



Indian Institute of Science Bangalore

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560012, Bangalore, Karnataka, India

Inquiry Number: DESE/LU/MSA/14/2023-2024

Dated: 02/11/2023

Request for Quote from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor for the procurement of Single photon source measurement setup

**Indian Institute of Science, Bangalore
(Last Date: 23/11/ 2023)**

Dear Sir/Madam,

Kindly send your best price quotation (in INR only) for the following item with various accessories on FOR-IISc Bangalore basis to the undersigned. Your quotation should clearly indicate the terms of delivery, delivery schedule, entry tax, payment terms, etc.

Your quote should also include mode of payment and **should reach the undersigned, duly signed on or before 10:00 hours (IST) on 23/11/2023.**

The quote must include all details of technical specifications of the equipment along with the commercial terms and conditions, the bill of materials, printed technical brochure and any other supporting document. **Please enclose a compliance certificate, printed on your letter head, along with the quote.**

The commercial bid must include the price of the item in Indian currency, indicating the following separately:

- FOR price
- Freight and Insurance
- Post warranty maintenance charges
- Tax
- Total

The quotation should address to:

The Chairman,
Department of Electronic Systems Engineering
Indian Institute of Science, Bangalore – 560012



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I. Technical Specifications of Different Parts and Features of the Single photon measurement setup

The general specification of the Single photon sources characterization setup is as below:

S/N	Item Description
	Technical Specifications
1	Single photon avalanche diode (SPAD)x2
1.1	The operating wavelength of Single photon counting module should be 400-1064 nm at room temperature, i.e., requiring no liquid Helium/Nitrogen transfer for the cool-down process.
1.2	A gating function is required with each module which is useful for viewing a signal that occurs only in a small timeframe window. Also, in some applications the background light flux is higher than the signal. In this case, the gating option could be used to improve the S/N ratio by opening a window only when the light signal is present.
1.3	The power supply must be able to support between 4.8 – 5.25V, and up to 1.2A current. Whether it's a linear or switch type of supply is not critical as long as the ripple and noise is kept below 50mV.
1.4	Photon detection efficiency should be more than 60% @600-650 nm
1.5	Dark count should be less than 100 counts/sec
1.6	Detectors must have options for fiber coupling with fiber connector
1.7	Output pulse width should be equal or less than 10 ns
1.8	Device active area at minimum photon detection efficiency 180 μm
2	Time tagging module (TTM)
2.1	Time Correlated Single Photon Counting module (TCSPC) with USB 2.0 connection
2.2	This module should have two independent channels with 4 ps temporal resolution suited for 1 sync & 1 detector for PL lifetime measurements or for 2 detectors for the coincidence count measurements.
2.3	Time tagger should be able to histogram with 65535-time bins and 16-bit depth, including data acquisition software
3	Data acquisition software and analysis
3.1	Quantum Correlation Analysis Software, Antibunching ($g^2(\tau)$) measurements including fitting to several models, coincidence counting/event filtering, real time preview of antibunching curve and correlation measurements
3.2	Photoluminescence lifetime data analysis software for TRPL measurements
4	Tunable bandpass filter
4.1	Tunable optical bandpass filter to filter out unwanted signal from the nearby emitters. This filter should offer wavelength tunability over a wide range of wavelengths by adjusting the angle of incidence.
4.2	Filters should cover wavelengths from 560 nm to 700 nm by tuning the incident angle from 0-60 ⁰ . CWL@0 ⁰ should be 627 and 704 nm. CWL@60 ⁰ should be 561.5 and 627.8 nm for the two required filters. Average transmission should be more than 80-85% with a bandwidth of 12 nm. Blocking band at 0 ⁰ should be 275-1100 nm with >OD6.

E-mail : mayank@iisc.ac.in (write to msdlab.esse@iisc.ac.in for tender related queries)
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4.3	Filter holder is required to place this on the optical table. Transverse dimension of the filter should be 25.2 mm x 35.6 mm with a thickness of 2 mm.
4.4	High Damage threshold and polarization insensitivity
5	Monochromator
5.1	Resolution < 3 nm
5.2	Wavelength range = 300 – 1100 nm
6	Free space optical components I. Free space 50:50 Non-polarizing Beam Splitter II. 30 mm cage system mountable 50:50 Non-polarizing Beam Splitter III. Flip mirror IV. Plano-convex Lenses (f = 5 cm) (Quantity = 2) V. 10X objective (Quantity = 2)
7	Opto-mechanical Components I. Free space beam splitter holder II. Tuneable bandpass filter holder III. Lens holder IV. 10X objective holder and adapter to the 30 mm cage system (Quantity = 2) V. Z axis stage for the SPADs (Quantity = 2)
8	System Control Configuration
8.1	A system PC and all other electronic components should be integrated into the system frame.
8.2	The system control PC should include a minimum of an Intel I5 processor; 4GB of memory; Windows 11/10 Embedded OS; and at least 19" LCD monitor. The costing must be given separately.
9	Site Installation, Training & Support
9.1	On-site installation support and commissioning should be provided for no cost.
9.2	Training on equipment maintenance to be provided.
9.3	The tenderer should be able to provide support and problem diagnosis service.
10	Certifications
10.1	The system shall bear CE marking or equivalent in compliance and the vendor should demonstrate a track record of selling similar systems worldwide.

Other Necessities

- Should include a written guide (tutorial) as well as a demonstration of how to operate the system.
- The setup should include all the hardware and software modules that are necessary for the system setup.
- Please provide the details about the required equipment that need to be purchased separately (if any).
- Packing freight and Installation cost should be included.

II. Optional Items

- Supercontinuum Pulsed Laser with wavelength tuneable filters:

Required Technical Specifications for the Supercontinuum Pulsed laser:

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A. Supercontinuum Laser

1. Minimum Wavelength: 400 nm or less
2. Maximum Wavelength: 2400 nm or more
3. Total average power: 4W or more
4. Spectral power density: The laser should provide 1mW/nm or more at the output in the entire range of 400nm to 2400 nm. Please provide spectral power density data.
5. Power stability: $< \pm 1\%$ in the long term. Please provide data.
6. Minimum power in the range of $< 850\text{nm}$: 750 mW
7. Spatial mode: Single spatial mode across the output spectrum
8. Polarization state: unpolarized
9. Output: collimated. Please specify the output beam diameter and divergence as a function of wavelength.
10. Armoured fiber length: 1m or more
11. Cooling: Integrated air cooling.
12. Please mention operating temperature range.
13. Power requirement: Must provide all necessary adapters that are compatible in India.
14. Provision for pulsing the laser in ps timescale

B. Tunable filters:

1. The vendor must provide appropriate tunable filters to cover the entire range of 400-2400 nm. The vendor has the flexibility in choosing the number of filters depending on the range of individual filters. The vendor must provide the price of individual filters.
 2. Bandwidth: $< 8\text{ nm}$ in the range up to 1100 nm and $< 20\text{ nm}$ above 1100 nm.
 3. Transmission efficiency: $> 40\%$ in the entire range.
 4. Shutter: integrated.
 5. Spatial mode: single mode
 6. Polarization: Linear polarization
 7. Output: The vendor must provide separate pricing for free space and fiber coupled output options.
 8. All necessary interfacing between the laser and the filter must be included.
- Please provide a separate letter indicating annual maintenance charges (AMC) post warrantee / guarantee period.

III. Additional Items (Must be added to compliance certificate as well):

1. Support: Please provide details of support provided within the warranty period
2. Shipping: The quote must be in FOR-IISc Bangalore.
3. Installation: Please list a set of acceptance tests for on-site (vendor) inspection and after installation at IISc Bangalore.
4. Other Options: Necessary spare parts should be quoted as an option.
5. Please include any other options currently available that can be added on in the future.
6. Training: Please state if training is required to operate this instrument, and if yes, please highlight the extent of training provided as part of this purchase and for how many days.



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All of the above-mentioned technical specifications are highly desired. However, lower technical specifications may be considered if the above-mentioned specifications are found to be unsuitable in financial terms. The Institute reserves the right to go for lower specifications taking into consideration its technical preferences and financial constraints. Vendors are encouraged to highlight the advantages of their tools over comparable tools from the competitors.

PI Terms and conditions (should be included in compliance certificate):

1. Necessary training to operate the procured setup and required literature support should be provided without additional cost.
2. In principle onsite installation should be free of cost. The amount of time / day committed by the engineer during installation must be clearly stated.
3. Software upgrade, if any, must be free of cost for next 5 years.
4. The vendor must assure that there are no bugs and glitches with the integration. In case of glitches or bugs at the time of installation, vendor must fix the issues in less than three days from the start date.
5. In case of hardware/software issues or support, vendor should be able to provide required solution within three days.
6. All equipment must be well calibrated before and after installation.
7. Additional quote for an annual maintenance contract should be included for the next 5 years.
8. The vendor should have a good track record of delivering such equipment at universities/research institutions (please furnish the details).
9. Please provide list of customers who have procured your equipment in last 5 years.
10. The vendor should be able to repair and maintain the equipment, once it is installed in India. No travel claims must be made by vendor for servicing during the warranty/guarantee period.
11. The system must be delivered before . The smallest lead time will be appreciated. Our expectation is shipment immediately after PO and full or part payment post installation.
12. On all systems the payment terms will be specified in the commercial proposal and is subject to negotiation.
13. The validity period of the quotation should be 90 days at least.
14. Please provide details of the number of trained personnel in India, who can service the machine.
15. Highlight the system/computer requirement to integrate the setup, if any other than specified in the specifications above.
16. See other Terms & Conditions, guidelines, eligibility criteria etc. in enclosed document in the next pages.



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IISc Terms and conditions :

1. The Bidder should belong to either Class-1 or Class-2 suppliers distinguished by their “local content” as defined by recent edits to GFR. 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%.
2. 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 the 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 the Class-1 supplier.
4. MSMEs can seek an exemption to some qualification criteria. IISc follows GFR2017 for such details.

Sincerely,

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Secretary (Ms. Rekha's) Contact: 9972525771 (On Behalf of Purchase Committee)
Email: msdlab.es@iisc.ac.in (for tender related queries)