Senceive
Wireless condition monitoring

DATA SHEET

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 the sensors supported:

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

Key Features

- High performance, easy to connect multichannel connectors
- 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™
reliable | robust | precise

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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
FM3N-VW17	7 VW and 1 Thermistor Channel	Single load cell
FM3N-VW121	1 VW and 1 Thermistor Channel (x12)	Many sensors in close proximity

Physical Specifications

Parameter	FM3N-VW11 FM3N-VW17	FM3N-VW41	FM3N-VW121
Dimensions excluding antenna and vent (mm)	90 x 90 x 60	90 x 130 x 50	100 x 140 x 70
Dimensions excluding antenna (mm)	90 x 96 x 60	90 x 136 x 50	100 x 146 x 70
Total Mass (approx.)	0.57kg	0.75kg	TBC
Housing Material	Die cast aluminium		
Protection (BS EN 60529: 1992 + A2: 2013)	IP66 / IP67 IP68 at 1m for 24 hours		
Mounting Options	M4 blind holes in side ¼" UNF holes in bottom	M6 holes in bottom	¼" UNF holes in bottom
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 v1.8.1)	6.5dBm
Maximum Permitted Antenna Gain	2.2dBi
Range	Up to 300m depending on the environment and fitted antenna Consult with Senceive for your application
RF Module	Senceive FM3Node

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Vibrating Wire Interface

Parameter	FM3N-VW11 FM3N-VW41 FM3N-VW121	FM3N-VW17
Connector	M12 Female 5-pole A-coded Screw-in Type	M12 Female 12-pole A-coded Screw-in Type
Frequency Resolution	0.001 Hz	
Frequency Repeatability	±0.02 Hz	
Frequency Range	200-6000Hz	
Stimulus Type	Swept Sine Wave, 6V peak to peak	
Thermistor Type	3kΩ NTC	
Temperature Resolution	0.05°	
Temperature Accuracy	±0.1°C	
Temperature Range	-40°C to +85°C	

Internal Battery

Parameter	FM3N-VW11 FM3N-VW17	FM3N-VW41	FM3N-VW121
Battery Type	Lithium Thionyl Chloride		
Nominal Voltage	3.6V		
Nominal Capacity	19000mAh	34400mAh	38000mAh
Typical Battery Life	10-15 years at 20 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 Radio Equipment Directive 2014/53/EU and RoHS Directive 2011/65/EU
- FCC Grant of Equipment Authorization: FCC ID 2AMFBFM3N

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Ordering Information and Accessories

Model	Description
FM3N-VW11	**FlatMesh 3 Vibrating Wire Sensor Node (1x 1-wire port)**
FM3N-VW41	**FlatMesh 3 Vibrating Wire Sensor Node (4x 1-wire port)**
FM3N-VW17	**FlatMesh 3 Vibrating Wire Sensor Node (1x 7-wire port)**
FM3N-VW121	**FlatMesh 3 Vibrating Wire Sensor Node (12x 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, FM3N-VW41 or FM3N-VW121
FS-VWTRM17	**Terminal Block and Cable for multi-wire sensor** Screw terminals for easy installation Suits FM3N-VW17
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)
FT-VW-TH17	**Test Harness for multi-wire sensors** Mates to FS-VWTRM17 for easy connection to hand-held vibrating wire readout device (not supplied)
FA-FM-WPS	**Waterproof straight antenna** Overall node height - 168mm (approx.) when fitted to FM3N-VW11 or FM3N-VW17 - 158mm (approx.) when fitted to FM3N-VW41 Maximum gain +1.1dBi
FA-FM-LPS	**Waterproof low profile straight antenna** Minimum overall node height, perfect for track bed and tight spots Overall node height - 92mm (approx.) when fitted to FM3N-VW11 or FM3N-VW17 - 82mm (approx.) when fitted to FM3N-VW41 Maximum gain 0dBi
FA-FM-ADJ	**Adjustable angle antenna** Flexible installation, perfect for use in tunnels and indoor environments Overall node height when upright - 202mm (approx.) when fitted to FM3N-VW11 or FM3N-VW17 - 192mm (approx.) when fitted to FM3N-VW41 Overall node height when at 90-degree angle - 102mm (approx.) when fitted to FM3N-VW11 or FM3N-VW17 - 92mm (approx.) when fitted to FM3N-VW41 Maximum gain +2dBi
FC-NC	**Antenna cover kit** Fits FM3N-VW11 and FM3N-VW17 only Use with FA-FM-LPS antenna Overall node height 96mm (approx.) when fitted

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