ENCARDIO RITE
METASENSING FOR MEGA STRUCTURES

WIRELESS TILT METER (RF)

NexaWave TiltSense

DATASHEET

NEXAWAVE TILTSENSE
TILT METER

NEXAWAVE HUB
GATEWAY

ESP-12V1A SOLAR
POWER SUPPLY

OVERVIEW

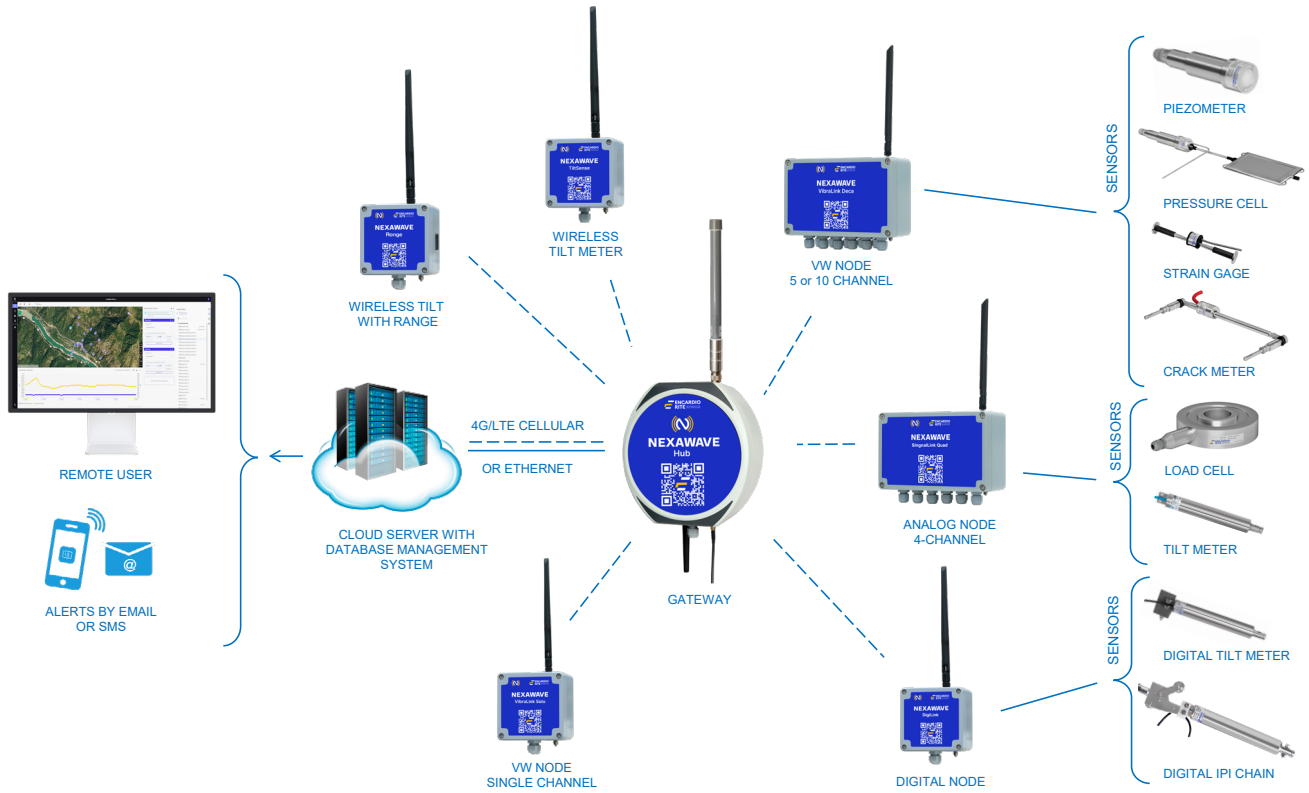
The Encardio Rite NexaWave TiltSense wireless tilt meter is engineered for precise remote monitoring of small changes in inclination and vertical rotation of structures. The triaxial tilt meter integrates a high-precision MEMS sensor with a LoRa RF network for radio transmission, ensuring accurate tilt data collection.

Encardio Rite's wireless LoRa RF system provides a reliable and efficient means of monitoring geotechnical and infrastructure health. The system consists of various sensor, nodes and a gateway that operates in a MESH (presently only STAR) configuration. These sensor and nodes are plug-and-play, offering intuitive on-site configuration via an Android device.

Wireles tilt meter are used across various civil engineering applications to ensure structural safety and performance. It is used to assess the inclination and rotation of metro stations and tunnels, monitor the stability of structures in landslide-prone areas, evaluate the performance of bridges and piers under load, and track the deformation of embankments and retaining walls. By providing real-time data, the tilt meters enable authorities to detect slightest of change in structures, facilitating timely decision-making, enhancing safety, minimizing project delays, and reducing costs.

FEATURES

- **Wireless triaxial sensor:** Measures 3-axis tilt relative to gravity's direction, with a range of ± 90° and an integrated datalogger.
- **Standalone operation:** Standalone unit in weatherproof compact enclosure; suitable to monitor hard to access sites and tunnels remotely.
- **Reliable data transmission:** High-resolution readings with long-term stability and uninterrupted data transmission.
- **Easy configuration:** Plug and play sensor installation. Intuitive set up and configuration on your mobile.
- **Scan rate:** The nodes can be configured to scan and transmit data at customizable frequencies, ranging from 3 minutes to 24 hours.
- **Remote gateway configuration:** Configure an inaccessible Gateway remotely using any RF sensor or node in network.
- **Seamless connectivity:** 200 RF sensor/nodes to 1 Gateway over large distances in MESH (presently only STAR) configuration.
- **Automatic alerts and reports:** Real-time alerts via SMS or email for data that crosses pre-defined alert levels allowing timely response to critical events or changes in the monitored parameters.
- **Cloud-hosted data management:** The collected sensor data is uploaded to a central/cloud server to be processed to provide 24/7 access to the data allowing advanced data analysis and visualization on our platform Proqio.
- **Privacy:** AES-128 encryption, maximizing the security of the sensor data collected.
- **High battery life:** 6 – 60 months for nodes, depending upon the application and data transmission rate.
  In gateway, batteries are only for emergency (as a short time back-up in case of power failure).
- **Versatile power options:** Choose from battery, mains, or optional solar power (model ESP-12V1A). For remote sites, mains or solar power is advised.



WIRELESS TILT METER WITH OTHER NODES CONNECTED TO GATEWAY IN LORA NETWORK

PRODUCT OFFERING

Description

NexaWave TiltSense is a highly accurate and reliable wireless three-axis tilt meter. This complete unit integrates a MEMS tilt sensor and node (datalogger). It is designed to measure the angular displacement of a structure relative to the horizontal plane i.e. perpendicular to the gravitational axis. Each unit undergoes individual calibration, ensuring exceptional accuracy and repeatability..

Mounting arrangment

The tilt meters are supplied with standard fasteners for easy mounting on either vertical or horizontal surfaces/walls. An optional mounting bracket, which provides enhanced flexibility in installation, is available upon request for an additional cost.

Datalogging

The tilt meter transmists the data to the Gateway via the long range (LoRa), low power RF wireless network. The intuitive configuration is super easy ad can be done using any Android device using our application that comes free with the system. The Gateway then uploads all the collected data to the central/cloud server via GSM/GPRS network.

Real-time data management system

Proqio, our data intelligence platform hosted on a central server, enables users to remotely monitor and manage structures with advanced infrastructure intelligence. Leveraging machine learning, it provides real-time insights and analytics, offering a clear visualization of the project's status. It features customized automatic reporting tailored to specific project needs, ensuring a comprehensive performance overview. Proqio also provides instant alerts via SMS or email when readings exceed predefined alert levels, enhancing project management and responsiveness.

SPECIFICATIONS

TiltSense (EAN-95MW) Tilt meter	
Standard range	± 90°, triaxial
Resolution	± 1 arc second
Accuracy[1]	± 0.1% fs
Operating Temp.	-40°C to +70°C
Antenna (LoRa)	Fiber Glass Antenna Omni directional (3 dBi)
[1]As tested under laboratory conditions.	

Hub (EWG-01) Gateway	
Nodes per Gateway	Up to 200
Storage	SD card 16 GB expandable up to 32 GB
Typical current drain	200 mA typical operating current
Internet connectivity	In-built 4G modem
Radio Frequency	EU: 863-870 MHz; US& ROA: 902-928 MHz
Antenna (Cellular)	Stub Antenna (3 dBi) External Whip Antenna (5 dBi)
Antenna (LoRa)	Fiber Glass Antenna Omni directional (3 dBi)

Power supply for tilt meter and gateway	
Internal non-rechargeable batteries	2 D-Cell Lithium Thionyl Chloride 3.6 V Nominal Voltage, 14 Ah batteries In gateway, batteries are only for emergency (as a short time back-up in case of power failure).
Power supply	9-30 VDC @ 1 A nominal
Solar power supply	Model ESP-12V1A solar power supply 12 VDC @ 1A, available on order. 9 VDC option available for Tilt meter.

**All specifications are subject to change without prior notice*

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