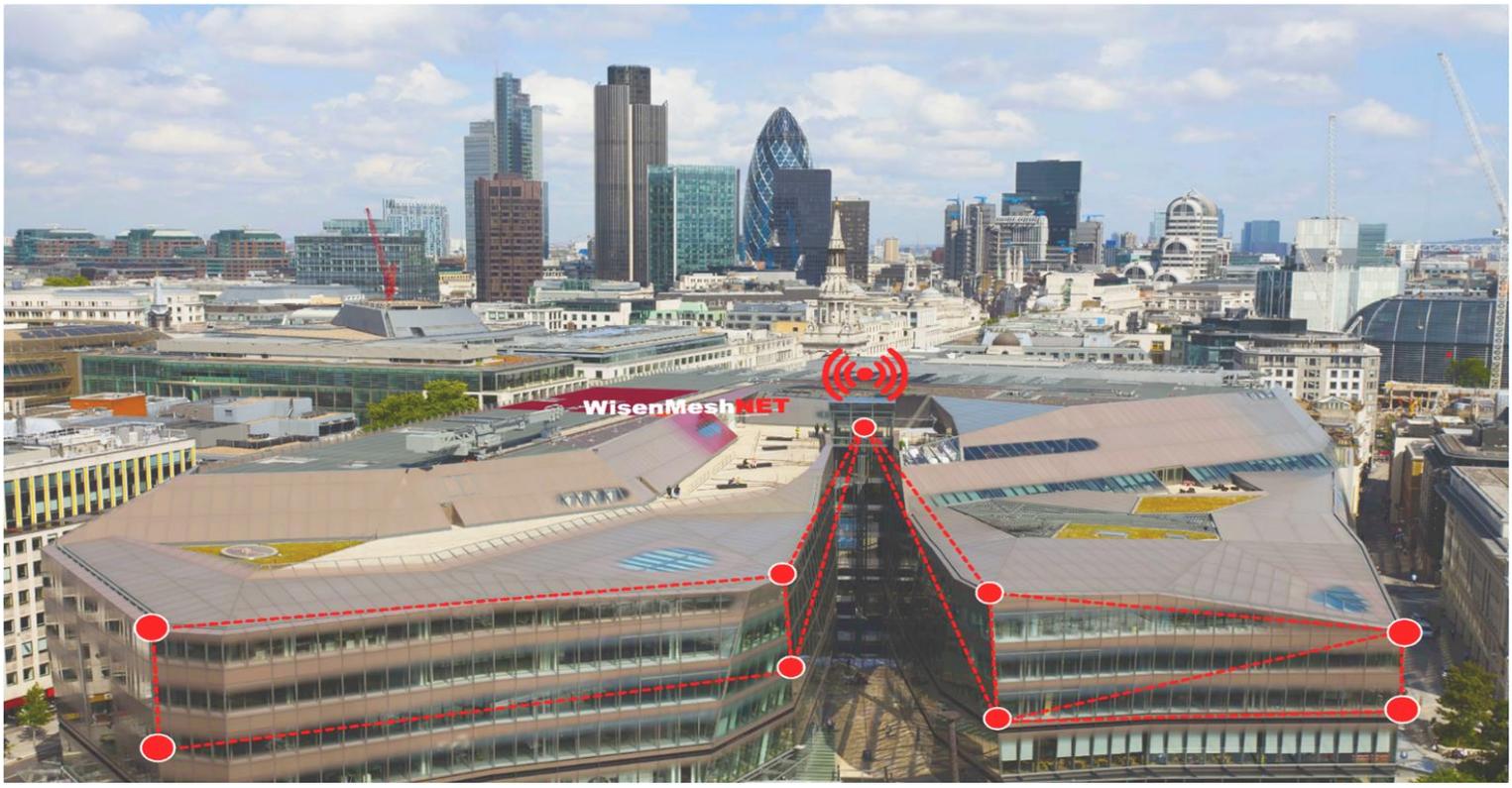
WiSenMeshNET: Omni Tilt & Tilt-R Node
Wireless Monitoring System



This internally powered sensor node allows measurement of tilt from the horizontal plane. With a full tilt range (360°any axis) and very high accuracy (±0.002°)and resolution (±0.0001°). The omni-axis sensors can be installed in any orientation and automatically detect the horizontal plane.

The nodes also include an integrated temperature sensor and wireless mesh radio transmitter via the external antenna.

The battery lifespan is up to 17 years at hourly readings.

It is also available in a configuration designed specifically for rail track monitoring with an integrated internal antenna.

WiSenMeshNET nodes communicate via bespoke encrypted mesh radio technology can be up to 400m from each other or the SmartGateway. The sensors mesh together and automatically form a network relaying data off each other (up to 10 sub mesh levels of data hop) and back to a central data hub called a SmartGateway which contains the data logging functions, radio mesh control systems and external communication to the WiSen cloud-based datacentre or local hosted system.

FEATURES

- WiSenMeshNET Node
- Omni-axis tilt 360° range
- ±0.002° accuracy
- ±0.0002° precision
- ±0.0001° resolution
- Intelligent node/repeater
- Battery life up to 17 years
- 1 second to 1 hour variable readings
- End user configurable
- Rugged Housing
- IP66
- Gravity Orientation Sensor

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PHYSICAL PROPERTIES	
Dimensions (L x W x H)	80mm x 75mm x 57mm (excluding antenna)
Weight	0.43kg
Casing and Painting Materials	Aluminium-Alloy & Epoxy Polyester Powder Coating
International Protection Mark Rating	≥IP66
Operating Temperature	-40 to +85°C
LOCAL STORAGE	
Local Flash Memory Storage	Min. 450 Data Packets
POWER	
Primary DC Power	1 xER34615 Lithium D Cell Battery

Battery Life Expectancy [1]

Sampling Interval - T	Model 1305			Model 1306		
	Duration (Days)	Duration (Months)	Duration (Years)	Duration (Days)	Duration (Months)	Duration (Years)
1 Min	179	5.9	0.5	225	7.4	0.6
5 Mins	870	28.6	2.4	992	32.6	2.7
15 Mins	2205	72.5	6.0	2695	88.6	7.4
30 Mins	4088	123.4	10.3	4401	144.7	12.0
1 Hour	5630	185.1	15.4	6543	215.1	17.9

(1) Quoted battery life are best case scenarios with minimal hops (mesh radio use), excellent signal quality and minimum transmission power. For example, a node taking 9-10 hops could lead to a reduction of 30% of quoted values. Please contact WiSen for further advice.

Accuracy Stop Voltage	2.7VDC
Mesh Stop Voltage	2.1VDC
Battery Connection	Standard Aluminum Battery Holder
Working Current (DC)	Max. 17mA (Typically 12mA)
PRIMARY SENSOR	
Sensor Type	MEMS Triple-Axis Tilt Sensor
Measuring Range	± 90° per axis
Accuracy	**For ± 0.0° to ± 2.0°** ± 0.0020° | 7.20" | 0.0349mm/m (or mrad) **For ± 2.0° to ± 90°** ± 0.0050° | 18.0" | 0.0872mm/m (or mrad)
Precision	± <0.00020° | 07.20" | 0.00349mm/m (or mrad)
Resolution	± 0.0001°| 0.36" | 0.0017mm/m (or mrad)
Long Term Stability	@ 10 Years 0.014°
Vibration Resistance	Conformance to EN60068-2-64:2004 & EN50125-3:2003+COR R2010 Standards for railtrack vibration/shock acceleration for on sleeper placement associated to peak vibration 800m/s² / 2ms or 81.6g
Impact Resistance (2)	1000g (Powered Mode)

(2) The sensor should not be subject to an impact greater than quoted number. Care and Consideration must be undertaken for this precise equipment.

RADIO SPECIFICATIONS	
Protocol	WiSenMeshNET® proprietary radio encryption
Radio Frequency	2.4GHz System
SERVICE INSPECTION	
Inspection Period	Every 3 Years by Manufacture (or inspected by arranged methods)
CERTIFICATION	
Regional Conformity	UKCA
Network Rail	PADS Number: 0055/162721
London Underground	Reg Number: 3224

ACCESSORIES

Radio Antennas	
WA029-00002	WiSenMeshNET Whip Mesh Antenna (+5dBi/195mm)
WA029-00039	WiSenMeshNET Whip Mesh Antenna (+10dBi/395mm)

Power Supply	
WB016-00016	3.6V ER34615 19AHr D Cell Lithium Battery

Mounting	
WM028-00155	WiSen L-Bracket for Tilt Sensor Node*
WM028-00187	WiSen Flat Mounting Plates with U Clamps for Sensor Nodes*
WM028-00203	WiSen Railway Two-Part Aluminium Mounting Plate
*Compatible with magnet fixings for non-intrusive installations	