

SnowSense Station

Novel GNSS based in-situ hardware



The key element of SnowSense® is the measurement of the **Snow Water Equivalent (SWE)** and the **Liquid Water Content (LWC)** of snow at any requested locations by a novel GNSS based solution. SWE (in mm) and LWC (in Vol.%) can be retrieved several times a day. All stations are pre-processing the data and transfer the measurements via satellite communication or cellular networks (optional). Access to the data via webservice. The stations operate autonomously, with an integrated solar-power supply and satellite-based communication and can be set up permanently or temporary, they may be removed during summer months. The Station is easy to transport and to install.



Key Features:

- **Determination of SWE and LWC based on a 2-GNSS-antenna concept**
- **Maintenance free installation of the antennas below and above the snow cover, non-destructive measurements, no influence on the snow cover, no mechanical components**
- **Autonomous power through integrated power management with solar cells and battery pack**
- **Patents pending**



Installation:

- Compact design of all components for easy transportation and installation
- All setup components can be carried by two persons, System can be installed and activated in 2 hours
- Portable mast-system for freestanding installation; Installation to existing infrastructure is possible

Operation:

- Use of microwave L-Band signals, with excellent specification for bulk snow pack monitoring, from globally and permanently available by GNSS satellites (e.g. GPS + Galileo)
- Automatic recording and processing of the measurements at the station
- Transmission of measurements and telemetry data via Iridium Satellites (typically)
- Automatic sleep mode and re-start algorithms
- Remote initialization trigger via satcom option

Maintenance:

- No specific maintenance during winter operation

Integration:

- Integration to existing meteorological information systems or stand-alone sensor solution
- Station designed to provide snow parameters for the Snow Cover Baseline Modelling Service
- Set up of multiple stations for a spatial measurement networks is recommended

Technical Data of Standard Configuration	
Power Supply	Internal 12V system with 3 x 20-Watt Solar Panel + 20 Ah Battery
	External 5 – 20 Volts
Power Consumption	Peak: (during calculation & communication) < 5 Watt
	Standby 0.01 Watt / Sleep 0.001 Watt
	Daily consumption for typical measurement cycles (e.g. 1 X SWE per day): 0.25 Ah
Temperature Range	-40° to + 40° Celsius
Measurement Range	> 2.000 mm SWE (dry snow) 0.0 – 15.0 Vol.% LWC
Measurement Accuracy	SWE < + - 15 mm (good conditions)
Area of measurement	Integrative spot: 0.5 – 5 m diameter (depending on snow depth)
Measurement Cycles	1 - 6 per day for SWE (typically: 1)
	1 - 8 per day for LWC (typically: 4)
Data transmission	Iridium Sat Com to SnowSense facilities, data access via webservice Mobile Networks and direct connection options
Dimensions	Mast: 3 m x 0.05 m (typically), can be extended
	Electronics Unit: 225 x 165 x 55 mm
	Box with Power Supply and Electronics: 375 x 270 x 125 mm
	Antennas: 38 x 38 x 12 mm Ground Plate: 160 x 160 x 5 mm
Packaging	1200 x 400 x 400 mm (full system); < 25 kg

Contact and Sales:

snowsense@vista-geo.de