

iProx Inductive Proximity Sensors

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The Cutler-Hammer® iProx represents the highest performance, most versatile tubular inductive sensor offered by Eaton's electrical business. By utilizing an embedded microprocessor 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 N.O. to N.C. Even noise immunity and response time can be adjusted if necessary. 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.

Approvals

- C-UL Listed
- CE



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

Our Highest Performance, Most Versatile Inductive Sensor Yet

Embedded Logic Can Be Enabled to Perform Advanced Sensing Functions

Potted Cable, Micro and Mini Connection Options

Vibration-Absorbing Potting Compound

Dual Color, 360-Degree Output Indicator LED

Sense up to Three Times as Far as Conventional Sensors

Shock Absorbing Ryton® Face Cap Material

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

Product Features

- Available in AC 2-Wire, DC 3-Wire and unique DC 4-Wire with complementary (N.O./N.C.) or dual N.O. 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°C)

Typical Applications

- Automotive
- Machine Tool
- Material Handling
- Metalworking

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.

Model Selection — iProx

		Operating Voltage	Sensing Range	Shielding	Connection Type ②	Catalog Number	
						N.O. Output ①	N.C. Output ①
2-Wire Sensors							
12 mm Diameter  Extended Range Standard Range	20 – 132V AC	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 ☼	
				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	
18 mm Diameter  Extended Range Standard Range	20 – 132V AC	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 ☼	
				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	
30 mm Diameter  Extended Range Standard Range	20 – 132V AC	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 ☼	
				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	

① Sensors are ordered with pre-set outputs from the factory, but can be later programmed either N.O. or N.C. using the ProxView software.

② For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

③ Standard pigtail cable length is 12 inches.

☼ See listing of compatible connector cables on **Page 3**.

■ Fast turn product with typical one business day lead-time to shipment.

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Model Selection — iProx (Continued)

	Operating Voltage	Sensing Range	Shielding	Connection Type ②	Catalog Number	
					N.O. Output ①	N.C. Output ①
3-Wire Sensors						
12 mm Diameter  Extended Range  Standard Range	6 – 48V DC	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
18 mm Diameter  Extended Range  Standard Range		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
30 mm Diameter  Extended Range  Standard Range		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

① Sensors are ordered with pre-set outputs from the factory, but can be later programmed either N.O. or N.C. using the ProxView software.

② For sensors with custom cable lengths or PUR jackets, contact Application Engineering at 1-800-426-9184.

③ Standard pigtail cable length is 12 inches.

■ Fast turn product with typical one business day lead-time to shipment.

Ⓢ See listing of compatible connector cables below.

Model Selection — Compatible Connector Cables ④

	Voltage Style	Number of Pins	Gauge	Length	Catalog Number			Pin Configuration/Wire Colors (Face View Female Shown)
					PVC Jacket	PUR Jacket	IRR PUR Jacket	

Standard Cables — Micro Style

Micro Style Straight Female 	AC	3-pin 3-wire	22 AWG	6.0 feet (2m)	CSAS3F3CY2202	CSAS3F3RY2202	—	 1-Green 2-Red/Black 3-Red/White
	DC	4-pin 4-wire	22 AWG	6.0 feet (2m)	CSDS4A4CY2202	CSDS4A4RY2202	CSDS4A4I02202	 1-Brown 2-White 3-Blue 4-Black

	Voltage Style	Number of Pins	Gauge	Length	Catalog Number	Pin Configuration/Wire Colors (Face View Female Shown)
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Standard Cables — Mini Style

Mini Style Straight Female  Current Rating @ 600V 3-pin: 13A	—	3-pin	16 AWG	6 feet (2m)	CSMS3F3CY1602	 1-Green 2-Black 3-White
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④ For a full selection of connector cables, see PG.05.05.T.E.

■ Stocked product, typical order quantities guaranteed in stock.

Model Selection — iProx Complementary and Dual Output

		Operating Voltage	Sensing Range	Shielding	Output Type	Connection Type	Catalog Number	
							Complementary Outputs (1 N.O. / 1 N.C.)	Dual N.O. Outputs ①
4-Wire Sensors								
12 mm Diameter  Extended Range Standard Range	6 – 48V DC	4 mm	Shielded	NPN (Sinking)	4-pin Micro DC Connector	E59-M12A105D01-D3NN ②	E59-M12A105D01-D1NN ②	
					2-meter Cable	E59-M12A105C02-D3NN	E59-M12A105C02-D1NN	
			PNP (Sourcing)	4-pin Micro DC Connector	E59-M12A105D01-D3PP ②	E59-M12A105D01-D1PP ②		
				2-meter Cable	E59-M12A105C02-D3PP	E59-M12A105C02-D1PP		
		10 mm	Unshielded	NPN (Sinking)	4-pin Micro DC Connector	E59-M12C110D01-D3NN ②	E59-M12C110D01-D1NN ②	
					2-meter Cable	E59-M12C110C02-D3NN	E59-M12C110C02-D1NN	
			PNP (Sourcing)	4-pin Micro DC Connector	E59-M12C110D01-D3PP ②	E59-M12C110D01-D1PP ②		
				2-meter Cable	E59-M12C110C02-D3PP	E59-M12C110C02-D1PP		
18 mm Diameter  Extended Range Standard Range		8 mm	Shielded	NPN (Sinking)	4-pin Micro DC Connector	E59-M18A108D01-D3NN ②	E59-M18A108D01-D1NN ②	
					2-meter Cable	E59-M18A108C02-D3NN	E59-M18A108C02-D1NN	
			PNP (Sourcing)	4-pin Micro DC Connector	E59-M18A108D01-D3PP ②	E59-M18A108D01-D1PP ②		
				2-meter Cable	E59-M18A108C02-D3PP	E59-M18A108C02-D1PP		
		18 mm	Unshielded	NPN (Sinking)	4-pin Micro DC Connector	E59-M18C116D01-D3NN ②	E59-M18C116D01-D1NN ②	
					2-meter Cable	E59-M18C116C02-D3NN	E59-M18C116C02-D1NN	
			PNP (Sourcing)	4-pin Micro DC Connector	E59-M18C116D01-D3PP ②	E59-M18C116D01-D1PP ②		
				2-meter Cable	E59-M18C116C02-D3PP	E59-M18C116C02-D1PP		
30 mm Diameter  Extended Range Standard Range		15 mm	Shielded	NPN (Sinking)	4-pin Micro DC Connector	E59-M30A115D01-D3NN ②	E59-M30A115D01-D1NN ②	
					2-meter Cable	E59-M30A115C02-D3NN	E59-M30A115C02-D1NN	
			PNP (Sourcing)	4-pin Micro DC Connector	E59-M30A115D01-D3PP ②	E59-M30A115D01-D1PP ②		
				2-meter Cable	E59-M30A115C02-D3PP	E59-M30A115C02-D1PP		
		29 mm	Unshielded	NPN (Sinking)	4-pin Micro DC Connector	E59-M30C129D01-D3NN ②	E59-M30C129D01-D1NN ②	
					2-meter Cable	E59-M30C129C02-D3NN	E59-M30C129C02-D1NN	
			PNP (Sourcing)	4-pin Micro DC Connector	E59-M30C129D01-D3PP ②	E59-M30C129D01-D1PP ②		
				2-meter Cable	E59-M30C129C02-D3PP	E59-M30C129C02-D1PP		

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.

② See listing of compatible connector cables on **Page 3**.

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Model Selection — Accessories

	Description	Catalog Number
	Step-by-step programming software required to program iProx. Compatible with Microsoft Windows® and Windows® Mobile devices.	E59SW1
	The iProx Programming Cable is used to program individual iProx sensors, providing a connection between the computer and the sensor. Requires an RS-232 serial port for connection to computer.	E59RP1
	The iProx Tray Programmer allows for batch programming of up to four iProx sensors at one time. Replaces the functionality of the iProx Remote Programmer (E59RP1) by connecting to your computer via included USB cable or RS-232 serial connection. (No sensors included with purchase.)	E59TP1
	iProx Tray Programmer Accessory ■ Two additional AC micro-connector cables.	E59ACMICRO
	iProx Tray Programmer Accessory ■ Two additional DC micro-connector cables.	E59DCMICRO
	iProx Tray Programmer Accessory ■ Two additional AC mini-connector cables.	E59ACMINI
	iProx Tray Programmer Accessory ■ Two additional alligator-clip cables for programming station. (For connecting potted-cable iProx sensors.)	E59CBL
	Field applied labels for iProx sensor (100 pcs)	E59LABEL

① The included PDA is correct as of print date, however it may be later substituted for an equivalent or better model. Consult Application Engineering at 1-800-426-9184 for more information.

Model Selection — iProx Starter Kit

	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 with 12 mm AC Unshielded iProx Sensor (E59-M12C110A01-A1)	E5912ACKIT
	Starter Kit with 12 mm DC Unshielded iProx Sensor (E59-M12C110D01-D1)	E5912DCKIT
	Starter Kit with 18 mm AC Unshielded iProx Sensor (E59-M18C118A01-A1)	E5918ACKIT
	Starter Kit with 18 mm DC Unshielded iProx Sensor (E59-M18C118D01-D1)	E5918DCKIT
	Starter Kit with 30 mm AC Unshielded iProx Sensor (E59-M30C129A01-A1)	E5930ACKIT
	Starter Kit with 30 mm DC Unshielded iProx Sensor (E59-M30C129D01-D1)	E5930DCKIT
	A powered, briefcase demo kit showcasing 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

Wiring Diagrams (Pin numbers are for reference, rely on pin location when wiring)

Operating Voltage	Output	Cable Models	Connector Models (Face View Male Shown)	
			Micro	Mini
2-Wire Sensors				
20 – 132V AC	N.O. and N.C.			
3-Wire Sensors				
6 – 48V DC	N.O. and N.C. (NPN and PNP) ②	①	①	—
4-Wire Dual Output and Complementary Sensors				
6 – 48V DC	N.O. and N.C. (NPN)	③	③	—
	N.O. and N.C. (PNP)	③	③	—

① Note: Pin numbers 2 and 4 are internally jumpered together. Either pin may be used.

② The 3-wire DC version of iProx automatically configures itself to NPN or PNP based on field wiring. No user intervention is required.

③ The complementary (1 N.O./1 N.C.) output models feature the N.C. output on pin 2 (white).

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Specifications — iProx

Description	2-Wire Sensors	3-Wire Sensors
Input Voltage	20 – 132V AC	6 – 48V DC
Load Current	12 mm: 5 – 300mA, 200mA > 50°C	≤500 mA @ 6 – 30V DC; ≤300 mA @ 32 – 48V DC
Leakage Current	≤1.7 mA @ 0°C, 2.0 mA @ -40°C	≤150 μA
Voltage Drop	<5V AC	≤2.5V DC
Burden Current	—	≤15 mA
Protection	None	Auto Reset
Switching Hysteresis	< 15% Rated Sensing Distance	
Repeat Accuracy	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)	
Material of Construction	303 Stainless steel; End bells: Polycarbonate; Face caps: Ryton®; Cable: AWM Style 20387 (PVC) ③	
Vibration and Shock	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	
Enclosure Ratings	NEMA 4, 4X, 6, 6P, 12 and 13 (IP67) ④	

Response Time ①	2-Wire Sensors	3-Wire Sensors					
	All 2-Wire Models	Shielded			Unshielded		
		12 mm	18 mm	30 mm	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 ②	30 Hz (10 V/m)	50 Hz (20 V/m)					
High Noise Immunity Mode	10 Hz (>20 V/m)	10 Hz (>20 V/m)					

① iProx sensors may be programmed to perform in Side by Side or High Noise immunity applications using the iProx Programming Cable (E59RP1) & ProxView software (E59SW1).

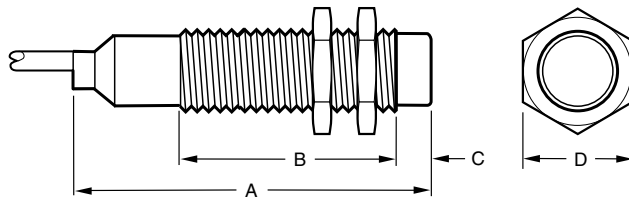
② Use the Side by Side response time parameter when using the iProx Tray Programmer (E59TP1), iProx Programming Cable (E59RP1) and ProxView software (E59SW1).

③ Ryton® is a registered trademark of Phillips Chemical (division of Phillips Petroleum).

④ Our products conform to NEMA tests as indicated, however, some severe washdown applications can exceed these NEMA test specifications. For questions about a specific application, contact our applications department at 1-800-426-9184.

Approximate Dimensions — iProx in Inches (mm)

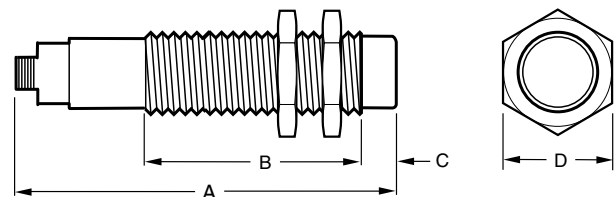
Cable Models



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



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)