पंडित द्वारका प्रसाद मिश्र
भारतीय सूचना प्रौद्योगिकी
अभिकल्पन एवं विनिर्माण संस्थान जबलपुर
(संसदीय अधिनियम द्वारा स्थापित राष्ट्रीय महत्व का संस्थान)

Pandit Dwarka Prasad Mishra
Indian Institute of Information Technology,
Design & Manufacturing Jabalpur
(An Institute of National Importance established by an Act of Parliament)

Letter No. IIITDM/SKJ/Proj/2025/01
Dated: July 18, 2025

To,

_____
_____
_____
Email:
Phone:

Sub: Inviting quotation for design, supply and commissioning of customized EV emulator

Dear Sir/Madam,

The Institute intends to establish a proof-of-concept experimental set up for one of its sponsored research projects on electric vehicle scheduling as per the specification provided in Annexure-I. You are invited to participate in this bidding process and submit your quotation for the design, supply and commissioning of the complete set-up with the following terms and conditions.

You may kindly give your lowest offer on the following terms and conditions by 1st August 2025.

1) Interested Firms / Parties should submit documentary proof (photocopy) of the following:
   a) Valid Registration Certificate of the firm.
   b) GSTIN and PAN Number
   c) Experience of executing / supplying such orders to any other Government / Educational Institution / Reputed Firms.
2) The rates quoted should be FOR Destination inclusive of all taxes/statutory levies (excise duty, sales tax, Octroi, Entry tax, GST or any other local/state/central Govt. taxes). No extra charge will be entertained by IIITDM Jabalpur.
3) The elements / components of the system shall be under warranty for the period specified in the detailed specifications in Annexure-I.
4) The supplier must provide service and support for the repair/replacement of any component / module for a minimum of 2 years from the date of supply.
5) Institute reserves the right to change the quantity as per its requirement at any stage. Further, the Institute reserves the right to place order either for all the items or only some of above items. The supplier shall have no right to claim any compensation in such case.
6) Delivery should be **within 4 months** from the date of receipt of the work order.
7) Sealed quotation should reach on or before **3.00PM, 01/08/2025**, to the **AR(Purchase), PDPM-IIITDM Jabalpur, Dumna Airport Road, Mehgawan, Jabalpur-482005**. Alternatively, duly signed quotations on the letter head of the firm can be submitted through email also at the following email addresses: arpurchase@iiitdmj.ac.in and skjain@iiitdmj.ac.in within the same deadline of **3.00PM, 01/08/2025.**
8) The Institute reserves the right to reject any or all bids without specifying any reasons thereof.

9) For any technical queries / clarification, please contact the undersigned at the following email address: skjain@iiitdmj.ac.in.
10) The components used in design and development of the system should be from reputed brand /manufacturer and free from any defect.
11) Any loss or damage to the items while handling / transporting, till such time the items are delivered and successfully installed / commissioned in this institute is the responsibility of supplier/dealer.
12) **Performance Security:** The successful bidder/supplier awarded the contract has to submit the performance security of Rs 5,000/- (Rupees Five Thousand only) in the form of DD / FDR / Bank Guarantee from a commercial bank in f/o "PDPM-IIITDM payable at Jabalpur". The performance security should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations.
13) All disputes should be within the jurisdiction of Jabalpur.

Thanking you,

(Dr. Sachin Kumar Jain)
Project Investigator

ANNEXURE-I

Detailed specifications for the experimental set-up

Key items: Battery banks/packs, Bidirectional battery chargers, Loads (resistive, motor), Controllers.

Objective: Design, Supply and Commissioning of a custom hardware featuring bidirectional chargers(BDC), battery bank, and controlled discharge load and associated power and control electronics, which receives signals/information from the scheduler (not part of this work) in the specified format and controls the charging and discharging of the batteries accordingly. It should also facilitate measurement of crucial parameters, e.g. current, power, voltage, battery state of charge (SoC), etc.

System overview:

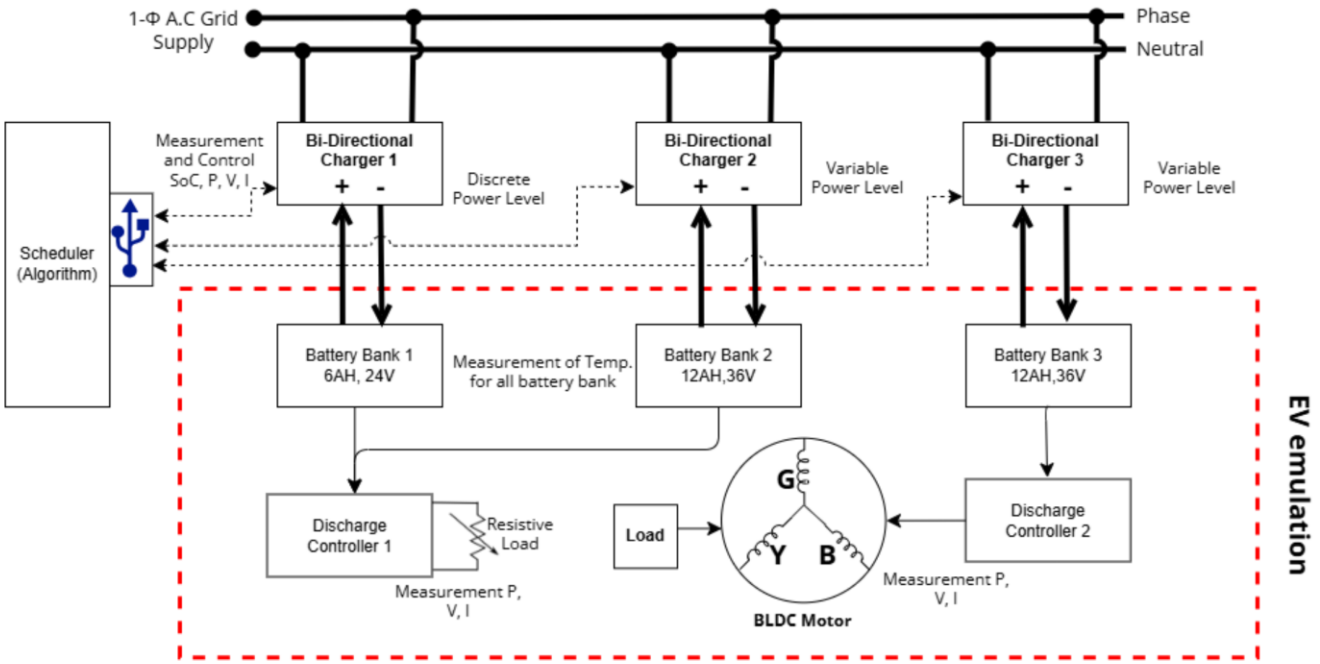

Figure 1: Block Diagram for Proposed System

The system should comprise three custom-built bidirectional chargers (BDCs), each connected to its own battery bank. The BDCs will receive a complete schedule for 24 hours from a scheduler (every 5 minutes), instructing them to charge or discharge at specified rates (power level) and directions, i.e. V2G (vehicle-2-grid, power exported from battery to the grid/source) or G2V (grid-2-vehicle, power is consumed from the grid to charge the batteries) after sensing the battery packs' SoC. Each 5-minute interval will define a fixed operating mode (charge or discharge) and power level for each charger. The scheduler will compute and transmit this schedule in advance, and the BDCs will operate accordingly for the entire interval. All the parameters of the charger will be monitored for every 10 sec interval by the scheduler. In case, scheduler revises the schedule during a day, the same will be followed by the developed system.

Two modes of discharge will be implemented: one with resistive loads and another one via a BLDC motor with adjustable mechanical load to emulate EV traction behavior. Controlled discharging to emulate EV behavior will be implemented using a controller-based setup using resistive load.

The format of communication between the scheduler and the BDCs may be structured in any standard data formats such as CSV, XLSX, or binary files. Any suitable communication protocols, e.g. CAN, RS485, I2C/SPI, or UART may be adopted depending on the user's compatibility.

There should be a user friendly interface, preferable using standard simulation software platforms, e.g. MATLAB, Simulink, or LabVIEW, etc.

Specifications of different elements

Bi-directional Charger (BDC)

BDC1:

Power levels: Discrete (0.5C ,1C, 1.5C, 2C)
(Note: C refers to C-rate, i.e. the charge or discharge current relative to the battery's capacity.)
Voltage: 24V DC
Direction control: V2G, G2V
Communication Interface: Provision for digital input (protocol TBD)
Measurement support: SoC, Voltage, Current, Power
Safety: Over-Voltage, Over-Current on both sides(both input and output side)
Includes rectifier and inverter stages
Option for grid synchronization

BDC2 and BDC3:

Power levels: Continuous range (0.2C to 1.6C or variable upto 700W with steps of maximum 10W)
Voltage: 36V DC and 36V DC respectively
Same measurement and synchronization capabilities as BDC1
Warranty: 6 Months for Manufacturing Defects and functional deficiency on all BDCs

Battery Packs/Banks

Battery Bank 1: 6Ah, 24V
Battery Bank 2: 12Ah, 36V
Battery Bank 3: 12Ah, 36V
Battery chemistry: Li-ion preferred
Measurement support: SoC, Temperature
Warranty: Minimum 1 year

Load Arrangement:

Linear resistive Load

Resistive Load Bank: Configurable step/resistive load to emulate basic discharging

BLDC load arrangement: (Slight variations are possible)

Voltage: 36V
Rated Power: 350W
RPM:600
Ability to emulate driving load characteristics (ramp, flat, braking)
Match BDC output specs (24-36V DC)
Thermal protection and dissipative safety features
Warranty: 6 Months for Manufacturing Defects

Note:

1. The supplier must provide service and support for the repair/replacement of any component / module for a minimum of 2 Years from the date of supply.
2. The delivery period will be 14 weeks from the date of the work order.
3. The scheduler is not part of this hardware supply, however, it should be able to communicate with the system to send schedules and receives measurements. The data exchange should follow a mutually decided pre-defined format, and there should be provision for minor changes, such as, inclusion of any new parameter, etc.