

MT228 Universal Ex-Isolating Driver

Power supply unit (MUS) for 4 - 20 mA transmitter / HART / FOXCOM,
Power supply unit (MUS) for positioner with FOXCOM digital,
Isolating driver (TV) for 4 - 20 mA signals. Intrinsically safe is the Input.



The Universal Ex-Isolating Driver MT228 separates intrinsically safe and non intrinsically safe circuits. It supplies galvanically isolated transmitters and positioners with FOXCOM communication or transmitter with HART communication. Connection to hand terminal or to personal computer can be made at every location in the signal loop. The bidirectional communication between a digital control system, a hand terminal or a PC and a transmitter or positioner is possible.

FEATURES

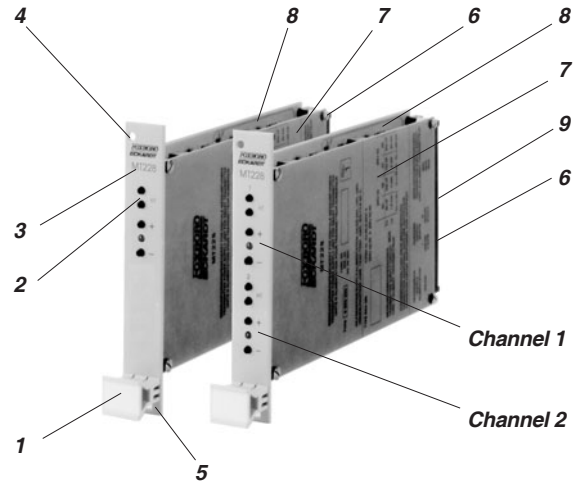
- Bidirectional communication with intelligent transmitters
- Bidirectional communication with intelligent positioners
- No external communication resistor required
- Rail mounting and nest mounting versions
- 1 or 2 channel version with nest mounting
- 2 channel version power supply unit + isolating driver can be used as signal multiplier
- Output 0 / 4 ... 20 mA
- Intrinsically safe [Ex ia] IIC
- Little natural energy consumption
- Concept of intrinsic safety includes linkage of operating device
- Galvanic isolation between all circuits
- Sockets for hand terminal or PC on the front
- EMC in accordance with the latest NAMUR-recommendations and international standards and laws
- Multidrop operation up to 5 intelligent HART transmitters
- Plugable terminals with rail-mounted module
- Optional plugable spring terminals

Repair and maintenance must be carried out by qualified personnel!

1 DESIGN

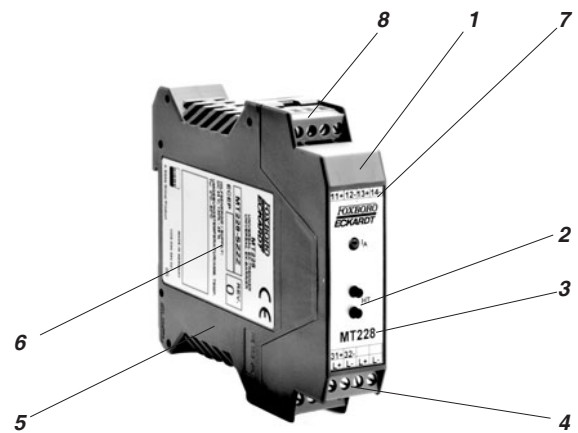
1.1 MT228, Nest-Mounted Module

- 1 Nameplate (replaceable)
- 2 HT: Plugs for communication
- 3 Model Name
- 4 Observation hole for slot No. (in TE)
- 5 Screw for fastening in 19" rack
- 6 Male multipoint connector DIN 41 612 Form F, 32-pins, rows z and d
- 7 Data label with connection diagram
- 8 Fuses in the device for power supply, input and output
- 9 Intrinsic Safety sticker (blue)



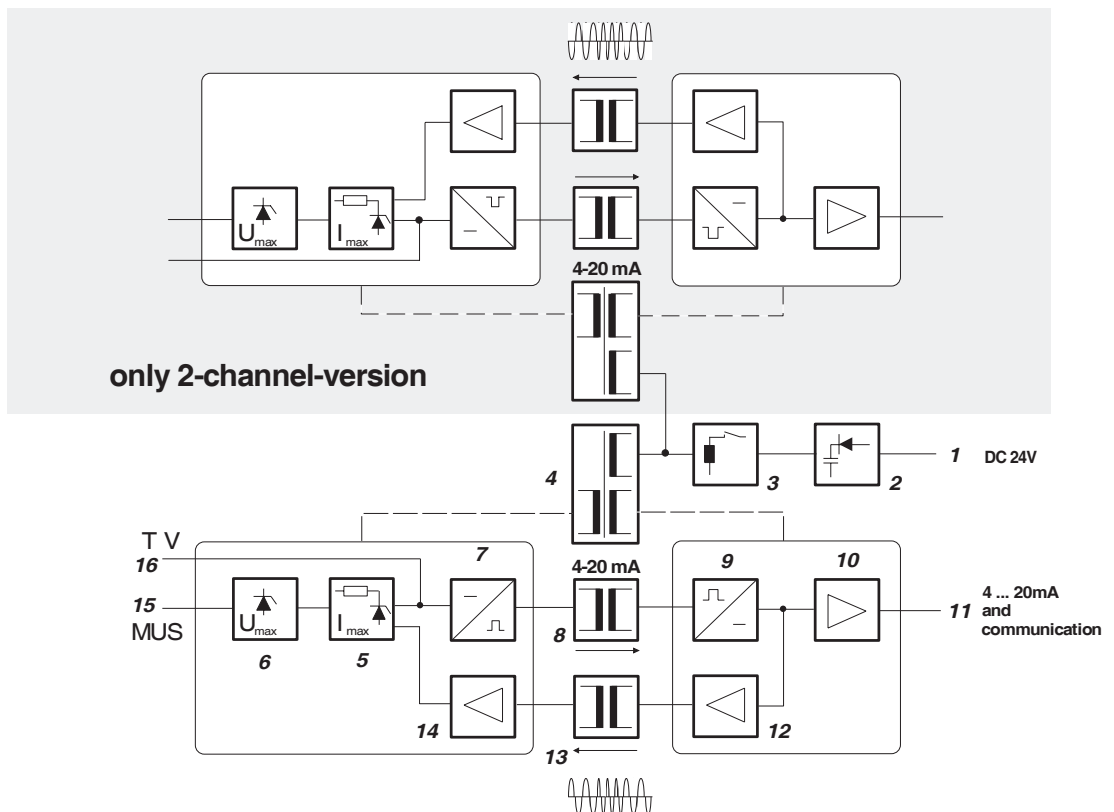
1.2 MT228, Rail-Mounted Module

- 1 Nameplate (replaceable)
- 2 HT: Plugs for communication
- 3 Model Name
- 4 Screw terminals for input and power supply, wire cross-section max. 2.5 mm²
- 5 Fuses in the device for power supply, input and output
- 6 Data label
- 7 Connection diagram (blue at intrinsic safety)
- 8 Screw terminals for input, wire cross-section max. 2.5 mm²



2 METHOD OF OPERATION

2.1 Block diagram



2.2 Description

The power supply unit is sourced via the plugs for power supply **1**. The following parts work as an electrical protection resp. as a protection against electro-magnetic influence. In accordance to the version of the device the power supply is rectified and smoothed **2**.

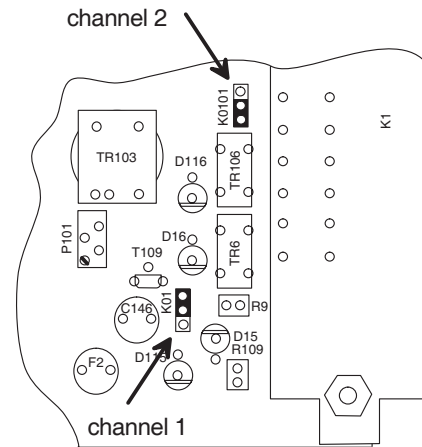
The electrical energy is sourced to the different areas galvanically separated by a flyback converter **3** and high-frequency transformer **4**.

2-wire-transmitters are supplied intrinsically safe (current **5** and voltage limited **6**) via the connector for transmitters **15**. The measuring signal of transmitter is chopped **7**, transferred galvanically separated by a high-frequency transformer **8**, reconstructed in a synchron rectifier **9** and put on the output of the device **11** via the output circuit **10**.

Communication signals of a transmitter are transferred via measuring channel **7, 8, 9, 10**, while communication signals are transferred from an operating device (e.g. PC) connected to the output **11** via amplifier **12** and transformer **13** and then will be reconstructed in a further amplifier with rectifier **14**.

The 2-wire-signal is connected via the power supply for transmitter **5**. If the device is operating as isolating driver (input **16**), the connected measuring signal will be transferred via measuring channel **7, 8, 9, 10**. The blocks **5, 6** (which are necessary for supplying of transmitter) and the communication way **12, 13, 14** cannot be used in this case. For two channel devices (19" only) the functional blocks **4 ... 16** are doubled. The function of first and second channel are equal.

Figure shows the jumper position for loads > 230 Ω. For the use with loads < 230 Ω the jumper must be plugged in the other position.



3 ELECTRICAL CONNECTION

3.1 Connection diagram

Rail mounted MT228 -S		19" nest-mounted version MT228-					
		...-N	...-M	...-O	...-P	...-R	
11	+ M	z2	+ M	- ET	+ M 1	+ M 1	- ET 1
12	-	d2	-	+	-	-	+
13	- ET	z8			+ M 2	- ET 2	- ET 2
14	+	d8			+	+	+
31	+	z16			+ A2*)	+ A2*)	+ A2*)
32	- A (Hi)	d16			-	-	-
34	- A (Lo)						
L+	+	z22	+ A *)	+ A *)	+ A1*)	+ A1*)	+ A1*)
L-	-	d22	-	-	-	-	-
L+	+	z26	- H	- H	- H	- H	- H
L-	-	d26	+	+	+	+	+

M: Supply circuit of transmitter ET: Input isolating driver
 A: Output H: Power supply DC 24V

Hi) Output for load > 230 Ω

Lo) Output for load < 230 Ω

*) Selection of output load for nest-mounted version via jumpers in the device. Factory set of jumpers: For loads > 230 Ω.

3.2 Output connection

The MT228 is also able to operate with communication by loads < 230 Ω. The device for rail mounting has therefore a second output. At the nest-mounted devices, the selection is done via jumper (by 2-channel-device 2 jumpers). The fi-

4 STARTING OPERATION

Isolating Drivers MT228 are ready for operation. Insert nest-mounted module MT228 into the slot in the rack and fix the fastening screw. Any slots in the 19" rack units or other housings which are not used must be sealed by means of dummy cover plates. Rail-mounted module MT228 snap on rail.

5 ENDING OPERATION

Loosen fastening screw of nest-mounted module and pull device unit off the rack. Seal the empty slot with a dummy cover plate. Remove connection wires and pull rail-mounted module from the rail. Before starting or ending operation the devices suitable measures are to take, to avoid any disturbance of operation.

6 MAINTENANCE

The Isolating Driver MT228 is maintenance-free.

7 SAFETY REQUIREMENTS

7.1 General requirements

The device satisfies the conditions for safety class III, over voltage categorie 1 according to EN 61010-1 (resp. IEC 1010-1). It is made for indoor use. The device has to be mounted in a rack or other equivalent housing. Maintenance and repair work must only be performed by authorized personnel if the device is under power.

7.2 Replacing fuses

The fuse F2 resp. F202 - IEC 127 T 0.2 - can be replaced by authorized personnel (for intrinsic safety refer to chap. 7.4).

7.3 Connection requirements

The device has to be connected in accordance with the electrical connection diagram. The national requirements are to be considered, e.g. DIN VDE 0100 or DIN VDE 0800 in the Federal Republic of Germany.

The device has to be operated with safety extra-low voltage SELV or SELV-E.

Protection arrangements in the device may be damaged if the master instruction is not observed.

7.4 Explosion protection

(Only if ordered accordingly)

Technical data for explosion protection see Product Specifications PSS EI10222 A-(en) and Certificate of Conformity EX EI10222 A-(en).

For installation in contact with explosive atmospheres, all relevant national regulations and installation conditions must be observed, e.g. ElexV and DIN VDE 0165 in the Federal Republic of Germany .

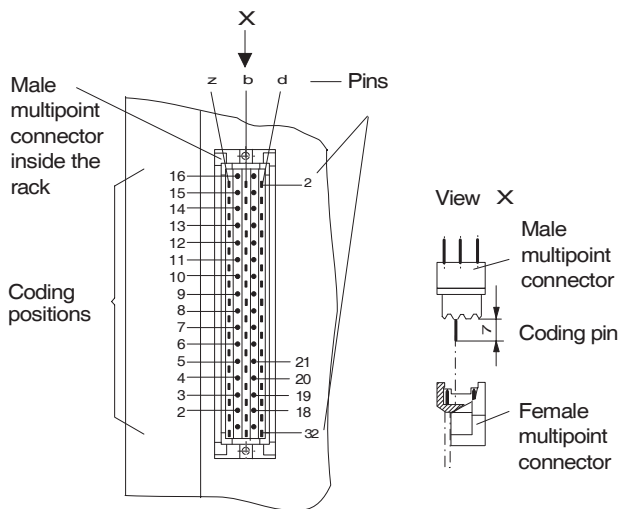
The following applies to the Federal Republic of Germany: Repairs involving parts required for explosion protection must either be carried out by the manufacturer or by authorized personnel and confirmed by certificate.

7.5 Coding of intrinsically-safe devices

For nest-mounted modules with intrinsic safe circuits the slots in a rack or equivalent housing have to be coded depending on the device, in order to avoid errors in mixed assemblies.

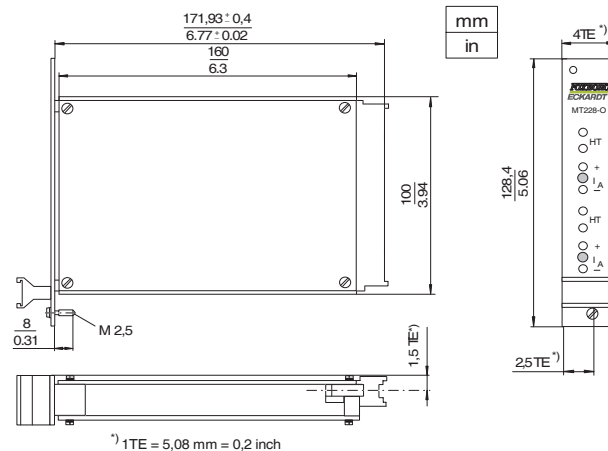
19" device	Type	Coding position
MT228-N	AS 423	5, 9, 15, 18
MT228-M		2, 9, 18
MT228-O		9, 18
MT228-P		6, 9, 18
MT228-R		2, 9, 18

The rail-mounted device encloses a set of coding pins.

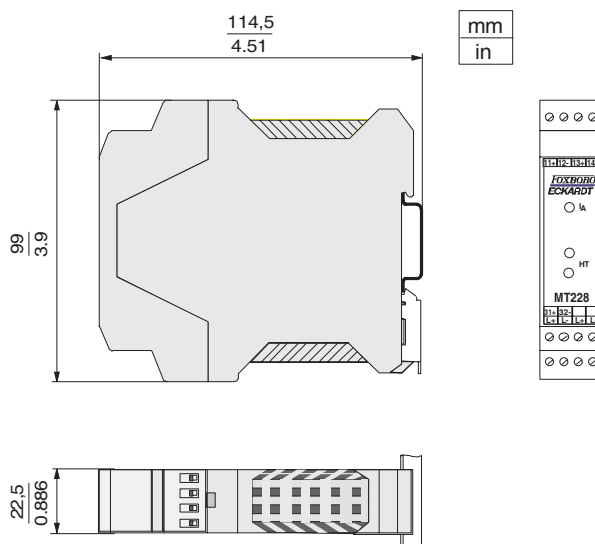


8 DIMENSIONS

MT228, nest mounted (Example: MT228-O)



MT228 rail mounted



Further documentation:

- Master Instruction MI EMO0110 A-(en)
HT991 Universal Hand Terminal for HART Devices
- Master Instruction MI EMO0120 A-(en)
ABO991 Display and User Interface for HART Devices
- WPP991 Write Protection Program
- HHT Instruction Book 3372
I/A Series Hand Held Terminal
- PC10 Instruction Book 3466
Intelligent Transmitter Configurator

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