



REGIONAL AGRICULTURAL RESEARCH STATION  
AMBALAVAYAL, WAYANAD - 673 593  
KERALA AGRICULTURAL UNIVERSITY

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No: D/3926/2021

Dated. 02 /02/2022

**TENDER NOTICE**

Sealed competitive tenders are invited for the **Supply, Installation, Testing and demonstration of Microclimate Monitoring station for monitoring of microclimate inside cropping system.** at Regional Agricultural Research Station (RARS), Kerala Agricultural University, Ambalavayal.

**CRITICAL DATES AND DETAILS**

Tender No. and Date	D/3926/2021
Last date of receipt of tender	28. 02.2022
Date and time of opening the tender	28.02.2022
Tender cost	Rs.1200/- + GST (18%)
EMD amount	1.5% of quoted rate
Designation and Address of the Officer to whom the tender should be addressed	Associate Director of Research, Regional Agricultural Research Station (RARS), Kerala Agricultural University, Ambalavayal, Wayanad Dist. Kerala – 673 593
Location of Supply / Work	Regional Agricultural Research Station (RARS), Ambalavayal, Wayanad Dist. Kerala – 673 593
<b>Superscription : Tender for the Supply, Installation, Testing and demonstration of Microclimate Monitoring station for monitoring of microclimate inside cropping system.</b>	

Technical details, Terms and conditions and other instructions to tenderers are provided as Annexure -I. The format for submission of technical details and financial bid is provided at Annexure-II.

## Annexure -I

### Technical details, Terms and Conditions and Instructions

Name of work	<b>Supply, Installation, Testing and demonstration of Microclimate Monitoring System</b> at Regional Agricultural Research Station (RARS), Kerala Agricultural University, Ambalavayal.	
Scope of Work	The work includes the supply of data logger, sensors and components and all accessories required for setting of Microclimate Monitoring System, its installation, testing and commissioning.	
<b>Quantity and technical details of basic components of Microclimate Monitoring System</b>		
1	Datalogger and Control Module-1 <b>No</b>	Data Sampling Rate: 1000 Hz, Analog Input Channels : 16 Nos, The datalogger should have multiple input ranges along with “AutoRanging” facility to measure the sensors accurately without any loss of accuracy. The datalogger should have these input ranges: $\pm 5000\text{mV}$ , $\pm 1000\text{mV}$ , $\pm 200\text{mV}$ , Analog Resolution : 0.05 Micro Voltage, Analog Input Accuracy : Voltage measurement accuracy no less than $\pm(0.04\%$ of reading + offset) over temperature range of $0^\circ$ to $40^\circ\text{C}$ , no less than $\pm(0.06\%$ of reading + offset) over temperature range of $-40^\circ$ to $70^\circ\text{C}$ , Pulse Counting Channel : At least two inputs individually configurable for switch closure, high-frequency pulse, or low-level AC measurements. Independent 32-bit counter for each input, Digital : At least eight ports configurable for digital input and output including status high/low, pulse width modulation, external interrupt, edge timing, switch closure, pulse counting, high-frequency pulse counting, UART, RS-232, RS-485, SDI-12, I2C, Analog to Digital Conversion Accuracy $\pm 1$ LSB, In addition the system should also have battery backed real time clock so that the time is updated even during power failure, Communication Interface : USB: Micro-B, RS-232, RJ-45: Ethernet, Communication port (for configuration) : Ethernet port/SD card/USB port/Device key pad, Power Requirements : Typical Current Drain in Sleep Mode: $\sim 2$ mA or better 1 Hz Scan (8 diff. meas. 60 Hz rej., 2 pulse meas.): 3 mA. 12 V switched DC with maximum current supplying capacity of 1.0A during measurement period for powering up the sensors. Short circuit and over load protection, Temperature Range: $-40$ to $+70^\circ\text{C}$ . Operating Humidity Range : 0 to 100% relative humidity non-condensing, Supply Voltage : 9 to 36 V DC
2	Air Temperature and Relative Humidity Sensor-2Nos	<b>Air Temperature Sensor:</b> Range: $-40^\circ\text{C}$ to $+70^\circ\text{C}$ , Accuracy: $\pm 0.4^\circ\text{C}$ or better, Resolution : $0.001^\circ\text{C}$ , Housing Classification IP67, Output: Compatible with data logger  <b>Relative Humidity Sensor:</b> Range: 0 to 100% RH, Output Compatible with data logger, Accuracy: $\pm 3\%$ or better, Housing Classification IP67 ,Operating Temp Range: $-40^\circ\text{C}$ to $+60^\circ\text{C}$ , A naturally aspirated radiation shield should be provided with the sensor.  A naturally aspirated radiation shield should be provided with the sensor. 1 <sup>st</sup> Sensor Cable Length 3m and 2 <sup>nd</sup> Sensor Cable Length 10m
3	Rainfall Sensor-1 No	Sensor type: Tipping bucket ,Temperature: $0^\circ$ to $+50^\circ\text{C}$ or better , Resolution: 1 tip or better , Rainfall per tip: 0.254 mm or better , Accuracy: $\pm 1\%$ at 50 mm/h or better ,Cable Length : 5m
4	Soil Moisture and	<b>SOIL MOISTURE &amp; TEMPERATURE SENSOR:</b> Measurement of Soil electrical conductivity (EC), relative dielectric permittivity, volumetric water content (VWC), soil temperature, Short rods to install in

Temperature Sensor- 1 No.	<p>hard soil. Suitable for soils with higher electrical conductivity, Rod Spacing 32 mm (1.3 in.), Rod Diameter 3.2 mm (0.13 in.), Rod Length 300mm, Ingress Protection Rating IP68</p> <p><b>Electrical Conductivity:</b> Range for Solution EC 0 to 8 dS/m, Range for Bulk EC 0 to 8 dS/m, Accuracy <math>\pm(5\%</math> of reading + 0.05 dS/m), Precision 0.5% of BEC</p> <p><b>Relative Dielectric Permittivity:</b> Range 1 to 81, Accuracy <math>\pm(3\%</math> of reading + 0.8) from 1 to 40 for solution EC <math>\leq 8</math> dS/m , <math>\pm 2</math> (from 40 to 81 for solution EC <math>\leq 2.8</math> dS/m), Precision <math>&lt; 0.02</math></p> <p><b>Volumetric Water Content:</b> Range 0 to 100% (with M4 command), Water Content Accuracy <math>\pm 3\%</math> (typical with factory VWC model) where solution EC <math>&lt; 10</math> dS/m, Precision <math>&lt; 0.05\%</math></p> <p><b>Soil Temperature:</b> Range <math>-50^{\circ}</math> to <math>+70^{\circ}\text{C}</math>, Resolution <math>0.001^{\circ}\text{C}</math>, Accuracy <math>\pm 0.1^{\circ}\text{C}</math> (for typical soil temperatures [0 to <math>40^{\circ}\text{C}</math>] when probe body is buried in soil) <math>\pm 0.5^{\circ}\text{C}</math> (for full temperature range), Precision <math>\pm 0.02^{\circ}\text{C}</math></p>
5 PAR Radiation Sensor-2 Nos	<p><b>PAR SENSOR :</b>Spectral Range 389 to 692 nm, Response Time <math>&lt; 1</math> ms, Field of View (FOV) <math>180^{\circ}</math>, Power Supply Self-powered, Sensitivity 0.01 mV per <math>\mu\text{mol m}^{-2} \text{s}^{-1}</math>, Calibrated Output Range 0 to 40 mV, Measurement Range 0 to 4000 <math>\mu\text{mol m}^{-2} \text{s}^{-1}</math>, IP Rating IP68, Operating Temperature Range <math>-40^{\circ}</math> to <math>+70^{\circ}\text{C}</math>, Operating Environment 0 to 100% relative humidity. 1<sup>st</sup> Sensor Cable Length 3m and 2<sup>nd</sup> Sensor Cable Length 10m</p>
6 Power Supply	<p>Vendor will provide Sealed Maintenance Free Lead Acid Batteries along with battery enclosures. A suitable charge controller of capacity having over and under voltage protection should be provided in the DCP, The battery backup must be at least for 1 week or better for AWS operation, The capacity of the Solar panels should be 20Watts for 12 VDC configuration.</p>
7 Telemetry Scope	<p>System should have facility of remote connectivity using GSM modem, Network operator should be suggested by the vendor according to the network availability site by site, Systems should also be accessible from any location on internet running computer with the compatible software, inbuilt GPRS Modem in datalogger is not acceptable, It should also be possible to connect the system using smart phone application, Smartphone application should have facility of retrieving old data, viewing real time data and uploading program file through smart phone application, At data receiving center, a real time data display in graphical and digital mode to be provided.</p>
8 Mounting Hardware : Enclosure for Datalogger and Battery and Installation	<p><b>ENCLOSURE :</b>IP 65 - UV protected FRP Enclosure, Cable entry options: Two sealable conduit port.</p> <p><b>MOUNTING STRUCTURE:</b>Individual mountings as required for each sensor should be provided with the system, A 2 Meter-high tripod must be supplied, installed and commissioned</p>
9 Warranty and AMC	<p>All the items supplied should have a minimum warranty of <b>one year</b> and the bidder will be responsible for the regular inspection ( once in 3 months) maintenance of the system for first one year. The bidder should also provide quote for Annual Maintenance Charges (AMC) for the next two years (Separately for 2<sup>nd</sup> and 3<sup>rd</sup> Year)</p>

**The acceptance of the quotations will be subject to the following Terms and conditions**

**1. Tender form**

The tender form can be downloaded from the following link in the internet [www.kau.in/tenders](http://www.kau.in/tenders)

2. The cost of tender form. GST and EMD will be accepted by way of separate DDs in favour of Associate Director, Regional Agricultural Research Station. Ambalavayal , Pin – 673593
3. **Earnest Money Deposit:** An EMD (1.5% of the amount quoted ) should be remitted by separate DD drawn in favour of Associate Director, Regional Agricultural Research Station. Ambalavayal Pin – 673593
4. The tender should be accompanied by an agreement in Kerala stamp paper worth Rs. 200/- (Rupees Two hundred only) in the format that can be downloaded from the website [www.kau.in/tenders](http://www.kau.in/tenders)
5. The sealed cover containing the tender documents should be super scribed as **“Tender for the Supply, Installation, Testing and demonstration of Microclimate Monitoring System”**. **The cover should contain the DD’s for tender cost, GST, EMD and the Agreement as mentioned above**
6. The successful tenders should execute and agreement in Kerala Stamp paper worth Rs. 200/- (Rupees Two hundred only) and furnish a security deposit of **3%** of cost of the rate quoted in the form of term deposit/bank guarantee/demand draft drawn in favour of Associate Director, Regional Agricultural Research Station. Ambalavayal Pin – 673593, Wayanad District payable at the State Bank of India, Kolagappara (IFSC: SBIN0070615), When directed from this office.
7. The rate quoted for each item should be inclusive all of charges , transportation, installation, testing and commissioning etc. if any separately stated.
8. The Associate Director has the right to accept or reject any or all of the offers without assigning any reason.
9. The successful Tender shall initiate the work/supply the item within one week of award and should finish the supply within one month.
10. If any hartal/strike/any unexpected holiday occurs on the date of opening of tender, the tender will be opened at the same time on the next working day
11. Firms which are excepted from payment of EMD should furnish copy of the currently valid certificates from Store Purchase Department , Govt. of Kerala.
12. Payment as per the invoice will be made only after satisfactory completion of work as per specifications and satisfactory installation of the item. Tenderer is liable to replace the defective articles/rectify the defective item of work immediately on receipt of intimation. Payment will be made only by Cheque on fulfillment of the contract satisfactory.
13. The EMD/Security Deposits furnished will be forfeited in case the contract is not fulfilled as per the terms and conditions mentioned in the tender notice and agreement.
14. All other technical and commercial terms and conditions pertaining to the execution of work/installations to Government/Public undertakings as per the code rules in force in Kerala will be applicable in this case also.

15. Further information such as terms and conditions, detailed specifications of the supply/work/installation, cost of tender forms etc. can be had on all working days from the office of the **Associate Director of Research, Regional Agricultural Research Station Ambalavayal, during duty hours.**

\*Enquiries if any may be mailed to [rarsamb@kau.in](mailto:rarsamb@kau.in) or contact 04936-260421.

### **Special Conditions**

1. The quote should be given the format provided at Annexure II.
2. Tender insisting payment in advance either full or part for releasing the documents through bank are liable for rejection.
3. Leaflets/brochures containing technical features of data logger and sensors etc quoted should be attached with the tender.
4. In the case of electrically operated equipment the circuit diagram will have to be supplied.
5. Payment will be made after satisfactory installation and demonstration of the equipment/system.
6. Operation manual and guarantee cards of the equipment wherever required should be supplied along with equipment.
7. The supplier should attach the client list for the equipment along with their performance certificate, spare parts availability and services facilities at or nearest to the station.
8. Details of warranty offered should be clearly stated in the "tender details of maintenance service contract offered after expiry of normal warrantee and after-sales service facilities available should be indicated.
9. Evidence of exclusive/authorized distributorship from foreign principals should be provided along with offers for overseas products.
10. The undersigned reserves the authority to accept or reject any or all of the offers for any particular item without assigning any reason whatsoever.
11. The decision of the under signed in finalizing the tender shall be final and binding.

Sd/-  
Associate Director of Research i/c

To: 1. Notice Board  
2. KAU web site ([www.kau.in](http://www.kau.in)>tenders)

**Annexure – II**

Format for submission of Technical and Financial Bid

Name and address of the firm	:				
Name of contact Person with mobile number and e-mail id	:				
<b>Details of Components and cost</b>					
Sl. No.	Item	Make, Model and Specifications and Warranty	Rate (INR)	Qty (No.)	Amount (INR)
1.	Datalogger and Control Module			1	
2.	Air Temperature and Relative Humidity Sensor			2	
3.	Rainfall Sensor			1	
4.	Soil Moisture and Temperature Sensor			1	
5.	PAR Radiation Sensor			2	
6.	Power Supply			1	
7.	Telemetry Scope			1	
8.	Mounting Hardware Enclosure for Datalogger and Battery and Installation			1	
9.	Warranty and AMC				
	AMC for 2 <sup>nd</sup> Year				
	AMC for 3 <sup>rd</sup> Year				
10.	Other items & charges, if any				
11.					
<b>TOTAL</b>					

Signature with Name, date and official seal