

WIRELESS NETWORK SOLUTION (RF)

DATASHEET

**NexaWave Wireless
RF LoRa System**



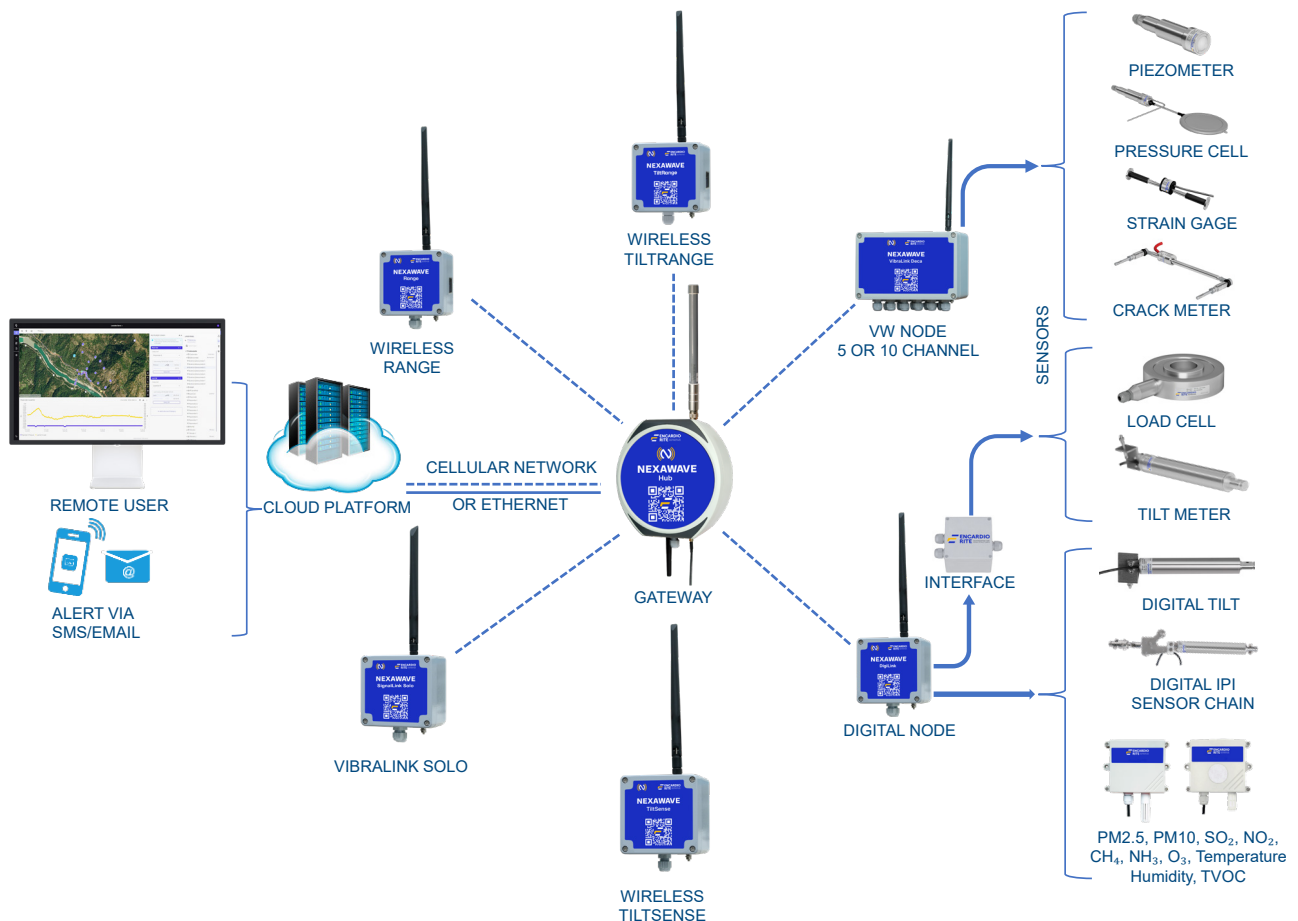
OVERVIEW

Encardio Rite's comprehensive wireless LoRa RF sensor solution provides a reliable and efficient means of monitoring geotechnical and infrastructure health. Easy setup, real-time data transfer, and advanced features enable effective project management and decision-making. The system consists of various nodes and a gateway that operates in a STAR configuration. The nodes include tilt meter sensor nodes, tilt & laser sensor nodes for distance measurement, vibrating wire nodes, digital nodes (SDI-12 nodes), and a relay node. These nodes are designed to be plug-and-play with our sensors. Site setup and configuration are intuitive and easy using an Android device.

The wireless sensor network provided by Encardio Rite is crucial for monitoring construction sites, infrastructure projects such as dams, railways, landslide areas and environmental parameters. By utilizing the wireless system, project owners, consultants, and contractors can stay informed about their site via an early warning system and make timely decisions to increase safety, reduce project delays and improve cost-effectiveness.

FEATURES

- **Reliable data transmission:** High-resolution readings with long-term stability and uninterrupted data transmission.
- **Seamless connectivity:** 200 nodes to 1 Gateway over large distances in STAR configuration.
- **Easy configuration:** Plug and Play sensor installation. Intuitive setup and configuration on your mobile.
- **Remote gateway configuration:** Configure an inaccessible Gateway remotely using any node in network.
- **Wide range of sensor compatibility:** The range of sensors include digital sensors, vibrating wire sensors, analog sensors, environmental sensors, and more.
- **Node scan rate:** The nodes can be configured to scan and transmit data at customizable frequencies, ranging from 3 minutes to 24 hours.
- **Cost-effective solution:** It eliminates the need for lengthy cables and reduces installation and maintenance costs.
- **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.

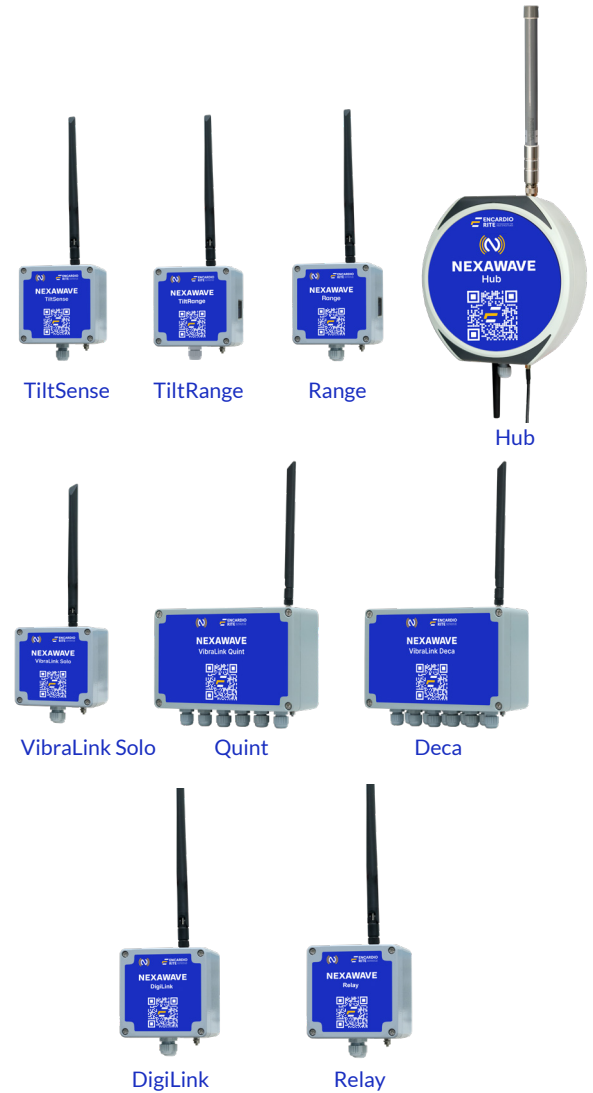


TYPICAL SCHEME

PRODUCT OFFERINGS

- **NexaWave Hub:** Gateway, to collect data from wireless sensors and nodes within the RF network and transmit it to the cloud/local server.
- **NexaWave TiltSense:** Wireless triaxial tilt meter. It is a complete unit, including the tilt sensor and the node.
- **NexaWave TiltRange:** Wireless tilt meter with distance meter. Includes tilt sensor, laser and the node.
- **NexaWave Range:** Wireless distance meter comprising of laser and the node.
- **NexaWave VibraLink:** Vibrating wire node. To be used with vibrating wire sensor(s). Variants available:

| | |
|------------------------|------------|
| VibraLink Solo | 1 channel |
| VibraLink Quint | 5 channel |
| VibraLink Deca | 10 channel |
- **NexaWave DigiLink:** Digital node. Single channel, to be used with SDI-12 interface sensors.
- **NexaWave Relay:** Relay node. To enhance the range of any node.



NODE COMPATIBILITIES

The complete range of vibrating wire sensors can be connected to **NexaWave VibraLink** node including:

- Piezometer, water level sensor
- Strain gage
- Pressure cell
- Displacement sensor, crack/joint meter
- Extensometer
- Temperature meter
- Settlement monitoring sensor

NexaWave DigiLink supports a wide range of sensors, both digital and analog, for seamless integration and real-time monitoring. The following sensors can be connected directly to NexaWave DigiLink, including those requiring an interface card for analog signals:

- IPI Chain
- Tilt Meter (MEMS with SDI 12 output)
- Environmental Sensors

- Analog Sensors (via Interface Card), including:
 - Resistive Strain Gage Type Load Cell
 - MEMS Tilt Meter
 - Electrolytic Level [EL] Tilt Meter
 - Thermistor Sensor with Millivolt Output
 - Sensors with 4-20 mA Output



SPECIFICATIONS

NexaWave 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) |

¹As tested under laboratory conditions.

NexaWave TiltRange (EWN-01ML) Tilt/Distance meter

| | |
|-------------------------|--|
| Tilt | Specifications as above |
| Laser range | 0.1 to 33 m; 0.1 to 100 m |
| Repeatability (1 Sigma) | ± 0.15 mm |
| Resolution | 0.1 mm |
| Operating Temp. | -40°C to +70°C |
| Antenna (LoRa) | Fiber Glass Antenna Omni directional (3 dBi) |

NexaWave Range (EWN-01LD) Displacement meter

| | |
|-------------------------|--|
| Laser range (mm) | 0.1 to 33 m; 0.1 to 100 m |
| Repeatability (1 Sigma) | ± 0.15 mm |
| Resolution | 0.1 mm |
| Operating Temp. | -40°C to +70°C |
| Antenna (LoRa) | Fiber Glass Antenna Omni directional (3 dBi) |



ESP-12V1A Solar power supply, 12 VDC, 1 A

NexaWave VibraLink Solo/Quint/Deca (EWN-01V/05V/10V) Vibrating wire node DigiLink (EWN-01D) Digital node

| | |
|-----------------|-----------------------|
| Operating Temp. | -40°C to +70°C |
| Storage | 3 million data points |

NexaWave 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) (node and gateway) | Fiber Glass Antenna Omni directional (3 dBi) |

NexaWave Power supply for TiltSense, TiltRange, Range sensors, VibraLink (VW node), DigiLink (digital node) and Gateway

| | |
|-------------------------------------|---|
| Internal non-rechargeable batteries | 2 D-Cell Lithium Thionyl Chloride 3.6 V Nominal Voltage, 14 Ah batteries <i>Provision for extra 2 batteries provided in Quint and Deca VW node for extended battery life.</i> |
| Power supply | 9-30 VDC @ 1 A nominal <i>The gateway must be powered using a continuous external power source.</i> |
| Solar power supply | Model ESP-12V1A solar power supply 12 VDC @ 1A, available on order. 9 VDC option available for TiltSense and VibraLink Solo node |

*All specifications are subject to change without prior notice

DATASHEET | 1916-25 R08



Dams



Mining



Tunnels



Transportation



Construction



Bridges



Landslides



Energy



Environmental Monitoring



Pipelines



Structural Health Monitoring



Smart Cities

ENCARDIO RITE GROUP - INDIA | BHUTAN | NEPAL | BAHRAIN | QATAR | SAUDI ARABIA | UAE | PERU | GREECE | SPAIN | UK | USA

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