LoRaWAN Precision Tilt Angle Sensor for Structural Health Monitoring

Smart City, Smart Factory, Smart Infrastructure

SKU: WSLRW-SHMAG

Safe Zone

Hazardous Zones

The WSLRW-SHMAG is a high-precision dual-axis tilt angle sensor specifically engineered for long-term Structural Health Monitoring (SHM) applications such as bridges, high-rise buildings, dams, tunnels, foundations, and critical infrastructures.

Utilizing advanced industrial-grade MEMS sensing technology combined with ultra-low power electronics and robust mechanical design, the SHMAG delivers reliable, repeatable tilt measurements over years of outdoor operation.

The device integrates seamlessly into wireless SHM networks via LoRaWAN, offering over 10 years of maintenance-free operation powered by a single LS33600 primary lithium battery.

Applications

Bridge structural monitoring, High-rise building sway detection, Dam and embankment deformation monitoring, Foundation settlement tracking, Tunnel and underground structure monitoring, Industrial plant infrastructure surveillance

Notes For Applications

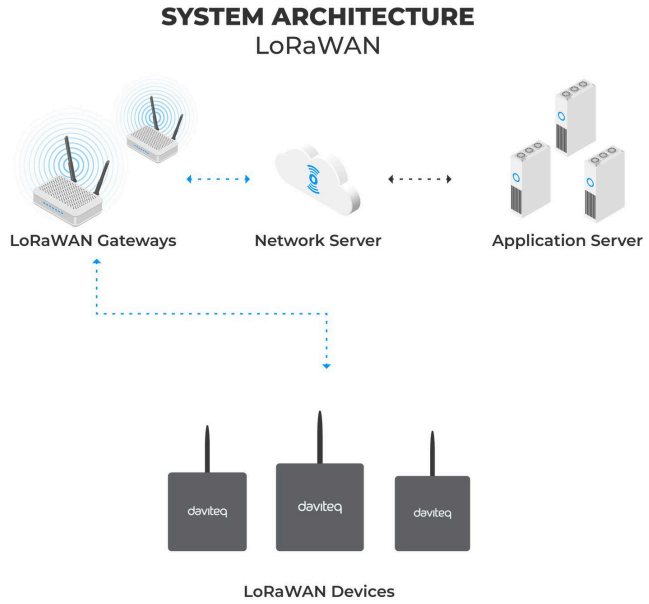
Tilt Range: Match the angle range to your needs (e.g., ±45°, ±90°). Accuracy & Resolution: Higher values for precise applications. Axes: Single or multi-axis depending on complexity. Sensor Type: Mechanical (simple) vs. MEMS (advanced). Environment: Check temperature, waterproofing, and shock resistance. Power: Ensure voltage/current match your system. Size & Mounting: Fit your design and installation needs.

Dual-axis precision tilt measurement
Ultra-high resolution and repeatability. Long-term stability under continuous thermal cycling. Integrated internal temperature measurement

Designed for harsh outdoor SHM deployments
IP67 rugged anodized aluminum enclosure for highest stability operation in more than 10 years!

10+ Year battery life
Ultra-low power design enabling 10+ years operation

Zero-offset calibration at Field
For easy deployment



DAVITEQ TECHNOLOGIES INC
Ho Chi Minh City, VN | Koblenz, DE | Melbourne, AU | Zurich, CH
+84.28.6268.2523 / 6268.2524
info@daviteq.com **www.iot.daviteq.com**
Created date: Jun-26-2025 | Updated date: May-04-2026

Specification

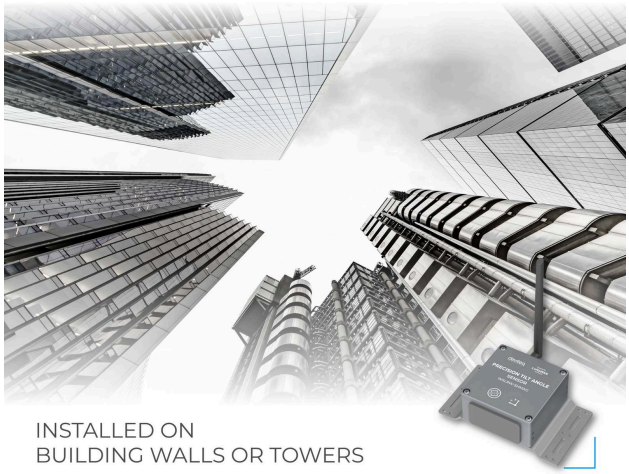
Measuring Range	±30° dual-axis, tilt measurement
Resolution (Intrinsic)	≤ 0.0001° after internal filtering
Short-Term Repeatability (Intrinsic Sensor Performance)	Single Sample (RMS): ±0.0021° at ODR=10Hz, no averaging
	Averaging 10 samples: ±0.00066° in 1 sec window
	Averaging 50 samples: ±0.00030° in 5 sec window
	Averaging 100 samples: ±0.00021° in 10 sec window
Long-Term Zero Stability	±0.15° over multi-year operation
Temperature Coefficient	±0.0043°/°C thermal-induced zero drift
Operating Temperature	-40°C to +85°C
Ingress Protection	IP67/IP68 fully sealed enclosure
COMMUNICATION	
SF Factors	SF7～SF12
Antenna	External Antenna 2 dbi
Power Supply	Single cell LiSOCl2 battery size D (not included), 10+ years typical lifetime
RF Frequency and Power	860～930MHz, 14～20 dBm, configurable for zones: EU868, IN865, RU864, KR920, AS923, AU915, US915
Protocol	LoRaWAN Class A V1.0.3
Data sending modes	interval time, alarm and manually triggering by magnetic key
Alarm function	Yes
Configuration	via downlink
RF Module	complies to ETSI EN 300 220, EN 303 204 (Europe) FCC CFR47 Part15 (US), ARIB STD-T108 (Japan)
Ambient working temperature	-40～85℃
Housing	Anodized A6061 Aluminum, Carbon-color, IP67
Bracket	2 x 304SS Bracket for base mount or wall mount
Dimension	W110xD113xH53 mm (not included antenna)
Net weight	700g

DAVITEQ TECHNOLOGIES INC
Ho Chi Minh City, VN | Koblenz, DE | Melbourne, AU | Zurich, CH
+84.28.6268.2523 / 6268.2524
info@daviteq.com **www.iot.daviteq.com**
Created date: Jun-26-2025 | Updated date: May-04-2026

LORAWAN PRECISION TILT ANGLE SENSOR FOR STRUCTURAL HEALTH MONITORING
WSLRW-SHMAG

INSTALLED IN
FACTORY/ PLANT FOUNDATIONS

LORAWAN PRECISION TILT ANGLE SENSOR FOR STRUCTURAL HEALTH MONITORING
WSLRW-SHMAG

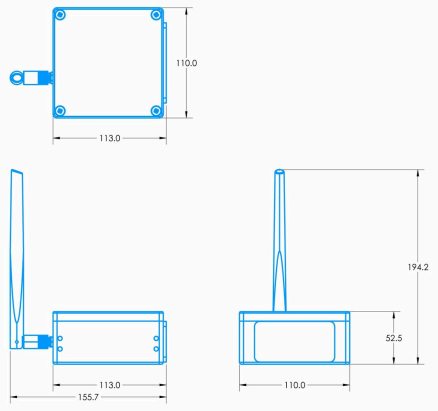


INSTALLED ON
BUILDING WALLS OR TOWERS

INSTALLED ON
A BRIDGE

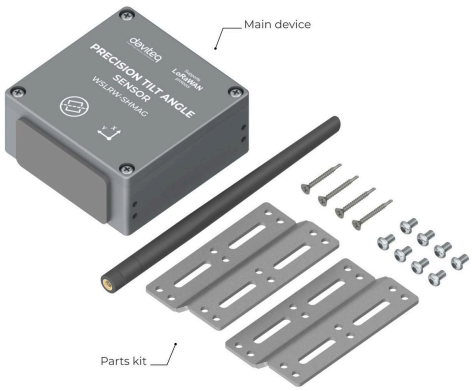
INSTALLED AT
A HYDROPOWER DAM

LORAWAN PRECISION TILT ANGLE SENSOR FOR STRUCTURAL HEALTH MONITORING
WSLRW-SHMAG



DIMENSION DRAWING OF
WIRELESS NODE (Unit: mm)

LORAWAN PRECISION TILT ANGLE SENSOR FOR STRUCTURAL HEALTH MONITORING
WSLRW-SHMAG



PRODUCT PACKAGE

DAVITEQ TECHNOLOGIES INC
Ho Chi Minh City, VN | Koblenz, DE | Melbourne, AU | Zurich, CH
+84.28.6268.2523 / 6268.2524
info@daviteq.com **www.iot.daviteq.com**
Created date: Jun-26-2025 | Updated date: May-04-2026

Ordering Information

Item code	Description
WSLRW-SHMAG-01	LoRaWAN Precision Dual axis Tilt angle sensor for Structural Health Monitoring SHM, 860~930MHZ, 3.6V Battery Supply