

Technical Specifications of Radar-based Surface Water Level, Velocity Sensor with Datalogger and Power Backup (Solar Panel with Battery)

Enquiry No: IITK/CE/EEM/2024-25/PDA/01

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Closing Date: June 9, 2024

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Bids are invited for supply of **2 (TWO) Sets** of radar-based Surface Water Level, Velocity Sensor with Datalogger. The system should be “All-In-One” with following features:

- Water level monitoring in water streams, open drains, rivers, channels and lakes etc.
- Accurate discharge monitoring in rivers
- Suitable for Water reservoir monitoring and irrigation control
- Complete integrated solution for all hydrology measurements
- Completely self-sustainable with a battery, a solar panel
- Datalogger with an integrated MPPT battery charger
- Easy integration of third-party sensors
- Robust modular mechanical design with IP68 enclosure
- Standalone Portable Preassembled and easy to install with minimum efforts

Componentwise details are as following:

1. Sensors

The sensor should be provided with complete accessories including an adequate length of low-temperature cable and mounting fixtures. The integration of the sensor with the datalogger will be ensured by the supplier.

1.1. Surface Water Level

- 1.1.1. Radar Type: Non-Contact type
- 1.1.2. Beam Angle: Less Than 6 Deg
- 1.1.3. Detection Distance: 30 m
- 1.1.4. Resolution: 0.5 mm
- 1.1.5. Accuracy should be atleast 2mm
- 1.1.6. Sampling Frequency: atleast 5 Hz or 10 Hz
- 1.1.7. IP rating: IP 68
- 1.1.8. Serial Interface: 1 x serial RS-485 half-duplex, 1 x serial RS-232
- 1.1.9. Input Voltage: 9 to 26 VDC
- 1.1.10. Operating Range: -20 to 60°C

1.2. Surface Water Velocity Sensor

- 1.2.1. Radar Type: Non-Contact type
- 1.2.2. Range: 0.02 m/s to 15 m/s
- 1.2.3. Beam Angle: 12 Deg
- 1.2.4. Detection Distance: 20 m
- 1.2.5. Resolution: 0.001 m/s
- 1.2.6. Accuracy: 1%
- 1.2.7. Sampling Frequency: 10 Hz

- 1.2.8. IP rating: IP 68
- 1.2.9. Serial Interface: 1 x serial RS-485 half-duplex, 1 x serial RS-232
- 1.2.10. Input Voltage: 9 to 26 VDC
- 1.2.11. Operating Range: -20 to 60°C

2. Datalogger

2.1. General Features

- 2.1.1. The datalogger explicitly designed for Hydrological and Environmental monitoring applications.
- 2.1.2. The Datalogger should be having Integrated GSM/GPRS modem, IoT communication.
- 2.1.3. The datalogger communication with instruments, sensors, and other equipment can be implemented using one of many serial communication interfaces (RS-232, RS-485 Modbus, CAN, SDI-12) or using analog current or voltage inputs.
- 2.1.4. The Datalogger should be enclosed in a NEMA-IV enclosure made of composite material.
- 2.1.5. All the connections from or to the Datalogger should be inside the NEMA-IV enclosure.
- 2.1.6. The complete technical manual, user manual and specially developed software's (if any) source code should be provided.
- 2.1.7. Datalogger should have 2 RS232, 2 RS485, 1-SDI-12, Atleast 2 Voltage Input (0-10V) & 1 Current Input (4-20 mA)
- 2.1.8. Datalogger should be able to monitor the voltage and current measurement for input, Battery and System
- 2.1.9. Datalogger should have MPPT digitally controlled multi-chemistry high-frequency charger with buck and boost mode support
- 2.1.10. Datalogger should have Standby Current less than 1 mA and Operating Current Less Than 100mA
- 2.1.11. Datalogger should have operating temperature range of -30 °C to +60 °C (without heating)

3. Software

- 3.1. Cloud based software for monitoring data acquisition and analysis
- 3.2. Receives site monitoring data from connected datalogger over HTTP API
- 3.3. Stores the monitoring data in an internal database
- 3.4. Web-based user interface for site configuration and data monitoring
- 3.5. User management with different permission levels
- 3.6. Two-factor authentication for user login supported
- 3.7. User interface displays latest real-time monitoring data for each site
- 3.8. User interface displays historic monitoring data for each site in a selectable time interval
- 3.9. Supports configuration of basic site parameters for each monitoring site:
 - o Site name
 - o Site location
 - o Type of equipment on site
 - o Measurement period
- 3.10. Each user can define custom Dashboard in the web-based user interface
- 3.11. Supports export of stored monitoring data from internal database to 3rd part software through HTTP(s) API, and optionally through FTP

4. Portable Support Structure

The instruments (Sensors, Datalogger, battery, solar pannel) are to be mounted on stable structures such as bridge, towers, poles on the main streams / banks of open channels (River/drains). The structure material with fixtures (nut-bolts) should be non-rusting.

Note: The firm must provide complete technical brochures, operating manuals.

Terms and Conditions:

1. Warranty & Support: Three years comprehensive on-site.
2. Quotations must be valid for 90 days.
3. The delivery to be made at IIT Kanpur within **10 Days** of receipt of purchase order.
4. Authorization certificate from the OEM must be provided.
5. The Institute reserves the right to accept, including minor relaxation in technical criteria, or reject any or all of the offers in full/part without assigning any reason whatsoever.
6. The firm must provide operating manuals and training at the project site.
7. The institute reserves the right to increase or decrease the quantity as per requirement.

Pre-Qualifying Requirements

SNo	
1	Only OEM or their authorized partners are eligible to participate in this bid. If bidder happens to be an Authorized channel partner, then valid certificate to be submitted along with the bid.
2	Bidder to furnish copy of one single PO from any reputed institute (IIT/NIT/Government Agency) for the supply of similar equipment.
3	As part of the work, the bidder should have supplied contactless Radar-based Surface Water Level, Velocity Sensor with Datalogger for an open channel/canal system in India.
4	Furnished PO should be for a Government Organization/Institution dated within the last 5 years in India.

The firms are advised to quote as per following format before the closing date i.e. June 9, 2024:

S No	Item	Quantity	Amount, Rs
1	Radar-based Surface Water Level, Velocity Sensor with Datalogger and Power Backup (Solar Pannel with Battery)	02 [SET]	

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