	सामग्री प्रबंधन अनुभाग भारतीय प्रौद्योगिकी संस्थान,रूडकी रूडकी–247667, हरिद्वार, उत्तराखण्ड, भारत Phone-(O) 01332-28-4293, 4693 E-mail: mmiitr@iitr.ac.in **GSTIN-05AAALI0033R1Z5** PAN-AAALI0033R	Material Management Section Indian Institute of Technology Roorkee Roorkee-247667(Haridwar) (Uttarakhand) (India) Phone-(O) 01332-28-4293, 4693 E-mail: mmiitr@iitr.ac.in	

निविदा पत्र/ Enquiry Letter

No.: 2026270067/MM-13/IITR/2026-27/Real Time Simulator and C/HRE/76

Date of Uploading of Tender -https://eprocure.gov.in/eprocure/app **2-Jun-26**

Bids under two bid systems (Technical and Commercial) are invited Online at CPP Portal (https://eprocure.gov.in/eprocure/app) from the reputed manufacturer/ authorized supplier/dealer for the following items.
Manual bids will not be accepted.

वस्तुओं का विवरण/ Details of items :

Sr. No	Name of item / Specifications/	QTY	UOM
1	Real Time Simulator and CHIL Platform	1	Set
(For Detailed Technical Specification Plz refer Annexure-VI)			
नोट-1: कृपया वस्तु का मूल्य एवं कर अलग-अलग दर्शाए।			
Note-1: Please quote the Rate & Taxes of the item separately.			
Note-2: E-way bill is to be issued by the Venders/Transporter			
Note-3: The HSN / SAC Code of the item must be mentioned.			
For Reasonability of Rates, The firm must enclose the last two supply orders for the same item with Bid.			
Critical Date Sheet			
1	Published Date	2-Jun-26	(18:30)
2	Bid Document Download / Sale Start Date	2-Jun-26	(18:40)
3	Seek Clarification Start Date	2-Jun-26	(18:50)
4	Seek Clarification End Date	4-Jun-26	(16:00)
5	Pre Bid Meeting Date	Not Required	Not Required
6	Bid Submission Start Date	5-Jun-26	(15:00)
7	Bid Submission End Date	17-Jun-26	(15:00)
8	Bid Opening Date	17-Jun-26	(15:30)

Chapter-1 : Instruction to bidders

A. The Tender should be enclosed with proper certifications like Agency Certification, Authorization certificate and/or Proprietary Certificate, as the case may be , in support of your offer.

B. **बोली का जमा किया जाना/ Submission of Bids:**

1 **The bids should be submitted online in two parts –**
(i) The Technical Bid (Annexure-I, II, V & VI) and Tender Acceptance Letter
(ii) The Financial Bid (Annexure-III) & Price Bid in .XLS Format
Rates in .xls format will only be considered for Financial evaluation & further processing.

2 The bids should be printed on official pad preferably with GST Number of the firm

3 The quotations should bear full details and where possible may be duly supported with catalogues, pamphlets, literature, samples of the item/items as the case may be for comparing the quality and rates of the item(s).

4 The transportation cost, insurance charge etc., if any, percentage/ rate of GST or all other taxes and duties should be clearly mentioned.

5 The bids / rates / tenders should remain valid for a minimum period of 90 days from the date of financial opening.

6 The rates shall not be subject to escalation of any nature.

7 The rates quoted should be applicable to educational institutions and any cost advantage received in lieu thereof should be passed on the Institution.

8 While quoting / sending rates, the firm shall give an undertaking as per Annexure-II.

C. *विधि निक्षेप* / Earnest Money Deposit (EMD):

The Technical Bid should accompany an EMD of value Rs. 1,48,500/- (Rupees One Lac Forty Eight Thousand and Five Hundred only) which should be deposited online into below mentioned account.

Details of IIT Roorkee Bank Account:

Account Name: NON MHRD GOVERNMENT FUND IIT ROORKEE
Account No.: 00000032685865515
Bank Name: STATE BANK OF INDIA
Branch Address: IIT ROORKEE, ROORKEE
IFSC Code: SBIN0001069
MICR: 247002094

The Bidder will have to fill EMD details & provide the tender reference number in the narration/remarks while doing the payment as per quoted items and share the receipt of the same in pdf on CPP Portal (https://eprocure.gov.in/eprocure/app). The qualification in Technical bid will be subject to the submission of EMD in above mentioned account within schedule date and time as mentioned in the NIT. IITR shall not be responsible for any delay in submission of EMD.

In case the EMD is not received in above mentioned account within the aforesaid period, the bid will be out rightly rejected.

Exemption on submission of EMD will be given against valid MSME/NSIC certificate under manufacturing (goods) category.

The earnest money shall be refunded to all the unsuccessful firms, without any interest after finalization of the contract. EMD shall be refunded to the successful firms on receipt of PBG/Security Deposit. No interest is payable on the EMD to either the successful firms or the unsuccessful firms.

D. *निष्पादन बैंक प्रत्याभूति* / Performance Bank Guarantee (PBG):

In case the total order value of items becomes Rs.25.00 Lakhs or above, 3% of the total order value in the form of Bank Guarantee or FDR pledged in favor of "The Registrar, IIT Roorkee" is required at the time of installation of the equipment which should remain valid at least during the warranty period plus sixty days. No interest shall be claimed by the bidder on the PBG submitted.

E. ***बोलियो का खोला जाना*/ Opening of Bids:**

1 The Technical Bids will be opened online at CPPP Portal (https://eprocure.gov.in/eprocure/app)-**Plz refer Critical Date Sheet**

2 The Financial bids of only the Technically Qualified bidders will be opened. The date and time for opening the Financial Bid will be communicated to the respective firm later by the system (CPP Portal (https://eprocure.gov.in/eprocure/app))

Chapter-2 : Conditions of Contract

F. *कार्य अनुबन्ध* / Award of Contract:

The final selection of the bidder for the award of the contract will be made on the basis of the lowest commercial bid amongst the Technically Qualified Bidders.

Prices of optional item will not be considered to identify lowest price bid.

G. *पूर्व-आपूर्ति निरीक्षण* / Pre-supply Inspection:

Authorized representative of the Institute shall make the final inspection before supply of the item at site of the firm, if required.

H. *वस्तु की आपूर्ति* / Supply of Item:

The whole supply as per order shall have to be completed within the time mentioned in the order failing which the I.I.T. Roorkee shall have the right to accept or reject any quantity of items ordered. The firm will have to arrange for supply of the material in good condition.

I. भुगतान की शर्तें/ Payment Terms:

A. Payment in INR for supply of goods:

Where installation is not required: 100% payment will be made after satisfactory delivery of material duly certified by the HOD/P.I. **OR**

Where Installation is required :100% payment will be made after satisfactory delivery and installation of the material duly certified by the HOD/P.I. **OR**

Upto 80% payment on receipt and acceptance of goods/service by the indenter and the balance on successful installation and commissioning by the supplier and acceptance by the indenter.

B Payment in INR for AMC/Service:

Quarterly/Halfyearly after satisfactory completion of work/service duly certified by the H.O.D./P.I.

J. दंड/Penalty:

A penalty of 0.5% of the total order value per week shall be levied for the delay subject to a maximum of 5% of the total order value.

In case of the non-supply of the item/service after the acceptance of the work/supply order, EMD & PBG (if submitted) will be forfeited by the Institute. Also, the firm will be debarred from any future bidding process of IIT Roorkee for a period of a minimum two year.

K. अप्रत्याशित घटना/Force Majeure:

For the purpose of and within the scope of contract by way of indication and not of limitation, the term "Force Majeure" shall mean acts of nature, strikes, Lockouts, or other industrial disturbances, act of public/enemy, wars, blockades, insurrection, riots, epidemics, landslides, earthquakes, storms lightening, flood, washouts, civil disturbances, explosion and any other similar even not within the control of either party on which by exercise of due care and diligence neither party is able to prevent or overcome.

L. मध्यस्थता/Arbitration:

If any dispute which may arise with respect to any term and condition or with respect to the interpretation of any term and condition of the Purchase Order/Work Order, which may be issued to the qualified and successful tenderer subsequently, the same shall be settled strictly in accordance with and in compliance of the Arbitration procedure which is mentioned descriptively in the Purchase Order/ Work Order.

M. बोली अस्वीकृती के लिए मानदंड/Criteria for bid rejection:

1. If technical bid found without the required undertaking (Annexure-II) & Self Certificate (Annexure-V).
2. If it found at a later date that any information given in the bids is Incorrect/false then the bid is liable to be disqualified/rejected.
3. Canvassing in any form will result to disqualification.
4. If "extra, as actual" etc. are mentioned against any of the price components in the bid the bid will be rejected.
5. If the firm quotes 'NIL' charges / consideration, the bid shall be treated as unresponsive and will not be considered.
6. If financial bid is found along with technical bid in pdf on CPP Portal, then the bid shall be rejected outrightly.
7. If any bidder submitting two/multiple bids for the same item of a tender, both/all the bids of that bidder will be outrightly rejected.

Chapter-3 : Schedule's of requirements

N. टिप्पणी/ Note:

1. If the supplier/firm is manufacturer/authorized dealer/sole distributor/of the item, the certificate to this effect should be attached.
2. **The bids should be submitted online in two parts –**
   (i) The Technical Bid (Annexure-I, II, V & VI) and Tender Acceptance Letter
   (ii) The Financial Bid (Annexure-III) & Price Bid in .XLS Format
3. It may also be noted that the tender bids received after the stipulated date & time or found incomplete and the tender bids containing false/incorrect information shall be summarily rejected. The Institute shall not entertain any communication in this regard, whatsoever.
4. The firm is required to give its Bank Account details with IFSC for the purpose of making e-payment.
5. The Indian Institute of Technology (IIT) Roorkee reserves the right to reject any quotation wholly or partly without assigning any reason.
6. The quantity shown against the item is approximate and may vary as per demand of the Institute at the time of placing order. Also, the final requirement of each line item will be decided by the Institute at the time of placing the PO.
7. The decision of the institute in all matters relating to eligibility, acceptance, rejection of the bid will be final and binding on the applicants.
8. IIT Roorkee discourages High Sea Sale purchase. All tenders with High Sea Sale will be rejected.

9	The firms should clearly mention (in the financial bid) the Harmonized System of Classification (HS code) defined by the Central Custom and Excise Board (Govt. of India)- for the item(s) involving import.
10	**If the due date happens to be a holiday, then the bid will be accepted till 12.00 Noon and opened at 3.30PM of the next working day followed by the holiday.**
11	If an agent submits bid on behalf of the Principal/OEM, the same agent can not submit a bid on behalf of another Principal/OEM in the same tender for the same item/product.
12	Indian Agent should submit the certificate from the Foreign Principal that they are the Authorized & Registered Indian Agent.
13	The quantity shown in the tender can be increased or decreased to any extent depending upon the actual requirement.
14	Any corrigendum/addendum/errata in respect of the Tender Notice/ Enquiry letter shall be made available only at our Institute website www.iitr.ac.in. Hence prospective bidders are advised to visit the Institute website regularly.
15	Bidders shall be responsible for the correctness of the information provided in the enquiry letter/tender document. If it is found at a later date that any information given in the bid is Incorrect/false then the bid is liable to be disqualified/rejected.
16	Before submission of bids, bidders should read the complete enquiry letter/tender document carefully and ensure that the bidders fulfill the eligibility criteria.
17	In case the item/product is under rate contract with DGS&D or GeM, then Bidder should certify that the rate quoted is not over and above (higher side) the rates under RC with the DGS&D or GeM.
18	**In Item Wise BoQ .xls sheet, In column M, leave blank for the item/service not provided/quoted by you. If quoted 0 then it will be considered that the item/service will be provided free of cost.** **Or** **In Item Rate BoQ .xls sheet, If quoted 0 for the items/services in column M then it will be considered that the items/services will be provided free of cost.**
19	**The bidder must quote the applicable GST appropriately in the price bid format provided i.e BoQ in .xls format. In case column of GST left blank, quoted 0, or inappropriate then total quoted amount shows in column BB would be final inclusive of GST & other charges. The difference in GST amount payable – if any will be borne by the bidder. In this case, the basic unit prices will be suitably adjusted by the bidder – if required.**
20	**Only 'Class-I local supplier' and 'Class-II local supplier', as defined in the Public Procurement (Preference to Make in India), Order 2017 shall be eligible to bid in tender. For more details please refer: Order No.: P-45021/2/2017-PP (BE-II), DPIIT, Ministry of Commerce and Industry issued Dated: 16th Sept. 2020.** **Self-certificate has to be provided in this regard that the item offered meets the local content requirement for 'Class-I local supplier' & 'Class-II local supplier'. (As per annexure-V)**
21	**The Institute reserves the right to rectify any discrepancy of this advertisement, if found later on. In case of any inadvertent mistake in the process which may be detected at any stage even after the issue of purchase order, the Institute reserves the right to modify/withdraw/cancel any communication made to the bidder.**

Chapter-4 : Specifications and allied Technical details	**Plz. See Annexure- I, II, V, VI**
Chapter-5 : Price Schedule (to be utilized by the bidders for quoting their prices online in .XLS format at CPPP Portal (https://eprocure.gov.in/eprocure/app)	**Plz. See Annexure- III & Price Bid in .XLS Format**
Chapter-6 : Contract Form	**Purchase Order is used as Contract Form**
Chapter-7 : Other Standard Forms, if any to be utilized by the purchaser and bidders	**Tender Acceptance Letter**

*उप कुलसचिव (सामग्री प्रबंधन)
Deputy Registrar (MM)

***Document Digitally Signed on https://eprocure.gov.in/eprocure/app**

For any Clarification Please Contact:

Prof. Himanshu Jain, HRED, IIT Roorkee	**HRED, IIT Roorkee**	**Ph. 01332-28-4978**	**Email: himanshu.jain@hre.iitr.ac.in**

Annexure –I

(अपने आधिकारिक लेटर हेड पर विक्रेता/फर्म द्वारा प्रस्तुत करने के लिए)

(to be submitted by the vendor/firm on its official letter head)

Sr.No	Name & Required Specifications of Item(s)	Qty	UOM	Offered specifications of item(s) by the firm
1	**Real Time Simulator and CHIL Platform**	**1**	**Set**	
	Firm's Profile :			
1	Manufacturer/Authorized Agent/Distributor/Dealer/Supplier(valid certificate must be attached)			
2	E-mail I.D. & Telephone/Mobile No. Detail of Bank A/C			
Note:	1. "offered specifications", should be filled up properly in the format provided as per Annexure-I.			
	2. Volume & Weight of the item should also be mentioned.			
	3. The HSN / SAC Code of the item must be mentioned.			

Signature:_____
Name : _____
Designation : _____
Seal of the Organisation

Annexure –II

उपबंध / UNDERTAKING

Ref. No. No.: 2026270067/MM-13/IITR/2026-27/Real Time Simulator and C/HRE/76
Dated:- 2-Jun-26

I/We hereby certify that we or Our OEM are not from such a country which shares a land border with India or, if from such a country, We are registered with the Competent Authority. [Where applicable, evidence of valid registration by the Competent Authority is attached.}" (For details Please refer Order No.: F.No. 6/18/2019-PPD Dt.: 23rd July 2020)

Link of Order: http://mm.iitr.ac.in/mmweb/public/forms/63374_GFR%20Rule%20144%20(xi).pdf

That all the terms/conditions mentioned in the enquiry letter/tender against which the rates are being given are acceptable to the firm.

It is certified that the rate quoted is not over and above (higher side) the rates under RC with the DGS&D or GeM.

It is certified that the firm has never been black-listed from any Government Department. (State/Central Govt./ Autonomous/ PSU) in last three years.

Signature_____
Name_____
Designation_____
Seal of the Firm/Agency

Annexure-III

(to be submitted by the vendor/firm on its official letter head)

Ref. No. No.: 2026270067/MM-13/IITR/2026-27/Real Time Simulator and C/HRE/76
Date: 2-Jun-26

Rates :

Sr. No	Name of item / Specifications/	Qty	UOM	Rate	Amount (INR Only)
1	**Real Time Simulator and CHIL Platform**	1	Set	To be filled in .XLS sheet (attached)	
Total					To be filled in .XLS sheet (attached)
Grand Total Rs.					

Terms & Conditions:

1	Prices (quoted in Rs.): FOR	HRED, IIT Roorkee
2	Payment:	Should be clearly mentioned, As per clause-I of enquiry letter.
3	Validity:	
4	Delivery period:	
5	Other charges:	
6	Warranty:	
7	Rejection:	Items if found not as per the required specification would be rejected.
8	Penalty Clause:	As per clause-J of enquiry letter.
9	**Order to be placed:** (Name and complete address of the firm to whom Purchase/Work order is to be issued.)	

It is certified that the rate quoted is not over and above (higher side) the rates under RC with the DGS&D or GeM.

Signature_____
Name_____
Designation_____
Seal Of the Firm/Organization_____

Details of Institute :

IEC CODE	0100000011	
AD CODE	0001069-2770325	S.B.I., IIT ROORKEE
	0303974-2770324	P.N.B. IIT ROORKEE

Annexure-IV

Instructions for Online Bid Submission

Instructions to the Bidders to submit the bids online through the Central Public Procurement Portal for e-Procurement at https://eprocure.gov.in/eprocure/app. Also, any modification on CPP portal in reference to below will be applicable. Therefore. for more details and update please refer CPP Portal (https://eprocure.gov.in/eprocure/app).

1	Possession of valid Digital Signature Certificate (DSC) and enrollment/registration of the contractors/bidders on the e-Procurement/e-tender portal are prerequisite for etendering.
2	Bidder should register for the enrollment in the e-Procurement site using the "Online Bidder Enrollment" option available on the home page. Portal enrollment is generally free of charge. During enrollment/registration, the bidders should provide only valid and true information including valid email id. All the correspondence shall be made directly with the contractors/bidders through email id as registered.
3	Bidder need to login to the site through their user ID/ password chosen during enrollment/registration.
4	Then the Digital Signature Certificate (Class III Certificates with signing key usage) issued by SIFY/nCode/eMudra etc. recognized by Controller of Certifying Authorities (CCA) India on eToken/SmartCard, should be registered.
5	The registered DSC only should be used by the bidder in the transactions and should ensure safety of the same.
6	Contractor/Bidder may go through the tenders published on the site and download the tender documents/ schedules for the tenders.
7	After downloading/getting the tender document/schedules, the Bidder should go through them carefully and then submit the documents as required, otherwise bid will be rejected.
8	Any clarifications may be sought online through the tender site, through the contact details or during pre-bid meeting if any. Bidder should take into account the corrigendum if any published before submitting the bids online.
9	Bidder may log in to the site through the secured login by the user id/ password chosen during enrolment/registration and then by submitting the password of the e-Token/Smartcard to access DSC.
10	Bidder may select the tender in which he/she is interested in by using the search option and then move it to the 'my tenders' folder.
11	From my tender folder, he may select the tender to view all the details uploaded there.
12	It shall be deemed that the bidder has read and understood all the terms and conditions before submitting the offer.Bidder should go through the tender schedules carefully and upload the documents as asked; otherwise, the incomplete bid shall stand rejected.
13	Bidder, in advance, should get ready the bid documents to be submitted as indicated in the tender document/ schedule and ordinarily it shall be in PDF/xls/rar/jpg/dwf formats. If there is more than one document, all may be clubbed together and provided in the requested format. Bidders Bid documents may be scanned with 100 dpi with black and white option. It is advisable that each document to be uploaded through online for the tenders should be less than 2 MB. If any document is more than 2MB, it can be reduced through zip/rar and the same if permitted may be uploaded. The file size being less than 1 MB the transaction uploading time will be very fast.
14	The Bidders can update well in advance, the documents such as certificates, annual report details etc., under "My Space option" and these can be selected as per tender requirements and then send along with bid documents during bid submission. This will facilitate the bid submission process faster by reducing upload time of bids.
15	Bidder should submit the Tender Fee/ EMD as specified in the tender. Scanned copy of the same should be uploaded as part of the offer.
16	While submitting the bids online, the bidder shall read the terms and conditions and may accept the same to proceed further to submit the bid packets.
17	The bidder has to select the payment option as offline to pay the Tender FEE/ EMD as applicable and enter details of the same.
18	The details of the DD/any other accepted instrument, physically delivered, should tally with the details available in the scanned copy and the data entered during bid submission time, otherwise submitted bid shall not be acceptable or liable for rejection. (If applicable)
19	The bidder has to digitally sign and upload the required bid documents one by one as indicated. Every act of using DSC for downloading the bids and uploading their offers shall be deemed to be a confirmation that they have read, understood and agreed with all clauses of the bid document including General conditions of contract without any exception.
20	The bidder has to upload the relevant files required as indicated in the cover content. In case of any irrelevant files, the bid may be rejected.

21	If the price bid format is provided in a spread sheet file like BoQ_XXXX.xls, the rates offered should be entered in the allotted space only and uploaded after filling the relevant columns. The Priced-bid/BOQ template shall not be modified / replaced by the bidder; else the bid submitted is liable to be rejected for the tender.
22	The bidders are advised to submit the bids through online e-tendering system to the Tender Inviting Authority (TIA) well before the bid submission due date and time (as per Server System Clock). The TIA shall not be held responsible for any delay or the difficulties faced during the submission of bids online by the bidders.
23	After the bid submission (i.e. after Clicking "Freeze Bid Submission" in the portal), the acknowledgement number indicated by the system should be printed by the bidder and kept as a record of evidence for online submission of bid for the particular tender and also be used as entry pass to participate in the bid opening.
24	The time settings fixed in the server side and displayed at the top of the tender site, shall remain valid for all actions of requesting, bid submission, bid opening etc., in the e- Tender system. The bidders should follow such time during bid submission.
25	All the data being entered by the bidders would be encrypted using Public Key Infrastructure (PKI) encryption techniques to ensure the secrecy of the data. The data entered is not retrievable by unauthorized persons during the bid submission and until the time of bid opening by any person.
26	Any bid document that is uploaded to the server is subjected to symmetric encryption using a system generated symmetric key. Further this key is subjected to asymmetric encryption using buyers/bid openers' public keys. Overall, the uploaded tender documents become readable only after the tender opening by the authorized bid openers.
27	The confidentiality of the bids is maintained with the use of Secured Socket Layer (SSL) 128 bit encryption technology. Data storage encryption of sensitive fields is done.
28	The bidder should logout of the tendering system using the normal logout option available at the top right hand corner and not by selecting the (X) exit option in the browser.
29	For any queries regarding e-Tendering process, the bidders may contact at address as provided in the tender document. Parallely for any further queries, the bidders are advised to contact over phone: **0120-4001005** or send an e-mail to – cppp-nic@nic.in.

Annexure - V

(to be submitted by the vendor/firm on its official letter head)

Self-Certificate for Local Content

Tender No.: **No.: 2026270067/MM-13/IITR/2026-27/Real Time Simulator and C/HRE/76** **Date: 2-Jun-26**

We hereby certify that the items quoted by us against above mentioned tender no. has the local content as per below:

Local Content (in %):……

Local Supplier Class:……..

The details of the Make in India items/parts used in the quoted products is/are as under:

1
2
3

The details of the location(s) at which the local value addition made/manufactured is/are as under:

1
2
3

We also understand, false declarations will be in breach of the code of integrity under rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151(iii) of the General Financial Rules along with such other actions as may be permissible under law.

Signature:
Name:
Designation:
Seal Of the Firm/Organization:

Tender Acceptance Letter

_____
_____
_____
_____
_____

Date:

Sub: Acceptance of Terms & Conditions of Tender.

Tender No.: 2026270067/MM-13/IITR/2026-27/Real Time Simulator and C/HRE/76

Tender description:

_____
_____
_____
_____
_____

Dear Sir,

1. I/We have downloaded/ obtained the tender document(s) for the above mentioned 'Tender No.' from the web site(s) namely:
as per your advertisement, given in the above mentioned website(s).

2. I/We hereby certify that I/We have read the entire terms and conditions of the tender documents from Page No. _____ to _____ (including all documents like section(s), schedules(s) etc.), which form part of the contract agreement and I/we shall abide hereby by the terms/conditions/ clauses contained therein.

3. The corrigendum(s) issued from time to time by your department/ organisation too have also been taken into consideration, while submitting this acceptance letter.

4. I/We hereby unconditionally accept the tender conditions of above mentioned tender document(s)/ corrigendum(s) in its totality/entirety.

5. In case any provisions of this tender are found violated, then your department/organisation shall without prejudice to any other right or remedy be at liberty to reject this tender/bid including the forfeiture of the full said earnest money deposit absolutely.

Yours Faithfully,

(Signature of the Bidder, with Official Seal)

Technical Specifications: Real Time Simulator & CHIL Platform

Items/Parameters	Specification	Compliance by Supplier/OEM (Write the offered specifications as per the submitted datasheet and indicate the page number of the specification in the datasheet)
1) Real-Time Simulator Hardware		
Real Time Simulator Chassis	It Should be able to expand by just adding IO expansion chassis to add more IO (AIO/DIO) as per future requirement	
	For high-speed communication it should have optical interface with speed of 1-5Gbit/s & Minimum 2-4 SFP sockets (Small form factor pluggable)	
	Should have LED indicators for synchronization status, target computer status etc.	
	Should have Various Connectors like– JTAG, Synchronization Connector, DB37 connector, ATX computer connector, VGA Port, USB port, Ethernet 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.	
Processor & Memory Unit	It should have a Multicore CPU to simulate Power System Models in Micro Sec : Minimum Six Core CPU	
	It should also have an FPGA Processing Unit to simulate Power Electronic Models in Nano Sec	
	CPU: Intel® Core™ i5 , 6-core , 4.1 GH processor or better	
	FPGA: Xilinx Kintex7 410T FPGA, 410,000 logic cells , DSP slice (Multiplier- adder) or better	
	Memory: 16 GB RAM, 1 TB NVMe SSD drive or better	
Analog Input Channels	Minimum 16-input channels	
	Resolution 16-bit ADC or better	
	Simultaneous sampling at 2 MS/s or better	
	Voltage range ±20V or better	
	All channels simultaneously captured	
	All channels should be differential	
	Differential input impedance 1 MΩ	
	FPGA Based Control of individual channels	
	Conversion time should be directly controlled by the FPGA	
AnalogOutput Channels	Minimum 16-output channels	
	Resolution 16-bit DAC or better	
	Sampling : 1MSPS or better	
	Output Voltage range:±5V, ±10V or ±16V	
	Upto 35mA	
	All channels should be simultaneously generated	
	Reconfigurable Voltage Range	
	Maximum noise: 20 mV peak-to-peak or lower	
	FPGA Based Control	
	Update time should be directly controlled by the FPGA	
Digital Input-	Minimum 64 channels -High Range DIO	
	Each channel should have capability to perform both DIN &DO functionality	
	Each Digital channel should be software configurable for PWM/TSD/STATIC functionality	

Output Channels (DIOChannels)	Reconfigurable functionality for DIN/DO/ PWM/TSD/STATIC should be in banks of eight minimum.	
	DO: 4.5 to 25Vdc Max , up to 50 mA per channel. Maximum current per external source: 550mA.	
	DI: 0-30V , up to 3.5 mA per channel.	
	FPGA Based Control	
	In the digital input circuit, the thresholds for both high and low-level detections should be programmable per bank.	
	Reverse Voltage Protection	
	Output configuration: Push-pull	
	Output protection via resettable fuse	
	Rise / Fall time: < 40 ns, < 50 ns	
Connectivity Ports	Minimum Two Ethernet port	
	Minimum Two USB port	
	Minimum Two PCIe Slot	
	Minimum Two Encoder IN	
	Minimum Two Encoder OUT	
Capabilities	CPU simulation time step should be any time step size between 10 Microseconds to 1 Mili Secondsdepending on the Model Complexity	
	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 have the provision to edit parameters of the system during real time execution.	
	It should do Automatic Core Allocation in cases of multi-core simulation as this helps to minimize time and effort spent to allocate cores manually.	
	Should Generate PWM pulses independent of simulation clock.	
	Should Simulate Power System Network as big as IEEE 14 bus system, IEEE 24 bus system, IEEE39 bus system on CPU in Micro Sec	
	Should Perform CPU + FPGA Co-simulation .ie a single model can be simulated on CPU & FPGA at the same time in different time steps to facilitate complex power electronics and power system applications like Microgrid etc.	
	FPGA simulation time step should be any step size between 200 ns to 500 ns depending on Model Complexity	
	Should simulate power electronic switches up to 48 in number, on FPGA in Nano Sec with switching frequencies of up to 200 KHz	
	Should Generate PWM Pulses with switching frequency of up to 200 KHz	
	Should support any standard and customer power electronic Converters topologies for real time simulation. Minimum 48 converter switches.	
	Should enable sub-microsecond simulation of switching power converters, detailed IGBT/MOSFET/SIC behavior, and Hardware-in-the-Loop (HIL) testing for inverter and HVDC/STATCOM controllers.	

	Electrical machine models (induction, permanent magnet, etc.) should be possible for Modelling and simulation on FPGA	
	Transformers including Ideal Transformer , Resistor, Inductor, Capacitor, Mutual inductance and Frequency Dependent lines should be readily available to quickly create circuit designs.	
	Should support IGBT/Diode, Diode, Breaker, Thyristor, Ideal Switch and FET/MOSFET.	
	Should support multiple scenario creation for fault simulations	
	No additional toolbox or software should be required for HDL Coding	
	Should provide FPGA based high fidelity Motor models.	
	Should support Modbus Communication Protocol using TCP-IP or RTU interfaces for applications like TCP/IP based Industrial application / Supervisory control/ Microgrid controller / IoT Application / Remote communication and control application / SCADA Communication / RTU/IED/PLC Communication.	
	Should support DNP3 communication protocol for transmission and reception of data and control commands between the simulator and master systems such as RTU, gateways, remote control center and SCADA systems.	
Modelling & Programing Environment	Simulator Modelling & Programing environment needs to be Matlab/Simulink Software only.	
	It should Simulate models built in Matlab/Simulink software directly on SimulatorHardware and allow the Matlab/Simulink software 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 software 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 laballowing users to run simulations on a windows target in non-real time mode.	
	It should have specialized FPGA solver compatible with Matlab/Simulink Software programing environment for performing converter & PE Simulations on FPGA hence eliminating VHDL Coding	
	It should be compatible with other Graphical Circuit Editor software like PLECS & PSIM.	
	It should interface with FEA tools like ANSYS/Maxwell/JMAG/Infolitica and simulate motor models on FPGA and interface with the internal /external/simulated/physical controller.	
	Models in the field of Controls, Drives, Power Systems & Power Electronics compatible to Matlab/ Simulink software must be provided.	
	It should have provision for scripting language (e.g., Python).	
	It should perform different applications like Power Electronics, Power System, EV, Microgrid Controls,	

	Machines and Drives.	
	It should aid in development of custom logic & algorithms used in advanced control schemes (e.g., C s-function).	
	It should be able to use LABVIEW GUI panels	
	Operating System should be Real Time Operating System dedicated for real time simulations and it should be COTS based.	
Other Required Features & capabilities	Individual user should be able to connect through LAN.	
	Should facilitate Multi rate simulations.	
	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 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 Solar PV inverters	
	Should simulate different control schemes associated with wind energy systems using DFIG /PMSG.	
	Should simulate & Validate control algorithms of Switched Mode Power Supply (SMPS)/UPS.	
	Should control Physical converters for drives/ motors/power conversion applications/Microgrid/ Renewable Sources etc.	
	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 simulate & test industrial controls for drives such as Direct Torque Control, V/f etc.	
Licensing Software	Software Licenses provided should be perpetual licenses.	
ISO 9001:2015 compliance	Real Time Simulator should be manufactured & developed by a globally recognized manufacturer conforming to the requirements of ISO 9001:2015 standards applicable to the development manufacturing & integration of products. Proof in this regard is required to be submitted with the Bid.	
2) HIL Platform		
Controller & Processing Unit	• Dual-Core 200 MHz Controller should support C2000 based TMS320F28379D or equivalent/better. • Should be compatible with the supplied Real Time Simulator • Should be interfaced with the supplied Real Time Simulator • Should have onboard signal conditioning circuitry to meet the signal voltage and current requirement for seamless integration.	

	• Should have onboard test points/hooks for Monitoring and debugging • Should provide a pin-to-pin compatible interface between the supplied Real Time Simulator thus eliminating setup time • Master Slave Interface • Power Supply: 15VDC nominal, 2A. • Operating temperature -20 degree Celsius to 50 degrees Celsius • Should have CAN, AI, AO, DI, DO connector Ports • CAN and Sync isolation 1000V	
Input and output channels	**Digital-** Minimum 16 Ch. PWM Digital Outputs Minimum 16 Ch. Digital Inputs 0-5V voltage range **Analog –** Analog inputs differential minimum 16 Ch., ±10 V with 8 channels (16-Bit) minimum 360 ksps or up to 1.1Mbps, 8 channels (12-Bit) Minimum 430 ksps or up to 3.5Mbps	
Communication protocol	• Isolated CAN Bus data rate up to 1Mbps, isolated CAN Transceiver IC ISO1042 • Low latency master-slave Sync protocol for distributed control • Isolated USB ports for programming and debugging	•
Interfaces	• Isolated USB for In Circuit Programming & Debugging • JTAG programming and debugging port • Reset Button • USB 2.0 Fast Speed (FS) for Data • Isolated Sync (A) RJ-45 Connector • Isolated Sync (B) RJ-45 Connector • Isolated CAN (A) RJ-45 Connector • Isolated CAN (B) RJ-45 Connector • DB37 based Connectors for Analog and Digital IO interface	•
Software Compatibility	• Windows OS • MATLAB, Simulink, MATLAB Coder, Embedded Coder and Simulink Coder • TI Code Composer Studio, control SUITE, and C2000 Ware	•
Mounting type	• Tabletop use • Capability to be mounted in a rack mount with optional hardware.	•

MANDATORY QUALIFICATIONS / BIDDER ELIGIBILITY CRITERIA:

1) A bidder has to Bid all the items.
2) Since multiple hardware's are to be interfaced together hence to minimize the hardware interfacing issues (which can happen any time) all the specified items must be supplied by a single vendor
3) Bidder is required to Interface the items and has to ensure & demonstrate the same
4) **Warranty**: 3 years from the date of installation/commissioning of equipment.

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5) Commissioning and installation of the above equipment is required to be done at IIT Roorkee
6) Demonstration of real-time simulation and HIL operation is required to be done at IIT Roorkee
7) The Supplier should provide the OEM/authorization certificate.
8) Operating instructions, datasheets containing the offered specifications, and user manuals must be provided.
9) All required accessories for the above equipment such as cables, connectors, indicators, etc. should be provided.
10) All modules and software should be fully compatible with each other
11) All software should be supplied in a USB drive or should be downloadable without additional charge

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