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# Simplified Installation of the 4-20mA Output on the EESiFlo 6000 Series Ultrasonic Flow Meter



*Note:* **The 4 to 20 mA outputs on FlowRental.com rental meters are**
**"ACTIVE" OUTPUTS**

Setting up the 4-20 mA output on the 6000 Series Ultrasonic Flow Meter involves four distinct steps.
1. Define the Pipe and Medium Parameters (PAR on the main menu)
2. Setting up the 4 to 20 mA output (SF on the main menu)
3. Selecting the Output Options (OPT on the main menu)
4. Enter the Measure Mode (MEA on the main menu)

## Defining the Pipe and Medium Parameters >PAR<

1) Start by turning the instrument **ON** by pressing the **ON/C** button

2) Plug the Transducers into the receptacle marked **Channel A** (or B) and the 6000 SERIES will automatically detect which transducers are installed by displaying that information on the LCD.

3) Using the 4 or 6 keys scroll to **PAR** (parameters) on the main menu and press **ENTER**.

4) Press **ENTER** again to view **Channel A Parameters** or use the 2 and 8 keys to select Channel B.

5) Enter the pipes **Outer Diameter** then press **ENTER.**

6) Or, if the pipes diameter is not known, simply enter 0.00 in the diameter and the 6725 will prompt you to enter the **Pipe Circumference.**

7) Next, enter **Wall Thickness**

8) Select a **Pipe Material** by using the 2 and 8 keys to scroll up and down through the available list.

9) Answer **YES** or **NO** to the prompt for **Lining**. If you answered **YES**, then enter the **Lining Type** (using the 2 and 8 keys) and then the **Lining Thickness**

10) Enter the internal **Roughness** of the pipe

11) Using the 2 and 8 keys, select the **Medium** (Liquid Type) from the available list.

12) Enter the approximate **Medium Temperature** and you'll return to the Main Menu.

## Setting up the 4 to 20 mA Output >SF<

1. At the Main Menu, use the 4 and 6 keys to navigate to **>SF<** Special Functions menu

2. Scroll down to "**System Settings**" and press **ENTER**

3. Scroll down to "**Proc. Outputs**" and press **ENTER**

4. When the screen displays "**Install Output**" use the Up (**8**) and Down (**2**) Arrows to select "**Current I1**" then press **ENTER**.

5. Use the Left (**4**) or Right (**6**) arrows to select **>NO<** at the "**I1 Disable**" prompt then press **ENTER**.

6. At the "**I1 Source Channel**" prompt use the Up (**8**) and Down (**2**) Arrows to select the channels into which the transducers are plugged (step 2 above). Press **ENTER** to continue.

7. At the "**Source Item**" prompt, use the Up (**8**) and Down (**2**) Arrows to select the type of output you want the 4 to 20 mA output signal to reflect, then press **ENTER**. Select the type of output from the next screen then press **ENTER**.

8. At the "**I1 Output Range**" prompt use the Up (**8**) and Down (**2**) Arrows to select "**4/20 mA**" then press **ENTER**.

9. At the "**Error-value**" prompt use the use the Up (**8**) and Down (**2**) Arrows to select which value you'd like output if an error is encountered, then press **ENTER.**

10. Hook a multi-meter set to measure mA outputs to the jacks on the back of the 6000 SERIES (Positive to Red, Negative to Black) Place the multi-meter in the DC current measuring mode.

11. At the "**Output Test**" prompt, enter a valid number between 4 and 20 mA then press **ENTER**. The value you entered will be output by the 6000 SERIES and should appear on the multi-meter.

12. At the "**Again ? no <YES>**" prompt you can enter another number to test, or enter **NO**. It is recommended that you answer **YES** a number of times and enter a couple of values between 4 and 20 mA to ensure the 4-20 mA output feature is functioning correctly.

13. Once you've answered **<NO>** to the above prompt you'll be returned to the **System Settings Menu**.

14. Press the red **BRK** key once and you'll return to the **Main Menu**, and the 4 to 20 mA output on your multi-meter will drop to 0 mA.

## Setting the Output Options >OPT<

1. At the Main Menu use the 4 and 6 keys, scroll to **OPT** (Output Options) then press **ENTER**.

2. Choose **Channel A** (or B) then press **ENTER**

3. The 6000 SERIES will prompt you for the **Physical Quantities** for your desired output. Use the 2 and 8 keys to scroll up and down through the available list. Press **ENTER**.

4. Using the 2 and 8 keys, choose your **Velocity In** units from the available list then press **ENTER.**

5. Answer **NO** to the prompt for **Temperature T1** then press **ENTER**

6. Answer **NO** to the prompt for **Temperature T2** then press **ENTER**

7. Choose a **Damping** (averaging) time in seconds then press **ENTER**

8. Answer **NO** to **Store Measured Data** then press **ENTER** or **YES** if required.

9. Answer **NO** to **Serial Output** then press **ENTER** or **YES** if required.

10. Enter **YES** to the **Current Loop I1**: prompt.

11. Choose either **Absolute** or **Signed** at the **Measured Values** prompt to indicate if you would like only positive (Absolute) or both positive and negative (Signed) flow.

12. At the **Zero-Scale Value** prompt enter a value that will represent the 4 mA output signal.

13. At the **Full-Scale Value** prompt enter a value that will represent the 20 mA output signal. Once entered you will return to the Main Menu.

## Enter the Measure Mode >MEA<

1) Using the 4 and 6 keys, scroll back to **MEA** (Measuring) then press **ENTER**

2) Below each channel will appear a minus sign **(-)**, a check mark **(v)** or a dot **(·)**. Using the 4 and 6 keys, select **Channel A** (or B), then ensure there is a check mark below that channel by pressing the 2 or 8 keys. Then press **ENTER**

3) The next prompt to appear may be different, depending upon how the 6000 SERIES has been initialized. If **Reflection Mode** appears, continue with step 4 below. If a prompt appears asking for a **Sound Path**, continue with step 5 below.

4) If **Reflection Mode** prompt appears, choose **NO** and the 6000 SERIES will measure in the **Direct Mode**, where the transducers are mounted on opposite sides of the pipe. If you choose **YES**, the 6000 SERIES will measure in the **Reflection Mode** where the transducers are mounted on the same side of the pipe.  It is recommended you answer **YES** and mount the transducers on the same side of the pipe. However, if problems are experienced getting good solid flow data, it is recommended you go through the **MEA** routine again, this time answering

**NO** to this prompt, then remembering that <u>transducers will be mounted on opposite sides of the pipe</u>. Continue at step #6 below.

5) If **A: Sound Path** appears, the number indicated below this prompt represents the number of Sound Paths (as indicated on page 5-4 of the 6000 SERIES Operating Instructions). This value may be manually adjusted by the User. After reading pages 5-4 through 5-10 of the 6000 SERIES Operating Manual, choose a Sound Path that matches your exact needs, then press **ENTER**.

6) Press **ENTER** and the 6000 SERIES will indicate how far apart the transducers must be separated. <u>This display may indicate the values are in millimeters, when in fact they are in inches</u>.

7) Select an appropriate transducer **Installation Site** by following the guidelines in the manual pages 3-1 and 3-2

8) Apply **Ultrasonic Couplant** to the bottom of the Transducers

9) **Install Transducers** with arrows pointing in the same direction, with the arrow pointing in the <u>normal direction of flow</u>.

10) Ensure Transducers are correct distance apart by pressing **ENTER** and reviewing the **SIGNAL STRENGTH** as discussed on **page 5-2**

11) A **GREEN** signal indicates you have sufficient signal strength to begin measuring. A **RED** signal indicates you should re-check your transducers installation.

12) Press **ENTER** again to confirm the transducer separation distance, and you will begin displaying the flow data you've selected, and outputting the appropriate value via the 4 to 20mA output port!!!

Once measurements are complete, press **BRK 3 times** to shut the instrument off, and it will retain your setup information for your next installation.

## <u>Don't forget to re-charge the battery after lengthy installations.</u>

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