



User Manual

UT3300+ Series Multi-Channel Data Loggers

REV 1.0

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Foreword

Thank you for choosing this UNI-T instrument. For safe and proper use this instrument, please read this manual carefully, especially the safety instructions section.

After reading this manual, it is recommended to keep the manual in a convenient location, preferably near the device, for future reference.

1. Introduction

This user manual contains important safety and installation information regarding the UT3300+ series, as well as a user guide covering the basic operation of the UT3300+ series multi-channel data loggers.

2. Safety Instructions

This chapter contains information and warnings that must be observed. Ensure that the instrument is operated under the safe conditions. In addition to the safety precautions indicated in this chapter, you must also follow accepted safety procedures.

Safety Precautions	
Warning	Please follow these guidelines to avoid possible electric shock and risk to personal safety.
	Users must adhere to standard safety precautions during the operation, servicing, and maintenance of this device. UNI-T will not be liable for any personal safety and property loss caused by the user's failure following the safety precautions. This device is designed for professional users and responsible organizations for measurement purposes. Do not use this device in any manner not specified by the manufacturer. This device is intended for indoor use only, unless otherwise stated in the product manual.
Safety Statements	
Warning	"Warning" indicates the presence of a hazard. It warns users to pay attention to a certain operation process, operation method or similar. Personal injury or death may occur if the rules in the "Warning" statement are not properly executed or observed. Do not proceed to the next step until you fully understand and meet the conditions stated in the "Warning" statement.

Caution		"Caution" indicates the presence of a hazard. It warns users to pay attention to a certain operation process, operation method or similar. Product damage or loss of important data may occur if the rules in the "Caution" statement are not properly executed or observed. Do not proceed to the next step until you fully understand and meet the conditions stated in the "Caution" statement.
Note		"Note" indicates important information. It reminds users to pay attention to procedures, methods, and conditions, etc. The contents of "Note" should be highlighted if necessary.
Safety Signs		
	Danger	It indicates danger of electric shock, which may cause personal injury or death.
	Warning	It indicates that there are factors you should be cautious of to prevent personal injury or product damage.
	Caution	It indicates danger, which may cause damage to this device or other equipment if you fail to follow a certain procedure or condition. If the "Caution" sign is present, all conditions must be met before you proceed to operation.
	Note	It indicates potential problems, which may cause failure of this device if you fail to follow a certain procedure or condition. If the "Note" sign is present, all conditions must be met before this device will function properly.
	AC	Alternating current of device. Please check the region's voltage range.
	DC	Direct current device. Please check the region's voltage range.
	Grounding	Frame and chassis grounding terminal
	Grounding	Protective grounding terminal
	Grounding	Measurement grounding terminal
	OFF	Main power off
	ON	Main power on
	Power	Standby power supply: When the power switch is turned off, this device is not completely disconnected from the AC power supply.
	Waste	Do not place equipment and accessories in the trash. Items must be properly disposed of in accordance with local regulations.

	EEUP	This environment-friendly use period (EFUP) mark indicates that dangerous or toxic substances will not leak or cause damage within this indicated time period. The environmentally friendly use period of this product is 40 years, during which it can be used safely. Upon expiration of this period, it should enter the recycling system.
Safety Requirements		
Warning		
Preparation before use	Please connect this device to AC power supply with the power cable provided. The AC input voltage of the line reaches the rated value of this device. See the product manual for specific rated value. The line voltage switch of this device matches the line voltage. The line voltage of the line fuse of this device is correct. This device is not intended for measuring the main circuit.	
Check all terminal rated values	Please check all rated values and marking instructions on the product to avoid fire and the impact of excessive current. Please consult the product manual for detailed rated values before connection.	
Use the power cord properly	You can only use the special power cord for the instrument approved by the local and state standards. Please check whether the insulation layer of the cord is damaged, or the cord is exposed, and test whether the cord is conductive. If the cord is damaged, please replace it before using the instrument.	
Instrument Grounding	To avoid electric shock, the grounding conductor must be connected to the ground. This product is grounded through the grounding conductor of the power supply. Please be sure to ground this product before it is powered on.	
AC power supply	Please use the AC power supply specified for this device. Please use the power cord approved by your country and confirm that the insulation layer is not damaged.	
Electrostatic prevention	This device may be damaged by static electricity, so it should be tested in the anti-static area if possible. Before the power cable is connected to this device, the internal and external conductors should be grounded briefly to release static electricity. The protection grade of this device is 4 kV for contact discharge and 8 kV for air discharge.	
Measurement accessories	Measurement accessories designated as lower-grade, which are not applicable to main power supply measurement, CAT II, CAT III, or CAT IV circuit measurement. Probe subassemblies and accessories within the range of IEC 61010-031 and current sensors within the range of IEC 61010-2-032 can meet its requirements.	

Use the input / output port of this device properly	Please use the input / output ports provided by this device in a proper manner. Do not load any input signal at the output port of this device. Do not load any signal that does not reach the rated value at the input port of this device. The probe or other connection accessories should be effectively grounded to avoid product damage or abnormal function. Please refer to the product manual for the rated value of the input / output port of this device.
Power fuse	Please use a power fuse of exact specification. If the fuse needs to be replaced, it must be replaced with another one that meets the specified specifications by the maintenance personnel authorized by UNI-T.
Disassembly and cleaning	There are no components available for operators inside. Do not remove the protective cover. Qualified personnel must conduct maintenance.
Service environment	This device should be used indoors in a clean and dry environment with ambient temperature from 0 °C to +40 °C. Do not use this device in explosive, dusty, or high humidity conditions.
Do not operate in humid environment	Do not use this device in a humid environment to avoid the risk of internal short circuit or electric shock.
Do not operate in flammable and explosive environment	Do not use this device in a flammable and explosive environment to avoid product damage or personal injury.
Caution	
Abnormality	If this device may be faulty, please contact the authorized maintenance personnel of UNI-T for testing. Any maintenance, adjustment or parts replacement must be done by the relevant personnel of UNI-T.
Cooling	Do not block the ventilation holes at the side and back of this device. Do not allow any external objects to enter this device via ventilation holes. Please ensure adequate ventilation and leave a gap of at least 15 cm on both sides, front and back of this device.
Safe transportation	Please transport this device safely to prevent it from sliding, which may damage the buttons, knobs, or interfaces on the instrument panel.
Proper ventilation	Insufficient ventilation will cause the device temperature to rise, thus causing damage to this device. Please keep proper ventilation during use, and regularly check the vents and fans.
Keep clean and dry	Please take precautions to prevent dust or moisture in the air affecting the performance of this device. Please keep the product surface clean and dry.
Note	
Calibration	The recommended calibration period is one year. Calibration should only be conducted by qualified personnel.

3. Overview

UT3300+ Series Multi-channel Data Loggers is a high-precision, highly stable, multi-channel scanning

data acquisition system featuring a 10.1-inch full-color touchscreen display and supporting up to 64 channels in a single unit. With fully isolated universal inputs, it accommodates a wide range of signal acquisitions, such as thermocouples, platinum resistance thermometers, voltage, and current. It boasts a maximum sampling rate of 1 sample per second and includes 8GB of built-in memory. The system supports both AC (85–265V) and DC (24V) power supply methods. It is equipped with versatile interfaces, including RS232/485, USB DEVICE, LAN, USB HOST, and an SD card slot. Whether for research and development testing or production automation, it offers comprehensive testing and measurement solutions.

3.1 Measurement Applications

UT3300+ Series Multi-Channel Data Loggers are used in power and electrical, biopharmaceutical, electronic testing, new energy, transportation, meteorology, environmental protection, agriculture, and other industrial sectors.

3.2 Performance Specifications

3.2.1 Technical Specifications

UT3300+ Specifications				
UT-M3300US Universal Signal Input Module (8 channels per module)				
No.	Input Type	Measurement Range	Measurement Accuracy	Digital Display Resolution
0	0 to 10 V	-0.5 V to 11.00 V	0.01%FS. ± 0.002 V	0.0001 V
1	0 to 5 V	-0.5 V to 5.50 V	0.01%FS. ± 0.002 V	0.0001 V
2	± 20 mV	-21.0 mV to 21.0 mV	0.005%FS. ± 0.005 mV	0.0001 mV
3	± 100 mV	-110.0 mV to 110.0 mV	0.005%FS. ± 0.005 mV	0.0001 mV
4	0-20 mA	0.00 mA to 21.0 mA	0.01%FS. ± 0.001 mA	0.0001 mA
5	K	-200 °C to +1372 °C	$\pm(0.1\%rdg. + 1.0\text{ °C})$	0.01 °C
6	J	0 °C to +1200 °C	$\pm(0.15\%rdg. + 1.0\text{ °C})$	0.01 °C
		-200 °C to 0 °C	$\pm(0.1\%rdg. + 1.0\text{ °C})$	

7	E	0 °C to +1000 °C	$\pm(0.15\% \text{rdg.} + 0.5 \text{ } ^\circ\text{C})$	0.01 °C
		-200 °C to 0 °C	$\pm(0.1\% \text{rdg.} + 1.0 \text{ } ^\circ\text{C})$	
8	T	-30 °C to +400 °C	$\pm(0.15\% \text{rdg.} + 0.5 \text{ } ^\circ\text{C})$	0.01 °C
		-200 °C to -30 °C	$\pm(0.1\% \text{rdg.} + 1 \text{ } ^\circ\text{C})$	
9	N	0 °C to +1300 °C	$\pm(0.3\% \text{rdg.} + 0.7 \text{ } ^\circ\text{C})$	0.01 °C
		-200 °C to 0 °C	$\pm(0.1\% \text{rdg.} + 1 \text{ } ^\circ\text{C})$	
10	R	+800 °C to +1768 °C	$\pm(0.05\% \text{rdg.} + 1.5 \text{ } ^\circ\text{C})$	0.01 °C
		+400 °C to +800 °C	$\pm(0.2\% \text{rdg.} + 2.0 \text{ } ^\circ\text{C})$	
11	S	+800 °C to +1768 °C	$\pm(0.05\% \text{rdg.} + 1.5 \text{ } ^\circ\text{C})$	0.01 °C
		+400 °C to +800 °C	$\pm(0.2\% \text{rdg.} + 2.0 \text{ } ^\circ\text{C})$	
12	B	+800 °C to +1820 °C	$\pm(0.05\% \text{rdg.} + 1.5 \text{ } ^\circ\text{C})$	0.01 °C
		+400 °C to +800 °C	$\pm(0.2\% \text{rdg.} + 2.0 \text{ } ^\circ\text{C})$	
13	C	+1500 °C to +2315 °C	$\pm(0.05\% \text{rdg.} + 1.5 \text{ } ^\circ\text{C})$	0.01 °C
		0 °C to +1500 °C	$\pm(0.05\% \text{rdg.} + 1.0 \text{ } ^\circ\text{C})$	
14	A	+1500 °C to +2500 °C	$\pm(0.05\% \text{rdg.} + 1.5 \text{ } ^\circ\text{C})$	0.01 °C
		0 °C to +1500 °C	$\pm(0.05\% \text{rdg.} + 1.0 \text{ } ^\circ\text{C})$	
15	Pt100	-200 °C to +660 °C	$\pm(0.05\% \text{rdg.} + 0.3 \text{ } ^\circ\text{C})$	0.01 °C
16	Pt1000	-200 °C to +300 °C	$\pm(0.05\% \text{rdg.} + 0.3 \text{ } ^\circ\text{C})$	0.01 °C
17	Cu50	-50 °C to +150 °C	$\pm(0.05\% \text{rdg.} + 0.3 \text{ } ^\circ\text{C})$	0.01 °C
Mainframe				
Display	10.1-inch TFT			
Touchscreen	Yes			
Alarm Type	Four-level high/low alarms per channel(HH, H, L, LL)			
Number of channels	1 to 64 channels			
Recording Interval	1-9999 s (user-defined)			
Recording Capacity	8 G (64 channels at 1 sample / cycle can record for approximately 360 days)			
Interface	RS232, RS485, LAN, USB DEVICE, USB HOST, SD CARD			

Warm-up Time	Above 60 minutes
Communication	RS232, RS485, LAN, USB DEVICE
Interfaces	Standard SCPI and Modbus (RTU) protocols
Power Supply Voltage and Frequency	AC85-265 V 50 / 60 Hz or DC24 V $\pm$ 10%
Power Consumption	Max.20 VA
Temperature and Humidity Parameters	Temperature: 25 $\pm$ 3 °C, humidity: 55 $\pm$ 10% RH
Operating Temperature	0-40 °C 80%RH
Storage Temperature	-20 to 60 °C
Operating Humidity	10 to 80%RH
Storage Humidity	10 to 80%RH
Operating Altitude	$\leq$ 2000 m
Enclosure Material	Flame-retardant ABS
Dimensions	378*220*153
Standard Accessories	K-type thermocouples, 8 pcs (2m each) per universal signal input module, temperature range:0-200°C RS-232 communication cable 8 GB USB flash drive USB communication cable
Optional modules (8 channels per module)	

DC Voltage Acquisition Module UT-M3300DCV	Measurement range: 0–120 V; Accuracy: 0.5%
DC Current Acquisition Module UT-M3300DCI	Measurement range: 0–10 A; Accuracy: 0.5%
Temperature and Humidity Acquisition Module UT-M3300TH	Accuracy of the dedicated temperature and humidity sensor: $\pm 0.5\text{ }^{\circ}\text{C}$ for temperature, $\pm 3\text{ \%RH}$ for humidity. Temperature Range: $-20\text{ }^{\circ}\text{C}$ – $80\text{ }^{\circ}\text{C}$ Humidity Range: 0%RH–100%RH (For use only with the UT-L3300TH digital temperature and humidity sensor)
Digital Input Module UT-M3300SW	8-channel digital input signals, 5–24 V
NTC Temperature Sensor Acquisition Module UT-M3300NTC	Supports NTC sensors such as 3380, 3600, 3950, 3435, etc. Temperature Range: $-40\text{ }^{\circ}\text{C}$ – $125\text{ }^{\circ}\text{C}$
Relay Alarm Output Module UT-M3300RLY	8 channels of relay contact output (Form C, NO/NC), max. 250 V AC, 2 A

Temperature Range for Specified Accuracy: $25 \pm 5\text{ }^{\circ}\text{C}$

Recommended Calibration Interval: 1 year

3.2.2 Alarm Output

Relay Output: Contact rating: 220 V AC / 5 A, resistive load. Settings can be configured on the parameter settings page.

3.2.3 External Power Supply

24 V DC Power Supply: Provides power to the transmitter; maximum load capacity $\leq 500\text{ mA}$.

3.2.4 Communication Interfaces

Standard: RS-232, RS-485, LAN (Ethernet), and USB

Baud rate options: 4800, 9600, 19200, 38400, 57600, or 115200 bps

LAN speed: up to 100 Mbps

Protocols: Modbus and SCPI commands

3.2.5 Power Requirements

AC input: 85 V to 265 V AC, < 20 VA

DC input: 24 V DC $\pm 10\%$, < 20 VA

Note: Actual power consumption depends on the number of installed acquisition modules.

3.2.6 Recording Time

Recording time depends on the user-defined logging interval and can be calculated as follows:

$$\text{Hours} = \frac{1024 \times 1024 \times 1024 \times 8 \times \text{Logging Interval}(s)}{278 \times 3600}$$

4. Product Structure

4.1 Front Panel

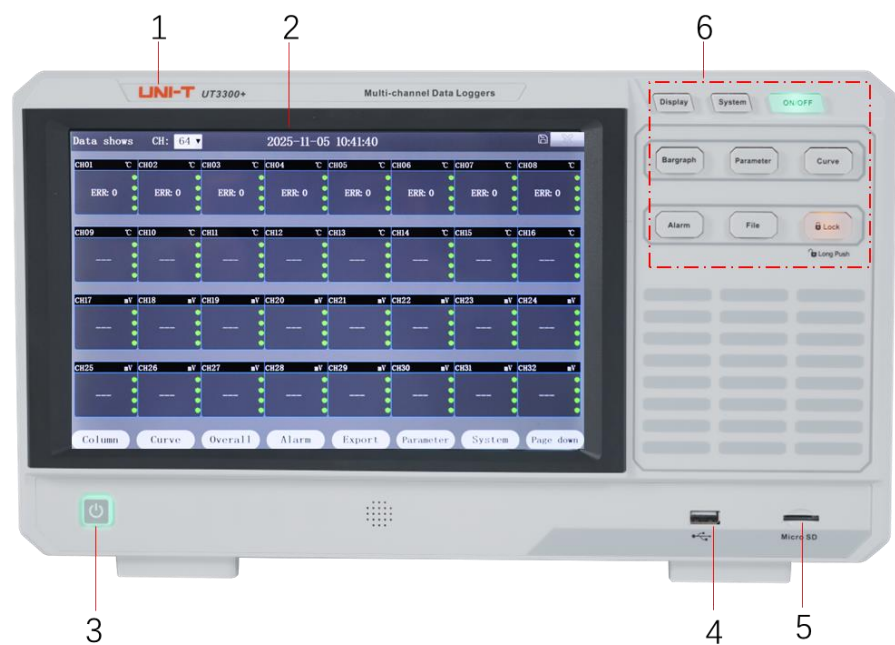


Figure 4-1 Front Panel

No.	Function		Description
1	Nameplate		Logo and model information
2	LCD Touchscreen Display		Display and perform related functions
3	Soft Power Switch		Green indicates that the instrument is powered on; red indicates that the instrument is in standby mode.
4	USB Port		Storage media interfaces for data export
5	Micro SD Card Slot		
6	Button	Display	Switch to the data display screen
		System	Switch to the system settings screen
		ON/OFF	Turn data collection ON or OFF
		Bargraph	Switch to the bar chart view
		Parameter	Switch to the settings screen
		Curve	Switch to the curve display screen
		Alarm	Switch to the alarm information screen
		File	Switch to the data export screen
		Lock	Enable/disable the lock function

4.2 Rear Panel

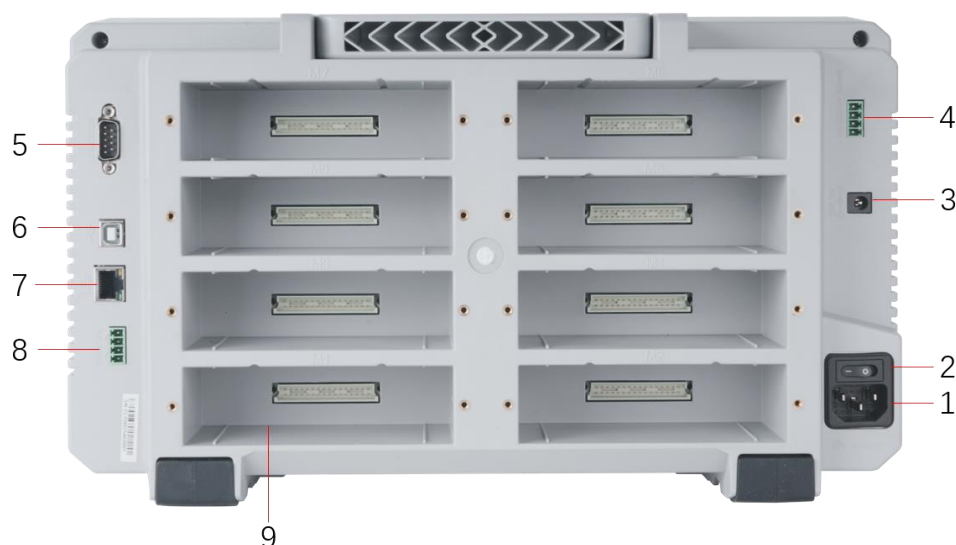


Figure 4-2Rear Panel

No.	Function	Description
1	AC Power Input	For connecting to an AC power source
2	Power Switch (Hard)	Turn the AC power on/off
3	DC Power Connector	24 V DC power supply interface
4	External Expansion Port	A/B: RS-485 signal lines (connect to the RS-485 bus) 24 V: Positive power terminal (+) COM: Negative power terminal (-) / Common ground
5	RS232/485 Interface	Serial communication
6	LAN Port	TCP communication interface
7	Type-B Port	Serial communication interface
8	Relay Contact Terminal	When a channel reading exceeds the High-High (HH) or Low-Low (LL) threshold, the corresponding relay is energized. This function can be configured on the System Settings page
9	Measurement Module Slots	Install the acquisition modules sequentially, starting with slot M1 (channels 1-8) in the lower-left corner, then slot M2 (channels 9-16) on the right. Continue row by row from left to right and from bottom to top. The top row contains slot M7 on the left and slot M8 (channels 57-64) on the right.

4.3 Display Area

The content displayed on the UT3300+ screen is divided into the following display areas, as shown in Figure 4-3.

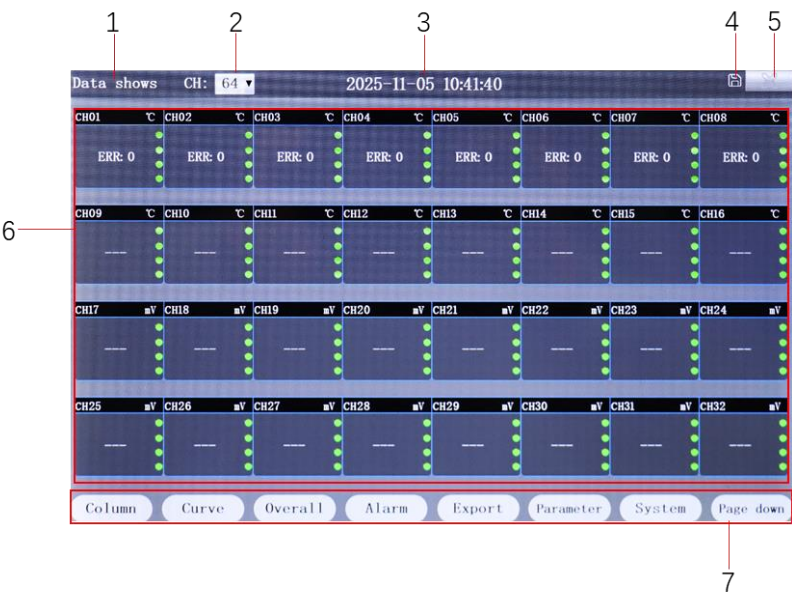


Figure 4-3 Display Area

No.	Function		Description
1	Page Prompt		Show the current page
2	Number of Channels Setting		Set the number of channels to display
3	Time Display		Display Time
4	Status Bar		Ethernet connection detected
			SD card detected
			A USB flash drive has been detected.
			Key lock
			Screen-off feature enabled
			Alarm sound on
			Data Logging feature enabled
5	X Button		Go back to the previous page
6	Data Display Area		Display relevant measurement data
7	Function Switch Button		Switch to a different feature page

5. Inspection and Installation

5.1 Packing List

Before Using the Instrument:

1. Inspect the product for any physical damage, scratches, or defects.
2. Check that all accessories are included as per the packing list.

If the product is damaged or any accessories are missing, contact the UNI-T Sales Department or your distributor for assistance.

5.2 Power Requirements

UT3300+ series operates on a single-phase AC power supply of 100–120 V AC or 200–240 V AC, 47–63 Hz, or a DC supply of 12–25 V DC. The instrument automatically detects the input voltage, no manual voltage selector switch is required.

- The power cord supplied with the unit is a three-wire power cord. Before use, please ensure that the ground wire of the outlet is properly grounded.



Warning: Do not use the power cord if it shows any signs of damage. Damaged cords may cause electric shock, fire, or injury.

5.3 Operating Environment

The environmental requirements for the UT3300+ Series Multi-Channel Data Loggers are shown in the table below:

Operating Environment	Environmental Requirements
Operating Humidity	20% to 80% (non-condensing)
Operating Temperature	0 °C to 40 °C
Storage Temperature	-20 °C to 60 °C
Operating Altitude	≤2000 meters
Pollution Degree	2

5.4 Cleaning

- To prevent the risk of electric shock, disconnect the power cord before cleaning.
- Clean the exterior and front panel with a clean, lint-free cloth lightly dampened with water. Ensure the instrument is completely dry before use, and do not allow water to enter the instrument.
- Do not clean the internal components.



Caution: Do not use solvents such as alcohol, gasoline, or other organic chemicals to clean the instrument. Doing so may damage the enclosure or internal components.

5.5 Routine Inspections

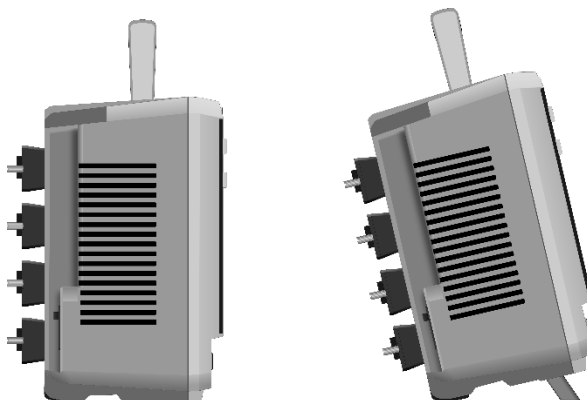
To prevent accidents, verify the following before use:

1. The input power meets the specifications, and the instrument is properly configured for the connected power source.
2. The instrument is securely connected to protective earth (ground).
3. All test leads are in good condition, with no breaks, cracks, or signs of damage.

6. Operating Instructions

6.1 Power-On

Connect the power cord and plug it into a grounded outlet; use the tilt adjustment bracket as needed to adjust the viewing angle.



Press the hard power switch  on the rear panel, to put the instrument into standby mode, the soft switch on the front panel will turn orange.

Press the soft switch  on the front panel, the square LED (green) will light up, and the instrument will power on.

To ensure optimal performance, allow the data logger to warm up for 60 minutes after power-on.

The instrument's default password is blank. On the user login screen, simply click OK to log in.

Note:

Before switching on the power, verify that the input voltage matches the specified supply voltage. Applying the wrong voltage may cause severe damage to the instrument.

Always connect the power cord to a mains outlet with protective earth (ground). Do not use a power strip or extension cord without protective earth.

6.2 Wiring Instructions

The wiring terminals for the module's input signals are shown in Figure 6-1.

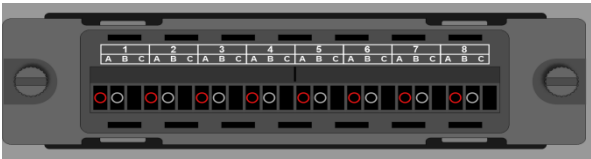


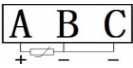
Figure 6-1 Module Input Terminal

6.2.1 Wiring the Universal Signal Input Module

Wiring configurations for the Universal Signal Input Module by signal type are shown in Table 6-1.

Table 6-1 Wiring Configurations for the Universal Signal Input Module

No.	Input Type	Wiring Methods
1	Thermocouple	Connect A to the positive terminal and B to the negative terminal.
3	Voltage signal (input voltage of 1 V or higher)	Connect B to the positive terminal and A to the negative terminal.
4	Voltage Signal (mV Signal)	Connect A to the positive terminal and B to the negative terminal.
5	Current Signal	Connect A to the positive terminal and B to the negative terminal.

6	Resistance Temperature	Connect A to the positive terminal, B to the negative terminal, and C to the reference terminal
	Detector Signal	



Channel Isolation Voltage: ≤ 600 V DC or 600 V AC peak

Note: Thermocouple Temperature Measurement on Live (Energized) Objects

When measuring temperature rise on live conductors — such as AC 220 V line wires, energized conductive materials, or copper-based connector surfaces — all thermocouples on a single module must be connected to conductors of the same electrical potential. This is required to prevent inter-channel voltage from exceeding the module's isolation rating and damaging the module.

Follow these guidelines:

1. Single-phase measurements (AC 220 V):
- Attach thermocouples from one module only to the Line (L) conductor. Remove any unused thermocouples from that module.
 - Use a separate module for thermocouples attached to the Neutral (N) conductor, following the same procedure.
2. Three-phase measurements (AC 380 V) on connectors, busbars, or other energized surfaces:
- Use one module exclusively for thermocouples attached to Phase A. Remove any unused thermocouples from that module.
 - Use a second module exclusively for thermocouples attached to Phase B.
 - Use a third module exclusively for thermocouples attached to Phase C.

Do not connect thermocouples from different phases or with different common-mode potentials to the same module. Excessive voltage between channels may result and could permanently damage the module.

6.2.2 Wiring the Relay Alarm Output Module

The internal operation of the relay alarm output module is shown in Figure 6-2.



Figure 6-2 Schematic Diagram of the Relay Alarm Output Module

In the relay alarm output module, A indicates a normally open port, B indicates a common port, and C indicates a normally closed port.

6.2.3 Wiring the DC Current Acquisition Module

The wiring for the DC current acquisition module is shown in Figure 6-3.

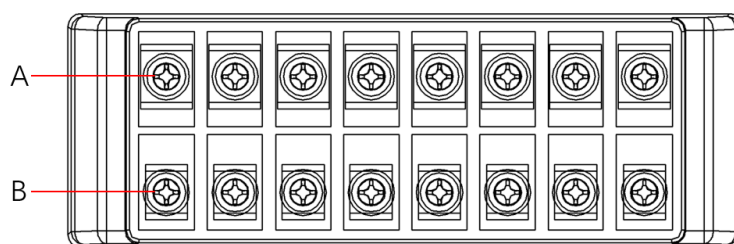


Figure 6-3 Wiring Diagram for the DC Current Acquisition Module

For the DC current acquisition module, connect the current input to terminal A and the current output to terminal B.

6.2.4 Wiring Instructions for the Remaining Modules

Table 6-2 Wiring Configurations for Remaining Modules

No.	Module Type	Wiring Methods
1	DC Voltage Acquisition Module	Connect B to the positive terminal and A to the negative terminal.
2	Digital Input Module	Connect to terminals A and B; no direction or Polarity is specified.
3	NTC Temperature Sensor Acquisition Module	Connect B to the positive terminal and C to the negative terminal.
4	Temperature and Humidity Acquisition Module	Connect A to the sensor's positive terminal, B to the sensor's digital I/O, and C to the sensor's negative terminal.

6.3 Data Display

After power-on, the instrument automatically enters the data shows page, as shown in Figure 6-4. When the ON/OFF button is green, data acquisition is active, and each channel's reading updates in real time.



Figure 6-4 Data Shows Page

6.3.1 Channel Display

The upper-left corner of each channel shows the channel name, and the upper-right corner shows the unit. Both can be configured on the Parameter Settings page or the Single-Channel Display page . Refer to the corresponding sections for details.

The indicators on the right side of each channel show whether the measured value has exceeded the configured alarm thresholds. An indicator turns red when the value rises above the high limit or falls below the low limit; otherwise, it remains green. The four indicators, from top to bottom, represent the High-High (HH), High (H), Low(L), and Low-Low (LL) thresholds. Threshold values can be configured on the Parameter Settings page.

The channel reading is displayed in the center. The number of decimal places can be configured on the Parameter Settings page. The meanings of special data displays are listed in Table 6-3.

Table 6-3 Special Data Display

No.	Display Data	Description
1	0/1	This channel carries data from the digital I/O module; 0 indicates the switch is open, and 1 indicates the switch is closed.

2	ON/OFF	This channel provides data for the relay module; "OFF" indicates that the relay is in the normally closed position, and "ON" indicates that the relay is energized.
3	---	No module is connected to this channel, or this channel on the module is not wired.
4	9E99/-9E99	The channel has exceeded the upper/lower measurement limits; for example, a 1 V signal was applied to a ± 100 mV channel.
5	ERR:0	Data was not being collected; press the ON/OFF button to start data collection, and the display returned to normal.
6	ERR:1	Channel data anomalies, such as failed data checks. If this continues to occur, please replace the module or contact the manufacturer.
7	ERR:2	The module is malfunctioning. Please replace the module or contact the manufacturer.

6.3.2 Channel Selection

Click the drop-down menu next to the number of channels to change the number of channels displayed on the data screen. When 64 channels are selected, you can use the "Previous Page" and "Next Page" buttons to view data for the first 32 channels and the next 32 channels, respectively.

Notes:

1. The default number of channels is 64.
2. Channels are always numbered starting from Channel 1. For example, if the number of channels is set to 16, the display shows data from Channels 1 to 16. For channel numbering, see the Rear Panel section.
3. Once the channel selection dialog is open, you must make a selection before any other functions can be used.

6.4 Single-Channel Display

Tap a channel's reading to open its single-channel view, where you can review detailed data and the trend for that channel (see Figure 6-5). The upper-left corner shows the channel's current reading and whether it has exceeded any configured limits.

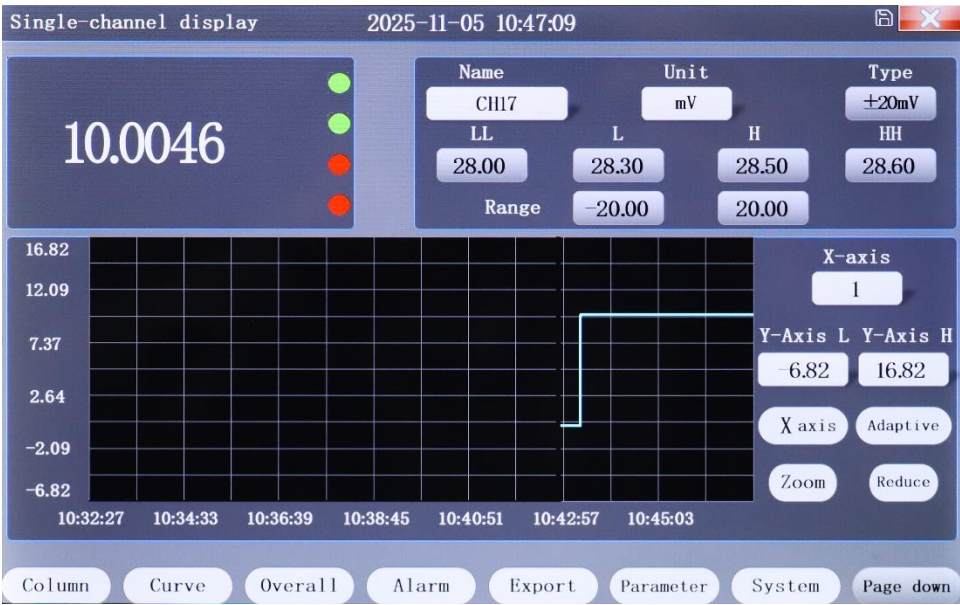


Figure 6-5 Single-Channel Display Page

6.4.2 Channel Settings

On the Single-Channel Display page, you can configure the channel name and unit. To prevent unintended changes, the channel type, Low-Low (LL), Low (L), High (H), High-High (HH) thresholds, and range are view-only. To modify these settings, refer to the Parameter Settings page description.

■ Setting the channel name:

- Step 1
- Click the white box below the channel name to bring up the on-screen keyboard.
- Step 2
- Enter the desired channel name and press Enter to confirm.

The following describes the keyboard function keys:

Function Keys	Function
Esc	Cancel the channel name edit. Tap this key to discard your input and close the keyboard.
Caps Lock / Shift	Toggles the keyboard between uppercase and lowercase modes. A blue background indicates uppercase mode; otherwise, lowercase mode is active.
Backspace	Backspace key – deletes the character before the cursor.
Enter	Enter key – saves the input value and closes the keyboard.

Delete	Delete key — deletes the character after the cursor
Left / Right arrow keys	Cursor movement keys that move the cursor one character to the left or right.

■ **Setting the unit:**

- Step 1

Tap the white box under unit.
- Step 2

A selection dialog appears. If the desired unit is listed, tap it to complete the setting.
Otherwise, tap the Custom button.
- Step 3

The Custom option opens an input window. Tap the white box to open the on-screen keyboard, enter the desired unit, and tap Enter to complete the setting.

Notes	1. The channel name must not exceed 10 characters.
	2. Custom units must not exceed 5 characters.

6.4.3 Curve Settings

The lower half of the Single-Channel Display page shows a trend curve. The Y-axis represents the measured value, and the X-axis represents time. The curve shows the change in the measured value over time. It is generated as follows:

Each X-axis interval is treated as a data segment. Within each segment, the data point with the greatest deviation from the previous point is selected as a curve point. These curve points are then connected to form the trend curve.

You can adjust the on-screen display range using the Zoom In / Zoom Out function keys on the right side of the screen, or by directly entering the upper and lower limits.

The function keys are described in Table 6-4.

No.	Button	Function
1	X-axis	Directly enter the X-axis data interval. For example, entering 4 means that within each 4-second interval, the data value that best represents the trend is selected as a curve point and displayed on the screen.
2	Y-axis Lower / Upper Limit	Set the upper and lower limits of the trend curve. The curve will scale to fit the new axis range.
3	X / Y-axis	Switch between the X-axis and Y-axis for zoom operations. When X-axis is shown on the screen, tapping Zoom In or Zoom Out adjusts the X-axis scale. When the Y-

		axis is displayed, the same operations adjust the Y-axis scale.
4	Auto-fit	The system automatically detects the minimum and maximum Y-values in the current trend curve, then calculates and applies the Y-axis upper and lower limits so that the curve is evenly distributed within the display area.
5	Zoom In	For the X-axis: reduces the displayed time span. For the Y-axis: expands the displayed temperature range shown by the curve.
6	Zoom Out	For the X-axis: extends the displayed time span. For the Y-axis: compresses the displayed temperature range shown by the curve.

Table 6-4 Function Button Descriptions

- Note:

1.

The X-axis zoom range is 1 to 128, integer values only.

2.

When entering Y-axis limits, the upper limit must be greater than the lower limit; otherwise, it will automatically snap to the other limit.

3.

Powering off clears the curve buffer. Curve drawing restarts when the instrument is powered on again.

4.

The curve can record up to 65,536 seconds of data. Once exceeded, the oldest data points are automatically overwritten.

6.5 Column Chart

Tap the Column Chart Display button to open the Column Chart Display page, as shown in Figure 6-6. Data is displayed proportionally as column, with 100% at the top and 0% at the bottom. The 8 channels of each module are grouped together and displayed simultaneously on the screen.

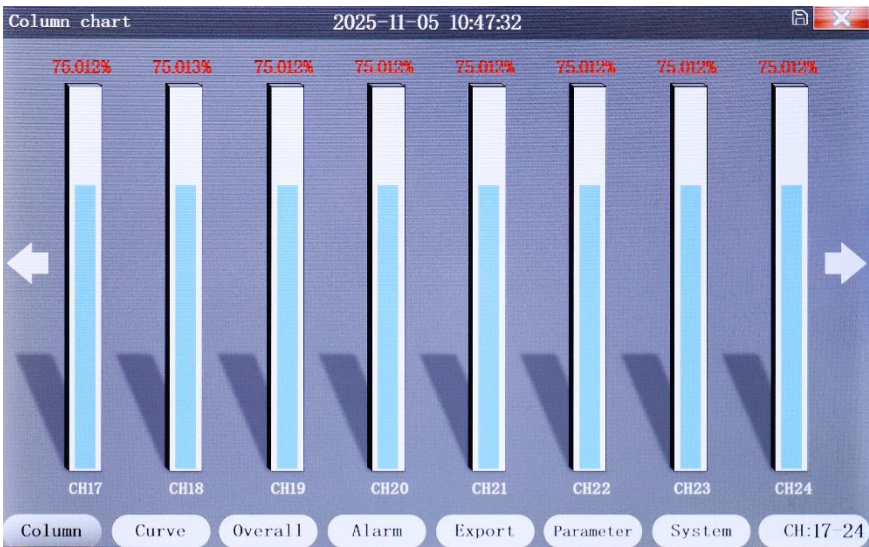


Figure 6-6 Column Chart Display Page

The percentage displayed on the column chart is calculated as follows:

$$\text{Top Percentage} = \frac{\text{Measured Value} - \text{Range Lower Limit}}{\text{Range Upper Limit} - \text{Range Lower Limit}} \times 100\%$$

When a channel reading exceeds any configured threshold, the top of the column turns red. When the reading returns to the normal range, the top turns white.

The following are instructions for switching channels:

■ **Configuring display channels:**

Step 1 Tap the channel button in the lower-right corner — the selection dialog opens automatically.

Step 2 Tap the desired channel number to switch the display.

You can also switch channels using the left and right arrows: tap the left arrow to display the previous 8 channels; tap the right arrow to display the next 8 channels.

6.6 Curves Display

6.6.2 Real-time Curves Display

Tap the Curves Display button to enter the Real-time Curves Display page, as shown in Figure 6-7. This page shows the trend of 8 channels' data from the same module, with the real-time acquired data displayed on the right, along with the color assigned to each channel in the curves chart. The X-axis represents time, and the Y-axis represents the acquired data.

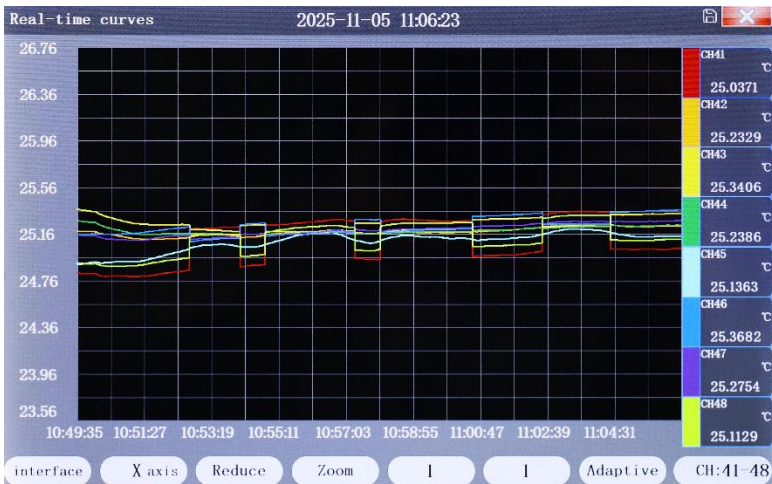


Figure 6-7 Real-time Curve Display

Tap the Curves Operation button to perform related actions on the curves, such as zoom in, zoom out, modifying the axis, and switching channels. For detailed operation methods, refer to the curves operation section under the Single Channel Display page.

6.6.3 Historical Curves Display

First, tap the Curves Display button, then tap the Historical Curves Display button to enter the Historical Curves Display page, as shown in Figure 6-8. This page determines the time interval based on the time range you set, extracts the data at the corresponding time points, and then connects the data points pairwise to form the curve. The X-axis represents time, and the Y-axis represents the stored data. You can slide the red scale line to obtain accurate historical data. The exact time of the data is displayed at the bottom of the screen, and the specific channel data is displayed on the right.

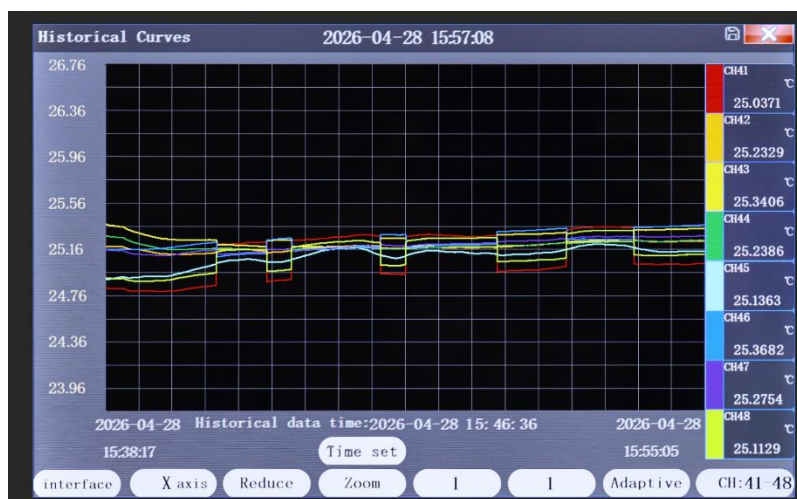


Figure 6-8 Historical Curves Display Page

Tap the Curves Operation button to perform related actions on the curves, such as zoom in, zoom out, and switching channels. For detailed operation methods, refer to the curves operation section under the Single Channel Display page.

The following describes how to set the time range:

■ Setting the time range

- Step 1** Tap the Time Range button to open the time range settings dialog.
- Step 2** Enter the desired start time and end time, then tap Confirm. The system automatically retrieves the data within the specified time range and plots the trend curve.

1. Only the Y-axis can be zoomed using the shortcut keys on the historical trend view. To zoom the X-axis, adjust the start time and end time accordingly.
2. Since the minimum X-axis coordinate is 1, the minimum interval between the start time and end time is 1,010 seconds.
3. The start time must be earlier than the end time, and the end time cannot be later than the current recording moment.

Notes:

4. If no data is stored in the instrument at the specified start time or end time, that portion of the curve will not be displayed.
5. If intermediate data within the specified time range is missing, the instrument connects the endpoints of the missing segment with a straight line.
6. After tapping Confirm on the time settings dialog, a brief delay is normal – the instrument automatically searches for matching data in the stored records.

6.7 Overall Display

Tap the Comprehensive Display button to open the Comprehensive Display page, as shown in Figure 6-9. This page combines the content of the Data Display, Column Chart Display, and Trend Curve pages: the upper-left corner shows the real-time reading and alarm status, the upper-right corner shows the column chart, and the lower-center area shows the trend curve. Tap the curve operation buttons to control the curve – for example, to zoom in, zoom out, or switch channels. For detailed operation instructions, see the trend curve section of the Single-Channel Display page.



Figure 6-9 Overall Page

6.8 Alarm Information

Tap the Alarm Information button to open the Alarm Information Display page, as shown in Figure 6-10. This page displays the start time and end time of each alarm event when a channel goes out of the configured range. The scrolling red text at the bottom of the page shows real-time alarm information for channels currently in an alarm state.

To browse recorded alarm information, tap the up or down arrow on the scroll bar on the right side of the page to scroll one entry at a time, or drag the scroll bar to browse quickly.



The screenshot shows the 'Alarm information display' page with a title bar indicating the date and time '2025-11-05 11:09:52'. The main content is a table with four columns: 'No', 'Start time', 'End time', and 'Alarm information'. The table lists 13 alarm events, all occurring on 2025-11-05 at 10:43:18. The alarm information for these events includes channels CH24, CH23, CH22, CH21, CH20, CH19, CH18, CH17, and CH45, all reporting a 'below the lowermost' condition. Below the table, there is a scrolling red text bar that displays real-time alarm information for channels currently in an alarm state, showing 'ermost CH45 below the lowermost CH46 below the lowermost CH47 below the lowermost CH'. At the bottom of the page, there is a navigation bar with buttons for 'Column', 'Curve', 'Overall', 'Alarm', 'Export', 'Parameter', 'System', and 'Range'.

No	Start time	End time	Alarm information
1	2025-11-05 10:43:18		CH24 below the lowermost
2	2025-11-05 10:43:18		CH23 below the lowermost
3	2025-11-05 10:43:18		CH22 below the lowermost
4	2025-11-05 10:43:18		CH21 below the lowermost
5	2025-11-05 10:43:18		CH20 below the lowermost
6	2025-11-05 10:43:18		CH19 below the lowermost
7	2025-11-05 10:43:18		CH18 below the lowermost
8	2025-11-05 10:43:18		CH17 below the lowermost
9	2025-11-05 10:43:18		CH24 below the lowermost
10	2025-11-05 10:43:18		CH23 below the lowermost
11	2025-11-05 10:43:18		CH22 below the lowermost
12	2025-11-05 10:43:18		CH21 below the lowermost
13	2025-11-05 10:43:18		CH20 below the lowermost

Figure 6-10 Alarm Information Display Page

The following shows how to set the display range:

■ Setting the Display Range

- Step 1

Tap the Display Range button in the lower-right corner. The time range settings dialog opens automatically.
- Step 2

Enter the desired start time and end time, then tap Confirm. The system automatically populates the table with the alarm information within the specified time range.

Notes:

1. If the end time is set beyond the current moment, the instrument continuously refreshes the alarm information within the specified time range.

2. The time range is determined by the start time; the end time represents only the moment when that alarm was cleared.

3. If the instrument is powered off while a channel is still in an alarm state, the end time is not recorded and the corresponding field is left blank. If the channel is still out of range at

the next power-on, a new alarm entry is generated.

4. The start time must be earlier than the end time, and the minimum interval between the start time and end time is 1 second.

5. At power-on, the default time range is set to the start times of the first and last alarm entries stored in the system.

6. The instrument can store up to 1,000,000 alarm entries. When the stored count exceeds 960,000, a dialog prompts you to clear the alarm information. Export the alarm data on the Data Export page before clearing the records. When the count exceeds 1,000,000, the instrument automatically exports the alarm information to an internal folder and starts a new alarm log.

6.9 Data Export

Tap the Data Export button to open the password entry dialog. The initial password is empty – for first-time use, tap Confirm without entering a password to open the Data Export page (see Figure 6-11). To set a password, refer to the password modification section of the System Settings chapter.

To export data stored in the instrument, first specify the start time and end time. The instrument searches for data within the specified time range and exports it to the selected disk.

Caution: The Clear Records button is independent of the specified time range. Tapping Clear opens a confirmation dialog – if confirmed, all corresponding data stored in the instrument is deleted. Tapping the Clear button in the data section deletes all channel data stored in the instrument. Export any important data before clearing.

The Estimated Storage Time shown at the top of the page indicates the maximum duration for which the instrument can continuously acquire and store data, calculated based on the remaining free space on the disk.

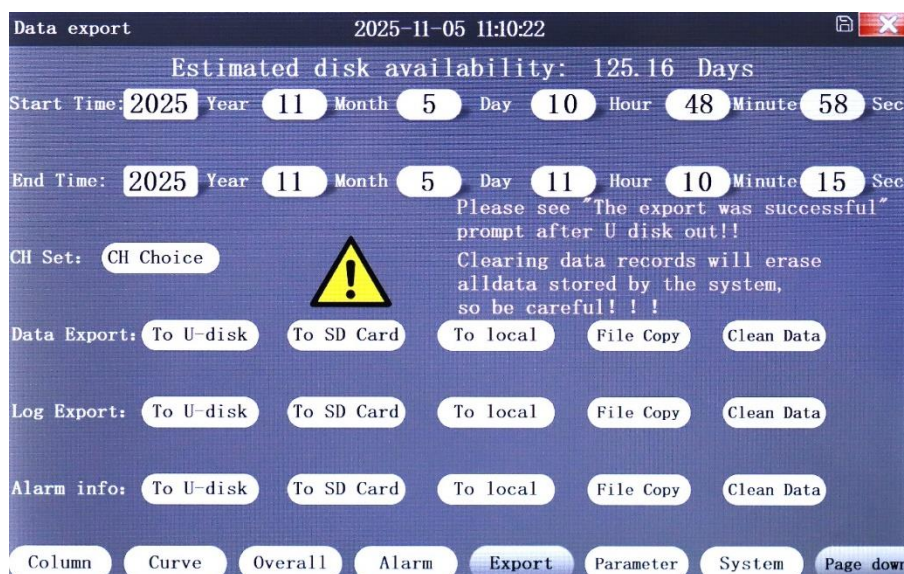


Figure 6-11 Data Export Page

The following is a brief overview of the data export procedure. For more detailed information, refer to the description for each destination path.

■ Data Export Procedure:

- Step 1 Tap the white box for the start time or end time as needed. A numeric keypad appears.
- Step 2 Enter the desired time, then tap Enter to confirm.
- Step 3 Tap the desired export path. When the "Export completed" dialog appears, tap Confirm to finish.

The data export function saves acquired raw data, alarm information, and user operation logs as .csv files to a USB drive, SD card, or the internal storage. CSV files stored on the internal storage can also be copied to a USB drive or SD card.

6.9.2 Data Operations

Before exporting channel data, verify which channels you want to include in the export. Tap the Channel Settings button to open the Channel Settings page, as shown in Figure 6-12.

Tap the checkbox next to a channel to select it (a check mark appears); tap the checkbox again to deselect. Data from unselected channels will not be included in the exported file. Other function buttons are described in the following table.

Table 6-5 Channel Selection Functions

No.	Button	Function
1	Confirm	Confirm the selected channels. Tapping this button returns to the Data Export page.
2	Select All	Shortcut to select all channels. Tapping this button selects all 64 channels.
3	Cancel All	Cancel all currently selected channels. Tapping this button clears the selection for all 64 channels.
4	Cancel	Discard the current selection, revert to the previous state, and return to the Data Export page.

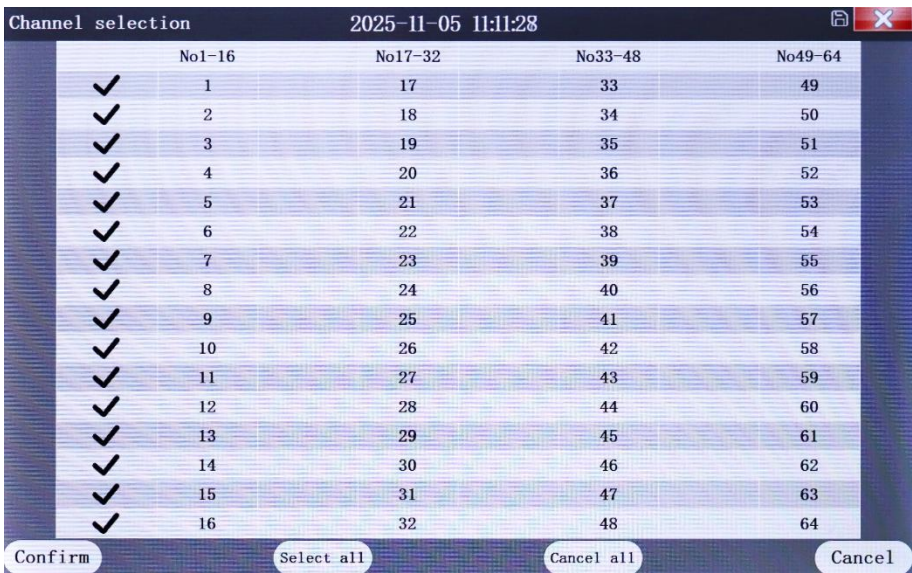


Figure 6-12 Channel Selection Page

Tap Export to USB Drive / SD Card. The instrument writes the data as CSV files to the "DATA" folder within the product model folder on the USB drive or SD card.

A2	2025/2/13 13:28:27								
	A	B	C	D	E	F	G	H	I
time	CH01	CH02	CH03	CH04	CH05	CH06	CH07	CH08	
2025/2/13 13:28	16.6151	16.3963	16.3924	16.9308	16.7081	16.7597	16.7774	16.7921	
2025/2/13 13:28	16.6299	16.4088	16.405	16.9069	16.709	16.76	16.7778	16.7931	
2025/2/13 13:28	16.6408	16.4188	16.417	16.892	16.7057	16.7606	16.778	16.7991	
2025/2/13 13:28	16.647	16.4233	16.4224	16.8851	16.7044	16.7606	16.7782	16.802	
2025/2/13 13:28	16.6517	16.4257	16.4248	16.8813	16.7038	16.7659	16.7834	16.8086	
2025/2/13 13:28	16.6514	16.4228	16.4222	16.8797	16.7036	16.7654	16.7831	16.809	
2025/2/13 13:28	16.6517	16.4209	16.4202	16.8796	16.7033	16.765	16.7827	16.8093	
2025/2/13 13:28	16.654	16.4161	16.4153	16.8889	16.7129	16.7649	16.7829	16.8101	
2025/2/13 13:28	16.6611	16.4179	16.4171	16.891	16.7147	16.7674	16.789	16.8137	
2025/2/13 13:28	16.6669	16.4183	16.4185	16.8902	16.7164	16.7671	16.7913	16.8142	
2025/2/13 13:28	16.6716	16.419	16.4196	16.8894	16.7176	16.7681	16.7932	16.8148	
2025/2/13 13:28	16.6758	16.4195	16.4204	16.891	16.7207	16.7688	16.7948	16.8153	
2025/2/13 13:28	16.6793	16.42	16.4212	16.8905	16.7213	16.7693	16.7962	16.8158	

Figure 6-13 Channel Data

Tap Export to Internal Storage to save the data as a CSV file to the internal storage. Tap Copy Data to open the file selection page, where you can view and manage the file.

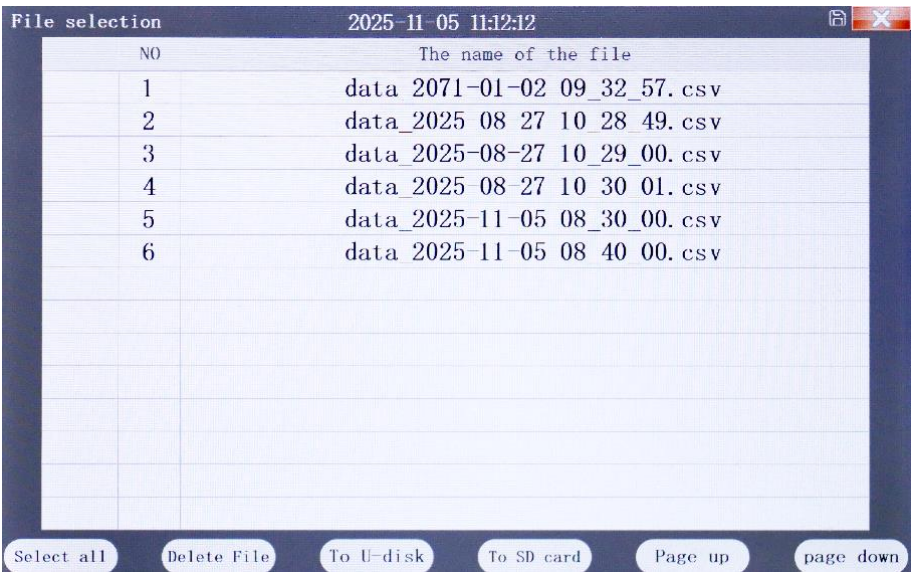


Figure 6-14 File Selection Page

Tap the checkbox before the No. column to select or deselect a file. The function buttons at the bottom of the page only apply to the selected files.

The buttons are described in the following table:

No.	Button	Function
1	Select All	Select or deselect all files on the current page.
2	Delete File	Delete the selected files.
3	To U-Disk / SD Card	Copy the selected files to a USB drive or SD card.
4	Page up / down	Navigate to the previous or next page of files.
5	X	Return to the Data Export page.

Table 6-5 File Selection Function

6.9.3 Log Operations

The log records user activity, such as changes to channel parameters. When exported, the log data is saved as a CSV file to the "LOG" folder within the product model folder. Channel selection is not required for log operations. For the other function buttons, refer to the Data Operations section.

6.9.4 Alarm Information Operations

The alarm information records channel out-of-range events. When exported, the alarm data is saved as a CSV file to the "ALARM" folder within the product model folder. Channel selection is not required for alarm information operations. For the other function buttons, refer to the Data Operations section.

time	Window_Name	Operation_Info
2025/12/31 16:14	The system configuration	turn on data collection
2026/1/4 12:58	Data export	Exporting to USB flash drive success
2026/1/4 12:58	The system configuration	The language was changed to English
2026/1/4 12:58	Data export	Exporting to USB flash drive success
2026/1/4 12:59	Data export	Exporting to USB flash drive success
2026/1/4 13:39	The system configuration	shut down data collection
2026/1/4 15:02	The system configuration	The time are modified to:2026-01-04 15:02:32
2026/1/4 15:09	The system configuration	The language was changed to Chinese
2026/1/4 15:10	Parameter configuration	The minimum limit of channel 1 is changed to :15.00
2026/1/4 15:10	Parameter configuration	The lower limit of channel 1 is changed to :17.00
2026/1/4 15:10	Parameter configuration	The upper limit of channel 1 is changed to:18.00
2026/1/4 15:10	Parameter configuration	The maximum limit of channel 1 is changed to:19.00
2026/1/4 15:10	Parameter configuration	The minimum limit of channel 2 is changed to :15.00
2026/1/4 15:10	Parameter configuration	The lower limit of channel 2 is changed to :17.00
2026/1/4 15:10	Parameter configuration	The upper limit of channel 2 is changed to:18.00
2026/1/4 15:10	Parameter configuration	The maximum limit of channel 2 is changed to:19.00
2026/1/4 15:10	Parameter configuration	The minimum limit of channel 3 is changed to :15.00
2026/1/4 15:10	Parameter configuration	The lower limit of channel 3 is changed to :17.00
2026/1/4 15:10	Parameter configuration	The upper limit of channel 3 is changed to:18.00
2026/1/4 15:10	Parameter configuration	The maximum limit of channel 3 is changed to:19.00
2026/1/4 15:10	Parameter configuration	The minimum limit of channel 4 is changed to :15.00

Figure 6-15. Log Data

start time	end time	alarm information
2025/12/31 16:14		CH24 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH17 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH18 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH19 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH20 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH21 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH22 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH23 below the lowermost
2026/1/4 12:57	2026/1/4 13:39	CH24 below the lowermost
2026/1/4 15:11		CH17 higher than the uppermost limit
2026/1/4 15:11		CH18 higher than the uppermost limit
2026/1/4 15:11		CH19 higher than the uppermost limit
2026/1/4 15:11		CH20 higher than the uppermost limit
2026/1/4 15:11		CH21 higher than the uppermost limit
2026/1/4 15:11		CH22 higher than the uppermost limit
2026/1/4 15:11		CH23 higher than the uppermost limit
2026/1/4 15:11		CH24 higher than the uppermost limit

Figure 6-16. Alarm Data

Notes:

1. Back up any important information before clearing records.

-
2. Internal storage is limited – a maximum of 42 files can be stored locally. Delete unused files regularly.
 3. Do not remove the USB drive or SD card until the "Export Successful" dialog appears. Removing it prematurely may corrupt the files.
 4. **Important:** When storage space is insufficient, new data cannot be recorded. Delete unused data promptly.
 5. Recommended external storage: branded USB drives or SD cards formatted as FAT32, with a maximum capacity of 128 GB.
 6. It is normal for one or two exported data entries to have timestamps earlier than the specified start time. When no data exists exactly at the start time, the instrument includes the closest earlier timestamp to indicate that data existed before the start time.
-

6.10 Parameter Configuration Page

Tap the Parameter Settings button. In the password entry dialog that appears, tap Confirm without entering a password (the initial password is empty) to open the Parameter Settings page, as shown in Figure 6-17. To set a password, refer to the password modification section of the System Settings chapter.

If multiple channels share the same parameter values, use the Copy and Paste buttons on the right to configure them quickly, rather than setting each channel individually.

Note: Copy and Paste apply only to the current page. For example, values copied on the Basic Parameter Settings page cannot be pasted on the Value Adjustment page.

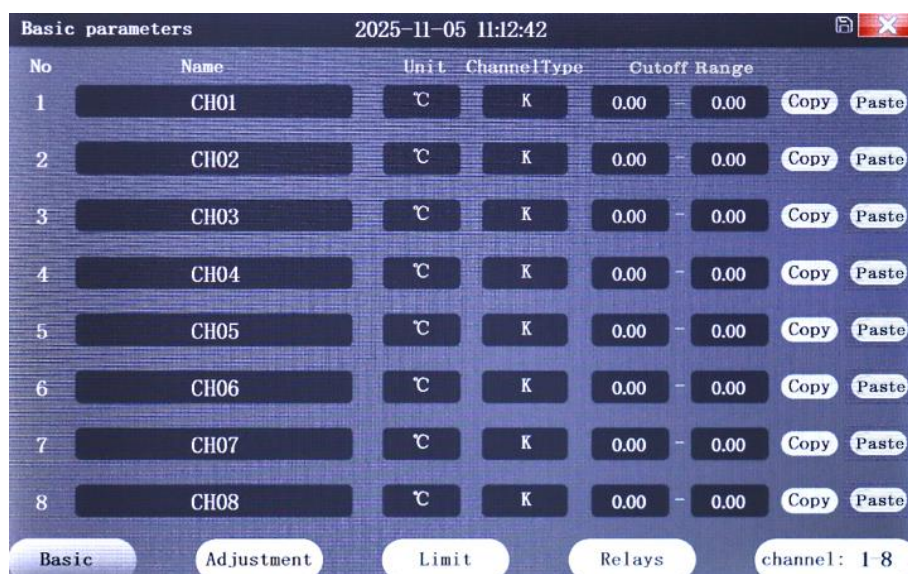


Figure 6-17 Parameter Settings

6.10.2 Basic Parameters

The parameters on this page are described in the following table:

Table 6-6 Basic Parameter Settings

No.		Description
1	Name	Set a user-defined channel name. For detailed configuration, refer to the channel name settings on the Single-Channel Display page.
2	Unit	Set a user-defined unit. For detailed configuration, refer to the unit settings on the Single-Channel Display page.
3	Channel Type	Set the input type for this channel. Note: The channel type must match the physical wiring; otherwise, incorrect readings may occur.
4	Cutoff Range	When the reading falls within the cutoff range, it is displayed as 0. This is used to suppress minor fluctuations at very low values.

Notes:

1. Channel names support English characters only.
2. When only one type of module is installed, the channel type is displayed as "---". In this case, no channel type configuration is required, and the instrument still acquires correct readings.
3. The channel type must be set to a type supported by the installed module. For example, the Universal Input Module does not support NTC-related types. The channel type must match the physical wiring; otherwise, incorrect readings may occur.

6.10.3 Value Adjustment

The parameters on this page are described in the following table:

Table 6-7 Value Adjustment Settings

No.	Parameter	Description
1	K value, b value	Variations in sensor lead length or ambient conditions can cause deviations in the measured value. When this occurs, the reading of the affected channel can be corrected using the following formula: $y=kx+b$

		Where: y = the desired display value k = the scaling factor (multiplier) x = the current reading on the recorder b = the offset value (positive or negative)
2	Range	The percentage displayed on the Column Chart page is calculated based on the range set here and the actual measured value. When an analog signal is connected (0-5 V, 0-10 V, 4-20 mA, ± 100 mV, or ± 20 mV), the actual output value is calculated using the following range conversion formula: Actual Output $= \frac{(\text{Range Upper Limit} - \text{Range Lower Limit}) \times (\text{Measured Value} - \text{Channel Input Lower Limit})}{\text{Channel Input Upper Limit} - \text{Channel Input Lower Limit}} + \text{Range Lower Limit}$ Example: If a channel is set to ± 100 mV, with a Range Lower Limit of -50 and Range Upper Limit of 50, and the actual input voltage is 25 mV, the displayed value is: $\frac{(50 - (-50)) \times (25 - (-100))}{100 - (-100)} + (-50) = 12.5$
3	Decimal Places	Set the number of decimal places for data display. The value must be between 0 and 4. For example, if set to 2, channel readings are displayed with 2 decimal places.

Notes:

1. The K value, b value, and range must be set correctly to match the actual conditions; otherwise, incorrect readings may occur.
2. The number of decimal places can only be set between 0 and 4. This setting affects the on-screen display only – exported data always uses 4 decimal places.

6.10.4 Threshold Settings

This page configures the Low-Low (LL), Low (L), High (H), and High-High (HH) thresholds for each channel. When a reading falls below the Low-Low threshold, both the Low-Low (LL) and Low (L) alarms are triggered simultaneously. Likewise, when a reading exceeds the High-High threshold, both the High-High (HH) and High (H) alarms are triggered.

Note:

Threshold values must satisfy Low-Low (LL) < Low (L) < High (H) < High-High (HH).

Otherwise, the instrument automatically adjusts the value to the nearest valid threshold.

6.10.5 Relay Settings

This page configures the mapping between the relay module contacts and channel readings. Each relay contact can be individually assigned to the High-High (HH), High (H), Low (L), or Low-Low (LL) threshold of any channel.

(1) Contact

The Contact field corresponds to a relay contact on the relay module. For example, if a relay module is installed in slot M-4, its 8 contacts are numbered 25–32. The channel number shown in front indicates the source channel. For instance, to link Channel 20's Low-Low (LL) alarm to the first contact of the M-4 relay module, set the LL contact of Channel 20 to 25. When the reading of Channel 20 falls below the LL threshold, the first contact on the M-4 relay module is energized.

(2) Hysteresis (Deadband)

Hysteresis is the offset from the alarm threshold at which the relay releases after being activated. In other words, once a relay is triggered, it remains energized until the reading returns within the threshold by at least the hysteresis value.

Example: If the High threshold is 50 and the hysteresis is set to 2:

When the channel reading exceeds 50, the corresponding relay contact closes.

The contact remains closed until the reading drops below 48 ($50 - 2$), at which point the relay releases (opens).

Notes:

-
1. When multiple channels are assigned to the same contact, the contact is energized as soon as any one of the readings exceeds its threshold. The contact only releases when all the assigned channels return within their thresholds.
 2. Setting the contact to 0 means the channel is not linked to any relay contact.
-

6.11 System Configuration

Tap the System Configuration button. In the password entry dialog that appears, tap Confirm without entering a password (the initial password is empty) to open the System Configuration page, as shown in Figure 6-18.

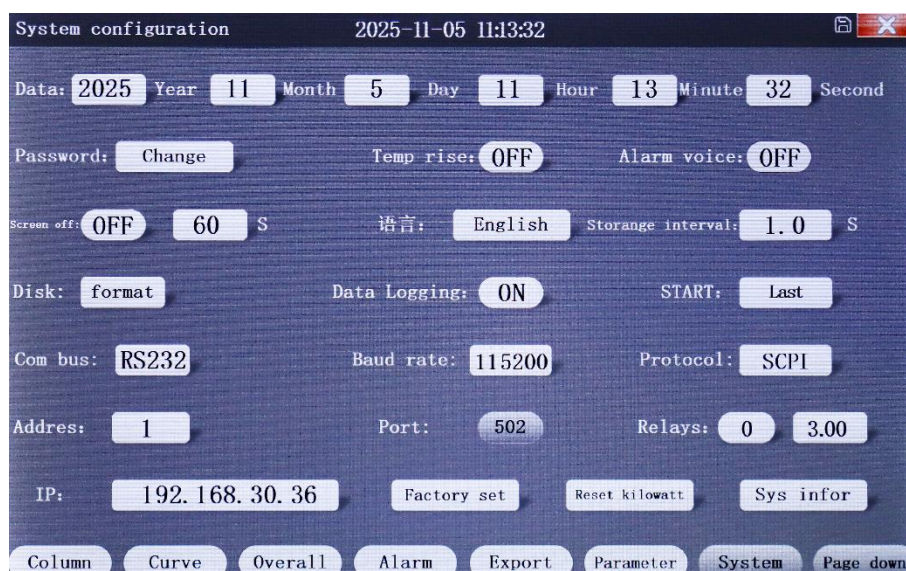


Figure 6-18 System Configuration Page

6.11.2 Time Settings

■ Setting the Time

- Step 1** Tap any of the time fields. The time settings dialog opens automatically.
- Step 2** Enter the desired date and time, then tap Confirm to complete the setting.

Note:

If the new time is set to an earlier moment than the currently displayed time, the instrument automatically exports all channel data, alarm information, and log information from the affected time range to the internal storage. This prevents timestamp inconsistencies in exported data. To avoid data loss, copy the exported files promptly.

6.11.3 Password Settings

■ Setting the Password

- Step 1** Tap the Change Password button. The password change dialog opens automatically.
- Step 2** Tap the field next to a password prompt. An on-screen keyboard appears. Enter the password, then tap Enter to confirm.
- Step 3** Tap the field next to a password prompt. An on-screen keyboard appears. Enter the password, then tap Enter to confirm.

Notes:

-
1. The New Password and Confirm Password must be identical to prevent input errors.
 2. The initial old password is empty. You can change the password without entering an old password on first use.
 3. Passwords can be up to 16 characters long.
-

6.11.4 Temperature Rise Settings

Tap the field next to Temperature Rise to toggle the mode on or off. ON indicates the mode is enabled; OFF indicates the mode is disabled.

When Temperature Rise mode is enabled, Channel 1 displays the actual measured value. All other channels display the difference between their actual measured value and the value of Channel 1.

Note:

Ensure Channel 1 provides a valid and correct reading before enabling Temperature Rise mode.

6.11.5 Alarm Sound Settings

Tap the field next to Alarm Sound to toggle the mode on or off. ON indicates the mode is enabled; OFF indicates the mode is disabled.

When Alarm Sound is enabled, the buzzer sounds as long as any channel's reading is out of range. The buzzer stops only when all channel readings return within their thresholds.

6.11.6 Screen Timeout Settings

Tap the field next to Screen Timeout to toggle the mode on or off. ON indicates the mode is enabled; OFF indicates the mode is disabled.

Tap the time field to open a numeric keypad. Enter the desired time and tap Enter to confirm. The Screen Timeout value defines the period of inactivity after which the screen backlight turns off. The value can be set between 60 and 65,500 seconds.

6.11.7 Language Settings

Tap the field next to Language to switch the instrument's language between English and Chinese.

6.11.8 Logging Interval Settings

Tap the time field next to Logging Interval to open a numeric keypad. Enter the desired value and tap Enter to confirm.

The Logging Interval defines the time between consecutive data records. For example, setting the value to 2 records one data point every 2 seconds. The value can be set between 1.0 and 9999.0 seconds, in increments of 1.0 s.

6.11.9 Format

Tap the Format button. A confirmation dialog appears – tapping Confirm formats the internal storage.

Caution: Formatting the internal storage permanently deletes all stored data. Ensure that any required data has been backed up before proceeding.

6.11.10 Recording Status

Tap the field next to Recording Status to toggle the mode on or off. ON indicates the mode is enabled; OFF indicates the mode is disabled.

When recording is disabled, the instrument does not save any acquired data. Change this setting with caution.

6.11.11 START Settings

Tap the field next to START to switch the START mode. Available options: Last State, ON, and OFF.

The START setting determines whether data acquisition begins automatically at power-on:

ON: Data acquisition starts automatically at power-on.

OFF: Data acquisition does not start at power-on.

Last State: If data acquisition was running before the last power-off, it resumes automatically at power-on.

6.11.12 Rear-Panel Relay Settings

These relay settings control the two relay outputs on the rear panel and are independent of the Relay Alarm Output Module. The first field next to each relay specifies the source data channel, and the second field specifies the hysteresis.

When the reading of the assigned channel falls below the Low (L) threshold or exceeds the High (H) threshold, Relay 1 is energized. When the reading falls below the Low-Low (LL) threshold or exceeds the High-High (HH) threshold, Relay 2 is energized. For details on hysteresis, refer to *Section 6.10.5*.

6.11.13 Other Settings

The remaining settings are described in the following table:

No.	Parameter	Range	Description
1	Communication Bus	RS232, RS485, USB, LAN	Select the bus type used for remote communication.
2	Baud Rate	4800, 9600, 19200, 38400, 57600, 115200	Must match the PC settings when RS-232, RS-485, or USB is selected as the communication bus.
3	Communication Protocol	MODBUS, SCPI	The instrument supports two protocols – SCPI and Modbus (RTU). SCPI is typically more convenient for PC communication; Modbus is easier to use with PLCs and other industrial control equipment.
4	Slave Address	1-241	Required when using the Modbus (RTU) protocol. 1. Address 00 is reserved for broadcast communication. 2. 1-241: The instrument's address on the bus.
5	Local IP		Set the instrument's IP address when communicating over the LAN port.
6	Factory Reset		Restore all instrument parameters to their factory default settings.
7	Energy Reset		Clear the accumulated energy value recorded by the power module.
8	System Information		Display the instrument's version information.

7. Remote Communication

This chapter covers the following topics:

-  RS-232C Interface Configuration
 -  RS-485 Interface Configuration
 -  LAN Interface Configuration
-

7.1 Introduction to the RS-232C Interface

RS-232 is a widely adopted serial communication standard — also known as asynchronous serial communication — used for data communication between computers or between a computer and peripheral devices. "RS" stands for "Recommended Standard," and "232" is the standard number. The standard was officially published by the Electronic Industries Association (EIA) in 1969 and specifies that data is transmitted one bit at a time over a single data line.

Most serial port implementations do not strictly follow the RS-232 standard: the standard specifies a 25-pin connector for each port, but modern computers typically use a 9-pin connector. The most commonly used RS-232 signals are listed in Table 7-1.

Signal	Symbol	25-Pin Connector	9-Pin Connector
Request to Send	RTS	4	7
Clear to Send	CTS	5	8
Data Set Ready	DSR	6	6
Data Carrier Detect	DCD	8	1
Data Terminal Ready	DTR	20	4
Transmit Data	TXD	2	3
Receive Data	RXD	3	2
Ground	GND	7	5

Table 7-1 RS-232 Common Signals

7.2 Serial Interface

7.2.1 RS232C Interface

The UT3300+ series serial interface does not strictly follow the RS-232 standard described above; it provides only a minimal subset, as shown in Table 7-2.

Signal	Symbol	9-Pin Connector
Transmit Data	TXD	3
Receive Data	RXD	2
Ground	GND	5

Table 7-2 RS-232 Serial Port Pin Assignments

The RS-232C connector uses a 9-pin DB-type socket. The pin arrangement is shown in Figure 7-1.

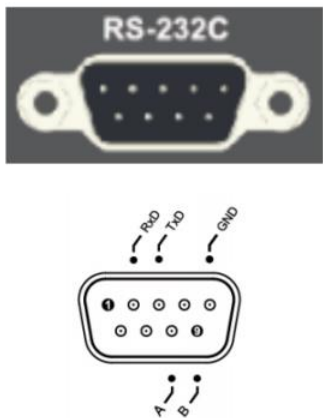


Figure 7-1 Rear View of the RS-232C / RS-485 Connector

7.2.2 RS485 Interface

The instrument comes standard with an RS-485 interface. The RS-485 and RS-232 interfaces share the same DB-9 connector. RS-485 supports multi-point communication, allowing one host (master) to connect to multiple slave devices in parallel.

Symbol	9-Pin Connector
A	8
B	9

GND	5
-----	---

Table 7-3 RS-485 Serial Port Pin Assignments

7.3 Connecting to a Computer



Caution:

1. To prevent electric shock, turn off the instrument's power before plugging in or unplugging the connector.
2. Do not short-circuit the output terminals or connect them to the chassis, as this may damage the instrument.

As shown in Figure 7-2, the pin definitions of the UT3300+ series differ from those of a standard 9-pin serial connector on a computer. You can either fabricate a three-wire cable using shielded twisted-pair wire according to the diagram (total length must be less than 1.5 m), or use serial cable attached with UT3300+. When fabricating your own cable, short pins 4 and 6, and short pins 7 and 8 on the computer side.

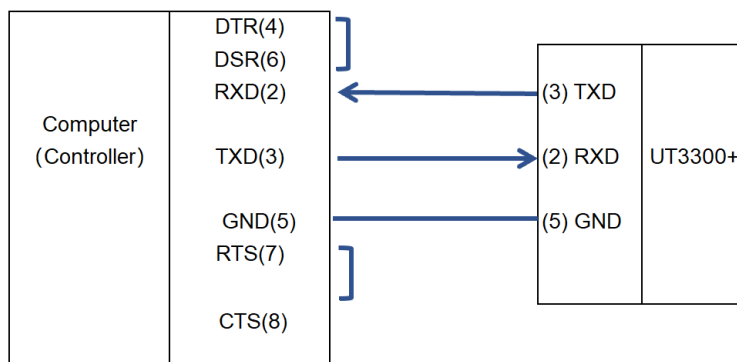


Figure 7-2 Instrument-to-Computer Connection

7.4 Serial Port Parameters

The serial interface parameters are listed in Table 7-4.

Transmission Mode	Full-duplex asynchronous communication, including start and stop bits
Baud Rate	115,200 bps
Data Bits	8-bit
Stop Bits	1 bit

Parity	None
End-of-Line Character	NL (Line Feed, ASCII code 10)
Connector	DB-9 (pin)

Table 7-4. Serial Interface Parameters

7.5 LAN Interface Configuration

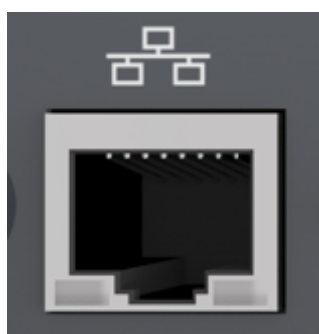


Figure 7-3 Rear View of the LAN Connector

Connect the LAN cable to the LAN connector on the instrument. On the System Settings page, set the Communication Bus to LAN and configure the instrument's IP address.

Green LED – Solid: Link established. Blinking: Data communication in progress.

Orange LED – Off: 10M BASE-T operation. Solid: 100M BASE-TX operation.

8. Appendix

8.1 Maintenance and Cleaning

(1) General Maintenance

Keep the instrument away from direct sunlight.

Caution

Keep sprays, liquids and solvents away from the instrument or probe to avoid damaging the instrument or probe.

(2) Cleaning

Regularly inspect the instrument based on its operating conditions. Follow the steps below to clean the exterior surfaces:

a. Exterior Cleaning

Use a soft, dry cloth to gently wipe off dust from the outer surface of the instrument.

b. LCD Screen

Take care when cleaning the LCD screen to avoid damaging the transparent surface. Use clean, soft cloth and avoid applying excessive pressure.

c. Dust Filter Screen

Use a screwdriver to remove the screws securing the dust cover.

Carefully remove the dust filter screen and clean it.

After cleaning, reinstall the screen and dust cover in the correct order.

d. Power and Cleaning

Disconnect the power supply before cleaning.

Wipe the instrument with a soft cloth dampened with water. Ensure the cloth is moist but not dripping.

Do not use abrasive or chemical cleaning agents on the instrument or probes.

Warning

Please confirm that the instrument is completely dry before use, to avoid electrical shorts or even personal injury caused by moisture.

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