XINJE

TS series HMI manual

［Hardware］

Wuxi Xinje Electric Co., Ltd.

Data No. HSC01 20220428EN 1.0

Basic description

- Thank you for purchasing the Xinje TS series HMI.
- This manual mainly introduces the hardware characteristics of TS series HMI.
- Before using the product, please read this manual carefully and conduct wiring on the premise of fully understanding the contents of the manual.
- Please refer to relevant manuals for introduction to software and programming.
- Please deliver this manual to the end user.

Notice to users

- Only operators with certain electrical knowledge can perform other operations such as wiring on the product. If there is any unknown place, please consult our technicians.
- The examples listed in the manual and other technical materials are only for users' understanding and reference, and do not guarantee certain actions.
- When using this product in combination with other products, please confirm whether it conforms to relevant specifications, principles, etc.
- When using this product, please confirm whether it meets the requirements and is safe.
- Please set the backup and safety functions by yourself to avoid possible machine failure or loss caused by the failure of this product.
- Please avoid using HMI in the environment of high radiation and strong magnetic field to avoid interference.

Declaration of responsibility

- Although the contents in the manual have been carefully checked, errors are inevitable, and we cannot guarantee that they are completely consistent.
- We will often check the contents of the manual and make corrections in subsequent versions. Please give us your valuable suggestions.
- The contents described in the manual are subject to change without notice.

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1. TS3 series HMI overview

1-1. Product features

- 16.77 million colors TFT-LCD, highlighted screen, full color, more realistic display effect.
- High speed A8 600MHz main frequency CPU, 128MB memory, excellent data processing ability, faster download speed and large. Greatly improve the boot loading speed, reduce the waiting time and screen jump, and the animation effect is better and smooth.
- Dimensions include 7'' and 10.1''.
- Ultra thin body, fashionable appearance, installation bayonet and back sealing, effectively preventing the entry of external dust, oil stain, etc.
- The standard USB interface supports the connection of USB devices such as mouse, keyboard and code scanning gun.
- The communication capability is upgraded. It can communicate with multiple PLCs at the same time. RJ45 Ethernet interface supports the communication with TBOX and Siemens S7-1200, S7-200 Smart and other Modbus TCP devices, break the traditional serial communication mode and form an open network structure.

1-1-1. Product features

(1) Display

- 16.77 million color display, supporting BMP and JPEG format pictures, with richer colors and more realistic display effect.
- Touch calibration function.
- 128MB large memory is used to realize high-speed downloading, high-speed loading and high-speed operation.
- The storage capacity is greatly increased.
- Support Chinese, English, Japanese, Korean and other languages, set fonts at will, size as you want, support underline, italic, bold, etc., and set shadow, three-dimensional, stroke and other artistic effects.
- Abundant picture materials, and the screen operation is free of stagnation.

(2) Control

- Switch control, data dynamic display monitoring, bar chart, data trend chart, XY trend chart, XY line chart, pie chart, alarm record, operation record and other control functions.
- Data collection and saving of user-defined conditions.
- User permission setting and multi-level password protection mechanism.
- Online simulation, offline simulation and data upload.
- Powerful function block of C language, including operation, command and communication.
- USB flash disk data backup function of USB-A (USB2.0 standard) interface, with a speed up to 480Mbps, can be connected to mouse, keyboard, code scanning gun and other USB port devices.
- USB-B (USB2.0 standard) download interface makes data transmission faster.
- Customized animation track design.
- It covers all functions of TG series.
- Multiple download methods.

(3) Communication

- Dual port independent communication, which can connect multiple different devices at the same time.
- -E series is equipped with Ethernet interface to support communication with Ethernet equipment, Siemens S7-1200, Siemens S7-200 Smart and other Modbus TCP equipment.
- The printer can be directly driven, which is economical and flexible.
- Support free format communication, and end users can write drivers freely.

1-1-2. Naming rule

$$\underset{①}{\text{TS3}} - \underset{②}{700} - \underset{③}{\text{E}}$$

①：	Series	TS3 series
②：	Display	700：7.0 inch
		1000：10.1 inch
③：	Interface	M：USB-B, USB-A, COM1, COM2
		E：USB-B, USB-A, RJ45, COM1, COM2

1-1-3. Model list

Xinje TS3 series HMI have the following models according to different display sizes and function types:

Display	7″	10.1″
General model	TS3-700-M TS3-700-E	TS3-1000-M TS3-1000-E

1-2. Product specification

Product model		TS3-700	TS3-1000
Product features	Size	7.0”	10.1”
	Resolution	800*480	1024*600
	LCD	TFT LCD display, LED	
	Display colors	16.77 million colors	
	Brightness	200 cd/m^2	
	Touch panel	Four wire resistive touch screen	
	LCD life	More than 50000 hours, ambient temperature 25℃, 24-hour operation	
	Processor	Cortex-A8 600MHz	
	Storage	128MB	
Interface	COM1	RS232/RS485	
	COM2	RS232/RS485/RS422	
	USB-A port	Flash disk port, USB2.0	
	USB-B port	USB download port, USB2.0	
	Ethernet port	Standard RJ45 (10/100M self-adaption), -E models support	
Electrical characteristics	Input voltage	DC24V (voltage range: DC22V-DC26V)	
	Current consumption	200mA	270mA
	Allowable power loss	Below 10ms (the actual power loss is less than 1s)	

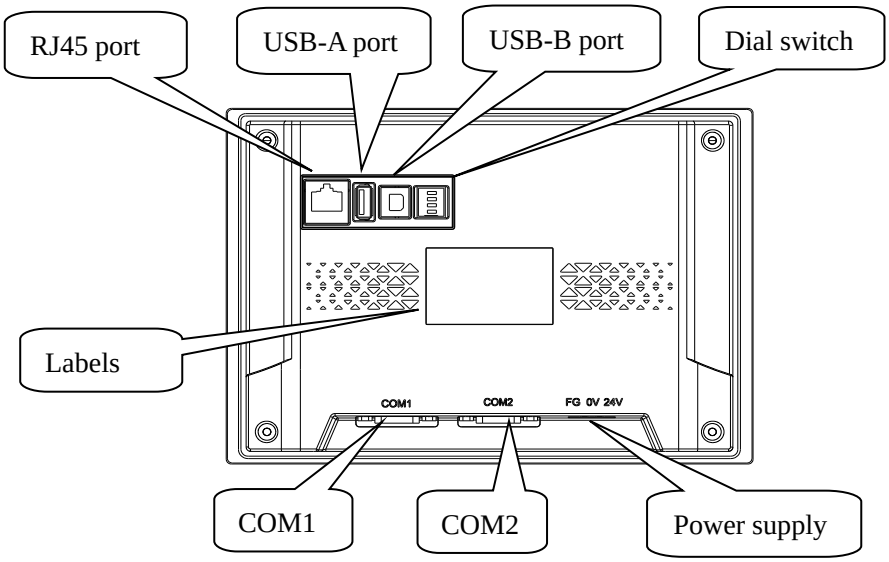
Product model		TS3-700	TS3-1000
	Voltage impact resistance	AC1000V, 10mA, less than 1 minute (signal and ground)	
	Insulation resistance	Above 10MΩ, DC500V	
Environment	Operation temperature	0-50℃	
	Storage temperature	-10-60℃	
	Operation humidity	10%RH-90%RH (no condensation)	
	Anti interference capability	Voltage noise: 1500Vp-p, pulse width 1us, 1 minute	
	Air	No corrosive gas	
	Cooling method	Natural air cooling	
	Protection	Front cover IP65	
Dimension	Display area	154.08*85.92 mm	219.6*131.76 mm
	Product dimension	206.0*147.0*35.0 mm	277.0*191.7*36.6 mm
	Opening dimension	192.3*138.6 (±0.5) mm	260.2*179.7 (±0.5) mm

【**Note**】: Flash has a lifetime of 100000 erasures.

1-3. Part description

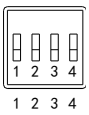
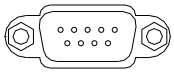
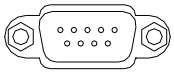
1-3-1. Structure description

The following figure shows the reverse area of TS3 HMI. For specific model and appearance, please refer to the chapter "1-4 Product Dimensions and Installation".



1-3-2. Interface description

The HMI of Xinje TS3 series is described as follows:

Appearance	Name	Function
	Dial switch	Used to set forced download, touch calibration, etc
 COM1	COM1	Support RS232/RS485 communication
 COM2	COM2	Support RS232/RS485/RS422 communication
	USB-A port	USB flash disk can be inserted to store data, and USB flash disk can be imported into the project
	USB-B port	Connect USB cable to upload/download program
	Ethernet port	Support communication with TBOX, Siemens S7-1200, Siemens S7-200 Smart and other Modbus TCP devices

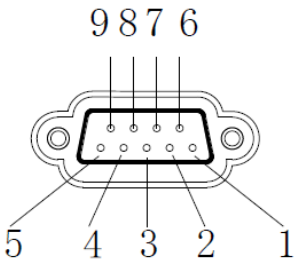
1. Dial switch

TS3 series HMI has a set of 4-bit dial switches, which are located at the bottom right of the back. Its setting functions are as follows:

Switch	DIP1	DIP2	DIP3	DIP4	Function
Status	**ON**	OFF	OFF	OFF	Undefined
	OFF	**ON**	OFF	OFF	USB flash disk import program
	OFF	OFF	**ON**	OFF	Touch screen calibration
	OFF	OFF	OFF	**ON**	Undefined

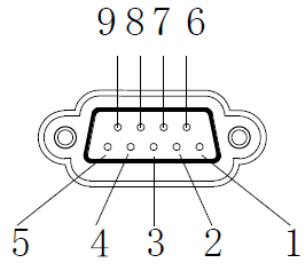
2. Communication port

(1) COM1 port pins definition



Pin	Name	Explanation
1	NC	Null signal pin
2	RXD	RS232 communication receive data
3	TXD	RS232 communication send data
4	A	RS485 communication signal +
5	GND	Signal ground
6	NC	Null signal pin
7	B	RS485 communication signal -
8	NC	Null signal pin
9	NC	Null signal pin

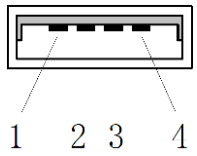
(2) COM2 port pins definition



Pin	Definition	Explanation
1	TD+	RS422 communication send +
2	RXD	RS232 communication receive data
3	TXD	RS232 communication send data
4	A	RS485 communication signal +
5	GND	Signal ground
6	TD-	RS422 communication send -
7	B	RS485 communication signal -
8	RDD-	RS422 communication receive -
9	RDD+	RS422 communication receive +

3. USB-A interface

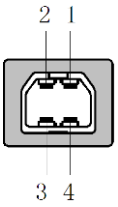
TS3 series HMI is equipped with one USB-A (USB2.0 specification) port as standard, which has the following functions: realize backup management, complete data import and export functions, and the transmission rate reaches 480Mbps.



Pin	Definition	Explanation
1	+5V	+5V voltage signal
2	DATA+	Data + signal
3	DATA-	Data - signal
4	-5V	-5V voltage signal (ground signal)

4. USB-B port

TS3 series HMI has a USB-B (USB2.0 specification) port, which is located on the upper right side of the reverse side, and realizes the following functions: data download function, and the transmission rate reaches 480Mbps.



Pin	Definition	Explanation
1	+5V	+5V voltage signal
2	DATA-	Data + signal
3	DATA+	Data - signal
4	GND	Signal ground

(1) Please use the shielded USB cable.

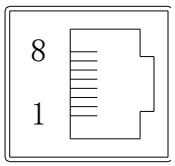
(2) The TouchWin Pro editing tool and USB drive must be correctly installed before using.

(3) After the drive is correctly installed, confirm that the computer is correctly connected to the TS3 series HMI, click

to download HMI program.

5. RJ45 port

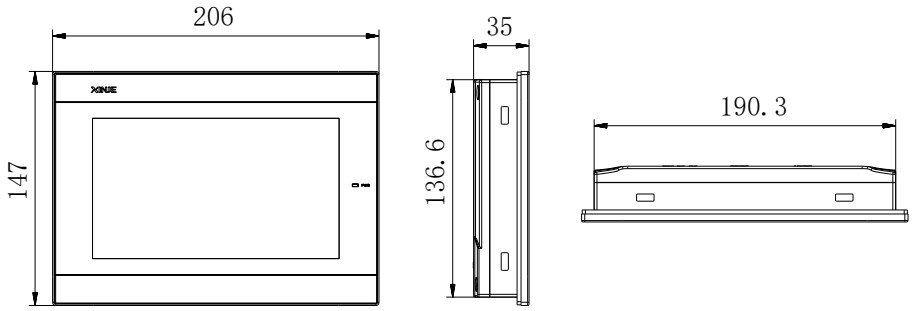
RJ45 port pin definition:

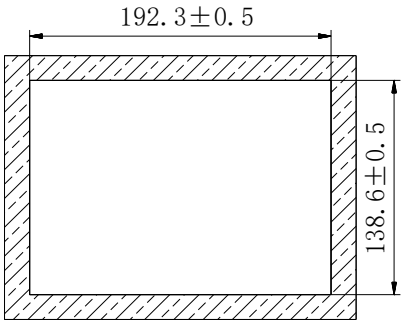
	Pin	Color	Definition	Explanation
	1	Orange white	TXD+	Data send +
	2	Orange	TXD-	Data send -
	3	Green white	RXD+	Data receive +
	4	Blue	-	-
	5	Blue white	-	-
	6	Green	RXD-	Data receive -
	7	Brown white	-	-
	8	Brown	-	-

1-4. Product dimension and installation

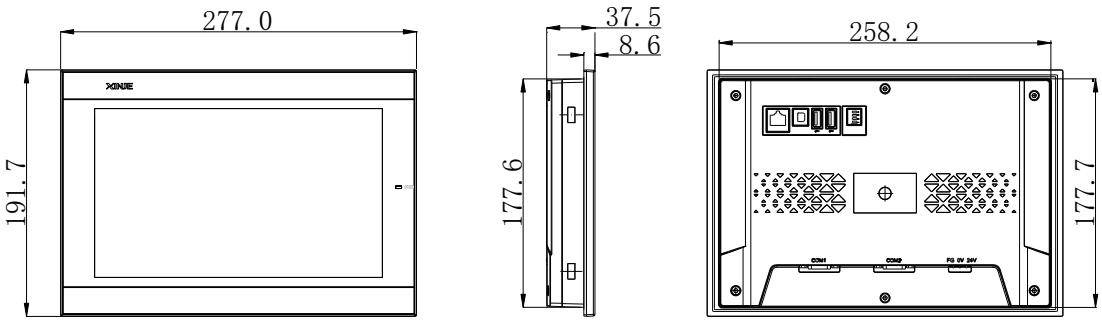
1-4-1. Product dimension

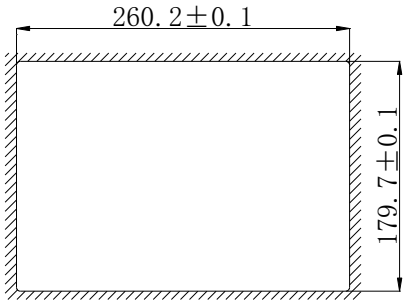
■ TS3-700 (unit: mm)





■ TS3-1000 (unit: mm)



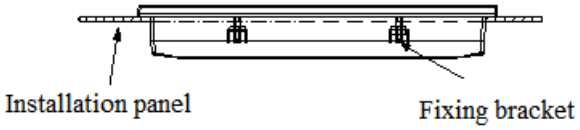


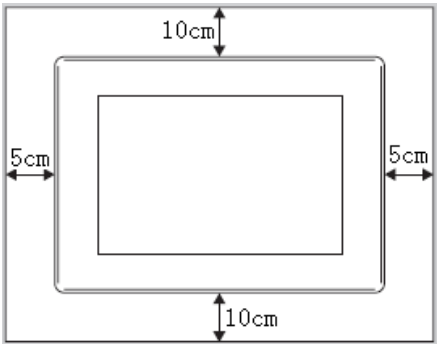
1-4-2. Product installation and use environment

1. Installation requirement

TS3 series HMI is equipped with four iron mounting brackets at the factory. The upper and lower sides of the display are respectively provided with two square fixing holes. The display is tightly fixed to the mounting holes of the control cabinet with the mounting bracket.

In order not to cause the temperature of the HMI to be too high when working for a long time, it is better to reserve 10cm space above and below the HMI and 5cm space left and right during installation to ensure smooth air convection.





2. Installation steps

(1) According to the dimensions in the previous section, open a rectangular mounting hole on the panel of the control cabinet.
(2) During installation, a sealing ring is added in the sealing groove.
(3) Insert the bottom of the display into the mounting hole of the control cabinet.
(4) Insert the mounting bracket into the side fixing hole of the display and tighten the screws.
(5) Connect the HMI and PLC communication port with communication cable.
The communication cable can be provided by the manufacturer or processed by the user according to the connection diagram, and can start to work after being connected to the +24V DC power supply.

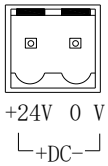
3. Environmental factor

Please install and use correctly within the specified environment.

【Note】: Do not use it in a dangerous environment full of flammable gas, water vapor or dust, and do not install it in an environment where the temperature changes too fast or the humidity is high, otherwise it will cause moisture condensation inside the HMI.

4. Power supply requirement

TS3 series HMI can only use DC power supply. The power supply specification is DC+24V (voltage range: 22V~26V), which conforms to the standard of DC power supply for most industrial control equipment. Connect the positive pole of the DC power supply to the "+24V" terminal and the negative pole of the DC power supply to the "0V" terminal. As shown in the figure below:



In addition, connecting high voltage or alternating current to the power input terminal in the HMI will make the equipment unusable and may cause electric shock to the human body. Such mistakes or serious electric shock can lead to personal injury, even death, and equipment damage.

【Note】:
If the PLC DC output is used to drive the HMI, it must be considered that the +24V DC output of some controllers may not have enough current to support it.

2. TS5L series HMI overview

2-1. Product features

- 16.77 million colors TFT-LCD, highlighted screen, full color, more realistic display effect.
- High speed A8 600MHz main frequency CPU, 128MB memory, excellent data processing ability, faster download speed and large. Greatly improve the boot loading speed, reduce the waiting time and screen jump, and the animation effect is better and smooth.
- Dimensions include 7'' and 10.1''.
- Ultra thin body, fashionable appearance, installation bayonet and back sealing, effectively preventing the entry of external dust, oil stain, etc.
- The standard USB interface supports the connection of USB devices such as mouse, keyboard and code scanning gun.
- Standard 3.5mm audio interface, supporting sound output.
- The communication capability is upgraded. It can communicate with multiple PLCs at the same time. RJ45 Ethernet interface supports the communication with TBOX and Siemens S7-1200, S7-200 Smart and other Modbus TCP devices, break the traditional serial communication mode and form an open network structure.
- WIFI/4G modules are optional.

2-1-1. Product features

(1) Display

- 16.77 million color display, supporting BMP and JPEG format pictures, with richer colors and more realistic display effect.
- Touch calibration function.
- 128MB large memory is used to realize high-speed downloading, high-speed loading and high-speed operation.
- The storage capacity is greatly increased.
- Support Chinese, English, Japanese, Korean and other languages, set fonts at will, size as you want, support underline, italic, bold, etc., and set shadow, three-dimensional, stroke and other artistic effects.
- Abundant picture materials, and the screen operation is free of stagnation.

(2) Control

- Switch control, data dynamic display monitoring, bar chart, data trend chart, XY trend chart, XY line chart, pie chart, alarm record, operation record and other control functions.
- Data collection and saving of user-defined conditions.
- User permission setting and multi-level password protection mechanism.
- Online simulation, offline simulation and data upload.
- Powerful function block of C language, including operation, command and communication.
- USB flash disk data backup function of USB-A (USB2.0 standard) interface, with a speed up to 480Mbps, can be connected to mouse, keyboard, code scanning gun and other USB port devices.
- USB-B (USB2.0 standard) download interface makes data transmission faster.
- Customized animation track design.
- It covers all functions of TG series.
- Multiple download methods.

(3) Communication

- Dual port independent communication, which can connect multiple different devices at the same time.
- Equipped with Ethernet interface to support communication with Ethernet equipment, Siemens S7-1200, Siemens S7-200 Smart and other Modbus TCP equipment.
- The printer can be directly driven, which is economical and flexible.
- Support free format communication, and end users can write drivers freely.
- Covering mainstream information interaction protocols and support MQTT/TCP IP communication.

2-1-2. Naming rule

$$\underset{①}{\text{TS5L}} - \underset{②}{700} - \underset{③}{\text{M}}$$

①:	Series	TS5L series
②:	Size	700: 7.0 inch
		1000: 10.1 inch
③:	Module type	M: no module
		E: no module, with Ethernet port
		G: with 4G module
		W: with WIFI module

2-1-3. Model list

Xinje TS5L series HMI has the following models according to different display sizes and function types:

Display size	7″	10.1″
General type	TS5L-700 TS5L-700-E TS5L-700-4G TS5L-700-W	TS5L-1000 TS5L-1000-E TS5L-1000-4G TS5L-1000-W

2-2. Product specification

Product model		TS5L-700	TS5L-1000
Features	Size	7.0”	10.1”
	Resolution	800*480	1024*600
	LCD	TFT LCD display, LED backlight	
	Display color	16.77 million colors	
	Brightness	200 cd/m^2	
	Touch panel	Four wire resistive touch screen	
	LCD life	More than 50000 hours, ambient temperature 25℃, 24-hour operation	
	Processor	Cortex-A8 600MHz	
	Storage	128MB	
Interface	COM1	RS232/RS485	
	COM2	RS232/RS485/RS422	
	USB-A port	USB flash disk port, USB2.0	
	USB-B port	USB download port, USB2.0	

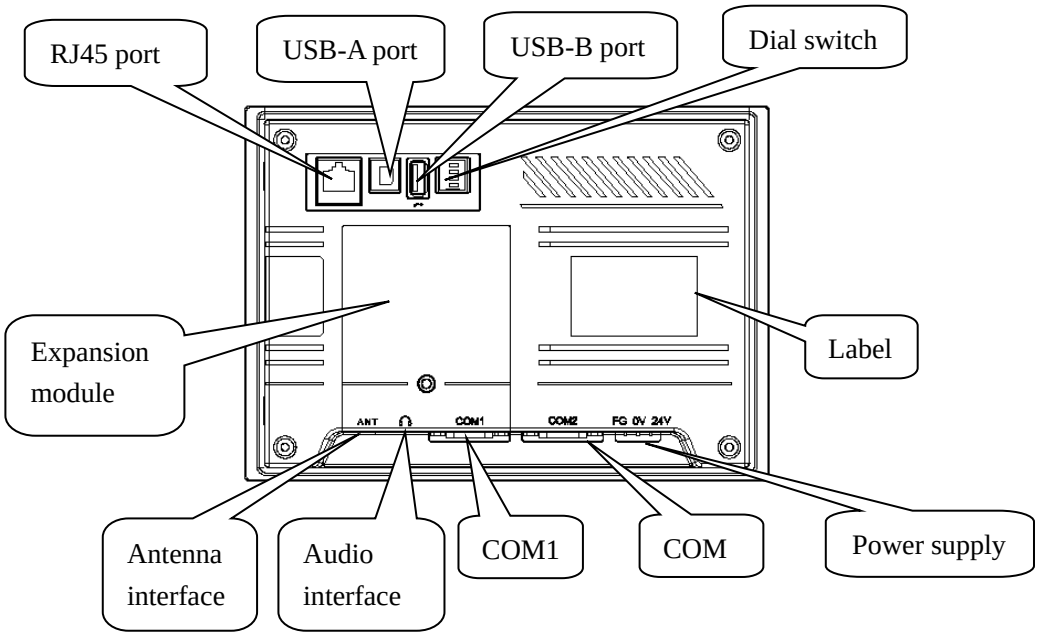
Product model		TS5L-700	TS5L-1000
	Ethernet port	Standard RJ45 (10/100M self-adpation)	
	Audio interface	ϕ3.5 coaxial audio plug	
	4G (optional)	4G LTE-FDD (Mbps): 10 (downlink) / 5 (uplink)	
	WIFI (optional)	IEEE 802.11 a/b/g/n IEEE 802.11 g: 54Mbps	
Electric features	Input voltage	DC24V (voltage range: DC22V-DC26V)	
	Current consumption	200mA	270mA
	Allowable power loss	Below 10ms (the actual power loss is less than 1s)	
	Voltage impact resistance	AC1000V, 10mA, less than 1 minute (signal and ground)	
	Insulation resistance	Above 10MΩ, DC500V	
Environment	Operation temperature	0-50℃	
	Storage temperature	-10-60℃	
	Operation humidity	10%RH-90%RH (no condensation)	
	Anti interference capability	Voltage noise: 1500Vp-p, pulse width 1us, 1 minute	
	Air	No corrosive gas	
	Cooling method	Natural air cooling	
	Protection	Front cover IP65	
Dimension	Display area	154.08*85.92 mm	219.6*131.76 mm
	Product dimension	205.8*147.2*35.5 mm	277.0*191.7*37.6 mm
	Opening dimension	192.1*138.5 mm (±0.1)	260.2*179.7 mm (±0.1)

【**Note**】: Flash rewriting life is 100000 times.

2-3. Part description

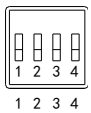
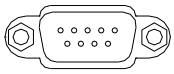
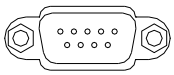
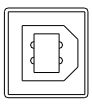
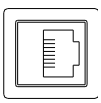
2-3-1. Structure description

The following figure shows the reverse area of TS5L HMI. For specific model and appearance, please refer to the chapter "1-4 Product Dimensions and Installation":



2-3-2. Interface description

The HMI of Xinje TS5L series is described as follows:

Appearance	Name	Function
	Dial switch	Used to set forced download, touch calibration, etc
 COM1	COM1	Support RS232/RS485 communication
 COM2	COM2	Support RS232/RS485/RS422 communication
	USB-A port	USB flash disk can be inserted to store data, and USB flash disk can be imported into the project
	USB-B port	Connect USB cable to upload/download program
	Ethernet port	Support communication with TBOX, Siemens S7-1200, Siemens S7-200 Smart and other Modbus TCP devices
	Audio interface	ϕ3.5 coaxial audio plug, supporting the connection of speakers for sound output

1. Dial switch

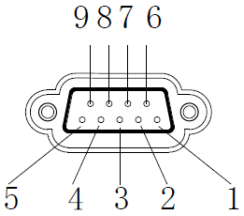
The TS5L series HMI has a set of 4-bit dial switches, which are located at the bottom right of the back. The

setting functions are as follows:

Switch	DIP1	DIP2	DIP3	DIP4	Function
Status	**ON**	OFF	OFF	OFF	Undefined
	OFF	**ON**	OFF	OFF	USB flash disk import program
	OFF	OFF	**ON**	OFF	Touch calibration
	OFF	OFF	OFF	**ON**	Undefined

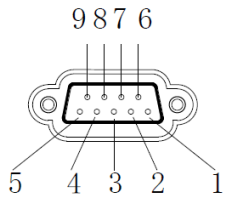
2. Communication port

(1) COM1 port pin definition:



Pin	Name	Explanation
1	NC	Null signal
2	RXD	RS232 communication receive data
3	TXD	RS232 communication send data
4	A	RS485 communication signal +
5	GND	Signal ground
6	NC	Null signal
7	B	RS485 communication signal -
8	NC	Null signal
9	NC	Null signal

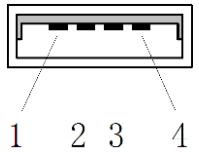
(2) COM2 port pin definition:



Pin	Name	Explanation
1	TD+	RS422 communication send +
2	RXD	RS232 communication receive data
3	TXD	RS232 communication send data
4	A	RS485 communication signal +
Pin	Name	Explanation
5	GND	Signal ground
6	TD-	RS422 communication send -
7	B	RS485 communication signal -
8	RDD-	RS422 communication receive -
9	RDD+	RS422 communication receive +

3. USB-A port

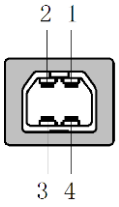
TS5L series HMI is equipped with one USB-A (USB2.0) port as standard, which has the following functions: realize backup management, complete data import and export functions, and the transmission rate reaches 480Mbps.



Pin	Definition	Explanation
1	+5V	+5V voltage signal
2	DATA+	Data + signal
3	DATA-	Data - signal
4	-5V	-5V voltage signal (ground signal)

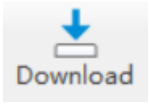
4. USB-B port

TS5L series HMI has a USB-B (USB2.0) port, which is located on the upper right side of the reverse side and realizes the following functions: data download function, transmission rate up to 480Mbps.

	Pin	Definition	Explanation
	1	+5V	+5V voltage signal
	2	DATA-	Data + signal
	3	DATA+	Data - signal
	4	GND	Signal ground

(1) Please use the shielded USB cable

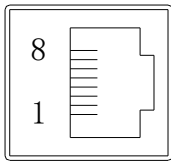
(2) The TouchWin Pro editing tool and USB drive must be correctly installed before using.

(3) After the drive is correctly installed, confirm that the computer is correctly connected to the TS5L series HMI, click 

to download HMI program.

5. RJ45 port

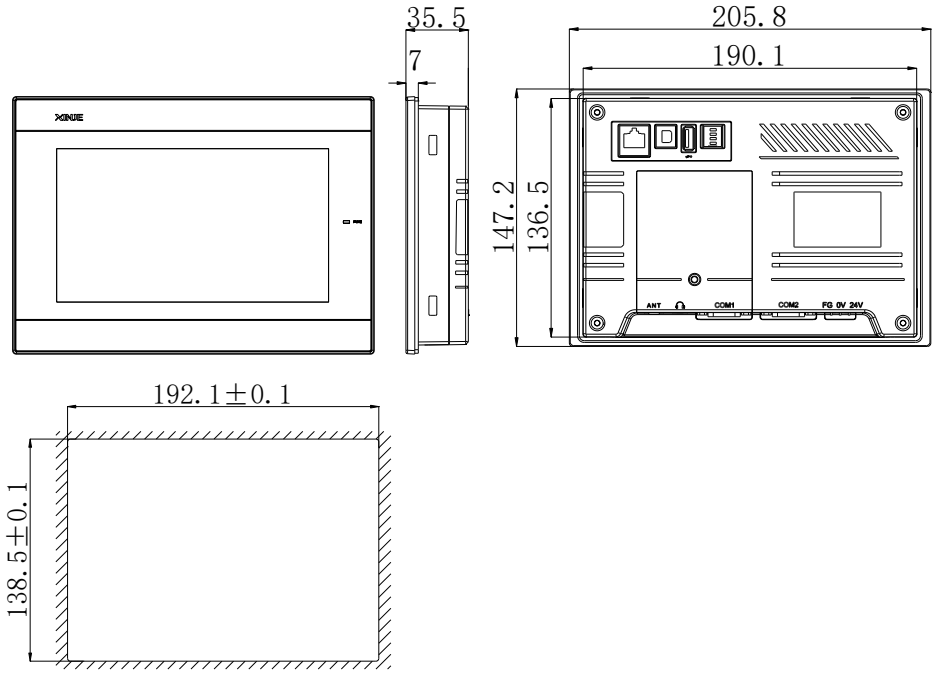
RJ45 port pin definition:

	Pin	Color	Definition	Explanation
	1	Orange white	TXD+	Data send +
	2	Orange	TXD-	Data send -
	3	Green white	RXD+	Data receive +
	4	Blue	-	-
	5	Blue white	-	-
	6	Green	RXD-	Data receive -
	7	Brown white	-	-
	8	Brown	-	-

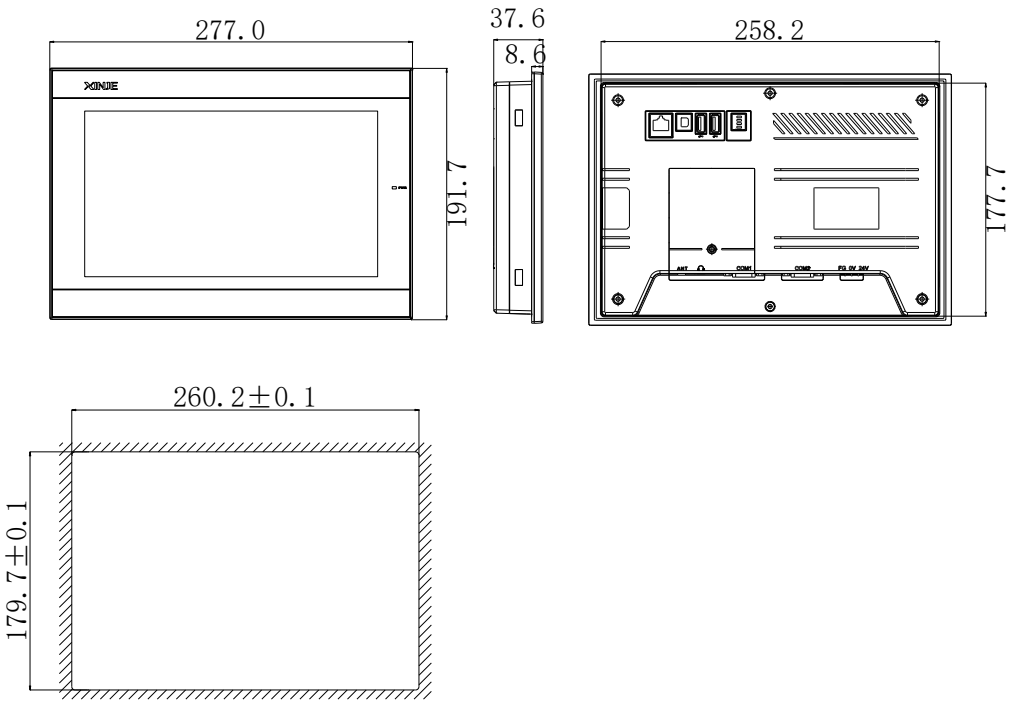
2-4. Product dimension and installation

2-4-1. Product dimension

■ TS5L-700 (unit: mm)



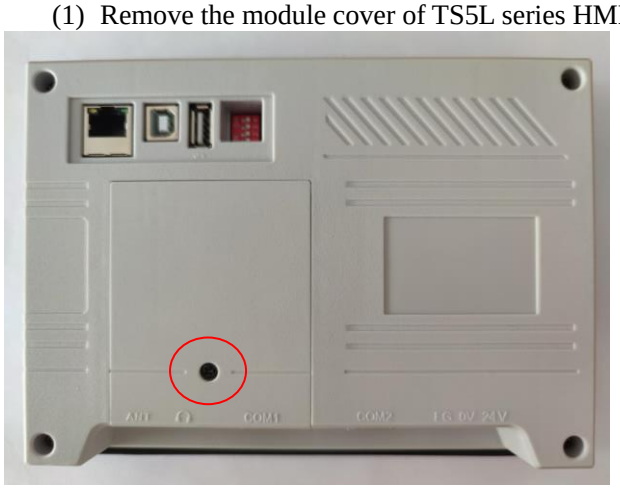
■ TS5L-1000 (unit: mm)



2-4-2. Module installation

Installation steps

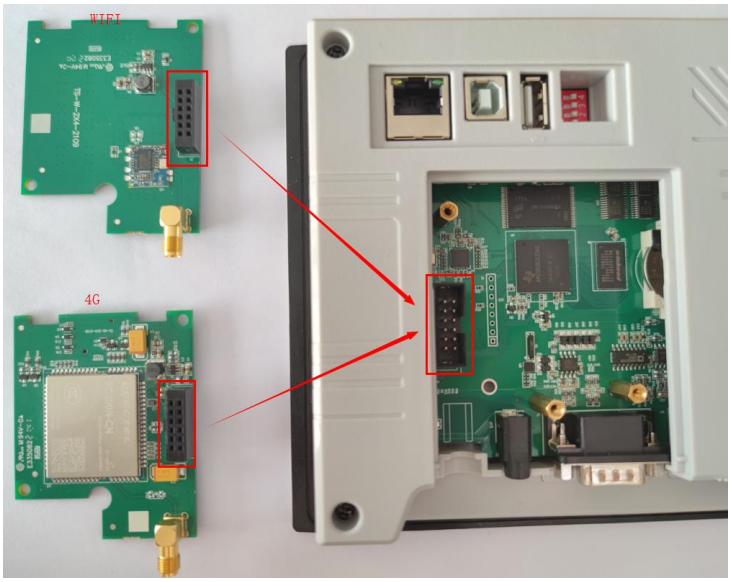
(1) Remove the module cover of TS5L series HMI



Before

After

(2) Select the module to be installed, and insert the module into the HMI interface by aligning it with the plug position



(3) Screw on the two fixing screws. The positions of the screws are shown in the figure below:

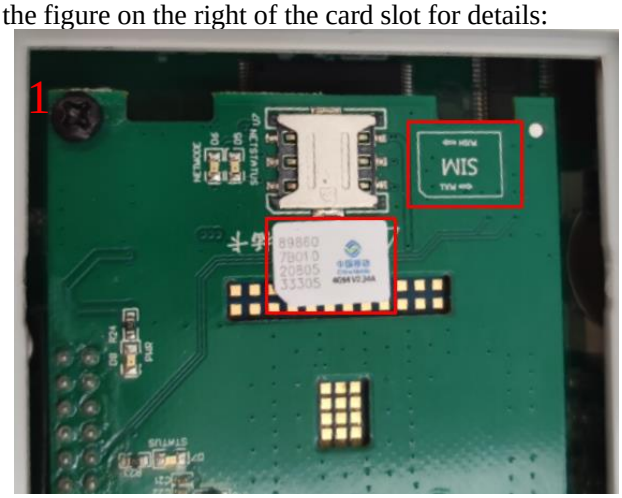
(WIFI module)

(4G module)

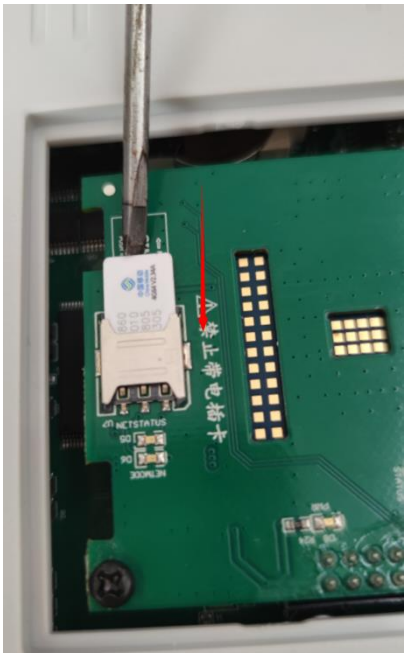
(4) SIM card installation (WIFI module no need this step)

4G module needs to install the SIM card. Please insert the SIM card into the card slot in the direction shown in the figure below. See the figure on the right of the card slot for details:

1



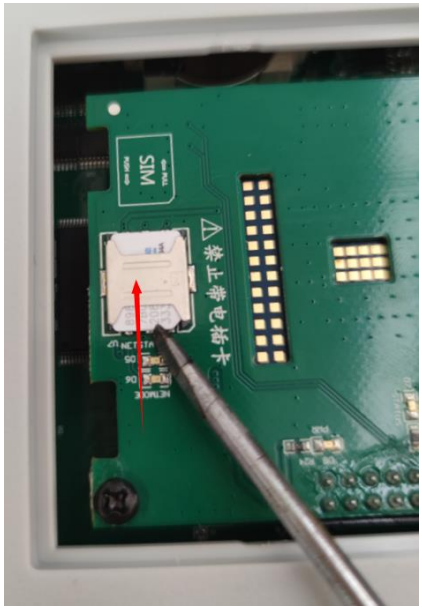
2



3

The removal of the SIM card is similar to the installation steps. Push the SIM card out in the opposite direction and then pull it out, as shown in the figure below

1



2

(5) Install the rear cover of the module removed in step 1.

Notice:

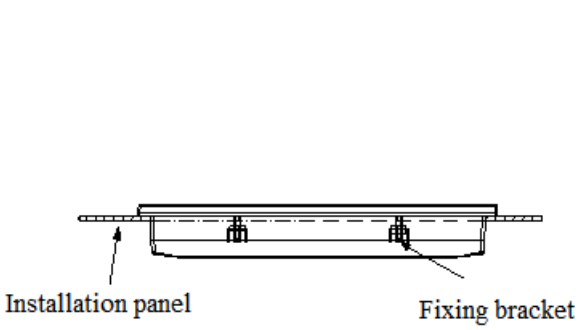
(1) 4G or WIFI modules cannot be disassembled with power, and the HMI must be powered off before installation.
(2) The SIM card of the 4G module cannot be plugged or unplugged with power. Please install it in the direction shown on the module.

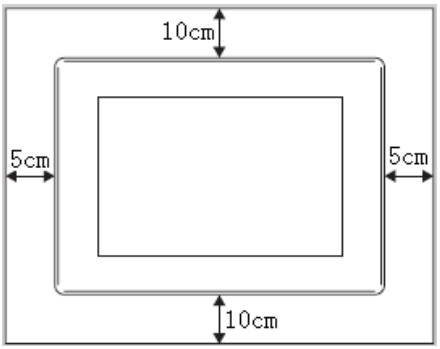
2-4-3. Product installation and using environment

1. Installation requirements

TS5L series HMI is equipped with four iron mounting brackets at the factory. The upper and lower sides of the display are respectively provided with two square fixing holes. The display is tightly fixed to the mounting holes of the control cabinet with the mounting bracket.

In order not to cause the temperature of the HMI to be too high when working for a long time, it is better to reserve 10cm space above and below the HMI and 5cm space left and right during installation to ensure smooth air convection.





2. Installation steps

(1) According to the dimensions in the previous section, open a rectangular mounting hole on the panel of the control cabinet.
(2) During installation, a sealing ring is added in the sealing groove.
(3) Insert the bottom of the display into the mounting hole of the control cabinet.
(4) Insert the mounting bracket into the side fixing hole of the display and tighten the screws.
(5) Connect the HMI and PLC communication port with communication cable.
The communication cable can be provided by the manufacturer or processed by the user according to the connection diagram, and can start to work after being connected to the +24V DC power supply.

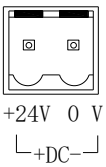
3. Environmental factor

Please install and use correctly within the specified environment.

【Note】: Do not use it in a dangerous environment full of flammable gas, water vapor or dust, and do not install it in an environment where the temperature changes too fast or the humidity is high, otherwise it will cause moisture condensation inside the HMI.

4. Power supply requirement

TS5L series HMI can only use DC power supply. The power supply specification is DC+24V (voltage range: 22V~26V), which conforms to the standard of DC power supply for most industrial control equipment. Connect the positive pole of the DC power supply to the "+24V" terminal and the negative pole of the DC power supply to the "0V" terminal. As shown in the figure below:



In addition, connecting high voltage or alternating current to the power input terminal in the HMI will make the equipment unusable and may cause electric shock to the human body. Such mistakes or serious electric shock can lead to personal injury, even death, and equipment damage.

【Note】:

If the PLC DC output is used to drive the HMI, it must be considered that the +24V DC output of some controllers may not have enough current to support it.

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