

Automatic Weather Station AWS810 *Solar Edition*



Features

- Complete solution for solar power plant needs
- Provides global, direct, and diffuse solar irradiance data and albedo, as well as all key weather parameters
- Connects to all standard/smart/high-quality irradiance sensors
- Excellent expandability and flexibility
- Modern security architecture
- Advanced data management with Vaisala Data Management Unit DMU801
- Enhanced remote maintenance and configuration management
- Easy integration with the solar power plant's SCADA system
- Vaisala cloud service connectivity

Vaisala Automatic Weather Station AWS810 *Solar Edition* combines reliable measurements, data collection, and connectivity to maximize the solar power plant performance. It is a complete communication and data monitoring solution including sensors, electronics, mast, and power supply.

An all-in-one solution for solar power plants

Vaisala Automatic Weather Station AWS810 *Solar Edition* is a weather data collection system that automatically measures, processes, and stores weather data for professional use. It is optimized for solar power plants to collect on-site weather data and help monitoring the solar energy performance.

AWS810 *Solar Edition* provides weather data for global, diffuse, and reflected solar irradiation, as well as all key weather parameters (temperature, pressure, humidity, rain, and wind speed and direction). In addition, data from the soiling sensors help the solar power plant with maintenance planning.

Validated data from reliable sensors

AWS810 *Solar Edition* is compliant with IEC 61724-1. The design quality of Vaisala weather stations has been proven with extensive tests in the development phase and on the field.

To ensure continuous accuracy of measurements and calculations, AWS810 *Solar Edition* includes built-in data quality controls that test sensor data against minimum and maximum limits and changes between successive measurements. The weather station's DMU801 data management unit continuously monitors the status of the sensors to ensure measurement reliability. All the sensors operate independently from each other, meaning that an individual sensor failure does not affect the performance of the other sensors.

Integration with solar power plant's control system

AWS810 *Solar Edition* can be integrated with the solar power plant's SCADA (Supervisory Control and Data Acquisition) system through a Modbus TCP interface. Modbus sensor mapping is compliant with SunSpec Alliance.

Data security prioritized

AWS810 *Solar Edition* provides first-class data security mechanisms to protect your data from security threats and unauthorized access. DMU801 data management unit brings along a number of data security features, such as secure network protocols, secure communication interfaces with industry standard encryption protocols, and dynamic firewall protection. Security development and maintenance, including regular firmware updates, is provided for continuous improvements.

Remote maintenance and station management

The AWS810 Web user interface allows you to adjust settings and fix problems remotely. It is possible to view basic station information, sensor status, and readings, and to set site-specific parameters. Through the Web UI you can also update the firmware and restore factory default settings.

In addition, it is possible to connect AWS810 *Solar Edition* to Vaisala cloud service for accessing observation data from the sensors.

Technical data

Operating environment

Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature with 28 Ah backup battery or without battery ¹⁾	−40 ... +60 °C (−40 ... +140 °F)
Operating temperature with 24 Ah backup battery ¹⁾	−40 ... +50 °C (−40 ... +122 °F)
Storage temperature ²⁾	−60 ... +70 °C (−76 ... +158 °F)
Operating humidity	0–100 %RH
Pollution degree	2
Maximum operating altitude	3000 m (approx. 9800 ft)

1) Excluding ARG314. See the manufacturer documentation.
2) Excluding backup battery. See the manufacturer documentation.

Powering specifications

AC (mains) power	100–240 V AC, −15 % ... +10 % 50–60 Hz 6.8 A maximum (100 V AC)
Mains fuse (nominal)	10 A
External DC	15–28 V DC 10 A maximum
Solar panel	70 W, typical 15–28 V DC 6 A maximum (each), 10 A combined (both inputs)
Internal backup battery	12 V / 24–28 Ah (48–56 Ah with 2 batteries)
Overvoltage category	II

ENC652 specifications

IP rating	IP66
UL 50E/NEMA rating	Type 4X
Maximum operating wind speed	75 m/s (168 mph)
Door opening angle	100°
Material	Stainless steel AISI 316L, painted white
Size (enclosure only)	600 × 500 × 207 mm (23.62 × 19.68 × 8.15 in)
Weight (excluding backup battery)	< 30 kg (66 lb) ¹⁾

1) Depends on the selected options.

Standard communication options

Wireless communication	LTE Cat 4 cellular modem (with UMTS/HSPA+ and GSM/GPRS/EDGE support)
Landline communication	RS-232, RS-485, LAN, fiber
Ethernet communication	HTTPS, TCP socket, SFTP, FTP
Data collection software	Vaisala cloud service (Xweather Insight)
Communication protocols	Modbus TCP (SunSpec) ASCII (SMSAWS)
Local maintenance connection	USB-C, browser-based Web UI
For other data validation, calculation, report, mast, powering, sensor, communication data collection software options, and measurement unit conversions, contact Vaisala.	

Measurements

Global, diffuse, and reflected solar irradiation and albedo
Atmospheric pressure, air temperature, relative humidity
Wind speed and direction
Rain/Precipitation
Soiling and temperature of solar panels

Compliance

EU directives and regulations	EMC, LVD, RoHS
EMC immunity	EN 61326-1, industrial environment ¹⁾ ²⁾ FCC part 15 B, Class B ICES-3 / NMB-3 (Class B)
EMC emissions	CISPR 32 / EN 55032, Class B
Safety	IEC/EN/AS/UL/CSA-C22.2 61010-1
Eye safety (SFP modules)	Class 1 laser product, EN 60825-1:2014
CLASS 1 LASER PRODUCT	
Safety listing (U.S. and Canada)	MET Listed ³⁾
Cybersecurity	Developed in accordance with ISO/IEC 27001 and IEC 62443-4-1 for secure product development practices
Compliance marks	CE, FCC, RCM, UKCA

1) Excluding EKO MS series and Kipp & Zonen SMP12 pyranometers.
2) Modern Carrier Module DMX801 complies with EN 61326-1 basic level. Ethernet connection in DMU801 base unit (**eth0**) requires external surge protection to comply with EN 61326-1 industrial environment level.
3) AWS810 backplate only -option is MET Recognized.

Environmental compliance

Test	Applied standard or test procedure	Specification
Operation		
Cold	IEC 60068-2-1	−40 °C (−40 °F)
Dry heat	IEC 60068-2-2	+60 °C (+140 °F)
Damp heat	IEC 60068-2-78	+40 °C (+104 °F), 93 %RH
Vibration (sinusoidal)	IEC 60068-2-6	Frequency range 5–200 Hz 1.2 mm/s velocity, 5–12 Hz 0.7 g, 12–200 Hz
Shock	IEC 60068-2-27	5.0 g, pulse duration 11 ms with 100 pulses in each direction
Vibration (random)	IEC 60068-2-64	5–100 Hz
Storage		
Cold ¹⁾	IEC 60068-2-1	−60 °C (−76 °F)
Dry heat ¹⁾	IEC 60068-2-2	+70 °C (+158 °F)
Transport		
Vibration (random)	IEC 60068-2-64	5–200 Hz
Shock	IEC 60068-2-27	18 g, pulse duration 6 ms with 100 pulses in each direction
Rough handling	IEC 600068-2-31	Drop height 25 cm (9.84 in)

1) Excluding backup battery.

Electromagnetic compatibility

Test	Applied standard or test procedure	Specification
Emissions radiated	CISPR 32 / EN 55032, Class B	30 MHz–6 GHz
Emissions conducted to mains (AC)	CISPR 32 / EN 55032, Class B	150 kHz–30 MHz
Emissions conducted to telecommunication lines	CISPR 32 / EN 55032, Class B	150 kHz–30 MHz
Emissions radiated, Class B	FCC part 15 B, Class B	30 MHz–18 GHz
Emissions conducted, Class B	FCC part 15 B, Class B	150 kHz–30 MHz
Emissions, harmonic current	EN 61000-3-2	0–40 th harmonic
Immunity to electrostatic discharge	EN 61000-4-2	Contact, HCP ±4 kV Contact, VCP ±4 kV Contact discharge, all conductive parts ±4 kV All discharge, all nonconductive parts ±2 kV, ±4 kV, ±8 kV
Immunity to RF field (80 MHz ... 6 GHz)	EN 61000-4-3	10 V/m (80 MHz–1 GHz) 3 V/m (1–6 GHz)
Immunity to electric fast transient	EN 61000-4-4	±2 kV AC, ±1 kV I/O
Immunity to surge	EN 61000-4-5	Line to line ±1 kV (AC and I/O) Line to ground ±2 kV (AC and I/O)
Immunity to conducted RF	EN 61000-4-6	3 V r.m.s. (150 kHz–80 MHz)
Immunity to voltage dips and short interrupts	IEC 61000-4-11	0 % 1 cycle 40 % 10 cycles 70 % 25 cycles 0 % 250 cycles