# Safety Light Curtain
# Orion1 Extended

Orion1 Extended is an easy to use light curtain with compact dimensions. It has two resolutions for detection of fingers and hands, and comes with advanced features like cascading, muting and blanking.

Light curtains are usually placed closed to the hazardous zone when repeated access to the machine is necessary, for example manually serviced machines.
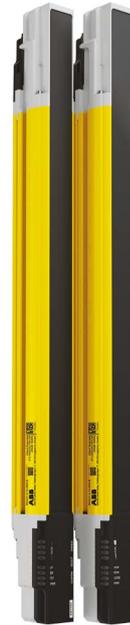
## Cost effective solution

**Integrated muting function**
Muting sensors are connected directly to the light grid, with no need for a remote muting module.

**No dead zones**
The light beams cover all of the profile length, without the usual dead zones at the ends requiring extra mechanical guards.

**Easy serial connection**
Cascading with the standard units: no separate slave or master units.

## Easy to install

**Easy to align**
Alignment help and a wide angle within the limits of a Type 4 device facilitate installation.

**Easy to connect**
Cables with M12 connectors speeds up connection.

## Continuous operation

**Reduced downtime**
Extensive error indication reduces troubleshooting time.

**Interference protection**
Protection against mutual interference with coding.

ABB

# Features
# Orion1 Extended

### Finger detection

A 14 mm resolution is intended for finger detection when the light guard needs to be very close to the machine in order to give the operator a good view and easy accessibility to the machine. A 14 mm resolution enables a sensing range of 7 m.
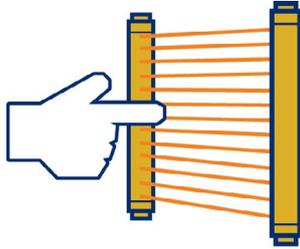
### Hand detection

A 30 mm resolution is intended for hand detection and area protection and is a good compromise between cost and accessibility to the machine. A 30 mm resolution enables a sensing range of 20 m.
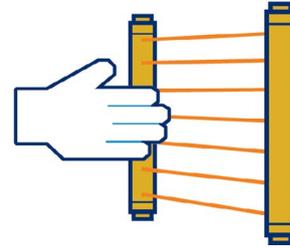
### Blanking

The blanking function allows to define a number of beams that can be constantly interrupted without stopping the machine. In this way a fixed material or a cable is allowed in the protected field, but a hand interrupting an extra beam would stop the machine. With floating blanking, the object, for ex. the cable, can move within the protected field.
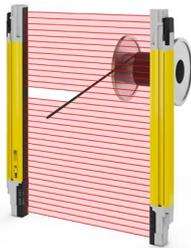
### No dead zones

A special feature of Orion1 Extended is that the light beams cover all of the profile length, without any dead zones. This enables to place it inside openings, instead of having a larger light guard in front of an opening.
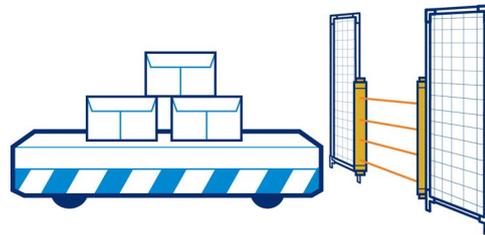
### Cascading

All Orion1 Extended units can be connected in series (cascaded) to easily create a suitable light curtain setup with no special units needed.

### Muting

By connecting muting sensors to the light guard, it can distinguish material from persons and allow the material to pass through an opening but not persons.

### Local reset

A local reset button is connected directly to the light guard instead of to the safety control module in the electrical cabinet. This saves safety relays/programmable inputs and minimizes cabling to the electrical cabinet.

### EDM

External Device Monitoring is a feature allowing the light guard to supervise the actuators in simpler applications, eliminating the need for a safety relay or programmable safety controller.

# Ordering information
## Orion1 Extended



**Orion1 Extended**

### Ordering details

| Resolution mm | Protected height mm | Type (Transmitter + receiver) | Order code |
|---|---|---|---|
| Finger (14) | 300 | Orion1-4-14-030-E | 2TLA022301R0100 |
| | 450 | Orion1-4-14-045-E | 2TLA022301R0200 |
| | 600 | Orion1-4-14-060-E | 2TLA022301R0300 |
| | 750 | Orion1-4-14-075-E | 2TLA022301R0400 |
| | 900 | Orion1-4-14-090-E | 2TLA022301R0500 |
| | 1050 | Orion1-4-14-105-E | 2TLA022301R0600 |
| | 1200 | Orion1-4-14-120-E | 2TLA022301R0700 |
| | 1350 | Orion1-4-14-135-E | 2TLA022301R0800 |
| | 1500 | Orion1-4-14-150-E | 2TLA022301R0900 |
| | 1650 | Orion1-4-14-165-E | 2TLA022301R1000 |
| | 1800 | Orion1-4-14-180-E | 2TLA022301R1100 |
| Hand (30) | 300 | Orion1-4-30-030-E | 2TLA022303R0100 |
| | 450 | Orion1-4-30-045-E | 2TLA022303R0200 |
| | 600 | Orion1-4-30-060-E | 2TLA022303R0300 |
| | 750 | Orion1-4-30-075-E | 2TLA022303R0400 |
| | 900 | Orion1-4-30-090-E | 2TLA022303R0500 |
| | 1050 | Orion1-4-30-105-E | 2TLA022303R0600 |
| | 1200 | Orion1-4-30-120-E | 2TLA022303R0700 |
| | 1350 | Orion1-4-30-135-E | 2TLA022303R0800 |
| | 1500 | Orion1-4-30-150-E | 2TLA022303R0900 |
| | 1650 | Orion1-4-30-165-E | 2TLA022303R1000 |
| | 1800 | Orion1-4-30-180-E | 2TLA022303R1100 |



**JSM Orion01**

### Spare parts (included when ordering Orion)

| Description | Type | Order code |
|---|---|---|
| 4 standard brackets for Orion1 & Orion2 | JSM Orion01 | 2TLA022310R0000 |

**ABB I** Orion1 Extended   3

# Accessories
## Orion1 Extended

**OMC1**
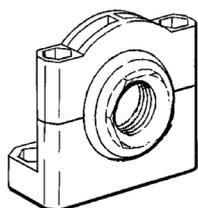
**JSM 64**

**Orion Laser pointer**

## Connection  accessories

### Connection accessories

| Description | Type | Order code |
|---|---|---|
| Connection box for two or four muting sensors | OMC1 | 2TLA022316R2000 |
| Retroreflex photoelectric sensor | Mute R2 | 2TLA022044R0500 |
| Adjustable mounting bracket for M18 sensors (e.g. Mute R2 and Spot 10). | JSM 64 | 2TLA040007R0200 |
| Reflector diameter 63 mm | Reflect 1 | 2TLA022044R2000 |
| Reflector diameter 82 mm | Reflect 2 | 2TLA022044R3000 |
| Smile reset button with NO contact | Smile 11 RA | 2TLA030053R0000 |
| Smile reset button with NO contact for Pluto | Smile 11 RB | 2TLA030053R0100 |

### Mounting accessories

| Description | Type | Order code |
|---|---|---|
| Orion Test Piece 14 mm | Orion TP-14 | 2TLA022310R5200 |
| Orion Test Piece 30 mm | Orion TP-30 | 2TLA022310R5300 |
| Orion Laser pointer | Orion Laser | 2TLA022310R5000 |
| Screw  MC6S M5x12 to be used with T-nut JSM M5B for mounting Orion on Quick-Guard | Screw  MC6S | 2TLA041012R0200 |
| JSM M5B Special T-nut M5 to be used with screw MC6S for mounting Orion on Quick-Guard | T-nut JSM M5B | 2TLA040035R0400 |
| Kit for mounting of Orion1 & Orion2 in Stand (4 pieces for lengths shorter than 1200 mm) | JSM Orion06 | 2TLA022310R0400 |
| Kit for mounting of Orion1 & Orion2 in Stand (6 pieces for lengths of 1200 mm or more) | JSM Orion07 | 2TLA022310R0500 |
| Kit for mounting of Orion1 Mirror in Stand | JSM Orion11 | 2TLA022310R0900 |
| Orion Plate kit for adjustment of protective stand | Orion Stand Plate | 2TLA022312R5000 |
| Deviating mirror to be mounted in Orion Stand with one kit JSM Orion11 | Orion1 Mirror* | |
| Protective stand | Orion Stand* | |

*These accessories are available in different sizes.
For more information see:
Orion1 Mirror 2TLC172058L0201
Orion Stand 2TLC172059L0201

For more information about the connection accessories, please see:
Orion connection accessories 2TLC172101L0201

# Cables
## Orion1 Extended



**M12-C61**



**M12-C61HE**



**M12-C2012**

### Cables with connectors

| Muting to be used | Neccessary transmitter/ receiver cable | Suitable cable between transmitter/receiver cable and el-cabinet | Length | Special feature | Type | Order code |
|---|---|---|---|---|---|---|
| Yes | Transmitter M12-C02PT2T | M12-5 female single ended, to e.g. el-cabinet | 6 m | | M12-C61 | 2TLA020056R0000 |
| | | | 6 m | Harsh environment, halogen free | M12-C61HE | 2TLA020056R8000 |
| | | | 10 m | | M12-C101HE | 2TLA020056R8100 |
| | | | 10 m | | M12-C101 | 2TLA020056R1000 |
| | | | 20 m | | M12-C201 | 2TLA020056R1400 |
| | Receiver M12-C02PT62RM | M12-5 male + female, to e.g. OMC1 | 0.06 m | | M12-C00612 | 2TLA020056R6300 |
| | | | 0.3 | | M12-C0312 | 2TLA020056R5800 |
| | | | 1 m | | M12-C112 | 2TLA020056R2000 |
| | | | 3 m | | M12-C312 | 2TLA020056R2100 |
| | | | 6 m | | M12-C612 | 2TLA020056R2200 |
| | | | 10 m | | M12-C1012 | 2TLA020056R2300 |
| | | | 16 m | | M12-C1612 | 2TLA020056R5400 |
| | | | 20 m | | M12-C2012 | 2TLA020056R2400 |
| | | M12-12 female single ended, to e.g. el-cabinet | 6 m | | M12-C65 | 2TLA020056R7200 |
| | | | 10 m | | M12-C105 | 2TLA020056R7300 |
| | | | 20 m | | M12-C205 | 2TLA020056R7500 |
| No | Transmitter M12-C02PT2T | M12-5 female single ended, to e.g. el-cabinet | 6 m | | M12-C61 | 2TLA020056R0000 |
| | | | 6 m | Harsh environment, halogen free | M12-C61HE | 2TLA020056R8100 |
| | | | 10 m | | M12-C101HE | 2TLA020056R5400 |
| | | | 10 m | | M12-C101 | 2TLA020056R1000 |
| | | | 20 m | | M12-C201 | 2TLA020056R1400 |
| | Receiver M12-C02PT6RB | M12-12 female single ended, to e.g. el-cabinet | 6 m | | M12-C65 | 2TLA020056R7200 |
| | | | 10 m | | M12-C105 | 2TLA020056R7300 |
| | | | 20 m | | M12-C205 | 2TLA020056R7500 |



**M12-C01**



**C5 cable**

### Separate cables and connectors

| Description | Type | Order code |
|---|---|---|
| **Connectors** | | |
| M12-5 pole female, straight | M12-C01 | 2TLA020055R1000 |
| M12-5 pole male, straight | M12-C02 | 2TLA020055R1100 |
| **Cable with 5 conductors** | | |
| 10 m cable with 5 x 0.34 shielded conductors | C5 cable 10 m | 2TLA020057R0001 |
| 50 m cable with 5 x 0.34 shielded conductors | C5 cable 50 m | 2TLA020057R0005 |
| 100 m cable with 5 x 0.34 shielded conductors | C5 cable 100 m | 2TLA020057R0010 |
| 200 m cable with 5 x 0.34 shielded conductors | C5 cable 200 m | 2TLA020057R0020 |
| 500 m cable with 5 x 0.34 shielded conductors | C5 cable 500 m | 2TLA020057R0050 |



**M12-C02PT2T**

### Special cables for Orion1 Extended

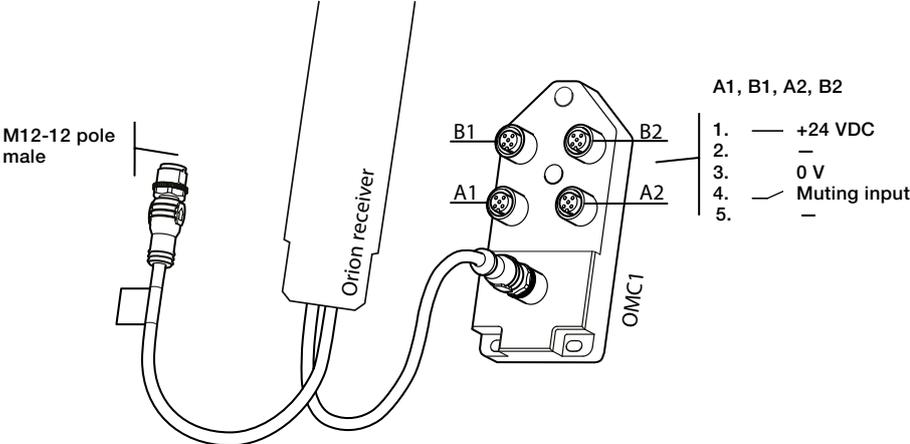| Description | Length | Type | Order code |
|---|---|---|---|
| Transmitter cable for Orion1 Extended. M12-5 male connector. | 0.2 m | M12-C02PT2T | 2TLA022315R0100 |
| Receiver cable for Orion1 Extended when no muting. M12-12 male connector. | 0.2 m | M12-C02PT6RB | 2TLA022315R0200 |
| Receiver cable for Orion1 Extended when muting. M12-5 male connector (for muting sensors) and M12-12 male connector. | 0.2 m | M12-C02PT62RM | 2TLA022315R0300 |
| Cascade cable for Orion1 Extended | 1 m | PT-C1PT | 2TLA022315R1000 |
| Cascade cable for Orion1 Extended | 0.5 m | PT-C05PT | 2TLA022315R1100 |
| Cascade cable for Orion1 Extended | 0.05 m | PT-C005PT | 2TLA022315R1200 |

**ABB I** Orion1 Extended   5

# Connection example
# Orion1 Extended

## Connection of the muting sensors with M12-C02PT62RM and OMC1



**M12-12 pole male**

Orion receiver

B1    B2

A1    A2

OMC1

**A1, B1, A2, B2**

| | | |
|---|---|---|
| 1. | —— | +24 VDC |
| 2. | — | |
| 3. | | 0 V |
| 4. | ⌣ | Muting input |
| 5. | — | |

NB: Cable with M12-5 male + female connectors shall be used between muting sensors and OMC1 inputs A1, B1, A2, B2.

# Technical data
# Orion1 Extended

## Technical data

| | |
|---|---|
| **Approvals** | c(UL)us LISTED   TÜV |
| **Conformity** | CE |
| | 2006/42/EC - Machinery |
| | 2004/108/EC - EMC |
| | EN ISO 13849-1:2008, EN 62061:2005/A1:2013, EN 61496-1:2013, EN 61496-2, EN 61508-1:2010, EN 61508-2:2010, EN 61508-3:2010, EN 61508-4:2010 |
| **Functional safety data** | |
|    **EN 61508:2010** | SIL3, $PFH_D$ = 2.64 x $10^{-9}$ |
|    **EN 62061:2005+A1:2013** | SILCL3, $PFH_D$ = 2.64 x1 $0^{-9}$ |
|    **EN ISO 13849-1:2008** | PL e, Cat. 4, $PFH_D$ = 2.64 x $10^{-9}$ |
| **Electrical data** | |
|    **Power supply** | +24 VDC ± 20 % |
|       **Power consumtion, Transmitter** | 3 W max |
|       **Power consumption, Receiver** | 5 W max (without load) |
|    **Outputs** | 2 PNP |
|       **Short-circuit protection** | 1.4 A max |
|       **Output current** | 0.5 A max / output |
|       **Output voltage – ON** | Vdd -1 V min |
|       **Output voltage – OFF** | 0.2 V max |
|       **Capacitive load** | 2.2 µF at +24 VDC max |
|    **Current for external lamp** | 20 mA min; 200 mA max |
|    **Cable length (for power supply)** | 50 m max |
| **Connectors** | M12-4 pole male on transmitter (compatible with M12-5 pole female) |
| | M12-8 pole male on receiver |
| **Optical data** | |
|    **Light emission (λ)** | Infrared, LED (950 nm) |
|    **Resolution** | 14 or 30 mm |
|    **Operating distance** | 0.2…20 m for 30 mm |
| | 0.2…7 m for 14 mm |
|    **Ambient light rejection** | According to IEC-61496-2:2013 |
| **Mechanical data** | |
|    **Operating temperature** | 0…+ 50 °C |
|    **Storage temperature** | - 25…+ 70 °C |
|    **Humidity range** | 15…95 % (no condensation) |
|    **Protection class** | IP65 (EN 60529:2000) |
|    **Weight** | 1.35 kg / meter for each single unit |
|    **Housing material** | Painted aluminium (yellow RAL 1003) |
|    **Front glass material** | PMMA |
|    **Cap material** | PBT Valox 508 |

For more information, e.g. the complete technical information, see product manual for:
Orion1 Extended 2TLC172290M0201

**ABB I** Orion1 Extended   7

# Dimension drawings
## Orion1 Extended

**Orion1 Extended**
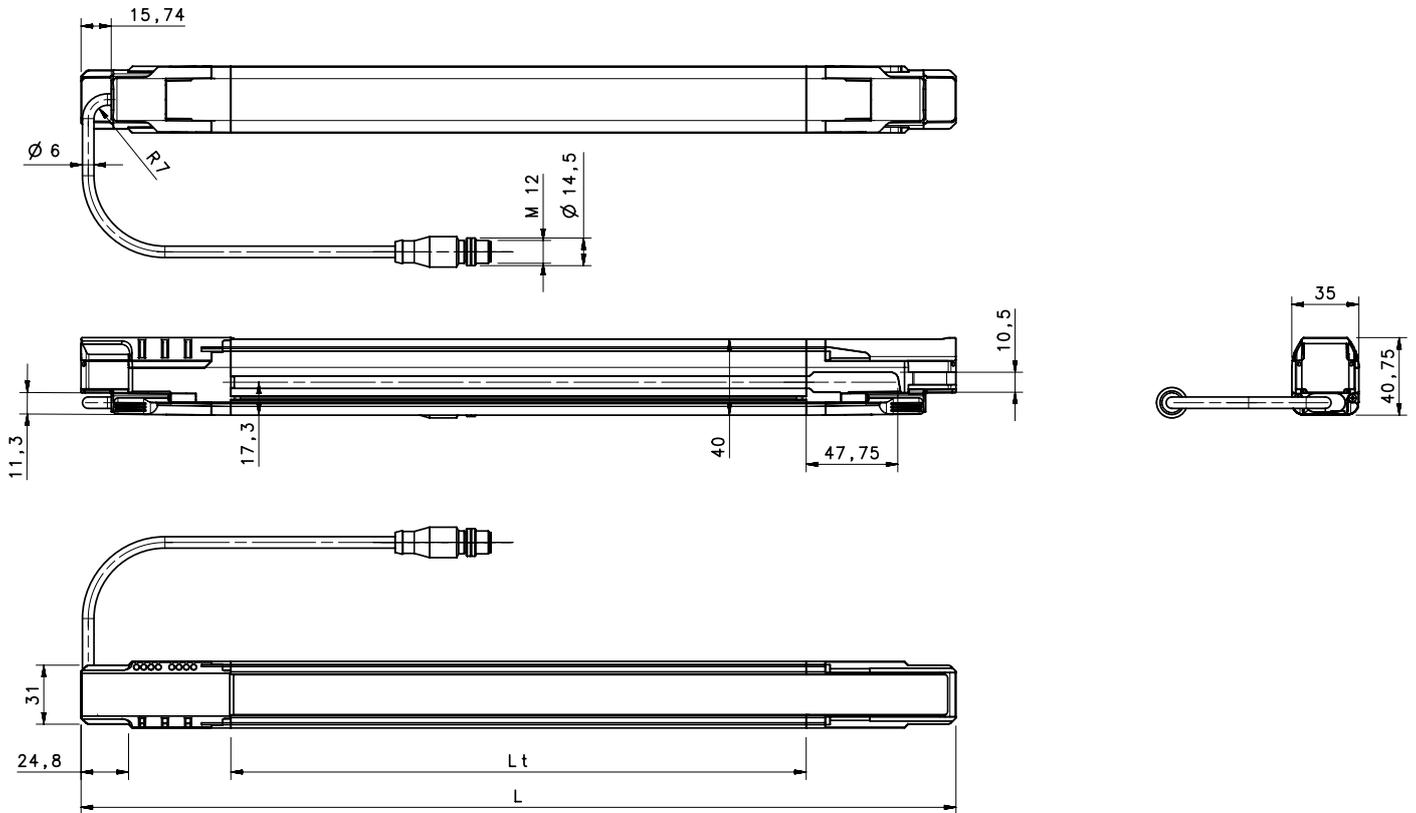


All dimensions in mm

**Dimension**

| L1 mm | L2 mm | Type |
|---|---|---|
| 300 | 306.3 | Orion1-4-xx-030-E |
| 450 | 456.3 | Orion1-4-xx-045-E |
| 600 | 606.3 | Orion1-4-xx-060-E |
| 750 | 756.3 | Orion1-4-xx-075-E |
| 900 | 906.3 | Orion1-4-xx-090-E |
| 1050 | 1056.3 | Orion1-4-xx-105-E |
| 1200 | 1206.3 | Orion1-4-xx-120-E |
| 1350 | 1356.3 | Orion1-4-xx-135-E |
| 1500 | 1506.3 | Orion1-4-xx-150-E |
| 1650 | 1656.3 | Orion1-4-xx-165-E |
| 1800 | 1806.3 | Orion1-4-xx-180-E |

xx = Resolution (14 or 30 mm)

# Contact us

ABB AB

**Jokab Safety**

Varlabergsvägen 11

SE-434 39 Kungsbacka

Tel. +46 (0) 21-32 50 00

www.abb.com/jokabsafety

Note

We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

**ABB**