ETT 352

Touch Operating Panel

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The ETT 352 is an intelligent terminal for pro-
gramming and visualization of automated process-
es. As a room operating device, the terminal is
equipped with temperature sensor.

A resistive touch screen serves as the input medi-
um for process data and parameters. The output is
shown on a 3.5" TFT color display. To save ener-
gy, the display is deactivated in sleep mode. When
the screen surface is touched, the terminal is acti-
vated and then deactivated a few minutes after the
last input.

With the LSE mask editor, graphics can be created on the PC, then stored and displayed
on the terminal. Data is exchanged over a CAN bus.

Contents

1   Technical Data

1.1   Performance Data

SDRAM	8-Mbyte
(Flash)	1-Mbyte
Interfaces	1x CAN bus (fixed terminal strip)
Terminating resistor	120 Ω settable with DIP-Switch
Data rate	maximum 1 Mbit/s
Display	3.5" TFT color display
Resolution	320 x 240 Pixel
Control panel	4-wire touch screen (analog resistive)

1.2   Electrical Requirements

Supply voltage	typically +24 V DC (+18-30 V DC)	
Current consumption of power supply at +24 V DC	typically 50 mA	maximum 100 mA
UL standard	for UL[1] : must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy.	

[1] In US according to Class 2 UL 1310 or UL 61010-1, 3rd edition, chapter 9.4 or LPS (limited power supply) UL 60950-1 or Limited Energy UL 1585

1.3   Terminal

Operating unit dimensions	93.3 x 93.3 x 12.1 mm (W x H x D)
Installation dimensions with panel mount	52 x 52 x 30 mm (W x H x D) corner hole spacing 81.3 mm
Material	plastic
Weight	circa 120 g

1.4   Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 … +55 °C	
Humidity	10-80 %, non-condensing	
Operating conditions	Pollution degree 2 Indoor use Altitude up to 2000 m	
EMV product norm	EN 60730-1	
EMC stability	according to EN 61000-6-2 (industrial area)	
EMC stability	according to EN 61000-6-3 (living area)	
Protection type	EN 60529	
	mounting in a panel	IP30 (no UL-rating)

## 1.5   Display

Type	3.5" LC graphic display
Resolution	320(RGB) x 240
Pixel size	0.219 x 0.219 mm
Number of pixels	320*3 (RGB) x 240 pixels
Active surface	70.08 x 52.56 mm
Color depth	24-bit
Backlighting	6x LED, white, regulatable
Contrast	400:1
Touch	resistive
Brightness	typically 350 cd/m²
Visible field	left, right, below 70°, above 60°

1.6   Miscellaneous

Article number	01-230-352-1
Hardware version	1.x
Standard	UL 61010-2-201
Approbations	UL, cUL, CE

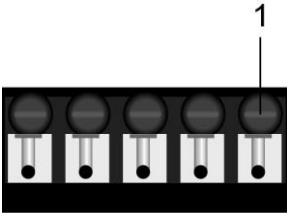# 2   Mechanical Dimensions
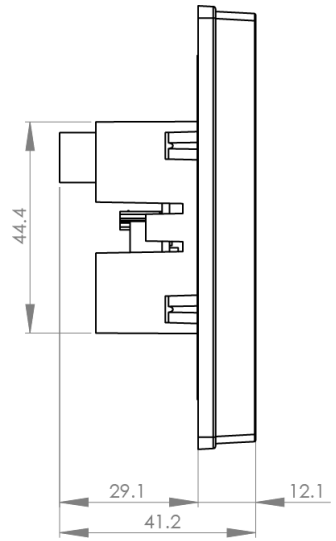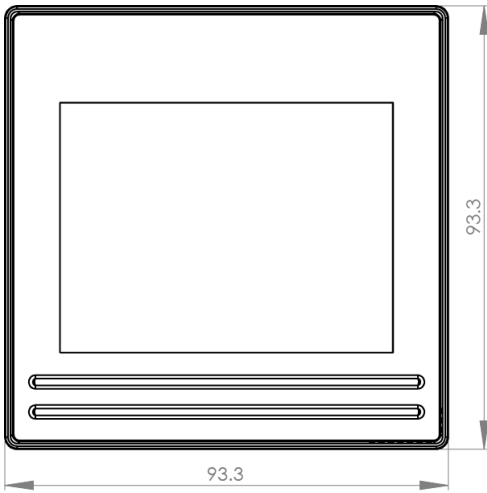
3 Connector Layout
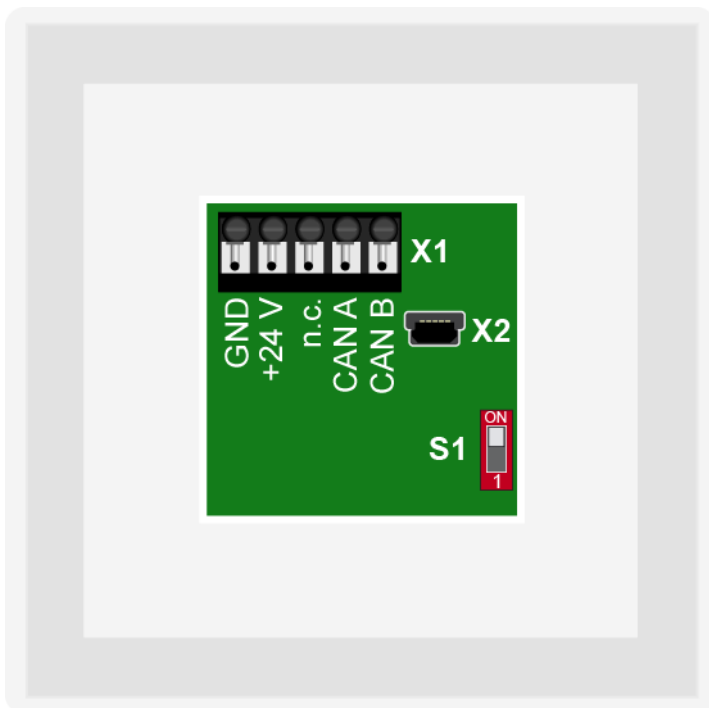
X1: Supply Terminal (Weidmüller LSF-SMT 5.00/05/180 3.5SN BK TU)

Pin	Function
1	CAN B (HIGH)
2	CAN A (LOW)
3	n.c.
4	+24 V
5	GND

n.c. = do not use

Connectable Leads

Wiring	Min.	Max.
Connection dimensions	0.13 mm²	1.5 mm²
Conductor cross-section AWG	AWG 24	AWG 16
Single wire	0.2 mm²	1.5 mm²
Fine-stranded with end sleeve	0.25 mm²	1.5 mm²
End sleeve with collar	0.25 mm²	0.75 mm²

X2: USB Device 1.1 (Type Mini-B) (for service purposes only)

Pin	Function
1	+5 V
2	D-
3	D+
4	n.c.
5	GND

S1: CAN Bus Termination (1-pin DIP-Switch)
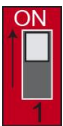
ON => CAN bus termination with 120 Ω

4   Mounting Instructions

4.1   Panel Mount
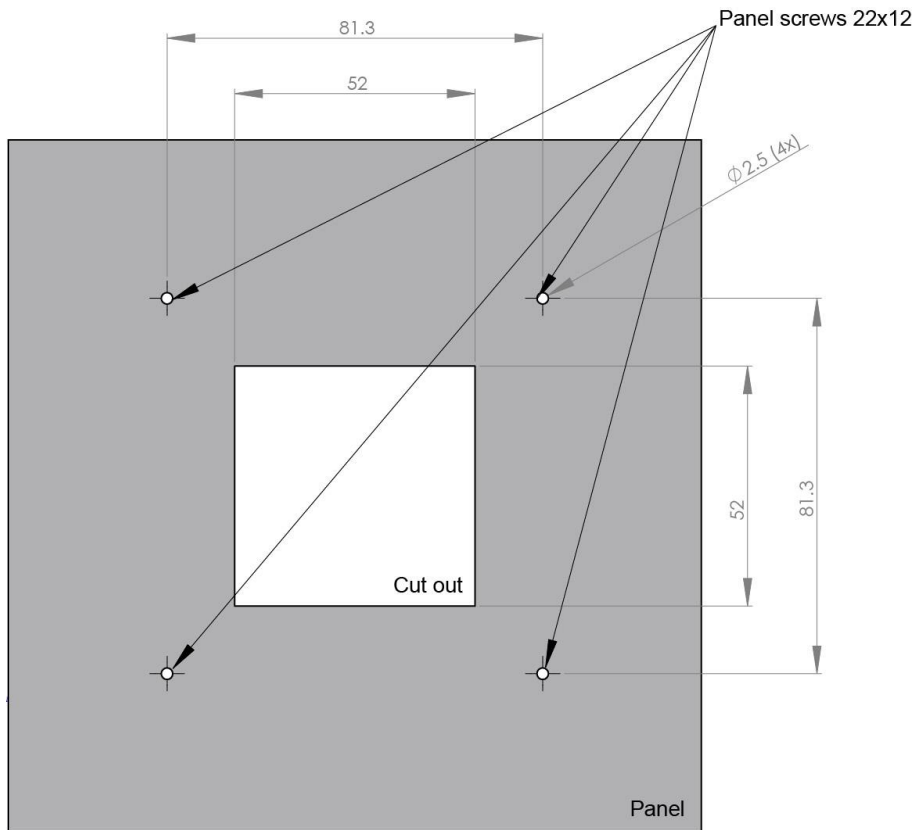
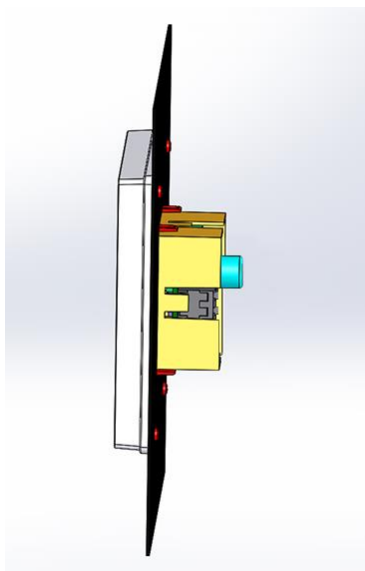Panel screw length for a
panel thickness of 2 mm:

Panel screw 22x12

Panel screw length for a
panel thickness > 2 mm:

Panel thickness + 10 mm = Panel screw length

Scheme

The touch operating terminal is inserted through the cutaway of the panel and secured from the back using 4 screws.

5 CAN Bus Setup

This section explains how to correctly configure the CAN bus. The following parameters must first be set: Station number and data transfer rate.

5.1 CAN Bus Station Number

Each CAN bus station is assigned its own station number. With this station number, data can be exchanged with other stations connected to the bus. In a CAN bus system however, each station number can only be assigned once!
During the initial start-up of the terminal, the setup is activated (see following image), in which the station number is set. This value must match the configuration in the software project.

5.2 CAN Bus Data Transfer Rate

Various data transfer rates (baud rates) can be set on the CAN bus. As with the station number, the baud rate is defined in the setup during the initial start-up (see the following image). This value must match the configuration in the software project.
The longer the bus line is, the lower the data transfer rate that must be selected.

Value	Baud Rate	Maximum Length
1	500 kbit/s	80 m
2	250 Kbits/s	160 m
3	125 Kbits/s	320 m
4	100 Kbits/s	400 m
5	50 Kbits/s	800 m
6	20 kbits/s	1200 m
7	1 Mbit/s	30 m

These values apply to the following cable: 120 Ω Twisted Pair.

Note: For the CAN bus protocol: 1 kbit/s = 1 kBaud.

5.3   Number of CAN Bus Participants

The maximum number of participants on the CAN bus depends on the cable length, termination resistance, data transfer rate and the drivers used in the participants.

With a termination resistance of 120 Ω, at least 100 participants are possible.

5.4   Wiring the CAN Bus

For the CAN bus wiring, a shielded cable containing two twisted pairs is used. The wires server to transmit the CAN-A and CAN-B signals, while the shielding provides the reference potential CAN_GND. Since the HZS 352 has no connection for CAN_GND, it is sufficient in this case, to connect the shielding on one side at the opposite end.

6   CAN Bus Termination

In a CAN bus system, both end modules must be terminated. This is necessary to avoid transmission errors caused by reflections in the line.
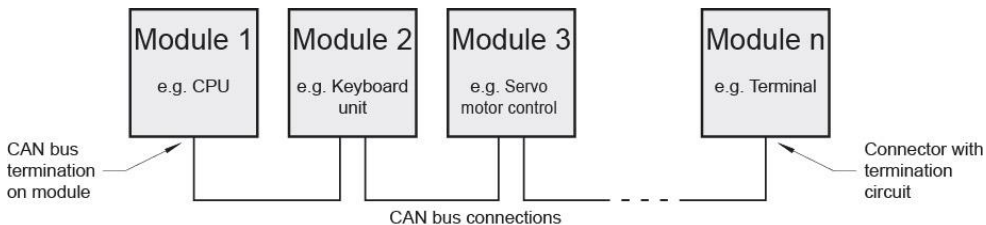
The termination is made by an internal 120 Ω resistor between CAN A (LOW) and CAN B (HIGH).

7   Cleaning the Touch Screen

> **CAUTION!**
> **Before cleaning the touch screen, the terminal must first be turned off to avoid unintentionally triggering functions or commands!**

> **ATTENTION!**
> **Avant de nettoyer l'écran tactile, le terminal doit d'abord être éteint afin d'éviter un déclanchement involontaire des commandes!**

The terminal's touch screen can only be cleaned with a soft, damp cloth. A screen cleaning solution such as an anti-static foam, water with a mild detergent or alcohol should be used to dampen the cloth. The cleaning solution should be sprayed onto the cloth and not directly on the terminal. The cleaning solution should not be allowed to reach the terminal electronics, for example, through the ventilation slots.

No erosive cleaning solutions, chemicals, abrasive cleansers or hard objects that can scratch or damage the touch screen may be used.

If the terminal comes in contact with toxic or erosive chemicals, carefully clean the terminal immediately to prevent corrosion!

> **To ensure the optimal function of the terminal, the touch screen should be cleaned at regular intervals!**

> **Pour garantir le fonctionnement optimal du terminal, le terminal doit être nettoyé régulièrement!**

> **To extend the lifespan of the touch screen as much as possible, using the fingers to operate the terminal is recommended.**

> **Pour prolonger la durée de vie de l'écran tactile on recommande d'utiliser les doigts pour l'opérer.**

Documentation Changes

Change date	Affected page(s)	Chapter	Note
08.10.2014	3	1.3 Electrical Requirements	changed to +18-30 V DC
23.03.2015	4	1.6 Miscellaneous	Changed article number
06.05.2015	1		Photo changed
25.03.2016	5	1.5 Display	Table updated
23.01.2017	3 4 5	1.2 Electrical Requirements 1.4 Environmental Conditions 1.6 Miscellaneous	Table content changed
03.03.2017	11, 12 12	5.1 CAN Bus Station Number 5.2 CAN Bus Data Transfer Rate 5.3 Number of CAN Bus Participants 5.4 CAN Bus Wiring	Note on the setup expanded Screenshot setup expanded Chapter moved Chapter expanded
06.02.2019	11	5.2 CAN Bus Data Trans.	First line in chart deleted