Fulcrum3D FDL1 High Speed Datalogger | Specification

data capture and storage	
Sampling rate	Default to 1 second for solar and 3 seconds for other data, configurable up to several hundred samples per second for high speed data (e.g. power quality).
Data averaging	Configurable, default 10 minutes
Data upload	End of each integration period (3G/4G/GSM systems). Every 2 hours on satellite. Standard configuration delivers ~100MB/month.
Data storage	16GB onboard data storage, expandable to 64GB
Data access	All data available via *Flightdeck* online data management system allows data download and operating status checks

Interfaces	
Serial	2x RS-232, 1x RS-485. Serial ports have switched battery power with current limit.
Ethernet	1x 10/100M Ethernet
USB	1x USB 2.0 user, 1x USB 2.0 for USB modems
Digital / analogue	Analogue and digital I/O available by Modbus modules
SCADA	Optional SCADA interface via Modbus RTU and TCP/IP

telemetry and control	
On-board control	Individual instrument power, system power for remote power cycle/watchdog
On-board telemetry	System temperature, battery voltage, internal rail voltages, system current and individual device current
GPS output	Location (WGS 84) <5m RMS horizontal position accuracy. Altitude (m)

power and communications	
Power	4W average consumption
Power supply	12/24V d.c. with optional industrial 110/230V a.c. *Solar Option*: Solar power supply with 1 x 60W PV module, MPPT,1x 12V 60Ah battery (~5 days storage typical).
Communications	*Standard*: NextG/3G/GPRS with 6.5dBi antenna *Optional*: Satellite/Wi-Fi/Ethernet

environmental conditions	
Temperature	-20°C to 60°C
IP rating	IP66 enclosure, IP68 electronics box
Lightning protection	Multi-strike lightning protection fitted to communications equipment. All instruments chassis grounded.

physical	
Dimensions	FDL1 data logger: 340x110x200mm incl mounting flanges. Enclosure: 470x300x530mm. excl. aerial, solar modules, mounting system, sensors etc
Weight	~18kg enclosure
Materials	Aluminium heat shields, powder coated steel box, sealed aluminium electronics box

standard solar monitoring configuration	
Pyranometers	Standard: 2x Kipp&Zonen SMP11 pyranometers. Optional: ▸ Kipp&Zonen CVF3 ventilation unit ▸ Alternate pyranometers ▸ Silicon reference cells
Pyrheliometer	Optional: Pyrheliometers with tracking mount
CloudCam™	Optional: CloudCAM™ all-sky cameras
Weather station	*Standard*: Vaisala HMP60 with naturally aspirated radiation shield, providing: ▸ Temperature -40°C to +60°C range, ±0.6°C ▸ Humidity ±3% (10% to 90%), ±5% (0% to 100%) *Optional* Vaisala WXT520 providing: Temperature -52°C to +60°C, ±0.3°C Humidity 0% to 100%, ±3% in range 0-90% Pressure 600 to 1100hPa, ±0.5hPa at 0 to 30°C Rain accumulation ±5% Rain intensity 0 to 200mm/hr Wind speed 0 to 60m/s, ±3% at 10m/s Wind Direction 0 to 360°, ±3°

standard noise monitoring configuration	
Noise logging	Standard: RION NL-42 for IEC 61672-1: 2002 Class 2. Optional: RION NL-52 for IEC 61672-1: 2002 Class 1
Sound recording	Available
Weather station	Optional Vaisala HMP60 or WXT520 (see specs above)

optional sensors and measurements	
Temperature and Humidity	Vaisala HMP60 with naturally aspirated radiation shield. Temperature -40°C to +60°C range with ±0.6°C accuracy. Humidity ±3% (10% to 90%), ±5% (0% to 100%)
Pressure	Various units available, please ask for details
Rainfall	Various units available, please ask for details
Wind speed / direction	Various units available with or without calibrations, please ask for details
Wind vector	3D ultrasonic with high speed sensing both scalar and vector averages
Eddy Flux covariance	High speed ultrasonic anemometer and infrared gas analyser can both be connected
Alternates	Other sensors to user specification available on request

optional mounting kits	
Post mount	1.8m 48.4mm aluminium mounting post
Wall mount	Standard and custom wall mounting brackets available on request for both mounting post and logger boxes.
Tripod mount	Standalone un-guyed folding tripod with 48mm boom mounting pole to 2m above ground. Earth screws for soil or sand, masonry fasteners or weights all optional.

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.*