

NOTICE INVITING DOMESTIC TENDER

Custom configured hardware unit for Ultra-Wide Band (UWB) sub nanosecond RF pulses transmission and receiving via FPGA and free space using antennas



Instrumentation and Applied Physics,
Indian Institute of Science, Bangalore

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Section 1- Bid Schedule

1	Tender No	IISC/IAP-01/CMC/2024-25
2	Tender Date	01.01.2025.
3	Item Description	<p>Custom configured hardware unit for Ultra-Wide Band (UWB) sub nanosecond RF pulses transmission and receiving via FPGA and free space using antennas.</p> <p>Scope of vendor –</p> <ol style="list-style-type: none"> 1. Custom FPGA board and RTL design according to the requirement for two transmitting, two receiving sub nano second pulses. Qty – 1. 2. RTL based multi-inputs real time correlations with adjustable delay parameter. 3. RF components as per the specifications or better (all components have 50-ohm impedance unless specified) <ol style="list-style-type: none"> a. Low Noise Amplifier (LNA) - UWB 100 MHz to 5000 MHz, 35 dB gain, +8 dB input power, Noise figure < 3 dB@2GHz. Qty – 2. b. RF Amplifier/Driver – UWB 100 MHz to 3000 MHz, 35 dB gain, +10 dB input power, output power 15 dBm@2GHz, Noise figure < 3 dB@2GHz. Qty – 2. c. Vivaldi Antennas – 1000 MHz to 6500 MHz, SWR < 2.5:1 @2GHz, realized gain > 7 dBi @2GHz, realized efficiency > 90% @2GHz. Qty – 4. 4. Pulse shaping electronics for the RF pulse receiver and input conditioning electronics for the transmitter. 5. GUI to control and monitor the status of the system as a whole. 6. The system should be developed and optimized for 500 ps FWHM UWB RF pulses creation (in FPGA), transmission (Driver), reception (LNA) and detection (in FPGA).
4	Tender Type	<p>Two bid system</p> <ol style="list-style-type: none"> (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
5	Place of tender submission	<p>Chairperson Office Ground Floor Instrumentation and Applied Physics Indian Institute of Science, Bangalore 560012</p>
6	Last Date & Time for submission of tender	22.01.2025
7	For further clarification	<p>Prof. C.M. Chandrashekar Room No: A201 Instrumentation and Applied Physics(Annex Building) Indian Institute of Science, Bangalore 560012 Email: chandracm@iisc.ac.in Phone: +91-95-6600-0369</p>

Section 2 – Eligibility Criteria

Prequalification criteria:

1. The bidder must have supplied similar systems to at least 10 educational institutes/universities and/or research organizations and at least five to the CFTI's in India along with contact details.
2. The Bidder should belong to either class 1 or class 2 supplier distinguished by their "local content" as defined by recent edits to GFR (please refer to annexure 1 attached). They should mention clearly which class they belong to in the cover letter.
 - a) Class 1 supplier: Goods and services should have local content of equal to or more than 50%.
 - b) Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.
 - c) Bidders offering imported products will fall under the category of non-local suppliers. They cannot claim themselves as Class-1 local suppliers/Class-2 local suppliers by claiming services such as transportation, insurance, installation, commissioning, training, and other sales service support like AMC/CMC, etc., as local value addition.
3. Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to Class-1 supplier.
4. MSME can seek exemption to some qualification criteria. IISc follows GFR2017 for such details
5. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 4.
6. The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3.
7. Original Invoice, Original Warranty Certificate, Original Test Reports should be produced for all imported items from OEM (Original Equipment Manufacturer) at the time of supply of the equipment's.
8. System Catalogue should be produced with the Technical Bid.
9. Manufacturers should have ISO or equivalent international standard certificate. Please attach the required certificate with the bid.
10. Supplier will support the user with all the spares for a minimum period of 5 years.
11. Details of experienced service engineering including contact details should be provided in tender document.
12. Bidder shall have to submit audited accounts (Balance sheet profit and loss account) for the last three financial years 2020-21, 2021-22 and 2022-23. Audited statement must be signed and stamped by qualified chartered accounts.
13. The bidder must submit Income Tax return for assessment year – 2020-21, 2021-22 and 2022-23.
14. The bidder must submit up to date sales tax or GST clearance certificate.
15. **CE Certification must be provided for the proposed system. The CE certificate should be provided with the Unit.**

Section 3 – Terms and Conditions

A) Submission of Tender:

1. All documentations in the tender should be in English. However, if the documentation is any other language, the bidder should provide the translated version to English. If there is any discrepancy between both versions, the English version will be considered authentic and valid
2. Tender should be submitted in two envelopes (two bid systems).
 - a. Technical Bid (Part-A) – Technical bid consisting of all technical details and check list for conformance to technical specifications.

The technical proposal should contain a technical compliance table with 5 columns.

- i. The first column must list the technical requirements, in the order that they are given in the technical requirement below.
 - ii. The second column should provide specifications of the instrument against the requirement. Please provide quantitative responses wherever possible with technical details in annexure.
 - iii. The third column should describe your compliance with a “Yes” or “No” only. Ensure that the entries in column 2 and column 3 are consistent.
 - iv. The fourth column should state the reasons/explanations/context for deviations, if any.
 - v. The fifth column can contain additional remarks from the OEM. You can use this opportunity to highlight technical features, qualify response of previous columns, or provide additional details.
- b. Commercial Bid (Part-B) – Indicating item wise price for the items mentioned in the technical bid, **as per the format of quotation provided in tender**, and other commercial terms and conditions.

3. The technical bid and price bid should each be placed in separate sealed covers, superscripting on both the envelopes the tender no. and the due date. Both these sealed covers are to be placed in a bigger cover which should also be sealed and duly subscripted with the Tender No, Tender Description & Due Date.
4. The SEALED COVER superscripting tender number / due date & should reach Chairperson Office, Instrumentation and Applied Physics, Indian Institute of Science, Bangalore – 560012, India on or before due date mentioned in tender notice. In case the due date happens to be a holiday the tender will be accepted and opened on the next working day. If the quotation cover is not sealed, it will be rejected.
5. All queries are to be addressed to the person identified in “Section 1 – Bid Schedule” of the tender notice.

6. The price must be quoted in INR (Indian Rupee). Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor. The quotations should be on FOR-IISc Bangalore basis in INR only.
7. If price is not quoted in Commercial Bid as per the format provided in tender document the bid is liable to be rejected.
8. The Institute reserves the right to accept or reject any bid and to annul the bidding process and reject all bids at any time prior to the award of contract, without thereby incurring any liability to the affected bidder or bidders or any obligation to inform the affected bidder or bidders.
9. Incomplete bids will be summarily rejected.

B) Cancellation of Tender:

Notwithstanding anything specified in this tender document, IISc Bangalore, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:

- a. To accept OR reject lowest tender or any other tender or all the tenders.
- b. To accept any tender in full or in part.
- c. To reject the tender, offer not confirming to the tender terms.

C) Validity of the Offer:

The offer shall be valid at least 90 Days from the date of opening of the commercial bid.

D) Evaluation of Offer:

1. The technical bid (Part A) will be opened first and evaluated.
2. Bidders meeting the required eligibility criteria as stated in Section 2 of this document shall only be considered for Commercial Bid (Part B) opening. Further, agencies not furnishing the documentary evidence as required will not be considered.
3. Pre-qualification of the bidders shall not imply final acceptance of the Commercial Bid. The agency may be rejected at any point during technical evaluation or during commercial evaluation. The decision in regard to acceptance and / or rejection of any offer in part or full shall be the sole discretion of IISc Bangalore, and the decision in this regard shall be binding on the bidders.
4. The award of contract will be subject to acceptance of the terms and conditions stated in this tender.
5. Any offer which deviates from the vital conditions (as illustrated below) of the tender is liable to be rejected:
 - a. Non-submission of complete offers.
 - b. Receipt of bids after due date and time and or by email / fax (unless specified otherwise).
 - c. Receipt of bids in open conditions.

6. In case any BIDDER is silent on any clauses mentioned in these tender documents, IISc Bangalore shall consider that the BIDDER had accepted the clauses as of the tender and no further claim will be entertained. Further if the BIDDER is silent or does not give detail justification of their claim regarding those mentioned in technical specifications, IISc Bangalore reserves the full right to reject the tender due to non-compliance without any further discussion.
7. No revision in the terms and conditions quoted in the offer will be entertained after the last date and time fixed for receipt of tenders.
8. Lowest bid will be calculated based on the total price of all items tendered for Basic equipment along with accessories selected for installation, operation, preprocessing and post processing, optional items, recommended spares, warranty, annual maintenance contract.

E) Pre-requisites:

The bidder will provide the prerequisite installation requirement of the equipment along with the technical bid.

F) Warranty:

The complete system is to be under warranty period of minimum 3 years (year wise breakup value should be shown in the commercial bid) including free supply of consumables, spare parts and data analysis software from the date of functional installation. If the instrument is found to be defective, it has to be replaced or rectified at the cost of the bidder within 30 days from the date of receipt of written communications from IISc, Bangalore. If there is any delay in replacement or rectification, the warranty period should be correspondingly extended.

G) Annual Maintenance Contract:

An annual maintenance contract for a period of at least 3 years post warranty should be provided on completion of the warranty period. The AMC costs will not be considered towards classifying the domestic nature (class 1 or class 2) of the vendor (see eligibility criteria in section 2). In the bid AMC charge should also be provided.

H) Purchase Order:

1. The order will be placed on the bidder whose bid is accepted by IISc based on the terms & conditions mentioned in the tender document.
2. The quantity of the items in tender is only indicative. IISc, Bangalore reserves the right to increase /decrease the quantity of the items depending on the requirement.
3. If the quality of the product and service provided is not found satisfactory, IISc, Bangalore reserves the right to cancel or amend the contract.

I) Delivery, Installation and Training:

The bidder shall provide the lead time to delivery, installation and made functional at IISc, Bangalore from the date of receipt of purchase order. The system should be delivered, installed and made functional **within 180 days**, from the date of receipt of purchase order. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and inspection of all the items and features/capabilities tested by the IISc, Bangalore. After successful installation and inspection, the date of taking over of the entire system by the IISc, Bangalore, shall be taken as the start of the warranty period. No partial shipment is allowed.

The bidder should also arrange for technical training to the local facility technologists and users.

J) Payment Terms:

100% payments (except AMC) will be released after completion of delivery and satisfactory installation subject to TDS as per rules. AMC costs (if ordered), after completion of warranty period) will be released on a half-yearly basis at the end of each six months subject to satisfactory services. The AMC will be comprehensive. Price basis must be on FOR-IISc Bangalore basis only. As per GFR no advance payment can be made to domestic vendors, unless an equal amount of bank guarantee is provided.

K) Statutory Variation:

Any statutory increase in the taxes and duties subsequent to bidder's offer, if it takes place within the original contractual delivery date, will be borne by IISc, Bangalore subject to the claim being supported by documentary evidence. However, if any decrease takes place the advantage will have to be passed onto IISc, Bangalore.

L) Disputes and Jurisdiction:

Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Bangalore, India.

M) General:

1. All amendments, time extension, clarifications etc., within the period of submission of the tender will be communicated electronically. No extension in the bid due date/time shall be considered on account of the delay in receipt of any document(s) by mail.
2. The bidder may furnish any additional information, which is necessary to establish capabilities to successfully complete the envisaged work. It is, however, advised not to furnish superfluous information.
3. The bidder may visit the installation site before submission of tender, with prior intimation.
4. Any information furnished by the bidder found to be incorrect, either immediately or at a later date, would render the bidder liable to be debarred from tendering/taking up of work in IISc, Bangalore.

Section 4 – Technical Specifications

A. Technical Specifications of Custom configured hardware unit for Ultra-Wide Band (UWB) sub nanosecond RF pulses transmission and receiving via FPGA and free space using antennas.

Sl. No	Description	Specification/Details	Essential/non-essential
1.	Number of total inputs	8	essential
2.	Time tag resolution of inputs	100 picoseconds	essential
3.	Number of RF Transmitters	2	essential
4.	Number of RF Receivers	2	essential
5.	RF Pulse FWHM	500 picoseconds	essential
6.	Coincidence Histogram	Real time	essential
7.	Coincidence scan resolution	100 picoseconds	essential
8.	Maximum pulse rate	100 MSPS	essential
9.	Optimized RF frequency	2 GHz	essential
10.	Ultra-wide band range	1 - 6 GHz	essential
11.	Coincidence delay step	< 500 picoseconds	essential
12.	Realized total transmission gain	> 30 dB	essential
13.	Realized total receiver gain	> 30 dB	essential
14.	Total noise figure	< 8 dB	essential
15.	Software to control the system	Must be included	
16.	Compliance sheet	A compliance sheet as mentioned below must be provided with proper details and supporting documents. All technical documents pre-qualification details and supporting documents should be in the technical bid and not in finance.	Essential

B. Compliance sheet of Custom configured hardware unit for Ultra-Wide Band (UWB) sub nanosecond RF pulses transmission and receiving via FPGA and free space using antennas.

Sl. No	Description	Specification/Details	Essential/non-essential	Yes/No (to be filled up by the vendor)
1.	Number of total inputs	8	essential	
2.	Time tag resolution of inputs	100 picoseconds	essential	
3.	Number of RF Transmitters	2	essential	
4.	Number of RF Receivers	2	essential	
5.	RF Pulse FWHM	500 picoseconds	essential	
6.	Coincidence Histogram	Real time	essential	
7.	Coincidence scan resolution	100 picoseconds	essential	
8.	Maximum pulse rate	100 MSPS	essential	
9.	Optimized RF frequency	2 GHz	essential	
10.	Ultra-wide band range	1 - 6 GHz	essential	
11.	Coincidence delay step	< 500 picoseconds	essential	
12.	Realized total transmission gain	> 30 dB	essential	
13.	Realized total receiver gain	> 30 dB	essential	
14.	Total noise figure	< 8 dB	essential	
15.	Software to control the system	Must be included		
16	Details of other purchase order of the same equipment with same technical specifications (Multi-Tasking System). The bidder must have supplied similar systems to at least 5 educational institutes/universities and/or research organizations .		Essential. Please attach all the details	
17.	2. The Bidder should belong to either class 1 or class 2 supplier distinguished by their "local content" as defined by		Essential	

	recent edits to GFR (please refer to annexure 1 attached). They should mention clearly which class they belong to in the cover letter.			
18.	a) Class 1 supplier: Goods and services should have local content of equal to or more than 50%.		Essential	
19.	b) Class 2 supplier: Goods and services should have local content of equal to or more than 20 % and less than 50%.		Essential. Please attach all the details.	
20.	The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per -Annexure 4		Essential	
21.	The Bidder must not be blacklisted/banned/suspended or have a record of any service-related dispute with any organization in India or elsewhere. A declaration to this effect has to be given as per Annexure 3		Essential	
22.	System Catalogue should be produced with the Technical Bid		Essential	
23.	Manufacturer should have ISO or equivalent international standard certificate. Please attach the required certificate with the bid.		Essential	

5. Training and demonstration

- Complete installation of the system needs to be provided
- Training for users by the company personnel present 'on-site' immediately after the installation.
- All pre-installation requirements to have the system installed in ideal room conditions should be included in the quote.

6. Others

- The system with similar specifications must submit references from previous installations.
- The names and contact addresses of the referees must be submitted with the proposal, so the purchase committee can contact them independently.
- The system should require minimal maintenance.

- Mention the recommended preventive maintenance schedule for the system. Any accessories needed for periodic preventive maintenance for 3 years should be mentioned in separately the itemized quote.
- Can the preventive maintenance be done by a trained on-site engineer or requires a specialist from the OEM? If the latter, please provide cost of a 3-year AMC with required kit/consumables.
- **CE Certification must be provided for the proposed system. The CE certificate should be provided with the Unit.**
- Operation Manual to be given after installation and acceptance of equipment
- The system should be supported by a trained local representative (contact details must be shared) and should have a minimum of 72-hour window of response.

Section 5- Technical Bid

The technical bid should furnish all requirements of the tender along with all annexures in this section and submitted to

The Chairperson,
Attn: Prof. C.M. Chandrashekar
Instrumentation and Applied Physics,
Indian Institute of Science
Bangalore – 560012, India

Annexure-1:

Details of the Bidder

The bidder must provide the following mandatory information & attach supporting documents wherever mentioned:

Details of the Bidder

Sl. No	Items	Details
1.	Name of the Bidder	
2.	Nature of Bidder (Attach attested copy of Certificate of Incorporation/ Partnership Deed)	
3.	Registration No/ Trade License, (attach attested copy)	
4.	Registered Office Address	
5.	Address for communication	
6.	Contact person- Name and Designation	
7.	Telephone No	
8.	Email ID	
9.	Website	
10.	PAN No. (attach copy)	
11.	GST No. (attach copy)	

Signature of the Bidder

Name
Designation, Seal

Date:

Annexure-2:

Declaration regarding experience

To,
The Chairperson,
Instrumentation and Applied Physics,
Indian Institute of Science
Bangalore – 560012, India

Ref: Tender No: IISC/IAP-01/CMC/2024-25

Dated: 01.01.2025

Custom configured hardware unit for Ultra-Wide Band (UWB) sub nanosecond RF pulses transmission and receiving via FPGA and free space using antennas at Quantum Optics and Quantum Information (QQI), IAP IISC Bangalore.

Sir,

I've carefully gone through the Terms & Conditions contained in the above-mentioned tender. I hereby declare that my company / firm has ---- years of experience in supplying and installing Confocal systems.

(Signature of the Bidder)

Printed Name

Designation, Seal Date:

Annexure-3:

Declaration regarding track record

To,
The Chairperson,
Instrumentation and Applied Physics,
Indian Institute of Science
Bangalore – 560012, India

Ref: Tender No: IISC/IAP-01/CMC/2024-25
Dated: 01.01.2025

Custom configured hardware unit for Ultra-Wide Band (UWB) sub nanosecond RF pulses transmission and receiving via FPGA and free space using antennas at Quantum Optics and Quantum Information (QOQI), IAP IISC Bangalore.

Sir,

I've carefully gone through the Terms & Conditions contained in the above-mentioned tender. I hereby declare that my company/ firm is not currently debarred /blacklisted by any Government / Semi Government organizations / institutions in India or abroad. I further certify that I'm a competent officer in my company / firm to make this declaration.

Or

I declare the following

Sl.No	Country in which the company is Debarred /blacklisted / case is Pending	Blacklisted / debarred by Government / Semi Government/Organizations /Institutions	Reason	Since when and for how long

(NOTE: In case the company / firm was blacklisted previously, please provide details regarding period for which the company / firm was blacklisted and the reason/s for the same).

Yours faithfully
(Signature of the Bidder)

Name
Designation, Seal

Date:

Annexure – 4:

Declaration for acceptance of terms and conditions

To,
The Chairperson,
Instrumentation and Applied Physics,
Indian Institute of Science
Bangalore – 560012, India

Ref: Tender No: IISC/IAP-01/CMC/2024-25
Dated: 01.01.2025

Custom configured hardware unit for Ultra-Wide Band (UWB) sub nanosecond RF pulses transmission and receiving via FPGA and free space using antennas at Quantum Optics and Quantum Information (QOQI), IAP IISC Bangalore.

Sir,

I've carefully gone through the Terms & Conditions as mentioned in the above-mentioned tender document. I declare that all the provisions of this tender document are acceptable to my company. I further certify that I'm an authorized signatory of my company and am, therefore, competent to make this declaration.

Yours faithfully,

(Signature of the Bidder)
Name
Designation, Seal

Date:

Annexure – 5:

Details of items quoted:

- a. Company Name
- b. Product Name
- c. Part / Catalogue number
- d. Product description / main features
- e. Detailed technical specifications
- f. Remarks

Instructions to bidders:

1. Bidder should provide technical specifications of the quoted product/s in detail.
2. Bidder should attach product brochures along with technical bid.
3. Bidders should clearly indicate compliance or non-compliance of the technical specifications provided in the tender document.

Section 6 – Commercial Bid

The commercial bid should be furnished with all requirements of the tender with supporting documents as mentioned under:

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Essential items noted in the technical specification				
1.a	... (details of essential items)				
1.b	...				
2.	Optional items noted in the technical specification				
2.a	... (details of essential items)				
2.b	...				
3.	Accessories for operation and installation				
4.	All Consumables, spares and software to be supplied locally				
5.	Warranty (1 year)				
6.	AMC 2 years beyond warranty				
7.	Cost of Insurance				
8.	Freight on Road				

Any additional items

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total

Addressed to

The Chairperson,
 Attn: Prof. C.M. Chandrashekar
 Instrumentation and Applied Physics,
 Indian Institute of Science
 Bangalore – 560012, India

Section 7 – Checklist

(This should be enclosed with technical bid- Part A)

The following items must be checked before the Bid is submitted:

1. Sealed Envelope “A”: Technical Bid

1. **Section 5- Technical Bid (each page signed by the authorized signatory and sealed) with the below annexures:**
 - a. **Annexure 1: Bidders details**
 - b. **Annexure 2: Declaration regarding experience**
 - c. **Annexure 3: Declaration regarding clean track record**
 - d. **Annexure 4: Declaration for acceptance of terms and conditions**
 - e. **Annexure 5: Details of items quoted**
2. **Copy of this tender document duly signed by the authorized signatory on every page and sealed.**

2. Sealed Envelop “B”: Commercial Bid

Section 6: Commercial Bid

Your quotation must be submitted in two envelopes: Technical Bid (Envelope A) and Commercial Bid (Envelope B) super scribing on both the envelopes with Tender No. and due date and both of these in sealed covers and put in a bigger cover which should also be sealed and duly super scribed with Tender No., Tender description & Due Date.