S8-MR…T

Polarised retroreflex for transparents with threshold auto-adjustment

S8-MR…W

Contrast sensor

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (yellow)
The yellow LED indicates the output status.

READY LED (green)
The green LED ON indicates normal functioning.

SET PUSH-BUTTON (S8…W03/T53)
The acquisition procedure is activated by pressing the SET push-button.
The control obtained with the SET push-button can be made externally with the REMOTE input.

DELAY TRIMMER (S8-W03)
The digital output's delay is selected/deselected by a monoturn trimmer.

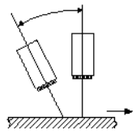
LIGHT/DARK TRIMMER (S8-T53)
The sensitivity and thus the operating distance are adjusted by a monoturn trimmer.

Please refer to the "SETTING" paragraph for the correct use procedures.

WARNING: the maximum mechanical rotation range of the trimmer is 240°. Do not force over of the maximum and minimum positions.

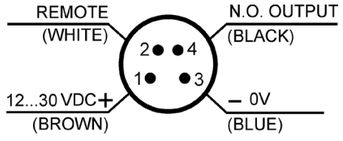
INSTALLATION

The sensor can be positioned by means of the two housing holes using two screws (M3x18 or longer, 0.8Nm maximum tightening torque) with washers.
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).

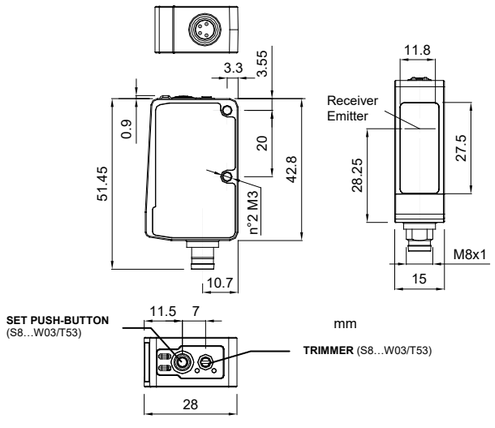


The operating distance is measured from the front surface of the sensor optics.
S8W - Mark detection on a reflective surface is improved adjusting the beam direction to 5° … 20° from surface axis.

CONNECTIONS



DIMENSIONS



TECHNICAL DATA

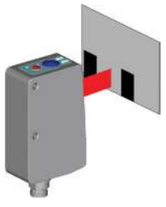
	S8-W03	S8-W00	S8-T53	S8-T50
Power supply:	12 … 30 VDC			
Ripple:	2 Vpp max.			
Consumption (output current excluded):	30 mA max			
Outputs:	PNP or NPN N.O.; 30 VDC max (short-circuit protection) Pull-down/up resistance = 47 KΩ			
Output current:	100 mA (overload protection)			
Output saturation voltage:	≤ 2 V			
Response time:	50 µs		250 us	
Switching frequency:	10 kHz		2KHz	
Emission type:	BLUE (465 nm) / GREEN (520 nm) / RED (630 nm) with automatic selection		RED (660 nm)	
Minimum spot dimension:	3x1 mm^2		-	
Operating distance (typical values):	9 mm		2 m (EG2) on R2 reflector	
Depth of field:	± 2 mm		-	
Settings:	SET push-button	-	SET push-button	-
DARK/LIGHT selection:	automatic		Mono-turn trimmer	Automatic
Delay OFF 20msec selection:	Mono-turn trimmer	Automatic	-	
Indicators:	OUTPUT LED (yellow) / READY LED (green)			
Operating temperature:	-10 … 55 °C			
Storage temperature:	-20 … 70 °C			
Dielectric strength:	⧈: 1500 VAC 1 min. between electronics and housing			
Insulating resistance:	>20 MΩ 500 VDC between electronics and housing			
Ambient light rejection:	according to EN 60947-5-2			
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for each axis (EN60068-2-6)			
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C			
Shock resistance:	11 ms (30 G) 6 shocks for each axis (EN60068-2-27)			
Housing material:	INOX AISI 316L			
Lens material:	Window in glass or PMMA; lens in PC			
Mechanical protection:	IP67; IP69K (TYPE 1 ENCLOSURE)			
Connections:	M8 4-pole connector			
Weight:	70 g. max.			

S8-W03 SETTINGS

ACQUISITION

Mark Detection
The DARK/LIGHT mode is automatically selected by the sensor.
Place mark in front of the sensor spot and press SET until the green READY LED turns off.
The sensor functions alternating red, green and blue emissions.
Do not move the mark during this phase.

Background Detection
Place background in front of the sensor spot and press SET again.
The sensor functions alternating red, green and blue emissions.
Do not move the background during this phase.



If the READY LED turns permanently ON the acquisition was successful. If the LED blinks slowly the acquisition failed due to insufficient contrast. Press SET and the sensor returns to the previous setting. Repeat procedure from the beginning.

DELAY OFF SETTING
The DELAY OFF extends the minimum output activation to 20 ms allowing the slower interface systems to detect also shorter pulses.

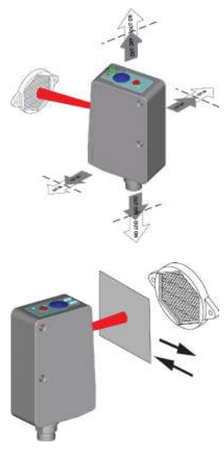
Delay Off Activation
Rotate trimmer fully counter-clockwise.

Delay Off Deactivation
Rotate trimmer fully clockwise.

S8-T53 SETTINGS

SENSITIVITY ADJUSTMENT

Alignment and Sensitivity Adjustment
- Positioning and align the sensor and the reflector on opposite side at the desired distance.
- Move the sensor vertically and horizontally to determine the powering on and powering off points of the yellow LED (OUT) and fix the sensor in the middle of these two points.
- Press SET push-button until the green READY LED turns off. The sensor adjusts the sensitivity. If the READY LED turns permanently ON the acquisition was successful. If the LED blinks the acquisition failed due to insufficient contrast. Press SET and the sensor returns to the previous setting. Verify alignment between sensor and reflector and the operative distance before repeat procedure from the beginning.
  If the signal that returns from the reflector is too high (saturated), the sensor sets the sensitivity to minimum and functions normally, however signalling this condition by the READY LED blinking slowly. In this case the sensor may not detect some transparent objects. You can press SET for 1s to make the READY LED stop blinking.

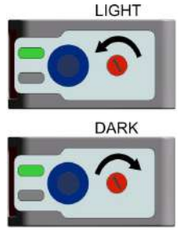


Control:
- Enter object laterally in the detection area and check that the yellow LED turns ON (in dark mode).
- Remove object and check that the yellow LED turns OFF immediately (in dark mode).

LIGHT/DARK MODE SETTING

Light Mode Setting
Rotate trimmer fully counter-clockwise to set the LIGHT mode (output ON with the reflector).

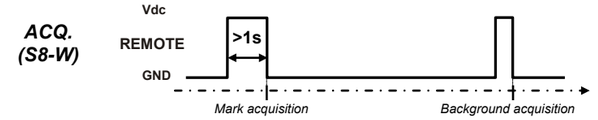
Dark Mode Setting
Rotate trimmer fully clockwise to set the DARK mode (output ON in presence of the object).



ADDITIONAL FUNCTIONS

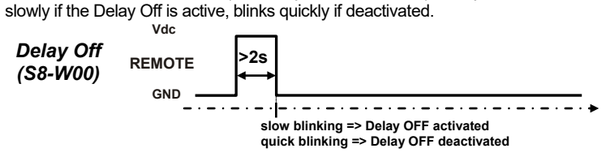
REMOTE INPUT
The REMOTE signal carries-out acquisition functions without using the SET push-button.
The REMOTE wire connected to +Vdc is equal to pressing the SET push-button; connected to GND or not connected is equal to not pressing the SET push-button.

S8-W:

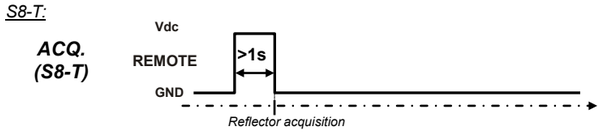


In the W00 version, the REMOTE input is also used for:
- Activation/deactivation of Delay Off (S8-W00)

The current setting of the Delay Off can be changed by connecting the REMOTE wire to +Vdc for at least 2sec (until the yellow LED blinks). The yellow LED blinks slowly if the Delay Off is active, blinks quickly if deactivated.

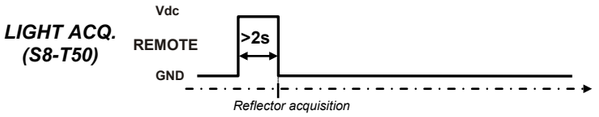


S8-T:



In the T50 version, the REMOTE input is also used for:
- Acquisition in LIGHT mode (S8-T50)

To activate this function, the REMOTE wire must be connected to +Vdc for at least 2sec (until the yellow LED blinks).



ADDITIONAL FUNCTIONS (S8-T53)

KEYLOCK FUNCTION (keyboard lock)
The KEYLOCK function (keyboard lock) allows to deactivate the keyboard avoiding accidental changes in the sensor setting.
If at sensor powering the REMOTE wire is connected to +Vdc for at least 1 s., the keyboard lock function is activated and the push-buttons are no longer active.
To deactivate the keyboard lock, the sensor must be turned off and repowered with the REMOTE wire not connected or connected to GND.

THRESHOLD AUTO-ADJUSTMENT FUNCTION
The sensor provides threshold auto-adjustment function. If the received signal decreases/increases due to dirty optical lens or reflector, or for cleaning, the sensor adjusts automatically the commutation threshold to avoid continuous cleaning of optical parts (after 1 minute of low/high signal). If the received signal is too low to be adjusted by the sensor, the output turns on and it is necessary to clean the optical parts.
At sensor powering, if the received signal is a lot higher than the switching threshold (e.g. after reflector cleaning), the sensor after 1s automatically adjusts the switching threshold.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

For information about the disposal of Waste Electrical and Electronic Equipment (WEEE), please refer to the website at www.datasensing.com.

826007006 Rev. F

DATALOGIC

S8-MH…M53

Background suppression for shiny objects

INSTRUCTION MANUAL

CLASS 1 EN 60825-1 (2014)
LASER PRODUCT

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

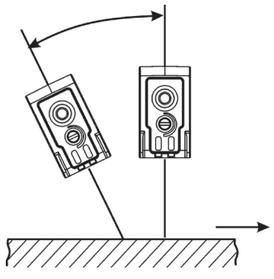
POWER ON LED (green)
The green LED ON indicates the powering status and the laser emission presence.

DISTANCE ADJUSTMENT TRIMMER (ADJ.)
The multiturn trimmer with clutch (8 turns) adjusts the suppression distance through the mechanical variation of the optic triangulation angle.
The operating distance increases rotating the trimmer in a clockwise direction.
Please refer to the “SETTING” paragraph for the correct procedure.

TEACH-IN PUSH-BUTTON
The push-button allows acquiring the background.
Please refer to the “SETTING” paragraph for the correct procedure.

INSTALLATION

The sensor can be positioned by means of the two housing holes using two screws (M3x18 or longer, 0.8 Nm maximum tightening torque) with washers.
Several fixing brackets are available which can be oriented in various positions to ease the sensor installation, (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.

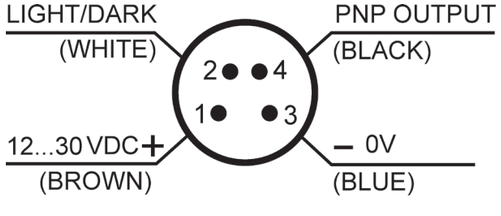


S8-MH

In the presence of moving backgrounds like conveyor belts, especially having a dark or shiny surface, the best object detection performance can be obtained by mounting the sensor at an angle (max 30°) with respect to the horizontal plane, as shown in the figure.

CONNECTIONS

M8 CONNECTOR



TECHNICAL DATA

Power supply:	12 … 30 VDC Class 2 (Type 1) UL508
Ripple:	2 Vpp max.
Consumption (output current excluded):	30 mA max
Outputs:	PNP; 30 Vdc max. (short-circuit protection)
Output current:	100 mA (overload protection)
Output saturation voltage:	≤ 2 V
Response time:	1 ms
Switching frequency:	500 Hz
Emission type:	RED LASER (λ = 645…665nm): Class 1 EN 60825-1 (2014), Class II CDRH 21 CFR PART 1040.10 Pulsed emission: pot. max ≤ 5 mW; pulse duration = 3 μs; frequency = 10 kHz
Operating distance (typical values):	50...150 mm
Setting:	8-turns distance adjustment trimmer – Background suppression push-button
LIGHT/DARK selection:	white wire
Indicators:	OUTPUT LED (YELLOW) / POWER ON LED (GREEN)
Operating temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Dielectric strength:	⧈: 1500 VAC 1 min between electronic parts and housing
Insulating resistance:	>20 MΩ 500 VDC between electronic parts and housing
Ambient light rejection:	according to EN 60947-5-2
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C
Shock resistance:	11 ms (30 G) 6 shocks per every axis (EN60068-2-27)
Housing material:	INOX AISI 316L
Lens material:	PMMA window; PC lens
Mechanical protection:	IP67, IP69K
Connections:	M8 4-pole connector
Weight:	70 g. max

SETTING

LIGHT/DARK MODE SETTING

LIGHT MODE setting	***DARK MODE setting***
Connect the LIGHT/DARK signal (white wire) to 0V or leave unconnected. The output is ON with the object in the sensing area and OFF on the background.	Connect the LIGHT/DARK signal (white wire) to +VDC. The output is OFF with the object in the sensing area and ON on the background.

BACKGROUND ACQUISITION PROCEDURE
The S8…M53 sensor allows detection of shiny objects without the false commutations typical of traditional background suppression sensors. To function correctly it is necessary to perform the Background Acquisition Procedure at power up as described below.

1. Activation Background Acquisition Procedure: press TEACH-IN push-button for 1 sec until OUT LED (yellow) turns OFF.
   The output (black wire) turns OFF and the yellow LED signals the commutations of a standard background suppressor.
2. Background suppression from the detection area (CUT-OFF): position the sensor in front of the background at a distance within its Operating Range. Turn the Distance Adjustment Trimmer in a clockwise direction until OUT LED (yellow) turns ON, then turn in a counter clockwise direction to turn OFF yellow OUT LED (Background **NOT** Detected Condition).
3. Background Acquisition: press TEACH-IN push-button for 1 sec. The sensor acquire the background. Successful Background Acquisition is indicated by a short blink of the laser emitter. If the yellow LED blinks, the background acquisition procedure has failed.
   Press TEACH-IN push-button and repeat the procedure from step 2.

Hysteresis setting
After background acquisition detection, the sensor is ready to detect any object that passes through the detection area. To obtain the best working for the application it is possible select 4 hysteresis levels. During the hysteresis setting the yellow OUT LED blinks with different frequency to indicate the hysteresis level and the digital output indicate the sensor’s commutation.

1. Position the sensor in front of the background
2. Press TEACH-IN push-button for 3 sec until OUT LED (yellow) turns ON. The yellow OUT LED start to blink with different frequency depending from the hysteresis level:

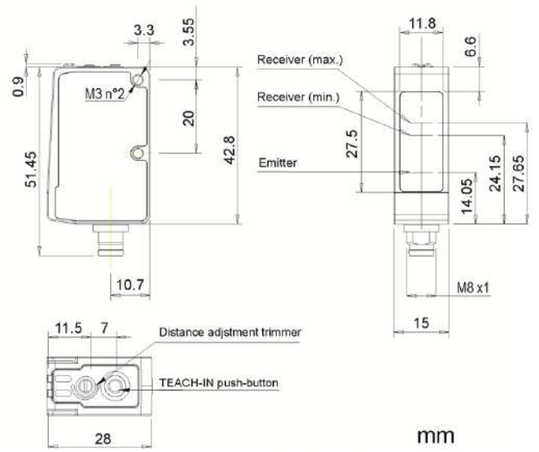
OUT LED BLINKING	HYSTERESIS	BACKGROUND FEATURE
SLOW	LOW	Stable background and optimum shiny objects reading
MIDDLE SLOW	MIDDLE LOW	Little variable background and good shiny objects reading
MIDDLE FAST	MIDDLE HIGH	Moving background and good shiny objects reading
FAST	HIGH	Moving and color variable background and reading of almost all shiny objects

3. Verify the there are not false commutation on the background through digital output, otherwise pass on upper hysteresis level pressing the push-button for 1 sec.
4. Press the TEACH-IN push-button for 3 sec (OUT LED turns OFF and then turns ON) to confirm the hysteresis level.
   Successful hysteresis setting is indicated by a short blink of the laser emitter.
5. Verify the shiny objects reading.

NOTE: With special fixed backgrounds, the S8-MH…M53 sensor detects correctly also transparent objects.

DIMENSIONS

S8-MH VERSION



ADDITIONAL FUNCTIONS

AUTO-ADAPTIVE FUNCTION
During normal operation, a commutation threshold auto-adjustment function is active. At intervals of 1 minute from the last acquisition, the sensor checks if the background signal has changed significantly, and if necessary, updates the commutation value. This function compensates for slow variations of the background caused for example by surface deterioration over time, and therefore avoids repeating the manual background acquisition procedure periodically.

SAFETY PRECAUTIONS

All the safety electrical and mechanical regulations and laws have to be respected during sensor functioning.
The sensor has to be protected against mechanical damages.
Place the given labels in a visible position close to the laser emission.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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For information about the disposal of Waste Electrical and Electronic Equipment (WEEE), please refer to the website at www.datasensing.com.

826000138 Rev. J

DATALOGIC

S8-MR…U

Luminescence sensor

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

READY LED (green)
The green LED ON indicates the powering status.

SET PUSH-BUTTON
A long pressure on the push-button activates the teach procedure.
The REMOTE input allows the external control of the SET push-button.

DARK/LIGHT TRIMMER
The light/dark mode is selected by a monoturn trimmer.

Please refer to the “SETTING” paragraph to get the correct setting procedure.
WARNING: *the maximum mechanical rotation range of the trimmer is 240°. Do not force over of the maximum and minimum positions.*

INSTALLATION

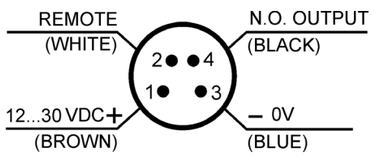
S8-MR:
The sensor can be positioned by means of the two threaded holes using two screws (M3x14 or longer, 0.8Nm maximum tightening torque) with washers.

Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.

S8-MR

CONNECTIONS

M8 connector



TECHNICAL DATA

	S8-MR…U
Power supply:	12 … 30 VDC Class 2 Type 1 for S8-MR UL508
Ripple:	2 Vpp max.
Current consumption (output current excluded):	30 mA max
Outputs:	PNP or NPN N.O.; 30 VDC max. (short-circuit protection) Pull-down/up resistance = 47 KΩ
Output current:	100 mA (overload protection)
Output saturation voltage:	≤ 2 V
Response time:	250 µs / 1 ms
Switching frequency:	500Hz / 2 kHz (according to sensitivity)
Emission type:	LED UV (375 nm)
Spot dimension:	Ø 2 mm a 15 mm
Operating distance (typical values):	10…30 mm
LIGHT/DARK selection:	Mono-turn trimmer
Indicators:	OUTPUT LED (YELLOW) / READY LED (GREEN)
Operating temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Dielectric strength:	⧈: 1500 VAC 1 min. between electronics and housing
Insulating resistance:	>20 MΩ 500 Vdc between electronics and housing
Ambient light rejection:	according to EN 60947-5-2
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for each axis (EN60068-2-6)
Housing material:	INOX AISI 316L
Lens material:	Window in glass; window in PMMA
Mechanical protection:	IP67, IP69K
Connections:	M8 4-pole connector
Weight:	70 g. max
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C

SETTINGS

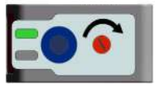
LIGHT/DARK MODE SETTING

LIGHT mode setting
Rotate trimmer in an anti-clockwise direction to set the LIGHT mode (output ON on fluorescent mark).

LIGHT

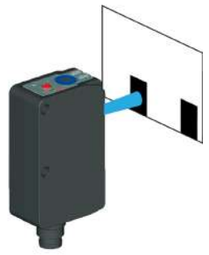
DARK mode setting
Rotate trimmer in a clockwise direction to set the DARK mode (output ON on background).

DARK



EASY TOUCH ACQUISITION
Place mark in front of the sensor spot and press SET until the green READY LED turns off.
If the READY LED turns permanently ON the acquisition was successful.
If the LED blinks slowly the acquisition failed due to insufficient signal.

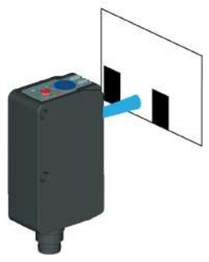
Press SET and the sensor returns to the previous setting.
If the Easy Touch acquisition fails due to insufficient signal, try using Mark-Background procedure described below.



MARK-BACKGROUND ACQUISITION

Mark acquisition
Place mark in front of the sensor spot and press SET until the green READY LED turns on again (3 sec).

Background acquisition
Place background in front of the sensor spot and press SET again.
If the READY LED turns permanently ON the acquisition was successful.
If the LED blinks slowly the acquisition failed due to insufficient contrast.
Press SET and the sensor returns to the previous setting.

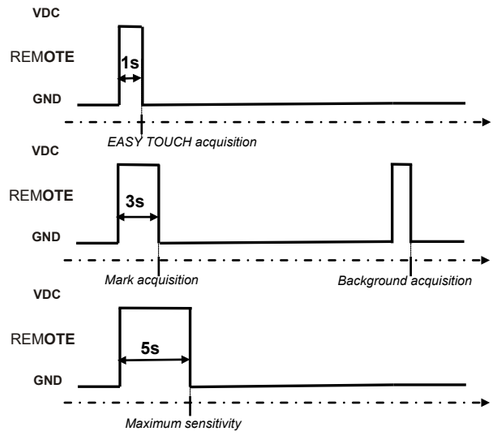


During detection if the luminescence is very low, the sensor increase his sensitivity with a frequency of 500Hz (LED READY green blinks two times at the end of teach procedure).

OTHER FUNCTIONS

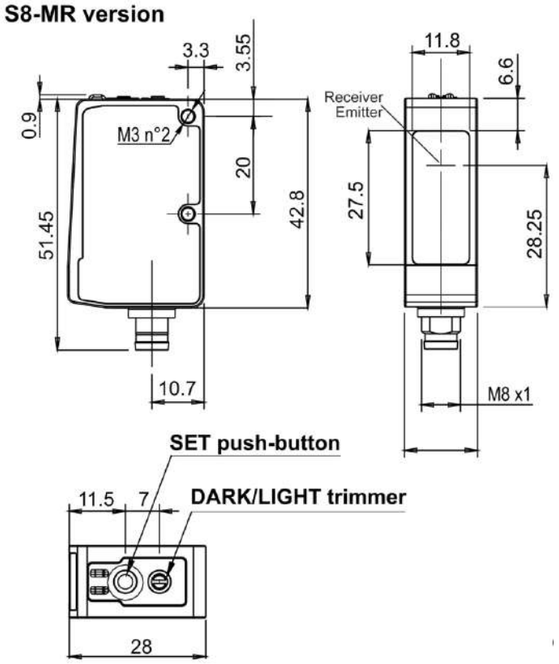
MAXIMUM SENSITIVITY WITH MAXIMUM FREQUENCY SETTING
To set maximum sensitivity with maximum frequency, press SET push-button for 5 sec. with LED READY green turns off again.

REMOTE INPUT
The REMOTE signal carries-out acquisition functions without using the SET push-button.
The REMOTE wire connected to +VDC is equal to pressing the SET pus-button, connected to GND or not connected is equal to not pressing the SET push-button.



DIMENSIONS

S8-MR version



The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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826000970 Rev. A

DATALOGIC

S8-MH…B Laser

Polarised Retroreflex

S8-MH…M Laser

Background suppression

INSTRUCTION MANUAL

CLASS 1 EN 60825-1 (2014)
LASER PRODUCT

CONTROLS

LED DI USCITA (giallo)
Il LED giallo acceso indica lo stato dell'uscita.
OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

POWER ON LED (green)
The green LED ON indicates the powering status and the laser emission presence.

SENSITIVITY TRIMMER (ADJ.) (S8…B)
The sensitivity and operating distance can be adjusted using this trimmer.
See the "SETTING" paragraph for procedure indications.

DISTANCE ADJUSTMENT TRIMMER (ADJ.) (S8…M)
The multiturn trimmer with clutch (8 turns) adjusts the suppression distance through the mechanical variation of the optic triangulation angle.
The operating distance increases rotating the trimmer in a clockwise direction.
Please refer to the "SETTING" paragraph for the correct procedure.

LIGHT/DARK TRIMMER
The light/dark mode can be selected using this mono-turn trimmer.
See the "SETTING" paragraph for procedure indications.

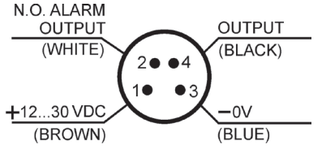
WARNING: the maximum mechanical rotation range of the TEACH-IN trimmer is 240°. Do not force over of the maximum and minimum positions.

INSTALLATION

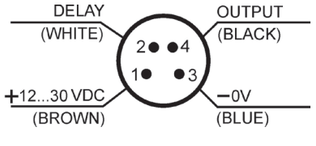
The sensor can be positioned by means of the two housing holes using two screws (M3x18 or longer, 0.8 Nm maximum tightening torque) with washers.
Several fixing brackets are available which can be oriented in various positions to ease the sensor installation, (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.

CONNECTIONS

S8…B



S8…M



TECHNICAL DATA

	S8…B	S8…M
Power supply:	12 … 30 VDC Class 2 Type 1 UL508	
Ripple:	2 Vpp max.	
Consumption (output current excluded):	30 mA max	
Outputs:	PNP and NPN; 30 Vdc max. (short-circuit protection)	
Output current:	100 mA (overload protection)	
Output saturation voltage:	≤ 2 V	
Response time:	50 µs	100 µs
Switching frequency:	10 KHz	5 KHz
Emission type:	RED LASER (λ = 645…665nm): Class 1 IEC 60825-1 (2014), Class II CDRH 21 CFR PART 1040.10 Pulsed emission: pot. max ≤ 5 mW; pulse duration = 3 µs; frequency = 40kHz (S8…B) / 20kHz (S8…M) / 10kHz (S8…M53)	
Spot dimension:	< 0.5 mm @ 500 mm	< 0.2 mm @ 110 m
Operating distance (typical values):	see tab.1	20…200 mm
Setting:	Sensitivity trimmer	8 turns distance adj. trimmer
LIGHT/DARK selection:	Mono-turn trimmer	
Indicators:	OUTPUT LED (yellow) / POWER ON LED (green)	
Operating temperature:	-10 … 55 °C	
Storage temperature:	-20 … 70 °C	
Dielectric strength:	⧈: 1500 VAC 1 min between electronic parts and housing	
Insulating resistance:	>20 MΩ 500 VDC between electronic parts and housing	
Ambient light rejection:	according to EN 60947-5-2	
AtEx 2014/34/EU:	II 3G Ex nA II T6° II 3D Ex tD A22 IP67 T85°C	
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)	
Shock resistance:	11 ms (30 G) 6 shocks per every axis (EN60068-2-27)	
Housing material:	INOX AISI 316L	
Lens material:	window in PMMA; lens in PC	
Mechanical protection:	IP67; IP69K	
Connections:	M8 4-pole connector	
Weight:	70 g. max.	

S8…B SETTINGS

DARK/LIGHT MODE SETTING
LIGHT mode: Rotate trimmer in an anti-clockwise.
DARK mode: Rotate trimmer in a clockwise.

SENSITIVITY SETTING
Alignment: Position and align the sensor and reflector on opposite side at the desired distance.
Rotate sensitivity adjustment trimmer (ADJ.) to maximum point (clockwise direction).
Move the sensor vertically and horizontally to determine the powering on and powering off points of the yellow LED (OUT) and fix the sensor in the middle of these two points. To detect very small objects, reduce the sensitivity using the specific trimmer (*if necessary*). Repeat procedure reducing progressively the sensitivity to improve alignment.

Control:
Enter object laterally in the detection area and check that the yellow LED turns ON (in dark mode).Remove object and check that the yellow LED turns OFF immediately (in dark mode).

ALARM OUTPUT
The alarm output is active (ON) when the received signal remains without safety margin for more than 1 second (30% respect to output switching value).

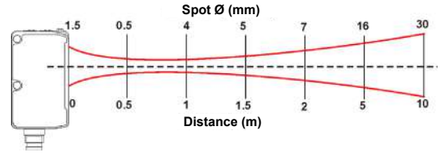
S8...B PERFORMANCES

TAB.1: Operative distance

REFLECTOR

R2	R6	R7	R8
10 m	10 m	12 m	1 m

N.B.: Si sconsiglia l'uso della pellicola riflettente RT3970.

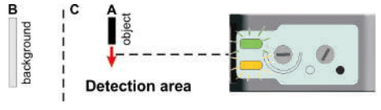


S8…M SETTINGS

DARK/LIGHT MODE SETTING
LIGHT mode: Rotate trimmer in an anti-clockwise.
DARK mode: Rotate trimmer in a clockwise.
SUPPRESSION DISTANCE SETTING
Object detection (LIGHT mode): Position object to detect in front of the sensor at the distance required.
Turn distance adjustment trimmer (ADJ) to minimum: yellow LED OFF.
Rotate trimmer in a clockwise direction until the yellow LED turns ON: Object detection condition (pos.A).

pos.A *pos.B* *pos.C*

Background detection: Remove object and ensure that the background is in front of the sensor: yellow LED OFF.
Rotate trimmer in a clockwise direction until the yellow LED turns ON: *background detection condition* (pos.B).
The trimmer reaches maximum level with yellow LED OFF if the background is outside the operating range.
Rotate trimmer in an anticlockwise direction until yellow LED turns OFF: *condition where background is outside operating range* (pos.C).
Setting and control: Rotate trimmer in an anti-clockwise direction until the trimmer reaches an intermediate point between position A and C.
If position A and C are close to each other, leave trimmer on position C.
The sensor is now ready to function correctly and in stable conditions.

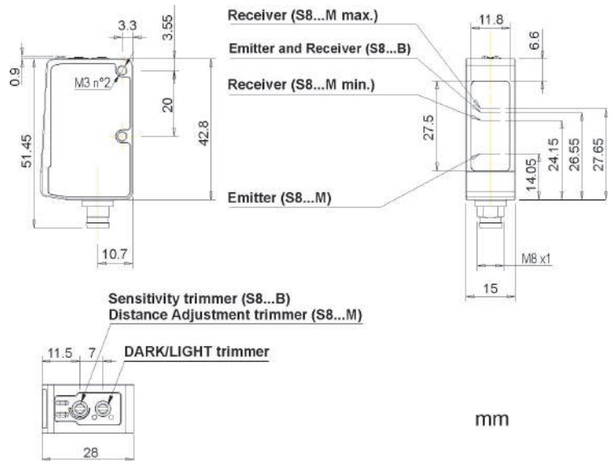


DELAY SETTING
The DELAY extends to 20ms the minimum duration of the output activation allowing even slower interfacing systems to detect shorter pulses.

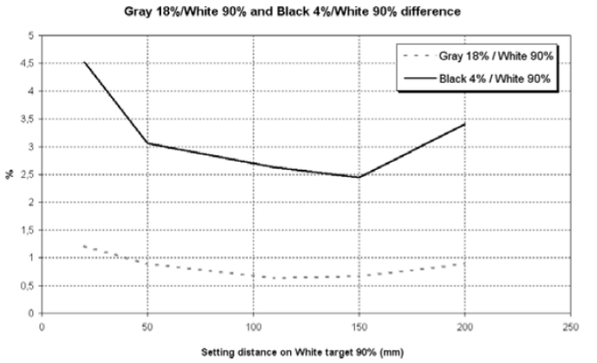
Delay activation
Connect Delay signal (white wire) to power supply.

Delay de-activation
Connect Delay signal (white wire) to 0V or leave it disconnected.

DIMENSIONS



DETECTION DIAGRAM



SAFETY PRECAUTIONS

All the safety electrical and mechanical regulations and laws have to be respected during sensor functioning.
The sensor has to be protected against mechanical damages.
Place the given labels in a visible position close to the laser emission.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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826000980 Rev. A

DATALOGIC

S8-MR…M
Background suppression

S8-MR…B
Polarised retroreflex

S8-MR…C
Diffuse proximity

S8-MR…F/G
Receiver/Emitter

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (yellow) (S8…B/C/M/F)
The yellow LED ON indicates the output status.

POWER ON LED (green)
The green LED ON indicates the powering status and the laser emission presence.

DISTANCE ADJUSTMENT TRIMMER (ADJ.) (S8…M)
The multiturn trimmer with clutch (8 turns) adjusts the suppression distance through the mechanical variation of the optic triangulation angle.
The operating distance increases rotating the trimmer in a clockwise direction.
Please refer to “SETTING” paragraph for the correct use procedure.

SENSITIVITY TRIMMER (ADJ.) (S8..B/C/F)
The sensitivity and operating distance can be adjusted using this trimmer.
See the “SETTING” paragraph for procedure indications.

LIGHT/DARK TRIMMER
The light/dark mode is selected using a mono-turn trimmer.
Please refer to “SETTING” paragraph for the correct use procedure.

***WARNING:** the maximum mechanical rotation range of the trimmer is 240°. Do not force over of the maximum and minimum positions.*

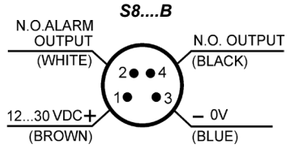
INSTALLATION

The sensor can be positioned by means of the two housing holes using two screws (M3x18 or longer, 0.8Nm maximum tightening torque) with washers.
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.

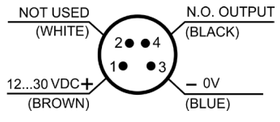
CONNECTIONS

M8 Connector

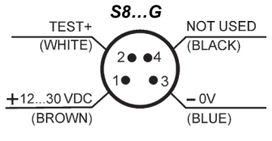
S8....B



S8....M/C/F



S8…G



TECHNICAL DATA

	S8…M	S8…B	S8…C	S8…F	S8…G
Power supply:	12 … 30 VDC				
Ripple:	2 Vpp max.				
Consumption (output current excluded):	35 mA max	30 mA max		20 mA max	15 mA max
Outputs / Alarm output (only B):	PNP or NPN N.O.; 30 Vdc max. (short-circuit protection)				-
Output current:	100 mA (overload protection)				-
Output saturation voltage:	≤ 2 V				-
Response time:	1ms	500 us			
Switching frequency:	500Hz	1KHz			
Emission type:	RED (660 nm)			-	RED (660 nm)
Operating distance (typical values):	50..300mm	5m on R2, 7m on R5 (EG2)	50cm on 90% white target (EG2)	25m (30m max)	
Regulations	8-turn distance adjustment trimmer	Mono-turn sensitivity adjustment trimmer			-
LIGHT/DARK selection:	Monoturn trimmer				-
Indicators:	OUTPUT LED (yellow) / POWER ON LED (green)				POWER ON LED (green)
Operating temperature:	-10 … 55 °C				
Storage temperature:	-20 … 70 °C				
Dielectric strength:	⧈: 1500 Vac 1 min. between electronics and housing				
Insulating resistance:	>20 MΩ 500 Vdc between electronics and housing				
Ambient light rejection:	according to EN 60947-5-2				
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C				
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for each axis (EN60068-2-6)				
Shock resistance:	11 ms (30 G) 6 shocks for each axis (EN60068-2-27)				
Housing material:	INOX AISI 316L				
Lens material:	Window in glass; lens in PC				
Mechanical protection:	IP67; IP69K (TYPE 1 ENCLOSURE)				
Connections:	M8 4-pole connector				
Weight:	70 g. max.				

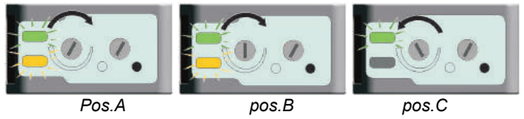
SETTINGS

DARK/LIGHT SETTING
Rotate trimmer in an anti-clockwise direction to set the LIGHT mode (output ON with the reflector).
Rotate trimmer in a clockwise direction to set the DARK mode (output ON in presence of the object).

LIGHT DARK

SUPPRESSION DISTANCE SETTING (S8...M)

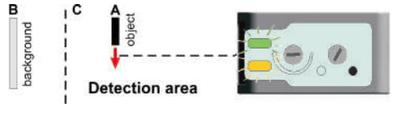
1. *Object detection (Light mode)*
Position object to detect in front of the sensor at the distance required.
Turn distance adjustment trimmer (ADJ) to minimum: yellow LED OFF.
Rotate trimmer in a clockwise direction until the yellow LED turns ON.
Object detection condition (pos.A).



Pos.A *pos.B* *pos.C*

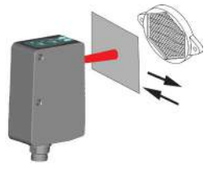
2. *Background suppression*
Remove object and ensure that the background is in front of the sensor: yellow LED OFF.
Rotate trimmer in a clockwise direction until the yellow LED turns ON: *background detection condition* (pos.B).
The trimmer reaches maximum level with yellow LED OFF if the background is outside the operating range.
Rotate trimmer in an anticlockwise direction until yellow LED turns OFF: *condition where background is outside operating range* (pos.C).

3. *Setting and control*
Rotate trimmer in an anti-clockwise direction until the trimmer reaches an intermediate point between position A and C.
If position A and C are close to each other, leave trimmer on position C.
The sensor is now ready to function correctly and in stable conditions.



SENSITIVITY SETTING (S8...B)
Alignment:
- Position and align the sensor and reflector on opposite side at the desired distance.
- Rotate sensitivity adjustment trimmer (ADJ.) to maximum point (clockwise direction).
- Move the sensor vertically and horizontally to determine the powering on and powering off points of the yellow LED (OUT) and fix the sensor in the middle of these two points.
- To detect very small objects, reduce the sensitivity using the specific trimmer (*if necessary*). Repeat procedure reducing progressively the sensitivity to improve alignment.

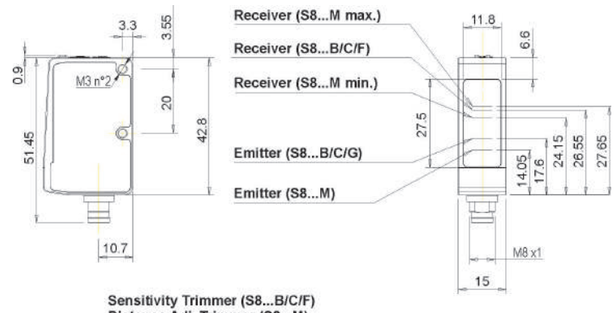
Control:
- Enter object laterally in the detection area and check that the yellow LED turns ON (in dark mode).
- remove object and check that the yellow LED turns OFF immediately (in dark mode).

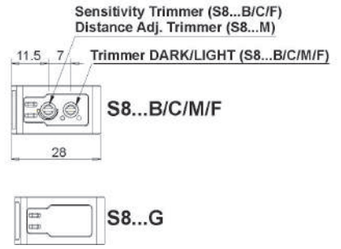


SETTINGS (S8...C)
Turn the sensitivity trimmer to minimum: the yellow LED is OFF (light mode).
Position the target to detect in front of the sensor.
Turn the sensitivity trimmer clockwise until the yellow LED turns ON *(Target detected state, pos.A)*.
Remove the target, the yellow LED turns OFF.
Turn the sensitivity trimmer clockwise until the yellow LED turns ON *(Background detected state, pos.B)*.
The trimmer reaches maximum if the background is not detected.
Turn the trimmer to the intermediate position C, between the two positions A and B.

SETTINGS (S8...F/G)
Position the sensors on opposite sides. Turn the sensitivity trimmer to maximum. Find the points where the yellow LED (OUT) is switched ON and OFF in both vertical and horizontal positions, and fix the sensor in the centre between these points. If necessary, reduce sensitivity using the trimmer, in order to detect very small targets. In order to improve alignment, repeat the procedure detailed above whilst progressively reducing the sensitivity.

DIMENSIONS





PERFORMANCES (S8..B)

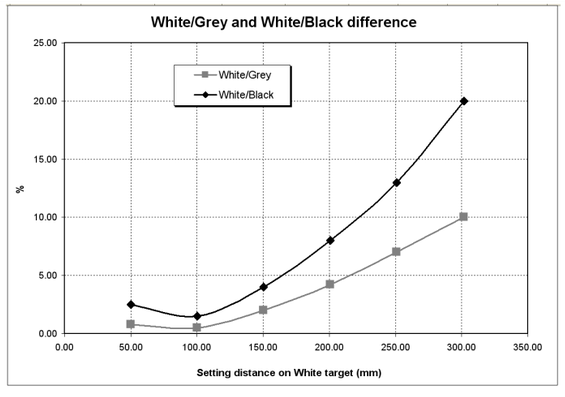
TAB.1: Operative distance

REFLECTOR

R2	R5	RT3970 (60x40mm)
5 m	7 m	2 m

On RT3970 the sensor performances are strongly influenced by the dimensions used.

DETECTION DIAGRAM (S8…M)



DIAGNOSTIC FUNCTIONS (S8…G)

TEST+ input
The TEST+ input can be used to inhibit the emitter and verify that the system is correctly operating. The TEST function is activated if the TEST+ input is connected to a voltage between 12…30V, whereas if the TEST+ input is connected to GND or it is not connected the function is disactivated.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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826001080 Rev. A

DATALOGIC

S8-MR…M53

Background suppression for shiny objects

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

POWER ON LED (green)
The green LED ON indicates the powering status and the laser emission presence.

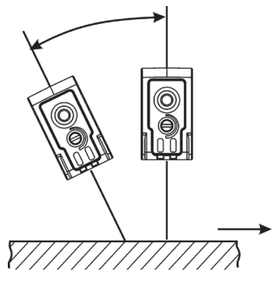
DISTANCE ADJUSTMENT TRIMMER (ADJ.)
The multiturn trimmer with clutch (8 turns) adjusts the suppression distance through the mechanical variation of the optic triangulation angle.
The operating distance increases rotating the trimmer in a clockwise direction.
Please refer to the “SETTING” paragraph for the correct procedure.

TEACH-IN PUSH-BUTTON
The push-button allows acquiring the background.
Please refer to the “SETTING” paragraph for the correct procedure.

INSTALLATION

The sensor can be positioned by means of the two housing holes using two screws (M3x18 or longer, 0.8 Nm maximum tightening torque) with washers.
Several fixing brackets are available which can be oriented in various positions to ease the sensor installation, (please refer to the accessories listed in the general catalogue).

The operating distance is measured from the front surface of the sensor optics.

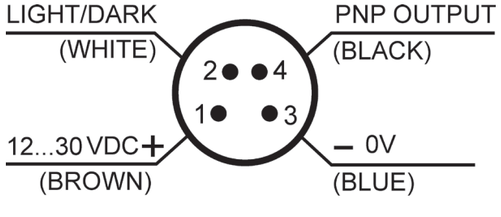


S8-MR

In the presence of moving backgrounds like conveyor belts, especially having a dark or shiny surface, the best object detection performance can be obtained by mounting the sensor at an angle (max 30°) with respect to the horizontal plane, as shown in the figure.

CONNECTIONS

M8 CONNECTOR



TECHNICAL DATA

	S8-MR…M53
Power supply:	12 … 30 VDC Class 2 Type 1 UL508
Ripple:	2 Vpp max.
Consumption (output current excluded):	30 mA max
Outputs:	PNP; 30 Vdc max. (short-circuit protection)
Output current:	100 mA (overload protection)
Output saturation voltage:	≤ 2 V
Response time:	2 ms
Switching frequency:	250 Hz
Emission type:	Red (660 nm)
Operating distance (typical values):	100...300 mm
Setting:	8-turns distance adjustment trimmer – Background suppression push-button
LIGHT/DARK selection:	white wire
Indicators:	OUTPUT LED (YELLOW) / POWER ON LED (GREEN)
Operating temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Dielectric strength:	⧈: 1500 VAC 1 min between electronic parts and housing
Insulating resistance:	>20 MΩ 500 VDC between electronic parts and housing
Ambient light rejection:	according to EN 60947-5-2
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shocks per every axis (EN60068-2-27)
Housing material:	ABS
Lens material:	PMMA window; PC lens
Mechanical protection:	IP67
Connections:	M8 4-pole connector
Weight:	70 g. max
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C

SETTING

LIGHT/DARK MODE SETTING

LIGHT MODE setting	***DARK MODE setting***
Connect the LIGHT/DARK signal (white wire) to 0V or leave unconnected. The output is ON with the object in the sensing area and OFF on the background.	Connect the LIGHT/DARK signal (white wire) to +VDC. The output is OFF with the object in the sensing area and ON on the background.

BACKGROUND ACQUISITION PROCEDURE
The S8…M53 sensor allows detection of shiny objects without the false commutations typical of traditional background suppression sensors. To function correctly it is necessary to perform the Background Acquisition Procedure at power up as described below.

1. Activation Background Acquisition Procedure: press TEACH-IN push-button for 1 sec until OUT LED (yellow) turns OFF.
   The output (black wire) turns OFF and the yellow LED signals the commutations of a standard background suppressor.
2. Background suppression from the detection area (CUT-OFF): position the sensor in front of the background at a distance within its Operating Range. Turn the Distance Adjustment Trimmer in a clockwise direction until OUT LED (yellow) turns ON, then turn in a counter clockwise direction to turn OFF yellow OUT LED (Background **NOT** Detected Condition).
3. Background Acquisition: press TEACH-IN push-button for 1 sec. The sensor acquire the background. Successful Background Acquisition is indicated by a short blink of the laser emitter. If the yellow LED blinks, the background acquisition procedure has failed.
   Press TEACH-IN push-button in the counter-clockwise direction and repeat the procedure from step 2.

Hysteresis setting
After background acquisition detection, the sensor is ready to detect any object that passes through the detection area. To obtain the best working for the application it is possible select 4 hysteresis levels. During the hysteresis setting the yellow OUT LED blinks with different frequency to indicate the hysteresis level and the digital output indicate the sensor’s commutation.

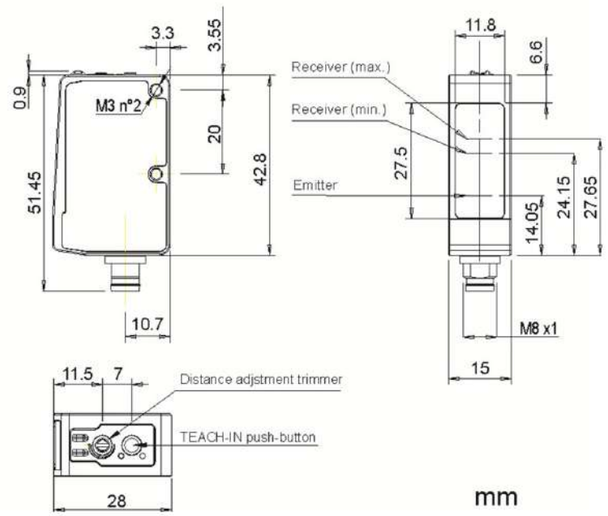
1. Position the sensor in front of the background
2. Press TEACH-IN push-button for 3 sec until OUT LED (yellow) turns ON. The yellow OUT LED start to blink with different frequency depending from the hysteresis level:

OUT LED BLINKING	HYSTERESIS	BACKGROUND FEATURE
SLOW	LOW	Stable background and optimum clear and shiny objects reading
MIDDLE SLOW	MIDDLE LOW	Little variable background and good clear and shiny objects reading
MIDDLE FAST	MIDDLE HIGH	Moving background and good clear and shiny objects reading
FAST	HIGH	Moving and color variable background and reading of almost all clear and shiny objects

3. Verify the there are not false commutation on the background through digital output, otherwise pass on upper hysteresis level pressing the push-button for 1 sec.
4. Press the TEACH-IN push-button for 3 sec (OUT LED turns OFF and then turns ON) to confirm the hysteresis level. Successful hysteresis setting is indicated by a short blink of the laser emitter.
5. Verify the clear and shiny objects reading.

DIMENSIONS

S8-MR VERSION



ADDITIONAL FUNCTIONS

AUTO-ADAPTIVE FUNCTION
During normal operation, a commutation threshold auto-adjustment function is active. At intervals of 1 minute from the last acquisition, the sensor checks if the background signal has changed significantly, and if necessary, updates the commutation value. This function compensates for slow variations of the background caused for example by surface deterioration over time, and therefore avoids repeating the manual background acquisition procedure periodically.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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826001090 Rev. A

S8-MR…W13

Contrast sensor

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

READY LED (green)
The green LED ON indicates the powering status.

SET PUSH-BUTTON
A long pressure on the push-button activates the teach procedure.
The REMOTE input allows the external control of the SET push-button.

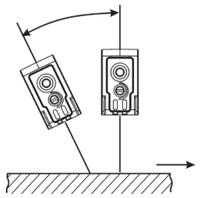
DARK/LIGHT TRIMMER (only for dynamic setting)
The light/dark mode is selected by a monoturn trimmer.

Please refer to the “SETTING” paragraph to get the correct setting procedure.
WARNING: *the maximum mechanical rotation range of the trimmer is 240°.*
Do not force over the maximum and minimum positions.

INSTALLATION

S8-MR:
The sensor can be positioned by means of the two threaded holes using two screws (M3x14 or longer, 0.8Nm maximum tightening torque) with washers.

Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.

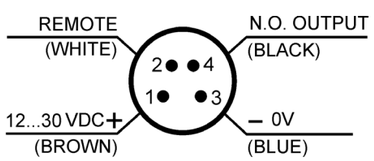


S8-MR

Mark detection on a reflective surface is improved adjusting the beam direction to 5° … 20° from surface axis.

CONNECTIONS

M8 connector



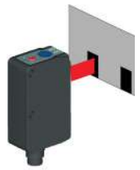
TECHNICAL DATA

	S8-MR…W13
Power supply:	12 … 30 VDC Class 2 Type 1 UL508
Ripple:	2 Vpp max.
Current consumption (output current excluded):	30 mA max
Outputs:	PNP or NPN N.O.; 30 VDC max. (short-circuit protection) Pull-down/up resistance = 47 KΩ
Output current:	100 mA (overload protection)
Output saturation voltage:	≤ 2 V
Response time:	20 µs
Switching frequency:	25 kHz
Emission type:	BLUE (465 nm) / GREEN (520 nm) / RED (630 nm) with automatic selection
Spot dimension:	3x1 mm^2
Operating distance (typical values):	9 mm
Depth of field:	± 3 mm
LIGHT/DARK selection:	Mono-turn trimmer (only for dynamic setting)
Indicators:	OUTPUT LED (YELLOW) / READY LED (GREEN)
Operating temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Dielectric strength:	⧈: 1500 VAC 1 min. between electronics and housing
Insulating resistance:	>20 MΩ 500 Vdc between electronics and housing
Ambient light rejection:	according to EN 60947-5-2
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for each axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shocks for each axis (EN60068-2-27)
Housing material:	INOX AISI 316L
Lens material:	Window in glass; window in PMMA
Mechanical protection:	IP67, IP69K
Connections:	M8 4-pole connector
Weight:	70 g. max
AtEx 2014/34/EU:	II 3G EX nA II T6 II 3D EX tD A22 IP67 T85°C

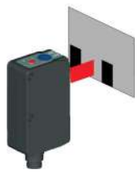
SETTINGS

MARK-BACKGROUND ACQUISITION

Mark acquisition
The DARK/LIGHT mode is automatically selected by the sensor.
Place mark in front of the sensor spot and press SET push-button until the green READY LED turns off (1 sec).
The sensor functions alternating red, green and blue emissions.
Do not move the mark during this phase.



Background acquisition
Place background in front of the sensor spot and press SET push-button again.
The sensor functions alternating red, green and blue emissions.
Do not move the mark during this phase.



DYNAMIC ACQUISITION
Use the dynamic setting to detect moving target. The sensor sets automatically the threshold value during target movement. The DARK/LIGHT mode has to be previously set.

LIGHT/DARK MODE SETTING

LIGHT mode setting
Rotate trimmer in an anti-clockwise direction to set the LIGHT mode (clear mark on dark background).

DARK mode setting
Rotate trimmer in a clockwise direction to set the DARK mode mode (dark mark on clear background).

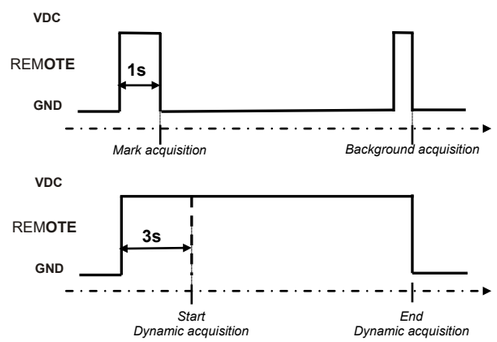
Dynamic detection
Position the sensor spot in front of the target to detect.
Press SET push-button until the green READY LED turns off (3sec) and keep it pressed.
To end the dynamic detection procedure release the SET push-button.
The sensor functions alternating red, green and blue emissions.

SETTING RESULT
The switching threshold is typically placed 25% below the mark. If the sensing conditions are accepted, at the end of teach procedure the READY LED blinks x2 for 3sec. If SET push-button is pressed in this 3 seconds the switching threshold is placed in the midpoint between the mark and the background. If the READY LED blinks fast the acquisition failed for to insufficient contrast. Press SET push-button and the sensor returns to the previous setting

OTHER FUNCTIONS

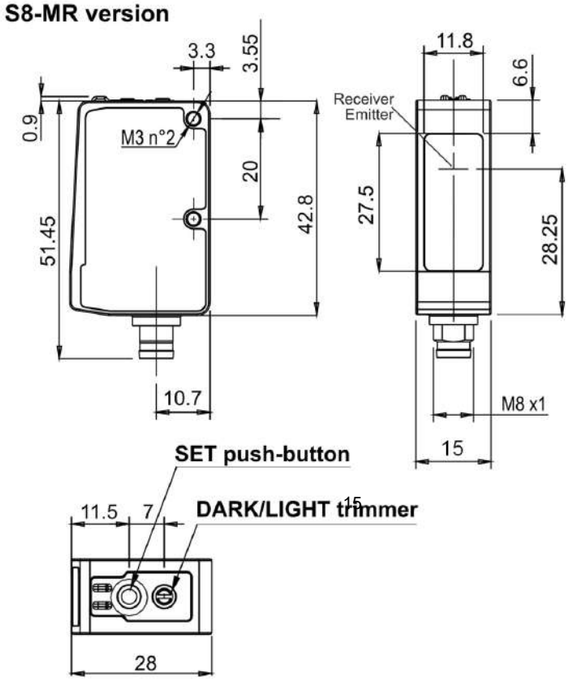
KEYLOCK function (keyboard lock)
The KEYLOCK function (keyboard lock) allows to deactivate the SET push-button avoiding accidental changes in the sensor setting.
If at sensor powering the REMOTE wire is connected to +Vdc for at least 1 sec., the *keylock* function is activated and the push-button is no longer active.
To deactivate the *keylock*, the sensor must be turned off and repowered with the REMOTE wire not connected or connected to GND.

REMOTE input
Different detection functions can be made with the REMOTE signal, without using the SET push-button.
The REMOTE wire connected to +VDC is equal to pressing the SET push-button, it connected to GND or not connected is equal to not pressing the SET push-button.
The connection duration of the REMOTE wire to +VDC determines the detected type requested:



DIMENSIONS

S8-MR version



sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

For information about the disposal of Waste Electrical and Electronic Equipment (WEEE), please refer to the website at www.datasensing.com.

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