



FinappSM

CRNS SM probe Soil Moisture

A CRNS non-invasive probe for measuring Soil Moisture, in real time, over a radius of almost 125m (5ha), from 0-50 cm depth.

Overview

The FinappSM is a CRNS technology sensor, measuring soil water content.

This soil moisture sensor was developed for environmental monitoring, hydrogeological risks and smart agriculture. The FinappSM is the ideal equipment for proximity measurements as it performs non-contact measurement, covering medium to large areas, considering interesting depths for these applications, making continuous non-invasive measurement available.

Cosmic rays come from space and in contact with the Earth's atmosphere generate a cascade of particles, including fast neutrons. The latter have the peculiarity of interacting mainly with water molecules.

When they come into contact with water in the ground or snow, part of the fast neutrons is absorbed and part is reflected back into the air, losing part of the initial energy: thus slow neutrons are born.

A large difference between the number of fast and slow neutrons implies a large amount of water and vice versa. Since fast neutrons have enough energy to penetrate inside the ground for many cm, the given figure is representative in depth.

Since slow neutrons are distributed over large distances, it is possible to monitor the water content over vast areas, about 5 hectares at sea level.

Finapp non-invasive soil moisture sensor technology superbly overcomes the limitations of point-scale sensors and satellite measurements.

Benefit & features

- Real time measurement
- Non-invasive
- Spatial scale 5 ha*
- Insensitivity to soil salinity, bulk density, texture and surface roughness
- Soil depth 0-50cm
- Remote IoT telemetry options
- Passive sensor
- Instant installation
- No consumable or moving parts
- Very low power consumption
- Overcoming the limits of point-scale sensors and satellite measurements
- Very large maintenance cycle

Application

- Smart Irrigation
- Smart Agriculture
- Climate Monitoring
- Drought monitoring

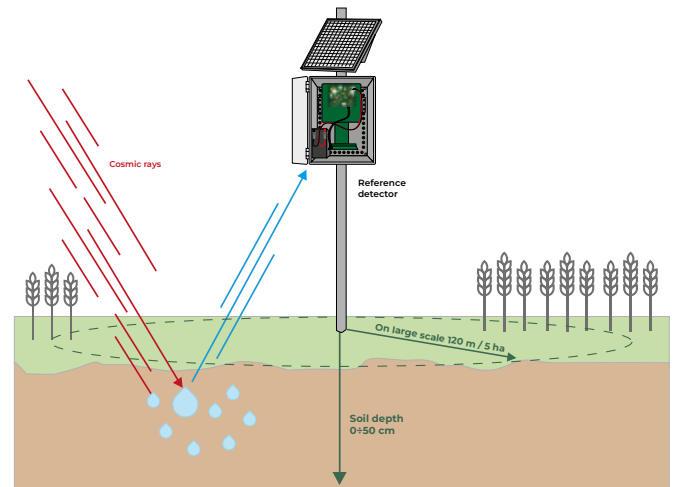
Specification

| | |
|--|---|
| Main output | Soil Moisture / Soil Water Content |
| Range | 0% - 100% |
| Measuring units | 1. percentage % 2. gravimetrics (Kg/Kg), 3. volumetrics (m ³ /m ³ ; given bulk density) |
| Footprint | 5ha (120-140m radius)* |
| Neutrons counting | 900 neutrons/h** |
| Muons counting for real time on site validation | 4'000 muons/h*** |
| Barometrics pressure | 900- 1100 mBar; included |
| Electrical consumption | 0,5Wh (40mA @ 12V) agg. peak 1,22A @ 12V |
| Case | ABS Plastic, IP67, 40x30x17cm |
| Power supply | Stand Alone: Battery & Solar Panel 17,1-30V / max 35W External: 11,5-15V External: 9,6-15V by SDI12 interface USBC: 5V |
| Temperature of use | -40°C / +65°C |
| Web interface | 2G/3G/4G (SIM included) |
| Data access | 1. Web Interface 2. API 3. MicroSD 4. USB / RS232 5. SDI12 6. Ethernet |
| Location identification | GPS (on demand) |
| Optional interfaces** | RS-232; RS-485; SDI-12; Ethernet |
| Optional parameters | Rain Gauge; External Temperature & Humidity |

*at sea level

** at sea level under standard conditions soil moisture ~5% at 5Gev cut-off Rigidity

*** to choose between two available slots



Optional accessories

| Model | Features |
|-------|-----------------|
| FR010 | Pole |
| FR011 | Tripod |
| FR003 | 40W solar Panel |
| FR012 | 18 Ah battery |
| FM007 | Sdi-12 Output |

Ordering Information

| Model | Features |
|-------|--|
| - | Brackets for anchoring to 40-50mm pole (default 48mm) |
| - | Cable with connector for connection to external power supply |
| FR002 | 20W Solar Panel |
| FR015 | 7 Ah Battery included |
| - | Instruction Manual |