COGNEX

In-Sight® L38 Series Vision System Manual



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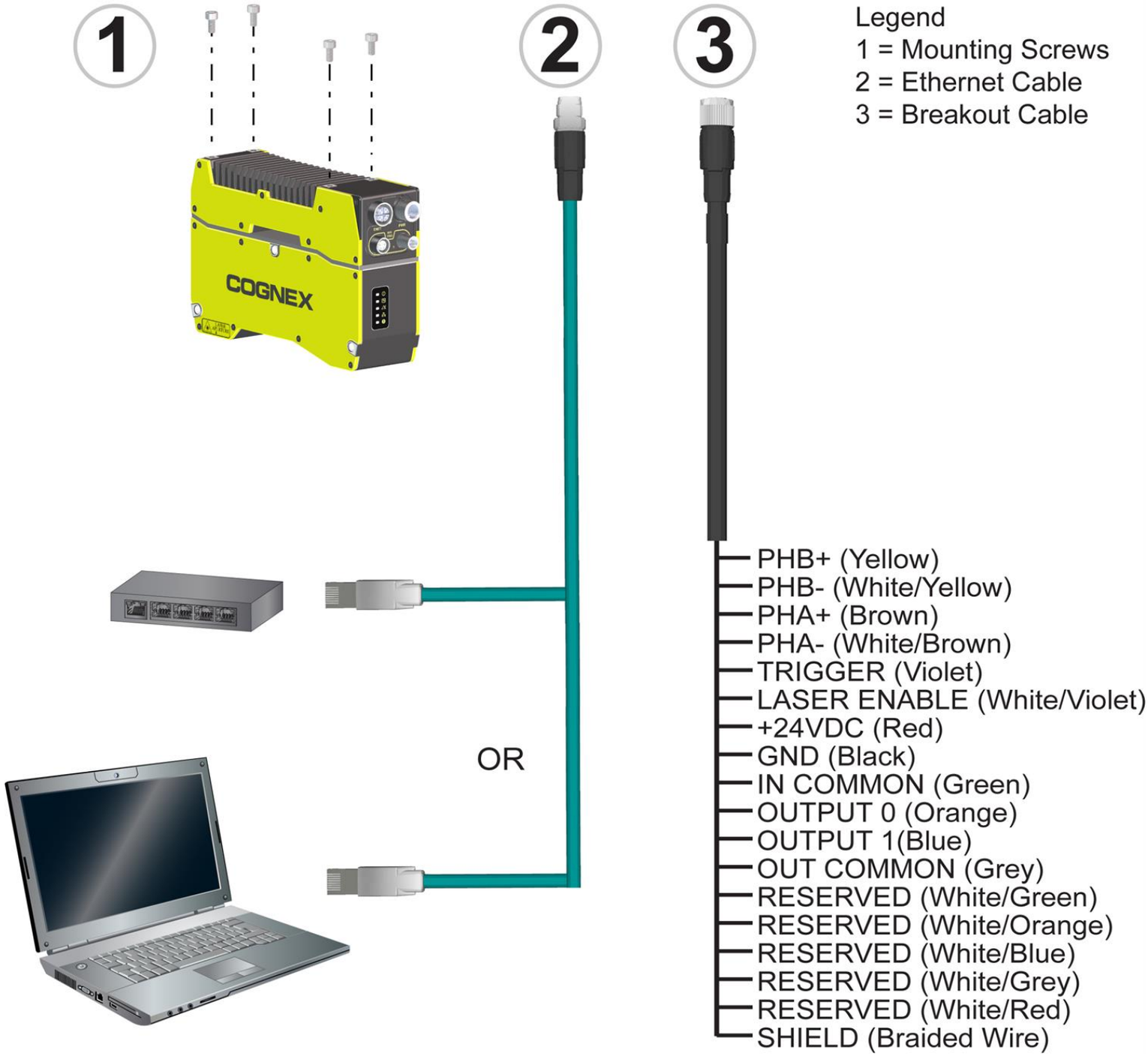
In-Sight L38 Series



Installation

Read this section to learn how the vision system connects to standard components and accessories. For a list of options and accessories, contact your Cognex sales representative.

Note: Cables are sold separately.

CAUTION: All cable connectors are keyed to fit the connectors on the vision system. Do not force the connections or damage may occur.

Mount the Vision System: Top Housing

1. Align the holes on the mounting surface with the mounting holes on the vision system.
2. Insert the M4 screws into the top mounting holes and tighten. The maximum torque is 2.00Nm (17.70in-lb). Do not exceed the maximum insertion depth of 8 mm for the M4 screws. The maximum insertion depth does not include the thickness of the mounting material.

Mount the Vision System: Rear Housing

1. Align the holes on the mounting surface with the mounting holes on the vision system.
2. Insert the M5 screws into the rear mounting holes and tighten. The maximum torque is 3.00 Nm (26.55 in-lb). Do not exceed the maximum insertion depth of 8 mm for the M5 screws.. The maximum insertion depth does not include the thickness of the mounting material.

Mount the Vision System: Through-Body

Note: Through-body mounting is recommended for operating temperatures between 35°C and 45°C.

1. Insert M4 screws (or appropriate hardware) through the 5 mm holes on the vision system.
2. Attach the screws to a mount to prevent the vision system from shifting during operation. The maximum torque is 2.00 Nm (17.70 in-lb).

Connect the Ethernet Cable

CAUTION: The Ethernet cable shield must be grounded at the far end. Whatever this cable is plugged into (typically a switch or router) should have a grounded Ethernet connector. A digital voltmeter should be used to validate the grounding. If the far end device is not grounded, a ground wire should be added in compliance with local electrical codes.

1. Connect the Ethernet cable's M12 connector to the vision system ENET connector.
2. Connect the Ethernet cable’s RJ-45 connector to a switch, router or PC, as applicable.

Vision System Specifications

Specification	L38-33	L38-50	L38-100	L38-300	L38-500
Scan rate	Full X resolution up to 7.5 kHz Binned mode up to 10-11 kHz				
Resolution X-axis	1920 points/profile				
Built-in I/O	**Inputs**: 1 dedicated trigger, 1 laser safety **Outputs**: 2 user-definable				
Encoder Input Specification	Differential: A+/B+/A-/B-: 5-24 V (1000 kHz max) Single Ended: A+/B+: 12-24 V (1000 kHz max) A-/B-: $V_{encoder}$/2 (6-12 V DC)				
Network Communication	• Gigabit Ethernet interface • Integrated link and traffic LED • Standard M12-8 X-Coded female connector				
Power Consumption	24 V DC ±10%, 750 mA maximum.				
Dimensions	150.5 mm x 101 mm x 45 mm				250.5 mm x 101 mm x 45 mm
Weight	0.94 kg				1.28 kg
Operating Temperature	0ºC to 45ºC (32ºF to 113ºF)				
Storage Temperature	20ºC to 70ºC (-4ºF to 158ºF)				
Operating and Storage Humidity	<80%, non-condensing Specification				
Protection	IP65 with all cables properly attached and M/S TRIG connectors capped. Altitude: 2000m, indoor use only, pollution degree II				

Specification	L38-33	L38-50	L38-100	L38-300	L38-500
Shock (Shipping and Storage)	15 G's, 6 milliseconds half sinusoidal				
Vibration (Shipping and Storage)	10 to 57 Hz, double amplitude 1.5 mm X,Y,Z, 3 hours in each direction				
Certification	CE, FCC, KCC, TÜV SÜD NRTL, RoHS				

Cleaning and maintenance

This chapter gives an overview about the cleaning and maintenance of the vision system.

Clean the Housing

To clean the outside of the vision system housing, use a small amount of mild detergent cleaner or isopropyl alcohol on a cleaning cloth. Do not pour the cleaner on the vision system housing.



CAUTION: Do not attempt to clean any In-Sight product with harsh or corrosive solvents, including lye, methyl ethyl ketone (MEK) or gasoline.

Window Maintenance

The windows of the vision system and laser must be kept clean and free of defects to ensure proper operation. Any scratches, dust or dirt will impact the accuracy of acquired images.

CAUTION: Use care not to damage the anti-reflective coating on the windows.

Cognex makes the following recommendations for cleaning the laser and vision system windows:

- Unplug the unit so the laser cannot be enabled.
- Use lint-free tissue or an optical grade cotton swab ("Q-tip").
- Use reagent-grade isopropyl alcohol.
- Use minimal pressure.
- Use several tissues or swabs.
- Start at the center of each window and spiral out to the edges.
- Rotate the tissue or swab during cleaning so dirt is not dragged across the surface.

Laser Models

The following sensors contain a class 2M laser:

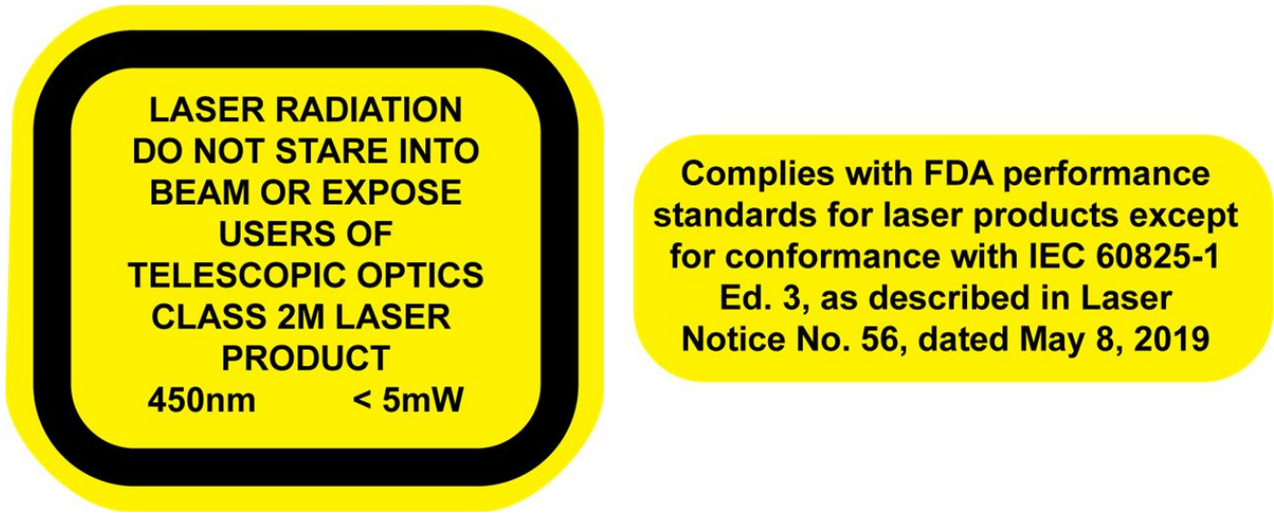
Model	Class 2M Laser
L38-50 L38-100 L38-300	√

Laser Compliance

WARNING: Laser light, do not stare into beam: Class 2 and Class 2M laser products. Failure to follow these instructions may cause serious injury.

Cognex places the following labels on every L38 series vision system:

- Blue laser:



- Red laser:



Cognex places the following labels on every L38-500 vision system:

- Blue laser:



- Red laser:



Complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3, as described in Laser Notice No. 56, dated May 8, 2019.

WARNING: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Blue Laser Specification	L38-33	L38-50	L38-100	L38-300	L38-500
Wavelength	445 nm +/- 10 nm				
½ Angle Beam Divergence along Y-Axis(mrad)	W0 2.40	W0 1.54	W0 0.93	W0 0.80	W0 0.50
Beam Divergence along X-Axis	32°	32°	32°	32°	40°
Pulse Duration	Varies to DC				
Maximum Power	< 5 mW accessible power				< 30 mW

Red Laser Specification	L38-33	L38-50	L38-100	L38-300	L38-500
Wavelength	638 nm +/- 10 nm				
½ Angle Beam Divergence along Y-Axis (mrad)	W0 2.40	W0 1.54	W0 0.93	W0 0.80	W0 0.50
Beam Divergence along X-Axis	32°	32°	32°	32°	40°
Pulse Duration	Varies to DC				
Maximum Power	< 5 mW accessible power				< 30 mW

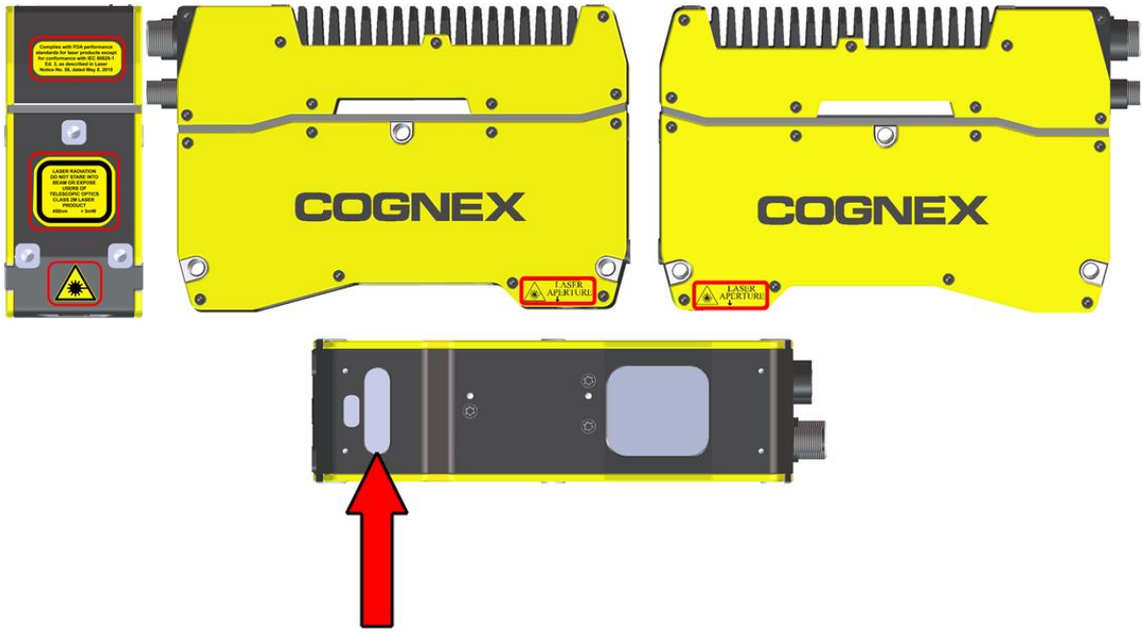
Laser Safety Warnings

- Do not stare into the beam.
- Do not view directly with optical instruments (magnifiers).
- Do not place optical components (mirrors) into the beam.
- Ensure that the laser is used as intended. Prevent unattended use or misuse of the laser.
- Design test fixtures in such a way that unintentional viewing into the beam is prevented.
- Switch off the laser when not in use.
- Avoid the use of highly reflective materials in the path of the laser beam. If you cannot, angle the part so unintentional viewing of the reflection is prevented.
- Terminate (block) unused beams.
- Keep the laser plane horizontal or pointing downwards.
- Report any issues that may have an impact on laser safety to your supervisor or Laser Safety Officer.

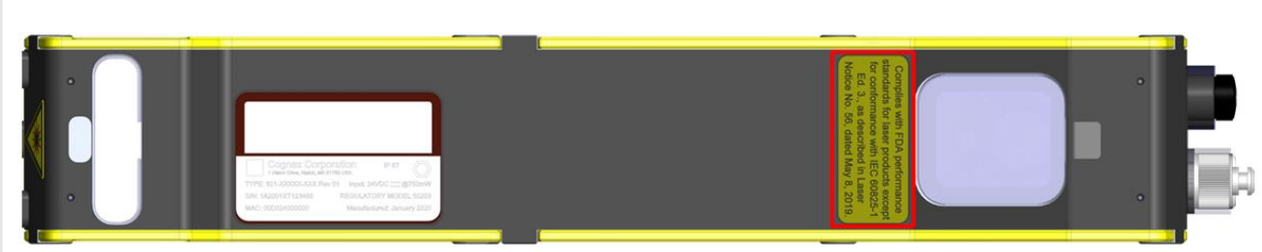
- There is no scheduled maintenance necessary to keep the product in compliance.
- Under no circumstances should you operate the sensor if it is defective or the seal damaged. Cognex Corporation cannot be held responsible for any harm caused by operating a faulty unit.
- Under no circumstances should you modify in any way the sensor or its housing.
- Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- When moving the unit from a very hot environment to a cold environment please allow the unit to equalize in a room temperature environment for 2 hours between temperature extremes.

Label Locations

WARNING: Laser light, do not stare into beam: Class 2 and Class 2M laser products. Failure to follow these instructions may cause serious injury.



Note:
On the L38-500 variant, the FDA label is located in a different position, on the underside of the vision system:



WARNING: Avoid exposure - laser radiation is emitted from this aperture.

Regulations and Conformity

Note: For the most current CE and UKCA declaration and regulatory conformity information, see the Cognex support site: cognex.com/support.

Manufacturer	Cognex Corporation One Vision Drive Natick, MA 01760 USA
CE	L38-33: Regulatory Model 50203 L38-50: Regulatory Model 50203 L38-100: Regulatory Model 50203 L38-300: Regulatory Model 50203 L38-500: Regulatory Model 50201 This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take immediate measures. This equipment complies with the essential requirements of the EU Directive 2014/30/EU. Declarations are available from your local representative.
EU RoHS	Compliant to the most recent applicable directive.
FCC	FCC Part 15, Class A This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
Laser Safety Certification	IEC 60825-1 US FDA CDRH Filing

Korea	L38-33: Regulatory Model 50201: R-R-CGX-50203 L38-50: Regulatory Model 50201: R-R-CGX-50203 L38-100: Regulatory Model 50201: R-R-CGX-50203 L38-300: Regulatory Model 50201: R-R-CGX-50203 L38-500: Regulatory Model 50201: R-R-CGX-50201 This device is certified for office use only and if used at home, there can be frequency interference problems.
TÜV	L38-33: Regulatory Model 50203 L38-50: Regulatory Model 50203 L38-100: Regulatory Model 50203 L38-300: Regulatory Model 50203 L38-500: Regulatory Model 50201
	NRTL: TÜV SÜD SCC/NRTL OSHA Scheme for UL/CAN 61010-1.
	CB report available upon request. TÜV SÜD, IEC/EN 61010-1.
UKCA	L38-33: Regulatory Model 50203 L38-50: Regulatory Model 50203 L38-100: Regulatory Model 50203 L38-300: Regulatory Model 50203 L38-500: Regulatory Model 50201 This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take immediate measures. This equipment complies with the essential requirements of the Electromagnetic Compatibility Regulations 2016. Declarations are available from your local representative.

China RoHS



	Hazardous Substances 有害物质					
Part Name 部件名称	Lead (Pb) 铅	Mercury (Hg) 汞	Cadmium (Cd) 镉	Hexavalent Chromium (Cr (VI)) 六价铬	Polybrominated biphenyls (PBB) 多溴联苯	Polybrominated diphenyl ethers (PBDE) 多溴二苯醚
Regulatory Model 50201	X	O	O	O	O	O
Regulatory Model 50203	X	O	O	O	O	O

This table is prepared in accordance with the provisions of SJ/T 11364.
这个标签是根据SJ / T 11364 的规定准备的。

O: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB / T26572 - 2011.
表示本部件所有均质材料中含有的有害物质低于GB / T26572 - 2011 的限量要求。

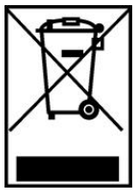
X: Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB / T26572 - 2011.
表示用于本部件的至少一种均质材料中所含的危害物质超过GB / T26572 - 2011 的限制要求。

For European Community Users

Cognex complies with Directive 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 on waste electrical and electronic equipment (WEEE).

This product has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment, if not properly disposed.

In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems for product disposal. Those systems will reuse or recycle most of the materials of the product you are disposing in a sound way.


The crossed out wheeled bin symbol informs you that the product should not be disposed of along with municipal waste and invites you to use the appropriate separate take-back systems for product disposal.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You may also contact your supplier for more information on the environmental performance of this product.

Precautions

To reduce the risk of injury or equipment damage, observe the following precautions when you install the Cognex product:

- The vision system requires a UL or NRTL listed power supply with a 24VDC output that meets the following rating requirements:
    - At least 1A1,5 A continuous current.
    - A maximum short circuit current of less than 4A.
    - A maximum power of less than 50VA and marked as a Limited Power Source (LPS) or National Electrical Code (NEC) Class 2.

  Any other voltage creates a risk of fire or shock and can damage the components. Applicable national and local wiring standards and rules must be followed.
- This product is intended for industrial use in automated manufacturing or similar applications.
- The safety of any system incorporating this product is the responsibility of the assembler of the system.
- Do not install Cognex products where they are exposed to environmental hazards such as excessive heat, dust, moisture, humidity, impact, vibration, corrosive substances, flammable substances, or static electricity.
- Route cables and wires away from high-current wiring or high-voltage power sources to reduce the risk of damage or malfunction from the following causes: over-voltage, line noise, electrostatic discharge (ESD), power surges, or other irregularities in the power supply.

- This product does not contain user-serviceable parts. Do not make electrical or mechanical modifications to product components. Unauthorized modifications can void your warranty.
- Changes or modifications not expressly approved by the party responsible for regulatory compliance could void the user's authority to operate the equipment.
- Include service loops with cable connections.
- Ensure that the cable bend radius begins at least six inches from the connector. Cable shielding can be degraded or cables can be damaged or wear out faster if a service loop or bend radius is tighter than 10X the cable diameter.
- The vision system's M/S connectors are not supported.
- This device should be used in accordance with the instructions in this manual.
- All specifications are for reference purposes only and can change without notice.

Product Service

- Bring any performance issues to the attention of your Cognex sales representative.
- The sensor can only be serviced by a trained Cognex representative. Return the unit to Cognex for any service or repairs.
- Do not operate the sensor if the enclosure appears damaged.

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