

XPSLCM1150

Safety light curtains mute module

User's Manual

08/2007



W917063480211A03

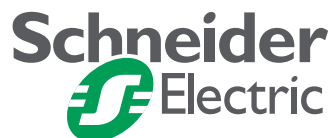
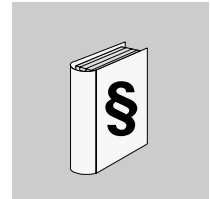


Table of Contents



	Safety Information	5
	About the Book	7
Chapter 1	Description of XPSLCM1150	11
	At a glance	11
	Description of XPSLCM1150 mute module	12
	Description of Controls	14
	Adjusting the safe mounting distance	19
	Technical ratings	20
	Terminal assignments	22
	Installation wiring example	23
	XPSLCM1150 visible indicators	28
	Operating states and corresponding outputs	30
	Cable lengths	33
	Setting XPSLCM1150 configuration switches	34
	Dimensions	36
Chapter 2	Application examples	37
	At a glance	37
	Application information	38
	Two sensor muting system	40
	Three sensor muting system	43
	Four sensor muting system	46
	Description of the bypass-allowed feature	50
Chapter 3	Diagnostic display	53
	At a glance	53
	System diagnostic codes	54
	Mute operation diagnostic codes	56
Chapter 4	Test procedure	57
	Test procedure	57
Glossary	61

Safety Information



Important Information

NOTICE

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation, which, if not avoided, **will result** in death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation, which, if not avoided, **can result** in death, serious injury, or equipment damage.

CAUTION

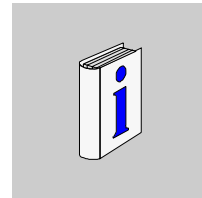
CAUTION indicates a potentially hazardous situation, which, if not avoided, **can result** in injury or equipment damage.

PLEASE NOTE

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

© 2007 Schneider Electric. All Rights Reserved.

About the Book



At a Glance

Document Scope The XPSLCM1150 Mute Module is an accessory device used to provide a safety-rated muting function in conjunction with safety light curtains. Muting is defined as «bypassing the protective function on safety related control system such as a safety light curtain, during a pre-determined operation of a machine.»

Validity Note The data and illustrations found in this book are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be construed as a commitment by Schneider Electric.

Product Related Warnings

 **WARNING**

IMPROPER SET UP OR INSTALLATION.

Read all responsibilities and requirements listed below before installing the XPSLCM1150 module.

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

 **WARNING**

UNINTENDED OPERATION.

Muting can disable the safety functions of a machine. The proper installation, checkout and operation of a machine and muting system in accordance with all applicable laws and standards, is critical to the safe operation of the machine. Failure to comply with these instructions may result in severe injury to personnel..

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

 **WARNING**

REDUCED PROTECTION LEVEL

When the XPSLCM1150 module is used with a Type 2 rated light curtain or another Type 2 device, the overall system protection is reduced to Category 2.

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

Whether a specific machine application and XPSLCM1150 installation complies with safety regulations depends on several factors, including the proper application, installation, maintenance and operation of the XPSLCM1150 and its associated sensors. These items are the responsibility of the purchaser, installer and employer. The employer is responsible for the selection and training of personnel to properly install, operate and maintain the machine and its safeguarding systems.

This product is designed to comply with:

- IEC61496-1
- ANSI B11.19 - 1990
- EN954-1

The XPSLCM1150 should only be installed, verified and maintained by a qualified person, as «a person or persons who, by possession of a recognized degree or certificate of professional training, or who, by extensive knowledge, training or experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work.».

Use of a muting function requires special precautions by the safety system machine controller, installer, operator and employer. The following is only a partial list of requirements when utilizing muting and is not intended to be a complete guide to muting standards. The employer must contact the local safety authority for specific requirements regarding the machine, machine controller and safety related control system. Schneider provides the following information for user reference only and makes no claim regarding the accuracy, completeness or effectiveness for a specific application from any organization:

- Muting of the light curtain is only permitted during the nonhazardous portion of the machine cycle.
- If the machine tool has reversing capability where a muting hazard is possible the control shall include an automatic means through which muting is only permitted in the forward direction.
- Selection of the muting feature shall be by a key-operated switch under supervisory control by the employer.
- One or more visual indicator(s) shall be provided which are illuminated when the light curtain is in a muted condition.
- Any fault condition of the mute indicator(s) shall not allow the light curtain to enter a mute condition.
- The mute indicator(s) should be readily visible from any normal machine operator position and from the position at which any adjustment of the muting is normally carried out.
- There shall be at least two, independent muting signal sources to be used with the XPSLCM1150. A single, simple cam-operated limit switch is inadequate as a muting signal source since its failure can remain undetected.
- The proper selection, installation and orientation of the muting sensors are the responsibility of the employer and installer.
- The muting position (of the mute signal source) shall be secured against unauthorized adjustment by provision of special tools, key entry, electronics passwords and the positioning and mounting of associated limit switches.
- The guarded machine must be able to stop anywhere in its cycle. Do not use an XPSLCM1150 on a press with a full-revolution clutch.
- The guarded machine must have a consistent stopping time and adequate control mechanisms.
- Severe smoke, particulate matter and corrosives may degrade the efficiency of the optical safety devices. Do not use optical safety devices in this type of severe environment.
- All applicable governmental, state, local and employers rules, codes and regulations must be satisfied. This is the employers responsibility.

- All safety-related machine control elements must be designed so that a fault in the control logic or failure of the control circuit does not lead to a failure or danger.
- Additional guarding may be required for access to dangerous areas not covered by the safety device system.
- Perform the test procedure at installation and after maintenance, adjustment, repair or modification to the machine controls, tooling, dies or machine, or the XPSLCM1150 and safety device system.
- Follow all procedures in this manual for proper operation of the XPSLCM1150 Mute Module.

The enforcement of these requirements is beyond the control of the manufacturer. The employer has the sole responsibility to follow the preceding requirements and any other procedures, conditions and requirements specific to his machinery.

User Comments

We welcome your comments about this document. You can reach us by e-mail at techpub@schneider-electric.com

Description of XPSLCM1150



1

At a glance

Overview

This chapter describes the XPSLCM1150.

What's in this Chapter?

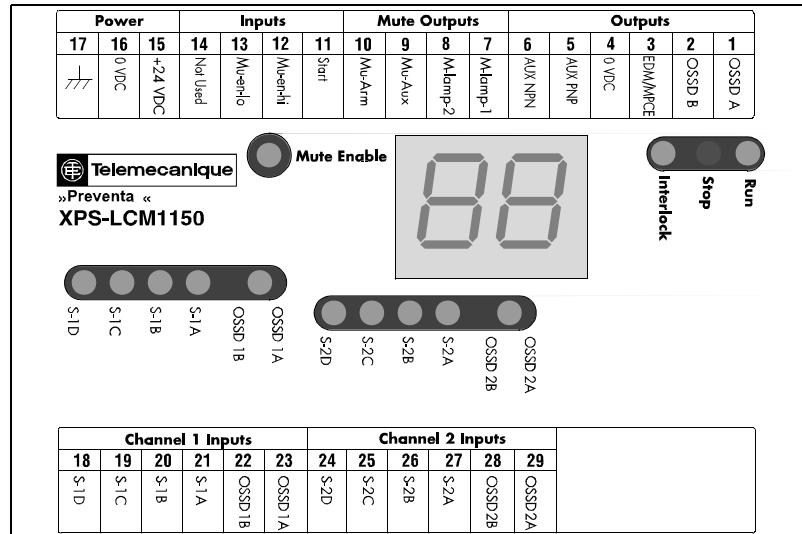
This chapter contains the following topics:

Topic	Page
Description of XPSLCM1150 mute module	12
Description of Controls	14
Adjusting the safe mounting distance	19
Technical ratings	20
Terminal assignments	22
Installation wiring example	23
XPSLCM1150 visible indicators	28
Operating states and corresponding outputs	30
Cable lengths	33
Setting XPSLCM1150 configuration switches	34
Dimensions	36

Description of XPSLCM1150 mute module

Front panel

XPSLCM1150 Front panel



Features

- The XPSLCM1150 Mute Module is a Category 4 safety device that interfaces between a machine and certain protective safety devices to temporarily suspend those devices during the non-hazardous portion of the machine cycle. It conforms with EN 954-1 and has been certified to IEC 61496-1.
- Fast 1 ms response time.
- Works with either 1 or 2 safety devices (safety light curtain, safety controller, etc.)
- Two-channel mute sensor inputs for 2, 3 or 4 PNP-type electro-optic sensors, or limit switches or other sensing devices.
- LED indications for individual input and output status.
- Two-digit diagnostic display.
- External mute indication for operator awareness.

Applications

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

When the mute mode is disabled, the XPSLCM1150 outputs are the same as those of the connected safety devices. Any entry into the guarded area will result in a stop signal being sent to the guarded machine.

The XPSLCM1150 provides two "mute safety channels", each accepts a single safety device, and either two, three or four mute sensors to activate the mute mode. The mute mode is active when the correct sequence of mute sensor input signals is achieved.

Each safety device output must be capable of supplying two 24 V DC (PNP) output signals when the sensing field is clear. Mute sensors must have PNP type outputs, sensor pairs are made-up of both "dark operate" and "light operate" sensors.

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 lamp circuit to ensure the indicator is operational.

Description of Controls

WARNING

IMPROPER INSTALLATION

Muting can disable the safety functions of a machine. The proper installation, checkout and operation of a machine and muting system; in accordance with all applicable laws and standards, is critical to the safe operation of the machine. Failure to comply with these instructions may result in severe injury to personnel. **Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Power requirements

The XPSLCM1150 requires a dedicated power supply of 24 V \pm 10 %, providing a minimum of 2 amperes that meets the requirements of IEC61496-1 and IEC60204-1, part number ABL8RPS24030 or equivalent.

- System Common Return

For proper operation, the power supply common, (0 V \pm), must be connected to each of the components in the system, including start/enable switches, EDM/MPCE monitor, all OSSD and Auxiliary loads.

- Chassis Ground or Protective Earth (PE) Connection

The chassis ground terminal of the XPSLCM1150 must be connected to the earth ground of the installation site to ensure protection from electrical interference and high voltage transients.

**XPSLCM1150
input devices**

- Sensor Inputs

The XPSLCM1150 module accommodates up to two independent channels identified as Channel 1 & Channel 2. Each channel is comprised of one safety input device and either two, three, or four mute input sensors.

- Safety Input Devices (OSSD Inputs)

The XPSLCM1150 supports safety devices such as safety light curtains, safety controllers or other safety-rated devices that provide two 24 V DC inputs into the XPSLCM1150 whenever their protected area is clear.

Note: If using an input from a relay-type safety device, the two OSSD signals must switch to the On and Off state within 300 msec of each other to be recognized as proper OSSD inputs.

- Mute Sensor Inputs

Muting is controlled by two or more separate input sources. These devices can be optical, inductive or mechanical. Sensors S1A, S1C, S2A & S2C must have «Dark-On» PNP type outputs, nominal 24 V DC when Ok to mute. Sensors S1B, S1D, S2B & S2D must have «Light-On» PNP type outputs, nominal 0 volts (no current flow) when Ok to mute.

 **WARNING**

IMPROPER SET UP OR INSTALLATION

You must have at least two independent mute sensors to activate the mute circuit. A single device with multiple outputs such as single limit switch, is inadequate as a mute sensor since its failure can remain undetected. Failure to comply with this requirement may cause the muting circuit to activate at the incorrect part of the machine cycle. Serious injury to personnel could result.

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

- Mute Enable / Disable

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 in the disable position all muting errors are cleared from the diagnostic display.

- Start Switch

A push-button switch is required to reset the XPSLCM1150 from a Start/Interlock condition, a fault interlock, or allow the Bypass feature to be used. The input is DIP switch selectable for N/O or N/C operation.

 WARNING

IMPROPER INSTALLATION OF THE START BUTTON

The Start switch shall be located outside of the safeguarded area such that it cannot be reached from within the safeguarded area. The location must allow complete visibility of the guarded area. The operator must ensure that the safeguarding zone is clear before press & release of Start. This prevents the machine or muting function from starting while personnel may be in the hazardous area and avoids possible serious injury to personnel.

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

**XPSLCM1150
outputs**

 **WARNING**

IMPROPER OUTPUT OPERATION

Muting is only allowed during the non-hazardous portion of the machine cycle! A muting application must be designed so that no single component failure can prevent the stop command or allow subsequent cycles until the failure is corrected. (USA standard OSHA 1910.217(c)(3)(iii) (d), ANSI B11.19-1990 section 4.2.3.3.7) Failure to comply with this requirement may cause the muting circuit to activate at the incorrect part of the machine cycle, serious injury to personnel could be resulted.

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

- Output Signal Switching Devices (OSSD's)

The XPSLCM1150 uses two solid-state outputs to send a stop signal to the guarded machine. When the XPSLCM1150 is in the normal Run mode with the safety device(s) clear, or in the Mute mode regardless of the safety device(s) status, the OSSD outputs are turned on, sourcing 24 V DC @ a maximum of 625 mA. Solid-state outputs achieve their safety ratings by periodically switching the output state and verifying that the device did indeed switch. This operation is performed periodically and is essentially transparent to the machine control circuit.

 **WARNING**

IMPROPER OUTPUT SET UP

You Must Use both OSSD safety outputs from the XPSLCM1150! Each output must be wired such that it is capable of stopping the guarded machine. Failure to use both XPSLCM1150 safety outputs may prevent the machine from stopping, resulting in possible severe injury to personnel.

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

- Auxiliary Outputs

The XPSLCM1150 provides non-safety auxiliary outputs in both PNP and NPN configurations. The PNP output source 24 V DC @ 500 mA, the NPN output sinks up to 100 mA.

The auxiliary outputs are user selected to either follow the OSSD outputs, or activate when a fault condition is detected.

- Mute Lamp Outputs 1 & 2

A visible mute lamp is required for each channel of the XPSLCM1150 to indicate the mute function is active. Mute Lamp outputs are NPN current sinking inputs. Each input is monitored to ensure 40-300 mA is flowing through the circuit when Mute is activated. If the required current is not detected, then the XPSLCM1150 will not enter the Muting state and will display diagnostic codes. If a current is detected when the mute function is NOT activated, the XPSLCM1150 will enter the Lockout state.

 WARNING
--

IMPROPER MUTE INDICATION

An indication that the protected area is muted must be provided and readily observable to the machine operator. The mute lamp is an important warning device to the machine operator, indicating that muting is active.

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

- Mute Indicator Auxiliary Outputs

Mute Auxiliary and Mute Armed functions are available as non-safety-rated outputs. Each is configured as NPN sinking at a maximum of 100 mA. Mute Aux will indicate whenever the XPSLCM1150 is in the Muting state. Mute Armed will indicate the XPSLCM1150 is Mute Enabled.

- EDM/MPCE Monitor

The XPSLCM1150 OSSD outputs are designed to connect directly to the machine primary control element, or EDM/MPCE. EDM/MPCE monitoring is the capability to directly monitor machine control devices and ensure their operation coincides with the commands of the XPSLCM1150.

Adjusting the safe mounting distance

Using the XPSLCM1150 without mechanical relays

The XPSLCM1150, when used without mechanical relays, will add 1 millisecond (0.001 sec) to the overall response time of the safety control system. This will increase the safe mounting distance of the safety sensing device. See the installation manual of the safety sensing device for further information on calculating the proper safeguarding distance.

Using the XPSLCM1150 with safety mechanical relays

The XPSLCM1150 itself adds 1 millisecond (0.001 sec) to the response time of the safety control system. Additionally, you must also add the response time of the mechanical relays to determine the total impact on the safety control system. This will increase the safe mounting distance of the safety device. The XPSLCM1150 should only be used with safety rated mechanical relays employing force guided contacts. Contact the relay supplier for the safety rating suitability and response time. Refer to the installation manual of the safety sensing device for further information on the safe mounting distance.

Technical ratings

Specifications

Safety Category	Type 4 per IEC 61496-1.
Response Time	Less than 1 msec.
Input Power	24 V \pm +/- 10%, 150 W max. (a) 24 V \pm +/- 10%, 6 W (250mA) min
Operating Temperature	0 °C to 55 °C.
Humidity	Less than 95% Non Condensing
Storage Temperature	-25 °C to 75 °C
Vibration	In accordance with IEC 60068-2-6, 0.35mm displacement, 10 to 55 Hz.
Shock	In accordance with IEC 60068-2-29, 10g, 16 ms pulses, 1000/ axis.
Enclosure	IP-20
Outputs	
Safety Outputs (OSSD)	Two independent 625 mA (max.) current sources (PNP), 24 V \pm .
Auxiliary Outputs	Auxiliary NPN output: 100 mA (max.) current sink, 24 V \pm max. Auxiliary PNP output: 500 mA (max.) current source, 24 V \pm .
Mute-Lamp	Two (NPN) Outputs 40-300 mA, 24 V \pm Max. (b)
Mute Auxiliary	NPN Output 100 mA (max.), 24 V \pm Max
Mute-Armed	NPN Output 100 mA (max.), 24 V \pm Max
EDM/MPCE Monitor	24 V \pm , 50 mA (sourced by XPS)
Inputs	
Safety Devices(OSSD Inputs)	PNP 24V \pm @ 50 mA Machine Run, 0 volt Machine Stop
Mute Sensor	PNP 24 V \pm (20 mA consumption)
Mute-Enable	Selector Key-Operated Switch, Maintained Contacts
Start / Restart	Either N/O or N/C Momentary Contact (10 mA consumption)

(a) Power to the XPSLCM1150 must be provided from a dedicated power supply that meets the requirements of IEC 60204-1 and IEC 61496-1, Schneider part number ABL8RPS24100 (150 W) or equivalent maxi loads on outputs.(not included NPN outputs, mute lamps, sensors and light curtains).

(b) The external lamp must provide a current load between 40 mA and 300 mA for the lamp monitoring circuit to sense proper operation of the mute lamp.

Power Supply Requirement

Total System Components

4 sensor muting system	Full output load + Full temperature range	Reduced output load (1)+ Full temperature range	
1 light curtain XUSLT	ABL8RPS24050	ABL8RPS24030 (Iout < 1.45 A)	
1 light curtain XUSLM		ABL8RPS24030 (Iout < 1.60 A)	
1 light curtain XUSLP		ABL8RPS24030 (Iout < 1,7 A)	
1 light curtain XUSLN		ABL8RPS24030 (Iout < 1,9 A)	
2 light curtains XUSLN		ABL8RPS24030 (Iout < 1,4 A)	
2 light curtains XUSLP		ABL8RPS24030 (Iout < 0,9 A)	
1 light curtain XUSLT 1 light curtain XUSLN		ABL8RPS24030 (Iout < 0,9 A)	
1 light curtain XUSLN 1 light curtain XUSLP		ABL8RPS24030 (Iout < 1,2 A)	
2 light curtains XUSLT	ABL8RPS24100	ABL8RPS24030 (Iout < 0.5 A)	ABL8RPS24050 (Iout < 2.3 A)
2 light curtains XUSLM		ABL8RPS24030 (Iout < 0.75 A)	ABL8RPS24050 (Iout < 2.55 A)
1 light curtain XUSLT 1 light curtain XUSLP		ABL8RPS24030 (Iout < 0.65 A)	ABL8RPS24050 (Iout < 2.45 A)
1 light curtain XUSLM 1 light curtain XUSLN		ABL8RPS24030 (Iout < 1,1 A)	ABL8RPS24050 (Iout < 2,9 A)
1 light curtain XUSLM 1 light curtain XUSLP		ABL8RPS24030 (Iout < 0,8 A)	ABL8RPS24050 (Iout < 2,6 A)

Note: (1): Output load I out = XPSLCM1150 OSSD output currents including light curtain Aux output, Mute lamp Aux output and Mute Lamps.

Terminal assignments

Function Pin Assignment

Pin #	Function	Assignment	Pin #	Function	Assignment	
1	XPS Outputs & EDM/MPCE Input	OSSD A	34	Mute Input Channel 2		
2		OSSD B	33			
3		EDM/MPCE MON	32			
4		0 V ===	31			
5		AUX-PNP	30			
6		AUX-NPN	29			
7	Mute Outputs	MUTE-LAMP 1	28		Mute Input Channel 1	OSSD 2A
8		MUTE-LAMP 2	27			SENSOR 2A
9		MUTE-AUX	26			SENSOR 2B
10		MUTE-ARMED	25			SENSOR 2C
11	XPS Control Inputs	START	24	Mute Input Channel 1	SENSOR 2D	
12		MUTE-ENABLE HI	23		OSSD 1A	
13		MUTE-ENABLE LO	22		OSSD 1B	
14	Power	Not used	21	Mute Input Channel 1	SENSOR 1A	
15		+24 V ===	20		SENSOR 1B	
16		0 V ===	19		SENSOR 1C	
17		Earth Ground	18		SENSOR 1D	

The XPSLCM1150 power input return (0 V ===) must be connected to the overall system component returns. Safety Light curtains, start switch, EDM/MPCE monitor, OSSD loads and auxiliary loads must be all connected in common for proper system operation.

The Earth Ground terminal of the XPSLCM1150 must be connected to the enclosure or chassis ground of the installation site. Protection devices internal to the XPSLCM1150 that provide immunity from electrical interference connect to this earth ground terminal.

Installation wiring example

Description

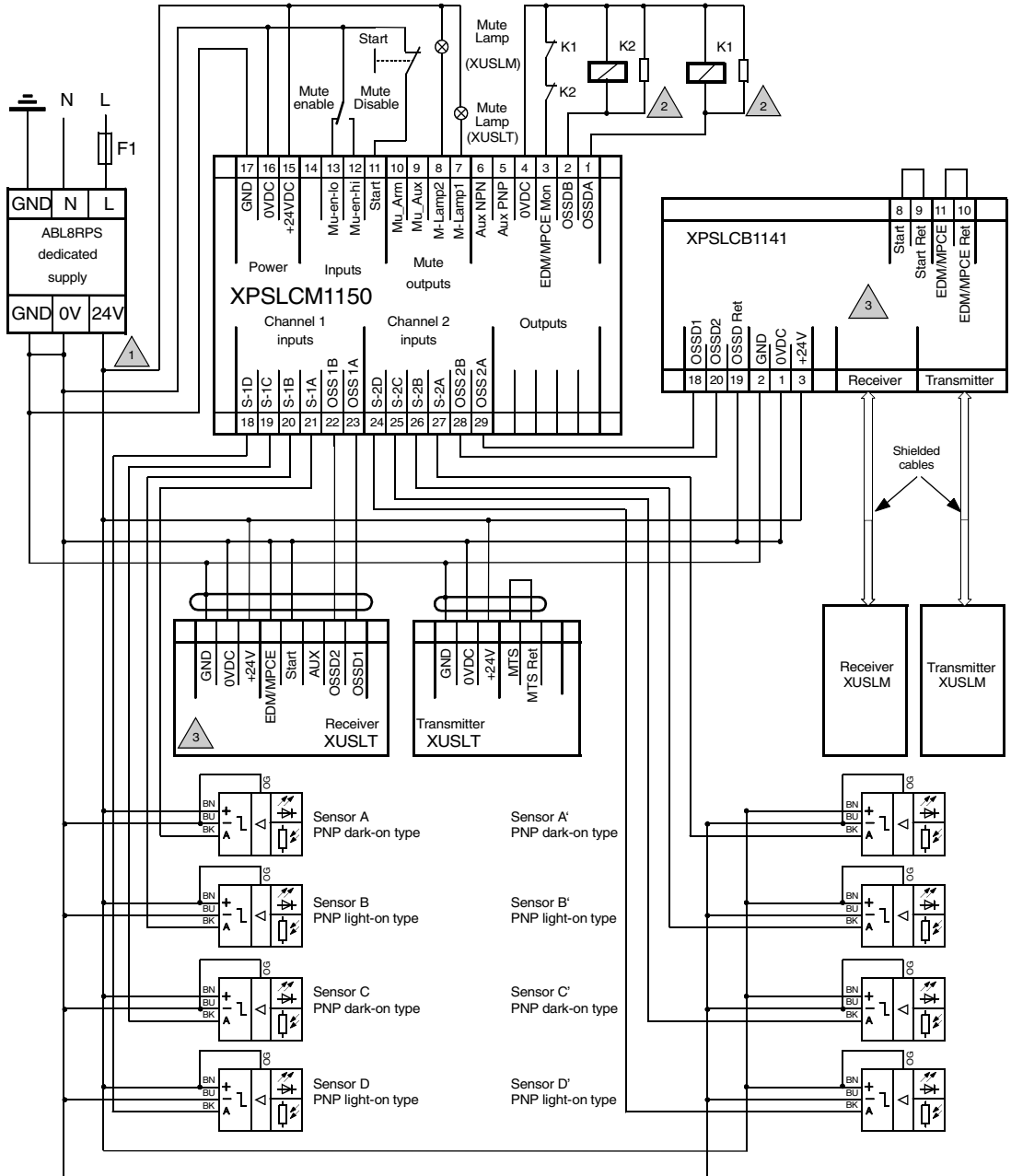
XPSLCM1150 Mute Module with two sensing channels connected.

Note:

- The Start switch must be located in an area that allows complete visibility of the guarded area. The operator must ensure that the protection zone is clear before press & release of Start.
 - Mute sensors S1A, S1C, S2A & S2C must have 'Dark-On' PNP type outputs, nominal 24 V \Rightarrow when Ok to mute and nominal 0 V \Rightarrow when no mute. Mute sensors S1B, S1D, S2B & S2D must have 'Light-On' PNP type outputs, nominal 0 V \Rightarrow when Ok to mute and nominal 24 V \Rightarrow when no mute.
-

Wiring

Wiring Diagram Example with 2 Light Curtains Connected (XUSLT and XUSLM):



Note: Transmitter and receiver sensors can also be used.

Legend



Install a wire between 0V and Ground
To choose the dedicated supply, see *Power Supply Requirement, p. 21*



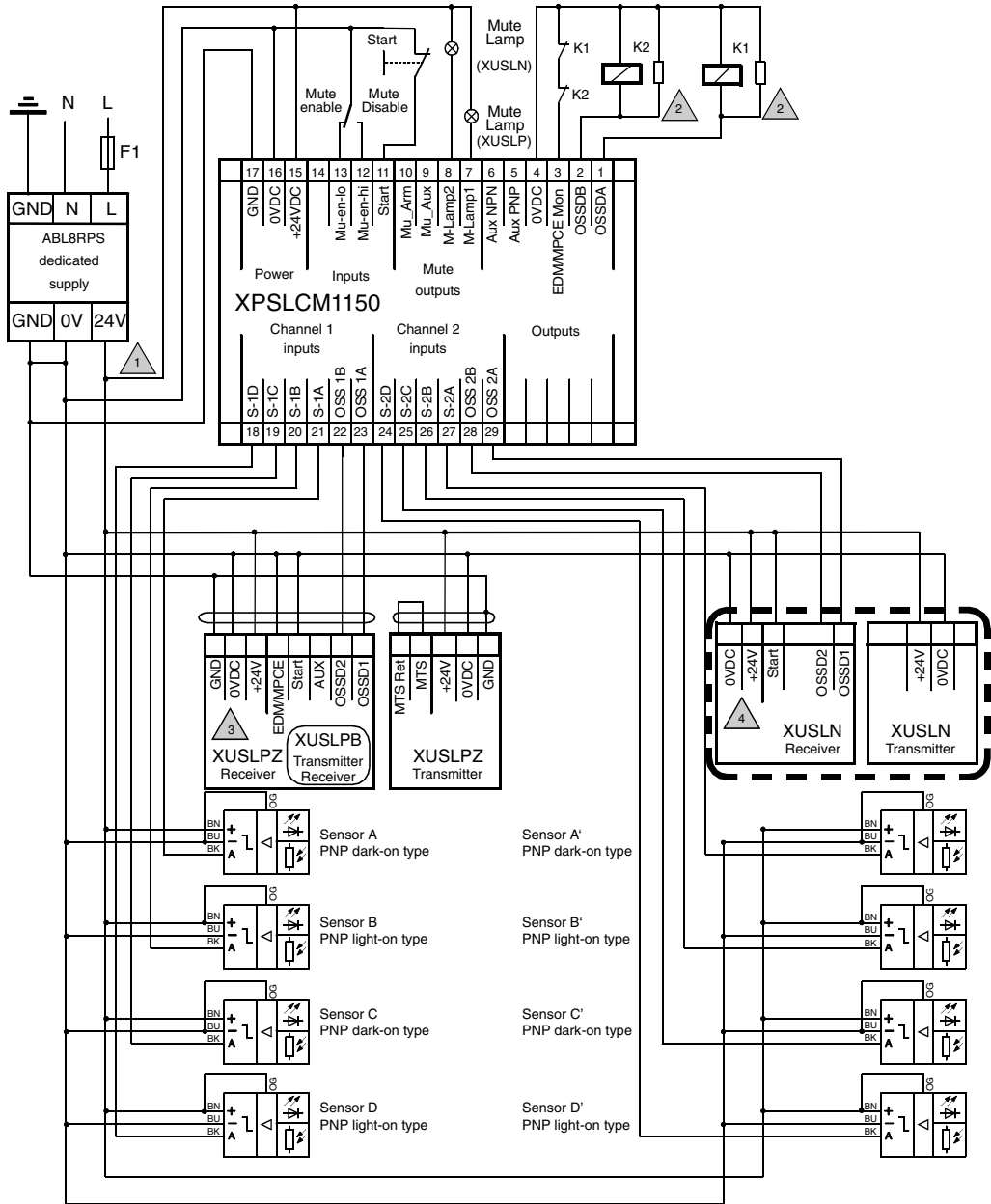
The coils must be suppressed with the arc suppressors provided in the documentation kit of the light barriers



The light barriers must be configured with EDM/MPCE monitoring disabled





Wiring

Wiring Diagram Example with 2 Light Curtains Connected (XUSLP and XUSLN):



Note: Tranmitter and receiver sensors can also be used.

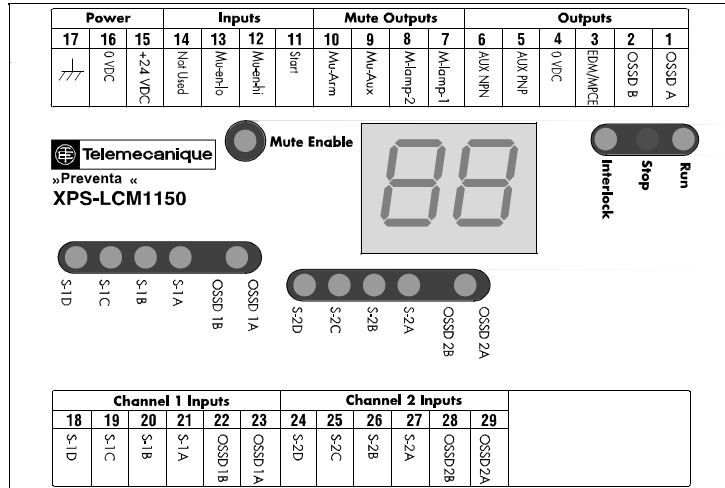
Legend

	Install a wire between 0V and Ground To choose the dedicated supply, see <i>Power Supply Requirement, p. 21</i>
	The coils must be suppressed with the arc suppressors provided in the documentation kit of the light barriers
	The light barriers must be configured with EDM/MPCE monitoring disabled
	When the XPSLCM1150 module is used with a Type 2 rated light curtain or another Type 2 device (XUSLN for example), the overall system protection is reduced to Category 2

XPSLCM1150 visible indicators

Description

Front panel and indicators



XPS Status	Color	State	Description
Mute Enable	Yellow	ON	External mute enable switch is set to ON
Interlock	Yellow	ON	Interlock State, waiting Start signal
	Yellow	FLASH	Lockout State (Internal or External Fault Detected)
Machine Stop	Red	ON	XPS OSSD Safety outputs are OFF
Machine Run	Green	ON	XPS OSSD Safety Outputs are ON
Channel 1 & 2 Status			
OSSD A/B	Green	ON	Both OSSD Inputs from Safety Device are On.
S-A	Yellow	ON	Muting Sensor S1-A is blocked (activated)
S-B	Yellow	ON	Muting Sensor S1-B is blocked (activated)
S-C	Yellow	ON	Muting Sensor S1-C is blocked (activated)
S-D	Yellow	ON	Muting Sensor S1-D is blocked (activated)

Diagnostic Display two digit numeric display that provides diagnostic codes.

Operating states and corresponding outputs

Corresponding table

XPSLCM1150 Operating States and Corresponding Outputs:

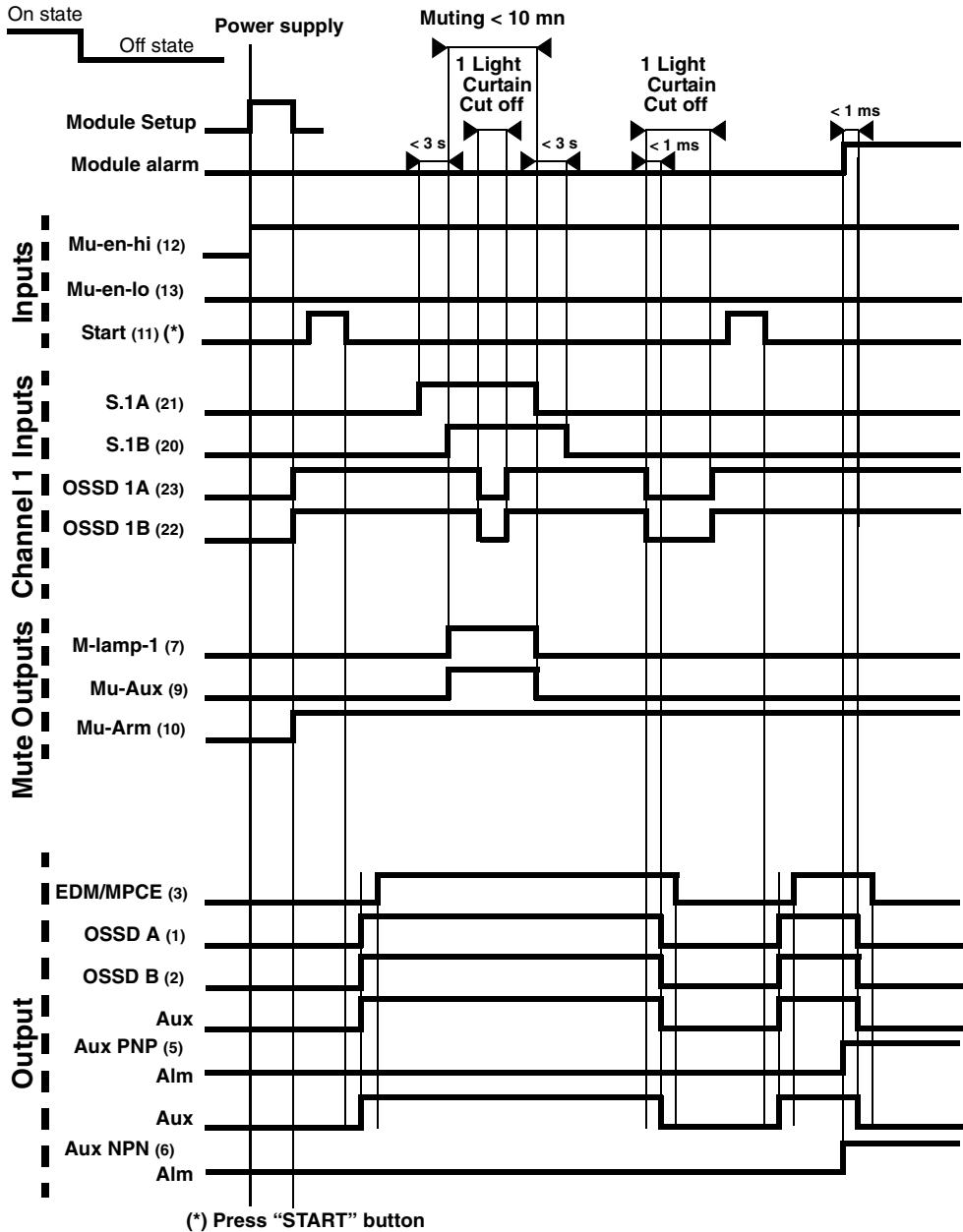
Output		Muting	Bypass Allowed	Machine Run	Machine Stop	Interlock	Lockout (Fault)
Machine Run, Green LED		ON	OFF	ON	OFF	OFF	OFF
Machine Stop, Red LED		OFF	ON	OFF	ON	ON	ON
Interlock or Fault, Yellow LED		OFF	OFF	OFF	OFF	ON	Blinking
OSSD A OUTPUT		ON	OFF	ON	OFF	OFF	OFF
OSSD B OUTPUT		ON	OFF	ON	OFF	OFF	OFF
AUXILIARY OUTPUTS	Follow OSSD	ON	OFF	ON	OFF	OFF	OFF
	Alarm Mode	OFF	OFF	OFF	OFF	OFF	ON
MUTE-LAMP 1 * OUTPUT		ON when Ch#1 is being muted	BLINKING when Ch #1 causes Bypass	OFF	OFF	OFF	OFF
MUTE-LAMP 2 * OUTPUT		ON when Ch#2 is being muted	BLINKING when Ch #2 causes Bypass	OFF	OFF	OFF	OFF
MUTE-AUX OUTPUT		ON	BLINKING	OFF	OFF	OFF	OFF
MUTE-ARMED OUTPUT		ON	ON	X	X	X	X

X = This output is dependent on Mute Enable input signal.

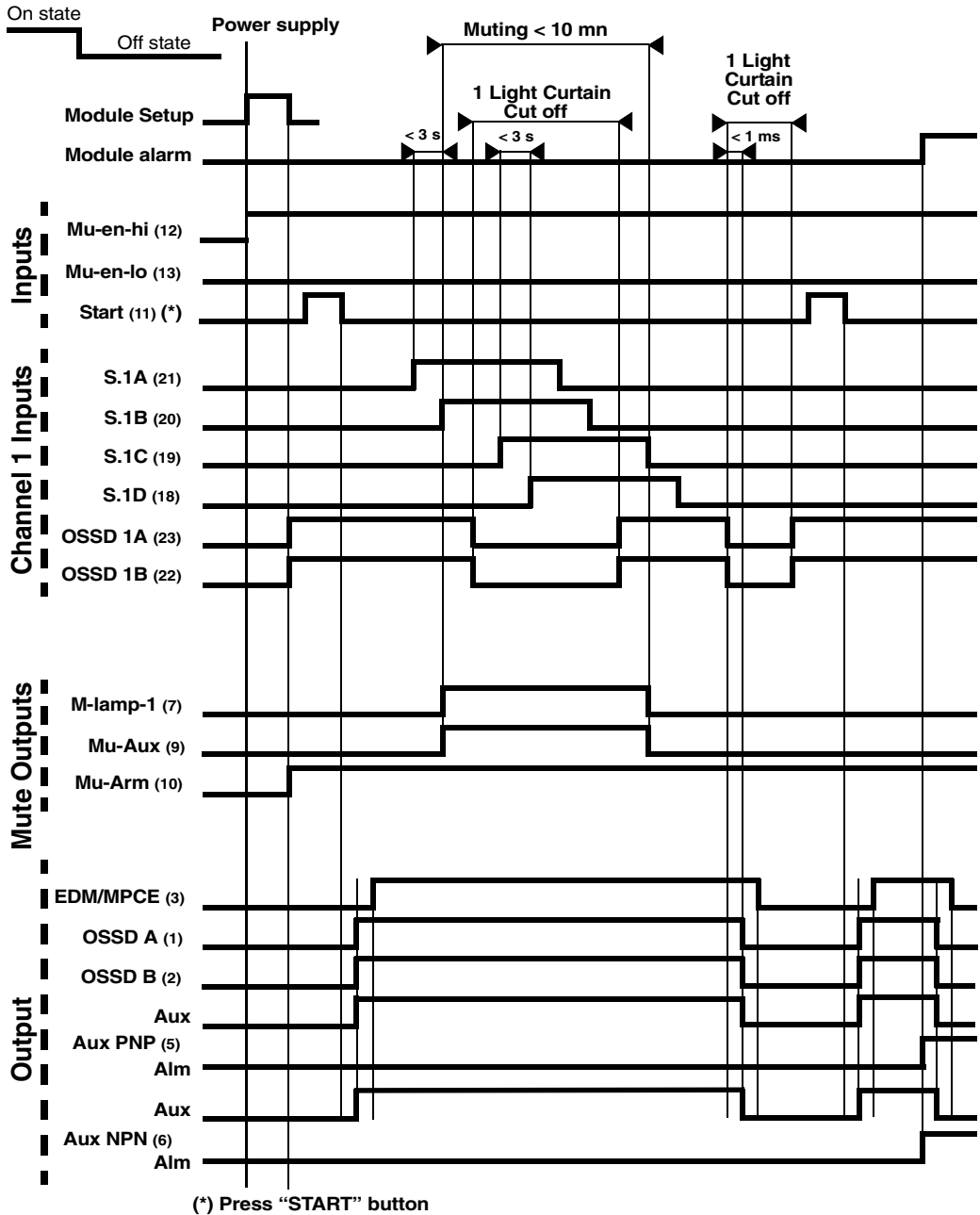
* = Use the mute lamp supplied with the module or be ordered separately in accessory.

Waveform Diagram

"Start/Restart Interlock" mode with 2 sensors



"Start/Restart Interlock" mode with 4 sensors



Cable lengths

Cables

The following table lists the recommended maximum lengths for the XPSLCM1150 input & output signals. Unshielded cables and wires may be used for all connections.

Signal Names	Cable or Wire	Specified max. length
Safety outputs A & B	20 AWG (0.3117 mm ²) wire with cable capacitance < 100 pF/ft. (<30pF/m)	300 mA load: 70 meter (230 ft.) 625 mA load: 35 meter (115 ft.)
Aux PNP and Mute Lamps 1 & 2 outputs	18 AWG (0.82 mm ²) wire	50 meter (164 ft.)
Aux NPN, Mute Aux and Mute Armed outputs	22 AWG (0.4418 mm ²) wire	100 meter (330 ft.)
Light curtain safety inputs	20 AWG (0.3117 mm ²) wire with cable capacitance < 100 pF/ft. (<30pF/m)	100 meter (330 ft.)
Mute sensor inputs	22 AWG (0.4418 mm ²) wire	100 meter (330 ft.)
Start input	22 AWG (0.4418 mm ²) wire	100 meter (330 ft.)
EDM/MPCE Monitor input	22 AWG (0.4418 mm ²) wire	100 meter (330 ft.)

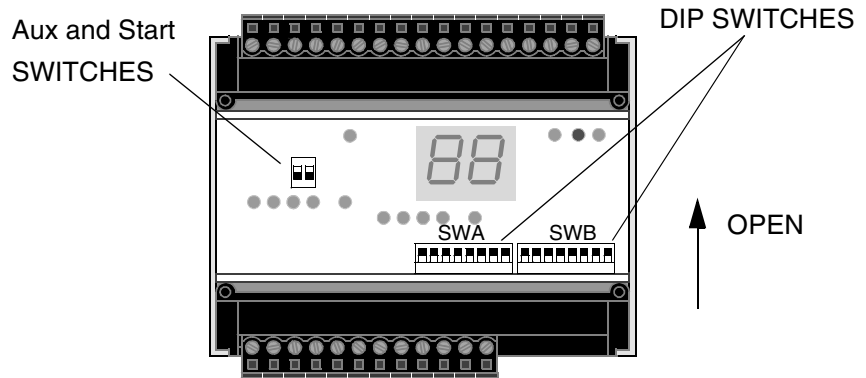
Setting XPSLCM1150 configuration switches

Principle

The XPSLCM1150 is configured for the various operating modes through the use of two banks of eight-position DIP switches and a single two-position DIP switch.

Accessing to configuration switches

The DIP switches are accessible by removing the front cover. The redundant DIP switches must be set exactly the same.



⚠ WARNING

IMPROPER MUTE INDICATION

Disconnect power before removing the controller cover.

Replace the controller cover before re-applying power.

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

**Field
configuration
switch settings**

Eight-Position Redundant DIP Switch Settings

Switch	Function Selection	Description
1 & 2	Start Mode	Automatic Start: 1 = On, 2 = On Start Interlock: 1 = On, 2 = Off Invalid Setting: 1 = Off, 2 = On Start/Restart Interlock: 1 = Off, 2 = Off
3	EDM/MPCE Monitoring	Enabled = Off, Disabled = On
4	Bypass Allowed	Enabled = On, Disabled = Off
5	Number of Light Curtains	1 Light Curtain System = On 2 Light Curtain System = Off
6 & 7	Number of Mute Sensors	Invalid Setting: 6 = On, 7 = On 2 Sensor System: 6 = On, 7 = Off 3 Sensor System: 6 = Off, 7 = On 4 Sensor System: 6 = Off, 7 = Off
8	Muting Time Limit	No time limit = On 2 minute time limit = Off

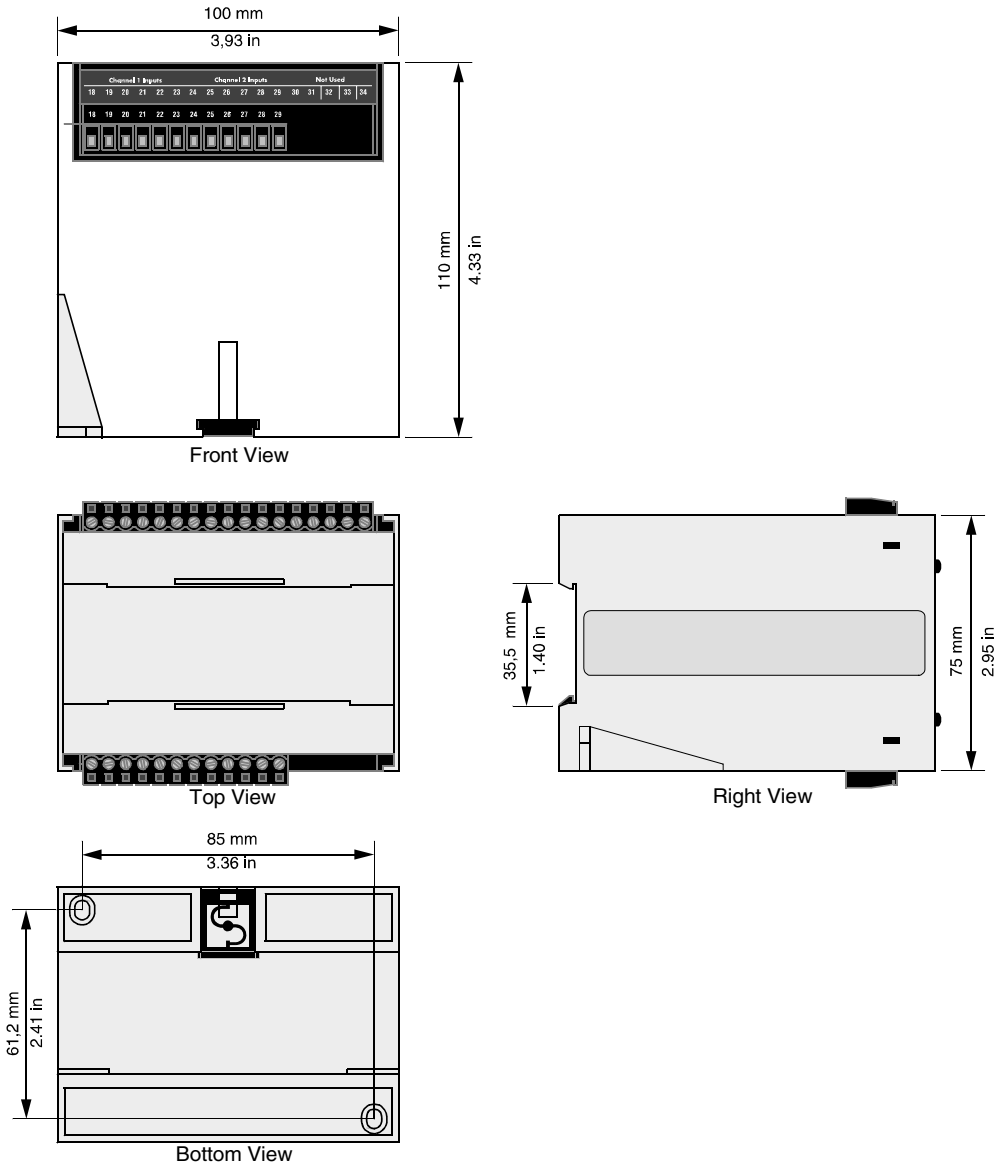
Two-Position DIP Switch Settings

Switch	Function Selection	Description
1	Auxiliary Output Mode	Follow OSSD output = On Alarm mode = Off
2	Start switch type	Normally Closed switch = On Normally Open switch = Off

Dimensions

Mechanical drawing

The drawing below gives the XPSLCM1150 dimensions:



Application examples

2

At a glance

Overview

This chapter describes some application examples.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
Application information	38
Two sensor muting system	40
Three sensor muting system	43
Four sensor muting system	46
Description of the bypass-allowed feature	50

Application information

Principle

The following section contains several application examples of how the XPSLCM1150 may be used with various arrangements of sensors to start and end the muting sequence.

Although photoelectric sensors are used in the example, other types of sensors, such as limit switches, inductive proximity sensors and ultrasonic sensors may be used as sensor inputs to the XPSLCM1150, provided that they met the electrical requirements of *XPSLCM1150 input devices*, p. 15.

Note: Schneider provides the following application examples for user reference only and makes no claim regarding the accuracy, completeness or effectiveness for a specific application from any organization.

WARNING

IMPROPER INSTALLATION OF SENSORS

The system installer and employer are responsible for the proper selection, installation and orientation of the muting sensors are critical to ensure that muting can never be initiated by personnel attempting access through the safeguarding device. Serious injury to personnel may result.

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

Selection and orientation of the muting sensors

The object of the correct muting sensor selection and orientation is to always recognize the presence of the workpiece 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.

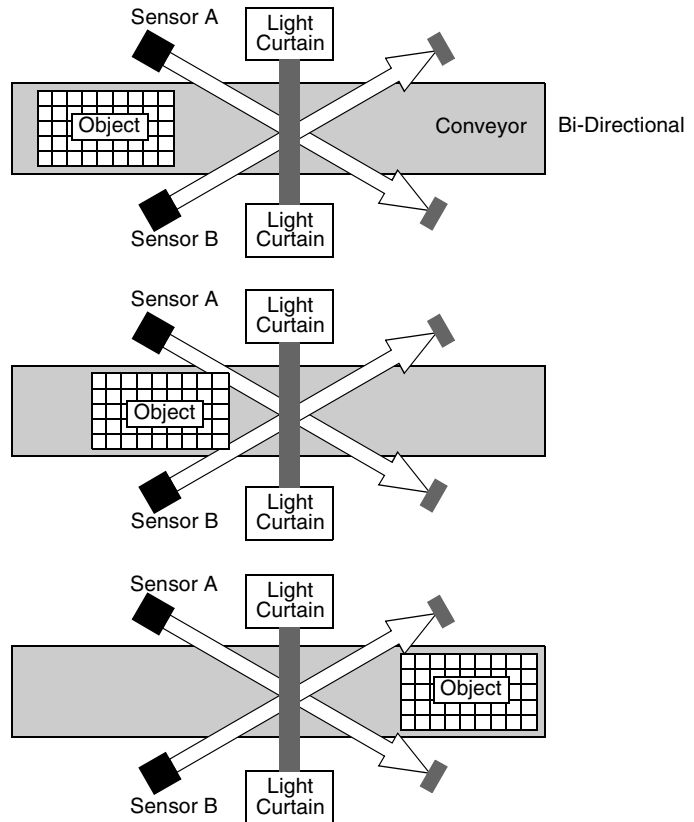
The proper selection, installation and orientation of the muting sensors are the sole responsibility of the employer and installer. The following recommendations must be observed, especially in conveyORIZED applications.

- The muting sensors should detect the material, and not the transportation means, such as a pallet, cart or other transport device. Ensure that a person on the transport device cannot initiate muting and enter the hazardous area.
 - Do not allow interruption in the sensing of the material while passing the muting sensors. The detection of the material should be continuous over its length.
 - If using photoelectric sensors, do not allow reflective material to interrupt or cause optical short circuits among different sensors. Likewise, do not allow sensors in adjacent areas to interfere or provide false indication.
 - Position the sensors such that before a new load of material is detected by the first sensor, the prior material has passed the last sensor and all muting sensors are deactivated for a period of time.
 - Consider the overall speed and cycle the material as it moves through the process. Time must be allowed for evaluating the muting sensors' output prior to the material reaching the safeguarding device.
 - Access by persons into the hazardous area of the machine must be prevented or detected such that a safeguarding device is able to send a stop signal to the machine before entering into the hazardous area. Other safeguarding methods, such as physical barriers or fences, may be necessary.
 - The muting position (of the sensors) shall be secured against unauthorized adjustment by provision of special tools, key entry, electronics passwords and the positioning and mounting of associated limit switches.
-

Two sensor muting system

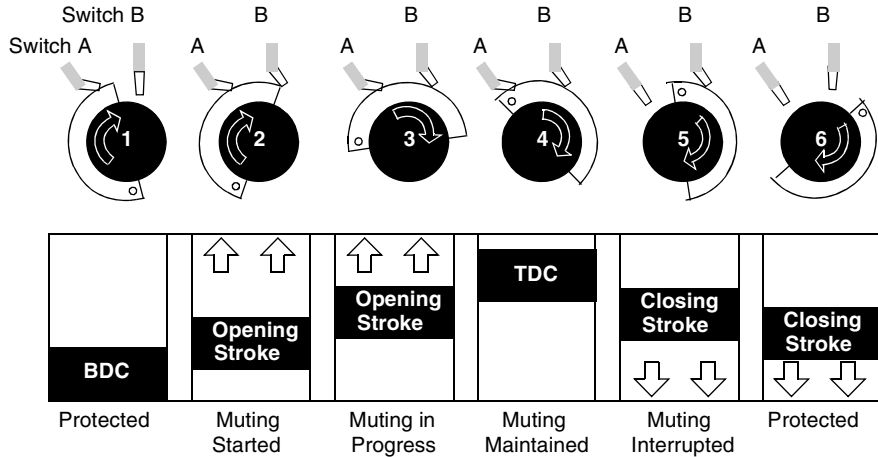
Conveyor belt muting system example

The figure below illustrates one application of a conveyor belt muting system using a two sensor configuration. The two sensor configuration muting system is bi-directional.



Mechanical press example

The figure below illustrates muting on a mechanical press using two switches to sense when to enter Muting state. Bottom Dead Center (BDC) is the point at which the tool is closest to the die. Top Dead Center (TDC) is the point at which the tool is furthest from the die.



Transition conditions

The table below describes conditions required to transition to Muting state with a two sensor system:

No. of Sensors	State	Mute Enable	Sensor A	Sensor B	Sensor C	Sensor D	System Status
2 Sensor System	State 1	OFF	X	X	X	X	Protected
	State 2	ON	OFF	OFF	XX	XX	Protected
	State 3	ON	OFF	ON	XX	XX	Protected
	State 4	ON	ON	OFF	XX	XX	Protected
	State 5	ON	ON	ON	XX	XX	Muting

X = Sensor can be in any state, does not apply to selected mode.

XX = Under normal conditions, these Sensor Inputs should not be connected. When the MUTE-ENABLE input is active, if at anytime these Sensor Inputs become active, the Muting system will transition to the LOCKOUT (FAULT) state.

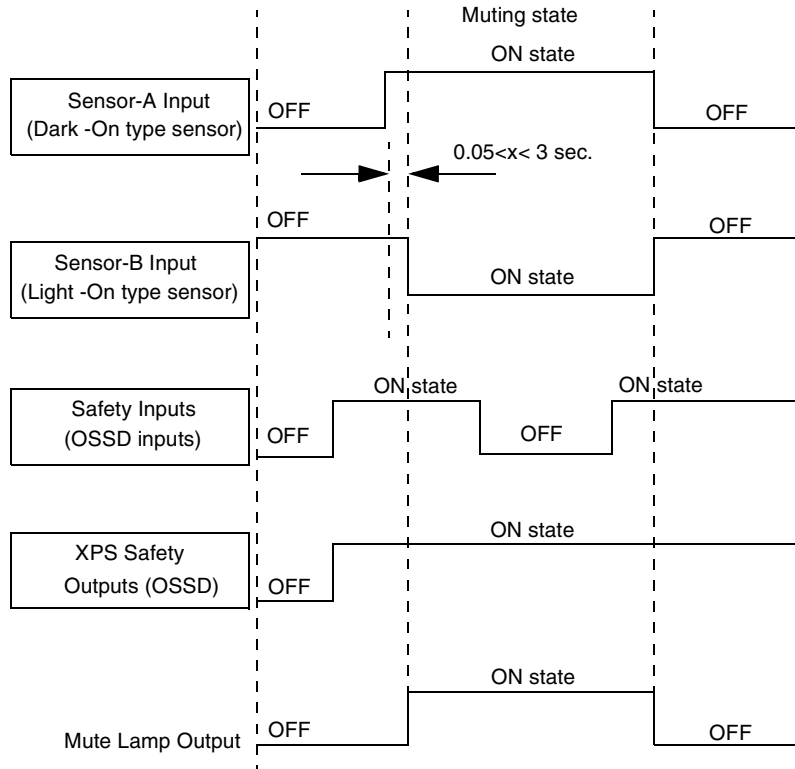
Sensor requirements

Sensor A must be a Dark-On type sensor with PNP type output or a switch that closes its contact to provide +24 V \equiv when it is Ok to mute.

Sensor B must be a Light-On type sensor with PNP type output or a switch that opens its contact when it is Ok to mute.

In a two sensor system, each sensor must transition to the ON state within 3 seconds of each other for the muting state to occur.

Two Sensor Muting System Waveform Diagram

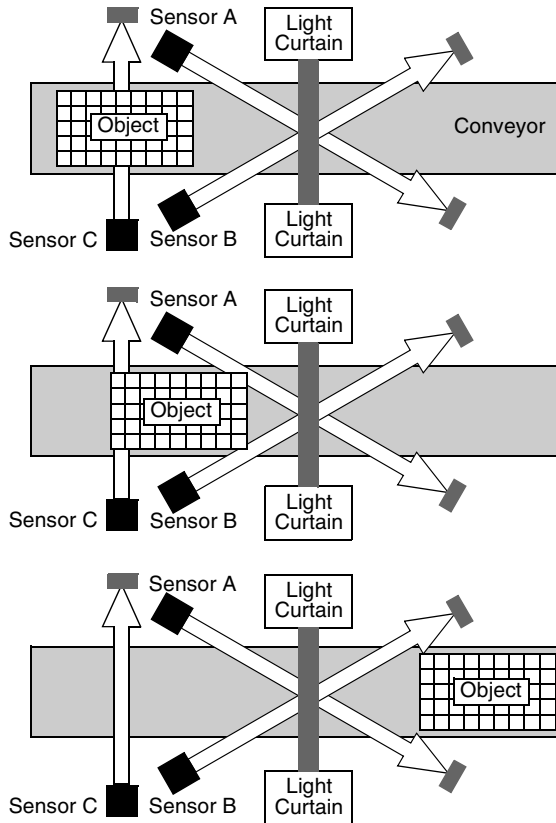


Three sensor muting system

Description

The three sensor system is a uni-directional system. In this application Sensor C is used as a direction detector, and must transition to the ON state prior to activation of sensor pair Sensor B and Sensor A. Sensors Sensor B and Sensor A must activate within 3 seconds of each other and Sensor C must turn OFF before Sensor B or Sensor A turn OFF. The figure below illustrates a muting system used in a three sensor conveyor belt configuration.

Three Sensor System Design



Transition conditions

The table below describes conditions required to transition to Muting state with a three sensor system:

No. of Sensors	State	Mute Enable	Sensor A	Sensor B	Sensor C	Sensor D	System Status
3 Sensor System	State 1	OFF	X	X	X	X	Protected
	State 2	ON	OFF	OFF	OFF	XX	Protected
	State 3	ON	OFF	OFF	ON	XX	Protected
	State 4	ON	ON	ON	ON	XX	Muting
	State 5	ON	ON	ON	OFF	XX	Muting

X = Sensor can be in any state, does not apply to selected mode.

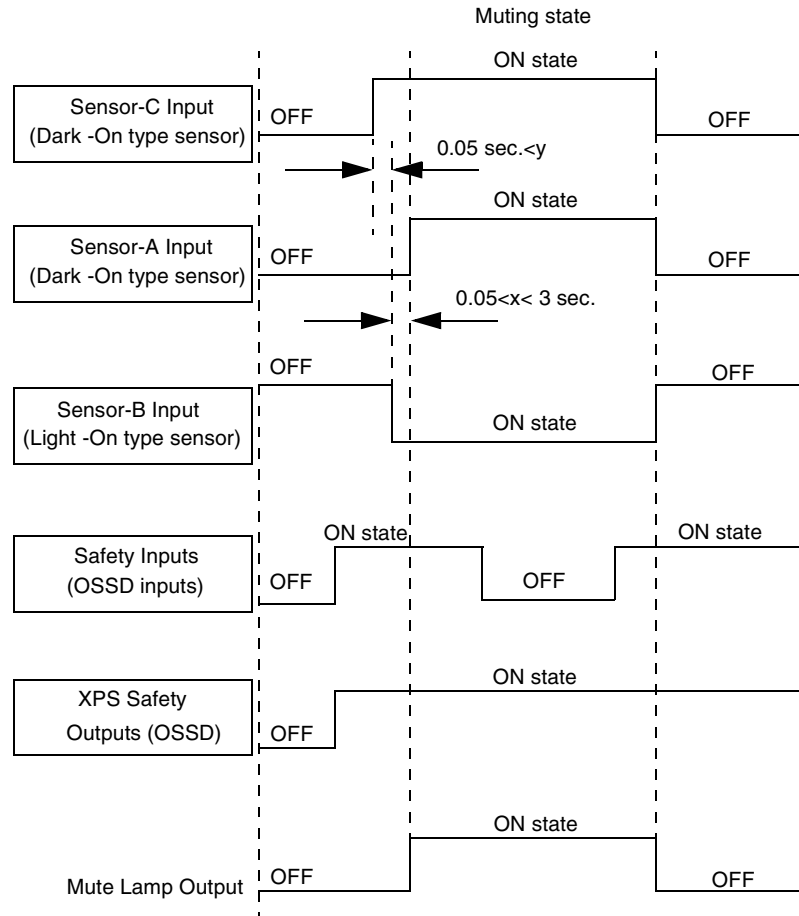
XX = Under normal conditions, these Sensor Inputs should not be connected. When the MUTE-ENABLE input is active, if at anytime these Sensor Inputs become active, the Muting system will transition to the LOCKOUT (FAULT) state.

Sensor requirements

The following conditions must be met for muting state to occur:

- Sensors A & C must be a Dark-On type sensor with PNP type output or a switch that closes its contact to provide +24 V $\overline{=}$ when it is Ok to mute.
- Sensor B must be a Light-On type sensor with PNP type output or a switch that opens its contact when it is Ok to mute.
- Sensor C must activate at least 0.05 seconds before sensors A & B.
- Concurrence of activation of the sensor pair, sensor A & B, must be within 3 seconds of each other.
- Sensor C must remain active until both sensors A & B activate.

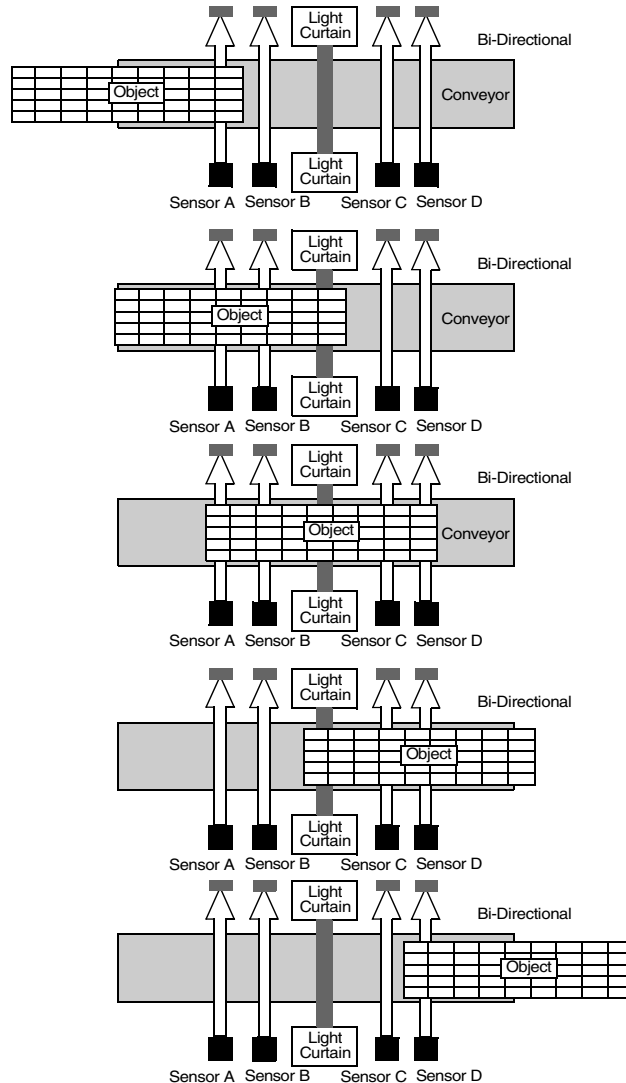
Three Sensor Muting System Waveform Diagram



Four sensor muting system

Description

To mute in this bi-directional configuration, a sensor pair (Sensor A & Sensor B or Sensor C & Sensor D) must transition to the ON state and concur within 3 seconds. Since conveyor is bi-directional either Sensor A or Sensor D can first be active in the sequence. The figure below illustrates a Muting system used in a four sensor conveyor belt configuration.



Transition conditions

The table below describes conditions required to transition to Muting state with a four sensor system:

No. of Sensors	State	Mute Enable	Sensor A	Sensor B	Sensor C	Sensor D	System Status
4 Sensor System	State 1	OFF	X	X	X	X	Protected
	State 2	ON	OFF	OFF	OFF	OFF	Protected
	State 3	ON	ON	OFF	OFF	OFF	Protected
	State 4	ON	ON	ON	OFF	OFF	Muting
	State 5	ON	ON	ON	ON	OFF	Muting
	State 6	ON	ON	ON	ON	ON	Muting
	State 7	ON	OFF	ON	ON	ON	Muting
	State 8	ON	OFF	OFF	ON	ON	Muting
	State 9	ON	OFF	OFF	OFF	ON	Protected

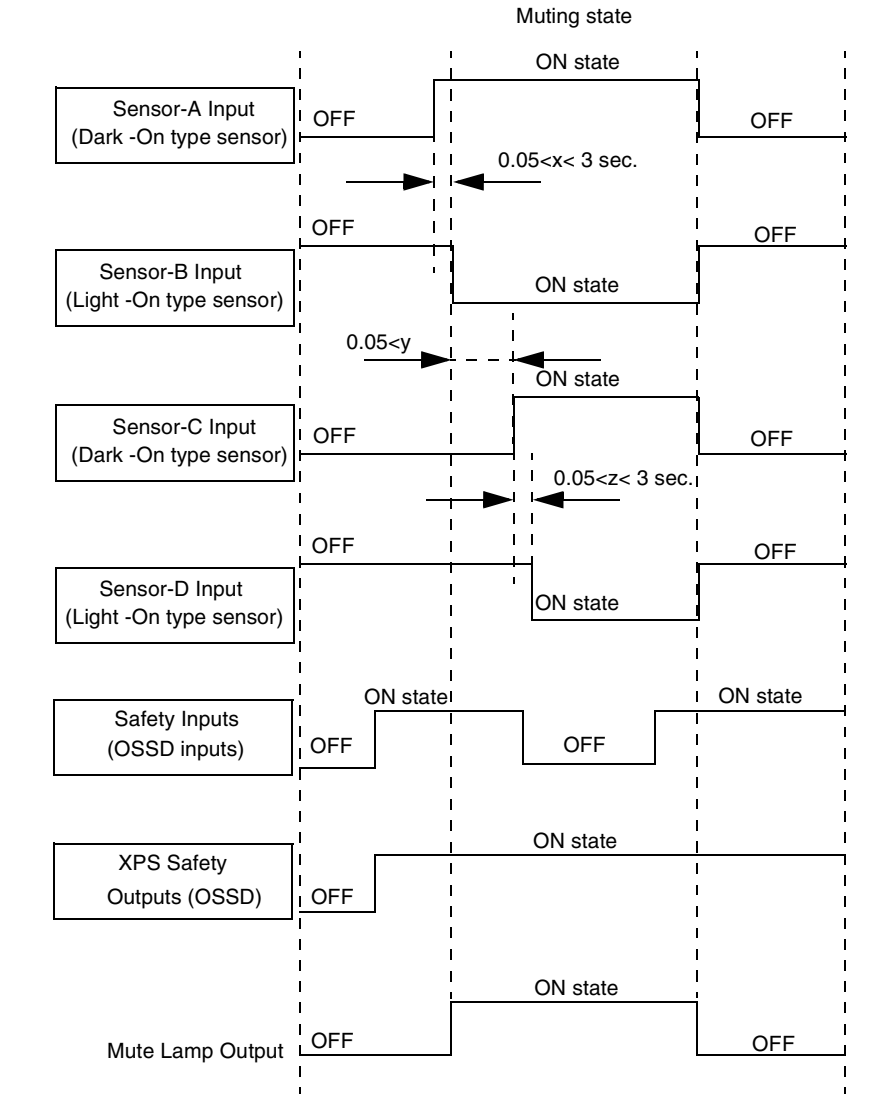
X = Sensor can be in any state, does not apply to selected mode.

Sensor Requirements

The following must be met for the XPSLCM1150 to enter or remain in the muting state:

- Sensors A & C must be a Dark-On type sensor with PNP type output or a switch that closes its contact to provide +24 V $\overline{\text{---}}$ when it is Ok to mute.
- Sensors B & D must be a Light-On type sensor with PNP type output or a switch that opens its contact when it is Ok to mute.
- Concurrence of activation of sensor pair Sensor A & Sensor B must be within 3 seconds and the concurrence of activation of sensor pair Sensor C & Sensor D must be within 3 seconds.
- Sequence of sensor activation is Sensor A before Sensor B before Sensor C before Sensor D or the sequence may be in reverse direction, Sensor D before Sensor C before Sensor B before Sensor A. The time difference between sensor activation must be at least 0.05 seconds.
- To stay in muting state sensor pair Sensor A & Sensor B must remain active until sensor pair Sensor C & Sensor D activate. In reverse direction sensor pair Sensor C & Sensor D must remain active until sensor pair Sensor A & Sensor B activate.

Four Sensor Muting System Waveform Diagram



Description of the bypass-allowed feature

Principle

The XPSLCM1150 allows supervisory personnel to momentarily override the machine stop signal of the XPSLCM1150. This function is used during instances where processing sequence operations did not allow an automatic transition to the muting state and the XPSLCM1150 safety outputs are in the Off state.

Signals in bypass-Allowed state

The XPSLCM1150 signals that it is in the Bypass-Allowed state by the following indications:

- The mute lamp of the effected safety channel will flash at about a 1-second interval.
 - The Mute Aux output will switch between active and inactive at about a 1 Hz rate.
 - The diagnostic display will show a code of 03.
-

Enter the bypass-Allowed state

The XPSLCM1150 will enter the Bypass-Allowed state under the following conditions:

- Redundant DIP switches must be set to enable Bypass-Allowed feature to occur.
 - The mute enable inputs are active.
 - The light curtain safety outputs (OSSD) are in the Off state and a minimum of one mute sensor is active in the effected safety channel.
-

Transition to the Muting state

To allow the XPSLCM1150 to transition to the Muting state the supervisory personnel must press-and-release the start button. When entering the Muting state through the Bypass-Allowed feature the following will occur:

- The mute lamp of the effected safety channel will now be On continuously.
 - The Mute Aux output will now be continuously in the active state.
 - The diagnostic display will show a code of 02.
 - If the light curtain is clear of obstructions before all of mute sensors have cleared then the XPSLCM1150 will leave the Muting state and enter the Machine Run state. Note, all of the mute sensors must clear for the XPSLCM1150 to automatically enter the Muting state during the next process cycle.
 - If all of the mute sensors clear of obstructions before the light curtain has cleared then the XPSLCM1150 will leave the Muting state and enter the Machine Stop state.
 - When the Muting state is entered through the Bypass-Allowed state then the maximum time for the XPSLCM1150 to be continuously in the Muting state is 10 minutes.
 - If the 10 minute time limit is exceeded the XPSLCM1150 will automatically change from the Muting state to the Bypass-Allowed state.
 - There is no limit on the number of times that the XPSLCM1150 can enter the Bypass- Allowed state and then with the press-and-release of the Start button into the Muting state.
-

Example of bypass-allowed

A conveyor is operated with an XPSLCM1150 that has one light curtain and three mute sensors connected. The XPSLCM1150 is set to Start Interlock mode and Bypass-Allowed is enable.

Conveyor System Condition	Sensor A Condition	Sensor B Condition	Sensor C Condition	Light Curtain Condition	XPSLCM1150 Response to these conditions
System power is restored.	Sensor is Clear	Sensor is Clear	Sensor is Blocked	Curtain is Cleared	Powers-up and enters Interlock state and senses that sensor C is active.
Supervisor verifies that system is safe to start, the XPSLCM1150 Start button is pressed and released.	Sensor is Clear	Sensor is Clear	Sensor is Blocked	Curtain is Cleared	Enters Machine Run state, safety outputs (OSSD) switch to On state and conveyor motors start.
Conveyor motors are initially running. Conveyor motors stop when light curtain becomes block.	Sensor becomes Blocked	Sensor becomes Blocked	Sensor becomes Clear	Curtain becomes Blocked	Enters Machine Stop (Bypass-Allowed) state since muting sensor C was not inactive at power-up, safety outputs (OSSD) switch to Off state.
Conveyor motors stop.	Sensor is blocked	Sensor is Blocked	Sensor is Clear	Curtain is Blocked	XPSLCM1150 indicates Bypass-Allowed by blinking mute lamp and diagnostic code of «03» is displayed.
Supervisor verifies that system is safe to bypass, the XPSLCM1150 Start button is pressed and released.	Sensor is blocked	Sensor is blocked	Sensor is Clear	Curtain is Blocked	Enters Muting state, safety outputs (OSSD) switch to On-state, mute lamp is lit and diagnostic code of «02» is displayed.
Conveyor motors are running.	Sensor is blocked	Sensor is blocked	Sensor is Clear	Curtain becomes Cleared	Enters Machine Run state, mute lamp turns off and diagnostic code of «00» is displayed.
Conveyor motors are running.	Sensor becomes Clear	Sensor becomes Clear	Sensor is Clear	Curtain is Cleared	Stays in Machine Run state and is ready to automatically enter muting when next object passes through sensors.

Diagnostic display



At a glance

Overview

This chapter describes the XPSLCM1150 Diagnostic display.

What's in this Chapter?

This chapter contains the following topics:

Topic	Page
System diagnostic codes	54
Mute operation diagnostic codes	56

System diagnostic codes

Operational codes

The operational codes are described in the table below

Code Displayed	System Status
00	Normal operation, no faults
01	In the Interlock state and waiting for Start input.
02	Operating in Muting state.
03	In Bypass Allowed state & waiting for Start input.
88	PowerUp Indication

DIP switch fault codes

The DIP switch fault codes are described in the table below.

Code Displayed	Fault Indicated
21	Invalid Mode Selection setting.
22	Switch Setting Changed During Operation.
23	DIP Switch Settings Not Identical.
27	Invalid selection for the number of safety inputs connected.
28	Invalid selection for the number of mute sensors connected.

OSSD faults

The safety output (OSSD) fault codes are described in the table below.

Code Displayed	Fault Indicated
31	Safety outputs A & B shorted together
32	Safety outputs A shorted to power
33	Safety outputs B shorted to power
34	Safety outputs A shorted to ground
35	Safety outputs B shorted to ground

EDM/MPCE codes

The EDM/MPCE fault codes are described in the table below.

Code Displayed	Fault Indicated
41	EDM/MPCE monitoring signal was in the Wrong state Before entering the Machine Run state.
42	EDM/MPCE monitoring signal was in the Wrong state After entering the Machine Run state.
43	EDM/MPCE monitoring signal was in the Wrong state during power up of XPSLCM1150.

Internal fault code

The Internal Fault codes are described in the table below.

Code Displayed	Internal Fault
50	Detected Fault of XPSLCM1150 internal circuits.

Mute operation diagnostic codes

Mute errors (not faults)

The operational codes are described in the table below

Code Displayed	Errors
61	Incorrect activation sequence of Channel 1 mute sensors did not allow Muting.
62	Incorrect activation sequence of Channel 2 mute sensors did not allow Muting.
63	The activation time period between the mute sensor pairs (S1A & S1B or S1C & S1D) of Channel 1 exceeded 3 seconds, concurrency error.
64	The activation time period between the mute sensor pairs (S2A & S2B or S2C & S2D) of Channel 2 exceeded 3 seconds, concurrency error.
65	The 2 minute time limit of being in the Muting state was exceeded, mute was initiated by the sensors of Channel 1.
66	The 2 minute time limit of being in the Muting state was exceeded, mute was initiated by the sensors of Channel 2.
67	The lamp connected to Mute Lamp 1 output is open circuit, this error will not allow muting to occur.
68	The lamp connected to Mute Lamp 2 output is open circuit, this error will not allow muting to occur.

Safety input devices, light curtain OSSD input signals, errors

Safety input devices, light curtain OSSD input signals, errors

Code Displayed	Safety input devices, light curtain OSSD input signals, errors
71	The On state or Off state switching time between Light Curtain 1 OSSD inputs 1A & 1B exceeded 300 msec, concurrency error.
72	The On state or Off state switching time between Light Curtain 2 OSSD input 2A & 2B exceeded 300 msec, concurrency error.

Test procedure

4

Test procedure

WARNING

IMPROPER TEST PROCEDURE

The following test procedure **MUST** be performed by qualified personnel:

- Following system installation.
- In accordance with the employer's regular inspection program.
- Immediately following any maintenance, adjustment or other modification to any system component.
- Testing ensures that the safety devices and associated machine control system work together to properly stop the guarded machine. Failure to perform these procedures could result in serious injury.

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

Note: It is the user's responsibility to ensure that the installation conforms to all federal, state, local and company regulations pertaining to safe operation of the equipment.

Installation checkout

Step	Action
1	Disable the guarded machine.
2	Visually inspect the machine to ensure that access to the danger point is only through the area (s) protected by the safety light curtain(s).
3	Verify that the mounting distance of the safety light curtain(s) is equal to or greater than the minimum safety distance required according to the EN 999 and ANSI Minimum Safe Distance calculation. (See (See <i>Adjusting the safe mounting distance</i> , p. 19).
4	Check the overall system for damage, security of electrical cabling and wiring, or other hazards.

CAUTION

IMPROPER INSTALLATION

If any of the above requirements are not met, immediately lock out the machine and initiate the necessary corrective action.

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

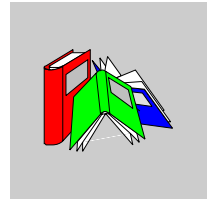
**Normal
operation with
muting disabled**

Step	Action
1	Disable the guarded machine. Apply power to the XPSLCM1150 system.
2	Ensure the Muting Enable switch is in the OFF (disabled) position.
3	Using the proper size test object for each light curtain, test the protected area of the light curtain. Test the area by moving completely through the field, top to bottom, ensuring that all the areas between transmitter and receiver are completely tested. The light curtain should remain blocked at any point with the test object present in the sensing field.
4	Enable the machine and initiate a start. Interrupt the sensing zone with the correct test object and verify the machine stops immediately. Never attempt to insert the test object directly into the danger area! If the machine fails to stop, discontinue the testing and lock out the machine. Investigate and correct prior to re-testing.
5	With the test object present in the field, verify the machine cannot start.
6	Repeat tests for all safety light curtains installed.

**Mute operation
(muting enabled)**

Step	Action
1	Complete testing requirements in <i>Installation checkout, p. 58</i> and <i>Normal operation with muting disabled, p. 59</i>
2	Disable the guarded machine and apply power to the system.
3	Set the Muting Enable Switch to the ON position.
4	Mute the system by blocking the correct sensors at the proper intervals (<3 seconds between sensors) and logical order. (Refer to the appropriate system timing diagram) Verify that the associated mute inputs on XPSLCM1150 are ON. Verify the external Mute active light(s) are ON and the XPSLCM1150 OSSD outputs are in the RUN mode, XPSLCM1150 Display indicates 02 (mute active)
5	Interrupt the safety light curtain (SLC) with the correct test object. Verify that the SLC outputs switch OFF (Red or blocked). OSSD inputs for that SLC are OFF, XPSLCM1150 outputs remain ON. XPSLCM1150 Display indicates 02 (mute active)
6	With the test object present in the light curtain sensing field, verify the machine is "run capable". Remove the test object for further tests.
7	If the Mute Time Limit is enabled, maintain the mute state for 2 minutes. After 2 minutes the XPSLCM1150 OSSD outputs will switch from RUN to STOP. The external Mute Active light will flash at a 1-2 Hz rate and the display will indicate 03 (Bypass Allowed). Press the Start switch and verify the XPSLCM1150 outputs return to the RUN state and external Mute Active lamp is ON. XPSLCM1150 Display indicates 02. Bypass is allowed until either the muting sensors clear or light curtain clears or 10 minutes has expired.
8	Reset system to Normal (non-mute) Operation.
9	If a one way or directional system is used, test operation to verify mute is activated only when the correct sequence and intervals are applied and that the machine (in the case of a machine tool such as a power press) is muted only during the non-hazardous cycle.
10	Repeat test procedure(s) for 2nd muting channel (if installed).

Glossary



A

Automatic Start Upon completion of power-up, the XPSLCM1150 will enter the MACHINE RUN state as soon as all of the selected light curtain OSSD inputs are in the ON state. Schneider has traditionally referred to this as the Normal mode.

B

Bypass-Allowed Allows supervisor personnel to momentarily override the Machine Stop operation of the XPSLCM1150. This function is used during instances where processing sequence operations did not allow a transition to the Muting state and the XPSLCM1150 entered the Machine Stop state. When in the Bypass-Allowed state, a press-and-release of the Start button allows the XPSLCM1150 to transition to the Muting state for only one cycle or a maximum duration of 10 minutes.

D

Dark-On A photo-electric sensor term that means the sensor output will be active when the sensor detects an object.

E

**EDM/MPCE
(Machine
Primary Control
Element)
Monitoring**

The XPSLCM1150 monitors the state of the EDM/MPCE signal produced by the guarded machine to insure that it is in the correct state with respect to "Machine Run" and "Machine Stop."

I

Interlock

For the XPSLCM1150 to enter this state the unit must be set to either the Start Interlock or Start/Restart Interlock mode. In this state the yellow Interlock LED is on and the red Machine Stop LED is on.

L

Light-On

A photo-electric sensor term that means the sensor output will be active when it receives the sensed light source.

Lockout (Fault)

When the XPSLCM1150 detects a fault, it transitions to this state. The Safety outputs will be held to the off state and the XPSLCM1150 will not attempt to leave this state without performing a comprehensive power-up self-test. A power-up self-test will be initiated by either cycling the XPSLCM1150 power or by a Start signal transition.

M

Machine Run

When the XPSLCM1150 is in this state the two Safety outputs are both active. In this state, the Green Machine Run LED is on, the Red Machine Stop LED is off and the Yellow Interlock LED is off.

Machine Stop

When the XPSLCM1150 is in this state the two Safety outputs are both inactive. In this state the Green Machine Run LED is off, the Red Machine Stop LED is on and the Yellow Interlock LED is off.

Muting The mute sensors have been properly activated for the XPSLCM1150 to keep the Safety outputs active when the light curtain detection zone is interrupted.

O

OFF State The state in which the output circuit is interrupted and does not permit the flow of current.

ON State The state in which the output circuit is completed and permits the flow of current.

R

Response Time The maximum amount of time required for the XPSLCM1150 to recognize a light curtain detection zone interruption and to set its Safety outputs to the Off state.

S

Safety Output (Output signal switching device (OSSD)) The component of the XPSLCM1150 connected to the control system of the guarded machine.

Start Interlock Upon completion of power-up, the XPSLCM1150 must go to the "Interlock" state. A Start signal transition must occur before going to Machine Run for the first time. Once the first Start condition has been met, the XPSLCM1150 will operate in the Automatic Start mode.

Start/Restart Interlock The XPSLCM1150 will go into the Interlock state upon completion of power-up and after all light curtain detection zone interruptions which cause a transition to the Machine Stop state. A Start signal transition must occur before returning to Machine Run following any transition to Machine Stop.
