

AWS **SOLUTION**

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Data Logger

The data logger is a rugged system capable of running 24x7 in harsh environment with dust and temperature. It has versatile integrated memory and interfaces. It is designed with industry standard 32 bit ARM Cortex and dual SIM wireless 4G based redundant system. If one 4G channel fails, the other 4G channel will take over automatically to send the data.

- Input/output: 08 Digital I/O, 04 Analog I/O, 04 nos. 4-20mA Input.
- 2 MODBUS RS485/RS232 ports with galvanic isolation.
- Built in isolated 10 Base T/100 Base TX Ethernet for Network/VSAT connectivity
- On-board Dual SIM GSM/GPRS 2G/3G/4G connectivity.
- Power Supply: 5-10V DC
- Inbuilt signal conditioning for various parameter measurements
- Display: Low power Mono graphic LCD Display Module 128×64 pixel
- 4 Keys for function execution
- SDI12 Interface
- Operating Temperature: -15 deg C to 70 deg C
- Programming: Local and remote through web server.
- USB port for programming through PC
- USB OTG for External Flash Drives
- Bluetooth configuration
- Built-in Alarm System.
- Software: Compatible configuration, diagnostic, parameter setting and view.
- SMS alert
- Device status checking and reset through SMS
- Data Memory: 128 MB on-board NAND Flash, On-Board SD Card up to 16 GB (more than 100,00,000 data points)
- Inbuilt RTC with Battery Backup, accuracy of $\pm 2\text{min/year}$, leap year compensation.
- Each logger can be configured for its own ID and other parameters like data fetching interval.



General Technical Specification for VSAT

- Dedicated 256Kbps Bandwidth
- Ku/ Extended C band VSAT
- Antenna size: 1.2m
- Separate battery bank for VSAT to provide power backup for minimum 15 days. e. Other Standard IDU and ODU features.
- Smooth operation during rainy or cloudy conditions.

Sensor Data Retrieval Procedure

- Local retrieval : An Ethernet port or a USB port should be used to obtain data from the datalogger locally.
- Remote retrieval :
 - a. An HTTPS online portal that can be accessed over the internet and that allows users to log in will be available for examining historical and current water levels as well as other sensor data. It will also allow users to export data in the form of PDFs or Excel files for a chosen time period.
 - b. To integrate the system with the Early Warning System, an API will be made available that returns a JSON response with the following details: water level, velocity data, date and time, and battery bank voltage.
 - c. JSON response example : { "Serial_No" : "987654321", "Node_Name" : "Node_1", "Node_Location" : "Location_1" , "Date_Time": "2024-01-01 12:45:00", "Water_Level" : "1000.00", "Battery_Voltage" : "11.0V", "Solar_Volatage" : "19.0V", "Battery_Health" : "Normal", "Status" : "1" }

*If a velocity sensor is installed, a key marked "velocity" might be included.



API & API Server

- For system integration, JSON-formatted data of sensors such as water level, velocity, date and time, and battery voltage and status is exchanged through an API.
- The vendor is responsible for maintaining the server that hosts the API. The server's physical location must be in India's boundaries.
- MeitY approved third-party cloud services.
- To obtain the most recent data, data from the datalogger will be continuously delivered to the API server.
- 24 hours internet access for the server.
- A secure https connection will be used to serve the API and web portal over the internet.



Network Connectivity

- Internet connectivity shall be maintained at G&D site for communicating data from datalogger to the vendor's API server.
- Network connectivity shall be established using dual sim based GPRS/3G/4G modem. Facility for dual sim with auto switching of network is available for ensuring continuous connectivity.
- Alternative VSAT commutation also available for 24x7 internet connectivity of the server.



Air Temperature Sensor

- Range : -40°C to $+60^{\circ}\text{C}$
- Accuracy : $\pm 0.50^{\circ}\text{C}$ or better (with radiation shield)
- Resolution : $\pm 0.10^{\circ}\text{C}$
- Response time : 10 sec or better
- Sensor type : Resistance type



Relative Humidity Sensor

- Range : 0 to 100% RH
- Accuracy : $\pm 3\%$ or better
- Resolution : 0.5%
- Stability : Better than 1 % RH per year
- Sensor type : Capacitive
- Response time : 15 sec. or better

Wind Speed Sensor

- Sensor type : Ultrasonic
- Range (Operation) : 0 to 60 m/s or better
- Accuracy : $\pm 2\%$ @12m/s or better
- Resolution : 0.1 m/s
- Threshold : 0.5 m/s or less
- Response time : 1sec or better



Wind Direction

- Sensor type : Ultrasonic
- Range : 0 to 360 Degrees
- Accuracy : ± 3 degrees 0 to 35 m/s and ± 5 degrees 35 to 60 m/s
- Resolution : 1 deg.
- Threshold : 0.5 m/s or better
- Response time : 250 milli sec or better

Barometric Pressure Sensor

- Range : 600 – 1100 hPa
- Accuracy : 0.5 hPa (at 25 deg C)
- Operating temperature : -40 deg C to $+60$ deg C
- Resolution : 0.1hPa



Rainfall Sensor

- Sensor Type : Tipping bucket
- Range : 200 mm/ h
- Accuracy : up to 50mm/hr @ $\pm 1\%$, up to 200mm/hr @ $\pm 2\%$ "
- Resolution : 0.5 mm/tip

Solar Radiation Sensor

- Sensor type : Silicon Photo voltaic detector type Pyranometer
- Spectral Range : 400 to 1100 nm
- Measurement Range : 0 to 2000 Watt/m²
- Sensitivity : Better than 10 micro V per 100 Watt/m²

**AWS
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