

LSH-10

The next generation laser snow depth sensor provides precise, reliable and maintenance free measurements in millimeter resolution



• Properties and benefits

- Continuous and non-contact snow depth measurement
- Reliable sensor for extreme conditions
 - Highly innovative laser technology
 - Correct measurement during snowfall and snow drift
 - Integrated lightning protection
- High measurement accuracy
 - Millimeter resolution
- Power-saving sensor operation
 - Smart heating
- Digital data output string
 - Snow depth; distance to snow
 - SDI-12, RS-485 Protocol ASCII / Modbus RTU



• Purpose of snow height measurements

In order to characterize the local snow cover, it is essential to know the snow height. Various factors determine the development of a snow cover: obviously weather and climate – ground and air temperature, irradiation, wind, distribution of precipitation – but also the topography and surface of the terrain.

Thus, a careful selection of the measurement site is crucial to obtain representative snow-depth data.

• Measurement principle and accuracy

The LSH-10 is based on laser distance measurement technology. It sends out several consecutive impulses and detects the signal reflected at the snow surface. From the distance measurement, the LSH-S directly calculates the snow-height.

The advantages of the Laser Snow Height depth sensor LSH-10 are measurement of extremely-accurate snow level measurements. Millimeter resolution even over long measurement distances is easily possible. Thanks to modern interfaces and advanced sensor technology, the LSH-10 surpasses the performance of other sensor on the market. In addition, the LSH-10 is equipped with options for limit monitoring.

With this feature set we provide a state-of-the-art instrument for our customers.

- Excellent accuracy
- Acquisition of millimeters of snow
- Smart heating of the laser diode
- Smart heating of the lens
- Compact, robust and weatherproof housing
- Status change on different limit values

• Reliable sensor for extreme conditions

Our sensors love big challenges – for example at research stations in Antarctica, where they prove their robustness in extreme conditions: they are maintenance-free, operate in a temperature range between -40 and +50°C and thus provide continuously reliable measurements.

Highly-innovative technology of the LSH-10 can cope with complex sun reflections as encountered in the high alpine areas. Further, the LSH-10 design shields the sensor lens from icing and precipitation does not interfere with the measurements – the advanced technology of the LSH-10 offers a tool to determine the correct snow height with a millimeter accuracy at any time.

Furthermore, the weather prove housing is extremely robust and maintenance free. This assures reliable, accurate measurements and minimum lifecycle costs.

• Power-saving operation

The LSH-10 operates extremely efficiently. At a measurement interval of 30 minutes it consumes only 0.01 Ah per day. It automatically switches between measurement- and sleep-mode, the latter consuming less than 0.4 mA. Optimized heating functions significantly optimize the power consumption and extend the lifetime of the laser diode the optimized window heating allow high-quality measurement data in all weather conditions

This offers the possibility to use LSH-10 even for autonomous monitoring sites with solar power supply.

Site selection and sensor mounting

- The adequate measurement site

The selection of a suitable measurement spot is crucial for representative snow-depth measurements. The terrain at the measurement site should be flat, not exposed to wind and safe from avalanches. Slopes, dips, ridges and big rocks in the vicinity should be avoided.

No steeper slopes should border the site, as snow gliding can affect the snow pack and therefore the measurement results.

A slightly sloping ground is acceptable but must be accounted for by adjusting the LSH-10 perpendicularly with the supplied bracket. Last but not least, the expected maximum snow depth at the measurement site should be estimated.

- Mounting

As the LSH-10 is calibrated and pre-configured by Sommer, installation is quick and easy. Only a few application settings need to be adjusted on site, e.g., communication interface, data protocol and zero-point. For this, the included software provides straightforward assistance. The minimum mounting height is 0,1 meters above ground, the upper limit is 10 meters.



- Easy integration into existing weather stations

The LSH-10 can be integrated into existing monitoring stations through the digital interface (SDI-12, RS-485). With the included bracket, mounting is quick and simple.

GENERAL	
Power supply	9 ... 27 VDC
	Energy consumption: 10mAh/day (at interval 15min)
Housing	Dimensions: Ø 90 mm, Length 300 mm, Weight: 1,2 kg
	Material: Anodized aluminum
Sensor mount	Ø 32-60 mm
Operating temperature	-40 ... 50 °C
Protection	IP 66
Lightning protection	Integrated (0,6 KV peak)
SNOW DEPTH MEASUREMENT	
Measurement range	0 ... 10 m
Minimum distance to the maximum expected snow depth	0,1 m
Accuracy	less +/- 3mm
Resolution	0,1 mm
Measurement principle	Laser distance measurement
Measurement angle	0 - 30°
ENERGY CONSUMPTION	
Consumption without heating	active (measurement approx. 1 sec) typ. 40mA
Consumption with heating	typ. 1.2 A (heating active programable type <- 7°C)
Consumption @ 12VDC	sleep <0,4mA
Heating laser module	1,0A (Active type <-7C° ... -5C°)
Lense heating	1,2A (smart heating)
LASER DATA	
Laser diode	Laser 635 nm (viewable red)
Laser class	class II, conforming to Standard IEC 825-1, EN 60825
Laser power	<1mW
Laser measurement diameter	<10 mm in 10 m distance
Certificates	CE; FCC Zertifikat: EMC : 61326-1; EN 610101-1
INTERFACES	
Analogue (option)	Snow depth or distance 4 - 20mA Signal; Resolution: 14 Bitmax. Load: 250 Ω
Digital	SDI-12, RS-485 (Protocol ASCII / Modbus RTU) Digital output values string: Snow depth; Distance to snow
PACKAGING	
Carton	475 x 225 x 255 mm
	Weight: about 1,6 kg