



**National Institute of Technology, Meghalaya**  
**Bijni Complex, Laitumkhrah, Shillong 793003**

## INVITATION LETTER

Ref No.: TEQIP III/2019/NITMGH/Shopping/138

Date: 03.04.2019

Package Code: TEQIP-III/2019/null/nimt/76

Current Date: 03-Apr-2019

Package Name: NITMGH/TEQIP III/EE/009

Method: Shopping Goods

To,

**Sub: INVITATION LETTER FOR NITMGH/TEQIP III/EE/009 (Real Time Simulator for Power Electronics and Drives application)**

Dear Sir,

You are invited to submit your most competitive quotation for the following goods with item wise detailed specifications given at Annexure I,

Sr. No	Item Name	Quantity	Place of Delivery	Installation Requirement (if any)
1	Real Time Simulator for Power Electronics and Drives application – 1 unit	1	National Institute of Technology Meghalaya, Bijni Complex, Laitumkhrah Shillong 793003	As applicable

1. Government of India has received a credit from the International Development Association (IDA) towards the cost of the **Technical Education Quality Improvement Programme [TEQIP]-Phase III** Project and intends to apply part of the proceeds of this credit to eligible payments under the contract for which this invitation for quotations is issued.

2. **Quotation**

2.1 The contract shall be for the full quantity as described above.

2.2 Corrections, if any, shall be made by crossing out, initialling, dating and re writing.

2.3 All duties and other levies payable by the supplier under the contract shall be included in the unit Price.

2.4 Applicable taxes shall be quoted separately for all items.

2.5 The prices quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.

- 2.6 The Prices should be quoted in Indian Rupees only.
3. Each bidder shall submit only one quotation.
  4. Quotation shall remain valid for a period not less than **45** days after the last date of quotation submission.
  5. Evaluation of Quotations: The Purchaser will evaluate and compare the quotations determined to be Substantially responsive i.e. which
    - 5.1 are properly signed; and
    - 5.2 Confirm to the terms and conditions, and specifications.
  6. The Quotations would be evaluated for all items together.
  7. Award of contract The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive and who has offered the lowest evaluated quotation price.
    - 7.1 Notwithstanding the above, the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of Contract.
    - 7.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be Incorporated in the purchase order.
  8. Payment shall be made in Indian Rupees as follows:  
**Satisfactory Delivery & Installation - 10% of total cost**  
**Satisfactory Acceptance - 90% of total cost**
  9. Liquidated Damages will be applied as per the below:  
Liquidated Damages Per Day Min % : 0  
Liquidated Damages Max % : 10
  10. All supplied items are under warranty of **24** months from the date of successful acceptance of items and AMC/Others is **As applicable.**
  11. You are requested to provide your offer latest by **14:00** hours on **16-Apr-2019.**
  12. Detailed specifications of the items are at Annexure I.
  13. Training Clause (if any) **Yes**
  14. Testing/Installation Clause (if any) **Yes**
  15. Performance Security shall be applicable: **0%**

16. Information brochures/ Product catalogue, if any must be accompanied with the quotation clearly indicating the model quoted for.
17. Sealed quotation to be submitted/ delivered at the address mentioned below, **National Institute of Technology, Meghalaya, Bijni Complex, Laitumkrah, Shillong 793003**
18. For authenticity/genuineness of the quoted product, the firm should be a reputable, well established and suppliers of the goods or services as part of their normal business.
19. **Technical Presentation:** If necessary then the authority may ask the technically qualified bidders to give full presentation or live demonstration of the Quoted equipment at NIT Meghalaya before finalization of the tender as a support of their specification.
20. Dealership Certificate: The bidder/tenderer should be either a manufacturer or authorized dealer of the foreign/Indian manufacturer. Dealers or Agents quoting on behalf of Manufacturer must enclose valid dealership certificate.
21. We look forward to receiving your quotation and thank you for your interest in this project.

  
 (Authorized Signatory)

Coordinator  
 TEQIP-III  
 National Institute of Technology  
 Meghalaya

Name & Designation

### Annexure I

Sr. No	Item Name	Specifications
1	Real Time Simulator for Power Electronics and Drives application – 1 unit	<b>Specifications :</b> <ul style="list-style-type: none"> <li>➤ It should be a Matlab-Simulink Based Real Time Simulation Platform using both CPU &amp; FPGA Co-Simulation Technology for Plant &amp; Controller Simulation on a Single Rack Mount Hardware Chasis for Power Electronics, Control Design ,Drives, Hardware in Loop (HIL), Rapid Control Prototyping (RCP) Applications &amp; Studies</li> <li>➤ Should have mentioned or better CPU configuration: Dual-core ARM® Processor Cortex A9 667MHz</li> <li>➤ Should have mentioned or better FPGA configuration : Xilinx Zynq®XC7Z030 all programmable SoC device with Kintex™-7 FPGA, 125K LUT</li> <li>➤ Should have mentioned or better Memory configuration 32GB SD card, 1024 MB DDR3L SD RAM</li> <li>➤ Simulator should have at least Four I/O Cards in a Single Chasis - 16AI, 16AO, 32DI, 32DO</li> <li>➤ I/O Cards should be Reconfigurable &amp; FPGA Based to minimize latency in ADC, DAC, DI, and DO.</li> <li>➤ I/O Cards should have at least the below mentioned or better Configuration:</li> </ul>

16 Analog input channels, 16 bits, 2.5  $\mu$ s conversion time simultaneously, 500 ns optional, +/-20V.

- 16 analog output channels, 16bits, 1.0  $\mu$ s update time simultaneously, 200 ns optional, +/-16V,10mA.
- 32 opto-isolated digital input channels, 4V to 30V,40 ns typical propagation delay.
- 32 opto-isolated digital output channels, 65 ns typical propagation delay, 5V to 30V adjustable, 50mA .
- Simulator should have at least the following Interfaces :

Host interface	Integrated Gigabit Ethernet host interface
Ethernet Real time I/O interface	Integrated low-latency Gigabit Ethernet I/O interface
USB interface	booting applications via USB mass storage device (max. 32 GB supported)
CAN interface	2 CAN Bus, 1Mbps, half duplex per channel
Serial interface	2 RS232, up to 250kbps, full duplex per channel

- Simulator should support following I/O Functionality

Electric motor control I/O functionality	Functionality on digital I/O channels	<ul style="list-style-type: none"> <li>✓ Block computational PWM</li> <li>✓ SPWM generation block</li> <li>✓ Encoder sensor input</li> <li>✓ Hall sensor input</li> </ul>
	Separate interfaces	<ul style="list-style-type: none"> <li>✓ Resolver interface</li> </ul>

- Simulator should support all the below mentioned capabilities on Single Simulator hardware Chasis:-

- a) CPU Simulation & Processing , FPGA Simulation & Processing and CPU + FPGA Co-simulation & Processing
- b) Hardware in Loop (HIL) Simulation, Rapid Control Prototyping (RCP) simulation and Model in Loop Simulation Techniques.
- c) Controller Simulation , Plant Simulation and both plant and controller simulation
- d) Generate PWM pulses of upto 200 KHz from a single hardware chasis
- e) Simulate upto 32 PE switches on FPGA at 200 Nano seconds with switching frequencies as high as 30 kHz
- f) Execute Models Built in MATLAB Simulink/SimPowerSystems/Simscape directly in Real time.
- g) Simulate power converters associated with RE sources operating at High switching frequencies
- h) Should support API Languages: C/C++, Python etc & Models from other schematic software like PSIM, PLECS or Multisim.
- i) Send up to 16 CT/PT/CVT signals to actual protection relays, PMUs and other Intelligent Electronic Devices (IEDs)
- j) Receive up to 32 status/command signals in the form of digital inputs from external controllers and components
- k) Detailed simulation of multilevel converters (up to 32 switches) used in

		<p>medium voltage industrial drives applications with high switching frequencies(30KHZ)</p> <ul style="list-style-type: none"> <li>l) Prototype control algorithms for laboratory scale converters used in renewable energy, power quality applications etc.</li> <li>m) Test in closed loop- multilevel Inverters (up to 32 switches) for drives and power conversion applications</li> <li>n) Prototype control of wind energy systems using DFIG or PMSG</li> <li>o) Prototype different control schemes associated with Solar PV inverters</li> <li>p) Validate control algorithms of Switched Mode Power Supply (SMPS) and UPS</li> <li>q) Validate control algorithms for under fault scenarios of electrical motor and converters</li> <li>r) 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 etc.</li> </ul>
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**FORMAT FOR QUOTATION SUBMISSION**  
(In letterhead of the supplier with seal)

Date: \_\_\_\_\_  
To: \_\_\_\_\_

Sl. No.	Description of goods \ (with full Specifications)	Qty.	Unit	Quoted Unit rate in Rs. (Including Ex-Factory price, excise duty, packing and forwarding, transportation, insurance, other local costs incidental to delivery and warranty/ guaranty commitments)	Total Price (A)	Sales tax and other taxes payable	
						In %	In figures (B)
<b>Total Cost</b>							

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ amount in words) within the period specified in the Invitation for Quotations.  
Gross Total Cost (A+B): Rs. \_\_\_\_\_ (Amount in figures)  
We confirm that the normal commercial warranty/ guarantee of \_\_\_\_\_ months shall apply to the offered items and we also confirm to agree with terms and conditions as mentioned in the Invitation Letter.  
We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf will engage in bribery.

Signature of Supplier  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Contact No. \_\_\_\_\_