

# Finapp SWE+SM

## CRNS SWE+SM probes Water Content in Snow (in winter) and Soil Moisture (in summer)

CRNS probes for measuring SWE - water content in snow - in real time, not invasively.  
A CRNS probe for measuring Soil Moisture contactless, in real time, over a radius of 125m (5ha), 0-50cm depth.



### Overview

The FinappSWE measures the water equivalent of snow (SWE) by passively detecting the variation of natural neutrons coming from the cosmos after their passage through the snowpack.

A pair of Finapp probes are installed: The first is placed above the snow pack. This probe is used to measure incoming neutrons from space before they interact with the snow. The second is placed at ground level, burying it slightly, when the ground is free of snow. The snow cover will completely cover the probe, which will then count neutrons that have already interacted with the snow pack. The difference in neutron counts between the two probes gives an accurate measure of how much water is present in the snow pack. The measurement area is 20 m in radius, and is the ideal sensor to replace weighing systems, snow pillows, or manual measurements. When the snow is fully melted, the probe will provide soil moisture, again on without contact with the soil, at large scale, in depth and in real time, thus becoming a multifunctional instrument.

The FinappSM is a CNRS technology sensor, measuring soil water content in summer. 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.

### Benefit & features SWE

- 10,000mm SWE
- Insensitivity to bridging
- Very low power consumption
- Ideal replacement for traditional snow-pillow sensors
- Does not cause the melt of light snow
- Site visits reduced
- No site preparation
- Fast set-up
- Performance not affected by rainfall or snowfall
- Not affected by type of snow or ice
- Will not cause snow drifting
- No antifreeze chemicals used (i.e., glycol)
- Large maintenance cycle

### Benefit & features SM

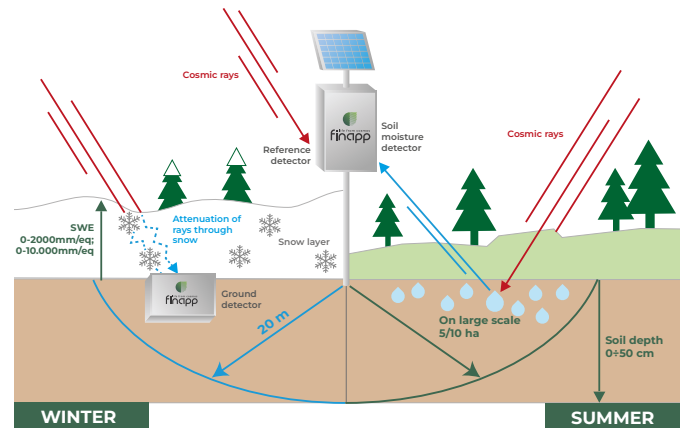
- Real Time Proximity sensor
- Non-invasive
- Spatial scale 5 ha
- Insensitivity to soil salinity, bulk density, texture and surface roughness
- Depth 0-50 cm
- No consumable or moving parts
- Overcoming the limits of point sensors and satellite measurements

### Application

- Water resources
- Water in Snow Monitoring
- Hydroelectric power forecasting
- Flood forecasting and risk management
- Dam Maintenance planning
- Soil Moisture summer monitoring

## Specification

<b>Main output</b>	SWE in winter, Soil Moisture / Soil Water Content in summer
<b>Range</b>	0% - 100% (SM); 1 - 10,000 (SWE)
<b>Measuring units SWE</b>	mm (of water equivalent)
<b>Measuring units SM</b>	1. percentuale % 2. gravimetrics (Kg/Kg), 3. volumetrics (m <sup>3</sup> /m <sup>3</sup> ; with soil texture value)
<b>Footprint SWE</b>	over an area of radius about 20m
<b>Footprint SM</b>	5-10ha (120 - 140m radius)
<b>Neutrons counting</b>	900 neutrons/h*
<b>Muons counting for real time on site validation</b>	4'000 muons/h**
<b>Barometrics pressure</b>	900- 1100 mBar; included
<b>Electrical consumption</b>	1,0 Wh / 80mA @ 12V
<b>Case</b>	Probe 1: Aluminum, IP68, 40x30x17cm Probe 2: ABS Plastic, IP67, 40x30x17cm
<b>Power supply</b>	Autonomous: Battery & Solar Panel 17,1-30V / max 35W External: 11,5-15V External: 9,6-15V by SDI12 interface USBC: 5V
<b>Temperature of use</b>	-40°C / +65°C
<b>Web interface</b>	2G/3G/4G (SIM included)
<b>Data access</b>	1. Web Interface 2. API 3. MicroSD 4. USB / RS232 5. SDI12 6. Ethernet
<b>Location identification</b>	GPS (on demand)
<b>Optional interfaces**</b>	RS-232; RS-485; SDI-12; Ethernet
<b>Optional parameters</b>	External Temperature & Relative Humidity



## 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
FM017	18A/h Battery included
-	Instruction Manual

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

\*\* to choose between two available slots