MAIN CATALOG

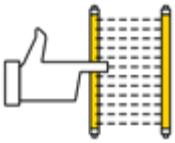
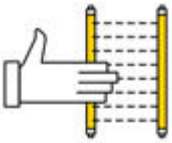
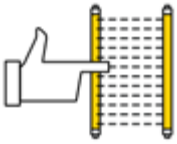
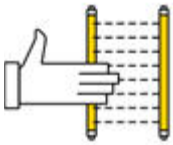
Safety Products

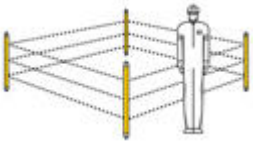
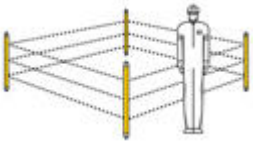
ABB Jokab Safety

Optical safety devices

Introduction and overview
Selection guide

Light curtains and light grids that cover most types of applications.

	Orion1			
Function	Light curtain, Transmitter + Receiver, Slim profile			
Image				
Type	**Orion1 Base**		**Orion1 Extended**	
Type of detection	 Finger	 Hand	 Finger	 Hand
Resolution	14 mm	30 mm	14 mm	30 mm
Protected height	15-180 cm	15-180 cm	30-180 cm	30-180 cm
Applications	Manually serviced machines with short safety distances.		Manually serviced machines with short safety distances. With advanced features like muting, blanking and cascading.	
Functions				
Range	6 m	19 m	7 m	20 m
Auto/Manual reset	•	•	•	•
EDM	•	•	•	•
Muting			•	•
Override			•	•
Integrated muting lamp				
Blanking			•	•
No dead zone			•	•
Coding			•	•
Cascading			•	•

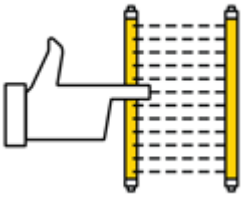
	Orion2		Orion3	
Function	Light grid, Transmitter + Receiver, Slim profile		Light grid, Active + Passive units, Sturdy profile	
Image				
Type	**Orion2 Base**	**Orion2 Extended**	**Orion3 Base**	**Orion3 Extended**
Type of detection	 Body		 Body	
Resolution	2, 3 or 4 beams			
Protected height	50-120 cm			
Applications	Perimeter guarding over long distances	Perimeter guarding over long distances with muting	Perimeter guarding with one-sided connection	Perimeter guarding with one-sided connection and muting
Functions				
Range	50 m	50 m	Up to 8 m	Up to 8 m
Auto/Manual reset	•	•	•	•
EDM	•	•	•	•
Muting		•		•
Override		•		•
Integrated muting lamp		•		•
Blanking				
No dead zone				
Coding				
Cascading				

Introduction and overview

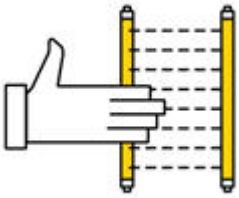
Selection orientation

Choose the right resolution for your application

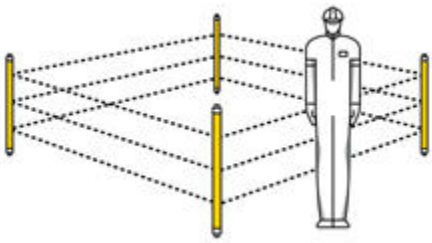
Finger detection
Light curtains with 14 mm resolution are intended for finger detection when the light guard needs to be very close to the machine in order to give the operator a good view and easy accessibility to the machine.



Hand detection
Light curtains with 30 mm resolution are intended for hand detection and area protection and is often a good compromise between cost and accessibility to the machine. They offer a better sensing range than finger detection light curtains, but require a slightly greater safety distance.



Body detection
Light grids have a resolution adapted for detection of the whole body and are intended for perimeter guarding where there is a requirement for high accessibility. They offer a very good sensing range, but require a much greater safety distance than light guards for finger and hand detection.



Introduction and overview
Standards

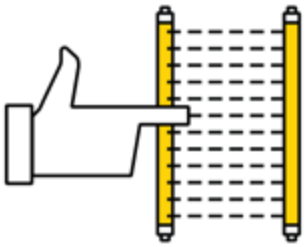
Resolution and safety distance
The optical safety device must be installed so that no-one can reach the hazardous area without first passing through the detection zone of the light guard. The distance from the hazardous area to the detection zone of the optical safety device must be large enough in order for the machine to have time to stop before someone can reach the hazardous area. This distance is called the safety distance, and it shall be calculated using the formula from EN ISO 13855.

The safety distance is influenced by the distance between each beam in the light guard. The closer the beams are together, the smaller the safety distance can be, which is why light curtains for finger detection can be placed much closer to the hazardous area than light grids for body detection.

Safety distance according to EN ISO 13855

The distance 'S' is the minimum distance between a light curtain and a hazardous area. This is calculated with the formula from EN ISO 13855 - Safety of machinery - Positioning of safeguards with respect to the approach speeds of parts of the human body.

$$S = (K \times T) + C$$



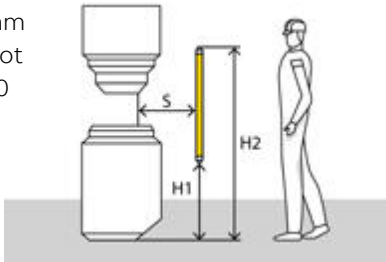
Resolution for finger (≤14 mm) gives C = 0

S = minimum distance in mm
K = approach speed (of hand or body) in mm/s
T = stopping time of the machine (including reaction time of safety devices) in seconds
C = additional distance in mm based upon the body´s intrusion towards the hazardous area before the safety device has been actuated.

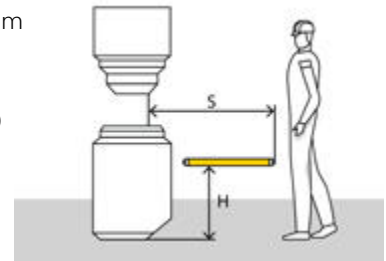
NB If it is possible to reach the hazard zone by reaching over the light beam, an adjustment is made to the formula. In table 1 in EN ISO 13855 an alternative safety distance addition (C_{ro}) is given to the formula S = (K x T) + C. The greatest value out of C and C_{ro} is to be used to prevent reaching the hazard zone by reaching over the light curtain/grid.

Minimum distances for light curtains installed vertically and horizontally according to EN ISO 13855

S = minimum distance in mm
H1 = the lower beam may not be situated higher than 300 mm above the ground
H2 = the upper beam may not be situated lower than 900 mm above the ground



S = minimum distance in mm
H = the light curtain detection zone must be positioned between 0 and 1000 mm above the floor



For S ≤ 500 mm the minimum distance for vertical installation is calculated with the following formula:

$$S = (2000 \times T) + 8 \times (d-14)$$

where d is the light curtain´s resolution in mm.

K = 2000 mm/s is used to represent the speed of the hand. The expression (8 x (d-14)) may never be less than 0. Minimum distance S may never be less than 100 mm.

If the minimum distance according to the formula above gets larger than 500 mm one can instead use:

$$S = (1600 \times T) + 8 \times (d-14)$$

K = 1600 mm/s is used to represent the speed of the body. Minimum distance according to this formula is 500 mm.

The minimum distance for horizontal installation is calculated with the following formula:

$$S = (1600 \times T) + (1200 - 0.4 \times H)$$

where H is the height of the detection zone above the reference plane, e.g. the ground

(1200 – 0,4 x H) may not be less than 850 mm. Depending on the resolution, d, that the light curtain has, there is a minimum height where the detection zone may be placed. This is calculated with:
H = 15 x (d – 50).
H cannot be less than 0. With a resolution d =14 or 30 mm one can therefore install the light curtain from H = 0 and up. The higher it is situated, the shorter the minimum distance gets. The highest permissible height H of the detection zone is 1000 mm.

When you use a horizontal light curtain as perimeter protection, the depth of the light curtain shall be at least 750 mm to prevent people from inadvertently stepping over it. The estimated minimum distance is measured from the machine's hazardous section to the outermost beam of the horizontal light curtain (seen from the machine).

Minimum distance for light beams according to EN ISO 13855

For light beams the minimum distance is calculated from the following:

$$S = (1600 \times T) + 850 \text{ mm}$$

NOTE! The additional distance will in most cases be more than 850 mm due to the possibility to reach over a light beam. (C_{ro})

The formula applies to light guards with 2, 3 or 4 beams. It is the risk assessment that decides the number of beams that are to be chosen. The following possibilities must be considered.

- to crawl under the lowest beam;
- to reach over the top beam;
- to reach in between two beams;
- that the body passes in between two beams.

To fulfill the requirements the beams shall be installed at the following heights:

Number of beams	Height over the reference plane, e.g. ground
4	300, 600, 900, 1200
3	300, 700, 1100
2	400, 900

Minimum distance for single beams according to EN ISO 13855

A single beam as only protection is normally not suitable to prevent whole body access. Single beams are mostly used in combination with other safety devices or fixed guards.

The risk assessment should determine if a single beam is a suitable protection for the hazard in question.

The safety distance is calculated using:

$$S = (1600 \times T) + 1200 \text{ mm}$$

A height of 750 mm from the reference plane has been found suitable to prevent inadvertent access to the danger zone.

Safety light curtain
Orion1 Base

Orion1 Base is an easy to use light curtain with compact dimensions and two resolutions for detection of fingers and hands.

Light curtains are usually used closed to the hazardous zone when repeated access to the machine is necessary, for example manually serviced machines.

Light curtains can also be used to limit work zones inside the hazardous area and be mounted horizontally for area protection.

Cost effective solution

No more functions than neccessary
Orion1 Base comes with a minimum of advanced functionalities to save cost.

Minimized cabling
A local reset button can be connected directly to the light curtain. In this way there is no need for a cable between the reset button and the electrical cabinet or for an extra control module.

External device monitoring
Each light curtain can monitor the actuators without any extra control module (EDM function).

Continuous operation

Visible alignment level
Since the alignment level is displayed, the alignment can be improved before the occurrence of an unwanted stop.

Extensive error indication
Extensive error indication reduces troubleshooting time.

Protection against harsh environment
Protective tubes and lens shields protect the devices in harsh environments.

Easy to install

Easy to align
Alignment help and a wide angle within the limits of a Type 4 device facilitate alignment. Rotation brackets also simplify alignment.

Easy to connect
M12 connectors speed up cabling.

Applications and features

Orion1 Base

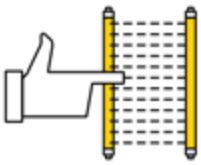
Applications

Vertical mounting
When using standard vertical mounting the light guard can be placed close to the hazard zone. This is suitable for applications where repeated access to the machine is necessary, e.g. manually serviced machines.

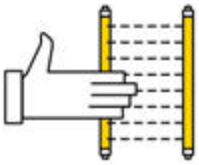
Horizontal mounting
Horizontal mounting is mainly used for area protection and limitation of work zones.

Features

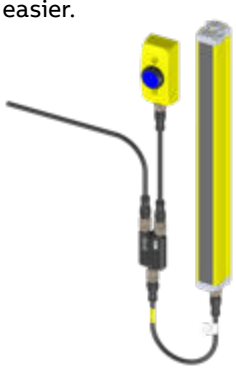
Finger detection
A 14 mm resolution is intended for finger detection when the light guard needs to be very close to the machine in order to give the operator a good view and easy accessibility to the machine. A 14 mm resolution enables a sensing range of 6 m.



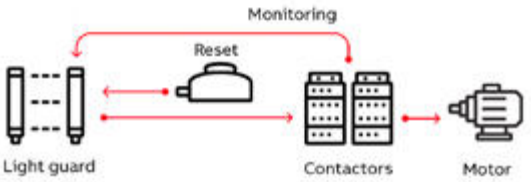
Hand detection
A 30 mm resolution is intended for hand detection and area protection and is a good compromise between cost and accessibility to the machine. A 30 mm resolution enables a sensing range of 19 m.



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/PLC inputs and minimizes cabling to the electrical cabinet. Clever accessories makes the connection easier.



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.



Safety light curtain

Orion1 Base

2TLC172787F0201

Orion1 Base

Ordering Details

Detection (Resolution mm)	Protected height mm	Type (Transmitter + receiver)	Order code
Finger (14)	150	Orion1-4-14-015-B	2TLA022300R0000
	300	Orion1-4-14-030-B	2TLA022300R0100
	450	Orion1-4-14-045-B	2TLA022300R0200
	600	Orion1-4-14-060-B	2TLA022300R0300
	750	Orion1-4-14-075-B	2TLA022300R0400
	900	Orion1-4-14-090-B	2TLA022300R0500
	1050	Orion1-4-14-105-B	2TLA022300R0600
	1200	Orion1-4-14-120-B	2TLA022300R0700
	1350	Orion1-4-14-135-B	2TLA022300R0800
	1500	Orion1-4-14-150-B	2TLA022300R0900
	1650	Orion1-4-14-165-B	2TLA022300R1000
	1800	Orion1-4-14-180-B	2TLA022300R1100
Hand (30)	150	Orion1-4-30-015-B	2TLA022302R0000
	300	Orion1-4-30-030-B	2TLA022302R0100
	450	Orion1-4-30-045-B	2TLA022302R0200
	600	Orion1-4-30-060-B	2TLA022302R0300
	750	Orion1-4-30-075-B	2TLA022302R0400
	900	Orion1-4-30-090-B	2TLA022302R0500
	1050	Orion1-4-30-105-B	2TLA022302R0600
	1200	Orion1-4-30-120-B	2TLA022302R0700
	1350	Orion1-4-30-135-B	2TLA022302R0800
	1500	Orion1-4-30-150-B	2TLA022302R0900
	1650	Orion1-4-30-165-B	2TLA022302R1000
	1800	Orion1-4-30-180-B	2TLA022302R1100

2TLC172781F0201

JSM Orion01

Spare parts (included when ordering Orion)

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

Accessories

Orion1 Base


2TLC172816F0201

Orion Laser pointer


2TLC172783F0201

JSM Orion03


2TLC172367F0201

Smile 11 RB


2TLC172012V0201

M12-3R


2TLC172477F0201

Tina 10C

Accessories

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
4 rotation brackets for Orion1 Base	JSM Orion03	2TLA022310R0100
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*	
Protective tube	Orion WET*	
Lens shield	Orion Shield*	

Connection accessories		
Smile reset button with NO contact	Smile 11 RA	2TLA030053R0000
Smile reset button with NO contact for Pluto	Smile 11 RB	2TLA030053R0100
Smile reset button with NO contact for Orion1 Base	Smile 11RO1	2TLA022316R3000
Y-connector for series connection of DYNlink devices with M12-5 connectors, e.g. Eden	M12-3A	2TLA020055R0000
Y-connector for connection of a Smile reset button to Orion	M12-3R	2TLA022316R0000
Y-connector for easy connection of a transmitter	M12-3D	2TLA020055R0300
Adaptation of OSSD to DYNlink. M12-8 connector for OSSD and M12-5 for DYNlink.	Tina 10A v2	2TLA020054R1210
Adaptation of OSSD to DYNlink with possibility to connect a local reset button. M12-8 connector for OSSD and M12-5 for DYNlink and reset.	Tina 10B v2	2TLA020054R1310
Adaptation of OSSD to DYNlink with possibility to power the transmitter. M12-8 connector for OSSD and M12-5 for DYNlink and transmitter.	Tina 10C v2	2TLA020054R1610

*These accessories are available in different sizes.
For more information see:
Orion1 Mirror 2TLC172058L0201, Orion Stand 2TLC172059L0201, Orion WET 2TLC172061L0201, Orion Shield 2TLC172071L0201

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

How to choose correct reset button

Local or global reset	Adaption to DYNlink*	Safety controle module	Type	Useful connection accessories
Local reset button connected to the light guard	Yes	Vital or Pluto	Smile 11RO1	Tina 10B: OSSD to DYNlink + local reset button M12-3A: Serial connection of DYNlink
(Orion in manual reset mode)	No	Any safety control module compatible with light guard	Smile 11RO1	M12-3R: Easy connection of a local reset button
Global reset button connected to the control module	Yes	Vital	Smile 11 RA	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
(Orion in automatic reset mode)		Pluto	Smile 11 RB	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
	No	Any safety control module compatible with light guard	Smile 11 RA**	-

* The ABB Jokab Safety DYNlink solution offers the following advantages:
- Serial connection of safety devices while maintaining PLe/cat. 4, up to 25 Tina 10 per Vital and up to 5 Tina 10 per Pluto input.
- Only one safety input of the Pluto instead of two with the standard OSSD outputs.

** Smile 11 RA has one NO contact, which is the most common for reset buttons. Please check what is requested for the chosen safety control module.

Cables and connectors

Orion1 Base

2TLC172951F0201

M12-C61

2TLC010003F0201

M12-C61HE

2TLC172931F0201

M12-C334

Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
	(b)	6 m		M12-C61	2TLA020056R0000
			Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		10 m		M12-C101	2TLA020056R1000
			Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
	(a)	0.06 m		M12-C00612	2TLA020056R6300
		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
	Male	6 m		M12-C62	2TLA020056R0200
	(c)	10 m		M12-C102	2TLA020056R1200
M12-8	Female	3 m		M12-C33	2TLA020056R2900
	(d)	6 m		M12-C63	2TLA020056R3000
		10 m		M12-C103	2TLA020056R4000
		20 m		M12-C203	2TLA020056R4100
	Female + male	0.06 m		M12-C00634	2TLA020056R6400
	(e)	1 m		M12-C134	2TLA020056R5000
		3 m		M12-C334	2TLA020056R5100
M12-8 male + female	Female + male	0.2		M12-CTO1BA[1]	2TLA022315R3000
M12-8 male + female	Female + male	0.2		M12-CTO1BM[2]	2TLA022315R3100
M12-8 female - M12-5 male	Female + male	1		M12-CTURAX-O1B[3]	2TLA022315R3300

Letters (a, b, c, d, e, t_1, t_2, t_3) refer to cables in connection examples, e.g:
2TLC010002T0001 Connection diagram Orion_cables_Tina10_M12-3A_M12-3D
2TLC010003T0001 Connection diagram Orion_cables_Smile11R_Urax_M12-3R

1) M12-CTO1BA (t_1) can be used for:
- connection of Orion1 Base to Tina 10A/C
- replacement of Focus II in automatic reset with Orion in automatic reset.
The EDM function should be deactivated in all cases.

2) M12-CTO1BM (t_2) can be used for:
- connection of Orion1 Base to Tina 10B or M12-3R for use of a local reset button, for example Smile 11ROx
- replacement of Focus II in manual reset with Orion in manual reset.
The EDM function should be deactivated in all cases.

3) M12-CTURAX-01B (t_3) is used for:
- the connection of Orion1 Base to URAX-D1R.
The light guard is automatically configured in automatic reset and the EDM function should be deactivated.

2TLC172657F0201

M12-C01

2TLC010038F0201

C5 cable

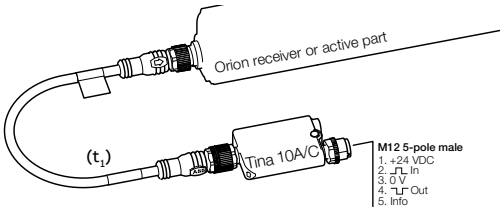
Separate cables and connectors

Description	Type	Order code
Connectors		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
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
Cable with 8 conductors		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

Connection examples

Orion1 Base

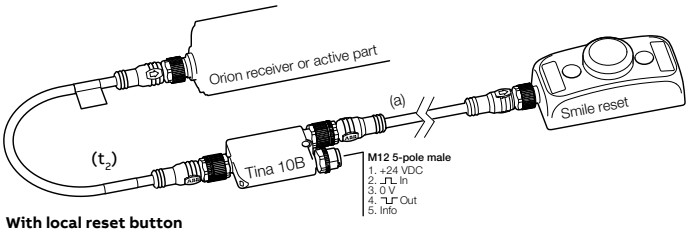
Orion with Tina 10A/C



Without local reset button

Connection to the ABB Jokab Safety DYNlink signal via Tina 10 A/C. To be used with Vital safety control module or Pluto programmable safety controller.

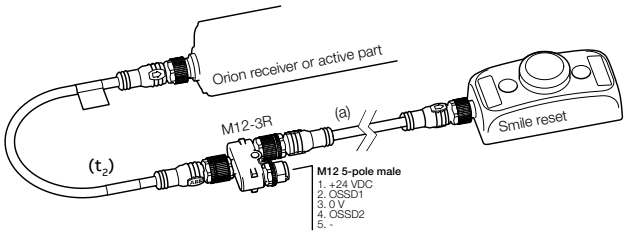
Reset to Orion with Tina 10B



With local reset button

Connection to the ABB Jokab Safety DYNlink signal via Tina 10B. To be used with Vital safety control module or Pluto programmable safety controller.

Reset to Orion with M12-3R



Connection of a local reset button via M12-3R.

Connection diagrams

For Orion1 Base connection diagrams please see https://library.abb.com/

Technical data

Orion1 Base

Technical data

Approvals	
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, $PFH_D = 2.64 \times 10^{-9}$
EN 62061:2005+A1:2013	SILCL3, $PFH_D = 2.64 \times 10^{-9}$
EN ISO 13849-1:2008	PL e, Cat. 4, $PFH_D = 2.64 \times 10^{-9}$
Electrical data	
Power supply	+24 VDC ± 20%
Power consumtion, transmitter	1.5 W max
Power consumption, receiver	4 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
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...19 m for 30 mm
	0.2...6 m for 14 mm
Ambient light rejection	According to IEC-61496-2:2013
Mechanical data	
Operating temperature	0...+ 55 °C
Storage temperature	- 25...+ 70 °C
Humidity range	15...95% (no condensation)
Protection class	IP65 (EN 60529:2000)
Weight	1.3 kg / meter for each single unit
Housing material	Painted aluminium (yellow RAL 1003)
Front glass material	PMMA
Cap material	PC MAKROLON

More information

For more information, e.g. the complete technical information, please see product manual for:
Orion1 Base 2TLC172287M0201

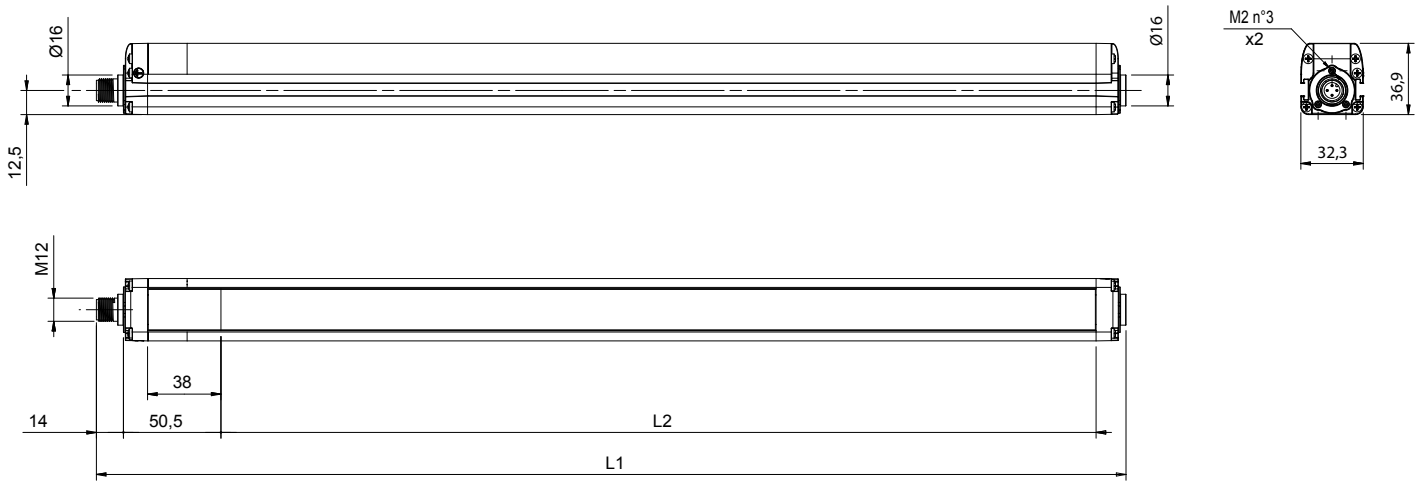
Connection diagrams

For Orion1 Base connection diagrams please see https://library.abb.com/

Dimension drawings

Orion1 Base

Orion1 Base



All dimensions in mm

Dimension

Protected height mm	L1 mm	L2 mm	Type
150	233.3	153.3	Orion1-4-xx-015-B
300	383.2	303.2	Orion1-4-xx-045-B
450	533.2	453.3	Orion1-4-xx-045-B
600	683.3	603.2	Orion1-4-xx-060-B
750	833.2	753.3	Orion1-4-xx-075-B
900	983.2	903.2	Orion1-4-xx-090-B
1050	1133.2	1053.2	Orion1-4-xx-105-B
1200	1283.2	1203.3	Orion1-4-xx-120-B
1350	1433.2	1353.2	Orion1-4-xx-135-B
1500	1583.3	1503.3	Orion1-4-xx-150-B
1650	1733.3	1653.3	Orion1-4-xx-165-B
1800	1883.3	1803.3	Orion1-4-xx-180-B

xx = Resolution

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

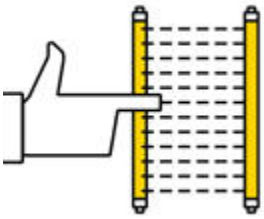
Reduced downtime
Extensive error indication reduces troubleshooting time.

Interference protection
Protection against mutual interference with coding.

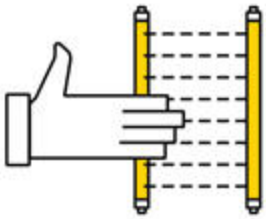
Features

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.

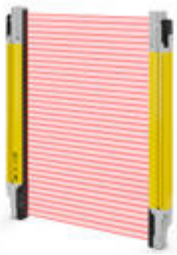


Hand detection
A 30 mm resolution is intended for hand detection and area protection and is a good compromise between cost and accessibility to the machine. A 30 mm resolution enables a sensing range of 20 m.



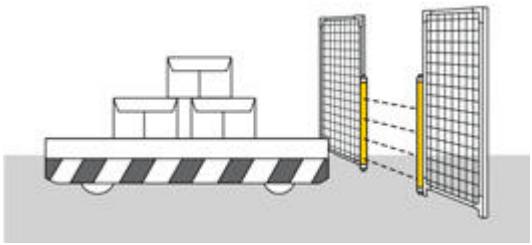
Blanking
The blanking function allows to define a number of beams that can be constantly interrupted without stopping the machine. In this way a fixed material or a cable is allowed in the protected field, but a hand interrupting an extra beam would stop the machine. With floating blanking, the object, 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

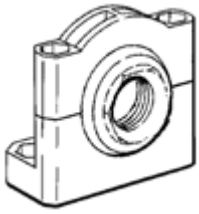
Spare parts (included when ordering Orion)

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

Accessories
Orion1 Extended


2TLC172016V0201

OMC1


2TLC010032F02011

JSM 64


2TLC172816F0201

Orion Laser pointer

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).	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		
Orion Test Piece 14 mm	Orion TP-14	2TLA022310R5200
Orion Test Piece 30 mm	Orion TP-30	2TLA022310R5300
Orion Laser pointer	Orion Laser	2TLA022310R5000
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

2TLC172951F0201

M12-C61

2TLC010003F0201

M12-C61HE

2TLC172935F0201

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 (b)	3 m		M12-C31	2TLA020056R0500
			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 (a)	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 (b)	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

2TLC172657F0201

M12-C01

2TLC010038F0201

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

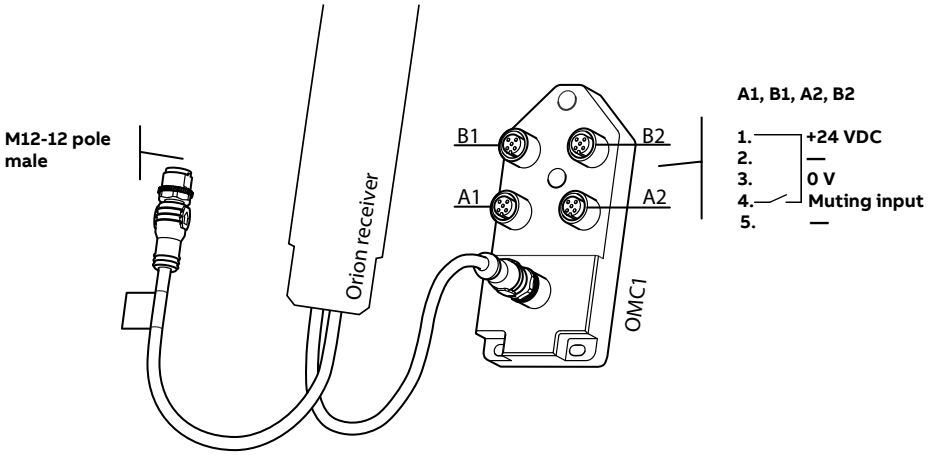
Special cables for Orion1 Extended

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

Connection example

Orion1 Extended

Connection of the muting sensors with M12-C02PT62RM and OMC1



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	
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, $PFH_D = 2.64 \times 10^{-9}$
EN 62061:2005+A1:2013	SILCL3, $PFH_D = 2.64 \times 1 0^{-9}$
EN ISO 13849-1:2008	PL e, Cat. 4, $PFH_D = 2.64 \times 10^{-9}$
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

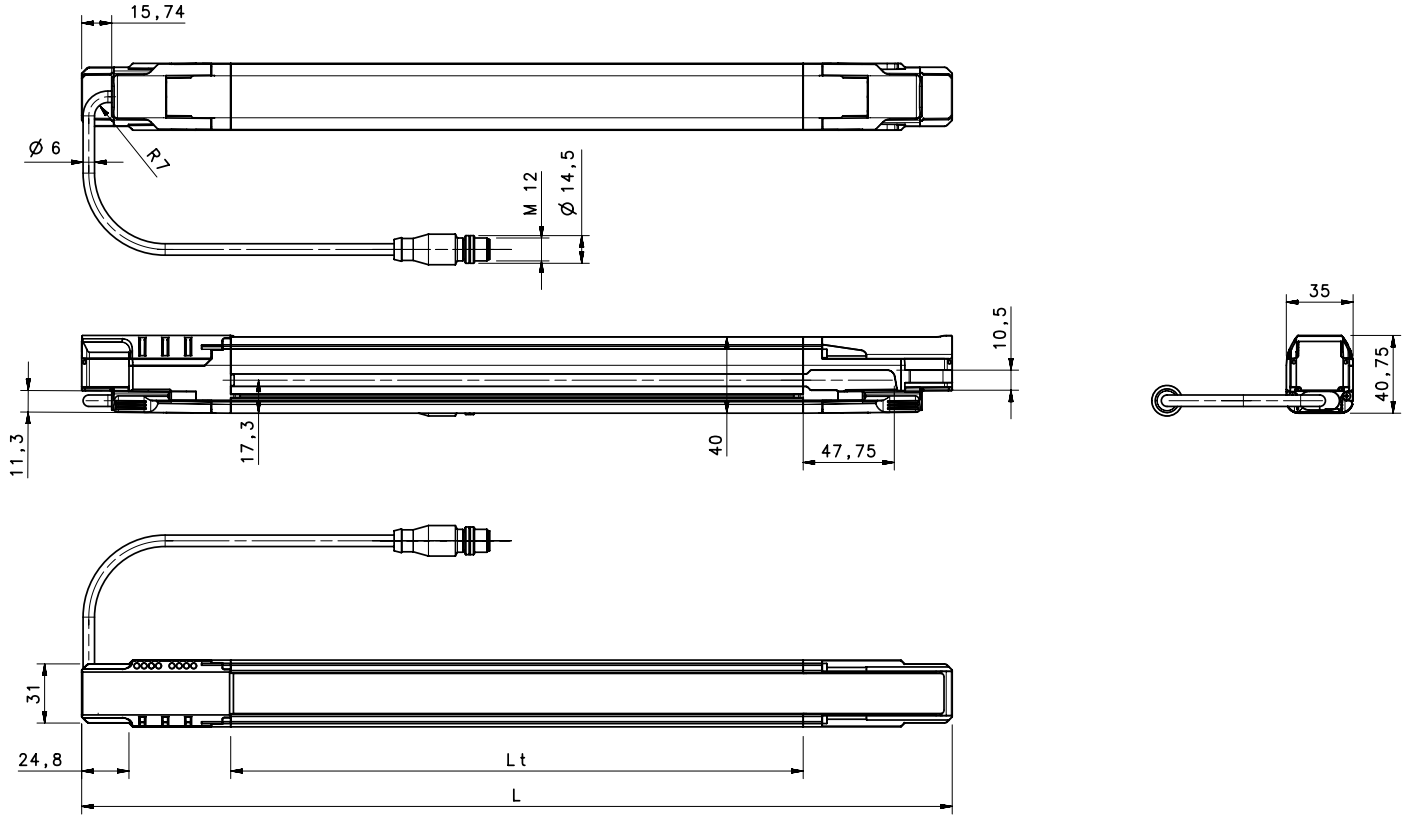
More information

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

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)

Safety light grid
Orion2 Base

Orion2 Base is a compact light grid for access protection.

The light grid has 2-4 beams and is intended for body detection.

With an operating distance of 50 m between transmitter and receiver the light grid is suitable for applications with deviating mirrors.

Cost effective solution

Minimized cabling
A local reset button can be connected directly to the light grid, eliminating the need for cable between the reset button and the electrical cabinet or for an extra control module.

External device monitoring
Each light grid can monitor the actuators without any extra control module (EDM function).

Easy to install

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

Easy adjustment
Rotation brackets makes alignment easy.

Fast connection
M12 connectors speed up cabling.

Continuous operation

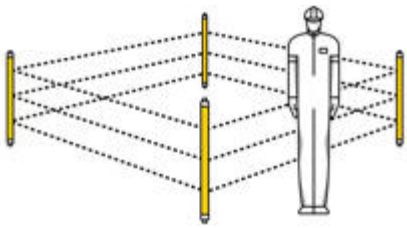
Protection in harsh environments
The housing is IP65 rated, and protective tubes and lens shields are available to provide further protection for the device in harsh environments.

Applications and features

Orion2 Base

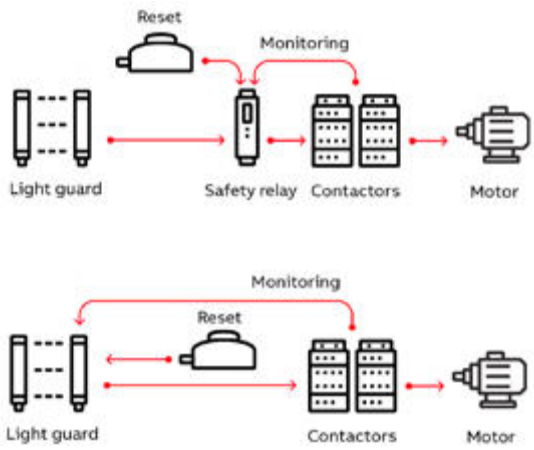
Application

Body detection over long distances
With 2-4 beams and a maximum sensing range of 50 m between transmitter and receiver, the light grid is intended for body detection and can be used with deviating mirrors to form a protective perimeter around a dangerous area.



Features

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.



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. Clever accessories make the connection easier.

Ordering information

Orion2 Base

Orion2 Base

Ordering details

Detection	Protected height mm	Type (Transmitter + receiver)	Order code
Body	500 (2 beams)	Orion2-4-K2-050-B	2TLA022304R0000
	800 (3 beams)	Orion2-4-K3-080-B	2TLA022304R0100
	900 (4 beams)	Orion2-4-K4-090-B	2TLA022304R0200
	1200 (4 beams)	Orion2-4-K4-120-B	2TLA022304R0300

JSM Orion01

Spare parts (imcluded when ordering Orion)

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

Accessories
Orion2 Base


2TLC172776F0201

JSM Orion 04


2TLC172012V0201

M12-3R

2TLC172367F0201

Smile 11 RB


2TLC172477F0201

Tina 10 C

Accessories

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
4 rotation brackets for Orion2	JSM Orion04	2TLA022310R0200
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
Orion Plate kit for adjustment of protective stand	Orion Stand Plate	2TLA022312R5000
Deviating mirror in stand for Orion 2 and 3	Orion Mirror*	
Protective stand	Orion Stand*	
Protective tube	Orion WET*	
Lens shield	Orion Shield*	

Connection accessories		
Smile reset button with NO contact	Smile 11 RA	2TLA030053R0000
Smile reset button with NO contact for Pluto	Smile 11 RB	2TLA030053R0100
Smile reset button with NO contact for Orion1 Base	Smile 11RO1	2TLA022316R3000
Y-connector for series connection of DYNlink devices with M12-5 connectors, e.g. Eden	M12-3A	2TLA020055R0000
Y-connector for connection of a Smile reset button to Orion	M12-3R	2TLA022316R0000
Y-connector for easy connection of a transmitter	M12-3D	2TLA020055R0300
Adaptation of OSSD to DYNlink. M12-8 connector for OSSD and M12-5 for DYNlink.	Tina 10A v2	2TLA020054R1210
Adaptation of OSSD to DYNlink with possibility to connect a local reset button. M12-8 connector for OSSD and M12-5 for DYNlink and reset button.	Tina 10B v2	2TLA020054R1310
Adaptation of OSSD to DYNlink with possibility to power the transmitter. M12-8 connector for OSSD and M12-5 for DYNlink and transmitter.	Tina 10C v2	2TLA020054R1610

*These accessories are available in different sizes.
For more information see:
Orion Mirror 2TLC172060L0201, Orion Stand 2TLC172059L0201, Orion WET 2TLC172061L0201, Orion Shield 2TLC172071L0201

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

How to choose correct reset button

Local or global reset	Adaption to DYNlink*	Safety controle module	Type	Useful connection accessories
Local reset button connected to the light guard (Orion in manual reset mode)	Yes	Vital or Pluto	Smile 11RO2	Tina 10B: OSSD to DYNlink + local reset button M12-3A: Serial connection of the DYNlink
	No	Any safety control module compatible with light guard	Smile 11RO2	M12-3R: Easy connection of a local reset button
Global reset button connected to the control module (Orion in automatic reset mode)	Yes	Vital	Smile 11 RA	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
		Pluto	Smile 11 RB	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
	No	Any safety control module compatible with light guard	Smile 11 RA**	-

* The ABB Jokab Safety DYNlink solution offers the following advantages:
- Serial connection of safety devices while maintaining PLe/cat. 4, up to 25 Tina 10 per Vital and up to 5 Tina 10 per Pluto input.
- Only one safety input of the Pluto instead of two with the standard OSSD outputs.

** Smile 11RA has one NO contact, which is the most common for reset buttons. Please check what is requested for the chosen safety control module.

Cables

Orion2 Base

2TLC172951F0201

M12-C61

2TLC010003F0201

M12-C61HE

2TLC172931F0201

M12-C334

Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
	(b)	6 m		M12-C61	2TLA020056R0000
			Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		10 m		M12-C101	2TLA020056R1000
			Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
	(a)	0.06 m		M12-C00612	2TLA020056R6300
		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
	Male	6 m		M12-C62	2TLA020056R0200
	(c)	10 m		M12-C102	2TLA020056R1200
M12-8	Female	3 m		M12-C33	2TLA020056R2900
	(d)	6 m		M12-C63	2TLA020056R3000
		10 m		M12-C103	2TLA020056R4000
		20 m		M12-C203	2TLA020056R4100
	Female + male	0.06 m		M12-C00634[1]	2TLA020056R6400
	(e)	1 m		M12-C134[1]	2TLA020056R5000
		3 m		M12-C334[1]	2TLA020056R5100
M12-8 female + M12-5 male	Female + male	1		M12-CT132[2]	2TLA020060R0600

Letters (a, b, c, d, e, t_3) refer to cables in connection examples, e.g:
2TLC010002T0001 Connection diagram Orion_cables_Tina10_M12-3A_M12-3D
2TLC010003T0001 Connection diagram Orion_cables_Smile11R_Urax_M12-3R

1) Used for the connection to Tina 10, M12-3D and M12-3R. Tina 10 can be connected directly to the light guard without cable, but will form an angle (i.e. not be aligned) with the light guard, which might be a problem if the light guard is mounted close to a wall/aluminum profile.

2) M12-CT132 (t_3) is used for the connection of Orion2 Base to URAX-D1R.

2TLC172657F0201

M12-C01

2TLC010038F0201

C5 cable

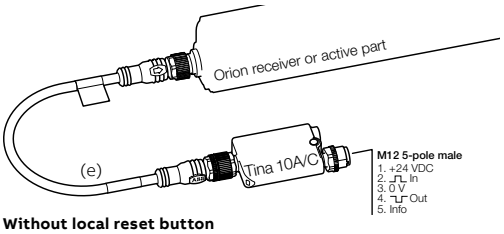
Separate Cables and connectors

Description	Type	Order code
Connectors		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
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
Cable with 8 conductors		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

Connection examples

Orion2 Base

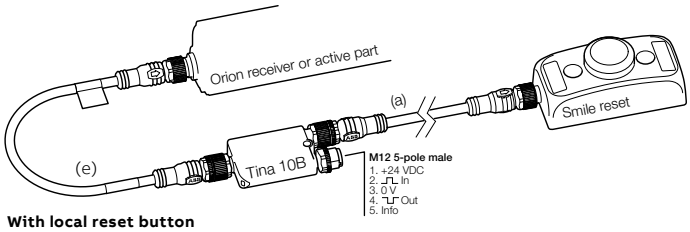
Orion with Tina 10A/C



Without local reset button

Connection to the ABB Jokab Safety DYNlink signal via Tina 10 A/C. To be used with Vital safety control module or Pluto programmable safety controller.

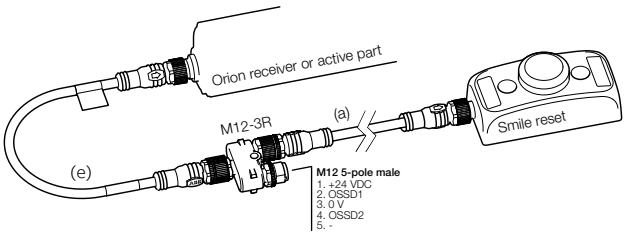
Reset to Orion with Tina 10B



With local reset button

Connection to the ABB Jokab Safety DYNlink signal via Tina 10B. To be used with Vital safety control module or Pluto programmable safety controller.

Reset to Orion with M12-3R



Connection of a local reset button via M12-3R.

Connection diagrams
For Orion2 Base connection diagrams please see https://library.abb.com/

Technical data

Orion2 Base

Technical data	
Approvals	
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, $PFH_D = 2.64 \times 10^{-9}$
EN 62061:2005+A1:2013	SILCL3, $PFH_D = 2.64 \times 10^{-9}$
EN ISO 13849-1:2008	PL e, Cat. 4, $PFH_D = 2.64 \times 10^{-9}$
Electrical data	
Power supply	+24 VDC ± 20% (SELV/PELV)
Power consumtion, Transmitter	30 mA max. / 0.9 W
Power consumption, Receiver	75 mA max. (without load) / 2.2 W
Cable length (for power supply)	50 m max with 50 nF capacitive load and +24 VDC
Internal capacitance	23 nF (Transmitter) / 120 nF (Receiver)
Outputs	2 PNP
Short-circuit protection	Max 1.4 A at 55 °C, min. 1.1 A at -10 °C
Output current	0.5 A max / output
Leakage current	< 1 mA
Capacitive load (pure)	65 nF max at 25 °C
Resitive load (pure)	56 Ω min at +24 VDC
Current for external lamp	20 mA min, 250 mA 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 (880 nm)
Resolution	315 - 515 mm
Operating distance	0.5...50 m
Ambient light rejection	According to IEC-61496-2:2013
Mechanical data	
Operating temperature	10...+ 55 °C
Storage temperature	- 25...+ 70 °C
Humidity range	15...95% (no condensation)
Protection class	IP65 (EN 60529:2000)
Weight	1.2 kg max / meter for each single unit
Housing material	Painted aluminium (yellow RAL 1003)
Front glass material	PMMA
Cap material	PC Lexan 943A

More information

For more information, e.g. the complete technical information, see product manual for:
Orion2 Base 2TLC172288M0201

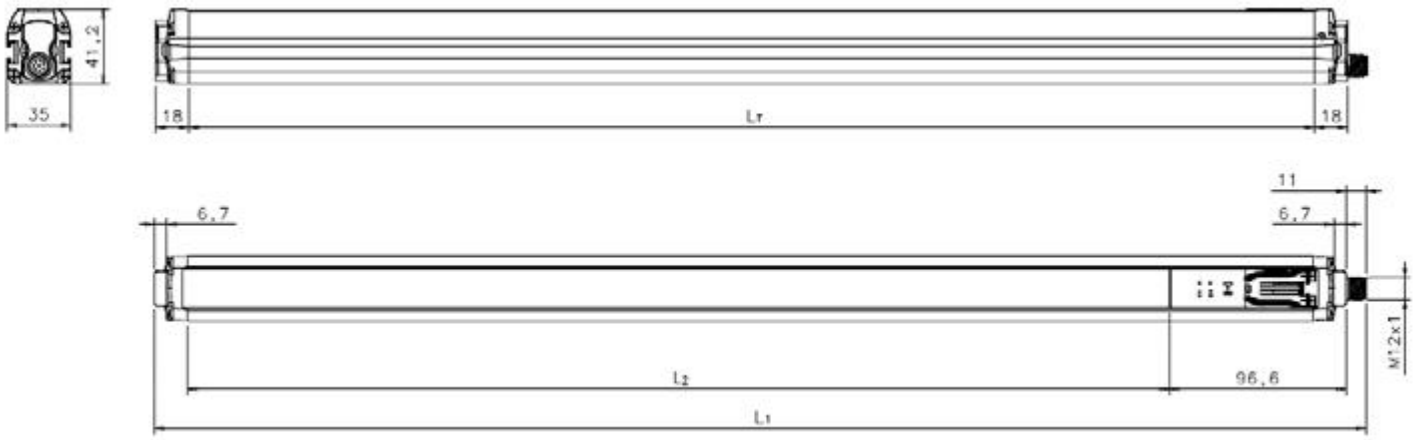
Connection diagrams

For Orion2 Base connection diagrams please see https://library.abb.com/

Dimension drawings

Orion2 Base

Orion2 Base



All dimensions in mm

Dimension

Lr mm	L1 mm	L2 mm	Type
617	664	538.4	Orion2-4-K2-050-B
917	964	838.4	Orion2-4-K3-080-B
1017	1064	938.4	Orion2-4-K4-090-B
1317	1364	1238.4	Orion2-4-K4-120-B

xx = Resolution

Safety light grid
Orion2 Extended

Orion2 Extended is a compact light grid for access protection in muting applications.

The light grid has 2-4 beams and is intended for body detection.

Cost effective solution

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

Minimized cabling
A local reset button can be connected directly to the light grid, eliminating the need for cable between the reset button and the electrical cabinet.

External device monitoring (EDM)
Each light grid can monitor the actuators without any extra control module.

Easy to install

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

Easy adjustment
Rotation brackets makes alignment easy.

Fast connection
M12 connectors speed up cabling.

Continuous operation

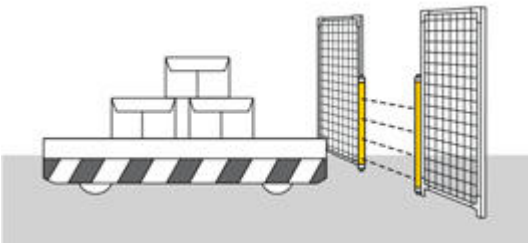
Protection in harsh environments
The housing is IP65 rated, and protective tubes and lens shields are available to provide further protection for the device in harsh environments.

Features

Orion2 Extended

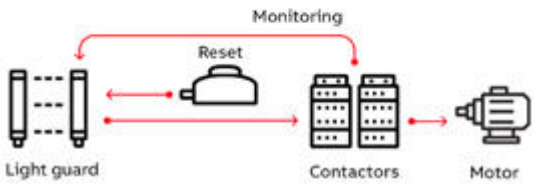
Muting

Orion2 Extended is intended for muting applications. 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. Muting sensors and a connection box for muting are available to simplify the muting application.



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.



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/PLC inputs and minimizes cabling to the electrical cabinet. Clever accessories makes the connection easier.

Ordering information

Orion2 Extended

Orion2 Extended

Ordering details

Resolution (Detection) mm	Protected height mm	Type (Transmitter + receiver)	Order code
Body	500 (2 beams)	Orion2-4-K2-050-E	2TLA022305R0000
	800 (3 beams)	Orion2-4-K3-080-E	2TLA022305R0100
	900 (4 beams)	Orion2-4-K4-090-E	2TLA022305R0200
	1200 (4 beams)	Orion2-4-K4-120-E	2TLA022305R0300

JSM Orion01

Spare parts (included when ordering Orion)

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

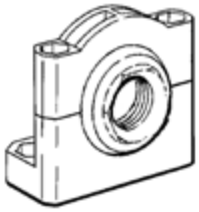
Accessories
Orion2 Extended


2TLC172016V0201

OMC1


2TLC172091V0201

Mute R2


2TLC010032F0201

JSM 64


2TLC172093V0201

Reflect 2


2TLC172367F0201

Smile 11 RB


2TLC172816F0201

Orion Laser pointer

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).	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
Smile reset button with NC contact for Orion2 Base/Extended and Orion3 Extended	Smile 11RO2	2TLA022316R3100
Y-connector for series connection of DYNlink devices with M12-5 connectors, e.g. Eden	M12-RA	2TLA020055R0000
Y-connector for connection of a Smile reset button to Orion	M12-3R	2TLA022316R0000
Y-connector for easy connection of a transmitter	M12-3D	2TLA020055R0300
Adaptation of OSSD to DYNlink. M12-8 connector for OSSD and M12-5 for DYNlink.	Tina 10A v2	2TLA020054R1210
Adaptation of OSSD to DYNlink with possibility to connect a local reset button. M12-8 connector for OSSD and M12-5 connector for DYNlink and reset button..	Tina 10B v2	2TLA020054R1310
Adaptation of OSSD to DYNlink with possibility to power the transmitter. M12-8 connector for OSSD and M12-5 connector for DYNlink and transmitter.	Tina 10C v2	2TLA020054R1610
Mounting accessories		
Orion Test Piece 14 mm	Orion TP-14	2TLA022310R5200
Orion Test Piece 30 mm	Orion TP-30	2TLA022310R5300
Orion Laser pointer	Orion Laser	2TLA022310R5000
4 standard brackets for Orion1 & Orion2	JSM Orion01	2TLA022310R0000
4 rotation brackets for Orion2	JSM Orion04	2TLA022310R0200
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
Orion Plate kit for adjustment of protective stand	Orion Stand Plate	2TLA022312R5000
Deviating mirror in stand for Orion 2 and 3	Orion Mirror*	
Protective stand	Orion Stand*	
Protective tube	Orion WET*	
Lens shield	Orion Shield*	

*These accessories are available in different sizes. For more information see:
Orion Mirror 2TLC172060L0201,,Orion Stand 2TLC172059L0201, Orion WET 2TLC172061L0201, Orion Shield 2TLC172071L0201

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

How to choose correct reset button

Local or global reset	Adaption to DYNlink*	Safety controle module	Type	Useful connection accessories
Local reset button connected to the light guard	Yes	Vital or Pluto	Smile 11RO2	Tina 10B: OSSD to DYNlink + local reset button M12-3A: Serial connection of DYNlink
(Orion in manual reset mode)	No	Any safety control module compatible with light guard	Smile 11RO2	M12-3R: Easy connection of a local reset button
Global reset button connected to the control module	Yes	Vital	Smile 11 RA	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
(Orion in automatic reset mode)		Pluto	Smile 11 RB	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
	No	Any safety control module compatible with light guard	Smile 11 RA**	-

* The ABB Jokab Safety DYNlink solution offers the following advantages:
- Serial connection of safety devices while maintaining PLe/cat. 4, up to 25 Tina 10 per Vital and up to 5 Tina 10 per Pluto input.
- Only one safety input of the Pluto instead of two with the standard OSSD outputs.

** Smile 11 RA has one NO contact, which is the most common for reset buttons. Please check what is requested for the chosen safety control module.

Cables

Orion2 Extended

2TLC172951F0201

M12-C61

2TLC010003F0201

M12-C61HE

2TLC172931F0201

M12-C334

Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
	(b)	6 m		M12-C61	2TLA020056R0000
			Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		10 m		M12-C101	2TLA020056R1000
			Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
	(a)	0.06 m		M12-C00612	2TLA020056R6300
		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
	Male	6 m		M12-C62	2TLA020056R0200
	(c)	10 m		M12-C102	2TLA020056R1200
M12-8	Female	3 m		M12-C33	2TLA020056R2900
	(d)	6 m		M12-C63	2TLA020056R3000
		10 m		M12-C103	2TLA020056R4000
		20 m		M12-C203	2TLA020056R4100
	Female + male	0.06 m		M12-C00634[1]	2TLA020056R6400
	(e)	1 m		M12-C134[1]	2TLA020056R5000
		3 m		M12-C334[1]	2TLA020056R5100
M12-8 male + female	Female + male	0.2		M12-CT132[2]	2TLA020060R0600
M12-8 female - M12-5 male	Female + male	1		M12-CYMUTE[3]	2TLA022316R0100

Letters (a, b, c, d, e, t_3) refer to cables in connection examples, e.g:
2TLC010002T0001 Connection diagram Orion_cables_Tina10_M12-3A_M12-3D
2TLC010003T0001 Connection diagram Orion_cables_Smile11R_Urax_M12-3R

1) Used for the connection to Tina 10, M12 3D and M12-3R. Tina 10 can be connected directly to the light guard without cable, but will form an angle (i.e. not be aligned) with the light guard, which might be a problem if the light guard is mounted close to a wall/aluminum profile.

2) M12-CT132 (t_3) is used for the connection of Orion2 Extended to URAX-D1R.

3) M12-CYMUTE is used to simplify the connection of 2 or 4 muting sensors with the help of the OMC1 connection box.

2TLC172657F0201

M12-C01

2TLC010038F0201

C5 cable

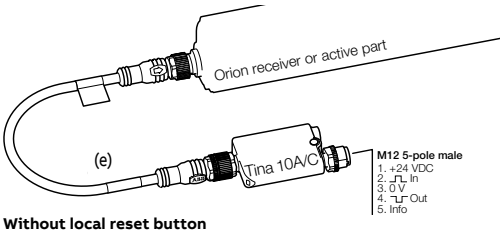
Separate cables and connectors

Description		Type	Order code
Connectors			
	M12-5 pole female, straight	M12-C01	2TLA020055R1000
	M12-5 pole male, straight	M12-C02	2TLA020055R1100
	M12-8 pole female, straight	M12-C03	2TLA020055R1600
	M12-8 pole male, straight	M12-C04	2TLA020055R1700
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
Cable with 8 conductors			
	50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
	100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
	200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
	500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

Connection examples

Orion2 Extended

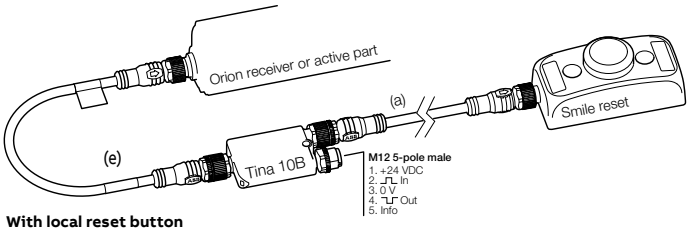
Orion with Tina 10A/C



Without local reset button

Connection to the ABB Jokab Safety DYNlink signal via Tina 10 A/C. To be used with Vital safety control module or Pluto programmable safety controller.

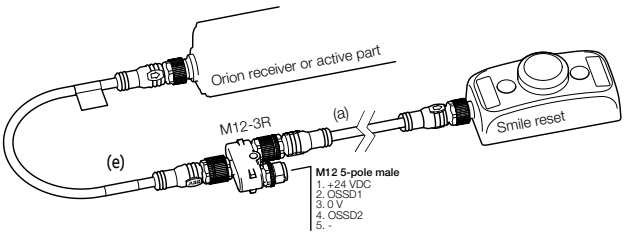
Reset to Orion with Tina 10B



With local reset button

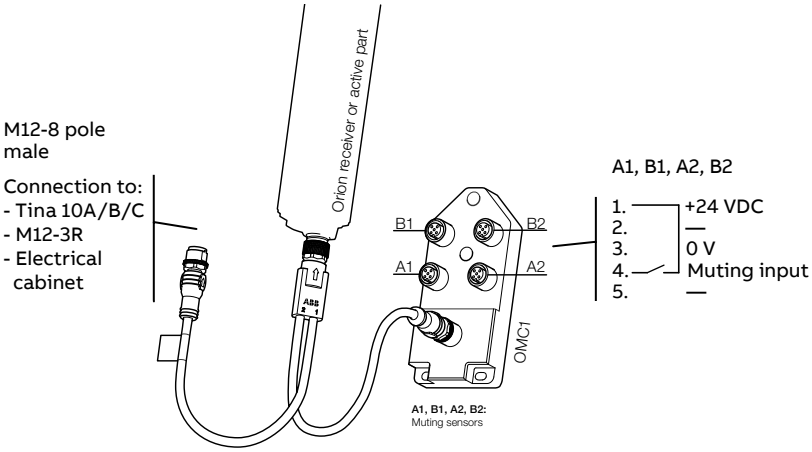
Connection to the ABB Jokab Safety DYNlink signal via Tina 10B. To be used with Vital safety control module or Pluto programmable safety controller.

Reset to Orion with M12-3R



Connection of a local reset button via M12-3R.

Connection of muting sensors with M12-CYMUTE and OMC1



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

Connection diagrams

For Orion2 Extended connection diagrams please see https://library.abb.com/

Technical data

Orion2 Extended

Technical data	
Approvals	
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, $PFH_D = 2.64 \times 10^{-9}$
EN 62061:2005+A1:2013	SILCL3, $PFH_D = 2.64 \times 10^{-9}$
EN ISO 13849-1:2008	PL e, Cat. 4, $PFH_D = 2.64 \times 10^{-9}$
Electrical data	
Internal capacitance	23 nF (Transmitter) / 120 nF (Receiver)
Power supply	+24 VDC ± 20% (SELV/PELV)
Power consumtion, Transmitter	0.5 W during normal operation
Power consumption, Receiver	2 W during normal operation
Outputs	2 PNP
Short-circuit protection	Max 1.4 A at 55 °C, min 1.1 A at -10 °C
Output current	0.5 A max / output
Leakage current	< 1 mA
Capacitive load (pure)	65 nF max at 25 °C
Resistive load (pure)	56 Ω min at +24 VDC
Current for external lamp	20 mA min, 250 mA max
Response time	2 and 3 beams: 14 ms; 4 beams: 16 ms
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 (880 nm)
Resolution	315 - 515 mm
Operating distance	0.5…50 m
Ambient light rejection	According to IEC-61496-2:2013
Mechanical data	
Operating temperature	- 10…+ 55 °C
Storage temperature	- 25…+ 70 °C
Humidity range	15…95% (no condensation)
Protection class	IP65 (EN 60529:2000)
Weight	1.2 kg max / meter for each single unit
Housing material	PC Lexan 943A
Lens material	PMMA
Cap material	PC MAKROLON

More information

For more information, e.g. the complete technical information, see manual for:
Orion2 Extended 2TLC172291M0201

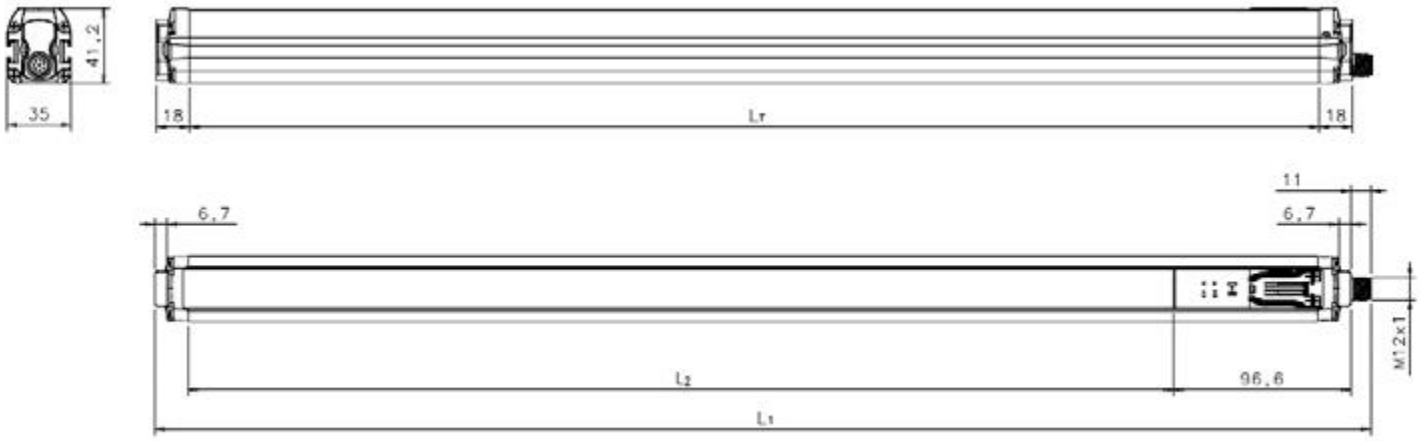
Connection diagrams

For Orion2 Extended connection diagrams please see https://library.abb.com/

Dimension drawings

Orion2 Extended

Orion2 Extended



All dimensions in mm

Dimension

Lr mm	L1 mm	L2 mm	Type
617	664	538.4	Orion2-4-K2-050-E
917	964	838.4	Orion2-4-K3-080-E
1017	1064	938.4	Orion2-4-K4-090-E
1317	1364	1238.4	Orion2-4-K4-120-E

Safety light grid
Orion3 Base

Orion3 Base is a light grid with a sturdy profile for access protection.

Only one of the parts needs power supply, since both transmitter and receiver are in the same active part. The other part is passive with mirrors to reflect the beams.

With 2-4 beams and an operating range of up to 8 m, it is intended for body detection.

Easy to install

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

Easy adjustment
Rotation brackets makes alignment easy.

Fast connection
M12 connectors speed up cabling.

Less cabling
Only the active part needs connecting.

Cost effective solution

Minimized cabling
A local reset button can be connected directly to the light grid, eliminating the need for cable between the reset button and the electrical cabinet or for an extra control module.

External device monitoring
Each light grid can monitor the actuators without any extra control module (EDM function).

Continuous operation

Visible alignment level
Since the alignment level is displayed, the alignment can be improved before the occurrence of an unwanted stop.

Extensive error indication
Extensive error indication reduces troubleshooting time.

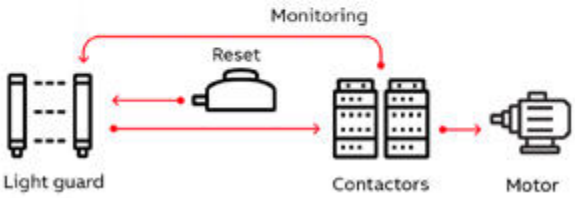
Features
Orion3 Base

Features

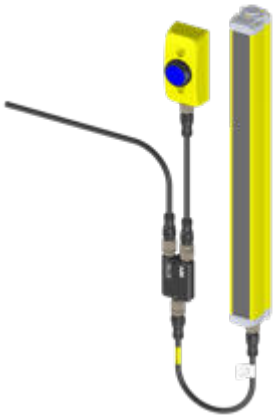
Sturdy profile for demanding applications
With its thicker and sturdier profile Orion3 is suitable for applications with tougher requirements.

Power on one side
Both transmitter and receiver is in one active part, and the other part is passive containing mirrors. This simplifies installation and saves cables, making it easier to place in applications where cables needs to be avoided.

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.



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/PLC inputs and minimizes cabling to the electrical cabinet. Clever accessories makes the connection easier.



Ordering information

Orion3 Base

2TLC172804F0201

Orion3 Base

Ordering details

Detection	Protected height mm	Active or passive part	Type	Order code
Body	500 (2 beams)	Active part	Orion3-4-K1C-050-B	2TLA022306R0000
		Passive part	Orion3-4-M1C-050	2TLA022306R1000
	800 (3 beams)	Active part	Orion3-4-K2C-080-B	2TLA022306R0100
		Passive part	Orion3-4-M2C-080	2TLA022306R1100
	900 (4 beams)	Active part	Orion3-4-K2C-090-B	2TLA022306R0200
		Passive part	Orion3-4-M2C-090	2TLA022306R1300
	1200 (4 beams)	Active part	Orion3-4-K2C-120-B	2TLA022306R0300
		Passive part	Orion3-4-M2C-120	2TLA022306R1400

2TLC172779F0201

JSM Orion02

Spare parts (included when ordering Orion)

Description	Type	Order code
4 standard brackets for Orion3	JSM Orion02	2TLA022310R1000

Accessories
Orion3 Base


2TLC172816F0201

Orion Laser pointer


2TLC172367F0201

Smile 11 RB


2TLC172012V0201

M12-3R


2TLC172477F0201

Tina 10C

Accessories

Mounting accessories		
Description	**Type**	**Order code**
Orion Laser pointer	Orion Laser	2TLA022310R5000
4 standard brackets for Orion3	JSM Orion05	2TLA022310R0300
Kit for mounting of Orion3 in Stand (4 pieces for lengths shorter than 1200 mm)	JSM Orion08	2TLA022310R0600
Kit for mounting of Orion3 in Stand (6 pieces for lengths of 1200 mm or more)	JSM Orion09	2TLA022310R0700
Orion Plate kit for adjustment of protective stand	Orion Stand Plate	2TLA022312R5000
Deviating mirror in stand for Orion 2 and 3	Orion Mirror*	
Protective stand	Orion Stand*	

Connection accessories		
Smile reset button with NO contact	Smile 11 RA	2TLA030053R0000
Smile reset button with NO contact for Pluto	Smile 11 RB	2TLA030053R0100
Smile reset button with NC contact for Orion3 Base	Smile 11 RO3	2TLA022316R3200
Y-connector for series connection of DYNlink devices with M12-5 connectors, e.g. Eden	M12-3A	2TLA020055R0000
Y-connector for connection of a Smile reset button to Orion	M12-3R	2TLA022316R0000
Y-connector for easy connection of a transmitter	M12-3D	2TLA020055R0300
Adaptation of OSSD to DYNlink. M12-8 connector for OSSD and M12-5 for DYNlink.	Tina 10A v2	2TLA020054R1210
Adaptation of OSSD to DYNlink with possibility to connect a local reset button. M12-8 connector for OSSD and M12-5 for DYNlink and reset button.	Tina 10B v2	2TLA020054R1310
Adaptation of OSSD to DYNlink with possibility to power the transmitter. M12-8 connector for OSSD and M12-5 connector for DYNlink and transmitter.	Tina 10C v2	2TLA020054R1610

*These accessories are available in different sizes.
For more information see:
Orion Mirror 2TLC172060L0201
Orion Stand 2TLC172059L0201

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

How to choose correct reset button

Local or global reset	Adaption to DYNlink*	Safety controle module	Type	Useful connection accessories
Local reset button connected to the light guard (Orion in manual reset mode)	Yes	Vital or Pluto	Smile 11 RO3	Tina 10B: OSSD to DYNlink solution + local reset button M12-3A: Serial connection of the DYNlink solution
	No	Any safety control module compatible with light guard	Smile 11 RO3	M12-3R: Easy connection of a local reset button
Global reset button connected to the control module (Orion in automatic reset mode)	Yes	Vital	Smile 11 RA	Tina 10A: OSSD to DYNlink solution Tina 10C: OSSD to DYNlink solution + supply to transmitter/active part
		Pluto	Smile 11 RB	Tina 10A: OSSD to DYNlink solution Tina 10C: OSSD to DYNlink solution + supply to transmitter/active part
	No	Any safety control module compatible with light guard	Smile 11 RA**	-

* The ABB Jokab Safety DYNlink solution offers the following advantages:
- Serial connection of safety devices while maintaining PLe/cat. 4, up to 25 Tina 10 per Vital and up to 5 Tina 10 per Pluto input.
- Only one safety input of the Pluto instead of two with the standard OSSD outputs.

** Smile 11 RA has one NO contact, which is the most common for reset buttons. Please check what is requested for the chosen safety control module.

Cables

Orion3 Base

2TLC172951F0201

M12-C61

2TLC010003F0201

M12-C61HE

2TLC172931F0201

M12-C334

Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
	(b)	6 m		M12-C61	2TLA020056R0000
			Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		10 m		M12-C101	2TLA020056R1000
			Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
	(a)	0.06 m		M12-C00612	2TLA020056R6300
		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
	Male	6 m		M12-C62	2TLA020056R0200
	(c)	10 m		M12-C102	2TLA020056R1200
M12-8	Female	3 m		M12-C33	2TLA020056R2900
	(d)	6 m		M12-C63	2TLA020056R3000
		10 m		M12-C103	2TLA020056R4000
		20 m		M12-C203	2TLA020056R4100
	Female + male	0.06 m		M12-C00634	2TLA020056R6400
		1 m		M12-C134	2TLA020056R5000
		3 m		M12-C334	2TLA020056R5100
		0,2 m		M12-CTO3B [1]	2TLA022315R3200
M12-8 female + M12-5 male	Female + male	1 m		M12-CTURAX-O3B [2]	2TLA022315R3400

Letters (a, b, c, d, t_2, t_3) refer to cables in connection examples, e.g:
2TLC010002T0002 Connection diagram Cables Orion3 to Tina10
2TLC010003T0002 Connection diagram Cables Orion3 to electrical cabinet URAX

1) M12-CTO3B (t_2) can be used for: - connection of Orion3 Base to Tina 10A/B/C.
- connection of Orion 3 Base to M12-3R.

The EDM function is deactivated in all cases

2) M12-CTURAX-03B (t_3) is used for: - connection of Orion3 Base to URAX-D1R.

The light guard is automatically configured in automatic reset and the EDM function is deactivated.

2TLC172657F0201

M12-C01

2TLC010038F0201

C5 cable

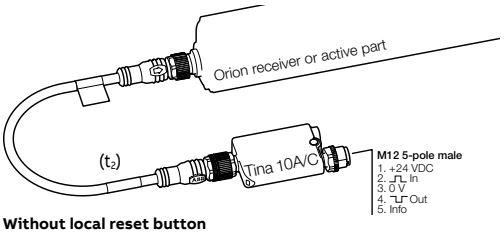
Separate cables and connectors

Description	Type	Order code
Connectors		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
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
Cable with 8 conductors		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

Connection examples

Orion3 Base

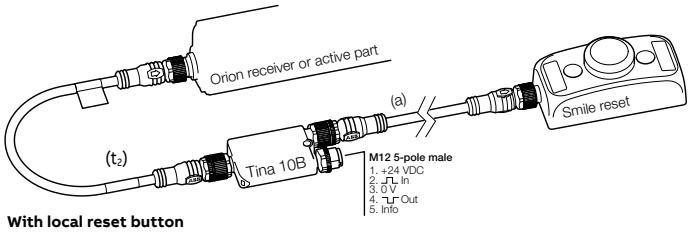
Orion with Tina 10A/C



Without local reset button

Connection to the ABB Jokab Safety DYNlink signal via Tina 10 A/C. To be used with Vital safety control module or Pluto programmable safety controller.

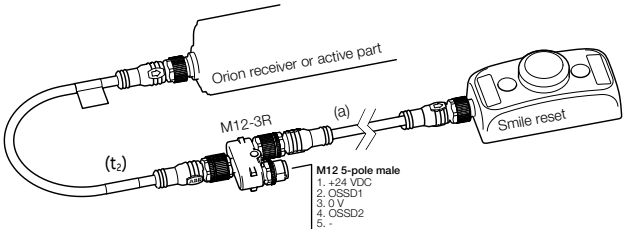
Reset to Orion with Tina 10B



With local reset button

Connection to the ABB Jokab Safety DYNlink signal via Tina 10B. To be used with Vital safety control module or Pluto programmable safety controller.

Reset to Orion with M12-3R



Connection of a local reset button via M12-3R.

Connection diagrams

For Orion3 Base connection diagrams please see https://library.abb.com/

Technical data

Orion3 Base

Technical data	
Approvals	
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, $PFH_D = 9.28 \times 10^{-9}$
EN 62061:2005+A1:2013	SILCL3, $PFH_D = 9.28 \times 10^{-9}$
EN ISO 13849-1:2008	PL e, Cat. 4, $PFH_D = 9.28 \times 10^{-9}$
Electrical data	
Power supply	+24 VDC ±20 %
Power consumption, Active unit	6.5 W max (without load)
Cable length (for power supply)	70 m max
Outputs	2 PNP
Short-circuit protection	1.4 A max
Output current	0.5 A max / output
Output voltage – ON	Power supply value less 1 V (min)
Output voltage – OFF	0.2 V max
Capacitive load	2.2 µF at +24 VDC max
Cable length (for power supply)	70 m max
Connectors	M12-8 pole male on receiver
Optical data	
Light emission (λ)	Infrared, LED (950 nm)
Resolution	319.75 - 519.75 mm
Operating distance	0.5...8 m except K2C-090: 0.5...6.5 m
Ambient light rejection	According to IEC-61496-2:2013
Mechanical data	
Operating temperature	0...+ 55 °C
Storage temperature	- 25...+ 70 °C
Humidity range	15...95% (no condensation)
Protection class	IP65 (EN 60529:2000)
Weight	
Orion3-4-K1C-050-B	1.3 kg
Orion3-4-K2C-080-B	1.8 kg
Orion3-4-K2C-090-B	2.1 kg
Orion3-4-K2C-120-B	2.6 kg
Orion3-4-M1C-050 (passive)	1.2 kg
Orion3-4-M2C-080 (passive)	1.7 kg
Orion3-4-M2C-090 (passive)	1.9 kg
Orion3-4-M2C-120 (passive)	2.5 kg
Housing material	Painted aluminium (yellow RAL 1003)
Cap material	PBT Valox 508
Lens material	PMMA

More Information

For more information about the connection accessories, see manual for:
Orion3 Base 2TLC172289M0201

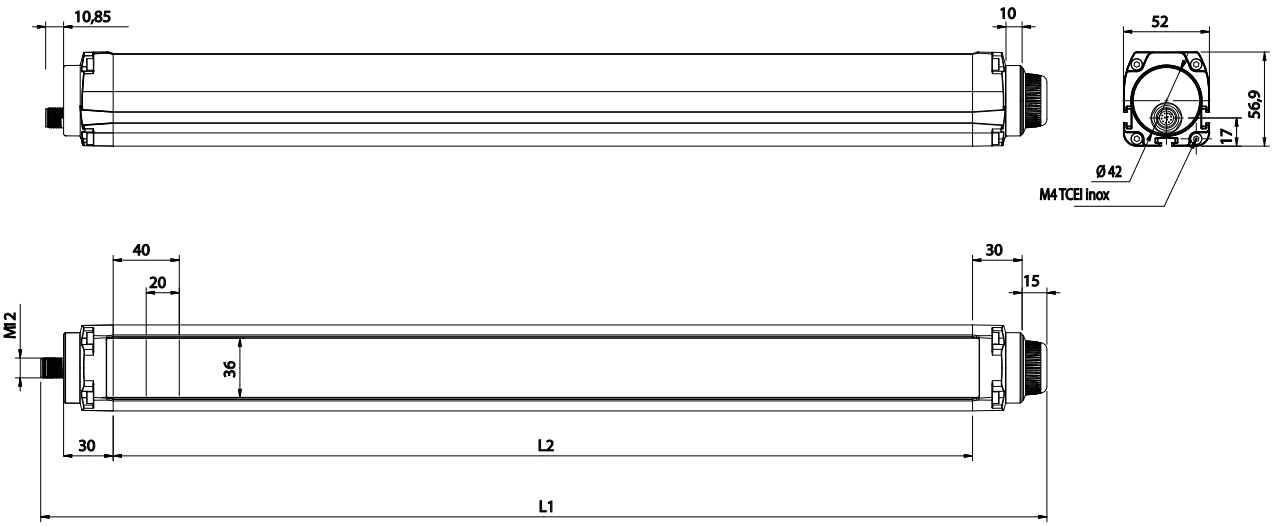
Connection diagrams

For Orion3 Base connection diagrams please see https://library.abb.com/

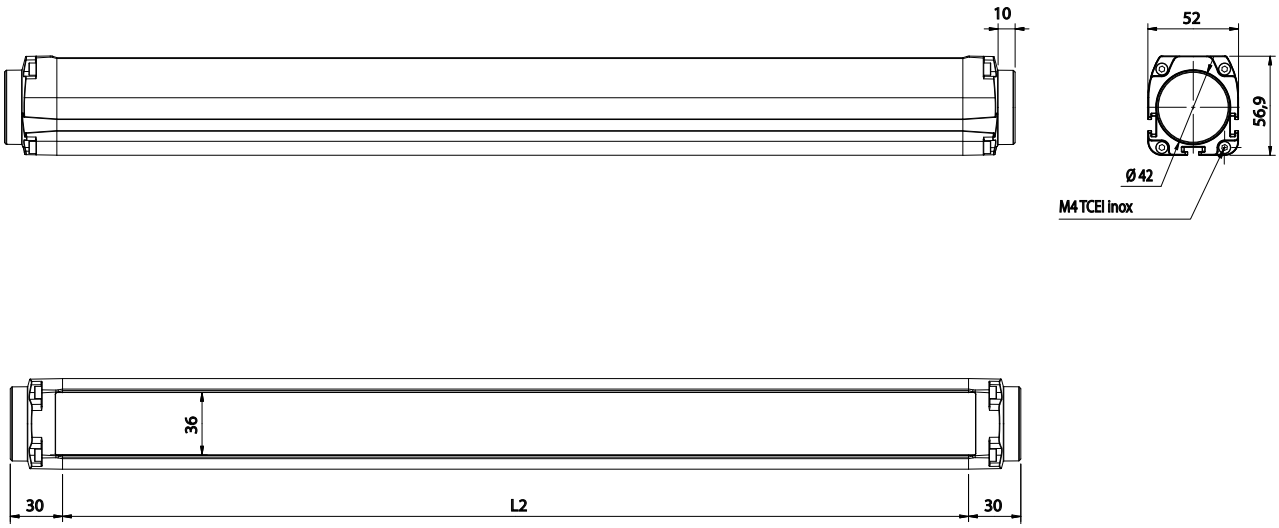
Dimension drawings

Orion3 Base

Orion3 Base



Active part – All dimensions in mm



Passive part – All dimensions in mm

—

Dimensions

L1 mm	L2 mm	Type
606.4	520.5	Orion3-4-K1C-050-B (active part)
906.4	820.5	Orion3-4-K2C-080-B (active part)
1006.4	920.5	Orion3-4-K2C-090-B (active part)
1306.4	1220.5	Orion3-4-K2C-120-B (active part)
580.5	520.5	Orion3-4-M1C-050 (passive part)
880.5	820.5	Orion3-4-M2C-080 (passive part)
980.5	920.5	Orion3-4-M2C-090 (passive part)
1280.5	1220.5	Orion3-4-M2C-090 (passive part))

xx = Resolution

Safety light grid
Orion3 Extended

Orion3 Extended is a sturdy light grid for access protection in muting applications.

Only one of the parts needs power supply, since both transmitter and receiver are in the same active part. The other part is passive and contains mirrors to reflect the beams.

With 2-4 beams and an operating range of up to 8 m, it is intended for body detection.

Cost effective solution

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

Minimized cabling
A local reset button can be connected directly to the light grid, eliminating the need for cable between the reset button and the electrical cabinet.

External device monitoring (EDM)
Each light grid can monitor the actuators without any extra control module.

Easy to install

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

Easy adjustment
Rotation brackets makes alignment easy.

Fast connection
M12 connectors speed up cabling.

Less cabling
Only the active part needs connecting.

Continuous operation

Visible alignment level
Since the alignment level is displayed, the alignment can be improved before the occurrence of an unwanted stop.

Extensive error indication
Extensive error indication reduces troubleshooting time.

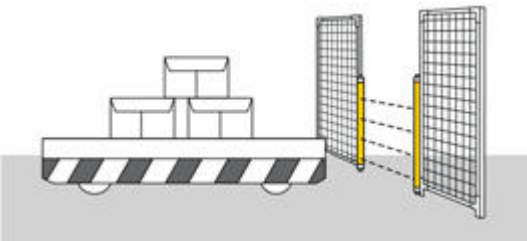
Applications and features

Orion3 Extended

Application

Muting

Orion2 Extended is intended for muting applications. 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. Muting sensors and a connection box for muting are available to simplify the muting application.



Features

Power on one side

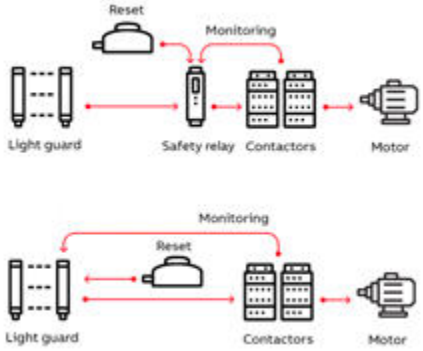
Both transmitter and receiver are in one active part, and the other part is passive and contains mirrors. This simplifies installation and saves cables, making it easier to place in applications where cables need to be avoided.

Sturdy profile for demanding applications

With its thicker and sturdier profile Orion3 is suitable for applications with tougher requirements.

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.



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/PLC inputs and minimizes cabling to the electrical cabinet. Clever accessories make the connection easier.

Ordering information
Orion3 Extended

Orion3 Extended

Ordering details

Detection	Protected height mm	Active or passive part	Type	Order code
Body	500 (2 beams)	Active part	Orion3-4-K1C-050-E	2TLA022307R0000
		Passive part	Orion3-4-M1C-050	2TLA022306R1000
	800 (3 beams)	Active part	Orion3-4-K2C-080-E	2TLA022307R0100
		Passive part	Orion3-4-M2C-080	2TLA022306R1100
	900 (4 beams)	Active part	Orion3-4-K2C-090-E	2TLA022307R0200
		Passive part	Orion3-4-M2C-090	2TLA022306R1300
	1200 (4 beams)	Active part	Orion3-4-K2C-120-E	2TLA022307R0300
		Passive part	Orion3-4-M2C-120	2TLA022306R1400

Please note that active and passive parts are ordered separately and both are necessary for Orion3 Extended to function.

JSM Orion02

Spare parts (included when ordering Orion

Description	Type	Order code
4 standard brackets for Orion3	JSM Orion02	2TLA022310R1000

Accessories
Orion3 Extended


2TLC172016V0201

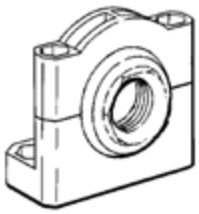
OMC1


2TLC172091V0201

Mute R2


2TLC172093V0201

Reflect 2


2TLC010032F02011

JSM 64


2TLC172367F0201

Smile 11 RB


2TLC172475F0201

Tina 10B


2TLC172816F0201

Orion Laser pointer

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).	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
Smile reset button with NC contact for Orion2 Base/Extended and Orion3 Extended	Smile 11R02	2TLA022316R3100
Y-connector for series connection of DYNlink devices with M12-5 connectors, e.g. Eden	M12-3A	2TLA020055R0000
Y-connector for connection of a Smile reset button to Orion	M12-3R	2TLA022316R0000
Adaptation of OSSD to DYNlink. M12-8 connector for OSSD and M12-5 for DYNlink.	Tina 10A v2	2TLA020054R1210
Adaptation of OSSD to DYNlink with possibility to connect a local reset button. M12-8 connector for OSSD and M12-5 for DYNlink and reset button.	Tina 10B v2	2TLA020054R1310
Mounting accessories		
Orion Laser pointer	Orion Laser	2TLA022310R5000
JSM M5B Special T-nut M5 to be used with screw M5x12 screw for mounting Orion on QuickGuard	T-nut JSM M5B	2TLA040035R0400
4 rotation brackets for Orion3	JSM Orion05	2TLA022310R0300
Kit for mounting of Orion3 in Stand (4 pieces) - For a pair Orion3 - 050 / 080 / 090 (active + passive units)	JSM Orion08	2TLA022310R0600
For a pair Orion3 - 120 (Orion3-4-K2C-120 + Orion3-4-M2C-120)	JSM Orion09	2TLA022310R0700
Orion Plate kit for adjustment of protective stand	Orion Stand Plate	2TLA022312R5000
Deviating mirror in stand for Orion 2 and 3	Orion Mirror*	
Protective stand	Orion Stand*	
Protective tube	Orion WET*	
Lens shield	Orion Shield*	

*These accessories are available in different sizes.
For more information see:
Orion Mirror 2TLC172060L0201, Orion Stand 2TLC172059L0201, Orion WET 2TLC172061L0201, Orion Shield 2TLC172071L0201

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

How to choose correct reset button

Local or global reset	Adaption to the DYNlink solution*	Safety controle module	Type	Suitable connection accessories
Local reset button connected to the light guard	Yes	Vital or Pluto	Smile 11RO2	Tina 10B: OSSD to DYNlink + local reset button M12-3A: serial connection of DYNlink
(Orion in manual reset mode)	No	Any safety control module compatible with light guard	Smile 11RO2	M12-3R: Easy connection of a local reset button
Global reset button connected to the control module	Yes	Vital	Smile 11 RA	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
(Orion in automatic reset mode)		Pluto	Smile 11 RB	Tina 10A: OSSD to DYNlink Tina 10C: OSSD to DYNlink + supply to transmitter
	No	Any safety control module compatible with light guard	Smile 11 RA**	-

* The ABB Jokab safety DYNlink solution offers the following advantages:
- Serial connection of safety devices while maintaining PLe/cat. 4, up to 25 Tina 10 per Vital and up to 5 Tina 10 per Pluto input.
- Only one safety input of the Pluto instead of two with the standard OSSD outputs.

** Smile 11RA has one NO contact, which is the most common for reset buttons. Please check what is requested for the chosen safety control module.

Cables

Orion3 Extended

2TLC172951F0201

M12-C61

2TLC010003F0201

M12-C61HE

2TLC172931F0201

M12-C334

Cable with connectors

Connector	Female/male	Length	Special feature	Type	Order code
M12-5	Female	3 m		M12-C31	2TLA020056R0500
	(b)	6 m		M12-C61	2TLA020056R0000
			Harsh environment, halogen free	M12-C61HE	2TLA020056R8000
		10 m		M12-C101	2TLA020056R1000
			Harsh environment, halogen free	M12-C101HE	2TLA020056R8100
		20 m		M12-C201	2TLA020056R1400
	Female + male	0.3 m		M12-C0312	2TLA020056R5800
	(a)	0.06 m		M12-C00612	2TLA020056R6300
		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
	Male	6 m		M12-C62	2TLA020056R0200
	(c)	10 m		M12-C102	2TLA020056R1200
M12-8	Female	3 m		M12-C33	2TLA020056R2900
	(d)	6 m		M12-C63	2TLA020056R3000
		10 m		M12-C103	2TLA020056R4000
		20 m		M12-C203	2TLA020056R4100
	Female + male	0.06 m		M12-C00634[1]	2TLA020056R6400
		1 m		M12-C134[1]	2TLA020056R5000
		3 m		M12-C334[1]	2TLA020056R5100
		0.2		M12-CT132[2]	2TLA020060R0600
M12-8 female + M12-5 male	Female + male	1		M12-CYMUTE[3]	2TLA022316R0100

Letters (a, b, c, d, t_2, t_3) refer to cables in connection examples, e.g:
2TLC010002T0002 Connection diagram Cables Orion3 to Tina10
2TLC010003T0002 Connection diagram Cables Orion3 to electrical cabinet URAX

1) These cables (t_2) are used for the connection to Tina 10, M12 3D and M12-3R. Tina 10 can be connected directly to the light guard without cable, but will form an angle (i.e. not be aligned) with the light guard, which might be a problem if the light guard is mounted close to a wall/aluminum profile.

2) M12-CT132 (t_3) is used for the connection of Orion3 Extended to URAX-D1R.

3) M12-CYMUTE is used to simplify the connection of 2 or 4 muting sensors with the help of the OMC1 connection box.

2TLC172657F0201

M12-C01

2TLC010038F0201

C5 cable

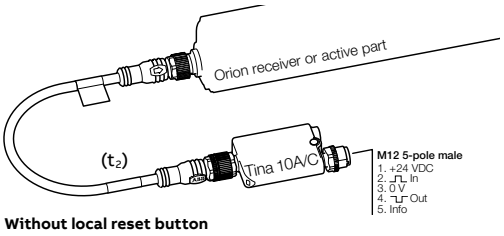
Separate cables and connectors

Description	Type	Order code
Connectors		
M12-5 pole female, straight	M12-C01	2TLA020055R1000
M12-5 pole male, straight	M12-C02	2TLA020055R1100
M12-8 pole female, straight	M12-C03	2TLA020055R1600
M12-8 pole male, straight	M12-C04	2TLA020055R1700
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
Cable with 8 conductors		
50 m cable with 8 x 0.34 shielded conductors	C8 cable 50 m	2TLA020057R1005
100 m cable with 8 x 0.34 shielded conductors	C8 cable 100 m	2TLA020057R1010
200 m cable with 8 x 0.34 shielded conductors	C8 cable 200 m	2TLA020057R1020
500 m cable with 8 x 0.34 shielded conductors	C8 cable 500 m	2TLA020057R1050

Connection examples

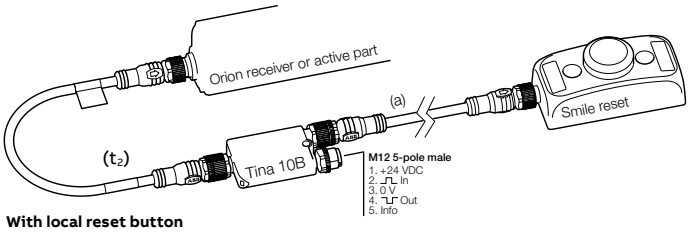
Orion3 Extended

Orion with Tina 10A/C



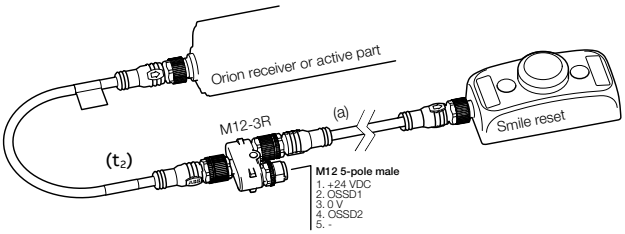
Connection to the ABB Jokab Safety DYNlink signal via Tina 10 A/C. To be used with Vital safety control module or Pluto programmable safety controller.

Reset to Orion with Tina 10B



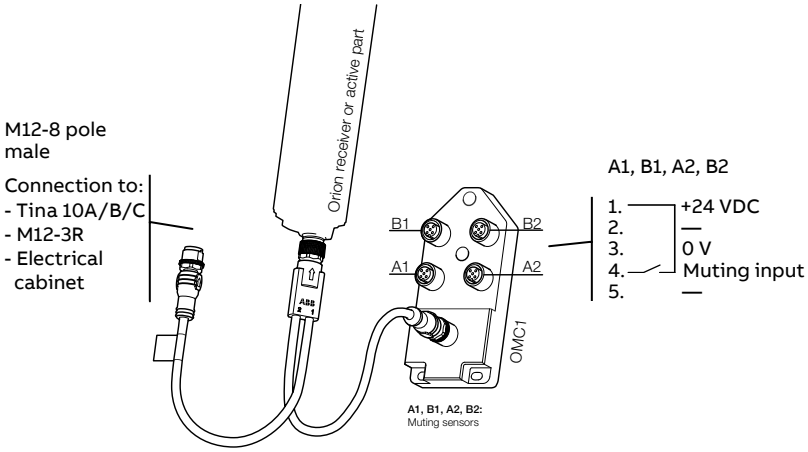
Connection to the ABB Jokab Safety DYNlink signal via Tina 10B. To be used with Vital safety control module or Pluto programmable safety controller.

Reset to Orion with M12-3R



Connection of a local reset button via M12-3R.

Connection of muting sensors with M12-CYMUTE and OMC1



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

Connection diagrams

For Orion3 Extended connection diagrams please see https://library.abb.com/

Technical data

Orion3 Extended

Technical data	
Approvals	
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, $PFH_D = 8.57 \times 10^{-9}$
EN 62061:2005+A1:2013	SILCL3, $PFH_D = 8.57 \times 10^{-9}$
EN ISO 13849-1:2008	PL e, Cat. 4, $PFH_D = 8.57 \times 10^{-9}$
Electrical data	
Power supply	+24 VDC ± 20%
Power consumtion, Active unit	2.5 W max (without load)
Cable length (for power supply)	70 m max
Outputs	2 PNP
Short-circuit protection	1.4 A at 55 °C
Output current	0.5 A max / output
Output voltage – ON	Power supply value less 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, 250 mA max
Response time	K1C-050: 11 ms, others: 12 ms
Connectors	M12-4 pole male on transmitter (compatible with M12-5 pole female)
Optical data	
Light emission (λ)	Infrared (860 nm)
Resolution	319.75 - 519.75 mm
Operating distance	0.5...8 m except K2C-090: 0.5...6.5 m
Ambient light rejection	According to IEC-61496-2:2013
Mechanical data	
Operating temperature	0...+ 55 °C
Storage temperature	- 25...+ 70 °C
Humidity range	15...95% (no condensation)
Protection class	IP65 (EN 60529:2000)
Housing material	Painted aluminium
Lens material	PMMA
Cap material	PBT Valox 508
Weight	
Orion3-4-K1C-050-E	1.3 kg
Orion3-4-K2C-080-E	1.8 kg
Orion3-4-K2C-090-E	2.1 kg
Orion3-4-K2C-120-E	2.6 kg
Orion3-4-M1C-050 (passive)	1.2 kg
Orion3-4-M2C-080 (passive)	1.7 kg
Orion3-4-M2C-090 (passive)	1.9 kg
Orion3-4-M2C-120 (passive)	2.5 kg

More information

For more information about the connection accessories, see manual for:
Orion3 Extended 2TLC172292M0201

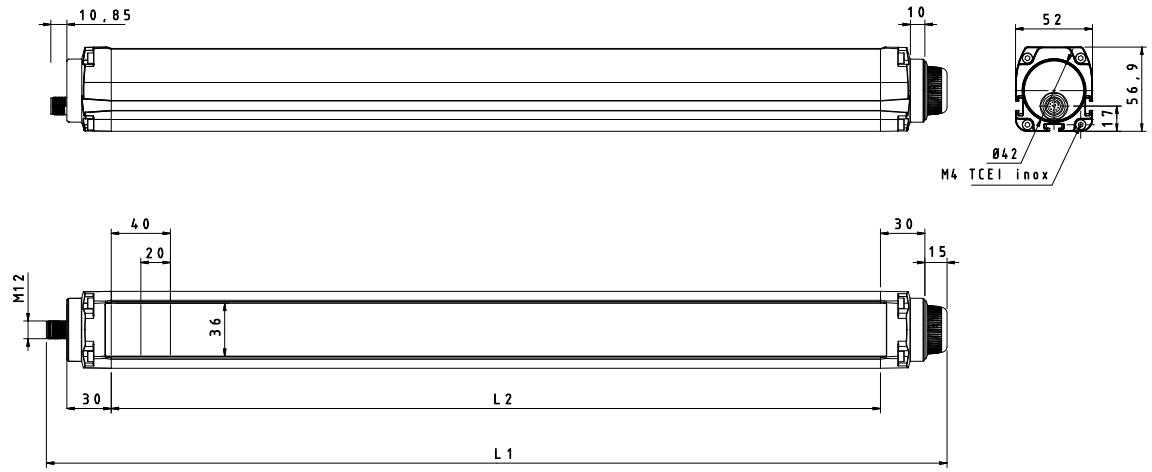
Connection diagrams

For Orion3 Extended connection diagrams please see https://library.abb.com/

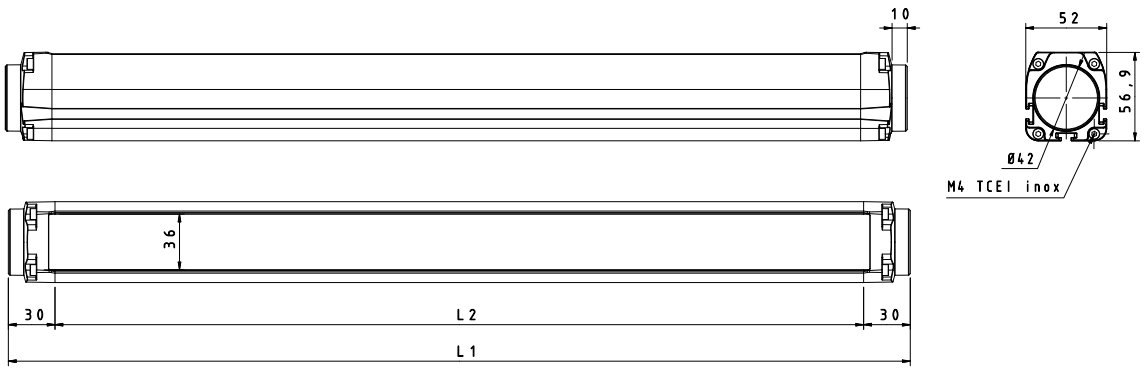
Dimension drawings

Orion3 Extended

Orion3 Extended



Active part - All dimensions in mm



Passive part - All dimensions in mm

Dimensions

L1 mm	L2 mm	Type
606.4	520.5	Orion3-4-K1C-050-E (active part)
906.4	820.5	Orion3-4-K2C-080-E (active part)
1006.4	920.5	Orion3-4-K2C-090-E (active part)
1306.4	1220.5	Orion3-4-K2C-120-E (active part)
580.5	520.5	Orion3-4-M1C-050 (passive part)
880.5	820.5	Orion3-4-M2C-080 (passive part)
980.5	920.5	Orion3-4-M2C-090 (passive part)
1280.5	1220.5	Orion3-4-M2C-090 (passive part)