

Liability

Mess- und Fördertechnik Gwinner GmbH & Co. does not offer any guarantees or assurances as to the accuracy or completeness of the information appearing in this manual.

Mess- und Fördertechnik Gwinner GmbH & Co. accepts no liability or responsibility for any errors or omissions in the content of this manual.

General Safety Notes

Before starting up the system, it is essential that you read document 643 "General Safety Notes".

Document Number	Description
000643	General Safety Notes for Products From the MFX_4 Range

ATEX Directives

This product may only be started up by personnel with specialist knowledge of explosion protection.

EMC Directives

With regard to the EMC protection of devices, it is essential that you read the following additional notes:

Document Number	Description
000311	Notes for Correct Planning and Installation
000321	Notes for Correct EMC Planning and Installation
000323	Notes for the Proper Use of Our Products

Basic Knowledge Required

In order to use this manual, general knowledge of automation is required. For start-up of the explosion protected version, you must be familiar with the applicable Ex protection standards.

Electronic Manual

This document is also available as an electronic manual in PDF format. The document number for this manual is 640.

Configuration Tips

Given that the MFX_4 terminal can be used in various applications, configuration examples are provided for different applications. These configuration examples are available in PDF format.

Service and Support on the Internet

Our Support service is available to you on 0049-(0)40-72550-0 or online at www.mfx-systems.de.

Table of Contents:

_ 1	General Information	4
_ 1.1	Scope of Application and Regulations	4
_ 1.2	Safety Measures	4
_ 2	Product Description	5
_ 2.1	Description of Function	5
_ 2.2	Designation and Technical Data	5
_ 2.3	Pin Assignment	6
_ 3	Assembly and Start-Up	7
_ 4	Maintenance	9
_ 4.1	Modifications and Repair	9
_ 4.2	Regular Maintenance and Safety Checks	9
_ 4.3	Checklist for Maintenance Work	10

_ 1 General Information

_ 1.1 Scope of Application and Regulations

These operating regulations apply to explosion protected electronic components with intrinsically safe explosion protection. This equipment is only to be used in accordance with its intended purpose. The components meet the requirements of VDE 0171 "Electrical Equipment for Potentially Explosive Areas". Their use is permitted in potentially explosive areas where there is a risk from gases and vapours falling under the explosion group and temperature class specified on the nameplate. When setting up and operating explosion protected systems and control systems, the relevant national regulations and requirements must be observed.

_ 1.2 Safety Measures

The electronic components generally contain capacitive loads and therefore within a potentially explosive area a waiting time of approximately 15 minutes must be observed after switching off the supply voltage.

Working on live electrical systems and equipment is generally prohibited in potentially explosive areas. In special cases, work can be carried out on circuits that are not intrinsically safe, however you must be certain that a potentially explosive atmosphere will not be present for the duration of the work. Safe isolation is only to be checked with approved explosion protected measuring instruments. Earthing and short-circuiting may only be carried out if there is no risk of explosion at the earthing or short-circuiting point.

_ 2 Product Description

_ 2.1 Description of Function

The TH_4 TAT keypad buffer is used to connect keypad controllers to a terminal unit, which is used for data input, identification and the control of flow computer systems in the fuel industry.

The TH_4 TAT is the Exi buffer of the terminal and is responsible for ensuring the electrical isolation of the power supply and signal cables.

On the one hand it is to be manufactured as a separate component and on the other it must be possible to combine it with various electronic versions. This is why the keypad buffer is located on the same printed circuit board as the electrical circuit in question, but keeping the same layout and observing the required distances.

The key elements of the TH_4 TAS keypad controller – membrane keypad, keypad housing, controller electronics and card reader – combine to create a unit that is connected with the keypad buffer via a short three-core cable and is fixed to the TH_4 terminal housing (explosion-proof encapsulation).

_ 2.2 Designation and Technical Data

Explosion protection:	[EEx ia] IIB
ATEX category:	II (2) G
Ambient temperature:	-25°C ... +70°C
Intrinsically safe supply circuit (X10)	
Maximum output voltage	$U_O = 14.15 \text{ V}$
Maximum output current	$I_O = 74.5 \text{ mA}$
Maximum output power	$P_O = 1.055 \text{ W}$
Permissible connection capacity	$C_O = 2.3 \mu\text{F}$
Permissible connection inductance	$L_O = 1 \text{ mH}$
Supply circuit (X20)	
Supply voltage	$V_{DC} = 5 \text{ V}_{DC} (\pm 10\%)$
Current consumption (nominal)	$I(5 \text{ V}) = 130 \text{ mA}$

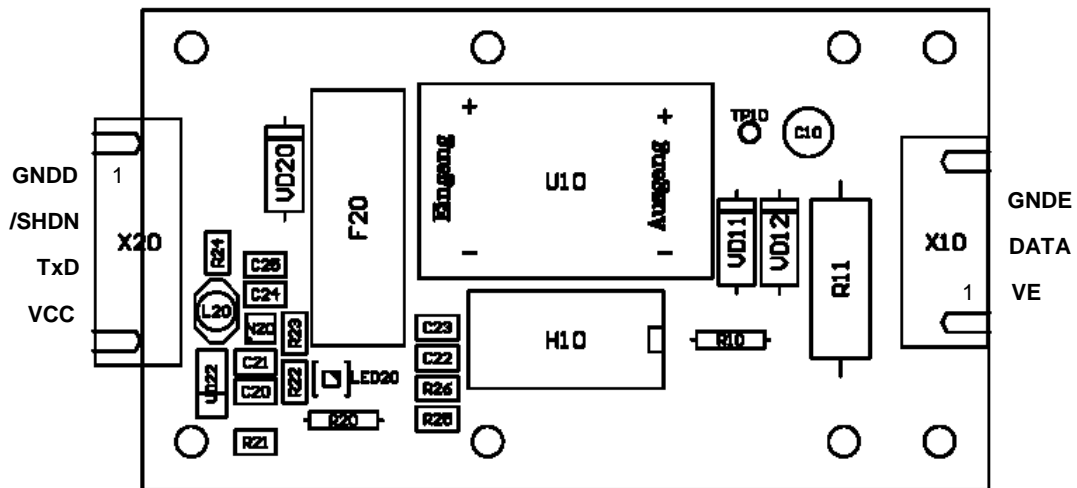
_ 2.3 Pin Assignment

Intrinsically safe connections

- | | | |
|---|------|------------------------------------|
| 1 | VE | Intrinsically safe supply voltage |
| 2 | DATA | Serial data cable |
| 3 | GNDE | Intrinsically safe earth reference |

Non-intrinsically safe connections

- | | | |
|---|-------|--------------------|
| 1 | GNDD | Earth |
| 2 | /SHDN | Enable signal |
| 3 | TxD | Serial data output |
| 4 | VCC | Supply voltage |



_ 3 Assembly and Start-Up

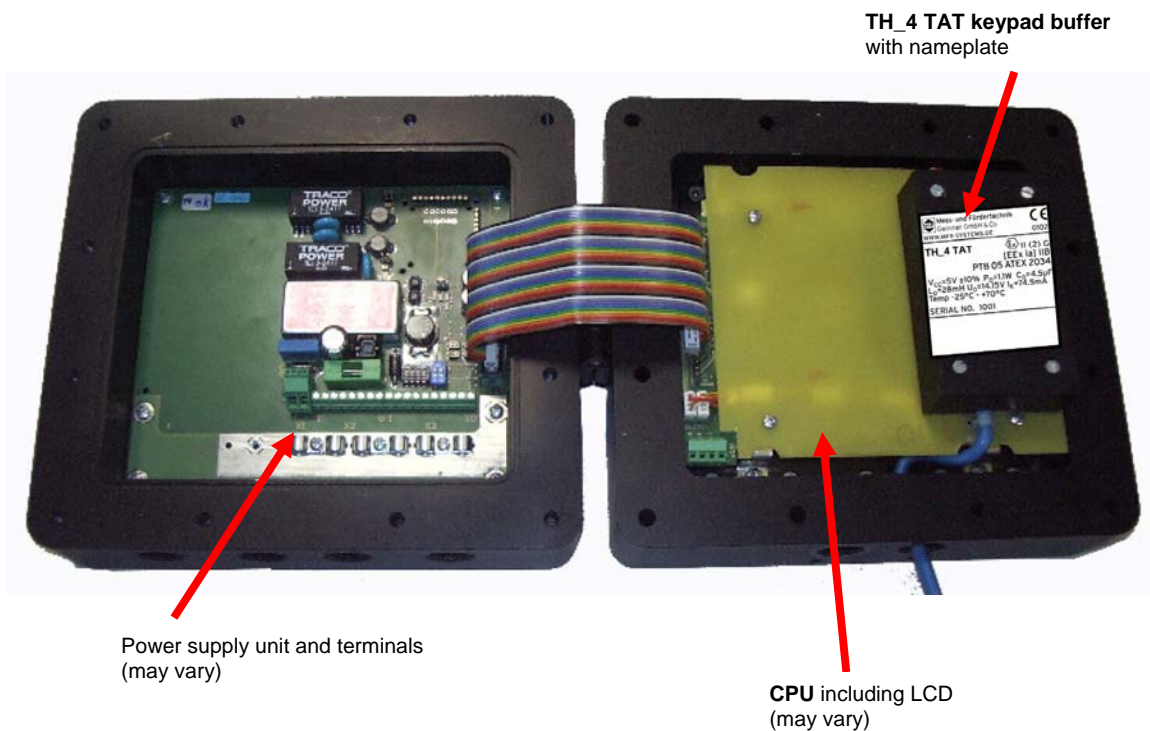
For maintenance and/or servicing of the TH_4 TAT keypad buffer, the operator must engage personnel who:

- Are over 18 years of age
- Meet the necessary requirements with regard to expertise, health and mental state
- Have been instructed in the assembly, operation and maintenance of the MFX_4 CH and the installation conditions
- Work in a responsible, proper and authorised way
- Are familiar with the applicable explosion protection regulations

Before starting the device, please ensure that:

- The device has been installed correctly
- The device is not damaged
- The cables have been connected correctly

The TH_4 TAT keypad buffer is fixed to the CPU in the device cover.

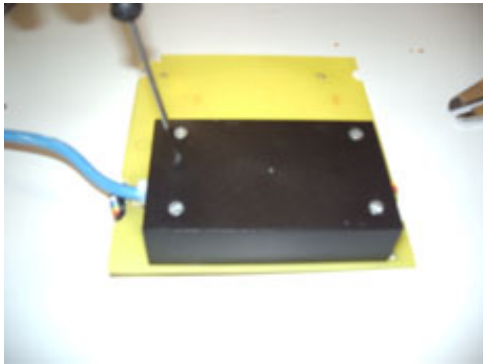




Attention:

The MFX_4 TAT is mounted on an appropriate component-free area of a mother board so that the insulating PCB material can act as a protective cover.

No metal screws or metal distance bolts may be used for assembly.



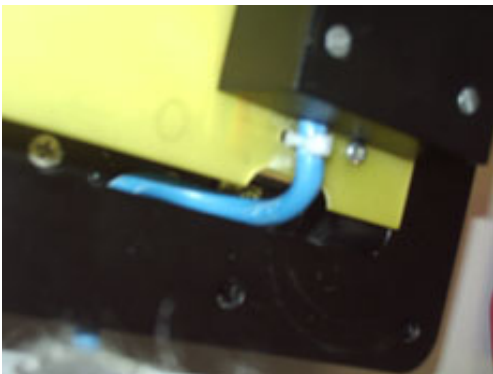
The cover is fixed using four plastic screws.



Use a cable tie for strain relief.

Connections from top to bottom:

- Top - 1
- Middle - 2
- Bottom - 3



When placing the CPU in the housing, make sure that the cable for the keypad is inserted correctly.

The cable must not be squeezed when the housing is snapped shut.

_ 4 Maintenance

_ 4.1 Modifications and Repair

If electrical equipment with explosion protection is repaired or modified, then, according to ElexV § 9, it can only be started up again once it has been checked by an authorised specialist.

Replacement of original devices in explosion-proof areas is not affected, for instance.

If repairs to the explosion-proof control system are carried out by the manufacturer, then acceptance by a specialist is not required.

_ 4.2 Regular Maintenance and Safety Checks

The electronic components must be subjected to regular safety checks and maintenance according to ElexV § 12 and VBG 4. The intervals for regular checks depend on the operating and ambient conditions. We recommend at least one safety check per year.

_ 4.3 Checklist for Maintenance Work

Cable inlet	Check that the screwed glands are secure and check the condition of the seals within the screwed gland.
Terminals	The contact points should be regularly checked for tightness. Terminals should be tightened.
Cables	The electrical cables and contact points inside the equipment must be regularly checked for traces of unacceptably high exposure to heat. Any discoloration indicates excessive temperatures.
Check switching devices	Check that the integrated electrical switching devices are in proper condition.
Equipotential bonding conductor	
	On metal housing the condition of the external connection of the equipotential bonding conductor must be checked.
Moisture	Dirt and moisture within the pressure area must be carefully removed.
Mechanical fixing	The fixing of the integrated equipment (mechanical fixing as well as tightness of the electrical contacts) must be checked.
External condition	Check whether any holes or cracks have appeared such as might allow penetration of moisture or dirt.
Heat generation	A regular check must be carried out to ensure that the maximum permitted temperatures are observed under normal operation. For connectors and sockets, this can for example be implemented adequately by touching them. If required, contact thermometers approved for use in potentially explosive areas can also be used. Temperature indicators attached to the housing have proved effective. Another effective indicator is the discoloration of insulating material from exposure to heat.
Assembly	Once inspection and maintenance work has been completed, the pressure area must be properly sealed again. In particular, ensure that any covers that have been removed are refitted properly to the correct housing base and secured in place (do not mix up similar covers).