

ETT 353

Operating Panel

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Operating Panel

ETT 353

- 3.5" color display with resistive touch
- CAN bus included +24 V supply
- IP54 plastic housing with front foil



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1 Technical Data

1.1 Performance Data

Interfaces	1x CAN data rate max. 1 Mbit/s
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1.2 Electrical Requirements

Supply voltage	typically +24 V (+18-30 V DC) supplied from Class 2 or LVLC	
Current consumption	typically 65 mA	maximum 100 mA

1.3 Controller

Controller	Cortex-M3
Internal data memory for visualization (SDRAM)	8-Mbyte
Internal data memory for visualization (flash)	8-Mbyte

1.4 Terminal

Dimensions	110 x 157 x 59 mm (W x H x D)
Material	plastic Color: RAL7035
Weight	circa 300 g

1.5 Environmental Conditions

Storage temperature	-10 ... +70 °C	
Environmental temperature	0 ... +50 °C	
Humidity	0-95 %, non-condensing	
Operating conditions	Pollution degree 2 indoor use altitude up to 2000 m	
EMC stability	in accordance with EN 61000-6-2 (industrial area)	
EMC stability	in accordance with EN 61000-6-4 (industrial area)	
Vibration resistance	EN60068-2-6	3.5 mm from 58.4-8.4 Hz 1 g from 8.4-50 Hz
Shock resistance	EN 60068-2-27	15 g
Protection type	EN 60529	IP54

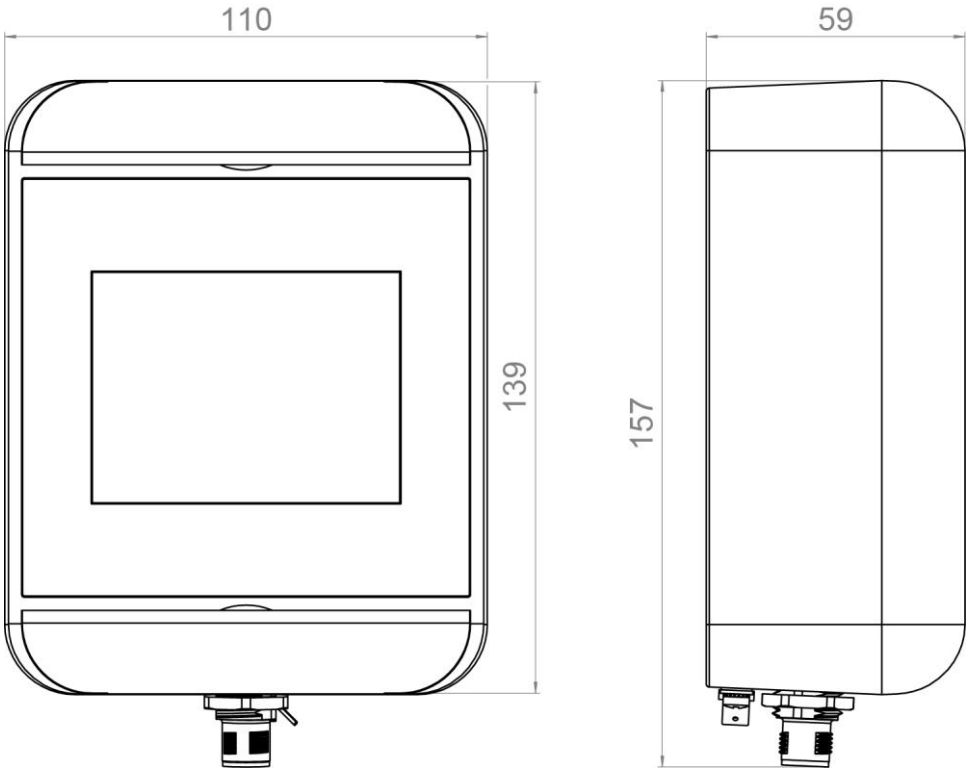
1.6 Display

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, adjustable	
Contrast	400:1	
Touch	resistive	
Brightness	typically 350 cd/m ²	
Visible field	left, right, below 70°, above 60°	

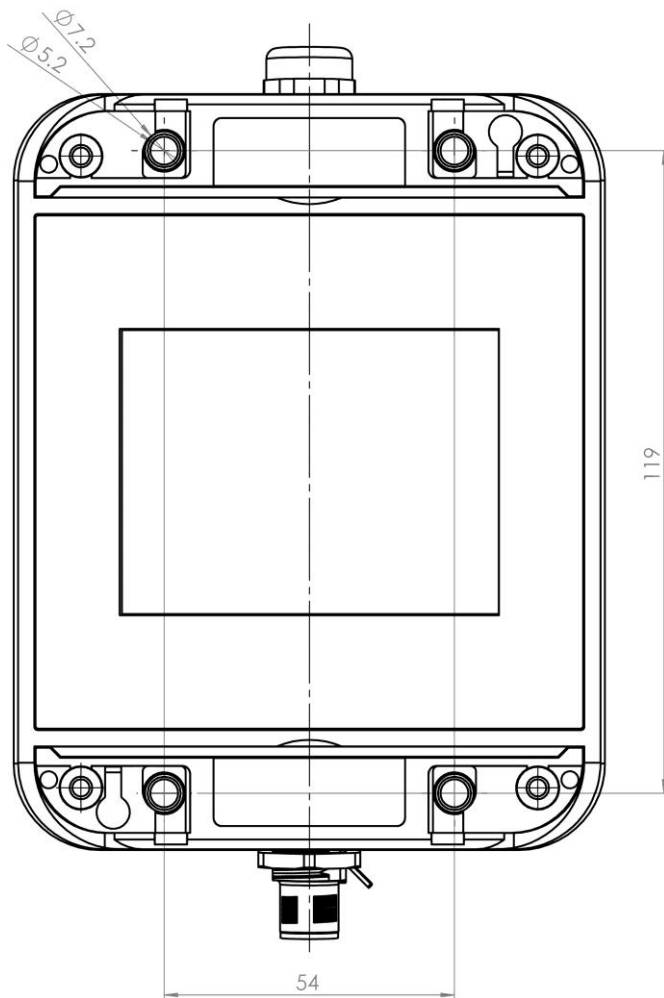
1.7 Miscellaneous

Article number	01-230-353
Hardware version	2.x
Connector cable	05-980-020 (2 m) 05-980-050 (5 m) 05-980-100 (10 m)
Standard	UL 508 (E247993)
Approbations	UL, cUL, CE

2 Mechanical Dimensions

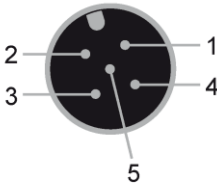


3 Mount Dimensions



4 Connector Layout

X1 connection for 3.5" terminal (M12, socket, 5-pin, type A)



Pin	Function	Cable wire color ⁽¹⁾
1	Ground (shielding cable)	Shield
2	+24 V	red
3	GND	black
4	CAN B (HIGH)	white
5	CAN A (LOW)	blue

⁽¹⁾ Cable must be ordered separately, see chapter „Miscellaneous“

The CAN interface contains a permanently installed 120 Ω resistor.
The thread cylinder is ground. A shielded connector cable must be used.

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
0	615 Kbits/s	60 m
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.

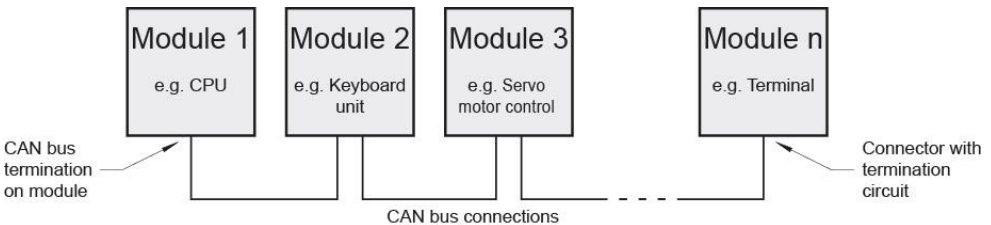
With a termination resistance of $120\ \Omega$, at least 100 participants are possible.

5.4 Wiring the CAN Bus

For the CAN bus wiring, a shielded cable containing two twisted pairs is used. The wires serve 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 $120\ \Omega$ 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!

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.

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!

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

Documentation Changes

Change date	Affected page(s)	Chapter	Note
16.11.2015	4	1.6 Miscellaneous	UL Standard removed
24.03.2016	6		CAN A, CAN B added
25.03.2016	4	1.5 Display	Table updated
01.04.2016	6	Connector Layout	Cable wire color added
10.06.2016	3	1.3 Controller	Added
20.06.2016	5	1.7 Miscellaneous	UL added
01.09.2016	7	3 Mount Dimensions	Added
08.05.2017	8, 9, 10	5 CAN Bus Setup 5.1 CAN Bus Station Number 5.2 CAN Bus Data Transfer Rate 5.3 Number of CAN Bus Participants 5.4 Wiring the CAN Bus 6 CAN Bus Termination	Chapters added
02.08.2017	4	1.5 Environmental Conditions	Operating conditions added