ACKCIO TILTMETER (LoRa WAN)

Code : N623



- A rugged, low-power wireless tiltmeter designed for long-term structural and geotechnical monitoring in harsh outdoor environments. The device measures static tilt relative to the horizontal plane on three axes and additionally records acceleration and internal temperature, enabling reliable movement assessment and early warning.
- The sensor supports scheduled measurements synchronized to UTC and optional trigger-based event capture. User-configurable thresholds allow alarm reporting when tilt and/or acceleration exceed preset limits, supporting rapid response in critical monitoring applications.
- Designed for unattended deployments, the unit features an IP67 outdoor enclosure and a replaceable lithium battery system for multi-year operation. LoRaWAN long-range communication enables wide-area monitoring with typical coverage up to 2 km in urban areas and up to 5 km in rural line-of-sight conditions (with suitable antenna).

TECHNICAL SPECIFICATIONS

- Tilt sensing technology: MEMS accelerometer (3-axis)
- Tilt measurement range: ±90°
- Tilt resolution: 0.001°
- Tilt accuracy: < ±15°: ±0.005°; > ±15°: ±0.01°
- Acceleration range: ±2 g
- Response bandwidth: 20 Hz
- Acceleration measurement bandwidth: 0.1–31.25 Hz
- Non-linearity: < 0.1 %FS
- Cross-axis sensitivity: 1 %
- Resonant frequency: 2.4 kHz
- Zero-bias stability: < 0.002 g
- Temperature coefficient (tilt): 0.0004 °/°C
- Temperature measurement range: −20°C to +70°C
- Temperature resolution: 0.05°C
- Temperature accuracy: ±0.2°C
- Wireless technology: LoRaWAN
- Supported regions: EU868, US915, AU915, AS923, IN865, KR920, RU864
- Wireless range: up to 2 km (urban), up to 5 km (rural line-of-sight with high-gain antenna)
- Join method: OTAA
- Ingress protection: IP67
- Operating temperature: −20°C to +70°C
- Operating modes: Scheduled acquisition only / Scheduled + tilt trigger / Scheduled + acceleration trigger / Scheduled + combined triggers
- Alarm reset logic: Returns to normal mode after values return within thresholds; optional confirmation delay before re-arming
- Configurable parameters (defaults):

- Tilt threshold (X or Y): 5.0°
- Acceleration threshold (any axis): 0.05 g
- Alarm confirmation count: 0
- Alarm reporting interval (alarm mode): 10 min
- Normal reporting interval: 60 min
- Output data: Tilt (X, Y, Z), Acceleration (X, Y, Z), Temperature, Battery level/voltage, Alarm status
- Enclosure material: Industrial-grade aluminium alloy
- Dimensions: 101 × 72 × 60 mm
- Weight: ≤ 280 g (without battery)
- Supply voltage range: 2.5–4.2 V (typ. 3.6 V)
- Power supply: 1 × D-cell 3.6 V Li-$SOCl_2$ (13–19 Ah)
- Battery capacity: 13–19 Ah
- Standby current: 280 µA
- Working current: 15 mA
- Transmission current: 150–250 mA
- Battery life estimation (typical):
- Normal (alarm off), 1 hr interval: 2.3 years
- Normal (alarm off), 24 hr interval: >10 years
- Dynamic (alarm on), 1 hr interval: 1.79 years
- Dynamic (alarm on), 24 hr interval: 5.3 years
- Reliability & vibration:
- MTBF: ≥ 98,000 hours
- Insulator resistance: ≥ 100 MΩ
- Shock resistance: 10 g @ 11 ms, 3-axis (half-sine)
- Vibration resistance: 10 g rms, 10–1000 Hz

EQUIPPED WITH

- IP67 outdoor enclosure
- Zero-set function for relative angle measurement
- User-configurable alarms for tilt and acceleration
- Integrated acceleration and temperature sensing
- LoRaWAN long-range wireless communication

SUPPLIED WITH

- Wireless 3-axis tiltmeter unit
- Antenna (standard)
- Mounting interface for direct installation on flat surfaces
- **Optional**: low-profile/straight antenna for reduced height installations
- **Optional**: L-shaped mounting plate for vertical installations

ORDERING INFORMATION

Item Name	Item Code
ACKCIO TILTMETER (LoRa WAN)	N623X001B