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

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
- 12-15year 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

Channel Combinations

Model	Ports	Applications
FM3N-VW11	1 VW and 1 Thermistor Channel	Single sensor
FM3N-VW41	A: 1 VW and 1 Thermistor Channel B: 1 VW and 1 Thermistor Channel C: 1 VW and 1 Thermistor Channel D: 1 VW and 1 Thermistor Channel	Four strain gauges in an array 2+ sensors in close proximity
FM3N-VW17	7 VW and 1 Thermistor Channel	Single load cell

Physical Specifications

Parameter	FM3N-VW11 / VW17	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	0.57kg	0.75kg
Housing Material	Die cast aluminium	
Protection (BS EN 60529: 1992 + A2: 2013)	IP66 / IP67 IP68 at 1m for 24 hours	
Mounting Options	Clearance holes for M4 socket head screw in bottom M4 blind holes in side	Clearance holes for M4 socket head screw 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

Vibrating Wire Interface

Parameter	FM3N-VW11 / VW41	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 / VW17	FM3N-VW41
Battery Type	Lithium Thionyl Chloride	
Nominal Voltage	3.6V	
Nominal Capacity	19000mAh	34400mAh
Typical Battery Life	12-15 years at 20/30 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 R&TTE Directive 1999/5/EC and RoHS Directive 2011/65/EU
- Network Rail Acceptance PA05/04146
- London Underground Approved Product ID 2073

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)**
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
FS-VWTRM17	**Terminal Block and Cable for multi-wire sensor**

CONTACT US
For information on **FlatMesh** - our award-winning wireless asset condition monitoring solution, call: **+44(0)20 7731 8269** email: **gsmith@senceive.com** visit: **senceive.com**

	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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Shaping New Dimensions

Senceive is committed to a process of continual development and therefore the information provided may be subject to change.

FlatMesh™
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