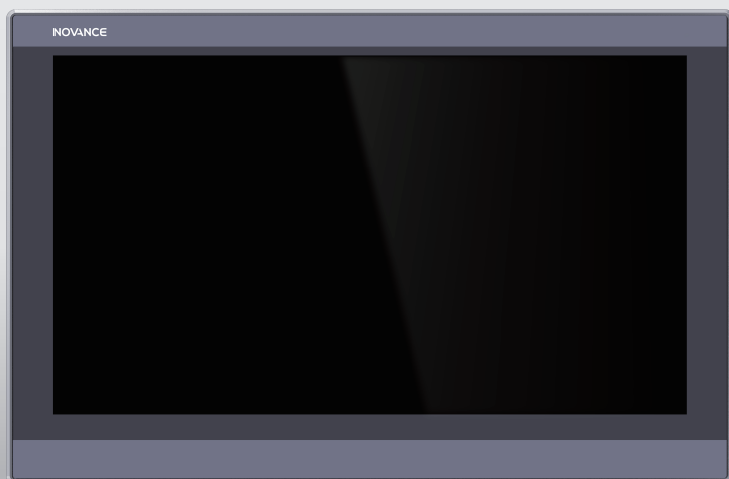




ITS7156 Series HMI User Guide



Industrial
Automation



Intelligent
Elevator



New Energy
Vehicle



Industrial
Robot



Rail
Transit



Data code P500018710A00

Preface

Introduction

This guide introduces the appearance, specifications, mounting methods, terminal assignment, and touch screen calibration of the ITS7156E series products.

Note

- The drawings in this guide are for illustration only and may be different from the product you purchased. Refer to the actual product for specific structure and configuration.
- The user guide is subject to change without notice due to product upgrade, specification modification as well as efforts to improve the accuracy and convenience of the guide.

More data

Data name	Data code	Description
ITS7000 Series HMI User Guide	PS00010954	Introduces the mechanical design, electrical design, and touch screen calibration of ITS7000 series products.
ITS7000 Series HMI Product Selection Guide	PS00017482	Introduces the model selection information of ITS7000 series products, including model, dimensions, specifications, accessories, and so on.
ITS7156 Series HMI User Guide (This guide)	PS00018710	Introduces the specifications, installation dimensions, and terminal assignment of the ITS7156E series products.

Revision history

Date	Version	Revision
2025-09	A00	Initial release.

Access to the guide

This guide is not delivered with the product. You can obtain the PDF version in the following ways:

- Do keyword search under Service and Support at www.inovance.com.
- Scan the QR code on the product with your smart phone.
- Scan the QR code below to install My Inovance app, where you can search for and download user guides.



Warranty disclaimer

Inovance provides warranty service within the warranty period (as specified in your order) for any fault or damage that is not caused by improper operation of the user. Maintenance will be charged after the warranty period expires.

Within the warranty period, maintenance will be charged for the following damage:

- Damage caused by operations not following the instructions in the user guide.
- Damage caused by fire, flood, or unusual voltage
- Damage caused by unintended use of the product
- Damage caused by use beyond the specified scope of application of the product
- Damage or secondary damage caused by force majeure (natural disaster, earthquake, and lightning strike)

The maintenance is charged according to the latest Price List of Inovance. If otherwise agreed upon, the terms and conditions in the agreement shall prevail.

For details, see Product Warranty Card.

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Safety Instructions

Safety disclaimer

1. Read and follow the safety instructions when installing, operating, and maintaining the equipment.
2. To ensure your safety and prevent damage to the equipment, follow the marks on the equipment and all the safety instructions in this guide.
3. "CAUTION", "WARNING", and "DANGER" items in this guide do not indicate all safety precautions that need to be followed; instead, they just supplement the safety precautions.
4. Use this equipment according to the designated environment requirements; otherwise, a fault may occur. Malfunction or damage caused by improper use is not covered by warranty.
5. Inovance shall take no responsibility for any personal injury or property damage caused by improper use.

Safety levels and definitions



: "DANGER" indicates that failure to comply with the notice can result in severe personal injury or even death.



: "WARNING" indicates that failure to comply with the notice may result in severe personal injury or even death.



: "CAUTION" indicates that failure to comply with the notice may result in minor or moderate personal injury or equipment damage.

Keep this user guide properly for future use and deliver it to the end user.

Control system design

- Set interlock circuits and other circuits (such as emergency stop, conventional protection, forward and reverse rotation) outside the product. Set devices for preventing equipment damage (such as up, down and reciprocating movement limit) outside the product.
- Set a fault protection circuit outside the product to prevent unintended mechanical movements, such as those arising from errors in undetectable I/O control areas.
- Design a user program to inform users of faults concerning the display, control, communication, power supply and so on, ensuring safety of the user system.
- Avoid malfunction, personal injury, and equipment damage caused by communication faults between the product and the master controller.
- Do not bring live parts into contact with the metal enclosure of the product.



- Do not set switches that may result in operator injury or equipment damage on the touch screen. Use independent switches for critical operations. Failure to comply may result in accidents caused by wrong outputs or faults.
- Do not set switches for equipment safety operations on the touch screen, such as the emergency stop switch. Use independent hardware switches for safety operations. Failure to comply may result in severe personal injury or equipment damage.
- Do not use this product for critical alarms that may result in severe personal injury, equipment damage or system shutdowns. Use independent hardware and/or mechanical interlocks for critical alarms and the related control/triggering devices.

Installation

- Install the product properly in indoor environments complying with the related specifications.
- Install the product in environments free from strong magnetic field, direct sunlight, high temperature, inflammable gases, vapors, and dust. Failure to comply may result in explosion.
- Use the product in environments without drastic temperature changes or high humidity. Failure to comply may result in water condensation inside the product, leading to equipment damage.
- Securely connect all cables to the product. Loose connection may result in wrong I/O signals.



- Install the product in environments with recommended storage temperature. Failure to comply may result in display faults of the LCD screen.

During wiring



- Before wiring, cut off all power supplies. Failure to comply may result in electric shock or damage to the circuit.
- Connect the DC power supply to the dedicated terminals specified in this guide.
- Prevent metal chippings or cable terminals from falling into the HMI during screw hole machining and wiring. Failure to comply may result in faults, fire, and component damage.
- After wiring, perform a meticulous inspection to ensure the operating voltage is correctly connected to the corresponding terminals. Failure to comply may result in fire or accident.



- To avoid electric shock, cut off the power supply before connecting the product to the power supply.
- The input power supply of this product must be 24 VDC. Power supplies outside $\pm 20\%$ of 24 VDC can cause severe damage to the product. Therefore, check whether the DC power supply provided by the switching-mode power supply is stable at a regular interval.

Operation and maintenance



- During use, touch the HMI panel with hands only. Failure to comply may result in panel damage, which is not covered by warranty.
- Retired lithium batteries, LCD screens, capacitors and other objects that may contain ingredients hazardous to health and environment must be disposed of as industrial waste.

Safety recommendations

- In the position where the operator directly touches the machinery part, for example, where a machinery tool is loaded/unloaded, or where a machine runs automatically, the on-site manual operating devices and any other alternative means must be carefully arranged and designed so that they are independent of the PLC and can start or terminate the automatic running of the system.
- If modification on the program is needed during system operation, use the lock function or other protective measures. Ensure that only authorized personnel can make the necessary modifications.

Battery use

- The battery model must be correct.
- Do not throw batteries into fire or hot ovens. Do not crush or cut batteries.
- Do not expose batteries to extremely high temperatures.
- Do not swallow batteries. Failure to comply can result in chemical burns.
- This product contains button batteries. If a button battery is swallowed by accident, severe internal burns may occur within two hours, which may result in death.



- Keep new and used batteries away from children.
- If the battery compartment cannot be shut tight, stop using the product and keep it away from children.
- If you suspect that a battery may have been swallowed or entered the body, seek medical help immediately.

Disposal

- Dispose of retired batteries as industrial waste according to local laws and regulations.

1 Product Information

1.1 Overview

The ITS7156E is an economical HMI product of Inovance. This product is equipped with a quad-core Cortex-A7 high-performance processor, 512M of memory, and 8G of storage space. The data processing and response speed have been significantly improved, making it capable of handling scenarios that require high performance, large capacity, and ample storage. This product comes with a metal casing and a 15.6-inch resistive touch screen with a 16:9 aspect ratio. The display resolution reaches 1920 x 1080, providing more refined and detailed image display.

This product is suitable for scenarios requiring a large number of screens, numerous labels, complex screen interactions, sensitive touch responses, smooth operation and switching, as well as long-term data and alarm record storage.

It can be widely applied in industries such as ceramics, machine tool connectivity, lithium batteries, silicon crystals, printing and packaging, food and beverages, adapting to various industrial application scenarios. While perfectly coordinating with Inovance PLCs, drives, and servos, it also supports communication connections with products from other major manufacturers.

1.2 Nameplate and Model

Nameplate



Model

ITS 7 156 E

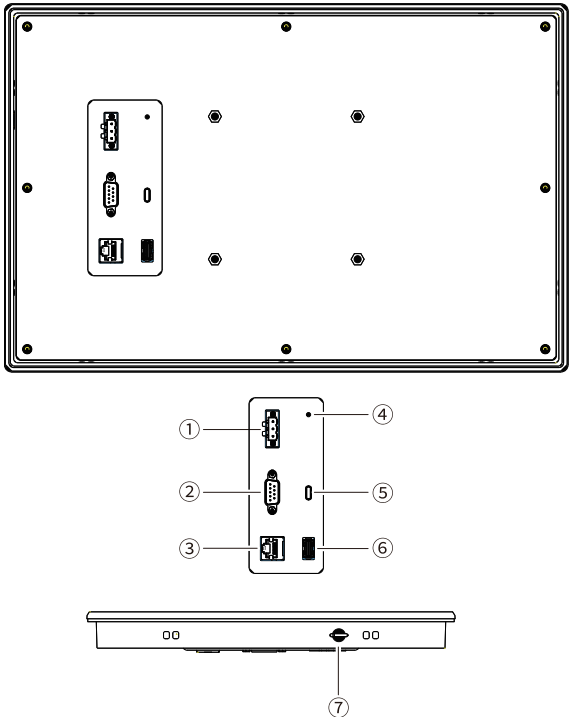
① ② ③ ④

① Product family ITS: Economical HMI	② Product series 7: 7000 series
③ Screen dimension 156: 15.6 (16:9) inches	④ Performance type E: Enhanced performance

The data for ordering the product is shown in the following table.

Model	Description	Product code
ITS7156E	ITS7000 series 15.6-inch touchscreen	01450256

1.3 Components



No.	Terminal name	Terminal function
①	Power supply interface	24 VDC power input This product comes with a power supply terminal used to connect to this power supply interface.
②	DB9 male	Communication port between HMI and peripherals, with built-in COM1, COM2, and COM3 serial communication ports. • COM1: RS422 or RS485 • COM2: RS232 interface • COM3: RS485 interface
③	EtherNet terminal	EtherNet communication port (RJ45) that used to access the PC or PLC with LAN port.
④	RST key	System reset button
⑤	USB Type-C terminal	Used as slave USB communication port for user program downloading and commissioning through PC.
⑥	USB Type-A terminal	Used as master USB communication port to read and write data in the USB flash drives, or connect to devices such as mouse, keyboard, printer, barcode scanner.
⑦	Micro SD card interface	Mounts a Micro SD card for data read/write and project file download.

1.4 Technical Data

Type	ITS7156E
Display specifications	
Screen dimension	15.6-inch
Resolution	1920 x 1080
Brightness (cd/m ²)	250
Color	16.2M
Backlight source	LED
Backlight life (hrs)	30,000
Touchscreen type	4-wire resistor type
System specifications	
CPU	Quad-core Cortex-A7
DRAM	512M
Flash	8 GB
RTC	Supported
Electrical specifications	
Input voltage	24 VDC±20%
Rated input current	600 mA
Interface specifications	
SD card interface	Micro SD card interface

Type	ITS7156E
Serial port	• COM1 DB9 male connector (RS422/RS485) • COM2 DB9 male connector (RS232) • COM3 DB9 male connector (RS485)
EtherNet	One 10M/100M adaptive RJ45 Ethernet port
USB Type-C interface	1 USB 2.0 high-speed
USB Type-A interface	1 USB 2.0 high-speed
Reset button	Supported
Structure specifications	
Enclosure color	Vibrant silver
Enclosure material	Cast aluminum panel
Overall dimensions	395 mm x 258 mm x 28.3 mm
Hole dimensions	• Through-hole mounting: 384 mm x 247 mm • VESA mounting: 100 mm x 100 mm
Max. thickness of the mounting plate	6.5 mm
Product weight (excluding packaging)	2 kg
Environmental specifications	
Operating temperature	0°C to 50°C
Storage temperature	-20°C to +60°C
Transportation temperature	-40°C to +70°C
Ambient humidity	10% RH to 95% RH, without condensation
Cooling method	Natural cooling
Altitude	< 2,000 m
Protection rating	Front panel: IP66; Rear cover: IP20
Ultraviolet (UV) protection	Free from direct sunlight
Model code	01450256

Note

Transport at the extreme temperatures (-40°C/+70°C) may result in a slight bulge of the membrane. The bulge disappears automatically at room temperatures, which does not affect its function.

2 Mechanical Design Reference

2.1 Installation Preparation

The related tools required before installation are listed in the table below.

Name	Quantity	Specification	Remarks
Phillips screwdriver	1	- Tip type: PH1 recommended (diameter: 5 mm). - Length: Not limited.	Required for both through-hole mounting and VESA mounting. Used for tightening the mounting screws.
VESA bracket	1	Universal 100 x 100 mm VESA brackets.	Required for VESA mounting only.

2.2 Installation Requirements

Installation precautions

Before installation, ensure that the product has been powered off.

- To avoid damage to the product, do not drop or strike on the module enclosure, terminal block, or connector.
- Do not disassemble the product. Otherwise, the product may be damaged.
- Do not fasten with excessively high tightening torque to avoid damage to the terminal.

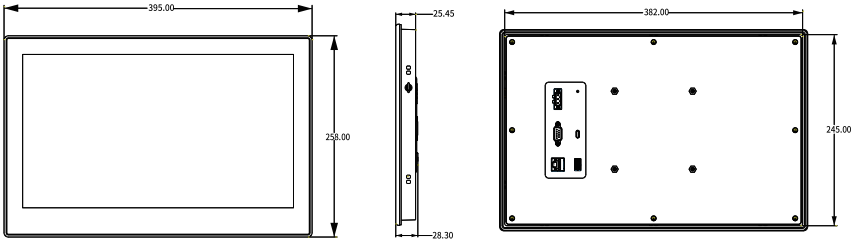
Requirements on the installation environment

This product is designed to operate in a temperature range between 0°C to 50°C, exceeding of which may result in damage to the HMI components, malfunction, or performance degradation. For use in special environments, contact Inovance.

- Do not install the HMI in environments suffering from strong mechanical vibration.
- For through-hole mounting, install the HMI in the cabinet with a depth of over 100 mm and reserve a surrounding clearance of at least 25 mm.
- Install the HMI away from cables and devices that generate strong interference, such as AC power supply cables, PLC output modules, AC drives, and relays. Use shielded cables as I/O cables and ground the shielded cable properly.
- The front panel of the HMI complies with the requirements of IP66. When the HMI is correctly installed in an IP54-rated cabinet, the complete cabinet must comply with the requirements of IP66, which means liquid sprayed on the cabinet cannot get into it.
- When the HMI is used in an environment with potential liquid contaminants (such as oil, salt mist, water mist, disinfectant solutions, etc.), install the rear cover plate inside

the electrical cabinet, and the protection rating of the cabinet should be no less than IP50.

2.3 Installation Dimensions



Model		ITS7156E
Display dimension (inch)		15.6
Dimensions W x H x D (mm)		395.0 x 258.0 x 28.3
Through-hole mounting dimensions W x H (mm)		382.0 x 245.0
Recommended hole dimensions (mm)	W+2	384.0
	H+2	247.0

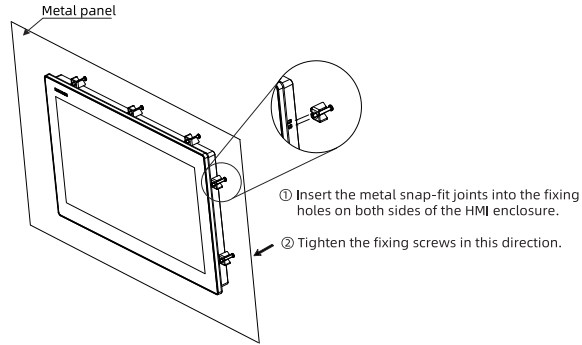
2.4 Mounting method

The HMI supports two mounting methods: through-hole mounting and VESA mounting.

Through-hole mounting

See the following steps for through-hole mounting:

1. Seat the HMI into the pre-drilled mounting holes in the panel.
2. Insert the 10 metal snap-fit joints provided with the HMI from the back of the panel into the 10 mounting holes on both sides of the product enclosure.
3. Tighten the fixing screws one by one until the HMI is fixed on the panel securely. The recommended tightening torque is 6.0 ± 0.5 kgf·cm (for waterproof integrity and prevention of housing deformation).



CAUTION

To comply with IP66 sealing specifications, ensure all the metal snap-fit joints (with screws) delivered (Inovance accessory, ordering code: 80240386) are used and the bending degree of the panel is no greater than 0.010° after installation.



WARNING

The fixing screw must be tightened with a proper tightening torque. If you have any question, contact the supplier.

VESA mounting

Mount the HMI using the bracket. Install the standard bracket on the back of the product and secure it with 4 screws.

Bracket standard: universal 100 x 100 mm VESA brackets. It supports mounting at angles of 0° , 90° , 180° , and 270° .

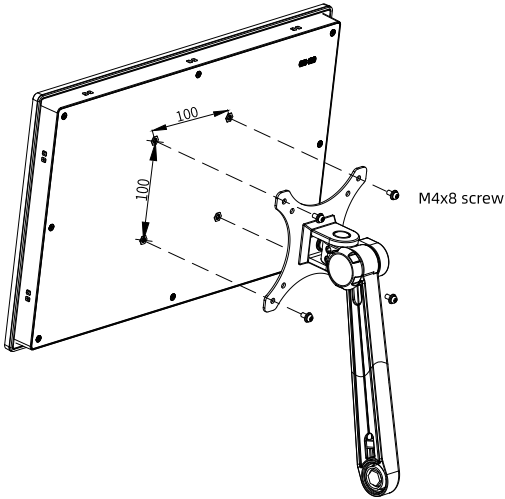


Figure 2-1 Before installation

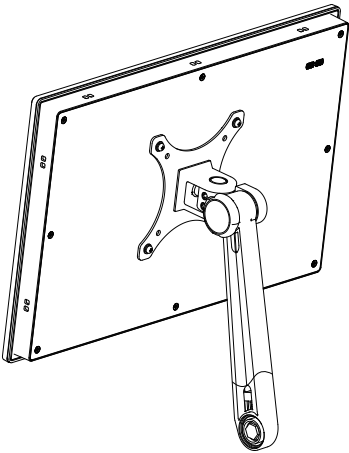


Figure 2-2 After installation

2.5 Post-installation Inspection

The post-installation inspection items are listed in the table below:

No.	Item
1	Check that the fixing screws are tightened properly (recommended torque value: 6.0 ± 0.5 kgf·cm) and the product is securely installed.
2	For through-hole mounting, check that all the 10 metal snap-fit joints (with screws) included in the package have been fully used.
3	For through-hole mounting, check that the bending degree of the installation panel does not exceed 0.010° .
4	Check that the installation environment meets the environmental requirements mentioned in the installation requirements.

3 Electrical Installation

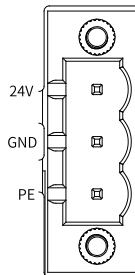
3.1 Power Supply Terminal

Precautions

- Requirements: The product can be powered up by a DC power supply only (24 V $\pm 20\%$). The capacity of the power supply must be higher than or equal to that required by the specifications.
- Isolate the DC power supply from the main AC power supply properly. Do not use the same power supply for the HMI and inductive load circuit (such as solenoid valve). Failure to comply may result in electromagnetic interference.
- Do not route the 24 V power supply cable or the communication cable in parallel with disturbing cables such as AC power supply cables and motor drive cables. Leave a clearance of at least 30 cm between them.
- It is recommended to use an independent 14AWG lead wire (as short as possible) as the conductor of the grounding cable. Connect the grounding conductor to the system grounding point directly without passing through the enclosures of other electrical devices or grounding terminals. This is to prevent the grounding conductor from bearing the current of other branch circuits.

Cable connection

The HMI is powered up by a 24 VDC power supply. Connect the positive and negative poles of the external power supply to +24V and GND terminals respectively. The PE terminal is the grounding terminal used to connect to the grounding cable of the HMI, as shown in the following figure:



HMI accessories

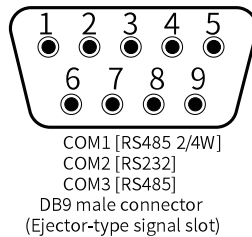
Inovance provides a full set of accessories for the power supply terminal and installation of the product. The specific accessories are shown in the table below.

Type	Quantity	Applicable HMI	Ordering code
Power supply terminal	1	ITS7156E	80240386
Metal snap-fit joint (with screw)	10		
Packing bag	1		

3.2 DB9 Terminal and Communication Cables

DB9 male connector

This equipment provides one DB9 communication terminal (DB9 male) and three built-in serial communication ports for connecting the PLC, AC drive, printer or other intelligent devices. The HMI is built-in with multiple communication protocols and usually acts as the communication master to access the data in external devices. The following figure shows the pinout and silk printing of the DB9 male connector.



The DB9 male connector is built-in with three serial communication ports – COM1, COM2, and COM3. The pins are described in the following table.

Pin No.	Signal			
	COM1 (RS485) 2 Wires	COM1 (RS485) 4 Wires	COM2 (RS232)	COM3 (RS485)
1	-	-	-	RS485-
2	-	-	RS232 RXD (receiving data)	-
3	-	-	RS232 TXD (transmitting data)	-
4	-	TX+ (positive transmitting signal)	-	-
5	GND (signal ground)			
6	-	-	-	RS485+
7	RS485-	RX- (negative receiving signal)	-	-

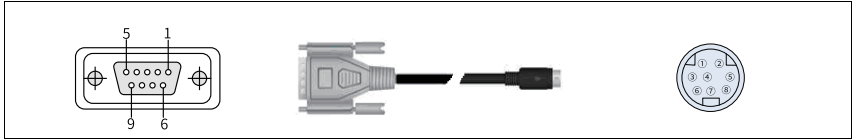
Pin No.	Signal			
	COM1 (RS485) 2 Wires	COM1 (RS485) 4 Wires	COM2 (RS232)	COM3 (RS485)
8	RS485+	RX+ (positive receiving signal)	-	-
9	-	TX- (negative transmitting signal)	-	-

Note

COM1 [RS485] port with four wires is equivalent to COM1 [RS422] port.

Communication cable for DB9 male connector

Inovance provides prefabricated communication cable options for DB9 male connector on this equipment (part number: IT7-H3U-CAB, ordering number: 1504AX53).



Cable connector and pins	DB9 female connector		8-pin DIN round connector	
Signal level	RS422		RS422	
-	Pin No.	Signal	Pin No.	Signal
Internal connection of the cable	7	RX-	4	TX-
	8	RX+	7	TX+
	9	TX-	1	RX-
	4	TX+	2	RX+
	5	GND	3	GND
Applicable HMI and interface of the cable	ITS7156E		Inovance H1U/H2U/H3U RS422 communication interface Mitsubishi FX1N/2N/3U/3G RS422 communication interface	
HMI user program setting for use of the cable	In the HMI user project, set the COM1 port to "RS422/RS485". The HMI and PLC must be set with the same communication protocol and data format.			

Note

1. Cable requirements: Different cables are required for connection of different external devices. Do not lay the communication cables together with the AC power cables or near electrical noise source. Do not plug/remove the communication cables during communication.
 2. To avoid communication problems, ensure that the communication cable does not exceed 150 m when connecting RS485/422 devices.
 3. In case of communication failure, the screen keeps displaying "Connection failed: connection_1, station 1. Err: 10001" until the communication is established.
 4. If the communication cable is long or passes through an environment with electrical noise, use a shielded cable.
-

3.3 EtherNet Terminal

Specification overview

Item	Specification
Output channel	1
Output connection mode	Standard Ethernet interface (no indicator for RJ45)
Output type	EtherNet
Output speed	1 channel 10/100 Mbps auto-negotiation
Communication distance	Network cables of CAT5 or higher, 100 m
Master/Slave	Master/Slave supported

Wiring precautions

When connecting Ethernet terminal cables, note the following:

- When connecting the cable to the Ethernet terminal of this product, insert it securely until it locks into place.
- Do not bundle communication cables with power cables (high voltage, high current) or other cables that produce strong interference signals. They should be routed separately, avoiding parallel routing.
- Do not place communication cables near noise-generating equipment. If it is necessary to place them near such equipment, take measures to address the noise issue, such as placing the noise-generating equipment in a metal enclosure for electromagnetic shielding.
- Do not place communication cables in environments with high temperatures or high humidity.
- Do not place communication cables in environments with excessive dust, oil mist, or other harmful contaminants.

- There is a limit to the bending radius of communication cables. check the bending radius specified in the cable specifications.

Cable connection/disconnection

The EtherNet terminal of this product uses a standard RJ45 network interface and standard crystal connector. Use CAT5 or higher grade network cables for connection.

- Connection: Hold the crystal connector and insert it into the EtherNet terminal until you hear a "click".
- Disconnection: Press and hold the release tab on the rear of the crystal connector and pull the connector out horizontally from the EtherNet terminal.



The cable length between devices cannot exceed 100 m. Failure to comply can lead to signal attenuation, affecting the communication performance.

3.4 USB Terminal

Specification overview

Item	Specification	
	USB Type-A	USB Type-C
Number of channels supported	1 channel	1 channel
USB communication speed	USB 2.0 high speed	USB 2.0 high speed
USB communication distance	1.5 m	1.5 m
Power supply to outside	5 V/500 mA	Not supported
Short-circuit protection	Supported	Not supported
Master/Slave	Master	Slave

Cable connection

- USB Type-A terminal is used to read and write data in the USB flash drives, or connect to devices such as mouse, keyboard, printer, barcode scanner.
For the connection, simply plug the USB cable connector of the corresponding device into the USB Type-A terminal of this product.

- USB Type-C is used to connect to PC for user program downloading and commissioning.

For the connection, plug one end of the USB cable to into the USB Type-C terminal, and connect the other end to PC.

Note

To remove the cable, simply pull out the USB cable directly.

4 Touch Screen Calibration

If the touch screen does not respond or responds slowly, use the calibration program to calibrate the touch screen.

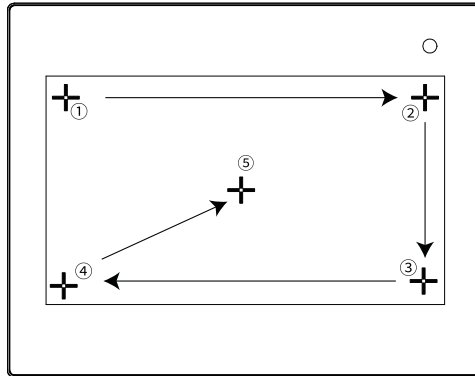
Entering the calibration program

Access the program through the system setup menu: After the HMI is powered on and the screen displays "Long press to enter the Setup screen", gently press the screen with your finger until the screen displays "Release to enter the Setup screen". After you enter the system setup password, the system setup menu pops up. Tap the "Calibrate" tab.

Detailed steps

1. After entering the calibration mode, "+" is shown in the upper left corner of the screen (as shown below).
2. Use the stylus or your finger to tap the center of "+". After tapping, "+" moves in the direction indicated by the arrows below. Tap each point where "+" moves.
3. After calibrating the preceding five points, "+" disappears. In this case, tap the blank space on the screen to exit. If calibration fails, the cursor returns to the upper left corner of the screen. In this case, calibrate the preceding five points again.

The calibration process is shown below.





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