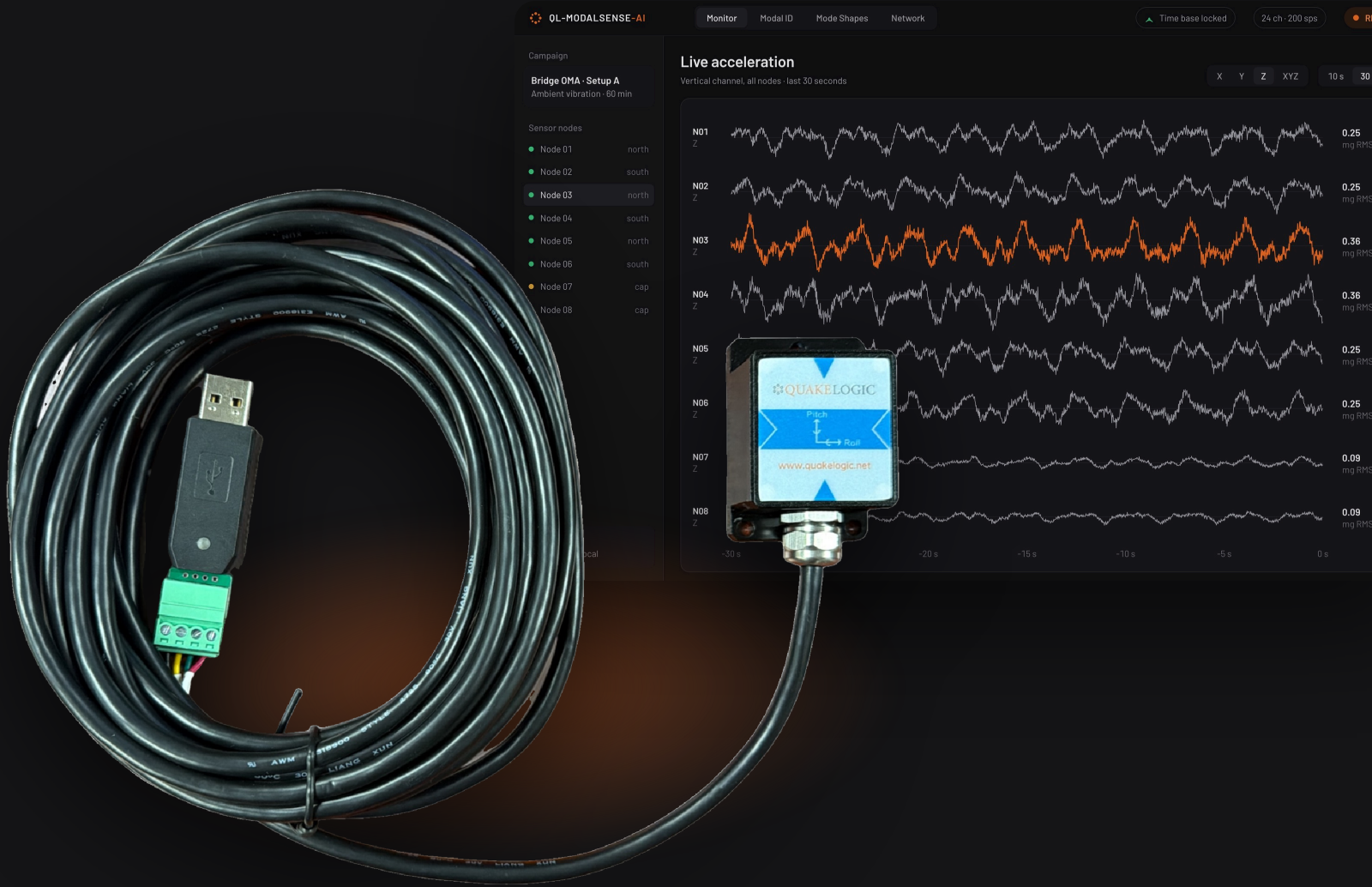




QUAKELOGIC · STRUCTURAL MONITORING

QL-MODALINK

TRIAxIAL MODBUS SENSOR NODE

Measures vibration, tilt and rotation at each point on a structure and carries it over long RS-485 cable runs to one server and one software.

TRIAxIAL MEMS · ±16 G

< 22.5 $\mu\text{G}/\sqrt{\text{Hz}}$

DC-500 HZ

MODBUS RS-485

IP68



MADE IN USA

With Globally Sourced Materials



PRODUCT OVERVIEW

MEASURED WHERE THE
STRUCTURE MOVES.

A seismic-grade triaxial sensor node for modal testing and structural health monitoring, built to run on long cables in the field.

< 22.5

µG/√HZ NOISE

Accelerometer floor

DC–500

HZ BANDWIDTH

0.2–200 Hz output

0.05°

STATIC TILT

X and Y axes

IP68

ALUMINUM HOUSING

–40 to +185 °F



QL-MODALINK node: IP68 aluminum housing with sealed cable gland.

QL-MODALINK combines a seismic-grade triaxial MEMS accelerometer with a tilt sensor, gyroscope, magnetometer and barometer in one CNC-milled aluminum housing. A 32-bit processor with Kalman-filtered fusion delivers stable acceleration and attitude data over an industrial Modbus RS-485 interface.

Each node runs on its own line to a QuakeVault edge server, so eight or more nodes record in one session on one time base. QL-MODALSENSE-AI turns the records into frequencies, damping and mode shapes.

STANDARD FEATURES

- Triaxial seismic-grade MEMS accelerometer
- ±16 g range, ±2 / ±4 / ±8 g options
- Noise floor < 22.5 µg/√Hz
- Bandwidth DC to 500 Hz
- Output rate 0.2–200 Hz, configurable
- Tilt 0.05° static, 0.1° dynamic
- Gyroscope, magnetometer, barometer
- 32-bit processor, Kalman fusion
- Modbus RS-485, adjustable baud rate
- IP68 CNC-milled aluminum housing
- Manual levelling knobs
- External function test
- ASCII, CSV and MAT export

APPLICATIONS

ONE NODE FOR TESTING AND MONITORING.

The same sensor serves a one-day modal test and a permanent monitoring network, from footbridges to high-rise buildings.

BRIDGE MODAL TESTING

Ambient vibration testing of decks, piers and cables to identify frequencies, damping and mode shapes for model updating and load rating.

STRUCTURAL HEALTH MONITORING

Permanent installations that track modal frequencies and tilt over time and flag changes after earthquakes or storms.

TOWERS, STADIUMS AND FOOTBRIDGES

Wind and crowd-induced vibration measurements for serviceability and comfort assessment.

MACHINE FOUNDATIONS

Vibration and tilt of equipment foundations and supports in power, process and manufacturing plants.

BUILDING DYNAMIC CHARACTERIZATION

Floor-by-floor measurements for fundamental periods, torsional response and before-and-after retrofit comparison.

TILT AND ROTATION

Static and dynamic tilt of piers, towers, walls and foundations from the same node, with no second sensor.

CONSTRUCTION VIBRATION

Monitoring of adjacent structures during piling, demolition and excavation, with records kept on site.

LABORATORY AND SHAKE TABLE TESTS

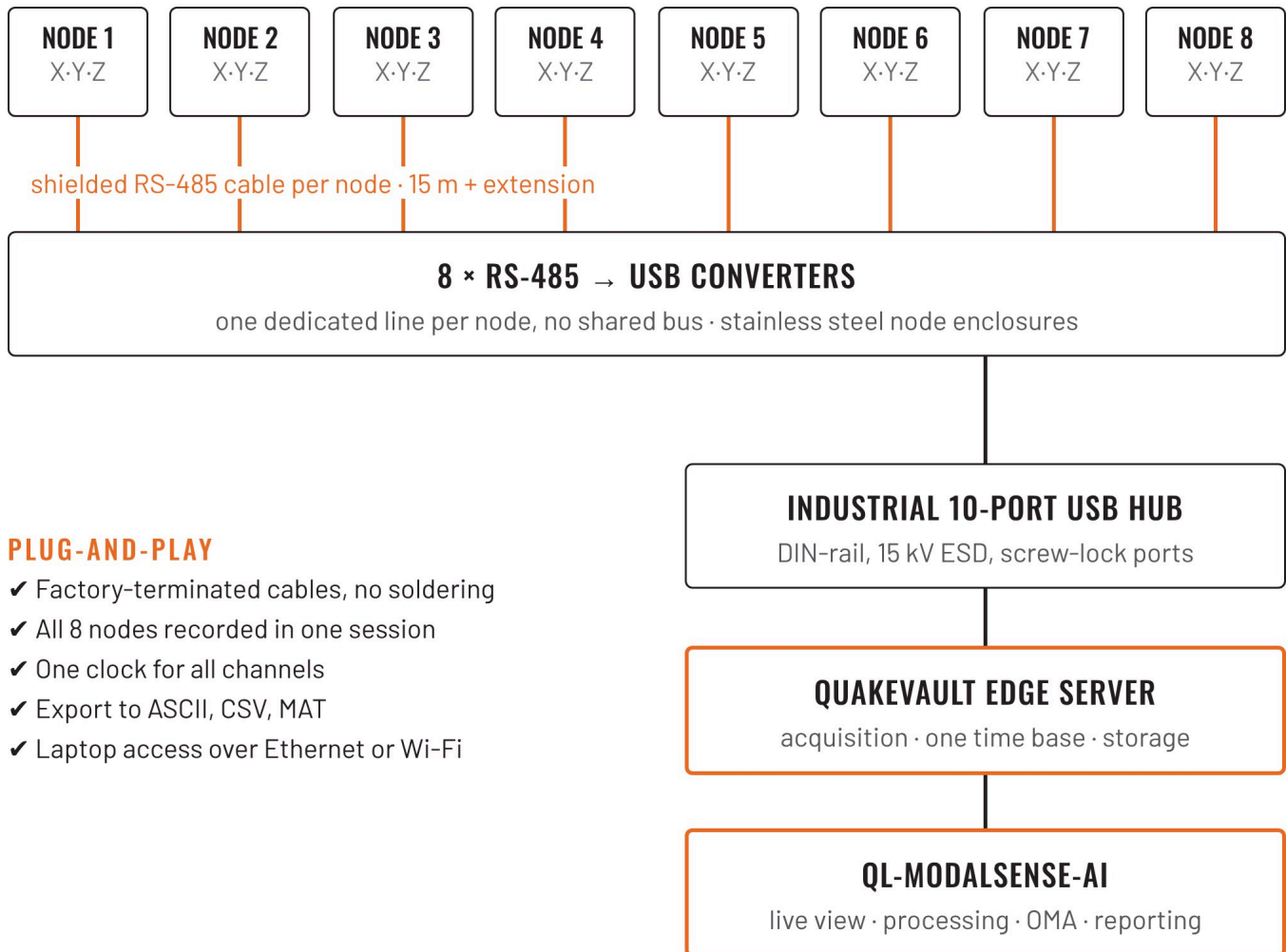
Multi-point response measurements on scale models and specimens, synchronized in one recording.

HOW IT WORKS

ONE SYSTEM, ONE SOFTWARE, ONE TIME BASE.

Every node has its own RS-485 line into a QuakeVault edge server, which records all channels against one clock.

SENSORS ON THE STRUCTURE



01 SENSE

Each node measures three axes of acceleration plus tilt and rotation, with Kalman-filtered fusion on its 32-bit processor.

02 LINK

Modbus RS-485 carries the data over long cable runs to dedicated converters and an industrial hub, one line per node.

03 ANALYZE

QuakeVault time-stamps and stores every sample; QL-MODALSENSE-AI displays it live and identifies the modes.

FROM VIBRATION TO MODE SHAPES, ON SITE.

QL-MODALSENSE-AI runs on QuakeVault and opens in any browser on the site laptop. The team sees every channel live and checks the modes before leaving the structure.



Live monitor: all nodes on one time base, with per-node RMS, noise floor and tilt.

Live multi-channel view

All channels of all nodes in one window, with per-node RMS, peak, noise floor and tilt.

AI-assisted modal identification

Automatic peak picking with frequency, damping, MAC and a confidence value for each mode.

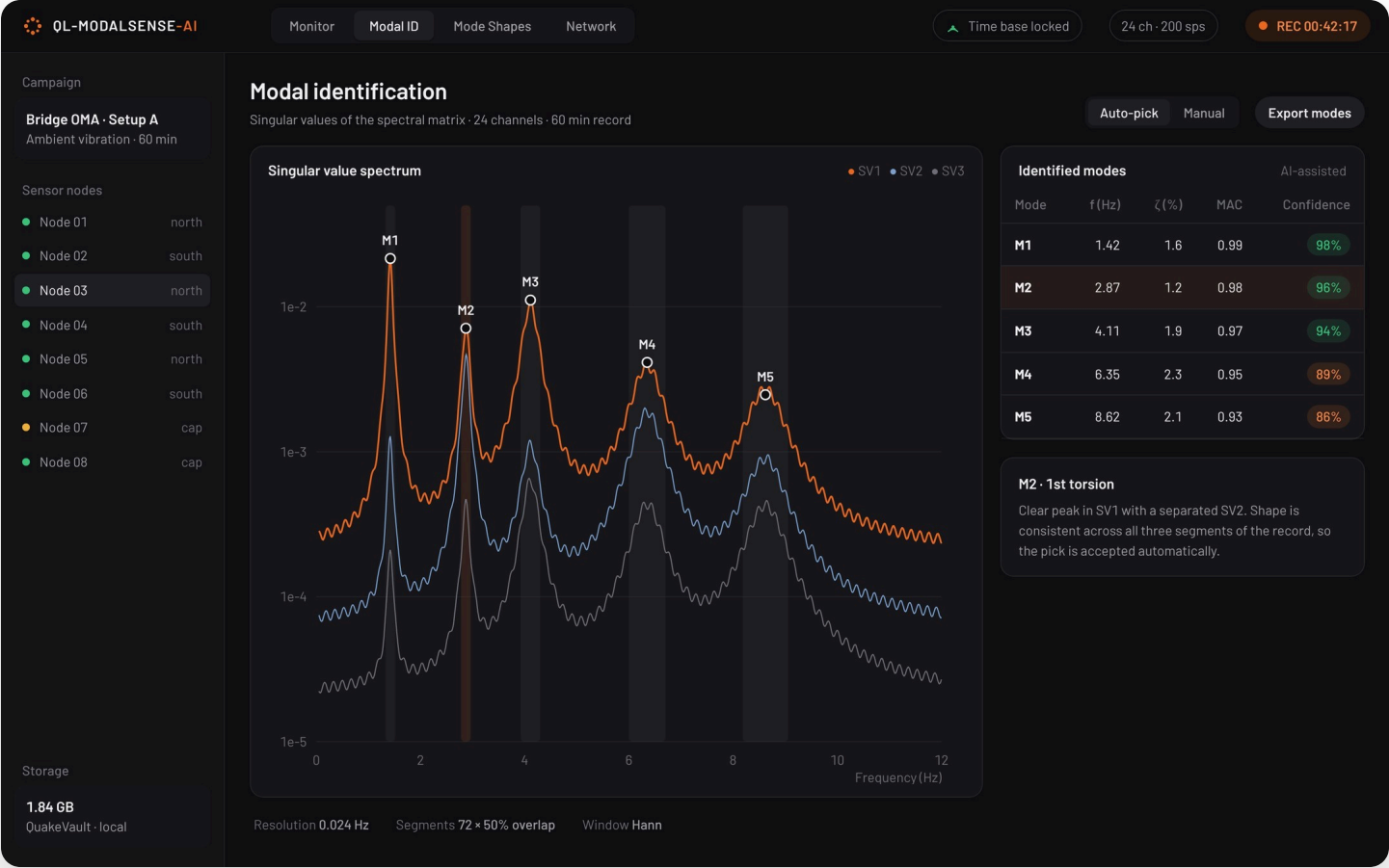
Signal processing

Filtering, detrending, spectra and power spectral density on the full record.

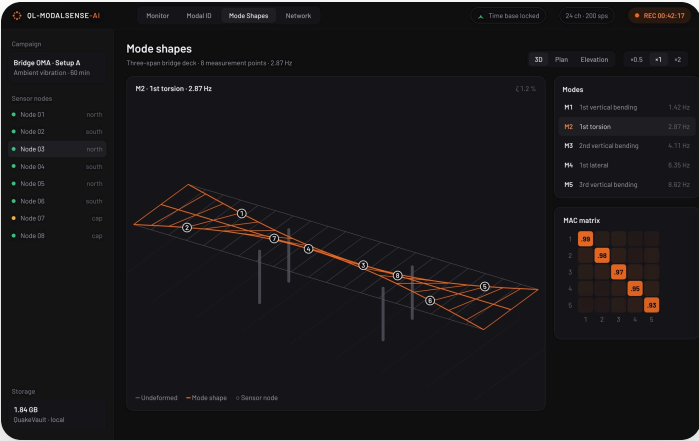
Mode shapes and export

Mode shapes on the structure geometry; records export to ASCII, CSV and MAT.

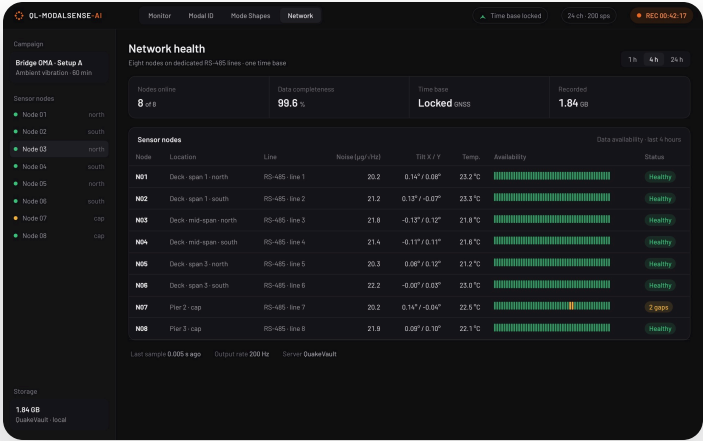
EVERY MODE, EVERY NODE, IN ONE PLACE.



Modal identification: singular value spectrum with AI-assisted peak picking, frequency, damping and MAC.



Mode shapes with MAC matrix.



Network health and data availability per node.

TECHNICAL SPECIFICATIONS

QL-MODALINK AT A GLANCE.

SENSING	VALUE
Sensor type	10-axis MEMS multi-sense
Accelerometer	Seismic-grade triaxial
Acceleration range	±16 g (±2, ±4, ±8 g options)
Noise floor	< 22.5 µg/√Hz
Resolution	0.005 g
Sensitivity	2 V/g (2 g version)
Dynamic range	90 dB (2 g version, 0.1-20 Hz)
Bandwidth	DC to 500 Hz
Nonlinearity	≤ 0.1%
Cross-axis sensitivity	≤ 1.2%
Offset drift	0.0001 g/°C
Tilt accuracy	0.05° static, 0.1° dynamic (X, Y)
Angle range	X, Z ±180°; Y ±90°
Gyroscope	±2,000 °/s, 0.61 °/s resolution
Magnetometer	±4,900 µT, 16-bit
Barometer	1 axis, with height output

INTERFACE	VALUE
Processor	32-bit, Kalman fusion filter
Interface	Modbus RS-485
Baud rate	4,800-921,600, adjustable
Output data rate	0.2-200 Hz
Outputs	Acceleration, angle, angular rate, magnetic field, quaternion, pressure, height
Data formats	ASCII, CSV, MAT
Output impedance	100 Ω
Power	3.3-5 VDC, < 40 mA
Function test	Externally driven test pulse
Housing	CNC-milled aluminum, corrosion-treated
Protection	IP68
Size	2.17 × 1.42 in (55 × 36 mm), excl. connectors
Weight	1.3 lb (0.6 kg)
Cable	49 ft (15 m) factory-terminated; custom lengths
Operating temp.	-40 to +185 °F (-40 to +85 °C)
Humidity	0-100%

STAINLESS STEEL ENCLOSURE

Field enclosure for decks, piers and outdoor installations.

EXTENSION CABLE

Shielded outdoor RS-485 and power cable, cut to the sensor layout.

BOREHOLE HOUSING

Sealed version for downhole and subsurface installation.

Supplied, configured and supported by QuakeLogic, Roseville, California, under an ISO 9001:2015 quality management system. 12-month warranty and lifetime technical support. Specifications are subject to change without notice.



QL-MODALINK · TRIAXIAL MODBUS SENSOR NODE

ONE SUPPLIER FOR SENSORS, SERVER AND SOFTWARE.

QuakeLogic delivers seismic monitoring, structural health monitoring and testing systems worldwide, from portable modal tests to permanent bridge and building networks.

HEADQUARTERS

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CREDENTIALS

ISO 9001:2015
ISO 14001:2015
ISO 45001:2018
CA-certified small business



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With Globally Sourced Materials

