

Technical Information

Xonic[®] 100 Series

Open Channel

Ultrasonic Flowmeter



Open Channel Guidebook

Instruction Manual

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Delivery Items

Flow Computer



Transducer



Mounting Track



Cable



Overview

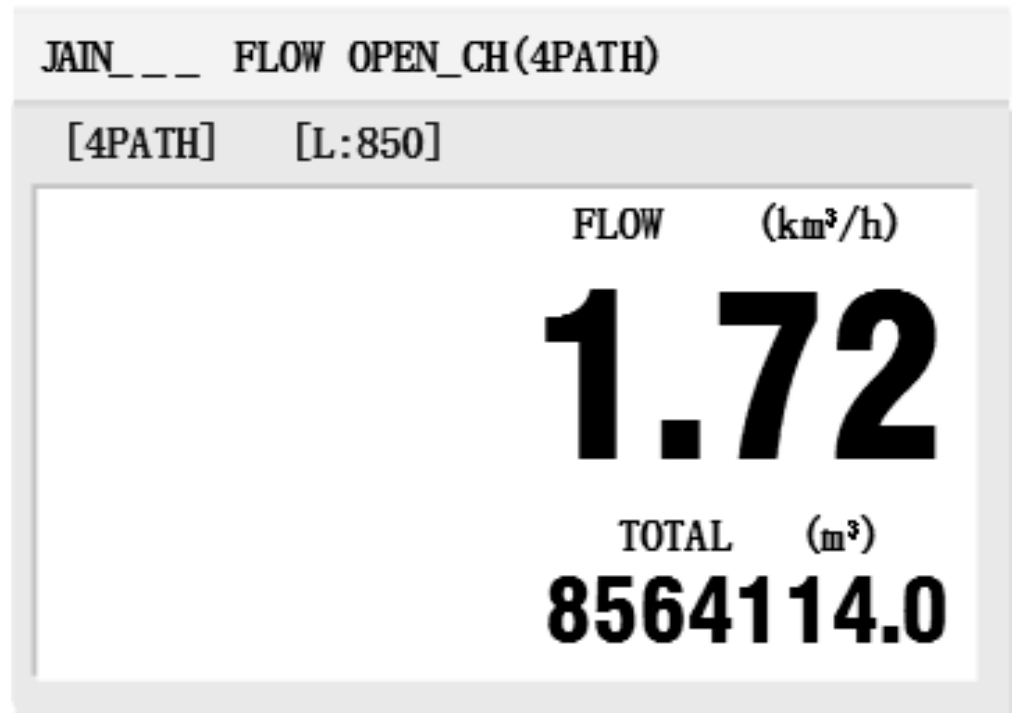
Introduction	<p>Xonic100LM Ultrasonic Open Channel Flowmeter use ultrasonic transit-time method for flow velocity and use level transmitter to receive level data. User can use either 4 path or 2 path for measuring the open channel application. Xonic 100LM is newly developed and has very sophisticated diagnostic functions for better performance.</p> <p>Xonic 100LM use certified new technology, PATENT “Very precise time measurement method” also with PATENT “Transducer Design for Open Channel”. The patent is about transducers alignment method in field, and engineers can align one transducers to opposite transducer very precisely with laser pointer. Xonic 100 transducers are designed as a ball type, so the transducer can be aligned to all directions.</p>
Application	<ul style="list-style-type: none"> Water Supply, Drainage, Water Purification Facility (Clean Water, Municipal Water, Waste Water, Manure and Etc.) Steel Factory and Mining Industries (Lime Stone Slurries, De-Ionized Water and Etc.) Power Plants
Features	<ul style="list-style-type: none"> Patent 10-0560364 Patent 10-0918369 Patented AR Mode (Anti-Round)
Specifications	<ul style="list-style-type: none"> Principle : <ul style="list-style-type: none"> Anti-Round Beam Transit-Time With Cross Correlation Fast Fourier Transform Measuring Width : ~ 20m Accuracy : ± 2.0 % Sensitivity: ± 0.03 m/s Analog Input : Two 4~20mADC Analog Output : Two 4~20mADC Relay for Total : Two <ul style="list-style-type: none"> RS-232C RS-485 Data Logger : 8 Mbytes Display : Graphic Color LCD (Flow, Total, Velocity, Delta T, Ultrasonic Signal Shape, Frequency) Temperature : <ul style="list-style-type: none"> Electronics: -20 ~ +60 °C Transducers : -40 ~ +120 °C Power Battery : AC 110 ~ 220V or DC 12 ~ 24V Enclosure : NEMA 4 (IP65) Transducer : NEMA 7 (IP68, Water Proof)

Identification of Product On the right side of flowmeter, there is a silver sticker with per product's S/N. This is Identification of the product.

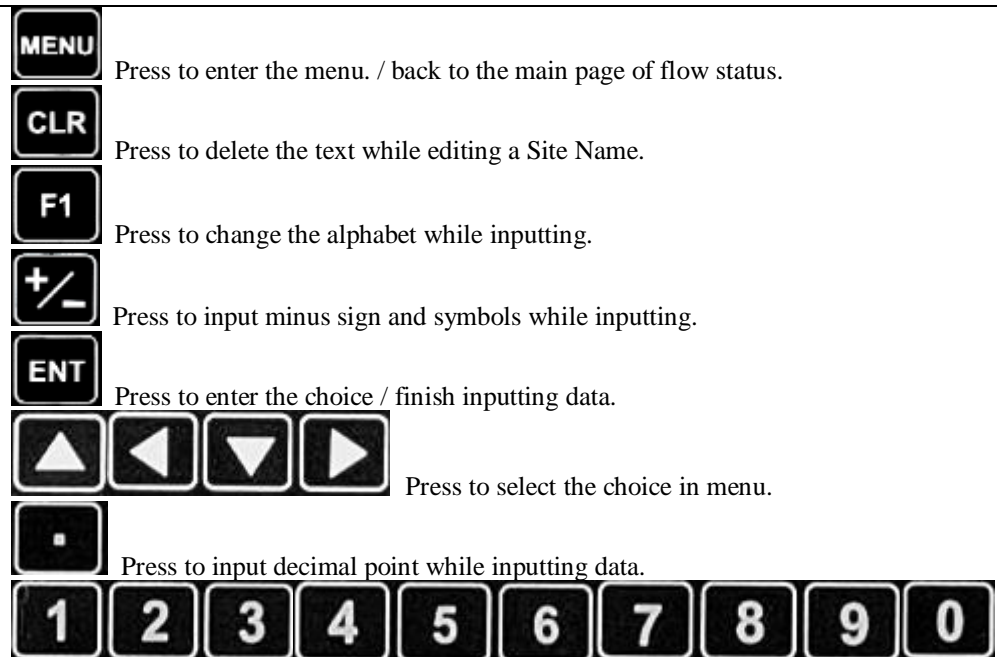
Ultrasonic Flowmeter	
Xonic – 100LM	
P/N: Xonic-100	V/M: 3.1.0
S/N: C10184	AC110~220V
JAIN TECHNOLOGY 02-856-4114 www.jain.co.kr	

Control and Display

Display



Keypad



Press to input numbers while inputting data / select the choice in menu.

*Numbers hereinafter referred to as [NUM]

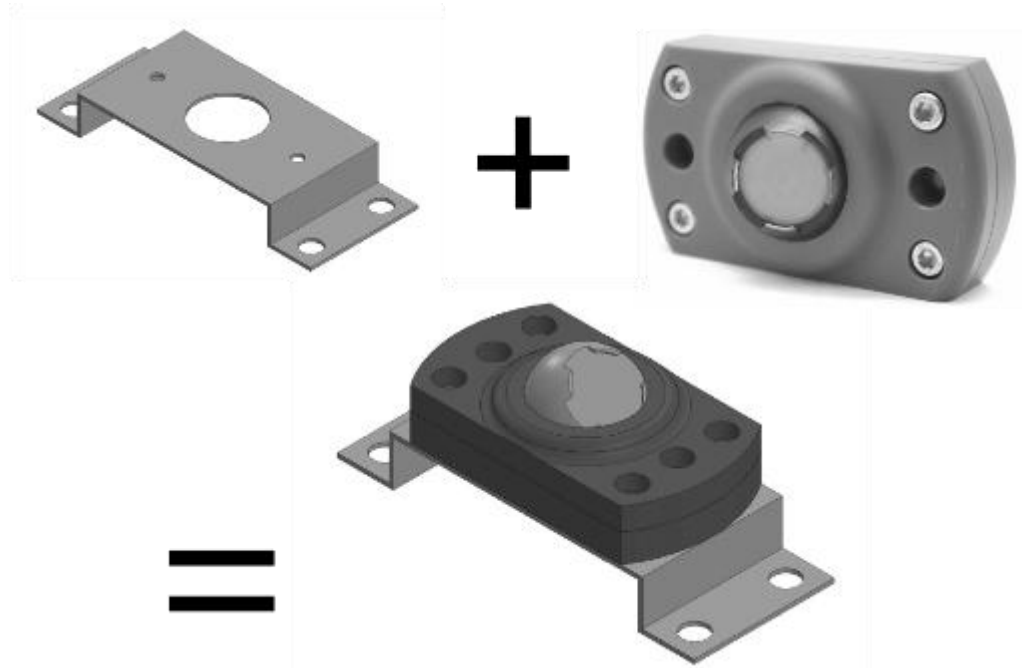
Instructions - Transducers Installation

The ALSONIC-AVM may be used in rectangular, circular, trapezoidal or other shaped channels. Since the transducers create almost no restriction, virtually no head loss is created. The advanced DSP-based flow computer with cross-correlation and FFT technology allows this system to work in the most difficult applications, including those involving liquids with high concentrations of suspended solids & air or a large noise component. Please read this manual carefully before installation.

e.g.) Open Channel - Dual Path

Step 1: Assembling Sensor and Bracket

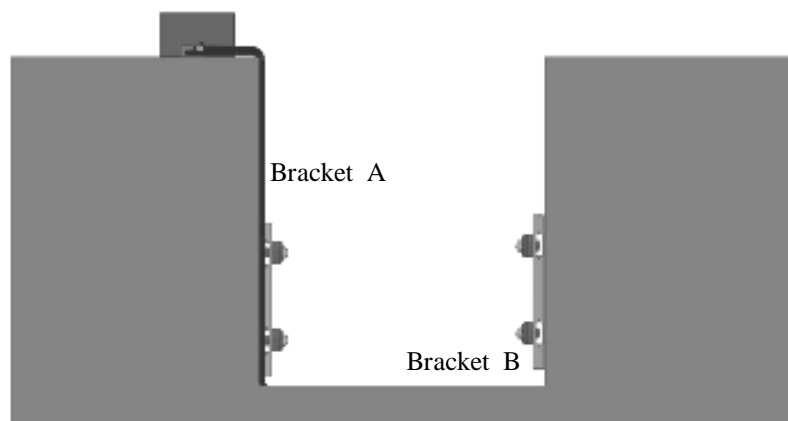
Tightly assemble Transducers with Brackets with screws.



Step 2: Mounting Bracket

Select the right mounting place is the most important thing for ensuring the accuracy. Please according to the follow steps to install the mounting bracket.

- 1) Install Bracket A on the wall tightly.
- 2) Confirm the installation place for Bracket B, then install Bracket B on the opposite wall tightly.

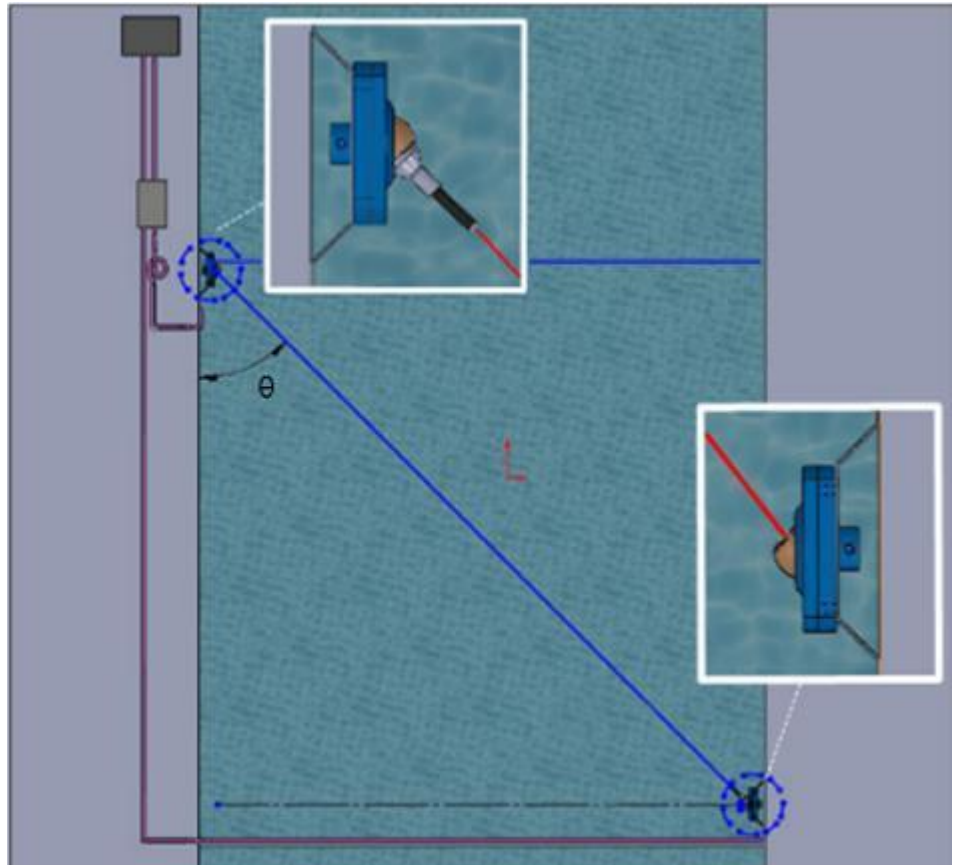


Step 3: Angle Adjustment & Installation of Laser Pointer

In the case of Open Channel, it needs Laser Pointer to work with Transducers for allowing the flow measurement. One pair of sensor will have a unit of Laser Pointer. In order to receive good signals for having the best accuracy, all transducers must be adjusted to the same angle. The angle shall be measured from the CENTER of sensor to the mounting wall.

Caution) The installation of Laser Pointer doesn't affect the measurement. User can install it at either Bracket A or Bracket B.

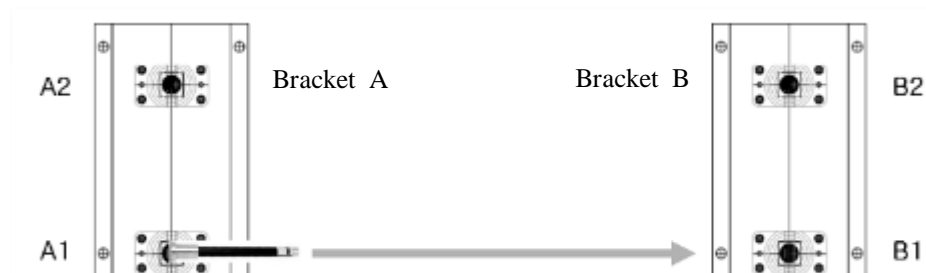
- 1) **Bracket B** : Aligning the Transducers on to the angle 45° .



- 2) **Bracket A** :

From the Laser Pointer, use can see there is a Button on each Laser Pointer.

- 2.1) Fix a Laser Pointer on A1 transducer, and pointing the direction of B1.
- 2.2) Fix a Laser Pointer on A2 transducer, and pointing the direction of B2.



**Step 4:
Install Flowmeter
and Connect**

Each cable should be connected to the transducers and the other side should be connected to the flow computer.

**Step 5:
Supply Power to
Flow Computer**

Connecting the Power Cable of the flow computer and turn on the power.

**Step 6:
Input the Values on
Flow Computer**

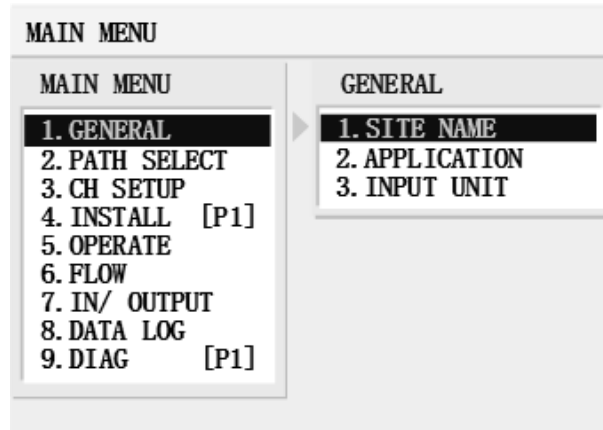
Please refer to next chapter for input the parameters of the open channel.

Instructions– Installation Quick Setup

This chapter provides user an overview and summary of Transducer Set Up Procedures. But user shall review all the chapter to set configuration data before operating the system in the actual Open Channel site.

Step 1: General Setup

➤ 1. General –

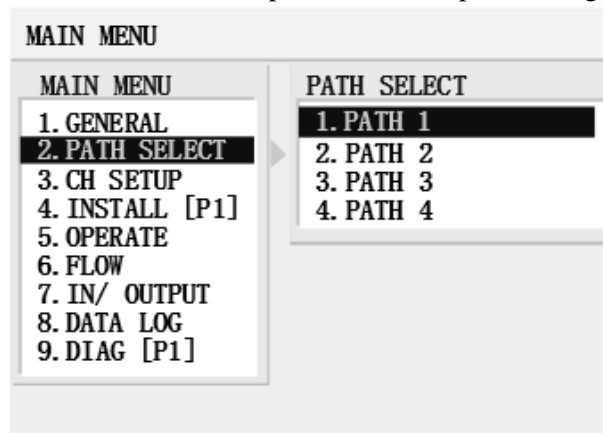


1. Site Name:
2. Application: Dual Path/Four Path
3. Input Unit: Metric / Inch

Step 2: Select the Path for introducing the Install Parameter

➤ 2. Path Select –

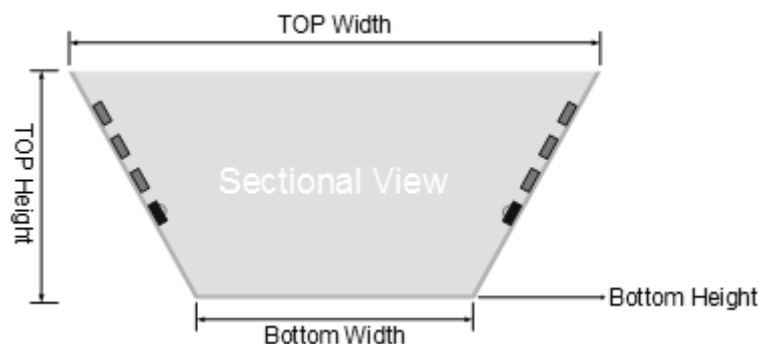
*User must select the path first to setup the configuration data in other tabs.



Step 3: Channel Shape Setup

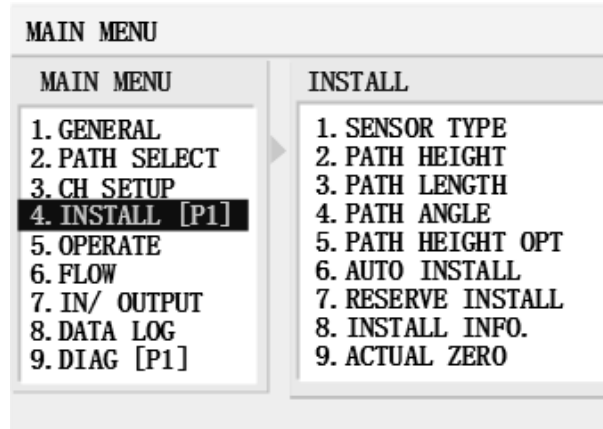
➤ 3. Channel Setup – Introduce at least TWO points of the channel so the software can calculate the Channel Shapes for the measurement.

1. Channel BOTTOM: Base Width and Height (Height should be “0”.)
2. Channel TOP: Top Width and Height

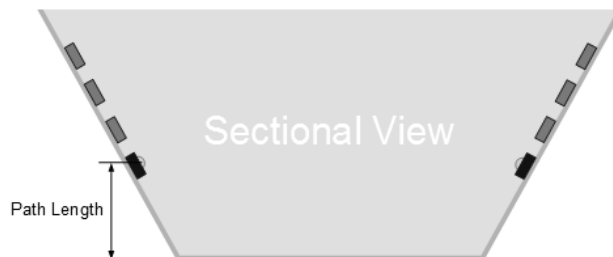


Step 4:
IMPORTANT
Path Parameters
Setup

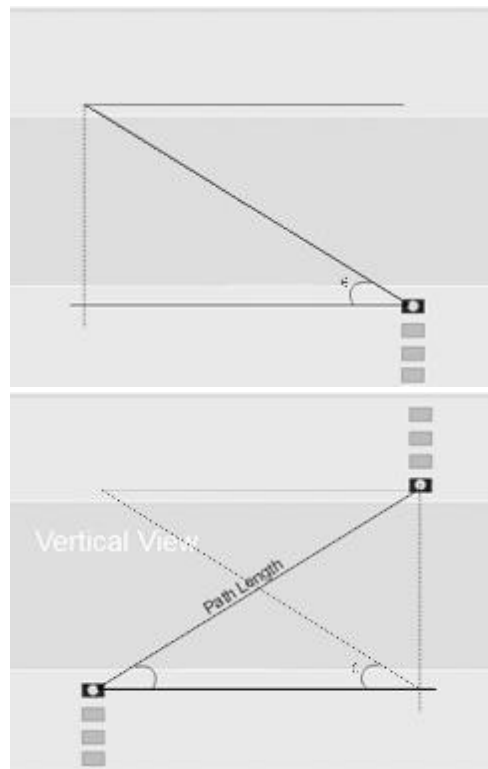
- **4. Install** – set up the configuration data for each path.



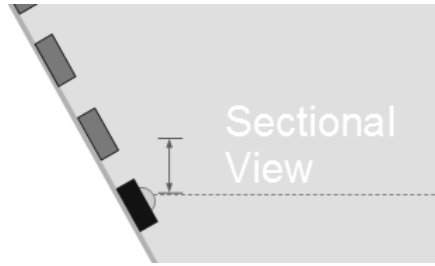
1. Sensor Type: D for small channel / F for big channel
2. Path Height: the mounting height from the bottom.



3. Path Length: the length between 2 transducers. (Lens to Lens)
4. Path Angle: the angle between path length and path distance (CH width).



5. Path Height Option: Increase the measuring range for each path.



7. Reserve Install: *click SET for each path to enable the auto installation.

(After setup the information for Path One. User needs to go back to **2. Path Select** to select other path and setup the install parameters individually in **4. Install**.)

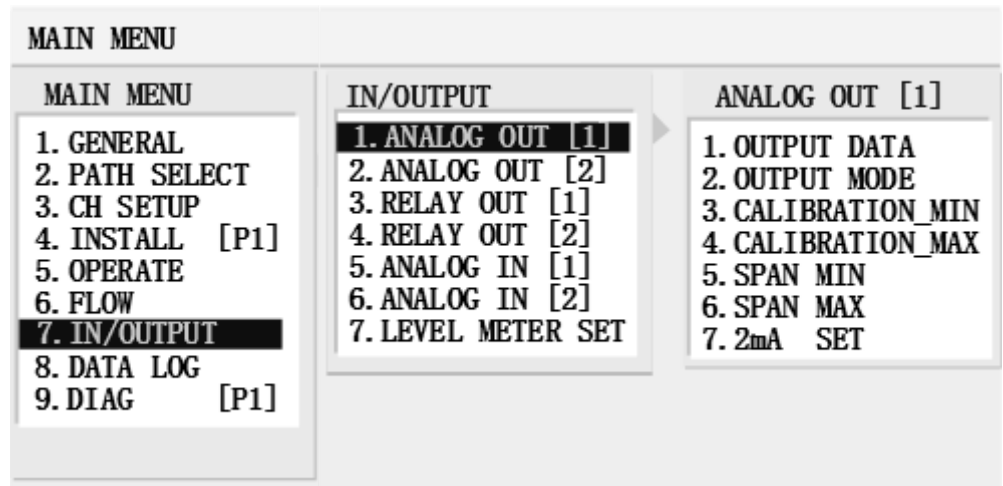
Instructions - Quick Analog Output

The flowmeter provides two 4-20 mA analog output for user. User can assign each data with Analog Out [1] and Analog Output [2] individually.

Caution) Before start this chapter, make sure user have configured the Flow Range Limited in the tab, **5. OPERATE and the units in the tab, **6.FLOW**.**

Step 1: Analog Output Setup

The analog output variable provides the signal value for flow rate. The standard range of output is in the 4–20 mA. User can Configure the parameters for the output device in the tab, **7.IN/OUTPUT**.

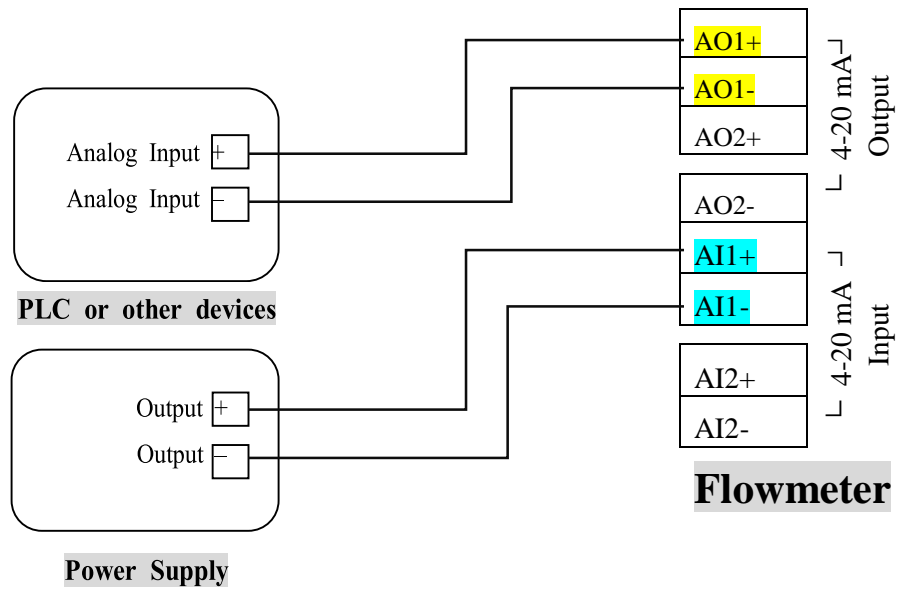


Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] or 2. ANALOG OUT [2]

- **7.1.1. Output Data** – Choose the required data for output.
 1. None (Disable)
 2. Flow
 3. Velocity
 4. Analog In [1]
 5. Analog In [2]
- **7.1.2. Output Mode** – Depending on the measuring application.
 1. By application (Automatically)
 2. [CH 1] Only (for Single Path)
 3. [CH 2] Only (for Dual Path)
- **7.1.3. Calibration MIN** – initial setup by manufactory.
- **7.1.4. Calibration MAX** – initial setup by manufactory.
- **7.1.5. Span MIN** – Introduce for Lower Flow Value.
 - 4 mA
- **7.1.6. Span MAX** – Introduce for Upper Flow Value.
 - 20 m A
- **7.1.7. 2mA Set** – initial setup by manufactory.

Step 2: Connect Devices

Turn off flowmeter and wiring the connecting devices to the selected OUTPUT on flowmeter's PC board as below wiring diagram.



Step 3: Power On

After reboot the flowmeter, the connecting device shall be able to receive the output data smoothly.

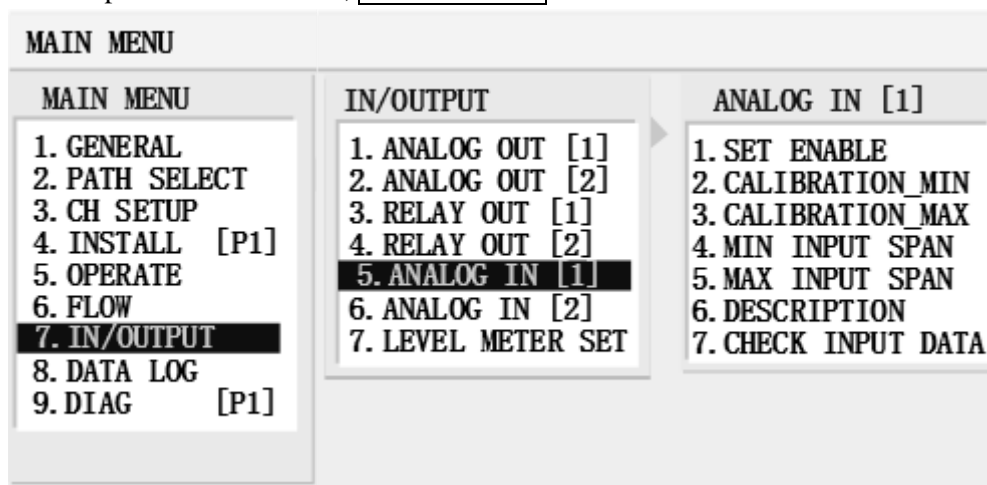
Instructions - Analog Input for Level Meter

The flowmeter provides two 4-20 mA analog input for user. User can assign each data with Analog In [1] and Analog In [2] individually.

Caution) In the case of Open Channel, user needs to connect a level transmitter and an extra Power Supply Device for the level transmitter.

Step 1: Analog Input Setup

The standard range of output is in the 4–20 mA. User can Configure the parameters for the input device in the tab, **7.IN/OUTPUT**.

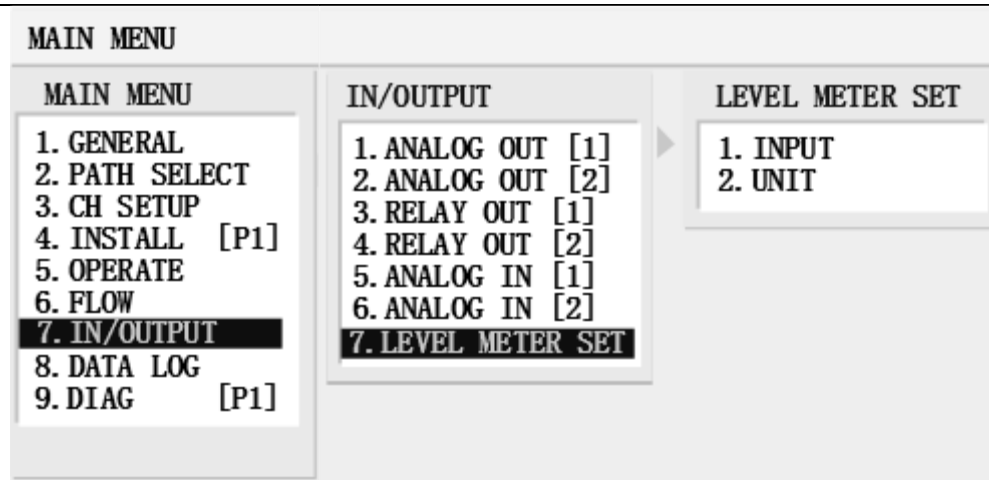


Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] or 6. ANALOG IN [2]

- 7.5.1. Set Enable – Enable the function
- 7.5.2. Calibration MIN – initial setup by manufactory.
- 7.5.3. Calibration MAX – initial setup by manufactory.
- 7.5.4. MIN Input Span – Introduce the minimum Level.
- 7.5.5. MAX Input Span – Introduce the maximum Level.
- 7.5.6. Description –
User can write some description for the input data.
- 7.5.7. Check Input Data –

After connected the input device, user can check the input data here.

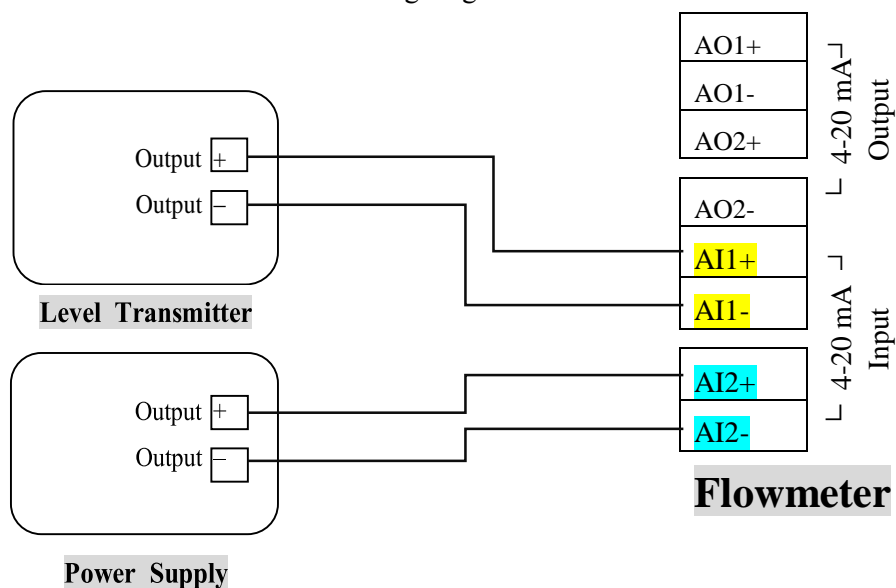
Step 2: Level Meter Setup



- 7.7.1. Input – Analog In [1] / Analog In [2]
- 7.7.2. Unit – The unit of level transmitter is “mm” or “inch”.

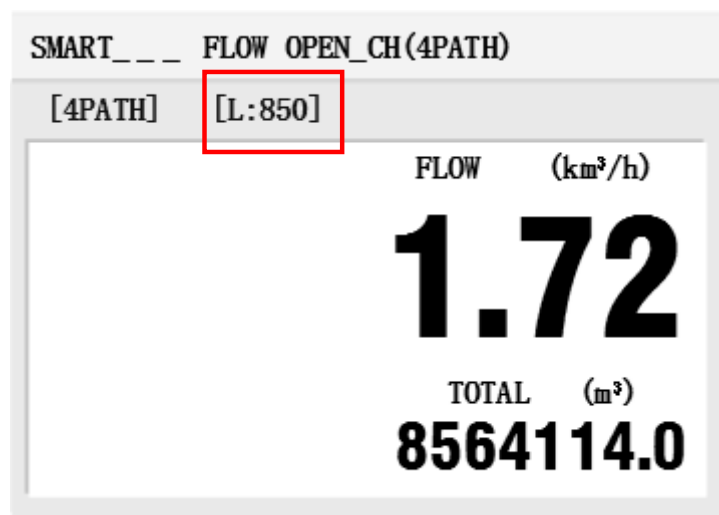
Step 3: Connect Devices

Turn off flowmeter and wiring the connecting devices to the selected INPUT on flowmeter's PC board as below wiring diagram.

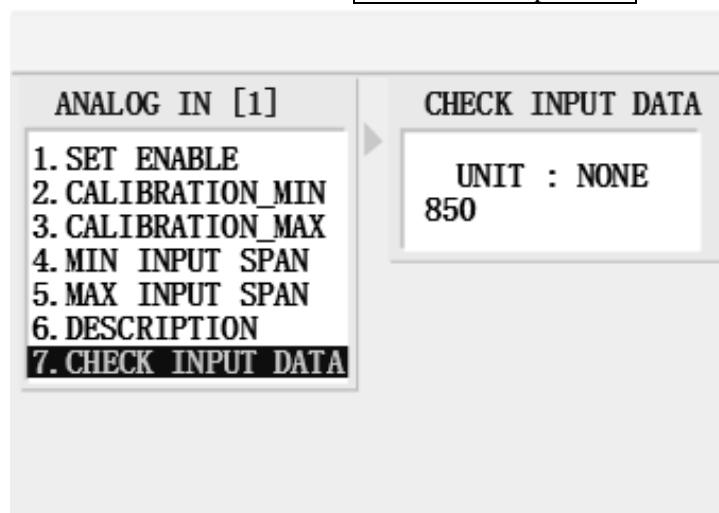


Step 4: Power On & Check Input Data

After connecting, user shall see the Input data in the MAIN display as below.



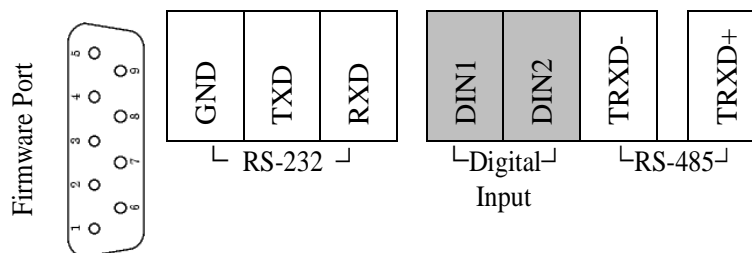
Or user can check in the tab, [7.5.7. Check Input Data](#) to check the input data as well.



Instructions – Data Logger

Step 1: Plugin the Cable

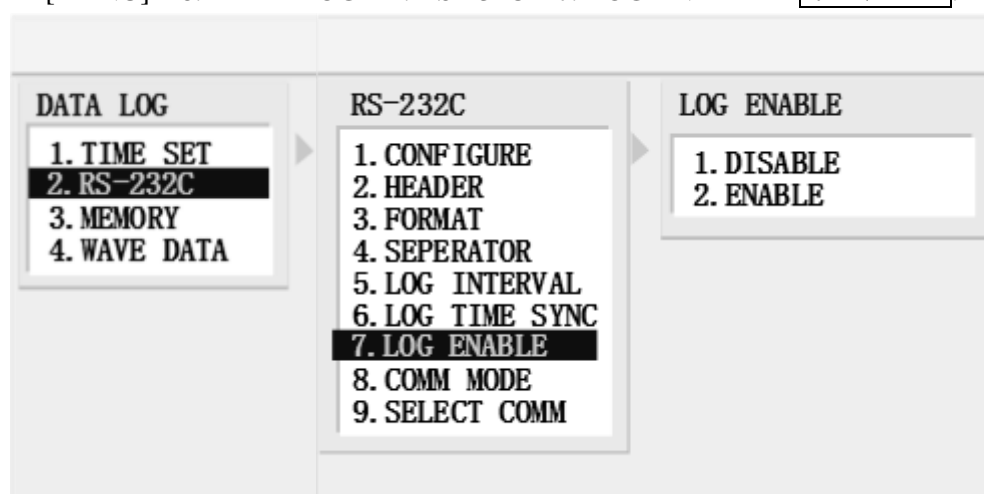
User can use RS-232C, RS-485 and 9- pin Communication Cable to output the data.



Step 2: Log Enable

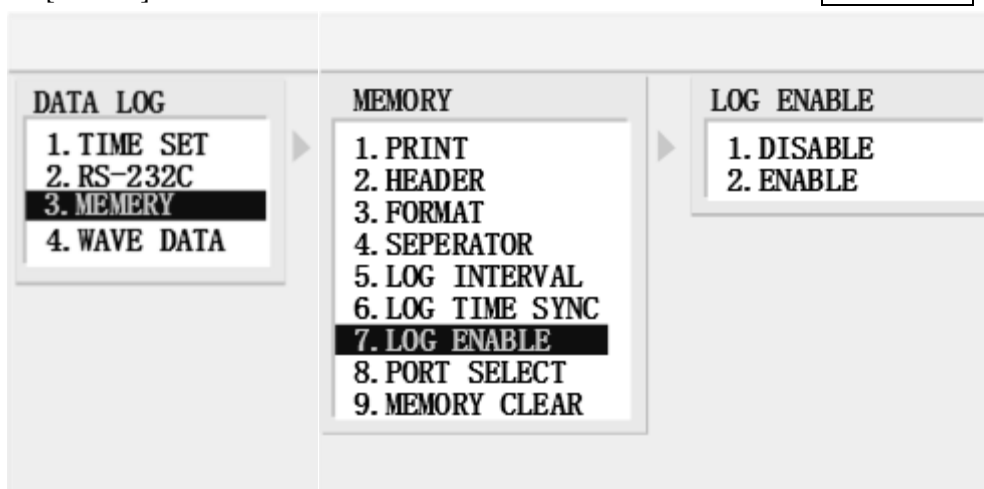
- For RS-232C and RS-485:

[MENU] – 8. DATA LOG – 2. RS-232C – 7. LOG ENABLE – **2. ENABLE**.



- For 9-pin Communication Cable:

[MENU] – 8. DATA LOG – 3. MEMORY – 7. LOG ENABLE – **2. ENABLE**.



Step 3: Download DNW.exe

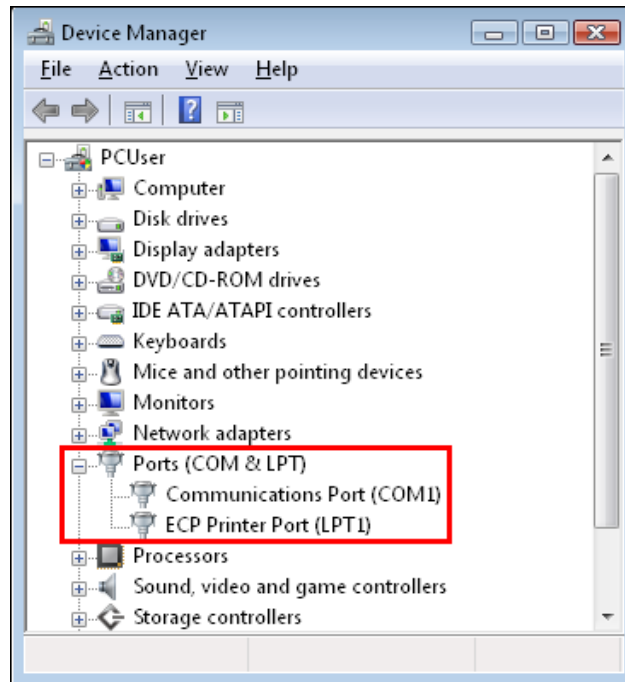
Download the software in user's Laptop.

Caution) Please contact the manufacture for the software.

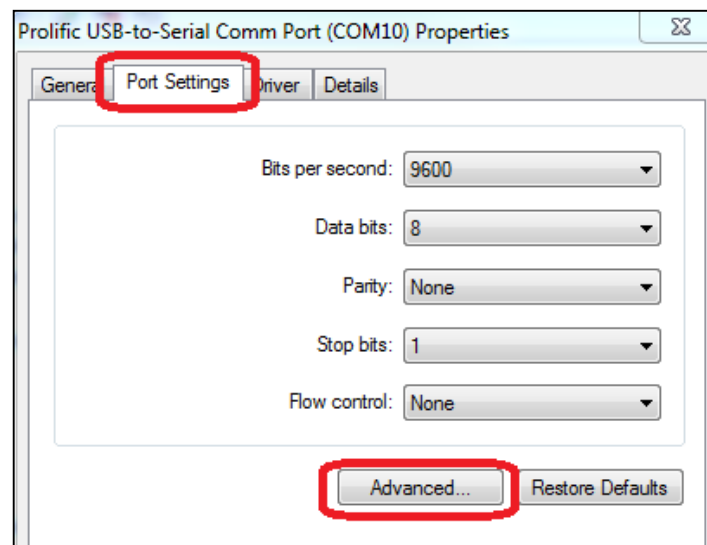
- DNW allows user to:
 1. Output the logger data
 2. Upgrade flowmeter

Step 4: Laptop's Port Setup

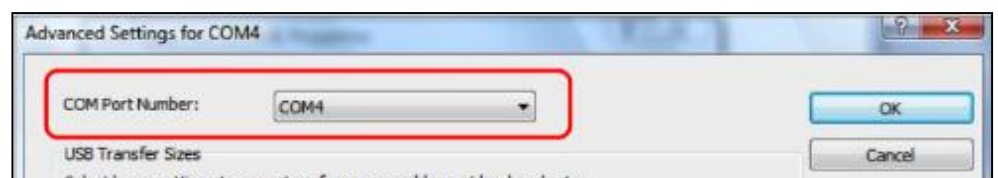
- Open the “Device Manager” on user’s Laptop.
- Find “PORTS (COM & LPT)” and click “Communications Port”.



- Open the tab, Port Settings and click “Advanced”.



- Feel free to set the COM Port Number to “COM 1/COM 2/COM 3/COM 4”. (*The software “DNW” works with COM 1~4 only.)

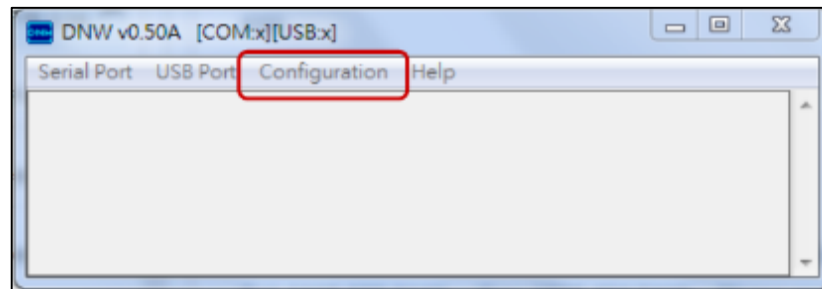


- Then, click “OK” button and close the Device Manager to complete the setting

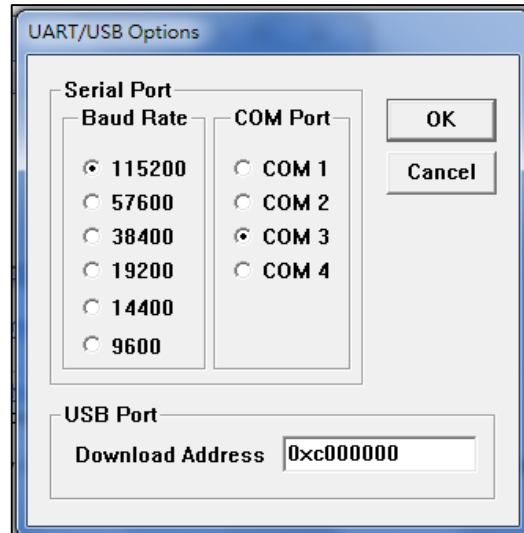
Step 5: Setup DNW

Caution) Make sure **NOT** to turn on flowmeter's power at this step

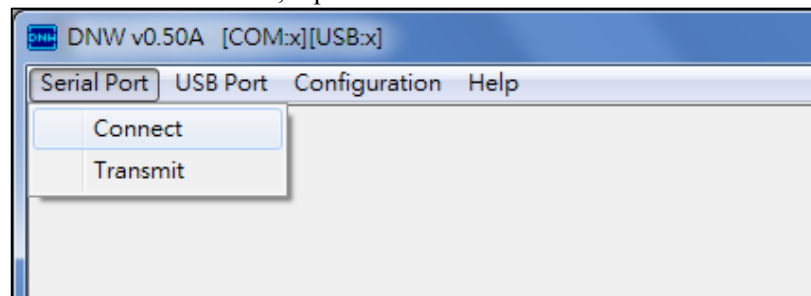
- Run the Software (DNW.exe) and click "Configuration".



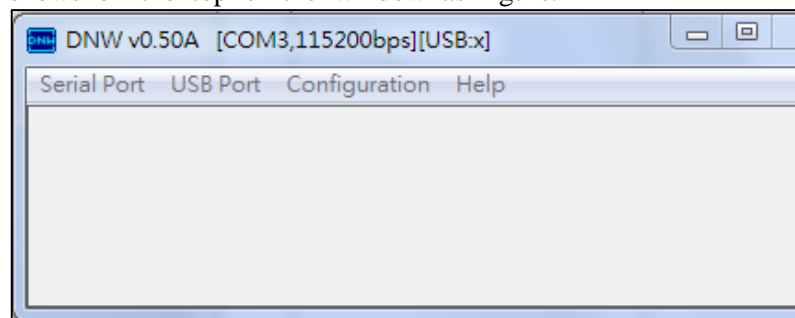
- User will see the window of "UART/USB Options" as below.



- Set the Baud Rate at "115200" and the COM Port that user just set.
- After return to DNW, open the "Serial Port" menu and click "Connect"



- After Connecting, user will see the information which just been setup and shows on the top of the window as figure.

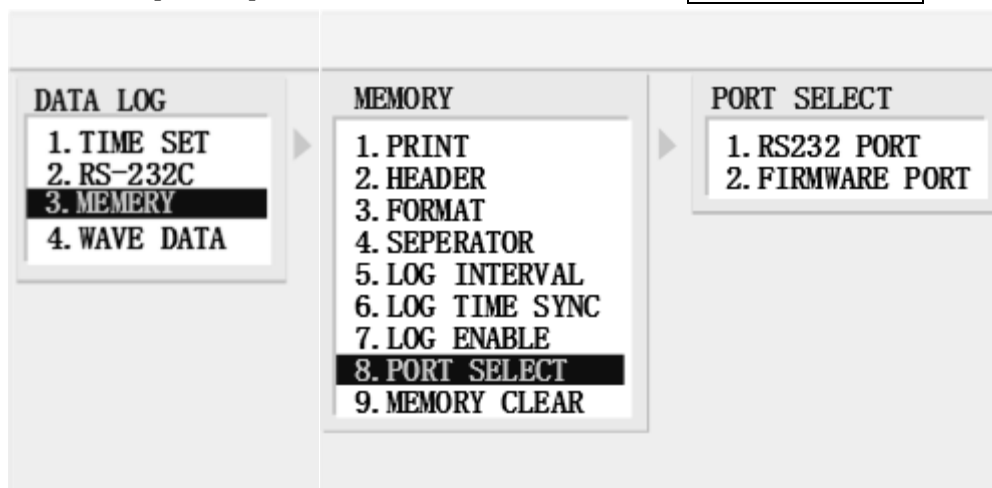


Step 6: Power On

- Press "U" key on Laptop and turn on flowmeter's power **at the same**.

Step 7:
Flowmeter
Port Select

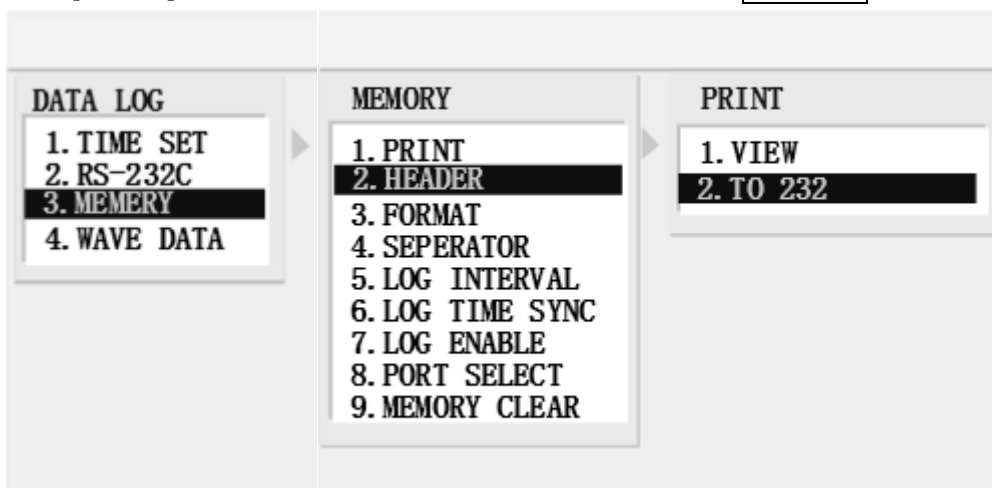
Go to [MENU] – 8. DATA LOG – 3. MEMORY – **8. PORT SELECT**.



- **8. Port Select**
 - 1. RS232 Port (RS-232C & RS485)
 - 2. Firmware Port (9-pin Communication Cable)

Step 8:
Print Out the Data

Go to [MENU] – 8. DATA LOG – 3. MEMORY – 1. PRINT – **2. TO 232**.



- **2. TO 232** (Available for all the communication cables.)
Press [ENT] to output the data. Then, user will see DNW is downloading the data automatically.

Setting Operation - General Setting

1.1 GENERAL - Site Name

User must input Site Name to record the flow data of the site. The name will be registered with other operation setting.

Press [MENU] – 1.GENERAL – 1.SITE NAME

- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].

GENERAL	SITE NAME
1. SITE NAME	JAIN_ _ _ _
2. APPLICATION	
3. INPUT UNIT	

1.2 GENERAL - Application

There're two kinds of system for Open Channel Application, Dual and Four Path.

Press [MENU] – 1.GENERAL – 2.APPLICATION

- OPEN CHANNEL-4 PATH
- OPEN CHANNEL-2 PATH

GENERAL	APPLICATION
1. SITE NAME	1. OPEN CH-4 PATH
2. APPLICATION	2. OPEN CH-2 PATH
3. INPUT UNIT	

1.3 GENERAL - Input Unit

User can use either “mm” or “inch” for the input unit.

Press [MENU] – 1.GENERAL – 3.INPUT UNIT

- Millimeter
- Inches

GENERAL	INPUT UNIT
1. SITE NAME	1. mm
2. APPLICATION	2. inch
3. INPUT UNIT	

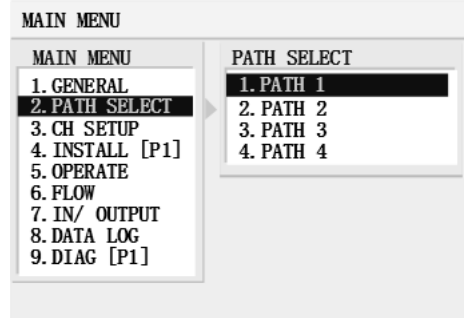
Setting Operation – Channel Setup

2. PATH SELECT –

Select the Path to setup the install parameters for each path.

Press [MENU] – 2.PATH SELECT

- PATH 1
- PATH 2
- PATH 3
- PATH 4



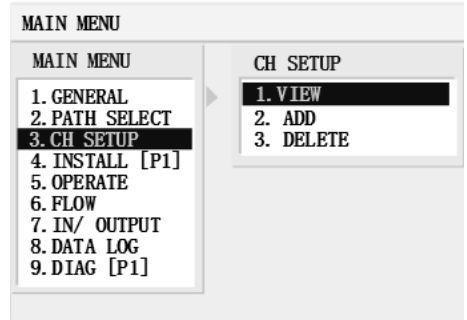
3. CH SETUP –

User must input the Channel elevation and the width to allow the measurements

Caution) Measurements cannot be accomplished without these settings.

Press [MENU] – 3.CH SETUP

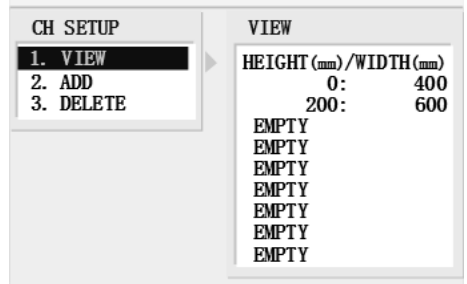
- View
- Add
- Delete



View

User can view the inputted parameters here.

Press [MENU] – 3.CH SETUP – 1.VIEW



Add

Input the elevation and the width of the channel to have the wetted area.

Caution) Input at least TWO parameters of the channel for the measurement.

Press [MENU] – 3.CH SETUP – 2. ADD

- Input the parameters in “mm”.
- Move the cursor to [SAVE] and press [ENT] to save the data.

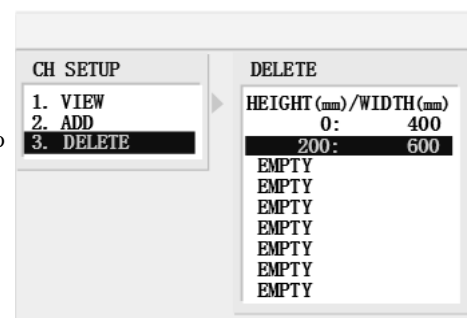


Delete

User could delete the channel parameters.

Press [MENU] – 3.CH INFO – 3. DELETE

- Move the cursor to the parameter that user wants to delete and press [CLR] to delete.



Setting Operation – Installation

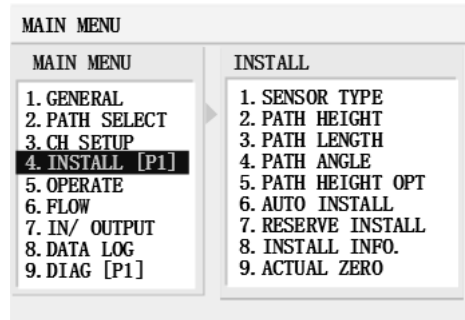
4. Install -

Before starting this section, please follow the directions in Section 3 to input the specifications of the Channel first.

Caution) This Section shall be review carefully before installation.

Press [MENU] – 4. INSTALL

- Input the parameters in “mm”.
- Move the cursor to [SAVE] and press [ENT] to save the data.

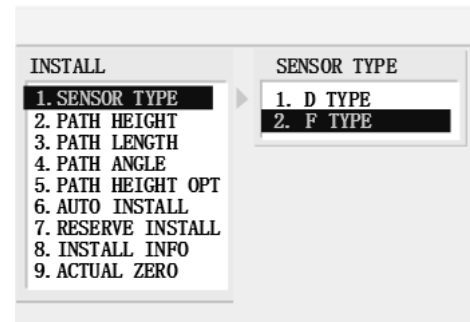


4.1 Install – Sensor Type

Choosing the correct type of transducer is extremely important. Each type of sensor measuring different size of Channel. User must select the right sensor type on the flowmeter for complete the installation.

Press [MENU] – 4. INSTALL – 1.SENSOR TYPE

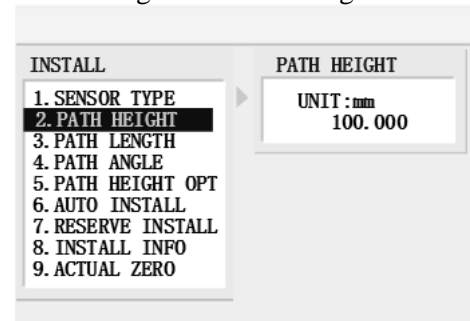
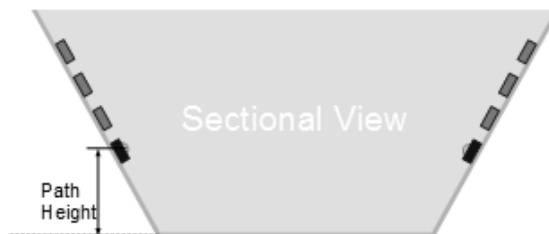
- D type (for the applications up to 2 meter)
- F type (for the applications up to 15 meter)



4.2 Install – Path Height

Set up the mounting height for each path. Refer to below figure for Path Height.

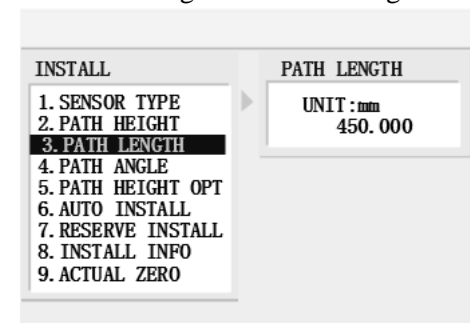
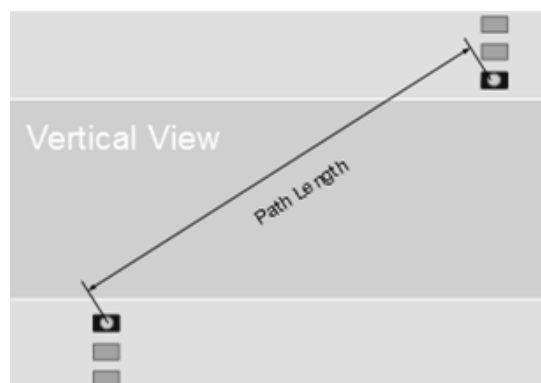
Press [MENU] – 4. INSTALL – 2. PATH HEIGHT



4.3 Install – Path Length

Set up the path length between for each path. Refer to below figure for Path Length.

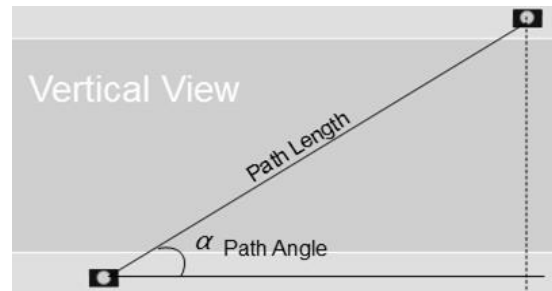
Press [MENU] – 4. INSTALL – 3. PATH LENGTH



4.4 Install – Path Angle

Input the install angle for each path. The angle between path length and the transducers. Refer to below figure for Path Angle.

Press [MENU] – 4. INSTALL – 4. PATH ANGLE

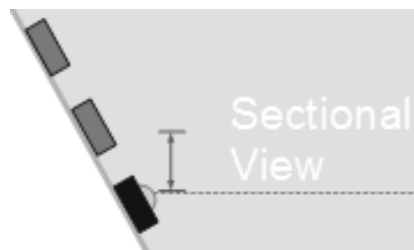


INSTALL	PATH ANGLE
1. SENSOR TYPE	UNIT : Degree 30.000
2. PATH HEIGHT	
3. PATH LENGTH	
4. PATH ANGLE	
5. PATH HEIGHT OPT	
6. AUTO INSTALL	
7. RESERVE INSTALL	
8. INSTALL INFO	
9. ACTUAL ZERO	

4.5 Install – Path Height OPT

In some cases, there might have rapids to cause the fluctuating flow rate which would affect the measurement. Hence, this function was created to increase the measuring range of each path.

Press [MENU] – 4. INSTALL – 5. PATH HEIGHT OPT



INSTALL	PATH HEIGHT OPT
1. SENSOR TYPE	UNIT : mm 50.000
2. PATH HEIGHT	
3. PATH LENGTH	
4. PATH ANGLE	
5. PATH HEIGHT OPT	
6. AUTO INSTALL	
7. RESERVE INSTALL	
8. INSTALL INFO	
9. ACTUAL ZERO	

4.6 Install – Auto Install

Caution) We suggest user to use 4.7 Reserve Installation for a better performance.

Press [MENU] – 4. INSTALL – 6. AUTO INSTALL

INSTALL	AUTO INSTALL
1. SENSOR TYPE	1. NO 2. YES
2. PATH HEIGHT	
3. PATH LENGTH	
4. PATH ANGLE	
5. PATH HEIGHT OPT	
6. AUTO INSTALL	
7. RESERVE INSTALL	
8. INSTALL INFO	
9. ACTUAL ZERO	

4.7 Install – Reserve Install

The software will run the installation automatically once the level reach the programmed height of each path. There're several messages the menu may display. User should review below carefully before setup.

Caution) User should introduce the parameters of the selecting path before enable this function.

Press [MENU] – 4. INSTALL – 7. RESERVE INSTALL

- Set – display “Reserved”
 - Enable.
 - The software will do auto installation when the level is over the path height.
- Clear – display “Cleared”
 - Disable.
- - display “Installed”
 - The system is already installed.

INSTALL	RESERVE INSTALL
1. SENSOR TYPE	SET CLEAR
2. PATH HEIGHT	
3. PATH LENGTH	
4. PATH ANGLE	
5. PATH HEIGHT OPT	
6. AUTO INSTALL	
7. RESERVE INSTALL	
8. INSTALL INFO	
9. ACTUAL ZERO	

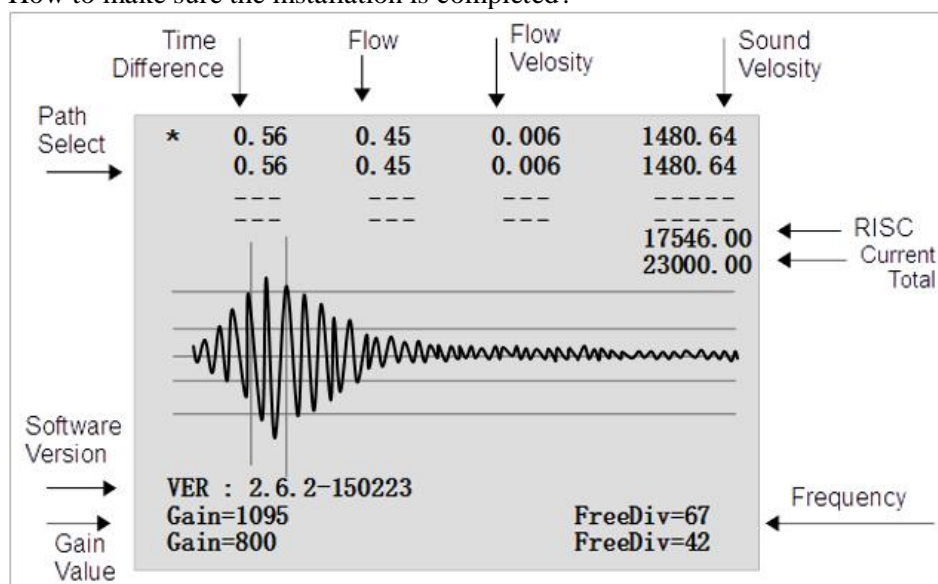
About **Installation**

There's some technical information about Reserve Installation that user need to know. The Reserve Installation was programed to perform the function automatically once the level has reach the Expected Height of Each Path.

(Here we will use the Dual path application as an example to explain.)

Example		
1.2 Application	Open Channel Dual Path	
2. Path Select	Path 1	Path 2
4.2 Path Height	100mm	250mm
4.5 Path Height OPT	50mm	50mm
4.7 Reserve Install	SET	SET

- What is the Expected Height of each Path?
 - **4.2. PATH HEIGHT** + **4.5. PATH HEIGHT**
- When the software will do the installation?
 - The Expected Height of Path 1 is" 150mm" and Path 2 is "300mm". Hence, the software will perform the Installation of Path 1 automatically when the level reach or over 150mm. And once the level is reach the Expected Height of Path 2(300mm). It will perform the installation automatically again for Path 2.
- How to make sure the installation is completed?



- There are some points user can check for the installation:
 - **Sound Vs:**
In the case of 20 degree's water, the Sound Velocity shall around 1480m/s.
 - **Gain Level:** Must be under 1500.
When the Gain is Higher than 1500, it means Ultrasonic Signal is weak.
 - **Signal Shape:** Like below attached figure shows.
The Best Ultrasonic Signal shall have the most spired shape in middle area.
 - How to access this display to check the Signals?
 - Press [F1] + Number [2] in the Main Display. (same keys to return)
 - Troubleshooting:
- If the flowmeter couldn't find the best wave frequency after running Auto Install, user could try to search the best signal manually. But it rarely happen.
- User could refer to the "RISC" value in this screen as the TOTAL LENGTH of the signal. Press [←] [→] multiple times to move the current position of RISC Value. Press [↑] [↓] multiple times to move the current position of Frequency.

4.8 Install – Install Info

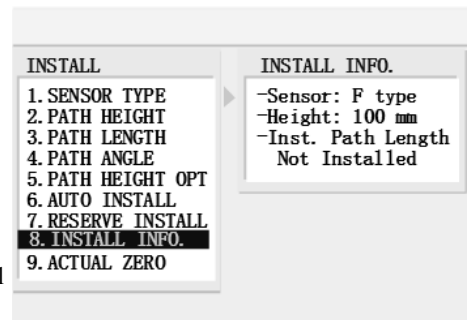
User could review the install information of the selected path in this display.

Caution) The Path Length will show once the program has finished the installation.

Press [MENU] – 4.INSTALL – 6.INSTALL INFO

Install Path Length

- Before run “Auto Install”, it will showing “**Not installed**” even user has input the path length.
- **The actual path length will be calculated automatically** after user run “4.6 Auto Install”.
- If the software has performed “Reserve Install”, it will shows “**Install Reserved**”.

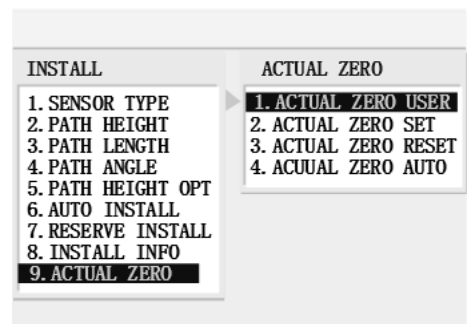


4.9 Install – Actual Zero

User should perform Actual Zero when the flow is actual stopped but the flowmeter shows other values instead of “0”. This function, Actual Zero can help user to adjust the Zero Point for flowmeter. **Caution) Use the function when the flow is stopped.**

Press [MENU] – 4. INSTALL – 8. ACTUAL ZERO

- Actual Zero User (automatic adjustment by software)
- Actual Zero Set (manual adjustment by user)
- Actual Zero Reset (clear data to zero)
- Actual Zero Auto (when user couldn't stop the flow)



Actual Zero User

Actual Zero User, is the automatic function to do actual zero by the software.

Press [MENU] – 4.INSTALL – 8. ACTUAL ZERO – 1.ACTUAL ZERO USER

- Press [ENT] to perform the function.
- The software will take about 30 second to reset the zero point for flowmeter
- After it finished, user will see a negative value in this menu.

Actual Zero Set

Actual Zero Set, is the manual function to do actual zero by user. Usually user will use the function after perform “Actual Zero User/Actual Zero Auto”. To clear the negative value.

Press [MENU] – 4.INSTALL – 8. ACTUAL ZERO – 2.ACTUAL ZERO SET

- Input the zero value with [NUM].
- Press [ENT] to save the data.

Actual Zero Set

Actual Zero Reset, is the function to clear the data. Usually user will use the function after perform “Actual Zero User/Actual Zero Auto”. To clear the negative value.

Press [MENU] – 4. INSTALL – 8. ACTUAL ZERO – 3.ACTUAL ZERO RESET

- Press [ENT] to clear the data.

Actual Zero Auto

Actual Zero Auto, is the automatic function to do actual zero by the software when user is UNABLE to stop the flow.

Press [MENU] – 4. INSTALL – 8. ACTUAL ZERO – 4.ACTUAL ZERO AUTO

- Press [ENT] to perform the function.
- The software will take about 30 second to reset the zero point for flowmeter.
- After it finished, user will see a negative value in this menu.

Setting Operation – Operating Condition

5. Operate -

Before installing the transducer, set the operating condition in the main menu to allow measurements.

Caution) The measurement might have some errors without these settings.

Press [MENU] – 5.OPERATE

MAIN MENU	
MAIN MENU	OPERATE
1. GENERAL	1. UPPER FLOW LIMIT
2. PATH SELECT	2. LOWER FLOW LIMIT
3. CH SETUP	3. DEAD LEVEL
4. INSTALL [P1]	4. DEAD ZONE
5. OPERATE	5. FLOW AVERAGE TIME
6. FLOW	6. TOTAL FLOW SET
7. IN/ OUTPUT	7. ALARM
8. DATA LOG	8. CALIBRATION
9. DIAG [P1]	9. ENABLE AGC
	0. DAMPING

5.1 Operate – Upper Flow Limit

Set the MAXIMUM measuring range of the flow so the software will measure the flow when not exceeds the limited flow rate.

Press [MENU] – 5.OPERATE – 1.UPPER FLOW LIMIT

OPERATE	UPPER FLOW LIMIT
1. UPPER FLOW LIMIT	Unit : m ³ /hour
2. LOWER FLOW LIMIT	20000.000
3. DEAD LEVEL	
4. DEAD ZONE	
5. FLOW AVERAGE TIME	
6. TOTAL FLOW SET	
7. ALARM	
8. CALIBRATION	
9. ENABLE AGC	
0. DAMPING	

5.2 Operate – Lower Flow Limit

Set the MINIMUM measuring range of the flow so that measuring rate will not lower than the limited flow rate.

Press [MENU] – 5.OPERATE – 2.LOWER FLOW LIMIT

OPERATE	LOWER FLOW LIMIT
1. UPPER FLOW LIMIT	Unit : m ³ /hour
2. LOWER FLOW LIMIT	-20000.000
3. DEAD LEVEL	
4. DEAD ZONE	
5. FLOW AVERAGE TIME	
6. TOTAL FLOW SET	
7. ALARM	
8. CALIBRATION	
9. ENABLE AGC	
0. DAMPING	

5.3 Operate – Dead Level

Dead Level, so called “Blanking Level”. In some cases, flow rate may be disregard due to small flow in the big channel. Therefore, user can perform the function, so the flowmeter can be set to ignore a level of the channel bottom to avoid false echoes from obstructions.

Press [MENU] – 6.OPERATE – 3.DEAD LEVEL

OPERATE	DEAD LEVEL
1. UPPER FLOW LIMIT	Unit : mm
2. LOWER FLOW LIMIT	-- -- --
3. DEAD LEVEL	
4. FLOW AVERAGE TIME	
5. TOTAL FLOW SET	
6. ALARM	
7. CALIBRATION	
8. ENABLE AGC	
9. DAMPING	

5.4 Operate – Dead Zone

Dead Zone, the flow rate that user want the flowmeter ignore. Smimilar with Dead Level.

Press [MENU] – 6.OPERATE – 4.DEAD ZONE

- Default setting is 0.05 m/s.

OPERATE 1. UPPER FLOW LIMIT 2. LOWER FLOW LIMIT 3. DEAD LEVEL 4. DEAD ZONE 5. FLOW AVERAGE TIME 6. TOTAL FLOW SET 7. ALARM 8. CALIBRATION 9. ENABLE AGC 0. DAMPING	DEAD ZONE m/s 0.050
--	----------------------------------

5.5 Operate – Flow Average Time

User can setup the average flow time for the measurements.

Press [MENU] – 6.OPERATE – 4. FLOW AVERAGE TIME

- Default setting is 5 seconds.
- Setup the average time in Second.

OPERATE 1. UPPER FLOW LIMIT 2. LOWER FLOW LIMIT 3. DEAD LEVEL 4. DEAD ZONE 5. FLOW AVERAGE TIME 6. TOTAL FLOW SET 7. ALARM 8. CALIBRATION 9. ENABLE AGC 0. DAMPING	FLOW AVERAGE TIME sec 3
--	--------------------------------------

5.6 Operate – Total Flow Set

User can correct the total flow manually in this menu.

Press [MENU] – 6.OPERATE – 5.TOTAL FLOW SET

OPERATE 1. UPPER FLOW LIMIT 2. LOWER FLOW LIMIT 3. DEAD LEVEL 4. DEAD ZONE 5. FLOW AVERAGE TIME 6. TOTAL FLOW SET 7. ALARM 8. CALIBRATION 9. ENABLE AGC 0. DAMPING	TOTAL FLOW SET 0
--	----------------------------

5.7.1 Operate – Alarm –

User can set the alarms for flow rates.

Press [MENU] – 5.OPERATE – 6.ALARM

- Introduce the values with [NUM].
- Press [ENT] to save the data.

OPERATE 1. UPPER FLOW LIMIT 2. LOWER FLOW LIMIT 3. DEAD LEVEL 4. DEAD ZONE 5. FLOW AVERAGE TIME 6. TOTAL FLOW SET 7. ALARM 8. CALIBRATION 9. ENABLE AGC 0. DAMPING	ALARM 1. LOW FLOW 2. HIGH FLOW
--	---

5.8 Operate – Calibration

The function is for people whom have calibration laboratory or experiences of calibrating to test the flowmeter. **Caution) User should not perform this function without manufacture's technical instruction.**

Press [MENU] – 5.OPERATE – 7. CALIBRATION

OPERATE 1. UPPER FLOW LIMIT 2. LOWER FLOW LIMIT 3. DEAD LEVEL 4. DEAD ZONE 5. FLOW AVERAGE TIME 6. TOTAL FLOW SET 7. ALARM 8. CALIBRATION 9. ENABLE AGC 0. DAMPING	CALIBRATION 1. METHOD 2. MULTI-POINT SET 3. Kc SET
--	--

5.8.1 Operate – Calibration – Method

User can select the Calibration Method to calibrate the flowmeter.

Press [MENU] – 6.OPERATE – 7. CALIBRATION
– 1. METHOD

CALIBRATION	METHOD
1. METHOD	1. NO CALIBRATION
2. MULTI-POINT SET	2. MULTI_POINTS
3. Kc SET	3. Kc CALIBRATION

5.8.2 Operate – Calibration – Mutli-Point Set

User can test the flow in the limited range that user set at Section 5.1 and 5.2. Then user can edit the points manually in this menu.

Press [MENU] – 6.OPERATE – 7. CALIBRATION
– 2. MULTI-POINT SET

CALIBRATION	MULTI-POINT SET
1. METHOD	1. VIEW
2. MULTI-POINT SET	2. ADD
3. Kc SET	3. DELETE

5.8.3 Operate – Calibration – Kc Set

The flow calibration with calibration factor.

Press [MENU] – 6.OPERATE – 7. CALIBRATION
– 3. Kc SET

CALIBRATION	Kc SET
1. METHOD	Unit : None
2. MULTI-POINT SET	-- --
3. Kc SET	

Ex)

- If Flow is 100, Kc is 1.0. The flow will be 100.
- If Flow is 100, Kc is 1.01. The flow will be 101.
- If Flow is 100, Kc is 0.09. The flow will be 99.9.

5.9 Operate – Enable AGC

AGC is “Automatic Gain Control”.

Press [MENU] – 6.OPERATE – 8. ENABLE AGC

OPERATE	ENABLE AGC
1. UPPER FLOW LIMIT	1. DISABLE
2. LOWER FLOW LIMIT	2. ENABLE
3. DEAD LEVEL	
4. DEAD ZONE	
5. FLOW AVERAGE TIME	
6. TOTAL FLOW SET	
7. ALARM	
8. CALIBRATION	
9. ENABLE AGC	
0. DAMPING	

5.0 Operate – Damping

Damping functions to display the data smoothly.

Press [MENU] – 6.OPERATE – 9. DAMPING

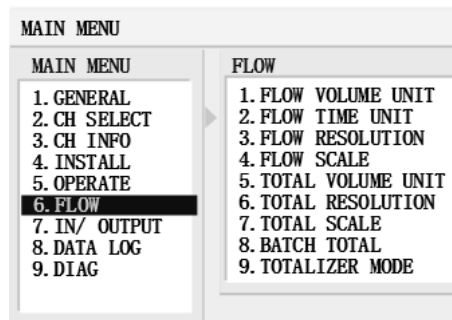
OPERATE	DAMPING
1. UPPER FLOW LIMIT	1. DISABLE
2. LOWER FLOW LIMIT	2. 30 SEC.
3. DEAD LEVEL	3. 1 MIN.
4. DEAD ZONE	4. 5 MIN.
5. FLOW AVERAGE TIME	5. 10 MIN.
6. TOTAL FLOW SET	6. 30 MIN.
7. ALARM	7. UNLIMITED
8. CALIBRATION	
9. ENABLE AGC	
0. DAMPING	

Setting Operation – Flow Parameters

6. Flow -

Before installing the transducer, set the flow parameters in the main menu to allow measurements.

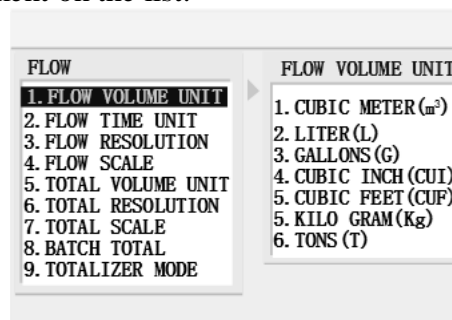
Press [MENU] – 7. FLOW



6.1 Flow – Flow Volume Unit

User can select the unit for flow measurement on the list.

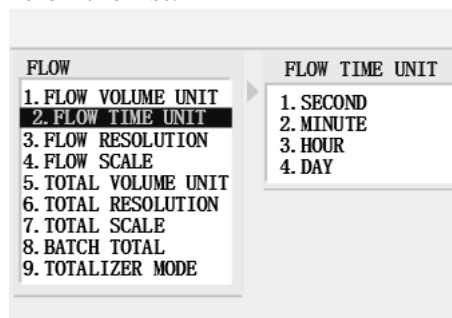
Press [MENU] – 6. FLOW – 1. FLOW VOLUME UNIT



6.2 Flow – Flow Time Unit

User can select the unit of measurement time on the list.

Press [MENU] – 6. FLOW – 2. FLOW TIME UNIT



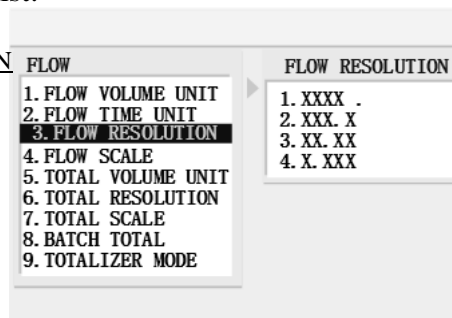
6.3 Flow – Flow Resolution

User can select the decimal points on the list.

Press [MENU] – 6. FLOW – 3. FLOW RESOLUTION

Ex)

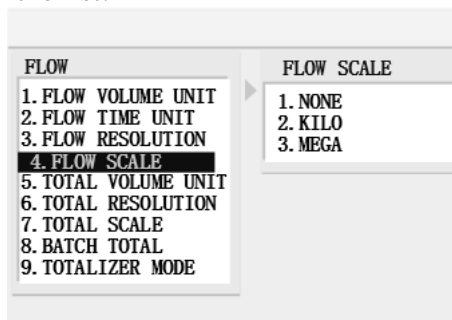
- xxxx. , means 10 for flow.
- xxx.x , means 10.1 for flow.
- xx.xx , means 10.12 for flow.
- x.xxx , means 10.123 for flow.



6.4 Flow – Flow Scale

In case of big flow, user can select Kilo on the list.

Press [MENU] – 6. FLOW – 4. FLOW SCALE



6.5 Flow – Total Volume Unit

User can select the unit for total flow on the list. Normally, the Setting of Total Volume will be same as Flow Unit.

Press [MENU] – 6. FLOW – 5. TOTAL VOLUME UNIT

FLOW	TOTAL VOLUME UNIT
1. FLOW VOLUME UNIT	1. CUBIC METER (m³)
2. FLOW TIME UNIT	2. LITER (L)
3. FLOW RESOLUTION	3. GALLONS (G)
4. FLOW SCALE	4. CUBIC INCH (CUI)
5. TOTAL VOLUME UNIT	5. CUBIC FEET (CUF)
6. TOTAL RESOLUTION	5. KILO GRAM (Kg)
7. TOTAL SCALE	6. TONS (T)
8. BATCH TOTAL	
9. TOTALIZER MODE	

6.6 Flow – Total Resolution

User can select the decimal points on the list.

Press [MENU] – 6. FLOW – 6. TOTAL RESOLUTION

FLOW	TOATL RESOLUTION
1. FLOW VOLUME UNIT	1. XXXX .
2. FLOW TIME UNIT	2. XXX. X
3. FLOW RESOLUTION	3. XX. XX
4. FLOW SCALE	4. X. XXX
5. TOTAL VOLUME UNIT	
6. TOATL RESOLUTION	
7. TOTAL SCALE	
8. BATCH TOTAL	
9. TOTALIZER MODE	

6.7 Flow – Total Scale

User can select Kilo for big flow total.

Press [MENU] – 6. FLOW – 7. TOTAL SCALE

FLOW	TOTAL SCALE
1. FLOW VOLUME UNIT	1. NONE
2. FLOW TIME UNIT	2. KILO
3. FLOW RESOLUTION	
4. FLOW SCALE	
5. TOTAL VOLUME UNIT	
6. TOTAL RESOLUTION	
7. TOTAL SCALE	
8. BATCH TOTAL	
9. TOTALIZER MODE	

6.8 Flow – Batch Total

The internal batch controller in the system is able to control the input signals through keypad or analog input.

Press [MENU] – 6. FLOW – 8. BATCH TOTAL

FLOW	BATCH TOTAL
1. FLOW VOLUME UNIT	Vol Unit : m³
2. FLOW TIME UNIT	-- · -----
3. FLOW RESOLUTION	
4. FLOW SCALE	
5. TOTAL VOLUME UNIT	
6. TOTAL RESOLUTION	
7. TOTAL SCALE	
8. BATCH TOATL	
9. TOTALIZER MODE	

6.9 Flow – Totalizer Mode

User can set the mode for toatlize flow.

Press [MENU] – 6. FLOW – 9. TOTALIZER MODE

- Net Total - Default
(The software will totalize positive and negative flow automatically)
- Positive Total (Only totalize positive flow)
- Negative Total (Only totalize negative flow)

FLOW	TOTALIZER MODE
1. FLOW VOLUME UNIT	1. NET TOTAL
2. FLOW TIME UNIT	2. POSTIVE TOTAL
3. FLOW RESOLUTION	3. NEGATIVE TOTAL
4. FLOW SCALE	
5. TOTAL VOLUME UNIT	
6. TOTAL RESOLUTION	
7. TOTAL SCALE	
8. BATCH TOTAL	
9. TOTALIZER MODE	

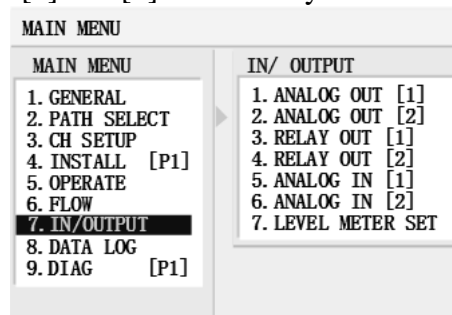
Input/output – Analog Out [1]&[2]

7. In/Output -

The flowmeter is available for 4-20m ADC output with two configurations. User can assign each data with Analog Out [1] and [2] individually.

Press [MENU] – 7. IN/OUTPUT

- Analog Output [1]&[2]
- Relay Out [1]&[2]
- Analog In [1]&[2]
- Level Meter Set Up



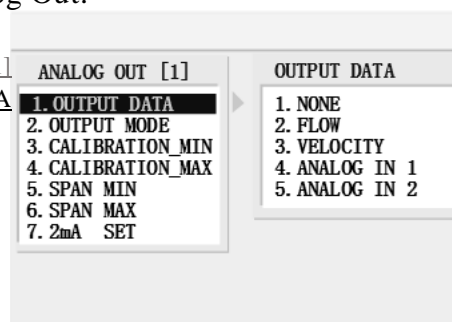
7.1 In/Output – Analog Out [1]

The flowmeter has two analog output for 4-20m ADC. Both Analog Out [1] and Analog Out [2] has exactly same functions to output data.

7.1.1 In/Output – Analog Out [1] – Output Data

Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] – 1. OUTPUT DATA

- None – Disable Output Function
- Output the Flow Data
- Output the Velocity Data
- Re-transmit the Data from Analog Input [1]
- Re-transmit the Data from Analog Input [2]
-

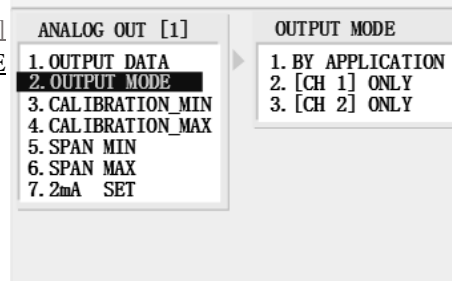


7.1.2 In/Output – Analog Out [1] – Output Mode

In the case of Open Channel, User shall use the default setting, by application.

Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] – 2. OUTPUT MODE

- By Application – Set Up by the program.
- [CH 1] only – Not available for Open Channel
- [CH 2] only – Not available for Open Channel



7.1.3 In/Output – Analog Out [1] – Calibration_Min

Caution) Do NOT use this function without manufacture's technical instructions.

Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] – 3. CALIBRATION_MIN

7.1.4 In/Output – Analog Out [1] – Calibration_Max

Caution) Do NOT use this function without manufacture's technical instructions.

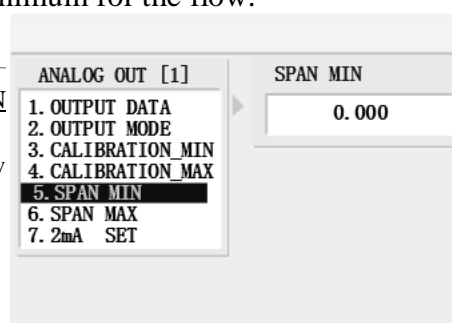
Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] – 4. CALIBRATION_MAX

7.1.5 In/Output – Analog Out [1] – Span Min

User can use this menu to set the Span Minimum for the flow.

Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] – 5. SPAN MIN

- The value should be same with the minimum flow user set in the menu, 5.2 Lower Flow Limit.

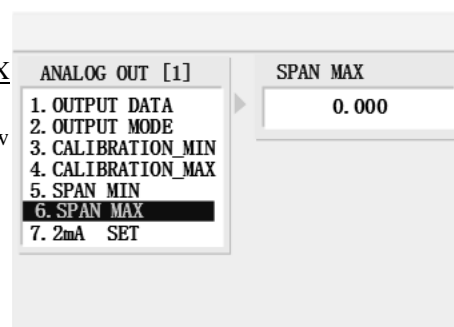


7.1.6 In/Output – Analog Out [1] – Span Max

User can use this menu to set the Span Maximum for the flow.

Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] – 6. SPAN MAX

- The value should be same with the maximum flow user set in the menu, 5.2 Upper Flow Limit.



7.1.7 In/Output – Analog Out [1] – 2mA Set

Caution) Do NOT use this function without manufacture's technical instructions.

Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] – 7. 2mA Set

7.2 In/Output – Analog Out [2]

Same with Analog Out [1]. Please refer to above instructions.

Press [MENU] – 7. IN/OUTPUT – 2. ANALOG OUT [2]

Input/output – Relay Out [1]&[2]

7.3 In/Output – Relay Out [1]

In this section, user can know how to set for Relay Output. User can assign each data with Relay Out [1] and [2] individually.

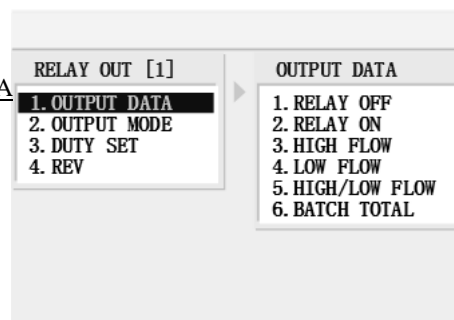
Press [MENU] – 7. IN/OUTPUT – 3. RELAY OUT [1]

7.3.1 In/Output – Relay Out [1] – Output Data

Select the data for Relay Out.

Press [MENU] – 7. IN/OUTPUT – 3. RELAY OUT [1] – 1. OUTPUT DATA

- Relay Off: Disable
- Relay On: Enable
- High Flow only
- Low Flow only
- Both of Height Flow and Low Flow
- Batch Total

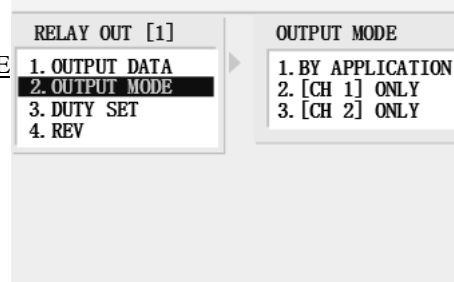


7.3.2 In/Output – Relay Out [1] – Output Mode

In the case of Open Channel, User shall use the default setting, by application.

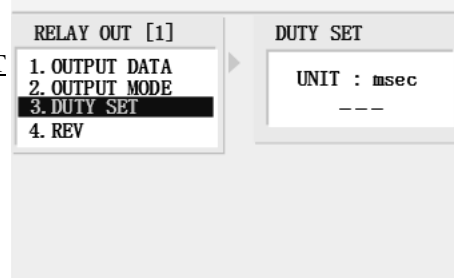
Press [MENU] – 7. IN/OUTPUT – 3. RELAY OUT [1] – 2. OUTPUT MODE

- By Application – Set Up by the program.
- [CH 1] only – Not available for Open Channel
- [CH 2] only – Not available for Open Channel



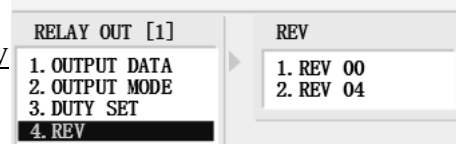
7.3.3 In/Output – Relay Out [1] – Duty Set

Press [MENU] – 7. IN/OUTPUT – 3. RELAY OUT [1] – 3. DUTY SET



7.3.4 In/Output – Relay Out [1] – Rev

Press [MENU] – 7. IN/OUTPUT – 3. RELAY OUT [1] –
4. REV



7.4 In/Output – Relay Out [2]

Same with Relay Out [1]. Please refer to above instructions.

Press [MENU] – 7. IN/OUTPUT – 4. RELAY OUT [2]

Input/output – Analog In [1]&[2]

7.5 In/Output – Analog In [1]

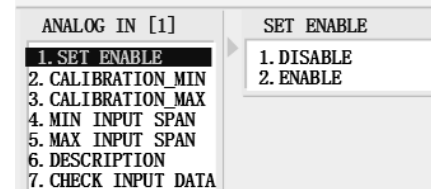
User can assign each data with Analog In [1] and [2] individually to receive the data from other devices. Which includes Current Temperature, Pressure, Liquid level and etc.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1]

7.5.1 In/Output – Analog In [1] – Set Enable

Set enable to use Analog In.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] –
1. SET ENABLE



7.5.2 In/Output – Analog In [1] – Calibration_Min

Caution) Do NOT use this function without manufacture's technical instructions.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] – 2. CALIBRATION_MIN

7.5.3 In/Output – Analog In [1] – Calibration_Max

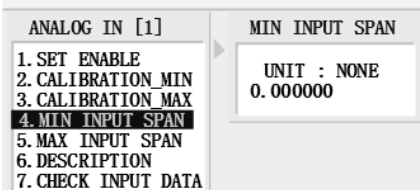
Caution) Do NOT use this function without manufacture's technical instructions.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] – 3. CALIBRATION_MAX

7.5.4 In/Output – Analog In [1] – Min Input Span

The input value is depending on the measuring range of user's input device.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] –
4. MIN INPUT SPAN



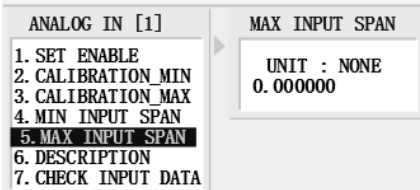
Ex)

- If the measuring range of transmitter is from 0 to 500mm. Then, the minimum input span is "0".

7.5.5 In/Output – Analog In [1] – Max Input Span

The input value is depending on the measuring range of user's input device.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] –
5. MAX INPUT SPAN



Ex)

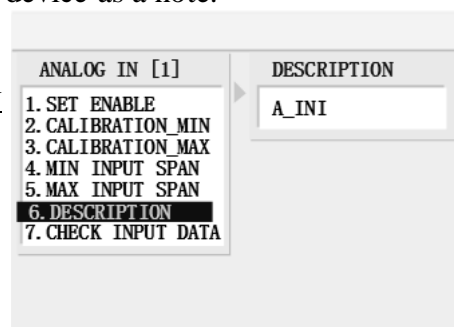
- If the measuring range of transmitter is from 0 to 500mm. Then, the maximum input span is "500".

7.5.6 In/Output – Analog In [1] – Description

User can write the description for the input device as a note.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] –
6. DESCRIPTION

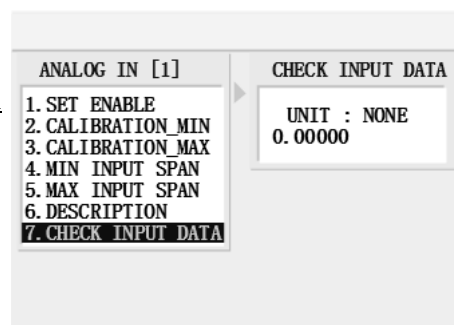
- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].



7.5.7 In/Output – Analog In [1] – Check Input Data

After enable the function and connect with the transmitter. User could see the detail input data in this display.

Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] –
7. CHECK INPUT DATA



7.6 In/Output – Analog In [2]

Same with Analog In [1]. Please refer to above instructions.

Press [MENU] – 7. IN/OUTPUT – 6. ANALOG IN [2]

Input/output – Level Meter Set Up

7.7 In/Output – Level Meter Set Up

In the case of Open Channel, user need to connect a Level Transmitter to allow the measurement. However, user will also need an Extra Power Supply Device to supply the power for the connected Level Transmitter.

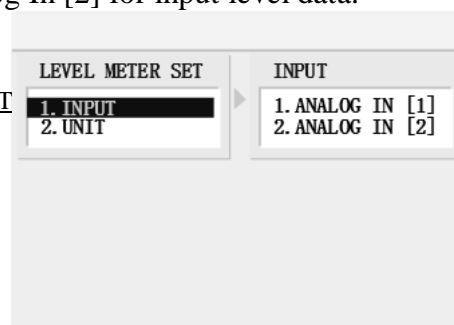
- For more information about devices connecting. Please refer to Page. 9 to 10.

7.7.1 In/Output – Input

User can use either Analog In [1] or Analog In [2] for input level data.

Press [MENU] – 7. IN/OUTPUT – 7. LEVEL METER SET –
1. INPUT

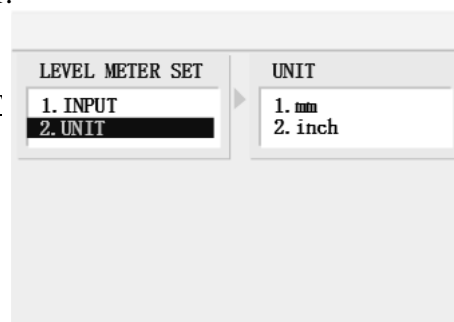
- Assign Analog In [1] for the Level Transmitter
- Assign Analog In [1] for the Level Transmitter



7.7.2 In/Output – Unit

Set up the input unit of the level transmitter.

Press [MENU] – 7. IN/OUTPUT – 7. LEVEL METER SET –
2. UNIT



Data Logger – Instructions

The flowmeter provides both of RS-232C and RS-485 for the communication.

Caution) Before user start logging data, user should review this section carefully.

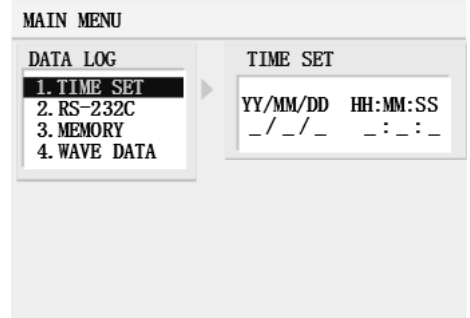
➤ Please refer to Page for Data logger instructions.

8.1 Data Log – Time Set

User must setup the correct date and time for recording the measurement.

Press [MENU] – 8.DATA LOG – 1.TIME SET

- Move cursor by [◀] [▶].
- Input numbers by [NUM].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].

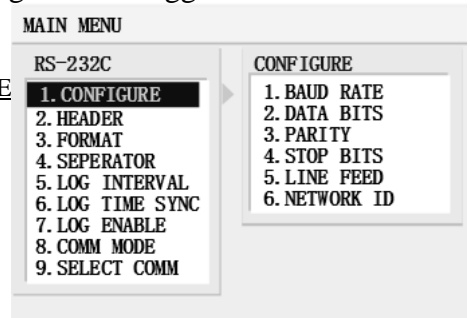


RS-232C Data logger

8.2.1 Data Log – RS-232C – Configure

User should complete the Configure Setting for data logger.

Press [MENU] – 8.DATA LOG – 2.RS-232C – 1.CONFIGURE

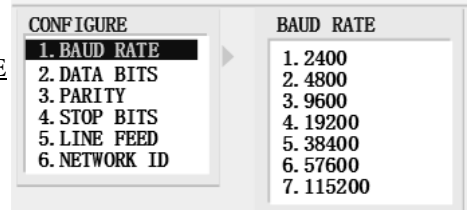


8.2.1.1 Data Log – RS-232C – Configure – Baud Rate

User can select the baud rate of the flow.

Caution) The value must be same with the value of user's PC or Laptop.

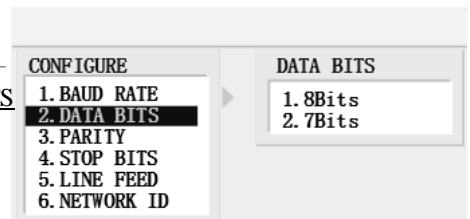
Press [MENU] – 8.DATA LOG – 2.RS-232C – 1.CONFIGURE – 1. BAUD RATE



8.2.1.2 Data Log – RS-232C – Configure – Data Bits

Set the Databits for data logger.

Press [MENU] – 8.DATA LOG – 2.RS-232C – 1.CONFIGURE – 2. DATA BITS



8.2.1.3 Data Log – RS-232C – Configure – Parity

Press [MENU] – 8.DATA LOG – 2.RS-232C– 1.CONFIGURE – 3. PARITY

CONFIGURE 1. BAUD RATE 2. DATA BITS 3. PARITY 4. STOP BITS 5. LINE FEED 6. NETWORK ID	PARITY 1. NO PARITY 2. EVEN PARITY 3. ODD PARITY
---	--

8.2.1.4 Data Log – RS-232C – Configure – Stop Bits

Set the Stopbits for data logger.

Press [MENU] – 8.DATA LOG – 2.RS-232C– 1.CONFIGURE – 4. STOP BITS

CONFIGURE 1. BAUD RATE 2. DATA BITS 3. PARITY 4. STOP BITS 5. LINE FEED 6. NETWORK ID	STOP BITS 1. 1Bits 2. 2Bits
---	--

8.2.1.5 Data Log – RS-232C – Configure – Line Feed

Press [MENU] – 8.DATA LOG – 2.RS-232C– 1.CONFIGURE – 5. LINE FEED

CONFIGURE 1. BAUD RATE 2. DATA BITS 3. PARITY 4. STOP BITS 5. LINE FEED 6. NETWORK ID	LINE FEED 1. LINE FEED OFF 2. LINE FEED ON
---	---

8.2.1.6 Data Log – RS-232C – Configure – Network ID

User can set a ID in order to identify.

Press [MENU] – 8.DATA LOG – 2.RS-232C– 1.CONFIGURE – 6. NETWORK ID

- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].

CONFIGURE 1. BAUD RATE 2. DATA BITS 3. PARITY 4. STOP BITS 5. LINE FEED 6. NETWORK ID	NETWORK ID -
---	------------------------

8.2.2 Data Log – RS-232C – Header

User can set a Header as a Network ID for the communication.

Press [MENU] – 8.DATA LOG – 2.RS-232C– 2. HEADER

- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].

RS-232C 1. CONFIGURE 2. HEADER 3. FORMAT 4. SEPERATOR 5. LOG INTERVAL 6. LOG TIME SYNC 7. LOG ENABLE 8. COMM MODE 9. SELECT COMM	HEADER DEFAULT
---	--------------------------

8.2.3 Data Log – RS-232C – Format

User can add and list the data here so th data will be download sequentially.

Press [MENU] – 8.DATA LOG – 2.RS-232C– 3.FORMAT

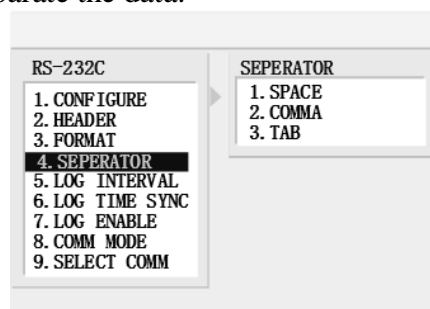
- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].

MAIN MENU RS-232C 1. CONFIGURE 2. HEADER 3. FORMAT 4. SEPERATOR 5. LOG INTERVAL 6. LOG TIME SYNC 7. LOG ENABLE 8. COMM MODE 9. SELECT COMM	FORMAT HFTA H:Header S:Site Name N:Channel No D:Date, C:Time F:Flow, T:Total I1-I2:AnalogIn1-2 U:Unit, A:Alram V:Velocity
--	---

8.2.4 Data Log – RS-232C – Separator

User can select Space, Comma or Tab to separate the data.

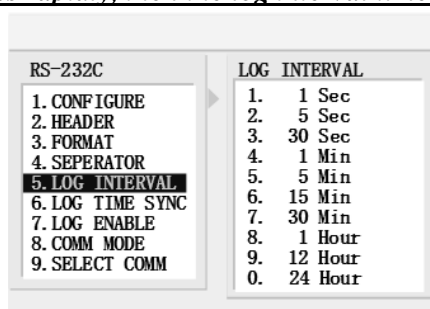
Press [MENU] – 8.DATA LOG – 2.RS-232C
– 4.SEPERATOR



8.2.5 Data Log – RS-232C – Log Interval

The Log Interval is the measurement period of time which are taken by the transducers. **Caution) If the flow value changes rapidly, then the log interval time needs to be rapidly as well.**

Press [MENU] – 8.DATA LOG – 2.RS-232C
– 5.LOG INTERVAL



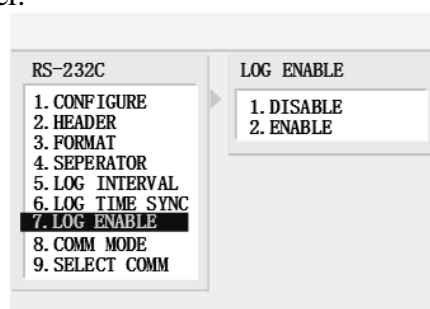
8.2.6 Data Log – RS-232C – Log Time Sync

Press [MENU] – 8.DATA LOG – 2.RS-232C – 6.LOG TIME SYNC

8.2.7 Data Log – RS-232C – Log Enable

User must enable the function for data logger.

Press [MENU] – 8.DATA LOG – 2.RS-232C – 7.LOG ENABLE

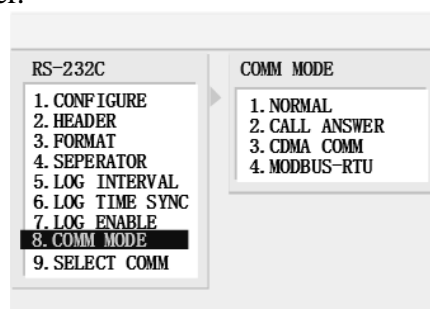


8.2.8 Data Log – RS-232C – Comm Mode

User must enable the function for data logger.

Press [MENU] – 8.DATA LOG – 2.RS-232C –
8. COMM MODE

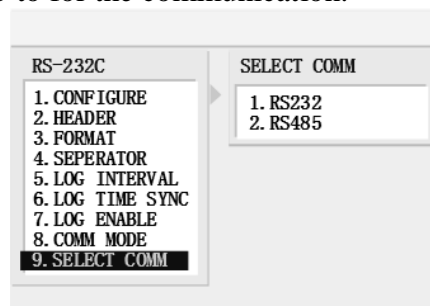
- Normal – Default
- Call Answer – Only available in local
- CDMA Comm – CDMA Communication
- MODBUS RTU – MODBUS Communication



8.2.9 Data Log – RS-232C – Select Comm

User can use both cable RS-232 and RS-485 to for the communication.

Press [MENU] – 8.DATA LOG – 2.RS-232C
– 9.SELECT COMM

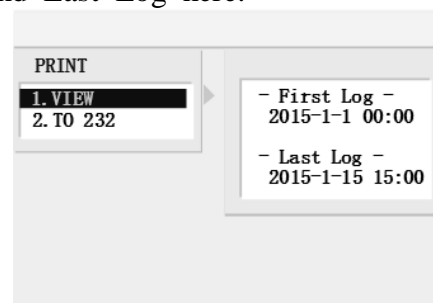


Memory of Data Logger

8.3.1.1. Data Log – Memory – Print – View

User can see the records of First Log and Last Log here.

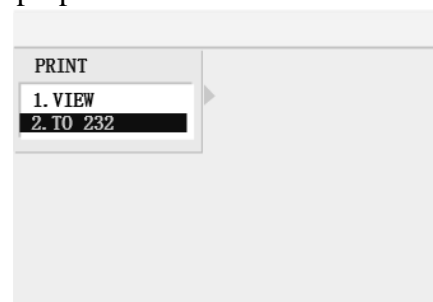
Press [MENU] – 8.DATA LOG – 3.MEMORY
– 1.PRINT – 1.VIEW



8.3.1.2 Data Log – Memory – Print – To 232

User should connect the flowmeter with laptop before use this function to download the data.

Press [MENU] – 8.DATA LOG – 3.MEMORY
– 1.PRINT – 2.TO 232



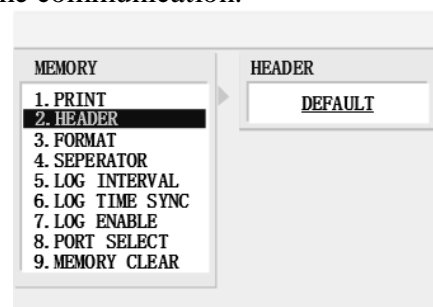
- Press [ENT] then user will see the laptop is downloading the data logger.

8.3.2 Data Log – Memory – Header

User can set a Header as a Network ID for the communication.

Press [MENU] – 8.DATA LOG – 3.MEMORY
– 2. HEADER

- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].

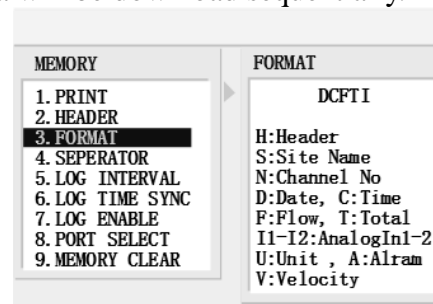


8.3.3 Data Log – Memory – Format

User can add and list the data here so th data will be download sequentially.

Press [MENU] – 8.DATA LOG – 3.MOMERY – 3.FORMAT

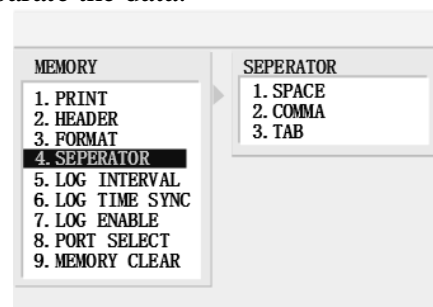
- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].



8.3.4 Data Log – Memory – Separator

User can select Space, Comma or Tab to separate the data.

Press [MENU] – 8.DATA LOG – 3.MEMORY
– 4. SEPARATOR



8.3.5 Data Log – Memory – Log Interval

The Log Interval is the measurement period of time which are taken by the transducers. **Caution) If the flow value changes rapidly, then the log interval time needs to be rapidly as well.**

Press [MENU] – 8.DATA LOG – 3.MEMORY
– 5.LOG INTERVAL

MEMORY	LOG INTERVAL
1. PRINT	1. 1 Sec
2. HEADER	2. 5 Sec
3. FORMAT	3. 30 Sec
4. SEPERATOR	4. 1 Min
5. LOG INTERVAL	5. 5 Min
6. LOG TIME SYNC	6. 15 Min
7. LOG ENABLE	7. 30 Min
8. PORT SELECT	8. 1 Hour
9. MEMORY CLEAR	9. 12 Hour
	0. 24 Hour

8.2.6 Data Log–RS-232– Log Time Sync

Press [MENU] – 8.DATA LOG – 2.RS-232C – 6.LOG TIME SYNC

8.2.7 Data Log – RS-232C – Log Enable

User must enable the function for data logger.

Press [MENU] – 8.DATA LOG – 2.RS-232C – 7.LOG ENABLE

MEMORY	LOG ENABLE
1. PRINT	1. DISABLE
2. HEADER	2. ENABLE
3. FORMAT	
4. SEPERATOR	
5. LOG INTERVAL	
6. LOG TIME SYNC	
7. LOG ENABLE	
8. PORT SELECT	
9. MEMORY CLEAR	

8.3.8 Data Log – Memory – Port Select

User can use both RS-232 port or Firmware port to connect flowmeter with user's laptops. **Caution) The setting must be correct otherwise use is unable to download the data.**

Press [MENU] – 8.DATA LOG – 3.MEMORY
– 8. PORT SELECT

MEMORY	PORT SELECT
1. PRINT	1. RS232 PORT
2. HEADER	2. FIRMWARE PORT
3. FORMAT	
4. SEPERATOR	
5. LOG INTERVAL	
6. LOG TIME SYNC	
7. LOG ENABLE	
8. PORT SELECT	
9. MEMORY CLEAR	

8.3.9 Data Log – Memory – Memory Clear

User can clear all of memory here.

Press [MENU] – 8.DATA LOG – 3.MEMORY
– 9. MEMORY CLEAR

MEMORY	MEMORY CLEAR
1. PRINT	1. CANCEL
2. HEADER	2. CLEAR
3. FORMAT	
4. SEPERATOR	
5. LOG INTERVAL	
6. LOG TIME SYNC	
7. LOG ENABLE	
8. PORT SELECT	
9. MEMORY CLEAR	

Wave Data

8.4 Data Log – Wave Data

Download the Signal Wave Data.

Press [MENU] – 8.DATA LOG – 4.WAVE DATA

DATA LOG	WAVE DATA
1. TIME SET	1. STOP
2. RS-232C	2. START
3. MEMORY	
4. WAVE DATA	

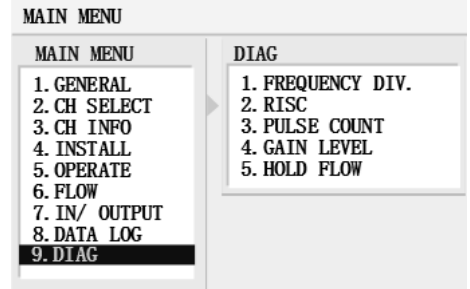
Diagnostics Menu

9. Diag -

User can review more information about the measurement in this menu.

Caution) The setting shall not be modify without manufacture's technical support.

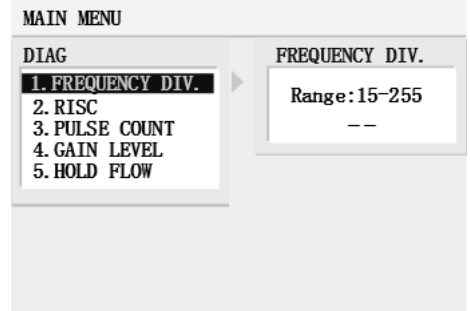
Press [MENU] – 9.DIAG



9.1 Diag – Frequency Div

Caution) The setting shall not be modify without manufacture's technical support.

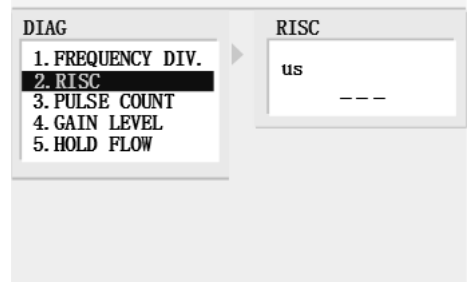
Press [MENU] – 9.DIAG – 1.FREQUENCY DIV



9.2 Diag – Risc

RISC is the distance from impulse signal to receive signal. **Caution) The setting shall not be modify without manufacture's technical support.**

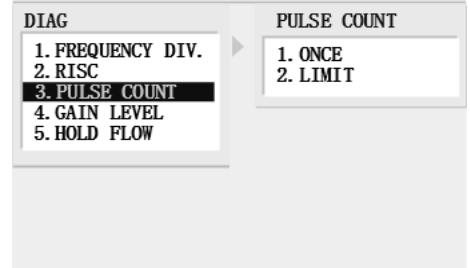
Press [MENU] – 9.DIAG – 2.RISC



9.3 Diag – Pulse Count

Set Once or Limit for Pulse Count.

Press [MENU] – 9.DIAG – 3.PULSE COUNT



Once

Once set for pulse count.

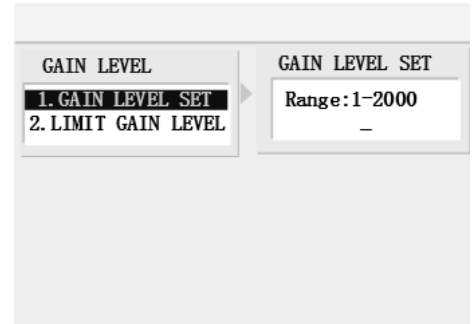
Limit

Enable or Disable the Limited for pulse count.

9.4 Diag – Gain Level

Gain Level is amplitude level of signal. The value will be set and calculated automatically by the flowmeter.

Press [MENU] – 9.DIAG – 4.GAIN LEVEL



9.5 Diag – Hold Flow

The function is for matching with remote indicator. User can use this menu to test Analog Output's function.

Press [MENU] – 9.DIAG – 5.HOLD FLOW

Ex) Analog out - SPAN MIN: 0 / SPAN MAX: 1000

- When user set HOLD FLOW at 0, flowmeter shall send 4mA signal to Analog Output.
- When user set HOLD FLOW at 1000, flowmeter shall send 20mA signal to Analog Output.

