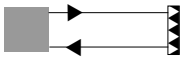
Series M1

Short and sweet – the metric M18, a highlight among many

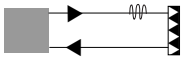
up to 35 m

Through-beam sensors M1S/M1E



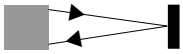
up to 6,2 m

Retro-reflective sensors M1R



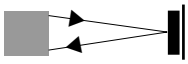
up to 5,4 m

Retro-reflective sensors
with polarizing filters M1P and M1C



up to 55 cm

Diffuse-reflective sensors M1T



10 cm

Diffuse-reflective sensors
with background rejection M1H

High functionality

Diverse operating principles
ELESTA's M1 sensors are available as through-beam sensors, retro-reflective sensors with and without polarizing filters, diffuse-reflective sensors, as well as retro-reflective sensors for transparent objects. Additionally, diffuse-reflective sensors with background rejection are available.

Light reserve warning indicator
All of the sensors in the M1 series contain a *light-reserve warning indicator* (blinking function indicator) for controlling dirt build-up on the lenses and as an *alignment aid.*

High switching frequency
All M1 sensors have a 1000 Hz switching frequency, allowing for the reliable detection of even fast moving objects.

Low power consumption
The M1 sensors distinguish themselves with an extremely small power consumption of less than 15 mA.

Test input
The M1 through-beam sensors are available standard with *test input,* for confirming that the sensor is operating properly.

Simple installation and operation

Unique angle optics
The diameter of the right angle optics head is no greater than that of the sensor housing. Therefore, the right angle optics sensors are very easy to bore mount. These sensors are optionally available with a extended stainless steel case for protection of the right angle optic head.

Various connection versions
All M1 sensors are available standard with a 4 wire 2 m cable or a 4 pin M12 connector.

User friendly adjustment button with integrated *function indicator*
The optical range of each M1 sensor can be adjusted to meet the specific application. The range is comfortably adjusted with a Nr. 2 screwdriver on a robust range adjustment button. The function indicator is integrated in the adjustment button and is visible over a wide angle even under bright ambient light conditions.

Reliable for the highest demands

Robust construction with IP 67 *sealing*
The M1 photoelectric sensors are built with a polyamide 12 or stainless steel housing, and are protected against water and dust. The sensors meet the *sealing* requirements of IP 67.

EMC-tested
The M1 sensors are tested according to IEC 801, EN50081-1 and EN50082-2. This assures trouble free use even in high electromagnetically contaminated environments.

High ambient light rejection
Thanks to pulse modulation and a multilevel disturbance rejection, the M1 sensors are extremely insensitive to foreign light sources.

Reverse polarity protection
All of the M1 sensor's electrical connections are protected against reverse wiring.

Short-circuit protection
The M1 sensor's transistor outputs are electronically protected against short circuit.

Power-up output suppression
During power-up the outputs of the M1 sensors are blocked for typically 30 msec.

Glass-protected optics
As an option, the M1 sensors are available with a glass window to protect the optics against aggressive chemicals and mechanical damage (scratching).

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Designation code

M1 x xxx xxx xxx

Housing

:Polyamid
M :Stainless steel
S :Stainless steel (protected angle optic head)

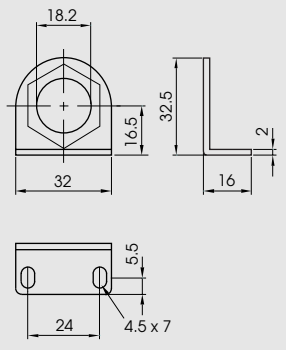
Principle	Supply	Outputs	Connection	Electr. option	Light	Range
C: Retro-reflective for transparent objects E: Through-beam receiver H: Diffuse-reflective with background rejection P: Retro-reflective with polarizing filters R: Retro-reflective S: Through-beam emitter T: Diffuse-reflective Z: Accessory	1: 10-30 VDC	KA: No output NA: NPN *light- and dark-on* PA: PNP *light- and dark-on*	1: Cable 2 m 4: Connector M12	00: Range adjustable 01: Range adjustable, *test input* 40: Range not adjustable 41: Range not adjustable, *test input*	A: Right angle optic, red I: Straight optic, infrared R: Straight optic, red W: Right angle optic, infrared	M1S/M1E: 1: 15 m 2: 10 m 3: 10 m 4: 35 m M1R/M1P/M1C: 1: 2,5 m 2: 3 m 3: 2 m 4: 2,5 m 5: 1,5 m M1T/H: 1: 10 cm 2: 20 cm 3: 40 cm 4: 55 cm 5: 5 cm 6: 10 cm

Accessories

Retroreflectors: see page 130

Connector cables: see page 128

Mounting:



Mounting bracket M1Z 001

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Diffuse-reflective sensors with background rejection, M18 housing

- ***Range*** **electronically adjustable between 5 and 10 cm**
- **Dual transistor outputs, PNP**
- **1000 Hz switching frequency**
- ***Short-circuit protection, reverse polarity protection,*** **and** ***power-up output suppression***
- **Connections: Straight cable, 2 meter**
  Connector, M12
- **EMC tested according to IEC 801 and EN50081-1/EN 50082-2**

CE

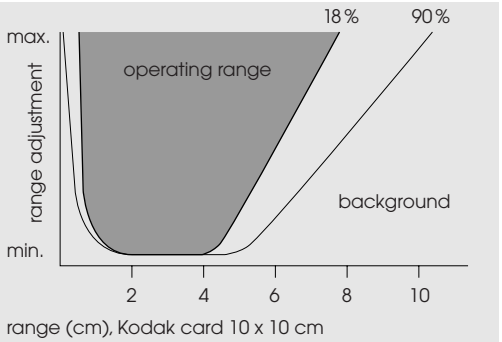
Product designation Plastic housing [1]	**M1H 1PA 100 I1**	**M1H 1PA 400 I1**
Product designation Stainless steel [1]	**M1H 1PA 100 I1M**	**M1H 1PA 400 I1M**
Output	PNP (light- and dark-on)	
Connection	Cable 2 m	Connector M12
Range adjustment	Ja	
Optical data [2]		
range	5...10 cm (Kodak card white, 10 x 10 cm)	
Typical grey/white difference (grey: 18%/white: 90%)	at 10 cm range: ca. 2 cm at 5 cm range: ca. 0,2 cm	
Emitter	Infrared-LED, 950 nm, pulsed	
Electrical data [2]		
Supply voltage U_S	10...30 VDC	
Allowable ripple	+/- 10% of U_{SP}	
Current consumption (without load)	< 35 mA	
Max. load current I_L	100 mA	
Residual voltage	<1,6 V	
Max. switching frequency	1000 Hz	
Environmental data		
Sealing	IP 67	
Temperature T_A (operating and storage)	-25...+65 ^{0}C	
Weight Plastic/Stainless steel	Connector M12: ca.15/25 g , Cable 2 m: ca. 100/110 g	

1) For product designation of sensors with options see designation code on page 23.
2) When not otherwise noted, all technical data at T_A = 25 ^{0}C and U_S = 24 V.

Technical explanation

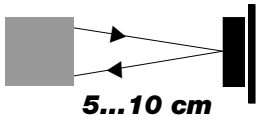
The 18%-linie shows the switching-on distance for a gray object.

The 90%-linie shows the switching-off distance for a white object.



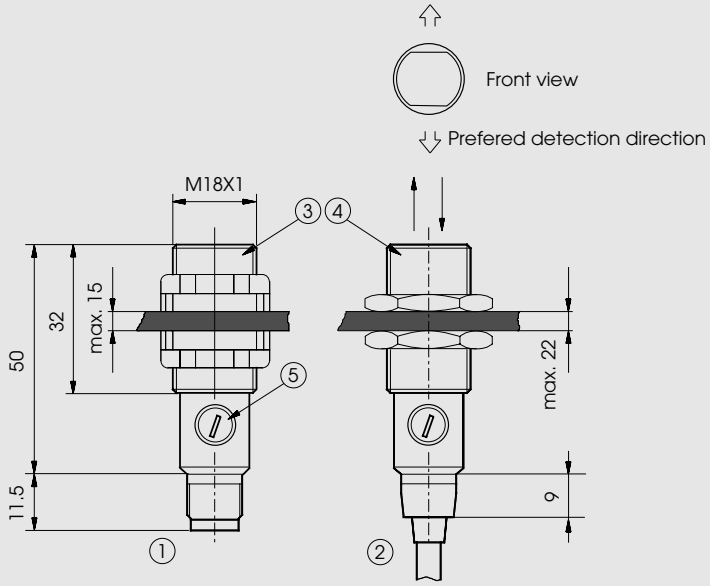
10...30 VDC

PNP
light-on and
dark-on output



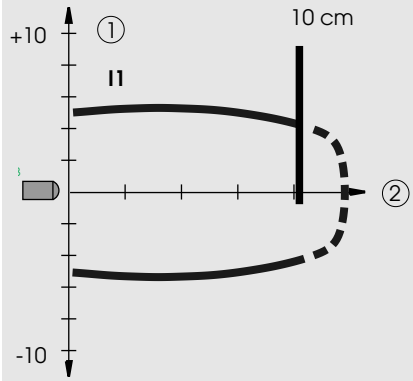
M1H

Dimensions (50 mm, M18 x 1)



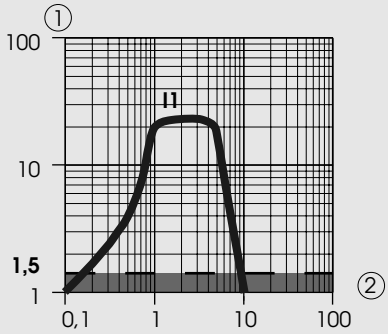
① Connector M12
② Cable connection
③ Plastic housing
④ Stainless steel housing
⑤ *Range adjustment* and *function indicator*

Optical diagrams



Typical beam diameter
(with Kodak card white, 10 x 10 cm)

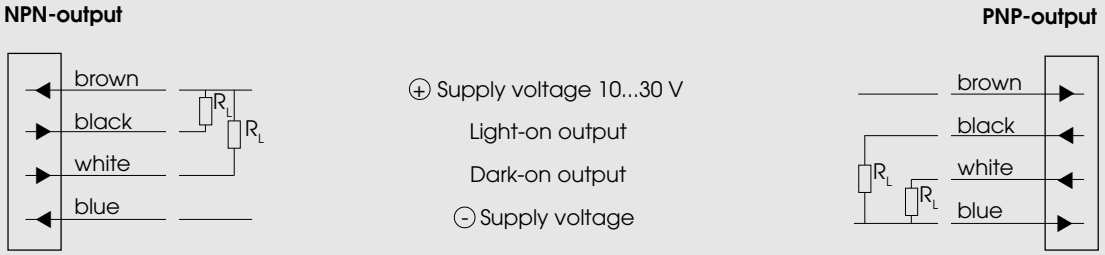
① Diameter in (cm)
② Range in (cm)



Typical excess gain curve
(with Kodak card white, 10 x 10 cm)

① Gain factor
② Range in (cm)

Wiring diagram



Connector
M12

Connection for connector M12	wire color
1	brown
2	white
3	blue
4	black

Light-on output:
Output energized when object is present.

Dark-on output:
Output energized when no object is present.

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