



## Industrial Safety Systems

M4000 Advanced and UE403  
Multiple Light Beam Safety Device



***SENSORS***  
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**SICK**  
Sensor Intelligence.



- Restart interlock (RES)
- External device monitoring (EDM)
- Beam coding
- LED/7-segment display
- Application diagnostic output (ADO)
- Configuration and diagnosis via PC
- SDL interface
- Muting configurable in conjunction with UE403
- Integrated laser alignment aid (optional)
- End cap with integrated LED (optional)



Further information	Page
→ Technical specifications	5
→ Dimensional drawings	7
→ Accessories	9

## Overview of technical specifications

Scanning range	0.5 m ... 70 m
Number of beams (depending on type)	2 ... 8
Beam separation (depending on type)	220 mm, 300 mm, 400 mm, 450 mm, 500 mm, 600 mm
Type	Type 4 according to IEC 61496
Enclosure rating	IP 65

## Product description

The M4000 Advanced multiple light beam safety device together with the UE403 switching amplifier form the efficient solution for decentralised conventional muting applications involving automatic material transport.

Access protection with muting can be achieved with maximum availability thanks to their integrated functions, easily configured by PC via the RS-232 interface, and the simple in-situ connection of muting signals and control switches to the UE403. The integrated functions, and status and diagnostic information, permit rapid

commissioning and prevent unnecessary machine downtimes. The modular concept provides a high level of machine safety that takes economic efficiency into account as device properties can be adapted to meet specific requirements. This is especially the case for the M4000 Advanced A/P (active/passive) variants, with which only one requires electrical connection - considerably simplifying installation and cutting costs.

## In-system added value

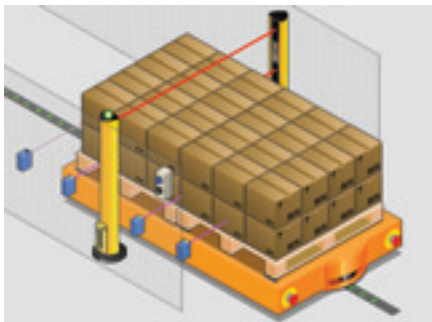
- Muting with UE403
- Combination with SICK-Interfaces
- Safe integration in bus systems

## Applications

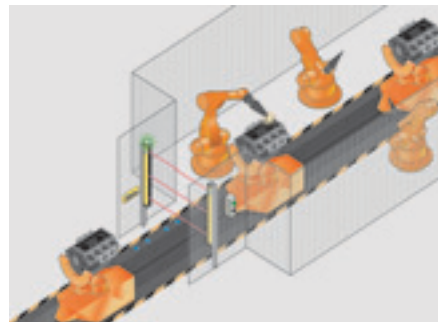
→ You can find more applications using the application finder at [www.sick.com](http://www.sick.com)

Provides access protection of hazardous areas on machining centres in mechanical engineering applications, robot systems

(such as welding lines in the automotive industry) and automated conveying, storage and transport systems.



Access protection with partial blanking on a system with floor transporter



Access protection with muting on a motor machining station

## Ordering information

### M4000 Advanced, M4000 Advanced A/P and UE403

<b>Housing cross-section</b>	52 mm x 55.5 mm
<b>Functions</b>	Restart interlock (RES), external device monitoring (EDM), beam coding, configurable scanning range, muting (with UE403), muting with override (with UE403), monitoring of the total muting time (with UE403), concurrence monitoring (with UE403), sensor gap monitoring (with UE403), sensor test (with UE403), partial blanking (with UE403), end of muting by ESPE (with UE403), belt stop (with UE403)
<b>Consisting of</b>	Sender unit and receiver unit or sender/receiver in one housing and deflector unit
<b>Usage</b>	Single system
<b>Connection types</b>	System connection: Plug Hirschmann 11-pin + FE Extension connection: Plug M12, 5-pin

### M4000 Advanced

Number of beams	Beam separation (mm)	Sender unit		Receiver unit	
		Type	Part number	Type	Part number
2	500	M40S-025003AA0	1200060	M40E-025003RB0	1200065
2	600	M40S-026003AA0	1200070	M40E-026003RB0	1200096
3	220	M40S-032203AA0	1200063	M40E-032203RB0	1200097
3	400	M40S-034003AA0	1200061	M40E-034003RB0	1200064
3	450	M40S-034503AA0	1200071	M40E-034503RB0	1200098
4	220	M40S-042203AA0	1200072	M40E-042203RB0	1200099
4	300	M40S-043003AA0	1200073	M40E-043003RB0	1200100
5	220	M40S-052203AA0	1200074	M40E-052203RB0	1200101
6	220	M40S-062203AA0	1200075	M40E-062203RB0	1200102
7	220	M40S-072203AA0	1200076	M40E-072203RB0	1200103
8	220	M40S-082203AA0	1200077	M40E-082203RB0	1200104

### M4000 Advanced with integrated alignment aid

Number of beams	Beam separation (mm)	Sender unit		Receiver unit	
		Type	Part number	Type	Part number
2	500	M40S-025013AA0	1200057	M40E-025013RB0	1200058
2	600	M40S-026013AA0	1200078	M40E-026013RB0	1200105
3	400	M40S-034013AA0	1200069	M40E-034013RB0	1200106
3	450	M40S-034513AA0	1200082	M40E-034513RB0	1200107
4	300	M40S-043013AA0	1200080	M40E-043013RB0	1200108

M4000 Advanced with end cap with integrated LED<sup>1)</sup>

Number of beams	Beam separation (mm)	Sender unit		Receiver unit	
		Type	Part number	Type	Part number
2	500	M40S-025003AA0	1200060	M40E-025023RB0	1200062
2	600	M40S-026003AA0	1200070	M40E-026023RB0	1200079
3	220	M40S-032203AA0	1200063	M40E-032223RB0	1200066
3	400	M40S-034003AA0	1200061	M40E-034023RB0	1200067
3	450	M40S-034503AA0	1200071	M40E-034523RB0	1200081
4	300	M40S-043003AA0	1200073	M40E-043023RB0	1200109

<sup>1)</sup> Receiver only

M4000 Advanced with integrated alignment aid and end cap with integrated LED<sup>1)</sup>

Number of beams	Beam separation (mm)	Sender unit		Receiver unit	
		Type	Part number	Type	Part number
2	500	M40S-025013AA0	1200057	M40E-025033RB0	1200110
2	600	M40S-026013AA0	1200078	M40E-026033RB0	1200111
3	400	M40S-034013AA0	1200069	M40E-034033RB0	1200068
3	450	M40S-034513AA0	1200082	M40E-034533RB0	1200112
4	300	M40S-043013AA0	1200080	M40E-043033RB0	1200113

<sup>1)</sup> Receiver only

## M4000 Advanced A/P

Number of beams	Beam separation (mm)	Sender/receiver in one housing		Deflector unit	
		Type	Part number	Type	Part number
2	500	M40Z-025003RB0	1200115	PSD01-1501 <sup>1)</sup>	1027906
2	500	M40Z-025003TB0	1200128	PSD01-2501 <sup>2)</sup>	1027907
4	300	M40Z-043003TB0	1200127	PSD02-2301 <sup>2)</sup>	1027908

<sup>1)</sup> With mirror deflection (max. effective scanning range 7.5 m)

<sup>2)</sup> With fibre-optic deflection (max. effective scanning range 4.5 m)

## M4000 Advanced A/P with end cap with integrated LED

Number of beams	Beam separation (mm)	Sender/receiver in one housing		Deflector unit	
		Type	Part number	Type	Part number
2	500	M40Z-025023RB0	1200126	PSD01-1501 <sup>1)</sup>	1027906
2	500	M40Z-025023TB0	1200125	PSD01-2501 <sup>2)</sup>	1027907
4	300	M40Z-043023TB0	1200131	PSD02-2301 <sup>2)</sup>	1027908

<sup>1)</sup> With mirror deflection (max. effective scanning range 7.5 m)

<sup>2)</sup> With fibre-optic deflection (max. effective scanning range 4.5 m)

## UE403

Description	Type	Part number
Safety switching amplifier UE403 for muting with M4000 Advanced	UE403-A0930	1026287

## Detailed technical specifications

### M4000 Advanced, M4000 Advanced A/P

#### General system data

Number of beams (depending on type)	2 ... 8
Beam separation (depending on type)	220 mm ... 600 mm
Scanning range (configurable)	Advanced Advanced A/P <sup>1)</sup>
	0.5 ... 20 m, 15 ... 70 m 0.5 ... 7.5 m, 0.5 ... 4.5 m
Protection class	III (EN 50178:1998)
Enclosure rating	IP 65 (EN 60529)
Supply voltage $V_s$ on device <sup>2)</sup>	24 V (19.2 V ... 28.8 V) DC
Ripple	Max. $\pm 10\%$
Synchronization	Optical, without separate synchronisation
Type	Type 4 according to IEC 61496

<sup>1)</sup> Depending on deflector unit.

<sup>2)</sup> The external voltage supply must be capable of buffering brief mains failures of 20 ms as specified in EN 60 204-1. Suitable power supplies are available accessories from SICK.

#### Sender unit

Power consumption	0.2 A
Display elements	LED/7-segment

#### Receiver unit, sender and receiver unit

Maximum response time (depending on type)	12 ms
Power consumption	0.7 A, without load
Switching outputs (OSSDs)	2 PNP semiconductors, short circuit protected, cross circuit monitored
Output voltage	24 V DC ( $V_s - 2,25\text{ V} \dots V_s$ )
Maximaler Schaltstrom	500 mA
Display elements	LED/7-segment
Laser class alignment laser	2 (IEC 60825-1:2001)
Optical power alignment laser	$\leq 1\text{ mW}$
Wavelength alignment laser	630 ... 680 nm

#### Operating data

System connection	Plug Hirschmann 11-pin + FE, plug M12, 5-pin
Cable length <sup>1)</sup>	Max. 50 m
Conductor cross-section	0.75 mm <sup>2</sup>
Ambient operating temperature from ... to	0 °C ... +55 °C
Storage temperature from ... to	-25 °C ... +70 °C
Air humidity from ... to	15 % ... 95 % non-dewing
Housing cross section	52 mm x 55.5 mm
Vibration resistance	5 g, 10 Hz ... 55 Hz (IEC 60068-2-6)
Shock resistance	10 g, 16 ms (IEC 60068-2-29)
Housing material	Aluminium alloy ALMGSI 0.5 (powder coated)
Front screen material	Polycarbonate, scratch-resistant coating

<sup>1)</sup> Depending on load, power supply and cable cross-section. The technical specifications must be observed.

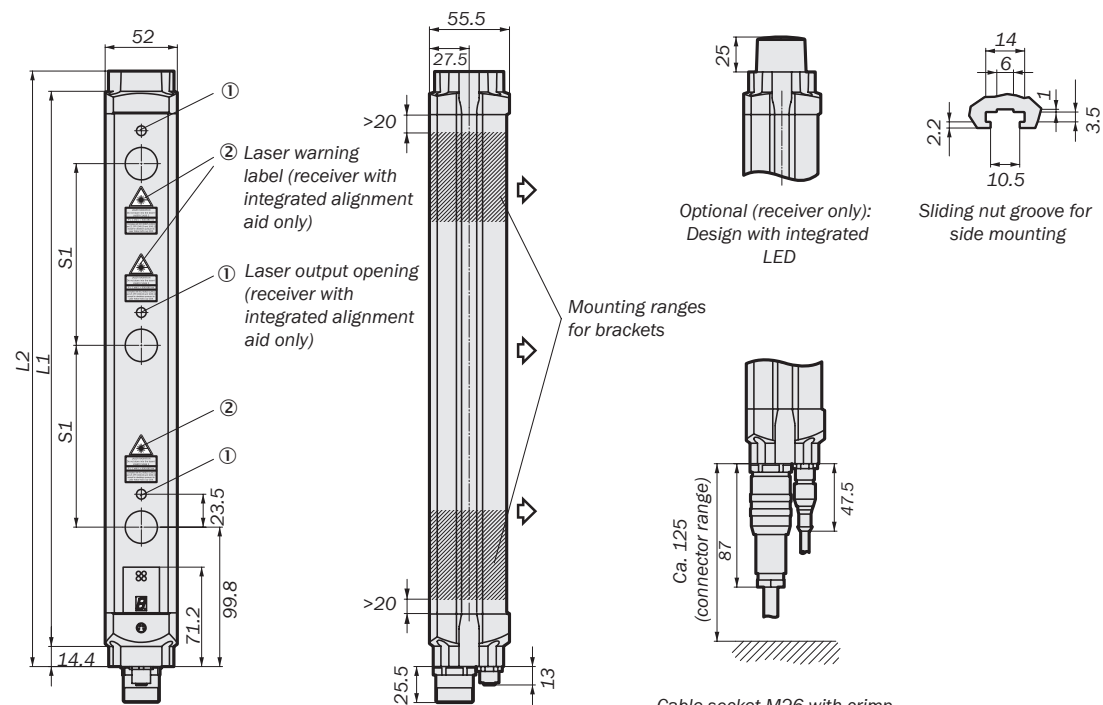
## UE403

Protection class	III (EN 50178:1998)
Enclosure rating	IP 65 (IEC 60529)
Type	Type 4 (IEC 61496)
Supply voltage	24 V (19.2 V ... 28.8 V) DC, via connected ESPE
Maximum power consumption	2 A
Maximum cable length between UE403 and ESPE	10 m
Minimum conductor cross-section	0.34 mm <sup>2</sup>
Maximum cable resistance	0.5 Ohm per cable
Type of muting sensors	Optical sensors, inductive sensors, mechanical switches, controller signals
Connection type	Socket M12 x 5
Switching voltage HIGH inputs	24 V (11 V ... 30 V) DC
Input current HIGH	10 mA (6 mA ... 15 mA)
Switching voltage LOW inputs	0 V (-30 V ... 5 V) DC
Input current LOW	0 mA (-0.5 mA ... 1.5 mA)
Supply voltage outputs	24 V (15 V ... 28.8 V) DC
Supply current outputs for muting sensors	500 mA <sup>1)</sup>
Supply current outputs for reset, override or C1	400 mA <sup>1)</sup>
Switching voltage HIGH output, muting lamp	24 V (15 V ... 28.8 V) DC
Output current HIGH (monitored), muting lamp	20 mA ... 400 mA
Output current HIGH (not monitored), muting lamp	0 mA ... 400 mA
Maximum output power HIGH, muting lamp	5 W
Ambient operating temperature	0 °C ... 55 °C
Storage temperature	-25 °C ... 70 °C
Air humidity	15 % ... 95 %, non-dewing
Vibration resistance (checked to)	5 g (IEC 60068-2-6)
Oscillation frequency	10 ... 55 Hz
Shock resistance	10 g, 16 ms, IEC 60068-2-29
Housing material	Aluminium die-cast powder coated
Material, connector strip	Polyamide
Mounting	flexible mounting to the M4000 Advanced or directly in the system

<sup>1)</sup> Total of all supply currents from the connections RES/OVR, A1, A2, B1 and B2 (pin 1 in each case): max. 1000 mA.

# Dimensional drawings

## M4000 Advanced, M4000 Advanced A/P



M4000 Advanced (receiver) or M4000 Advanced A/P

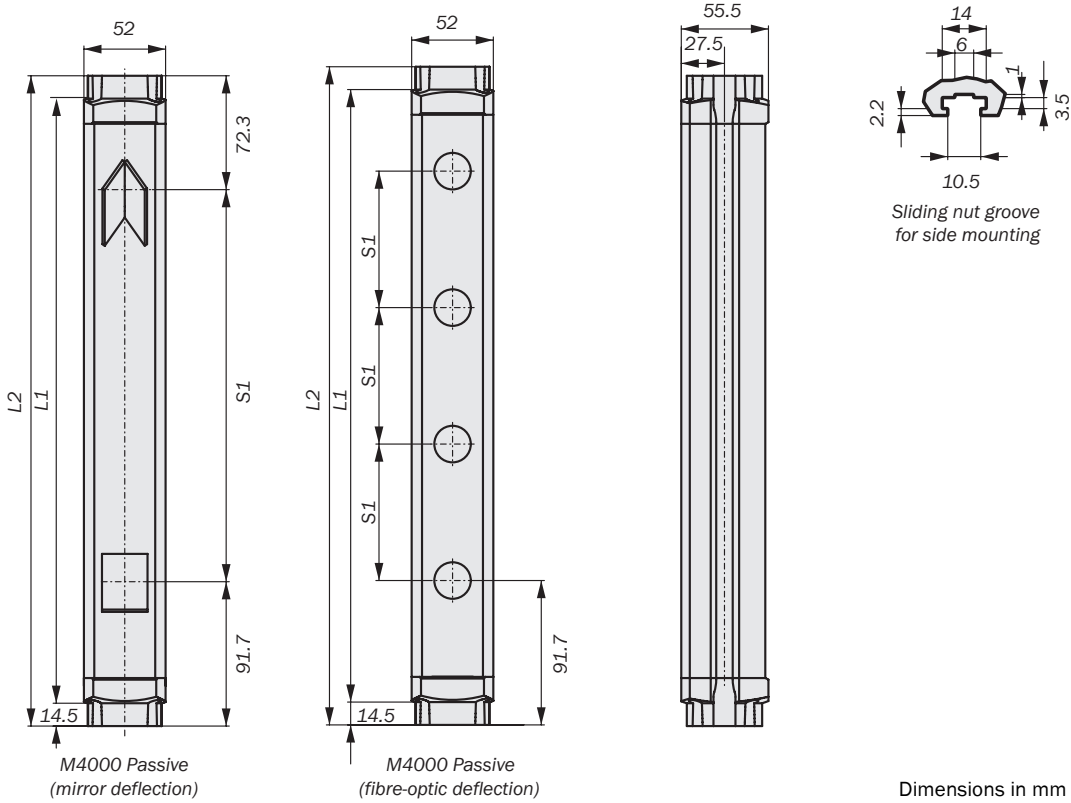
Cable socket M26 with crimp contacts (for DIN 43 651, left) and cable plug M12 with cable (right, only on receiver)

Dimensions in mm

Number of beams	S1	L1	L2
2	500	643	672
2	600	743	772
3	220	583	612
3	400	943	972
3	450	1043	1072
4	220	803	832
4	300	1043	1072
5	220	1023	1052
6	220	1243	1272
7	220	1462	1491
8	220	1682	1711

Dimensions in mm

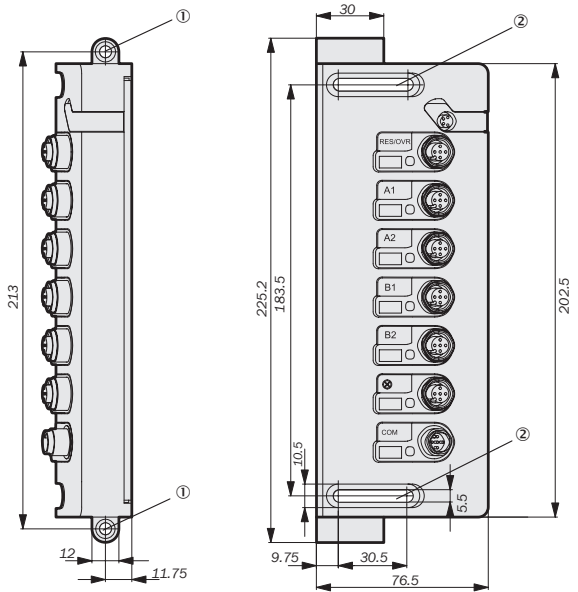
**M4000 Passive**



Number of beams	S1	L1	L2
2	500	635	664
4	300	1035	1064

Dimensions in mm

**UE403**



**Note:**  
The fixing holes ① and slots ② are suitable for cheese head screws M5 x 30 as per DIN EN ISO 4762.



Dimensions in mm

## Accessories

### M4000 Advanced, M4000 Advanced A/P

#### Mounting systems

Description	Type of fastening	Packing unit	Part number
Mounting kit 1	Rigid	4	7021352
Mounting kit 2	Pivoting	4	2017751
Mounting kit 6	Pivoting, side bracket	4	2019506
Mounting kit 12	Pivoting, swivel mount	4	2030510

#### Sliding nuts/sliding blocks

Description	Packing unit	Remark	Part number
Sliding block (sliding nut)	4	Supplied with delivery	2017550

#### Cable sockets

Description	Direction of the cable outlet	Part number
Cable socket Hirschmann	Straight	6020757
Cable socket Hirschmann	Angled	6020758

#### Connection cables

Connection type	Direction of the cable outlet	Cable length	Part number
Hirschmann cable socket M26 x 11 + FE	Straight	2.5 m	2022544
		5 m	2022545
		7.5 m	2022546
		10 m	2022547
		15 m	2022548
		20 m	2022549
		30 m	2022550

#### Extension connection cable (between M4000 and UE403)

Direction of the cable outlet	Cable length	Part number
Plug straight, socket angled	0.6 m	6025930
	1 m	6029280
	1.5 m	6029281
	2 m	6025931
	5 m	6029282

#### Configuration connection cable

Description	Cable length	Part number
Connection cable	2 m	6021195

**Interfaces**

Type	Description	Part number
UE48-20S2D2	Safety relay for external restart interlock and external device monitoring, with 2 NO, 1 NC, screw type terminals	6024915
UE48-20S3D2	Safety relay for external restart interlock and external device monitoring, with 2 NO, 1 NC, removable terminals	6024916
UE48-30S2D3	Safety relay for external restart interlock and external device monitoring with 3 NO, screw type terminals	6025089
UE48-30S2D4	Safety relay for external restart interlock and external device monitoring, with 3 NO, removable terminals	6025097

**Additional front screens**

Suitable for	Part number
M40x-0250xxxx	2033225
M40#-0250#####	2033225
M40#-0260#####	2033226
M40#-0322#####	2033227
M40#-0340#####	2033228
M40#-0345#####, M40#-0430#####	2033229
M40#-0422#####	2033230
M40#-0522#####	2033231
M40#-0622#####	2033232
M40#-0722#####	2033233
M40#-0822#####	2033234

**Configuration software**

Description	Remark	Part number
CDS	Supplied with delivery	2032314

**Laser alignment aid**

Description	Maximum scanning range	Light type	Remark	Part number
Laser alignment aid AR 60	60 m	Red light		1015741
Adapter AR60 M4000	-	-		4040006
Alignment template for integrated laser alignment aid	-	-	Supplied with delivery	4040263

## UE403

## Connection cables muting sensor

Type of connection to the muting sensor	Cable length	Remark	Part number
Socket M12 x 4	1 m	Suitable for muting sensor WL24, WT24 und WT260	6025974
	2 m	Suitable for muting sensor WL24, WT24 und WT260	6025975
	5 m	Suitable for muting sensor WL24, WT24 und WT260	6025087
	1 m	Suitable for muting sensor WL12, WL14, WL18, WL23, WL27, pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	6025944
	2 m	Suitable for muting sensor WL12, WL14, WL18, WL23, WL27, pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	6025945
	5 m	Suitable for muting sensor WL12, WL14, WL18, WL23, WL27, pin 4 (plug) rotated to pin 2 (socket), pin 2 (plug) not connected	6025116
	1 m	Suitable for muting sensor WT27, WL260, pin 2 (plug) not connected	6026106
	2 m	Suitable for muting sensor WT27, WL260, pin 2 (plug) not connected	6026107
	5 m	Suitable for muting sensor WT27, WL260, pin 2 (plug) not connected	6025118

## Connecting cables for muting sensors with connection terminal

Connection type	Direction of the cable outlet	Cable length	Part number
Plug M12 x 5	Straight	2 m	6026133
		5 m	6026134
		10 m	6026135

## Connector, M12, 4-pin

Type	Connector type	Enclosure rating	Cable outlet	Part number
DOS-1204-W	Female connector	IP 67	Angled	6007303
STE-1204-G	Male connector		Straight	6009932

## Muting indicator lamps

Type of muting indicator	Cable length	Remark	Part number
Incandescent lamp	2 m	Incl. mounting bracket, mounting kit and connection cable	2033116
	10 m	Incl. mounting bracket and connection cable	2033117
LED	10 m	Incl. mounting bracket and connection cable	2033119
	2 m	Incl. mounting bracket, mounting kit and connection cable	2033118

## Muting-Accessories, other

Type	Remark	Part number
Protective cap for device socket	Supplied with delivery	6011170

## Mounting systems

Type	Mounting system type	Packing unit	Remark	Part number
Fixing screws	Fixing screws with sliding nuts	2	Supplied with delivery	2033250

## Accessories, other

Type	Remark	Part number
Mounting bracket for UE403	For device column for mounting on base plate, incl. screw	2032035

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