FM4 – field mountable 4-channel I/O module

FM4 is a four channel I/O module for condition monitoring applications in harsh process environments (IP65 protection). Four identical analog channels sampled simultaneously for streaming via Ethernet or WLAN. FM 4 is designed for machinery located in places where conventional instrument cabling is problematic, small scope systems and temporary installations. Module includes easy connection to Valmet DNA Machine Monitoring or other third-party systems.

Module Description

FM4 can store the sampled data in its memory or it can stream it via Ethernet or WLAN. The module can be powered from Power-over-Ethernet, auxiliary DC-supply or a smart battery. The four identical analog channels are sampled simultaneously and can be configured by software to measure different types of sensors with 24-bit resolution. Sampling frequency is configurable from 1 kHz to 42 kHz (channel bandwidth 0.47...20 kHz).

Inputs

The analog channels have a configurable input range of 0...24 V or -24...0 V. All channels support the following sensor configurations (configured by software):

- IEPE vibration sensor (4 mA constant current supply)
- Magnetic, inductive or optical pulse sensor (24 V supply, max. current limited to 30 mA)
- Eddy current proximity sensor (-24 V supply, max. current limited to 30 mA)
- Voltage measurement (0...24 V or -24...0 V)
- Current measurement (0...24 mA)

The built in 3-axis MEMS accelerometer can measure vibrations with 0.1...3.2 kHz sampling range.

Memory

Two options for storing measurement data:

- Volatile memory for constant monitoring (ring buffer measurement) 8,400,000 analog measurement samples (200 seconds at maximum sampling speed from all channels) and 500,000 MEMS measurement samples (156 seconds at maximum sampling speed on all axis)
- Non-volatile memory for request measurements and data logging purposes 42,000,000 analog measurement samples or 84,000,000 MEMS measurement samples.

All device identification data and settings are stored in the flash memory.

Ethernet (10/100Base-TX)

FM4 has two physical Ethernet ports, a primary port to communicate with monitoring system and secondary port used to daisy-chain multiple FM4 modules into the same network segment to simplify cabling.

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WLAN

WLAN supports IEEE 802.11b/g/n standards with WEP, WPA and WPA2 encryption for the following bands and channels:

- Europe: 2.412...2.472 GHz (13 channels)
- USA: 2.412...2.462 (11 channels)
- Japan: 2.412...2.484 (14 channels)

GPS/GLONASS

FM4 has a built-in GPS/GLONASS capability to provide location data and accurate timing. Multiple position and navigation systems supported including autonomous GPS, GLONASS, SBAS (including WAAS, EGNOS, MSAS and GAGAN), QZSS, and AGPS. For accurate measurement synchronization, 1 PPS (pulse per second) signal (typical accuracy <15 ns) is used by the FM4's CPU.

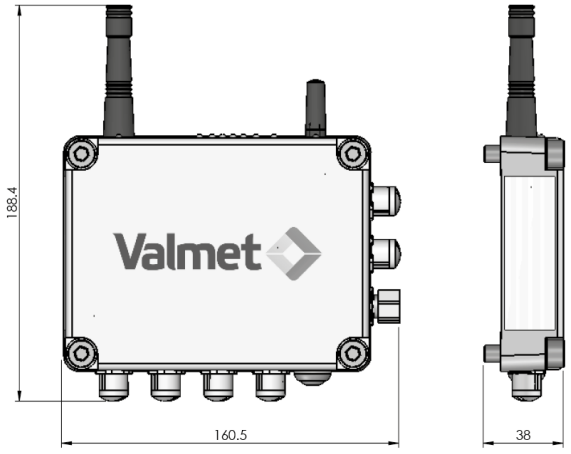
GPS/GLONASS satellite data is kept in memory with backup super capacitor to retain the memory for 24 hours after power down. This will help acquiring a location fix faster the next time the device is turned on.

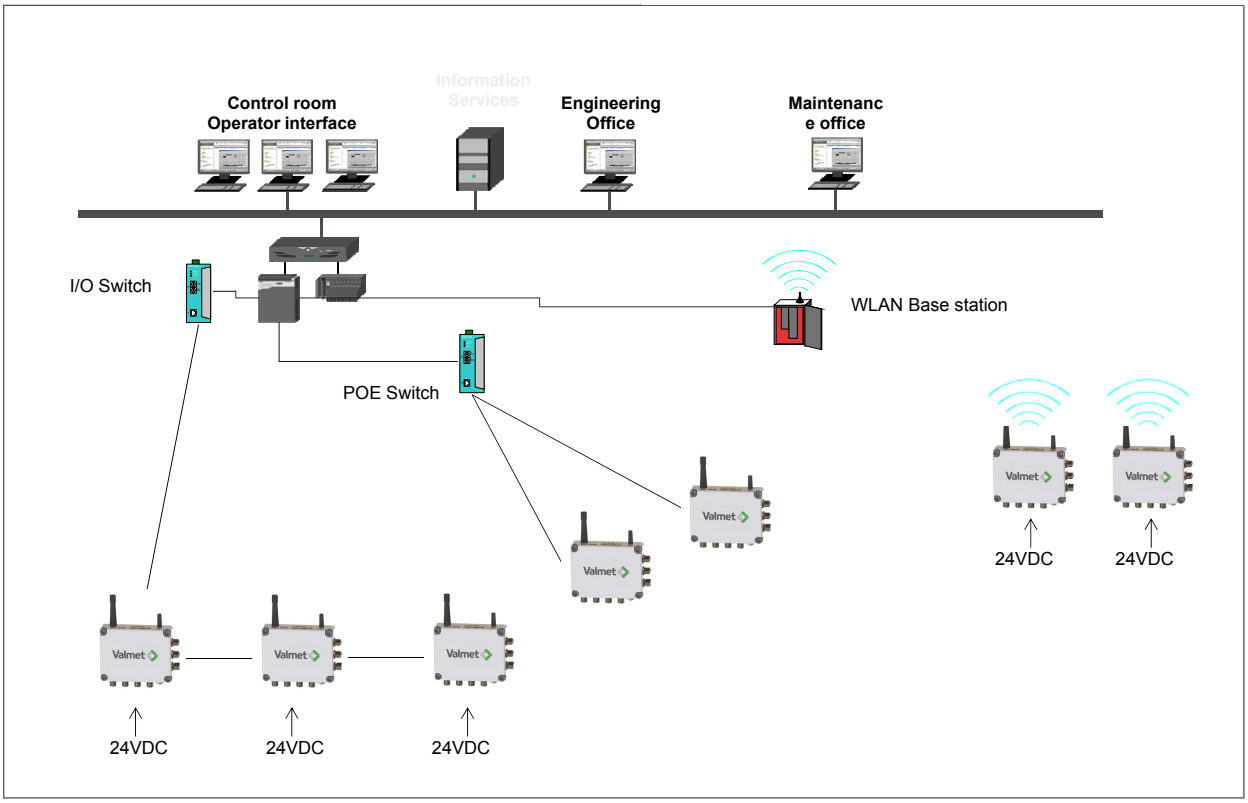
Power

FM4 has three different power supply options:

- Power-over-Ethernet (PoE), galvanically isolated, 37...57 VDC, Class 3, Type 1 (6.49...12.95 W)
- Auxiliary PoE DC-supply, galvanically isolated, 15...30 VDC
- Smart Battery Supply, non-isolated, 9.6...30 VDC, SMBus support for battery status information

Smart Battery supply is useful for data logging applications, where the module is left in one place for a longer time to do periodical measurements.





Connection possibilities into Valmet DNA Machine Monitoring

Product code: 600-10230

For more information, contact your local Valmet office. www.valmet.com