



User Guide

IT6000 Human Machine Interface (HMI)



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Disclaimer

- The drawings in the manual are shown for description only and may not match the product you purchased.
- The instructions are subject to change, without notice, due to product or software upgrade, specification modification as well as efforts to increase the accuracy and convenience of the manual.
- Contact our agents or customer service center if you have problems during the use.

Approvals

Certification marks on the product nameplate indicate compliance with the corresponding certificates and standards.

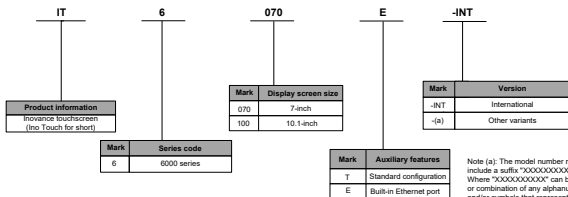
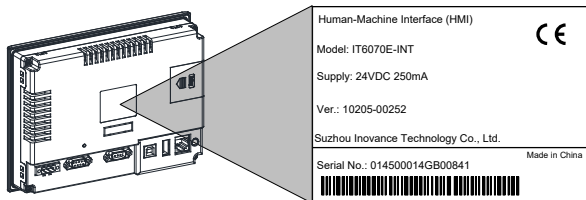
Certification	Mark	Directives		Standard
CE		EMC directives	2014/30/ EU	EN61131-2
		LVD directives	2014/35/ EU	EN 61010-1, EN61010-2-201
		RoHS directives	2011/65/ EU	EN 50581
TUV		-		EN 61010-1, EN61010-2-201

Note

- The above EMC directives are complied with only when the EMC electric installation requirements are strictly observed.
- Machines and devices used in combination with this drive must also be CE certified and marked. The integrator who integrates the drive with the CE mark into other devices has the responsibility of ensuring compliance with CE standards and verifying that conditions meet European standards.
- The installer of the drive is responsible for complying with all relevant regulations for wiring, circuit fuse protection, earthing, accident prevention and electromagnetic (EMC regulations). In particular fault discrimination for preventing fire risk and solid earthing practices must be adhered to for electrical safety (also for good EMC practice).
- For more information on certification, consult our distributor or sales representative.

1. Product Information

1.1 Nameplate and Designation Rule

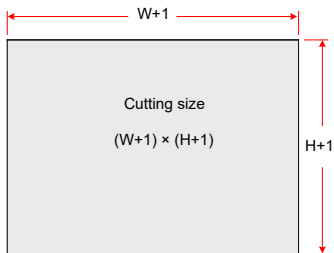
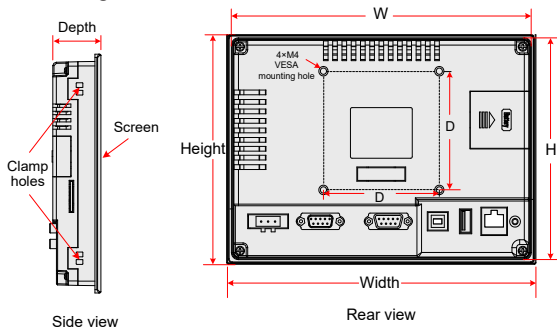


1.2 General Specification

HMI Model	IT6070T	IT6070E	IT6100E
Hardware Specifications			
Display screen size	7.0"	7.0"	10.1"
Resolution (mm)	800*480	800*480	1024*600
Brightness (cd/m ²)	300	300	350
Display color	24-bit color		
Backlight source	LED		
Backlight service life	30000 hours		
CPU	Cortex A8 600 MHz		
Flash	128MB		
DRAM	128MB DDR3		
Recipe storage	256KB		
SD card interface	√	√	√
USB Host	√	√	√
USB Device	√	√	√
Ethernet port	/	√	√
Serial port	COM1 (RS422/ RS485)	COM1 (RS422/ RS485) COM2 (RS232) COM3 (RS485)	COM1 (RS422/ RS485) COM2 (RS232) COM3 (RS485)
RTC	√	√	√

HMI Model	IT6070T	IT6070E	IT6100E
Electrical Specifications			
Input voltage	24 VDC \pm 20%		
Rated current	250mA	250mA	300mA
Structure Specifications			
Housing color	Metal grey		
Housing material	ABS+PC engineering plastics		
Mounting hole dimensions (mm)	192 x 138		259 x 201
General Specifications			
Working temperature	0 $^{\circ}$ C \sim +50 $^{\circ}$ C		
Working humidity	10%-90%RH (without condensation)		
Storage temperature	-20 $^{\circ}$ C \sim +70 $^{\circ}$ C		
Cooling mode	Natural air cooling		
Panel IP level	IP65		

1.3 Mounting Dimensions of the IT6000



HMI Model	Product Specifications			Recommended Screw Hole Size	
	Physical Dimensions W x H x D (mm)	Through-Hole Mounting W x H (mm)	VESA Mounting D x D (mm)	W+1 (mm)	H+1 (mm)
IT6070T	200 x 146 x 42	191 x 137	/	192	138
IT6070E	200 x 146 x 42	191 x 137	/	192	138
IT6100E	271 x 213 x 40	258 x 200	75 x 75	259	201

2. Installation

2.1 Installation Environment

Ambient temperature: The HMI works stably in the temperature range of 0°C to 50°C (32°F~122°F). Using the HMI outside the temperature range may cause damage to HMI components, abnormal operation or performance deterioration. If the HMI needs to be used in specific occasions outdoors, contact your supplier.

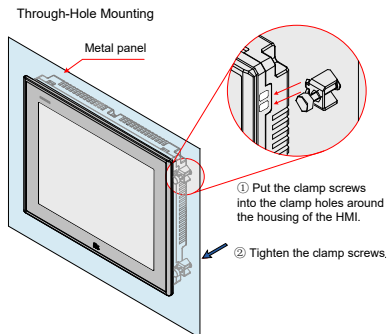
Install the HMI free from strong mechanical vibration.

Install the HMI in the panel of over 105 mm depth. Ensure at least 25 mm clearances surrounding the HMI.

When connecting other devices to the HMI, make sure to locate the AC power cable, output module, contactor, AC drive, relay, and electrical devices of other types away from the back of the HMI. Use shielded cables as input and output cables of the equipment and properly ground the shielded cables.

The front panel of the HMI meets the IP65 protection regulations. When the HMI is properly installed into the cabinet complying with IP65 protection regulations, the cabinet still meets the IP65 protection regulations. That is, when liquid is sprayed on the surface of the cabinet, the liquid will not go inside the cabinet.

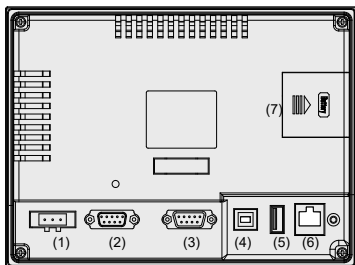
2.2 Mounting Method



Note: Only IT6100E HMI supports VESA mounting. Install the HMI by using the 4 x M4 VESA mounting holes at the back side.

3. Wiring

3.1 Terminal Description



Rear view

Terminal Function description

Terminal No.	Terminal Name	Terminal Function Description	Remarks
(1)	Power supply terminal	24 VDC power supply terminal of the HMI	An extra power supply terminal connector is delivered along with the HMI.
(2)	DB9 female	Communication port between the HMI and the PLC	Two serial communication ports, COM1 and COM3, are available in the HMI. COM1: RS485/422 COM3: RS485
(3)	DB9 male	Communication port between the HMI and the PLC	Only IT6***E HMIs support this COM2 RS232 port.
(4)	USB (Type B)	USB client, for external devices such as PC for downloading or user program commissioning	
(5)	USB (Type A)	USB host, for devices such as USB drive, USB mouse and printer	

Terminal No.	Terminal Name	Terminal Function Description	Remarks
(6)	Ethernet port (RJ45)	Communication port with PLC or PC.	Only IT6***E HMIs support this port.
(7)	Battery cover ⁽¹⁾	One battery is inside. It is used as backup power of the HMI perpetual calendar.	The battery is 3 V CR2032 lithium battery (lifespan: around five years with ambient temperature at 25°C).

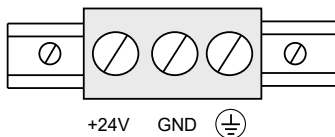
Note

⁽¹⁾: The battery of IT6100E is built inside the HMI.

3.2 Wiring Description

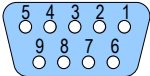
3.2.1 Power Supply Connection

The power supply of the HMI is 24 VDC. Connect the power positive to the +24V terminal and negative to the GND terminal. The terminal marked with \oplus is used to connect to the PE cable. The power port is as shown in the following figure:



3.2.2 Connection to External Device (DB9 Female)


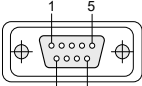

The COM1 and COM3 communication ports are available in the DB9 female. The pin arrangement of DB9 female is described in the following table.

Pin No.	Signal			Pin Arrangement of DB9 Female
	COM1[RS485] 2-wire	COM1[RS485] 4-wire	COM3[RS485]	
1	RS485-	RX- (receiving negative)		 <p>COM1 [RS485 2/4W] COM3 [RS485] DB9 female (Pinhole-type signal plate)</p>
2	RS485+	RX+ (receiving positive)		
3		TX- (sending negative)		
4		TX+ (sending positive)		
5	GND (signal ground)			
6			RS485-	
7				
8				
9			RS485+	

Note
The COM1 [RS485] 4-wire port means COM1 [RS422] port.

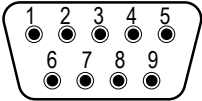
Communication cables and settings (DB9 male):

Invoice provides accessory communication cable (Model: IT5-H2U-CAB* Order No.: 15041140) to work with the DB9 female of the HMI.

IT5-H2U-CAB* (Order No.: 15041140)  Cable length: 3m				
Cable connector and pin	 DB9 male		 8-pin DIN round port	
Signal level	RS422		RS422	
Internal connection between the cables	Pin No.	Signal	Pin No.	Signal
	1	RX-	4	TX-
	2	RX+	7	TX+
	3	TX-	1	RX-
	4	TX+	2	RX+
	5	GND	3	GND
Model and port using the cable	IT5*** HMI COM1[RS485]4w IT6*** HMI COM1[RS485]4w		Inovance H1U/H2U/H3U RS422 communication port Mitsubishi FX1N/2N/3U/3G RS422 communication port	
HMI user program setting when using this cable	<ul style="list-style-type: none"> · Set COM1 to RS485-4W. · Select the same communication protocol and data format for the HMI and the PLC. 			


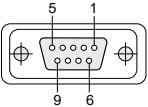

3.2.3 Connection to External Device (DB9 Male)

The COM2 communication port is available in the DB9. The pin arrangement of DB9 male is described in the following table.

Pin No.	Signal	Pin Arrangement of DB9 Male
	COM2[RS-232]	
1		 <p>COM2 [RS232] DB9 male (Pin-type signal plate)</p>
2	RXD (receiving)	
3	TXD (sending)	
4		
5	GND (signal ground)	
6		
7		
8		
9		

Communication cables and settings (DB9 female):

Inovance provides accessory communication cable (Model: H2U-232-CAB Order No.: 15042148) to work with the DB9 male of the HMI.

H2U-232-CAB (Order No.: 15042148)				
				
Cable connector and pin	 DB9 female		 8-pin DIN round port	
Signal level	RS232, with built in RS232-RS422 transfer circuit		RS422	
Internal connection between the cables	Pin No.	Signal	Pin No.	Signal
	1		4	TX-
	2	RXD	7	TX+
	3	TXD	1	RX-
	4		2	RX+
	5	GND	3	GND
Model and port using the cable	IT5*** HMI COM2[RS232] IT6***E HMI COM2[RS232]		Inovance H1U/H2U/H3U RS422 communication port Mitsubishi FX1N/2N/3U/3G RS422 communication port	
HMI user program setting when using this cable	<ul style="list-style-type: none"> · Set COM2 to RS232. · Select the same communication protocol and data format for the HMI and the PLC. 			

3.2.4 Precautions on Communication Connection

Cable requirements: Use different cables for connection of different external devices. Do not lay the communication cable together with the AC power cables or near sources of electrical noise. Do not plug/remove the communication cable during communication.

To avoid communication problems, ensure:

Communication cable \leq 150 m when connecting RS485/422 devices

Communication cable \leq 15 m when connecting RS232 devices

If a communication problem exists, “Out time” will display on the screen and disappears only after the communication becomes normal.

Use a shielded cable as the communication cable if the cable is too long or needs to run through the electrical noise environment.

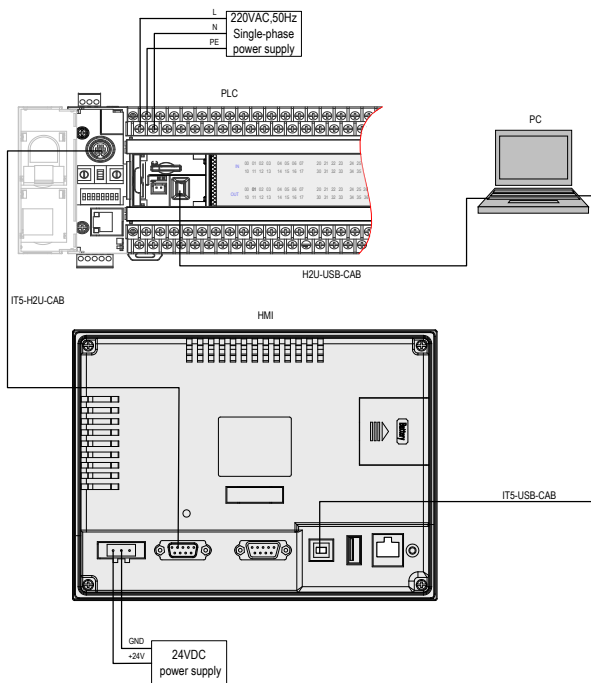
4. Quick Setup

4.1 Tools Requirements


Hardware Tool Kit	
HMI (IT6000 Series, for example, IT6070T)	
PLC (H3U Series, for example, H3U-3232MT)	
USB download cable for HMI (Inovance Part No.: IT5-USB-CAB)	 <p>→ USB2.0 (Type-A) to Laptop</p> <p>→ USB2.0 (Type-B) to HMI</p>
HMI-PLC communication cable (Inovance Part No.: IT5-H2U-CAB)	 <p>→ USB2.0 (Type-B) to HMI</p> <p>→ DB9 (male) to DB9 (female) of HMI</p>
USB download cable for PLC (Inovance Part No.: H2U-USB-CAB)	 <p>→ USB2.0 (Type-A) to Laptop</p> <p>→ mini USB to PLC</p>

<p>Laptop for firmware update & program download (Windows 7)</p>	
<p>Software Tool on Laptop</p>	
<p>InoTouch Editor (free installation, English, support Windows XP, Windows 7, Windows 8, Windows 10)</p>	
<p>AutoShop (free installation, English, support Windows XP, Windows 7, Windows 8, Windows 10)</p>	

4.2 Wiring



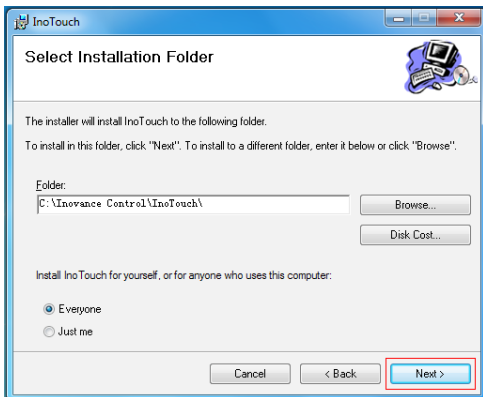
4.3 Installation of InoTouch Editor

Step 1: Double click  InoTouch Editor Setup.msi , .

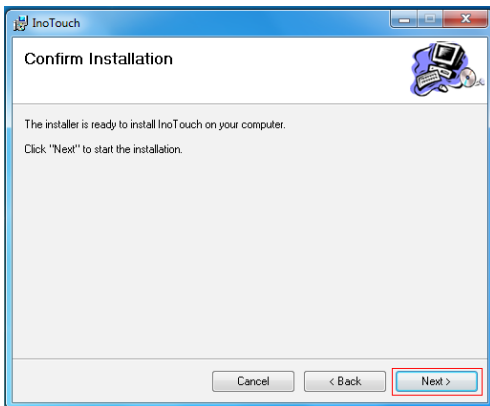
Step 2: Click “Next” .



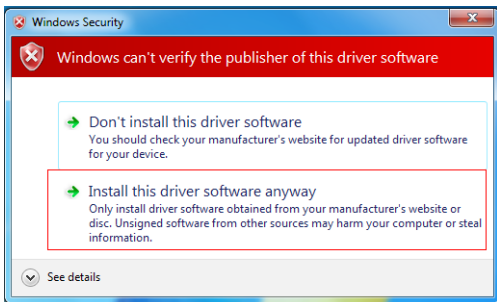
Step 3: Click “Next” .



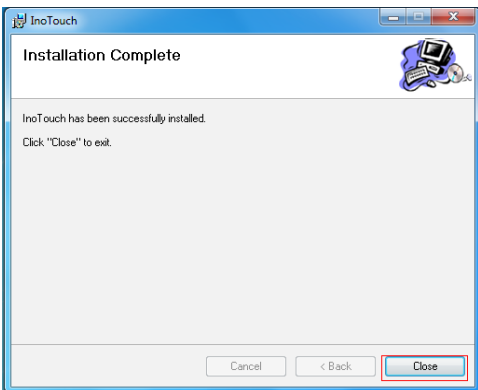
Step 4: Click “Next” .



Step 5: Select as below.



Step 5: Wait until "Installation Complete" , and then click "Close" .

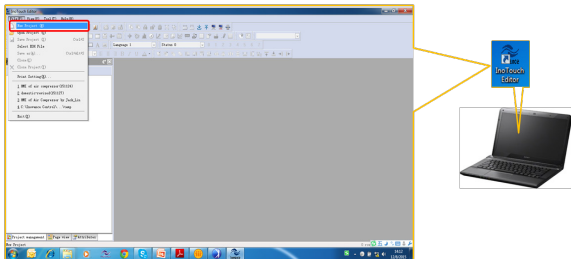


4 Quick Setup

4.4 Creating a Project

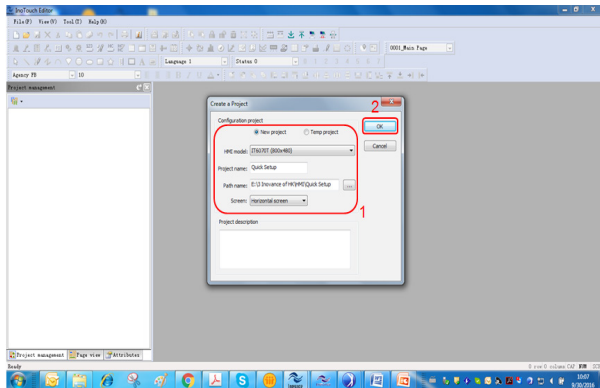
Step 1:

1. Power on HMI.
2. Double click “InoTouch Editor” .
3. Choose File > New Project from the main menu.

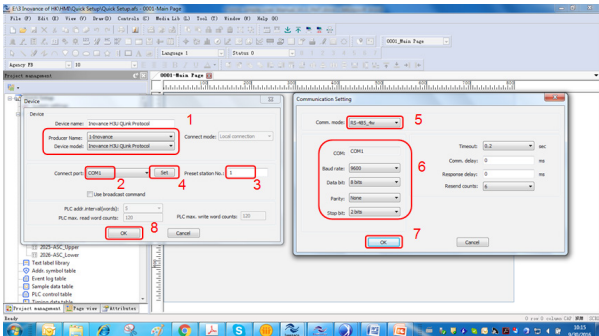


Step 2:

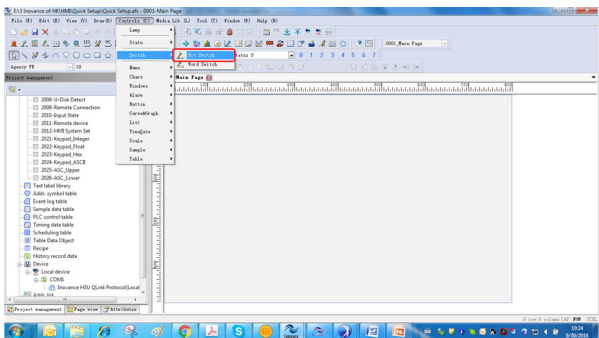
1. Select items as follows.
2. Click “OK” .



Step 3: Follow steps as follows.

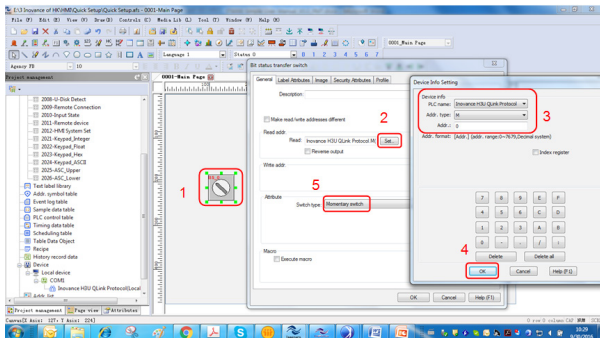


Step 4: Select “Bit Switch” .



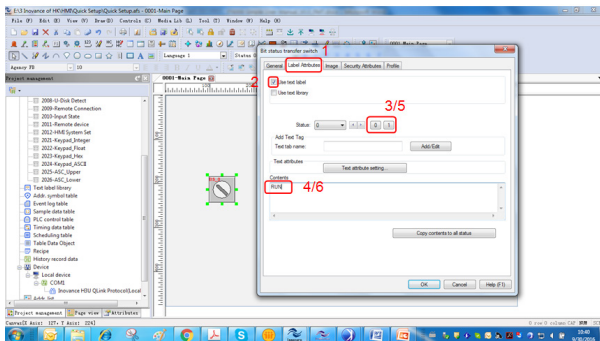
4 Quick Setup

Step 5: Follow below steps.

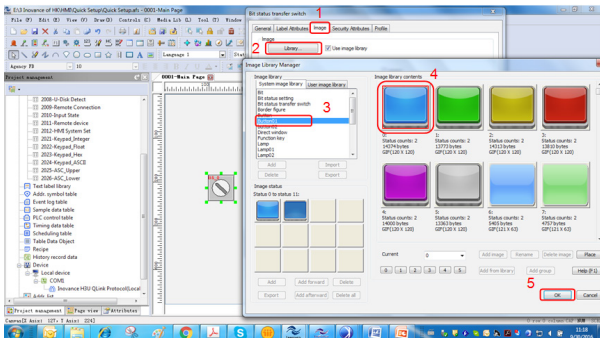


Step 6:

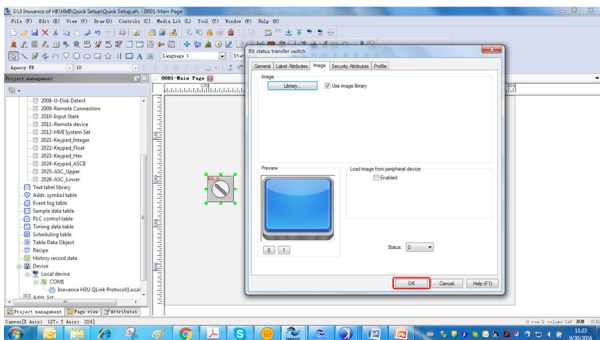
1. Select “Label/Attributes” .
2. Check “Use text label” .
3. Select “0” .
4. Input “RUN” .
5. Select “1” .
6. Input “RUN” .



Step 7: Follow below steps.

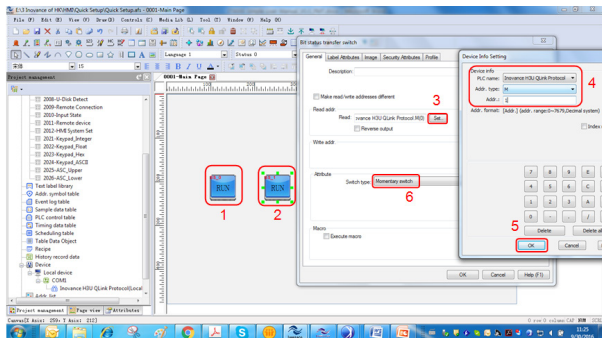


Step 8: Click “OK” .



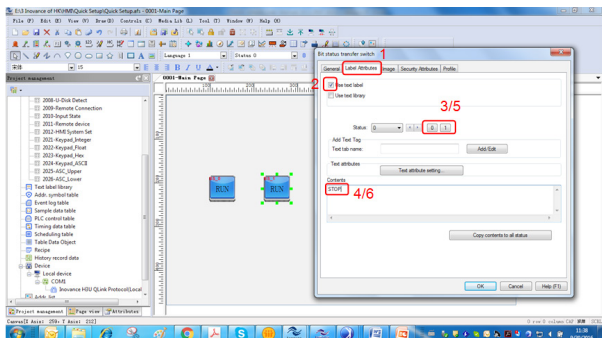
4 Quick Setup

Step 9: Copy and paste the “RUN” widget, follow below steps.

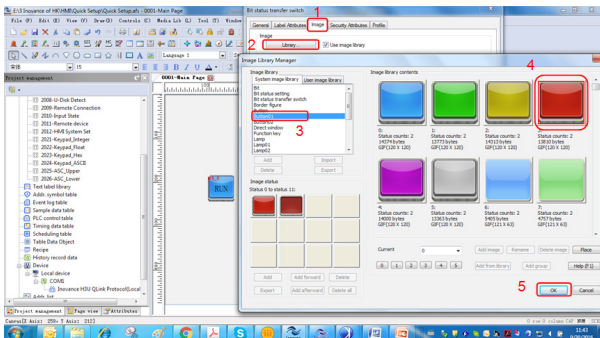


Step 10:

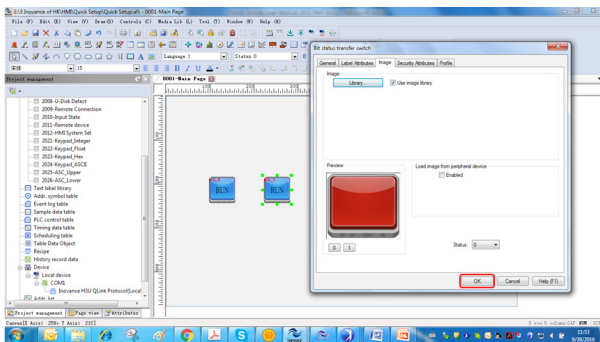
1. Select “Label/Attributes” .
2. Check “Use text label” .
3. Select “0” .
4. Input “STOP” .
5. Select “1” .
6. Input “STOP” .



Step 11: Follow below steps.

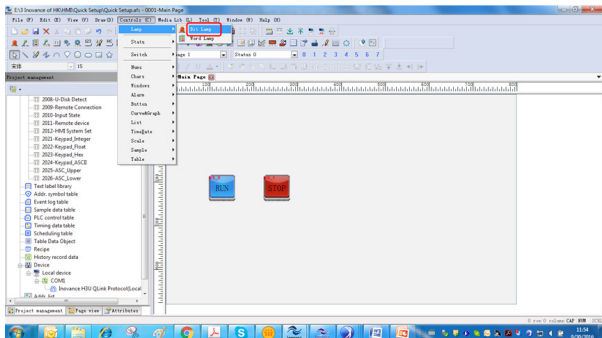


Step 12: Click "OK".

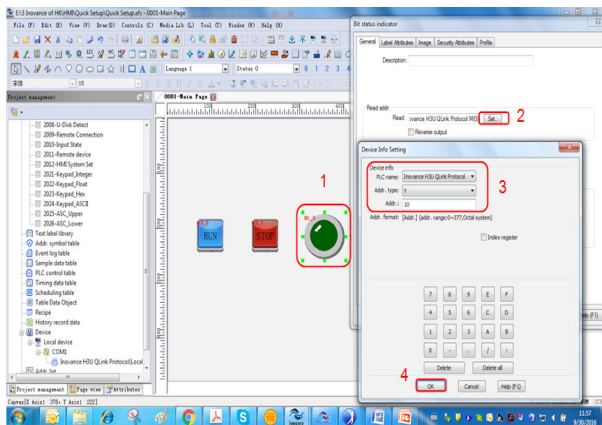


4 Quick Setup

Step 13: Select “Bit Lamp” .

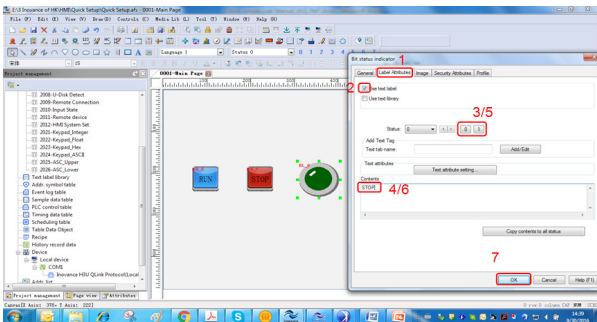


Step 14: Follow below steps.



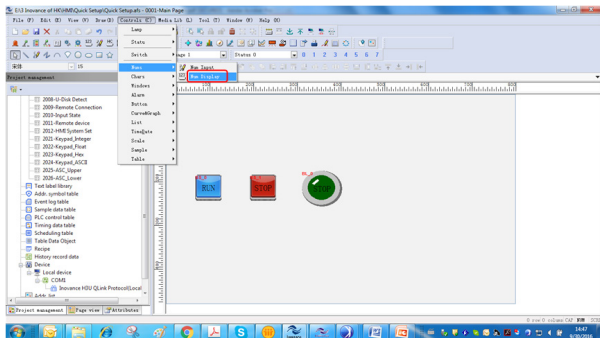
Step 15:

1. Select “Label/Attributes” .
2. Check “Use text label” .
3. Select “0” .
4. Input “STOP” .
5. Select “1” .
6. Input “RUN” .
7. Click “OK” .

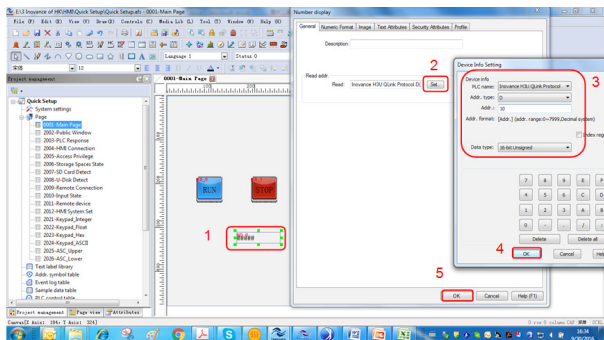


4 Quick Setup

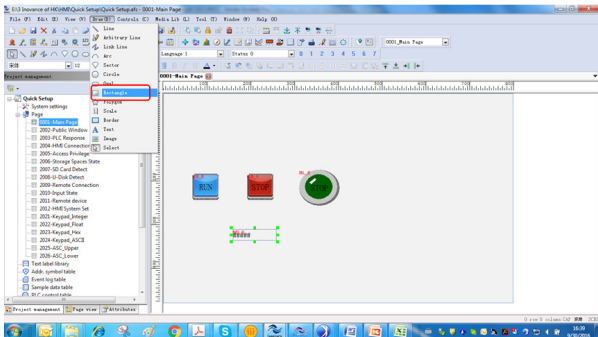
Step 16: Select “Num Display” .



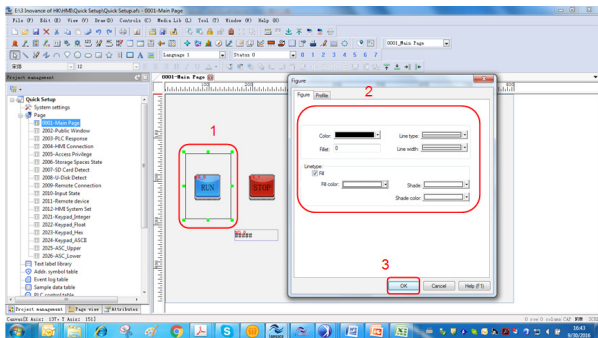
Step 17: Follow below steps.



Step 18: Select “Rectangle” .

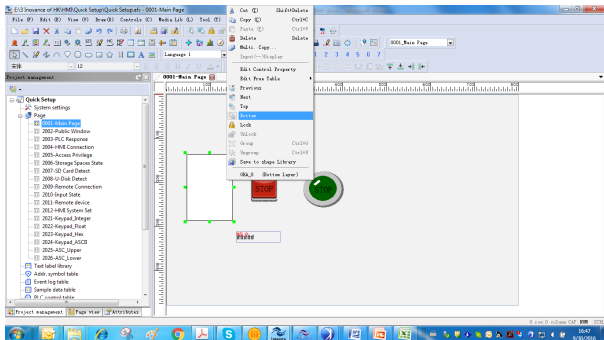


Step 19: Follow below steps.

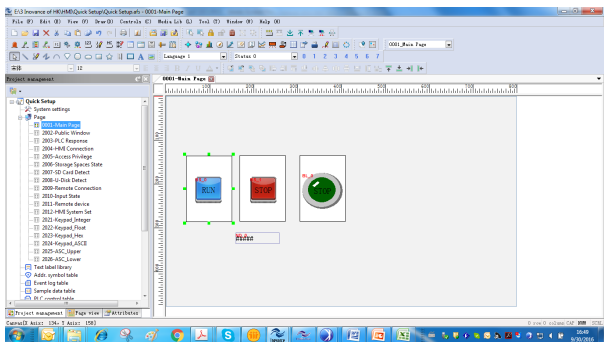


4 Quick Setup

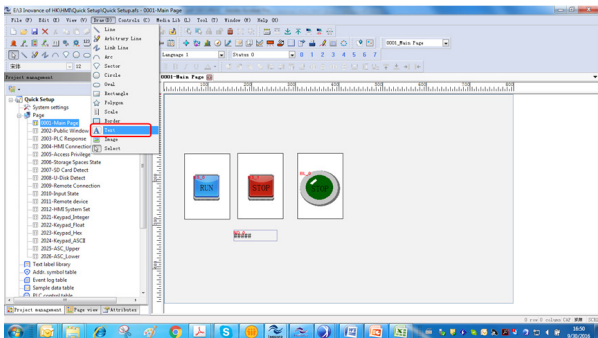
Step 20: Right click the rectangle and select “Bottom” .



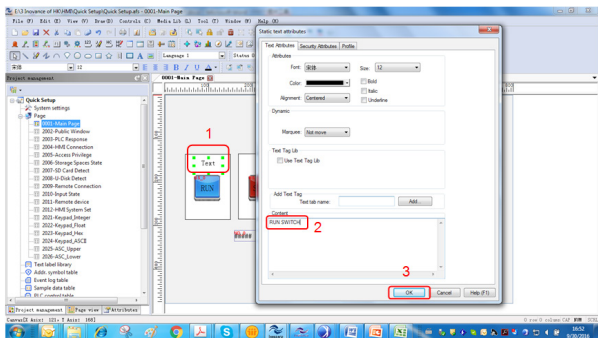
Step 21: Copy and paste the rectangle to other area.



Step 22: Select “Text” .

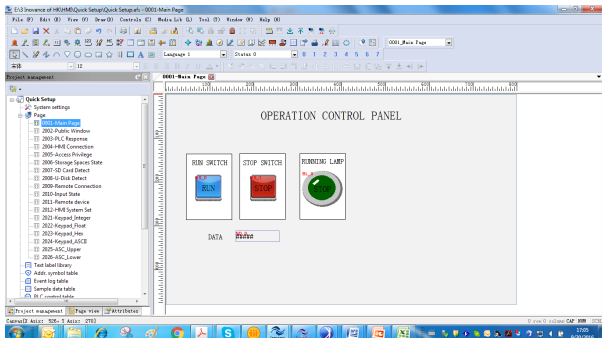


Step 23: Follow below steps.

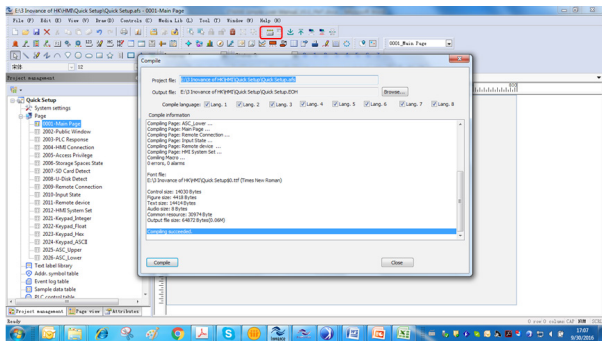


4 Quick Setup

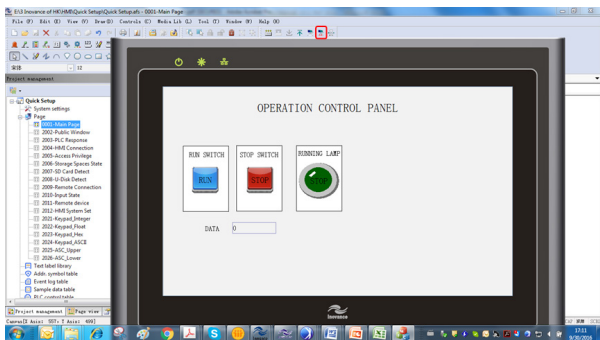
Step 24: Set other texts in the same way.



Step 25: Click “Compile” to check errors.



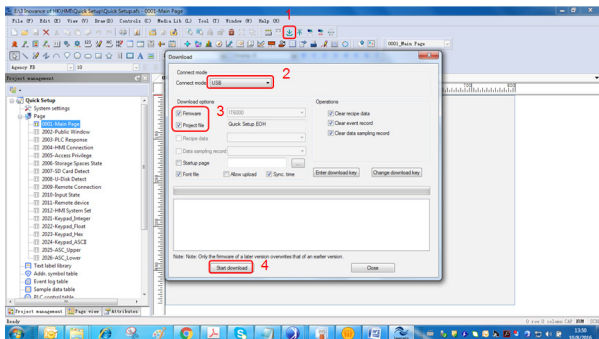
Step 26: Click “Off-line simulation” to check the functions, right click the screen to withdraw.



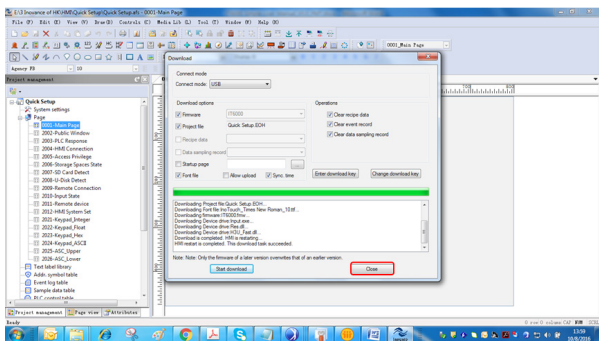
4 Quick Setup

4.5 Transferring the Project Data

Step 1: Follow below steps.

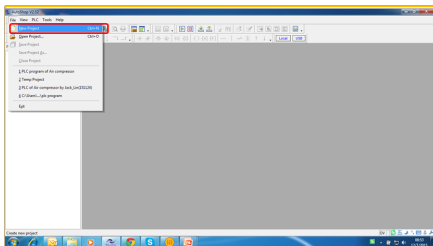


Step 2: Wait until download task succeeded, click “Close” .



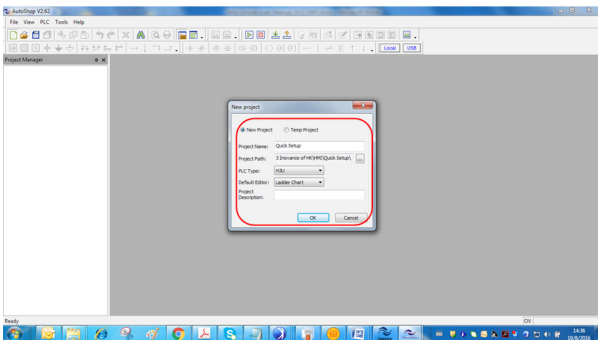
Step 3:

1. Power on PLC.
2. Double click “AutoShop” .
3. Click “File” and select “New Project” .



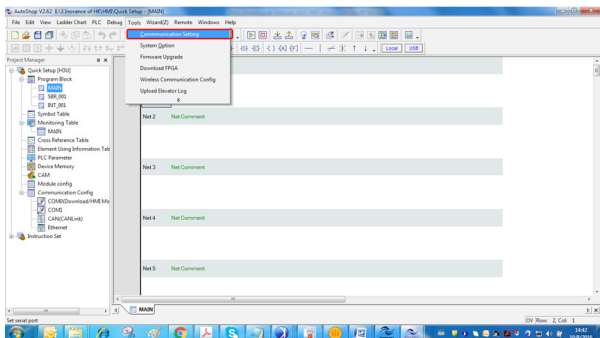
Step 4:

1. Select “New Project” .
2. Input “Project Name” .
3. Select “Project Path” .
4. Select “H3U” as PLC Type.
5. Select “Ladder Chart” as Default Editor .
6. Click “OK” .



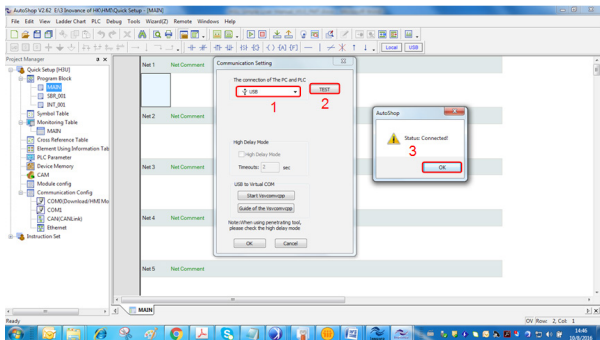
4 Quick Setup

Step 5: Click “Tools” and select “Communication Setting” .

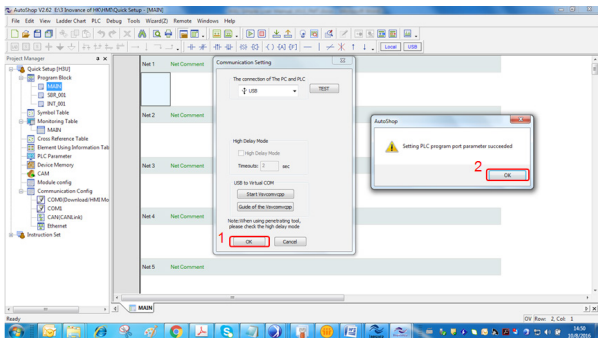


Step 6:

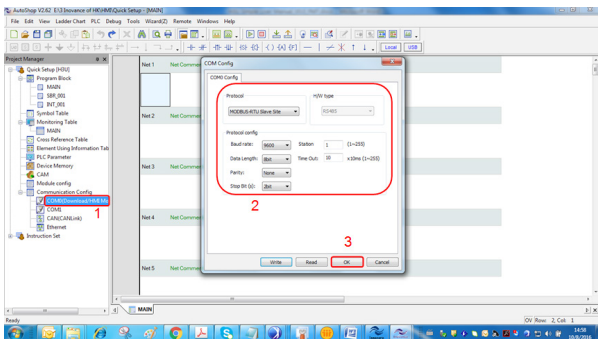
1. Select “USB” .
2. Click “TEST” .
3. Pop-up window shows “Status: Connected” , and then click “OK” .



Step 7: Follow below steps.

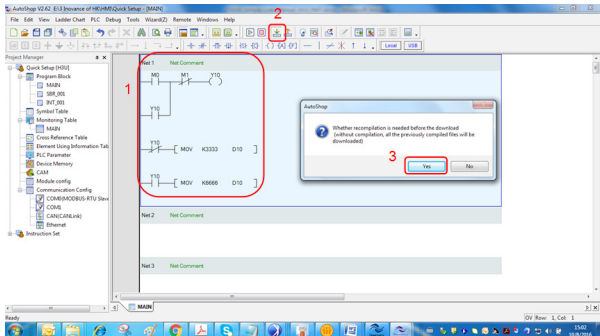


Step 8: Follow below steps.

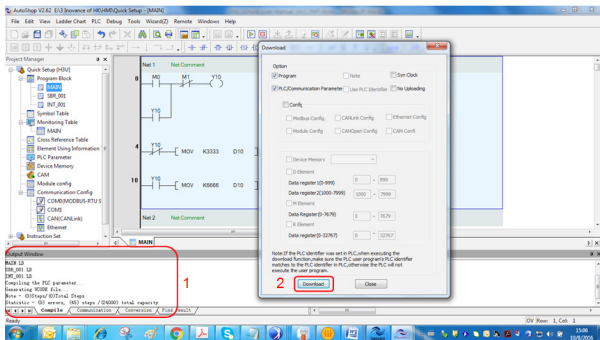


4 Quick Setup

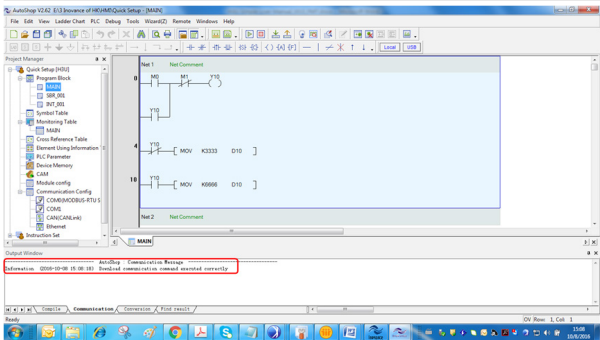
Step 9: Follow below steps.



Step 10: Follow below steps.

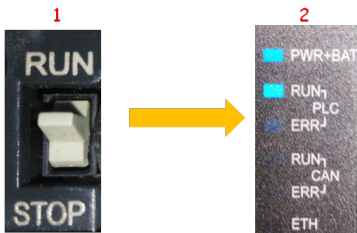


Step 11:



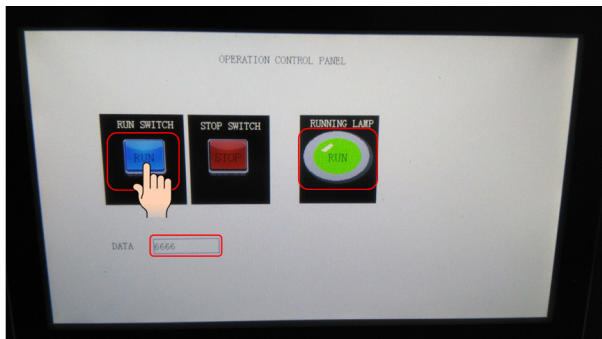
Step 12:

1. Switch to “RUN” .
2. The RUN light is on.

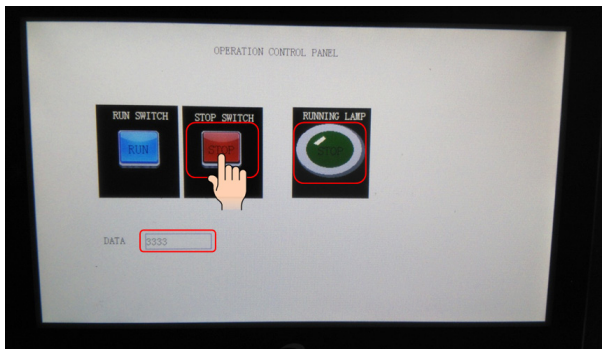


4.6 Using the HMI

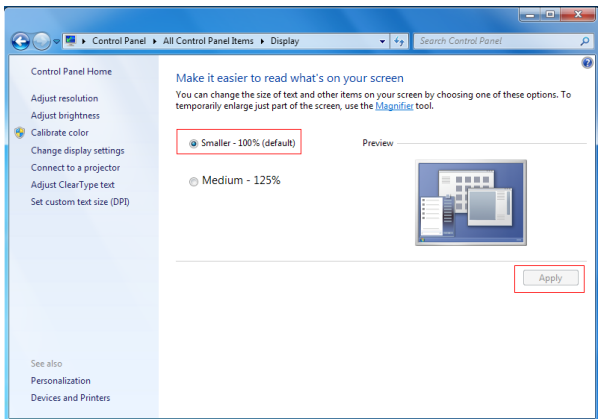
Step 1: Touch the RUN SWITCH, the RUNNING LAMP turns on and 6666 displays in DATA.



Step 2: Touch the STOP SWITCH, the RUNNING LAMP turns off and 3333 displays in DATA.

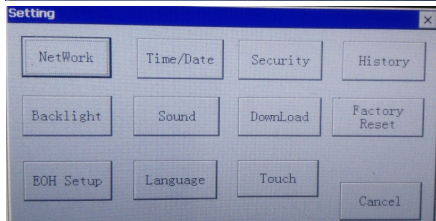
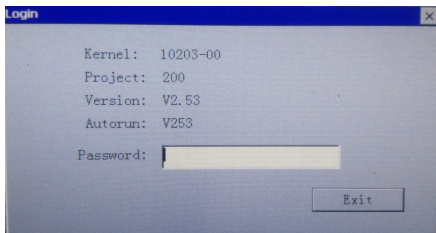


Tip: Set Display as below.

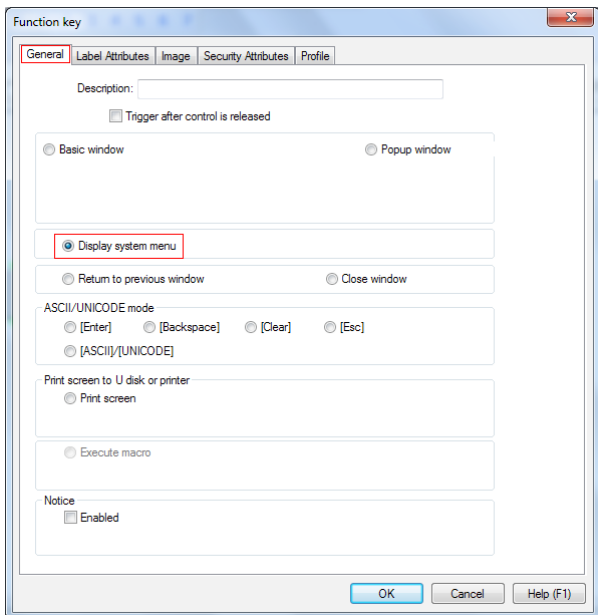


5. System Setting

Way 1: When powering on the HMI, hold down any place of the screen. After the system starts up, enter the password on the "Login" interface and the "Setting" interface will appear.

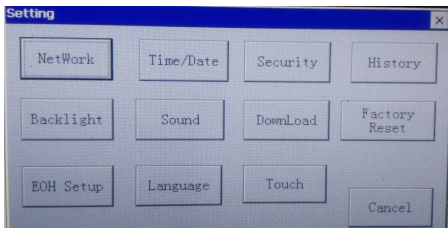


Way 2: Adding a Function key to the HMI interface: Click the Function key in the shortcut menu and then double click the newly-created Function key to enter property menu, and then select Display system menu.



5 System Setting

The HMI will reboot when program downloading is finished. Press "Function key" to enter the system. Enter the password (default: 111111) and the "Setting" interface as follows will appear.

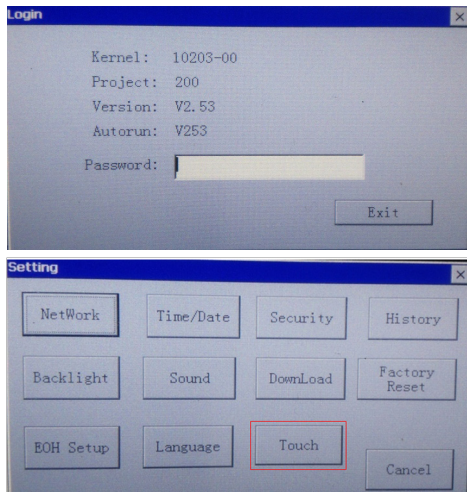


6. Troubleshooting

If the HMI touch screen becomes insensitive or abnormal, use the touch calibration program to calibrate it.

Step 1:

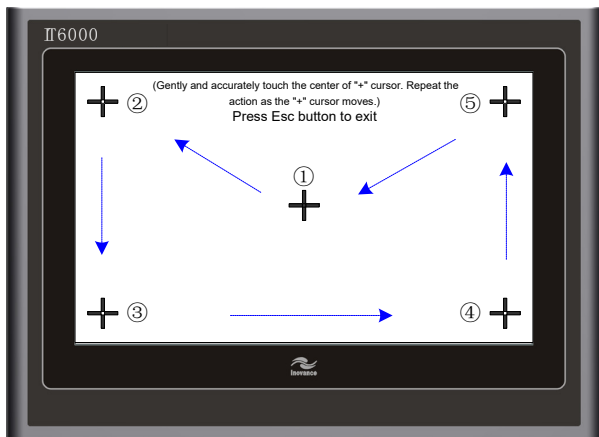
When powering on the HMI, hold down the screen to enter "Login" interface (the system automatically enters calibration program if the Password box is not touched within 20s) .Input the default password 111111 and the "Setting" menu will appear. And then press "Touch".



Step 2:

After the system enters the calibration mode, a "+" cursor is displayed at the center of the screen.

Touch the center of "+" cursor by using a stylus or with your finger. The "+" cursor will move according to the direction as shown in the following figure.



After finishing calibration of the "+" cursor at five points, the cursor disappears. Touch the blank area of the screen to exit. If calibration fails, the "+" cursor will appear at the center of the screen again. Do the calibration again.

Revision History

Date	Version	Change Description
Jan 2017	A00	First issue. Firmware version: 10205-00252
Nov. 2020	A01	Made minor corrections.

Shenzhen Inovance Technology Co., Ltd.

Add.: Building E, Hongwei Industry Park, Liuxian Road, Baocheng No. 70 Zone, Bao'an District, Shenzhen

Tel: +86-755-2979 9595

Fax: +86-755-2961 9897

<http://www.inovance.com>

Suzhou Inovance Technology Co., Ltd.

Add.: No. 16 Youxiang Road, Yuexi Town, Wuzhong District, Suzhou 215104, P.R. China

Tel: +86-512-6637 6666

Fax: +86-512-6285 6720

<http://www.inovance.com>



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