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M+F | Systems

MFX_4 CONTROLLER NO EX V4

The MFX_4 Controller is the flow computer for custody transfer applications.

The MFX_4 Controller is also available with an approved explosion-proof housing.

The MFX_4 Controller offers a two-line display, which remains in operation in case of power outage [OIML requirement]. 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 NO EX V4

CHARACTERISTICS

Approvals	PTB Type-Approval Certificate [W&M approved] OIML R117-1 2007 MID Type-Examination Certificate several more national approvals
Housing	Aluminium / ABS, black, IP 20 DIN rail module: W 93 mm x H 128 mm x D 158 mm Minimum clearance: left/right 10 mm top/bottom 50 mm
Weight	1.100 g (without connectors)
Ambient working temperature	-20 °C ... +40 °C (see installation instructions)
Storage temperature	-25 °C to +75 °C
Power supply	24 VDC ±10 % P _{typ} = 8 W P _{max} = 15 W (without using the analogue output) P _{max} = 40 W (using the analogue output 0...400 mA)
Display	Alphanumeric display; 2x16 characters LED backlight Automatic contrast tracking 5 minute display buffer in case of power outage [OIML requirement]
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)



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SINGLE METER VERSION

DUAL METER VERSION

<p>Pulse Input</p> <ul style="list-style-type: none"> • 1x pulse input (double pulse) (2 KHz) • 1x pulse input (single pulse) (2 KHz) <p>Maximum 4 single pulse inputs by using the digital inputs 1-4 (200 Hz).</p>	<p>Pulse Input</p> <ul style="list-style-type: none"> • 1x pulse input (A/B) (double pulse) (2 KHz) (meter 1) • 1x pulse input (C/D) (double pulse) (2 KHz) (meter 2) <p>Maximum 4 single pulse inputs by using the digital inputs 1-4 (200 Hz).</p>
<p>Temperature Measurement</p> <ul style="list-style-type: none"> • 1x resistance thermometer PT100 4-wire 	<p>Temperature Measurement</p> <ul style="list-style-type: none"> • 1x resistance thermometer PT100 4-wire (meter 1) • 1x resistance thermometer PT100 4-wire (meter 2)
<p>Density Measurement</p> <ul style="list-style-type: none"> • 1x direct density input [frequency] • 1x resistance thermometer PT100 4-wire or via 20 mA input (not available in Germany) 	<p>Density Measurement</p> <ul style="list-style-type: none"> • via 20 mA input (not available in Germany)
<p>Analogue Inputs</p> <ul style="list-style-type: none"> • 2x analogue inputs 0/4 ...20 mA e.g.: pressure-, density measurement, etc. 	<p>Analogue Inputs</p> <ul style="list-style-type: none"> • 2x analogue inputs 0/4 ...20 mA e.g.: pressure-, density measurement, etc.
<p>Analogue Outputs</p> <ul style="list-style-type: none"> • 2x analogue outputs 0/4 ...20 mA e.g.: flow control, blending, etc. • 1x analogue output 0...400 mA (control of proportional valves) 	<p>Analogue Outputs</p> <ul style="list-style-type: none"> • 2x analogue outputs 0/4 ...20 mA e.g.: flow control, blending, etc. • 1x analogue output 0...400 mA (control of proportional valves)
<p>Digital In-/Outputs</p> <ul style="list-style-type: none"> • 7x AC switching output (230 V) • 8x DC switching output (24 V) relay output, solid state, optocoupler on request • 12x digital inputs, of which 5 as configurable bidirectional inputs/outputs (max. 3 optocoupler outputs) <p>The digital inputs 1 to 4 may also be used as pulse inputs (max. 200 Hz).</p>	<p>Digital In-/Outputs</p> <ul style="list-style-type: none"> • 7x AC switching output(230 V) • 8x DC switching output (24 V) relay output, solid state, optocoupler on request • 12x digital inputs, of which 5 as configurable bidirectional inputs/outputs (max. 3 optocoupler outputs) <p>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.</p>
<p>Pulse Output</p> <ul style="list-style-type: none"> • 1x rated pulse output (optocoupler) configurable: net volume, gross volume, mass • 1x pulse output (A/B pulse) (optocoupler) copy of pulse input (e.g. prover) 	<p>Pulse Output</p> <ul style="list-style-type: none"> • 1x rated pulse output (optocoupler) configurable: net volume, gross volume, mass • 1x pulse output (A/B pulse) (optocoupler) copy of pulse input (e.g. prover)



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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
- Volume conversion according to ASTM Table 54-A/B/D/X, API 5/6-A/B, API 1250 59/60-A/B/C/D
- KOE calculation of up to 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 pulse input 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



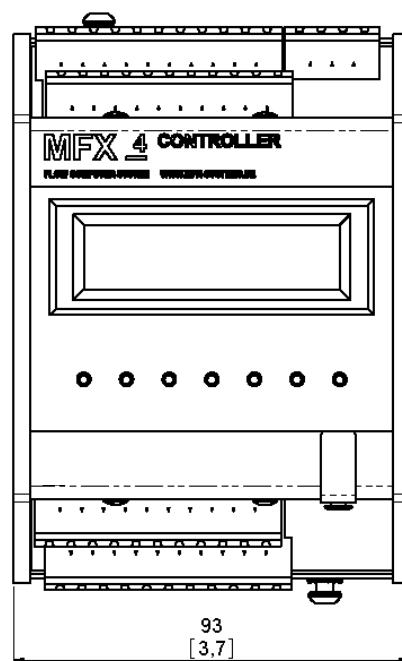
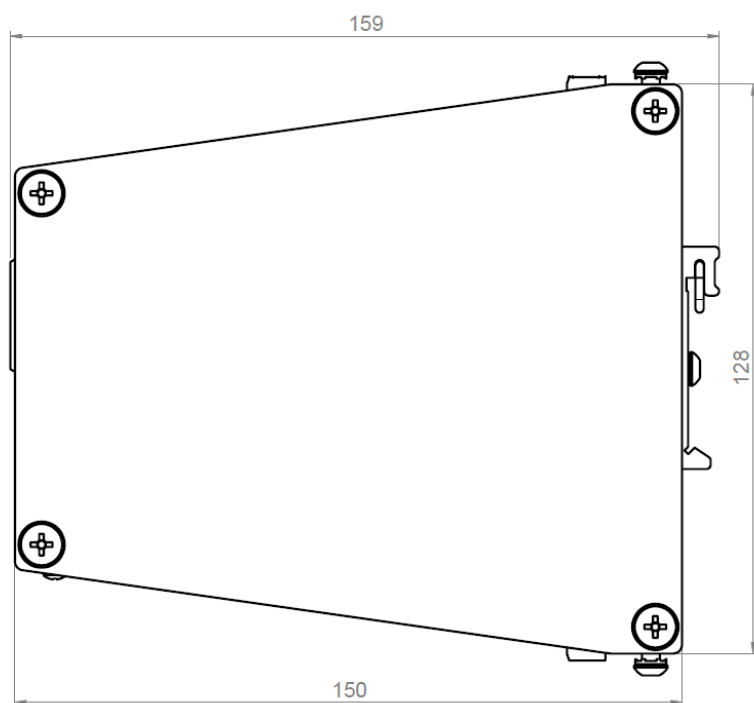
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PRODUCT KEY MFX_4 CONTROLLER NO EX V4

	4000677 + [basic device] + [software option] + [I/O option] + [interface option] + [approval] e.g. 4000677 - CH1- SW00 - R13 - RS232 - C1	
Basic device	CH1 CH2	= Single 24 VDC = Dual 24 VDC
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 4A9 4D9	= 7 AC relays + 8 DC relays = 13 relays = 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

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DIMENSIONS



Dimensions

254 : Dimension in millimeters

[10] : *Dimensions in inches*

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PIN CONFIGURATION

Housing Top



Housing Bottom



PIN	X1	X2	X3	X4	X5	X6	X7	X8
1	0V	Ai6+	Di+	A+	R-			TxD+
2	CANL	Ai6-	Di1-	A-	GndS			T2S+
3	Sh	Ai7+	Di2-	B+	T+			T2S-
4	CANH	Ai7-	Di3-	B-	cB-			T2D-
5	24V	Ty+	Di4-	C+	cB+			
6		T1S+	Di5-	C-	cA-			
7		T1S-	Di6-	D+	cA+			
8		T1D-	Di7-	D-	Do1+			
9		Ao+	G12	G12	Do1- / DI8			
10		Ao1-	Do3+ / DI11	P+	Do2+ / DI9			
11		Ao2-	Do3- / DI12	P-	Do2- / DI10			

PIN	X6	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+

X7	R13	4A9	4D9
ADR	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