InnovaMass iSeries 240i/241i Frequently Asked Questions (FAQ) & Basic Trouble Shooting Guide

This guide provides a summary of frequently asked questions (FAQ) plus basic troubleshooting suggestions to improve your experience with the InnovaMass iSeries 240i/241i.

1. How do I update my 240i/241i firmware to get the most current firmware version on my meter?

If you are having issues with your InnovaMass 240i/241i, your first step is to upgrade your meter firmware to the latest version. The most current firmware version provides upgrades to current functionality, some new functionality, and includes all known bug fixes.

The InnovaMass iSeries has been designed, so that firmware is updateable in the field. To do this you will need the meter powered up and connected to the computer running the Smart Interface Portal (SIP) via the USB port. In summary, first you will need to update your SIP software to the latest version which will then allow you to upgrade your meter firmware to the latest version.

There are three different scenarios for updating your firmware:
1) SIP currently is loaded on your computer.
2) You don't have the SIP.
3) You don't have internet connection.

Below is a summary of how to update your firmware for all three scenarios.

Scenario 1: You have the InnovaMass 240i/241i SIP loaded on your computer with internet connection.

1. When you open your SIP program, the SIP software will determine if there is a SIP upgrade available. If you need to update your SIP software to a more current version, there will be a message with instructions on how to update your SIP software.
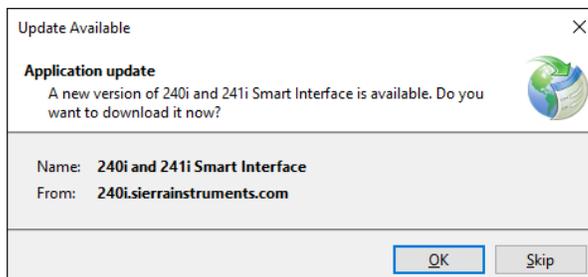
2. Once you have the most current SIP software version installed, in this example SIP software version 1.1.38 (shown below in the upper left corner), you are ready to update your firmware. The firmware version for this example is v1.1.84.
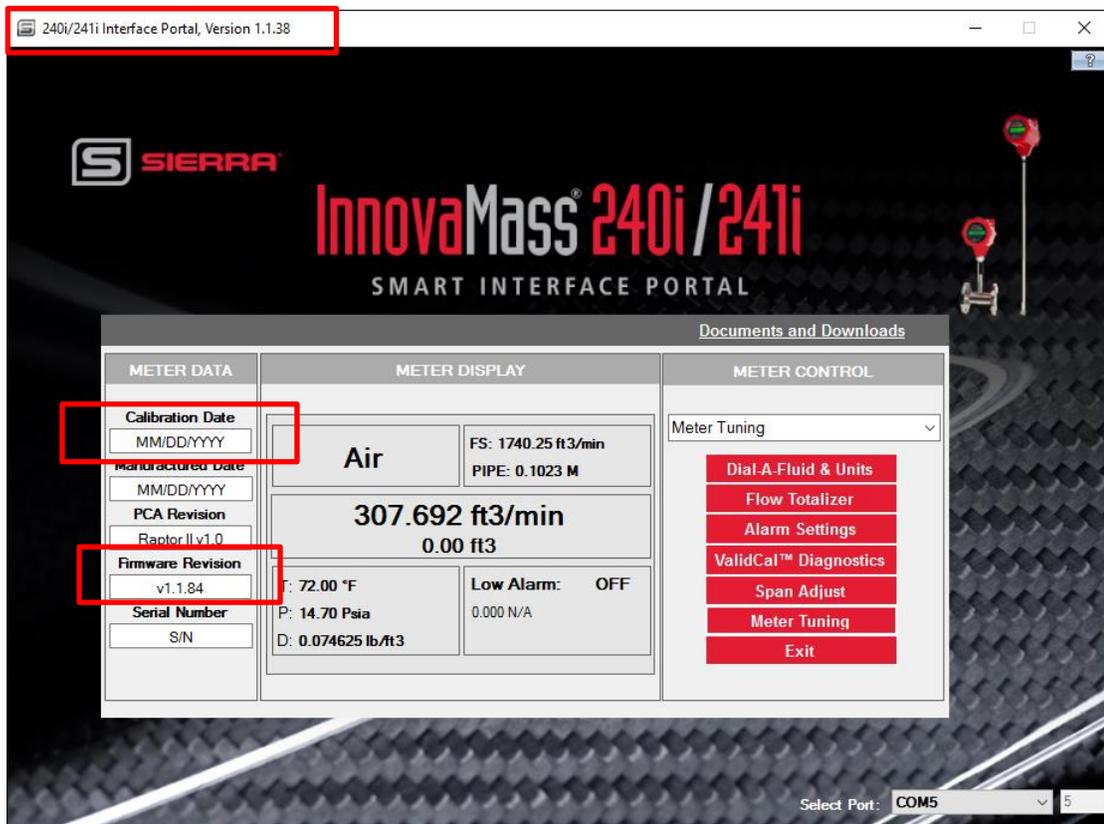

Figure 1. InnovaMass Smart Interface Portal Main Screen

3. Next, you need to upgrade your firmware to the most current version. Note that the "Firmware Revision" version in this example is v1.1.84.

4. To begin the firmware upgrade process, select "Save/Restore Data" from the main menu drop down selection in the "Meter Control" section.
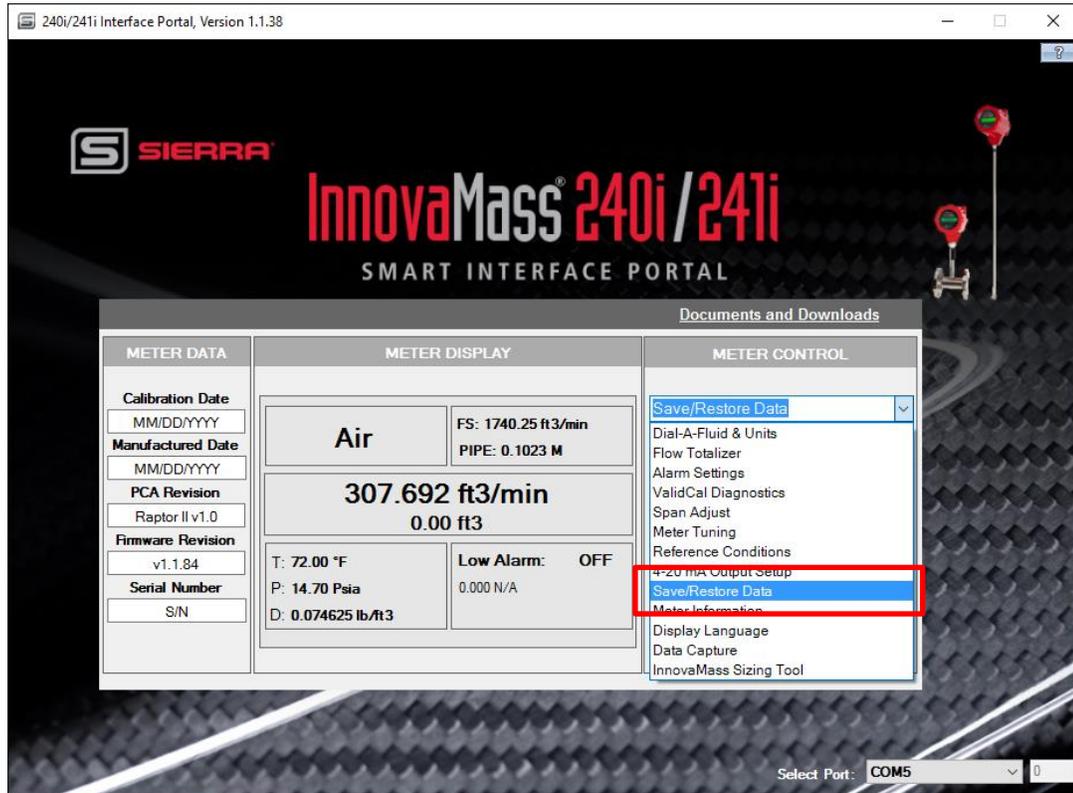


5. Next, select "Reflash Firmware."
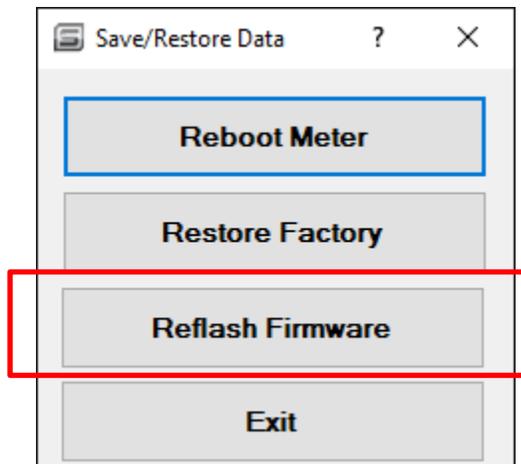
6. Once "Reflash Firmware" is selected, the "Firmware Updater" dialog box will open and automatically connect to the meter through Com Port 5. It should also be noted that once you enter this screen, the **meter will be offline** (no flow readings). To load the most current firmware file, select "Load File."
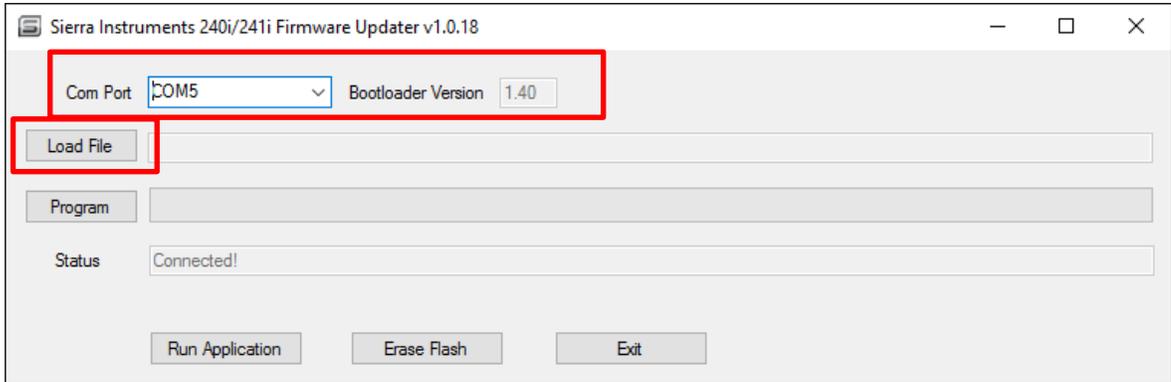

7. Once you select "Load File," a dialog box will open that shows the most current firmware "HEX file". In this case, the most current HEX file is "borax_1-0-v1.1.90.production.hex." Select this file and click "Open."
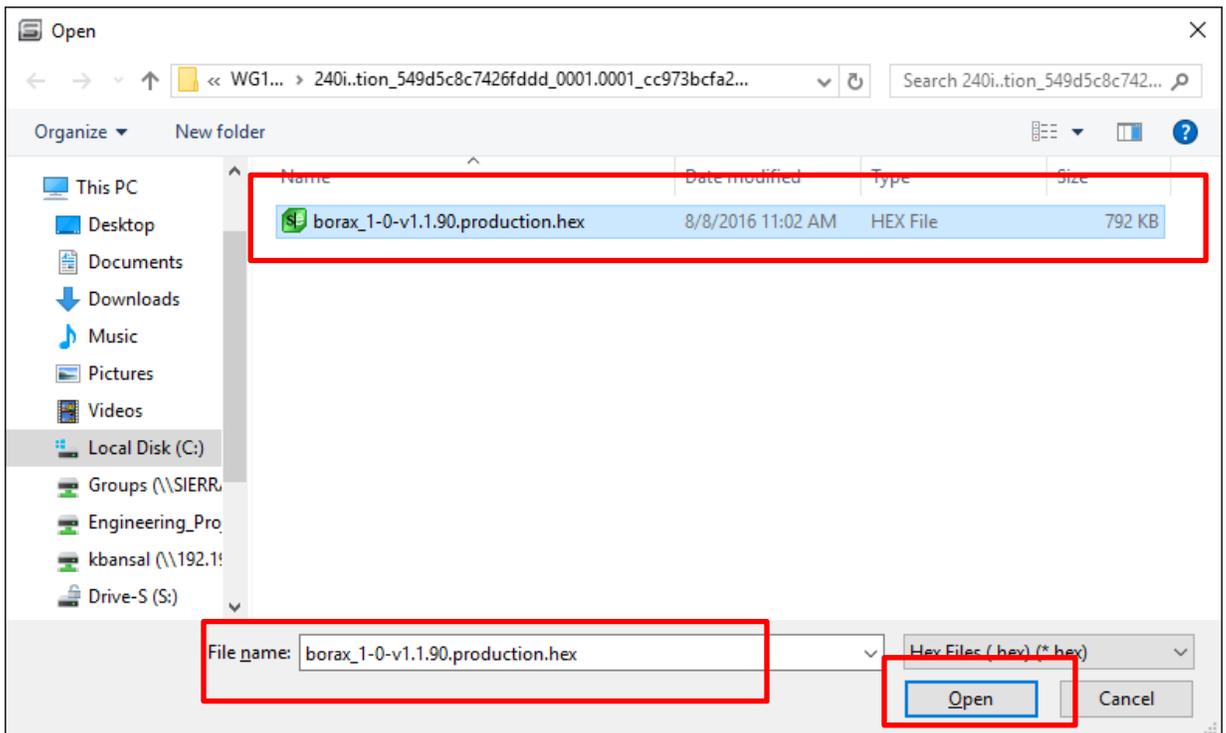
8. After selecting the firmware HEX file, you will return back to the "Firmware Updater" dialog box. Click the "Program" button to continue with the firmware upgrade. In the "Program" text box, you will see a progress bar to indicate your progress status next "Program." This process usually takes between -3-4 minutes. **DO NOT POWER OFF THE METER UNTIL COMPLETED.**
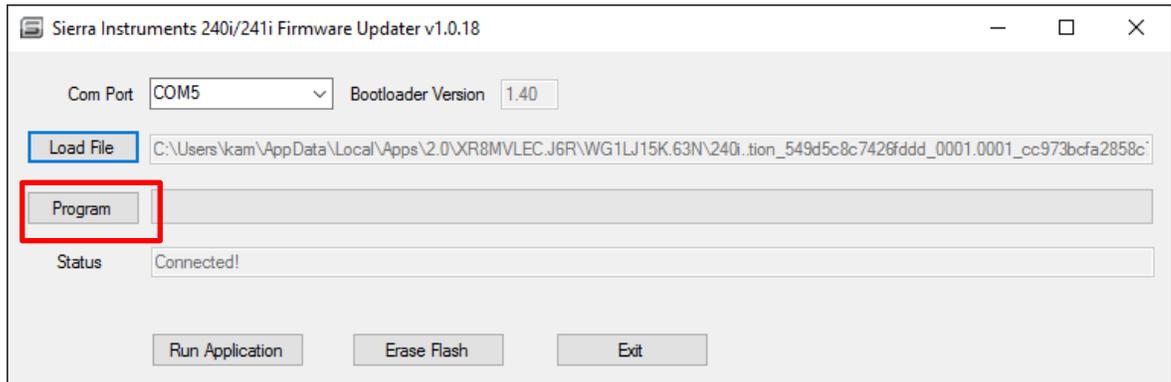
9. **Important.** There is a time limit on how much time you have to select and click the "Program" command. If you exceed this time limit, you will see a warning message in the "Status" field. If the warning message appears, you will have to reselect "Com Port 5", or click "Exit" and return to the "Firmware Updater" dialog box.
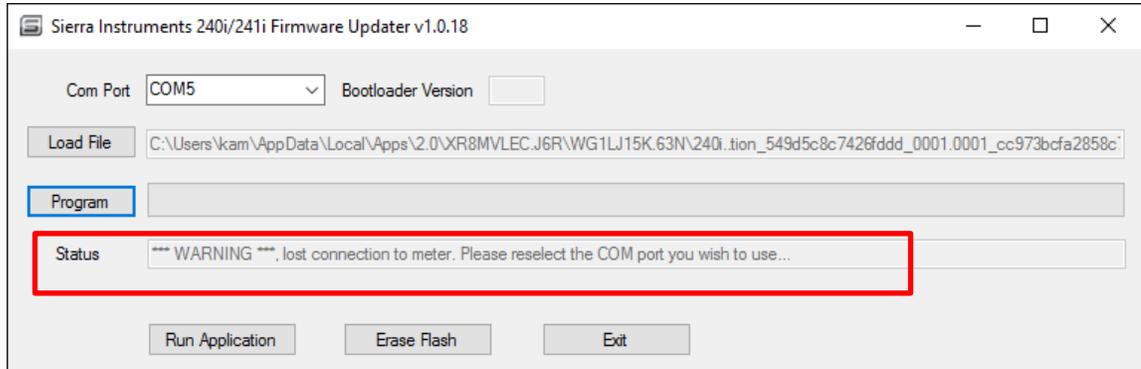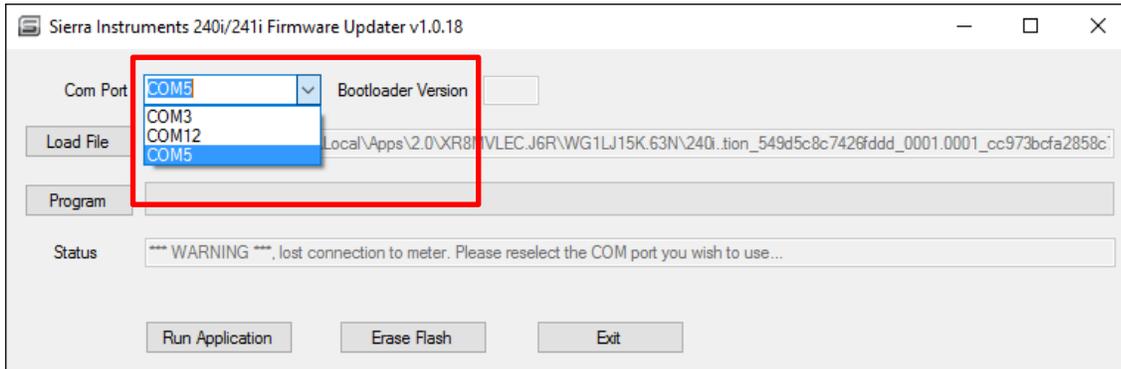
If you have chosen to reselect "Com Port 5," click on "Program" next to install the new firmware version. You should see the progress status bar appear.
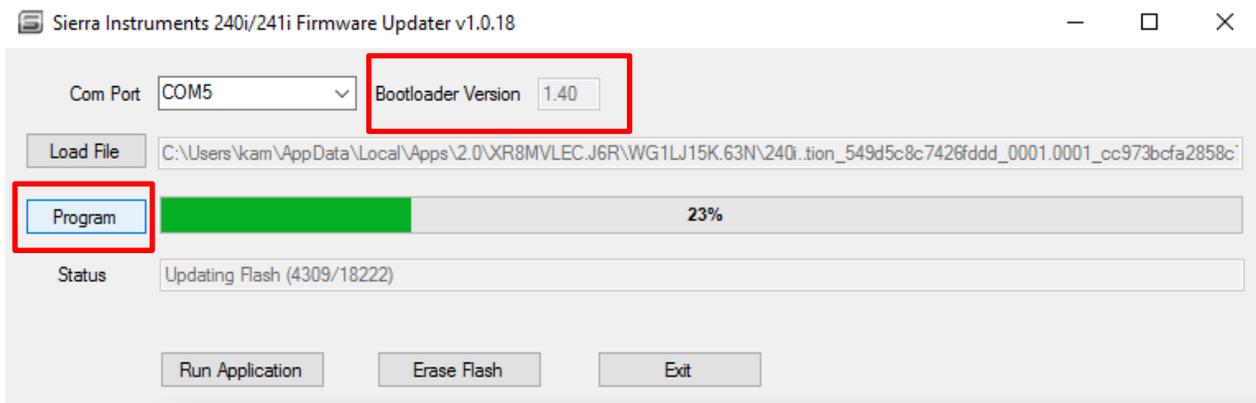
10. Once the "Program" is "Done," the meter will automatically come "on-line."
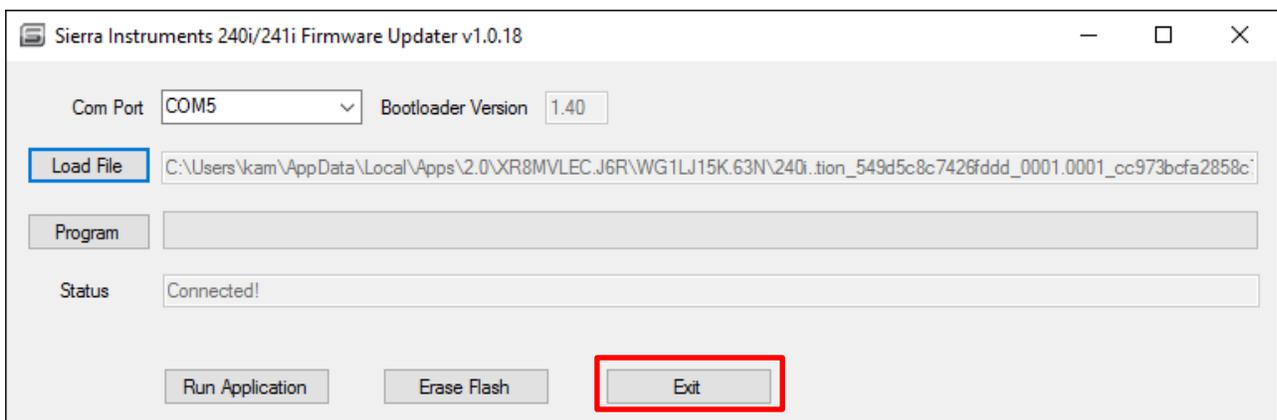
11. The latest firmware will now be active! Notice the new "Firmware Revision" in this example is now v1.1.90.
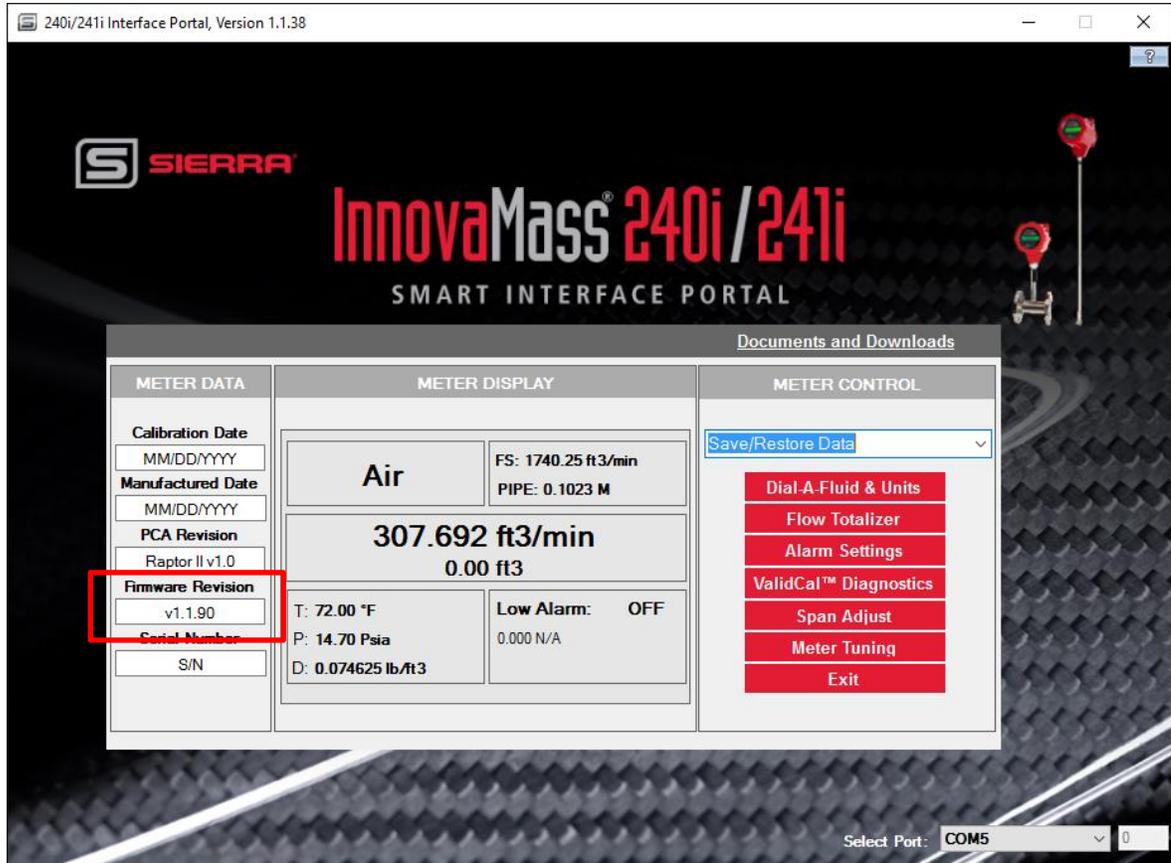
Scenario 2: You do not have the InnovaMass SIP loaded on your computer.

1. The first step is to download the latest SIP software onto your computer from sierrainstruments.com website. Go to sierrainstruments.com/sip-innovamass to download the most current version of SIP. Follow the instructions on the web page.

2. Once the most current version of SIP is installed, you will be prompted if there is a firmware upgrade available. Follow the instructions under Scenario 1 above to update your meter's firmware.

Scenario 3: You don't have internet connection.
You must have internet connection in order for the SIP to determine if you have the latest SIP and latest firmware.

1. If you don't have SIP on your computer, go to sierrainstruments.com/sip-innovamass to download the most current version of SIP. Follow the instructions on the web page to install software.
2. Once the most current version of SIP is installed, you will be prompted if there is a firmware upgrade available. Follow the instructions in Scenario 1 above to update your meter's firmware.

2. How do I determine what version SIP software and firmware I have on my meter?

If you need to determine what version firmware you have, there are two ways to get this information: Either on the local display of your instrument and/or on your SIP software via computer.

1. On the display when the meter boots up, the firmware version will show on the initial screen. The firmware version will show as v1.1.xx. The firmware of the display PCA will also be shown which can only be changed at the factory.

Firmware Version → 240i / 241i ← Firmware of PCA
v1.1.90/v1.0.35

Figure 2. InnovaMass iSeries Display Screen

2. You can also determine your firmware version through the InnovaMass SIP software. Once you open your SIP, the "Firmware Revision" is displayed on the left. In this example, the firmware version is v1.1.90 and the software version is 1.1.38. If firmware updates are available, the SIP will inform you that a more current firmware upgrade is available (follow instructions to upgrade your firmware under FAQ 1). Your SIP will also let you know if there are software updates available. For these updates to happen, you need to be hooked up to the internet and not be blocked by your firewall.
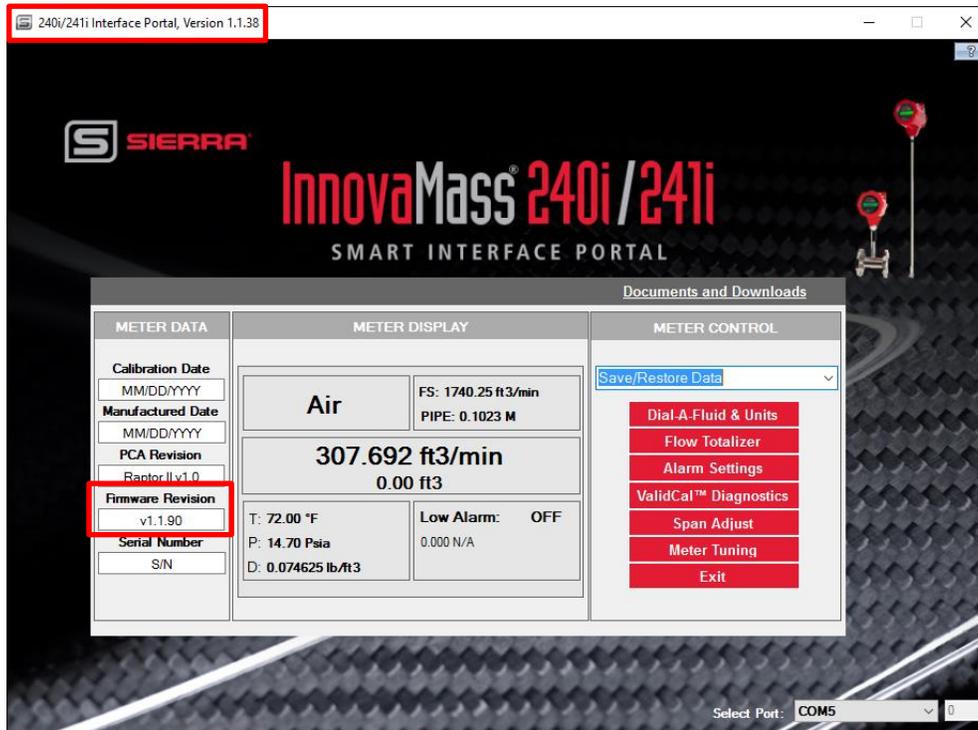
3. How do I perform basic troubleshooting for my meter through the SIP?

You can perform basic troubleshooting for your meter using the SIP's "ValidCal Diagnostic" and "MeterTuning" tools to diagnose and troubleshoot issues with your meter.

Use ValidCal Diagnostics for Quick Meter Hardware Validation
Once your meter is powered on, the meter will report any hardware faults by displaying a flashing "!" on both the local display and the Smart Interface Portal (SIP).

Hover over the "!" on the SIP to get a description of the detected error and click the "!" to automatically run the ValidCal Diagnostic tests. A full description of the procedures and error codes can be found in the Quick Tuning Guide, and the SIP manual .

Use Meter Tuning to Monitor & Adjust Meter Constants

If you are having trouble with meter tuning, updating the firmware to version V1.1.90 or greater should solve many of the issues associated with meter tuning. To further analyze the problem, the "Meter Tuning" menu provides the ability to adjust and monitor all of the most important meter constants, inputs and outputs, and minimum noise level. If you are still having issues, please follow the steps in the InnovaMass Quick Tuning Guide and the SIP manual.
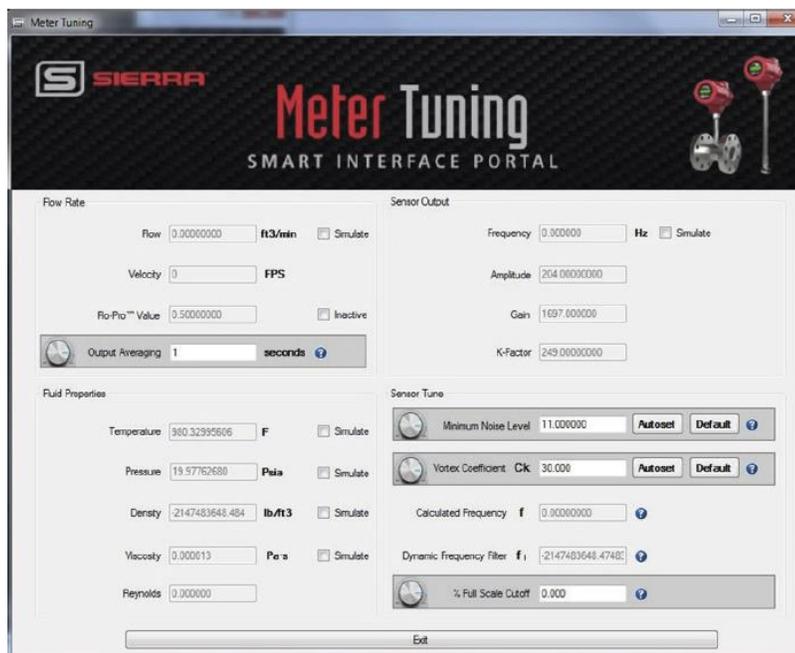
4. How do I troubleshoot if the temperature is incorrect on the display?

If temperature is reading incorrectly, it could be one of the following:

- ➢ The temperature setup is incorrect/corrupted.
- ➢ The sensor has failed (evidenced by a very **high** temperature reading on the display).
- ➢ The remote wiring is incorrect.

Note: the 240i/241i V has no temperature input. Mass flow is determined by calculating density from the values located in the process temperature and pressure menu. The 240i/241i VT and VTP have one 1000 ohm PRTD for measuring process temperature. Temperature ranges: ST: -40°F to +392°F (-40°C to +200°C)

To Troubleshoot the issue:

1.) Go to the ValidCal Diagnostics menu on the SIP and click Low/High FTP button (see Quick Tuning Guide and the SIP manual) to check if the meter's temperature limits have been exceeded. If so, the sensor may be damaged and the meter may need to be returned to the factory.

2.) If this is not immediately possible, go to the SIP "Meter Tuning" screen and enter your temperature in the "Fluid Properties Section" and click "Simulate". This will simulate your temperature input until repairs can be made.
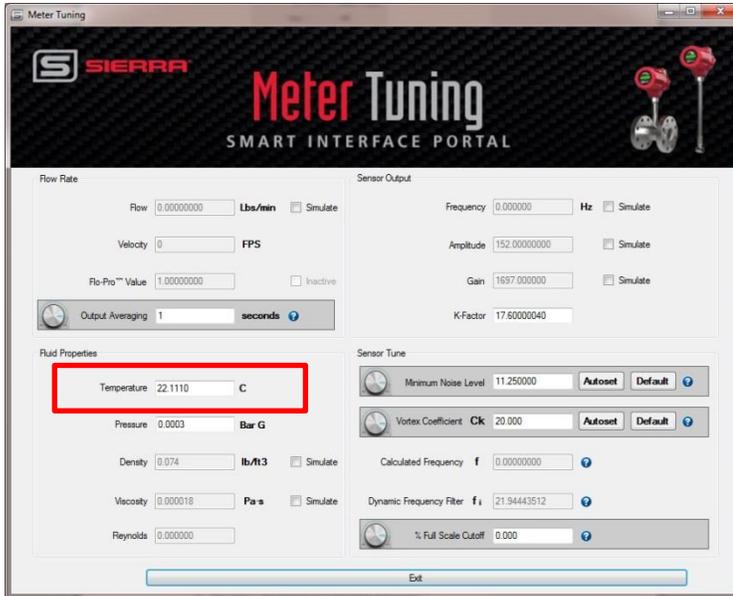
3.) If the unit is a remote, check the remote terminal wiring per Figure 3 below.
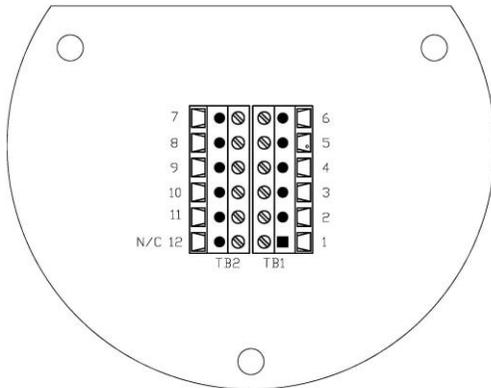
Figure 3. Remote Junction Box

Terminal Block Number	Remote Cable Wire Color
1	*Orange
2	*White/Black
3	*Red/Black
4	*Orange/Black
5	White
6	Black
7	**Blue/Black
8	**Blue
9	**Green
10	**Green/Black
11	Red
12	N/C

These wires are only present if the pressure option was ordered.

** These wires are only present if the temperature option was ordered.*

5. How do I troubleshoot if the temperature is correct on the display, but not on the 4-20mA output?

1.) The first step is to check your setup. Temperature units are set in the "Dial-A-Fluid & Units" menu. Refer to the SIP Manual for more information.
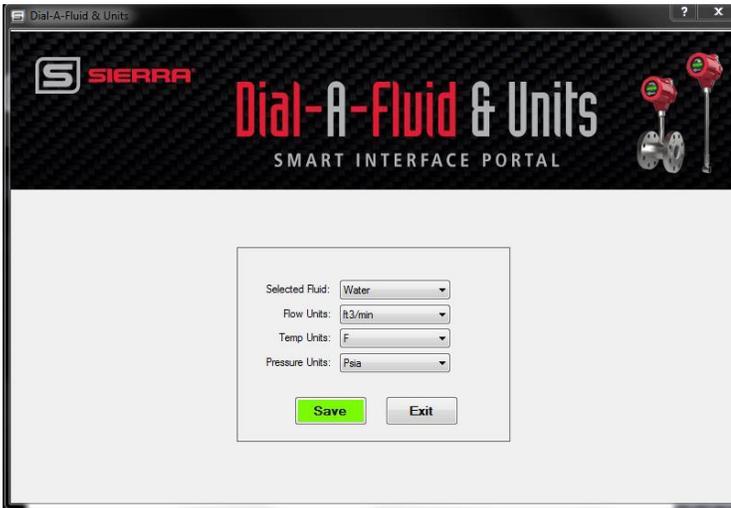
2.) Next, scale your 4-20 mA. 4-20mA outputs may be scaled for temperature in the "Flow, pressure and Temperature 4-20 mA Output Range Setup" menu under the "4-20 mA OUTPUT RANGE" section.
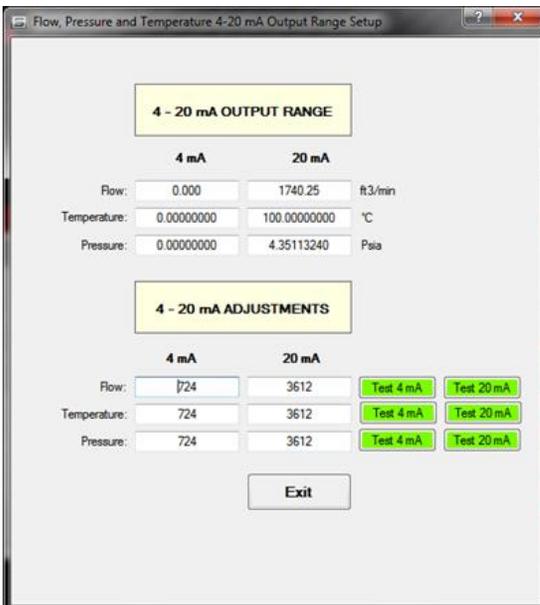
	Note: 4-20 mA adjustments values should **not** be changed! The 4-20 scaling in the "4-20 Adjustments" section represents calibration information for the electronics of the 4-20 current loops and should **not** be adjusted by the customer.

6. How do I troubleshoot if the pressure is incorrect on the display?

First verify your unit type and pressure specs. In general, the 240i/241i V and VT have no pressure input. Mass flow is determined by calculating density from the values located in the "Process Temperature and Pressure" menu. The 240i/241i VTP has one transducer for measuring process pressure.

The available pressure ranges are:
MP0: No pressure input (incompressible liquids)
MP1: 30 psia
MP2: 100 psia
MP3: 300 psia
MP4: 500 psia

After your check, if your pressure is reading incorrectly, it could be one of the following:

  ➢ The pressure setup is incorrect/corrupted
  ➢ The sensor has failed
  ➢ The remote wiring is incorrect

Troubleshooting suggestions:

  1.) Go to the ValidCal Diagnostics menu on the SIP and click Low/High FTP button (See Quick Tuning Guide and the SIP manual). Check if the meter's pressure limits have been exceeded. If so, the meter may need to be returned to the factory.

2.) If this is not immediately possible, go to the "Meter Tuning" screen and enter your pressure in the "Fluid Properties Section" and click "simulate." This will simulate your pressure input until repairs can be made.
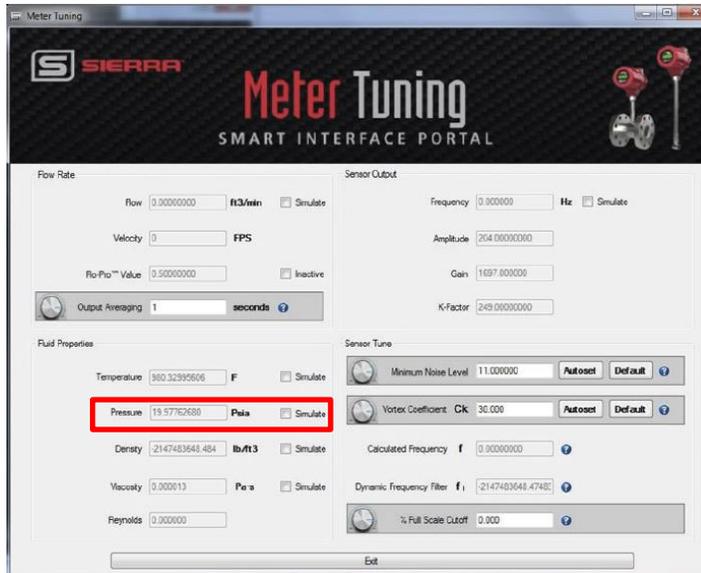
- If the unit is a remote, check the remote terminal wiring per Figure 3 in FAQ 4.

7. What do I do if the flow shows correct on the display, but 4-20 mA output is wrong?

In most cases, this is because the 4-20 mA Output in the "Flow, Pressure and Temperature 4-20 mA Output Range Setup" menu is incorrect or the "4-20 mA ADJUSTMENTS" have been altered. The "4-20 mA ADJUSTMENTS" represent calibration constants for the electronics (in A/D counts) and should not be changed. If you have done this, you will need to reset the "4-20 mA ADJUSTMENTS" back to factory constants.

8. What do I do if the flow is ZERO at low flows?

First, understand that vortex meters **cannot** read down to zero flows even though that's what you see on the meter. Physically, the meter cannot read down to zero. There is a specified minimum mass flow rate below which the meter will read "zero" (Liquids – 1-30 fps, Gases – 10-300 fps). There is no way around it short of increasing the velocity in the pipe by reducing the cross sectional area.

9. What do I do if the flow is unstable?

In some cases, this is an installation issue. You must verify insertion depth, probe orientation, and proper upstream and downstream diameters. In other cases, this may be a tuning issue. You will need to tune the flow per the Quick Tuning Guide.

10. What do I do if the flow always reads zero, even at very high actual flow rates?

This may be a vortex sensor fault.

- ➢ Ensure that the sensor is connected or that it is wired correctly.
- ➢ Go to the "ValidCal Diagnostics" menu, click the High/Low FTP button (See FAQ 5 for diagram), and check the highest velocity recorded.
- ➢ The max velocity spec is 30 fps for a liquid; 300 fps for a gas. If these velocities have been exceeded, the sensor may have been damaged.
- ➢ Pull the probe and check for visible damage.
- ➢ If still not working, you will need to send your meter back to the factory.

11. What do we do if the flow is "not what we expected"?

This is obviously the most difficult one. You will need to do some or all of the following:

1.) Check the installation (insertion depth, straight run, probe orientation).
2.) Check the cabling. Do you have the power wires in the same conduit as the signal wires? This could couple noise into the line...especially if it is AC powered. See Chapter 2 in the [InnovaMass 240i/241i manual](#).
3.) Check the meter Earth Ground.
4.) Check the cable length on remoted units. Have you spliced an additional cable into the meter's lines? If yes, that can lead to an attenuated vortex signal which is of insufficient strength for the meter electronics to process.
5.) Check the programming. Is the 4-20 mA output scaled correctly? Are the meter type, fluid type and the units (flow, temperature, pressure) correct? Have you changed anything in the "Dial-A-Pipe" menu (especially pipe size)?
6.) Check the pressure and temperature readings (if 240i/241i VT and VTP). Are they being reported correctly? Obviously, an incorrect T or P will lead to an incorrect density calculation and therefore and incorrect flow. See above for troubleshooting tips on the T and P sensors.
7.) If all of the above looks good (programmed and installed correctly), do a meter tuning per the [Meter Tuning Guide](#). Be aware that the meter will lock onto the strongest signal available, which may be 50 or 60 Hz, especially if the meter is not grounded correctly.

Still have questions?

For further assistance, contact the factory at 800-866-0200 and ask for our Customer Service Department. You can also, [click here](#) to Contact us.