Temperature and humidity programmable controller

US-9356P-ACCU1

Operating Manual (Ver 01)





This manual describes the use and operating parameters. Please store it accordingly.

Please read the manual carefully before operation.



応用電子工業株式会社

Table of contents

1.Preface	4
2.System Configuration Diagram	5
3.Introduction to the "Contents" Screen	6
3.1 Operation Display	6
3.2 Operation Settings	6
3.3 Program Settings	6
3.4 Curve Analysis	6
3.5 Auxiliary Settings	6
3.6 Event Log	6
3.7 Data Logging	6
3.8 Authorization Management	6
4. Operation of the "Operation Display" Screen	7
4.1 When the Control Mode is "Program Control"	7
4.2 When the Control Mode is "Setpoint Control"	8
5. Operation of the "Operation Settings" Screen	9
5.1 Selection of Operation Mode (Setpoint Control / Program Control)	9
5.2 Execution Mode (Immediate / Scheduled) Selection	9
5.3 Test End (Immediate Stop / Return to Normal) Selection	9
5.4 Power-off Restart Mode (Interrupt / Cold Start / Hot Start) Selection	9
5.5 Option to Operate Operation (Yes / No) Selection	9
6. Operation of the "Program Settings" Screen	10
6.1 Program Creation	. 1 0
6.2 Program Editing	. 1 3
6.3 Time Signal	. 1 3
7. Operation of the "Curve Analysis" Screen	.14
7.1 Real-time Curve	. 1 4
7.2 Setpoint Curve and Historical Curve Setting	
8. Operation of the "Auxiliary Settings" Screen	15
8.1 Test Standby	
8.2 Time Setting	
8.3 LCD Related Settings	. 15
8.4 Language	
8.5 Version	
9. Operation of the "Event Log" Screen	
9.1 Abnormal History Record	
9.2 Operation History Record	
10. Operation of the "Data Logging" Screen	
10.1 Optional Data Storage Location	
10.2 Optional Data Recording Time	
10.3 View Recorded Entries	
10.4 View Changes in Storage Content Size	
10.5 Option for Automatic or Manual Recording Functionality	
10.6 Copying and Deleting Functions for Files	
11. Operation of the "Authorization Management" Screen	17

1. Preface

Thank you for purchasing the US-9356P-ACCU1 Temperature and Humidity Programmable Controller. This operating manual provides detailed explanations of parameters for everyday operation.

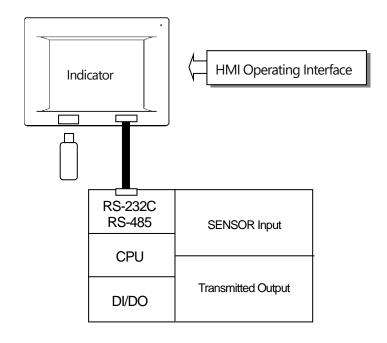
Safety precautions contain important information regarding safety. Please make sure to comply with them.

Safety Precautions:

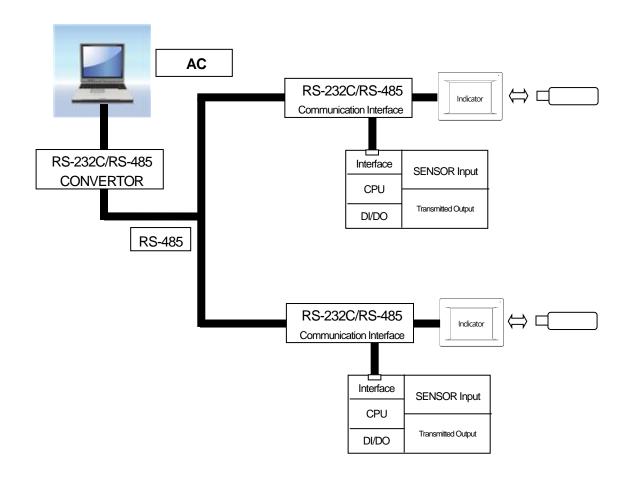
- This instrument can operate normally in general situations. However, if concerned about potential accidents or damage to other equipment due to malfunctions or abnormalities of this instrument, it is advisable to set up emergency stop circuits and protective circuits to prevent accidents.
- To prevent instrument malfunctions, please provide power within the rated voltage range.
- To avoid electric shock, misoperation, and malfunctions, do not connect power before installation and wiring are completed.
- This product is not explosion-proof. Do not use it in environments with combustible or explosive gases.
- Do not disassemble, process, alter, or repair this instrument without authorization, as it may lead to abnormal operation, electric shock, or fire hazards.
- Do not touch the power terminals after power is applied, as it may cause electric shock or misoperation.
- Only disconnect wiring after power is turned off to prevent electric shock or misoperation.
- Keep the ventilation holes of the casing clear to prevent malfunctions, abnormal operations, reduced lifespan, and fire hazards.
- Do not use the instrument if it is damaged or deformed upon unpacking.
- During installation, ensure no dust, wire ends, iron filings, or other foreign objects enter the instrument to avoid misoperation or malfunctions.
- Wiring must be correct, and grounding must be ensured. Failure to ground may result in electric shock, misoperation accidents, abnormal display, or significant measurement errors.
- When connecting Resistance Temperature Detectors (RTDs), use three wires with equal resistance and less than 10Ω, or it may cause display errors or abnormal operation.
- Regularly check terminal screws and fixtures. Do not use if they are loose.
- During instrument operation, ensure the power input terminal cover is installed on the terminal board to prevent electric shock.
- Before modifying settings, signal output, starting, stopping, or any other operations during instrument operation, consider safety carefully. Incorrect operations may damage the working equipment or cause malfunctions.
- Clean the instrument with a dry cloth. Do not use alcohol, gasoline, or other organic solvents, and avoid splashing water onto the instrument. If the instrument is immersed in water, immediately stop using it to avoid electric leakage, shock, or fire hazards.
- Internal components of the instrument have a certain lifespan. For continued safe use of this instrument,
 regular maintenance is recommended.
- Dispose of this product following industrial waste disposal regulations.

2. System Configuration Diagram

2.1 Mode One



2.2 Mode Two



3. Introduction to the "Contents" Screen

This controller operates via a touchscreen interface, where each option can be selected from the "Menu" screen and further instructions can be followed accordingly.



3.1 Operation Display

- 1. Display of current actual value, set value, control mode, and operating status.
- 2. Operation buttons for run, stop, pause, and segment skip.
- 3. Pressing the "Next Page" button allows for viewing of current dry/wet bulb temperature, output quantity, output status, and operating time; also allows operation of run, stop, pause, and segment skip buttons.
- 4. When in setpoint control mode, pressing the "Set" button allows for setting of setpoint control data.
- 5. Pressing the "Curve" button allows for viewing or operation of real-time curve, setpoint curve, and historical curve related buttons.
- 6. Functionality for data and curve storage.

3.2 Operation Settings:

- 1. Selection of operation mode (setpoint control / program control).
- 2. Selection of execution mode (immediate / scheduled).
- 3. Option to operate operation (yes / no).
- 4. Selection of power-off restart mode (interrupt / cold start / hot start).
- 5. Selection of test end mode (immediate stop / return to normal).

3.3 Program Settings:

- 1. Editing of program content to be executed.
- 2. Editing of program test name.
- 3. Time signal control setting.
- Cycle condition setting.

3.4 Curve Analysis:

- 1. Display of real-time curve, setpoint curve, and historical curve.
- 2. Selection of temperature/humidity/time scale values.

3.5 Auxiliary Settings:

- 1. Setting of test standby.
- 2. Date and time setting.
- 3. LCD-related settings.
- 4. Language selection.
- 3. Viewing of controller version.

3.6 Event Log:

- 1. Viewing of alarm event log.
- 2. Viewing of operation log.

3.7 Data Logging:

1. Option to select recording mode, recording period, storage zone, and viewing of stored entries.

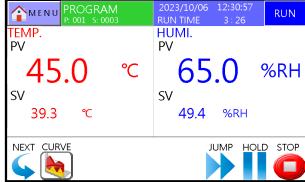
3.8 Authorization Management:

1. Setting of operator permissions.

4. Operation of the "Operation Display" Screen

4.1 When the control mode is "Program Control":





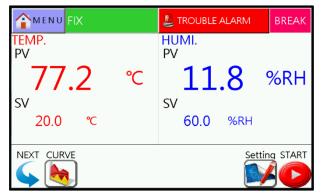
Program - Stopping

Program - Running



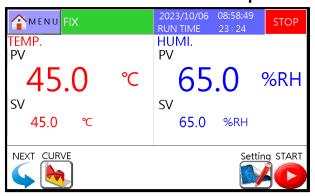
Program - Status Screen

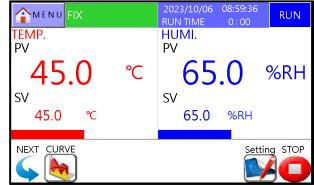
- 4.1.1. The "Running" indication in the upper right corner of the screen represents the current controller status.
- 4.1.2. Pressing the "Menu" button in the upper left corner of the screen will return you to the menu screen.
- 4.1.3. Pressing the "Curve" button at the bottom left of the screen allows you to view real-time curves, setpoint curves, and historical curves.
- 4.1.4. Pressing the "Next Page" button at the bottom of the screen allows you to check the current dry/wet bulb temperature, output quantity, output status, operating time, and program status; you can also operate the run, stop, pause, and segment skip buttons.
- 4.1.5. Pressing the "Segment Skip" button at the bottom of the screen allows you to skip to the next segment. (press twice if there is standby set to skip to the next segment)
- 4.1.6. Pressing the "Pause" button at the bottom of the screen temporarily suspends the time operation.
- 4.1.7. Pressing the "Run" button at the bottom of the screen and confirming it will start the controller, pressing the "Stop" button once and confirming it will stop the controller.
- 4.1.8. When an alarm occurs, it will be displayed as shown in the following figure. After troubleshooting, the corresponding status will change from red to green. Pressing the "Reset" button will clear the alarm status.





4-2. When the control mode is "Setpoint Control":

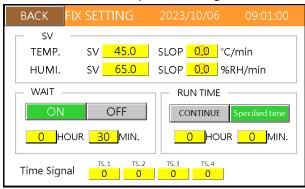




Setpoint - Stopping



Setpoint - Running



Setpoint - Status Screen

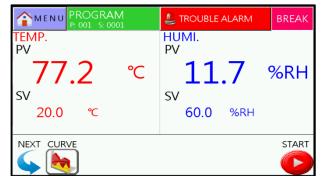
Setpoint - Settings Screen

- 4.2.1. The "Running" indication in the upper right corner of the screen represents the current controller status.
- 4.2.2. Pressing the "Menu" button in the upper left corner of the screen will return you to the menu screen.
- 4.2.3. Pressing the "Curve" button at the bottom left of the screen allows you to view real-time curves, setpoint curves, and historical curves.
- 4.2.4. Pressing the "Next Page" button at the bottom of the screen allows you to check the current dry/wet bulb temperature, output quantity, output status, and operating time.
- 4.2.5. Pressing the "Run" button at the bottom right of the screen and confirming it will start the controller, pressing the "Stop" button once and confirming it will stop the controller.
- 4.2.6. Pressing the "Settings" button at the bottom right of the screen allows you to enter the setpoint setting page to set the target temperature/humidity, slope conditions, standby or not, maximum standby time allowed, operating time, time signal, etc.
 - *The allowed standby time range can be set from 00H00M to 99H59M.
 - *The specified operating time range can be set from 0000H00M to 9999H59M.
 - *The time signal setting function will only appear if selected in "Initial Setup. 2" under "Output RELAY No. Setting".

It can be set within the range of No.0 to No.8, and its operational logic can be referred to in Chapter 6.3.

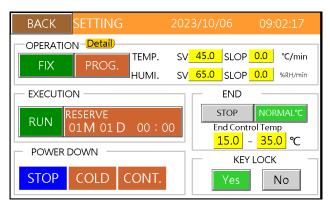
4.2.7. When an alarm occurs, it will be displayed as shown in the figure below.

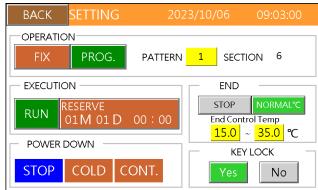
After troubleshooting, the corresponding status will change from red to green. Pressing the "Reset" button will clear the alarm status.





5. Operation of the "Operation Settings" Screen





5.1 Control Mode Selection (Fixed Value Control / Program Control):

Determines whether the controller will perform fixed value control or program control.

When selecting fixed value control, you can set the target value and slope conditions for temperature/humidity to be executed.

When selecting program control, you can choose the program group and segment number to be executed.

5.2 Execution Mode Selection (Immediate / Scheduled 01/0100:00):

Determines whether the controller will start immediately (activated immediately upon pressing the "Operation" button) or scheduled (scheduled to start when the "Operation" button is pressed, with activation occurring at the scheduled time). The format for scheduling options is month/day hour:minute.

5.3 Test Termination:

Determines whether the controller will return to normal temperature when the test ends.

Immediate Stop: The controller stops immediately when the test ends.

Return to Normal: The controller must return to the set normal temperature conditions when the test ends before stopping operation.

Conditions can be set from 0 to 50°C.

5.4 Power Failure Restart Mode (Interrupt / Cold Start / Hot Start) Selection:

Interrupt: Control is interrupted after power is restored.

(Select this option if you want the machine to stop running after a fault.)

Cold Start: The controller will restart from the initial segment of the program after power is restored.

Hot Start: The controller will continue executing from the interruption point of the program after power is restored.

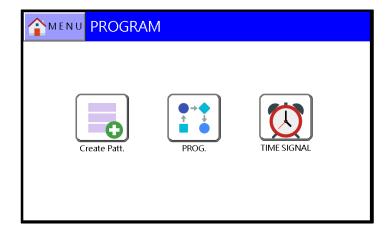
5.5 Operation Availability (Yes / No) Selection:

Determines whether the controller can operate the operation function keys.

Yes: Operation is allowed.

No: Operation is not allowed (the "Operation" button disappears from the operation display screen).

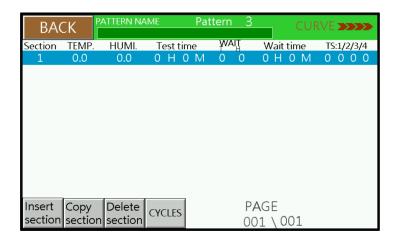
6. Operation of the "Program Settings" Screen



6.1 Program Creation:

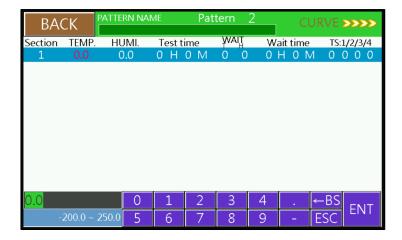
You can set the temperature value, humidity value, time, standby, standby time, signal, cycle settings data, and the desired program group number.

Upon entry, the following screen appears:



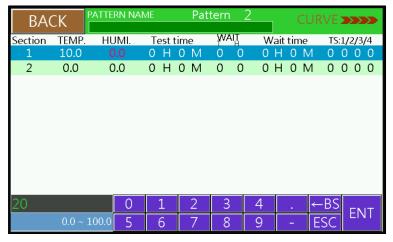
Setting Step 1: Confirm the program group number, then begin setting the program content, which includes temperature value, humidity value, test time, temperature standby, humidity standby, standby time, and time signal (total of 4 sets).

Setting Step 2: Set the temperature target value using the keyboard below. ** Range: -200.0 to 250.0 °C.



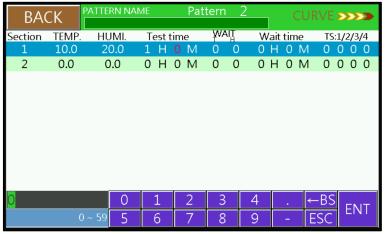
Setting Step 3: Set the humidity target value using the keyboard below.

- Range: 0.0 to 99.9%RH
- If the temperature set value exceeds the upper and lower temperature limits set by the controller (generally below 0°C and above 100°C), the humidity value cannot be set, and the cursor will move directly to the time position.
- * If the humidity value is set to 0, the humidity value field in the "Operation Display" screen will disappear (no humidity condition).



Setting Step 4: Set the test time value for this program segment.

- Range: 00H00M to 99H59M
- If a time is set (time setting value is not 0), it indicates slope control, where the temperature/humidity target value (SV) will increase or decrease incrementally according to the time division after operation.



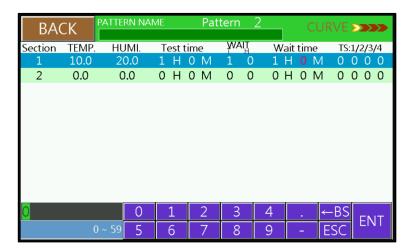
Setting Step 5: Set whether temperature and humidity should be on standby for this program segment.

- * Here, you can separately set whether temperature and humidity are on standby; standby value settings will be detailed in "Program Standby".
- "0" indicates no standby; "T" inputting "1" indicates temperature standby enabled, "H" inputting "1" indicates humidity standby enabled.



Setting Step 6: Set the system's waiting time. Standby status is automatically released when the system reaches the specified target conditions within the standby time; if the system does not reach the specified target conditions after the standby time elapses, standby status will still be automatically released, and the next segment's settings will be executed.

Range: 00H00M to 99H59M



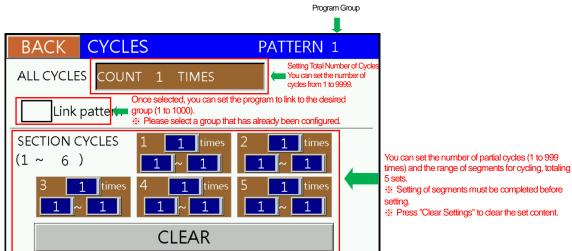
Setting Step 7: Set the action group for Time Signal 1/Time Signal 2/Time Signal 3/Time Signal 4 for this segment.

- Time Signal 1/Time Signal 2/Time Signal 3/Time Signal 4 share 10 sets of action groups.
- * The content of each action group (No.0 to No.9) is set in "Time Signal Control Settings".
- The setting function of Time Signal 4 will only appear if it has been selected in "Initial Setting 2" under "Output RELAY No. Setting".



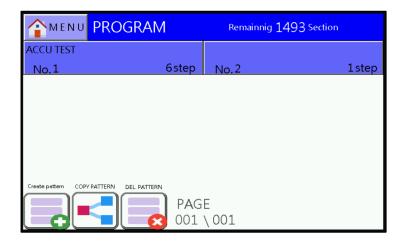
Supplementary: Explanation of "Cycle Setting"

You can set the full cycle and partial cycle of a certain program group and link it to the next program group data.



6.2 Program Editing

You can view and edit the content of the programs that have been configured.



6.3 Time Signal Settings

This setting includes No.0-8, a total of 9 sets of time signals that can be configured. No.0 is for all OFF; No.1 is for all ON, and No.0 and No.1 cannot be changed; No.2-No.8 can be planned by the user. The following will detail the meaning of each parameter:

**ON DELAY: After the timer of this segment starts, how long (ON DELAY TIME) will it be before the selected signal contact begins ON.

Example: Time Signal Mode No.2 ON DELAY = 1 hour, a certain program segment has a duration of 2 hours, and in this program segment, the mode selection of Time Signal T.S1 is set to No.2.

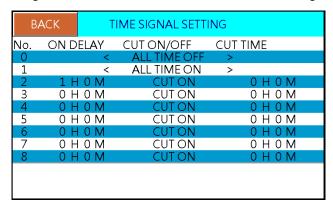
Its action is: after entering this program segment, the Time Signal is OFF for the first hour, and ON for the next hour.

*CUT ON/OFF: Whether to enable CUT TIME mode; when CUT is ON, CUT TIME can be set, and its function is to delete the time of subsequent actions that do not need to be executed.

Example: Time Signal Mode No.2 ON DELAY = 1 hour, CUT = ON, CUT TIME = 30 minutes, a certain program segment has a duration of 2 hours, and in this program segment, the mode of Time Signal T.S1 is set to No.2.

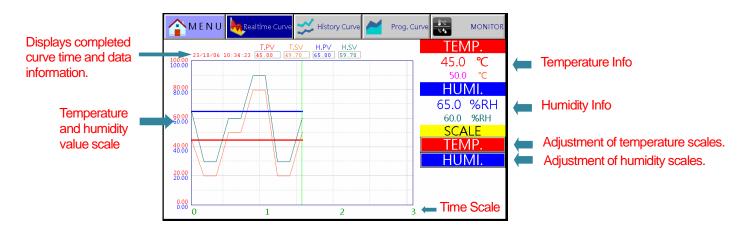
Its action is: after entering this program segment, the Time Signal is OFF for the first hour, ON for the middle 30 minutes, and OFF for the last 30 minutes.

Press the "Time Signal" button, then click to set, as shown in the figure below.



7. Operation of the "Curve Analysis" Screen:

7.1 Real-time Curve



Pressing the "Menu" button at the top left corner returns to the menu screen, while pressing the "Operation Display" button at the top right corner returns to the operation display screen.

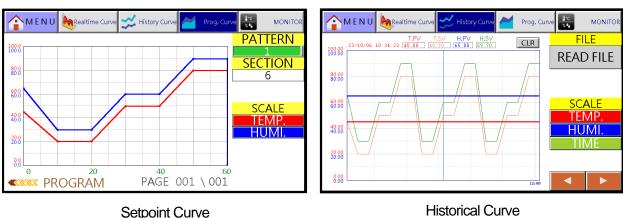
Pressing the "Temperature" button on the right side allows setting the temperature scale range (conditions can be set from -200.0 to 250.0°C) pressing the "Humidity" button allows setting the humidity value scale range (conditions can be set from 0.0 to 100.0%RH).

Even if the curve can be displayed for a maximum of 3 hours, when it exceeds this time, the data will automatically be stored as a file, the curve will be cleared, and this action will be repeated.

Temperature and humidity value curves are represented by lines indicating the current actual values (T.PV: red, T.SV: orange, H.PV: blue, H.SV: dark green).

When the controller stops running, data will automatically be stored as a file, and the curve will be cleared.

7.2 Setpoint Curve and Historical Curve



By pressing the "Menu" button in the top left corner of the screen, you can return to the menu screen; by pressing the "Operation Display" button in the top right corner of the screen, you can return to the operation display screen.

On the right side of the setpoint curve screen, the desired program group and segment number are displayed.

On the setpoint curve and historical curve screen, press the "Temperature" button to set the temperature scale range (can be set from -200.0 to 250.0°C).

On the setpoint curve and historical curve screen, press the "Humidity" button to set the humidity scale range (can be set from 0.0 to 100.0%RH).

The time displayed on the setpoint curve screen is in minutes.

On the historical curve screen, press the "Time" button to select the time scale range (can be set to: 3H/6H/12/1D).

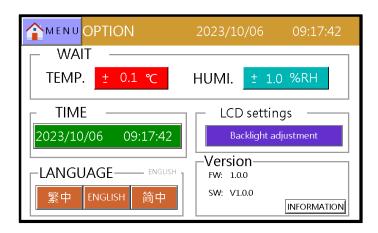
On the historical curve screen, pressing the "Clear" button clears the displayed curves.

On the historical curve screen, pressing the "Load File" button allows you to select and load recorded historical curve files.

Temperature/humidity setpoint curves are represented by lines (temperature: red, humidity: blue).

Temperature and humidity curves represent the current actual values in a line format; if the selected file data exceeds the selected time conditions, you can use the change time conditions or switch buttons to move and view.

8. Operation of the "Auxiliary Settings" Screen:



8.1 Experiment Standby:

Allows setting of standby conditions for temperature and humidity; The allowable range for settings is 0.1 to 9.9.

8.2 Time Setting:

Adjusts the system time of the controller.

8.3 LCD Related Settings:

Allows setting of backlight brightness (0~15) and screen sleep time (0~99 minutes).

8.4 Language:

Can switch between three languages: Traditional Chinese, Simplified Chinese, and English.

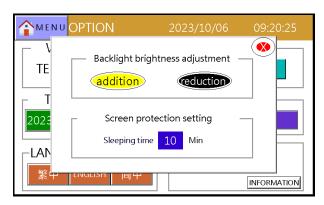
8.5 Version:

Displays controller version and device information.

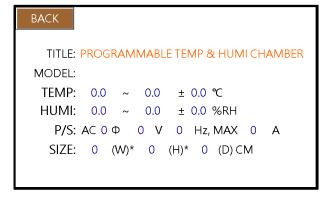
Versions may vary due to functional changes or customer requirements.

FW indicates the main control board hardware version, while SW indicates the HMI operating program version.

* Device information can be modified in the inner settings.



LCD Related Settings Screen



Information Setting Screen

9. Operation of the "Event Log" Screen:



9.1 Abnormal History Record:

Records the time and status of alarm occurrences. Can display the closest 20 sets of alarm history.

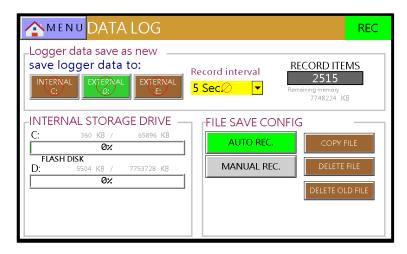


9.2 Operation History Record:

Records all messages related to operational history.



10. Operation of the "Data Logging" Screen:

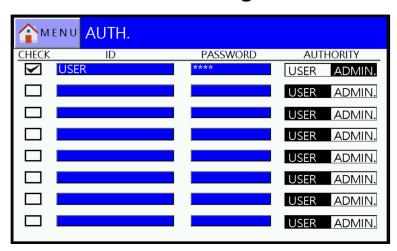


10.1 You can select the data storage location.

The default storage path is [D:], and if no Micro SD or USB memory card is inserted, the system will automatically change the storage path to [C:].

- 10.2 You can select the data recording time.
 - Time options include: 5 seconds, 30 seconds, 1 minute, 5 minutes, 10 minutes.
- 10.3 You can view the number of recorded entries.
- 10.4 You can view the changes in storage content size.
- 10.5 You can choose between automatic recording or manual recording functions.
- 10.6 You can copy and delete files.

11. Operation of the "Permission Management" Screen:



The permission management is initially set to be disabled. To utilize this feature, you need to access the inner settings and enable the permission management function. Once enabled, you can log in to this screen to enter the account (ID) / password (PASSWORD) and choose the operation permissions as either user or administrator.

- Account names can have a maximum of 11 characters, while passwords can have a maximum of 7 characters.
- * There are two types of users: administrators and regular users. Administrators have full permission to perform any operation, while regular users can only view experimental curves or operate equipment for starting and stopping, among other operations.