Beam Weather Station BWS500

Features

- Accurate, high-quality weather data with Vaisala WXT530 Series sensors, air quality data with Vaisala AQT530 and GMP252, and visibility and present weather data with Vaisala PWD12 or PWD22
- Accurate, reliable road state and condition data with Vaisala DSC211 and DST111
- Secure software platform and data communications
- Vaisala cloud APIs and PODS-MQTT interface for third-party integrations

Vaisala Beam Weather Station BWS500 is a compact weather station for cities, road authorities, and industrial zones. With the flexible and scalable Beam station, communities can assess road conditions, air pollution, and other environmental challenges. The weather, environmental, and road state observations can be used to fit various and specific needs.

BWS500 provides the required hardware and software for obtaining your weather data. In BWS500, you can choose for aggregated data (observations) or measurements directly from the sensors or both to be sent to your data collection system. Alternatively, you can view selected data through the Vaisala cloud services.

BWS500 is suitable for a variety of applications, including traffic management, urban flooding monitoring, and heat island tracking. It can be scaled to support both small and large-scale weather observation networks.

Secure data connectivity

BWS500 takes care of the measurements, as well as data storage and transfer with Vaisala Edge Gateway EGW501. EGW501 provides secure data transfer between the sensors and Vaisala cloud or customer data collection systems.

BWS500 offers an option for an integrated SIM card and cellular data plan that makes the station ready for use as soon as it is installed. You can also use any compatible SIM card.

Easy installation

A range of options for mast, tripod, and wall mounting are available for the station hardware, enabling optimal installation regardless of the location.

BWS500 is easy to install and requires minimal configuration. Simply install and connect the devices, and start gathering data.

Flexible powering solution

Power Supply Unit PSU501 is the powering solution for BWS500, designed to ensure uninterrupted power supply (UPS) to the station. PSU501 can be used to power the station at sites where AC (mains) power is available. Where AC power is not available, PSU501 can work together with a solar panel or other DC power source.

PSU501 is suitable for both portable and fixed installations.

The solar panel in conjunction with low power consumption makes BWS500 an ideal choice for data applications in remote locations. To ensure sufficient power supply, solar power can only be used when BWS500 contains only a non-heated WXT530 series sensor.

Data sharing and management

BWS500 provides a PODS-MQTT (point observations and device state over message queuing telemetry transport) interface for sending observations, device information, and device status from BWS500 to customer data collection systems.

Alternatively, you can use the Vaisala cloud to collect and visualize measurement data from selected sensors. Once you have a Vaisala cloud account, you can share the data to third-party services and systems through APIs.

Technical data

Operating environment

Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	−40 … +55 °C (−40 … +131 °F) [1]
Storage temperature	−40 … +60 °C (−40 … +140 °F) [1]
Operating humidity	0–100 %RH [1]
Pollution degree	2
Maximum operating altitude	2000 m (approx. 6500 ft)
IP rating	
PSU501, AQT530 [2], WXT530 series (without mounting kit), GMP252, DSC211, DST111	IP65
WXT530 series (with mounting kit), PWD12, PWD22	IP66
EGW501	IP67

1) *Excluding AQT530. See AQT530 specifications.*
2) *Specified for gas measurement device only.*

Powering

Powering options	Power supply unit PSU501 for AC (mains) power and solar panel/ external DC power use DC input without PSU501
AC (mains) power	100–240 V AC, ±10 % 50/60 Hz 800 mA
AC (mains) fuse, internal (non-replaceable)	Type 3, 1.5 kV / 3 kA
AC (mains) cable connection	Conductor cross-section (flexible): 0.75–2.5 mm^2 (20–14 AWG) Cable lead-through: for 6–12.5 mm (0.24–0.49 in) cable
External DC / Solar panel input	15–32 V DC Max. 2 A
Solar panel [1]	20 W for Vaisala-provided solar panel
Battery	Lead-acid battery
Battery capacity	12 V / 7 Ah
Overvoltage category	CAT II
Power output (PSU501)	30 W
Power consumption [2]	
EGW501	< 0.75 W, typical

1) *Solar panel feasibility and operation depends on the installation location and the amount of sunshine.*
2) *For power consumption of sensors, see the relevant sensor documentation.*

Communication options

Wireless communication	4G LTE/3G/2G
Maintenance communication	USB 3.0 Web UI (locally)
Data collection and visualization	Vaisala cloud or directly to customer system
Data interfaces	• PODS-MQTT interface for observations and device information • WebSocket API from Vaisala cloud for real-time measurement data stream • REST API from Vaisala cloud for measurement history data requests
Sensor interfaces	RS-485 Modbus and ASCII

Compliance

EU directives and regulations	EMC, LVD, RED, RoHS
Electromagnetic compatibility (EMC)	EN 61326-1, basic electromagnetic environment CISPR 32 / EN 55032, Class B EN 301 489-1 FCC part 15 B, Class B ICES-3 / NMB-3 (Class B)
Electrical safety	EN 61010-1
Cold	IEC 60068-2-1
Dry heat	IEC 60068-2-2
Vibration	IEC 60068-2-6, IEC 60068-2-64
Change of temperature	IEC 60068-2-14
Damp heat, cyclic	IEC 60068-2-30
Rough handling	IEC 60068-2-31
Damp heat	IEC 60068-2-78
Freezing rain	NWS 8.0
Compliance marks	CE, EAC/CE, FCC, IC, RCM, UKCA

Radio module

Acceptance	CE (Europe), EAC/CE (Ukraine), FCC (USA), IC (Canada), RCM (Australia and New Zealand), Giteki (Japan)
SIM card type	Mini-SIM
Frequency bands	
LTE-FDD	B1/ B2/ B3/ B4/ B5/ B7/ B8/ B12/ B13/ B18/ B19/ B20/ B25/ B26/ B28
LTE-TDD	B38/ B39/ B40/ B41
WCDMA	B1/ B2/ B4/ B5/ B6/ B8/ B19
GSM	B2/ B3/ B5/ B8

Sensor options

Vaisala Air Quality Transmitter AQT530
Vaisala Remote Road Surface State Sensor DSC211
Vaisala Remote Road Surface Temperature Sensor DST111
Vaisala Carbon Dioxide Probe GMP252
Vaisala Present Weather and Visibility Sensor PWD12 or PWD22
Vaisala WXT530 Series Weather Transmitter (heated or non-heated)

Mounting options

Mast 4 m (13 ft 1 in) [1]	DKP204W
Mast 3 m (9 ft 10 in) [1]	DKP203W
Mast 2 m (6 ft 7 in) [1]	DKP202W
Tripod 3 m (9 ft 10 in) [2]	DKT504
Wall mounting kit for gateway	ASM213843
Wall mounting kit for power supply unit	ASM213949
Mast mounting kit for gateway or power supply unit	ASM213841

1) *Installation to concrete foundation. Optional accessories: leveling/welding plate, tilt division flange, support guy wire set (DKP204 only), and lightning protection kit.*
2) *Tripod comes with a toolkit, including tools bag, hammer, and ground pegs.*

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