



**University of Calcutta**

**Dept. of Applied Physics**  
**92 APC Road, Kolkata 700009**

**Tender Notice**

Enq No.: AP/UGC-SAP-DRS-II/JNB/ENQ/19-20/16

Dated: 08/01/2020

To  
**The All Interested Parties**

Dear M/s.

Please submit sealed quotation within **16/01/2020 (4 PM)** at the Office of the Department of Applied Physics for the following item.

Please enclose the copy of the following papers along with the quotation.

1. Trade License, 2. PAN Card, 3. VAT & Service Tax Registration wherever necessary

**1. Introduction**

Department of Applied Physics, University of Calcutta (CU) invites sealed bids from GST compliant bidders for a turnkey contract based jobs

**2. Background**

Department of Applied Physics, University of Calcutta wants to make a **PLC Controller panel for Power system to wards smart grid test beds** which will facilitate simulation of power systems, smart grid, testing and analysis for experiments and research purpose. The requirement envisages supplies to be made as modular components and future expansion of modules to be integrated with the present scope to further introduce additional components for necessary analysis and testing.

**3. Requirement for this Tender**

Supply of 1 no. **PLC Controller panel for Power system** along with installation and commissioning services for the total system.

**4. Scope of Work.**

**Module:** PLC controller and communication panel for remote monitoring and control of hybrid generation, Transmission and distribution substations of power system towards smart grid test bed development.

- I. The scope of work will cover design, Engineering, procurement of material/equipment, fabrication/ manufacturing, supply, inspection, transportation to site, storage, insurance, handling, erection,testing,trial run and commissioning of offered system for PLC Controller and Communication Panel for Power system with digital communication along with all associated equipment including interconnection to two different control bus panels for their networking and interfacing with external Drive panel and external Power system control & monitoring panel in fully integrated manner on turnkey basis. The basic scope of work includes the following:
  - Smart controller PLC/RTU based with
    - i. DI, DO as required
    - ii. AI (4-20mA/0-10V), AO (4-20mA/0-10V) as required
    - iii. Analog input, SM 1238 Energy Meter 480VAC
    - iv. Digital I/O, 16 DI, 24V DC / 16 DO, relay
    - v. RS485 communication board
    - vi. Integrated Power monitoring capability for: Line voltage, Phase voltage, Line current, frequency, Line pf, Total pf, Line phase angle, Amplitude unbalance for voltage & current, Line power (KW, KVAR, KVA, KWH, KVARH, KVAH), Total power (KW, KVAR, KVA, KWH, KVARH, KVAH), Total reactive energy inflow & outflow, Total active energy inflow & outflow, Neutral conductor current
    - vii. Solar Hybrid bidirectional inverter 3PH 5 kW with RS232 communication facility and advanced battery management features
    - viii. Provision for 20% spare module space in the PLC
    - ix. Programming Logic control using Ladder/FBD/Statement List
    - x. Interface capability through Ethernet, Profinet/Modbus/Profibus/ IEC61850/provision for optical fibre based system is required.
    - xi. Monitoring & Control facility through **external HMI** along with existing Smart control panels will be provided for ON/OFF of the power sources etc. Such control logic will be done in the PLC/RTU and interfaced with this Panel Display/HMI through Ethernet/Profinet/Modbus. The external HMI are basically a server based multi-client system. The communication with HMI and PLC must be made via ethernet.
    - xii. PLC communication for AC drive control to be considered. Interface with external AC drives (2 nos.) will be through Modbus.
    - xiii. PLC programming software latest version license to be provided.
    - xiv. Application software development, as required.
- II. Site survey for understanding the technical requirements.
- III. Existing equipment to be relocated, if required.
- IV. The panel should be table mounted, with provision for laying cable suitably (Tenderer to visit site for offering suitable solution). Necessary power and control terminals to be provided for external interfacing. 20% spare terminals to be provided.
- V. GI, conduits pipes, tools and tackles, cable trays racks, junction box, foundation bolts, inserts and anchor etc. and all the required materials fittings, and accessories to be provided as necessary.
- VI. Spares and consumables for commissioning of the total system.
- VII. Any small civil work if necessary during erection.
- VIII. Drawing documents to be furnished.

- IX. Tenderer should supply required power cable for connection with external source distributed at different floors of the department. All Control, Signal and Communication cable necessary will be considered part of this supply. For cable length estimations the tenderer is required to make prior site survey.

## **5. General terms of supply.**

- a. Power tapping source will be 5 metres or of suitable length from the location of control panel.
- b. Power supply will be 230 VAC, 50 Hz.
- c. Experts to be provided by the bidder for installation and commissioning till handover.

## **6. Preferred make list**

- Enclosure: Rittal, Pyrotech, Valrack or any reputed make
- PLC: Siemens, Rockwell, GE
- HMI Control unit: Siemens, Dell, HP, IBM

For  
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