

SLA-1500-PENC Interface Control Documentation

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PN: ICD-SLA-1500-PENC

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USA

Table of Contents

Revision History.....	3
Overview.....	4
SLE-1500-PENC Summary.....	5
FEATURES:.....	5
Standards & Specifications:.....	5
Connector Overview.....	6
Connector J1: Ethernet.....	7
PIN OUT.....	7
Connector J5: Power.....	7
PIN OUT.....	8
Connector J26: Digital Video and Camera Control.....	8
PIN OUT.....	9
Connector J3: Analog Video Input.....	9
Connector J4: Analog Video Output.....	9
Connector J2: VPU Command and Control.....	9
RS-232 pass-through to the Digital Camera.....	10
RS-232 Command and Control of the SLE-1500-OEM.....	11
PIN OUT.....	12
SLA-CAB-DB9x Breakout Cable.....	13
LEDS.....	13
Dimensions.....	13
Example Mounting:.....	15
Getting Started.....	16
Configuring the SLA-1500-PENC.....	16
Definitions.....	17
SightLine Product Export Controls.....	18
FILES.....	18
ERRATA.....	18
Contacts.....	18

Illustration Index

Illustration 1: SLA-1500-PENC Summary.....4
 Illustration 2: Direct serial control of the camera from the PC.....10
 Illustration 3: Ethernet Pass-Through to Camera.....11
 Illustration 4: PC RS-232 command and control of SLA-1500-PENC.....11
 Illustration 5: SLA-CAB-DB9x breakout cable.....13
 Illustration 6: SLA-1500-PENC Dimension Drawing.....14
 Illustration 7: SLA-1500-PENC Mounting Hole Pattern.....15

Index of Tables

Table 1: SLE-1500-PENC Physical Characteristics.....5
 Table 2: Hardware Feature Summary.....5
 Table 3: Connector Summary.....6
 Table 4: J1 Pin-out.....7
 Table 5: J5 Pin-out.....8
 Table 6: J26 Pin-out.....9
 Table 7: J2 Pin-out.....12
 Table 8: Additional SightLine Documentation References.....17
 Table 9: Terms and Definitions.....17

Revision History

Date	Notes
3/13/2015	Update Reference document table and product weight
02/10/15	Reverting J6 back to J26.
02/06/15	Corrected measurement units, updated serial port usage illustrations, updated SLA-CAB-DB9x breakout cable, additional content, connector J26 is now J6.
01/27/15	Preliminary release available to customers.

Overview

This document covers all variations of the **SLA-** and **SLE-1500-PENC** products available from SightLine Applications. For the purposes of this document SLA-1500 and SLE-1500 will be used interchangeably.

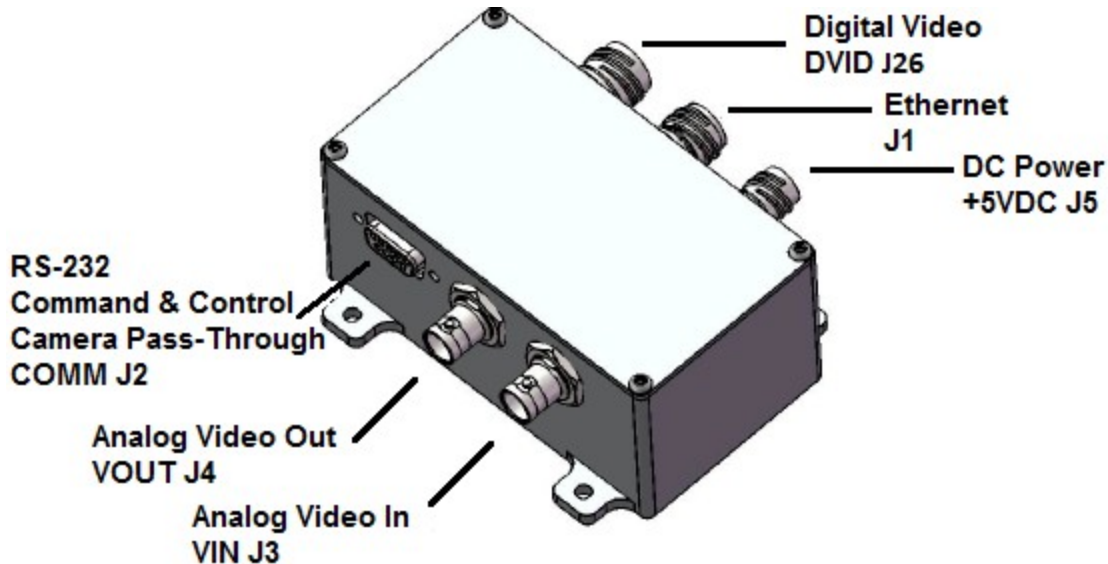


Illustration 1: SLA-1500-PENC Summary

The **SLE-1500-PENC** is a small, low power, video processing unit can provide video encoding and other image processing functionality for the FLIR Photon HRC infrared camera. The SLE-1500-PENC accepts the raw digital video signals generated by the Photon and transmits the video as H.264 compressed data in an MPEG2 Transport Stream (TS) over Ethernet. This Ethernet video can then be piped through a local network for viewing and dissemination, or piped to an IP radio for downlink to a ground station. The MPEG2-TS can also include meta-data such as GPS Latitude and Longitude, aircraft attitude, and other mission critical data using standard MISB 601.4 KLV encoded values.

The SLE-1500-PENC can also accept a second video source using the Analog Video Input. The operator can then switch between the Photon and the second video source. The Analog Video Output can be used for diagnostic purposes or integrated into an existing Analog Video communication chain.

Operators can interface to the VPU using RS-232 or over Ethernet with SightLine's Command and Control Protocol or Graphical User Interface SLA-PANEL (2.20 or greater). The SLE-1500-PENC also allows operators to interact with the Photon using the FLIR Camera Control UI with our command pass-through functionality.

SLE-1500-PENC Summary

Dimensions	4.20" x 3.20" x 1.92"
Weight	12.1 oz
Operating Temp	-20°C to 55°C
Non-Operating Temp	-40°C to 71°C
Power	4.5V to 6V DC
Current Product Revision	A

Table 1: SLE-1500-PENC Physical Characteristics

FEATURES:

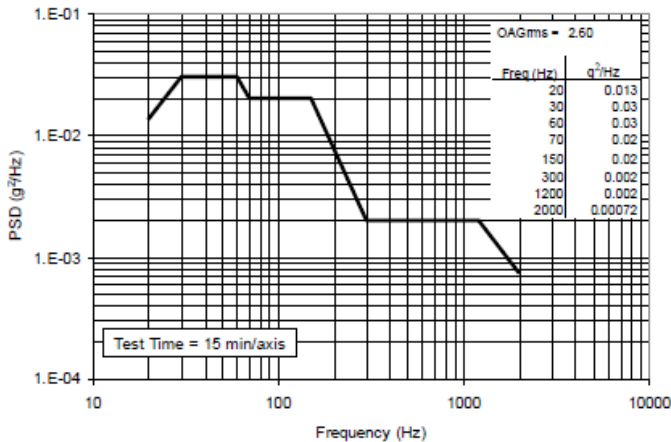
- Single Analog Video Input
- Single Analog Video Output
- RS-232 command and control of SLE-1500
- RS-232 command and control of camera
- 10/100Base-T Ethernet
- 13-pin Digital Video Connector
- 5V DC input
- Tough anodized aluminum enclosure

Table 2: Hardware Feature Summary

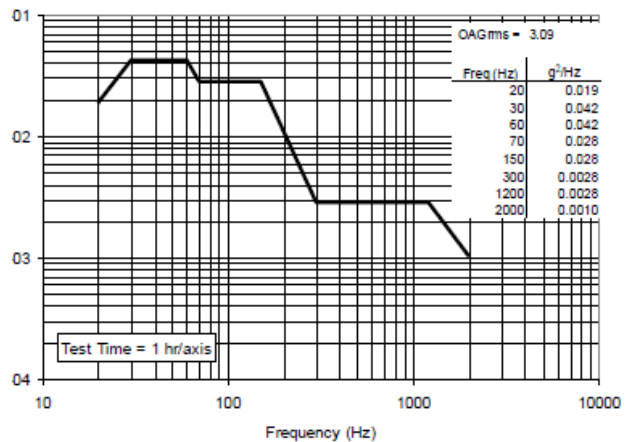
Standards & Specifications:

The SLE-1500-PENC will be tested to the following specifications:

Environmental Durability Vibrations and Shock : **MIL-STD-810F**



Maximum Flight Functional level



Maximum Flight Endurance levels

Electromagnetic Interference: **MIL-STD-461E**

- 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.

Connector Overview

Label	Function	Manufactures PN:	Mates with...
J1	Ethernet	Glenair 805-003-07NF9-10PA	805-002-16NF9-10SA
J2	VPU Command and Control & Camera Control Pass-through	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

Table 3: Connector Summary

NOTE: When not in use, it is recommended that protective metal caps (or similar) be used to protect the system.

Connector J1: Ethernet

Glenair 805-003-07NF9-10PA	
----------------------------	--

PIN OUT

Pin #	Signal Type	Name
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	NC	
6	NC	
Shield		

Table 4: J1 Pin-out

Connector J5: Power

Glenair 805-003-07NF8-23PA	
----------------------------	--

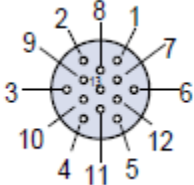
PIN OUT

Pin #	Signal Type	Name
1	5V DC IN	Power
2	5V DC RETURN	Ground
3	NC	
Shield		

Table 5: J5 Pin-out

Connector J26: Digital Video and Camera Control

- Digital Video
- RS-232

<p>Glenair 805-003-07NF10-13PA</p>	
------------------------------------	---

PIN OUT

Pin #	Signal Type	Name
1	Differential Signal Pairs see FLIR Photo 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-232C	RS232_TX1
3	NC	RS232_RX1
9		RS232_GND
13		
Shell	Chassis Ground	

Table 6: J26 Pin-out

Connector J3: Analog Video Input

0.75 V _{peak-to-peak} Z ₀ = 75 Ω	Standard NTSC / PAL Analog Video (BNC)
---	--

Connector J4: Analog Video Output

0.75 V _{peak-to-peak} Z ₀ = 75 Ω	Standard NTSC / PAL Analog Video (BNC)
---	--

Connector J2: VPU Command and Control

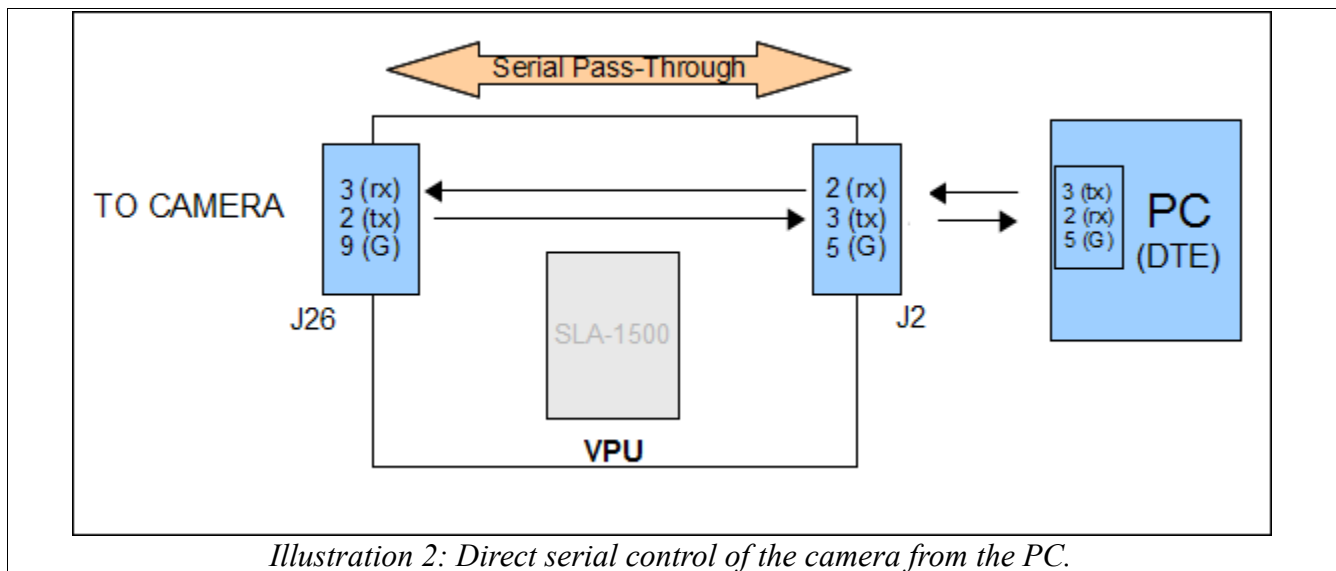
WARNING: This DB-9 connector **shall not** be connected to a PC or other device directly. Please use the **SLA-CAB-DB9x** break out cable or see schematic for reference (below).

This connector provides dual functionality:

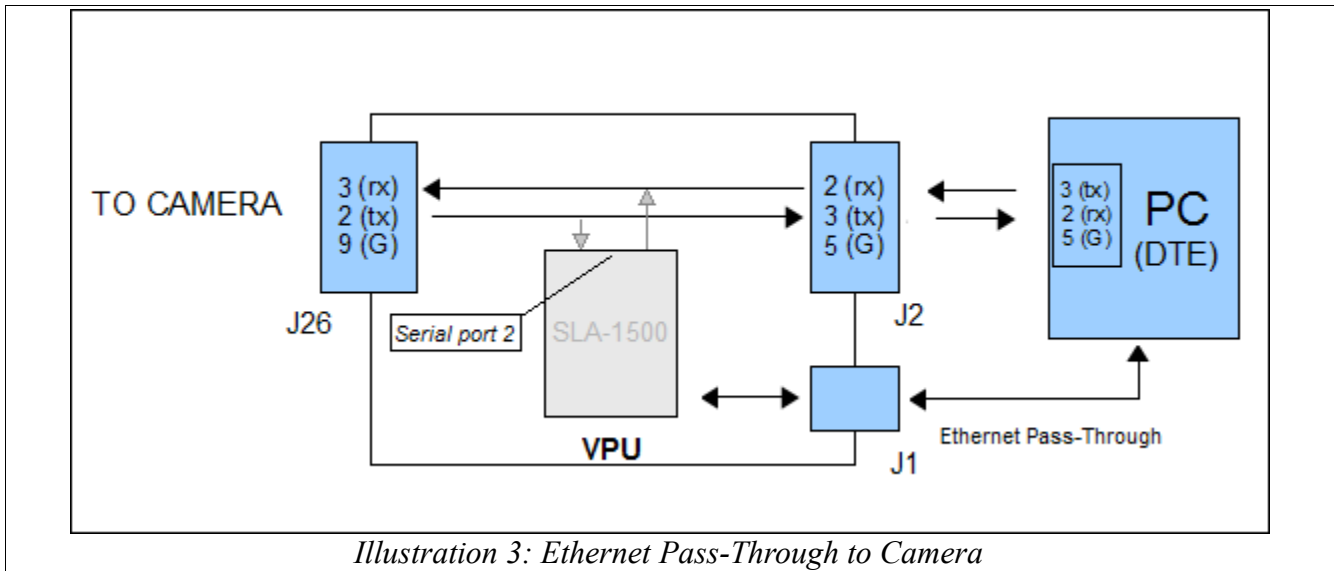
- RS-232 pass-through to the Digital Camera
- RS-232 Command and Control of the SLE-1500-OEM

RS-232 pass-through to the Digital Camera

- SLA-1500-PENC acts as a passive RS-232 splitter when powered off allowing straight serial pass-through to the camera connected to J26 (see Illustration 2).
- 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

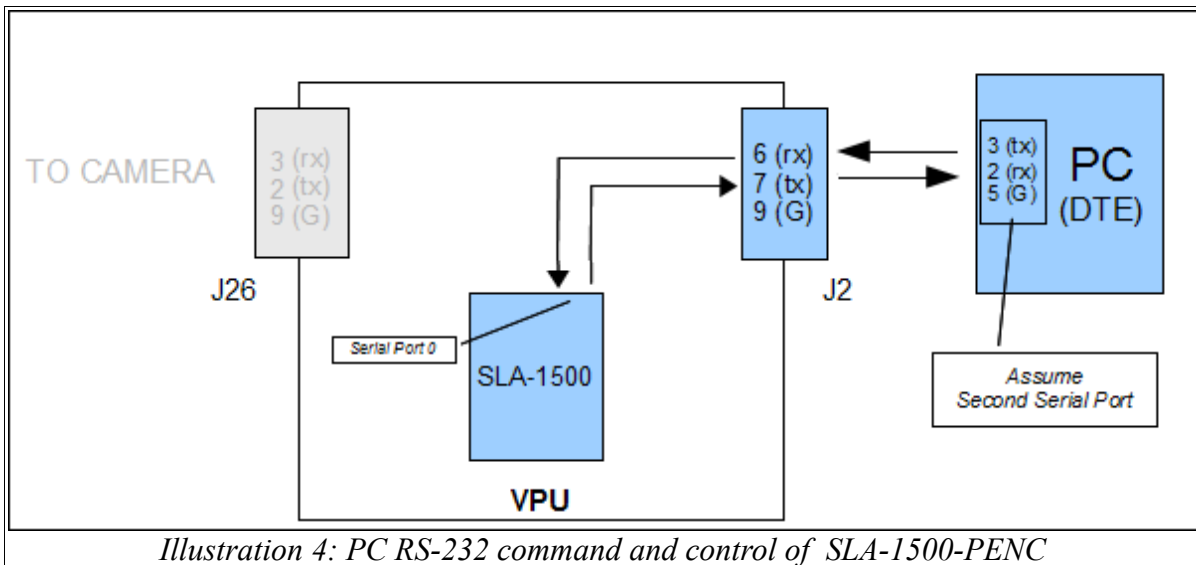


- When the **SLA-1500-PENC-1500-PENC** is powered on, command and control of the Digital Camera can be achieved using the Ethernet pass-through capability (see Illustration 3).
- This allows the FLIR Photon Camera Control software (or similar) to communicate over Ethernet to the camera.
- Additional 3rd party software may be required and is outlined in **Configuring for Serial Pass-through** document listed below.
- The PC can still communicate over serial to the camera.

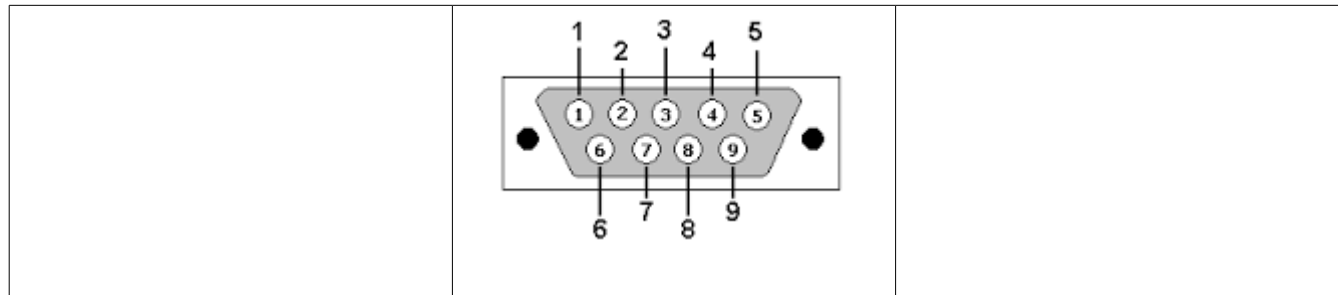


RS-232 Command and Control of the SLE-1500-OEM

- The internal VPU (**SLA-1500-OEM**) can be configured and controlled using RS-232 on pins 6,7, and 9 (see below) as well as Ethernet (preferred).
 - Use SLA-PANEL or create your own custom software using SLA Command and Control Protocol
- Default RS-232 configuration is 57600, 8, 1, None, No Handshake
- This can be changed and saved to internal flash using SLA-PANEL



PIN OUT



PIN #	Signal Type	Name
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 SLA-1500-OEM
7	RS-232C	TX to SLA-1500-OEM
8	NC	
9	SIGNAL GROUND	Ground
Shield		

Table 7: J2 Pin-out

SLA-CAB-DB9x Breakout Cable

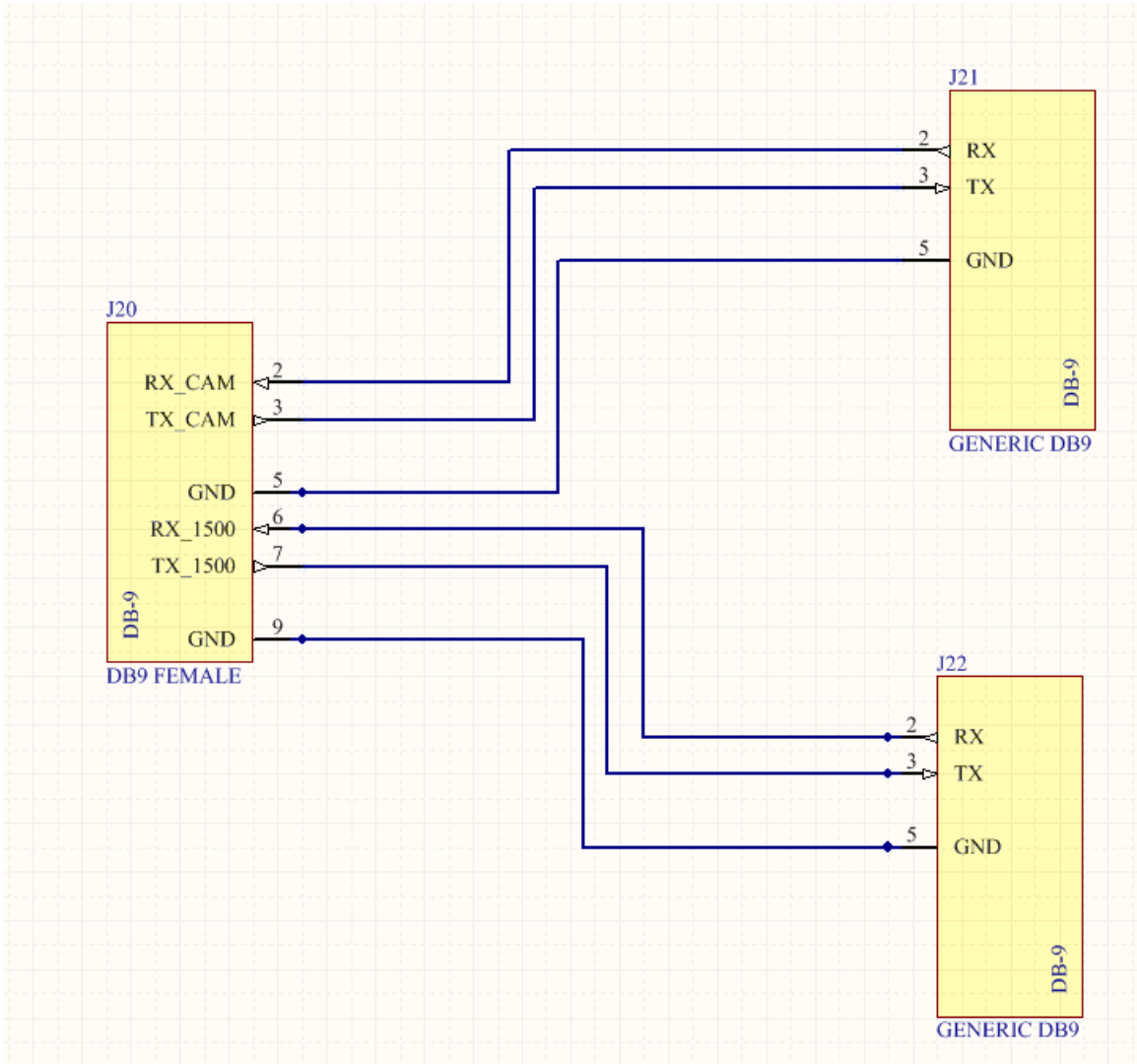


Illustration 5: SLA-CAB-DB9x breakout cable

LEDS

There are no LEDs on this product.

Dimensions

Illustration 6 outlines the major dimensions of the SLA-1500-PENC. More details are available from the 3D model.

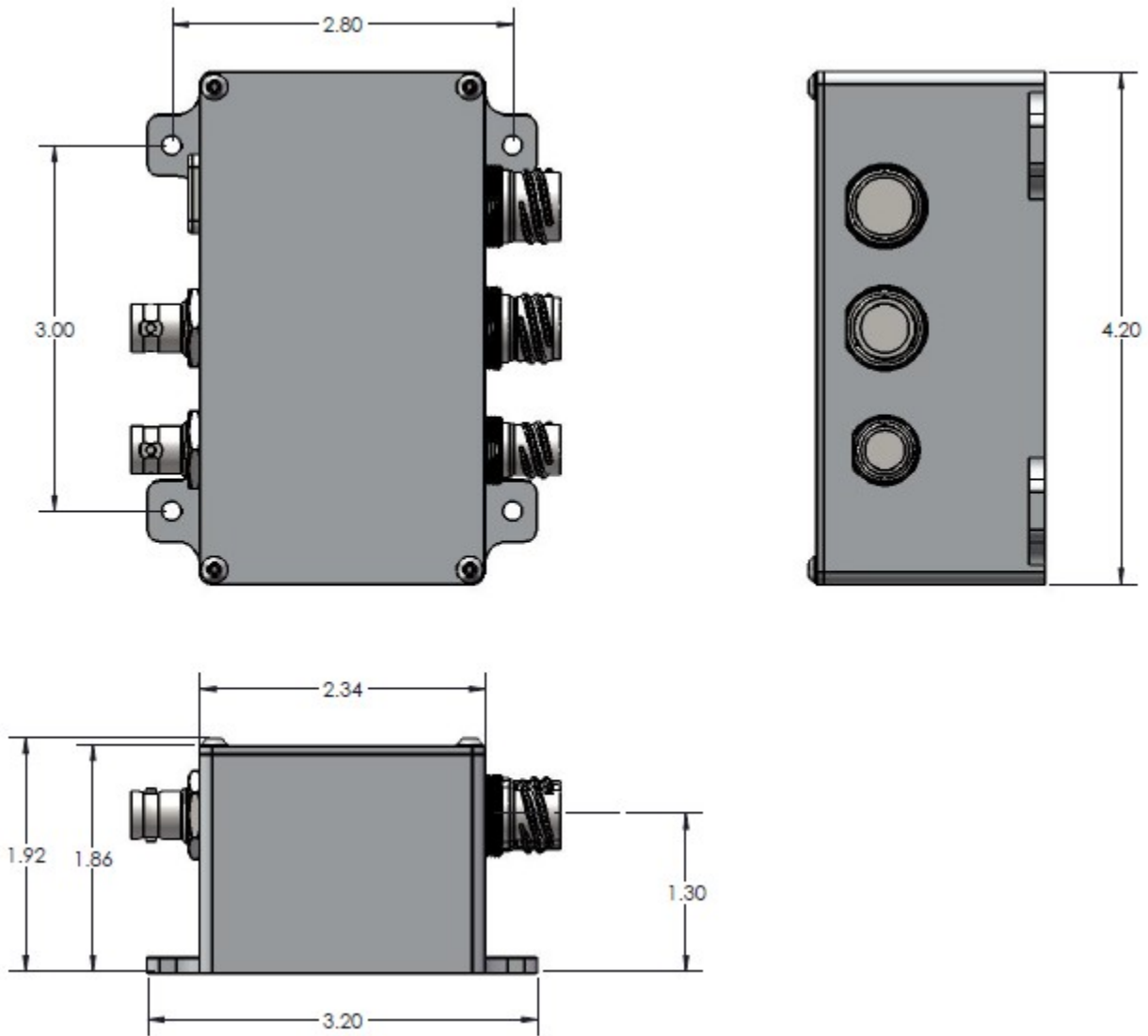
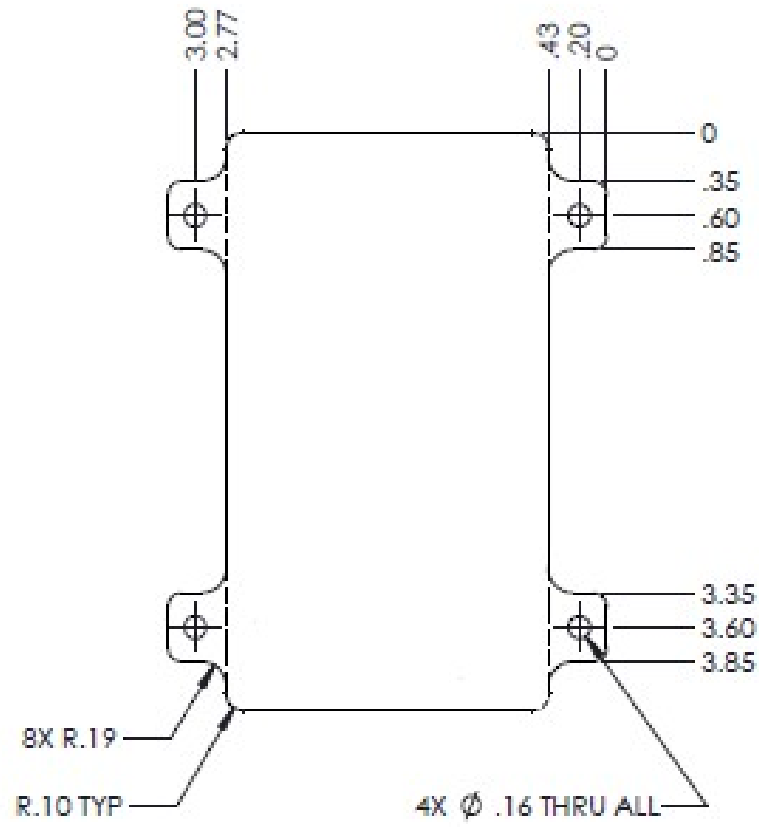


Illustration 6: SLA-1500-PENC Dimension Drawing

[Dimensions are in inches]

Example Mounting:



*Illustration 7: SLA-1500-PENC Mounting Hole Pattern
[Dimensions are in inches]*

Getting Started

1. Connect Digital Video cable to J26
2. Connect Ethernet cable to J1
3. [OPTIONAL] Connect BNC video Cable from camera source to J3
4. [OPTIONAL] Connect BNC video cable from J4 to TV or other display
5. [OPTIONAL] Connect DB-9 cable assembly (see above) to J2
6. Connect power cable to J5
7. Apply power
8. The SLA-1500-PENC takes approximate 15 – 20 seconds to complete its boot cycle

The SLA-1500-PENC is now ready to be used on the network and is ready to be configured.

It is recommended that the SLA-1500-PENC be configured in a lab environment before being integrated into a larger system. Once a default configuration is established, the SLA-1500 Upgrade Utility can be used to copy a parameters file from that system to the PC, and from the PC to other SLA-1500 units.

Configuring the SLA-1500-PENC

The SLA-1500-PENC will come pre-configured with a set of default parameters for use with the FLIR Photon HRC camera and H.264 video encoding. However, the following Engineering Application Notes (EANs) are recommended additional reading for learning how to configure or tune your system for application specific operations.

Functionality	Document Name
Configuring for use on the network	<ul style="list-style-type: none"> EAN-ChangeIPAddress.pdf EAN-SLA-1500-Networking.pdf
Configuring for Digital Video Input	<ul style="list-style-type: none"> EAN-DigitalVideo.pdf EAN-SLA-1500-Tau.pdf EAN-SLA-1500-Photon.pdf
Configuring H.264 Video Compression and Transmission	<ul style="list-style-type: none"> EAN-UsingVLC.pdf
Configuring for Serial Pass-through	<ul style="list-style-type: none"> EAN-Passthrough.pdf EAN-SLA-1500-SerialPassthrough.pdf EAN-SLA-1500-Tau.pdf
Using KLV Metadata	<ul style="list-style-type: none"> EAN-SLA-UserGuide.pdf
Upgrading the SLA-1500-PENC	<ul style="list-style-type: none"> EAN-Upgrading-Software-Firmware-1500.pdf
SightLine Command and Control	<ul style="list-style-type: none"> IDD_SLA_Protocol.pdf
Digital Infrared Image formatting	<ul style="list-style-type: none"> EAN-InfraredTemperature.pdf

Table 8: Additional SightLine Documentation References

Definitions

NC	No Connect
SLA-xxxxx	Full featured SightLine Software
SLE-xxxxx	Limited feature SightLine Software
KLV	Key, Length, Value
MPEG2-TS	MPEG2 Transport Stream
H.264	Video compression algorithm
EAN	Engineering Application Note
PENC	Enclosure of SLA-1500-OEM built to work with FLIR Photon HRC
RS-232	Shorthand to indicate voltage levels similar to RS-232C
NYI	Not Yet Implemented – Typically used as place holder for future revisions.
VPU	Video Processing Unit

Table 9: Terms and Definitions

SightLine Product Export Controls

Exports of SightLine products and technical data are governed by the US Export Administration Regulations (EAR) (15 CFR parts 730-774) administered by the US Department of Commerce. Classification of SightLine products has been defined as ECCN 4A994 for documentation and hardware/firmware, and 4D994 for licensed software. Customers acknowledge re-export responsibility and certify that their sale or distribution of SightLine products (whether incorporated into another system or otherwise) may constitute a new export and as such must be in accordance with the requirements of the EAR.

FILES

Additional files such as 3D models, Schematics, Gerbers, etc. may be available for some products. Contact your Sales Representative for more information.

ERRATA

Please contact your Sales Representative often as new versions of the product (new schematics, etc.) may be available.

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