

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, up to six channels available on request
- 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 | Value |
|---|--|
| Dimensions excluding antenna | 90 x 90 x 60 mm 90 x 96 x 60 mm (including vent) |
| Total Mass | 0.5 kg (approx.) |
| 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 | Clearance holes for M4 socket head screw in bottom M4 blind holes in side Plates and brackets available for magnetic fixing, track bed, stake and pole mounting, and many other applications |
| 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 |

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 | Value |
|-----------------------------|--|
| Battery Type | Lithium Thionyl Chloride |
| Nominal Voltage | 3.6V |
| Nominal Capacity | 19000mAh |
| 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-CS | FlatMesh 3 Crack Sensor Node (one port) |
| FM3N-CS2 | FlatMesh 3 Crack Sensor Node (two port) |
| FS-CS25 | Potentiometer 25mm crack sensor IP66 rated, with connector fitted Use with FF-CS1 |
| FS-CS125 | Potentiometer 125mm crack sensor IP66 rated, with connector fitted Use with FF-CS1 |
| FF-CS1 | Crack Sensor mounting kit |
| FF-MP-S360 | Swivel mounting kit with 360-degree adjustment range Mounting bracket for node |
| FF-MP-V | Vertical mounting plate <ul style="list-style-type: none"> - use U-bolts to fix to poles or stakes - use glue to fix to walls where drilling is not permitted Use with FF-MP-S360 |
| FA-FM-WPS | Waterproof straight antenna Overall node height 168mm (approx) when fitted 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 Maximum gain 0dBi |
| FA-FM-ADJ | Adjustable angle antenna Flexible installation, perfect for use in tunnels and indoor environments Overall node height 202mm (approx) when fitted and upright Overall node height 102mm (approx) when fitted and at 90-degree angle Maximum gain +2dBi |
| FC-NC | Antenna cover kit Use with FA-FM-LPS antenna Overall node height 96mm (approx) when fitted |