Addendum Sheet

In-Sight 5000 Series Vision System Installation Manual Addendum

The In-Sight® 5000 series of vision systems now includes models with 128MB of non-volatile flash memory and 256MB of image processing memory. This addendum includes hardware specifications to support these vision systems, along with updates and corrections to existing legal notices, precautions and specifications. This information will be included in the next revision of the *In-Sight® 5000 Series Vision System Installation Manual*. Please keep this addendum with your installation manual.

The following In-Sight vision systems are supported with firmware version 4.4.3.

In-Sight Models	32MB non-volatile flash memory	64MB non-volatile flash memory	128MB non-volatile flash memory[1]
5100, 5110	P/N 800-5870-1R	N/A	Type 821-0034-1R
5400, 5410	P/N 800-5855-1R	N/A	Type 821-0034-1R
5100C, 5400C	P/N 800-5837-4R	N/A	Type 821-0036-1R
5400R	P/N 800-5829-1R	N/A	N/A
5400S, 5410S	P/N 800-5855-3R	N/A	N/A
5400CS	P/N 800-5837-6R	N/A	N/A
5401, 5411	P/N 800-5838-4R	N/A	Type 821-0035-1R
5403, 5413	P/N 800-5830-4R	N/A	Type 821-0037-1R
5403S	P/N 800-5830-6R	N/A	N/A
5600, 5610	N/A	P/N 800-5871-1R	N/A
5603, 5613	N/A	P/N 800-5873-1R	N/A
5604, 5614	N/A	P/N 800-5874-1R P/N 800-5874-2R	N/A
5605, 5615	N/A	N/A	Type 821-0032-1R

Note: This addendum does not include information for vision systems with 32MB or 64MB of memory. Models with 32MB and 64MB of memory can be identified by the Part Number (800-xxxx-xx). Models with 128MB of memory can be identified by the Type number (821-xxxx-xx). To locate the Part Number or Type number, refer to the yellow label affixed to the vision system.

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[1] Vision systems with 128MB of non-volatile flash memory cannot be downgraded below version 4.4.3 firmware.

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Legal Notices

Regulations/Conformity

Note: For the most up-to-date regulations and conformity information, please refer to the In-Sight online support site: http://www.cognex.com/Support/InSight.

Declaration of Conformity	
Manufacturer	Cognex Corporation One Vision Drive Natick, MA 01760 USA
Declares this CE-marked Machine Vision System Product	
Product Type	In-Sight 5100/5110/5400/5410: Type 821-0034-1R In-Sight 5100C/5400C: Type 821-0036-1R In-Sight 5401/5411: Type 821-0035-1R In-Sight 5403/5413: Type 821-0037-1R
Complies With	2004/108/EC Electromagnetic Compatibility Directive
Compliance Standards	EN 55022:2006 +A1:2007 EN 61000-6-2:2005
European Representative	COGNEX INTERNATIONAL Immeuble "Le Patio" 104 Avenue Albert 1er 92563 Rueil Malmaison Cedex - France

Safety and Regulatory	
FCC	FCC Part 15, Class A This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference; and (2) this device must accept any interference received, including interference that may cause undesired operation. 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 their own expense.
KCC	In-Sight 5100/5110/5400/5410: CGX-IS5400-01(A) In-Sight 5100C/5400C: CGX-IS5400-C01(A) In-Sight 5401/5411: CGX-IS5401-01(A) In-Sight 5403/5413: CGX-IS5403-01(A)
NRTL	TÜV SÜD AM SCC/NRTL OSHA Scheme for UL/CAN 60950-1
CB	TÜV SÜD AM, IEC/EN 60950-1. CB report available upon request.
RoHS	RoHS 6 Compliant.

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Precautions

Observe these precautions when installing In-Sight 5000 series vision systems to reduce the risk of injury or equipment damage:

- In-Sight 5000 series vision systems are intended to be supplied by a UL or NRTL listed power supply with a 24VDC output rated for at least 600 mA continuous and a maximum short circuit current rating of less than 8A and a maximum power rating of less than 100VA and marked Class 2 or Limited Power Source (LPS). Any other voltage creates a risk of fire or shock and can damage the In-Sight components.

- Do not install In-Sight 5000 series vision systems where they are directly exposed to environmental hazards such as excessive heat, dust, moisture, humidity, impact, vibration, corrosive substances, flammable substances, or static electricity.

- To reduce the risk of damage or malfunction due to over-voltage, line noise, electrostatic discharge (ESD), power surges, or other irregularities in the power supply, route all cables and wires away from high-voltage power sources.

- The housing of the vision system is internally connected to the system ground wire (pin 8 of the Breakout cable). Therefore, if the mounting surface of the vision system is at a non-zero ground potential, it is strongly recommended that the vision system be mounted on an isolated or non-conductive mount.

- Do not expose the CCD to laser light; CCDs can be damaged by direct, or reflected, laser light. If your application requires the use of laser light that may strike the CCD, a lens filter at the corresponding laser's wavelength is recommended. Contact your local integrator or application engineer for suggestions.

- Do not open the In-Sight 5000 series vision system or remote head camera. These devices do not contain user-serviceable parts.

- Do not make electrical or mechanical modifications to In-Sight components. Unauthorized modifications may violate 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.

- Cable shielding can be degraded or cables can be damaged or wear out more quickly if a bend radius or service loop is tighter than 10X the cable diameter.

- Service loops should be included with all cable connections.

- This device is for business purposes and is qualified and registered for electromagnetic compatibility. The seller or purchaser should be notified if you incorrectly purchased these products; please exchange them for home use.

In-Sight 5100 and 5400 Series Vision System Specifications

Table 1-1: 5100, 5100C, 5401, 5400C, 5403 and 5400 Vision System Specifications

Specification	In-Sight 5100/5110	In-Sight 5100C	In-Sight 5401/5411	In-Sight 5400C	In-Sight 5403/5413	In-Sight 5400/5410
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	1/3-inch CCD				1/1.8-inch CCD	1/3-inch CCD
Sensor Properties	5.92mm diagonal, 7.4 x 7.4µm sq. pixels		5.952mm diagonal, 4.65 x 4.65µm sq. pixels	5.92mm diagonal, 7.4 x 7.4µm sq. pixels	8.8mm diagonal, 4.4 x 4.4µm sq. pixels	5.92mm diagonal, 7.4 x 7.4µm sq. pixels
Resolution (pixels)	640 x 480		1024 x 768	640 x 480	1600 x 1200	640 x 480
Electronic Shutter Speed	16µs to 1000ms		32µs to 1000ms	16µs to 1000ms	27µs to 1000ms	16µs to 1000ms
Acquisition	Rapid reset, progressive scan, full-frame integration.					
	256 grey levels (8 bits/pixel)	24 bit color	256 grey levels (8 bits/pixel)	24 bit color	256 grey levels (8 bits/pixel)	
	Gain/Offset controlled by software.					
	60 full frames per second.[1]	17 full frames per second.[2]	60 full frames per second.[3]	14 full frames per second.[4]	60 full frames per second.[5]	
Lens Type	C-mount					
CCD Alignment Variability[6]	±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 and RS-232C.					
Discrete Inputs	None built-in. Additional inputs available using a compatible I/O module. Unlimited inputs when using an Ethernet I/O system.					

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[1] Maximum frames per second is job-dependent and based on the minimum exposure for a full image frame capture.
[2] Maximum frames per second are job dependent and based on an 8ms exposure and a full image frame capture.
[3] Maximum frames per second is job-dependent and based on the minimum exposure for a full image frame capture.
[4] Maximum frames per second is job-dependent and based on the minimum exposure for a full image frame capture.
[5] Maximum frames per second is job-dependent and based on the minimum exposure for a full image frame capture.
[6] 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, ~ ±27 pixels on a 1024 x 768 resolution sensor and ~ ±29 pixels on a 1600 x 1200 resolution CCD.

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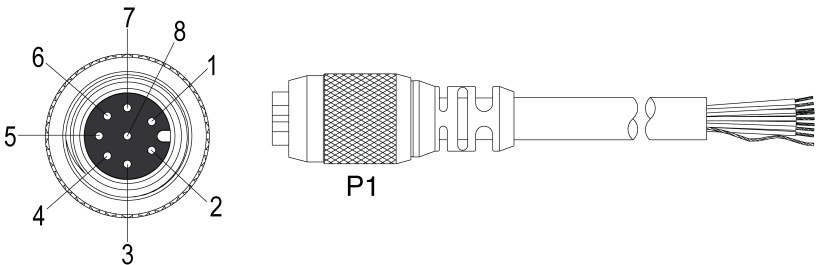| Specification	In-Sight 5100/5110	In-Sight 5100C	In-Sight 5401/5411	In-Sight 5400C	In-Sight 5403/5413	In-Sight 5400/5410
Discrete Outputs	2 built-in, high-speed outputs. Additional outputs available using a compatible I/O module. Unlimited outputs when using an Ethernet I/O system.					
Status LEDs	Power, Network Status, Network Traffic, 2 user configurable.					
Network Communication	1 Ethernet port, 10/100 BaseT, TCP/IP protocol. Supports DHCP (factory default) or static IP address.					
1588 Support	Timestamp Resolution: 8ns Synchronization Accuracy Through Transparent Clock: 5µs					
Serial Communication	RS-232C when connected to a compatible I/O module.					
Power (24VDC)	24VDC ±10%, 350mA maximum				24VDC ±10%, 500mA maximum.	24VDC ±10%, 350mA maximum.
Material	Die-cast aluminum housing.					
Finish	Painted.					
Mounting	Eight M4 threaded mounting holes (four front and four back).					
Dimensions	83.4mm (3.28in) x 124.2mm (4.89in) x 61.4mm (2.42in) with lens cover installed. 43.5mm (1.71in) x 124.2mm (4.89in) x 61.4mm (2.42in) without lens cover installed (includes Thread Guard).					
Weight	350 g (12.3 oz.) Lens cover installed, without lens.					
Operating Temperature	0°C to 45°C (32°F to 113°F)					
Storage Temperature	–30°C to 80°C (22°F to 176°F)					
Humidity	95%, non-condensing (Operating and Storage)					
Protection	IP67 (with appropriate lens cover properly installed).					
Shock	80 G Shock with 150 gram lens attached per IEC 68-2-27.					
Vibration	10 G from 10-500 Hz with 150 gram lens per IEC 68-2-6.					
Regulatory Compliance	CE, FCC, KCC, TÜV SÜD NRTL, RoHS					

Breakout Cable Specifications

The 24VDC Breakout connector provides access to power, serial communications, trigger and high-speed outputs. The Breakout cable is not terminated.

> **Note**:
>
> - Cables are sold separately.
>
> - Unused bare wires can be clipped short or tied back using a tie made of non-conductive material. Keep all bare wires separated from the +24VDC wire.
>
> - The housing of the vision system is internally connected to the system ground wire (pin 8 of the Breakout cable). Therefore, if the mounting surface of the vision system is at a non-zero ground potential, it is strongly recommended that the vision system be mounted on an isolated or non-conductive mount.

Table 1-2: Breakout Cable Pin-Out

Pin#	Signal Name	Wire Color
1	POWER, +24 VDC	White/Green
2	TRIGGER+	Green
3	TRIGGER-	White/Orange
4	HS OUT 0	Blue
5	HS OUT 1	White/Blue
6	RS-232 RECEIVE (RxD)[1] (In-Sight 5604 Only: Encoder A)	Orange
7	RS-232 TRANSMIT (TxD)[2] (In-Sight 5604 Only: Encoder B)	White/Brown
8	GROUND	Brown

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[1] If hardware handshaking is required, an I/O module must be used.
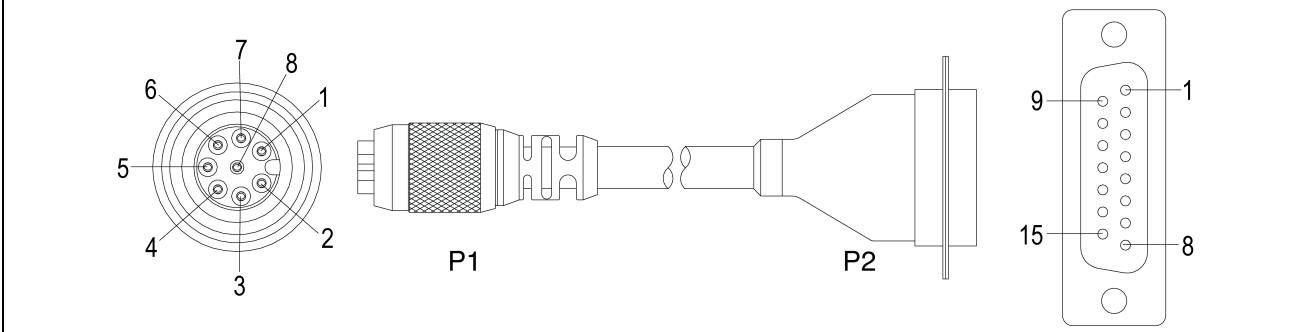[2] If hardware handshaking is required, an I/O module must be used.

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I/O Module Cable Specifications

The I/O Module cable is used with the optional I/O module and 1350 Breakout Module. The I/O Module cable connects the vision system directly to the applicable I/O module via the DB15 connector. When the I/O module or 1350 Breakout Module is used, all power and communication lines used by the vision system are connected using the I/O Module cable.

> **Note**:
> - Cables are sold separately.
> - Refer to your specific I/O module installation manual for more connection information.

Table 1-3: I/O Module Cable Pin-Out

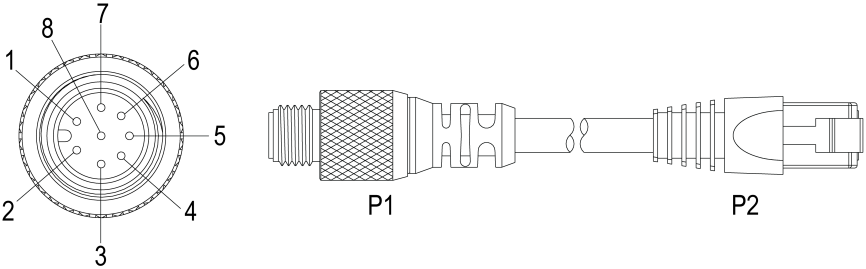| P1 Pin#	Signal Name	P2 Pin#
1	POWER, +24 VDC	1
2	TRIGGER+	2
3	TRIGGER-	3
4	HS OUT 0	4
5	HS OUT 1	5
6	RS-232 RECEIVE (RxD) (In-Sight 5604 Only: Encoder A)	6
7	RS-232 TRANSMIT (TxD) (In-Sight 5604 Only: Encoder B)	7
8	Ground	8

Ethernet Cable Specifications

The Ethernet cable is used to connect the vision system to other network devices. The Ethernet cable can be connected to a single device or provide connections to multiple devices via a network switch or router.

> **Note**:
> - Cables are sold separately.
> - The wiring for this cable follows standard industrial Ethernet M12 specifications. This varies from the 568B standard.

Table 1-4: Ethernet Cable Pin-Out

P1 Pin#	Signal Name	Wire Color	P2 Pin#
6	TPO+	White/Orange	1
4	TPO-	Orange	2
5	TPI+	White/Green	3
7	TRMA	Blue	4
1	TRMB	White/Blue	5
8	TPI-	Green	6
2	TRMC	White/Brown	7
3	TRMD	Brown	8

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Dimensional Drawings

5100, 5100C, 5400, 5401, 5400C and 5403 Vision System Dimensions

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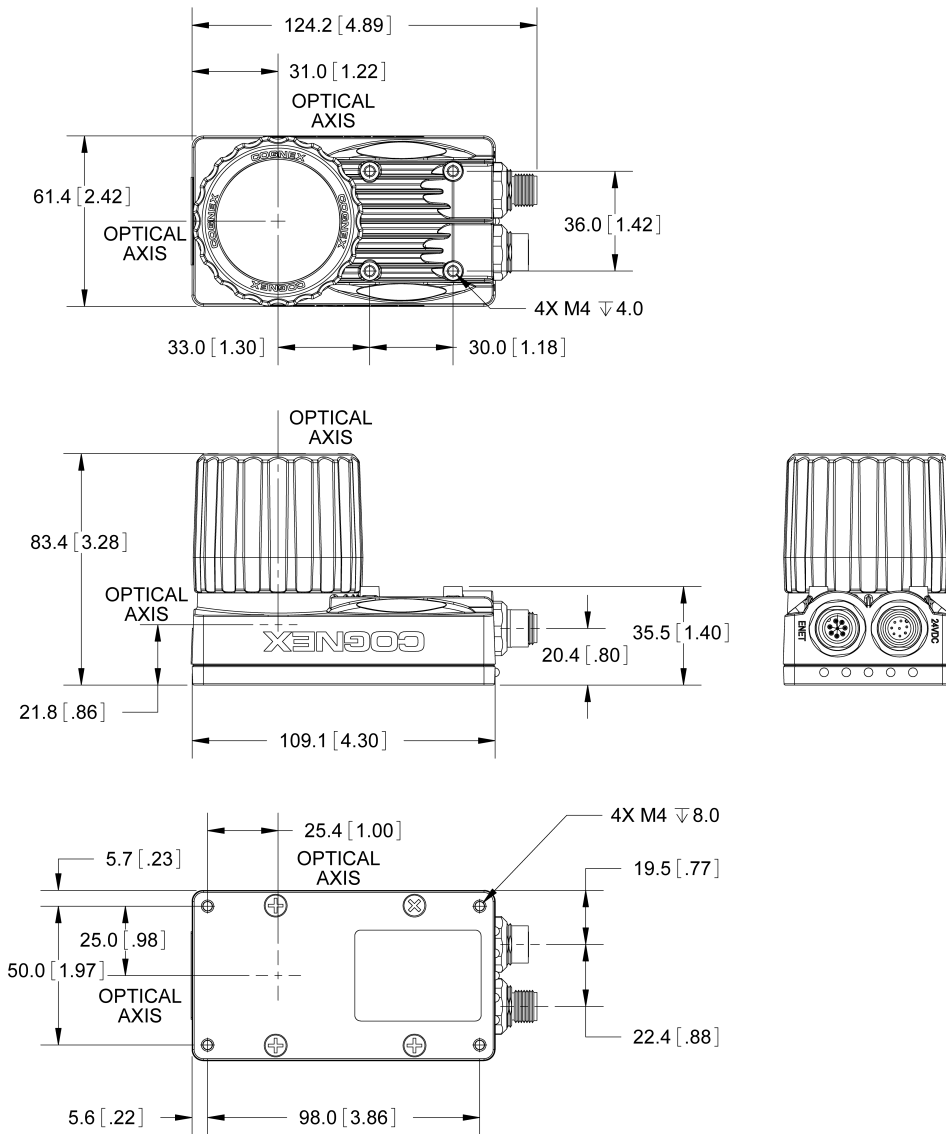- All specifications may be changed without notice.

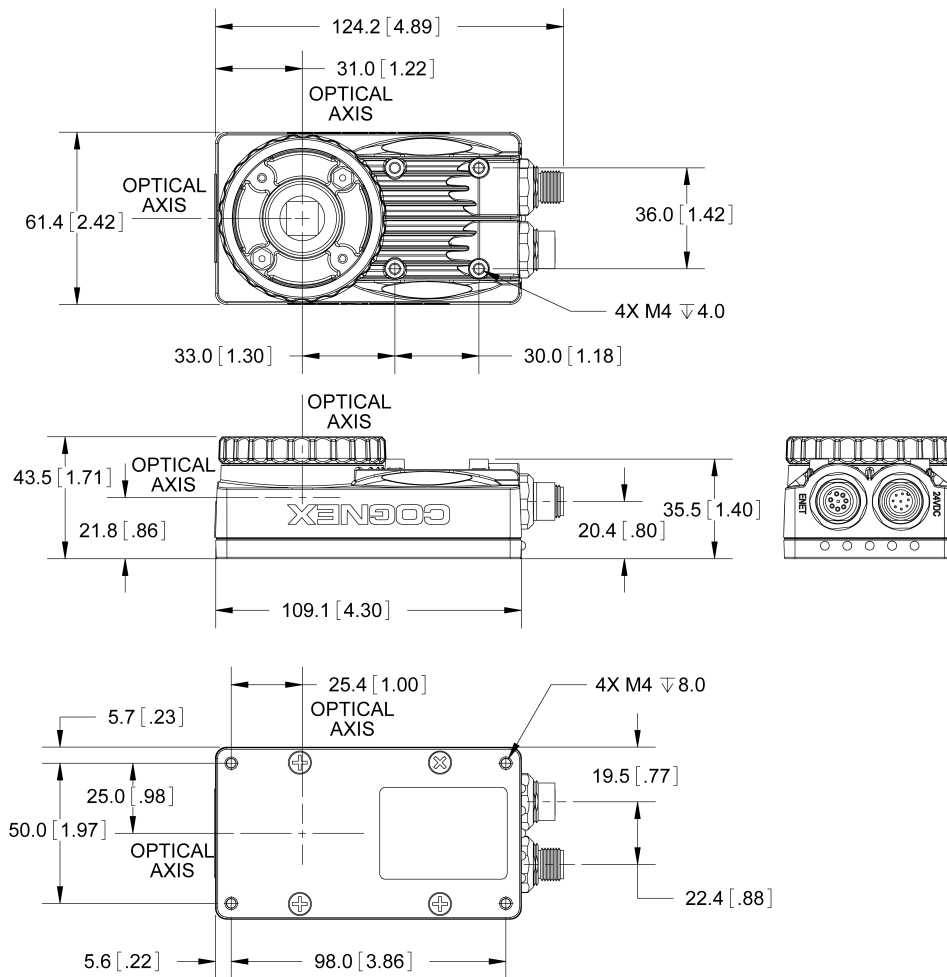**Figure 1-1: Standard Vision System Dimensions (With Lens Cover)**

124.2 [4.89]

31.0 [1.22]

OPTICAL
AXIS

OPTICAL
AXIS

61.4 [2.42]

36.0 [1.42]

4X M4 �óð 4.0

33.0 [1.30]

30.0 [1.18]

OPTICAL
AXIS

OPTICAL
AXIS

43.5 [1.71]

21.8 [.86]

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35.5 [1.40]

20.4 [.80]

109.1 [4.30]

ENET   24VDC

25.4 [1.00]

4X M4 ⍯ 8.0

OPTICAL
AXIS

5.7 [.23]

19.5 [.77]

25.0 [.98]

50.0 [1.97]

OPTICAL
AXIS

22.4 [.88]

5.6 [.22]

98.0 [3.86]

Figure 1-2: Standard Vision System Dimensions (Without Lens Cover)