

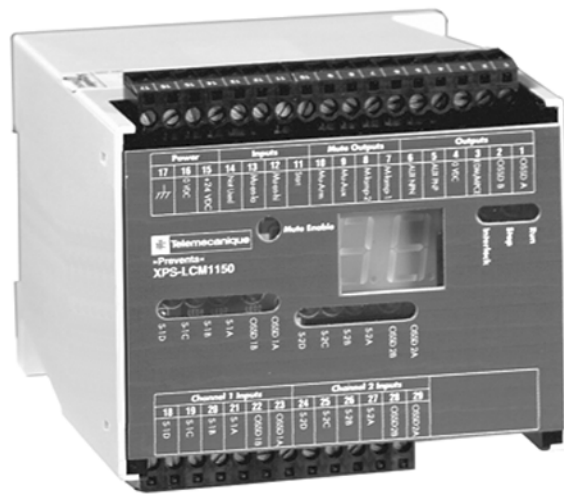
Preventa™

Safety Modules for Light Curtains

Catalog

06

File 9007



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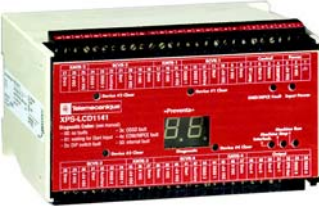

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Merlin Gerin
 Square D
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Preventa™ XPS Safety Relays Selection

Applications			
Modules	For monitoring XUSLM 3 Box Light Curtains	For monitoring multiple XUSL Light Curtains	For muting of light curtains
			
Conformity to standards	EN 954-1 - category 4, EN 61496-1, EN 61496-2		
Product certifications	UL, CSA, TÜV, CE		
Number of circuits	Safety	2 solid-state PNP (N.O.)	
	Additional	1 PNP (N.O.) + 1 NPN (N.O.) output for signalling to PLC	
Display	4 LEDs + 2-digit display	9 LEDs + 2-digit display	14 LEDs + 2-digit display
Supply voltage	24 Vdc		
Product type	XPSLCB	XPSLCD	XPSLCM
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Preventa™ XPS Safety Relays Monitoring 3 Box XUSLM Light Curtains

Operating principle

The safety monitoring module XPSLCB1141 used in conjunction with XUSLM light curtains establishes a type 4 light curtain system conforming to the standard EN/IEC 61496-1.

The Preventa safety monitoring module XPSLCB1141 has removable terminal blocks, thus optimizing machine maintenance.

Environmental characteristics		
Module type		XPSLCB1141
Certifications		C, TUV, CSA, UL
Ambient air temperature		Operation: + 32 to +131 °F (0 to + 55 °C); storage: - 13 to +167 °F (- 25 to + 75 °C)
Relative humidity		95% maximum, without condensation
Degree of protection		IP 20
Shock and vibration resistance	Conforming to EN/IEC 61496-1	Shock resistance: 10 gn, impulse 16 ms. Vibration resistance: 5...55 Hz max. on all 3 axes
Materials		ABS thermoplastic enclosure
Mounting		35 mm rail

Electrical characteristics		
Power supply	V	24 Vdc ± 10%
Thermal current (I _{th})	mA	0.625
Current	A	2.25 max.
Response time	ms	< 26 depending on height protected
Safety outputs		2 solid-state PNP outputs (N.O.), 625 mA on 24 Vdc
Alarm or auxiliary output		1 solid-state PNP (N.O.), 500 mA on 24 Vdc, and/or 1 solid-state NPN, 100 mA on 24 Vdc, output
Monitoring activation of output switching devices (MPCE/EDM)	mA	50 ± 20% on 24 Vdc
Start button monitoring	mA	20 ± 20% on 24 Vdc
Signalling		4 LEDs plus 2-digit display
Functions		<ul style="list-style-type: none"> - Auto/Manual, manual 1st cycle, - Monitoring of external switching devices (EDM: External Devices Monitoring), - Blanking (ECS/B), - Floating Blanking (FB), - Display of operating modes and alarm by 4 LEDs and 2-digit display. Selection of Auto/Manual, blanking relay monitoring, floating/blanking and blanking + floating/blanking relay monitoring using configuration switches behind front cover.
Monitoring of external switching devices (EDM = External Devices Monitoring)		Monitoring of the function (open or closed) as well as the response time of the power components. Selectable by using configuration switches behind front cover.
"Muting" function (inhibition)		Possible with additional external module XPSLCM1150
Connection	Type	Captive screw clamp terminals, removable terminal block
1-wire connection	Without cable end	Solid cable: 14 awg (1.63 mm ²)
	Without cable end	Flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)
	With cable end	Without bezel, flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)
2-wire connection	Without cable end	Solid cable: 26 to 16 awg (0.14 to 1.5 mm ²)
	Without cable end	Flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)

Preventa™ XPS Safety Relays Monitoring 3 Box XUSLM Light Curtains

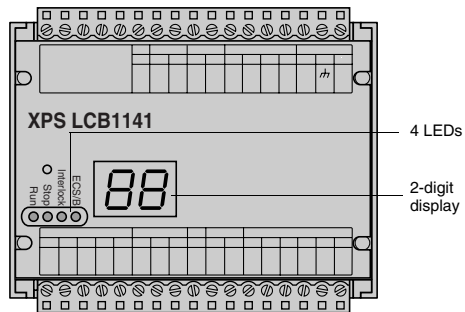
Ordering information



XPSLCB1141

Description	Type of terminal block	Number of safety circuits	Auxiliary outputs	Power supply	Catalog number	Weight oz. (kg)
Safety module for monitoring XUSLM light curtains	Removable	2 PNP	1 PNP + 1 NPN	24 Vdc	XPSLCB1141	11.11 (0.315)

LEDs and Displays



To aid diagnostics, the XPSLCB1141 module has 4 LEDs and a 2-digit display on the front face which provide information on the monitoring circuit status.

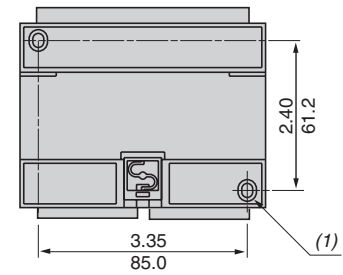
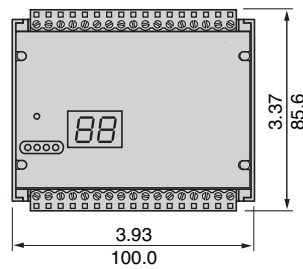
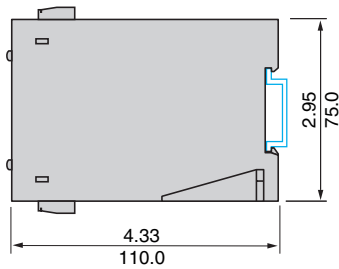
Description of the 2 digit display, the LED's, their function, and their status indication, is provided with the instruction bulletin enclosed with the product.

Dimensions

XPSLCB1141

Mounting on 35 mm rail

Rear view



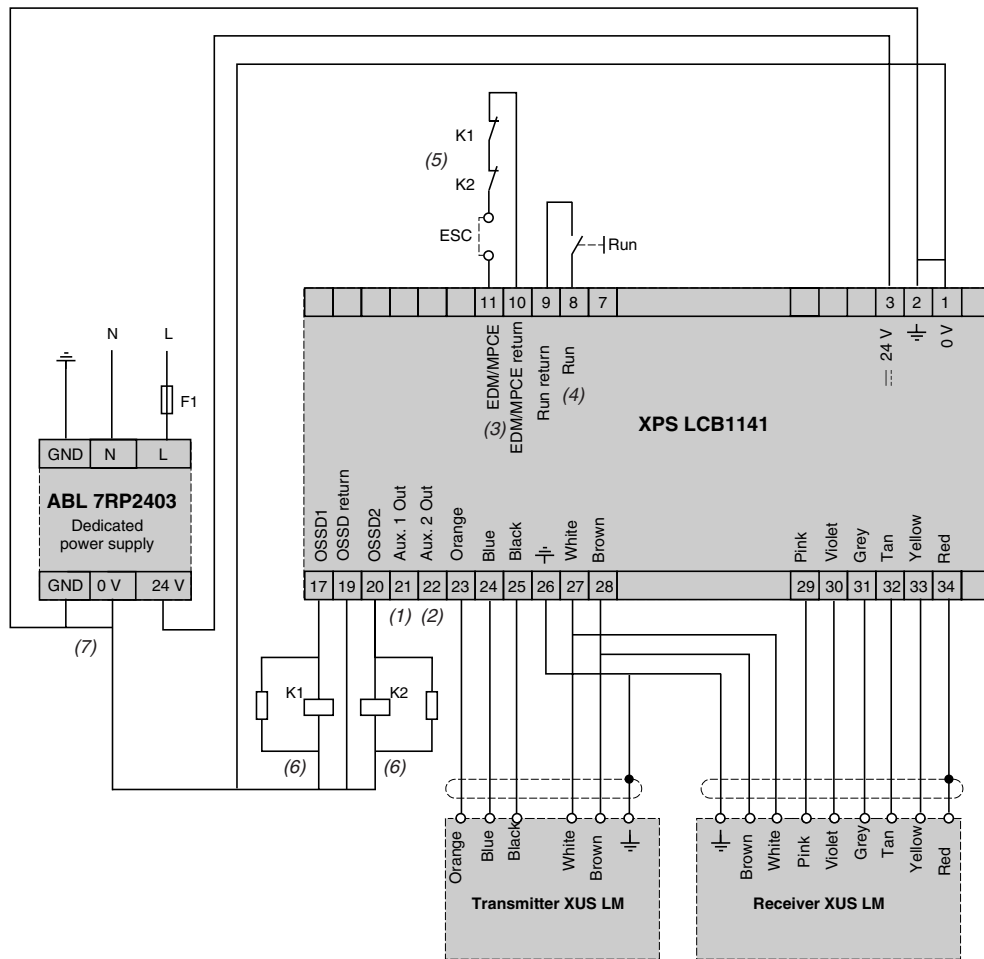
Dual Dimensions: INCHES
Millimeters

(1) 2 elongated holes \varnothing 0.180 x .23 L
(\varnothing 4.40 x 5.70 L).

Preventa™ XPS Safety Relays Monitoring 3 Box XUSLM Light Curtains

Wiring diagram

XPSLCB1141



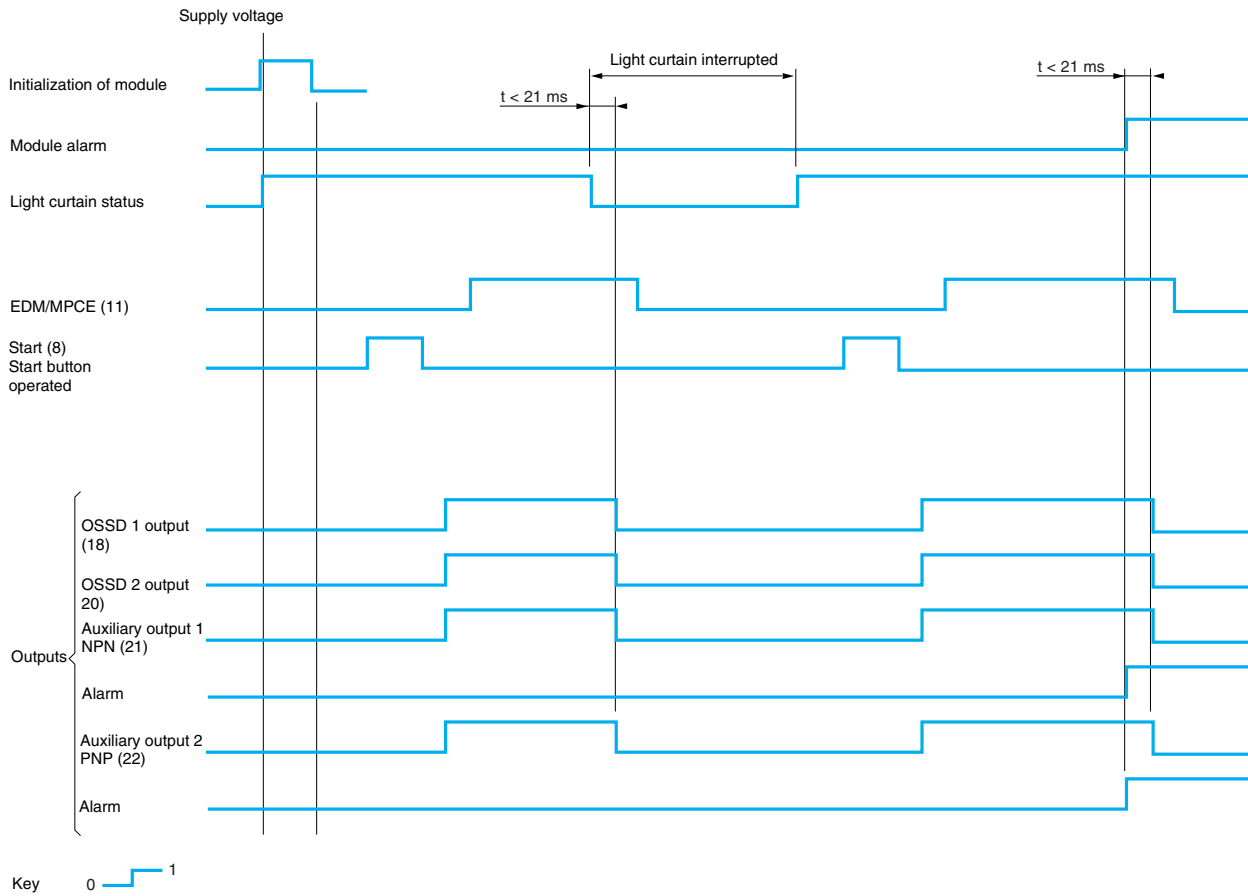
Terminal	Function	Terminal	Function	Terminal	Function
23	Transmitter loopback	27	Transmitter/receiver supply	31	Receiver loopback
24	Transmitter data inputs	28	Transmitter/receiver supply return	32	Receiver data inputs
25	Transmitter clock	29	Receiver data + outputs	33	Receiver clock
26	Transmitter/receiver screening	30	Receiver data – outputs	34	Receiver data LEDs

- (1) Auxiliary output 1: NPN, 100 mA max., 30 Vdc max.
 (2) Auxiliary output 2: PNP, 500 mA max., $V_{supply} - 2 V$.
 (3) To enable testing prior to installation, the user can select EDM/MPCE OFF. In this case, the EDM/MPCE input must be connected to the EDM/MPCE return.
 (4) If remote start is not used, connect the start output to the start return.
 (5) EDM/MPCE monitoring must be used when relays with linked contacts are used as the final switching devices. Connect the EDM/MPCE output to the EDM/MPCE return using N.C. contacts.
 (6) The EDM/MPCE coils must be protected using the arc suppressors included in the documentation kit.
 (7) Make a wiring connection between 0 V and the earth terminals of the transmitter and receiver.
 ESC: external start conditions.
 EDM/MPCE: External Device Monitoring/Machine Primary Control Element monitoring.

Preventa™ XPS Safety Relays Monitoring 3 Box XUSLM Light Curtains

Functional diagram of the XPSLCB1141 module

Manual start and restart mode



Preventa™ XPS Safety Relays Monitoring Multiple XUSL Light Curtains

Operating principle

The safety monitoring module XPSLCD1141 enables independent monitoring of 2 to 4 XUSL light curtains type 2 and type 4.

Each output of the light curtain is separately connected to the inputs of the safety monitoring module, which either authorizes or prevents activation of its two safety outputs.

The module manages starting and EMD/MPCE (External Device Monitoring/Machine Primary Control Element monitoring) functions and therefore, the light curtains connected to it must be configured for automatic start and the EDM/MPCE function deactivated. The safety monitoring module XPSLCD1141 provides the supply and also manages, in addition to its own auxiliary outputs (1 PNP and 1 NPN), the auxiliary outputs of the light curtains.

At the slightest intrusion through one or more light beams of any of the light curtains, the outputs of the safety monitoring module XPSLCD1141 open. This also applies in the event of any internal fault or output relay(s) fault (subject to the EDM/MPCE configuration on the module).

The light curtain system conforms to the standard EN/IEC 61496-1 (type 4).

The Preventa safety monitoring module XPSLCD1141 incorporates removable terminal blocks, thus optimizing machine maintenance.

To aid diagnostics, the safety monitoring module has 9 LEDs and a 2-digit display on the front cover which provide information on the monitoring circuit status.

Environmental characteristics		
Safety monitoring module type		XPSLCD1141
Certifications		CE, TÜV, CSA, UL
Ambient air temperature		Operation: + 32 to +131 °F (0 to + 55 °C); storage: - 13 to +167 °F (- 25 to + 75 °C)
Relative humidity		95% maximum, without condensation
Degree of protection		IP 20
Shock and vibration resistance	Conforming to EN/IEC 61496-1	Shock resistance: 10 gn, impulse 16 ms. Vibration resistance: 5...55 Hz max. on all 3 axes
Materials		ABS thermoplastic enclosure
Mounting		35 mm rail
Electrical characteristics		
Power supply	V	24 Vdc ± 10%
Current	A	10 max.
Response time	ms	< 1
Safety outputs		2 solid-state PNP outputs (N.O.), 625 mA on 24 Vdc
Alarm or auxiliary output		1 solid-state PNP (N.O.), 500 mA on 24 Vdc, and 1 solid-state NPN (N.O.), 100 mA on 24 Vdc, output
Monitoring activation of output switching devices (EDM/MPCE)	mA	50 ± 20% on 24 Vdc
Signalling		9 LEDs plus 2-digit display
Functions		<ul style="list-style-type: none"> - Auto/Manual, manual 1st cycle, - Monitoring of external switching devices (EDM: External Devices Monitoring), - Restart request indicator light, - Display of operating modes and alarm by 9 LEDs and 2-digit display. Selection of Auto/Manual, blanking relay monitoring, floating/blanking and blanking + floating/blanking relay monitoring using configuration switches behind front cover of module. - Independent monitoring of 2 to 4 safety light curtains.
Monitoring of external switching devices (EDM = External Devices Monitoring)		Monitoring of the function (open or closed) as well as the response time of the power components. Selectable by using configuration switches behind front cover.
Start input	mA	50 at 24 Vdc
Connection	Type	Captive screw clamp terminals, removable terminal block
1-wire connection	Without cable end	Solid cable: 14 awg (1.63 mm ²)
	Without cable end	Flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)
	With cable end	Without bezel, flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)
2-wire connection	Without cable end	Solid cable: 26 to 16 awg (0.14 to 1.5 mm ²)
	Without cable end	Flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)

Preventa™ XPS Safety Relays Monitoring Multiple XUSL Light Curtains

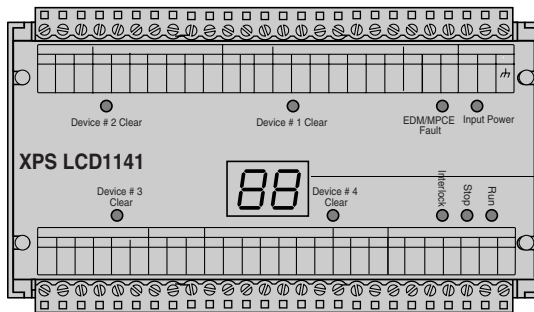
Ordering information



XPSLCD1141

Description	Type of terminal block	Number of safety circuits	Auxiliary outputs	Power supply	Catalog number	Weight oz. (kg)
Safety module for monitoring 2 to 4 XUSL light curtains type 2 and type 4	Removable	2 PNP	5 (4 PNP + 1 PNP or NPN)	24 Vdc	XPSLCD1141	26.46 (0.750)

LEDs and Displays



2-digit display

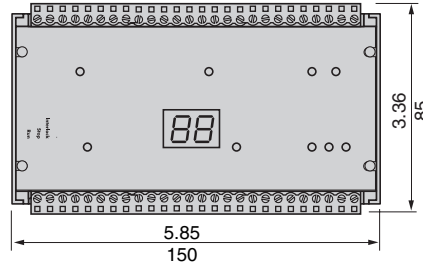
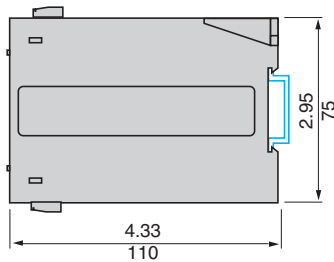
The safety monitoring module XPS LCD has 9 LEDs and a 2-digit display on the front face.

Description of the 2 digit display, the LED's, their function, and their status indication, is provided with the instruction bulletin enclosed with the product.

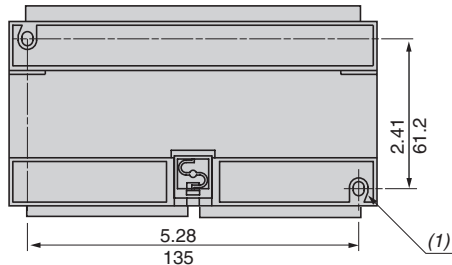
Dimensions

XPSLCD1141

Mounting on 35 mm rail



Rear view



Dual Dimensions: INCHES
Millimeters

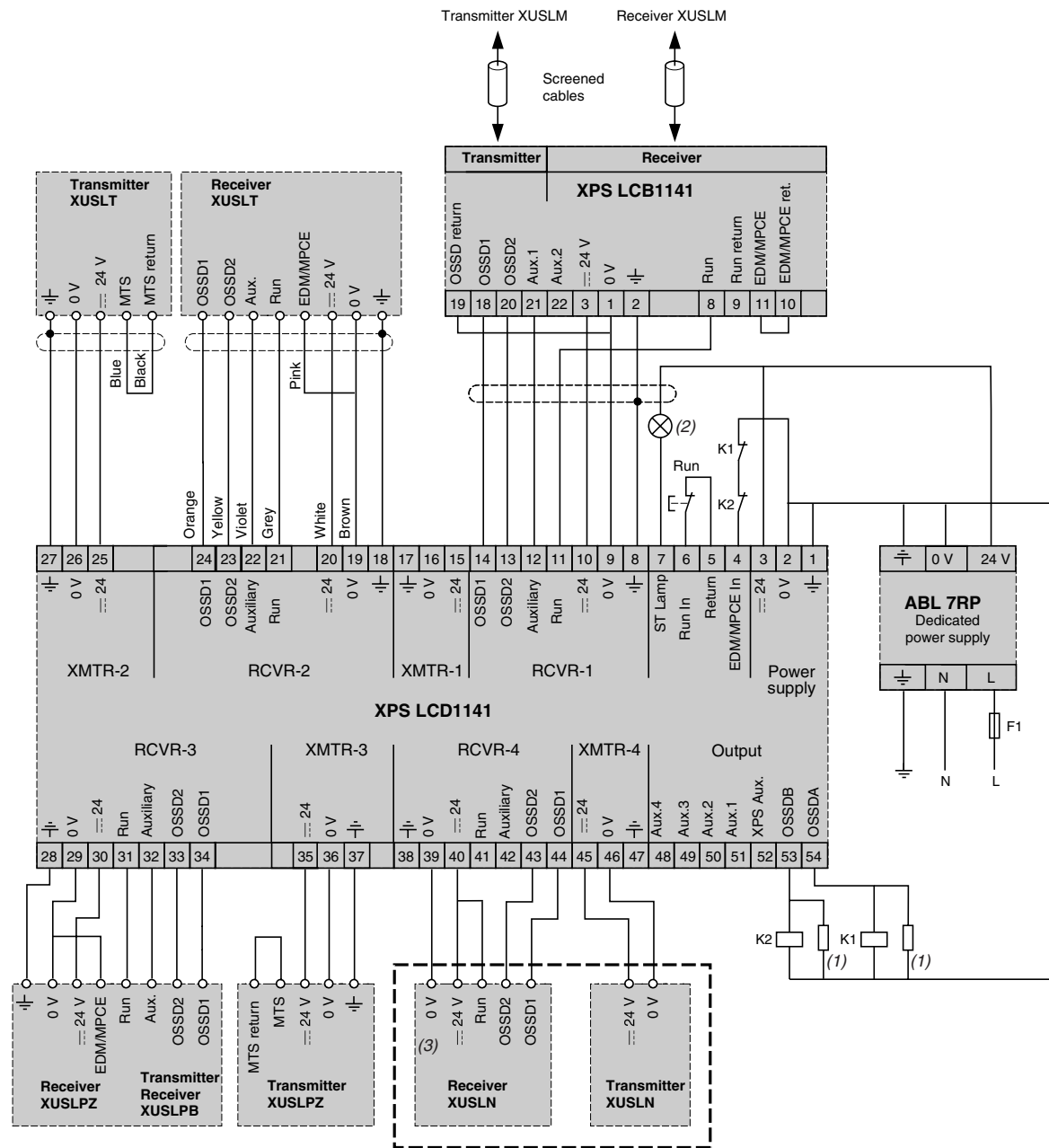
(1) 2 elongated holes Ø 0.180 x .23 L (Ø 4.40 x 5.70 L).

Preventa™ XPS Safety Relays Monitoring Multiple XUSL Light Curtains

Wiring diagram

XPSLCD1141

Example: configuration with 4 light curtains XUSLT, XUSLM, XUSLP and XUSLN



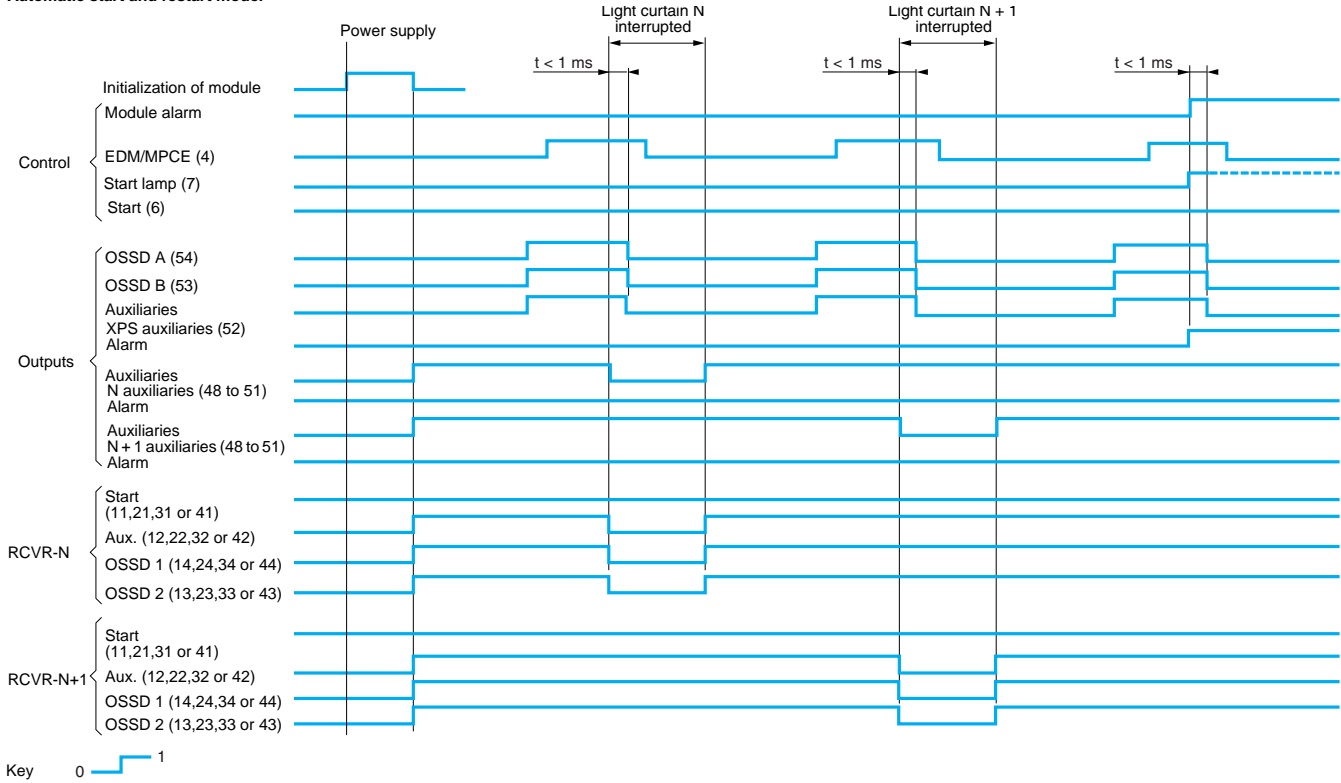
- (1) Arc suppressor.
- (2) Restart request indicator light.
- (3) When module XPSLCD1141 is used with a type 2 light curtain (example: XUSLN), the entire protection system is downgraded to category 2.

Preventa™ XPS Safety Relays

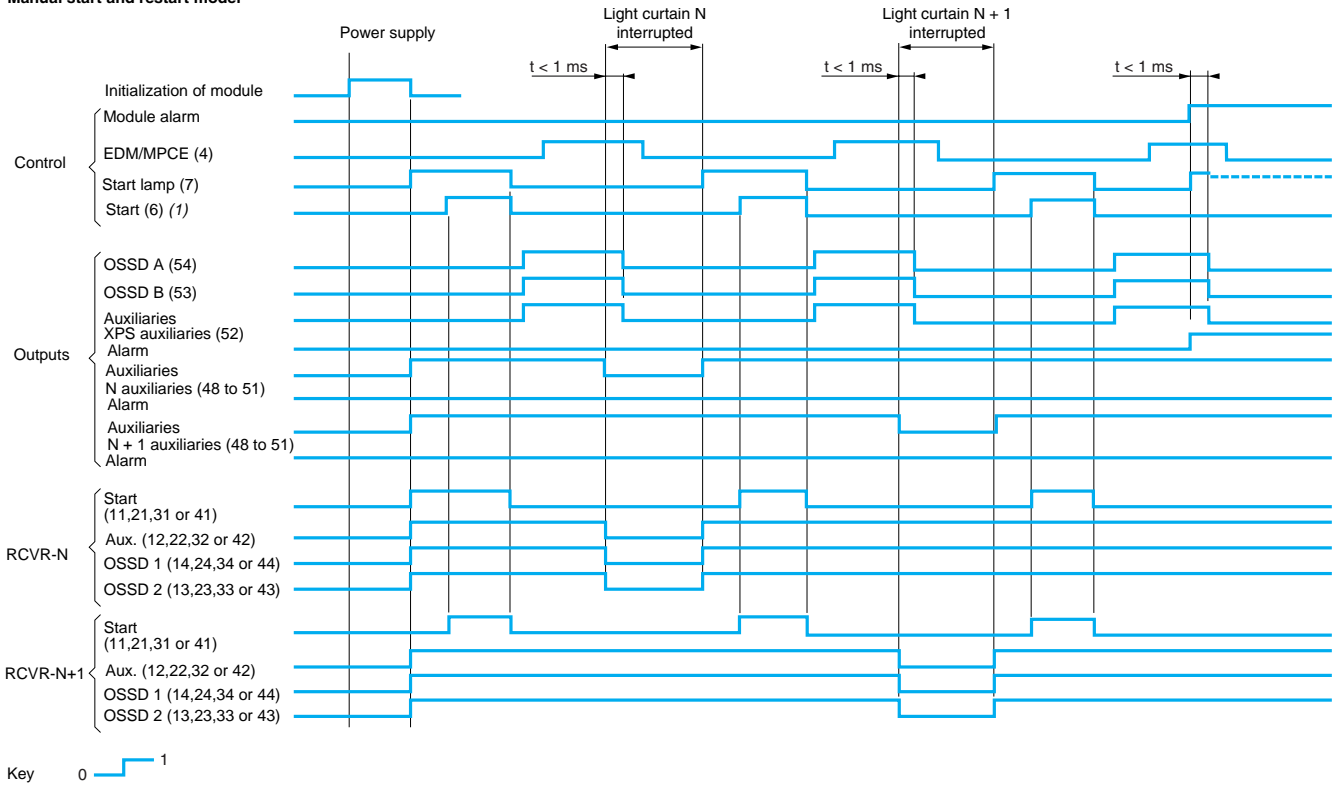
Monitoring Multiple XUSL Light Curtains

Functional diagram of the XPSLCD1141 module

Automatic start and restart model



Manual start and restart model



(1) Start button.

Preventa™ XPS Safety Relays Muting of Light Curtains

Operating principle

The XPSLCM1150 Mute Module is used in conjunction with Type 4 light curtains to provide a safety related muting function. Muting is defined as "bypassing the protective function on safety related control systems, such as a safety light curtain, during a pre-determined portion of the operation of a machine" and is only allowed during the non-hazardous portion of the machine cycle. Muting functions are commonly used in applications such as:

- Automatic conveyer, stacker and palletizing machines.
- Mechanical and hydraulic presses with automatic or manual feed with the muting function only used in the non-hazardous portion of the press cycle.

The XPSLCM1150 provides two "mute safety channels", each accepts a single safety device (i.e.: light curtain emitter and receiver for each channel), and either two, three or four muting sensors to activate the mute mode. The mute mode is active when the correct sequence of mute sensor input signals is achieved. Muting sensors can be thru-beam or polarized photoelectric sensors, sensors with hard contact outputs, or limit switches with hard contact outputs. If solid state sensors are used, they must have PNP type outputs, and if photoelectric sensors are used the sensor pairs must be made-up of both "dark operate" and "light operate" sensors.

The object of the correct muting sensor selection and orientation is to always recognize the presence of the work piece material as the intended means to start or stop the muting sequence. The presence of any person in the detection zone of the muting sensors must never be able to initiate a muting sequence, or otherwise bypass the safe guarding device (i.e.: light curtain).

Each safety device output (light curtain) must be capable of supplying two 24 V (PNP) output signals when the sensing field is clear. An indicator lamp for each safety channel is required to illuminate anytime the XPSLCM1150 is in the mute state. These lamps must be visible to personnel in the immediate area. The XPSLCM1150 monitors the indicator lamp circuit to ensure the indicator lamp is operational.

A single selector switch is used to enable the XPSLCM1150 to detect the mute input sensors, or disable the XPSLCM1150 from entering the mute state. When the switch is in the disable position all muting errors are cleared from the diagnostic display.

When the mute mode is disabled, the XPSLCM outputs are the same as those of the connected safety devices (light curtain). Any entry into the guarded area will result in a stop signal being sent to the guarded machine.

This module manages starting and EDM/MPCE functions and therefore, the light curtains connected to it must be configured for automatic start and the EDM/MPCE functions deactivated.

Technical data		
Module type		XPSLCM1150
Certifications		CE, TÜV, CSA, UL
Products designed for max. use in safety related parts of control systems	Conforming to EN 954-1/ISO 13849-1	Category 4
Ambient air temperature	For operation	+ 32 to +131 °F (0 to + 55 °C)
	For storage	- 13 to +167 °F (- 25 to + 75 °C)
Degree of protection conforming to IEC 529	Terminals	IP 20
	Enclosure	IP 20
Power supply	Voltage	V 24 Vdc
	Voltage limits	- 10 to + 10%
Maximum consumption		W < 150
Rated insulation voltage (Ui)		V 300 (degree of pollution 2 conforming to EN/IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)
Rated impulse withstand voltage (Uimp)		kV 4 (overvoltage category III, conforming to EN/IEC 60947-5-1, DIN VDE 0110 parts 1 and 2)
Number of light curtains monitored		1 or 2 transmitter-receiver pairs
Inputs for "muting" sensors		
	number of inputs to be monitored	2 to 4 per "muting" function
	supply voltage of sensors	V 24 Vdc
	output current of each sensor	mA < 20
Type of "muting" sensors		Thru-beam or polarized photoelectric sensors, sensors with hard contact outputs, or limit switches with hard contact outputs.
Synchronization time of "muting" sensors		s 3 or unlimited
Maximum "muting" time		min 2 or unlimited
Safety outputs		
	number and type	2 PNP (terminals 1 and 2), 0.625 A at 24 Vdc
Auxiliary outputs		
		1 PNP (terminal 5) + 1 NPN (terminal 6)
	breaking capacity of solid-state PNP outputs	mA 24 V/500
	breaking capacity of solid-state NPN outputs	mA 24 V/100
"Muting" indicator light power		W 1 to 7 max.
Response time on input change of state		ms 1
Signalling		
		14 LEDs plus 2-digit display
Connection		Type
1-wire connection		Captive screw clamp terminals, removable terminal block
	Without cable end	Solid cable: 14 awg (1.63 mm ²)
	With cable end	Flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)
2-wire connection	Without bezel, flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)	
	Without cable end	Solid cable: 26 to 16 awg (0.14 to 1.5 mm ²)
	Without cable end	Flexible cable: 26 to 16 awg (0.14 to 1.5 mm ²)

Preventa™ XPS Safety Relays Muting of Light Curtains

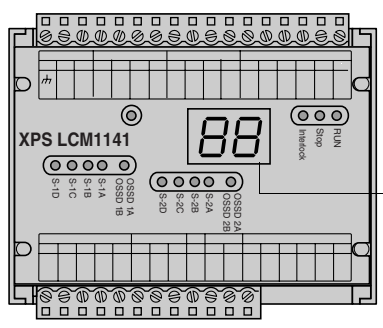
Ordering information



XPS LCM1150

Safety module						
Description	Type of terminal block	Number of safety circuits	Auxiliary outputs	Power Supply	Catalog number	Weight oz. (kg)
Safety module for "muting" function	Removable	2 PNP	1 PNP + 1 NPN	24 Vdc	XPS LCM1150	23.28 (0.660)
Spare parts						
Description	Power W	Catalog number	Weight oz. (kg)			
"Muting" indicator light kit	5	XSZCM01	0.42 (0.012)			
Replacement bulbs for "muting" indicator light kit comprising one lot of 10 replacement bulbs and 1 removal/insertion tool XBF-X13. The muting status indicator light is not included with the XPS LCM module. It must to be ordered separately.	1 to 7	XSZCM02	0.56 (0.016)			

LEDs and displays

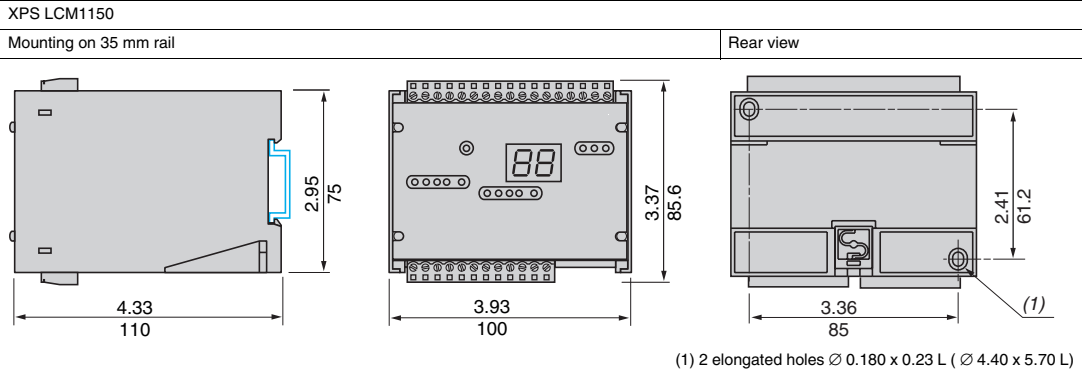


XPS LCM1150

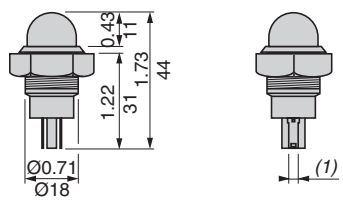
To aid diagnostics, the safety monitoring module has 14 LEDs and a 2-digit display on the front face which provide information on the monitoring circuit status.

Description of the 2 digit display, the LED's, their function, and their status indication, is provided with the instruction bulletin enclosed with the product.

Dimensions



"Muting" indicator light kit XSZCM01

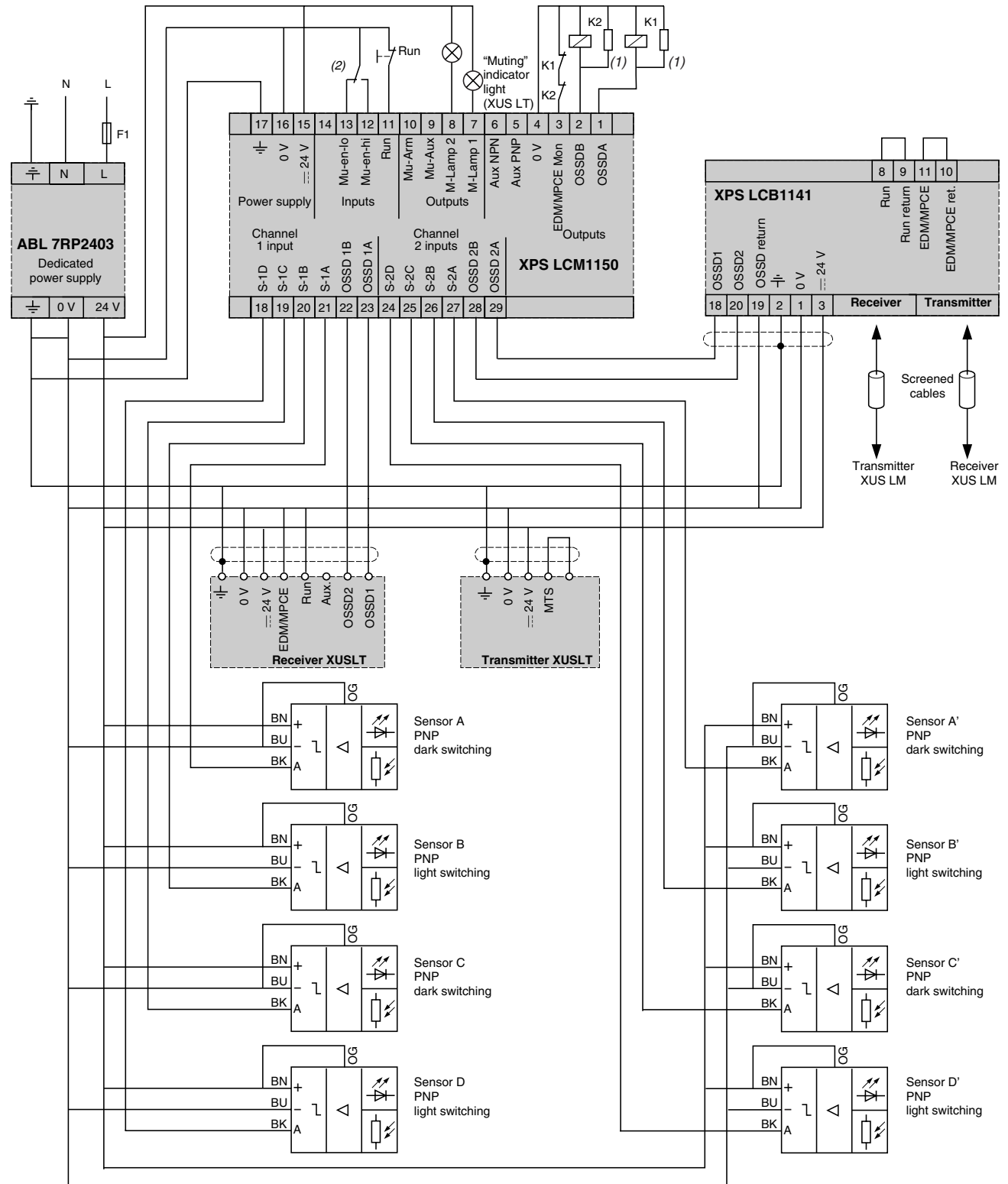


(1) Faston connector 4.7.

Dual Dimensions: INCHES
Millimeters

Wiring diagrams XPSLCM1150

This module manages starting and EDM/MPCE functions and therefore, the light curtains connected to it must be configured for automatic start and the EDM/MPCE functions deactivated.



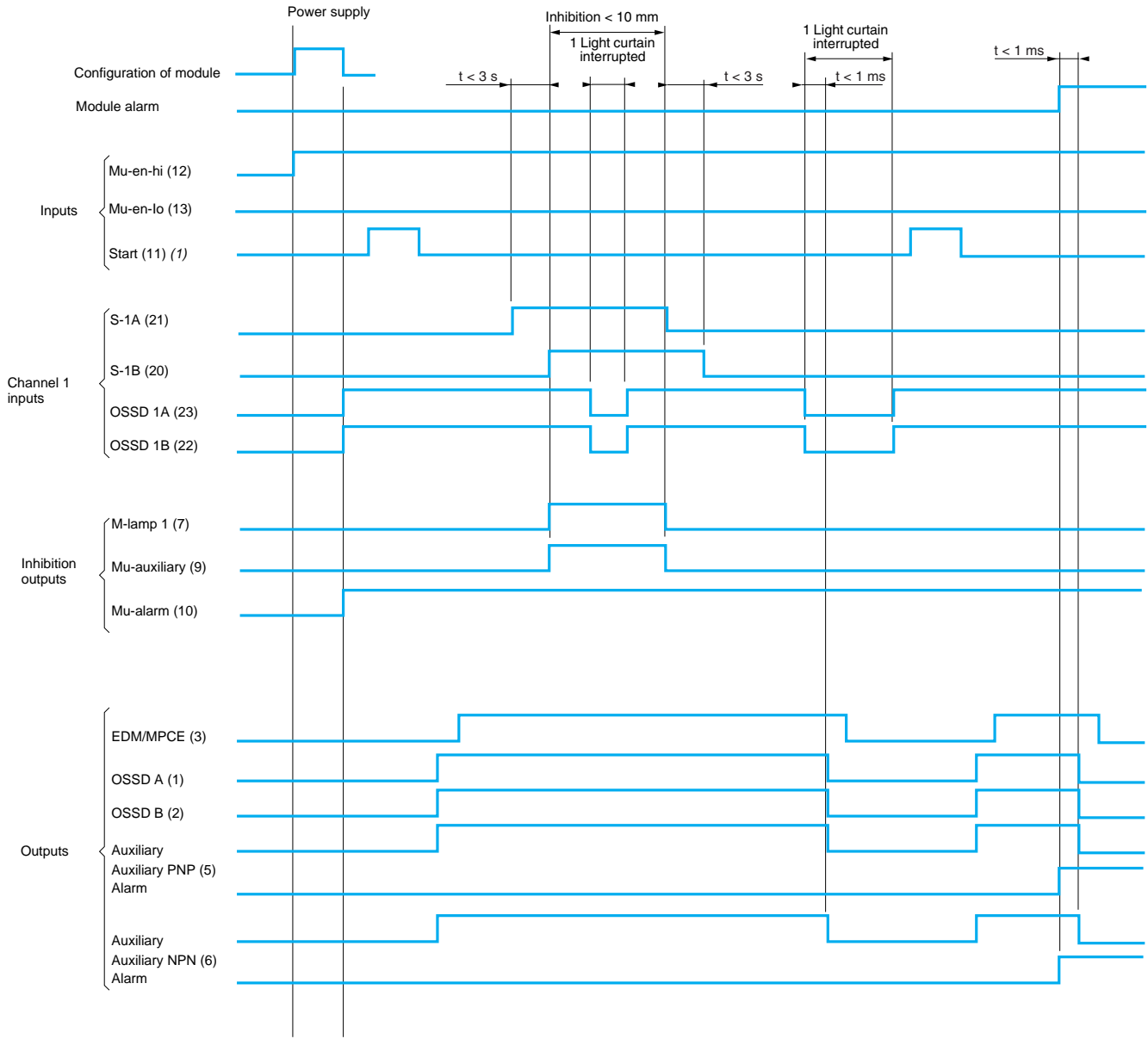
- (1) Arc suppressor.
- (2) Mute enable/disable selector switch.

Preventa™ XPS Safety Relays

Muting of Light Curtains

Functional diagram of the XPSLCM1150 module

"Start/restart interlock" mode with 2 sensors

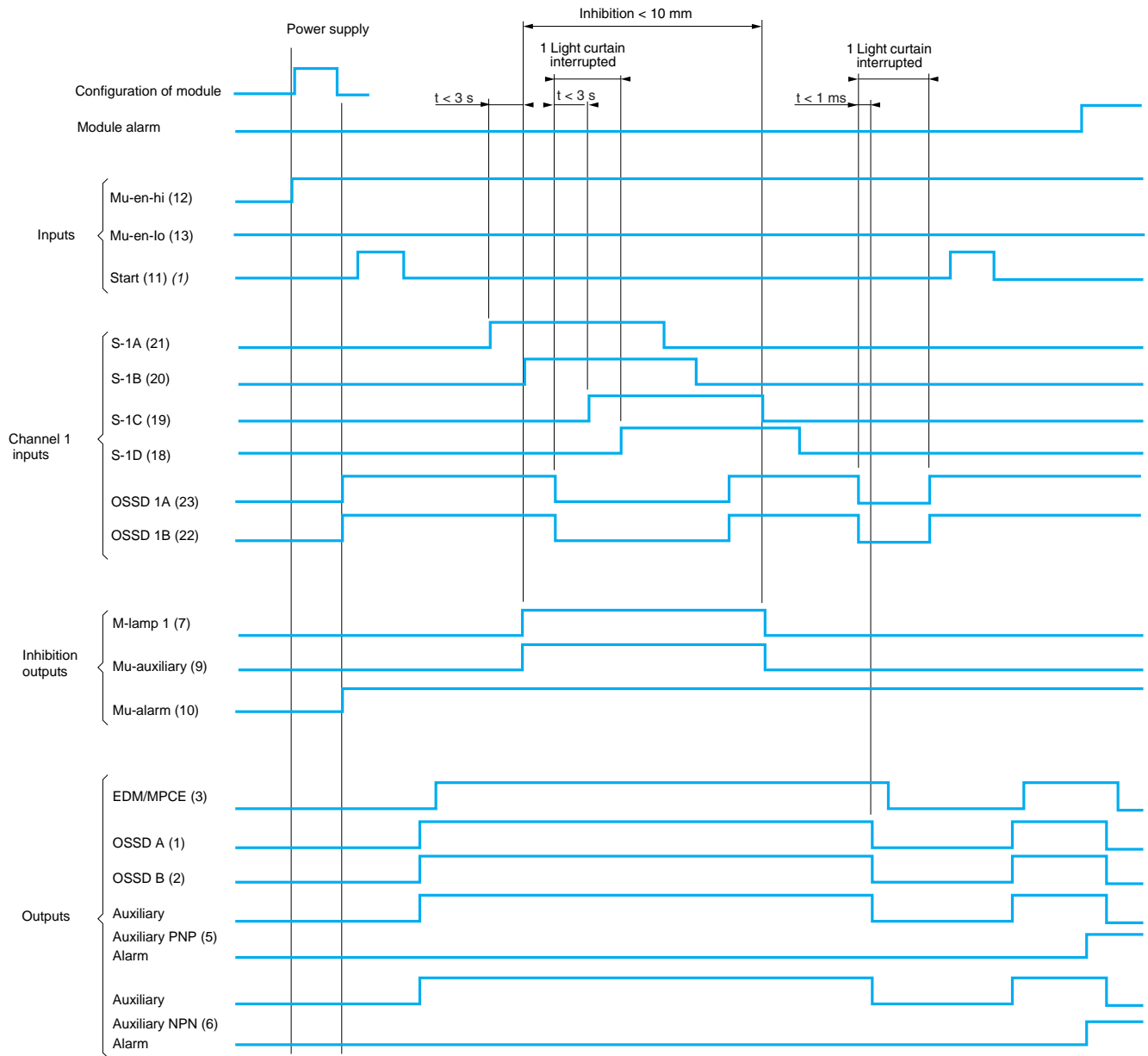


Key 0 1

(1) Press Start button.

Functional diagram of the XPSLCM1150 module

"Start/restart interlock" mode with 4 sensors



Key 0 1

(1) Press Start button.

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