iProx Sensors

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iProx Sensors

Product Description

The iProx® represents the highest performance, most versatile tubular inductive sensor offered by Eaton's electrical sector. By utilizing an embedded micro-processor and exclusive SmartSense™ technology, iProx can sense up to three times farther than typical sensors of its class, while providing an unheard-of level of customization.

Both shielded and unshielded versions of iProx feature extended sensing ranges. This allows the sensor to be mounted farther from the target, thereby reducing the potential for target impacts and increasing the sensing reliability of your application.

The iProx also includes a wide range of advanced features that can be enabled via optional programming tools. Using the ProxView Windows-based software package, an entirely custom sensor can be programmed to perfectly fit an application.

Sensor characteristics, such as sensing range, can be customized down to the nearest tenth of a millimeter. Outputs can be changed from NO to NC. The iProx even features built-in timing delays and speed detection logic— no PLC programming is necessary.

With extended sensing range, quality construction and the ability to adapt to its environment, iProx is the ideal choice for even the most demanding inductive sensing applications.

Application Description
Typical Applications

- Automotive
- Machine Tool
- Material Handling
- Metalworking

Features

- Available in AC two-wire, DC three-wire and unique DC four-wire with complementary (NO-NC) or dual NO outputs
- Reliably detect metal targets at up to three times the range of conventional shielded or unshielded tubular inductive sensors
- Quality construction using a stainless steel barrel, 360-degree dual-color LED indicator, Ryton® impact-resistant face cap and vibration-absorbing potting compound
- Auto-configure technology automatically detects a sinking (NPN) or sourcing (PNP) connection and switches the sensor accordingly, without any user intervention
- Exclusive SmartSense embedded microprocessor technology allows for customizable range, band sensing, nuisance metal rejection, timing delays and over/under speed detection
- Optional computer programming cable and Windows-based ProxView configuration software makes it easy to customize sensors
- Withstands high electrical noise (up to 20 V/m)
- Resistant to extreme temperatures (–40°F [–40°C])

Standards and Certifications

- cUL Listed
- CE

Safety Note

⚠ **Unless otherwise noted, the products contained in this document are not designed or intended for use in human safety applications.**

For Customer Service in the U.S. call **1-877-ETN CARE (386-2273)**, in Canada call **1-800-268-3578**. For Application Assistance in the U.S. and Canada call **1-800-426-9184**.

For the most current information on this product, visit our web site: www.eaton.com

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Product Selection

iProx Sensors

Note: Custom iProx models can also be ordered directly from the factory with pre-set ranges, outputs and connectors.
Consult the Eaton Application Engineers at 1-800-426-9184 for more information.

Two-Wire Sensors

Operating Voltage	Sensing Range	Shielding	Connection Type [1]	NO Output Catalog Number [2]	NC Output Catalog Number [2]
Extended Range	**12 mm Diameter**				
20–132 Vac	4 mm	Shielded	3-pin micro AC connector	**E59-M12A105A01-A1** ⊛	**E59-M12A105A01-A2** ⊛
			3-pin micro AC pigtail [3]	**E59-M12A105A01P-A1** ⊛	**E59-M12A105A01P-A2** ⊛
			3-pin mini AC pigtail [3]	**E59-M12A105A01PB-A1** ⊛	**E59-M12A105A01PB-A2** ⊛
Standard Range			2-meter cable	**E59-M12A105C02-A1**	**E59-M12A105C02-A2**
	10 mm	Unshielded	3-pin micro AC connector	**E59-M12C110A01-A1** ⊛	**E59-M12C110A01-A2** ⊛
			3-pin micro AC pigtail [3]	**E59-M12C110A01P-A1** ⊛	**E59-M12C110A01P-A2** ⊛
			3-pin mini AC pigtail [3]	**E59-M12C110A01PB-A1** ⊛	**E59-M12C110A01PB-A2** ⊛
			2-meter cable	**E59-M12C110C02-A1**	**E59-M12C110C02-A2**
Extended Range	**18 mm Diameter**				
20–132 Vac	8 mm	Shielded	3-pin micro AC connector	**E59-M18A109A01-A1** ⊛	**E59-M18A109A01-A2** ⊛
			3-pin micro AC pigtail [3]	**E59-M18A109A01P-A1** ⊛	**E59-M18A109A01P-A2** ⊛
			3-pin mini AC pigtail [3]	**E59-M18A109A01PB-A1** ⊛	**E59-M18A109A01PB-A2** ⊛
Standard Range			2-meter cable	**E59-M18A109C02-A1**	**E59-M18A109C02-A2**
	18 mm	Unshielded	3-pin micro AC connector	**E59-M18C118A01-A1** ⊛	**E59-M18C118A01-A2** ⊛
			3-pin micro AC pigtail [3]	**E59-M18C118A01P-A1** ⊛	**E59-M18C118A01P-A2** ⊛
			3-pin mini AC pigtail [3]	**E59-M18C118A01PB-A1** ⊛	**E59-M18C118A01PB-A2** ⊛
			2-meter cable	**E59-M18C118C02-A1**	**E59-M18C118C02-A2**
Extended Range	**30 mm Diameter**				
20–132 Vac	15 mm	Shielded	3-pin micro AC connector	**E59-M30A115A01-A1** ⊛	**E59-M30A115A01-A2** ⊛
			3-pin micro AC pigtail [3]	**E59-M30A115A01P-A1** ⊛	**E59-M30A115A01P-A2** ⊛
			3-pin mini AC pigtail [3]	**E59-M30A115A01PB-A1** ⊛	**E59-M30A115A01PB-A2** ⊛
Standard Range			2-meter cable	**E59-M30A115C02-A1**	**E59-M30A115C02-A2**
	29 mm	Unshielded	3-pin micro AC connector	**E59-M30C129A01-A1** ⊛	**E59-M30C129A01-A2** ⊛
			3-pin micro AC pigtail [3]	**E59-M30C129A01P-A1** ⊛	**E59-M30C129A01P-A2** ⊛
			3-pin mini AC pigtail [3]	**E59-M30C129A01PB-A1** ⊛	**E59-M30C129A01PB-A2** ⊛
			2-meter cable	**E59-M30C129C02-A1**	**E59-M30C129C02-A2**

Notes

⊛ See listing of compatible connector cables on **Page 130**.

[1] For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

[2] Sensors are ordered with pre-set outputs from the factory, but can be later programmed either NO or NC using the ProxView software.

[3] Standard pigtail cable length is 12 in.

Note: Custom iProx models can also be ordered directly from the factory with pre-set ranges, outputs and connectors.
Consult the Eaton Application Engineers at 1-800-426-9184 for more information.

Three-Wire Sensors

Operating Voltage	Sensing Range	Shielding	Connection Type [1]	NO Output Catalog Number [2]	NC Output Catalog Number [2]
Extended Range	**12 mm Diameter**				
6–48 Vdc	4 mm	Shielded	4-pin micro DC connector	**E59-M12A105D01-D1** ⊞	**E59-M12A105D01-D2** ⊞
			4-pin micro DC pigtail [3]	**E59-M12A105D01P-D1** ⊞	**E59-M12A105D01P-D2** ⊞
			2-meter cable	**E59-M12A105C02-D1**	**E59-M12A105C02-D2**
	10 mm	Unshielded	4-pin micro DC connector	**E59-M12C110D01-D1** ⊞	**E59-M12C110D01-D2** ⊞
			4-pin micro DC pigtail [3]	**E59-M12C110D01P-D1** ⊞	**E59-M12C110D01P-D2** ⊞
			2-meter cable	**E59-M12C110C02-D1**	**E59-M12C110C02-D2**
Extended Range	**18 mm Diameter**				
6–48 Vdc	8 mm	Shielded	4-pin micro DC connector	**E59-M18A108D01-D1** ⊞	**E59-M18A108D01-D2** ⊞
			4-pin micro DC pigtail [3]	**E59-M18A108D01P-D1** ⊞	**E59-M18A108D01P-D2** ⊞
			2-meter cable	**E59-M18A108C02-D1**	**E59-M18A108C02-D2**
	18 mm	Unshielded	4-pin micro DC connector	**E59-M18C116D01-D1** ⊞	**E59-M18C116D01-D2** ⊞
			4-pin micro DC pigtail [3]	**E59-M18C116D01P-D1** ⊞	**E59-M18C116D01P-D2** ⊞
			2-meter cable	**E59-M18C116C02-D1**	**E59-M18C116C02-D2**
Extended Range	**30 mm Diameter**				
6–48 Vdc	15 mm	Shielded	4-pin micro DC connector	**E59-M30A115D01-D1** ⊞	**E59-M30A115D01-D2** ⊞
			4-pin micro DC pigtail [3]	**E59-M30A115D01P-D1** ⊞	**E59-M30A115D01P-D2** ⊞
			2-meter cable	**E59-M30A115C02-D1**	**E59-M30A115C02-D2**
	29 mm	Unshielded	4-pin micro DC connector	**E59-M30C129D01-D1** ⊞	**E59-M30C129D01-D2** ⊞
			4-pin micro DC pigtail [3]	**E59-M30C129D01P-D1** ⊞	**E59-M30C129D01P-D2** ⊞
			2-meter cable	**E59-M30C129C02-D1**	**E59-M30C129C02-D2**

Extended Range (12 mm Diameter)

Standard Range (12 mm Diameter)

Extended Range (18 mm Diameter)

Standard Range (18 mm Diameter)

Extended Range (30 mm Diameter)

Standard Range (30 mm Diameter)

Notes

⊞ See listing of compatible connector cables on **Page 130**.

[1] For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

[2] Sensors are ordered with pre-set outputs from the factory, but can be later programmed either NO or NC using the ProxView software.

[3] Standard pigtail cable length is 12 in.

Complementary and Dual Output Sensors

Four-Wire Sensors

Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	Complementary Output (1NO-1NC) Catalog Number	Dual NO Output Catalog Number ①
Extended Range	**12 mm Diameter**					
6–48 Vdc	4 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M12A105D01-D3NN** ⊞	**E59-M12A105D01-D1NN** ⊞
				2-meter cable	**E59-M12A105C02-D3NN**	**E59-M12A105C02-D1NN**
			PNP (sourcing)	4-pin micro DC connector	**E59-M12A105D01-D3PP** ⊞	**E59-M12A105D01-D1PP** ⊞
				2-meter cable	**E59-M12A105C02-D3PP**	**E59-M12A105C02-D1PP**
	10 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M12C110D01-D3NN** ⊞	**E59-M12C110D01-D1NN** ⊞
				2-meter cable	**E59-M12C110C02-D3NN**	**E59-M12C110C02-D1NN**
			PNP (sourcing)	4-pin micro DC connector	**E59-M12C110D01-D3PP** ⊞	**E59-M12C110D01-D1PP** ⊞
				2-meter cable	**E59-M12C110C02-D3PP**	**E59-M12C110C02-D1PP**
Extended Range	**18 mm Diameter**					
6–48 Vdc	8 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M18A108D01-D3NN** ⊞	**E59-M18A108D01-D1NN** ⊞
				2-meter cable	**E59-M18A108C02-D3NN**	**E59-M18A108C02-D1NN**
			PNP (sourcing)	4-pin micro DC connector	**E59-M18A108D01-D3PP** ⊞	**E59-M18A108D01-D1PP** ⊞
				2-meter cable	**E59-M18A108C02-D3PP**	**E59-M18A108C02-D1PP**
	18 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M18C116D01-D3NN** ⊞	**E59-M18C116D01-D1NN** ⊞
				2-meter cable	**E59-M18C116C02-D3NN**	**E59-M18C116C02-D1NN**
			PNP (sourcing)	4-pin micro DC connector	**E59-M18C116D01-D3PP** ⊞	**E59-M18C116D01-D1PP** ⊞
				2-meter cable	**E59-M18C116C02-D3PP**	**E59-M18C116C02-D1PP**
Extended Range	**30 mm Diameter**					
6–48 Vdc	15 mm	Shielded	NPN (sinking)	4-pin micro DC connector	**E59-M30A115D01-D3NN** ⊞	**E59-M30A115D01-D1NN** ⊞
				2-meter cable	**E59-M30A115C02-D3NN**	**E59-M30A115C02-D1NN**
			PNP (sourcing)	4-pin micro DC connector	**E59-M30A115D01-D3PP** ⊞	**E59-M30A115D01-D1PP** ⊞
				2-meter cable	**E59-M30A115C02-D3PP**	**E59-M30A115C02-D1PP**
	29 mm	Unshielded	NPN (sinking)	4-pin micro DC connector	**E59-M30C129D01-D3NN** ⊞	**E59-M30C129D01-D1NN** ⊞
				2-meter cable	**E59-M30C129C02-D3NN**	**E59-M30C129C02-D1NN**
			PNP (sourcing)	4-pin micro DC connector	**E59-M30C129D01-D3PP** ⊞	**E59-M30C129D01-D1PP** ⊞
				2-meter cable	**E59-M30C129C02-D3PP**	**E59-M30C129C02-D1PP**

Extended Range

Standard Range

Extended Range

Standard Range

Extended Range

Standard Range

Notes

⊞ See listing of compatible connector cables on **Page 130**.

① At this time, iProx Complementary and Dual Output models are not available with auto-sink/source detection.
Therefore, PNP (sourcing) and NPN (sinking) models must be ordered separately.

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Compatible Connector Cables

Standard Cables [1]

	Current Rating at 600V	Voltage Style	Number of Pins	Gauge	Length	Pin Configuration/Wire Colors (Face View Female Shown)	PVC Jacket Catalog Number	PUR Jacket Catalog Number
Micro-Style Straight Female	**Micro-Style, Straight Female**							
	—	AC	3-pin, 3-wire	22 AWG	6.0 ft (2m)	1-Green 2-Red/Black 3-Red/White	**CSAS3F3CY2202**	**CSAS3F3RY2202**
	—	DC	4-pin, 4-wire	22 AWG	6.0 ft (2m)	1-Brown 2-White 3-Blue 4-Black	**CSDS4A4CY2202**	**CSDS4A4RY2202**
Mini-Style Straight Female	**Mini-Style, Straight Female**						**Catalog Number**	
	13A	—	3-pin	16 AWG	6 ft (2m)	1-Green 2-Black 3-White	**CSMS3F3CY1602**	

Accessories

iProx Sensors

	Description	Catalog Number
Software	Step-by-step programming software required to program iProx. Compatible with Microsoft Windows® and Windows® Mobile devices.	**E59SW1**
Cable	The iProx programming cable is used to program individual iProx sensors, providing a connection between the computer and the sensor. Connects to computer via a serial (RS-232) or USB port. (USB connection requires an adapter which is included with purchase.)	**E59RP1**
Labels	Field applied labels for iProx sensor (100 pcs)	**E59LABEL**

Note

[1] For a full selection of connector cables, see **Tab 54**, **section 54.1**.

Starter Kit

iProx Starter Kits

Description	Catalog Number
Interested in custom programming iProx sensors to fit your application?	
These kits include everything needed to get the most out of iProx: a sensor, a programming cable (E59RP1), a micro connector cable (CSDS4A4CY2202) and ProxView software on CD-ROM (E59SW1).	
Starter kit includes:	
12 mm AC unshielded iProx sensor (E59-M12C110A01-A1)	**E5912ACKIT**
12 mm DC unshielded iProx sensor (E59-M12C110D01-D1)	**E5912DCKIT**
18 mm AC unshielded iProx sensor (E59-M18C118A01-A1)	**E5918ACKIT**
18 mm DC unshielded iProx sensor (E59-M18C116D01-D1)	**E5918DCKIT**
30 mm AC unshielded iProx sensor (E59-M30C129A01-A1)	**E5930ACKIT**
30 mm DC unshielded iProx sensor (E59-M30C129D01-D1)	**E5930DCKIT**

Demo Kit

iProx Demonstration Kit

Description	Catalog Number
A powered, briefcase demo kit show-casing the capabilities of iProx and AccuProx sensors. Kit includes one 18 mm iProx sensor and one 18 mm AccuProx sensor. A quick disconnect cable and mounting system allow for fast swapping of sensors. Demo kit is powered by two replaceable 9-volt alkaline batteries.	**E59DEMO1**

Technical Data and Specifications

iProx Sensors

Description	Two-Wire Sensors	Three-Wire Sensors
Input voltage	20–132 Vac	6–48 Vdc
Load current	12 mm: 5–300 mA, 200 mA >122°F (50°C)	≤500 mA at 6–30 Vdc; ≤300 mA at 32–48 Vdc
Leakage current	≤1.7 mA at 32°F (0°C), 2.0 mA at –40°F (–40°C)	≤150 µA
Voltage drop	<5 Vac	≤2.5 Vdc
Burden current	—	≤15 mA
Protection	None	Auto reset
Switching hysteresis	<15% rated sensing distance	<15% rated sensing distance
Repeat accuracy	Shielded models: <1% sensing distance; Unshielded models: <3% sensing distance	Shielded models: <1% sensing distance; Unshielded models: <3% sensing distance
Surge capacity	3A/30 ms	—
Temperature range	–40° to 158°F (–40° to 70°C)	–40° to 158°F (–40° to 70°C)
Material of construction	303 stainless steel; end bells: polycarbonate; face caps: Ryton®; cable: AWM style 20387 (PVC)	303 stainless steel; end bells: polycarbonate; face caps: Ryton®; cable: AWM style 20387 (PVC)
Vibration and shock	Vibration: 10 to 55 Hz, 1 mm amplitude, IEC 60068-2-6; shock: 30g, 11 ms per IEC 68-2-27	Vibration: 10 to 55 Hz, 1 mm amplitude, IEC 60068-2-6; shock: 30g, 11 ms per IEC 68-2-27
Indicator LED	360° viewable LED	360° viewable LED
Enclosure ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K [1]	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) IP69K [1]

Response Time [2]

Description	Two-Wire Sensors All Two-Wire Models	Three-Wire Sensors Shielded 12 mm	18 mm	30 mm	Unshielded 12 mm	18 mm	30 mm
Factory default mode	Shipped in "Side by Side Mode" by default (20 V/m)	580 Hz (10 V/m)	390 Hz (10 V/m)	240 Hz (10 V/m)	300 Hz (10 V/m)	150 Hz (10 V/m)	145 Hz (10 V/m)
Side by side [3]	30 Hz (10 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)	50 Hz (20 V/m)
High noise immunity mode	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)	10 Hz (>20 V/m)

Notes

Ryton® is a registered trademark of Phillips Chemical (division of Phillips Petroleum).

[1] Our products conform to NEMA tests as indicated, however, some severe washdown applications can exceed these NEMA test specifications.

[2] iProx sensors may be programmed to perform in side by side or high noise immunity applications using the iProx programming cable (E59RP1) and ProxView software (E59SW1).

[3] Use the side by side response time parameter when using the iProx Tray Programmer (E59TP1), iProx programming cable (E59RP1) and ProxView software (E59SW1).

Wiring Diagrams

Pin numbers are for reference, rely on pin location when wiring.

iProx Sensors

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown) Micro	Mini
Two-Wire Sensors				
20–132 Vac	NO and NC			
Three-Wire Sensors				
6–48 Vdc	NO and NC (NPN and PNP) [1]	[2]	[2]	—
Four-Wire Dual Output and Complementary Sensors				
6–48 Vdc	NO and NC (NPN)	[3]	[3]	—
	NO and NC (PNP)	[3]	[3]	—

Dimensions
Approximate Dimensions in Inches (mm)

Cable Models
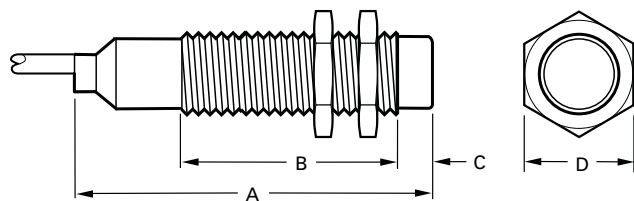
Size	Shielding	A	B	C	D
12 mm	Shielded	2.46 (62.4)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.46 (62.4)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.54 (64.5)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.54 (64.5)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.74 (69.6)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.74 (69.6)	1.41 (35.8)	0.75 (19)	1.41 (36)

Micro-Connector Models
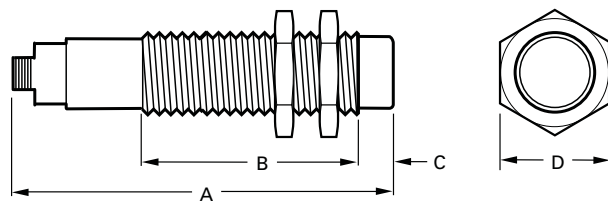
Size	Shielding	A	B	C	D
12 mm	Shielded	2.71 (68.7)	1.98 (50.3)	0.02 (0.5)	0.67 (17)
	Unshielded	2.71 (68.7)	1.64 (41.6)	0.36 (9)	0.67 (17)
18 mm	Shielded	2.73 (69.3)	2.00 (50.9)	0.02 (0.5)	0.94 (24)
	Unshielded	2.73 (69.3)	1.47 (37.4)	0.55 (14)	0.94 (24)
30 mm	Shielded	2.92 (74.1)	2.13 (54.1)	0.03 (0.75)	1.41 (36)
	Unshielded	2.92 (74.1)	1.41 (35.8)	0.75 (19)	1.41 (36)

Notes

[1] The three-wire DC version of iProx automatically configures itself to NPN or PNP based on field wiring. No user intervention is required.

[2] Pin numbers 2 and 4 are internally jumpered together. Either pin may be used.

[3] The complementary (1NO-1NC) output models feature the NC output on pin 2 (white).