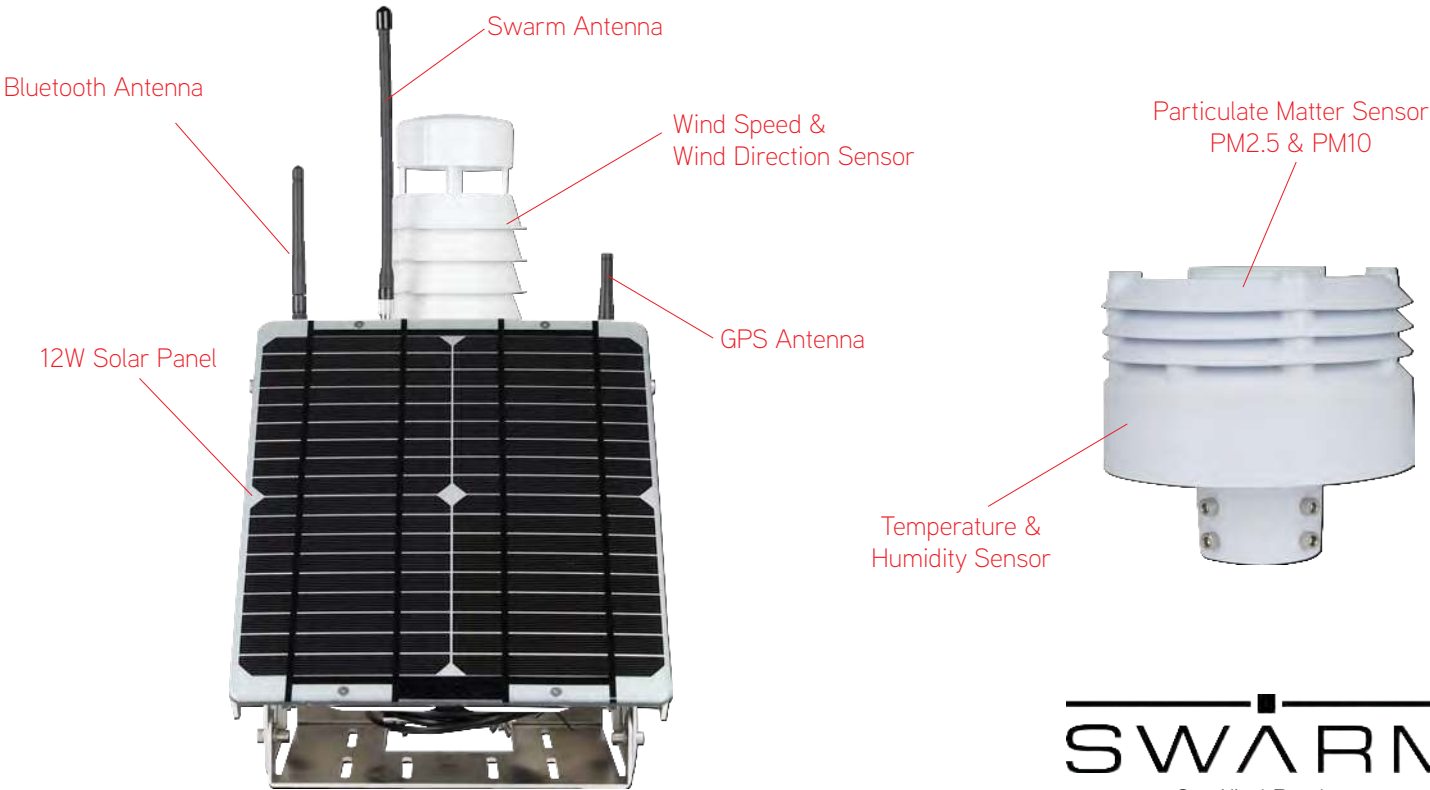# FREEWAVE

IIoT Air Quality Station

The IIoT Air Quality Station is a ready-to-deploy satellite-connected environmental monitoring solution with a focus on air quality. It comes pre-configured with the required industrial-grade sensors as well as low-cost communications options providing global connectivity and reliability.

To make things easy, the Swarm Satellite fees are included in the annual Data Platform subscription cost. Options ranging from simple OEM Data Broker message routing through to full dashboard and analytics. Using the IIoT Gateway could not be easier, simply deploy the unit and data will flow.

Swarm provides affordable satellite connectivity for IoT applications, particularly in remote regions that lack reliable access to the Internet. The geographic range of satellite is much greater than traditional terrestrial networks. Satellite is also a highly reliable method of data transfer since - unlike terrestrial networks - it cannot be knocked out by weather events or man-made accidents.

Bluetooth Antenna

Swarm Antenna

Wind Speed &
Wind Direction Sensor

Particulate Matter Sensor
PM2.5 & PM10

12W Solar Panel

GPS Antenna

Temperature &
Humidity Sensor

SWARM
Certified Product

IIoT Air Quality Station Specifications

MODELS	BDL-AQ-S2-1.x.x
Model Reference	IIoT Air Quality Station Satellite (Swarm)
Satellite Communications	SWARM TILE01 with 2-way 137-138MHz Downlink / 148-150MHz Uplink
Processors & Memory	Arm® Cortex®-M4 NOR Memory IC 32Mb, SPI - Quad I/O
Included Sensors	GPS, Power, Temperature, Humidity, Wind Speed & Direction, PM2.5, PM10
GPS Module	Sierra Wireless XM1210, TCXO. GPS+Glonass, GPS+BeiDou, GPS+Galileo. Signal used for both position information and accurate time sync for data records.
Charge Circuit & Battery	Tracking onboard battery voltage, along with the status output of onboard solar charging circuit in order to give a clear indication of how well the internal battery is charging.
Temperature & Humidity Particulate PM2.5/PM10	Resolution: Temperature: 0.01°C, Humidity: 1%, Particulate: 1 ug/m^3 Accuracy: Temperature: 0.3°C, Humidity: 3%, Particulate: 10 ug/m^3
Wind Speed & Direction	Resolution: Speed: 0.01 m/s, Direction: 0.1 deg, Max Speed: 60 m/s Ultrasonic Sensor Accuracy: Speed: 0.5 m/s, Direction: 3 deg
Bluetooth Host	U-BLOX NINA B3, v5.0 (Bluetooth low energy) nRF52840
Power Supply	Built-in 6000mAH Li-polymer Battery Charging Voltage: 4.2V, Rated Voltage: 3.7V, UVLO at 3.4V
Solar Panel	Epoxy encapsulated Monocrystaline, 12W Nominal output
DC Input & Charging	18~30VDC, 2A Max Current, MPPT Charger (19.4Vmp), Optional 12v DC Battery Input
CONNECTORS	
Antenna - Satellite	n/a
Antenna - GPS	Female SMA, GPS/GNSS Whip Antenna
Antenna - Bluetooth	Female SMA, Bluetooth Whip Antenna
DC Input	IP68 Circular Connector Socket, paired with solar panel cable
PHYSICAL DESCRIPTION	
Assembly at 45° (L x W x H)	448x260x210mm (without antenna), 545x260x210mm (with antenna)
Particulate Sensor (Dia. x H)	175mm x 160mm, Requires 50mm hollow pipe for installation
Weight (full assembly + antenna)	4.6kg excluding packaging
ENVIRONMENTAL	
Operating / Storage Temperature	-20°C to 60°C / -20°C to 85°C