



FlatMesh™



Product Data Sheet:

NanoMacro Triaxial Tilt Sensor Node

The FlatMesh NanoMacro is an extremely high precision and exceptionally stable three axis tilt sensor which reports its measurements through Senceive’s FlatMesh wireless communications network to a FlatMesh Gateway.

The FlatMesh NanoMacro is highly robust, has a long battery life, and comes with Near Field Communication (NFC)™ capability, enabling on the spot interactions with the node.

Successfully applied in many applications, including those measuring:

- Tunnel deformation
- Tunnel heave/settlement
- Embankment slippage
- Structural movement
- Rail track heave/settlement
- Rail trackbed cant and twist

Key features

- Integrated triaxial tilt sensor
- Extremely low noise performance
- Extremely low profile
- Resolution of 0.0001° (0.0018 mm/m) and repeatability of ±0.0005° (±0.009 mm/m) (Standard version)
- Operational in any orientation
- Integrated battery
- 12-15 year battery life, including when acting as a relay node within the mesh communications network
- Integrated temperature sensor
- Versatile mounting options
- Waterproof to IP68 / IP69K
- NFC capability, enabling on the spot adjustments to the node
- “Sleep mode” functionality

NanoMacro Triaxial Tilt Sensor Node



Physical Specifications

Parameter	Value
Diameter	86.7 mm
Height	64.2 mm
Total Mass	305 g
Housing Material	Polycarbonate and Aluminium
Protection	IP68 at 1 m for 24 hours IP69K
Mounting Options	Magnetic, screws, gluing, swivel mount or clamping
Operating Temperature Range	-40°C to +85°C

FlatMesh Radio Specifications

Parameter	Value
Communication Type	Proprietary FlatMesh v3 Mesh Networking Protocols IEEE 802.15.4 compliant
Frequency Band	2400 – 2485 MHz ISM Band
Maximum Transmit Power (EN 300 328 v2.2.2)	6.5 dBm
Range	Up to 300 m depending on the environment and fitted antenna Consult with Senceive for your application
RF Module	FM3Nano

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Tilt Sensor Specifications

Parameter	Value
Resolution	0.0001° (0.00175 mm/m)
Repeatability	±0.0005° (±0.0087 mm/m)
Repeatability (High G variant)	±0.0025° (±0.0436 mm/m)
Range	±90°

Internal Battery

Parameter	Value
Battery Type	Lithium Thionyl Chloride
Nominal Voltage	3.6 V
Nominal Capacity	19000 mAh
Typical Battery Life	12-15 years at 30 minute reporting intervals, including when acting as a relay node Consult with Senceive for your application

Certifications

- Tested to conformity with all the essential requirements of the Radio Equipment Directive 2014/53/EU and RoHS Directive 2011/65/EU
- FCC Grant of Equipment Authorization
- Transit Drop Tested to MIL-STD-810G CN1 method 516.7
- Vibration and Shock tested to EN 50125-3 on sleeper levels

Patents pending in the UK and other jurisdictions. Registered design.

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Ordering Information and Accessories

Model	Description
FM3NT-50	FlatMesh NanoMacro
FM3NT-50H	FlatMesh NanoMacro (High-G)
FS-FM3NT-NFC	Contactless NFC Reader
FF-MK50	Magnetic Mounting Kit Perfect for steel or cast iron structures
FF-T2P50	Two Part Mount Trackbed, screwing, gluing
FF-S50	Swivel Mount Screw directly to vertical walls
FF-SK-NT50	NanoMacro Stake Mount NanoMacro Stake Mount Kit for self-supplied stake/pole with diameter 23-53 mm
FF-SK-NT50-1250	NanoMacro Stake Mount Kit with 1250 mm long stake
FF-SK-NT50-1500	NanoMacro Stake Mount Kit with 1500 mm long stake
FF-SK-NT50-1750	NanoMacro Stake Mount Kit with 1750 mm long stake