EAN-Startup Guide 4000-OEM

2022-09-16

Exports: Export Summary Sheet

EULA: End User License Agreement

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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. It can be accessed from 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 Safe Device Handling

CAUTION: To prevent damage to hardware boards, disconnect all input power to OEMs and adapter boards before connecting or disconnecting cables including all FFC, FPC, KEL, HDMI, MIPI, and round wire (Molex) cables.

CAUTION: To prevent damage to 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 antistatic mat.

3 4000-EVAL Kit

Provides a complete laboratory bench/development interface with standard connectors. For additional options and interface boards, please contact Sales. To review all the interface board options, see the 4000-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	Part Number	Qty	Description
4000-SOM	1	Video processing board	SLA-PWR-B12V-36W	1	12V Power supply w/ 2p connector (36W) plus AC power cord
4000-OEM	1	REV A, PCBA	SLA-CAB-0504	1	5P PicoBlade to 3P Molex, and pigtail
SLA-PAD-020-01	1	Thermal pad pink 0.020-inch x 1.63-inch x 0.010 inch with 0.5 x 0.5 cutout	SLA-CAB-0804	1	8P PicoBlade to 3P (2) Molex, and pigtail

(4000-EVAL Kit continued)

SLA-PAD-010-01	1	Thermal pad 1.4-inch x 1.6-inch x 0.010 inch	SLA-CAB-0305	1	TTL (3.3V) to USB serial cable w/ 3p Molex
4000-OEM-MP	1	4000-OEM mounting base	SLA-CAB-0402	1	4p Molex to pigtail
4000-BRACKET	1	4000-OEM heat sink bracket	SLA-CAB-TC2USB	1	USB3.0 Type-C to Type-A adapter
SLA-3000-HDSDI-IN	1	HDSDI-IN Adapter board	SLA-CAB-HD10	1	HDMI output cable
SLA-DIST	1	PWR/ENET distribution board	SL00852	1	HDMI out adapter, female
SLA-KIT-4000-DEBUG	1	4000-DEBUG PCBA, kit	SLA-MSD-ADPT	1	SD adapter
SLA-CAB-0405	1	4-in Molex-to-Molex PicoBlade, 3.0 inches, PWR (BLK/RED)	SLA-CAB-MCX2BNC	1	Cable, MCX (RA) to BNC(M) for HDSDI-IN
SLA-CAB-0404	1	4-in Molex-to-Molex PicoBlade, 3.0 inches, GEN (WHT)	SLA-CAM-HDSDI	1	HD-SDI 1080p camera
SLA-MSD-32GB	1	32GB uSD card (installed)	SLA-PWR-A12V	1	12V Power Supply for camera
SLA-CAB-1505	1	4p PicoBlade to pigtail	Mounting hardware	-	Spacers and mounting screws

4 Hardware Bench Setup

ⓘ **IMPORTANT:** To prevent damage to hardware boards, disconnect the power before connecting or disconnecting all cable connections.

Included boards:

- SLA-DIST: Provides power switch and standard bench interface connections for power and ethernet connections.
- SLA-3000-HDSDI-IN: Provides camera interface to HDSDI cameras.

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-0404: Connects to J3 on the SLA-DIST board and J4 on 4000-OEM. Provides Ethernet to the 4000-OEM.
- SLA-CAB-0405: Connects to J50 on the 4000-OEM board and J2 on the SLA-DIST board. Provides power to the 4000-OEM.
- SLA-PWR-A12V (110-250VAC input / 12VDC output): Connects to the red power connector on the HD-SDI 1080p camera.
- SLA-PWR-B12V-36W (110-250VAC input / 12VDC output): Connects to J4 on the SLA-DIST 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.
- To prevent voltage spikes to the board, plug in the power adapter to an AC power source first and then connect to the board.

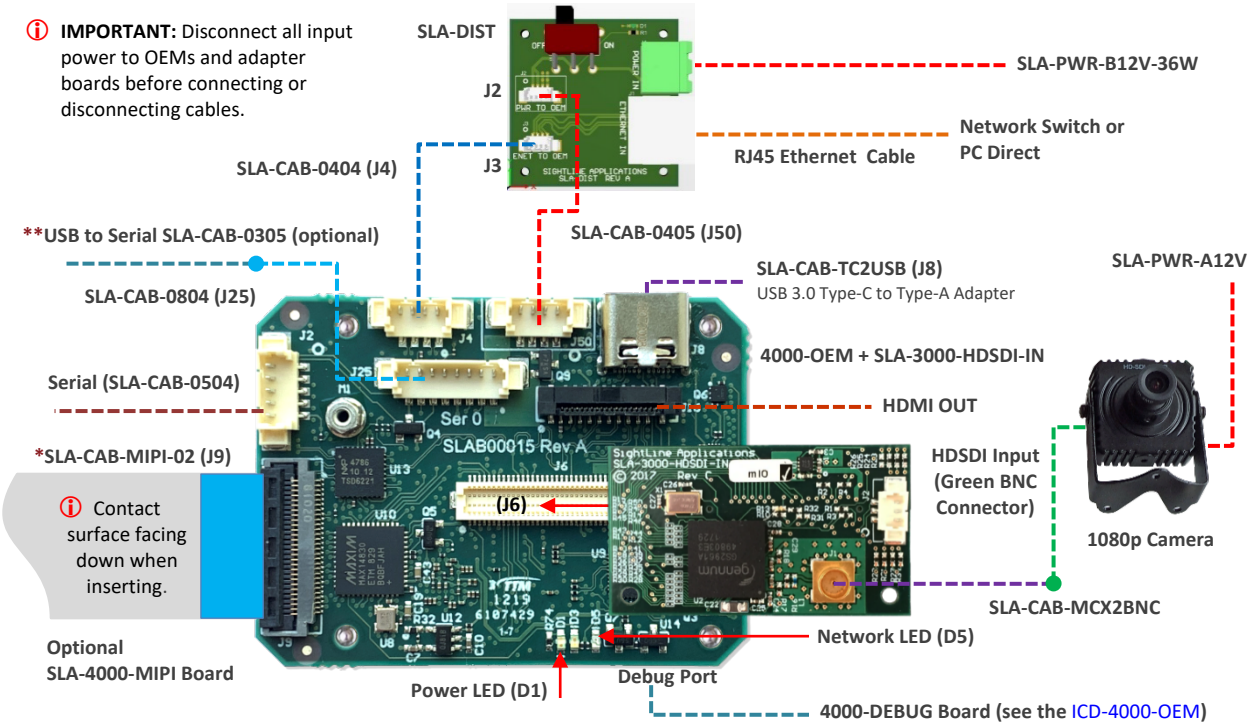


Figure 1: Typical Bench Hardware Setup

**SLA-CAB-MIPI-02 FFC cable must be connected correctly. See FFC cable instructions before connecting the SLA-4000-MIPI board.*

***SLA-CAB-0305 can connect to SLA-CAB-0804 to facilitate a PC/USB connection to serial port 0 on the 4000-OEM. See the Serial Communications section for more information.*

4.1 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.

5 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.

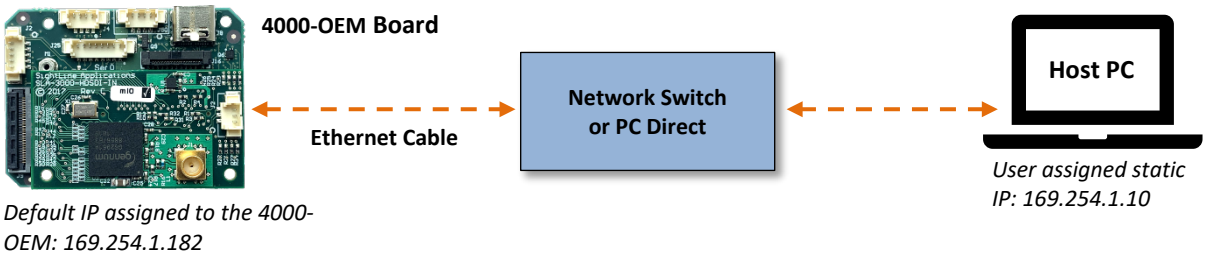


Figure 2: Network Configuration Options

5.1 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.

6 Serial Communications

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

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 (Figure 3). Serial ports on the 4000-OEM are 3.3V TTL.

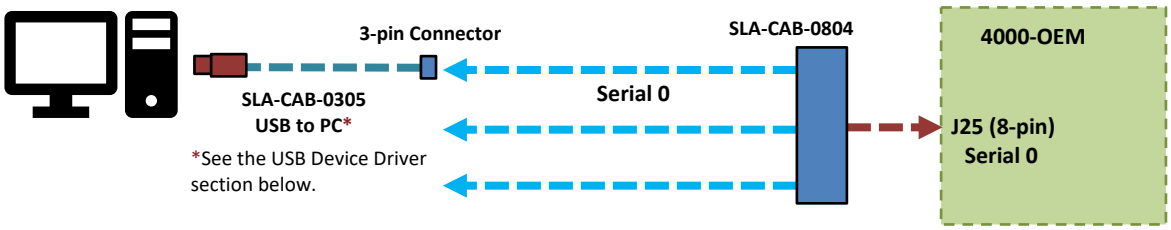


Figure 3: J25 Serial 0 to PC Connection (SLA-CAB-0804)

6.1 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.

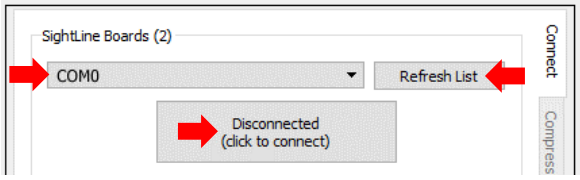


Figure 4: Direct Serial Connection

6.2 USB Device Driver

If the USB connection on SLA-CAB-0305 is not functioning correctly a third-party driver may be needed. The driver can be found on the Silicon Labs web page » *Downloads* tab » *CP210x Universal Windows Driver*. Once installed open the Run window in Windows (WIN+R) and enter *devmgmt.msc* to open the Device Manager. Verify the new driver is listed under *Ports (COM & LPT)* as shown in Figure 5.

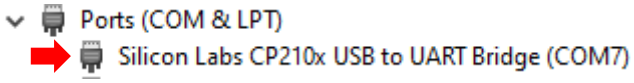


Figure 5: CP210x Universal Windows Driver Installed

7 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 6).

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

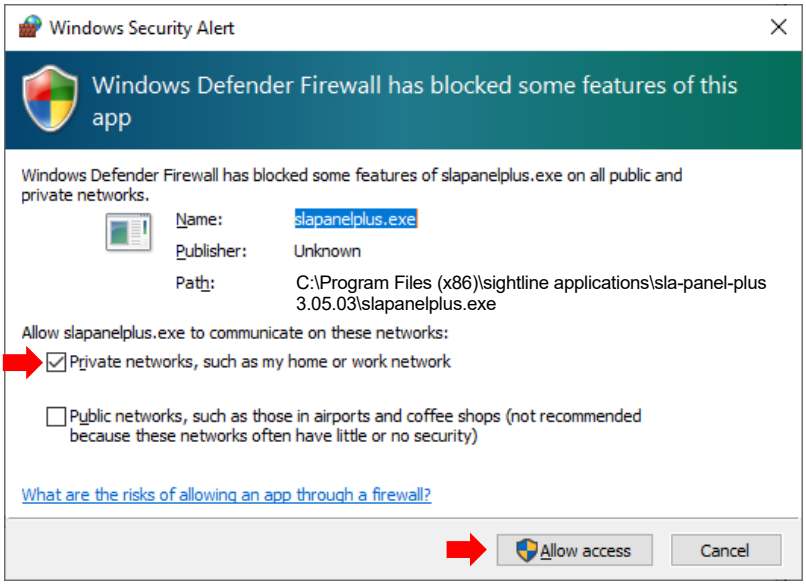


Figure 6: Windows Security Alert Prompt

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.

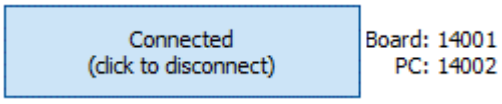


Figure 7: Network Connection to the OEM Board

5. 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.

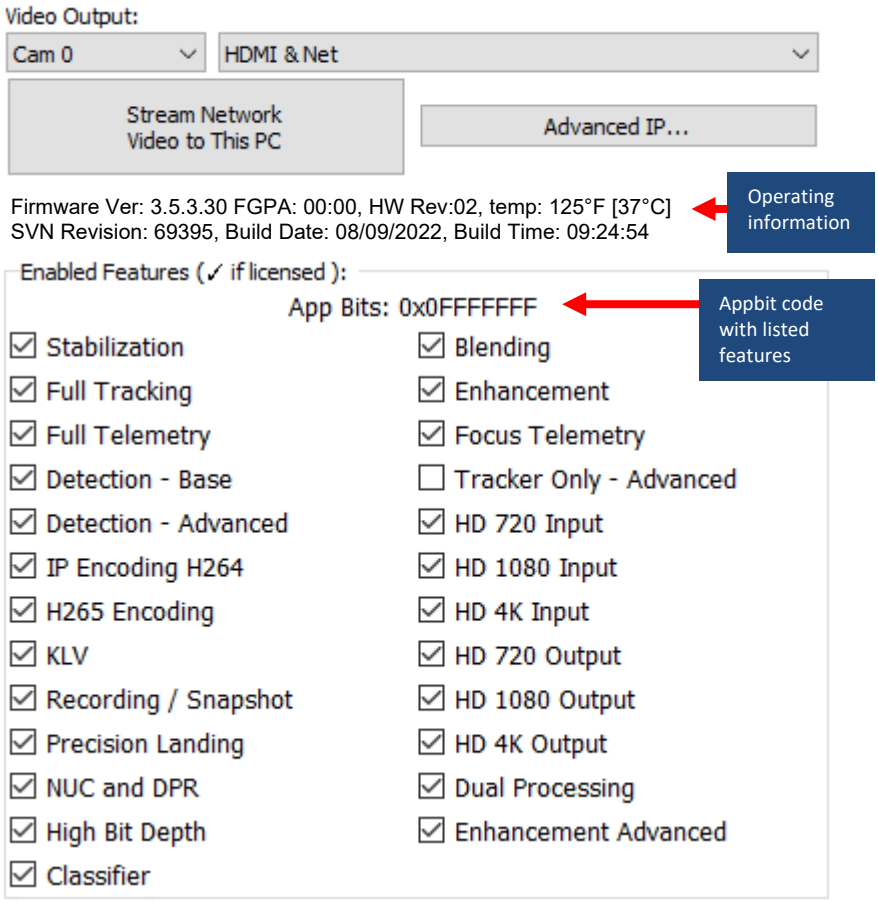
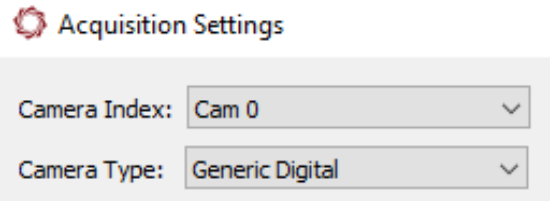


Figure 8: Firmware Version and Enabled Features

7.1 Camera Acquisition

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



3. 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 as shown in Figure 9.

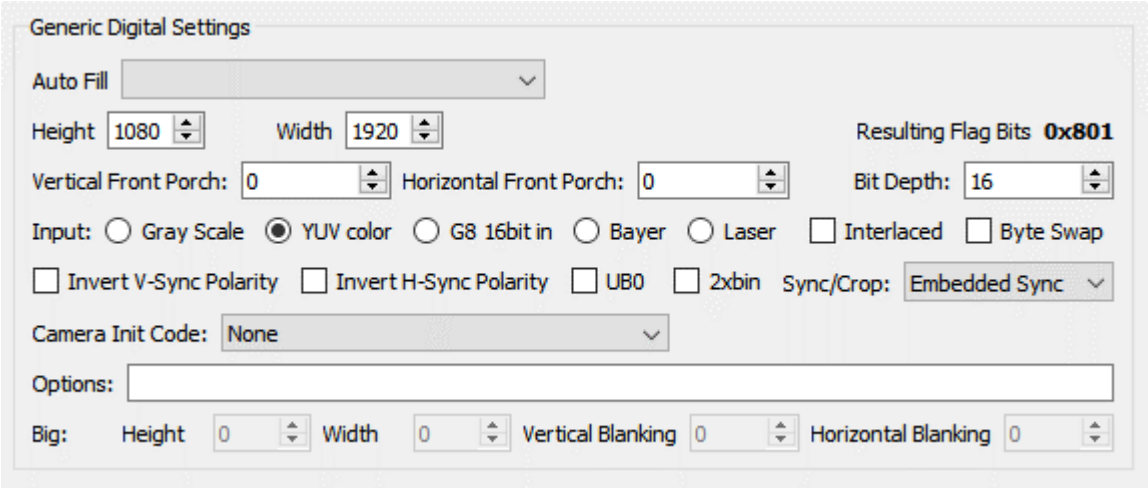


Figure 9: Camera Acquisition Auto Fill Settings Example - HD-SDI 1080p30

4. 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.
5. Save and activate the settings:
   a. Main menu » *Parameters* » *Save to Board*.
   b. Main menu » *Reset* » *Board*.
   c. 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.

7.2 Stream Network Video to This PC

To stream network video to the connected PC, click the *Connection* tab in Panel Plus and then click *Stream Network Video to this PC*.

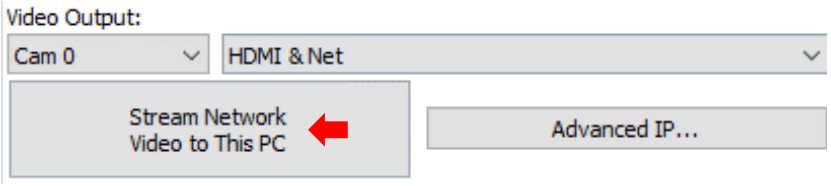


Figure 10: Stream Network Video to PC

8 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.

To modify the encoder parameters of the OEM, see the Modifying Encoder Parameters section.

Figure 11: Panel Plus Connection to Board

IMPORTANT: Not all 4000-OEM purchased configurations include encoded IP video. 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.

8.1 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 Demo Mode screen overlay will display until the *Demo Mode* function is turned off.

9 Modifying Encoder Parameters

The encoder parameters can be modified from the *Compress* tab in Panel Plus.

- The H.264 encoding option is a good choice to get started.
- In the *Output Properties* section, use the default values for *Frame Step* and *Down Sample*.
- The *Streaming* parameters section defines the destination IP address and port.
- To set the parameters quickly, click the Use My IP - Unicast button. This sets the outbound destination IP address to the network interface card on the PC.
- Click *Send* to dynamically set the desired IP Address, UDP Port, and UDP delivery format (Unicast, Multicast, or Broadcast).
- 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.

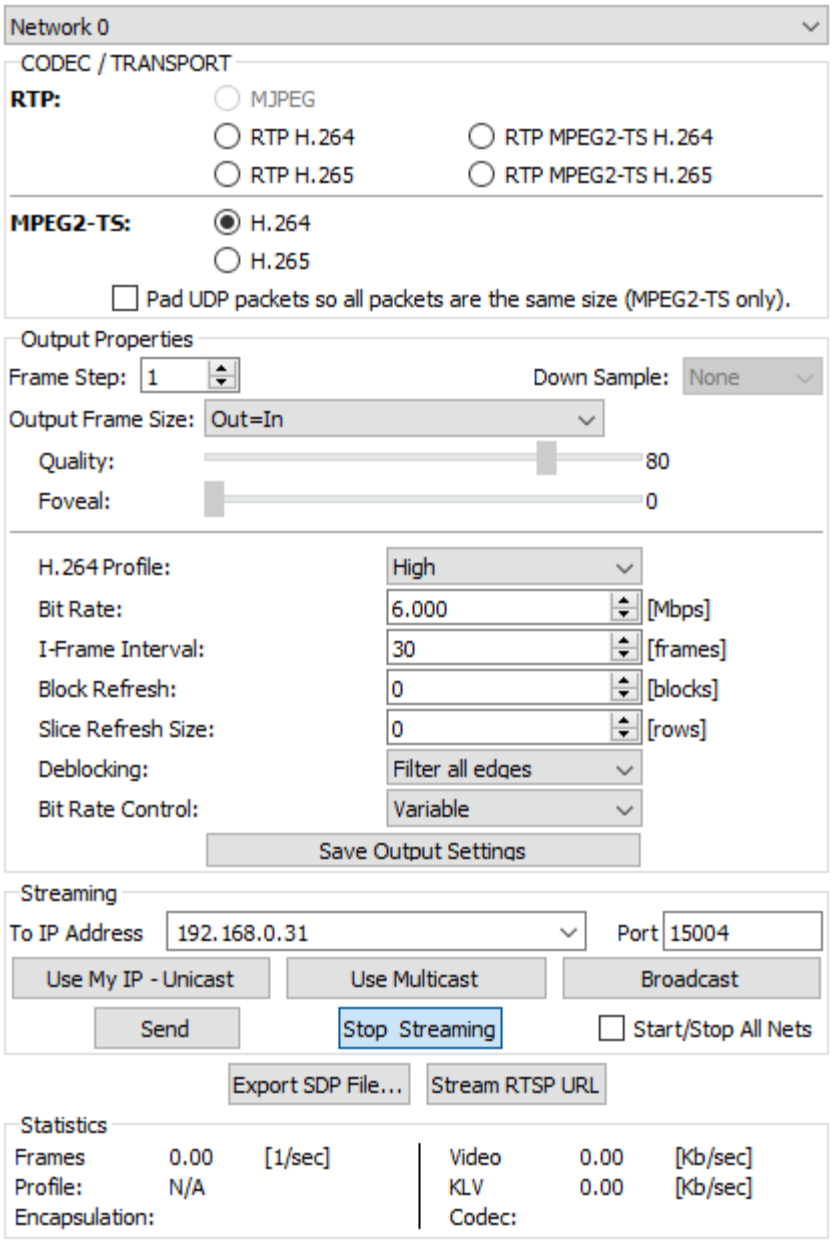


Figure 12: Compress Tab

10 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 Windows Firewall Security Manager on the host PC.
2. Go to Inbound rules and delete the two *slapanelplus* rules (TCP and UDP).

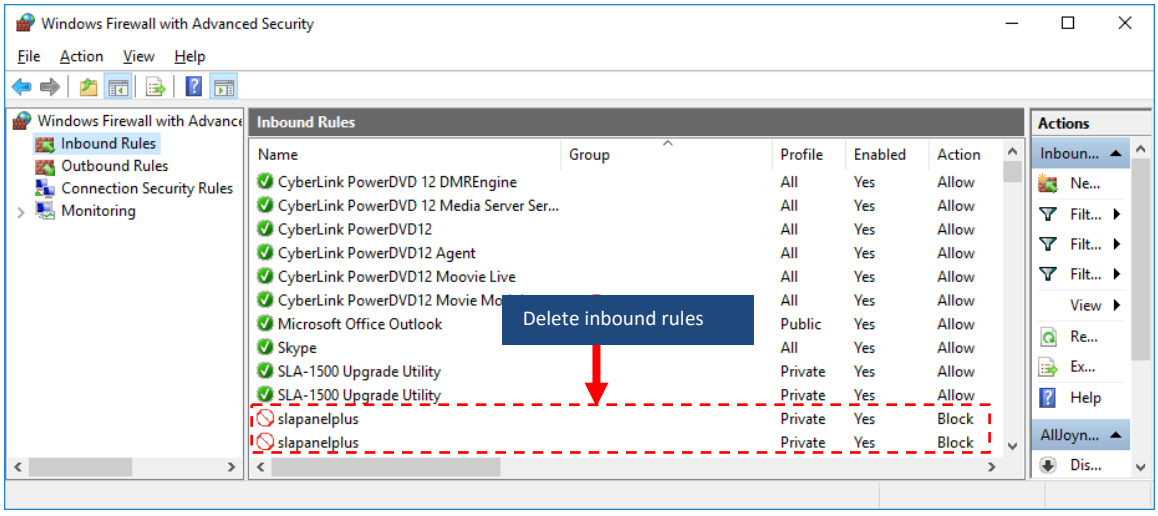


Figure 13: Windows Firewall Security Manager Fire - Delete Inbound Rules

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 the addressing scheme of your network.

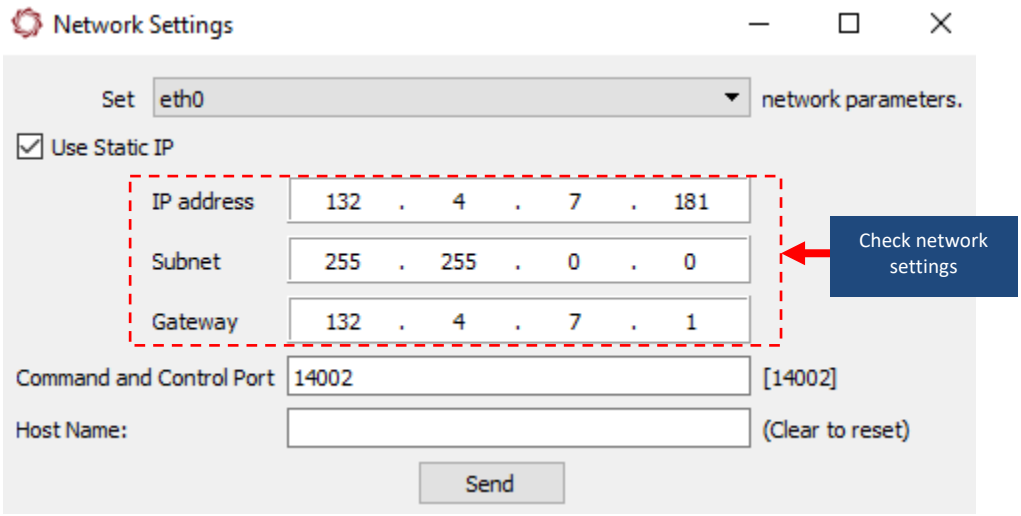


Figure 14: Check Network Settings

10.1 Send Diagnostic Files to SightLine Support

In the event of a system malfunction or other issue, use the *Get Diagnostic Files* feature in the SightLine upgrade utility application to download files and then send them to Support.

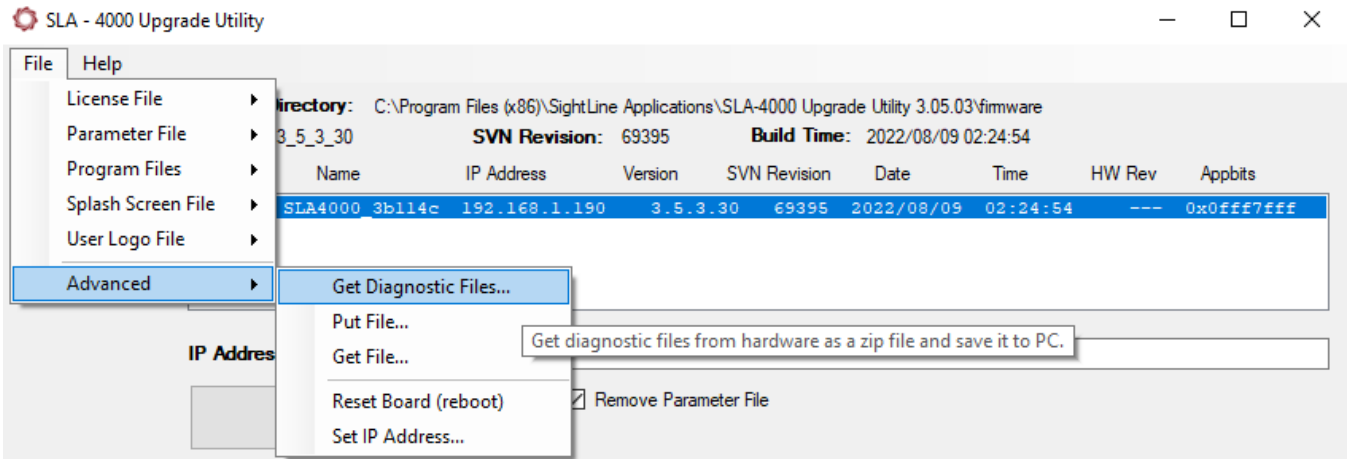


Figure 15: Get Diagnostic Files

Additional diagnostic information can also be obtained from the 4000-OEM by displaying the system log.

1. Establish an SSH session to the OEM with Tera Term (recommended) or similar application.
2. Login using the default username and password for the 4000-OEM: *slroot*

3. At the prompt, type:

   ```
   dmesg
   ```

4. Copy the output and send it to Support.

10.2 Nonfunctional SLA-4000-MIPI-IN Board (4000-MIPI-IN Kit)

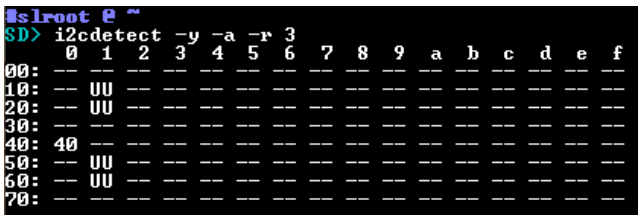
I2C Bus 3 detect can be used to help diagnose issues with ports and/or cable connections on the SLA-4000-MIPI-IN board.

1. Remove all the adapter boards from the 4000-OEM.
2. Establish an SSH session to the 4000-OEM with Tera Term (recommended) or similar application.

   Username and password: *slroot*

3. Run command: *i2cdetect -y -a -r 3.* The status of the SLA-4000-MIPI-IN board in Tera Term is shown in Figure 12.

Functioning and Connected Correctly



Not Functioning and/or Connected Correctly

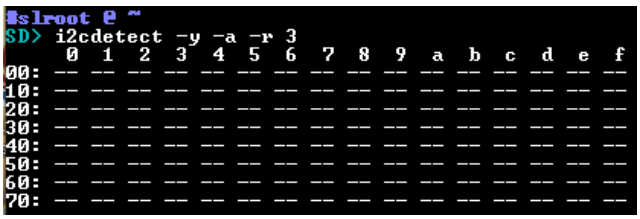


Figure 16: I2C Bus 3 Detect with Tera Term

4. If nothing shows up using I2C Bus 3 detect, check the SLA-CAB-MIPI-02 cable connection between the SLA-4000-IN MIPI board and the 4000-OEM, and then repeat steps 1 through 3.

ⓘ **IMPORTANT:** To prevent damage to hardware boards, disconnect the power before connecting or disconnecting the SLA-CAB-MIPI-02 cable.

5. If the board is still not responding contact SightLine Support.

10.3 Questions and Additional Support

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