

Fulcrum3D CloudCAM | Specification

data capture and storage	
Sampling rate	Default 1s solar data and 3s 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 for solar and met data and 1 minute for cloud and solar forecast data.
Data upload	End of each integration period (3G/4G/GSM systems). Every 2 hours on satellite. Standard configuration delivers ~100MB/month (excluding imagery).
Data storage	16GB on-board data storage, expandable to 64GB. Optional image storage via 2TB hot-swap USB2 HDD.
Data access	All data available via <i>Flightdeck</i> online data management system allows data download and operating status checks. Image thumbnails and/or sample high resolution image download available depending on data bandwidth.
interfaces	
Serial	2x RS-232, 1x RS-485. Serial ports have switched battery power with current limit.
Ethernet	1x 10/100M Ethernet
USB	1x USB2 user; 1x USB2 for USB modem
Digital / analogue	Analogue and digital I/O available via Modbus modules
SCADA	Optional SCADA interface via Modbus RTU and TCP/IP (Modbus data specification available on request)
telemetry and controls	
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
power and communications	
Average power consumption	15W (daytime) / 8W (night-time) average consumption with standard configuration.
Power supply	12/24V d.c. with optional industrial 110/230V a.c. <i>Solar option:</i> 1x 150W PV module, MPPT, 2x 12V 80Ah battery (~5 days storage typical).
Communications	<i>Optional:</i> NextG/3G/GPRS with 6.5dBi antenna Satellite/Wi-Fi/Ethernet
environmental conditions	
Temperature	-20° to 60°C ambient
IP Rating	IP66 mounting enclosure, IP68 instruments
Lightning protection	Multi-strike lightning protection fitted to communications equipment. All instruments chassis grounded.
physical (standard configuration)	
Dimensions (WxDxH)	FDL1 data logger: 340x110x200mm incl mounting flanges Enclosure: 470x300x530mm. excl. aerial, solar modules, mounting system, sensors etc
Weight	~18kg enclosure; ~7kg sensor head incl 800mm boom
Materials	Aluminium heat shields, powder coated steel box, sealed aluminium electronics box, aluminium brackets and booms

standard configuration	
Standard inclusions	<i>Logger Box:</i> IP66 enclosure and wall/post mounting brackets including FDL1 datalogger; 12/24V d.c. power connection; GSM/3G/4G communications and antennae. <i>Sensor head:</i> Standard sensors and mounting brackets, 0.8m x 48.4mm boom and mounting bracket, cabling kit. Installation tool kit; material safety datasheets; instruction manual. <i>Mounting kit and local SIM not included.</i>
standard sensors	
CloudCAM™	<i>Fulcrum3D CloudCAM™ All-sky</i> cloud detection/forecast and solar forecasting system: <ul style="list-style-type: none"> ▶ Forecast time 0 – 15 min (typical)² ▶ Configurable update frequency Outputs include: <ul style="list-style-type: none"> ▶ current and forecast % cloud cover ▶ current and forecast solar irradiance ▶ performance statistics ▶ sensor head roll / tilt / orientation
Location	GPS altitude (m) and location (WGS 84) <5m RMS horizontal position accuracy
optional sensors	
Pyranometer	Kipp&Zonen SMP11 with mounting bracket
Temperature and Humidity ¹	Vaisala HMP60 with radiation shield, providing: <ul style="list-style-type: none"> ▶ Temperature -40°C to +60°C range, ±0.6°C ▶ Humidity ±3% (10% to 90%), ±5% (0% to 100%)
Weather station upgrade	Replace Vaisala HMP60 with Vaisala WXT520 providing: <ul style="list-style-type: none"> ▶ Temperature -52°C to +60°C, ±0.3°C ▶ Humidity 0% to 100%, ±3% in range 0-90% ▶ Pressure 600 to 1100hPa, ±0.5hPa (0 to 30°C) ▶ Rain accum. ±5% ▶ Rain intensity 0 to 200mm/hr ▶ Wind speed 0 to 60m/s, ±3% at 10m/s ▶ Wind direction 0 to 360°, ±3°
Other sensors	Additional or alternate sensors available including: <ul style="list-style-type: none"> ▶ Kipp&Zonen CVF3 ventilation unit ▶ Alternate pyranometers or silicon reference cells ▶ Kipp&Zonen SHP1 pyrliometer & SOLYS 2 tracker ▶ Additional met sensors as required <i>(may need power supply upgrade depending on selection)</i>
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.