Keyboard Unit   TE 501-T

The TE 501-T keyboard unit has 50 keys and 50 LEDs. These keys are read by the software and can be used for any function. The operating status is indicated by the LEDs.

In addition, 4 external switching elements can be connected.

Technical data

Performance data

Interfacing	12-pin connector plug for 4 x 3-pin switching elements 2-pin plug connector for the supply 1 x CAN with 2 connections
Control panel	50 x function button/ 4 x switching element cuts
Signal generator	No

Electrical Requirements

Supply voltage	Minimum +18 V DC	Maximum +30 V DC
Current consumption of the voltage supply	148 mA – 207 mA	

Terminal

Dimensions	320/ 260 mm/ 46.7 mm (W/ H/ D)	
Material	Housing: aluminum	Front plate: aluminum

Miscellaneous

Article number	12-210-501-T
Hardware version	1.x

Environmental conditions

| Storage temperature	-20 – +85 ℃	
Operating temperature	0 – +60 ℃	
Humidity	0 – 95 %, uncondensed	
EMV stability	According to EN 61000-6-2 (Industrial area)	
Shock resistance	EN 60068-2-27	150 m/s²
Protection type	IP20 according to EN 60529	

Mechanical Dimensions
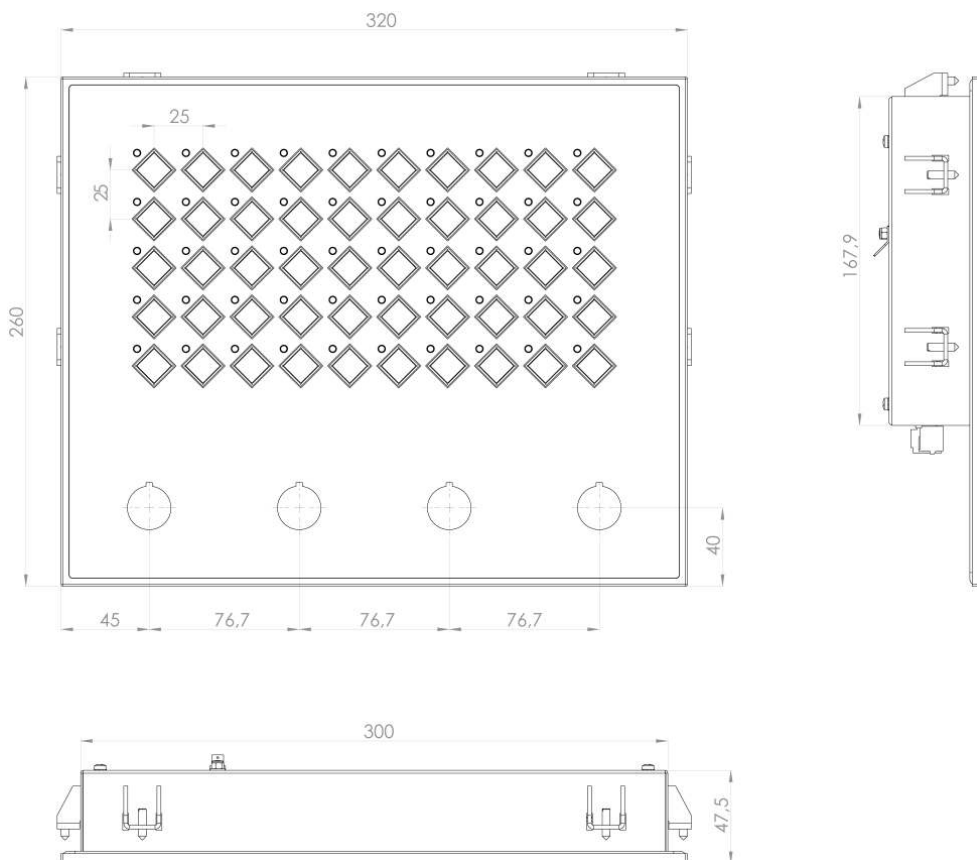
Interfacing

General

The connection to the display unit is made over the CAN bus, which also supplies the +24 V. An additional voltage supply is therefore not required.
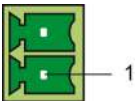
Layout of the back panel
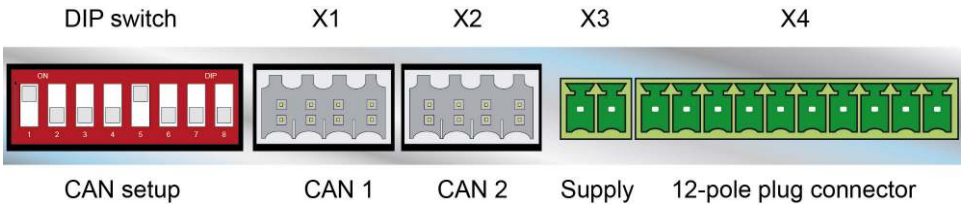
X1, X2 CAN (Weidmüller B2L 3,5/8)
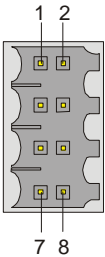
Pin	Function
1	CAN A (LOW)
2	CAN B (HIGH)
3	CAN A (LOW)
4	CAN B (HIGH)
5	GND
6	(+5 V)
7	GND
8	+24 V

X3 Supply +24 V (Phoenix MCV1,5/2-G-3,5 2-pole Spring terminal connector)

Pin	Function
1	+24 V
2	GND

X4 Switching elements 1 – 4 (Phoenix MCV1,5/12-G-3,5 12-pole Spring terminal connector)
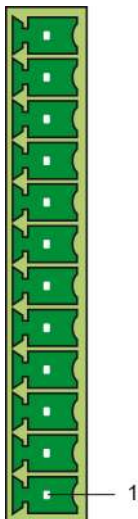
	Pin	Function
Switching element 1	1	+24 V
	2	IN 1
	3	IN 2
Switching element 2	4	+24 V
	5	IN 1
	6	IN 2
Switching element 3	7	+24 V
	8	IN 1
	9	IN 2
Switching element 4	10	+24 V
	11	IN 1
	12	IN 2

— 1

DIP SWITCH CAN BUS Setup (8-times)

ON
1 2 3 4 5 6 7 8
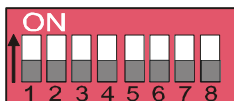
Switch 1 – 4	CAN station 0 – 15
Switch 5 – 6	Baud rate 0 – 3
Switch 7	Not used
Switch 8	CAN termination 150 Ohms

Additional Shipment

1 m CAN – cable with 2 x Weidmüller B2L 3,5/8)
2-pin connector plug (Phoenix 1939918)
12-pin connector plug (Phoenix 1942251)

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	615 kbit/s	60 m
1	0	1	500 kbit/s	80 m
0	1	2	250 kbit/s	160 m
1	1	3	125 kbit/s	320 m

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

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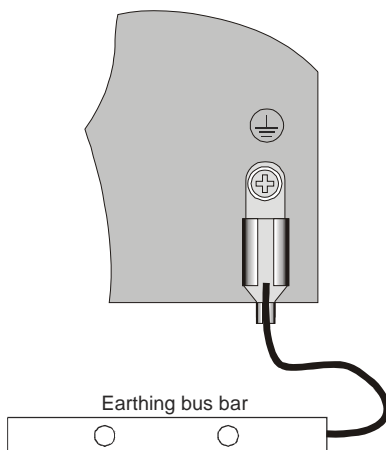
CAN Bus

CAN Bus Termination

In a CAN bus system, both ends must be terminated. This is required to avoid transmission errors caused by reflections in the line.
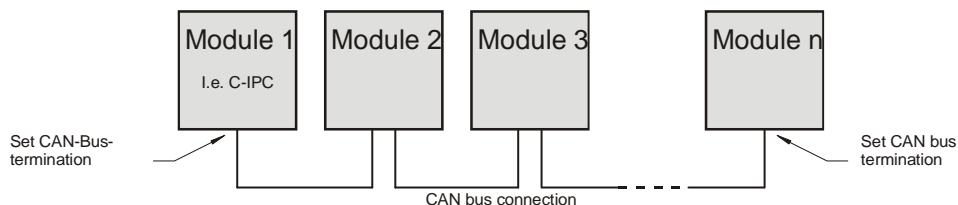
A line termination switch is already built into the console unit. If the unit is an end module, the DIP switch SW8 should be set.

Earth Ground

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

Earthing bus bar

Addressing

Data transferred over the CAN bus:

1. PS/2-Keyboard (not used)
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 No.	LED No.	LED No.

Receive object:

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

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		Switching elements