



Snow Water Analyser SWA

Reliable snow PARAmeters By Means of GNSS DATA

The Snow Water Analyzer (SWA) is using a revolutionary innovation for an automatic measurement of Snow Water Equivalent (SWE) and the Liquid Water Content (LWC)– GNSS Signals. Therefore the SWA is measuring automatically, continuously an aerial measurement of the parameters Snow Water Equivalent (SWE) and the Liquid Water Content (LWC). Due to the non-contact technology and the software built into the SWA, the significance and reliability of the data about the snow pack state can be increased substantially.

The SWA enables a modern, up-to-date data recording with a high resolution over time. Moreover, the system helps to reduce the often dangerous and expensive employment of staff in wintry terrain.

Features and advantages

- Recording of snow parameters - Snow water equivalent (SWE) - Liquid water content (LWC)
- Sensor integration via RS-485 or SDI interface
- Not affected by ice bridging
- No site preparation
- No construction work required
- Without parametrization, easy to install
- No antifreeze or other chemicals needed
- Information about SWE of the whole snowpack

Fields of application

The SWA-System provides high resolution data of the snow pack parameters snow water equivalent (SWE) and liquid water content (LWC). The most interesting period of the year is during springtime, when the snow-melt begins.

- Water supply and management, hydropower plants, flood prevention authorities - Run-off predictions and expected water quantity during snowmelt
- Agriculture, mining - Expected infiltration of melting water into the soil or underground, Run-off and SWE
- Hydrology - Point of saturation and snowmelt discharge
- Alpine communities, skiing resorts – liquid water content for risk assessment of wet snow avalanches
- Research facilities – snow water equivalent, contents of liquid water

Installation

The SWA-system can be integrated simply and conveniently into new or existing weather stations. One SWA-sensor antenna is fixed on top of a mast. The second SWA-sensor antenna is attached to a metal plate on the ground. A further core part of the SWA-system is the SWA-analyzer that is integrated in an enclosure. It analyses the GNSS data and transfers the measurement results of the SWE and the LWC to a data logger via an RS-485 or SDI-12 interface.

Technical details

Measurement RAnGe

- **Snow depth** 0 to 6 m
- **SWE mm of water** 0...2000 mm H₂O
- **Accuracy** 0...100 mm H₂O +/- 10% FS
- **Accuracy** 100...2000 mm H₂O accuracy +/- 5% FS
- **Liquid water content accuracy 2% FS** 0...15%

GENERAL

- **Dimensions framework** 202 x 112 x 62 mm
- **Power supply** 5...20 VDC
- **Power consumption** active: 5W (sleep-mode: 0.001W)
- **Operating temperature** -40...50°C

SWA-Antennas

- **Material** weatherproof, UV resistant antenna
- **Size** 38x38x12 mm
- **Frequencies** L-band
- **Number of satellites** 32 at 20.000 km
- **Ground plate** 160x160x15 mm

SWA- Analyser

- **Inputs** up to two antennas
- **Measurement cycles** 3 h measurement time cycle 1-6 per day for SWE / LWC
- **Outputs** RS 485 /SDI-12, various ASCII formats