This product is covered by one or more of the following patents European Patent: 1,324,072 B1

ATALOGIC



S81-M Background suppressor with laser emission and time of flight measurement



INSTRUCTION MANUAL

CONTROLS OUT LED (yellow) The yellow LED SON indicates the activation of the S output. OUT LED (yellow) The yellow LED TON indicates the activation of the T output. POWER ON/ALARM LED (green) Î The green LED blinking indicates received signal absence or distance target outside the measurement range. ₽ The green LED on indicates the power of the sensor. **OUT PUSH-BUTTON** The teach-in procedure of the digital threshold of the 🜷 output is activated by pressing the - push-button. 4 ô P **OUT PUSH-BUTTON** The teach-in procedure of the digital threshold of the *****

The teach-in procedure of the digital threshold of the **o**utput is activated by pressing the **o** push-button.

See the "THRESHOLD SETTING" paragraph for digital threshold teachin procedure

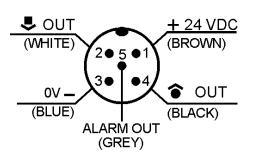
INSTALLATION

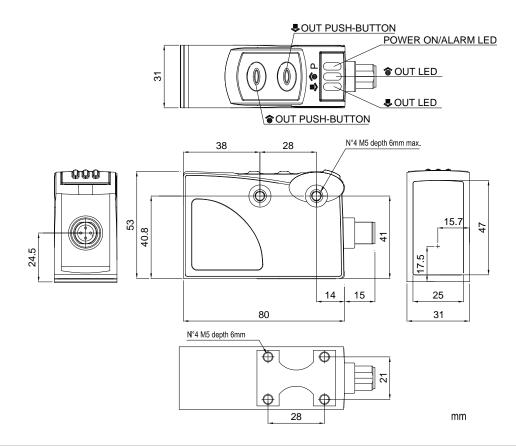
The sensor can be positioned using threaded M5 holes with max. 6 mm. depth.

Do not apply excessive torque when adjusting (max 2.2 Nm).

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







DIMENSIONS

TECHNICAL DATA

S81-M-PPC S81-M-NC Power supply: 24 +/- 20% VDC limit values (Class 2 UL 508) Ripple: 2 Vpp max. Consumption (output current excluded): 120 mA max (100 mA @ 24 V) Outputs: 30 VDC max, (short-circuit protection) 1 alarm output PNP 30 VDC max, (short-circuit protection) 1 alarm output NPN Switching mode LIGHT Outputs: 30 VDC max, (short-circuit protection) 1 alarm output NPN Switching mode LIGHT Output current: 000 mA max Measurement range: 300				
Ripple: 2 Vpp max. Consumption (output current excluded): 120 mA max (100 mA @ 24 V) Outputs: 30 VDC max. (short-circuit protection) 1 alarm output PNP 30 VDC max. (short-circuit protection) 1 alarm output NPN Switching mode LIGHT Outputs: 30 VDC max. (short-circuit protection) 1 alarm output NPN Switching mode LIGHT Output current: 100 MA max Measurement range: 300 4000 mm (90% while) 300 3000 mm (4% black) White 90% hysteresis < 30 mm White 90% hysteresis < 30 mm White 90% hysteresis < 40 mm White 90% hysteresis < 50 mm Temperature drift:: < 1 mm/°C Response time: 5 ms Switching frequency: 80 Hz Indicators: © UT LED (yellow) / POWER ON-ALLARM (green) Setting: © UT and © UT push-buttons Warm-up: 15 min. Operating temperature: 0 50 °C Storage temperature: 20 MQ 500 VDC between electronics parts and housing Insulating resistance: 0 50 °C Insulating resistance: 0 50 °C Insiston type:		S81-M-PPC	S81-M-NNC	
Consumption (output current excluded): 120 mA max (100 mA @ 24 V) Outputs: 2 PNP outputs 30 VDC max. (short-circuit protection) 1 alarm output PNP 30 VDC max. (short-circuit protection) 1 alarm output NPN Switching mode LIGHT Output current: 100 mA max Measurement range: 300 4000 mm (90% white) 300 2000 mm (4% black) White 90% -prey 18% hysteresis < 30 mm	Power supply:	24 +/- 20% VDC limit values (Class 2 UL 508)		
(output current excluded):120 mA max (100 mA $@ 24 V$)Outputs:2 PNP outputs 30 VDC max. (short-circuit protection) 1 alarm output PNP2 NPN outputs 30 VDC max. (short-circuit protection) 1 alarm output NPNSwitching modeLIGHTOutput current:100 mA maxMeasurement range:300 4000 mm (90% white) 300 3000 mm(18% gray) 300 3000 mm (18% gray) 300 3000 mm (18% gray) 300 3000 mm (4% black)White 90% hysteresis< 30 mm	Ripple:	2 Vpp max.		
(dutputs: 2 PNP outputs 30 VDC max. (short-circuit protection) 1 alarm output PNP 2 NPN outputs 30 VDC max. (short-circuit protection) 1 alarm output NPN Switching mode LIGHT Output current: 100 mA max Measurement range: 300 4000 mm (90% white) 300 3000 mm (19% pray) 300 3000 mm (19% pray) 300 3000 mm (19% pray) 300 3000 mm (19% pray) 300 2000 m		120 mA may (100 mA @ 24 \/)		
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1 alarm output PNP1 alarm output NPNSwitching modeLIGHTOutput current:100 mA maxMeasurement range: 3004000 mm (90% white) 3004000 mm (90% white) 3004000 mm (90% white) 3004000 mm (90% white) 3004000 mm (4% black)White 90%, hysteresis <30 mmWhite 90%, orgen 18% hysteresis <30 mmTemperature drift: <1 mm ^o CResponse time: 5 msSwitching frequency: 5 msIndicators: \bigcirc OUT LED (yellow) / \bigcirc OUT LED (yellow) / POWER ON-ALLARM (green)Setting: \bigcirc OUT and \bigcirc OUT push-buttonsWarm-up: \bigcirc OUT LED (yellow) / \bigcirc OUT LED (yellow) / POWER ON-ALLARM (green)Setting: \bigcirc OUT and \bigcirc OUT and \bigcirc OUT push-buttonsWarm-up: \bigcirc OUT and \bigcirc OUT and \bigcirc OUT push-buttonsDielectric strength: 20 MQ 500 VDC between electronics parts and housingInsulating resistance: 20 MQ 500 VDC between electronics parts and housingThylical spot dimension: \bigcirc RED LASER ($\lambda = 665$ nm): Class 2 EN 60825-1 (2014) + A1(2002) + A2(2001)Ambient light rejection: 050 Hz frequency, for every axis (EN6068-2-6)Shock resistance: 050 Hz frequency, for every axis (EN6068-2-6) <t< td=""><td>Outputs:</td><td></td><td>•</td></t<>	Outputs:		•	
Switching mode LIGHT Output current: 100 mA max Measurement range: 300 4000 mm (90% white) 300 4000 mm (90% white) 300 2000 mm (4% black) White 90%, hysteresis < 30 mm				
Dutput current:100 mA maxMeasurement range: $300 \dots 4000 \text{ mm} (90\% \text{ white})$ $300 \dots 3000 \text{ mm} (18\% gray)$ $300 \dots 3000 \text{ mm} (18\% gray)$ $300 \dots 2000 \text{ mm} (4\% black)$ White 90% hysteresis $<30 \text{ mm}$ White 90% - grey 18% hysteresis $<30 \text{ mm}$ White 90% - black4% hysteresis $<30 \text{ mm}$ Temperature drift: $<1 \text{ mm/°C}$ Response time: 5 ms Switching frequency: 80 Hz Indicators: $\bigcirc OUT \text{ LED (yellow) / POWER ON-ALLARM (green)}$ Setting: $\bigcirc OUT \text{ and } \bigcirc OUT push-buttons$ Warm-up: $0 \text{ min} = 0000 \text{ mm} = 000000000000000000000000000000000$		•	•	
Measurement range: 300 4000 mm (90% white) 300 3000 mm (18% gray) 300 2000 mm (4% black) White 90% -ysteresis 30 2000 mm (4% black) White 90% -grey 18% hysteresis < 30 mm	Switching mode	LIGHT		
$300 \dots 3000 mm(18\% gray)$ $300 \dots 2000 mm (4\% black)$ White 90% hysteresis< 30 mm	Output current:	100 mA max		
300 2000 mm (4% black) White 90% hysteresis <30 mm	Measurement range:	300 3000 mm(18% gray)		
White 90% hysteresis < 30 mm				
Withe 90% - grey 18% hysteresis < 40 mm				
White 90% - black4% hysteresis < 50 mm				
Temperature drift::< 1 mm/°CResponse time:5 msSwitching frequency:80 HzIndicators: \bigcirc OUT LED (yellow) / \bigcirc OUT LED (yellow) / POWER ON-ALLARM (green)Setting: \bigcirc OUT and \bigcirc OUT push-buttonsWarm-up: \bigcirc OUT and \bigcirc OUT and \bigcirc OUT push-buttonsOperating temperature:0 50 °CStorage temperature:-20 70 °CDielectric strength:500 VAC 1 min between electronics parts and housingInsulating resistance:20 MΩ 500 VDC between electronics parts and housingTypical spot dimension: \oslash 3.5 mm at 30 cm - \oslash 7 mm at 4 mEmission type:RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001)Ambient light rejection:0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6)Shock resistance:11 ms (30 G) 6 shock for every axis (EN60068-2-6)Housing material:ABSLens material:PMMAMechanical protection:IP67Connections:M12 5-pole connector				
Response time: 5 ms Switching frequency: 80 Hz Indicators: ● OUT LED (yellow) / ● OUT LED (yellow) / POWER ON-ALLARM (green) Setting: ● OUT and ● OUT push-buttons Warm-up: 050 °C Storage temperature: -20 70 °C Dielectric strength: 500 VAC 1 min between electronics parts and housing Insulating resistance: 20 MΩ 500 VDC between electronics parts and housing Typical spot dimension: Ø 3.5 mm at 30 cm - Ø 7 mm at 4 m Emission type: RED LASER (λ. = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001) Ambient light rejection: 0 50 Hz frequency, for every axis (EN60068-2-6) Shock resistance: 11 ms (30 G) 6 shock for every axis (EN60068-2-27) Housing material: ABS Lens material: PMMA Mechanical protection: IP67 Connections: M12 5-pole connector				
Switching frequency: 80 Hz Indicators: ♦ OUT LED (yellow) / ♥ OUT LED (yellow) / POWER ON-ALLARM (green) Setting: ● OUT and ♥ OUT push-buttons Warm-up: 15 min. Operating temperature: 0 50 °C Storage temperature: -20 70 °C Dielectric strength: 500 VAC 1 min between electronics parts and housing Insulating resistance: 20 MΩ 500 VDC between electronics parts and housing Typical spot dimension: Ø 3.5 mm at 30 cm -Ø 7 mm at 4 m Emission type: RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001) Ambient light rejection: 0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6) Shock resistance: 11 ms (30 G) 6 shock for every axis (EN60068-2-27) Housing material: ABS Lens material: PMMA Mechanical protection: IP67 Connections: M12 5-pole connector				
Indicators: OUT LED (yellow) / OUT LED (yellow) / POWER ON-ALLARM (green) Setting: OUT and OUT push-buttons Warm-up: 050 °C Storage temperature: 050 °C Dielectric strength: 500 VAC 1 min between electronics parts and housing Insulating resistance: 20 MΩ 500 VDC between electronics parts and housing Typical spot dimension: Ø 3.5 mm at 30 cm - Ø 7 mm at 4 m Emission type: RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001) Ambient light rejection: 0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6) Shock resistance: 11 ms (30 G) 6 shock for every axis (EN60068-2-6) Shock resistance: 11 ms (30 G) 6 shock for every axis (EN60068-2-7) Housing material: ABS Lens material: PMMA Mechanical protection: M12 5-pole connector				
Setting: OUT and OUT push-buttons Warm-up: 15 min. Operating temperature: 0 50 °C Storage temperature: -20 70 °C Dielectric strength: 500 VAC 1 min between electronics parts and housing Insulating resistance: 20 MΩ 500 VDC between electronics parts and housing Typical spot dimension: Ø 3.5 mm at 30 cm - Ø 7 mm at 4 m Emission type: RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001) 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 shock for every axis (EN60068-2-6) Housing material: ABS Lens material: PMMA Mechanical protection: IP67 Connections: M12 5-pole connector				
Warm-up:15 min.Operating temperature: $0 \dots 50 \text{ °C}$ Storage temperature: $-20 \dots 70 \text{ °C}$ Dielectric strength: 500 VAC 1 min between electronics parts and housingInsulating resistance: $20 \text{ M}\Omega$ 500 VDC between electronics parts and housingTypical spot dimension: $\emptyset 3.5 \text{ mm}$ at $30 \text{ cm} - \emptyset 7 \text{ mm}$ at 4 m Emission type:RED LASER ($\lambda = 665 \text{ nm}$): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001)Ambient light rejection: 0.5 mm amplitude, $10 \dots 55 \text{ Hz}$ frequency, for every axis (EN60068-2-6)Shock resistance:11 ms (30 G) 6 shock for every axis (EN60068-2-7)Housing material:ABSLens material:PMMAMechanical protection:IP67Connections:M12 5-pole connector				
Operating temperature:0Operating temperature:0Storage temperature:-20Dielectric strength:500 VAC 1 min between electronics parts and housingInsulating resistance:20 M Ω 500 VDC between electronics parts and housingTypical spot dimension: \emptyset 3.5 mm at 30 cm - \emptyset 7 mm at 4 mEmission type:RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001)Ambient light rejection:0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6)Shock resistance:11 ms (30 G) 6 shock for every axis (EN60068-2-6)Housing material:ABSLens material:PMMAMechanical protection:IP67Connections:M12 5-pole connector	Setting:	OUT and ♣ OUT push-buttons		
Storage temperature: $-20 \dots 70 ^{\circ}C$ Dielectric strength: $500 ^{\circ}VAC ^{\circ}$ min between electronics parts and housingInsulating resistance: $20 ^{\circ}M\Omega ^{\circ}500 ^{\circ}VDC$ between electronics parts and housingTypical spot dimension: $0.35 ^{\circ}m at 30 ^{\circ}m - 0.7 ^{\circ}m at 4 ^{\circ}m$ Emission type:RED LASER ($\lambda = 665 ^{\circ}m$): Class 2 EN $60825 \cdot 1 ^{\circ}(2014) ^{\circ}A1(2002) ^{\circ}A2(2001)$ Ambient light rejection:According to EN $60947 \cdot 5 \cdot 2$ Vibrations: $0.5 ^{\circ}m ^{\circ}$	Warm-up:	15 min.		
Dielectric strength:500 VAC 1 min between electronics parts and housingInsulating resistance:20 MΩ 500 VDC between electronics parts and housingTypical spot dimension: \emptyset 3.5 mm at 30 cm - \emptyset 7 mm at 4 mEmission type:RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001)Ambient light rejection:According to EN 60947-5-2Vibrations:0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6)Shock resistance:11 ms (30 G) 6 shock for every axis (EN60068-2-6)Housing material:ABSLens material:PMMAMechanical protection:IP67Connections:M12 5-pole connector	Operating temperature:	0 50 °C		
Insulating resistance:20 MΩ 500 VDC between electronics parts and housingTypical spot dimension: \emptyset 3.5 mm at 30 cm - \emptyset 7 mm at 4 mEmission type:RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001)Ambient light rejection:According to EN 60947-5-2Vibrations:0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6)Shock resistance:11 ms (30 G) 6 shock for every axis (EN60068-2-7)Housing material:ABSLens material:PMMAMechanical protection:IP67Connections:M12 5-pole connector	Storage temperature:	-20 70 °C		
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Vibrations: 0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6) Shock resistance: 11 ms (30 G) 6 shock for every axis (EN60068-2-27) Housing material: ABS Lens material: PMMA Mechanical protection: IP67 Connections: M12 5-pole connector		RED LASER (λ = 665nm): Class 2 EN 60825-1 (2014) +A1(2002) +A2(2001)		
Shock resistance: 11 ms (30 G) 6 shock for every axis (EN60068-2-27) Housing material: ABS Lens material: PMMA Mechanical protection: IP67 Connections: M12 5-pole connector	Ambient light rejection:			
Housing material: ABS Lens material: PMMA Mechanical protection: IP67 Connections: M12 5-pole connector	Vibrations:	0.5 mm amplitude, 10 55 Hz frequency, for every axis (EN60068-2-6)		
Lens material: PMMA Mechanical protection: IP67 Connections: M12 5-pole connector				
Mechanical protection: IP67 Connections: M12 5-pole connector		ABS		
Connections: M12 5-pole connector		РММА		
	Mechanical protection:	IP67		
Weight: 92 g. max.	Connections:	M12 5-pole connector		
	Weight:	92 g.	92 g. max.	

THRESHOLD SETTING

The sensor uses the patent-covered EASY TOUCH^{\rm IM} technology that allows a rapid and safe self-setting of the product.

EASY TOUCHTM

Place the background or the object to be suppressed inside the operating range.

Press the SOUT push-button until the OUT LED is OFF.

The sensor is now ready to detect all objects in the operating field distinguishing them from the suppressed background (\clubsuit LED OUT turns ON).

Repeat, if necessary, the same procedure for **ô** ouput.

Both digital outputs switch in the light mode.

When the target is inside the detection threshold the corresponding output is at 24 V.

Viceversa, if the measured target is outside the detection threshold, the corresponding output is at 24 V.

The switching thresholds are set by default at 3700 mm.

TYPICAL DETECTION DIAGRAMS

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. 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!

Eye irradiation for over 0.25 seconds is dangerous; refer to class 2 standard (EN60825-1).

These sensors are not conform to safety applications!

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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Helpful links at www.datalogic.com: Contact Us, Terms and Conditions, Support.

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

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorised waste collection centres.

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