Ref. No. 05 /QT/ENS/17-18 **Date: 01.12.2017**

QUOTATION NOTICE

Sealed quotations are invited from the eligible firms for the supply and installation of Automatic Weather Station in the Dept. of Environmental Sciences, University of Kerala, Kariavattom Campus.

Technical Specifications for Automatic Weather Station

	Parameter Measured	Specification
	Wind Speed	● Range: 1 to 200 mph, 1 to 173 Knots, 0.5 to 89m/s, 1 to 322 km/h. ● Accuracy: ±2mph (3km/h, 1m/s) or ±5 %, whichever is greater. ● Resolution is 1mph (1Knot, 0.1m/s, 1km/hr)
	Wind Direction	● Operating Range: 360° mechanical; 355° electrical (5° open) Or ● Range: 0°to 360°or 16 compass points. ● Accuracy: +/- 7 degrees. ● Resolution: 1 degree. 22.5 degrees between compass points.
	Air Temperature	● Resolution is +/- 0.04 (min) to max +/- 0.01. ● Typical accuracy is +/- 0.3 (maximal is +/- 1.5) . ● Repeatability is (+/-) 0.1 celsius. ● Operating Range -40 to 123 Celsius. ● Long term drift is < 0.04 Celsius/year.
	Relative Humidity	● Range: 0 – 100% ● Accuracy: + 1% RH from 3 to 95%. ● Excellent linearity and sensitivity with fast response and long-term stability ● Operating Temp. range: -10 to +60°C ● Response time: less than 20s
	Solar Radiation	● Range: 0-1800 W/m^2 ● Drift: upto +/- 2% /year ● Accuracy: +/- 5% of Full scale ● Operating Temperature: -40 -65C ● Spectral response: 400-1100 nm
	Rain, Precipitation	● Temperature: 0 to + 50 ^{o}C ● Diameter of aperture: 225mm • Orifice: 400cm^2 ● Resolution/Sensitivity: 0.2mm ● Rainfall capacity: Unlimited ● Capacity per Minute: Max. 30 tips (3 resp. 6mm)

		• Accuracy: ± 1% (at 25 mm/hr.)
	Pressure	• Range is 300-1100 hPa, • Resolution is 0.06 hPa to 0.02hPa. • Operating range is -40C to 85C. Best results in 0C to 65C range. • Long term stability is +/- 1 hPa/year.
	Soil Temperature Sensors and Soil Moisture	**Accuracy** • Apparent Dielectric Permittivity (εa): ± 1 εa from 1 - 40 (soil range); ± 15% from 40 - 80 • Soil Volumetric Water Content (VWC): Using Topp equation: ± 0.03 m3/m3 (± 3% VWC) typical in mineral soils that have solution electircal conductivity < 10 dS/m; using medium specific calibration, ± 0.02 m3/m3 (± 2% VWC) in any porous medium • Temperature: ± 1°C Resolution • εa: 0.1 εa from 1-20, < 0.75 εa from 20-80 • VWC: 0.0008 m3/m3 (0.08% VWC) from 0 to 50% VWC • Temperature: 0.1°C Range • εa: 1 (air) to 80 (water) • Temperature: -40 - 60°C*
	Evaporation pan sensor	• Range : 0 to 250 mm water gauge • Accuracy : 1mm of water depth
	Leaf wetness	• Dielectric constant based measurement. • Operating temp. 0 to + 60°C • Storage temp. : -20 to + 80°C

Installation

1. Single Pole - 3.5 meter installation (SS Pole)
2. Concrete work to be done to provide more stability to the system
3. All the related accessories to be provided by the vendor.

Data logger

1. Local Storage 4GB SD card which can store data for 1 year as back-up
2. Data synchronisation In case of non-availability of network, data is stored locally which is pushed further when network is available
3. Local RTC - Local I2C based RTC with low drift with respect to time
4. PC software for SD card - PC software for reading data from SD card.
5. GPRS as a communication option

6. 8 Bit micro-controller with low power consumption and functionality to go in deep sleep mode so as to consume less power. Controller should have 10 bit ADC resolution, 8 Analog inputs I2C port, UART port, Ability to change data push interval.
7. Data protocol - Bencode based data protocol should be used to transfer data from weather station to Web-server in real time.
8. Power It should run either from 12V DC power supply or Solar power.
9. Battery Back-up - 4.4 Ah LIPO battery which should atleast give back-up of 7 days without recharge.
10. Enclosure - IP 65 based weatherproof enclosure with MX connectors to connect the sensor so that the logger is totally insulated from the surrounding environmental conditions

Web-Dashboard and Web-server

1. Web-server to receive, store and analyse data
2. Weekly and Monthly reports on the mail.
3. SMS / Email based alert mechanism.
4. REST API for further integration or development of institute own dashboard.
5. Visualisation of data on last 6 hour, last 24 hour, last week.
6. Functionality to download data between a specified date interval.
7. Public access - If requested, same data should be made available to public also.

Guarantee / Warranty

1. Comprehensive warranty with spares for 3 years from the date of installation of the instrument should be covered. The complete service, maintenance, repair and calibration of the instruments shall be provided by the party on free of cost during warranty period. Also there is no limit of visit for attending any faulty during warrantee period on priority.
2. AMC charges for two years after warranty should be mentioned separately. Minimum of 4 visits per year for attending the fault and routine maintenance is mandatory. In addition, the party has to respond to any type of communication like over phone, mail and other correspondence to attend/rectify the fault and bring the instrument in normal operation condition with in 48hrs.

PC

1. A PC with Windows and Google Chrome installed need to be provided to access the data.
2. A small display need to be installed in the reception displaying real time data.

Conditions

1. The rate quoted should be inclusive of Tax, transportation charges and any other charges.

2. Complaints with the items supplied should be rectified /replaced to the satisfaction of the University by the suppliers at their own cost.

3. Payment will be made only after the supply of the items at our own site.

4. The undersigned reserves the right to reject /accept any quotation without assigning any reason.
5. The equipment should be installed in the Department of Environmental Sciences, University of Kerala.

The sealed quotations should reach **'The Associate Professor and Head, Department of Environmental Sciences, University of Kerala, Kariavattom Campus P.O. Thiruvananthapuram-695 581, Kerala** on or before **16/12/2017** at **3.00 p.m**.