

# In-Sight 7000 Series Vision System FAQs

## Contents

Imager .....	4
Q: What is the imager size? .....	4
Q: Since the imager is CMOS, how is the image quality of the In-Sight 7000 image sensor? .....	4
Q: How is the sensor sensitivity to IR and UV? .....	4
Q: What are the FOV and working distance for each autofocus lens? .....	4
Q: I feel something different with the image taken by In-Sight 7000 series from the In-Sight Micro. ....	4
Cables .....	4
Q: Do you have a serial cable for In-Sight 7000? .....	4
Q: What is the external Light cable part number for the In-Sight 7000? .....	4
Q: Why do I need the external Light cable on the In-Sight 7000? .....	4
Q: What external lights have been tested with the In-Sight 7000 and the Light cable? .....	5
Q: What is the CCS cable: IC00-ADAP-02? How does this work with the In-Sight 7000? .....	5
Q: Are there right angled or longer Power and I/O Breakout cables available? .....	5
Q: What is the exit angle on the right angle Power and I/O Breakout cables? What Ethernet cable should I use to have the same exit angle? .....	5
Q: What is the flex rating on the external Light cable (CCB-M12LTF-xx)? .....	5
Q: What is the flex rating on the Power and I/O Breakout cables (CCB-PWRIO-xxx)? .....	5
Q: Are the Power and I/O Breakout cable and the Light cable silicon free? .....	5
Q: Is there a flying lead external Light cable that plugs directly into the In-Sight 7000's LIGHT M12 connector? .....	5
Lights and Lighting .....	6
Q: What external lights are supported by the In-Sight 7000 Light connector? .....	6
Q: I just received some CLRxxxx lights (Di-Soric Manufacturer) but I do not see the CLR part number on the light. What does the part number 119-xxxx represent? .....	6
Q: Can the internal ring light and external light be used at the same time? .....	7
Q: There is a knob on the Cognex (Di-Soric, Product ID Prefix CLR) light. What should I set this to in order for it to work with the In-Sight 7000? .....	7
Q: Where do I set the External Light Settings? .....	7
Q: If I set my Integrated LED ring light on my In-Sight 7000 series to ALWAYS ON, the external light connected to my In-Sight 7000 does not stay ALWAYS ON. Is it broken? .....	7
Q: In the Setup Image application step in EasyBuilder, can I set the external lights to ALWAYS ON or are these always EXPOSURE CONTROLLED? Can I set the light intensity of my external lights here as well? .....	7
Q: Can I use the integrated lights with my C-Mount In-Sight 7000? .....	7
Q: What is the current limit for the external light? .....	7
Q: Can the external light be overdriven (supply more than 500mA) during strobe sequence? .....	7
Q: I have a light: CLRR-R7030G1CLR light. The specification sheet says it draws 470mA at 24 V. But on the label of the light it states it draws 650mA at 18V. This is over the 500mA limit. Is it safe to use even though it is less voltage? .....	8

Q: Is there intensity control for the external light connected directly to the LIGHT connector in the In-Sight 7000? .....	8
Q: Can I strobe the attached external light at a different time as the Camera trigger? .....	8
Q: Will the integrated LED ring light, the external light attached to the M12 Light connection and the strobe signal from the Power and I/O Breakout cable – all strobe at the same time? .....	8
Q: If I order a red ring light on my integrated In-Sight 7000, can I change this to blue (or a different color light) without ordering a new In-Sight 7000? .....	8
Q: I have a M12 Light cable not from Cognex. Can I use it? .....	8
Q: Can I connect to the CIO-MICRO to use the HS OUT terminals to strobe an external light? (External light is powered independently from the In-Sight 7000 and is not directly connected to the LIGHT connector) .....	8
Q: What is the IP rating for the external lights that connect to the In-Sight 7000 series LIGHT connector? .....	9
Q: Are filters available for the integrated (M12 lens configuration) In-Sight 7000? .....	9
Lens .....	9
Q: What lens format is recommended for each resolution offering? .....	9
Q: Are there restrictions on the C-Mount lens size on the In-Sight 7000 if I want to use the standard lens cover? .....	9
Q: I want to use a lens that is longer than the standard cover. Is there an extension available? .....	10
Q: How do I change the M12 lens on my integrated In-Sight 7000? .....	10
Q: Can I use my own M12 lens in the In-Sight 7000 integrated vision system? .....	10
Q: Is the M12 lens that Cognex sells suitable for high resolution measurement? .....	10
Q: Can I use a standard M12 lens (without the integrated autofocus) mechanism? .....	11
Q: Does the integrated In-Sight 7000 (M12 configuration) use spacers or extension tubes? .....	11
Q: Cognex currently offers five M12 lens – from 6mm to 25mm. Will Cognex offer more sizes in the future? .....	11
Q: What is the mechanical life cycle for the integrated M12 autofocus mechanism? .....	11
General and High Speed Inputs / Outputs .....	11
Q: What inputs and outputs are available? .....	11
Q: I need more I/O points. Does Cognex offer any I/O expansion modules for the In-Sight 7000 series? .....	11
Q: Do I need to set any software in the In-Sight 7000 to get all 4 inputs or all 4 outputs? .....	11
Q: I want to use the Strobe output signal. On the In-Sight 5000 series and In-Sight Micro series, I always use High Speed output 1 (HSOUT1). Is this the same for the In-Sight 7000 series? .....	12
Q: The CIO-MICRO has HS OUT0, HS OUT1, COMMON, TRIGGER + and TRIGGER- signals for the In-Sight 5000 and In-Sight Micro series. Can the In-Sight 7000 access these? .....	12
Q: I see the high-speed output latency in the <i>In-Sight® 7000 Series Vision System Installation Manual</i> . What is the latency with the LIGHT Connector? .....	12
Tool Configuration of Models .....	12
Q: What is the tool set for each model of the In-Sight 7000? .....	12
Hardware Configuration of Models .....	12
Q: What are the hardware models available? .....	12
Q: Can I change my integrated M12 lens configuration into a C-Mount lens configuration? .....	13
Q: Can I change my C-Mount lens configuration into an integrated M12 lens configuration? .....	13
Cognex Connect Support .....	13
Q: Does the In-Sight 7000 support CIP-Sync? .....	13

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Q: What communication protocols does the In-Sight 7000 support? .....	13
General Hardware .....	13
Q: How much flash memory does the In-Sight 7000 have? .....	13
Q: What enclosures are available for the In-Sight 7000? .....	13
Q: Are there brackets available for the In-Sight 7000? .....	13
Q: Does a bracket ship with the In-Sight 7000? .....	13
Q: Do we have any explosion proof enclosures available for the In-Sight 7000? .....	13
Q: What is the outer shell of the In-Sight 7000 made of? .....	14
Q: The lens cover is difficult to install back on the vision system, why? .....	14
Q: The lens cover can move in and out. How should this be installed to keep IP67 rating? .....	14
Q: Does the In-Sight 7000 series support Power over Ethernet (PoE)? .....	14
Q: Is electricity conducted from the screw holes on the back of the In-Sight 7000 series to the signal ground? .....	14
General Software .....	14
Q: What version of the firmware does In-Sight 7000 series support? .....	14
Q: Does the In-Sight 7000 series (other than In-Sight 7x2x) have the OCR tool? .....	14
Q: I noticed the Gain settings have a different minimum and maximum from the In-Sight 5000 and In-Sight Micro series. How does the Gain settings on In-Sight 7000 compare? .....	14
Q: Does VisionView support the Autofocus function? .....	14
Q: Does the In-Sight 7000 series support Gigabyte Ethernet? .....	14

## Imager

### **Q: What is the imager size?**

A: There are two resolution sizes available. Physically both are 1/1.8" format with pixel size of 5.3um.

The two resolution offerings are:

- 1280 X 1024 – In-Sight 7xx2 version
- 800 X 600 – In-Sight 7xx0 version

### **Q: Since the imager is CMOS, how is the image quality of the In-Sight 7000 image sensor?**

A: Image quality is comparable to the In-Sight 5000 and In-Sight Micro. In addition, it supports a much higher frame rate.

### **Q: How is the sensor sensitivity to IR and UV?**

A: The In-Sight 7000 image sensor is more sensitive to IR than the In-Sight 5000 and In-Sight Micro. For UV, it is about the same.

### **Q: What are the FOV and working distance for each autofocus lens?**

A: These graphs are available in the *In-Sight® 7000 Series Vision System Installation Manual*, which is installed by default with all In-Sight Explorer Software.

### **Q. I feel something different with the image taken by In-Sight 7000 series from the In-Sight Micro.**

A. By default, the Gain setting is set differently since it is a different imager than the In-Sight 5000 and In-Sight Micro. The In-Sight 5000 and In-Sight Micro share the same CCD manufacturer, while the In-Sight 7000 uses a CMOS imager from a different manufacturer. The Gain range is the same, however the initial Gain settings are different between the In-Sight 5000/In-Sight Micro and the In-Sight 7000.

## Cables

### **Q: Do you have a serial cable for In-Sight 7000?**

A: No, we do not have a serial cable for the In-Sight 7000; the signals are flying leads, available on the Power and I/O Breakout Cable, similar to the In-Sight 5000 and Micro series.

### **Q: What is the external Light cable part number for the In-Sight 7000?**

A: The external Light cable part number is CCB-M12LTF-xx.

### **Q: Why do I need the external Light cable on the In-Sight 7000?**

A: Some of the external lights do not have a built in pigtail and need this cable to connect between the light and the In-Sight 7000. These lights include Smart Vision Lights (Cognex Product ID Prefix: ISWB, IVSL), Cognex lights (Product ID prefix: IDIA, IDRA, IDWA CLR).

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**Q: What external lights have been tested with the In-Sight 7000 and the Light cable?**

A: These lights include:

- Smart Vision Lights (Cognex Product ID Prefix: ISWB, IVSL)
- Cognex lights (DVT – smart lights, Product ID prefix: IDIA, IDRA, IDWA)
- Cognex (Di-Soric lights - Product ID Prefix: CLR) lights

<b>NOTE</b> Additional lights are being tested and added. Timeline and manufacturer(s) are TBD.
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**Q: What is the CCS cable: IC00-ADAP-02? How does this work with the In-Sight 7000?**

A: This is an M12-to-FM3 connector adapter cable from CCS that supports the CCS 24V lights FM3 connector to the In-Sight 7000 LIGHT connector. Keep in mind that the current limit of the In-Sight 7000 is 500mA at 24V and intensity control is not available with the In-Sight 7000 on these lights. Make sure to verify the current limit of the lights at the input voltage of 24V.

**Q: Are there right angled or longer Power and I/O Breakout cables available?**

A: The Power and I/O Breakout cable is available in a right angle: CCB-PWRIO-05R and CCB-PWR10-15R.

There are two lengths available – the 5M Power and I/O Breakout straight cable: CCB-PWRIO-05 and the 15M Power and I/O Breakout cable: CCB-PWRIO-15.

**Q. What is the exit angle on the right angle Power and I/O Breakout cables? What Ethernet cable should I use to have the same exit angle?**

A. The right angle Power and I/O Breakout cables exit to the back of the In-Sight 7000. Use the 135-degree key, right angle, Ethernet cable so both cables exit to the back.

**Q: What is the flex rating on the external Light cable (CCB-M12LTF-xx)?**

A: The Light cable has a flex rating of 5X cable outer diameter when installed in a static (no motion) environment. For a flex (motion) environment, the flex is 10X cable outer diameter. Cable Outer Diameter is 5.69mm. Flex is rated to 2 million cycles.

**Q: What is the flex rating on the Power and I/O Breakout cables (CCB-PWRIO-xxx)?**

A: The Power and I/O Breakout cable has a flex rating of 5X cable outer diameter when installed in a static (no motion) environment. For a flex (motion) environment, the flex is 15X cable outer diameter. Cable Outer Diameter: 7.87mm. Flex is rated to 2 million cycles.

**Q: Are the Power and I/O Breakout cable and the Light cable silicon free?**

A: Yes, both cables are silicon free.

**Q: Is there a flying lead external Light cable that plugs directly into the In-Sight 7000's LIGHT M12 connector?**

A: No, Cognex does not offer an open ended, flying lead Light cable. The Light cable (CCB-M12LTF-xx) we offer (and have tested) is a closed M12-to-M12 connector; no flying lead is offered or available.

## Lights and Lighting

### Q: What external lights are supported by the In-Sight 7000 Light connector?

A: The In-Sight 7000 provides 500mA at 24V. The chart below lists the lights that are currently tested with the In-Sight 7000 along with the cable connections, and settings necessary in In-Sight Explorer.

Light Vendor	Need Light Cable?	Notes
Cognex Light Manufacturer: Di-Soric, Product ID Prefix: CLR	Yes, needs a Light cable. The lights do not come with a cable. Use the Cognex cable: CCB-M12LTF-xx to connect to In-Sight 7000.	There is a knob on the lights. If the knob is set to H, set the External Light settings in In-Sight Explorer to PNP. Light is exposure controlled (strobed on/off)  If the knob is set to L, the External Light settings in In-Sight Explorer to NPN or PNP and the light will be always ON.
QL series lights Product ID Prefix: IQx	No, the light has a cable (pigtail) already included with light. The light will directly connect to the In-Sight 7000 M12 LIGHT connector.	Light is always ON. Use CCS cable IQ00-ADAP-02 to use light as exposure controlled (on/off). External Light settings should be set to NPN when using the CCS cable.
SVL (Smart Vision Lights) Product ID Prefix: ISWB, IVSL)	Yes, needs a Light cable. The lights do not come with a cable. Use the Cognex cable: CCB-M12LTF-xx to connect to In-Sight 7000.	Light is exposure controlled (ON/OFF); External Light settings should be PNP.
Cognex Light DVT Smart Light Product ID: IDIA, IDRA, IDWA	Yes, needs a Light cable. The lights do not come with a cable. Use the Cognex cable: CCB-M12LTF-xx to connect to In-Sight 7000.	Light is exposure controlled (ON/OFF); External Light settings should be PNP.

### Q: I just received some CLRxxxx lights (Di-Soric Manufacturer) but I do not see the CLR part number on the light. What does the part number 119-xxxx represent?

A: The 119-xxxx is the Cognex item ID. These numbers are summarized below:

Description	Product ID	Part Number on Light
External Cognex Spot Light	CLRS-P14G1	119-2041R
External Cognex Dark-Field Light	CLRD-D120G1	119-2042R
External Cognex Ring Light	CLRR-R7030G1CLR	119-2043R
External Cognex Back Light	CLRB-F100100G1	119-2044R

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**Q: Can the internal ring light and external light be used at the same time?**

A: Yes, they can be as long as external light is within the current limit.

**Q: There is a knob on the Cognex (Di-Soric, Product ID Prefix CLR) light. What should I set this to in order for it to work with the In-Sight 7000?**

A: These lights support High (H) or Low (L) signal strobe triggering. If the knob is set to H, set the External Light Setting in In-Sight Explorer to PNP for strobe (on/off). The other knob is for light brightness which can be adjusted as desired. The In-Sight 7000 does not control the brightness aspect of the light.

**Q: Where do I set the External Light Settings?**

A: When you are logged onto the In-Sight 7000, select **Sensor menu > External Light Settings**. The strobe setting can be set to PNP or NPN, depending on the light connected. Most lights work with the default PNP setting.

**Q: If I set my Integrated LED ring light on my In-Sight 7000 series to ALWAYS ON, the external light connected to my In-Sight 7000 does not stay ALWAYS ON. Is it broken?**

A: No, only the Integrated LED ring light on the Integrated In-Sight 7000 series (includes lens and light) can be set to DISABLED, EXPOSURE COTROLLED or ALWAYS ON in the Set Up Image step in the EasyBuilder View or in the A0 function in the Spreadsheet View. The external light connected to the M12 Light connector on the In-Sight 7000 is not controlled by the parameters in the A0 parameter sheet or Setup Image step in EasyBuilder. These parameters only apply to the integrated LED ring lights.

**Q: In the Setup Image application step in EasyBuilder, can I set the external lights to ALWAYS ON or are these always EXPOSURE CONTROLLED? Can I set the light intensity of my external lights here as well?**

A: The Light Control Mode and Light Intensity parameters are only for the integrated ring light, and not for the external light connected to the LIGHT connector on the In-Sight 7000. The External lights, specifically any light connected to the LIGHT connector on the In-Sight 7000 series, are not controlled in the Set Up Image application step (or the A0 property sheet in the Spreadsheet View).

**Q: Can I use the integrated lights with my C-Mount In-Sight 7000?**

A: The integrated light is only intended to work with integrated M12 lens; however, there is nothing blocking the use of the light on the C-Mount version. The same circuitry exists.

**NOTES**

- The C-Mount lens may obstruct the light.
- Shut off the power supply when changing the C-Mount lens if you have integrated light as the metal rim may cause a short.

**Q: What is the current limit for the external light?**

A: 500mA at 24V is the current limit for any external light connected to the In-Sight 7000, constant on or strobed.

**Q: Can the external light be overdriven (supply more than 500mA) during strobe sequence?**

A: Yes, the max current draw is 1A at 50% duty cycle (max on time of 100ms).

**Q: I have a light: CLRR-R7030G1CLR light. The specification sheet says it draws 470mA at 24 V. But on the label of the light it states it draws 650mA at 18V. This is over the 500mA limit. Is it safe to use even though it is less voltage?**

A: The In-Sight 7000 supplies 24V to the lights connected to the device. Use the reference for 24V and current draw at 24V. If this current is at 500mA or below – it is safe to use. For this case, the 470mA draw at 24V is safe. Keep in mind –the system can be overdriven to 1A if used with a 50% duty cycle as well.

**Q: Is there intensity control for the external light connected directly to the LIGHT connector in the In-Sight 7000?**

A: No, there is no intensity control for external light with In-Sight Explorer. Many lights come with intensity/brightness control on the light hardware such as Smart Vision Lights, or the Cognex light (original manufacture: Di-Soric).

**Q: Can I strobe the attached external light at a different time as the Camera trigger?**

A: No, all of the strobe outputs are synced to the Camera trigger only.

**Q: Will the integrated LED ring light, the external light attached to the M12 Light connection and the strobe signal from the Power and I/O Breakout cable – all strobe at the same time?**

A: The signals are all initiated by the same internal strobe signal. However, since the circuitry is different on the strobe+/- output signal on the Power and I/O Breakout cable, there could be a maximum latency of 750us due to optical isolation of the circuit. The integrated ring light and LIGHT connector strobe signal has minimal latency, less than 100us.

**Q: If I order a red ring light on my integrated In-Sight 7000, can I change this to blue (or a different color light) without ordering a new In-Sight 7000?**

A: Yes! The In-Sight 7000 is completely configurable with different M12 lenses and light color options, meaning that the lenses and lights on the integrated In-Sight 7000 are field replaceable/configurable! There is a kit that is available for purchase that contains all of the light options. Also, each lens and light ring is available to purchase individually. There is also direction on how to change the light ring in the appendix of the *In-Sight® 7000 Series Vision System Installation Manual*.

**Q: I have a M12 Light cable not from Cognex. Can I use it?**

A: Specific lighting vendors have come up with their own light cables such as SVL. These cables can be used; however, contact the lighting vendor to verify functionality and testing with the In-Sight 7000 series before attaching them to the In-Sight 7000.

**Q: Can I connect to the CIO-MICRO to use the HS OUT terminals to strobe an external light? (External light is powered independently from the In-Sight 7000 and is not directly connected to the LIGHT connector)**

A: No, the I/O module's TRIGGER+, TRIGGER-, HS OUT 0, HS OUT 1 and HS COMMON terminals are not supported with the In-Sight 7000 series vision system. Do not connect wire leads from remote devices to these terminals. If you need to strobe an external light, use the Direct high-speed outputs (Direct output 0) on the In-Sight 7000 from the Power and I/O Breakout cable.



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**Q: What is the IP rating for the external lights that connect to the In-Sight 7000 series LIGHT connector?**

A: The IP ratings for the lights are on the specification for the lights from their manufacturer. It is best to verify on the specification sheets for the individual lights.

**Q: Are filters available for the integrated (M12 lens configuration) In-Sight 7000?**

A: Yes, these filters fit over the integrated ring light and M12 lens. There are instructions to attach the filters with the filters.

Filters - Red	IMRF-BP635-IS7
Filters - Orange	IMOF-BP590-IS7
Filters - Green	IMGF-BP525-IS7
Filters - Blue	IMBF-BP470-IS7
Filters - IR	IMIF-BP850-IS7
Diffuser ring	IMDF-DC100-IS7
Polarizer Kit (Polarizing lens and ring material included)	IMPF-PC100-IS7

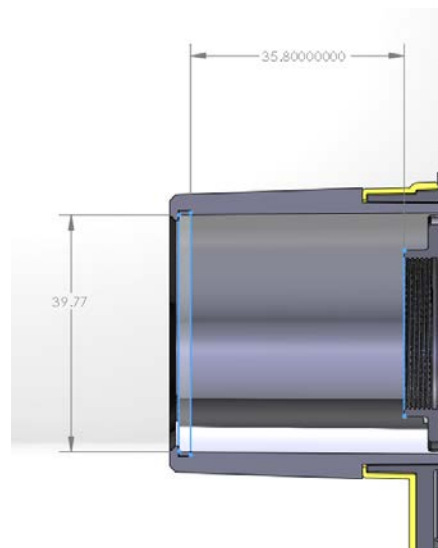
## Lens

**Q: What lens format is recommended for each resolution offering?**

A: A 2/3" lens format is sufficient for both optical formats. The pixel size is 5.3um, for the 1280x1024 a 2/3" lens is sufficient, and the 800x600, a 1/3" lens format or larger is sufficient.

**Q: Are there restrictions on the C-Mount lens size on the In-Sight 7000 if I want to use the standard lens cover?**

A: The standard lens cover can be extended up to 8mm, therefore the maximum length of lens with the standard lens cover is 35.8mm + 8mm extension = 43.8mm. The length of the lens needs to be less than 35.8mm if the lens cover is not extended. Please also note the locking screws plus the lens diameter must be less than 39.77mm.

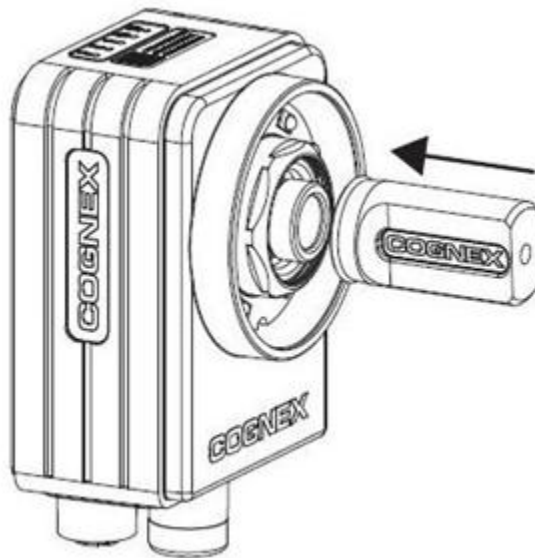


**Q: I want to use a lens that is longer than the standard cover. Is there an extension available?**

A: First, please note that the current lens cover can be extended by 8mm. If the lens you are using is longer than 43.8mm (standard lens cover is 35.8mm + 8mm extension = 43.8mm), then yes – you would need a longer lens cover. A longer cover is not currently available.

**Q: How do I change the M12 lens on my integrated In-Sight 7000?**

A: Cognex offers a Lens Tool accessory to facilitate the change of M12 lens on integrated In-Sight 7000 vision systems. Please refer to the instruction card included with the Cognex Lens Tool as part of the lens evaluation kit. (Part number: LNS-M12-TOOLKIT)



**Q: Can I use my own M12 lens in the In-Sight 7000 integrated vision system?**

A: No, it is not recommended. Cognex has tested all the M12 lens offered and they all fit and work with the In-Sight 7000 autofocus mechanism as well as the imager. If the M12 lens you choose is too long or heavy, it may damage the In-Sight 7000 autofocus mechanism and the lens holder. We highly recommend only using M12 lens approved and offered by Cognex.

**CAUTION:** Using a non-Cognex lens or replacing the M12 lens without the Cognex Lens Tool accessory (P/N 823-0196-xR) may cause damage to the vision system.

**Q: Is the M12 lens that Cognex sells suitable for high resolution measurement?**

A: The integrated M12 lenses are megapixel lenses (2- 3 Mega Pixel). This is suitable for high resolution measurement; however, there are other factors involved including lighting, mounting, and calibration. If there is any question, it is best to review the application with a Cognex Application Engineer to understand if a higher megapixel lens or a telecentric lens is needed for the specific application.

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**Q: Can I use a standard M12 lens (without the integrated autofocus) mechanism?**

A: Yes assuming you are using an In-Sight 7000 C-Mount configuration vision system. Any C-Mount vision system can use a standard C-Mount-to-M12 adaptor. Cognex does not sell these directly but they are available. The M12 lenses would then screw in to the adapter.

**Q: Does the integrated In-Sight 7000 (M12 configuration) use spacers or extension tubes?**

A: The integrated autofocus mechanism does not use any spacers or extension tubes. These cannot be added to the integrated autofocus mechanism.

**Q: Cognex currently offers five M12 lens – from 6mm to 25mm. Will Cognex offer more sizes in the future?**

A: We could potentially add more M12 lenses if the need is there. Please let us know of applications where we need other sizes.

<b>NOTE</b> The 6mm and 8mm release is delayed until Q4 2012.
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**Q: What is the mechanical life cycle for the integrated M12 autofocus mechanism?**

A: 350,000 full cycles.

## **General and High Speed Inputs / Outputs**

**Q: What inputs and outputs are available?**

A: 4 inputs (3 general purpose plus 1 acquisition trigger), 4 outputs and Serial (no hardware handshake)

**Q: I need more I/O points. Does Cognex offer any I/O expansion modules for the In-Sight 7000 series?**

A: Yes, the CIO-MICRO is supported and provides 8 general purpose inputs and 8 general purpose outputs via the LAN connection on the CIO-MICRO.

<b>NOTE</b> The I/O module's TRIGGER+, TRIGGER-, HS OUT 0, HS OUT 1 and HS COMMON terminals are not supported with the In-Sight 7000 series vision system. Do not connect wire leads from remote devices to these terminals.
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**Q: Do I need to set any software in the In-Sight 7000 to get all 4 inputs or all 4 outputs?**

A: No, all I/O is built in and ready to be configured to your application. The 4 inputs and 4 outputs are labeled Direct 0, Direct 1, etc., in the In-Sight Explorer Software.

<b>NOTE</b> One of the inputs is dedicated as the Camera trigger input.
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**Q: I want to use the Strobe output signal. On the In-Sight 5000 series and In-Sight Micro series, I always use High Speed output 1 (HSOUT1). Is this the same for the In-Sight 7000 series?**

A: The strobe signal, built into all In-Sight models, can be used on the In-Sight 7000 to provide a strobe signal to an independently power light (independently powered = NOT connected to the LIGHT connection on the In-Sight 7000).

When logged onto an In-Sight 7000 from In-Sight Explorer, set Direct Output 0 (also referred to as Line 0) to Strobe. Reference the *In-Sight® 7000 Series Vision System Installation Manual* for signal specification and circuit diagram examples.

**Q: The CIO-MICRO has HS OUT0, HS OUT1, COMMON, TRIGGER + and TRIGGER- signals for the In-Sight 5000 and In-Sight Micro series. Can the In-Sight 7000 access these?**

A: No, these are not supported with the In-Sight 7000. The I/O module's DB15 connection is not supported with the In-Sight 7000. This I/O module is connected via Ethernet port and provides access to 8 additional inputs and 8 additional outputs only. For further information, see the appendix in the *In-Sight® 7000 Series Vision System Installation Manual*

**Q: I see the high-speed output latency in the *In-Sight® 7000 Series Vision System Installation Manual*. What is the latency with the LIGHT Connector?**

A: Latencies of the LIGHT connector circuit are less than 100us.

## Tool Configuration of Models

**Q. What is the tool set for each model of the In-Sight 7000?**

A:

- The In-Sight 7010 is EasyBuilder-only with basic tools.
- The In-Sight 7020 is EasyBuilder-only with basic and essential tools.
- The In-Sight 7050 has EasyBuilder/Spreadsheet with basic and essential tools.
- The In-Sight 7200, 7400, 7402 are EasyBuilder/Spreadsheet with basic, essential, extended and PatMax tools.
- The In-Sight 7230, 7430, 7432 are EasyBuilder only with OCR and Pattern tools for **fixturing** only.
- The In-Sight 7210, 7410, 7412 are EasyBuilder/Spreadsheet with ID and OCR tools (**NO** Pattern tools for fixturing).

## Hardware Configuration of Models

**Q: What are the hardware models available?**

A: Two imager size options: 800 x 600 (IS7xx0) or 1280x1024 (IS7xx2).

Two imaging systems to choose from:

- The integrated M12 lens configuration with autofocus (IS7xxx-xx-xxx-xxx).
- The C-Mount lens configuration (IS7xxx-xx).

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**Q: Can I change my integrated M12 lens configuration into a C-Mount lens configuration?**

A: Yes. This is only recommended as a last-effort basis as this conversion is considered a one-way conversion. You cannot take a C-Mount vision system and replace the autofocus mechanism and get repeatable results. This will be detailed in the hardware manual.

**Q: Can I change my C-Mount lens configuration into an integrated M12 lens configuration?**

A: No. See comment above.

## **Cognex Connect Support**

**Q: Does the In-Sight 7000 support CIP-Sync?**

A: No, but it does support EIP, just not the Rockwell 1588 implementation (CIP-Sync). CIP-Sync is available on the 56xx platform only.

**Q: What communication protocols does the In-Sight 7000 support?**

A: All the protocols listed under Cognex Connect, with the exception of CIP-Sync.

Please Note: the In-Sight 7000 is the only Vision System to support POWERLINK.

## **General Hardware**

**Q: How much flash memory does the In-Sight 7000 have?**

A: Flash memory= 512 MB

**Q: What enclosures are available for the In-Sight 7000?**

A: There are two enclosures offered:

- C-Mount configuration enclosure: ENC-L7-01
- M12 configuration enclosure: ENC-LD-01

**Q: Are there brackets available for the In-Sight 7000?**

A: Yes, Cognex sells the BKT-7k-01 (plate mount which comes with each vision system), BKT-7k-02 (bar mount), and the BKT-7k-03 (Pan and Tilt) bracket.

**Q: Does a bracket ship with the In-Sight 7000?**

A: For the integrated vision system the BKT-7k-01 is shipped with the product. For the C-Mount configuration, no bracket is shipped with the product.

**Q: Do we have any explosion proof enclosures available for the In-Sight 7000?**

A: No, not at this moment. We do offer two enclosures, but they are not explosion proof.

**Q: What is the outer shell of the In-Sight 7000 made of?**

A: Die Cast Aluminum with a yellow plastic overlay. The same paint is used on all of our In-Sight 5000 and In-Sight Micro vision systems.

**Q: The lens cover is difficult to install back on the vision system, why?**

A: The lens cover is keyed; make sure the cover keys are lined up correctly with the housing before pushing the lens cover back on.

**Q: The lens cover can move in and out. How should this be installed to keep IP67 rating?**

A: The lens cover is designed to slide out 8mm to accommodate for longer lenses. The In-Sight 7000 will continue to be IP67 at the lens cover full extension. Push the lens cover down as close to the lens as possible when installing the cover.

**Q. Does the In-Sight 7000 series support Power over Ethernet (PoE)?**

A. No. You have to provide +24V power for the In-Sight 7000 series.

**Q. Is electricity conducted from the screw holes on the back of the In-Sight 7000 series to the signal ground?**

A. No. They are isolated from each other.

## General Software

**Q. What version of the firmware does In-Sight 7000 series support?**

A. 4.7.1 or higher for the C-Mount, and 4.7.3 or higher for the integrated units.

**Q. Does the In-Sight 7000 series (other than In-Sight 7x2x) have the OCR tool?**

A. Yes, the standard models of the In-Sight 7000 series (like the In-Sight 7402) also have the OCR tool.

**Q: I noticed the Gain settings have a different minimum and maximum from the In-Sight 5000 and In-Sight Micro series. How does the Gain settings on In-Sight 7000 compare?**

A: The In-Sight 7000 has the same range of Gain results; however there is less iteration of the Gain settings on the In-Sight 7000 series.

**Q: Does VisionView support the Autofocus function?**

A: Yes, there is an In-Sight 7000 plug-in, and also this functionality is supported in VisionView 1.6.0, released in June 2012.

**Q: Does the In-Sight 7000 series support Gigabyte Ethernet?**

A: No, only the In-Sight 56xx series supports Gigabyte Ethernet speeds.