PEPPERL+FUCHS

Technical Manual

TERME 220/230
320/330
TER 220/230
320/330

ATEX 95

Pepperl+Fuchs - EXTEC GmbH Esslingen

PEPPERL+FUCHS

Table of Contents

1 Important information

1.1 General instructions

Copyright © 2005 by Pepperl+Fuchs EXTEC GmbH

All rights reserved

The publisher reserves the right to alter the information and data contained in this manual without prior notice. Unless otherwise indicated, the company names as well as other names and data used in the examples are purely fictitious.

The publisher may have registered patents or pending patent applications for subject matter covered in the manual. This manual does not give you license to these patents.

Limited warranty:

No warranty is provided for the accuracy of the information contained in this manual. As mistakes cannot be entirely avoided despite taking the greatest of care, we would be grateful to receive information about any errors you may discover. The publisher disclaims all legal responsibility or liability for errors as well as for subsequent damages and claims.

Microsoft, MS, MS-DOS, Windows and Windows-NT are registered trademarks of the Microsoft Corporation.

How to contact Pepperl+Fuchs - EXTEC GmbH:

Should you encounter any problems with the **TERMEX / TERM terminals**, please consult the Technical Manual first of all. If you are still unable to solve the problems after studying the above information carefully, you can contact Pepperl+Fuchs - EXTEC GmbH directly as follows:

1) Internet: http://www.extec.de

2) E-mail: support@extec.de

3) Support hotline: Tel. +49 (0)711/31 54 55 12

4) Write to the address below

If you need to contact the EXTEC support hotline, please make sure you have the Technical Manual handy!

Latest information, new products, support, updates, etc.

You can call up the latest information about EXTEC products on the Support page of our web site (Internet address: **http://www.extec.de**) or ask to be put on the mailing list for the **EXTEC NEWSLETTER**, our regular circular which will then be sent to you automatically. Please consult the EXTEC web site for details of how to subscribe.

Publisher:

Pepperl+Fuchs - EXTEC GmbH
Schorndorfer Straße 55
D-73730 Esslingen

1.2 Safety instructions

⇒ These devices are only allowed to be installed and operated by trained and qualified personnel who have received suitable instruction in their use.

⇒ These devices represent state-of-art technology. They are only allowed to be connected to systems that have been approved by Pepperl+Fuchs - EXTEC GmbH.

⇒ Never open the devices yourself. They are only allowed to be opened by authorized Pepperl+Fuchs - EXTEC GmbH personnel.
Pepperl+Fuchs - EXTEC GmbH is not liable for any resulting damages.

⇒ The devices are not allowed to be modified or otherwise altered in any way.
Pepperl+Fuchs - EXTEC GmbH is not liable for any resulting damages.

⇒ Please study the *technical documentation* carefully prior to starting up the devices (available for downloading on our web site: www.extec.de / support).

⇒ The most recent version of the ***technical documentation*** or **technical supplements** is always valid (available for downloading on our web site: www.extec.de / support).

⇒ The operating voltage of the devices must not exceed the limits indicated in the **technical data** section of the *technical documentation*.
In the event of failure to comply, Pepperl+Fuchs - EXTEC GmbH is not liable for any resulting damages.

⇒ The relevant **specifications for hazardous areas** (EN60079, EN 50014 - 50039) and **accident prevention regulations (UVV)** must be observed.

The technical data specified for the hazardous area corresponds to the certified values for the European EEx approval. The user is responsible for ensuring that the devices are suitable for their intended application and for the prevailing ambient conditions.
No warranty can be given by Pepperl+Fuchs - EXTEC GmbH in this connection and no liability can be assumed for resulting damages.

1.3 Symbols used in this manual

Warning:

The specified technical data must be complied with. Failure to do so may result in dangerous situations or damage.

Caution:

Careful installation is necessary: do not replace electrical fuses with fuses from other manufacturers. Failure to comply may result in dangerous situations or damage.

Important:

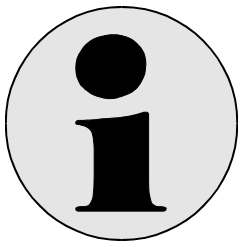
The product may be impaired or damaged as a result of external influences.

Safe area:

Assembly and installation are only permitted in the **safe area**.

Important:
Hazardous area

All safety requirements, the **Ex certificates of conformity** and the **Ex** and **EN** specifications relating to operation of the devices in the **hazardous area must** be complied with.



Additional information:

Information and instructions that should be observed **additionally**.

Pressure load:

Severe mechanical **pressure** or **shock loads** may damage the devices.

Data subject to change without notice.

2 Startup

This description of the startup procedure only contains information that is relevant to the TERMEX terminals. Please refer to the respective manuals for details of how to start up the peripheral devices, the ENT-DC power supply unit and the host computer.

Proceed as follows to start up the equipment:

- Switch off the system or machine.
- Make sure that that the installation area is non-hazardous for the duration of the startup procedure if any non-intrinsically safe voltages need to be wired and/or non-intrinsically safe devices opened.
- This device is designed for use in the hazardous area (Zones 1 and 2).
- The requirements of the applicable explosion protection codes (EN 50014 and following) and the installation requirements specified in EN 50039 must be observed when these devices are installed. In addition, the technical and electrical data stated in the certificate of conformity for this device must be complied with.
- This device is only allowed to be started up by trained personnel. The applicable explosion protection codes must be observed. Please study the current versions of the "TERMEX 22X / 32X Technical Manual" and the "TERMEX 2xx / 3xx Firmware Manual" carefully prior to starting up the device (you can download the latest versions from www.extec.de/support).
- The maximum cable length between the intrinsically safe terminal and the ENT-DC mains buffer stage is 230 m. If peripherals are connected to the terminal, this length is reduced by the length of the cable between the terminal and the peripheral. Other lengths are subject to special approval by EXTEC.

Important

The maximum cable length between the intrinsically safe terminal and the ENT-... mains buffer stage is 230 m.

- The device must be connected to the equipotential bonding conductor (wire cross-section ≥ 4 mm^2, PA connection on the TERMEX terminal).

Warning

The case must be earthed. The earth wire must have a cross-section of at least 4 mm² and be as short as possible.

- The device is not allowed to be modified or otherwise altered in any way. In particular, soldering operations or repairs are not permissible. Such work may only be carried out by the manufacturer or by other authorized persons. If this warning is ignored, the approval for the hazardous area is no longer valid.
- Since these devices are intrinsically safe, the connecting leads may also be connected or disconnected when the unit is live. This is not recommended for the following reasons, however:
    - Order when connecting:
      Connect the GND cables first, then the communication cables and finally the supply voltage.
    - Order when disconnecting:
      Disconnect the supply voltages and the communication cables first, then disconnect the GND cables.

- Connect the terminal and the power supply unit. Please refer to the section entitled "Terminal assignment" for the wiring diagram.

- 

Warning

Only ENT-DC power supply units are allowed to be used.
Only the components listed in section 4 are allowed to be used as peripherals, and only in the specified configurations. All other components require the written approval of EXTEC.
All wiring must conform to the latest state of the art as well as to the wiring diagrams approved by EXTEC.

- If the terminal is installed in a front panel, make sure that the mounting depth is sufficient to guarantee the minimum cable radius (please also refer to the dimension drawings and technical documentation provided by the cable manufacturer).
  Please also make sure that the front panel is not warped, as otherwise proper sealing cannot be guaranteed (IP protection). The 4 or 6 clips for fastening onto the front panel should only be tightened gently to achieve an optimum sealing contact.

- Check that all connectors are correctly assigned prior to starting up the device. An assignment plan showing all the terminal signals together with the wire or connection numbers can be found on the rear of the terminal.

- Only now should you switch on the system or machine.

- The terminal runs an internal self-test when the auxiliary voltage is activated on the mains buffer stage (e.g. ENT-DC). The display goes dark for approximately 1 second (all pixels are energized) and the internal hardware is tested. The startup message, the firmware version number and the EXTEC logo are displayed for this time (approximately 4 seconds). The terminal then switches to the normal operating mode. If the project design data is already loaded, 'screen 1' is automatically displayed in ASCII mode.

- If you are using the device for the first time, you should branch to the internal setup menu with the shortcut <Shift ⇑ > + < F1> during the self-test phase in order to check that the values of all the most important parameters are correct ("TERMEX 2xx / 3xx Firmware Manual").

- To load the project design data, the terminal must be connected to a PC via the mains buffer stage (e.g. ENT-DC). The mains buffer stage and the PC must be connected to the power supply and switched on. You must select 'Protocols: EXTEC' in the terminal setup menu in order to load the project design software, because you are now using a standard ASCII protocol. After the data has been loaded successfully, the terminal performs a reset, displays the startup message and runs a self-test. If you want to use a protocol other than the standard ASCII protocol, select the required protocol under 'Protocols…' in the setup menu.

- The terminal is now ready to use and can be controlled from the connected control computer.

- Check the functions on the control panel.

- Check the interaction of the functions with the complete system or machine step by step.

Warning

The system or machine may malfunction if the TERMEX terminal is not correctly connected and configured.

Warning

The TERMEX terminal is intended solely for installation in another machine. It is not allowed to be started up until the conformity of the final product with the 94/9/EC and 99/92/EC Directives has been established and this product inspected by an authorized expert in accordance with EN 60079 and EN 50014 ff.

Warning Zone 22

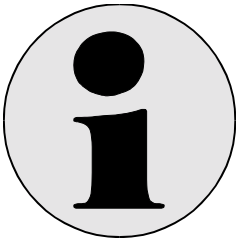
After installation cable glands have to be saved with a suitable adhesive (e. g. Screw stop varnish or Loctite metal adhesive).
So the unintentional opening and occurance of dust is prevented.

3 TERMEX Exi terminal

TERMEX 220 Text terminal
TERMEX 320 Text terminal with large keyboard
TERMEX 230 Graphics terminal
TERMEX 330 Graphics terminal with large keyboard

3.1 Important characteristics

- Intrinsically safe control panel for Zones 1 and 2 (EEx ib IIC T4)
- Classification according to ATEX 95 RL94/9/EG: II 2G EEx ib IIC T4
- combined with mounting case ABG-1 or ABG-3 for Zone 22
- Classification for Zone 22 II 3 D X T 134°C IP65 (Declaration of Conformity)
- Simple to connect directly to many PLC and computer systems
- Typical applications:
  In processes in the chemical, pharmaceutical and petrochemical industries,
  in industrial plant engineering, in weighing systems and in metering and filling stations
- Industry-standard design, suitable for:
  Graphics based control and display functions (TERMEX 220 / 320: text only)
  Simple visualization tasks
  Output of fault messages
  Input of set values
  Display of actual values
  Collection of plant data, also with barcode readers
  Gravimetric filling and metering applications
- Easy-to-read LC display 148 x 74 mm, optional with backlight
  TERMEX 230 / 330: text and graphics can be combined as desired
  TERMEX 220 / 320: 4 x 20 characters, character height 12 mm, plus softkey bar (5 mm)
- 4 standard fonts, additional fonts can be loaded (TERMEX 230 / 330 only)
- Background bitmaps can be loaded (TERMEX 230 / 330 only)
- Graphic elements: pixel, line, block, border, window (TERMEX 230 / 330 only)
- Automatic bar graph display (TERMEX 230 / 330 only)
- High EMI resistance
- Non-volatile storage of project displays (TERMEX 220 / 320: text, TERMEX 230 / 330: text and graphics)
- PC based project design of pictures and texts with TERMEXpro for Windows©
- Project data can also be loaded when the control panel is installed
- Degree of protection: IP 65 (front)
- Several versions for panel and surface mounting
- Additional binary inputs (NAMUR) and outputs (isolated) as well as serial ports for the hazardous area available as options
- All system parameters verified and selected by means of integrated setup and remote setup on the PC
- Only one cable used to connect data and power for all device versions



Note

All terminals are referred to below in this manual simply as 'TERMEX' unless the differences between the individual models are significant.

3.2 Overview of models

Additional Ex devices can be connected to the TERMEX terminals via serial ports. These ports can be provided on the terminal as options.

Important

The ports must be designed to withstand the power requirement of the connected devices. A maximum of 3 supply circuits can be used with the TERMEX terminal.

Connections:

Marking	For interface	Terminal	Manufacturer	Possible ENT-DC voltages
D	Digital I/O			7.0 V / 8.0 V / 8.5 V
S	Scanner		Ex-Dragon D101	7.0 V / 8.0 V (7.0 V for EXDS-40)
WMx				
WMa	GD130x	TBRICK, k-cell	Mettler scale	7.0 V / 8.0 V / 8.5 V
WMb	GD13x	TBRICK, k-cell	Mettler scale	7.0 V / 8.0 V / 8.5 V
WMc		ID5sx	Mettler scale	7.0 V / 8.0 V / 8.5 V
WMd		ID5 / 083	Mettler scale	7.0 V / 8.0 V / 8.5 V
WMe	PM, SM, AM		Mettler laboratory scales	7.0 V / 8.0 V / 8.5 V
WMg		ID5	Mettler scale	
WMh	EXDK-LWL		Mettler Puma / ST3xx	7.0 V / 8.0 V / 8.5 V
WMi	20 mA pp		Mettler Puma / ST3xx	7.0 V / 8.0 V / 8.5 V
WMj	TERMEX = aa		ID5sx	
WMl	PSU	TBRICK pf/pf	Mettler	7,0 V / 8,0 V / 8,5 V
WMm		Point-Ex	Mettler	8,5 V, 240mA ENT-DC-30 Exi port version 7
WA		EXAWUx-5	DMS scale	8.5 V
WE		MVS-1.1	DMS scale	8.0 V / 8.5 V
WSarx				
WSara		F-/ L-/ QS-/ X149-/ I1200S scales	Sartorius	7.0 V / 8.0 V / 8.5 V
WSarb	20 mA pp (ENT-DC)		Sartorius	7.0 V / 8.0 V / 8.5 V
Wsard*	Ex-PW-SAR-10 Interface no longer available!	FC-/ IS scales	Sartorius	7.0 V / 8.0 V / 8.5 V
WBa		ITE	Bizerba scale	7.0 V / 8.0 V / 8.5 V
WBb		ITL	Bizerba scale	7.0 V / 8.0 V / 8.5 V
ZT		Expansion keyboard	TERMEX K36 / KL36	7.0 V / 8.0 V / 8.5 V

Default values are underlined * only as spare equipment available

B1	RS 232	Dragon	For TERM (only for safe area) and Dragon (only for safe area)
WMk	WMk RS 323	Mettler Toledo	RS 232 (only for safe area)

3.3 Technical data

Type of protection TERMEX 22x 23x / 32x 33x	 Intrinsically safe (acc. to EN 50020), EEx ib IIC T4 ATEX 95, RL94/9 EG: II 2G EEx ib IIC T4 DMT 02 ATEX E 239 Dust explosion proof acc. EN50281 Ex II 3 D X T134°C IP65 in case of mounting ABG-1 or ABG-3
Degree of protection acc. to EN 60529/IEC 529	IP 65 (front) IP 20 (case) IP 54 (installed in polyester case ABG-P) IP 65 (installed in stainless steel case ABG-V2A)
Calibration certificate TERMEX 2x0 / 3x0 TERMEX 2x5 / 3x5	 Acc. to DIN EN 45501 No. D09-95.32 Addendum 2 As a module for class III and IIII scales No calibration certificate

Display	LCD, supertwisted nematic, with or without backlight Active display area: 148 mm x 74 mm
TERMEX 22x / 32x	4 lines x 20 characters, character height 12 mm plus 1 line for softkeys, character height 4.5 mm
TERMEX 23x / 33x	240 x 128 pixels, 4 standard fonts, additional fonts can be loaded 12 lines x 40 characters, character height 4.5 mm 8 lines x 26 characters, character height 5.5 mm 4 lines x 20 characters, character height 12 mm 4 lines x 13 characters, character height 12 mm Text and graphics freely designable Background bitmaps can be loaded Pixels, lines, blocks, borders and bar graphs can be designed.

Front plate	Anodized aluminium Display cutout with non-reflecting glass cover Polyester front foil, printed on reverse Chemical resistance: see below

Keyboard	- Short-stroke keys - Number block
TERMEX 22X, 23X	- 5 function keys (dual assignment with Shift key) Either standard layout or customized layout with insertable label strips (ex works)
TERMEX 32X, 33X	-10 function keys (dual assignment with Shift key) Either standard layout or customized layout with insertable label strips (not ex works) - 3 special keys S1 .. S3 - Shift and Alt keys - Cursor block

LEDs (TERMEX 32X, 33X only)	F keys with 10 green LEDs for application-specific programming LED array (6 red LEDs, parallel) to indicate alarms
LEDs TERMEX 22X 23X / 32X 33X	ON LED to indicate the power supply COM LED to indicate a host communication fault ! LED to indicate that messages are pending A..Z LED to indicate that alphabetical input modes are allowed

Configuration	Integrated setup menu for setting all device parameters

Project design data	Downloadable from a PC via a serial port PC port (RS232) connected to mains buffer stage, type ENT-DC-xxx
Port parameters X1 (TERMEX <--> ENT <--> host)	TERMEX <--> ENT: 20 mA current loop, passive/passive ENT <--> host: RS232 / 20 mA current loop, active/passive, settable / optional RS485 1200 - 19,200 baud, settable (setup) Parity: even, odd, mark, space, none (setup) 7 / 8 data bits, settable (setup) 1 / 2 stop bits, settable (setup) Default: 9600 baud, 8 data bits, even parity, 1 stop bit

Firmware	The firmware is stored in a FLASH chip and is updatable. The latest version can be downloaded from the EXTEC web site. The firmware can be loaded onto TERMEX 2xx/3xx terminals using the TERMEX PRO Loader software. Additional information about firmware updates is enclosed.

Functional test	Integrated detection of all hardware components during start/reset and self-test.

Dimensions of TERMEX 22X/23X chassis	Front plate (WxH): Cutout (WxH): Mounting depth:	288 x 144 mm 277 x 137 mm 72 mm incl. terminals, without connector
Weight	Approx. 1.5 kg	
Dimensions of TERMEX 32X/33X chassis	Front plate (WxH): Cutout (WxH): Mounting depth:	288 x 220 mm 276 x 208 mm 72 mm incl. terminals, without connector
Weight	Approx. 1.9 kg	

Ambient conditions Do not expose the display to direct sunlight (UV)  	Operation: Storage: Rel. humidity:	0 °C to +50 °C -20 °C to +70 °C 0% - 75%, without condensation 48 h endurance test

EMC declaration	The manufacturer, Pepperl+Fuchs-EXTEC GmbH, certifies that this product conforms to the relevant EMC directive. Interference emission: EN 55011: 1998 + A1: 1999 Noise immunity: EN 61000-6-2: 1999

Chemical resistance of the front foil

Polyester foil with biaxial alignment, resistant to the following chemicals in accordance with DIN 42 115 Part 2, when exposed for more than 24 hours without any visible change:

Ethanol Cyclohexanol Diaceton alcohol Glycol Isopropanol Glycerin Methanol Triacetin Dowandol DRM/PM	Formaldehyde 37% - 42% Acetaldehyde Aliphatic hydrocarbons Toluene Xylene Thinner (white spirit)	1.1.1. trichloroethane Ethyl acetate Diethyl ether N-butyl acetate Amyl acetate Butyl Cellosolve Ether
Acetone Methyl ethyl ketone Dioxan Cyclohexanol MIBK Isophorone	Formic acid < 50% Acetic acid < 50% Phosphoric acid < 30% Hydrochloric acid < 36% Nitric acid < 10% Trichloroacetic acid < 50% Sulphuric acid < 10%	Chlomatron < 20% Hydrogen peroxide < 25% Potassium soap Detergent Tensides Softener Ferric chloride ($FeCl_3$) Ferric chloride ($FeCl_2$) Dibutyl phtalate Dioctyl phtalate Sodium carbonate
Ammonia < 40% Sodium hydroxide solution < 40% Potassium hydroxide Alkali carbonate Bichromate Potassium prussiate Acetonitrile Sodium bisulphate	Cutting emulsions Diesel oil Varnish Paraffin oil Castor oil Silicone oil Turpentine oil substitute Brake fluid Decon Aviation fuel Benzine Water, brine	

Resistant in accordance with DIN 42 115 Part 2 when exposed to acetic acid for < 1 hour without any visible damage

Not resistant to:

Concentrated mineral acids Concentrated alkaline solutions High-pressure vapour hotter than 100 °C	Benzyl alcohol Methylene chloride

Like all polyester foils, not resistant to long-term exposure to direct sunlight (UV)

Chemical resistance of the front plate seal

Material: Foam rubber (EPDM)
- Good resistance to weather and ozone
- Very good resistance to hot detergent solutions
- Operating temperature: 50 ... +120 °C

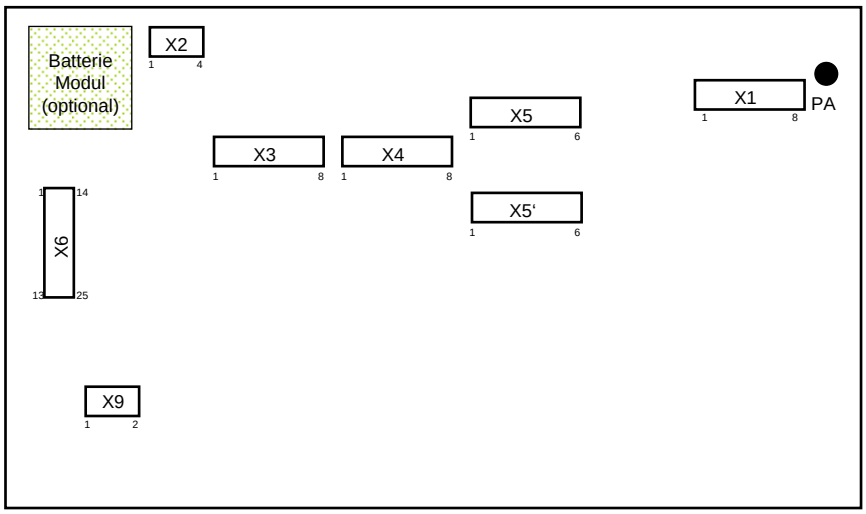
1 = very good; 2 = good; 3 = medium; 4 = poor; 5 = not suitable, n.n. = not known

Mineral oils + greases	3	Ketones	n.n.
Alcohols	n.n.	Chlorinated solvents	n.n.
Benzine	3	Sulphuric acid	1
Water	1	Ozone	1

3.4 Terminal assignment

On the rear of the TERMEX 22X / 32X case with terminal designations

Terminals X1 to X5 and X9 are designed as a terminal block. Terminal X6 is a sub-D socket / plug.



Port X1 Supply and data port (ENT-DC)	
8-pole terminal block 0.5 mm² to 2.5 mm²	X1.1 Tx X1.2 Rx X1.3 Us1 X1.4 GND X1.5 Us2 (only assigned for 2 supply circuits) X1.6 GND (only assigned for 2 supply circuits) X1.7 GND (only assigned for 3 supply circuits) X1.8 Us3 (only assigned for 3 supply circuits)

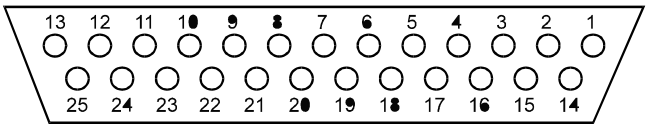
Port X1 with backlight
For the backlight a separate supply circuit is needed. For the backlight. X1.5/X1.6 (supply circuit 2) or X1.7/1.8 (supply circuit 3) can be used. If a barcode reader is applied, must be used the X1.7/X1.8 (supply circuit 3).

Port X2 (optional) 5 mA CL (scanner, expansion keyboard type EXTA)	
4-pole terminal block 0.5 mm² to 2.5 mm²	X2.1 Rx X2.2 Tx X2.3 Us2 X2.4 GND

Port X3 (optional) Interface module (scales, scanners)	
8-pole terminal block 0.5 mm² to 2.5 mm²	Refer to "Interface modules" for assignment

Port X4 (optional) Interface module (scales, scanners)	
8-pole terminal block 0.5 mm² to 2.5 mm²	Refer to "Interface modules" for assignment

Ports X5 & X5' (optional) Module		
2 x 6-pole terminal block 0.5 mm² to 2.5 mm² (see 3.7.2)	X5.1 / X5.2	Output 1
	X5.3 / X5.4	Output 2
	X5.5 / X5.6	Output 3
	X5'.1	Input 1
	X5'.2	Frame 1
	X5'.3	Input 2
	X5'.4	Frame 2
	X5'.5	Input 3
	X5'.6	Frame 3

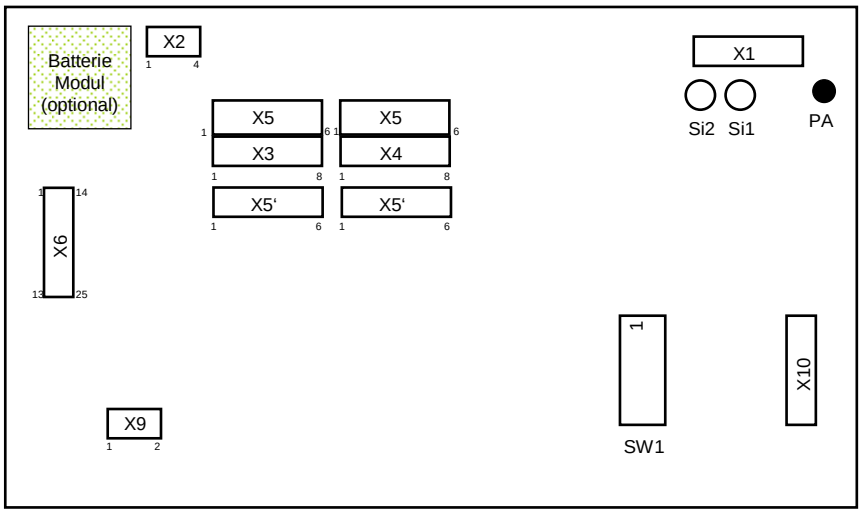
Port X6 (optional) External extensions (TERMEX K36 / KL36)		
Sub-D, 25-pole socket contacts  	X6.1	Vcc
	X6.2	Out 0
	X6.3	Out 1
	X6.4	Out 2
	X6.5	Out 3
	X6.6	Out 4
	X6.7	Out 5
	X6.8	Out 6
	X6.9	Out 7
	X6.10 - .13	n.u.
	X6.14	Gnd
	X6.15	In 0
	X6.16	In 1
	X6.17	In 2
	X6.18	In 3
	X6.19	In 4
	X6.20	In 5
	X6.21	In 6
	X6.22	In 7
	X6.23 - .25	n.u.

Port X9 (optional), external Exi beeper		
2-pole terminal block	X9.1	Beeper control
	X9.2	GND

3.5 Terminal assignment TERM

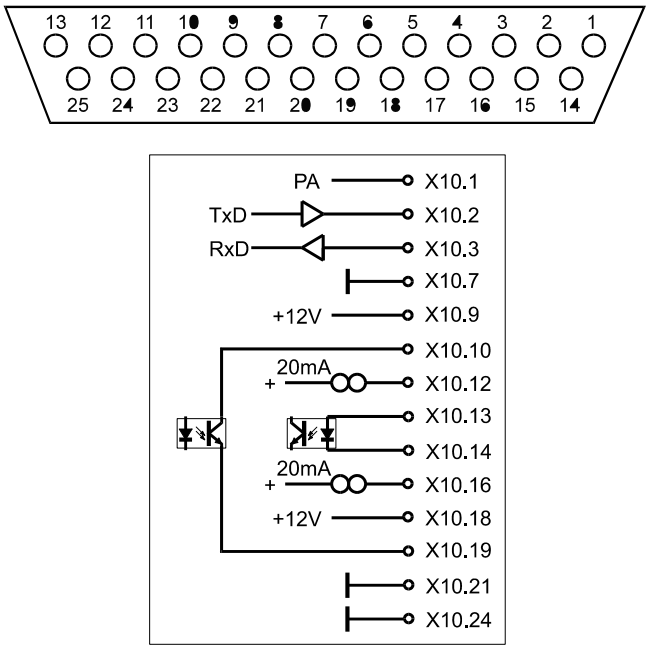
On the rear of the TERMEX 22X / 32X case with terminal designations

Terminals X1 to X5 and X9 are designed as a terminal block. Terminal X6 is a sub-D socket / plug.



Port X1 (non Ex-Version) Supply interface (24V DC)	
2-pin terminal block 0,5 mm² bis 2,5 mm²	X1.1 + 24V DC X1.2 GND

Port X9 (optional) (external Beeper)	
reserved	

Port X10 (only not Ex-Version) Data interface	
D-Sub, 25 pin, receptacle contacts  	X10.1 PA X10.2 TxD RS 232 X10.3 RxD RS 232 X10.4 nu X10.5 nu X10.6 nu X10.7 GND RS 232 X10.8 nu X10.9 +12V X10.10 Tx1– X10.11 nu X10.12 Source 20mA for Tx X10.13 Rx1– X10.14 Rx1+ X10.15 nu X10.16 Source 20mA for Rx X10.17 nu X10.18 +12V X10.19 Tx1+ X10.20 nu X10.21 GND for Tx X10.22 nu X10.23 nu X10.24 GND for Rx X10.25 nu

Assignment examples interface X10

Transmitter passive:
X10.10 Tx1- transmitter input (technical current direction)
X10.19 Tx1+ transmitter output (technical current direction)

Transmitter active:
jumper X10.12 (source 20mA) to X10.10 (Tx1)
X10.21 Tx- (GND for Tx) Transmitter input (technical current direction)
X10.19 Tx1+ Transmitter output (technical current direction)

Receiver passive:
X10.13 Rx1- Receiver input (technical current direction)
X10.14 Rx1+ Receiver output (technical current direction)

Receiver active:
Jumper X10.16 (source 20 mA) to X10.13 (Rx1-)
X10.24 Rx- (GND for Rx) receiver input (technical current direction)
X10.14 Rx1+ receiver output (technical current direction)

3.5.1 Fuses

The fuses Si1 and Si2 are only available in the non ex version of the terminal.

Si1	1A T (4x20mm)	für 24V DC supply voltage
Si2	1A T (4x20mm)	reserve

3.5.2 DIP Switch

The DIP Switch is only available in the not ex version of the terminal.

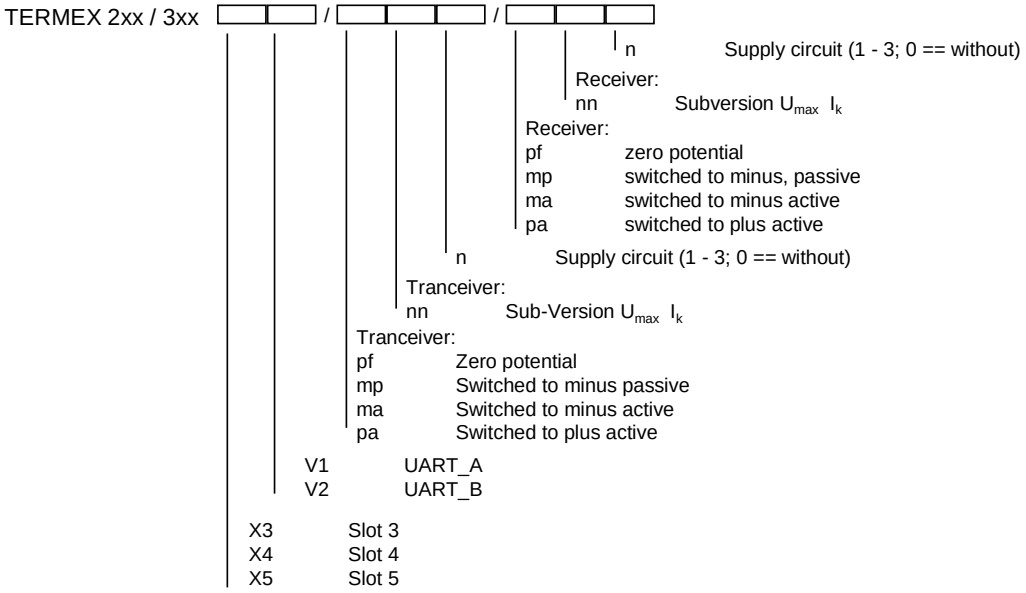
	Kommunikation RS232	Kommunikation 20mA CL
SW1.1	ON	OFF
SW1.2	OFF	ON
SW1.3	nu	nu
SW1.4	nu	nu
SW1.5	ON	OFF
SW1.6	OFF	ON
SW1.7	nu	nu
SW1.8	nu	nu

The terminal assignment of further interfaces please take from chapter 3.4

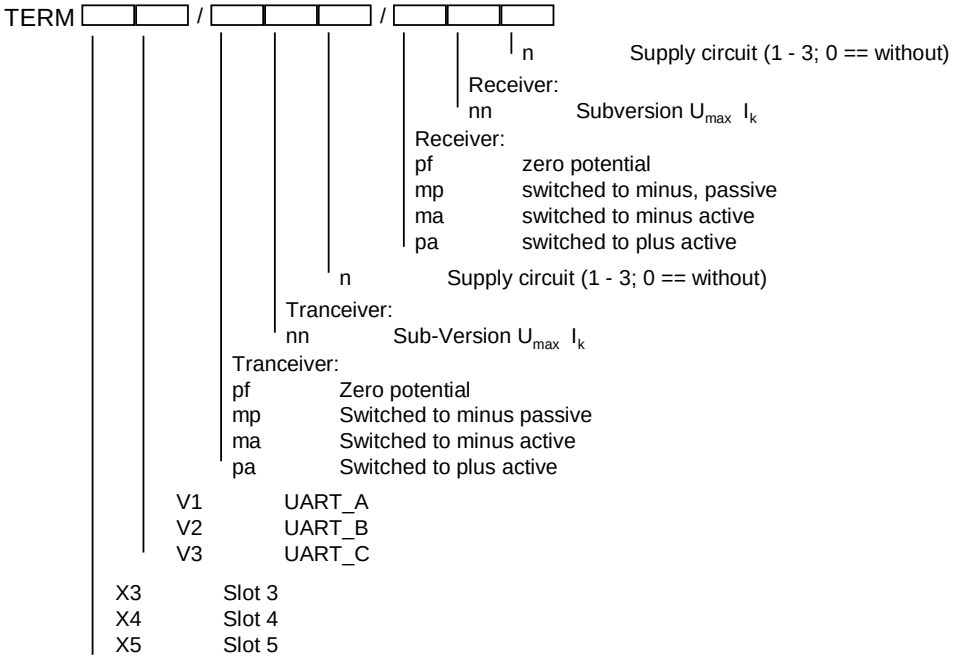
3.6 Interface modules

Interface modules can be integrated into the TERMEX terminal. These modules are installed in the terminal in the factory. Interface modules cannot be exchanged later because they are entered on the rating plate, which is an integral part of the approval for use in hazardous areas.

3.6.1 Type code for interface modules (UART)



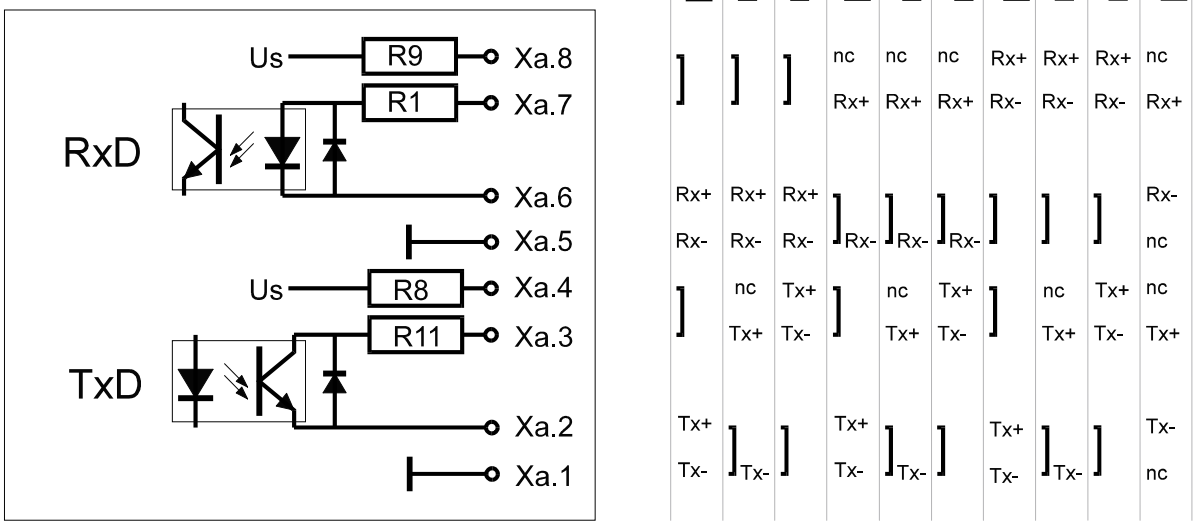
A detailed description can be found in ‘Rating plate’.



3.6.2 Interface module type UART_A:

Warning

The specified jumpers are part of the terminal and are set in the factory. If jumpers are removed or modified, the terminal approval is no longer valid.

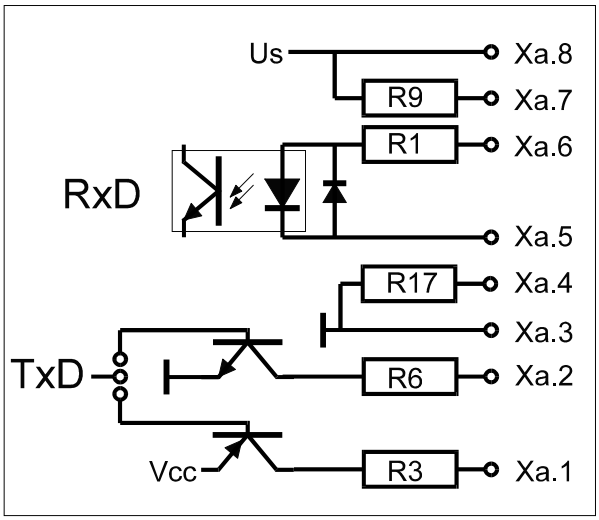


Tx /Rx	pa.. /pa..	mp../pa..	ma../pa..	pa.. /mp..	mp../mp..	ma../mp..	pa.. /ma..	mp../ma..	ma../ma..	pf.. /pf..
	]	]	]	nc Rx+	nc Rx+	nc Rx+	Rx+ Rx-	Rx+ Rx-	Rx+ Rx-	nc Rx+
	Rx+ Rx-	Rx+ Rx-	Rx+ Rx-	]Rx-	]Rx-	]Rx-	]	]	]	Rx- nc
	]	nc Tx+	Tx+ Tx-	]	nc Tx+	Tx+ Tx-	]	nc Tx+	Tx+ Tx-	nc Tx+
	Tx+ Tx-	]Tx-	]	Tx+ Tx-	]Tx-	]	Tx+ Tx-	]Tx-	]	Tx- nc

3.6.3 Interface module Type UART_B:

Warning

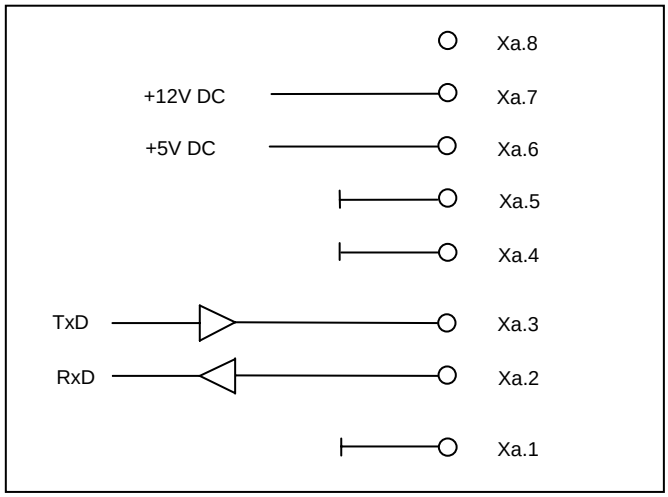
The specified jumpers are part of the terminal and are set in the factory. If jumpers are removed or modified, the terminal approval is no longer valid.



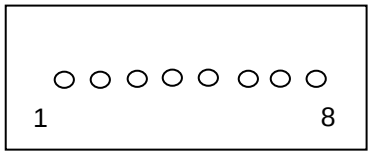
Tx /Rx	pa.. /pa..	ma../pa..	pa.. /mp..	ma../mp..	pa.. /ma..	ma../ma..
		Tx+		Tx+		Tx+
	]	]	nc	nc	Rx+	Rx+
			Rx+	Rx+	Rx-	Rx-
	Rx+	Rx+	]	]	]	]
	Rx-	Rx-	Rx-	Rx-		
	Tx-		Tx-		Tx-	
	nc	Tx-	nc	Tx-	nc	Tx-
	Tx+	nc	Tx+	nc	Tx+	nc

3.6.4 Interface module Type UART_C: (only for safe area version TERM)

Assembly and installation only in **safe area!**
UART_C is not intrinsically safe.

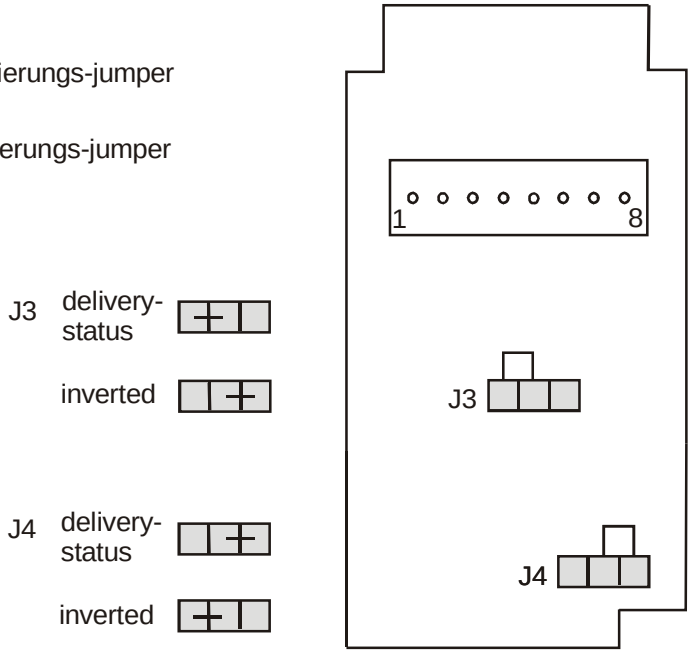


PIN	
1	GND
2	RxD (zum TERM)
3	TxD (vom TERM)
4	GND
5	GND
6	+5V
7	+12V
8	n.c.



J3 Rx Invertierungs-jumper

J4 Tx Invertierungs-jumper



3.6.5 Sub versions of the interface modules

Interface type **pa** (sender / receiver positive-switching and active) or interface type **ma** (sender / receiver negative-switching and active):

Subversion	Internal power source			R9 / R8	R1 / R11
	U_{max}	**I_{Kmax} ≈**	**P_{max} ≈**		
03	**9.0 V**	**62 mA**	**137 mW**	150 Ω	0 Ω
04	**9.0 V**	**42 mA**	**94 mW**	220 Ω	0 Ω
05	**9.0 V**	**34 mA**	**76 mW**	270 Ω	0 Ω
06	**9.0 V**	**26 mA**	**57 mW**	360 Ω	0 Ω
07	**9.0 V**	**20 mA**	**44 mW**	470 Ω	0 Ω
08	**9.0 V**	**14 mA**	**32 mW**	680 Ω	0 Ω
09	**9.0 V**	**10 mA**	**21 mW**	1 kΩ	0 Ω
10	**9.0 V**	**7 mA**	**14 mW**	1.5 kΩ	0 Ω
11	**9.0 V**	**5 mA**	**10 mW**	2.2 kΩ	0 Ω

Interface type **mp** (sender / receiver negative-switching and passive) or interface type **pf** (sender / receiver passive and isolated):

Subversion	External power source			R9 / R8	R1 / R11
	U_{max}	**I_{Kmax}**	**P_{max}**		
01	**20 V**	**350 mA**	**1.2 W**	nc	0 Ω
02	**20 V**	**350 mA**	**1.2 W**	nc	22 Ω
03	**20 V**	**350 mA**	**1.2 W**	nc	150 Ω
04	**20 V**	**350 mA**	**1.2 W**	nc	220 Ω
05	**20 V**	**350 mA**	**1.2 W**	nc	270 Ω
06	**20 V**	**350 mA**	**1.2 W**	nc	360 Ω
07	**20 V**	**350 mA**	**1.2 W**	nc	470 Ω
08	**20 V**	**350 mA**	**1.2 W**	nc	680 Ω
09	**20 V**	**350 mA**	**1.2 W**	nc	1 kΩ
10	**20 V**	**350 mA**	**1.2 W**	nc	1.5 kΩ
11	**20 V**	**350 mA**	**1.2 W**	nc	2.2 kΩ

3.7 Modules

Interface modules can be integrated into the TERMEX terminal. These modules are installed in the terminal in the factory. Interface modules cannot be exchanged later.

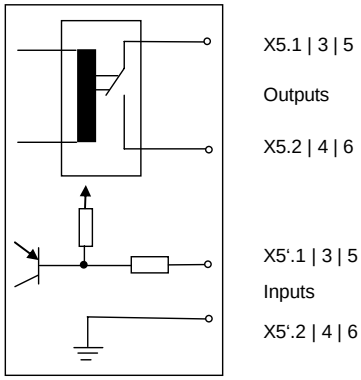
3.7.1 Type code for modules

TERMEX 22X ..... – ☐ / ☐

D1 — DIGIO33 module

S — Supply circuit 1, 2 or 3

3.7.2 DIGIO33 module



3.7.3 Input and output parameters

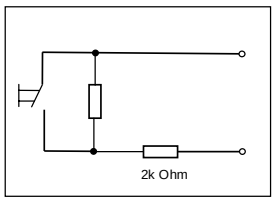
Maximum switching capacity of the output relays x5.1/2 x5.3/4 x5.5/6

Maximum switching voltage	U_{max}	60 V
Maximum switching current	I_{max}	500 mA
Maximum switching power	P_{max}	5 W

Input switch

The input circuit is specified according to NAMUR (IEC 60947-5-6). It is monitored for interruptions and short-circuits.

Required switch:



Maximum values of the input circuit

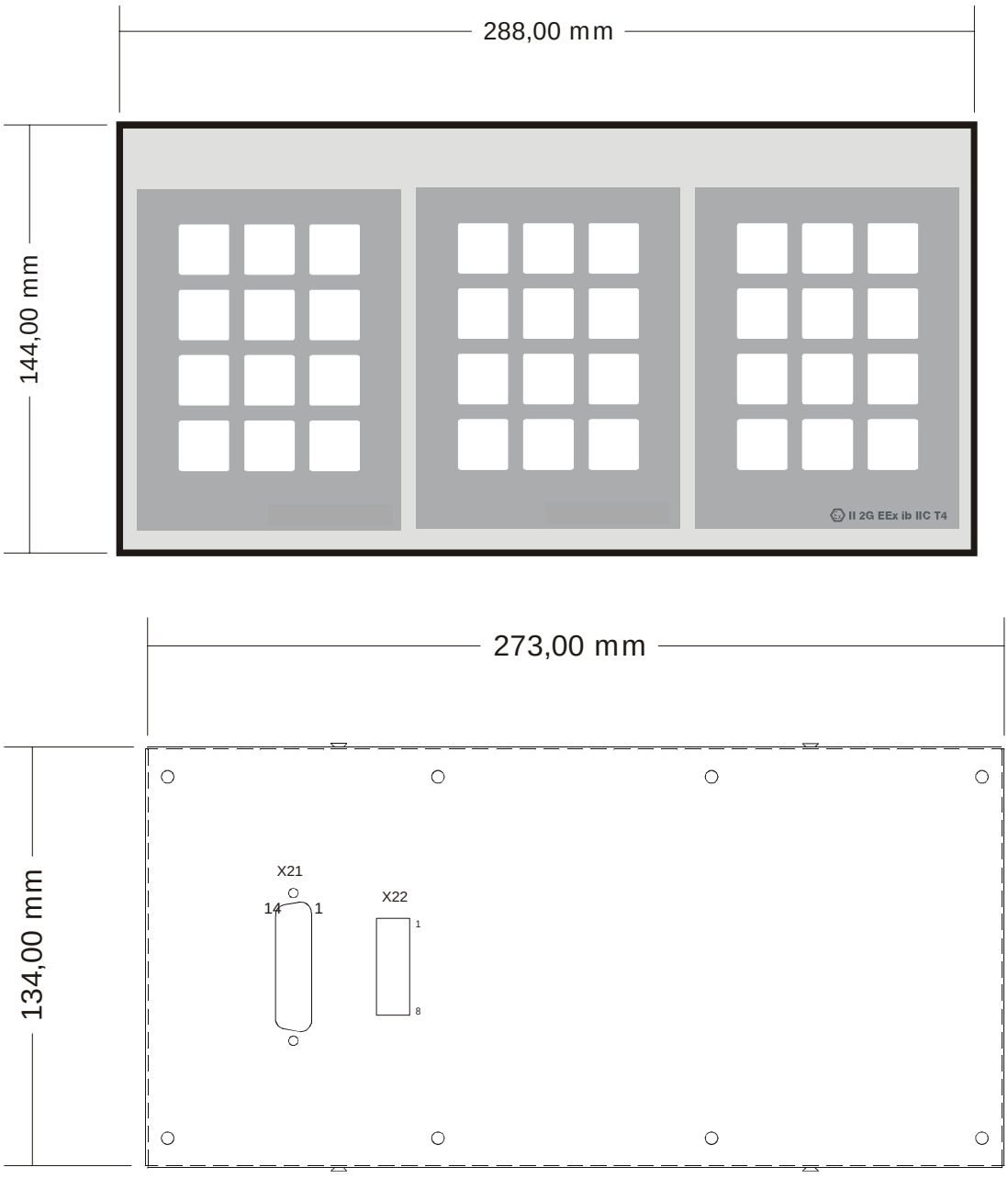
Maximum switching voltage	U_{max}	9 V
Maximum switching current	Ik_{max}	13 mA
Maximum switching power	Po_{max}	30 mW

3.8 TERMEX K36 / KL36 Extended Keyboards

An extended keyboard can be connected to the terminals in the TERMEX 22x / 23x, 32x / 33x series to facilitate extended operation.
The TERMEX 22x and 23x can be equipped either with a TERMEX K36 keyboard or with a TERMEX KL36 with LEDs. The TERMEX 32x and 33x can only be used with the TERMEX K36 keyboard.

The TERMEX 22X / 32X (port X6) and the TERMEX K36 / KL36 (port X21) are connected together using the enclosed flat cable.

Front view

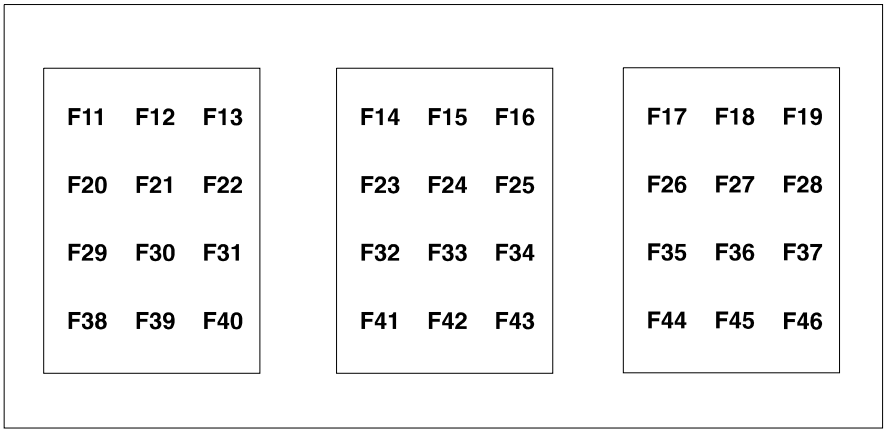


3.9 Key Assignment for Extended Keyboard

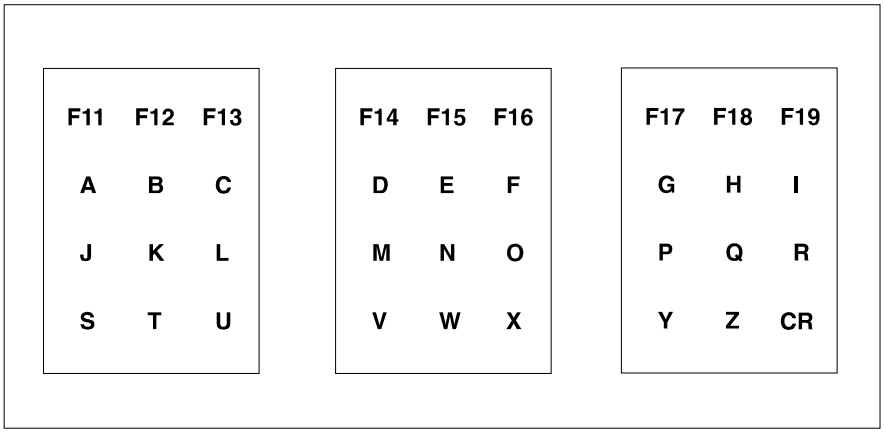
The extended keyboard has 36 keys and up to 64 LEDs. On the keyboard comes the standard module strips specified down. In addition, an individual allocation of the module strips is possible for each time.
The terminal must be factory preset to be used with an extended keyboard.

Standard module strips:

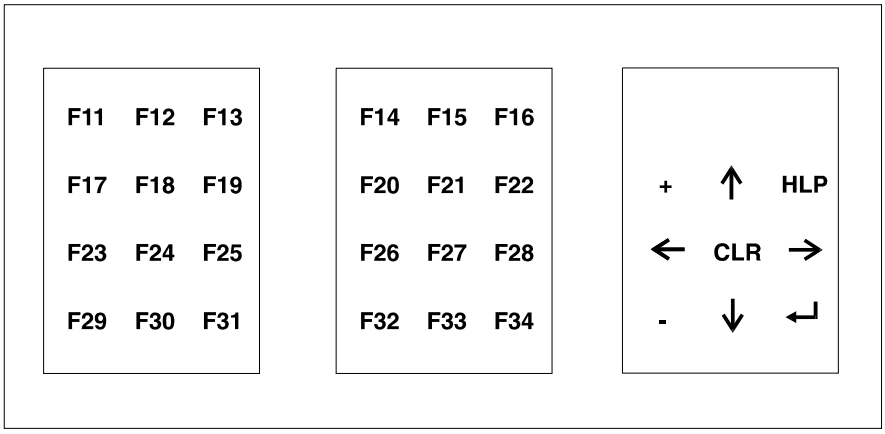
F11-F46

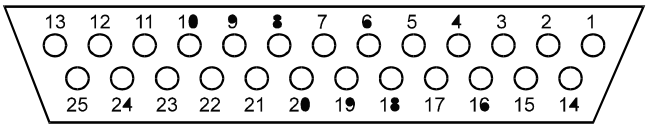


F11-F19, A-Z



CU-Extension

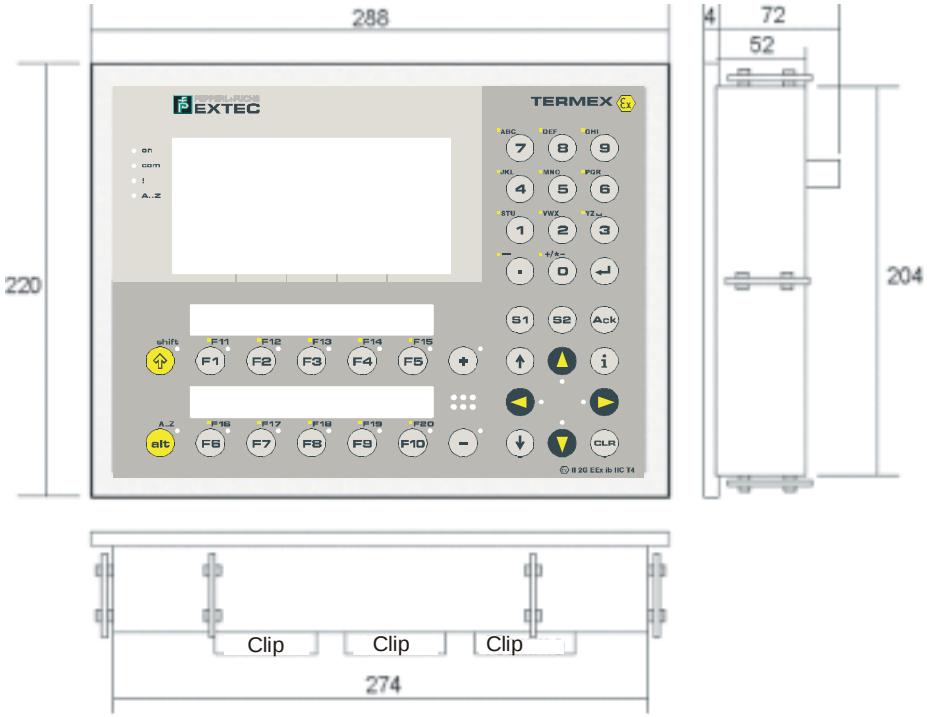


Port X21 (TERMEX K36 / KL36)	
Sub-D, 25-pole plug contacts  	X21.1 Vcc X21.2 Out 0 X21.3 Out 1 X21.4 Out 2 X21.5 Out 3 X21.6 Out 4 X21.7 Out 5 X21.8 Out 6 X21.9 Out 7 X21.10 - .13 n.u. X21.14 Gnd X21.15 In 0 X21.16 In 1 X21.17 In 2 X21.18 In 3 X21.19 In 4 X21.20 In 5 X21.21 In 6 X21.22 In 7 X21.23 - .25 n.u.
Port X22 (TERMEX K36 / KL36) External buttons	X22.1 Out 1 X22.2 In 1 X22.3 Out 2 X22.4 In 2 X22.5 Out 3 X22.6 In 3 X22.7 Out 4 X22.8 In 4
Weight:	1.2 kg

3.10 Case

3.10.1 TERMEX 32X / 33X chassis (panel-mounting case)

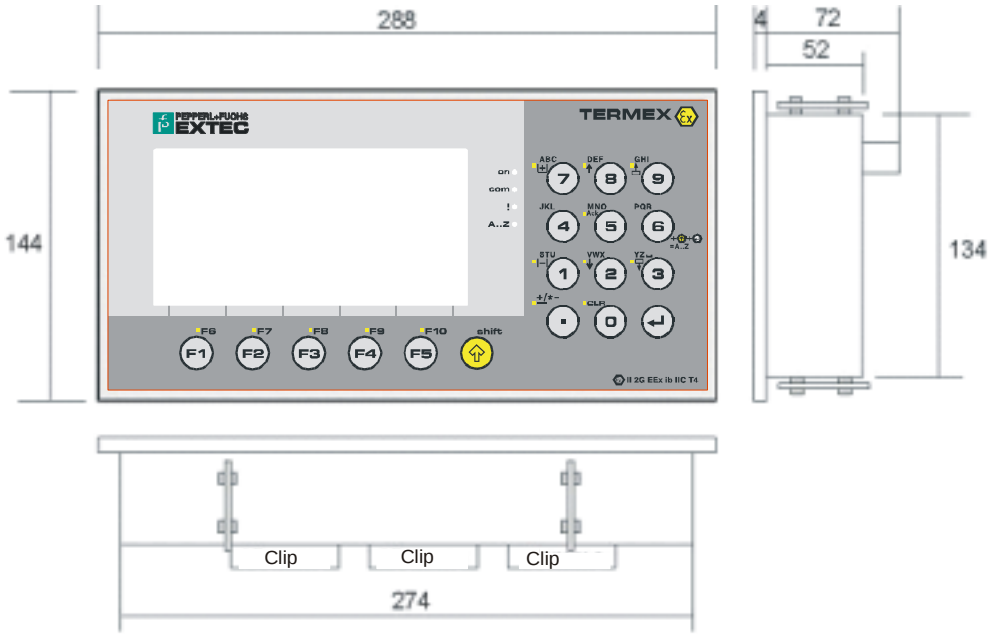
All dimensions in mm
Mounting cutout: 278 x 208



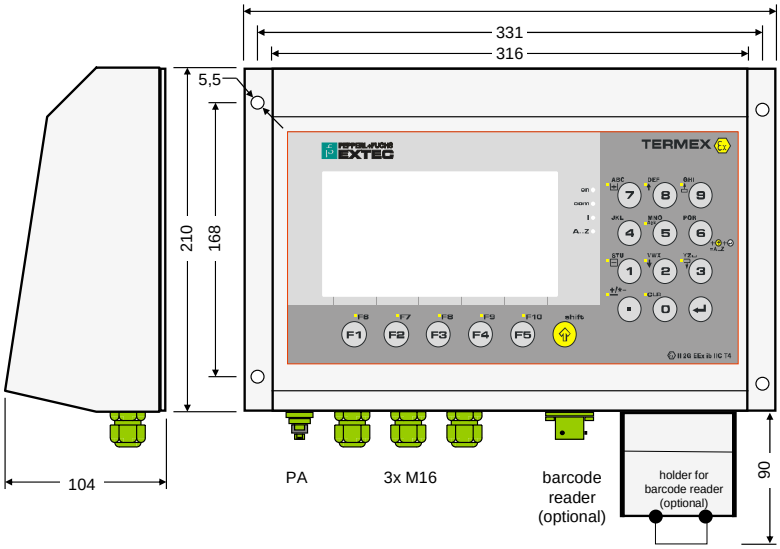
Fastened with 6 clamping mounting plates (included in the scope of supply)

3.10.2 TERMEX 22X / 23X chassis (panel-mounting case)

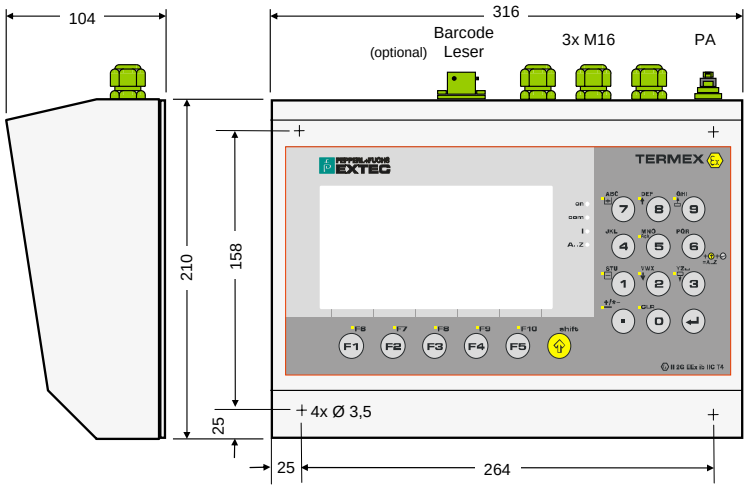
All dimensions in mm
Mounting cutout: 277 x 137
Fastened with 4 clamping mounting plates (included in the scope of supply)



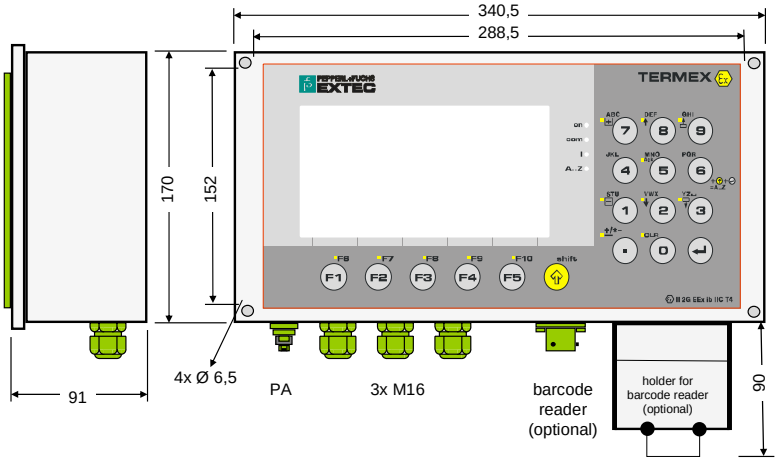
3.10.3 Wall-mounting case V2A (ABG-V2A-W) for TERMEX 2xx



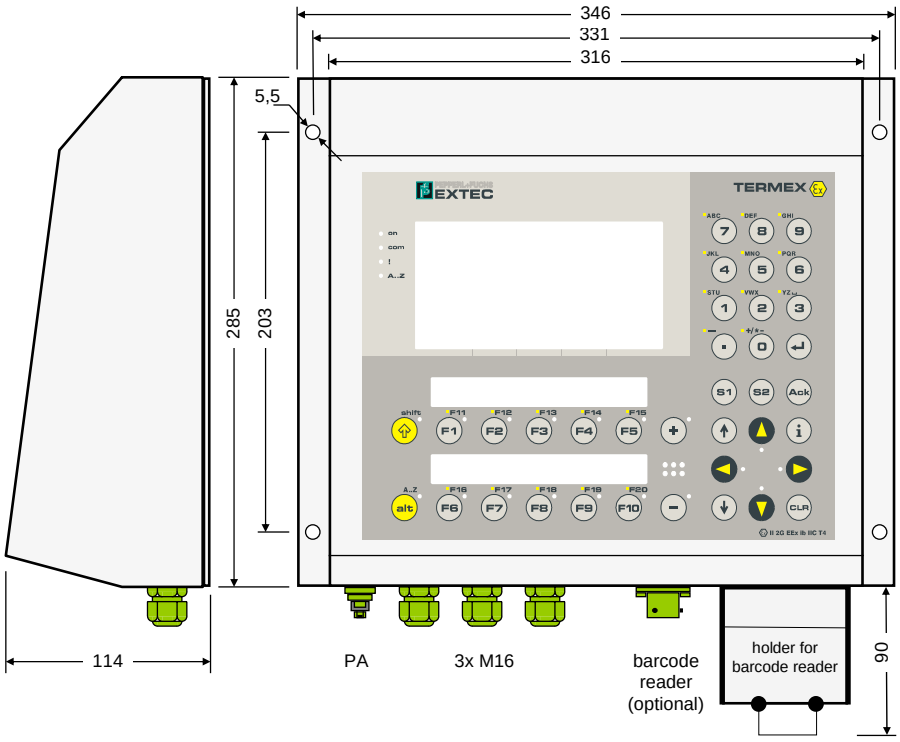
3.10.4 Desk-type case V2A (ABG-V2A-T) for TERMEX 2xx



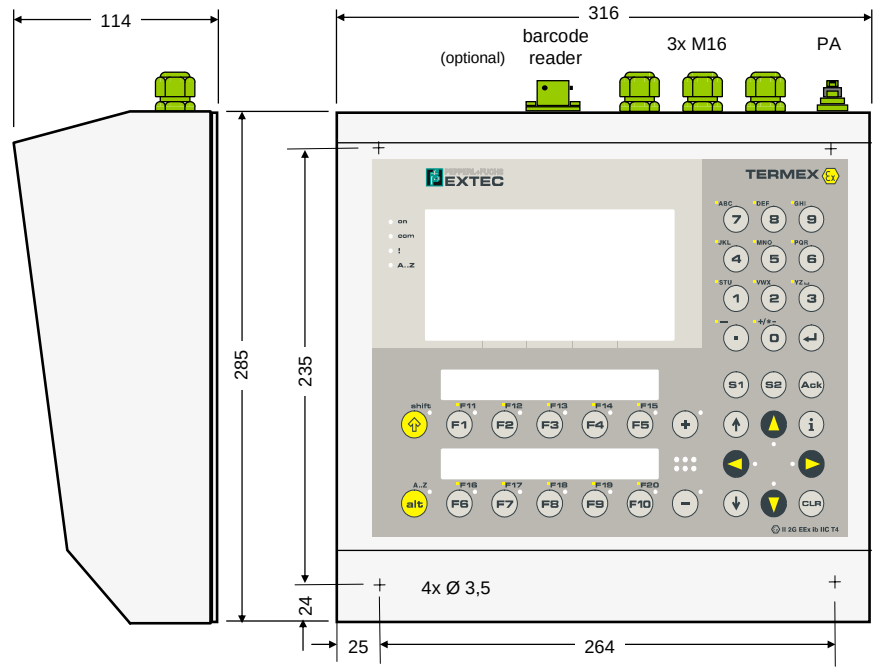
3.10.5 Polyester wall-mounting case (ABG-P-W) for TERMEX 2xx



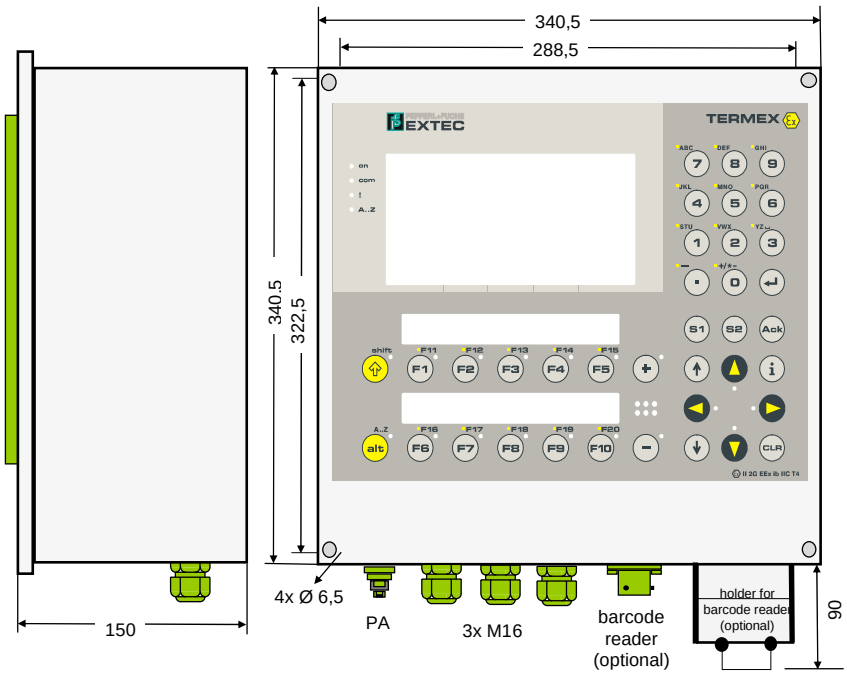
3.10.6 Wall-mounting case V2A (ABG-V2A-W) for TERMEX 3xx



3.10.7 Desk-type case (ABG-V2A-T) for TERMEX 3xx

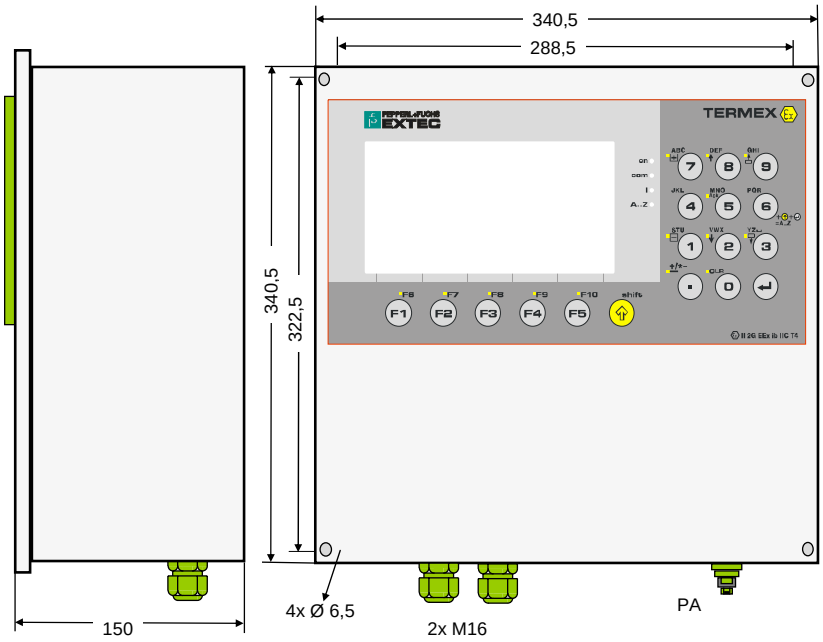


3.10.8 Polyester wall-mounting case (ABG-P-W) for TERMEX 3xx



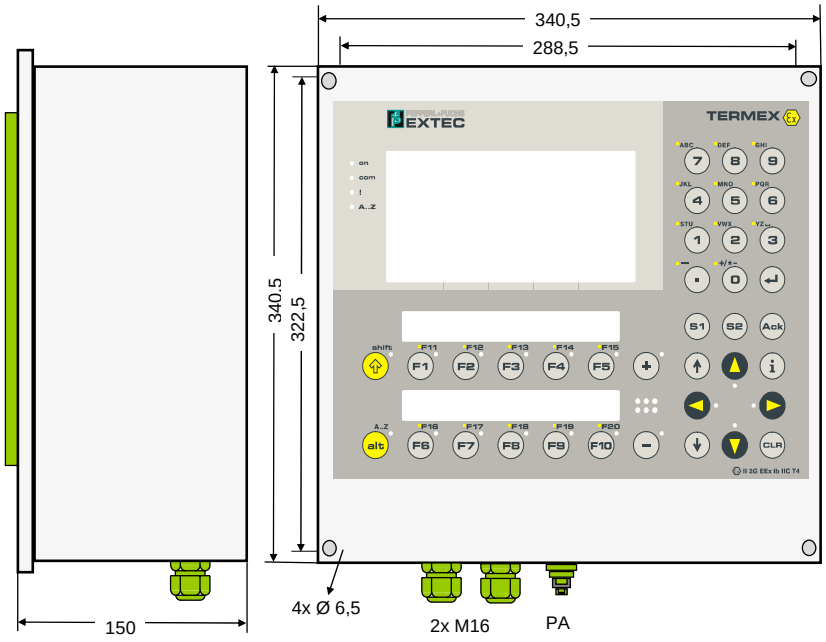
3.10.9 Polyester wall-mounting case with heating (ABG- P-H) for TERMEX 2xx

This case is only for TERMEX 22X / 23X with heating.



3.10.9.1 Polyester wall-mounting case with heating (ABG-P-H) for TERMEX 3xx

(Application with heating)



3.11 Special equipment with heating

A heating can be built into the following case:
ABG-P-H (for TERMEX 220, TERMEX 230, TERMEX 320 and TERMEX 330)

Technical Data EX MINITHERM DBA T4 ATEX

Ignition protection class:	II 2 GD EEx d II C T4
Temperature Class:	T4
EC Type-examination certificate:	PTB-Nr. 02 ATEX 1116 X
Nominal voltage:	110 bis 265 V
Nominal power:	70W
Ambient termperature range:	-50 bis +180°C
Protection degree:	IP 68, NEMA 4X
Material:	Seewater-proof aluminium, black anodized

*** The temperatures lower than -20°C the following is to be considered:**

The display must be warmed up in warmer environment by at least -20°C, for 1,5 hours.Only then the display may be switched on.
Power supply should be feeded in this case continuously.

3.12 Configuration using the internal setup menu

The TERMEX 22X / 23X and TERMEX 32X / 33X terminals feature an integrated setup menu (configuration program). All the most important terminal parameters can be verified and selected here. The parameters are set to default values when the equipment is delivered. Please refer to the 'TERMEX 2xx / 3xx Firmware Manual' for a more detailed description.

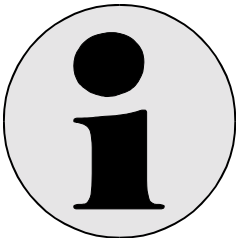
Warning

The system or machine may malfunction if the TERMEX 22X/ 23X or TERMEX 32X / 33X terminal is not correctly connected and configured or if an existing configuration is changed.

The setup menu can be accessed in two steps by using keyboard shortcuts and entering a password (optional).

- First, press the shortcut <SHIFT⇧>+<ENTER ↵>+<9>. This action triggers a reset on the control panel and interrupts communication with the host computer connected to X1. The startup message with the software version number and the hardware configuration is displayed for approximately 4 seconds and the system runs an internal self-test on all hardware components belonging to the control panel.
- Press the shortcut <SHIFT⇧>+<F1> while the startup message is displayed (approximately 4 seconds). This takes you to the internal setup menu. If a password was specified in a previous configuration, the system will ask for this four-digit number before it opens the setup menu.

You are now in the main setup menu. You can check, and if necessary correct, the various settings on the control panel using the function keys (softkeys) that appear on the display:



Note

Changes made in the setup menu take effect as soon as the menu is exited.
When you exit the setup menu, all changes are saved.

Warning

If SETUP attitudes are stored, supply voltage may be interrupted in no case, otherwise it can come to durable malfunctions.

1. Serial Ports...
   You can verify all the parameters of the 4 serial ports here and change them if necessary: Check the baud rate, the parity, the number of data bits, the number of stop bits and the hardware configuration in the "USE" line (e.g. 'Scanner' for the model with a barcode reader connection or 'n.u.' if the serial port is not used in your configuration). The entries in USE cannot be changed.

2. Protocols...
   You can display and select the protocol that is used on the interface to the host computer (X1) here.
   The following protocols are currently available:

   - EXTEC
   - Siemens S5 / AS511 (S5 progr.) The communication block in the PLC (DB) can be selected.
   - 3964R / RK512 The communication block in the PLC (DB) can be selected.
   - Modbus RTU (slave) The slave address can be set.
   - Modbus RTU (master) The slave address can be set.
   - Allen-Bradley DF1 families The SLC 500, PLC 5, CompactLogix and ControlLogix

     can be selected
     The communication block (file) in the PLC can be selected.
   - ET-1 emulation Emulation of the ET-1 terminal
   - BAZ-03/1 emulation Emulation of the BAZ-03/1 terminal
     (ASCII version, F1-F5, Shift, V600146)

3. General Settings...
   You can set general control panel functions here (e.g. key repeat on/off, date and time, message management).
   In addition the brightness of the backlight can be placed here in 16 levels.
   This basic adjustment is then durably saved. In addition a temporary adjustment can be made with the combination of keys <Shift> <Enter> 3 . (outside of the setup).

4. You can parameterize and configure the intelligent peripherals connected to serial ports X3, X4 and X5 here (e.g. Mettler-Toledo, Bizerba or Sartorius scales, barcode readers, etc.).

5. Status
   You can display terminal status information here (firmware version, operating hours, file name of the loaded project design software including the date and time compiled, resources (memory map), number of variables, number of message texts, etc.).

6. Test
   You can choose between 9 different test programs here:
   Keyboard test, interface test (loopback), interface monitors, I/O test

7. EPCA / OS
   You can enter EPCA programming system settings here. Status information is displayed. EPCA can be activated or deactivated.

8. Quit Setup and Save
   This closes the setup menu. The terminal asks whether you want to save your changes and then returns to the normal operating mode (port X1 to the host computer is activated again). 'SCREEN 1' is automatically displayed in ASCII mode if it exists in the internal project memory (refer to the "TERMEX 2xx / 3xx Software Manual").

3.13 TERMEXpro project design software

Application-specific pictures and text can be created on a Windows PC. TERMEXpro is a graphics-oriented programming environment with the characteristics of a drawing program (WYSIWYG) and mouse control. The project design data generated with this program is transferred from the PC (COM1 or COM2) via the mains buffer stage ENT-DCxx to serial port X1 on the terminal, where it is stored in non-volatile memory. It can also be transferred when the system is already installed. Please refer to the latest version of the "TERMEXpro Technical Manual" for further details (this manual can be downloaded from the EXTEC web site: www.extec.de/support):

3.14 Computer link (PC, PLC, PCS, etc.)

The TERMEX 22x/23x and TERMEX 32x/33x control panels have various operating modes for the different computer links used in process control and automation engineering.

3.14.1 ASCII protocol

A pure ASCII protocol can be used for links to PCs, workstations and simple serial ports (internal setup menu, Protocol: EXTEC). The control panel can be controlled by means of command sequences (preceded by ESC) and ASCII characters (or character strings). Keystrokes and peripheral equipment data are transferred to the computer as ASCII characters. Suitable for point-to-point connections.

3.14.2 PLC interfaces

The protocols of all major PLC manufacturers are supported to allow the terminals to be linked to a programmable controller. The control panel is the PLC master. It automatically writes the required data into the PLC and reads it from the PLC. Communication with the PLC takes place using an intelligent protocol specified by the PLC manufacturer. Data is exchanged via a selectable data block in the PLC. The following protocols are currently implemented.

AS511 (Siemens S5 programming interface)

Control panels can be connected directly to the programmer interface of the Siemens S5 90U, 95U, 100U, 115U, 135U and 155U families.

3964R protocol with RK512 procedure

This protocol is offered by several manufacturers. In most cases, either special modules/drivers are required in the PLC or a second port is used in the CPU of the PLC (e.g. Siemens S5: CP524/CP525/CP544, CPU 945, CPU 928B, CPU 948, etc.).

Allen Bradley: DF1 protocol (DH485, DH+)

The DF1 protocol can be used for point-to-point connections via the RS232 interface of the CPU (programming interface) for all programmable controllers in the Allen-Bradley SLC 500 and PLC 5 families. The DH485 and DH+ data highway protocols of the Allen-Bradley SLC, PLC, ControlLogix and CompactLogix families can also be connected with the above protocol and an additional Allen-Bradley bus coupling unit.

3.14.3 Modbus/RTU (slave)

Many manufacturers of programmable controllers and process control systems support the Modbus/RTU protocol for point-to-point connections or bus coupling (e.g. ABB, AEG, Alfa Laval, Allen-Bradley, Eckardt, Foxboro, Hartmann&Braun, HIMA, Honeywell, Modicon, Yokogawa, etc.).

In the slave variant, the TERMEX 22x/23x and TERMEX 32x/33x control panels are passive, in other words they act as the bus slave. The slave address can be set between 1 and 32.
The following Modbus functions are supported:

1	Read coils
3	Read output register
4	Read input register
6	Load register
8	Loopback test
15	Force multiple coils
16	Load multiple registers

3.14.4 Modbus/RTU (master)

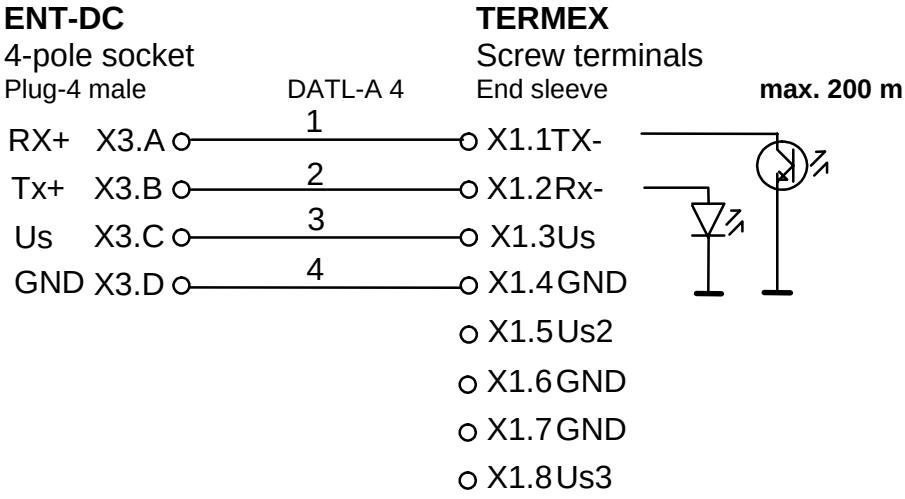
The terminal exchanges the data block data with a connected slave. Function 3 is used for reading and function 16 for writing.

The terminal controls all communication with the slave, in other words it is active.
Data is exchanged in the directions specified in the description of the communication data block contained in the Firmware Manual. The terminal uses Modbus function 16 to send data to the slave (PLC) and function 3 to read data.
The maximum length of the variable area that can be exchanged in a screen is 125 DW (also a Modbus condition).
The slave data must be organized so that the read and write areas are mapped onto one another, in other words it is not allowed to be in different data areas. This is particularly important when (set) variable data is exchanged, because otherwise your set value inputs will not be accepted.

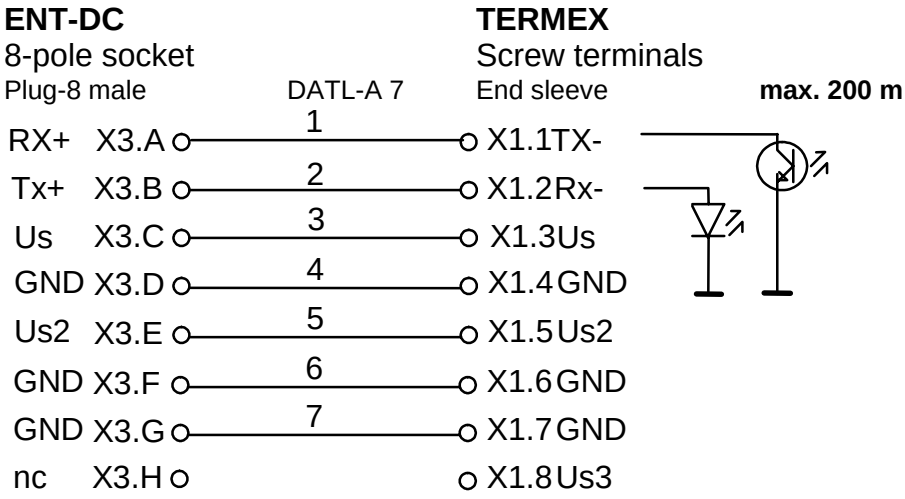
You can set the slave address in the setup menu, in other words the address of the remote end with which the terminal is required to communicate as master.
A communication timeout can be specified here as an option. If a message from the master is not answered with a request from the slave before this time expires, the terminal triggers an error and the COM LED lights up. The settable address offset allows matching to the memory area of the controller.

4 Connecting cables

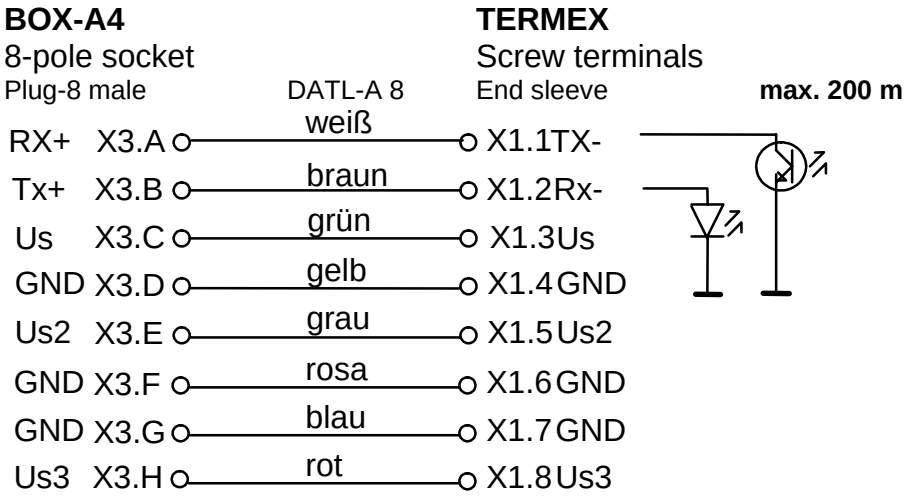
4.1 ENT-DC - TERMEX 22X / 23X / 32X / 33X 1 supply circuit



4.2 ENT-DC - TERMEX 22X / 23X / 32X / 33X 2 supply circuits

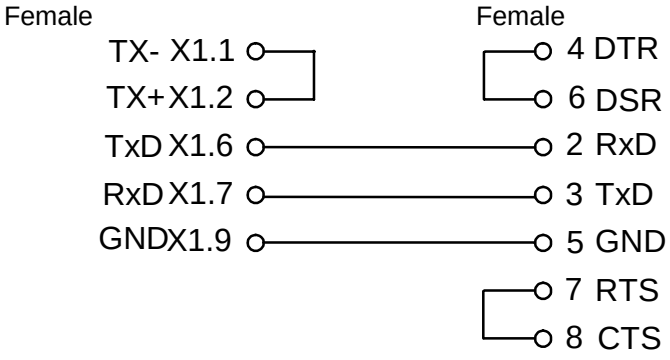


4.3 ENT-DC - TERMEX 22X / 23X / 32X / 33X 3 supply circuits



4.4 S-ENT/PC-9, S-ENT-AB SLC 500

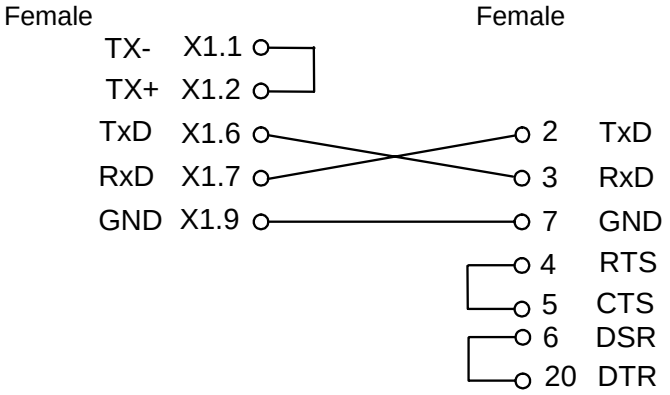
ENT **sub-D 9-pole** -- PC, A-B SLC 500, MPI interface, (RS232) **sub-**D 9-pole



Note: The Tx jumpers for the 20 mA interface in the ENT-DC-1 must be set to "active". The Rx jumper setting is not relevant (see ENT-DC Technical Manual).

4.5 S-ENT/PC-25, S-ENT-AB PLC 5

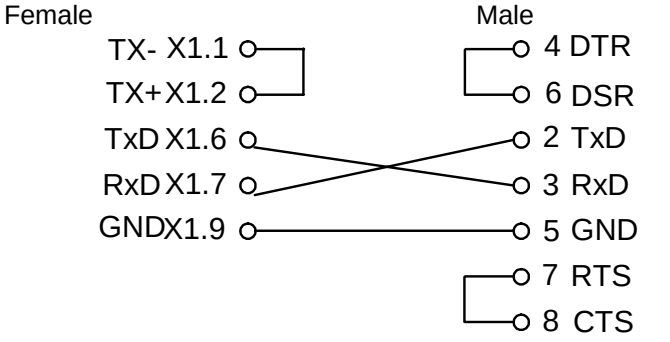
ENT, sub-D 9-pole -- **PC, A-B PCS 5** (RS232) sub-D 25-pole



Note: The Tx jumpers for the 20 mA interface in the ENT-DC-1 must be set to "active". The Rx jumper setting is not relevant (see ENT-DC Technical Manual).

4.6 S-ENT/SPI3

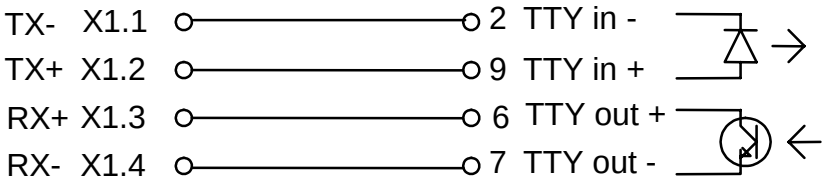
ENT **sub-D 9-pole** -- SK-PROFIBUS-DP-SPI3 **sub-D 9-pole**



Note: The Tx jumpers for the 20 mA interface in the ENT-DC-1 must be set to "active". The Rx jumper setting is not relevant (see ENT-DC Technical Manual).

4.7 S-ENT/PGSSaa (Siemens S5 programming interface)

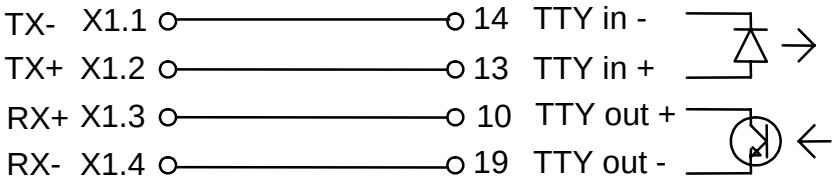
ENT, sub-D 9-pole -- **PG-SS**, sub-D 15-pole
Female Male



Note: The jumpers for the 20 mA interface in the ENT-DC must be set to "active, active" (see ENT-DC Technical Manual).

4.8 S-ENT/CP524/525/544 (Siemens S5)

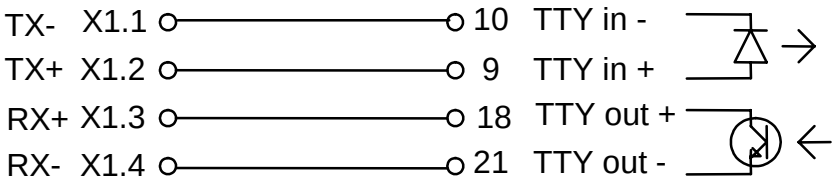
ENT, sub-D 9-pole -- **CP524/525/544**, sub-D 25-pole
Female Male



Note: The jumpers for the 20 mA interface in the ENT-DC must be set to "active, active" (see ENT-DC Technical Manual).

4.9 S-ENT/CP521 (Siemens S5)

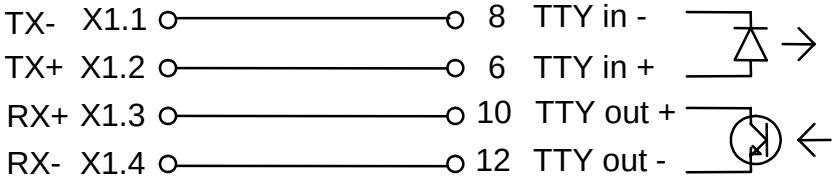
ENT, sub-D 9-pole -- **CP521**, sub-D 25-pole
Female Male



Note: The jumpers for the 20 mA interface in the ENT-DC must be set to "active, active" (see ENT-DC Technical Manual).

4.10 S-ENT/CP523 (Siemens S5)

ENT, sub-D 9-pole -- **CP523**, sub-D 25-pole
Female Male



Note: The jumpers for the 20 mA interface in the ENT-DC must be set to "active, active" (see ENT-DC Technical Manual).

4.11 S-TERMEX/TERMEX K36 / KL36

TERMEX 22X / 23X -- TERMEX K36 / KL36
32X / 33X

Sub-D 25-pole, male		Sub-D 25-pole, female
1	⟷	1
2	⟷	3
3	⟷	5
4	⟷	7
5	⟷	9
6	⟷	11
7	⟷	13
8	⟷	15
9	⟷	17
14	⟷	2
15	⟷	4
16	⟷	6
17	⟷	8
18	⟷	10
19	⟷	12
20	⟷	14
21	⟷	16
22	⟷	18

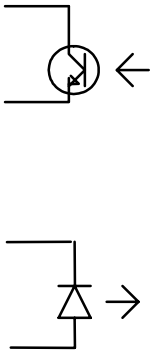
Note: All contacts not shown are not assigned

4.12 TERMEX 22X / 23X / 32X / 33X - MVS-1.1-5 (marked WE)

TERMEX -- MVS-1.1-5

Interface type: UART_B -pa08/mp01-

X3, X4, X5	DATL-A 4		PG/screw terminal
Us, Rx+	Xa.8	8	Us
	Xa.7		
Rx-	Xa.6	6	Tx5mA
	Xa.5		
	Xa.4		
GND, Tx-	Xa.3	9	GND
	Xa.2		
Tx+	Xa.1	7	Rx5mA

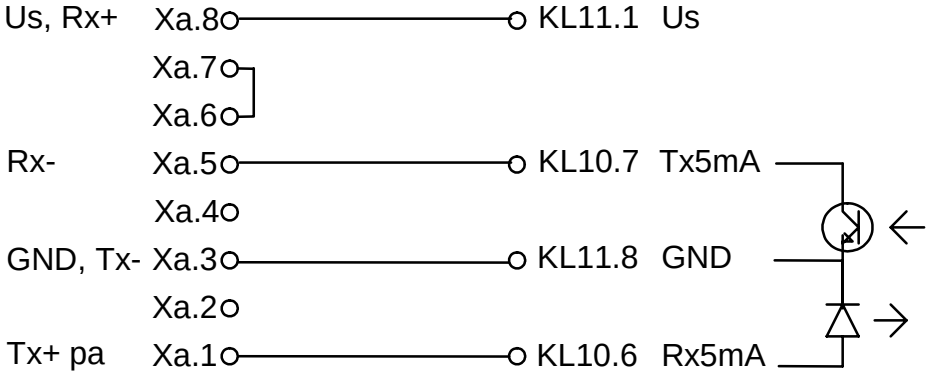


4.13 TERMEX 22X / 32X – AWU-Ex 3/6 - 5 (marked WA)

TERMEX -- **EXAWU3-5**

Interface type: UART_B -pa08/mp01-

X3, X4, X5 DATL-A 4 PG/screw terminal

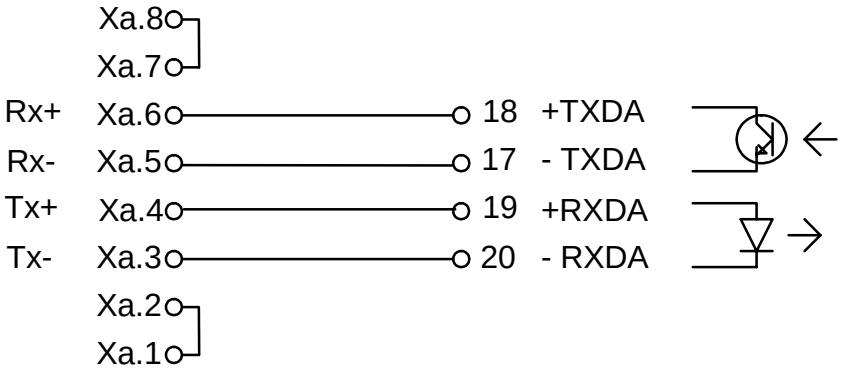


4.14 TERMEX 22X / 32X - Mettler GD130X (marked WMa)

TERMEX -- **GD130X**

Interface type: UART_A -ma05/pa05-

X3, X4, X5 DATL-A 4 PG/screw terminal

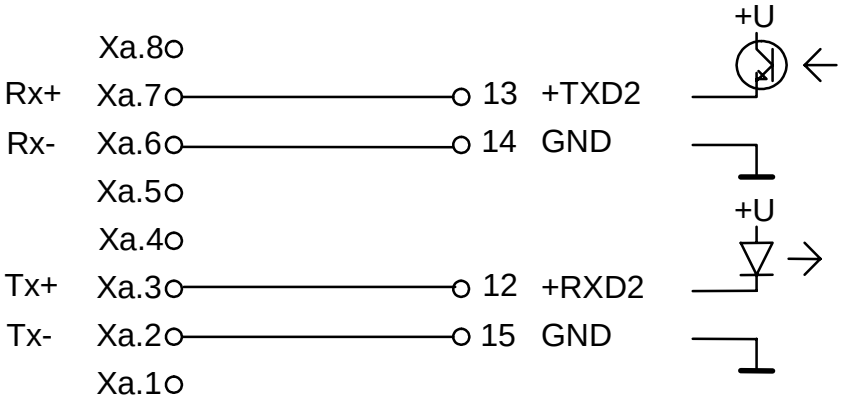


4.15 TERMEX 22X / 32X - Mettler GD13X (marked WMb)

TERMEX -- **GD13X**

Interface type: UART_A -pf01/pf01-

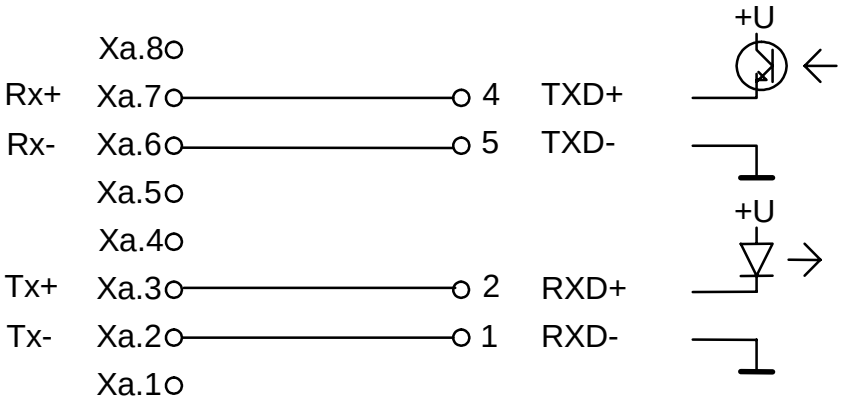
X3, X4, X5 DATL-A 4 PG/screw terminal



4.16 TERMEX 22X / 32X - Mettler ID 5 with 083 option (marked WMd)

TERMEX -- **ID 5**, CL 083 active

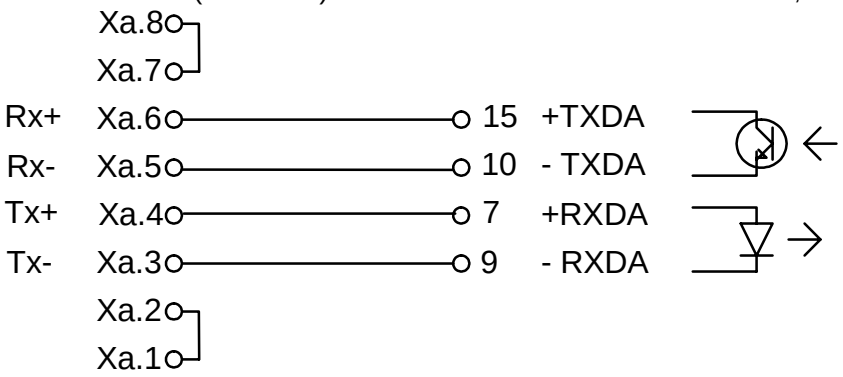
Interface type: UART_A -pf01/pf01-
X3, X4, X5 DATL-A 4



4.17 TERMEX 22X / 32X - Mettler SM-/PM-/AM (marked WMe)

TERMEX -- **SM-/PM-/AM-**, plug

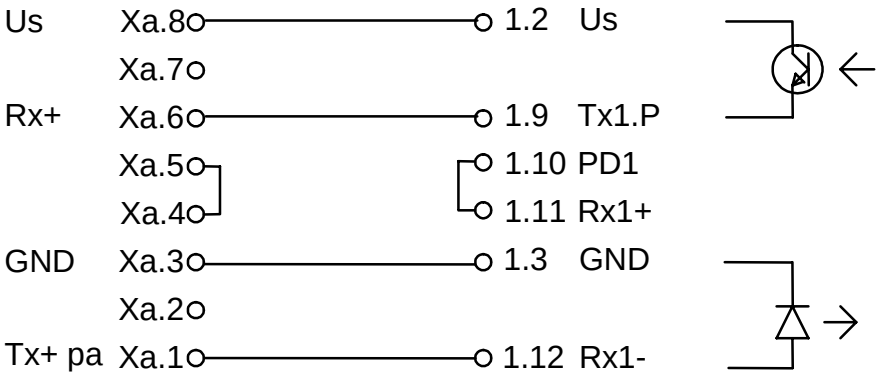
Interface type: UART_A -ma05/pa05-
X3, X4, X5 (DATL-A 4) "MiniMETTLER" connector, male



4.18 TERMEX 22X / 32X - Puma / ST3x via EXDK (marked WMh)

TERMEX -- **EXDK**

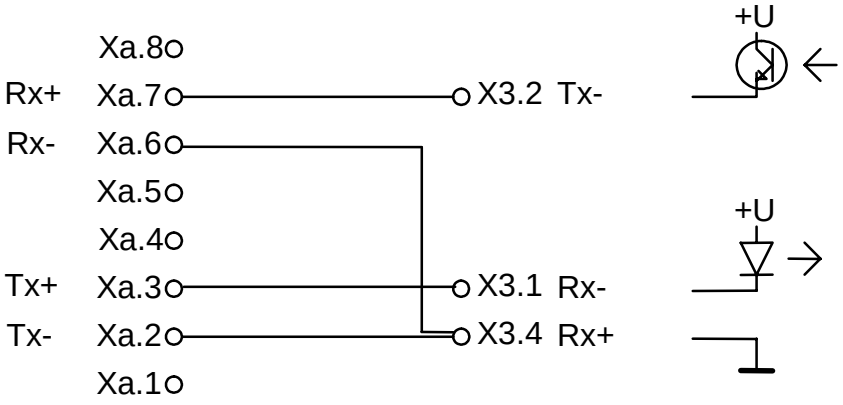
Interface type: UART_B -pa08/mp01-
X3, X4, X5 Coiled cable Connected ex works



4.19 TERMEX 22X / 32X - Puma / ST3x via ENT-DC-3.0 (marked WMi)

TERMEX -- **ENT-DC-3.0 as barrier**

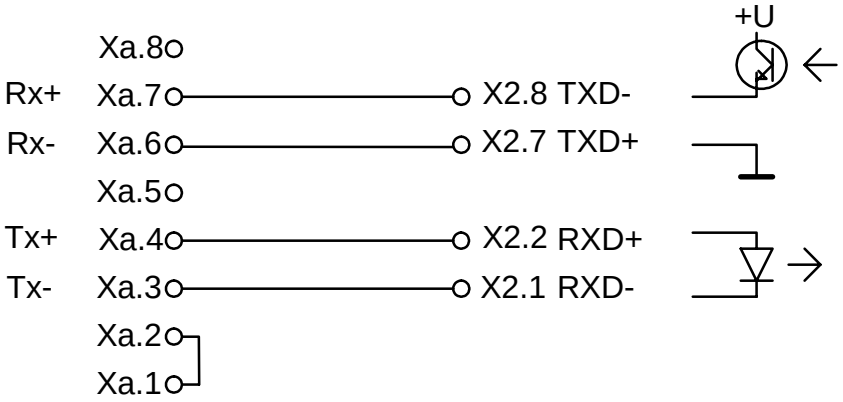
Interface type: UART_A -pf05/pf05-
X3, X4, X5 DATL-A 4 Screw terminal



4.20 TERMEX 22X / 32X - Bizerba ITE-Ex (marked WBa)

TERMEX -- **ITE-Ex**, terminal blocks

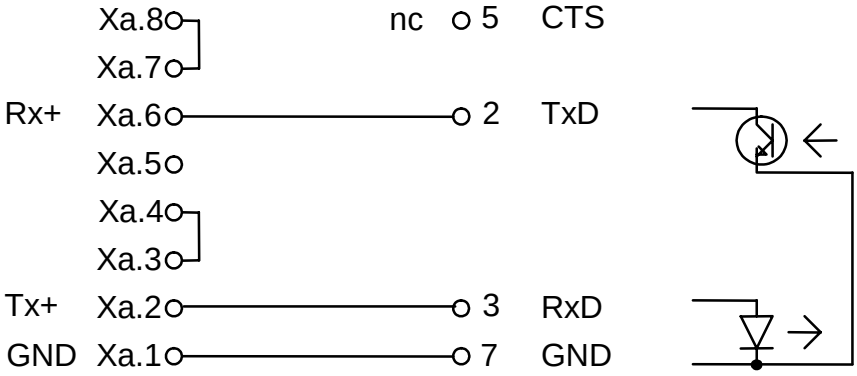
Interface type: UART_A -ma05/pf01-
X3, X4, X5 (DATL-A 4) Terminal



4.21 TERMEX 22X / 32X - Sartorius-Ex (marked WSara)

TERMEX -- **Sartorius F scale**

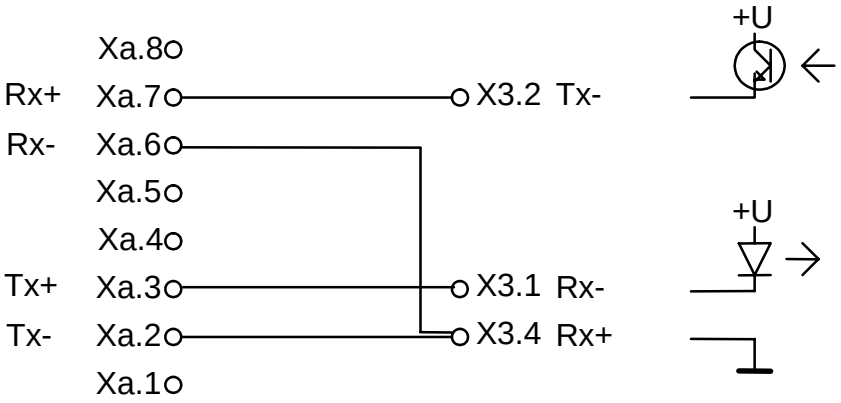
Interface type: UART_A -pa06/pa06-
X3, X4, X5 DATL-A 4-0 Plug, sub-D 25-pole, female



4.22 TERMEX 22X / 32X - Sartorius Ex via ENT-DC-3.0 (marked WSarb)

TERMEX -- **ENT-DC-3.0 as barrier**

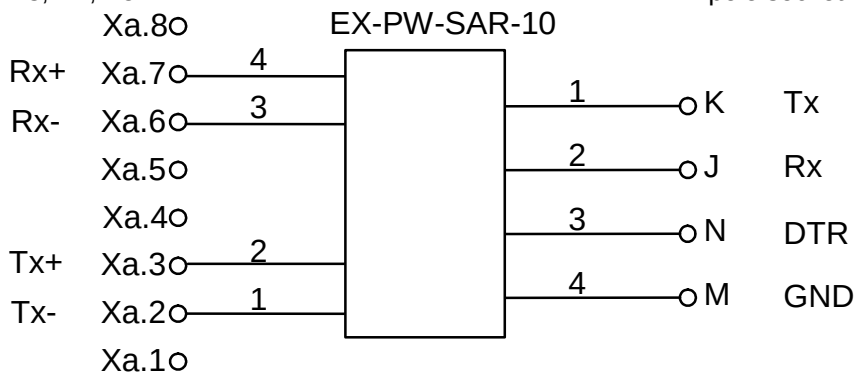
Interface type: UART_A -pf05/pf05-
X3, X4, X5 DATL-A 4 Screw terminal



4.23 TERMEX 22X / 32X - Sartorius Ex via EX-PW-SAR-10 (marked WSard)

TERMEX -- **Sartorius FC scale**

Interface type: UART_A -pf01/pf01-
(data negated)
X3, X4, X5 14-pole socket



4.24 TERMEX 22X / 32X - 2nd scanner (marked 2S)

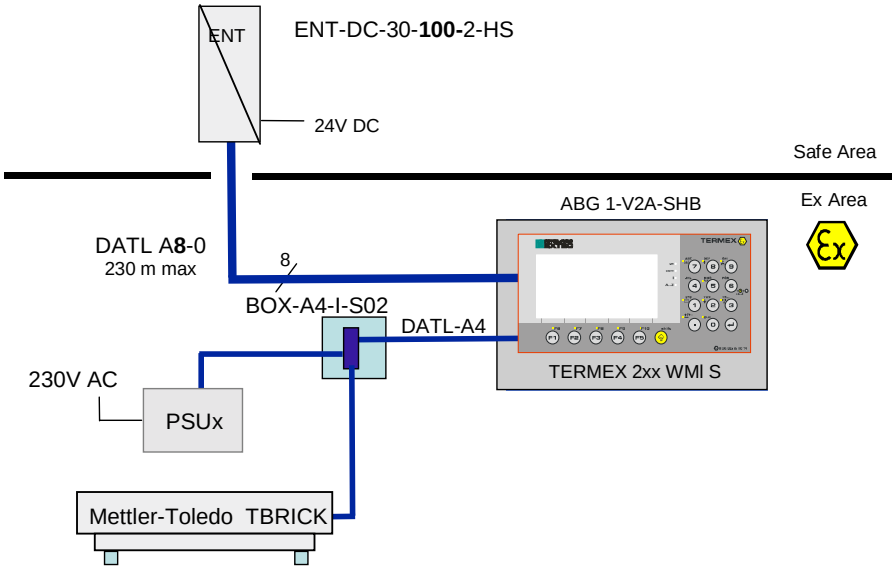
TERMEX -- **Scanner**

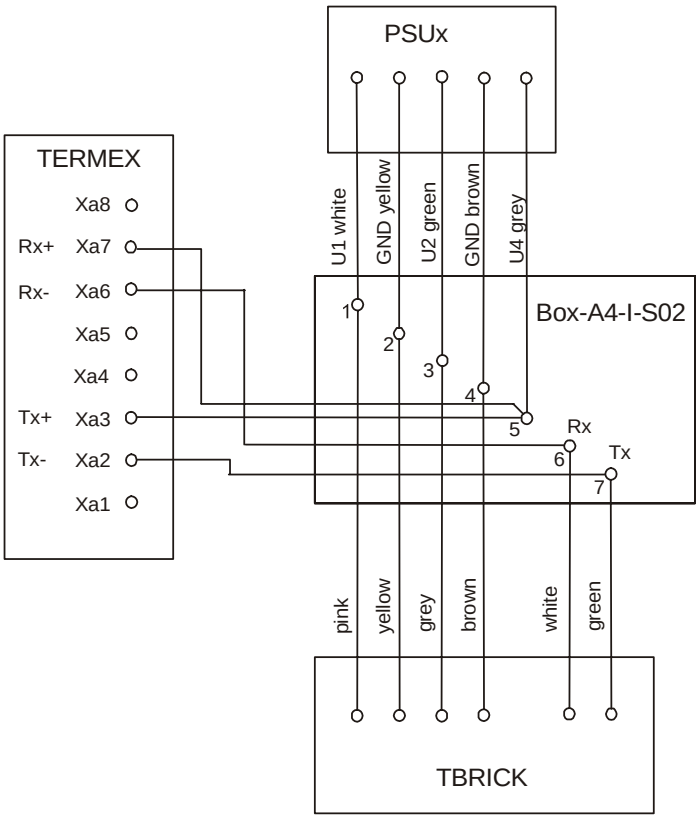
Interface type: UART_B -pa08/mp01-
X3, X4, X5 Coiled cable Connected ex works

4.25 TERMEX 22X / 32X – Mettler TBRICK 15-Ex / 32-Ex (marked WMI)

TERMEX -- TBRICK / PSUx

Interface type: UART_A –pf01/pf01
X3,X4,X5



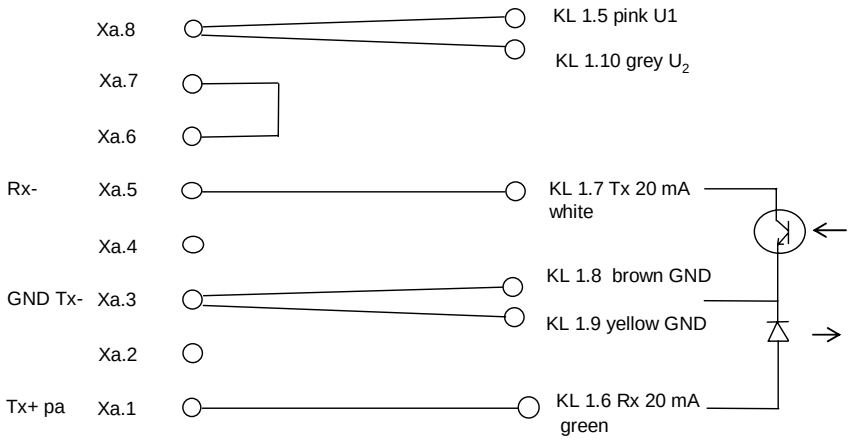


4.26 TERMEX 22X / 32X – Point Ex (marked WMm)

TERMEX -- Point Ex

Interface type: UART_B -pa05/pa05-

X3, X4, X5 DATL-A 4 PG/screw terminal



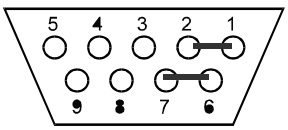
5 Interface test

It is possible to test the functionality of port X1 (via ENT-DC). The send and receive lines are short-circuited downstream of the ENT-DC for this purpose. This allows the terminal to check whether the characters it sends actually arrive in the input buffer. A loopback connector is connected to the sub-D socket of the ENT-DC in order to short-circuit the lines. It may be necessary to use a special loopback connector, depending on the interface mode (RS232, 20 mA CL).

After the connector has been plugged in, the interface test can be started in the terminal setup menu:
- Reset the terminal with the shortcut <Shift><Enter><9>
- Open the setup menu while the startup message is displayed by pressing <Shift><F1>
- Select the "Status & Test" submenu
- Click <NEXT> to open the "Test Terminal" page
- Select "Ser 1 Loopback Test" with the arrow keys
- Click <ENTER> to start the test

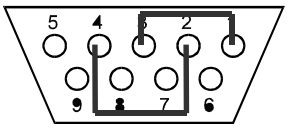
The test is repeated automatically until you stop it again by clicking <EXIT>.

5.1.1 Loopback connector for RS 232

Sub-D, 9-pole, socket contacts  	Jumper pin 1 with pin 2 Jumper pin 6 with pin 7

Note: The Tx jumpers for the 20 mA interface in the ENT-DC must be set to "active". The Rx jumper setting is not relevant (see ENT-DC Technical Manual).

5.1.2 Loopback connector for 20 mA CL

Sub-D, 9-pole, socket contacts  	Jumper pin 2 with pin 4 Jumper pin 1 with pin 3

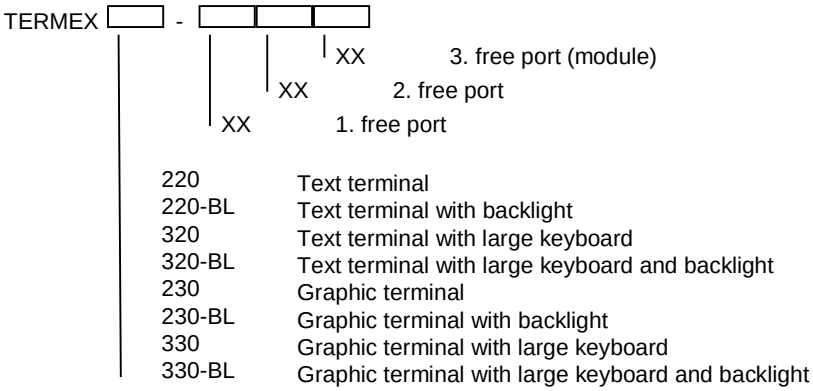
The 20 mA CL loopback connector can be used for the following configurations: active/active, active/passive and passive/active. The interface test does not work for a passive/passive configuration.

6 Type code / rating plate

A rating plate is provided on each control panel on the rear of the chassis case. It indicates, among other things, the name of the manufacturer, the serial number and the permissible limit values for operation in hazardous areas. These limits must be observed if the control panel is integrated into a system or machine, and especially if other peripherals are also connected to the TERMEX 320 or TERMEX 330 terminal.

Warning

The information specified on the rating plate refers to the maximum values for the hazardous area. Compliance with the maximum electrical values is necessary to ensure reliable operation of the device (see also "Technical data").



Special features:

X3Va/xxaas/yybbs	3rd serial port Va: Type of the interface module (V1 = UART A, V2 = UART B) XX: Sender configuration aa: Sender subversion s: 0,1,2,3 for supply circuit used, if passive: 0 yy: Receiver configuration bb: Receiver subversion s: 0,1,2,3 for supply circuit used, if passive: 0
-X4Va/xxaas/yybbs	4th serial port (see above)
-X5Va/xxaas/yybbs	5th serial port (see above) or module designation
-LEDnu	TERMEX 32X without LEDs $\Rightarrow$ higher $C_{a\ max}$ (Vcc) for TERMEX 32X
-ZT	25-pole sub-D socket for expansion unit (expansion keyboard)
-BPx	Beeper (x: i = internal, e = external, nu = not used)
-D1/s	DIGIO33 module slot s: 1,2,3 for supply circuit used
-K36	With expansion keyboard, without LEDs
-KL36	With expansion keyboard, without LEDs (TERMEX 22x only)

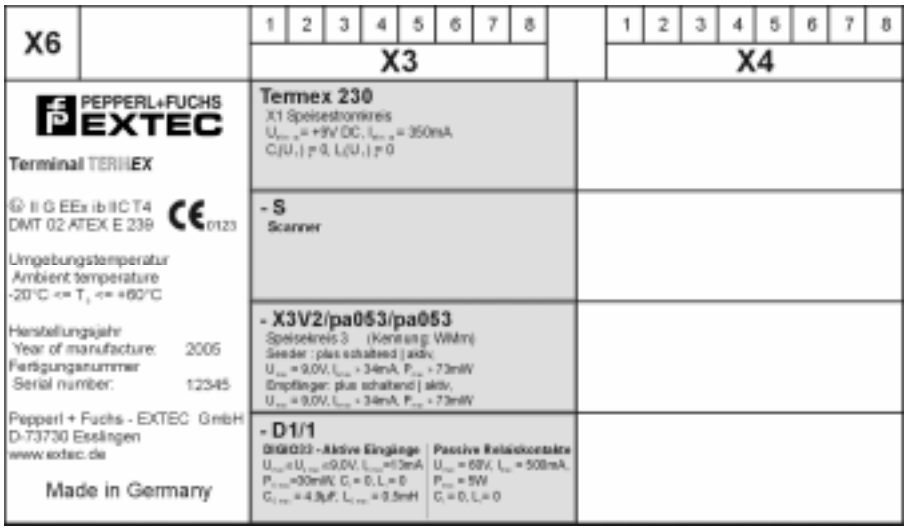
If special features are not implemented, they are either omitted from the type code or indicated by the suffix "nu" (not used)

- The option "-LED…" is always indicated for TERMEX 32X:
  With LEDs: -LED -
  Without LEDs and drive circuit: -LEDnu-
  The different $C_{i\ max}$ and $C_{a\ max}$ values are thus also readily apparent from the type code
- The type code for the TERMEX 22x does not include the suffix –LEDnu because this terminal is always supplied without LEDs

The type code may also include other information, providing it does not refer to safety-relevant modifications.

Free ports can be assigned as described in 'Overview of models'.

Example of a rating plate:
(Optionally, depending on the equipment)



Optionally, depending on interface module

7 Order designation

Terminal Type	Text / Graphics	ABG housing	EX Protection	Keyboard	1. Interface Option	2. Interface Option	3. Interface Option

Terminal Type

TERMEX	Ex version
TERM	Non Ex version

Text / Graphics

-220	Text T., 5 Fkeys
-220B	Text T., 5 Fkeys, backlight
-220S	Text T., 5 Fkeys, stripes
-220SB	Text T., 5 Fkeys, stripes + backlight
-230	Graph.T., 5 Fkeys
-230B	Graph.T., 5 Fkeys, backlight
-230S	Graph.T., 5 Fkeys, stripes
-230SB	Graph.T., 5 Fkeys, stripes + backlight
-320	Text T., 12 Fkeys
-320B	Text T., 12 Fkeys, backlight
-330	Graph.T., 12 Fkeys
-330SB	Graph.T., 12 Fkeys, stripes + backlight

ABG housing

-0	Without housing
-W	ABG wall-mounting case V2A
-T	ABG desk-type case V2A
-P	ABG plastic
-PH	ABG plastic with heating

Ex-Protection

-C	ATEX II 2G
-D	ATEX II 3D
-E	ATEX II 2G, II 3D
-N	Non EX version

Keyboard Type

-K0	Without Keyboard
-K	K36 Keyboard
-KL	KL36 Keyboard

1. Interface Option

-NO	No interface
-S	1. Barcode Reader Interface
-D33	Digital I/O: 3xInp., 3xOutp.
-D30	Digital I.: 3xInp., 0xOutp.
-WA	M.Toledo EX-AWU
-WML	M.-Toledo T-Brick
-WMb	M.-Toledo GD130x, TBRICK-K-cell
-WMA	M.-Toledo GD13x, TBRICK-K-cell
-WMm	M.-Toledo Point-EX
-WMk	for WMHA32S cell , MT,SICS
-WSa	SART. F-, L-, X149-, QS-,...
-WSb	SART. with - 20mA pp interface
-WSc	SART. with RS232 interface
-B1	For RS232 interface (non EX)

2. Interface Option

-NO	No interface
-S	1. Barcode Reader Interface
-D33	Digital I/O: 3xInp., 3xOutp.
-D30	Digital I.: 3xInp., 0xOutp.
-WA	M.Toledo EX-AWU
-WML	M.-Toledo T-Brick
-WMb	M.-Toledo GD130x, TBRICK-K-cell
-WMA	M.-Toledo GD13x, TBRICK-K-cell
-WMm	M.-Toledo Point-EX
-WMk	for WMHA32S cell , MT,SICS
-WSa	SART. F-, L-, X149-, QS-,...
-WSb	SART. with - 20mA pp interface
-WSc	SART. with RS232 interface
-B1	For RS232 interface (non EX)

3. Interface Option

-NO	No interface
-S	1. Barcode Reader Interface
-D33	Digital I/O: 3xInp., 3xOutp.
-D30	Digital I.: 3xInp., 0xOutp.
-WA	M.Toledo EX-AWU
-WML	M.-Toledo T-Brick
-WMb	M.-Toledo GD130x, TBRICK-K-cell
-WMA	M.-Toledo GD13x, TBRICK-K-cell
-WMm	M.-Toledo Point-EX
-WMk	for WMHA32S cell , MT,SICS
-WSa	SART. F-, L-, X149-, QS-,...
-WSb	SART. with - 20mA pp interface
-WSc	SART. with RS232 interface
-B1	For RS232 interface (non EX)

8 Index

9 Appendix: Test certificates

Declaration of Conformity Pepperl+Fuchs-EXTEC (1page)

DMT 02 ATEX E 239 (6 pages in german, 6 pages in english)

DMT 02 ATEX E 239 1. Addendum
(1 page in german, 1 page in english)

Declaration of Conformity, use in Zone 22 (1 page)

PEPPERL+FUCHS
EXTEC

Konformitätserklärung / Declaration of Conformity

Nach EN 45014:1998 / in accordance with EN 45014:1998

Die Pepperl + Fuchs EXTEC GmbH, Esslingen, Deutschland erklärt hiermit in alleiniger Verantwortung, dass seitlich genanntes Produkt mit den angegebenen Normen oder normativen Dokumenten übereinstimmt und (gegebenenfalls) von einer zuständigen Stelle freigegeben wurde.

We, Pepperl + Fuchs EXTEC GmbH, Esslingen, Germany hereby declare under our sole responsibility that the beside mentioned products are in accordance with the beside listed harmonized standards or normative documents and (where necessary) have been released by a competent body.

Diese Konformitätserklärung gilt für folgende Produktfamilien:
This Declaration of Conformity is valid for the following products

Produktgruppe / product group **TERMEX**
Typ / Type: **TERMEX**0-*****

Zutreffende EG-Richtlinien: Relevant EC-directives:	**94/9/EC** **89/336/EEC**
Angewandte harmonisierte Normen: Applied harmonized standards:	**EN 50014:1997** **EN 50020:1994**
Angewandte nationale Normen oder normative Dokumente: Applied national standards or normative documents:	Nicht belegt / not used
EG-Baumusterprüfbescheinigungsnummer: CE Type Examination Certificate number:	**DMT 02 ATEX E 239**
Benannte Stelle für QS-Überwachung: Notified Body for QA-Assessment:	**PTB, CE 0102**
Hersteller-Unterschrift: Signature of manufacturer:	Best Hermann Best
Funktion des Unterzeichners: Function of the signer:	Geschäftsführer Managing Director
Datum / date:	March 2006

(1) # EG-Baumusterprüfbescheinigung

(2) **- Richtlinie 94/9/EG -**
Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen

(3) ## DMT 02 ATEX E 239

(4) **Gerät:** **Bedien- und Anzeigegerät Typ TERMEX **0-*****

(5) **Hersteller:** **EX TEC Oesterle GmbH**

(6) **Anschrift:** **D 73730 Esslingen**

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Baumusterprüfbescheinigung festgelegt.

(8) Die Zertifizierungsstelle der Deutsche Montan Technologie GmbH, benannte Stelle Nr. 0158 gemäß Artikel 9 der Richtlinie 94/9/EG des Europäischen Parlaments und des Rates vom 23. März 1994, bescheinigt, dass das Gerät die grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie erfüllt.
Die Ergebnisse der Prüfung sind in dem Prüfprotokoll BVS PP 02.2124 EG niedergelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 50014:1997 + A1 – A2 Allgemeine Bestimmungen
EN 50020:1994 Eigensicherheit 'i'

(10) Falls das Zeichen „X" hinter der Bescheinigungsnummer steht, wird in der Anlage zu dieser Bescheinigung auf besondere Bedingungen für die sichere Anwendung des Gerätes hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf die Konzeption und die Baumusterprüfung des beschriebenen Gerätes in Übereinstimmung mit der Richtlinie 94/9/EG.
Für Herstellung und Inverkehrbringen des Gerätes sind weitere Anforderungen der Richtlinie zu erfüllen, die nicht durch diese Bescheinigung abgedeckt sind.

(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

Ex II 2G EEx ib IIC T4

Deutsche Montan Technologie GmbH
Essen, den 20. Dezember 2002

DMT-Zertifizierungsstelle

Fachbereichsleiter

Dieses Zertifikat darf nur unverändert weiterverbreitet werden.
Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

(13) Anlage zur

(14) # EG-Baumusterprüfbescheinigung

DMT 02 ATEX E 239

(15) 15.1 Gegenstand und Typ

Bedien- und Anzeigegerät Typ TERMEX **0-***

Anstelle der *** werden in der vollständigen Benennung Buchstaben und Ziffern eingefügt, die unterschiedliche Ausführungen kennzeichnen :

Typ TERMEX **0-***

Art der Anzeige:
2 = Textterminal
3 = Grafikterminal

Gehäusegröße: 2 = klein, 3 = groß

Die *** nach dem Bindestrich kennzeichnen die eingebauten Baugruppen sowie die Belegung der äußeren Anschlüsse und es können, je nach Ausführung, die folgenden Kennzeichen eingesetzt sein:
-XaVb/xxaas/yybbs

a = Schnittstellennummer
b = Version des Schnittstellenmoduls
xx = Konfiguration Sender
aa = Sub-Version Sender
yy = Konfiguration Empfänger
bb = Sub-Version Empfänger
s = Ziffer für verwendeten Speisekreis

-LEDnu	Ausführung bei Typ 320-*** ohne Leuchtdioden
-ZT	Belegung Anschl. X6 für Zusatztastatur
-BP*	Verwendung des Signalgebers: x = intern, e = extern, nu = nicht vorhanden
-D1/s	Modul mit 3 Eingängen und 3 Ausgängen s = Ziffer für verwendeten Speisekreis
-K36	mit Zusatztastatur ohne Leuchtdioden
-KL36	mit Zusatztastatur mit Leuchtdioden, nur bei Typ 220-***

15.2 Beschreibung

Das Bedien- und Anzeigegerät dient in explosionsgefährdeten Bereichen zur Anzeige von Daten und Messwerten sowie zur Datenübertragung.

Die elektrischen Bauteile des Bedien- und Anzeigegerätes sind in einem Metallgehäuse gesichert befestigt. An der Frontseite des Gehäuses sind Anzeigen und eine Tastatur angeordnet.

Der elektrische Anschluss der eigensicheren Stromkreise erfolgt über Klemmen bzw. Steckverbinder an der Rückseite des Gehäuses.

Bei der Ausführung Typ TERMEX **0-***-BPe kann außen ein Signalgeber Typ EXBP-1.0 angeschlossen werden.

Dieses Zertifikat darf nur unverändert weiterverbreitet werden.
Am Technologiepark 1, 45307 Essen, Telefon (0201)172-1416, Telefax (0201)172-1716

DMT

15.3 Kenngrößen

15.3.1 Anschluss an X1

15.3.1.1 Speisekreis 1 (Anschl. X1.3 (Us1) und X1.4 (GND))

Spannung	Ui	DC	9	V
Stromstärke	Ii		350	mA
Leistung	Pi			
bei Ta –20 °C bis +40 °C			1,3	W
bei Ta –20 °C bis +60 °C			1,2	W
wirksame innere Kapazität	Ci	vernachlässigbar		
wirksame innere Induktivität	Li	vernachlässigbar		

15.3.1.2 Speisekreis 2 (Anschl. X1.5 (Us2) und X1.6 (GND))

Spannung	Ui	DC	9	V
Stromstärke	Ii		350	mA
Leistung	Pi		1,5	W
wirksame innere Kapazität	Ci	vernachlässigbar		
wirksame innere Induktivität	Li	vernachlässigbar		

15.3.1.3 Speisekreis 3 (Anschl. X1.8 (Us3) und X1.7 (GND))

Spannung	Ui	DC	9	V
Stromstärke	Ii		350	mA
Leistung	Pi		1,5	W
wirksame innere Kapazität	Ci	vernachlässigbar		
wirksame innere Induktivität	Li	vernachlässigbar		

15.3.1.4 Signalstromkreise RX20 (Anschl. X1.2) – GND und TX20 (Anschl. X1.1) – GND
Sender und Empfänger passiv zum Anschluss jeweils eines eigensicheren Stromkreises mit den folgenden Höchstwerten:

Spannung	Ui	DC	9	V
Stromstärke	Ii		350	mA
Leistung	Pi			
bei Ta –20 °C bis +40 °C			1,3	W
bei Ta –20 °C bis +60 °C			1,2	W
wirksame innere Kapazität	Ci	vernachlässigbar		
wirksame innere Induktivität	Li	vernachlässigbar		

Die Stromkreise sind intern über GND miteinander verbunden. Der Summenstrom für die Kreise Us1, RX20 und TX20 darf 350 mA nicht überschreiten.

15.3.2 Anschluss an X2

15.3.2.1 Speiseausgang Us2 (X2.3) – GND (X2.4) , direkt verbunden mit Us2 an Anschluss X1
Die Werte für diesen Stromkreis hängen von dem verwendeten Speisegerät am Anschluss X1 Us2 – GND ab, betragen jedoch höchstens

Spannung	Uo	DC	9	V
Stromstärke	Io		350	mA
Leistung	Po		1,5	W

Die Werte für die max. äußere Kapazität Co und die max. äußere Induktivität Lo können nur in Verbindung mit dem verwendeten Speisegerät angegeben werden.

wirksame innere Kapazität	Ci	vernachlässigbar		
wirksame innere Induktivität	Li	vernachlässigbar		

15.3.2.2 Signalstromkreis RX5 (X2.1) – GND (X2.4), Empfänger passiv
zum Anschluss eines eigensicheren Stromkreises mit den folgenden Höchstwerten:

Spannung	Ui	DC	9	V
Stromstärke	Ii		350	mA
Leistung	Pi			
bei Ta –20 °C bis +40 °C			1,3	W

Dieses Zertifikat darf nur unverändert weiterverbreitet werden.
Am Technologiepark 1, 45307 Essen, Telefon (0201) 172-1416, Telefax (0201) 172-1716

bei Ta –20 °C bis +60 °C			1,2 W
wirksame innere Kapazität		Ci	vernachlässigbar
wirksame innere Induktivität		Li	vernachlässigbar

15.3.2.3 Signalstromkreis TX5 (X2.2) – GND (X2.4), Sender aktiv

Spannung Uo	DC	5,2	V	
Stromstärke	Io	12	mA	
Leistung Po		34	mW	
wirksame innere Kapazität			Ci	vernachlässigbar
wirksame innere Induktivität			Li	vernachlässigbar

Die Stromkreise sind intern über GND miteinander verbunden. Der Summenstrom für die Kreise Us2, RX5 und TX5 darf 350 mA nicht überschreiten.

15.3.3 Anschluss an X3, X4 und X5, Schnittstellenstromkreise

15.3.3.1 Kennbuchstaben ma = Minusschaltend aktiv
potentialmäßig mit dem gemäß Kennzeichnung (Ziffer 1, 2 oder 3 anstelle des Buchstaben a) festgelegten Speisekreis verbunden

Version	Spannung Uo [V]	Stromstärke Io [mA]	Leistung Po [mW]
ma03	9	62	137
ma04	9	42	94
ma05	9	34	73
ma06	9	26	57
ma07	9	20	44
ma08	9	14	32
ma09	9	10	21
ma10	9	7	14
ma11	9	5	10

max. äußere Kapazität		Co	4,9 µF
max. äußere Induktivität		Lo	1 mH

15.3.3.2 Kennbuchstaben pf = potentialfrei
zum Anschluss eines eigensicheren Stromkreises mit den folgenden Höchstwerten:

Spannung		Ui	DC 20	V
Stromstärke		Ii	350	mA
Leistung		Pi	1,2	W
wirksame innere Kapazität		Ci	vernachlässigbar	
wirksame innere Induktivität		Li	vernachlässigbar	

15.3.3.3 Kennbuchstaben mp = minusschaltend passiv
zum Anschluss eines eigensicheren Stromkreises mit den folgenden Höchstwerten:

Spannung		Ui	DC 20	V
Stromstärke		Ii	350	mA
Leistung		Pi	1,2	W
wirksame innere Kapazität		Ci	vernachlässigbar	
wirksame innere Induktivität		Li	vernachlässigbar	

15.3.3.4 Kennbuchstaben pa = plusschaltend aktiv
potentialmäßig mit dem gemäß Kennzeichnung (Ziffer 1, 2 oder 3 anstelle des Buchstaben a) festgelegten Speisekreis verbunden

Version	Spannung Uo [V]	Stromstärke Io [mA]	Leistung Po [mW]
pa03	9	62	137
pa04	9	42	94
pa05	9	34	73
pa06	9	26	57
pa07	9	20	44
pa08	9	14	32
pa09	9	10	21
pa10	9	7	14
pa11	9	5	10

max. äußere Kapazität	Co	4,9	µF
max. äußere Induktivität	Lo	1	mH

15.3.4 Kennzeichnung –ZT, Anschluss an Stecker X6, Anschluss Erweiterungsgeräte
potentialmäßig mit dem Speisekreis 1 (Us1 –GND) verbunden

Spannung	Uo	DC	5,2	V
Stromstärke	Io		350	mA
Leistung	Po		1,2	W
max. äußere Kapazität	Co			
bei Typ Termex 220-***			67	µF
bei Typ Termex 230-***			67	µF
bei Typ Termex 320-***			13	µF
bei Typ Termex 330-***			13	µF

15.3.5 Kennzeichnung –BPe, Anschluss an Stecker X9, Anschluss externer Signalgeber Typ EXBP-1.0
potentialmäßig mit dem Speisekreis 1 (Us1 –GND) verbunden

Spannung	Uo	DC	5,2	V
Stromstärke	Io		350	mA
Leistung	Po		1,2	W

15.3.6 Kennzeichnung –D1/s, Anschluss an Klemmen X5 und X5'
15.3.6.1 potentialfreie Relaiskontakt-Stromkreise, Anschlüsse KL1, KL2 und KL3
zum Anschluss jeweils eines eigensicheren Stromkreises mit den folgenden Höchstwerten:

Spannung	Ui	DC	60	V
Stromstärke	Ii		500	mA
Leistung	Pi		5	W
wirksame innere Kapazität	Ci		vernachlässigbar	
wirksame innere Induktivität	Li		vernachlässigbar	

15.3.6.2 Eingangsstromkreise, Anschluss an X5' Klemmen KL1 bis KL6
potentialmäßig mit dem gemäß Kennzeichnung (Ziffer 1, 2 oder 3 anstelle des Buchstaben s) festgelegten Speisekreis verbunden
Werte je Eingangskreis

Spannung	Uo	DC	9	V
Stromstärke	Io		13	mA
Leistung	Po		30	mW
max. äußere Kapazität	Co		4,9	µF
max. äußere Induktivität	Lo		0,5	mH

Dieses Zertifikat darf nur unverändert weiterverbreitet werden.
Am Technologiepark 1, 45307 Essen, Telefon (0201) 172-1416, Telefax (0201) 172-1716

15.3.7	Kennzeichnung TERMEX **0-K36, Zusatztastatur, Anschluss an Stecker X6		
	Spannung Ui DC 5,2 V		
	wirksame innere Kapazität	Ci	vernachlässigbar
	wirksame innere Induktivität	Li	vernachlässigbar
15.3.8	Kennzeichnung TERMEX **0-KL36, Zusatztastatur, Anschluss an Stecker X6		
	Spannung Ui DC 5,2 V		
	wirksame innere Kapazität	Ci	53,1 µF
	wirksame innere Induktivität	Li	vernachlässigbar
15.3.9	Kapazität des Gesamtgerätes gegen Gehäuse		230 nF
15.3.10	Umgebungstemperaturbereich	Ta	-20 °C bis +60 °C

(16) Prüfprotokoll
BVS PP 02.2124 EG, Stand 20.12.2002

(17) Besondere Bedingungen für die sichere Anwendung
Entfällt

EXAM
BBG Prüf- und Zertifizier GmbH

1. Nachtrag

(Ergänzung gemäß Richtlinie 94/9/EG Anhang III Ziffer 6)

zur EG-Baumusterprüfbescheinigung
DMT 02 ATEX E 239

Gerät: **Bedien- und Anzeigegerät Typ TERMEX **0-*****

Hersteller: **Pepperl+Fuchs - EXTEC GmbH**

Anschrift: **73730 Esslingen**

Beschreibung

Das Bedien- und Anzeigegerät kann auch nach den im zugehörigen Prüfprotokoll aufgeführten Prüfungsunterlagen gefertigt werden und auch die Ausführungen

Typ TERMEX **0-BL

sind möglich.

Die grundlegenden Sicherheits- und Gesundheitsanforderungen der geänderten Ausführung werden erfüllt durch Übereinstimmung mit

EN 50014:1997 + A1 – A2 Allgemeine Bestimmungen
EN 50020:2002 Eigensicherheit 'i'

Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

Ex II 2G EEx ib IIC T4

Besondere Bedingungen für die sichere Anwendung bzw. Verwendungshinweise
Entfällt

Prüfprotokoll
BVS PP 02.2124 EG, Stand 23.05.2006

EXAM BBG Prüf- und Zertifizier GmbH
Bochum, den 23. Mai 2006

Zertifizierungsstelle

Fachbereich

Dieses Zertifikat darf nur unverändert weiterverbreitet werden.
Dinnendahlstraße 9 44809 Bochum Telefon 0234/3696-105 Telefax 0234/3696-110
(bis 31.05.2003: Deutsche Montan Technologie GmbH Am Technologiepark 1 45307 Essen)

CERTIFIED TRANSLATION

E

DMT

(1) **EC Type Examination Certificate**

(2) **- Directive 94/9/EC -**

Equipment and protective systems for use to the intended purpose
in potentially explosive atmospheres

(3) **DMT 02 ATEX E 239**

(4) **Equipment:** **Operator Control and Display unit Type TERMEX **0-*****

(5) **Manufacturer:** **EXTEC Oesterle GmbH**

(6) **Address:** **D 73730 Esslingen**

(7) The design of this equipment and the various permissible variants are specified in the Appendix to this Type Examination Certificate.

(8) The certification body of Deutsche Montan Technologie GmbH, accredited as body no. 0158 in accordance with Article 9 of Directive 94/9/EC of the European Parliament and the Council dated March 23rd 1994, hereby certifies that the equipment conforms with the basic safety and health requirements relating to the design and construction of equipment and protective systems for use to the intended purpose in potentially explosive atmospheres in accordance with Annex II of the same Directive.
The results of the test are recorded in Test Report No. BVS PP 02.2124 EG.

(9) The basic safety and health requirements are satisfied through conformance with:

EN 50014:1997 + A1 - A2	General requirements
EN 50020:1994	Intrinsic safety 'i'

(10) If the mark "X" appears after the certificate number, it means that this equipment is subject to the special conditions for safe usage specified in the Appendix to this certificate.

(11) This EC Type Examination Certificate only refers to the design of, and the type examination for, the equipment described here in conformance with Directive 94/9/EC.
The manufacture and introduction into circulation of the equipment are subject to other Directive requirements which are not covered by this certificate.

(12) The marking on the equipment must include the following information:

E Ex II 2G EEx ib IIC T4

Deutsche Montan Technologie GmbH
Essen, December 20, 2002

DMT certification body — Department head

This certificate may only be passed on to others without change.
Am Technologiepark 1, D-45307 Essen, Phone +49 (0)201/172-1416, Fax +49 (0)201/172-1716

EXTEC Oesterle GmbH

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: Aug 14, 2003 D Allison

David Allison
Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.

DAVID ALLISON VVU Öffentl. bestellter und beeidigter Urkundenübersetzer der englischen Sprache in Baden-Württemberg 72581 DETTINGEN

CERTIFIED TRANSLATION

DMT

(13)
(14) Appendix to
EC Type Examination Certificate

DMT 02 ATEX E 239

(15) 15.1 Subject and type

Operator Control and Display Unit Type TERMEX **0-***
In the full designation the ** are replaced by letters and numbers which identify the different variants and have the following meanings:

Type TERMEX **0-***

- Type of display: 2 = Text terminal, 3 = Graphics terminal
- Case size: 2 = small, 3 = large

The ** after the hyphen refer to the integrated assemblies and to the assignment of the external connectors; the following markings may be used depending on the variant:
-XaVb/xxaas/yybbs

a = Interface number
b = Version of the interface module
xx = Sender configuration
aa = Sender subversion
yy = Receiver configuration
bb = Receiver subversion
s = Code for supply circuit used

-LEDnu	Type 320-*** variant without light-emitting diodes
-ZT	Assignment of connector X6 for expansion keyboard
-BP*	Use of the signal generator: x = internal, e = external, nu = not used
-D1/s	Module with 3 inputs and 3 outputs s = Code for supply circuit used
-K36	With expansion keyboard, without light-emitting diodes
-KL36	With expansion keyboard, with light-emitting diodes, type 220-*** only

15.2 Description
The operator control and display unit is used in potentially explosive atmospheres to display data and measured values as well as to transmit data.

The electrical components of the operator control and display unit are securely fastened inside a metal case. Displays and a keyboard are arranged on the front of the case.
The electrical connections for the intrinsically safe circuits take the form of terminals and plug connectors on the rear of the case.

A signal generator type EXBP-1.0 can be connected externally in the case of the TERMEX **0-***-BPe variant.

This certificate may only be passed on to others without change.
Am Technologiepark 1, D-45307 Essen, Phone +49 (0)201/172-1416, Fax +49 (0)201/172-1716

EXTEC Oesterle GmbH

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: Aug 14, 2003

David Allison
Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.

DAVID ALLISON VVU Öffentl. bestellter und beeidigter Urkundenübersetzer der englischen Sprache in Baden-Württemberg 72581 DETTINGEN

CERTIFIED TRANSLATION

DMT

15.3 Parameters

15.3.1 Connection to X1

15.3.1.1 Supply circuit 1 (terminals X1.3 (Us1) and X1.4 (GND))

Voltage	Ui	DC	9	V
Current	Ii		350	mA
Power	Pi			
for T_a = -20 °C to +40 °C			1.3	W
for T_a = -20 °C to +60 °C			1.2	W
Effective internal capacitance	Ci	negligible		
Effective internal inductance	Li	negligible		

15.3.1.2 Supply circuit 2 (terminals X1.5 (Us2) and X1.6 (GND))

Voltage	Ui	DC	9	V
Current	Ii		350	mA
Power	Pi		1.5	W
Effective internal capacitance	Ci	negligible		
Effective internal inductance	Li	negligible		

15.3.1.3 Supply circuit 3 (terminals X1.8 (Us3) and X1.7 (GND))

Voltage	Ui	DC	9	V
Current	Ii		350	mA
Power	Pi		1.5	W
Effective internal capacitance	Ci	negligible		
Effective internal inductance	Li	negligible		

15.3.1.4 Signal circuits RX20 (terminal X1.2) – GND and TX20 (terminal X1.1) – GND
Sender and receiver passive. Each designed for connecting one intrinsically safe circuit with the following maximum values:

Voltage	Ui	DC	9	V
Current	Ii		350	mA
Power	Pi			
for T_a = -20 °C to +40 °C			1.3	W
for T_a = -20 °C to +60 °C			1.2	W
Effective internal capacitance	Ci	negligible		
Effective internal inductance	Li	negligible		

The circuits are connected to one another internally via GND. The total current for the Us1, RX20 and TX20 circuits must not exceed 350 mA.

15.3.2 Connection to X2

15.3.2.1 Supply output Us2 (X2.3) – GND (X2.4), connected directly to Us2 at connector X1
The values for this circuit are dependent on the power supply unit connected to X1 Us2 – GND, but are limited to the following maximum values:

Voltage	Uo	DC	9	V
Current	Io		350	mA
Power	Po		1.5	W

The values for the maximum external capacitance Co and the maximum external inductance Lo can only be specified in conjunction with the particular power supply unit which is used.

Effective internal capacitance	Ci	negligible	
Effective internal inductance	Li	negligible	

15.3.2.2 Signal circuit RX5 (X2.1) – GND (X2.4), receiver passive
Designed for connecting one intrinsically safe circuit with the following maximum values:

Voltage	Ui	DC	9	V
Current	Ii		350	mA
Power	Pi		1.3	W
for Ta = -20 °C to +40 °C				

This certificate may only be passed on to others without ch
Am Technologiepark 1, D-45307 Essen, Phone +49 (0)201/172-1416, Fax +49 (0)201/172-1716

EXTEC Oesterle GmbH

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: Aug 14, 2003

David Allison
Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.

DAVID ALLISON
VVU
Öffentl. bestellter und beeidigter Urkundenübersetzer der englischen Sprache in Baden-Württemberg
72581 DETTINGEN

for Ta = -20 °C to +60 °C			1.2	W
Effective internal capacitance	Ci		negligible	
Effective internal inductance	Li		negligible	

15.3.2.3 Signal circuit TX5 (X2.2) – GND (X2.4), sender active

Voltage	Uo	DC	5.2	V
Current	Io		12	mA
Power	Po		34	mW
Effective internal capacitance	Ci		negligible	
Effective internal inductance	Li		negligible	

The circuits are connected to one another internally via GND. The total current for the Us2, RX5 and TX5 circuits must not exceed 350 mA.

15.3.3 Connection to X3, X4 and X5, interface circuits

15.3.3.1 Marking ma = negative-switching active

Equipotential bonding connection to the supply circuit specified by the marking (number 1, 2 or 3 instead of letter a)

Version	Voltage Uo[V]	Current Io [mA]	Power Po [mW]
ma03	9	62	137
ma04	9	42	94
ma05	9	34	73
ma06	9	26	57
ma07	9	20	44
ma08	9	14	32
ma09	9	10	21
ma10	9	7	14
ma11	9	5	10

Max. external capacitance	Co	4.9	µF
Max. external inductance	Lo	1	mH

15.3.3.2 Marking pf = isolated

Designed for connecting one intrinsically safe circuit with the following maximum values:

Voltage	Ui	DC	20	V
Current	Ii		350	mA
Power	Pi		1.2	W
Effective internal capacitance	Ci		negligible	
Effective internal inductance	Li		negligible	

15.3.3.3 Marking mp = negative-switching passive

Designed for connecting one intrinsically safe circuit with the following maximum values:

Voltage	Ui	DC	20	V
Current	Ii		350	mA
Power	Pi		1.2	W
Effective internal capacitance	Ci		negligible	
Effective internal inductance	Li		negligible	

This certificate may only be passed on to others without change.
Am Technologiepark 1, D-45307 Essen, Phone +49 (0)201/172-1416, Fax +49 (0)201/172-1716

EXTEC Oesterle GmbH

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: Aug 14, 2003

David Allison

Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.

DAVID ALLISON
VVU
Öffentl. bestellter und beeidigter Urkundenübersetzer der englischen Sprache in Baden-Württemberg
72581 DETTINGEN

15.3.3.4 Marking pa = positive-switching active
Equipotential bonding connection to the supply circuit specified by the marking (number 1, 2 or 3 instead of letter a)

Version	Voltage Uo [V]	Current Io [mA]	Power Po [mW]
pa03	9	62	137
pa04	9	42	94
pa05	9	34	73
pa06	9	26	57
pa07	9	20	44
pa08	9	14	32
pa09	9	10	21
pa10	9	7	14
pa11	9	5	10

Max. external capacitance	Co	4.9	µF
Max. external inductance	Lo	1	mH

15.3.4 Marking –ZT, connection to connector X6, for connecting expansion units
Equipotential bonding connection to supply circuit 1 (Us1 – GND)

Voltage	Uo	DC	5.2	V
Current	Io		350	mA
Power	Po		1.2	W
Max. external capacitance	Co			
for type Temex 220-***			67	µF
for type Temex 230-***			67	µF
for type Temex 320-***			13	µF
for type Temex 330-***			13	µF

15.3.5 Marking –BPe, connection to connector X9, for connecting external signal generators type EXBP-1.0
Equipotential bonding connection to supply circuit 1 (Us1 – GND)

Voltage	Uo	DC	5.2	V
Current	Io		350	mA
Power	Po		1.2	W

15.3.6 Marking –D1/s, connection to terminals X5 and X5'
15.3.6.1 Isolated relay contact circuits, terminals KL1, KL2 and KL3
Designed for connecting one intrinsically safe circuit with the following maximum values:

Voltage	Ui	DC	60	V
Current	Ii		500	mA
Power	Pi		5	W
Effective internal capacitance	Ci		negligible	
Effective internal inductance	Li		negligible	

15.3.6.2 Input circuits, connection to X5' terminals KL1 to KL6
Equipotential bonding connection to the supply circuit specified by the marking (number 1, 2 or 3 instead of letter s)
Values per input circuit

Voltage	Uo	DC	9	V
Current	Io		13	mA
Power	Po		30	mW
Effective internal capacitance	Co		4.9	µF
Effective internal inductance	Lo		0.5	mH

This certificate may only be passed on to others without change.
Am Technologiepark 1, D-45307 Essen, Phone +49 (0)201/172-1416, Fax +49 (0)201/172-1716
EXTEC Oesterle GmbH

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: Aug 14, 2003

David Allison
Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.

DAVID ALLISON
VVU
Öffentl. bestellter und beeidigter Urkundenübersetzer der englischen Sprache in Baden-Württemberg
72581 DETTINGEN

15.3.7	Marking TERMEX **0-K36, expansion keyboard, connection to connector X6				
	Voltage	Ui	DC	5.2	V
	Effective internal capacitance	Ci		negligible	
	Effective internal inductance	Li		negligible	
15.3.8	Marking TERMEX **0-KL36, expansion keyboard, connection to connector X6				
	Voltage	Ui	DC	5.2	V
	Effective internal capacitance	Ci		53.1	µF
	Effective internal inductance	Li		negligible	
15.3.9	Capacitance of complete device to case			230	nF
15.3.10	Ambient temperature range	Ta		-20 °C to +60 °C	

(16) Test report
BVS PP 02.2124 EG, dated 20.12.2002

(17) Special conditions for safe usage
Not applicable

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: Aug 14, 2003

David Allison
Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.

DAVID ALLISON VVU Öffentl. bestellter und beeidigter Urkundsübersetzer der englischen Sprache in Baden-Württemberg 72581 DETTINGEN

CERTIFIED TRANSLATION

Ex

EXAM
BBG Prüf- und Zertifizier GmbH

Addendum 1
(Amendment in accordance with Directive 94/9/EC Annex III Clause 6)

to EC Type Examination Certificate
DMT 02 ATEX E 239

Equipment:	**Operator Control and Display Panel Type TERMEX**0-***
Manufacturer:	**Pepperl+Fuchs - EXTEC GmbH**
Address:	**D – 73730 Esslingen**

Description

The operator control and display panel can also be manufactured in accordance with the test documentation mentioned in the associated Test Report as well as in the following versions:

Type TERMEX **0-BL

The basic safety and health requirements of the modified version are satisfied through conformance with

EN 50014:1997 + A1 - A2	General requirements
EN 50020:2002	Intrinsic safety 'i'

The marking on the device must contain the following information:

Ex II 2G EEx ib IIC T4

Special conditions for safe usage
Not applicable

Test Report
BVS PP 02.2124 EG, dated May 23, 2006

EXAM BBG Prüf- und Zertifizier GmbH
Bochum, May 23, 2006

(Signature illegible) (Signature illegible)

Certification body Department

This certificate may only be passed on to others without change.
Dinnendahlstrasse 9, D-44809 Bochum, Phone +49 (0)234/3696-105, Fax +49 (0)234/3696-110
(Until May 31, 2003: Deutsche Montan Technologie GmbH, Am Technologiepark 1, D-45307 Essen)

LEGAL CERTIFICATION

I hereby certify that this is a complete and correct translation of the original document drawn up in the German language

Date: 8.06.2006

David Allison
Officially appointed and sworn document translator for the English language at the Regional Court of Stuttgart in Baden-Württemberg, Federal Republic of Germany.

DAVID ALLISON
Öffentlich best. u. beeidigter Urkundenübersetzer der englischen Sprache in Baden-Württemberg
DETTINGEN / REUTLINGEN

Declaration of Conformity, use in Zone 22

Product designation: **Exi-Operator Terminal TERMEX...Z22-**

Types: TERMEX 220-..-Z22, ABG-1 V2A-.
TERMEX 230-..-Z22, ABG-1 V2A-.
TERMEX 320-..-Z22, ABG-3 V2A-.
TERMEX 330-..-Z22, ABG-3 V2A-.

Manufacturer: Pepperl + Fuchs - EXTEC GmbH
Schorndorfer Str. 55
D-73730 Esslingen

The designated products agree with the following regulations and standards:

Reference number
RL 94/9 EG (ATEX 95)
EN 50281-1-1: 1998

The products specified above may be used in explosion protection zone 22 (not conductive types of dust) (Category II 3D)
The operator terminal mentioned, must be mounted into the associated case (ABG).

The maximum surface temperature of the product is ≤ 135 °C.

Place, date: Esslingen, 31.05.2005

Signature:

ppa. Achim Rausenberger
Technical Manager

This declaration certifies the conformity with the guidelines mentioned, contains however no warranty of characteristics.
The safety instructions of the provided technical manuals are to be considered.

SIGNALS FOR THE WORLD OF AUTOMATION

For half a century Pepperl+Fuchs has been continually providing new impetus to the world of automation. We develop, manufacture and market electronic sensors and interface modules through our worldwide network. Our global presence and highly flexible production and service organisations enable us to offer you complete individual solutions – right where you need us! We know what we are talking about – because today Pepperl+Fuchs is the company with the largest selection of industrial sensor technology in the world – serving an exceptionally broad spectrum of applications.
Our signals move the World.

www.extec.de

Pepperl+Fuchs Extec GmbH
Schorndorfer Straße 55
73730 Esslingen - Germany
Tel. +49 711 315455-0 · Fax +49 711 315455-29
E-Mail: info@extec.de

USA Headquarters
Pepperl+Fuchs Inc. · 1600 Enterprise Parkway
Twinsburg, Ohio 44087 · USA
Tel. +1 330 4253555 · Fax +1 330 4254607
E-mail: sales@us.pepperl-fuchs.com

Asia Pacific Headquarters
Pepperl+Fuchs Pte Ltd. · P+F Building
18 Ayer Rajah Crescent · Singapore 139942
Company Registration No. 199003130E
Tel. +65 67799091 · Fax +65 68731637
E-mail: sales@sg.pepperl-fuchs.com

PEPPERL+FUCHS
EXTEC

Subject to reasonable modifications due to technical advances
Copyright PEPPERL+FUCHS • Printed in Germany