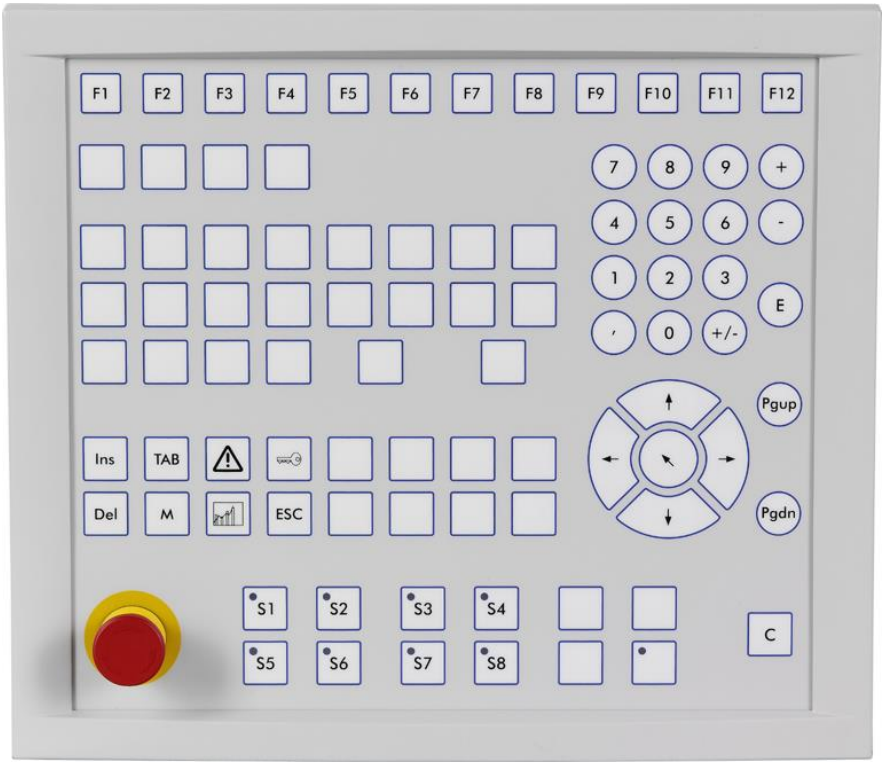
# Keyboard Unit Sigmatek TE891



# Technical Data

## Performance data

| | |
|---|---|
| Interfacing | Left or right: chip card reader<br>Back panel: emergency stop connector<br>1 x CAN with 2 connections |
| Control panel | 89 x function button/ 1 x emergency stop |
| Signal generator | No |

## Electrical Requirements

| | | |
|---|---|---|
| Emergency stop | Maximum +24V AC/ 2A | |
| Supply voltage | Minimum +18V DC | Maximum +30V DC |
| Current consumption of the voltage supply | Maximum 250mA (at +24V) | |

(The supply voltage is provided by the display unit over the CAN cable)

## Miscellaneous

| | |
|---|---|
| Hardware version | 1.x |
| Article number | 12-210-891 |
| Standard | UL (E247993) |

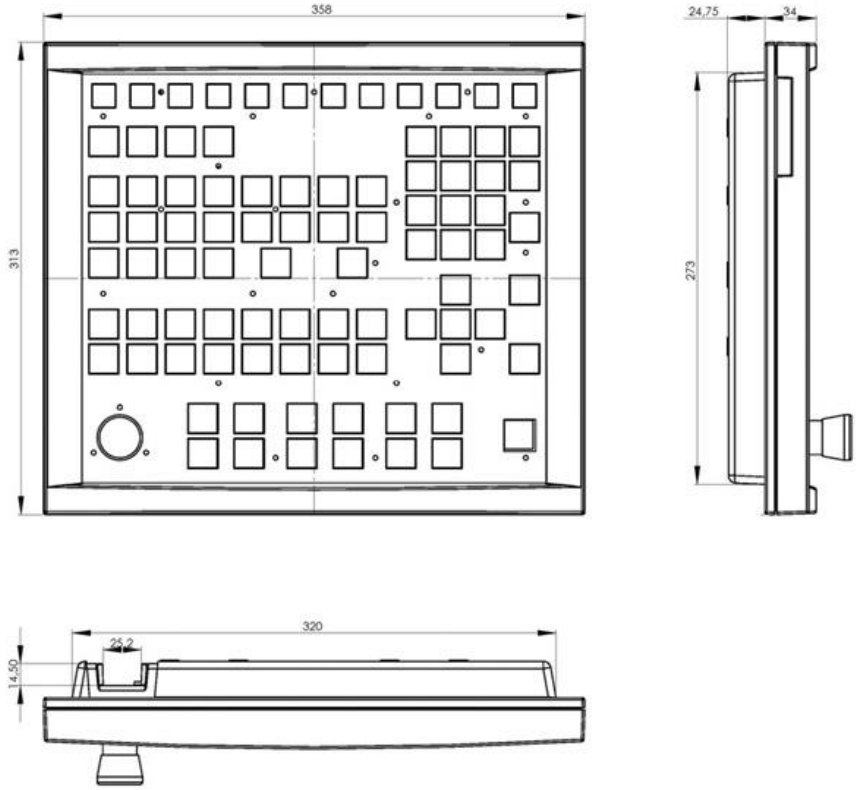
## Environmental conditions

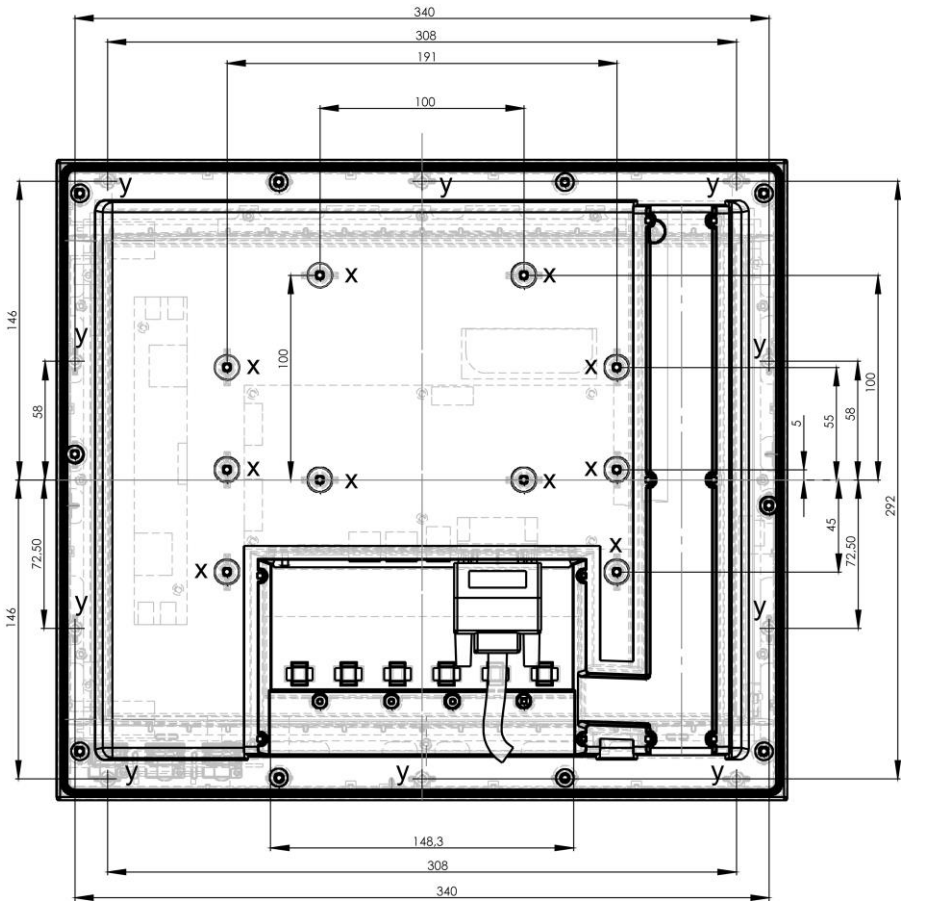
| | | | | | |
|---|---|---|---|---|---|
| Storage temperature | | -20 – +85°C | | | |
| Operating temperature | | 0 – +60°C | | | |
| Humidity | | 0 – 95%, uncondensed | | | |
| EMV stability | | According to EN 61000-6-2:2001 (Industrial area) | | | |
| Shock resistance | | EN 60068-2-27 | | 150m/s² | |
| Protection type | | Control box mount without Chip card reader | Control box mount with Chip card reader | Support arm mount without Chip card reader | Support arm mount with Chip cared reader |
| | EN 60529 | Front: IP 54<br>Back panel: IP 20, with IP 43 cable, if the cable outlet is located below | Front: IP 30<br>Back panel: IP 20, with IP 43 cable, if the cable outlet is located below | Front: IP 54<br>Back panel: IP 20, with IP 43 cable, if the cable outlet is located below | Front: IP 30<br>Back panel: IP 20, with IP 43 cable, if the cable outlet is located below. |
| | NEMA 250 (UL50) | Type 12 | Type 1 | Type 1 | Type 1 |

## Terminal

| | | |
|---|---|---|
| Dimensions | 358mm/ 313mm/ 62mm (W/ H/ D) | |
| Material | Housing: Plastic ASA | Front plate: Sheet aluminum with covered Foil |
| Weight | Typically 2,5kg | |

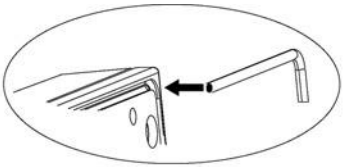
## Mechanical Dimensions



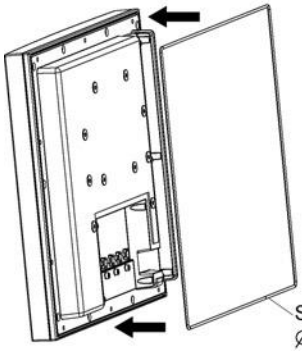



x => Mounting holes for support arm mounting (10x).
y => Mounting holes for control box mounting (10x).

**Instructions/ Control box mounting:**



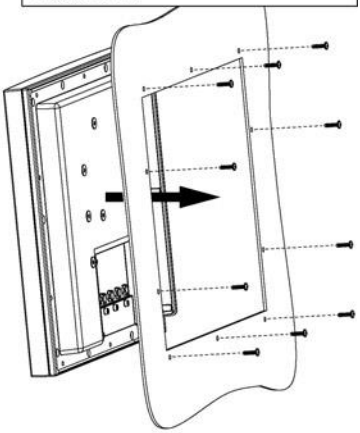
① Sponge rubber band should be inserted in the groove provided on the back of the terminal.

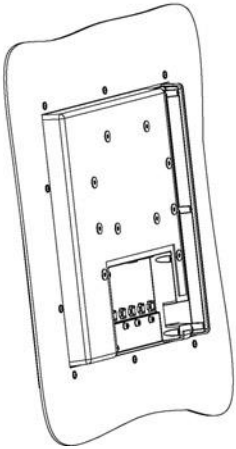



| Screw length | Plate thickness | Art. No. Installation kit switch cabinet installation |
|---|---|---|
|  16 mm | 1,0 - 3,0mm | 12-209-021 |
|  18mm | 4,0 - 6,0mm | 12-209-022 |

**Caution must be taken that the correct screw length is used!**

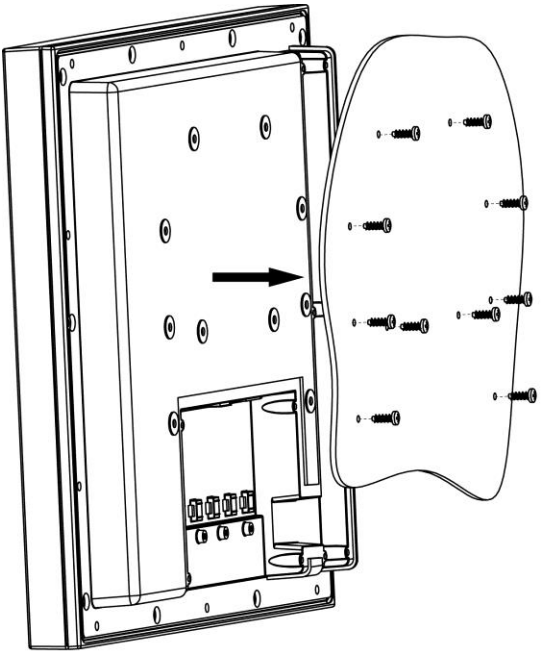
② Incorporate section with the switch cabinet. Connect the terminal with the supplied screws.



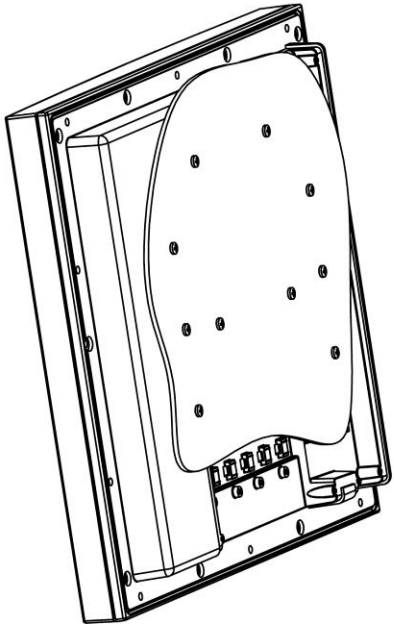


③ Completed mounted terminal.

**Instructions/ Arm mounting:**



| Screw length | Thickness of plate | Art. No. Installation kit carrying arm |
|---|---|---|
|  12mm | 1,0 - 3,0mm | 12-209-011 |
|  16mm | 4,0 - 6,0mm | 12-209-012 |
| **Caution must be taken that the correct screw length is used!** | | |



# Chemical Resistance

## Plastic housing ASA

| Solution | Visual Effect |
|---|---|
| Acetic acid (5%) at 23°C | None |
| Chromium (40%) at 23°C | None |
| Citric acid (10%) at 23°C | None |
| Hydrochloric (36%) at 23°C | None |
| Lactic acid (10%) at 23°C | None |
| Nitric acid (40%) at 23°C | None |
| Sulfuric acid (38 %) at 23°C | None |
| Sulfuric acid (5%) | None |
| Ammonia hydroxide (10%) at 23 °C | None |
| Caustic soda (1%) at 23°C | None |
| Caustic soda (35%) at 23°C | None |
| Ethyl alcohol at 23°C | None |
| Isopropyl Alcohol at 23°C | None |
| Methanol at 23°C | None |
| Iso-Octane at 23°C | None |
| N-Hexane at 23°C | None |
| Tulol at 23°C | Yes |
| Acetone at 23°C | Yes |
| Diethyl ether at 23°C | Yes |
| SAE 10W40 motor oil at 23°C | None |
| Sodium carbonate (20%) at 23°C | None |
| Sodium chloride (10%) at 23°C | None |
| Sodium Hypochloride (10%) at 23°C | None |
| Zinc chloride (50%) at 23°C | None |
| Ethyl acetate at 23°C | Yes |
| Water at 23°C | None |

## Decoration foil

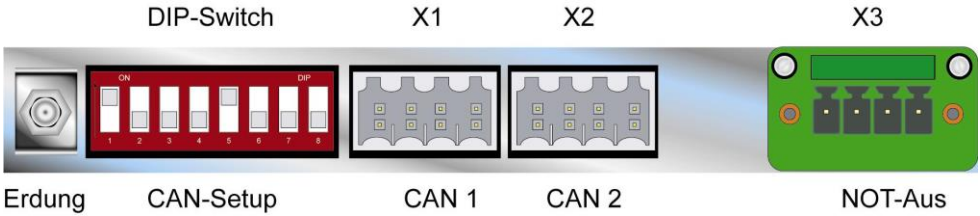
| Solution | Effects over time | |
|---|---|---|
| | 1 Hour | 24 Hours |
| Methylethylketone | None | None |
| Cyklohexanol | None | None |
| Acetone | None | None |
| Ethanol | None | None |
| Benzyl alcohol | Yes | Yes |
| Trichloroaethan (Genklene) | None | None |
| Perchloroäthylen (Perklone) | None | None |
| Perchloroaethylen | None | None |
| Dichloromethane | Yes | Yes |
| Diethyl ether | None | None |
| Toluene | None | None |
| Xylene | None | None |
| Gasoline | None | None |
| Diesel oil | None | None |
| Nitric acid <10% | None | None |
| Sodium hydroxide <10% | None | None |
| Turpentine | None | None |
| Ethyl acetate | None | None |

# Interfacing

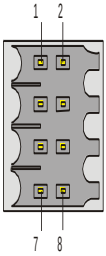
## General

The connection to the display unit is made over the CAN bus, which also supplies the +24V. Therefore, an additional voltage supply is not required.

## Layout of the back panel

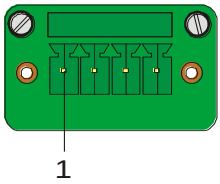



**X1, X2 CAN** (Weidmüller B2L/B2CF 3,5/8)



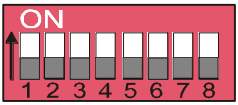

| Pin | Function |
|---|---|
| 1 | CAN A (LOW) |
| 2 | CAN B (HIGH) |
| 3 | CAN A (LOW) |
| 4 | CAN B (HIGH) |
| 5 | GND |
| 6 | (+5V) |
| 7 | GND |
| 8 | +24V |

**X3 Emergency Stop button** (FK-MCP 1,5/8-ST-3,81)




| Pin | Function |
|---|---|
| 1 | Root 1 |
| 2 | Normally closed 1 |
| 3 | Normally closed 2 |
| 4 | Root 2 |

**DIP SWITCH CAN-BUS Setup** (8-times)




| | |
|---|---|
| Switch 1 – 4 | CAN Station 0 – 15 |
| Switch 5 – 6 | Baud rate 0 – 3 |
| Switch 7 | PS/2 – Master/Slave |
| Switch 8 | CAN termination 150-Ohms |

# CAN-BUS-Setup

In this section the CAN bus configuration is explained. When configuring the CAN bus the following parameters must be set: Station number and data transfer rate.

## CAN bus-Stations number

Each CAN bus station has its own station number. Under this station number, all station connected in the bus can exchange data. Up to 16 (0 to 15) stations can be installed in a CAN bus system, however, each station number can only be assigned once.

| SW 1 | SW 2 | SW 3 | SW 4 | Station |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | **0** |
| 1 | 0 | 0 | 0 | **1** |
| 0 | 1 | 0 | 0 | **2** |
| 1 | 1 | 0 | 0 | **3** |
| 0 | 0 | 1 | 0 | **4** |
| 1 | 0 | 1 | 0 | **5** |
| 0 | 1 | 1 | 0 | **6** |
| 1 | 1 | 1 | 0 | **7** |
| 0 | 0 | 0 | 1 | **8** |
| 1 | 0 | 0 | 1 | **9** |
| 0 | 1 | 0 | 1 | **10** |
| 1 | 1 | 0 | 1 | **11** |
| 0 | 0 | 1 | 1 | **12** |
| 1 | 0 | 1 | 1 | **13** |
| 0 | 1 | 1 | 1 | **14** |
| 1 | 1 | 1 | 1 | **15** |

## CAN Bus Transfer Rate

The data transfer rate (Baud rate) for the CAN bus is settable, however, the longer the bus, the lower the Baud rate that must be selected.

| SW 5 | SW 6 | Value | Baud rate | Maximum length |
|---|---|---|---|---|
| 0 | 0 | 0 | 615kBit/s | 60m |
| 1 | 0 | 1 | 500kBit/s | 80m |
| 0 | 1 | 2 | 250kBit/s | 160m |
| 1 | 1 | 3 | 125kBit/s | 320m |

These values are valid for the following cable: 120Ω, Twisted Pair.

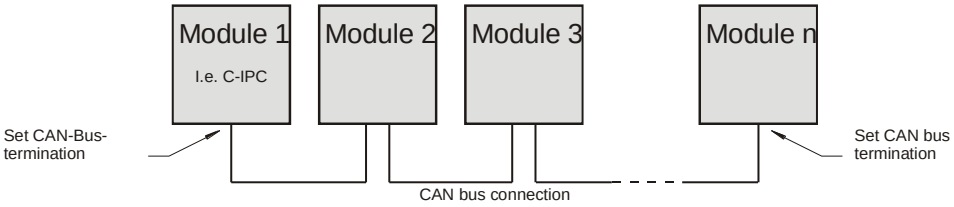
Note: For the CAN bus Protocol: 1kBit/s = 1kBaud.

## CAN Bus PS/2 Master

Because the CAN bus and PS/2 signals are transmitted, a PS2 master must be defined that controls and answers queries from the CPU. There can be only one PS/2 master in the system. The selection is made by setting SW7.

## CAN-Bus Termination

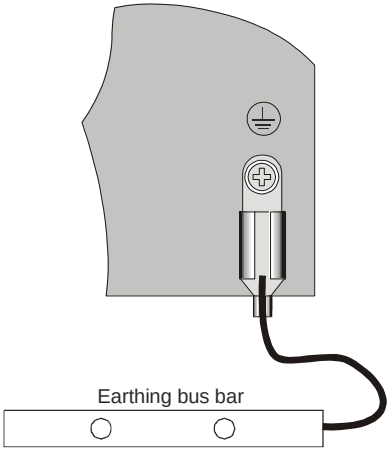
In a CAN bus system, both ends must be terminated. This is required to avoid transfer errors cause be reflections in the line.




A line termination switch is already built into the console unit. If the unit is an end module, the DIP switch SW8 should be set.

## Earth Ground

To ensure the display unit functions error-free, an earth connection must be made over the blade terminal on the back panel.



# Addressing

Data transferred over the CAN bus:

1. PS/2-Keyboard
2. Initialization of the Machine keyboard
3. Machine buttons
4. Control of the LEDs
5. Display recognition and settings

**Items 1 and 5:**

The following CAN objects are reserved for the PS/2 keyboard area and display recognition:

040 hex to 08F hex

16 independent terminals can be installed in a single system using the available station numbers. The station numbers are set using the DIP switches on the pack panel. A terminal must also be defined as a master, which answers to global objects (i.e. NumLock or CapsLock).

Since only a limited number objects are available in the CAN controller (14 standard objects max.), the machine buttons are limited to two objects.

**Items 2, 3 and 4:**

**Send object:**

Object number: $120-$12F (depending on the station)
Object size: 2 Byte

**Application for initializing, setting LEDs**

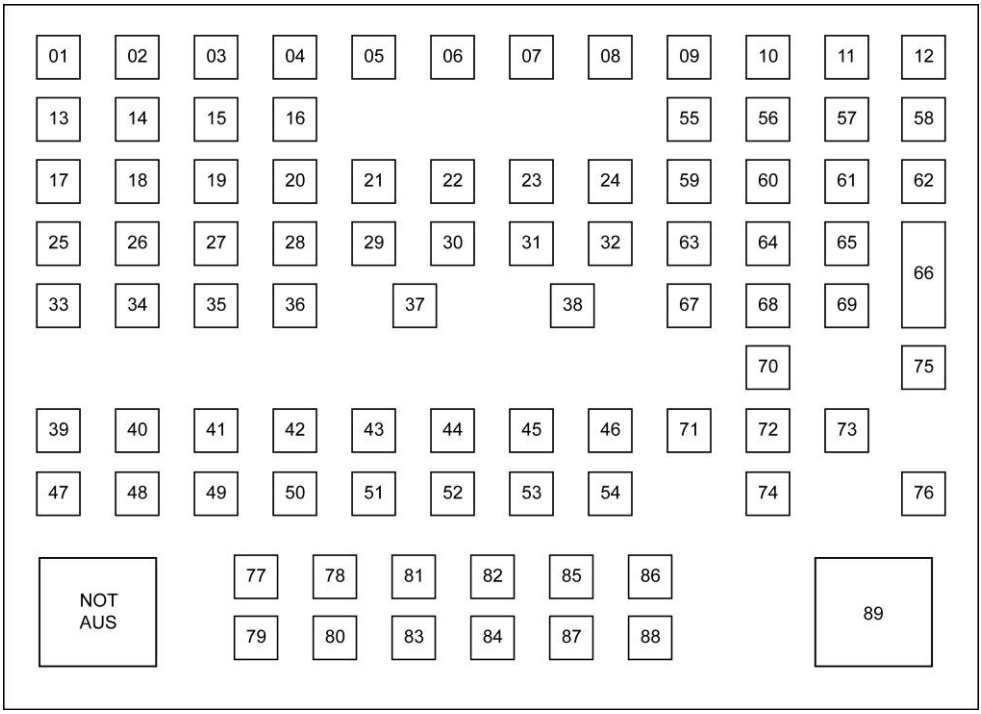
| | Initializa-tion: | All LEDs off | All LEDs on | All LEDs blink-ing | One LED off | One LED on | One LED blinking |
|---|---|---|---|---|---|---|---|
| Data 0 | CMD = $80 | CMD = $00 | CMD = $01 | CMD = $02 | CMD = $10 | CMD = $11 | CMD = $12 |
| Data 1 | Bit 0 – 2: Repetition rate | --- | --- | --- | LED-Nr. | LED-Nr. | LED-Nr. |

**Receive object:**

Object number: $130-$13F (depending on the station)
Object size: 4 Byte

**Application for button codes, answer LEDs**

| | ACK for LEDs | Button codes |
|---|---|---|
| Data 0 | CMD = $00 | CMD = $10 |
| Data 1 | | Button code 1 |
| Data 2 | | Button code 2 |
| Data 3 | | Button code 3 |



## Code LEDs