147483647

**Description**

Defines the displacement reference in the interpolation mode.
In interpolation mode, 60C1.01h must be set to synchronize PDO and the transmission type must be set to 1.
The host controller will send a displacement reference to the slave upon every synchronization cycle.

### 60C2.01h Interpolation time period

| | | | |
|---|---|---|---|
| Address: | 0x3745 | | |
| Min.: | 1 | Unit: | - |
| Max.: | 20 | Data Type: | UInt16 |
| Default: | 1 | Change: | Real-time modification |

**Value Range:**

1 to 20

**Description**

Defines the interpolation time units.
The allowed sync period range is 1 ms to 20 ms. When a value beyond this range is set, the setpoint is used as the sync period.
The synchronization cycle must be set after the servo drive stops running.

### 60C2.02h Interpolation time units

| | | | |
|---|---|---|---|
| Address: | 0x3845 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 253 | Data Type: | UInt16 |
| Default: | 253 | Change: | Real-time modification |

**Value Range:**

0 to 253

**Description**

Defines the interpolation period time unit.
The value "–3" indicates the unit ms. Therefore, the actual interpolation period (ms) is the value of 60C2.01h.

### 60C5h Max. acceleration

| | | | |
|---|---|---|---|
| Address: | 0x360C | | |
| Min.: | 0 | Unit: | Reference unit/s$^2$ |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 4294967295 | Change: | Real-time modification |

**Value Range:**

0 reference unit/s$^2$ to 4294967295 reference units/s$^2$

**Description**

Defines the maximum permissible deceleration in the profile position mode, profile velocity mode, and homing mode.
For 609Ah, the setpoint 0 will be forcibly changed to 1.

**60C6h** **Max. deceleration**

Address:

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | Reference unit/s2 |
| Max.: | 4.294967295E9 | Data Type: | UInt32 |
| Default: | 4.294967295E9 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

Defines the maximum permissible deceleration in the profile position mode, profile velocity mode, and homing mode.
For 609Ah, the setpoint 0 will be forcibly changed to 1.

**60D5h** **Touch probe 1 positive edge counter**

Address: 0x362C

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

The counting value is added by "1" each time this object is triggered.

**60D6h** **Touch probe 1 negative edge counter**

Address: 0x362E

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

The counting value is added by "1" each time this object is triggered.

**60D7h** **Touch probe 2 positive edge counter**

Address: 0x3630

| | | | |
|---|---|---|---|
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

The counting value is added by "2" each time this object is triggered.

### 60D8h Touch probe 2 negative edge counter

| | | | |
|---|---|---|---|
| Address: | 0x3632 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 65535 | Data Type: | UInt16 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 65535

**Description**

The counting value is added by "2" each time this object is triggered.

### 60E0h Positive torque limit value

| | | | |
|---|---|---|---|
| Address: | 0x3642 | | |
| Min.: | 0 | Unit: | 0.001 |
| Max.: | 4000 | Data Type: | UInt16 |
| Default: | 3500 | Change: | Real-time modification |

**Value Range:**

0.000 to 4000.000

**Description**

Defines the maximum torque limit of the servo drive in the forward direction.

### 60E1h Negative torque limit value

| | | | |
|---|---|---|---|
| Address: | 0x3644 | | |
| Min.: | 0 | Unit: | 0.001 |
| Max.: | 4000 | Data Type: | UInt16 |
| Default: | 3500 | Change: | Real-time modification |

**Value Range:**

0.000 to 4000.000

**Description**

Defines the maximum torque limit of the servo drive in the reverse direction.

### 60F4h Position deviation

| | | | |
|---|---|---|---|
| Address: | 0x366A | | |
| Min.: | -2147483648 | Unit: | Reference unit |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

-2147483648 to 2147483647

**Description**

Indicates the position deviation (reference unit).

**60FCh** **Position reference**

| | | | |
|---|---|---|---|
| Address: | 0x367A | | |
| Min.: | -2147483648 | Unit: | Pulse |
| Max.: | 2147483647 | Data Type: | Int32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

–2147483648 to +2147483647

**Description**

Indicates the position reference (encoder unit).

If no warning is detected when the S-ON signal is active, the relation between the position reference in reference unit and that in encoder unit is as follows:

60FCh (in encoder unit) = 6062h (in reference unit) x 6091h

**60FDh** **DI state**

| | | | |
|---|---|---|---|
| Address: | 0x367C | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Unchangeable |

**Value Range:**

0 to 4294967295

**Description**

Indicates current DI logic of the drive.

0: Inactive
1: Active
The signal indicated by each bit is described as follows:

| bit | Function |
|---|---|
| 0 | Negative limit switch |
| 1 | Positive limit switch |
| 2 | Home switch |
| 3 to 15 | N/A |
| 16 | DI1 input |
| 17 | DI2 input |
| 18 | DI3 input |
| 19 | DI4 input |
| 20 | DI5 input |
| 21 | DI6 input |
| 22 | DI7 input |
| 23 | DI8 input |
| 24 to 26 | N/A |
| 27 | STO1 signal input |
| 28 | STO2 signal input |
| 29 | EDM output active |
| 30 | Z signal active |
| 31 | N/A |

### 60FFh Target velocity

Address: 0x3680
Min.: -2147483648    Unit: Reference unit/s
Max.: 2147483647    Data Type: Int32
Default: 0    Change: Real-time modification

**Value Range:**

–2147483648 to +2147483647

**Description**

Defines the target speed in the profile velocity mode.

### 60FE.01h Physical outputs

Address: 0x3781
Min.: 0    Unit: -
Max.: 4294967295    Data Type: UInt32
Default: 0    Change: Real-time modification

**Value Range:**

0 to 4294967295

**Description**

Indicates the DO logic.

The signal indicated by each bit is described as follows:

| bit | Description |
|---|---|
| 0 to 15 | N/A |
| 16 | Forced DO1 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 16 of 60FE.02h is set to 1 |
| 17 | Forced DO2 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 17 of 60FE.02h is set to 1 |
| 18 | Forced DO3 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 18 of 60FE.02h is set to 1 |
| 19 | Forced DO4 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 19 of 60FE.02h is set to 1 |
| 20 | Forced DO5 output (0: OFF; 1: ON) only when function 31 is assigned to DO and bit 20 of 60FE.02h is set to 1 |
| 21 to 25 | N/A |
| 26 | Switched between P and PI for gain switchover only when bit 26 of 60FE.02h is set to 1 |
| 27 to 31 | N/A |

**60FE.02h Bitmask**

| | | | |
|---|---|---|---|
| Address: | 0x3881 | | |
| Min.: | 0 | Unit: | - |
| Max.: | 4294967295 | Data Type: | UInt32 |
| Default: | 0 | Change: | Real-time modification |

**Value Range:**

0 to 4294967295

**Description**

0 to 15: N/A

16: Forced DO1 output enable

17: Forced DO2 output enable

18: Forced DO3 output enable

19: Forced DO4 output enable

20: Forced DO5 output enable

19 to 25: N/A

26: P/PI switchover enable

27 to 31: N/A

# 7 List of Parameters

## 7.1 Parameter Group H00

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H00.00 | 0x0000 | Motor code | 0 to 65535 | 14101 | - | At stop | " H00.00" on page 118 |
| H00.02 | 0x0002 | Customized No. | 0 to $2^{32}$ - 1 | 0 | - | Unchangeable | " H00.02" on page 118 |
| H00.04 | 0x0004 | Encoder version | 0.0 to 6553.5 | 0 | - | Unchangeable | " H00.04" on page 118 |
| H00.05 | 0x0005 | Serial-type motor code | 0 to 65535 | 0 | - | Unchangeable | " H00.05" on page 118 |
| H00.06 | 0x0006 | FPGA customized SN | 0.00 to 655.35 | 0 | - | Unchangeable | " H00.06" on page 119 |
| H00.07 | 0x0007 | STO version | 0.00 to 655.35 | 0 | - | Unchangeable | " H00.07" on page 119 |
| H00.08 | 0x0008 | Serial encoder type | 0 to 65535 | 0 | - | At stop | " H00.08" on page 119 |

## 7.2 Parameter Group H01

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H01.00 | 0x0100 | MCU software version | 0.0 to 6553.5 | 0 | - | Unchangeable | " H01.00" on page 120 |
| H01.01 | 0x0101 | FPGA software version | 0.0 to 6553.5 | 0 | - | Unchangeable | " H01.01" on page 120 |
| H01.02 | 0x0102 | Servo drive series No. | 0 to 65535 | 0 | - | Unchangeable | " H01.02" on page 120 |
| H01.06 | 0x0106 | Board software version | 0 to 6554 | 0 | - | Unchangeable | " H01.06" on page 120 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H01.10 | 0x010A | Drive series No. | 2: S1R6<br>3: S2R8<br>5: S5R5<br>60005: S6R6<br>6: S7R6<br>7: S012<br>8: S018<br>9: S022<br>10: S027<br>10001: T3R5<br>10002: T5R4<br>10003: T8R4<br>10004: T012<br>10005: T017<br>10006: T021<br>10007: T026 | 3 | - | At stop | " H01.10" on page 121 |
| H01.11 | 0x010B | DC-AC voltage class | 0 V to 65535 V | 220 | V | Unchangeable | " H01.11" on page 121 |
| H01.12 | 0x010C | Rated power of the drive | 0.00 kW–10737418.24 kW | 0.4 | kW | Unchangeable | " H01.12" on page 121 |
| H01.14 | 0x010E | Max. output power of the drive | 0.00 kW–10737418.24 kW | 0.4 | kW | Unchangeable | " H01.14" on page 122 |
| H01.16 | 0x0110 | Rated output current of the drive | 0.00 A to 10737418.24 A | 2.8 | A | Unchangeable | " H01.16" on page 122 |
| H01.18 | 0x0112 | Max. output current of the drive | 0.00 A to 10737418.24 A | 10.1 | A | Unchangeable | " H01.18" on page 122 |
| H01.40 | 0x0128 | DC bus overvoltage protection threshold | 0 V to 2000 V | 420 | V | Immediately | " H01.40" on page 122 |
| H01.75 | 0x014B | Current loop amplification factor | 0.00 to 655.35 | 1 | - | Immediately | " H01.75" on page 123 |
| H01.89 | 0x0159 | Junction temperature parameter version | 0 to 65.535 | 0 | - | Unchangeable | " H01.89" on page 123 |

# 7.3 Parameter Group H02

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H02.00 | 0x0200 | Control mode | 0: Speed control mode<br>1: Position control mode<br>2: Torque control mode<br>3: Torque/Speed control mode<br>4: Speed/Position control mode<br>5: Torque/Position control mode<br>6: Torque/Speed/Position compound mode<br>7: Process segment | 1 | - | At stop | " H02.00" on page 123 |
| H02.01 | 0x0201 | Absolute system selection | 0: Incremental mode<br>1: Absolute position linear mode<br>2: Absolute position rotation mode<br>3: Absolute position linear mode (without encoder overflow warning)<br>4: Absolute position single-turn mode | 0 | - | At stop | " H02.01" on page 124 |
| H02.02 | 0x0202 | Direction of rotation | 0: Counterclockwise (CCW) as forward direction<br>1: Clockwise (CW) as forward direction | 0 | - | At stop | " H02.02" on page 124 |
| H02.03 | 0x0203 | Output pulse phase | 0: Phase A leads phase B<br>1: Phase A lags behind phase B | 0 | - | At stop | " H02.03" on page 125 |
| H02.05 | 0x0205 | Stop mode at S-ON OFF | -4: Stop based on ramp 2, keeping dynamic braking state<br>-3: Stop at zero speed, keeping dynamic braking state<br>-2: Stop based on ramp 1, keeping dynamic braking state<br>-1: Dynamic braking stop, keeping dynamic braking state<br>0: Coast to stop, keeping de-energized state<br>1: Stop based on ramp 1, keeping de-energized state<br>2: Dynamic braking stop, keeping de-energized state | 0 | - | Immediately | " H02.05" on page 126 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H02.06 | 0x0206 | Stop mode at No.2 fault | -5: Stop at zero speed, keeping dynamic braking state<br>-4: Stop at emergency stop torque, keeping dynamic braking state<br>-3: Stop based on ramp 2, keeping dynamic braking state<br>-2: Stop based on ramp 1, keeping dynamic braking state<br>-1: Dynamic braking stop, keeping dynamic braking state<br>0: Coast to stop, keeping de-energized state<br>1: Stop based on ramp 1, keeping de-energized state<br>2: Stop based on ramp 2, keeping de-energized state<br>3: Stop at emergency stop torque, keeping de-energized state<br>4: Dynamic braking stop, keeping de-energized state | 2 | - | Immediately | " H02.06" on page 126 |
| H02.07 | 0x0207 | Stop mode at overtravel | 0: Coast to stop, keeping de-energized state<br>1: Stop at zero speed, keeping position lock state<br>2: Stop at zero speed, keeping de-energized state<br>3: Stop based on ramp 2, keeping de-energized state<br>4: Stop based on ramp 2, keeping position lock state<br>5: Dynamic braking stop, keeping de-energized state<br>6: Dynamic braking stop, keeping dynamic braking state<br>7: Not responding to overtravel | 1 | - | At stop | " H02.07" on page 126 |
| H02.08 | 0x0208 | Stop mode at No.1 fault | 0: Coast to stop, keeping de-energized state<br>1: Dynamic braking stop, keeping de-energized state<br>2: Dynamic braking stop, keeping dynamic braking state | 2 | - | At stop | " H02.08" on page 127 |
| H02.09 | 0x0209 | Delay from brake output ON to command received | 0 ms to 500 ms | 250 | ms | Immediately | " H02.09" on page 127 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H02.10 | 0x020A | Delay from brake output off to motor de-energized | 50 ms to 1000 ms | 150 | ms | Immediately | " H02.10" on page 128 |
| H02.11 | 0x020B | Motor speed threshold at brake output OFF in rotation state | 20 rpm to 3000 rpm | 30 | rpm | Immediately | " H02.11" on page 128 |
| H02.12 | 0x020C | Delay from S-ON OFF to brake output OFF in rotation state | 1 ms to 65535 ms | 500 | ms | Immediately | " H02.12" on page 128 |
| H02.15 | 0x020F | Warning display on the keypad | 0: Output warning information immediately<br>1: Not output warning information | 0 | - | Immediately | " H02.15" on page 128 |
| H02.17 | 0x0211 | Stop mode upon main circuit power failure | 0: Keep current action<br>1: Stop upon fault as defined by H02.06<br>2: Stop at S-ON OFF as defined by H02.05<br>3: Stop quickly as defined by H02.18 | 2 | - | Immediately | " H02.17" on page 129 |
| H02.18 | 0x0212 | Quick stop mode | 0: Coast to stop, keeping de-energized state<br>1: Stop based on ramp 1, keeping de-energized state<br>2: Stop based on ramp 2, keeping de-energized state<br>3: Stop at emergency stop torque, keeping de-energized status<br>5: Stop based on ramp 1, keeping position lock state<br>6: Stop based on ramp 2, keeping position lock state<br>7: Stop at emergency stop torque, keeping position lock state | 2 | - | Immediately | " H02.18" on page 129 |
| H02.21 | 0x0215 | Permissible minimum resistance of regenerative resistor | 1 Ω to 1000 Ω | 40 | Ω | Unchangeable | " H02.21" on page 129 |
| H02.23 | 0x0217 | Resistance of built-in regenerative resistor | 0 Ω to 65535 Ω | 50 | Ω | Unchangeable | " H02.23" on page 130 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H02.24 | 0x0218 | Resistor heat dissipation coefficient | 10% to 100% | 30 | % | Immediately | " H02.24" on page 131 |
| H02.25 | 0x0219 | Regenerative resistor type | 0: Built-in<br>1: External, natural cooling<br>2: External, forced air cooling 3: No resistor needed | 3 | - | Immediately | " H02.25" on page 132 |
| H02.26 | 0x021A | Power of external regenerative resistor | 1 W–65535 W | 40 | W | Immediately | " H02.26" on page 132 |
| H02.27 | 0x021B | Resistance of external regenerative resistor | 15 Ω to 1000 Ω | 50 | Ω | Immediately | " H02.27" on page 132 |
| H02.30 | 0x021E | User password | 0 to 65535 | 0 | - | Immediately | " H02.30" on page 132 |
| H02.31 | 0x021F | System parameter initialization | 0: No operation<br>1: Restore default settings<br>2: Clear fault records | 0 | - | At stop | " H02.31" on page 133 |
| H02.32 | 0x0220 | Selection of parameters in group H0b | 0 to 99 | 50 | - | Immediately | " H02.32" on page 133 |
| H02.35 | 0x0223 | Keypad data update frequency | 0 Hz to 20 Hz | 0 | Hz | Immediately | " H02.35" on page 133 |
| H02.41 | 0x0229 | Manufacturer password | 0 to 65535 | 0 | - | Immediately | " H02.41" on page 133 |

# 7.4 Parameter Group H03

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H03.00 | 0x0300 | DI function allocation 1 (activated upon power-on) | 0: Corresponding to null<br>1: Corresponding to FunIN.1<br>2: Corresponding to FunIN.2<br>4: Corresponding to FunIN.3<br>8: Corresponding to FunIN.4<br>16: Corresponding to FunIN.5<br>32: Corresponding to FunIN.6<br>64: Corresponding to FunIN.7<br>128: Corresponding to FunIN.8<br>256: Corresponding to FunIN.9<br>512: Corresponding to FunIN.10<br>1024: Corresponding to FunIN.11<br>2048: Corresponding to FunIN.12<br>4096: Corresponding to FunIN.13<br>8192: Corresponding to FunIN.14<br>16384: Corresponding to FunIN.15<br>32768: Corresponding to FunIN.16 | 0 | - | Immediately | " H03.00" on page 134 |
| H03.01 | 0x0301 | DI function allocation 2 (activated upon power-on) | 0: Corresponding to null<br>1: Corresponding to FunIN.17<br>2: Corresponding to FunIN.18<br>4: Corresponding to FunIN.19<br>8: Corresponding to FunIN.20<br>16: Corresponding to FunIN.21<br>32: Corresponding to FunIN.22<br>64: Corresponding to FunIN.23<br>128: Corresponding to FunIN.24<br>256: Corresponding to FunIN.25<br>512: Corresponding to FunIN.26<br>1024: Corresponding to FunIN.27<br>2048: Corresponding to FunIN.28<br>4096: Corresponding to FunIN.29<br>16384: Corresponding to FunIN.31<br>32768: Corresponding to FunIN.32 | 0 | - | Immediately | " H03.01" on page 134 |
| H03.02 | 0x0302 | DI1 function selection | See " H03.02" on page 135 for details. | 14 | - | Immediately | " H03.02" on page 135 |
| H03.03 | 0x0303 | DI1 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.03" on page 137 |
| H03.04 | 0x0304 | DI2 function selection | See " H03.02" on page 135 for details. | 15 | - | Immediately | " H03.04" on page 137 |
| H03.05 | 0x0305 | DI2 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.05" on page 137 |
| H03.06 | 0x0306 | DI3 function selection | See " H03.02" on page 135 for details. | 13 | - | Immediately | " H03.06" on page 137 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H03.07 | 0x0307 | DI3 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.07" on page 138 |
| H03.08 | 0x0308 | DI4 function selection | See " H03.02" on page 135 for details. | 2 | - | Immediately | " H03.08" on page 138 |
| H03.09 | 0x0309 | DI4 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.09" on page 138 |
| H03.10 | 0x030A | DI5 function selection | See " H03.02" on page 135 for details. | 1 | - | Immediately | " H03.10" on page 138 |
| H03.11 | 0x030B | DI5 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.11" on page 139 |
| H03.12 | 0x030C | DI6 function selection | See " H03.02" on page 135 for details. | 0 | - | Immediately | " H03.12" on page 139 |
| H03.13 | 0x030D | DI6 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.13" on page 139 |
| H03.14 | 0x030E | DI7 function selection | See " H03.02" on page 135 for details. | 45 | - | Immediately | " H03.14" on page 139 |
| H03.15 | 0x030F | DI7 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.15" on page 140 |
| H03.16 | 0x0310 | DI8 function selection | See " H03.02" on page 135 for details. | 31 | - | Immediately | " H03.16" on page 140 |
| H03.17 | 0x0311 | DI8 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H03.17" on page 140 |
| H03.34 | 0x0322 | DI function allocation 3 (activated upon power-on) | 0: Corresponding to null<br>1: Corresponding to FunIN.33<br>2: Corresponding to FunIN.34<br>4: Corresponding to FunIN.35<br>8: Corresponding to FunIN.36<br>16: Corresponding to FunIN.37<br>32: Corresponding to FunIN.38<br>64: Corresponding to FunIN.39<br>128: Corresponding to FunIN.40<br>256: Corresponding to FunIN.41<br>512: Corresponding to FunIN.42<br>1024: Corresponding to FunIN.43<br>2048: Corresponding to FunIN.44<br>4096: Corresponding to FunIN.45<br>8192: Corresponding to FunIN.46<br>16384: Corresponding to FunIN.47<br>32768: Corresponding to FunIN.48 | 0 | - | Immediately | " H03.34" on page 140 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H03.35 | 0x0323 | DI function allocation 4 (activated upon power-on) | 0: Corresponding to null<br>1: Corresponding to FunIN.49<br>2: Corresponding to FunIN.50<br>4: Corresponding to FunIN.51<br>8: Corresponding to FunIN.52<br>16: Corresponding to FunIN.53<br>32: Corresponding to FunIN.54<br>64: Corresponding to FunIN.55<br>128: Corresponding to FunIN.56<br>256: Corresponding to FunIN.57<br>512: Corresponding to FunIN.58<br>1024: Corresponding to FunIN.59<br>2048: Corresponding to FunIN.60<br>4096: Corresponding to FunIN.61<br>8192: Corresponding to FunIN.62<br>16384: Corresponding to FunIN.63 | 0 | - | Immediately | " H03.35" on page 141 |
| H03.50 | 0x0332 | Voltage-type AI1 offset | -5000 mV to 5000 mV | 0 | mV | Immediately | " H03.50" on page 142 |
| H03.51 | 0x0333 | Voltage-type AI1 input filter time constant | 0.00 ms to 655.35 ms | 2 | ms | Immediately | " H03.51" on page 142 |
| H03.53 | 0x0335 | Voltage-type AI1 dead zone | 0 mV to 1000 mV | 10 | mV | Immediately | " H03.53" on page 143 |
| H03.54 | 0x0336 | Voltage-type AI1 zero drift | -5000 mV to 5000 mV | 0 | mV | Immediately | " H03.54" on page 143 |
| H03.60 | 0x033C | DI1 filter time | 0.00 ms to 500.00 ms | 3.00 | ms | Immediately | " H03.60" on page 143 |
| H03.61 | 0x033D | DI2 filter time | 0.00 ms to 500.00 ms | 3.00 | ms | Immediately | " H03.61" on page 143 |
| H03.62 | 0x033E | DI3 filter time | 0.00 ms to 500.00 ms | 3.00 | ms | Immediately | " H03.62" on page 144 |
| H03.63 | 0x033F | DI4 filter time | 0.00 ms to 500.00 ms | 3.00 | ms | Immediately | " H03.63" on page 144 |
| H03.64 | 0x0340 | DI5 filter time | 0.00 ms to 500.00 ms | 3.00 | ms | Immediately | " H03.64" on page 144 |
| H03.65 | 0x0341 | DI6 filter time | 0.00 ms to 500.00 ms | 3.00 | ms | Immediately | " H03.65" on page 144 |
| H03.66 | 0x0342 | DI7 filter time | 0.00 ms to 500.00 ms | 0.00 | ms | Immediately | " H03.66" on page 145 |
| H03.67 | 0x0343 | DI8 filter time | 0.00 ms to 500.00 ms | 3.00 | ms | Immediately | " H03.67" on page 145 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H03.80 | 0x0350 | Speed corresponding to analog 10 V | 0 rpm to 10000 rpm | 3000 | rpm | At stop | " H03.80" on page 145 |
| H03.81 | 0x0351 | Torque corresponding to analog 10 V | 1 to 8 | 1 | Multiplier | At stop | " H03.81" on page 146 |

## 7.5 Parameter Group H04

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H04.00 | 0x0400 | DO1 function selection | 0: No function<br>1: Servo ready<br>2: Motor rotation signal<br>3: Zero speed signal<br>4: Speed matching signal<br>5: Positioning completed<br>6: Positioning near<br>7: Torque limited signal<br>8: Speed limited signal<br>9: Braking<br>10: Warning<br>11: Fault<br>15: Interrupt positioning completed<br>16: Home found<br>17: Electrical homing completed<br>18: Torque reached signal<br>19: Speed reached signal<br>21: Enable completed<br>22: Internal command completed<br>23: Writing next command allowed<br>24: Internal motion completed<br>25: Comparison output<br>26: Closed loop state<br>30: Warning or fault output<br>31: Communication-forced DO<br>32: EDM output | 1 | - | Immediately | " H04.00" on page 146 |
| H04.01 | 0x0401 | DO1 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H04.01" on page 147 |
| H04.02 | 0x0402 | DO2 function selection | See " H04.00" on page 146 for details. | 9 | - | Immediately | " H04.02" on page 147 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H04.03 | 0x0403 | DO2 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H04.03" on page 147 |
| H04.04 | 0x0404 | DO3 function selection | See " H04.00" on page 146 for details. | 0 | - | Immediately | " H04.04" on page 148 |
| H04.05 | 0x0405 | DO3 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H04.05" on page 148 |
| H04.06 | 0x0406 | DO4 function selection | See " H04.00" on page 146 for details. | 11 | - | Immediately | " H04.06" on page 148 |
| H04.07 | 0x0407 | DO4 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H04.07" on page 148 |
| H04.08 | 0x0408 | DO5 function selection | See " H04.00" on page 146 for details. | 16 | - | Immediately | " H04.08" on page 149 |
| H04.09 | 0x0409 | DO5 logic selection | 0: Normally open<br>1: Closed | 0 | - | Immediately | " H04.09" on page 149 |
| H04.22 | 0x0416 | DO source selection | bit0: DO1<br>0: DO1 function output<br>1: Bit 0 of H31.04 set through communication<br>bit1: DO2<br>0: DO2 function output<br>1: Bit 1 of H31.04 set through communication<br>bit2: DO3<br>0: DO3 function output<br>1: Bit 2 of H31.04 set through communication<br>bit3: DO4<br>0: DO4 function output<br>1: Bit 3 of H31.04 set through communication<br>bit4: DO5<br>0: DO5 function output<br>1: Bit 4 of H31.04 set through communication | 0 | - | Immediately | " H04.22" on page 149 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H04.23 | 0x0417 | Communication-forced DO logic in non-OP status | bit0: DO1<br>0: Status unchanged<br>1: No output<br>bit1: DO2<br>0: Status unchanged<br>1: No output<br>bit2: DO3<br>0: Status unchanged<br>1: No output<br>bit3: DO4<br>0: Status unchanged<br>1: No output<br>bit4: DO5<br>0: Status unchanged<br>1: No output | 0 | - | Immediately | " H04.23" on page 150 |
| H04.50 | 0x0432 | AO1 signal selection | 0: Motor speed (1 V/1000 RPM)<br>1: Speed reference (1 V/1000 RPM)<br>2: Torque reference (1 V/100 x Rated torque)<br>3: Position deviation (0.5 mV/1 reference unit)<br>4: Position deviation (0.5 mV/1 encoder unit)<br>5: Position reference speed (1 V/1000 RPM)<br>6: Positioning completed<br>8: AI1 voltage<br>10: Defined by H31.05 | 0 | - | Immediately | " H04.50" on page 151 |
| H04.51 | 0x0433 | AO1 offset voltage | -10000 mV to 10000 mV | 0 | mV | Immediately | " H04.51" on page 151 |
| H04.52 | 0x0434 | AO1 multiplier | -99.99 to 99.99 | 1 | - | Immediately | " H04.52" on page 152 |

## 7.6 Parameter Group H05

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H05.00 | 0x0500 | Main position reference source | 0: Pulse reference<br>1: Step reference<br>2: Multi-position reference | 0 | - | Immediately | " H05.00" on page 152 |
| H05.01 | 0x0501 | Position pulse reference input terminal | 0: Low speed<br>1: High speed | 0 | - | At stop | " H05.01" on page 152 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H05.02 | 0x0502 | Pulses per revolution | 0 PPR to 4294967295 PPR | 0 | PPR | At stop | " H05.02" on page 153 |
| H05.04 | 0x0504 | First-order low-pass filter time constant | 0.0 ms to 6553.5 ms | 0 | ms | At stop | " H05.04" on page 153 |
| H05.05 | 0x0505 | Step reference | -9999 to +9999 | 50 | Reference unit | At stop | " H05.05" on page 154 |
| H05.06 | 0x0506 | Moving average filter time constant 1 | 0.0 ms to 128.0 ms | 0 | ms | At stop | " H05.06" on page 154 |
| H05.07 | 0x0507 | Electronic gear ratio 1 (numerator) | 1 to 1073741824 | 8388608 | - | Immediately | " H05.07" on page 154 |
| H05.09 | 0x0509 | Electronic gear ratio 1 (denominator) | 1 to 1073741824 | 10000 | - | Immediately | " H05.09" on page 155 |
| H05.11 | 0x050B | Electronic gear ratio 2 (numerator) | 1 to 1073741824 | 8388608 | - | Immediately | " H05.11" on page 155 |
| H05.13 | 0x050D | Electronic gear ratio 2 (denominator) | 1 to 1073741824 | 10000 | - | Immediately | " H05.13" on page 155 |
| H05.15 | 0x050F | Pulse reference form | 0: Direction + Pulse, positive logic<br>1: Direction + Pulse, negative logic<br>2: Phase A + phase B quadrature pulse, quadrupled frequency<br>3: CW + CCW | 0 | - | At stop | " H05.15" on page 155 |
| H05.16 | 0x0510 | Clear action | 0: Position deviation cleared upon S-OFF or non-RUN state<br>1: Position deviation cleared upon fault or non-RUN state<br>2: Position deviation cleared upon active DI function 35 or non-RUN state | 0 | - | At stop | " H05.16" on page 157 |
| H05.17 | 0x0511 | Number of encoder frequency-division pulses | 0 PPR to 4194303 PPR | 2500 | PPR | At stop | " H05.17" on page 157 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H05.19 | 0x0513 | Speed feedforward control | 0: No speed feedforward<br>1: Internal speed feedforward<br>2: External speed feedforward<br>3: Zero phase | 1 | - | At stop | " H05.19" on page 158 |
| H05.20 | 0x0514 | Condition for COIN (positioning completed) signal output | See " H05.20" on page 158 | 0 | - | Immediately | " H05.20" on page 158 |
| H05.21 | 0x0515 | Threshold of positioning completed | 1 to 65535 | 5872 | Encoder unit | Immediately | " H05.21" on page 159 |
| H05.22 | 0x0516 | Proximity threshold | 1 to 65535 | 65535 | Encoder unit | Immediately | " H05.22" on page 160 |
| H05.24 | 0x0518 | Displacement of interrupt positioning | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H05.24" on page 160 |
| H05.26 | 0x051A | Constant operating speed in interrupt positioning | 0 rpm to 10000 rpm | 200 | rpm | Immediately | " H05.26" on page 160 |
| H05.27 | 0x051B | Acceleration/ Deceleration time of interrupt positioning | 0 ms to 65535 ms | 10 | ms | Immediately | " H05.27" on page 160 |
| H05.29 | 0x051D | Interrupt positioning cancel signal | 0: Disable<br>1: Enable | 1 | - | Immediately | " H05.29" on page 161 |
| H05.30 | 0x051E | Homing selection | 0: Disabled<br>1: Homing enabled through the HomingStart signal input from DI<br>2: Electrical homing enabled through the HomingStart signal input from DI<br>3: Homing started immediately upon power-on<br>4: Homing executed immediately<br>5: Electrical homing started<br>6: Current position as home<br>8: D-triggered position as home | 0 | - | Immediately | " H05.30" on page 161 |
| H05.31 | 0x051F | Homing mode | See " H05.31" on page 161 | 0 | - | Immediately | " H05.31" on page 161 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H05.32 | 0x0520 | Speed in high-speed searching for the home switch signal | 0 rpm to 3000 rpm | 100 | rpm | Immediately | " H05.32" on page 162 |
| H05.33 | 0x0521 | Speed in low-speed searching for the home switch signal | 0 rpm to 1000 rpm | 10 | rpm | Immediately | " H05.33" on page 162 |
| H05.34 | 0x0522 | Acceleration/ Deceleration time during homing | 0 ms to 1000 ms | 1000 | ms | Immediately | " H05.34" on page 163 |
| H05.35 | 0x0523 | Homing time limit | 0 ms to 65535 ms | 10000 | ms | Immediately | " H05.35" on page 163 |
| H05.36 | 0x0524 | Mechanical home offset | -2147483648 to 2147483647 | 0 | Reference unit | Immediately | " H05.36" on page 163 |
| H05.38 | 0x0526 | Frequency-division output source | 0: Encoder frequency-division output<br>1: Pulse reference synchronous output<br>2: Frequency-division output inhibited<br>3: Second encoder frequency-division output | 0 | - | Immediately | " H05.38" on page 163 |
| H05.39 | 0x0527 | Electronic gear ratio switchover condition | 0: Switchover after position reference is kept 0 for 2.5 ms<br>1: Switched in real time | 0 | - | At stop | " H05.39" on page 164 |
| H05.40 | 0x0528 | Mechanical home offset and action upon overtravel | 0: H05.36 as the coordinate after homing, reverse homing applied after homing triggered again upon overtravel<br>1: H05.36 as the relative offset after homing, reverse homing applied after homing triggered again upon overtravel<br>2: H05.36 as the coordinate after homing, reverse homing applied automatically upon overtravel<br>3: H05.36 as the relative offset after homing, reverse homing applied automatically upon overtravel | 0 | - | Immediately | " H05.40" on page 164 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H05.41 | 0x0529 | Z pulse output polarity | Bit 0: Frequency-division Z output polarity<br>0: Positive (high level upon active Z pulse)<br>1: Negative (low level upon active Z pulse)<br>Bit 1: output polarity<br>0: Positive (high level upon active Z pulse)<br>1: Negative (low level upon active Z pulse)<br>bit2: Inner loop probe Z signal source<br>0: Motor Z signal<br>1: Frequency-division output Z signal | 1 | - | At stop | " H05.41" on page 165 |
| H05.43 | 0x052B | Position pulse edge | 0: Rising edge-triggered<br>1: Falling edge-triggered | 0 | - | Immediately | " H05.43" on page 166 |
| H05.44 | 0x052C | Numerator of frequency-division output reduction ratio | 1 to 16383 | 1 | - | At stop | " H05.44" on page 167 |
| H05.45 | 0x052D | Denominator of frequency-division output reduction ratio | 1 to 8191 | 1 | - | At stop | " H05.45" on page 167 |
| H05.46 | 0x052E | DI selection of multi-turn frequency-division Z starting point | 0: No selection<br>1: DI1<br>2: DI2<br>3: DI3<br>4: DI4<br>5: DI5<br>6: DI6<br>7: DI7<br>8: DI8 | 0 | - | Immediately | " H05.46" on page 167 |
| H05.47 | 0x052F | Frequency-division Z pulse width | 0 us to 400 us | 0 | us | Immediately | " H05.47" on page 168 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H05.50 | 0x0532 | Mechanical gear ratio in absolute position rotation mode (numerator) | 1 to 65535 | 1 | - | At stop | " H05.50" on page 168 |
| H05.51 | 0x0533 | Mechanical gear ratio in absolute position rotation mode (denominator) | 1 to 65535 | 1 | - | At stop | " H05.51" on page 168 |
| H05.52 | 0x0534 | Pulses per revolution of the load in absolute position rotation mode (low 32 bits) | 0 to 4294967295 | 0 | Encoder unit | At stop | " H05.52" on page 168 |
| H05.54 | 0x0536 | Pulses per revolution of the load in absolute position rotation mode (high 32 bits) | 0 to 4294967295 | 0 | Encoder unit | At stop | " H05.54" on page 169 |
| H05.58 | 0x053A | Torque threshold in homing upon hit-and-stop | 0.0% to 400.0% | 100 | % | Immediately | " H05.58" on page 169 |
| H05.59 | 0x053B | Positioning window time | 0 ms to 30000 ms | 0 | ms | Immediately | " H05.59" on page 169 |
| H05.60 | 0x053C | Hold time of positioning completed | 0 ms to 30000 ms | 0 | ms | Immediately | " H05.60" on page 170 |
| H05.66 | 0x0542 | Homing time unit | 0: 1 ms<br>1: 10 ms<br>2: 100 ms | 2 | - | At stop | " H05.66" on page 170 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H05.67 | 0x0543 | Offset between zero point and single-turn absolute position | -2147483648 to +2147483647 | 0 | 1 encoder unit | At stop | " H05.67" on page 170 |
| H05.70 | 0x0546 | Moving average filter time constant 2 | 0.0 ms to 1000.0 ms | 0 | ms | At stop | " H05.70" on page 170 |
| H05.71 | 0x0547 | Motor Z signal width | 1 ms to 100 ms | 4 | ms | Immediately | " H05.71" on page 171 |
| H05.72 | 0x0548 | External speed feedforward source selection | 0: 60B1<br>1: AI1 | 1 | - | Immediately | " H05.72" on page 171 |

## 7.7 Parameter Group H06

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H06.00 | 0x0600 | Source of main speed reference A | 0: Digital setting (H06.03)<br>1: AI1 | 0 | - | At stop | " H06.00" on page 171 |
| H06.01 | 0x0601 | Source of auxiliary speed reference B | 0: Digital setting (H06.03)<br>1: AI1<br>5: Multi-speed reference | 1 | - | At stop | " H06.01" on page 172 |
| H06.02 | 0x0602 | Speed reference source | 0: Source of main speed reference A<br>1: Source of auxiliary speed reference B<br>2: A+B<br>3: Switched between A and B<br>4: Communication | 0 | - | At stop | " H06.02" on page 172 |
| H06.03 | 0x0603 | Speed reference set through keypad | –10000 RPM to +10000 RPM | 200 | rpm | Immediately | " H06.03" on page 173 |
| H06.04 | 0x0604 | DI jog speed reference | 0 rpm to 10000 rpm | 150 | rpm | Immediately | " H06.04" on page 173 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H06.05 | 0x0605 | Acceleration ramp time of speed reference | 0 ms to 65535 ms | 0 | ms | Immediately | " H06.05" on page 173 |
| H06.06 | 0x0606 | Deceleration ramp time of speed reference | 0 ms to 65535 ms | 0 | ms | Immediately | " H06.06" on page 174 |
| H06.07 | 0x0607 | Maximum speed limit | 0 rpm to 10000 rpm | 7000 | rpm | Immediately | " H06.07" on page 174 |
| H06.08 | 0x0608 | Forward speed limit | 0 rpm to 10000 rpm | 7000 | rpm | Immediately | " H06.08" on page 174 |
| H06.09 | 0x0609 | Reverse speed limit | 0 rpm to 10000 rpm | 7000 | rpm | Immediately | " H06.09" on page 174 |
| H06.10 | 0x060A | Deceleration unit in emergency stop | 0: Multiplied by 1<br>1: Multiplied by 10<br>2: Multiplied by 100 | 0 | - | At stop | " H06.10" on page 175 |
| H06.11 | 0x060B | Torque feedforward control | 0: No torque feedforward<br>1: Internal torque feedforward | 1 | - | Immediately | " H06.11" on page 175 |
| H06.12 | 0x060C | Acceleration ramp time of jog speed | 0 ms to 65535 ms | 10 | ms | Immediately | " H06.12" on page 175 |
| H06.13 | 0x060D | Speed feedforward smoothing filter | 0 us to 65535 us | 0 | us | Immediately | " H06.13" on page 175 |
| H06.15 | 0x060F | Zero clamp speed threshold | 0 rpm to 10000 rpm | 10 | rpm | Immediately | " H06.15" on page 176 |
| H06.16 | 0x0610 | Threshold of TGON (motor rotation) signal | 0 rpm to 1000 rpm | 20 | rpm | Immediately | " H06.16" on page 176 |
| H06.17 | 0x0611 | Threshold of V-Cmp (speed matching) signal | 0 rpm to 100 rpm | 10 | rpm | Immediately | " H06.17" on page 176 |
| H06.18 | 0x0612 | Threshold of speed reach signal | 20 rpm to 10000 rpm | 1000 | rpm | Immediately | " H06.18" on page 176 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H06.19 | 0x0613 | Threshold of zero speed output signal | 1 rpm to 10000 rpm | 10 | rpm | Immediately | " H06.19" on page 177 |
| H06.40 | 0x0628 | Deceleration time of ramp 1 | 0 ms to 65535 ms | 0 | ms | Immediately | " H06.40" on page 177 |
| H06.41 | 0x0629 | Deceleration time of ramp 2 | 0 ms to 65535 ms | 0 | ms | Immediately | " H06.41" on page 177 |
| H06.50 | 0x0632 | Speed S-curve enable switch | 0: Disable<br>1: Enable | 1 | - | At stop | " H06.50" on page 177 |
| H06.51 | 0x0633 | Increasing acceleration 1 of speed S-curve acceleration segment | 0.0% to 100.0% | 50 | % | At stop | " H06.51" on page 178 |
| H06.52 | 0x0634 | Decreasing acceleration 1 of speed S-curve acceleration segment | 0.0% to 100.0% | 50 | % | At stop | " H06.52" on page 178 |
| H06.53 | 0x0635 | Decreasing deceleration 1 of speed S-curve deceleration segment | 0.0% to 100.0% | 50 | % | At stop | " H06.53" on page 178 |
| H06.54 | 0x0636 | Decreasing acceleration 1 of speed S-curve deceleration segment | 0.0% to 100.0% | 50 | % | At stop | " H06.54" on page 179 |
| H06.55 | 0x0637 | Increasing acceleration 2 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.55" on page 179 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H06.56 | 0x0638 | Decreasing acceleration 2 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | *" H06.56" on page 179* |
| H06.57 | 0x0639 | Decreasing deceleration 2 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | *" H06.57" on page 179* |
| H06.58 | 0x063A | Decreasing acceleration 2 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | *" H06.58" on page 180* |
| H06.59 | 0x063B | Increasing acceleration 3 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | *" H06.59" on page 180* |
| H06.60 | 0x063C | Decreasing acceleration 3 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | *" H06.60" on page 180* |
| H06.61 | 0x063D | Decreasing deceleration 3 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | *" H06.61" on page 181* |
| H06.62 | 0x063E | Decreasing acceleration 3 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | *" H06.62" on page 181* |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H06.63 | 0x063F | Increasing acceleration 4 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.63" on page 181 |
| H06.64 | 0x0640 | Decreasing acceleration 4 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.64" on page 182 |
| H06.65 | 0x0641 | Decreasing deceleration 4 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.65" on page 182 |
| H06.66 | 0x0642 | Decreasing acceleration 4 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.66" on page 182 |
| H06.67 | 0x0643 | Increasing acceleration 5 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.67" on page 183 |
| H06.68 | 0x0644 | Decreasing acceleration 5 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.68" on page 183 |
| H06.69 | 0x0645 | Decreasing deceleration 5 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.69" on page 183 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H06.70 | 0x0646 | Decreasing acceleration 5 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.70" on page 184 |
| H06.71 | 0x0647 | Increasing acceleration 6 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.71" on page 184 |
| H06.72 | 0x0648 | Decreasing acceleration 6 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.72" on page 184 |
| H06.73 | 0x0649 | Decreasing deceleration 6 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.73" on page 185 |
| H06.74 | 0x064A | Decreasing acceleration 6 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.74" on page 185 |
| H06.75 | 0x064B | Increasing acceleration 7 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.75" on page 185 |
| H06.76 | 0x064C | Decreasing acceleration 7 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.76" on page 186 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H06.77 | 0x064D | Decreasing deceleration 7 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.77" on page 186 |
| H06.78 | 0x064E | Decreasing acceleration 7 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.78" on page 186 |
| H06.79 | 0x064F | Increasing acceleration 8 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.79" on page 187 |
| H06.80 | 0x0650 | Decreasing acceleration 8 of speed S-curve acceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.80" on page 187 |
| H06.81 | 0x0651 | Decreasing deceleration 8 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.81" on page 187 |
| H06.82 | 0x0652 | Decreasing acceleration 8 of speed S-curve deceleration segment | 0.0% to 100.0% | 50.0 | % | At stop | " H06.82" on page 188 |

## 7.8 Parameter Group H07

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H07.00 | 0x0700 | Source of main torque reference A | 0: Keypad (H07.03)<br>1: AI1 | 0 | - | At stop | " H07.00" on page 188 |
| H07.01 | 0x0701 | Source of auxiliary torque reference B | 0: Keypad (H07.03)<br>1: AI1 | 1 | - | At stop | " H07.01" on page 188 |
| H07.02 | 0x0702 | Torque reference source | 0: Source of main torque reference A<br>1: Source of auxiliary torque reference B<br>2: Source of A+B<br>3: Switched between A and B<br>4: Communication | 0 | - | At stop | " H07.02" on page 189 |
| H07.03 | 0x0703 | Torque reference set through keypad | -400.0% to 400.0% | 0 | % | Immediately | " H07.03" on page 189 |
| H07.05 | 0x0705 | Torque reference filter time constant 1 | 0.00 ms to 30.00 ms | 0.5 | ms | Immediately | " H07.05" on page 190 |
| H07.06 | 0x0706 | Torque reference filter time constant 2 | 0.00 ms to 30.00 ms | 0.27 | ms | Immediately | " H07.06" on page 190 |
| H07.07 | 0x0707 | Torque limit source | 0: Positive/Negative internal torque limit<br>1: Internal or external limit as defined by DI<br>2: T_LMT<br>3: T_LMT or external limit as defined by DI (FunIN.16 or FunIN.17)<br>4: T_LMT or internal limit (FunIN.16 or FunIN.17) as defined by DI | 0 | - | Immediately | " H07.07" on page 190 |
| H07.08 | 0x0708 | T-LMT selection | 1: AI1 | 1 | - | Immediately | " H07.08" on page 190 |
| H07.09 | 0x0709 | Positive internal torque limit | 0.0% to 400.0% | 350 | % | Immediately | " H07.09" on page 191 |
| H07.10 | 0x070A | Negative internal torque limit | 0.0% to 400.0% | 350 | % | Immediately | " H07.10" on page 191 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H07.11 | 0x070B | Positive external torque limit | 0.0% to 400.0% | 350 | % | Immediately | " H07.11" on page 191 |
| H07.12 | 0x070C | Negative external torque limit | 0.0% to 400.0% | 350 | % | Immediately | " H07.12" on page 191 |
| H07.15 | 0x070F | Emergency-stop torque | 0.0% to 400.0% | 100 | % | Immediately | " H07.15" on page 192 |
| H07.17 | 0x0711 | Speed limit source | 0: Internal speed limit<br>1: V-LMT<br>2: H07.19 or H07.20 as defined by DI | 0 | - | Immediately | " H07.17" on page 192 |
| H07.18 | 0x0712 | V-LMT selection | 1: AI1 | 1 | - | Immediately | " H07.18" on page 192 |
| H07.19 | 0x0713 | Positive speed limit/Speed limit 1 in torque control | 0 rpm to 10000 rpm | 3000 | rpm | Immediately | " H07.19" on page 192 |
| H07.20 | 0x0714 | Negative speed limit/ Speed limit 2 in torque control | 0 rpm to 10000 rpm | 3000 | rpm | Immediately | " H07.20" on page 193 |
| H07.21 | 0x0715 | Base value for torque reach | 0.0% to 400.0% | 0 | % | Immediately | " H07.21" on page 193 |
| H07.22 | 0x0716 | Threshold of valid torque reach | 0.0% to 400.0% | 20 | % | Immediately | " H07.22" on page 193 |
| H07.23 | 0x0717 | Threshold of invalid torque reach | 0.0% to 400.0% | 10 | % | Immediately | " H07.23" on page 193 |
| H07.24 | 0x0718 | Field weakening depth | 60% to 115% | 115 | % | Immediately | " H07.24" on page 194 |
| H07.25 | 0x0719 | Max. permissible demagnetizing current | 0% to 300% | 100 | % | Immediately | " H07.25" on page 194 |
| H07.26 | 0x071A | Field weakening selection | 0: Disable<br>1: Enable | 1 | - | At stop | " H07.26" on page 194 |
| H07.27 | 0x071B | Field weakening gain | 0.001 Hz to 1.000 Hz | 0.03 | Hz | Immediately | " H07.27" on page 194 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H07.28 | 0x071C | Speed of field weakening point | 0 to 65535 | 0 | - | Unchangeable | " H07.28" on page 195 |
| H07.35 | 0x0723 | Torque non-standard feature enable | bit0: Motor output correction enable<br>bit1: Shield compensation data enable | 0 | - | At stop | " H07.35" on page 195 |
| H07.36 | 0x0724 | Time constant of low-pass filter 2 | 0.00 ms to 10.00 ms | 0 | ms | Immediately | " H07.36" on page 195 |
| H07.37 | 0x0725 | Torque reference filter selection | 0: First-order filter<br>1: Biquad filter | 0 | - | Immediately | " H07.37" on page 195 |
| H07.38 | 0x0726 | Biquad filter attenuation ratio | 0 to 50 | 16 | - | At stop | " H07.38" on page 196 |
| H07.40 | 0x0728 | Speed limit window in the torque control mode | 0 ms to 300 ms | 10 | ms | Immediately | " H07.40" on page 196 |

## 7.9 Parameter Group H08

| Param. No. | Comm. Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H08.00 | 0x0800 | Speed loop gain | 0.1 Hz to 2000.0 Hz | 40 | Hz | At once | " H08.00" on page 196 |
| H08.01 | 0x0801 | Speed loop integral time constant | 0.15 ms to 512.00 ms | 19.89 | ms | At once | " H08.01" on page 197 |
| H08.02 | 0x0802 | Position loop gain | 0.1 Hz to 2000.0 Hz | 64 | Hz | At once | " H08.02" on page 197 |
| H08.03 | 0x0803 | 2nd speed loop gain | 0.1 Hz to 2000.0 Hz | 75 | Hz | At once | " H08.03" on page 197 |
| H08.04 | 0x0804 | 2nd speed loop integral time constant | 0.15 ms to 512.00 ms | 10.61 | ms | At once | " H08.04" on page 198 |
| H08.05 | 0x0805 | 2nd position loop gain | 0.1 Hz to 2000.0 Hz | 120 | Hz | At once | " H08.05" on page 198 |
| H08.08 | 0x0808 | 2nd gain mode setting | 0: Fixed to the 1st gain, switched between P and PI as defined by bit26 of external 60FEh<br>1: Switched between the 1st and 2nd gain sets as defined by H08.09 | 1 | - | At once | " H08.08" on page 198 |

| Param. No. | Comm. Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H08.09 | 0x0809 | Gain switchover condition | 0: Fixed to the 1st gain set (PS)<br>1: Switched as defined by bit26 of 60FEh<br>2: Torque reference too large (PS)<br>3: Speed reference too large (PS)<br>4: Speed reference change rate too large (PS)<br>5: Speed reference low/high speed threshold (PS)<br>6: Position deviation too large (P)<br>7: Position reference available (P)<br>8: Positioning unfinished (P)<br>9: Actual speed (P)<br>10: Position reference + Actual speed (P) | 0 | - | At once | " H08.09" on page 198 |
| H08.10 | 0x080A | Gain switchover delay | 0.0 ms to 1000.0 ms | 5 | ms | At once | " H08.10" on page 200 |
| H08.11 | 0x080B | Gain switchover level | 0 to 20000 | 50 | - | At once | " H08.11" on page 201 |
| H08.12 | 0x080C | Gain switchover dead time | 0 to 20000 | 30 | - | At once | " H08.12" on page 201 |
| H08.13 | 0x080D | Position gain switchover time | 0.0 ms to 1000.0 ms | 3 | ms | At once | " H08.13" on page 201 |
| H08.15 | 0x080F | Load moment of inertia ratio | 0.00 to 120.00 | 1 | - | At once | " H08.15" on page 202 |
| H08.17 | 0x0811 | Zero phase delay | 0.0 ms to 4.0 ms | 0 | ms | At once | " H08.17" on page 202 |
| H08.18 | 0x0812 | Speed feedforward filter time constant | 0.00 ms to 64.00 ms | 0.5 | ms | At once | " H08.18" on page 202 |
| H08.19 | 0x0813 | Speed feedforward gain | 0.0% to 100.0% | 0 | % | At once | " H08.19" on page 202 |
| H08.20 | 0x0814 | Torque feedforward filter time constant | 0.00 ms to 64.00 ms | 0.5 | ms | At once | " H08.20" on page 203 |
| H08.21 | 0x0815 | Torque feedforward gain | 0.0% to 300.0% | 0 | % | At once | " H08.21" on page 203 |

| Param. No. | Comm. Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H08.22 | 0x0816 | Speed feedback filtering option | 0: Inhibited<br>1: 2 times<br>2: 4 times<br>3: 8 times<br>4: 16 times | 0 | - | At stop | " H08.22" on page 204 |
| H08.23 | 0x0817 | Cutoff frequency of speed feedback low-pass filter | 100 Hz to 8000 Hz | 8000 | Hz | At once | " H08.23" on page 204 |
| H08.24 | 0x0818 | PDFF control coefficient | 0.0% to 200.0% | 100 | % | At once | " H08.24" on page 204 |
| H08.27 | 0x081B | Speed observer cutoff frequency | 50 Hz to 600 Hz | 170 | Hz | At once | " H08.27" on page 205 |
| H08.28 | 0x081C | Speed observer inertia correction coefficient | 1% to 1600% | 100 | % | At once | " H08.28" on page 205 |
| H08.29 | 0x081D | Speed observer filter time | 0.00 ms to 10.00 ms | 0.8 | ms | At once | " H08.29" on page 205 |
| H08.31 | 0x081F | Disturbance cutoff frequency | 10 Hz to 4000 Hz | 600 | Hz | At once | " H08.31" on page 206 |
| H08.32 | 0x0820 | Disturbance compensation gain | 0% to 100% | 0 | % | At once | " H08.32" on page 206 |
| H08.33 | 0x0821 | Disturbance observer inertia correction coefficient | 1% to 1600% | 100 | % | At once | " H08.33" on page 206 |
| H08.37 | 0x0825 | Phase modulation for medium-frequency jitter suppression 2 | -90° to 90° | 0 | ° | At once | " H08.37" on page 207 |
| H08.38 | 0x0826 | Frequency of medium-frequency jitter suppression 2 | 0 Hz to 1000 Hz | 0 | Hz | At once | " H08.38" on page 207 |

| Param. No. | Comm. Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H08.39 | 0x0827 | Compensation gain of medium-frequency jitter suppression 2 | 0% to 300% | 0 | % | At once | " H08.39" on page 207 |
| H08.40 | 0x0828 | Speed observer selection | 0: Disable<br>1: Enable | 0 | - | At once | " H08.40" on page 207 |
| H08.42 | 0x082A | Model control selection | 0: Disable<br>1: Enable<br>2: Dual-inertia model | 0 | - | At once | " H08.42" on page 208 |
| H08.43 | 0x082B | Model gain | 0.1 to 2000.0 | 40 | - | At once | " H08.43" on page 208 |
| H08.46 | 0x082E | Feedforward value | 0.0 to 102.4 | 95 | - | At once | " H08.46" on page 208 |
| H08.53 | 0x0835 | Medium- and low-frequency jitter suppression frequency 3 | 0.0 Hz to 300.0 Hz | 0 | Hz | At once | " H08.53" on page 208 |
| H08.54 | 0x0836 | Medium- and low-frequency jitter suppression compensation 3 | 0% to 200% | 0 | % | At once | " H08.54" on page 209 |
| H08.56 | 0x0838 | Medium- and low-frequency jitter suppression phase modulation 3 | 0% to 600% | 100 | % | At once | " H08.56" on page 209 |
| H08.59 | 0x083B | Medium- and low-frequency jitter suppression frequency 4 | 0.0 Hz to 300.0 Hz | 0 | Hz | At once | " H08.59" on page 209 |
| H08.60 | 0x083C | Medium- and low-frequency jitter suppression compensation 4 | 0% to 200% | 0 | % | At once | " H08.60" on page 209 |

| Param. No. | Comm. Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H08.61 | 0x083D | Medium- and low-frequency jitter suppression phase modulation 4 | 0% to 600% | 100 | % | At once | " H08.61" on page 210 |
| H08.62 | 0x083E | Position loop integral time constant | 0.15 to 512.00 | 512 | - | At once | " H08.62" on page 210 |
| H08.63 | 0x083F | 2nd position loop integral time constant | 0.15 to 512.00 | 512 | - | At once | " H08.63" on page 210 |
| H08.64 | 0x0840 | Speed observer feedback source | 0: Disable<br>1: Enable | 0 | - | At once | " H08.64" on page 210 |
| H08.65 | 0x0841 | Zero deviation control selection | 0: Disable<br>1: Enable | 0 | - | At once | " H08.65" on page 211 |
| H08.66 | 0x0842 | Zero deviation control position average filter | 0.0 ms to 320.0 ms | 5 | ms | At once | " H08.66" on page 211 |
| H08.68 | 0x0844 | Speed feedforward of zero deviation control | 0.0% to 100.0% | 100 | % | At once | " H08.68" on page 211 |
| H08.69 | 0x0845 | Torque feedforward of zero deviation control | 0.0% to 100.0% | 100 | % | At once | " H08.69" on page 212 |
| H08.81 | 0x0851 | Anti-resonance frequency of dual-inertia model | 1.0 Hz to 400.0 Hz | 20 | Hz | At once | " H08.81" on page 212 |
| H08.82 | 0x0852 | Resonance frequency of dual-inertia model | 0.0 Hz to 6553.5 Hz | 0 | Hz | At once | " H08.82" on page 212 |
| H08.83 | 0x0853 | Dual-inertia model gain | 0.1/s to 300.0/s | 60 | 1/s | At once | " H08.83" on page 212 |
| H08.84 | 0x0854 | Inertia ratio of dual-inertia model | 0.00 to 120.00 | 1 | - | At once | " H08.84" on page 213 |

| Param. No. | Comm. Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H08.88 | 0x0858 | Speed feedforward value of dual-inertia model | 0.0 to 6553.5 | 100 | - | At once | " H08.88" on page 213 |
| H08.89 | 0x0859 | Torque feedforward value of dual-inertia model | 0.0 to 6553.5 | 100 | - | At once | " H08.89" on page 213 |

## 7.10 Parameter Group H09

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H09.00 | 0x0900 | Gain auto-tuning mode | 0: Disabled, manual gain tuning required<br>1: Enabled, gain parameters generated automatically based on the stiffness level<br>2: Positioning mode, gain parameters generated automatically based on the stiffness level<br>3: Interpolation mode+Inertia auto-tuning<br>4: Normal mode+Inertia auto-tuning<br>6: Quick positioning mode+Inertia auto-tuning | 4 | - | Immediately | " H09.00" on page 213 |
| H09.01 | 0x0901 | Stiffness level | 0 to 41 | 15 | - | Immediately | " H09.01" on page 214 |
| H09.02 | 0x0902 | Adaptive notch mode | 0: Adaptive notch no longer updated;<br>1: One adaptive notch activated (3rd notch)<br>2: Two adaptive notches activated (3rd and 4th notches)<br>3: Resonance point tested only (displayed in H09.24)<br>4: Adaptive notch cleared, values of 3rd and 4th notches restored to default | 3 | - | Immediately | " H09.02" on page 214 |
| H09.03 | 0x0903 | Online inertia auto-tuning mode | 0: Disabled<br>1: Enabled, changing slowly<br>2: Enabled, changing normally<br>3: Enabled, changing quickly | 2 | - | Immediately | " H09.03" on page 215 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H09.05 | 0x0905 | Offline inertia auto-tuning mode | 0: Bi-directional<br>1: Unidirectional | 1 | - | At stop | " H09.05" on page 215 |
| H09.06 | 0x0906 | Maximum speed of inertia auto-tuning | 100 rpm to 1000 rpm | 500 | rpm | At stop | " H09.06" on page 215 |
| H09.07 | 0x0907 | Time constant for accelerating to the max. speed during inertia auto-tuning | 20 ms to 800 ms | 125 | ms | At stop | " H09.07" on page 215 |
| H09.08 | 0x0908 | Interval time after an individual inertia auto-tuning | 50 ms to 10000 ms | 800 | ms | At stop | " H09.08" on page 216 |
| H09.09 | 0x0909 | Number of motor revolutions per inertia auto-tuning | 0.00 to 100.00 | 1 | - | Immediately | " H09.09" on page 216 |
| H09.11 | 0x090B | Vibration threshold | 0.0% to 100.0% | 5 | % | Immediately | " H09.11" on page 216 |
| H09.12 | 0x090C | Frequency of the 1st notch | 50 Hz to 8000 Hz | 8000 | Hz | Immediately | " H09.12" on page 217 |
| H09.13 | 0x090D | Width level of the 1st notch | 0 to 20 | 2 | - | Immediately | " H09.13" on page 217 |
| H09.14 | 0x090E | Depth level of the 1st notch | 0 to 99 | 0 | - | Immediately | " H09.14" on page 217 |
| H09.15 | 0x090F | Frequency of the 2nd notch | 50 Hz to 8000 Hz | 8000 | Hz | Immediately | " H09.15" on page 218 |
| H09.16 | 0x0910 | Width level of the 2nd notch | 0 to 20 | 2 | - | Immediately | " H09.16" on page 218 |
| H09.17 | 0x0911 | Depth level of the 2nd notch | 0 to 99 | 0 | - | Immediately | " H09.17" on page 218 |
| H09.18 | 0x0912 | Frequency of the 3rd notch | 50 Hz to 8000 Hz | 8000 | Hz | Immediately | " H09.18" on page 218 |
| H09.19 | 0x0913 | Width level of the 3rd notch | 0 to 20 | 2 | - | Immediately | " H09.19" on page 219 |
| H09.20 | 0x0914 | Depth level of the 3rd notch | 0 to 99 | 0 | - | Immediately | " H09.20" on page 219 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H09.21 | 0x0915 | Frequency of the 4th notch | 50 Hz to 8000 Hz | 8000 | Hz | Immediately | " H09.21" on page 219 |
| H09.22 | 0x0916 | Width level of the 4th notch | 0 to 20 | 2 | - | Immediately | " H09.22" on page 219 |
| H09.23 | 0x0917 | Depth level of the 4th notch | 0 to 99 | 0 | - | Immediately | " H09.23" on page 220 |
| H09.24 | 0x0918 | Auto-tuned resonance frequency | 0 Hz to 5000 Hz | 0 | Hz | Unchangeable | " H09.24" on page 220 |
| H09.26 | 0x091A | ITune response | 50.0% to 500.0% | 100 | % | Immediately | " H09.26" on page 220 |
| H09.27 | 0x091B | ITune mode | 0: Disabled<br>1: ITune mode 1<br>2: ITune mode 2 | 0 | - | Immediately | " H09.27" on page 220 |
| H09.28 | 0x091C | Minimum inertia ratio of ITune | 0.0% to 80.0% | 0 | % | Immediately | " H09.28" on page 221 |
| H09.29 | 0x091D | Maximum inertia ratio of ITune | 1.0% to 120.0% | 30 | % | Immediately | " H09.29" on page 221 |
| H09.32 | 0x0920 | Gravity compensation value | -100% to 100.0% | 0 | % | Immediately | " H09.32" on page 221 |
| H09.33 | 0x0921 | Positive friction compensation value | 0.0% to 100.0% | 0 | % | Immediately | " H09.33" on page 222 |
| H09.34 | 0x0922 | Negative friction compensation value | -100.0% to 0.0% | 0 | % | Immediately | " H09.34" on page 222 |
| H09.35 | 0x0923 | Friction compensation speed | 0.0 to 20.0 | 2 | - | Immediately | " H09.35" on page 222 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H09.36 | 0x0924 | Friction compensation speed | 0: Slow speed mode + Speed reference<br>1: Slow speed mode + Model speed<br>2: Slow speed mode + Speed feedback<br>3: Slow speed mode + Observe speed<br>16: High speed mode + Speed reference<br>17: High speed mode + Model speed<br>18: High speed mode + Speed feedback<br>19: High speed mode + Observe speed | 0 | - | Immediately | " H09.36" on page 222 |
| H09.37 | 0x0925 | Vibration monitoring time | 0 to 65535 | 600 | - | Immediately | " H09.37" on page 223 |
| H09.38 | 0x0926 | Frequency of low-frequency resonance suppression 1 at the mechanical end | 1.0 Hz to 100.0 Hz | 100 | Hz | Immediately | " H09.38" on page 223 |
| H09.39 | 0x0927 | Low-frequency resonance suppression 1 at the mechanical end | 0 to 3 | 2 | - | At stop | " H09.39" on page 223 |
| H09.44 | 0x092C | Frequency of low-frequency resonance suppression 2 at mechanical load end | 0.0 to 100.0 | 0 | - | Immediately | " H09.44" on page 224 |
| H09.45 | 0x092D | Responsiveness of low-frequency resonance suppression 2 at mechanical load end | 0.01 to 5.00 | 1 | - | Immediately | " H09.45" on page 224 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H09.47 | 0x092F | Width of low-frequency resonance suppression 2 at mechanical load end | 0.00 to 2.00 | 1 | - | Immediately | " H09.47" on page 224 |
| H09.49 | 0x0931 | Frequency of low-frequency resonance suppression 3 at mechanical load end | 0.0 to 100.0 | 0 | - | Immediately | " H09.49" on page 224 |
| H09.50 | 0x0932 | Responsiveness of low-frequency resonance suppression 3 at mechanical load end | 0.01 to 5.00 | 1 | - | Immediately | " H09.50" on page 225 |
| H09.52 | 0x0934 | Width of low-frequency resonance suppression 3 at mechanical load end | 0.00 to 2.00 | 1 | - | Immediately | " H09.52" on page 225 |
| H09.54 | 0x0936 | Vibration threshold | 0.0% to 300.0% | 50 | % | Immediately | " H09.54" on page 225 |
| H09.56 | 0x0938 | Max. overshoot allowed by ETune | 0 to 65535 | 2936 | - | Immediately | " H09.56" on page 225 |
| H09.57 | 0x0939 | STune resonance suppression switchover frequency | 0 Hz to 4000 Hz | 900 | Hz | Immediately | " H09.57" on page 226 |
| H09.58 | 0x093A | STune resonance suppression reset selection | 0: Disable<br>1: Enable | 0 | - | Immediately | " H09.58" on page 226 |

# 7.11 Parameter Group H0A

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0A.00 | 0x0A00 | Power input phase loss protection | 0: Enable<br>1: Disable | 0 | - | Immediately | " H0A.00" on page 226 |
| H0A.01 | 0x0A01 | Absolute position limit | 0: Disabled<br>1: Enabled<br>2: Enabled after homing | 0 | - | Immediately | " H0A.01" on page 227 |
| H0A.04 | 0x0A04 | Motor overload protection gain | 50 to 300 | 100 | - | Immediately | " H0A.04" on page 227 |
| H0A.08 | 0x0A08 | Overspeed threshold | 0 rpm to 20000 rpm | 0 | rpm | Immediately | " H0A.08" on page 227 |
| H0A.09 | 0x0A09 | Max. pulse input frequency in position control | 100 kHz to 8000 kHz | 8000 | kHz | At stop | " H0A.09" on page 228 |
| H0A.10 | 0x0A0A | Threshold of excessive local position deviation | 0 to 4294967295 | 27486951 | - | Immediately | " H0A.10" on page 228 |
| H0A.12 | 0x0A0C | Runaway protection | 0: Disable<br>1: Enable | 1 | - | Immediately | " H0A.12" on page 228 |
| H0A.17 | 0x0A11 | Reference pulse selection | 0: Pulse unit<br>1: Reference unit | 1 | - | At stop | " H0A.17" on page 229 |
| H0A.18 | 0x0A12 | IGBT over-temperature threshold | 120°C to 175°C | 140 | °C | Immediately | " H0A.18" on page 229 |
| H0A.19 | 0x0A13 | Filter time constant of touch probe 1 | 0.00 us to 6.30 us | 2 | us | Immediately | " H0A.19" on page 229 |
| H0A.20 | 0x0A14 | Filter time constant of touch probe 2 | 0.00 us to 6.30 us | 2 | us | Immediately | " H0A.20" on page 230 |
| H0A.23 | 0x0A17 | TZ signal filter time | 0 ns to 31 ns | 15 | 25 ns | At stop | " H0A.23" on page 230 |
| H0A.24 | 0x0A18 | Filter time constant of low-speed pulse input pin | 0 ns to 255 ns | 30 | 25 ns | At stop | " H0A.24" on page 230 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0A.25 | 0x0A19 | Speed display DO low-pass filter time | 0 ms to 5000 ms | 0 | ms | Immediately | " H0A.25" on page 231 |
| H0A.26 | 0x0A1A | Motor overload detection | 0: Show motor overload warning (E909.0) and fault (E620.0)<br>1: Hide motor overload warning (E909.0) and fault (E620.0) | 0 | - | Immediately | " H0A.26" on page 231 |
| H0A.27 | 0x0A1B | Average filter time for speed display DO | 0 ms to 100 ms | 50 | ms | Immediately | " H0A.27" on page 231 |
| H0A.29 | 0x0A1D | Fully closed-loop encoder (ABZ) filter time | bit0–bit7: Fully closed loop encoder (ABZ) pulse signal filtering time<br>bit8–bit15: Fully closed loop encoder (ABZ) wire breakage filter time | 4111 | 25 ns | At stop | " H0A.29" on page 231 |
| H0A.30 | 0x0A1E | Filter time constant of high-speed pulse input pin | 0 ns to 255 ns | 3 | ns | At stop | " H0A.30" on page 232 |
| H0A.32 | 0x0A20 | Motor stall over-temperature protection time window | 10 ms to 65535 ms | 200 | ms | Immediately | " H0A.32" on page 232 |
| H0A.33 | 0x0A21 | Motor stall over-temperature detection | 0: Hide<br>1: Enable | 1 | - | Immediately | " H0A.33" on page 232 |
| H0A.36 | 0x0A24 | Encoder multi-turn overflow fault selection | 0: Not hide<br>1: Hide | 0 | - | Immediately | " H0A.36" on page 233 |
| H0A.40 | 0x0A28 | Compensation function selection | bit00: Overtravel compensation<br>0: Enabled<br>1: Disabled<br>bit01: Touch probe rising edge compensation<br>0: Disabled<br>1: Enabled<br>bit02: Touch probe falling edge compensation<br>0: Disabled<br>1: Enabled<br>bit03: Touch probe edge solution<br>0: New solution<br>1: Old solution (same as SV660N) | 6 | - | At stop | " H0A.40" on page 233 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0A.41 | 0x0A29 | Forward position of software position limit | -2147483648 to 2147483647 | 2147483647 | Encoder unit | At stop | " H0A.41" on page 233 |
| H0A.43 | 0x0A2B | Reverse position of software position limit | -2147483648 to 2147483647 | -2147483648 | Encoder unit | At stop | " H0A.43" on page 234 |
| H0A.49 | 0x0A31 | Regenerative resistor overtemperature threshold | 100°C to 175°C | 140 | °C | Immediately | " H0A.49" on page 234 |
| H0A.50 | 0x0A32 | Encoder communication fault tolerance threshold | 0 to 31 | 5 | - | Immediately | " H0A.50" on page 234 |
| H0A.51 | 0x0A33 | Phase loss detection filter times | 3 ms to 36 ms | 20 | 55 ms | Immediately | " H0A.51" on page 235 |
| H0A.52 | 0x0A34 | Encoder temperature protection threshold | 0°C to 175°C | 125 | °C | Immediately | " H0A.52" on page 235 |
| H0A.53 | 0x0A35 | Touch probe DI ON compensation time | –3000 ns to 3000 ns | 200 | 25 ns | Immediately | " H0A.53" on page 235 |
| H0A.54 | 0x0A36 | Touch probe DI OFF compensation time | –3000 ns to 3000 ns | 1512 | 25 ns | Immediately | " H0A.54" on page 235 |
| H0A.55 | 0x0A37 | Runaway current threshold | 100.0% to 400.0% | 200 | % | Immediately | " H0A.55" on page 236 |
| H0A.56 | 0x0A38 | Fault reset delay | 0 ms to 60000 ms | 10000 | ms | Immediately | " H0A.56" on page 236 |
| H0A.57 | 0x0A39 | Runaway speed threshold | 1 rpm to 1000 rpm | 50 | rpm | Immediately | " H0A.57" on page 236 |
| H0A.58 | 0x0A3A | Runaway speed filter time | 0.1 ms to 100.0 ms | 2 | ms | Immediately | " H0A.58" on page 236 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0A.59 | 0x0A3B | Runaway protection detection time | 10 ms to 1000 ms | 30 | ms | Immediately | " H0A.59" on page 236 |
| H0A.60 | 0x0A3C | Black box function mode | 0: Disable<br>1: Any fault<br>2: Designated fault<br>3: Triggered based on designated condition | 1 | - | Immediately | " H0A.60" on page 237 |
| H0A.61 | 0x0A3D | Designated fault code | 0.0 to 6553.5 | 0 | - | Immediately | " H0A.61" on page 237 |
| H0A.62 | 0x0A3E | Trigger source | 0 to 25 | 0 | - | Immediately | " H0A.62" on page 237 |
| H0A.63 | 0x0A3F | Trigger level | -2147483648 to 2147483647 | 0 | - | Immediately | " H0A.63" on page 238 |
| H0A.65 | 0x0A41 | Trigger level | 0: Rising edge<br>1: Equal<br>2: Falling edge<br>3: Edge-triggered | 0 | - | Immediately | " H0A.65" on page 238 |
| H0A.66 | 0x0A42 | Trigger position | 0% to 100% | 75 | % | Immediately | " H0A.66" on page 238 |
| H0A.67 | 0x0A43 | Sampling frequency | 0: Current loop<br>1: Position loop<br>2: Main cycle | 0 | - | Immediately | " H0A.67" on page 238 |
| H0A.70 | 0x0A46 | Overspeed threshold 2 | 0 rpm to 20000 rpm | 0 | rpm | Immediately | " H0A.70" on page 239 |
| H0A.71 | 0x0A47 | MS1 motor overload curve switchover | 0 to 65535 | 4098 | - | Immediately | " H0A.71" on page 239 |
| H0A.72 | 0x0A48 | Maximum stop time in ramp-to-stop | 0 ms to 65535 ms | 10000 | ms | At stop | " H0A.72" on page 239 |
| H0A.73 | 0x0A49 | STO 24 V disconnection filter time | 1 ms to 5 ms | 5 | ms | Immediately | " H0A.73" on page 240 |
| H0A.74 | 0x0A4A | Filter time for two inconsistent STO channels | 1 ms to 1000 ms | 100 | ms | Immediately | " H0A.74" on page 240 |
| H0A.75 | 0x0A4B | Servo OFF delay after STO triggered | 0 ms to 25 ms | 20 | ms | Immediately | " H0A.75" on page 240 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0A.90 | 0x0A5A | Moving average filter time for speed display values | 0 ms to 100 ms | 0 | ms | Immediate ly | " H0A.90" on page 240 |
| H0A.91 | 0x0A5B | Moving average filter time for torque display values | 0 ms to 100 ms | 0 | ms | Immediate ly | " H0A.91" on page 241 |
| H0A.92 | 0x0A5C | Moving average filter time for position display values | 0 ms to 100 ms | 0 | ms | Immediate ly | " H0A.92" on page 241 |
| H0A.93 | 0x0A5D | Low-pass filter time for voltage display values | 0 ms to 250 ms | 0 | ms | Immediate ly | " H0A.93" on page 241 |
| H0A.94 | 0x0A5E | Low-pass filter time for thermal display values | 0 ms to 250 ms | 0 | ms | Immediate ly | " H0A.94" on page 241 |

## 7.12 Parameter Group H0b

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.00 | 0x0B00 | Motor speed actual value | –32767 RPM to +32767 RPM | 0 | rpm | Un changea ble | " H0b.00" on page 242 |
| H0b.01 | 0x0B01 | Speed reference | –32767 RPM to +32767 RPM | 0 | rpm | Un changea ble | " H0b.01" on page 242 |
| H0b.02 | 0x0B02 | Internal torque reference | -500.0% to 500.0% | 0 | % | Un changea ble | " H0b.02" on page 242 |
| H0b.03 | 0x0B03 | Monitored DI status | 0 to 65535 | 0 | - | Un changea ble | " H0b.03" on page 243 |
| H0b.05 | 0x0B05 | Monitored DO status | 0 to 65535 | 0 | - | Un changea ble | " H0b.05" on page 243 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.07 | 0x0B07 | Absolute position counter | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.07" on page 243 |
| H0b.09 | 0x0B09 | Mechanical angle | 0.0° to 360.0° | 0 | ° | Unchangeable | " H0b.09" on page 243 |
| H0b.10 | 0x0B0A | Electrical angle | 0.0° to 360.0° | 0 | ° | Unchangeable | " H0b.10" on page 244 |
| H0b.12 | 0x0B0C | Average load rate | 0.0% to 800.0% | 0 | % | Unchangeable | " H0b.12" on page 244 |
| H0b.13 | 0x0B0D | Input reference counter | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.13" on page 244 |
| H0b.15 | 0x0B0F | Position following error (encoder unit) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.15" on page 245 |
| H0b.17 | 0x0B11 | Feedback pulse counter | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.17" on page 245 |
| H0b.19 | 0x0B13 | Total power-on time | 0.0s to 429496729.5s | 0 | s | Unchangeable | " H0b.19" on page 245 |
| H0b.21 | 0x0B16 | Displayed AI1 voltage | -12.000 V to 12.000 V | 0 | V | Unchangeable | " H0b.21" on page 246 |
| H0b.24 | 0x0B18 | RMS value of phase current | 0.0 A to 6553.5 A | 0 | A | Unchangeable | " H0b.24" on page 246 |
| H0b.25 | 0x0B19 | Angle obtained upon voltage injection auto-tuning | 0.0° to 360.0° | 0 | ° | Unchangeable | " H0b.25" on page 246 |
| H0b.26 | 0x0B1A | Bus voltage | 0.0 V to 6553.5 V | 0 | V | Unchangeable | " H0b.26" on page 246 |
| H0b.27 | 0x0B1B | Module temperature | -20°C to 200°C | 0 | °C | Unchangeable | " H0b.27" on page 247 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.28 | 0x0B1C | Absolute encoder fault information given by FPGA | 0 to 65535 | 0 | - | Unchangeable | " H0b.28" on page 247 |
| H0b.29 | 0x0B1D | Axis status information given by FPGA | 0 to 65535 | 0 | - | Unchangeable | " H0b.29" on page 247 |
| H0b.30 | 0x0B1E | Axis fault information given by FPGA | 0 to 65535 | 0 | - | Unchangeable | " H0b.30" on page 247 |
| H0b.31 | 0x0B1F | Encoder fault information | 0 to 65535 | 0 | - | Immediately | " H0b.31" on page 248 |
| H0b.33 | 0x0B21 | Fault log | 0: Present fault<br>1: Last fault<br>2: 2nd to last fault<br>3: 3rd to last fault<br>4: 4th to last fault<br>5: 5th to last fault 6: 6th to last fault<br>7: 7th to last fault<br>8: 8th to last fault<br>9: 9th to last fault<br>10: 10th to last fault<br>11: 11th to last fault<br>12: 12th to last fault<br>13: 13th to last fault<br>14: 14th to last fault<br>15: 15th to last fault<br>16: 16th to last fault<br>17: 17th to last fault<br>18: 18th to last fault<br>19: 19th to last fault | 0 | - | Immediately | " H0b.33" on page 248 |
| H0b.34 | 0x0B22 | Fault code of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.34" on page 249 |
| H0b.35 | 0x0B23 | Time stamp upon occurrence of the selected fault | 0.0s to 429496729.5s | 0 | s | Unchangeable | " H0b.35" on page 249 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.37 | 0x0B25 | Motor speed upon occurrence of the selected fault | –32767 RPM to +32767 RPM | 0 | rpm | Unchangeable | " H0b.37" on page 249 |
| H0b.38 | 0x0B26 | Motor phase U current upon occurrence of the selected fault | -3276.7 A to 3276.7 A | 0 | A | Unchangeable | " H0b.38" on page 249 |
| H0b.39 | 0x0B27 | Motor phase V current upon occurrence of the selected fault | -3276.7 A to 3276.7 A | 0 | A | Unchangeable | " H0b.39" on page 249 |
| H0b.40 | 0x0B28 | Bus voltage upon occurrence of the selected fault | 0.0 V to 6553.5 V | 0 | V | Unchangeable | " H0b.40" on page 250 |
| H0b.41 | 0x0B29 | DI status upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.41" on page 250 |
| H0b.43 | 0x0B2B | DO status upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.43" on page 250 |
| H0b.45 | 0x0B2D | Internal fault code | 0 to 65535 | 0 | - | Unchangeable | " H0b.45" on page 250 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.46 | 0x0B2E | Absolute encoder error information given by FPGA upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.46" on page 251 |
| H0b.47 | 0x0B2F | System status information given by FPGA upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.47" on page 251 |
| H0b.48 | 0x0B30 | System fault information given by FPGA upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.48" on page 251 |
| H0b.49 | 0x0B31 | Encoder fault information upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.49" on page 251 |
| H0b.51 | 0x0B33 | Internal fault code upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.51" on page 252 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.52 | 0x0B34 | FPGA timeout fault standard bit upon occurrence of the selected fault | 0 to 65535 | 0 | - | Unchangeable | " H0b.52" on page 252 |
| H0b.53 | 0x0B35 | Position following error (reference unit) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.53" on page 252 |
| H0b.55 | 0x0B37 | Motor speed actual value | –2147483648 RPM to +2147483647 RPM | 0 | rpm | Unchangeable | " H0b.55" on page 253 |
| H0b.57 | 0x0B39 | Bus voltage of the control circuit | 0.0 V to 6553.5 V | 0 | V | Unchangeable | " H0b.57" on page 253 |
| H0b.58 | 0x0B3A | Mechanical absolute position (low 32 bits) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.58" on page 253 |
| H0b.60 | 0x0B3C | Mechanical absolute position (high 32 bits) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.60" on page 253 |
| H0b.63 | 0x0B3F | NotRdy state | 1: Control circuit error<br>2: Main circuit power input error<br>3: Bus undervoltage<br>4: Soft start failed<br>5: Encoder initialization undone<br>6: Short circuit to ground failed<br>7: Others | 0 | - | Unchangeable | " H0b.63" on page 254 |
| H0b.64 | 0x0B40 | Real-time input position reference counter | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " H0b.64" on page 254 |
| H0b.66 | 0x0B42 | Encoder temperature | -32768°C to 32767°C | 0 | °C | Unchangeable | " H0b.66" on page 254 |
| H0b.67 | 0x0B43 | Load rate of regenerative resistor | 0.0% to 200.0% | 0 | % | Unchangeable | " H0b.67" on page 255 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.70 | 0x0B46 | Number of absolute encoder revolutions | 0 Rev to 65535 Rev | 0 | Rev | Unchangeable | " H0b.70" on page 255 |
| H0b.71 | 0x0B47 | Single-turn position fed back by the absolute encoder | 0 p to 2147483647 p | 0 | p | Unchangeable | " H0b.71" on page 255 |
| H0b.74 | 0x0B4A | System fault information given by FPGA | 0 to 65535 | 0 | - | Unchangeable | " H0b.74" on page 255 |
| H0b.77 | 0x0B4D | Encoder position (low 32 bits) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.77" on page 255 |
| H0b.79 | 0x0B4F | Encoder position (high 32 bits) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.79" on page 256 |
| H0b.81 | 0x0B51 | Single-turn position of the rotary load (low 32 bits) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.81" on page 256 |
| H0b.83 | 0x0B53 | Single-turn position of the rotary load (high 32 bits) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.83" on page 256 |
| H0b.85 | 0x0B55 | Single-turn position of the rotary load (reference unit) | –2147483648 p to +2147483647 p | 0 | p | Unchangeable | " H0b.85" on page 257 |
| H0b.87 | 0x0B57 | IGBT junction temperature | 0 to 200 | 0 | - | Unchangeable | " H0b.87" on page 257 |
| H0b.90 | 0x0B5A | Group No. of the abnormal parameter | 0 to 65535 | 0 | - | Unchangeable | " H0b.90" on page 257 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0b.91 | 0x0B5B | Offset within the group of the abnormal parameter | 0 to 65535 | 0 | - | Unchangeable | " H0b.91" on page 257 |
| H0b.93 | 0x0B5D | Closed loop state | 0: Half closed loop<br>1: Fully closed loop | 0 | - | Unchangeable | " H0b.93" on page 258 |
| H0b.94 | 0x0B5E | Individual power-on time | 0.0s to 429496729.5s | 0 | s | Unchangeable | " H0b.94" on page 258 |
| H0b.96 | 0x0B60 | Individual power-on time upon occurrence of the selected fault | 0.0s to 429496729.5s | 0 | s | Unchangeable | " H0b.96" on page 258 |

## 7.13 Parameter Group H0d

| Param. No. | Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H0d.00 | 0x0D00 | Software reset | 0: No operation<br>1: Enable | 0 | - | At stop | " H0d.00" on page 258 |
| H0d.01 | 0x0D01 | Fault reset | 0: No operation<br>1: Enable | 0 | - | At stop | " H0d.01" on page 259 |
| H0d.02 | 0x0D02 | Inertia auto-tuning selection | 0 to 65 | 0 | - | At once | " H0d.02" on page 259 |
| H0d.04 | 0x0D04 | Read/write in encoder ROM | 0: No operation<br>1: Write ROM<br>2: Read ROM<br>3: ROM failure | 0 | - | At stop | " H0d.04" on page 259 |
| H0d.05 | 0x0D05 | Emergency stop | 0: No operation<br>1: Enable | 0 | - | At once | " H0d.05" on page 260 |
| H0d.10 | 0x0D0A | Auto-tuning of analog channel | 0: No operation<br>1: Adjust AI1 | 0 | - | At stop | " H0d.10" on page 260 |
| H0d.12 | 0x0D0C | Phase U/V current balance correction | 0: Disable<br>1: Enable | 0 | - | At stop | " H0d.12" on page 260 |

| Param. No. | Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H0d.17 | 0x0D11 | Forced DI/DO enable switch | bit 0: Forced DI enable switch<br>0: Disable<br>1: Enable<br>bit 1: Forced DO enable switch<br>0: Disable<br>1: Enable | 0 | - | At once | " H0d.17" on page 261 |
| H0d.18 | 0x0D12 | Forced DI value | 0 to 255 | 255 | - | At once | " H0d.18" on page 261 |
| H0d.19 | 0x0D13 | Forced DO value | 0 to 31 | 0 | - | At once | " H0d.19" on page 261 |
| H0d.20 | 0x0D14 | Absolute encoder reset selection | 0: No operation<br>1: Reset the fault<br>2: Reset the fault and multi-turn data<br>3: Reset Inovance 2nd encoder fault<br>4: Reset Inovance 2nd encoder fault and multi-turn data | 0 | - | At stop | " H0d.20" on page 262 |
| H0d.23 | 0x0D17 | Torque fluctuation auto-tuning | 0 to 1 | 0 | - | At stop | " H0d.23" on page 262 |
| H0d.26 | 0x0D1A | Brake and dynamic brake started forcibly | 0: Disable<br>1: Dynamic brake deactivated forcibly<br>2: Brake released forcibly<br>3: Dynamic brake deactivated and brake released forcibly | 0 | - | At stop | " H0d.26" on page 262 |

## 7.14 Parameter Group H0E

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0E.00 | 0x0E00 | Node address | 1 to 127 | 1 | - | At stop | " H0E.00" on page 263 |
| H0E.01 | 0x0E01 | Save objects written through communication to EEPROM | 0: Not save<br>1: Save parameters<br>2: Save object dictionaries<br>3: Save parameters and object dictionaries<br>4: Save object dictionaries written before communication (OP)<br>255: Determine through H0E03 and H0E04 | 1 | - | Immediately | " H0E.01" on page 263 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0E.03 | 0x0E03 | Save objects written through software (commissioning protocol) to e2prom | 0: Do not save<br>1: Save | 1 | - | Immediately | " H0E.03" on page 263 |
| H0E.04 | 0x0E04 | Save objects written through communication to e2prom (excluding commissioning protocol) | 0: Do not save<br>1: Save | 0 | - | Immediately | " H0E.04" on page 264 |
| H0E.10 | 0x0E0A | CAN selection | 0: Pulse/Axis control command<br>1: Enhanced axis control command | 0 | - | At stop | " H0E.10" on page 264 |
| H0E.11 | 0x0E0B | CAN baud rate | 0: 20 kbit/s<br>1: 50 kbit/s<br>2: 100 kbit/s<br>3: 125 kbit/s<br>4: 250 kbit/s<br>5: 500 kbit/s<br>7: 1 Mbps | 5 | - | At stop | " H0E.11" on page 264 |
| H0E.80 | 0x0E50 | Modbus baud rate | 0: 300 bps<br>1: 600 bps<br>2: 1200 bps<br>3: 2400 bps<br>4: 4800 bps<br>5: 9600 bps<br>6: 19200 bps<br>7: 38400 bps<br>8: 57600 bps<br>9: 115200 bps | 9 | - | Immediately | " H0E.80" on page 265 |
| H0E.81 | 0x0E51 | Modbus data format | 0: No parity, 2 stop bits (N-2)<br>1: Even parity, 1 stop bit (E-1)<br>2: Odd parity, 1 stop bit (O-1)<br>3: No parity, 1 stop bit (N-1) | 3 | - | Immediately | " H0E.81" on page 265 |
| H0E.82 | 0x0E52 | Modbus response delay | 0 ms to 20 ms | 0 | ms | Immediately | " H0E.82" on page 266 |
| H0E.83 | 0x0E53 | Modbus communication timeout | 0 ms to 600 ms | 0 | ms | Immediately | " H0E.83" on page 266 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0E.84 | 0x0E54 | Sequence of Modbus communication data bits | 0: High bits before low bits<br>1: Low bits before high bits | 1 | - | Immediately | " H0E.84" on page 266 |
| H0E.90 | 0x0E5A | Modbus version | 0.00 to 655.35 | 0 | - | Unchangeable | " H0E.90" on page 267 |
| H0E.92 | 0x0E5C | CANlink version | 0.00 to 655.35 | 0 | - | Unchangeable | " H0E.92" on page 267 |
| H0E.97 | 0x0E61 | Communication monitoring parameter 1 | 0 to 65535 | 0 | - | Immediately | " H0E.97" on page 267 |
| H0E.98 | 0x0E62 | Communication monitoring parameter 2 | 0 to 65535 | 0 | - | Immediately | " H0E.98" on page 267 |

## 7.15 Parameter Group H0F

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0F.00 | 0x0F00 | Encoder feedback mode | 0: Internal encoder feedback<br>1: External encoder feedback<br>2: Inner/Outer loop switchover | 0 | - | Immediately | " H0F.00" on page 268 |
| H0F.01 | 0x0F01 | External encoder usage mode | 0: Standard operating direction<br>1: Reverse operating direction | 0 | - | Immediately | " H0F.01" on page 268 |
| H0F.02 | 0x0F02 | External encoder absolute value | 0: Incremental mode<br>1: Absolute linear mode | 0 | - | At stop | " H0F.02" on page 269 |
| H0F.03 | 0x0F03 | External encoder feedback type | 0: Quadrature pulse | 0 | - | At stop | " H0F.03" on page 269 |
| H0F.04 | 0x0F04 | External encoder pulses per revolution | 0 to 2147483647 | 10000 | - | At stop | " H0F.04" on page 269 |

| Param. No. | Commu nication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0F.08 | 0x0F08 | Excessive deviation threshold in compound control mode | 0 to 2147483647 | 1000 | - | Immedi ately | " H0F.08" on page 270 |
| H0F.10 | 0x0F0A | Clear deviation in compound control mode | 0 R to 100 R | 1 | R | Immedi ately | " H0F.10" on page 270 |
| H0F.13 | 0x0F0D | Compound vibration suppression filter time | 0.0 ms to 6553.5 ms | 0 | ms | At stop | " H0F.13" on page 271 |
| H0F.16 | 0x0F10 | Pulse deviation display in compound control mode | -2147483648 to 2147483647 | 0 | Refer ence unit | Un changea ble | " H0F.16" on page 271 |
| H0F.18 | 0x0F12 | Internal position pulse feedback display | -2147483648 to 2147483647 | 0 | Refer ence unit | Un changea ble | " H0F.18" on page 271 |
| H0F.20 | 0x0F14 | External position pulse feedback display | -2147483648 to 2147483647 | 0 | Refer ence unit | Un changea ble | " H0F.20" on page 272 |
| H0F.22 | 0x0F16 | External encoder phase Z detection invalid (quadrature pulse feedback) | 0: Detected<br>1: Not detected | 0 | - | Immedi ately | " H0F.22" on page 272 |
| H0F.25 | 0x0F19 | Set the source of touch probe Z signal in fully closed-loop mode. | 0: Motor Z signal<br>1: External feedback Z signal | 0 | - | Immedi ately | " H0F.25" on page 272 |

| Param. No. | Commu nication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H0F.45 | 0x0F2D | Positioning completed/ Position deviation threshold in fully closed-loop mode | 0: Threshold scaled to outer loop unit<br>1: Same threshold used for inner and outer loops | 0 | - | At stop | " H0F.45" on page 272 |
| H0F.46 | 0x0F2E | Fully closed-loop speed feedback selection | 0: Internal encoder feedback<br>1: External encoder feedback | 0 | - | At stop | " H0F.46" on page 273 |

## 7.16 Parameter Group H11

| Param. No. | Hexadeci mal Parame ters | Parameter Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H11.00 | 2011.01h | Multi-position operation mode | 0: Single run (number of displacements selected in H11.01)<br>1: Cyclic operation (number of displacement selected in H11.01)<br>2: DI-based operation (selected by DI)<br>3: Sequential operation<br>5: Axis-controlled continuous operation | 1 | - | At stop | " H11.00" on page 273 |
| H11.01 | 2011.02h | Number of displace ment references in multi-position mode | 1 to 16 | 1 | - | At stop | " H11.01" on page 277 |
| H11.02 | 2011.03h | Starting displace ment No. after pause | 0: Continue to execute the unexecuted displacements<br>1: Start from displacement 1 | 0 | - | At stop | " H11.02" on page 277 |
| H11.03 | 2011.04h | Interval time unit | 0: ms<br>1: s | 0 | - | At stop | " H11.03" on page 278 |
| H11.04 | 2011.05h | Displace ment reference type | 0: Relative displacement reference<br>1: Absolute displacement reference | 0 | - | Immedi ately | " H11.04" on page 278 |

| Param. No. | Hexadecimal Parameters | Parameter Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H11.05 | 2011.06h | Starting displacement No. in sequential operation | 0 to 16 | 0 | - | At stop | " H11.05" on page 279 |
| H11.09 | 2011.0Ah | Deceleration upon axis control OFF | 0 ms to 65535 ms | 65535 | ms | Immediately | " H11.09" on page 279 |
| H11.10 | 2011.0Bh | Starting speed of displacement 1 | 0 rpm to 10000 rpm | 0 | rpm | Immediately | " H11.10" on page 279 |
| H11.11 | 2011.0Ch | Stop speed of displacement 1 | 0 rpm to 10000 rpm | 0 | rpm | Immediately | " H11.11" on page 280 |
| H11.12 | 2011.0Dh | Displacement 1 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.12" on page 280 |
| H11.14 | 2011.0Fh | Max. speed of displacement 1 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.14" on page 280 |
| H11.15 | 2011.10h | Acc/Dec time of displacement 1 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.15" on page 280 |
| H11.16 | 2011.11h | Interval time after displacement 1 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.16" on page 281 |
| H11.17 | 2011.12h | Displacement 2 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.17" on page 281 |
| H11.19 | 2011.14h | Max. speed of displacement 2 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.19" on page 282 |
| H11.20 | 2011.15h | Acc/Dec time of displacement 2 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.20" on page 282 |
| H11.21 | 2011.16h | Interval time after displacement 2 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.21" on page 282 |

| Param. No. | Hexadecimal Parameters | Parameter Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H11.22 | 2011.17h | Displacement 3 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.22" on page 282 |
| H11.24 | 2011.19h | Max. speed of displacement 3 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.24" on page 283 |
| H11.25 | 2011.1Ah | Acc/Dec time of displacement 3 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.25" on page 283 |
| H11.26 | 2011.1Bh | Interval time after displacement 3 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.26" on page 283 |
| H11.27 | 2011.1Ch | Displacement 4 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.27" on page 283 |
| H11.29 | 2011.1Eh | Max. speed of displacement 4 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.29" on page 284 |
| H11.30 | 2011.1Fh | Acc/Dec time of displacement 4 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.30" on page 284 |
| H11.31 | 2011.20h | Interval time after displacement 4 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.31" on page 284 |
| H11.32 | 2011.21h | Displacement 5 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.32" on page 284 |
| H11.34 | 2011.23h | Max. speed of displacement 5 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.34" on page 285 |
| H11.35 | 2011.24h | Acc/Dec time of displacement 5 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.35" on page 285 |
| H11.36 | 2011.25h | Interval time after displacement 5 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.36" on page 285 |

| Param. No. | Hexadecimal Parameters | Parameter Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H11.37 | 2011.26h | Displacement 6 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.37" on page 285 |
| H11.39 | 2011.28h | Max. speed of displacement 6 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.39" on page 286 |
| H11.40 | 2011.29h | Acc/Dec time of displacement 6 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.40" on page 286 |
| H11.41 | 2011.2Ah | Interval time after displacement 6 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.41" on page 286 |
| H11.42 | 2011.2Bh | Displacement 7 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.42" on page 286 |
| H11.44 | 2011.2Dh | Max. speed of displacement 7 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.44" on page 287 |
| H11.45 | 2011.2Eh | Acc/Dec time of displacement 7 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.45" on page 287 |
| H11.46 | 2011.2Fh | Interval time after displacement 7 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.46" on page 287 |
| H11.47 | 2011.30h | Displacement 8 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.47" on page 287 |
| H11.49 | 2011.32h | Max. speed of displacement 8 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.49" on page 288 |
| H11.50 | 2011.33h | Acc/Dec time of displacement 8 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.50" on page 288 |
| H11.51 | 2011.34h | Interval time after displacement 8 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.51" on page 288 |

| Param. No. | Hexadecimal Parameters | Parameter Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H11.52 | 2011.35h | Displacement 9 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.52" on page 288 |
| H11.54 | 2011.37h | Max. speed of displacement 9 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.54" on page 289 |
| H11.55 | 2011.38h | Acc/Dec time of displacement 9 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.55" on page 289 |
| H11.56 | 2011.39h | Interval time after displacement 9 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.56" on page 289 |
| H11.57 | 2011.3Ah | Displacement 10 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.57" on page 289 |
| H11.59 | 2011.3Ch | Max. speed of displacement 10 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.59" on page 290 |
| H11.60 | 2011.3Dh | Acc/Dec time of displacement 10 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.60" on page 290 |
| H11.61 | 2011.3Eh | Interval time after displacement 10 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.61" on page 290 |
| H11.62 | 2011.3Fh | Displacement 11 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.62" on page 290 |
| H11.64 | 2011.41h | Max. speed of displacement 11 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.64" on page 291 |
| H11.65 | 2011.42h | Acc/Dec time of displacement 11 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.65" on page 291 |
| H11.66 | 2011.43h | Interval time after displacement 11 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.66" on page 291 |

| Param. No. | Hexadecimal Parameters | Parameter Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H11.67 | 2011.44h | Displacement 12 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.67" on page 291 |
| H11.69 | 2011.46h | Max. speed of displacement 12 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.69" on page 292 |
| H11.70 | 2011.47h | Acc/Dec time of displacement 12 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.70" on page 292 |
| H11.71 | 2011.48h | Interval time after displacement 12 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.71" on page 292 |
| H11.72 | 2011.49h | Displacement 13 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.72" on page 292 |
| H11.74 | 2011.4Bh | Max. speed of displacement 13 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.74" on page 293 |
| H11.75 | 2011.4Ch | Acc/Dec time of displacement 13 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.75" on page 293 |
| H11.76 | 2011.4Dh | Interval time after displacement 13 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.76" on page 293 |
| H11.77 | 2011.4Eh | Displacement 14 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.77" on page 293 |
| H11.79 | 2011.50h | Max. speed of displacement 14 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.79" on page 294 |
| H11.80 | 2011.51h | Acc/Dec time of displacement 14 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.80" on page 294 |
| H11.81 | 2011.52h | Interval time after displacement 14 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.81" on page 294 |

| Param. No. | Hexadecimal Parameters | Parameter Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H11.82 | 2011.53h | Displacement 15 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.82" on page 294 |
| H11.84 | 2011.55h | Max. speed of displacement 15 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.84" on page 295 |
| H11.85 | 2011.56h | Acc/Dec time of displacement 15 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.85" on page 295 |
| H11.86 | 2011.57h | Interval time after displacement 15 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.86" on page 295 |
| H11.87 | 2011.58h | Displacement 16 | -1073741824 to 1073741824 | 10000 | Reference unit | Immediately | " H11.87" on page 295 |
| H11.89 | 2011.5Ah | Max. speed of displacement 16 | 1 rpm to 10000 rpm | 200 | rpm | Immediately | " H11.89" on page 296 |
| H11.90 | 2011.5Bh | Acc/Dec time of displacement 16 | 0 ms to 65535 ms | 10 | ms | Immediately | " H11.90" on page 296 |
| H11.91 | 2011.5Ch | Interval time after displacement 16 | 0 ms (s)–10000 ms (s) | 10 | ms (s) | Immediately | " H11.91" on page 296 |

## 7.17 Parameter Group H12

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H12.00 | 0x1200 | Multi-speed operation mode | 0: Stop after running for one cycle (number of speeds defined by H12.01)<br>1: Cyclic operation (number of speeds defined by H12.01)<br>2: DI-based operation | 1 | - | At stop | " H12.00" on page 296 |
| H12.01 | 0x1201 | Number of speed references in multi-speed mode | 1 to 16 | 16 | - | At stop | " H12.01" on page 298 |
| H12.02 | 0x1202 | Operating time unit | 0: s<br>1: min | 0 | - | At stop | " H12.02" on page 299 |
| H12.03 | 0x1203 | Acceleration time 1 | 0 ms to 65535 ms | 10 | ms | Immediately | " H12.03" on page 299 |
| H12.04 | 0x1204 | Deceleration time 1 | 0 ms to 65535 ms | 10 | ms | Immediately | " H12.04" on page 300 |
| H12.05 | 0x1205 | Acceleration time 2 | 0 ms to 65535 ms | 50 | ms | Immediately | " H12.05" on page 300 |
| H12.06 | 0x1206 | Deceleration time 2 | 0 ms to 65535 ms | 50 | ms | Immediately | " H12.06" on page 300 |
| H12.07 | 0x1207 | Acceleration time 3 | 0 ms to 65535 ms | 100 | ms | Immediately | " H12.07" on page 301 |
| H12.08 | 0x1208 | Deceleration time 3 | 0 ms to 65535 ms | 100 | ms | Immediately | " H12.08" on page 301 |
| H12.09 | 0x1209 | Acceleration time 4 | 0 ms to 65535 ms | 150 | ms | Immediately | " H12.09" on page 301 |
| H12.10 | 0x120A | Deceleration time 4 | 0 ms to 65535 ms | 150 | ms | Immediately | " H12.10" on page 302 |
| H12.20 | 0x1214 | 1st speed reference | –10000 RPM to +10000 RPM | 0 | rpm | Immediately | " H12.20" on page 302 |
| H12.21 | 0x1215 | Operating time of speed 1 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.21" on page 302 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H12.22 | 0x1216 | 1st speed rise/drop and curve smoothing parameter time | bit0-bit7: Speed rise and drop time<br>0: Zero acc and dec time<br>1: Acc and dec time 1<br>2: Acc and dec time 2<br>3: Acc and dec time 3<br>4: Acc and dec time 4<br>bit8-bit15: S curve smoothing parameter<br>1: Smoothing parameter 1<br>2: Smoothing parameter 2<br>3: Smoothing parameter 3<br>4: Smoothing parameter 4<br>5: Smoothing parameter 5<br>6: Smoothing parameter 6<br>7: Smoothing parameter 7<br>8: Smoothing parameter 8 | 256 | - | Immedi ately | *" H12.22" on page 303* |
| H12.23 | 0x1217 | Speed reference for speed 2 | –10000 RPM to +10000 RPM | 100 | rpm | Immedi ately | *" H12.23" on page 305* |
| H12.24 | 0x1218 | Operating time of speed 2 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immedi ately | *" H12.24" on page 306* |
| H12.25 | 0x1219 | 2nd speed rise/drop and curve smoothing parameter time | See *" H12.22" on page 303* for details. | 0 | - | Immedi ately | *" H12.25" on page 306* |
| H12.26 | 0x121A | 3rd speed reference | –10000 RPM to +10000 RPM | 300 | rpm | Immedi ately | *" H12.26" on page 306* |
| H12.27 | 0x121B | Operating time of speed 3 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immedi ately | *" H12.27" on page 306* |
| H12.28 | 0x121C | 3rd speed rise/drop and curve smoothing parameter time | See *" H12.22" on page 303* for details. | 0 | - | Immedi ately | *" H12.28" on page 307* |
| H12.29 | 0x121D | Speed reference for speed 4 | –10000 RPM to +10000 RPM | 500 | rpm | Immedi ately | *" H12.29" on page 307* |
| H12.30 | 0x121E | Operating time of speed 4 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immedi ately | *" H12.30" on page 307* |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H12.31 | 0x121F | 4th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.31" on page 307 |
| H12.32 | 0x1220 | Speed reference for speed 5 | –10000 RPM to +10000 RPM | 700 | rpm | Immediately | " H12.32" on page 308 |
| H12.33 | 0x1221 | Operating time of speed 5 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.33" on page 308 |
| H12.34 | 0x1222 | 5th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.34" on page 308 |
| H12.35 | 0x1223 | Speed reference for speed 6 | –10000 RPM to +10000 RPM | 900 | rpm | Immediately | " H12.35" on page 308 |
| H12.36 | 0x1224 | Operating time of speed 6 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.36" on page 309 |
| H12.37 | 0x1225 | 6th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.37" on page 309 |
| H12.38 | 0x1226 | Speed reference for speed 7 | –10000 RPM to +10000 RPM | 600 | rpm | Immediately | " H12.38" on page 309 |
| H12.39 | 0x1227 | Operating time of speed 7 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.39" on page 309 |
| H12.40 | 0x1228 | 7th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.40" on page 310 |
| H12.41 | 0x1229 | Speed reference for speed 8 | –10000 RPM to +10000 RPM | 300 | rpm | Immediately | " H12.41" on page 310 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H12.42 | 0x122A | 8th speed rise/drop and curve smoothing parameter time | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.42" on page 310 |
| H12.43 | 0x122B | Acceleration/ Deceleration time of speed 8 | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.43" on page 310 |
| H12.44 | 0x122C | Speed reference for speed 9 | –10000 RPM to +10000 RPM | 100 | rpm | Immediately | " H12.44" on page 311 |
| H12.45 | 0x122D | Operating time of speed 9 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.45" on page 311 |
| H12.46 | 0x122E | 9th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.46" on page 311 |
| H12.47 | 0x122F | Speed reference for speed 10 | –10000 RPM to +10000 RPM | -100 | rpm | Immediately | " H12.47" on page 311 |
| H12.48 | 0x1230 | Operating time of speed 10 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.48" on page 312 |
| H12.49 | 0x1231 | 10th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.49" on page 312 |
| H12.50 | 0x1232 | Speed reference for speed 11 | –10000 RPM to +10000 RPM | -300 | rpm | Immediately | " H12.50" on page 312 |
| H12.51 | 0x1233 | Operating time of speed 11 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.51" on page 312 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H12.52 | 0x1234 | 11th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.52" on page 313 |
| H12.53 | 0x1235 | Speed reference for speed 12 | –10000 RPM to +10000 RPM | -500 | rpm | Immediately | " H12.53" on page 313 |
| H12.54 | 0x1236 | Operating time of speed 12 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.54" on page 313 |
| H12.55 | 0x1237 | 12th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.55" on page 313 |
| H12.56 | 0x1238 | Speed reference for speed 13 | –10000 RPM to +10000 RPM | -700 | rpm | Immediately | " H12.56" on page 314 |
| H12.57 | 0x1239 | Operating time of speed 13 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.57" on page 314 |
| H12.58 | 0x123A | 13th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.58" on page 314 |
| H12.59 | 0x123B | Speed reference for speed 14 | –10000 RPM to +10000 RPM | -900 | rpm | Immediately | " H12.59" on page 314 |
| H12.60 | 0x123C | Operating time of speed 14 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.60" on page 315 |
| H12.61 | 0x123D | 14th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.61" on page 315 |
| H12.62 | 0x123E | Speed reference for speed 15 | –10000 RPM to +10000 RPM | -600 | rpm | Immediately | " H12.62" on page 315 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H12.63 | 0x123F | Operating time of speed 15 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.63" on page 315 |
| H12.64 | 0x1240 | 15th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.64" on page 316 |
| H12.65 | 0x1241 | Speed reference for speed 16 | –10000 RPM to +10000 RPM | -300 | rpm | Immediately | " H12.65" on page 316 |
| H12.66 | 0x1242 | Operating time of speed 16 | 0.0s(m) to 6553.5s(m) | 5 | s (m) | Immediately | " H12.66" on page 316 |
| H12.67 | 0x1243 | 16th speed rise/drop and curve smoothing parameter time | See " H12.22" on page 303 for details. | 0 | - | Immediately | " H12.67" on page 316 |

# 7.18 Parameter Group H17

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H17.90 | 0x175A | Communication VDI enabling | 0: Disable<br>1: Enable | 0 | - | At stop | " H17.90" on page 317 |
| H17.91 | 0x175B | VDI default value upon power-on | 0: No default<br>1: VDI1 default value<br>2: VDI2 default value<br>4: VDI3 default value<br>8: VDI4 default value<br>16: VDI5 default value<br>32: VDI6 default value<br>64: VDI7 default value<br>128: VDI8 default value<br>256: VDI9 default value<br>512: VDI10 default value<br>1024: VDI11 default value<br>2048: VDI12 default value<br>4096: VDI13 default value<br>8092: VDI14 default value<br>16384: VDI15 default value<br>32768: VDI16 default value | 0 | - | Immediately | " H17.91" on page 317 |
| H17.00 | 0x1700 | VDI1 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.00" on page 318 |
| H17.01 | 0x1701 | VDI1 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.01" on page 319 |
| H17.02 | 0x1702 | VDI2 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.02" on page 320 |
| H17.03 | 0x1703 | VDI2 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.03" on page 320 |
| H17.04 | 0x1704 | VDI3 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.04" on page 320 |
| H17.05 | 0x1705 | VDI3 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.05" on page 321 |
| H17.06 | 0x1706 | VDI4 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.06" on page 321 |
| H17.07 | 0x1707 | VDI4 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.07" on page 321 |
| H17.08 | 0x1708 | VDI5 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.08" on page 321 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H17.09 | 0x1709 | VDI5 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.09" on page 322 |
| H17.10 | 0x170A | VDI6 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.10" on page 322 |
| H17.11 | 0x170B | VDI6 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.11" on page 322 |
| H17.12 | 0x170C | VDI7 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.12" on page 323 |
| H17.13 | 0x170D | VDI7 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.13" on page 323 |
| H17.14 | 0x170E | VDI8 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.14" on page 323 |
| H17.15 | 0x170F | VDI8 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.15" on page 323 |
| H17.16 | 0x1710 | VDI9 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.16" on page 324 |
| H17.17 | 0x1711 | VDI9 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.17" on page 324 |
| H17.18 | 0x1712 | VDI10 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.18" on page 324 |
| H17.19 | 0x1713 | VDI10 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.19" on page 325 |
| H17.20 | 0x1714 | VDI11 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.20" on page 325 |
| H17.21 | 0x1715 | VDI11 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.21" on page 325 |
| H17.22 | 0x1716 | VDI12 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.22" on page 325 |
| H17.23 | 0x1717 | VDI12 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.23" on page 326 |
| H17.24 | 0x1718 | VDI13 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.24" on page 326 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H17.25 | 0x1719 | VDI13 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.25" on page 326 |
| H17.26 | 0x171A | VDI14 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.26" on page 327 |
| H17.27 | 0x171B | VDI14 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.27" on page 327 |
| H17.28 | 0x171C | VDI15 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.28" on page 327 |
| H17.29 | 0x171D | VDI15 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.29" on page 327 |
| H17.30 | 0x171E | VDI16 function selection | See " H17.00" on page 318 for details. | 0 | - | Immediately | " H17.30" on page 328 |
| H17.31 | 0x171F | VDI16 logic level | 0: Active when the written value is 1<br>1: Active when the written value changes from 0 to 1 | 0 | - | Immediately | " H17.31" on page 328 |
| H17.92 | 0x175C | Communication VDO enabling | 0: Disable<br>1: Enable | 0 | - | At stop | " H17.92" on page 328 |
| H17.93 | 0x175D | VDO default value upon power-on | 0: No default<br>1: VDO1 default value<br>2: VDO2 default value<br>4: VDO3 default value<br>8: VDO4 default value<br>16: VDO5 default value<br>32: VDO6 default value<br>64: VDO7 default value<br>128: VDO8 default value<br>256: VDO9 default value<br>512: VDO10 default value<br>1024: VDO11 default value<br>2048: VDO12 default value<br>4096: VDO13 default value<br>8192: VDO14 default value<br>16384: VDO15 default value<br>32768: VDO16 default value | 0 | - | At stop | " H17.93" on page 329 |
| H17.32 | 0x1720 | VDO virtual level | 0 to 65535 | 0 | - | Unchangeable | " H17.32" on page 329 |
| H17.33 | 0x1721 | VDO1 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.33" on page 330 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H17.34 | 0x1722 | VDO1 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.34" on page 331 |
| H17.35 | 0x1723 | VDO2 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.35" on page 331 |
| H17.36 | 0x1724 | VDO2 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.36" on page 331 |
| H17.37 | 0x1725 | VDO3 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.37" on page 331 |
| H17.38 | 0x1726 | VDO3 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.38" on page 332 |
| H17.39 | 0x1727 | VDO4 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.39" on page 332 |
| H17.40 | 0x1728 | VDO4 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.40" on page 332 |
| H17.41 | 0x1729 | VDO5 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.41" on page 333 |
| H17.42 | 0x172A | VDO5 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.42" on page 333 |
| H17.43 | 0x172B | VDO6 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.43" on page 333 |
| H17.44 | 0x172C | VDO6 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.44" on page 333 |
| H17.45 | 0x172D | VDO7 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.45" on page 334 |
| H17.46 | 0x172E | VDO7 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.46" on page 334 |
| H17.47 | 0x172F | VDO8 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.47" on page 334 |
| H17.48 | 0x1730 | VDO8 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.48" on page 335 |
| H17.49 | 0x1731 | VDO9 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.49" on page 335 |
| H17.50 | 0x1732 | VDO9 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.50" on page 335 |
| H17.51 | 0x1733 | VDO10 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.51" on page 335 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H17.52 | 0x1734 | VDO10 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.52" on page 336 |
| H17.53 | 0x1735 | VDO11 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.53" on page 336 |
| H17.54 | 0x1736 | VDO11 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.54" on page 336 |
| H17.55 | 0x1737 | VDO12 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.55" on page 337 |
| H17.56 | 0x1738 | VDO12 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.56" on page 337 |
| H17.57 | 0x1739 | VDO13 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.57" on page 337 |
| H17.58 | 0x173A | VDO13 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.58" on page 337 |
| H17.59 | 0x173B | VDO14 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.59" on page 338 |
| H17.60 | 0x173C | VDO14 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.60" on page 338 |
| H17.61 | 0x173D | VDO15 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.61" on page 338 |
| H17.62 | 0x173E | VDO15 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.62" on page 339 |
| H17.63 | 0x173F | VDO16 function selection | See " H17.33" on page 330 for details. | 0 | - | Immediately | " H17.63" on page 339 |
| H17.64 | 0x1740 | VDO16 logic level | 0: Output 1 upon active logic<br>1: Output 0 upon active logic | 0 | - | Immediately | " H17.64" on page 339 |

# 7.19 Parameter Group H18

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H18.00 | 0x1800 | Position comparison output selection | 0: Disable<br>1: Enable (rising edge-triggered) | 0 | - | Immediately | " H18.00" on page 339 |
| H18.01 | 0x1801 | Position comparison output feedback source | 0: Motor encoder feedback<br>1: Fully closed-loop position feedback | 0 | - | Immediately | " H18.01" on page 340 |
| H18.02 | 0x1802 | Position comparison resolution | 0: 24-bit<br>1: 23-bit<br>2: 22-bit<br>3: 21-bit<br>4: 20-bit<br>5: 19-bit<br>6: 18-bit<br>7: 17-bit | 0 | - | Immediately | " H18.02" on page 340 |
| H18.03 | 0x1803 | Position comparison mode | 0: Individual comparison mode<br>1: Cyclic comparison mode<br>2: Fixed cyclic comparison mode | 0 | - | Immediately | " H18.03" on page 340 |
| H18.04 | 0x1804 | Current position as zero | 0: Disable<br>1: Enable (rising edge-triggered)<br>Note: This function needs to be used when the comparison state is inactive, otherwise the comparison logic may malfunction. | 0 | - | Immediately | " H18.04" on page 341 |
| H18.05 | 0x1805 | Position comparison output width | 0.1 ms to 204.7 ms | 0.1 | ms | Immediately | " H18.05" on page 341 |
| H18.06 | 0x1806 | Position comparison output ABZ port polarity | Bit 0: OCZ output logic<br>0: Positive, output high level upon active logic<br>1: Negative, output low level upon active logic<br>Bit 1: Z port output logic<br>0: Positive, output high level upon active logic<br>1: Negative, output low level upon active logic<br>bit2: A/B output logic<br>0: Positive, output high level upon active logic<br>1: Negative, output low level upon active logic | 0 | - | Immediately | " H18.06" on page 341 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H18.07 | 0x1807 | Start point of position comparison | 0 to 40 | 0 | - | Immediately | " H18.07" on page 342 |
| H18.08 | 0x1808 | End point of position comparison | 0 to 40 | 0 | - | Immediately | " H18.08" on page 342 |
| H18.09 | 0x1809 | Current status of position comparison | 0 to 1024 | 0 | - | Unchangeable | " H18.09" on page 342 |
| H18.10 | 0x180A | Real-time position of position comparison | -2147483648 to 2147483647 | 0 | - | Unchangeable | " H18.10" on page 343 |
| H18.12 | 0x180C | Zero offset of position comparison | -2147483648 to 2147483647 | 0 | - | Immediately | " H18.12" on page 343 |
| H18.14 | 0x180E | Position comparison output delay compensation | –12.00 μs to +12.00 μs | 0 | us | Immediately | " H18.14" on page 343 |
| H18.15 | 0x180F | Fixed cyclic comparison | 1 to 65535 | 1 | - | Immediately | " H18.15" on page 343 |
| H18.16 | 0x1810 | ABZ output function setting | Bit 0: OCZ output function<br>0: Frequency-division output<br>1: Position comparison<br>Bit 1: Z port output function<br>0: Frequency-division output<br>1: Position comparison<br>bit2: A/B port output function<br>0: Frequency-division output<br>1: Position comparison | 0 | - | Immediately | " H18.16" on page 344 |
| H18.17 | 0x1811 | Number of fixed mode cycles | 0 to 65535 | 1 | - | Unchangeable | " H18.17" on page 344 |

## 7.20 Parameter Group H19

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.00 | 0x1900 | Target value of position comparison 1 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.00" on page 345 |
| H19.02 | 0x1902 | Attribute value of position comparison 1 | Bit 0: Current position changes from "less than" to "more than" the comparison point<br>Bit 1: Current position changes from "more than" to "less than" the comparison point<br>bit2 to bit6: Reserved<br>bit7: DO1 output<br>bit8: DO2 output<br>bit9: DO3 output<br>bit10: DO4 output<br>bit11: DO5 output<br>bit12: Frequency-division A output<br>bit13: Frequency-division B output<br>bit14: Frequency-division Z output<br>bit15: Frequency-division OCZ output | 0 | - | Immediately | " H19.02" on page 345 |
| H19.03 | 0x1903 | Target value of position comparison 2 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.03" on page 346 |
| H19.05 | 0x1905 | Attribute value of position comparison 2 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.05" on page 346 |
| H19.06 | 0x1906 | Target value of position comparison 3 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.06" on page 346 |
| H19.08 | 0x1908 | Attribute value of position comparison 3 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.08" on page 346 |
| H19.09 | 0x1909 | Target value of position comparison 4 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.09" on page 346 |
| H19.11 | 0x190B | Attribute value of position comparison 4 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.11" on page 347 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.12 | 0x190C | Target value of position comparison 5 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.12" on page 347 |
| H19.14 | 0x190E | Attribute value of position comparison 5 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.14" on page 347 |
| H19.15 | 0x190F | Target value of position comparison 6 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.15" on page 347 |
| H19.17 | 0x1911 | Attribute value of position comparison 6 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.17" on page 348 |
| H19.18 | 0x1912 | Target value of position comparison 7 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.18" on page 348 |
| H19.20 | 0x1914 | Attribute value of position comparison 7 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.20" on page 348 |
| H19.21 | 0x1915 | Target value of position comparison 8 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.21" on page 348 |
| H19.23 | 0x1917 | Attribute value of position comparison 8 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.23" on page 349 |
| H19.24 | 0x1918 | Target value of position comparison 9 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.24" on page 349 |
| H19.26 | 0x191A | Attribute value of position comparison 9 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.26" on page 349 |
| H19.27 | 0x191B | Target value of position comparison 10 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.27" on page 349 |
| H19.29 | 0x191D | Attribute value of position comparison 10 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.29" on page 350 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.30 | 0x191E | Target value of position comparison 11 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.30" on page 350 |
| H19.32 | 0x1920 | Attribute value of position comparison 11 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.32" on page 350 |
| H19.33 | 0x1921 | Target value of position comparison 12 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.33" on page 350 |
| H19.35 | 0x1923 | Attribute value of position comparison 12 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.35" on page 351 |
| H19.36 | 0x1924 | Target value of position comparison 13 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.36" on page 351 |
| H19.38 | 0x1926 | Attribute value of position comparison 13 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.38" on page 351 |
| H19.39 | 0x1927 | Target value of position comparison 14 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.39" on page 351 |
| H19.41 | 0x1929 | Attribute value of position comparison 14 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.41" on page 352 |
| H19.42 | 0x192A | Target value of position comparison 15 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.42" on page 352 |
| H19.44 | 0x192C | Attribute value of position comparison 15 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.44" on page 352 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.45 | 0x192D | Target value of position comparison 16 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.45" on page 352 |
| H19.47 | 0x192F | Attribute value of position comparison 16 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.47" on page 353 |
| H19.48 | 0x1930 | Target value of position comparison 17 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.48" on page 353 |
| H19.50 | 0x1932 | Attribute value of position comparison 17 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.50" on page 353 |
| H19.51 | 0x1933 | Target value of position comparison 18 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.51" on page 353 |
| H19.53 | 0x1935 | Attribute value of position comparison 18 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.53" on page 354 |
| H19.54 | 0x1936 | Target value of position comparison 19 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.54" on page 354 |
| H19.56 | 0x1938 | Attribute value of position comparison 19 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.56" on page 354 |
| H19.57 | 0x1939 | Target value of position comparison 20 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.57" on page 354 |
| H19.59 | 0x193B | Attribute value of position comparison 20 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.59" on page 355 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.60 | 0x193C | Target value of position comparison 21 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.60" on page 355 |
| H19.62 | 0x193E | Attribute value of position comparison 21 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.62" on page 355 |
| H19.63 | 0x193F | Target value of position comparison 22 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.63" on page 355 |
| H19.65 | 0x1941 | Attribute value of position comparison 22 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.65" on page 356 |
| H19.66 | 0x1942 | Target value of position comparison 23 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.66" on page 356 |
| H19.68 | 0x1944 | Attribute value of position comparison 23 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.68" on page 356 |
| H19.69 | 0x1945 | Target value of position comparison 24 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.69" on page 356 |
| H19.71 | 0x1947 | Attribute value of position comparison 24 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.71" on page 357 |
| H19.72 | 0x1948 | Target value of position comparison 25 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.72" on page 357 |
| H19.74 | 0x194A | Attribute value of position comparison 25 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.74" on page 357 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.75 | 0x194B | Target value of position comparison 26 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.75" on page 357 |
| H19.77 | 0x194D | Attribute value of position comparison 26 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.77" on page 358 |
| H19.78 | 0x194E | Target value of position comparison 27 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.78" on page 358 |
| H19.80 | 0x1950 | Attribute value of position comparison 27 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.80" on page 358 |
| H19.81 | 0x1951 | Target value of position comparison 28 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.81" on page 358 |
| H19.83 | 0x1953 | Attribute value of position comparison 28 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.83" on page 359 |
| H19.84 | 0x1954 | Target value of position comparison 29 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.84" on page 359 |
| H19.86 | 0x1956 | Attribute value of position comparison 29 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.86" on page 359 |
| H19.87 | 0x1957 | Target value of position comparison 30 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.87" on page 359 |
| H19.89 | 0x1959 | Attribute value of position comparison 30 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.89" on page 360 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.90 | 0x195A | Target value of position comparison 31 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.90" on page 360 |
| H19.92 | 0x195C | Attribute value of position comparison 31 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.92" on page 360 |
| H19.93 | 0x195D | Target value of position comparison 32 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.93" on page 360 |
| H19.95 | 0x195F | Attribute value of position comparison 32 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.95" on page 361 |
| H19.96 | 0x1960 | Target value of position comparison 33 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.96" on page 361 |
| H19.98 | 0x1962 | Attribute value of position comparison 33 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.98" on page 361 |
| H19.99 | 0x1963 | Target value of position comparison 34 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.99" on page 361 |
| H19.101 | 0x1965 | Attribute value of position comparison 34 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.101" on page 362 |
| H19.102 | 0x1966 | Target value of position comparison 35 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.102" on page 362 |
| H19.104 | 0x1968 | Attribute value of position comparison 35 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.104" on page 362 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H19.105 | 0x1969 | Target value of position comparison 36 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.105" on page 362 |
| H19.107 | 0x196B | Attribute value of position comparison 36 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.107" on page 363 |
| H19.108 | 0x196C | Target value of position comparison 37 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.108" on page 363 |
| H19.110 | 0x196E | Attribute value of position comparison 37 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.110" on page 363 |
| H19.111 | 0x196F | Target value of position comparison 38 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.111" on page 363 |
| H19.113 | 0x1971 | Attribute value of position comparison 38 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.113" on page 364 |
| H19.114 | 0x1972 | Target value of position comparison 39 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.114" on page 364 |
| H19.116 | 0x1974 | Attribute value of position comparison 39 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.116" on page 364 |
| H19.117 | 0x1975 | Target value of position comparison 40 | -2147483648 to 2147483647 | 0 | - | Immediately | " H19.117" on page 364 |
| H19.119 | 0x1977 | Attribute value of position comparison 40 | See " H19.02" on page 345 for details. | 0 | - | Immediately | " H19.119" on page 365 |

## 7.21 Parameter Group H1F

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H1F.90 | 0x1F5A | DI function state 1 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.90" on page 365 |
| H1F.91 | 0x1F5B | DI function state 2 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.91" on page 365 |
| H1F.92 | 0x1F5C | DI function state 3 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.92" on page 366 |
| H1F.93 | 0x1F5D | DI function state 4 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.93" on page 366 |
| H1F.94 | 0x1F5E | DO function state 1 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.94" on page 366 |
| H1F.95 | 0x1F5F | DO function state 2 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.95" on page 367 |
| H1F.96 | 0x1F60 | DO function state 3 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.96" on page 367 |
| H1F.97 | 0x1F61 | DO function state 4 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H1F.97" on page 368 |

# 7.22 Parameter Group H22

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H22.00 | 0x2200 | Process segment command trigger | 0 to 1000 | 0 | - | Immediately | " H22.00" on page 368 |
| H22.01 | 0x2201 | Process segment triggered by the event rising edge | 0 to 65535 | 0 | - | Immediately | " H22.01" on page 369 |
| H22.02 | 0x2202 | Process segment triggered by the event falling edge | 0 to 65535 | 0 | - | Immediately | " H22.02" on page 369 |
| H22.03 | 0x2203 | Acceleration/ Deceleration time upon process segment pause | 0: Acceleration/Deceleration time<br>1: Acceleration/Deceleration time 1<br>2: Acceleration/Deceleration time 2<br>3: Acceleration/Deceleration time 3<br>4: Acceleration/Deceleration time 4<br>5: Acceleration/Deceleration time 5<br>6: Acceleration/Deceleration time 6<br>7: Acceleration/Deceleration time 7 | 0 | - | Immediately | " H22.03" on page 370 |
| H22.04 | 0x2204 | Positive software position limit | -2147483648 to 2147483647 | 2147483647 | Reference unit | Immediately | " H22.04" on page 370 |
| H22.06 | 0x2206 | Negative software position limit | -2147483648 to 2147483647 | -2147483648 | Reference unit | Immediately | " H22.06" on page 371 |
| H22.08 | 0x2208 | Process segment number | 0 to 65535 | 0 | - | Unchangeable | " H22.08" on page 371 |
| H22.19 | 0x2213 | Target speed | 0.1 rpm to 6000.0 rpm | 50 | rpm | Immediately | " H22.19" on page 371 |
| H22.20 | 0x2214 | Target speed 1 | 0.1 rpm to 6000.0 rpm | 200 | rpm | Immediately | " H22.20" on page 372 |
| H22.21 | 0x2215 | Target speed 2 | 0.1 rpm to 6000.0 rpm | 500 | rpm | Immediately | " H22.21" on page 372 |
| H22.22 | 0x2216 | Target speed 3 | 0.1 rpm to 6000.0 rpm | 1000 | rpm | Immediately | " H22.22" on page 372 |
| H22.23 | 0x2217 | Target speed 4 | 0.1 rpm to 6000.0 rpm | 1500 | rpm | Immediately | " H22.23" on page 372 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H22.24 | 0x2218 | Target speed 5 | 0.1 rpm to 6000.0 rpm | 2000 | rpm | Immediately | " H22.24" on page 373 |
| H22.25 | 0x2219 | Target speed 6 | 0.1 rpm to 6000.0 rpm | 2500 | rpm | Immediately | " H22.25" on page 373 |
| H22.26 | 0x221A | Target speed 7 | 0.1 rpm to 6000.0 rpm | 3000 | rpm | Immediately | " H22.26" on page 373 |
| H22.35 | 0x2223 | Acceleration/ Deceleration time | 0 ms to 65535 ms | 50 | ms | Immediately | " H22.35" on page 373 |
| H22.36 | 0x2224 | Acceleration/ Deceleration time 1 | 0 ms to 65535 ms | 200 | ms | Immediately | " H22.36" on page 374 |
| H22.37 | 0x2225 | Acceleration/ Deceleration time 2 | 0 ms to 65535 ms | 500 | ms | Immediately | " H22.37" on page 374 |
| H22.38 | 0x2226 | Acceleration/ Deceleration time 3 | 0 ms to 65535 ms | 1000 | ms | Immediately | " H22.38" on page 374 |
| H22.39 | 0x2227 | Acceleration/ Deceleration time 4 | 0 ms to 65535 ms | 1500 | ms | Immediately | " H22.39" on page 374 |
| H22.40 | 0x2228 | Acceleration/ Deceleration time 5 | 0 ms to 65535 ms | 2000 | ms | Immediately | " H22.40" on page 375 |
| H22.41 | 0x2229 | Acceleration/ Deceleration time 6 | 0 ms to 65535 ms | 2500 | ms | Immediately | " H22.41" on page 375 |
| H22.42 | 0x222A | Acceleration/ Deceleration time 7 | 0 ms to 65535 ms | 3000 | ms | Immediately | " H22.42" on page 375 |
| H22.51 | 0x2233 | Delay after completion of the process segment | 0 ms to 65535 ms | 0 | ms | Immediately | " H22.51" on page 375 |
| H22.52 | 0x2234 | Delay time 1 after completion of the process segment | 0 ms to 65535 ms | 50 | ms | Immediately | " H22.52" on page 376 |
| H22.53 | 0x2235 | Delay time 2 after completion of the process segment | 0 ms to 65535 ms | 200 | ms | Immediately | " H22.53" on page 376 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H22.54 | 0x2236 | Delay time 3 after completion of the process segment | 0 ms to 65535 ms | 500 | ms | Immediately | " H22.54" on page 376 |
| H22.55 | 0x2237 | Delay time 4 after completion of the process segment | 0 ms to 65535 ms | 1000 | ms | Immediately | " H22.55" on page 376 |
| H22.56 | 0x2238 | Delay time 5 after completion of the process segment | 0 ms to 65535 ms | 1500 | ms | Immediately | " H22.56" on page 377 |
| H22.57 | 0x2239 | Delay time 6 after completion of the process segment | 0 ms to 65535 ms | 2000 | ms | Immediately | " H22.57" on page 377 |
| H22.58 | 0x223A | Delay time 7 after completion of the process segment | 0 ms to 65535 ms | 3000 | ms | Immediately | " H22.58" on page 377 |
| H22.70 | 0x2246 | Homing mode | -32768 to 32767 | -2 | - | Immediately | " H22.70" on page 377 |
| H22.71 | 0x2247 | Speed in high-speed searching for the home switch signal | 0 rpm to 3000 rpm | 100 | rpm | Immediately | " H22.71" on page 378 |
| H22.72 | 0x2248 | Speed in low-speed searching for the home switch signal | 0 rpm to 1000 rpm | 10 | rpm | Immediately | " H22.72" on page 378 |
| H22.73 | 0x2249 | Acceleration/ Deceleration time during homing | 0 ms to 1000 ms | 1000 | ms | Immediately | " H22.73" on page 378 |
| H22.74 | 0x224A | Homing time limit | 0 ms to 65535 ms | 10000 | ms | Immediately | " H22.74" on page 379 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H22.75 | 0x224B | Mechanical home offset | –2147483648 to +2147483647 | 0 | Refer ence unit | Immediate ly | " H22.75" on page 379 |
| H22.79 | 0x224F | Relative/ Absolute homing | 0 to 65535 | 0 | - | Immediate ly | " H22.79" on page 379 |

# 7.23 Parameter Group H23

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H23.00 | 0x2300 | Definition of homing | 0 to 4294967295 | 0 | - | Immediate ly | " H23.00" on page 380 |
| H23.02 | 0x2302 | Homing data | -2147483648 to 2147483647 | 0 | - | Immediate ly | " H23.02" on page 380 |
| H23.04 | 0x2304 | Definition of process segment 1 | 0 to 4294967295 | 0 | - | Immediate ly | " H23.04" on page 380 |
| H23.06 | 0x2306 | Data of process segment 1 | -2147483648 to 2147483647 | 0 | - | Immediate ly | " H23.06" on page 381 |
| H23.08 | 0x2308 | Definition of process segment 2 | 0 to 4294967295 | 0 | - | Immediate ly | " H23.08" on page 381 |
| H23.10 | 0x230A | Data of process segment 2 | -2147483648 to 2147483647 | 0 | - | Immediate ly | " H23.10" on page 381 |
| H23.12 | 0x230C | Definition of process segment 3 | 0 to 4294967295 | 0 | - | Immediate ly | " H23.12" on page 381 |
| H23.14 | 0x230E | Data of process segment 3 | -2147483648 to 2147483647 | 0 | - | Immediate ly | " H23.14" on page 382 |
| H23.16 | 0x2310 | Definition of process segment 4 | 0 to 4294967295 | 0 | - | Immediate ly | " H23.16" on page 382 |
| H23.18 | 0x2312 | Data of process segment 4 | -2147483648 to 2147483647 | 0 | - | Immediate ly | " H23.18" on page 382 |
| H23.20 | 0x2314 | Definition of process segment 5 | 0 to 4294967295 | 0 | - | Immediate ly | " H23.20" on page 382 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H23.22 | 0x2316 | Data of process segment 5 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.22" on page 382 |
| H23.24 | 0x2318 | Definition of process segment 6 | 0 to 4294967295 | 0 | - | Immediately | " H23.24" on page 383 |
| H23.26 | 0x231A | Data of process segment 6 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.26" on page 383 |
| H23.28 | 0x231C | Definition of process segment 7 | 0 to 4294967295 | 0 | - | Immediately | " H23.28" on page 383 |
| H23.30 | 0x231E | Data of process segment 7 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.30" on page 383 |
| H23.32 | 0x2320 | Definition of process segment 8 | 0 to 4294967295 | 0 | - | Immediately | " H23.32" on page 384 |
| H23.34 | 0x2322 | Data of process segment 8 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.34" on page 384 |
| H23.36 | 0x2324 | Definition of process segment 9 | 0 to 4294967295 | 0 | - | Immediately | " H23.36" on page 384 |
| H23.38 | 0x2326 | Data of process segment 9 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.38" on page 384 |
| H23.40 | 0x2328 | Definition of process segment 10 | 0 to 4294967295 | 0 | - | Immediately | " H23.40" on page 385 |
| H23.42 | 0x232A | Data of process segment 10 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.42" on page 385 |
| H23.44 | 0x232C | Definition of process segment 11 | 0 to 4294967295 | 0 | - | Immediately | " H23.44" on page 385 |
| H23.46 | 0x232E | Data of process segment 11 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.46" on page 385 |
| H23.48 | 0x2330 | Definition of process segment 12 | 0 to 4294967295 | 0 | - | Immediately | " H23.48" on page 386 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H23.50 | 0x2332 | Data of process segment 12 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.50" on page 386 |
| H23.52 | 0x2334 | Definition of process segment 13 | 0 to 4294967295 | 0 | - | Immediately | " H23.52" on page 386 |
| H23.54 | 0x2336 | Data of process segment 13 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.54" on page 386 |
| H23.56 | 0x2338 | Definition of process segment 14 | 0 to 4294967295 | 0 | - | Immediately | " H23.56" on page 387 |
| H23.58 | 0x233A | Data of process segment 14 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.58" on page 387 |
| H23.60 | 0x233C | Definition of process segment 15 | 0 to 4294967295 | 0 | - | Immediately | " H23.60" on page 387 |
| H23.62 | 0x233E | Data of process segment 15 | -2147483648 to 2147483647 | 0 | - | Immediately | " H23.62" on page 387 |

## 7.24 Parameter Group H30

| Param. No. | Comm. Address | Name | Setpoint | Default | Unit | Change | Page |
|---|---|---|---|---|---|---|---|
| H30.00 | 0x3000 | Servo status read through communication | 0 to 65535 | 0 | - | Unchangeable | " H30.00" on page 388 |
| H30.01 | 0x3001 | DO function state 1 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H30.01" on page 388 |
| H30.02 | 0x3002 | DO function state 2 read through communication | 0 to 65535 | 0 | - | Unchangeable | " H30.02" on page 388 |
| H30.03 | 0x3003 | Input pulse reference sampling value read through communication | 0 to 65535 | 0 | - | Unchangeable | " H30.03" on page 389 |

## 7.25 Parameter Group H31

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| H31.00 | 0x3100 | VDI virtual level set through communication | 0 to 65535 | 0 | - | Immediately | " H31.00" on page 389 |
| H31.04 | 0x3104 | DO state set through communication | 0 to 65535 | 0 | - | Immediately | " H31.04" on page 390 |
| H31.05 | 0x3105 | AO set through communication | -10000 mV to 10000 mV | 0 | mV | Immediately | " H31.05" on page 390 |
| H31.09 | 0x3109 | Speed reference set through communication | –10000 RPM to +10000 RPM | 0 | rpm | Immediately | " H31.09" on page 390 |
| H31.11 | 0x310B | Torque reference set through communication | -100.000% to 100.000% | 0 | % | Immediately | " H31.11" on page 390 |

## 7.26 Parameter Group 1000h

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 1000h | - | Device type | - | 0x20192 | - | Unchangeable | " 1000h" on page 391 |
| 1005h | 0x2D00 | SYNC message COB-ID | 128 to 4294967295 | 128 | - | Immediately | " 1005h" on page 391 |
| 1006h | 0x2D02 | Synchronization cycle | 0us to 2147483647us | 0 | us | Immediately | " 1006h" on page 391 |
| 1008h | - | Device manufacturer name | - | SV680C | - | Unchangeable | " 1008h" on page 392 |
| 100Ch | 0x2D04 | Node guarding time | 0 ms to 65535 ms | 0 | ms | Immediately | " 100Ch" on page 392 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 100dh | 0x2D05 | Life factor | 0 to 255 | 0 | - | Immediately | " 100dh" on page 392 |
| 1014h | 0x2D06 | Emergency message COB-ID | 0 to 4294967295 | 0 | - | Immediately | " 1014h" on page 392 |
| 1016.01h | 0x2D08 | Consumer heartbeat time 1 | 0 to 2147483647 | 0 | - | Immediately | " 1016.01h" on page 393 |
| 1016.02h | 0x2D0A | Consumer heartbeat time 2 | 0 to 2147483647 | 0 | - | Immediately | " 1016.02h" on page 393 |
| 1016.03h | 0x2D0C | Consumer heartbeat time 3 | 0 to 2147483647 | 0 | - | Immediately | " 1016.03h" on page 393 |
| 1016.04h | 0x2D0E | Consumer heartbeat time 4 | 0 to 2147483647 | 0 | - | Immediately | " 1016.04h" on page 394 |
| 1016.05h | 0x2D10 | Consumer heartbeat time 5 | 0 to 2147483647 | 0 | - | Immediately | " 1016.05h" on page 394 |
| 1017h | 0x2D12 | Producer heartbeat time | 0 ms to 65535 ms | 0 | ms | Immediately | " 1017h" on page 394 |
| 1018.01h | - | Vendor ID | - | 0x3B9 | - | Unchangeable | " 1018.01h" on page 394 |
| 1018.02h | - | Device code | - | 0xD0117 | - | Unchangeable | " 1018.02h" on page 394 |
| 1018.03h | - | Device revision | - | 0x20001 | - | Unchangeable | " 1018.03h" on page 395 |
| 1400.01h | 0x2D14 | COB-ID of RPDO1 | 0 to 4294967295 | 512 | - | Immediately | " 1400.01h" on page 395 |
| 1400.02h | 0x2D16 | Transmission type of RPDO1 | 0 to 255 | 255 | - | Immediately | " 1400.02h" on page 395 |
| 1401.01h | 0x2D17 | COB-ID of RPDO2 | 0 to 4294967295 | 0 | - | Immediately | " 1401.01h" on page 396 |
| 1401.02h | 0x2D19 | Transmission type of RPDO2 | 0 to 255 | 255 | - | Immediately | " 1401.02h" on page 396 |
| 1402.01h | 0x2D1A | COB-ID of RPDO3 | 0 to 4294967295 | 0 | - | Immediately | " 1402.01h" on page 396 |
| 1402.02h | 0x2D1C | Transmission type of RPDO3 | 0 to 255 | 255 | - | Immediately | " 1402.02h" on page 396 |
| 1403.01h | 0x2D1D | COB-ID of RPDO4 | 0 to 4294967295 | 0 | - | Immediately | " 1403.01h" on page 397 |
| 1403.02h | 0x2D1F | Transmission type of RPDO4 | 0 to 255 | 255 | - | Immediately | " 1403.02h" on page 397 |
| 1600.00h | 0x2D20 | Number of valid mapped objects in RPDO1 | 0 to 8 | 1 | - | Immediately | " 1600.00h" on page 397 |
| 1600.01h | 0x2D21 | 1st mapped object in RPDO1 | 0 to 2147483647 | 1614807056 | - | Immediately | " 1600.01h" on page 397 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 1600.02h | 0x2D23 | 2nd mapped object in RPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1600.02h" on page 398 |
| 1600.03h | 0x2D25 | 3rd mapped object in RPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1600.03h" on page 398 |
| 1600.04h | 0x2D27 | 4th mapped object in RPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1600.04h" on page 398 |
| 1600.05h | 0x2D29 | 5th mapped object in RPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1600.05h" on page 399 |
| 1600.06h | 0x2D2B | 6th mapped object in RPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1600.06h" on page 399 |
| 1600.07h | 0x2D2D | 7th mapped object in RPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1600.07h" on page 399 |
| 1600.08h | 0x2D2F | 8th mapped object in RPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1600.08h" on page 399 |
| 1601.00h | 0x2D31 | Number of valid mapped objects in RPDO2 | 0 to 8 | 2 | - | Immediately | " 1601.00h" on page 399 |
| 1601.01h | 0x2D32 | 1st mapped object in RPDO2 | 0 to 2147483647 | 1614807056 | - | Immediately | " 1601.01h" on page 400 |
| 1601.02h | 0x2D34 | 2nd mapped object in RPDO2 | 0 to 2147483647 | 1616904200 | - | Immediately | " 1601.02h" on page 400 |
| 1601.03h | 0x2D36 | 3rd mapped object in RPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1601.03h" on page 400 |
| 1601.04h | 0x2D38 | 4th mapped object in RPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1601.04h" on page 401 |
| 1601.05h | 0x2D3A | 5th mapped object in RPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1601.05h" on page 401 |
| 1601.06h | 0x2D3C | 6th mapped object in RPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1601.06h" on page 401 |
| 1601.07h | 0x2D3E | 7th mapped object in RPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1601.07h" on page 401 |
| 1601.08h | 0x2D40 | 8th mapped object in RPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1601.08h" on page 402 |
| 1602.00h | 0x2D42 | Number of valid mapped objects in RPDO3 | 0 to 8 | 2 | - | Immediately | " 1602.00h" on page 402 |
| 1602.01h | 0x2D43 | 1st mapped object in RPDO3 | 0 to 2147483647 | 1614807056 | - | Immediately | " 1602.01h" on page 402 |
| 1602.02h | 0x2D45 | 2nd mapped object in RPDO3 | 0 to 2147483647 | 1618608160 | - | Immediately | " 1602.02h" on page 403 |
| 1602.03h | 0x2D47 | 3rd mapped object in RPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1602.03h" on page 403 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 1602.04h | 0x2D49 | 4th mapped object in RPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1602.04h" on page 403 |
| 1602.05h | 0x2D4B | 5th mapped object in RPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1602.05h" on page 403 |
| 1602.06h | 0x2D4D | 6th mapped object in RPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1602.06h" on page 403 |
| 1602.07h | 0x2D4F | 7th mapped object in RPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1602.07h" on page 404 |
| 1602.08h | 0x2D51 | 8th mapped object in RPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1602.08h" on page 404 |
| 1603.00h | 0x2D53 | Number of valid mapped objects in RPDO4 | 0 to 8 | 2 | - | Immediately | " 1603.00h" on page 404 |
| 1603.01h | 0x2D54 | 1st mapped object in RPDO4 | 0 to 2147483647 | 1614807056 | - | Immediately | " 1603.01h" on page 404 |
| 1603.02h | 0x2D56 | 2nd mapped object in RPDO4 | 0 to 2147483647 | 1627324448 | - | Immediately | " 1603.02h" on page 405 |
| 1603.03h | 0x2D58 | 3rd mapped object in RPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1603.03h" on page 405 |
| 1603.04h | 0x2D5A | 4th mapped object in RPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1603.04h" on page 405 |
| 1603.05h | 0x2D5C | 5th mapped object in RPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1603.05h" on page 406 |
| 1603.06h | 0x2D5E | 6th mapped object in RPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1603.06h" on page 406 |
| 1603.07h | 0x2D60 | 7th mapped object in RPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1603.07h" on page 406 |
| 1603.08h | 0x2D62 | 8th mapped object in RPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1603.08h" on page 406 |
| 1800.01h | 0x2E00 | COB-ID of TPDO1 | 0 to 4294967295 | 0 | - | Immediately | " 1800.01h" on page 407 |
| 1800.02h | 0x2E02 | Transmission type of TPDO1 | 0 to 255 | 255 | - | Immediately | " 1800.02h" on page 407 |
| 1800.03h | 0x2E03 | Inhibit time of TPDO1 | 0 us to 65535 us | 500 | 100us | Immediately | " 1800.03h" on page 407 |
| 1800.05h | 0x2E04 | Event counter of TPDO1 | 0 ms to 65535 ms | 0 | ms | Immediately | " 1800.05h" on page 408 |
| 1801.01h | 0x2E05 | COB-ID of TPDO2 | 0 to 4294967295 | 0 | - | Immediately | " 1801.01h" on page 408 |
| 1801.02h | 0x2E07 | Transmission type of TPDO2 | 0 to 255 | 255 | - | Immediately | " 1801.02h" on page 408 |
| 1801.03h | 0x2E08 | Inhibit time of TPDO2 | 0 us to 65535 us | 500 | 100us | Immediately | " 1801.03h" on page 408 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 1801.05h | 0x2E09 | Event counter of TPDO2 | 0 ms to 65535 ms | 0 | ms | Immediately | " 1801.05h" on page 409 |
| 1802.01h | 0x2E0A | COB-ID of TPDO3 | 0 to 4294967295 | 0 | - | Immediately | " 1802.01h" on page 409 |
| 1802.02h | 0x2E0C | Transmission type of TPDO3 | 0 to 255 | 255 | - | Immediately | " 1802.02h" on page 409 |
| 1802.03h | 0x2E0D | Inhibit time of TPDO3 | 0 us to 65535 us | 500 | 100us | Immediately | " 1802.03h" on page 409 |
| 1802.05h | 0x2E0E | Event counter of TPDO3 | 0 ms to 65535 ms | 0 | ms | Immediately | " 1802.05h" on page 410 |
| 1803.01h | 0x2E0F | COB-ID of TPDO4 | 0 to 4294967295 | 0 | - | Immediately | " 1803.01h" on page 410 |
| 1803.02h | 0x2E11 | Transmission type of TPDO4 | 0 to 255 | 255 | - | Immediately | " 1803.02h" on page 410 |
| 1803.03h | 0x2E12 | Inhibit time of TPDO4 | 0 us to 65535 us | 500 | 100us | Immediately | " 1803.03h" on page 410 |
| 1803.05h | 0x2E13 | Event counter of TPDO4 | 0 ms to 65535 ms | 0 | ms | Immediately | " 1803.05h" on page 411 |
| 1A00.00h | 0x2E14 | Number of valid mapped objects in TPDO1 | 0 to 8 | 1 | - | Immediately | " 1A00.00h" on page 411 |
| 1A00.01h | 0x2E15 | 1st mapped object in TPDO1 | 0 to 2147483647 | 1614872592 | - | Immediately | " 1A00.01h" on page 411 |
| 1A00.02h | 0x2E17 | 2nd mapped object in TPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1A00.02h" on page 412 |
| 1A00.03h | 0x2E19 | 3rd mapped object in TPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1A00.03h" on page 412 |
| 1A00.04h | 0x2E1B | 4th mapped object in TPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1A00.04h" on page 412 |
| 1A00.05h | 0x2E1D | 5th mapped object in TPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1A00.05h" on page 412 |
| 1A00.06h | 0x2E1F | 6th mapped object in TPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1A00.06h" on page 412 |
| 1A00.07h | 0x2E21 | 7th mapped object in TPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1A00.07h" on page 413 |
| 1A00.08h | 0x2E23 | 8th mapped object in TPDO1 | 0 to 2147483647 | 0 | - | Immediately | " 1A00.08h" on page 413 |
| 1A01.00h | 0x2E25 | Number of valid mapped objects in TPDO2 | 0 to 8 | 2 | - | Immediately | " 1A01.00h" on page 413 |
| 1A01.01h | 0x2E26 | 1st mapped object in TPDO2 | 0 to 2147483647 | 1614872592 | - | Immediately | " 1A01.01h" on page 413 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 1A01.02h | 0x2E28 | 2nd mapped object in TPDO2 | 0 to 2147483647 | 1616969736 | - | Immediately | " 1A01.02h" on page 414 |
| 1A01.03h | 0x2E2A | 3rd mapped object in TPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1A01.03h" on page 414 |
| 1A01.04h | 0x2E2C | 4th mapped object in TPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1A01.04h" on page 414 |
| 1A01.05h | 0x2E2E | 5th mapped object in TPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1A01.05h" on page 415 |
| 1A01.06h | 0x2E30 | 6th mapped object in TPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1A01.06h" on page 415 |
| 1A01.07h | 0x2E32 | 7th mapped object in TPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1A01.07h" on page 415 |
| 1A01.08h | 0x2E34 | 8th mapped object in TPDO2 | 0 to 2147483647 | 0 | - | Immediately | " 1A01.08h" on page 415 |
| 1A02.00h | 0x2E36 | Number of valid mapped objects in TPDO3 | 0 to 8 | 2 | - | Immediately | " 1A02.00h" on page 416 |
| 1A02.01h | 0x2E37 | 1st mapped object in TPDO3 | 0 to 2147483647 | 1614872592 | - | Immediately | " 1A02.01h" on page 416 |
| 1A02.02h | 0x2E39 | 2nd mapped object in TPDO3 | 0 to 2147483647 | 1617166368 | - | Immediately | " 1A02.02h" on page 416 |
| 1A02.03h | 0x2E3B | 3rd mapped object in TPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1A02.03h" on page 417 |
| 1A02.04h | 0x2E3D | 4th mapped object in TPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1A02.04h" on page 417 |
| 1A02.05h | 0x2E3F | 5th mapped object in TPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1A02.05h" on page 417 |
| 1A02.06h | 0x2E41 | 6th mapped object in TPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1A02.06h" on page 417 |
| 1A02.07h | 0x2E43 | 7th mapped object in TPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1A02.07h" on page 417 |
| 1A02.08h | 0x2E45 | 8th mapped object in TPDO3 | 0 to 2147483647 | 0 | - | Immediately | " 1A02.08h" on page 418 |
| 1A03.00h | 0x2E47 | Number of valid mapped objects in TPDO4 | 0 to 8 | 2 | - | Immediately | " 1A03.00h" on page 418 |
| 1A03.01h | 0x2E48 | 1st mapped object in TPDO4 | 0 to 2147483647 | 1614872592 | - | Immediately | " 1A03.01h" on page 418 |
| 1A03.02h | 0x2E4A | 2nd mapped object in TPDO4 | 0 to 2147483647 | 1617690656 | - | Immediately | " 1A03.02h" on page 419 |
| 1A03.03h | 0x2E4C | 3rd mapped object in TPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1A03.03h" on page 419 |

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 1A03.04h | 0x2E4E | 4th mapped object in TPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1A03.04h" on page 419 |
| 1A03.05h | 0x2E50 | 5th mapped object in TPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1A03.05h" on page 419 |
| 1A03.06h | 0x2E52 | 6th mapped object in TPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1A03.06h" on page 420 |
| 1A03.07h | 0x2E54 | 7th mapped object in TPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1A03.07h" on page 420 |
| 1A03.08h | 0x2E56 | 8th mapped object in TPDO4 | 0 to 2147483647 | 0 | - | Immediately | " 1A03.08h" on page 420 |

## 7.27 Parameter Group 6000h

| Param. No. | Communi cation Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 603Fh | 0x3500 | Error Code | 0 to 65535 | 0 | - | Unchangeable | " 603Fh" on page 420 |
| 6040h | 0x3502 | Control word | 0 to 65535 | 0 | - | Immediately | " 6040h" on page 421 |
| 6041h | 0x3504 | Status word | 0 to 65535 | 0 | - | Unchangeable | " 6041h" on page 421 |
| 605Ah | 0x3536 | Quick stop option code | 0: Coast to stop, keeping de-energized state<br>1: Ramp to stop as defined by 6084h/609Ah (HM), keeping de-energized state<br>2: Ramp to stop as defined by 6085h, keeping de-energized state<br>3: Stop at emergency stop torque, keeping de-energized state<br>5: Ramp to stop as defined by 6084h/609Ah (HM), keeping position lock state<br>6: Ramp to stop as defined by 6085h, keeping position lock state<br>7: Stop at emergency stop torque, keeping position lock state | 2 | - | At stop | " 605Ah" on page 421 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 605Ch | 0x353A | Stop mode at S-ON OFF | –4: Ramp to stop as defined by 6085h, keeping dynamic braking state<br>–3: Stop at zero speed, keeping dynamic braking state<br>–2: Ramp to stop as defined by 6084h/ 609Ah, keeping dynamic braking state<br>–1: Dynamic braking stop, keeping dynamic braking state<br>0: Coast to stop, keeping de-energized state<br>1: Ramp to stop as defined by 6084h/ 609Ah, keeping de-energized state<br>2: Dynamic braking stop, keeping de-energized state | 0 | - | At stop | *" 605Ch" on page 422* |
| 605Dh | 0x353C | Stop option code | 1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping position lock state<br>2: Ramp to stop as defined by 6085h, keeping position lock state<br>3: Stop at emergency stop torque, keeping position lock state | 1 | - | At stop | *" 605Dh" on page 423* |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 605Eh | 0x353E | Stop mode at No.2 fault | –5: Stop at zero speed, keeping dynamic braking state<br>–4: Stop at emergency stop torque, keeping dynamic braking state<br>–3: Ramp to stop as defined by 6085h, keeping dynamic braking state<br>–2: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping dynamic braking state<br>–1: Dynamic braking stop, keeping dynamic braking state<br>0: Coast to stop, keeping de-energized state<br>1: Ramp to stop as defined by 6084h/ 609Ah (HM), keeping de-energized state<br>2: Ramp to stop as defined by 6085h, keeping de-energized state<br>3: Stop at emergency stop torque, keeping de-energized state<br>4: Dynamic braking stop, keeping de-energized state | 2 | - | At stop | " 605Eh" on page 423 |
| 6060h | 0x3542 | Modes of operation | 1: Profile position (PP) mode<br>3: Profile velocity (PV) mode<br>4: Profile torque (PT) mode<br>6: Homing (HM) mode<br>7: Interpolation (IP) mode | 0 | - | Immediately | " 6060h" on page 424 |
| 6061h | 0x3544 | Operation mode display | 1: Profile position (PP) mode<br>3: Profile velocity (PV) mode<br>4: Profile torque (PT) mode<br>6: Homing (HM) mode<br>7: Interpolation (IP) mode | 0 | - | Unchangeable | " 6061h" on page 424 |
| 6062h | 0x3546 | Position reference | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " 6062h" on page 425 |
| 6063h | 0x3548 | Position actual value | –2147483648 to +2147483647 | 0 | Pulse | Unchangeable | " 6063h" on page 425 |
| 6064h | 0x354A | Position actual value | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " 6064h" on page 425 |
| 6065h | 0x354C | Following error window | 0 to 4294967295 | 27486951 | Reference unit | Immediately | " 6065h" on page 426 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 6066h | 0x354E | Following error time out | 0 ms to 65535 ms | 0 | ms | Immediately | " 6066h" on page 426 |
| 6067h | 0x3550 | Position window | 0 to 4294967295 | 5872 | Reference unit | Immediately | " 6067h" on page 426 |
| 6068h | 0x3552 | Position window time | 0 ms to 65535 ms | 0 | ms | Immediately | " 6068h" on page 427 |
| 606Ch | 0x355A | Actual speed | –2147483648 to +2147483647 | 0 | Reference unit/s | Unchangeable | " 606Ch" on page 427 |
| 606Dh | 0x355C | Velocity window | 0 to 65535 | 10 | rpm | Immediately | " 606Dh" on page 427 |
| 606Eh | 0x355E | Velocity window time | 0 ms to 65535 ms | 0 | ms | Immediately | " 606Eh" on page 428 |
| 606Fh | 0x3560 | Velocity threshold | 0 to 65535 | 10 | rpm | Immediately | " 606Fh" on page 428 |
| 6070h | 0x3562 | Velocity threshold time | 0 ms to 65535 ms | 0 | ms | Immediately | " 6070h" on page 429 |
| 6071h | 0x3564 | Target torque | -40000 to 40000 | 0 | 0.001 | Immediately | " 6071h" on page 429 |
| 6072h | 0x3566 | Max. torque | 0 to 40000 | 3500 | 0.001 | Immediately | " 6072h" on page 430 |
| 6074h | 0x356A | Torque reference | -40000 to 40000 | 0 | 0.001 | Unchangeable | " 6074h" on page 430 |
| 6077h | 0x3570 | Torque actual value | -40000 to 40000 | 0 | 0.001 | Unchangeable | " 6077h" on page 430 |
| 607Ah | 0x3576 | Target position | -2147483648 to 2147483647 | 0 | Reference unit | Immediately | " 607Ah" on page 430 |
| 607Ch | 0x357A | Home offset | -2147483648 to 2147483647 | 0 | Reference unit | Immediately | " 607Ch" on page 431 |
| 607D.01h | 0x3700 | Min. position limit | -2147483648 to 2147483647 | -2147483648 | Reference unit | Immediately | " 607D.01h" on page 431 |
| 607D.02h | 0x3800 | Max. position limit | -2147483648 to 2147483647 | 2147483647 | Reference unit | Immediately | " 607D.02h" on page 432 |
| 607Eh | 0x357E | Reference polarity | 0 to 128 | 0 | - | Immediately | " 607Eh" on page 432 |
| 607Fh | 0x3580 | Max. profile velocity | 0 to 4294967295 | 838860800 | Reference unit/s | Immediately | " 607Fh" on page 432 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 6081h | 0x3584 | Profile velocity | 0 to 4294967295 | 13981013 | Reference unit/s | Immediately | " 6081h" on page 433 |
| 6083h | 0x3588 | Profile acceleration | 0 reference unit/$s^2$ to 4294967295 reference units/$s^2$ | 1398101333 | Reference unit/$s^2$ | Immediately | " 6083h" on page 433 |
| 6084h | 0x358A | Profile deceleration | 0 reference unit/$s^2$ to 4294967295 reference units/$s^2$ | 1398101333 | Reference unit/$s^2$ | Immediately | " 6084h" on page 433 |
| 6085h | 0x358C | Quick stop deceleration | 0 reference unit/$s^2$ to 4294967295 reference units/$s^2$ | 2147483647 | Reference unit/$s^2$ | Immediately | " 6085h" on page 434 |
| 6087h | 0x3590 | Torque slope | 0%/S to 4294967295%/s | 4294967295 | 0.1%/s | Immediately | " 6087h" on page 434 |
| 6091.01h | 0x3714 | Motor revolutions | 1 to 4294967295 | 1 | - | At stop | " 6091.01h" on page 434 |
| 6091.02h | 0x3814 | Shaft revolutions | 1 to 4294967295 | 1 | - | At stop | " 6091.02h" on page 435 |
| 6098h | 0x35B2 | Homing method | -3 to 35 | 1 | - | Immediately | " 6098h" on page 435 |
| 6099.01h | 0x371C | Speed during search for switch | 0 to 4294967295 | 13981013 | Reference unit/s | At stop | " 6099.01h" on page 437 |
| 6099.02h | 0x381C | Speed during search for zero | 0 to 4294967295 | 1398101 | Reference unit/s | At stop | " 6099.02h" on page 437 |
| 609Ah | 0x35B6 | Homing acceleration | 0 reference unit/$s^2$ to 4294967295 reference units/$s^2$ | 1398101333 | Reference unit/$s^2$ | Immediately | " 609Ah" on page 437 |
| 60B8h | 0x35F2 | Touch probe function | 0 to 65535 | 0 | - | Immediately | " 60B8h" on page 438 |
| 60B9h | 0x35F4 | Touch probe status | 0 to 65535 | 0 | - | Unchangeable | " 60B9h" on page 438 |
| 60BAh | 0x35F6 | Touch probe 1 positive edge | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " 60BAh" on page 438 |
| 60BBh | 0x35F8 | Touch probe 1 negative edge | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " 60BBh" on page 439 |
| 60BCh | 0x35FA | Touch probe 2 positive edge | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " 60BCh" on page 439 |
| 60BDh | 0x35FC | Touch probe 2 negative edge | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " 60BDh" on page 439 |

| Param. No. | Communication Address | Name | Setpoint | Default | Unit | Change Method | Page |
|---|---|---|---|---|---|---|---|
| 60C1.01h | 0x3744 | Interpolation displacement | -2147483648 to 2147483647 | 0 | Reference unit | Immediately | " 60C1.01h" on page 439 |
| 60C2.01h | 0x3745 | Interpolation time period | 1 to 20 | 1 | - | Immediately | " 60C2.01h" on page 440 |
| 60C2.02h | 0x3845 | Interpolation time units | 0 to 253 | 253 | - | Immediately | " 60C2.02h" on page 440 |
| 60C5h | 0x360C | Max. acceleration | 0 reference unit/$s^2$ to 4294967295 reference units/$s^2$ | 4294967295 | Reference unit/$s^2$ | Immediately | " 60C5h" on page 440 |
| 60C6h | 0x360E | Max. deceleration | 0 reference unit/$s^2$ to 4294967295 reference units/$s^2$ | 4294967295 | Reference unit/$s^2$ | Immediately | " 60C6h" on page 441 |
| 60D5h | 0x362C | Touch probe 1 positive edge counter | 0 to 65535 | 0 | - | Unchangeable | " 60D5h" on page 441 |
| 60D6h | 0x362E | Touch probe 1 negative edge counter | 0 to 65535 | 0 | - | Unchangeable | " 60D6h" on page 441 |
| 60D7h | 0x3630 | Touch probe 2 positive edge counter | 0 to 65535 | 0 | - | Unchangeable | " 60D7h" on page 441 |
| 60D8h | 0x3632 | Touch probe 2 negative edge counter | 0 to 65535 | 0 | - | Unchangeable | " 60D8h" on page 442 |
| 60E0h | 0x3642 | Positive torque limit value | 0 to 40000 | 3500 | 0.001 | Immediately | " 60E0h" on page 442 |
| 60E1h | 0x3644 | Negative torque limit value | 0 to 40000 | 3500 | 0.001 | Immediately | " 60E1h" on page 442 |
| 60F4h | 0x366A | Position deviation | -2147483648 to 2147483647 | 0 | Reference unit | Unchangeable | " 60F4h" on page 442 |
| 60FCh | 0x367A | Position reference | –2147483648 to +2147483647 | 0 | Pulse | Unchangeable | " 60FCh" on page 443 |
| 60FDh | 0x367C | DI state | 0 to 4294967295 | 0 | - | Unchangeable | " 60FDh" on page 443 |
| 60FFh | 0x3680 | Target velocity | –2147483648 to +2147483647 | 0 | Reference unit/s | Immediately | " 60FFh" on page 444 |
| 60FE.01h | 0x3781 | Physical outputs | 0 to 4294967295 | 0 | - | Immediately | " 60FE.01h" on page 444 |
| 60FE.02h | 0x3881 | Bitmask | 0 to 4294967295 | 0 | - | Immediately | " 60FE.02h" on page 445 |

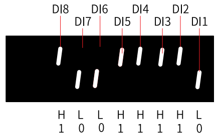
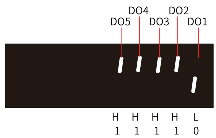
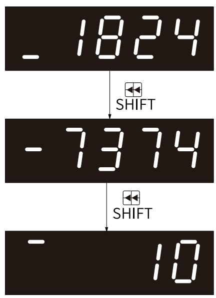
# 8 Appendices

## 8.1 Display of Monitoring Parameters

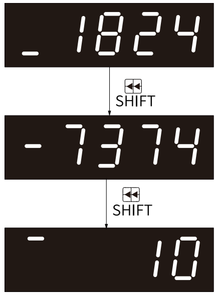
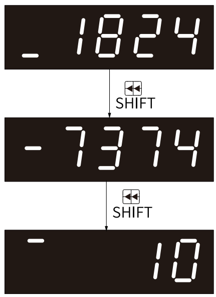
- Group H0B: Displays parameters used to monitor the operating state of the servo drive.
- Set H02.32 (Default keypad display) properly. After the motor operates normally, the keypad switches from status display to parameter display. The parameter group number is H0b and the offset within the group is the setpoint of H02.32.
- For example, if H02.32 is set to 00 and the motor speed is not 0 rpm, the keypad displays the value of H0b.00.

The following table describes the monitoring parameters in group H0b.

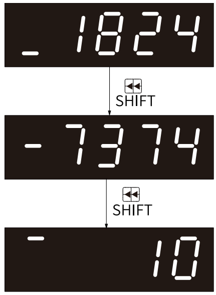
| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.00 | Motor speed actual value | rpm | Displays the actual value of the motor speed after round-off, which can be accurate to 1rpm. | 3000 rpm:   -3000 rpm:   |
| H0b.01 | Speed reference | rpm | Displays the present speed reference of the servo drive. | 3000 rpm:   -3000 rpm:   |
| H0b.02 | Internal torque reference | 0.10% | Displays the ratio of actual torque output of the motor to the rated torque of the motor. | Display of 100.0%:   Display of -100.0%:   |

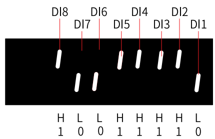
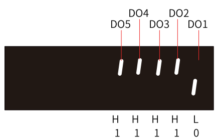
| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.03 | Monitored DI status | - | Displays the optocoupler status of DI1 to DI8:<br>Upper LED segments turned on: The optocoupler is switched off (indicated by "1").<br>Lower LED segments turned on: The optocoupler is switched on (indicated by "0").<br>The value of H0b.03 read in the software tool is a decimal. | For example, if DI1 is low level and DI2 to DI8 are high level, the corresponding binary value is "10011110", and the value of H0b.03 read in the software tool is 158.<br>The keypad displays as follows:<br> |
| H0b.05 | Monitored DO status | - | Displays the optocoupler status of DO1 to DO5:<br>Upper LED segments turned on: The optocoupler is switched off (indicated by "1").<br>Lower LED segments turned on: The optocoupler is switched on (indicated by "0").<br>The value of H0b.05 read in the software tool is a decimal. | For example, if DO1 is low level and DO2 to DO5 are high level, then, the binary value is "11110",<br>and the value of H0b.05 read in the software tool is 30.<br>The keypad displays as follows:<br> |
| H0b.07 | Absolute position counter (32-bit decimal) | Reference unit | Displays current absolute position of the motor (reference unit). | Display of 1073741824 in reference unit:<br> |

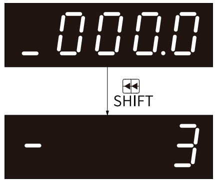
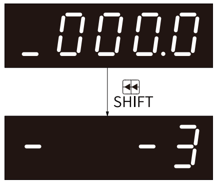
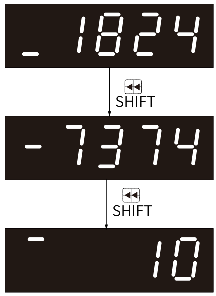
| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.09 | Mechanical angle (pulses starting from the home) | p | Indicates the current mechanical angle (p) of the motor. The value 0 indicates that the mechanical angle is 0°.<br>Maximum value of H0b.09 for an incremental encoder: Number of encoder pulses per revolution x 4 - 1. For example, the maximum value of H0b.09 for a 2500-PPR incremental encoder is 9999.<br>Maximum value of H0b.09 for an absolute encoder is 65535.<br>The actual mechanical angle is calculated using the following formula:<br>$\text{Actual mechanical angle} = \frac{\text{H0b.09}}{\text{H0b.09 max. value} + 1} \times 360.0°$ | Display of 10000 p:<br> |
| H0b.10 | Rotation angle (electrical angle) | 0.1° | Displays current electrical angle of the motor. | Display of 360.0°:<br> |
| H0b.11 | Speed correspond ing to the input position reference | rpm | Displays the speed corresponding to the position reference per control cycle of the servo drive. | 3000 rpm:<br><br>-3000 rpm:<br> |
| H0b.12 | Average load rate | 0.10% | Displays the ratio of the average load torque to the rated torque of the motor. | Display of 100.0%:<br> |

| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.13 | Input position reference counter (32-bit decimal) | Reference unit | Counts and displays the number of input position references. | Display of 1073741824 in reference unit:<br> |
| H0b.15 | Encoder position deviation counter (32-bit decimal) | Encoder unit | Encoder position deviation = Sum of input position references (encoder unit) – Sum of pulses fed back by the encoder (encoder unit) | Display of 10000 in encoder unit:<br> |
| H0b.17 | Feedback pulse counter (32-bit decimal) | Encoder unit | Counts and displays the number of pulses fed back by the encoder (encoder unit). | Display of 1073741824 in encoder unit:<br> |
| H0b.19 | Total power-on time (32-bit decimal) | 0.1s | Counts and displays the total power-on time of the servo drive. | Display of 429496729.5s:<br> |

| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.24 | RMS value of phase current | 0.01 A | Displays the RMS value of the phase current of the servo motor. | Display of 4.60 A:<br> |
| H0b.26 | Bus voltage | 0.1 V | Displays the DC bus voltage of the main circuit. | Display of 311.0 V rectified from 220 VAC:<br><br>Display of 537.0 V rectified from 380 VAC:<br> |
| H0b.27 | Module temperature | °C | Displays the temperature of the power module inside the servo drive. | Display of 27°C:<br> |
| H0b.33 | Fault log | - | Used to select the previous fault to be viewed.<br>0: Present fault<br>1: Last fault<br>2: 2nd to last fault<br>...<br>20: 20th to last fault | 0: Display of present fault:<br> |
| H0b.34 | Fault code of the selected fault | - | Displays the code of the fault selected in H0b.33.<br>When no fault occurs, the value of H0b.34 is 0. | If H0b.33 is 0, and H0b.34 is E941.0, the current fault code is 941.0. Corresponding display:<br> |

| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.35 | Time stamp upon occurrence of the selected fault | s | Displays the total operating time of the servo drive when the fault displayed in H0b.34 occurred.<br>When no fault occurs, the value of H0b.35 is 0. | If H0b.34 is E941.0 and H0b.35 is 1073741824, the current fault code is 941 and the total operating time of the servo drive is 1073741824s when the fault occurs.<br> |
| H0b.37 | Motor speed upon occurrence of the selected fault | rpm | Displays the speed of the servo motor when the fault displayed in H0b.34 occurred.<br>When no fault occurs, the value of H0b.37 is 0. | 3000 rpm:<br><br>-3000 rpm:<br> |
| H0b.38 | Motor phase U current upon occurrence of the selected fault | 0.01 A | Displays the RMS value of motor phase U winding current when the fault displayed in H0b.34 occurred.<br>When no fault occurs, the value of H0b.38 is 0. | Display of 4.60 A:<br> |
| H0b.39 | Motor phase V current upon occurrence of the selected fault | 0.01 A | Displays the RMS value of motor phase V winding current when the fault displayed in H0b.34 occurred.<br>When no fault occurs, the value of H0b.39 is 0. | Display of 4.60 A:<br> |

| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.40 | Bus voltage upon occurrence of the selected fault | V | Displays the DC bus voltage of the main circuit when the fault displayed in H0b.34 occurred.<br>When no fault occurs, the value of H0b.40 is 0. | Display of 311.0 V rectified from 220 VAC:<br><br>Display of 537.0 V rectified from 380 VAC:<br> |
| H0b.41 | DI status upon occurrence of the selected fault | - | Displays the high/low level status of DI1 to DI8 when the fault displayed in H0b.34 occurred.<br>The method for determining the DI level status is the same as that of H0b.03. When no fault occurs, all DIs are displayed as low level in H0b.41 (indicated by the decimal value 0). | Display of H0b.41 = 158:<br> |
| H0b.42 | DO status upon occurrence of the selected fault | - | Displays the high/low level status of DO1 to DO5 when the fault displayed in H0b.34 occurred.<br>The method for determining the DO level status is the same as that of H0b.05.<br>When no fault occurs, all DOs are displayed as low level in H0b.42 (indicated by the decimal value 0). | Display of H0b.42 = 15:<br> |

| Param. No. | Name | Unit | Meaning | Example of Display |
|---|---|---|---|---|
| H0b.53 | Position deviation counter (32-bit decimal) | Reference unit | Position deviation = Sum of input position references (reference unit) - Sum of pulses fed back by the encoder (reference unit) | Display of 10000 in reference unit:  |
| H0b.55 | Motor speed actual value | 0.1 rpm | Displays the actual value of the motor speed, which can be accurate to 0.1 RPM. | Display of 3000.0rpm:   Display of –3000.0 RPM:   |
| H0b.64 | Real-time input position reference counter | Reference unit | Displays the value of the position reference counter before being divided or multiplied by the electronic gear ratio. This value is independent of the servo drive status and the control mode. | Display of 1073741824 in reference unit:   |

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