



5580/SW5580 DUAL CHANNEL SMART SIGNAL CONDITIONER AND SWITCH

Software User Manual

Metrix Signal Conditioner Configuration Software

METRIX

Dual Channel Smart Signal Conditioner

HOME RELAYS ROD DROP ADVANCED SETTINGS IMPACT

Product Information

Serial Number:	040107
Firmware Version:	2.6.68
Hazardous Area Certification:	Multiple Hazardous Area Approvals

Channel 1 Configuration

Model:	SW5580-2-2-102A-0-0-100A-0-S5-2
Input Signal Type:	Accelerometer
Sensor Output:	100 mV/g (10.20 mV/m/s ²)
Bandpass Filter:	No Filter
Full Scale Range:	0 - 10 g, pk
Events/Rev:	0: Not Programmed (Speed Only)

Channel 2 Configuration

Model:	SW5580-2-102A-0-0-100A-0
Input Signal Type:	Accelerometer
Sensor Output:	100 mV/g (10.20 mV/m/s ²)
Bandpass Filter:	No Filter
Full Scale Range:	0 - 10 g, pk
Events/Rev:	0: Not Programmed (Speed Only)

Metric Units

Disconnect

Change Configuration

Refresh

Restore Factory Configuration

Enter Simulation Mode

Two Channels In

Channel 2 Enabled

Electro-Mechanical Relays

Connected

SIL Approved Version: 2.07.12

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SOFTWARE DOWNLOAD

1. To download the software, [click here](#) or go to the Metrix website.
2. On the homepage, place mouse over PRODUCTS, under SEISMIC select SIGNAL CONDITIONERS > 5580 Smart Vibration Signal Conditioner or SW5580 Switch.

On the 5580 Smart Vibration Signal Conditioner or SW5580 Switch page, scroll down to find the Software Download Form.

Software Download Documentation

Software Download Form

FIRST NAME *

LAST NAME *

COMPANY *

ADDRESS

CITY

STATE

ZIP

COUNTRY *

MOBILE PHONE

WORK PHONE

EMAIL *

Figure 1: Required information for software download.

3. Enter all required information and submit.
4. Double-click the file Signal_Conditioner.exe and follow installation instructions.

OPENING APPLICATION

1. Double click on the application icon.
2. Application will be displayed as seen in Figure 2.



Note: Unit will be detected if USB cable is already connected. Otherwise, connect USB cable to enable the “Connect” button.

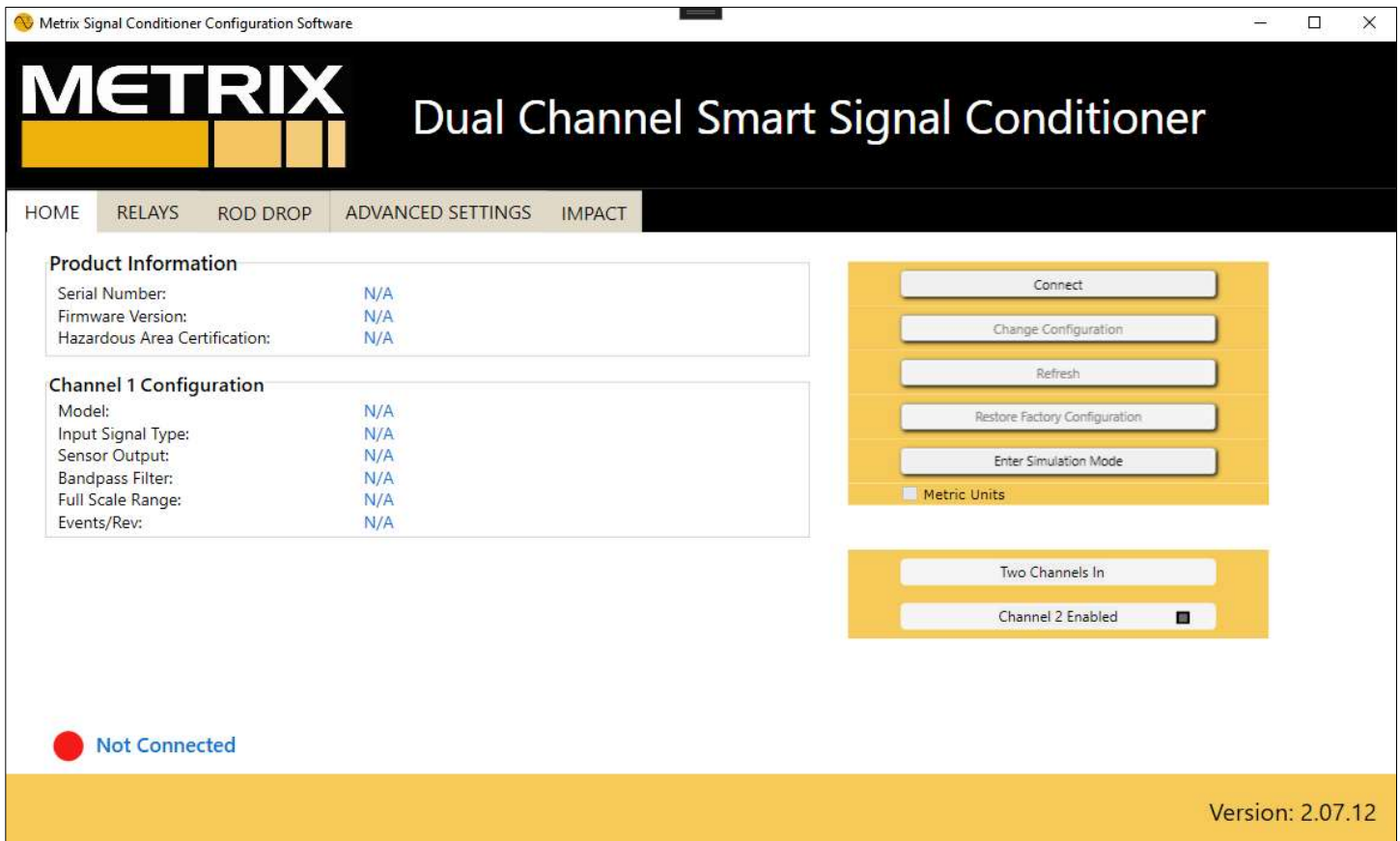


Figure 2: USB cable is connected, “Connect” button is enabled.

HOME

This tab displays the configuration stored in the unit.

Connect

Click “Connect” to connect device to the application, the screen will be populated with the configuration stored in the unit and all buttons will be enabled. See the figure below:

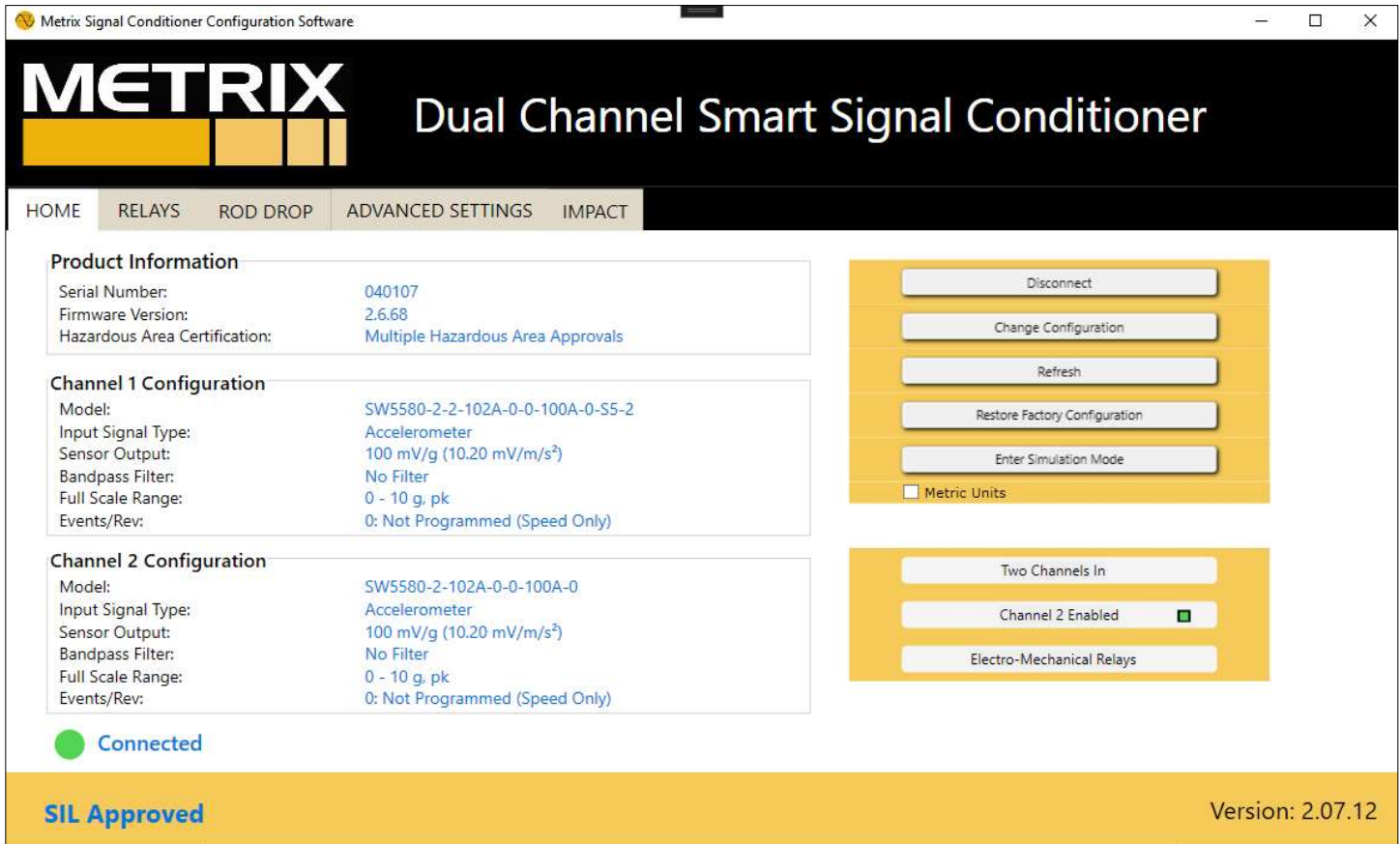


Figure 3: Screen displayed after connecting a 5580 unit.

Disconnect

“Disconnect” is enabled after connecting with unit.

Click “Disconnect” to close communication with the 5580/SW5580 unit.

Change Configuration

Click the “Change Configuration” button to display the following screen:

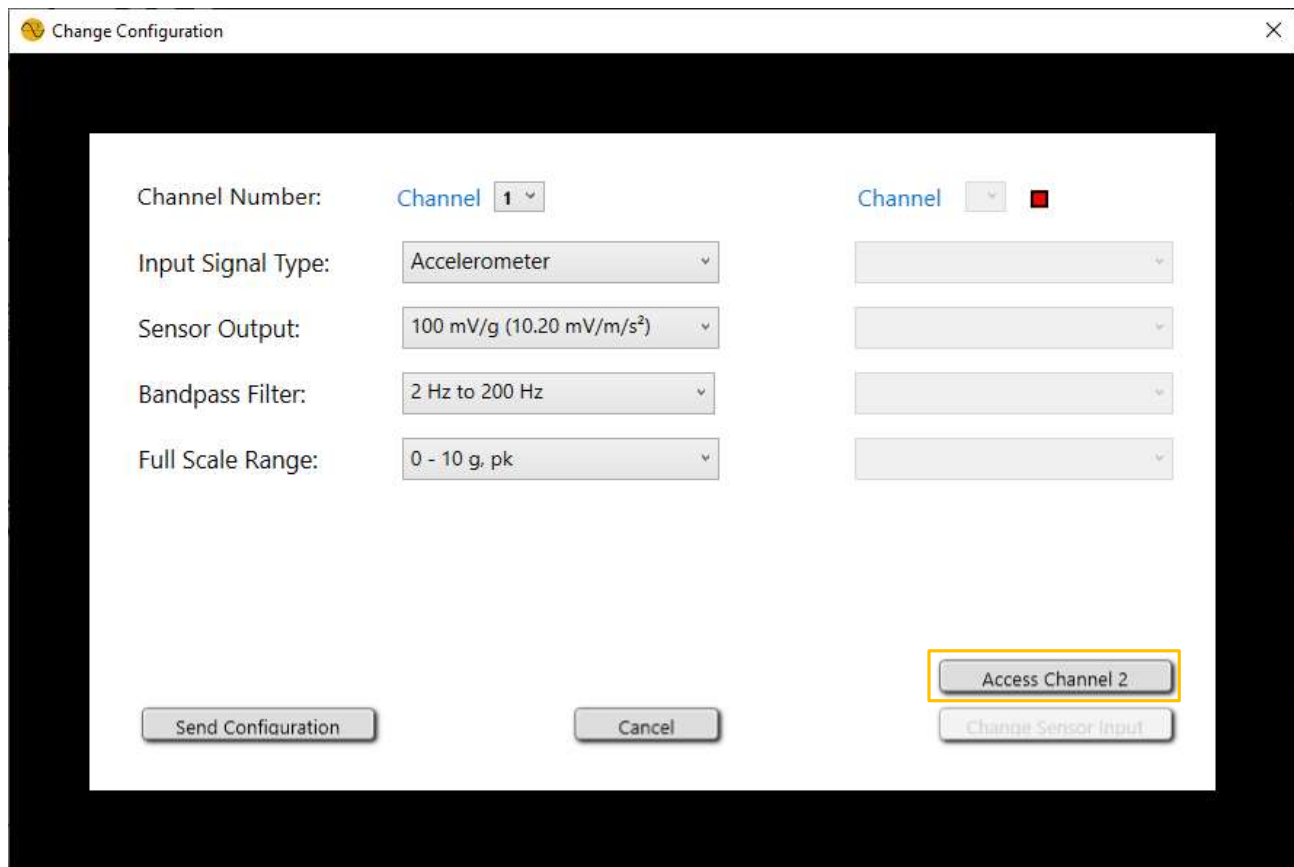


Figure 4: Change Configuration Screen.

Changes can be made to:

1. **Input Signal Type:** Velocity Sensor, Accelerometer, or Proximity Probe.
2. **Sensor Output:** Options vary for each sensor. Please refer to Datasheet.
3. **Bandpass Filter:** Please refer to Datasheet.
4. **Full Scale Range:** Options vary for each sensor. Please refer to Datasheet.
5. **Events/Rev:** For Speed Only.
6. **Channel:** Channel Number displayed in unit.

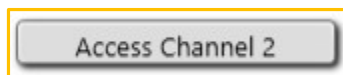


Figure 5: Access Channel 2 button.

Access Channel 2: Applicable only if channel two was not ordered. Use this button to enter the Access Key for channel 2. ([See page 24 for more details](#))

Select the appropriate changes, then click “Send Configuration.”

Note:

- Password is required to change the configuration of the unit.
- Default password: mtrx

Enter the password and click “Enter.”

The following screen is displayed after the configuration has been set.

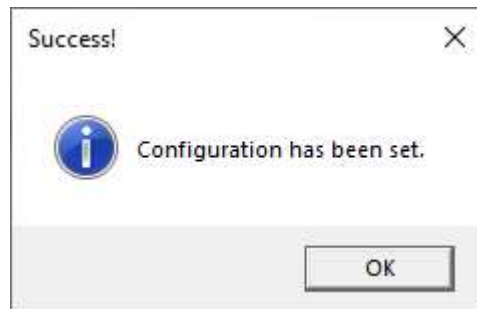


Figure 6: Success screen appears after configuration is stored in the unit.

Click “OK” to return to the main screen.

Change Configuration - Two Channels

If channel configuration “2” was ordered or if the second channel was enabled from the configuration software ([See page 24 for more details](#)), Change Configuration will display both channels.

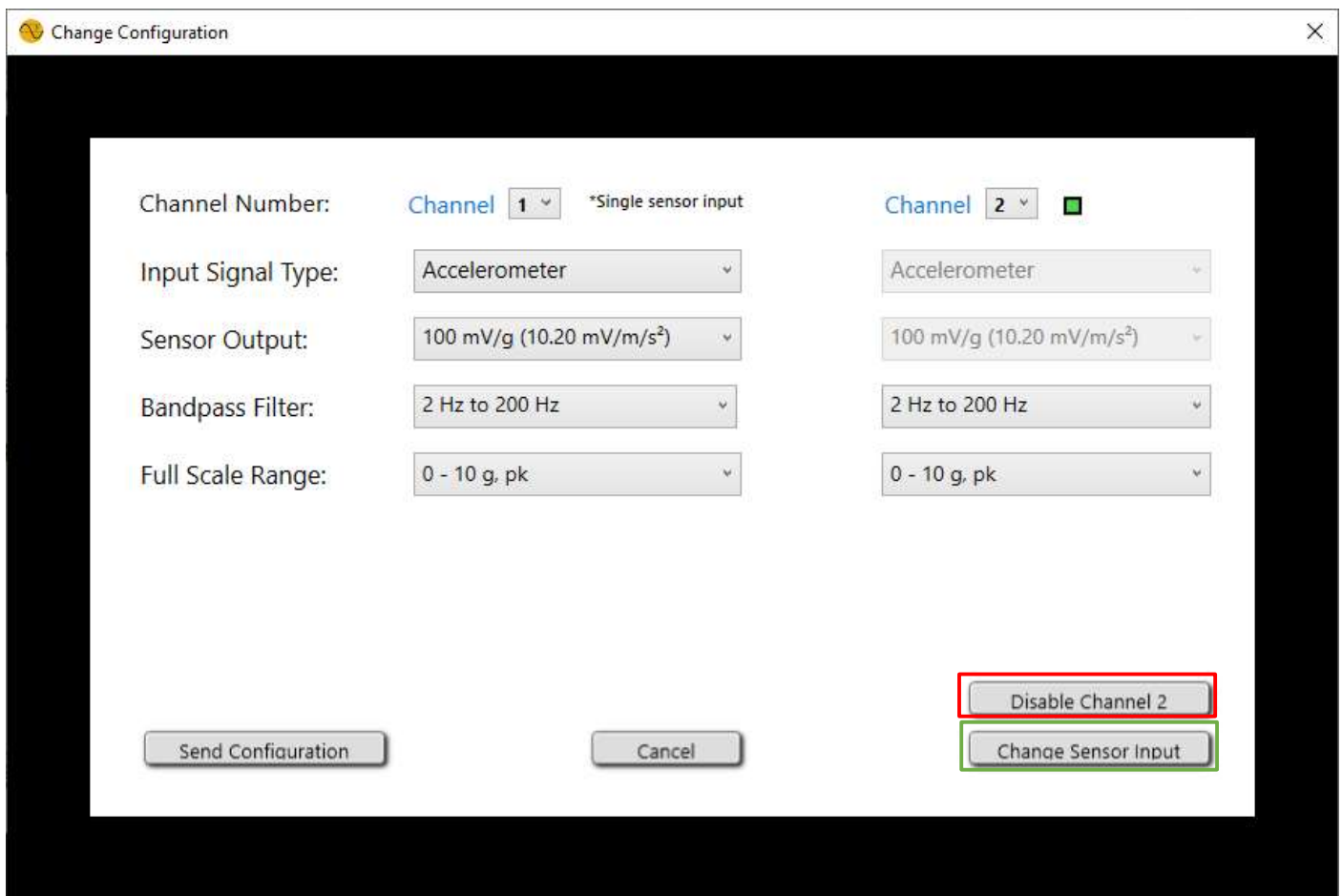


Figure 7: Change Configuration Screen for two channel mode.



Figure 8: Disable Channel 2 button.

Disable Channel 2 - Use this button to disable/enable the second channel. Disabling the channel will change the button to “Enable Channel 2.”

Enabling the second channel will result in:

- The same configuration as that of the first channel.
- *Dual sensor input: For Dual Channel measurements, inputs to both channels 1 and 2.

Note: Password is required to make changes.

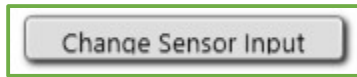


Figure 9: Change Sensor Input button.

Change Sensor Input - Use this button to change the sensor input mode. Observe the change in mode after each click:

1. *Single sensor input:

For Dual Path measurements the input channel is Channel 1.

- One accelerometer input may generate an accelerometer output and an integrated velocity output.
- One accelerometer input may generate an accelerometer output and an impact output.
- One velocity input may generate a vibration output and an integrated position output.
- One proximity input may generate a position output (gap) and a vibration output.

Note: Input Signal Type and Sensor Output cannot be changed for Channel 2 and are greyed out. Full Scale Range and Bandpass Filters can be changed.

2. *Dual sensor input:

For Dual Channel measurements, inputs to both Channels 1 and 2.

- Two acceleration inputs generate two acceleration outputs.
- Two acceleration inputs generate two impact outputs.
- Two velocity inputs generate two velocity outputs
- Two proximity inputs generate two proximity outputs.
- One acceleration and one velocity input generate one acceleration and one velocity output.
- One velocity input and one proximity input generate one velocity and one proximity output (proximity output can be vibration, position, or speed).

Refresh

Clicking “Refresh” will retrieve the loaded configuration from the unit and populate the values displayed on the screen.

Restore Factory Configuration

Clicking “Restore Factory Configuration” will restore the unit to the original configuration from factory.

Note:

- Password is required to restore the configuration of the unit
- **SW5580 ONLY:** The two relay levels at factory are set at one quarter (1/4) and one half (1/2) of the full-scale range.

Simulation Mode

Simulation Mode allows the user to get acquainted with the Dual Channel Smart Signal Conditioner application prior to using in the field.

Selecting “Enter Simulation Mode” will display the following:

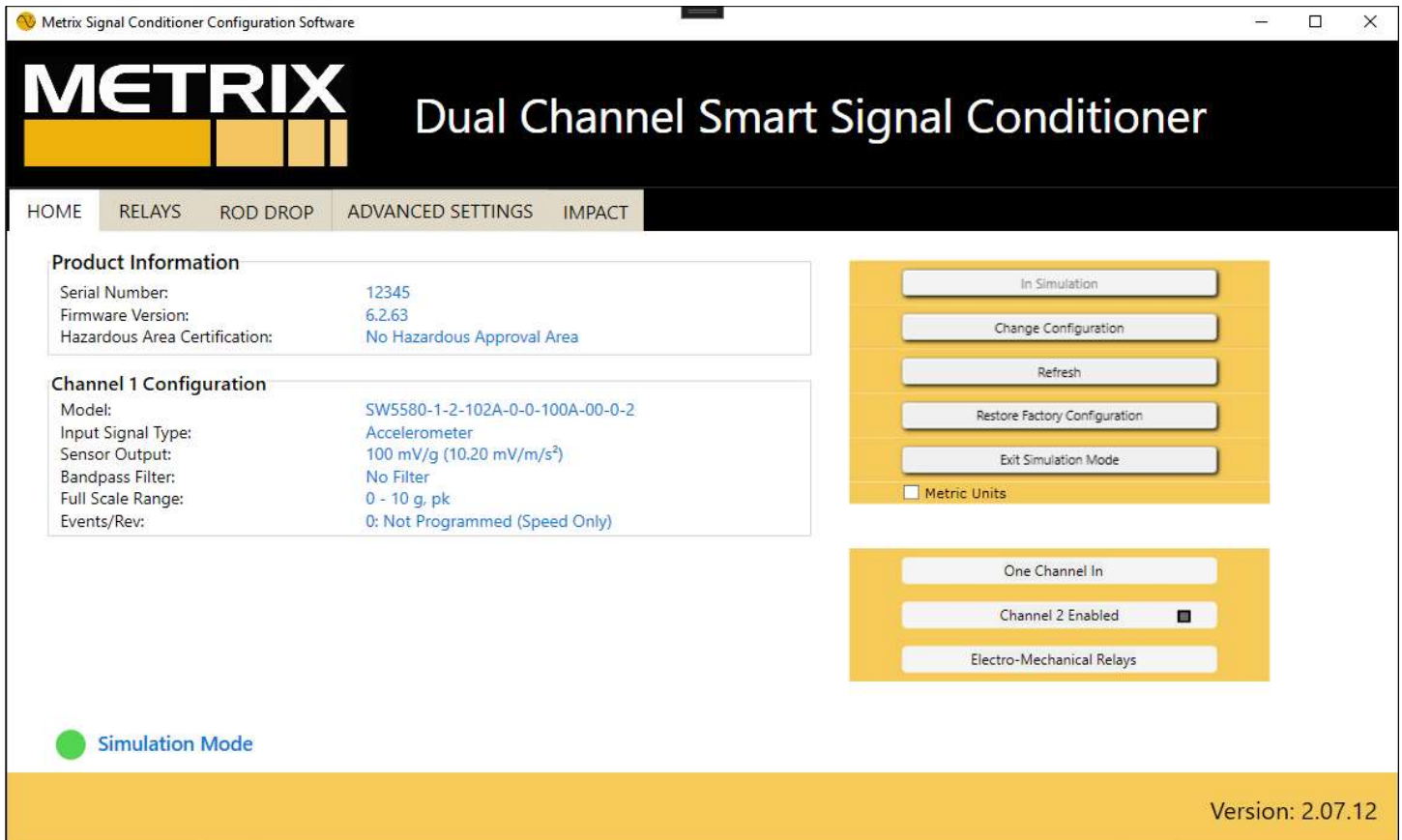


Figure 10: Simulation Mode Screen with an SW5580 Configuration.

The screen is populated with a simulated configuration for an SW5580 unit, and all buttons are enabled. Change Configuration, Refresh and Restore Factory Configuration buttons have functionality that allows user to become acquainted with this application. **Note not all functionality of the SW5580/5580 is available in simulation mode.**

Simulation Mode Access Key: password

Select “Exit Simulation Mode” to go back to the default main screen.

Metric Units

Metric units are available by selecting “Metric Units” checkbox on the HOME page.

RELAYS

This tab allows user to change Relay Settings (**SW5580 SIGNAL CONDITIONER ONLY**).

The screenshot shows the 'RELAYS' configuration screen for a Dual Channel Smart Signal Conditioner. The interface is divided into several sections:

- Channel 1 Settings:** Alert Level (1 g, pk), Alert Delay (3 sec), Alert Latching Mode (Latching Mode), Danger Level (1.5 g, pk), Danger Delay (3 sec), Danger Latching Mode (Latching Mode), Active/Passive (Active (Fail-Safe)), Input Signal Type (Accelerometer), Full Scale Range (0 - 10 g, pk).
- Channel 2 Settings:** Alert Level (1 g, pk), Alert Delay (3 sec), Alert Latching Mode (Latching Mode), Danger Level (1.5 g, pk), Danger Delay (3 sec), Danger Latching Mode (Latching Mode), Active/Passive (Active (Fail-Safe)), Input Signal Type (Accelerometer), Full Scale Range (0 - 10 g, pk).
- Relay Settings Table:**

	Alert Level	Danger Level	Time Delay	Latch Mode	Sensor	Not OK
CH 1 - Alert Level:	2.5 g, pk		3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CH 1 - Danger Level:		5 g, pk	3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CH 2 - Alert Level:	2.5 g, pk		3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CH 2 - Danger Level:		5 g, pk	3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Additional controls include a 'Startup Delay' button, radio buttons for 'Active (Fail-Safe)' and 'Passive (Not Fail-Safe)', and a 'Send' button. A note at the bottom states: '*Fail-Safe modes are required for SIL ratings.'

Figure 11: Relay Screen (SW5580 Only)

Changes can be made to:

1. **Alert Level:** Level for alert alarm. Input value must be within full scale range.
2. **Danger Level:** Level for danger alarm. Input value must be within full scale range.
3. **Time Delay:** Time that alarm is bypassed when threshold level is reached.
4. **Latch Mode:** Alarm will stay engaged until reset (SIL requirement).
5. **Sensor Not Okay:** Alarm will trigger on sensor disconnect (SIL requirement).
6. **FSR Not Okay:** Enables relays to operate beyond the full scale range (SIL requirement).
7. **Active/Passive:** Active (Fail-Safe) or Passive (Not Fail-Safe).
8. **Startup Delay:** Delay value must be between 0 to 600 seconds. *(Requires firmware version 2.6.68 or greater and software version 2.07.12 or greater)*

Note: The two relay levels at factory are set at one quarter (1/4) and one half (1/2) of the full-scale range.

NOTES:

1. Engineering units are the same as selected for the full-scale range.
2. Regarding Relays, “Fail Safe*” means the Relay’s state is the same as in the Alarm Condition, Open or Shut, when the Relay is not powered.
3. Normal State, Normally Open or Normally Shut, refers to a Relay’s not powered, de-energized, or Shelf State.
4. Normally Open Relay will present an open circuit at the terminals of the Relay when not powered (de-energized).
5. Normally Closed Relay will present a short circuit at the terminals of the Relay when not powered (de-energized).
6. Please refer to the User Manual for more specific information on relay operation.

*Fail-Safe modes are required for SIL ratings.

Select the intended configuration for the relays, then click “Send.”

If applicable enter password, otherwise, Figure 12 will be displayed after the values are stored in the unit.

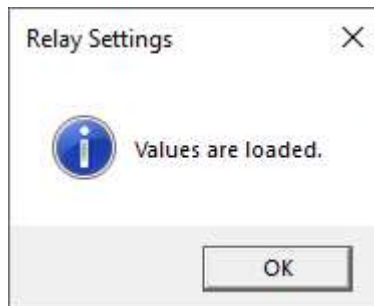


Figure 12: Relay screen after values are loaded.

Click “OK” to close the message window.

Startup Delay

1. To configure startup delay, click the Startup Delay button found on the Relays tab.



Figure 13: Startup Delay button

2. Startup delay disables alert and danger relays from triggering for the desired time duration. This applies when the SW5580 is powered on and on a Reset event (shorting pins 8 & 9).
3. Clicking the Startup Delay button will bring up a window where a value can be entered. After clicking Send, a confirmation will indicate that startup delay has been set:

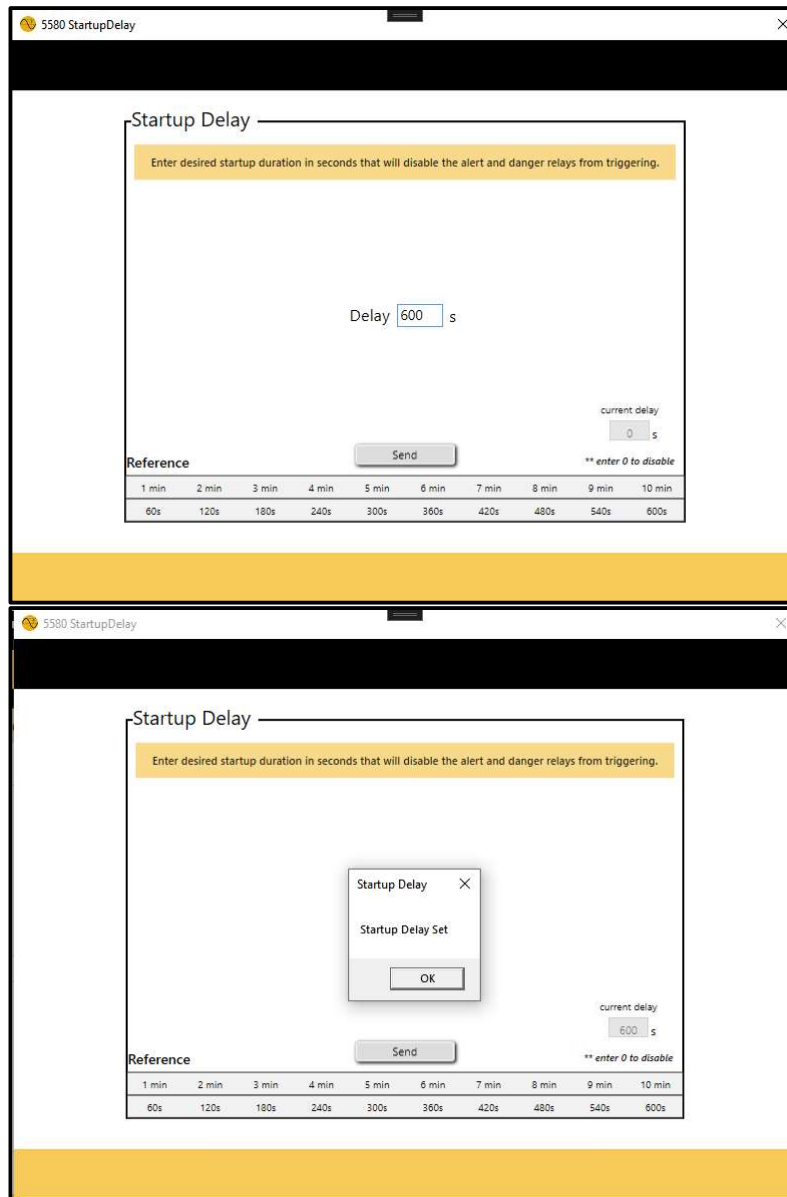


Figure 14: Configuring startup delay

IMPACT

This tab allows user to configure the unit to Impact Measurement.

The screenshot displays the 'IMPACT' configuration screen within the 'METRIX Dual Channel Smart Signal Conditioner' software. The interface is divided into two main sections for Channel 1 and Channel 2. Each channel section includes input fields for 'Actual' (mV (pk)), 'Threshold' (mV (pk)), and 'Machine RPM' (RPM), along with a 'Get Peak' button. A 'Current Values' box on the right of each section displays 'Threshold', 'Cycle Time', and 'Reset Time' in mV (pk) and ms. Below these fields are radio buttons for 'Channel 1 - Impact Enabled' and 'Channel 2 - Impact Enabled'. At the bottom of the screen, there is a yellow bar with 'SIL Approved' on the left and 'Version: 2.07.12' on the right. A small note on the right side of the screen reads: '*use refresh button on Home tab if values don't populate after enabling impact'.

Figure 15: Impact Screen

Impact is available with firmware versions greater than or equal to 2.6.66 and software versions greater than or equal to 2.07.11.

Note:

1. The Impact Measurement must have an Accelerometer input.
2. If signal conditioner was ordered as Impact Measurement, the Impact tab is enabled and populated with the configuration ordered.
3. For Two Channel Mode, sensor input is configured from the Change Configuration window.
 - ***Single sensor input** - For Dual Path measurements only Channel 1 can be the input channel. One accelerometer input may generate an accelerometer output and an impact output.
 - ***Dual sensor input** - For Dual Channel measurements, there are two Acceleration inputs to Channels 1 and 2. Two acceleration inputs generate two impact outputs.

Selecting the channel Impact Enabled option will prompt the following message:

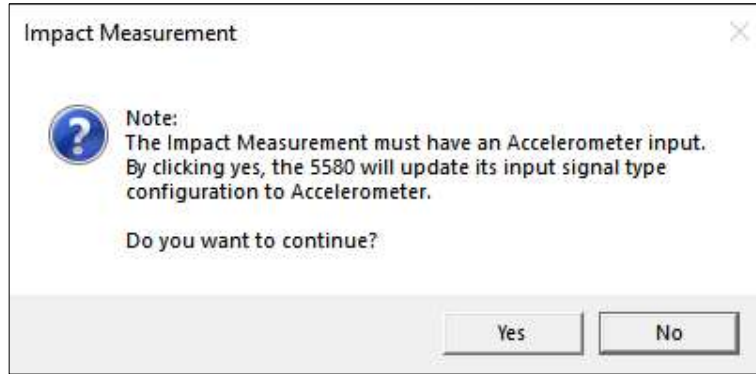


Figure 16: Impact Measurement sensor input requirement.

Click “YES” and enter password if applicable.

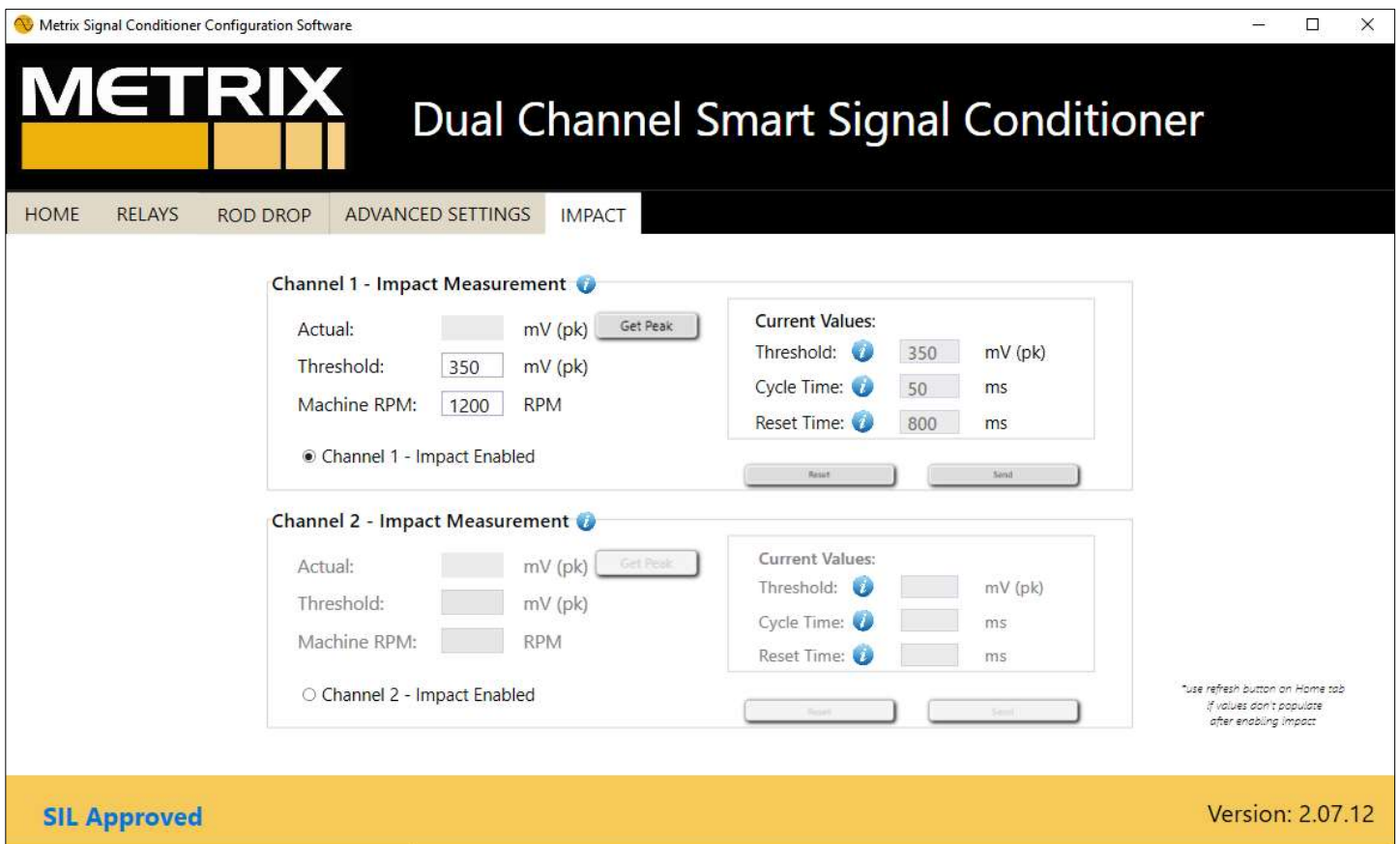


Figure 17: Unit configured for Impact Measurement.

Get Peak

Get Peak button obtains the actual mV value from the Impact Measurement.

For Impact Measurement, changes can be made to:

1. **Threshold:** Level must be between 1 and 4095 mV.
2. **Machine RPM:** Value must be between 120 and 6000 RPM.

Enter the intended values for Impact Measurement, then click "Send." If applicable enter password.

Current Values will update:

1. **Threshold:** Threshold level in mV.
2. **Cycle Time:** Time for one revolution of the crankshaft in milliseconds.
3. **Reset Time:** In milliseconds. Calculation Example (assume 300 RPM):

$$\left(300 \text{ RPM} = \frac{300 \text{ revolutions}}{1 \text{ minute}} = \frac{300 \text{ revolutions}}{60 \text{ seconds}} = 5 \frac{\text{revolutions}}{\text{second}} \right)$$
$$\text{Reset Time} = \left(\frac{16 \text{ revolutions}}{5 \frac{\text{revolutions}}{\text{second}}} = 3.2 \text{ s} = 3200 \text{ ms} \right)$$

RELAYS TAB (SW5580 ONLY)

Relay settings for Impact Measurement can be configured from the Relays tab. Alert and Danger levels are number of impacts.

Channel 1

Alert Level: 4 impacts
Alert Delay: 3 sec
Alert Latching Mode: Latching Mode
Danger Level: 8 impacts
Danger Delay: 3 sec
Danger Latching Mode: Latching Mode
Active/Passive: Active (Fail-Safe)
Input Signal Type: Accelerometer
Full Scale Range: 0 to 16 Impacts, Sensor Range < 1500 mV, pk-pk

Channel 2

Alert Level: 4 impacts
Alert Delay: 3 sec
Alert Latching Mode: Latching Mode
Danger Level: 8 impacts
Danger Delay: 3 sec
Danger Latching Mode: Latching Mode
Active/Passive: Active (Fail-Safe)
Input Signal Type: Accelerometer
Full Scale Range: 0 to 16 Impacts, Sensor Range < 1500 mV, pk-pk

	Alert Level	Danger Level	Time Delay	Latch Mode	Sensor	>FSR
CH 1 - Alert Level:	4 impacts		3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CH 1 - Danger Level:		8 impacts	3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CH 2 - Alert Level:	4 impacts		3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CH 2 - Danger Level:		8 impacts	3 s	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

SIL devices are latching and have non-toggable not ok sensors

Startup Delay Active (Fail-Safe) Passive (Not Fail-Safe) Send

NOTES:

1. Engineering units are the same as selected for the full-scale range.
2. With regard to Relays, "Fail Safe" means the Relay's state is the same as in the Alarm Condition, Open or Shut, when the Relay is not powered.
3. Normal State, Normally Open or Normally Shut, refers to a Relay's not powered, de-energized, or Shelf State.
4. Normally Open Relay will present an open circuit at the terminals of the Relay when not powered (de-energized).
5. Normally Closed Relay will present a short circuit at the terminals of the Relay when not powered (de-energized).
6. Please refer to the User Manual for more specific information on relay operation.
7. Not OK can provide an alarm if the boxes are checked.

*Fail-Safe modes are required for SIL ratings.

SIL Approved Version: 2.07.12

Figure 18: Relays tab for Impact Measurement.

Change Configuration – Impact Enabled

Change Configuration window will show channel(s) where is impact enabled.

Signal type and filters cannot be selected when impact is enabled.

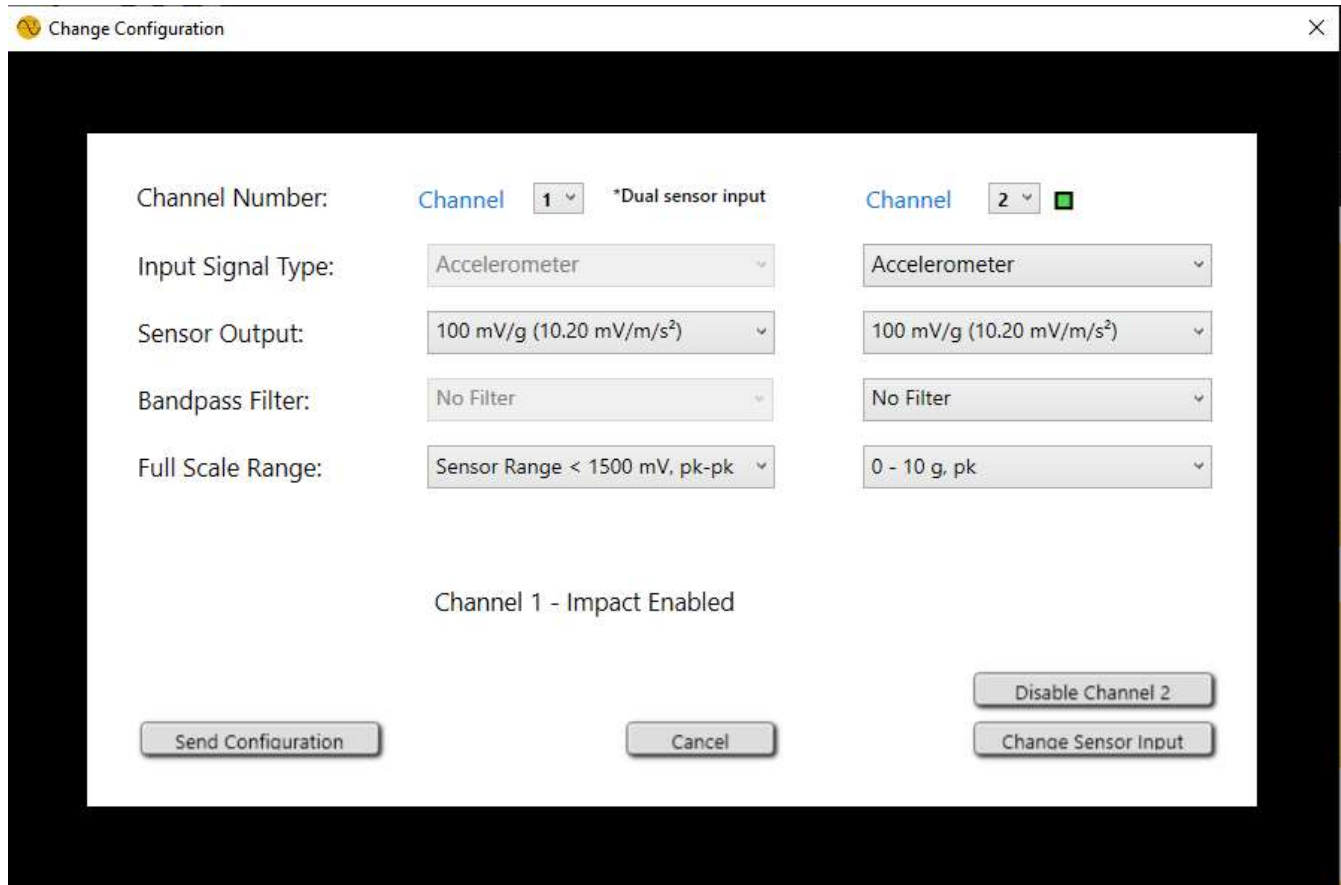


Figure 19: Change Configuration screen, Channel 1 is impact enabled.

To disable Impact Measurement from the Impact tab, de-select the “Impact Enabled” option for the channel.

Note: Disabling impact will restore the channel to the following Accelerometer configuration:

- Input Signal Type: Accelerometer
- Sensor Output: 100 mV/g (10.20 mV/m/s²)
- Bandpass Filter: No Change
- Full Scale Range: 0 – 10 g, pk
- Events/Rev: 0: Not Programmed (Speed Only)

ROD DROP

This rod drop tab allows configuration of the unit for Rod-Drop measurement.

Note:

Rod-Drop is only available for **Proximity Probe Systems** configured for **Position**.

Metrix Signal Conditioner Configuration Software

METRIX

Dual Channel Smart Signal Conditioner

HOME RELAYS ROD DROP ADVANCED SETTINGS IMPACT

Channel 1
L1 = inches Enabled
L2 = inches
RP = Vdc at zero wear (Drives 12 mA Output) RD = mils

Channel 2
L1 = inches Enabled
L2 = inches
RP = Vdc at zero wear (Drives 12 mA Output) RD = mils

RP = Rod Position
RD = Rod Drop

By Similar Triangles

$$\frac{RP}{L1} = \frac{RD}{L2}$$
$$(RP) \frac{L2}{L1} = RD$$

Wrist Pin

L1 = Probe Position (Piston at Top Dead Center)

L2 = Piston Rod Length

SIL Approved

Version: 2.07.12

Figure 20: Rod-Drop Screen.

Rod-Drop User Inputs:

1. **L1 = Probe Position:** Value for L1 cannot be greater than value for L2.
2. **L2 = Piston Rod Length**
3. **RP = Rod Position:** Value must be between within +/- 3V DC of the mid-range of the probe.
Example: 10-90 mil Scale Factor Range, mid-range is 50 mils or -9V DC (-6V DC and -12V DC).

Rod Drop Displayed Value:

RD = Rod Drop: Value in will be displayed after "Enabled" option has been selected.

Enter values for L1, L2 and RP, then click "Enabled."

The Rod-Drop message appears before Rod Drop is enabled.

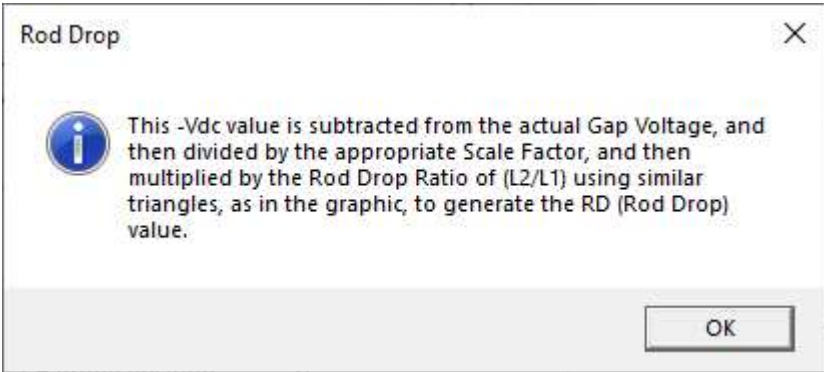


Figure 21: Rod Drop Message

Click "OK" to exit the message window.

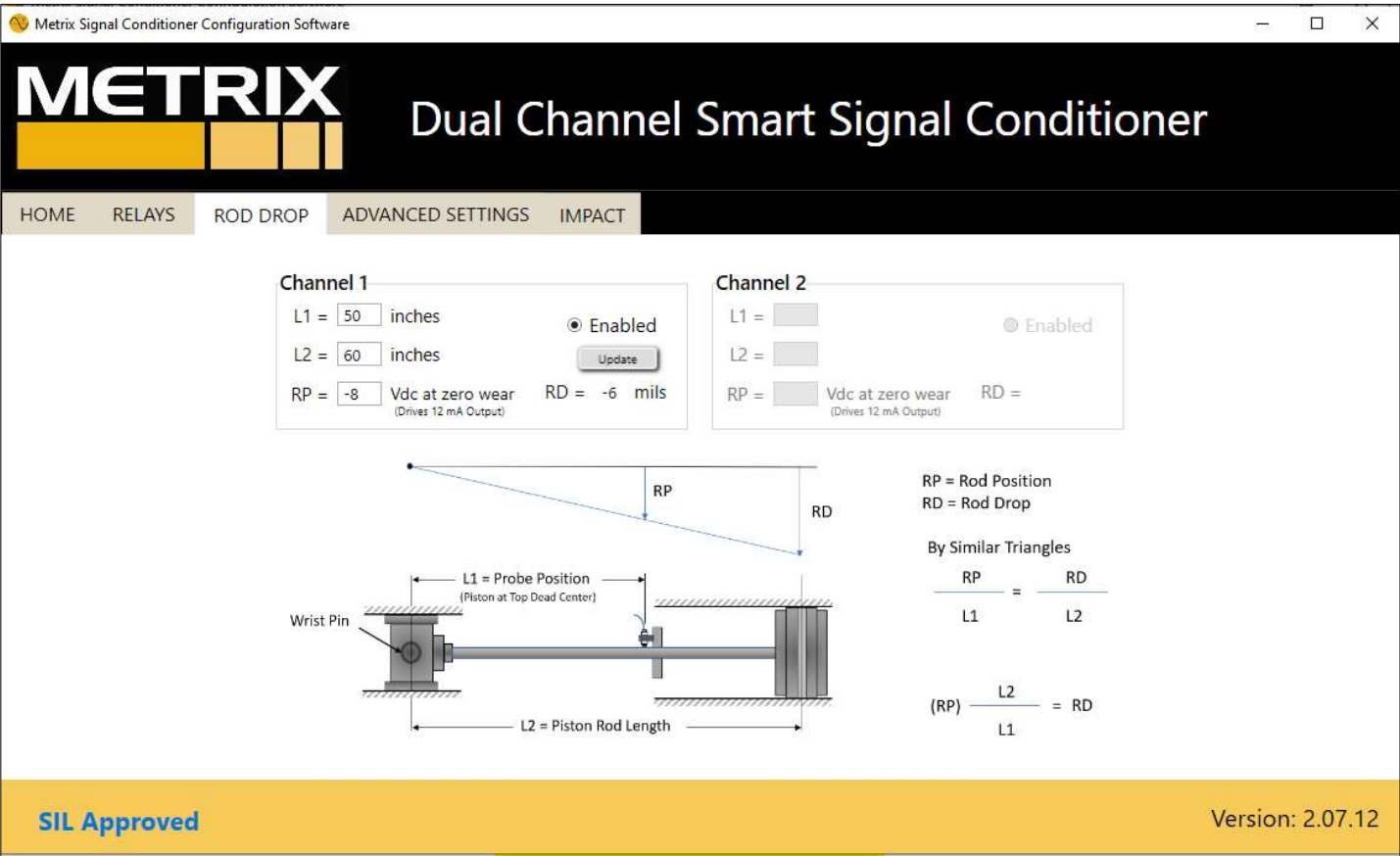


Figure 22: Channel 1 – Rod Drop Enabled.

Update



To update the RD (Rod Drop) value, re-enter values and click “Update.”

Note: RELAYS TAB (SW5580 ONLY)

Relay levels have the Rod Drop multiplier applied.

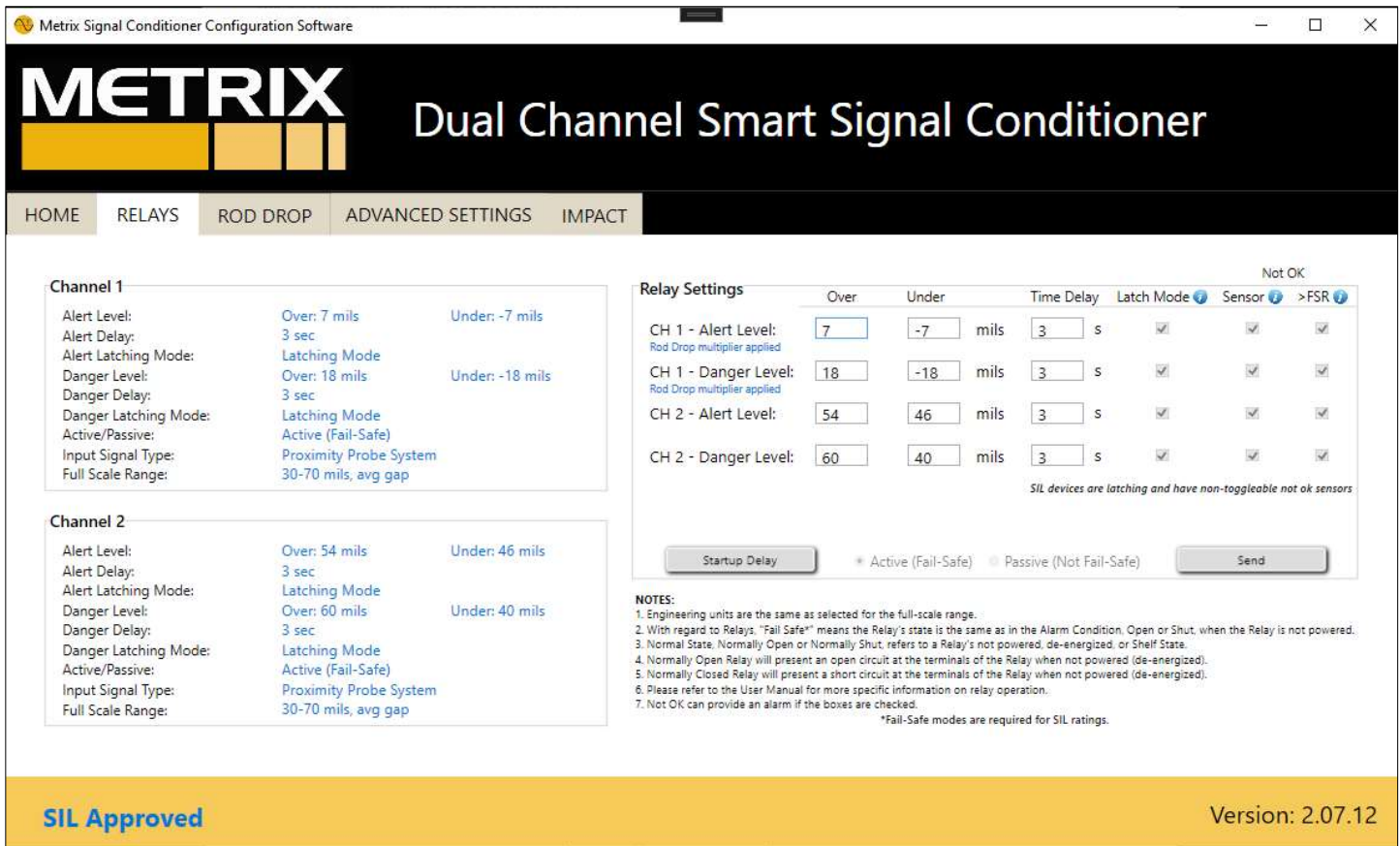


Figure 23: Relays Screen with Rod Drop enabled.

To disable Rod Drop, de-select the “Enabled” option from the Rod Drop tab.

ADVANCED SETTINGS

This tab allows user to change the 4-20mA Direction for **Proximity Probe Systems** configured for **Position** only.

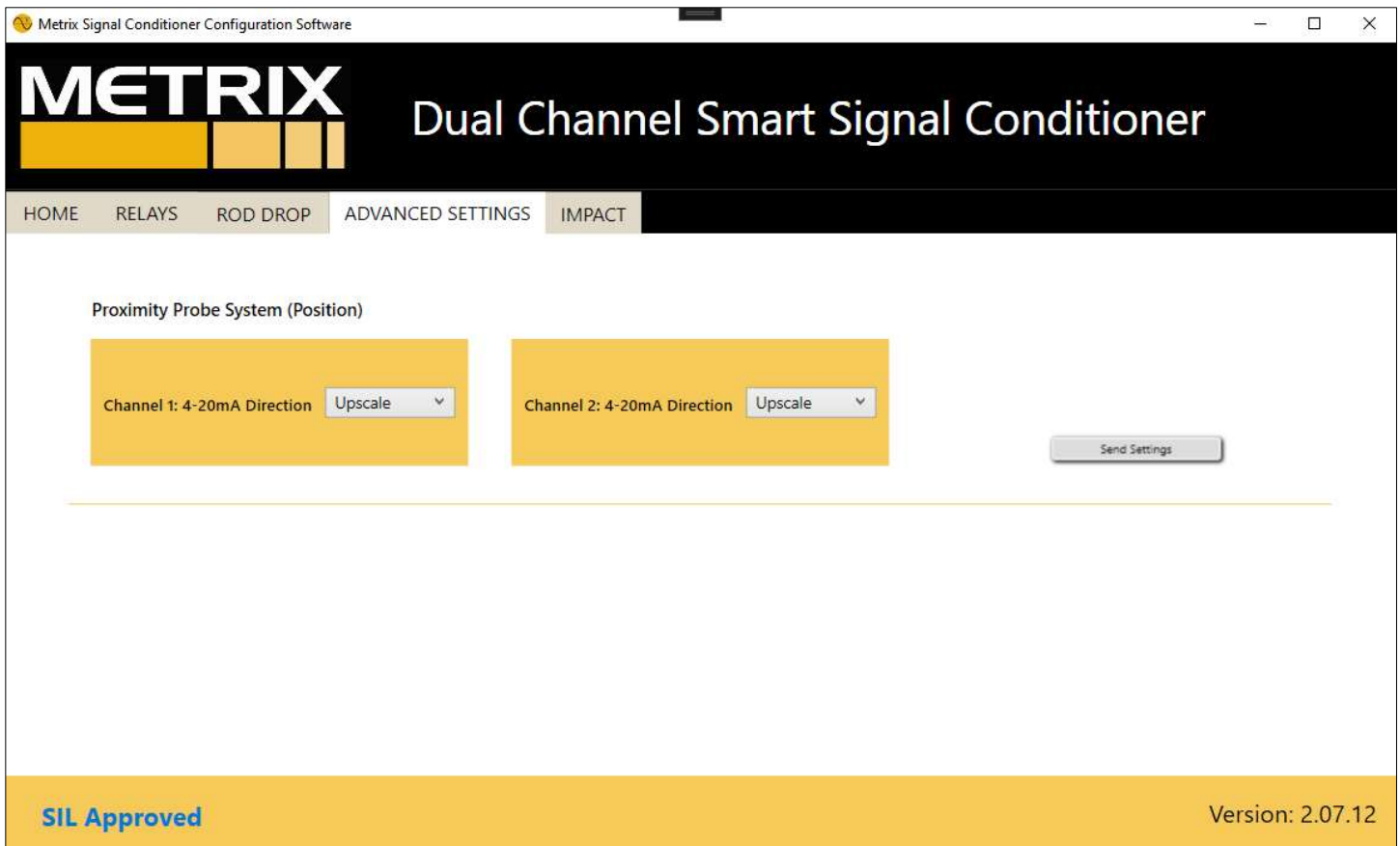


Figure 24: Advance Settings Screen. Channel 1 configured for Position.

From the drop-down, user can change the Upscale or Downscale direction for the 4-20mA. When a selection is made, the following message appears:

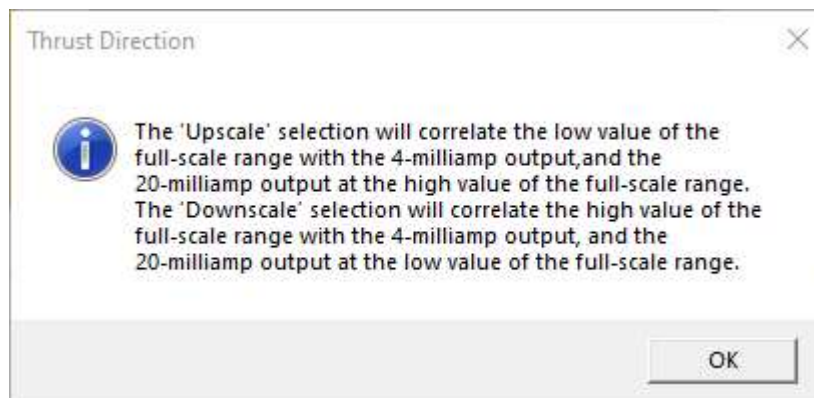


Figure 25: Thrust Direction Message.

Note: Thrust Direction: The “Upscale” selection will correlate the low value of the full-scale range with the 4-milliamp output, and the 20-milliamp output at the high value of the full-scale range. The “Downscale” selection will correlate the high value of the full-scale range with the 4-milliamp output, and the 20-milliamp output at the low value of the full-scale range.

Click “OK” to exit the message window and click “Send Settings” to apply the change.

Once the settings have successfully changed, the window in Figure 24 appears.

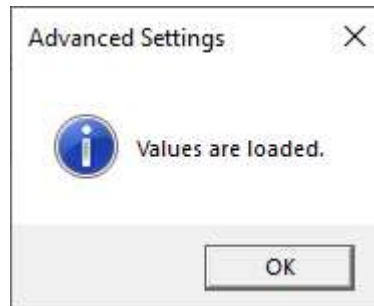


Figure 26: Advanced Settings screen after the change is applied.

Click “OK” to exit the message window.

PASSWORD

Password is required to change or restore a configuration in the unit. The following window appears to enter the password.

Note: Default password: mtrx

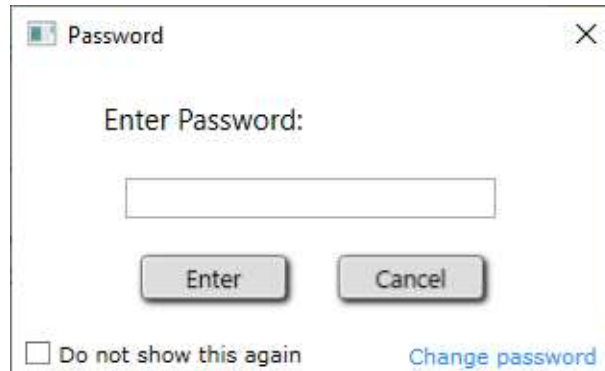


Figure 27: Password Window

- Entering the correct password will change or restore the configuration in the unit.
- Entering an incorrect password will prompt the following message to appear:

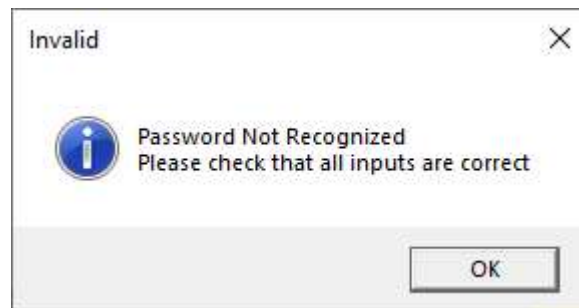


Figure 28: Message for an incorrectly entered password.

Password Options:

1. Do not show this again

This selection will not require the password to be entered again while the unit is connected.

Note: Each time the unit is connected, password is required to change the configuration of the unit.

2. Change password

Changing existing password can be done by clicking the “[Change password](#)” label on the bottom right corner of the Password window.

A dialog box titled "Change Password" with a close button (X) in the top right corner. The text inside reads: "*New password must be 4 characters long." Below this, it says "Please Enter:". There are two input fields: "Existing password:" and "New password:". At the bottom, there are two buttons: "Enter" and "Cancel". In the bottom right corner, there is a blue link that says "Forgot password".

Figure 29: Change Password window.

Enter existing password and new password, then click “Enter.” Once the new password has changed, the following message appears:



Figure 30: Success screen appears after new password is saved.

Click “OK” to return to the Password window.

3. Forgot Password

This option applies only if the [default password](#) changed.

To reset the password please contact Metrix for assistance.

To enter the code provided by Metrix, open the Password window, select **Restore Factory Configuration** > [Change Password](#) > [Forgot Password](#).

ACCESS KEY

If only channel configuration “1” is entered in the order, channel 2 will be disabled by manufacturer. With an additional fee, Metrix will ship a passcode for user to enable channel 2 from the configuration software.

To open Access Key window, in the **HOME** tab select **Change Configuration > Access Channel 2**.



Figure 31: Access Key Required Message.

Select “Yes” to open Access Key window.

Note: Password is required to change the settings in the unit.

This does not apply if the password was entered and “Do not show this again” was checked.

If applicable, enter the password and click and “Enter”.

Note: Default password: mtrx

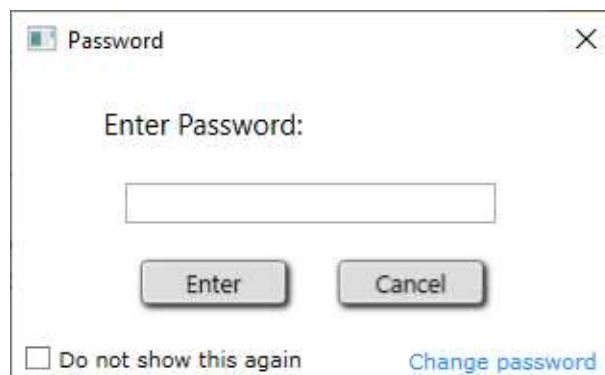


Figure 32: Password Window.

Otherwise, Access Key window opens. Enter Access Key and click “Enter.”



Figure 33: Access Key Screen.

Note:

- Channel 2 is configured with the same configuration as channel 1.
- Unit is set up as *Dual sensor input - For Dual Channel measurements, inputs to both Channels 1 and 2

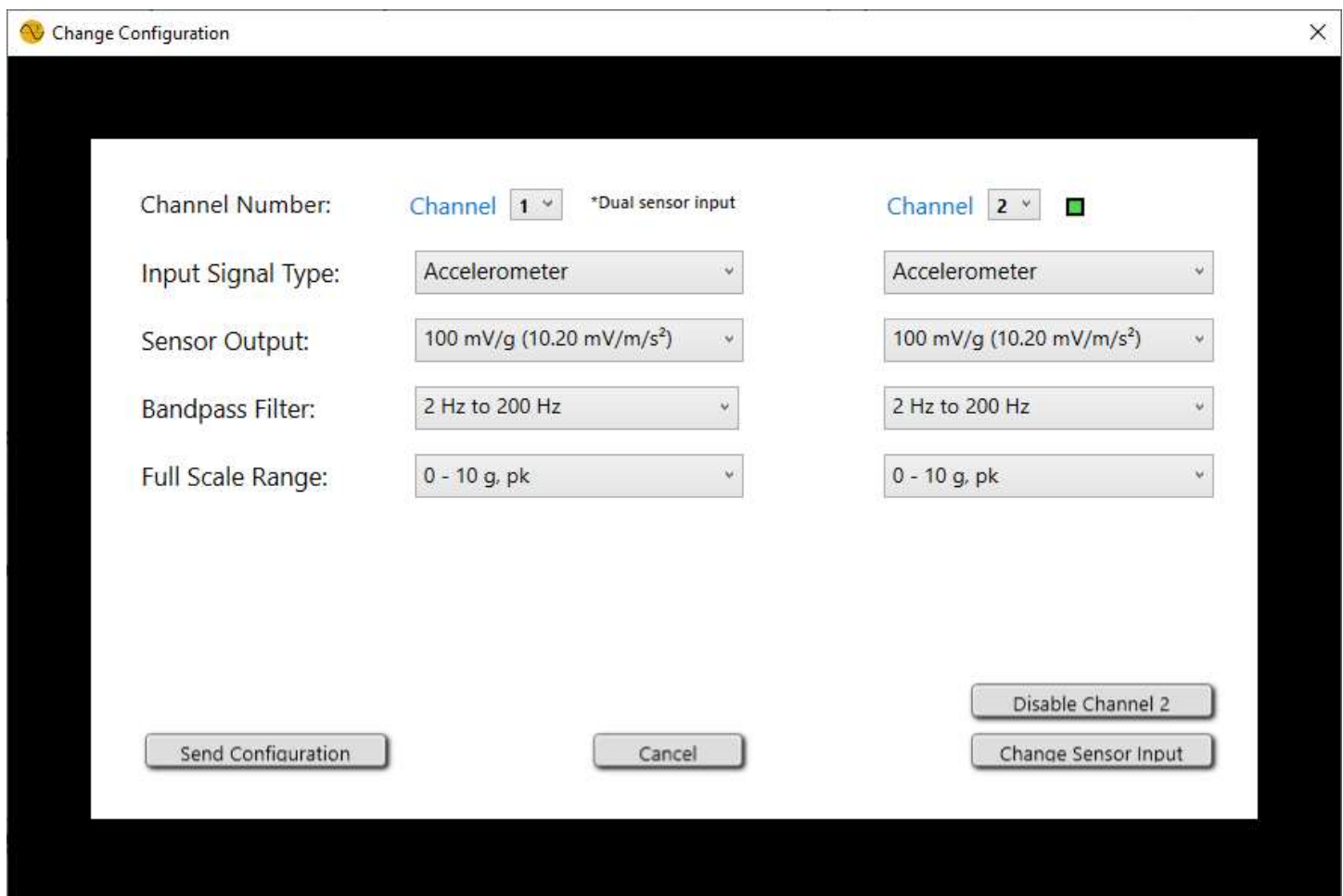


Figure 34: Change Configuration Window. Channel 2 is active after Access Key is entered.