Product Data Sheet:
FlatMesh Triaxial Tilt Node

The FlatMesh Triaxial Tilt Sensor Node 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.

Successfully used in many applications, including those measuring:

- Tunnel distortion
- 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
- Resolution of 0.0001° (0.0018 mm/m) and repeatability of ±0.0005° (±0.009 mm/m)
- Integrated long life 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 IP66 / IP67 / IP68
- Firmware is remotely upgradeable over the air via the gateway reducing costly site visits

FlatMesh Triaxial Tilt Node

Physical Specifications

Parameter	Value
Dimensions	90 x 90 x 60 mm
Dimensions including vent	90 x 96 x 60 mm
Total Mass	0.6 kg (approx.)
Housing Material	Die cast aluminium body
Internal Protection Marking	IP66 / IP67 IP68 (1 m for 24 hours)
Mounting Options	1/4" UNF holes in bottom, M4 blind holes in side Plates and brackets available for magnetic fixing, trackbed, stake and pole mounting, and many other applications
Operating Temperature Range	-40°C to +85°C

Internal Battery

Parameter	Value
Battery Type	Lithium Thionyl Chloride, non-rechargeable
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.

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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	6.5 dBm (EN 300 328 v2.2.2)
Maximum Permitted Antenna Gain	2.2 dBi
Range	Up to 300 m depending on the environment and fitted antenna Consult with Senceive for your application
RF Module	Senceive FM3Node

Tilt Sensor Specification

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

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
- RCM (Australia and New Zealand)

FlatMesh Triaxial Tilt Node

Ordering Information and Accessories

Model	Description
FM3N-IX	**FlatMesh 3 Triaxial Inclinometer**
FM3N-IXH	**FlatMesh 3 Triaxial Inclinometer (High-g)**
FF-MP-S360	**Swivel mounting kit with 360-degree adjustment range** Screw directly to vertical walls
FF-MP-V	**Vertical mounting plate** Use U-bolts to fix to poles or stakes Use glue to fix to walls where drilling is not permitted (Order with FF-MP-S360)
FF-MP-RA	**Right angle mounting bracket** Screw to concrete tunnel linings and inclined walls (Order with FF-MP-S360)
FF-MP-T2	**Trackbed mounting plate kit**
FF-BK-xxxx **FF-BE**	**Tilt beam kit** See separate datasheet for more information
FA-FM-WPS	**Waterproof straight antenna** Overall node height 168 mm (approx) when fitted Maximum gain +1.1 dBi
FA-FM-LPS	**Waterproof low profile straight antenna** Minimum overall node height, perfect for trackbed and tight spots Overall node height 92 mm (approx) when fitted Maximum gain 0 dBi
FA-FM-ADJ	**Adjustable angle antenna** Flexible installation, perfect for use in tunnels and indoor environments Overall node height 202 mm (approx) when fitted and upright Overall node height 102 mm (approx) when fitted and at 90-degree angle Maximum gain +2 dBi
FC-NC	**Antenna cover kit** Use with FA-FM-LPS antenna Overall node height 96 mm (approx) when fitted