

# Micromate Plus™

## A Better Way to Monitor

With over 40 years of expertise, Instantel has set the industry standard with our vibration, air-overpressure and sound monitoring units. The Micromate Plus monitoring unit reinforces our position as a market leader.

### Key Features

- Built-in features—Wi-Fi, Cellular, GPS, USB-C, Solar Controller, Optional AUX Port.
- Use multiple sensors at the same time—connect a geophone, air overpressure microphone and a sound microphone for complete project management.
- Simplified Calibration Process - the base unit does not require calibration. Only the sensors (Geophone, Linear Microphone, Sound Level Microphone) require annual calibration. To avoid downtime, leave the base unit in the field while you swap out the sensors for calibration.
- Single-geophone design, factory-calibrated, with software-selectable compliance standards. Switch standards on the fly in Vision II.
- Create your own customizable and multichannel compliance charts.
- Two orthogonal through-holes allows the geophone to be easily mounted to the ground or wall.
- Flexible data retrieval options: (1) cloud upload to Vision II via cellular or Wi-Fi; (2) local export to a USB-C mass-storage drive; (3) direct USB-C connection to a computer.
- No-locked in subscription fees.
- Easy-to-use, fail-safe keypad for in-field configuration in areas without wireless coverage.
- Rugged Design—color-coded Mil-Spec connectors usable with gloves, IP68 rating, aluminum casing, with optional protective boot and cover.

### Range of Applications

- Construction
- Quarries
- Oil & Gas
- Environmental
- Blasting
- Dynamic Compaction
- Tunnels & Subways
- Heavy Transportation
- Demolitions
- Civil Projects
- Sound/Noise
- Pile Driving
- Underground Mines
- Remote Access

### Monitor Remote Locations with Vision II Software

- Integrates seamlessly into Vision II software—monitor as if you were on site 24/7/365.
- Change unit parameters without wait time on any device with an internet connection.
- Monitor vibrations, air overpressure, sound level, and audio recording, all time-synchronized.

### Standard Sensors

- Triaxial Geophone
- Linear Microphone
- Sound Level Microphone

### Future Advanced Sensor Options

- High-Frequency Geophone
- High-Pressure Microphone
- Hydrophone
- High-Frequency Borehole Geophone
- Uniaxial and Triaxial Accelerometers
- Borehole Geophone

### Vision II Software can Include Custom Graphs as well as International Compliance Standards and Graphs

- Arrêté de 1994 (explosif)
- Australian 2187-2
- ANSI S2.71 RMS 1s
- AS 2187.2-2006
- Brazilian Standard NBR 9653
- British Standard 6472
- British Standard 7385
- Une 22-381-93 (Criterio Prevencion)
- DIN 4150
- France SNCF, Internal Procedure IN1226
- FTA (VdB)
- ICPE-Circulaire 86
- Indian CMRI, DGMS India (A) & (B)
- ISO Standards: 10816-2 RMS, 2631-2 and 8569
- JIS C 1510 1995
- NCh 3577
- NF E90-020:2015
- NOM-026-SESH
- NS 8141 and NS 8141-1
- NS 8175 and NS 8176
- NZS/ISO 2631-2 Combined curves
- OfM 9/1997
- ÖNORM S9012 and S9020
- PN-B-02170
- SBR-A and SBR-B
- Swedish Blasting SS 4604866
- Swedish Pile Driving SS 025211
- Swedish Human Annoyance SS 4604861:2022
- Swedish Air-Shock SS 025210 2
- Swiss SN 640 312a
- Toronto 514-1, 514-2
- Turkey Mining & Quarry
- USBM RI8507 And OSMRE



Standard Sensors (L to R):  
Triaxial Geophone  
Sound Level Microphone  
ISEE Linear Microphone



Optional Protective Boot

## General Specifications

Micromate Plus Channels	Channels 1 to 3: Triaxial Geophone Channels 4 to 5: Sound Level Microphone and Audio Channel Channel 6: ISEE Linear Microphone
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Geophone	ISEE Mode	DIN Mode
Range	Up to 254 mm/s (10 in/s)	Up to 254 mm/s (10 in/s)
Response Standard	ISEE Seismograph Specification (2022)	DIN 45669-1
Resolution	0.00775 mm/s (0.000305 in/s)	0.00775 mm/s (0.000305 in/s)
Sensor Density	2.3 g/cc, (144 lb/ft <sup>3</sup> )	2.3 g/cc, (144 lb/ft <sup>3</sup> )
Frequency Range	2 to 250 Hz	1 to 80 Hz, 1 to 315 Hz
Accuracy	From 2 to 4 Hz and 125 to 250 Hz: +5% to -3 dB of an ideal flat response, from 4 to 125 Hz: ±5% or ±0.5 mm/s (0.02 in/s) whichever is larger.	DIN 45669-1 Standard
Phase Response	Phase shift from 2.5 to 250 Hz <10% of maximum absolute value of 2 superimposed harmonic vibrations.	
Maximum Cable Length	1000 m (3280.8 ft)	1000 m (3280.8 ft)
Extension Cable Lengths	10 m (32.8 ft), 30 m (98.4 ft), 75 m (246.1 ft)	10 m (32.8 ft), 30 m (98.4 ft), 75 m (246.1 ft)
Microphones	ISEE Linear Microphone	Sound Level Microphone
Weighting Scales	ISEE Linear Microphone	A-Weight or C-Weight
Response Standard	ISEE Seismograph Specification (2022)	Fast (125 ms) or Slow (1 s)
Range	Up to 1000 Pa (0.145 psi) [154 dB]	30 to 140 dB, A or C
Resolution	0.0305 Pa (4.4262x10 <sup>-6</sup> psi) [0.05 dB]	0.05 dB
Frequency Range	2 to 250 Hz	Up to 20 kHz
Accuracy	2 Hz: -3 dB ± 1 dB, 3 Hz: -1 dB ± 1 dB, from 4 Hz to 125 Hz: ±1 dB, 200 Hz: +1 dB to -3 dB, 250 Hz +1 dB to -4 dB	IEC 61672 Class 1
Maximum Cable Length	77 m (252.6 ft)	77 m (252.6 ft)
Extension Cable Lengths	10 m (32.8 ft), 30 m (98.4 ft), 75 m (246.1 ft)	10 m (32.8 ft), 30 m (98.4 ft), 75 m (246.1 ft)

Recording	Waveform	Histogram
Record Modes	Waveform, Waveform Manual	Record Modes
Storage Capacity	32 GB	Storage Capacity
Seismic Trigger	0.13 to 254 mm/s (0.005 to 10 in/s)	Histogram and Histogram Combo™ (Unit captures triggered waveforms while recording in Histogram mode.)
Linear Acoustic Trigger	2.0 to 1000 Pa (0.00029 to 0.145 psi) [100 to 154 dB]	Recording Interval
Sound Level Microphone Trigger	33 to 140 dB (A or C)	From 2 seconds to 3600 seconds (1 hour)
Sample Rate—S/s (per channel)	1024, 2048, 4096, 8192 (audio recording only)	Storage Capacity
Record Stop Mode	Fixed record time, AutoRecord™ (see Auto Record Time below)	>10 years at 2-second intervals
Record Time	2 - 90 seconds (plus up to a maximum of 10 seconds pre-trigger)	>20 years at 1-minute intervals
Auto Record Time	An event is recorded until the vibration activity remains below the trigger level for the duration of the auto window. When the maximum of 90 seconds is reached, recording continues as a new event file.	
Cycle Time	Recording uninterrupted by event processing, monitoring, or communication - zero dead time between events.	
Full Waveform Events	>170 000: All 6 channels including audio using a 1-second pretrigger for a 3-second event at 2048 S/s.	

## Physical Specifications

Dimensions	20.1 x 11.9 x 8.1 cm (7.9 x 4.7 x 3.2 in) LWH; length dimension includes connectors and dust caps.
Unit Weight	2.27 kg (5 lb)
Battery	172 Wh
User Interface	10 domed tactile keys, color touch screen, with display keyboard and dedicated shortcuts for common functions.
Display	QVGA, 320 x 240 color touch screen
PC Interface	USB-C
Auxiliary Inputs and Outputs	External Trigger and Remote Alarm
Environmental	
- LCD Operating Temperatures	-20 to 55 °C (-4 to 131 °F)
- Electronics Operating Temperature	-40 to 55 °C (-40 to 131 °F)
- Sound Level Microphone	-20 to 55 °C (-4 to 131 °F)
- Water Resistance	IP68 – submerge base unit to 30 cm (1 ft) for 24 hours, 1.5 m (4.9 ft) for 1 hour.
- Humidity	Up to 95% RH, non-condensing
- Maximum Operating Altitude	5000 m (16404 ft), power adaptor: 2000 m (6561 ft)
Remote Communications	Built-in cellular modem and Wi-Fi to automatically transfer events when they occur.
Other Features	
- GPS	The onboard global positioning system connects to multiple GNSS constellations including GPS, Galileo and BeiDou. Factory installed, for time synchronizing event data, location stamping and geofencing (future).
- Data Hosting Software	Vision II cloud-based software. Provides stakeholders with secure, encrypted, access to event data, and allows instant sharing for time-sensitive projects.
- Wi-Fi	2.4 GHz (802.11 b/g/n). Requires internet access to connect to Vision II.
- Cellular	Micro-SIM, 12mm x 15mm (0.47 x 0.59 in), LTE-M (Cat M1) and NB-IoT (Cat NB2). APN must have access to WAN (public internet) to connect to Vision II.
Electrical Standards	CE Class A