



EAN- Startup Guide 4000-OEM

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CAUTION: Alerts to a potential hazard that may result in personal injury, or an unsafe practice that causes damage to the equipment if not avoided

IMPORTANT: Identifies crucial information that is important to setup and configuration procedures.

Used to emphasize points or reminds the user of something. Supplementary information that aids in the use or understanding of the equipment or subject that is not critical to system use.



1 Overview

This Startup Guide provides the steps for connecting, configuring, and testing the 4000-OEM video processing board. The 4000-OEM board provides the standard connections for power and communication as well as general purpose IO and camera connections.

For 4000-OEM software debugging capabilities see the 4000-DEBUG board in the [ICD-4000-OEM](#). The DEBUG board gives the developer access to a debug serial port at RS-232 level, a USB programming/debugging port, and a switch/button combination for [board recovery](#).

1.1 Additional Support Documentation

Additional Engineering Application Notes (EANs) can be found on the [Documentation](#) page of the SightLine Applications website.

The [Panel Plus User Guide](#) provides a complete overview of settings and dialog windows located in the Help menu of the Panel Plus application.

The Interface Command and Control ([IDD](#)) describes the native communications protocol used by the SightLine Applications product line. The IDD is also available as a PDF download on the [Documentation](#) page under Software Support Documentation.

1.2 SightLine Software Requirements

ⓘ IMPORTANT: The Panel Plus software version should match the firmware version running on the board. Firmware and Panel Plus software versions are available on the [Software Download](#) page.

2 Network Configuration

The 4000-OEM Ethernet interface is configured for DHCP at factory default settings. No configuration is necessary to acquire an IP address from a DHCP server. It will self-assign the link-local address of 169.254.1.182/16 if it does not receive a DHCP response.

Refer to [EAN-Network Configuration](#) for more network configuration information.

SightLine recommends assigning a static IP on the PC when a DHCP server is not present on the network.

If you require additional assistance with assigning a static IP address to the host PC, contact your network administrator or search online for procedures that corresponds with your current PC operating system.

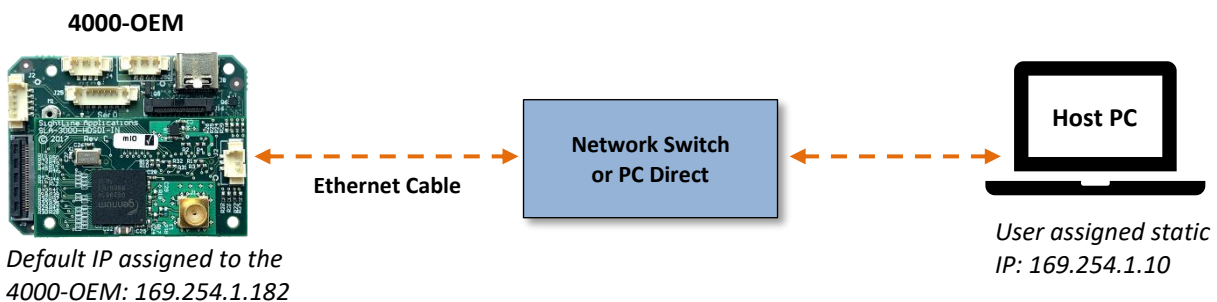


Figure 1: Network Configuration Options



2.1 Static IP Configuration Through Ethernet

1. Connect the board to a DHCP network.
2. Apply power to the 4000-OEM and wait for the board to receive an address from the DHCP server.
3. Connect to the board in Panel Plus.
4. Configure a static IP address using the procedure outlined in [EAN-Network-Configuration](#).

Configuration notes:

- If a wireless adapter is active on the host PC it should be disabled.
- If using the link local address, we recommend assigning a static IP address to the host PC of 169.254.X.X, where X is 1-254 (do not use 182). Use a subnet mask of 255.255.0.0.
- Problems with outbound streaming are often related to setting/assigning IP addresses and ports. See the Encoding Configuration settings in [EAN-Encoding](#) for advanced settings.

3 Serial Communications

To connect to a PC USB port, attach the USB to TTL (3.3V) serial cable (SLA-CAB-0305) to SLA-CAB-0804 to J25 (Serial 0) on the 4000-OEM board (see [Figure 2](#)). Serial ports on the 4000-OEM are 3.3V TTL.

Use a direct serial connection for troubleshooting or if a network connection cannot be established.

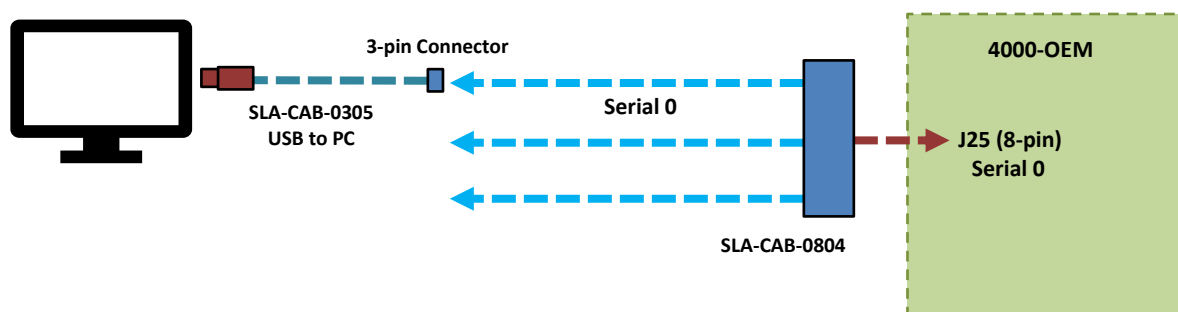


Figure 2: J25 Serial 0 to PC Connection (SLA-CAB-0804)

4 4000-EVAL Kit

Parts listed below are included in the 4000-EVAL kit. It is our intention that all the 3000-OEM camera adapter boards will be compatible with the 4000-OEM. If your application calls for other options or interface boards, please [contact](#) us. To review all the interface board options, see the [3000-OEM Accessories](#) page on the SightLine Applications website.

The 4000-OEM will also support a number of USB Webcams and USB 3.0 Vision cameras.



Table 1: 4000-EVAL Kit

Part Number	Qty	Description
4000-SOM	1	Video processing board
4000-OEM	1	REV A
Fan, heat sink and mounting assembly	1	Thermal pads, mounting plate, mounting hardware, fan and heat sink
SLA-KIT-4000-DEBUG	1	4000-DEBUG PCBA, KIT
SLA-DIST	1	Provides power switch and standard bench interface connections
SLA-PWR-B12V-36W	1	12V Power supply w/ 2-pin connector (36W)
SLA-CAB-1504		2P Phoenix to 4-pin picoblade
SLA-CAB-0504	1	5P Picoblade to 3P Molex, and pigtail
SLA-CAB-0804	1	J25 Molex fanout with labels
SLA-CAB-0305	1	TTL (3.3V) to USB serial cable w/ 3-pin Molex
SLA-CAB-0403	1	4-pin Molex to RJ45 adapter
SLA-CAB-TC2USB	1	J8 USB type-C to USB 3.0 adapter
SLA-CAB-HD10	1	HDMI cable
SL00852	1	Female HDMI adapter
SLA-MSD-ADPT	1	SD adapter
SL00767	1	1.5 ALLEN KEY
SLA-3000-HDSDI-IN	1	HDSDI-IN Adapter board
SLA-CAB-MCX2BNC	1	Cable, MCX (RA) to BNC(M) for HDSDI-IN
SLA-CAM-HDSDI	1	HD-SDI 1080p Camera
SLA-PWR-A12V	1	12V Power Supply for Camera

5 Hardware Bench Setup

ⓘ IMPORTANT: To prevent damage to the hardware boards, use a conductive wrist strap attached to a good earth ground. Before picking up an ESD sensitive electronic component, discharge built-up static by touching a grounded bare metal surface or approved anti-static mat.

Cable connections:

- SLA-CAB-MCX2BNC: Connects to J1 (MCX jack) on the 3000-HDSDI-IN board and to the green BNC connector of the 1080p camera.

The yellow BNC connector is for analog use only.

- SLA-CAB-0403: Connects to J4 on the 4000-OEM board. Provides an RJ45 Ethernet connection.
- SLA-PWR-A12V (110-250VAC input / 12VDC output): Connects to the red power connector on the 1090p camera.
- SLA-CAB-1504 / SLA-PWR-B12V-36W (110-250VAC input / 12VDC output): Connects to J50 on the 4000-OEM board.

Power and network connectivity LEDs:

A green light (D1) on the 4000-OEM indicates that all boards are powered on. An amber light (D5) verifies network connection.

ⓘ IMPORTANT: To prevent voltage spikes to the board, plug in the power adapter (PWR-C12V) to an AC power source first and then connect to the board.

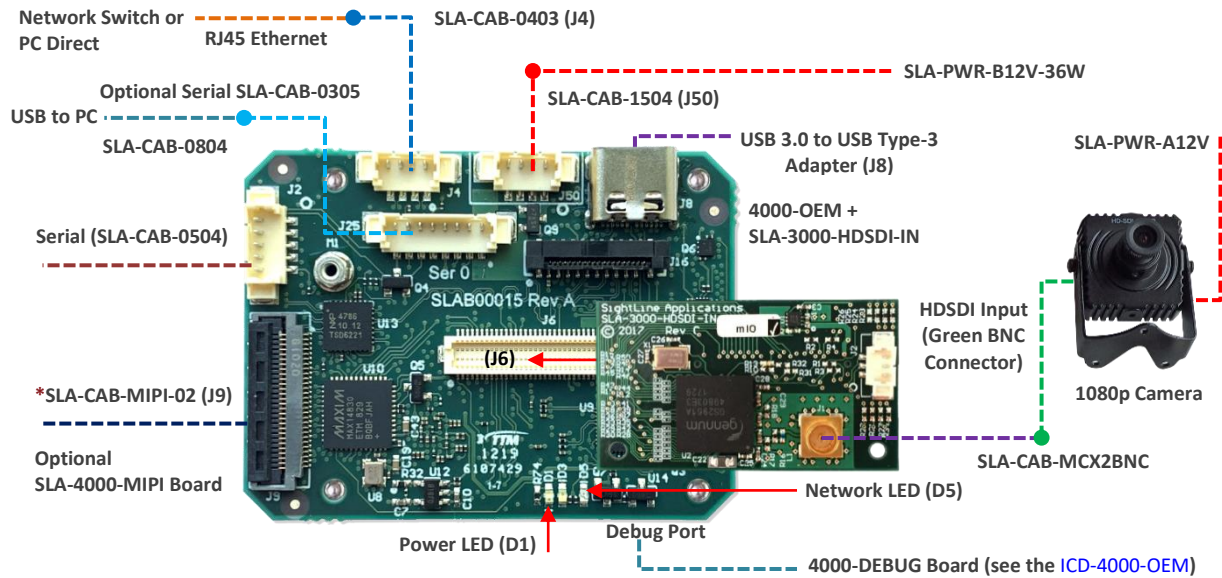


Figure 3: Typical Bench Hardware Setup

*SLA-CAB-MIPI-02 is an FFC cable and must be oriented and connected correctly. See [FFC cable](#) instructions and precautions before connecting the SLA-4000-MIPI board.

5.1 Additional SightLine Adapter Boards

SightLine adapter boards provide different I/O, camera inputs, or digital outputs. The boards can be attached directly to the 4000-OEM or through a secondary adapter allowing customers to swap out modules for custom configurations. This setup guide assumes the initial use of the EVAL kit only. Customer specific configurations with other camera input boards are fully supported. See the [EAN-Digital Video Configuration](#) for more setup and configuration information for supported cameras.

6 Panel Plus

This section covers the Panel Plus setup and configuration process. Panel Plus provides a basic graphical interface to the 4000-OEM board.

Before connecting with the Panel Plus software, the 4000-OEM board should be powered up and connected through:

- a network switch or directly to the host PC (preferred) or,
- Direct serial connection (for troubleshooting or if a network connection cannot be established).

1. Go to the [Software Downloads](#) page on the SightLine website and download the Panel Plus application installer. Older releases are available under the *Previous Versions* section.

ⓘ IMPORTANT: The firmware version number and Panel Plus Software version number should match. If the board firmware version is initially unknown, reference the SightLine invoice that came with the board when it was purchased.

2. Launch the installer file and follow the prompts. After installation, open the Panel Plus application.
3. The first time that Panel Plus is launched, a Windows Security Alert prompt should appear. Select *Allow Access* to create a firewall exception ([Figure 4](#)).



Approving private network access is sufficient in most cases. Check public networks if directly connecting to the board.

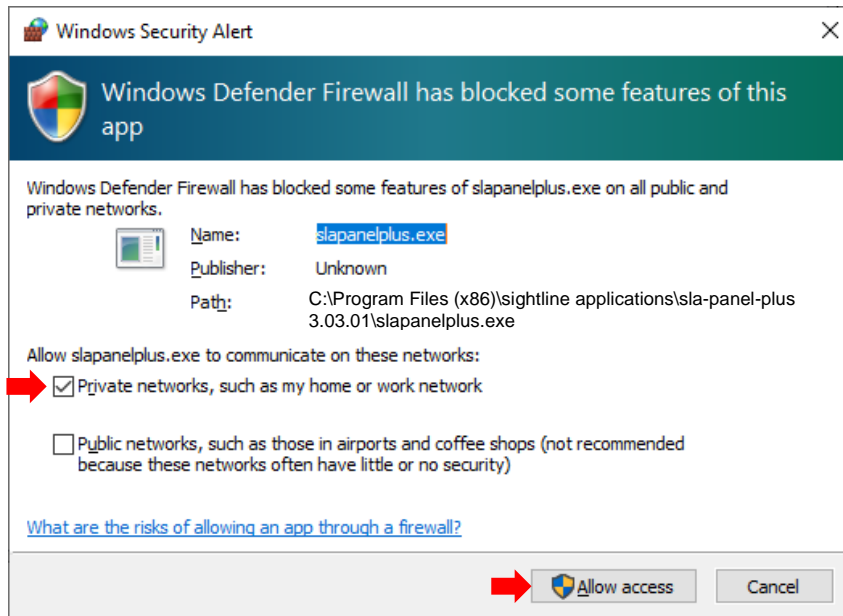


Figure 4: Windows Security Alert Prompt

IMPORTANT:

- Do not cancel this prompt. Failure to allow access at this point will not allow the Panel Plus application to connect to the board. See the [Troubleshooting](#) section for more information.
 - Before using the Panel Plus program, review the Panel Plus User Guide in the Help section of the Panel Plus application for additional user and setup information.
4. Network connection to the board:
- a. From the *Connect* tab, click the *Refresh List* button to get a list of boards on the network.
 - b. Select the appropriate board in the drop-down menu.
 - c. Click the *Disconnected (click to connect)* button.

Once the connection is successful, the button changes to *Connected*.

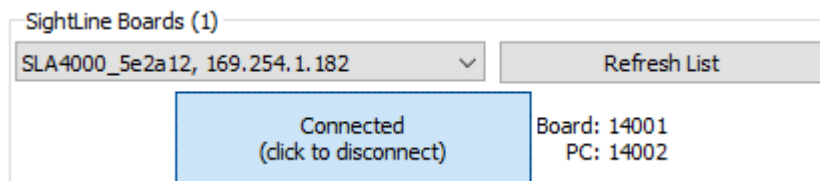


Figure 5: Network Connection to Board



- Verify the connection. When the Panel Plus has successfully connected to the 4000-OEM board, operating information is displayed under the *Video Output* section and the bottom status bar in Panel Plus. If the connection was not successful, this information will not be present or incomplete.
- ⓘ IMPORTANT:** For optimal performance, monitor the board temperature. Board temperatures should be below 185°F (85°C). To keep boards within the optimal temperature range, use the included heatsink during bench testing. For more information about thermal management, see the [ICD-4000-OEM](#).

The screenshot displays the 'Video Output' configuration window. At the top, there are two dropdown menus: 'Cam 0' and 'HDMI & Net'. Below these are two buttons: 'Stream Network Video to This PC' and 'Advanced IP...'. A blue callout box labeled 'Operating information' has a red arrow pointing to the text: 'Firmware Ver: 3.3.0.138 FGPA: 00:00, HW Rev:02, temp: 125°F [37°C] SVN Revision: 58013, Build Date: 12/17/2020, Build Time: 2:59:27'. Below this is a section titled 'Enabled Features (✓ if licensed):' with a sub-label 'App Bits: 0x0FFFFFFF'. A blue callout box labeled 'Appbit code with listed features' has a red arrow pointing to the 'App Bits' value. The features are listed in two columns, each with a checked checkbox:

Enabled Features (✓ if licensed):	
<input checked="" type="checkbox"/> Stabilization	<input checked="" type="checkbox"/> Blending
<input checked="" type="checkbox"/> Full Tracking	<input checked="" type="checkbox"/> Enhancement
<input checked="" type="checkbox"/> Full Telemetry	<input checked="" type="checkbox"/> Focus Telemetry
<input checked="" type="checkbox"/> Detection - Base	<input type="checkbox"/> Tracker Only - Advanced
<input checked="" type="checkbox"/> Detection - Advanced	<input checked="" type="checkbox"/> HD 720 Input
<input checked="" type="checkbox"/> IP Encoding H264	<input checked="" type="checkbox"/> HD 1080 Input
<input checked="" type="checkbox"/> H265 Encoding	<input checked="" type="checkbox"/> HD 4K Input
<input checked="" type="checkbox"/> KLV	<input checked="" type="checkbox"/> HD 720 Output
<input checked="" type="checkbox"/> Recording / Snapshot	<input checked="" type="checkbox"/> HD 1080 Output
<input checked="" type="checkbox"/> Precision Landing	<input checked="" type="checkbox"/> HD 4K Output
<input checked="" type="checkbox"/> NUC and DPR	<input checked="" type="checkbox"/> Dual Processing
<input checked="" type="checkbox"/> High Bit Depth	<input checked="" type="checkbox"/> Enhancement Advanced
<input checked="" type="checkbox"/> Classifier	

At the bottom of the window is a 'Demo Mode' button.

Figure 6: Firmware Version and Enabled Features



6. Select the *Compression* tab:
 - a. Use the H.264 encoding options to get started.
 - b. In the *Output Properties* section, use the default values for *Frame Step* and *Down Sample*.
 - c. In the *Streaming* parameters section, define the destination IP address and port.

To set these parameters quickly, click the Use My IP - Unicast button. This sets the outbound destination IP address to the network interface card on the PC.

- d. Click *Send* to dynamically set the desired IP Address, UDP Port, and UDP delivery format (Unicast, Multicast, or Broadcast).
- e. To save the settings and make them recurrent through restarts, main menu » *Parameters* » *Save to board*.

See [EAN-Parameter File](#) for a comprehensive guide to saving parameter settings.

Figure 7: Compression Tab

6.1 Camera Setup and Network Configuration

1. From the main menu go to *Configure* » *Aquisition Settings*. This dialog window allows changes to the camera configurations.
2. Set the *Camera Index* to *Cam 0*. Set the *Camera Type* to *Generic Digital*.



- In the *AutoFill* drop-down menu, select *HD-SDI 1080p30* from the Auto Fill menu or enter the *Height* and *Width* settings of the connected camera.

If using a camera that is not configured for 1080p30, choose a corresponding option under Auto Fill that matches the camera, e.g., *HD-SDI 720p* or *HD-SDI 1080p60*.

If the camera is listed, the *AutoFill* drop-down menu automatically populates the relevant fields with the correct settings.

Generic Digital Settings

Auto Fill: HD-SDI 1080p30

Height: 1080 Width: 1920 Resulting Flag Bits: 0x31

Vertical Front Porch: 36 Horizontal Front Porch: 148 Bit Depth: 16

Input: Gray Scale YUV color G8 16bit in Bayer Laser Interlaced Byte Swap

Invert V-Sync Polarity Invert H-Sync Polarity UBO 2xbins Sync/Crop: None

Camera Init Code: None Options:

Big: Height 0 Width 0 Vertical Blanking 0 Horizontal Blanking 0

- After changes have been made, the *Apply* button will turn red indicating that a change has been detected. Click *Apply* to apply the changes. Close the *Acquisition Settings* dialog window.

- Save and activate the settings:

- Main menu » Parameters » Save to Board.
- Main menu » Reset » Board.
- After the system reboots reconnect to the board. Make sure the board connects.

See [EAN-Camera Compatibility](#) for all third-party cameras and lens assemblies that are currently supported by SightLine software. Includes configuration and setting support guidance.

- From the *Connection* tab, click *Stream Network Video to This PC*.

SightLine Boards (1)

SLA4000_5e2a12, 169.254.1.182 Refresh List

Connected (click to disconnect) Board: 14001 PC: 14002

Video Output:

Cam 0 HDMI & Net

Stream Network Video to This PC Advanced IP...



6.2 Direct Serial Connection (optional):

1. Connect the serial cable to the 4000-OEM board and host PC as show in [Serial Communications](#).
2. From the *Connect* tab, click the *Refresh List* button to get a list of available COM ports.
3. Select the Com port in the drop-down menu.
4. Click the *Disconnected (click to connect)* button.

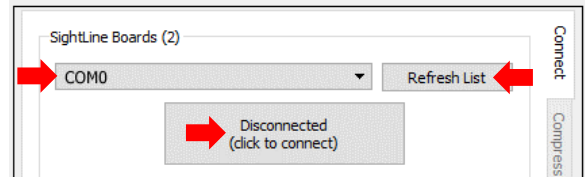


Figure 8: Direct Serial Connection

7 Summary

This completes the startup guide for the 4000-OEM board. See the Panel Plus User Guide (main menu » *Help* » *User Guide*) for additional user and setup information.

If the board has been connected to a camera and encoding functions are part of the configuration, video will be displayed in the main window. On the *Connect* tab of Panel Plus, the purchased/enabled functions are checked. To add additional features to 4000-OEM, contact [Sales](#).



Figure 9: Panel Plus Connection to Board



IMPORTANT: Not all 4000-OEM purchased configurations include encoded IP video, e.g., the Tracker-only configuration. For configurations that include encoding, video will be displayed in the Panel Plus main window. Tracker-only configurations will display processed video on the HDMI output only. An HDMI-capable monitor is required for viewing this output.

7.1 Demo Mode

To enable all features for testing and evaluation purposes, click the *Demo Mode* button from the *Connect* tab. All the features enabled on the board are now available for testing.

The video screen will have a Demo Mode screen overlay until the Demo Mode function is turned off.

8 Troubleshooting

Issue: Unable to connect with the Panel Plus application to the 4000-OEM over a standard network connection.

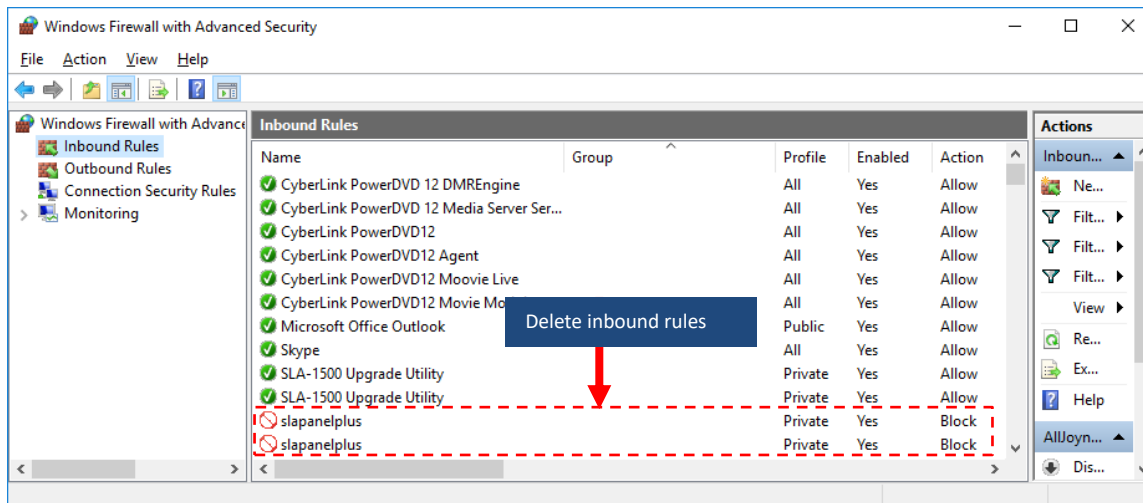
Check static IP address:

Check the static IP address configuration. Improper or unknown static IP address setup is a common connection problem. See the [Network Configuration](#) section and [EAN-Network Configuration](#) for more network configuration information.

Check Windows firewall:

Failure to allow access in the Windows Security Alert dialog during initial startup of the Panel Plus application can cause connection issues.

1. Close the Panel Plus software application and open the Window Firewall Security Manager on the host PC.
2. Go to Inbound rules and delete the two *slapanelplus* rules (TCP and UDP).




3. Re-start the Panel Plus application and allow access in the Windows Security Alert prompt window.



Check hardware connections:

Make sure that all the boards are powered on. If connecting over the network, switch to a direct serial connection. See the [Serial Communications](#) section. The Panel Plus software will automatically recognize serial ports and list them in the drop-down menu for available connections.

 *Connecting to the serial port on the 4000-OEM board from a host PC requires TTL (3.3V) to USB serial cable w/ 3-pin Molex cable (SLA-CAB-0305).*

Check network configuration:

After communications have been established using the serial connection, networking settings can be corrected to allow proper network communications.

1. From the main menu, go to *Configure » Network Settings*.
2. If an unknown static IP address is assigned, remove it or update it to match your network's addressing scheme.

8.1 Questions and Additional Support

For questions and additional support, please contact [Support](#). Additional support documentation and Engineering Application Notes (EANs) can be found on the Documentation page of the SightLine Applications [website](#).