InnovaSonic 207i Quick Start Guide

InnovaSonic® 207i Ultrasonic Thermal Energy/ BTU Liquid Flow Meter

This is the Quick Start Guide for the 207i liquid flow meter for easy installation & set up instructions. To get more technical information on the InnovaSonic 207i, refer to the InnovaSonic 207i Instruction Manual, 207i Smart Interface Portal (SIP) Manual, and 207i Quick Start Guide at sierrainstruments.com/downloads/207i.

Watch the How to Install & Operate video at sierrainstruments.com/207i-how-to

Installation Steps: Set Up Power Connections and Transducers

WARNING! Wire the 207i with the power off with the proper ESD precautions.

Please verify which power option you have before connecting power to the unit.
The 207i is available with one of two power options:

- Option P2: DC powered, 9-36 VDC, 0.5 Amps. (See Figure 1 “DC Power Option”).
- Option P3: AC powered, 100-240 VAC, 50-60 Hz, 0.5 Amps. (See Figure 1 “AC Power Option”).
- Open the hinged top cover of the electronics (see Figure 1). The power input terminal block is labeled “POWER IN.” On the AC power unit, it is labeled E E N L, and on the DC powered unit it’s labeled E E -V +V (See Figure 1).

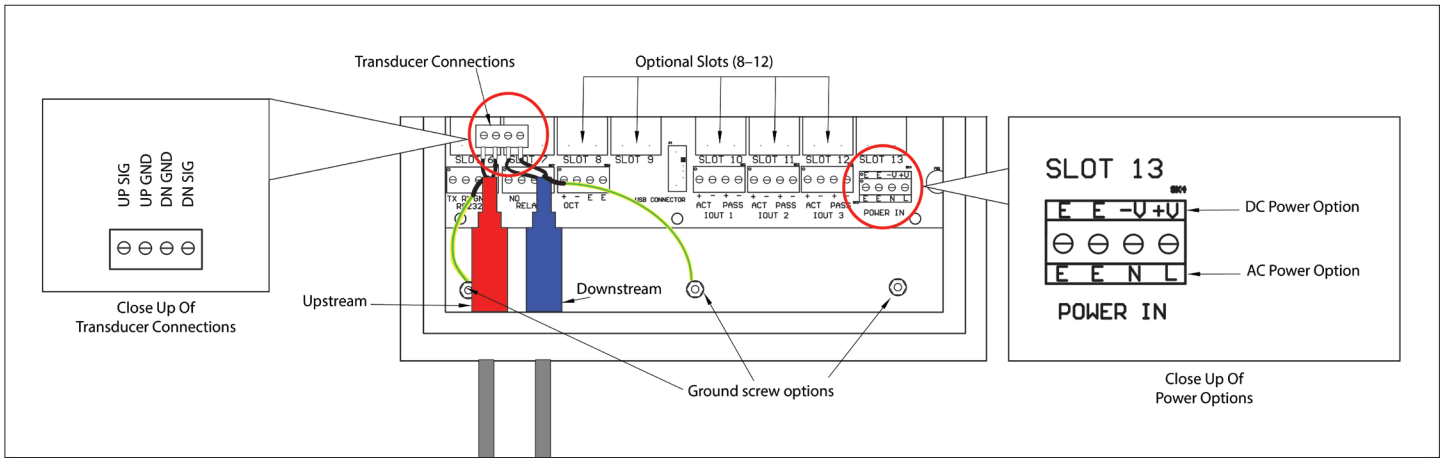


Figure 1. 207i AC and DC Power Options: Minimum Required Wiring

Note: The standard 207i is equipped with 3 onboard 4-20mA current outputs, 1 relay, 1 OCT, RS-232, and USB port. Optional plug in slots (see Figure 1) can add PT 100 RTD inputs, 4-20mA inputs, and Modbus-RTU slave. For this Quick Install example, we will only be using the bare minimum to measure water flow.

Power Installation:

1. Connect AC or DC power options.

- AC power connections: L to AC line (hot), N to neutral, E to safety earth ground; 100-240 VAC, 50-60 Hz, 0.5 Amps (See Figure 1)
- If the AC mains wiring is not installed in conduit a ferrite core should be installed (CE requirement) just inside the enclosure with the 2 turns (3 passes) of the AC wiring thru it. Ferrite core Wurth Electronics pn 74270095/Digi-Key pn 732-1564-ND or similar should be used
- DC power connections; V+ to DC plus, V- to DC power return, the E connection are optional Earth ground. 9-36 VDC 0.5 Amps (See Figure 1).
- We also recommend a heavy guage wire to the large E (Earth) or directly to enclosure for lightening protection.

2. Connect the upstream (red) transducer white wire to the UP SIG terminal on the ultrasonic board, and the black wire to the UP GND terminal. The green/yellow wire is the earth ground wire. It attaches to the enclosure ground screw as shown (See Figure 1).

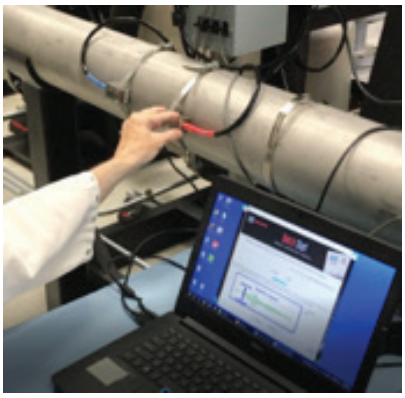
3. Connect the downstream (blue) transducer white wire to the DN SIG terminal on the ultrasonic board and the black wire to the DN GND terminal. The green/yellow wire is the earth ground wire. It attaches to the enclosure ground screw as shown (See Figure 1).

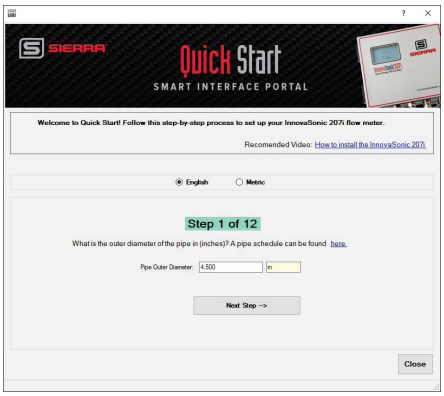
Making Installation Easier

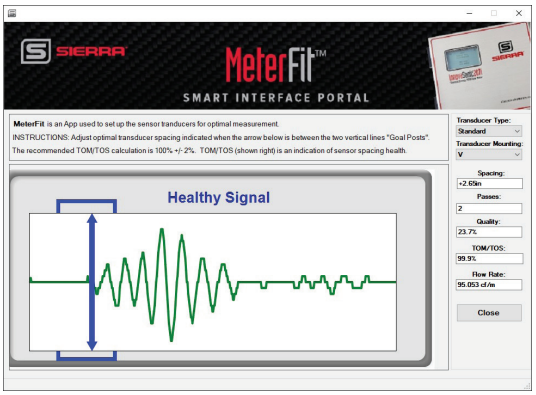
There are two ways to ensure you are installing your meter correctly. You can either use the Quick Start menu on the local display or the QuickStart App on the 207i Smart Interface Portal (SIP) software. Using the SIP is recommended for easy set up.

Installation with the Smart Interface Portal (SIP)-Quick Start App

To use the Smart Interface Portal (SIP) for commissioning and set up, download the software at sierrainstruments.com/downloads/207i. Connect your meter to your computer via USB. Click the "Quick Start" button on the main menu and follow the easy step-by-step set up process. For more information, watch the 207i SIP How to Install video at sierrainstruments.com/207iSIP







Installation on the Local Display with Quick Start Menu

You can also use your local display for meter set up. For the local display set up, we will an example of a water flow measurement in cf/m (cubic feet per minute) using the V mounting (2 passes) method with the standard transducer set (see page 5 for V mounting diagram). To view other installation types, Chapter 6 of the InnovaSonic 207i Instruction Manual. Download manual at sierrainstruments.com/downloads/207i.

Overview of Keypad Functions

The InnovaSonic 207i keypad offers 14 dual-function keys and two dedicated keys: ENTER and < . Primary keypad functions:

- Use the ENTER to confirm (input) your choices in various menus.
- Use the < to go back to the previous menu screen or leave your current screen. Note: This key is not an undo key.
- Numeric dual-function keys act as a numeric input key when you are in a menu requiring numeric input (example: quick start 1).
- Use the ∧ + and v − dual-functions keys for scrolling up or down in a selection list. Alternately, when a +/- input is required these provide a + or - input.
- The RUN MENU key toggles between run mode and menu mode.

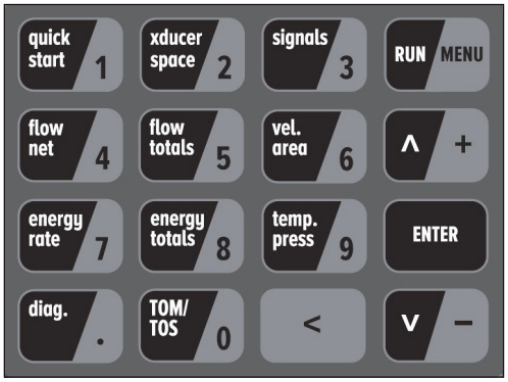
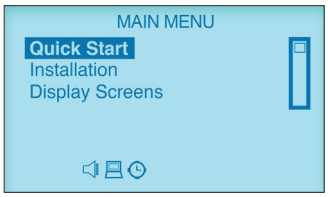


Figure 2. InnovaSonic 207i 14 Key Dual-Function Keypad

To Get Started With Set up on Local Display:

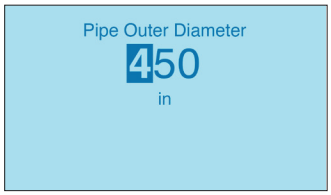
1. Press the quick start 1 key. Pressing the quick start 1 key will bring you the top of the "MAIN MENU". This menu will guide you through the minimum required settings for measuring flow.



2. Once on the “Quick Start” main menu, press the ENTER key to start entering the set up parameters for your pipe, fluid, transducer type, and transducer mounting (meter accuracy is only as good as the parameters you enter), so this is a critical set up stage. Press the ENTER key to save.

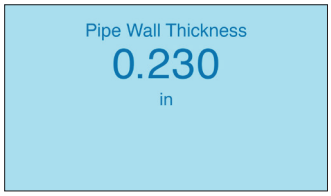
Step 1: Pipe Outer Diameter

The first screen is the “Pipe Outer Diameter” setting. Enter the Pipe Outer Diameter of your pipe using numeric side of the keys. This is the actual outside diameter, not just the nominal size. Press the ENTER key to save.



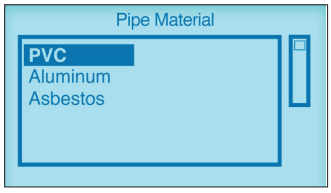
Step 2. Pipe Wall Thickness

“Pipe Wall Thickness” is the next setting. Enter the pipe wall thickness of your pipe using the numeric side of the keys. Press the ENTER key to save.



Step 3. Pipe Material

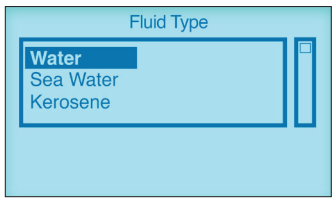
“Pipe Material” is the next setting. Using the ∧ + and ∨ − scroll to the pipe material of your pipe. If your pipe material is not on the list, chose other. You will need to enter the speed of sound of your pipe material. Press the ENTER key to save.



Press the ENTER key again. Most pipes do not have liners, so leave liner material at “None” for this example. Press the ENTER key again.

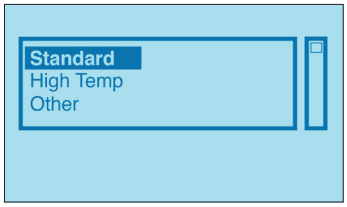
Step 4. Fluid Type

"Fluid Type" is the next setting. Using the ∧ + and ∨ − scroll to fluid in your pipe. Press the ENTER key to save.



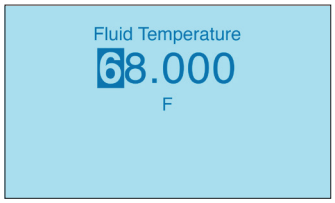
Step 5. Fluid Temperature

"Fluid Temperature" is the next setting. Enter your approximate fluid temperature using the numeric side of the keys. Press the ENTER key to save.



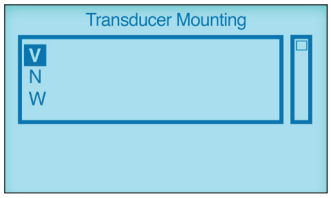
Step 6. Transducer Type

"Transducer Type" is the next setting. Using the ∧ + and ∨ − scroll to "standard" transducer type. Your unit was most likely sent with a Memkey matched to the transducer that was sent with the unit.; the correct selection will be highlighted. Press the ENTER key to save.



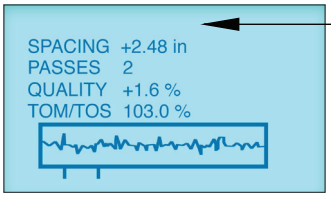
Step 7. Transducer Mounting

"Transducer Mounting" is the next setting. Using the ∧ + and ∨ − scroll to V indicating the V mounting method (see Figure 3). This is the easiest and most common mounting for smaller pipes. See Chapter 6 of the manual for other options. Press the ENTER key to save.



Step 8. Transducer Spacing

Press the ENTER key to move to the "Transducer Spacing" and setup menu. Because your transducers are not mounted to the pipe at the correct spacing yet, the waveform will just look like random noise shown below. See the suggested spacing below; in this case 2.48 inches. Make a mark on your pipe at suggested transducer spacing. (See Figure 4). You can also use the MeterFit™ app on your Smart Interface Portal (SIP) software. Download software at sierrainstruments.com/downloads/207i.



Transducer Set Up & Mounting

As noted, this quick install guide is using the V method as our installation method. The V method is considered the standard installation method (See Figure 3). The V method is usually more accurate and works well on pipe diameters ranging from approximately 1 inch to 8 inches (25 mm to 200 mm). With all installation types, the V method requires proper installation of the transducer, contact on the pipe at the pipe's centerline and equal spacing on either side of the centerline.

Watch the How to Install & Operate video at sierrainstruments.com/207i-how-to

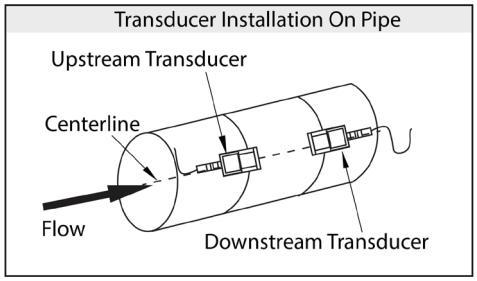


Figure 3. V Method for Transducer Placement

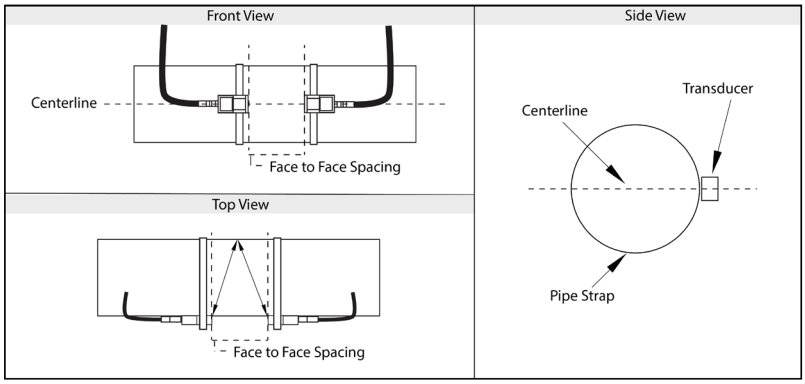


Figure 4. Transducer Spacing

For placement of the transducers for the V method, we recommend you do the following:

1. Make contact on the pipe at the pipes centerline. See "Transducer Space" in Figure 4.

2. Make two marks on the pipe for the correct transducer spacing from "Step 8. Transducer Spacing" on the display (See p. 4) Calipers provide the best measurement. Note: start at the standard suggested transducer spacing, but this will most likely need to be adjusted.

3. Then coat the bottoms of the each transducer with ultrasonic mounting grease. Note: you will need to wear gloves.

4. One at a time, mount the transducer to the pipe at the marks you made. Observe the Upstream / Downstream labels on the transducers (see Figure 3). Note: The sensors have groves to place the pipe strap.

5. Tighten the first clamp firmly. Repeat the process with the second transducer, but do not tighten the hose clamp all the way on second transducer.

For more detailed installation information, see Chapter 6 of the InnovaSonic 207i instruction manual. Download at sierrainstruments.com/downloads/207i.

Confirm Transducer Mounting and Spacing

Once your transducers are close to the correct spacing, you will see the waveform of the returning ultrasonic signal on the display in the "Transducer Spacing" menu (see Step 8). It will take several seconds for the gain to adjust to the range of the returned signal. Wait for the gain to adjust until you see a returned signal as below. The TOM / TOS should be as close to 100% as possible (See Figure 5). You can also use the MeterFit™ app on your Smart Interface Portal (SIP) software. Download software at sierrainstruments.com/downloads/207i.

The line identifying the beginning of the waveform ("the arrival marker") should be between the two goal posts \ to verify the transducers have the correct spacing. Adjust the transducers closer or further apart so that the arrival marker is between the goal posts at the beginning of the wave from. If the transducers are not at the correct spacing, you will need to move the transducer closer or further apart to make the arrival marker line be within the goal post marks at the bottom of the wave form. Once the arrival marker line is between the goal posts, tighten the clamp on the second transducer. Make sure to maintain a layer of ultrasonic grease between the transducer and the pipe while adjusting the spacing (see Figure 6).

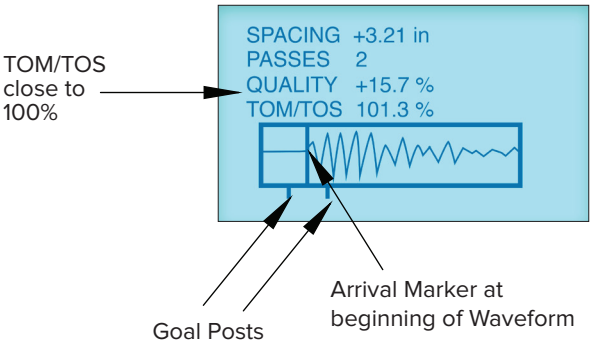


Figure 5

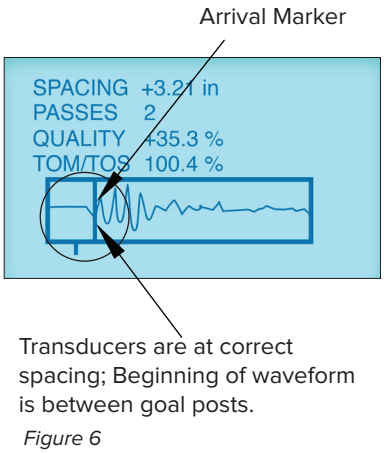
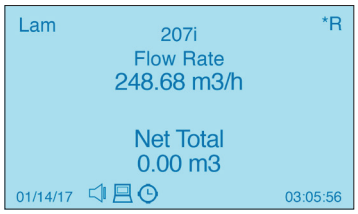


Figure 6

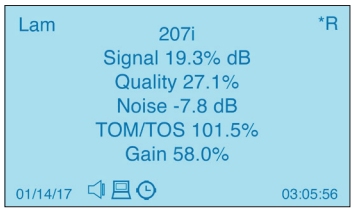
Verify Flow Rate

To start reading the flow rate and net total, press the flow net 4. You can always get back to the transducer spacing menu by pressing the xducer space 2 key. You need to wait 5–10 seconds for the "Flow Rate" screen to show up.



Checking The Received Signal Quality

Press the signals 3 key to view the returned signal strength which includes: signal quality, signal to noise, the "TOM/TOS" measured transit time/ calculated transit time, and the amplifier "Gain" is set automatically to get an optimum signal. See chapter 6 in the 207i manual for standard reading values.



Limited Warranty Policy – Register Online

All Sierra products are warranted to be free from defects in material and workmanship and will be repaired or replaced at no charge to the customer, provided return or rejection of product is made within a reasonable period but no longer than one (1) year for calibration and non-calibration defects, from date of delivery. To assure warranty service, customers must register their products online on Sierra's website. Online registration of all of your Sierra products is required for our warranty process. Register now at www.sierrainstruments.com/register. Learn more about Sierra's warranty policy at http://www.sierrainstruments.com/warranty

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