



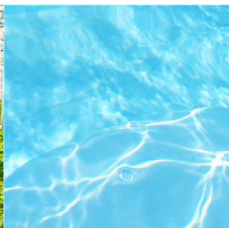
# Operation Manual

## eyc-tech FDM06S

Differential pressure type air flow transmitter



eyc-tech FDM06



## Contents

1. Security considerations.....	P.02
2. Operation Form.....	P.03
3. Connection Diagram.....	P.04
4. Installation.....	P.05
5. RS-485 and Modbus.....	P.06
6. Autozero.....	P.06
7. Software and calibration operation step.....	P.07
8. Inspection and maintenance.....	P.16

## 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.

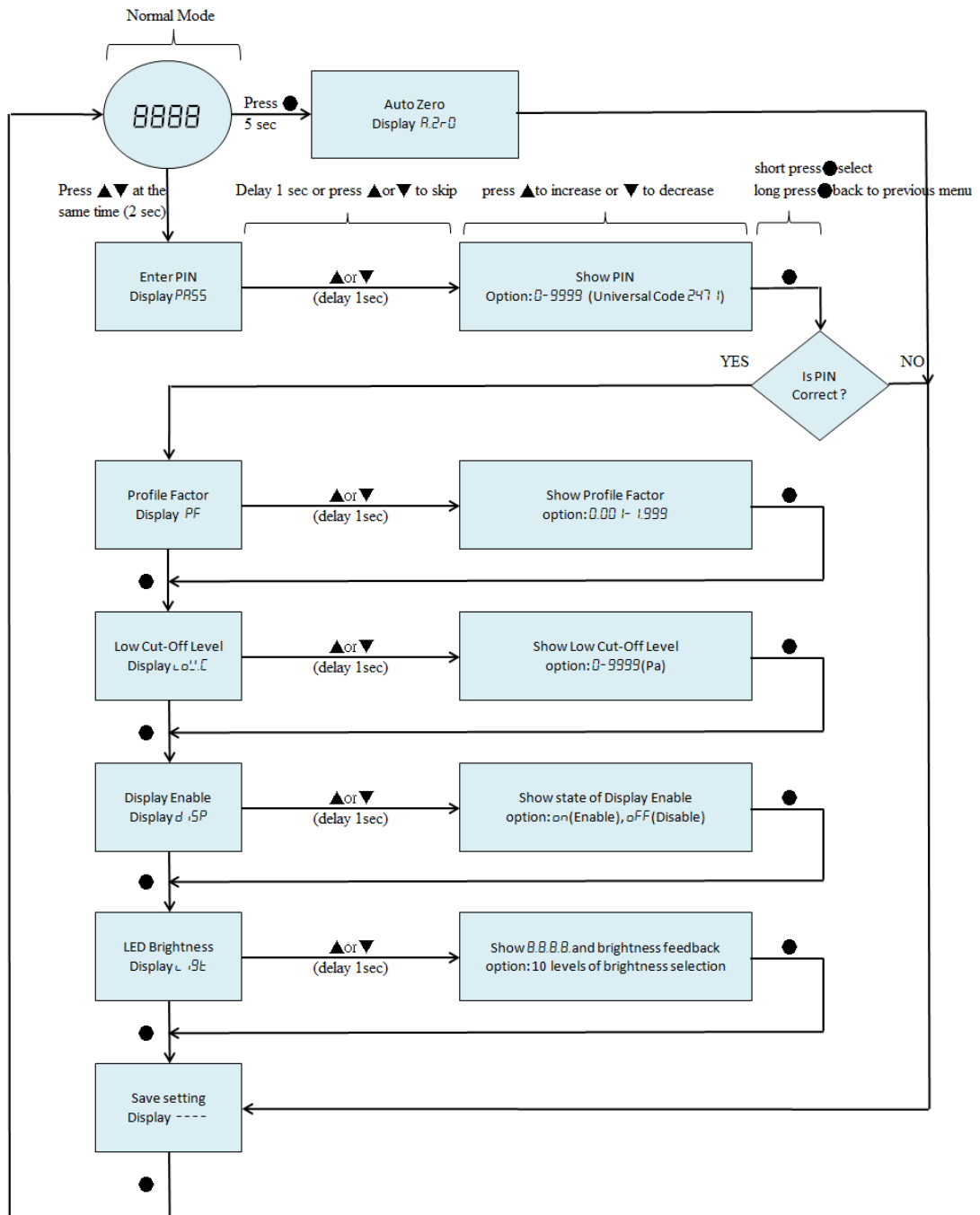
Do not use this product in a situation where human life may be affected.

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



## Differential pressure type air flow transmitter

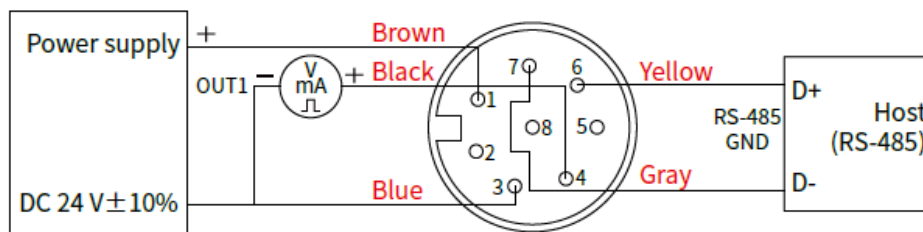
### ※Key Pad Operation Mode

Key Pad Operation	Display Mode	
	Normal	Menu
Click UP	Reserved	Next Option or Increase Value Once
Click OK	Reserved	Submit and Go Next Menu or Return to Normal Mode
Click DOWN	Reserved	Previous Option or Decrease Value Once
Hold UP	Reserved	Speedy Next Option or Increase Value
Hold DOWN	Reserved	Speedy Previous Option or Decrease Value
Hold OK 5 sec	Auto Zero	Reserved
Press UP and DOWN	Go Menu Mode	Reserved

### ※Display Symbol

Symbol	Description
<b>PASS</b>	Password Validation
<b>PF</b>	Profile Factor
<b>LOW</b>	Low Cut-Off
<b>DISP</b>	Display Enable
<b>BRT</b>	Brightness Level
<b>ON</b>	ON
<b>OFF</b>	OFF
<b>----</b>	Submit Setting and Exit Menu Mode


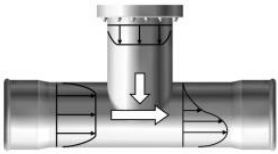
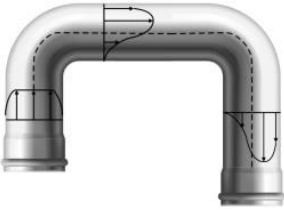
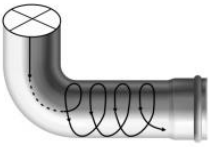
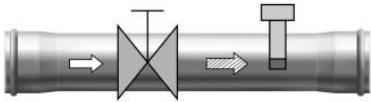
## 3. Connection Diagram



\*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.

Type	Drawing	Upstream straight pipe	Downstream straight pipe
Light bend (< 90°)		10 x D	10 x D
T-junction		15 x D	10 x D
Two 90° bends in one plane		20 x D	5 x D
Two 90° bends with 3-dimensional Change in direction		35 x D	10 x D
Shut-off valve		45 x D	10 x D

## 5. RS-485 and Modbus

FDM06 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

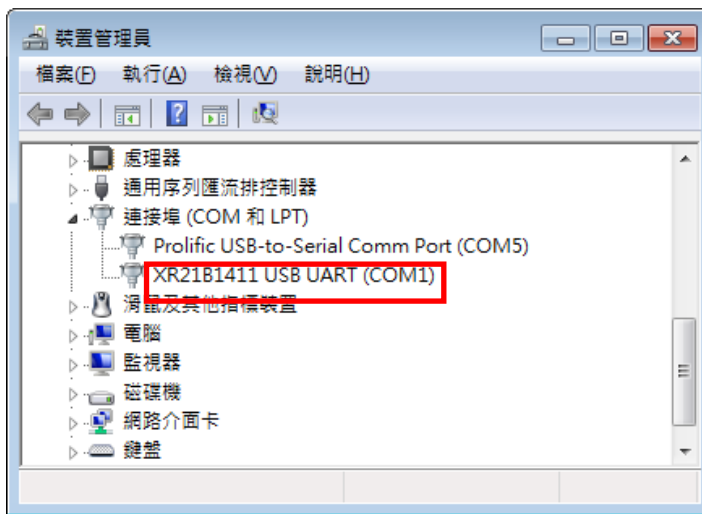
The middle button allows user to set the current pressure to zero point. It is required to press the button about 5 seconds, and user can see **A.2-r-o** will be display. Then user can release this button and will see the prompt **-----**, and the new zero point has been set. Please make sure that the 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 **F.2-r-o** will be display. Then user can release this button and will see the prompt **-----**, and the new zero point has been set.

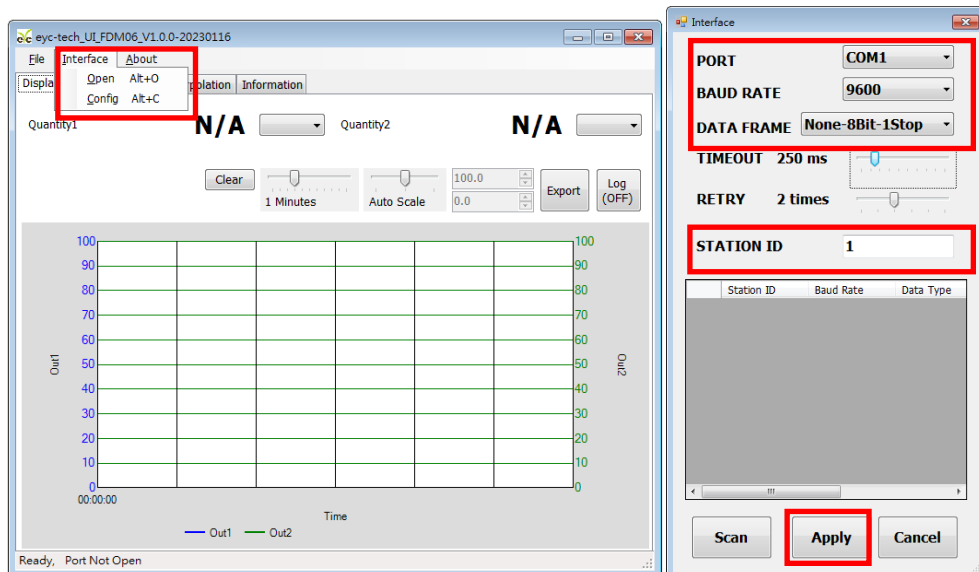
## 7. Software and configuration step

User may download the configuration software on eyc web site. Please decompress the application prior to execute it. Operating System requirements : above Windows XP. Other application program requirements : above Microsoft Office 2003

1. Hardware connection : Connect the FDM06 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



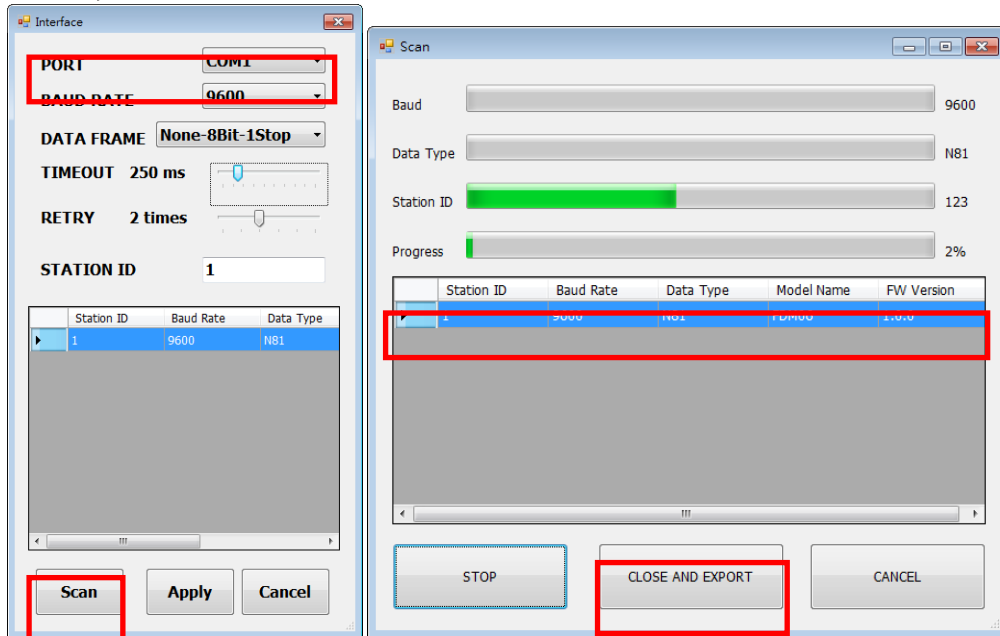
3. Open the FDM06C UI, go to function " Interface " , click item " Config " and then setting COM port, BAUD rate, data format and Station ID, pressed " Apply " for connection





4. Scan RS-485 connection

Open the FDM06 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.

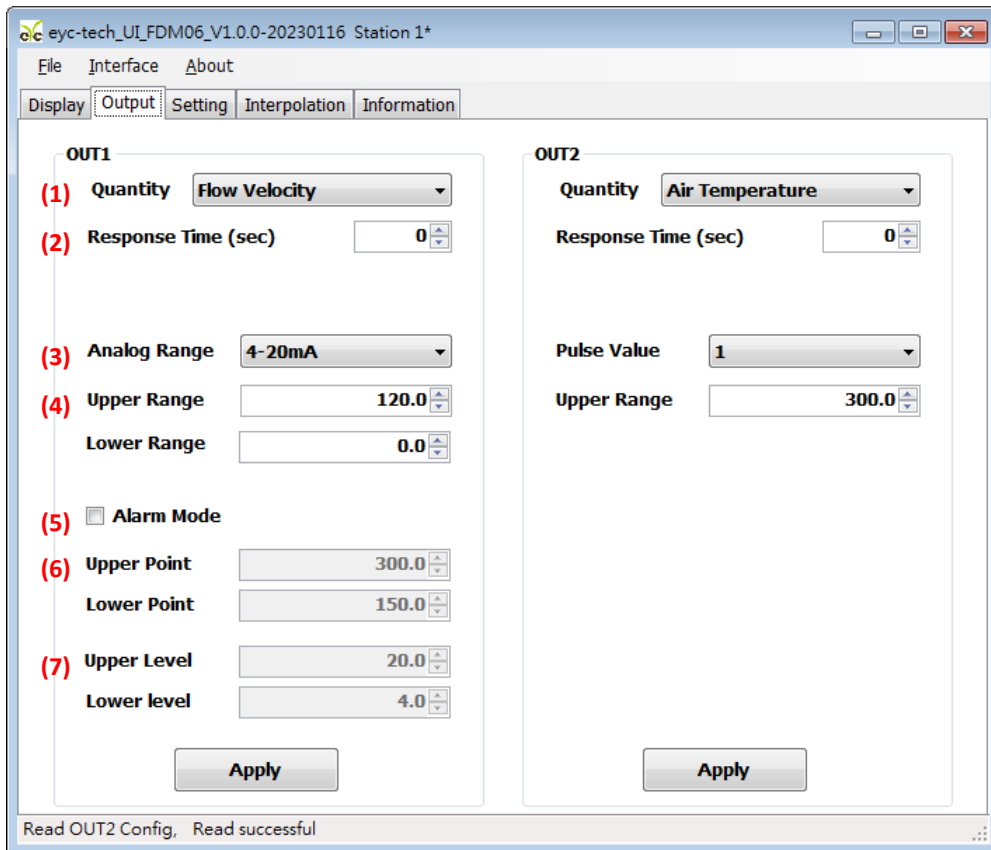


Pick up the device that you want to connect to and then press "Apply" to go.

5. Setting on Analog Output

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

- (1) Quantity : Differential Pressure, Flow Velocity, Air Temperature, Flow Volume and Barometric Pressure
- (2) Response rate : 1<sup>st</sup> order low pass filter, T90 time 0 ... 100 , higher value if lower fluctuation but longer response time, lower value if allow higher fluctuation but shorter response time.
- (3) Analog type : 0 ... 20 mA / 4 ... 20 mA (if output current) / 0 ... 10 V (if output voltage)
- (4) Range for Upper and Lower
- (5) Alarm Mode: Check the box if analog output pretend a alarm switch output
- (6) Alarm Trigger Point: Upper and Lower
- (7) Alarm Output Level: Upper and Lower

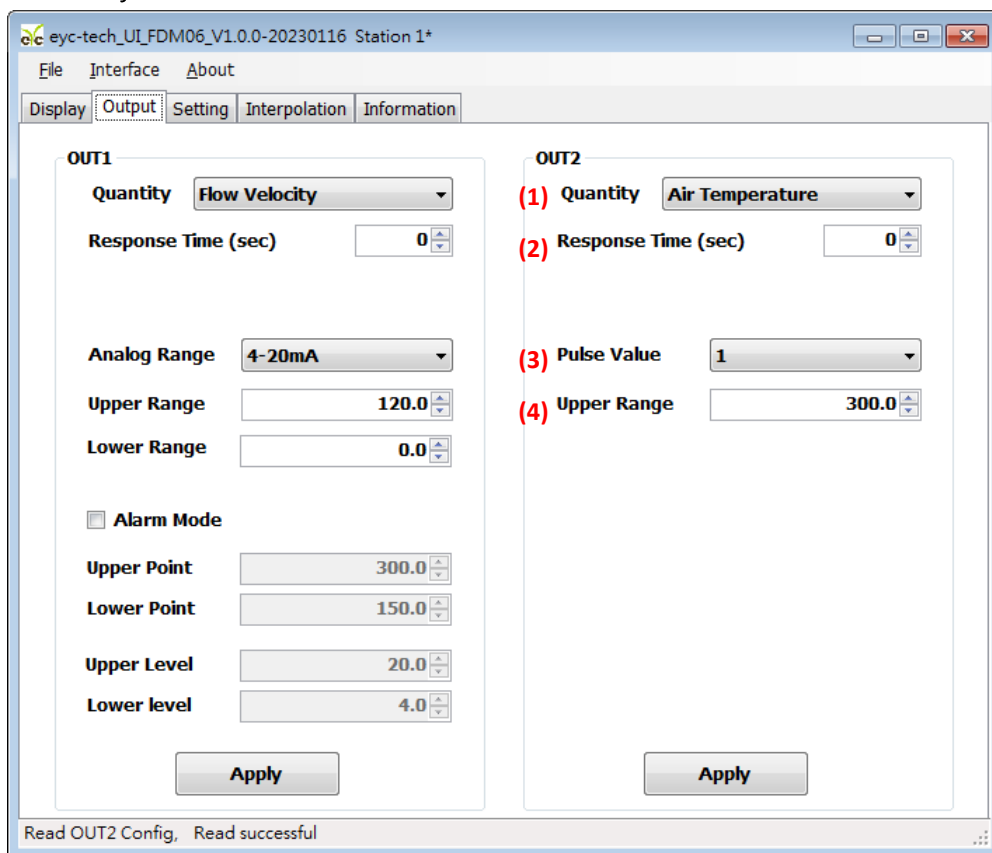


## Differential pressure type air flow transmitter

### 6. Setting on Impulse Output (Optional, Only Available if Function Equipped)

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

- (1) Quantity : Differential Pressure, Flow Velocity, Air Temperature, Flow Volume and Barometric Pressure
- (2) Response rate : 1st order low pass filter, T90 time 0 ... 100 , higher value if lower fluctuation but longer response time, lower value if allow higher fluctuation but shorter response time.
- (3) Impulse Value : The valence of single impulse quantity
- (4) Upper Range : Span upper point or maximum output. The span lower point always const zero.



### 7. Setting on RS-485, Process Parameters and offset adjustment

## Differential pressure type air flow transmitter

There are 4 groups in setting tab. The description of each item as below.

※ Process Parameters :

(1) Gas molar mass, default air

Common gas molar table, the actual molar mass depends on substances molar mass of compounds and mixtures. The table of common molar mass for reference.

substances	Molar mass (g/mol)
Air	28.966
Argon, Ar <sub>2</sub>	39.948
Carbon Dioxide, CO <sub>2</sub>	44.01
Hydrogen, H <sub>2</sub>	2.016
Nitrogen, N <sub>2</sub>	28.0134
Neon, Ne	20.179
Oxygen, O <sub>2</sub>	31.9988

(2) Relative Humidity of working condition

(3) Profile factor of gas velocity

(4) Differential Pressure factor, default 1

(5) Pipe shape and dimension: round duct, square duct and any if input area directly.

※ Offset Adjustment :

(6) velocity offset

(7) temperature offset

(8) differential pressure cut off level

(9) differential pressure offset

(10) atmosphere pressure offset

(11) flow direction: Enable bidirectional flow: considers reserve flow if negative differential pressure. Disable bidirectional flow: considers still flow if negative differential pressure.

※ Modbus Protocol :

(12) station ID

(13) Baud Rate

(14) Data Frame

(15) Flash memory write protect

※ Miscellaneous :

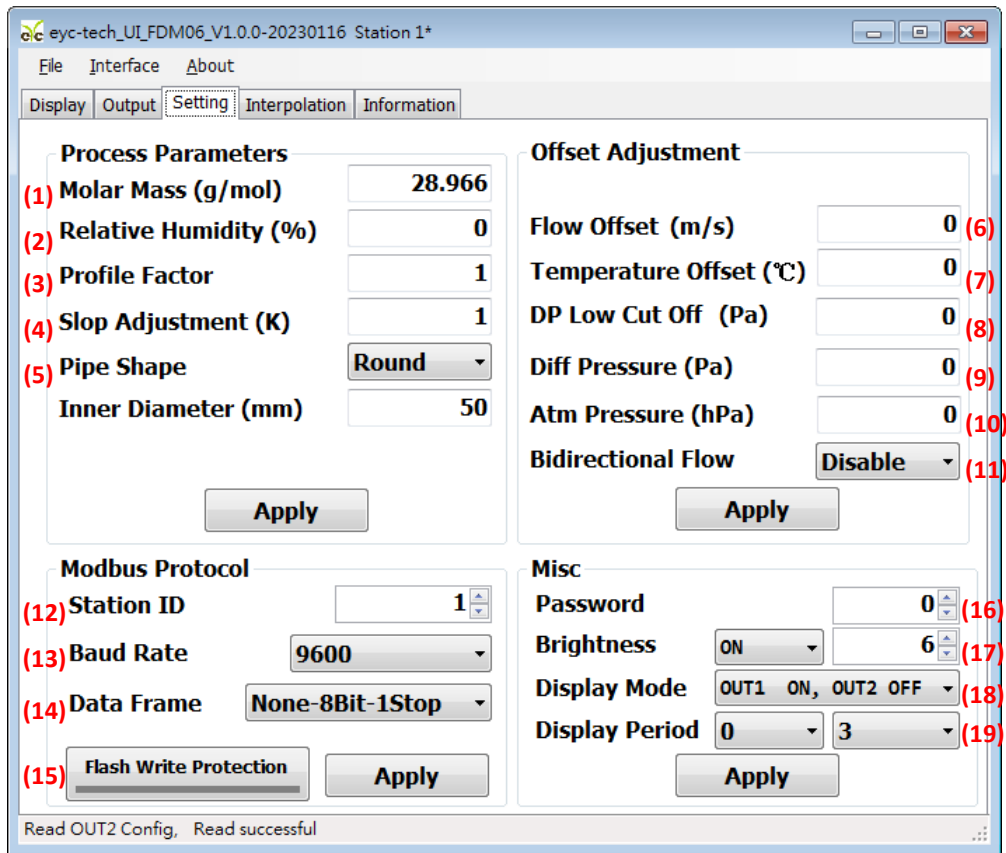
(16) Password of keypad menu

(17) LED brightness

(18) Display Alternate Items : Only OUT1, Only OUT2 or display OUT1 and OUT2 in turn

Differential pressure type air flow transmitter

- (19) Display Alternate Period : the first field for quantity unit duration, the seconds field for quantity measure duration (seconds)



The screenshot shows the following configuration details:

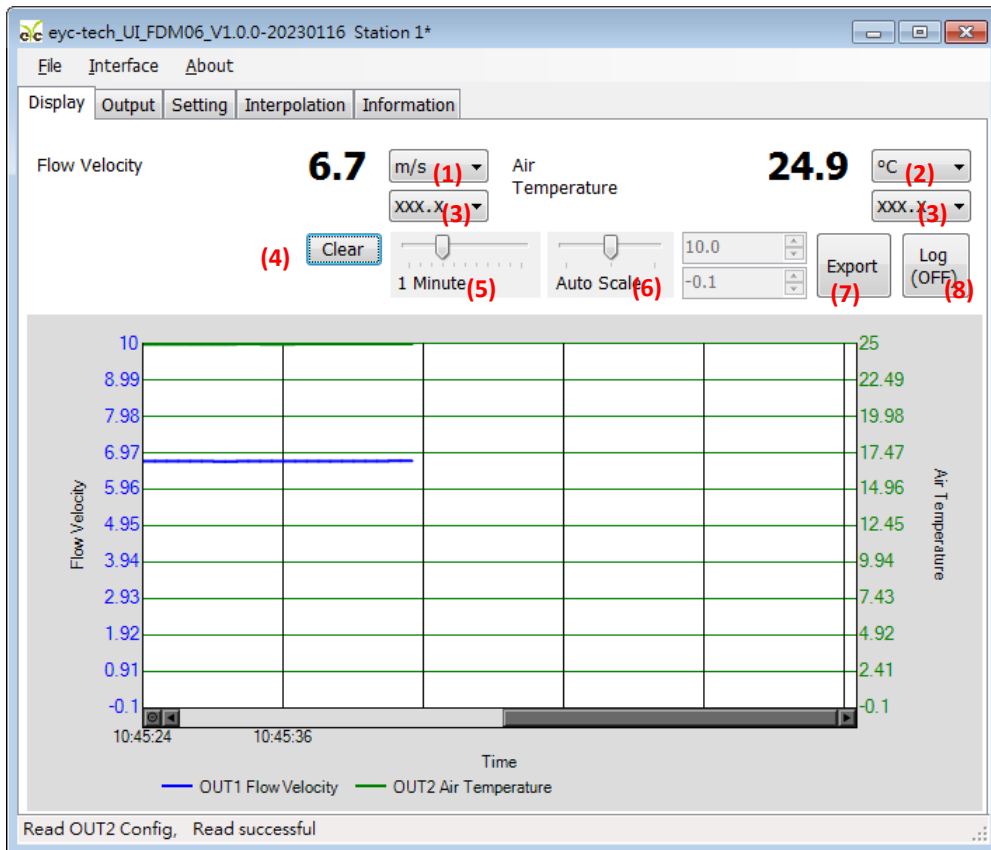
- Process Parameters:**
  - (1) Molar Mass (g/mol): 28.966
  - (2) Relative Humidity (%): 0
  - (3) Profile Factor: 1
  - (4) Slop Adjustment (K): 1
  - (5) Pipe Shape: Round
  - Inner Diameter (mm): 50
- Offset Adjustment:**
  - (6) Flow Offset (m/s): 0
  - (7) Temperature Offset (°C): 0
  - (8) DP Low Cut Off (Pa): 0
  - (9) Diff Pressure (Pa): 0
  - (10) Atm Pressure (hPa): 0
  - (11) Bidirectional Flow: Disable
- Modbus Protocol:**
  - (12) Station ID: 1
  - (13) Baud Rate: 9600
  - (14) Data Frame: None-8Bit-1Stop
  - (15) Flash Write Protection: [Checked]
- Misc:**
  - (16) Password: 0
  - (17) Brightness: ON, 6
  - (18) Display Mode: OUT1 ON, OUT2 OFF
  - (19) Display Period: 0, 3

At the bottom of the window, a status bar reads: "Read OUT2 Config, Read successful".

## Differential pressure type air flow transmitter

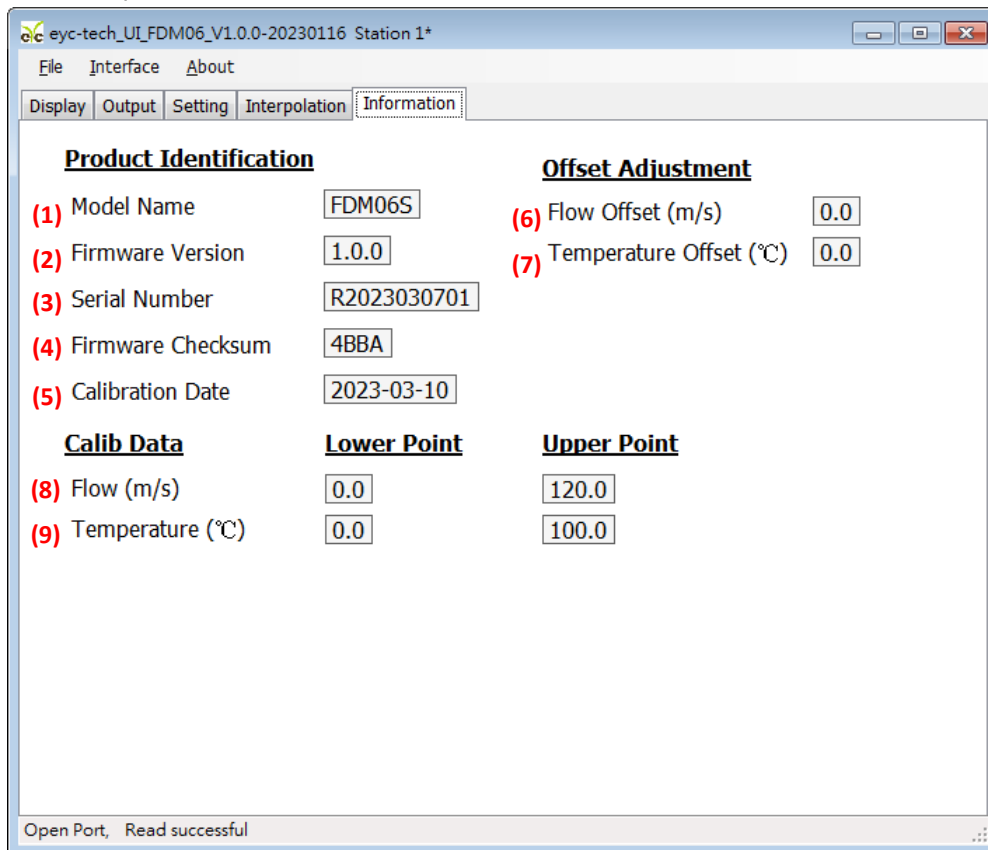
### 8. Data display and logging

- (1) Assign OUT1 Unit : Differential Pressure : mBar, Pa, hPa, kPa, mmWS, inH2O, mmHg ; Flow Velocity : m/s, ft/s ; Air Temperature : °C, °F ; Flow Volume : Kg/h, Nm3/h, L/min, m3/min ; Barometric Pressure : ATM, Bar, hPa, kPa, mmHg
- (2) Assign OUT2 Unit : as OUT1' s
- (3) Display Decimals
- (4) Clear Measure Plot Chart
- (5) Time scale of plot
- (6) Vertical scale of plot
- (7) Export all logging data since device is connected
- (8) Start/Stop data logging



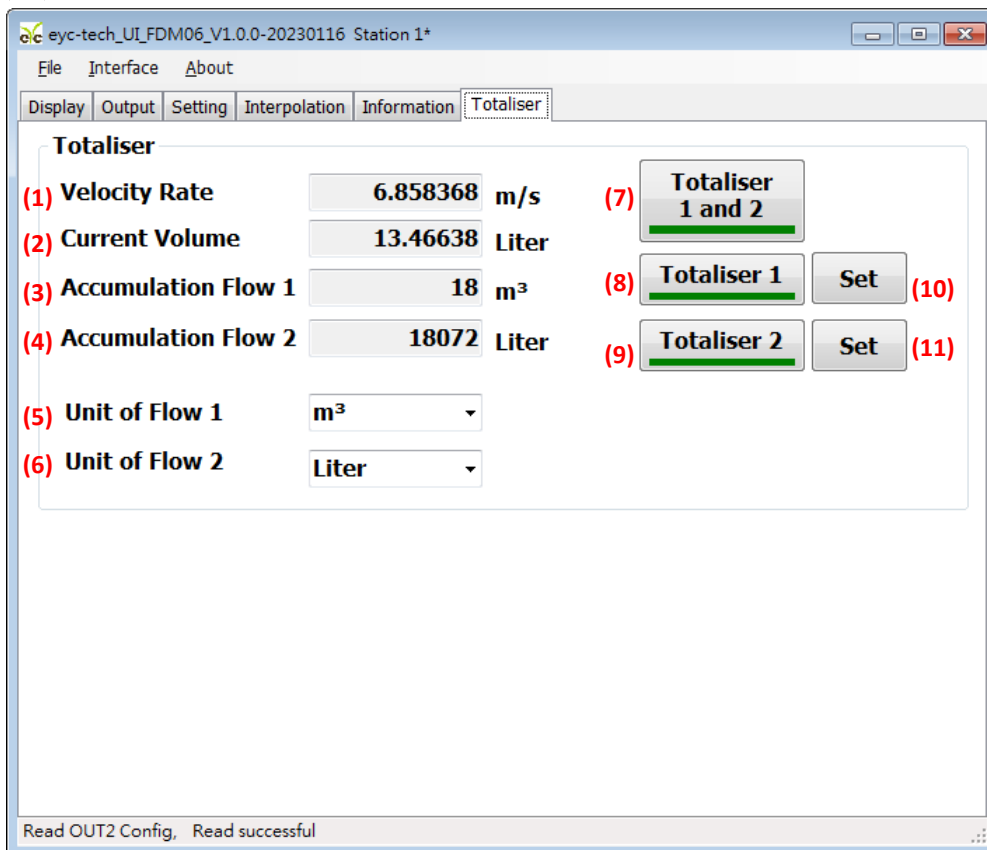
9. Device Information

- (1) Model Name of Device
- (2) Firmware Version of Device
- (3) Serial Number of Device
- (4) Firmware Checksum
- (5) Calibration Date
- (6) Flow Offset
- (7) Temperature Offset
- (8) Flow Calibration Range
- (9) Temperature Calibration Points



10. Totalizer

- (1) Flow Velocity
- (2) Flow Volume Rate
- (3) Volume Accumulation Totalizer 1. Count positive flow only.
- (4) Volume Accumulation Totalizer 2. Count total flow amount without direction if Bidirectional flow mode is enabled. Thus, the reverse flow amount = Totalizer 2 – Totalizer 1
- (5) unit of counter 1
- (6) unit of counter 2
- (7) Main switch of totalizer
- (8) Function switch of totalizer 1
- (9) Function switch of totalizer 2
- (10) Ser/Reset Totalizer 1
- (11) Set/Reset Totalizer 2





## 7. 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 cover  
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
<ul style="list-style-type: none"> <li>● No output</li> <li>● Unstable output</li> </ul>	<ul style="list-style-type: none"> <li>● Disconnected wiring</li> <li>● Loose wiring</li> <li>● Power supply voltage</li> <li>● Sensor damages</li> </ul>	<ul style="list-style-type: none"> <li>● Re-perform wiring</li> <li>● Crew on terminal tightly or replace wires</li> <li>● Replace the sensor</li> </ul>
<ul style="list-style-type: none"> <li>● Slow response to output</li> <li>● Error in output</li> </ul>	<ul style="list-style-type: none"> <li>● Moisture / Condensation on the product</li> <li>● Execute Autozero before measures</li> <li>● Check installed location</li> <li>● Check installed angle</li> <li>● Check dust and contamination on the sensor</li> </ul>	<ul style="list-style-type: none"> <li>● Remove the sensor and filter dry power-off state sensor in clean air seasoning</li> <li>● Refer to the section</li> <li>● Align measurement head with flow direction</li> <li>● Cleaning the filter</li> <li>● Changing the filter</li> <li>● Calibrate</li> <li>● Replace the sensor</li> </ul>

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