Operation Manual

eyc-tech FDM06-I

Venturi Thermal Mass Flow Meter

Contents

1. Security Considerations

Please read this Specification carefully, prior to use of this, and keep the manual properly, for timely reference.

Solemn Statement：

This product can not be used for any explosion-proof area.

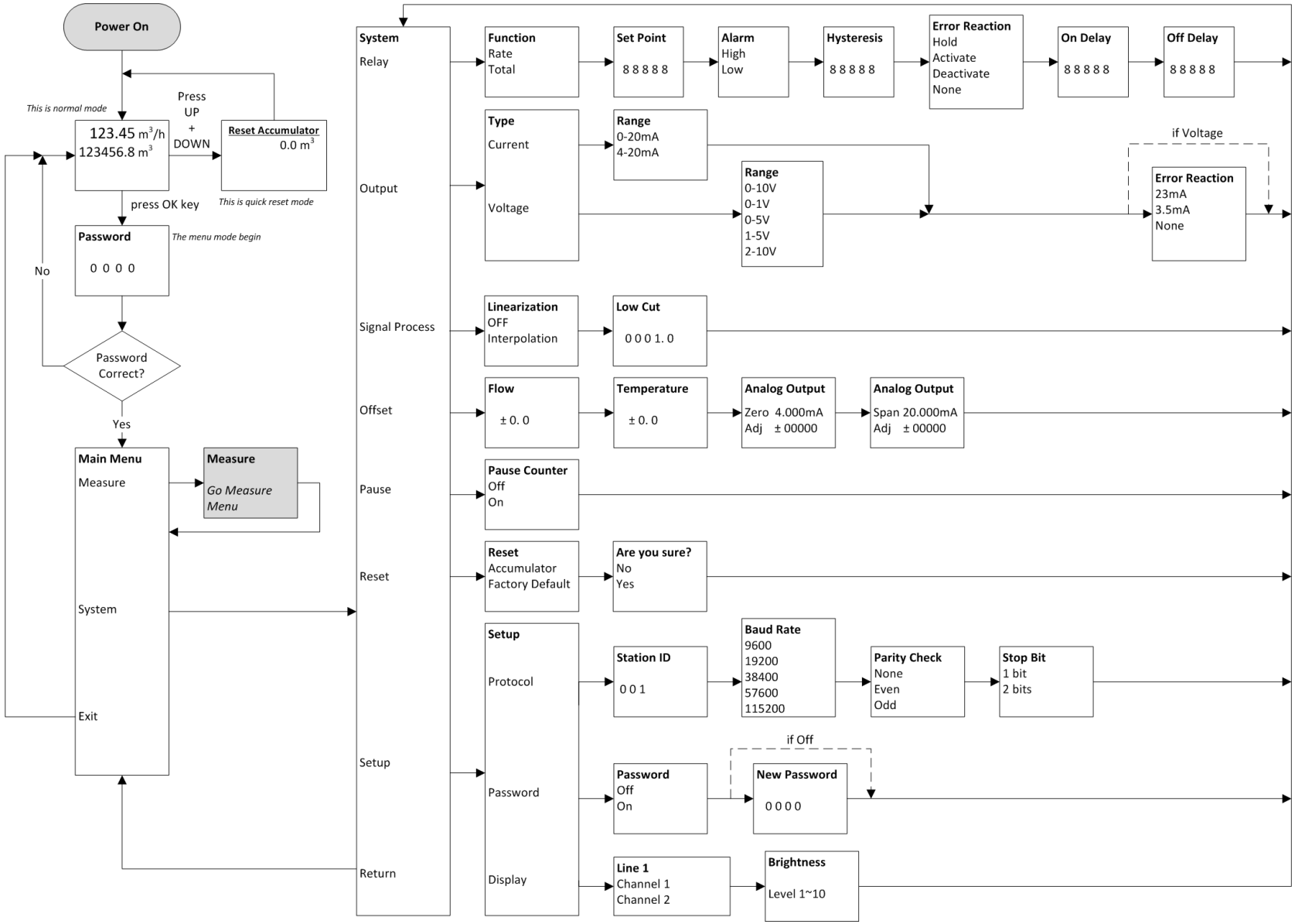
Do not use this product in a situation where human life may be affected.

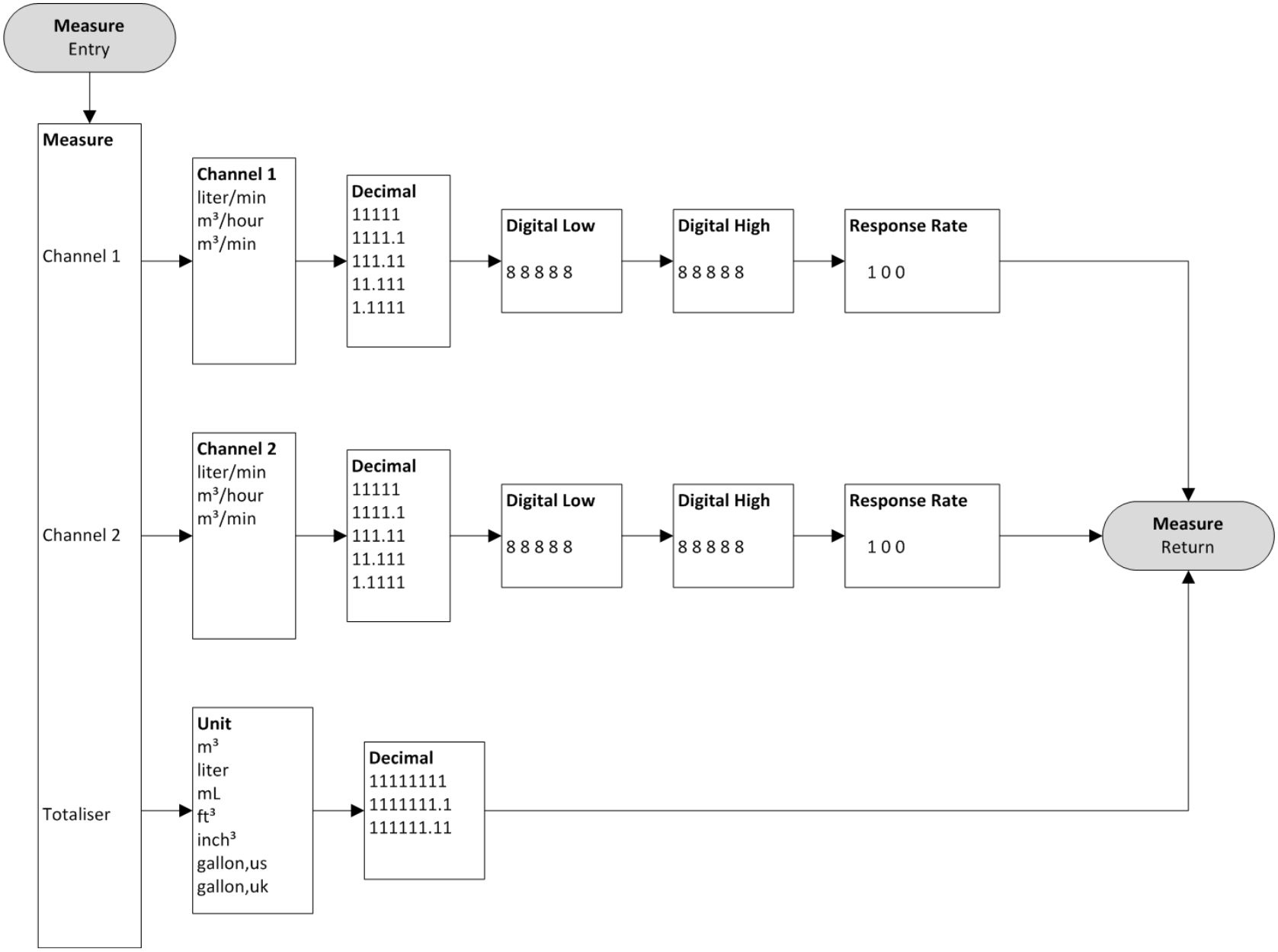
eyc-tech will not bear any responsibility for the results produced by the operators！

Warning!

- Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
- This product must be operated under the operating conditions specified in manual to prevent equipment damages.
- Please using the product under the ordinary pressure, or it will influence safe problem.
- This product must be operated under the operating condition specified in this manual to prevent equipment damages.
- This product must be operated under the normally atmospheric condition to prevent equipment damages.
- To prevent products damage, always disconnect the power supply from the product before performing any wiring and installation.
- All wiring must comply with local codes of indoor wiring and electrical installation rules.
- Please use crimp type terminal.
- To prevent personal injury, do not touch the moving part of product in operation.
- It may cause high humidity atmosphere during the product was breakdown. Please take safety strategy.

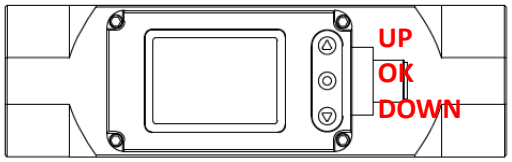
2. Operation Form

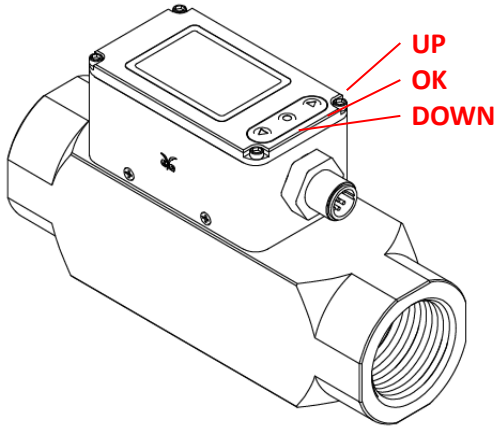



Measure
Entry
Measure
Channel 1
Channel 2
Totaliser
Channel 1
liter/min
m³/hour
m³/min
Channel 2
liter/min
m³/hour
m³/min
Unit
m³
liter
mL
ft³
inch³
gallon,us
gallon,uk
Decimal
11111
1111.1
111.11
11.111
1.1111
Decimal
11111
1111.1
111.11
11.111
1.1111
Decimal
11111111
1111111.1
111111.11
Digital Low
88888
Digital Low
88888
Digital High
88888
Digital High
88888
Response Rate
100
Response Rate
100
Measure
Return

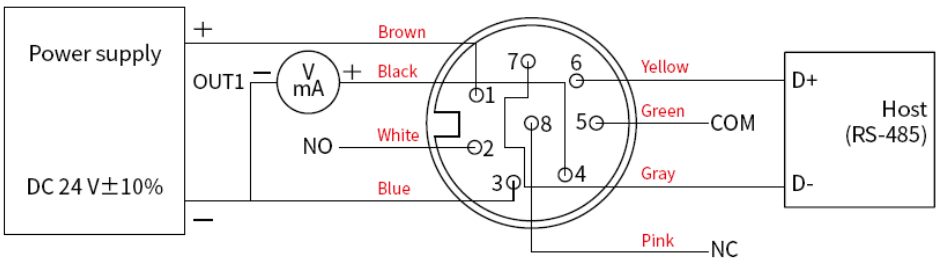
※Key Pad Operation Mode

Button Instruction	FDM06-I Operation Mode	
	Normal Mode	Menu Mode
Press UP once	Reserved	increase number or option once
Press OK once	Go Menu Mode	Submit the selection, go on next menu or complete the setting and then return to the normal mode
Press DOWN once	Reserved	decrease number or option once, shift cursot if numerical menu
Hold UP	Reserved	increase number or option faster
Hold OK 1.5 seconds	Reserved	Return to previous menu, or leave menu mode
Hold OK 5 seconds	Flow Rate Auto Zero	Reserved
Hold DOWN	Reserved	decrease number or option faster
Press UP and DOWN simultaneously	Reset Counter	Not Available





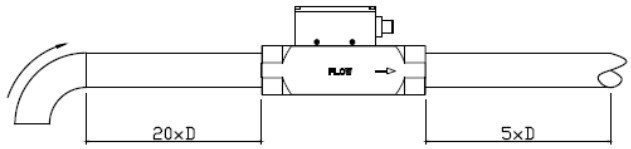
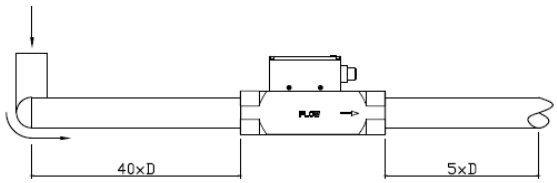
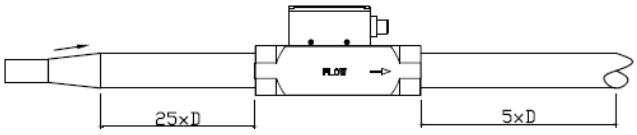
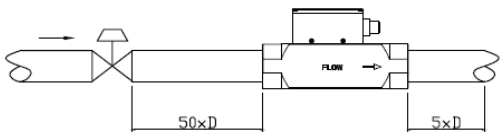
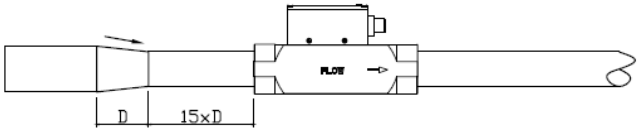
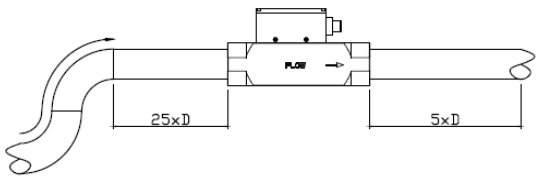
3. Connection Diagram



*Please make sure the product and the device which connect with RS-485 are on common ground, avoid damaged product.

4. Installation

The following table specifies the required straight lengths of the pipe sections depending on pipe diameter in case of different disturbances.

90° pipe(gas passes through the pipe turn)	Continuous 90° pipes in different horizontal planes (vertical gas flow and through curved pipes)
	
Tube expanding state (gas flow becomes large from small)	Control valve status (switch switching / gas flow adjustment)
	
Shrinking tube state (gas flow from large to small)	The gas flows continuously through the 90° bend in the same horizontal plane
	

5. RS-485 and Modbus

FDM06-I integrate a RS-485 interface for digital communication as an option feature. Based on Modbus protocol makes the general convenience on PLC, HMI and PC connection. For Modbus protocol information please download the file from website. Besides the PLC, HMI application, the user software provide the device setting and data logging function, it also can free download from website.

Technical Data：

(1) Max. network size：32 transmitters
(2) Communication：with COM-Port (serial interface) of PC
(3) Max. network expansion：1200m (3937ft) total length at 9600 baud
(4) Transmission rate：9600, 19200, 38400, 57600, 115200 Baud
(5) Parity：None, Even, Odd
(6) Data length：8 bit
(7) Stop bit：1 or 2 bit
(8) Factory default Station address = 1, Data format= 9600, N81

6. Autozero

The middle button allows user to set the current flow rate to zero point. It is required to press the button about 5 seconds, and user can see Auto Zero will be display. Then user can release this button and will see the prompt Auto Zero Done, and the new zero point has been set. Please make sure that the gas is completely still prior to execute this function.

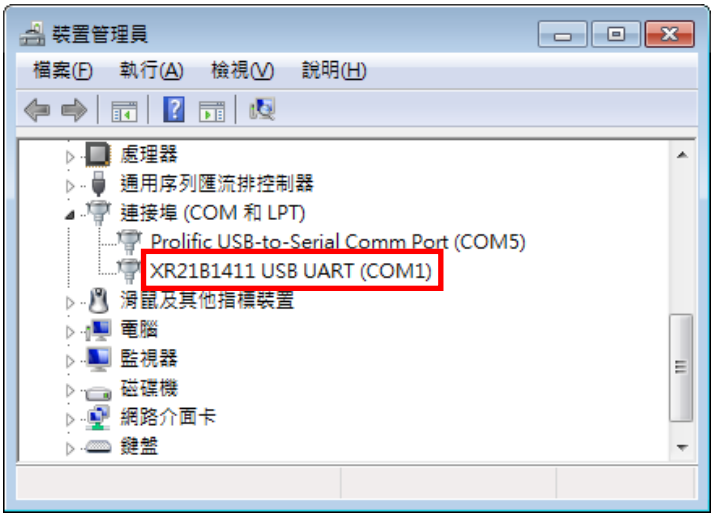
This button also allows user to restore factory default setting. It is required to press the button about 10 seconds, user will first see Reset Zero will be display. Then user can release this button and will see the prompt Reset Zero Done, and the new zero point has been set.

7. Software and Configuration Step

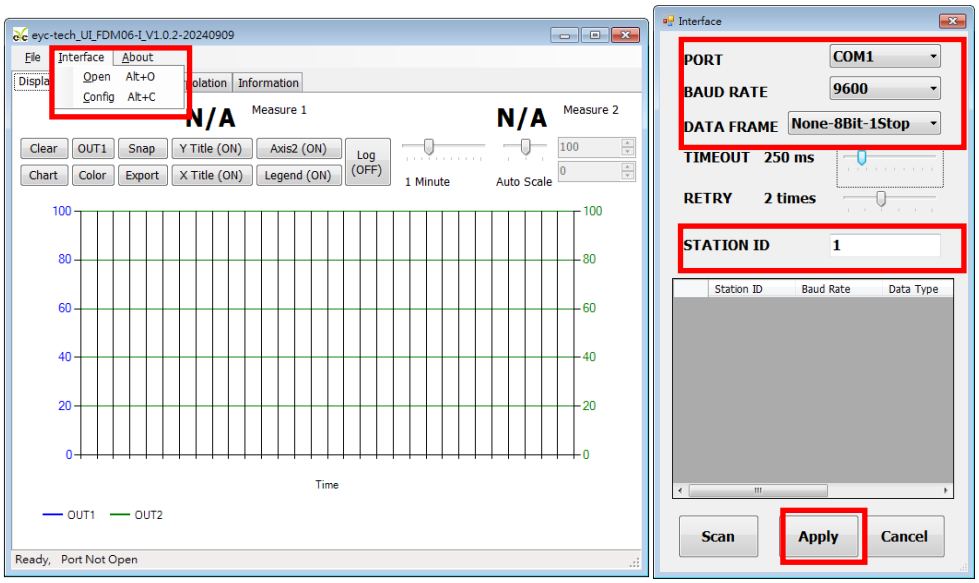
User may download the configuration software on eyc web site. Please decompress the application prior to execute it. Operating System requirements : above Windows

7. Other application program requirements：above Microsoft Office 2003

1. Hardware connection：Connect the FDM06-I to PC through USB to RS-485 or RS-232 to RS-485 converter
2. Check the COM port number from Device Manager in Computer Management. e.g. COM1 in illustration

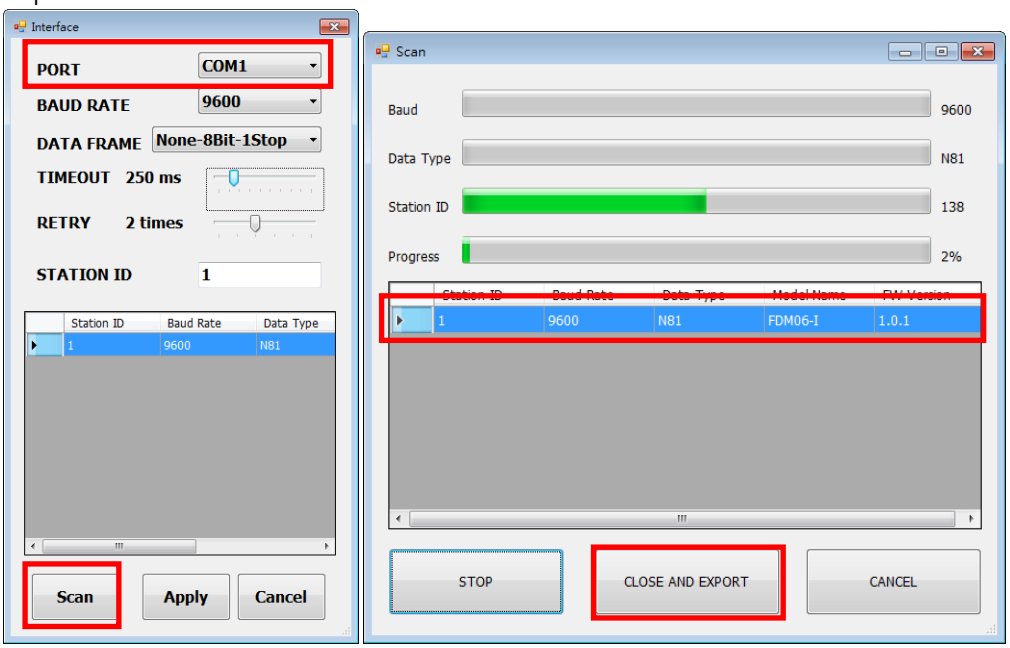


3. Open the FDM06-IC UI, go to function " Interface " , click item " Config " and then setting COM port, BAUD rate, data format and Station ID, pressed " Apply " for connection



4. Scan RS-485 connection

Open the FDM06-I UI, go to function " Interface " , click item " Config " and then setting COM port, pressed " Scan " bottom for scan devices and pressed " Close and Export " when the interested devices found.



Pick up the device that you want to connect to and then press "Apply" to go.

5. Setting on Analog Output

In the group of OUT1, Output tab. The output1 related setting could be found.

(1) Quantity：Flow Rate in unit of L/min, Flow Rate in unit of m/h, Flow Rate in unit of m/min

(2) Response rate： 1st order low pass filter inside, set 100 if filter disable and set 0 if the maximum response time. 100~0 possible. Lower value if lower fluctuation but longer response time, higher value if allow higher fluctuation but shorter response time.

(3) Analog Type：Voltage or Current

(4) Analog Range：0 ... 20 mA / 4 ... 20 mA (if output current) / 0 ... 10 V (if output voltage)

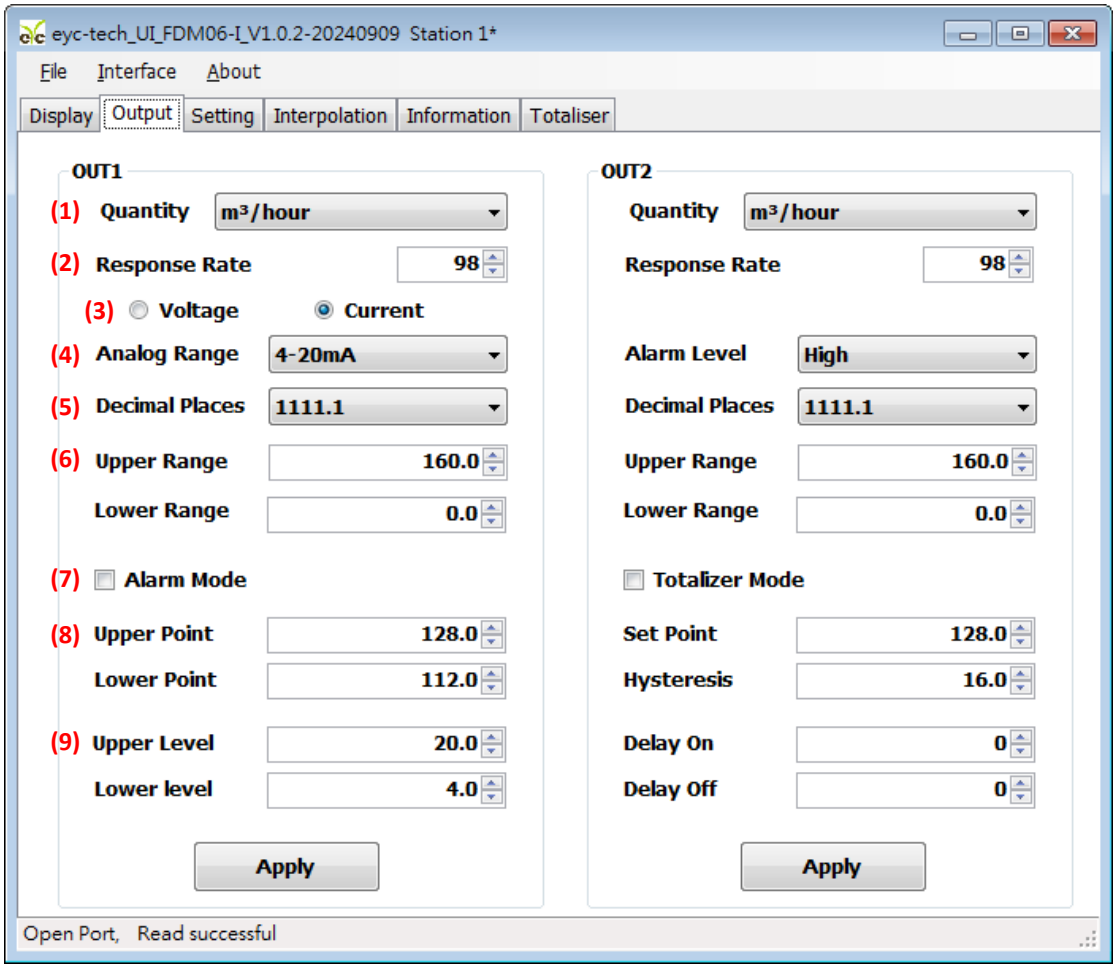
(5) Decimal Places：Up to 4 decimal places. Please note that the number of displayed digits is a fixed maximum of 5 digits, and the decimal digits need to occupy integer digits.

(6) Range for Display Upper and Lower

(7) Alarm Mode: Check the box if analog output pretend a alarm switch output

(8) Alarm Trigger Point: Upper and Lower

(9) Alarm Output Level: Upper and Lower



6. Setting on Relay Output

In the group of OUT2, Output tab. The relay related setting could be found.

(1) Quantity：Flow Rate in unit of L/min, Flow Rate in unit of m/h, Flow Rate in unit of m/min,

(2) Response rate： 1st order low pass filter inside, set 100 if filter disable and set 0 if the maximum response time. 100~0 possible. Lower value if lower fluctuation but longer response time, higher value if allow higher fluctuation but shorter response time.

(3) Alarm Level：Relay activate mode, activate at increasing signal (High) or activate at decreasing signal (Low)

(4) Decimal Places：Up to 4 decimal places. Please note that the number of displayed digits is a fixed maximum of 5 digits, and the decimal digits need to occupy integer digits.

(5) Range for Display Upper and Lower

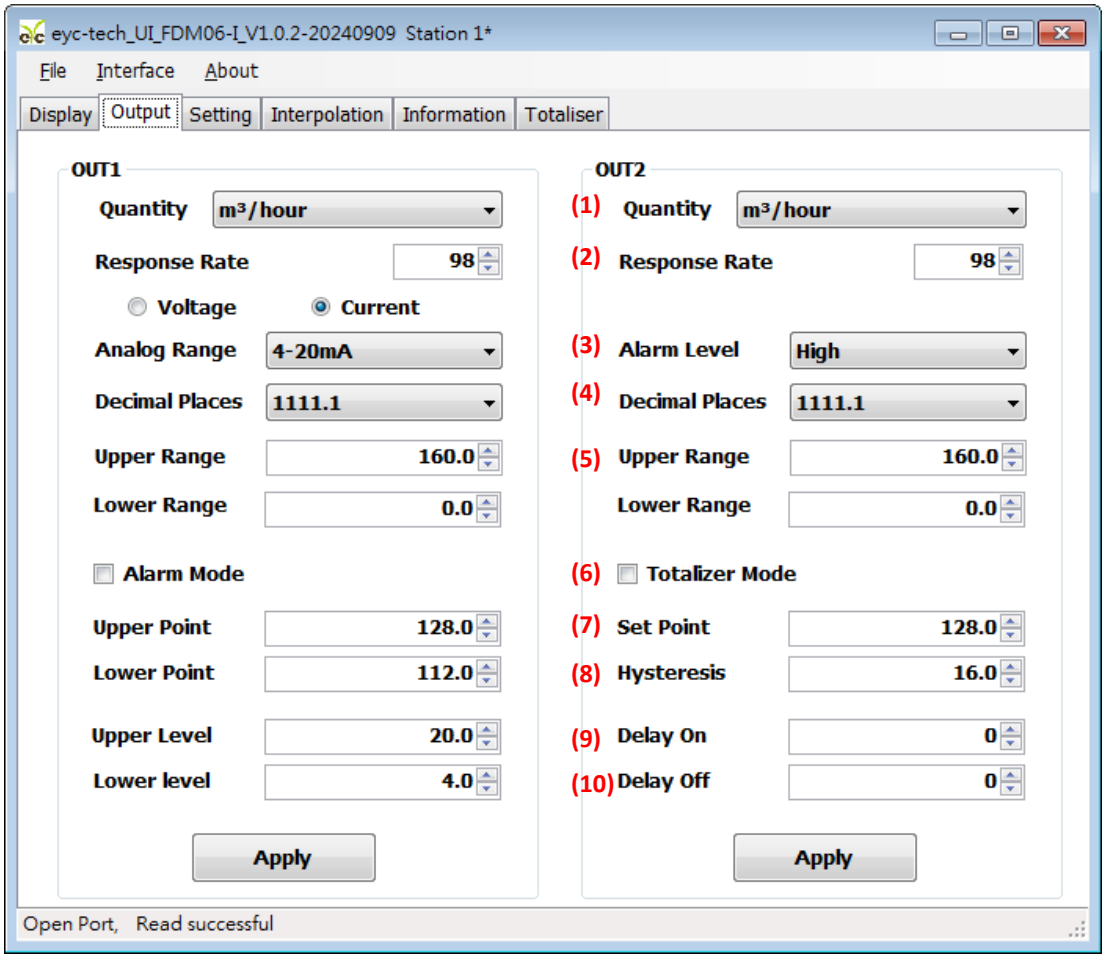
(6) Totalizer Mode: Check the box if relay activate source from flow accumulation counter

(7) Set Point：Activation Set Point

(8) Hysteresis：Activation Hysteresis Gap

(9) Delay On：Relay Activate Delay Time in second

(10) Delay Off：Relay Deactivate Delay Time in second



7. Offset adjustment and RS-485 Setup

There are 3 groups in setting tab. The description of each item as below.

※ Offset adjustment：

(1) Flow Rate Offset

(2) Flow Rate Low Cut Off Level

※ Modbus Protocol：

(3) Station ID

(4) Baud Rate

(5) Data Frame, the combination of parity check and stop bit

※ Menu Configuration：

(6) Configuration brief

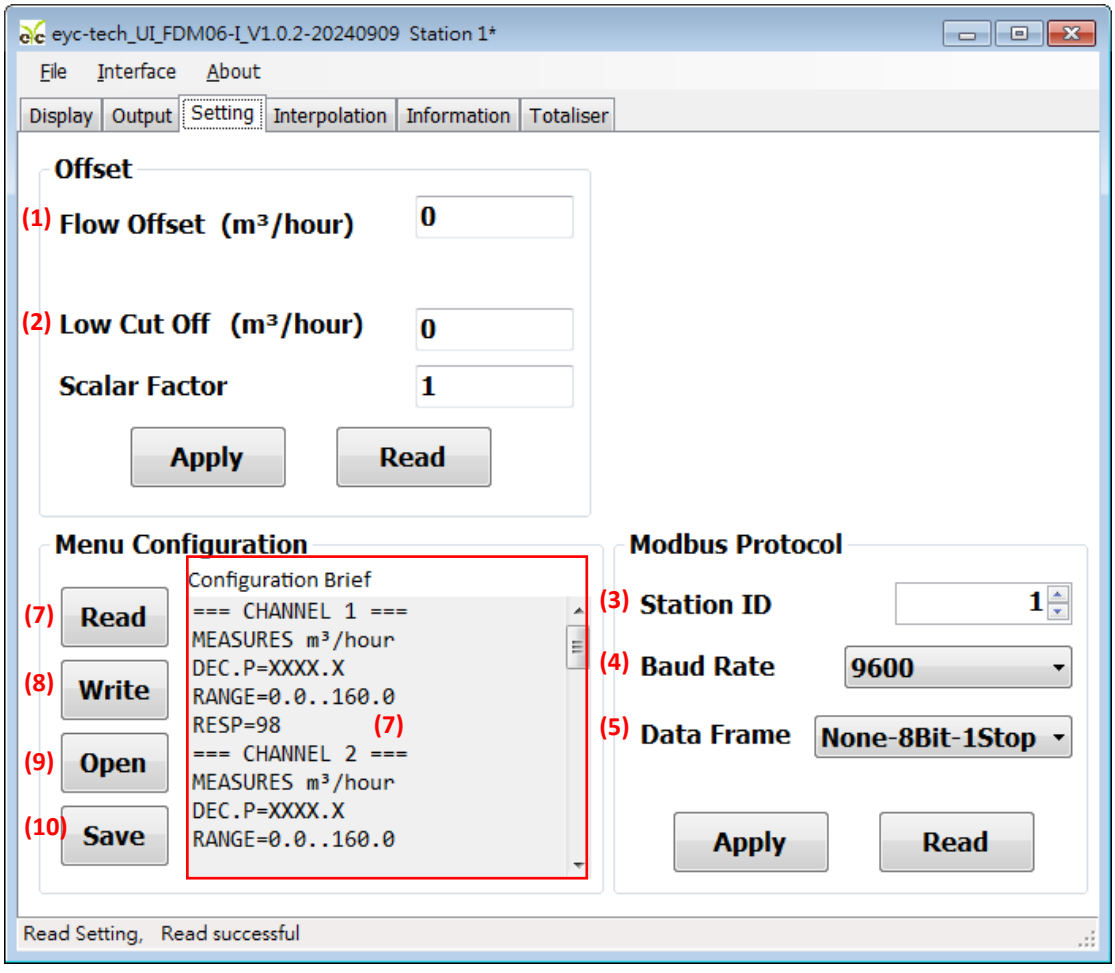
(7) Read：Upload the settings of the currently connected device

(8) Write：Download the setting of the currently connected device

(9) Open：Open configuration file and load the settings

(10) Save：Save configuration file

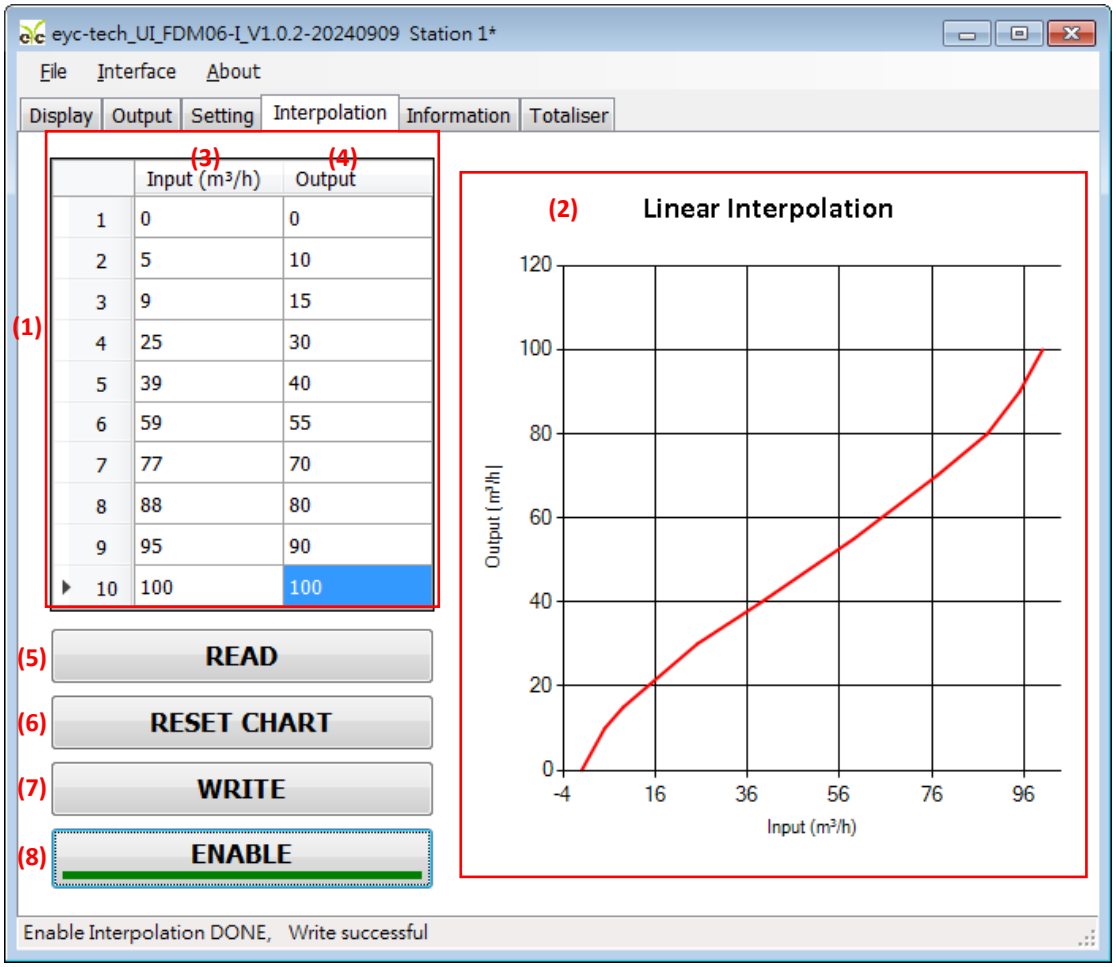
※ Modbus Protocol：



8. Linear Interpolation

Click the Interpolation tab to specify linear interpolation points.

(1) interpolation table
(2) interpolation curve
(3) interpolation input column, device measures value (raw value)
(4) interpolation output column, device output value (standard value or correction value)
(5) read the interpolation table of connected device
(6) Clear the interpolation table on configuration software. Note: this action will not modify the interpolation table of the device
(7) apply, the interpolation would be written in device
(8) enable, activate the interpolation calculation. When a green rectangle as shown below is displayed under the button, it means that interpolation is enabled, otherwise the interpolation function is turned off.



9. Data display and logging

On the Display tab, display the measurement data and log the data. The settings are as follows.

※button function description

Clear clear chart

Chart change chart drawing line style

OUT1 select the activate channel to be set color

Color set the activate channel line color

Snap capture drawing chart screen

Export export measurement data since the last "clear chart" or ui start up

Y Title (ON) Y-axis label On/Off

X Title (ON) X-axis label On/Off

AxisY2 (ON) secondary Y-axis On/Off

Legend (ON) chart legend On/Off

Log (OFF) data log function On/Off

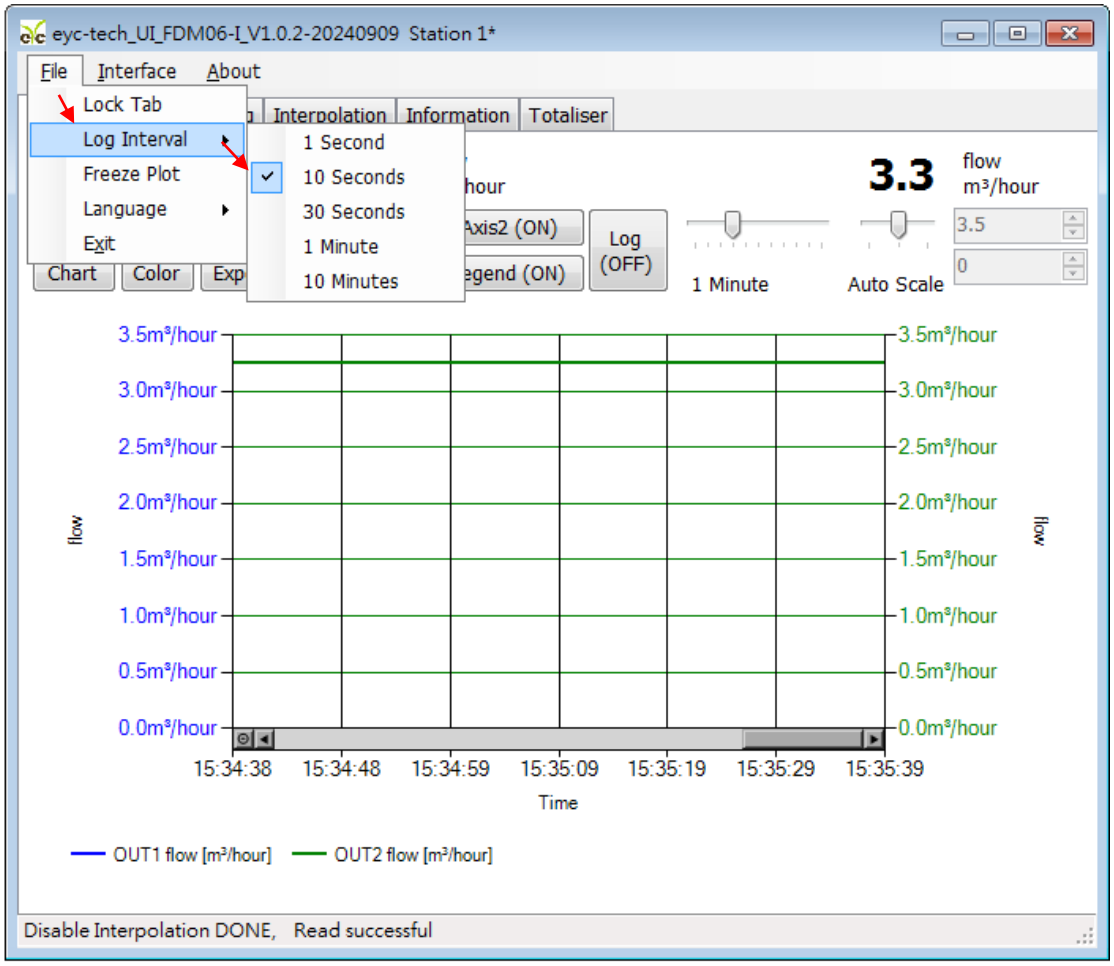
The X-axis scale adjustment

The Y-axis scale mode

※Set recording time interval

a. File > Log Interval

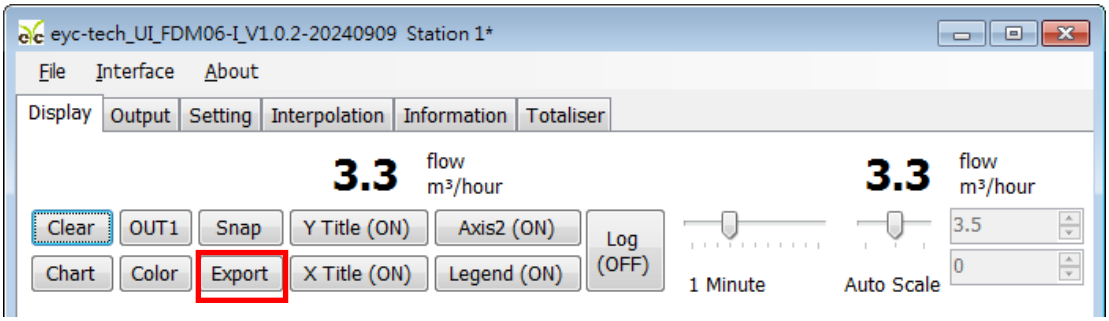
b. Select recording interval



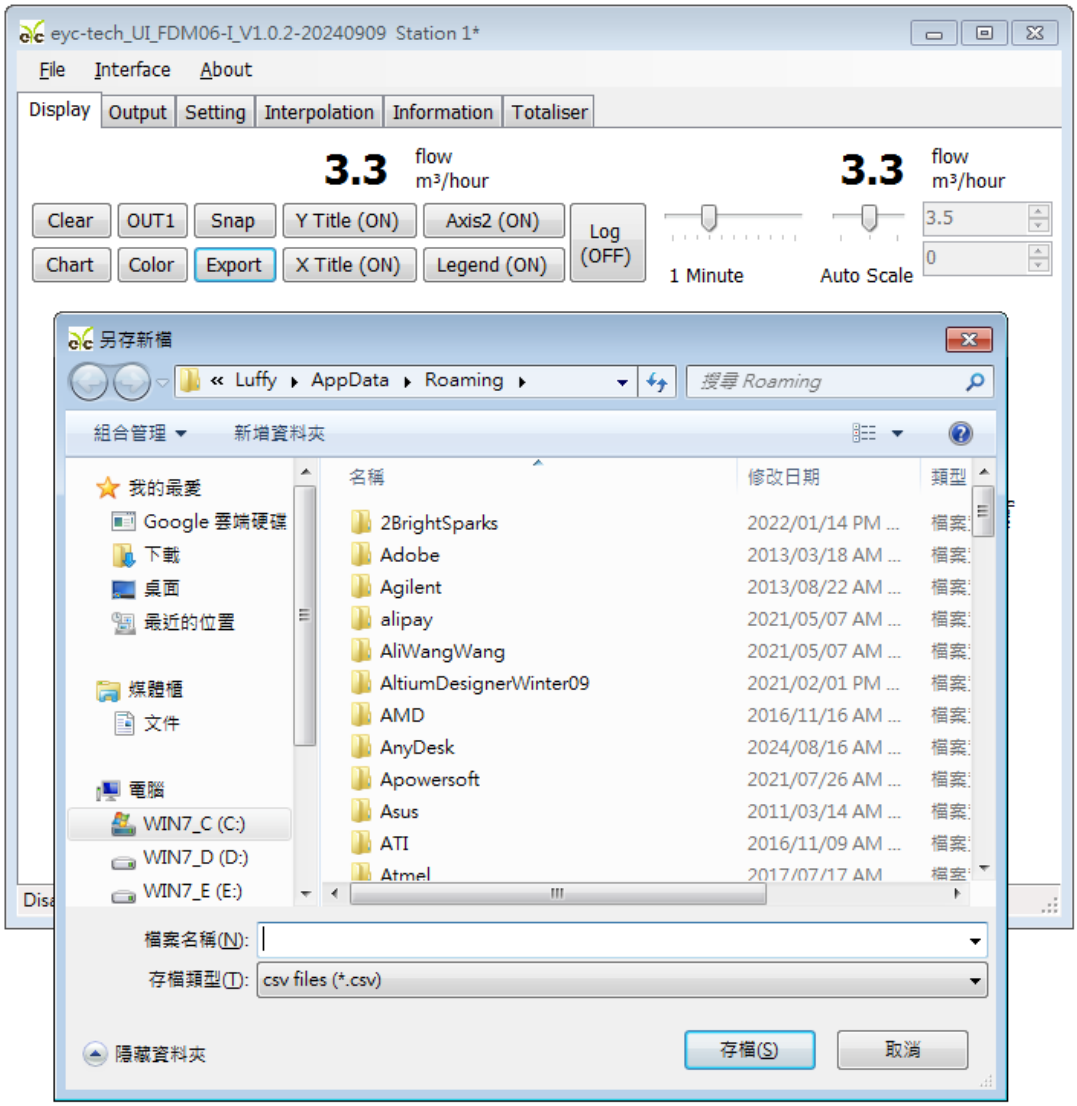
※Export/recording measurement

1. export measurement data since the last "clear chart" or ui start up

1-1. clock Display > Export



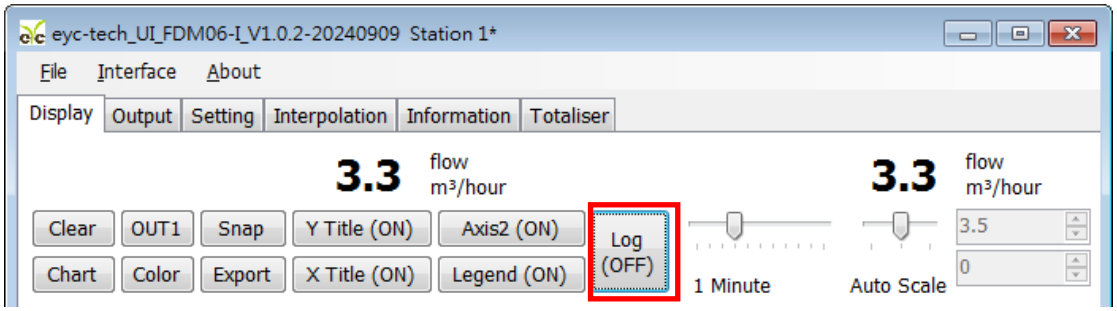
1-2. Specify the file path and file name > Save



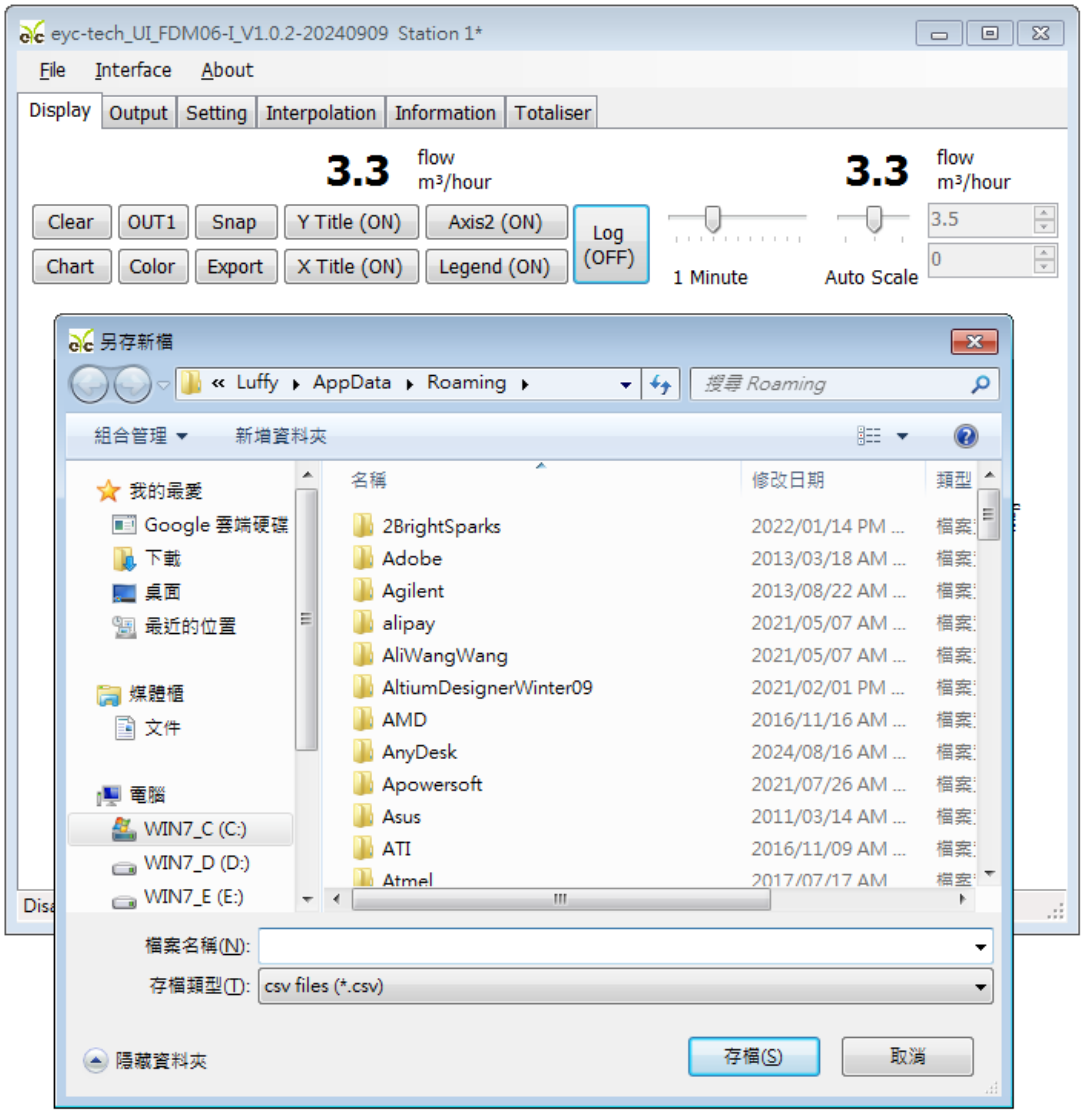
Note: If the specified file already exists, the data will be overwritten.

2. Record measurement data: record data since the Log function is turn on

2-1. Clock Display > Log(OFF)

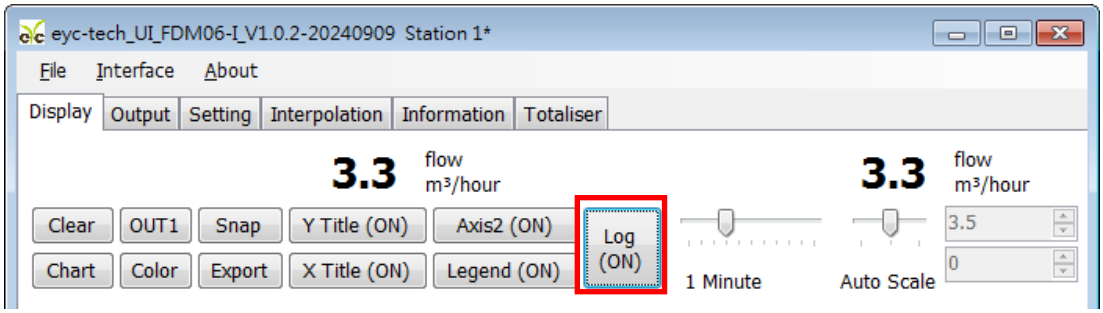


2-2. Specify the file path and file name > Save > Log(ON)

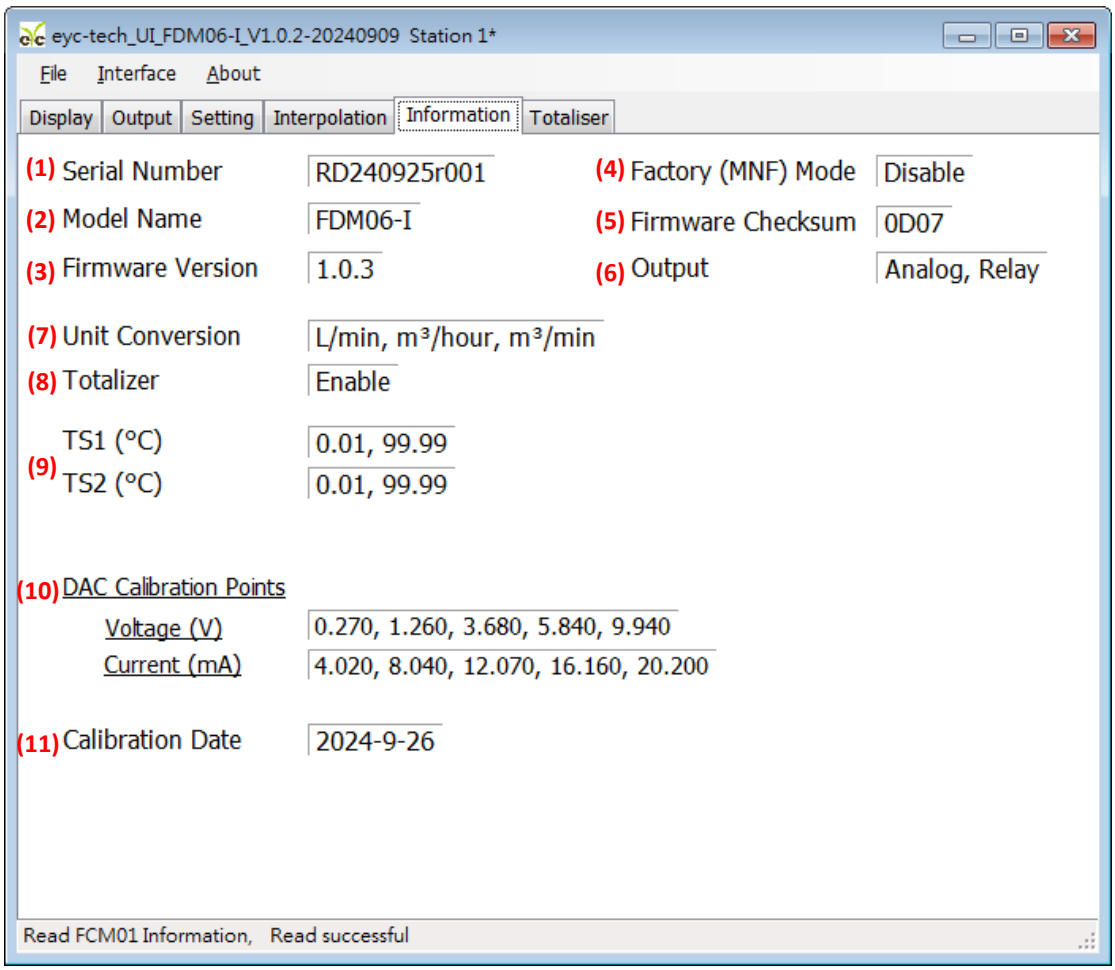


Note: If the specified file already exists, the data will be overwritten.

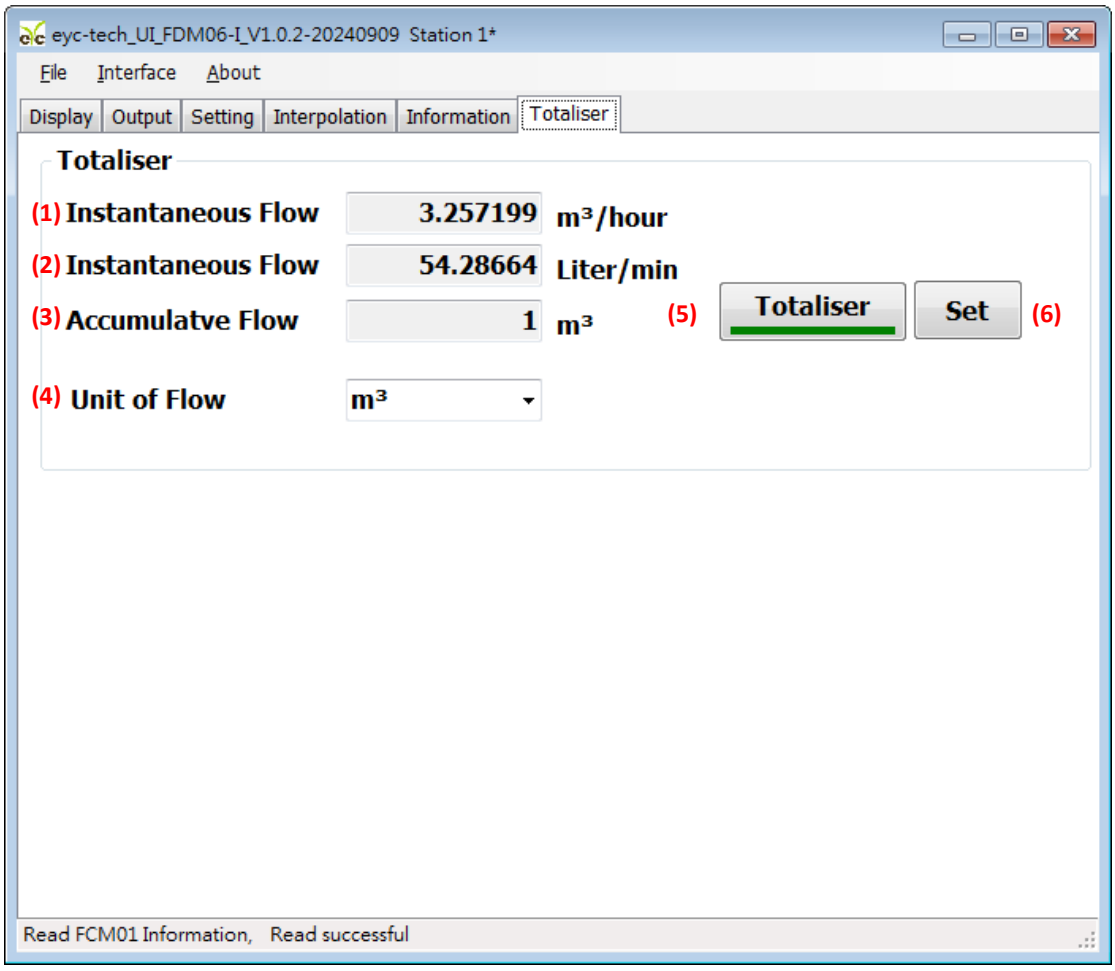
2-3. Finish recording measurement data: Click Log(ON) again. At this time, the button returns to displaying Log(OFF), and the recorded data file is stored in the specified file.



10. Device Information
    (1) Serial Number of Device
    (2) Model Name of Device
    (3) Firmware Version of Device
    (4) Factory Mode Status, default Disable
    (5) Firmware Checksum
    (6) Output equipment, supports analog output and relay functions
    (7) Supported Unit Conversion
    (8) Totalizer function, default enable
    (9) Temperature Calibration Points
    (10) Analog Output Calibration points
    (11) Calibration Date



11. Totalizer
    (1) Flow Velocity
    (2) Flow Volume Rate
    (3) Volume Accumulation Totalizer 1. Count positive flow only.
    (4) unit of counter 1
    (5) Function switch of totalizer 1
    (6) Ser/Reset Totalizer 1



8. Inspection and Maintenance

1. Maintenance

Since this product is inspected and calibrated for high accuracy at the factory before shipment, no calibration on the installation site is necessary when this product is installed

For inspection and maintenance follow the instructions below：

(a) Periodic inspection

Periodically inspect this product for its sensing accuracy, and clean the bypass channel. Set the period between inspections based on atmospheric dust and other contaminants in the installation environment

(b) Sensor maintenance

Do not damage sensor surface during maintenance process

(c) Troubleshooting

If any problem occurs during operation, refer to the table below for appropriate solutions

2. Troubleshooting：

Problem	Cleck items	Soluations
●No output ●Unstable output	●Disconnected wiring ●Loose wiring ●Power supply voltage ●Sensor damages	●Re-perform wiring ●Crew on terminal tightly or replace wires ●Clean up the bypass channel ●Replace the sensor
●Slow response to output ●Error in output	●Moisture / Condensation on the product ●Execute Autozero before measures ●Check installed location ●Check bypass channel ●Check dust and contamination on the sensor	●Remove the sensor cover and filter. Let the sensor unit dry naturally in a clean air environment ●Refer to the section 6. Autozero ●The straight length of pipe did not satisfy design specifications. Refer to the section 4. Installation ●Cleanup the bypass channel ●Calibrate ●Replace the sensor

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