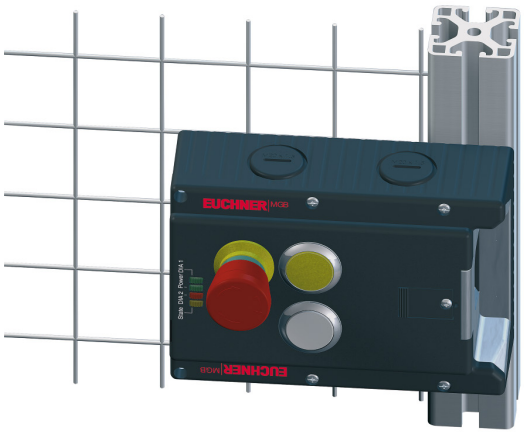
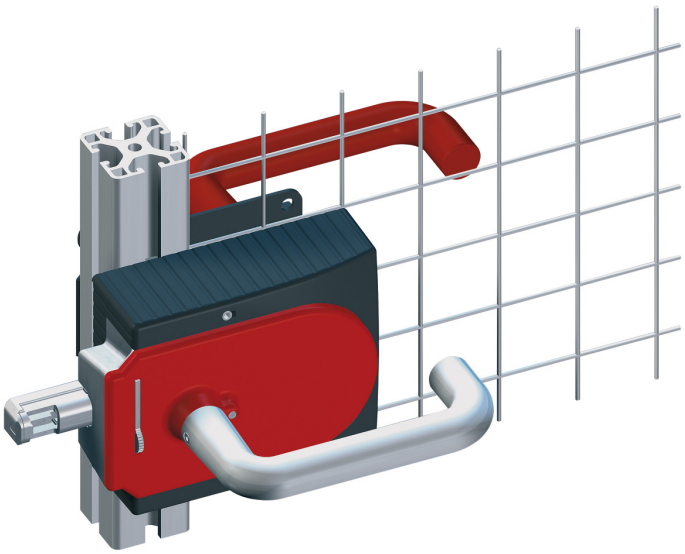
# MGB

## Help for Setup and Service

## (from V2.0.0)



More than safety.

EUCHNER

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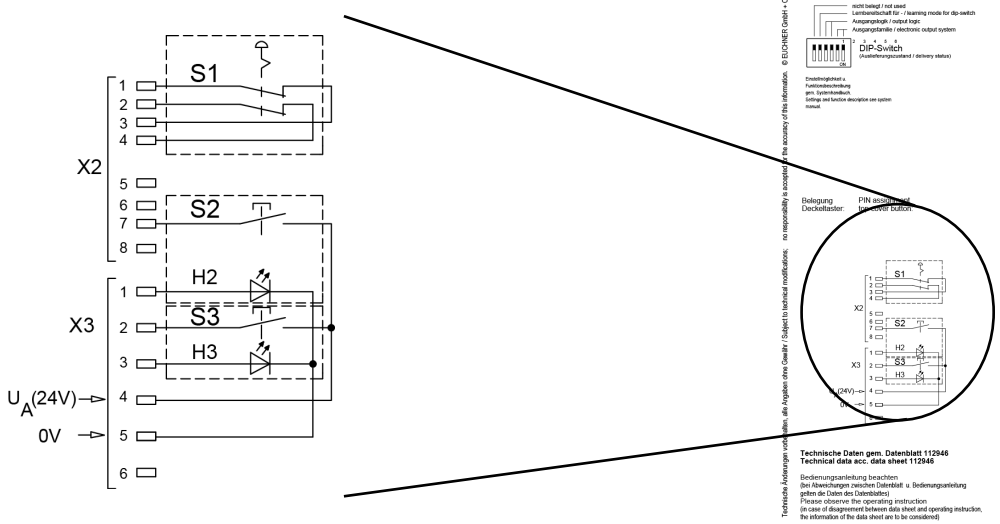
# 1 Connection

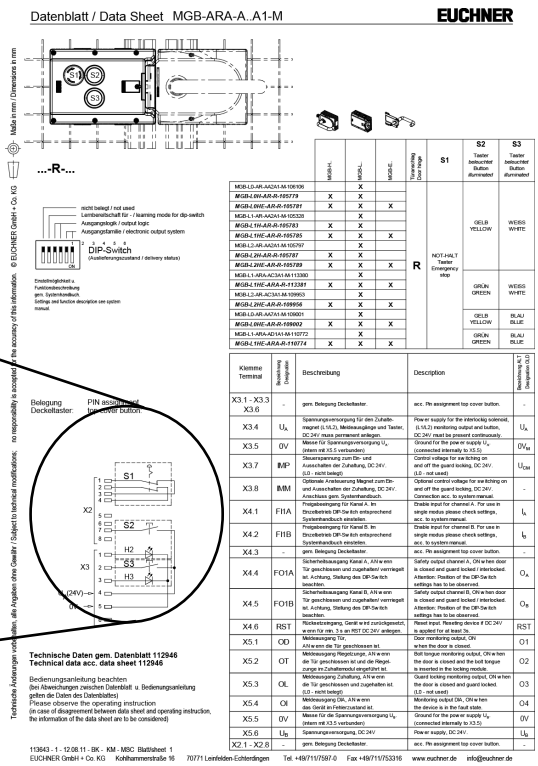
## 1.1 Connection of the buttons in the MGB

The terminal assignment of the switches (lights, buttons, emergency stop, etc.) in the cover of the MGB is not described in the system manual. These terminals can be found in the associated data sheet of the MGB included with every delivery. Please contact EUCHNER if the data sheet has been lost, and you will promptly be sent a data sheet. Alternatively, you can look in the MGB catalog.

The switches and the emergency stop are floating. However, the lights and the buttons all referred to a common potential. The terminals are to be found on connections X2 and X3.

**Example:**




## 1.2 Control of the guard locking

The guard locking is typically controlled by a PLC via one channel. The monitoring of the installed solenoid in combination with the locking arm, which represents the locking device as defined in EN 1088, is suitable for PL e.

Two-channel control, e.g. by a safe PLC, is technically possible but does not provide improved safety. The two connection terminals $I_{MP}$ and $I_{MM}$ are intended for this purpose.
Always use connection terminal $I_{MP}$ in case of one-channel control.

## 1.3 Parallel control of the guard locking

The guard locking solenoids are supplied from voltage $U_A$. The inputs $I_{MP}$ serve to control the solenoids; the current draw here is only approx. 3 mA. Several $I_{MP}$ inputs can be controlled in parallel if a common 0 V potential is present at $OV_M$.

## 1.4 Operation on safety relay

The MGB can be connected to most conventional safety relays. Since the outputs, similar to those on a so-called OSSD on light barriers or light curtains, produce clock pulses, a connection as described for non-contact systems must be used.

Alternatively, the circuit from the section “Operating on clocking outputs” can be used.

# 2 Teach-in operation

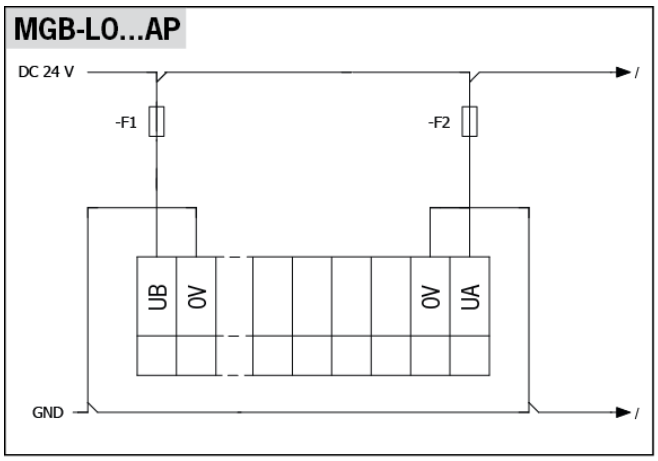
## 2.1 Preparing device for teach-in operation

- Connect the MGB as shown below, but do not apply any voltage to UB yet.
- Observe different control of guard locking for MGB-L1 and MGB-L2.

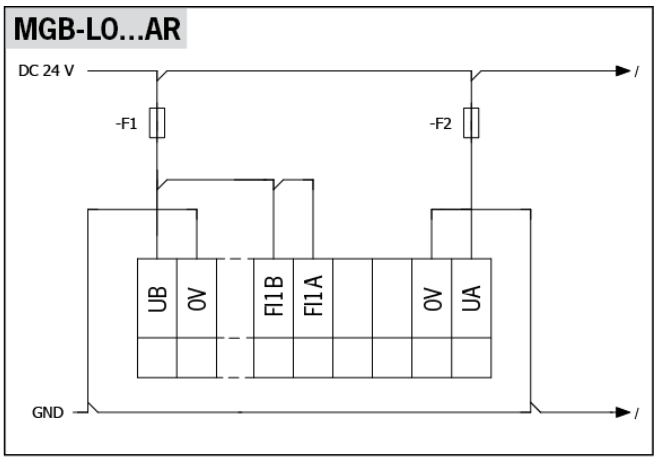
**Note:**

**In case of AR configuration:** For the teach-in standby state, FI1A and FI1B must be connected to DC 24 V. Every MGB taught-in individually before a switch chain is set up.

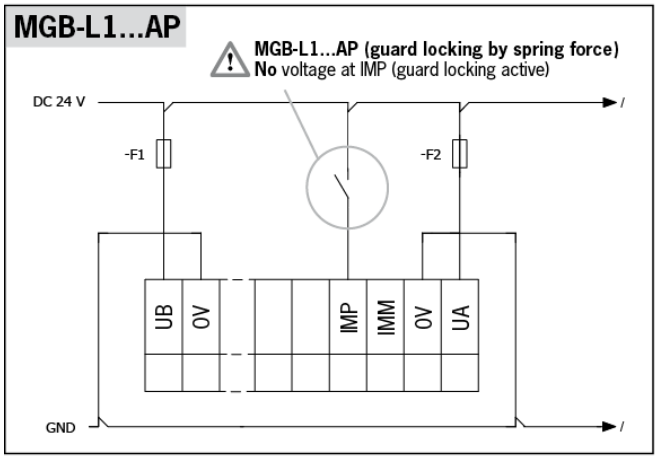
**MGB-L0...AP**



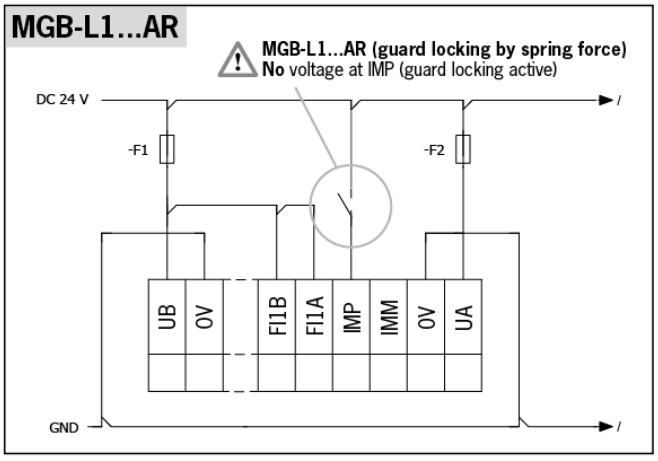

**MGB-L0...AR**



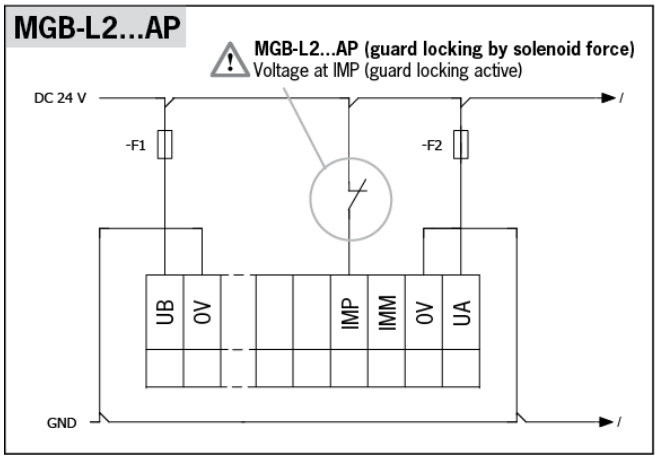

**MGB-L1...AP**



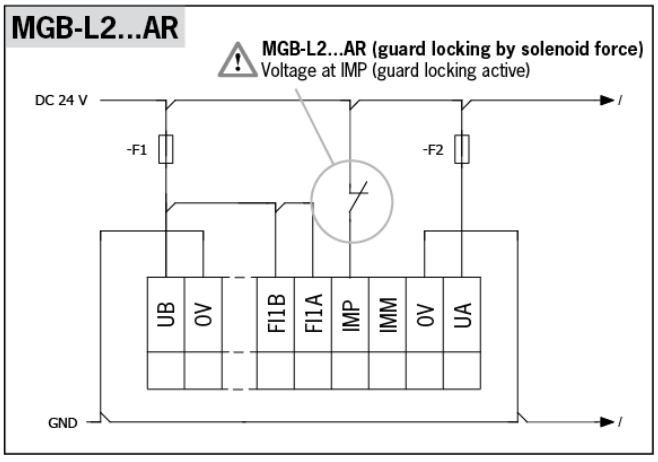

**MGB-L1...AR**

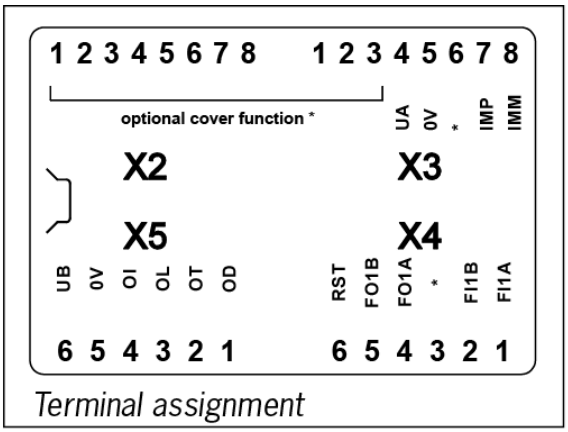



**MGB-L2...AP**




**MGB-L2...AR**





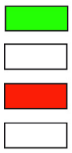
Terminal assignment

## 2.2 Teaching in handle module

1. Insert bolt tongue into the evaluation module.
2. Switch on operating voltage UA and UB.
   - ➡ **In case of AR configuration:** The green LED (State) flashes quickly (approx. 5 Hz). A self-test is performed during this time (approx. 8 s).
   - ➡ If the red LED (DIA) is illuminated, there is a fault. Teach-in is not possible. The green LED (State) indicates the fault code. Refer to the “System status table” in the respective system manual for diagnostics.
3. Activate guard locking (only MGB-L1/MGB-L2).
   **MGB-L1:** no voltage at IMP.
   **MGB-L2:** voltage at IMP.
   - ➡ Teach-in operation starts, green LED (State) flashes (approx. 1 Hz). The teach-in operation is completed after approx. 60 seconds, the green LED (State) goes out.
4. Switch off operating voltage UB (min. 3 seconds).
   - ➡ The code of the handle module that was just taught in is activated in the evaluation module.
5. Switch on operating voltage UB.
   - ➡ The device operates normally.

# 3 Troubleshooting

## 3.1 LED DIA illuminated + LED STATE not illuminated (AR and AP modes)




**Fault symptom:**

The MGB displays the fault state “internal fault”.

**Possible fault causes:**

- Data error
- Locking arm blocked
- Internal component fault

**Remedy:**

1. Check whether the locking arm is blocked (possibly by the bolt of the handle module).
2. Switch the voltage off at all devices
   or
   press the reset button (if present) that controls ALL integrated reset inputs in the series connection
3. Close the door(s).
4. Switch the voltage on again
   or
   release the reset button
5. Wait until the STATE LED flashes with the code “LONG ON, SHORT OFF”.
   ➥ The MGBs are now ready for operation again
6. If the fault persists, please send in the device for inspection

## 3.2 LED DIA illuminated + LED STATE flashes 1 time (AR and AP modes)


**Fault symptom:**

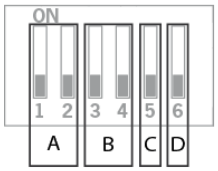
The MGB displays the fault state “fault during teach-in/configuration or invalid DIP switch position”.

**Possible fault causes:**

- Invalid DIP switch position
  1. Malfunction due to incorrect configuration of the DIP switch

**Remedy:**

1. Check of the DIP switch setting. Configuration must be repeated if the setting is incorrect. Follow the instructions “Changing device configuration” in the system manual (section 10.5).




### Function of the switches

| Detail | Switch | Function |
|---|---|---|
| A | 1+2 | on: Device is operated as AP system |
| | | off: Device is operated as AR system |
| B | 3+4 | on: Guard lock monitoring is deactivated |
| | | off: Guard lock monitoring is active (factory setting) |
| C | 5 | on: Configuration possible |
| | | off: Configuration inhibited (factory setting) |
| D | 6 | No function |

## 3.3 LED DIA illuminated + LED STATE flashes 2 times (single wiring – only AR mode)

Power
State 2 x flash
DIA
Lock

**Fault symptom:**

The MGB displays the fault state “input error (e.g. missing test pulses)”.

**Possible fault causes:**

- 24 V DC missing at inputs FI1A and/or FI1B
- A safety evaluation device or a safe control system with clocking outputs is connected to FI1A and/or FI1B.

**Remedy:**

1. Check the wiring and correct it if necessary or switch to AP mode.
2. Switch the voltage off
   or
   press the reset button (if present) that controls the integrated reset input.
3. Close the door(s).
4. Switch the voltage on again
   or
   release the reset button
5. Wait until the STATE LED flashes with the code “LONG ON, SHORT OFF”.
   ➥ The MGB is now ready for operation again

## 3.4 LED DIA illuminated + LED STATE flashes 2 time (series wiring – only AR mode)

Power
State 2 x flash
DIA
Lock

**Fault symptom:**

The MGB displays the fault state “Input fault (e.g. missing test pulses, illogical switching state of upstream switch)”

**Possible fault causes:**

- 24 V DC missing at inputs FI1A and/or FI1B of the first MGB
- In case of series operation, FI1A is connected with FO1B or FI1B is connected with FO1A
- In case of series operation, conventional safety components (switching contacts) are connected to FI1A and/or FI1B
- A safety evaluation unit or a safe control system with clocking outputs is connected.

- All connections are correct, but there is no common potential for the series-connected devices (several power supply units for one chain)
- In case of series operation, an upstream unit is set as an AP unit.

**Remedy:**

1. Check the wiring and correct it or switch the clock pulses off
   or check the upstream devices for incorrect DIP switch configuration.
2. Switch the voltage off at all devices
   or
   press the reset button (if present) that controls ALL integrated reset inputs in the series connection
3. Close the door(s).
4. Switch the voltage on again
   or
   release the reset button
5. Wait until the STATE LED flashes with the code “LONG ON, SHORT OFF”.
   ➡ The MGBs are now ready for operation again

## 3.5 LED DIA illuminated + LED STATE flashes 3 time (AR and AP modes)


**Fault symptom:**

The MGB displays the fault state “handle module read error (e.g. error in code/code not readable)”.

**Possible fault causes:**

- EMC interference, e.g. caused by clocked cables near the MGB.
- Hardware fault in the handle module
- Different potentials at the fence and door, causing compensating currents that could lead to this error message.

**Remedy (in case of EMC interference or potential differences):**

1. Check the area of use with regard to increased EMC radiation or lack of grounding connections of the protective enclosure.
2. Switch the voltage off at all devices
   or
   press the reset button (if present) that controls ALL integrated reset inputs in the series connection
3. Switch the voltage on again
   or
   release the reset button
4. Wait until the STATE LED flashes with the code “LONG OFF, SHORT ON”.
   ➡ The MGBs are now ready for operation again

**Remedy (hardware fault in the handle module):**

1. Replace the handle module and repeat the teach-in operation. Observe the instructions for “Teaching in a handle module” in the system manual for this purpose. Tip: Close the door and activate guard locking to avoid interruptions during teach-in operation.

## 3.6 LED DIA illuminated + LED STATE flashes 4 time (AR and AP modes)


**Fault symptom:**

The MGB displays the fault state “output fault”.

**Possible fault causes:**

- The connected control system and the MGB do not have a common reference potential (common ground)
- A ground loop has been produced by bridges having been installed both on the MGB and in the control cabinet (refer to the system manual for this purpose).
- The internal output circuit is damaged.
- 24 V DC or 0 V is present at one of the two safety outputs during the switch-on process.
- A safety evaluation unit or a safe control system with clocking outputs is connected.

**Remedy:**

2. Check the wiring and correct it
3. Switch the voltage off at all devices
   or
   press the reset button (if present) that controls ALL integrated reset inputs in the series connection
4. Switch the voltage on again
   or
   release the reset button
5. Wait until the STATE LED flashes with the code “LONG ON, SHORT OFF”.
6. The MGBs are now ready for operation again if no fault occurred in the internal output connection.

## 3.7 LED DIA illuminated + LED Lock flashes 1 time (AR and AP modes)


**Fault symptom:**

The MGB displays the fault state “signal sequence incorrect”

**Possible fault causes:**

- Actuator broken.
- EMC interference.
- Hardware fault in the handle module
- Different potentials between fence and door.

**Remedy:**

1. Open all safety doors on which the LED Lock is flashing (irrespective of the number of flashing pulses) so that no passage is possible.
2. Switch the voltage off at all devices
   or
   press the reset button (if present) that controls the integrated reset inputs.
3. Switch the voltage on again
   or
   release the reset button
4. Wait until the STATE LED flashes with the code “LONG OFF, SHORT ON”.
5. Close the safety doors
   ➥ If there is no internal fault (break), the MGBs are now ready for operation again.

## 3.8 LED DIA not illuminated + LED STATE not illuminated or does not flash

- Power
- State
- DIA
- Lock

**Possible causes:**

- Teach-in operation complete.
- DIP switch 5 still set to “ON” (AP/AR configuration process not fully completed yet).

**Remedy:**

- When the teach-in operation is complete, the operating voltage must then be switched off at the locking module for at least 3 minutes in order to activate the taught-in code of the handle module in the locking module. As an alternative, 24V can be applied to the input RST for at least 3 seconds.
- Complete the AP/AR configuration process (set DIP switch 5 to “OFF”), restart the MGB.

## 3.9 LED DIA not illuminated + LED STATE flashes 3 times (AR and AP modes)

- Power
- State 3 x flash
- DIA
- Lock

The device indicates that it is ready to learn a new handle module. Observe the specifications for learning a handle module in the system manual for this purpose. This state persists for 3 minutes after power up with the door open.

## 3.10 LED DIA not illuminated + LED STATE flashes approx. every 3 sec. (AR and AP modes)

- Power
- State flashes approx. every 3 sec.
- DIA
- Lock

The device displays normal operation with the door open. If this display also occurs with the door close, the handle module has already been taught in and is currently being blocked on this MGB.

**Remedy:**

1. Repeat teach-in operation with a new handle module. Observe the instructions for “Teaching in a handle module” in the system manual for this purpose. Tip: Close the door and activate guard locking to avoid interruptions during teach-in operation.

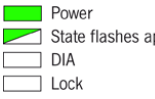
## 3.11 Individual flickering input LED on the evaluation unit

Even when the MGB is switched off, it emits a pulse sequence at output FO1A in order to ensure the functional capability of the output circuit at all times. Consequently, a faintly flickering LED can be seen on an input of an evaluation unit even though the evaluation unit does not switch on or signal any fault.

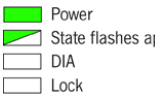
This usually does not result in any problems during operation.

# 4 System status tables

## 4.1 MGB-AR

| Operating mode | LED indicator | State |
|---|---|---|
| Diagnostics |  | Error during teach-in / configuration or invalid DIP switch setting |
| |  | Input fault |
| |  | Handle module read error |
| |  | Output fault |
| |  | Signal sequence erroneous |
| |  | Internal fault |
| Setup |  | Positive acknowledgment after completion of teach-in operation |
| Normal operation |  | Normal operation, door open |

## 4.2 MGB-AP

| Operating mode | LED indicator | State |
|---|---|---|
| Diagnostics |  | Error during teach-in/configuration or invalid DIP switch setting |
| |  | Handle module read error |
| |  | Output fault |
| |  | Signal sequence erroneous |
| |  | Internal fault |
| Setup |  | Positive acknowledgment after completion of teach-in operation |
| Normal operation |  | Normal operation, door open |