Installation Instructions

Original Instructions

RightSight M30

Catalog Numbers 42AF-P2MAB1-F4,42AF-P2MAB1-D4, 42AF-P2RHB1-G4, 42AF-E1EZB1-F4, 42AF-E1EZB1-D4, 42AF-R1MAB1-D4, 42AF-R1MAB1-F4, 42AF-R1RHB1-G4, 42AF-E1UZB1-G4, 42AF-P2CHB1-A2, 42AF-R1CHB1-A2, 42AF-E1UZB1-A2, 42AF-P2SHB1-G4, 42AF-R1SHB1-G4, 42AF-P2CHB1-M5, 42AF-R1CHB1-M5, 42AF-E1UZB1-M4

IMPORTANT Save these instructions for future use.

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Description

The RightSight™ M30 family of photoelectric sensors offers high-performance general-purpose sensing in a robust flexible package. They are designed for applications where simplified installation and maintenance are required.

Designed to withstand the rigors of material handling and packaging environments, the RightSight M30 standard models can withstand IP69K high-pressure washdowns.

Features

- Right-angle housing with universal 30 mm (1.18 in.) threaded nose and 18 mm (0.71 in.) threaded base for maximum application flexibility
- 360° highly visible (status indicators helps the operators verify proper operation regardless of sensor installation location)
- Visible status indicator light source for ease of alignment
- Alignment aid helps deliver reliable operating margin
- Dual auto PNP or NPN outputs for added application flexibility
- IP67 and IP69K rated enclosure
- IO-Link 1.1 Communication protocol that is offered in all standard modes

Status Indicators

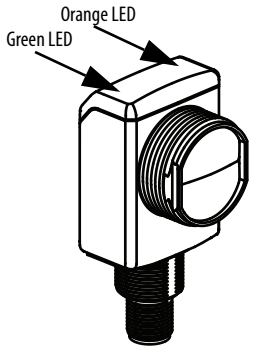


Table 1 provides indicator status in the RUN mode, during operation. The sensor is always in run mode except when being taught.

Table 1 - Standard I/O (Auto PNP/NPN) Operating Mode Indication

Color	Status	Description
Green	OFF	Power is off
	ON	Power is on
	Flash (6 Hz)	Unstable light: 0.8 X <margin<1.5X
	Flash (1.4 Hz)	Output short circuit protection active
Orange	OFF	Output de-energized
	ON	Output energized

Table 2 - I/O Link Operating Mode Indication

Color	Status	Description
Green	OFF	Power is off
	Flash (1 Hz)	Power is on
Orange	OFF	Output de-energized
	ON	Output energized

See https://ab.rockwellautomation.com/Sensors-Switches/Photoelectric-Sensors for additional details about the operation of the RightSight M30 in IO-Link mode.

Sensor User Interface

The green status indicator can also serve as a setup alignment aid. As the sensor is adjusted,

- A flashing green LED indicates that the sensor has detected a margin of 0.8 X
- A flashing green LED and solid orange output LED indicates a margin greater than 1
- Both green and orange solid LED indicates a margin greater than 1.5. This status means that the sensor is receiving at least 1.5 times the signal strength back from the target that is required to trigger an output signal.

In general, it is desirable to have a higher margin to help overcome any deteriorating environmental conditions (dust build-up on the sensor lens). When aligning the sensor, the optimum performance can be obtained if this margin indicator is illuminated with the target in place.

Specifications

Attribute	Value
Certifications	CCC, c-UL-us, and CE Marked for all applicable directives
Vibration	10…55 Hz, 1 mm (0.04 in.) amplitude, meets, or exceeds 60947-5-2
Shock	30 g with 1 ms pulse duration per IEC 60947-5-2
Ambient light immunity	Direct Illumination: 20,000 lux Indirect Illumination: 5,000 lux Sunlight immunity; 108,000 lux
User Interface	
Status indicators	Green and Orange LED
Electrical	
Adjustments	No Physical adjustment. IO-Link adjustable
Operating voltage	DC models: 10…30V DC, IO-Link: 18…30V AC/DC models: DC: 20V DC to 250V DC AC: 24V AC to 250V AC
Current consumption	35 mA max
Sensor protection	DC: Reverse polarity and short circuit AC/DC: Reverse polarity
Discrete Output	
Response time	DC: 1 ms AC/DC: 15 ms max
Output type	DC: Dual Auto PNP or NPN AC/DC: EM Relay
Load current	DC: 100 mA max AC/DC SPDT: 10 - 30V DC: 3 A 31…125V DC: 200 mA 24…250V AC: 3 A
IO-Link	
Communications mode	COM2
Cycle time, min	2 ms
Process data bit length	32 bits (4 bytes)
Specifications	1.1
Mechanical	
Housing material	PBT
Lens material	PMMA
Cover material	Polysulfone
Reliability Data	
Transmitted Beam and Polarized Retroreflective AC/DC	
MTTFd (hours)	6548788.474
T10d	78.76
Transmitted Beam and Polarized Retroreflective DC	
MTTFd (hours)	9310986.965
T10d	111.9875
Transmitted Beam Emitter AC/DC	
MTTFd (hours)	24271844.66
T10d	291.9285467
Transmitted Beam Emitter DC	
MTTFd (hours)	24271844.66
T10d	291.9285467
Environmental	
Enclosure type rating	IP67 and IP69K per ISO 20653 rated enclosure
Operating temperature	-40…+70 °C (31…158 °F) (1)
Connection type	2 m (6.5 ft) cable 4-pin Integral M12 QD 4-pin M12 QD on a 150 mm (5.9 in.) pigtail 4-pin mini QD on 150 mm pigtail 5-pin mini QD on 150 mm pigtail

(1) The sensing range for all sensing modes can be reduced up to 20% when operated between -40…-25 °C (-40…-13 °F).

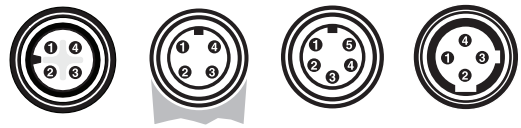
Table 3 - Connection Types

Description	Cat. No. Suffix
2 m (6.56 ft) cable	-A2
4-pin DC micro (M12) QD on 150 mm (6 in.) pigtail	-F4
Integral 4-pin DC micro (M12) QD	-D4
4-pin AC micro on 150 mm (6 in.) pigtail	-G4
4-pin mini QD on 150 mm (6 in.) pigtail	-M4
5-pin mini QD on 150 mm (6 in.) pigtail	-M5

Wiring

The quick-disconnect connector is shown in Figure 1. The pin numbers correspond to the male connectors on the sensor.

Figure 1 - Pinouts



DC Models

Figure 2 - Polarized Retroreflective (42AF-P2MAB1-F4 and 42AF-P2MAB1-D4) Light Operate and Dark Operate (Auto PNP or NPN)

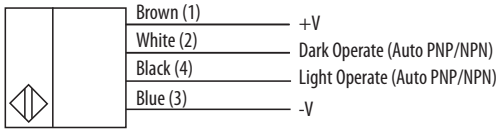


Figure 3 - Transmitted Beam Receiver (42AF-R1MAB1-D4 and 42AF-R1MAB1-F4) Light Operate and Dark Operate (Auto PNP or NPN)

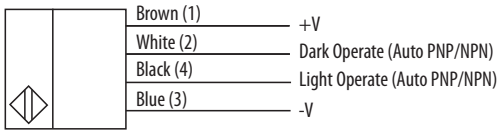
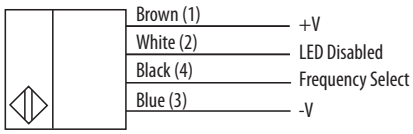


Figure 4 - Transmitted Beam Emitter (42AF-E1EZB1-D4 and 42AF-E1EZB1-F4)



LED Disable - For normal operation, the white wire needs no connection.
To disable the light source, connect the white wire to +V.

Frequency Select - For normal operation, the white wire needs no connection.
To change the emitter operating frequency, connect the black wire to +V. This feature is supported in future firmware revisions of the Transmitted Beam Receiver.

IMPORTANT For Transmitted Beam Emitter only: Do not connect pin 2 and pin 4 for normal operation. Unless a change in frequency is required when working with a receiver, these two pins remain unconnected when wiring the Transmitted Beam Emitter sensor to an Allen-Bradley® ArmorBlock® I/O module.

AC/DC Models

Figure 5 - Polarized Retroreflective and Transmitted Beam Emitter Light Operate (42AF-P2RHB1-G4 and 42AF-R1RHB1-G4)

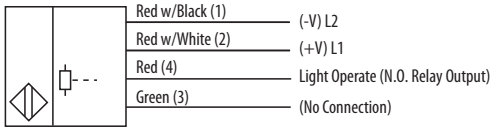


Figure 6 - Polarized Retroreflective and Transmitted Beam Emitter Dark Operate (42AF-P2SHB1-G4 and 42AF-R1SHB1-G4)

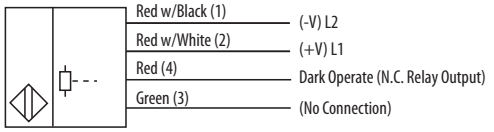


Figure 7 - Polarized Retroreflective and Transmitted Beam (42AF-P2CHB1-A2 and 42AF-R1CHB1-A2) — SPDT EM Relay

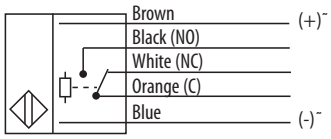


Figure 8 - Polarized Retroreflective and Transmitted Beam (42AF-P2CHB1-M5 and 42AF-R1CHB1-M5) — SPDT EM Relay

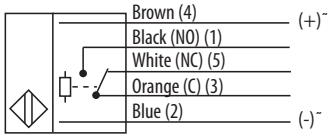


Figure 9 - Transmitted Beam Emitter (42AF-E1UZB1-A2 and 42AF-E1UZB1-G4)

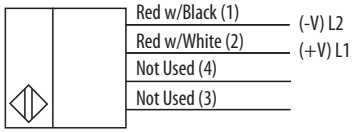


Table 4 - UL508 Overcurrent Protection

Conductor Size		Max Ampere Rating of the Overcurrent Protection
AWG	(mm^2)	
20	(0.52)	5
22	(0.32)	3
24	(0.20)	2
26	(0.13)	1
28	(0.08)	0.8
30	(0.05)	0.5

Dimensions

Figure 10 - Integral M12 Connector [mm (in.)]

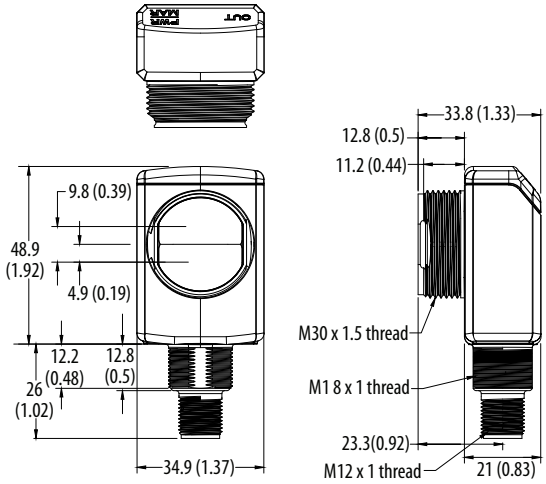
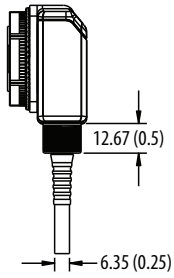


Figure 11 - M12 Pigtail and Cable Models [mm (in.)]



Typical Response Curves

Figure 12 - Visible Red Polarized Retroreflective — 10 m Margin Curve

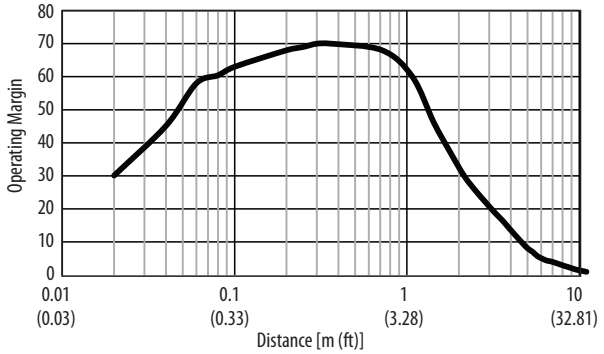


Figure 13 - Visible Red Polarized Retroreflective — 10 m Beam Pattern

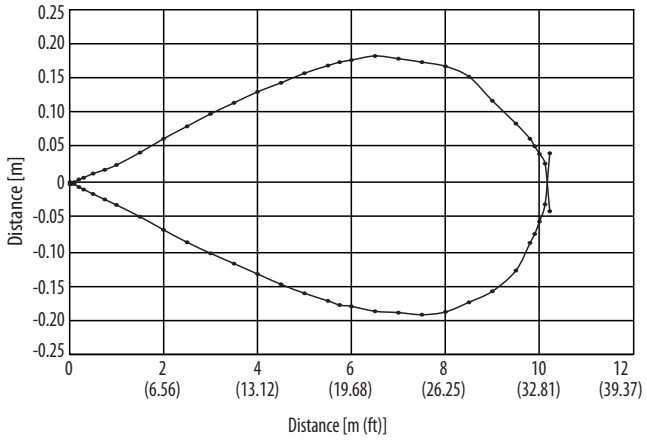


Figure 14 - Infrared Transmitted Beam Emitter — 80 m Margin Curve

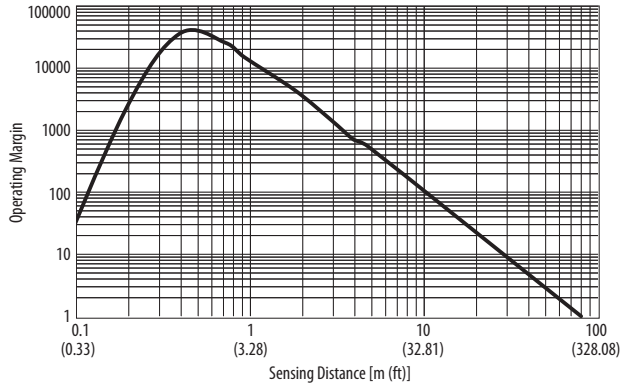
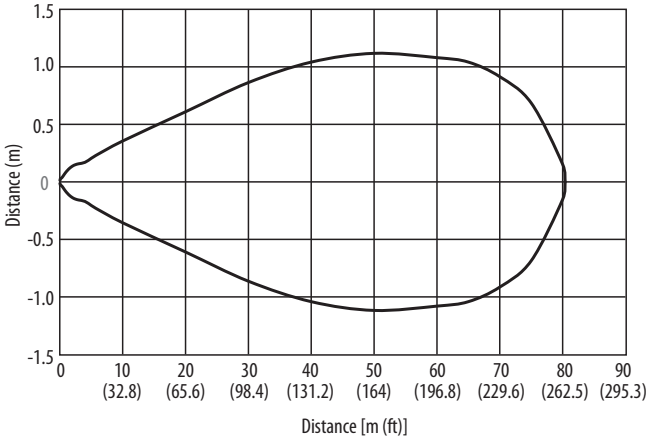


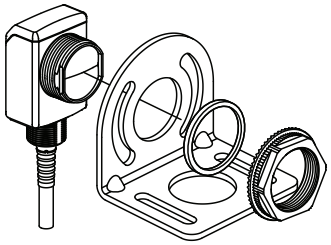
Figure 15 - Infrared Transmitted Beam Emitter — 80 m Beam Pattern



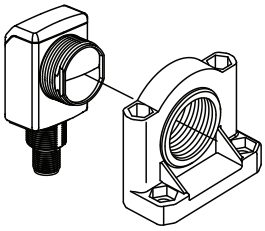
Accessories

Figure 16 - 30 mm Right Angle Mounting Bracket

Cat. No. 60-2421



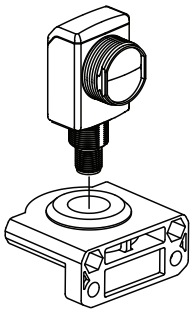
Cat. No. 60-2439



IMPORTANT For polarized retroreflective sensors only: For optimal detection performance, when highly reflective targets pass between the emitter and the reflector, we recommend that you always install the rubber washer that is provided with the polarized sensor.

Figure 17 - 18 mm Swivel/tilt Mounting Bracket

Cat. No. 60-2649



Cat. No. 60-2681

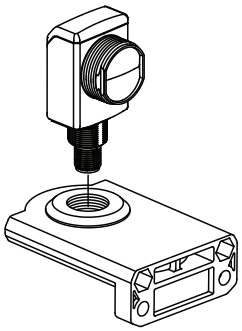
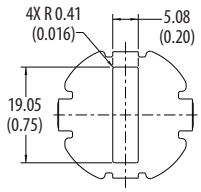


Table 5 - Accessories

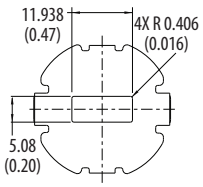
Description	Cat. No.
4-pin DC micro, 2 m (6.5 ft) cordset	889D-F4AC-2
18 mm straight bracket	60-2656
18 mm right angle bracket	60-2657
30 mm stainless steel mounting bracket	60-2421
30 mm swivel/tilt bracket	60-2439
18 mm swivel/tilt bracket	60-2649
Extended 18 mm swivel/tilt bracket	60-2681
76 mm (3 in.) diameter reflector	92-39
47 mm (1.85 in.) diameter reflector	92-47
84 mm (3.3 in.) diameter reflector	92-125
18 mm base mount, U-shaped protective bracket	60-BAF-US
18 mm base mount bracket, stainless steel	60-BAF-BM
30 mm nose mount bracket, stainless steel	60-BAF-SM
Aperture, 5 x 17 mm (0.2 x 0.67 in.) vertical slot, stainless steel	60-AAF1-VS
Aperture, 5 x 12 mm (0.2 x 0.47 in.) horizontal slot, stainless steel	60-AAF1-HS
Aperture, 2.5 x 12 mm (0.1 x 0.47 in.) horizontal slot, stainless steel	60-AAF2-HS
Aperture, 5 mm (0.2 in.) diameter, stainless steel	60-AAF1-DS
Aperture, 2.5 mm (0.1 in.) diameter, stainless steel	60-AAF2-DS
U-shaped protective bracket	60-BAF-US
18 mm base mount bracket, stainless steel	60-BAF-BM
30 mm Nose Mount Bracket, stainless steel	60-BAF-SM
Aperture, 5 x 17 mm vertical slot, stainless steel	60-AAF1-VS
Aperture, 5 x 12 mm horizontal slot, stainless steel	60-AAF1-HS
Aperture, 2.5 x 12 mm horizontal slot, stainless steel	60-AAF2-HS
Aperture, 5 mm diameter, stainless steel	60-AAF1-DS
Aperture, 2.5 mm diameter, stainless steel	60-AAF2-DS

Figure 18 - Apertures

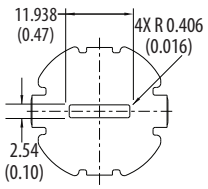
60-AAF1-VS, 5 x 7 mm Vertical Slot



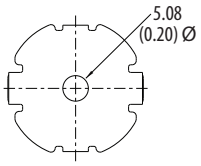
60-AAF1-HS, 5 x 12 mm Horizontal Slot



60-AAF2-HS, 2.5 x 12 mm Horizontal Slot



60-AAF1-DS, 5 mm Diameter



60-AAF2-DS, 2.5 mm Diameter

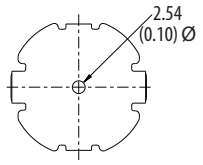


Figure 19 - Cat. No. 60-BAF-US 18 mm Mounting Bracket

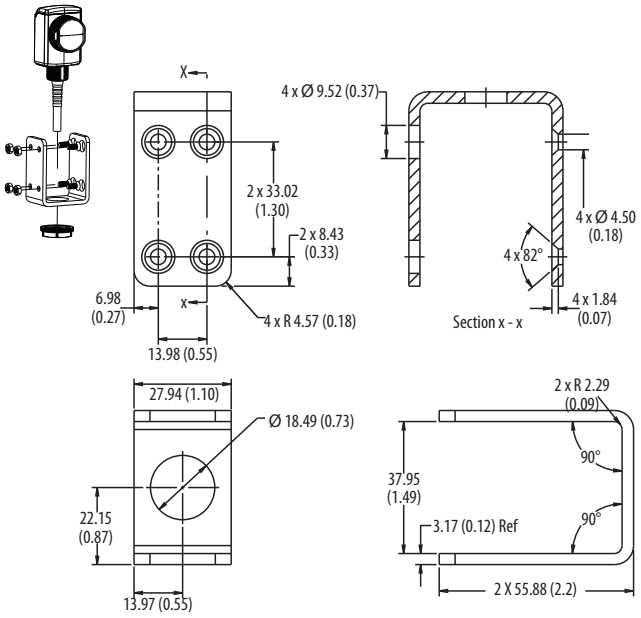


Figure 20 - Cat. No. 60-BAF-SM 30 mm Bracket Side

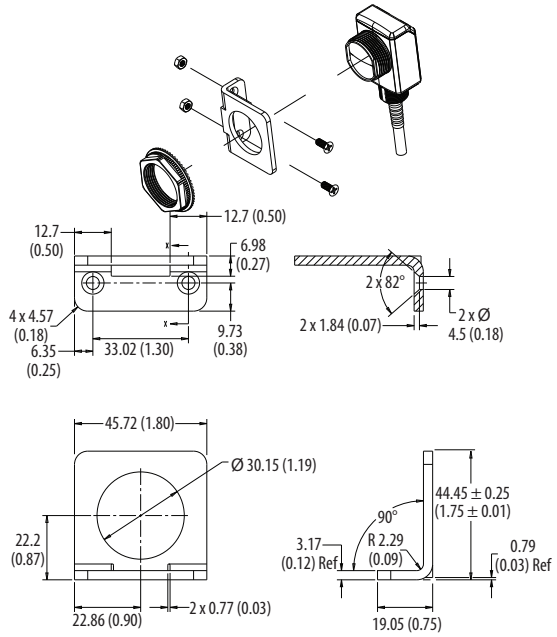
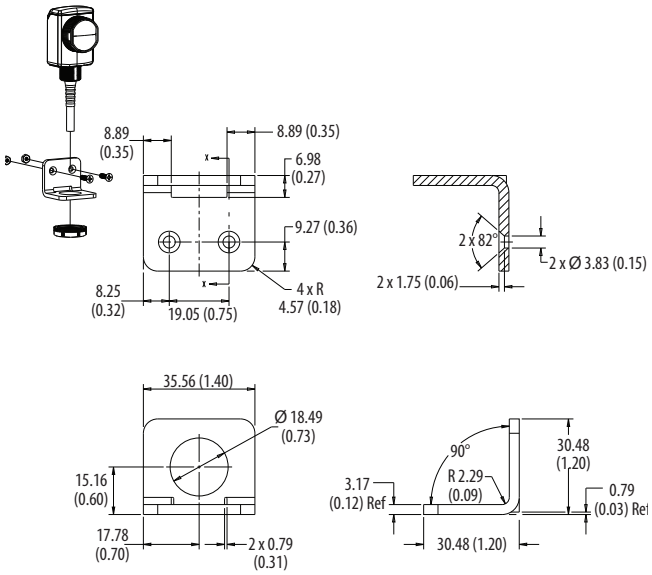


Figure 21 - Cat. No. 60-BAF-BM 18 mm Bracket Back



Summary of Changes

Corrected errors and updated margin curves for polarized retroreflective sensing modes and transmitted beam.

Rockwell Automation Support

For technical support, visit
http://www.rockwellautomation.com/support/overview.page.

Waste Electrical and Electronic Equipment (WEEE)

At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at
http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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https://www.rockwellautomation.com/global/support/technical-documentation/overview.page

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Rockwell Otomasyon Ticaret A.Ş., Kar Plaza İş Merkezi E Blok Kat:6 34752 İçerenköy, İstanbul, Tel: +90 (216) 5698400

www.rockwellautomation.com

Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444
Europe/Middle East/Africa: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640
Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846

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