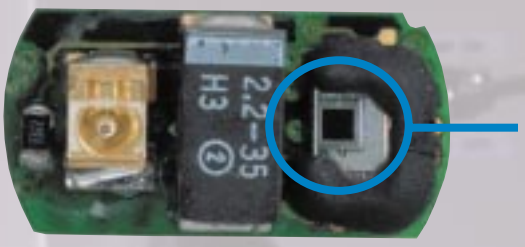
SICK

W.1000

Featuring OneTouch™

SICK Quality

SICK's W.1000 photoelectric sensor family is the product of over 50 years of quality, innovation and leadership in the world of industrial sensor technology. We were the first to bring you contrast sensors, polarized reflex sensors and background suppression sensors. Now we introduce a custom ASIC, developed by SICK engineers, to provide the most cost-effective and feature-rich sensor. Ever.



Over 50 years of sensor technology crammed onto a 3 x 4 mm chip – even the light receiver is built-in to reduce cost

(shown 4x actual size)

Cost

We designed the W.1000 to meet three goals: expanded features, popular housing and lower cost. SICK's exclusive OES II ASIC makes all three possible. With over two million gates on one 3 x 4 mm chip, the OES II provides unparalleled features, plus a huge dynamic range. The OES II silicon is even bonded directly to the circuit board to include the light receiver. The lens of the W.1000 series is the first stress-free molded lens used on a photoelectric sensor. Normally polarizing filters must be placed in front of molded lenses to prevent light distortion. Now, with stress-free molding, the lens goes in front, again reducing parts and cost.

The insert molded/sealed button is the only interface on the W.1000 – no covers to lose or break

Output/Alignment/Margin indicator is ultrasonically welded into place and can be seen from the sides and the top, not just the back

It's your choice: M12 style quick disconnect plugs on the housing or on a 6 in pigtail - or choose a 6 or 30 ft cable

OneTouch™

The first Teach-in sensor you don't have to be an expert to use. One press of the Teach-in button and the sensor automatically sets itself up for your application. This is the way Teach-in was meant to work. The Teach-in ability is built into the OES II ASIC, making the feature standard on the energetic proximity and fiber optic sensing modes at no extra cost.

Housing

The W.1000 looks different. The nose of the W.1000 is molded as part of the body, making it much more durable. ABS plastic, the same used for pro football helmets, is ultrasonically welded together to form a one-piece sensor that is completely watertight: IP 67 and NEMA 6 ratings, plus the ability to withstand 1200 psi washdown. All adjustments to the W.1000 are made via wire or with a sealed push button. No covers to open, lose or leak! We print all the information you need on both sides of the W.1000 body so you can read it no matter how the sensor is mounted. The Output/Alignment/Margin indicator can easily be read from the sides and top, not just the back.

All parts ultrasonically welded

The first stress-free molded lens

Printed on both sides so you can read it no matter how it is mounted

The nose is a molded part of the body – not screwed on later

Options

The W.1000 comes standard with M12 style quick disconnect plugs or a 6 ft cable with a strain relief. If you need more flexibility, you can get the connector on a 6 in pigtail or even a 30 ft cable.

Background Suppression

Another SICK first! The W.1000 provides the first true background suppression in this familiar package. Background suppression allows the sensor to "see" dark-colored objects directly in front of a light-colored background without the false readings and constants adjustments that may be familiar to you. Two models provide 2 in and 4 in ranges to solve virtually any application.

Sensing

As with all SICK sensors, 50 years of industrial sensor experience provide superior optical performance. This translates into longer ranges than other sensors with similar housing. The W.1000 comes in the following ranges:

2 in (50 mm) Background Suppression Proximity
4 in (100 mm) Background Suppression Proximity
20 in (500 mm) Energetic Proximity
13.8 ft (4.2 m) Polarized Reflex
3.3 ft (1 m) Fiber Optic with Through Beam Fibers
6 in (150 mm) Fiber Optic with Proximity Fibers
34.5 ft (10.5 m) Through Beam

WT1000 BGS 50

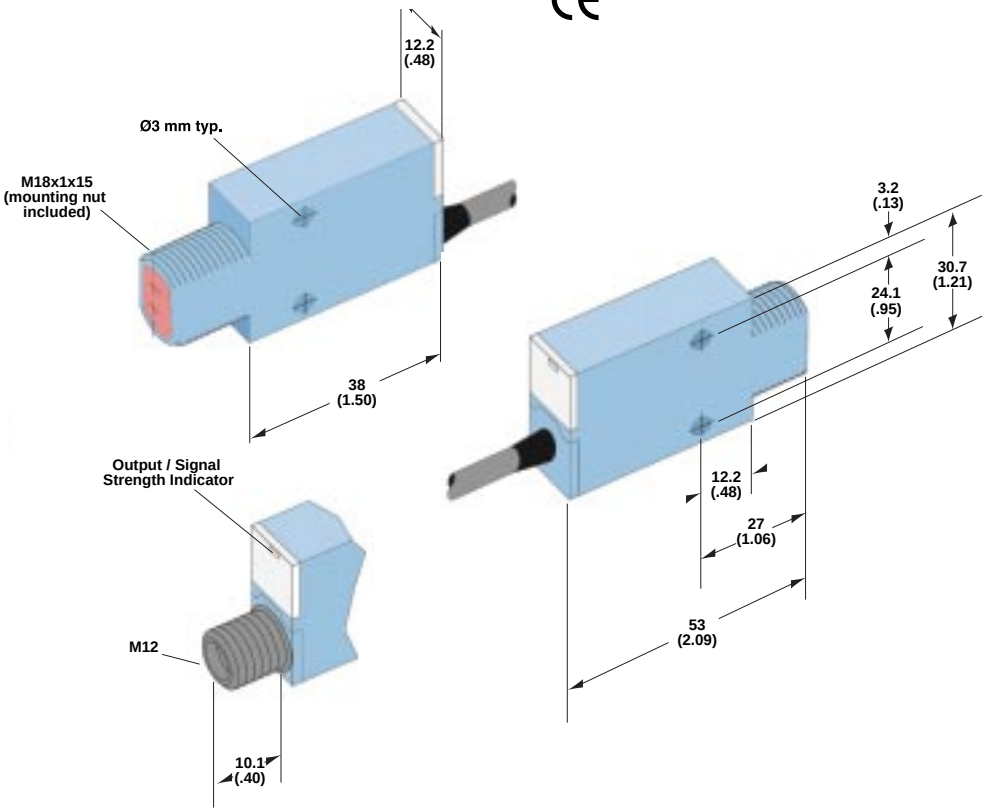
background suppression proximity sensor

50 mm (2 in)

H I G H L I G H T S

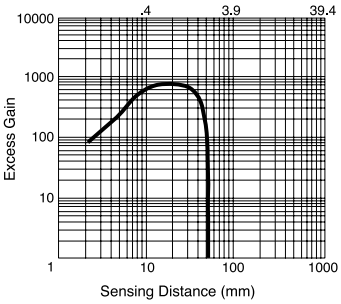
- ➤ Fixed background suppression provides superior performance to focused sensors
- ➤ Excels at sensing dark objects on light colored backgrounds
- ➤ Digital signal evaluation provides exceptional ambient light immunity
- ➤ Signal strength indicator
- ➤ Plastic housing is ultrasonically welded for outstanding durability in the harshest environments
- ➤ Custom electronics inside means the smallest outside
- ➤ All inputs/outputs short circuit protected
- ➤ Cable or quick disconnect versions available

CE



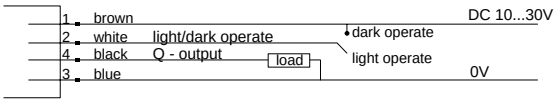
Dimensions in mm (in)

excess gain curve

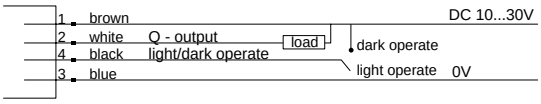


connection diagram

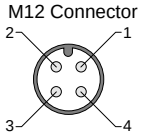
PNP Models



NPN Models



M12 Connector



wire colors refer to standard cable, not included with quick disconnect models

WT1000 BGS 50

background suppression proximity sensor

WT 1000	-P152	-P450	-P451	-N152	-N450	-N451
Part Number	7 023 817	7 023 818	7 024 615	7 023 819	7 023 820	7 024 616
Sensing Range (fixed)	50 ± 10 mm (2.0 ± 0.39 in)					
Background Suppression 6% / 90%	≤ 3% (1.5 mm @ 50 mm, 0.06 in @ 2 in)					
Angle of Divergence	approx. 10.5°					
Light Spot Size	approx. 9.2 mm @ 50 mm (0.36 in @ 2 in)					
Light Source	LED Infrared (880 nm), average service life 50,000 hours @ 25° C (77° F)					
External Light Immunity	Modulated light source with digital signal evaluation					
Response Time / Frequency	600 µs / 840 Hz					
Supply Voltage	10...30 V DC					
Current Consumption (no load)	≤ 50 mA					
Ripple (within V_S tolerance)	≤ 5 V peak-to-peak					
Output Type	PNP			NPN		
Output Voltage High	V_S - (≤ 2.9 V)			approx. V_S		
Output Voltage Low	approx. 0 V			≤ 2.9 V		
Output Current Max.	100 mA					
Operation Mode	Light or dark switching selectable via wire					
Connection Type	Cable	M12 4-pin plug		Cable	M12 4-pin plug	
Connecting Cable	PVC, 2 m	7 020 020	150 mm pigtail	PVC, 2 m	7 020 020	150 mm pigtail
Housing	Glass fiber reinforced ABS plastic body, acrylic lens					
Enclosure Rating	IP 67 / NEMA 6					
VDE Protection Class	II Double Insulated					
EMC	IEC 61000-4-2,3,4,5,6					
Circuit Protection	Outputs short circuit and over current protected, V_S and outputs reverse polarity protected					
Shock / Vibration	IEC 68-2-27,29 / IEC 68-2-6					
Test Input	-					
Test Input Response Time	-					
Alarm Output	-					
Timing Options	-					
Ambient Operating Temperature	-40...60°C (-40...140°F)					
Storage Temperature	-40...75°C (-40...167°F)					
Mounting Bracket	7 023 800 (MB W1000 - not included)					
Weight	approx. 100 g (3.5 oz)	approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)		approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)

WT1000 BGS 100

background suppression proximity sensor

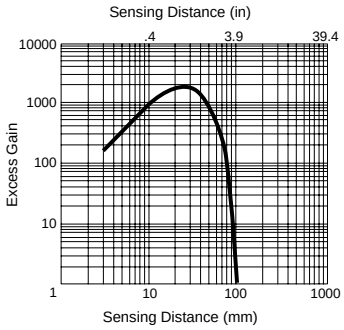
100 mm (4 in)

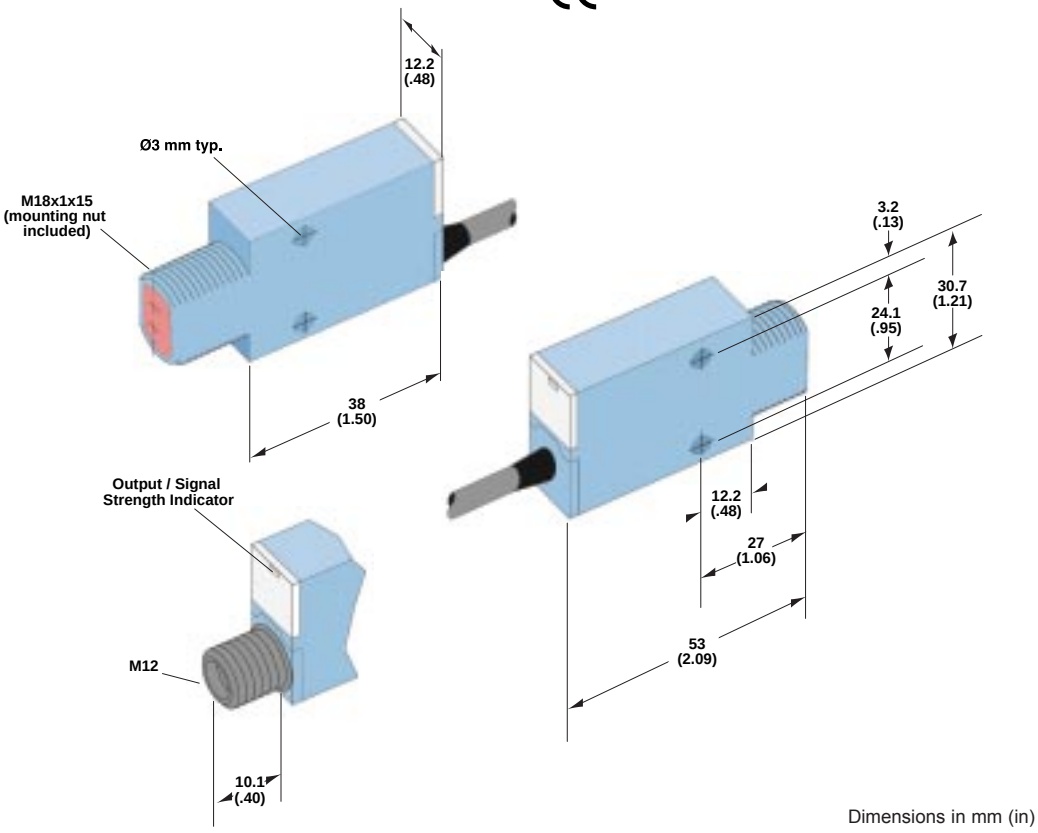
H I G H L I G H T S

- ➤ Fixed background suppression provides superior performance to focused sensors
- ➤ Excels at sensing dark objects on light colored backgrounds
- ➤ Digital signal evaluation provides exceptional ambient light immunity
- ➤ Signal strength indicator
- ➤ Plastic housing is ultrasonically welded for outstanding durability in the harshest environments
- ➤ Custom electronics inside means the smallest outside
- ➤ All inputs/outputs short circuit protected
- ➤ Cable or quick disconnect versions available

CE

excess gain curve

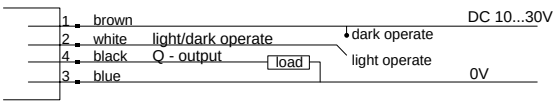




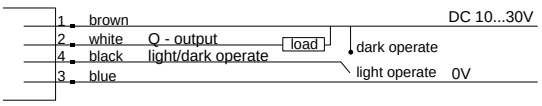
Dimensions in mm (in)

connection diagram

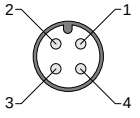
PNP Models



NPN Models



M12 Connector



wire colors refer to standard cable, not included with quick disconnect models

WT1000 BGS 100

background suppression proximity sensor

WT 1000	-P162	-P460	-P461	-N162	-N460	-N461
Part Number	7 023 823	7 023 824	7 024 617	7 023 825	7 023 826	7 024 618
Sensing Range (fixed)	100 ± 20 mm (3.9 ± 0.79 in)					
Background Suppression 6% / 90%	≤ 5% (5 mm @ 100 mm, 0.20 in @ 4 in)					
Angle of Divergence	approx. 10.5°					
Light Spot Size	approx. 18.4 mm @ 100 mm (0.72 in @ 3.9 in)					
Light Source	LED Infrared (880 nm), average service life 50,000 hours @ 25°C (77°F)					
External Light Immunity	Modulated light source with digital signal evaluation					
Response Time / Frequency	600 µs / 840 Hz					
Supply Voltage	10...30 V DC					
Current Consumption (no load)	≤ 50 mA					
Ripple (within V_S tolerance)	≤ 5 V peak-to-peak					
Output Type	PNP			NPN		
Output Voltage High	V_S - (≤ 2.9 V)			approx. V_S		
Output Voltage Low	approx. 0 V			≤ 2.9 V		
Output Current Max.	100 mA					
Operation Mode	Light or dark switching selectable via wire					
Connection Type	Cable	M12 4-pin plug		Cable	M12 4-pin plug	
Connecting Cable	PVC, 2 m	7 020 020	150 mm pigtail	PVC, 2 m	7 020 020	150 mm pigtail
Housing	Glass fiber reinforced ABS plastic body, acrylic lens					
Enclosure Rating	IP 67 / NEMA 6					
VDE Protection Class	II Double Insulated					
EMC	IEC 61000-4-2,3,4,5,6					
Circuit Protection	Outputs short circuit and over current protected, V_S and outputs reverse polarity protected					
Shock / Vibration	IEC 68-2-27,29 / IEC 68-2-6					
Test Input	-					
Test Input Response Time	-					
Alarm Output	-					
Timing Options	-					
Ambient Operating Temperature	-40...60°C (-40...140°F)					
Storage Temperature	-40...75°C (-40...167°F)					
Mounting Bracket	7 023 800 (MB W1000 - not included)					
Weight	approx. 100 g (3.5 oz)	approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)		approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)

WT1000E

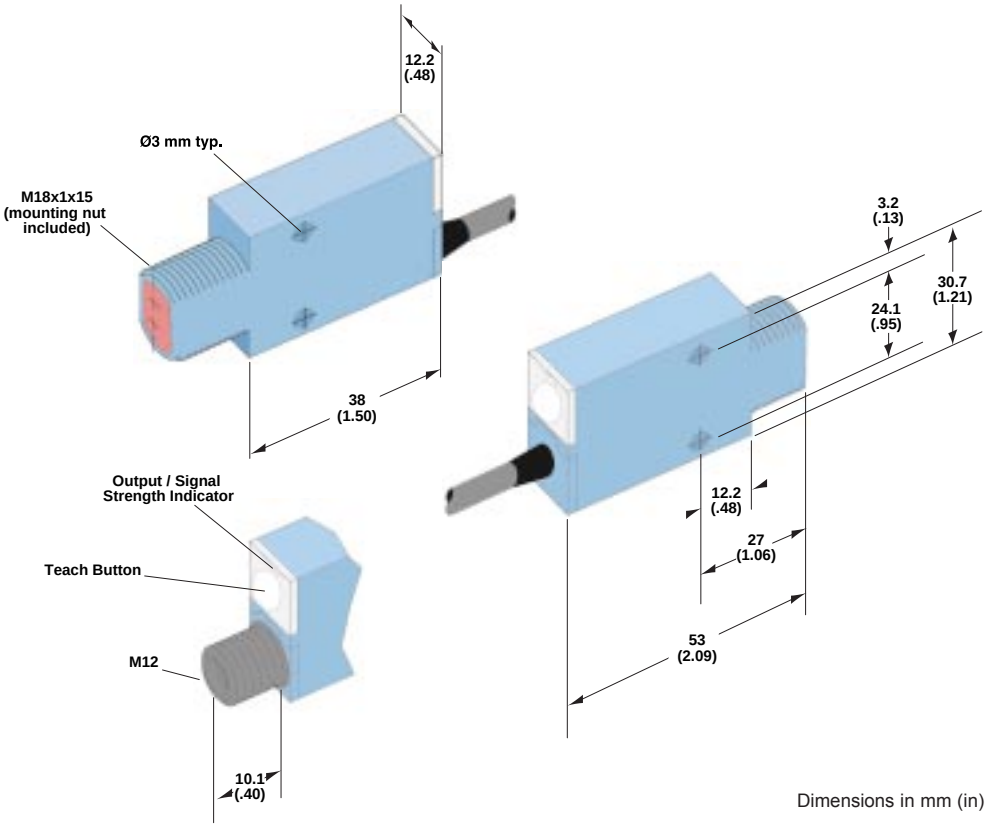
energetic proximity sensor

H I G H L I G H T S

- Energetic proximity with One-Touch™ teach-in feature, the first teach-in you don't have to be an expert to use
- Two teach-in modes for easy detection of any target
- Superior sensing range of 500 mm in a small package
- Digital signal evaluation provides exceptional ambient light immunity
- Signal strength indicator
- Plastic housing is ultrasonically welded for outstanding durability in the harshest environments
- Custom electronics inside means the smallest outside
- All inputs/outputs short circuit protected
- Cable or quick disconnect versions available

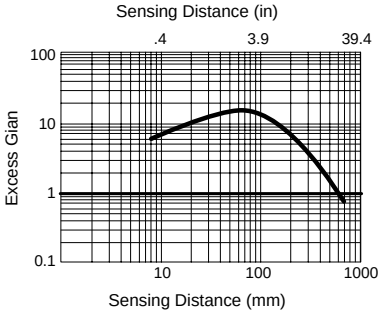
500 mm (19.7 in)

CE



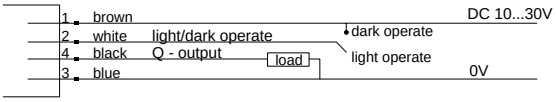
Dimensions in mm (in)

excess gain curve

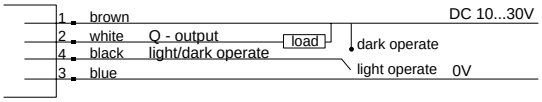


connection diagram

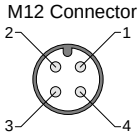
PNP Models



NPN Models



M12 Connector



wire colors refer to standard cable, not included with quick disconnect models

WT1000E

energetic proximity sensor

WT 1000	-P112	-P410	-P411	-N112	-N410	-N411
Part Number	7 023 811	7 023 812	7 024 613	7 023 813	7 023 814	7 024 614
Sensing Range, Adjustable	500 mm (19.7 in)					
Angle of Divergence	approx. 10.5°					
Light Spot Size	approx. 70 mm @ 380 mm (2.8 in @ 15 in)					
Light Source	LED Infrared (880 nm), average service life 50,000 hours @ 25°C (77°F)					
External Light Immunity	Modulated light source with digital signal evaluation					
Response Time / Frequency	600 µs / 840 Hz					
Supply Voltage	10...30 V DC					
Current Consumption (no load)	≤ 50 mA					
Ripple (within V_S tolerance)	≤ 5 V peak-to-peak					
Output Type	PNP			NPN		
Output Voltage High	V_S - (≤ 2.9 V)			approx. V_S		
Output Voltage Low	approx. 0 V			≤ 2.9 V		
Output Current Max.	100 mA					
Operation Mode	Light or dark switching selectable via wire					
Connection Type	Cable	M12 4-pin plug		Cable	M12 4-pin plug	
Connecting Cable	PVC, 2 m	7 020 020	150 mm pigtail	PVC, 2 m	7 020 020	150 mm pigtail
Housing	Glass fiber reinforced ABS plastic body, acrylic lens					
Enclosure Rating	IP 67 / NEMA 6					
VDE Protection Class	II Double Insulated					
EMC	IEC 61000-4-2,3,4,5,6					
Circuit Protection	Outputs short circuit and over current protected, V_S and outputs reverse polarity protected					
Shock / Vibration	IEC 68-2-27,29 / IEC 68-2-6					
Test Input	-					
Test Input Response Time	-					
Alarm Output	-					
Timing Options	-					
Ambient Operating Temperature	-40...60°C (-40...140°F)					
Storage Temperature	-40...75°C (-40...167°F)					
Mounting Bracket	7 023 800 (MB W1000 - not included)					
Weight	approx. 100 g (3.5 oz)	approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)		approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)

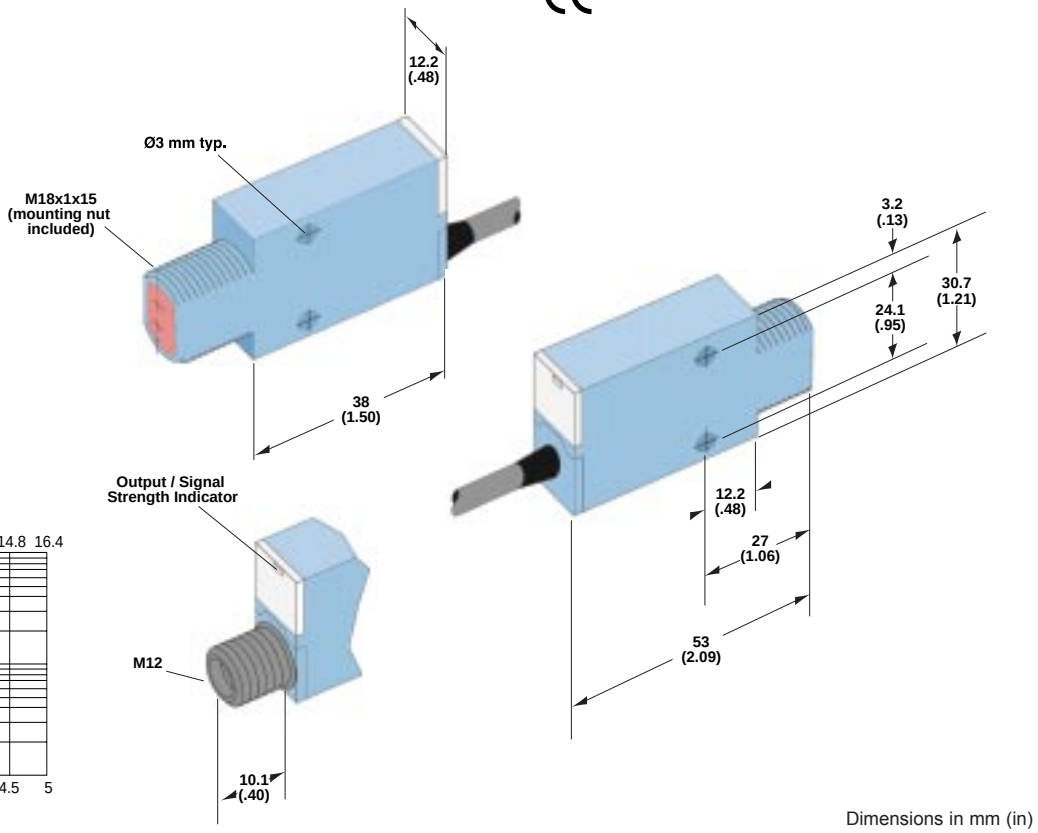
WL1000

photoelectric reflex sensor

H I G H L I G H T S

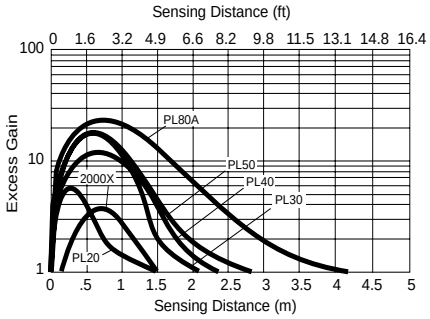
- Polarized reflex sensor
- Lens molded stress-free for more efficient polarization and superior error rejection
- Digital signal evaluation provides exceptional ambient light immunity
- Signal strength indicator
- Plastic housing is ultrasonically welded for outstanding durability in the harshest environments
- Custom electronics inside means the smallest outside
- All inputs/outputs short circuit protected
- Cable or quick disconnect versions available

4.2 m (13.8 ft)



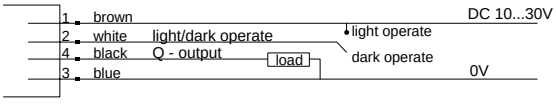
Dimensions in mm (in)

excess gain curve

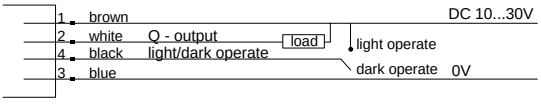


connection diagram

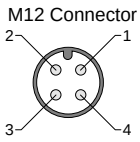
PNP Models



NPN Models



M12 Connector



wire colors refer to standard cable, not included with quick disconnect models

WL1000

photoelectric reflex sensor

WL 1000	-P132	-P430	-P431	-N132	-N430	-N431
Part Number	7 023 829	7 023 830	7 024 619	7 023 831	7 023 832	7 024 620
Max. Range @ Excess Gain 1 with PL 80A	4.2 m (13.8 ft)					
Typ. Range with PL 80A	2.7 m (8.9 ft)					
Typ. Range with PL 50A	1.6 m (5.2 ft)					
Typ. Range with PL 40A	1.5 m (4.9 ft)					
Typ. Range with PL 30A	1.3 m (4.3 ft)					
Typ. Range with PL 20A	0.6 m (2 ft)					
Typ. Range with 2000X Tape	0.8 m (2.6 ft)					
Angle of Divergence	approx. 2.5°					
Light Spot Size	115 mm @ 3 m (4.5 in @ 9.8 ft)					
Light Source	LED Red (660 nm), average service life 50,000 hours @ 25°C (77°F)					
External Light Immunity	Modulated light source with digital signal evaluation					
Response Time / Frequency	600 µs / 840 Hz					
Supply Voltage	10...30 V DC					
Current Consumption (no load)	≤ 50 mA					
Ripple (within V_S tolerance)	≤ 5 V peak-to-peak					
Output Type	PNP			NPN		
Output Voltage High	V_S - (≤ 2.9 V)			approx. V_S		
Output Voltage Low	approx. 0 V			≤ 2.9 V		
Output Current Max.	100 mA					
Operation Mode	Light or dark switching selectable via wire					
Connection Type	Cable	M12 4-pin plug		Cable	M12 4-pin plug	
Connecting Cable	PVC, 2 m	7 020 020	150 mm pigtail	PVC, 2 m	7 020 020	150 mm pigtail
Housing	Glass fiber reinforced ABS plastic body, acrylic lens					
Enclosure Rating	IP 67 / NEMA 6					
VDE Protection Class	II Double Insulated					
EMC	IEC 61000-4-2,3,4,5,6					
Circuit Protection	Outputs short circuit and over current protected, V_S and outputs reverse polarity protected					
Shock / Vibration	IEC 68-2-27,29 / IEC 68-2-6					
Test Input	-					
Test Input Response Time	-					
Alarm Output	-					
Timing Options	-					
Ambient Operating Temperature	-40...60°C (-40...140°F)					
Storage Temperature	-40...75°C (-40...167°F)					
Mounting Bracket	7 023 800 (MB W1000 - not included)					
Weight	approx. 100 g (3.5 oz)	approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)		approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)

WLL1000

fiber optic sensor

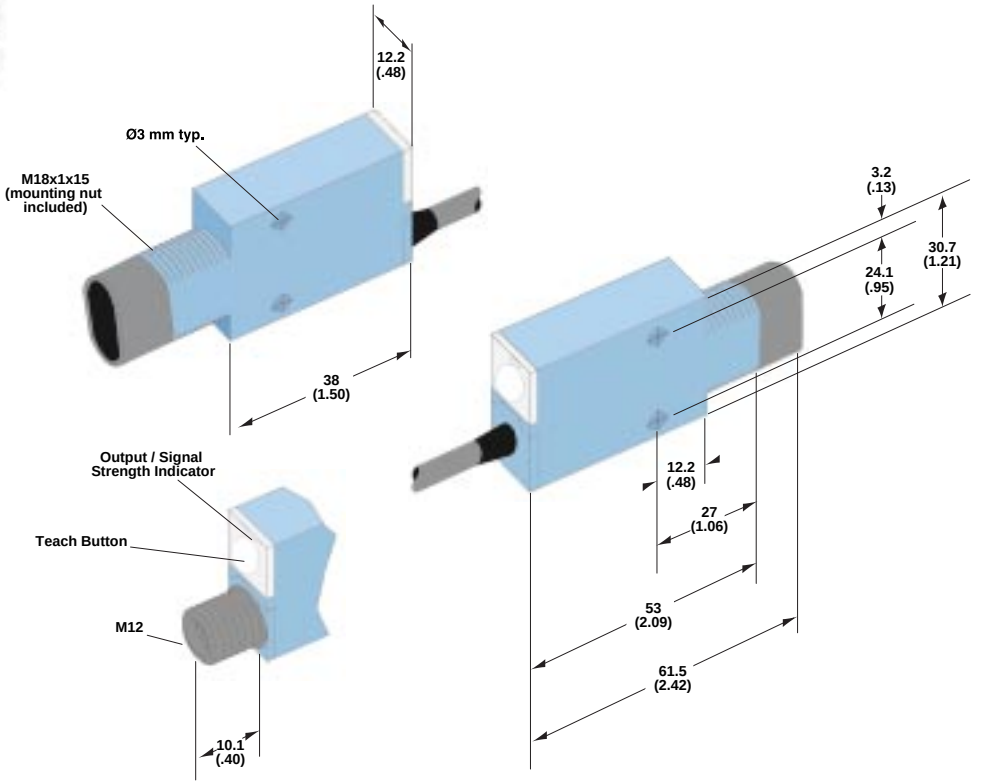
H I G H L I G H T S

- Fiber optic sensor with One-Touch™ teach-in feature, the first teach-in you don't have to be an expert to use
- Two teach-in modes for easy detection
- Works with both plastic and glass style fibers with included adapter
- Digital signal evaluation provides exceptional ambient light immunity
- Plastic housing is ultrasonically welded for outstanding durability in the harshest conditions
- Signal strength indicator
- Custom electronics inside means the smallest outside
- All inputs/outputs short circuit protected
- Cable or quick disconnect versions available

CE

1 m (3.3 ft)

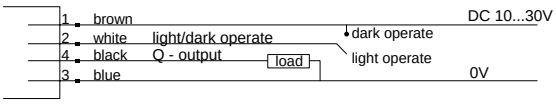
150 mm (5.9 in)



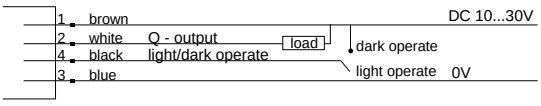
Dimensions in mm (in)

connection diagram

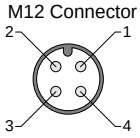
PNP Models



NPN Models



M12 Connector



wire colors refer to standard cable, not included with quick disconnect models

WLL1000

fiber optic sensor

WLL 1000	-P112	-P410	-P411	-N112	-N410	-N411
Part Number	7 023 835	7 023 836	7 024 624	7 023 837	7 023 838	7 024 625
Sensing Range	Dependent on fibers					
Light Source	LED Infrared (880 nm), average service life 50,000 hours @ 25°C (77°F)					
External Light Immunity	Modulated light source with digital evaluation					
Response Time / Frequency	600 µs / 840 Hz					
Supply Voltage	10...30 V DC					
Current Consumption (no load)	≤ 50 mA					
Ripple (within V_S tolerance)	≤ 5 V peak-to-peak					
Output Type	PNP			NPN		
Output Voltage High	V_S - (< 2.9 V)			approx. V_S		
Output Voltage Low	approx. 0 V			≤ 2.9 V		
Output Current Max.	100 mA					
Operation Mode	Light or dark switching selectable via wire					
Connection Type	Cable	M12 4-pin plug		Cable	M12 4-pin plug	
Connecting Cable	PVC, 2 m	7 020 020	150 mm pigtail	PVC, 2 m	7 020 020	150 mm pigtail
Housing	Glass fiber reinforced ABS plastic					
Enclosure Rating	IP 67 / NEMA 6					
VDE Protection Class	II Double Insulated					
EMC	IEC 61000-4-2,3,4,5,6					
Circuit Protection	Outputs short circuit and over current protected, V_S and outputs reverse polarity protected					
Shock / Vibration	IEC 68-2-27,29 / IEC 68-2-6					
Test Input	-					
Test Input Response Time	-					
Alarm Output	-					
Timing Options	-					
Ambient Operating Temperature	-40...60°C (-40...140°F)					
Storage Temperature	-40...75°C (-40...167°F)					
Mounting Bracket	7 023 800 (MB W1000 - not included)					
Weight	approx. 100 g (3.5 oz)	approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)		approx. 30 g (1.1 oz)	approx. 100 g (3.5 oz)

WS/WE1000

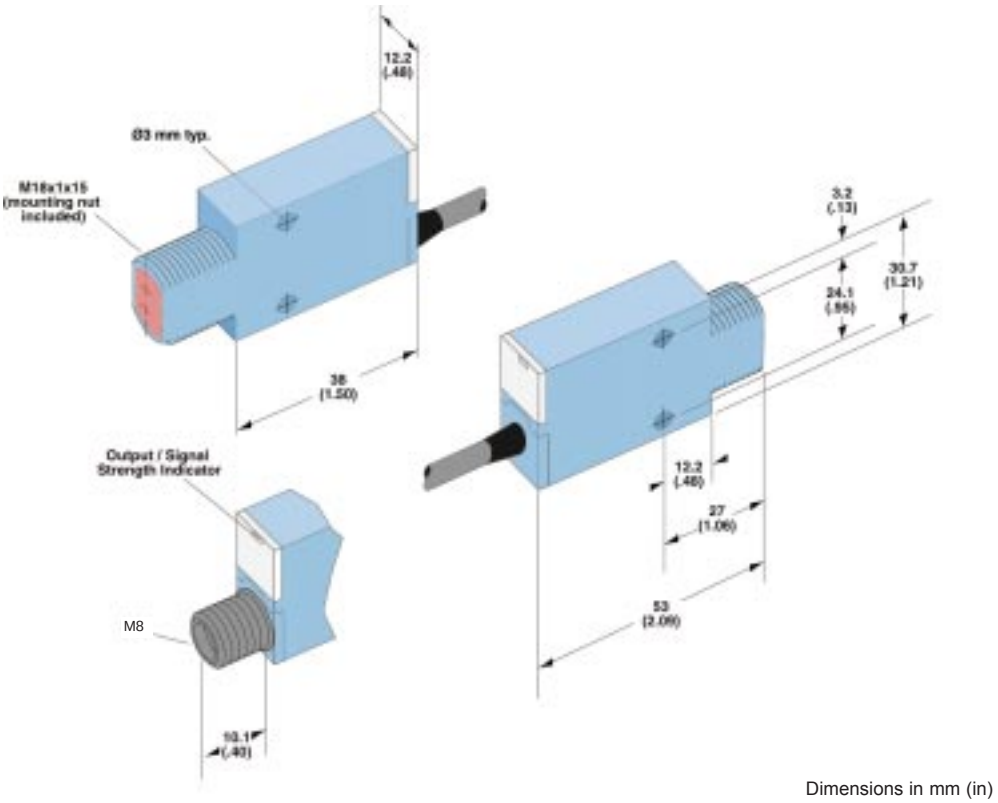
photoelectric through beam sensor

H I G H L I G H T S

- ➤ Long range through beam sensors
- ➤ Digital signal evaluation provides exceptional ambient light immunity
- ➤ Plastic housing is ultrasonically welded for outstanding durability in the harshest environments
- ➤ Signal strength indicator
- ➤ Custom electronics inside means the smallest outside
- ➤ All inputs/outputs short circuit protected
- ➤ Cable or quick disconnect versions available

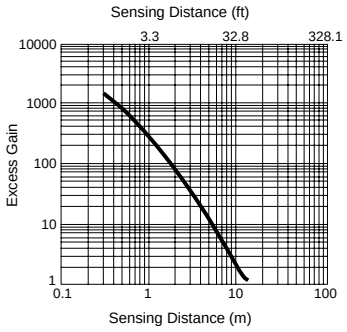
CE

10.5 m (34.5 ft)



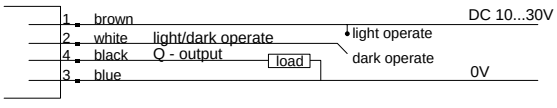
Dimensions in mm (in)

excess gain curve

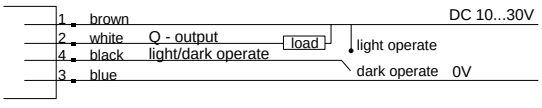


connection diagram

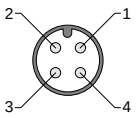
PNP Models



NPN Models



M12 Connector



wire colors refer to standard cable, not included with quick disconnect models

WS/WE1000

photoelectric through beam sensor

WS/WE 1000	-P112	-P410	-P411	-N112	-N410	-N411
Part Number	7 023 851	7 023 852	7 024 681	7 023 853	7 023 854	7 024 682
Max Range @Excess Gain 1	10.5 m (34.4 ft)					
Typical Range @ Excess Gain 3	9 m (29.5 ft)					
Angle of Divergence	approx. 10.5°					
Light Spot Size	approx. 1.65 m @ 9 m (5.4 ft @ 29.5 ft)					
Light Source	LED Infrared (880 nm), average service life 50,000 hours @ 25°C (77°F)					
External Light Immunity	Modulated light source with digital signal evaluation					
Response Time / Frequency	830 µs / 600 Hz					
Supply Voltage	10...30 V DC					
Current Consumption (no load)	≤ 50 mA					
Ripple (within V_S tolerance)	≤ 5 V peak-to-peak					
Output Type	PNP			NPN		
Output Voltage High	V_S - (≤ 2.9 V)			approx. V_S		
Output Voltage Low	approx. 0 V			≤ 2.9 V		
Output Current Max.	100 mA					
Operation Mode	Light or dark switching selectable via wire					
Connection Type	Cable	M12 4-pin plug		Cable	M12 4-pin plug	
Connecting Cable	PVC, 2 m	7 020 020	150 mm pigtail	PVC, 2 m	7 020 020	150 mm pigtail
Housing	Glass fiber reinforced ABS plastic body, acrylic lens					
Enclosure Rating	IP 67 / NEMA 6					
VDE Protection Class	II Double Insulated					
EMC	IEC 61000-4-2,3,4,5,6					
Circuit Protection	Outputs short circuit and over current protected, V_S and outputs reverse polarity protected					
Shock / Vibration	IEC 68-2-27,29 / IEC 68-2-6					
Test Input	-					
Test Input Response Time	-					
Alarm Output	-					
Timing Options	-					
Ambient Operating Temperature	-40...60°C (-40...140°F)					
Storage Temperature	-40...75°C (-40...167°F)					
Mounting Bracket	7 023 800 (MB W1000 - not included)					
Weight	approx. 100 g (3.5 oz) each cable model, approx. 30 g (1.1 oz) each connector model					

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