# C4P-SA06010A001000, C4P-EA06010A001000

deTec4 Prime

**SAFETY LIGHT CURTAINS**

**SICK**
Sensor Intelligence.

## Ordering information

| System part | Type | Part no. |
|---|---|---|
| Sender | C4P-SA06010A001000 | 1215653 |
| Receiver | C4P-EA06010A001000 | 1215654 |

Other models and accessories ➜ www.sick.com/deTec4_Prime

## Detailed technical data

### Features

| | |
|---|---|
| **System part** | Sender/receiver pair with system plug and QuickFix bracket |
| **Usage** | As a standalone system and as last system in a cascade |
| **Resolution** | 14 mm |
| **Protective field height** | 600 mm |
| **Scanning range** | |
| Minimum | 0.15 m ... 16 m |
| Typical | 0.15 m ... 20 m |
| **Response time** | 13 ms [1] |
| **No blind zones** | ✓ |
| **Synchronization** | Optical synchronisation |

[1] , without beam coding, no cascaded systems. Other response times see operating instructions.

### Safety-related parameters

| | |
|---|---|
| **Type** | Type 4 (IEC 61496) |
| **Safety integrity level** | SIL3 (IEC 61508) <br> SILCL3 (EN 62061) |
| **Category** | Category 4 (EN ISO 13849) |
| **Performance level** | PL e (EN ISO 13849) |
| **$PFH_D$ (mean probability of a dangerous failure per hour)** | |
| Single device | $9.6 \times 10^{-9}$ (EN ISO 13849) |
| Cascade with one guest | $1.9 \times 10^{-8}$ (EN ISO 13849) |
| Cascade with two guest devices | $2.9 \times 10^{-8}$ (EN ISO 13849) |
| **$T_M$ (mission time)** | 20 years (EN ISO 13849) |
| **Safe state in the event of a fault** | At least one OSSD is in the OFF state. |

## Functions

| | Functions | Delivery status |
|---|---|---|
| **Restart interlock** | ✓ | Deactivated |
| **External device monitoring (EDM)** | ✓ | Deactivated |
| **Beam coding** | ✓ | Uncoded |
| **Automatic calibration of the protective field width** | ✓ | |

## Interfaces

| | |
|---|---|
| **System connection** | |
| Connection type | Male connector M12, 5-pin |
| Flexi-Loop-ready | ✓ |
| Sender/receiver communication (COM1) | ✓ [1] |
| Permitted cable length | Receiver power supply: 15 m [2]<br>All additional conductors at the system connection: 37.5 m |
| **Configuration method** | |
| Cascade | Automatic detection when starting the device |
| External device monitoring (EDM) | Automatic detection when starting the device |
| Calibration of the protective field width | Automatic detection when starting the device |
| Restart interlock | Teach-in procedure when starting the device |
| Beam coding | DIP switch |
| Reset to factory default | DIP switch |
| **Status display** | LEDs |
| **Fieldbus, industrial network** | |
| Integration via Flexi Soft safety controller | CANopen, DeviceNet™, EtherCAT®, EtherNet/IP™, Modbus TCP, PROFIBUS DP, PROFINET [3] |

[1] Optional: To indicate the status on both sides, the COM1 connections from the sender and receiver must be connected to each other in the control cabinet.

[2] If no inductive OSSD loads (e.g., contactors) are in use, the power supply cable for the receiver of a single device (no cascade) can be up to 30 m in length.

[3] For additional information on Flexi Soft -> www.sick.com/Flexi_Soft.

## Electrical data

| | |
|---|---|
| **Protection class** | III (EN 50178) [1] |
| **Supply voltage $V_S$** | 24 V DC (19.2 V DC … 28.8 V DC) |
| **Ripple** | ≤ 10 % [2] |
| **Power consumption typical** | 3.76 W (DC) / 1.6 W (DC)  (depending on type) |
| **Safety outputs (OSSD)** | |
| Type of output | 2 PNP semiconductors, short-circuit protected, cross-circuit monitored [3] |
| Switching voltage HIGH | 24 V DC ($V_S$ – 2.25 V DC … $V_S$) |
| Switching voltage LOW | ≤ 2 V DC |
| Switching current | ≤ 500 mA |

[1] SELV/PELV safety/protective extra-low voltage.

[2] Within the limits of $V_S$.

[3] Applies to the voltage range between –30 V and +30 V.

## Mechanical data

| | |
|---|---|
| **Housing cross-section (incl. system connection)** | 34 mm x 41.1 mm |
| **Housing material** | Aluminum extruded profile |
| **Front screen material** | Polycarbonate, scratch-resistant coating |

## Ambient data

| | |
|---|---|
| **Enclosure rating** | IP65 (EN 60529)<br>IP67 (EN 60529) |
| **Ambient operating temperature** | –30 °C ... +55 °C |
| **Storage temperature** | –30 °C ... +70 °C |
| **Air humidity** | 15 % ... 95 %, Non-condensing |
| **Vibration resistance** | 5 g, 10 Hz ... 55 Hz (EN 60068-2-6) |
| **Shock resistance** | 10 g, 16 ms (EN 60068-2-29) |

## Other information

| | | |
|---|---|---|
| **Wave length** | | 850 nm |
| **Integrated laser alignment aid** | | ✓ |
| | Light source | Laser diode |
| | Laser class | 1 (IEC 60825-1) |
| | Type of light | Visible red light |
| | Wave length | 650 nm |

## Classifications

| | |
|---|---|
| **ECl@ss 5.0** | 27272704 |
| **ECl@ss 5.1.4** | 27272704 |
| **ECl@ss 6.0** | 27272704 |
| **ECl@ss 6.2** | 27272704 |
| **ECl@ss 7.0** | 27272704 |
| **ECl@ss 8.0** | 27272704 |
| **ECl@ss 8.1** | 27272704 |
| **ECl@ss 9.0** | 27272704 |
| **ETIM 5.0** | EC002549 |
| **ETIM 6.0** | EC002549 |
| **UNSPSC 16.0901** | 46171620 |

## Dimensional drawing (Dimensions in mm (inch))
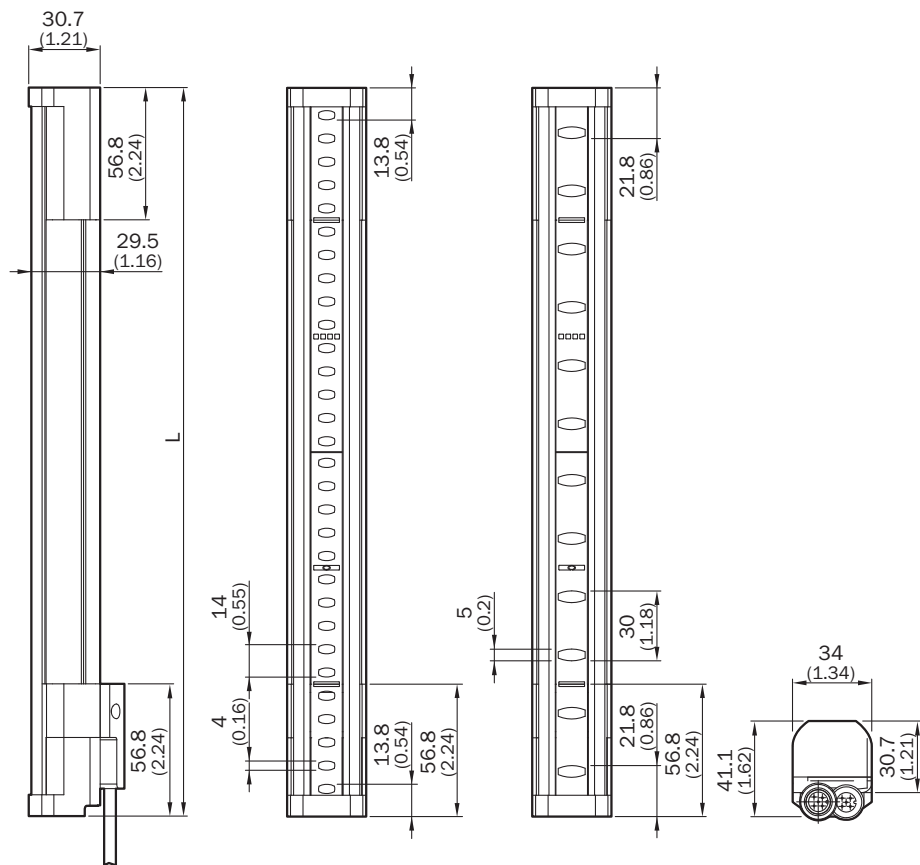


| | L |
|---|---|
| 300 | 313 |
| 450 | 463 |
| 600 | 613 |
| 750 | 763 |
| 900 | 913 |
| 1,050 | 1,063 |
| 1,200 | 1,213 |
| 1,350 | 1,362 |
| 1,500 | 1,512 |
| 1,650 | 1,662 |
| 1,800 | 1,812 |
| 1,950 | 1,962 |
| 2,100 | 2112 |

## Connection diagram

deTec4 Prime safety light curtain to UE10-3OS safety relay
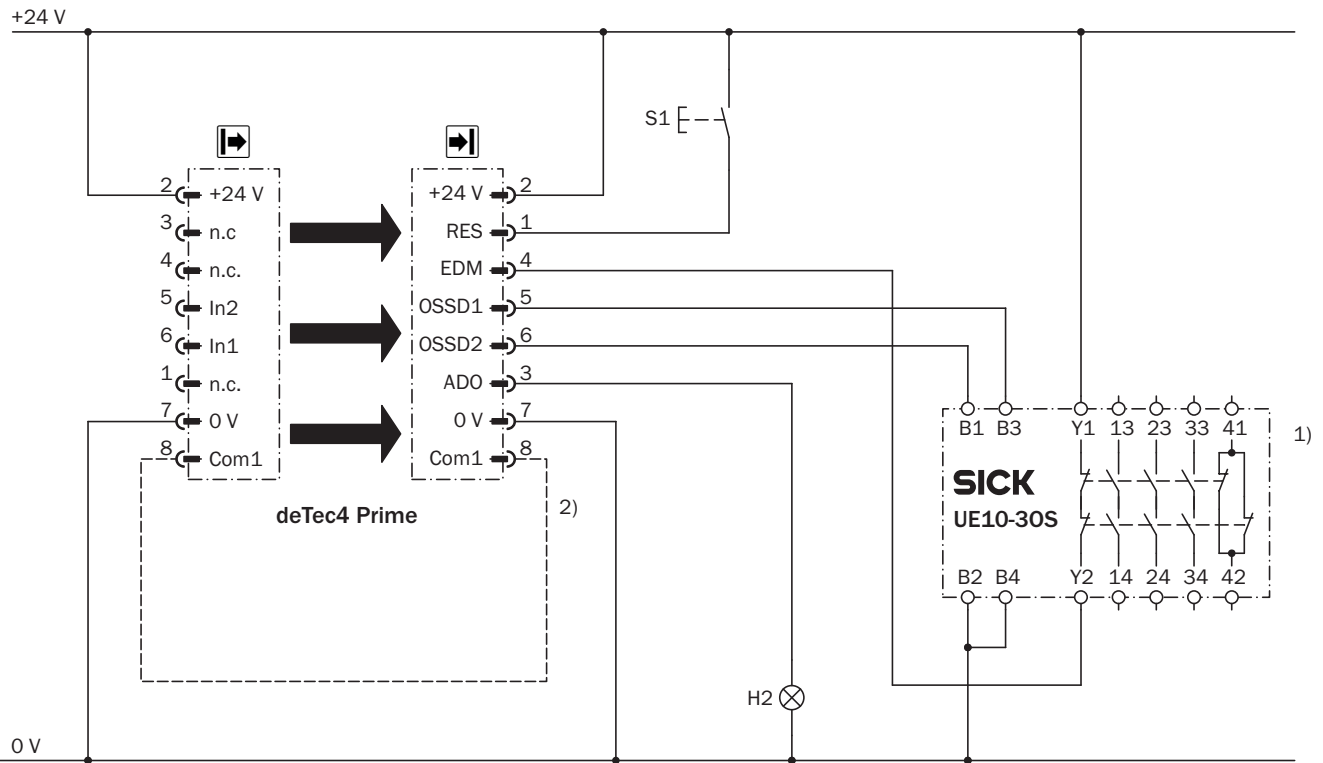


E132908/00/2015-04-07

3) PELV

① Output circuits. These contacts must be incorporated into the control such that the dangerous state is brought to an end if the output circuit is open. For categories 4 and 3, they must be incorporated on two channels (x, y paths). Single-channel incorporation into the control (z path) is only possible with a single-channel control and taking the risk analysis into account.

② To indicate the status on both sides, the Com1 connections from the sender and receiver must be connected to each other in the control cabinet (optional).

③ SELV/PELV safety/protective extra-low voltage.

deTec4 Prime safety light curtain cascade to UE10-3OS safety relay
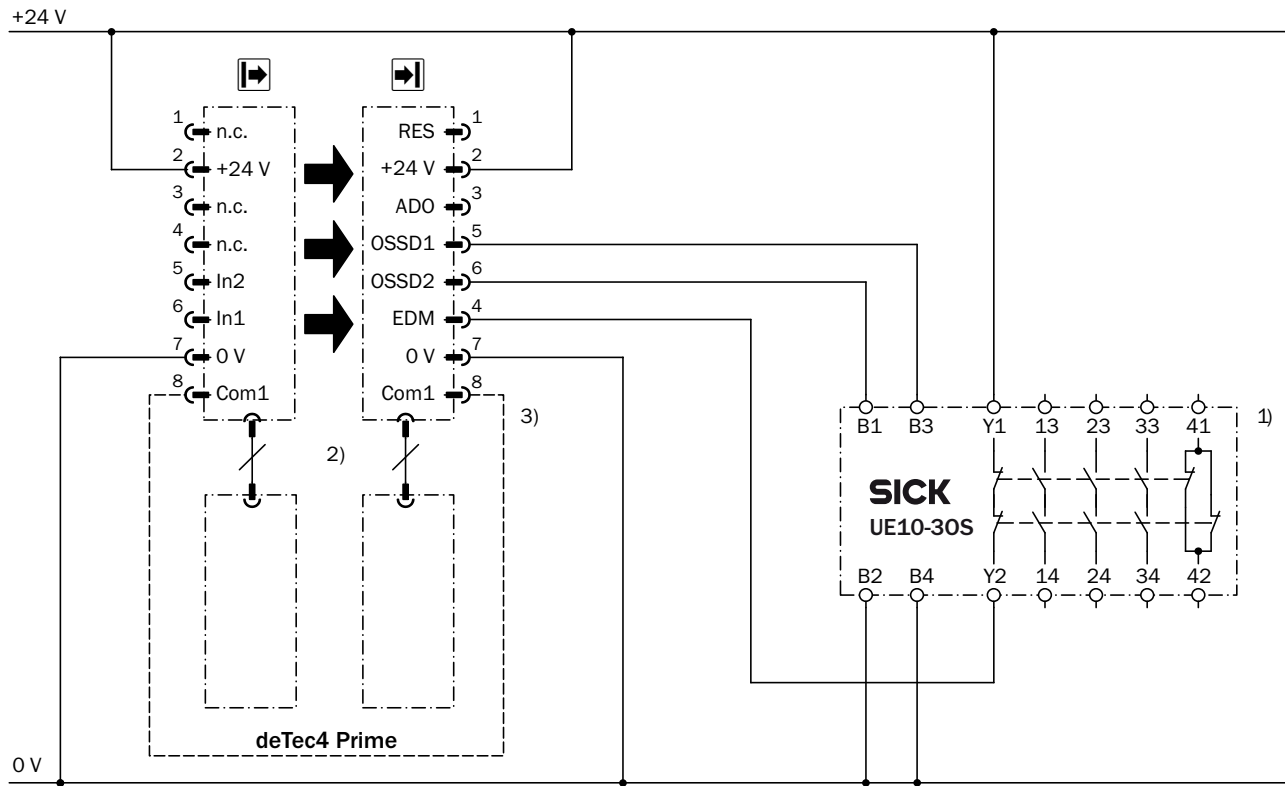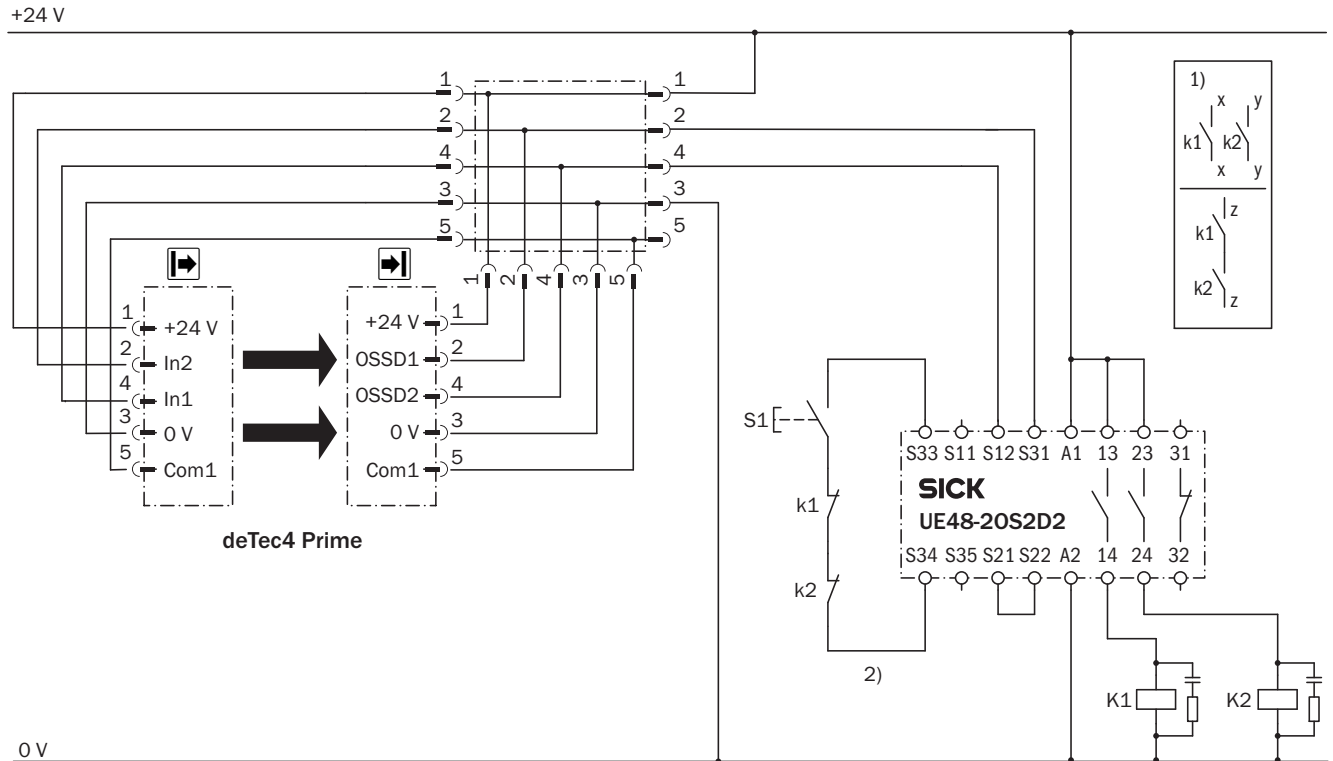


E132954/00/2015-04-07

4) PELV

① Output circuits. These contacts must be incorporated into the control such that the dangerous state is brought to an end if the output circuit is open. For categories 4 and 3, they must be incorporated on two channels (x, y paths). Single-channel incorporation into the control (z path) is only possible with a single-channel control and taking the risk analysis into account.

② Connection of the 5-pin extension connection of the host device to the 5-pin system connection of the guest device.

③ To indicate the status on both sides, the Com1 connections from the sender and receiver must be connected to each other in the control cabinet (optional).

④ SELV/PELV safety/protective extra-low voltage.

deTec4 Prime safety light curtain with T-connector to UE48-2OS safety relay



E132906/00/2015-04-07

3) PELV

① Output circuits. These contacts must be incorporated into the control such that the dangerous state is brought to an end if the output circuit is open. For categories 4 and 3, they must be incorporated on two channels (x, y paths). Single-channel incorporation into the control (z path) is only possible with a single-channel control and taking the risk analysis into account.

② External device monitoring is only static.

③ SELV/PELV safety/protective extra-low voltage.

**Task**

Connection of a deTec4 Prime safety light curtain to a UE48-2OS safety relay. Operating mode: with restart interlock and external device monitoring (EDM). The T-piece establishes a connection between the sender and the receiver.

**Mode of operation**

When the protective field is clear, the OSSD1 and OSSD2 outputs carry voltage. The system can be switched on when K1 and K2 are in a fault-free de-energized position. The UE48-2OS is switched on by pressing S1 (pushbutton is pressed and released). The outputs (contacts 13-14 and 23-24) switch the K1 and K2 contactors on. When the protective field is interrupted, the OSSD1 and OSSD2 outputs switch the UE48-2OS off. Contactors K1 and K2 are switched off.

**Fault analysis**

Cross-circuits and short-circuits of the OSSD1 and OSSD2 outputs are recognized and lead to the locking state (lock-out). A malfunction with one of the K1 or K2 contactors is detected. The shut-down function is retained. In the event of manipulation (e.g., jamming) of the S1 pushbutton, the UE48-2OS will not re-enable the output current circuits.

**Task**

Connection of two deTec4 Prime safety light curtains to a UE10-3OS safety relay. Operating mode: without restart interlock, with external device monitoring (EDM). If required, the restart interlock is implemented via the machine controller.

**Mode of operation**

If the protective field is clear and the UE10-3OS is in a fault-free de-energized position, the system is enabled. Outputs OSSD1 and OSSD2 carry voltage, the UE10-3OS is switched on. When the protective field is interrupted, the OSSD1 and OSSD2 outputs switch the UE10-3OS off.

**Fault analysis**

Cross-circuits and short-circuits of the OSSDs are recognized and lead to the locking state (lock-out). The malfunction of the UE10-3OS is detected. The shut-down function is retained.

**Task**

Connection of a deTec4 Prime safety light curtain to a UE10-3OS safety relay. Operating mode: with restart interlock, external device monitoring (EDM), and application diagnostic output.

**Mode of operation**

If the protective field is clear and the UE10-3OS is in a fault-free de-energized position, the field indicator and the H2 lamp flash. The system can be switched on. The system is enabled by pressing S1 (pushbutton is pressed and released). Outputs OSSD1 and OSSD2 carry voltage, the UE10-3OS is switched on. When the protective field is interrupted, the OSSD1 and OSSD2 outputs switch the UE10-3OS off.

Fault analysis

Cross-circuits and short-circuits of the OSSDs are recognized and lead to the locking state (lock-out). The malfunction of the UE10-3OS is detected. The shut-down function is retained. Manipulation (e.g., jamming) of the S1 pushbutton prevents the output circuits from being enabled.

## SICK AT A GLANCE

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