EOS2

EOS2 is a compact Type 2 light curtain with competitive performance and innovative features.
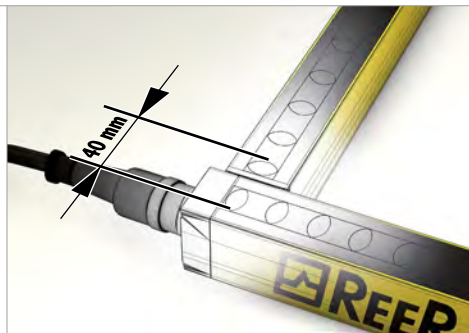
Its features include::

- Minimal cross section - 28 x 30 mm.
- No blind area on one side:
  The position of first beam ensures that the sensitive area extends to end of the light curtain.
- The solution with two L-mounted light curtains, e.g. Master-Slave, maintains 40 mm resolution in corner (models with resolution 30 and 40 mm).
- Minimal blind area on connector side.
- Easy connection and installation thanks to the M12 connectors and the use of unshielded cables up to 100 m.
- Integrated safety functions, including self-monitoring of static outputs, control of external contactors (EDM) and automatic/manual selectable Restart.
- Built-in auto-test function, every 0.5 sec.
- Exceptional mechanical and electrical robustness are the result of extensive experience gained hands-on with all kinds of applications.
- Operating temperature range -10 to 55 °C.
- Protection rate: IP 65 and IP 67 at the same time.
- High resistance to infiltration by dust and liquids in a highly compact light curtain.
- Models Master/Slave for cascade connection of two or three light curtains.
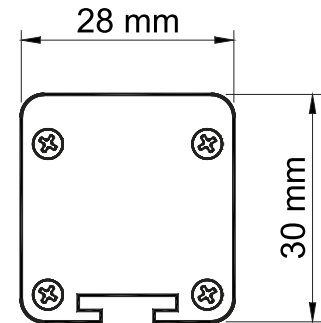- 2 safety PNP static outputs.

Special versions with IP 69K watertight enclosure (WTF and WTHF), also suitable for Food & Beverage industry, available (see page 192).

EOS2 light curtains may be connected to the dedicated safety interfaces series AD SR, or directly to contactors actuated and controlled by the light curtain, or to MOSAIC or to suitable commercial safety modules or safety PLCs.

Cross section

28 mm

30 mm

Two L-mounted light curtains
maintain 40 mm resolution in the corner
(models with resolution 30 and 40 mm)

40 mm

⊠ ReeR

< of safety
light curtain
resolution
=
no blind zone

Safety level: **Type 2 – SIL 2 – SILCL 2 – PL d – Cat. 2**

- 2006/42/EC "Machinery Directive"
- 2004/108/EC " Electromagnetic Compatibility (EMC)"
- 2006/95/EC "Low Voltage Directive (LVD)"
- IEC/EN 61496-1 Ed. 2.1, IEC/TS 61496-2 Ed. 2 " Safety of machinery - Electro-sensitive protective equipment- General requirements and tests"
- EN ISO 13849-1 "Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design"
- IEC/EN 62061 "Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems"
- IEC 61508 "Functional safety of electrical/electronic/programmable electronic safety-related systems"
- IEC/TS 62046 Ed. 2 "Safety of machinery – Application of protective equipment to detect the presence of persons"
- UL (C+US) mark for USA and Canada
- ANSI / UL 1998 "Safety Software in Programmable Components".

CE

TÜV SÜD

c(UL)us LISTED ESPE

EOS2

THE EOS2 RANGE

EOS2 A

- Protected height range 160 to 1510 mm
- 5 types of detection:
  - Resolution 30 - 40 mm for hand detection
  - Resolution 50 - 90 mm for detection of the body in a dangerous area
  - 2 - 3 - 4 beams for detection of the body in access control
- Max. range 12 m
- 2 safety static outputs PNP with auto-test protected against short circuits and overloads
- Automatic Start/Restart
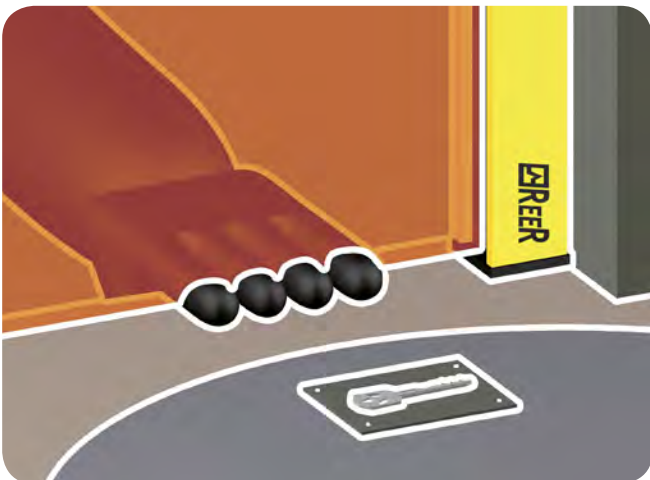- M12 5-pole connectors

The ideal light curtain for straightforward interfacing with safety modules or safety PLCs.

EOS2 X

- Protected height range 160 to 1510 mm
- 5 types of detection:
  - Resolution 30 - 40 mm for hand detection
  - Resolution 50 - 90 mm for detection of the body in a dangerous area
  - 2 - 3 - 4 beams for detection of the body in access control
- Max. range 12 m
- M12 5-pole connector for emitter and M12 8-pole for receiver
- Integrated, selectable manual or automatic Start/Restart
- Feedback input for external relay monitoring (EDM)
- Master and Slave models for series connection of two or three light curtains regardless of height or resolution.

An effective light curtain for directly controlling and monitoring machine circuits with no need of external safety modules.
Master/Slave models are also ideal for series connection of several light curtains and combined detection of hand and body or the protection of two different sides of a machine.

The protected area extends until the light curtain end
maintaining the resolution

The resolution is maintained (up to 40 mm) in the junction
between the 2 protected areas

◾ EOS2 A

MAIN FEATURES

Automatic Start/Restart.
Two safety PNP static outputs, auto-controlled.
All connections and configurations through M12 5-pole connectors.
Unshielded cables up to 100 meter long.
Start/Restart interlock and EDM through external AD SR1 interface.
Muting function through external AD SRM interface.
Autotest every 0,5 sec.

TECHNICAL FEATURES

Safety level	Type 2 according to IEC/TS 61496-2 SIL 2 − SILCL 2 according to IEC 61508 - IEC 62061 PL d − Cat. 2 according to ISO 13849-1
Protected heights (mm)	160 − 1510
Resolutions (mm)	30 − 40 − 50 − 90
Numbers of beams for body detection in access control	2 − 3 − 4
Max. range (m)	4 − 12 selectable
Response time (ms)	2,5 − 18,5
Safety outputs	2 PNP − 400 mA at 24 VDC
Signaling	LEDs for light curtain's status and diagnostic
Start/Restart	automatic
Power supply (VDC)	24 ± 20%
Electrical connections	M12 - 5 poles for emitter and receiver
Max. cable lenght (m)	100
Operating temperature (°C)	-10 to 55
Protection rating	IP 65 and IP 67
Fastening modes	back slot
Cross section (mm)	28 x 30

CE TÜV SUD c(UL)us LISTED ESPE

Safety level:

Type 2

SIL 2 − SILCL 2
PL d − Cat. 2

EOS2 A

Resolution 30 mm	EOS2 153 A	EOS2 303 A	EOS2 453 A	EOS2 603 A	EOS2 753 A	EOS2 903 A	EOS2 1053 A	EOS2 1203 A	EOS2 1353 A	EOS2 1503 A
Protected heights (mm)	160	310	460	610	760	910	1060	1210	1360	1510
Number of beams	8	16	23	31	38	46	53	61	68	76
Overall height (mm)	213	363	513	663	813	963	1113	1263	1413	1563

Resolution 40 mm	EOS2 154 A	EOS2 304 A	EOS2 454 A	EOS2 604 A	EOS2 754 A	EOS2 904 A	EOS2 1054 A	EOS2 1204 A	EOS2 1354 A	EOS2 1504 A
Protected heights (mm)	160	310	460	610	760	910	1060	1210	1360	1510
Number of beams	6	11	16	21	26	31	36	41	46	51
Overall height (mm)	213	363	513	663	813	963	1113	1263	1413	1563

Resolution 50 mm	EOS2 155 A	EOS2 305 A	EOS2 455 A	EOS2 605 A	EOS2 755 A	EOS2 905 A	EOS2 1055 A	EOS2 1205 A	EOS2 1355 A	EOS2 1505 A
Protected heights (mm)	160	310	460	610	760	910	1060	1210	1360	1510
Number of beams	4	8	12	16	20	24	28	32	36	40
Overall height (mm)	213	363	513	663	813	963	1113	1263	1413	1563

Resolution 90 mm	EOS2 309 A	EOS2 459 A	EOS2 609 A	EOS2 759 A	EOS2 909 A	EOS2 1059 A	EOS2 1209 A	EOS2 1359 A	EOS2 1509 A
Protected heights (mm)	310	460	610	760	910	1060	1210	1360	1510
Number of beams	4	6	8	10	12	14	16	18	20
Overall height (mm)	363	513	663	813	963	1113	1263	1413	1563

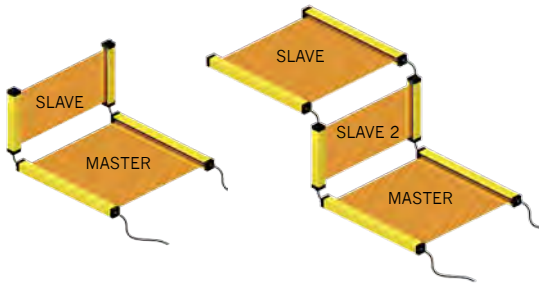| 2-3-4-beams	EOS2 2B A	EOS2 3B A	EOS2 4B A
Number of beams	2	3	4
Beam spacing (mm)	500	400	300
Protected heights (mm)	510	810	910
Overall height (mm)	653	953	1053

• For accessories see page 126   • For ordering codes see page 221

⬛ REER

■ EOS2

Master/Slave models permit series connection of up to three safety light curtains and combined detection of hand and presence of a person or of more sides of the machine, with the following major benefits:
- A single pair of safety outputs
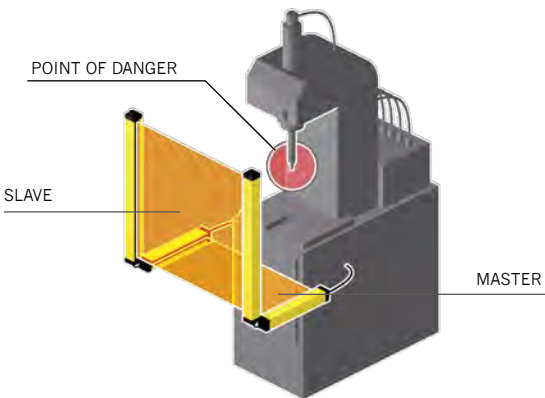- No interference between light curtains installed adjacent to one another.

EXAMPLES OF SERIES CONNECTION OF MASTER AND SLAVE LIGHT CURTAINS

Any Master model can be used together with any Slave model.

All electrical connections are made using M12 5-pole connectors, except for Master receivers which necessitate the adoption of M12 8-pole connectors.

Pre-wired cables with twin connectors are available for the connection between Master and Slave.
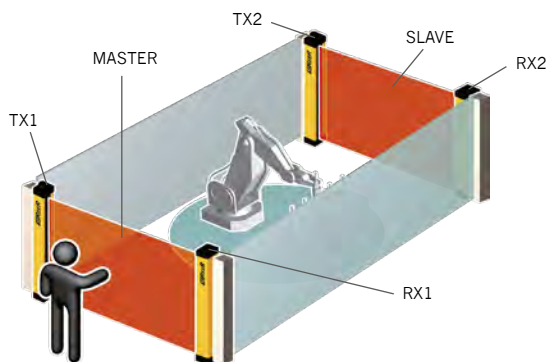
EXAMPLES OF SERIES CONNECTION OF MASTER AND SLAVE LIGHT CURTAINS

Master light curtain is placed horizontally for detection of the person and Slave light curtain is placed vertically to detect fingers or hands.

The arrangement can be reversed to have the Master light curtain vertical for finger and hand detection and the Slave light curtain horizontally for detecting the presence of a person.
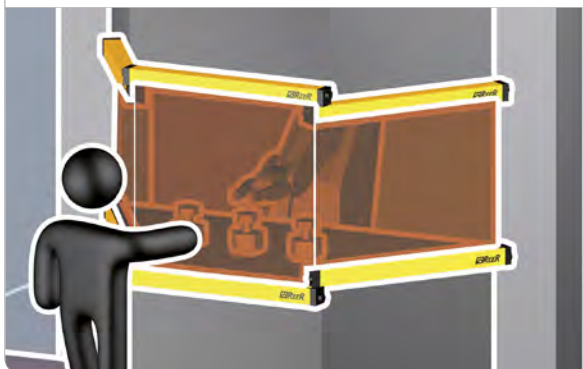
The application shown is one of the most common: horizontal curtains are used to prevent the operator from being undetected in the space between vertical light curtain and dangerous machine, upon system start-up or restarting.

EXAMPLE OF SERIES CONNECTION OF MASTER AND SLAVE LIGHT CURTAINS FOR PROTECTION OF TWO SIDES OF THE MACHINE

On EOS2 X the connecting cable across Master and Slave is a standard (unshielded) cable up to 50 meter long.
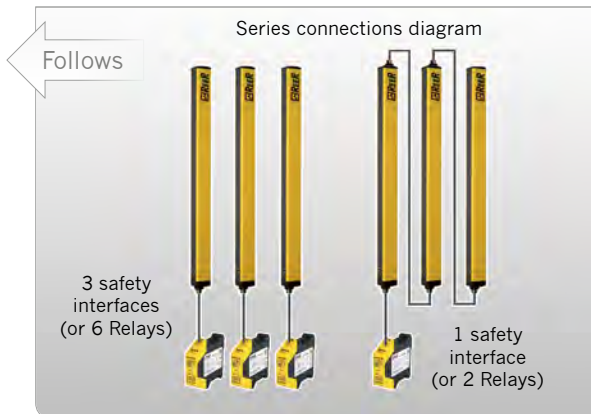
Thus, two series connected curtains may be located one at the front of the machine and the other at the rear, with a single connection to the machine power and control circuitry.

EXAMPLE OF SERIES CONNECTION OF ONE MASTER AND TWO SLAVE LIGHT CURTAINS FOR THE PROTECTION OF THREE SIDES OF THE MACHINE

Benefit: unimpeded operator access to work area from front and sides.

Continues ➡

EOS2

Series connections diagram

Follows

3 safety interfaces (or 6 Relays)

1 safety interface (or 2 Relays)

Benefit: with three standard curtains it will be necessary to use and wire up 3 safety interfaces or 6 contactors.

With the master/slave solution having 3 series light curtains it will be enough to use and wire up only 1 safety interface or 2 contactors.

MASTER/SLAVE MODELS

MASTER Resolution 30 mm		EOS2 303 XM	EOS2 453 XM	EOS2 603 XM	EOS2 753 XM	EOS2 903 XM	EOS2 1053 XM	EOS2 1203 XM	EOS2 1353 XM	EOS2 1503 XM
SLAVE Resolution 30 mm	EOS2 153 XS	EOS2 303 XS	EOS2 453 XS	EOS2 603 XS	EOS2 753 XS	EOS2 903 XS	EOS2 1053 XS	EOS2 1203 XS	EOS2 1353 XS	EOS2 1503 XS
SLAVE 2 Resolution 30 mm		EOS2 303 XS2	EOS2 453 XS2	EOS2 603 XS2	EOS2 753 XS2	EOS2 903 XS2	EOS2 1053 XS2	EOS2 1203 XS2	EOS2 1353 XS2	EOS2 1503 XS2
Protected heights (mm)	160	310	460	610	760	910	1060	1210	1360	1510
Number of beams	8	16	23	31	38	46	53	61	68	76
Overall height (mm) *	213	363	513	663	813	963	1113	1263	1413	1563

MASTER Resolution 40 mm		EOS2 304 XM	EOS2 454 XM	EOS2 604 XM	EOS2 754 XM	EOS2 904 XM	EOS2 104 XM	EOS2 1204 XM	EOS2 1354 XM	EOS2 1504 XM
SLAVE Resolution 40 mm	EOS2 154 XS	EOS2 304 XS	EOS2 454 XS	EOS2 604 XS	EOS2 754 XS	EOS2 904 XS	EOS2 1054 XS	EOS2 1204 XS	EOS2 1354 XS	EOS2 1504 XS
SLAVE 2 Resolution 40 mm		EOS2 304 XS2	EOS2 454 XS2	EOS2 604 XS2	EOS2 754 XS2	EOS2 904 XS2	EOS2 1054 XS2	EOS2 1204 XS2	EOS2 1354 XS2	EOS2 1504 XS2
Protected heights (mm)	160	310	460	610	760	910	1060	1210	1360	1510
Number of beams	6	11	16	21	26	31	36	41	46	51
Overall height (mm) *	213	363	513	663	813	963	1113	1263	1413	1563

EOS2

Each EOS2 light curtain comprises:

- Emitter and Receiver pair
- Brackets and inserts
- CD-ROM containing the multi-language instruction manual complete with CE declaration of conformity
- Quick installation guide

ACCESSORIES

EOS2 curtains can be supplied with the following accessories, to be ordered separately:

- AD SR Safety Relays   see page 180
- LAD laser alignment device   see page 210
- FMC floor mounting columns   see page 206
- SP deflection mirrors   see page 209
- SAV E vibrations dampers   see page 211
- SFB swivel fixing brackets   see page 212
- Connectors   see list hereunder:

CONNECTORS EOS2 (EOS2 A emitter and receiver / EOS2 X emitter)

Model	Description
CD 5	M12 straight connector, 5 poles, pre-wired cable 5 m
CD 10	M12 straight connector, 5 poles, pre-wired cable 10 m
CD 15	M12 straight connector, 5 poles, pre-wired cable 15 m
CD 20	M12 straight connector, 5 poles, pre-wired cable 20 m
CD 25	M12 straight connector, 5 poles, pre-wired cable 25 m
CD 50	M12 straight connector, 5 poles, pre-wired cable 50 m
CD 95	M12 90° angle connector, 5 poles, pre-wired cable 5 m
CD 910	M12 90° angle connector, 5 poles, pre-wired cable 10 m
CD 915	M12 90° angle connector, 5 poles, pre-wired cable 15 m
CDM 9	M12 straight connector, 5 poles with screw terminal, PG9 cable gland
CDM 99	M12 angle connector, 5 poles with screw terminal, PG9 cable gland

CONNECTORS EOS2 X receivers

Model	Description
C8D 5	M12 straight connector, 8 poles, pre-wired cable 5 m
C8D 10	M12 straight connector, 8 poles, pre-wired cable 10 m
C8D 15	M12 straight connector, 8 poles, pre-wired cable 15 m
C8D 25	M12 straight connector, 8 poles, pre-wired cable 25 m
C8D 40	M12 straight connector, 8 poles, pre-wired cable 40 m
C8D 95	M12 90° angle connector, 8 poles, pre-wired cable 5 m
C8D 910	M12 90° angle connector, 8 poles, pre-wired cable 10 m
C8D 915	M12 90° angle connector, 8 poles, pre-wired cable 15 m
C8DM 11	M12 straight connector, 8 poles with screw terminal, PG9/11 cable gland
C8DM 911	M12 90° angle connector, 8 poles with screw terminal, PG9/11 cable gland

CONNECTION BETWEEN MASTER AND SLAVE

Model	Description
CDS 03	0,3 m pre-wired cable with 2 straight connectors, M12 5 poles
CJBE 3	3 m pre-wired cable with 2 straight connectors, M12 5 poles
CJBE 5	5 m pre-wired cable with 2 straight connectors, M12 5 poles
CJBE 10	10 m pre-wired cable with 2 straight connectors, M12 5 poles
CJBE 25	25 m pre-wired cable with 2 straight connectors, M12 5 poles