

## Fulcrum3D Sodar Specifications

### Design Parameters

Phased array	3 phased arrays each with 37 Piezoelectric transducers 100% acoustic fill factor
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.
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 <sup>1</sup>	Naturally aspirated radiation shield, -40°C to +60°C range with ±0.6°C accuracy
Humidity <sup>1</sup>	±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: 2 x 220W solar panel and 3x 12V 120AH AGM batteries providing in excess of 7 days storage. Optional: Solar expansion pack; 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

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 440W/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:

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