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M+F | Systems

MFX_4 CONTROLLER EX V4

MFX_4 Controller V4 [Ex] Housing (for field installation).

The MFX_4 Controller is the flow computer for custody transfer, and it is available as explosion-proof housing type. The MFX_4 Controller is also available as DIN rail version.

The MFX_4 Controller offers a two-line display. The first line always shows the measured quantity; the second line can show several configurable values, e.g. density, temperature, net volume and others.



MFX_4 CONTROLLER EX V4

CHARACTERISTICS

Approvals	PTB Type-Approval Certificate [W&M approved] OIML R117-1 2007 MID Type-Examination Certificate several more national approvals
Housing	W 220 mm x H 200mm x D 200 mm, IP65
Marking of Equipment	II 2 G Ex d [ia/ib] IIB T6
Weight	9.500 g (with cable glands)
Ambient working temperature	-20 °C ... +40 °C -25 °C ... +60 °C (option) extended temperature range
Storage temperature	-25 °C to +75 °C
Power supply	24 VDC ±10 % Ptyp = 8 W Pmax = 15 W (without using the analogue output) Pmax = 40 W (using the analogue output 0...400 mA) or 110 VAC... 240 VAC Ptyp = 8 W Pmax = 15 W (without using the analogue output)
Display	Alphanumeric display; 2x16 characters LED backlight Automatic contrast tracking
Interfaces	CAN-Bus (with electrical isolation) RS232 or RS485 (with electrical isolation)
Protocols	CANopen MODBUS RTU TCP/IP via MFX_4 EDI or MFX_4 Terminal MODBUS TCP via MFX_4 EDI
DIP switch	For termination resistors RS485
LEDs	Power (green) Connect (green) CAN_T (yellow) CAN_R (yellow) Pulse (yellow) Loading (yellow) Error (red)

MFX_4 CONTROLLER EX V4

SINGLE METER VERSION	DUAL METER VERSION
Pulse Input • 1x pulse input (double pulse) (2 KHz) • 1x pulse input (single pulse) (2 KHz) Maximum 5 single pulse inputs by using the digital inputs 1-4 (200 Hz).	**Pulse Input** • 1x pulse input (A/B) (double pulse) (2 KHz) **(meter 1)** • 1x pulse input (C/D) (double pulse) (2 KHz) **(meter 2)**
Temperature Measurement • 1x resistance thermometer PT100 4-wire	**Temperature Measurement** • 1x resistance thermometer PT100 4-wire (meter 1) • 1x resistance thermometer PT100 4-wire (meter 2)
Density Measurement • 1x direct density input [frequency] • 1x resistance thermometer PT100 4-wire or via 20 mA input (not available in Germany)	**Density Measurement** • via 20 mA input (not available in Germany)
Analogue Inputs • 2x analogue inputs 0/4 ...20 mA e.g.: pressure-, density measurement, etc.	**Analogue Inputs** • 2x analogue inputs 0/4 ...20 mA e.g.: pressure-, density measurement, etc.
Analogue Outputs • 2x analogue outputs 0/4 ...20 mA e.g.: flow control, blending, etc.	**Analogue Outputs** • 2x analogue outputs 0/4 ...20 mA e.g.: flow control, blending, etc.
Digital In-/Outputs • 7x AC switching output (230 V) 8x DC switching output (24 V) if required: relay output, solid state, optocoupler • 12x digital inputs The digital inputs 1 to 4 may also be used as pulse inputs (max. 200 Hz).	**Digital In-/Outputs** • 7x AC switching output(230 V) 8x DC switching output (24 V) relay output, solid state, optocoupler on request • 12x digital inputs The digital inputs 1 to 4 may also be used as pulse inputs (max. 200 Hz). (The in-/outputs may be allocated to both meters in any user-defined order.
Pulse Output • 1x rated pulse output (optocoupler) configurable: net volume, gross volume, mass • 1x pulse output (A/B pulse) (optocoupler) copy of pulse input (for prover)	**Pulse Output** • 1x rated pulse output (optocoupler) configurable: net volume, gross volume, mass • 1x pulse output (A/B pulse) (optocoupler) copy of pulse input (for prover)

MFX_4 CONTROLLER EX V4

STANDARD FEATURES

- Single or multi product operation
- Additive blending with flushing feature
- Flow control for digital or analogue valves
- Dual pulse security according to ISO 6551 Level A
- Configurable inputs/outputs
- Automatic temperature and pressure compensation
- Preset for batching with automatic trip correction
- Meter factor calculation
- Error curve linearization (4 curves with up to 10 data points)
- Up to 10 products configurable
- ASTM Table 54A,B,D,X
- KOE calculation of up o 5 data points
- KOE polynomial calculation (method 3) (product mixtures)
- Pressure compensation (correction)
- Rated pulse output
- Graphic display with multi-language capability
- Automatic error handling and reporting
- Integrated log-book for selected procedures
- Manual or automatic mode selection
- Configurable I/O sequencing
- 5 level access authorisation
- Voucher storage of up to 200 transactions per meter
- Interface to density meter
- Configurable control functions (SPS/PLC)
- Remote maintenance via diagnostic interface

Interfaces

- Field bus communication CANopen
- LAN communication Ethernet TCP/IP via MFX_4 EDI
- Serial interfaces RS232/RS485
- OPC server via MFX_4 EDI, Modbus RTU, Modbus TCP via MFX_4 EDI

OPTIONAL FEATURES

- Density measurement via frequency from density meter
- Density measurement via 0/4 ... 20 mA from density meter
- Inline blending -> ratio, side or sequential (with flushing feature)
- Multi-product blending (max. 10 products)
- Additive control with integrated controller (analogue and digital) for max. 10 additives
- Serial interface to smart additive controller
- Pipeline metering applications
- Volume comparison for leakage detection
- Master meter feature

- PC-based features:

MPC Pipeline metering and proving systems
Master meter feature
Multi-product blending controller
UPC 2000 (data memory approved for custody transfer)

- PC-based service tools:

MFX_4 Explorer for equipment configuration
Remote maintenance and diagnostic tools

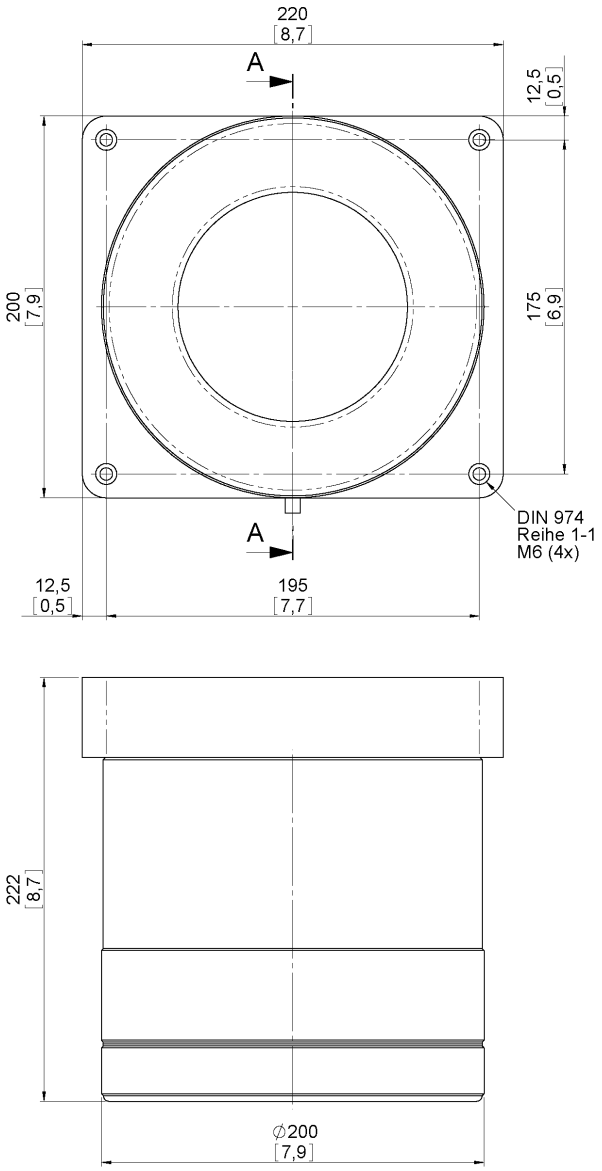
MFX_4 CONTROLLER EX V4

PRODUCT KEY MFX_4 CONTROLLER EX V4

	4000004 + [basic device] + [temperature range] +[metering option] + [software option] + [I/O option] + [interface option]+ [approval] + [cable] + [options] e.g. 4000004 – P230 – TR1 – CH1 – SW00 – R13 – RS232 –C1 – IK01			
Basic device	P230 P024	= Supply voltage 230 VAC = Supply voltage 24 VDC		
Temperature range	TR1 TR2	= -20 °C ... +40 °C (standard) = -25 °C ... +60 °C (extended)		
Metering Option	CH1 CH2	= Single = Dual		
Software option	SW00 SW01 SW02 SW03 SW04 SW05 SW06	= Meter controller + additive = Blending controller = Density = Pipeline = Pipeline leakage detection = Master meter = Master meter (duty meter)		
I/O option	ADR R13	= 7 AC relays + 8 DC relays = 13 relays	4A9 4D9	= 4 solid state (AC) + 9 relays = 4 solid state (DC) + 9 relays
Interface option	RS232 RS485	= RS232 = RS485		
Approval	C0 C1 C2	= No W&M approval = Measuring Instruments Directive = W&M approval		
Cable	IK0 IK01 IK02 IK03	= No cable = 5m (Power + CANopen) = 10m (Power + CANopen) = 15m (Power + CANopen)		
Options	WM	= External W&M Switch		

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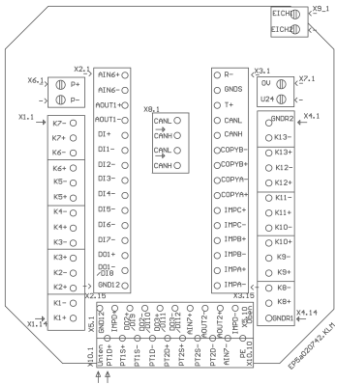
DIMENSIONS

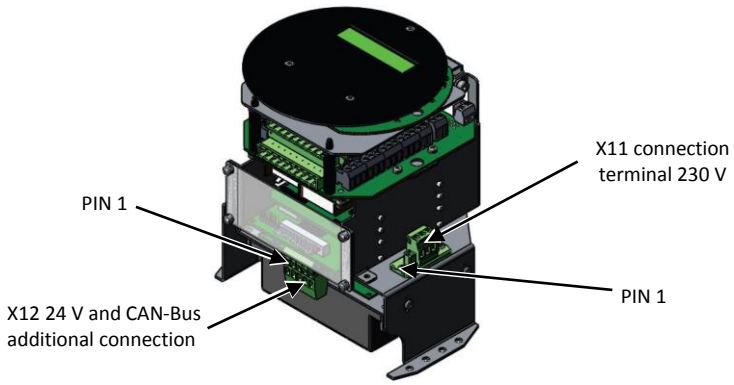


Dimensions
254 : Dimension in millimetres
[10] : *Dimensions in inches*

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PIN CONFIGURATION





PIN	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
1		AIn6+	R-		GND12	P+	0V	CANL	EICH1	PT1D+	L	0V
2		AIn6-	GNDS		IMPD+	P-	U24	CANH	EICH2	PT1S+	PE	CANL
3		AOut1+	T+		DO2+ / DI9			CANL		PT1S-	N	SH
4		AOut1-	CANL		DO2- / DI10			CANH		PT1D-		CANH
5		DI+	CANH		DO3+ / DI11					PT2D+		24V
6		DI1-	CopyB-		DO3- / DI12					PT2S+		
7		DI2-	CopyB+		AIn7+					PT2S-		
8		DI3-	CopyA-		AOut2-					PT2D-		
9		DI4-	CopyA+		AOut2+					Ain7-		
10		DI5-	IMPC+		IMPD-					PE		
11		DI6-	IMPC-									
12		DI7-	IMPB+									
13		DO1+	IMPB-									
14		DO1- / DI8	IMPA+									
15		GND12	IMPA-									

PIN	X1			
	ADR	R13	4A9	4D9
1	GNDR	K7-	K7-	K7-
2	GNDR	K7+	K7+	K7+
3	K8-	K6-	K6-	K6-
4	K7-	K6+	K6+	K6+
5	KD+	K5-	K5-	K5-
6	K6-	K5+	K5+	K5+
7	K5-	K4-	K4-	K4-
8	KC+	K4+	K4+	K4+
9	K4-	K3-	K3-	K3-
10	K3-	K3+	K3+	K3+
11	KB+	K2-	K2-	K2-
12	K2-	K2+	K2+	K2+
13	K1-	K1-	K1-	K1-
14	KA+	K1+	K1+	K1+

X4			
ADR	R13	4A9	4D9
K9_AC	GNDR2	GNDR2	GNDR2
K9_AC	K13-	K13-	K13-
K10_AC	K13+	K13+	K13+
K10_AC	K12-	K12-	K12-
K11_AC	K12+	K12+	K12+
K11_AC	K11-	K11-	K11-
K12_AC	K11+	K11+	K11+
K12_AC	K10-	K10-	K10-
K13_AC	K10+	K10+	K10+
K13_AC	K9-	K9-	K9-
K14_AC	K9+	K9+	K9+
K14_AC	K8-	K8-	K8-
K15_AC	K8+	K8+	K8+
K15_AC	GNDR1	GNDR1	GNDR1

Options for relay card:

ADR	- 7 AC relays+ 8 DC relays
R13	- relay card with 13 relay
4A9	- 4 AC solid state relay + 9 relay
4D9	- 4 DC solid state relay + 9 relay

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CABLE GLANDS

6 x M20
2 x M25
(1 x M16 (W&M Switch))

