

## DATA SHEET



# 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.



Standard sensors used in the Encardio-rite model EAWS-101 weather station are briefly outlined below:

**Rain gage:** Tipping bucket type rain gage.

**Wind speed and direction sensor:** Three cup anemometer speed sensor along with direction sensor with dynamically balanced wind vane gives precise wind velocity.

**Relative humidity & temperature:** Advanced humidity sensor with Pt 100 for temperature measurement.

**Data logger:** Provides unattended monitoring & recording.

## 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. EAWS-101 features a combination of model ERG-200 tipping bucket type rain gage, model EWW-101S wind speed sensor, EWW-101D wind direction sensor, model EWH-101T relative humidity & temperature sensor, model EWR-101R/EWR-102T solar radiation sensors and model EWDAS-101 data logger. The Encardio-rite data logger 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.

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.

### Data logger

The EWDAS-101 data logger system configuration is capable of recording rainfall, wind velocity, relative humidity and temperature. 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

### Datalogger

|                             |   |
|-----------------------------|---|
| Scan rate                   | Few times/sec to once/hour                  |
| Power consumption           | 50 mA during measurement                    |
| Power requirement           | 9.6 to 16 VDC                               |
| Storage capacity            | 2 MB for data (expandable with peripherals) |
| Temperature limit           | -25 to 50°C                                 |
| Data retrieval/transmission | GSM/GPRS telemetry link, laptop/PC          |

### Model ERG-200 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

### Rain gage

|                |  |
|----------------|--|
| Sensor Type    | Tipping bucket   |
| Output         | Potential free contact, one momentary switch closure per tip |
| Tip sensor     | Sealed magnetic proximity                                    |
| Resolution     | 0.2 mm/tip for model ERG-200<br>0.5 mm/tip for model ERG-201 |
| Accuracy       | ± 2 % at around 30 mm/hour<br>± 5 % at around 120 mm/hour    |
| Operating temp | Up to 50°C   |
| Catchment area | 200 mm diameter  |
| Construction   | Corrosion resistant stainless steel outer housing            |

### Model EWW-101S wind speed and Model EWW-101D wind direction sensor

Encardio-rite model EWW-101S wind speed sensor consists of three cup anemometer and model EWW-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 EWW-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 EWW-101D, the wind direction is monitored by a dynamically balanced wind vane coupled to a low-torque potentiometer.

## SPECIFICATIONS

|                       |  |
|-----------------------|--|
| <b>Wind speed</b>     |  |
| 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          |
| <b>Wind direction</b> |  |
| Range                 | Up to 50°C                             |
| Range                 | 360° mechanical (3° dead band near 0°) |
| Accuracy              | ±3°                                    |
| Operating Temp.       | -20 to 50°C                            |
| Output                | 0 - 25 VDC                             |
| Power requirement     | 15 VDC                                 |

### 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.



## SPECIFICATIONS

### Solar Radiation

|                         |  |
|-------------------------|--|
| Sensor Type             | EWR-101S: Silicon photovoltaic detector mounted in a cosine corrected head<br>EWR-102T: Blackened thermopile protected by a dome |
| Light Spectrum Waveband | EWR-101S: 360 to 1120 nm<br>EWR-102T: 285 to 3000 nm   |
| Sensitivity             | EWR-101S: 5 W m <sup>-2</sup> mV <sup>-1</sup><br>EWR-102T: 15 μV/W/m <sup>2</sup>   |
| Temperature ranges      | EWR-101S: -40 to 70°C<br>EWR-102T: -40 to 80°C   |

## SPECIFICATIONS

|                      |  |
|----------------------|--|
| Sensor Type          | Humidity: Capacitance thin film sensor<br>Temperature: Pt100 |
| Operating range      | Humidity: 0...100% rh<br>Temperature: -10 to 80°C            |
| Outputs              | Humidity: 0-1 V DC<br>Temperature: 0-1 V DC, Pt 100 Ohm      |
| Sensor response Time | 10 seconds   |
| Temperature ranges   | -20 to +50°C   |
| Housing protection   | IP 65  |

### Model EWR-101/102 solar radiation sensors

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

### 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

Following options are available:

- Telemetry through GSM/GPRS modem
- Readout/data retrieval using laptop, PC.

### 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

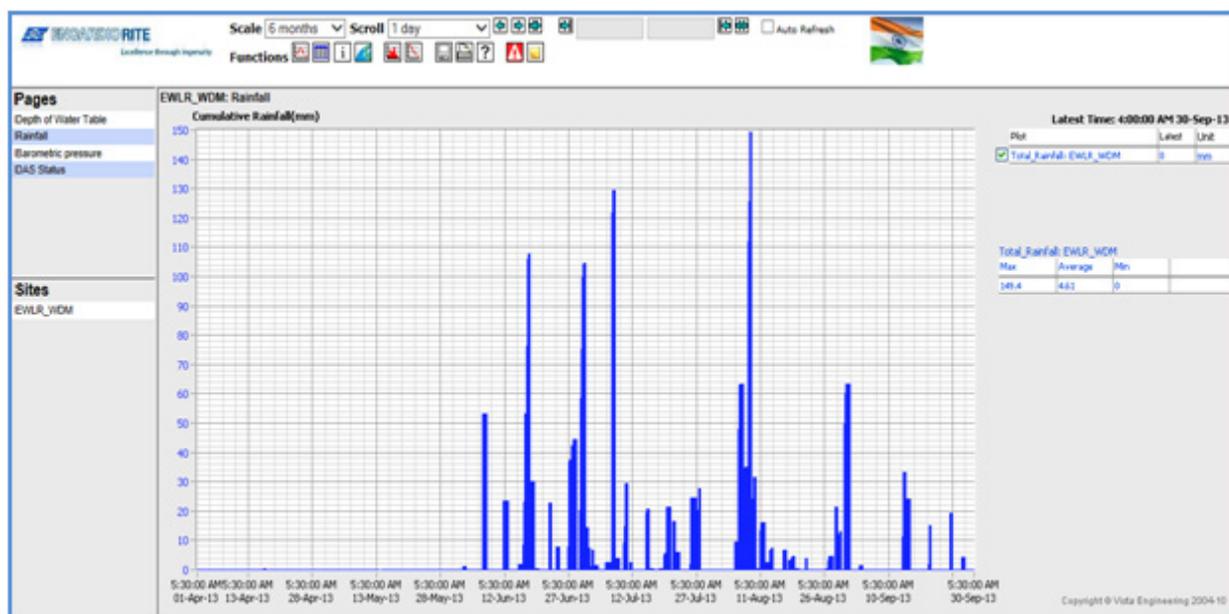
Encardio-rite offers public cloud based web data monitoring services to its customers for retrieving data from Encardio-rite data loggers, archiving the retrieved data in a SQL database, processing the data and presenting the processed data in tabular and most suitable graphical forms for easy interpretation 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.



RAINFALL DATA

\*All specifications are subject to change without prior notice

DATASHEET | 1182-12 R02



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