

## CES-FD-AP-U-01-USI-166446 (Order no. 166446)

### Field evaluation unit CES-FD-AP-....

- ▶ connection of a CES/CKS read head
- ▶ Evaluation of signals in the field
- ▶ EUCHNER AP interface
- ▶ Suitable for separate operation (no series connection)
- ▶ Unicode
- ▶ Direct connection to IP67 field modules (e.g. ET200pro)
- ▶ Connecting cables PUR, with plug connector: – M8 angled / 3-pin (read head connection) – M12 straight / 5-pin (AP interface)



### Short circuit monitoring

The switch generates its own clock signal on the output lines FO1A/FO1B. Pay attention to this aspect when connecting to control systems and relays.

### Category according to EN ISO 13849-1

Due to two redundantly designed semiconductor outputs (safety outputs) with internal monitoring suitable for:

- ▶ Category 4 / PL e according to EN ISO 13849-1

**Important:** To achieve the stated category according to EN ISO 13849-1, both safety outputs (FO1A and FO1B) must always be evaluated.

### LED indicator

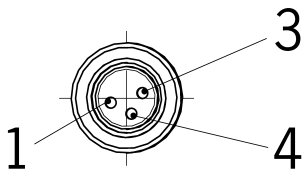
STATE Status LED

DIA Diagnostics LED

### Connection for control system

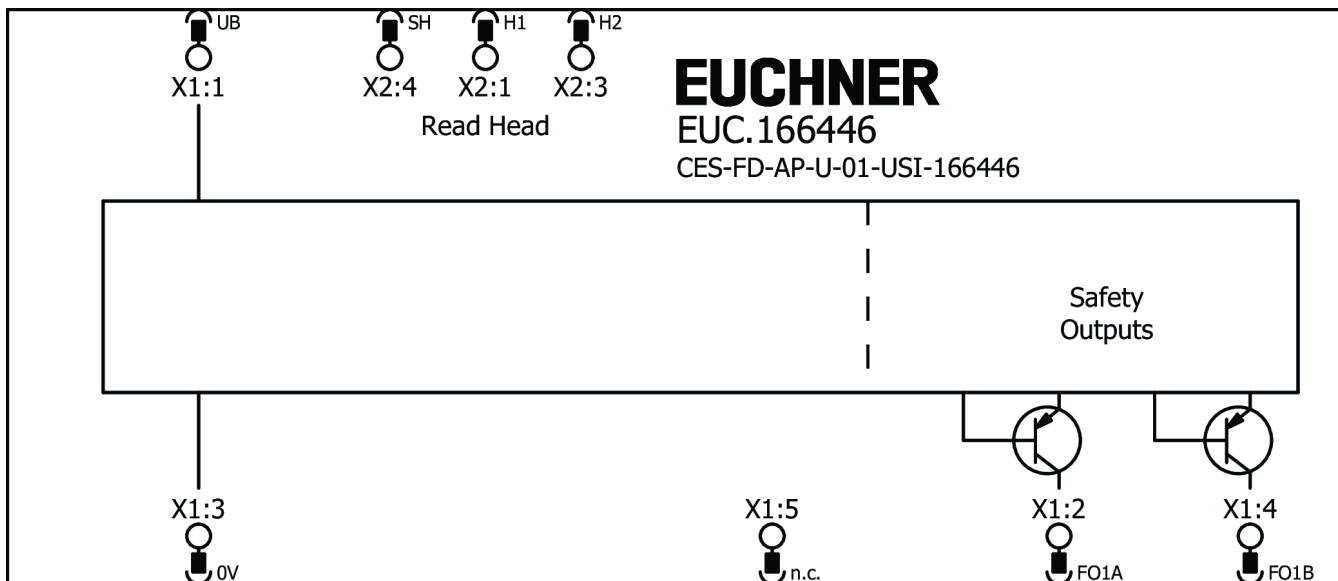
| Plug connector (view of connection side) | Pin | Designation | Function                 | Connecting cable conductor coloring |
|--|-----|-------------|--------------------------|-------------------------------------|
|  | 1   | UB          | Power supply, DC 24 V    | BN                                  |
|  | 2   | FO1A        | Safety output, channel 1 | WH                                  |
|  | 3   | 0 V         | Ground, DC 0 V           | BU                                  |
|  | 4   | FO1B        | Safety output, channel 2 | BK                                  |
|  | 5   | –           | n.c.                     | GY                                  |

## Connection for read head

| Plug connector (view of connection side)  | Pin | Designation | Function  | Connecting cable conductor coloring |
|---|-----|-------------|-----------|-------------------------------------|
|  | 1   | H1          | Data line | BN                                  |
|   | 3   | H2          | Data line | WH                                  |
|   | 4   | SH          | Shield    | -                                   |



## Connection examples



## Technical data

### Approvals



### Workspace

Repeat accuracy R

according to EN 60947-5-2  $\leq 10$

### Electrical connection values

Fuse

external (operating voltage) 0.25 ... 8 A

Rated insulation voltage  $U_i$  75 V

Rated impulse voltage  $U_{imp}$  1.5 kV

Operating voltage DC

UB (PELV, see operating instructions) 24 V DC -15% ... +15%

(reverse polarity protected, regulated, residual ripple < 5%) (The device tolerates voltage interruptions in the operating voltage, e.g. test pulses, of up to 5 ms. These voltage interruptions are also output on the safety outputs.)

Turn-on time

Safety outputs max. 400 ms

EMC protection requirements Acc. to EN IEC 60947-5-3

Risk time according to EN 60947-5-3 max. 260 ms

Safety class III

Current consumption max. 45 mA

Degree of contamination (external, according to EN 60947-1) 3

### Safety outputs F01A / F01B

Output type Semiconductor outputs, p-switching, short circuit-proof

|   |  |
|---|--|
| Output voltage                          |  |
| HIGH U(F01A) / U(F01B)                  | UB-1.5V ... UB V DC<br>(Values at a switching current of 50 mA without taking into account the cable lengths.) |
| LOW U(F01A) / U(F01B)                   | 0 ... 1 V DC   |
| rated conditional short-circuit current | 100 A  |
| Discrepancy time                        | max. 10 ms   |
| Utilization category                    |  |
| DC-13                                   | 24 V 150 mA<br>(Caution: outputs must be protected with a free-wheeling diode in case of inductive loads.)     |
| Off-state current I <sub>r</sub>        | max. 0.25 mA   |
| Switching current                       |  |
| per safety output                       | 1 ... 150 mA   |
| Test pulse duration                     | max. 0.3 ms<br>(Applies to a load with C ≤ 30 nF and R ≤ 20 kohm)  |
| Test pulse interval                     | min. 100 ms  |

## Mechanical values and environment

|                                     |   |
|-------------------------------------|---|
| Connection type                     | Connecting cable PUR with plug connector M12, 5-pin; pin 5 not used |
| Tightening torque                   | max. 1 Nm   |
| Ready delay                         | 1 s   |
| Installation orientation            | any   |
| Switching frequency                 | max. 1 Hz   |
| Shock and vibration resistance      | Acc. to EN IEC 60947-5-3  |
| Degree of protection                | IP65/IP67   |
| Cable ambient temperature (dynamic) | -5 ... +65 °C   |
| Cable ambient temperature (static)  | -20 ... +65 °C  |
| Material                            |   |
| Housing                             | Plastic, PBT  |

## Characteristic values according to EN ISO 13849-1 and EN IEC 62061

|  | PL | Maximum SIL | PFH <sub>D</sub> | Category | Mission time |
|--|----|-------------|------------------|----------|--------------|
|--|----|-------------|------------------|----------|--------------|

|                                  |      |   |                      |   |      |
|----------------------------------|------|---|----------------------|---|------|
| Monitoring of the guard position | PL e | - | $4.5 \times 10^{-9}$ | 4 | 20 y |
|----------------------------------|------|---|----------------------|---|------|

## Miscellaneous

|                         |  |
|-------------------------|--|
| Notices for UL approval | Operation only with UL Class 2 power supply or equivalent measures |
|-------------------------|--|

## In combination with read head CES-A-LMN-SC and actuator CES-A-BMB

|                                      |   |
|--------------------------------------|---|
| Switch-on distance                   | 5 mm<br>(with read head CES-A-LMN-SC and actuator CES-A-BMB)            |
| Secured switch-off distance $s_{ar}$ | max. 10 mm<br>(with read head CES-A-LMN-SC and actuator CES-A-BMB)      |
| Secured switching distance $s_{ao}$  | min. 3.4 mm<br>(with read head CES-A-LMN-SC and actuator CES-A-BMB)     |
| Switching hysteresis                 | 0.05 ... 0.2 mm<br>(with read head CES-A-LMN-SC and actuator CES-A-BMB) |

## Downloads

All documentation for this material can be found on our website:

<https://www.euchner.de/en-us/a/166446/?#downloads-tab>

**Ordering data**

|                       |   |
|-----------------------|---|
| Ordernumber           | 166446  |
| Item designation      | CES-FD-AP-U-01-USI-166446                     |
| Gross weight          | 0,85kg  |
| Customs tariff number | 85365019                                      |
| ECLASS                | 27-27-24-03 Safety-related transponder switch |

## Accessories

### CES read heads

#### Read head CES-A-LMN-SC, M8 plug connector



**077790**

CES-A-LMN-SC

- ▶ Cylindrical design M12
- ▶ M8 plug connector

### CKS

#### Electronic-Key adapter CKS, round design



**171792**

CKS-A-LA1-SC-171792

- ▶ Key adapter with integrated CES read head
- ▶ Mechanical detent mechanism for inserted key
- ▶ LED indicator when key detected
- ▶ Simple connection via M8 plug connector(s)
- ▶ Mounting; assembly at the front; mounting cut-out  $\varnothing$  22.5 mm

#### Key adapter CKS



**113130**

CKS-A-L1B-SC-113130

- ▶ Key adapter with integrated CES read head
- ▶ Simple connection via plug connector M8
- ▶ Front cover: red
- ▶ High degree of protection IP67
- ▶ LED indicator

### Connection material

#### Connecting cable with 2 plug connectors M12, 5-pin, 10 m



**100181**

C-M12F05-05X034PV10,0-M12M05-100181

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PVC cable
- ▶ Cable length 10 m

#### Connecting cable with 2 plug connectors M12, 5-pin, 20 m



**100182**

C-M12F05-05X034PV20,0-M12M05-100182

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PVC cable
- ▶ Cable length 20 m

#### Connecting cable with 2 plug connectors M12, 5-pin, 5 m



**100180**

C-M12F05-05X034PV05,0-M12M05-100180

- ▶ M12 female plug to M12 plug connector, 5-pin
- ▶ Straight female plug and plug connector
- ▶ PVC cable
- ▶ Cable length 5 m

## Connecting cable with straight plug connector M12, 5-pin, 10 m



**100184**  
C-M12F05-05X034PV10,0-MA-100184

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PVC cable
- ▶ Cable length 10 m
- ▶ With flying lead



**113640**  
C-M12F05-05X034PU10,0-MA-113640

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 10 m
- ▶ With flying lead

## Connecting cable with straight plug connector M12, 5-pin, 20 m



**100185**  
C-M12F05-05X034PV20,0-MA-100185

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PVC cable
- ▶ Cable length 20 m
- ▶ With flying lead



**113682**  
C-M12F05-05X034PU20,0-MA-113682

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 20 m
- ▶ With flying lead

## Connecting cable with straight plug connector M12, 5-pin, 30 m



**122784**  
C-M12F05-05X034PU30,0-MA-122784

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 30 m
- ▶ With flying lead

## Connecting cable with straight plug connector M12, 5-pin, 5 m



**100183**  
C-M12F05-05X034PV05,0-MA-100183

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PVC cable
- ▶ Cable length 5 m
- ▶ With flying lead



**113620**  
C-M12F05-05X034PU05,0-MA-113620

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 5 m
- ▶ With flying lead

## Connecting cable with straight plug connector M12, 5-pin, 50 m



**156064**  
C-M12F05-05X034PV50,0-MA-156064

- ▶ M12 female plug, 5-pin
- ▶ Straight plug connector
- ▶ PVC cable
- ▶ Cable length 50 m
- ▶ With flying lead

## Extension for read head, with plug connector M8, 3-pin, 0.4m



**115464**

C-M08M03-02X025PU0,4-M08F03-115464

- ▶ Extension cable with M8 plug connector, 3-pin
- ▶ Straight plug connector
- ▶ PUR cable
- ▶ Cable length 0.4 m

## Mounting accessories

### Safety screws M4 x 14, large head

**086232**

M4X14-NIRO/V100

- ▶ Safety screws M4 x 14 (large head)
- ▶ Packaging unit 100 pieces