



**KERALA AGRICULTURAL UNIVERSITY**  
Regional Agricultural Research Station,  
Kumarakom, Kottayam, 686 566  
E-mail: rarskum@kau.in

No. E2/1810/2019

Date: 02/02/2023

**Tender Notice**

Sealed tenders are invited from competent firms for the restoration of VFPCK-Automatic Weather Stations installed at 10 locations in Kerala for, RARS, Kerala Agricultural University, Kumarakom, Kottayam with specifications as given in Annexure. The tenders will be accepted upto 11.00 a.m. on 20/02/2023. The tenders received after the stipulated time will not be considered under any circumstances. The technical bid of tenders will be opened on 20/02/2023 at 02.00 p.m. More information regarding the tender can be obtained from the Associate Director, Regional Agricultural Research Station, Kumarakom during office hours (Mob.9447012612), The details, tender form, format of agreements, etc can be downloaded from the KAU website [www.kau.in/tenders](http://www.kau.in/tenders).

**Cost tender forms**

| Particulars   | Original (Rs.)   | Duplicate (Rs.)   |
|---|--|---|
| Supplies costing above Rs.50,000 and upto Rs.10 lakhs | 0.2% of the quoted amount rounded to the nearest multiple of 100, subject to a minimum of Rs. 400 and maximum of Rs. 1500+ GST 12% | 50% of the cost of the original, upper rounded to the nearest multiple of Rs.100+ GST 12% |
| Supplies costing more than Rs.10 lakhs                | 0.15% of the cost of the quoted amount rounded to the nearest multiple of 100, subject to a maximum of Rs.25000+ GST 12%           |   |

Last date of receipt of tender : 20/02/2023 11.00 a.m

Date & time of opening tender : 20/02/2023 2.00 p.m

**Terms and conditions**

1. Tender should be submitted in the prescribed forms which can be downloaded from the website [www.kau.in/tenders](http://www.kau.in/tenders). The cost of the tender forms will not be refunded under any circumstances.
2. The sealed cover containing the tender should be super scribed "Tender for the restoration of Automatic Weather Station" (along with the notification number) and addressed to the Associate Director, Regional Agricultural Research Station, Kumarakom, Kottayam Dist., Kerala PIN 686 563
3. Each tender should be accompanied by tender fee and an Earnest Money Deposit (EMD) @ 1% of the total rupee equivalent cost of the quoted items (subject to minimum of Rs. 500/-) by way of two crossed Demand Drafts separately for tender fee and EMD



drawn in favour of The Associate Director, Regional Agricultural Research Station, Kumarakom, Kottayam Dist., Kerala, PIN 686 563 payable at the State Bank of India, Kumarakom (Branch Code 70116). Late and incomplete tenders without tender fee, EMD and agreement will not be accepted. Firms who are exempted from payment of EMD should furnish copy of the currently valid certificate from the store Purchase Department, Govt. of Kerala.

4. The tender should be accompanied by an agreement in Kerala Stamp Paper worth Rs.200/- (Rupees two hundred only) and format can be downloaded from the above website.
5. The tender should be accompanied with hard copy of pamphlet of the company with photographs of AWS, copy of PAN card, certification of sensors by an authorized agency.
6. The vendor should have past experience (last three years) of supply and commissioning of AWS and similar items worth one crore rupees or above. A copy of balance sheet of last three years should be attached with the tender.
7. Vendor should have supplied and installed AWS / micro meteorological stations comprising a minimum of 25 stations in last three years. Provide a copy of purchase order and installation certificate of past experiences (last 3 years) of supply and commissioning of AWS and similar items. The list of Indian and Kerala customers who have bought the same /similar instrument within last 3 years with contact details also should be attached.
8. Technical compliance statement (in attached form) should be attached with the technical bid. The exact specifications, details of make, model, name of manufacturer, warranty details etc. of the items must be clearly specified.
9. Vendor should have its service centre in South India preferably in Kerala. Office address and telephone numbers should be specified.
10. **Separate bids (Technical and Financial) should be enclosed** in separate sealed covers. The two covers be then placed in a single cover and sealed. The Technical bid should include the following documents. ie. **Tender form** (downloaded from website), **items mentioned in serial nos. 3 to 9**. Details regarding **price quotes** only should be included in financial bid.
11. Financial bids of those firms successful in technical bid only will be opened. Financial bids will be opened on **23/02/2021, 2 pm. Total cost of the project only** (ie. including total cost of deliverables charges for installation and data streaming from all the 10 sites to two servers) will be considered for financial bid.
12. The no. of sites may vary according to availability of funds. If funds are available for restoration of 'x' sites only, then the total amount quoted for the project will be divided by 10 and will be multiplied by 'x' and this will be considered as the quoted amount while issuing work order.
13. The tenderers or their authorized representatives may attend at the time of opening of the tender, if they desire so. **The physical demonstration of data loggers & sensors, Communication equipment (GPRS) etc should be done before the technical committee on 22/02/2023, 10:00 am at RARS, Kumarakom.**
14. The successful tenders shall undertake to complete the supply, successful installation and commissioning of the equipment at the place of delivery within 30 days from the

- date of placing the order. Place of delivery is the places of installation anywhere in Kerala state.
15. The quotation should include all the charges for delivery at the site of installation including cost of service as to make the AWS in working condition. The cost of the item, tax and other charges should be separately stated.
  16. Prices quoted should be valid upto one year.
  17. If any Bandh /strike/ any unexpected holidays occurs on the date of opening of tender, the tender will be opened at the same time on the next working day. The decision of the undersigned in finalizing the tenders shall be final and binding.
  18. The successful tenderee should execute an agreement in Kerala Stamp Paper worth Rs.200/- (Rupees two hundred only) and furnish a security deposit of 5% of the cost of the quoted amount in the form of term deposit/ bank guarantee/demand draft drawn in favour of Associate Director, Regional Agricultural Research Station, Kumarakom, Kottayam Dist., Kerala PIN 686 563, payable at the State Bank of India, Kumarakom (Branch Code 70116), when directed from this office. The format for the agreement can be downloaded from the above website.
  19. Withdrawal of tenders after its acceptance or failure to supply the equipment or not according to the specification will entail cancellation of the tender. The supply order will be issued on the acceptance of the tender and the invoice should be addressed to Associate Director, Regional Agricultural Research Station, Kumarakom, Kottayam Dist., Kerala, PIN 686 563. The payment will be effected only after satisfactory supply, installation and commissioning of the items.
  20. The Associate Director, Regional Agricultural Research Station, Kumarakom, reserves the right to remove the defaulted name from the list of suppliers permanently or for a specific period.
  21. The Associate Director, Regional Agricultural Research Station, Kumarakom has the right to accept or reject any or all of the offers without assigning any reason.
  22. All the rules and regulations applicable to Government Tenders will be applicable to this tender also.

## ANNEXURE

### GENERAL SPECIFICATIONS

1. The broad scope of the tender is to install Automatic Weather Systems with Meteorological Sensors on the existing Tripod mast at 10 locations in Kerala. The System will constitute of fully functional Data Logger with GPRS transmission , GSM SIM card, SMF Battery, Solar panel, Solar Charge controller, and Meteorological Sensors
2. The bidder should install all the AWS systems on the existing Tripod mast and make the system in working condition with data reception through GPRS/GSM communication at two destinations one at the server of VFPCCK and other at the server of Kerala Agricultural University / India Meteorological Department (IMD), Pune India
3. The complete system should be under warranty for two years from the date of Installation. The bidder should maintain the system during the warranty period including the cleaning of the site, repair etc.

4. The AWS equipment along with data communication system provide capability for unattended operation in all weather conditions. The system shall run using Sealed Maintenance Free (12V, 42 AH SMF) battery(s), rechargeable through a solar panel. The battery shall be capable to run the system for minimum period of **15 days** on full load during total cloudy or rainy conditions. The bidders shall provide power budget calculation in the technical bid.
5. All equipment should be qualified for MIL GRADE or better specifications and suitable for outdoor applications.
6. **All Datalogger and sensors quoted by the bidder should have been used in Meteorological purpose sites for three years or more. The performance report of Datalogger and sensors from users is to be submitted with technical bids.**
7. The Datalogger, GPRS modem, SMF battery and Solar Charge controller must be housed in FRP Enclosure (IP 66) .
8. GPRS modem can be inbuilt or external
9. All sensors should be interfaced with Data logger as per VFPCCK requirement. There should be provision of storage for 10 years data in the Datalogger and stored data shall be retrievable via serial port/ USB port/Ethernet port to a PC/laptop and a pen drive or any other compact and commercially available solid-state memory device in standard text file format without requirement of specific software to retrieve the data.
10. The system shall have facility to issue command for forced/manual transmission of data.
11. The system shall have time synchronization (time keeping) via GPRS modem/Internet.
12. The AWS data (.csv format) should be disseminated to **Two IP address** and one at VFPCCK server and other at KAU/ IMD server.
13. AWS data can also be made available to PC available to nearby building at AWS site by OFC cable as per user defined time interval (1 min to 60 minutes). **Provision of Ethernet port in Datalogger and Application software to see the Graphical Display of AWS data in a Desktop PC as per user defined time interval (1 min to 60 minutes).**
14. The bidder will provide Resident Engineers during the warranty period and they should be available on all the days from 0000 HRS to 2300 HRS (Monday to Sunday including Holidays). They should be capable of handling the system including OS, application software, its backup and restoration, network configuration including router, firewall and switches etc. They should be equipped with mobile phones to ensure their availability.
15. VFPCCK/KAU officials should be given training on the operation and maintenance of system with operation manuals both hard copy and soft copy.
16. **The firm shall provide presentation and demonstration of the complete AWS system including sensors, datalogger ,communication equipment (GPRS) etc. offered in their bids at no cost and no commitment basis as a part of Technical Evaluation at IMD Pune. Failure and/or Non-compliance of any component during the above period will be liable to cancel the bid.**

## NICAL SPECIFICATION OF DATA LOGGER

Data logger quoted in tender bid should have been used for last three years in Meteorological purpose and should be well proven during severe weather conditions. Its performance certificate from users is to be submitted for last two years. The requirement is a GPRS based Data logger with SMS facilities to modify some parameters like station ID, Time period of transmission, sampling time, reset the value of sensors etc

| S no. | Features                  | Requirements  |
|-------|---------------------------|---|
| i)    | Power                     | Shall Operate with 12V Power from Solar panel through Battery. Data Logger should supply controlled Power to all sensors.   |
| ii)   | Sampling                  | Every one second Wind, Temperature, Humidity, Pressure and every one minute Rain Fall   |
| iii)  | Ports                     | All Ports used to sample data should be configurable to any digital wind, temperature, pressure sensor and rainfall available in globe. Facility to connect new sensors to redundant ports (if required). Cables from sensors should be directly connected to Ports of Data Logger without any Signal conditioner in between. Should have facility to apply slope and Offset for all above sensors to maintain WMO accuracy. All ports should be protected from surges due to lightning activities. RS232/USB/Ethernet Port to GPRS with SIM. Compulsory Ethernet Port Data Output to local computer which can be configured to any Wireless Modem for communicating to Local Data Processing Computer and slave display computers. Data from Ethernet port to local computer shall be every one second. The data transmission and the data coming out of Ethernet port shall be in the CSV text format |
| iv)   | Quality Checks            | Before processing Data Logger shall apply quality checks such as gross error check and time consistency check for <b>sensors</b>  |
| v)    | Key pad                   | Inbuilt keypad and inbuilt backlit LCD/LED display with menu driven facility to display the command, data characters. Facility to Input station parameters such as Station ID (Alphanumeric), Station name (Alphanumeric), calibration constants offset and slope of sensors etc. <b>TOUCH SCREEN KEY PAD AND DISPLAY WILL NOT ACCEPTED</b>   |
| vi)   | Processing & Data storage | Process & Stores data one string in every minute containing one min vector average of Wind direction, speed, Temperature, Humidity, Rainfall, Max Temp, Min Temp, 24hrs Rainfall, Battery Voltage, Health status etc. Internal memory of Data Logger should be sufficient to store 10 years of 1min average and one min interval. Stored data should be transferred to a commercially available pen drive through a front panel keys. It shall compute & store Daily minimum Temperature at 03UTC, Daily maximum at 12UTC, 24 Hrs Rainfall at 03 UTC.   |

|       |                       |  |
|-------|-----------------------|--|
| vii)  | RTC                   | RTC clock should have internal battery for retention of time in absence of External Power supply. Stability Long-term is 1 ppm/year or better.   |
| viii) | Communication to GPRS | GPRS Modem should be internal or external to Data Logger with external SIM card slot. Stored data every 1min should be communicated via GPRS Modem with GSM SIM to Central Server. If Data logger is unable to send data through GPRS modem for some period due to absence of mobile data connectivity the all logged data to be communicated to central server as & when communication link established. Provision to access Data logger from remote for retrieval of data or any purpose with password protection. GPRS Modem in built in the Data Logger is also acceptable provided SIM card slot is external. |
| ix)   | Software              | Interface. Software in data Logger is upgradable by transferring upgraded software to Data logger through USB Pen drive  |

### SPECIFICATION FOR GPRS MODEM WITH SIM CARD

GPRS Modem with SIM facility and also have provision of fast and reliable wireless data communications along with support for IP based access to the central server IP. The following technical specifications are indicative.

- a) Operating on standard SIM card.
- b) Suitable High gain GPRS Antenna for reliable communication and to connect to nearest mobile tower.
- c) Operate with 12V DC Power supply.
- d) Provision to configure to SIM Cards used and IP address and Port no of central Data receiving server.
- e) GPRS facility with fast and reliable wireless data communications.
- f) Remote dial-up facility.
- g) Shall support SMS, Email , FTP and TC/IP.
- h) Ethernet/RS 232/RS 485/USB interface with Datalogger.
- i) Indication of network availability (signal strength).

### SPECIFICATION FOR ENCLOSURE

- a) Weather proof Enclosure of AWS should be FRP Enclosure (IP 66) and for outdoor use to provide a degree of protection against falling dirt, rain, sleet, snow, windblown dust, splashing water, and hose-directed water. It should be suitable to keep Data logger, 12V, 42 AH SMF battery, solar charge Controller, switch with suitable fuse for power supply to Data logger and GPRS modem.
- b) Silicone gasket is used for Enclosure for harsh environments and extreme temperatures.
- c) FRP Enclosure (IP 66) enclosures should be designed for outdoor applications that require corrosion protection against chemicals and water. From humble to harsh

- environments, it safeguards vital electrical and electronic components with enclosures, climate control and accessories to help keep operations up and running smoothly.
- d) Enclosure with hinged door and locking facility.
  - e) Data Pockets provide convenient storage for wiring diagrams, operation manuals and other documentation inside an enclosure.

## POWER SUPPLY

- a) The complete AWS station shall have capability for unattended operation at remote place using Sealed Maintenance Free (SMF) battery, Electrical charger, Solar charge controller and rechargeable through a Solar panel.
  - o **Battery:** Single 12 V chargeable SMF battery 42 AH capacity or better.
  - o **The switch with fuse is required for power supply to the Data logger.**
  - o **Solar Charge controller:** It should charge the 12 V, 42 AH SMF battery through 40 W Solar panel and also Over-load protection, Short circuit protection, Protection from the lightning strike and Under-voltage protection.
  - o **Solar Panel:** Rated capacity 40 W or better, Open Circuit voltage: 21 V or better, Short circuit current: 2.5 A or better.
  - o The Supplier must attach a detailed **POWER BUDGET CALCULATION** taking care of solar panel and battery efficiency and sufficient safety factor of the system supported with documentary proof in technical bid for power consumption of the AWS station so that AWS should run for 15 days during cloudy day or without charging the battery. The detailed power consumption of each component of the AWS system must be clearly mentioned in the technical brochures to support Successful bidder's statement.

## ENVIRONMENTAL SPECIFICATIONS

The AWS, Antenna, Sensors, Cable, Connectors, Battery, Solar panel etc. should be able to operate at optimal efficiency and withstand the following environmental conditions

- a. Storage Temperature : : -40°C to +50°C
- b. Operating Temperature : -40°C to +50°C
- c. Humidity : 10% to 100%
- d. Wind Speed : Up to 50m/s
- e. The System should be hermetically sealed to avoid ingress of dust, rain, moisture and corrosion

## SPECIFICATION FOR WEATHER STATION SENSORS

| Temperature and Relative Humidity Sensor with Radiation Shield |   |
|--|---|
| Air Temperature  |   |
| Sensor type  | Pt 100 RTD                              |
| Measurement Range  | -40 °C to +60 °C                        |
| Accuracy (with radiation shield)                               | ± 0.20 °C or better for +10°C to +60 °C |

|   |   |
|---|---|
|   | $\pm 0.35$ °C or better for $-40$ °C to $+10$ °C  |
| Resolution  | 0.1 °C  |
| Output  | Analog/ Digital   |
| <b>Relative Humidity</b>  |   |
| Measurement Range   | 0% to 100%  |
| Accuracy (including non-linearity, hysteresis and repeatability)  | $\pm 3\%$ RH or better with membrane filter (In the Range 10% to 100%)  |
| Output  | Analog / Digital  |
| Resolution  | 1% or better  |
| Sensor type   | Capacitive / solid state  |
| <b>Radiation Shield</b>   |   |
| Type  | Thermoplastic   |
| Louvered  | Minimum 9   |
| Ventilation   | Natural   |
| Mounting Accessories  | Aluminium Mounting bracket and Stainless-steel U Bolt clamp   |
| <b>Wind Sensor with mounting accessories</b>                      |   |
| <b>Wind Speed</b>   |   |
| Range (Operation)   | 0 to 60m/s or better  |
| Sustainability  | Up to 60 m/sec  |
| Accuracy  | $\pm 0.5$ m/s or better   |
| Resolution  | 0.1 m/s   |
| Threshold   | 0.5 m/s   |
| Response time   | 1 sec or better   |
| Output  | Analog/Digital  |
| <b>Wind Direction</b>   |   |
| Range   | 0 to 359 Degrees  |
| Accuracy  | $\pm 5$ degrees or better   |
| Resolution  | 1 deg. or better  |
| Response time   | 1 sec or better   |
| Output  | Analog/ Digital   |
| <b>Tipping Bucket Rain Gauge sensor or with better technology</b> |   |
| Collector Area  | Specified Collector Area should be between 200 cm <sup>2</sup> to 325 cm <sup>2</sup>                               |
| Height above funnel   | Height above funnel should be sufficient to accumulate rain during heavy rainfall as per WMO guidelines.            |
| Switch  | Rugged Magnetic Proximity   |
| Resolution  | 0.5 mm per tip  |
| Output  | 0.1 sec switch closure  |
| Accuracy  | $\pm 2\%$ or better, for rain rate up to 25 mm/hr<br>$\pm 3\%$ or better, for rain rate between 25mm/hr to 50 mm/hr |



|   |   |
|---|---|
|   | ±4% or better, for rain rate between 50mm/hr to 100 mm/hr<br>±5% or better, for rain rate >100 mm/hr  |
| Material of Outer Body/housing (Base/Collector) | Rust Proof Housing.   |
| Levelling                                       | Suitable levelling adjustment screws and circular spirit level must be provided on the base of TBRG for levelling the Tipping bucket Mechanism. |
| Debris protection filter                        | Suitable (Wire mesh) debris protection filter should be provided inside the collector.  |

### LIST OF DELIVERABLES

| S. No.                                    | Item   | Make & model<br>Country of origin* | Qty. Nos.* |
|---|--|------------------------------------|------------|
| 1   | 2  | 3                                  | 4          |
| <b>Sensors and hardware for AWS sites</b> |  |                                    |            |
| 1.  | Temperature Humidity Sensor with Radiation Shield with 5m Teflon cable with suitable MIL grade Amphenol connectors and mounting accessories (Calibration certificate of all sensors with validity certificate is required) |                                    | 10         |
| 2.  | Wind sensors with mounting accessories and 10 m Teflon cable with suitable MIL grade Amphenol connectors (Calibration certificate of all sensors with validity certificate is required)                                    |                                    | 10         |
| 3.  | Rain Gauge Sensor (TBRG) with mounting accessories and with 5m Teflon cable with suitable MIL grade Amphenol connectors (Calibration certificate of all sensors with validity certificate is required)                     |                                    | 10         |
| 4.  | Data logger (GPRS based) with mounting accessories on the enclosure  |                                    | 10         |
| 5.  | 16 GB or more USB Pen drive for retrieval of data  |                                    | 10         |
| 6.  | GPRS modem with single SIM (4G) (compatible with 3G) facility with minimum 8 dB antenna gain with mounting accessories   |                                    | 10         |
| 7.  | FRP Enclosures for keeping electronics items- Data logger, solar charge controller, ON/ OFF power  |                                    | 10         |

| S. No. | Item  | Make & model<br>Country of origin* | Qty. Nos.* |
|--------|---|------------------------------------|------------|
| 1      | 2   | 3                                  | 4          |
|        | supply switch with suitable fuses and 12V,42 AH, SMF battery  |                                    |            |
| 8.     | 12V,42 AH SMF BATTERY   |                                    | 10         |
| 9.     | 40 W Solar Panel with mounting accessories on the mast with solar charge controller   |                                    | 10         |
| 10.    | Transportation of materials to AWS sites safely in good condition   |                                    | One item   |
| 11.    | Installation and integration of data logger, sensors and other accessories, solar panel, charge controller, lightning arrester, earthing for protection of complete AWS in the existing tripod mast |                                    | 10 sites   |
| 12.    | Hard and soft copy of operation and maintenance manuals.  |                                    | 10 sets    |
| 13.    | Training of VFPCCK/KAU officials  |                                    | One item   |
| 14.    | Warranty and maintenance charges for two years  |                                    | One item   |
| 15.    | Procurement of SIM card and its charges for two years for all the 10 sites  |                                    | One item   |

\*Number of items to be supplied may vary with the availability of funds

06/02/23  
 Administrative Officer  
 Regional Agricultural Research Station  
 Kerala Agricultural University  
 Kumarakom