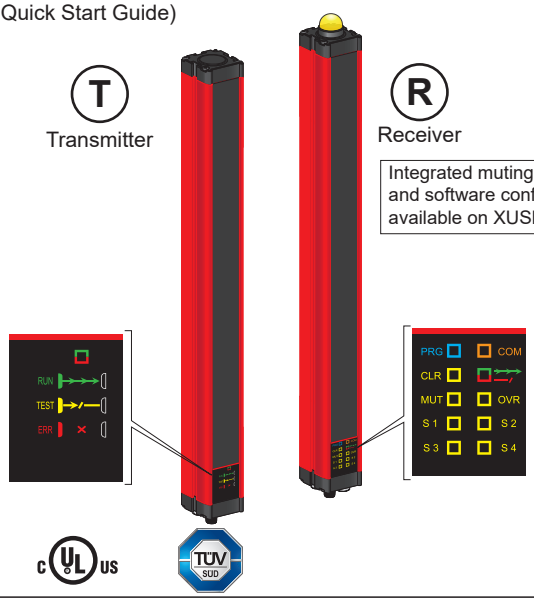
Type 4 Safety Light Curtains with integrated Muting function

(Original Quick Start Guide)



Note: you can download the complete User Manual in different languages from our website at: **www.tesensors.com**

http://qr.tesensors.com/XU0006

Flash the Qr-code to access the complete User Manual and this Quick Start Guide in different languages

- en N°: PHA6622901
- fr N°: PHA6622902
- de N°: PHA6622903
- es N°: PHA6622904
- it N°: PHA6622905
- pt N°: PHA6622906
- zh N°: PHA6622907
- ru N°: PHA6622908

We welcome your comments about this document. You can reach us by e-mail at: **customer-support@tesensors.com**

⚠ WARNING

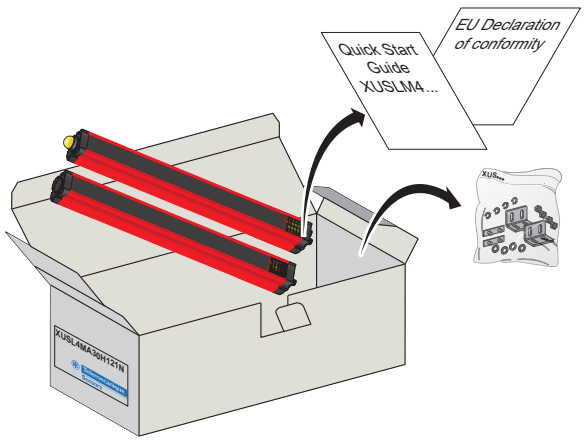
IMPROPER SETUP OR INSTALLATION

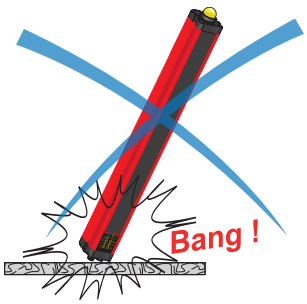
- This equipment must only be installed and serviced by qualified personnel.
- Read, understand, and follow the compliance below and the complete XUSL4M User Manual before installing the XUSL4M Safety light curtains.
- Do not tamper with or make alterations on the unit.
- Comply with the wiring and mounting instructions.
- Check the connections and fastening during maintenance operations.
- Disconnect all power before servicing equipments.
- The proper functioning of the XUSL4M Safety light curtains and its operating line must be checked on a regular basis based on the level of security required by the application (e.g. number of operations, level of environmental pollution, etc.).

Failure to follow these instructions can result in death, serious injury, or equipment damage.

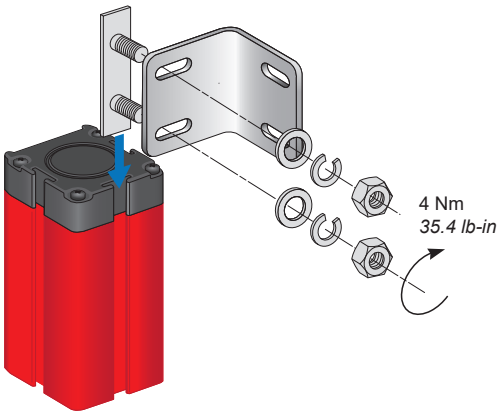
These devices have been designed to be in compliance with the standards currently in effect:
XUSL4M: Type 4 (**EN/IEC 61496-1**), SIL 3 (**EN/IEC 61508**), SILCL 3 I(**EN/IEC 62061**), PLe–Cat.4 (**EN/ISO 13849-1**)

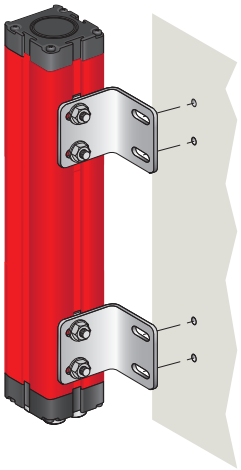
Package Content *(Example)*





Mounting

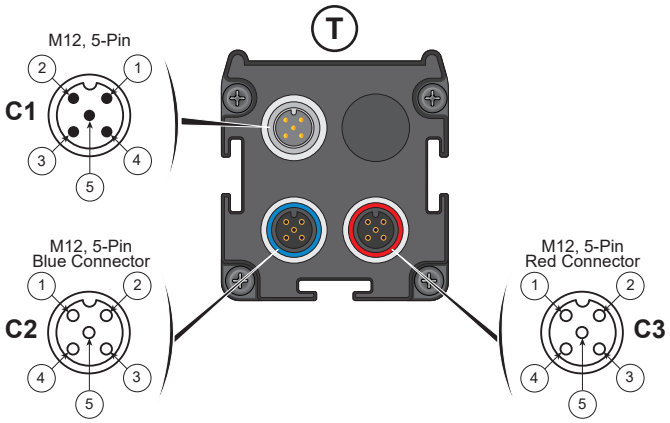




en Electrical equipment should be installed, operated and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

Connectors description and wiring

XUSL4MA●●● / XUSL4MB●●● Transmitter



C1 — Male connector - M12, 5-Pin - Range / Test selection - XZCP1164L●

Pin N°	Wire color	Description	Range and Test selection		
			Range_0 (2)	Range_1 (4)	Function
1	BN: Brown	+24 Vdc			
2	BK/WH: Black/White	Range_0	+24 Vdc	0 Vdc	Low range
3	BU: Blue	0 Vdc	0 Vdc	+24 Vdc	High range
4	BK: Black	Range_1	0 Vdc	0 Vdc	Light Curtain under test
5	YE/GN: Yellow/Green	FE (Functional Earth)	+24 Vdc	+24 Vdc	

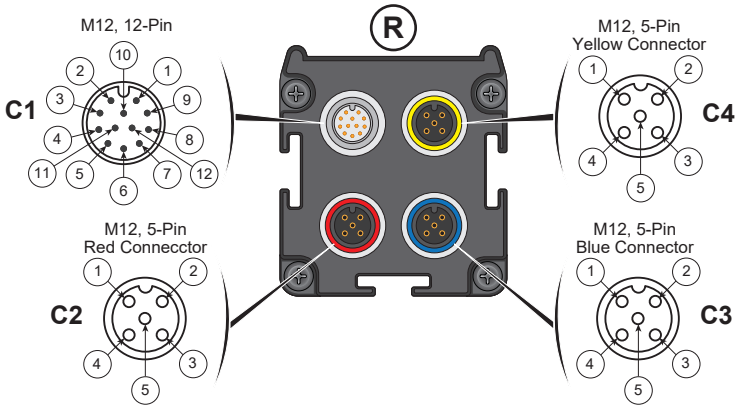
C2 — Female connector - M12, 5-Pin - Power supply of Muting sensors 1 & 2

Pin N°	Description
1	+24 Vdc (Power supply sensor)
2	SYNC (Synchronization for **XUSZAM●** arms)
3	0 Vdc (Power supply sensor)
4	0 Vdc (Power supply sensor)
5	FE (Functional Earth)

C3 — Female connector - M12, 5-Pin - Power supply of Muting sensors 3 & 4

Pin N°	Description
1	+24 Vdc (Power supply sensor)
2	SYNC (Synchronization for **XUSZAM●** arms)
3	0 Vdc (Power supply sensor)
4	0 Vdc (Power supply sensor)
5	FE(Functional Earth)

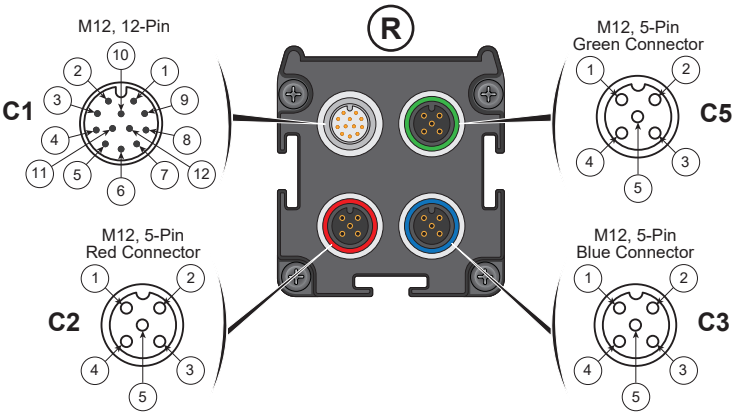
XUSL4MB●●● Receiver



C1 — Main male connector - M12, 12-Pin - XZCP57V12L●

Pin N°	Wire color	Input/Output	Description
1	BN: Brown		+24 Vdc
2	BU: Blue		0 Vdc
3	WH: White	O	OSSD1
4	GN: Green	O	OSSD2
5	PK: Pink		FE (Functional Earth)
6	YE: Yellow	I	SEL_A (Muting configuration)
7	BK: Black	I	MUT_ENABLE (External muting enable)
8	GY: Grey	I	EDM (K1_K2 Feedback)
9	RD: Red	I	OverRide2 (Override request)
10	VT: Violet	I	OverRide1 (Override request)
			Restart (Restart interlock)
11	GY/PK: Grey/Pink	I	SEL_B (Muting configuration)
12	RD/BU: Red/Blue	O	Status (System status)

XUSL4MA●●● Receiver



C2 — Female connector - M12, 5-Pin - Power supply of Muting sensors 3 & 4

Pin N°	Description
1	+24 Vdc (Power supply sensor)
2	Sensor4 (Sensor 4 Input)
3	0 Vdc (Power supply sensor)
4	Sensor 3 (Sensor 3 Input) or second Sensor (Sensor 2 Input) in the 2 types of muting sensors (see NOTE below)
5	FE (Functional Earth)

C3 — Female connector - M12, 5-Pin - Power supply of Muting sensors 1 & 2

Pin N°	Description
1	+24 Vdc (Power supply sensor)
2	Sensor2 (Sensor 2 Input)
3	0 Vdc (Power supply sensor)
4	Sensor1 (Sensor 1 Input)
5	FE (Functional Earth)

C4 — Female connector - M12, 5-Pin - Muting lamp - XZCP1541L●

Pin N°	Wire color	Description
1	BN: Brown	MUT_LAMP (+24 Vdc = Active Muting)
2	WH: White	NC (Not Connected)
3	BU: Blue	MUT_LAMP (0 Vdc)
4	BK: Black	NC (Not Connected)
5	-	-

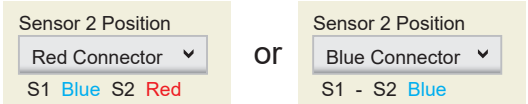
C5 — Female connector - M12, 5-Pin

	XUSL4MA● in programming mode XZCRPC		XUSL4MA● in operating mode XZCP1541L●		
Pin N°	Description	Pin N°	Wire color	Description
1	MUT_LAMP (Activation command)	1	BN: Brown	MUT_LAMP (+24 Vdc = Active Muting)
2	USB+ data	2	WH: White	Do not connect
3	MUT_LAMP (0 Vdc)	3	BU: Blue	MUT_LAMP (0 Vdc)
4	USB Power supply (+5 Vdc)	4	BK: Black	(+5 Vdc) - Do not connect
5	USB- data	5	-	-

Note:
Concerning 2 types muting sensors:

- When using **XUSZASL2●** integrated muting arms:
  The single output connector must be connected to the Blue connector.
- When using **XUSZAML2●** or **XUSZA●T2X●** integrated muting arms or ,T2X, L2P or L2X muting types with two separate muting sensors (with 2 separate connectors):
  Sensor 1 connector has to be wired on Sensor 1 input (Blue connector) and Sensor 2 connector must be connected to the Red connector (Sensor 3 input).
  Sensor 1 and Sensor 2 can also be both connected to the Blue connector through **XZCRSR** (for receiver) and **XZCRSE** (for transmitter) splitters.

Note:
In hardware configuration, the **XUSL4M** detects automatically the position of the connectors at the first switching of sensor 2 after power-up.
In software configuration (**XUSL4MA●** only), the physical position of the connectors must be set in accordance in SoMute software:



Wiring diagram

⚠ WARNING

IMPROPER CONNECTION

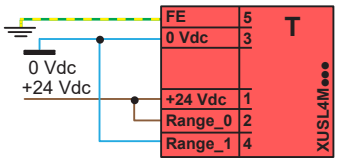
- The XUSL4M light curtain system must be powered by a safety extra low voltage (SELV) or a protected extra low voltage (PELV)
- Never connect the ground (here the Functional Earth FE) with the 0 Volt reference of the safety extra low voltage (SELV) power supply.
- The XUSL4M safety light curtains must be connected using both safety outputs.
- A single safety output, if it fails, may not stop the machine.
- The Receiver provides a voltage of 24VDC on BOTH safety outputs. Therefore, the load must be connected between BOTH output terminals and the 0VDC.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

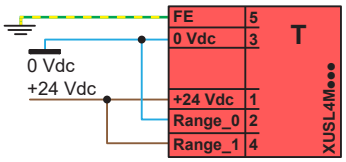
Note: The XUSL4M light curtain system operates directly from a 24 Vdc ±20% power supply. The power supply must meet the requirements of **EN/IEC 60204-1** and **EN/IEC 61496-1**. The SELV Schneider Electric part number **ABL8RPS24•••** is recommended.

Transmitter

Wiring diagram for hardware configuration, only.



Transmitter - Low range connection



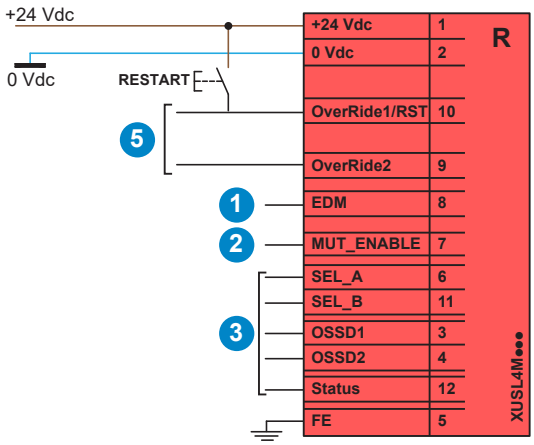
Transmitter - high range connection

1	+24 Vdc	BN
2	Range_0	BK WH
3	0 Vdc	BU
4	Range_1	BK
5	FE (Functional Earth)	YE GN

Receiver

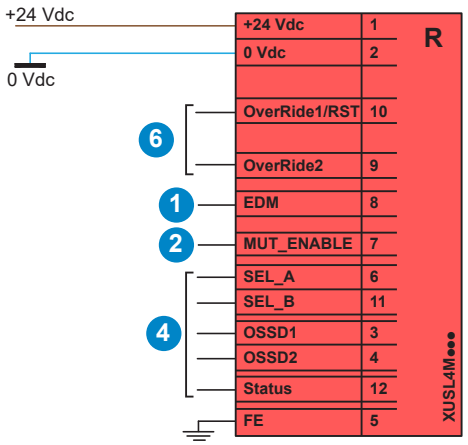
Wiring diagram for hardware configuration, only.

Manual start/restart



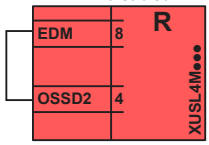
1	+24 Vdc	BN
2	0 Vdc	BU
3	OSSD1	WH
4	OSSD2	GN
5	FE (Functional Earth)	PK
6	SEL_A	YE
7	MUT_ENABLE	BK
8	EDM (K1_K2 Feedback)	GY
9	OverRide2	RD
10	OverRide1 / Restart	VT
11	SEL_B	GY/PK
12	Status	RD/BU

Automatic start/restart

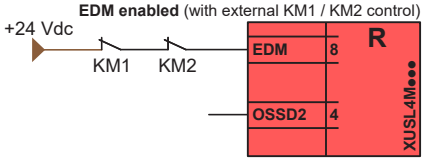


1 Wiring configuration to enable or to disable the EDM function

EDM disabled

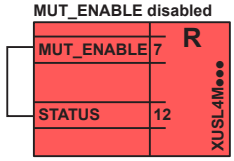


EDM enabled (with external KM1 / KM2 control)

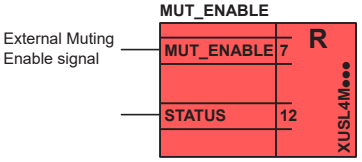


2 Wiring configuration to enable or to disable the MUT_ENABLE function

MUT_ENABLE disabled



MUT_ENABLE



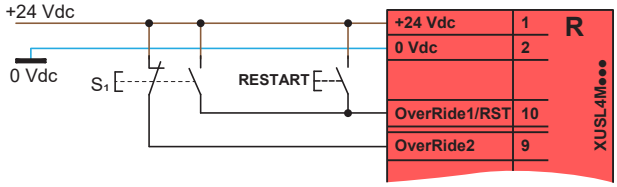
3 Wiring configuration - manual start/restart - muting modes

Muting modes	SEL_A ⑥	SEL_B ⑪
4 sensors, "T4P" mode, sequential control, timeout 30s	+24 Vdc ①	OSSD1 ③
4 sensors, "T4P" mode, sequential control, timeout ∞	+24 Vdc ①	OSSD2 ④
2 sensors, "T2X" mode, timeout 30 s	OSSD2 ④	OSSD1 ③
2 sensors, "T2X" mode, timeout 9 hours	OSSD1 ③	OSSD2 ④
2 sensors, "L2X" or "L2P" modes, timeout 30 s	OSSD1 ③	+24 Vdc ①
2 sensors, "L2X" or "L2P" modes, timeout 9 hours	OSSD2 ④	+24 Vdc ①
4 sensors, "T4P" mode, timing control, timeout 30 s	OSSD2 ④	OSSD2 ④
4 sensors, "T4P" mode, timing control, timeout 9 hours	OSSD1 ③	OSSD1 ③

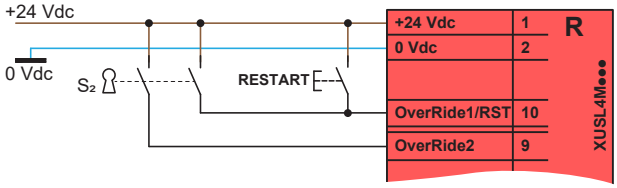
4 Wiring configuration - Automatic start/restart - muting modes

Muting modes	SEL_A ⑥	SEL_B ⑪
4 sensors, "T4P" mode, sequential control, timeout 30s	+24 Vdc ①	+24 Vdc ①
4 sensors, "T4P" mode, sequential control, timeout ∞	Status ⑫	Status ⑫
2 sensors, "T2X" mode, timeout 30 s	+24 Vdc ①	Status ⑫
2 sensors, "T2X" mode, timeout 9 hours	Status ⑫	+24 Vdc ①
2 sensors, "L2X" or "L2P" modes, timeout 30 s	Status ⑫	OSSD1 ③
2 sensors, "L2X" or "L2P" modes, timeout 9 hours	OSSD1 ③	Status ⑫
4 sensors, "T4P" mode, timing control, timeout 30 s	Status ⑫	OSSD2 ④
4 sensors, "T4P" mode, timing control, timeout 9 hours	OSSD2 ④	Status ⑫

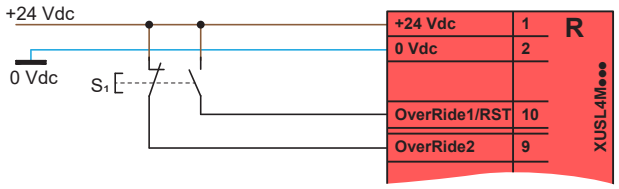
5 Manual start/restart and Override with pulse control



Manual start/restart and Override with maintained action control

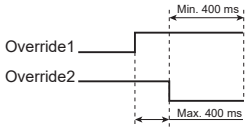


6 Automatic start/restart and Override with pulse control



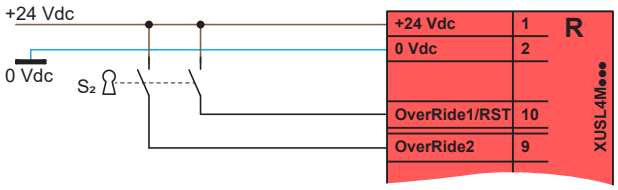
The function starts with the simultaneous activation of the two OVERRIDE inputs according to the following table:

OVERRIDE2 (pin 9)	**OVERRIDE1** (Pin 10)	S_1
1	0	
0	1	



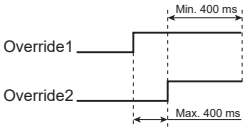
The function starts only if the signals are activated at the same time (within a maximum delay of 400 ms) and the button is held pressed for at least 400 ms.

Automatic start/restart and Override with maintained action control



The function starts with the simultaneous activation of the two OVERRIDE inputs according to the following table:

OVERRIDE2 (pin 9)	**OVERRIDE1** (Pin 10)	S_2
0	0	
1	1	



Both signals are active at 24VDC and the function only starts if they are activated at the same time (within a maximum delay of 400 ms) and the key is kept active for at least 400 ms.

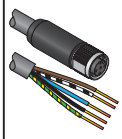
Configuration with SoMute software (XUSL4MA●●● only)

- To configure the **XUSL4MA●●●** models with SoMute software, connect pins 1 and 2 (power supply) of the main 12pins connector (DO NOT connect the other pins, except the connections for EDM and/or Overide and/or Manual Start and/or Muting Enable external signal, if they are required)
- For switching from hardware to software configuration, respect at power-up the indication of the following table (main 12pins connector):

SEL_A (pin 6)	**SEL_B (pin 11)**	**MUT_ENABLE (pin 7)**	**EDM (pin 8)**
0VDC (or open circuit)	0VDC (or open circuit)	0VDC (or open circuit)	. 0VDC, if not requested by the Software . Connected to 24VDC (through series of contacts N.C. (Normally Close) of external relays)

Cables

M12 - 5 pins female 5 wires



XZCP1164L2
XZCP1164L5
XZCP1164L10
XZCP1164L15
XZCP1164L25
XZCC12FDM50B

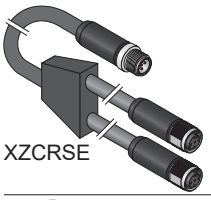
Transmitter main connection

M12 - 12 pins female 12 wires

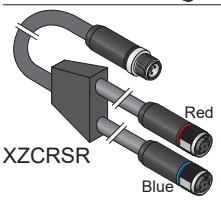
XZCP57V12L3
XZCP57V12L5
XZCP57V12L10
XZCP57V12L15
XZCP57V12L20

Receiver main connection

Splitter M12 - 5 pins male - female



XZCRSE



XZCRSR

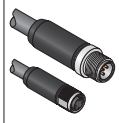
T4P multi-beam muting arms or individual muting sensors connection

M12 - 5 pins male / USB

XZCRPC

XUSL4MA programming connection

Jumper M12 - 5 pins male M8 - 4 pins female



XZCR1509040H1/2

XUM● individual muting sensor connection

M12 - 4 pins 4 wires male

XZCP1541L●●

External muting lamp connection

Jumper M12 - 4 pins - 4 wires male M12 - 5 pins - 4 wires female

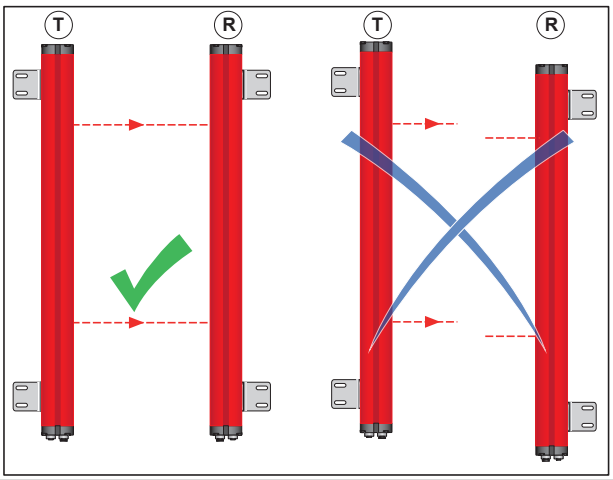
XZCR1511041C●●

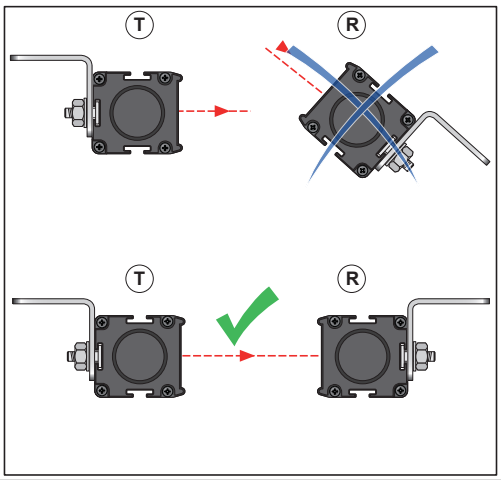
XUK● and XUB● individual muting sensor connection

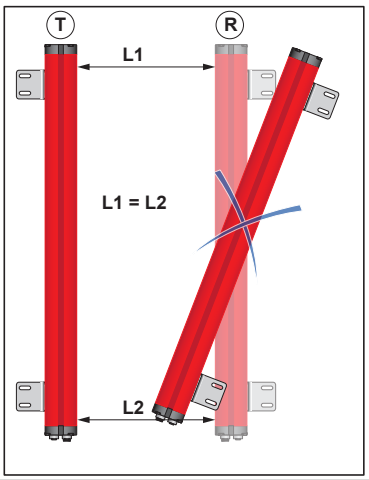
Alignment procedure

The transmitter and receiver must be installed with the optical surfaces face to face, connectors oriented in the same way. Perfect alignment of the transmitter and the receiver corresponding beams is mandatory for an optimum functioning, meaning that the transmitter and receiver must have the same height and be parallel. A good positioning will be facilitated by using the provided mounting accessories.

- For an easier alignment setting, configure the safety light curtain in Automatic mode. That will avoid to restart the system during the alignment adjustments.
- Place the optical axis of the first and last beams of the Emitter on the same axis as that of the corresponding beams on the Receiver.
- Move the Emitter to find the area within which the green LED on the Receiver stays on, then place the first transmitter beam (the one near the signal LED) at the centre of this area.
- Using this beam as a pivot, with small lateral displacements of the opposite end, move to the free guarded area condition, which in this situation will be indicated by turning on the green LED on the receiver.
- Firmly tighten the Emitter and the Receiver.
- Do not forget to reconfigure the safety light curtain in Manual start mode if this operating mode is required.

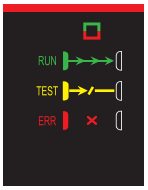






LEDs Status

(T)



LEDs		LEDs Meaning
ERR	Red	Power-On Initialization Test.
ERR	Red flashes	Error condition
TEST	Yellow	Safety light curtain under test
RUN	Green	Normal operation.

(R)

LEDs							LEDs Meaning
PRG	COM	CLR		MUT	OVR	S 1 S 2 S 3 S 4	
Blue							Safety light curtain programmed via USB
	Orange						Communication with active PC
		Yellow					Safety light curtain awaiting RESTART (clear gate)
			Green				Normal operation (clear gate)
			Red				Safety Light Curtain interrupted
			Red flashing				Detected failure (see “TROUBLESHOOTING”)
				Yellow			Muting active
					Yellow		Override active
					Yellow Flashing		Override request
						Yellow	Muting Sensor interrupted
Blue Flashing	Orange Flashing						No Safety light curtain programmation
Blue Flashing	Orange Flashing		Red flashing				Detected double programmation (hardware and software)

Diagnosis and Causes

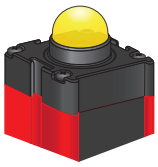
(T)

LED ERR / Number of flashes	Default	Troubleshooting
2	RANGE0 / RANGE1 wrong wiring	Check pin 2 and 4 connections on the main connector
3 or 4	Internal error	Contact **Telemecanique Sensors Customers Support**
5	SYNC wrong wiring	Check pin 2 connection on the sensors connectors

(R)

Number of flashes					Default	Troubleshooting
	CLR	MUT	OVR	S 1 S 2 S 3 S 4		
2					Configuration error SEL_A/SEL_B/EDM	Check Pin 6-8-11 connections on the Receiver male connector
2				2 (S1 / S2)	Inconsistency between the red & blue connector selection for S2 wiring and the physical wiring of S2	Wire S2 in consistency with the selected wiring option (red or blue connector)
3					Wrong EDM configuration	Check Pin 8 connections on the Receiver male connector
3	3				EDM feedback failure	Check EDM feedback loop (e.g. K1/K2 contactor contacts)
3		3			STATUS input failure	Check Pin 12 connections on the Receiver male connector
3			3		OVERRIDE_1 / OVERRIDE_2 input failure	Check Pin 9-10 connections on the Receiver male connector
3				3	SENSOR input failure	Check Pin 2-4 connections on the sensor connectors
3	3	3	3		MUTING LAMP FAILURE	Check connections on the auxiliary lamp connector
4					OSSD1 / OSSD2 error	Check 3-4 pin connections on the Receiver male connector
5					MAIN CARD ERROR	Contact **Telemecanique Sensors Customers Support**
5	5				BASE SHEET (EEPROM) error	Contact **Telemecanique Sensors Customers Support**
5			5		MAIN CARD ERROR	Contact **Telemecanique Sensors Customers Support**
6					MAIN CARD (Microcontroller) error	Contact **Telemecanique Sensors Customers Support**
6	6				GENERIC DEFAULT BOARD ERROR	Check 6-7-8-9-10-11 pin connections on the Receiver male connector
6		6			Beam error	Contact **Telemecanique Sensors Customers Support**
6			6		24VDC power supply overload	Eventual short-circuit on OSSD outputs
6	6	6	6		LAMP/STATUS over current	Eventual short-circuit on pin 12 or auxiliary lamp connector
7					Receiving beams failure	Contact **Telemecanique Sensors Customers Support**
8					Interfering Emitter Detected	Verify the presence of another safety light curtain not correctly positioned (see section "Multiple Systems")

Integrated Muting lamp status (available on XUSL4MA●●●)



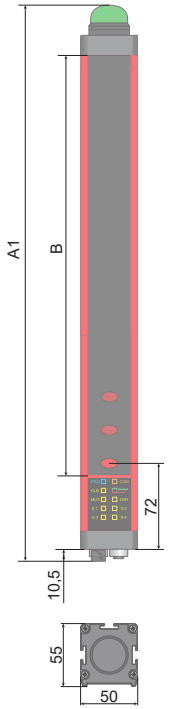
						
GUARD	CLEAR	MUTING	OVERRIDE	OVERRIDE REQUEST	BREAK	FAIL
Green	Green / Yellow Alternate	Yellow	Yellow Flashing	Yellow / Red Alternate	Red	Red Flashing
Normal operations	Waiting for restart	Muting in progress	Override in progress	Waiting for an override	Safety light curtain interrupted (at least one beam occupied)	Error condition

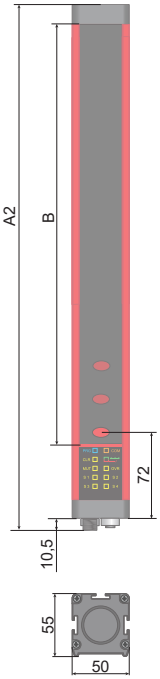
Characteristics

Product certifications		CE, cULus, TüV
Ambient air temperature	Operation	Normal sensing range (0...4 m / *0...13.1 ft*) : -30 °C...+55 °C *(-22 °F...+131 °F)*
		Long sensing range (0...12 m / *0...39.4 ft*) : -30 °C…+55 °C *(-22 °F ...+131 °F)*
	Storage	Standard and Long Sensing Range: -30 °C…70 °C (*-22 °F...+158 °F*)
Resolutions		30 mm or 40 mm or 2/3/4 beams
Degree of protection		Conforming **EN/IEC 60529**: IP65, IP67
Shock and Vibration resistance		Conforming to **EN/IEC 61496-1**: ● Shock: 10 g ● Impulse: 16 ms ● Vibration: 10...55 Hz ● Amplitude: 0.35 ± 0.05 mm (*0.0014 ± 0.00020 inches*)
Light source		Infrared λ = 950 Nm
Resistance to light disturbance		Conforming to **EN/IEC 61496-2**.
Power Supply		24 Vdc ± 20% - 2 A The power supply must meet the requirements of **EN/IEC 60204-1** relative to SELV/PELV power supply
Maximum current consumption (no load)		**Transmitter**: 42 mA - **Receiver**: 83 mA
Input power supply		**Transmitter**: 42 mA - **Receiver**: 900 mA (Including OSSD current)
Resistance to interference		Conforming to EN/IEC 61496-1.
Safety outputs (OSSD)		Two PNP - 400 mA per output @ 24 Vdc, drop out voltage <0.5 Vdc (Integrated arc suppressors), leakage current (OFF state) < 2 mA. Load capacity 0.82µF under 24 Vdc
STATUS output		PNP – 100mA @ 24VDC (shows the condition of the OSSD outputs)
Reponse Time		5,5 ms...28 ms (see model tables)
Current rating available for Muting sensors		50 mA
Muting lamp output		24VDC / 0.5 ÷ 5 W
Muting Signal Response Time (Muting sensors of pre-built muting arms)		100 ms
Muting: max timeout time		30 sec, 90 min (all models except T4P configuration with sequential control: 30 sec or infinite)
Override: max timeout time		15 minutes (renewable)
Max number of consecutive Override		30
Tolerance time between sensor 1 and sensor 2		4 s
Mission Time (TM)		20 years
PFH$_D$		Depends on the models. Refer to the complete User Manual
First-up time		10 s max.
OSSDs	Pulse Duration	≤ 100 µs
	Minimum pulse period	≈ 60 ms
OSSD classification		CL3 according to **ZVEI (CB24I)**

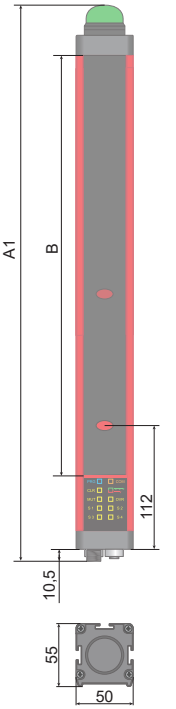
Note: More characteristics in the User Manual

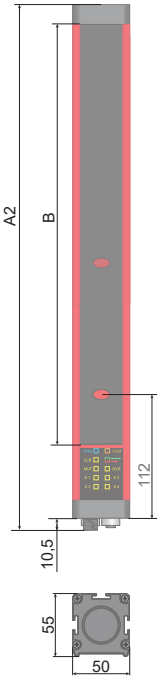
Dimensions





References	A1	A2	B
XUSL4M●30H031N	420	395	300
XUSL4M●30H046N	570	545	450
XUSL4M●30H061N	720	695	600
XUSL4M●30H076N	870	845	750
XUSL4M●30H091N	1020	995	900
XUSL4M●30H106N	1170	1145	1050
XUSL4M●30H121N	1320	1295	1200
XUSL4M●30H136N	1470	1445	1350
XUSL4M●30H151N	1620	1595	1500
XUSL4M●40H091N	1020	995	900
XUSL4M●40H106N	1170	1145	1050
XUSL4M●40H121N	1320	1295	1200
XUSL4M●40H136N	1470	1445	1350
XUSL4M●40H151N	1620	1595	1500
XUSL4M●40H166N	1770	1745	1650
XUSL4M●40H181N	1920	1895	1800
XUSL4M●40H196N	2070	2045	1950
XUSL4M●40H211N	2220	2195	2100
XUSL4M●40H226N	2370	2345	2250





References	A1	A2	B
XUSL4M●2BB051N	710	685	590
XUSL4M●3BB081N	1010	985	890
XUSL4M●4BB091N	1110	1085	1090