WASiTES® 华知科

User Manual

WS10 Multi-channel Temperature Recorder

Foshan Huazhike Electronic Technology Co., Ltd.

Preface

Thank you for choosing our company's product. To ensure proper use of this product, please read this product manual carefully before use. Additionally, please check the product and its accessories against the packing list included in this manual. If there is any discrepancy, please contact our company or the authorized distributor.

Cautions

1、This manual is to be used in conjunction with the instrument. In case of content changes (e.g., due to version upgrades), no separate notification will be given.

2、The content of this manual has been verified as accurate and is written in the simplest manner to ensure user-friendliness and readability. If any inaccuracies or unclear descriptions are found, please contact our company or the authorized distributor.

Version: V1.0

Warning

For your personal safety and the proper use of this instrument, please strictly follow the requirements of this manual during operation and measurement. Additionally, adhere closely to the following safety regulations:

1、Power Supply and Grounding Protection

This product operates on an AC 220V power supply. Before turning on the power, ensure the supply voltage matches the rated voltage. Additionally, confirm that the power supply is connected to a protective ground wire to prevent electric shock. The instrument’s outer casing is already connected to the ground terminal of the power socket.

2、Prohibition of Operation in Explosive Environments

Do not operate the instrument in explosive environments, as this may cause explosions and result in personal injury.

3、Prohibition of Unauthorized Opening of the Instrument Casing

Do not open the instrument’s outer casing by yourself. Certain parts inside the instrument carry high-voltage electricity, which may lead to electric shock.

4、Prohibition of Plugging/Unplugging Terminals Under Live Conditions

Do not plug in or unplug wiring terminals when the instrument is energized, to avoid electric shock.

5、Liability Exclusion for Damages Due to Non-Compliance

Our company shall bear no responsibility for any instrument damage caused by non-compliance with these safety regulations.

1. Overview

This multi-channel temperature data logger adopts a 32-bit high-speed CPU for data processing and is equipped with a 4.3-inch industrial display screen. It supports K, J, and T type thermocouple inputs and offers multiple display modes, enabling users to read various parameters more intuitively. Characterized by comprehensive functions, superior performance, and simple operation, the instrument can meet the measurement needs of production, laboratory, and R&D scenarios.

It is widely applied in the production lines, laboratories, and quality inspection departments of manufacturing enterprises and scientific research institutions across industries including lighting appliances, power tools, household appliances, motors, electric heating appliances, pharmaceuticals, petroleum, chemical engineering, metallurgy, and electric power.

Additionally, various measurement functions can be customized according to customers' actual needs to meet their more advanced application requirements.

The WS10 Series Multi-channel Temperature Data Logger features the following characteristics:

▲ It is equipped with a 4.3-inch industrial true-color LCD display, featuring clear images, vivid colors, and a wide viewing angle.

▲ It adopts a 32-bit MCU design, enabling more accurate measurement, faster sampling speed, and greater stability.

▲ It supports real-time numerical display on 8/16 multi-interface screens.

▲ It supports list, curve, and bar chart display modes.

▲ Supports multiple sensor inputs: K, J, T.

▲ The voltage difference between channels can reach up to AC/DC 350V, with ultra-strong anti-interference capability.

▲ It is equipped with a built-in memory, capable of recording up to 8 files. Each file can store 130,000 sets of data, and the 8 files support infinite loop recording.

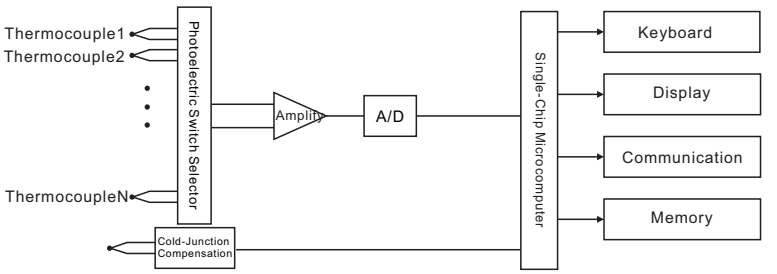
▲ Standard USB Communication Interface

▲ It is equipped with a USB flash drive interface and supports data export to a USB flash drive, ensuring more convenient use.

▲ Modular design, facilitating users' needs for capacity expansion.

▲ Each module has 8 channels, and the device supports up to 16 channels in total.

2. Basic Principle



Basic Schematic Block Diagram

As shown in the diagram, the instrument consists of the following components: thermocouples, photoelectric switch selectors, amplifiers, A/D converters, single-chip microcomputers (SCMs), a keyboard, a display, a communication module, a data storage unit, and a cold-junction compensation (CJC) module.

The corresponding channel signal is selected by the photoelectric switch selector, amplified by a signal amplifier, and then converted from an analog signal to a digital signal by an A/D converter before being sent to the single-chip microcomputer (SCM) for data processing. A cold-junction compensation circuit performs room-temperature measurement to obtain the cold-junction temperature value. The measurement signal and the cold-junction temperature value are then processed by the SCM, and finally, the accurate measured temperature value is derived and displayed on the screen.

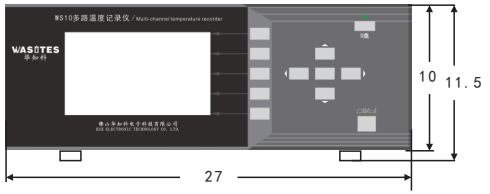
The keyboard, communication module, and data storage unit enable the configuration and storage of data on the display screen. Additionally, a computer can be connected via the communication interface to perform direct data analysis.

3. Technical Specifications

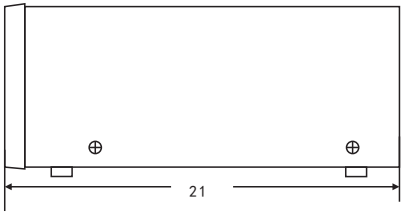
Display Mode	4.3-inch TFT True-Color LCD Industrial Display Screen
Display Format	Real-Time Tabular Values, Curves, and Bar Charts
Number of Channels	Each module has 8 channels, with support for up to 16 channels in total.
Thermocouple	K J T
Type K Thermocouple	-100～1370℃ Accuracy±0.5℃+0.6℃
Type J Thermocouple	-100～1200℃ Accuracy±0.5℃+0.6℃
Type T Thermocouple	-100～400℃ Accuracy±0.5℃+0.5℃
Resolution	0.1℃
Recording Interval	The instrument supports recording intervals set arbitrarily between 1 second and 9999 seconds. When recording via a computer, the interval can also be set arbitrarily within the range of 1 second to 9999 seconds.
Communication Interface	USB(Standard Configuration)
Power Supply	220V ±10%, Frequency 50Hz/60Hz, ≤5W (Standard Configuration) 86-265V Wide Voltage Range, ≤5W (Optional Configuration)
Thermocouple	Each channel is equipped with one 2-meter Type K thermocouple as standard.

4. Overall Dimensions (Unit: cm)

Front

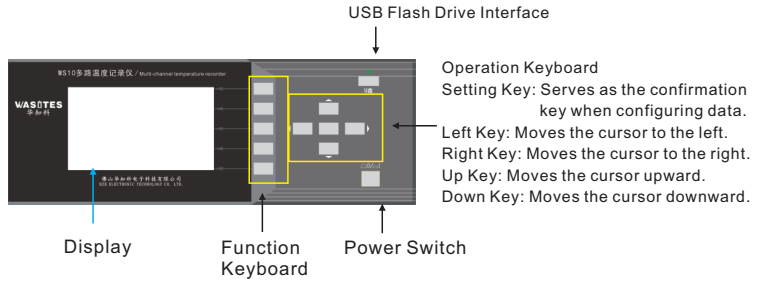


Side

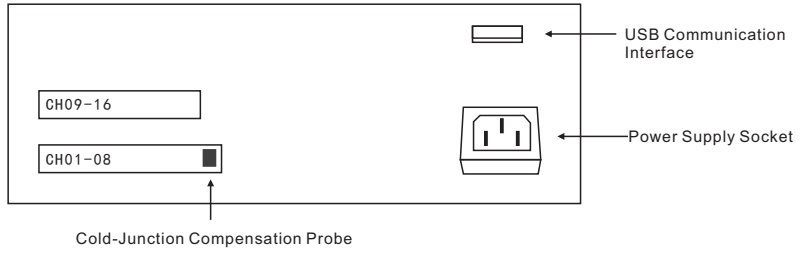


5. Panel Description

Front Panel



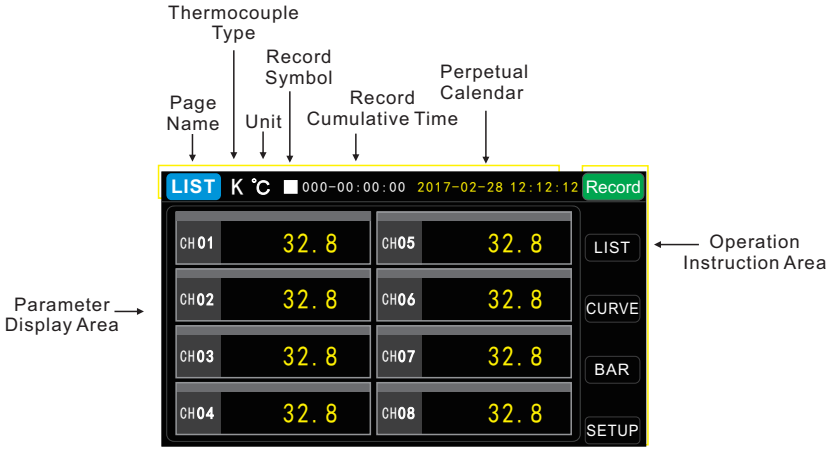
Rear Panel



6. Display and Operation Instructions

6. 1Instructions for the Display Interface

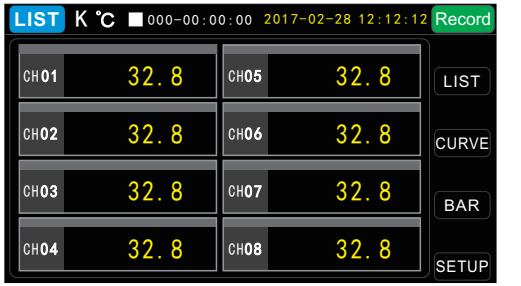
6. 1. 1Instructions for Interface Icons

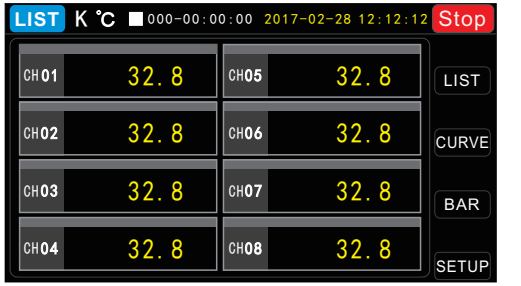


6. 1. 2Startup Screen

When powered on, the startup screen will be displayed, showing the company's logo and product model information.

6. 1. 3Real-Time Parameter List Display





The real-time parameter interface can display multiple measurement parameters simultaneously. The display interface is divided into 8-channel data display and 16-channel data display, and data of each channel can be displayed through page turning and pagination.

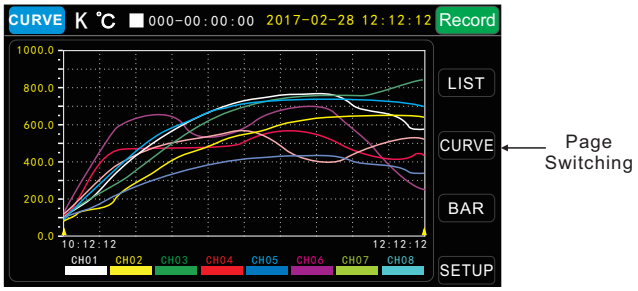
Press the "List" button to switch between the 8-channel and 16-channel display pages.

Press the "Curve" button to enter the system curve interface.

Press the "Bar Chart" button to enter the system bar chart interface.

Press the "Settings" button to enter the system settings interface.

6. 1. 4 Curve Display



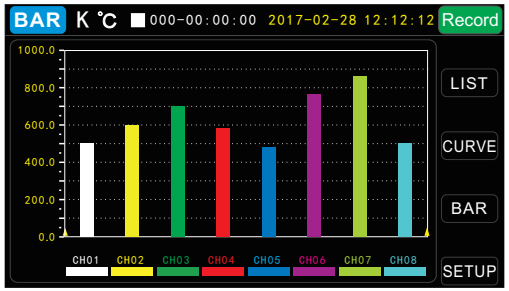
The curve graph is mainly a trend chart that displays temperature changes, with data points plotted at recorded intervals.For the speed display curve, there are 175 data points across 10 grid divisions. For example: when data points are plotted at a speed of 5 seconds per point, the curve graph can display data for a maximum of 875 seconds.

The range of the curve's Y-axis can be adjusted in the "Settings - Curve Y" page.

The curve is displayed in real time and cannot be panned left/right, zoomed in, or zoomed out.

Press the "Curve" button to switch between pages.

6. 1. 5 Bar Chart Display



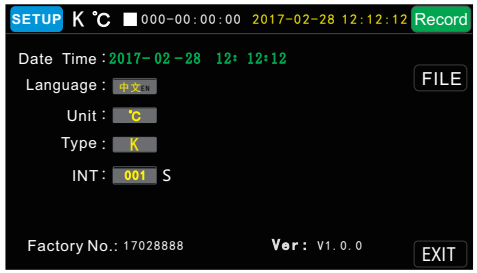
Real-Time Bar Chart

The bar chart enables comparison of the ratio magnitudes among different channels.

Note: The temperature range displayed on the Y-axis is consistent with the range set for the curve, and can only be configured in the curve settings.

Press the "Bar Chart" button to switch pages.

6. 1. 6System Settings

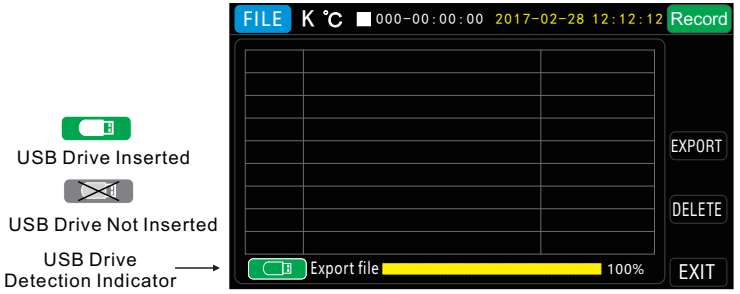


The system settings feature a rich set of setting menus that are clear and easy to use. It provides configurations for date and time, display language, measurement units, sensor type, and recording interval respectively.

Use the "Confirm" button to select the item you wish to modify; the corresponding position will be indicated or displayed in red text. Use the up/down buttons to adjust values (by increasing or decreasing) or switch between options. Press the "Confirm" button and left/right buttons to navigate to the previous/next item.

Note: When recording is activated, the date and time, measurement units, and sensor settings cannot be modified. When switching between Chinese and English, you must exit [the settings interface] to display the switched language.

6. 1. 7Record File



In the list of this interface are the recorded files, which can display the real-time size of the recorded files. The file export function is equipped with a progress bar, allowing users to observe in real time whether the file export progress is completed. Files can only be exported in full batches or deleted entirely. A maximum of 8 files can be recorded, with each file capable of storing up to 130,000 data entries. The 8 files are recorded in an infinite loop.

The USB drive must be 32GB or smaller and formatted in FAT32. When no USB drive is inserted, the file export operation will be ineffective.

10. Software Operation Instructions

Installation of Communication Driver

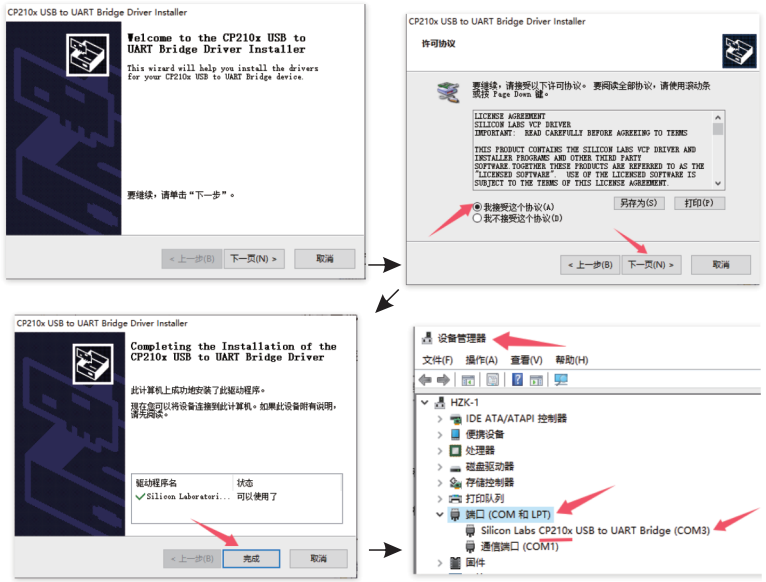
The CP2102 communication chip is adopted, and the driver installation method is as follows.

1).Run the file in the CP210x_Windows_Drivers folder:

CP210xVCPInstaller_x64.exe for 64-bit operating systems

CP210xVCPInstaller_x86.exe for 32-bit operating systems

2).Installation



Proceed step by step until completion.

Plug the USB cable into the USB port on the back of the instrument, connect it to a computer, and then check Device Manager > Ports (COM & LPT). If a serial port number labeled "CP210X" is present, it indicates a successful connection.

Communication Connection Method

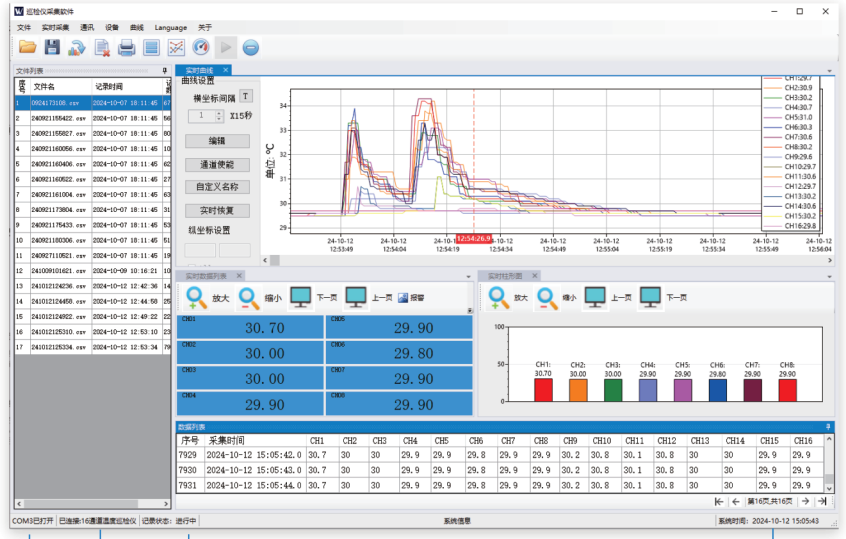
1. Ensure the aforementioned driver has been fully installed and the COM port is detectable.

2.Launch the software, select the newly added COM port (mentioned above) from the Communication menu. If "COM Port Opened" and "Connected to Data Logger" are displayed in the bottom-left corner of the software, it indicates that the communication has been successfully established.

The Use of the Software

This software is a portable application (no installation required).To run it, simply open the file named "巡检仪采集软件. exe" (Inspection Device Data Acquisition Software.exe). If your antivirus software flags the program during launch,select "Allow" to proceed until the software interface opens.

Enter the Startup Interface



There are seven menus in the menu bar: File, Real-Time Acquisition, Communication, Device, Curve, Language, and About.

1、The File menu includes the Open function (opens a specified data file).、Save (saves the data file to a specified location)、Import (imports the specified data file into the upper computer)、Print Preview (previews the layout of the list to be printed) and Exit (exits the upper computer) — totaling five functions.

2、The Real-Time Acquisition menu allows starting and stopping real-time data acquisition.

3、The Communication menu enables specification of the communication interface type between the upper computer and the instrument. Available options include Serial Port (with selectable COM ports); Ethernet ports and USB ports are supported for other model series.

4、The Device menu includes the function of Time Synchronization (synchronizes the upper computer with the computer's system time).、Alarm Settings (configures the upper and lower limits for data alarms) and Read Files from Instrument (enables the upper computer to read files stored internally in the instrument).

5、The Language menu allows configuration of the display language for the upper computer.

6、The About menu displays information about the upper computer.

Tool Introduction

There are ten shortcut tools in the toolbar, namely Open File, Save File, Import File, Delete File, Print File, Data List, Curve, Real-time Data List, Start Real-time Acquisition and Stop Real-time Acquisition.

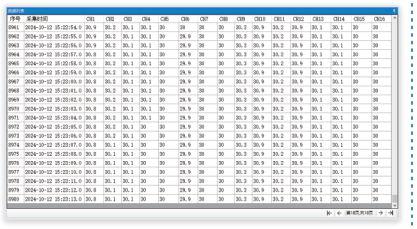
File List

The file list displays the names and quantities of files recorded by the upper computer. After selecting a file in the list, you can right-click to quickly open or delete it.

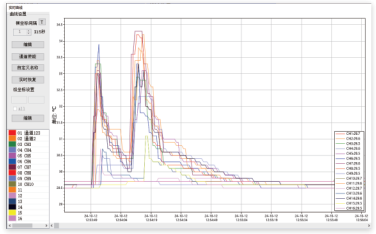
Data Processing List

The Data Processing List can display the Data List, Curve List, Real-time Data List, and Bar Chart List simultaneously.

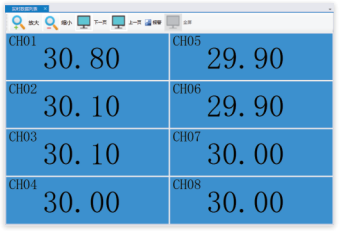
The Curve List allows you to zoom in or out on the vertical axis (Y-axis) at the mouse position using the mouse wheel.



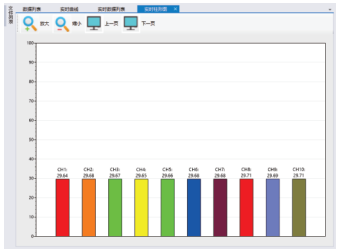
Data List



Curve List



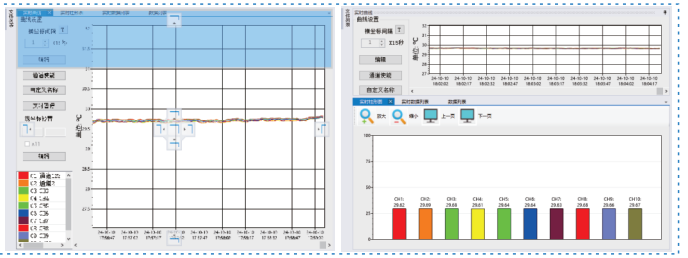
Real-time Data List



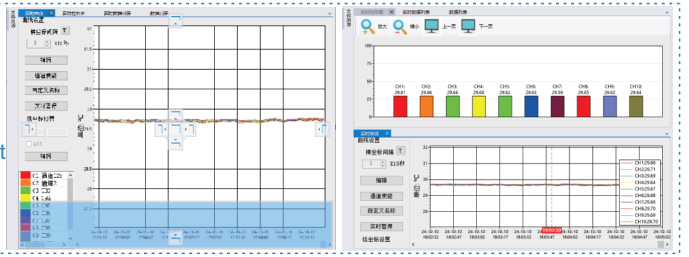
Bar Chart List

Each data list can have its position and size adjusted as needed. Take the Curve List and Bar Chart List as examples: the Curve List is the one being moved, while the Bar Chart List is the selected one.

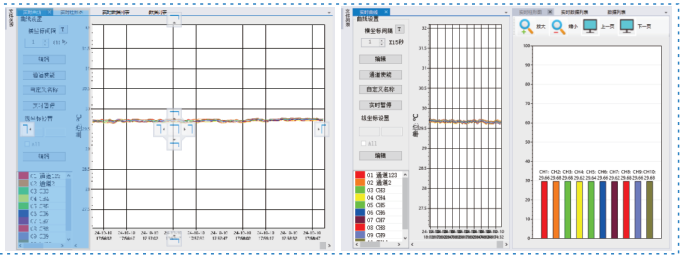
Move to Above the Selected List



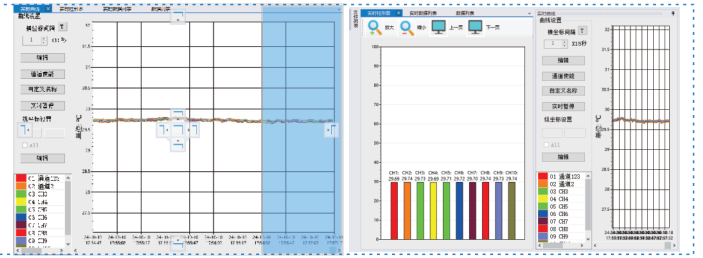
Move to Below the Selected List



Move to the Left of the Selected List



Move to the Right of the Selected List



Verification Conditions

Project	Reference Value or Range	Reference Value or Range
Ambient Temperature℃	20	±5
Ambient Humidity%RH	45～75	
Atmospheric PressureKPa	86～106	
AC Supply VoltageV	220	±2%
AC Supply VoltageHz	50	±1%
AC Power Supply Waveform	Sine Wave	ß=0.05
External Electromagnetic Field Interference	Should Be Avoided	
Ventilation	Good	
Sunlight Exposure	Avoid Direct Exposure	

Packing List

Main Unit	1 Unit
Power Cable	1 Volume
User Manual	1 Copy
Certificate of Conformity / Warranty Card	1 Set
Thermocouple Wire	1 Strip (2 Meters) per Channel

Warranty

The instrument comes with a 2-year warranty period starting from the date of purchase. If the instrument is damaged due to improper operation by the user within the warranty period, the user shall bear the repair costs and any other expenses arising from the repair. The company shall be responsible for providing lifetime paid repair services for the instrument.

Without the written consent of our company, the user shall not open the instrument's outer casing; such an act will affect the instrument's warranty.

Repairs to the instrument shall be conducted by professional technicians authorized by our company. During the repair process, do not arbitrarily replace the internal components of the instrument. After the instrument is repaired, it must be re-calibrated to avoid affecting the testing accuracy. If the user carries out blind repairs and replaces instrument parts, resulting in damage to the instrument, such damage shall not be covered by the warranty, and the user shall bear the repair costs.

Our company reserves the right to improve the instruction manual, as well as the instrument's appearance and functions, without prior notice.

Certificate of Product Conformity

Product Name：Multi-channel Temperature Recorder

Product Model：WS10

Product Code：

Date：

Inspector：

Verification Conclusion：

Product Warranty Card

●Warranty Instructions:

1. The warranty period is 24 months from the date of purchase.
2. If the warranted equipment malfunctions within the warranty period under normal use and maintenance, and the issue is verified to be true after inspection, our company will provide free repair services and replacement of parts.

●Free repair services shall not be provided in the following cases.

1. The product has been repaired, altered, modified by technicians not authorized by our company, or the user has replaced any internal components on their own.
2. The device serial number has been altered or does not match the one listed in this certificate.
3. Damage caused by water or other substances infiltrating into the device.

●For equipment that is either beyond the free warranty period or not covered by the free warranty terms, our company can still provide repair services, but will charge fees for spare parts and repairs at its discretion.

Full Name		Model	
Phone		Date of Purchase	
Address		Number	
Maintenance Date	MaintenanceRecord		Maintenance Technician

WASITES®

华知科

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For sales and service,
please contact your local distributor.