

## Product Data Sheet: FlatMesh Crack Sensor Node

The FlatMesh Crack Sensor Node interfaces to a linear displacement sensor. Its high precision sampling circuit powers the sensor and reports its measurements through Senceive's FlatMesh wireless communications network to a FlatMesh Gateway.

It has been successfully used in many applications, including those measuring:

- Crack movement
- Pile separation
- Structural movement
- Expansion joint monitoring



### Key Features

- Waterproof, robust connectors for simple installation
- Automatic sensor type detection
- Extremely low noise performance
- 16-bit resolution (65,536 steps over the full scale)
- Integrated long life battery
- 12-15 years' battery life, including when acting as a relay node within the mesh communications network
- Integrated temperature sensor
- One and two channel variants readily available
- Waterproof to IP66 / IP67 / IP68
- Firmware is remotely upgradeable over the air via the gateway reducing costly site visits
- Variety of fixings available for easy installation on site

## Physical Specifications

Parameter	FM3N-CS/CS2	FM3N-CS4
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 (approx.)	0.57kg	0.75kg
Housing Material	Die cast aluminium	
Protection (BS EN 60529: 1992 + A2: 2013)	IP66 / IP67 IP68 at 1m for 24 hours Includes connectors while unmated	
Mounting Options	M4 blind holes in side ¼" UNF holes in bottom	M6 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

## Crack Sensor Interface

Parameter	Value
Circuit Topology	Voltage divider
Stimulus	2.5V, 100mA max
Resolution	0.0015% of full scale
Noise Level	0.005% of full scale (typical peak to peak)

## Internal Battery

Parameter	FM3N-CS/CS2	FM3N-CS4
Battery Type	Lithium Thionyl Chloride	
Nominal Voltage	3.6V	
Nominal Capacity	19000mAh	34400mAh
Typical Battery Life	12-15 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

## Ordering Information and Accessories

Model	Description
FM3N-CS	<b>FlatMesh 3 Crack Sensor Node (one port)</b>
FM3N-CS2	<b>FlatMesh 3 Crack Sensor Node (two port)</b>
FM3N-CS4	<b>FlatMesh 3 Crack Sensor Node (four port)</b>
FS-CS25	<b>Potentiometer 25mm crack sensor</b> IP66 rated, with connector fitted Use with FF-CS1
FS-CS125	<b>Potentiometer 125mm crack sensor</b> IP66 rated, with connector fitted Use with FF-CS1
FF-CS1	<b>Crack Sensor mounting kit</b>
FA-FM-WPS	<b>Waterproof straight antenna</b> Overall node height <ul style="list-style-type: none"> <li>- 168mm (approx.) when fitted to FM3N-CS or FM3N-CS2</li> <li>- 158mm (approx.) when fitted to FM3N-CS4</li> </ul> Maximum gain +1.1dBi
FA-FM-LPS	<b>Waterproof low profile straight antenna</b> Minimum overall node height, perfect for track bed and tight spots Overall node height <ul style="list-style-type: none"> <li>- 92mm (approx.) when fitted to FM3N-CS or FM3N-CS2</li> <li>- 82mm (approx.) when fitted to FM3N-CS4</li> </ul> Maximum gain 0dBi
FA-FM-ADJ	<b>Adjustable angle antenna</b> Flexible installation, perfect for use in tunnels and indoor environments Overall node height when upright <ul style="list-style-type: none"> <li>- 202mm (approx.) when fitted to FM3N-CS or FM3N-CS2</li> <li>- 192mm (approx.) when fitted to FM3N-CS4</li> </ul> Overall node height when at 90-degree angle <ul style="list-style-type: none"> <li>- 102mm (approx.) when fitted to FM3N-CS or FM3N-CS2</li> <li>- 92mm (approx.) when fitted to FM3N-CS4</li> </ul> Maximum gain +2dBi
FC-NC	<b>Antenna cover kit</b> Fits FM3N-CS and FM3N-CS2 only Use with FA-FM-LPS antenna Overall node height 96mm (approx) when fitted