Specifications

The following sections list general specifications for the In-Sight Micro vision systems.

In-Sight Micro Vision System Specifications

Table 3-1: In-Sight Micro Vision System Specifications

Specifications	1020/1050	1100/1110	1100C	1400/1410	1400C	1403/1413	1403C
Minimum Firmware Requirement	In-Sight version 4.4.3						
Job/Program Memory	128MB non-volatile flash memory; unlimited storage via remote network device.						
Image Processing Memory	256MB						
Sensor Type	1/3-inch CCD					1/1.8-inch CCD	
Sensor Properties	5.92mm diagonal, 7.4 x 7.4µm sq. pixels					8.8mm diagonal, 4.4 x 4.4µm sq. pixels	
Resolution (pixels)	640 x 480					1600 x 1200	
Electronic Shutter Speed	16µs to 1000ms					52µs to 1000ms	
Acquisition	Rapid reset, progressive scan, full-frame integration.						
Bit Depth	256 grey levels (8 bits/pixel)		24 bit color	256 grey levels (8 bits/pixel)	24 bit color	256 grey levels (8 bits/pixel)	24 bit color
Image Gain/Offset	Controlled by software.						
Frames Per Second[1]	60 full frames per second		58 full frames per second	60 full frames per second	58 full frames per second	14 full frames per second	7 full frames per second
Lens Type	CS-mount and C-mount (with 5mm extension, included).						
CCD Alignment Variability[2]	±0.127mm (0.005in), (both x and y) from lens C-mount axis to center of imager.						
Trigger	1 opto-isolated, acquisition trigger input. Remote software commands via Ethernet. (RS-232C available when using the optional CIO-MICRO or CIO-MICRO-CC I/O module.)						
Discrete Inputs	None. (Eight additional inputs available when using the optional CIO-MICRO or CIO-MICRO-CC I/O module.)						
Discrete Outputs	2 opto-isolated, NPN/PNP high-speed outputs. (Eight additional outputs available when using the optional CIO-MICRO or CIO-MICRO-CC I/O module.)						
Status LEDs	Network, 2 user-configurable.						
Network Communication	1 Ethernet port, 10/100 BaseT with auto MDI/MDIX. Supports DHCP (factory default), static and link-local IP address configuration.						
Serial Communication	None. (RS-232C: 4800 to 115,200 baud rates when connected to the optional CIO-MICRO or CIO-MICRO-CC I/O module).						
Power	Class 2 Power over Ethernet (PoE) device.						
Power Type	A and B.						

[1] Maximum frames per second is job-dependent and based on the minimum exposure for a full image frame capture.

[2] Expected variability in the physical position of the CCD, from vision system-to-vision system. This equates to ~ ±17 pixels on a 640 x 480 resolution CCD and ~ ±29 pixels on a 1600 x 1200 resolution CCD.

Specifications	1020/1050	1100/1110	1100C	1400/1410	1400C	1403/1413	1403C
Power Consumption	6.49 W maximum per Class 2 PoE.						
Current	Per Class 2 PoE requirements.						
Voltage	48 V nominal, applied from a Class 2 PoE injector which is typically powered from some other voltage.						
Material	Die-cast zinc housing.						
Finish	Painted						
Mounting	Four M3 threaded mounting holes (1/4 - 20 and M6 mounting holes also available on mounting block).						
Dimensions	30mm (1.18in) x 30mm (1.18in) x 60mm (2.36in) without mounting block. 30mm (1.18in) x 38.2mm (1.50in) x 60mm (2.36in) with mounting block.						
Weight	121g (4.27oz.) without mounting block. 146g (5.15oz.) with mounting block.						
Temperature	Operating: 0°C to 45°C (32°F to 113°F) Storage: -30°C to 80°C (-22°F to 176°F)						
Humidity	90%, non-condensing (Operating and Storage)						
Protection	IP51 with cables and lens attached.						
Shock	80 G shock with 50 gram or lighter lens attached per IEC 68-2-27 EA.						
Vibration	10 G with 50 gram or lighter lens attached 2 hrs/axis (10-500 Hz) per IEC 68-2-6, FC.						
Regulatory Compliance	CE, FCC, KCC, TÜV SÜD NRTL, RoHS						

I/O Specifications

Cable and connector specifications and connection examples for the acquisition trigger input and the high-speed outputs are provided in the following sections.

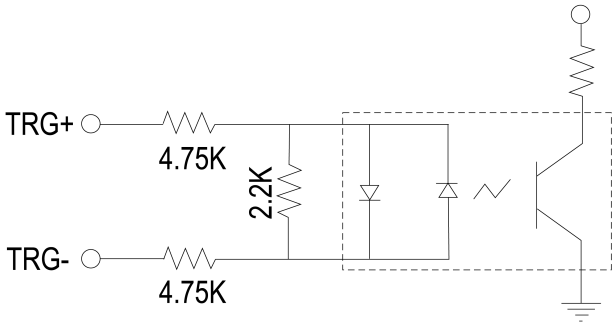
Acquisition Trigger Input

Table 3-2: Acquisition Trigger Input Specifications

Specification	Description	
Voltage	ON	20 to 28V (24V nominal)
	OFF	0 to 3V (8V nominal threshold)
Current	ON	2.0 to 2.9mA
	OFF	< 250µA
	Resistance	~10,000 Ohms
Delay[1]	In-Sight Micro 1020, 1050, 1100, 1100C, 1110, 1400, 1400C & 1410	63µs maximum latency between leading edge of trigger and start of acquisition. Input pulse should be minimum of 1 ms wide.
	In-Sight Micro 1403 & 1413	81µs maximum latency between leading edge of trigger and start of acquisition. Input pulse should be minimum of 1 ms wide.
	In-Sight Micro 1403C	116µs maximum latency between leading edge of trigger and start of acquisition. Input pulse should be minimum of 1 ms wide.

The acquisition trigger input is opto-isolated. To trigger from an NPN (pull-down) type photoelectric sensor or PLC output, connect pin 3 (TRG+) to +24V and connect pin 4 (TRG-) to the output of the photoelectric sensor.

When the output turns ON, it pulls TRG- down to 0V, turning the opto-coupler ON. To trigger from a PNP (pull-up) photoelectric sensor or PLC output, connect pin 3 (TRG+) to the output of the photoelectric sensor and connect pin 4 (TRG-) to 0V. When the output turns ON, it pulls TRG+ up to 24V, turning the opto-coupler ON.



28V Max. Across input pins - Transition approx. 8V (Nom).

Figure 3-1: Acquisition Trigger Input Schematic

[1] Maximum latency is based on a 1µs trigger debounce.

High-Speed Outputs

The In-Sight Micro vision system features two built-in, high-speed outputs, which are optically isolated. The high-speed outputs can be used as either NPN (pull-down) or PNP (pull-up) lines.

Table 3-3: High-Speed Output Specifications

Specification	Description
Voltage	28V maximum through external load.
Current	100mA maximum sink current.
	OFF state leakage current 100µA maximum.
	External load resistance 240 Ohms to 10K Ohms.
	Each line rated at a maximum 100mA, protected against over-current, short circuit and transients from switching inductive loads. High current inductive loads require external protection diode.

For NPN lines, the external load should be connected between the output and the positive supply voltage (24V nominal). The OUT COMMON should be connected to the negative supply voltage (0V). The outputs pull down to less than 3V when ON, which causes current to flow through the load. When the outputs are OFF, no current flows through the load.

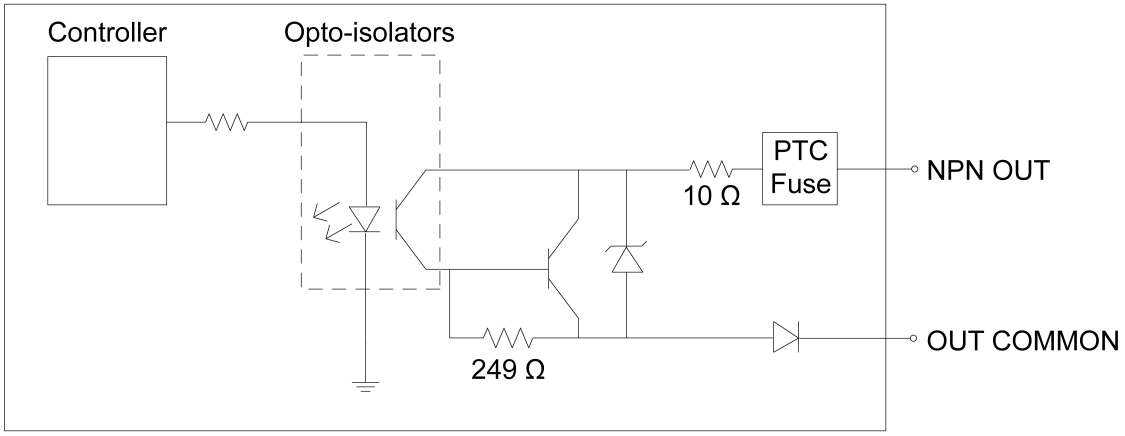


Figure 3-2: NPN High-Speed Output Schematic

For PNP lines, the external load should be connected between the output and the negative supply voltage (0V). When the OUT COMMON is connected to the positive supply voltage (24V nominal), the outputs pull up to greater than 21V when ON, and current flows through the load. When the outputs are OFF, no current flows through the load.

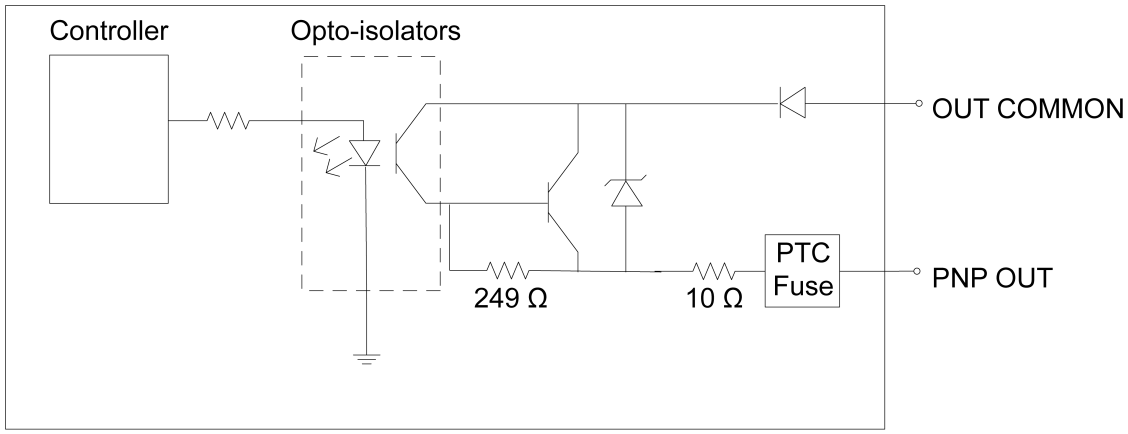


Figure 3-3: PNP High-Speed Output Schematic

Example 1

The Breakout cable (see Table 3-5 on page 18) can be used to connect the high-speed outputs to a relay, LED or similar load. Connect the negative side of the load to the output and the positive side to +24V. When the output switches on, the negative side of the load is pulled down to less than 3V, and greater than 21V appears across the load. Use a protection diode for a large inductive load, with the anode connected to the output and the cathode connected to +24V.

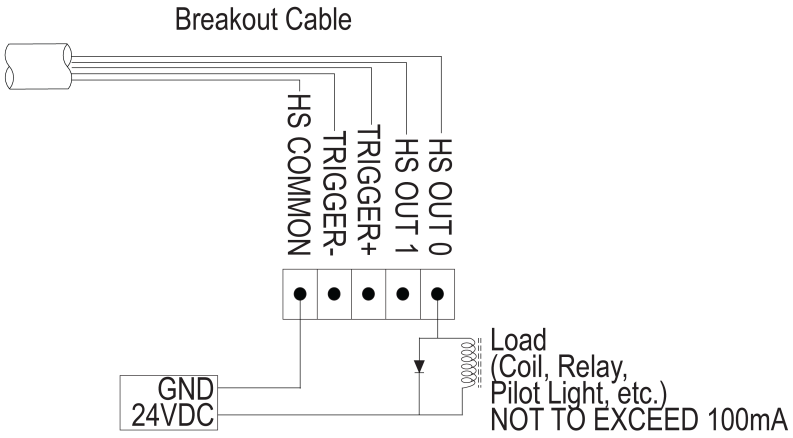


Figure 3-4: High-Speed Output Connection Example 1

Example 2

The Breakout cable (see Table 3-5 on page 18) can be used to connect to an NPN-compatible PLC input. Connect Output 0 or Output 1 directly to the PLC input. When enabled, the output pulls the PLC input down to less than 3V.

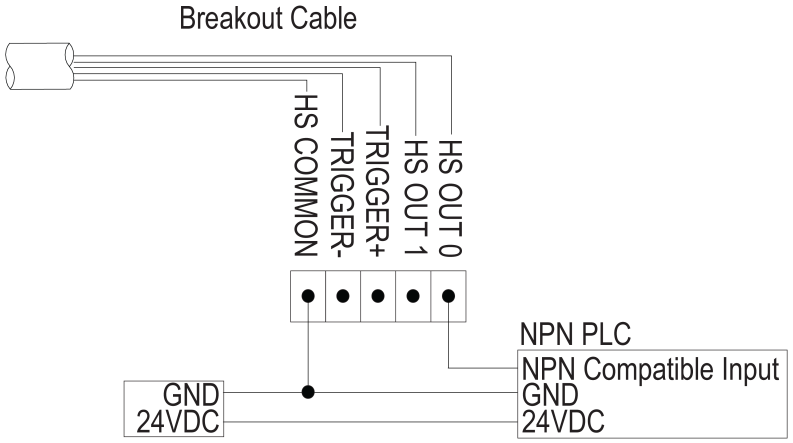


Figure 3-5: High-Speed Output Connection Example 2

Example 3

The Breakout cable (see Table 3-5 on page 18) can be used to connect to a PNP-compatible PLC input. Connect Output 0 or Output 1 directly to the PLC input. When enabled, the output pulls the PLC input up to greater than 21V.

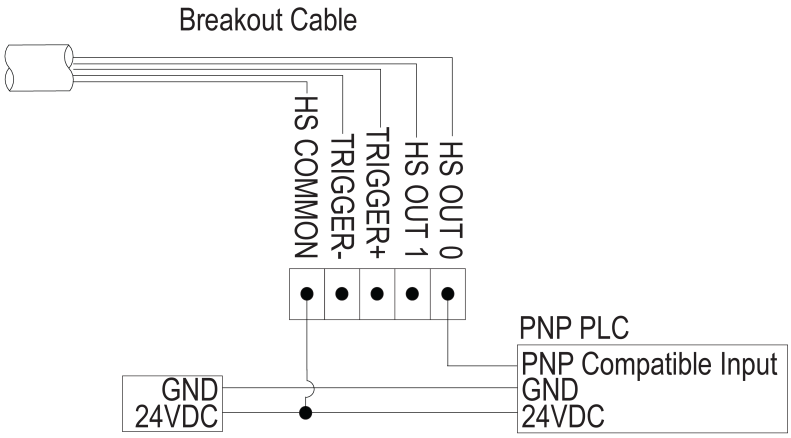
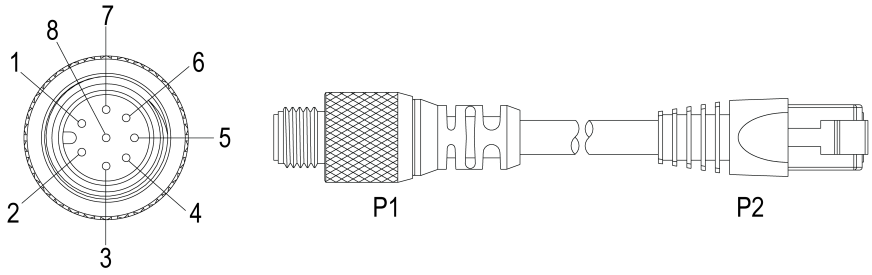


Figure 3-6: High-Speed Output Connection Example 3

Ethernet Cable Specifications

The Ethernet cable provides the Ethernet connection for network communications and supplies power to the vision system.

Table 3-4: Ethernet Cable Pin-Out



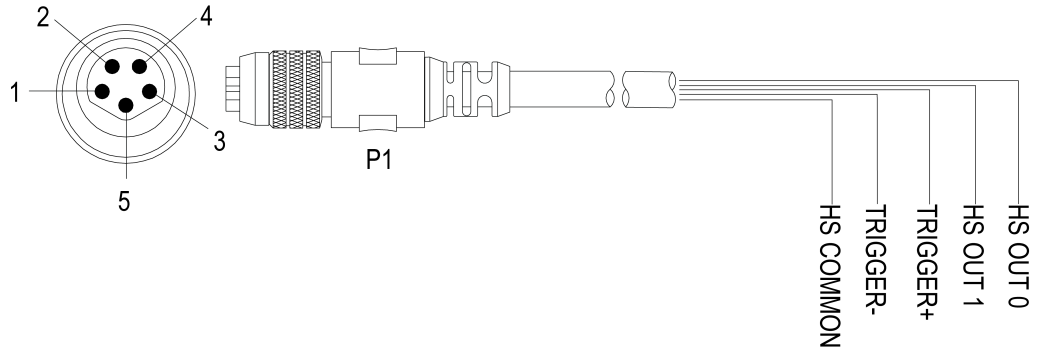
P1 Pin#	Signal Name	Wire Color	P2 Pin#
6	TPO+/+48V (Mode A)	White/Orange	1
4	TPO-/+48V (Mode A)	Orange	2
5	TPI+/+48V RTN (Mode A)	White/Green	3
7	+48V (Mode B)	Blue	4
1	+48V (Mode B)	White/Blue	5
8	TPI-/+48V RTN (Mode A)	Green	6
2	+48V RTN (Mode B)	White/Brown	7
3	+48V RTN (Mode B)	Brown	8

Note: Cables are sold separately.

Breakout Cable Specifications

The Breakout cable provides access to trigger and high-speed outputs.

Table 3-5: Breakout Cable Pin-Out



P1 Pin#	Signal	Wire Color
1	HS OUT 0	Brown
2	HS OUT 1	White
3	TRIGGER+	Blue
4	TRIGGER-	Black
5	HS COMMON	Gray

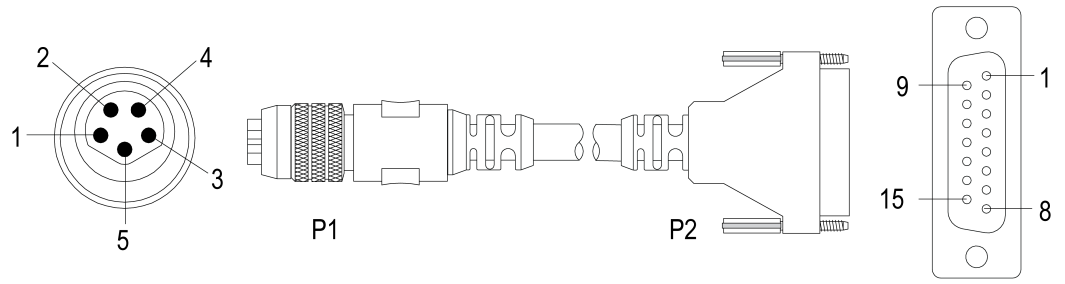
Note:

- Cables are sold separately.
- Unused bare wires can be clipped short or tied back using a tie made of non-conductive material.

I/O Module Cable Specifications

The I/O Module cable is used with the CIO-MICRO or CIO-MICRO-CC I/O module. The I/O Module cable connects the vision system directly to the I/O module via the DB15 connector. When connected, the I/O Module cable provides access to the vision system's trigger and high-speed outputs.

Table 3-6: I/O Module Cable Pin-Out



P1 Pin#	Signal Name	P2 Pin#
1	HS OUT 0	4
2	HS OUT 1	5
3	TRIGGER+	2
4	TRIGGER-	3
5	HS COMMON	15

Note:

- Cables are sold separately.
- Refer to the *In-Sight® CIO-MICRO and CIO-MICRO-CC I/O Module Installation Manual* for detailed connection information.

Dimensional Drawings

Note:

- All dimensions are in millimeters [inches] and are for reference purposes only.
- All specifications may be changed without notice.

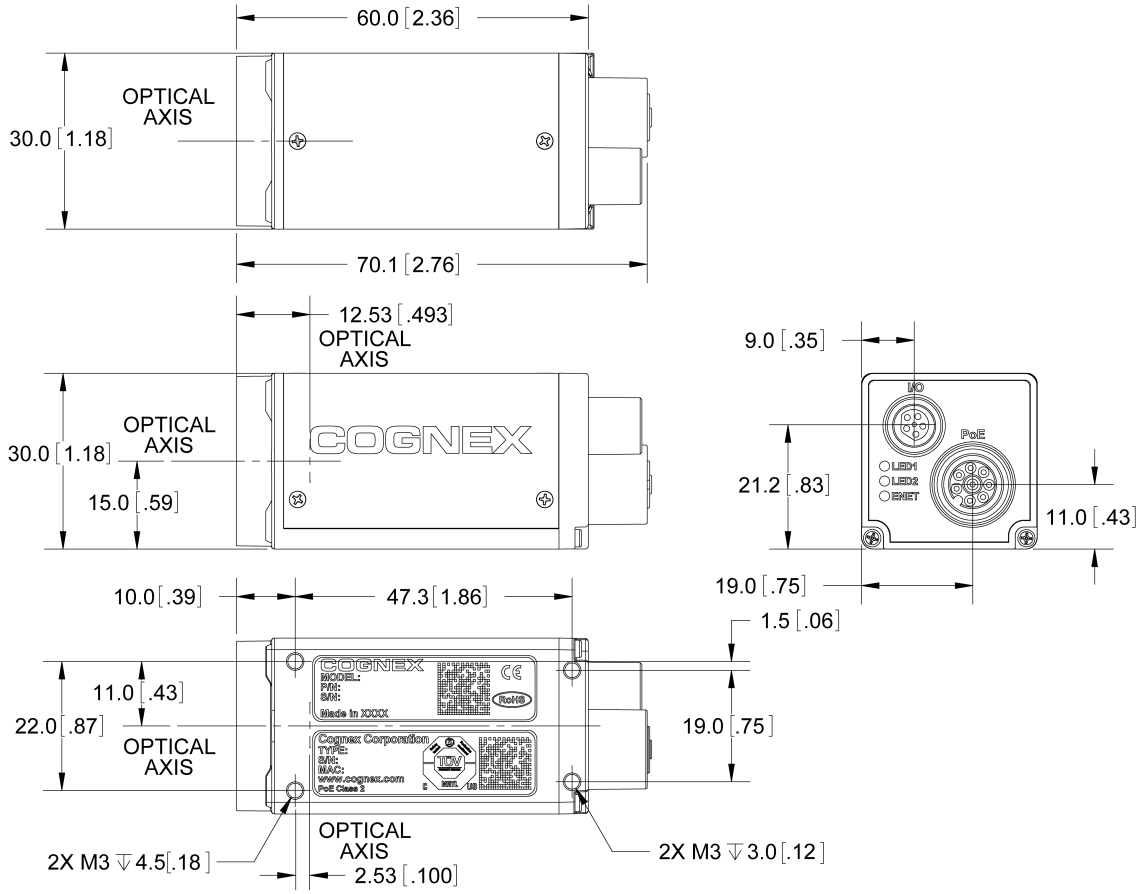


Figure 3-7: In-Sight Micro Vision System Dimensions

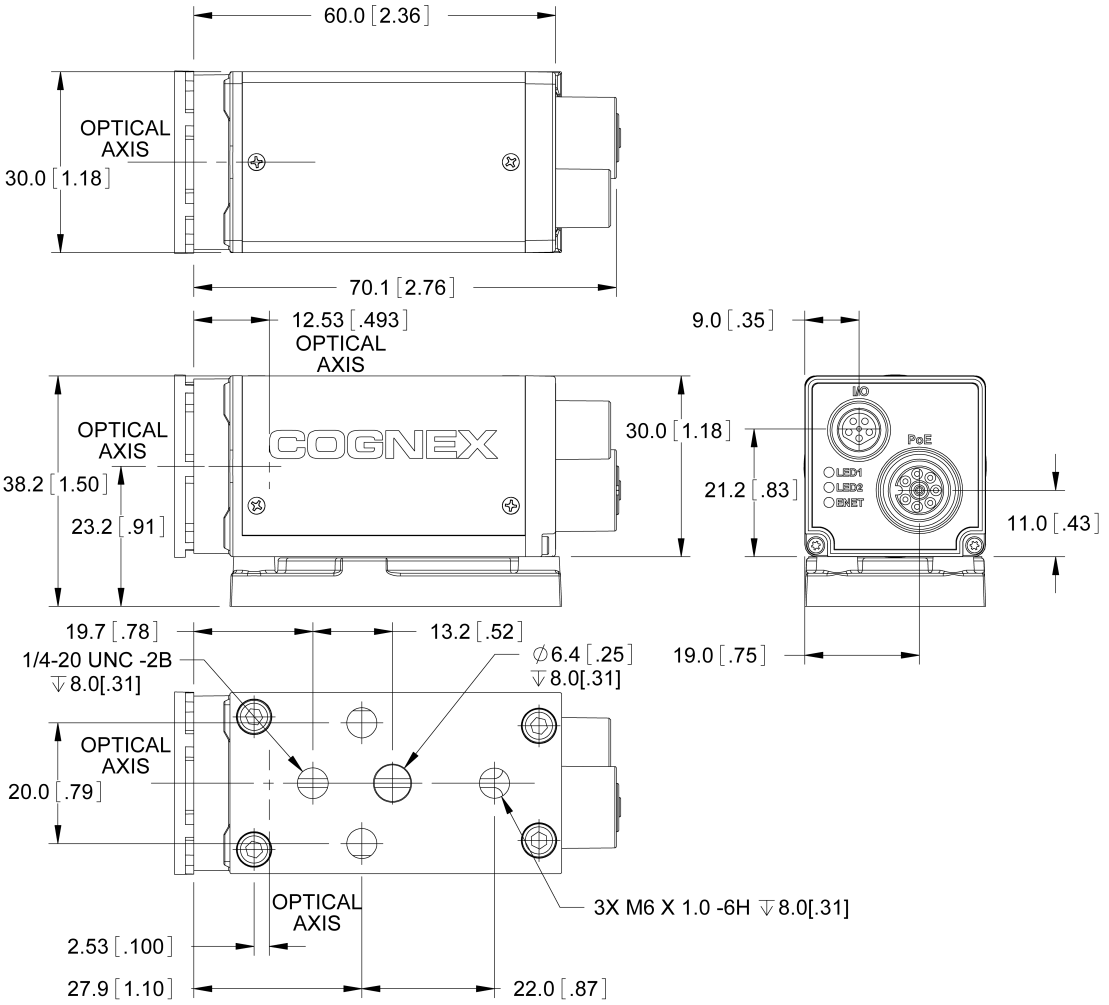


Figure 3-8: In-Sight Micro Vision System Dimensions (with Mounting Block)