FinappSM Plus

CRNS SM probe
Soil Moisture

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

Overview

The FinappSM Plus is a CNRS 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 non-invasive continuous 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, 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 sensors and satellite measurements
- Large maintenance cycle

Application

- Early-warning Landslides Monitoring
- Drought monitoring
- Climate overlook
- Flooding
- Wildfire Risk
- Early-warning Hydrological Hazards
- Enviromental monitoring
- Smart Agriculture

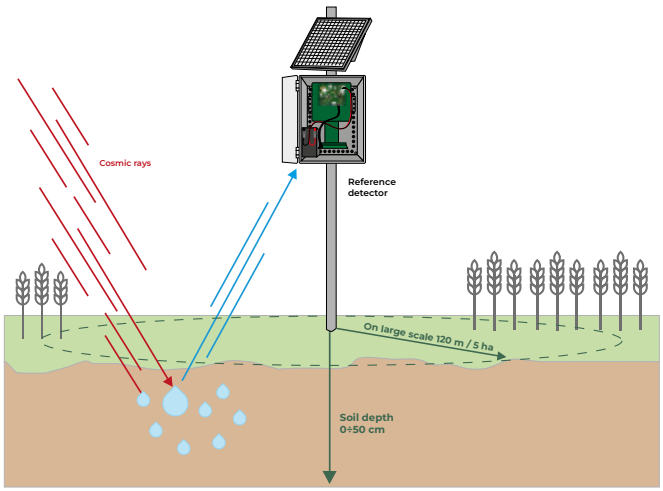
Specification

Main output	Soil Moisture / Soil Water Content
Range	0% - 100%
Measuring units	1. percentage % 2. gravimetrics (Kg/Kg), 3. volumetrics (m3/m3; given soil bulk)
Footprint	5ha (120-140m radius)*
Neutrons counting	2'000 neutrons/h**
Muons counting for real time on site validation	5'000 muons/h***
Barometrics pressure	900- 1100 mBar; included
Electrical consumption	0,5Wh (40mA @ 12V) agg. peak 1,22A @ 12V
Case	ABS Plastic, IP67, 50x40x21cm
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
FR030	30 A/h 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
FM002	20W Solar Panel
FM015	18 A/h Battery included
_	Instruction Manual

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