Installation and Technical Manual for the **Summing In-Line Amplifier, Order Code AA919**

Issue A

008-0749-00

⚠ WARNING
MISUSE OF DOCUMENTATION

- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.
- **Failure to comply with these instructions could result in death or serious injury**.

⚠ AVERTISSEMENT
MAUVAIS USAGE DE LA DOCUMENTATION

- Les informations complètes d'installation, d'utilisation et d'entretien sont fournies avec les instructions accompagnant chaque produit.
- **L'inobservation de ces instructions risque d'entraîner des blessures graves, voire mortelles.**

⚠ WARNING
PERSONAL INJURY

- DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.
- **Failure to comply with these instructions could result in death or serious injury.**

⚠ AVERTISSEMENT
PERSONNELS BLESSURES CORPORELLES

- NE PAS UTILISER ces produits en tant que dispositifs d'arrêt d'urgence ou de sécurité, ni dans aucune autre application où la défaillance du produit pourrait entraîner des personnels blessures corporelles.
- **L'inobservation de ces instructions risque d'entraîner des blessures graves, voire mortelles**.

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Summing In-Line Amplifier, Order Code AA919

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About this Document

This document provides details for using the User Interface Software that comes with the Summing In-Line Amplifier.

User Interface software can be used to:

- Communicate with the Device
- Configuring/Output Scaling of the Sensor's
- Preload Tare
- Shunt Calibration

1 | PRODUCT DESCRIPTION

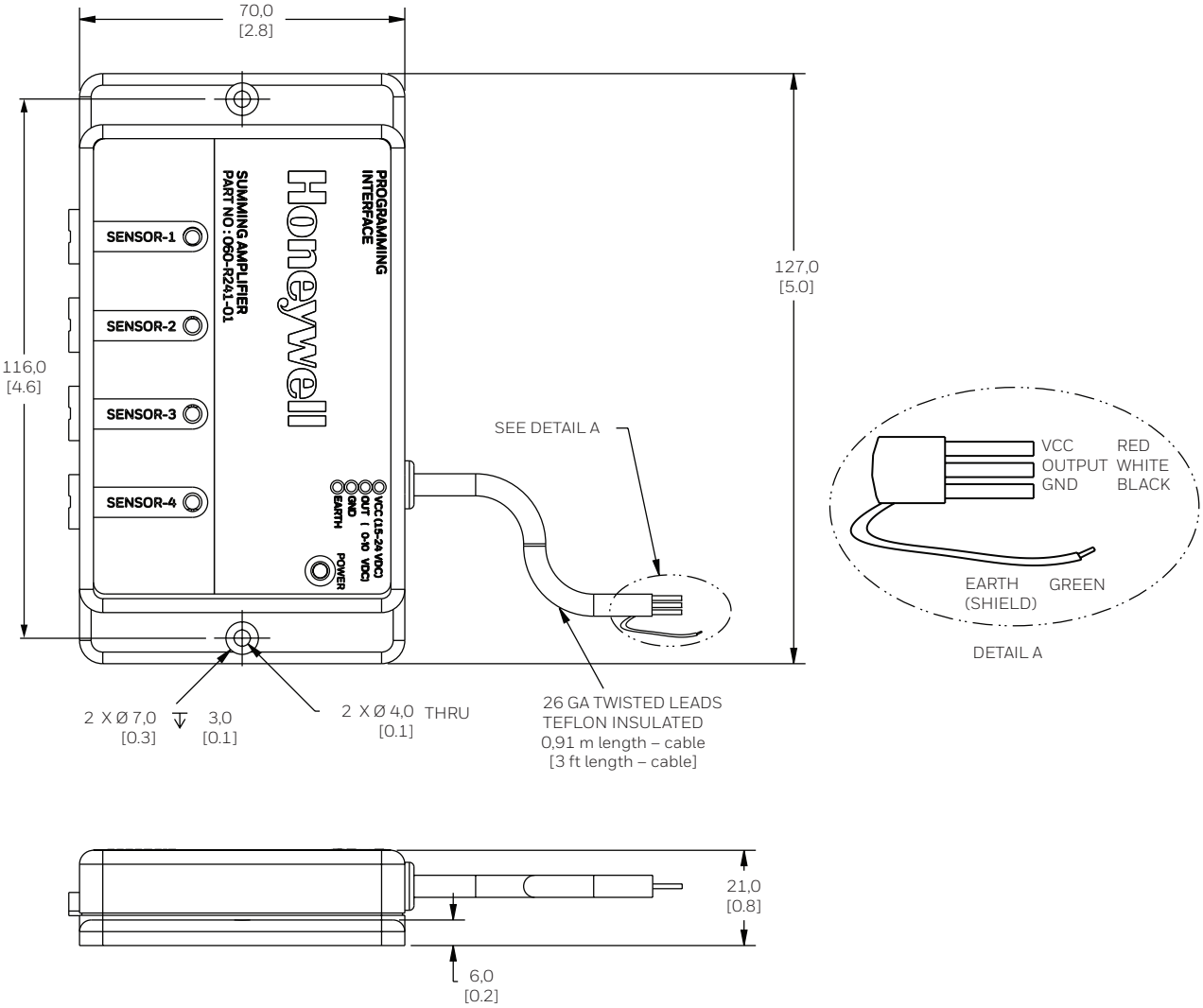
1.1 | General

Honeywell's Summing In-Line Amplifiers are housed in a small plastic package, which is connected between the transducer and a readout instrument/UI running on a computer or laptop. The Summing In-Line Amplifier supplies a regulated bridge excitation voltage for the transducer and converts the millivolt signal from the transducer to a 0-10 Vdc amplified signal. The Summing In-Line Amplifier features include auto excitation voltages, programmable gain settings, and a wide adjustment range on the Span and offset value.

1.2 | Product Specifications

Power Requirements	15 Vdc to 24 Vdc
Output Voltage	0 Vdc to 10 Vdc
Accuracy	±0.25 % full scale span (FSS)
Operating Temperature Range	-10 °C to 60 °C [14 °F to 140 °F]

MOUNTING DIMENSIONS mm [in]



2 | MODULE DETAILS

2.1 | External Connections - Sensor's Side

The front view below shows the connections for the 4 sensors to be connected to the Summing In-Line Amplifier. There are 4 mating connectors provided.

Figure 2.1a. External Connections

Figure 2.1b. External Connector Pinout

pin 1 2 3 4

Pin Number	Connection
1	+ Vexc
2	-Signal
3	+ Signal
4	-Vexc/Gnd

Note: Pin numbers are in the same order for all: Sensor-1, Sensor-2, Sensor-3, Sensor-4.:

2.2 | External Connections - Rear Side

The rear view below shows the power input cable, as well as the USB mini connector for Programming interface to connect the Summing In-Line Amplifier to host PC.

Figure 2.2. External Connections - Cable and Mini USB

Cable Wire Color	Connection
Red	(+) Supply
Black	Supply Return / (-) Output
White	(+) Output
Green	Earth

- The Summing In-Line Amplifier can be powered from a 15-24V DC power supply.
- The power cable used for the Summing In-Line Amplifier is shielded 4 core cable. There are 4 conductors available for the connections.

Note: Green Wire is connected to the Shield of the cable

Note Mini USB connector is used to configure the sensor's using the host PC/Laptop

3 | OPERATING GUIDE

3.1 | Installation of Software and Drivers

The Summing In-Line Amplifier requires installation of the Desktop Application and accompanying software drivers.

Please follow these instructions to obtain and load the software on a compatible PC or laptop.

Before installing, be sure to remove any earlier versions by using the Uninstall programs feature on your computer.

3.1.1 | System Requirements

- Operating System – Windows 7 or Windows 10, 32 & 64 bits
- The screen must support and be set for a resolution of 800 x 600 or higher

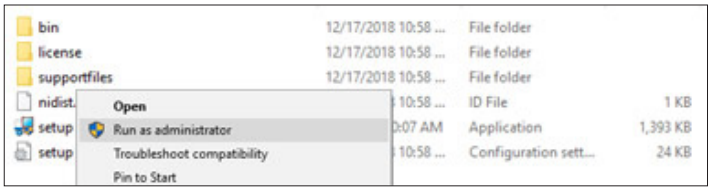
3.1.2 | Loading Software and Device Drivers

1. Download the required Summing In-Line Amplifier Software and Device Drivers from the following URL:

https://sensing.honeywell.com/test-measurement-products/summing-amplifiers/aa919

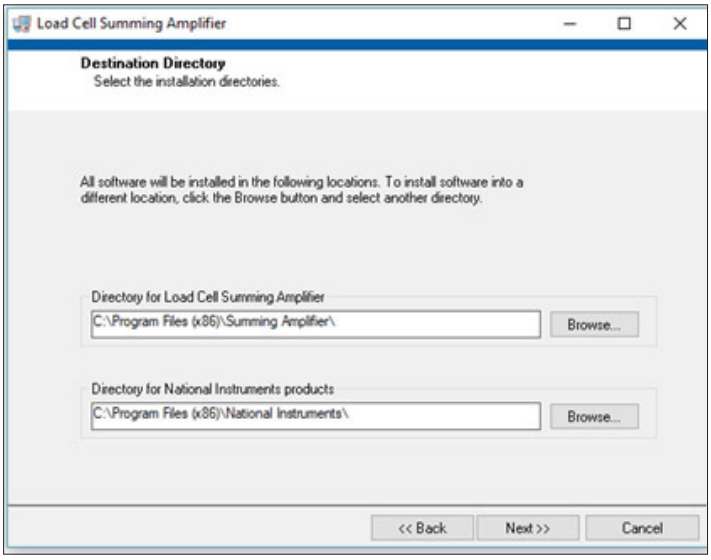
2. Unzip the downloaded file to a location on your computer or laptop.
3. Navigate to that location and run Setup.exe by right-clicking the file and selecting Run as administrator.

Figure 3.1.2a. Start Setup.exe in Administrator Mode



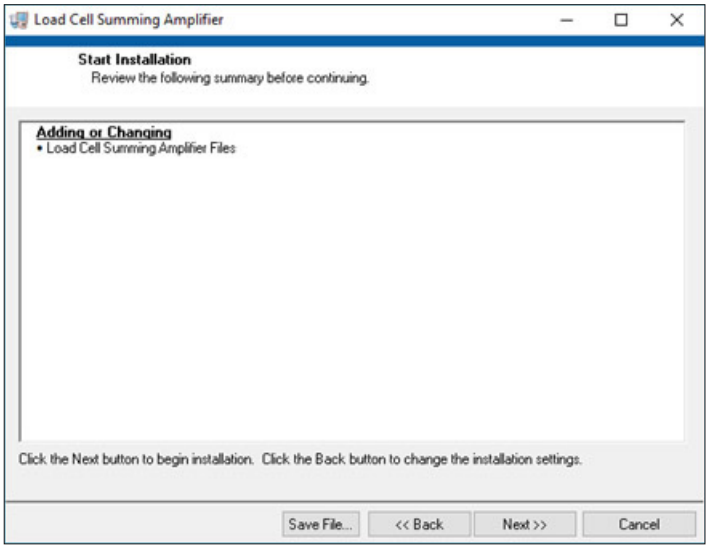
4. Select the directory for the installation and click the Next Button.

Figure 3.1.2b. Identify Installation Directory



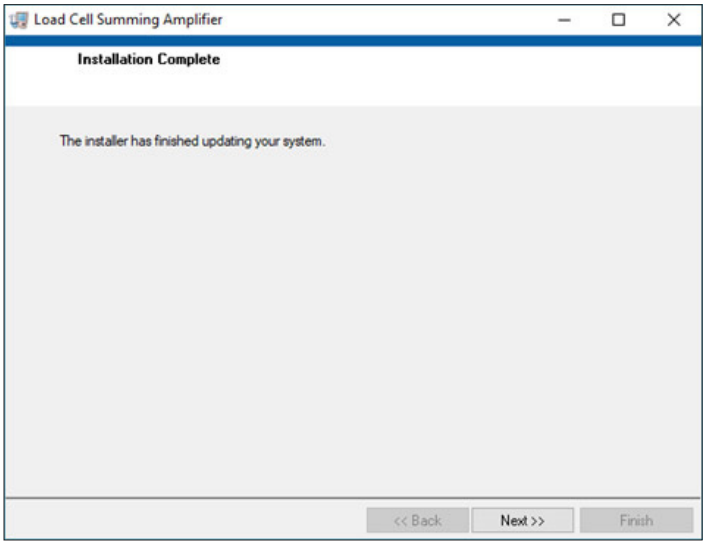
5. Review the details and click Next.

Figure 3.1.2c. Continue Installation



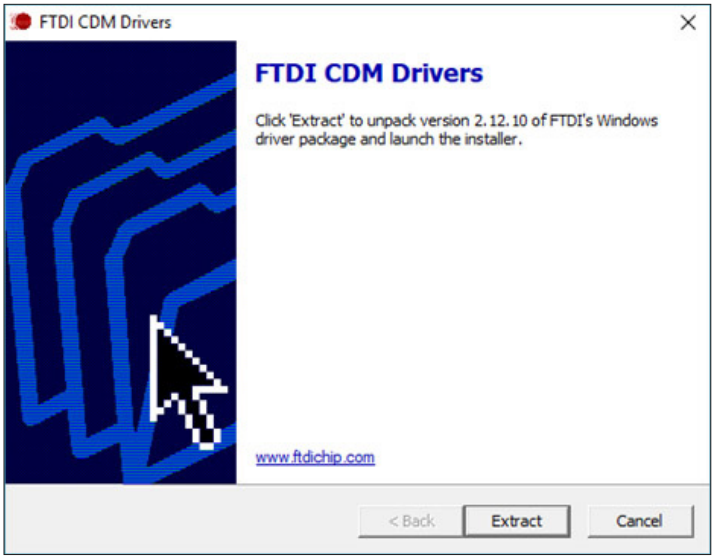
6. When you see Installation Complete, click the Next button.

Figure 3.1.2d Desktop Application Install Completes



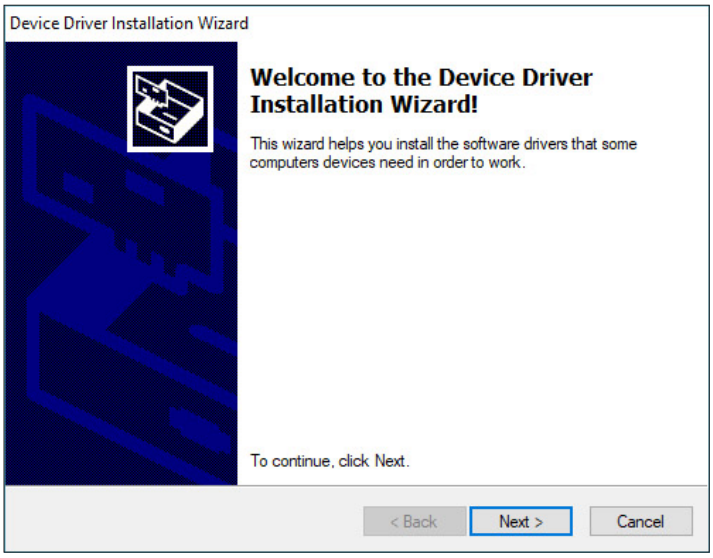
7. Install the Future Technology Devices International (FTDI) Combined Driver Model (CDM) drivers. Click on the Extract button.

Figure 3.1.2e. FTDI CDM Driver Installation



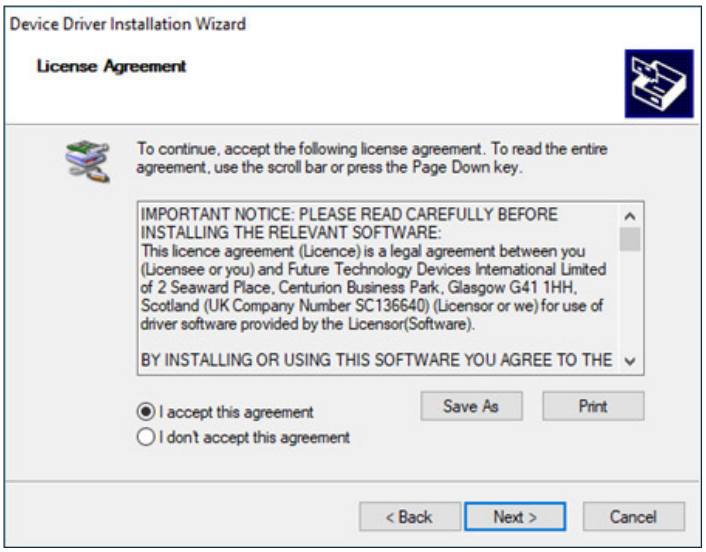
8. After extraction, click Next to continue with the Device Driver installation.

Figure 3.1.2f. Device Driver Welcome Screen



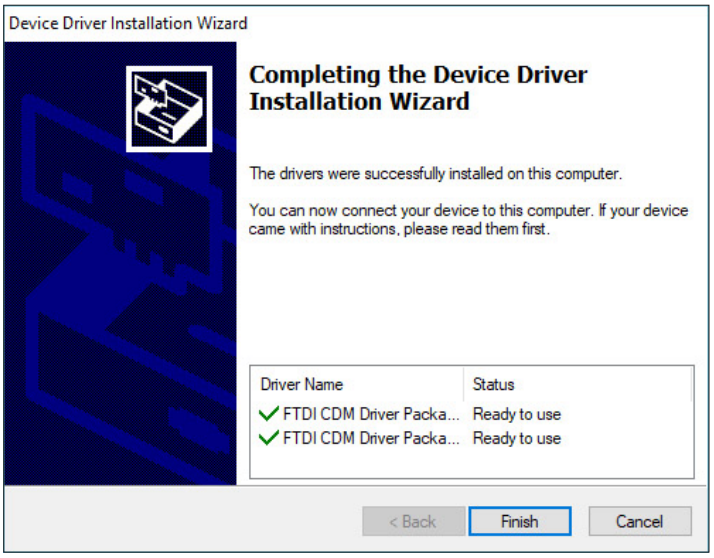
9. Accept the agreement by selecting the radio button, and click Next.

Figure 3.1.2g. Device Driver License Agreement



10. Allow the Device Driver installation to run. Drivers will display as Ready to use when installation is complete, .

Figure 3.1.2h. Device Driver Installation Completion



3.2 | Making the Connections

3.2.1 | Connect Amplifier to Power

Refer to 1.3 and 2.2 to properly connect and apply power to the Summing In-Line Amplifier.

When you apply power to the Summing In-Line Amplifier, the POWER LED on the front of the device will glow green. The four sensor LEDs will blink red.

3.2.2 | Connect the Sensors

Refer to 2.1 to properly connect required sensors to amplifier ports. Up to four sensors can be connected.

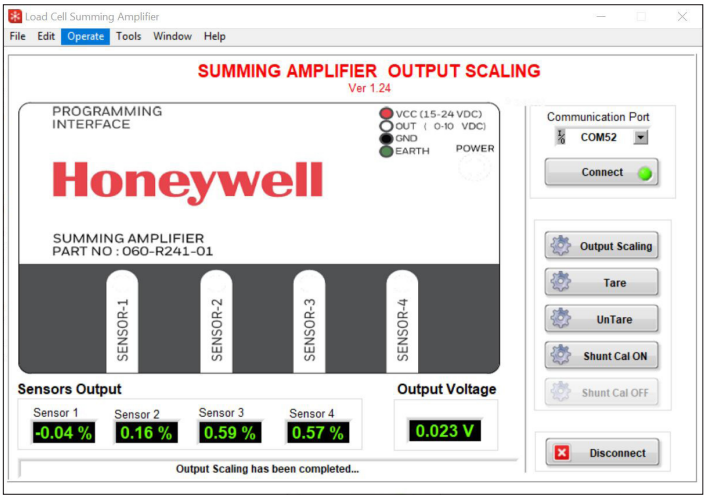
As sensors are connected, accompanying port LEDs on the front of the amplifier will glow green.

3.3 | Connect Amplifier to PC and Launch Desktop Application

3.3.1 | Connect Mini USB cable

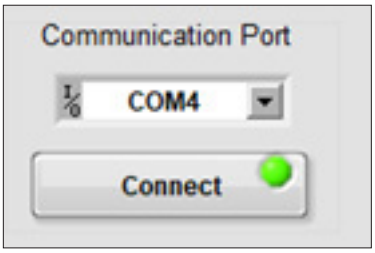
1. Connect the smaller end of the provided Mini USB cable to the port on the rear of the Summing In-Line Amplifier as shown in 2.2. Then connect the larger end of the mini USB cable to a USB port on the computer..
2. Launch the Load Cell Summing In-Line Amplifier desktop application on the PC.

Figure 3.3.1a. Honeywell Splash Screen (momentarily shown)



3. Select the appropriate Communication Port from the drop down. You can verify port availability by opening Device Manager> Ports(COM & LPT), then select the correct port from the dropdown.

Figure 3.3.1b. Select Communication Port

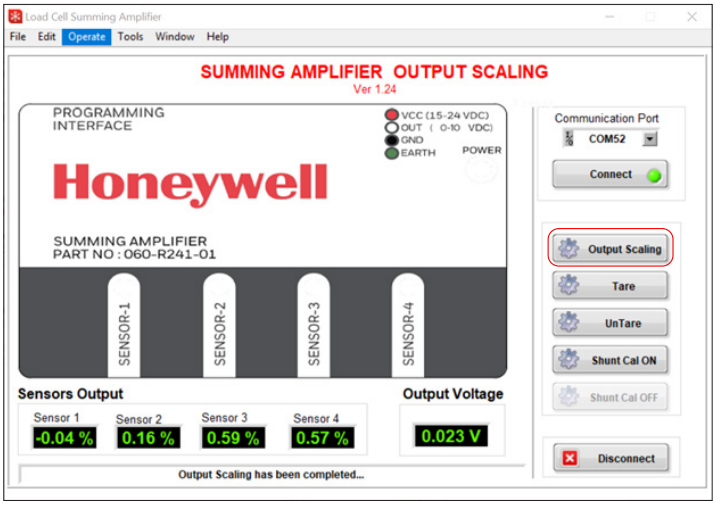


4. Click Connect. When the connection is complete the simulated LED on the Connect button will glow green as shown in “Figure 3.3.1b. Select Communication Port”

3.4 | Output Scaling

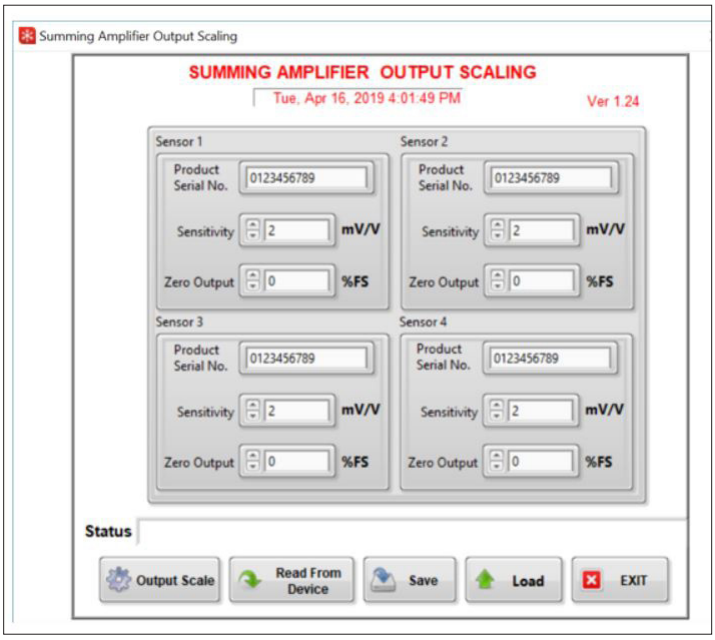
1. Click on the Output Scaling button on the application interface that should now be active.

Figure 3.4a. Output Scaling Option



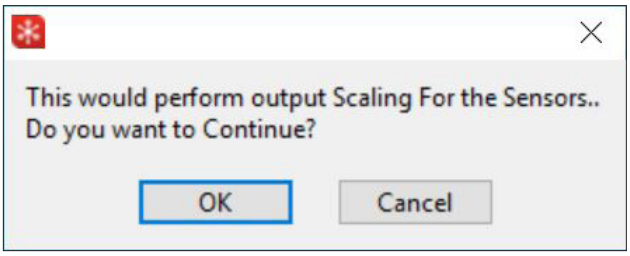
2. The user interface reads the default configuration values from the Summing In-Line Amplifier and displays them.
3. Modify desired values based on calibration sheets provided by the sensor manufacturers. Fields available include product serial number, sensitivity in mV/V, and zero output of the sensor from the calibration sheet. Zero output has to be entered as % of FS.

Figure 3.4b Output Scaling User Interface



4. Click on the Output Scale button to apply the changes back to the amplifier. The application interface asks for verification first.

Figure 3.4c. Verify Output Scaling Changes



5. Click OK to continue.

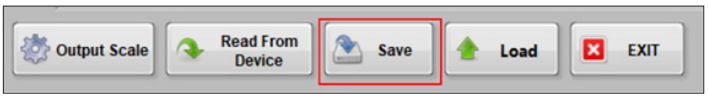
Note:

- The Sensivity should be within the Range of 1.5 mV/V-12 mV/V. You will see a warning if the value is out of range.
- Zero Output should be within ± 10 % of FS. You will see a warning if the value is out of range.

3.5 | Save Configuration

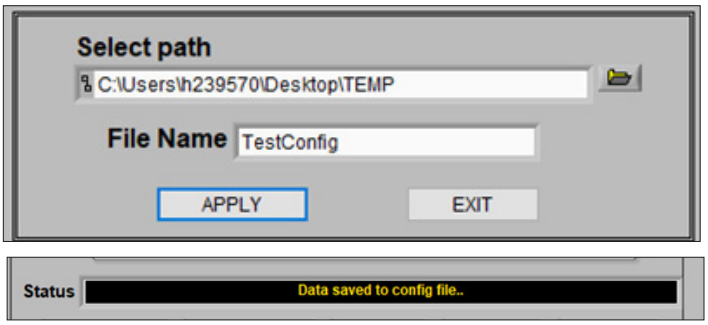
1. To save the configuration to the PC/laptop, click on the Save button.

Figure 3.5a. Save Configuration Option



2. Select the desired directory path and provide a file name. Then click Apply, and the interface will validate the save.

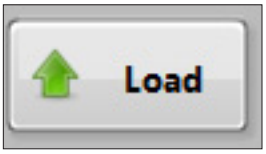
Figure 3.5b. Saving - Provide Path and File Name



3.6 | Load Configuration

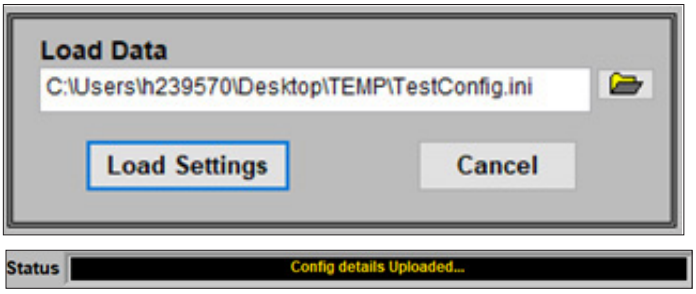
1. To load a configuration previously saved to the PC/laptop into the user interface, then to the amplifier, click on the Load button.

Figure 3.6a. Load Configuration Option



2. Select the path and file, and click on the Load Settings button to load the settings into the user interface.

Figure 3.6b. Load Configuration Option

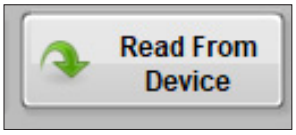


3. Click on the Output Scale button to apply the settings to the amplifier.

Figure 3.6c. Apply Settings to Device

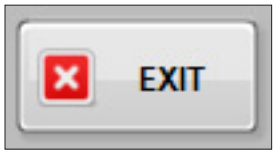
4. Verify that the settings were loaded into the amplifier by clicking Read From Device.

Figure 3.6d. Read from Device Option



5. Exit Output Scaling by clicking on Exit.

Figure 3.6e. Exit Output Scaling Option

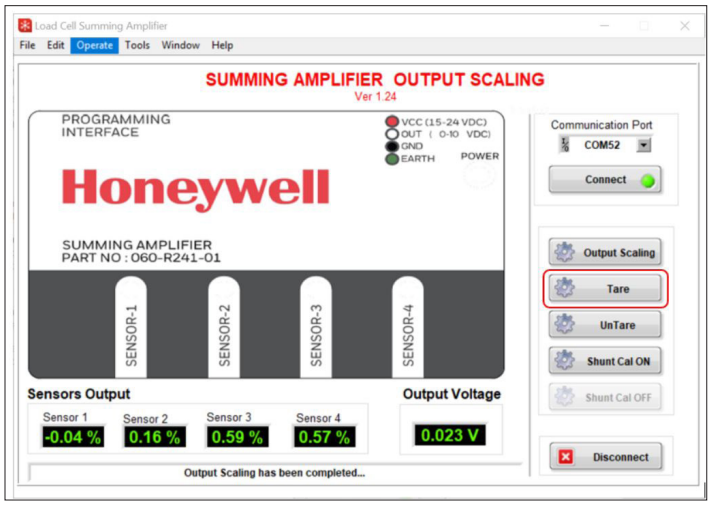


3.7 | Tare and UnTare

1. The Tare function is useful in zeroing the preload on setup. Click the Tare button to load Zero Value to the amplifier.

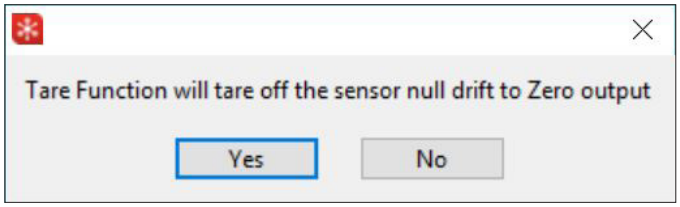
Note: Tare limit is 30% of FS. When the preload of load on the amplifier is more than 30% of FS, Tare command will show an error.

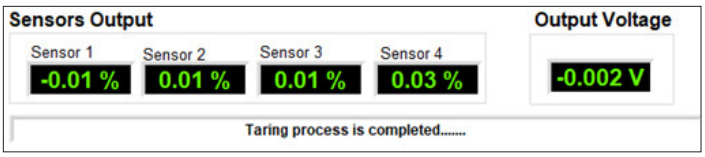
Figure 3.7a. Tare Option



2. Click Yes to continue with the Tare function.

Figure 3.7b Tare Validation

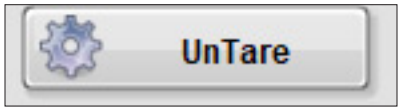




3. The Output Voltage is now set close to zero and the values are saved to flash memory on the Summing In-Line Amplifier.

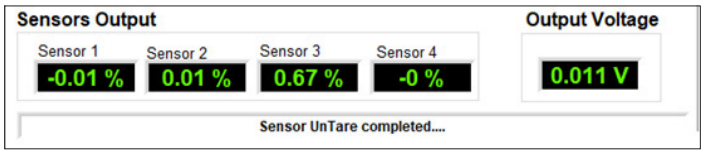
4. Tared output can be reversed by clicking on the UnTare button.

Figure 3.7c. UnTare Option



1. After UnTare, the output will return to original values..

Figure 3.7d. UnTare Results



3.8 | Shunt Calibration

1. An electrical signal equivalent to that produced by a known load can be obtained by activating the Shunt Calibration function.

   The Shunt Calibration function is achieved by connecting a high-precision resistor of known value, in parallel (shunt) with one arm of the strain gage Wheatstone bridge. The connection is made by a solid-state switch, which will be activated by the Shunt Cal ON button.

   In the Summing In-Line Amplifier, a fixed resistor with resistance of 61900 Ohms is used as the shunt resistor. The output of the Summing In-Line Amplifier during Shunt Cal ON depends on the bridge resistance and sensitivity of the sensor connected to the amplifier.

   When a Sensor with the 350 Ohm Bridge resistance and 2.0mV/V sensitivity is connected to the amplifier, the output of the amplifier will saturate to ~70% of full scale during the shunt calibration.

Table 3.8a. Shunt calibration Output vs Bridge resistance & Sensitivity

SL No	Bridge resistance of Sensor in Ohms	Sensitivity In mV/V	% of Full Scale Output of Summing In-Line Amplifier when Shunt Cal ON
1	350	2	70%
2	350	4	35%
3	350	10	14%
4	700	10	28.2%

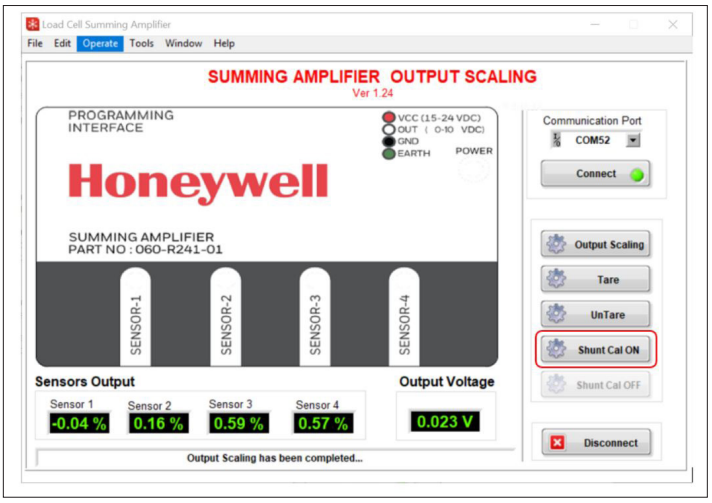
Output of the Summing In-Line Amplifier under shunt calibration for any other values of the bridge resistance and sensitivity can be calculated using this equation:

$$\text{Shunt Cal On Output} = \frac{(0.000004286 * \text{Bridge Resistance}) * 100}{(\text{Sensitivity})}$$

Example:
Consider Sensor with Bridge resistance of 700 Ohm & Sensitivity 10mV/V

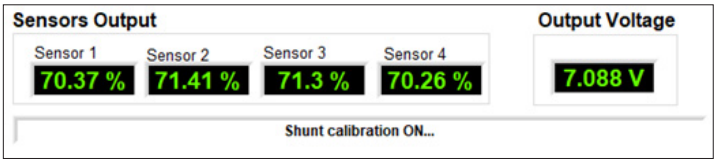
$$\text{Shunt Cal On Output} = \frac{0.000004286 * 700 * 100}{0.010} = 28.2\% \text{ of Full Scale} = 2.82\text{V}$$

Figure 3.8a. Shunt Cal ON Option



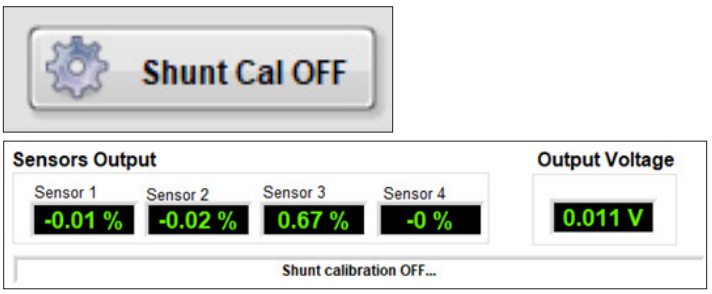
1. Observe the output.

Figure 3.8b. Shunt Cal ON Output



2. Turn off shunt calibration by clicking the Shunt Cal OFF button:

Figure 3.8c Shunt Cal OFF Option3.9 | Other Options



3.9 | Disconnect Option

1. To disconnect the device from the PC/laptop, click on the Disconnect button.

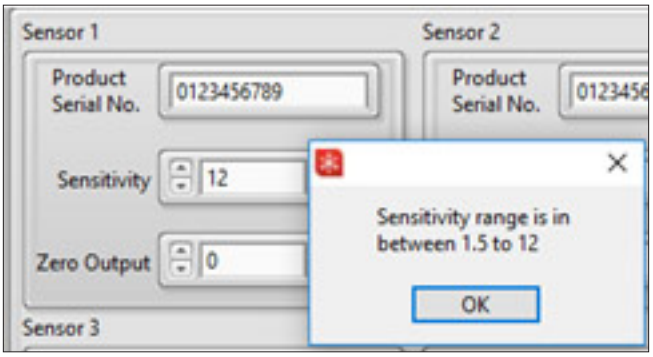
Figure 3.9. Disconnect Option

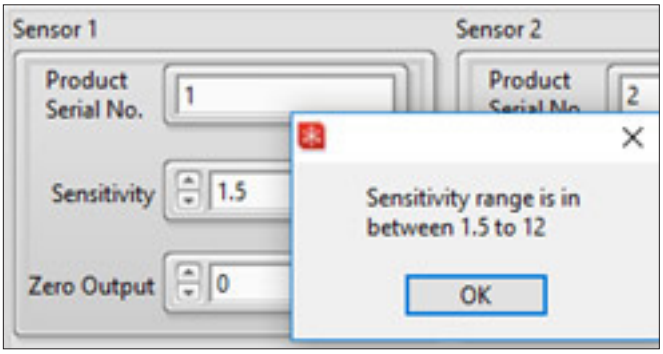
4 | WARNING & ERROR MESSAGES

4.1 | Output Scaling

The Sensitivity should be within the Range of 1.5mV/V -12mV/V. The user interface will pop up a warning when it is out of range

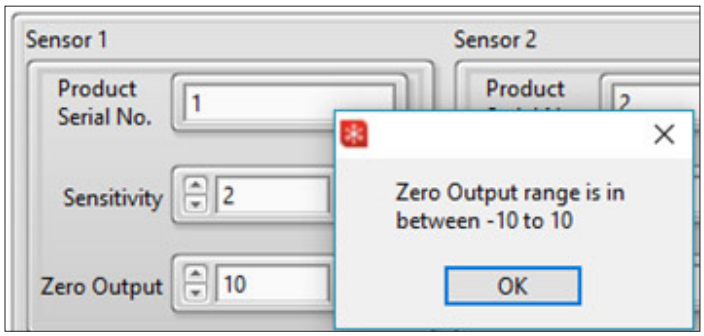
Figure 4.1. Sensivity Out of Range





- If the entered value is more than 12, a default value of 12 mV/V will be used.
- If the entered value is less than 1.5, a default value of 1.5 mV/V will be used.

Similarily, the Value of Zero output should be within the range of ± 10 % FSS.



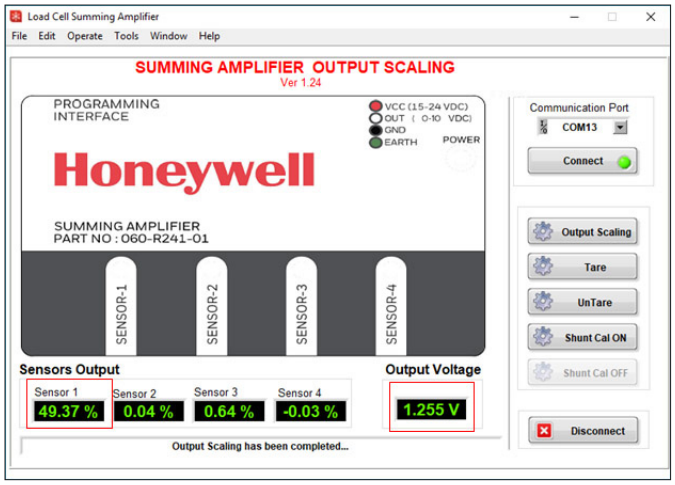
4.2 | Taring with More Than 30 % Load

The amplifier will allow Taring off 30 % of FS preload of the system.

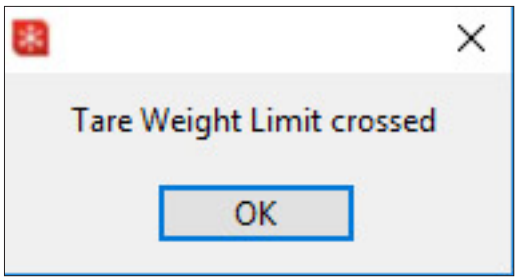
Taring off with more than 30 % delivers an error message.

Here is an example.

Figure 4.2a. Tare Weight Limit Crossed

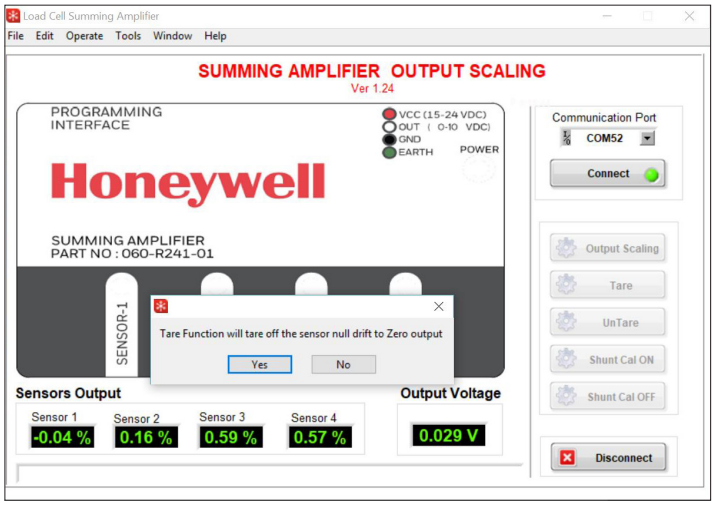


Because the example shows 50 % of load applied, the device would pop up a warning message.

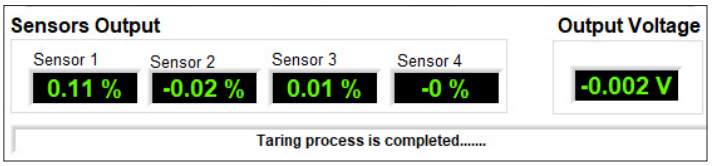


Here is an example showing a successful Tare using 25 % load on Sensor 1.

Figure 4.2b. Successful Tare



The Output also shows appropriate value in a successful Tare..

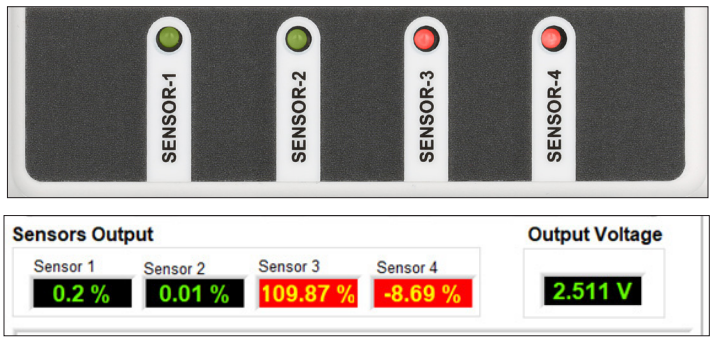


5 | DIAGNOSTIC FEATURES

The amplifier's sensor LED indicators glow red or green depending on whether a sensor is connected to the amplifier port. Under normal operating conditions with four sensors connected to the amplifier, all four LEDs will glow green.

1. When sensors are not conencted to an amplifier port, the LED for that port will glow red instead of green. Likewise when the amplifier is connected to a PC/laptop with the desktop application running, the sensor displays will also glow green or red.

Figure 5. Sensor LED and Desktop Interface



In this example you see that sensors 3 and 4 are not connected and glowing red on the amplifier and the user interface.

2. A red indicator can also mean the sensor is faulty, a bridge is open, or shorted out.
3. A red indicator also indicates a sensor is loaded more than 110 % of FS.

   Example: When the load on an individual sensor is more than 110 % of FS, the LED will blink red to indicate potential overload of the sensor.

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