SNOdar

Snow Depth Sensor

Overview

SNOdar is an Infrared-based sensor for accurately and robustly monitoring snow depth and new snowfall in remote sensing applications. A powerful yet low-power device ideal for remote, harsh environments.

SNOdar measures snow depth, accumulation and compaction, snowfall, and outside temperature. Simultaneously, it can relay data over a serial RS-232 or SDI-12 bus to commercially available telemetry, i.e. Satcom, or data logger units. Furthermore, it can record an entire season of data on its internal, nonvolatile data logger, so there is no need to pair every sensor with a commercial data logger and therefore a large cost savings upon deployment.

Applications

- SNOTEL snow monitoring
- Stormboard snow measurement
- Avalanche monitoring & forecasting
- DOT road conditions
- Ski resort snow monitoring
- Scientific snow monitoring

The sensor is small and lightweight, yet durable enough to monitor snow depth all season long at -40 C and colder. The unit is typically powered from a 12 VDC (as low as 6V and as high as 24V) source and consumes less than 0.5 W on average. A small battery and solar panel is all that is needed for seasonal deployment. The unit can be set up to operate as a distance sensor, stormboard snow fall sensor, or a seasonal snow depth sensor that measures settlement. A powerful mobile companion App allows the user to quickly configure and deploy the unit as well as monitor real-time data when within Bluetooth range. As a stormboard sensor, view or download the latest storm snow total, wipe the board, and re-calibrate for the next snow fall event. Alternatively, set up the sensor as a data logger, within minutes of deployment, and return periodically to download the latest data and instantly upload the data to a cloud server for viewing, management, or analysis.

SensorLogic

Non-Contact - Non-Invasive - Highly Accurate

985 Technology Blvd, Bozeman MT 59718
www.sensorlogic.ai

Features

- Real-time, accurate snow depth information during storms
- Bluetooth Low Energy (BLE) enabled configuration, installation, and live display
- Seasonal internal data logger
- Snow depth (compaction)
- New snowfall
- Seasonal snowfall
- Model-based Snow Water Equivalent (SWE)
- Seamless SDI-12 data logger connection with commercially available devices
- Seamless RS-232 Satcom connection with commercially available devices
- Sensor orientation monitoring (e.g. high snow load, high wind, tower shifting)
- Oblique or normal angle mounting on tower

Specifications

Parameter	Description	Min	Max	Units
Input Voltage		6	24	Volts
Operating Temperature		-40	60	C
Storage Temperature		-40	85	C
Mechanical Vibration	Mil-STD-883D, Method 2007.2, 20 to 2000 Hz		20	G
Mechanical Shock	Mil-STD-883D, Method 2002.3, 1 msec, 1/2 sine, mounted		500	G
Ingress Protection	Dust tight. Immersion, up to 1 meter (3 ft 3 in) depth	IP67		
Corrosion Resistance	MIL-A-8625, Hard-anodizing process	Type III		
Accuracy	Typical Deviation from absolute depth	+/- 1	+/- 2	cm
Resolution	Minimum detectable depth change	0.2	0.5	cm
Range	Distance from snow target	0.10	10	meters
Measurement Interval	1 minute granularity	1	60	mins
Current Consumption	@12 VDC, max measured with heater ON	0.04	0.270	amps
Power Consumption	Max measured with heater ON	0.48	3.24	watts
Average Power	Typical average seasonal power usage	0.5		watts
Weight			380	grams
Size	6.4 x 6.4 x 10.2 (W x L x H)			cm

ESD Ratings

Electrostatic Discharge	Value	Unit
Human-body Model (HBM)	+/- 2500	V
Charged-device Model (CDM)	+/- 1000	V

Electrical Interfaces

Wired

The wired communications, included in the power cable, allow rapid deployment with either a commercial off-the-shelf (COTS) S.

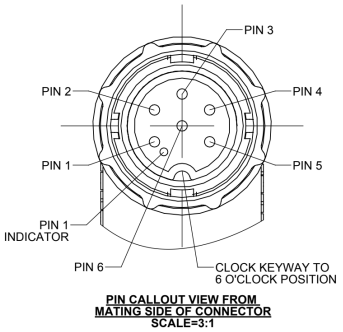
- RS-232: 2-wire serial communications for Satcom connections
- SDI-12: 1-wire communications for off-the-shelf data logger

Wireless

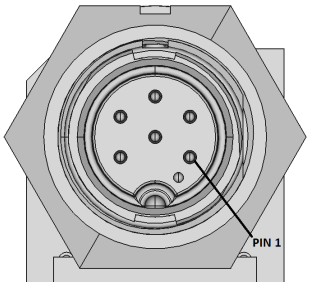
- Bluetooth Low Energy (BLE) 5.x
- 2 Mbps PHY capable, up to 100 meters Line-of-Sight (LOS)
- Long Range 125 Kbps PHY, up to 500 meters LOS
- The wireless connection allows for quick setup, calibration, and data monitoring.

Pin Configuration

SNOdar Pin Name	SNOdar Pin NO.	Cable Pin NO.	Cable Color
GND	1	1	BLACK
PWR +12V	2	2	WHITE
GND	3	3	GREEN
SDI-12	4	4	RED
TX: RS-232	5	5	BLUE
RX: RS-232	6	6	VIOLET

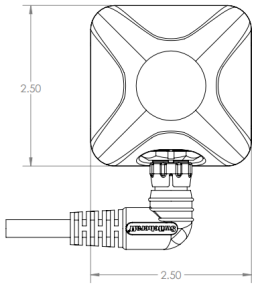


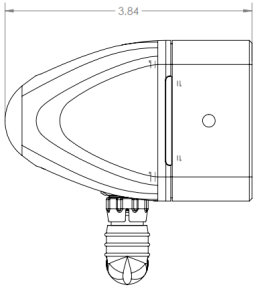
Mating Cable Pinout



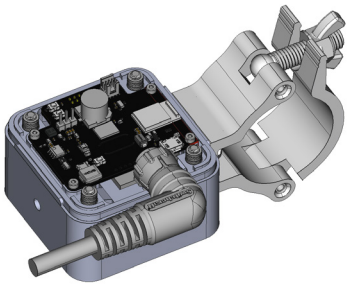
Sensor Pinout

Side View Render





Dimensions



Internal Render