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M+F

M+F│Systems

MFX_4 COMPACT V 1.0

The MFX_4 Compact combines the features of the MFX_4 Controller and the MFX_4 Terminal in an [Ex]-proof housing.

Due to its compact one-box-design, the MFX_4 Compact is especially suited for small installations.

The MFX_4 Terminal is the Human-Machine-Interface [HMI] between the flow computer [e.g. MFX_4 Controller] and the operator in the field.

The MFX_4 Controller is the flow computer and the core unit of the MFX_4 System.

MFX_4 COMPACT V 1.0

CHARACTERISTICS

Approvals	PTB Type-Approval Certificate [W&M approved] OIML R117-1 2007 MID Type-Examination Certificate several more national approvals	
Housing	W 232 mm x H 255 mm x D 291 mm IP65	
Marking of Equipment	II 2 G EEx d... IIB T6	
Weight	16.000 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 = 15 W　　　　　Pmax = 30 W	110 VAC... 240 VAC Ptyp = 16 W　　　　　Pmax = 32 W
Keypad	Foil keypad Mechanical keypad (weatherproof)	
Display	**Controller** Alphanumeric display; 2x16 characters LED backlight Automatic contrast tracking	**Terminal** Large graphic display, ¼VGA LED backlight Automatic contrast tracking
Integrated card reader	Transponder (Proximity) 13,56 MHz	
Interfaces	CAN-Bus (with electrical isolation) 1x RS232 or 1x RS485 (with electrical isolation) 1x Ethernet TCP/IP (option)	
Protocols	CANopen MODBUS RTU TCP/IP via MFX_4 EDI or MFX_4 Terminal MODBUS TCP via MFX_4 EDI	
LEDs (Controller)	Power　　(green) Connect　(green) CAN_T　　(yellow) CAN_R　　(yellow) Pulse　　　(yellow) Loading　(yellow) Error　　　(red)	

MFX_4 COMPACT V 1.0

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.

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- 2x analogue inputs 0/4 ...20 mA
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Analogue Outputs
- 2x analogue outputs 0/4 ...20 mA
  e.g.: flow control, blending, etc.

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- 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)
  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).

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 pulse output configurable (optocoupler)
  configurable: net volume, gross volume, mass
- 1x pulse output (A/B pulse) (optocoupler)
  copy of pulse input (for prover)

Pulse Output
- 1x pulse output configurable (optocoupler)
  configurable: net volume, gross volume, mass
- 1x pulse output (A/B pulse) (optocoupler)
  copy of pulse input (for prover)

MFX_4 COMPACT V 1.0

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
- Meter 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 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
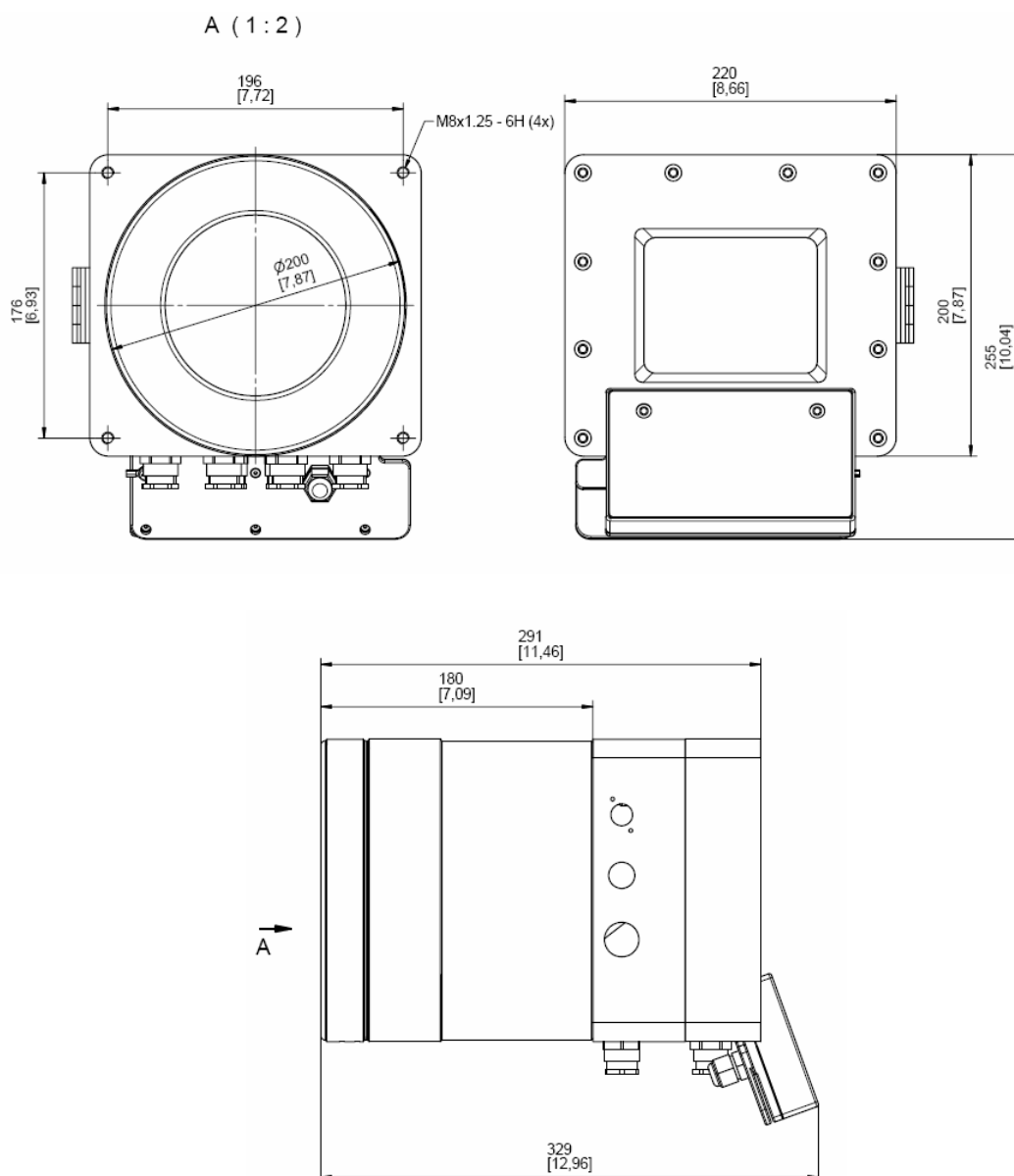Remote maintenance and diagnostic tools

MFX_4 COMPACT V 1.0

PRODUCT KEY MFX_4 COMPACT EX V 1.0

	4000003 + [basic device] + [temperature range] + [metering option] + [keypad] + [card reader] + [Ethernet] + [software option] + [I/O option] + [interface option] + [cable] + [language] + [housing type] e.g. 4000003 – P230 – TR1 – CH1 – KF –CR1 – E1 – SW00 – ADR – RS232 – IK02 – D – Sw
Basic device **(without keypad)**	P230 = Supply voltage 230 VAC P024 = Supply voltage 24 VDC
Temperature range	TR1 = -20 °C … +40 °C (standard) TR2 = -25 °C … +60 °C (extended)
Metering Option	CH1 = Single CH2 = Dual
Keypad	K0 = No keypad KF = Foil keypad KM = Mechanical keypad
Card reader	CR0 = No card reader CR1 = RFID
Ethernet	E0 = No Ethernet E1 = with Ethernet
Software option	SW00 = Meter controller + additive SW01 = Blending controller SW02 = Density SW03 = Pipeline SW04 = Pipeline leakage detection SW05 = Master meter SW06 = Master meter (duty meter)

I/O option	ADR = 7 AC relays + 8 DC relays	4A9 = 4 solid state (AC) + 9 relays
	R13 = 13 relays	4D9 = 4 solid state (DC) + 9 relays

| **Interface option**	RS232 = RS232 RS485 = RS485
Cable	IK0 = No cable IK01 = 5m (Power + CANopen) IK02 = 10m (Power + CANopen) IK03 = 15m (Power + CANopen)
Languages **(see also 571)**	Ost = Polish, Russian, Hungarian, Slovenian, Slovakian, Czech, Romanian, German, English (UK) West = German, English (UK), English (US), French, Spanish, Portuguese, Dutch D = German, English (UK), English (US) CN = Chinese
Housing type	Sw = Housing black anodized Si = Housing silver anodized

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DIMENSIONS

A (1 : 2)

196
[7,72]

M8x1.25 - 6H (4x)

176
[6,93]

Ø200
[7,87]

220
[8,66]

200
[7,87]

255
[10,04]

291
[11,46]

180
[7,09]

A

329
[12,96]

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

MFX_4 COMPACT V 1.0

PIN CONFIGURATION SUPPLY VOLTAGE

X11 connection terminal 230 V

PIN 1

X12 24 V and CAN-Bus additional connection

PIN 1
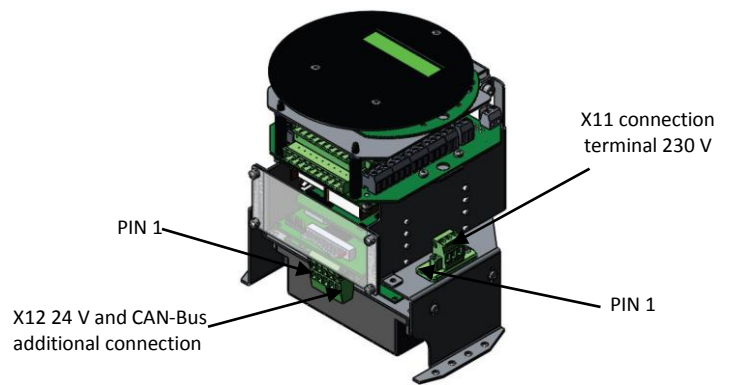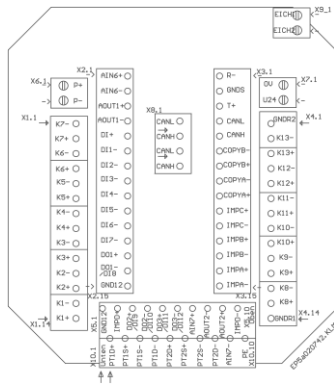
PIN	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12
1		AIn6+	R-		GND12	P+	0V	CANL	EICH1	PT1D+	L	0V
2		AIn6-	GNDS		IMPD+	P-	U24	CANH	EICH2	PT1S+	PE	CANL
3		AOut1+	T+		DO2+ / DI9			CANL		PT1S-	N	SH
4		AOut1-	CANL		DO2- / DI10			CANH		PT1D-		CANH
5		DI+	CANH		DO3+ / DI11					PT2D+		24V
6		DI1-	CopyB-		DO3- / DI12					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				X4			
	ADR	R13	4A9	4D9	ADR	R13	4A9	4D9
1	GNDR	K7-	K7-	K7-	K9_AC	GNDR2	GNDR2	GNDR2
2	GNDR	K7+	K7+	K7+	K9_AC	K13-	K13-	K13-
3	K8-	K6-	K6-	K6-	K10_AC	K13+	K13+	K13+
4	K7-	K6+	K6+	K6+	K10_AC	K12-	K12-	K12-
5	KD+	K5-	K5-	K5-	K11_AC	K12+	K12+	K12+
6	K6-	K5+	K5+	K5+	K11_AC	K11-	K11-	K11-
7	K5-	K4-	K4-	K4-	K12_AC	K11+	K11+	K11+
8	KC+	K4+	K4+	K4+	K12_AC	K10-	K10-	K10-
9	K4-	K3-	K3-	K3-	K13_AC	K10+	K10+	K10+
10	K3-	K3+	K3+	K3+	K13_AC	K9-	K9-	K9-
11	KB+	K2-	K2-	K2-	K14_AC	K9+	K9+	K9+
12	K2-	K2+	K2+	K2+	K14_AC	K8-	K8-	K8-
13	K1-	K1-	K1-	K1-	K15_AC	K8+	K8+	K8+
14	KA+	K1+	K1+	K1+	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

4 x M20
Cable Gland
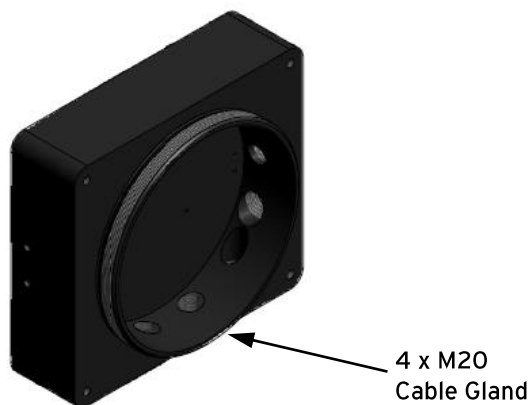
CABLE GLANDS CENTRE PART

Internal M16 for
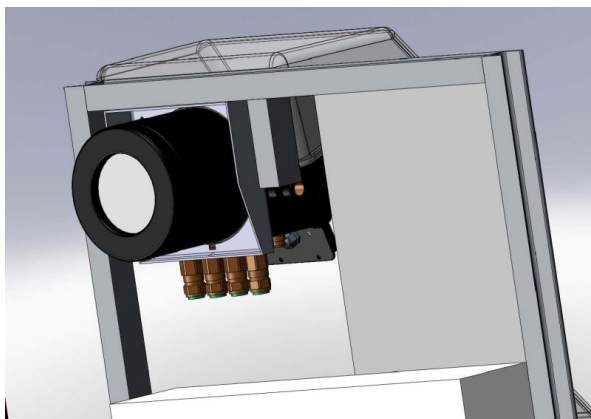external W&M

1 x M20 + 1 x M25
Cable Gland
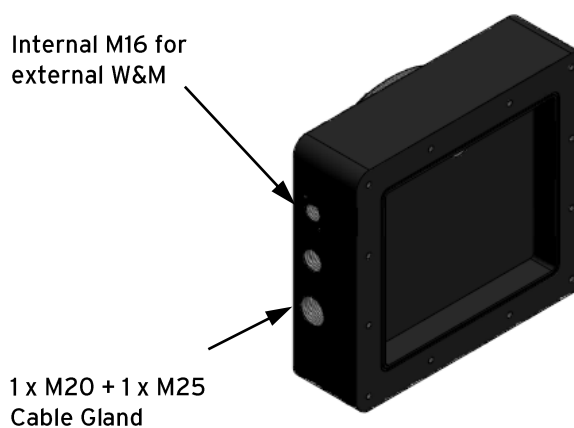
INFORMATION FOR INSTALLATION

For installation, you can order a separate retainer with part number 1010510 (option).

MFX_4 Compact: Controller installation position

MFX_4 Compact: Terminal installation position