清 诚 QAWRUMS

TECHNICAL DATASHEET

V51 Series

Wireless Vibration and Temperature Sensors

V51-B | V51-L | V51-G

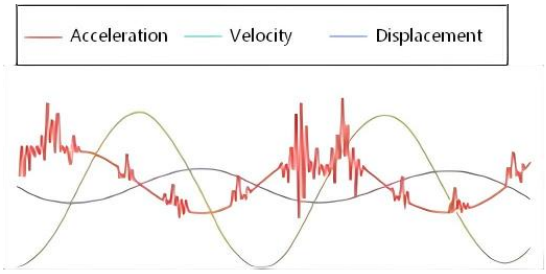
Industrial condition monitoring with three-axis MEMS vibration sensing, temperature measurement and wireless reporting. The series provides vibration feature values and, where supported by the selected communication mode, waveform data for rotating machinery monitoring and fault diagnosis.

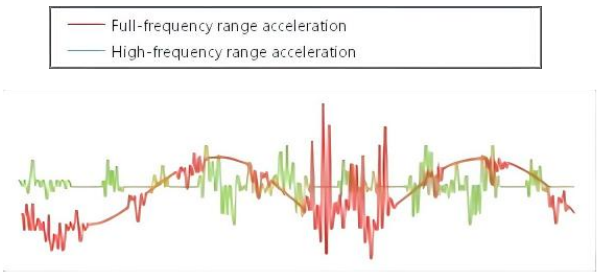
Product capabilities

Parameter	Specification
Measurement	Three-axis acceleration and object temperature; vibration features, FFT outputs and waveform acquisition.
Wireless options	Bluetooth 5.0, LoRa or 4G Cat.1; select one model.
Power	Replaceable 6,500 mAh battery; stated operating life of 2-10 years. Microwatt-level low-power operation is claimed by the manufacturer.
Acquisition	Scheduled acquisition or low-power vibration-triggered wake-up; remotely configurable parameters.
Industrial protection	IP67 enclosure; stainless steel and weather-resistant engineering plastic; Ex ia IIC T4 Ga marking as published.
Monitoring	Cloud display, remote configuration, diagnostic results and automatic alerts; private-cloud upload available on request.

Model selection

Attribute	V51-B	V51-L	V51-G
Radio	Bluetooth 5.0	LoRa	4G Cat.1
Published range	600 m line of sight	3,000 m line of sight	Not specified
Network equipment	GW-B gateway; optional R20 repeater	GW-L gateway	IoT data SIM
Waveform support	10-20,000 ms records	8,192-point upload per day	10-20,000 ms records





Measurement specifications

Parameter	Specification
Accelerometer type	Three-axis MEMS
Acceleration range	±16 g
Z-axis frequency response	10 Hz-2 kHz (±5%); 0 Hz-6 kHz (±3 dB)
X and Y frequency response	0 Hz-5 kHz
Velocity range	200 mm/s at 80 Hz
Acceleration resolution	16 bit
Acceleration sampling rate	0.4-26.67k, as published; unit not stated. See specification notes.
Acceleration sensitivity	0.5 mg/LSB
Temperature drift	1%/°C
Nonlinearity	2%
Noise density	75 µg/√Hz
Temperature range	-40 to +85 °C
Temperature accuracy	±1 °C
Velocity RMS frequency range	10 Hz-1 kHz
Displacement peak-to-peak frequency range	10 Hz-1 kHz; low band: 10-200 Hz; high band: 200 Hz-1 kHz
Acceleration envelope	At 25.6, 26.67, 51.2 or 64 kS/s: 500 Hz-10 kHz (SKF ENV3). At other sample rates: 500 Hz high-pass filter.
Acceleration FFT	2,048 lines; base frequency and amplitudes at 1×, 2×, 3× and 0.5×.

Reported vibration features

Parameter	Specification
Frequency and amplitudes	Frequency; acceleration peak; acceleration RMS; velocity RMS; displacement peak-to-peak; acceleration envelope; 1×, 2×, 3× and 0.5× amplitudes.
Statistical indicators	Skewness; skewness index; clearance factor; crest factor; kurtosis; kurtosis index; impulse factor; variance; spectral variance; spectral mean; spectral RMS.
Orientation	Tilt angle; roll angle; pitch angle.

RMS = root mean square. LSB = least significant bit. g = standard gravitational acceleration; mg and µg are milli-g and micro-g.

Acquisition and data handling

Parameter	Specification
Feature calculation record length	1k, 2k or 4k sample points; configurable.
Acquisition trigger	Low-power vibration wake-up trigger or scheduled collection.
Scheduled intervals	1, 2, 5, 10, 15, 20, 30, 60 or 120 minutes; configurable.
Waveform configurations	Three independently configured acquisition groups; up to 128k points per group, subject to communication-mode limitations.
Waveform record duration	10-20,000 ms for Bluetooth or 4G Cat.1.
LoRa waveform limit	One waveform upload per day, containing 8,192 sample points.
LoRaWAN waveform limit	Waveform data not supported.
Waveform transfer	Compression and retransmission for low-power wireless delivery and data integrity.
Local storage	64 MB
Adjustable settings	Measurement range, sampling rate, point count and sampling interval.

Power and environmental specifications

Parameter	Specification
Battery	ER26500M lithium thionyl chloride battery; 6,500 mAh; replaceable.
Published battery life	2-10 years; operating conditions for this figure are not stated.
Weight	211 g
Operating temperature	-40 to +85 °C
Operating humidity	10-90% RH
Housing	Stainless steel and weather-resistant engineering plastic.
Ingress protection	IP67
Explosion-protection marking	Ex ia IIC T4 Ga (source capitalization: EX ia IIC T4 Ga).
Mounting	M6 threaded fastening, adhesive bonding or optional magnetic mounting.

Cloud platform and software

The Qingcheng IoT Cloud Platform provides data display and queries, remote configuration, monitoring and alarm notifications. The same companion software applies to all three sensor models.

- **Remote configuration and maintenance**

Feature acquisition: acquisition interval and delay, displacement filter mode, principal vibration frequency, measurement range, sample rate and point count.

Waveform acquisition: acquisition interval and delay, waveform measurement range, sample rate and acquisition duration. Waveform functions remain subject to model limitations.

Firmware: remote firmware updates are supported.

- **Data access and alarms**

The platform displays the reported vibration features listed in this datasheet. Data can be downloaded in CSV format. Threshold exceedances trigger maintenance alerts by SMS and email. Upload to a customer-designated private cloud is available on request.

Platform address: http://cloud.ae-ndt.com

- **Mobile inspection**

Bluetooth 5.0 direct phone connectivity is described for on-site inspection. The mobile inspection app is explicitly marked as **under development** on the product page.

Installation

The sensor is battery powered and requires no sensor power or signal cabling. The installation described on the page consists of the following steps:

1. Remove protective paint from the measurement surface by grinding.
2. Apply coupling agent.
3. Secure the sensor using the M6 thread, adhesive bonding or optional magnetic mounting.
4. For Bluetooth and LoRa installations, place the gateway in the designated equipment enclosure at the installation site. The 4G configuration does not require this gateway.

System configurations

Parameter	Specification
V51-G	V51-G sensor and IoT data SIM. A SIM is not included with standard shipment; arrange it in advance if required.
V51-L	V51-L sensor with a GW-L LoRa gateway for network operation.
V51-B	V51-B sensor with a GW-B Bluetooth gateway. R20 repeater available as an option and not included with standard shipment; arrange it in advance if required.
R20 link distances	R20 to GW-B: 600 m. R20 to V51-B: 300 m, as listed in the configuration section.
Companion software	Qingcheng IoT Cloud Platform; mobile inspection app under development.

Contacts

Items	Information
Product	V51 Series Wireless Vibration and Temperature Sensors
Source organization	Qingcheng AE Institute (Guangzhou) Co., Ltd. (Brand name: QAWRUMS)
Contact Email	sales2@ae-ndt.com
Website	https://www.aendt.com/
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