POLEBOT ONE / STRUCTURAL MEASUREMENT SYSTEM

Polebot One

Precision structural monitoring instrument for utility poles

Polebot One is a rugged, battery-powered instrument that tracks small changes in utility-pole orientation and low-frequency structural vibration over time. It combines inertial sensing, onboard spectral analysis, global LTE Cat 1 bis connectivity, internal health monitoring, and cloud access in one field-ready system.

KEY FEATURES

- **Global LTE Cat 1 bis** connectivity with no local gateway
- Absolute and reference-relative inclination
- Low-frequency FFT spectral monitoring
- High-rate acceleration waveform capture
- Three-axis acceleration, angular velocity, and magnetic field
- Internal enclosure temperature, humidity, and device health
- Cloud dashboard, exports, and API access
- Event-triggered acquisition and synchronization

APPLICATIONS SUPPORTED BY MEASUREMENT DATA

- Pole lean and asset-condition monitoring
- Structural-health and resonance studies
- Foundation and soil-movement observation
- Inspection prioritization
- Storm and construction monitoring
- Research and engineering field studies
- Event awareness after abrupt movement

MEASUREMENT BOUNDARY

Supports engineering decisions; does not predict failures or replace utility inspections.

POLEBOT ONE / PRODUCT DATASHEET V1

Performance specifications

Inclination, vibration, inertial, and internal device-health specifications

INCLINATION PERFORMANCE

Parameter	Specification	Conditions
Absolute lean accuracy	±0.1° typical	Calibrated vertical reference; constant temperature
Reported resolution	0.01°	Reported lean
Repeatability (1 sigma)	0.015°	Static conditions
Recommended minimum detectable change	~0.05°	Three-sigma repeatability
Long-term drift	<0.3°	Constant conditions; duration not specified
Thermal sensitivity	0.01° per °C typical	Tested over a 5°C to 35°C span

VIBRATION PERFORMANCE

Parameter	Specification	Notes
Measurement band	0-12.5 Hz	Continuous onboard spectral analysis
FFT bin spacing	25 mHz	Fourier-transform bin spacing
Spectral amplitude resolution	0.1 milli-g	Spectral amplitude
Natural-frequency monitoring	Supported	Continuous spectral monitoring
Raw accelerometer recording	Supported	High-rate waveform capture

INERTIAL MEASUREMENT SYSTEM

Parameter	Specification
IMU	9-axis accelerometer, gyroscope, and magnetometer
Configured accelerometer range	±2 g
Sampling modes	Continuous, scheduled, and event-triggered
Waveform capture	Supported

INTERNAL ENVIRONMENTAL AND HEALTH MONITORING

Measurement	Specification
Internal temperature	Digital sensor; enclosure diagnostics and compensation
Internal relative humidity	Digital sensor; enclosure moisture diagnostics
Battery and signal	Continuous device-health measurements
Device diagnostics	Firmware, storage, modem, and system health

Specification note: internal temperature and relative humidity are enclosure diagnostics, not ambient meteorological measurements. Values describe product capabilities and do not predict structural failure.

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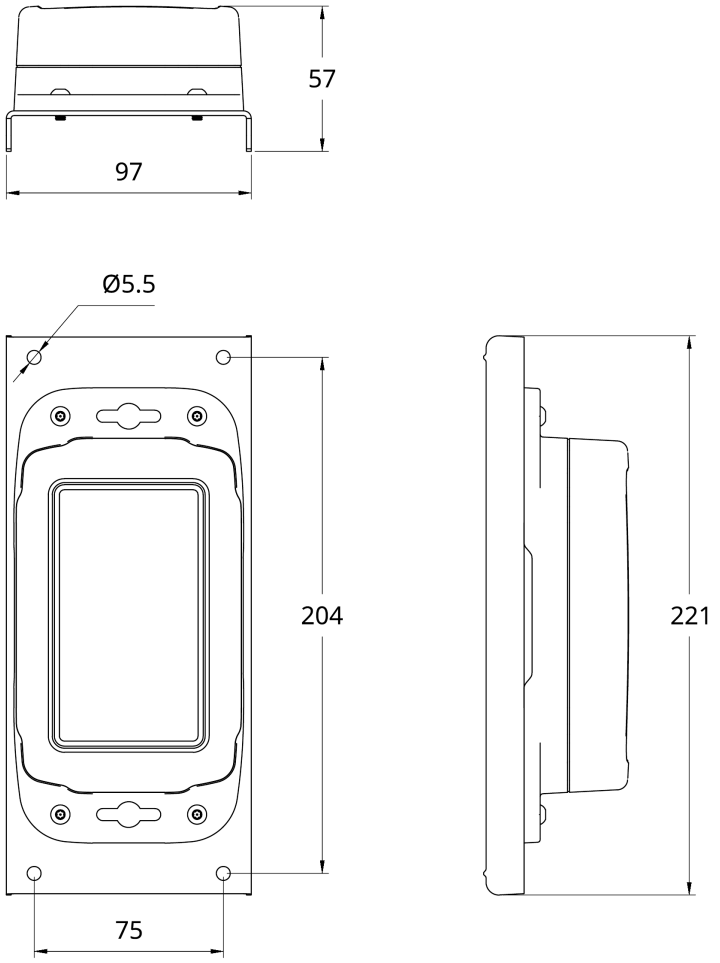
Mechanical dimensions

Dimensioned projected views and installation envelope



ALL DIMENSIONS IN MILLIMETRES

Dimensioned-view excerpt; not a released manufacturing drawing

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Hardware specifications

Physical construction, environment, power, sampling, and communications

PHYSICAL

Parameter	Specification
Overall dimensions	221 H x 97 W x 57 D mm
Mounting-hole spacing	75 x 204 mm center-to-center
Mounting-hole diameter	5.5 mm
Weight	680 g including bracket
Enclosure	UV-stabilized polycarbonate
Bracket and hardware	Stainless steel

ENVIRONMENTAL

Parameter	Specification
Operating temperature	-40°C to +65°C
Ingress protection	IP68
Enclosure sealing	Silicone gasket
Outdoor use	Permanent installation
Corrosion resistance	Stainless mounting hardware

POWER

Parameter	Specification
Battery	Primary lithium Li/FeS2
Nominal voltage / energy	4.5 V / 15 Wh
Battery life	3-36 months; application dependent
Solar power	Optional kit

SAMPLING

Parameter	Specification
Lean interval	1-60 minutes; user configurable
Vibration interval	1-60 minutes; user configurable
Event sampling	Thresholds based on lean change or acceleration
Routine synchronization	1-24 hours; user configurable
Event synchronization	Immediate after event-triggered sample

COMMUNICATIONS AND DATA

Parameter	Specification
Cellular network	Global LTE Cat 1 bis
Frequency bands	Global LTE bands; configuration and region dependent
Local gateway	Not required
Cloud access	Dashboard, exports, and API
Device management	Fleet tools, remote diagnostics, OTA firmware

CONFIGURATION NOTES

Battery life depends on sampling, synchronization, cellular conditions, temperature, and event activity. Certification and cellular-band availability vary by configuration and region.

POLEBOT ONE / PRODUCT DATASHEET V1

Installation and ordering

Fast field deployment with battery or optional solar configurations

01 Place

Place Polebot and its included stainless-steel bracket directly on the wooden pole.

02 Secure

Affix Polebot using 4 included stainless steel wood screws.

03 Activate

Login to your dashboard and pair Polebot to your pole asset's identification and location information.

TYPICAL INSTALLATION TARGET: UNDER ONE MINUTE / FIELD METHOD AND SCOPE APPLY

ORDERING INFORMATION

Model	Description
Polebot One	Standard battery-powered unit
Polebot One + Solar	Solar-powered configuration; availability dependent
Mounting Kit	Stainless-steel mounting hardware
Replacement Bracket	Spare mounting bracket

INCLUDED IN THE BOX

- Polebot One
- Stainless-steel mounting bracket
- Mounting hardware
- Quick-start guide

PRODUCT IDENTIFICATION

PRODUCT	**Polebot One**
DOCUMENT	**Datasheet v1**
PUBLICATION	**July 2026**

START WITH A PILOT

Measure what your poles are already telling you.

Email info@1bitsquared.com to request a Polebot One pilot

REQUEST A PILOT