



FlatMesh™



Product Data Sheet: FlatMesh Vibrating Wire Sensor Node

The FlatMesh Vibrating Wire Sensor Node brings a wide variety of vibrating wire sensors into the FlatMesh system. It is a highly integrated system which is capable of exciting and sampling vibrating wire sensors and reporting its measurements through Senceive's FlatMesh wireless communications network to a FlatMesh Gateway.

Examples of sensors supported:

- Piezometers
- Strain Gauges
- Crack Meters
- Load Cells
- Pressure Cells
- Extensometers
- In-Place Inclinometers

Key features

- Waterproof, robust connectors for simple installation
- Resolution of 0.001 Hz and repeatability of ± 0.02 Hz
- Integrated long life battery
- 10-15 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 Vibrating Wire Sensor Node



Physical Specifications

Parameter	FM3N-VW11	FM3N-VW41
Dimensions excluding antenna and vent	90 x 90 x 60 mm	90 x 130 x 50 mm
Dimensions excluding antenna	90 x 96 x 60 mm	90 x 136 x 50 mm
Total Mass	0.57 kg	0.75 kg
Housing Material	Die cast aluminium	
Protection (BS EN 60529: 1992+A2:2013)	IP66 / IP67 / IP68 (1 m for 24 hours)	
Mounting Options	1/4" UNF holes in bottom M4 blind holes in side	M6 holes in bottom
Operating Temperature Range	-40°C to +85°C	

Internal Battery

Parameter	FM3N-VW11	FM3N-VW41
Battery Type	Lithium Thionyl Chloride	
Nominal Voltage	3.6 V	
Nominal Capacity	19000 mAh	34400 mAh
Typical Battery Life	10-15 years at 20 minute reporting intervals, including when acting as a relay node. Consult with Senceive for your application.	

Channel Combinations

Model	Ports	Applications
FM3N-VW11	1 VW and 1 Thermistor Channel	Single sensor
FM3N-VW41	1 VW and 1 Thermistor Channel (x4)	Four strain gauges in an array 2+ sensors in close proximity

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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 v1.8.1)
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

Vibrating Wire Interface

Parameter	FM3N-VW11; FM3N-VW41
Connector	M12 Female 5-pole A-coded Screw-in Type
Frequency Resolution	0.001 Hz
Frequency Repeatability	±0.02 Hz
Frequency Range	200-6000 Hz
Stimulus Type	Swept Sine Wave, 6 V peak to peak
Thermistor Type	3 kΩ NTC
Temperature Resolution	0.05°
Temperature Accuracy	±0.1°C
Temperature Range	-40°C to +85°C

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

FlatMesh Vibrating Wire Sensor Node



Ordering Information and Accessories

Model	Description
FM3N-VW11	FlatMesh 3 Vibrating Wire Sensor Node (1 x 1-wire port)
FM3N-VW41	FlatMesh 3 Vibrating Wire Sensor Node (4 x 1-wire port)
FS-VWCON11	Sensor Connector for 1-wire sensor Screw terminals for easy installation Sensor cable outside diameter 5.0-8.0 mm Suits FM3N-VW11 or FM3N-VW41
FT-VW-TH11	Test Harness for 1-wire sensors Mates to FS-VWCON11 for easy connection to hand-held vibrating wire readout device (not supplied)
FA-FM-WPS	Waterproof straight antenna Overall node height - 168 mm (approx.) when fitted to FM3N-VW11 or FM3N-VW17 - 158 mm (approx.) when fitted to FM3N-VW41 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 to FM3N-VW11 or FM3N-VW17 - 82 mm (approx.) when fitted to FM3N-VW41 Maximum gain 0 dBi
FA-FM-ADJ	Adjustable angle antenna Flexible installation, perfect for use in tunnels and indoor environments Overall node height when upright - 202 mm (approx.) when fitted to FM3N-VW11 or FM3N-VW17 - 192 mm (approx.) when fitted to FM3N-VW41 Overall node height when at 90-degree angle - 102 mm (approx.) when fitted to FM3N-VW11 or FM3N-VW17 - 92 mm (approx.) when fitted to FM3N-VW41 Maximum gain +2 dBi
FC-NC	Antenna cover kit Fits FM3N-VW11 and FM3N-VW17 only Use with FA-FM-LPS antenna Overall node height 96 mm (approx.) when fitted