High Altitude Mountain AWS

Snow Avalanche Meteorological Monitoring

The High Altitude Mountain AWS is a robust, modular automatic weather station designed for continuous meteorological and snowpack monitoring in extreme alpine environments. Built to operate reliably in high-altitude and avalanche-prone locations, the system delivers precise measurements of key atmospheric and snow parameters essential for snow avalanche forecasting, climate research, and operational safety.

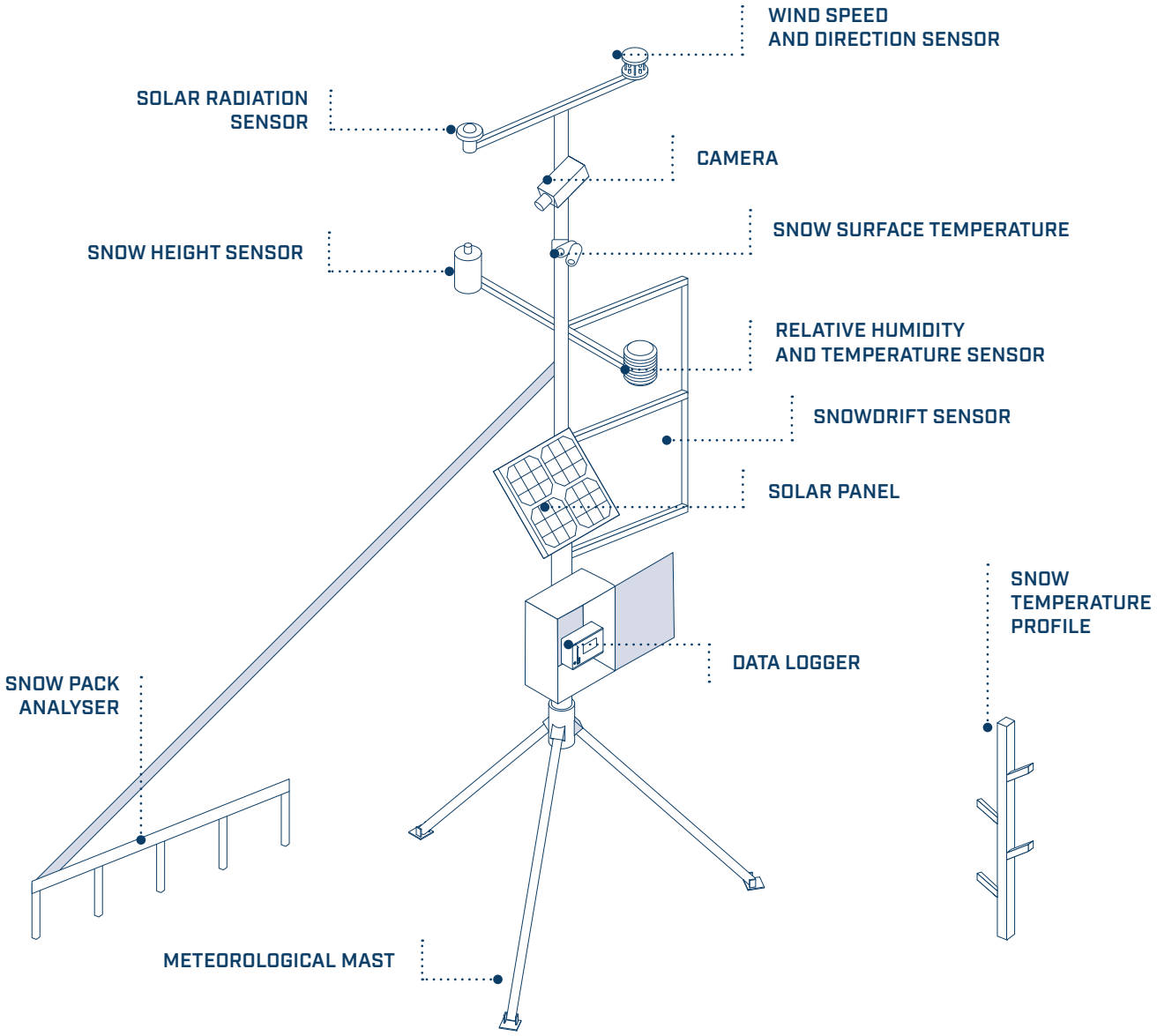
Modular and scalable configuration

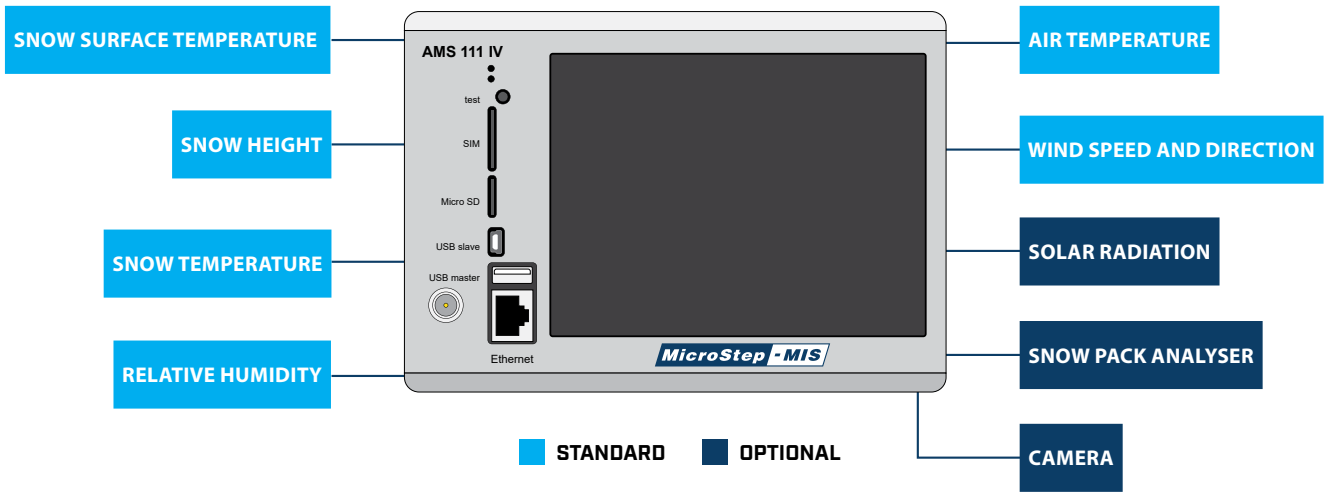
Comprehensive snow and meteorological monitoring

Reliable operation in extreme alpine conditions

Efficient data access, alerts, and visualization

Station configuration overview





Technical specifications

Data Logger AMS 111 IV

Internal 128 MB Flash memory
Internal 128 MB DRAM memory
Secure digital card up to 64 GB
External USB mass storage up to 256 GB
Real time clock (backup with Lithium battery)

Communication I/O ports

3x RS-232 port (baud rate: 300 to 115200), 1x UART	
2x RS-485 port	
Interface for GSM / Wifi / Radio module	
Ethernet 10/100 Mbit	
USB master, USB slave	
2x SDI-12	
Supported Protocols	FTP server, FTP client, HTTP server, telnet, SMTP, SMTPS, MODBUS RS-485, MODBUS, NTP Ethernet

P4-4G modem

Data rates	• LTE-FDD Max 100 Mbps (DL) Max 50 Mbps (UL) • LTE-TDD Max 61 Mbps (DL) Max 18 Mbps (UL) • DC-HSPA+ Max 42 Mbps (DL) Max 5.76 Mbps (UL) • UMTS Max 384 Kbps (DL) Max 384 Kbps (UL) • TD-SCDMA Max 4.2 Mbps (DL) Max 2.2 Mbps (UL) • CDMA Max 5.4 Mbps (DL) Max 14.7 Mbps (UL) • EDGE Max 236.8 Kbps (DL) Max 236.8 Kbps (UL) • GPRS Max 85.6 Kbps (DL) Max 85.6 Kbps (UL)
Operating temperature range	–40 °C to +85 °C
Environmental conditions	Operating temperature range: –40 °C to +70 °C Operating humidity range: 0 to 100 %

P4-GSM modem

Specification	• Quad Band GSM/GPRS/3G modem E-GSM 850/900/1800/1900 • Class 4 (2 W at 900 MHz) • Class 1 (1W at 1800 MHz) • Data, SMS • Fax and data transmission without extra hardware
Operating temperature range	–40 °C to +85 °C
Environmental conditions	Operating temperature range: –40 °C to +70 °C Operating humidity range: 0 to 100 %

Air temperature sensor

Measurement range	–65 °C to +75 °C
Accuracy	±0.2 (-40 to +60) °C

Snow drift sensor

Range particle flux	0 to 250 g/m²/s (0 to 2.5 V, or 0 to 5 V)
Range wind speed	0 to 250 km/h (0 to 2.5 V, or 0 to 5 V)
Measurement principle	Acoustic pressure
Temperature range	-40 °C to +80 °C (-40 °F to +176 °F)
Analog interface	0 to 2.5 V, or 0 to 5 V
Digital	SDI-12, RS-232 TTL
Power supply	6 to 30 V DC
Power consumption	<1 mA in stand-by and 20 mA in acquisition mode
Proteciton	IP 67

Snow height sensor

Measurement range (snow depth or water level)	0 m to 10 m
Resolution	1 mm
Accuracy	±0.5 cm or ±0.2 % of measured value whichever is greater

Snow pack analyser

SPA sensor	1 - 4 sensors (straps) mountable (as a standard we provide one horizontal and one diagonal tape)	
Weatherproof and UV-resistant	Flat strap sensor that includes three wide copper wires. 4 cm depth of penetration of the measurement field	
Solid aluminium construction	For fixation and tensioning of the SPA sensors	
Serial interface	RS 485, SDI-12; ASCII format	
USH-9	Ultrasonic snow depth sensor with integrated temperature compensation	
Optional components	Integration of up to two sensors for temperature (snow, ground, surface), power supply, data logger and telemetry	
Power supply	9 to 28 V DC, reverse voltage protection, overvoltage protection	
Power consumption	Active 65 mA per SPA sensor, inactive: 1 mA	
Dimensions of frame	6360 mm x 1100 mm x 3700 mm (L x W x H)	
Dimensions of control unit	165 mm x 105 mm x 55 mm (L x W x H)	
Operating temperature	-35 °C to 60 °C (-31 °F to 140 °F)	
Snow depth	0 to 2.5 m	0 to 5 m
SWE (mm of water)	0 to 1000 mm H2O	0 to 3000 mm H2O
Density	0 to 1000 kg/m³	
Volumetric water content	0 to 100 %	
Volumetric ice content	0 to 100 %	

Snow surface temperature

Measurement repeatability	Less than 0.05 C
Long-term drift	Less than 2 % change in slope per year when germanium filter is maintained in clean condition
Spectral Range	8 to 14 µm; atmospheric window

Operating Environment	-55 to 80 C; 0 to 100 % relative humidity (non-condensing)
Dimensions	23 mm diameter, 60 mm length
Cable	5 m of four conductor, shielded, twisted-pair wire; TPR jacket (high water resistance, high UV stability, flexibility in cold conditions); pigtail lead wires; stainless steel (316), M8 connector located 25 cm from sensor head
Mass	190 g (with 5 m of lead wire)

Snow temperature profile

Measurement range	–65 °C to +75 °C
Temperature sensor	PT100 RTD Class F0.1 IEC 60751 Platinum resistance element
Accuracy	±(0.1 + 0.00167 x |temperature|) °C
Measuring element	100 Ω, α = 0.00385
Long-term stability	< 0.1 °C / year
Resolution	0.01 °C (for AMS 111 Data Logger) depends on data logger
Response time	63 % to < 20 s
Recommended current	1 mA max.
Protection rating	IP 68
Measuring tip	Length 15 mm, diameter 4 mm

Solar radiation sensor

Classification to ISO 9060: 1990	Secondary Standard
Sensitivity	7 to 14 µV/W/m2
Maximum operational irradiance	4000 W/m2
Detector type	Thermopile
Spectral range (20 % points)	270 to 3000 nm
Non-stability (change/year)	< 0.5 %
Non-linearity (100 to 1000 W/m^2)	< 0.2 %

Relative humidity sensor

Measurement range	0 to 100 %RH
Accuracy (@ 25 °C)	±1 %RH
Short term hysteresis	< 0.6 %RH
Accuracy over temperature range	1 + |t - 25| *(0.008 + 0.00052 *RH)
Typical long-term stability	±1.0* % per year
Sensor type	thin film capacitive

** dependent on operating environment*

Wind sensor

Wind speed

Range	0 to 60 m/s (116 knots)
Accuracy	±2 % @ 12 m/s
Resolution	0.01 m/s (0.02 knots)
Response time	0.25 seconds
Threshold	0.01 m/s

Wind direction

Range	0 to 359° (no dead band)
Accuracy	±2° @ 12 m/s
Resolution	1°
Response time	0.25 seconds

Light Portable Meteorological Mast

Material	Aluminium alloy
Color	White RAL9016
Paint color category	Super durable polyester powder coating (for exteriors)
Fixation	Self-standing on 3 legs
Weight (mast)	4.5 kg
Weight (packed in a bag with grounding screws)	9 kg
Height	200 cm (when fully extended)
Footprint	from 130 to 180 cm (when fully extended)