



भारतीय प्रौद्योगिकी संस्थान (भारतीय खनि विद्यापीठ), धनबाद

धनबाद, झारखण्ड, भारत, पिन-826004

(शिक्षा मंत्रालय, भारत सरकार के अधीन राष्ट्रीय महत्व का एक संस्थान)

INDIAN INSTITUTE OF TECHNOLOGY (INDIAN SCHOOL OF MINES), DHANBAD

DHANBAD, JHARKHAND, INDIA, PIN-826004

(An Institute of National Importance under Ministry of Education, Govt. of India)

PROJECT PURCHASE SECTION Phone: (0326)2235660 || Email: projectpurchase@iitism.ac.in || Website: www.iitism.ac.in

EE-PRJ-054-23-24

15th September 2023

Request for Quotation

Subject: Supply & Installation of Opal – RT – Real time HIL, Simulator. (Model No. OP 4512)

Sirs

Indian Institute of technology (Indian School of Mines), Dhanbad is interested for the purchase of the materials/ equipment listed below:

| Sl. No. | Detailed Specifications | Quantity |
|---------|---|----------|
| 1 | Supply & Installation of Opal – RT – Real time HIL, Simulator. (Model No. OP 4512) (Specification in Annexure –II) | 01 No |

INSTRUCTIONS:

- Please attach relevant technical literature of the item.
- Please fill the attached form 01 regarding class of supplier.
- Please mention warranty/ guarantee period in your offer. Equipment/ material supplied must have minimum warranty/ guarantee of **12 months**.
- Please attach authorization certificate from OEM.
- Please mention after sales service information in your offer.
- Please attach a certificate that the quoted price is not more than that of any other Govt. organization/ institution in India. This has to be mentioned in the offer letter clearly.**
- The rates should be quoted for each item separately as per price schedule attached as annexure I.
- The items/ materials shall be required to be delivered at **Department of Applied Geophysics of IIT (ISM) Dhanbad** at the risk and cost of the tenderer.
- Your tender must be **valid for minimum 120 days** from the date of opening of tender.
- The stores are required to be delivered within 30 days from the date of receipt of P.O. late delivery may not be accepted.
- Full details of stores offered should be given in the tender along with supporting & relevant literatures/ Technical Literature.
- The items offered should be of good quality confirming to BIS standards, wherever applicable.
- Advance payment is not admissible.** Payment shall normally be made within 3-4 weeks subject to receipt and acceptance & installation (as per Purchase Order Terms) of the ordered materials/items.
- In the event of the supplier failed to supply the materials or install the same as contractual condition, IIT (ISM) Dhanbad shall have the right to deploy suitable agency/ third party to get the job completed at the risk and cost of the supplier.
- Tender may please be submitted **in sealed cover only super scribed with Enquiry No. EE-PRJ-054-23-24 latest by 06.12.2023.**
- The offer must be submitted in the office of **Deputy Registrar (Project Purchase Section), Dean(R&D) office, IIT (ISM), Dhanbad– 826004 (Jharkhand, India)** only. Please send your offer by Regd.Post/ Speed Post/ Courier along with Courier receipt. Tender/ quotation will be received during IIT (ISM) Dhanbad working hours only (i.e. Monday to Friday). At any circumstances by hand delivery is not acceptable. Late or delayed tenders shall be summarily rejected. Bids sent through Email/Fax or submitted in unsealed cover(s) will not be accepted and such bids will be treated as non-responsive bids.
- Performance Bank Guarantee:** A bank guarantee issued by a Nationalized Bank in India towards PBG for an amount equal to 10% of total value of purchase order and valid till the period beyond two months of completion of warranty period should be submitted in favour of **Registrar, IIT (ISM) Dhanbad.**



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- 18) Any other information that you may like to obtain, you are free to contact IIT (ISM) Dhanbad before submission of tender.
- 19) IIT (ISM) Dhanbad reserves the right to accept and/or to reject any/all tenders without assigning any reason.
- 20) **Payment:** will be made within 30-45 days after satisfactory supply, inspection, installation/commissioning/satisfactory services & acceptance and on submission of pre-receipted tax invoice, delivery challan, warranty certificate and installation report in triplicate
- 21) **Please attach purchase order copies of the same equipment which you have supplied to any other Govt., public sector and autonomous institutions.**
- 22) **a) In a tender, either the Indian agent on behalf of the principle/ OEM and the Principle/OEM itself can bid but both cannot bid simultaneously for the same item/product in the same tender.**
b) If an agent submit bid on behalf of the principle/ OEM, the same agent shall not submit a bid on behalf of another principle/ OEM in the same tender for the same item/product.

Deputy Registrar
Project Purchase Section
Dean (R&D) office
IIT(ISM),Dhanbad



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Annexure –I

1. PRICE SCHEDULE FOR GOODS BEING OFFERED WITHIN INDIA

Name of the Bidder _____

NIT Reference No. _____

File Reference No. _____

| Sl. No. | Full Description of items with (HSN Code/SAC Code) | Quantity | Unit Price (in INR) | Total Amount (in INR) |
|--|--|----------|---------------------|-----------------------|
| 1. | | | | |
| 2. | | | | |
| 3. | | | | |
| Ex-Works Price- | | | | |
| Packing & forwarding | | | | |
| Transportation | | | | |
| FOR (IIT ISM) Dhanbad | | | | |
| GST/IGST (their rate(s) as the case may be, clearly specified) | | | | |
| Insurance up to Destination/handover (in case of fabrication) | | | | |
| Installation & Commissioning charge | | | | |
| Training charges, if any | | | | |
| Additional Warranty Charges, if any | | | | |
| Annual Maintenance Charge, if any | | | | |

*(On the basis of the technical specifications submitted)

Total Bid Price _____

in words _____

Note :

(a) The Price schedule of optional items shall be indicated in a separate sheet in the same Performa.

(b) Cost spare parts may be indicated separately

Signature of Bidder

Name _____

Business

Address _____



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Form-1

Declaration by bidder

(Please specify Class of Supplier and Local Content percentage)

In accordance and manner as specified in Order No. P45021/2/2017-PP (BE-II) dated: 04th June 2020 and 2th March 2021 issued by DIPP, Ministry of Commerce and Industries, GoI.

To,

The Director,

Indian Institute of Technology (Indian School of Mines)

Dhanbad -826004

Respected Sir,

In accordance with the order No. P-45021/2/2017-PP (BE-II) dated 04th June, 2020 and P-45021/2/2017-BE-II-Part (1) (E-50310) dated 4th March 2021 I hereby declare that

I am aware about all provision mentioned in Tender No. GP-PRJ-035-23-24 as well as order No. P-45021/2/2017-PP (BE-II) dated 04th June, 2020 and P-45021/2/2017-BE-II-Part (1) (E-50310) dated 4th March 2021 and abides by the same.

I declare that for this tender, I am a **Class-I local supplier / Class-II local supplier / Non-local supplier** (Strike out whichever is not applicable) and classification is based on local content of goods/services/work offered by bidder in this tender.

Local content (in percentage) in offered good/services/work is: _____%

Whereas 'Local Content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the item procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.

The services such as transportation, insurance, installation, commissioning, training and after sales service support like ACM/CMC etc. are not included as Local content in case of imported products.

The local content for all inputs which constitute the said goods/services/works has been verified and bidder is responsible for the correctness of the claims made therein.

Date:

Signature:

Name of Authorized Signatory:

Name of Bidder:

Seal of Bidder:

Annexure –II

**भारतीय प्रौद्योगिकी संस्थान (भारतीय खनि विद्यापीठ), धनबाद**

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EC-PRJ-008-23-24

Date: 15 November 2023

Technical specification**Tender Specifications: Opal-RT Real Time HIL Simulator (Model No- OP4512)**

| Category | Technical Specifications |
|---|---|
| Processor & Memory Unit | It should have a powerful CPU with multicore processor: Minimum Quad Core. |
| | CPU: Intel Xeon E3-1240 v6, 4 Core Processor, 3.7 GHz or better |
| | FPGA: Xilinx Kintex7 410T FPGA, 410,000 logic cells or better. |
| | Memory: 16 GB DDR RAM & 256 GB SSD Or better. |
| | Connectors: Should have Various Connectors like – JTAG, Ethernet Connector, Synchronization Connector, DB37 connector, ATX computer connector, VGA Port, USB port, serial port, network port. |
| | Software licenses: RTOS with Real-Time Kernel, GCC compiler, FPGA driven Digital I/O License, Simulator Host License & Simulator Target License for designing and simulating Plant & Controller Models. |
| | Should have the LED indicators for synchronization status, target computer status etc. |
| Inbuilt Analog Input Channels | Minimum 16-input channels. |
| | Resolution 16-bit ADC or better. |
| | Upto 2.5 μ s conversion time. |
| | Upto ± 20 V |
| | All channels simultaneously captured/sampled. |
| | Reconfigurable Voltage Range. |
| | Short Circuit Protected. |
| | FPGA Based Control. |
| | Conversion time should be directly controlled by the FPGA. |
| Inbuilt Analog Output Channels | Minimum 16-output channels. |
| | Resolution 16-bit DAC or better. |
| | Upto 1 μ s update time |
| | Upto ± 16 V |
| | Upto 15mA |
| | All channels simultaneously captured/sampled. |
| | Short circuit protected. |
| | Reconfigurable Voltage Range. |
| | FPGA Based Control. |
| Inbuilt Digital Input- Output Channels (DIO Channels) | Update time should be directly controlled by the FPGA. |
| | Minimum 64 channels High Range DIO. |
| | DO: 5- 24V, upto 50 mA per channel. |
| | DI: 0-30V, upto 3.5 mA per channel. |
| | All input/outputs are sampled simultaneously. |
| | Push pull type. |
| | Short circuit protected. |
| | Galvanic isolation. |
| | Optocoupler. |
| | Reconfigurable Voltage Range. |
| | FPGA Based Control. |



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| | |
|---------------------------------|--|
| Connectivity | Ethernet, USB, RS422, Encoder IN, Encoder Out. |
| Embedded Mode operation Feature | It should run in embedded mode option. i.e. Once model is flashed on to the simulator it should run same model automatically without the involvement of the host computer even after rebooting the system. |
| | It should be possible to erase and reprogram the flash for multiple times on the simulator. |
| | If user simulates inverter model in embedded mode, it should behave like an inverter all the time even after rebooting until any other new model is flashed on it. |

| | |
|------------------------------------|---|
| Capabilities | Should Perform CPU + FPGA Co-simulation .ie a single model can be simulated on CPU & FPGA at a same time in different time steps to facilitate complex power electronics and power system applications like Microgrid etc. |
| | CPU simulation time step should be any time step size between 10 Microseconds to 1 Mili Seconds depending on the Model Complexity. |
| | Should Generate PWM pulses independent of simulation clock. |
| | Should Simulate Power System Network similar / upto IEEE 14 bus system, IEEE 24 bus system, IEEE39 bus system. |
| | Hardware in Loop (HIL), Rapid Control Prototyping (RCP), Model in Loop (MIL), Software in Loop (SIL), Controller in loop (CIL), Controller Hardware in Loop (CHIL), Power Hardware in Loop (PHIL) Simulation Techniques should be performed. |
| | It should edit parameters of the system during real time execution. |
| | It should do Automatic Core Allocation in cases of multi-core simulation as this helps in minimizing time and effort spent to allocate cores manually. |
| Modelling & Programing Environment | Modelling & Programing environment needs to be Matlab/Simulink/SimPowerSystems only. |
| | It should Simulate models built in Matlab/Simulink/SimPowerSystems software directly on Simulator Hardware and allow the Matlab/Simulink/SimPowerSystem models to interact with real world signals /hardware through Analog /Digital voltages and currents. |
| | Any Other Proprietary/ Custom Developed Modelling Environment/ Compatibility with Matlab/Simulink/SimPowerSystems models by using DLL files or any other interface is not desired and may not be considered. |
| | It should Facilitate Integrated Development Environment Host software licenses across the lab allowing users to run simulations on a windows target in non-real time mode. |
| | It should perform different applications like Power System, Drives, and Controls. |
| | It should aid in development of custom logic & algorithms used in advanced control schemes (e.g., Cs-function). |
| | It should be able to use LABVIEW GUI PANNELS. |
| | Operating System used should be 64 bit Real Time Operating System dedicated for real time simulation and it should be COTS based. |
| | • Individual users should be able to connect through LAN. |
| | • Should facilitate Multi rate simulations. |
| | • Should simulate detailed Wind power plant using DFIG or PMSG. |
| | • Should simulate detailed model of multiple solar PV panels-based PV farm. |
| | • Should simulate various FACTS devices like SVC, TCSC, STATCOM, UPFC |
| | • Should send up to 16 CT/PT/CVT signals to actual protection relays, PMUs, and other Intelligent Electronic Devices (IEDs). |
| | • Should receive up to 32 status/command signals in the form of digital inputs from |



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| | |
|--|---|
| Other Required Features & capabilities | external controllers. |
| | • Should simulate control algorithms for laboratory scale converters used in renewable energy integration studies/power quality applications. |
| | • Should simulate different control schemes associated with wind energy systems using DFIG. |
| | /PMSG. |
| | • Should simulate control algorithms for under fault scenarios of electrical motor and converters. |
| | • Should simulate various types of faults like open-fault, short circuit, or gate-fault on any IGBT, Motor open line and line-line faults, DC links faults. |
| | • Should control Physical converters for drives/ motors/power conversion applications/Microgrid/Renewable Sources etc. |
| | • Should simulate different control schemes associated with Solar PV inverters. |
| Licensing Software | • Should simulate & Validate control algorithms of Switched Mode Power Supply (SMPS)/UPS. |
| | • Should simulate & test industrial controls for drives such as Direct Torque Control, V/f etc. |
| | • Perpetual license of the software should be provided. |