ENCARDIO RITE

ONE STOP MONITORING SOLUTIONS | HYDROLOGY | GEOTECHNICAL | STRUCTURAL | GEODETIC
Over 50 years of Excellence through ingenuity

DATASHEET

AUTOMATIC WEATHER STATION

MODEL EAWS-101

OVERVIEW

Encardio-rite automatic weather station is a weather data management and presentation system for meteorological data collected by individual sensors from a site. The system provides a reliable and cost effective means of recording meteorological data. Encardio-rite offers weather system with standard sensors for essential parameters i.e. rainfall, wind velocity, relative humidity and temperature. Other sensors are also available on request. The weather station can be configured based on the parameters to be measured or the sensors required. The system handles all data processing requirements, starting with collection and storage of data, performing the required calculations on the data, presenting the results in graphical and numerical format and generating alarm messages.

FEATURES

- Durable rugged design and corrosion free.
- Modular construction with easy system maintenance.
- Easy to install and operate: pre-configured for quick setup.
- Option to monitor meteorological data collected remotely from an internet connected computer available.
- High precision, quality automatic weather monitoring system.
- Simple user-friendly software.
- Range of communication options for remote operation.
- Mains or solar power option with rechargeable battery backup.
- Suitable for unattended operation.

DESCRIPTION

Encardio-rite automatic weather station model EAWS-101 allows monitoring meteorological data collected by EWDAS-101 Data logger from sensors connected and located at the site. It has precision meteorological data measurement capability, having rugged construction, wide operating temperature range and low power consumption. The weather station is ideally suitable for meteorological and climatologic monitoring. Standard sensors used are briefly outlined below:

- Rain gage
- Wind speed and direction sensor
- Relative humidity & temperature
- Solar radiation
- Evaporation meter
- Air pressure or barometric pressure

Encardio-rite EAWS-101 is the answer where users require a compact weather station and where cost is an important consideration. In meteorology, precision measurement of weather parameters is critical for accurate weather forecasting and environmental research. Encardio-rite offers meteorological sensors having an excellent reputation for providing precise results even in the most demanding of environments, especially where high humidity and low temperatures dominate. The system is provided with suitable lightning protection.

DATA LOGGER

The EWDAS-101 data logger system configuration is capable of recording data from all the weather monitoring sensors as mentioned above. The data is logged at pre-selected time intervals and stored in an internal memory.

Suitable software and interface cables are provided for transferring the logged data from the data logger memory to a desktop or laptop computer. The data logger can store many days data in its internal memory. The standard configuration is supplied with mains powered battery backed power supply adequate for most sites. The Automatic weather station system data logger itself is housed in weather proof housing.

SPECIFICATIONS

Scan/upload interval	5 seconds to 168 hours
Power supply	2 x D size 3.6 V/19 Ah Lithium cells, or 2 x D size 1.5 V Alkaline high power cells, or 12V SMF battery chargeable from AC mains or solar panel
Memory capacity	Flash Memory (64-Mbit); 2 Million data points
Temperature limit	-30 to 70°C
Data retrieval/ transmission	GSM/GPRS telemetry link, laptop/PC
Communication port	RS-232 (Standard) 115 kbps
Housing	Corrosion resistant weather proof enclosure

RAIN GAGE

Model ERG-200/201 Rain Gage

Encardio-rite model ERG-200/201 rain gage with a proven tipping bucket mechanism provides a cost effective reliable method for measuring and recording rainfall. It is easy to use, durable and precision sensor that provides long term, trouble free operation with a minimum of maintenance. It is corrosion resistant having a stainless steel outer housing. It is designed for many years of trouble free operation.

Inside each rain gage is a balanced tipping bucket mechanism with a magnet and switch assembly. Collection of rain is through a 200 mm diameter catchment through a debris filtering screen. A funnel inside the rain gage feeds collected rain water into one of the two buckets. As soon as the preset amount of water has been collected in the bucket, it tips the other way, automatically emptying the water and positioning the other bucket for collecting rainfall. The measured water exits through drain tubes provided at the base of the rain gage. The tipping bucket mechanism activates a sealed magnet sensitive switch that produces a contact closure for each 0.2/0.5 mm of rainfall. Two adjustable screws provide calibration of buckets by changing position of the bucket stop point. High vertical sidewalls of the model ERG-200/201 prevent splash-out of rain from the catchment thus resulting in better accuracy. Each rain gage is individually calibrated for optimum accuracy. Three adjustable legs allow the rain gage to be fastened permanently onto a platform or deck using standard fasteners.

SPECIFICATIONS

Sensor Type	Tipping bucket
Output	Potential free contact, one momentary switch closure per tip
Tip sensor	Sealed magnetic proximity switch
Measurement range	0-500 mm/hr
Resolution	0.2 mm/tip for model ERG-200 0.5 mm/tip for model ERG-201
Accuracy	± 2 %
Operating temp	Up to 50°C
Catchment area	200 mm diameter
Construction	Corrosion resistant stainless steel outer housing, shock and vibration resistant

Model ERG-160 rain gage

Model ERG-160 mechanical rain gage is similar to model ERG-200/201 rain gage excepting that instead of the tipping bucket mechanism in the latter, there is a container to collect water in the former.

The collected rain water in the container is poured into the graduated flask to measure the rainfall over a period of time.

WIND SPEED & WIND DIRECTION SENSOR

Model EWV-101S wind speed sensor and EWV-101D wind direction sensor

Encardio-rite model EWV-101S wind speed sensor consists of three cup anemometer and model EWV-101D wind direction sensor consists of a direction vane that gives accurate, reliable data. The sensors are designed for long term unmanned operations under varied meteorological environments.

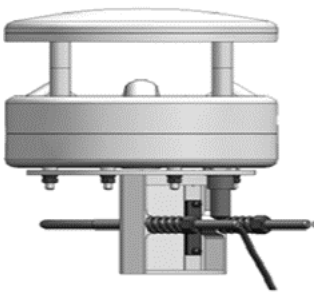
Model EWV-101S is simple and easy to use sensor that responds to the dynamic force on three cups. The set of three cups rotates at a speed proportional to the wind speed. The rotation is converted to an electrical signal in form of pulses. By counting the pulses over a given time interval the speed can be determined. In EWV-101D, the wind direction is monitored by a dynamically balanced wind vane coupled to a low-torque potentiometer.

EWV-101S wind speed sensor

EWV-101D wind direction sensor

Model EWV-102U wind speed & direction sensor (ultrasonic)

Model EWV-102U uses ultrasonic technology to take measurements of wind speed and direction. It is maintenance free and easy to install. The data of speed and direction are available in the form of a public protocol.



SPECIFICATIONS

Wind speed EWV-101S	
Range	0-70 m/s
Accuracy	±0.3 m/s or 1% of reading
Operating Temp.	-20 to 50°C
Output	Potential free switch closure
Wind direction EWV-101D	
Range	360° mechanical (3° dead band near 0°)
Accuracy	±3°
Operating Temp.	-20 to 50°C
Output	0 – 25 VDC
Power requirement	15 VDC max
Wind speed and direction EWV-102U (ultrasonic)	
Wind speed	
Range	0-60 m/s
Accuracy	±0.3 m/s
Resolution	0.1 m/s
Operating Temp.	-20 to 60°C
Wind direction	
Sensor type	Ultrasonic (no moving parts)
Range	0-360°
Accuracy	± 3°
Resolution	±1°
Operating Temp.	-20 to 60°C
General info for EWV-102U wind sped & direction	
Output	RS232/RS485
Response time	Less than 1 second lag in operating range

RELATIVE HUMIDITY & TEMPERATURE GAGE

Model EWH-101T relative humidity & temperature gage

The model EWH-101T performs both relative humidity & temperature measurement. The humidity sensor is based on advanced technology with a unique sensing technology. The multi plate radiation shield protects the sensors from direct and reflected solar radiation, thus minimizing errors.

A 20 µm polyethylene filter provides a high level of protection and maintains the optimum measurement environment for the humidity & temperature sensors. The sensors are mounted in a small probe which contains all the electronics necessary to provide output for indicating the ambient humidity and temperature.

The sensor comes complete with the mounting clamps for easy mounting.

Model EWH-101T Relative Humidity & Temperature Gage

SPECIFICATIONS

Sensor Type	Humidity: Capacitance thin film sensor Temperature: Pt100
Operating range	Humidity: 0....100 % Rh Temperature: -40 to 60°C
Accuracy	Humidity: ±0.8 % Rh Temperature: ± 0.2°C
Outputs	Humidity: 0-1 V DC Temperature: 0-1 V DC, Pt 100 Ohm
Resolution	Humidity: 1% Temperature: ± 0.1°C
Sensor response Time	10 seconds
Temperature ranges	-40 to 85°C
Housing protection	IP 65

SOLAR RADIATION

Model EWR-101S/102T solar radiation sensor

Solar Radiation sensor are available in two variations: Model EWR-101S having a silicon photovoltaic detector mounted in a cosine corrected head and model EWR-102T that has a high quality blackened thermopile protected by a dome.

EWR-101S measures sun plus sky radiations, while EWR-102T monitors solar radiation for full solar spectrum range. This enables EWR-102T to be used under plant canopies, artificial light conditions, when the sky is cloudy and for reflected radiation measurements. Both the models are accurate and dependable, ideal for long term use in harsh conditions.

EWR-101S

EWR-102T

SPECIFICATIONS

Sensor Type	EWR-101S: Silicon photovoltaic detector mounted in a cosine corrected head EWR-102T: Blackened thermopile protected by a dome
Light Spectrum Waveband	EWR-101S: 360 to 1120 nm EWR-102T: 285 to 3000 nm
Range	0 – 2000 W/m^2
Accuracy	3%
Sensitivity	EWR-101S: 5 W m^{-2} mV^{-1} EWR-102T: 15 µV/W/m^2
Resolution	1 W/m^2
Threshold	120 W/m^2 of direct solar irradiance
Temperature ranges	EWR-101S: -40 to 70°C EWR-102T: -40 to 80°C

EVAPORATION MEASUREMENT

Model EEG-10 evaporation measurement system

Model EEG-10 evaporation measurement system consists of evaporation gage and an evaporation pan. The system determines evaporation rate by measuring the changing water level in an evaporation pan. The evaporation gage is connected to the pan using stainless-steel pipe and fittings.

The evaporation gage consists of a float, pulley and counterweight attached to a precision 1000 Ω potentiometer mounted through a gear assembly in a weatherproof housing. It has a square base plate equipped with three leveling screws and a bubble level. The potentiometer produces a resistance output proportional to the position of the float. The data can be collected at site using a datalogger and can be monitored remotely.

Model EEG-10 Evaporation measurement system

SPECIFICATIONS

Model EEG-10 Evaporation measurement system

Total Resolution	0.76 mm (0.03 in)
Potentiometer Accuracy	0.25%
Rotation	360° continuous
Operating Temp. Range	-40° to +60°C
Linearity	0.25%
Pan material	Non-corrosive, weather resistant stainless steel or cast acrylic plastic
Pan diameter	1.2 m
Platform for pan	Rot resistant wood with suitable wood preservative coating
Graduation	In millimeters

BAROMETRIC PRESSURE SENSOR

The model EWP-101 barometric pressure sensor is ideal for measuring barometric pressure for remote environmental applications. It is designed to meet stringent accuracy requirements over wide operating temperatures in remote applications.

SPECIFICATIONS

Range	800-1100 hPa/mb
Accuracy	± 0.3 hPa
Resolution	± 0.01 mB

MASTS AND MOUNTING ACCESSORIES

In its standard configuration, EAWS-101 is supplied with a 2 m high guy wire stayed corrosion resistant mast for mounting the various sensors and the data logger enclosure.

Suitable mounting brackets and accessories for mounting the various sensors, optional solar panels, data logger enclosure etc. are included as necessary. Rain gages are generally fixed to the floor or ground near the base of the mast. Optionally, masts suitable for mounting sensors at higher levels are also available to suit unusual site conditions like those near low lying obstructions etc.

DATA RETRIEVAL AND TRANSMISSION

Telemetry through GSM/GPRS modem

In an area covered by any GSM/GPRS service provider network, the data from the datalogger can be transmitted to a remote server at a central location. The user will need a data SIM card for each GSM/GPRS modem. In case telemetry is not required, the GSM/GPRS modem is not provided.

Readout/data retrieval using laptop, PC

Logged data from datalogger at site can be directly downloaded to a laptop. Data can be transferred to the server or central PC from the laptop using either a USB pen drive or through Internet.

DATA PRESENTATION, ARCHIVING AND WORLD WIDE ACCESS THROUGH ENCARDIO-RITE PUBLIC CLOUD SERVICE

Encardio-rite offers public cloud based web data monitoring services to its customers for retrieving data from Encardio-rite data loggers, archiving the retrieved data in a SQL database, processing the data and presenting the processed data in tabular and most suitable graphical forms for easy interpretation of logged data. The tables and graphs related to any site or sites can be accessed by authorized personnel who can login to their site using the supplied login ID and access password from anywhere in the world over the internet.

Any internet connected computer and a standard web browser like Microsoft Explorer, Google Chrome or Firefox, etc. can be used for the purpose.

Data from the Encardio-rite cloud based web monitoring servers can be accessed from just about any type of device that supports a standard web browser like a desktop or laptop PC, Tablet, smart phone or most other mobile computing devices.

Encardio-rite cloud services work on a rental model. User has to pay a small setup fee for first time and then a monthly rental has to be paid for accessing the data over the cloud as long as required

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