

NOCTURN GV MONOCHROME Interface Control Document

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Document Revisions

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1 Introduction

1.1 Scope

This document describes the electrical and mechanical interfaces to the NOCTURN GV monochrome camera module only. Operational instructions and additional support documentation are described in separate documents. Please contact PHOTONIS technical support if you require additional information.

2 Electrical and Mechanical Interfaces

2.1 Introduction

The NOCTURN product name identifies a family of low light level cameras developed around the PHOTONIS' 1280 × 1024 LYNX CMOS imaging sensor. The “GV” model indicates that the NOCTURN camera has an integrated interface board that can be used to output digital video over a Gigabit Ethernet Vision or GEV standard version 1.1 compliant interface. The GEV interface normalizes image transport and camera control communications over internet protocol (IP) networks. This section provides detailed information on the NOCTURN GV monochrome specifications, power requirements as well as the electrical and mechanical interface of the module.

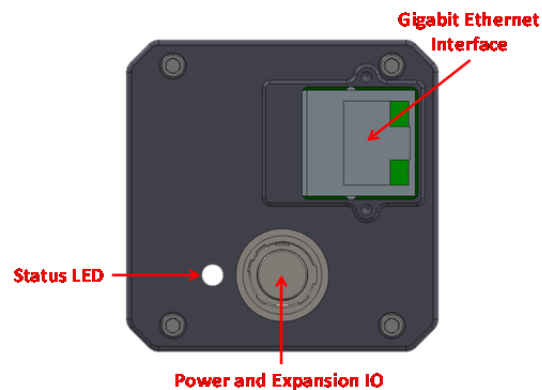


Figure 1 Back Side View of the NOCTURN GV Camera

2.2 NOCTURN GV Specifications

The NOCTURN GV is a rugged low light camera module that features high-definition, high sensitivity and high dynamic range with low power consumption. Depending on the model, it provides either monochrome or color real-time imaging capabilities from daylight to sub quarter moon illumination in the visible and near infrared spectrum. Detailed specifications of the NOCTURN GV monochrome camera are given in Table 1.

Table 1 NOCTURN GV Monochrome Specifications

Parameter	Specification
Sensor Resolution	1280 × 1024 Pixels
Sensor Pixel Pitch	9.7 μm × 9.7 μm
Sensor Well Capacity	> 25000 e-
Sensor Dynamic Range	> 60 dB
Sensor Read Noise	< 4 e- med. (60fps Mode)
Sensor Quantum Efficiency	> 60% at 600nm
Frame Rate	> 55Hz in 10-bit Mode, > 90Hz in 8-bit Mode
Sensor Image Lag	< 0.1 %
Sensor Shutter Mode	Rolling
Lens Mount	CS
Dimensions (W × H × D)	47 mm × 47 mm × 57.3 mm
Weight	< 180 grams
Digital Video Output	10/8 bit GEV compatible
Communication	RS-232 or Ethernet (RJ-45)
Image Correction	Bad pixel replacement and 2 points non uniformity correction
Contrast Enhancement	Contrast stretching, equalization and adaptive equalization
Gain Control	Automatic gain and exposure control or manual
Digital Zoom	Up to 8X (0.001 increment resolution)
Synchronization	Frame start trigger (2 to 12V) Analog output strobe reference (2 to 12V)
OSD	Full on screen display capability with text, standard geometrical shape and graphics

Parameter	Specification
Snapshots	On board capture of *.JPG (8b) or *. PGM (8/10b)
Operating Temperature	0° to +45° C
Storage Temperature	-50° to +80° C
Input Voltage	+5 to +12 VDC (Need External Power Supply)
Power (Typical)	< 4 W (typical)

NOTE: the NOCTURN GV can only be powered via the Power and Expansion IO.

2.3 Quantum Efficiency

The typical quantum efficiencies as a function of wavelength for the LYNX monochrome CMOS imagers for versions with and without micro-lenses as well as color are shown in *Figure 2*.

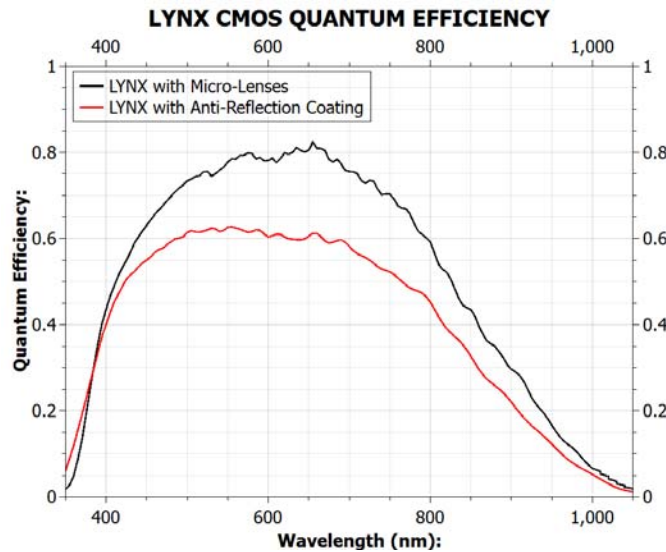


Figure 2 LYNX CMOS Quantum Efficiency Curves

2.4 Electrical Interfaces

2.4.1 12 Pin Circular Connector: Power and Expansion IO (J1)

The external 12 pin circular connector electrical interface is given in *Table 2*. The physical pin numbering convention is shown in *Figure 3*.

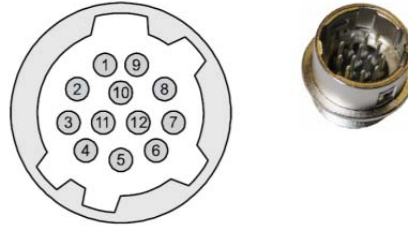


Figure 3 12 Pin Circular Connector

Table 2 12 Pin Circular Connector: Power and Expansion IO (J1)

Pin	Signal Name	Function	Description
J1-1	ISO_EXT_TRIGGER_IN_N	Input	External Trigger Input N Bias (2-12VDC, 2-50mA Max)
J1-2	ISO_EXT_TRIGGER_IN_P	Input	External Trigger Input P Bias (2-12VDC, 2-50mA Max)
J1-3	ISO_EXT_TRIGGER_OUT_P	Output	External Trigger Output P Bias with 2-12VDC 12mA Max
J1-4	ISO_EXT_TRIGGER_OUT_N	Output	External Trigger Output N Bias with 2-12VDC 12mA Max
J1-5	+VIN	Power	Primary Voltage Supply (5-12VDC)
J1-6	GND	Power	Primary Ground Return
J1-7	GND	Power	Primary Ground Return
J1-8	COM_CTS_TO_FPGA_RS232	I/O	RS232 CTS
J1-9	COM_RTS_FROM_FPGA_RS232	I/O	RS232 RTS
J1-10	COM_RXD_TO_FPGA_RS232	I/O	RS232 RXD
J1-11	COM_TXD_FROM_FPGA_RS232	I/O	RS232 TXD
J1-12	GND	Power	Primary Ground Return
SHELL	GND_CHASSIS	Ground	Primary Ground Return

2.4.2 LAN Connector: Gigabit Ethernet Interface (J2)

The LAN connector (J2) electrical interface is given in Table 3 and follows the standard Gigabit Ethernet (RJ-45) pin numbering convention.

Table 3 LAN Connector: Gigabit Ethernet Interface (J2)

Pin	Signal Name	Function	Description
J2-1	TX+_D1	I/O	Transmit Data +
J2-2	TX-_D1	I/O	Transmit Data -
J2-3	RX+_D2	I/O	Receive Data +
J2-4	BI+_D3	I/O	Bi-directional +
J2-5	BI-_D3	I/O	Bi-directional -
J2-6	RX-_D2	I/O	Receive Data -
J2-7	BI+_D4	I/O	Bi-directional +

2.5 Mechanical Interface

2.5.1 Basic Mechanical Dimensions

The basic mechanical dimensions of the NOCTURN GV camera are provided in Figure 4. A more detailed drawing can be requested from PHOTONIS.

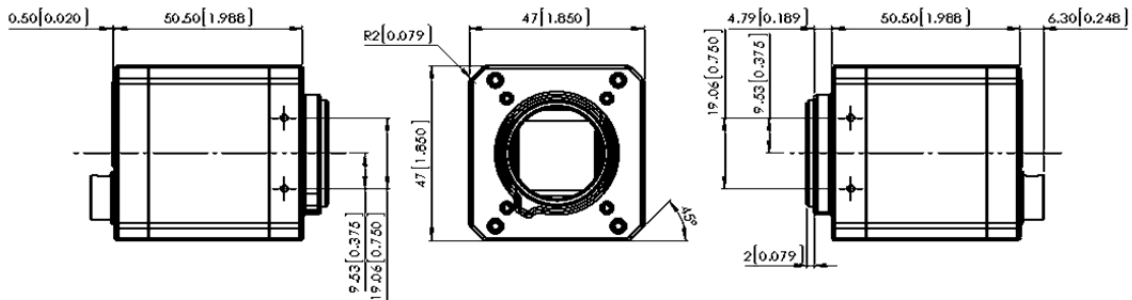


Figure 4 Basic Mechanical Dimensions of the NOCTURN GV Camera (all dimensions are in mm [in])

2.5.2 Mount Interfaces

The NOCTURN GV cameras have an integrated ¼"-20 tripod mount adapter (see Figure 5) on the bottom of the camera as well as some two additional 2-56 thread mounting holes on all four sides (along the optical axis) of the camera lens mount.

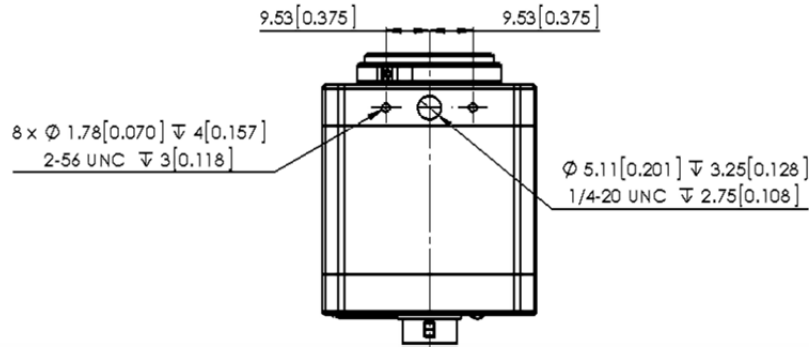


Figure 5 Basic Mechanical Dimensions of the Tripod Mount adapter and 2-56 mounting holes (all dimensions are in mm [in])

2.5.3 Gigabit Ethernet Interface Mount

The NOCTURN GV rear camera cover has integrated screw post to securely fasten RJ-45 cable (see Figure 6).

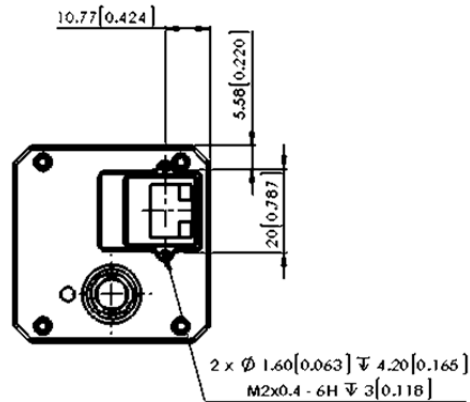


Figure 6 RJ-45 mounting post locations on rear of camera (all dimensions are in mm [in])

2.5.4 Focus Adjustments

In the event that focus cannot be achieved through normal lens operation, the lens mount ring (see Figure 7) can be adjusted to compensate for small variation in the back focal flange distance of the lens. This is done by loosening the lens mount 2-56 setscrew and performing a flange back adjustment.

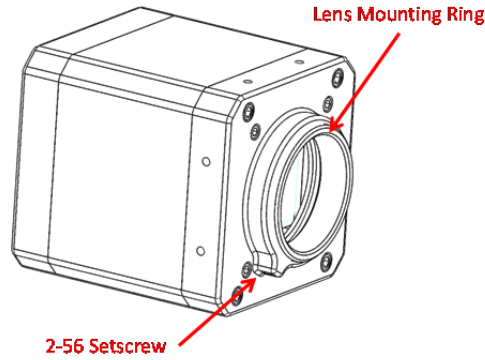


Figure 7 Location of Setscrew to Loosen Lens Mounting Ring for Focus Adjustments

2.6 Optical Interface

The NOCTURN GV monochrome is designed to work with 1” optical format cs mount lens¹. C mount lens with 1” optical format can be utilized as well as long as a 5mm cs to c mount adapter is inserted between the lens back flange and the NOCTURN GV lens mounting ring.

2.7 Input Power Specifications

The NOCTURN GV monochrome is powered via the Power and Expansion IO connector (J1). The voltage input must be within a range of +5.0 to + 12.0 VDC (see Table 4).

Table 4 NOCTURN GV Monochrome Input power Specifications

Parameter	Description	Min	Typ	Max	Units
Vin	Input Voltage	5	--	12	V
Icc	Input Current in 50/60Hz mode ²	--	420	--	mA
Icc	Input Current in 100Hz Mode ³	--	450	--	

2.8 Communication Interface

Control of the camera can either be done using three different methods. The first one is through the GenICam interface implemented over the GEV interface (please refer to the user guide for further details). The second and third methods are done using serial communication protocol over either the RS-232 interface on the 12 pins circular connector or by creating a serial bridge over the GEV interface with the Pleora SDK.

¹ A lens extender can be purchase separately from PHOTONIS to utilized lenses designed for 2/3” and 1/2” format imagers

² Measured with Vin at +8.0 VDC and advanced image processing options disabled

³ Measured with Vin at +8.0 VDC and advanced image processing options disabled

For the RS-232 port located on the 12 pins circular connector, the serial port settings should be 8 bits data, no parity, 1 stop bit and no flow control with a default baud rate of 115200 bits per second. The user should refer to the NOCTURN GV monochrome manual for a list of valid commands and communication syntax examples.

3 Video Interface

The NOCTURN GV monochrome uses a Pleora NTx-mini frame grabber interface board that complies with the GEV standard. Details for this interface can be found on the AIA website.

4 Electrical Connectors

This section provides the part number of all the user accessible connectors and suggested mating connector when applicable.

4.1 12 Pin Circular Connector: Power and Expansion IO (J1)

Camera Connector:

Manufacturer: HIROSE ELECTRIC CO LTD

Description: CONN RECEPT 12POS MALE DIP

Manufacturer part number: HR10A-10R-12PB(71)

Mating Connector:

Manufacturer: HIROSE ELECTRIC CO LTD

Description: CONN HR10A PLUG 12POS FEMALE

Manufacturer Part Number: HR10A-10P-12S(73)

4.2 LAN Connector: Gigabit Ethernet Interface (J2)

Camera Connector:

Manufacturer: ERNI

Description: Vertical Ethernet Jack (RJ45)

Manufacturer Part Number: 203346