

PRODUCT **BROCHURE**



VOYAGER

Mobile Data Acquisition and Acoustic Analyzer



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THE CORE OF EVERY MICROFLOWN SOLUTION

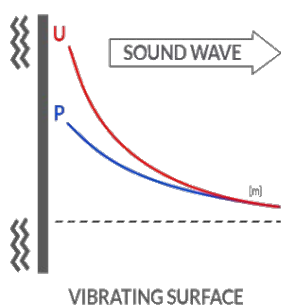
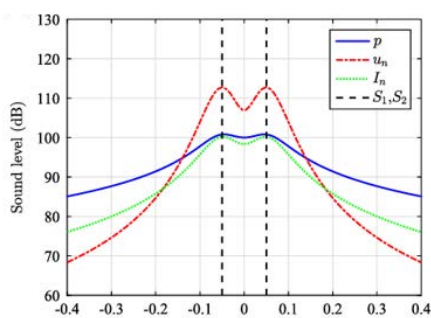
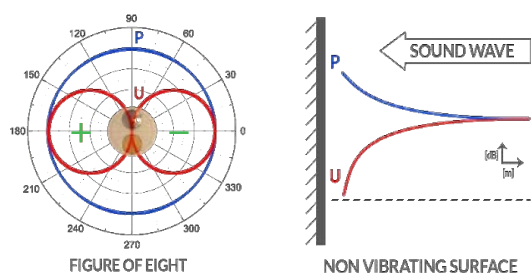
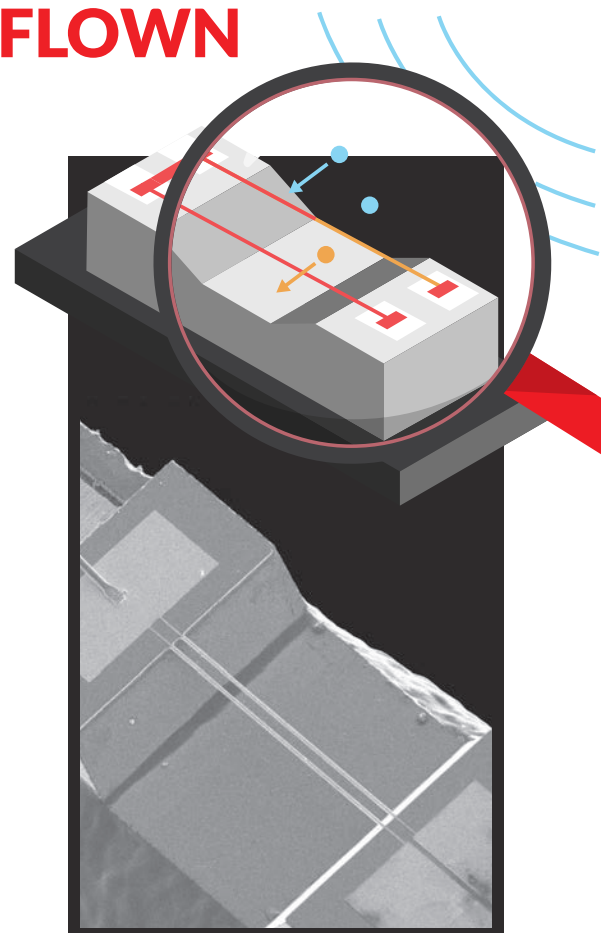
Sensing acoustic particle velocity

THE FOUNDATION

At the heart of every Microflown solution is the acoustic particle velocity sensor, also known as a Microflown. This MEMS-based sensor directly measures acoustic particle velocity, giving access to a fundamental property of sound that traditional microphones do not capture.

Particle velocity describes the local oscillating motion within a sound field and is a vector quantity, containing both magnitude and direction. This makes it possible to analyse how sound propagates, where it originates, and how energy is distributed in space.

Manufactured on silicon wafers using cleanroom technology, the sensor consists of two ultra-thin platinum wires, each heated and acting as a temperature sensor. As sound waves pass, they disturb the temperature distribution asymmetrically, creating a resistance difference between the wires. This generates a signal proportional to the acoustic particle velocity, covering a wide frequency range.



Background noise reduction

Particle velocity measurements are naturally less sensitive to surrounding noise because they combine two key advantages: directional sensitivity and vector behaviour. The Microflown sensor has a frequency-independent figure-of-eight directivity, allowing the most sensitive axis to be aimed toward the area of interest while rejecting sound arriving from other directions.

When measuring close to a rigid surface in a noisy environment, incoming and reflected sound waves travel in opposite directions. In terms of particle velocity, these opposite directions largely cancel each other, reducing the influence of surrounding sound fields. This helps isolate local sources and improves clarity in complex acoustic environments.

Enhanced spatial resolution

Close to a radiating source, particle velocity shows large level variations over very small distances. This is caused by near-field effects and the vector nature of this quantity.

The strong spatial gradient make it easier to separate closely spaced sources and reveal local acoustic details that can be difficult to distinguish with pressure-based measurements alone.

Low-frequency performance

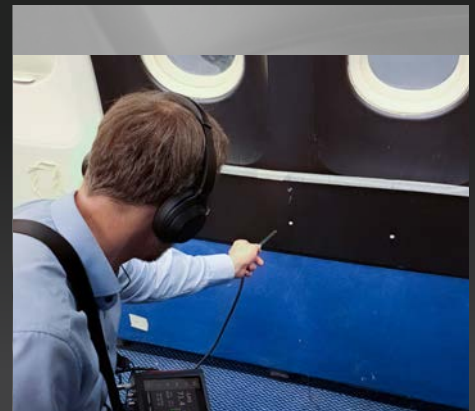
At low frequencies, near-field effects increase the particle velocity signal close to the source. This creates a stronger signal-to-noise ratio, making particle velocity especially valuable for troubleshooting low-frequency acoustic problems.



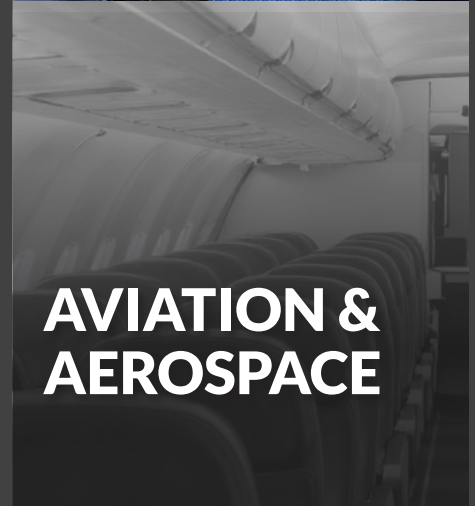
RAIL & HEAVY VEHICLES



NAVAL & MARINE



AVIATION & AEROSPACE



ONE DEVICE FOR RECORDING, LISTENING, AND ANALYSIS

The power of VOYAGER in one portable device

Acoustic troubleshooting often requires several separate devices for signal conditioning, data acquisition, recording, listening, and analysis. This increases setup time and makes measurements outside the laboratory unnecessarily complicated.

VOYAGER combines these functions in one compact, battery-powered touchscreen analyzer. Connect a Microflown probe and additional reference sensors to inspect, record, filter, and listen to acoustic signals directly at the measurement location.

The device can operate independently or as a portable frontend for VELO. With integrated storage, a built-in camera, network connectivity, and upgradeable firmware, VOYAGER provides a flexible platform for measurements ranging from quick source localization to complete sound and vibration investigations.

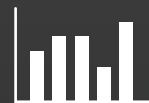
KEY FEATURES



All-in-one analyzer
Signal conditioning, acquisition, recording storage



6 inputs / 1 output
Up to 4 Microflown probe channels and 2 auxiliary IEPE



Real-Time analysis
FFT, octave bands, spectrograms, psychoacoustics



Fast and intuitive
Optimized user experience



Real operating environments,
No need for anechoic rooms



Mobile & Remote
Battery-powered





VEHICLE NVH



POWER & ENERGY



APPLIANCES & ELECTRONICS

KEY APPLICATIONS

- On-site NVH troubleshooting
- Noise source identification
- Buzz, squeak, and rattle localization
- Transient and intermittent noise investigation
- Automotive and cabin NVH testing
- Machinery and component diagnostics
- Acoustic leakage detection
- Sound intensity measurements
- Sound power assessment and source ranking
- Psychoacoustic and sound-quality evaluation
- Product benchmarking and development
- Measurements in noisy operating environments
- Portable data acquisition for VELO applications



THE HARDWARE BEHIND THE MEASUREMENT

All-in-one analyzer

VOYAGER combines data acquisition, signal conditioning, processing, storage, and power in one portable 7-inch touchscreen device. Its compact housing and built-in battery allow measurements to be performed directly at the test location without a separate frontend or external power supply.

Six synchronized input channels support a Micro-flow probe and two additional IEPE sensors. This makes the hardware suitable for acoustic and vibration measurements using microphones, accelerometers, or reference channels.

VOYAGER can operate independently for recording, listening, filtering, and analysis, or function as a portable frontend for VELO software. Internal storage keeps measurement data on the device, while the compact tablet design supports both laboratory and mobile applications.



Weight
1300 g



CPU Quad Core
1 GHz



Internal Storage
128 GB



Lithium-ion
6 Hours
5700 mAh



Operating Temp
0 to
40 °C



Storage Temp
-20 to
50 °C



Integrated camera

The integrated camera allows VOYAGER to capture images and video of the device under test while recording time-synchronized acoustic data. This enables quick and effortless data collection in the field, with both the visual information and measurement signals synchronized.

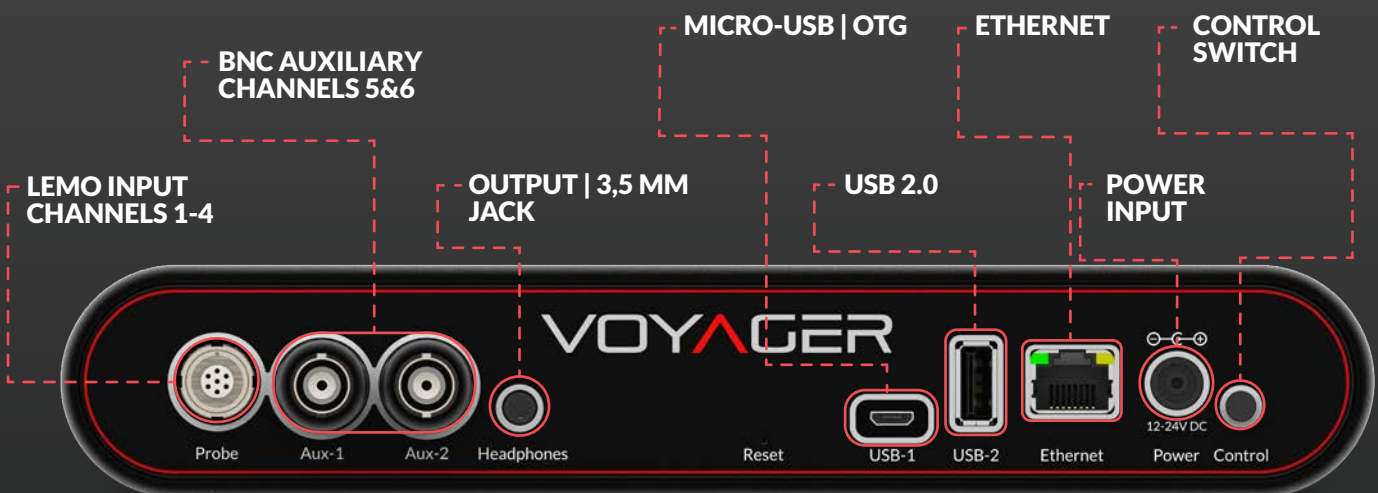
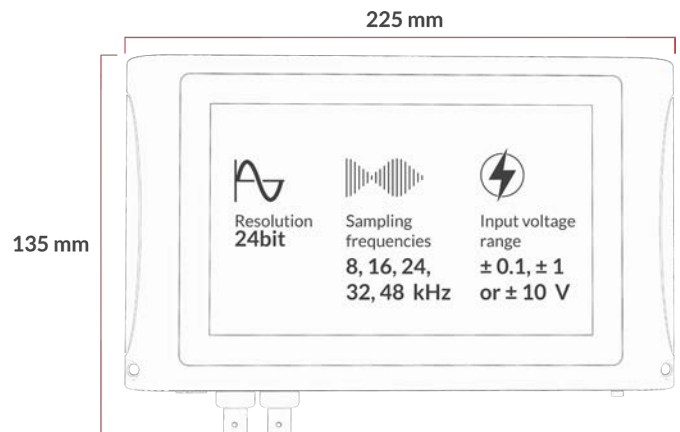
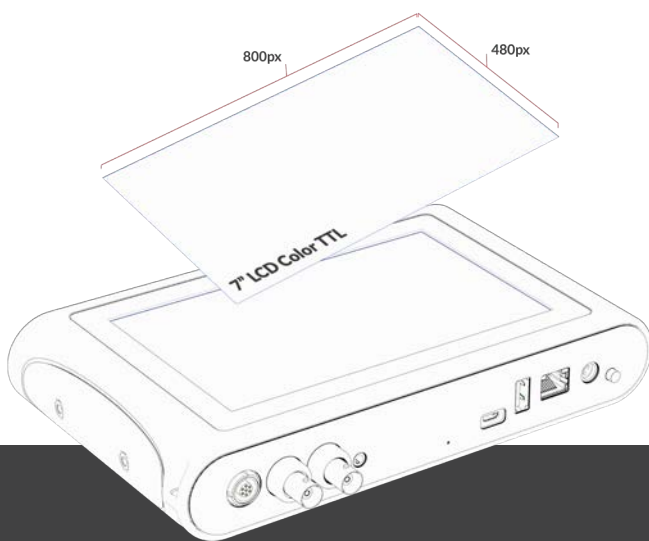
The recorded dataset can later be opened in the desktop application Scan&Paint 2D (license required), where the probe position can be tracked and the acoustic data processed into sound maps. At the same time, the captured images document the sensor placement and test conditions, making projects easier to identify, review, compare, and report.



Flexible connectivity

Ethernet connectivity allows VOYAGER to be accessed and controlled remotely from a computer, tablet, or smartphone on the same network. Users can start recordings, monitor measurements, transfer files, and operate VOYAGER as a

portable frontend for VELO without remaining next to the device. For a straightforward local setup, the Micro USB connection provides a direct wired interface between VOYAGER and the computer.



HARDWARE CONFIGURATIONS

The solution is available in two main hardware configurations: VOYAGER and VOYAGER+. The “+” designation indicates that the system is supplied with an extended set of accessories. Both hardware configurations can be provided with either Lite or Standard firmware.

Every VOYAGER is supplied in a compact and robust Peli case with a custom-designed inlay. Depending on the selected configuration, the case securely stores the device, cables, power supply, headphones, and adapters, keeping the complete system organised, protected, and easy to transport between laboratory and field measurements.

VOYAGER Lite + & Standard +
VOYAGER device
- Lanyard
- USB cable
- Sony WH-1000XM4 Headphones
- Tripod Adapter (1/4 to 3/8)
- Power supply
- Pelicase + inlay
- Firmware Reset Ejector Pin

VOYAGER Lite & Standard
VOYAGER device
- USB cable
- Power supply
- Pelicase + inlay
- Firmware Reset Ejector Pin



Probe compatibility

VOYAGER is compatible with the complete range of Microflow probes, allowing one portable platform to support both standalone acoustic measurements and dedicated VELO solutions such as Scan&Paint 2D and Scan&Paint 3D.

The choice of probe depends on the required bandwidth, measurement direction, physical access, and application. The 1D PU probes combine sound pressure and particle velocity for source localization, sound intensity, and sound power measurements. The USP adds three orthogonal particle-velocity components, enabling complete 3D acoustic characterization.

This flexibility allows VOYAGER to operate as a compact troubleshooting instrument or as the data-acquisition frontend of a larger measurement system, without changing the core hardware platform.



USP Regular
Channels : 4
Frequency range: 20 Hz – 10 kHz
Noisefloor : 21 SPL / 32 PVL dB(A)
Best for: 3D sound intensity, direction-of-arrival (DoA) and Scan&Paint 3D measurements.



PU VOYAGER
Channels : 2
Frequency range: 20 Hz – 8 kHz
Noise floor : 29 SPL / 35 PVL dB(A)
Best for: Robust field troubleshooting, direct source localization, and measurements in narrow locations.



PU Gen2
Channels : 2
Frequency range: 20 Hz – 14 kHz
Noise floor : 31 SPL / 26 PVL dB(A)
Best for: Broadband sound mapping, Scan&Paint 2D, real-time position tracking

Field calibration

Combined with the Microflow Sound Calibrator, VOYAGER enables quick field calibration of the PU VOYAGER and PU Regular Gen2 probes using their dedicated calibration adapters. Both the sound pressure and particle velocity channels can be calibrated against a known acoustic reference before and after a measurement campaign.

This provides a practical verification of the complete measurement chain at the test location, helping to ensure that the measurement data achieves the highest possible accuracy.



VOYAGER EMBEDDED SOFTWARE

VOYAGER is built around a continuously developed firmware platform, allowing new functions, performance improvements, and expanded compatibility to be added over time. These firmware updates are provided free of charge to VOYAGER users, helping the device remain current as measurement requirements evolve. Each unit is also calibrated using instrumentation covered by ISO/IEC 17025 accreditation, providing a reliable foundation for acoustic measurement and analysis.

- Compatibility with all Microflown probes (channel 1 to 4)
- Display auto- and cross-power spectra (narrowband results)
- Certified calibration with ISO 17025 reference instruments
- Bluetooth support
- Synchronized multi-channel data recording
- Data playback (audio and spectra)
- IEPE sensors (channels 5 and 6)
- Octave analyser (1, 1/3, and 1/12 bands)
- Spectrogram
- Sound intensity (including phase direction)
- Sound quality parameters (loudness, sharpness, and roughness)
- Coherence quality indicator for octave band analysis
- Sound level meter (SLM)
- Data exporting (*.txt, *.csv, *.wav files)
- Field calibration for particle velocity and sound pressure
- Signal generator (white noise, pink noise, sweep, and sine waves)
- Standalone capability with Scan&Paint 2D and In-situ Absorption data recording
- Embedded camera and external camera support
- Direction of Arrival (DOA)

LITE

Essential Scan&Listen functionality

VOYAGER Lite provides the essential tools for fast acoustic troubleshooting and source localization at an accessible entry level. Connect a Microflown probe, listen to the signal in real time, and inspect narrowband auto- and cross-power spectra directly on the touchscreen.

The optional DAQ module transforms VOYAGER Lite into a portable frontend for VELO, creating a future-ready Scan&Listen system that can grow with your measurement requirements. When more onboard recording and analysis functionality is needed, the same device can be upgraded to the Standard firmware license



DAQ module

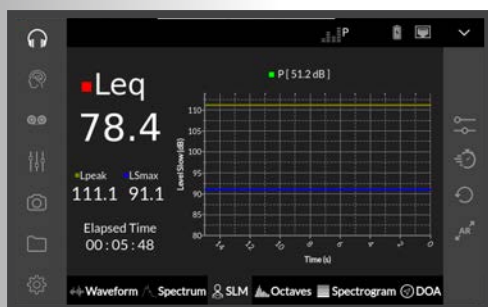
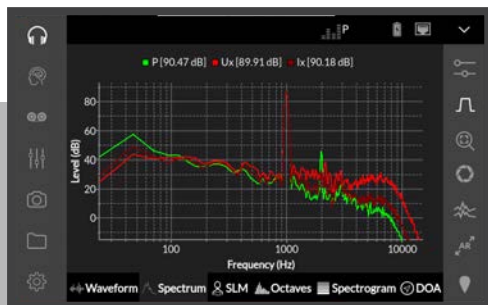
The optional DAQ firmware module expands VOYAGER from a standalone portable analyzer into a six-channel data acquisition frontend for VELO. Available for both VOYAGER Lite and Standard, it allows synchronized measurement data to be streamed in real time to a computer via a direct Micro-USB connection or over Ethernet.

This gives users the flexibility to perform quick stand-alone measurements in the field and use the same device for software-based acquisition and analysis in VELO. Integrated signal conditioning, battery operation, and compatibility with Microflown probes remain available in both configurations.

STANDARD

Complete onboard measurement and analysis

VOYAGER Standard unlocks the complete onboard measurement environment, allowing users to listen, record, process, review, and manage vibro-acoustic data directly on the device. Its dedicated modules bring real-time analysis, sound quality evaluation, multichannel recording, filtering, visual documentation, and data management together in one portable interface. This creates a self-contained measurement solution for field and laboratory use, while keeping recorded data ready for further processing, reporting, or analysis in VELO.



Real-time signal analysis

View the selected measurement channel as a waveform, narrow-band spectrum, octave-band display, or spectrogram. Adjustable FFT, averaging, weighting, and display settings allow the analysis to be adapted to tonal, broadband, or time-varying sound.

Measurements can be evaluated live or during playback, while snapshots, cursors, and multichannel selection support direct comparison between signals.

Sound level measurement

The integrated sound-level display shows instantaneous level variations together with equivalent, maximum, and peak values. Frequency and time weightings can be selected depending on the measurement requirement. Calculations follow IEC 61672-1, allowing VOYAGER to provide recognizable sound-level information directly beside its particle-velocity and intensity analysis tools.

Coherence and reactivity indication

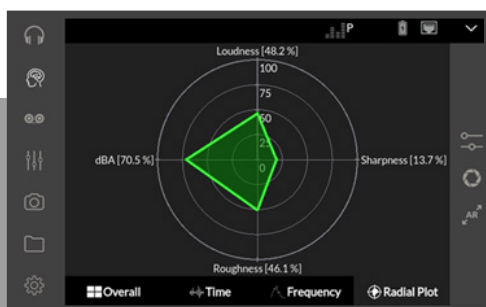
When sound intensity is selected, VOYAGER displays coherence and reactivity-error indicators for each octave band. A simple green, yellow, and red classification provides immediate feedback on the relationship between the pressure and particle-velocity signals. These indicators help users recognize frequency regions where the intensity result is more reliable or where reactive behaviour and limited coherence require additional attention

Direction of arrival

With a USP probe, VOYAGER uses the active sound-intensity vector to display the direction from which sound is arriving. Azimuth and elevation are shown directly on the device, together with the level within the selected frequency range.

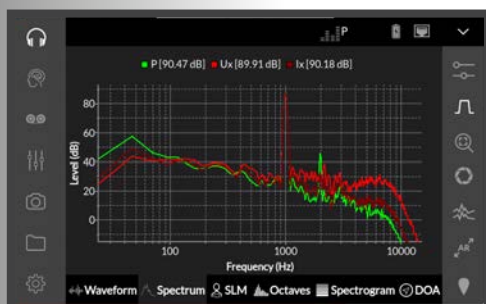
Frequency filtering allows users to concentrate on a specific tonal component or band, supporting fast directional source investigation at the measurement location.





Sound quality analysis

VOYAGER calculates loudness, sharpness, and roughness directly from a selected input channel. Results can be viewed as overall values, over time, across frequency, or together in a radial display. These psychoacoustic quantities complement conventional level measurements by describing characteristics related to human perception, supporting product comparison and sound-quality development.



Multichannel recording

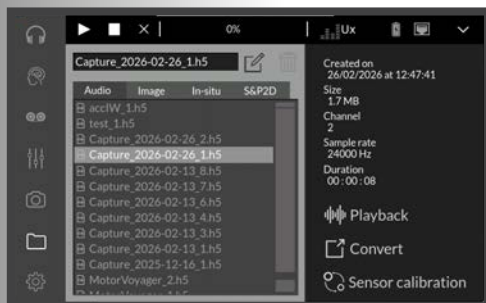
Record synchronized data from a Microflown probe and the two auxiliary input channels while monitoring input levels and spectra in real time. Captures can be controlled manually or stopped automatically using a defined timer.

Dedicated capture options also allow VOYAGER to acquire datasets for later processing in Scan&Paint 2D or VELO In-situ Absorption (additional license required).



Real-time filtering

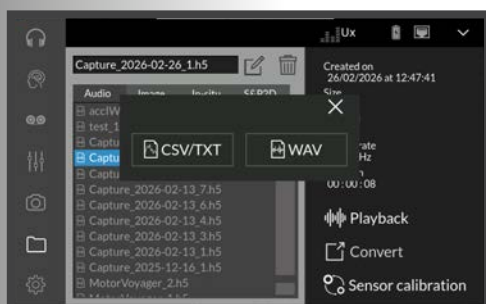
Create low-pass, high-pass, band-pass, and band-stop filters directly on VOYAGER. Multiple filters can be combined and stored within each project, allowing complex frequency selections to be created without external software. The configured filters can be applied during real-time listening, visualization, and playback, helping isolate relevant components and suppress unrelated frequency content.



Playback and project review

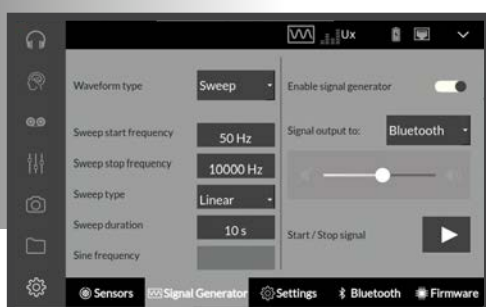
Saved measurements can be replayed and analysed using the same waveform, spectrum, octave, spectrogram, and filtering tools available during real-time operation. A timeline allows users to navigate directly to specific moments within the recording.

This makes it possible to inspect important events again at the test location without first transferring the data to a computer.



File management and export

VOYAGER keeps recordings, images, settings, and calibration information together inside structured project folders. Files can be renamed, reviewed, deleted, or converted directly from the onboard File Manager. Native HDF5 recordings can be exported as calibrated WAV files, while time-averaged intensity, coherence, and reactivity-error results can be converted to CSV or TXT for reporting or external processing.



Signal generation

VOYAGER can generate white noise, pink noise, sine waves, and frequency sweeps directly from the device. Signal settings and output level can be configured on the touchscreen, providing a convenient source for controlled acoustic testing without requiring a separate signal generator. The generated signal can be reproduced through the 3.5 mm audio output or a connected Bluetooth device, while start and stop controls remain accessible from the main interface.



ADDITIONAL SOFTWARE

Get more out of your VOYAGER

Free VELO Analyzer Lite

VELO Analyzer is free to download and install, extending VOYAGER measurements from the portable device to a complete desktop environment. Standard VOYAGER recordings can be transferred to a computer and imported directly, without requiring a dedicated recording mode.

Its guided workflow makes it easy to review, process, compare, and export acoustic data on a larger screen. Optimized for Microflow probes but compatible with a wider range of supported sensors, Analyzer provides a flexible platform for everyday vibro-acoustic analysis.



Playback and data validation

Listen to VOYAGER recordings while viewing the waveform and spectrogram in detail. Select specific time regions, apply configurable playback filters, and automatically detect potential problems such as overloads, probe impacts, or impulses. Unwanted sections can be excluded from processing without deleting the original measurement, helping users prepare a cleaner and more reliable dataset before analysis.

Process, compare and export

Create analysis processes for complete recordings or selected time ranges and compare multiple measurements within one view. Analyzer supports pressure, particle velocity, sound intensity, phase, coherence, and transfer-function evaluation. Snapshots, frequency weighting, data cursors, harmonic tools, and curve overlays support deeper interpretation, while flexible export options prepare the results for reporting or further processing.





One frontend, multiple measurement solutions

With the optional DAQ module, VOYAGER becomes a portable frontend for the complete VELO 64-bit platform. Connect it to a computer through Micro USB or Ethernet and use your VOYAGER as a portable and compact hardware to simplify your testing campaigns.

By adding the relevant VELO license, probe, and application-specific accessories, VOYAGER can expand from portable acoustic analysis into 2D and 3D sound mapping, material testing, and non-stationary source localization.

Scan&Paint 2D

Create high-resolution 2D maps of sound pressure, particle velocity, and sound intensity directly over an image of the device under test. Scan&Paint 2D is designed for fast localization, troubleshooting, and benchmarking of stationary noise sources.

Scan&Paint 3D

Capture and visualize stationary sound fields around complete products, machinery, or environments in three dimensions. Sound pressure, particle velocity, and intensity vectors reveal where sound originates, how it propagates, and which areas contribute most.

In-situ Absorption

Measure sound absorption, reflection, airflow resistivity, and complex acoustic impedance directly on the installed material. The handheld system supports flat, curved, homogeneous, and assembled surfaces without requiring an impedance tube or reverberation room.

Acoustic Shape

Investigate transient, changing, or repeatable operating conditions using synchronized 3D measurements. Acoustic Shape tracks the probe position and combines multiple captures to visualize how sound radiation changes over time, rotational speed, or operating condition.



Scan&Paint 2D

Probe:
PU Gen2

Tracking:
Intel D415 or D455f

Accessories:
Camera tripod and probe cable



Scan&Paint 3D

Probe: USP Regular

Tracking: PST Iris, PTS Base or HD

Accessories: Tracking sphere, remote handle, and tripod



In-situ absorption

Probe: PU Probe (PI)

Measurement tool:
Impedance Gun

Accessories: (optional)
Dedicated amplifier and cable set



Acoustic shape

Probe: USP Regular

Tracking: PST Iris and spherical tracker

Accessories: Tripod and reference sensors



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