

Technical Information

Xonic[®] 100 Series

Open Channel

Ultrasonic Flowmeter



Open Channel Guidebook

Instruction Manual

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Delivery Items

Flow Computer



Transducer Bracket Cable



Overview

Introduction

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 2 or 4 paths for measuring flow in open channel. Xonic 100LM is newly developed and has very sophisticated diagnostic functions for better performance. Xonic 100LM transducers are designed as a rocket type to avoid flowing solid particles. Also, transducer angle is fixed to 60° to ensure it will not get disturbed by the high velocity water.

Application

- Water Supply, Drainage, Water Purification Facility (Clean Water, Municipal Water, Wastewater, Manure Etc.)
- Steel Factory and Mining Industries (Limestone Slurries, Deionized Water Etc.)
- Power Plants
- Irrigation Canal, River, Stream etc.

Features

- Patented AR Mode (Anti-Round)

Specifications

- Principle :
 - Anti-Round Beam
 - Transit-Time
 - With Cross Correlation
 - Fast Fourier Transform
- Measuring Width : ~ 30m
- Accuracy : ±2.0 %
- Sensitivity: ±0.03 m/s
- Analog Input : Two 4~20mADC
- Analog Output : Two 4~20mADC
- Relay for Total : Two
 - RS-232C
 - RS-485
- Data Logger : 8 Mbytes
- Display : Graphic Color LCD
- (Flow, Total, Velocity, Delta T, Ultrasonic Signal Shape, Frequency)
- Temperature :
 - 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, Waterproof)

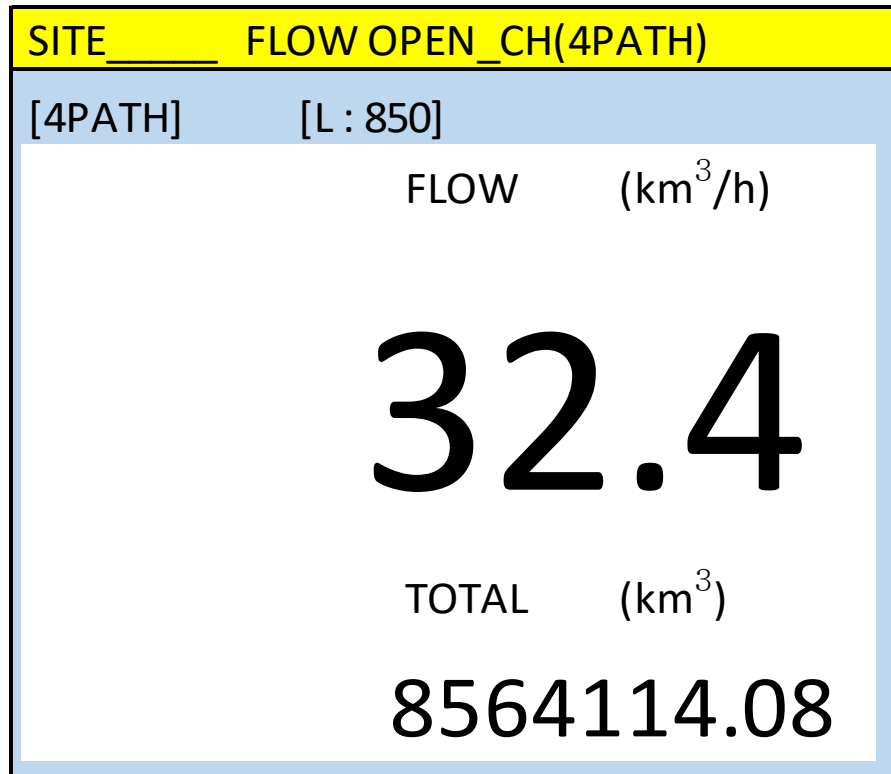
Identification of Product

On the right side of flow computer, you will see a silver label with per product's Part Name and Serial Number. This is Identification of the product. Check for the correct supply voltage printed on the label.

| | |
|--|-------------------|
| 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 enter the menu / back to the main page of flow status.



Press to delete the text while editing a Site Name.



Press to change the alphabet while inputting.



Press to input minus sign and symbols while inputting.



Press to enter the choice / finish inputting data.



Press to select the choice in menu.



Press to input decimal point while inputting data.



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

*Numbers hereinafter referred to as [NUM]

Instructions - Transducers Installation

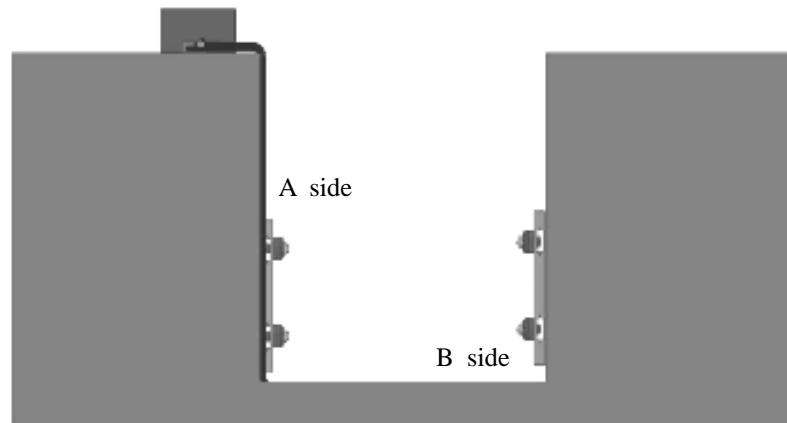
The open channel system may be used in rectangular, circular, trapezoid, or other shaped channels. Since the transducers create almost no restriction, virtually no head loss is created. The advanced DSP-based flow computer with cross-correlation and FFT technology allows this system to work in the most 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: Fixing of Mounting Bracket

Selecting the right mounting place is the most important for ensuring the accuracy. Please follow below steps to install the mounting bracket.

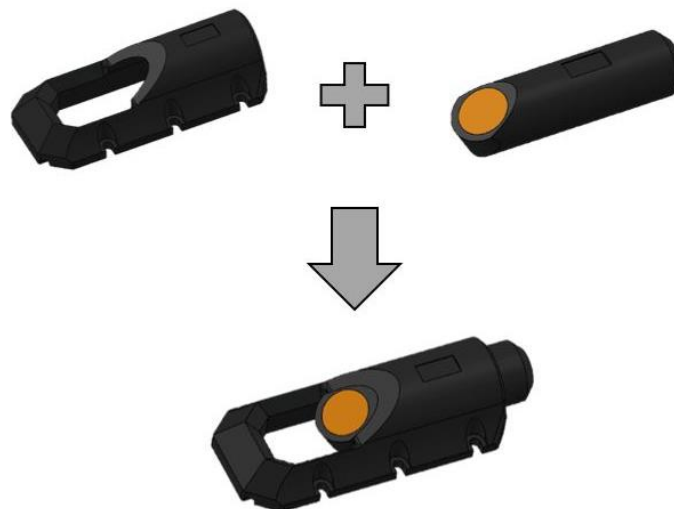
- 1) Install mounting brackets on the A side wall tightly. Considering highest and lowest water level, select distance between paths or distance between lower path and the bottom.



- 2) Confirm the installation place for the opposite side wall, then install brackets on the wall tightly.

Step 2: Assembling of Sensor and Bracket

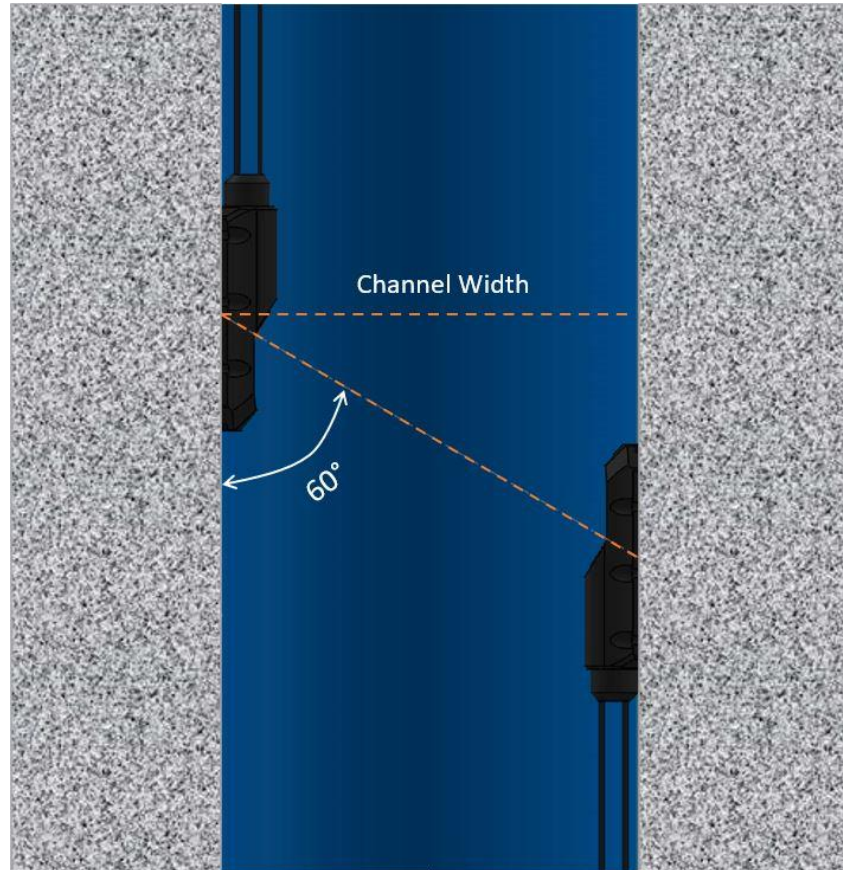
Insert sensors into brackets tightly.



**Step 3:
Adjusting of sensor
direction**

The Open Channel transducer angle is fixed to 60°. The angle is measured from the CENTER of the sensor to the mounting wall.

In order to receive a good signal for best accuracy, all transducers must face diagonally. For trapezoidal or circular channels, rotate the sensors on both walls so that they face each other.

**Step 4:
Install Flowmeter
and Connect**

Cables are integrated with transducers, so connect the other side of cable to the flow computer.



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

Connect 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 –

| MAIN MENU | | GENERAL | |
|-----------|-------------|---------|-----------------|
| 1 . | GENERAL | 1 . | SYSTEM LOCK |
| 2 . | PATH SELECT | 2 . | SITE NAME |
| 3 . | CH SETUP | 3 . | APPLICATION |
| 4 . | INSTALL | 4 . | UNIT |
| 5 . | OPERATE | 5 . | CHANNEL SHAPE |
| 6 . | FLOW | 6 . | LEVEL METER SET |
| 7 . | IN/OUTPUT | | |
| 8 . | DATALOG | | |
| 9 . | DIAG | | |

1. System Lock: User can set password to prevent unauthorized access to the flow computer.
2. Site Name: Input site name.
3. Application: Dual Path/Four Path/Crossed 2 Path
4. Unit: Metric / Inch
5. Channel Shape: Polygon/Pipe
6. Level Meter Set: Input/Unit

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.

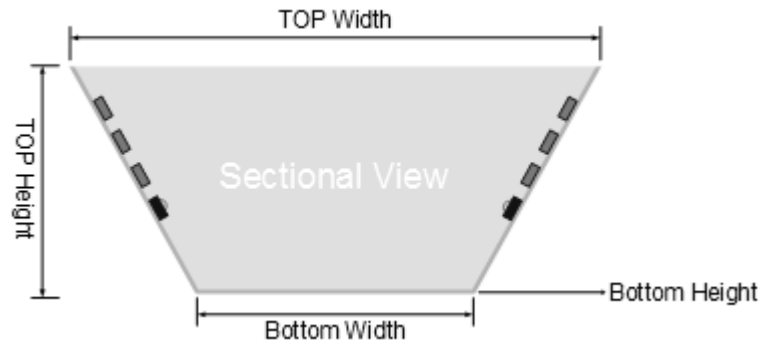
| MAIN MENU | | PATH SELECT | |
|-----------|-------------|-------------|--------|
| 1 . | GENERAL | 1 . | PATH 1 |
| 2 . | PATH SELECT | 2 . | PATH 2 |
| 3 . | CH SETUP | 3 . | PATH 3 |
| 4 . | INSTALL | 4 . | PATH 4 |
| 5 . | OPERATE | | |
| 6 . | FLOW | | |
| 7 . | IN/OUTPUT | | |
| 8 . | DATALOG | | |
| 9 . | DIAG | | |

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.

| MAIN MENU | | CH SETUP | |
|-----------|-------------|----------|--------|
| 1 . | GENERAL | 1 . | VIEW |
| 2 . | PATH SELECT | 2 . | ADD |
| 3 . | CH SETUP | 3 . | DELETE |
| 4 . | INSTALL | | |
| 5 . | OPERATE | | |
| 6 . | FLOW | | |
| 7 . | IN/OUTPUT | | |
| 8 . | DATALOG | | |
| 9 . | DIAG | | |

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



Step 4:
IMPORTANT
Path Parameters
Setup

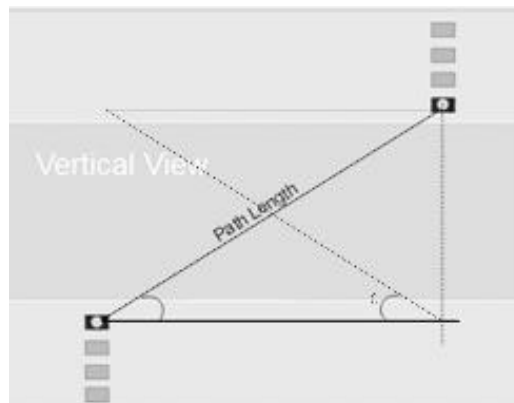
➤ **4. Install** – set up the configuration data for each path.

| MAIN MENU | INSTALL | SENSOR TYPE |
|------------------------|--------------------|---------------------|
| 1. GENERAL | 1. SENSOR TYPE | 1. LTO-S (C 1.0MHz) |
| 2. PATH SELECT | 2. PATH HEIGHT | 2. LTO-M (D 0.5MHz) |
| 3. CH SETUP | 3. PATH LENGTH | 3. LTO-L (F 0.3MHz) |
| 4. INSTALL [P1] | 4. PATH ANGLE | 4. LTR-S (C 1.0MHz) |
| 5. OPERATE | 5. PATH HEIGHT OPT | 5. LTR-M (D 0.5MHz) |
| 6. FLOW | 6. AUTO INSTALL | 6. LTR-L (F 0.3MHz) |
| 7. IN/OUTPUT | 7. RESERVE INSTALL | 7. A Type |
| 8. DATALOG | 8. INSTALL INFO. | |
| 9. DIAG [P1] | 9. ACTUAL ZERO | |
| | 0. SAMPLING CLK | |

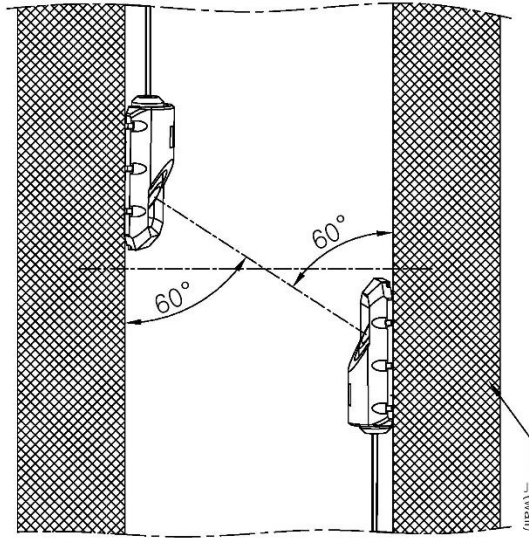
1. Sensor Type: Select corresponding sensor.
2. Path Height: the mounting height from the bottom.



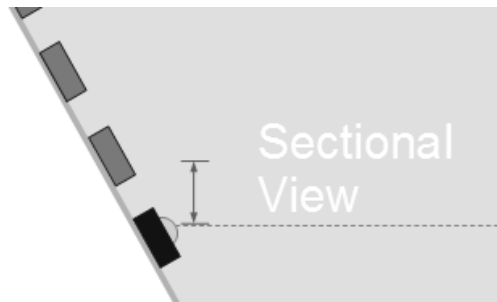
3. Path Length: the length between 2 transducers. (Lens to Lens)



4. Path Angle: the angle between path length and path distance (CH width).
For LTR-S, LTR-M, LTR-L sensors, the angle is fixed to 60°.



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



6. Auto Install: Do not use Auto Install for Open Channel. It is suggested to use Reserve Install for a better performance.
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 paths and setup the install parameters individually in **4. Install**.)
8. Install Info: User can review the install information of the selected path.
9. Actual Zero: User should perform Actual Zero when the flow is actual stopped but the flowmeter shows other values instead of “0”.
10. Sampling Clk: Flow computer will select Sampling Clock automatically, therefore, user does not need to change.

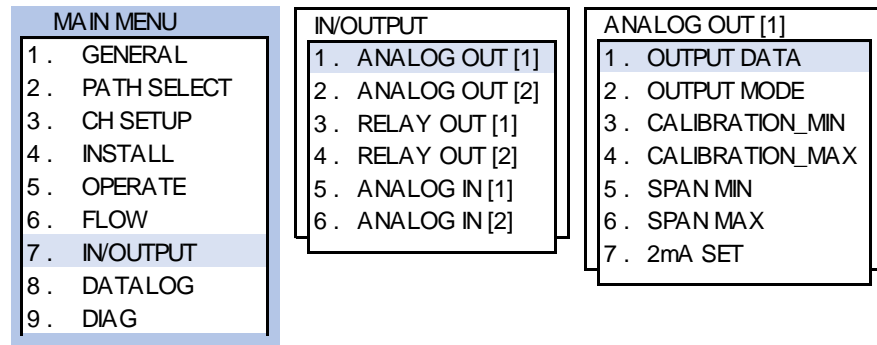
Instructions - Quick Analog Output

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 starting 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.

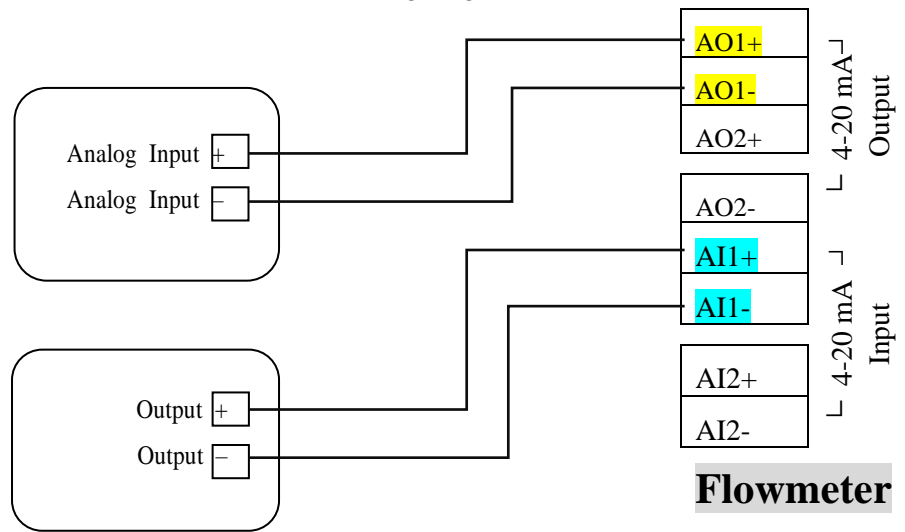


Press [MENU] – 7. IN/OUTPUT – 1. ANALOG OUT [1] or 2. ANALOG OUT [2]

- 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.

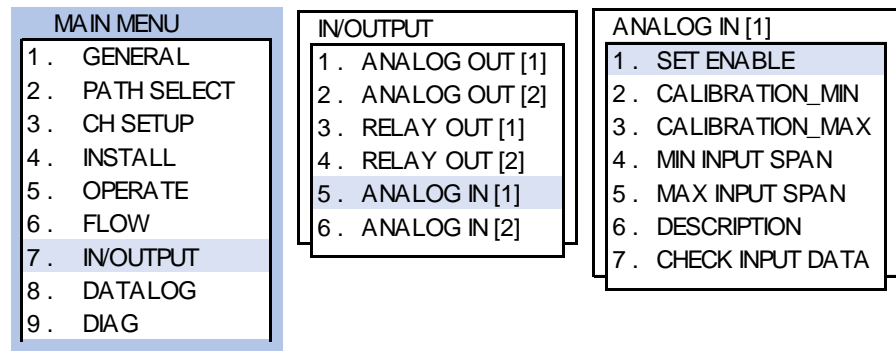
Instructions - Analog Input for Level Meter

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**.

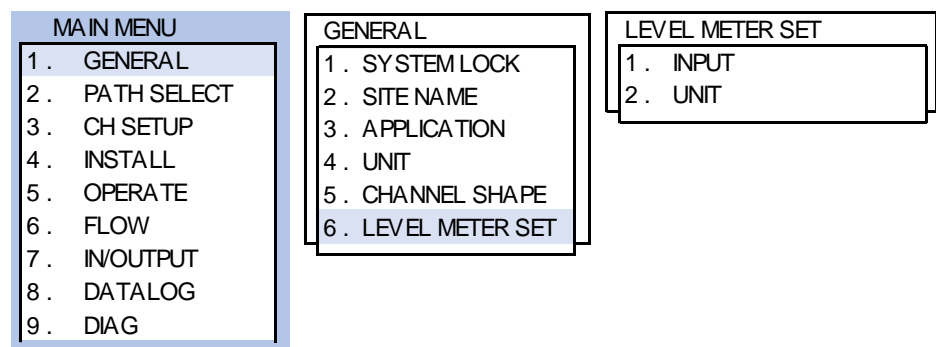


Press [MENU] – 7. IN/OUTPUT – 5. ANALOG IN [1] or 6. ANALOG IN [2]

- **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

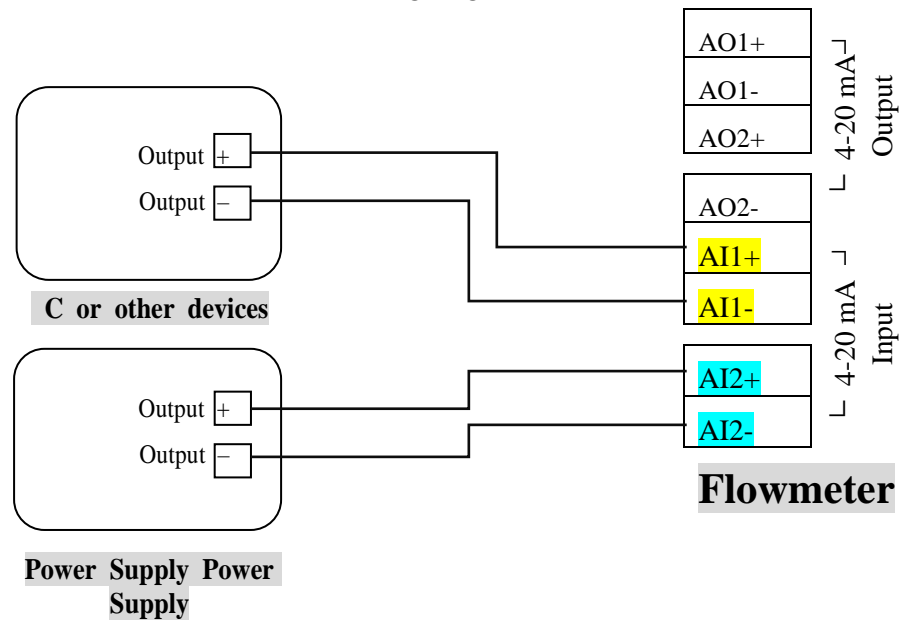
In the case of Open Channel, user need to connect a Level Transmitter to allow the measurement. However, user will also need an extra power supply device to power up the connected Level Transmitter.



- **7.7.1. Input** – User can use either Analog In [1] or Analog In [2] for input level data.
- **7.7.2. Unit** – The unit of level transmitter is “mm” or “inch”.

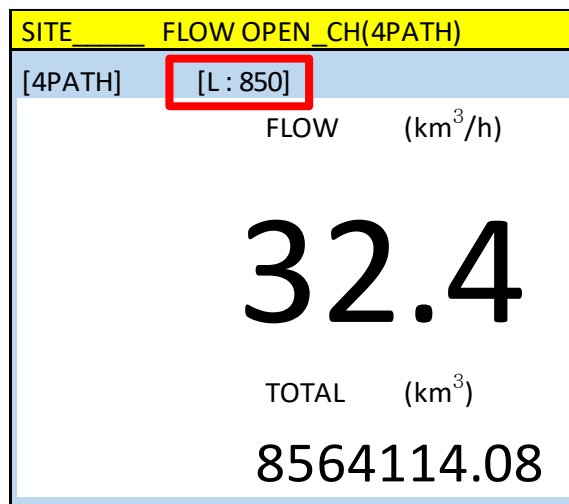
**Step 3:
Connect Devices**

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

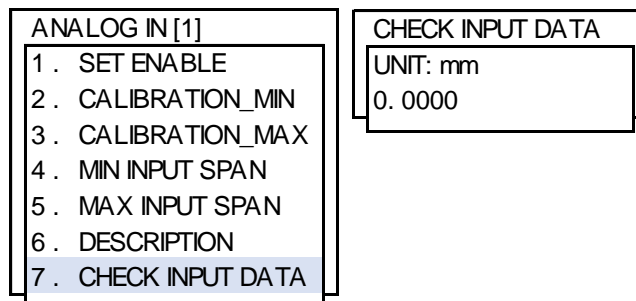


**Step 4:
Power On &
Check Input Data**

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



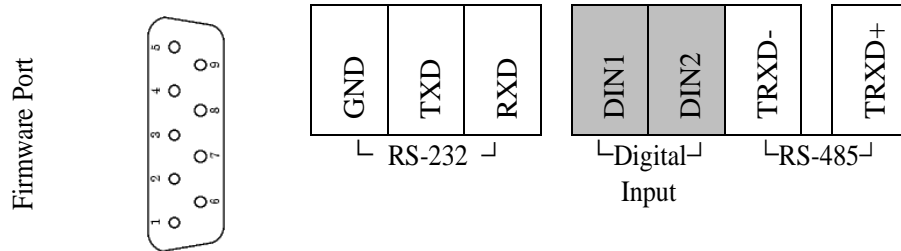
Or user can check in the tab, **7.5.7. Check Input Data** to check the input data as well.



Instructions – Data Logger

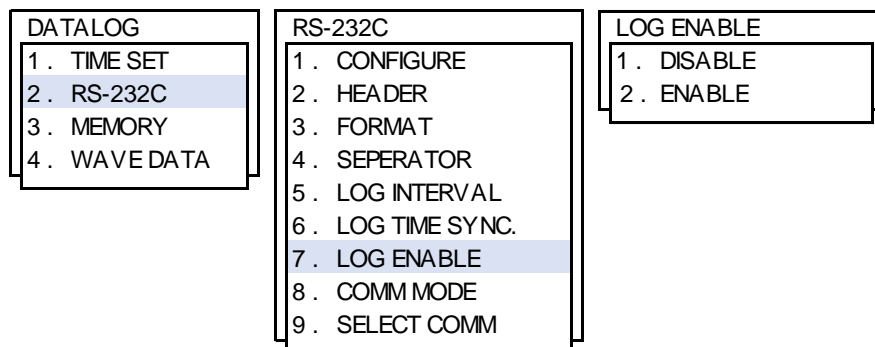
Step 1: Plugin the Cable

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

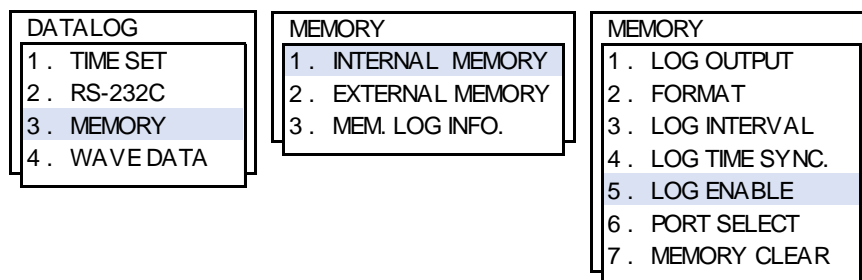


Step 2: Log Enable

- 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 – 1. INTERNAL MEMORY - 5. LOG ENABLE – **2. ENABLE**.



Step 3: Download DNW.exe

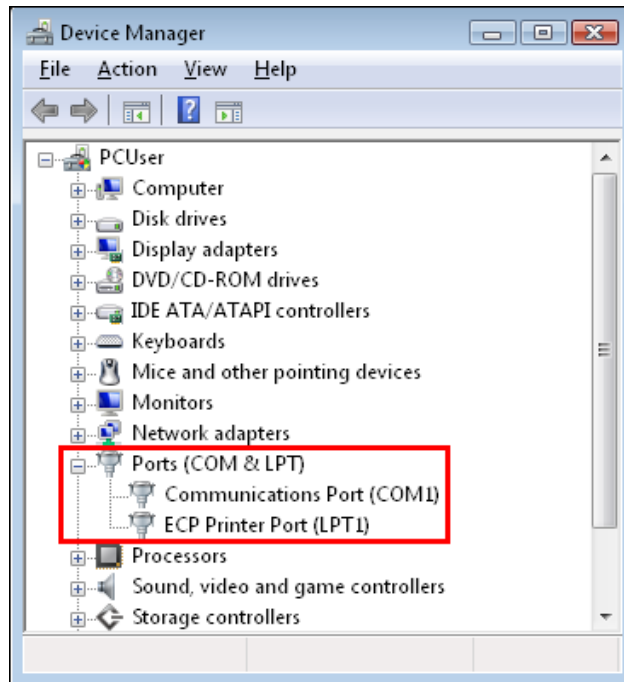
Download the software in user's Laptop.

Caution) Please contact the manufacture for the software.

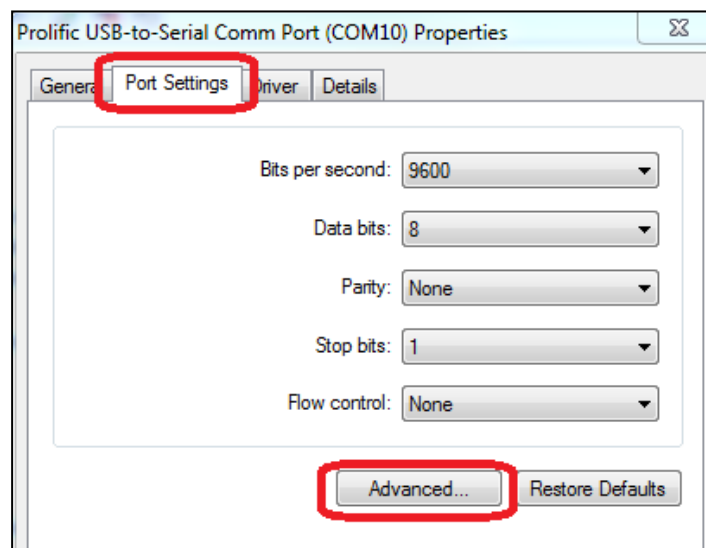
- DNW allows user to:
 1. Output the logger data
 2. Upgrade flowmeter

Step 4: Laptop's Port Setup

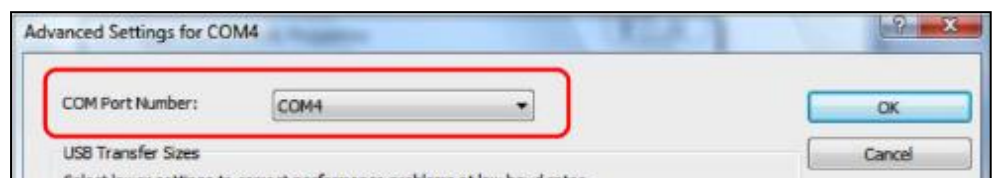
- Open the “Device Manager” on user’s Laptop.
- Find “PORTS (COM & LPT)” and click “Communications Port”.



- 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.)

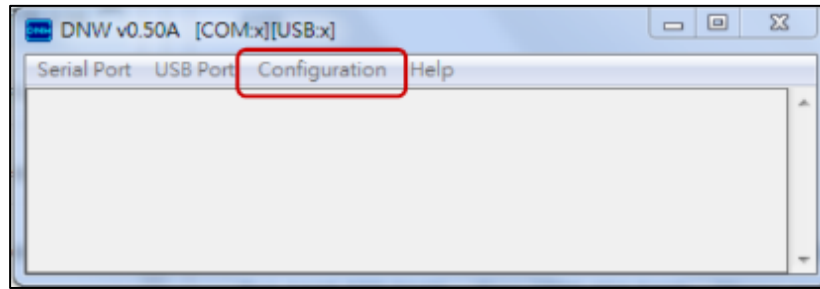


- Then, click “OK” button and close the Device Manager to complete the setting

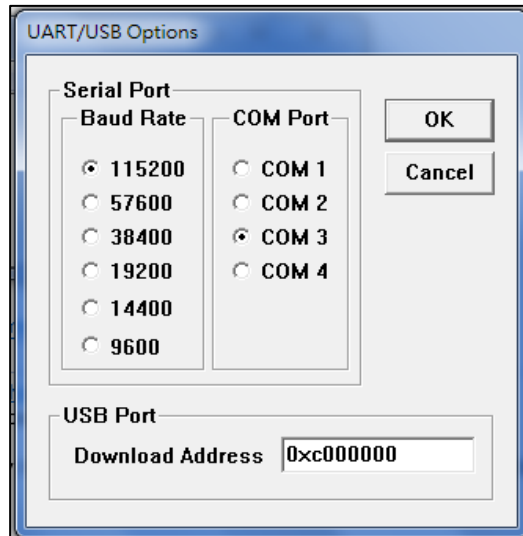
Step 5: Setup DNW

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

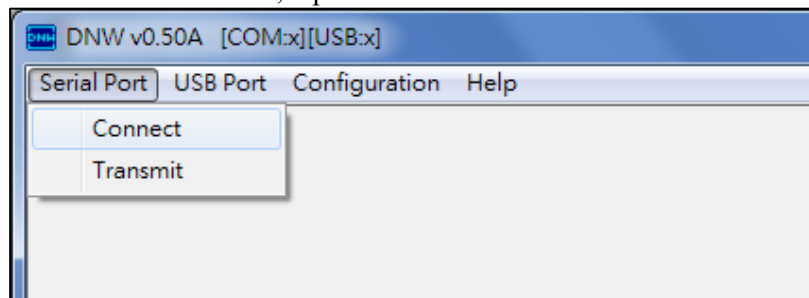
- Run the Software (DNW.exe) and click “**Configuration**”.



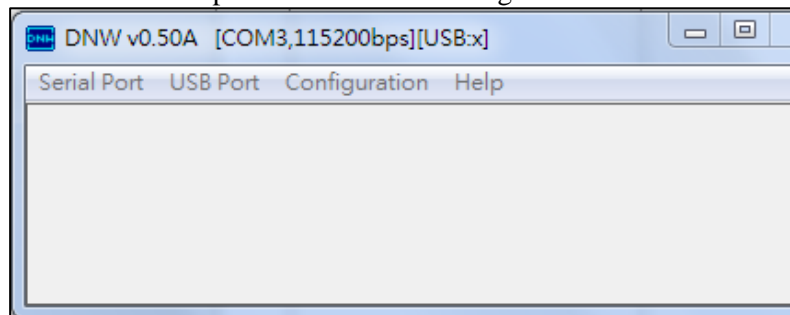
- User will see the window of “UART/USB Options” as below.



- 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.

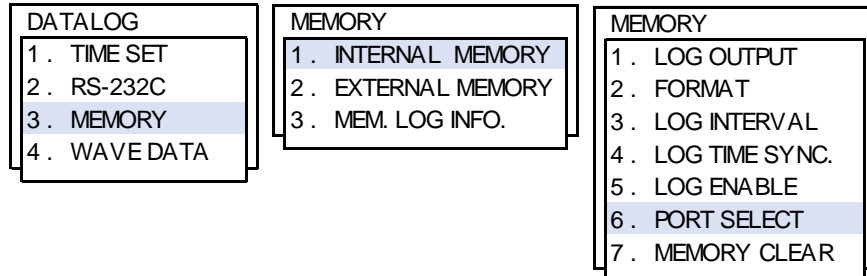


Step 6: Power On

- Press “U” key on Laptop and turn on flowmeter’s power **at the same.**

Step 7: Flowmeter Port Select

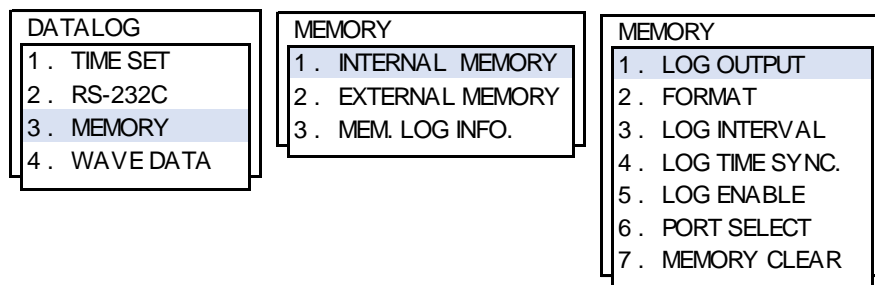
Go to [MENU] – 8. DATA LOG – 3. MEMORY – 1. INTERNAL MEMORY – **6.**
PORT SELECT.



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

Step 8: Log Out the Data

Go to [MENU] – 8. DATA LOG – 3. MEMORY – 1. INTERNAL MEMORY – 1.
LOG OUTPUT – **2. LOG OUTPUT.**



- Press [ENT] to output the data.
- Make sure 2. ENABLE is selected on 5. LOG ENABLE menu.

Setting Operation - General Setting

1.1 GENERAL - System Lock

User can input password to prevent unauthorized access to the flow computer. Initial setup by manufactory is 0000. User should input numbers and alphabets using keypad to change password.

Press [MENU] – 1.GENERAL – 1.SYSTEM LOCK

- UNLOCK/LOCK
- CHANGE PASSWORD

| GENERAL |
|--------------------|
| 1. SYSTEM LOCK |
| 2. SITE NAME |
| 3. APPLICATION |
| 4. UNIT |
| 5. CHANNEL SHAPE |
| 6. LEVEL METER SET |

| SYSTEM LOCK |
|--------------------|
| 1. UNLOCK/LOCK |
| 2. CHANGE PASSWORD |

1.2 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 – 2.SITE NAME

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

| GENERAL |
|--------------------|
| 1. SYSTEM LOCK |
| 2. SITE NAME |
| 3. APPLICATION |
| 4. UNIT |
| 5. CHANNEL SHAPE |
| 6. LEVEL METER SET |

| SITE NAME |
|-----------|
| SITE_---- |

1.3 GENERAL - Application

There are three kinds of system for Open Channel Application.

Press [MENU] – 1.GENERAL – 3.APPLICATION

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

| GENERAL |
|--------------------|
| 1. SYSTEM LOCK |
| 2. SITE NAME |
| 3. APPLICATION |
| 4. UNIT |
| 5. CHANNEL SHAPE |
| 6. LEVEL METER SET |

| APPLICATION |
|-------------------|
| 1. OPEN CH-4 PATH |
| 2. OPEN CH-2 PATH |
| 3. CROSSED 2 PATH |

1.4 GENERAL - Input Unit

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

Press [MENU] – 1.GENERAL – 4. UNIT

- Millimeter
- Inches

| GENERAL |
|--------------------|
| 1. SYSTEM LOCK |
| 2. SITE NAME |
| 3. APPLICATION |
| 4. UNIT |
| 5. CHANNEL SHAPE |
| 6. LEVEL METER SET |

| UNIT |
|---------|
| 1. mm |
| 2. inch |

1.5 GENERAL - Channel Shape

User must select shape of the open channel.

Press [MENU] – 1.GENERAL – 5.CHANNEL SHAPE

- POLYGON
- PIPE

| GENERAL |
|--------------------|
| 1. SYSTEM LOCK |
| 2. SITE NAME |
| 3. APPLICATION |
| 4. UNIT |
| 5. CHANNEL SHAPE |
| 6. LEVEL METER SET |

| CHANNEL SHAPE |
|---------------|
| 1. POLYGON |
| 2. PIPE |

1.6 GENERAL - Level Meter Set

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.

User can use either Analog In [1] or Analog In [2] for input level data.
If Channel is always full, select Set Full.

Press [MENU] – 1.GENERAL – 6.LEVEL METER SET – 1. INPUT

| | |
|-----------------|------------------|
| LEVEL METER SET | INPUT |
| 1. INPUT | 1. ANALOG IN [1] |
| 2. UNIT | 2. ANALOG IN [2] |
| | 3. SET FULL |

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

Set up the input unit of the level transmitter.

Press [MENU] – 1.GENERAL – 6.LEVEL METER SET – 2. UNIT

| | |
|-----------------|---------|
| LEVEL METER SET | UNIT |
| 1. INPUT | 1. mm |
| 2. UNIT | 2. inch |

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

| MAIN MENU | |
|-----------|-------------|
| 1. | GENERAL |
| 2. | PATH SELECT |
| 3. | CH SETUP |
| 4. | INSTALL |
| 5. | OPERATE |
| 6. | FLOW |
| 7. | IN/OUTPUT |
| 8. | DATALOG |
| 9. | DIAG |

| PATH SELECT | |
|-------------|--------|
| 1. | PATH 1 |
| 2. | PATH 2 |
| 3. | PATH 3 |
| 4. | PATH 4 |

3. CH SETUP –

User must input the Channel elevation and the width to allow the measurement.

Caution) Measurements cannot be accomplished without these settings.

Press [MENU] – 3.CH SETUP

- View
- Add
- Delete

| MAIN MENU | |
|-----------|-------------|
| 1. | GENERAL |
| 2. | PATH SELECT |
| 3. | CH SETUP |
| 4. | INSTALL |
| 5. | OPERATE |
| 6. | FLOW |
| 7. | IN/OUTPUT |
| 8. | DATALOG |
| 9. | DIAG |

| CH SETUP | |
|----------|--------|
| 1. | VIEW |
| 2. | ADD |
| 3. | DELETE |

View

User can view the inputted parameters here.

Press [MENU] – 3.CH SETUP – 1.VIEW

| CH SETUP | |
|----------|--------|
| 1. | VIEW |
| 2. | ADD |
| 3. | DELETE |

| VIEW | |
|-----------------------|-----|
| HEIGHT (mm)/WIDTH(mm) | |
| 0: | 400 |
| 200: | 600 |
| EMPTY | |
| EMPTY | |
| EMPTY | |
| EMPTY | |
| EMPTY | |
| EMPTY | |

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.

| CH SETUP | |
|----------|--------|
| 1. | VIEW |
| 2. | ADD |
| 3. | DELETE |

| ADD | |
|---------|---|
| HEIGHT: | 0 |
| WIDTH: | 0 |
| SAVE: | 0 |

Delete

User could delete the channel parameters.

Press [MENU] – 3.CH SETUP – 3. DELETE

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

| CH SETUP | |
|----------|--------|
| 1. | VIEW |
| 2. | ADD |
| 3. | DELETE |

| DELETE | |
|-----------------------|-----|
| HEIGHT (mm)/WIDTH(mm) | |
| 0: | 400 |
| 200: | 600 |
| EMPTY | |
| EMPTY | |
| EMPTY | |
| EMPTY | |
| EMPTY | |
| EMPTY | |

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.

| MAIN MENU | | INSTALL | |
|-----------|--------------|---------|-----------------|
| 1 . | GENERAL | 1 . | SENSOR TYPE |
| 2 . | PATH SELECT | 2 . | PATH HEIGHT |
| 3 . | CH SETUP | 3 . | PATH LENGTH |
| 4 . | INSTALL [P1] | 4 . | PATH ANGLE |
| 5 . | OPERATE | 5 . | PATH HEIGHT OPT |
| 6 . | FLOW | 6 . | AUTO INSTALL |
| 7 . | IN/OUTPUT | 7 . | RESERVE INSTALL |
| 8 . | DATALOG | 8 . | INSTALL INFO. |
| 9 . | DIAG [P1] | 9 . | ACTUAL ZERO |
| | | 0 . | SAMPLING CLK |

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

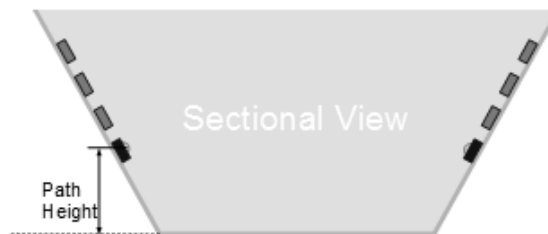
- LTO-S (N/A)
- LTO-M (for the applications up to 3 meter)
- LTO-L (for the applications up to 30 meter)
- LTR-S (N/A)
- LTR-M (for the applications up to 3 meter)
- LTR-L (for the applications up to 30 meter)
- A type (N/A)

| INSTALL | | SENSOR TYPE | |
|---------|-----------------|-------------|------------------|
| 1 . | SENSOR TYPE | 1 . | LTO-S (C 1.0MHz) |
| 2 . | PATH HEIGHT | 2 . | LTO-M (D 0.5MHz) |
| 3 . | PATH LENGTH | 3 . | LTO-L (F 0.3MHz) |
| 4 . | PATH ANGLE | 4 . | LTR-S (C 1.0MHz) |
| 5 . | PATH HEIGHT OPT | 5 . | LTR-M (D 0.5MHz) |
| 6 . | AUTO INSTALL | 6 . | LTR-L (F 0.3MHz) |
| 7 . | RESERVE INSTALL | 7 . | A Type |
| 8 . | INSTALL INFO. | | |
| 9 . | ACTUAL ZERO | | |
| 0 . | SAMPLING CLK | | |

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

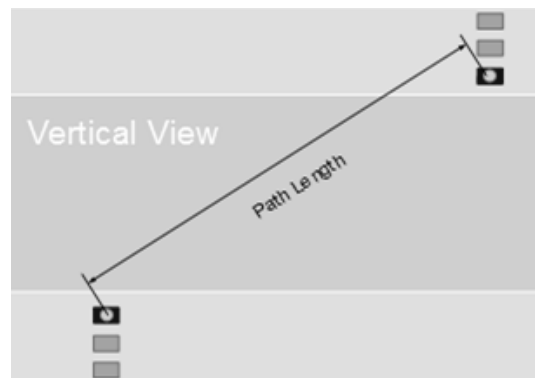


| INSTALL | | PATH HEIGHT | |
|---------|-----------------|-------------|---------|
| 1 . | SENSOR TYPE | UNIT : | mm |
| 2 . | PATH HEIGHT | | 100.000 |
| 3 . | PATH LENGTH | | |
| 4 . | PATH ANGLE | | |
| 5 . | PATH HEIGHT OPT | | |
| 6 . | AUTO INSTALL | | |
| 7 . | RESERVE INSTALL | | |
| 8 . | INSTALL INFO. | | |
| 9 . | ACTUAL ZERO | | |
| 0 . | SAMPLING CLK | | |

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

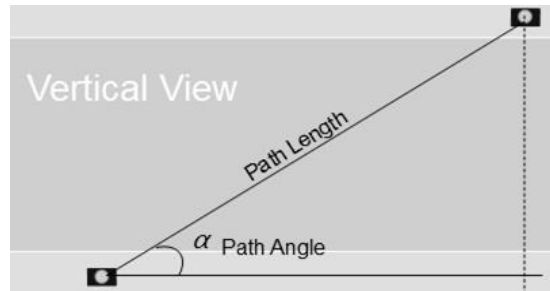


| INSTALL | | PATH LENGTH | |
|---------|-----------------|-------------|---------|
| 1 . | SENSOR TYPE | UNIT : | mm |
| 2 . | PATH HEIGHT | | 450.000 |
| 3 . | PATH LENGTH | | |
| 4 . | PATH ANGLE | | |
| 5 . | PATH HEIGHT OPT | | |
| 6 . | AUTO INSTALL | | |
| 7 . | RESERVE INSTALL | | |
| 8 . | INSTALL INFO. | | |
| 9 . | ACTUAL ZERO | | |
| 0 . | SAMPLING CLK | | |

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



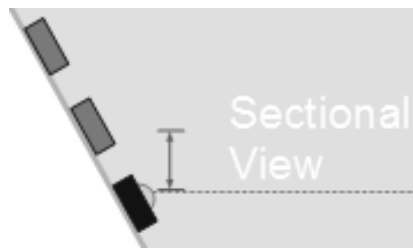
| INSTALL |
|--------------------|
| 1. SENSOR TYPE |
| 2. PATH HEIGHT |
| 3. PATH LENGTH |
| 4. PATH ANGLE |
| 5. PATH HEIGHT OPT |
| 6. AUTO INSTALL |
| 7. RESERVE INSTALL |
| 8. INSTALL INFO. |
| 9. ACTUAL ZERO |
| 0. SAMPLING CLK |

| PATH ANGLE |
|---------------|
| UNIT : Degree |
| 60.000 |

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 |
|--------------------|
| 1. SENSOR TYPE |
| 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 |
| 0. SAMPLING CLK |

| PATH HEIGHT OPT |
|-----------------|
| UNIT : mm |
| 150.000 |

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 |
|--------------------|
| 1. SENSOR TYPE |
| 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 |
| 0. SAMPLING CLK |

| AUTO INSTALL |
|--------------|
| 1. NO |
| 2. YES |

4.7 Install – Reserve Install

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

Caution) User should introduce the parameters of the selecting path before enabling 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 |
|--------------------|
| 1. SENSOR TYPE |
| 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 |
| 0. SAMPLING CLK |

| RESERVE INSTALL |
|-----------------|
| 1. SET |
| 2. CLEAR |

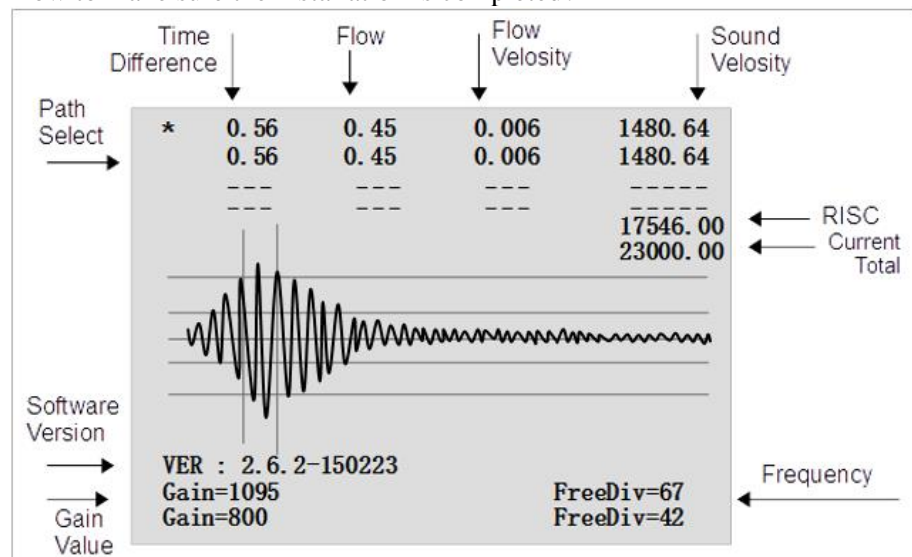
About Installation

There is some technical information about Reserve Installation that user need to know. The Reserve Installation was programmed to perform the function automatically once the level has reached 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 will the software do 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 reaches 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 that 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 could not find the best wave frequency after running Auto Install, user could try to search the best signal manually. But it rarely happens.

- 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 – 8.INSTALL INFO

Install Path Length

- Before running “Auto Install”, it will show “**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 show “**Install Reserved**”.

| INSTALL | INSTALL INFO. |
|--------------------------|-------------------------------------|
| 1 . SENSOR TYPE | -Sensor: LTR-L (F 0.3MHz) |
| 2 . PATH HEIGHT | -Height: 100mm |
| 3 . PATH LENGTH | -Inst. Path Length Not Installed |
| 4 . PATH ANGLE | |
| 5 . PATH HEIGHT OPT | |
| 6 . AUTO INSTALL | |
| 7 . RESERVE INSTALL | |
| 8 . INSTALL INFO. | |
| 9 . ACTUAL ZERO | |
| 0 . SAMPLING CLK | |

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 – 9. 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)

| INSTALL | ACTUAL ZERO |
|------------------------|-----------------------------|
| 1 . SENSOR TYPE | 1 . ACTUAL ZERO USER |
| 2 . PATH HEIGHT | 2 . ACTUAL ZERO SET |
| 3 . PATH LENGTH | 3 . ACTUAL ZERO RESET |
| 4 . PATH ANGLE | 4 . ACTUAL ZERO AUTO |
| 5 . PATH HEIGHT OPT | |
| 6 . AUTO INSTALL | |
| 7 . RESERVE INSTALL | |
| 8 . INSTALL INFO. | |
| 9 . ACTUAL ZERO | |
| 0 . SAMPLING CLK | |

Actual Zero User

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

Press [MENU] – 4.INSTALL – 9. 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 – 9. 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 – 9. 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 – 9. 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.

4.9 Install – Sampling Clk

Flow computer will select Sampling Clock automatically, therefore, user does not need to change.

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 | OPERATE |
|----------------|----------------------|
| 1. GENERAL | 1. UPPER FLOW LIMIT |
| 2. PATH SELECT | 2. LOWER FLOW LIMIT |
| 3. CH SETUP | 3. DEAD LEVEL |
| 4. INSTALL [1] | 4. DEAD ZONE |
| 5. OPERATE | 5. FLOW AVERAGE TIME |
| 6. FLOW | 6. TOTAL FLOW SET |
| 7. IN/OUTPUT | 7. ALARM |
| 8. DATALOG | 8. CALIBRATION |
| 9. DIAG [1] | 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 | 20000.160 |
| 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 | - 20000.160 |
| 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] – 5.OPERATE – 3.DEAD LEVEL

| OPERATE | DEAD LEVEL |
|----------------------|------------|
| 1. UPPER FLOW LIMIT | UNIT: mm |
| 2. LOWER FLOW LIMIT | 0.000 |
| 3. DEAD LEVEL | |
| 4. DEAD ZONE | |
| 5. FLOW AVERAGE TIME | |
| 6. TOTAL FLOW SET | |
| 7. ALARM | |
| 8. CALIBRATION | |
| 9. ENABLE AGC | |
| 0. DAMPING | |

5.4 Operate – Dead Zone

Dead Zone, the flow rate that user want the flowmeter ignore. Similar 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 – 5.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 | |
| 5 | |

5.6 Operate – Total Flow Set

User can correct the total flow manually in this menu.

Press [MENU] – 6.OPERATE – 6.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 | |
|----------------|--|
| Unit: m³ | |
| 0 | |

5.7.1 Operate – Alarm

User can set the alarms for flow rates.

Press [MENU] – 5.OPERATE – 7.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 |
| 3. | HIGH SPEED |

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 – 8.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] – 5. OPERATE – 8. CALIBRATION
– 1. METHOD

| CALIBRATION |
|--------------------|
| 1. METHOD |
| 2. MULTI-POINT SET |
| 3. Kc SET |

| METHOD |
|-------------------|
| 1. NO CALIBRATION |
| 2. MULTI-POINTS |
| 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] – 5. OPERATE – 8. CALIBRATION – 2. MULTI-POINT SET

| CALIBRATION |
|--------------------|
| 1. METHOD |
| 2. MULTI-POINT SET |
| 3. Kc SET |

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

| Kc SET |
|-------------|
| Unit : None |
| 1. 000 |

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] – 5. OPERATE – 9. ENABLE AGC

| 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 |

| ENABLE AGC |
|------------|
| 1. DISABLE |
| 2. ENABLE |

5.10 Operate – Damping

Damping functions to display the data smoothly.

Press [MENU] – 5. OPERATE – 0. DAMPING

| 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 |

| DAMPING |
|--------------|
| 1. DISABLE |
| 2. 30 SEC. |
| 3. 1 MIN. |
| 4. 5 MIN. |
| 5. 10 MIN. |
| 6. 30 MIN. |
| 7. UNLIMITED |

Setting Operation – Flow Parameters

6. Flow -

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

Press [MENU] – 6. FLOW

| MAIN MENU | FLOW |
|----------------|----------------------|
| 1. GENERAL | 1. FLOW VOLUME UNIT |
| 2. PATH SELECT | 2. FLOW TIME UNIT |
| 3. CH SETUP | 3. FLOW RESOLUTION |
| 4. INSTALL | 4. FLOW SCALE |
| 5. OPERATE | 5. TOTAL VOLUME UNIT |
| 6. FLOW | 6. TOTAL RESOLUTION |
| 7. IN/OUTPUT | 7. TOTAL SCALE |
| 8. DATALOG | 8. BATCH TOTAL |
| 9. DIAG | 9. TOTALIZER MODE |

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

| FLOW | FLOW TIME UNIT |
|----------------------|----------------|
| 1. FLOW VOLUME UNIT | 1. SECOND |
| 2. FLOW TIME UNIT | 2. MINUTE |
| 3. FLOW RESOLUTION | 3. HOUR |
| 4. FLOW SCALE | 4. DAY |
| 5. TOTAL VOLUME UNIT | |
| 6. TOTAL RESOLUTION | |
| 7. TOTAL SCALE | |
| 8. BATCH TOTAL | |
| 9. TOTALIZER MODE | |

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

| FLOW | FLOW TIME UNIT |
|----------------------|----------------|
| 1. FLOW VOLUME UNIT | 1. SECOND |
| 2. FLOW TIME UNIT | 2. MINUTE |
| 3. FLOW RESOLUTION | 3. HOUR |
| 4. FLOW SCALE | 4. DAY |
| 5. TOTAL VOLUME UNIT | |
| 6. TOTAL RESOLUTION | |
| 7. TOTAL SCALE | |
| 8. BATCH TOTAL | |
| 9. TOTALIZER MODE | |

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.

| FLOW | FLOW 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. TOTAL RESOLUTION | |
| 7. TOTAL SCALE | |
| 8. BATCH TOTAL | |
| 9. TOTALIZER MODE | |

6.4 Flow – Flow Scale

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

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

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

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 | FLOW 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(CUJ) |
| 5. TOTAL VOLUME UNIT | 5. CUBIC FEET(CUF) |
| 6. TOTAL RESOLUTION | 6. KILO GRAM(Kg) |
| 7. TOTAL SCALE | 7. 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 | TOTAL 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. TOTAL 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 TOTAL | |
| 9. TOTALIZER MODE | |

6.9 Flow – Totalizer Mode

User can set the mode for totalize 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. POSITIVE 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]

| MAIN MENU | IN/OUTPUT |
|----------------|-------------------|
| 1. GENERAL | 1. ANALOG OUT [1] |
| 2. PATH SELECT | 2. ANALOG OUT [2] |
| 3. CH SETUP | 3. RELAY OUT [1] |
| 4. INSTALL | 4. RELAY OUT [2] |
| 5. OPERATE | 5. ANALOG IN [1] |
| 6. FLOW | 6. ANALOG IN [2] |
| 7. IN/OUTPUT | |
| 8. DATALOG | |
| 9. DIAG | |

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

User can assign Flow or Velocity to Analog Out.

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]

| ANALOG OUT [1] | OUTPUT DATA |
|--------------------|----------------|
| 1. OUTPUT DATA | 1. NONE |
| 2. OUTPUT MODE | 2. FLOW |
| 3. CALIBRATION_MIN | 3. VELOCITY |
| 4. CALIBRATION_MAX | 4. ANALOG IN 1 |
| 5. SPAN MIN | 5. ANALOG IN 2 |
| 6. SPAN MAX | |
| 7. 2mA SET | |

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

| ANALOG OUT [1] | OUTPUT MODE |
|--------------------|-------------------|
| 1. OUTPUT DATA | 1. BY APPLICATION |
| 2. OUTPUT MODE | 2. [CH 1] ONLY |
| 3. CALIBRATION_MIN | 3. [CH 2] ONLY |
| 4. CALIBRATION_MAX | |
| 5. SPAN MIN | |
| 6. SPAN MAX | |
| 7. 2mA SET | |

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.

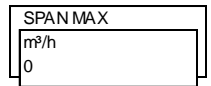
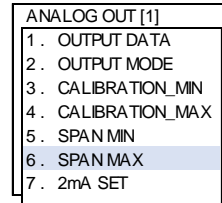
| ANALOG OUT [1] | SPAN_MIN |
|--------------------|-------------------|
| 1. OUTPUT DATA | m ³ /h |
| 2. OUTPUT MODE | 0 |
| 3. CALIBRATION_MIN | |
| 4. CALIBRATION_MAX | |
| 5. SPAN_MIN | |
| 6. SPAN_MAX | |
| 7. 2mA SET | |

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.

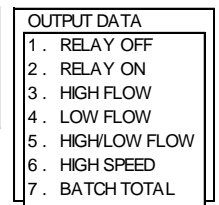
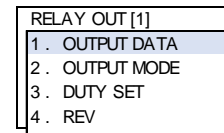
Press [MENU] – 7. IN/OUTPUT – 3. RELAY OUT [1]

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

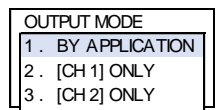
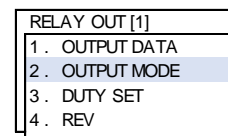


7.3.2 In/Output – Relay Out [1] – Output Mode

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

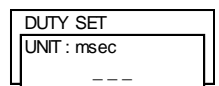
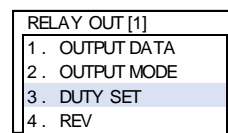
Press [MENU] – 7. IN/OUTPUT – 3. RELAY OUT [1] – 2. OUTPUT MODE

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



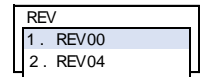
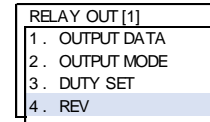
7.3.3 In/Output – Relay Out [1] – Duty Set

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]

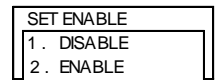
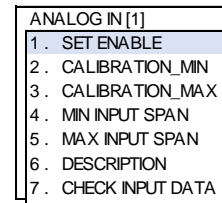
User can assign each data with Analog In [1] and [2] individually to receive the data from other devices. Which includes Current Temperature, Pressure, Liquid level and etc.

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

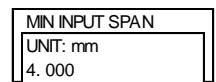
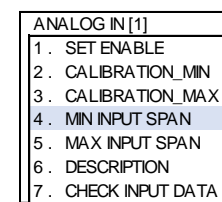
Caution) Do NOT use this function without manufacture's technical instructions.

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



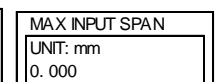
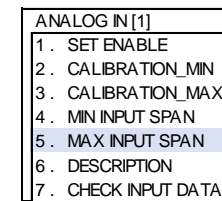
Ex)

- 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].

| ANALOG IN [1] |
|---------------------|
| 1. SET ENABLE |
| 2. CALIBRATION_MIN |
| 3. CALIBRATION_MAX |
| 4. MIN INPUT SPAN |
| 5. MAX INPUT SPAN |
| 6. DESCRIPTION |
| 7. CHECK INPUT DATA |

| DESCRIPTION |
|-------------|
| A_IN1 |

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

| ANALOG IN [1] |
|---------------------|
| 1. SET ENABLE |
| 2. CALIBRATION_MIN |
| 3. CALIBRATION_MAX |
| 4. MIN INPUT SPAN |
| 5. MAX INPUT SPAN |
| 6. DESCRIPTION |
| 7. CHECK INPUT DATA |

| CHECK INPUT DATA |
|------------------|
| UNIT: mm |
| 0.0000 |

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]

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].

| DATALOG |
|--------------|
| 1. TIME SET |
| 2. RS-232C |
| 3. MEMORY |
| 4. WAVE DATA |

| TIME SET |
|-------------------|
| YY/MM/DD HH:MM:SS |
| _/_/_ _:__:__ |

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

| 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 |

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

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

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

| BAUD RATE | |
|-----------|--------|
| 1. | 2400 |
| 2. | 4800 |
| 3. | 9600 |
| 4. | 19200 |
| 5. | 38400 |
| 6. | 57600 |
| 7. | 115200 |

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

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

| DATA BITS | |
|-----------|-------|
| 1. | 8Bits |
| 2. | 7Bits |

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

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

| NETWORK ID | |
|------------|--|
| – | |

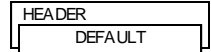
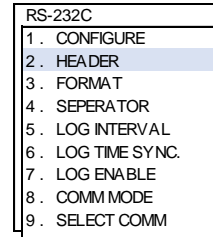
- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].

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].

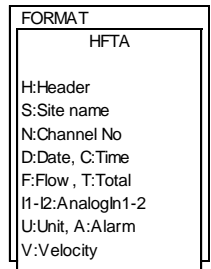
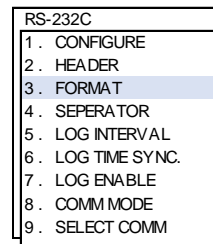


8.2.3 Data Log – RS-232C – Format

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

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

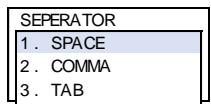
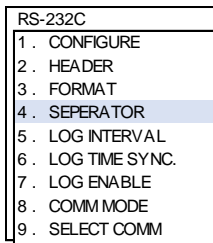
- Move cursor by [◀] [▶].
- Input alphabet characters by [F1].
- Delete characters by [CLR].
- Leave the edit mode by pressing [ENT].



8.2.4 Data Log – RS-232C – Separator

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

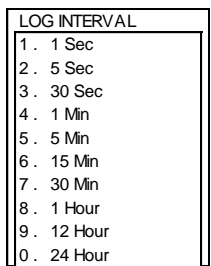
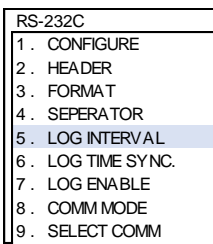
Press [MENU] – 8.DATA LOG – 2.RS-232C –
4.SEPERATOR



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



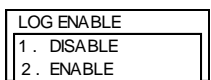
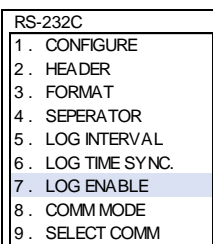
8.2.6 Data Log – RS-232C – Log Time Sync

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 –

User must enable the function for data logger.

**RS-232C –
Comm Mode**

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

| 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 |

| COMM MODE |
|----------------|
| 1. NORMAL |
| 2. CALL ANSWER |
| 3. CDMA COMM |
| 4. MODBUS-RTU |

**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

| 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 |

| SELECT COMM |
|-------------|
| 1. RS232 |
| 2. RS485 |

Memory of Data Logger

**8.3.1 Data Log –
Memory –
Log Output**

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

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

| MEMORY |
|-------------------|
| 1. LOG OUTPUT |
| 2. FORMAT |
| 3. LOG INTERVAL |
| 4. LOG TIME SYNC. |
| 5. LOG ENABLE |
| 6. PORT SELECT |
| 7. MEMORY CLEAR |

| LOG OUTPUT |
|---------------|
| 1. LOG DATE |
| 2. LOG OUTPUT |

**8.3.2 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- 2.FORMAT

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

| MEMORY |
|-------------------|
| 1. LOG OUTPUT |
| 2. FORMAT |
| 3. LOG INTERVAL |
| 4. LOG TIME SYNC. |
| 5. LOG ENABLE |
| 6. PORT SELECT |
| 7. MEMORY CLEAR |

| FORMAT |
|-----------------|
| SCFTIVE |
| F: Flow |
| T: Total |
| S: Site Name |
| C: Channel No |
| I: Analog Input |
| V: Velocity |
| E: Error |

**8.3.3 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 |
|-------------------|
| 1. LOG OUTPUT |
| 2. FORMAT |
| 3. LOG INTERVAL |
| 4. LOG TIME SYNC. |
| 5. LOG ENABLE |
| 6. PORT SELECT |
| 7. MEMORY CLEAR |

| LOG INTERVAL |
|--------------|
| 1. 1 Sec |
| 2. 5 Sec |
| 3. 30 Sec |
| 4. 1 Min |
| 5. 5 Min |
| 6. 15 Min |
| 7. 30 Min |
| 8. 1 Hour |
| 9. 12 Hour |
| 0. 24 Hour |

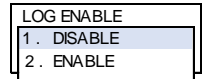
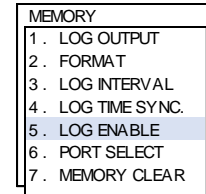
**8.2.4 Data Log–
Memory–
Log Time Sync**

Press [MENU] – 8.DATA LOG – 2.MEMORY – 6.LOG TIME SYNC

8.2.5 Data Log – Memory – Log Enable

User must enable the function for data logger.

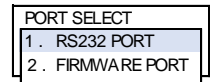
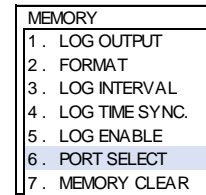
Press [MENU] – 8.DATA LOG – 3.MEMORY –
7.LOG ENABLE



8.3.6 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.***

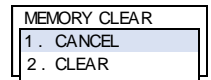
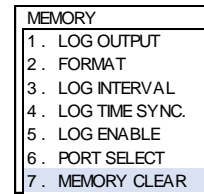
Press [MENU] – 8.DATA LOG – 3.MEMORY
– 8. PORT SELECT



8.3.7 Data Log – Memory – Memory Clear

User can clear all of memory here.

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

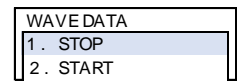
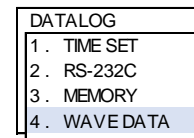


Wave Data

8.4 Data Log – Wave Data

Download the Signal Wave Data.

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



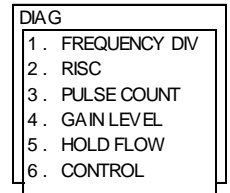
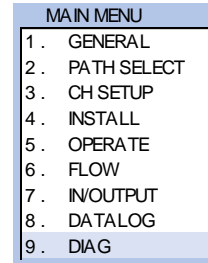
Diagnostics Menu

9. Diag -

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

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

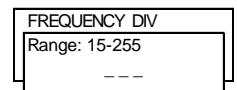
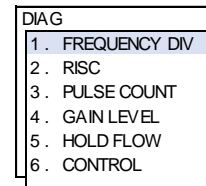
Press [MENU] – 9.DIAG



9.1 Diag – Frequency Div

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

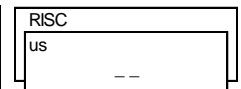
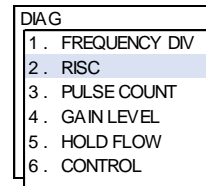
Press [MENU] – 9.DIAG – 1.FREQUENCY DIV



9.2 Diag – Risc

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

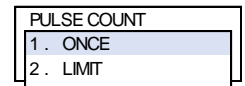
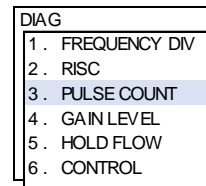
Press [MENU] – 9.DIAG – 2.RISC



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.

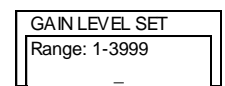
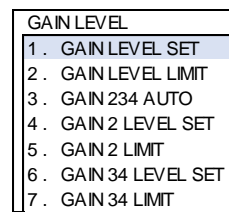
Limit

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



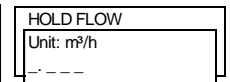
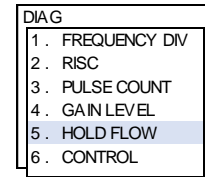
9.5 Diag – Hold Flow

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

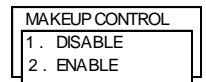
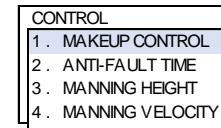
Ex) Analog out - SPAN MIN: 0 / SPAN MAX: 1000

- 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.

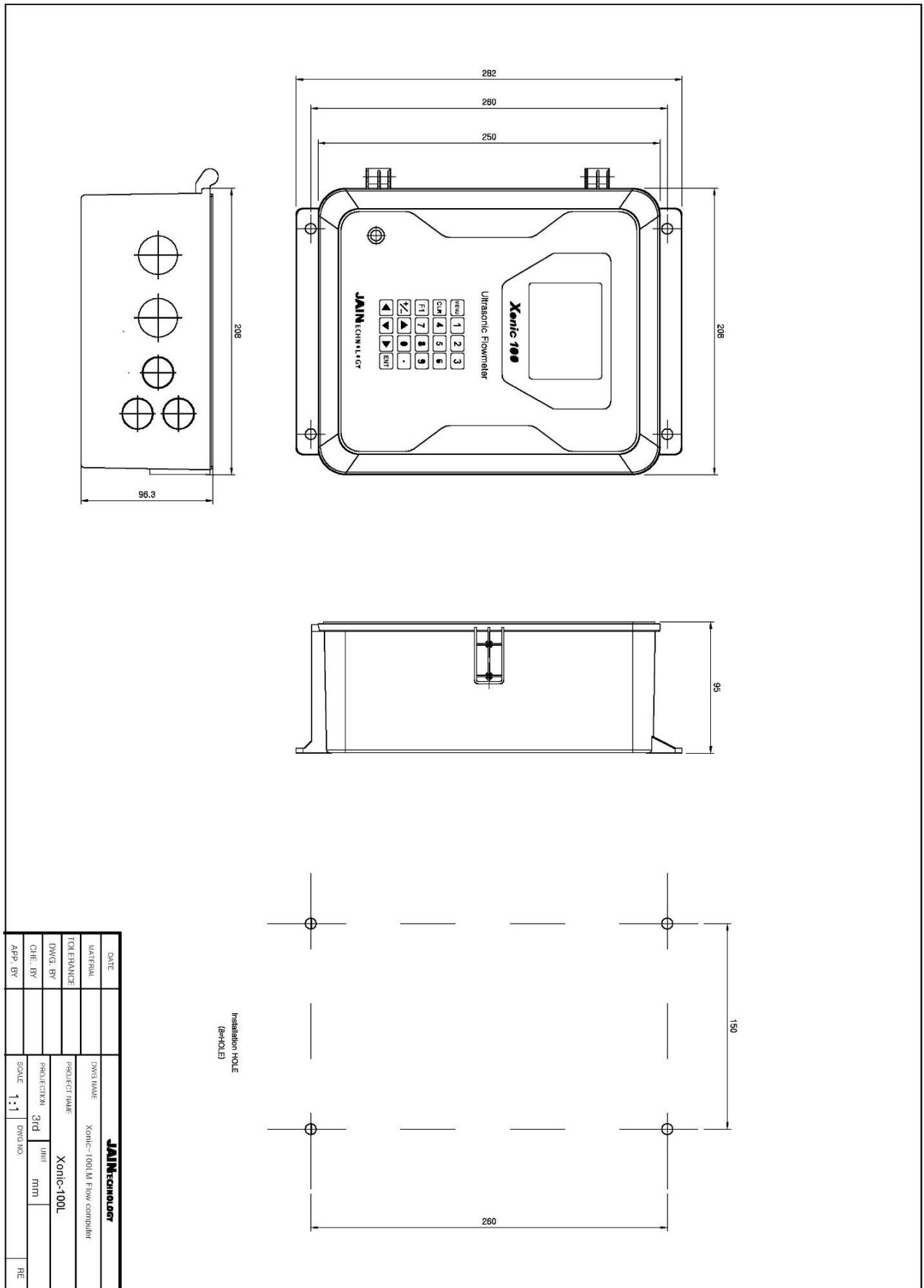


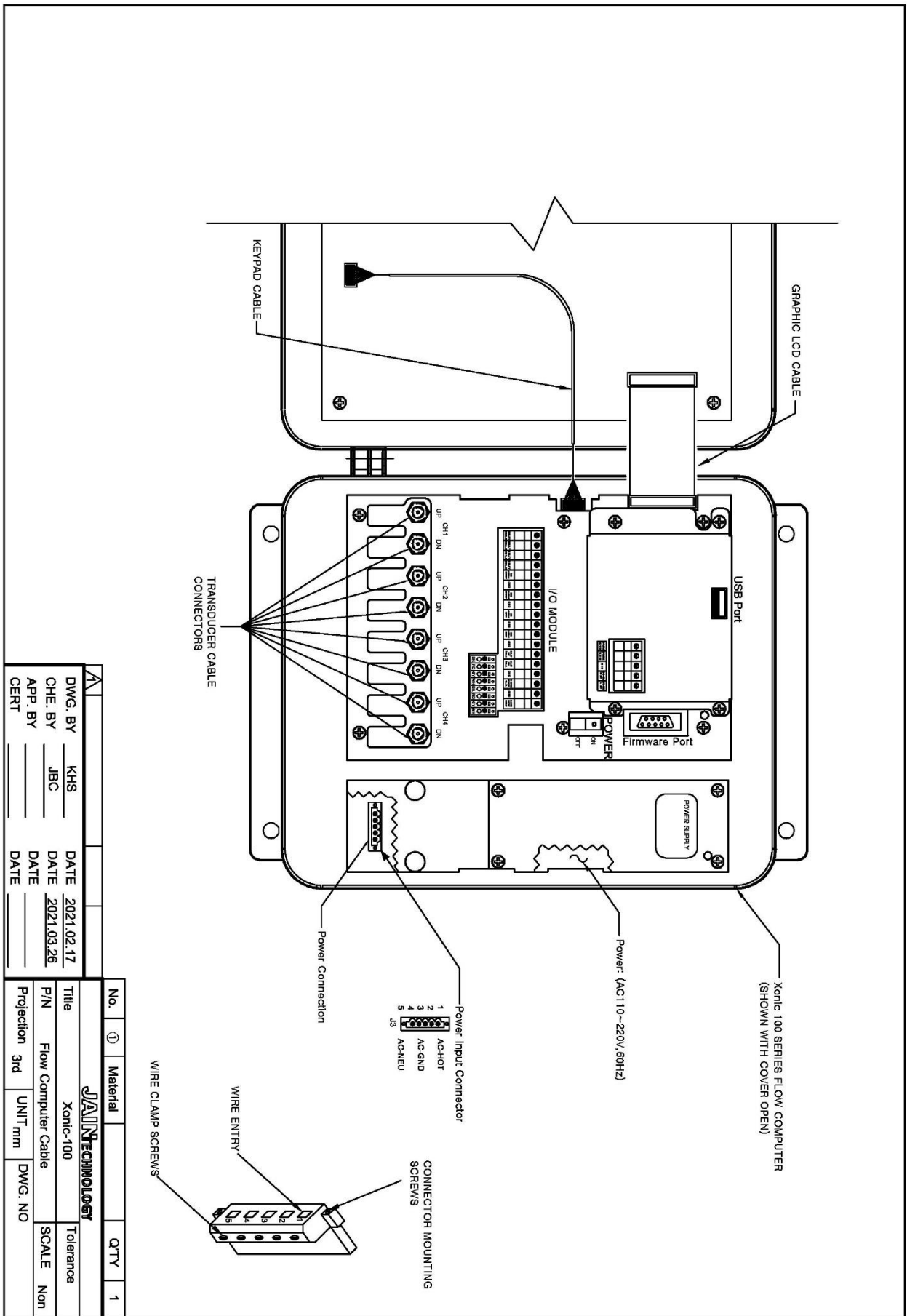
9.5 Diag – Control

Press [MENU] – 9.DIAG – 6.CONTROL



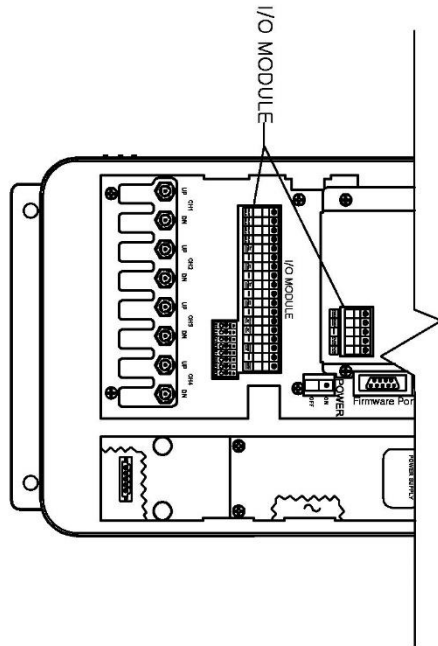
DRAWINGS





| | | | |
|---------|-----|------|------------|
| DWG. BY | KHS | DATE | 2021.02.17 |
| CHE. BY | JBC | DATE | 2021.03.26 |
| APP. BY | | DATE | |
| CERT | | DATE | |

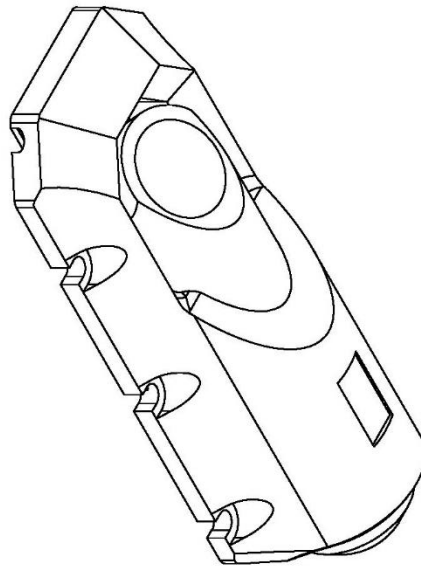
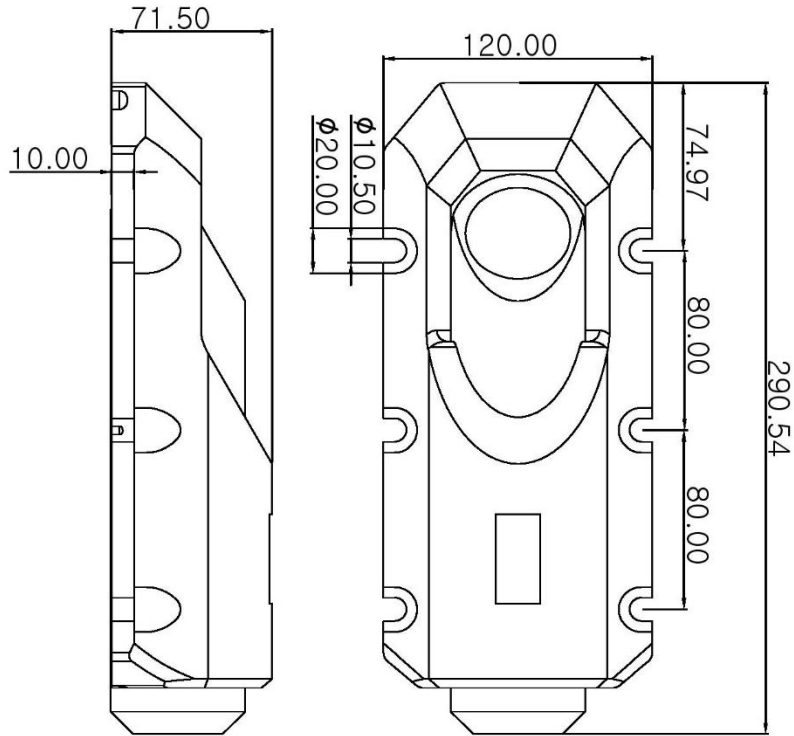
| No. | Material | QTY |
|------------|-------------------------------------|-----------|
| 1 | JAIN TECHNOLOGY Xonic-100 | 1 |
| Title | | Tolerance |
| P/N | | SCALE |
| Projection | 3rd | UNIT |
| mm | | DWG. NO |



<I/O MODULE>

| | PIN# | SIGNAL | FUNCTION |
|------------------------------|------|--------------|--|
| RS-232 | 1 | RX COM | RS-232 Transmitter Output |
| | 2 | TX COM | RS-232 Receiver Input |
| | 3 | GND | STANDARD |
| RS-485 | 4 | B OUT | Inverting Receiver Input and Noninverting Driver Output |
| | 5 | A OUT | Noninverting Receiver Input and Noninverting Driver Output |
| | 6 | CH2_E | RELAY 2 OPEN(A) |
| RELAY2 | 7 | CH2_C | RELAY 2 COMMON(C) |
| | 8 | CH1_E | RELAY 1 OPEN(A) |
| RELAY1 | 9 | CH1_C | RELAY 1 CLOSED(C) |
| | 10 | GND | ANALOG 4--20mA OUTPUT 1OH |
| ANALOG OUTPUT | 11 | GND | STANDARD |
| | 12 | GND | ANALOG 4--20mA OUTPUT 2OH |
| | 13 | GND | STANDARD |
| ANALOG INPUT | 14 | ICH | ANALOG 4--20mA INPUT 1OH |
| | 15 | GND | STANDARD |
| ISOLAT POWER SUPPLY (OUTPUT) | 16 | ICH | ANALOG 4--20mA INPUT 2OH |
| | 17 | GND | STANDARD |
| POWER SUPPLY (OUTPUT) | 18 | ISOLAT 24V | Isolate Positive Supply Output DC+24V / Max : 50mA |
| | 19 | ISOLAT 24V | Isolate Negative Supply Output DC-24V / Max : 50mA |
| POWER (INPUT) | 20 | GND | STANDARD |
| | 21 | ROUTER POWER | Positive Supply Output DC+5V / Max : 1A |
| | 22 | GND | STANDARD |
| | 23 | ROUTER POWER | Positive Supply Input DC+12V ~ DC+24V / Max : 2A |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------------|------------|------------|--|------------|---------|-----------|---|------------|---|--|------|------------|-------|-----|------|--|--|--|-----|---|----------|--|-----|---|
| <table border="1"> <tr> <td>DWG. BY</td> <td>KHS</td> <td>DATE</td> <td>2021.02.18</td> </tr> <tr> <td>CHE. BY</td> <td>JBC</td> <td>DATE</td> <td>2021.03.26</td> </tr> <tr> <td>APP. BY</td> <td></td> <td>DATE</td> <td></td> </tr> <tr> <td>CERT</td> <td></td> <td>DATE</td> <td></td> </tr> </table> | | DWG. BY | KHS | DATE | 2021.02.18 | CHE. BY | JBC | DATE | 2021.03.26 | APP. BY | | DATE | | CERT | | DATE | | <table border="1"> <tr> <td>No.</td> <td>①</td> <td>Material</td> <td></td> <td>QTY</td> <td>1</td> </tr> </table> | | No. | ① | Material | | QTY | 1 |
| DWG. BY | KHS | DATE | 2021.02.18 | | | | | | | | | | | | | | | | | | | | | | |
| CHE. BY | JBC | DATE | 2021.03.26 | | | | | | | | | | | | | | | | | | | | | | |
| APP. BY | | DATE | | | | | | | | | | | | | | | | | | | | | | | |
| CERT | | DATE | | | | | | | | | | | | | | | | | | | | | | | |
| No. | ① | Material | | QTY | 1 | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td colspan="2" style="text-align: center;">JAIN TECHNOLOGY</td> </tr> <tr> <td>Title</td> <td>Xonic-100</td> </tr> <tr> <td>Tolerance</td> <td></td> </tr> </table> | | | | JAIN TECHNOLOGY | | Title | Xonic-100 | Tolerance | | <table border="1"> <tr> <td>PIN</td> <td>I/O MODULE</td> <td>SCALE</td> <td>Non</td> </tr> </table> | | PIN | I/O MODULE | SCALE | Non | | | | | | | | | | |
| JAIN TECHNOLOGY | | | | | | | | | | | | | | | | | | | | | | | | | |
| Title | Xonic-100 | | | | | | | | | | | | | | | | | | | | | | | | |
| Tolerance | | | | | | | | | | | | | | | | | | | | | | | | | |
| PIN | I/O MODULE | SCALE | Non | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>Projection</td> <td>3rd</td> </tr> </table> | | Projection | 3rd | <table border="1"> <tr> <td>UNIT</td> <td>mm</td> </tr> </table> | | UNIT | mm | <table border="1"> <tr> <td>DWG. NO</td> <td></td> </tr> </table> | | DWG. NO | | | | | | | | | | | | | | | |
| Projection | 3rd | | | | | | | | | | | | | | | | | | | | | | | | |
| UNIT | mm | | | | | | | | | | | | | | | | | | | | | | | | |
| DWG. NO | | | | | | | | | | | | | | | | | | | | | | | | | |



| | | | | | | | | | |
|-------------------------------------|------------|--------------|-----------------|----------|-------|-----|----------|------|-----|
| <input checked="" type="checkbox"/> | REVISIN | DATE | REV. BY | APP. BY | SCALE | 1:1 | DWG. NO. | REV. | .01 |
| No. | ① | Part Name | LTR-L | Material | PE | QTY | 1 | | |
| DATE | 2019/05/21 | DWG. NAME | JAIN TECHNOLOGY | | | | | | |
| MATERIAL | PE | PROJECT NAME | LTR-L | | | | | | |
| TOLERANCE | 3% | DWG. BY | Xonic-100 | | | | | | |
| CHE. BY | 박승원 | PROJECTION | 3rd | UNIT | mm | | | | |

