



Fulcrum3D Sodar | Specifications

design parameters	
Phased array	3 phased arrays each with 37 Piezoelectric transducers 100% acoustic fill factor
Number of sound beams	1 beam per array, 3 beams total Single beam or simultaneous multi-beam sampling
Sound beam tilt	Physically set at 9° and 12.7° from vertical Beam tilt independent of frequency and temperature
Sound beam frequency	Range 3.5 – 7.5kHz, nominally 5kHz. Simultaneously sampled beams separated by 500Hz.
Sound level	<90dBA at 10m, <70dBA at 50m
data capture and storage	
Sampling rate	Nominally 2 seconds between pulses
Integration time	Adjustable, default 10 minutes.
Data upload	Every 10 minutes (3G/4G/GSM systems)
Memory storage	32 GB Micro SD card records a minimum of 6 months full noise and signal data. Expandable to 128GB.
wind measurements	
Measurement range	40 - 200m in 10m height bands centred on nominal height (40, 50m...), user defined heights available within this range.
Measurement accuracy	Typical correlation coefficient >0.98 and <2% bias compared to mast (dependent on site conditions)
Horizontal wind speed	0 to 40m/s, resolution 0.01m/s
Horizontal wind direction	0 to 360°, resolution 0.1°
Inflow angle / Vertical wind speed	-20 to +20°, resolution 0.1° -8.0 to +8.0 m/s, resolution 0.01 m/s
Fixed echo removal	Automatic for wind speeds > 2m/s
additional sensors	
GPS output	Location (WGS 84) <5m RMS horizontal position accuracy Altitude (m)
Temperature ¹	Naturally aspirated radiation shield, -40°C to +60°C range with ±0.6°C accuracy
Humidity ¹	±3% between 10% to 90%, ±5% between 0% to 100%
Hardware support	1x RS232/422/485, 1x USB, 1x Ethernet
power and communications	
Average power consumption	15W operating (single beam sampling) 25W operating (multi-beam sampling)
Power supply	Standard: 1 x 220W solar panel and 3x 12V 120AH AGM batteries providing in excess of 7 days storage. Optional: Solar expansion pack available for low insolation areas; Mains power supply kit; Fuel cell power kit.
Communications	3G/4G/GPRS/GSM Optional: Satellite/Wi-Fi/Ethernet

environmental conditions	
Operating temperature	Standard: -10° to 50°C Cold Climate version: : -30° to 50°C
Lightning protection	Multi-strike lightning protection fitted to communications equipment. All chassis wiring has transient voltage suppressors, all instruments chassis grounded.
safety standards	
Emergency stop	Emergency stop button located near user access panel.
Warning signage	Hearing protection warning signs on all sides visible in compliance with AS 1319:1994.
Applicable standards	AS 4086.2:1997 <i>Secondary batteries for use with stand-alone power systems - Installation and maintenance</i> AS 1319:1994 <i>Safety signs for the occupational environment</i> AS/NZS 5033:2005 <i>Installation of photovoltaic (PV) arrays</i> AS/NZS 3000:2007 <i>Electrical installations (known as the Australian/New Zealand Wiring Rules)</i>
transportation	
Dimensions	Skid mounted: 1000 x 2600 x 1500 mm fully assembled. Trailer mounted: Fits in standard 7'x4' trailer for transport.
Weight	~400kg including battery, solar panels and skids (skid mount, excluding trailer)
Material	Marine grade aluminium, resin encased rock-wool acoustic insulation.
Transportation	7'x4' trailer with stabilising anchors. Five Fulcrum3D FS1 skid mounted units fit in a standard 20' shipping container.
configurations	
Standard configuration	Skid mounted SODAR installed in 7'x4' box trailer with stabilising anchors 220W/360Ah solar power supply Installation tool kit
Cold climate version	660W/360Ah upgraded solar power supply battery heating, thermal management and snow melt capability 45 / 110 W fuel cell power supply options
Options	Additional sensors (e.g. pressure, rain gauge, solar radiation, pyranometer etc) Solar expansion pack (to 660W) Mains power supply kit Satellite / WiFi / Ethernet communications

Notes:

1. NIST traceable and NATA calibrated sensors available on request.
2. Actual performance of instrument depends on local atmospheric conditions.
3. These specifications may change without notice.