# Emergency-stop monitor BH 5922, BL 5922 safemaster

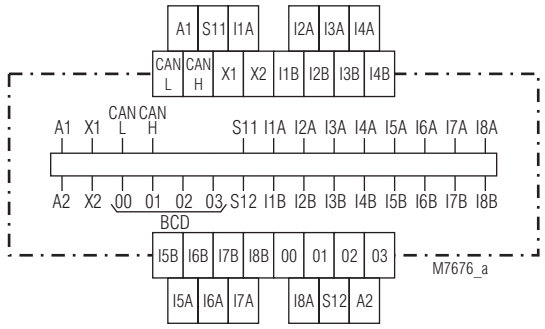
0234656

- Applied for patent
- To monitor max. 8 single-channel or 2-channel e-stop buttons
- E-stop button can be connected directly to BH 5922
- Single channel monitoring of max. 8 e-stop buttons
- For direct connection of single channel e-stop buttons
- As option direct connection of 2-channel e-stop buttons to BH 5922 / BL 5922
- Simple wiring of e-stop buttons
- Extendable in steps of 8 inputs
- No influence on e-stop system
- Adjustable
  - with manual reset (without link X1 / X2)
  - with automatic reset (with link X1 / X2)
- Reset button and remote reset
- LED indicators to show the state of the e-stop buttons
- as option with BCD output (high or low active) or CANopen (plug and play possible for closed system)
- BH 5922: width 45 mm
  BL 5922: width 90 mm

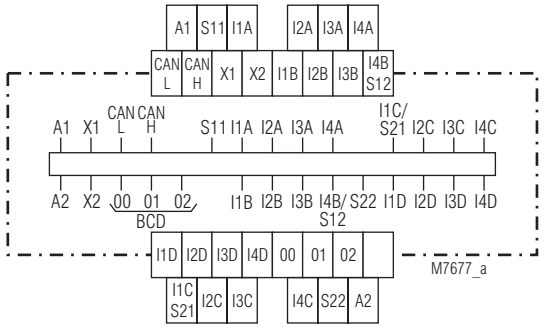
## Approvals and marking

CE

## Circuit diagrams

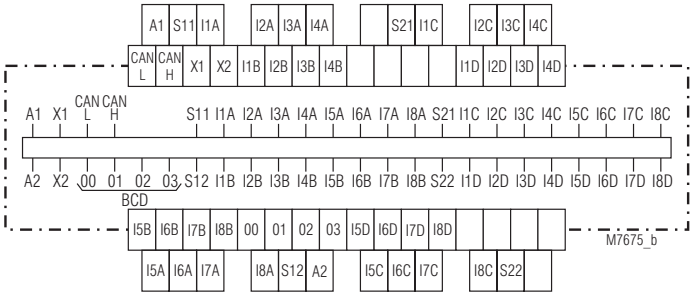



**E-stop button single-channel connection (8 inputs)**
BH 5922.08 BCD output and CANopen not available
BH 5922.08/00_

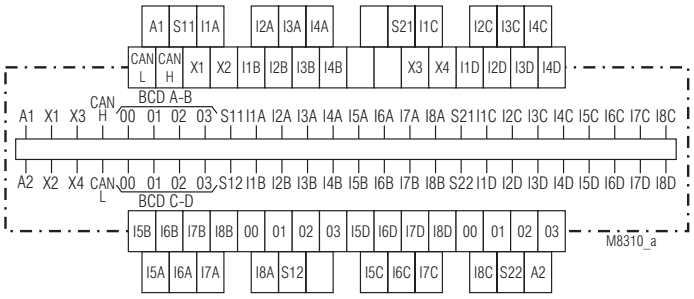



**E-stop button 2-channel connection (4 inputs)**
BH 5922.04/01_

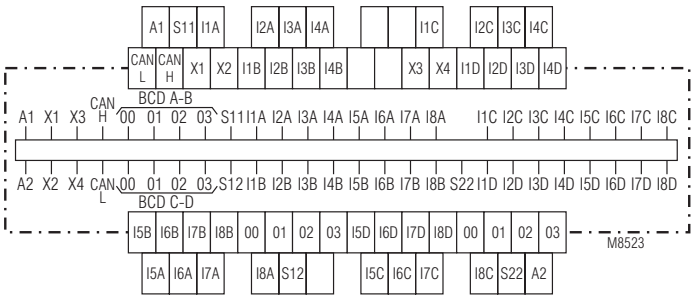
## Circuit diagrams




**E-stop button 2-channel connection (8 inputs)**
BL 5922.08/01_




**E-stop button 2-channel connection, 2-channel reset for cross fault monitoring systems (8 inputs)**
BL 5922.08/03_




**E-stop button 2-channel connection, 2-channel reset for systems without cross fault monitoring (8 inputs)**
BL 5922.08/02_

## Application

Indication of the status of e-stop buttons in an e-stop chain. We recommend to use the BH 5922 together with DOLD E-stop modules (approval).

## Function

If all the e-stop buttons are closed all green LEDs are on. If one button is activated the corresponding LED goes off.

The e-stop buttons are connected in series, therefore only one LED goes off even if several buttons are pressed. Only the first activated button in the row is indicated. When this e-stop button is released again the LED lights up again and the LED of the next activated button in the row goes off.

If the variant B_ 5922/0_2, B_ 5922/0_4, B_ 5922/0_5 is connected to a IP 5503 in Plug and Play modus the outputs show the state of the E-stop buttons an dthe LEDs the state of the status LEDs I1 - I8 on the e-stop monitor.

## Indicators

| | |
|---|---|
| Green LED "On": | on, when supply connected |
| Yellow LED: | on, when bus active (only with /002) |
| Green status LEDs: | - Continuous:<br>when all e-stop buttons are closed<br>- Off:<br>when corresponding e-stop button is pressed<br>- Flashing:<br>when e-stop button is released, but not acknowledged. Acknowledging with reset button or remote reset. |

## Notes

When using B_ 5922/00_ or B_ 5922/01_ for single channel monitoring or 2-channel connection of the e-stop chain the e-stop monitor has to be conected to the loop between S11 and S12 of the e-stop module. In this way channel AB is monitored.

In a 2-channel e-stop loop, the e-stop monitor has to be connected to the channel which normally is between the terminals S11 and S12 of the e-stop module. The E-stop monitor and the e-stop module have to be connected to the same DC 24 V power supply. When using an E-stop module with AC-supply the minus-terminal of the e-stop monitor (A2) must be connected to the minus-terminal of the e-stop control voltage (S21 or PE) on the e-stop module.

## Setup procedure

**CANopen mode**
With switch position "CANopen" the CANopen protocol is active on the interface. The configuration of the device is made by software, e.g. Pro CANopen. The configuration file for BH 5922 can be ordered with reference: PN5501/CD/01/000

**Plug and Play mode**
With switch position "Plug and Play" a variant of the CANopen protocol is active on the interface. The unit setting is done with a switch on the front, see picture below. If a system is on plug and play mode it can be switched over to CANopen protocol at any time.

**Address setting Plug and Play mode**
To allow the E-stop monitor to communicate with a corresponding device via the CAN-bus the addresses have to be set with the 2 rotational switches on the front according to the table below. Adresses between 1...49, 51...99 are possible. Adress 0 and 50 cannot be chosen in Plug and Play mode.

| **E-stop monitor BH/BL 5922 with address** | **transmits to** | **output module IP 5503 with address** |
|---|---|---|
| 1 | → | 51 |
| . | | . |
| . | | . |
| 49 | → | 99 |

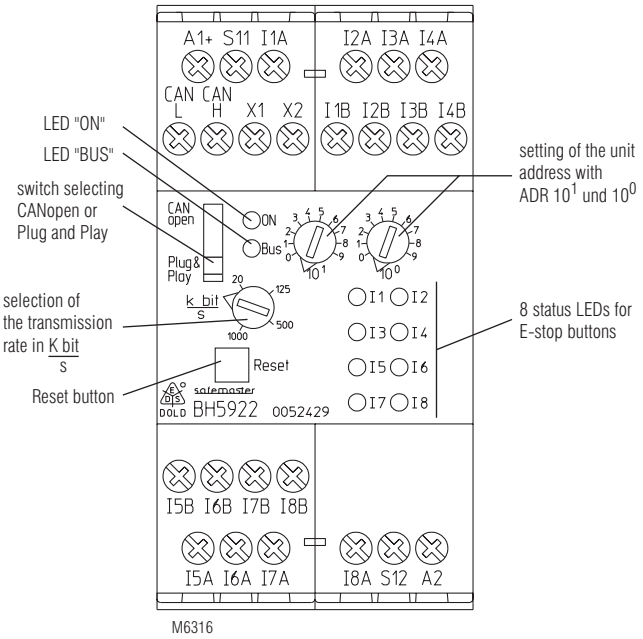
Example of setting: Address 14
left switch $10^1$: to position 1 x $10^1$
right switch $10^0$: to position 4 x $10^0$

## Setup procedure

**Notes for Plug and Play mode**
On the BL-models with 2-channel monitoring of the e-stop loop 2 addressees and 2 transmission rates can be chosen (channel AB and channel CD). For correct operation the adress settings must be different and the transmisson rate settings must be the same.
The screen of the bus wire has to be connected to A2 of the e-stop monitor.

**Setup procedure**
1.) Connect CAN-bus to terminals CAN_L and CAN_H
2.) Terminate the physical end of the bus by connecting a termination resistor of 120 Ω between CAN_L and CAN_H on the first and last module of the bus
3.) Connect screen of bus wire to A2
4.) Select transmission rate (e.g. 20 K bit/sec) using the rotational switch on the front (see drawing)
5.) Select address of the module using rotational switches on the front (see drawing and above example)

**Attention:** To communicate in a system configured in Plug and Play modus it is necessary to set one module in the system to the address 1.



M6316

## Technical data

**Input**

| | |
|---|---|
| **Nominal voltage $U_N$ (A1/A2):** | DC 24 V |
| **Voltage range:** | 0,8 ... 1,1 $U_N$ |
| **Control voltage on S11/S12:** | DC 24 V |
| **Reset input $X_1$, $X_2$:** | Voltfree contact |
| **BCD interface:** | |
| Output (O0,O1,O2, O3): | Transistor switching + |
| switched /auxiliary voltage: | DC 24 V |
| Switching capacity: | 40 mA short circuit proof |
| Residual voltage: | typ. 0,6 V |

**BCD output, high active:** (only with B_ 5922/001, B_ 5922/011)

| O3 | O2 | O1 | O0 | description |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | input S11 without voltage |
| 0 | 0 | 0 | 1 | E-stop 1 active |
| 0 | 0 | 1 | 0 | E-stop 2 active |
| 0 | 0 | 1 | 1 | E-stop 3 active |
| 0 | 1 | 0 | 0 | E-stop 4 active |
| 0 | 1 | 0 | 1 | E-stop 5 active |
| 0 | 1 | 1 | 0 | E-stop 6 active |
| 0 | 1 | 1 | 1 | E-stop 7 active |
| 1 | 0 | 0 | 0 | E-stop 8 active |
| 1 | 1 | 1 | 1 | no E-stop active |

## Technical data

**BCD output, low active:** (only with B_ 5922/003, B_ 5922/013)

| O3 | O2 | O1 | O0 | description |
|---|---|---|---|---|
| 1 | 1 | 1 | 1 | input S11 without voltage |
| 1 | 1 | 1 | 0 | E-stop 1 active |
| 1 | 1 | 0 | 1 | E-stop 2 active |
| 1 | 1 | 0 | 0 | E-stop 3 active |
| 1 | 0 | 1 | 1 | E-stop 4 active |
| 1 | 0 | 1 | 0 | E-stop 5 active |
| 1 | 0 | 0 | 1 | E-stop 6 active |
| 1 | 0 | 0 | 0 | E-stop 7 active |
| 0 | 1 | 1 | 1 | E-stop 8 active |
| 0 | 0 | 0 | 0 | no E-stop active |

**BCD output, high active:** (only with B_ 5922/021, B_ 5922/031)

| O7 | O6 | O5 | O4 | O3 | O2 | O1 | O0 | description |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | input S11 without voltage |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | E-stop 1 active |
| 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | E-stop 2 active |
| 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | E-stop 3 active |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | E-stop 4 active |
| 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | E-stop 5 active |
| 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | E-stop 6 active |
| 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | E-stop 7 active |
| 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | E-stop 8 active |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | no E-stop active |

**BCD output, low active:** (only with B_ 5922/023, B_ 5922/033)

| O7 | O6 | O5 | O4 | O3 | O2 | O1 | O0 | description |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | input S11 ist without voltage |
| 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | E-stop 1 active |
| 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | E-stop 2 active |
| 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | E-stop 3 active |
| 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | E-stop 4 active |
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | E-stop 5 active |
| 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | E-stop 6 active |
| 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | E-stop 7 active |
| 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | E-stop 8 active |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | no E-stop active |

0 = voltage on output: 0 V
1 = voltage on output: 24 V

**CANopen interface**

| | |
|---|---|
| wiring: | screened twisted pair |
| transmission rate: | settable 20 K bit/s, 125 K bit/s, 500 K bit/s, 1 M bit/s, |
| max. length: | 20 K bit/s = 2. 500 m |
| | 125 K bit/s = 500 m |
| | 500 K bit/s = 100 m |
| | 1 M bit/s = 25 m |

**Plug and Play**
transmission rate: 20 K bit / sec (recommended)

**Attention:**

Both physical ends of the 2-wire system must be terminated with a 120 Ω resistor between the terminals CAN_L and CAN_H.

## General data

| | | |
|---|---|---|
| **Operating mode:** | Continuous operation | |
| **Temperature range:** | - 20 ... + 60 °C | |
| **EMC** | | |
| Electrostatic discharge: | 8 kV (air) | EN 61 000-4-2 |
| Surge proof against wire bound surges, induced by high frequency fields: | 10 V class 3, f = 150 kHz - 80 MHz | EN 61 000-4-6 |
| Fast transients: | 2 kV | EN 61 000-4-4 |
| Surge voltages between | | |
| wires for power supply: | 1 kV | EN 61 000-4-5 |
| between wire and ground: | 2 kV | EN 61 000-4-5 |
| Interference suppression: | Limit value class B | EN 55 011 |
| **Degree of protection** | | |
| Housing: | IP 40 | EN 60 529 |
| Terminals: | IP 20 | EN 60 529 |
| **Housing:** | Thermoplastic with V0-behaviour to UL subject 94 | |

## Technical data

| | | |
|---|---|---|
| **Vibration resistance:** | Amplitude 0,35 mm frequency 10 ... 55 Hz | EN 60 068-2-6 |
| **Climate resistance:** | 20 / 060 / 04 | EN 60 068-1 |
| **Terminal designation:** | EN 50 005 | |
| **Wire connection:** | 1 x 4 mm² solid or 1 x 2,5 mm² stranded ferruled (isolated) or 2 x 1,5 mm² stranded ferruled (isolated) DIN 46 228-1/-2/-3/-4 or 2 x 2,5 mm² stranded ferruled DIN 46 228-1/-2/-3 | |
| **Wire fixing:** | Terminal screws M3.5, box terminals with wire protection | |
| **Mounting:** | DIN rail | EN 50 022 |
| **Weight:** | 255 g | |

### Dimensions

**Width x height x depth:**

| | |
|---|---|
| BH 5922: | 45 x 86 x 121 mm |
| BL 5922: | 90 x 86 x 121 mm |

## Standard type

BH 5922.08 DC 24 V
Article number:
- for 8 e-stop-buttons, single channel connection
- Nominal voltage $U_N$: DC 24 V
- Width: 45 mm

BL 5922.08/010 DC 24 V
Article number:
- for 8 e-stop buttons, 2-channel connection
- Nominal voltage $U_N$: DC 24 V
- BH 5922: 45 mm width
  BL 5922: 90 mm width

## Variants

B_ 5922 ._ _ / 0 _ _

- 0 = without BCD output and CANopen interface
- 1 = with BCD output, high active
- 2 = with CANopen interface
- 3 = with BCD output, low active
- 4 = with CANopen interface and BCD output, high active
- 5 = with CANopen interface and BCD ouput, low active

Connection of e-stop buttons
- 0 = single channel
- 1 = 2-channel
- 2 = 2-channel, 2-channel monitoring when no cross fault monitoring (only with BL 5922)
- 3 = 2-channel, 2-channel monitoring when cross fault monitoring (only with BL 5922)

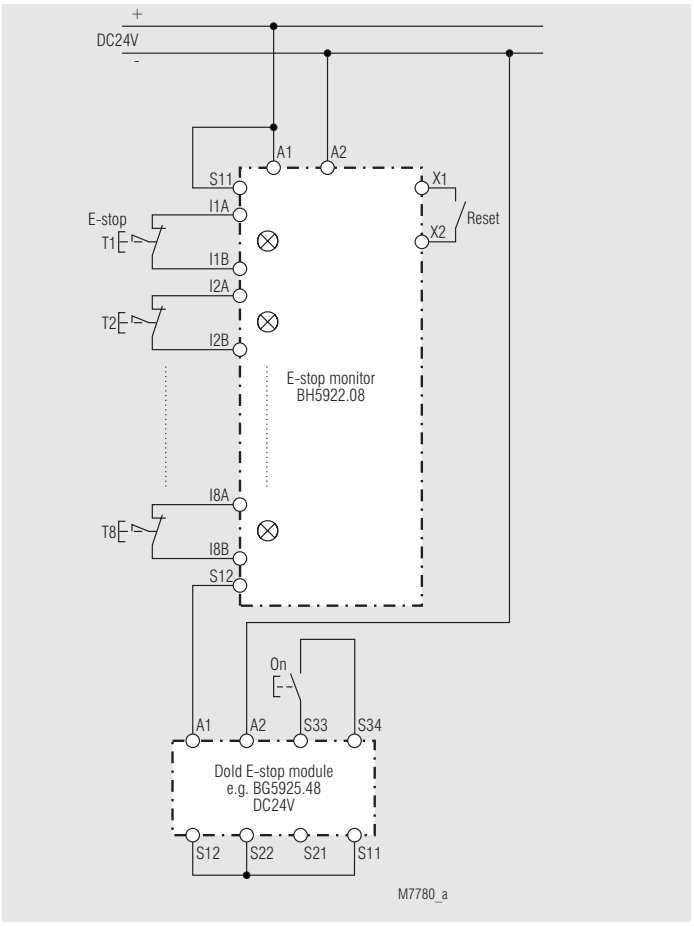
Number of e-stop buttons that can be connected
- 04 = 4 e-stop buttons, 2-channel connection with BH 5922
- 08 = 8 e-stop buttons
- H width 45 mm
- L width 90 mm

**Ordering example for variants**

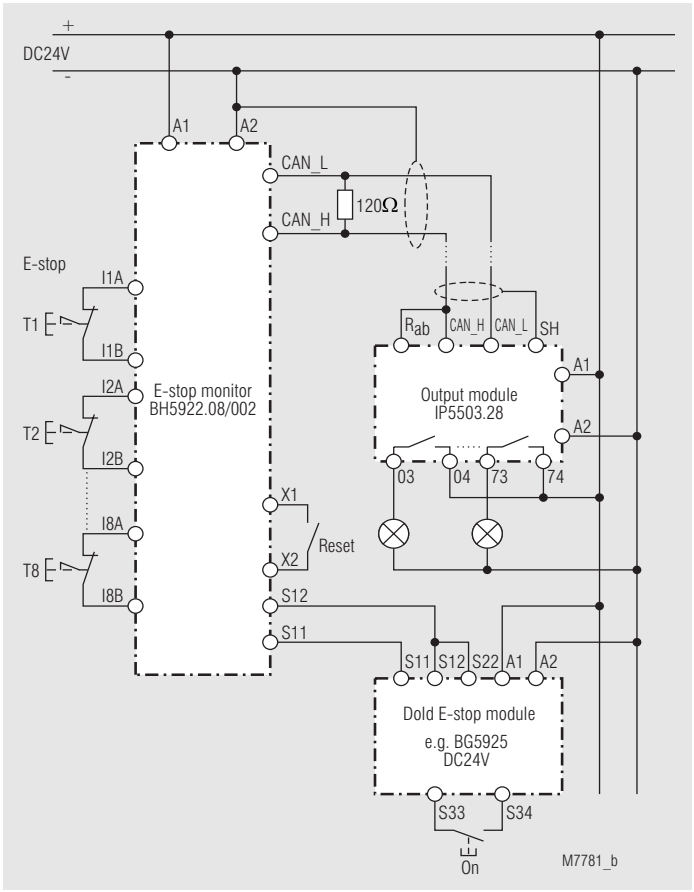
BH 5922. 08 / _ _ _ DC 24 V

- Nominal voltage
- Variant, if required
- Number of e-stop buttons that can be connected
- Type

## Application examples

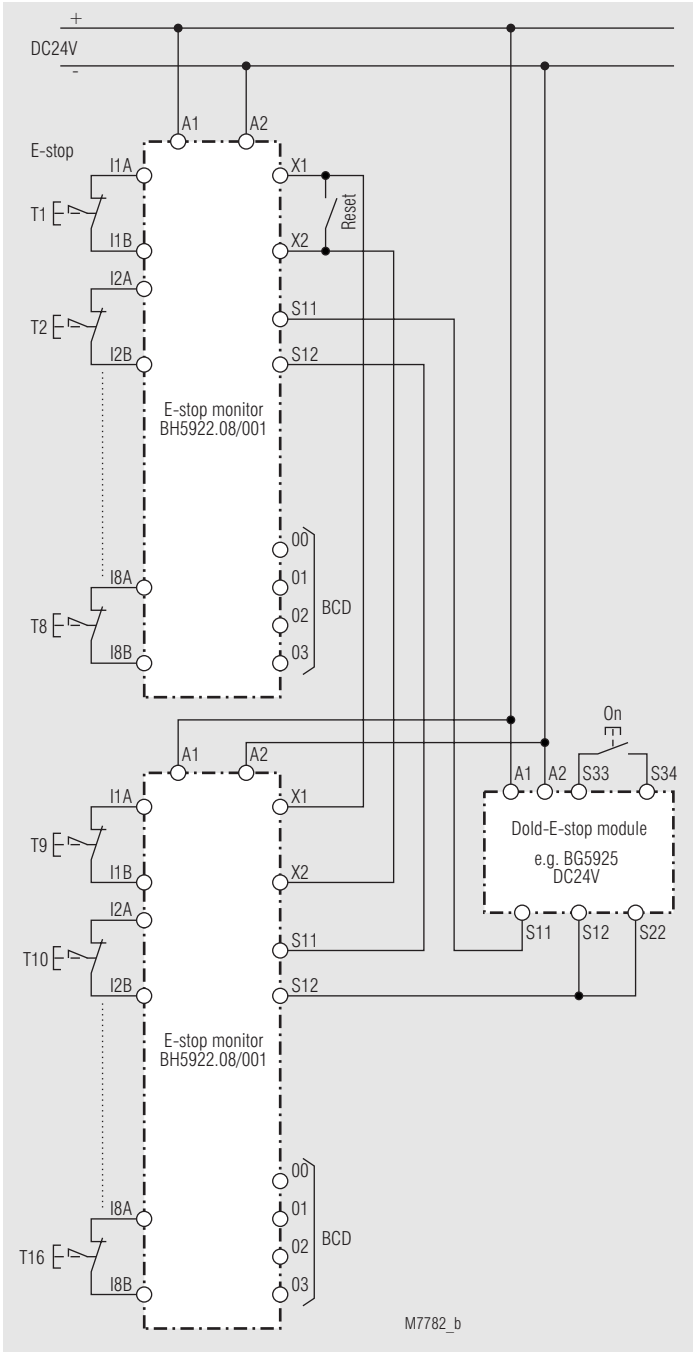



Pic 1: Monitoring of 8 e-stop buttons with e-stop monitor, single-channel connection, e-stop module single channel. Display via 8 LEDs on frontside of the module

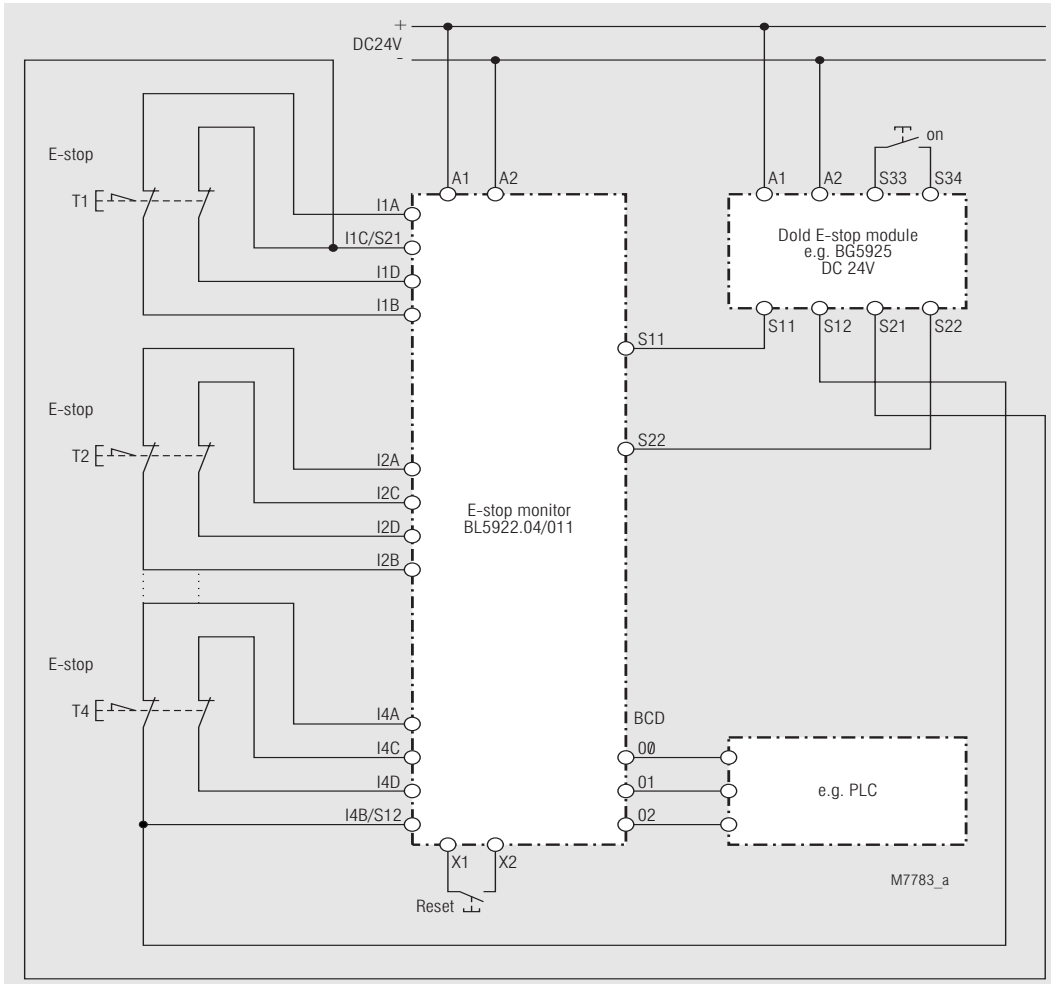



Pic 2: Monitoring of 8 e-stop buttons with e-stop monitor, single-channel connection, e-stop module 2-channel. Remote display of the status of e-stop buttons via CANopen interface on Dold output module.

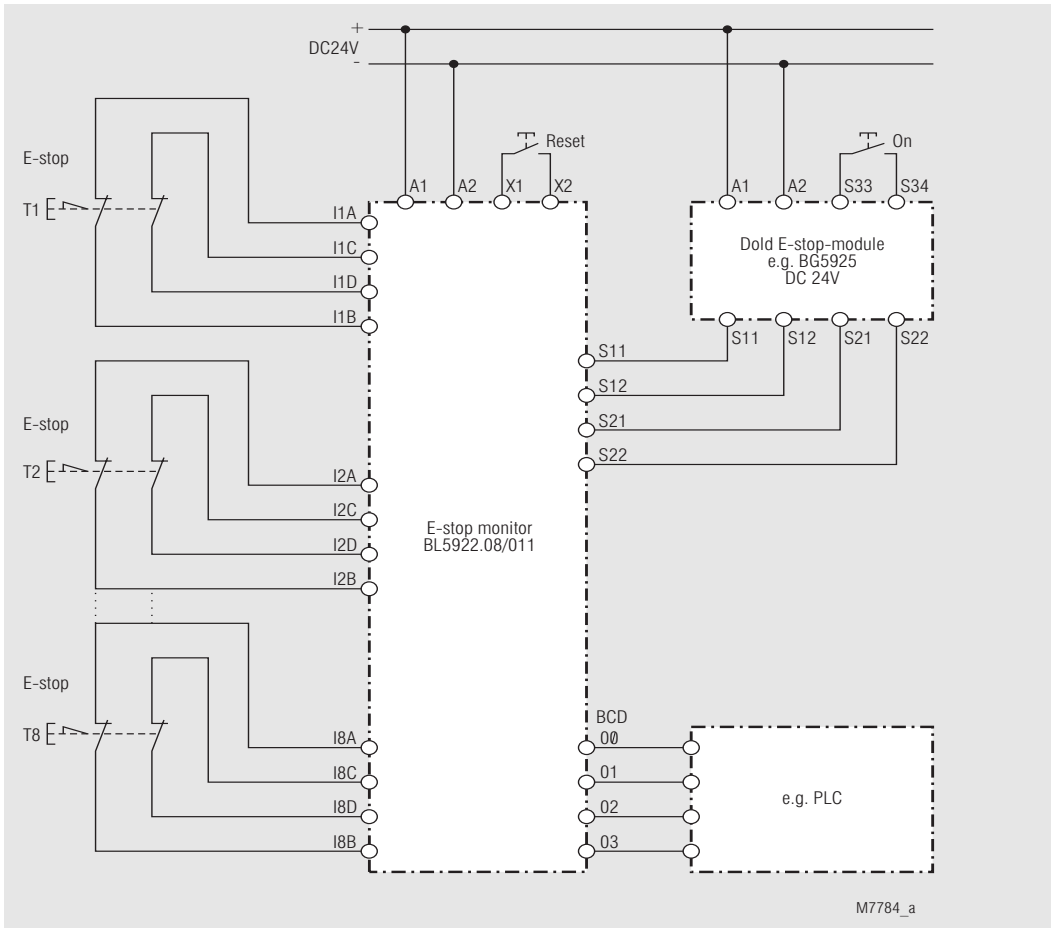
## Application example



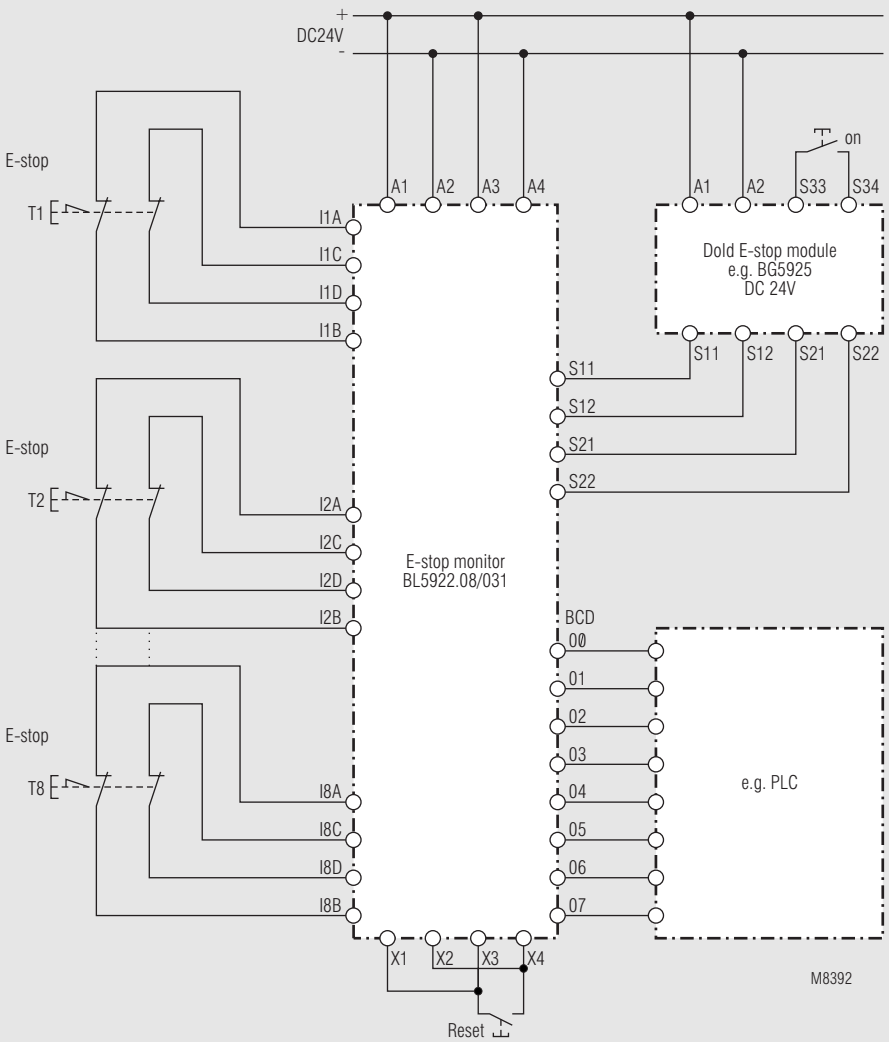

Pic 3: Monitoring of 16 e-stop buttons with e-stop monitor, single-channel connection, e-stop module 2-channel. BCD-output for remote display of the status of the e-stop buttons




Pic 4: Monitoring of 4 e-stop buttons with e-stop monitor, 2-channel connection, BCD output, single-channel monitoring




Pic 5: Monitoring of 8 e-stop buttons with e-stop monitor, 2-channel connection, BCD output, single-channel monitoring




Pic 6: Monitoring of 8 e-stop buttons with e-stop monitor, 2-channel connection, 2-channel monitoring (witch cross fault monitoring), BCD output