

# Code Handheld Barcode Scanners

## Advanced, cost-effective barcode readers

The Code Reader™ line of advanced barcode readers have been designed to provide reliable data capture in a variety of settings, while maintaining an ergonomic, lightweight form factor. Code has developed the world's best image capture by using a powerful vision sensor and built-in lighting to reliably capture the barcode while not relying on external light sources.

In addition to leading-edge technical capabilities, all Code handheld barcode scanners feature housings made from specially engineered CodeShield™ plastics. These case materials are designed to provide superior, long-term protection against most commonly used chemicals and chemical disinfectants without damage to the housing.



**CR950**

The Code Reader™ 950 (CR950) is an aggressive barcode reader that rapidly decodes 1D and 2D barcodes. Its lightweight, ergonomic design makes it comfortable to use over long shifts, and unmatched durability makes it an investment that will last.



**CR1500**

The Code Reader™ 1500 (CR1500) is a compact tethered barcode reader that features a high-performance scan engine, patented dual-field optical platform, and intuitive targeting that makes reading 1D, 2D, and postal bar codes extremely fast and reliable.



**CR6022**

The Code Reader™ 6022 (CR6022) is an industrial grade direct part mark (DPM) imager designed to read barcodes of every sort. The CR6022 effortlessly reads laser-etched, embossed, dot peen and low-contrast barcodes and easily decodes dense and extremely small barcodes.



**CR5210**

The Code Reader™ 5210 (CR5210) is designed for use in fast-paced environments and handles data from 1D, 2D and postal barcodes with speed and accuracy. The tabletop design allows for hands-free operation or optional trigger reading of large, heavy or bulky items.



**CR1100**

The Code Reader™ 1100 (CR1100) is a compact, corded barcode reader that takes up limited workspace without compromising barcode reading performance. The patented dual-field optical platform of the CR1100 allows users to quickly scan both wide 1D barcodes and small dense 2D barcodes.



**CR2701 / CR2702**

The Code Reader™ 2700 (CR2701/CR2702) is Code's fourth-generation (Bluetooth 5) barcode scanner, combining nearly 20 years of market experience with new features to improve workflow in any setting. Code has taken their unparalleled scanning performance and stepped it up a notch, tackling even more damaged or poorly-printed barcodes to keep your business moving.

# Code Handheld Barcode Scanners



## CR950 Advanced Cost-Effective Barcode Scanner



CR950

The Code Reader™ 950 (CR950) is a versatile barcode reader that is easy to set up and use in a variety of different settings. It is available with either USB or RS-232 communication capabilities. The USB version can connect to the **C-more** HMI. AutomationDirect provides sample code which can be used to connect the reader to Click, BRX, and Productivity PLCs.

### Features

- High-speed, omnidirectional reading of 1D and 2D barcode symbologies.
- Manual or automatic triggering. Stand (sold separately) is required for automatic triggering.
- User feedback with LED and audible tone.
- All-inclusive kits include reader and cable.
- Reads barcodes on backlit screens such as those found on mobile devices.
- Optional stand (sold separately).

### Code Handheld Barcode Reader – Selection Chart

Part Number	Price	Description	Communication Protocol	Corded/Cordless	Form Factor	Weight (lb [kg])	Dimensional Drawing
<a href="#">CR950-K301-C298</a>	\$153.00	Code barcode scanner, 6ft [1.83 m] USB cable included.	USB	Corded	Handheld	0.25 [0.11]	<a href="#">PDF</a>
<a href="#">CR950-K302-C298</a>	\$177.00	Code barcode scanner, 6ft [1.83 m] RS-232 (DB9) cable and power supply included.	RS-232	Corded	Handheld	0.25 [0.11]	<a href="#">PDF</a>

### Code Handheld Barcode Scanners Typical Working Range (in [mm])

Size and Type of Barcode (in [mm])	CR950-K30x-C298	
	Min	Max
3 mil Code 39	–	–
7.5 mil Code 39	2 [50]	9.6 [245]
10.5 mil GS1 DataBar	1.4 [35]	8.9 [225]
5.8 mil PDF417	3.3 [85]	6.1 [155]
6.7 mil PDF417	2.6 [65]	6.9 [175]
13 mil UPC	1.6 [40]	14.6 [370]
4.2 mil Data Matrix	–	–
5 mil Data Matrix	3.0 [75]	3.5 [90]
6.3 mil Data Matrix	2.8 [70]	5.3 [135]
10 mil Data Matrix	2.0 [50]	8.1 [205]
20.8 mil Data Matrix	1.2 [30]	15.7 [400]

**Note:** Working ranges may vary depending on barcode quality and reading environment. The above numbers are a combination of both the wide and high density fields. All samples were high quality barcodes and were read along a physical center line at a 10 degree angle. Distances are measured from the front of the reader. Default automatic gain control settings were used with regular office lighting. Accuracy = +/- 10%. Test conditions may affect working ranges.

### Code Handheld Barcode Scanners Specifications

	CR950-K30x-C298
<b>Power Requirements</b>	5VDC (USB versions are powered from the host device) (RS232 versions utilize a 120VAC-to-5VDC power adapter)
<b>Sensor</b>	CMOS 1.2 megapixel monochrome
<b>Operating Temperature</b>	-20 to 50°C [-4 to 122°F]
<b>Storage Temperature</b>	-30 to 65°C [-22 to 150°F]
<b>Humidity</b>	5% to 95% non-condensing
<b>Field Selection</b>	Wide Field (used for long barcodes)
<b>Field of View</b>	51° horizontal by 39.4° vertical
<b>Focal Point</b>	Approximately 130mm [5.12 in]
<b>Optical Resolution</b>	1280 x 960
<b>Pitch</b>	± 65° (from front to back)
<b>Skew</b>	± 60° from plane parallel to symbol (side to side)
<b>Rotational Tolerance</b>	±180°
<b>Symbol Contrast</b>	15% minimum reflectance difference
<b>Target Beam</b>	Single, blue targeting bar
<b>Ambient Light Immunity</b>	Sunlight: Up to 9,000 ft candles
<b>Shock</b>	Withstands multiple drops of 6ft [1.8 m] to concrete
<b>IP Rating</b>	IP54
<b>Agency Approval</b>	CE

# Code Handheld Barcode Scanners **code**

## CR1100 Advanced Cost-Effective Barcode Scanner



CR1100

The Code Reader™ 1100 (CR1100) is a versatile barcode reader that is easy to set up and use in a variety of different settings. It is available with either USB or RS-232 communication capabilities. The USB version can connect to the **C-more** HMI. AutomationDirect provides sample code which can be used to connect the reader to Click, BRX, and Productivity PLCs.

### Features

- High-speed, omnidirectional reading of 1D and 2D barcode symbologies.
- Manual or automatic triggering.
- Pre-threaded screw holes to allow for mounting.
- User feedback with LED and audible tone.
- Reads barcodes on mobile device screens.
- Efficient power consumption (lowest in its class).
- Optional stand (sold separately).

### Code Handheld Barcode Reader – Selection Chart

Part Number	Price	Description	Communication Protocol	Corded/Cordless	Form Factor	Weight (lb [kg])	Dimensional Drawing
<a href="#">CR1100-K201-C298</a>	\$236.00	Code barcode scanner, 6ft [1.83 m] USB cable included.	USB	Corded	Handheld/presentation	0.15 [0.07]	<a href="#">PDF</a>
<a href="#">CR1100-K202-C298</a>	\$260.00	Code barcode scanner, 6ft [1.83 m] RS-232 (DB9) cable and power supply included.	RS-232	Corded	Handheld/presentation	0.15 [0.07]	<a href="#">PDF</a>

### Code Handheld Barcode Scanners Typical Working Range (in [mm])

Size and Type of Barcode (in [mm])	CR1100-K20x-C298	
	Min	Max
3 mil Code 39	3.3 [84]	4.3 [109]
7.5 mil Code 39	1.9 [47]	7 [177]
10.5 mil GS1 DataBar	0.6 [16]	7.7 [196]
5.8 mil PDF417	–	–
6.7 mil PDF417	–	–
13 mil UPC	1.3 [33]	11.3 [286]
4.2 mil Data Matrix	–	–
5 mil Data Matrix	1.9 [48]	4.8 [121]
6.3 mil Data Matrix	1.4 [35]	5.6 [142]
10 mil Data Matrix	0.6 [14]	7.2 [182]
20.8 mil Data Matrix	1.0 [25]	12.6 [319]

**Note:** Working ranges may vary depending on barcode quality and reading environment. The above numbers are a combination of both the wide and high density fields. All samples were high quality barcodes and were read along a physical center line at a 10 degree angle. Distances are measured from the front of the reader. Default automatic gain control settings were used with regular office lighting. Accuracy = +/- 10%. Test conditions may affect working ranges.

### Code Handheld Barcode Scanners Specifications

	CR1100-K20x-C298
<b>Power Requirements</b>	5VDC (USB versions are powered from the host device) (RS232 versions utilize a 120VAC-to-5VDC power adapter)
<b>Sensor</b>	CMOS 1.2 megapixel monochrome
<b>Operating Temperature</b>	-20 to 55°C [-4 to 131°F]
<b>Storage Temperature</b>	-30 to 65°C [-22 to 150°F]
<b>Humidity</b>	5% to 95% non-condensing
<b>Field Selection</b>	High Density (used for small/dense barcodes) and Wide Field (used for long barcodes)
<b>Field of View</b>	High Density: 30° horizontal by 20° vertical Wide Field 50° horizontal by 35.5° vertical
<b>Focal Point</b>	High Density: ~100mm [3.94 in] Wide Field ~115mm [4.53 in]
<b>Optical Resolution</b>	High Density: 960 x 640 Wide Field: 960 x 640
<b>Pitch</b>	± 65° (from front to back)
<b>Skew</b>	± 60° from plane parallel to symbol (side to side)
<b>Rotational Tolerance</b>	±180°
<b>Symbol Contrast</b>	15% minimum reflectance difference
<b>Target Beam</b>	Single, blue targeting bar
<b>Ambient Light Immunity</b>	Sunlight: Up to 9,000 ft candles
<b>Shock</b>	Withstands multiple drops of 6ft [1.8 m] to concrete
<b>IP Rating</b>	Not tested
<b>Agency Approval</b>	CE

# Code Handheld Barcode Scanners **code**

## CR6022 Advanced Cost-Effective Barcode Scanner



CR6022

The Code Reader™ 6022 (CR6022) is a versatile barcode reader that is easy to set up and use in a variety of different settings. It is available with either USB or RS-232 communication capabilities. The USB version can connect to the **C-more** HMI. AutomationDirect provides sample code which can be used to connect the reader to Click, BRX, and Productivity PLCs.

### Features

- Reads laser-etched and dot peen markings.
- Reads color and low-contrast barcodes.
- IP54 housing protects against dust and debris.
- Small form factor for operator comfort.
- Integrated metal hook holder for ease of placement and retrieval.
- User feedback with programmable LED, audible tone and vibrating good read indicators.
- Operates hands-free or handheld.
- Optional stand (sold separately).

### Code Handheld Barcode Reader – Selection Chart

Part Number	Price	Description	Communication Protocol	Corded/Cordless	Form Factor	Weight (lb [kg])	Drawing
<a href="#">CR6022-C500-C298</a>	\$744.00	Code barcode scanner, 6ft [1.83 m] USB cable included.	USB	Corded	Handheld	0.35 [0.16]	<a href="#">PDF</a>
<a href="#">CR6022-C502-C298</a>	\$754.00	Code barcode scanner, 6ft [1.83 m] RS-232 (DB9) cable and power supply included.	RS-232	Corded	Handheld	0.35 [0.16]	<a href="#">PDF</a>

### Code Handheld Barcode Scanners Typical Working Range (in [mm])

Size and Type of Barcode (in [mm])	CR6022-C50x-C298	
	Min	Max
3 mil Code 39	1 [25]	2 [50]
7.5 mil Code 39	0.8 [20]	5.9 [150]
10.5 mil GS1 DataBar	0 [0]	5.9 [150]
5.8 mil PDF417	-	-
6.7 mil PDF417	-	-
13 mil UPC	0.6 [15]	7.9 [200]
4.2 mil Data Matrix	0.6 [15]	1.8 [45]
5 mil Data Matrix	0.6 [15]	2.4 [60]
6.3 mil Data Matrix	0.2 [5]	3 [75]
10 mil Data Matrix	0 [0]	3.9 [100]
20.8 mil Data Matrix	0.4 [10]	7.5 [190]
Low Contrast Data Matrix DPM		
Laser Marks	0 [0]	1.4 [35]
Dot Peen Marks	0 [0]	2.8 [70]

**Note:** Working ranges may vary depending on barcode quality and reading environment. The above numbers are a combination of both the wide and high density fields. All samples were high quality barcodes and were read along a physical center line at a 10 degree angle. Distances are measured from the front of the reader. Default automatic gain control settings were used with regular office lighting. Accuracy = +/- 10%. Test conditions may affect working ranges.

### Code Handheld Barcode Scanners Specifications

	CR6022-C50x-C298
<b>Power Requirements</b>	5VDC (USB versions are powered from the host device) (RS232 versions utilize a 120VAC-to-5VDC power adapter)
<b>Sensor</b>	CMOS 1.2 megapixel monochrome
<b>Operating Temperature</b>	-20 to 55°C [-4 to 131°F]
<b>Storage Temperature</b>	-30 to 65°C [-22 to 150°F]
<b>Humidity</b>	5% to 95% non-condensing
<b>Field Selection</b>	High Density (used for small/dense barcodes) and Wide Field (used for long barcodes)
<b>Field of View</b>	30° horizontal by 33.5° vertical
<b>Focal Point</b>	~50mm [1.97 in]
<b>Optical Resolution</b>	High Density: 960 x 640 Wide Field: 960 x 640
<b>Pitch</b>	± 65° (from front to back) (varies with DPM)
<b>Skew</b>	± 60° from plane parallel to symbol (side to side)
<b>Rotational Tolerance</b>	±180°
<b>Symbol Contrast</b>	15% minimum reflectance difference
<b>Target Beam</b>	Single, blue targeting bar
<b>Ambient Light Immunity</b>	Sunlight: Up to 9,000 ft candles
<b>Shock</b>	Withstands multiple drops of 6ft [1.8 m] to concrete
<b>IP Rating</b>	IP54
<b>Agency Approval</b>	CE



# Code Handheld Barcode Scanners **code**<sup>®</sup>

## CR1500 Advanced Cost-Effective Barcode Scanner



CR1500

The Code Reader™ 1500 (CR1500) is a dual-field barcode reader that is easy to set up and use in a variety of different settings. It is available with either USB or RS-232 communication capabilities. The USB version can connect to the **C-more** HMI. AutomationDirect provides sample code which can be used to connect the reader to Click, BRX, and Productivity PLCs.

### Features

- Dual-field imager enhances readability and processing time.
- High-speed, omnidirectional reading of 1D and 2D barcode symbologies.
- Manual or automatic triggering. Stand (sold separately) is required for automatic triggering.
- User feedback with LED and audible tone.
- All-inclusive kits include reader and cable.
- Reads barcodes on backlit screens such as those found on mobile devices.
- Optional stand (sold separately).

### Code Handheld Barcode Reader – Selection Chart

Part Number	Price	Description	Communication Protocol	Corded/Cordless	Form Factor	Weight (lb [g])	Dimensional Drawing
<a href="#">CR1500-K201-C298</a>	\$242.00	Code barcode scanner, 6ft [1.83 m] USB cable included.	USB	Corded	Handheld	0.26 [116]	<a href="#">PDF</a>
<a href="#">CR1500-K202-C298</a>	\$258.00	Code barcode scanner, 8ft [2.44 m] RS-232 (DB9) cable and power supply included.	RS-232	Corded	Handheld	0.26 [116]	<a href="#">PDF</a>

### Code Handheld Barcode Scanners Typical Working Range (in [mm])

Size and Type of Barcode (in [mm])	CR1500-K20x-C298	
	Min	Max
3 mil Code 39	3.3 [84]	4.2 [107]
7.5 mil Code 39	0.7 [18]	6.6 [167]
10.5 mil GS1 DataBar	0.2 [5]	8.1 [205]
5.8 mil PDF417	–	–
6.7 mil PDF417	–	–
13 mil UPC	0.5 [13]	10.4 [265]
4.2 mil Data Matrix	–	–
5 mil Data Matrix	1.1 [28]	3.9 [100]
6.3 mil Data Matrix	0.7 [18]	5.3 [135]
10 mil Data Matrix	0.2 [5]	6.5 [165]
20.8 mil Data Matrix	0.5 [13]	12.9 [328]

### Code Handheld Barcode Scanners Specifications

	CR1500-K20x-C298
<b>Power Requirements</b>	5VDC (USB versions are powered from the host device) (RS232 versions utilize a 120VAC-to-5VDC power adapter)
<b>Sensor</b>	CMOS 1.2 megapixel monochrome
<b>Operating Temperature</b>	-20 to 55°C [-4 to 131°F]
<b>Storage Temperature</b>	-30 to 65°C [-22 to 150°F]
<b>Humidity</b>	5% to 95% non-condensing
<b>Field Selection</b>	High Density (used for small/dense barcodes) Wide Field (used for long barcodes)
<b>Field of View</b>	High Density: 30° horizontal by 20° vertical Wide Field 50° horizontal by 35.5° vertical
<b>Focal Point</b>	High Density: ~100mm [3.94 in] Wide Field ~115mm [4.53 in]
<b>Optical Resolution</b>	High Density: 960 x 640 Wide Field: 960 x 640
<b>Pitch</b>	± 65° (from front to back)
<b>Skew</b>	± 60° from plane parallel to symbol (side to side)
<b>Rotational Tolerance</b>	±180°
<b>Symbol Contrast</b>	15% minimum reflectance difference
<b>Target Beam</b>	Single, blue targeting bar
<b>Ambient Light Immunity</b>	Sunlight: Up to 9,000 ft candles [96,890 lux]
<b>Shock</b>	Withstands multiple drops of 6ft [1.8 m] to concrete
<b>IP Rating</b>	IP54
<b>Agency Approval</b>	CE

# Code Handheld Barcode Scanners **code**<sup>®</sup>

## CR5210 Advanced Cost-Effective Barcode Scanner



CR5210

The Code Reader™ 5210 (CR5210) is a dual-field barcode reader that is easy to set up and use in a variety of different settings. It is available with either USB or RS-232 communication capabilities. The USB version can connect to the **C-more** HMI. AutomationDirect provides sample code which can be used to connect the reader to Click, BRX, and Productivity PLCs.

### Features

- Dual-field imager enhances readability and processing time.
- High-speed, omnidirectional reading of 1D and 2D barcode symbologies.
- Manual or automatic triggering.
- User feedback with LED and audible tone.
- All-inclusive kits include reader and cable.
- Reads barcodes on backlit screens such as those found on mobile devices.

### Code Handheld Barcode Reader – Selection Chart

Part Number	Price	Description	Communication Protocol	Corded/Cordless	Form Factor	Weight (lb [g])	Dimensional Drawing
<a href="#">CR5210-C500-C298</a>	\$312.00	Code barcode scanner, 6ft [1.83 m] USB cable included.	USB	Corded	Presentation	0.7 [318]	<a href="#">PDF</a>
<a href="#">CR5210-C502-C298</a>	\$346.00	Code barcode scanner, 6ft [1.83 m] RS-232 (DB9) cable and power supply included.	RS-232	Corded	Presentation	0.7 [318]	<a href="#">PDF</a>

### Code Handheld Barcode Scanners Typical Working Range (in [mm])

Size and Type of Barcode (in [mm])	CR5210-C50x-C298	
	Min	Max
3 mil Code 39	-	-
7.5 mil Code 39	0.4 [10]	5.9 [150]
10.5 mil GS1 DataBar	0.4 [10]	6.7 [170]
5.8 mil PDF417	0.6 [15]	4.0 [102]
6.7 mil PDF417	0.4 [10]	4.8 [122]
13 mil UPC	0.4 [10]	8.0 [203]
4.2 mil Data Matrix	-	-
5 mil Data Matrix	1.2 [31]	2.3 [59]
6.3 mil Data Matrix	0.9 [23]	3.5 [89]
10 mil Data Matrix	0.4 [10]	5.7 [146]
20.8 mil Data Matrix	0.4 [10]	8.9 [225]

Note: Working ranges may vary depending on barcode quality and reading environment. The above numbers are a combination of both the wide and high density fields. All samples were high quality barcodes and were read along a physical center line at a 10 degree angle. Distances are measured from the front of the reader. Default automatic gain control settings were used with regular office lighting. Accuracy = +/- 10%. Test conditions may affect working ranges.

### Code Handheld Barcode Scanners Specifications

	CR5210-C50x-C298
<b>Power Requirements</b>	5VDC (USB versions are powered from the host device) (RS232 versions utilize a 120VAC-to-5VDC power adapter)
<b>Sensor</b>	CMOS 1.2 megapixel monochrome
<b>Operating Temperature</b>	-20 to 55°C [-4 to 131°F]
<b>Storage Temperature</b>	-30 to 65°C [-22 to 150°F]
<b>Humidity</b>	5% to 95% non-condensing
<b>Field Selection</b>	Single field
<b>Field of View</b>	51° horizontal by 39.4° vertical
<b>Focal Point</b>	~40mm [1.6 in]
<b>Optical Resolution</b>	1280 x 960
<b>Pitch</b>	± 65° (from front to back)
<b>Skew</b>	± 60° from plane parallel to symbol (side to side)
<b>Rotational Tolerance</b>	±180°
<b>Symbol Contrast</b>	15% minimum reflectance difference
<b>Target Beam</b>	Single, blue targeting bar
<b>Ambient Light Immunity</b>	Sunlight: Up to 9,000 ft candles [96,890 lux]
<b>Shock</b>	Withstands multiple drops of 6ft [1.8 m] to concrete
<b>IP Rating</b>	IP 52
<b>Agency Approval</b>	CE

# Code Handheld Barcode Scanners **code**<sup>®</sup>

## CR2700 Advanced Cordless Barcode Scanner



**CR2701-200-C298**



**CR2702-200-C298**

The Code Reader™ 2700 (CR2700) is a cordless, rechargeable, rugged barcode reader that is easy to set up and use in a variety of different settings. It features Bluetooth-to-USB communication and can connect to the **C-more** HMI.

### Features

- Dual-field imager enhances readability and processing time.
- High-speed, omnidirectional reading of 1D and 2D barcode symbologies.
- Manual or automatic triggering.
- User feedback with LED and audible tone.
- All-inclusive kits include reader and cable.
- Reads barcodes on backlit screens such as those found on mobile devices.

### Code Handheld Barcode Reader – Selection Chart

Part Number	Price	Description	Communication Protocol	Corded/ Cordless	Form Factor	Weight (lb [g])	Dimensional Drawing
<b>CR2701-200-C298</b>	\$750.00	Code barcode scanner (Bluetooth) with removable battery and charging base, 3ft [0.91 m] USB cable included.	Bluetooth to USB	Cordless	Palm	0.29 [131]	<a href="#">PDF</a>
<b>CR2702-200-C298</b>	\$792.00	Code barcode scanner (Bluetooth) with removable battery and charging base, 3ft [0.91 m] USB cable included.	Bluetooth to USB	Cordless	Handheld	0.39 [177]	<a href="#">PDF</a>

### Code Handheld Barcode Scanners Typical Working Range (in [mm])

Size and Type of Barcode (in [mm])	CR270x-200-C298	
	Min	Max
<b>3 mil Code 39</b>	3.5 [90]	4.4 [112]
<b>7.5 mil Code 39</b>	0.9 [23]	6.8 [172]
<b>10.5 mil GS1 DataBar</b>	0.4 [10]	8.3 [210]
<b>5.8 mil PDF417</b>	-	-
<b>6.7 mil PDF417</b>	-	-
<b>13 mil UPC</b>	0.7 [18]	10.6 [270]
<b>4.2 mil Data Matrix</b>	-	-
<b>5 mil Data Matrix</b>	1.3 [33]	4.1 [105]
<b>6.3 mil Data Matrix</b>	0.9 [23]	5.5 [140]
<b>10 mil Data Matrix</b>	0.4 [10]	6.7 [170]
<b>20.8 mil Data Matrix</b>	0.7 [18]	13.1 [333]

**Note:** Working ranges may vary depending on barcode quality and reading environment. The above numbers are a combination of both the wide and high density fields. All samples were high quality barcodes and were read along a physical center line at a 10 degree angle. Distances are measured from the front of the reader. Default automatic gain control settings were used with regular office lighting. Accuracy = +/- 10%. Test conditions may affect working ranges.

### Code Handheld Barcode Scanners Specifications

	CR270x-200-C298
<b>Power Requirements</b>	5VDC, 5W max Powered from the host device
<b>Sensor</b>	CMOS 1.2 megapixel monochrome
<b>Operating Temperature</b>	-20 to 55°C [-4 to 131°F]
<b>Storage Temperature</b>	-30 to 65°C [-22 to 150°F]
<b>Humidity</b>	5% to 95% non-condensing
<b>Field Selection</b>	High Density (used for small/dense barcodes) Wide Field (used for long barcodes)
<b>Field of View</b>	High Density: 30° horizontal by 20° vertical Wide Field 50° horizontal by 33.5° vertical
<b>Focal Point</b>	~100mm [3.94 in]
<b>Optical Resolution</b>	High Density: 960 x 640 Wide Field: 960 x 640
<b>Pitch</b>	± 65° (from front to back)
<b>Skew</b>	± 60° from plane parallel to symbol (side to side)
<b>Rotational Tolerance</b>	±180°
<b>Symbol Contrast</b>	15% minimum reflectance difference
<b>Target Beam</b>	Single, blue targeting bar
<b>Ambient Light Immunity</b>	Sunlight: Up to 9,000 ft candles [96,890 lux]
<b>Shock</b>	Withstands multiple drops of 6ft [1.8 m] to concrete
<b>IP Rating</b>	IP 65
<b>Agency Approval</b>	CE
<b>Number of Scans Per Charge</b>	50,000
<b>Reader Communication</b>	Bluetooth 5 Low Energy (Class II)

# Code Handheld Barcode Scanners



Code Handheld Barcode Scanners Decode Capability							
Decode Capability	CR950	CR1100	CR1500	CR5210	CR270x	CR6022	
<b>1D</b>	BC412	✓	✓	✓	✓	✓	✓
	Codabar	✓	✓	✓	✓	✓	✓
	Code 11	✓	✓	✓	✓	✓	✓
	Code 32	✓	✓	✓	✓	✓	✓
	Code 39	✓	✓	✓	✓	✓	✓
	Code 39 Extended	-	✓	-	-	-	✓
	Code 93	✓	✓	✓	✓	✓	✓
	Code 128	✓	✓	✓	✓	✓	✓
	GS1 Databar	✓	✓	✓	✓	✓	✓
	Hong Kong 2 of 5	✓	✓	✓	✓	✓	✓
	IATA 2 of 5	✓	✓	✓	✓	✓	✓
	Interleaved 2 of 5	✓	✓	✓	✓	✓	✓
	Matrix 2 of 5	✓	✓	✓	✓	✓	✓
	MSI Plessey	✓	✓	✓	✓	✓	✓
	NEC 2 of 5	✓	✓	✓	✓	✓	✓
	Pharmacode	-	✓	✓	✓	✓	✓
	Straight 2 of 5	✓	✓	✓	✓	✓	✓
	Telepen	✓	✓	✓	✓	✓	✓
	Trioptic	✓	✓	✓	✓	✓	✓
	UK Plessey	✓	✓	✓	✓	✓	✓
UPC/EAN/JAN	✓	✓	✓	✓	✓	✓	
<b>Stacked 1D</b>	Codablock F	-	✓	✓	✓	✓	✓
	Code 49	-	✓	✓	✓	✓	✓
	GS1 Composite (CC-A/CC-B/CC-C)	✓	✓	✓	✓	✓	✓
	GS1 DataBar Expanded Stack	✓	✓	-	-	-	✓
	MicroPDF	✓	✓	✓	✓	✓	✓
	PDF417	✓	✓	✓	✓	✓	✓
<b>2D</b>	Aztec Code	✓	✓	✓	✓	✓	✓
	Data Matrix	✓	✓	✓	✓	✓	✓
	Grid Matrix	-	✓	✓	✓	✓	✓
	HanXin	-	✓	✓	✓	✓	✓
	Maxicode	-	✓	✓	✓	✓	✓
	Micro QR Code	✓	✓	✓	✓	✓	✓
	QR Code	✓	✓	✓	✓	✓	✓
	QR Model 1	-	✓	✓	✓	✓	✓
<b>Postal Codes</b>	Australian Post	-	✓	✓	✓	✓	✓
	Canada Post	-	✓	✓	✓	✓	✓
	Japan Post	-	✓	✓	✓	✓	✓
	KIX Code	-	✓	✓	✓	✓	✓
	Korea Poast	-	✓	✓	✓	✓	✓
	UK Royal Mail	-	✓	✓	✓	✓	✓
	UPU ID Tags	-	✓	✓	✓	✓	✓
	USPS Intelligent Mail	-	✓	✓	✓	✓	✓
	USPS Planet	-	✓	✓	✓	✓	✓
USPS Post-net	-	✓	✓	✓	✓	✓	



# Code Handheld Barcode Scanners



Code Handheld Barcode Reader Accessories				
Part Number	Price	Description	Weight (lb [kg])	Drawing
<a href="#"><u>CRA-C503-C298</u></a>	\$38.50	8ft coiled RS232 cable with power supply	0.40 [0.18]	N/A
<a href="#"><u>CRA-A274-P1-C298</u></a>	\$108.00	Quad bay battery charger	0.67 [0.30]	N/A
<a href="#"><u>CRA-B27DK-C298</u></a>	\$75.00	Battery for CR270x	0.10 [0.05]	N/A
<a href="#"><u>CRA-C34-C298</u></a>	\$15.00	3ft straight USB cable (USB-A to micro USB)	0.09 [0.04]	N/A
<a href="#"><u>CRA-C500-C298</u></a>	\$14.50	6ft straight USB cable	0.15 [0.07]	N/A
<a href="#"><u>CRA-C501-C298</u></a>	\$14.50	8ft coiled RS232 cable	0.35 [0.16]	N/A
<a href="#"><u>CRA-C502-C298</u></a>	\$14.50	6ft straight RS232 cable	0.20 [0.09]	N/A
<a href="#"><u>CRA-C508-C298</u></a>	\$14.50	8ft coiled USB cable	0.25 [0.11]	N/A
<a href="#"><u>CRA-C519-C298</u></a>	\$14.50	6ft straight DB9-RJ12 RS232 cable	0.20 [0.09]	N/A
<a href="#"><u>CRA-US3-C298</u></a>	\$26.00	Flexible stand for CR950, CR1100 in dark gray	0.85 [0.39]	<a href="#"><u>PDF</u></a>
<a href="#"><u>CRA-US4-C298</u></a>	\$38.50	Flexible stand for CR6022 in dark gray	0.85 [0.39]	<a href="#"><u>PDF</u></a>
<a href="#"><u>CRA-US9-C298</u></a>	\$17.50	Rigid stand for CR950, CR1100 in dark gray	0.20 [0.09]	<a href="#"><u>PDF</u></a>
<a href="#"><u>CR2AG-P1-C298</u></a>	\$26.00	Power supply for RS232 readers	0.10 [0.05]	N/A

## RS232 Accessories



[CRA-C501-C298](#)



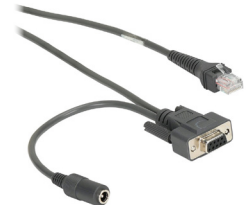
[CRA-C502-C298](#)



[CR2AG-P1-C298](#)



[CRA-C519-C298](#)



[CRA-C503-C298](#)

## USB Cables



[CRA-C500-C298](#)



[CRA-C508-C298](#)



[CRA-C34-C298](#)

## Stands



[CRA-US4-C298](#)



[CRA-US3-C298](#)



[CRA-US9-C298](#)

## Battery and Charger



[CRA-B27DK-C298](#)



[CRA-A274-P1-C298](#)

# Code Handheld Barcode Scanners

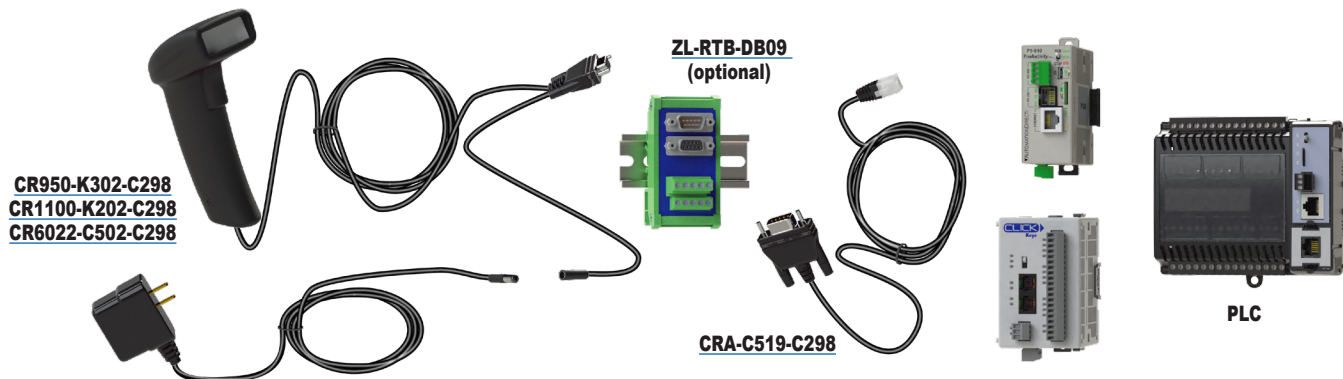


Compatibility						
Scanner	C-more EA7*	C-more EA9	C-more CM5	Productivity PLC	CLICK PLC	BRX PLC
<a href="#">CR950-K301-C298</a>	Yes	Yes	Yes	No	No	No
<a href="#">CR950-K302-C298</a>	No	No	No	Yes	Yes	Yes
<a href="#">CR1100-K201-C298</a>	Yes	Yes	Yes	No	No	No
<a href="#">CR1100-K202-C298</a>	No	No	No	Yes	Yes	Yes
<a href="#">CR1500-K201-C298</a>	Yes	No	Yes	No	No	No
<a href="#">CR1500-K202-C298</a>	No	No	No	Yes	Yes	Yes
<a href="#">CR5210-C502-C298</a>	No	No	No	Yes	Yes	Yes
<a href="#">CR5210-C500-C298</a>	Yes	Yes	Yes	No	No	No
<a href="#">CR2701-200-C298</a>	Yes**	Yes**	Yes**	No	No	No
<a href="#">CR2702-200-C298</a>	Yes**	Yes**	Yes**	No	No	No
<a href="#">CR6022-C500-C298</a>	Yes	No	No	No	No	No
<a href="#">CR6022-C502-C298</a>	No	No	No	Yes	Yes	Yes

\* Please note that the C-more EA7 is no longer in active production.

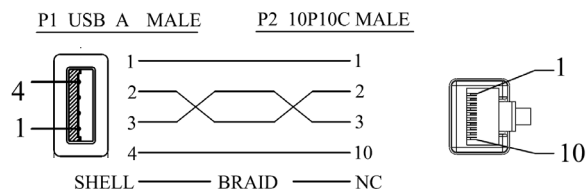
\*\* Please note that although the CR270x will work with the HMI, the HMI will not provide enough current to charge the scanner. However, the scanner battery can always be charged using an external charger such as the [CRA-A274-P1-C298 quad bay battery charger](#).

## System Assembly Options

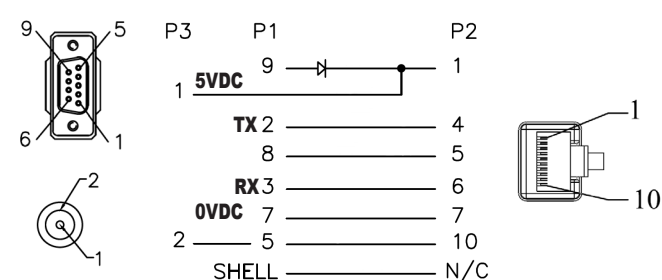


## Connection Diagrams

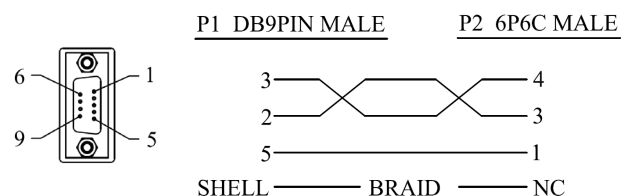
### USB Connections (CRA-C500-C298, CRA-C508-C298)



### RS232 Connections (CRA-C501-C298, CRA-C502-C298)



### DB9 to RJ12 (CRA-C519-C298)



# Datalogic Rugged Handheld Barcode Scanners



## Advanced, cost-effective barcode readers

The Datalogic PowerScan family of barcode readers represents the ultimate in industrial handheld scanners, designed and constructed to withstand the toughest environmental conditions. They are designed to enhance productivity and efficiency through best-in-class scanning performance and reduced total solution cost.



**PM9600-SR910RBK10**

## Features

- Ultra-robust construction – designed to resist more than 50 drops of 8.2 ft [2.5 m].
- Center-of-gravity design for reduced fatigue of the operator's wrist
- Ergonomic shape
- USB and RS-232 multi-interface
- Easy system integration
- Inductive charging eliminates physical problems with battery contacts and pins.
- Built-in white light illumination
- Image resolution of 1280x800 pixels
- Large field of view – 38 degrees horizontal by 24 degrees vertical

Datalogic Rugged Barcode Handheld Scanners Kits					
Part Number	Price	Communication Type	Connection	Includes	Drawing
<a href="#"><u>PM9600-SR910RBK10</u></a>	\$871.00	RF (910MHz)	USB	Scanner with removable battery, base station, USB cable, power brick and power cord	<a href="#"><u>PDF</u></a>
<a href="#"><u>PM9600-SR910RBK20</u></a>	\$871.00	RF (910MHz)	RS-232	Scanner with removable battery, base station, RS-232 cable, power brick and power cord	<a href="#"><u>PDF</u></a>
<a href="#"><u>PBT9600-SRRBK20US</u></a>	\$871.00	Bluetooth	RS-232	Scanner with removable battery, base station, RS-232 cable, power brick and power cord	<a href="#"><u>PDF</u></a>
<a href="#"><u>PBT9600-SRRBK10US</u></a>	\$871.00	Bluetooth	USB	Scanner with removable battery, base station, USB cable, power brick and power cord	<a href="#"><u>PDF</u></a>

Datalogic Rugged Barcode Handheld Scanners and Base Stations					
Part Number	Price	Item	Communication Type	Includes	Drawing
<a href="#"><u>PBT9600-SRRB</u></a>	\$584.00	Barcode scanner	Bluetooth	Scanner with removable battery	<a href="#"><u>PDF</u></a>
<a href="#"><u>PM9600-SR910RB</u></a>	\$584.00	Barcode scanner	RF (910MHz)	Scanner with removable battery	<a href="#"><u>PDF</u></a>
<a href="#"><u>BC9630-BT</u></a>	\$381.00	Base station	Bluetooth	Base Station (USB and RS-232 compatible)	<a href="#"><u>PDF</u></a>
<a href="#"><u>BC9630-910</u></a>	\$363.00	Base station	RF (910MHz)	Base Station (USB and RS-232 compatible)	<a href="#"><u>PDF</u></a>



**PBT9600-SRRB**



**BC9630-BT**

# Datalogic Rugged Handheld Barcode Scanners



## Datalogic Rugged Barcode Handheld Scanners Specifications

<b>Wireless Communications</b>	
<b>PowerScan PM9600</b>	
<b>Radio Frequency</b>	910MHz
<b>Effective Radiated Power</b>	<50mW
<b>Configuration</b>	Point-to-point / multipoint
<b>Max Readers Per Radio Receiver</b>	16
<b>Radio Range (Open Air)</b>	230m [754ft]
<b>PowerScan PBT9600 (Bluetooth Wireless Technology)</b>	
<b>Radio Frequency</b>	2.4 GHz
<b>Profiles</b>	SSP (Serial Port Profile) and HID (Human Interface Device)
<b>Protocol</b>	Bluetooth 5.0 Certified Class 1, Class 2, Class 3
<b>Radio Range (Open Air)</b>	100m [328ft] Range distances are measured using the base station. Range with connection to other Bluetooth peripherals may vary.
<b>Security</b>	Data encryption, scanner authentication
<b>Decoding Capability</b>	
<b>1D / Linear Codes</b>	Auto discriminates all standard 1D codes including GS1 DataBar™ linear codes
<b>2D Codes</b>	Aztec Code; China Han Xin Code; Data Matrix; MaxiCode; Micro QR Code; QR Code; Dot Code
<b>Postal Codes</b>	Australian Post; British Post; China Post; IMP; Japanese Post, KIX Post; Planet Code, Postnet; Royal Mail Code (RMM4SCC)
<b>Stacked Codes</b>	EAN/JAN Composites; GS1 DataBar Composites; GS1 DataBar Expanded Stacked; GS1 DataBar Stacked; GS1 DataBar Stacked Omnidirectional; MacroPDF; MicroPDF417; PDF417; UPC A/E Composites
<b>Electrical</b>	
<b>Current</b>	Operating 480mA @ 3.7 V Charging (typical) < 15W Cradle BC96xx only: 150mA @ 5V (operative)
<b>Input Voltage</b>	Host powered: 5VDC ±5% External power supply: 10-30 VDC ±5%
<b>Battery</b>	Battery type: Lithium-Ion, 3350mAh Charge time @ 12VDC: 2.5 hours to charge up to 95%, 3.2 hours to charge 100% Reads per charge: 80,000
<b>Environmental</b>	
<b>Ambient Light</b>	0-100,000 lux
<b>Drop Resistance</b>	Withstands 50 drops from 2.5 m [8.2 ft] @ 20°C [68°F] Withstands 50 drops from 2.0 m [6.6 ft] @ -20°C [-4°F]
<b>Trigger Resistance</b>	Withstands 10 million hits
<b>ESD Protection (Air Discharge)</b>	20kV
<b>Humidity Non-Condensing)</b>	0 to 95%
<b>Particulate and Water Sealing</b>	Handheld unit: IP67 and IP65 Cradle unit: IP40
<b>Temperature</b>	Operating: -20 to 50°C [-4 to 122°F] Storage/Transport: -40 to 70°C [-40 to 158°F] Charging: 0 to 40°C [32 to 104°F] Ideal: 0 to 35°C [32 to 95°F]
<b>Interfaces</b>	
<b>Interfaces</b>	RS-232 / USB / Ethernet and Industrial Protocols



# Datalogic Rugged Handheld Barcode Scanners



<b>Datalogic Rugged Barcode Handheld Scanners Specifications (continued)</b>	
<b>Physical Characteristics</b>	
<b>Weight</b>	Handheld portion: 425g [15.0 oz]
<b>Reading Performance</b>	
<b>Imager Sensor</b>	1280 x 800 pixels
<b>Light Source</b>	Aiming: 630-680 nm VLD Illumination: White LED reading light
<b>Print Contrast Ratio (Minimum)</b>	15%
<b>Reading Angle</b>	Pitch: $\pm 52^\circ$ Roll (tilt): $360^\circ$ Skew (yaw): $\pm 52^\circ$
<b>Field of View</b>	38° H, 24° V
<b>Reading Indicators</b>	Beeper (adjustable tone and volume) Datalogic's 3GL™ (Three Green Lights) technology for good-read feedback Datalogic "Green Spot" Dual good-read LEDs Vibration
<b>Resolution (Maximum)</b>	1D codes: 3 mil, 2D codes: 6 mil
<b>Reading Ranges</b>	
<b>SR Models</b>	Code 128 5 mils: 6.4 to 30.9 cm [2.5 to 12.2 in] 20 mils: 4 to 103.7 cm [1.6 to 40.8 in] 40 mils: 5.5 to 175 cm [2.2 to 68.9 in] EAN/UPC 13 mils: 4 to 67.5 cm [1.5 to 26.5 in] DataMatrix 10 mils: 6 to 30 cm [2.5 to 11.8 in]
<b>Safety and Regulatory</b>	
<b>Laser Classification</b>	Caution: Laser radiation Do not stare into beam CDRH Class II; IEC 60825 Class 2
<b>LED Classification</b>	IEC 62471 LED Class: Exempt
<b>Warranty</b>	
<b>Warranty</b>	3-year factory warranty

# Datalogic Rugged Handheld Barcode Scanners Accessories



## Communication Cables

Datalogic Rugged Barcode Handheld Scanners Accessories – Communication Cables					
Part Number	Price	Cable Type	Connection 1	Connection 2	Cable Length
<a href="#"><u>CAB-549</u></a>	\$43.00	Coiled	RJ50	9-pin female D-sub	8ft [2.43 m]
<a href="#"><u>CAB-548</u></a>	\$36.00	Straight	RJ50	9-pin female D-sub	5ft [1.52 m]
<a href="#"><u>CAB-551</u></a>	\$36.00	Straight	RJ50	USB-A	6.5 ft [2m]



[CAB-549](#)



[CAB-548](#)



[CAB-551](#)

## Battery

Datalogic Rugged Barcode Handheld Scanners Accessories – Battery			
Part Number	Price	Item	Battery Power
<a href="#"><u>RBP-PM96</u></a>	\$60.00	Replacement Battery	11.9 Wh



[RBP-PM96](#)

## Power Cables

Datalogic Rugged Barcode Handheld Scanners Accessories – Power Cables					
Part Number	Price	Item	Voltage	Voltage Type	Fits
<a href="#"><u>8-0935</u></a>	\$24.00	US power cable	12VDC	AC/DC	PowerScan 960X Series base stations BC9630-BT and BC9630-910
<a href="#"><u>6003-0941</u></a>	\$7.00	US power cable	110VAC	AC	Datalogic power supply 8-0935



[8-0935](#)



[6003-0941](#)

## Mount

Datalogic Rugged Barcode Handheld Scanners Accessories – Vehicle Mount		
Part Number	Price	Item
<a href="#"><u>VMK-P096</u></a>	\$118.00	Vehicle mount



[VMK-P096](#)



**VMK-P096 bracket, shown here with base station and scanner, mounted to a fork truck, lift truck or other machine column.**

# Datalogic Smart-VS Vision Sensor



959971320

The Smart-VS is a smart vision sensor. It can be set up as easily as a basic photoelectric sensor but provides enhanced functionality. This self-contained vision sensor provides an elegant solution for applications requiring presence and/or orientation object detection. The Smart-VS is built around a powerful multiprocessor platform featuring embedded artificial intelligence technology. The user can step through the simple teach procedure to obtain a GOOD or NO-GOOD (pass or fail) result.

## Features

- Machine learning assisted setting
- No vision tools programming experience required
- No inspection threshold adjustment
- Fast and easy set-up
- Deterministic response time 50ms
- Reduced cost of ownership and maintenance
- TEACH button and comprehensive UI with 5 status LEDs
- Electronic focus control
- 50-150 mm operating distance
- Bright and highly visible red LED pointer
- Built-in white polarized light illuminator
- Green/red LED spot for GOOD/NO GOOD part
- Ethernet point-to-point communication available for configuration
- Easy and intuitive WEB server GUI for maintenance and job setting
- Easy photosensor-style output interface
- Cable exit connections can be rotated to accommodate a variety of installation configurations.

## Applications

- Processing and packaging machinery
- Transport and handling lines
- Assembly lines
- Food and beverage
- Bottling lines
- Machines for the cosmetic and pharmaceutical sectors

## Agency Approvals

- CE and CSA

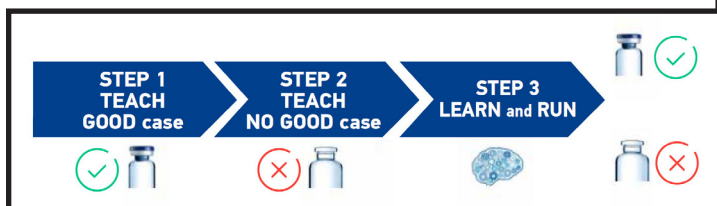


Datalogic Smart-VS Smart Vision Sensor Selection Guide						
Part Number	Price	Operating Distance	Resolution	Illuminator	I/O	Drawing
959971320	\$879.00	50 to 150 mm [1.97 to 5.91 in]	320 x 240	Polarized white LED	2 inputs and 3 outputs	<a href="#">PDF</a>

## The Smart-VS System

The Smart-VS system teaches the sensor GOOD and NO GOOD object conditions. This allows the Smart-VS system to be used in an effective and reliable way for detecting the presence/absence of object features for side orientation of objects, referring to proper object attributes.

This makes the sensor setting independent of the type, material, or color of the object that needs to be detected.



Application name	Solved cases (OK / NOT OK)
Check label presence	OK:  NOT OK:
Cap orientation	OK:  NOT OK:
Cap presence	OK:  NOT OK:
Check printing on label	OK:  NOT OK:

# Datalogic Smart-VS Vision Sensor



## Datalogic Smart-VS Smart Vision Sensor Specifications

Supply Voltage	10 to 30 VDC
Communication Interface (Ethernet) <sup>1</sup>	10/100 Mbit/s
Inputs	Opto-coupled and polarity insensitive
Maximum Voltage	30VDC
Maximum Input Current Consumption	0.4 to 0.14 A (4.2 W)
Output Type	Push-pull, NPN or PNP. Short circuit protected. Default is push-pull.
Outputs	3 outputs (DATA VALID, GOOD, NO GOOD)
$V_{out}$ ( $I_{load} = 0mA$ ) Maximum	30VDC
$V_{out}$ ( $I_{load} = 100mA$ ) Maximum	3VDC
$I_{load}$ Maximum	100mA
Operating Distance	50 to 150 mm [1.97 to 5.91 in]
View Angle	19°
Field Of View Area @ 50 mm	22mm (H) x 16mm (V) [0.87 in (H) x 0.63 in (V)] (Refer to field of view diagram below)
Field Of View Area @ 150 mm	55mm (H) x 41mm (V) [2.17 in (H) x 1.61 in (V)] (Refer to field of view diagram below)
Response Time	50ms from input trigger
Maximum Reference Images (GOOD+NO GOOD)	6 images
Maximum Inspection Rate	20 per second
Active Area Resolution	320x240 pixels
Illuminator	White LED polarized
Weight	173g [6.1 oz]
Material	Aluminum with plastic PMMA protective window
Operating Temperature <sup>2</sup>	-10° to 50°C [14° to 122°F]
Storage Temperature	-20° to 70°C [-4° to 158°F]
Maximum Humidity	90% non-condensing
Vibration Resistance	14mm [0.55 in] @ 2 to 10 Hz; 1.5 mm [0.06 in] @ 13 to 55 Hz; 2 g @ 70 to 500 Hz (2 hours on each axis)
Shock Resistance	30g; 11ms; 3 shocks on each axis
Protection Class <sup>3</sup>	IP65 and IP67
Agency Approvals	CE, CSA

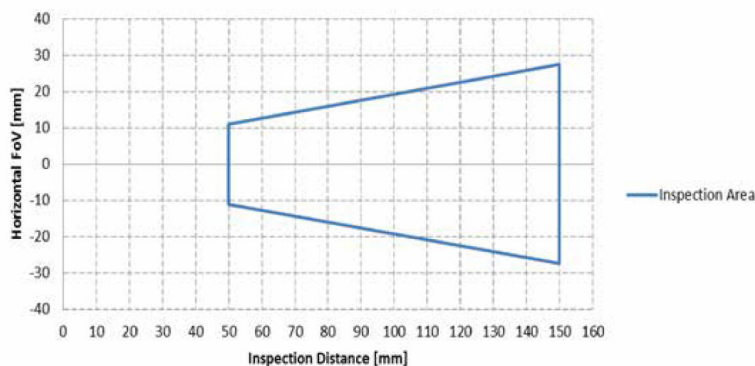
1) The embedded Ethernet interface is intended for configuration only through connection to the device IP. Point-to-point connection is recommended. The IP address is factory set to 192.168.3.100.

2) High ambient temperature applications should use metal mounting bracket for heat dissipation.

3) When correctly connected (fully tightened) to IP67 cables with seals.

## Field of View Diagram

Smart-VS Inspection Area

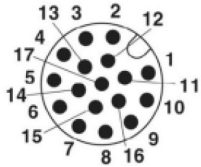




# Datalogic Smart-VS Vision Sensor

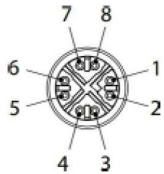


## Connections



M12 17-Pin Power and I/O Connector Pinout			
Pin	Name	Color*	Function
1	Vdc	Brown	Power supply input voltage +
2	GND	Blue	Power supply input voltage -
<b>Connector Case</b>	Chassis	-	Connector case provides electrical connection to chassis
6	I1A	Yellow	I1A Trigger Input A (polarity insensitive)
5	I1B	Pink	I1B Trigger Input B (polarity insensitive)
13	I2A	Green	I2A Remote Teach A (polarity insensitive)
3	I2B	White	I2B Remote Teach B (polarity insensitive)
9	O1	Red	Data Valid (default is push-pull)
8	O2	Gray	GOOD Output (default is push-pull)
16	O3	Black	NO GOOD Output (default is push-pull)

\* The wire colors refer to cables part numbers [CAB-GD03](#) and [CAB-GD05](#)



M12 8-Pin Standard Ethernet Network Connector Pinout		
Pin	Name	Function
1	TX+	Transmit data (positive pin)
2	TX-	Transmit data (negative pin)
3	RX+	Receive data (positive pin)
4	RX-	Receive data (negative pin)
5	NC	Not connected
6	NC	Not connected
7	NC	Not connected
8	NC	Not connected

# Datalogic Smart-VS Vision Sensor Mounting Bracket



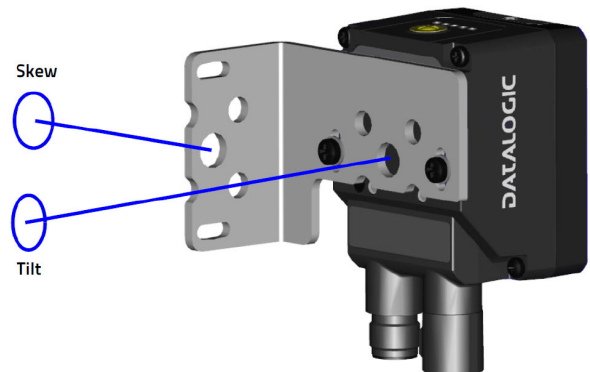
Datalogic Smart-VS Smart Vision Sensor Mounting Bracket Selection Guide			
Part Number	Price	Description	Drawing
<a href="#">BK-22-000</a>	\$36.50	Replacement mounting bracket, stainless steel	<a href="#">PDF</a>



**BK-22-000**

## Mounting and Positioning the Smart-VS Vision Sensor

Smart-VS mounting brackets are fabricated with slots which allow for easy rotation. This permits precise setting of skew and tilt. When using Smart-VS mounting brackets, you have the ability to rotate the sensor on two axes, as shown in the accompanying diagrams.



## Smart-VS Vision Sensor Mounting Options

The Smart-VS Vision Sensor can be attached to the mounting bracket in several ways. Cable exit connections can be rotated to accommodate a variety of installation configurations.



Side mounting with vertical cable exit



Top mounting with vertical cable exit  
(Horizontal cable exit is also possible)



Side mounting with horizontal cable exit

# Datalogic X-Coded Ethernet Cables



Datalogic X-Coded Ethernet Cables Selection Guide		
Part Number	Price	
<a href="#"><u>CAB-ETH-X-M01</u></a>	\$92.00	Datalogic cable, Ethernet, PVC jacket, shielded, 1m [3.28 ft] cable length, M12 8-pin male X-coded to RJ45
<a href="#"><u>CAB-ETH-X-M03</u></a>	\$101.00	Datalogic cable, Ethernet, PVC jacket, shielded, 3m [9.84 ft] cable length, M12 8-pin male X-coded to RJ45
<a href="#"><u>CAB-ETH-X-M05</u></a>	\$122.00	Datalogic cable, Ethernet, PVC jacket, shielded, 5m [16.40 ft] cable length, M12 8-pin male X-coded to RJ45

Note: Ethernet cable jacket color may vary.



[CAB-ETH-X-M01](#)

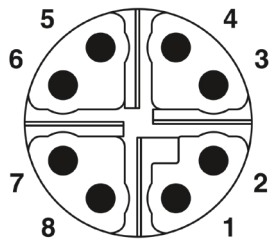


[CAB-ETH-X-M03](#)

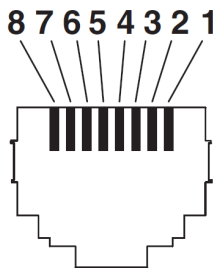


[CAB-ETH-X-M05](#)

## Diagrams



Pin assignment M12 male connector, 8-pin, X-coded, male side



Connector pin assignment plug RJ45

# Datalogic 17-Pin M12 Cables



## Datalogic 17-Pin M12 Cables Selection Guide

Part Number	Price	
<b>CAB-GD03</b>	\$50.00	Datalogic cable, M12 axial female to pigtail, 17-pin, PVC, 9.8 ft [3m] cable length.
<b>CAB-GD05</b>	\$67.00	Datalogic cable, M12 axial female to pigtail, 17-pin, PVC, 16.4 ft [5m] cable length.

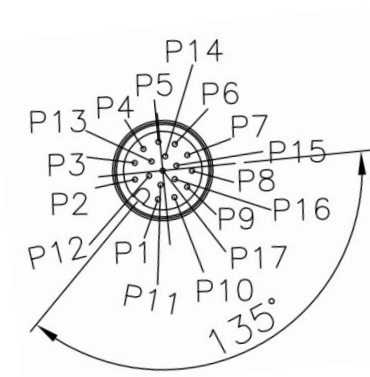


**CAB-GD03**



**CAB-GD05**

### Diagrams



### Wire Run List

AWG	CONN 1	Color
26	1	Brown
	2	Blue
	3	White
	4	Not connected
	5	Pink
	6	Yellow
	7	Not connected
	8	Gray
	9	Red
	10	Not connected
	11	Not connected
	12	Not connected
	13	Green
	14	Not connected
	15	Not connected
	16	Black
	17	Not connected

# ifm efector Machine Mount 1D/2D Barcode Scanner



**O2I500**

The ifm efector machine mount 1D/2D barcode scanner provides simple, capable, and reliable image-based barcode reading. The O2I barcode reader is fully self-contained, including the imager, evaluation unit, illumination, and outputs. The evaluation algorithm provides 4x higher resolution for reliable reading results, 10x faster evaluation for high-speed applications, and 10x faster setup to optimize production availability.

## Features

- Convenient autofocus
- Alignment laser
- Four built-in lights (two non-polarized and two polarized)
- Two configurable outputs
- Onboard logic engine
- IP65
- Local device backup and cloning
- Optical Character Recognition (OCR)

## Applications

- Barcode presence
- Barcode placement
- Barcode quality
- Identification and verification of text (via OCR)

ifm efector Machine Mount 1D/2D Barcode Scanner Selection Guide							
Part Number	Price	Scanner Capability	Lens Type	Light Emission	Port Protocols	Lens Material	Dimensional Drawing
<a href="#">O2I500</a>	\$1,436.00	1D and 2D	Standard	Visible red	TCP/IP and EtherNet/IP	Gorilla glass	<a href="#">PDF</a>
<a href="#">O2I501</a>	\$1,436.00			Infrared			<a href="#">PDF</a>
<a href="#">O2I502</a>	\$1,436.00		Wide angle	Visible red			<a href="#">PDF</a>
<a href="#">O2I503</a>	\$1,436.00			Infrared			<a href="#">PDF</a>

## One-Button Teach Configuration

Simple applications for the O2I can be programmed by the single touch button located on the back of the O2I device.

Trigger and network settings are configured via a data matrix code generated by a smartphone app (iOS and Android).



Android QR Code



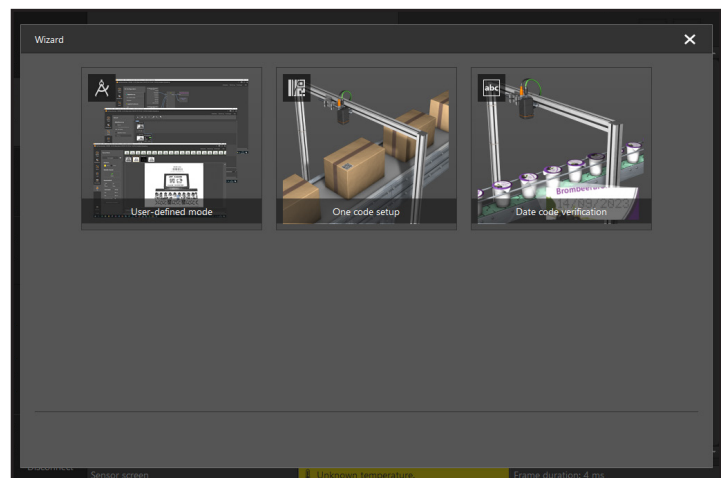
iOS QR Code



**O2I500 rear view showing touch button and LEDs.**

## Full-Featured Vision Assistant Configuration

ifm's free Vision Assistant configuration software has easy-to-use wizards to read a single code or to do date code verification via Optical Character Recognition (OCR). The software also allows the user to define the parameters for each specific application. The camera also has built-in logic to simplify the integration of the camera into the system.





# ifm efector Machine Mount 1D/2D Barcode Scanner

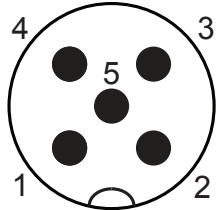


ifm efector Machine Mount 1D/2D Barcode Scanners Technical Specifications					
<b>Product Characteristics</b>					
<b>Image Resolution</b>	(pixels)	1280 x 960			
<b>Maximum Reading Rate</b>	(Hz)	40			
<b>Electrical Data</b>					
<b>Operating Voltage</b>	(V)	18-30 VDC			
<b>Current Consumption</b>	(mA)	<400 @ 24VDC			
<b>Reverse Polarity Protection</b>		Yes			
<b>Wavelength</b>	(nm)	Red: 617 (O2I500 and O2I502) Infrared: 850 (O2I501 and O2I503)			
<b>Image Sensor</b>		CMOS image sensor (black/white)			
<b>Inputs</b>					
<b>Trigger</b>		External: 24V PNP/NPN (IEC 61131-2 Type 3) TCP/IP EtherNet/IP Continuous			
<b>Outputs</b>					
<b>Number of Digital Outputs</b>		2 (configurable)			
<b>Output Function</b>		24V PNP/NPN			
<b>Maximum Current Load Per Output</b>	(mA)	100			
<b>Monitoring Range</b>					
<b>Field of View</b>	(mm [in])	For Standard Lens (O2I500 and O2I501)		For Wide-Angle Lens (O2I502 and O2I503)	
		Operating Distance:	Field of View:	Operating Distance:	Field of View:
		85 [3.35]	28 x 21 [1.10 x 0.83]	35 [1.38]	25 x 19 [0.98 x 0.75]
		300 [11.81]	92 x 69 [3.62 x 2.72]	300 [11.81]	184 x 138 [7.24 x 5.43]
		500 [19.69]	152 x 114 [5.98 x 4.49]	500 [19.69]	304 x 228 [11.97 x 8.98]
		1000 [39.37]	302 x 227 [11.89 x 8.94]	1000 [39.37]	604 x 453 [23.78 x 17.83]
<b>Operating Distance</b>	(mm)	>85 [3.35]		>35 [1.38]	
<b>Image Resolution</b>	(pixels)	1280 x 960			
<b>Autofocus Type</b>		Mechanical autofocus			
<b>Readable Codes</b>		1D: Interleaved 2-of-5; Industrial 2-of-5; Code 39; Code 93; Code 128; Pharmacode; Codabar; EAN8; EAN8 Add-On 2; EAN8 Add-On 5; EAN13; EAN13 Add-On 2; EAN13 Add-On 5; UPC-A; UPC-A Add-On 2; UPC-A Add-On 5; UPC-E; UPC-E Add-On 2; UPC-E Add-On 5; GS1 DataBar Omnidirectional; GS1 DataBar Truncated 2D: GS1 DataBar Stacked; GS1 DataBar Stacked Omnidirectional; GS1 DataBar Limited; GS1 DataBar Expanded; GS1 DataBar Expanded Stacked; GS1-128; MSI Barcode; Datamatrix (ECC200); PDF-417; QR; Micro-QR; Aztec Code; GS1 ECC200; GS1 QR Code; GS1 Aztec Code			
<b>Maximum Inclination to the Image Plane</b>	(°)	45			
<b>Interfaces</b>					
<b>Communication Interface</b>		Ethernet			
<b>Transmission Standard</b>		10Base-T; 100Base-TX			
<b>Transmission Rate</b>		10 MBit/s; 100 MBit/s			
<b>Protocol</b>		TCP/IP; EtherNet/IP			
<b>Factory Settings</b>		IP address: 192.168.0.69 Subnet mask: 255.255.255.0 (Class C) Gateway IP address: 192.168.0.201			
<b>Operating Conditions</b>					
<b>Ambient Temperature</b>		-10 to 50°C [14 to 122°F]			
<b>Storage Temperature</b>		-40 to 70°C [-40 to 150°F]			
<b>IP Rating</b>		IP65			
<b>Tests/Approvals</b>					
<b>Notes on Laser Protection</b>		Caution: Laser light, laser class: 1			
<b>Mechanical Data</b>					
<b>Weight</b>	(g [lb])	601 [1.32]			
<b>Material</b>		Housing: Diecast zinc powder coated; Front lens: Gorillaglas; LED window: PC; Pushbuttons: POM			

# ifm efector Machine Mount 1D/2D Barcode Scanner

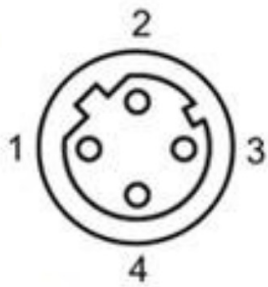


## Electrical Connections – Supply



M12 5-Pin Male Connector	
1	+24VDC
2	Trigger input+
3	0V-
4	Switching output 1, configurable
5	Switching output 2, configurable/ trigger output with external illumination

## Electrical Connections – Ethernet



M12 4-Pin Male (D-coded Ethernet)	
1	TxD+, transmit data +
2	RxD+, receive data +
3	TxD-, transmit data -
4	RxD-, receive data -

## Accessories

O2I Accessories Selection Guide			
Part Number	Price	Description	Drawing
<a href="#">E2D500</a>	\$34.00	Right-angle bracket for 12mm rod	<a href="#">PDF</a>



**E2D500**



**E21112**

316L Stainless Steel Rod Selection Guide				
Part Number	Price	Diameter (mm [in])	Length (mm [in])	Drawing
<a href="#">E21112</a>	\$14.50	12 [0.5]	200 [7.9]	<a href="#">PDF</a>
<a href="#">E21113</a>	\$16.50	12 [0.5]	300 [11.8]	<a href="#">PDF</a>

# ifm efector Machine Vision 2D Camera



**O2D500**

The ifm efector 2D machine vision sensor provides simple, capable and reliable image-based detection. Whether contour detection or BLOB analysis, the O2D family of vision sensors excels at solving most error-proofing and inspection applications throughout the manufacturing plant for a fraction of the cost of other vision systems and sensors.

## Features

- Convenient autofocus
- Four built-in lights (two non-polarized and two polarized)
- Up to five configurable outputs
- Onboard logic engine
- IP65
- Anchor tracking
- Multi-image analysis at various exposure rates
- Contour and BLOB detection
- Imager resolution: 1.2MP

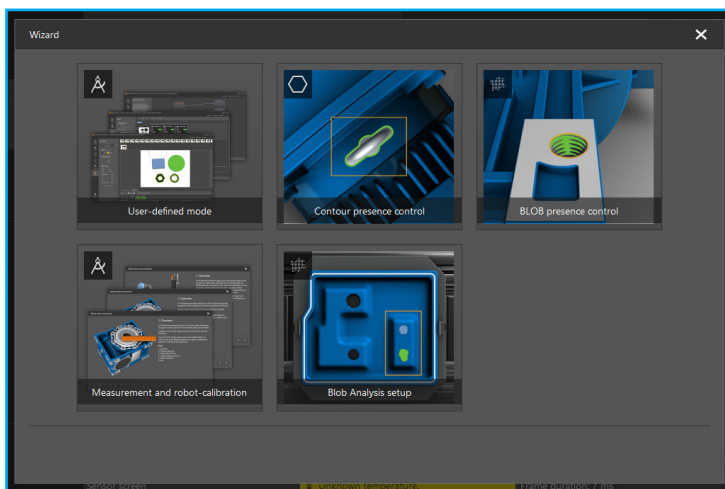
## Applications

- Metal injection molding quality
- Bottle filling operation quality
- Packaging box quality
- Filter quality
- Tapped hole detection

ifm efector Machine Vision 2D Camera Selection Guide						
Part Number	Price	Lens Type	Light Emission	Port Protocols	Lens Material	Dimensional Drawing
<a href="#"><u>O2D500</u></a>	\$1,436.00	Standard	RGBW (red/green/blue/white)	TCP/IP and EtherNet/IP	Gorilla glass	<a href="#"><u>PDF</u></a>
<a href="#"><u>O2D520</u></a>	\$1,436.00		Infrared			<a href="#"><u>PDF</u></a>
<a href="#"><u>O2D502</u></a>	\$1,436.00	Wide angle	RGBW (red/green/blue/white)			<a href="#"><u>PDF</u></a>
<a href="#"><u>O2D522</u></a>	\$1,436.00		Infrared			<a href="#"><u>PDF</u></a>

## Full-Featured Vision Assistant Configuration

The free ifm Vision Assistant configuration software contains several tools to make integration more seamless. The tools in the library include pattern, form, object, location, measurement, diameter, and roundness, just to name a few. The powerful camera features a 35 frames-per-second target speed. Please note that camera speed is dependent on how much processing must be done by the camera.



**Screenshot of ifm's Vision Assistant software. The software contains several wizards to assist in efficient integration of the camera into the automation system and PLC to quickly get you up and running.**

# ifm efector Machine Vision 2D Camera



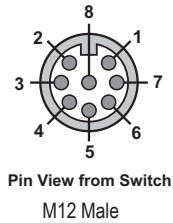
ifm efector Machine Vision 2D Camera Technical Specifications					
<b>Product Characteristics</b>					
<b>Image Resolution</b>	(pixels)	1280 x 960			
<b>Maximum Reading Rate</b>	(Hz)	40			
<b>Electrical Data</b>					
<b>Operating Voltage</b>	(V)	18-30 VDC			
<b>Current Consumption</b>	(mA)	<400 (24VDC; with switched outputs: <900mA)			
<b>Reverse Polarity Protection</b>		Yes			
<b>Wavelength</b>	(nm)	625, 525, and 423			
<b>Image Sensor</b>		CMOS image sensor (black/white)			
<b>Inputs</b>					
<b>Trigger</b>		External: 24V PNP/NPN (IEC 61131-2 Type 3) TCP/IP EtherNet/IP Continuous			
<b>Outputs</b>					
<b>Output Function</b>		PNP/NPN (configurable)			
<b>Maximum Current Load Per Output</b>	(mA)	100			
<b>Monitoring Range</b>					
<b>Field of View</b>	(mm [in])	For Standard Lens (O2D500 and O2D520)		For Wide Angle Lens (O2D502 and O2D522)	
		Operating Distance:	Field of View:	Operating Distance:	Field of View:
		85 [3.35]	28 x 21 [1.10 x 0.83]	35 [1.38]	25 x 19 [0.98 x 0.75]
		300 [11.81]	92 x 69 [3.62 x 2.72]	300 [11.81]	184 x 138 [7.24 x 5.43]
		500 [19.69]	152 x 114 [5.98 x 4.49]	500 [19.69]	304 x 228 [11.97 x 8.98]
		1000 [39.37]	302 x 227 [11.89 x 8.94]	1000 [39.37]	604 x 453 [23.78 x 17.83]
		1500 [59.06]	453 x 340 [17.83 x 13.39]	1500 [59.06]	904 x 678 [35.59 x 26.69]
		2000 [78.74]	603 x 452 [23.74 x 17.80]	2000 [78.74]	1204 x 903 [47.40 x 35.55]
	2500 [98.43]	753 x 564 [29.65 x 22.20]	2500 [98.43]	1504 x 1128 [59.21 x 44.41]	
<b>Operating Distance</b>	(mm [in])	>85 [3.35]		>35 [1.38]	
<b>Image Resolution</b>	(pixels)	1280 x 960			
<b>Autofocus Type</b>		Mechanical autofocus			
<b>Interfaces</b>					
<b>Communication Interface</b>		Ethernet			
<b>Transmission Standard</b>		10Base-T; 100Base-TX			
<b>Transmission Rate</b>		10 MBit/s; 100 MBit/s			
<b>Protocol</b>		TCP/IP; EtherNet/IP			
<b>Factory Settings</b>		IP address: 192.168.0.69 Subnet mask: 255.255.255.0 (Class C) Gateway IP address: 192.168.0.201			
<b>Operating Conditions</b>					
<b>Ambient Temperature</b>		-10 to 50°C [14 to 122°F]			
<b>Storage Temperature</b>		-40 to 70°C [-40 to 150°F]			
<b>IP Rating</b>		IP65			
<b>Mechanical Data</b>					
<b>Weight</b>	g [lb]	612.4 [1.35]			
<b>Material</b>		Housing: Diecast zinc powder coated; Front lens: Gorillaglas; LED window: PC; Pushbuttons: POM			

# ifm efector Machine Vision 2D Camera



## Electrical Connections – Supply

### Connection Colors

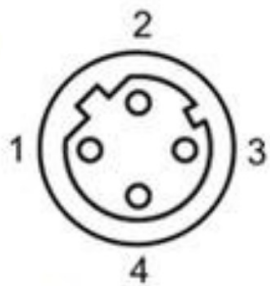


M12 8-Pin Male Connector				
Pin	292 Cable*	295 Cable*	Signal	Description
1	White	Brown	+24V	Power supply
2	Brown	White	Trigger	Trigger input
3	Green	Blue	GND	Ground
4	Yellow	Black	OUT5	Switching output 5
5	Gray	Gray	OUT3	Switching output 3
6	Pink	Pink	OUT4	Switching output 4
7	Blue	Violet	OUT2/IN2	Switching input or output 2
8	Red	Orange	OUT1/IN1	Switching input or output 1

**Notes:**

\* AutomationDirect sells M12 8-pole cables with two different color patterns (7000-170x1-292xxxx and 7000-170x1-295xxxx).

## Electrical Connections – Ethernet



M12 4-Pin Male (D-coded Ethernet)	
1	TxD+, transmit data +
2	RxD+, receive data +
3	TxD-, transmit data -
4	RxD-, receive data -

## Accessories

O2D Accessories Selection Guide			
Part Number	Price	Description	Drawing
<b>E2D500</b>	\$34.00	Right-angle bracket for 12mm rod	<a href="#">PDF</a>



**E2D500**



**E21112**

316L Stainless Steel Rod Selection Guide				
Part Number	Price	Diameter (mm [in])	Length (mm [in])	Drawing
<b>E21112</b>	\$14.50	12 [0.5]	200 [7.9]	<a href="#">PDF</a>
<b>E21113</b>	\$16.50	12 [0.5]	300 [11.8]	<a href="#">PDF</a>



# ifm efector Machine Mount 3D Vision Sensor



**O3D302**

The ifm efector 3D Smart Sensor utilizes the revolutionary PMD Time of Flight Imager to quickly and accurately measure the distance of 23,232 points within the field of view. The imager measures the distance between the sensor and the nearest surface point by point using the time-of-flight principle. The sensor illuminates the scene with an internal infrared light source and calculates the distance by means of the light reflected from the surface.

## Features

- Color and lighting independent
- Digital switching between 32 recipes
- Three configurable outputs
- Onboard logic engine
- IP65

## Applications

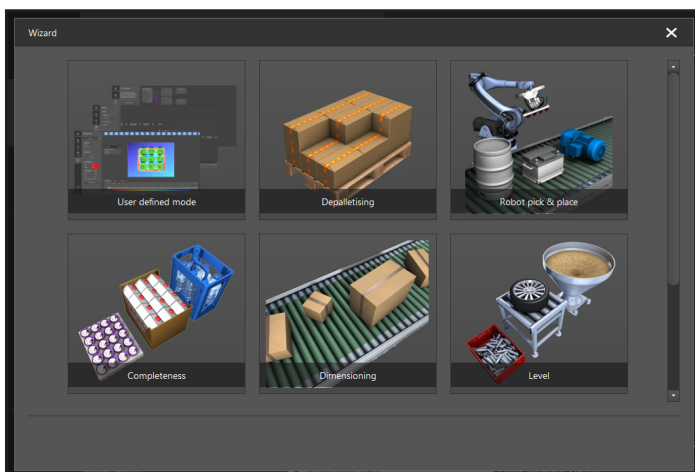
- Volume determination for storage and conveyor technology
- Non-contact dimensioning of rectangular objects such as cardboard packages or parcels
- Measurement of height, width and length to calculate strap length and volume
- Detection of size, orientation and positioning of the objects for automated storage space planning
- Robot navigation

ifm efector Machine Mount 3D Vision Sensor Selection Guide							
Part Number	Price	Scanner Capability	Lens Type	Light Emission	Port Protocols	Lens Material	Dimensional Drawing
<a href="#">O3D302</a>	\$1,520.00	3D – Time of Flight	Standard	Infrared	TCP/IP and EtherNet/IP	Gorilla glass	<a href="#">PDF</a>
<a href="#">O3D304</a>	\$1,520.00		Wide angle	Infrared			<a href="#">PDF</a>

**Note:** For continuous use, a heat sink ([E3D302](#)) is strongly recommended.

## Full-Featured Vision Assistant Configuration

The free ifm Vision Assistant configuration software contains several tools to make integration more seamless. The software also comes with several wizards including Robot Pick and Place, Completeness, Dimensioning, and Level.



**Screenshot of ifm's Vision Assistant Software. The software contains several wizards to assist in quick integration of the 3D sensor.**

**Please note that there is a wizard called "Depalletising." However, due to the large number of factors which may impact the implementation of this wizard, at this time AutomationDirect does not support this application.**

# ifm efector

## Machine Mount 3D Vision Sensor



ifm efector Machine Mount 3D Vision Sensor Technical Specifications				
<b>Electrical Data</b>				
<b>Operating Voltage</b>	(V)	20.4 to 28.8 VDC, to EN 61131-2		
<b>Current Consumption</b>	(mA)	<2400 peak current pulsed, typ. mean value 420; max mean value 1600		
<b>Power consumption</b>	(W)	10 (typical value)		
<b>Inputs</b>				
<b>Trigger</b>		External: 24V PNP/NPN (IEC 61131-2 Type 3) TCP/IP EtherNet/IP Continuous		
<b>Outputs</b>				
<b>Maximum Current Load Per Output</b>	(mA)	100		
<b>Output</b>		Digital outputs: 3 (configurable), 24 V PNP/NPN (IEC 61131-2) Analog outputs: 1 output (configurable as current or voltage output)		
<b>Current Output</b>	(mA)	4 - 20		
<b>Max Load</b>	(Ω)	500		
<b>Min Load</b>	(Ω)	230		
<b>Voltage Output</b>	(V)	0 - 10		
<b>Min Load</b>	(Ω)	10,000		
<b>Detection Range</b>				
<b>Operating Distance</b>	(mm [in])	300 - 8000 [11.81 - 314.96], with reflectivity of 18% and object size of 200mm x 200mm [7.87 in x 7.87 in]		
<b>Max Measuring Range</b>		Typically up to 5000mm, but depending on setting and reflectivity can be up to 30m		
<b>Resolution</b>	(pixels)	176 x 132		
<b>Angle of Aperture</b>	(°)	O3D302: 60 x 45 nominal value without lens distortion correction O3D304 70 x51, nominal value without lens distortion correction		
<b>Interfaces</b>				
<b>Parameter Setting Interface</b>		Ethernet TCP/IP: 10Base-T / 100Base-TX		
<b>Process Interface</b>		Ethernet TCP/IP: Ethernet/IP		
<b>IP Address</b>		192.168.0.69		
<b>Subnet Mask</b>		255.255.255.000		
<b>Gateway IP Address</b>		192.168.0.201		
<b>Environment</b>				
<b>Ambient Temperature</b>		-10 to 50°C [14 to 122°F]		
<b>Storage Temperature</b>		-40 to 85°C [-40 to 185°F]		
<b>IP Rating</b>		IP65		
<b>Other Technical Data</b>				
<b>Integrated Lighting</b>		Infrared LED (850nm), invisible radiation of light-emitting diodes		
<b>Other Data</b>				
<b>Field of View Size With Lens Distortion Correction</b>	For Standard Lens (O3D302)		For Wide-Angle Lens (O3D304)	
	Measuring Range/ Distance (m [ft])	Length x Width (m [ft])	Measuring Range/ Distance (m [ft])	Length x Width (m [ft])
	0.50 [1.64]	0.37 x 0.50 [1.21 x 1.64]	0.50 [1.64]	0.40 x 0.55 [1.31 x 1.80]
	1.00 [3.28]	0.75 x 1.00 [2.46 x 3.28]	1.00 [3.28]	0.80 x 1.10 [2.62 x 3.61]
	2.00 [6.56]	1.50 x 2.00 [4.92 x 6.56]	2.00 [6.56]	1.60 x 2.20 [5.25 x 7.22]
	3.00 [9.84]	2.25 x 3.00 [7.38 x 9.84]	3.00 [9.84]	2.40 x 3.30 [7.87 x 10.83]
	4.00 [13.12]	3.00 x 4.00 [9.84 x 13.12]	4.00 [13.12]	3.20 x 4.40 [10.50 x 14.44]
5.00 [16.40]	3.75 x 5.00 [12.30 x 16.40]	5.00 [16.40]	4.00 x 5.00 [13.12 x 16.40]	

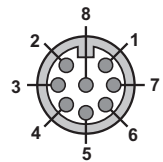
For application specific accuracy information, please refer to the datasheet

# ifm efector Machine Mount 3D Vision Sensor



## Electrical Connections – Supply

### Connection Colors



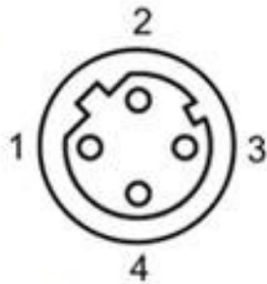
Pin View from Switch  
M12 Male

M12 8-PIN MALE CONNECTOR				
Pin	292 Cable*	295 Cable*	Signal	Description
1	White	Brown	+24V	Power supply
2	Brown	White	Trigger	Trigger input
3	Green	Blue	GND	Ground
4	Yellow	Black	OUT	Switching Output 1 (digital or analog)
5	Gray	Gray	OUT3	Switching Output 3 Ready
6	Pink	Pink	OUT2	Switching Output 2 (digital)
7	Blue	Violet	IN1	Switching Input 1
8	Red	Orange	IN2	Switching Input 2

**Notes:**

\* AutomationDirect sells M12 8-pole cables with two different color patterns (7000-170x1-292xxxx and 7000-170x1-295xxxx).

## Electrical Connections – Ethernet



M12 4-Pin Male (D-coded Ethernet)	
1	TxD+, transmit data +
2	RxD+, receive data +
3	TxD-, transmit data -
4	RxD-, receive data -

## Accessories

O3D Accessories Selection Guide			
Part Number	Price	Description	Drawing
<a href="#">E3D302</a>	\$85.00	Heat sink	<a href="#">PDF</a>
<a href="#">E3D301</a>	\$60.00	Right-angle bracket for 14mm rod	<a href="#">PDF</a>



**E3D302**



**E3D301**



**E21228**

316L Stainless Steel Rod Selection Guide				
Part Number	Price	Diameter (mm [in])	Length (mm [in])	Drawing
<a href="#">E21228</a>	\$21.50	14mm [0.6]	200 [7.9]	<a href="#">PDF</a>
<a href="#">E21229</a>	\$22.50	14mm [0.6]	300 [11.8]	<a href="#">PDF</a>
<a href="#">E21232</a>	\$25.00	14mm [0.6]	400 [15.7]	<a href="#">PDF</a>

# Machine Vision Lighting Overview

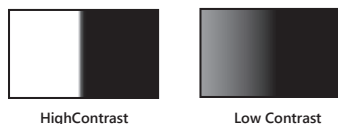
Generic lighting products are designed to provide basic illumination. However, lights designed for use as part of machine vision systems are designed with high-quality LEDs to provide consistent and uniform light across the desired field of view. Here are some considerations that should be kept in mind when designing an optimized machine vision lighting system.

## Goals for Machine Vision Lighting

### **Contrast**

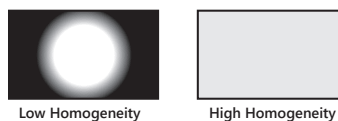
Maximizing contrast is the ultimate goal for any machine vision lighting system. If high contrast can be obtained, then detection is going to be a lot easier. In fact, maximizing contrast is the reason that most camera vision applications are monochrome. Contrast in monochrome images makes image processing easier.

To achieve the best contrast, the user must have a balance between homogeneity and brightness.



### **Homogeneity**

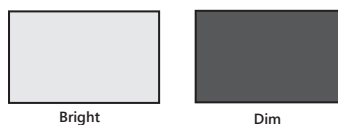
Homogeneity can be thought of as uniformity. The light needs to illuminate the whole field of view uniformly. Hot spots or dark spots remove contrast from specific regions of the field of view and can adversely impact vision accuracy, while a homogenous (uniform) field of illumination can greatly enhance accuracy.



### **Brightness**

Brightness, which is essential in creating contrast, is important in machine vision systems.

By increasing the brightness, system designers can create more robust systems using shorter exposure times. As an added benefit, this will also reduce motion blur.



It is true that if you put more current through an LED, it will get brighter. But one of the worst things for an LED's lifespan is over-current. Even though more current means a brighter LED, that brightness comes at a cost, for the brighter the LED gets the more heat is generated and the more its lifespan is reduced. In other words, the lifespan of an LED is directly related to the current through the LED.

The manufacturers of our machine vision lights have taken great care in selecting the brightest and highest quality LEDs. They have also carefully engineered these lights to maximize light output and LED lifespan in order to deliver a product that will work consistently well for a long period of time. For instance, in order to achieve higher brightness, some of our lights can be strobed with higher current. In these lights, built-in microprocessors manage strobe duration to maximize brightness without adversely impacting life expectancy of the LEDs.

## Dealing With Ambient Light

One of the hardest things to design out of a machine vision application is the ambient light present in the location where the system will be used. Ambient light varies greatly from location to location, so designers must keep potential ambient light impacts in mind when designing machine vision lighting systems.

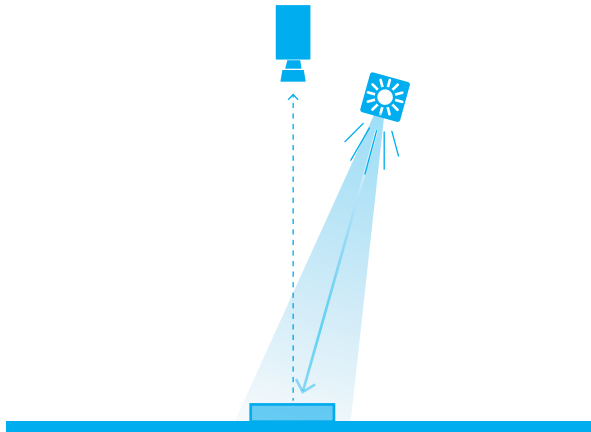
A common misconception is that ambient light comes only from overhead. However, the truth is that ambient light can come from several sources. Among the conditions which can impact ambient lighting are sunlight through a window, the reflection off of a reflective surface, or even a shadow.

There are situations in which building a shroud around the inspection area is the most appropriate way to deal with ambient light. In other situations, the best way to deal with it is to increase the brightness of the light source.

# Machine Vision Lighting Overview, continued

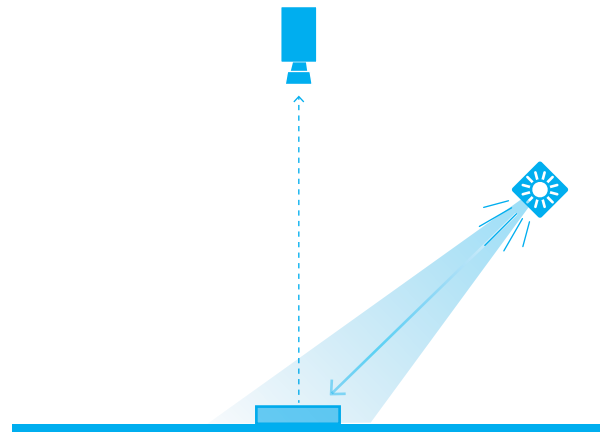
## Lighting Principles

Effective machine vision lighting relies on several factors, including what is known as the “angle of incidence.” Angle of incidence is defined as the angle at which the light strikes the object being illuminated. This angle is measured from an imaginary line between the camera and the light source. The examples below illustrate how different lighting angles can be used in various applications.



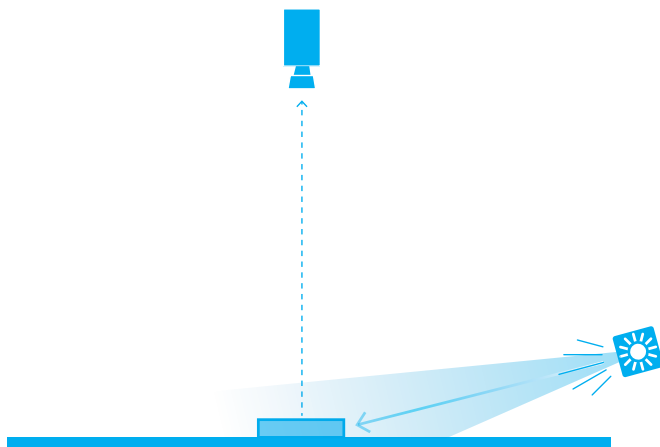
### **Bright field**

- Usually, the angle of incidence is between 0 and 30 degrees.
- Bright field is the easiest type of lighting principle for humans to understand, because this is how we generally see the world. However, this type of lighting system may not be well suited for use where shiny parts are involved.
- Diffusers or polarizers might be needed to decrease the unintended direct reflections.



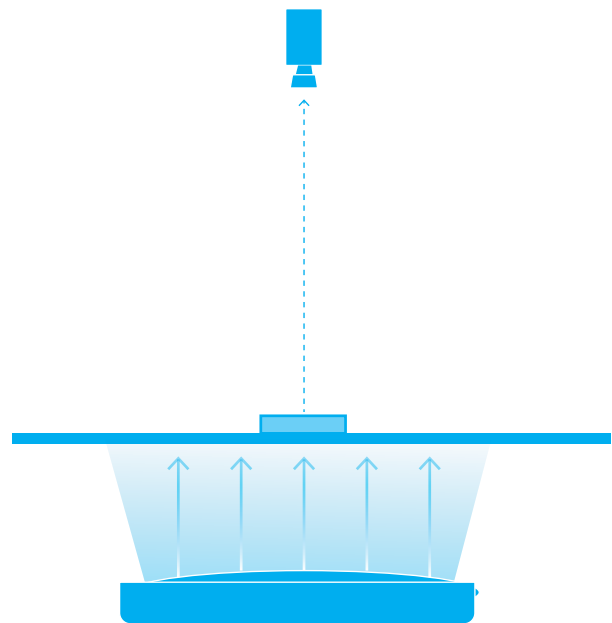
### **Low angle**

- Usually, the angle of incidence is between 30 and 80 degrees.
- The lighting source is placed between the dark field and the bright field so that the user can take advantage of both illumination methods.
- Good for engravings



### **Dark field**

- Usually, the angle of incidence is between 80 and 90 degrees
- This lighting configuration will generally bring high contrast to the edges. For parts that are not shiny, a narrow beam angle is usually best. For shiny parts, a diffused light source usually works best.
- Applications include edge detection and measurement.



### **Backlight**

- The light source is placed behind the object.
- When using this method, it is important that the light is bigger than the field of view.
- Backlighting light sources should be highly diffused and offer high homogeneity.
- Backlighting makes it possible to see a silhouette.



# WenglorTPL Vision Lighting M-EBAR Lights



WenglorTPL M-EBAR (Modular Essential Bar) Lights, which feature high-power LEDs, come in various sizes and are available with either white or infrared lights to help create the best contrast for image processing. These linear lights are extremely versatile and can be used to create different types of lighting (for example, bright field, dark field, or dome effect) suited to various automation and robotics applications. Designed with flexibility in mind, WenglorTPL bar lights simplify the product selection process and make for easy integration.

WenglorTPL's award-winning Modular Essential Bar Light illumination provides universal solutions for pick-and-place, logistics, packaging and traceability applications. These bar lights can be combined with WenglorTPL's Angle Changers to suit almost any machine vision application.

## Features

- Illumination angle can be customized to suit almost any application with the addition of angle changers
- Ultra narrow lens delivers  $\pm 7^\circ$  illumination
- Robust aluminum body
- IP65
- Non-removable M4 nut included on back of bar
- Built-in overdrive protection safeguards against damage from overcurrent



**OPT2401**

WenglorTPL White M-EBAR Selection Guide							
Part Number	Price	Color of Light	Light Temperature	Length of Light	Overdrive	Mode of Operation	Drawings
<a href="#">OPT2400</a>	\$381.00	White	5800K	125mm [4.92 in]	Yes	Continuous or strobe	<a href="#">PDF</a>
<a href="#">OPT2401</a>	\$511.00			250mm [9.84 in]			<a href="#">PDF</a>
<a href="#">OPT2402</a>	\$642.00			375mm [14.76 in]			<a href="#">PDF</a>
<a href="#">OPT2403</a>	\$775.00			500mm [19.69 in]			<a href="#">PDF</a>



**OPT2406**

WenglorTPL Infrared M-EBAR Selection Guide							
Part Number	Price	Color of Light	Wavelength	Length of Light	Overdrive	Mode of Operation	Drawings
<a href="#">OPT2404</a>	\$401.00	Infrared	850nm	125mm [4.92 in]	Yes	Continuous or strobe	<a href="#">PDF</a>
<a href="#">OPT2405</a>	\$532.00			250mm [9.84 in]			<a href="#">PDF</a>
<a href="#">OPT2406</a>	\$659.00			375mm [14.76 in]			<a href="#">PDF</a>
<a href="#">OPT2407</a>	\$789.00			500mm [19.69 in]			<a href="#">PDF</a>

WenglorTPL Vision Bar Clamp Selection Guide				
Part Number	Price	Description	Material	Drawing
<a href="#">OPT2432</a>	\$81.00	Bar clamp	Aluminum	<a href="#">PDF</a>

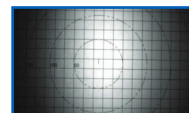


**OPT2432**

## Angle Changers

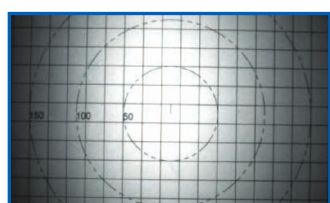
WenglorTPL bar lights can be used as-is in a wide range of applications. However, the addition of an angle changer accessory can greatly enhance the versatility of the overall lighting system by changing the angle of the illumination and thus allowing a single light to be used in multiple applications.

Angle changers are easy to install on the Wenglor bar lights and do not have any impact on the IP rating. Installation takes just seconds and is simply a matter of clipping them into the light's aluminum frame.

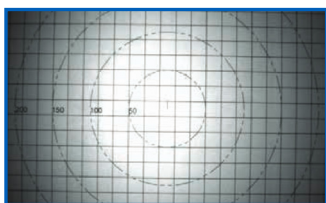


**M-EBAR  
without angle changer**

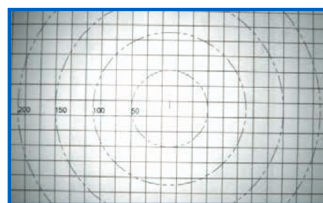
### Result when using different angle changers



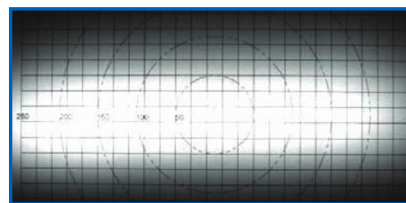
**With Narrow Angle Changer**



**With Medium Angle Changer**



**With Wide Angle Changer**



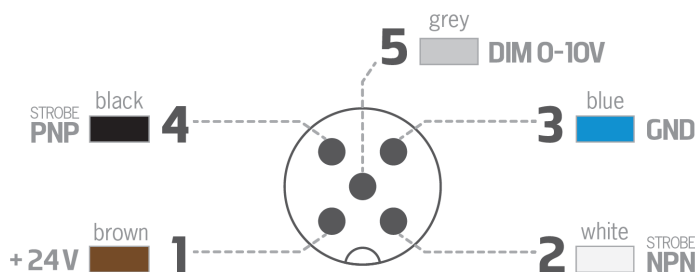
**With Line Light Angle Changer**

# Wenglor TPL Vision Lighting M-EBAR Lights



M-EBAR General Specifications				
	125mm [4.92 in]	250mm [9.84 in]	375mm [14.76 in]	500mm [19.69 in]
<b>Electronics</b>				
Functioning Mode	Continuous or strobe			
Strobe Input	PNP: From 5 to 24V for 100% ON. From 0 to 1V for 100% OFF NPN: Less than 1V for 100% ON. Above 2V for 100% OFF. Max 20V			
Overdrive	Yes			
Strobe Conditions (ON time, duty cycle)	LEDs are supplied with 240% maximum current. After 30ms, LED are supplied at 100% level.			
Maximum Rising Time	15µs			
Maximum Falling Time	15µs			
Connection	M12 5-pole connector			
Consumption CW Mode	0.3 A	0.6 A	0.9 A	1.2 A
Consumption Strobe Mode	1.2 A	2.4 A	3.6 A	4.8 A
Minimum Functioning Voltage	20V at the light input			
Normal Functioning Voltage	24V at the light input (± 10%)			
Maximum Functioning Voltage	30V at the light input			
Maximum Consumption Strobe and Dimming Signal	10mA			
Maximum Strobe Duty Cycle	20%			
Dimming	Pin 5 (M12 5-pole connector): 0-10 V = 100-30% respectively			
Operating Temperature	-10°C to 40°C [14°F to 104°F]			
Operating Maximum Humidity	80% without condensation			
Maximum Temperature Variation in 24 Hours	10°C [18°F] over 24 hours			
<b>Optics</b>				
Color	White (5800k) Infrared (850nm)			
<b>Mechanics</b>				
Weight	0.8 lb [380g]	1.4 lb [630g]	2.1 lb [950g]	2.6 lb [1.20 kg]
Materials	Aluminum and fiberglass-reinforced ABS			
Mounting	2 M4 nuts (non-removable) installed in T slot in rear of bar light		4 M4 nuts (non-removable) installed in T slot in rear of bar light	
<b>Environment</b>				
Storage Temperature	-20°C to 60°C / 80% humidity without condensation No thermal shock (maximum temperature variation 10C in 24 hours)			
IP Protection	IP65			

## Connections



Strobe PNP		Strobe NPN	
1	+24V	1	+24V
2	Not connected	2	NPN-signal
3	Ground	3	Ground
4	PNP-signal	4	Not connected
5	Dim 0-10 V	5	Dim 0-10 V

Continuous Mode			
1	+24V	OR	+24V
2	Not connected		Ground
3	Ground		Ground
4	+24V		Not connected
5	Dim 0-10 V		Dim 0-10 V

# WenglorTPL Vision Lighting Angle Changers for M-EBAR



WenglorTPL Angle Changers are inserts for the modular essential bar light that make it easy for you to change illumination angles as needed to meet changing application demands.

## Features

- Quickly and easily change illumination angles as your project evolves.
- No need to dismantle the product to adjust the illumination angle. All you need to do is to swap Angle Changers.
- Angle Changers do not have an impact on the IP rating of the bar light.
- Allows for rapid feasibility testing.
- Quickly and easily identify the best illumination solution with different angle changer combinations.



WenglorTPL M-EBAR Angle Changers Selection Guide					
Part Number	Price	Angle Type	Angle	Quantity in Package	Drawings
<a href="#">OPT2408</a>	\$30.50	Narrow	±10°	1	<a href="#">PDF</a>
<a href="#">OPT2408-2</a>	\$58.00			2	<a href="#">PDF</a>
<a href="#">OPT2408-4</a>	\$110.00			4	<a href="#">PDF</a>
<a href="#">OPT2409</a>	\$30.50	Medium	±17°	1	<a href="#">PDF</a>
<a href="#">OPT2409-2</a>	\$58.00			2	<a href="#">PDF</a>
<a href="#">OPT2409-4</a>	\$110.00			4	<a href="#">PDF</a>
<a href="#">OPT2410</a>	\$30.50	Wide	±25°	1	<a href="#">PDF</a>
<a href="#">OPT2410-2</a>	\$58.00			2	<a href="#">PDF</a>
<a href="#">OPT2410-4</a>	\$110.00			4	<a href="#">PDF</a>
<a href="#">OPT2411</a>	\$30.50	Line light	±9° x ±16°	1	<a href="#">PDF</a>
<a href="#">OPT2412</a>	\$70.00	Polarized narrow	±10°	1	<a href="#">PDF</a>
<a href="#">OPT2413</a>	\$70.00	Polarized medium	±17°	1	<a href="#">PDF</a>
<a href="#">OPT2414</a>	\$70.00	Polarized wide	±25°	1	<a href="#">PDF</a>
<a href="#">OPT2415</a>	\$70.00	Polarized line light	±9° x ±16°	1	<a href="#">PDF</a>
<a href="#">OPT2416</a>	\$52.00	Polarized	None	1	<a href="#">PDF</a>
<a href="#">OPT2417</a>	\$21.00	Transparent	None	1	<a href="#">PDF</a>
<a href="#">OPT2417-2</a>	\$39.50			2	<a href="#">PDF</a>
<a href="#">OPT2417-4</a>	\$75.00			4	<a href="#">PDF</a>

## Angle Changer Installation



Number of Angle Changers Needed	
Length of Bar Light	Quantity of Angle Changers Required
125mm [4.92 in]	1
250mm [9.84 in]	2
375mm [14.76 in]	3
500mm [19.69 in]	4

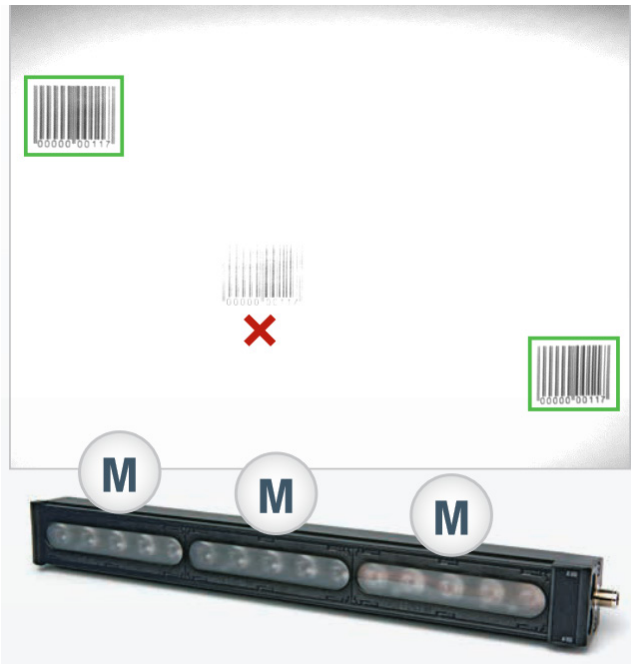
# WenglorTPL Vision Lighting Angle Change Inserts For M-EBAR

**wenglor**TPL

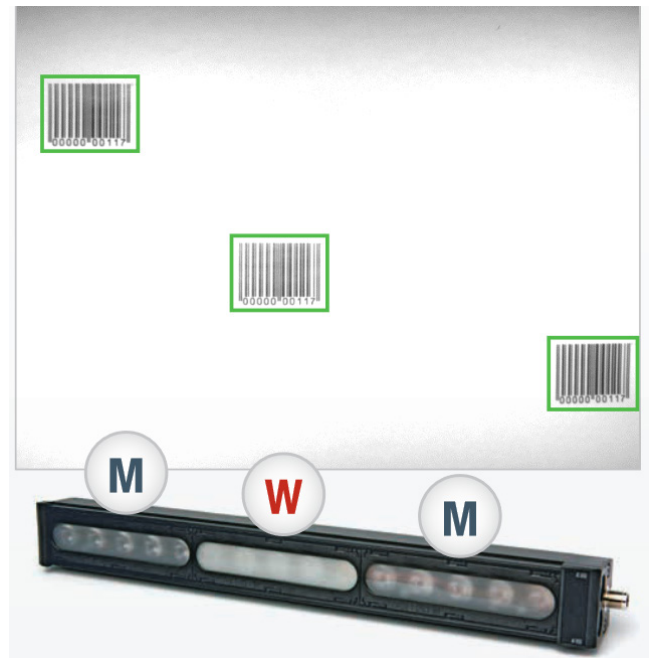
## Application Example

Hot spots are often a problem in machine vision lighting, and WenglorTPL Angle Changers provide an excellent solution to help you deal with hot spots by utilizing different angle changers on the same bar light.

**OPT2402 light bar  
with 3 medium-angle Angle Changers (OPT2409)**



**OPT2402 light bar  
with 2 medium-angle Angle Changers (OPT2409)  
and 1 wide-angle Angle Changer (OPT2410)**

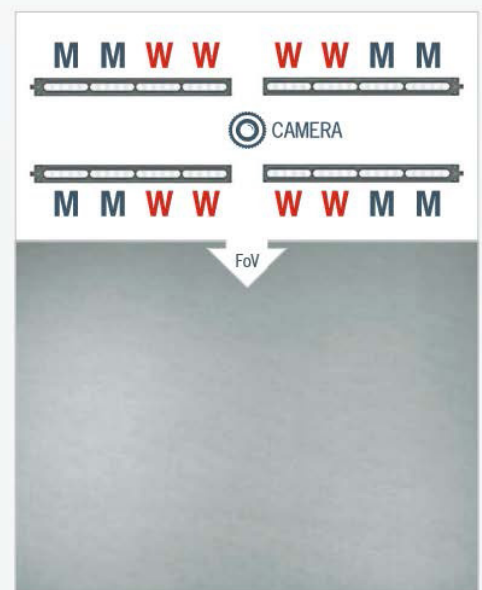
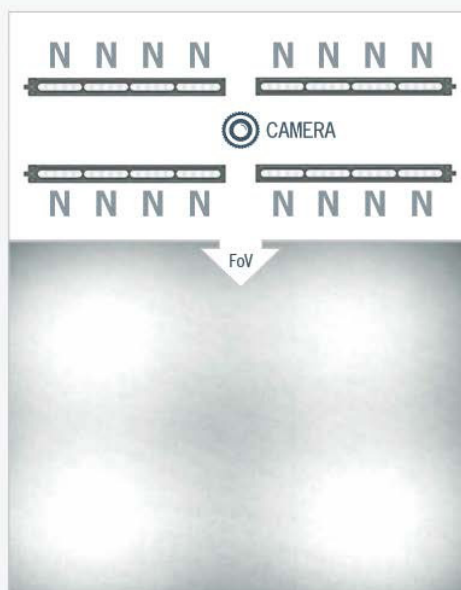


## Example

- 2000mm working distance
- 1300 x 900 field of view
- Four OPT2403 light bars with angle changers

**Angle changers marked at each 125mm as Narrow, Medium or Wide by N, M, or W**

**Schematic views show a plan of the system from behind the camera**



# WenglorTPL Vision Lighting Modular Ring Light, Dome, and Low-Angle Accessories

**wenglor**TPL

The WenglorTPL Modular Ring Light offers bi-color LED illumination. Models are available in two sets of colors (only one color can be used at a time) and in two different sizes. All have been designed with tough production environments in mind with IP65 as standard and overdrive embedded.

To further enhance the Modular Ring Light's versatility, users have the ability to select colors and quadrants via the simple controls on the device or via I/O from a connected PLC.



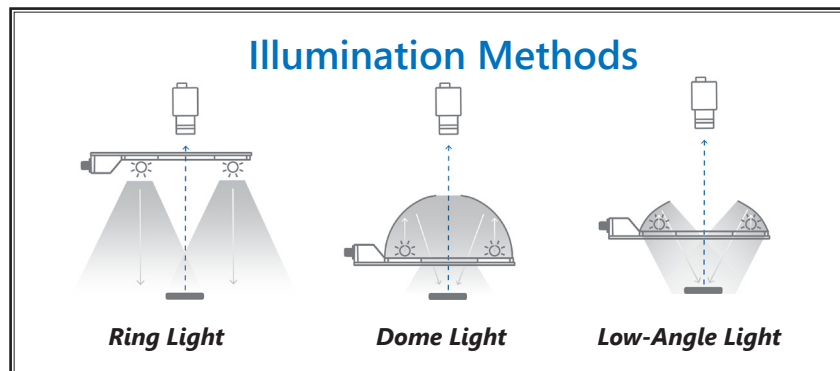
**OPT2425**

WenglorTPL Modular Ring Light Selection Guide						
Part Number	Price	Colors	Size* (mm [in])	Overdrive	Mode of Operation	Drawings
<a href="#">OPT2424</a>	\$757.00	Red / Cyan	80 [3.15]	Yes	Continuous or strobe	<a href="#">PDF</a>
<a href="#">OPT2425</a>	\$757.00	White / Infrared	80 [3.15]			<a href="#">PDF</a>
<a href="#">OPT2426</a>	\$1,005.00	Red / Cyan	130 [5.12]			<a href="#">PDF</a>
<a href="#">OPT2427</a>	\$1,005.00	White / Infrared	130 [5.12]			<a href="#">PDF</a>

\* Approximate diameter to inner ring of LEDs



**OPT2427**



## Ring Light Accessories

WenglorTPL ring light accessories transform a ring light into a dome light or a low-angle light. These accessories attach to the appropriate sized modular ring light by use of built-in magnets. They are then secured using the provided screws.

For dome light applications, the aperture size for the dome light may need to be reduced to decrease the dark spot on the field of view. The WenglorTPL dome accessory comes with multiple aperture covers to maximize flexibility.

WenglorTPL Ring Light Accessory Selection Guide				
Part Number	Price	Item	Corresponding Ring Light Size* (mm [in])	Drawings
<a href="#">OPT2428</a>	\$91.00	Dome	80 [3.15]	<a href="#">PDF</a>
<a href="#">OPT2429</a>	\$116.00	Dome	130 [5.12]	<a href="#">PDF</a>
<a href="#">OPT2430</a>	\$91.00	Low-angle dome	80 [3.15]	<a href="#">PDF</a>
<a href="#">OPT2431</a>	\$116.00	Low-angle dome	130 [5.12]	<a href="#">PDF</a>

\* Approximate diameter to inner ring of LEDs on corresponding ring light



**OPT2428**



**OPT2430**

WenglorTPL Mounting Bracket Selection Guide				
Part Number	Price	Description	Material	Drawings
<a href="#">OPT2434</a>	\$65.00	Mounting bracket	Aluminium	<a href="#">PDF</a>



**OPT2434**

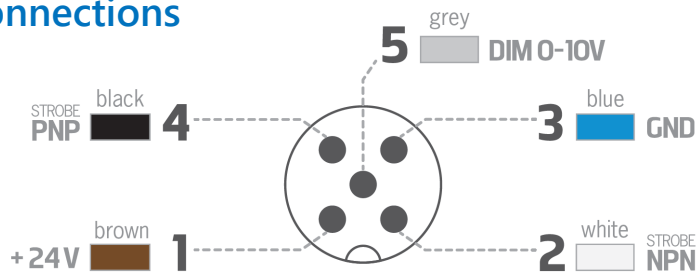


# WenglorTPL Vision Lighting Modular Ring Light



Modular Ring Light General Specifications		
	80mm [3.15 in]	130mm [5.12 in]
<b>Electronics</b>		
<b>Power Supply</b>	24VDC ±10%	
<b>Functioning Mode</b>	Continuous, strobe, overdrive, dimming, sector control, LED color	
<b>Rising Time</b>	10µs	
<b>Falling Time</b>	10µs	
<b>Wiring</b>	5-pin M12 male connector for power Optional: 8-pin M12 male connector for remote control	
<b>Maximum Consumption, Red-Cyan</b>	9W average / 51W peak	11W average, 82W peak
<b>Maximum Consumption, White-IR</b>	10W average / 42W peak	13W average / 62W peak
<b>Optics</b>		
<b>Color</b>	Red (625nm) - Cyan (505nm) - White (5000K) - Infrared (860nm)	
<b>Number of LEDs</b>	96	144
<b>Mechanical</b>		
<b>Height</b>	Lighting portion: 11mm Wiring portion, with connectors: 31mm	
<b>Weight</b>	360g [0.8 lb]	550g [1.2 lb]
<b>Material</b>	Aluminum and ABS	
<b>Mounting</b>	2 x M5 screws (included with OPT2434 bracket)	
<b>Environment</b>		
<b>Operating Temperature</b>	-10°C to 40°C / 80% humidity without condensation No thermal shock (maximum temperature variation 10C in 24 hours)	
<b>Storage Temperature</b>	-20°C to 60°C / 80% humidity without condensation No thermal shock (maximum temperature variation 10C in 24 hours)	
<b>IP Protection</b>	IP65	

## Connections



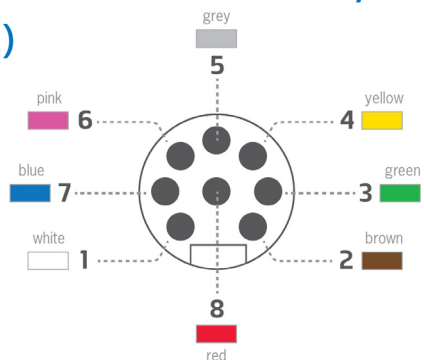
Strobe PNP	
1	+24V
2	+24V*
3	Ground
4	PNP
5	Dim 0-10 V

Strobe NPN	
1	+24V
2	NPN
3	Ground
4	Ground
5	Dim 0-10 V

\* Using this connection increases EMC immunity. This connection is not required.

Continuous Mode			
1	+24V	OR	+24V
2			Ground
3	Ground	OR	Ground
4	+24V		
5	Dim 0-10 V		Dim 0-10 V

## Optional Remote Connection I/O (8-pin M12)



**NOTE:** The colors used in this connection chart are for 292 series 8-pin cables.

Remote I/O	
1	Overdrive
2	LED color selection
3	Ground
4	Sector 1 ON
5	Sector 2 ON
6	Sector 3 ON
7	Sector 4 ON
8	Deactivate Keyboard



# WenglorTPL Vision Lighting High-Powered Back Light

**wenglor**TPL



**OPT2420**

The WenglorTPL Vision Back light is a high-powered solution for all backlighting applications and quality control tasks, including detection of presence/absence, analysing edge defects, liquid fill level measurement and silhouetting.

The WenglorTPL Vision Back Light has exceptionally narrow borders (only 4mm wide), making the useful illumination area of the light easy to integrate into your system. The unit's LEDs are mounted with highly efficient lenses, engineered to distribute the highest brightness and uniformity balance available for machine vision backlights.

The Back Light also features integrated current control, making it easy to wire, install and use.

WenglorTPL Vision Back Lighting Selection Guide							
Part Number	Price	Color of Light	Light Temperature	Area of Light	Overdrive	Mode of Operation	Drawings
<a href="#">OPT2418</a>	\$676.00	White	5700K	200 x 200mm [7.87 x 7.87 in]	No	Continuous or strobe	<a href="#">PDF</a>
<a href="#">OPT2420</a>	\$1,135.00			300 x 300mm [11.81 x 11.81 in]			<a href="#">PDF</a>
<a href="#">OPT2422</a>	\$1,646.00			400 x 400mm [15.75 x 15.75 in]			<a href="#">PDF</a>

WenglorTPL Vision Infrared Back Lighting Selection Guide							
Part Number	Price	Color of Light	Wavelength	Area of Light	Overdrive	Mode of Operation	Drawings
<a href="#">OPT2419</a>	\$841.00	Infrared	850nm	200 x 200mm [7.87 x 7.87 in]	No	Continuous or strobe	<a href="#">PDF</a>
<a href="#">OPT2421</a>	\$1,546.00			300 x 300mm [11.81 x 11.81 in]			<a href="#">PDF</a>
<a href="#">OPT2423</a>	\$2,271.00			400 x 400mm [15.75 x 15.75 in]			<a href="#">PDF</a>

WenglorTPL Vision Lighting Bracket Selection Guide					
Part Number	Price	Description	Material	Qty in Package	Drawing
<a href="#">OPT2433</a>	\$82.00	Mounting bracket	Aluminium	4	<a href="#">PDF</a>



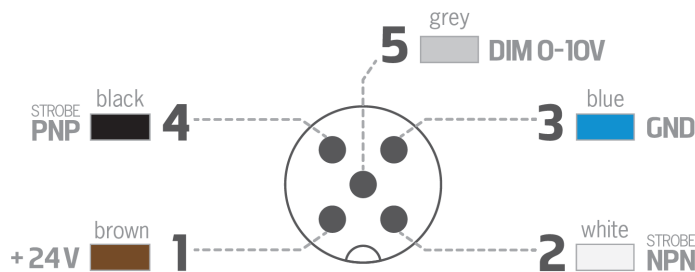
**OPT2433**

# WenglorTPL Vision Lighting High-Powered Back Light



Back Light General Specifications	
<b>Electronics</b>	
Power Supply	24VDC ± 10%
Functioning Mode	Continuous or strobe
Strobe Input	PNP: From 5 to 24V for 100% ON. From 0 to 1V for 100% OFF NPN: Less than 1V for 100% ON. Above 2V for 100% OFF. Max 20V
Overdrive	No
Strobe Conditions (ON time, duty cycle)	No restriction
Dimming	Pin 5 (M12 5-pole connector): 0-10 V = 100-30% respectively
Maximum Rising Time	15µs
Maximum Falling Time	10µs
Control	Connector M12 5 poles
Consumption	White: 21.6 W (OPT2418), 48.6 W (OPT2420), 86.4 W (OPT2422) Infrared: 27.5 W (OPT2419), 61.9 W (OPT2421), 110 W (OPT2423)
Minimum Functioning Voltage	20V at the light input
Normal Functioning Voltage	24V at the light output (± 10%)
Maximum Functioning Voltage	30V at the light input
Maximum Consumption Strobe Signal On Largest Product (400x400 mm)	250mA
Maximum Consumption Dimming Signal On Largest Product (400x400 mm)	150mA
<b>Optics</b>	
Color	White (5700K) Infrared (850nm)
<b>Mechanics</b>	
Thickness	45mm
Weight	23.2 kg/m <sup>2</sup> ± 15%
Materials	Aluminum and loaded ABS
Diffuser	White PMMA
Mounting	4 M4 nuts (supplied) to insert in the groove or 4 M4x20 screws (not supplied) applied to the corner slots
<b>Environment</b>	
Operating Temperature	-10°C to 40°C / 80% humidity without condensation No thermal shock (maximum temperature variation 10C in 24 hours)
Storage Temperature	-20°C to 60°C / 80% humidity without condensation No thermal shock (maximum temperature variation 10C in 24 hours)
IP Protection	IP40

## Connections



Strobe PNP		Strobe NPN	
1	+24V	1	+24V
2	Not connected	2	NPN
3	Ground	3	Ground
4	PNP	4	Not connected
5	Dim 0-10 V	5	Dim 0-10 V

Continuous Mode			
1	+24V	OR	+24V
2	Not connected		Ground
3	Ground		Ground
4	+24V		Not connected
5	Dim 0-10 V		Dim 0-10 V

# WenglorTPL Vision Lighting Flat Dome Light **wenglor** TPL



**OPT2435**

WenglorTPL Vision’s Flat Dome Light is a high-power flat dome illumination solution for machine vision applications such as Pick and Place or Logistics. The LEDs are mounted with highly efficient lenses, engineered to distribute the highest brightness and uniformity balance available for machine vision applications.

The Flat Dome Light also also features integrated current control, making it easy to wire, install and use. The central opening allows for simple placement of cameras using lenses up to 65mm [2.56 in] in diameter.

WenglorTPL Vision White Illumination Flat Dome Light Selection Guide							
Part Number	Price	Color of Light Emission	Temperature	Area of Light	Overdrive	Mode of Operation	Drawings
<a href="#">OPT2435</a>	\$1,002.00	White	5700K	200 x 200mm	No	Continuous or strobe	<a href="#">PDF</a>
<a href="#">OPT2437</a>	\$1,432.00			300 x 300mm			<a href="#">PDF</a>

WenglorTPL Vision Infrared Illumination Flat Dome Light Selection Guide							
Part Number	Price	Color of Light Emission	Wavelength	Area of Light	Overdrive	Mode of Operation	Drawings
<a href="#">OPT2436</a>	\$1,169.00	Infared	850nm	200 x 200 mm	No	Continuous or Strobe	<a href="#">PDF</a>
<a href="#">OPT2438</a>	\$1,682.00			300x300 mm			<a href="#">PDF</a>

Part Number	Price	Description	Material	QTY in Package	Drawings
<a href="#">OPT2433</a>	\$82.00	Mounting Bracket	Aluminium	4	<a href="#">PDF</a>

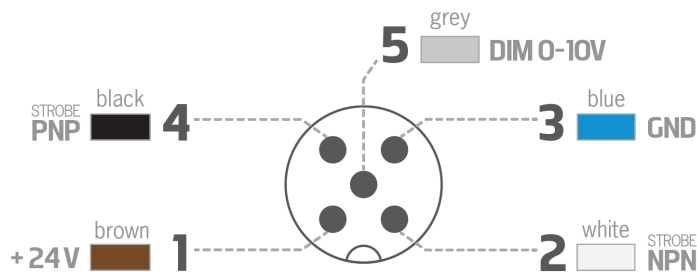


**OPT2433**

# WenglorTPL Vision Lighting Flat Dome Light **wenglor**TPL

Flat Dome Light General Specifications	
<b>Electronics</b>	
<b>Power Supply</b>	24VDC ±10%
<b>Functioning Mode</b>	Continuous or strobe
<b>Strobe Input</b>	PNP: From 5 to 24V for 100% ON. From 0 to 1V for 100% OFF NPN: Less than 1V for 100% ON. Above 2V for 100% OFF. Max 20V
<b>Overdrive</b>	No
<b>Strobe Conditions (ON time, duty cycle)</b>	No restriction
<b>Dimming</b>	Pin 5 (M12 5-pole connector): 0-10 V = 100-30% respectively
<b>Maximum Rising Time</b>	15us
<b>Maximum Falling Time</b>	10us
<b>Control</b>	Conector M12 5 poles
<b>Consumption</b>	White: 21.6 W (OPT2435), 48.6 W (OPT2437) Infrared: 27.5 W (OPT2436), 61.9 W (OPT2438)
<b>Minimum Functioning Voltage</b>	20V at the light input
<b>Normal Functioning Voltage</b>	24V at the light output (±10%)
<b>Maximum Functioning Voltage</b>	30V at the light input
<b>Maximum Consumption Strobe Signal On Largest Product (400x400 mm)</b>	250mA
<b>Maximum Consumption Dimming Signal On Largest Product (400x400 mm)</b>	150mA
<b>Optics</b>	
<b>Color</b>	White (5700k) Infrared (850nm)
<b>Mechanics</b>	
<b>Thickness</b>	45mm
<b>Internal Diameter</b>	65mm
<b>Weight</b>	23.8 kg/m <sup>2</sup> ±15%
<b>Materials</b>	Aluminum and loaded ABS
<b>Diffuser</b>	White PMMA
<b>Mounting</b>	4 M4 nuts (supplied) to insert in the groove or 4 M4x20 screws (not supplied) applied to the corner slots
<b>Environment</b>	
<b>Operating Temperature</b>	-10°C to 40°C / 80% humidity without condensation No thermal shock (maximum temperature variation 10°C in 24 hours)
<b>Storage Temperature</b>	-20°C to 60°C / 80% humidity without condensation No thermal shock (maximum temperature variation 10°C in 24 hours)
<b>IP Protection</b>	IP40

## Connections



Strobe PNP		Strobe NPN	
1	+24V	1	+24V
2	Not connected	2	NPN
3	Ground	3	Ground
4	PNP	4	Not connected
5	Dim 0-10 V	5	Dim 0-10 V

Continuous Mode			
1	+24V	OR	+24V
2	Not connected		Ground
3	Ground		Ground
4	+24V		Not connected
5	Dim 0-10 V		Dim 0-10 V

# Swivellink Mounting System Standard Series (Imperial/English Units)



Swivellink Mounts are a better way to mount vision cameras, lights, and sensors. Because of the flexibility and range of Swivellink's patented design, you can fine-tune each installation to just about any position required. Components are made from aluminum alloy for light weight and structural rigidity. Both Metric and Imperial/English versions are available; however, they are not interchangeable.

This page describes Swivellink's AFSB components, which are blue in color and are in Imperial/English units.

Consider the following when selecting your components:

- Amount of weight the mount will be holding
- The overall length of the mount
- The area you have to work with

Carrying capacity varies with overall length and system configuration. The Standard Series can hold up 30lb [13.6 kg] at 1ft [0.3 m] with all screws torqued to 50 in•lb [5.65 N•m].



**AFSB-1-15**

Swivellink Bases (Imperial/English) Selection Guide*				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-1</a>	\$32.00	Round ball base	5.28 [149.7]	<a href="#">PDF</a>
<a href="#">AFSB-1-15</a>	\$47.50	Narrow ball base	5.28 [149.7]	<a href="#">PDF</a>

\* These bases fit SureFrame 10 and 15 Series T-slotted rail.

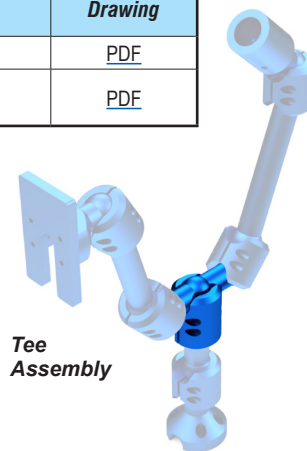


**AFSB-1**



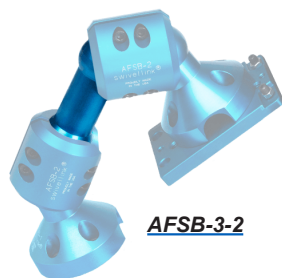
**AFSB-2**

Swivellink Knuckle (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-2</a>	\$40.50	Knuckle	5.49 [155.6]	<a href="#">PDF</a>
<a href="#">AFSB-2-2XS</a>	\$44.00	Standard to XS Series coupler	1.95 [55.3]	<a href="#">PDF</a>



**Tee Assembly**

Swivellink Tee (Imperial/English) Selection Guide					
Part Number	Price	Description	Length (in [mm])	Weight (oz [g])	Drawing
<a href="#">AFSB-3T</a>	\$28.50	Tee link	4 [101.6]	2.19 [62.1]	<a href="#">PDF</a>
<a href="#">AFSB-290</a>	\$41.50	Tee knuckle	NA	5.15 [146.1]	<a href="#">PDF</a>



**AFSB-3-2**

Swivellink Links (Imperial/English) Selection Guide					
Part Number	Price	Description	Length (in [mm])	Weight (oz [g])	Drawing
<a href="#">AFSB-3-2</a>	\$20.00	Ball link	2 [50.8]	1.47 [41.7]	<a href="#">PDF</a>
<a href="#">AFSB-3-4</a>	\$23.00		4 [101.6]	2.05 [58.1]	<a href="#">PDF</a>
<a href="#">AFSB-3-6</a>	\$26.00		6 [152.4]	2.62 [74.4]	<a href="#">PDF</a>
<a href="#">AFSB-3-8</a>	\$31.00		8 [203.2]	3.20 [90.7]	<a href="#">PDF</a>
<a href="#">AFSB-3-12</a>	\$37.00		12 [304.8]	3.78 [107.0]	<a href="#">PDF</a>

Swivellink Handle Kit (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-CLAMP-HANDLE</a>	\$21.50	Clamp handle kit	1.44 [40.8]	<a href="#">PDF</a>



**AFSB-CLAMP-HANDLE**



# Swivellink Mounting System Standard Series (Metric Units)



Swivellink Mounts are a better way to mount vision cameras, lights, and sensors. Because of the flexibility and range of Swivellink's patented design, you can fine-tune each installation to just about any position required. Components are made from aluminum alloy for light weight and structural rigidity. Both Metric and Imperial/English versions are available; however, they are not interchangeable.

This page describes Swivellink's SLM components, which are gray in color and are in Metric units.

Consider the following when selecting your components:

- Amount of weight the mount will be holding
- The overall length of the mount
- The area you have to work with

Carrying capacity varies with overall length and system configuration. The Standard Series can hold up 13.6 kg [30lb] at 0.3 m [1ft] with all screws torqued to 5.65 N•m [50 in•lb].



**SLM-1-40**

Swivellink Bases (Metric) Selection Guide*				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-1</a>	\$32.00	Round ball base	149.7 [5.28]	<a href="#">PDF</a>
<a href="#">SLM-1-40</a>	\$47.50	Narrow ball base	149.7 [5.28]	<a href="#">PDF</a>

\* These bases fit SureFrame 40 Series and 45 Series T-slotted rail.

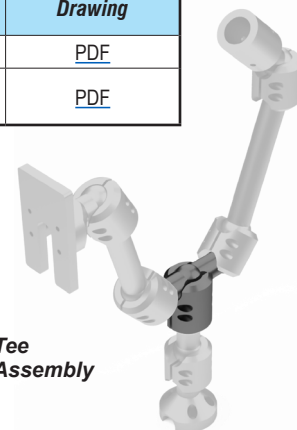


**SLM-1**



**SLM-2**

Swivellink Knuckle (Metric) Selection Guide				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-2</a>	\$40.50	Knuckle	155.6 [5.49]	<a href="#">PDF</a>
<a href="#">SLM-2-2XS</a>	\$44.00	Standard to XS Series coupler	55.3 [1.95]	<a href="#">PDF</a>



**Tee Assembly**

Swivellink Tee (Metric) Selection Guide					
Part Number	Price	Description	Length (mm [in])	Weight (g [oz])	Drawing
<a href="#">SLM-3T</a>	\$28.50	Tee link	100 [3.94]	62.1 [2.19]	<a href="#">PDF</a>
<a href="#">SLM-290</a>	\$41.50	Tee knuckle	NA	146.1 [5.15]	<a href="#">PDF</a>



**SLM-3-50**

Swivellink Links (Metric) Selection Guide						
Part Number	Price	Description	Length (mm [in])	Weight (g [oz])	Drawing	
<a href="#">SLM-3-50</a>	\$20.50	Ball link	50 [1.97]	41.7 [1.47]	<a href="#">PDF</a>	
<a href="#">SLM-3-100</a>	\$29.50		100 [3.94]	58.1 [2.05]	<a href="#">PDF</a>	
<a href="#">SLM-3-150</a>	\$26.00		150 [5.91]	74.4 [2.62]	<a href="#">PDF</a>	
<a href="#">SLM-3-200</a>	\$31.00		200 [7.87]	90.7 [3.20]	<a href="#">PDF</a>	
<a href="#">SLM-3-300</a>	\$44.00		300 [11.81]	107.0 [3.78]	<a href="#">PDF</a>	

Swivellink Handle Kit (Metric) Selection Guide				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-CLAMP-HANDLE</a>	\$21.50	Clamp handle kit	40.8 [1.44]	<a href="#">PDF</a>



**SLM-CLAMP-HANDLE**

# Swivellink Mounting System Standard Series Accessories



## Blank Mounting Plates



**AFSB-6**



**SLM-6**

The AFSB-6 (Imperial/English) and SLM-6 (metric) mounting plates allow users to customize mounting holes for their specific application.

Swivellink Generic Mounting Accessories Blank Mounting Plate Selection Guide					
Part Number	Price	Description	Fits To	Weight (oz [g])	Drawing
<b>AFSB-6</b>	\$29.50	Blank mounting plate	AFSB-1 and AFSB-1-15	6.11 [173.3]	<a href="#">PDF</a>
<b>SLM-6</b>	\$30.50		SLM-1 and SLM-1-40	6.11 [173.3]	<a href="#">PDF</a>

## Barrel Sensor Mounts

The barrel sensor mount accessories allow use with standard threaded barrel sensors of 18mm and 30mm diameter.

Swivellink Generic Mounting Accessories Knuckle Selection Guide					
Part Number	Price	Description	For Use With	Weight (oz [g])	Drawing
<b>AFSB-7</b>	\$29.00	Mounting for 30mm barrel sensor	AFSB-2 and AFSB-290	5.84 [165.6]	<a href="#">PDF</a>
<b>AFSB-8</b>	\$30.50	Mounting for 18mm barrel sensor	AFSB-2 and AFSB-290	5.26 [149.2]	<a href="#">PDF</a>
<b>SLM-7</b>	\$36.50	Mounting for 30mm barrel sensor	SLM-2 and SLM-290	5.84 [165.6]	<a href="#">PDF</a>
<b>SLM-8</b>	\$37.00	Mounting for 18mm barrel sensor	SLM-2 and SLM-290	5.26 [149.2]	<a href="#">PDF</a>



**AFSB-7**



**AFSB-8**



**SLM-7**

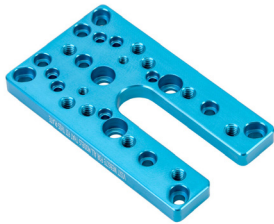


**SLM-8**

# Swivellink Mounting System Standard Series Mounting Plates



## Mounting Plates for Cognex, Dalsa and Keyence



**AFSB-5**



**SLM-5**

Swivellink Versatile Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b>AFSB-5</b>	\$43.00	Versatile mounting plate	<a href="#">AFSB-1</a> and <a href="#">AFSB-1-15</a>	5.38 [152.4]	<a href="#">PDF</a>
<b>SLM-5</b>	\$46.00		<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	5.38 [152.4]	<a href="#">PDF</a>

AFSB-5 and SLM-5 Versatile Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>Cognex</b>	Dataman 70 Mounting Plate
<b>Cognex</b>	Dataman 100 Mounting Plate
<b>Cognex</b>	Dataman 200 Mounting Plate
<b>Cognex</b>	Dataman 260 Mounting Plate
<b>Cognex</b>	Dataman 280 Mounting Plate
<b>Cognex</b>	Insight 5000 Series Mounting Plate
<b>Cognex</b>	Insight 9902L Series Mounting Plate
<b>Cognex</b>	Insight 9912 Series Mounting Plate
<b>Dalsa</b>	Boa Vision Mounting Plate
<b>Keyence</b>	IV-150 Vision Mounting Plate
<b>Keyence</b>	IV-2000 Vision Mounting Plate
<b>Keyence</b>	IV-500 Vision Mounting Plate

Note: Device compatibility was verified at time of launch.

## Mounting Plates for Cognex

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b>AFSB-521-C-DI</b>	\$46.00	Mounting plate	<a href="#">AFSB-1</a> and <a href="#">AFSB-1-15</a>	5.30 [150.1]	<a href="#">PDF</a>
<b>SLM-521-C-DI</b>	\$46.00		<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	5.30 [150.1]	<a href="#">PDF</a>



**AFSB-521-C-DI**

AFSB-521-C-DI and SLM-521-C-DI Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>Cognex</b>	Dataman 300 Mounting Plate
<b>Cognex</b>	Insight 7000 Series Mounting Plate

Note: Device compatibility was verified at time of launch.



**SLM-521-C-DI**

# Swivellink Mounting System Standard Series Mounting Plates



## Mounting Plates for WenglorTPL and Keyence



**AFSB-550-K-CVIV**



**SLM-550-K-CVIV**

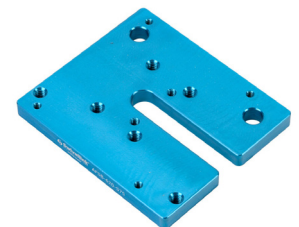
Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b><u>AFSB-550-K-CVIV</u></b>	\$38.50	Mounting plate	<a href="#">AFSB-1</a> and <a href="#">AFSB-1-15</a>	6.37 [180.5]	<a href="#">PDF</a>
<b><u>SLM-550-K-CVIV</u></b>	\$41.00		<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	6.37 [180.5]	<a href="#">PDF</a>

AFSB-550-K-CVIV and SLM-550-K-CVIV Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>WenglorTPL</b>	OPT2400 through OPT2407
<b>Keyence</b>	IV-150 Vision Mounting Plate
<b>Keyence</b>	IV-2000 Vision Mounting Plate
<b>Keyence</b>	IV-500 Vision Mounting Plate
<b>Keyence</b>	IV-H2000MA Series Mounting Plate
<b>Keyence</b>	IV-H500CA Vision Mounting Plate
<b>Keyence</b>	IV-H500MA Vision Mounting Plate

Note: Device compatibility was verified at time of launch.

## Mounting Plates for Smart Vision Lights (Brick Lights)

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b><u>AFSB-620-S75</u></b>	\$46.00	Mounting plate	<a href="#">AFSB-1</a> and <a href="#">AFSB-1-15</a>	8.5 [240.9]	<a href="#">PDF</a>
<b><u>SLM-620-S75</u></b>	\$46.00		<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	8.5 [240.9]	<a href="#">PDF</a>



**AFSB-620-S75**



**SLM-620-S75**

AFSB-620-S75 and SLM-620-S75 Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>Smart Vision Lights</b>	ODS75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	ODSB75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	ODSW75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	S75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	SB75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	SC75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	SW75 Brick Light Mounting Plate

Note: Device compatibility was verified at time of launch.

# Swivellink Mounting System Standard Series Mounting Plates



## Mounting Plates for Smart Vision Lights (Bar Lights)



**AFSB-621-L300**



**SLM-621-L300**

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b>AFSB-621-L300</b>	\$59.00	Mounting plate	AFSB-1 and AFSB-1-15	14.86 [421.4]	<a href="#">PDF</a>
<b>SLM-621-L300</b>	\$59.00	Mounting plate	SLM-1 and SLM-1-40	14.86 [421.4]	<a href="#">PDF</a>

AFSB-621-L300 and SLM-621-L300 Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
Smart Vision Lights	L300 Bar Light Mounting Plate
Smart Vision Lights	LB300 Bar Light Mounting Plate
Smart Vision Lights	LC300 Bar Light Mounting Plate

Note: Device compatibility was verified at time of launch.

## Mounting Plates for Cognex Insight

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b>AFSB-523-C-I2000</b>	\$46.00	Mounting plate	AFSB-1 and AFSB-1-15	3.57 [101.2]	<a href="#">PDF</a>
<b>SLM-523-C-I2000</b>	\$46.00		SLM-1 and SLM-1-40	3.57 [101.2]	<a href="#">PDF</a>



**AFSB-523-C-I2000**

AFSB-523-C-I2000 and SLM-523-C-I2000 Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
Cognex	Insight 2000 Series Mounting Plate
Cognex	Insight 8000 Series Mounting Plate

Note: Device compatibility was verified at time of launch.



**SLM-523-C-I2000**

# Swivellink Mounting System Standard Series Mounting Plates



## Mounting Plates for Banner, Dalsa, IFM and Wenglor



**SLM-540-IFM**

### Swivellink Mounting Plates Selection Guide

Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<a href="#">SLM-540-IFM</a>	\$40.00	Mounting plate	<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	5.38 [152.4]	<a href="#">PDF</a>

### AFSB-621-L300 and SLM-621-L300 Mounting Plates Device Compatibility

Brand	Mounting Plate/Adapter
<b>IFM</b>	01D Barcode Reader
<b>IFM</b>	02D Vision Camera
<b>IFM</b>	03D 3-Dimensional Camera
<b>Banner</b>	Q5X Mounting Plate
<b>Dalsa</b>	Boa 2 Vision Mounting Plate
<b>Wenglor</b>	Weqube Vision Camera

Note: Device compatibility was verified at time of launch.

## Mounting Plates for VESA

### Swivellink Mounting Plates Selection Guide

Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<a href="#">AFSB-9</a>	\$60.00	VESA mounting plate	<a href="#">AFSB-1</a> and <a href="#">AFSB-1-15</a>	11.86 [336.1]	<a href="#">PDF</a>
<a href="#">SLM-9</a>	\$60.00		<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	11.86 [336.1]	<a href="#">PDF</a>

Note: Carrying capacity varies with overall length and system configuration. The Standard Series can hold up 30lb [13.6 kg] at 1ft [0.3 m] with all screws torqued to 50 in·lb [5.65 N·m].



**AFSB-9**



**SLM-9**



# Swivellink Mounting System Standard Series Mounting Plates



## Clamp-On Base



**AFSB-CB**



**SLM-CB**

Swivellink Mounting Plates Selection Guide						
Part Number	Price	Type	Fits to	Range of Grip	Weight (oz [g])	Drawing
<a href="#"><u>AFSB-CB</u></a>	\$92.00	Clamp-on base	<a href="#"><u>AFSB-1</u></a> and <a href="#"><u>AFSB-1-15</u></a>	0.5 to 1.25 in [12.7 to 31.8 mm]	11.65 [330.2]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-CB</u></a>	\$118.00		<a href="#"><u>SLM-1</u></a> and <a href="#"><u>SLM-1-40</u></a>	0.63 to 1.38 in [16 to 35 mm]	11.65 [330.2]	<a href="#"><u>PDF</u></a>

# Swivellink Mounting System XS Series (Imperial/English Units)



Swivellink Mounts are a better way to mount vision cameras, lights, and sensors. Because of the flexibility and range of Swivellink's patented design, you can fine-tune each installation to just about any position required. Components are made from aluminum alloy for light weight and structural rigidity. Both Metric and Imperial/English versions are available; however, they are not interchangeable.

This page describes Swivellink's AFSB components, which are blue in color and are in Imperial/English units.

Consider the following when selecting your components:

- Amount of weight the mount will be holding
- The overall length of the mount
- The area you have to work with

Carrying capacity varies with overall length and system configuration. The XS Series can hold up 3lb [1.36 kg] at 1ft [0.3m] with all screws torqued to 50 in•lb [5.65 N•m].



**AFSB-1XS**

Swivellink Bases (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-1XS</a>	\$15.00	Round ball base	0.67 [19.1]	<a href="#">PDF</a>

Recommended Screw Sizes for Attaching to SureFrame (T-Slot Nuts Also Required)											
Part Number	Qty	10 Series		15 Series		30 Series		40 Series		45 Series	
		Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number
<a href="#">AFSB-1XS</a>	2	Socket head socket cap screw 10-32, 1/2 in	<a href="#">162995</a>	Button head socket cap screw 10-32, 5/8 in	<a href="#">161047</a>	Socket head cap screw M5-0.8, 12mm	<a href="#">161091</a>	Socket head cap screw M5-0.8, 16mm	Not available from ADC	Socket head cap screw M5-0.8, 16mm	Not available from ADC



**AFSB-2XS**

Swivellink Knuckle (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-2XS</a>	\$31.00	Knuckle	1.46 [41.3]	<a href="#">PDF</a>
<a href="#">AFSB-2-2XS</a>	\$44.00	Standard to XS Series coupler	1.95 [55.3]	

Swivellink Tee (Imperial/English) Selection Guide					
Part Number	Price	Description	Length (in [mm])	Weight (oz [g])	Drawing
<a href="#">AFSB-3XST</a>	\$13.00	Tee link	3 [76.2]	0.77 [21.8]	<a href="#">PDF</a>
<a href="#">AFSB-2XS90</a>	\$32.50	Tee knuckle	NA	1.71 [48.5]	<a href="#">PDF</a>



**AFSB-3XST**



**AFSB-2XS90**



**AFSB-3-2XS**

Swivellink Links (Imperial/English) Selection Guide					
Part Number	Price	Description	Length (in [mm])	Weight (oz [g])	Drawing
<a href="#">AFSB-3-2XS</a>	\$16.00	Ball link	2 [50.8]	0.54 [15.4]	<a href="#">PDF</a>
<a href="#">AFSB-3-4XS</a>	\$23.00		4 [101.6]	0.83 [23.6]	<a href="#">PDF</a>

Swivellink Handle Kit (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-CLAMP-HANDLE</a>	\$21.50	Clamp handle kit	1.44 [40.8]	<a href="#">PDF</a>



**AFSB-CLAMP-HANDLE**

# Swivellink Mounting System XS Series (Metric Units)



Swivellink Mounts are a better way to mount vision cameras, lights, and sensors. Because of the flexibility and range of Swivellink's patented design, you can fine-tune each installation to just about any position required. Components are made from aluminum alloy for light weight and structural rigidity. Both Metric and Imperial/English versions are available; however, they are not interchangeable.

This page describes Swivellink's SLM components, which are gray in color and are in Metric units.

Consider the following when selecting your components:

- Amount of weight the mount will be holding
- The overall length of the mount
- The area you have to work with

Carrying capacity varies with overall length and system configuration. The Standard Series can hold up 1.36 kg [3lb] at 0.3 m [1ft] with all screws torqued to 5.65 N•m [50 in•lb].



**SLM-1XS**

Swivellink Bases (Metric) Selection Guide				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-1XS</a>	\$15.00	Round ball base	19.1 [0.67]	<a href="#">PDF</a>

## Recommended Screw Sizes for Attaching to SureFrame (T-Slot Nuts Also Required)

Part Number	Qty	10 Series		15 Series		30 Series		40 Series		45 Series	
		Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number
<a href="#">SLM-1XS</a>	2	Socket head socket cap screw 10-32, 1/2 in	<a href="#">162995</a>	Button head socket cap screw 10-32, 5/8 in	<a href="#">161047</a>	Socket head cap screw M5-0.8, 12mm	<a href="#">161091</a>	Socket head cap screw M5-0.8, 16mm	Not available from ADC	Socket head cap screw M5-0.8, 16mm	Not available from ADC



**SLM-2-2XS**

Swivellink Knuckle (Metric) Selection Guide				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-2XS</a>	\$31.00	Knuckle	41.3 [1.46]	<a href="#">PDF</a>
<a href="#">SLM-2-2XS</a>	\$44.00	Standard to XS Series coupler	55.3 [1.95]	<a href="#">PDF</a>

## Swivellink Tee (Metric) Selection Guide

Part Number	Price	Description	Length (mm [in])	Weight (g [oz])	Drawing
<a href="#">SLM-3XST</a>	\$13.00	Tee link	100 [3.94]	21.8 [0.77]	<a href="#">PDF</a>
<a href="#">SLM-2XS90</a>	\$32.50	Tee knuckle	NA	36.3 [1.28]	<a href="#">PDF</a>



**SLM-3XST**



**SLM-2XS90**



**SLM-3-50XS**

## Swivellink Links (Metric) Selection Guide

Part Number	Price	Description	Length (mm [in])	Weight (g [oz])	Drawing
<a href="#">SLM-3-50XS</a>	\$16.50	Ball link	50 [1.97]	15.4 [0.54]	<a href="#">PDF</a>
<a href="#">SLM-3-100XS</a>	\$23.00		100 [3.94]	23.6 [0.83]	<a href="#">PDF</a>

## Swivellink Handle Kit (Metric) Selection Guide

Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-CLAMP-HANDLE</a>	\$21.50	Clamp handle kit	40.8 [1.44]	<a href="#">PDF</a>



**SLM-CLAMP-HANDLE**

# Swivellink Mounting System XS Series Accessories



## Blank Mounting Plates



**AFSB-6XS**



**SLM-6XS**

The AFSB-6XS (Imperial/English) and SLM-6XS (metric) mounting plates allow users to customize mounting holes for their specific application.

Swivellink Generic Mounting Accessories Blank Mounting Plate Selection Guide					
Part Number	Price	Description	Fits To	Weight (oz [g])	Drawing
<a href="#"><u>AFSB-6XS</u></a>	\$16.50	Blank mounting plate	<a href="#"><u>AFSB-1XS</u></a>	2.99 [84.8]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-6XS</u></a>	\$16.50		<a href="#"><u>SLM-1XS</u></a>	2.99 [84.8]	<a href="#"><u>PDF</u></a>

## Barrel Sensor Mounts

The barrel sensor mount accessories allow use with standard threaded barrel sensors of 18mm and 30mm diameter.

Swivellink Generic Mounting Accessories Knuckle Selection Guide					
Part Number	Price	Description	For Use With	Weight (oz [g])	Drawing
<a href="#"><u>AFSB-7XS</u></a>	\$25.00	Mounting for 12mm barrel sensor	<a href="#"><u>AFSB-2XS</u></a> and <a href="#"><u>AFSB-2-2XS</u></a>	0.8 [22.7]	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-8XS</u></a>	\$20.50	Mounting for 8mm barrel sensor	<a href="#"><u>AFSB-2XS</u></a> and <a href="#"><u>AFSB-2-2XS</u></a>	0.94 [26.8]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-7XS</u></a>	\$35.50	Mounting for 12mm barrel sensor	<a href="#"><u>SLM-2XS</u></a> and <a href="#"><u>SLM-2-2XS</u></a>	0.8 [22.7]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-8XS</u></a>	\$30.50	Mounting for 8mm barrel sensor	<a href="#"><u>SLM-2XS</u></a> and <a href="#"><u>SLM-2-2XS</u></a>	0.94 [26.8]	<a href="#"><u>PDF</u></a>



**AFSB-7XS**



**AFSB-8XS**



**SLM-7XS**



**SLM-8XS**

## Camera Stem Mounts

The camera stem mounts allow use with standard camera mounts. This link has a standard tripod mount (1/4 in - 20) screw on it.

Swivellink Generic Mounting Accessories Camera Stem Mounts Selection Guide					
Part Number	Price	Description	For Use With	Weight (oz [g])	Drawing
<a href="#"><u>AFSB-5XS</u></a>	\$18.50	Camera stem mount	<a href="#"><u>AFSB-2XS</u></a> and <a href="#"><u>AFSB-2-2XS</u></a>	0.5 [14.1]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-5XS</u></a>	\$26.50		<a href="#"><u>SLM-2XS</u></a> and <a href="#"><u>SLM-2-2XS</u></a>	0.5 [14.1]	<a href="#"><u>PDF</u></a>



**AFSB-5XS**



**SLM-5XS**

# Swivellink Mounting System Mounting Plates



## Sensor Brackets

Choose sensor bracket holder based on size (Standard vs XS) and series (AFSB vs SLM).  
Then choose the sensor bracket based on the size of sensor barrel.

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b>Sensor Bracket Holders (Standard)</b>					
<a href="#"><u>AFSB-SBH</u></a>	\$43.50	Sensor bracket holder for standard series knuckles	Fits to Standard Series knuckle (ie <a href="#"><u>AFSB-2</u></a> )	2.51 [71.2]	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-SBH-XS</u></a>	\$38.50	Sensor bracket holder for XS series knuckles	Fits to XS Series knuckle (ie <a href="#"><u>AFSB-2XS</u></a> )	0.8 [22.7]	<a href="#"><u>PDF</u></a>
<b>Sensor Brackets (Standard)</b>					
<a href="#"><u>AFSB-SB-8</u></a>	\$9.50	Sensor bracket 8mm	Fits to <a href="#"><u>AFSB-SBH</u></a> or <a href="#"><u>AFSB-SBH-XS</u></a>	1.63 [46.3]	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-SB-12</u></a>	\$9.75	Sensor bracket 12mm		1.57 [44.5]	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-SB-18</u></a>	\$14.00	Sensor bracket 18mm		1.41 [39.9]	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-SB-30</u></a>	\$14.00	Sensor bracket 30mm		2.14 [60.8]	<a href="#"><u>PDF</u></a>



[AFSB-SBH](#)



[AFSB-SB-12](#)



[SLM-SBH](#)



[SLM-SB-30](#)

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<b>Sensor Bracket Holders (Metric)</b>					
<a href="#"><u>SLM-SBH</u></a>	\$31.00	Metric sensor bracket holder for standard series knuckles	Fits to Standard Series knuckle (ie <a href="#"><u>SLM-2</u></a> )	2.5 [70.8]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SBH-XS</u></a>	\$27.50	Metric sensor bracket holder for XS series knuckles	Fits to XS Series knuckle (ie. <a href="#"><u>SLM-2XS</u></a> )	0.8 [22.7]	<a href="#"><u>PDF</u></a>
<b>Sensor Brackets (Metric)</b>					
<a href="#"><u>SLM-SB-8</u></a>	\$9.50	Metric sensor bracket 8mm	Fits to <a href="#"><u>SLM-SBH</u></a> or <a href="#"><u>SLM-SBH-XS</u></a>	1.63 [46.3]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SB-12</u></a>	\$9.75	Metric sensor bracket 12mm		1.57 [44.5]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SB-18</u></a>	\$10.00	Metric sensor bracket 18mm		1.41 [39.9]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SB-30</u></a>	\$10.50	Metric sensor bracket 30mm		2.14 [60.8]	<a href="#"><u>PDF</u></a>

# Swivellink Mounting System Assemblies



## Mounting System Assemblies

Mounting system assemblies come with 2 bases, 2 knuckles and a link.

Standard Mounting System Assemblies Selection Guide				
Part Number	Price	Measurement Type	Length of Link	Drawing
<a href="#"><u>AFSB-1002</u></a>	\$187.00	Imperial	2in	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-1004</u></a>	\$190.00		4in	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-1006</u></a>	\$193.00		6in	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-10050</u></a>	\$187.00	Metric	50mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-100100</u></a>	\$190.00		100mm	<a href="#"><u>PDF</u></a>



**AFSB-1004**



**SLM-100100**



**AFSB-1004XS**



**SLM-100100XS**

Extra Small Standard Mounting System Assemblies Selection Guide				
Part Number	Price	Measurement Type	Length of Link	Drawing
<a href="#"><u>AFSB-1002XS</u></a>	\$130.00	Imperial	2in	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-1004XS</u></a>	\$137.00		4in	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-10050XS</u></a>	\$130.00	Metric	50mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-100100XS</u></a>	\$136.50		100mm	<a href="#"><u>PDF</u></a>

## Sensor Mounting Kit Assemblies

Sensor mounting kit assemblies come with 1 base, 1 knuckle, 1 sensor bracket holder, and 1 sensor bracket.

Sensor Mounting Kit Assemblies Selection Guide				
Part Number	Price	Measurement Type	Length of Link	Drawing
<a href="#"><u>AFSB-SBKIT-8</u></a>	\$126.00	Imperial	8mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-SBKIT-12</u></a>	\$126.00		12mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-SBKIT-18</u></a>	\$130.00		18mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>AFSB-SBKIT-30</u></a>	\$130.00		30mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SBKIT-8</u></a>	\$113.00	Metric	8mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SBKIT-12</u></a>	\$113.00		12mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SBKIT-18</u></a>	\$114.00		18mm	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-SBKIT-30</u></a>	\$114.00		30mm	<a href="#"><u>PDF</u></a>



**AFSB-SBKIT-12**



**SLM-SBKIT-30**



# Swivellink Mounting System (Imperial/English Units)



Swivellink Mounts are a better way to mount vision cameras, lights, and sensors. Because of the flexibility and range of Swivellink's patented design, you can fine-tune each installation to just about any position required. Components are made from aluminum alloy for light weight and structural rigidity. Both Metric and Imperial/English versions are available; however, they are not interchangeable.

This page describes Swivellink's AFSB components, which are blue in color and are in Imperial/English units.

Consider the following when selecting your components:

- Amount of weight the mount will be holding
- The overall length of the mount
- The area you have to work with

Carrying capacity varies with overall length and system configuration. The Standard series can hold up to 30lb [13.6 kg] at 1ft [0.3 m] with all screws torqued to 50 in·lb [5.65 N·m].



**AFSB-1-15**

Swivellink Bases (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-1</a>	\$32.00	Round ball base	5.28 [149.7]	<a href="#">PDF</a>
<a href="#">AFSB-1-15</a>	\$47.50	Narrow ball base	5.28 [149.7]	<a href="#">PDF</a>



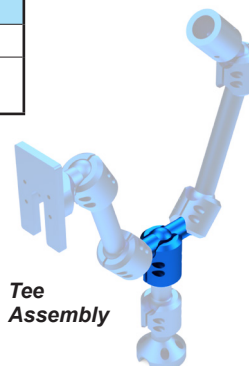
**AFSB-1**

Recommended Screw Sizes for Attaching to SureFrame (T-Slot Nuts Also Required)											
Part Number	Qty	10 Series		15 Series		30 Series		40 Series		45 Series	
		Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number
<a href="#">AFSB-1</a>	4	Socket head cap screw	<a href="#">151040</a>	Socket head cap screw	<a href="#">161087</a>	Socket head cap screw	<a href="#">161094</a>	Socket head cap screw	<a href="#">161095</a>	Socket head cap screw	<a href="#">161096</a>
<a href="#">AFSB-1-15</a>	2	1/4-20, 1/2 in		1/4-20, 5/8 in		M6-1.0, 14mm		M6-1.0, 16mm		M6-1.0, 18mm	



**AFSB-2**

Swivellink Knuckle (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-2</a>	\$40.50	Knuckle	5.49 [155.6]	<a href="#">PDF</a>
<a href="#">AFSB-2-2XS</a>	\$44.00	Standard to XS Series coupler	1.95 [55.3]	<a href="#">PDF</a>



**Tee Assembly**

Swivellink Tee (Imperial/English) Selection Guide					
Part Number	Price	Description	Length (in [mm])	Weight (oz [g])	Drawing
<a href="#">AFSB-3T</a>	\$28.50	Tee link	4 [101.6]	2.19 [62.1]	<a href="#">PDF</a>
<a href="#">AFSB-290</a>	\$41.50	Tee knuckle	NA	5.15 [146.1]	<a href="#">PDF</a>



**AFSB-3-2**

Swivellink Links (Imperial/English) Selection Guide					
Part Number	Price	Description	Length (in [mm])	Weight (oz [g])	Drawing
<a href="#">AFSB-3-2</a>	\$20.00	Ball link	2 [50.8]	1.47 [41.7]	<a href="#">PDF</a>
<a href="#">AFSB-3-4</a>	\$23.00		4 [101.6]	2.05 [58.1]	<a href="#">PDF</a>
<a href="#">AFSB-3-6</a>	\$26.00		6 [152.4]	2.62 [74.4]	<a href="#">PDF</a>
<a href="#">AFSB-3-8</a>	\$31.00		8 [203.2]	3.20 [90.7]	<a href="#">PDF</a>
<a href="#">AFSB-3-12</a>	\$37.00		12 [304.8]	3.78 [107.0]	<a href="#">PDF</a>

Swivellink Handle Kit (Imperial/English) Selection Guide				
Part Number	Price	Description	Weight (oz [g])	Drawing
<a href="#">AFSB-CLAMP-HANDLE</a>	\$21.50	Clamp handle kit	1.44 [40.8]	<a href="#">PDF</a>



**AFSB-CLAMP-HANDLE**

# Swivellink Mounting System Standard Series (Metric Units)



Swivellink Mounts are a better way to mount vision cameras, lights, and sensors. Because of the flexibility and range of Swivellink's patented design, you can fine-tune each installation to just about any position required. Components are made from aluminum alloy for light weight and structural rigidity. Both Metric and Imperial/English versions are available; however, they are not interchangeable.

This page describes Swivellink's SLM components, which are gray in color and are in Metric units.

Consider the following when selecting your components:

- Amount of weight the mount will be holding
- The overall length of the mount
- The area you have to work with

Carrying capacity varies with overall length and system configuration. The Standard series can hold up to 30lb [13.6 kg] at 1ft [0.3 m] with all screws torqued to 50 in·lb [5.65 N·m].



**SLM-1-40**

Swivellink Bases (Metric) Selection Guide				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-1</a>	\$32.00	Round ball base	149.7 [5.28]	<a href="#">PDF</a>
<a href="#">SLM-1-40</a>	\$47.50	Narrow ball base	149.7 [5.28]	<a href="#">PDF</a>



**SLM-1**

Recommended Screw Sizes for Attaching to SureFrame (T-Slot Nuts Also Required)											
Part Number	Qty	10 Series		15 Series		30 Series		40 Series		45 Series	
		Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number	Screw	Part Number
<a href="#">SLM-1</a>	4	Button head socket cap screw	<a href="#">161047</a>	Button head socket cap screw	<a href="#">161048</a>	Socket head cap screw	<a href="#">161096</a>	Socket head cap screw	<a href="#">161063</a>	Socket head cap screw	<a href="#">161063</a>
<a href="#">SLM-1-40</a>	2	10-32, 5/8 in		10-32, 3/4 in		M6-1.0, 18mm		M6-1.0, 20mm		M6-1.0, 20mm	



**SLM-2**

Swivellink Knuckle (Metric) Selection Guide				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-2</a>	\$40.50	Knuckle	155.6 [5.49]	<a href="#">PDF</a>
<a href="#">SLM-2-2XS</a>	\$44.00	Standard to XS Series coupler	55.3 [1.95]	<a href="#">PDF</a>



**Tee Assembly**

Swivellink Tee (Metric) Selection Guide					
Part Number	Price	Description	Length (mm [in])	Weight (g [oz])	Drawing
<a href="#">SLM-3T</a>	\$28.50	Tee link	100 [3.94]	62.1 [2.19]	<a href="#">PDF</a>
<a href="#">SLM-290</a>	\$41.50	Tee knuckle	NA	146.1 [5.15]	<a href="#">PDF</a>



**SLM-3-50**

Swivellink Links (Metric) Selection Guide					
Part Number	Price	Description	Length (mm [in])	Weight (g [oz])	Drawing
<a href="#">SLM-3-50</a>	\$20.50	Ball link	50 [1.97]	41.7 [1.47]	<a href="#">PDF</a>
<a href="#">SLM-3-100</a>	\$29.50		100 [3.94]	58.1 [2.05]	<a href="#">PDF</a>
<a href="#">SLM-3-150</a>	\$26.00		150 [5.91]	74.4 [2.62]	<a href="#">PDF</a>
<a href="#">SLM-3-200</a>	\$31.00		200 [7.87]	90.7 [3.20]	<a href="#">PDF</a>
<a href="#">SLM-3-300</a>	\$44.00		300 [11.81]	107.0 [3.78]	<a href="#">PDF</a>

Swivellink Handle Kit (Metric) Selection Guide				
Part Number	Price	Description	Weight (g [oz])	Drawing
<a href="#">SLM-CLAMP-HANDLE</a>	\$21.50	Clamp handle kit	40.8 [1.44]	<a href="#">PDF</a>



**SLM-CLAMP-HANDLE**

# Swivellink Mounting System Standard Series Accessories



## Blank Mounting Plates



**AFSB-6**



**SLM-6**

The AFSB-6 (Imperial/English) and SLM-6 (metric) mounting plates allow users to customize mounting holes for their specific application.

Swivellink Generic Mounting Accessories Blank Mounting Plate Selection Guide					
Part Number	Price	Description	Fits To	Weight (g [oz])	Drawing
<b><u>AFSB-6</u></b>	\$29.50	Blank mounting plate	AFSB-1 and AFSB-1-15	6.11 [173.3]	<a href="#">PDF</a>
<b><u>SLM-6</u></b>	\$30.50	Blank mounting plate	SLM-1 and SLM-1-40	6.11 [173.3]	<a href="#">PDF</a>

## Barrel Sensor Mounts

The barrel sensor mount accessories allow use with standard threaded barrel sensors of 18mm and 30mm diameter.

Swivellink Generic Mounting Accessories Knuckle Selection Guide					
Part Number	Price	Description	For Use With	Weight (oz [g])	Drawing
<b><u>AFSB-7</u></b>	\$29.00	Mounting for 30mm barrel sensor	AFSB-2 and AFSB-290	5.84 [165.6]	<a href="#">PDF</a>
<b><u>AFSB-8</u></b>	\$30.50	Mounting for 18mm barrel sensor	AFSB-2 and AFSB-290	5.26 [149.2]	<a href="#">PDF</a>
<b><u>SLM-7</u></b>	\$36.50	Mounting for 30mm barrel sensor	SLM-2 and SLM-290	5.84 [165.6]	<a href="#">PDF</a>
<b><u>SLM-8</u></b>	\$37.00	Mounting for 18mm barrel sensor	SLM-2 and SLM-290	5.26 [149.2]	<a href="#">PDF</a>



**AFSB-7**



**AFSB-8**



**SLM-7**



**SLM-8**

# Swivellink Mounting System Standard Series Mounting Plates



## Mounting Plates for Cognex, Dalsa and Keyence



**AFSB-5**



**SLM-5**

Swivellink Versatile Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<a href="#">AFSB-5</a>	\$43.00	Versatile mounting plate	<a href="#">AFSB-1</a> and <a href="#">AFSB-1-15</a>	5.38 [152.4]	<a href="#">PDF</a>
<a href="#">SLM-5</a>	\$46.00	Versatile mounting plate	<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	5.38 [152.4]	<a href="#">PDF</a>

AFSB-5 and SLM-5 Versatile Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>Cognex</b>	Dataman 70 Mounting Plate
<b>Cognex</b>	Dataman 100 Mounting Plate
<b>Cognex</b>	Dataman 200 Mounting Plate
<b>Cognex</b>	Dataman 260 Mounting Plate
<b>Cognex</b>	Dataman 280 Mounting Plate
<b>Cognex</b>	Insight 5000 Series Mounting Plate
<b>Cognex</b>	Insight 9902L Series Mounting Plate
<b>Cognex</b>	Insight 9912 Series Mounting Plate
<b>Dalsa</b>	Boa Vision Mounting Plate
<b>Keyence</b>	IV-150 Vision Mounting Plate
<b>Keyence</b>	IV-2000 Vision Mounting Plate
<b>Keyence</b>	IV-500 Vision Mounting Plate

Note: Device compatibility was verified at time of launch.

## Mounting Plates for Cognex

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<a href="#">AFSB-521-C-DI</a>	\$46.00	Mounting plate	<a href="#">AFSB-1</a> and <a href="#">AFSB-1-15</a>	5.30 [150.1]	<a href="#">PDF</a>
<a href="#">SLM-521-C-DI</a>	\$46.00	Mounting plate	<a href="#">SLM-1</a> and <a href="#">SLM-1-40</a>	5.30 [150.1]	<a href="#">PDF</a>



**AFSB-521-C-DI**

AFSB-521-C-DI and SLM-521-C-DI Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>Cognex</b>	Dataman 300 Mounting Plate
<b>Cognex</b>	Insight 7000 Series Mounting Plate

Note: Device compatibility was verified at time of launch.



**SLM-521-C-DI**

# Swivellink Mounting System Standard Series Mounting Plates



## Mounting Plates for WenglorTPL and Keyence



**AFSB-550-K-CVIV**



**SLM-550-K-CVIV**

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<a href="#"><u>AFSB-550-K-CVIV</u></a>	\$38.50	Mounting plate	<a href="#"><u>AFSB-1</u></a> and <a href="#"><u>AFSB-1-15</u></a>	6.37 [180.5]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-550-K-CVIV</u></a>	\$41.00	Mounting plate	<a href="#"><u>SLM-1</u></a> and <a href="#"><u>SLM-1-40</u></a>	6.37 [180.5]	<a href="#"><u>PDF</u></a>

AFSB-550-K-CVIV and SLM-550-K-CVIV Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>WenglorTPL</b>	OPT2400 through OPT2407
<b>Keyence</b>	IV-150 Vision Mounting Plate
<b>Keyence</b>	IV-2000 Vision Mounting Plate
<b>Keyence</b>	IV-500 Vision Mounting Plate
<b>Keyence</b>	IV-H2000MA Series Mounting Plate
<b>Keyence</b>	IV-H500CA Vision Mounting Plate
<b>Keyence</b>	IV-H500MA Vision Mounting Plate

Note: Device compatibility was verified at time of launch.

## Mounting Plates for Smart Vision Lights (Brick Lights)

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<a href="#"><u>AFSB-620-S75</u></a>	\$46.00	Mounting plate	<a href="#"><u>AFSB-1</u></a> and <a href="#"><u>AFSB-1-15</u></a>	8.5 [240.9]	<a href="#"><u>PDF</u></a>
<a href="#"><u>SLM-620-S75</u></a>	\$46.00	Mounting plate	<a href="#"><u>SLM-1</u></a> and <a href="#"><u>SLM-1-40</u></a>	8.5 [240.9]	<a href="#"><u>PDF</u></a>



**AFSB-620-S75**

AFSB-620-S75 and SLM-620-S75 Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
<b>Smart Vision Lights</b>	ODS75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	ODSB75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	ODSW75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	S75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	SB75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	SC75 Brick Light Mounting Plate
<b>Smart Vision Lights</b>	SW75 Brick Light Mounting Plate



**SLM-620-S75**

Note: Device compatibility was verified at time of launch.



# Swivellink Mounting System Standard Series Mounting Plates



## Mounting Plates for Smart Vision Lights (Bar Lights)



[AFSB-621-L300](#)



[SLM-621-L300](#)

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<u><a href="#">AFSB-621-L300</a></u>	\$59.00	Mounting plate	<u><a href="#">AFSB-1</a></u> and <u><a href="#">AFSB-1-15</a></u>	14.86 [421.4]	<u><a href="#">PDF</a></u>
<u><a href="#">SLM-621-L300</a></u>	\$59.00	Mounting plate	<u><a href="#">SLM-1</a></u> and <u><a href="#">SLM-1-40</a></u>	14.86 [421.4]	<u><a href="#">PDF</a></u>

AFSB-621-L300 and SLM-621-L300 Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
Smart Vision Lights	L300 Bar Light Mounting Plate
Smart Vision Lights	LB300 Bar Light Mounting Plate
Smart Vision Lights	LC300 Bar Light Mounting Plate

Note: Device compatibility was verified at time of launch.

## Mounting Plates for Cognex Insight

Swivellink Mounting Plates Selection Guide					
Part Number	Price	Type	Fits to	Weight (oz [g])	Drawing
<u><a href="#">AFSB-523-C-I2000</a></u>	\$46.00	Mounting plate	<u><a href="#">AFSB-1</a></u> and <u><a href="#">AFSB-1-15</a></u>	3.57 [101.2]	<u><a href="#">PDF</a></u>
<u><a href="#">SLM-523-C-I2000</a></u>	\$46.00	Mounting plate	<u><a href="#">SLM-1</a></u> and <u><a href="#">SLM-1-40</a></u>	3.57 [101.2]	<u><a href="#">PDF</a></u>



[AFSB-523-C-I2000](#)

AFSB-523-C-I2000 and SLM-523-C-I2000 Mounting Plates Device Compatibility	
Brand	Mounting Plate/Adapter
Cognex	Insight 2000 Series Mounting Plate
Cognex	Insight 8000 Series Mounting Plate

Note: Device compatibility was verified at time of launch.



[SLM-523-C-I2000](#)



# Contrinex Read-Write Modules IO-Link Capable RFID (13.56 MHz)

## RFID

RFID (Radio Frequency Identification) technology is useful in a wide range of automation and logistics applications.

This technology allows objects to be identified by means of electronic labels (also known as tags or transponders). Compared to more traditional approaches such as bar codes or laser marking, RFID technology offers a number of significant advantages. For example:

- A direct line of sight between the tag and the read/write module is not needed to read or write data.
- Information stored in the tag can be added, modified or replaced.
- Human error is reduced while increasing reliability, flexibility and traceability.

There are three standard frequencies of RFID:

- Low-Frequency (30 to 300 KHz – most are 125 to 134.2 KHz). Various application-specific standards apply
- High-Frequency (13.56 MHz) (ISO/IEC 15693)
- Ultra High-Frequency (860 to 960 MHz) (ISO/IEC 18000-63)

While there are pros and cons for each type of system, the High Frequency systems allow for fast communication between transponder and read/write modules. Contrinex IO-Link ready RFID technology operates on 13.56 MHz and complies with ISO/IEC 15693 and is therefore compatible with any components that meet this standard. The series has been designed for easy, cost-effective integration into existing control systems.

## Simplicity of IO-Link

IO-Link is a standardized protocol (IEC 61131-9) that enables connection of intelligent devices, similar to the Contrinex RFID Read-Write Modules, to an automation system.

Communication takes place between an IO-Link master and one or more IO-Link devices. IO-Link is a point-to-point communication system and is not a fieldbus. A master module has one or more ports, and one device can be connected to each port.

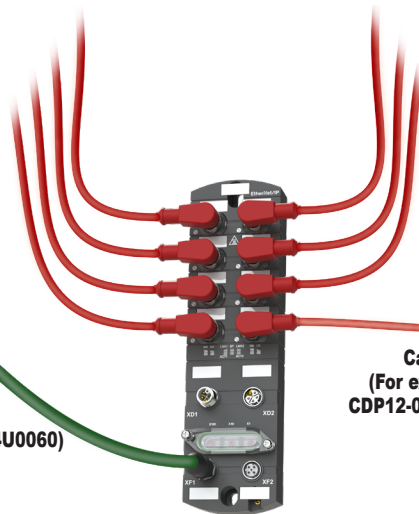
The IO-Link master module serves as the interface between the IO-Link devices and the controller (PLC or Computer). The example below uses an IO-Link Master to communicate using EtherNet/IP.



**Productivity PLC  
(For example,  
P1-540)**



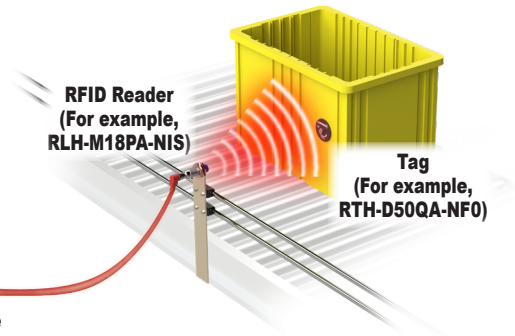
**Cable  
(For example,  
7700-44761-S4U0060)**



**IO-Link Master  
(For example, SIOL-  
E18B)**

**RFID Reader  
(For example,  
RLH-M18PA-NIS)**

**Cable  
(For example,  
CDP12-0B-030-BB)**



**Tag  
(For example,  
RTH-D50QA-NF0)**



## Contrinex RHL Read/Write Units

Once the RLH unit is attached to the IO-Link master, the SIO functions of the device can be configured. Note that the SIO outputs will only be active if the IO-Link is not active. After the RLH unit is attached to the PLC using IO-Link, a lot more data will be available to the PLC.

- Read the identification of the Read-Write unit (for example: Manufacture, Firmware Version, Part Number, etc.)
- How long the RFID tag has been present
- Tag history
- Diagnostics
- Write to the tag
- Read the tag

And many more functions.

# Contrinex Read-Write Modules IO-Link Capable RFID (13.56 MHz)



**RLH-C44PA-NIS**



**RLH-M30PA-NIS**



**RLH-M18PA-NIS**

## Features

- IO-Link for greatly simplified RFID integration
- Available in M18 and M30 barrel sizes as well as 44mm cubic housing
- IO-Link compatible (V 1.1).
- IO-Link Class A device
- Simple I/O (SIO) mode available
- IP68/IP69K option available
- Complies with ISO/IEC 15693 (High Frequency) 13.56 MHz

## Applications

- Track and trace
- Production automation
- Process control
- Automatic sorting systems
- Logistics and distribution
- Access control
- Machine tools
- Robotics
- Packaging System
- Automotive Industry
- Pharmaceutical



## Agency Approvals

- CE, UL (E239373)



## Simple I/O (SIO) Mode

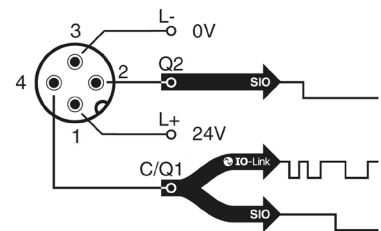
If the Read/Write unit has a simple task, then the device may be able to be used in Simple I/O Mode.

Out of the box, the read/write module is configured to simultaneously trigger both of its outputs upon tag detection. The two outputs can be individually reconfigured for data block comparison, tag IN-RANGE time over threshold, or tag is too far from reader (RSSI is below threshold) via an IO-Link master.

Full functionality is available when the module is used as an IO-Link device.

Contrinex HF RFID Read-Write Module Selection Guide					
Part Number	Price	Housing Size	IP Rating	Weight (g [oz])	Drawing
<a href="#">RLH-C44PA-NIS</a>	\$169.00	40 x 40 x 67 mm [1.57 x 1.57 x 2.64]	IP68/IP69K	105g [3.7 oz]	<a href="#">PDF</a>
<a href="#">RLH-M30PA-NIS</a>	\$169.00	30mm [1.18 in] diameter 63.5 mm [2.5 in] length	IP67	87g [3.1 oz]	<a href="#">PDF</a>
<a href="#">RLH-M18PA-NIS</a>	\$158.00	18mm [0.71 in] diameter 63.5 mm [2.5 in] length	IP67	37g [1.3 oz]	<a href="#">PDF</a>

## Connection Diagram



Standard HF RFID Read-Write Module Specifications			
	<a href="#">RLH-C44PA-NIS</a>	<a href="#">RLH-M30PA-NIS</a>	<a href="#">RLH-M18PA-NIS</a>
Supply Voltage	11-32 VDC		
Maximum Current	≤ 50mA (with no load)		
Maximum Output Current	≤ 200mA (per output)		
Maximum Operating Temperature	-25° to 80°C [-13° to 176°F]		
Maximum Storage Temperature	-25° to 80°C [-13° to 176°F]		
Maximum Cable Length	20m [65.62 ft]		
Housing Material	PBTP (polybutylene terephthalate polymer)	Chrome-plated brass	Chrome-plated brass
Sensing Face Material	PBTP (polybutylene terephthalate polymer)		
Tightening Force	0.6 N•m [0.4 lb•ft] (on M12 connector)	70 N•m [51.6 lb•ft]	25 N•m [18.4 lb•ft]

# Contrinex 13.56 MHz HF RFID Tags



## Standard HF RFID Tags



RTH-D20QA-ND0



RTH-D30QA-ND0



RTH-D50QA-NF0

RFID tags (also known as transponders) are electronic devices that store data. Each tag has fixed memory which stores a unique preset number (i.e., an identifier) as well as user memory which can be written to for storing data. Writable data may include, for example, the object's history or the parameters of operations to which it will be subjected.

## EEPROM Tag Features

- Unlimited read cycles
- 100,000 write cycles
- 4 bytes per block
- Fully complies with ISO/IEC 15693 (High Frequency) 13.56 MHz

## FRAM Tag Features

- Unlimited read cycles
- $10^{12}$  write cycles
- Larger amount of memory
- 8 bytes per block

## Applications

- Track and trace
- Production automation
- Process control
- Automatic sorting systems
- Logistics and distribution
- Access control

## Agency Approvals

- CE



## Standard HF RFID Tag Selection Guide

Part Number	Price	Pack Size	Diameter (mm [in])	Memory Type	User Memory Size	IP Rating	Component Material	Operating Temperature	Storage Temperature	Tightening Torque	Weight (g [oz])	Drawing
<a href="#">RTH-D09RA-NF0-901</a>	\$50.00	10	9 [0.35]	EEPROM	316 bytes	IP67	Epoxy + PPS (Polyphenylene sulfide)	-20° to 85°C [-4° to 185°F]	-20° to 110°C [-4° to 230°F]	NA	0.25 g [0.01 oz]	<a href="#">PDF</a>
<a href="#">RTH-D16RA-NF0-901</a>	\$45.00	10	16 [0.63]	EEPROM	316 bytes	IP67					0.75 g [0.03 oz]	<a href="#">PDF</a>
<a href="#">RTH-D20QA-NF0-901</a>	\$80.00	10	20 [0.79]	EEPROM	316 bytes	IP68 IP69K	PPA (Polyphthalamide)	-25° to 80°C [-13° to 176°F]	-40° to 90°C [-40° to 194°F]	1 N•m [0.74 lb•ft]	1.3 g [0.05 oz]	<a href="#">PDF</a>
<a href="#">RTH-D20QA-ND0</a>	\$11.00	1	20 [0.79]	FRAM	2000 bytes	IP68 IP69K					1.3 g [0.05 oz]	<a href="#">PDF</a>
<a href="#">RTH-D30QA-NF0-901</a>	\$80.00	10	30 [1.18]	EEPROM	316 bytes	IP68 IP69K					3g [0.11 oz]	<a href="#">PDF</a>
<a href="#">RTH-D30QA-ND0</a>	\$17.50	1	30 [1.18]	FRAM	2000 bytes	IP68 IP69K					3g [0.11 oz]	<a href="#">PDF</a>
<a href="#">RTH-D50QA-NF0</a>	\$9.50	1	50 [1.97]	EEPROM	316 bytes	IP68 IP69K					9.5 g [0.34 oz]	<a href="#">PDF</a>
<a href="#">RTH-D50QA-ND0</a>	\$19.50	1	50 [1.97]	FRAM	2000 bytes	IP68 IP69K					9.5 g [0.34 oz]	<a href="#">PDF</a>

## High-Temperature HF RFID Tag

High-temperature RFID tags feature 100% silicone-free construction and thermal cycling reliability of 1000 hours (or 1000 cycles). Passive tags from the high-temperature family are ideal for use in paintshops and other high-temperature environments. Tags are insensitive to dirt, and their housings have an IP68 and IP69K enclosure rating. They are also fully ISO/IEC 15693-compliant. Tags are made from PPS (polyphenylene sulfide).

## High-Temperature HF RFID Tag Selection Guide

Part Number	Price	Diameter (mm [in])	Memory Type	User Memory	IP Rating	Operating Temperature	Storage Temperature	Tightening Torque	Weight (g [oz])	Drawing
<a href="#">RTP-0263-020</a>	\$11.00	26 [1.97]	EEPROM	160 bytes	IP68 IP69K	-25 to 180°C [-13 to 356°F]	-40 to 180°C [-40 to 356°F]	1 N•m [0.74 lb•ft]	3.3 g [0.12 oz]	<a href="#">PDF</a>



RTP-0263-020

# Contrinex 13.56 MHz HF RFID Tags

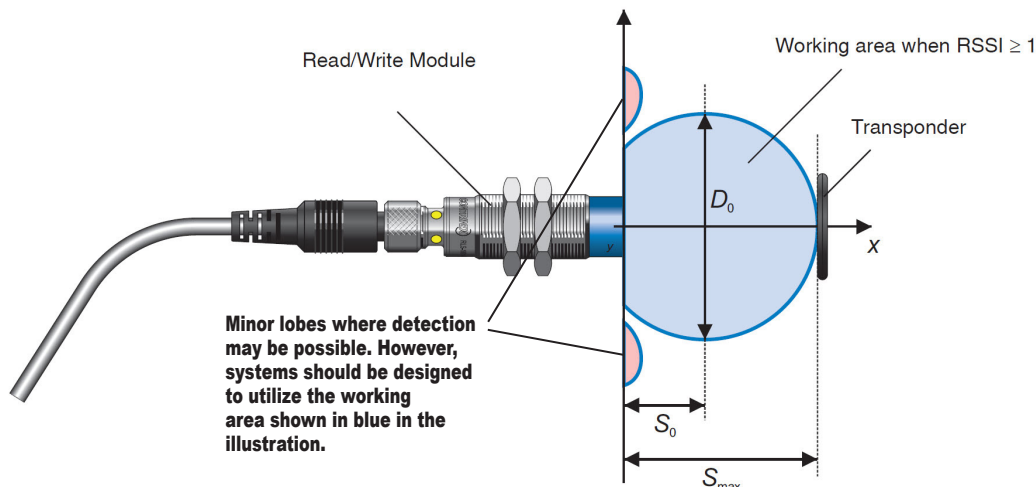


## Working Distance Tables

Typical Working Distances When Using RLH-C44PA-NIS			
Tag (Transponder) Part Number	$S_{max}$ (mm [in])	$S_o$ (mm [in])	$D_o$ (mm [in])
Ø 9 <a href="#">RTH-D09RA-NF0-901</a>	24 [0.94]	9 [0.35]	32 [1.26]
Ø 16 <a href="#">RTH-D16RA-NF0-901</a>	40 [1.57]	20 [0.79]	44 [1.73]
Ø 20 <a href="#">RTH-D20QA-NF0-901</a>	40 [1.57]	18 [0.71]	44 [1.73]
Ø 20 <a href="#">RTH-D20QA-ND0</a>	38 [1.50]	17 [0.67]	42 [1.65]
Ø 26 <a href="#">RTP-0263-020</a>	38 [1.50]	17 [0.67]	44 [1.73]
Ø 30 <a href="#">RTH-D30QA-NF0-901</a>	44 [1.73]	21 [0.83]	48 [1.89]
Ø 30 <a href="#">RTH-D30QA-ND0</a>	46 [1.81]	23 [0.91]	52 [2.05]
Ø 50 <a href="#">RTH-D50QA-NF0</a>	64 [2.52]	32 [1.26]	68 [2.68]
Ø 50 <a href="#">RTH-D50QA-ND0</a>	58 [2.28]	26 [1.02]	66 [2.60]

Typical Working Distances When Using RLH-M30PA-NIS			
Tag (Transponder) Part Number	$S_{max}$ (mm [in])	$S_o$ (mm [in])	$D_o$ (mm [in])
Ø 9 <a href="#">RTH-D09RA-NF0-901</a>	17 [0.67]	5.5 [0.22]	24 [0.94]
Ø 16 <a href="#">RTH-D16RA-NF0-901</a>	28 [1.10]	13 [0.51]	31 [1.22]
Ø 20 <a href="#">RTH-D20QA-NF0-901</a>	26 [1.02]	12 [0.47]	30 [1.18]
Ø 20 <a href="#">RTH-D20QA-ND0</a>	26 [1.02]	11.5 [0.45]	31 [1.22]
Ø 26 <a href="#">RTP-0263-020</a>	33 [1.30]	15 [0.59]	36 [1.42]
Ø 30 <a href="#">RTH-D30QA-NF0-901</a>	30 [1.18]	13 [0.51]	38 [1.50]
Ø 30 <a href="#">RTH-D30QA-ND0</a>	34 [1.34]	15 [0.59]	38 [1.50]
Ø 50 <a href="#">RTH-D50QA-NF0</a>	46 [1.81]	19 [0.75]	54 [2.13]
Ø 50 <a href="#">RTH-D50QA-ND0</a>	44 [1.73]	18 [0.71]	54 [2.13]

Typical Working Distances When Using RLH-M18PA-NIS			
Tag (Transponder) Part Number	$S_{max}$ (mm [in])	$S_o$ (mm [in])	$D_o$ (mm [in])
Ø 9 <a href="#">RTH-D09RA-NF0-901</a>	11 [0.43]	3.5 [0.14]	15 [0.59]
Ø 16 <a href="#">RTH-D16RA-NF0-901</a>	19 [0.75]	8.5 [0.33]	22 [0.87]
Ø 20 <a href="#">RTH-D20QA-NF0-901</a>	18 [0.71]	8 [0.31]	21 [0.83]
Ø 20 <a href="#">RTH-D20QA-ND0</a>	17 [0.67]	6 [0.24]	21 [0.83]
Ø 26 <a href="#">RTP-0263-020</a>	15 [0.59]	4 [0.16]	21 [0.83]
Ø 30 <a href="#">RTH-D30QA-NF0-901</a>	22 [0.87]	9 [0.35]	28 [1.10]
Ø 30 <a href="#">RTH-D30QA-ND0</a>	19 [0.75]	5 [0.20]	28 [1.10]
Ø 50 <a href="#">RTH-D50QA-NF0</a>	24 [0.94]	6 [0.24]	42 [1.65]
Ø 50 <a href="#">RTH-D50QA-ND0</a>	20 [0.79]	0 [0]	44 [1.73]





# AutomationDirect Standalone HF (13.56 MHz) RFID Read/Write Unit

## RFID

RFID (Radio Frequency Identification) technology is useful in a wide range of automation and logistics applications.

This technology allows objects to be identified by means of electronic labels (also known as tags or transponders). Compared to more traditional approaches such as bar codes or laser marking, RFID technology offers a number of significant advantages. For example:

- A direct line of sight between the tag and the read/write module is not needed to read or write data.
- Information stored in the tag can be added, modified or replaced.
- Human error is reduced while increasing reliability, flexibility and traceability.

There are three standard frequencies for RFID:

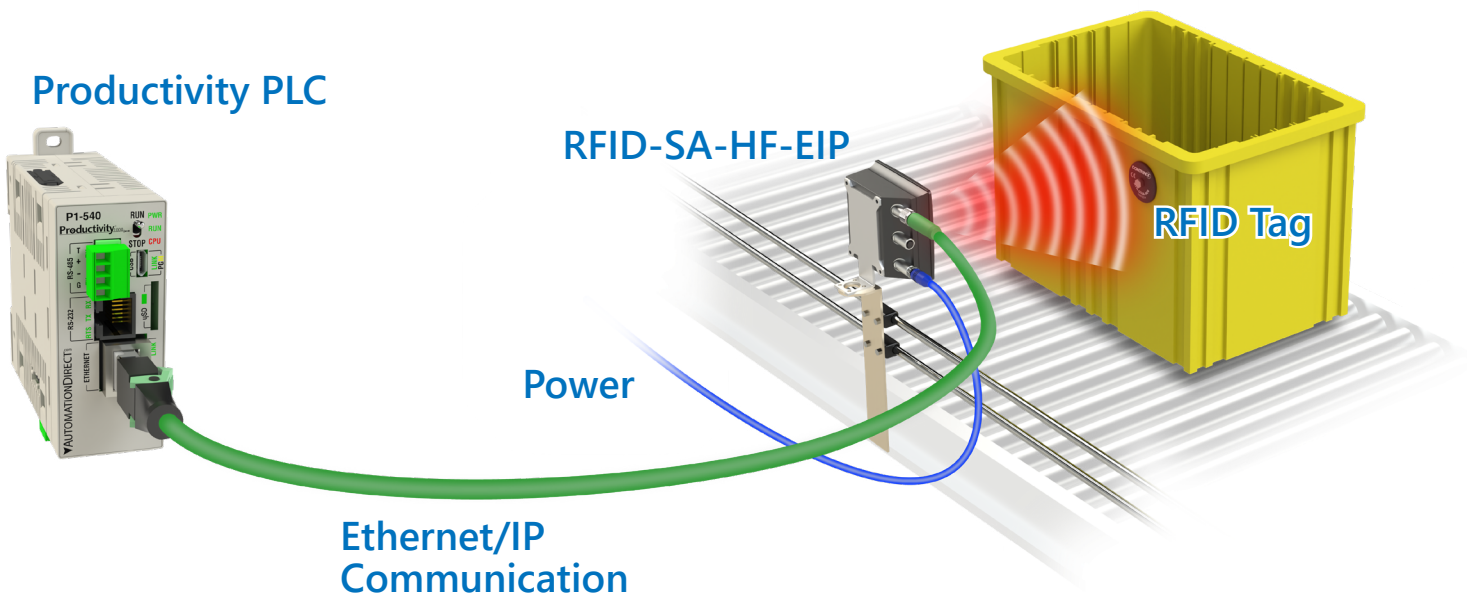
- Low-Frequency (30 to 300 KHz – most are 125 to 134.2 KHz). Various application-specific standards apply
- High-Frequency (13.56 MHz) (ISO/IEC 15693)
- Ultra High-Frequency (international range 860 to 960 MHz, US range 902-928 MHz) (ISO/IEC 18000-63)

It is worth noting that NFC (Near Field Communication) also operates on the 13.56 MHz frequency. The NFC standard is detailed in ISO14443 and ISO18092. Some items that comply with NFC also comply with ISO15693. However, not all items that comply with 15693 also comply with NFC.

While there are pros and cons for each type of system, the High Frequency systems allow for fast communication between transponder and read/write modules. AutomationDirect RFID technology operates on 13.56 MHz and complies with ISO/IEC 15693 and is therefore compatible with any components that meet this standard. The series has been designed for easy, cost-effective integration into existing control systems.



**RFID-SA-HF-EIP**



# AutomationDirect Standalone HF (13.56 MHz) RFID Read/Write Unit



**RFID-SA-HF-EIP**

Designed for simple integration into an existing network, the AutomationDirect Standalone HF Read/Write unit is optimized for high speed, high payload data transfer. The unit also contains an internal Ethernet switch for easy incorporation into a prewired network.

## Features

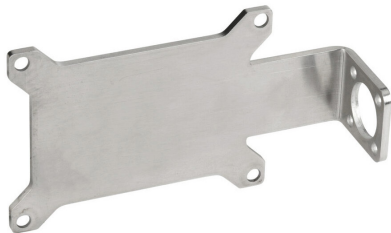
- Compact standalone unit with antenna, evaluation unit and integrated communication fieldbus
- EtherNet/IP communications
- Two configurable digital I/O points
- Complies with ISO/IEC

## Applications

- Track and trace
- Production automation
- Process control
- Automatic sorting systems
- Logistics and distribution
- Access control
- Machine tools
- Robotics
- Packaging System
- Automotive Industry
- Pharmaceutical

AutomationDirect RFID Read/Write Unit Selection Guide				
Part Number	Price	IP Rating	Communication Protocol	Drawing
<b><u>RFID-SA-HF-EIP</u></b>	\$647.00	IP 67	Ethernet/IP	<a href="#">PDF</a>

## Mounting Bracket



**RFID-SA-BA1**

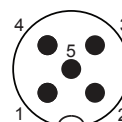
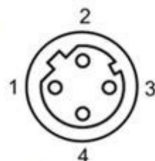
AutomationDirect RFID Unit Mounting Bracket Selection Guide				
Part Number	Price	Material	Weight	Drawing
<b><u>RFID-SA-BA1</u></b>	\$25.50	304 stainless steel	0.37 lb [168g]	<a href="#">PDF</a>

## Electrical Connections

Connection (M12 D-Coded Ethernet)	
Pin	Signal
1	TxD+, transmit data +
2	RxD+, receive data +
3	TxD-, transmit data -
4	RxD-, receive data -

Note: Unit provides two M12 D-coded Ethernet connections.

M12 5-Pin Connections		
Pin	Color	Signal
1	Brown	+24V
2	White	Digital Input/Output 2
3	Blue	0V
4	Black	Digital Input/Output 1
5	Gray	Not Used





# AutomationDirect Standalone HF (13.56 MHz) RFID Read/Write Unit

<b>AutomationDirect RFID Read/Write Unit General Specifications</b>	
<b>Electrical Data</b>	
<b>Operating Voltage</b>	19.2 to 28.8 VDC
<b>Current Consumption</b>	500mA
<b>Protection Class</b>	III
<b>Operating Frequency</b>	13.56 MHz
<b>RFID Standard</b>	ISO 15693
<b>Outputs</b>	
<b>Maximum Current Load Per Output</b>	100mA
<b>Monitoring Range</b>	
<b>Maximum Distance to ID Tag</b>	220mm
<b>Interfaces</b>	
<b>Communication Interface</b>	Ethernet
<b>Protocol</b>	Ethernet/IP
<b>Default Settings, Ethernet – TCP/IP</b>	
<b>Protocol</b>	TCP/IP
<b>Factory Settings</b>	IP address: 192.168.0.79 Subnet mask: 255.255.255.0 Gateway IP address: 192.168.0.100
<b>Usage Type</b>	Parameter setting: Data transmission
<b>Operating Conditions</b>	
<b>Ambient Temperature</b>	-20 to 60°C [-4 to 140°F]
<b>Storage Temperature</b>	-25 to 80°C [-13 to 176°F]
<b>Protection</b>	IP 67
<b>Tests/Approvals</b>	
<b>EMC</b>	EN 301489-3
<b>Shock Resistance</b>	IEC 60028-2-27 50g (11ms) / single shock
<b>Vibration Resistance</b>	EN 60068-2-6 2g (10 to 150 Hz)
<b>Radio Approval</b>	EN 300 330 V2.1.1
<b>MTTF</b>	130 years
<b>Mechanical Data</b>	
<b>Weight</b>	640.5 g [22.58 oz]
<b>Material</b>	PBT/PC, stainless steel, aluminum
<b>Displays/Operating Elements</b>	
<b>Voltage Supply</b>	1xLED, green
<b>Signal Strength LED Display</b>	4x LED, yellow
<b>Ethernet Status (per Ethernet Port)</b>	2x LED, green/yellow

# Contrinex 13.56 MHz HF RFID Tags

## Working Distance Tables

Typical Working Distances When Using RFID-SA-HF-EIP			
Tag (Transponder) Part Number	$S_{max}$ (mm [in])	$S_o$ (mm [in])	$D_o$ (mm [in])
Ø 9 <a href="#">RTH-D09RA-NF0-901</a>	Not recommended*		
Ø 16 <a href="#">RTH-D16RA-NF0-901</a>	50 [1.97]	20 [0.79]	100 [3.94]
Ø 20 <a href="#">RTH-D20QA-NF0-901</a>	80 [3.15]	30 [1.18]	130 [5.12]
Ø 20 <a href="#">RTH-D20QA-ND0</a>	75 [2.95]	30 [1.18]	130 [5.12]
Ø 26 <a href="#">RTP-0263-020</a>	90 [3.54]	40 [1.57]	135 [5.31]
Ø 30 <a href="#">RTH-D30QA-NF0-901</a>	100 [3.94]	50 [1.97]	140 [5.51]
Ø 30 <a href="#">RTH-D30QA-ND0</a>	95 [3.74]	50 [1.97]	140 [5.51]
Ø 50 <a href="#">RTH-D50QA-NF0</a>	170 [6.69]	65 [2.56]	150 [5.91]
Ø 50 <a href="#">RTH-D50QA-ND0</a>	165 [6.50]	65 [2.56]	150 [5.91]

\* The size of this particular tag requires extremely short distances to work. For this reason this particular tag is not recommended for use with the RFID-SA-HF-EIP RFID unit.

