



# SightLine

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APPLICATIONS

## **EAN-Hitachi Block-Cameras**

PN: EAN-Hitachi-Block-Cameras

8/10/2020

**Contact:**

Web: [sightlineapplications.com](http://sightlineapplications.com)

Sales: [sales@sightlineapplications.com](mailto:sales@sightlineapplications.com)

Support: [support@sightlineapplications.com](mailto:support@sightlineapplications.com)

Phone: +1 (541) 716-5137

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**Alerts**

The following notifications are used throughout the document to help identify important safety and setup information to the user:

 **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.*



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## 1 Overview

This document describes how to set up and configure the SightLine OEM video processing boards to receive video from Hitachi DI-SC120R camera.

SightLine OEM boards configured in this document: 1500-OEM, 3000-OEM, and 4000-OEM.

### 1.1 Associated Documents

[EAN-Camera Compatibility](#): Lists third-party cameras that are currently supported by SightLine software. Lists camera adapter board kits for the SightLine OEM video processing boards.

[EAN-Digital Video Configuration](#): Describes how to configure the SightLine hardware for digital video input.

[EAN-Ethernet-and-Serial-Communication](#): Describes how to set up serial communications for cameras or other payload devices from SightLine hardware.

[EAN-Lens Focus Control.pdf](#): Describes how to configure the SightLine hardware for controlling motorized lenses.

[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 [Software Download](#) page.

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

Additional support documentation EANs can be found on the Documentation pages of the SightLine Applications [website](#).

### 1.2 Sightline Firmware and Software Requirements

1500-OEM: Version 2.18 and higher and FPGA version 5 or 12. 3000-OEM: Version 2.21 and higher.

**ⓘ 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.

#### 1.2.1 FPGA - 1500-OEM

Version 5 of the FPGA driver firmware is required for the camera to operate correctly with the 1500-OEM. Version information is located on the *Connect* tab under the *Video Output* section. See the [EAN-FPGA Firmware Update 1500-OEM](#) for updating instructions.



Firmware Ver: 3.0.3.9 [5], temp: 98°F [37°C]  
SVN Revision: 50052, Build Date: 9/25/2019, Build Time: 4:48:51

**Figure 1: FPGA Version Number Location**

### 1.3 Third Party Software

Camera control software from Hitachi (contact your Hitachi representative).

[HW VSP3-Virtual Serial Port](#) from the HW group.



## 2 Interface Boards and Adapters

System interface boards provide options for network interfacing, serial ports, and GPIO. Camera interface and adapter boards provide an interface from the camera to OEM. See the [ICD-1500 Adapter Boards](#) and [ICD-3000-4000 Adapter Boards](#) for complete specifications and pinouts.

**IMPORTANT:** All boards should be connected and secured with the included cables and hardware fasteners first before applying power.

### 2.1 1500-AB Power Connection

REV H and later 1500-AB boards have a single power switch. REV E and earlier boards have a dual power switch. REV H and later boards are immediately powered on when power is connected. If using the 1500-AB board in a bench setup, review [Figure 2](#) and [Figure 3](#) prior to making power connections.

- ⚠ **CAUTION:** Power to the 1500-OEM board is provided through the 1500-HITACHI interface board using the SLA-PWR-B12V power supply shown in [Figure 3](#). Powering the OEM through the J3 power pins and through the 1500-HITACHI board can damage the OEM.
- ⚠ **CAUTION:** DO NOT power up the 1500-OEM board from the 1500-AB interface board. The power switches should be set to the positions shown in [Figure 2](#) (AB board power ON / 1500-OEM power OFF). Long term overpowering will permanently damage the 1500-OEM board.

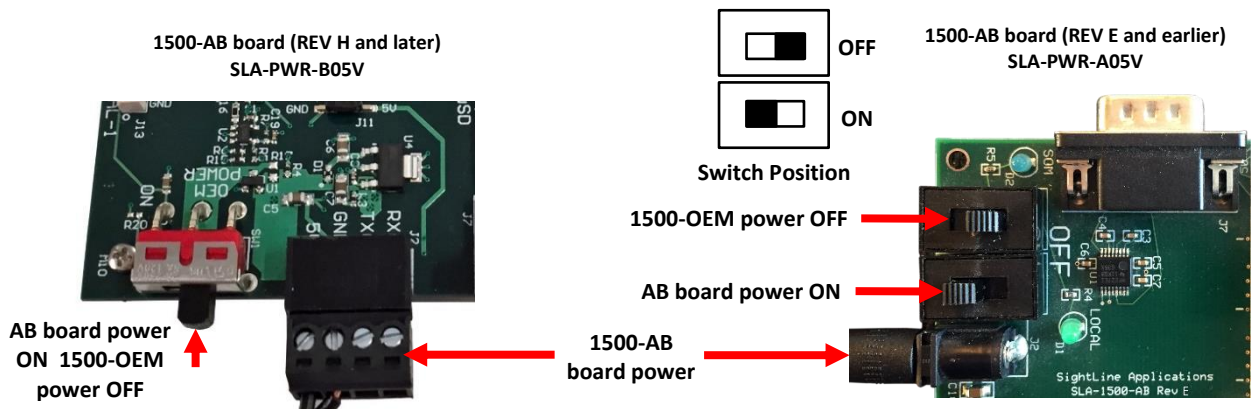


Figure 2: 1500-AB Board Power Connections



### 3 Hardware Connections

#### 3.1 1500-OEM DI-SC120R Camera Bench Setup

##### Interface and adapter boards:

- [SLA-1500-HITACHI](#): DI-SC120R camera and [1500-OEM](#) interface.
- [SLA-1500-AB](#): Provides serial and network interfaces.

Do not attach the 1500-OEM and Hitachi adapter board to the 1500-AB board. They should remain separate.

##### Cable connections:

**IMPORTANT:** Do not apply power to the 1500-OEM board from the 1500-AB board (see [Figure 2](#)).

Power on the 1500-AB board (first), then connect the SLA-PWR-B12V to an AC power source to power up the 1500-OEM and DI-SC120R camera.

- SLA-CAB-1514: Connects to J3 (14-pin) on the 1500-OEM connector and to the 1500-AB J3 (14-pin) connector. Provides analog video, network, and serial connections to the 1500-OEM.
- SLA-CAB-HC36: Connects to the 1500-HITACHI board and the Hitachi camera. Provides serial communication and digital video to the camera.
- SLA-CAB-1504: Connects to J2 on the SLA-1500-HITACHI board and SLA-PWR-B12V power adapter.
- SLA-PWR-B12V: Connects to an AC power source. Powers the camera, SLA-1500-HITACHI board, and the 1500-OEM.
- SLA-PWR-B05V: Connects to the 1500-AB board and AC power source.

##### Power and network connectivity LEDs:

A green light indicates the 1500-AB board is powered on. A blue light on the 1500-AB and a green light on the 1500-OEM board indicate that all the boards are powered on. A second flashing green light on the 1500-OEM indicates network connectivity.

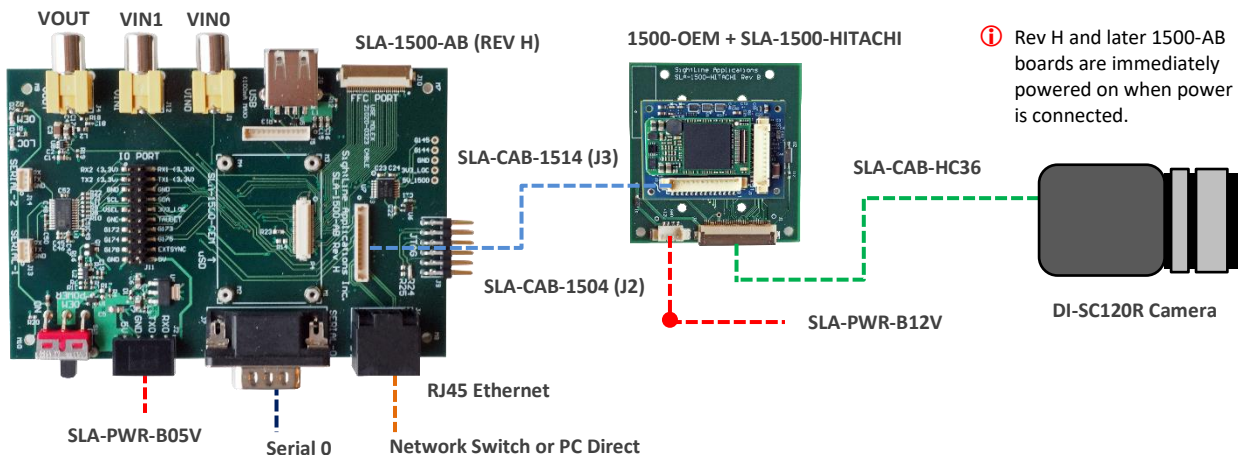


Figure 3: 1500-OEM DI-SC120R Camera Bench Setup



### 3.2 3000-OEM DI-SC120R Camera Bench Setup

#### Interface and adapter boards:

- [SLA-3000-HITACHI](#): DI-SC120R camera and [3000-OEM](#) interface. The 3000-OEM supplies power to the camera through the SLA-3000-HITACHI board.
- [SLA-3000-IO](#): Provides serial and network interfaces. Adapter boards can be connected to one of two available video input connectors (VIN1 or VIN0). See the 3000-OEM [exploded assembly](#) drawing for more connection layout information.

*VIN0 has camera channels 0 and 1 assigned. VIN1 has camera channels 2 and 3 assigned. If the configuration includes an analog board with a digital adapter board the analog board must be installed on VIN0.*

- [SLA-3000-mIO](#) (optional smaller IO board): Provides serial and network interfaces. This board allows SLA-3000-HITACHI board to be connected directly to the OEM board.

#### Cable connections:

- SLA-CABHC36: Connects to the 3000-HITACHI board and the Hitachi camera. Provides serial communication and digital video to the camera.
- SLA-CAB-0403: Connects to J4 on SLA-3000-mIO board. Provides an RJ45 Ethernet connection.
- SLA-PWR-C12V: Connects to J5 on SLA-3000-IO board and AC power source.
- SLA-CAB-1504 / SLA-PWR-B12V: Connects to J9 on the SLA-3000-mIO board and AC power source.

#### Power and network connectivity LEDs:

A green light on the 3000-IO or 3000-mIO board indicates that all boards are powered on. An amber light on the 3000-OEM board verifies network connection.

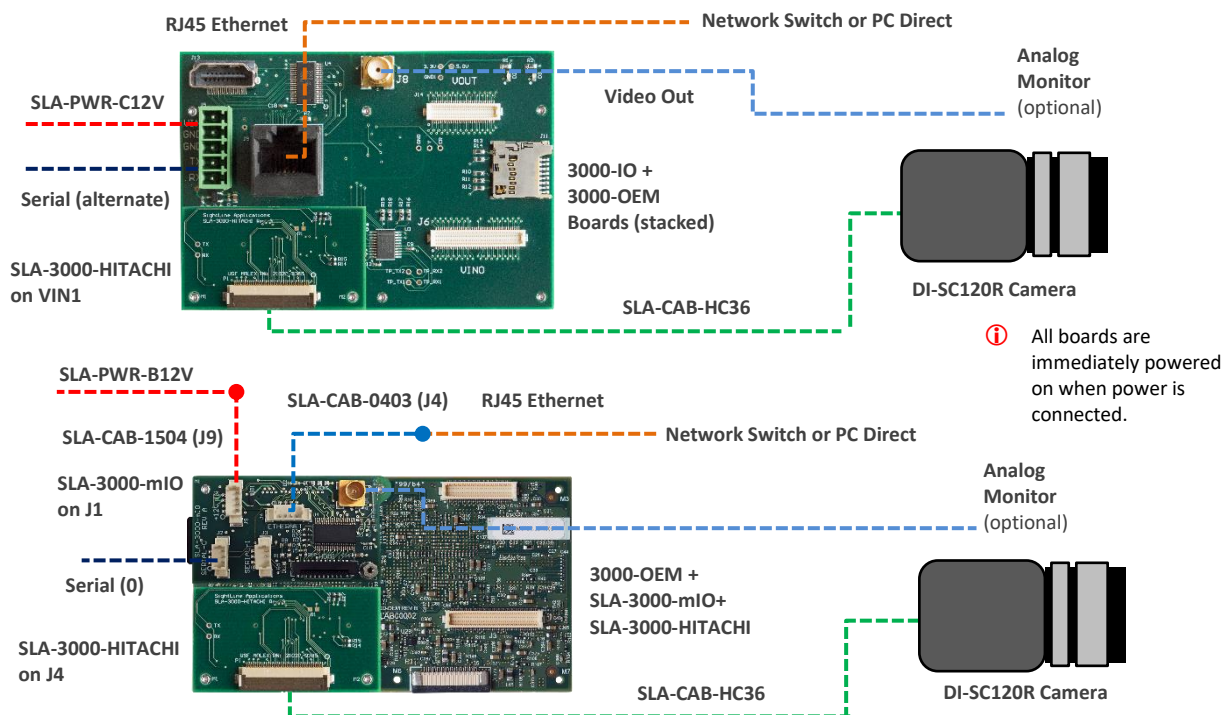
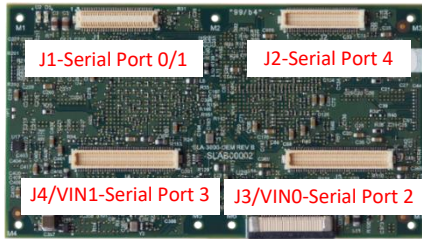


Figure 4: 3000-OEM DI-SC120R Camera Bench Setup





3000-OEM	SLA-3000-IO	Serial Port	Camera Index Panel Plus
J1		0/1	NA
J2	VOUT	4	NA
J3	VIN0	2	CAM0/CAM1
J4	VIN1	3	CAM2

Figure 5: 3000-OEM Serial Port and Connector Reference

### 3.3 4000-OEM DI-SC120R Camera Bench Setup

#### Interface and adapter boards:

- [SLA-3000-HITACHI](#): DI-SC120R camera and [4000-OEM](#) interface. The 4000-OEM supplies power to the camera through the SLA-3000-HITACHI board. Serial and network interfaces are provided on the 4000-OEM board.
- The SLA-3000-HITACHI board can be connected to J6 on the 4000-OEM. Additional camera adapter boards can be connected using the SLA-4000-MIPI board. See the [ICD-3000-4000 Adapter Boards](#) for specific MIPI board power requirements.

#### Cable connections:

- SLA-CABHC36: Connects to the 3000-HITACHI board and the DI-SC120R camera. Provides serial communication and digital video to the camera.
- SLA-CAB-0403: Connects to J4 on 4000-OEM board. Provides an RJ45 Ethernet connection.
- SLA-CAB-1504 / SLA-PWR-B12V-36W: Connects to J50 on the 4000-OEM board and AC power source.

#### Power and network connectivity LEDs:

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

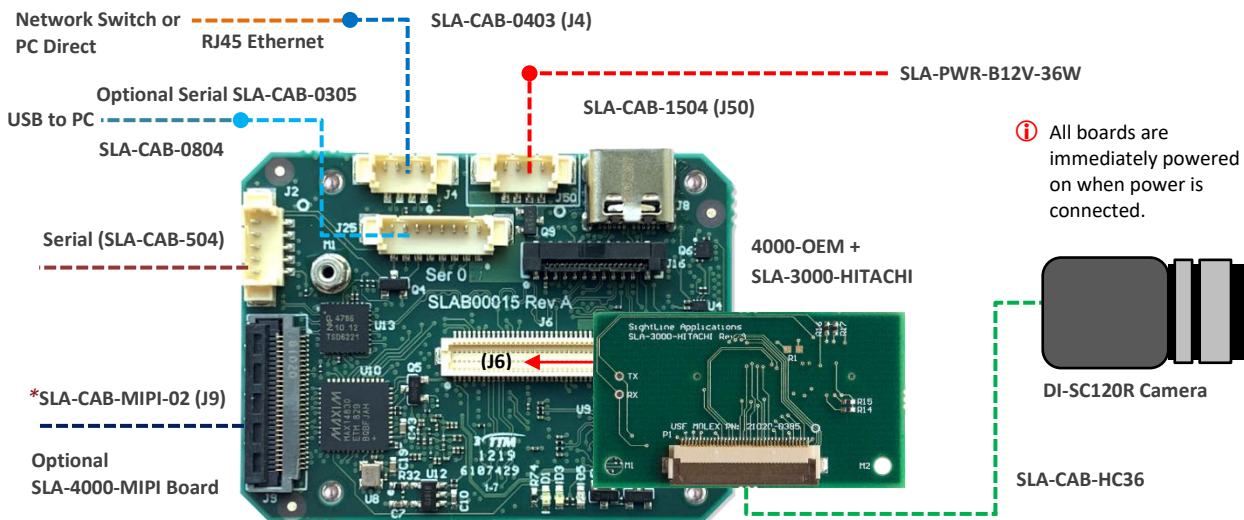


Figure 6: 4000-OEM DI-SC120R Camera Bench Setup

\*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.



## 4 Configuration Settings


This section covers the basic camera configuration settings in Panel Plus for the OEM video processing boards.

Before connecting with the Panel Plus software, the 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).

 See the one of the corresponding OEM startup guides for connection and video streaming instructions:

- [EAN-Startup Guide 1500-OEM](#)
- [EAN-Startup Guide 3000-OEM](#)
- [EAN-Startup Guide 4000-OEM](#)

 **IMPORTANT:** This procedure makes the assumption that the customer has read the OEM startup guide(s) and has a basic understanding of the following fundamentals:

- Completed a functional connection between the SightLine video processing board and Panel Plus application
- Familiar with Panel Plus controls
- Successfully streamed video in Panel Plus


 If you do not have a strong basic system setup and familiarity, we recommend reviewing the OEM startup guide(s) and work with our support team to establish basic connection and streaming fundamentals.


### 4.1 Acquisition Settings

From the main menu in Panel Plus go to *Configure » Acquisition Settings*.

If available, use the *AutoFill* drop down menu in the *Acquisition Settings* dialog to automatically populate the relevant fields with the correct settings. The settings can also be manually entered as shown in [Table 1](#), [Table 2](#), or [Table 3](#).

For information about Acquisition fields in Panel Plus see [EAN-Digital Video Configuration](#).

 Save parameters and reset the board when changing parameters. Cycle system power when changing resolution. If video is not present, cycle system power.

 If video does not display, try saving and activating the settings again. Check the encoding settings on the *Compression* tab and review the network addresses for the destination video.



**Table 1: 1500-OEM Panel Plus Basic Acquisition Settings**

Digital Cameras	Camera Index = Digital		Camera Type = Generic Digital									
Acquisition Settings	Auto Fill	Height	Width	VFP	HFP	Bits	Input	Invert VSync	Invert HSync	Sync/Crop	Init Code	Flags
<b>Hitachi</b>												
DI-SC110	No	720	1280	0	0	8	YUV	None	None	None	None	0x01
<i>Configuration notes: Requires software version 2.18.xx and above and FPGA version 5.</i>												
DI-SC120R	Hitachi 720p	720	1280	0	0	8	YUV	None	None	None	None	0x01
<i>Configuration notes: Requires software version 2.18.xx and above and FPGA version 5. Hitachi has announced the end-of-life (EOL) notice for this camera. Commercial availability may be limited. See <a href="#">Appendix</a>.</i>												

**Table 2: 3000-OEM Panel Plus Basic Acquisition Settings**


Digital Cameras	Camera Index = Digital		Camera Type = Generic Digital									
Acquisition Settings	Auto Fill	Height	Width	VFP	HFP	Bits	Input	Invert VSync	Invert HSync	Sync/Crop	Init Code	Flags
<b>HIKROBOT</b>												
UAV-CZD2302-N	No	1080	1920	0	0	16	YUV	None	None	Embedded Sync	InitVISCA	0x841
<i>Configuration notes: Requires software version 2.25.xx and above. This camera has been discontinued by the manufacturer.</i>												
<b>Hitachi</b>												
DI-SC110	No	720	1280	30	320	16	YUV	Yes	Yes	Hardware Crop	None	0xc31
<i>Configuration notes: Requires software version 2.21.xx and above.</i>												
DI-SC120R	Hitachi 720p	720	1280	0	0	16	YUV	None	None	None	None	0x1
	Hitachi 720p	720	1280	30	320	16	YUV	Yes	Yes	Hardware Crop	None	0xc31
<i>Configuration notes: Requires software version 2.21.xx and above. Hitachi has announced the end-of-life (EOL) notice for this camera. Commercial availability may be limited. See <a href="#">Appendix</a>.</i>												

**Table 3: 4000-OEM Panel Plus Basic Acquisition Settings**

Digital Cameras	Camera Index = Digital		Camera Type = Generic Digital									
Acquisition Settings	Auto Fill	Height	Width	VFP	HFP	Bits	Input	Invert VSync	Invert HSync	Sync/Crop	Init Code	Flags
<b>Hitachi</b>												
DI-SC120R	Hitachi 720p	720	1280	0	0	16	YUV	None	None	None	None	0x1
<i>Configuration notes: Requires software version 3.00.04 and above. Hitachi has announced the end-of-life (EOL) notice for this camera. Commercial availability may be limited. See <a href="#">Appendix</a>.</i>												

## 5 Camera Control

This section describes how to set up a TCP passthrough and virtual COM port to allow camera control through the Hitachi GUI. The [HW VSP3-Virtual Serial Port](#) application is used to set up a virtual COM port. Alternatively, the lens focus and zoom can be controlled through Panel Plus - see the [EAN-Lens Focus Control](#) document for setup instructions.

 *Enabling TCP passthrough will disable lens control in Panel Plus (or SightLine protocol) for the camera and lens attached to that port. The SightLine lens control implementation requires that port protocol is set to Port Not Used.*



## 5.1 TCP Passthrough Setup

Serial passthrough is supported by the SightLine OEM boards to allow connection to the camera from a network controlling host.

- From the Panel Plus main menu » *Configure* » *Serial Ports*:

- 3000-OEM: Serial Port 2 (Cam0 / VIN0) or Serial Port 3 (Cam2 / VIN1).
- 1500-OEM/4000-OEM: Select Serial Port 2.
- *Protocol: TCP Pass Through.*
- Enter the desired inbound port number. This example uses port 4001.
- *Baud: 4800*
- *Data Bits* and *Stop Bits* are set at the default values shown. Set *Parity* to *Even*.

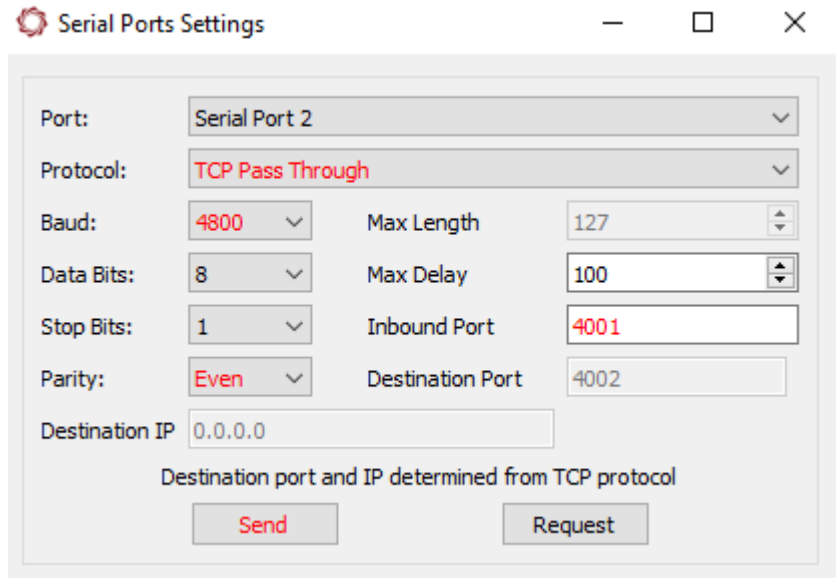



Figure 7: TCP Passthrough Setup

- After configuring the settings, changed fields will be highlighted in red. Click *Send*.
- To save the configuration to the parameter file, from the Panel Plus main menu » *Parameters* » *Save to board*.

 In 3.01.xx and earlier software versions, saving the Serial Port settings will prompt an additional dialog window. Some setting changes require the board to be restarted for the settings to take effect. In the *Apply New Settings* dialog window, select an option to save the port configuration.

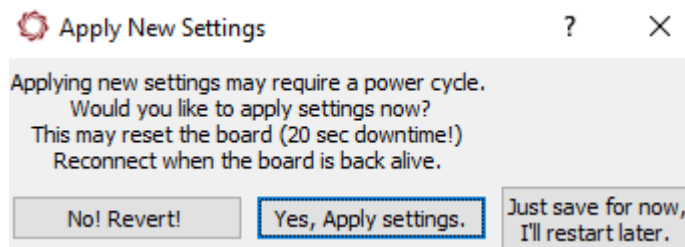


Figure 8: Apply New Settings Dialog - 3.01.xx and Earlier

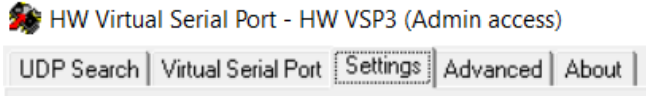
- Proceed to the next section to set up the virtual COM port.



## 5.2 Virtual Com Port Setup

Review the physical serial ports on the host PC. Create virtual serial ports that are not already assigned or in use on the current system. COM4 is used in this example.

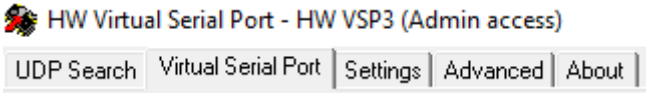
1. Launch the HW VSP3-Virtual Serial Port application.
2. Select the *Setting* tab.



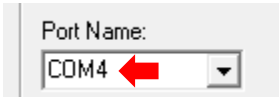
3. Make sure the *NVT Enabled* box is unchecked.



4. Select the *Virtual Serial Port* tab.



5. Select an unused COM port from the *Port Name* drop-down menu.



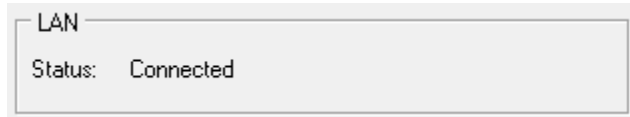
6. Enter the IP address of the SightLine hardware and TCP passthrough inbound port.



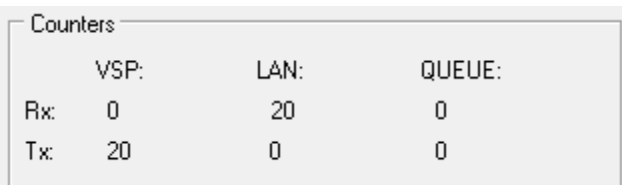
7. Click *Create COM* to create the virtual serial port. The virtual serial port parameters are configured automatically.



8. Verify a successful connection in the LAN Status section of the dialog window.



9. Launch the Hitachi camera control application (*ECRS2.exe* file).
10. Select the virtual port and the baud rate. COM4 is used in this example. Set *Parity* to *Even*.
11. Verify sent and received packets are being shown in the *Counters* section of the *Virtual Serial Ports* tab. The Hitachi control application is now ready to use.





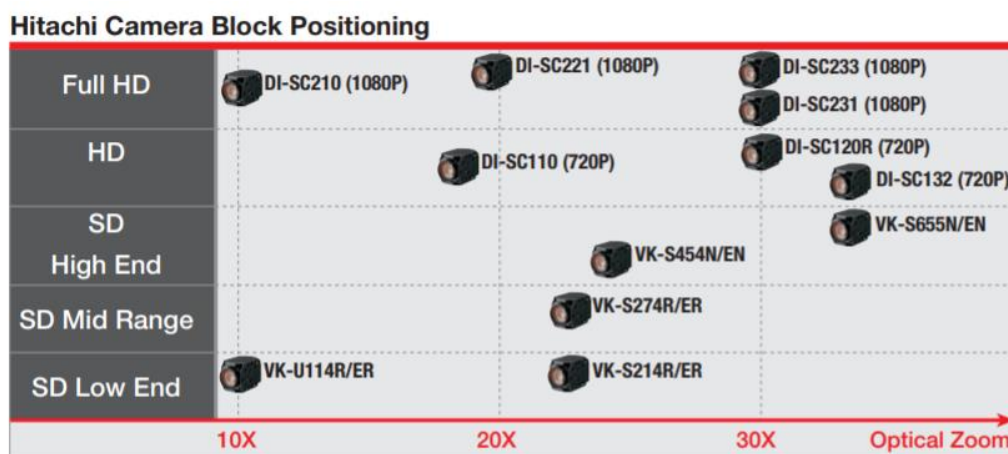
## 6 Questions and Additional Support

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

### Appendix - Hitachi SC-120R Camera

The Hitachi DI-SC120R camera is being phased out by Hitachi. The only compatible camera is the DI-SC-110, which has less zoom. The DI-SC120R and DI-SC110 are CCD cameras. All other Hitachi block cameras are CMOS cameras that have rolling shutter effects.

**ⓘ IMPORTANT:** The Hitachi camera models shown in [Figure A1](#) have different connectors and cables than the DI-SC-120 and DI -SC110. They are not compatible with the SightLine Hitachi adapter boards.



#### Cables

Type	Models
Molex 9 pin FFC cable	VK-S454N/EN, VK-S655N/EN
Molex 30 pin micro-coax cable	VK-S454N/EN, DI-SC220, VK-S655N/EN
Molex 40 pin micro-coax cable	DI-SC110, DI-SC120R
KEL 30 pin micro-coax cable	DI-SC132, DI-SC210, DI-SC221, DI-SC231, DI-SC233

Hitachi offers a variety of cable lengths for analog and HD camera blocks with Molex flat flex and/or micro-coax connectors. For assistance with KEL cables, please contact your local KEL representative.

**Figure A1: Hitachi Camera Models Chart**