

## Tender Notification for the Procurement of an UV-sensitive intensified Scientific CMOS camera (Last Date for Submission: 9<sup>th</sup> September 2021)

This is a Request for quote (RFQ) from domestic (India-based) manufacturers only for procurement of an UV-sensitive intensified Scientific CMOS camera at the department of Aerospace Engineering, Indian Institute of Science, Bangalore. With respect to this tender, the rules laid out by the Government of India in order No. P45021/2/2017-pp-BE-II issued by the Public Procurement Section, Department or Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, dated 4<sup>th</sup> June 2020 will be followed. As per this order, the government has defined a ‘Class-I local supplier’ as “a supplier or service provider whose goods, services or work offered for procurement, has local content equal to or more than 50%”. A ‘Class-II local supplier’ is “a supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%”. Only Class-I and Class-II local suppliers are eligible to participate in this open domestic tender. Any “Non-local supplier” i.e., “a supplier or service provider, whose goods, services or works offered for procurement, has local content less than 20%” is ineligible to participate in this tender. The tender should be submitted in two separate sealed envelopes: one containing the technical bid and the other containing the commercial bid, both of which should reach us, duly signed on or before 5 PM on 9<sup>th</sup> September 2021.

The bids should be addressed to:

The Chairman,  
 Department of Aerospace Engineering  
 Indian Institute of Science  
 Bangalore 560012, India.  
 Kind attention: Dr. Irfan Mulla  
 email: irfanmulla@iisc.ac.in, chair.aero@iisc.ac.in

1	Section 1	Bid Schedule	As specified by IISc
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			Annexure 2: Declaration regarding experience of bidder
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## Section 1: Bid Schedule

1.	Tender No	IISc/AE/Tender/2021/Local/iCMOS-UV
2.	Tender date	26 <sup>th</sup> August 2021
3.	Instrument	Intensified Scientific CMOS camera
4.	Tender type	i) Technical bid (Part A) ii) Commercial bid (Part B)
5.	Place of tender submission	The Chairman, Department of Aerospace Engineering Indian Institute of Science Bangalore 560012, India. Kind attention: Dr. Irfan Mulla
6.	Last date and time of tender submission	9 <sup>th</sup> September 2021, 5 PM
7.	For Further clarification	Dr. Irfan Mulla Department of Aerospace Engineering Indian Institute of Science Bangalore 560012, India. Ph: +91-80-2293-2875 email: irfanmulla@iisc.ac.in

## Section 2: Eligibility Criteria

Prequalification criteria:

1. Quote should come only from Indian Original Equipment Manufacturer (OEM) or their Indian authorized distributor.
2. The quotations should be on FOR-IISc Bangalore basis in INR only.
3. The Bidder's firm should have existence for a minimum of 3 years (Enclose Company Registration Certificate).
4. The Bidder should belong to either Class 1 or Class 2 supplier 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%.
5. Purchase preference as defined by the recent edits to GFR (within the "margin of purchase preference") will be given to Class-1 supplier.
6. The bidder should sign and submit the declaration for Acceptance of Terms and Conditions as per - Annexure 4.
7. 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.

### Section 3: Technical Specification for intensified scientific CMOS camera

Submit quote for one intensified scientific CMOS camera with following specifications.

#### T1. Mandatory specifications:

<b>A. Sensor specifications</b>		
<b>S.N.</b>	<b>Parameter</b>	<b>Specification</b>
1.	Sensor type	Scientific CMOS
2.	Sensor size: width × height	≥ 2048 × 2048 pixels
3.	Pixel size	6.5 μm
4.	Pixel binning feature	E.g., 2 × 2, 4 × 4 pixels
5.	Sensor cooling options	Thermoelectric air cooling
6.	Sensor cooling temperature	0 to 7 °C
7.	Dark Current	≤ 0.2 e-/pix/s @ 0 °C, Or ≤ 0.6 e-/pix/s @ 7 °C
11.	Digitization and data storage range	16-bit
12.	Pixel scan/readout rate	200 to 560 MHz
8.	Read noise, rms	≤ 3 e- @ 560 MHz or ≤ 2.5 e- @ 200 to 300 MHz
9.	Pixel well depth	≥ 30,000 e-
10.	Sensor linearity	≥ 99 %
14.	Frame rate for 2048 × 2048 pixel image	≥ 30 fps @ 16-bit
15.	Global shutter	True global shutter capability
16.	Quantum efficiency at 545 nm	≥ 55%
<b>B. Intensifier specifications</b>		
1.	Intensifier type	UV sensitive with high quantum efficiency
2.	Intensifier diameter	Ø18 or 25 mm photocathode tube
3.	Optical coupling to sensor	i) Fibre-optic, Or ii) Tandem lens-coupled with coupling efficiency ≥ 30%. iii) If lens-coupling is used, entire system including intensifier lens and CMOS sensor should be robustly integrated as a single unit
4.	Phosphor option	P43
5.	Phosphor decay time to 10% of its initial value	≤ 2 ms
6.	Wavelength range of sensitivity	200 - 750 nm
7.	Minimum Quantum efficiency in 200-350 nm	≥ 18%
8.	Peak Quantum efficiency in UV spectrum	≥ 20%
9.	Intensifier resolution	≤ 25 μm
10.	Maximum photocathode repetition rate with MCP gating	≥ 5 kHz
11.	Minimum optical gate width	≤ 4 ns

13.	Adjustable gate pulse delay & width range	4 ns to 1 s
<b>C. System specifications</b>		
1.	Intensifier gate timing synchronization	Through TTL input
2.	Gate monitoring capability	Signal output from camera unit
3.	Data acquisition software	Should be provided with camera
4.	Operating temperature	10 to 40 °C
5.	Warranty	At least 2 years for complete system, including intensifier
6.	External trigger and digital delay generator capability within the camera system	
7.	Detector sensor, Intensifier, and Digital delay generator should be built as a single integrated camera module.	

**T2. Optional requirements/specifications for the above camera system:**

1.	Minimum insertion delay	$\leq 20$ ns
2.	On-head delay generator capability with timing jitter [rms]	$\leq 35$ ps
3.	Internal memory within camera if USB interface is used	$\geq 1$ GB
4.	Equivalent background Illuminance/ EBI	$\leq 0.2$ photoe-/pix/s
5.	Quantum efficiency vs. wavelength for intensifier photocathode	Provide the curve/data
6.	Adjustable gate pulse delay & width	0 ns to 10 s in steps of 10 ps
7.	Shuttering efficiency in the UV spectrum with MCP gating	$\geq 1:10^7$
8.	Camera lens adapter	F-mount
9.	Dual frame mode capability with minimum interframe time of	300 ns
10.	Data exchange interface	USB 3.0 or another high-speed interface

**T3. Optional accessories: A 100 mm F/2.8 UV imaging lens** compatible with a quoted intensified camera. Lens should have the manual control of aperture (iris) and focus. The following are the required specifications:

1.	Focal length	95 to 100 mm
2.	F-number stop	F/2.8 to F/8
3.	Focus range	Infinity to 45 cm
4.	Image size at the focal plane	$\varnothing 25$ mm
5.	Field of view	14 to 15° diagonal
6.	Spectral transmission range	230 to 750 nm
7.	Transmission in UV spectral range	$\geq 90\%$ in 250 to 410 nm range
8.	Modulation Transfer Function for 250 - 410 nm	30% for 60 lines/mm at F/2.8
9.	Camera mount type	F-mount
10.	Overall diameter	65 to 70 mm

## Section 4: Terms and Conditions

1. All documentations in the tender should be in English.
2. Tender should be submitted in two envelopes (two bid system).
  - a) Technical Bid (Part-A) – Technical bid consisting of all technical details and checklist for conformance to technical specifications. The proposal should contain a compliance table. The compliance table should include all the items of the technical specifications in the same order and format. The first additional column should describe product specifications. The next column should indicate compliance in a “Yes” or “No” response.
  - 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, superscribing 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 superscribed with the Tender No, Tender Description & Due Date.
4. The SEALED COVER superscribing tender number and due date & should reach the office of the Chairman, Department of Aerospace Engineering Indian Institute of Science Bangalore 560012, India. Kind attention: Dr. Irfan Mulla, on or before the due date mentioned in the 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. The covering letter should clearly state that whether the vendor is a Class-I or Class-II local supplier. Failing this the bid will be automatically rejected.
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 should be provided.
7. The lead-time for the delivery of the equipment should be less than 3 to 4 months from the date of receipt of necessary documents. It should be clearly mentioned in the technical and commercial bids.
8. The vendor must provide a compliance statement in a tabular form concerning each technical specification in the tender document duly supported by the manufacturer’s literature and published papers. Any other claim will not be accepted and may lead to the rejection of the bid.
9. Wherever requested, data must be supplied along with technical compliance documents. Technical bids without supporting data will be deemed as technically non-compliant.
10. The institute reserves the right to verify the accuracy and seek clarification of submitted specifications after opening the technical bids. Based on such clarification, if specifications are found to be unsuitable, the technical committee reserves the right to disqualify vendors. Any discrepancy between the promised and verified specifications will be deemed as technical non-compliance.
11. The technical bid should also contain warranty details and terms. Further, any periodic maintenance requirements for regular operation should be specified in detail, along with the extent of coverage under warranty for such maintenance activity.
12. The bidder will provide the prerequisite installation requirement of the equipment along with the technical bid. The vendor is responsible for the installation of the system at the institute, along with the training of end-users.
13. In the commercial bid, the price should be inclusive of all discounts. The price quotation should include the cost of installation and training of potential users if any. Please quote the

- price of each optional item, separately.
14. The quotations should be on FOR-IISc Bangalore basis in INR only. GST must be not more than 5% (Institute will provide the GST exemption certificate).
  15. 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. 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 the bidding process.
  16. The vendor should have an office with qualified technical service personnel based in India and should assure a response time of less than five business days.
  17. The vendor must submit a list of all Indian customers (only Government of India organizations) where similar systems have been installed. References from this list can be used to disqualify vendors with a poor track record of service, build quality, system performance, or poor availability of spares. Additionally, IISc shall have the absolute right to take the opinion of other departments/institutes for their opinion/experience about the bidder's services/sales. Based on such input, IISc may decide about the rejection of a bid of such bidder(s).
  18. The vendor should include at least five testimonials from existing users of a similar camera system indicating the performance of the camera and maintenance satisfaction.
  19. 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 the 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 the tender terms.
  20. The indenter reserves the right to relax any or all of the above conditions without assigning any reason.

**Annexure 1:**

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

Sr. No.	Type	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 Chairman,  
Department of Aerospace Engineering  
Indian Institute of Science  
Bangalore 560012, India.  
Kind attention: Dr. Irfan Mulla

Ref: Tender No:

Dated:

Sub: Supply and installation of intensified scientific CMOS camera

I have carefully gone through the Terms & Conditions contained in the above referred tender. I hereby declare that my company / firm has ---- years of experience in supplying and installing intensified scientific CMOS camera.

(Signature of the Bidder)

Name:

Designation, Seal

Date:

**Annexure 3:**

Declaration of track record

To,  
The Chairman,  
Department of Aerospace Engineering  
Indian Institute of Science  
Bangalore 560012, India.  
Kind attention: Dr. Irfan Mulla

Ref: Tender No:

Dated:

Sub: Supply and installation of intensified scientific CMOS camera

Sir,

I have carefully gone through the Terms & Conditions contained 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 am competent officer in my company / firm to make this declaration.

OR

I declare the following:

Sr. No.	Country in which the company is debarred/ blacklisted / having pending case	Blacklisted / debarred by Government / Semi Government Organizations or Institutions / having pending case	Reason	Time Period

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

(Signature of the Bidder)

Name:

Designation, Seal

Date:

**Annexure 4:**

Declaration of acceptance of terms and conditions

To,  
The Chairman,  
Department of Aerospace Engineering  
Indian Institute of Science  
Bangalore 560012, India.  
Kind attention: Dr. Irfan Mulla

Ref: Tender No:

Dated:

Sub: Supply and installation of intensified scientific CMOS camera

Sir,

I have carefully gone through the Terms & Conditions contained 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 am an authorized signatory of my company and am, therefore, competent to make this declaration.

(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, if applicable

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 5 – Commercial Bid

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

Items requested in the mandatory specification section

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Essential items noted in the technical specification				
2	... (details of essential items)				
3.	Warranty (years)				
4.	FOR-IISc Bangalore only				

Items requested in the optional specification section

S.No	Description	Cat. Number	Quantity	Unit Price	Sub total
1.	Optional items noted in the technical specification				
2	... (details of Optional items)				
3.	Warranty (years)				
4.	FOR-IISc Bangalore only				

## Section 6 - Checklist

The following items must be checked before the bid is submitted.

1. Sealed Envelope “A”: Technical Bid  
Technical bid (signed by the authorized signatory and sealed) with the below documents:
  - a. Annexure 1: Bidders details
  - b. Annexure 2: Declaration regarding experience
  - c. Annexure 3: Declaration of track record
  - d. Annexure 4: Declaration of acceptance of terms and conditions
  - e. Annexure 5: Details of item quoted.
  
2. Sealed Envelope “B”: Commercial Bid

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