WAVETRONIX WX-500-0053 Smart Sensor Matrix User Guide

WAVETRONIX

SmartSensor Matrix
USER GUIDE

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Contents

WX-500-0053 Smart Sensor Matrix

FCC Part 15 Compliance: The Wavetronix SmartSensor sensors comply with Part 15 of the Federal Communications Commission (FCC) rules which state that operation is subject to the following two conditions:

1. this device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesirable operation.

FCC compliance statements for applicable optional modules are to be found in the module specifications. Unauthorized changes or modifications not
expressly approved by the party responsible for compliance with the FCC rules could void the user's authority to operate this equipment.
Disclaimer: The advertised detection accuracy of the Wavetronix Smart Sensor sensors is based on both external and internal testing, as outlined in each product's specification document. Although our sensors are very accurate by industry standards, like all other sensor manufacturers we cannot guarantee perfection or assure that no errors will ever occur in any particular applications of our technology. Therefore, beyond the express Limited Warranty that accompanies each sensor sold by the company, we offer no additional representations, warranties, guarantees or remedies to our customers.
It is recommended that purchasers and integrators evaluate the accuracy of each sensor to determine the acceptable margin of error for each application within their particular system(s).

Introduction

Welcome to the Wavetronix SmartSensor Matrix user guide.

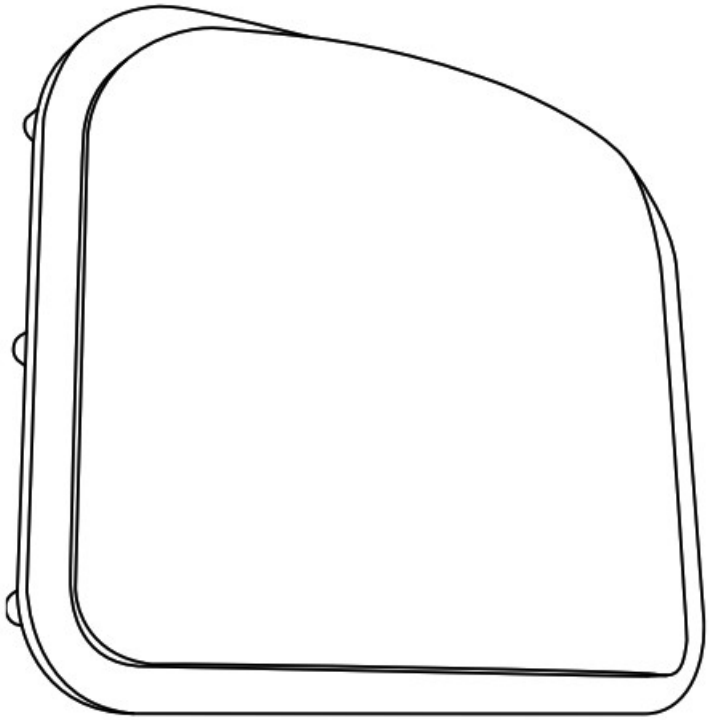

Figure 1. SmartSensor Matrix

This guide will cover selecting a mounting location, installing, and configuring a Smart Sensor Matrix. To find the instructions for specific tasks, see the table of contents or index. If your questions aren't answered in this guide, visit **www.wavetronix.com/support** for access to supplemental materials, like technical documents, knowledge base articles, and troubleshooting information.

What you'll need

The sensor package includes the following:

- A Smart Sensor Matrix
- A tube of silicon dielectric compound
- A Smart Sensor Matrix quick start guide

The following can be ordered separately and are necessary for installation:

- Sensor mount
- Smart Sensor 6-conductor cable

To support the sensor installation, you may need to order devices for power conversion, surge protection, and communication. The Click 650 or Click 656 provide this functionality in a single module.

Service information

Don't try to service or repair this unit; none of its components or parts are serviceable in the field. Attempting to

open this unit, unless expressly directed by Wavetronix, will void the customer warranty. Wavetronix is not liable for any bodily harm or damage caused if unqualified persons attempt to service or open the back cover of this unit. Refer all service questions to Wavetronix or an authorized distributor.

Support
Knowledge Base articles referred to in this guide can be found at **www.wavetronix.com**.

Important note
Failure to follow the installation guidelines laid out in this guide could result in decreased performance. If you believe it is necessary to deviate from these guidelines, contact a Wavetronix application engineer or technical support for assistance and recommendations.

Choosing a Mounting Location

Mounting location, height, and offset

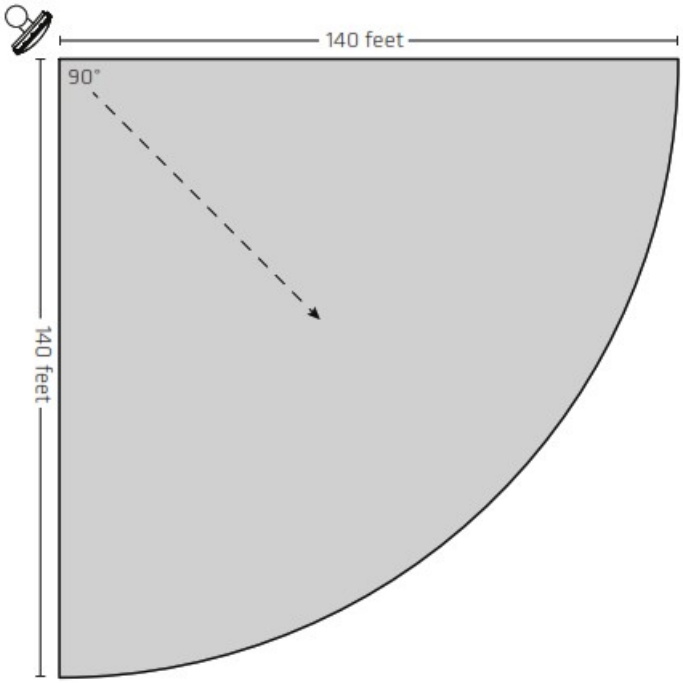

Figure 2. SmartSensor Matrix footprint's 140-ft. (42.6-m) range

Note. For more on cable lengths, see Smart Sensor Matrix Cable Length Recommendations, available in the online knowledge base.

Keep these general guidelines in mind as you choose your sensor mounting location:

- Make sure the sensor has a clear view of the area you want to detect. Pay particular attention to signs, poles, signal heads, and mast arms.
- The sensor needs to see at least 15–20 ft. (4.6–6.1 m) of a lane in order to detect it properly.
- Vehicles should typically enter the sensor's footprint on the rounded edge.
- Make sure the footprint extends several feet beyond the stop bar.
- The front of the sensor should be at least 10 ft. (3 m) away from suspended power lines and other electrical cables.
- Keep cable lengths in mind when you pick mounting locations; when you use the Wavetronix 6-conductor cable, runs can be as long as 1000 ft. (304.8 m) if you're using 24 VDC and RS-485 communications; for

longer connections, consider alternate wired and wireless options.

The mounting location will vary based on your intersection and your needs. The locations in the image below are recommended because of their clear view of the detection area.

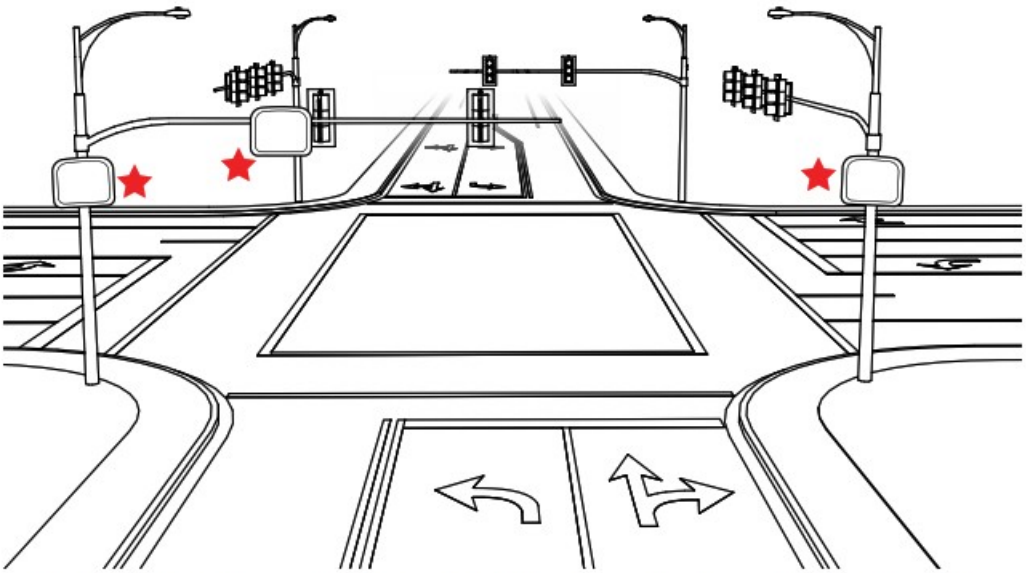

Figure 3. Recommended mounting locations in a mast arm intersection

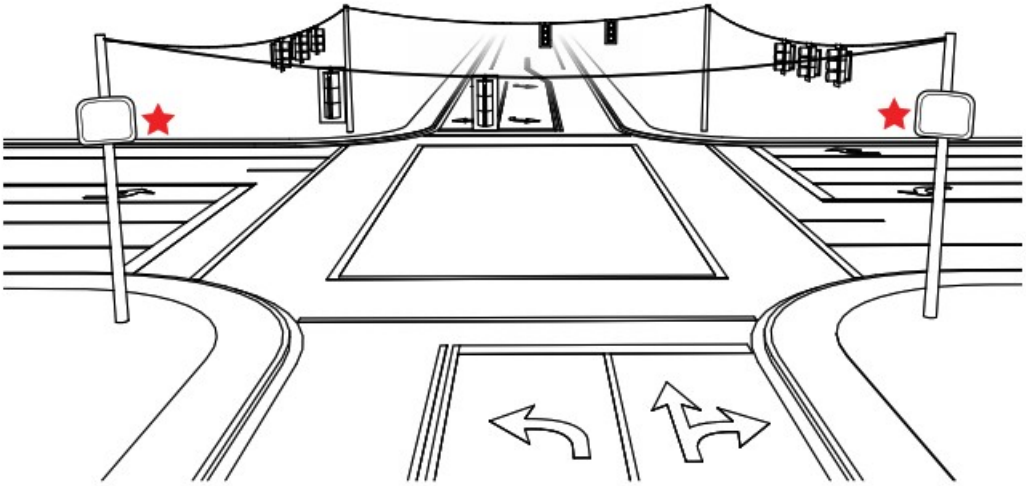

Figure 4. Recommended mounting locations in a span wire intersection

In an intersection with tethered span wire, you can mount the sensor using the Wavetronix span wire mount and other equipment.

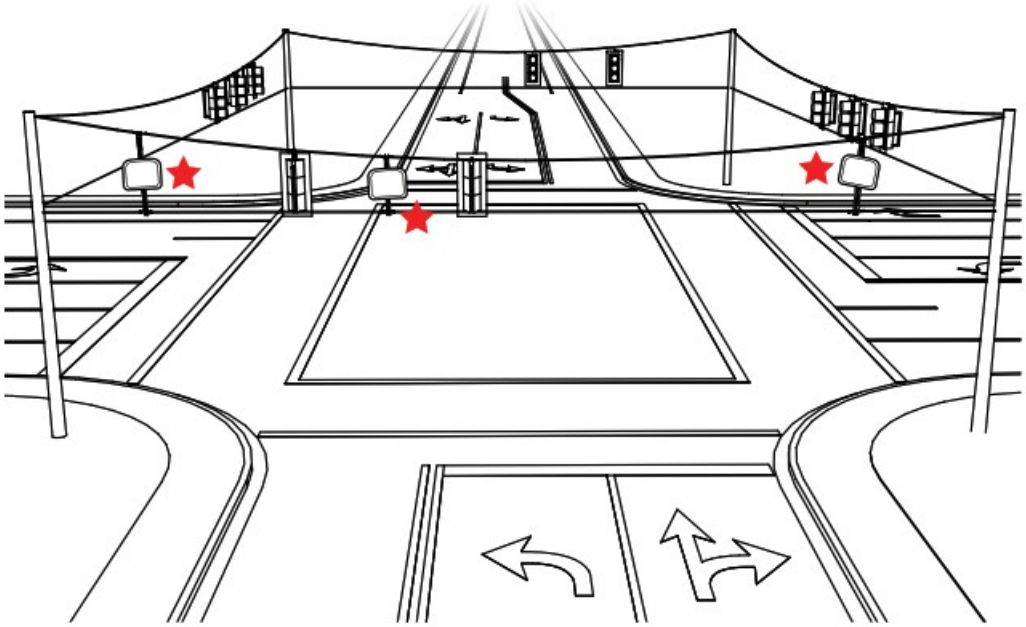

Figure 5. Recommended mounting locations in dual span wire intersection

Note. See Using the Span Wire Mount with the Smart Sensor Matrix, available in the online knowledge base.

Mounting on the back side of the mast arm

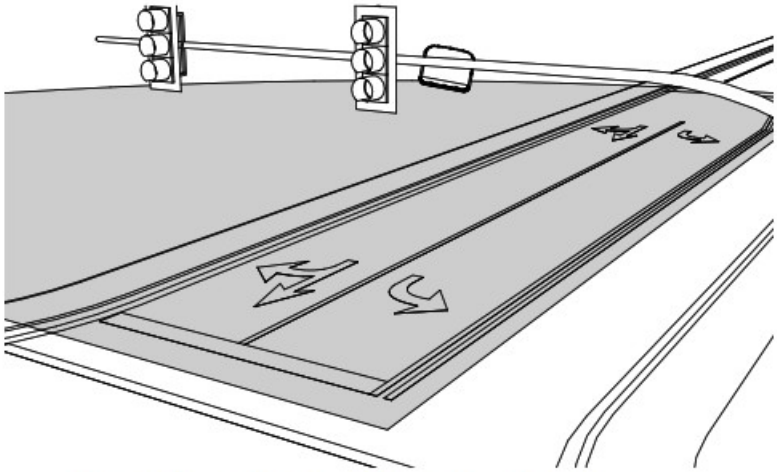

Figure 6. Back side of the opposing mast arm

Note. Make sure the sensor has at least a six-foot offset to the nearest lane of interest.

- Allows you to place the sensor near the lanes of interest.
- May be the best location for wide approaches.

Mounting on the far side of the approach

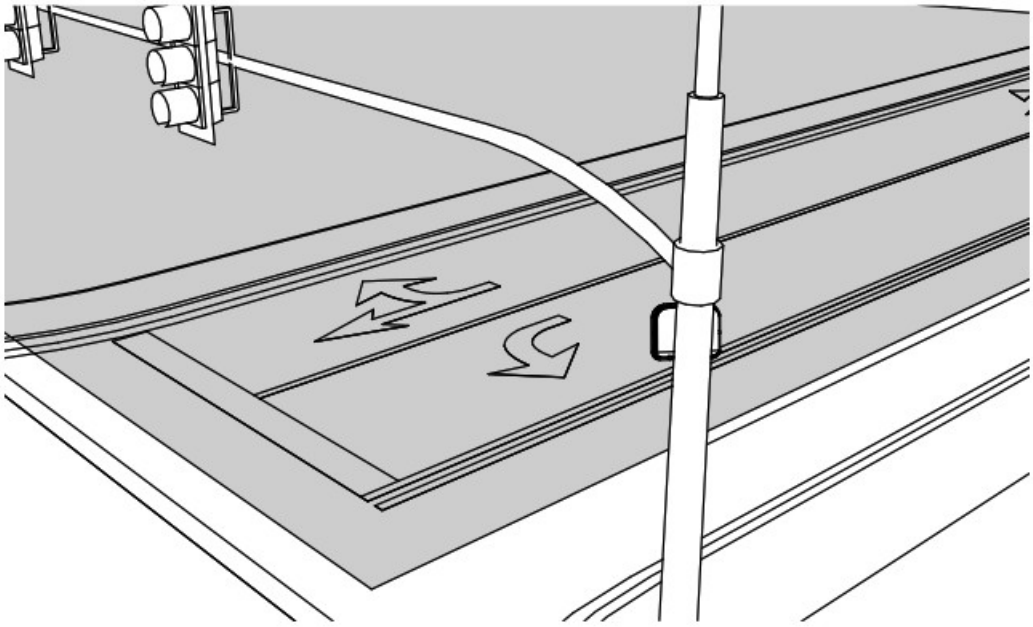

Figure 7. Far side of the approach

- Gives you more flexibility with mounting height than mounting on the mast arm.
- May be the best location if detecting the left-turn lane is a high priority.

Mounting on the near side of the approach

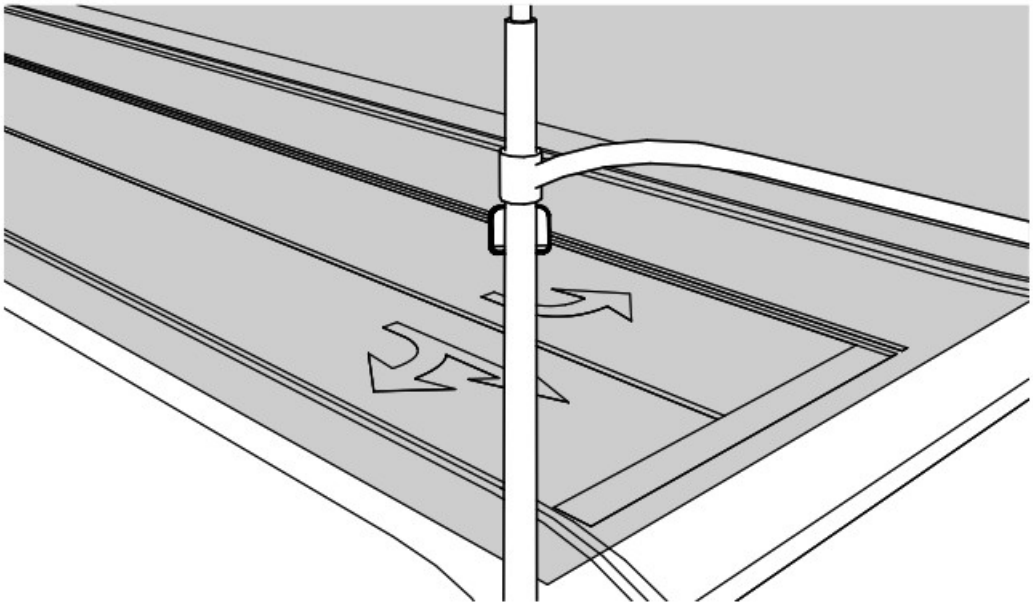

Figure 8. Near side of the approach

- Gives you more flexibility with mounting height than mounting on the mast arm.
- If the mast arm or signal head is occluding the sensor's view, this may be the best location.

Choosing a mounting height and offset

In general, the sensor should be mounted 20 ft. ± 5 ft.
(6.1 m ± 1.5 m) above the surface of the road. If mounting on a mast arm or other location where the height cannot be changed significantly, use the table below to choose an offset. If mounting on a vertical pole, where the offset cannot be changed significantly, use the table to choose a mounting height.

Offset	Height
6–15 ft	12–25 ft
15–50 ft	15–25 ft
> 50 ft	25–60 ft

Definition. Mounting height is the distance between the sensor and the road's height, not the bottom of the pole. If installing a new pole, remember that part of the pole will likely
be below ground.
Definition. Offset is the distance between the sensor and the edge of the first lane to be detected.

Occlusion

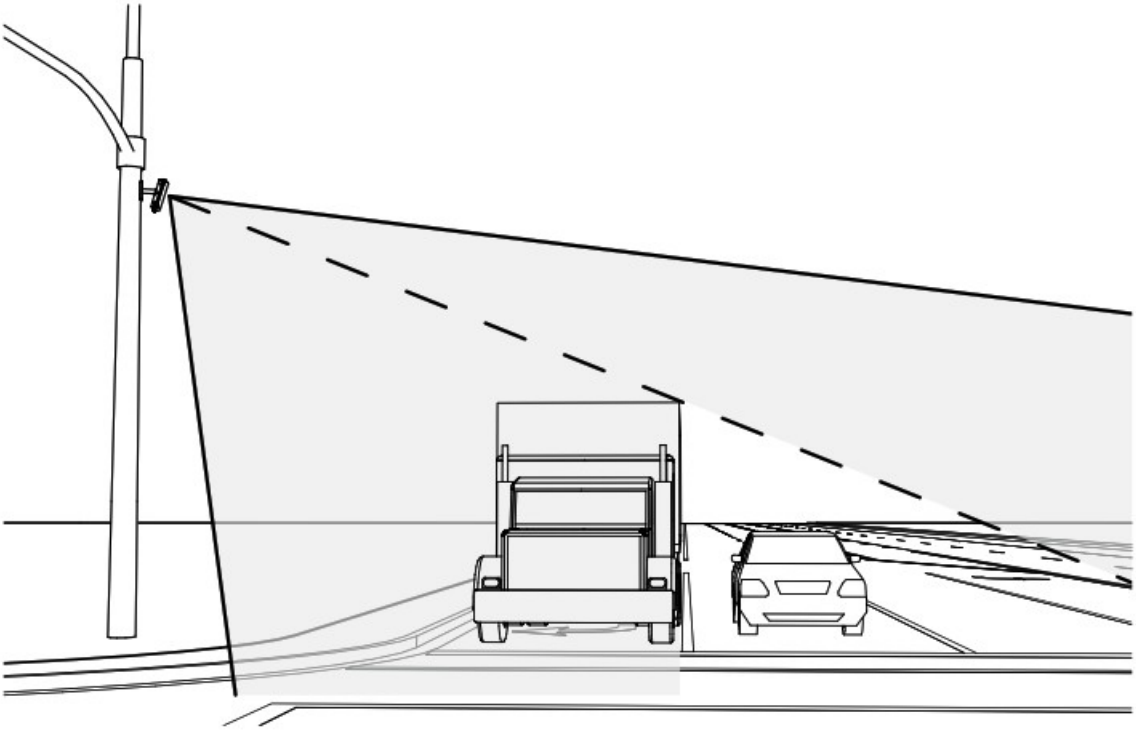

Figure 9. Occlusion

Note. The sensor does compensate for occlusion; if it sees a vehicle that then becomes occluded, it will extend the call until it sees the vehicle again.
Note. A good rule of thumb is that 50% of a vehicle must be visible above any barrier in order to be detected.

Occlusion occurs when one object blocks another object from the sensor's view, as shown above. This can happen with:

- Tall vehicles like semitrucks
- Signs
- Barriers and sounding walls
- Trees and more

Fixing occlusion problems

- Move the sensor higher on the pole (keeping it within the guidelines in the mounting height and offset table).

- Move the sensor to another spot if possible, away from obstructions.

Multipathing

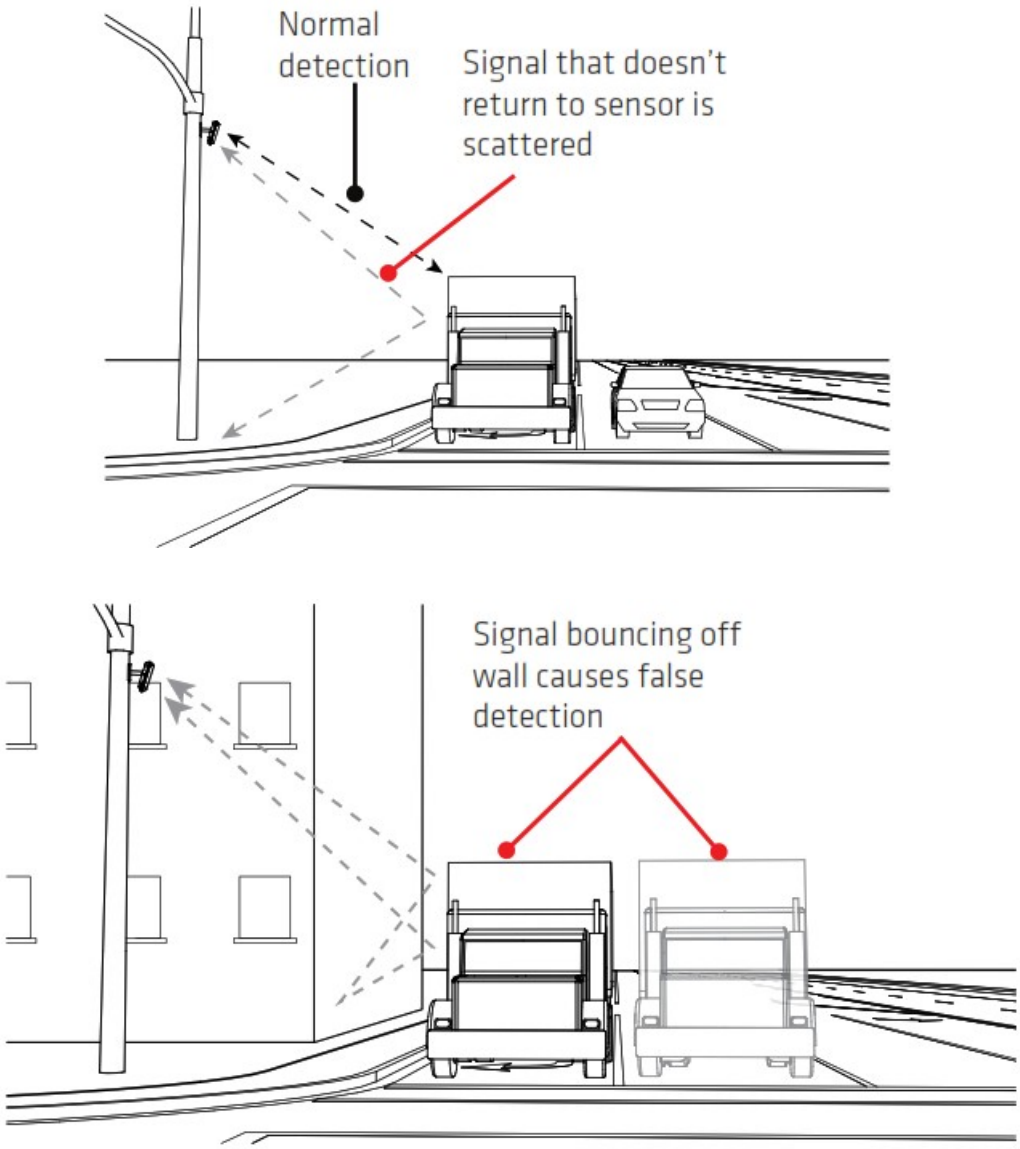

Figure 10. Top: direct path return; bottom: multipath return

Multipathing occurs when a large flat surface near the sensor interferes with detection. A radar signal can bounce around several times between the surface and any vehicles before returning to the sensor. This can make the sensor detect a vehicle where there is none. This can happen with:

- Buildings
- Signs
- Guard rails
- Sounding walls and more

Fixing multipath problems

- Move the sensor if possible; make sure it is separated from overhead signs, overpasses, parallel walls, etc. A 30-ft. (9.1-m) lateral separation is ideal, but even just a few feet can make a difference.
- Adjust the sensor's sensitivity thresholds in Smart Sensor Manager Matrix, as covered in chapter 6.

Installing the Smart Sensor Matrix

Note. Before attaching the mount to the pole, make sure your cables are long enough to reach the sensor height and to run from the sensor to the cabinet; see Smart Sensor Matrix Cable Length Recommendations, available in the online knowledge base.
Note. The mounting process will be different for a span wire mount; see Using the Span Wire Mount with the Smart Sensor Matrix, available in the online knowledge base.

Mounting the sensor

1. While still on the ground: remove the large bolts holding the end knuckle to the mount, then use the four small bolts and lock washers to attach the knuckle to the sensor backplate.

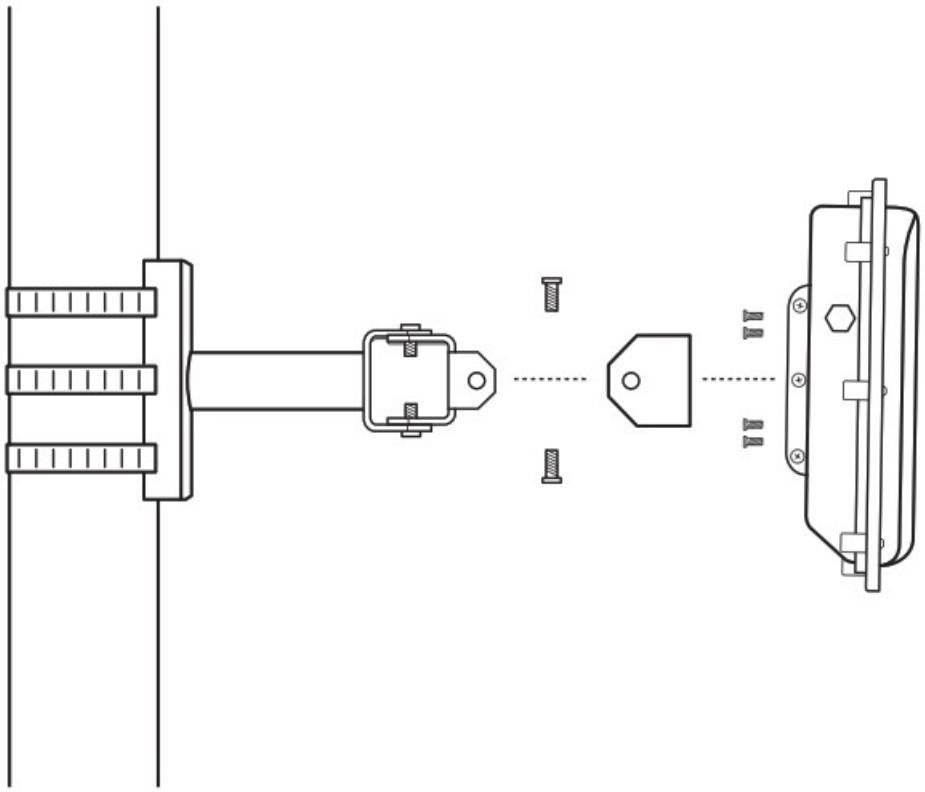

Figure 12. Mounting the sensor

2. Once you're ready to mount the sensor on the pole, insert the mounting straps through the slots on the mount.
3. Position the mount on the pole in your chosen mounting location.
4. Secure the straps.
5. Replace the large bolts from step 1 and attach the sensor to the mount (the cable connector should be pointed down). Don't tighten the bolts completely yet, as you still need to align the sensor to the roadway.

Aligning the sensor to the roadway

1. Tilt the sensor down so it is aimed at the center of the lanes of interest.

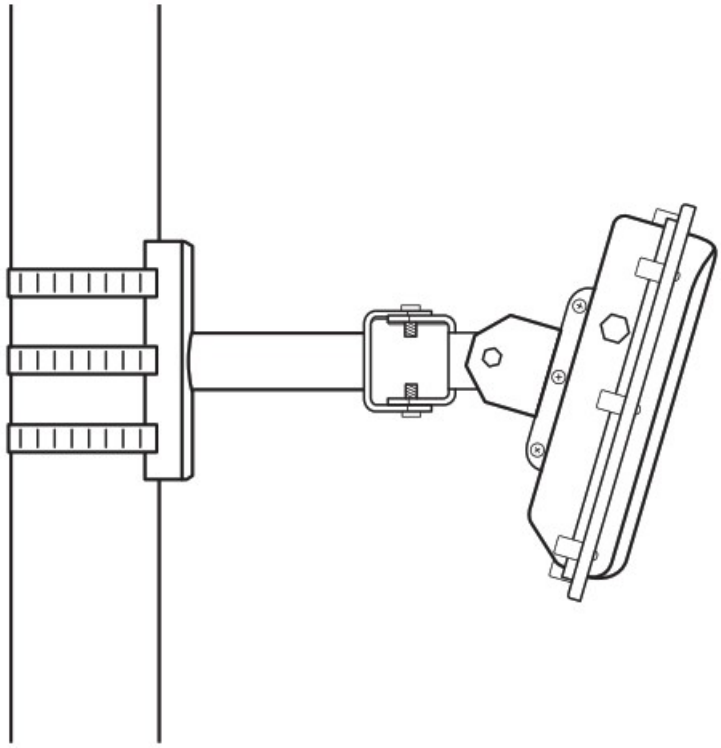

Figure 13. Aiming the sensor

2. Adjust the side-to-side angle so that the sensor's 90º field of view covers the approach.

   Note. To help you visualize the installation, the sensor's 90º field of view is imprinted on the top and bottom of the sensor case.

   Note. Do NOT roll the sensor to match the grade of the road.

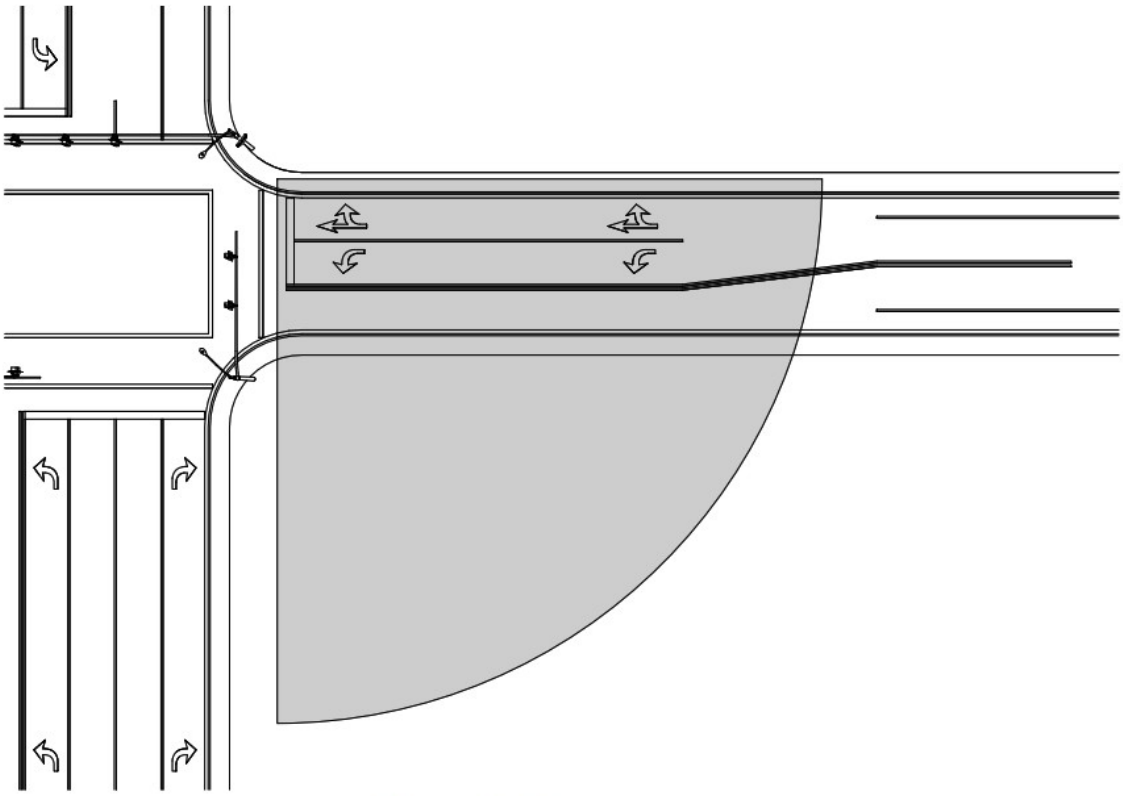

Figure 14. Detection area

   Note. You will complete the alignment process by connecting to SmartSensor Manager Matrix; see chapters 5–7.

3. Make sure the front edge of the sensor's footprint covers beyond the stop bar. This allows you to detect vehicles that do not stop at or behind the stop bar.

Cable connection
Applying silicon dielectric compound

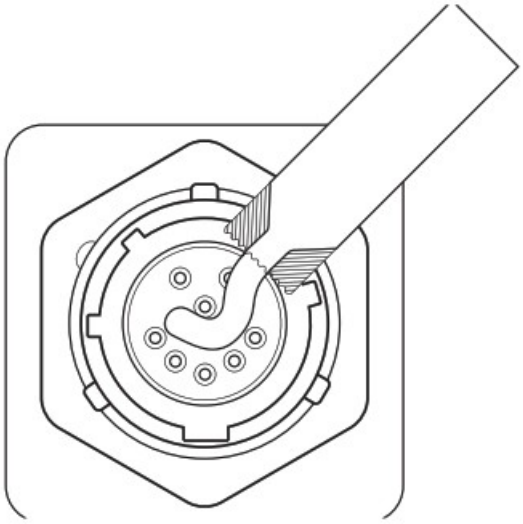

Figure 15. Applying the compound

1. Tear the tab off the tube of silicon dielectric compound that came with the sensor.
2. Squeeze about half of the compound onto the connector at the base of the sensor.

Connecting the cable

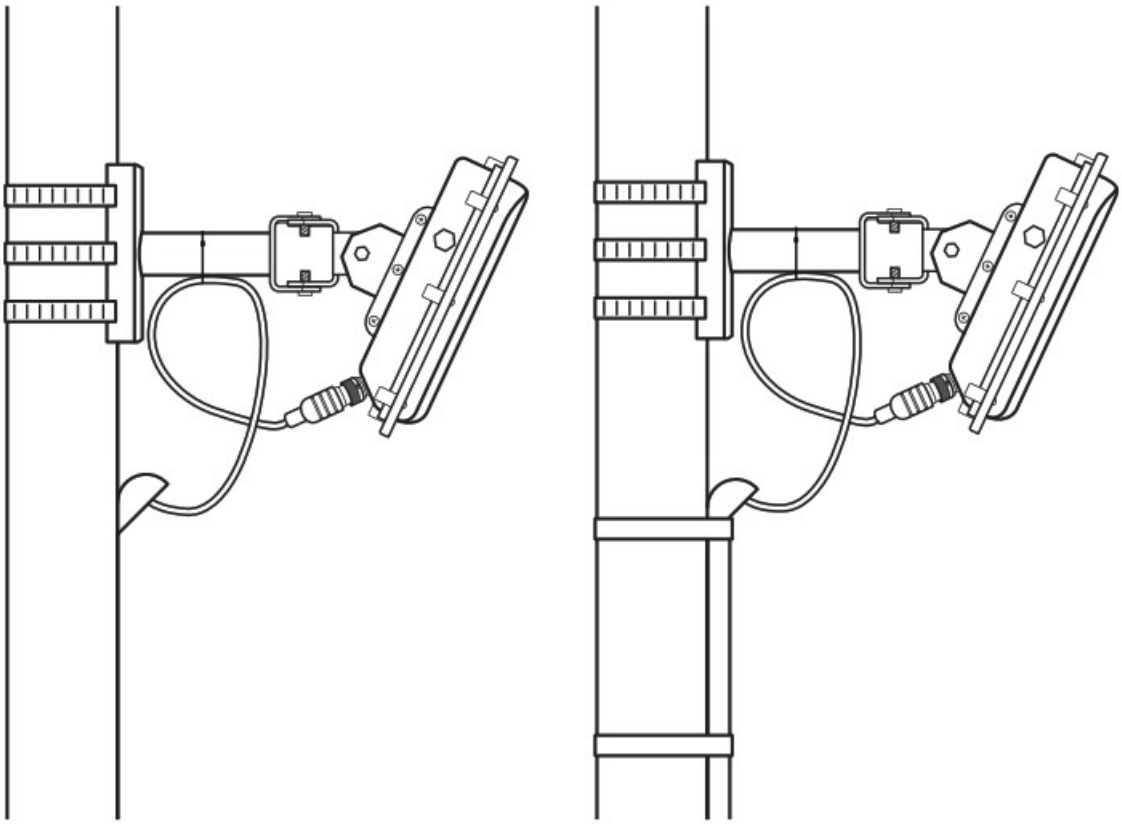

Figure 16. Cable run through pole (left) and through conduit (right)

1. Insert the cable connector into the sensor connector. Be aware that it is a keyed connector.
2. Twist the cable connector clockwise until you hear it click into place.
3. Run the cable through the pole/conduit. Leave some slack at the top to reduce strain on the cable connector

and create a drip loop. The recommended way to do this is shown above, including using a zip tie to secure the drip loop to the mount. This method also gives you something to work with should you someday need to move the sensor to a different spot on the pole.

4. If there's excess cable, don't cut it, as you may need it in the future; leave it in the pole.

Note. If you can't run the cable through the pole, run it instead through a conduit affixed to the pole.
Note. Don't drill through the sensor mount while running cable.

Grounding the sensor

1. Connect a 12 AWG grounding wire to the grounding lug on the bottom of the sensor.
2. If the intersection is bonded, connect the other end of the grounding wire to the earth ground for the pole that the sensor is mounted on.

Note. For more complete grounding schematics, see Intersection Grounding Schematics, available in the online knowledge base.

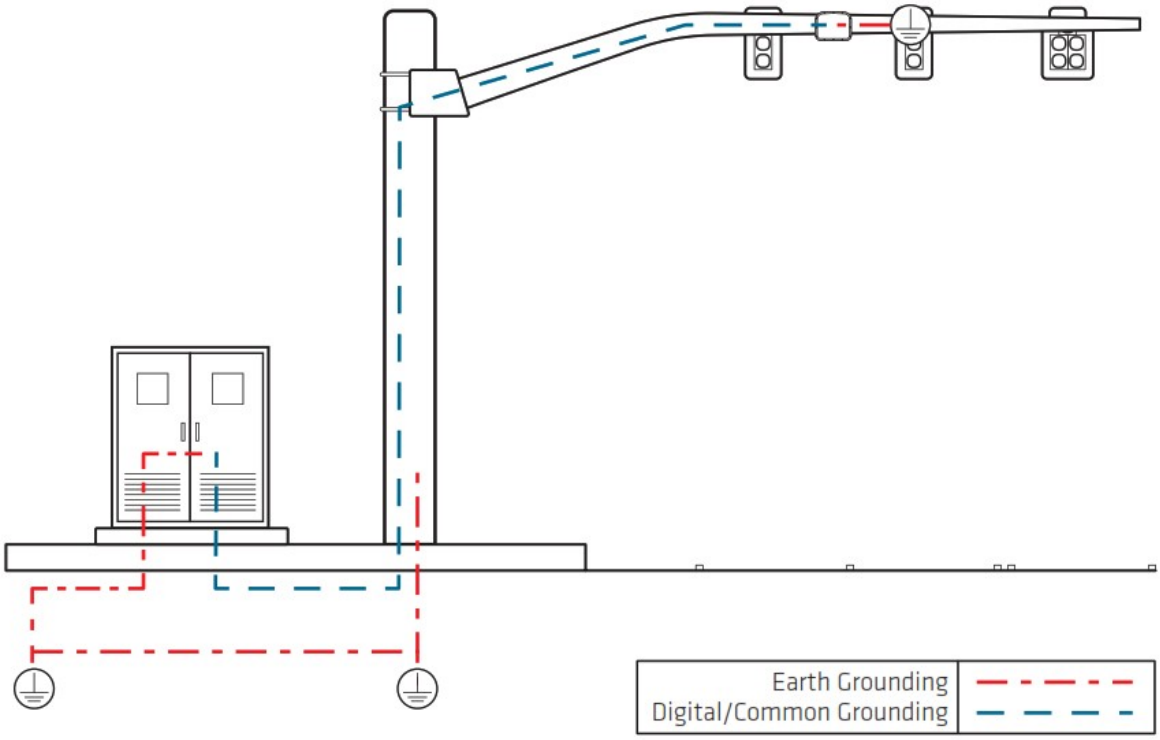

Figure 17. Grounding a bonded intersection

If the intersection is not bonded, run the grounding wire down the pole, alongside the cable, back to cabinet ground.

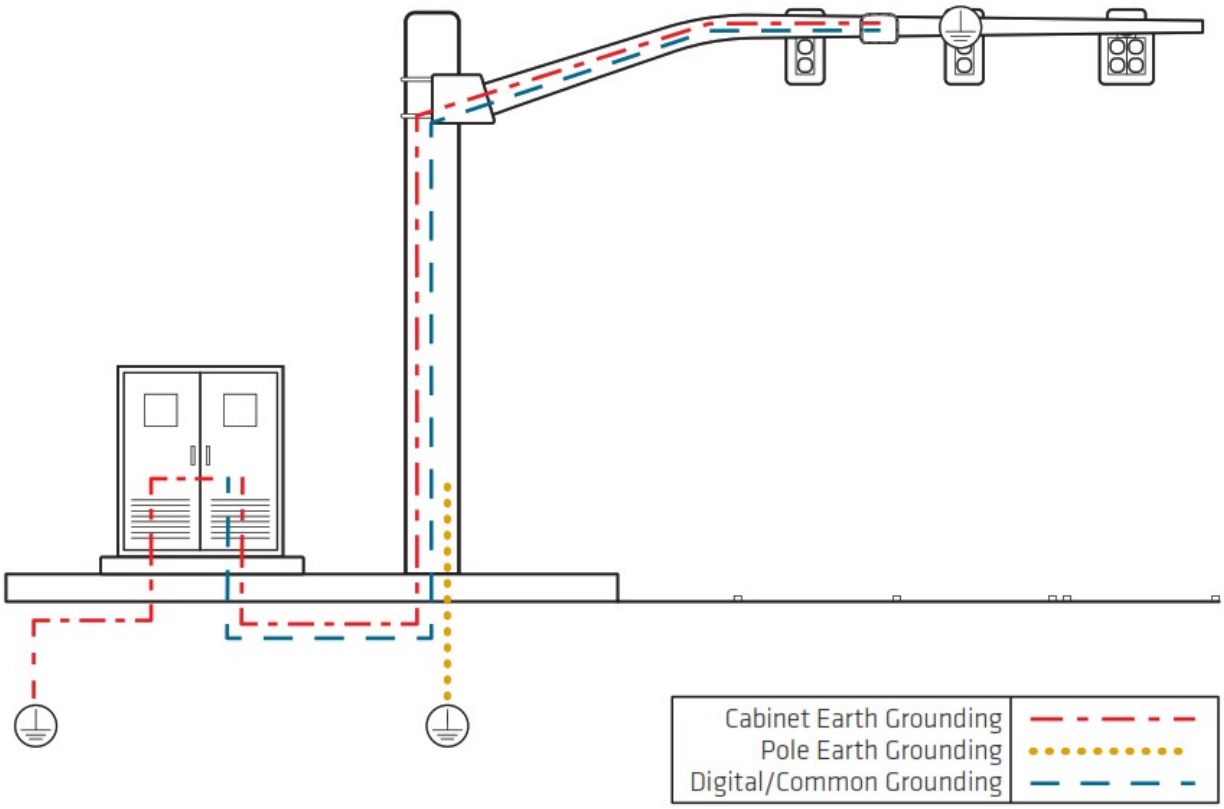

Figure 18. Grounding a non-bonded intersection

Wiring the junction box

1. Insert the cable coming from the sensor (the pigtail cable) through one of the cable grips. Twist the cable grip clockwise to tighten.
2. Do not strip the conductors. Land each conductor and the drain in the terminal blocks inside the box, according to color. Insert each conductor into the round hole on the plug portion of the correct terminal block and make sure it bottoms out.
3. Insert a small screwdriver into the square hole beside each conductor, and rock upwards to secure the conductor in place.
4. Insert one end of the cable that runs to the traffic cabinet (the homerun cable) into the other cable grip. Twist the cable grip clockwise to tighten.
5. Follow the instructions in steps 2–3 to land each conductor and the drain from the homerun cable into the correct spots in the terminal blocks, according to color.

Note. For best results, you may want to put a ferrule on the end of the drain, or twist the strands of the drain together tightly, before terminating it in the terminal block.

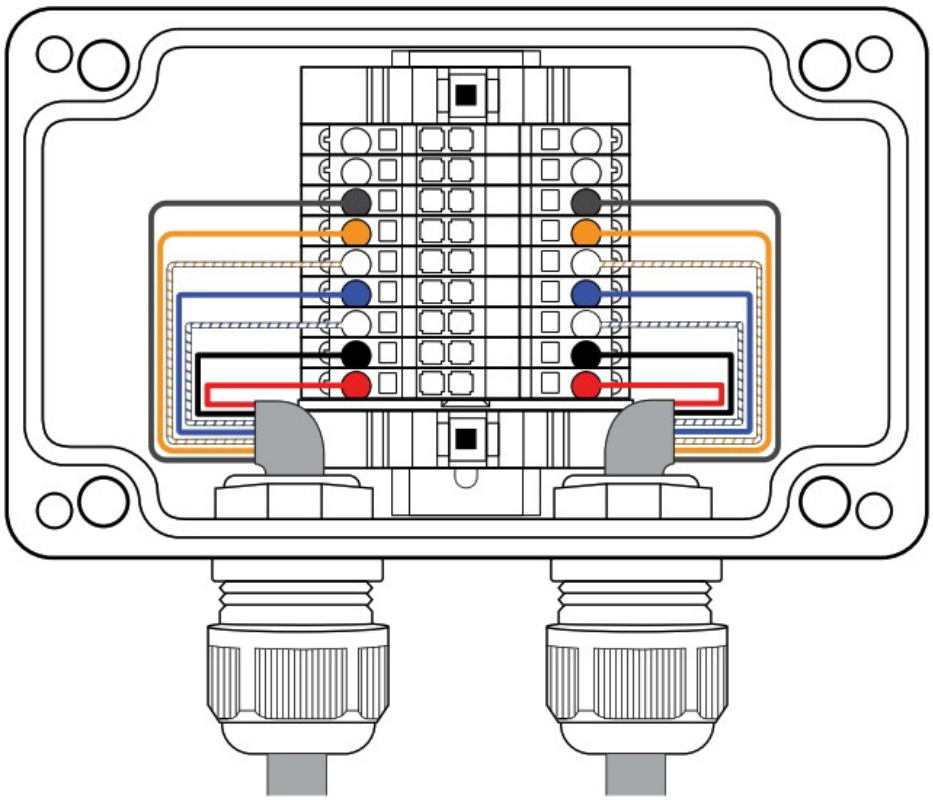

Figure 19. Junction box wiring

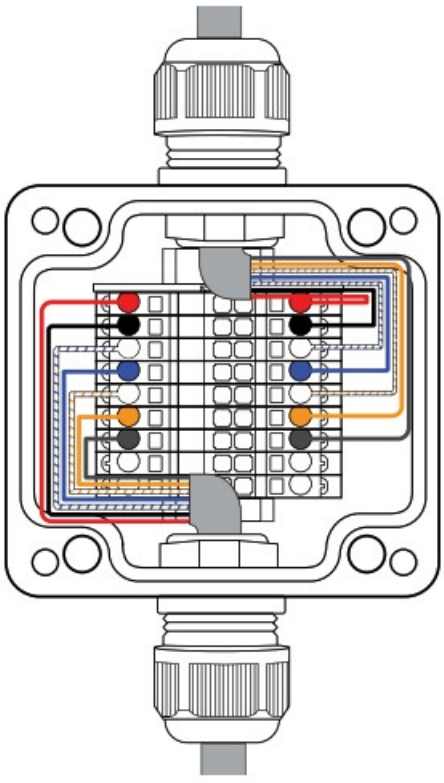

Figure 20. Mini junction box wiring

Installing Cabinet Solutions

The power, surge protection, and communication modules you will install vary based on what equipment you are using.

Using the Click 65x

Using the Click 65x line, power, surge, and communication are provided to a combination of four (Click 650) or six

(Click 656) Matrix and Advance sensors all in one device. If your cabinet supports SDLC, you can connect the Click 65x straight to the controller; if your cabinet doesn't support SDLC, you can connect the Click 65x to contact closure cards.

Warning. Failure to follow the guidelines in this chapter regarding proper surge protection will void the sensor warranty. If you need more information, contact **support@wavetronix.com**.

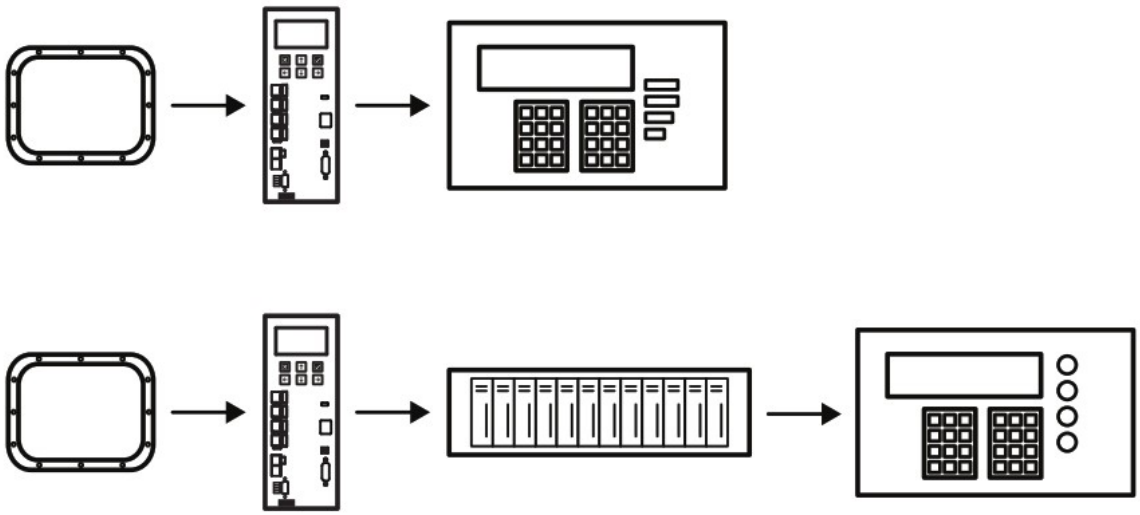

Figure 21. Click 65x using SDLC (above) and contact closures (below)

1. Run cable from the sensor to the traffic cabinet.
2. Place the Click 65x on a shelf in the cabinet or use U-channel mounting brackets to attach it to the cabinet wall.
3. Insert each conductor from the homerun cable into the corresponding round hole in the 7-position plug on the back of the Click 65x, shown below. Match each conductor to the correct label on the plug.
4. Insert a small screwdriver into the square hole above each conductor, and rock upwards to secure the conductor in place.

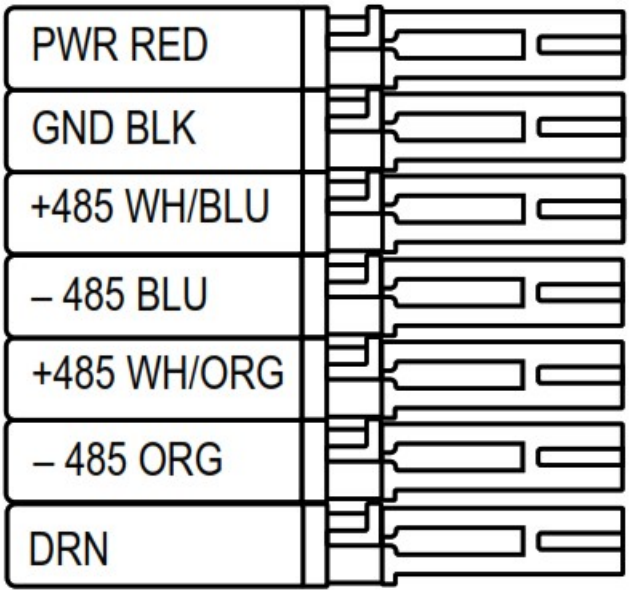

Figure 22. 7-position plug

5. Power on the 65x by using the switch on the back; power on each connected sensor by toggling the appropriate switches on the front of the Click 65x.
6. Connect communication cables (Ethernet, SDLC, and/or RJ-11 jumper cables) into their respective ports on the front of the Click 65x.

Note. For more information on the Click 65x products, see the Click 65x Series User Guide.

Using the Click 600

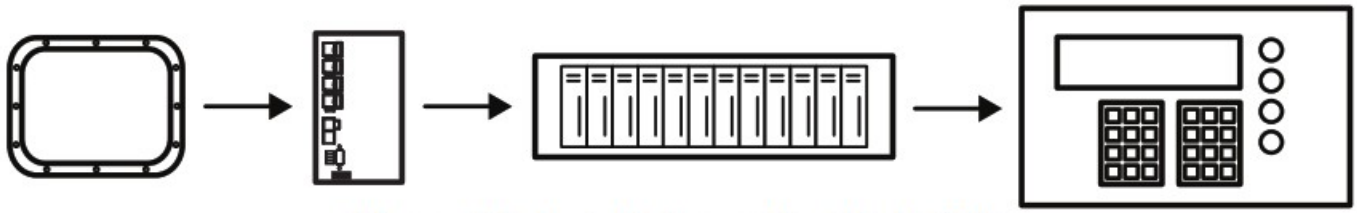

Figure 23. Installation with Click 600

1. Run cable from the sensor to the traffic cabinet.
2. Place the Click 600 on a shelf in the cabinet or use U-channel mounting brackets to attach it to the cabinet wall.
3. Insert each conductor from the homerun cable into the corresponding round hole in the 7-position plug on the back of the Click 600, shown above. Match each conductor to the correct label on the plug.
4. Insert a small screwdriver into the square hole above each conductor, and rock upwards to secure the conductor in place.
5. Power on the Click 600 by using the switch in the back; power on each connected sensor by toggling the appropriate switches on the front of the Click 600.
6. Connect jumper cables from the RJ-11 jacks on the front of the Click 600 to your contact closure devices.

Note. For more information on the Click 600, see the Click 600 Quick Start Guide.

Using a preassembled backplate

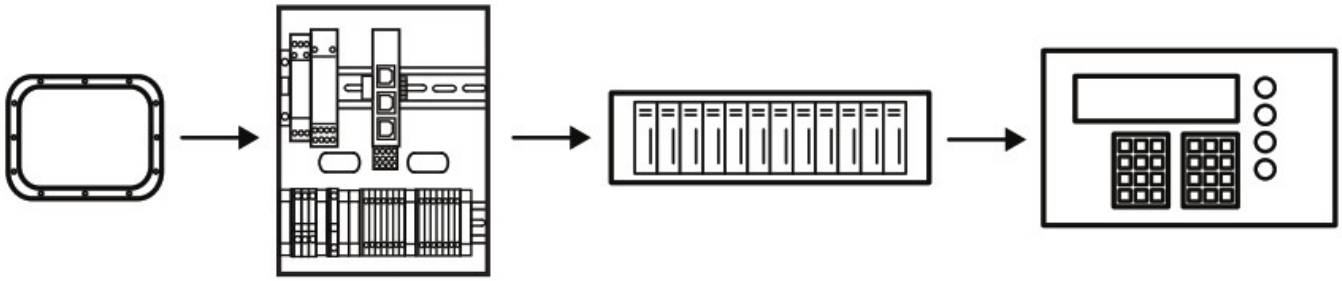

Figure 24. Installation with a preassembled backplate

1. Run cable from the sensor to the traffic cabinet.
2. Use the included screws to mount the Intersection Preassembled Backplate in the cabinet.

   Note. This section assumes you are using the Intersection Preassembled Backplate from Wavetronix; if you bought individual Click modules instead, see Assembling the Click Power Plant, available in the online knowledge base.

   Note. Additional Click modules can be added to the backplate by placing a T-bus on the DIN rail and then rocking the module onto the T-bus.

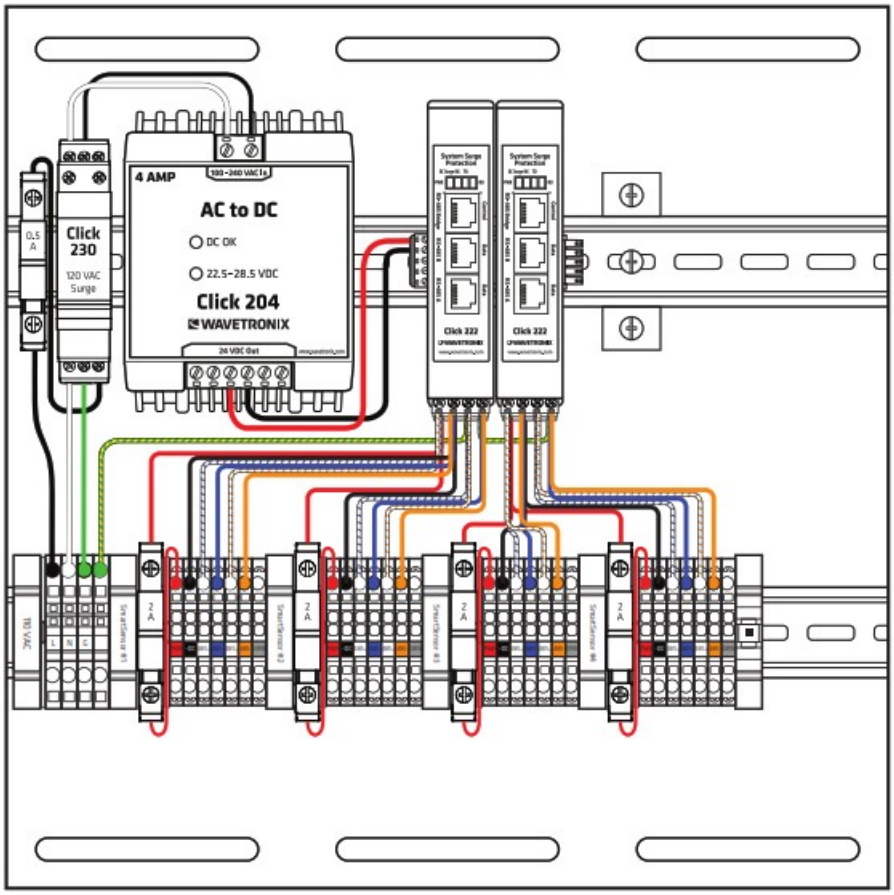

Figure 25. Intersection Preassembled Backplate (for traffic cabinet)

3. Start by connecting the power cable. This backplate is shipped from Wavetronix with the conductors in the cable already terminated in a terminal block plug. Insert this plug into the power terminal blocks.

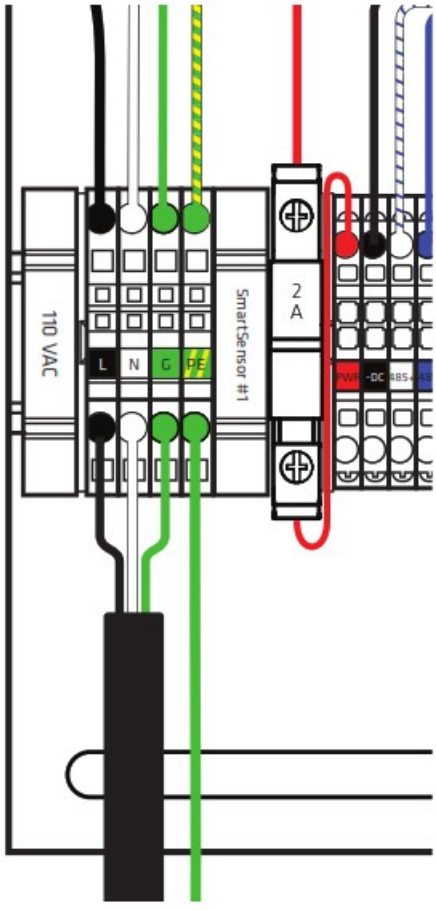

Figure 26. Connecting power cable to terminal blocks

4. If for some reason the conductors aren't terminated into the terminal block plug, terminate them by inserting

each conductor into the corresponding round hole on the plug (match each conductor to the label of the same color on the plug). Do not strip the insulation. Insert a small screwdriver into the square hole above it, and rock upwards to secure the conductor in place. Repeat with each conductor.

5. Connect a 12 AWG wire from the earth ground terminal block to the cabinet's earth ground.
   Note. All electronic components should be grounded.

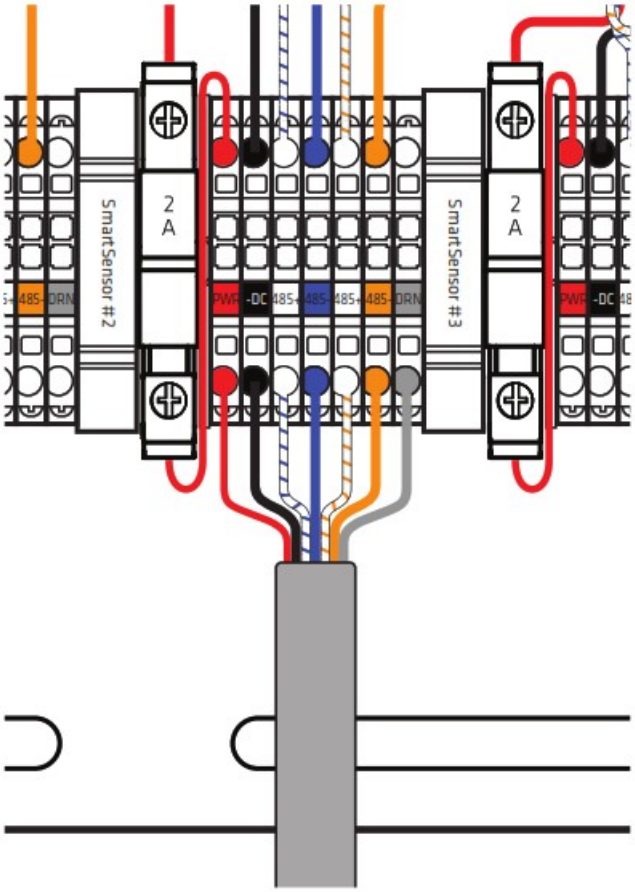

Figure 27. Connecting sensor cable to terminal blocks

6. Now wire the sensor cable: follow the instructions in step 4 to land each conductor from the cable coming from the sensor into the correct terminal block.

More information about this setup
This backplate is designed to be mounted in a traffic cabinet and to provide everything your sensor needs:

- The Click power plant, consisting of a circuit breaker, AC surge protector, and AC to DC converter.
- The Click 222, which is a lightning surge protector. This device is where the sensor cable is landed (via the terminal blocks). It protects the rest of the traffic cabinet from surges coming from the sensor cable. It's also where you can plug in to communicate with and configure the sensor.
  There are no communication options besides RS-485 on the Click 222. An additional communication device can be easily added to communicate with the installation remotely or over RS-232.

Connecting to the Sensor

Download and installation
Smart Sensor Manager Matrix (SSMM) is software that lets you configure and interact with the Matrix sensor. It can only be installed on a PC.

Downloading SSMM

Figure 28. Finding the SSMM download on the Wavetronix website

1. In a browser, navigate to **www.wavetronix.com/en/support**.
2. Click the Downloads link under Smart Sensor Matrix.
3. Click the Latest Software button.

Note. You must have administrator rights to install the program, as well as Microsoft .NET Framework version 3.5.

Installing SSMM

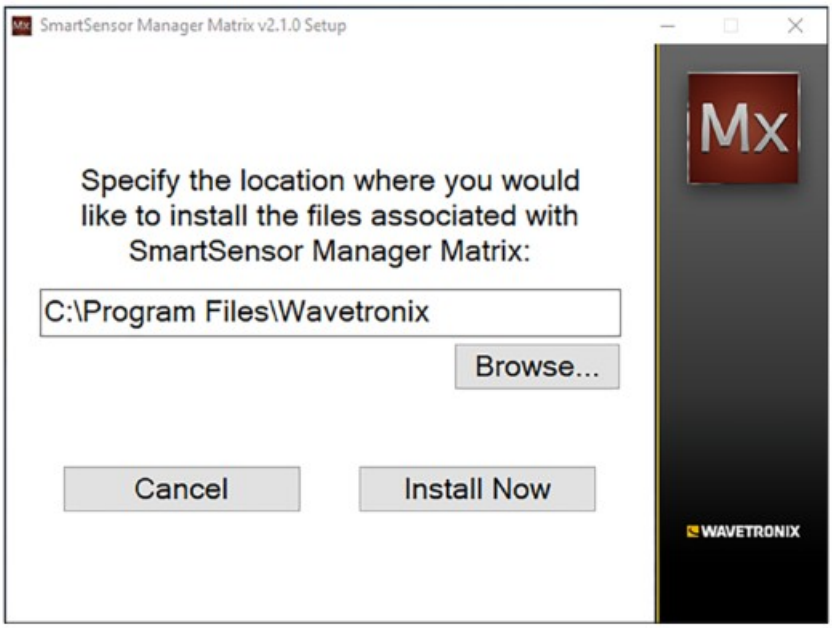

Figure 29. SSMM install wizard

1. Double-click on the setup file.
2. Follow the instructions on your screen to choose where to install, and then to choose which shortcuts to create.
3. Click Finish when you're done.

SSMM main screen
Open SSMM to see the screen below.

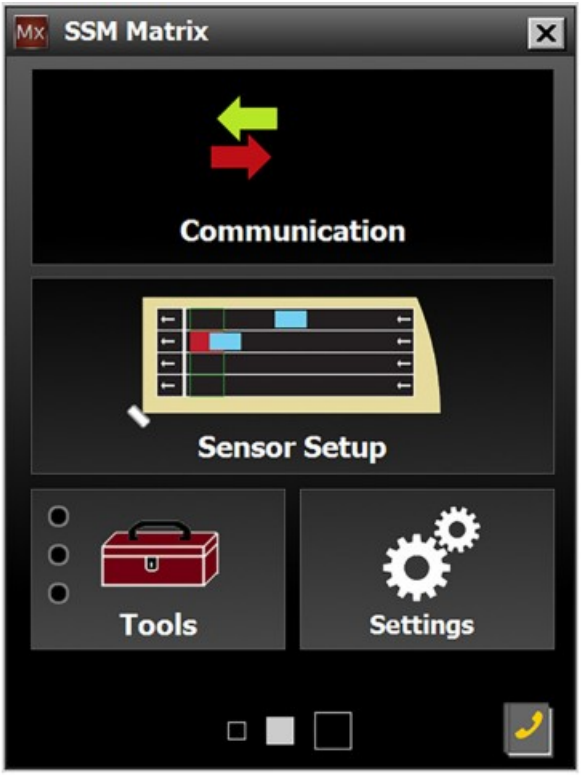

Figure 30. SSMM main screen

Changing the software language

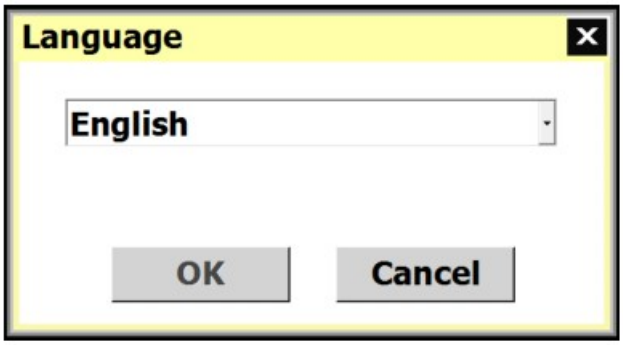

Figure 31. Language selection

1. Click the globe icon in the lower left corner.
2. A window will appear. Choose your desired language from the drop-down menu.
3. Click OK.

Changing the software size
Click one of the three boxes at the bottom of the screen to choose between the small, medium and large display sizes.

SSMM communication basics

Figure 32. Communication button, main screen

Smart Sensor Manager can connect to your sensors via a serial (RS-485) or Internet (IP address) connection; this may require additional equipment. There is also a virtual option for testing or demo purposes.

Making a serial connection

Note. You may need a USB to serial adapter to connect to your computer.

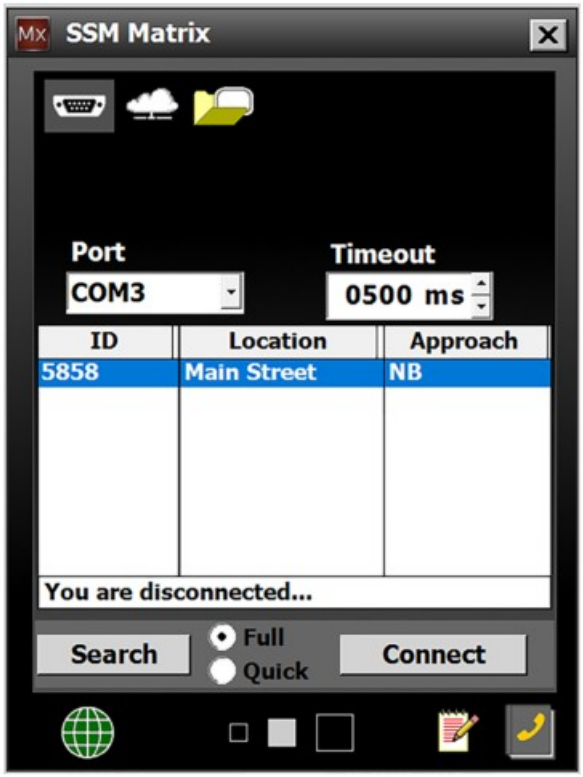

Figure 33. For serial connections

Note. The first time you connect to a sensor, the Sensor ID will be the last seven digits of the sensor's serial number. However, the names in the Location and Approach fields will be set to different values.

1. Click Communication on the main screen and then click the serial connector icon at the top of the screen.
2. From the Port drop-down, choose the COM port on your computer that the sensor is plugged into. If you are unsure of the port, select Search to cycle through all available COM ports.
3. Click Search. The first time you connect, use a Full search, which will find all the Matrix sensors on the selected RS-485 control bus and can take up to 30 seconds. A Quick search can be used for any subsequent connections and will take considerably less time.
4. Once the list of sensors appears, click on the sensor you would like to configure.
5. Click Connect.

Serial connection settings

- Timeout – This is how long the software tries to connect to the sensor before it gives up. You can increase this time if you're having trouble connecting to the sensor.
- Full search – Select this when searching for sensors for the very first time on an RS-485 control bus. You need to perform a full search to completion before all sensors can be discovered using a quick search. If you perform a full search and then cancel before the search is complete, the sensors not discovered before the full search was terminated will also not be visible after a quick search.
- Quick search – Lets you quickly connect to sensors that were already discovered using a full search. If you add or replace a sensor on an existing control bus, you will need to do a full search before that new sensor will appear on a quick search.

Making an Internet connection

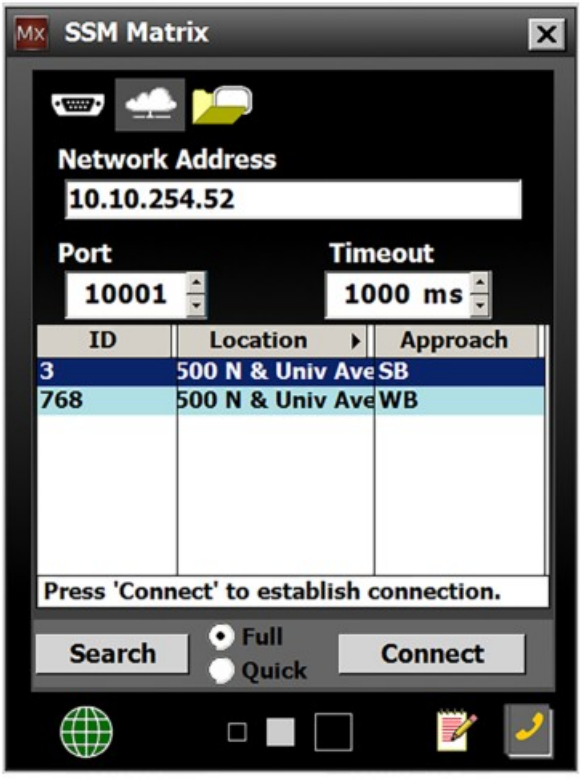

Figure 34. Internet connection screen

Note. The Matrix is not a native IP device. Therefore, connecting via the Internet requires a terminal server, such as a Click 65x, Click 301 serial to Ethernet converter in the cabinet, or an external modem to put it on a cellular network.

1. Click Communication on the main screen and then click the cloud icon at the top of the screen.
2. Under Network Address, enter the IP address of the terminal server (such as a serial to Ethernet converter or the cellular modem) that the sensor is connected to. Do the same with the port number in the Port field.
3. Click Search. The first time you connect, use a Full search, which will find all the Matrix sensors on the selected RS-485 control bus and can take up to 30 seconds. A Quick search can be used for any subsequent connections.
4. Once the list of sensors appears, click on the sensor you would like to configure.
5. Click Connect.

Internet connection settings

- Timeout – This is how long the software tries to connect to the sensor before it gives up. You can increase this time if you're having trouble connecting to the sensor.
- Full search – Select this when searching for sensors for the very first time. You need to perform a full search to completion before all sensors can be discovered using a quick search. If you perform a full search and then cancel before the search is complete, the sensors not discovered before the full search was terminated will also not be visible after a quick search.
- Quick search – Lets you quickly connect to sensors that were already discovered using a full search. If you add or replace a sensor on an existing control bus, you will need to do a full search before that new sensor will appear on a quick search.

Making a virtual connection

Definition. A virtual sensor connection lets you see simulated traffic in SSMM without actually being connected to a sensor—great for demos!

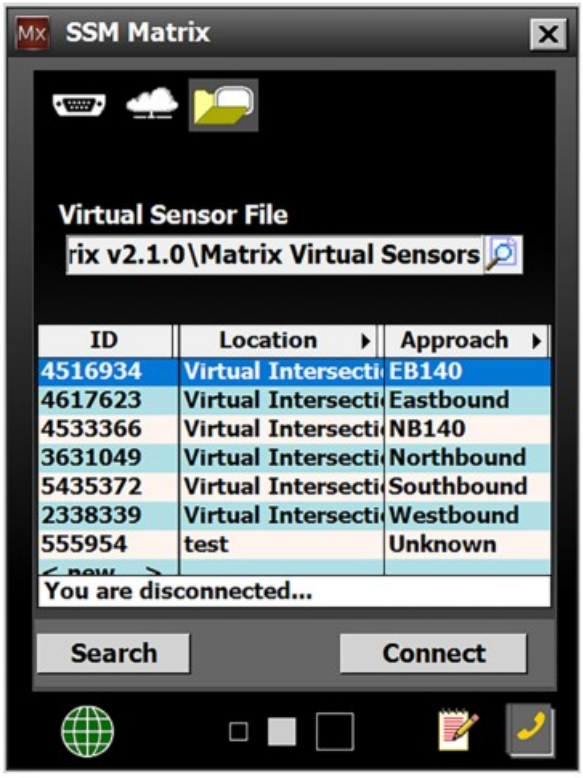

Figure 35. Virtual connection screen

1. Click Communication on the main screen and then click the folder icon at the top of the screen.
2. Under Virtual Sensor File, click the magnifying glass icon to navigate to the virtual sensor file you want on your hard drive. You can also create a new virtual sensor file in the window that pops up by navigating to the desired save location, typing in a new file name, and clicking OK.
3. Click Search.
4. Once the list of virtual sensors appears, click on the virtual sensor you would like to configure.
5. Click Connect.

About virtual sensor files
If you make changes to the sensor's setup while using a virtual connection, those changes are saved to the virtual sensor file, which by default will be saved to C:\Program Files\Wavetronix\ SmartSensor Manager Matrix vX.X.X\Bin. If you want, you can back up those virtual sensor settings; that will create a sensor setup file which can then be restored to an actual sensor. More on the backup/restore tools in chapter 10.

Troubleshooting a connection
Some or all of the following may help you troubleshoot:

- Make sure that all power and communication wiring is correct.
- Check the port settings.
- Make sure the Click 65x is configured properly.
- If a failure occurs repeatedly, contact **support@wavetronix.com**.

Advanced communication tools
Once you've made a connection, the Communication button of the main screen should now be animated, with arrows moving past each other.

Viewing sensor information

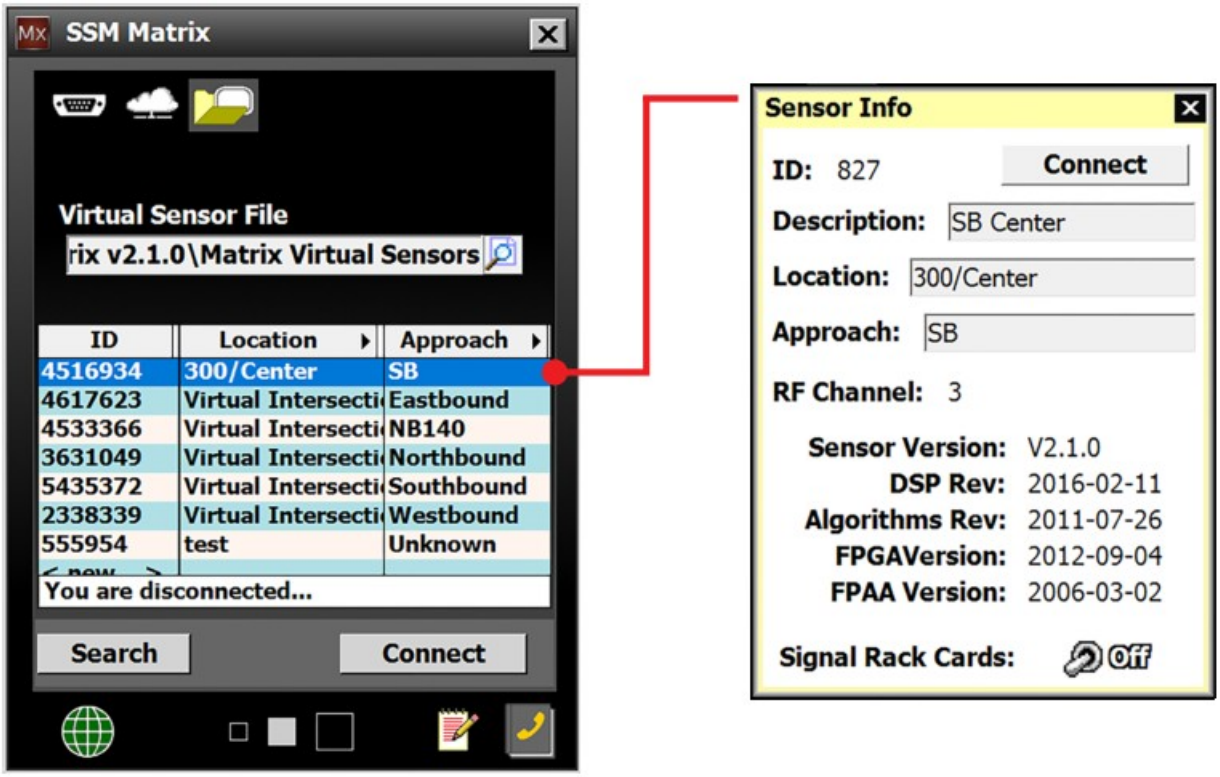

Figure 36. Sensor Info window

1. Before connecting to a sensor, double-click on the sensor row. This will bring up the Sensor Info window, with information about the sensor's location. These settings will be explained further in Chapter 6.
2. If you desire, click the Connect button to connect to this particular sensor.

   Note. To see which rack cards are connected to this sensor's data port, turn the Signal Rack Cards toggle switch on and the rack card LEDs will begin flashing.

Viewing software version information

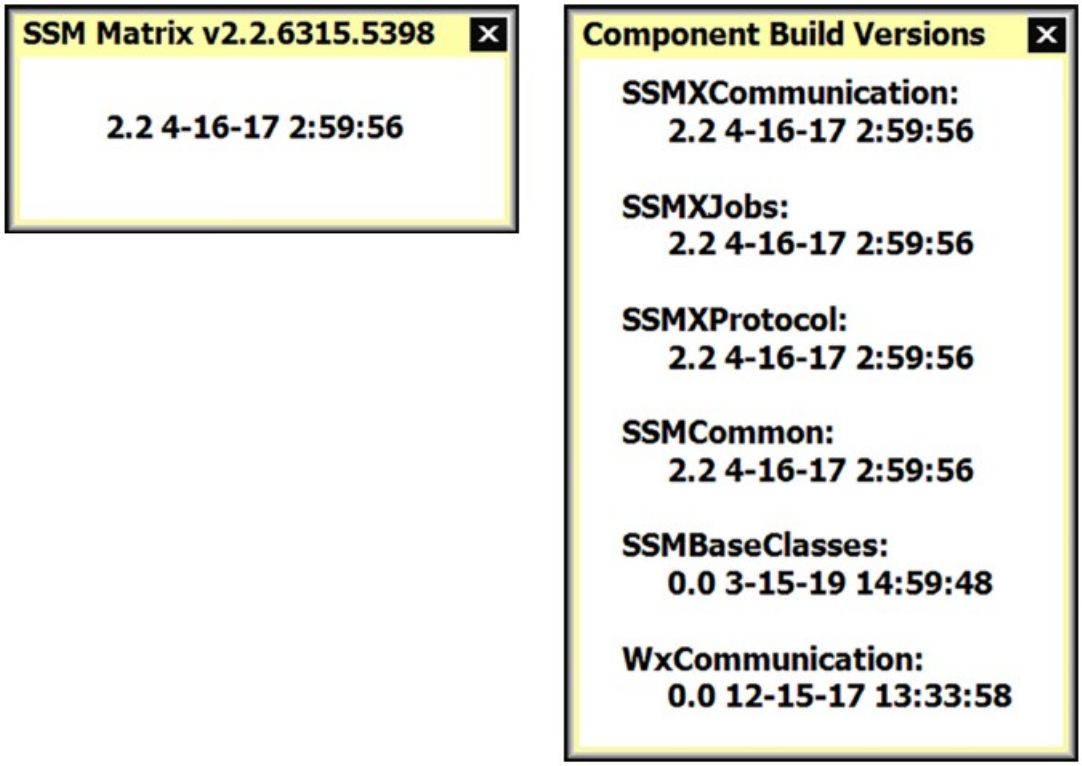

Figure 37. Version windows

1. Right-click anywhere on the screen.
2. This will bring up a small window that will allow you to view component, firmware, and hardware version information.

Disconnecting from a sensor

1. Click Communication on the main screen.
2. Click Disconnect.

Using the address book

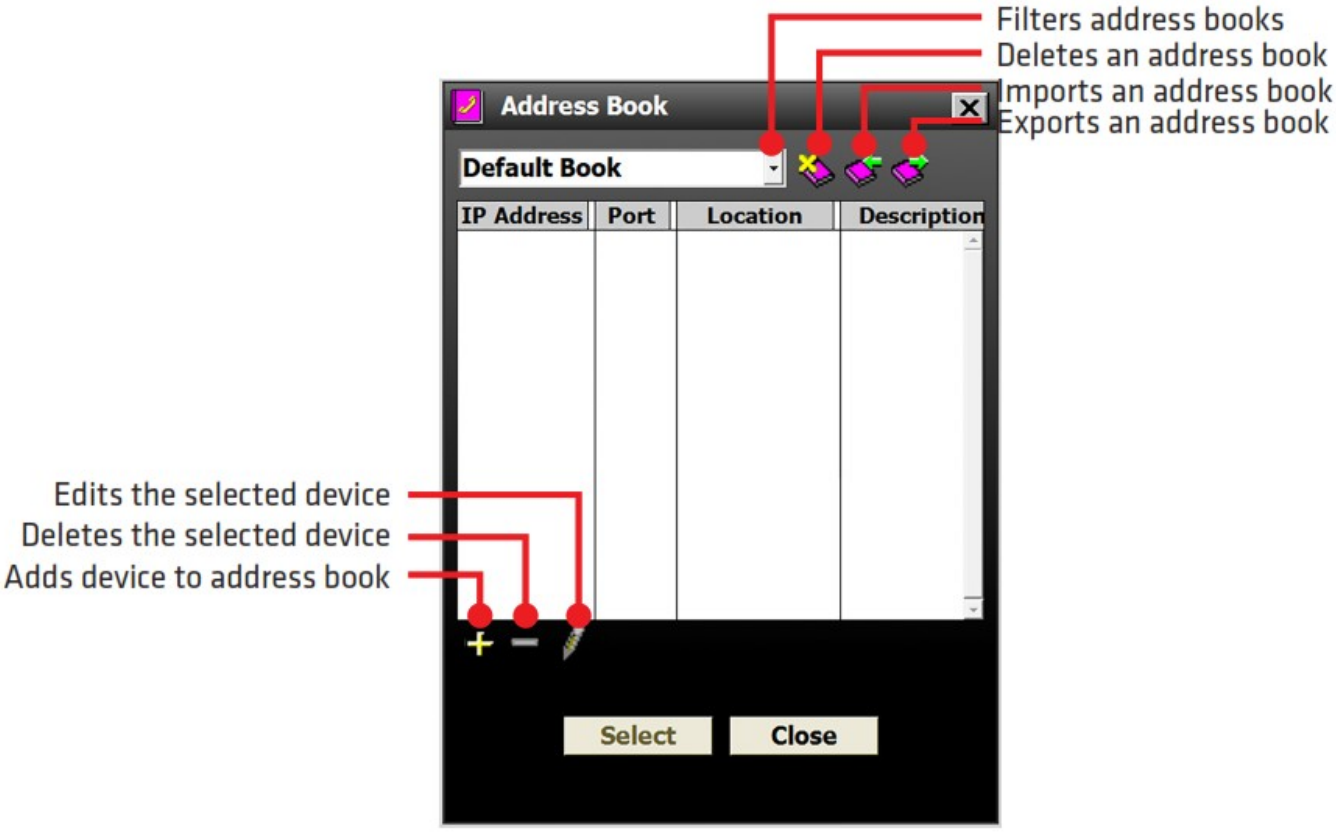

Figure 38. Address book screen

Note. The address book lets you save device connection settings for future use.

1. Click on the book icon at the bottom of the connection screen (serial, Internet, or virtual).
2. The address book screen will appear; use the settings pointed out to add, edit, and delete device connection settings.

Viewing the error log

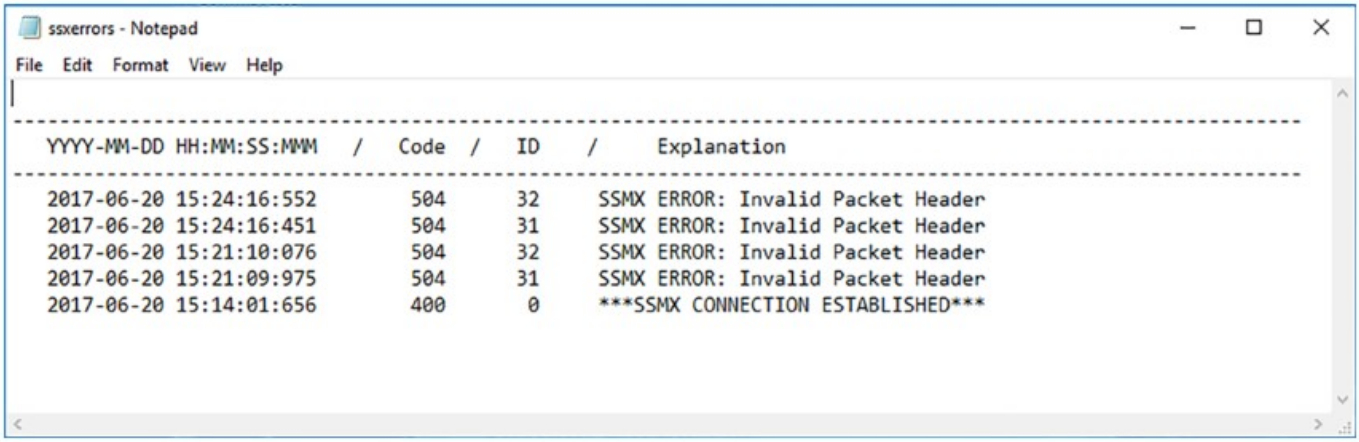

Figure 39. Error log

Note. The error log can be useful in troubleshooting, or you may need to save it and send to support@wavetronix.com.

1. Click on the notepad icon at the bottom of the connection screen (serial, Internet, or virtual).
2. The error log will be saved to C://ProgramFiles/Wavetronix/ SmartSensor Manager Matrix vX.X.X/bin. It will

also open in your default .txt editor. If you need to save a copy for troubleshooting purposes, do a Save As, as the file will be written over next time you view an error log.

Updating the sensor

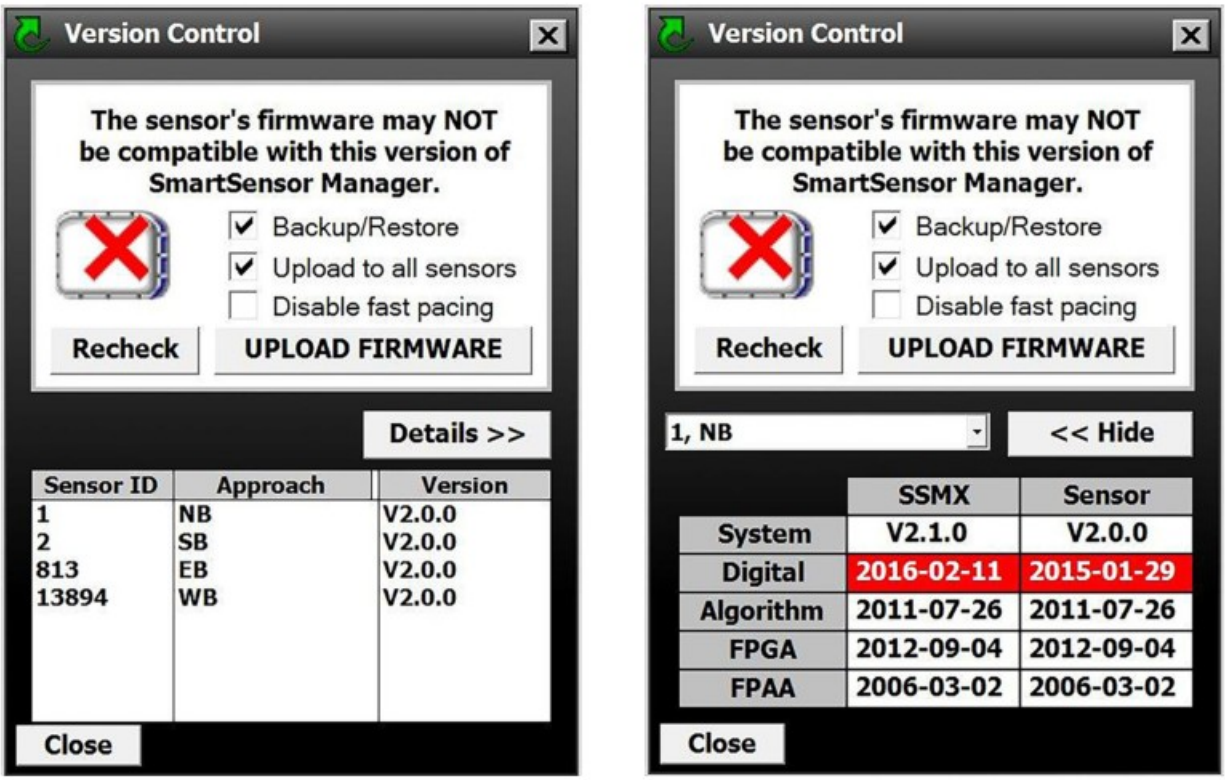

Figure 40. Version Control basic screen and detailed screen

1. If the version of SSMM doesn't match the version of the sensor's embedded firmware, then after you click Connect, the Version Control screen will appear.
2. If you would like specifics on the mismatch, click a sensor ID and then click the Details >> button.
3. Click UPLOAD FIRMWARE, or, if you prefer not to update at this time, click Close.

Advanced settings

- Backup/Restore – This backs up all of the settings for the sensor(s) before the upload. When the upload is finished, it will restore the settings.
- Upload to all sensors – This setting broadcasts the upgrade to all the sensors on the control bridge.
- Disable fast pacing – Check this box if you are connected using Bluetooth or other devices with a slow connection speed.

Downgrading the sensor

Figure 41. Downgrade warning message

If the downgrade message appears, it means that the sensor firmware is newer than the version of SSMM you're using. Get the newest version of SSMM from www.wavetronix.com.

Configuring Sensor Settings

Settings tabs

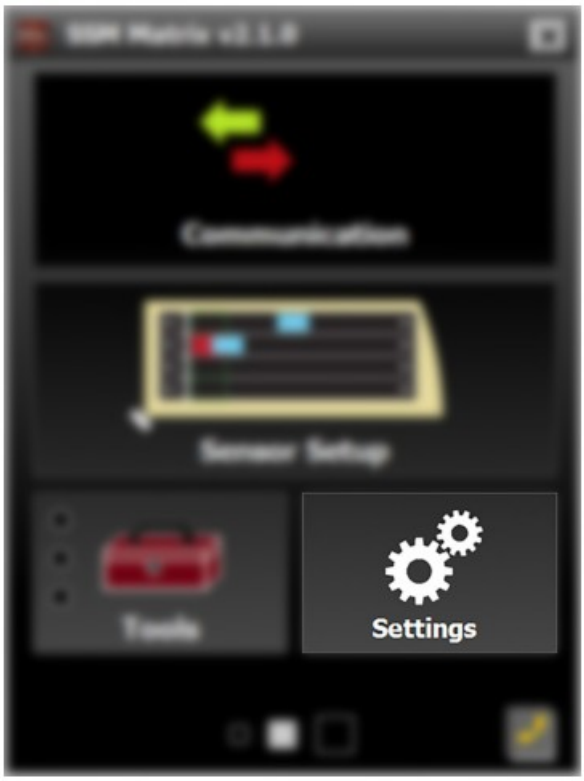

Figure 42. Settings button, main screen

Access the sensor settings by clicking on the Settings button on the main screen. Changing these settings is optional; if you leave them set to their defaults, the sensor will still function.

Changing General tab settings

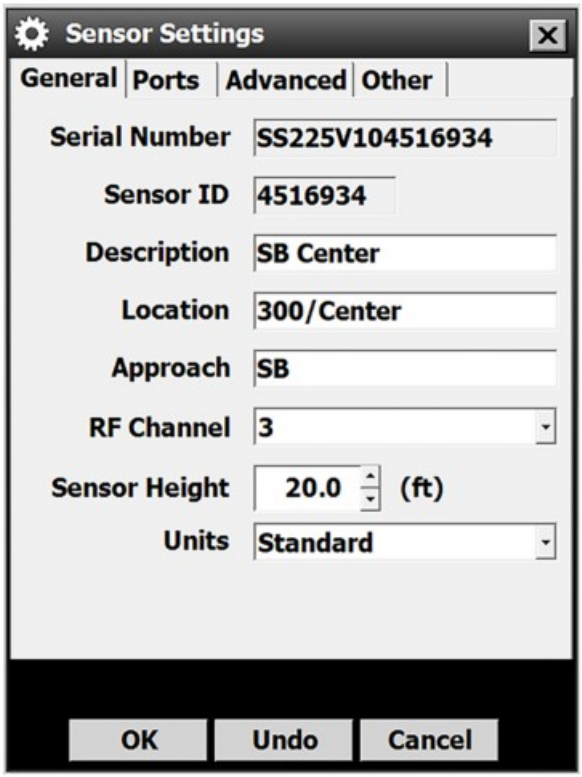

Figure 43. General tab

Setting	Description	Details
Serial Number	Shows the identification number assig ned to the sensor by Wavetronix.	Can’t be changed.
Sensor ID	Shows the sensor ID, which is the last seven digits of the sensor serial numb er. No two sensors should have the same ID.	Can’t be changed.
Description	Lets you create a short description of the sensor.	Change this if you think you’ll find it us eful in identifying the sensor later.
Location	Lets you enter the sensor’s location.	Change this if you think you’ll find it us eful in identifying the sensor later.
Approach	Lets you enter which direction of traffi c the sensor is detecting.	Change this if you think you’ll find it us eful in identifying the sensor later.
RF Channel	Lets you change the radio frequency channel the sensor is transmitting on.	If you’re using multiple sensors in the same intersection, set each to a uniqu e RF channel. The software should no tify you when an RF channel needs to change.
Sensor Height	Lets you enter the sensor’s height.	Entering an approximate height allows vehicles to be shown at the correct dis tance in the software.
Units	Sets whether the software displays di stances in standard (mph/feet) or met ric (kph/meters).	Purely for your convenience—does no t affect sensor performance.

Note. Whatever you enter in the Approach field will also appear on the Sensor Setup screens. See Chapter 7.

Changing Ports tab settings

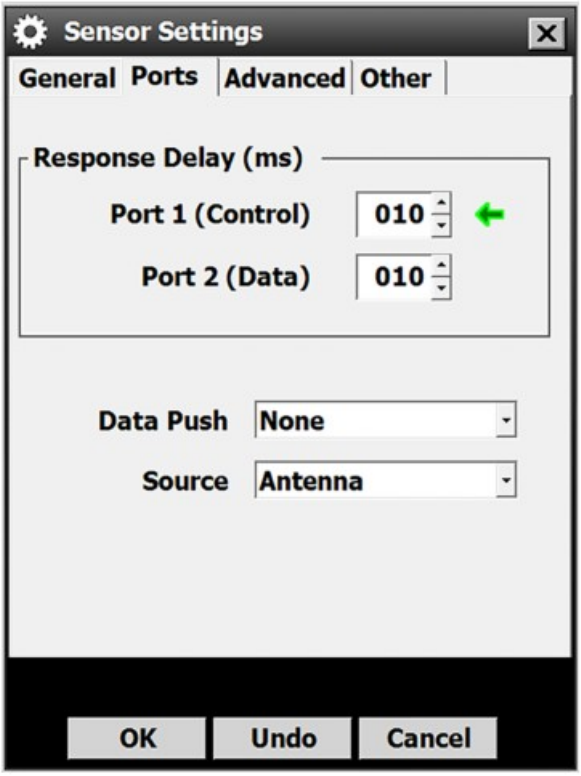

Figure 44. Ports tab

Setting	Description	Details
Response Delay	How long the sensor will wait before r esponding to a received message, sh own in milliseconds. Default is 10 ms.	The default setting is 10 milliseconds. Please contact Wavetronix Technical Support before changing this setting.
Port 1 (Control)	Port usually reserved for connecting a nd configuring the sensor.	Please contact Wavetronix Technical Support before changing thi s setting.
Port 2 (Data)	Port usually reserved for pushing data .	Please contact Wavetronix Technical Support before changing this setting.
Green Arrow	Shows the port over which SSMM is c onnected to the sensor.	N/A
Data Push	Lets you choose which port you want to use to push presence data.	Please contact Wavetronix Technical Support before changing this setting.
Source	Lets you choose where the SSMM get s the traffic data it reports.	Choose Antenna for standard use (rep orts data as detected by the sensor). Choose Diagnostic for testing and trai ning (creates simulated traffic).

Changing Advanced tab settings

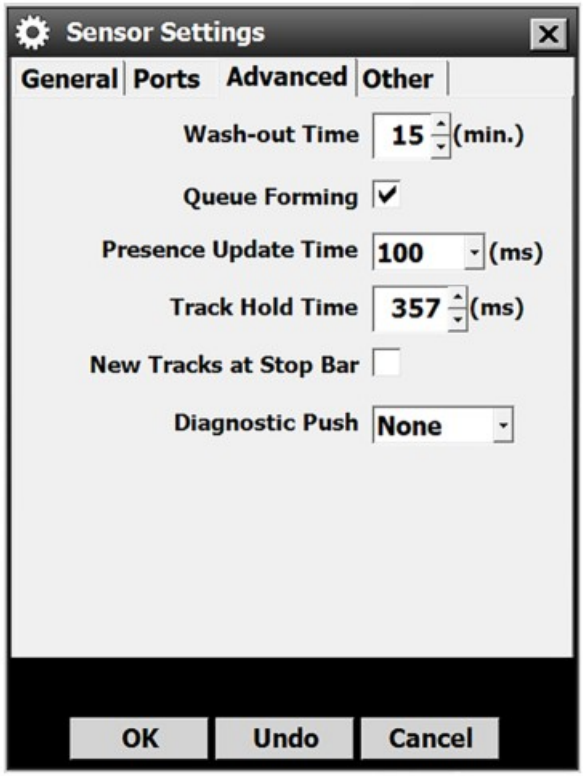

Figure 45. Advanced tab

Setting	Description	Details
Wash-out Time	Lets you set the amount of time a tracker is detected before it washes out into the background.	Use this if cars or trucks are temporarily parked along the approach for long stretches of time, causing unwanted calls.
Queue Forming	Enables the sensor fill in gaps between cars in a queue.	Use this in areas where queues often form, if vehicles are frequently occluded or missed. Turning this setting off may improve counting channel accuracy.
Presence Update Time	Lets you control how often the sensor pushes data.	Please contact Wavetronix Technical Support before changing this setting.
Track Hold Time	Lets you specify a time a tracker will be held if detection of that tracker is temporarily lost.	Use this setting to maintain a detection when corresponding trackers are fluctuating or fading in and out.
New Tracks at Stop Bar	Enables the sensor to pick up new tracks at the stop bar.	Turn this setting on if you notice the sensor dropping detections at the stop bar. This will make the area close to the stop bar more sensitive to detections.
Diagnostic Push	Lets you push engineering diagnostic data to an external device.	This is only used to push sensor diagnostic data to the Click 65x across port 2 for use by Wavetronix engineers.

Note. Changing this setting may cause you to see false detection from pedestrians or cross traffic.

Changing Other tab settings

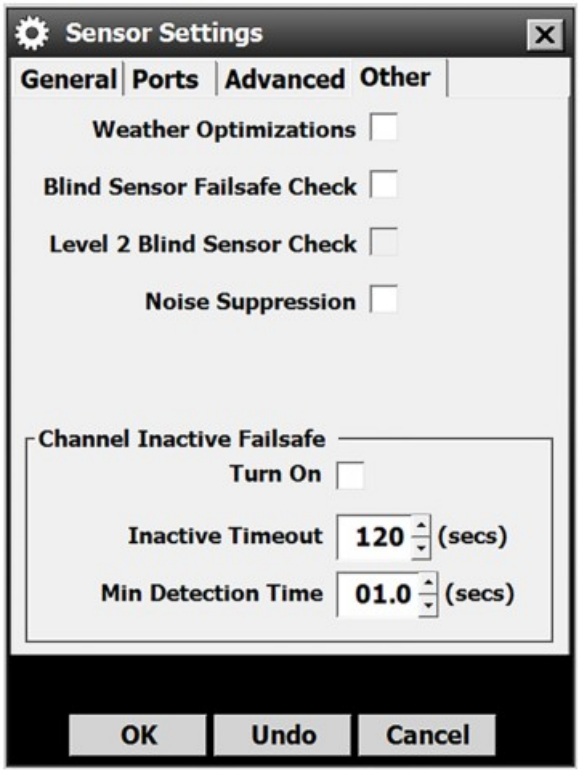

Figure 46. Other tab

Setting	Description	Details
Weather Optimizations	Improves detections where heavy rai n or snow occurs.	Use this setting if you are consistently getting false detections from extreme r ain storms or rutted snow on the groun d.
Blind Sensor Failsafe Check	Helps the sensor determine if its abilit y to detect targets has been comprom ised and allows the sensor to go into f ailsafe (constant calls on all channels) .	Turn this on prior to a storm where wet , sticky snow may stick to the face of t he sensor.
Level 2 Blind Sensor Check	Enables quicker adaptation to compro mised detection events. Becomes ava ilable after clicking Blind Sensor Fails afe Check.	This setting should remain off unless t here is a storm with wet, sticky snow s ticking to the face of the sensor.
Noise Suppression	Enables additional noise filtering.	Please contact Wavetronix Technical Support before changing this setting.
Channel Inactive Failsafe		
Turn On	Enables a channel output to activate when no detection has occurred for the user-de fined time period.	Use this setting when there is consiste nt truck traffic occluding neighboring la nes.
Inactive Timeout	Lets you define the time period a cha nnel will wait without a detection before triggeri ng a failsafe output call.	Use this setting to make sure a vehicle is not left waiting for a call longer than the defined phase time.
Min Detection Time	Defines the amount of time a tracker must persist to be considered a valid detection and reset the timeout.	To keep false detections from affecting the Channel Inactive Failsafe detectio n algorithms, consider selecting a time value a little lower than the amount of t ime it would take a small vehicle, going the speed limit, to pass through the zone.

Configuring Lanes & Stop Bars

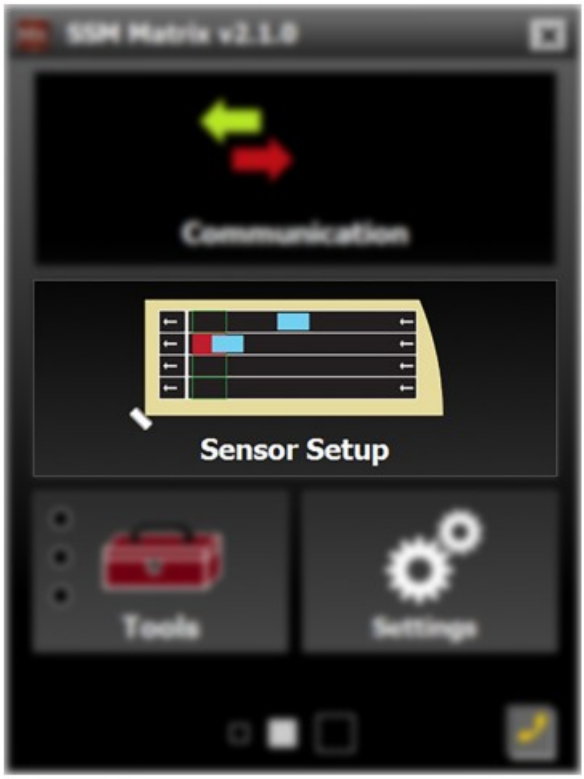

Figure 47. Sensor Setup, main screen

Click Sensor Setup on the main screen to open the Sensor Setup screen.

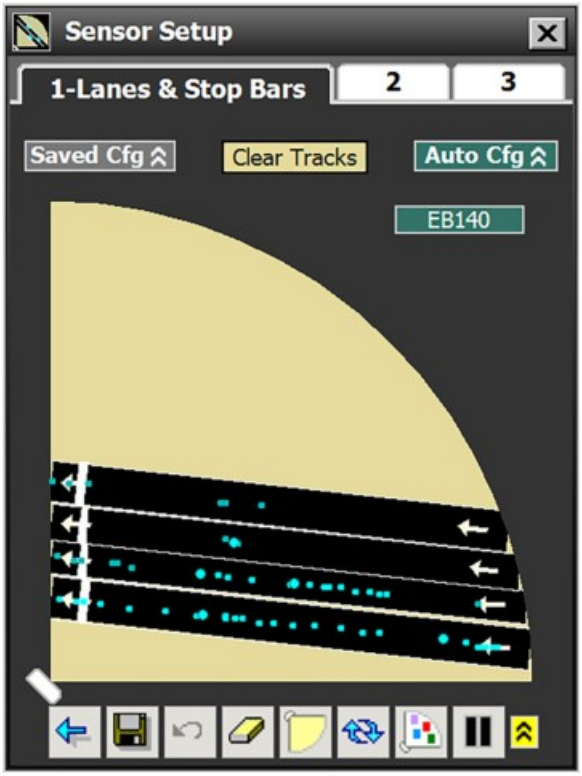

Figure 48. Lanes & Stop Bars screen

Lanes & Stop Bars tab

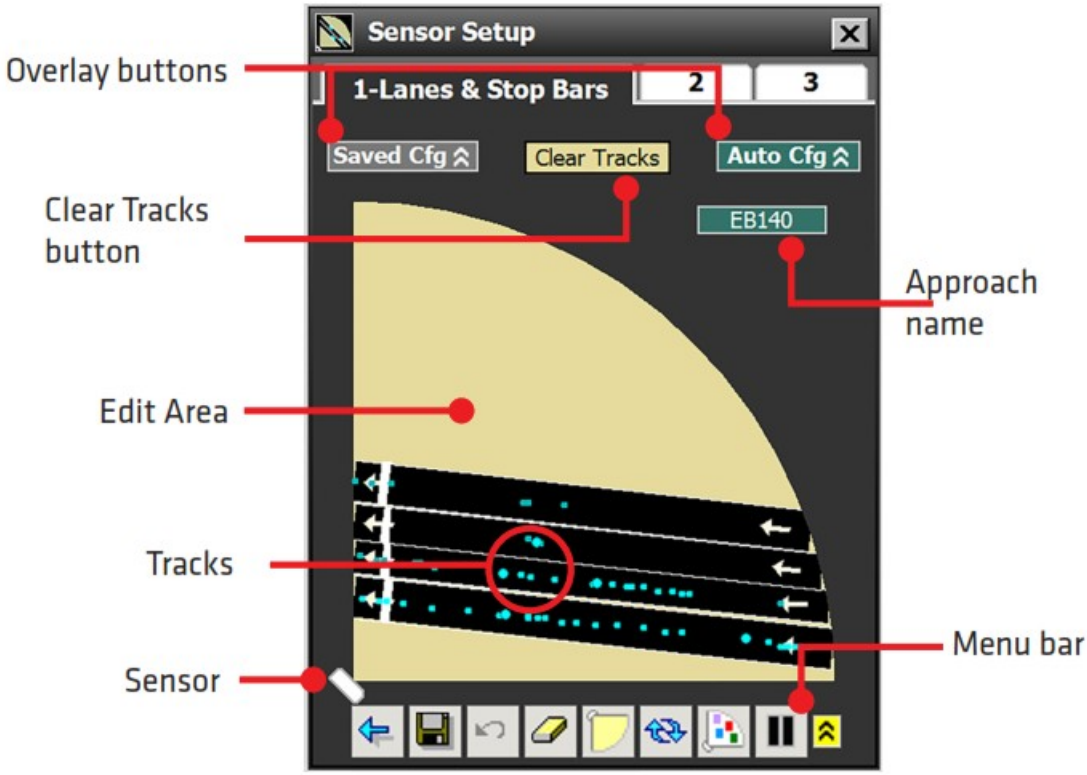

Figure 49. Lanes & Stop Bars tools

Tracks
The Sensor Setup screen shows the sensor's 140-ft. (42.7-m), 90º field of view. Vehicle detections are represented in the software by tracks, or blue dots, along the sensor's field of view. These tracks exist to show where lanes wll be configured. If desired, you can clear all the tracks from the screen by clicking Clear Tracks.

Note. Vehicle tracks are not constrained to lanes, even after you have saved sensor lane configuration.
Note. Lanes are updated as traffic moves through the sensor's field of view.

Auto Cfg overlay
The automatic configuration overlay shows lanes and stop bars that are automatically discovered by the sensor. These lanes will be blue until they are captured. Click Auto Cfg to show or hide this overlay.

Saved Cfg overlay
The saved configuration overlay shows the lanes and stop bars that you saved to the sensor. You can compare everything you see in this overlay to the changes you're making in the edit area. Click Saved Cfg to show or hide this overlay.

Using the menu bar

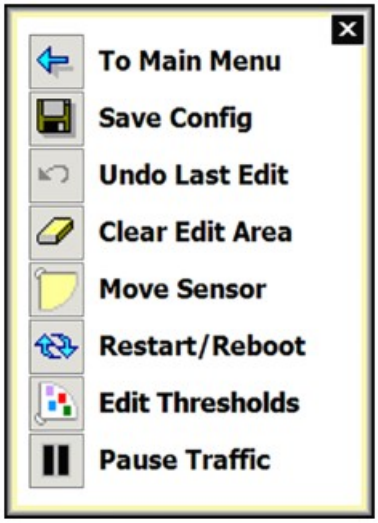

Figure 50. Lanes & Stop Bars menu bar

Setting	Description	Details
To Main Menu	Takes you back to the main screen.	N/A
Save Config	Saves lanes and stop bars to the sensor.	N/A
Undo Last Edit	Undoes the last change you made in t he edit area.	N/A
Clear Edit Area	Deletes all lanes from the edit area.	Use this before you create new lanes and stop bars.
Move Sensor	Rotates the view of the edit area.	Change this to match the software wit h the approach being detected. Purely for your convenience— does not affec t sensor performance.
Restart/Reboot	Allows you to either restart automatic configuration or reboot the sensor.	Click Restart Auto Lane Cfg to start th e auto configuration over again. Click Reboot Sensor to clear all sensor thresholds.
Edit Thresholds	Lets you edit the sensor's sensitivity t hresholds.	Use this to increase or decrease the s ensitivity of the sensor's detection.
Play/Pause Traffic	Plays/pauses tracks in the edit area.	Use this when a vehicle is in a certain position you'd like to use as a referenc e.
	Shows a description of each menu ba r button.	N/A

Lane Setup
Auto-configuring lanes

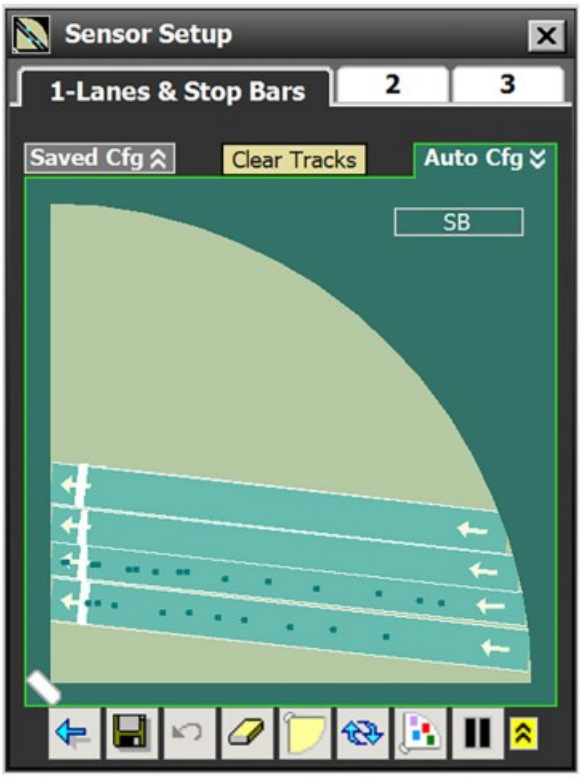

Figure 51. Automatically configuring lanes

Note. Stop bars are captured with lanes.

1. Click the Clear Edit Area button.
2. Click the Restart/Reboot button in the menu bar, select the Restart Auto Lane Cfg radio button and click OK.
3. Allow the intersection to cycle 2–3 times before proceeding.
4. Click Auto Cfg to open the auto config overlay.
5. Double click on any lane and then click either Capture Lane to capture one lane or Capture All to capture all lanes.
6. Click Auto Cfg to close the auto config overlay and the lanes will appear in the edit area.

Adding a lane

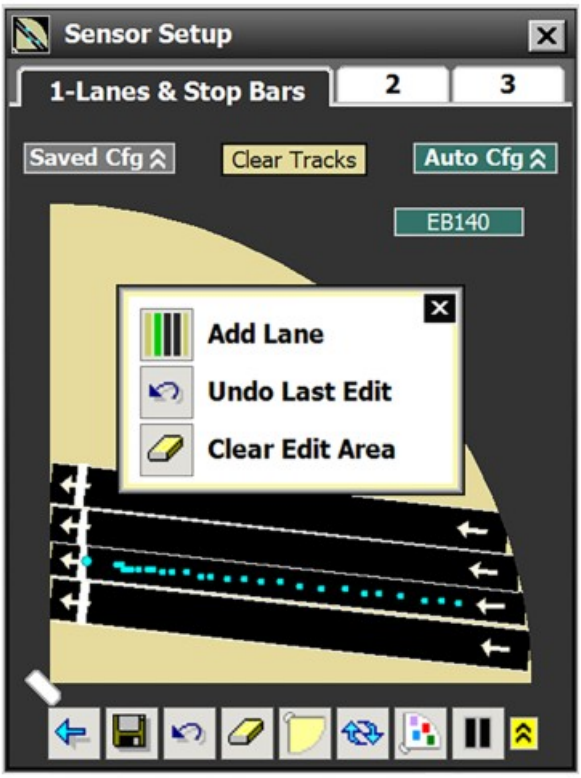

Figure 52. Adding a lane

Note. You are allowed to have a maximum of ten lanes; you will not be able to save the configuration if lanes overlap.

1. Click in the edit area where you would like to add a lane and the Edit Area window will appear.
2. Click Add Lane.

Note. You can also move lanes by clicking and dragging anywhere in the edit area.

Deleting a lane

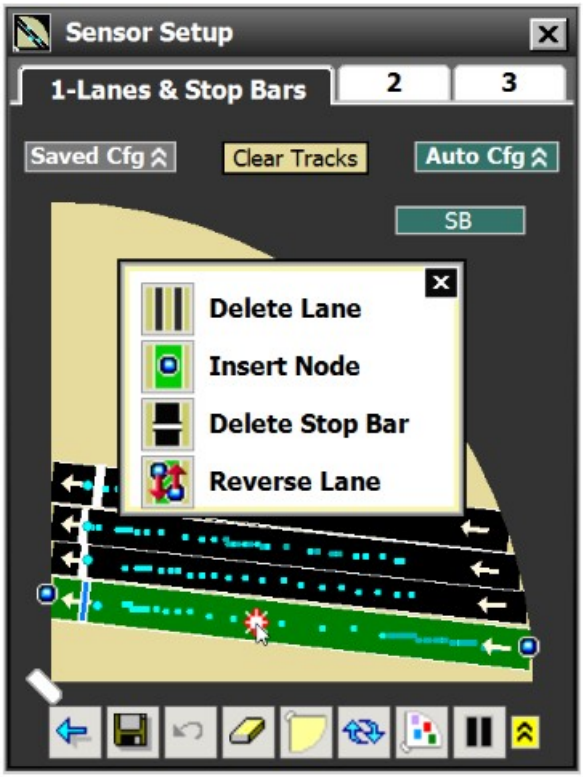

Figure 53. Deleting a lane

1. Double-click on the lane you would like to delete and the Edit Lane window will appear.
2. Click Delete Lane.

Note. Adjusting the width of a lane will impact the detection search area for that lane.

Changing the width of a lane

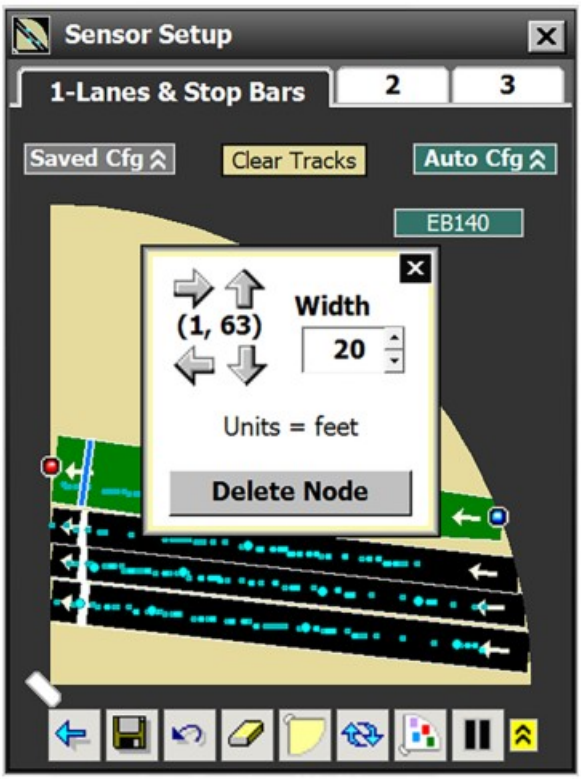

Figure 54. Adjusting lane width

Definition. A lane node is a point, placed within a lane, that can be used to adjust a lane by moving its trajectory, adding turns or corners, or widening part or all of a lane.

1. Select a lane in the edit area.
2. Click on the selected lane and then click again on the node you want to adjust.
3. Change the width of the node by clicking the direction buttons or enter the desired lane width in the Width field.
   The numbered pair between the arrows shows the (x, y) coordinates of the node within the sensor's footprint.

Creating a curve in a lane

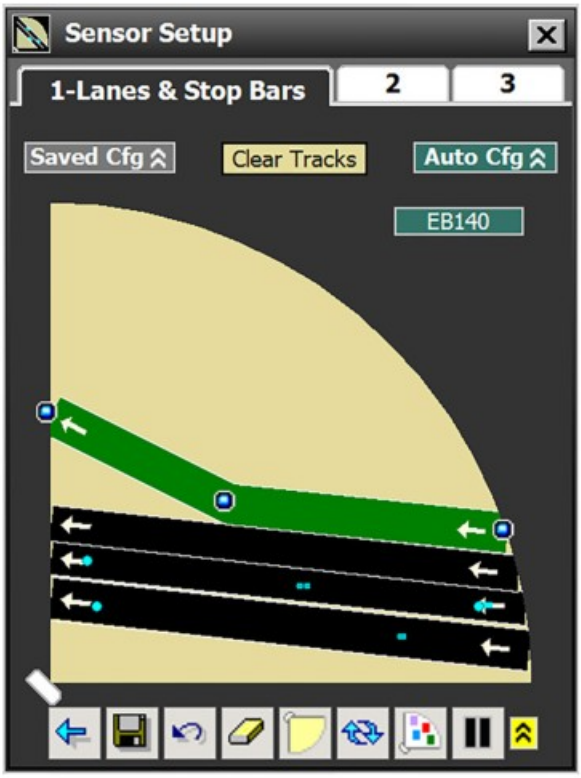

Figure 55. Moving a lane node

1. Select a lane in the edit area.
2. Click again and select Insert Node.
3. Click and drag one of the lane nodes anywhere in the edit area.
   You can also click on a node and then click on the arrows in the Node Adjustment window to move the node in the desired direction.

Note. A lane can only have up to six nodes.

Changing the path of a lane

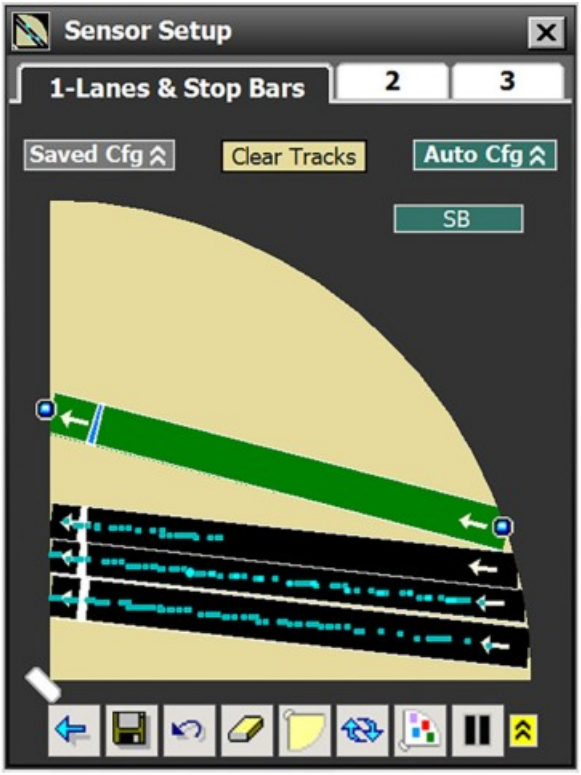

Figure 56. Changing the path of a lane

1. Select a lane in the edit area.
2. Click and drag a lane node anywhere within the edit area.

Inserting/moving/deleting a stop bar

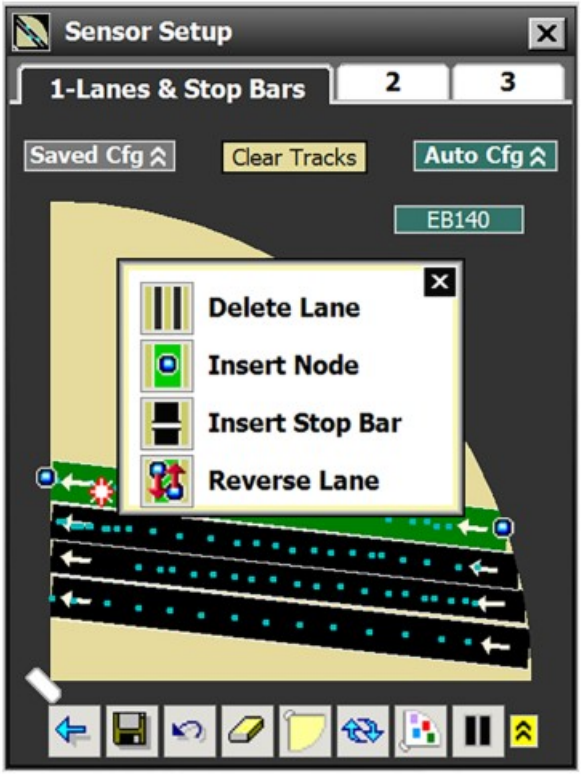

Figure 57. Inserting a stop bar

1. Select a lane in the edit area.

2. Click the lane again to bring up the Edit Lane window.
3. Click Insert Stop Bar. To delete a stop bar, click on an existing stop bar and then click Delete Stop Bar. To move the stop bar, either click and drag it anywhere along the lane or click on the stop bar and then use the arrows in the adjustment window. The number between the arrows shows the distance from the lane's end node.

Changing lane arrows

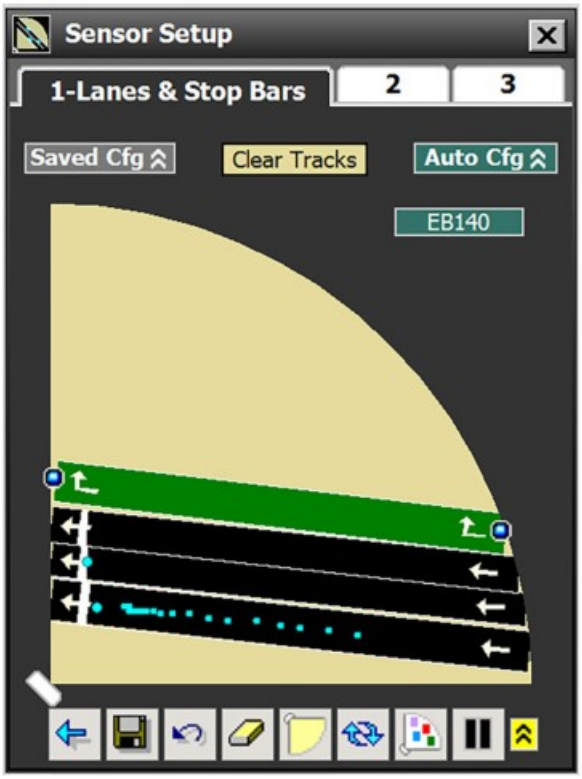

Figure 58. Changing the lane arrows

1. Click on the lane with the arrows you want to change.
2. Click the lane arrow to cycle through the lane arrow options.

Changing the direction of a lane

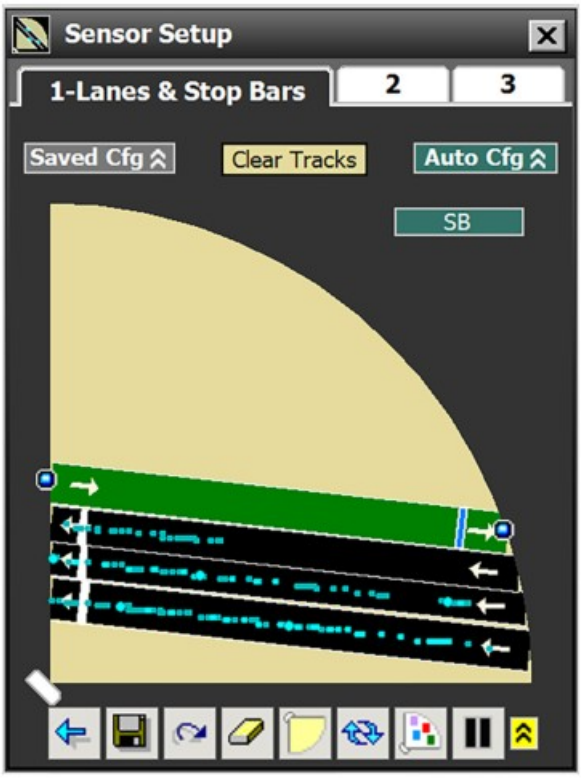

Figure 59. Changing lane direction

1. Select a lane in the edit area.
2. Click the lane again and then select Reverse Lane.

Edit Thresholds
Adjusting all thresholds

Note. Adjusting thresholds impacts the detection of vehicles. When adjusting, you should not change the value more than 2dB in either direction at one time. After each adjustment, save the settings and check the performance of the sensor. Contact Wavetronix for more information regarding thresholds and how to adjust them.

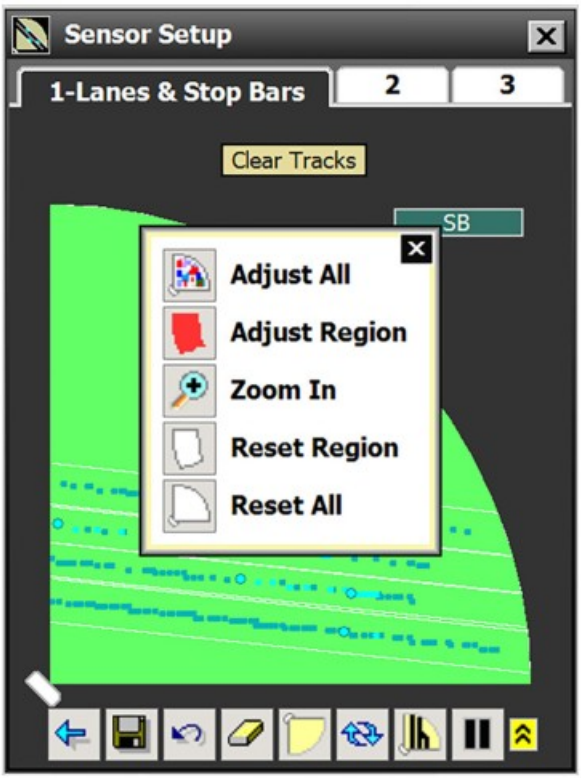

Figure 60. Changing sensor thresholds

1. Click the Edit Thresholds button. This will change the color of the sensor's footprint and allow you to change the sensitivity of certain areas in the footprint.
2. Click anywhere within the sensor's footprint and the Sensitivity window will appear.
3. Click Adjust All and the sensitivity slider window will appear.

   Note. Negative values will increase sensitivity; positive values will decrease sensitivity.

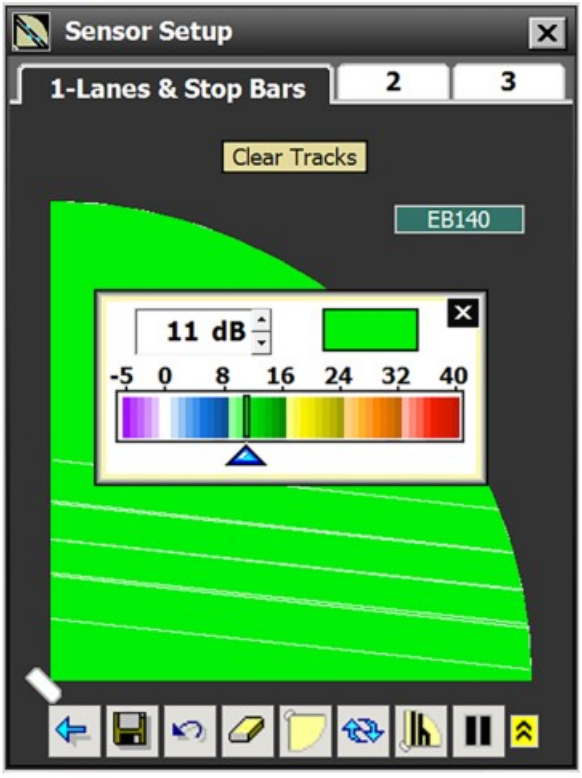

Figure 61. Adjusting sensitivity levels

4. Click the arrow buttons to change the sensitivity (in decibels).

Adjusting a region of thresholds

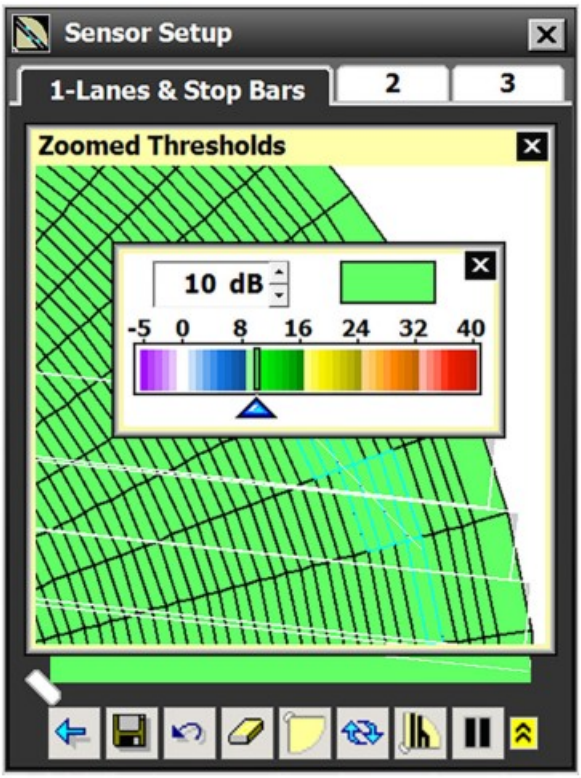

Figure 62. Adjusting a region

1. Click the Edit Thresholds button. This will change the color of the sensor's footprint and allow you to change the sensitivity of certain areas in the footprint.
2. Click anywhere within the sensor's footprint and the Sensitivity window will appear.
3. Click Zoom In.
4. Click and drag on the threshold region(s) you would like to change and the sensitivity slider window will appear.
5. Click the arrow buttons to change the sensitivity (in decibels).

Resetting all thresholds

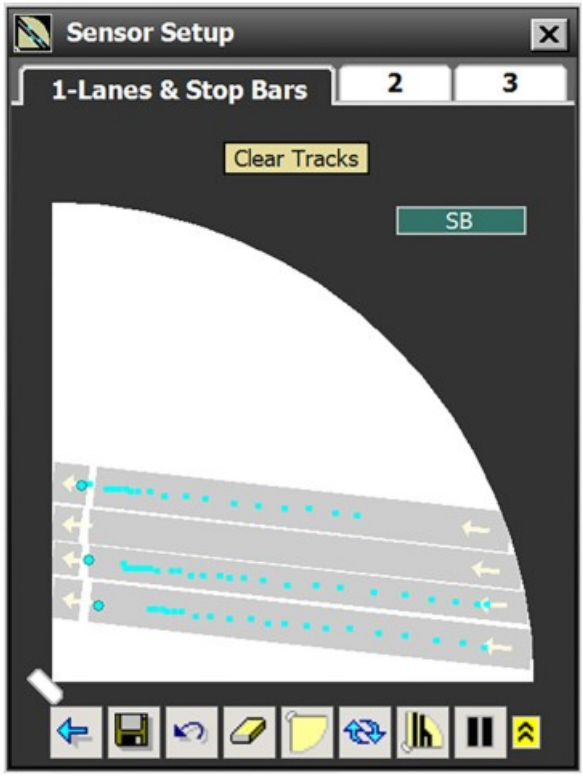

Figure 63. Resetting all thresholds

1. Click the Edit Thresholds button. This will change the color of the sensor's footprint and allow you to change the sensitivity of certain areas in the footprint.
2. Click anywhere within the sensor's footprint and the Sensitivity window will appear.
3. Click Reset All.

Configuring Zones & Channels

Figure 64. Zones & Channels screen

Click tab 2 on the Sensor Setup screen to open the Zones & Channels tab.

Zones & Channels tab

Note. Each SmartSensor Matrix supports up to 16 zones and 16 channels.

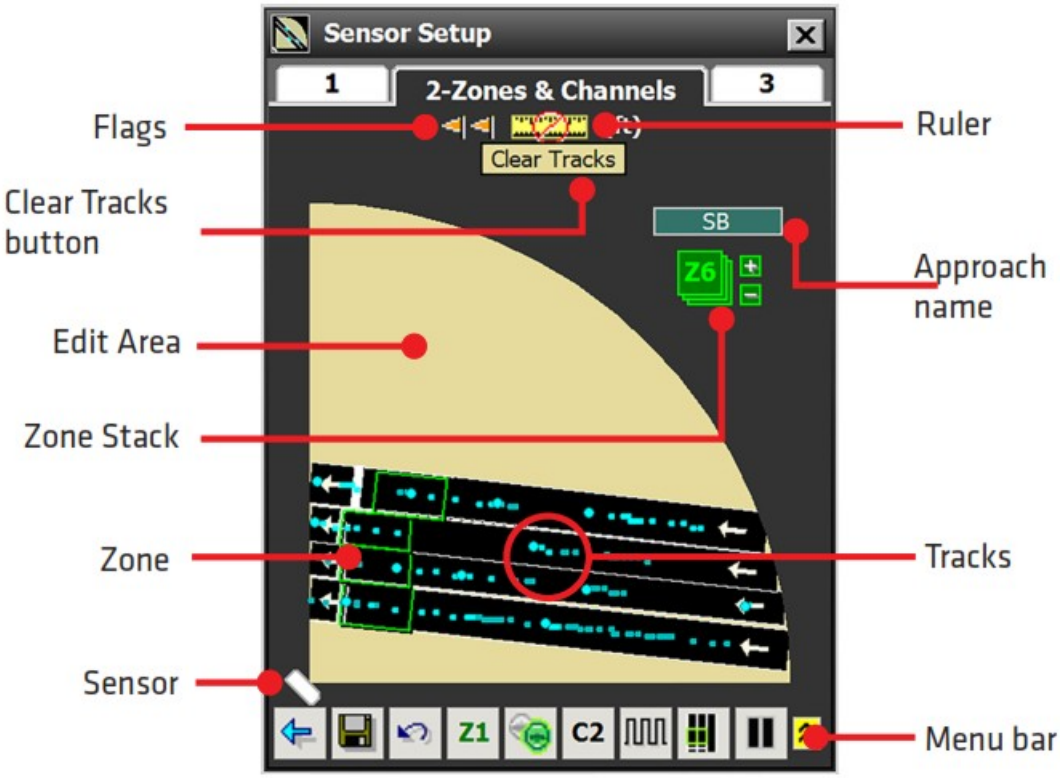

Figure 65. Zones & Channels tab

Tracks
The Sensor Setup screen shows the sensor's 140-ft. (42.7-m), 90º field of few. Vehicle detections are represented in the software by tracks, or blue dots, along the sensor's footprint. You can clear these tracks from the screen by clicking Clear Tracks.

Measuring tools
Click a zone and then click the ruler icon to see that zone's dimensions. A red and blue flag will appear inside the zone and can be used to measure the distance from that zone to anywhere in the edit area. The flags at the top of the screen can also be dragged anywhere in the edit area to find the distance between two objects in the sensor's footprint.

Using the menu bar

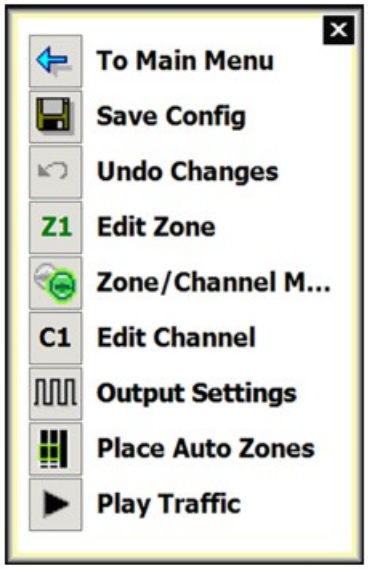

Figure 66. Zones & Channels menu bar

Setting	Description	Details
To Main Menu	Takes you back to the main screen.	N/A
Save Config	Saves lanes and stop bars to the sensor.	N/A
Undo Changes	Undoes the last change you made in t he edit area.	N/A
Edit Zone	Allows you to move a zone, add delay /extend settings, and create small zon es for counts.	Use this to make changes to a zone.
Zone/ Channel Map	Lets you quickly map zones to channels.	Use this table to set up your zone/channel mapping. Click and drag to see all 16 channels.
Edit Channel	Lets you select channel type, apply a nd/or logic, invert a zone, map zones t o channels, change delay/extend setti ngs, and choose min and max speeds .	Use this to make changes to a channe l.
Output Settings	Lets you change delay/ extend setting s for channels, change minimum puls e width, and change pulsed channel width.	Use this to quickly see all channel sett ings at a glance.
Place Auto Zones	Lets you replace zones with auto zon es.	Use this if you want each lane to have a 20-ft. zone, starting at the stop bar. Create custom auto zones by selectin g <new> in the drop-down list.
Play Traffic	Plays/pauses tracks in the edit area.	Use this when a vehicle is in a certain position you'd like to use as a referenc e.
	Shows a description of each menu ba r button.	N/A

Zones

Adding auto zones

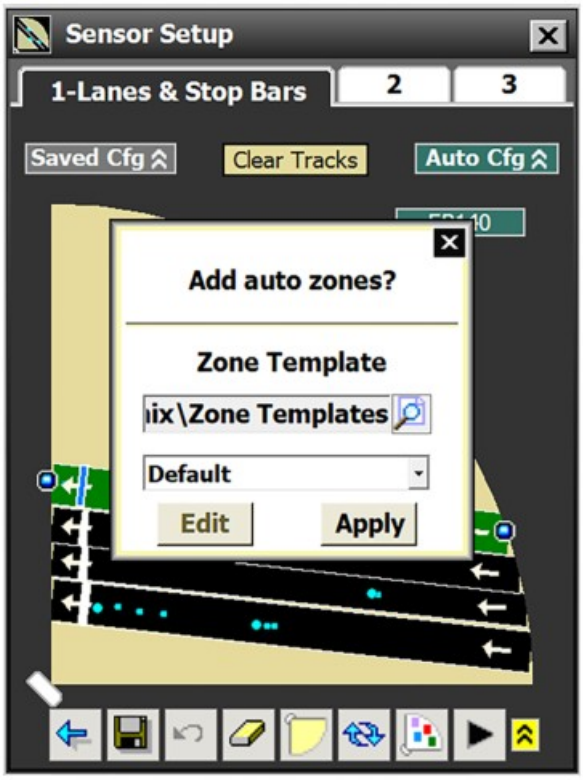

Figure 67. Adding auto zones

1. Click tab 2 and the Add auto zones? window will appear if lanes have a stop bar configured.
2. Select Default from the drop-down menu.
3. Click Apply and a 20-ft. zone will be placed in each configured lane.

Zone templates

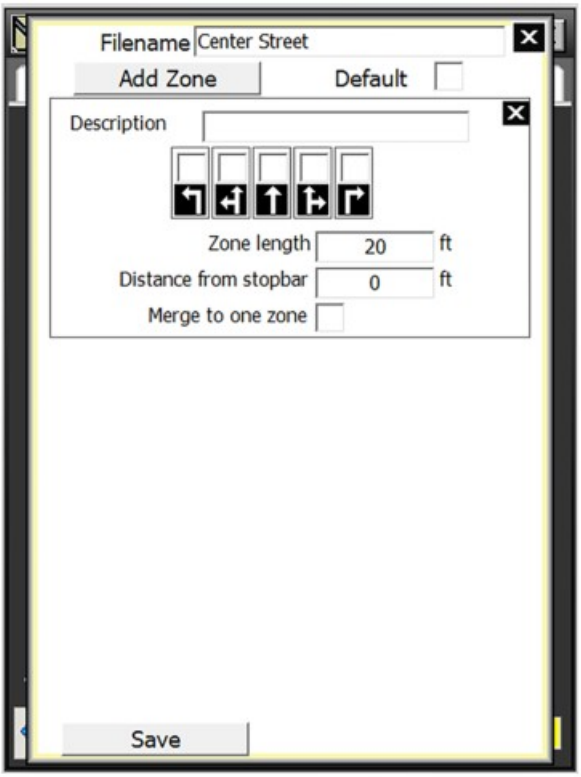

Figure 68. Creating a zone template

1. Select <new> from the drop-down menu in the Add auto zones? window and then click Edit.
2. Enter a filename. This filename will appear in the Zone Template drop-down menu.
3. Click Add Zone.
4. Enter a description of the zone and select which lane type you would like to apply auto zones to.
5. Enter the length you would like the auto zones to be.
6. Enter the distance you want the auto zones from the stop bar. If you enter a negative number in this field, the zone will be placed after the stop bar.
7. Check the Merge to one zone checkbox if you want one zone across the selected lane type.
8. Click Save.

Note. Check the Default checkbox to make this your default auto zone template.

Adding a zone to the road

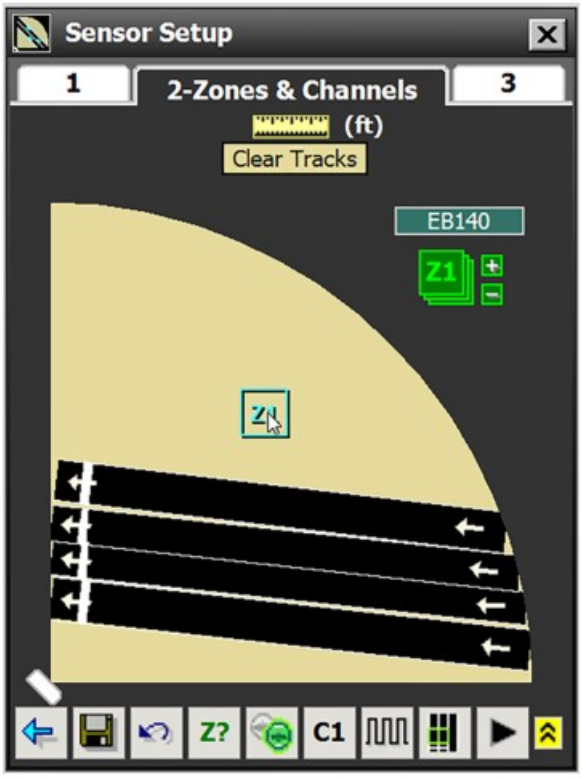

Figure 69. Placing zones

1. Click and drag a zone from the zone stack to the edit area.
2. Place the zone anywhere along the lane(s).

Zone stack
Click the plus/minus buttons by the zone stack to cycle through zones.
Place zones back in the zone stack by clicking and dragging them off the edit area.

Moving a zone

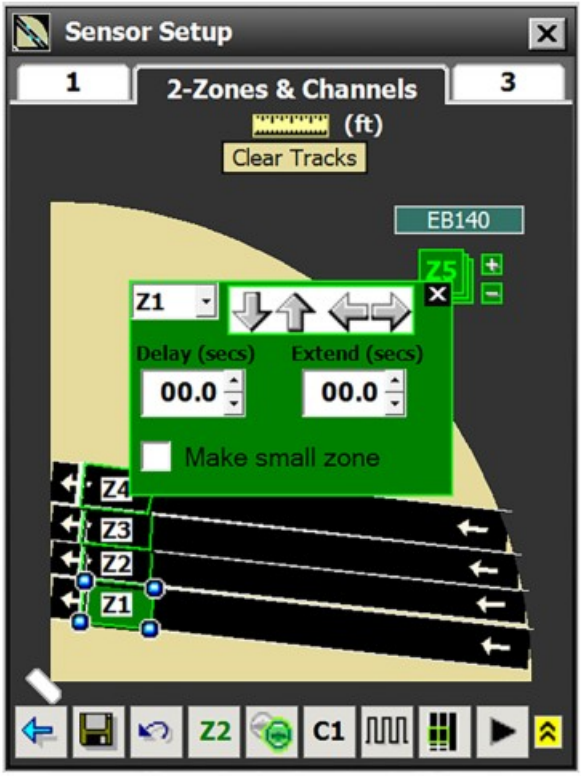

Figure 70. Editing zones

1. Select the zone you want to move and click the Edit Zone button.
2. Move the zone either by using the arrows in the Edit Zone window or by clicking and dragging the zone anywhere along the approach.

Note. Zones cannot extend past the edit area.

Resizing a zone

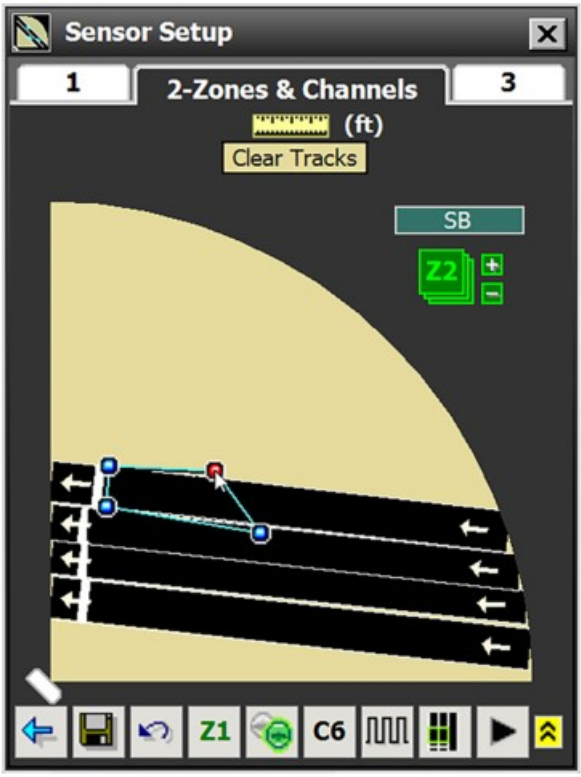

Figure 71. Changing the size of a zone

1. Click on the zone you want to resize.
2. Click and drag the corners of the zone.

Deleting a zone

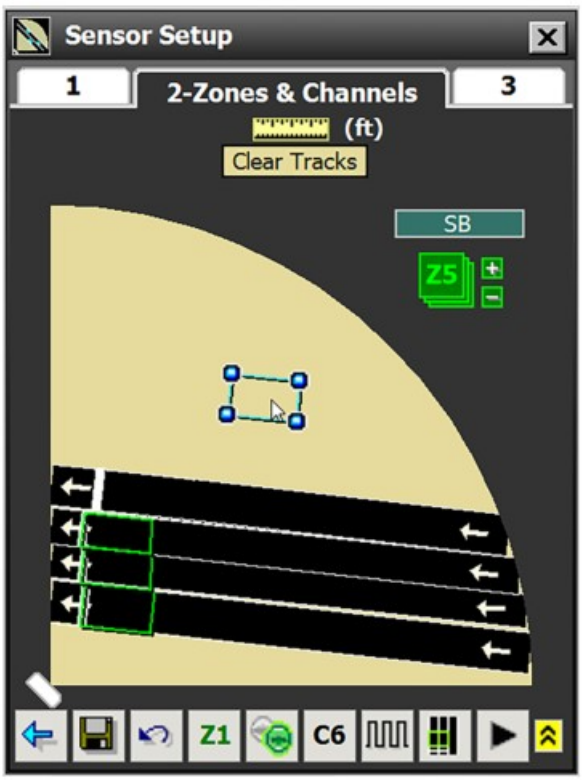

Figure 72. Deleting a zone

1. Select the zone you want to delete.

2. Click and drag the zone back to the zone stack or anywhere outside the edit area.

Note. The Make a small zone feature allows you to create two-foot zones, which are typically used for counting applications.

Making a small zone

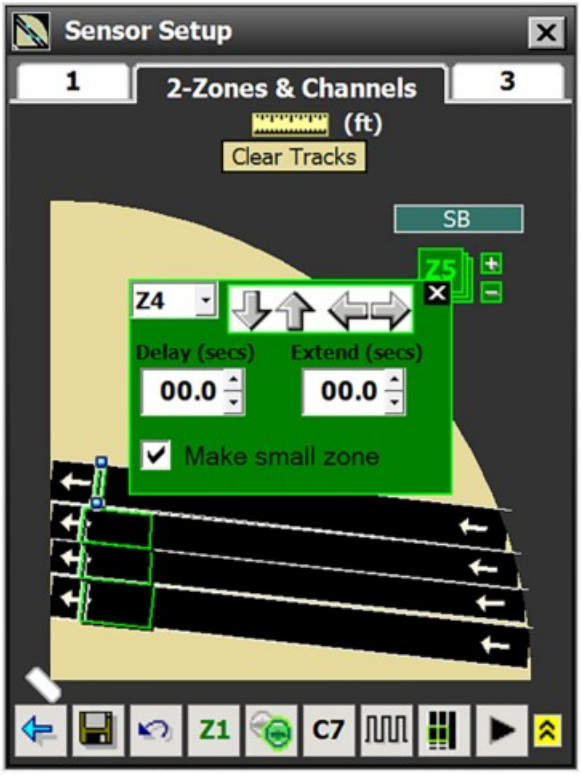

Figure 73. Making a small zone

1. Select the zone you want to make small.
2. Click Edit Zone in the menu bar.
3. Check the Make small zone checkbox.

Changing delay/extend settings for a zone

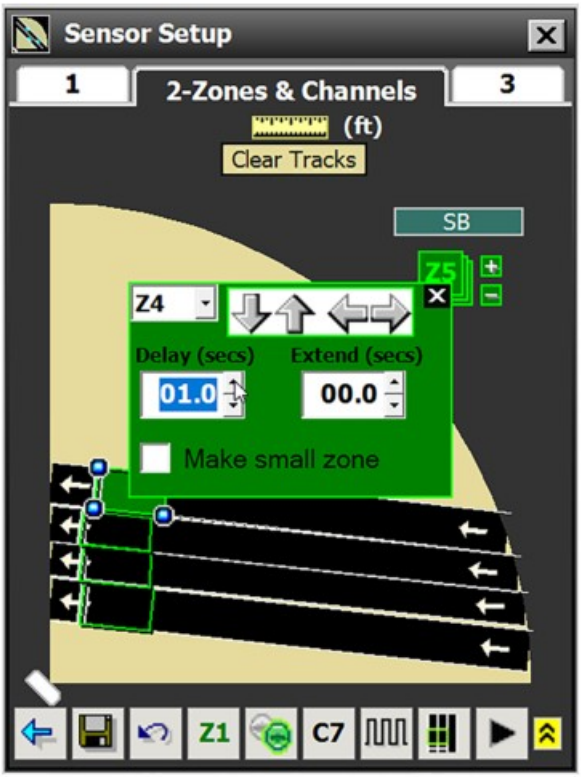

Figure 74. Changing zone delay/extend time

Note. It is recommended that you change delay/ extend settings in the traffic controller before changing delay/extend settings in the SSMA software.

1. Select the zone you want to change.
2. Click Edit Zone in the menu bar.
3. Use the up/down arrows to change the delay/extend time.

Channels
Mapping zones to channels

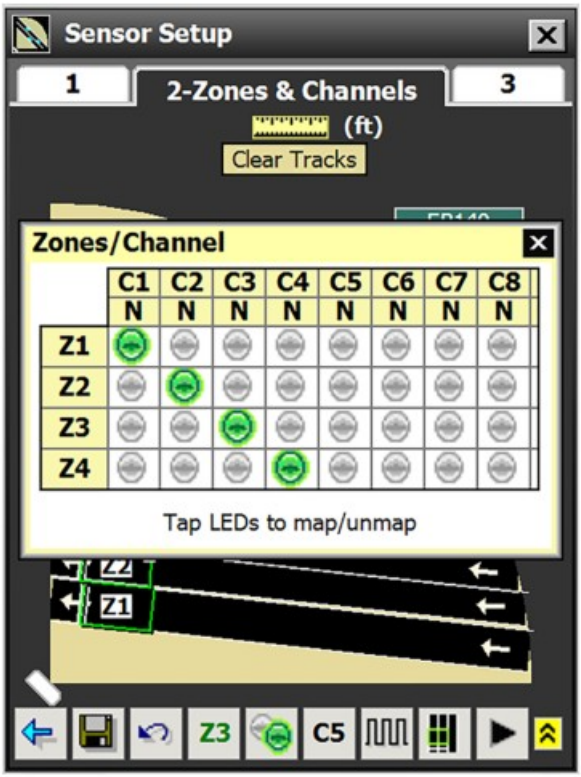

Figure 75. Zone/Channel mapping

Note. The channel column shows the channel number and type (N=normal, C=count, P=pulse). To edit channels 9—16, click anywhere in the table and drag to the left.
Note. Clicking on the zone number in the zone column will highlight that zone in the edit area.

1. Click the Zone/Channel Map button in the menu bar.
2. Determine which zone(s) you would like to map to which channel(s).
3. Map the zone row to the channel column by clicking the gray LEDs. A zone is mapped to a channel when the LED is green.

Using the Edit Channel window

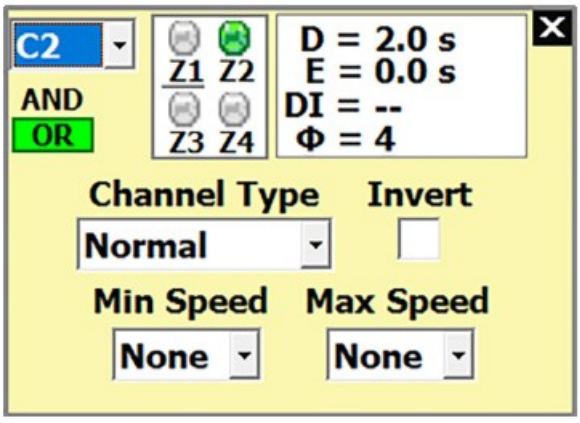

Figure 76. Edit Channel window

Setting	Description	Details
Channel selection	Lets you cycle through different channels and edit settings without leaving the Edit Channel window.	N/A
AND/OR	Allows you to apply AND/ OR logic to the channel.	Click AND or OR to apply logic. AND logic means that all mapped zones have to be active to trigger the channel. OR logic means that any activity in any mapped zone will trigger the channel.
Zone mapping	Lets you quickly map currently configured zones to the channel.	Click the zone LED to map that zone to the channel.
Delay	Ignores outputs that are shorter than the specified delay time.	Click anywhere in the white box and use the up/ down arrows to change the delay setting in the Output Settings window.
Extend	Continues a channel output until the time specified runs out.	Click anywhere in the white box and use the up/ down arrows to change the extend setting in the Output Settings window.
DI (Detector Input)	Allows you to map inputs to the intersection phase in the controller. The default is “00,” which means the detector input is unassigned.	Purely for reference— does not affect sensor or controller performance.
Φ (Phase)	Allows you to map inputs to the intersection phase in the controller. The default is “00,” which means the detector input is unassigned.	Purely for reference— does not affect sensor or controller performance.
Invert	Allows the channel output to be inverted.	When checked, the channel output will remain on until a vehicle is detected.
Min Speed	Lets you set a minimum speed for the channel.	Select a minimum speed from the drop-down list.
Max Speed	Lets you set a maximum speed for the channel.	Select a maximum speed from the drop-down list.

Channel Type – Normal Channel

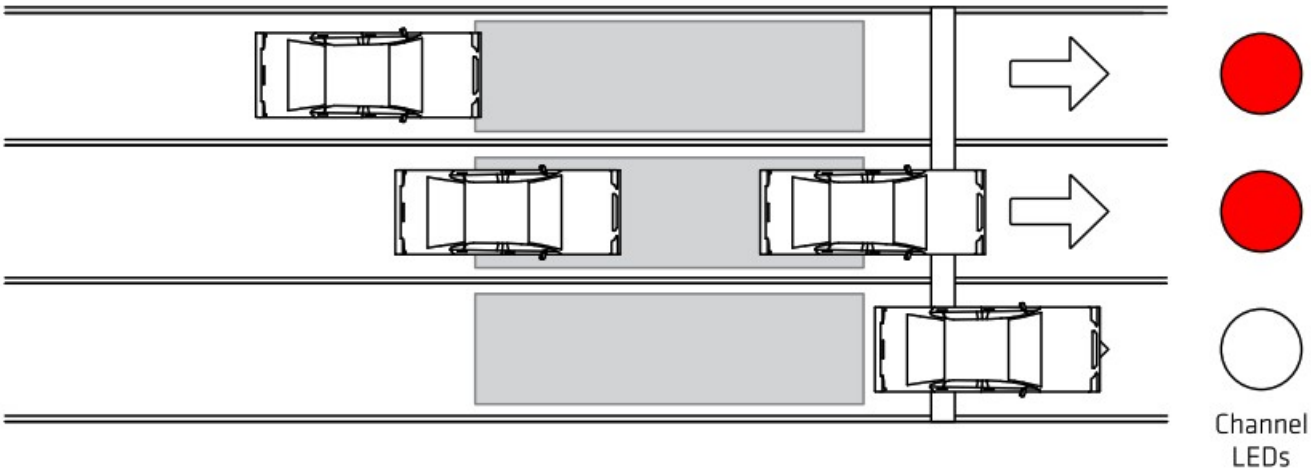

Figure 77. Normal Channel

Note. The leading edge of a car refers to the front end of it. The leading edge of a zone refers to the edge that a car crosses as it enters the zone.

Normal channel	Detects vehicle presence in the zone.	Is activated as soon as the leading ed ge of a vehicle breaks the plane of the leading edge of a zone. If there are no delay or extend settings, the zone will remain activated until the vehicle has exited the zone.

Channel Type – Counting Channel

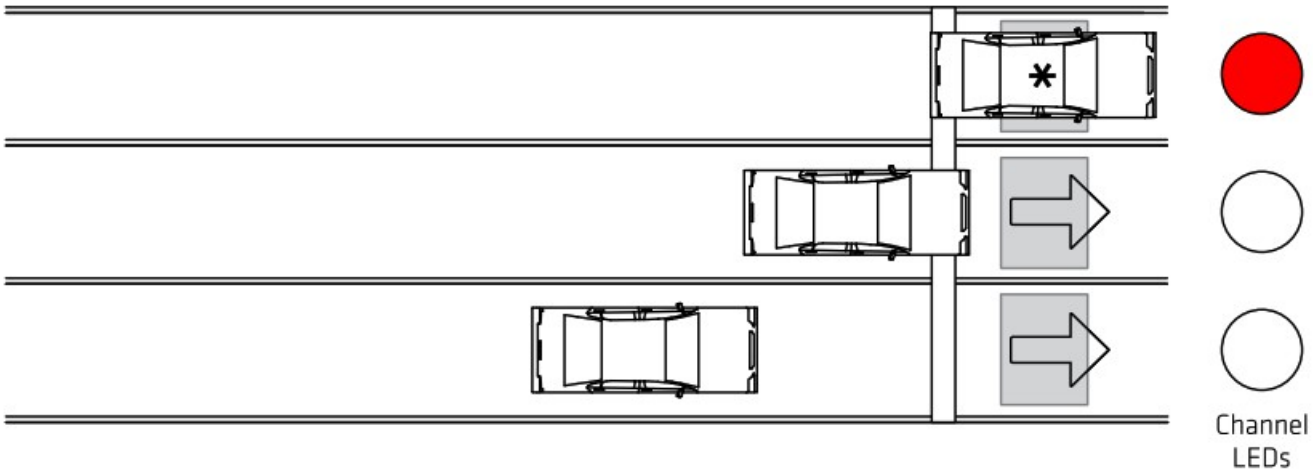

Figure 78. Counting Channel

Counting channel	Counts vehicles as they pass through the zone.	Is activated when the middle of the ve hicle crosses the leading edge of the zone. The output stays on for the duration of the Pulsed Channel Width setting.

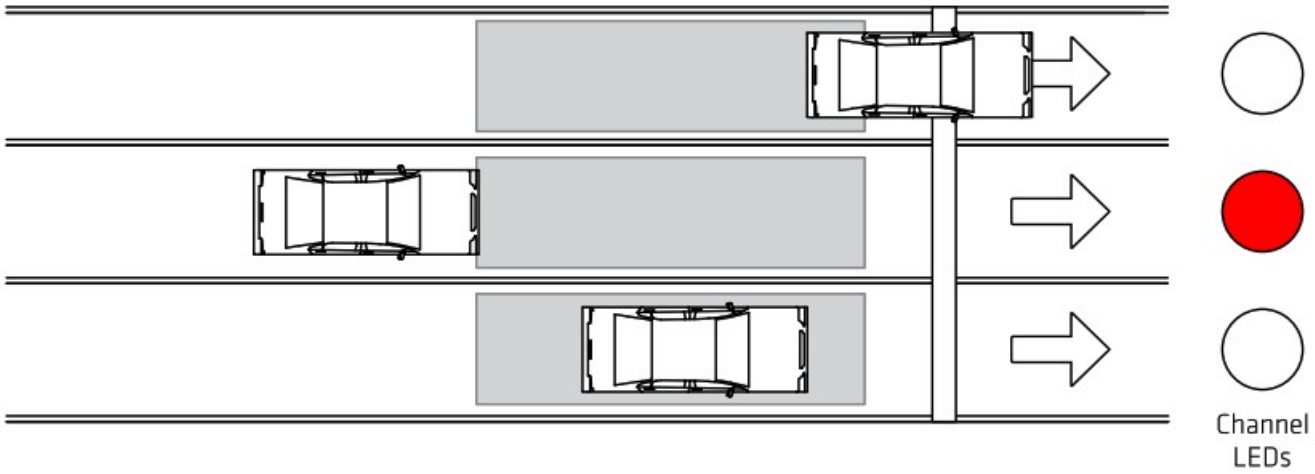

Figure 79. Pulse Channel

Pulse channel	Sends a quick pulse when a vehicle is detected.	Is activated for a very short period of ti me when the front edge of a vehicle cr osses the leading edge of a zone. A n ew pulse will be sent only after a car e nters a zone while the zone is empty. You can configure how long you want the pulse to be by changing the Pulsed Channel Width s etting in the Output Settings window.

Adding delay/extend time for a channel

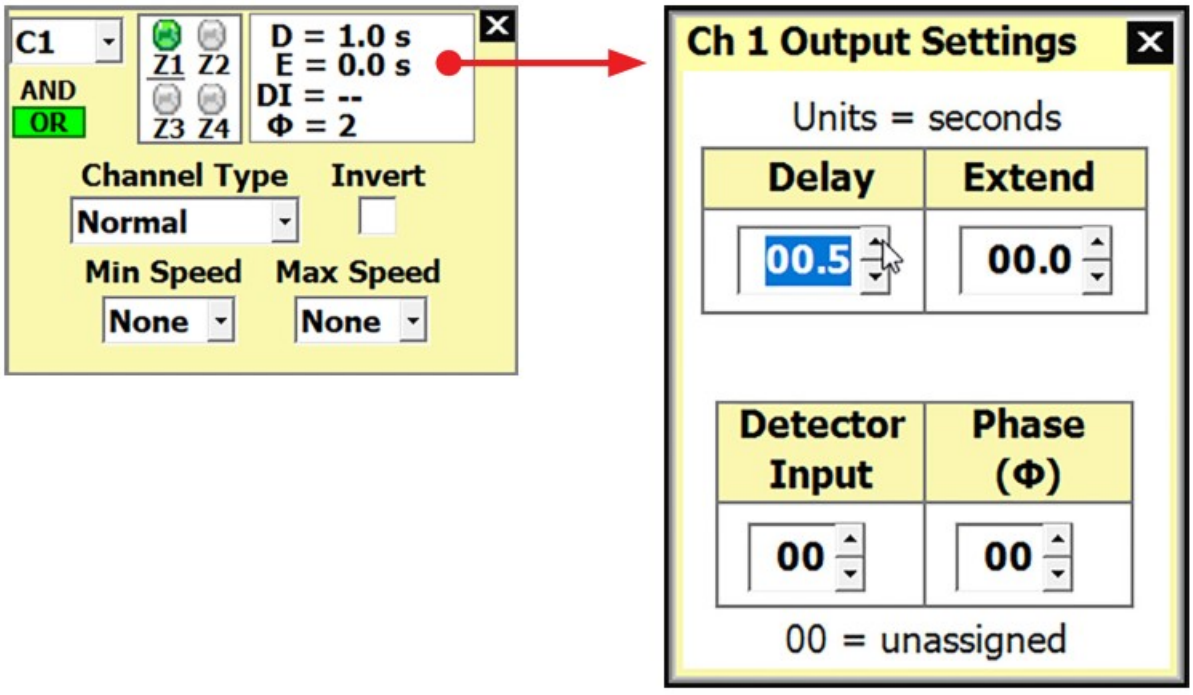

Figure 80. Adding delay/extend settings

1. Click the Edit Channel button.
2. Click anywhere in the top-right part of the Edit Channel window and the Output Settings window will appear for

that channel.

3. Add delay or extend time using the up/down arrows.

Note. These settings are for reference purposes only and do not affect sensor or controller performance.

Changing detector input and phase

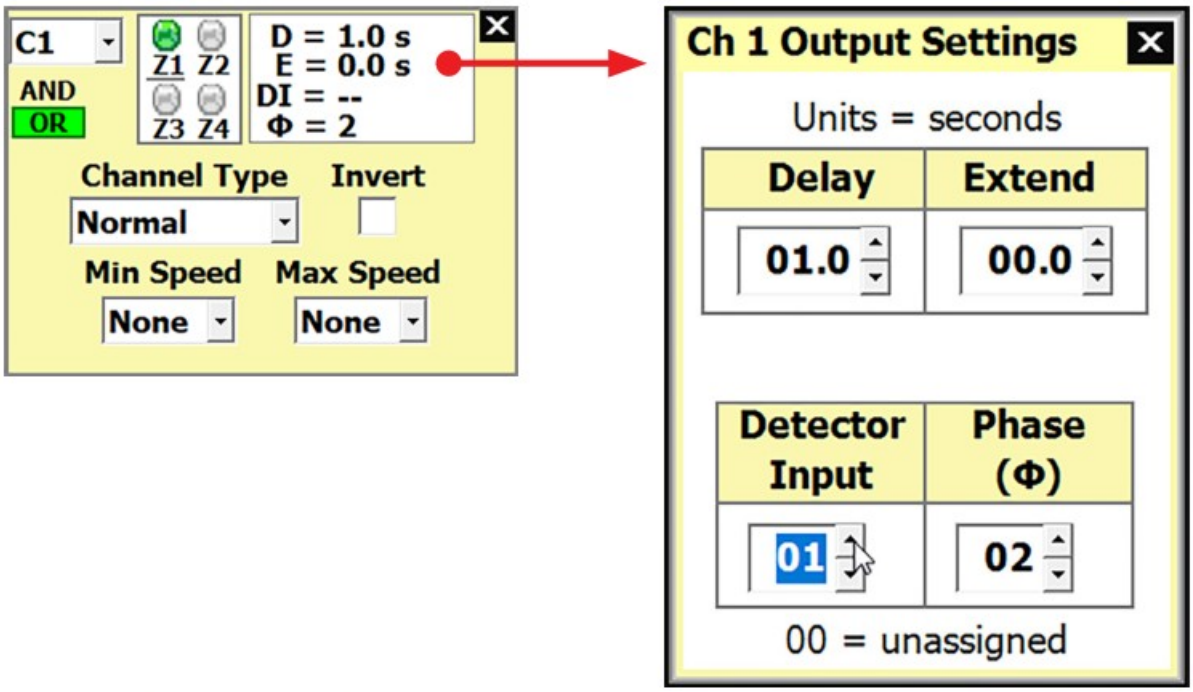

Figure 81. Changing the detector input and phase

1. Click the Edit Channel button.
2. Click anywhere in the top-right part of the Edit Channel window and the Output Settings window will appear for that channel.
3. Use the up/down arrows to change both the Detector Input and Phase.

Using the Output Settings window

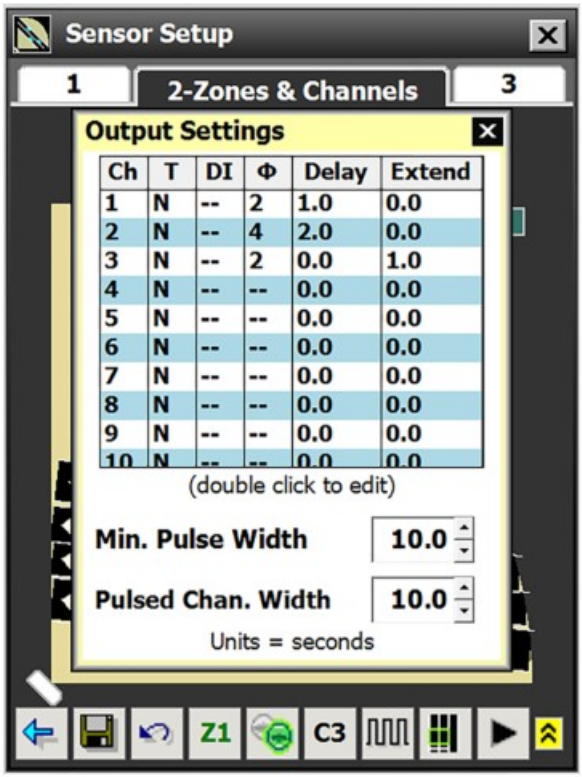

Figure 82. Output Settings window

Note. Double-click on any channel row to see the output settings for that specific channel.

Setting	Description	Details
Ch	Channel	N/A
T	Channel Type	N/A
DI	Detector Input	Double-click on the row to change this setting.
Φ	Phase	Double-click on the row to change this setting.
Delay	Delay	Double-click on the row to change this setting.
Extend	Extend	Double-click on the row to change this setting.
Min. Pulse Width	The minimum duration a presence detection will be signaled via the contact closure rack cards.	This may be useful if you are using the Matrix for counts. Contact Wavetronix Technical Support before changing this setting.
Pulsed Chan. Width	The duration the contact closure message lasts for a pulse or counting channel.	This may be useful if you are using the Matrix for counts. Contact Wavetronix Technical Support before changing this setting.

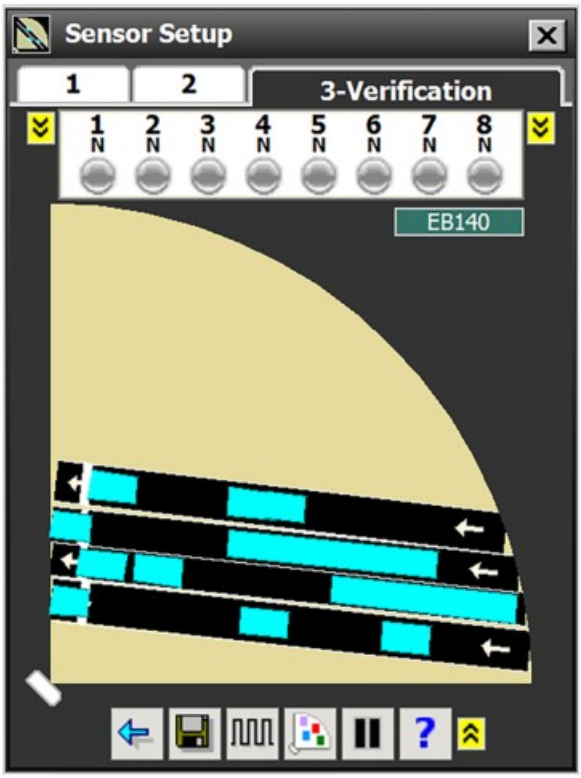

Figure 83. Verification screen

Click tab 3 on the Sensor Setup screen to open the Verification tab.
In this tab, instead of tracks, vehicle detections will now appear as light blue rectangles.

Verification tab

Note. The letter under the channel number represents the channel type (N=normal, C=count, P=pulse, I=inverted).
To see channels 9–16, click the yellow down arrows.

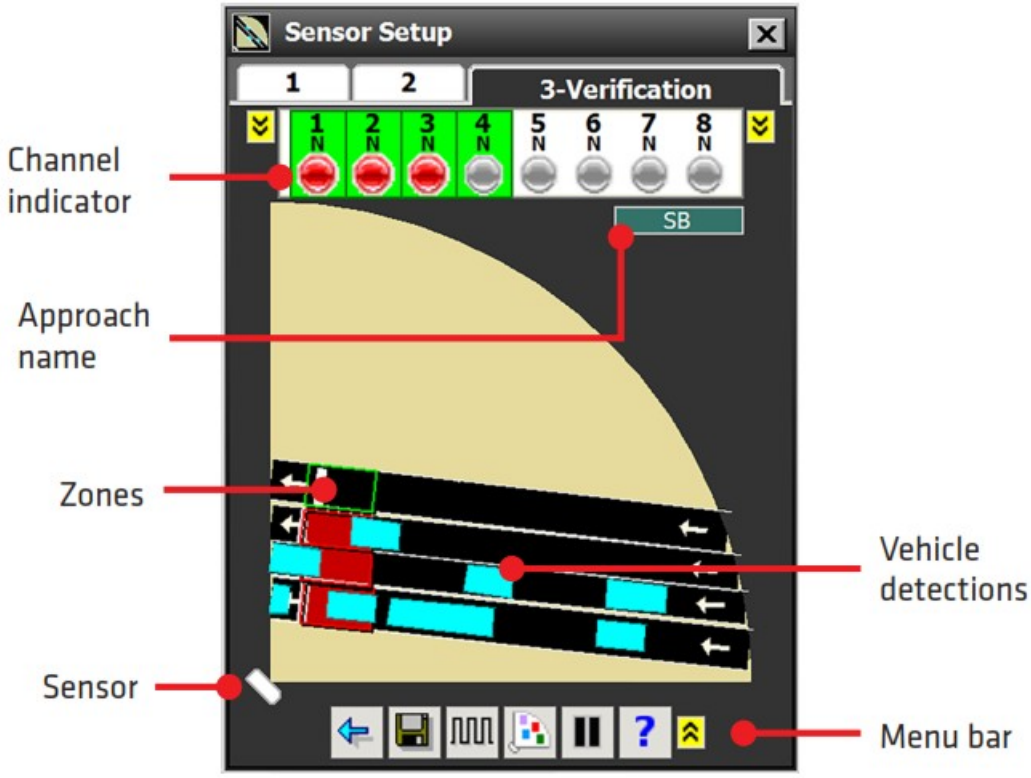

Figure 84. Verification screen

Note. Zones must be mapped to a channel to be visible in the Verification window.

Channel Indicators

The channel LEDs will turn red when vehicles enter a zone that is mapped to that channel. Click a channel indicator to see the zones mapped to that channel. Click and hold on a channel indicator to see channel settings.

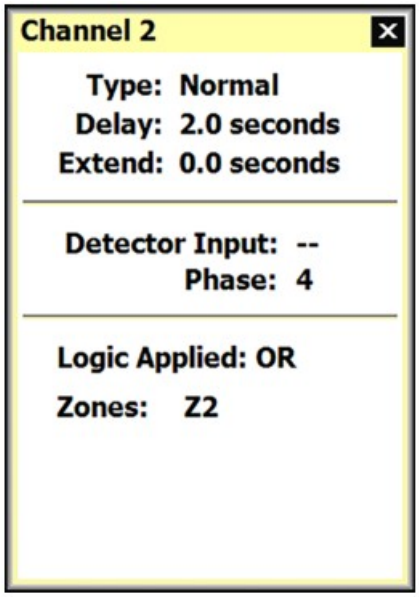

Figure 85. Channel settings

Using the menu bar

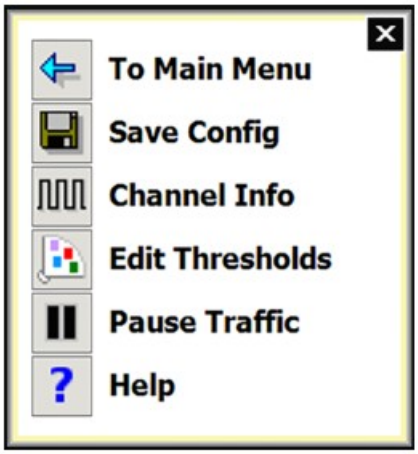

Figure 86. Verification menu bar

Setting	Description	Details
To Main Menu	Takes you back to the main screen.	N/A
Save Config	Saves threshold changes.	N/A
Channel Info	Shows channel settings and lets you t roubleshoot channel outputs.	Use this to verify channel settings, counts, and channel outputs. Click and drag to see all 16 channels.
Edit Thresholds	Lets you edit the sensor's sensitivity.	Use this to increase or decrease the s ensitivity of the sensor's detection.
Play/Pause Traffic	Plays/pauses tracks in the edit area.	Use this when a vehicle is in a certain position you'd like to use as a referenc e.
Help	Shows a list of channel types for refer ence.	N/A
	Shows a description of each menu ba r button.	N/A

Lane Verification

Verifying your configuration

Verifying lanes and outputs means comparing the detection data in the SSMM software with the actual traffic at the intersection; you can observe the intersection traffic yourself, or record it using a separate device. Make sure the sensor is detecting moving and stopped vehicles in all lanes.

Note. You can turn this feature off by unchecking the Queue Forming checkbox in the Advanced tab of the Sensor Settings screen.

Queue extension

When vehicles stop before and after a zone, the stopped vehicle queue is extended to fill the space between the two vehicles. This ensures that a queue of vehicles that extends in front and behind a zone will always activate the zone even if the vehicles are not directly over it.

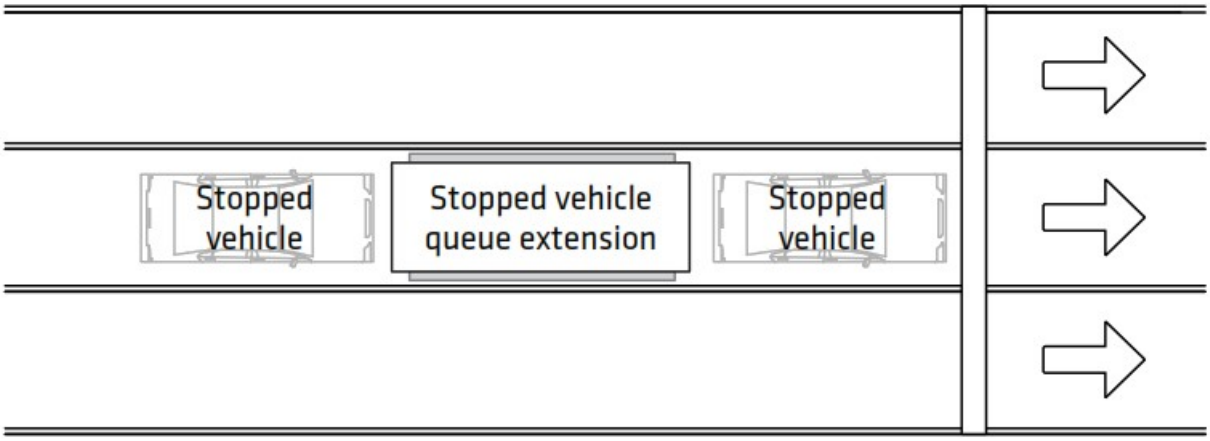

Figure 87. Queue extension

If a vehicle stops within 30 feet of the stop bar, the stopped vehicle queue will be extended to the stop bar. This ensures that a vehicle will activate a zone even if it stops behind the zone.

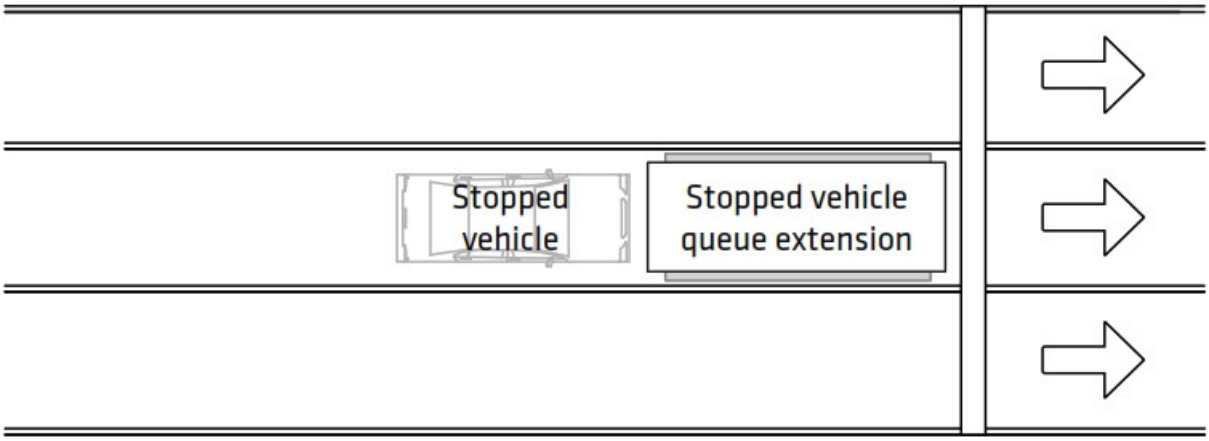

Figure 88. Queue extension

Using the Channel Info window

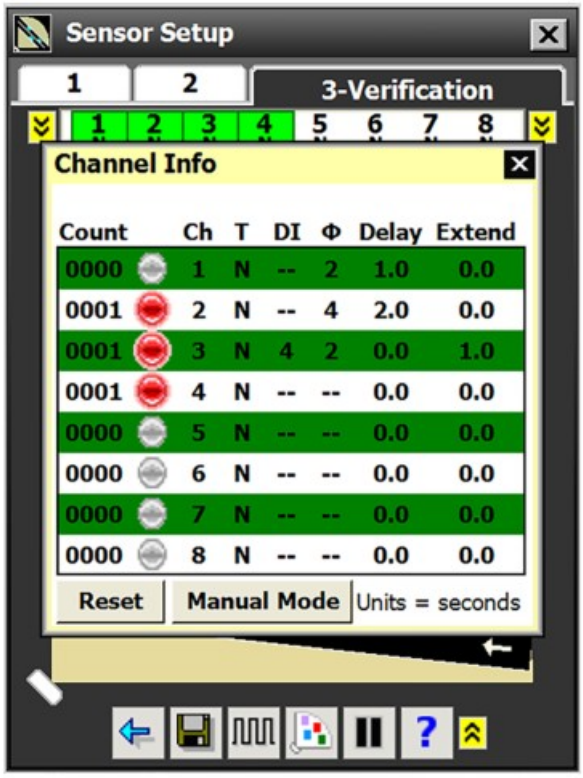

Figure 89. Channel Info window

Setting	Description	Details
Count	Shows the counts as detected by the sensor.	Use this to verify the sensor is detecting vehicles in the approach. Click Reset to set counts back to 0.
Ch	Channel	N/A
T	Channel type. Lets you see if the cha nnel is N=normal, C=counting, P=pulse or I=inverted.	N/A
DI	Detector input	N/A
Φ	Phase	N/A
Delay	Delay setting in seconds.	N/A
Extend	Extend setting in seconds.	N/A

Manual/Sensor Mode

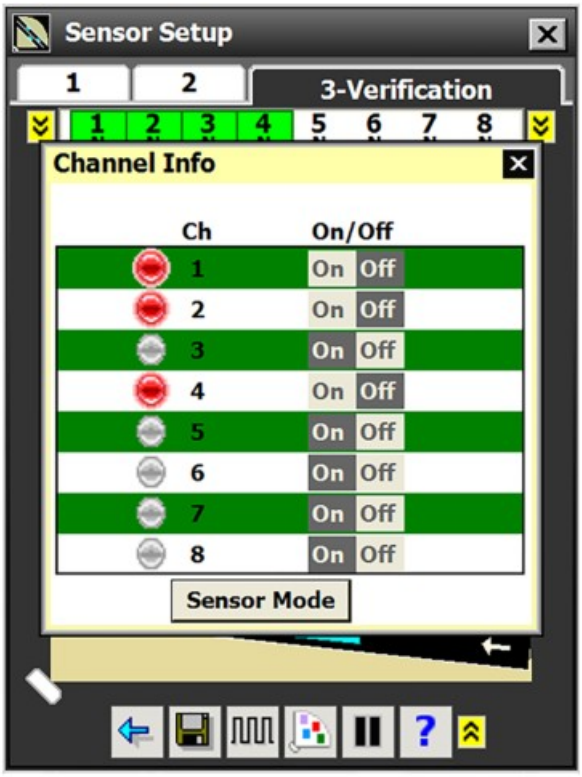

Figure 90. Manual mode

Click the Manual Mode button at the bottom of the Channel Info window. Here you can manually turn the channel outputs on and off to make sure the call is being placed to the correct output.

Edit Thresholds
Adjusting all thresholds

Note. You can also edit thresholds in the Lanes & Stop Bars tab (see Chapter 7).
Note. Adjusting thresholds impacts the detection of vehicles. When adjusting, you should not change the value more than 2dB in either direction at one time. After each adjustment, save the settings and check the performance of the sensor. Contact Wavetronix for more information regarding thresholds and how to adjust them..

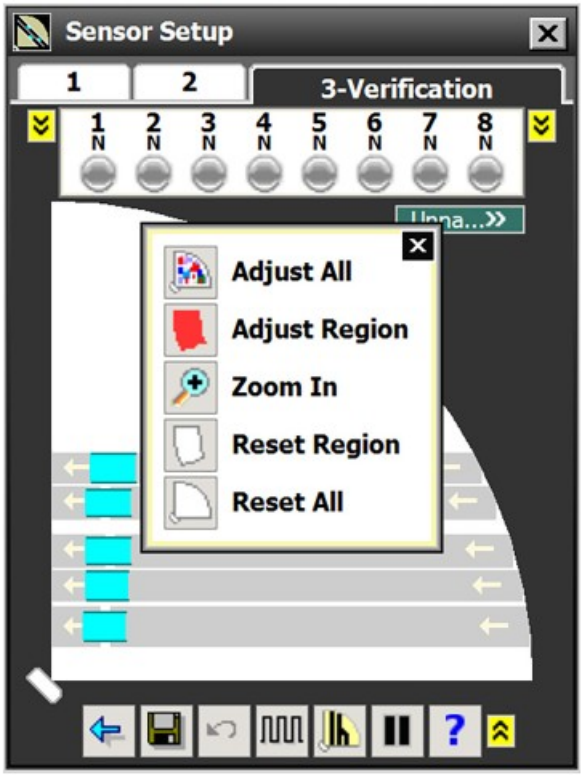

Figure 91. Changing sensor thresholds

1. Click the Edit Thresholds button. This will change the color of the sensor's footprint and allow you to change the sensitivity of certain areas in the footprint.
2. Click anywhere within the sensor's footprint and the Sensitivity window will appear.
3. Click Adjust All and the sensitivity slider window will appear.

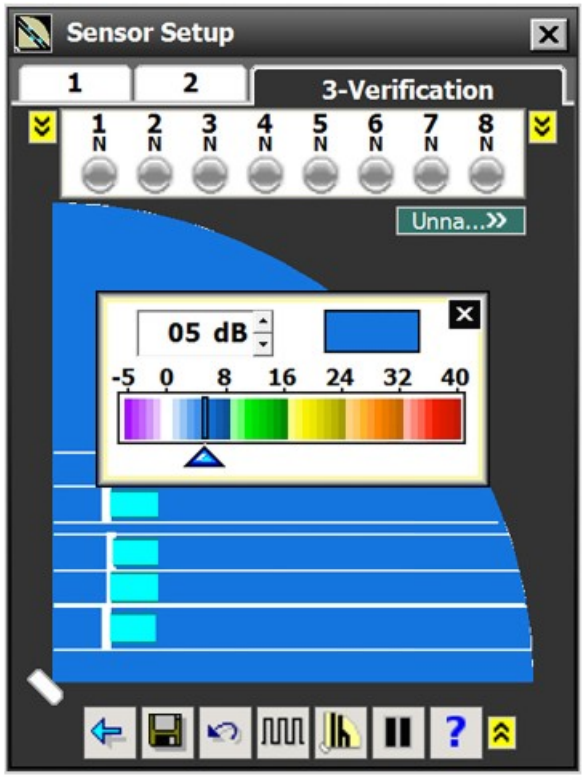

Figure 92. Adjusting sensitivity levels

Note. Negative values will increase sensitivity; positive values will decrease sensitivity.

4. Click the arrow buttons to change the sensitivity (in decibels).

Adjusting a region of thresholds

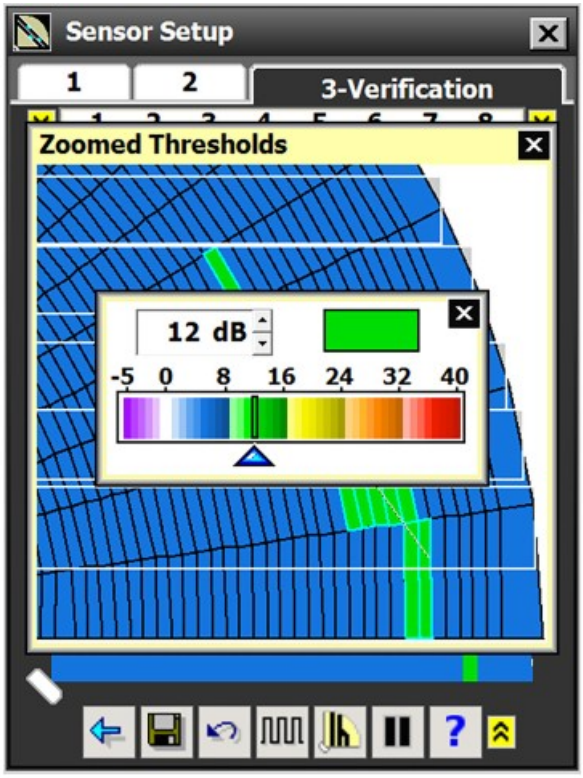

Figure 93. Adjusting a region

1. Click the Edit Thresholds button. This will change the color of the sensor's footprint and allow you to change the sensitivity of certain areas in the footprint.
2. Click anywhere within the sensor's footprint and the Sensitivity window will appear.
3. Click Zoom In.
4. Click and drag on the threshold region(s) you would like to change and the sensitivity slider window will appear.
5. Click the arrow buttons to change the sensitivity (in decibels).

Resetting all thresholds

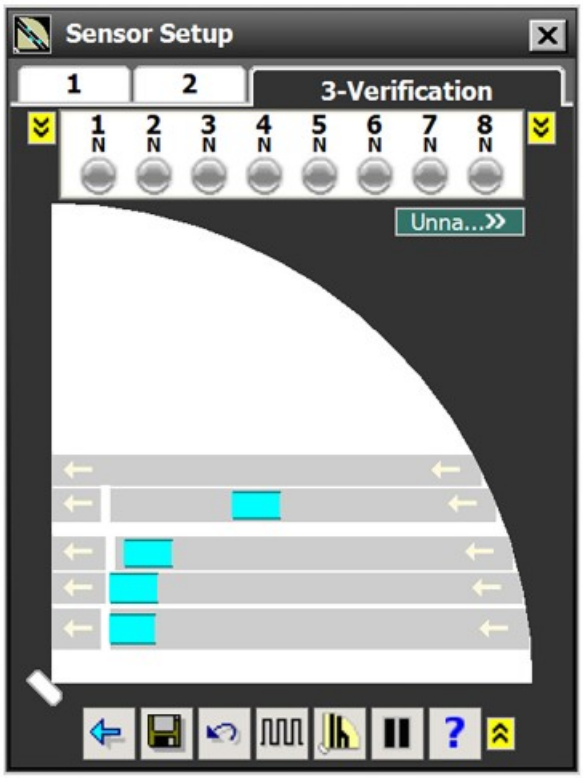

Figure 94. Resetting all thresholds

1. Click the Edit Thresholds button. This will change the color of the sensor's footprint and allow you to change the sensitivity of certain areas in the footprint.
2. Click anywhere within the sensor's footprint and the Sensitivity window will appear.
3. Click Reset All.

Using Tools

Figure 95. Tools button, main screen

Click Tools on the main screen to open the Tools screen.

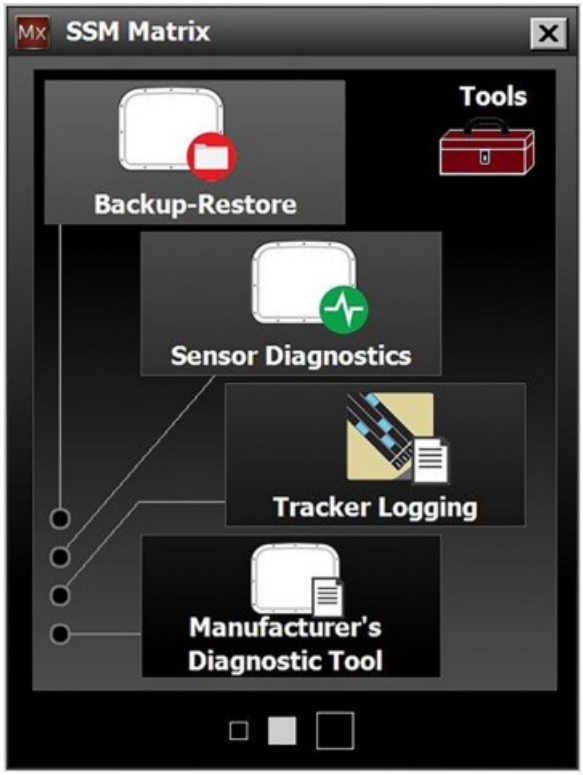

Figure 96. Tools screen

Backing up and restoring sensor files

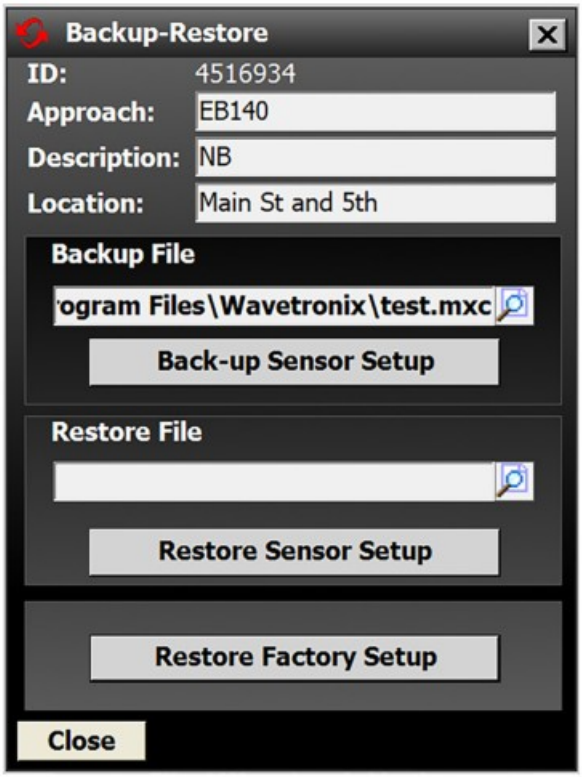

Figure 97. Backup-Restore screen

Setting	Description	Details
ID	The last seven digits of the sensor serial number.	Can’t be changed.
Approach	Which direction of traffic the sensor is detecting.	Can be changed in the Settings screen.
Description	A description of the sensor.	
Location	The sensor’s location.	
Backup File	Allows you to create a backup file (.mxc) of the sensor settings you currently have configured. Click the magnifying glass to navigate to where you want to create the backup file; type a name and hit OK. Click the Back-up Sensor Setup button to save the backup file to your computer.	This may be useful if you are making changes to the sensor and want to back up your configuration before you do so, so that you have a known good configuration to fall back on if necessary. Alternatively, it may be useful if you are replacing a sensor in the field, and you want to quickly apply the settings from the old sensor to the new one.
Restore File	Loads a backup file (.mxc) to the sensor, replacing the current sensor configuration with the configuration saved to the .mxc file. Click the magnifying glass to navigate to where the desired backup file is saved; select it and hit OK. Click the Restore Sensor Setup button to apply the saved configuration from the backup file to the sensor.	This may be useful if you have made changes to the sensor and need to restore a backed-up configuration from a saved file (see above).
Restore Factory Setup	Sets all sensor settings back to the factory defaults.	N/A

Tip. It may be useful to keep backup files on a flash drive inside the traffic cabinet for convenience.

Checking sensor diagnostics

Figure 98. Sensor Diagnostics screen

Note. If a sensor fails a self test, contact support@wavetronix.com.

1. Click Run Sensor Self Tests.
2. Check the results. They will appear as either “Success” or “Failed.”

Logging traffic

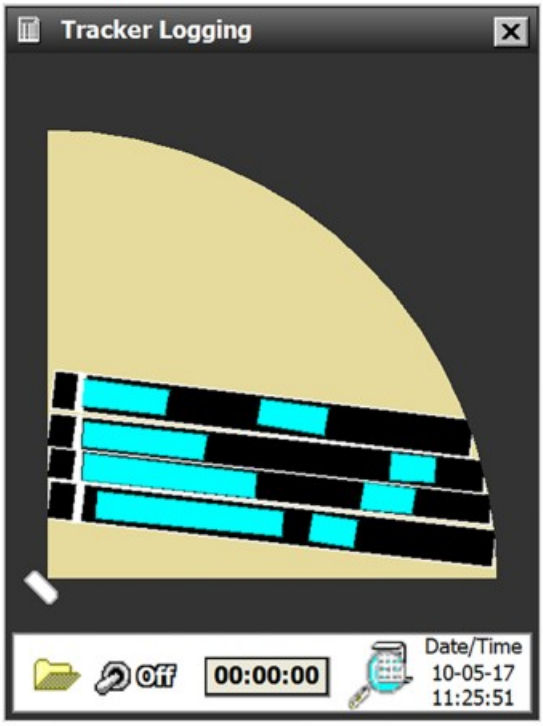

Figure 99. Tracker Logging screen

1. Click Tracker Logging.
2. Click the folder icon and specify a location for your log file.

3. Click On/Off switch to begin logging traffic. Once the switch is on, the timer will begin.
4. Turn the toggle switch off once you are done logging traffic. You can open the log file by either clicking the magnifying glass icon or going to the location you specified.

Testing rack cards

Note. The rack cards should be configured to communicate at 9600 bps.

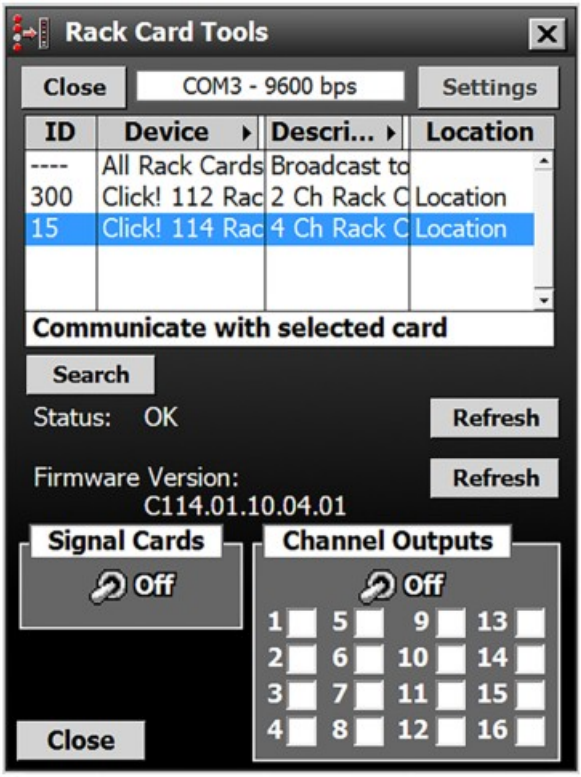

Figure 100. Rack Card Tools screen

1. Click Settings and choose a communication port and baud rate.
2. Close the Serial Settings window.
3. Click Search.
4. Once a list of devices appears, click on the device you want to test. Click All Rack Cards in the Device column if you want to test all devices at the same time.

Setting	Description	Details
Close	Closes the window.	N/A
Settings	Allows you to select the type of connection, a communications port, a baud rate, and adjust the timeout setting.	N/A
ID	Shows the rack card ID number.	N/A
Device	Shows the type of rack card found on the bus.	N/A
Description	Shows a description of the rack card product.	N/A
Location	Shows the rack card's location.	N/A
Search	Searches for all available cards on the shared RS-485 T-bus.	N/A
Status	Shows that the card is operating normally or in fail-safe mode.	Failsafe Initializing means the rack card hasn't seen detection call messages since it was rebooted. Failsafe Timeout (No Data) means the rack card was previously receiving detection calls, but hasn't received any in the last 10 seconds or more. Timeout (No Data) means you are connected to Rack Card Tools, but you're not connected to any rack cards. N/A means you are communicating with all devices.
Firmware Version	Shows either the version of the rack card firmware or N/A, which means you're communicating with all devices.	N/A
Refresh	Refreshes the Status and Firmware Version fields.	N/A
Signal Cards	Allows you to identify which contact closure card you are connected to.	Click the toggle switch and all four menu LEDs will begin flashing.
Channel Outputs	Allows you to manually send channel outputs to the controller to verify channel mapping.	Click the toggle switch and then select a checkbox to send that numbered channel call to the controller. The channel will remain on until the checkbox is unchecked.

Using the Manufacturer's Diagnostic Tool

Note. Contact Wavetronix Technical Support before using this tool.

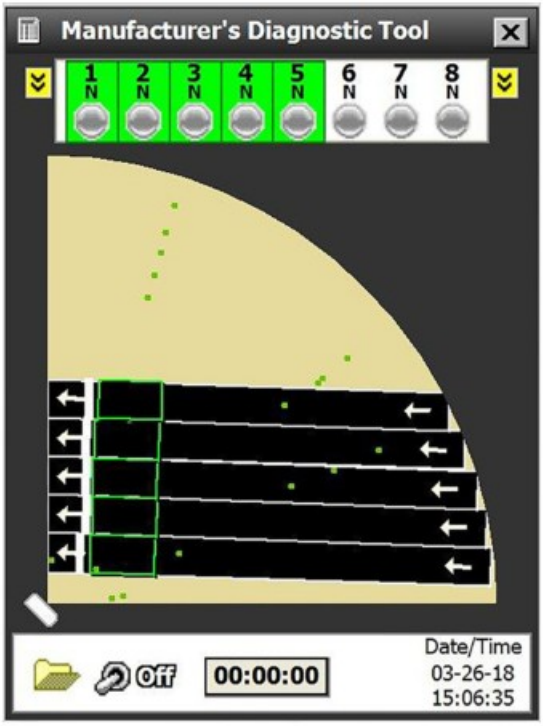

Figure 101. Manufacturer's Diagnostic Tool

SYMBOLS
6-conductor cable. See cable .NET Framework 28

WAVETRONIX

www.wavetronix.com

Documents / Resources

	WAVETRONIX WX-500-0053 Smart Sensor Matrix [pdf] User Guide WX-500-0053 Smart Sensor Matrix, WX-500-0053, Smart Sensor Matrix, Sensor Matrix, Matrix

References

- Wavetronix
- Wavetronix
- Wavetronix Legal
- Wavetronix Support