



Distributed Process & Monitoring Module

PMM-305 PLUS

The PMM-305 PLUS is a standalone 5-channel Process & Monitoring Module bridging third-party acquisition systems to the CMS-500 PLUS Orca software over Modbus TCP/RTU and OPC UA.

KEY FEATURES

- 5-channel Distributed Process & Monitoring Module
- Bridge to CMS-500P Orca for third-party devices
- Compact and self-contained, stackable up to 8 modules
- Predefined Vibration and Airgap acquisition modes
- Four factory pre-configured conditioning modes available
- Configurable alarms and status signals for each channel
- Modbus RTU/TCP and OPC UA with built-in firewall



MONITORING SOLUTIONS



Endwinding



Air gap



Roller bearing



Axial thrust



Shaft & bearing vibration



DESCRIPTION

The PMM-305P is a standalone 5-channel Process & Monitoring Module designed to seamlessly integrate third-party acquisition systems with the CMS-500P Orca (Condition Monitoring Software). Supporting 4 dynamic signals and 1 reference signal, the PMM-305P offers direct connectivity to buffered outputs



(BNC) from monitoring devices, with an extended input range of -24 V to $+24\text{ V}$, eliminating the need for additional hardware.

Up to eight PMM-305P modules can be stacked to create a compact and economical monitoring system. The DIN-rail backplane features an embedded bus for power supply sharing, phase reference signal distribution, and Modbus RTU communication, simplifying wiring during installation.

The module can be factory-configured to accept IEPE sensors or 4-20 mA current loop inputs, making it versatile for direct sensor integration. It transmits data to SCADA/PLC systems via its dual Modbus interfaces (TCP and RTU) or an optional OPC UA server.

The PMM-305P supports configurable alarm and danger thresholds for each dynamic channel, with up to 16 levels of alarm (OTP Mode) managed through digital input or Modbus TCP/RTU. Supplied with PMx-300P Manager software for real-time data visualization and configuration via TCP/IP, the module also integrates with CMS-500P Orca for long-term trending and in-depth machine health analysis.

FUNCTIONAL OVERVIEW

The example below uses multiple PMM-305P modules to connect a third-party device to the CMS-500P Orca Condition Monitoring Software. The PMM-305P acquires data from the BNC output of the third-party devices, digitizes it, and sends it to the CMS-500P Orca Data Server. Simultaneously, the PLC system can retrieve data from the PMM-305P via the Modbus protocol.

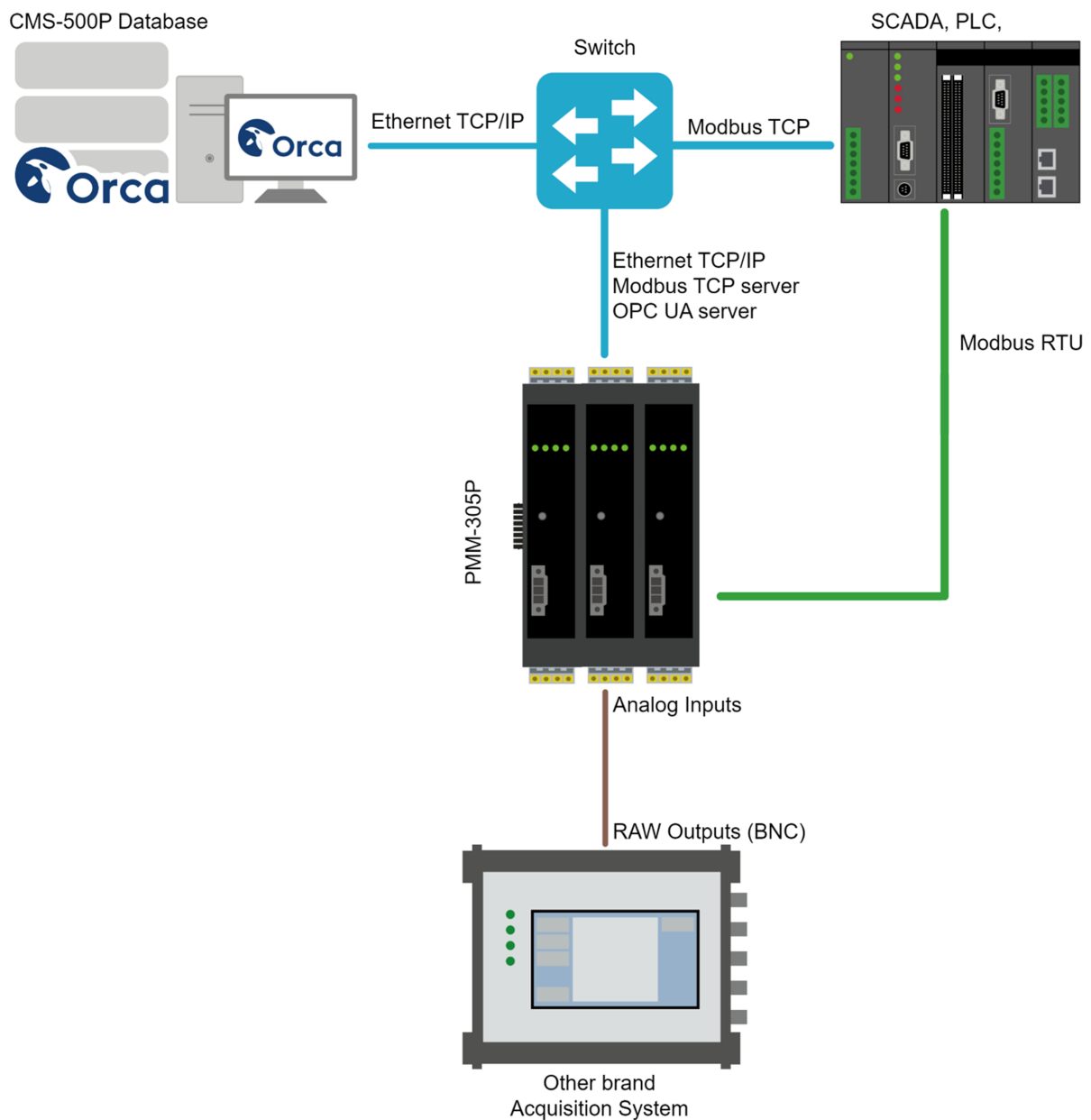


Figure 1: Functional overview

Furthermore the PMM-305P module has four digital inputs named ModeOTP, Save, RotD and Reset Alarm. Each of these inputs allows the module to be controlled from a PLC, enabling the following functions:

Save	Triggers the recording of raw data.
ModeOTP	Switches the alarm threshold values according to the configuration.
RotD	Specifies the machine's rotation direction to the module.
Reset Alarm	Sends a command to reset latched alarms.

OPERATIONAL SPECIFICATION

POWER SUPPLIES

Inputs supply voltage	+24 V _{DC} nominal
Typical power consumption	< 3 W at 24 V
Constant current source	+4 mA

MODULE DATA ACQUISITION

A/D type	Sigma-delta 4+1 channels with true simultaneous sampling
A/D converter	16 bits at 49152 S/s
Frequency bandwidth (A+D)	DC to 20 kHz (−3 dB)

DYNAMIC INPUT CHANNELS

Available conditioning mode	Voltage, Current (differential) and IEPE (single ended)
Measurement range	−24 V to +24 V or −30 mA to 30 mA
Input coupling	DC-coupling
Measurement accuracy (amplitude)	< 1% of full scale between 1 Hz and 10 kHz
Measurement accuracy (phase)	< 2° between 1 Hz and 200 Hz, < 10° between 200 Hz and 1 kHz

PHASE REFERENCE INPUT CHANNEL

Available conditioning mode	Voltage
Measurement range	−24 V to +24 V (DC-coupling)
Trigger method	Crossing of threshold with or without hysteresis
Triggering threshold	Rising or falling edge, configurable level
Speed measurement range	60 RPM to 15'000 RPM (1 Hz to 250 Hz) by default
Measurement accuracy	≤ 0.2% of maximum speed

DIGITAL SIGNAL PROCESSING

Multi-Stage FIR anti-aliasing filter	–100 dB attenuation in stop band
LF path digital filtering	IIR Butterworth LP, HP, BP and SB user configurable
HF path digital filtering	IIR Butterworth LP, HP, BP and SB user configurable
LF path Integrator	Digital Integration 1x/2x with custom High Pass filter cutoff
LF path measurement resolution	1024 to 24576 point waveform (1s) / 1600 lines spectrum
HF path measurement resolution	4096 point waveform (84 ms) / 1600 lines spectrum
Windowing	Hanning
Averaging	6x (applied on extracted values) (user configurable)
Characteristic values	Min, Max, Mean, Gap, TRMS, Peak, PeakPeak, Smax, BCU, Crest Factor, Kurtosis, RMS band, Harmonics Amp., Harmonic Phase, Speed
Order tracking	Digital resampling from even-time signal to even-angle signal
LF path refresh rate	Default 1s, configurable as 125 ms, 250 ms, 500 ms, 1s and 2s
HF path refresh rate	1 second

ALARM PROCESSING

Alarms	One Alert and Danger states by dynamic channel over a user selectable characteristics value
Alarm range	Four configurable alarm ranges (Danger Above, Alert Above, Alert Below, Danger Below)
Alarm levels	Up to 16 different levels of alarm depending on OTP mode input (OTP mode selectable by Modbus or Digital Inputs)
Alarm options	User configurable latched and time delayed alarms
Control signal — MOTP	Selectable by digital inputs or by Modbus to switch the alarm levels between 16 predefined levels.
Control signal — AL RST	Digital Input to reset the latched alarms

SENSOR OK CHECK

Sensor OK range	Two user configurable ranges (Above and Below) for Sensor OK check based on sensor signals (± 24 V)
-----------------	--

DIGITAL INPUTS

Input type +24 V logic level, not isolated

Input names	Effect when "high"
AL RST	Resets the latched alarms
OTP	Switches the alarm level from OTP 0 to OTP 1
ROTD	Rotor direction: clockwise
SAVE	Saves a dataset of raw signal

DIGITAL OUTPUT

Output 8x 0V/+24V digital output

Mapping (user configurable)	System OK	default
	Sensor OK	logical AND
	Alert	logical OR / AND 2oo4 or 3oo4 CH1&CH2 CH3&CH4 CH1 CH2 & CH3 CH4
	Danger	logical OR / AND 2oo4 or 3oo4 CH1&CH2 CH3&CH4 CH1 CH2 & CH3 CH4
Refresh rate	Default 1s, maximum 125 ms for LP path.	

LED INDICATOR

SYST. OK	Diagnostic of module
SENS. OK	Diagnostic of the sensors
ALERT	Indicates one or more channels in Alert state
DANGER	Indicates one or more channels in Danger state

COMMUNICATION INTERFACES

Ethernet 10/100 Mbit/s	Configuration & Commissioning with PMx-300P Manager Monitoring & Analysis with CMS-500P Modbus TCP Server and Modbus TCP Master OPC UA Server
RS485	Modbus RTU Slave (configurable: 19200 to 115200) No 120 Ω termination resistor available
Interconnection bus	Available to connect multiple PMM-300P and share Power Supply, Modbus RTU, Phase reference signal and Status

PREDEFINED OPERATING MODE

Vibration mode

• 4x Relative Vibration	Relative vibration monitoring according to ISO 20816
• 4x Absolute Vibration	Absolute vibration according to ISO 20816 Roller bearing vibration according to DIN 3832
• 2x Relative and 2x Absolute Vib.	Mixed relative and absolute vibration for sleeve bearing monitoring
• Endwinding	Endwinding monitoring for large turbogenerator

Airgap mode

• Airgap	Four channel Airgap monitoring for hydro-generators, ring motors and gearless windmills.
----------	--

Misc. mode

• AMT Pole Analysis	Special mode for Magnetic Flux and poles temperature measurement.
• Expert	Special mode with all calculations enabled
• Differential expansion	Measurement of expansion in steam turbine

PINOUT DESCRIPTION

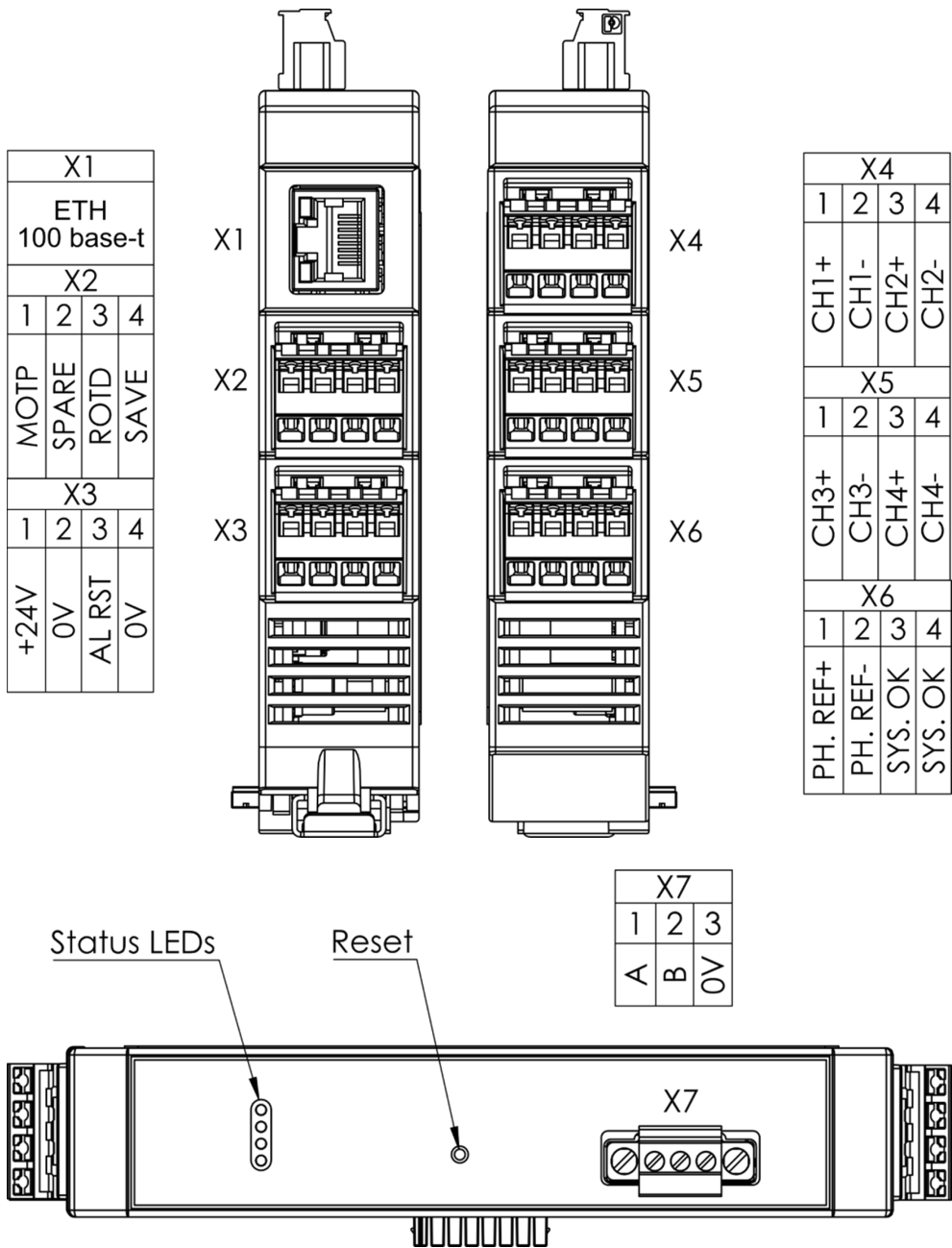


Figure 2: PMM-305P pinout

MECHANICAL DRAWING

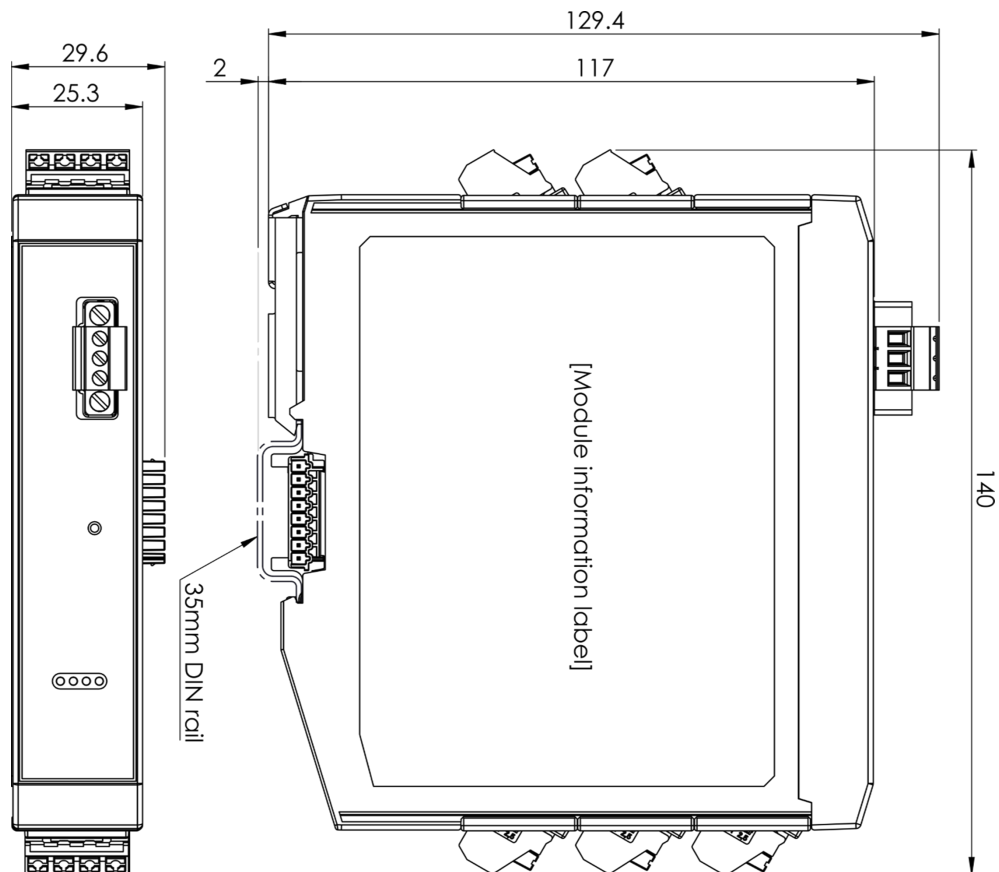


Figure 3: PMM-305P dimensions

PHYSICAL CHARACTERISTICS

Item	Specification
Mounting	DIN 35 mm rail mount
Terminals	Input and output via push-in terminals, clamping range 0.2 mm ² to 2.5 mm ²
Size	Approx. h: 140 mm, L: 120 mm, l: 26 mm
Weight	Approx. 250 g

ELECTRICAL SPECIFICATION

POWER SUPPLY

Parameter	Min.	Typ.	Max.	Unit	Conditions
Voltage Power supply	20.4	24.0	27.6	V	
Power consumption			3	W	
Current consumption			110	mA	

COMMON ANALOG INPUTS

Parameter	Min.	Typ.	Max.	Unit	Conditions
Voltage channel gain error	-0.5	0	+0.5	%	of reading value
Current channel gain error	-1.0	0	+1.0	%	of reading value
Voltage channel offset error	-10	0	+10	mV	CHx+/CHx- shorted
Current channel offset error	-40	0	+40	μA	CHx+/CHx- shorted
Signal to Noise Ratio	70			dB	
Noise Amplitude			1.6	mVpp	CHx+/CHx- shorted
Total harmonic distortion			0.007	%	
Voltage amplitude resolution		763		μV	
Current amplitude resolution		3		μA	
ADC Sampling Rate		49152		S/s	
Analog Frequency bandwidth		24		kHz	−3 dB
Antialiasing image rejection (ADC)	39			dB	
In-band frequency max ripple			0.6	dB	DC to 20 kHz
Stopband attenuation	100			dB	at 0.547 * SR
Coefficient of thermal deviation		100		ppm/°C	

VOLTAGE DIFFERENTIAL MODE

Parameter	Min.	Typ.	Max.	Unit	Conditions
Differential voltage range	-24		+24	V	CHx+ to CHx-
Common mode voltage range	-25		+25	V	CHx+ or CHx- to 0V
Differential input impedance		100		kΩ	CHx+ to CHx-
Common mode input impedance		51		kΩ	CHx+ or CHx- to 0V

VOLTAGE SINGLE ENDED MODE

Parameter	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	-25		+25	V	
	0	0	0	V	Internally grounded
Input impedance		51		k Ω	CHx+ to 0V

CURRENT DIFFERENTIAL MODE

Parameter	Min.	Typ.	Max.	Unit	Conditions
Input current range	-30		+30	mA	CHx+ to CHx-
Internal shunt resistance	249.5	250	250.5	Ω	CHx+ to CHx-

CURRENT SINGLE ENDED MODE

Parameter	Min.	Typ.	Max.	Unit	Conditions
Input current range	-30		+30	mA	CHx+ to internal 0V
Internal shunt resistance	249.5	250	250.5	Ω	CHx+ to internal 0V

IEPE MODE

Parameter	Min.	Typ.	Max.	Unit	Conditions
Input voltage range	0		20	V	
	0	0	0	V	Internally grounded
Input impedance		51		k Ω	
IEPE current loop		4		mA	Internally fixed

DIGITAL INPUTS

Parameter	Min.	Typ.	Max.	Unit	Conditions
Logic high input voltage range	9.2		26	V	
Logic low input voltage range	0		7.2	V	
Input resistance		31		k Ω	

DIGITAL OUTPUT

Parameter	Min.	Typ.	Max.	Unit	Conditions
Switching voltage			25	Vdc	
Switching current			100	mA	
On-state resistance			16	Ω	

ENVIRONMENTAL SPECIFICATION AND APPROVALS

Item	Specification
Ambient operating temperature	0 to 55°C
Ambient storage temperature	-20 to 75°C
Ambient operating humidity	10 to 90% RH, No-condensing
Ambient storage humidity	10 to 90% RH, No-condensing
Operating atmosphere	No corrosive gases, Indoor use
Ingress protection	IP30
EMC compliance	IEC 61326-1:2013
Environmental Affairs (RoHS)	IEC 63000:2018

ORDERING INFORMATION

Part type	Ordering code	Description
PMM-305P	20.305.401 A0-B0-C0-D0-E1	4x Differential voltage inputs
PMM-305P	20.305.401 A4-B4-C4-D4-E1	4x IEPE sensors inputs
PMM-305P	20.305.401 A2-B2-C2-D2-E1	4x Differential 0 to 20 mA inputs
PMM-305P	20.305.401 A0-B0-C4-D4-E1	2x Differential voltage inputs + 2x IEPE sensors inputs

Code description:

Ch. Code	Channel	Cond. Code	Channel configuration
A	CH1	0	Voltage Differential
B	CH2	1	Voltage Single Ended
C	CH3	2	Current Differential
D	CH4	3	Current Single Ended
E	Ph. Ref.	4	ICP / IEPE

License options

Part type	Ordering code	Description
OPC UA server	Var. OPCUA or 22.300.010	Enable OPC UA server for characteristics values and status.
OPC UA server Advanced	Var. OPCUA-ADV or 22.300.011	Enable OPC UA server with characteristics values, status and RAW data.

All information provided in this document, including specifications, descriptions, recommendations, drawings, and other statements, is believed to be accurate and reliable at the time of publication. However, MC-monitoring SA makes no warranties, express or implied, regarding the completeness, accuracy, or fitness of the information for any particular purpose. MC-monitoring SA reserves the right to modify specifications, design, features, or discontinue products without prior notice. MC-monitoring SA disclaims any liability for direct, indirect, consequential, or incidental damages arising from the use of this document or products described herein. All trademarks and brand names are property of their respective owners. © 2026 MC-monitoring SA. All rights reserved.

Quality certification



Local representative

MC-monitoring SA
Route André Piller 19
CH-1762 Givisiez
+41 58 411 54 00
info@mc-monitoring.com
sales@mc-monitoring.com
www.mc-monitoring.com