RUNNING MARKLESS FOR STABILITY AND DESIGN FREEDOM

Product description

The markless sensor is based on a pattern recognition principle. A taught-in image is used as a reference for the detection of a recurring contrast pattern. A stable switching signal is generated at high speed thanks to new technology without print marks. The markless sensor is ideal for applications in the packaging industry. User-friendly configuration is offered via the sensor's control panel or by using SICK's SOPAS software via Ethernet.

At a glance

- Tough metal housing
- Scanning speed of 7 m/s
- Monitor process quality via a control panel or SOPAS, via Ethernet
- Easy sensor teach-in and alignment
- Reproducibility up to 0.3 mm (2 Sigma)
- Plug can be rotated 90°

Your benefits

- Reliable detection, even with complex images reduces system downtime and waste
- More freedom when designing packaging
- Allows for more efficient utilization of space on the product instead of using unnecessary print marks and place markers
- Faster and easier format change by teaching of saved formats via Ethernet
- Monitor process and teach quality via a display or SOPAS, increasing reliability
- Fast and simple sensor alignment via a visible light spot and notches on the housing
- Easy sensor teach-in, directly via the control panel, external teach-in signal or using SOPAS via Ethernet

Additional information

→ www.sick.com/de/en/ML20

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.

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Detailed technical data

Features

Dimensions (W x H x D)	46 mm x 77 mm x 46 mm
Sensing distance	20 mm
Housing design (light emission)	Rectangular
Sensing distance tolerance	± 2.5 mm
Light source [1]	LED
Type of light	Visible white light
Wave length	400 nm ... 700 nm
Repeatability [2]	0.6 mm (7 m/s) / 0.3 mm (3.5 m/s)
Max. movement speed	7 m/s
Teach-in mode	Start stop teach, trigger teach
Picture length (min.)	≥ 40 mm
Picture length (max.)	≤ 1,000 mm
Picture height (min.)	≥ 34 mm
Tolerance lateral movement	± 5 mm

[1] Average service life: 100,000 h at T_U = +25 °C.

[2] Statistical error 2 σ.

Mechanics/electronics

Supply voltage [1]	12 V DC ... 30 V DC
Ripple [2]	≤ 5 V_{pp}
Power consumption [3]	< 6 W
Output type	PNP: HIGH = V_S – ≤ 2 V / LOW < 0,5 V
Status output [4]	PNP: HIGH = V_S – ≤ 2 V / LOW < 0,5 V
Output type	PNP
Output current $I_{max.}$ [5]	< 100 mA
Input, teach-in (ET)	PNP: Teach: U = 12 V ... < U_V, Run: U < 2 V
Input, blanking input (AT) [6]	PNP: blanked: U = 12 V ... < Uv, free-running U < 2 V
Initialization time	< 10 s
Retention time (ET)	≥ 6 s, non-volatile memory
Connection type	Connector M12, 12-pin / Connector M12, 4-pin
Ambient light safety	30,000 lx
Protection class	III
Circuit protection	V_S connections reverse-polarity protected, Output Q short-circuit protected, Interference suppression
Fieldbus interface	EtherNet/IP
Enclosure rating	IP 65
Weight	325 g
Housing material	Metal
Encoder resolution	100 µm ... 400 µm (in 1 µm)
Encoder input	Differentiel: 4,5 V - 5,5 V / TTL / RS-422, single ended: 12 V - 30 V / HTL / push-pull

[1] Limit values; operation in short-circuit protected network max. 8 A.

[2] May not exceed or fall below U_v tolerances.

[3] Without load.

[4] Detailed description of the status output in operating manual.

[5] Sum I_{out} = Q + Q status.

[6] Fade-out of identical areas.

Ambient data

Ambient operating temperature	–10 °C ... +55 °C
Ambient storage temperature	–20 °C ... +75 °C
Shock load	According to IEC 60068
UL File No.	NRKH.E181493 & NRKH7.E181493

Ordering information

Other models ➜ www.sick.com/de/en/ML20

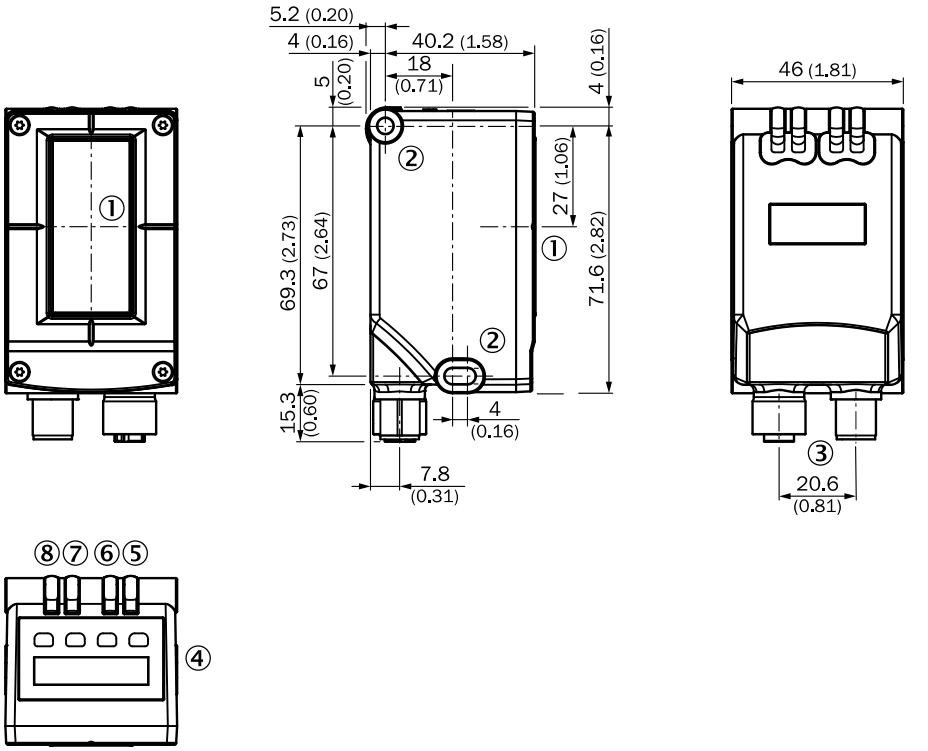
- **Data interface:** Ethernet TCP/IP

Light source [1]	Max. movement speed	Sensing distance	Repeatability [2]	Output type	Type	Part no.
LED	7 m/s / 3.5 m/s	20 mm	0.6 mm (7 m/s) / 0.3 mm (3.5 m/s)	PNP	ML20M-P1211	1044675

[1] Average service life: 100,000 h at T_U = +25 °C.

[2] Statistical error 2 σ.

Dimensional drawing (Dimensions in mm (inch))



① Center of optical axis
② Mounting hole, Ø 4.2 mm
③ Connector M12, 12-pin/Connector M12, 4-pin, rotatable up to 90° (Ethernet)
④ Display and function buttons
⑤ Function signal indicator (green) “on”
⑥ Function signal indicator (yellow) “Q”
⑦ Function signal indicator (green) “Link”
⑧ Function signal indicator (yellow) “Act”

Connection diagram

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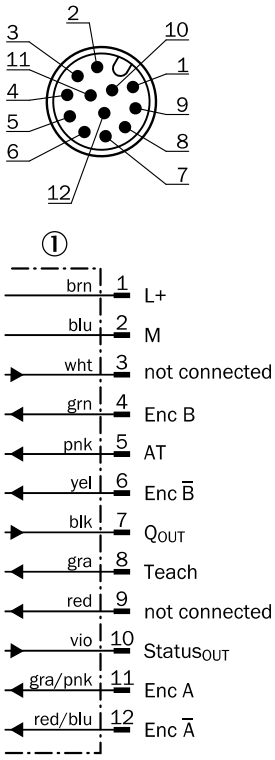

M12 (A-coded)

① Connection diagram M12, 12-pin

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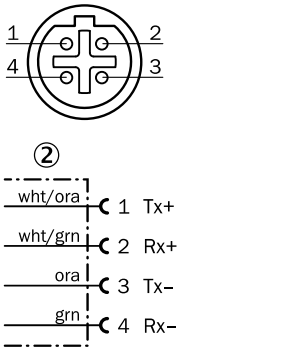

M12 (D-coded)

② Connection diagram M12, 4-pin

Recommended accessories

Universal bar clamp systems

Figure	Material	Description	Type	Part no.
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N04 for universal clamp bracket, steel	BEF-KHS-N04	2051610
	Steel, zinc coated	Mounting bar, straight, 200 mm, steel	BEF-MS12G-A	4056054
		Mounting bar, L-shaped, 250 x 250 mm, steel	BEF-MS12L-B	4056053

Plug connectors and cables

Connecting cables with female connector

M12, 12-pin, PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Female connector, M12, 12-pin, angled, shielded	Cable, open conductor heads	5 m, 12-wire	DOL-1212-W05MAS02	6044109
	Female connector, M12, 12-pin, straight, shielded	Cable, open conductor heads	5 m, 12-wire, twisted pair	DOL1212-G05MAS02	6042754

Connection cables with female connector and male connector

M12, 12-pin, PVC

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Female connector, M12, 12-pin, straight, shielded	Male connector, M12, 12-pin, straight	5 m, 12-wire, twisted pair	DSL-1212-G05MAS02	6045234

Connection cables with male connector and male connector

M12, 4-pin, Ethernet

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Male connector, M12, 4-pin, angled, D-coded, shielded	Male connector, RJ45, 8-pin, straight	5 m	Connection cable (male connector-male connector)	6039488
	Male connector, M12, 4-pin, straight, D-coded, shielded	Male connector, RJ45, 8-pin, straight	5 m, 4-wire, AWG26	SSL-2J04-G05ME	6034415

→ For additional accessories, please see page K-240