



# SightLine

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APPLICATIONS

## ICD-1500-Enclosures

PN: ICD-1500-Enclosures

1/23/2020

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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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### Revision History

Date	Description
1/23/2020	Corrected PENC part number.
5/31/2018	Update 1500-ENC weight specification.
5/10/2018	Updated ICD to new format. Combined 1500-ENC and 1500-PENC in one document



## 1 Overview

Describes power requirements, interface specifications, and connector pin-outs for the 1500-ENC and 1500-PENC enclosures.

### 1.1 Associated Documents

[EAN-Startup Guide 1500-OEM](#): Describes steps for connecting, configuring, and testing the 1500-OEM video processing board on the 1500-AB accessory board.

[ICD-1500 Adapter Boards](#): Describes power requirements, thermal management, interface specifications, and connector pin-outs for the 1500-OEM associated camera interface boards.

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

[EAN-Firmware Upgrade Utility](#): Outlines the steps for installing and running the Upgrade Utility to manage the firmware, parameter, license and other program files critical to hardware and software functions.

[EAN-Network Configuration](#): Describes how to assign a static IP address to the board, set telemetry destinations and ports, and provide configuration information for both the 3000-OEM and the 1500-OEM video processing boards

[Interface Command and Control \(IDD\)](#): Describes the native communications protocol used by the SightLine Applications product line. The IDD is also available as a local download on the [Software Download](#) page.

EAN-Panel Plus User Guide: Provides descriptions of all the settings in the Panel Plus application. (Located in the Panel Plus application in the *Help* menu.)

### 1.2 Software Compatibility

Windows 7, 8, or 10 required for use with the Panel Plus software.

### 1.3 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, use the following Electro Static Discharge (ESD) guidelines:

- 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 1500-ENC

The 1500-ENC is a small economical enclosure suitable for laboratory and protected environment applications. It provides a compact single channel solution with encoded Ethernet video and analog outputs.

**Revision:** C

**Dimensions:** 2.5 in x 2.4 in x 1.0 in (64 mm x 61 mm x 24 mm)

**Weight:** 3.24 oz (92 grams)

**Drawing:** [SLA-1500-ENC](#)

**STEP File:** [SLA-1500-ENC STEP](#)

**Rev History:**



Figure 1: 1500-ENC

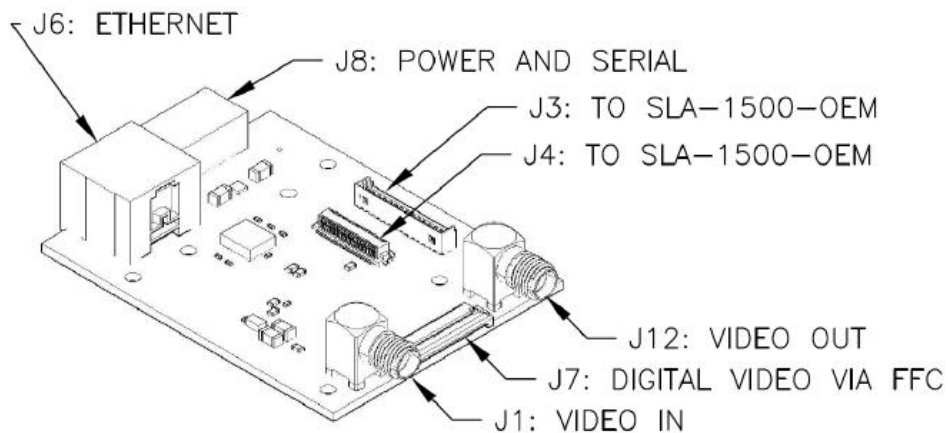


Figure 2: 1500-ENC Connector Callouts

Table 1: 1500-ENC Connector Summary

Label	MFG Part Number	Function	Mates with:
J1	CONSMA002	Analog Video Input	Standard SMA
J12	CONSMA002	Analog Video Output	Standard SMA
J6	1-406525-1	Ethernet	Standard CAT-5e cable
J8	39506-1004	Power, RS-232C	<a href="#">MOLEX 039500-0004</a>
J7	FH12-30S-0.5SH(55)	Digital Video	Molex 21020-0323



**Table 2: 1500-ENC Connector Descriptions**

<b>Socket S1: MicroSD (internal)</b>	<ul style="list-style-type: none"> <li>• Push in, push out</li> <li>• 10,000 mating cycles</li> <li>• 3.3mm card eject length</li> <li>• Works with most MicroSD cards</li> </ul>																														
<b>Connector J1: Analog Video Input</b>	NTSC and PAL analog video input.																														
<b>Connector J6: 10/100 Base-T Ethernet</b>	Provides 10/100Base-T access using a standard Ethernet modular jack. <table border="1" data-bbox="695 541 1482 772"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Description</th> <th>Pin</th> <th>Signal</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>TX+</td> <td>ORANGE + WHITE</td> <td>5</td> <td>NC</td> <td></td> </tr> <tr> <td>2</td> <td>TX-</td> <td>ORANGE</td> <td>6</td> <td>RX-</td> <td>GREEN</td> </tr> <tr> <td>3</td> <td>RX+</td> <td>GREEN + WHITE</td> <td>7</td> <td>NC</td> <td></td> </tr> <tr> <td>4</td> <td>NC</td> <td></td> <td>8</td> <td>NC</td> <td></td> </tr> </tbody> </table>	Pin	Signal	Description	Pin	Signal	Description	1	TX+	ORANGE + WHITE	5	NC		2	TX-	ORANGE	6	RX-	GREEN	3	RX+	GREEN + WHITE	7	NC		4	NC		8	NC	
Pin	Signal	Description	Pin	Signal	Description																										
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2	TX-	ORANGE	6	RX-	GREEN																										
3	RX+	GREEN + WHITE	7	NC																											
4	NC		8	NC																											
<b>Connector J7: FFC Digital Video Connector</b>	This connector is used to connect the board to various cameras using an FFC cable with a custom FFC-XXX board on the other side, where XXX stands for the individual camera being used. See ICD-FFC-Camera-Interface document for more information.																														
<b>Connector J12: Analog Video Output</b>	NTSC analog video output																														
<b>Connector J12: 802.11n (WiFi) antenna (alternate)</b>	Special versions of the product may be purchased which provides WiFi access in place of analog video Output. Contact <a href="#">Sales</a> for more information.																														
<b>Connector J8: Power + RS-232</b>	<table border="1" data-bbox="695 1108 1482 1339"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Power</td> <td>4.5V - 5.5V</td> </tr> <tr> <td>2</td> <td>GND</td> <td>Ground</td> </tr> <tr> <td>3</td> <td>TX</td> <td rowspan="2">RS-232C level serial port. Share ground with PIN 2.</td> </tr> <tr> <td>4</td> <td>RX</td> </tr> </tbody> </table> <p>3.5 mm TERM BLOCK PLUG STR 4POS MOLEX 039500-0004 Use with SLA-PWR-B05V power supply or similar.</p>	Pin	Signal	Description	1	Power	4.5V - 5.5V	2	GND	Ground	3	TX	RS-232C level serial port. Share ground with PIN 2.	4	RX																
Pin	Signal	Description																													
1	Power	4.5V - 5.5V																													
2	GND	Ground																													
3	TX	RS-232C level serial port. Share ground with PIN 2.																													
4	RX																														



## 4 1500-PENC

The 1500-PENC is a rugged enclosure built to military standards capable of withstanding demanding shock and environmental conditions. It comes pre-configured with a set of default parameters for use with the FLIR Photon HRC camera and H.264 video encoding. Additional Engineering Application Notes (EANs) to configure or tune your system for application specific operations can be found on the Support pages of the SightLine Applications [website](#).

**Revision:** A

**Dimensions:** 4.20 in x 3.20 in x 1.92 in (106 mm x 81 mm x 48 mm)

**Weight:** 12.1 oz (343 grams)

**Drawing:** (coming soon)

**STEP File:** (coming soon)

**Rev History:**



Figure 3: 1500-PENC

**ⓘ IMPORTANT:** When the enclosure is not being used, cover the connectors with protective caps to protect the system.

Table 3: 1500-PENC Connector Summary

Label	MFG Part Number	Function	Mates with:
J1	Ethernet	Glenair 805-003-07NF9-10PA	805-002-16NF9-10SA
J2	VPU Command and control and camera control passthrough	DB-9 (Male)	Recommend using custom breakout cable (see below)
J3	Analog video input	75Ω BNC (Female)	Any standard BNC cable
J4	Analog video output	75Ω BNC (Female)	Any standard BNC cable
J5	Power	Glenair 805-003-07NF8-23PA	805-002-16NF8-23SA
J26	Digital video and camera control	Glenair 805-003-07NF10-13PA	805-002-16NF10-13SA





## 4.1 MIL Testing Standards

### 4.1.1 MIL-STD-810F Standard

The 1500-PENC has been tested to the MIL-STD-810F environmental durability vibrations and shock standard.

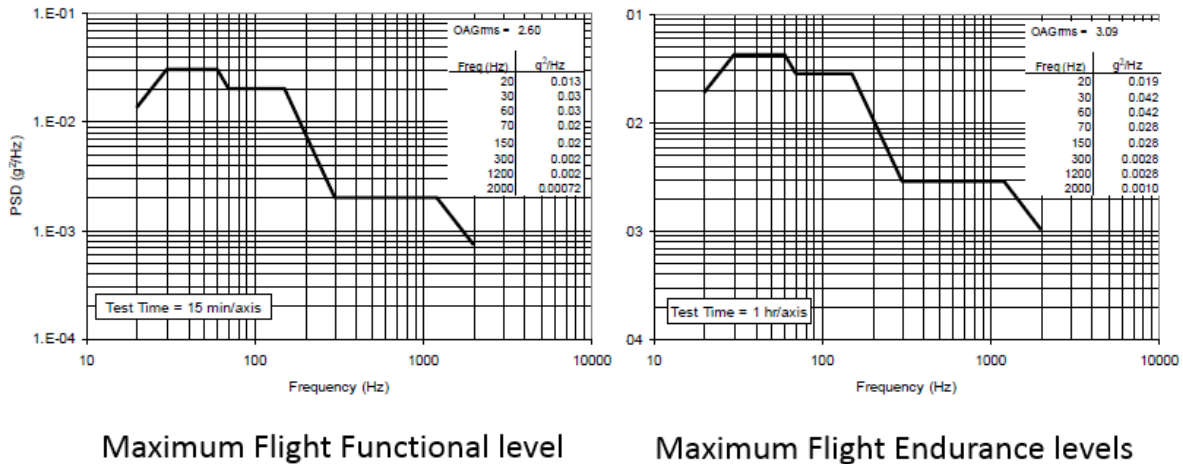


Figure 4: MIL-STD-810F Standard

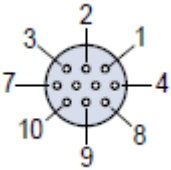
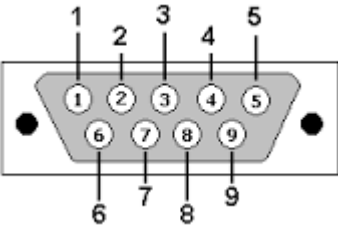
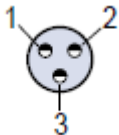
### 4.1.2 MIL-STD-461E Standard

The 1500-PENC has been tested to the MIL-STD-461E electromagnetic interference standard that includes the following tests:

- CE102 Conducted emissions, power leads, 10 kHz to 10 MHz
- CS101 Conducted susceptibility, power leads, 30 Hz to 150 kHz
- CS114 Conducted susceptibility, bulk cable injection, 10 kHz to 200 MHz, curve 5
- CS115 Conducted susceptibility, bulk cable injection, impulse excitation
- CS116 Conducted susceptibility, damped sinusoidal transients, cables and power leads, 10 kHz to 100 MHz
- RE102 Radiated emissions, electric field, 10 kHz to 18 GHz
- RS103 Radiated susceptibility, electric field, 2 MHz to 18 GHz, 200 V/m

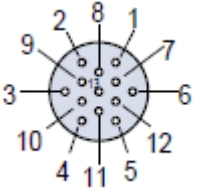


**Table 4: 1500-PENC Connector Descriptions**

<p><b>Connector J1: Ethernet</b></p> 	<p>Glenair 805-003-07NF9-10PA</p> <table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>DA+</td> <td>TX+ (WHITE/GREEN)</td> </tr> <tr> <td>4</td> <td>DA-</td> <td>TX- (GREEN)</td> </tr> <tr> <td>8</td> <td>DB+</td> <td>RX+ (WHITE/ORANGE)</td> </tr> <tr> <td>9</td> <td>DB-</td> <td>RX- (ORANGE)</td> </tr> <tr> <td>10</td> <td>DC+</td> <td rowspan="4">NYI</td> </tr> <tr> <td>7</td> <td>DC-</td> </tr> <tr> <td>3</td> <td>DD+</td> </tr> <tr> <td>2</td> <td>DD-</td> </tr> <tr> <td>5</td> <td>DD-</td> <td></td> </tr> <tr> <td>6</td> <td>NC</td> <td></td> </tr> </tbody> </table>	Pin	Signal	Description	1	DA+	TX+ (WHITE/GREEN)	4	DA-	TX- (GREEN)	8	DB+	RX+ (WHITE/ORANGE)	9	DB-	RX- (ORANGE)	10	DC+	NYI	7	DC-	3	DD+	2	DD-	5	DD-		6	NC				
Pin	Signal	Description																																
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7	DC-																																	
3	DD+																																	
2	DD-																																	
5	DD-																																	
6	NC																																	
<p><b>Connector J2: VPU Command and Control</b></p> 	<p><b>ⓘ IMPORTANT:</b> The DB-9 connector should not be connected to a PC or other device directly. Use the SLA-CAB-DB9x break out cable or see schematic for reference in <a href="#">Figure 5</a>.</p> <table border="1"> <thead> <tr> <th>Signal</th> <th>Description</th> <th>Signal</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>NC</td> <td></td> </tr> <tr> <td>2</td> <td>RS-232C</td> <td>RX to camera</td> </tr> <tr> <td>3</td> <td>RS-232C</td> <td>TX to camera</td> </tr> <tr> <td>4</td> <td>NC</td> <td></td> </tr> <tr> <td>5</td> <td>Signal ground</td> <td>Ground</td> </tr> <tr> <td>6</td> <td>RS-232C</td> <td>RX to 1500-OEM</td> </tr> <tr> <td>7</td> <td>RS-232C</td> <td>TX to 500-OEM</td> </tr> <tr> <td>8</td> <td>NC</td> <td></td> </tr> <tr> <td>9</td> <td>Signal ground</td> <td>Ground</td> </tr> <tr> <td>Shield</td> <td></td> <td></td> </tr> </tbody> </table>	Signal	Description	Signal	1	NC		2	RS-232C	RX to camera	3	RS-232C	TX to camera	4	NC		5	Signal ground	Ground	6	RS-232C	RX to 1500-OEM	7	RS-232C	TX to 500-OEM	8	NC		9	Signal ground	Ground	Shield		
Signal	Description	Signal																																
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2	RS-232C	RX to camera																																
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Shield																																		
<p><b>Connector J3: Analog Video Input</b></p>	<p>Standard NTSC / PAL Analog Video (BNC) 0.75 V peak-to-peak (Z0 = 75Ω)</p>																																	
<p><b>Connector J4: Analog Video Output</b></p>	<p>Standard NTSC / PAL Analog Video (BNC) 0.75 V peak-to-peak (Z0 = 75Ω)</p>																																	
<p><b>Connector J5: Power</b></p> 	<table border="1"> <thead> <tr> <th>Pin</th> <th>Signal</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5V DC in</td> <td>Power</td> </tr> <tr> <td>2</td> <td>5V DC return</td> <td>Ground</td> </tr> <tr> <td>3</td> <td>NC</td> <td></td> </tr> <tr> <td>Shield</td> <td></td> <td></td> </tr> </tbody> </table>	Pin	Signal	Description	1	5V DC in	Power	2	5V DC return	Ground	3	NC		Shield																				
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Shield																																		



(1500-PENC Connector Descriptions continued)

Connector J26: Digital Video and Camera Control	Pin	Signal	Description
	1	Differential signal pairs (see FLIR HRC documentation for details)	SD_CLK1+
	7		SD_CLK1-
	6		SD_FSYNCH1+
	12		SD_FSYNCH1-
	5		SD_DATA2+
	11		SD_DATA2-
	4		SD_DATA1+
	10		SD_DATA1-
	8	NC	
	2	RS-232	RS232_TX1
	3		RS232_RX1
	9		RS232_GND
	13	NC	
	Shield	Chassis ground	

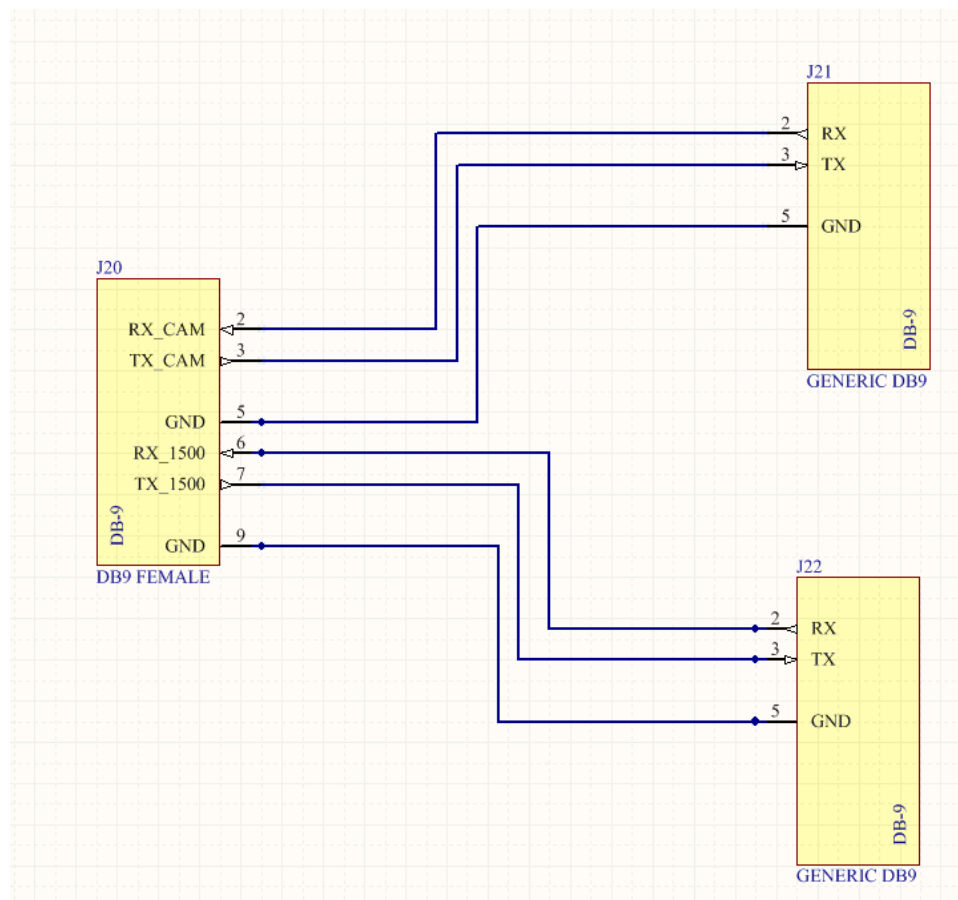


Figure 5: SLA-CAB-DB9x Breakout Cable



## 4.2 RS-232 Digital Camera Passthrough

The 1500-PENC acts as a passive RS-232 splitter when powered off allowing straight serial pass-through to the camera connected to J26.

The default baud rate and other communication setting are determined by the peripheral attached to J26.

Example: FLIR Photon HRC expects 57600, 8, 1, NONE serial settings.

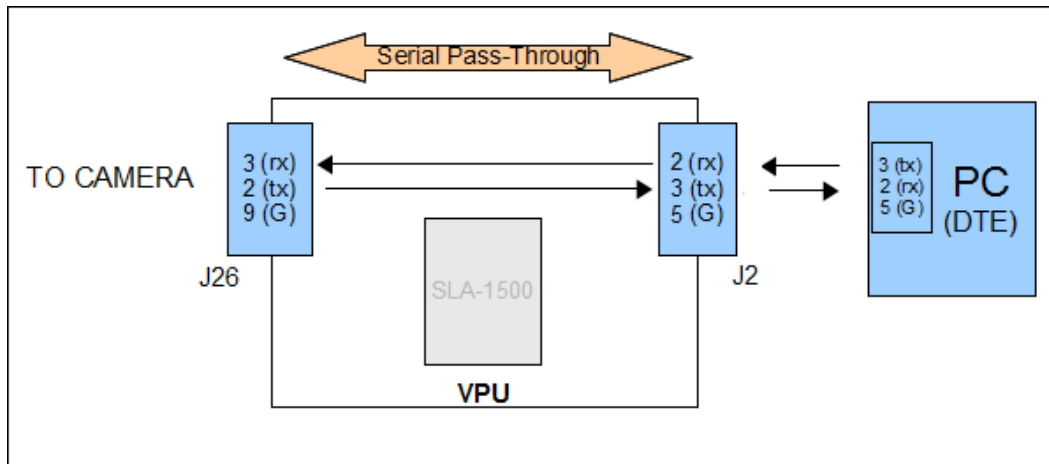


Figure 6: RS-232 Passthrough to Digital Camera

When the 1500-PENC is powered on, command and control of the Digital Camera can be achieved using the Ethernet passthrough capability (see Illustration 3).

This allows the FLIR Photon camera control software (or similar) to communicate over Ethernet to the camera. The PC can still communicate over serial to the camera.

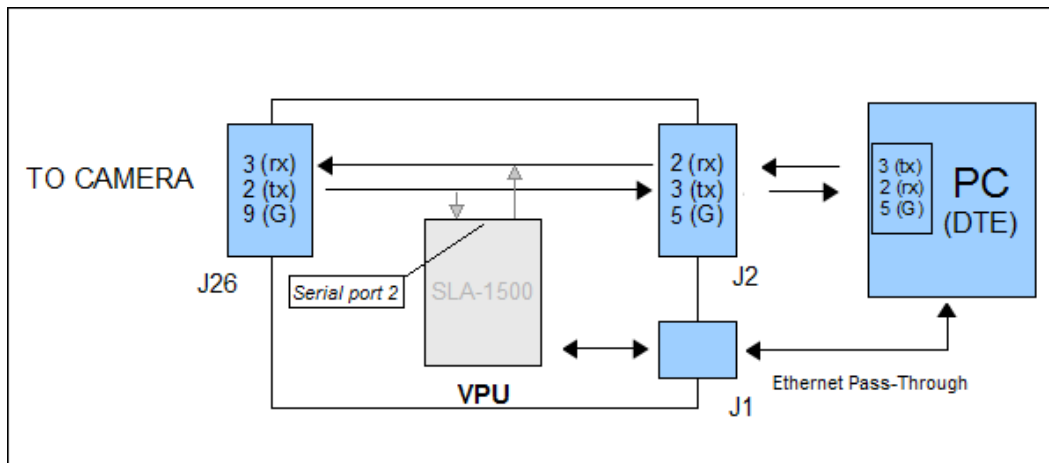


Figure 7: Ethernet Passthrough



### 4.3 RS-232 Command and Control 1500-OEM

The internal VPU (1500-OEM) can be configured and controlled using RS-232 on pins 6, 7, and 9 as well as Ethernet (preferred).

Use Panel Plus or create a custom software using SLA command-and-control protocol.

The default RS-232 configuration is 57600, 8, 1, None, No Handshake. This can be changed and saved to internal flash using Panel Plus.

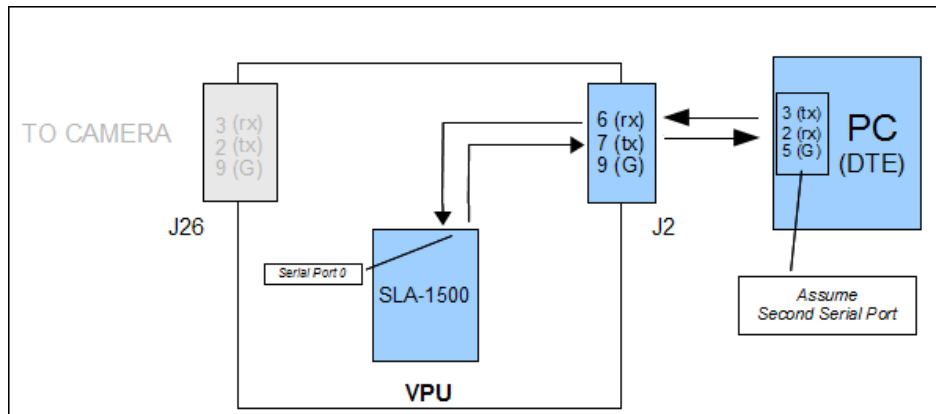


Figure 8: RS-232 Command and Control 1500-OEM

## 5 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.