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Product information
MODB221220-MODVIBE2

Name	MODB221220-MODVIBE2
ModVibe2 Vibration Sensor	
Short description	Industrial Modbus Vibration and Internal Temperature Sensor with **Selectable Low-Noise and Wideband MEMS Measurement Paths**
Product description	
SKU	**MODB221220-MODVIBE2**
Description	Industrial **dual** MEMS digital vibration and internal device-temperature sensor with Modbus RTU (RS-485) output, designed for direct integration with the iQunet Edge Gateway M4. ModVibe2 combines **two selectable triaxial** MEMS vibration measurement paths in one compact field sensor: a low-noise precision path for clean lower-amplitude vibration analysis and a wideband/high-g path for higher-amplitude and higher-frequency diagnostics. The wideband/high-g measurement path supports vibration bandwidth up to **8 kHz**, using internal MEMS ODR capability up to **64.000 samples/s**. Effective capture and export rate depend on firmware configuration. Full waveform acceleration data from the selected measurement path is transmitted to the iQunet platform for storage, visualization, spectrum analysis and trend monitoring. ModVibe2 is ideal for detailed diagnostics and integration with machine-learning/AI workflows
Dual sensor benefits	ModVibe2 has two complementary MEMS vibration paths on board, giving one installed sensor a much wider diagnostic range. The **low-noise precision path** captures small vibration changes with clean spectra and stable trends. This is valuable for slow-speed machinery, imbalance, misalignment, looseness, structural response and early-stage fault development. The **wideband/high-g path** captures higher vibration levels, impacts, shocks, bearing fault energy and gearbox signatures up to **8 kHz vibration bandwidth**. Together, both paths make ModVibe2 suitable for **condition monitoring, long-term trending and AI-based anomaly detection**: the sensor can deliver clean low-amplitude data for sensitive trend changes, while still providing wideband/high-g data when machines generate impacts, shocks or high-frequency fault energy. One sensor body, one cable and two selectable measurement paths support multiple diagnostic objectives without changing hardware.

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Use	Designed for condition-based monitoring of rotating machinery where vibration levels can range from small structural movements to high-energy impacts. Select the low-noise precision path when sensitivity and clean low-frequency spectra are the priority; select the wideband/high-g path when higher vibration range or up to 8 kHz vibration bandwidth is required. ***Low-speed / low-frequency use case:*** *At 250 S/s, ModVibe2 can capture a 32.8-second waveform with 8,192 samples per axis from the selected measurement path. This provides approximately 0.03 Hz frequency resolution and a usable −3 dB bandwidth of 90 Hz. The long measurement window is suitable for slow-speed machinery such as gearboxes, mills, fans, conveyors and rollers, where shaft orders, harmonics and closely spaced sidebands must be clearly separated.* *For high-frequency bearing or gear diagnostics, select the ADXL382 wideband path with a higher waveform sampling rate.*

Key features	• **Dual triaxial** MEMS measurement paths **in ONE industrial sensor**: selectable low-noise precision mode and wideband/high-g mode.
	• **Selectable ranges**: low-noise precision path ±4 g, ±8 g, ±16 g; wideband/high-g path ±15 g, ±30 g, ±60 g.
	• **Bandwidth capability**: low-noise precision path up to 4 kHz; wideband/high-g path up to 8 kHz vibration bandwidth.
	• Wideband/high-g path uses internal MEMS Output Data Rate (ODR) capability up to 64.000 S/s; effective capture/export rate depends on firmware configuration.
	• Internal MEMS Noise density**:
	  ○ low-noise precision mode: 20 µg/√Hz X/Y, 27 µg/√Hz Z;
	  ○ in wideband/high-g mode: 44 µg/√Hz X/Y, 55 µg/√Hz Z;
	  ○ ** Consult the ModVibe product-level noise density specifications for the assembled ModVibe2 sensor in the Technical Datasheet published at the iQunet website.
	• **Low-power operation:** ModVibe2 supply current is 9–14 mA at 24 VDC.
	• **Long low-frequency spectrum mode:** 32 seconds at 250 Hz for slow-speed/order/sideband diagnostics.
	• **Selectable waveform rates with automatic filtering:** Firmware automatically applies the appropriate fixed Type I linear-phase low-pass FIR decimation profile or full-rate bypass according to the selected sensor and waveform sampling rate. This preserves waveform shape while controlling measurement bandwidth and suppressing out-of-band content.
	• **Daisy-chain RS-485 Modbus RTU architecture** to reduce field wiring.
	• **IP67/IP68 housing**, 24 VDC supply and practical mounting options for industrial installation.
	• **Status LED** for commissioning and diagnostics.

Product specifications	
Dimensions	80 x 25 x 25 (mm) – (cable not included)
Case material	PA glass reinforced, chemical resistant to many oils, fuels and greases, water resistant
Cable material	PUR outer sheath, chemical resistant to common oils, greases and cooling lubricants, water resistant
Weight	Approx. 50 g (excl. cable)
Sealing	IP67
Operating temperature	Ambient and mounting interface temperature: -20° to +80°C (including cable) Intermittent: -40° to +105°C (excluding cable)
Recommended storage temperature	+20°C
Certifications	CE / FCC
Transmitted data	100% full raw time waveform acceleration data , processed in the iQunet Gateway M4 (see post-processing topic)
Power supply	12–30 VDC at the sensor; 24 VDC nominal; 9–14 mA at 24 VDC • Polarity reversal protected

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Internal dual sensor specifications	**ModVibe2 dual MEMS sensor specification** • **Low-noise precision path:** triaxial acceleration; selectable **±4 g, ±8 g, ±16 g**; vibration bandwidth up to **4 kHz**; internal MEMS ODR capability up to **32 kS/s** PDM; low-noise internal MEMS basis with typical noise density **20 µg/√Hz XY**, **27 µg/√Hz Z**; internal device-temperature measurement; electromechanical self-test support. • **Wideband/high-g path:** triaxial acceleration; selectable **±15 g, ±30 g, ±60 g**; vibration bandwidth up to **8 kHz**; internal MEMS ODR capability up to **64 kS/s** PDM; low-noise internal MEMS basis with typical noise density **44 µg/√Hz XY**, **55 µg/√Hz Z**; internal device-temperature measurement; electromechanical self-test support.
Measurement axes	Simultaneous X/Y/Z (triaxial)
Internal sampling rate	Internal MEMS ODR capability: up to 64.000 Samples/s.
Number of samples	User-selectable record length via sensor management software (Edge Gateway M4 required).
Units	g or mm/s – user selectable via sensor management software of the Edge Gateway M4
Activity threshold	Auto or user selectable – user selectable via sensor management software
Temperature sensor on board	Yes
Data storage	Upon connection, Tri-Axial full time-series acceleration data and temperature data is instantly transmitted to and stored in the iQunet Edge Gateway M4's SQL database.
Sensor Management	Sensor Management software is embedded in iQunet Edge Gateway M4's web interface
Start data acquisition	Via iQunet Edge Gateway M4 software • Manual trigger • Automatic measurements • Conditional automatic measurements
Postprocessing	Post-processing is performed in the iQunet Edge Gateway M4 / Vibration Expert software. • Time waveform, spectrum and waterfall visualization. • Configurable filters for acceleration and velocity analysis. • Averaging and detrending tools for cleaner spectra. • Trend metrics such as RMS and kurtosis. • Bearing, order, THD, enveloping and sideband analysis tools when configured in Vibration Expert.
Communication protocols	ModVibe2 communicates with the iQunet Edge Gateway M4 over Modbus RTU. Plant-system integration is handled by the iQunet Edge Gateway M4, including OPC UA, MQTT and GraphQL interfaces for selected sensor data, parameters and controls.

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Picture & Drawing	
Dimensions (excl. mounts)	
Sensor mounting options	• Captive mounting bolt M6x1, standard included (optional: UNF 1/4"-28 captive bolt) • Epoxy mounting pad with internal M6 thread (optional: UNF 1/4"-28 thread) • Magnetic mounting option for flat surfaces For best high-frequency vibration performance, use drilled/tapped mounting on a clean, rigid machine surface. Magnetic or adhesive mounting may reduce usable high-frequency response. Alternative mounting options available on request.
Sensor cable color indications	Standard Integrated cable length: **2m (1x2 data shielded, 1x2 power shielded, overall shielded)** Modbus sensor cable wire connection scheme: • BLUE: RS485 A+ (High) • WHITE: RS485 B- (Low) • Blank/Silver: Shield/drain • RED: VDC + (Pos) • BLACK: VDC – (Neg) Bond the **shield/drain** to earth at the master end (don't bond at both ends to avoid ground loops)
Sensor Modbus RTU Communication	• Modbus RTU over RS-485. • Default communication setting: 115200 bit/s, 8 data bits, no parity, 1 stop bit. • Optional controlled boost to 230.4 or 460.8 kbit/s (~0.5Mb/s) using a compatible Modbus client • Modbus read/write configuration for supported functions. .
Sensor LED indicator status information	Sensor status information is available in the iQunet Edge Gateway M4 dashboards. For troubleshooting notice the following LED indicator status

LED state	Description
Solid RED – low brightness	Powered, all sensor subsystems running
Blinking RED	Communicating
Solid RED – high brightness	Measuring

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Analytics Software

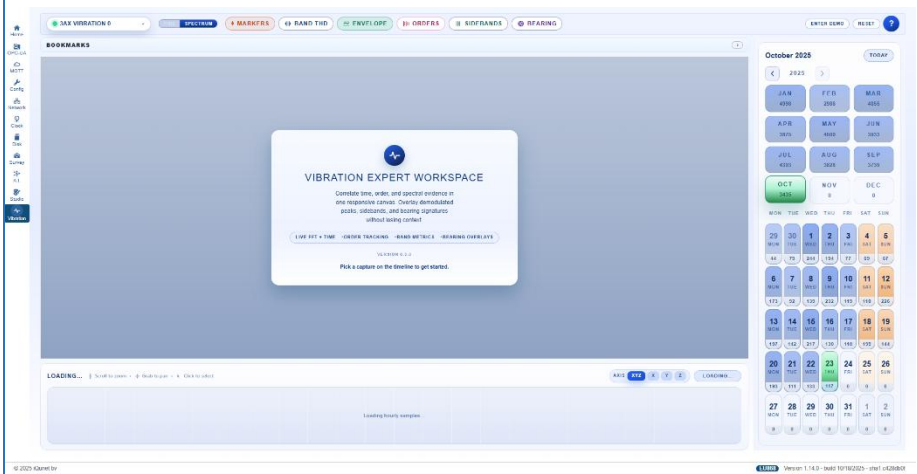
For analyzing the sensor data, iQunet provides iQunet Vibration Expert (iVE).
This software **runs standard on the iQunet Edge Gateway M4** and is accessible from any browser either in the plant network (Edge) or from remote.

The software allows the user, without installing software to run in-depth analysis on the spectrum of the captured vibration sensor data.

For detailed information regarding this embedded software, visit www.iQunet.com/M4

Qunet Vibration Expert (iQunet Edge Gateway Software)

Selection of historical captured data



Inspecting time waveform

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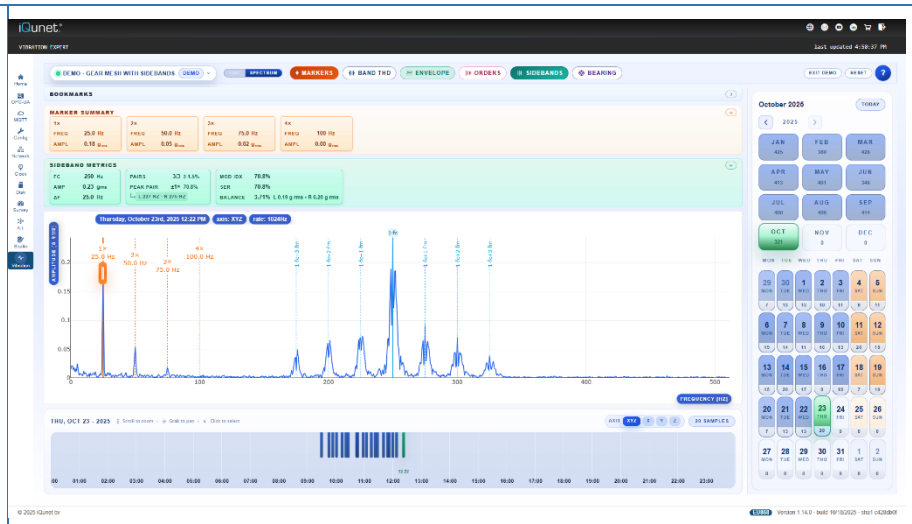
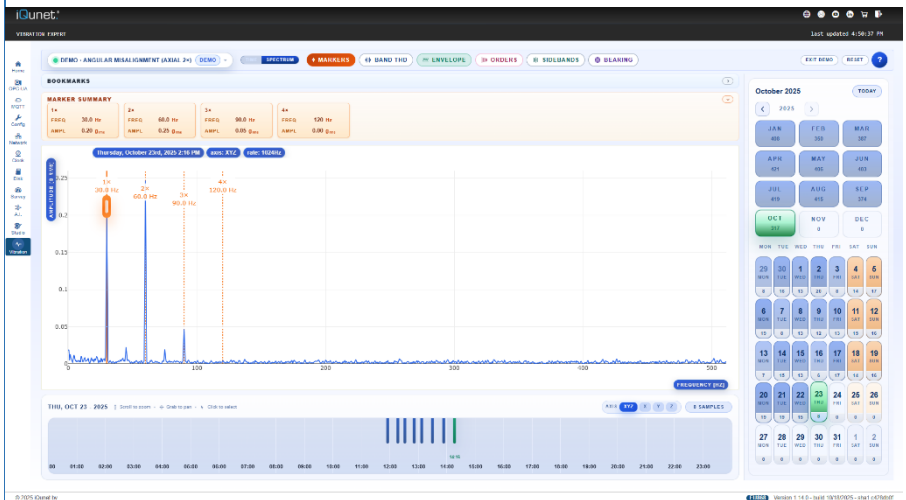
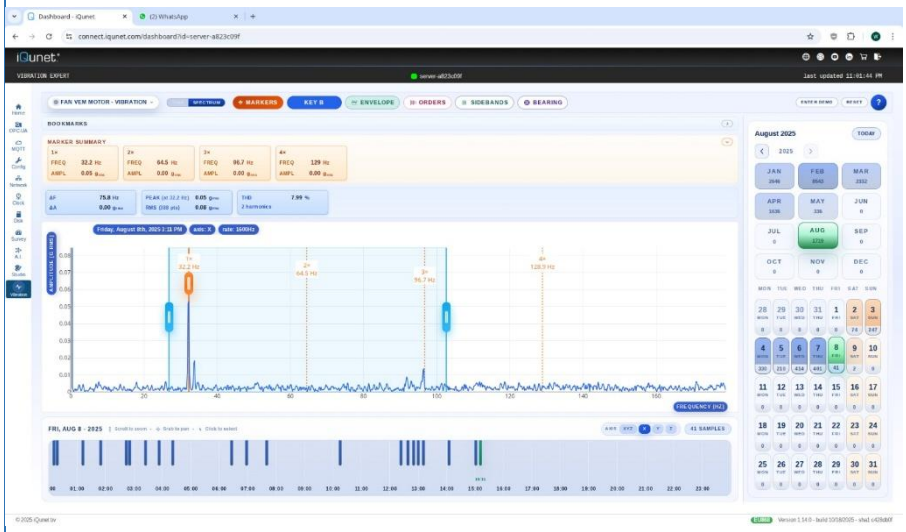
Setting markers and orders



Implement band filters



Find Sidebands



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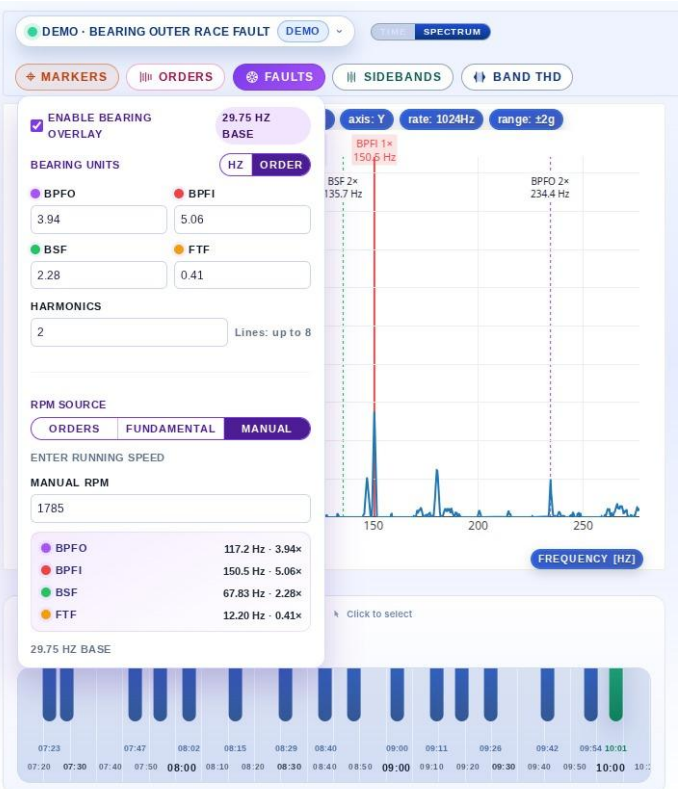
Use Envelope analysis

Enabling bearing fault frequency overlay



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