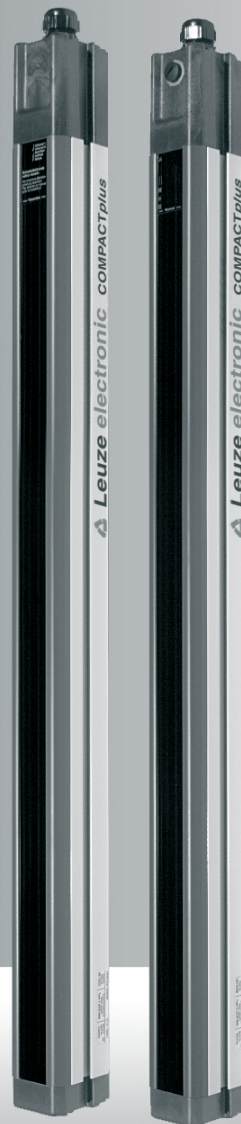


the sensor people

## COMPACT*plus*-XSS/R


Access Protection with  
Automatic Recognition of  
Rectangular Objects




## Notes on the Connecting and Operating Instructions

These Connecting and Operating Instructions contain information on the proper use of COMPACT*plus*-XSS/R in accordance with its intended purpose.

All the information contained herein, in particular the safety notes, must be carefully observed.

Safety and warning notes are identified by the  symbol.

Notes on important information are identified by the  symbol.

These connecting and operating instructions must be stored carefully. They must be available for the entire operating time of the COMPACT*plus*-XSS/R.

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Leuze electronic GmbH + Co. KG  
Liebigstrasse 4  
82256 Fuerstenfeldbruck, Germany  
Phone +49 8141 5350-0  
Fax +49 8141 5350-190  
info@leuze.de  
www.leuze.com

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# 1 General

COMPACTplus – XSS/R is an extension of the COMPACTplus series with the addition of the **eXtended Shape Scanning for Rectangular objects** function (“XSS” pronounced like “access”). It is based on the “Muting” functions package. Additions and differences vis-à-vis the “COMPACTplus – m Connecting and Operating Instructions” are the basis for the contents of these additional connecting and operating instructions, which supplement or replace the information provided in the “COMPACTplus – m Connecting and Operating Instructions”.

In addition to XSS/R, further monitoring functions, such as the testing of type 2 Safety Light Curtains and Muting, are also implemented.

## 1.1 Certifications



Fig. 1.1-1 Certificates for COMPACTplus – XSS/R

## 1.2 Symbols and terms

Symbols used:




	Warning sign. This symbol indicates possible dangers. Please pay especially close attention to these instructions!
	Sign indicating important information.
	A note, which also refers to a course of action, provides information about special attributes or describes set-up procedures.

Table 1.2-1 Symbols

Terms used:

S/RS interlock	Start/restart interlock
Start/restart interlock	Prevents automatic start after the supply voltage has been turned off, after the protective field has been penetrated or activation of the external safety circuit.
AOPD	Active Opto-electronic Protective Device
OSSD1, OSSD2	Safety-related switch outputs (transistor or optional relay contacts)
SafetyLab	PC diagnostics and parameterization software for COMPACTplus (optional)
Contactor Monitoring (EDM)	Also called <b>External Device Monitoring (EDM)</b> , dynamically monitors the positive-guided normally closed contacts of downstream relays, contactors or valves.
SLS	Single Light Beam Safety Device consisting of transmitter with test input and receiver with switching output.
FS	Factory setting (value of a parameter with delivery from the factory, which can be changed with switches or SafetyLab).
XSS	<b>eXtended Shape Scanning</b> (pronounced like “access”), evaluation algorithm in the light curtain for safe differentiation between admissible and inadmissible objects that pass the protective field.
XSS/R	Special XSS algorithm for differentiating between rectangular objects and people in the side projection.

Table 1.2-2 Terms

## 2 Safety notes on the XSS/R function

In addition to the safety notes provided in chapter 2 of the “COMPACT*plus* – m Connecting and Operating Instructions”, the following safety notes must also be observed for the XSS/R function:

- Light curtains with the XSS/R function are only designed for vertical access guarding. The protective field height must be at least high enough so that the tallest admissible object height can be completely detected by the light curtain.
- Access guardings with the XSS/R function must always be operated with start/restart interlock. Either the internal start/restart interlock in the COMPACT*plus* Receiver or the start/restart interlock in a downstream Safety Interface can be used for this. As only the access, and not the presence of people in the danger zone, is monitored, the reset button for resetting the start/restart interlock must be installed in such a way that the entire danger zone is clearly visible. It must not be possible to press the reset button from inside the danger zone. The distance between COMPACT*plus* Transmitters and Receivers must,
  - be either so small that there is not enough space for a person to enter the protective field undetected when the XSS/R function has been activated by an admissible object or,
  - the area in the protective field at the side of admissible objects is monitored by additional measures that, similar to the OSSDs of this protective device, cause the same safety circuit to switch off when a person is detected. These can include, for example, Single Light Beam Safety Devices SLS with crossed beams (see chap. 4.3), step-on mats next to the conveyor line or swing doors with electrical integration via safety door switch.



Light Curtains with activated XSS/R function are only suitable for vertical access guarding with a vertical protective field. Despite a resolution of 50 or 90 mm, they are neither appropriate for point of operation guarding (finger and hand protection) nor for danger zone guarding (horizontal protective field), as under certain circumstances the switch-off of the safety function can only be assured when leaving the protective field. The safety distance to the point of operation must be dimensioned accordingly (chap. 6). As the XSS/R algorithm achieves SIL2, only machines and systems that require SIL2 at the most may be guarded with COMPACT*plus* – XSS/R.

### 3 System design and possible uses

The XSS/R function is provided exclusively for COMPACT*plus* Light Curtains; Multiple Light Beam Safety Devices and Muting Transceivers are not supported, as these only have a very limited number of beams, which is not sufficient for XSS/R.

For reliable, fail-safe differentiation between rectangular admissible objects and inadmissible objects (e.g. people) in the side projection, the Light Curtain must be inclined in order to detect the front and rear vertical edges of the rectangle.

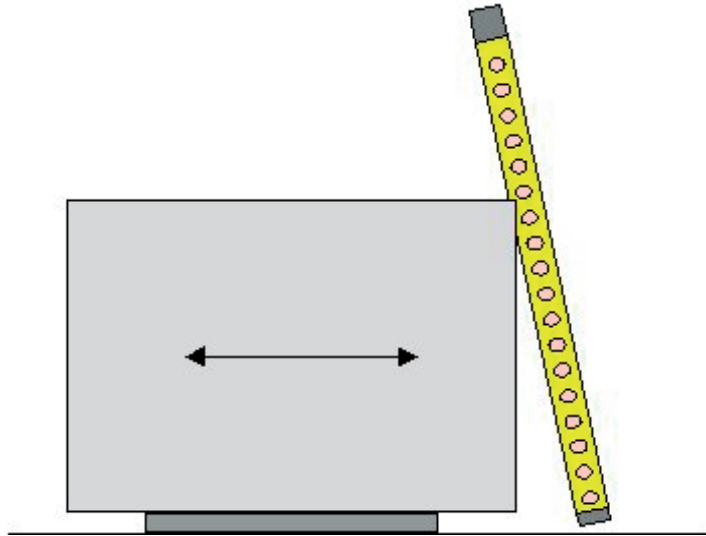
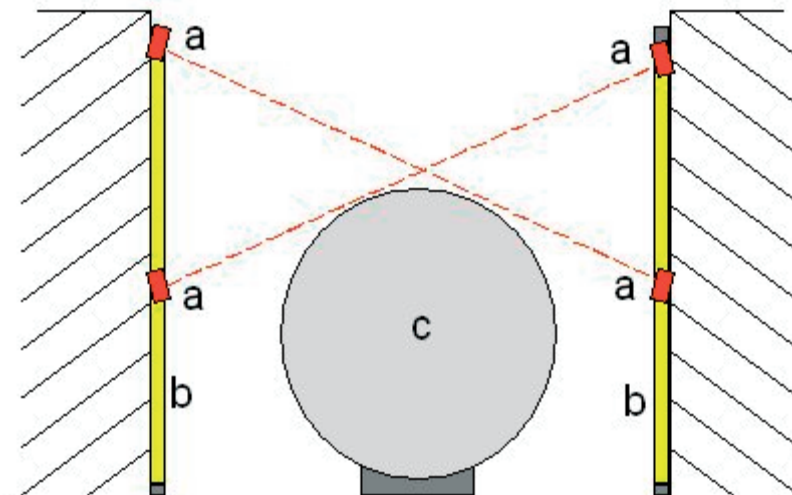


Fig. 3.1-1 COMPACT*plus* – XSS/R inclined installation

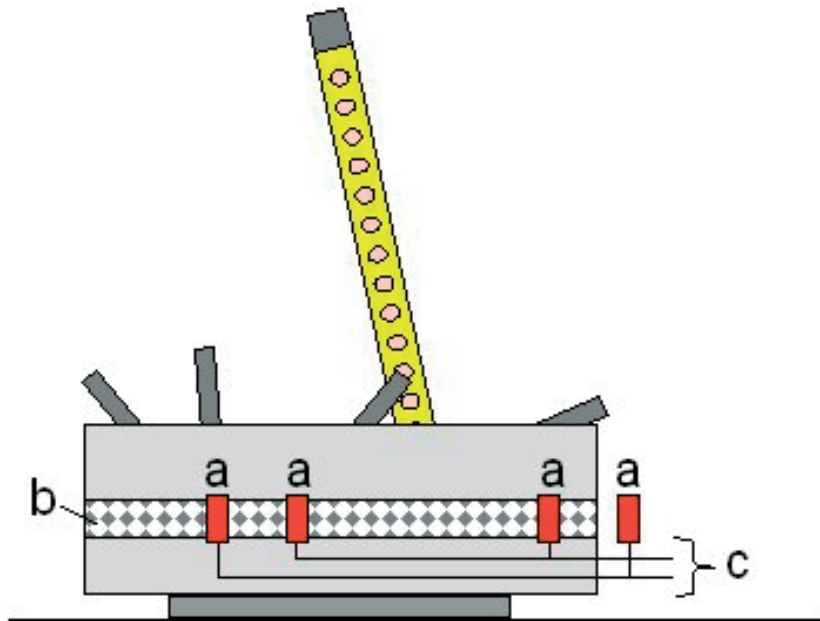
Crossed beams of Single Light Beam Safety Devices can be used to detect people beside an admissible object during the transit. COMPACT*plus* – XSS/R generates and evaluates the required test signal.



a = Single Light Beam Safety Device SLS      c = Permissible Object  
 b = Safety Light Curtain

Fig. 3.1-2 Side guarding with crossed Single Light Beam Safety Devices

If both rectangular *and* irregularly shaped objects have to be moved through the protective field, a 2-sensor Parallel Muting function is also provided parallel to XSS/R. The configuration and installation of the Muting Sensors must be performed here in such a way that people are safely and definitively differentiated from admissible objects. This is possible, for example, by using 2 x 2 Reflex Light Barriers as Muting Sensors, which work on a reflective foil on the transport vehicle.



- a = Reflex Light Barriers PRK
  - b = Reflective Foil on Transport Vehicle
  - c = 2 Muting Signals
- Fig. 3.1-3 Muting for bridging the XSS/R function

## 4 Functions

The additional functions vis-à-vis the Muting functions package are only selected with switches. The PC software SafetyLab can be used without restrictions for the diagnostics, but not for the parameterization.

### 4.1 XSS/R

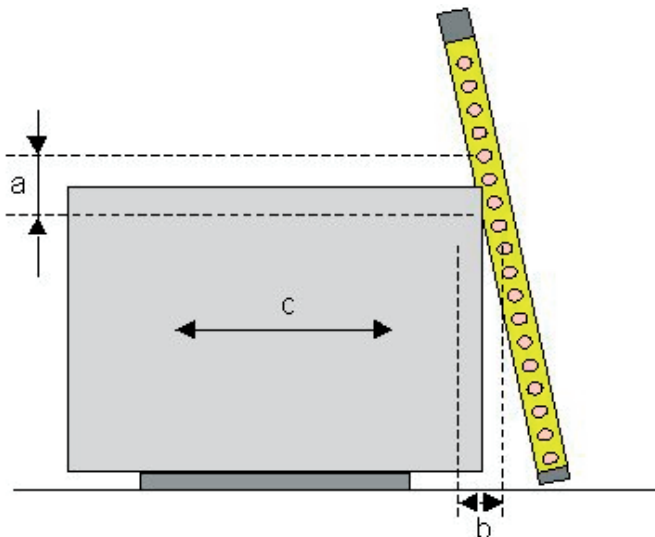
This function is selected with the S5 switch on the display and parameterization module in the R position. Its task is to tell the difference between rectangular admissible objects (e.g. a roll of paper or a loaded palette) and inadmissible objects (people, in combination with admissible objects, where required) on the basis of the contour of the pattern of interrupted beams in the side projection.

The connection cap of the Light Curtain, and therefore synchronization beam 1 as well, must be at the top. The protective field height must be high enough so that beam 1 is always above all admissible objects, i.e. beam 1 must always be free. The maximum admissible object height including tolerance therefore goes up to beam 2.

In order to safely detect the vertical edges of admissible objects and differentiate them from people going quickly in and out of the protective field, the Light Curtain is installed inclined by approx. 15° off the vertical. Depending on the movement direction from the Light Curtain Receiver point of view, this results in the following:

- During penetration into the protective field (phase 1),
  - a continuously growing object from the maximum height downwards or,
  - a continuously growing object from the bottom upwards.
- After complete penetration into the protective field (phase 2), a constant-sized object; the lowest beam must be interrupted.
- On leaving the protective field (phase 3),
  - a continuously reducing object from the maximum height downwards or,
  - a continuously reducing object from the bottom upwards.

Both movement directions are supported. After an object has completely penetrated the protective field (phase 2), its height may change by a maximum of 2 beams. Stopping is not a problem in this phase and is permitted up to the 10-minute limit. Stopping when penetrating or leaving the protective field is also allowed, as long as one of the two transitions is completed without stopping, i.e. one of the two flanks may become discontinuous if the object passing through is stopped.



- |     |                             |     |                                   |
|-----|-----------------------------|-----|-----------------------------------|
| a = | Height tolerance +/- 1 beam | b = | Flank tolerance/speed             |
|     | from penetration point      | c = | Transport speed (see Table 4.1-1) |

Fig. 4.1-1 Admissible object geometry tolerances



Admissible objects must always be closed, i.e. openings in the object are not permitted.



Admissible objects must move within a specific speed range for reliable detection of the vertical edges of the objects. The following are the admissible speed ranges as per resolution:

Light Curtain resolution	Admissible transport speed with a 15° vertical incline	Admissible height tolerance in phase 2
50 mm	0.5 m/min to 14 m/min	+/- 37 mm
90 mm	1 m/min to 28 m/min	+/- 75 mm

Table 4.1-1 Transport speeds and object tolerances as per resolution

In addition to complete paper rolls, applications in the print industry often also require detection of partially unwound rest rolls, which may be on a rest roll frame if they have been unwound too much to be set directly on the transport unit by the roll changer. XSS/R therefore also accepts the objects shown below, with which an area with free beams up to the height of the rest roll frame is permitted. The expected height of the rest roll frame can be factory-set.

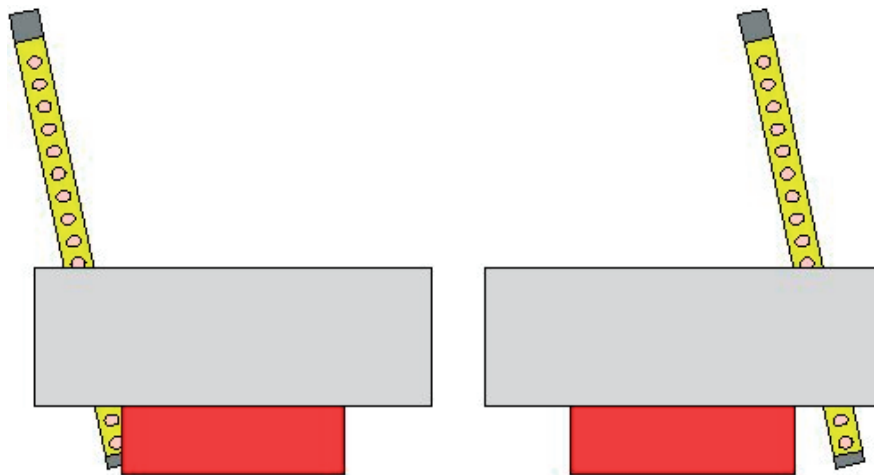


Fig. 4.1-2 Paper roll (top) on rest roll frame (bottom)

#### 4.2 XSS time limit

The XSS/R function is time-limited by default to 10 minutes to safeguard against manipulation. This means that the OSSDs are switched off after the time expires, even if XSS/R has detected an admissible object in the protective field. Depending on the operation, it is possible that an admissible object may have to remain in the protective field for more than 10 minutes. In this case, for example, a PLC can generate a 24VDC signal to the Receiver's M5 control input to hold the timer. It continues to run when M5 switches back to 0V.

This timer control signal is dynamically monitored. It must,

- be at 0V when the Receiver switches on.
- change switching status at least once within 8 hours.

If one of these conditions is not satisfied, the timer cannot be stopped; it continues to run after the set 10 minutes.



Stopping the XSS time limit is safety-relevant. The M5 control signal must therefore be integrated into the application in such a way that excludes a permanent switching off of the XSS time limit, and instead, for example, only causes the transport unit to stop.

### 4.3 Additional guarding with tested Light Beam Safety Devices

An arrangement of tested Light Beam Safety Devices with crossed beams in acc. with Fig. 3.1-2 can be optionally connected for guarding the side area of admissible objects. Activation of this additional safety circuit is performed with the S6 switch when the XSS/R function is also activated with S5. The test signal for controlling the transmitter of the Light Beam Safety Device is generated at L2 (X3). The response of the Receiver's switching output is expected at input L1 (X2). A 40ms LOW test signal is generated at an interval of 1.6 seconds. The admissible test response time at L1 (X2) is  $1 < t < 40 \text{ ms}$ .

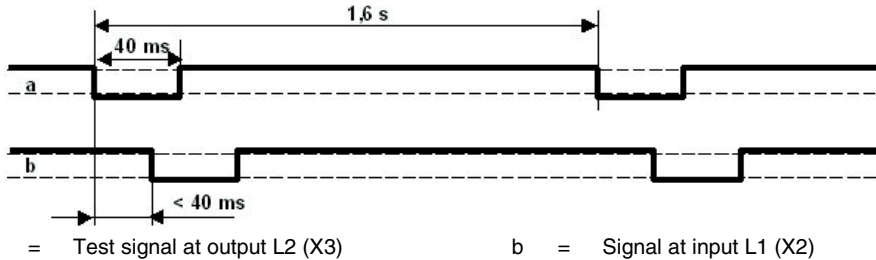


Fig. 4.3-1 Tested Light Beam Safety Device signals in ON state

If the expected test reply at L1 (X2) is not received, the OSSDs open and the restart interlock locks when it has been activated with switch S3. Depending on the type of signal received at the signal input, the Receiver responds as follows:

- The signal at input L1 (X2) stays off (LOW). This happens both when an error occurs (short to 0V at the Receiver's output) and with normal operating conditions interruption of the protective field. "U1" appears on the 7-segment display, i.e. safety circuit opens.

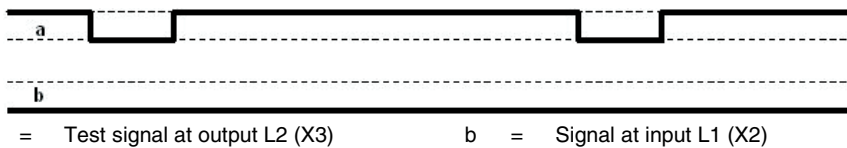


Fig. 4.3-2 Tested Light Beam Safety Device signals in OFF state → "U1"

- The signal at input L1 (X2) stays on (HIGH). This happens both when an error occurs (short to 24V at the Receiver's output) and with wrong Transmitter connection (test input on 24V). Both are external faults, which are therefore displayed on the 7-segment display with "E 41" (short to 24V). The error code is entered in the event log. SafetyLab can display this error code.

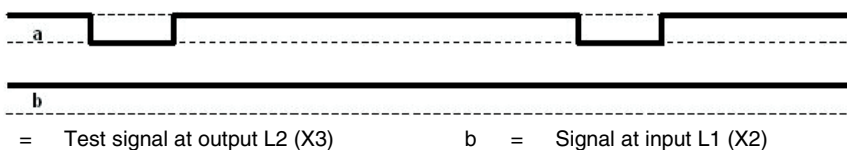


Fig. 4.3-3 Tested Light Beam Safety Device level error → "E41"

- The response time at the signal input is less than 1 ms. This happens with a cross connection between signal input L1 (X2) and test output L2 (X3). An "E 42" error code (time error) is therefore displayed on the 7-segment display and the error code is entered in the event log. SafetyLab can display this error code.

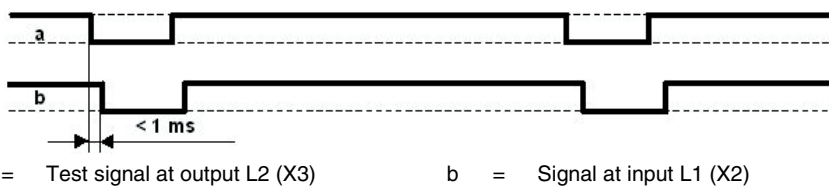


Fig. 4.3-4 Tested Light Beam Safety Device cross connection → "E42"

#### 4.4 Muting

2-sensor Parallel Muting is selected simultaneous with the XSS/R function with switch S5. It is therefore sufficient to connect suitable Muting sensors, such as reflex light barriers, for example, to inputs L3 (X1) and L4 (X4) and a Muting indicator to L5 (X5) in order to use the Muting function.

The Muting signals at L3 and L4 must both be activated within 4 seconds to start Muting.

As Muting and XSS/R run parallel, the OSSDs remain switched on, as long as either the XSS/R conditions or the Muting conditions or both are in place. The XSS/R algorithm is skipped when Muting is activated. An admissible shape can only be detected again after the Muting function has ended. It is therefore not possible to switch off the Muting while an admissible object is passing through.

Muting applies exclusively to the protective field function. The Light Beam Safety Devices for side guarding may therefore not be interrupted with active Muting either when this function is used.



If the type 2 testing of an additional safety circuit has been activated via switch S6 (chap. 4.3), the Muting time limit is set fixed to 10 minutes. Unlike the function in the normal COMPACT*plus* Muting mode, S6 cannot be used here for selecting the Muting time monitoring.

Input M5 can be optionally set at 24VDC during the Muting to hold on the Muting timer. If M5 goes from 24VDC back to 0V, the timer continues to run. Before the next Muting activation M5 must be reset to 0V to be able to stop the timer again during the coming Muting cycle if required. If one of these conditions is not met an error code is generated and the OSSDs are switched off.

#### 4.5 Override

After switching off as a result of detecting an inadmissible object contour, e.g. because a person has passed the protective field, the restart interlock is unlocked by pressing and releasing the reset button at L5 (X5) or M1, so that the OSSDs switch on when the protective field is free. Override is required when,

- the safety function has been activated, as XSS/R detected an object as inadmissible and the object is still in the protective field.
- the safety function has been activated, as Muting was not activated while an object was being moved in the protective field.
- the operating voltage fails and returns while an object is passing through.

Depending on whether XSS/R or Muting was active, XSS restart or Muting restart will be required; the two differ very little from one another.

##### 4.5.1 XSS restart

An admissible or inadmissible object may be in the protective field after the supply voltage switches off and returns. As the full XSS/R cycle expected by the Light Curtain has not been completed, override is only possible by pressing, releasing and pressing the reset button within 4 seconds. The OSSDs switch on with the second pressing. The button must be kept pressed until the object is outside the protective field; only then do the OSSDs stay switched on.

##### 4.5.2 Muting restart

Override after a Muting error is almost identical to XSS restart. The Muting indicator flashes to indicate that a Muting restart is expected. The button can be released if an admissible sensor combination is found after pressing the reset button the second time. This is indicated when the Muting indicator stops flashing and lights constantly.

#### **4.6 Start/restart interlock**

The start/restart interlock is obligatory with access guardings. It can be selected in the Light Curtain Receiver via switch S3 (FS) or implemented in a downstream safety interface. The reset button is connected to input L5 (X5) or M1. The override function is always possible via the button at L5 (X5)/M1, regardless of the activation of the internal start/restart interlock. If the start/restart interlock is implemented externally, the override function must also be activated via an external override switch, as although the receiver's OSSDs do actually switch on, the downstream safety interface would have to be reset at the same time via its own reset button.

#### **4.7 Contactor monitoring (EDM)**

This function is provided in the receiver, but it is not selected in the factory setting. It can be activated via switch S1, in which case 24VDC must be provided at input M2 via the protective feedback circuit (N/C). If this signal is not provided or is provided incorrectly, an E3x error code is displayed on the 7-segment display.

## 5 Display elements

The same display elements as in the standard device are used; for this, see "COMPACT*plus* – m Connecting and Operating Instructions", chapter 5.

The red/green LED is green with switched on OSSD and red with switched off OSSD.

The yellow LED is switched on with locked start/restart interlock.

As the internal start/restart interlock is activated in the FS, the orange LED (protective field free) is used for checking the alignment between transmitter and receiver. The 7-segment display can also be used for aligning; for this, see "COMPACT*plus* – m Connecting and Operating Instructions", chapter 9.2.1.

When XSS/R is activated it is shown similar to Muting by the blue LED. This LED therefore lights,

- constant when an admissible object has been detected in the protective field by XSS/R
- constant when Muting has been correctly initiated by the two Muting sensors;
- flashing when override is requested after a Muting error (Muting restart).

If a beam pattern that differs from that expected is detected during an XSS/R cycle, an "Lx xx" code is briefly displayed on the 7-segment display and stored in the event log.

## 6 Installation

As the functions are only set per switch, this should be performed before the Light Curtain is installed. The Receiver's connection cap has to be removed for this, and the switches on the removable parameter module must be set to the required positions. You will find details in chapter 8 of the "COMPACTplus – m Connecting and Operating Instructions" and in Table 8.1-1. The connection cap must then be screwed back on.

Transmitters and receivers are installed inclined by approx. 15° or more off the vertical with the mounting brackets included with delivery. The connection cap must be at the top, as the XSS/R algorithm expects beam 1 to always be free. The greater the incline, the more reliable the object's vertical edges are detected with fast moving objects. The lowest beam should be approx 10 cm above the reference plane in order to safely detect fast moving feet.

A possible arrangement of the optional tested Safety Light Curtains is shown in Fig. 3.1-2. You will find a possible arrangement of the Muting sensors in Fig. 3.1-3.



The safety distance to the point of operation must be calculated from the device's response time (Table 10.2-1) and additional amount C and must be observed with installation. As in some cases the XSS/R function can only conclusively determine whether or not the detected object is admissible or not on leaving the protective field, the additional amount for the safety distance is 1200 mm (a person's step length + arm length).

The safety distance S for access guarding can be calculated in accordance with EN 999 using the formula:

$$S \text{ [mm]} = K[\text{mm/s}] \times T[\text{s}] + C \text{ [mm]}$$

S = Safety distance in mm

K = Approach speed 1600 in mm/s.

T = Total delay time in s; sum of the,  
 safety device response time,  $t_{R \text{ AOPD}}$ , (Table 10.2-1)  
 the downstream safety interface,  $t_{\text{Interface}}$ , (interface techn. data)  
 and the machine's stopping time,  $t_{\text{Maschine}}$ .

C = Additional amount, 1200 mm (step length + arm length)

$$S \text{ [mm]} = 1600 \text{ mm/s} \times (t_{R \text{ AOPD}} + t_{\text{Interface}} + t_{\text{Maschine}}) \text{ [s]} + 1200 \text{ mm}$$

**7 Electrical connection**

The connection of COMPACTplus to various machine interfaces is described in the “COMPACTplus – m Connecting and Operating Instructions”. The signals on the local interface are covered in general there. You find here two variants for connecting the display and control elements, e.g. Muting Sensors and Light Beam Safety Devices SLS:

- Connection via terminal distributor panel.
- Connection via AC-SCM1 sensor connection box with M12 plugs.

Integration into the machine's switch-off circuit is performed as shown here.

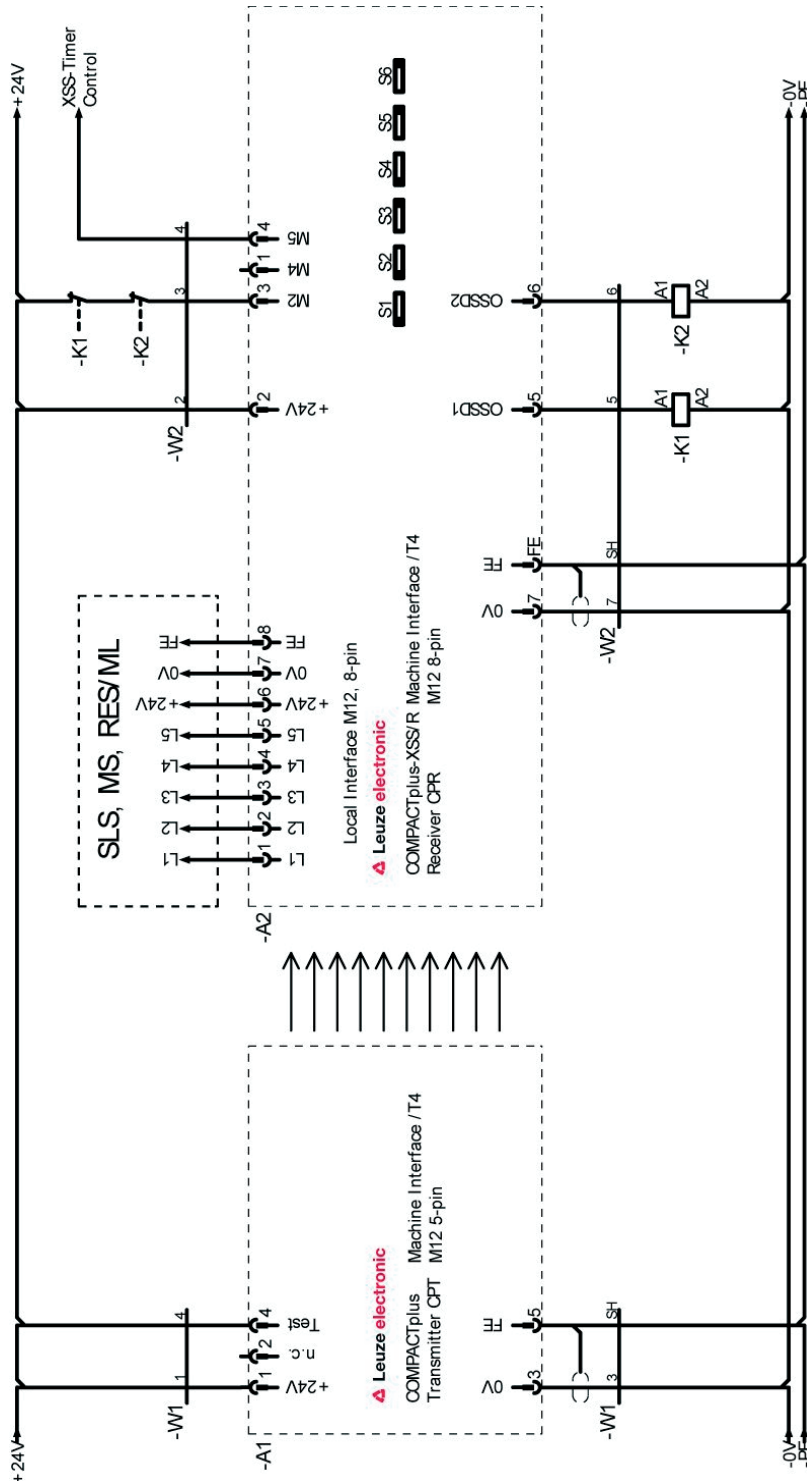


Fig. 7.1-1 COMPACTplus XSS/R machine interface connection

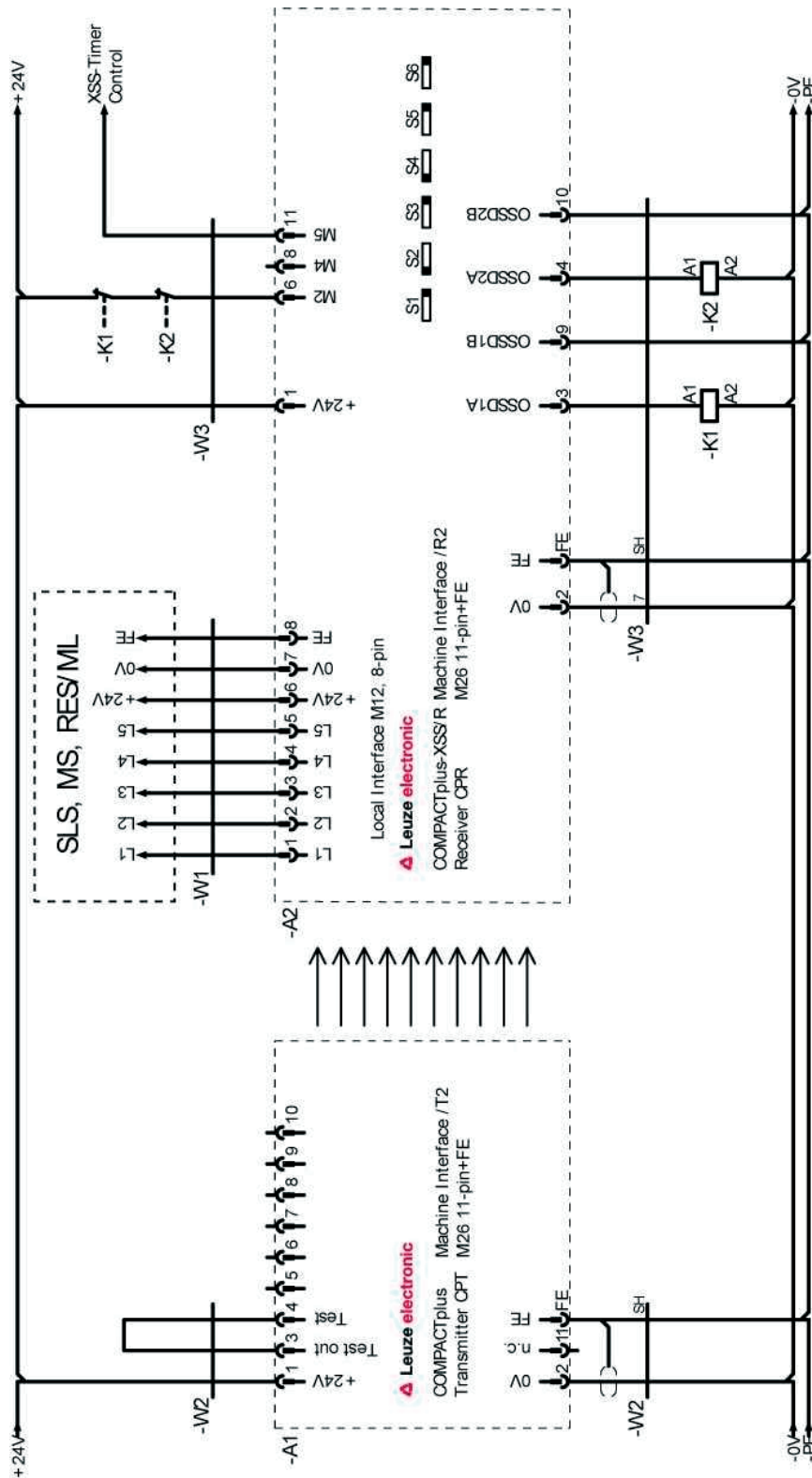


Fig. 7.1-2 Anschluss COMPACTplus – XSS/R Maschine-Interface /R2

The OSSD signals can be integrated either contact-less or via the MSI-RM2 relay module to a safe evaluation unit in the switch-off circuit.

Additional optional sensors and control elements are coupled via the local interface, an 8-pin M12 connection socket in the Receiver's connection cap. The coupling via a distributor terminal panel (Fig. 7.1-1) and plug-in via the AC-SCM1 connection module (Fig. 7.1-3) are shown below as examples for the SLS, MS, RES/ML connection shown with dashed lines in Fig. 7.1-4.



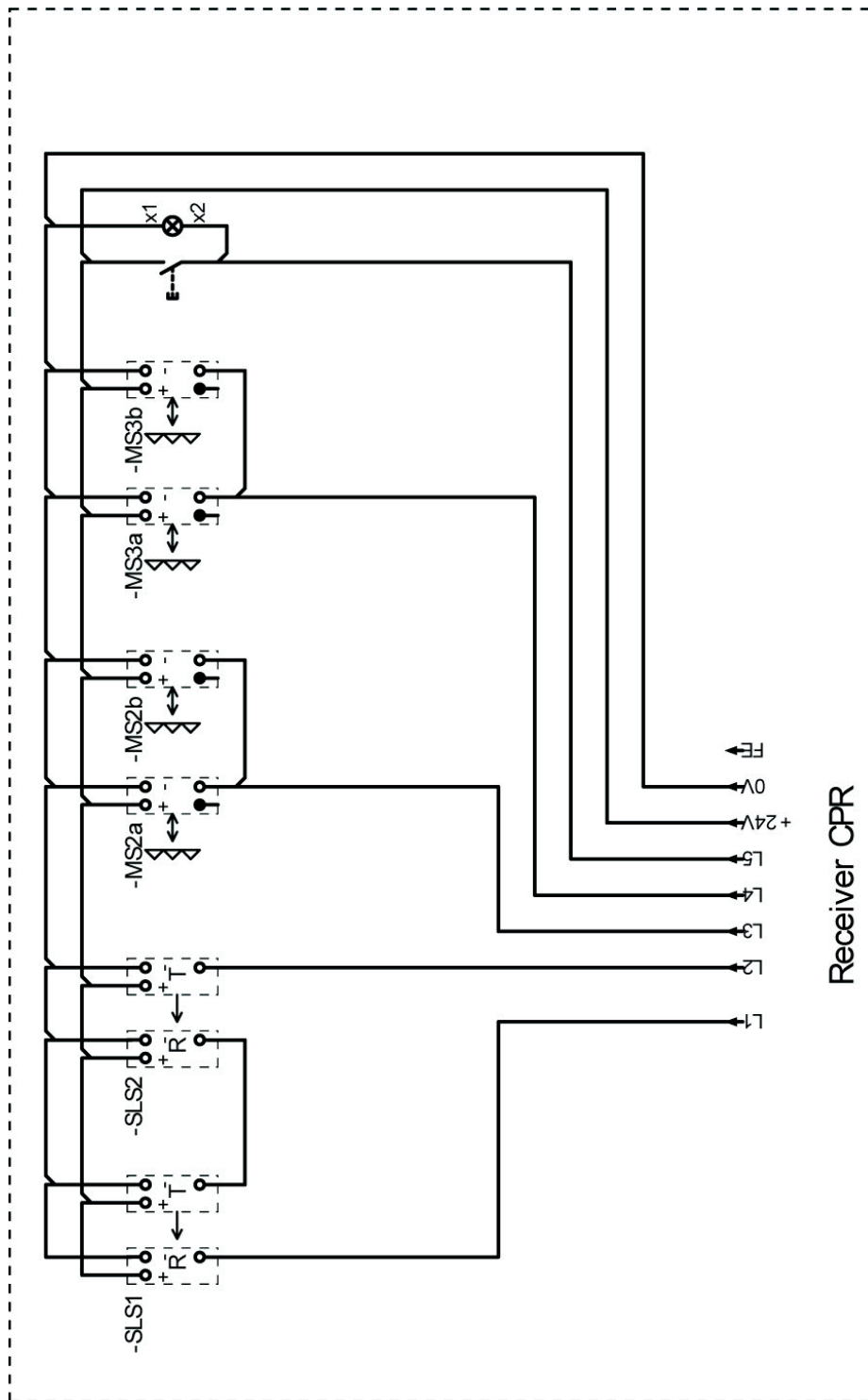


Fig. 7.1-3 COMPACTplus XSS/R local connection via distributor terminal panel

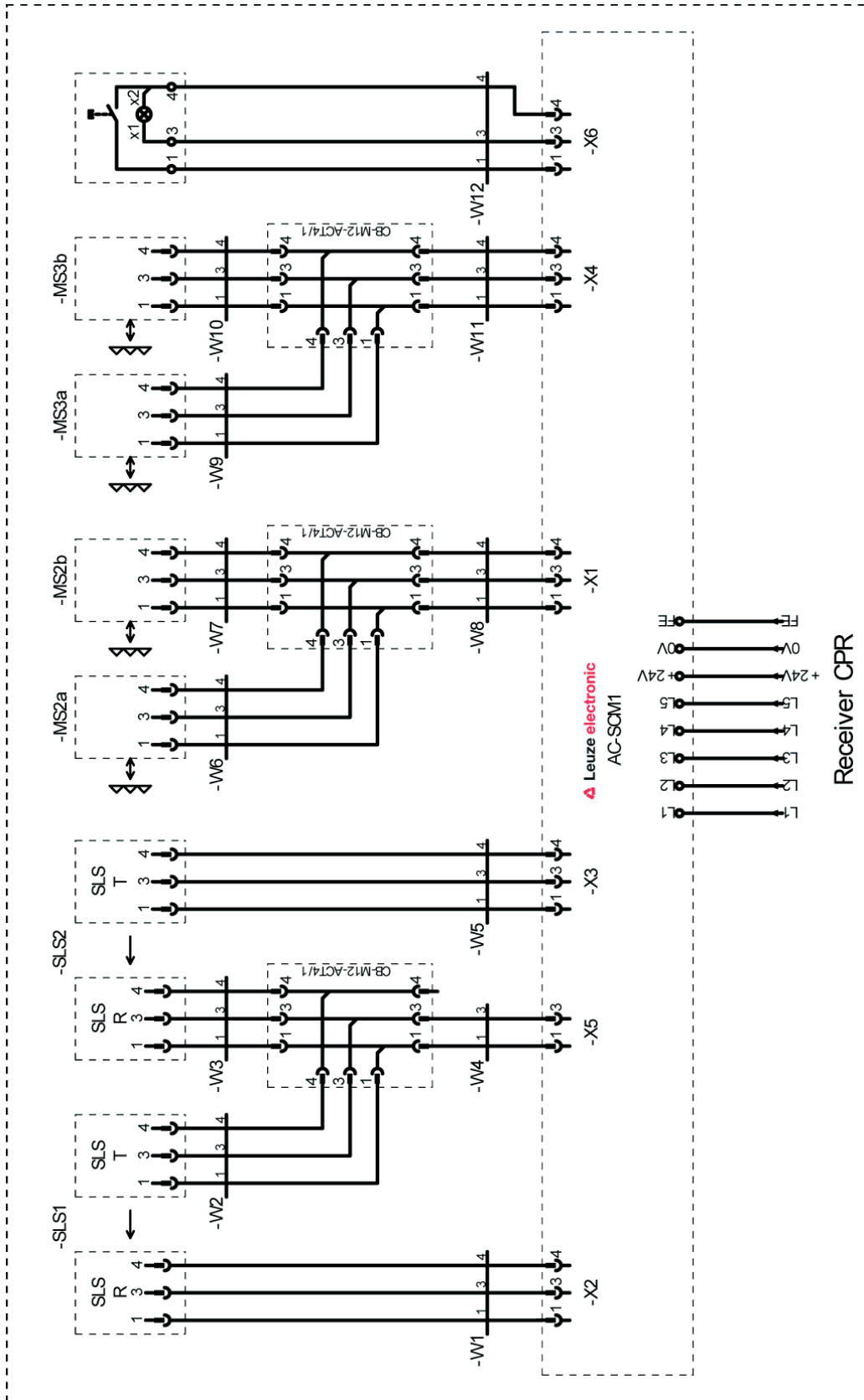
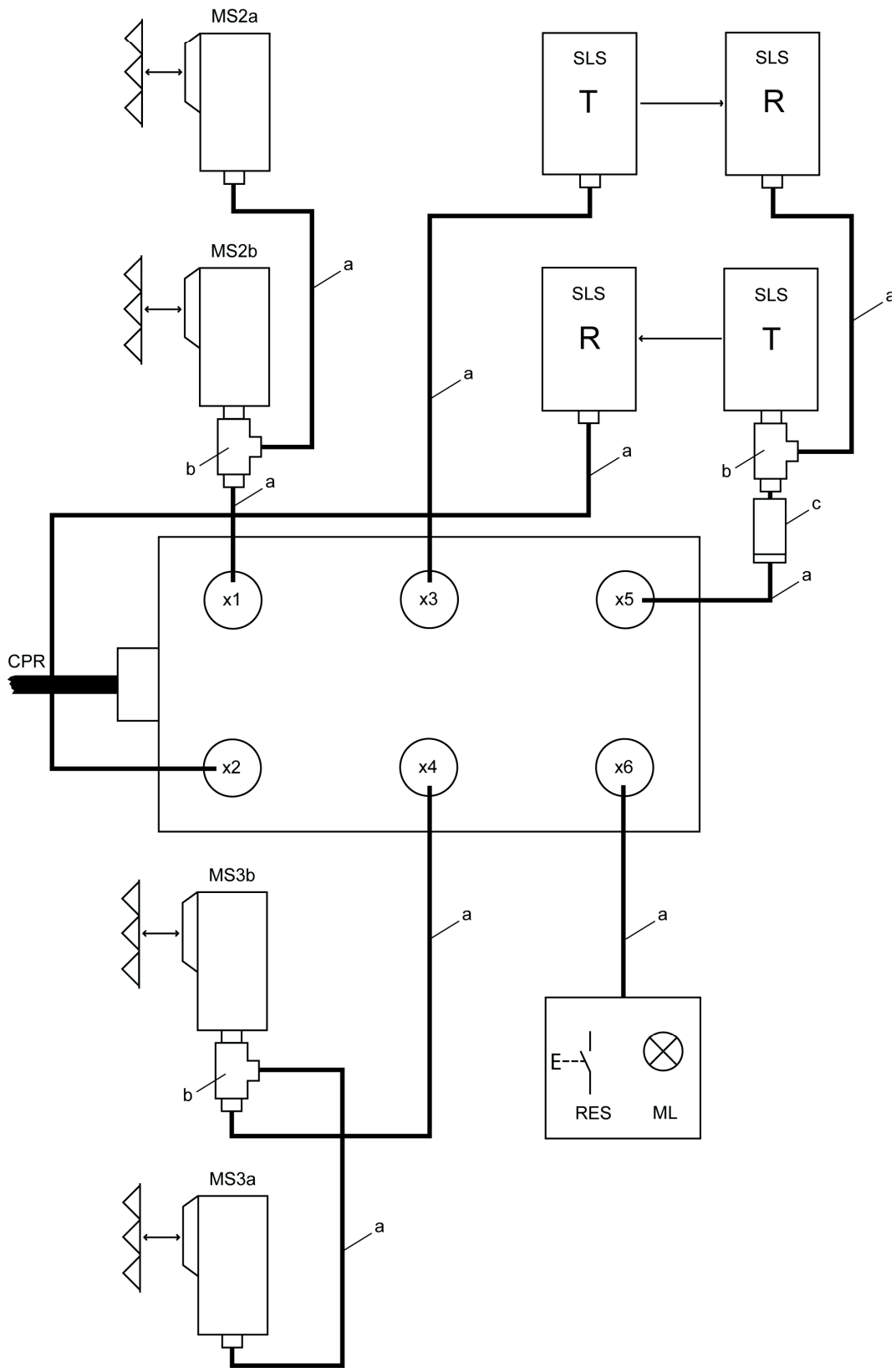


Fig. 7.1-4 COMPACTplus XSS/R local connection via AC-SCM1 sensor connection box

The circuit diagram shown in Fig. 7.1-4 complies with the following configuration.



a = Cable, CB-M12-xx00-3GF/GM  
 b = T distributor, CB-M12-ACT4/1

c = Self-assemble cable box, KD-095A

Fig. 7.1-5 Cable plan with sensor connection box AC-SCM1

## 8 Parameterization

The functions extended vis-à-vis the “Muting” function package are only selected using the S4, S5 and S6 switches in the Receiver. The function of S4 and S6 is only first extended when S5 is changed to the R position. While the function of switches S1 to S3 continues to correspond with that of COMPACT*plus* – m as before, switches S4, S5 and S6 have the following functionality:

S5	S6	S4
<b>L = Display below</b> Muting type selection with S4	<b>Muting time limit</b> L = Muting time limit 10 min	<b>Muting mode</b> L = AutoMode Muting
	R = No Muting time limit	R = 4-sensor Parallel Muting
<b>R = Display above</b> Only for Light Curtains: - XSS/R function activated with TXlim time limit = 10 min - 2 sensor-Parallel Muting with Muting sensors at L3 and L4. TMLim time limit =10 min	<b>Type 2 safety circuit</b> L = No type 2 testing	<b>Reserved</b> -
	R = Type 2 testing via L1 / L2 L1 = Signal input from SLS Receiver L2 = Test output to SLS Transmitter	-

Table 8.1-1 Switches S4, S5 and S6: Function



Settings with SafetyLab are generally not possible with COMPACT*plus* – XSS/R devices; SafetyLab can only be used for protective field status display and diagnostics, internal and external signals and events.

## 9 Setting into operation

The switches S3 and S5 are in the R position in the delivery status; all others are in the L position. The following are therefore selected:

- S1=L: No contactor monitoring
- S2=L: Transmission channel 1
- S3=R: With start/restart interlock, reset button at input L5 or M1
- S4=L: -
- S5=R: XSS/R activated; 2-sensor Parallel Muting activated
- S6=L: No tested type 2 Light Beam Safety Devices connected

The function should be selected in accordance with the application before the Light Curtain is installed. To do this:

- Loosen the 4 connection cap screws and remove the connection cap.
- Take out the parameter module under the front screen.
- Set the switches in accordance with your application.
  - If the “External Light Beam Safety Devices Test” function is required, turn switch S6 to the R position.
  - If the start/restart interlock is set in a downstream safety interface, deselect this function by turning switch S3 to the L position.
- Replace the parameter module.
- Replace the connection cap on the device and tighten the screws.

The Light Curtain is installed inclined as described in chapter 6. The electrical connection is as described in chapter 7, whereby the local connection socket can be wired either via a distributor terminal panel or via plug connectors on the AC-SCM1 connection box.

- See chapter 9 of the "COMPACT*plus* – m Connecting and Operating Instructions" for aligning transmitters and receivers.
- The optional tested Light Beam Safety Devices must be mounted so that a protection beam forms between transmitter and receiver, which people positioned beside the transport material would have to interrupt.
- The optional Muting sensors must be mounted so that both will be activated by the transport material within 4 seconds and stay activated as long as the transport material is in the protective field.
- The reset button for the start/restart interlock must be mounted so that it cannot be reached from inside the danger zone.

## 10 Technical data

### 10.1 Additional technical data

Safety category	Type 4 in acc. with IEC EN 61496-1
Device: XSS/R algorithm:	SIL 3 in acc. with IEC EN 61508 SIL 2 in acc. with IEC EN 61508
Additional amount for the safety dist.	C = 1200 mm

Table 10.1-1 COMPACTplus – XSS/R additional technical data

### 10.2 Response times

Protective field height	50 mm resolution					90 mm resolution				
	n	/T	/R	/A	/P	n	/T	/R	/A	/P
450 mm	12	60 ms	75 ms	65 ms	80 ms					
600 mm	16	60 ms	75 ms	65 ms	80 ms					
750 mm	20	60 ms	75 ms	65 ms	80 ms	10	60 ms	75 ms	65 ms	80 ms
900 mm	24	60 ms	75 ms	65 ms	80 ms	12	60 ms	75 ms	65 ms	80 ms
1050 mm	28	80 ms	95 ms	85 ms	100 ms	14	60 ms	75 ms	65 ms	80 ms
1200 mm	32	80 ms	95 ms	85 ms	100 ms	16	60 ms	75 ms	65 ms	80 ms
1350 mm	36	80 ms	95 ms	85 ms	100 ms	18	60 ms	75 ms	65 ms	80 ms
1500 mm	40	80 ms	95 ms	85 ms	100 ms	20	60 ms	75 ms	65 ms	80 ms
1650 mm	44	80 ms	95 ms	85 ms	100 ms	22	60 ms	75 ms	65 ms	80 ms
1800 mm	48	80 ms	95 ms	85 ms	100 ms	24	60 ms	75 ms	65 ms	80 ms
2100 mm	56	100 ms	115 ms	105 ms	120 ms	28	80 ms	95 ms	85 ms	100 ms
2400 mm	64	100 ms	115 ms	105ms	120 ms	32	80 ms	95 ms	85 ms	100 ms
2700 mm	72	100 ms	115 ms	105 ms	120 ms	36	80 ms	95 ms	85 ms	100 ms
3000 mm	80	120 ms	135 ms	125 ms	140 ms	40	80 ms	95 ms	85 ms	100 ms

Table 10.2-1 COMPACTplus – XSS/R response times  $t_r$  depending on beam number n for receivers with transistor output /T, relay output /R, AS-Interface /A, PROFIBUS /P with active XSS/R function

**10.3 Signal assignment**

The following signals are expected on the interface cables:

**Local interface**

L1-in	Tested SLS Light Beam Safety Device Receiver SLS-R
L2-in	-
L2-out	Tested Light Beam Safety Device Transmitter SLS-T
L3-in	Muting sensor
L4-in	Muting sensor
L5-in	Reset button; M1 alternative
L5-out	Muting indicator

**Machine interface**

M1-in	Reset button; L5 alternative
M2-in	EDM feedback circuit
M3-in	-
M3-out	Protective field free/ready for unlocking
M4-in	-
M4-out	Failure, Error and Pollution Indication
M5-in	Control signal for time limit (10 min) for XSS/R or Muting
M5-out	-

**10.4 Ordering information**

Supplementary to the ordering information in the “COMPACTplus – m Connecting and Operating Instructions” chap. 1.3.1, the following coding also applies for COMPACTplus Receivers with XSS/R functions extension:

CPRrro-hhhh-znn/cc with

- **z** functions package with specific extension
- **nn** serial number for customer-specific parametering

A receiver with the **CP50-1500-z01/T4** article code, for example, has:

- 50 mm resolution.
- 1500 mm protective field height.
- XSS/R function extension with customer-specific parametering 01.
- A machine interface /T4 with transistor output and M12 plug.

**10.5 Checklists**

In addition to the points in the checklists of the “COMPACTplus – m Connecting and Operating Instructions” chap. 13.3, the following must also be checked and corrected if required before the initial operation:

	Yes	No
Have the transmitters and receivers been installed inclined by at least 15° on the vertical so that the edges of rectangular objects are safely detected?		
Has the side area beside the objects that pass the protective field been secured, e.g. with Light Beam Safety Devices with crossed beams?		
Are Muting sensors mounted so that they can only be activated simultaneously by admissible objects?		
Is the reset button for resetting the start/restart interlock mounted so that it cannot be reached from inside the safe area and the entire danger zone can be seen from where it is installed?		
Is the safety distance between the part of the Light Curtain that is nearest to the point of operation and the point of operation greater than 1200 mm?		

## 10.6 EC Declaration of Conformity

Leuze electronic GmbH + Co. KG  
In der Braike 1  
73277 Owen - Teck / German

The manufacturer declares that the safety components of series **COMPACTplus-XSS/R** in the form in which they are marketed by us conform with the relevant, basic safety and health requirements of the EC directives\*, and that the standards\* were used in their design and construction.

Owen, 01.02.2009



Dr. Harald Grübel  
General Manager

\* You can also download this EC Declaration of Conformity from the Internet under:  
<http://www.leuze.com/compactplus>