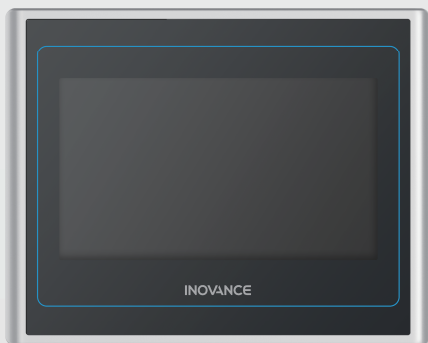




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IT7043 HMI

User Guide

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Preface

■ Introduction

Thank you for purchasing InoTouch series human machine interface (HMI) independently developed and produced by Inovance. With an Android style Linux system, the product provides users with user-friendly interactive experience. It features: Custom styles, VNC remote desktop, vector format icons, and scripting; Connection to a PC through USB; Automatic and efficient PLC communication with Modbus protocol; Firmware, screen program and recipe data update through a USB drive. To facilitate HMI program commissioning and system commissioning, online simulation and offline simulation are available in IT7150E HMIs.

This guide describes the specifications, characteristics and using methods of the product. Please read this guide carefully before using to ensure more safe usage. For details on use of user program development environment and user program designs, see the help file in InoTouchPad. Visit our website (www.inovance.com) for the latest version of the guide.

■ Revision History

Date	Version	Description
September 2024	A02	Corrected some minor errors.
July 2024	A01	● Added the code "F01" in "1.1 Model Number" on page 8. ● Added parameter description of models IT7043T-F01 and IT7043E-F01 in "1.2 Technical Data" on page 8. ● Added dimension description of models IT7043T-F01 and IT7043E-F01 in "2.2 Mounting Dimensions" on page 10. ● Added terminal description of models IT7043T-F01 and IT7043E-F01 in "3.1 Terminal Description" on page 13. ● Added models IT7043T-F01 and IT7043E-F01 to the description of communication port and DB9 male connector in "3.2 Terminal Wiring" on page 14. ● Added the wiring diagram in "Programming" on page 19. ● Updated the Suzhou address on the cover page and added the My Inovance QR code on the cover page.
August 2021	A00	First release.

■ Access to the Guide

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

- Do keyword searching under Service and Support at <http://www.inovance.com>.
- Scan the QR code on the equipment to acquire more.
- 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 faults or damage that occur during normal operation. Maintenance will be charged after the warranty expires.

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

- Damage caused by operations not following the instructions in the user guide
- The product is damaged due to fire, flood, and abnormal 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.

Safety Instructions

■ Safety Disclaimer

1. Read through the safety instructions before installing, operating, and servicing the equipment, and comply with these instructions.
2. To ensure personal and equipment safety, observe the notes indicated on the product labels and all the safety instructions in the user guide.
3. "CAUTION", "WARNING", and "DANGER" in the user guide only indicate some of the precautions that need to be followed; they just supplement the safety precautions.
4. Use this equipment according to the designated environment requirements.
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 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 damage to the equipment. Keep this guide properly for future use and deliver this guide to the end user.

Control System Design



- Interlock circuits and other circuits such as emergency stop, conventional protection, forward and reverse rotation must be set outside the product; devices for preventing equipment damage (up, down and reciprocating movement limit) must be set outside the product.
- A fault protection circuit must be laid outside the to prevent unexpected mechanical movement caused by, for example, errors in the non-detectable I/O control area.
- A user program must be designed to inform users of faults concerning the display, control, communication, power supply and so on, ensuring safety of the user system.
- Make sure that measures have been taken to avoid malfunction caused by the communication faults between the product and the master controller. This is to prevent personal injury and equipment damage.
- Do not bring live parts into contact with the metal enclosure of the product.



- Do not create, on the touch screen of the HMI, switches that may result in personal injury of the operator or equipment damage . Use independent switches for performing critical operations. Failure to comply may result in accidents caused by wrong outputs or faults.
- Do not create switches that are used to control equipment safety operations on the touch screen, such as the emergency stop switch. Use independent hardware switches to perform safety-related operations. Failure to comply may result in series personal injury or equipment damage.
- Do not use this product as an alarm device to report critical alarms that may cause severe personal injury, equipment damage or system stop. Use an independent hardware and/or mechanical interlock to design a mechanism for reporting critical alarms and the related control/triggering devices.

Installation



- This equipment must only be used indoor. Ensure that the environment meets the specified requirements;
- Install the product in a place free from strong magnetic field, direct sunlight, high temperature, inflammable gases, vapors, and dust. Failure to comply will result in the risk of explosion.
- Operate the product only in environments without drastic temperature changes or high humidity. Failure to comply may result in water condensation inside the product, leading to equipment damage.
- Ensure all the cable connectors are connected to the product securely. Loose connection may result in wrong I/O signals.



- Install the HMI in environments with temperatures within the recommended storage temperature range. Failure to comply may result in display faults of the LCD.

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. This is to prevent faults, component damage, and fire accidents.
- Perform meticulous inspection after wiring to ensure the operating voltage and terminal positions are correct. Failure to comply may result in a 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 the HMI should 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



- Touch the HMI panel with hands only during use. Do not use tools to touch the HMI panel. Inovance assumes no responsibility for panel damage caused by excessive external force.
- Retired lithium batteries, LCD screens, capacitors and any other matters that may contain ingredients that are hazardous to health and the environment must be disposed of as industrial wastes.

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 programmable controller and can start or terminate the automatic running of the system.
- If you need to modify the program while the system is running, use the lock function or other protective measures. Ensure that only authorized personnel can make the necessary modifications.

Battery



- The battery model must be correct.
- Do not throw the battery into a fire or heat oven. Do not crush or cut the battery.
- Do not expose the battery to extremely high temperatures.
- Do not swallow the battery to prevent the risk of chemical burns.
- This product contains the button battery. If the 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 is not tight, stop using the device and keep it away from children.
- If you swallowed the battery, see a doctor immediately.

Disposal



CAUTION

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

1 Product Information

1.1 Model Number

IT 7 043 T - CP

Product info
Inovance InoTouch HMI

Product series
7: 7000 series

Screen size
043: 4.3-inch
070: 7-inch
100: 10-inch

Auxiliary info
CP: For air compressor
F01: Conformal coating

Auxiliary info
T: Standard
E: With Ethernet

1.2 Technical Data

Model	IT7043T-CP	IT7043T-F01	IT7043E-F01
Hardware specifications			
Display screen size	4.3"		
Resolution	480 x 272		
Brightness (cd/m ²)	400		
Display color	24-bit true color		
Backlight source	LED		
Backlight lifetime	30000 h		
CPU	Cortex A8 600 MHz		
Flash	128 MB		
DRAM	128 MB DDR3		
Recipe memory	256 KB		

Model	IT7043T-CP	IT7043T-F01	IT7043E-F01
USB type-B port	✓	✓	/
Ethernet port	/	/	✓
Serial port	COM1 (RS485)	COM1 (RS422/RS485) COM2 (RS232) COM3 (RS485)	COM1 (RS422/RS485) COM2 (RS232) COM3 (RS485)
RTC	✓		
Electrical specifications			
Input voltage	24 VDC ± 20%		
Rated current	200 mA		
Structure specifications			
Enclosure color	Metal grey		
Enclosure material	ABS+PC		
Mounting hole dimensions (mm)	119 x 93		
General specifications			
Operating temperature	0°C to 50°C		
Storage humidity	10% to 90% RH (non-condensing)		
Storage temperature	-20°C to +70°C		
Cooling mode	Natural ventilation		
IP rating of the panel	IP65		

2 Mechanical Design

2.1 Installation Environment

1. This product is designed to operate in a temperature range between 0°C and 50°C (32°F to 122°F), exceeding of which may result in damage to the HMI components, malfunction, or performance degradation. For use in special environments, contact Inovance.
2. Do not install the HMI in environments suffering from strong mechanical vibration.
3. Install the HMI in the panel with a depth of over 105 mm and reserve a surrounding clearance of at least 25 mm.
4. 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 for I/O cables and ground the shielded cable properly.
5. The front panel of the HMI complies with the requirements of IP65. When the equipment is installed in a IP65-rated cabinet, the cabinet must retain its IP rating, which means liquid sprayed on the cabinet cannot get into it.

2.2 Mounting Dimensions

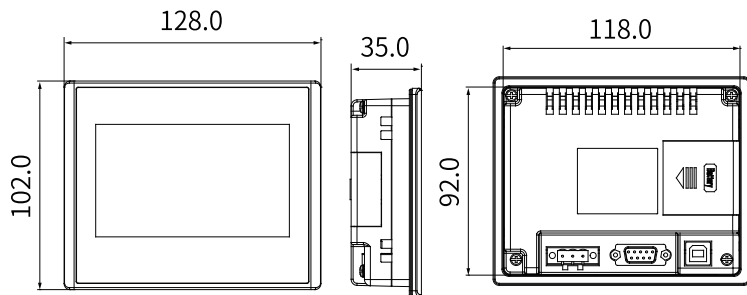


Figure 2-1 IT7043T-CP/IT7043T-F01

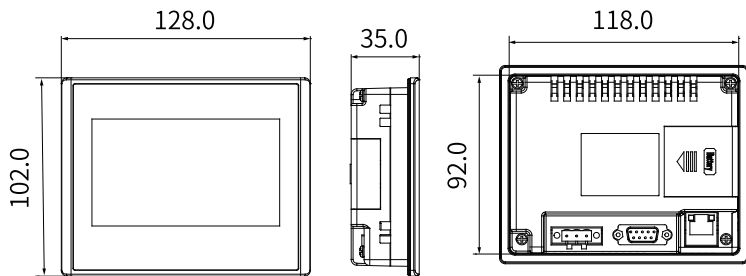


Figure 2-2 IT7043E-F01

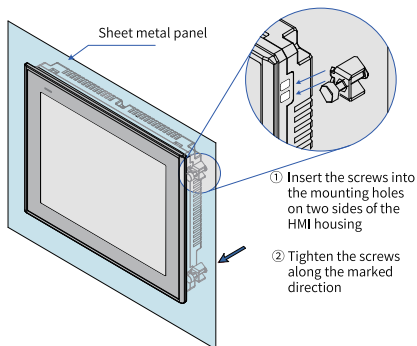
Model	Display screen size	Product specifications (mm)			Recommended cut-out dimensions (mm)	
		Outline dimensions W x H x D	Through-hole mounting dimensions W x H	VESA mounting dimensions D x D	W+1	H+1
IT7043T-CP	4.3"	128 x 102 x 35	118 x 92	Not supported	119	93
IT7043T-F01						
IT7043E-F01						

2.3 Installation Method

Refer to the following steps for through-hole mounting:

Procedure

- Put the HMI into the pre-drilled mounting holes in the panel.
- Snap the four mounting screws (delivered by default) from the back of the panel into the four mounting holes on both sides of the enclosure (step ① in the figure).



3. Tighten the mounting screws one by one until the HMI is secured to the panel (step ② in the figure). Recommended torque: $6.0 \pm 0.5 \text{ kgf} \cdot \text{cm}$ (to ensure water resistance and prevent deformation).



Caution

To comply with IP65 sealing specifications, ensure all the mounting screws delivered are used and the curvature of the panel is no greater than 0.010° .

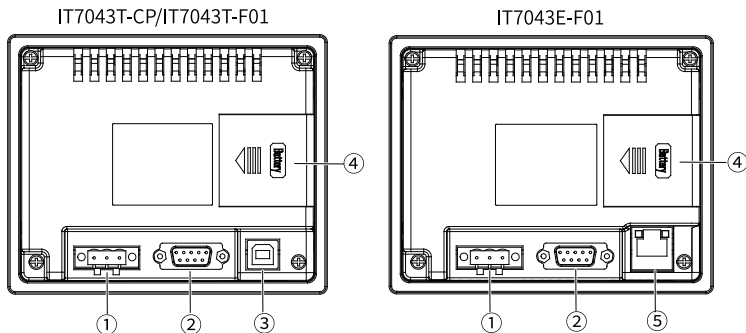


Warning

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

3 Electrical Design

3.1 Terminal Description



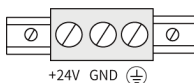
No.	Name	Description	Remarks
①	Power port	24 VDC power input	The product comes with a power plug for connection to the power port.
②	DB9 female	Communication port between HMI and PLC	IT7043T-CP includes built-in COM1 serial communication port. COM1: RS485 IT7043E-F01 and IT7043T-F01 include built-in COM1, COM2 and COM3 serial communication ports. COM1: RS485/RS422 COM2: RS232 COM3: RS485
③	USB type-B port	Slave USB communication port, used for user program downloading and commissioning through PC	IT7043T-CP and IT7043T-F01 come with a USB type-B port.

No.	Name	Description	Remarks
④	Battery cover	A battery is included for power backup of permanent calendar.	1x CR2032 3 V lithium battery (battery life: Approx. 5 years at 25°C)
⑤	Ethernet port	Ethernet communication port (RJ45), used to access the PLC including a LAN port, or the PC.	IT7043E-F01 comes with an Ethernet port.

3.2 Terminal Wiring

■ Power supply

The product is powered by a 24 VDC power supply. Connect the positive pole of the external power supply to the +24V terminal, and the negative pole to the GND terminal. Connect the grounding wire to the terminal marked with $\oplus$. See the figure below:



- 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 independent 14AWG lead wires (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.

■ Communication port

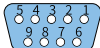
- IT7043T-CP provides one DB9 communication port (DB9 female connector) and one built-in independent serial communication port for connecting the PLC, AC drive, printer or other intelligent devices. The product is built-in with multiple communication protocols and usually acts as the communication master to access the data in external devices.
- IT7043T-F01 and IT7043E-F01 provide one DB9 communication port (DB9 female connector) and three built-in independent serial communication ports for connecting the PLC, AC drive, printer or other intelligent devices. The product is built-in with multiple communication protocols and usually acts as the communication master to access the data in external devices.

■ DB9 female connector

The DB9 connector of IT7043T-CP includes a built-in serial communication port COM1. The connector pins are described in the following table:

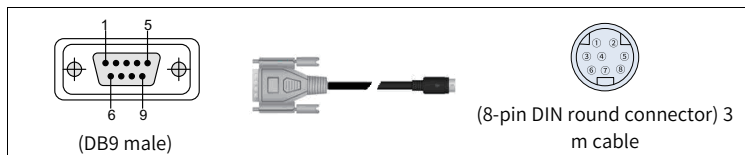
Pin No.	Signal	Pin layout of DB9 female
	COM1 [RS485] 2 Wires	
1	RS485-	 COM1 [RS485 2W] DB9 female (pogo pin connector)
2	RS485+	
3	-	
4	-	
5	GND	
6	-	
7	-	
8	-	
9	-	

The DB9 connector of IT7043T-F01/IT7043E-F01 includes three built-in serial communication ports COM1, COM2 and COM3. The connector pins are described in the following table:

Pin No.	Signal				Pin layout of DB9 female
	COM1 [RS485] 2 Wires	COM1 [RS422]	COM2 [RS232]	COM3 [RS485]	
1	RS485-	RX- (Receive-)	-	-	 COM1[RS485 2W/RS422] COM2[RS232] COM3[RS485] DB9 female (pogo pin connector)
2	RS485+	RX+ (Receive+)	-	-	
3	-	TX- (Transmit-)	-	-	
4	-	TX+ (Transmit +)	-	-	
5	GND				
6	-	-	-	RS485-	
7	-	-	TXD (transmit data)	-	
8	-	-	RXD (receive data)	-	
9	-	-	-	RS485+	

■ Communication cable for DB9 female

Inovance provides preformed communication cable options (model: IT5-H2U-CAB*, ordering No.: 15041140) for the DB9 female.



Cable connector and pin	DB9 male		8-pin DIN round connector	
Signal interface	RS485		RS485	
-	Pin No.	Signal	Pin No.	Signal
Pin assignment	1	RS485-	4	-
	2	RS485+	7	-
	3	-	1	RS485-
	4	-	2	RS485+
	5	GND	3	GND
Applicable model and port	IT7*** HMI COM1[RS485]2W		Inovance H1U/H2U/H3U RS485 communication port Mitsubishi FX1N/2N/3U/3G RS485 communication port	
HMI user program setting for use of the cable	Select the same communication protocol and data formate for the HMI and PLC.			

■ Precautions on communication cable connection

- Requirement: Use different communication cables to connect to different external devices. Do not route communication cables in parallel with AC power supply cables or route communication cables near electrical noise source. Do not connect/disconnect communication cables during communication.
- To avoid communication problems, ensure that the communication cable does not exceed 150 m when connecting RS485 devices.
- If a communication error occurs, "Communication timeout" will be displayed until the communication is back to normal.
- Use shielded cables as communication cables in case of long communication cables or where communication cables need to pass through environments suffering from electrical noise.

■ USB port

USB type-B interface: Used to connect to PC through a general USB communication cable for downloading/uploading user configuration programs and setting HMI system parameters.

■ Ethernet communication

The 10M/100M adaptive Ethernet port, located on the back of the equipment, can be used for:

- Download/upload HMI configurations, set system parameter, and perform online simulation of configurations.
- Connected to multiple HMIs through Ethernet to form a networked communication.
- Communicate with PLC through Ethernet.
- Connected to HUB or Ethernet switch through a standard Ethernet cable to access the LAN, or connected to the Ethernet port of the PC directly through a dual interconnect network cable. To ensure communication stability, use shielded cables for Ethernet.

4 Programming

The product supports user programming. Before programming the product, you need to prepare:

a PC installed with InoTouchPAD, a programming cable, and an InoTouch 7043HMI.

■ Software source

For the latest version of the programming software InoTouchPAD developed by Inovance, contact your HMI supplier or visit our website (<http://www.inovance.com>).

■ Recommended PC configurations

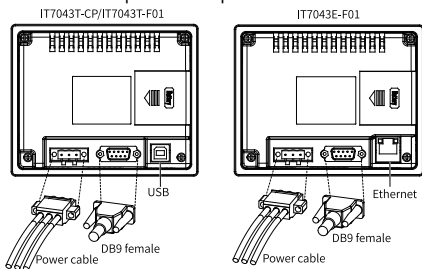
1. CPU: Intel or AMD, 2.0 GHz or higher
2. Memory: 1 GB or above
3. Hard disk: At least 1 GB free space
4. Display: Color display with resolution of 1024 x 768 or above
5. USB port: Used for uploading and downloading page programs
6. Ethernet port: Used for data transfer
7. Operating system: Linux

■ Programming cable (connecting to Inovance PLC)

The USB communication cable (optional) is used as the programming cable, which is available from Inovance (model: IT5-USB-CAB, ordering number: 15041123).

■ Wiring (connecting to Inovance PLC)

Connect an Inovance PLC to the port of the product as shown in the figure below.



5 Touchscreen Calibration

If the touch screen is unresponsive or abnormal, calibrate the touch screen using the calibration program.

■ 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

- After entering the calibration mode, "⛶" is shown in the upper left corner of the screen (as shown below).
- Use the stylus or your finger to tap the center of "⛶". "⛶" moves in the direction indicated by the arrows below. Tap each point where "⛶" stops.
- After the 5-point calibration is completed, "⛶" will disappear. Tap the blank space of the screen to exit; if the calibration fails, the crosshair will return to the upper left corner of the screen and you must repeat the calibration.

