

Global Tender

This is a Request for Quote (RFQ) from all vendors for supply and installation of **high-speed control electronics for a multi-qubit quantum processor** at Department of Physics, IISc Bangalore.

Section 1 - Bid Schedule

1	Tender No	IISC-PHY-VBSI/608/26-27
2	Tender Date	28.04.2026
3	Item Description	High-speed control electronics for a multi-qubit quantum processor
4	Tender Type	Two bid system (i) Technical Bid (Part A) (ii) Commercial Bid (Part B)
5	Place of tender submission	Chairperson's Office Department of Physics, Indian Institute of Science, Bangalore 560012 Attn: Dr. Vibhor Singh
6	Last Date & Time for submission of tender	22.05.2026
7	For further clarification	Dr. Vibhor Singh Associate Professor, Department of Physics, Bangalore 560012 Email: vsingh@iisc.ac.in

Section 2 – Eligibility Criteria

Prequalification criteria:

1. The Bidder's firm should have existed for at least 3 years. Bidders should enclose a self-declaration.
2. Only the Original Equipment Manufacturer or their authorized representatives across the globe shall participate in the bid.
3. The order will be placed only on the bidder who participated in the bid.
4. Foreign currency quotations should be on CIP Bangalore basis. INR quotes should be on a FOR-IISc Bangalore basis.
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 must be given as per Annexure 3.

Section 3 – Terms and Conditions

A) Submission of Tender:

1. All documentation in the tender should be in English.
2. Tenders should be submitted in two envelopes (a two-bid system).
 - a. Technical Bid (Part-A) – Technical bid consisting of all technical details and checklist 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 instrument specifications against the requirement. Please provide quantitative responses wherever possible.
 - 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 responses of previous columns, provide additional details, compare your solution with that of your competitors, or provide details as requested in the technical requirements table below.
- 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 the tender**, and other commercial terms and conditions.
3. The technical bid and price bid should be placed in **separate sealed covers**, superscribing on both the envelopes the tender description, 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 superscripted with the Tender No, Tender Description & Due Date.
 4. The SEALED COVER should reach the **Chairperson Office, Department of Physics, Indian Institute of Science, Bangalore – 560012**, India, on or before the due date mentioned in the tender notice. If the due date is a holiday, the tender will be accepted 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. GST/other taxes, levies, etc., should be indicated separately. The BIDDER should mention GST Registration and PAN in the tender document.
7. If the price is not quoted in the Commercial Bid as per the format provided in the tender document, the bid is liable to be rejected.
8. The purchase committee reserves the right to accept or reject any bid and annul the bidding process and reject all bids at any time prior to the award of the 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, the IISc purchase committee, in its sole discretion, unconditionally and without having to assign any reason, reserves the rights:

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

C) Validity of the Offer:

The offer shall be valid 90 Days from the commercial bid’s opening date.

D) Evaluation of Offer:

1. The technical bid (Part A) will be opened first and evaluated.
2. Bidders meeting the required eligibility criteria 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 the 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 the due date and time 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 construe that the BIDDER has accepted the clauses as of the tender, and no further claim will be entertained.
7. No revision of 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 the basic equipment along with accessories selected for installation, operation, preprocessing and post-processing, optional items, recommended spares, warranty, and annual maintenance contract. The purchase committee is looking for the most cost-effective solution for obtaining a new tool. Vendors are encouraged to propose all avenues, including but not limited to buy back of the existing tool, turnkey upgrade of existing tool or purchase of a new tool.

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 for a minimum period of 1 year. IISc prefers 3 years warranty. The vendor should include the cost of any spares expected to be needed during the warranty period, including electronics, subcomponents, and software. If the instrument is defective, it has to be replaced or rectified at the bidder's cost within 30 days from receipt of written communications from IISc, Bangalore. If there is any delay in replacement or rectification, the warranty period should be extended.

G) SPARES:

Vendors must provide a detailed list of spares and a user manual with a detailed Bill of Materials for all Parts. It should include the Spares Column with the Manufacturer part Number, and Qty. The vendor should guarantee availability of service and stocks for 7 Years.

H) Purchase Order:

The quantity of the items in the tender is only indicative. IISc, Bangalore reserves the right to increase /decrease the quantity of the items depending on the requirement.

If the product and service quality 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 the purchase order. The system should be delivered, installed, and made functional within 10 weeks from receipt of purchase order. The supply of the items will be considered as effected only on satisfactory installation and inspection of the system and the inspection of all the items and features/capabilities tested by the IISc, Bangalore. **For acceptance, the vendor must demonstrate the technical specifications mentioned in the tender.** 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 for the local facility technologists and users.

J) Payment Terms:

For INR quotes, 100% payments (except AMC) will be released after completion of delivery, satisfactory installation, and qualification, subject to TDS as per rules. As per GFR no advance payment can be made to domestic vendors unless an equal amount of bank guarantee is provided. For INR quotes, the price must be on FOR-IISc Bangalore basis only.

For quotes in foreign currency, the quote must be on a CIP Bangalore basis. The

payment terms for the foreign currency quotes should be mentioned along with the commercial offer.

AMC costs (if ordered after completion of the warranty period) will be released on a half-yearly basis at the end of each six months, subject to satisfactory services.

K) Statutory Variation:

Any statutory increase in the taxes and duties subsequent to the 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 on to IISc, Bangalore.

L) Disputes and Jurisdiction:

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

M) General:

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

Section 4 – Technical Specifications

Technical specification for control electronics for a multi-qubit quantum processor

The requirements of the control electronics for a multi-qubit quantum processor have been broken down into following different sections: (i) High frequency Input channel configuration (ii) High frequency Output channel configuration, (iii) Low frequency output channel configuration, (iv) Optional item - Low phase noise microwave channels for TWPA pumps

The number of required I/O channels for (i), and (ii) must be met by using 3 or more chassis.

Software and other general specifications are listed in section (v) and (vi).

(i) High frequency input channel configuration:

SN	Specification	values
1.	Total number of analog channels required (readout analysis)	6
2.	Frequency range (each channel)	2 GHz – 8.5 GHz
3.	Simultaneous, frequency-multiplexed readout of qubits (each channel)	At least 8 qubits
4.	Instantaneous Bandwidth	750 MHz or wider
5.	A/D conversion	12-bit resolution or better
6.	Input power range	-40 dBm to -10 dBm or wider
7.	Input impedance	50 Ohm
8.	Input channel type	SMA-F
9.	Sampling rate	1 GSPS per I/Q quadrature or better

(ii) High frequency output channels configuration:

SN	Specification	values
1.	Total number of analog channels required (control +readout generation)	40 (or more)
2.	Frequency range (each channel)	2GHz – 8.5 GHz
3.	Arbitrarily shaped microwave pulses	Yes
4.	Instantaneous Bandwidth	800 MHz or wider
5.	D/A conversion; Vertical resolution	14-bit
6.	Waveform sampling rate	1 GSPS or more for each I/Q quadrature
7.	Number of Digital outputs	1 or more
8.	Max output power range	+10 dBm or more
9.	Output impedance	50 Ohm
10.	Output channel type	SMA-F
11.	CW operation parameters	
12.	Phase noise	< -110 dBc/Hz at 5 GHz, 10 kHz offset < -138 dBc/Hz at 5 GHz, 10 MHz offset
13.	Worst harmonic component	40 dBc or higher at 0 dBm
14.	Spurious free dynamic range (SFDR)	48 dBc or higher at 0 dBm

(iii) Low-frequency output channel configuration:

SN	Specification	values
1.	Total number of analog channels required	40 (or more)
2.	Frequency range (each channel)	DC-750MHz or wider
3.	Arbitrarily shaped microwave pulses	Yes
4.	D/A conversion; Vertical resolution	16-bit
5.	Waveform sampling rate	1 GSPS or more for each quadrature
6.	Number of Digital outputs	1 or more
7.	Voltage range:	5 Vpp or larger.
8.	Output impedance	50 Ohm
9.	Output channel type	SMA-F
10.	CW parameters	
11.	Phase noise	-135 dBc/Hz at 100 MHz with 10 kHz offset
12.	Worst harmonic component	60 dBc for 4 dBm range
13.	Spurious free dynamic range (SFDR)	55 dBc
14.	Voltage noise	12 nV/sqrt(Hz) > 200 kHz, into high impedance

(iv) Optional item - Low phase noise microwave channels for TWPA pumps:

SN	Specification	values
1.	Total number of channels required	6 (or more)
2.	Frequency range (each channel)	4-10 GHz or wider
3.	Frequency resolution	1kHz or better
4.	Max power	0 dBm at 10 GHz.
5.	Power resolution	0.01 dB or better
6.	Output level drift	0.02 dB/24 hr or better
7.	Output impedance	50 Ohm
8.	Output channel type	SMA-F
9.	CW parameters	
10.	Phase noise@10GHz carrier	-95 dBc/Hz@1kHz -115 dBc/Hz@1 MHz -145dBc/Hz@10 MHz
11.	Reference Input/Output	10/100 MHz with SMA, 50 Ohm port

(v) Software:

1. The Device must be controllable via pulse-level language compatible with Python API and with real-time processing. Comprehensive API documentation must be provided, including programming examples. The Device should be easy to install and program.
2. The Device must allow the possibility of programming new custom sequences, with access to FPGA logic, including conditional statements, without need to implement or understand low-level FPGA-based programming
3. If the software or part of the software required to control the Device is not open source, the license must allow installing and using the control software on multiple computers. It must not be tied to a single control computer. The license must include software updates for at least 5 years.
4. Open-source Qubit calibration software with visual must be included without extra cost.

(vi) General specifications:

1. Due to complexity of the project, the proposed system must have been purchased and actively used by at least 10 superconducting quantum computing systems (at least 5 qubits size) in the last two years. References must be provided.
2. The device must be able to control superconducting qubits with measurement-based feedback control.
3. The device must be based on a scalable and modular architecture with large number of channel count, and synchronization between all the channels, low latency between input and output channels.
4. Standard operation of the Device must not require any external MW hardware such as mixers, couplers, splitters, signal generators, switches, or spectrum analyzers. Microwave signal generation must require no IQ calibration procedures.
5. The Device must be in a form factor that fits into a standard 19" rack. Rack mounting hardware (rails, handles etc.) should be included with the Device.
6. The Device architecture must integrate a classical processor directly with the analog front-end to enable parametric waveform generation, waveform acquisition, data processing and control flow on the hardware.
7. The device architecture must ensure high density of control channels for the measurement system with low feedback latency, which must be measured with last sample in and first sample out. Feedback latency should be below 360 ns within one instrument or module, and below 550 ns between any module. Such decision-based feedback must be possible between any readout and any output channel of the Device.

Section 5- Technical Bid

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

The Chairperson,
Attn: Dr. Vibhor Singh
Department of 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 an 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,
Department of Physics,
Indian Institute of Science,
Bangalore – 560012, India

Ref: Tender No: XXXXXXXXX

Dated: XXXXX

Dear Sir/Madam

I've carefully reviewed the Terms & Conditions in the above-referred tender. I hereby declare that my company/firm has -----years of experience in supplying and installing the proposed equipment.

(Signature of the Bidder)

Printed Name

Designation, Seal Date:

Annexure-3:

Declaration regarding track record

To,
The Chairperson,
Department of Physics,
Indian Institute of Science,
Bangalore – 560012, India

Ref: Tender No: XXXXXXXX
Dated: XXXXX

Dear Sir/Madam,

I've carefully reviewed the Terms & Conditions in the above-referred 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 the details regarding the 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,
Department of Physics,
Indian Institute of Science,
Bangalore – 560012, India

Ref: Tender No: XXXXXX
Dated: XXXX

Dear Sir/Madam,

I've carefully reviewed the Terms & Conditions mentioned in the above-referred 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 the technical bid.
3. Bidders should clearly indicate compliance or non-compliance with 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:

Addressed to

The Chairperson,
 Attn: Dr. Vibhor Singh
 Department of Physics,
 Indian Institute of Science
 Bangalore – 560012, India

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 (3 years)				
6.	AMC 3 years beyond warranty				

Any additional items such as Spares and Hardware/PCB'S/Other items Likely to going Obsolete after the next 3 Years

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

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 Envelope “B”: Commercial Bid

Section 6: Commercial Bid

Your quotation must be submitted in two envelopes: **Technical Bid (Envelope A) and Commercial Bid (Envelope B)** superscribing on both the envelopes with, Tender description, 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.