# Inhalt

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1 About this document

Please read this chapter carefully before working with this documentation and the Flexi Classic Muting modular safety controller.

1.1 Purpose of this document

These operating instructions are designed to address the technical personnel of the machine manufacturer or the machine operator with regard to the safe mounting, installation, configuration, electrical installation, commissioning, operation and maintenance of the Flexi Classic Muting modular safety controller.

These operating instructions do not provide instructions for operating machines on which the Flexi Classic Muting has been, or could be integrated. Information on this is to be found in the appropriate operating instructions for the machine.

1.2 Target group

These operating instructions are intended to be used by planning engineers, developers and the operators of machines, plant and systems which are to be protected by an Flexi Classic Muting modular safety controller. These operating instructions are also intended for persons who integrate the Flexi Classic Muting into a machine/system, initialise its use, or who are charged with servicing and maintaining such a machine/system.

1.3 Depth of information

These operating instructions contain information about the Flexi Classic Muting modular safety controller on the following subjects:

- installation and mounting
- electrical installation
- commissioning and configuration
- care and maintenance
- error diagnosis and troubleshooting
- part numbers
- conformity and approval

Beyond this, the planning and use of SICK protective devices requires specialist technical knowledge which is not imparted by this documentation.

It is a fundamental rule that the national, local and statutory rules and regulations must be observed when operating the Flexi Classic Muting modular safety controller.

General information on accident prevention with the aid of opto-electronic protective devices is contained in the competence brochure “Guidelines Safe Machinery”, which is available from SICK.

Note Please use the Internet website at www.sens-control.com. There you will find:

- product and application animations
- configuration aids
- these operating instructions in several languages for viewing and printing
- the competence brochure “Guidelines Safe Machinery”
1.4 Scope

These operating instructions are original operating instructions. These operating instructions are valid for all Flexi Classic Muting modular safety controllers. You must also take into account the relevant Brief Operating Instructions (see entries on the device type labels on the modules).

1.5 Abbreviations employed

EDM  External device monitoring = relay/contactor monitor
ESPE  Electro-sensitive protective equipment (e.g. C4000)
OSSD  Output signal switching device = Signal output which controls a safety circuit
PLC   Programmable logic controller
SIL   Safety integrity level = safety class

1.6 Symbols used

Recommendation  Recommendations are designed to give you some assistance in your decision-making process with respect to a certain function or a technical measure.
Note           Notes inform you about special features of the device.

LED symbols indicate the status of the diagnosis LEDs.

Examples:

- **Red** The red LED is continuously on.
- **Red** The red LED blinks.
- **Green** The green LED is off.

Instructions for taking action are shown by an arrow. Read the take-action instructions carefully and follow them precisely.

Warning!
A warning notice indicates an actual or potential hazard. Warnings are intended to help protect you from accidents. Read warnings carefully and follow them precisely!
2 On safety

This chapter deals with your own safety and the safety of persons operating the equipment.

- Please read this chapter carefully before starting to work with the Flexi Classic Muting modular safety controller or with machinery protected by a Flexi Classic Muting.

2.1 Qualified safety personnel

The Flexi Classic Muting modular safety controller must be mounted, commissioned and serviced only by qualified safety personnel.

Qualified safety personnel are defined as persons who ...

- have undergone the appropriate technical training
- have been instructed by the responsible machine operator in the operation of the machine and the current valid safety guidelines
- have access to the operating instructions of the Flexi Classic Muting and those of the particular modules and have read and familiarised themselves with them
- have access to the operating instructions for the protective devices (e.g. C4000) connected to the safety controller and have read and familiarised themselves with them.

2.2 Field of application

The Flexi Classic Muting family is a range of modules within the Flexi Classic family. These muting modules can be used to solve both simple and more complex muting applications. Configuration is carried out by setting rotary switches on the modules.

The category in accordance with EN ISO 13 849 J 1 or the SIL in accordance with IEC 61 508 and the SILCL in accordance with EN 62 061 depend on the external circuit, the realisation of the wiring, the choice of the sensors and their location at the machine.

The safety level of the device corresponds to up to SIL3 in accordance with IEC 61 508, up to SILCL3 in accordance with EN 62 061, PL e in accordance with EN ISO 13 849 J 1 and category 4 in accordance with EN ISO 13 849 1. The emergency stop function in the device corresponds to stop category 0 in accordance with EN 60 204 J 1.

In order to reach the SIL3 safety level (see chapter 13 “Technical data” on page 58) in accordance with IEC 61 508, the following test must be made at least every 365 days:

- The Flexi Classic Muting system must be powered down.
- The Flexi Classic Muting system must be powered up.
- All safety functions of the connected safety sensors must be verified.

The type of safety sensors as well as the method of wiring must be chosen according to the category which is to be achieved.

Opto-electronic and tactile safety sensors (e.g. light curtains, laser scanners), muting sensors (photoelectric switches, photoelectric proximity switches, inductive proximity switches, ...) as well as additional signals from other sensors or from the higher level controller are connected to the Flexi Classic Muting modular safety controller. Via the switching outputs on the safety controller the related actuators on the machines or in the systems can be muted or safely shut down as per the muting function configured.

The modular safety controller Flexi Classic Muting has been tested in accordance with UL 508.
2.3 Correct use

The Flexi Classic Muting modular safety controller is only to be used as defined in section 2.2 “Field of application”. It must be used only by qualified personnel and only on a machine on which it has been installed and initialised by competent personnel in accordance with these operating instructions.

If the device is used for any other purposes or modified in any way — including during mounting and installation — any warranty claim against SICK AG shall become void.

2.4 General safety notes and protective measures

**Observe the safety notes and protective measures!**

Please observe the following items in order to ensure correct use of the Flexi Classic Muting safety controller.

- When mounting, installing and using the Flexi Classic Muting, observe the standards and directives applicable in your country.
- The national/international rules and regulations apply to the installation, use and periodic technical inspection of the Flexi Classic Muting safety controller, in particular ...
  - Machinery Directive 2006/42/EC,
  - EMC Directive 2004/108/EC,
  - Provision and Use of Work Equipment Directive 2009/104/EC,
  - Low-Voltage Directive 2006/95/EC,
  - the work safety regulations/safety rules.
- Manufacturers and owners of the machine on which a Flexi Classic Muting is used are responsible for obtaining and observing all applicable safety regulations and rules.
- The notes, in particular the test notes of these operating instructions (e.g. on use, mounting, installation or integration into the existing machine controller) must be observed (see section 10.2 “Testing instructions” on page 52).
- The tests must be carried out by qualified safety personnel or specially qualified and authorised personnel and must be recorded and documented to ensure that the tests can be reconstructed and retraced at any time by third parties.
- These operating instructions must be made available to the operator of the machine where the Flexi Classic Muting is used. The machine operator is to be instructed in the use of the device by qualified safety personnel and must be instructed to read the operating instructions.
- The external voltage supply of the device must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60 204. Suitable power supplies are available as accessories from SICK.
- The modules of the Flexi Classic Muting family conform to Class A, Group 1, in accordance with EN 55 011. Group 1 encompasses all ISM devices in which intentionally generated and/or used conductor-bound RF energy that is required for the inner function of the device itself occurs.

**WARNING**

The Flexi Classic Muting system complies, as per the “radiated emissions” generic standard, with the requirements of class A (industrial applications).

The Flexi Classic Muting system is therefore only suitable for use in an industrial environment.
2.5 Environmental protection

The Flexi Classic Muting modular safety controller is designed so that it has the least possible impact on the environment. It consumes only a minimum of energy and resources.

➢ Always act in an environmentally responsible manner at your workplace.

2.5.1 Disposal

Unusable or irreparable devices should always be disposed of in accordance with the relevant national regulations on waste disposal (e.g. European waste code 16 02 14).

Note

We would be pleased to assist you to dispose of this device. Just contact us.

2.5.2 Separation of materials

The separation of materials is only to be carried out by competent persons!

Caution is required when dismantling devices. There is a risk of injuries.

Before you send the devices for appropriate recycling, it is necessary to separate the different materials of the Flexi Classic Muting module.

➢ Separate the housing from the rest of the parts (in particular the circuit board).

➢ Send the separated parts for recycling as appropriate (see the table below).

<table>
<thead>
<tr>
<th>Components</th>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product</td>
<td></td>
</tr>
<tr>
<td>Body, PCBs, wiring, plugs and electrical connectors</td>
<td>Electronics recycling</td>
</tr>
<tr>
<td>Packaging</td>
<td></td>
</tr>
<tr>
<td>Cardboard, paper</td>
<td>Paper/cardboard recycling</td>
</tr>
</tbody>
</table>
3 Muting

Always observe the following safety instructions!

- Muting must only be activated for the period of time during which the transported material (e.g. on a pallet) blocks access to the hazardous area.
- Muting must take place automatically, but must not be dependent on a single electrical signal.
- Muting must be triggered by at least two independently wired signals (e.g. from muting sensors) and must not depend entirely on software signals (e.g. from a PLC).
- The muting condition must be cancelled as soon as the transported material no longer blocks access to the hazardous motion, so that the protective device becomes effective again.
- The material to be transported must be detected over its entire length, i.e. there must be no interruption in the output signals.
- Mount control switches for reset and override outside the hazardous area so that they cannot be operated by a person inside the hazardous area. In addition, when operating control switches, the operator must have full visual command of the hazardous area.
- Always position muting sensors so that the minimum safety distance to the safety device is complied with.
- Muting sensors must be positioned so that a person cannot unintentionally activate the muting function (see illustrations below)!

Fig. 1: Safe mounting of muting sensors

A: It may not be possible to activate sensors lying opposite each other simultaneously.
B: It may not be possible to activate sensors mounted next to each other simultaneously.
3.1 Muting principle

Muting is the temporary bypassing of the protective action of a safety device. In this way, material can be permitted to pass to or from a machine or plant without the need to interrupt a work process.

With the aid of additional sensor signals, muting distinguishes between objects and persons. A controller (e.g. the Flexi Classic Muting switch unit) logically evaluates the signals from external sensors and, when the muting conditions are valid, bypasses the protective device, so that the material being transported can pass the protective device. Immediately anything other than the material enters the hazardous area, the work process is interrupted.

In the above figure, the material moves on a conveyor from left to right. As soon as the muting sensors M1 and M2 are activated, the protective action of the protective device ESPE is bypassed and material can enter the hazardous area. As soon as the muting sensors are free again, the protective action of the protective device is reactivated.

3.1.1 Muting cycle

The muting cycle is the fixed sequence of all procedures encompassed by muting. The cycle begins when the first muting sensor is activated. It ends when the last muting sensor returns to its initial state (e.g. free optical path for optical sensors). Muting can only then become active again.

Within a muting cycle, the material can be transported several times if the muting condition is continuously maintained, i.e. at least one pair of sensors remains continuously activated.

3.1.2 Muting sensors

Muting sensors detect material and supply the necessary signals that a controller (e.g. a Flexi Classic Muting safety controller) needs. When the muting conditions are fulfilled, the controller will bypass the protective installation on the basis of the sensor signals.

If additional functions, e.g. C1 or conveyor stopped (CS) have been selected (only with UE410-MDI), these control signals also are evaluated (usually by a higher-level control system).
Muting sensors can be produced by the following external sensors:

- optical sensors
- inductive sensors
- mechanical switches
- signals from the control system

**SICK muting sensors**

A selection of optical muting sensors is given below. You can use them according to their type (light or dark switching).

<table>
<thead>
<tr>
<th>Type</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>W9-3</td>
<td>Light switching/dark switching, complementary</td>
</tr>
<tr>
<td>W12-3</td>
<td>Light switching/dark switching, switchable</td>
</tr>
<tr>
<td>W18-3</td>
<td></td>
</tr>
<tr>
<td>W27-3</td>
<td></td>
</tr>
<tr>
<td>W24-3</td>
<td></td>
</tr>
</tbody>
</table>

**Note**

For the selection and setting of SICK optical muting sensors for muting applications, the following apply:

- Sensor outputs must be PNP switching.
- Other component ranges can also be chosen.
- Observe the output levels given in Table 3.

<table>
<thead>
<tr>
<th>Outputs of muting sensors</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>Activated, material detected</td>
</tr>
<tr>
<td>LOW</td>
<td>De-activated, no material detected</td>
</tr>
</tbody>
</table>

### 3.1.3 Muting lamp

To signal muting, it is recommended that a muting lamp is installed. The muting lamp indicates temporary muting.

**WARNING**

Install the muting lamp so that it is always clearly visible!

The muting lamp must be visible from all sides around the hazard zone and for the plant operator.

**WARNING**

A muting status signal or warning light must be installed!

EN 61496-1 requires that a muting status signal or a warning light is installed.
3.2 Arrangement of muting sensors

When designing an arrangement of muting sensors, observe the following points!

- Always position the muting sensors such that only the material is detected and not the means of transport (pallet or vehicle).
- Always position muting sensors such that material can pass unhindered, but people are reliably detected.

![Fig. 3: Detection of material during muting](image)

- Always arrange the muting sensors so that when material \( \text{①} \) is recognised, the required minimum distance to the light beam of the ESPE \( \text{②} \) is maintained.

**Note** The minimum distance ensures that there is sufficient time for processing data before muting is activated.

![Fig. 4: Minimum distance between material detection and ESPE during muting](image)

How to calculate the minimum distance:

\[
L \geq v \times \left( t_d + t_{res} \right)
\]

Where ...

- \( L \) = Minimum distance [m]
- \( v \) = Speed of material (e.g. conveyor speed) [m/s]
- \( t_d \) = Input delay of external switching device [s]
  (see operating instructions for external switching device)
- \( t_{res} \) = Response time of Flexi Classic Muting [s]
  (see chapter 13 “Technical data” on page 58)
Use optical sensors with background suppression. This type of sensor recognises material presence only within a fixed distance. Objects that are further away are ignored.

In the example, the material moves from left to right, or, alternatively, from right to left. As soon as muting sensors M1 and M2 are activated, the protective action of the protective device (ESPE) is bypassed.

**The following conditions must be met**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 &amp; M2</td>
<td>Muting applies as long as this condition is met.</td>
</tr>
</tbody>
</table>
Muting

How to calculate the distance:

\[ L_1 \geq v \times \left( t_d + t_{res} \right) \]
\[ v \times t > L_2 + L_3 \]

Where ...

- \( L_1 \) = Minimum distance between the ESPE light beams and the point of detection by muting sensors [m]
- \( L_2 \) = Distance between the two detection lines of the sensors (sensors activated/sensors free) [m]
- \( L_3 \) = Length of material in direction of travel [m]
- \( v \) = Speed of material (e.g. conveyor speed) [m/s]
- \( t \) = Setting for total muting time [s]
- \( t_d \) = Response time of external switching device [s]
  (see operating instructions for external switching devices)
- \( t_{res} \) = Response time of Flexi Classic Muting [s]
  (see chapter 13 “Technical data” on page 58)

Note

- Material is permitted to travel in both directions.
- Arrange for the crossing point of the muting sensors to be precisely on the ESPE light beams. If this is not possible, shift the crossing point towards the hazard zone.
- This arrangement is suitable for both through-beam photoelectric switches and photoelectric reflex switches.
- You can usefully increase the protection against manipulation and improve safety by using the following configurable functions:
  - concurrence monitoring
  - monitoring of the total muting time
  - end of muting by ESPE
3.2.2 Muting with two sensors (a pair of sensors), crossed arrangement, and a supplementary signal

The protective action of the protective device is bypassed when the muting sensors are activated in a defined sequence. The muting Sensor (Signal C1) must always be activated before both muting sensors of a pair (e.g. M1 and M2) (see section 5.1.1 “Supplementary signal C1” on page 32).

Muting sensor input requirements

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 &amp; M1 &amp; M2</td>
<td>A short time before the start of muting: C1 must always be active before both muting sensors of a pair (e.g. M1 and M2).</td>
</tr>
<tr>
<td>M1 &amp; M2</td>
<td>Muting applies as long as this condition is met.</td>
</tr>
</tbody>
</table>

How to calculate the distance:

\[
L_1 \geq v \times (t_d + t_{res})
\]

\[
v \times t > L_2 + L_3
\]

\[
L_4 < L_3
\]

Where ...

- \( L_1 \) = Minimum distance between the ESPE light beams and detection by the muting sensors [m]
- \( L_2 \) = Distance between the two detection lines of the sensors (sensors activated/sensors free) [m]
- \( L_3 \) = Length of material in direction of travel [m]
- \( L_4 \) = Maximum distance between C1 and the detection line of M1, M2 [m]
- \( v \) = Speed of material (e.g. conveyor speed) [m/s]
- \( t \) = Setting for total muting time [s]
- \( t_d \) = Response time of external switching device [s]
  (see operating instructions for external switching devices)
- \( t_{res} \) = Response time of Flexi Classic Muting [s]
  (see chapter 13 “Technical data” on page 58)
Muting

- Material can travel in one direction only.
- This arrangement is suitable for both through-beam photoelectric switches and photoelectric reflex switches.
- Avoid mutual interference between the sensors.
- You can usefully increase the protection against manipulation and improve safety by using the following configurable functions:
  - concurrence monitoring
  - monitoring of the total muting time
  - end of muting by ESPE

3.2.3 Muting with four sensors (two pairs of sensors), sequential arrangement

In the example, material moves from left to right. As soon as muting sensors M1 & M2 are activated, the protective action of the protective device (ESPE) is bypassed. The protective action remains bypassed until one sensor of the pair of muting sensors M3 & M4 is free again.

Muting sensor input requirements

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 &amp; M2 (or M3 &amp; M4)</td>
<td>A short time before the start of muting: depending on the transport direction of the material, the first pair of sensors is activated.</td>
</tr>
<tr>
<td>M1 &amp; M2 &amp; M3 &amp; M4</td>
<td>Briefly for continuation of the muting condition.</td>
</tr>
<tr>
<td>M3 &amp; M4 (or M1 &amp; M2)</td>
<td>Muting applies as long as this condition is met. Depending on the transport direction of the material, the second pair of sensors is activated.</td>
</tr>
</tbody>
</table>
How to calculate the distance:

\[
L_1 \geq v \times 2 \times (t_d + t_{res})
\]

\[
v \times t > L_1 + L_3
\]

\[
L_2 < L_3
\]

Where ...

- \( L_1 \) = Distance between the inner sensors (positioned symmetrically about the ESPE light beams) [m]
- \( L_2 \) = Distance between the outer sensors (positioned symmetrically about the ESPE light beams) [m]
- \( L_3 \) = Length of material in direction of travel [m]
- \( v \) = Speed of material (e.g. conveyor speed) [m/s]
- \( t \) = Setting for total muting time [s]
- \( t_d \) = Response time of external switching device [s]
  
  (see operating instructions for external switching devices)

- \( t_{res} \) = Response time of Flexi Classic Muting [s]
  
  (see chapter 13 “Technical data” on page 58)

Note

- The material can travel in both directions.
- The direction can also be permanently defined:
  - with supplementary signal C1: signal C1 must always be activated before the two muting sensors of the first pair (e.g. M1 and M2);
  - using the function “Direction recognition”, configurable by setting rotary switches (see section 5.3 “Direction recognition” on page 36).
- With this arrangement, all types of sensor can be employed.
- You can usefully increase the protection against manipulation and improve safety by using the following configurable functions:
  - concurrence monitoring
  - monitoring of the total muting time
  - end of muting by ESPE
### 3.2.4 Mutting with four sensors (two pairs of sensors), parallel arrangement

In the example, material moves from left to right. As soon as the first pair of muting sensors M1 & M2 is activated, the protective action of the protective device (ESPE) is bypassed. The protective action remains bypassed until the pair of muting sensors M3 & M4 is free again.

#### Muting sensor input requirements

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 &amp; M2 (or M3 &amp; M4)</td>
<td>A short time before the start of mutting: depending on the transport direction of the material, the first pair of sensors is activated.</td>
</tr>
<tr>
<td>M1 &amp; M2 &amp; M3 &amp; M4</td>
<td>Briefly for continuation of the muting condition.</td>
</tr>
<tr>
<td>M3 &amp; M4 (or M1 &amp; M2)</td>
<td>Mutting applies as long as this condition is met. Depending on the transport direction of the material, the second pair of sensors is activated.</td>
</tr>
</tbody>
</table>
How to calculate the distance:

\[ L_1 \geq v \times 2 \times \left( t_d + t_{res} \right) \]
\[ v \times t > L_1 + L_3 \]
\[ L_1 < L_3 \]

Where ...

- \( L_1 \): Distance between the inner sensors (positioned symmetrically about the ESPE light beams) [m]
- \( L_3 \): Length of material in direction of travel [m]
- \( v \): Speed of material (e.g. conveyor speed) [m/s]
- \( t \): Setting for total muting time [s]
- \( t_d \): Response time of external switching device [s]
  (see operating instructions for external switching devices)
- \( t_{res} \): Response time of Flexi Classic Muting [s]
  (see chapter 13 “Technical data” on page 58)

**Note**

- The material can travel in both directions.
- With the parallel arrangement, the muting sensors are positioned so that they also verify the width of permissible objects. Objects passing the muting sensors must always be identical in width.
- The direction can also be permanently defined:
  - with supplementary signal C1: signal C1 must always be activated before the two muting sensors of the first pair (e.g. M1 and M2);
  - using the function “Direction recognition”, configurable by setting rotary switches (see section 5.3 “Direction recognition” on page 36)
- With this arrangement, optical sensors and all types of non-optical sensor can be employed. Use sensors and feelers with background suppression.
- Avoid mutual interference between the sensors.
- You can usefully increase the protection against manipulation and improve safety by using the following configurable functions:
  - concurrence monitoring
  - monitoring of the total muting time
  - end of muting by ESPE
4 Product description

This chapter informs you about special features of the Flexi Classic Muting modular safety controller. It describes the structure and the function of the device.

➤ Be sure to read this chapter, before you install the equipment, configure or commission the device.

4.1 Special features

The Flexi Classic Muting family is part of the larger Flexi Classic family of safety controllers that allow you to realise solutions for muting applications. These can be used either as an autonomous safety system or connected together as an integrated muting system within a Flexi system.

The compact housing of these modules is 22.5 mm wide.

Modules are plugged together, whereby communication between individual units occurs on an internal bus (FlexBus).

The necessary muting functions and parameter settings are implemented using rotary switches on the modules.

The Flexi Classic Muting family consists of 3 modules:
- Main Muting UE410-MM (main module)
- Expansion Muting UE410-XM (expansion module)
- Muting Digital Input UE410-MDI (MDI module)

Note

For diagnosis, optional gateways can be connected.

Optionally, the Flexi Classic Muting can be coupled with other modules in the Flexi Classic family (see section 4.3 “Flexi Classic Muting in the Flexi family” on page 27).


4.2 **System structure**

The structure of a Flexi Classic Muting system depends on your muting application requirements and on the other safety-related tasks you have to implement with the Flexi Classic. The muting modules UE410-MM and UE410-XM will operate in conjunction with other Flexi Classic components.

1. For a pure, isolated, basic muting application, such a system consists of a single main module and, if necessary, modules from the Flexi Classic family, together with an output module. An optional gateway can be connected for diagnosis.

2. If further muting functions have to be implemented in addition to the basic muting function, then a muting Digital Input Module UE410-MDI is required in addition to the system described under 1., above.

3. The system can be extended to two muting stations by adding a UE410-XM.

4. For diagnostics, gateways are available in the Flexi Classic family.

![Fig. 11: Structure of the Flexi Classic Muting modular safety controller system](image)

4.2.1 **Muting main module UE410-MM**

The muting main module UE410-MM is the main module, in which the system configuration of the complete Flexi Classic Muting system is stored.

The muting main module UE410-MM can be used to implement basic muting functions such as 2 or 4 sensor muting, with or without override. For this purpose it has 2 inputs for connecting the main sensor that is to be muted, 4 inputs for the muting sensors, and 2 control inputs. Outputs from this module include 2 semiconductor-based, safety-rated outputs, 2 signal outputs and 2 test outputs.

Mode of operation and parameters are configured using two rotary switches on the upper surface of the module. The Function A rotary switch is used to define the mode of operation, with/without override, muting end condition and direction monitoring. The Function B rotary switch is used to define muting duration and with/without concurrence monitoring of sensors.

Functions such as EDM, restart etc. are implemented by control wiring to terminal S1.
**Connections to the muting main module**

### Inputs

<table>
<thead>
<tr>
<th>EN</th>
<th>Enable input used in supervisory control applications and cascaded systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>Input: manual reset incl. EDM; override automatic reset incl. EDM; override</td>
</tr>
<tr>
<td>M1, M2</td>
<td>Inputs for pair of muting sensors 1</td>
</tr>
<tr>
<td>M3, M4</td>
<td>Inputs for pair of muting sensors 2</td>
</tr>
<tr>
<td>I1 and I2</td>
<td>Inputs for OSSD of relevant ESPE (ESPE = Electro-Sensitive Protective Equipment)</td>
</tr>
</tbody>
</table>

### Outputs

<table>
<thead>
<tr>
<th>Q1/Q2</th>
<th>Safety output (OSSD)</th>
</tr>
</thead>
</table>
| Q3    | Signal output for controlling a lamp  
        The muting system status and the “Reset required” status (2 Hz flashing) are indicated |
| X1/X2 | Control outputs      |
| Q4    | Signal output for controlling a lamp  
        The override system status and the “Reset required” status (2 Hz flashing) are indicated |

### Notes

- Safe semiconductor outputs: The safe semiconductor outputs Q1 and Q2 on the UE410-MM/XM module are used to control actuators. The outputs are suitable for loads up to 2 A, and are resistant to short-circuits. The switchability of the outputs is continuously monitored. This is achieved by periodically switching off the outputs and checking the resulting signal for the expected LOW state. When a fault is detected, the outputs are switched off by removal of the control signal and switching the output current supply to LOW.

- When electromechanical relay contacts are required, they are available on output modules UE410-2RO/UE410-4RO.

- For further information on output modules UE410-2RO/UE410-4RO, see the Flexi Classic operating instructions (8011737) or go to www.sens-control.com.
4.2.2 Connections to muting expansion module UE410-XM

The UE410-XM module is the input/output expansion module of the Flexi Classic Muting system.

The UE410-XM module can be used to implement basic muting functions such as 2 or 4 sensor muting, with or without override. For this purpose it has 2 inputs for connecting the main sensor that is to be muted, 4 inputs for the muting sensors and 2 control inputs. Outputs from this module include 2 semiconductor-based, safety-rated outputs, 2 signal outputs and 2 test outputs.

Mode of operation and parameters are configured using two rotary switches on the upper surface of the module. The Function A rotary switch is used to define the mode of operation with/without override, muting end condition and direction monitoring. The Function B rotary switch is used to define muting duration and with/without concurrence monitoring of sensors.

Functions such as EDM, restart etc. are implemented by control wiring to terminal S1.

Note: The UE410-XM module can be integrated into a Flexi Classic system.

For further information on the Flexi Classic system see the Flexi Classic operating instructions (8011737) or go to www.sens-control.com.
4.2.3 Muting expansion module UE410-MDI

Where the application requires it, additional muting functions can be implemented with an MM or XM module by adding a UE410-MDI module. The user then has a total of three further control inputs for the integration or evaluation of control or conveyor signals. These functions are activated and their parameters set using the Function C rotary switch on the upper face of the module.

**Note**
UE410-MDI can never be used separately in a Flexi system; it can only be used as an extension to a muting main module UE410-MM or a muting expansion module UE410-XM.

**Connections to muting expansion module UE410-MDI**

![Diagram of UE410-MDI connections]

**Inputs**

<table>
<thead>
<tr>
<th>Input</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Control input for supplementary muting signal &lt;C1&gt;. Depending on the configuration, this signal will be evaluated by an MM or XM module.</td>
</tr>
<tr>
<td>OVR</td>
<td>Input for a separate button to acknowledge an override request.</td>
</tr>
<tr>
<td>CS</td>
<td>Input for connecting a conveyor-stopped signal.</td>
</tr>
<tr>
<td>S4</td>
<td>Currently has no function.</td>
</tr>
</tbody>
</table>

*Fig. 14: Inputs of muting expansion module UE410-MDI*

*Tab. 10: Inputs of muting expansion module UE410-MDI*
Product description

4.3 Flexi Classic Muting in the Flexi family

Flexi Classic Muting modules can be combined with other modules from the Flexi family in several different ways:

A muting system can, for example, consist of a UE410-MM module with a subsystem comprising a UE410-XU module and, where necessary, a UE410-8DI module. In this case, the complete system configuration would be stored in the UE410-MM.

Another example would be a Flexi Classic system comprising a UE410-MU module with a muting subsystem made up of a UE410-XM module and, where necessary, a UE410-MDI. Here, the complete system configuration would be stored in the UE410-MU.

**Flexi Classic module**
- main module UE410-MU
- input/output expansion module UE410-XU
- input expansion module UE410-8DI

**Output module UE410-2RO/UE410-4RO**

As with the Flexi Classic system, these output modules can also be used to implement electromechanical contacts for a Flexi Classic Muting module.

**Gateways**

With a Flexi Classic gateway module, information can be transmitted from a Flexi Classic Muting module to a non-safety fieldbus.

For further information on the Flexi Classic family and the output modules, see the Flexi Classic operating instructions (8011737). For further information about gateways, see the Flexi Classic gateway operating instructions (8011834).

Further information on the Flexi Classic family, the output modules, and gateways, is also available at www.sens-control.com.
4.4 Module description

Depending on the functional requirements of the muting application, a system will consist of at least one UE410-MM module or a UE410-XM module. If the functional requirements cannot be met in this way, an expansion module UE410-XM or UE410-MDI must be used. The modules and the functions they offer are described below.

<table>
<thead>
<tr>
<th>Functions</th>
<th>UE410-MM</th>
<th>UE410-XM</th>
<th>UE410-MDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muting with 4 muting sensors</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Muting with 2 muting sensors</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Concurrence</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Muting duration</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Internal override</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>End muting when ESPE is clear</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Direction monitoring</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Muting duration (max.)</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Reset</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>EDM</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Sequence monitoring</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Supplementary signal C1</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conveyor stopped (CS)</td>
<td>x</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.4.1 Module description UE410-MM and UE410-XM

Differences between modules UE410-XM and UE410-MM
- UE410-XM is an expansion module and has connections on both sides (plugs/sockets).
- UE410-MM has a configuration memory.

Configuration UE410-MM and UE410-XM

The functions of muting modules UE410-MM and UE410-XM as defined in Table 12 are set using the rotary switches Function A and Function B on the appropriate module. The switch settings for the required function result from the combination of individual functions.

Configuration using Function A

<table>
<thead>
<tr>
<th>Number of muting sensors</th>
<th>Internal override possible</th>
<th>Muting end when ESPE clear</th>
<th>Direction monitoring</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/4</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>2/4</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>2/4</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>5</td>
</tr>
<tr>
<td>2/4</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

Example showing choice of switch setting
(with reference to Table 13)

Required configuration:
- 4 muting sensors
- internal override possible
- normal end of muting
- direction monitoring activated

Result:
- switch setting 5

Tab. 13: Result of Function A example

<table>
<thead>
<tr>
<th>Number of muting sensors</th>
<th>Internal override possible</th>
<th>Muting end when ESPE clear</th>
<th>Direction monitoring</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>5</td>
</tr>
</tbody>
</table>
## Configuration using Function B

<table>
<thead>
<tr>
<th>Muting duration (max.)</th>
<th>Concurrence monitoring</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>~</td>
<td>~</td>
<td>0</td>
</tr>
<tr>
<td>20 s</td>
<td>~</td>
<td>1</td>
</tr>
<tr>
<td>1 min</td>
<td>~</td>
<td>2</td>
</tr>
<tr>
<td>15 min</td>
<td>~</td>
<td>3</td>
</tr>
<tr>
<td>60 min</td>
<td>~</td>
<td>4</td>
</tr>
<tr>
<td>~</td>
<td>3 s</td>
<td>5</td>
</tr>
<tr>
<td>20 s</td>
<td>3 s</td>
<td>6</td>
</tr>
<tr>
<td>1 min</td>
<td>3 s</td>
<td>7</td>
</tr>
<tr>
<td>15 min</td>
<td>3 s</td>
<td>8</td>
</tr>
<tr>
<td>60 min</td>
<td>3 s</td>
<td>9</td>
</tr>
</tbody>
</table>

### Example showing choice of switch setting

(with reference to Table 15)

Required configuration:
- muting duration: 1 minute
- concurrence: 3 seconds

Result:
- switch setting 7

---

Tab. 14: Function B rotary switch on the UE410-MM and UE410-XM modules

Tab. 15: Result of Function B example
4.4.2 Module description UE410-MDI

Module function

The expansion module provides supplementary signal C1, conveyor stop (CS) and an override input (OVR).

The Function C rotary switch is used for configuration of additional function parameters.

Configuration of UE410-MDI

Tab. 16: Function C rotary switch on the UE410-MDI module

<table>
<thead>
<tr>
<th>Sequence monitoring</th>
<th>C1 evaluation</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>⇐ 0</td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td>⇐ 1</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>⇐ 2</td>
</tr>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>⇐ 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⇐ 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⇐ 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⇐ 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⇐ 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⇐ 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>⇐ 9</td>
</tr>
</tbody>
</table>

Note

If the conveyor stop (CS) function is not used, the CS input must be connected to +24 V.

Example showing choice of switch setting

(with reference to Table 17)

Required configuration:
- sequence monitoring activated
- C1 evaluation activated

Result:
- switch setting 3

Tab. 17: Result of Function C example

<table>
<thead>
<tr>
<th>Sequence monitoring</th>
<th>C1 evaluation</th>
<th>Switch setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>⇐ 3</td>
</tr>
</tbody>
</table>

For setting/modifying a configuration, see chapter 11 “Configuration” on page 54.
5 Configurable functions

5.1 Number of muting sensors

Muting can be achieved using either two or four sensors. The number of sensors used depends on the geometry of the object to be detected.

The following sensor combinations are possible:
- two sensors (one pair of sensors)
- two sensors (one pair of sensors) and a supplementary signal C1 (requires module MDI in addition)
- four sensors (two pairs of sensors)
- four sensors (two pairs of sensors) and a supplementary signal C1 (requires module MDI in addition)

The electrical connection of muting sensors is described in the chapter "Examples of applications and connections" in the operating instructions of the switching device used.

Note

There must always be connections to all 4 muting sensor inputs, i.e. for applications with only 2 muting sensors, bridges must be installed between M1 and M3, and M2 and M4.

5.1.1 Supplementary signal C1

You can also connect a supplementary signal C1 to the muting sensors. The signal can be a control signal from a PLC or from an additional sensor. The supplementary signal C1 must not be a static signal. It will be checked during the muting cycle for dynamic behavior. If the signal does not change during a cycle, no further muting will take place.

Dynamic sequence of input signals

![Diagram showing the sequence of input signals](image-url)
Con digitally functions

5.2 Time monitoring

5.2.1 Concurrence monitoring

To protect against manipulation (e.g. covering an optical sensor) of the safety application, *concurrence monitoring* can be configured.

When this function is selected, both muting sensors must become active within a defined time (see chapter 13 “Technical data” on page 58). When this function is not selected, there is no time monitoring.

Configuration is carried out using the Function B rotary switch on module UE410-MM or UE410-XM. The configurable time for concurrence monitoring applies to both sensors of a pair.

**Note**

Configuration is carried out using the Function B rotary switch on module UE410-MM or UE410-XM. The configurable time for concurrence monitoring applies to both sensors of a pair.
5.2.2 Monitoring the total muting duration

When *Monitoring the total muting duration* is active, the maximum duration of muting is limited. Monitoring of the total muting duration can be set in stages. The times are configurable (see chapter 13 “Technical data” on page 58).

Muting is ended, at the latest, when the total muting duration expires.

**Note** Configuration is set using the Function B rotary switch on module UE410-MM or UE410-XM.

5.2.3 Sensor gap monitoring

When a valid muting state has been achieved for a pair of sensors, it is permissible for one sensor to briefly change state (become inactive) for a defined time without causing the muting state to be discontinued (see chapter 13 “Technical data” on page 58).

**Note**
- Only one sensor of a pair may briefly become clear (inactive).
- At the affected pair of sensors, one valid muting condition must always be met.

5.2.4 Conveyor stopped (CS)

To prevent valid muting conditions from being cancelled by the expiry of time monitoring when the conveyor stops, the function *Conveyor stopped* and a conveyor-stopped signal can be used to suspend time monitoring. At the same time, the conditions of the active muting sensors and the ESPE, when the conveyor has stopped, are monitored for changes.

The following timeout controls are suspended when the conveyor stopped signal is active:
- monitoring of the total muting time
- concurrence monitoring

When the conveyor restarts, the muting state ...
- continues, if the muting conditions remain valid;
- is terminated, if the muting conditions became invalid.

**Note** Monitoring of the condition of the sensors and the ESPE begins after a fixed deceleration time (see chapter 13 “Technical data” on page 58).

When the *Conveyor stopped* function is configured, the signal from the conveyor must be connected to the “Conveyor stopped” input.

The function *Conveyor stopped* is only possible in conjunction with expansion module MDI.

<table>
<thead>
<tr>
<th>Conveyor stopped (CS) input signals</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH</td>
<td>Conveyor is running, muting timeout controls are active</td>
</tr>
<tr>
<td>LOW</td>
<td>Conveyor is not running:</td>
</tr>
<tr>
<td></td>
<td>• Muting timeout controls are paused</td>
</tr>
<tr>
<td></td>
<td>• the last states of all active muting sensors and the ESPE are monitored.</td>
</tr>
</tbody>
</table>

**WARNING** If the conveyor stopped (CS) function is not used, the CS input must be connected to +24 V!
5.2.5 Muting end by ESPE

Muting ends when one sensor of the last pair becomes inactive, and, thus, there is no longer a valid muting condition fulfilled. The function Muting end by ESPE shortens the duration of muting to the time at which the light beam of the ESPE is cleared again. In this way, you achieve a shorter muting time and, simultaneously, greater safety.

**Note**
- Material and means of transport must be detected by the muting sensors or the ESPE over their entire length. There must be no detectable gaps, otherwise muting will be ended too early.
- If the ESPE light path does not become clear, then muting will be ended, at the latest, when the muting condition is no longer met.
- Observe the muting-end delay time (see chapter 13 “Technical data” on page 58).
- Configuration of the Muting end by ESPE function is carried out using the Function A rotary switch on module UE410-MM or UE410-XM.
- When muting with 4 muting sensors, detection by the second pair of sensors is necessary.

Without the function Muting end by ESPE, muting is not ended before one sensor of the last pair becomes free again ①.

With the function Muting end by ESPE, muting ends as soon as the ESPE beam is clear again ②.
Chapter 5

Configurable functions

5.3 Direction recognition

When Direction recognition is activated, a pair of sensors must be activated and be cleared again in a particular sequence. The material can then only pass the protective installation in a specified direction. The sequence of sensors within a pair is, in this case, not relevant. The following table shows the precise conditions in relation to the number of sensors.

<table>
<thead>
<tr>
<th>Number of muting sensors</th>
<th>Conditions to be met</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (1 pair of sensors)</td>
<td>Direction recognition not possible</td>
</tr>
</tbody>
</table>
| 4 (2 pairs of sensors)   | According to the direction set, the pairs of sensors must be activated in the following sequence:  
  - sensor pair A before sensor pair B  
  or  
  - sensor pair B before sensor pair A |

For muting conditions to be met, the object can only move in the defined direction and sequence through the muting sensors.

Note: Configuration is carried out using the Function A rotary switch on module UE410-MM or UE410-XM.

5.4 Sequence monitoring

When Sequence monitoring is activated, the sensors must become active and then be cleared again in a certain sequence. The material must pass completely through the protective installation for there to be no muting error. In addition, the direction can be defined by configuring Direction recognition. The following table shows the precise conditions in relation to the number of sensors.

<table>
<thead>
<tr>
<th>Number of muting sensors</th>
<th>Conditions to be met</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 (1 pair of sensors)</td>
<td>Sequence monitoring not possible</td>
</tr>
<tr>
<td>4 (2 pairs of sensors)</td>
<td></td>
</tr>
</tbody>
</table>
  - M1 before M2 before M3 before M4  
  (defined direction, defined sequence)  
  or  
  - M4 before M3 before M2 before M1  
  (defined direction, defined sequence)  
  or  
  - M1 before M2 before M3 before M4, alternatively  
  M4 before M3 before M2 before M1  
  (changing direction, defined sequence) |

In order to fulfill muting conditions, the object may only move through the muting sensors in the defined direction and sequence.

Note:  
- Sequence monitoring can only be implemented with an MDI module.  
- Configuration is carried out using the Function C rotary switch on the MDI module.
### 5.5 Override function

Override is manual initiation of muting after a muting condition error. By briefly simulating a valid muting condition, you can bypass the protective installation (muting) and run the system to clear it, or to achieve an error-free state.

The system differentiates between two conditions: Override and Override required.

#### Override

The Override function is activated using the Function A rotary switch.

#### Override required

The condition Override required means that the switched outputs (OSSD) are in the OFF condition and the system is waiting for the Override control to be operated. The system signals this condition by a blinking muting lamp (2 Hz).

The condition Override required is only triggered by the system when, during a valid muting condition...

- an error occurs
- and
- muting is ended
- and
- the ESPE is interrupted by an object.

Errors can arise due to concurrence monitoring, total muting time monitoring, direction recognition, sequence monitoring, and sensor gap monitoring, all governed by the muting sensors, or due to a restart after an emergency stop or power failure.

---

**Observe the following safety instructions for the Override condition!**

- Install the Override control in a position where the operator has a clear view of the entire hazardous area.
- Before operating Override, ensure that the muting system components are operating properly, in particular the muting sensors.
- When two successive muting cycles require the Override to be used, then the muting arrangement and muting sensors must be examined and verified for correct operation.

The Override function can only be started in the condition Override required by operating the Override control. The system will resume muting at the point at which it was interrupted. The switch outputs (OSSD) change to the ON status and the system will then monitor the Override condition.

Override can be started in two ways:

- using a separate Override control (only with the MDI module)
- using a common control for Reset and Override

Electrical connection of the control device is described in chapter 9 “Examples of applications and connections” from page 47.

---

**Note**

When using a common control device for Reset and Override the Reset and Override input terminals must be bridged if an MDI module is also used.
Configurable functions

Admissibility of Override conditions

For safety reasons, the permissible number of Override conditions is limited.
The permissible number depends on configuration of the function Monitoring of total muting time.

<table>
<thead>
<tr>
<th>Configuration of the function Monitoring of total muting time</th>
<th>Permissible number of Override conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deactivated</td>
<td>5×</td>
</tr>
<tr>
<td>Activated Values:</td>
<td></td>
</tr>
<tr>
<td>20 s ⇒ 180×</td>
<td></td>
</tr>
<tr>
<td>60 s ⇒ 60×</td>
<td></td>
</tr>
<tr>
<td>15 m ⇒ 5×</td>
<td></td>
</tr>
<tr>
<td>60 m ⇒ 5×</td>
<td></td>
</tr>
</tbody>
</table>

Notes

- Every time the system is switched on, and after a muting cycle in which no errors were detected the counter for the number of Override cycles allowed is automatically reset.
- When the permissible number of muting cycles using Override is exceeded, the system goes to the Lock-out state. This is indicated by an error signal at the ERR LED.

WARNING

Concurrence and direction monitoring are deactivated for the duration of Override operation!
Configurable functions

5.6 Restart interlock

The hazardous movement of the machine ① is stopped when the optical protective device is interrupted ②, and restarting cannot occur until the operator is outside the hazardous area and operates the Reset button ③.

Do not confuse the restart interlock with the machine's start interlock. The start interlock prevents the machine from starting when it is switched on. The restart interlock prevents the machine from restarting after an error or after a light beam has been interrupted.

You can prevent the machine from restarting in two ways:

- with the internal restart interlock in the modules UE410-MM or UE410-XM:
  then the muting module controls restarting,

- with the restart interlock of the machine (external):
  then the muting module has no control over restarting.

The following table shows the possible combinations:

<table>
<thead>
<tr>
<th>Restart interlock of muting module</th>
<th>Restart interlock of the machine</th>
<th>Permissible applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deactivated</td>
<td>Deactivated</td>
<td>Observe the conditions in EN 60 204-1!</td>
</tr>
<tr>
<td>Deactivated</td>
<td>Activated</td>
<td>All</td>
</tr>
<tr>
<td>Activated</td>
<td>Deactivated</td>
<td>Observe the conditions in EN 60 204-1!</td>
</tr>
<tr>
<td>Activated</td>
<td>Activated</td>
<td>The restart interlock in the muting module takes over the Reset function.</td>
</tr>
</tbody>
</table>

When the function is activated, the status “Reset required” is indicated by the muting lamp on the Q3 and/or on the Q4 output blinking at a rate of 1 Hz.

Observe the following safety instruction!

- Always configure an application with restart interlock! Make sure that there is always a restart interlock. The Flexi Classic Muting family cannot verify if the machine's restart interlock is connected.

If you deactivate both the internal and the external restart interlocks, you expose the plant operator to acute danger.
5.6.1 Reset

When you both activate the restart interlock (internal) and implement the restarting interlock of the machine (external), then each restart interlock must have its own button.

When the Reset button is operated (for the internal restart interlock), the safety outputs are activated in the modules UE410-MM and UE410-XM.

Then, only the external restart interlock prevents a restart of the machine. After pressing the reset button for the muting module, the operator must press the restart button for the machine. If the reset button and restart button are not operated in the order given, the dangerous state remains interrupted.

Tab. 23: Reset without MDI

<table>
<thead>
<tr>
<th>Without MDI</th>
<th>Without EDM</th>
<th>With EDM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual reset</td>
<td>Reset</td>
<td>Reset</td>
</tr>
<tr>
<td></td>
<td>UB</td>
<td>S1</td>
</tr>
<tr>
<td>Automatic reset</td>
<td></td>
<td>S1</td>
</tr>
<tr>
<td>Manual reset with override</td>
<td>Reset + Override</td>
<td>Reset + Override</td>
</tr>
<tr>
<td></td>
<td>UB</td>
<td>S1</td>
</tr>
<tr>
<td>Automatic reset with override</td>
<td></td>
<td>S1</td>
</tr>
</tbody>
</table>

**Recommendation**
With the aid of the reset button, you can eliminate unintentional operation of the external restart button. The user must first acknowledge the safe condition by pressing the reset button.

5.7 External device monitoring (EDM)

On reset, the static external device monitor checks whether the controlled relays have dropped out. The external device monitor can thus recognise if, for example, a pair of relay contacts have become welded. In such cases, the external device monitor switches the system to a safe condition. Then, the safety outputs are not re-activated.
6 Subsystems and cascaded systems

6.1 Subsystems

Note
Only a UE410-MDi is allowed to follow immediately after a UE410-MM. Only a UE401-MDixC2 is allowed to follow immediately after a UE410-XM. For further information please refer to the Flexi Classic configurator at www.sens-control.com.

WARNING
Exclude cross-circuits by means of appropriate cabling!

If several modules are used (UE410-MM and UE410-XM), cross-circuits on safety outputs (Q1/Q2) can not always be detected.
- If several modules are used, the possibility of cross-circuits has to be excluded by means of appropriate cabling measures (protected installation, control cabinet, plastic-sheathed cable etc.).

6.2 Grouping

Note
In case of the single-channel wiring of a safety output (Q1/Q2) to a signal input (EN), if the wiring is laid with protection, SIL3 in accordance with IEC 61508, SILCL3 in accordance with EN 62061, PL e as per EN ISO 13849-1 and category 4 as per EN ISO 13849-1 can be achieved.

WARNING
Exclude cross-circuits by means of appropriate cabling!

Single-channel wiring is only allowed to be realized with protection (control cabinet, plastic-sheathed cable etc.).
- If several modules are used, the possibility of cross-circuits has to be excluded by means of protected installation:
  - If several modules are used (>1), cross-circuits on control outputs (X1-Xn) can not always be detected.
  - If several modules are used (MU and XU), cross-circuits on safety outputs (Q1-Q4) can not always be detected.

If these conditions cannot be met, then the safety level stated above cannot be achieved.
6.3 ENABLE input

For all UE410-MM and UE410-XM devices with a type label entry from E1 the following applies: In case of the single-channel wiring of a safety output (Q1/Q2) to a signal input (EN), SIL3 in accordance with IEC 61508, SILCL3 in accordance with EN 62061, PL e as per EN ISO 13849-1 and category 4 as per EN ISO 13849-1 can be achieved.

Exclude cross-circuits by means of appropriate cabling!
Single-channel wiring is only allowed to be realized with protection (control cabinet, plastic-sheathed cable etc.).
If this condition cannot be met, the safety level stated above cannot be achieved.

The ENABLE input makes it possible to cascade safety circuits or to form subsystems. ENABLE input has a higher ranking than all other input signals (sensors, muting).

Unused ENABLE inputs must be permanently connected to the supply voltage $+U_B$. Otherwise the OSSDs (Q1-Q2) cannot be released.

When ENABLE input goes to LOW (0 V DC), the OSSDs (Q1-Q4) always go to LOW as well, and, simultaneously, signals such as Reset and Muting are not recognised until ENABLE input is HIGH again.

Switching ENABLE off and then on again does not require a new Reset at the appropriate modules; the OSSDs (Q1-Q4) go to HIGH.

For further information on subsystems and cascading, see operating instructions Flexi Classic (8011737) or go to www.sens-control.com.
7 Mounting and dismounting

This chapter describes how to mount modules of the Flexi Classic Muting modular safety controller.

After they have been mounted, the following steps are necessary:

- making the electrical connections
- configuration
- checking the installation

7.1 Mounting the modules

The Flexi Classic Muting system must be mounted in an enclosure with at least degree of protection IP 54.

- In a Flexi Classic Muting system the main module UE410-MM is installed at the extreme left, one of the optional gateways, e.g. UE410-PRO, at the extreme right.
- Connections between the modules are by means of connectors integrated into the housings.
- The installation must comply with EN 50274.
- The modules are in 22.5 mm wide housings for installation on 35 mm standard DIN mounting rails to EN 60715.

![Fig. 21: Hook module on to the DIN mounting rail](image)

- Hook the top of the module on to the DIN mounting rail ①.
- Ensure that the grounding clip ② is correctly seated. The grounding clip of the module must have secure contact and good electrical conductivity to the DIN mounting rail.
- Apply light pressure in the direction of the arrow to click the module on to the DIN mounting rail ③.
Mounting and dismounting

Fig. 22: Install end stops

- When several modules are used, slide the modules together in the direction of the arrows until the connectors between modules are fully engaged.
- Install end stops at each end of the module assembly.

7.2 Dismounting modules

Fig. 23: Unplug the terminal blocks

- Unplug the terminal blocks with their wiring and remove the end stops.

Fig. 24: Separate the connectors

- If there are several modules, slide them apart in the direction of the arrow until the connectors on the module sides have separated.
Mounting and dismounting

Press the top of the module down ① at the rear and, while maintaining the pressure, rotate in the direction of the arrow to remove it from the DIN mounting rail ②.

7.3 Removing the anti-manipulation cap

Push a screwdriver into the opening ①.
Move the screwdriver upwards to release the cap. The cap can then be removed ②.
A cap can be replaced by just clicking it into its opening.
Electrical installation

Switch the entire machine/system off line!
The machine/system could inadvertently start up while you are connecting the devices.

- The Flexi Classic Muting safety controller fulfils the EMC requirements in accordance with the basic specification EN 61000-6-2 for industrial use and EN 61131-2 for control systems.
- The control cabinet or mounting housing of the Flexi Classic Muting must at least comply with enclosure rating IP 54.
- The modules of the Flexi Classic Muting family conform to Class A, Group 1, in accordance with EN 55011. Group 1 encompasses all ISM devices in which intentionally generated and/or used conductor-bound RF energy that is required for the inner function of the device itself occurs.
- Mounting according to EN 50274
- In order to ensure EMC safety, the DIN mounting rail must be connected to FE.
- You must connect the Flexi Classic Muting to the same voltage supply as the connected protective devices.
- The voltage supply of the devices must be capable of buffering brief mains voltage failures of 20 ms as specified in EN 60204-1.
- The voltage supply as well as all signals connected have to fulfil the regulations for extra-low voltages with safe isolation (SELV, EN 61140) for overvoltage category III according to EN 60664.
- For UL 508 and CSA applications a class 2 power supply as per UL 1310 must be used.
- If several power supplies are used, the 0 V connections of the power supplies must be connected to each other.
- For installation in environments with overvoltage category III, external protection elements must be used. The required level of protection as per EN 62305-1 can be achieved using an external snubber circuit. The protection elements (SPD — surge protective devices) must comply with the requirements as per EN 61643-11.
- The cables of a connected reset button must be laid in separate plastic-sheathed cables.
- All connected sensors and downstream controllers and wiring/installation must correspond to the required category according to EN ISO 13849-1 and to the SILCL according to EN 62061 (e.g. protected installation, single plastic-sheathed cable with shielding etc.).
- In order to protect the safety outputs and to increase the life of the module, the external load must be equipped with e.g. varistors and RC circuits. Please also note that the selection of the arc suppression can increase the total response time of the safety function.
- Single-channel safety outputs, the external device monitoring (EDM) and ENABLE (EN) must be wired in a protected area (e.g. in the control cabinet). If this condition cannot be met, the stated safety level cannot be achieved.
- External faults (e.g. cross-circuits) between two modules within a Flexi Classic Muting system are to be avoided through use of appropriate countermeasures (separating effected wires, shielded cable).
- Mount the reset device so that it cannot be actuated by a person located in the hazardous area. When operating the reset device, the operator must have full visual command of the hazardous area.
Examples of applications and connections

If all the conditions stated in chapter 3 “Muting” on page 11 are taken into account and evaluated in an analysis (e.g. FMEA), applications up to maximum of SIL3 in accordance with IEC 61508, SILCL3 in accordance with EN 62061, PL e as per EN ISO 13849-1 and category 4 as per EN ISO 13849-1 can be realized. In particular the selection of the muting sensors (see section 3.1.2 “Muting sensors” on page 12) and their placement (see section 3.2 “Arrangement of muting sensors” on page 14) are an important element of the safety level described.

If the conditions stated there cannot be met, the safety level stated above cannot be achieved.

Functions:

- External Device Monitoring (EDM)
- S1: Manual Reset and Override
- H1: Lamp: Reset or Override required/Muting active
- H2: Lamp: Override required

On selecting the muting sensors please follow section 3.1.2 “Muting sensors” on page 12. You will find information on their placement in section 3.2 “Arrangement of muting sensors” on page 14.
## Examples of applications and connections

### Flexi Classic Muting

**Fig. 28: 4 sensor muting with M4000**

Functions:
- External Device Monitoring (EDM)
- S1: Manual Reset and Override
- H1: Lamp: Reset or Override required/Muting active
- H2: Lamp: Override required

On selecting the muting sensors please follow section 3.1.2 “Muting sensors” on page 12. You will find information on their placement in section 3.2 “Arrangement of muting sensors” on page 14.
**Flexi Classic Muting**

*Fig. 29: 4 sensor muting with M4000 A/P (Example 1)*

Functions:
- External Device Monitoring (EDM)
- Conveyor stopped (CS)
- S1: Manual Reset
- S2: Override
- H1: Lamp: Reset or Override required/Muting active
- H2: Lamp: Override required

On selecting the muting sensors please follow section 3.1.2 “Muting sensors” on page 12. You will find information on their placement in section 3.2 “Arrangement of muting sensors” on page 14.
Examples of applications and connections

Fig. 30: 4 sensor muting with M4000 A/P (Example 2)

Functions:
- External Device Monitoring (EDM)
- Conveyor stopped (CS)
- S1: Manual Reset and Override
- H1: Lamp: Reset or Override required/Muting active
- H2: Lamp: Override required

On selecting the muting sensors please follow section 3.1.2 “Muting sensors” on page 12. You will find information on their placement in section 3.2 “Arrangement of muting sensors” on page 14.
Commissioning

10

No start-up without inspection by a competent person!
Before you commission a plant in which you are using a Flexi Classic Muting, the installation must be examined by a competent person and its release documented.

Check the hazard zone!
Before start-up and commissioning, make absolutely certain that there is no one in the hazard zone.
- Check the hazard zone and secure it so that persons cannot enter (e.g. place warning signs, install a barrier, etc.). Observe applicable laws and local regulations.

10.1 Application acceptance
You may only commission the system if validation was successful. Validation may only be performed by professionals trained accordingly.

The general acceptance comprises the following test points:
- Check whether the connection of the components to the connections corresponds to the required Performance Level in accordance with EN ISO 13849-1 or to the SIL in accordance with IEC 61508 or the SILCL in accordance with EN 62061.
- Check the devices connected to the safety controller in accordance with the test notes from the accompanying operating instructions.

Note
You will find the “Tests before the first commissioning” chapter for this in the operating instructions of the ESPE from SICK AG.

- Clearly mark all connection cables and plugs at the safety controller.
- Perform a complete verification of the safety functions of the system in each operating mode and an error simulation. Observe the response times of the individual applications in particular.

Completely document the configuration of the system, the individual devices and the result of the safety check.

Note
The software for the configuration documentation is available
- on the Internet at www.sens-control.com
- on the Flexi Classic Mini CD (part no. 2040332)
10.2 Testing instructions

10.2.1 Tests before first commissioning

The purpose of the tests before the first commissioning is to confirm the safety requirements specified in the national/international rules and regulations, especially in the Machinery Directive and the Work Equipment Directive (EU Conformity).

- Check the effectiveness of the protective installation mounted on the machine, in all selectable operating modes and functions.
- Make sure that the operating personnel for a machine fitted with a safety controller are instructed by a competent person before they are allowed to operate the machine. Instructing the operating personnel is the responsibility of the authority responsible for the machine.

10.2.2 Periodic testing

The Flexi Classic Muting system must be tested at regular intervals.

To comply with the safety-relevant characteristics (see chapter 13 “Technical data” on page 58) of SILCL3 to EN 62061, the following proof test must be carried out at least every 365 days:

- Switch off the power supply to the Flexi Classic Muting system.
- Switch on the power supply to the Flexi Classic Muting system.
- Verify that all the safety functions of the connected sensors are operating correctly.

10.2.3 Regular inspection of the protective installation by a competent person

- Check the system according to the valid national regulations within the time limits. The objective is to discover changes to the machine and manipulations of the protective installation since first commissioning.
- Each safety application must be checked daily or at the start of every shift for correct operation and detectable manipulations by an authorised and assigned person. In accordance with the safety performance requirements given in the Technical data, a complete check of function and wiring must be carried out at appropriate intervals.
- If any modifications have been made to the machine or the protective installation, or if the safety controller has been changed or repaired, then you must check the system again as specified in the checklist in the Annex.
### 10.3 Meanings of optical signals

<table>
<thead>
<tr>
<th>Signal</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Signals of UE410-MM and UE410-XM</strong></td>
<td></td>
</tr>
<tr>
<td>PWR on</td>
<td>Supply voltage OK</td>
</tr>
<tr>
<td>M1-M4, I1, I2 on</td>
<td>Appropriate inputs are active (High)</td>
</tr>
<tr>
<td>I1, I2 blink alternately</td>
<td>A procedure error has occurred at inputs I1, I2</td>
</tr>
<tr>
<td>M1, M2 blink alternately</td>
<td>A procedure error has occurred at inputs M1, M2</td>
</tr>
<tr>
<td>M3, M4 blink alternately</td>
<td>A procedure error has occurred at inputs M3, M4</td>
</tr>
<tr>
<td>M1, M3 and M2, M4 blink alternately</td>
<td>Procedure error of both pairs (wrong direction, missing muting condition. Also possible: concurrence error between the sensors of both pairs)</td>
</tr>
<tr>
<td>M1 or M2 blinks</td>
<td>Synchronous time error, synchronization time has elapsed on the related input.</td>
</tr>
<tr>
<td>M3 or M4 blinks</td>
<td>Synchronous time error, synchronization time has elapsed on the related input.</td>
</tr>
<tr>
<td>EN, S1 on</td>
<td>Appropriate input is active (High)</td>
</tr>
<tr>
<td>S1 blinks</td>
<td>Time for operation of the reset button has expired (only for restart interlock)</td>
</tr>
<tr>
<td>Q1, Q2 on</td>
<td>Appropriate output is active (High)</td>
</tr>
<tr>
<td>OVR REQ blinks</td>
<td>System is in Override required condition and is waiting for the restart button to be pressed</td>
</tr>
<tr>
<td>ERR off</td>
<td>There is no error condition</td>
</tr>
<tr>
<td><strong>Signals of UE410-MDI</strong></td>
<td></td>
</tr>
<tr>
<td>PWR on</td>
<td>Supply voltage OK</td>
</tr>
<tr>
<td>C1, CS, OVR</td>
<td>Appropriate inputs are active (High)</td>
</tr>
<tr>
<td>ERR off</td>
<td>There is no error condition</td>
</tr>
</tbody>
</table>

*Tab. 24: LED signals*
11 Configuration

Check the configuration for the protective installation after every change!

- If you change the configuration, you must check that the protective installation is still effective. When checking the system, observe the testing instructions in the operating instructions for the protective device used.

For configuring the Flexi Classic Muting modules, you require a screwdriver.

- Switch off the power supply to all main modules (terminals A1, A2).
- Use the screwdriver to set the rotary switches for the required functions on all system modules.
- Set up the control functions of the system by connecting the external devices at the S1 terminals on the UE410-MM or UE410-XM module.
- With the ENTER button on the main module UE410-MU or UE410-MM held down, switch on the power supply to all main modules.

It is important that no connected RESET button is operated with the system in this condition!

- When the display ERR starts to blink, release the ENTER button within 3 seconds. The configuration is now stored, active, and protected against power loss.

Note

- If the ENTER button is pressed for longer than 3 seconds, the whole system goes to the fault condition. The display ERR blinks (see also section 12.4 “Error-LED displays (ERR)” on page 56).

All subsequent changes to the circuits at S1 result in a lockout condition (ERR).
12 Diagnosis

12.1 Behavior in the event of an error

Do not run the machine if you cannot clearly determine the cause of a fault!
Take the machine out of service if you are not certain of the cause of a fault or are not sure how to correct it.

Perform a full function test after an error has been corrected!
After correcting a fault, carry out a complete function test.

The operating condition ERROR
After certain faults, and when there is a configuration error, the Flexi Classic Muting goes to a safe condition. The ERR-LEDs on the individual modules of the safety controller indicate what type of error has occurred.
To put the device into service again, proceed as follows:
➢ Correct the cause of the fault as indicated by the ERR-LED display.
➢ Switch the power supply to the Flexi Classic Muting off and on again.

12.2 Safe state in case of an error

On the occurrence of an error that results in the loss of the safety function, the Flexi Classic Muting modules adopt a defined, safe state.
All safety outputs are shut down (Q1-Q4 = LOW) and the ERR LED flashes.
The Flexi Classic Muting modules remain in this state until the error is rectified and then a power-up is undertaken.
Errors that can result in the loss of the safety function, can be e.g.:
• safety-related internal errors
• an invalid start-up configuration
• sensor error
• supply voltage loss
You will find the complete list in section 12.4 “Error-LED displays (ERR)” on page 56.

12.3 SICK support

If you cannot remedy an error with the help of the information provided in this chapter, please contact your local SICK agency.

Note
When you send a device to us for repair, it will be returned to you with our standard delivery settings. Please, therefore, note the configuration of your devices before you send them to us.
## 12.4 Error-LED displays (ERR)

This section explains what the ERR-LED displays mean and how you should react to them.

<table>
<thead>
<tr>
<th>Display</th>
<th>Possible cause</th>
<th>How to correct the fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>●</td>
<td>Sequence error. Error is not at this module</td>
<td>Eliminate the error at the respective module</td>
</tr>
<tr>
<td>2 × ●</td>
<td>Error in module configuration</td>
<td>Repeat the configuration procedure</td>
</tr>
</tbody>
</table>
| 3 × ●   | Rotary switch manipulated | Turn the rotary switch back to the original position  
Carry out a power-up or repeat teach-in |
| 4 × ●   | Change to the configuration (at S1 or rotary switches) with power off  
or slot list comparison has found a difference | Reset configuration to original state  
or  
Re-connect module to original position  
or  
Carry out a power-up and repeat teach-in |
| 5 × ●   | Supply voltage defective | Check power supply |
| 6 × ●   | Self-diagnostics, internal error, etc. | Carry out a power-up |
| 7 × ●   | Maximum permissible number of override cycles exceeded | Check the muting arrangement and sensors |

Tab. 25: Fault displays at ERR-LED
## 12.5 Anti-manipulation measures

Certain safety measures are incorporated as anti-manipulation measures to help eliminate misbehavior.

<table>
<thead>
<tr>
<th>Reaction of the system</th>
<th>Cause</th>
<th>How to correct the fault</th>
</tr>
</thead>
</table>
| - Immediate disconnection of all outputs  
- System goes into status “System error”  
- Red ERR LED of the affected module blinks  
- Green PWR LED blinks  
- All other ERR LEDs are continuous red  
- Message via gateway | A rotary switch has been turned. | ➢ Return the switch back to the old position (setting aid if voltage remains activated: flashing PWR LED changes to steady green).  
➢ Restart the system by switching the voltage off and on again. |
| - De-activation of the outputs of the system/subsystem during the next cycle  
- Red ERR LED of the respective module blinks  
- Message via diagnostics module | Change in the control circuit configuration (Input S1) | ➢ Reset the old configuration at S1.  
➢ Restart the system by switching off and on again. |
| - The last configurations are saved internally in non-volatile memory and can be read by the manufacturer if required. | Intentional use of an incorrect configuration | ➢ You can read out the last (correct) configuration using one of the Flexi Classic gateways.  
➢ Check the configuration visually at regular intervals. |
| - Outputs of the system cannot be activated  
- Red ERR LED of the main module (UE410-MM) blinks  
- All other ERR LEDs to steady red | A rotary switch has been turned. | ➢ Return the switch back to the old position (setting aid if voltage remains activated: flashing PWR LED changes to steady green).  
➢ Restart the system by switching the voltage off and on again. |
| - Outputs of the system/subsystem cannot be activated  
- Red ERR LED of the master module (UE410-MM) blinks  
- All other ERR LEDs are steady red | Change in the control circuit configuration (Input S1) | ➢ Reset the old configuration at S1.  
➢ Restart the system by switching off and on again. |

For further information on anti-manipulation measures, see operating instructions Flexi Classic (8011737) or go to www.sens-control.com.
13 Technical data

13.1 Data sheet

13.1.1 Module UE410-MM/UE410-XM

<table>
<thead>
<tr>
<th>Supply circuit (A1, A2)</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage $U_a$</td>
<td>19.2 V DC</td>
<td>24 V DC</td>
<td>30 V DC</td>
</tr>
<tr>
<td>Type of supply voltage</td>
<td>PELV or SELV</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The current from the power supply that supplies the main module must be limited externally to max. 6 A — either by the power supply itself or by a fuse.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residual ripple $U_{ss}$</td>
<td>-</td>
<td>-</td>
<td>3 V</td>
</tr>
<tr>
<td>Power consumption</td>
<td>-</td>
<td>-</td>
<td>3 W</td>
</tr>
<tr>
<td>Maximum switch-on time</td>
<td>-</td>
<td>-</td>
<td>60 s</td>
</tr>
<tr>
<td>Short circuit protection</td>
<td>4 A gG with release characteristic B or C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input circuits (I1, I2, EN, S1, M1-M4)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of inputs</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Input voltage HIGH</td>
<td>13 V DC</td>
<td>-</td>
<td>30 V DC</td>
</tr>
<tr>
<td>Input voltage LOW</td>
<td>-5 V DC</td>
<td>-</td>
<td>5 V DC</td>
</tr>
<tr>
<td>Input current HIGH</td>
<td>2.4 mA</td>
<td>3 mA</td>
<td>3.8 mA</td>
</tr>
<tr>
<td>Input current LOW</td>
<td>-2.5 mA</td>
<td>-</td>
<td>2.1 mA</td>
</tr>
<tr>
<td>Input capacitance</td>
<td>9 nF</td>
<td>10 nF</td>
<td>11 nF</td>
</tr>
<tr>
<td>Minimum switch-on time</td>
<td>70 ms</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Duration of actuation of the reset button</td>
<td>50 ms</td>
<td>-</td>
<td>5 s</td>
</tr>
<tr>
<td>Minimum switch-off time</td>
<td>See response time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum inactive state without causing tripped condition</td>
<td>-</td>
<td>-</td>
<td>0.9 ms</td>
</tr>
<tr>
<td>Muting-on time</td>
<td>-</td>
<td>-</td>
<td>70 ms</td>
</tr>
<tr>
<td>Teach-in time, ENTER button</td>
<td>-</td>
<td>3 s</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control outputs (X1, X2)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of outputs</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Output type</td>
<td>PNP semiconductor, short circuit protected, cross-circuit detecting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output voltage</td>
<td>16 V DC</td>
<td>-</td>
<td>30 V DC</td>
</tr>
<tr>
<td>Output current</td>
<td>-</td>
<td>-</td>
<td>120 mA</td>
</tr>
</tbody>
</table>

1) Only for UE410-MM module during power-up phase.

2) Cross circuit detecting only within a module.
## Technical data

### Load capacity
<table>
<thead>
<tr>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>–</td>
<td>–</td>
<td>1000 nF</td>
</tr>
</tbody>
</table>

### Line resistance
<table>
<thead>
<tr>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>–</td>
<td>–</td>
<td>100 ohm</td>
</tr>
</tbody>
</table>

## Output circuit (Q1, Q2, Q3, Q4)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of outputs</td>
<td>– 4</td>
<td>– 4</td>
<td>– 4</td>
</tr>
<tr>
<td>Type of output</td>
<td>PNP semiconductors, short-circuit protected, cross-circuit detecting²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching voltage</td>
<td>18.4 V DC</td>
<td>–</td>
<td>30 V DC</td>
</tr>
</tbody>
</table>
| Switching current
  - $I_{Qn}, T_A \leq 45 \, ^\circ C$       | –       | –       | 2.0 A   |
  - $I_{Qn}, T_A \leq 55 \, ^\circ C$       | –       | –       | 1.6 A   |
| Total current $I_{sum}$
  - $\Sigma I_{Qn}, T_A \leq 45 \, ^\circ C$ | –       | –       | 4 A     |
  - $\Sigma I_{Qn}, T_A \leq 55 \, ^\circ C$ | –       | –       | 3.2 A   |

![Load diagram for the Q1 to Q4 outputs of the UE410-MM/UE410-XM modules](image)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test pulse width</td>
<td>– 500 µs</td>
<td>700 µs</td>
<td></td>
</tr>
<tr>
<td>Test pulse frequency</td>
<td>12.5 Hz</td>
<td>– 32 Hz</td>
<td></td>
</tr>
<tr>
<td>Inductive switch-off energy $E = 0.5 \times L \times I^2$</td>
<td>–</td>
<td>–</td>
<td>370 mJ</td>
</tr>
<tr>
<td>Load capacity</td>
<td>–</td>
<td>–</td>
<td>500 nF</td>
</tr>
<tr>
<td>Cable length (single, Ø 1.5 mm²)</td>
<td>–</td>
<td>–</td>
<td>100 m</td>
</tr>
<tr>
<td>Response time ($I1/I2$)³ (if not in muting operation)</td>
<td>–</td>
<td>–</td>
<td>13 ms</td>
</tr>
<tr>
<td>Response time (EN)⁴</td>
<td>–</td>
<td>–</td>
<td>13 ms</td>
</tr>
</tbody>
</table>

³) Time without sensor, the data for the sensors connected apply in addition.

⁴) Cascading subsystems.
**Technical data**

<table>
<thead>
<tr>
<th>Activation times/deceleration times/response times</th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concurrence monitoring (M1-M4)</td>
<td>3 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring of total muting time</td>
<td>Min: 20 s</td>
<td></td>
<td>Max.: 60 min</td>
</tr>
<tr>
<td>Sensor gap monitoring (M1-M4)</td>
<td>200 ms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conveyor stopped</td>
<td>3 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muting ended by ESPE</td>
<td>200 ms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Response time Flexi Classic Muting</td>
<td>0.07 s</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| General system data                                |         |         |         |
| Weight (not including packing)                     | –       | 0.18 kg | –       |
| Electrical safety                                  | Class III |         |         |
| Electromagnetic compatibility                      | EN 61000-6-2, EN 55011 Class A |         |         |

| Operating data                                     |         |         |         |
| Operating temperature                              | –25 °C  | –       | 55 °C   |
| Storage temperature                                | –25 °C  | –       | 70 °C   |
| Relative humidity                                  | 10% to 95%, non-dewing |         |         |
| Climatic conditions                                | EN 61131-2 |         |         |
| Operating altitude                                 | Max. 2000 m above sea level (80 kPa) |         |         |

| Mechanical strength                                |         |         |         |
| Vibration                                          | EN 61131-2 |         |         |
| Vibration resistance                               | 5-500 Hz/5 grms (EN 60068-2-64) |         |         |

| Terminals and connection data                      |         |         |         |
| Single or fine stranded wire                       | 1 × 0.14 mm² to 2.5 mm² or 2 × 0.14 mm² to 0.75 mm² |         |         |
| Fine stranded wire with terminal sleeves           | 1 × 0.25 mm² to 2.5 mm² or 2 × 0.25 mm² to 0.5 mm² (EN 46288) |         |         |
| Insulation stripping length                        | –       | –       | 8 mm    |
| Maximum tightening torque                          | –       | –       | 0.6 Nm  |

For UL 508 and CSA applications

| UE410-xx3XX                                       |         |         |         |
| - Connection cross-section                         |         |         |         |
| - Tightening torque                                |         |         |         |
| UE410-xx4XX                                       |         |         |         |
| - Connection cross-section                         |         |         |         |

For UL 508 and CSA applications

- Connection cross-section: AWG 30-12 (only use 60/75 °C copper flexible wire)
- Tightening torque: 5-7 lb. in
- Connection cross-section: AWG 24-16 (only use 60/75 °C copper flexible wire)
### Technical data

#### Safety specific characteristics

All these data are based on an ambient temperature of +40 °C.

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety Integrity Level(^5)</td>
<td>SIL3 (IEC 61508)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIL claim level</td>
<td>SILCL3 (EN 62061)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Category 4 (EN ISO 13849-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance Level(^5)</td>
<td>PL e (EN ISO 13849-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(T_M) (mission time)</td>
<td>20 years (EN ISO 13849-1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFD</td>
<td>(3.9 \times 10^{-6})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PFHd</td>
<td>(2.5 \times 10^{-9}) h(^{-1})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SFF</td>
<td>96%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>93%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For further information on the output modules UE410-2RO/UE410-4RO, see operating instructions Flexi Classic Standard at www.sens-control.com.

#### 13.1.2 Special data UE410-MDI

The following data apply to the muting expansion module UE410-MDI only. Otherwise, the general data in section 13.1.1 apply.

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply circuit (via UE410-MM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>–</td>
<td>–</td>
<td>1.8 W</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input circuit (C1, CS, OVR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of inputs</td>
<td>–</td>
<td>–</td>
<td>3</td>
</tr>
<tr>
<td>Input voltage (HIGH)</td>
<td>13 V DC</td>
<td>–</td>
<td>30 V DC</td>
</tr>
<tr>
<td>Input voltage (LOW)</td>
<td>–5 V DC</td>
<td>–</td>
<td>5 V DC</td>
</tr>
<tr>
<td>Input current (HIGH)</td>
<td>2.4 mA</td>
<td>3 mA</td>
<td>3.8 mA</td>
</tr>
<tr>
<td>Input current (LOW)</td>
<td>–2.5 mA</td>
<td>–</td>
<td>2.1 mA</td>
</tr>
<tr>
<td>Input response time</td>
<td>70 ms</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Input capacitance</td>
<td>9 nF</td>
<td>10 nF</td>
<td>11 nF</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Typical</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>General system data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (not including packing)</td>
<td>–</td>
<td>0.15 kg</td>
<td>–</td>
</tr>
</tbody>
</table>

\(^5\) For detailed information on the safety design of your machine/system, please contact your local SICK representative.
13.2 Dimensions

13.2.1 Main module UE410-MM

Fig. 31: Dimensions of UE410-MM (mm)

13.2.2 Modules UE410-XM and UE410-MDI

Fig. 32: Dimensions of UE410-XM, UE410-MDI (mm)
14 Ordering information

14.1 Available modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>UE410-MM3</td>
<td>Main module</td>
<td>6034482</td>
</tr>
<tr>
<td>UE410-XM3</td>
<td>Module</td>
<td>6034483</td>
</tr>
<tr>
<td>UE410-MDI3</td>
<td>Input expansion module</td>
<td>6034484</td>
</tr>
<tr>
<td>UE410-MDI3C2</td>
<td>Input expansion module</td>
<td>6036291</td>
</tr>
<tr>
<td>UE410-MM4</td>
<td>Main module</td>
<td>6034645</td>
</tr>
<tr>
<td>UE410-XM4</td>
<td>Module</td>
<td>6034646</td>
</tr>
<tr>
<td>UE410-MDI4</td>
<td>Input expansion module</td>
<td>6034647</td>
</tr>
<tr>
<td>UE410-MDI4C2</td>
<td>Input expansion module</td>
<td>6036294</td>
</tr>
<tr>
<td>UE410-PRO3</td>
<td>PROFIBUS-DP gateway,</td>
<td>6028407</td>
</tr>
<tr>
<td></td>
<td>plugs with screw terminals</td>
<td></td>
</tr>
<tr>
<td>UE410-DEV3</td>
<td>DeviceNet gateway</td>
<td>6032469</td>
</tr>
<tr>
<td></td>
<td>and 4 information signals, 24 VDC,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plugs with screw terminals</td>
<td></td>
</tr>
<tr>
<td>UE410-CAN3</td>
<td>CANopen gateway</td>
<td>6033111</td>
</tr>
<tr>
<td></td>
<td>and 4 information signals, 24 VDC,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plugs with screw terminals</td>
<td></td>
</tr>
<tr>
<td>UE410-PRO4</td>
<td>PROFIBUS-DP gateway,</td>
<td>6032678</td>
</tr>
<tr>
<td></td>
<td>and 4 information signals, 24 VDC,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plugs with spring terminals</td>
<td></td>
</tr>
<tr>
<td>UE410-DEV4</td>
<td>DeviceNet gateway</td>
<td>6032679</td>
</tr>
<tr>
<td></td>
<td>and 4 information signals, 24 VDC,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plugs with spring terminals</td>
<td></td>
</tr>
<tr>
<td>UE410-CAN4</td>
<td>CANopen gateway</td>
<td>6033112</td>
</tr>
<tr>
<td></td>
<td>and 4 information signals, 24 VDC,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plugs with spring terminals</td>
<td></td>
</tr>
</tbody>
</table>

You will find a complete list of the available modules at www.sens-control.com.
### 14.2 Accessories and spare parts

#### 14.2.1 Non-contact safety switches

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>RE300-DA03P</td>
<td>Set consisting of sensor and actuator RE300, sensor with cable 3 m long</td>
<td>6025080</td>
</tr>
<tr>
<td>RE300-DA10P</td>
<td>Set consisting of sensor and actuator RE300, sensor with cable 10 m long</td>
<td>6025079</td>
</tr>
<tr>
<td>T4000-2DRNAC</td>
<td>Sensor T4000 Compact</td>
<td>6022052</td>
</tr>
<tr>
<td>T4000-1KBA</td>
<td>Actuator</td>
<td>5306531</td>
</tr>
<tr>
<td>DOL-1208-G10MA</td>
<td>T4000 Compact connecting cable M12 — 8-pin with cable 10 m long</td>
<td>6022152</td>
</tr>
<tr>
<td>IN40-D0101K</td>
<td>IN4000 Sensor Q40</td>
<td>6027389</td>
</tr>
<tr>
<td>IN40-D0202K</td>
<td>IN4000 Sensor M30</td>
<td>6027392</td>
</tr>
<tr>
<td>IN40-D0303K</td>
<td>IN4000 Sensor M18</td>
<td>6027391</td>
</tr>
<tr>
<td>DOL-1204-G10M</td>
<td>IN4000 connecting cable M12 — 8-pin with cable 10 m long</td>
<td>6010543</td>
</tr>
</tbody>
</table>

You will find a complete list of the available accessories at www.sens-control.com.

#### 14.2.2 Safety light curtains, multiple light beam safety devices

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4000</td>
<td>All variants</td>
<td>–</td>
</tr>
<tr>
<td>M4000</td>
<td>All variants</td>
<td>–</td>
</tr>
<tr>
<td>C2000</td>
<td>All variants</td>
<td>–</td>
</tr>
<tr>
<td>M2000</td>
<td>All variants</td>
<td>–</td>
</tr>
</tbody>
</table>

You will find a complete list of the available devices at www.sens-control.com.

#### 14.2.3 Muting lamp with cable

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>–</td>
<td>Muting display lamp with mounting kit</td>
<td>2020743</td>
</tr>
<tr>
<td>–</td>
<td>LED muting lamp with cable, 2 m</td>
<td>2019909</td>
</tr>
<tr>
<td>–</td>
<td>LED muting lamp with cable, 10 m</td>
<td>2019910</td>
</tr>
</tbody>
</table>

#### 14.2.4 Anti-manipulation cap

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>–</td>
<td>Anti-manipulation cap</td>
<td>5319789</td>
</tr>
</tbody>
</table>
15.1 EC declaration of conformity

EC declaration of conformity

TYPE: UE410-MMI-XMI-MDI

Ident-No.: 9126184 UM98

EU abteilungsklarer (iv)
Apaikā parastījumus personai, kas pārdāv zemāk minēto rādītāju ar šo deklarāciju, ka izstrādājums atbilst zemāk minētajā (-ām) EK direktīvā (-ās) ietilpītās visu abstāvstābas grūtnīcas un/ vai izstrādājumam ir piemērotā atliegās standarti un/ vai tehniskās specifikācijas.

EG-verklaiss van overeenstemming (nl)
Ondergedeeld, verklaring van de volgende fabrikant, verklaart hiermee dat het product voldoet aan de bepalingen van de volgende EG-richtlijn(en) (inclusief alle van toepassing zijnde wijzigingen) en dat de overeenkomstige normen en/of technische specificaties zijn toegestaan.

EF-samarsverklaring (no)
Undertegnede, som representerer nednevnevnte produsent, erklærer herved at produktet er i samsvar med bestemmelsene i følgende EU-direktiv(er) (inklusiv alle relevante endringer) og at relevante normer og/eller tekniske spesifikasjoner er blitt anvendt.

Declaración de conformidad (es)
La presente sociedad, que representa a la siguiente fabricante, declara que el producto cumple con la normativa y especificaciones técnicas que forman parte de la normativa y específicas técnicas.

Declaratie van overeenstemming (nl)
Ondergetekende, als vertegenwoordiger van de volgende fabrikant, verklaart hiermee dat het product voldoet aan de bepalingen van de volgende EG-richtlijn(en) (inclusief alle van toepassing zijnde wijzigingen) en dat de overeenkomstige normen en/of technische specificaties zijn toegestaan.

ES vyklausėnė v. zodžiu (sk)
Dňa podpísaného zástupcu výrobku týmto vyhlasuje, že výrobok je v súlade s ustanoveniami nasledujúcej (nasledujúčich) smernice (smernic) ES (vrátane všetkých platných zmen) a že sa používajú príslušné normy a/alebo specifikácie technické.

Izjava ES o skladnosti (si)
Podpisani predstavnik spodaj navedenega proizvajalca izjavlja, da je proizvod v skladu z obdobjem spodaj navedenih direktiv ES (vključno z vsemi ustreznimi spremembami) in da so bili upoštevani ustrezni standardi in/ali tehnične specifikacije.

EG-försäkring om överensstämmelse (sv)
Undertecknad, som representor närvarande tillväxtbolag, förser härmed att produkten överensstämmer med bestämmelserna i följande EU-direktiv (inklusive samtliga tillämpliga tillägg till dessa) och att relevanta standarder och/eller tekniska specifikationer ha tillämpats.

AB-Gyűzűskő Bayon (tr)
Aşgınralı iletçili temel eden imza sahibi bolyosika, ürûnün atopobuları AB-Yönetmenin(lerin) direktifleri ile (tüm tıglı değeriyle) kapasityayı yükleyerek üyüm olmaları ve tıglı normların ve/veya teknik spesifikasyonlarının uygulanmış bolyosika eder.

Directives used: MAS-DIRECTIVE 2006/42/EC
EMC-DIRECTIVE 2004/108/EC
Standards used: SAFETY OF MACHINERY; ELECTRICAL EQUIPMENT
SAFETY-RELATED PARTS OF CONTROL SYSTEMS
FUNCTIONAL SAFETY
EN 60204-1
EN 13849-1
EN 92001

Product: UE410-MMI-XMI-MDI

You can obtain the EC declaration of conformity with the standards used at www.sick.com search: 9126184

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2013-03-07 9126184.pdf
EC declaration of conformity

The undersigned, representing the following manufacturer herewith declares that the product is in conformity with the provisions of the following EC directive(s) (including all applicable amendments), and that the respective standards and/or technical specifications have been applied.

EC-Konformitätserklärung

Der Unterzeichner, der den nachstehenden Hersteller vertreten, erklärt hiermit, dass das Produkt in Übereinstimmung mit den Bestimmungen der nachstehenden (EU-Richtlinien) (einschließlich aller zutreffenden Änderungen) ist, und dass die entsprechenden Normen und/oder technischen Spezifikationen zur Anwendung gelangt sind.

EC декларация за съответствие

Подписващият, представлявайки следния производител, заявява, че продуктът е съответстващ на следващите правилни (EU- direktиви) (включително всички приложими промени) и че са приложени съответните стандарти и технически спецификации за приложение.

ES prohlášení o shodě

Niže podepsaní, zastupující následujícího výrobce, tímto prohlašují, že výrobek je v souladu s ustanoveniami následujícich směrnic (směrnice) ES (většině východních změn) a že byly použity odpovídající normy a/nebo technické specifikace.

GF-overensstemmelseserklæring

Undertegnede, der repræsenterer følgende producerer erklærer hermed at produktet er i overensstemmelse med bestemmelserne i følgende EF-direktiver (inklusive alle gældende ændringer) og at alle tilsvarende standarder og/eller tekniske specifikationer er blevet anvendt.

ΕΕ-δήλωση συμμόρφωσης

Ο Υπογράφων, παρακολουθώντας την εκτέλεση κατασκευής δηλώνει με το παρόν ότι το προϊόν συμμορφώνεται με τους όρους της (των) απολογίας (-ων) Οδηγίας (-ών) της ΕΕ (συμπεριλαμβάνοντας όλους τους συμπεριλαμβανόμενους προσθετικούς) και ότι έχουν συμμορφωθεί από τον ισχυρισμό πρόωρη άποψη.

Declaración de conformidad CE

El abajo firmante, en representación del fabricante indicado a continuación, declara que el producto es conforme con las disposiciones de la(s) siguiente(s) directiva(s) de la CE (incluyendo todas las modificaciones aplicables) y que las respectivas normas y/o especificaciones técnicas han sido aplicadas.

EÚ vastavúsdeklaratsioon

Allakirjanottu, kui eesistab järgmist tootjat, kinnitab käesolevaga, et antud toode vastab järgnevates (EÜ) direktiivist(la) sätetele (kaasa arvatud kõikide asjakohaste muudatuste) ja et on kohaldatakse vastavalt nõudele jäävile tehnilist kõrgeust.

ЕВ-вястомименсучевасвукватус

Allekirjoittanut, joka edustaa alla mainittua valmistajaa, vakuuttaa täten, että tuote on seuraavan (-jen) EÜ-direktiivin (-ten) vaatimuksien mukainen (muuta tai kaikkia sovellettavia muutoksia) ja että vastaava standardite ja teknisesti on sovellettu.

Déclaration CE de conformité

Le sous-signé, représentant le constructeur ci-après, déclare par la présente que le produit est conforme aux exigences de la (des) directive(s) CE suivante(s) (y compris tous les amendements applicables) et que les normes et/ou spécifications techniques correspondantes ont été appliquées.

EK megfelelőség nyilatkozat

A kijelentő, az alábbi gyártó képviselőjében ezenél kijelenti, hogy a termék megfelel az alábbi EK-vallélyek követelményeinek (beleértve azok minden vonzóas módosítást) és kijelenti hogy a megfelelő szabványokat és/magas műszaki előírásokat alkalmazza.

EB-samramsfestningsförklaring

Undertskrivare, ifyr händ framförandet ser refindat er här att ned, lyssar bvi med yfr att vän ar er i samranni vi vôle äkvelds effektivt EB-tekniska (ad massööm omv brytningem som vôle ego) och att vän ar er i samranni vi völgevidig stadga ogfr tekniska tekniskt.

Декlarация CE di conformità

Il sottoscritto, rappresentante il seguente costruttore dichiara qui di seguito che il prodotto risulta in conformità a quanto previsto dalle(a) seguente(s) direttiva(s) comunitaria(e) (comprende tutte le modifiche applicabili e che sono state applicate tutte le relative norme e/o specifiche tecniche.

EB artikkelide deklaracija

Pärasildaspeaks, atstovavajád šām gaminjūti deklarāciju, kad gaminys atitinka šūn (-ų) EB direktyvę (-ų) neskaidrums (šķiltat visus faktūrās keliņus) ir kad buvo teikta antražė papildyti nuorodai standardo ir (arbas) technines specifikacijas.

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SICK
TYPE: UE410-MM/XM/MDI
Ident-No.: 9126184 UM98

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# 15.2 Checklist for the manufacturer

## Checklist for the manufacturer/installer for installation of the Flexi Classic Muting modular safety controller

The answers to the questions listed below must be available at least before first commissioning. They depend on the application, whose requirements the manufacturer/installer has to verify.

This checklist should be retained or included with the machine documentation, so that it can be used as a reference for the periodic tests and inspections.

1. Were the safety regulations according to the valid directives and standards for the machine used as a basis?  
   - Yes  
   - No

2. Are the directives and standards used listed in the declaration of conformity?  
   - Yes  
   - No

3. Does the protective device fulfil the required PL/SILCL and PFHd according to EN ISO 13 849-1/EN 62 061 and the type according to EN 61 496-1?  
   - Yes  
   - No

4. Are the necessary protective measures against electric shock effective (degree of protection)?  
   - Yes  
   - No

5. Has the protective function been checked as specified in the testing instructions in this documentation? In particular:
   - function testing of the control elements, sensors and actuators connected to the safety controller  
   - testing of all switch-off paths  
   - Yes  
   - No

6. Have measures been adopted to ensure that, after every configuration change, a complete check of the safety functions of the safety controller will be carried out?  
   - Yes  
   - No

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**This checklist does not replace initial commissioning or regular inspections and tests by a competent person.**
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