

ACKCIO TILTMETER (LoRa Mesh) (N625)

Category: Monitoring



Product Code: N625

Category: MONITORING

Sub-Category: DATALOGGER

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- The Ackcio BEAM-TM is a wireless tiltmeter node engineered for high-precision angular measurement and deformation monitoring in geotechnical and structural applications.
 - It integrates a self-compensated MEMS biaxial inclinometer developed by Sisgeo, providing accurate tilt readings with extremely low noise and excellent long-term

stability.

- Designed to capture minute angular changes in structures such as retaining walls, tunnels, bridges, and buildings, the BEAM-TM ensures accurate real-time data collection through Ackcio's long-range wireless mesh network.
 - The node supports a measurement range of $\pm 15^\circ$ with an exceptional resolution of 0.0001° , and accuracy up to $\pm 0.003^\circ$ for smaller ranges, ensuring precise performance in critical monitoring scenarios.
 - Temperature effects are minimized through automatic thermal compensation, maintaining consistent accuracy between -20°C and $+80^\circ\text{C}$.
 - Wireless communication is powered by Ackcio Mesh, a secure, long-range, self-healing network that supports up to 50 nodes and 12 hops with AES-128 end-to-end encryption.
 - The BEAM-TM operates autonomously using a high-capacity Li-SOCl₂ D-cell battery, delivering multi-year performance depending on sampling frequency and transmission settings.
 - Configuration, setup, and data diagnostics are handled through Ackcio Nimbus, an Android application for quick deployment and network management.
 - The IP67-rated aluminium enclosure provides superior environmental protection, making it ideal for long-term outdoor installations in challenging site conditions.
 - Mounting options include both horizontal/vertical and rail mounting plates, designed for flexible installation and secure alignment in any orientation.
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TECHNICAL SPECIFICATIONS

- Sensor Type: Sisgeo self-compensated MEMS inclinometer
- Measurement Axes: Biaxial
- Measurement Range: $\pm 15^\circ$
- Accuracy: $\pm 0.003^\circ$ (for $\pm 2.5^\circ$, $\pm 5.0^\circ$, $\pm 10^\circ$ ranges); $\pm 0.01^\circ$ (for $\pm 15^\circ$ range)
- Resolution: 0.0001°
- Temperature Offset: $\pm 0.003^\circ/\text{C}$ (-20°C to $+80^\circ\text{C}$)
- Thermistor Range: -20°C to $+80^\circ\text{C}$ (3 k Ω sensor)
- Thermistor Resolution: 0.1 $^\circ\text{C}$
- Thermistor Accuracy: $\pm 0.5^\circ\text{C}$ (0°C to $+50^\circ\text{C}$)
- Radio Band: ISM 863-870 MHz / 902-928 MHz
- Transmit Power: Up to 1 W (30 dBm)
- Modulation: 2-GFSK
- Data Rate: 50 kbps
- Network Capacity: Up to 50 nodes, 12 hops
- Range: Up to 5 km (line-of-sight), 1 km (urban), 500 m (subsurface)
- MCU: Arm® Cortex®-M3 48 MHz, 32-bit CPU
- Memory: 128 KB flash, 20 KB SRAM, 8 MB external flash
- Clock: High-precision RTC (10 ppm, -40°C to $+80^\circ\text{C}$)
- Interfaces: USB 2.0 (Micro B, 5 V, 500 mA max), LED indicators (SYS, SENS), buttons (TEST, RESET, FORMAT)
- Operating Temperature: -40°C to $+80^\circ\text{C}$
- Enclosure: Die-cast aluminium, IP67 rated
- Power Supply: 2.7-4 V DC internal battery
- Internal Battery: 1 $\times$ D-cell Li-SOCl₂ 3.6 V, 19 Ah
- Typical Current Drain: <20 μA (idle), <100 mA (RX), <300 mA (TX)

- Circuit Protection: Surge (60 V DC breakdown), impulse (500 V typical), reverse polarity, short-circuit, ESD 15 kV
- Firmware: Ackcio Mesh low-power networking firmware
- Software: Ackcio Nimbus Android setup and monitoring app

ORDERING INFORMATION

Item Name	Item Code
ACKCIO TILTMETER (LoRa Mesh)	N625X001B

Keywords: Ackcio BEAM-TM, wireless tiltmeter, MEMS inclinometer, biaxial tilt sensor, Ackcio Mesh, Sisgeo sensor, structural monitoring, geotechnical monitoring, deformation monitoring, IP67 wireless node, long-range tilt monitoring, autonomous wireless inclinometer, low-power mesh sensor, tilt angle measurement