



S8-PH/MH...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

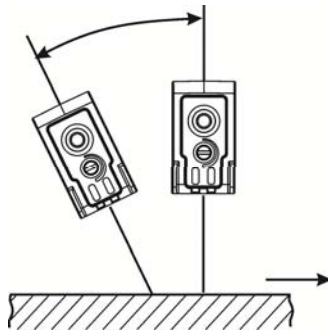
The push-button allows acquiring the background. Please refer to the "SETTING" paragraph for the correct procedure.

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).

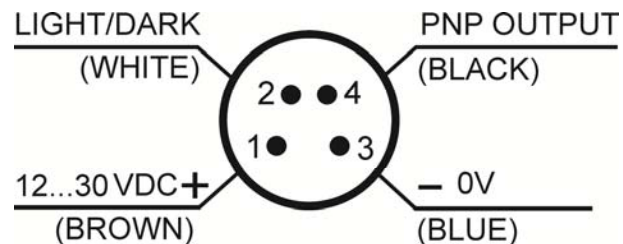
The operating distance is measured from the front surface of the sensor optics.



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 for S8-MH) 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 2 IEC 60825-1, 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)
Shock resistance:	11 ms (30 G) 6 shocks per every axis (EN60068-2-27)
Housing material:	ABS (S8-PH) / INOX AISI 316L (S8-MH)
Lens material:	PMMA window; PC lens
Mechanical protection:	IP67 (S8-PH) / IP67, IP69K (S8-MH)
Connections:	M8 4-pole connector
Weight:	12 g. max. (S8-PH) / 70 g. max (S8-MH)

SETTING

LIGHT/DARK MODE SETTING

LIGHT 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.

DARK MODE setting

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-PH...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:

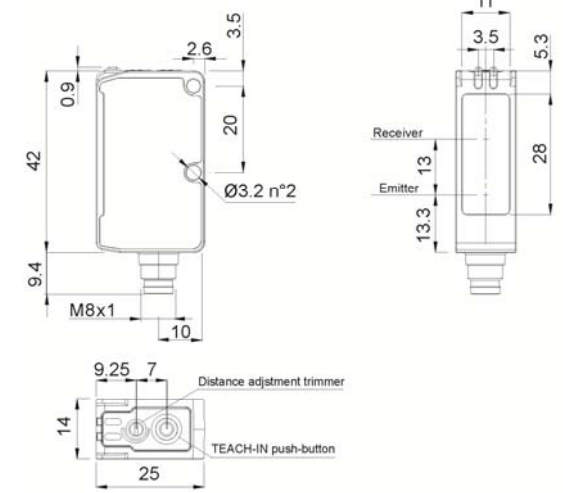
OUT LED BLINKING	HYSTERESIS	BACKGROUND FEATURE
SLOW	LOW	Stable background and optimum shiny objects reading
MIDDLE SLOW	MIDDLE LOW	Little variable background and good shiny objects reading
MIDDLE FAST	MIDDLE HIGH	Moving background and good shiny objects reading
FAST	HIGH	Moving and color variable background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

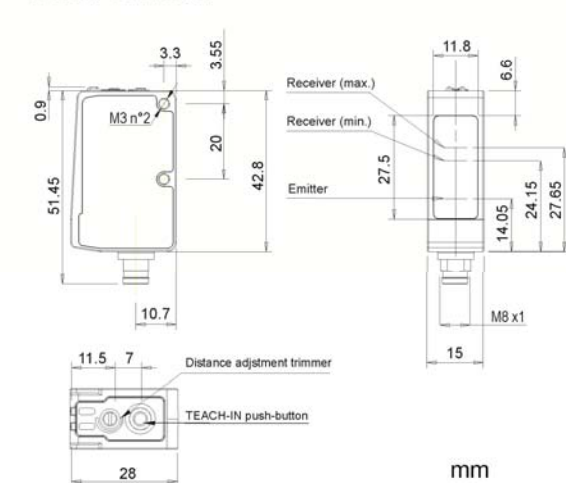
NOTE: With special fixed backgrounds, the S8-PH/MH...M53 sensor detects correctly also transparent objects.

DIMENSIONS

S8-PH VERSION



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.



Do not look directly into the laser beam!
Do not point the laser beam towards people!
These sensors are not to be used for safety applications!

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

DECLARATION OF CONFORMITY

We Datalogic Automation declare under our sole responsibility that these products are conform to the 2004/108/CE and successive amendments.

WARRANTY

Datalogic Automation warrants its products to be free from defects. Datalogic Automation will repair or replace, free of charge, any product found to be defective during the warranty period of 36 months from the manufacturing date. This warranty does not cover damage or liability deriving from the improper application of Datalogic Automation products.

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