

Tel : +91-135-278004-7  
Fax : +91-135-2787128/161  
Email : director@irde.drdo.in

MMG Email : mmg@irde.drdo.in



Government of India  
Ministry of Defence  
Defence Research & Development  
Organisation  
Instruments Research & Development  
Establishment  
Raipur Road,  
Dehradun – 248 008.

---

सभी पत्रादि निदेशक को ही सम्बोधित किए जाने चाहिये, किसी वैज्ञानिक / अधिकारी के नाम से नहीं ।

---

Dated: 9<sup>th</sup> Oct, 2020

**INVITATION FOR EXPRESSION OF INTEREST**  
**FOR**  
**Space Qualified Opto-mechanical Assembly for Hyperspectral**  
**Payload**

**EOI Reference No:**

The Director, Instruments Research & Development Establishment (IRDE), Raipur Road, Dehradun-248008 invites **Expression of Interest (EOI) from Indian Industry (as defined under the Companies Act, 2013)**, “Space Qualified Opto-mechanical Assembly for Hyperspectral Payload” for a specific application of DRDO. IRDE requires qty 03 nos. of this assembly. IRDE intends to develop the same with Indian Industries only and would assess the indigenous firm’s capabilities in this direction, as per the scope of work given below:

**1. Scope of Work (brief):**

The Hyperspectral Payload unit consists of one unit of Visible-Near Infrared (VNIR) Opto-mechanical Assembly and one unit of Short Wave Infrared (SWIR) Opto-mechanical Assembly. Both the units will be mounted on a payload bracket provided by IRDE. The detailed specifications of SWIR & VNIR units are given in subsequent sections of this document.

The broad scope of work consists of:

- 1) Design and Fabrication Light weight Primary mirror
- 2) Design and Fabrication of Dispersive Element (Grating)
- 3) Design and Fabrication of Order Sorting Filter
- 4) Optimization of Opto-mechanical design provided by IRDE
- 5) Structural and thermal analysis of complete assembly including electronics card
- 6) Fabrication, assembly, functional testing and space qualification testing of Opto-mechanical assembly
- 7) Documentation for space qualification

**Qualification and Acceptance level tests to be carried out:**

All the system parameters (for VNIR and SWIR) will be verified and validated to meet the defined specifications as per following criteria:

- Test (T) – Measurement in laboratory
- Inspection (I) – Inspection
- Analysis (A) – Computation /COC

**Table: Tests Verification Matrix**

S.No	Description	I	A	T
1.	Spectral Range		√	
2.	Ground Sampling Distance (Spatial Resolution)		√	
3.	Swath		√	
4.	Spectral Resolution		√	
5.	Spectral Bands		√	
6.	SNR			√
7.	Operating Temp.			√

8.	Weight			√
9.	Size			√
10.	F#		√	
11.	EFL		√	
12.	FOV			√
13.	Distortion			√
14.	MTF			√
15.	Linear Dispersion (spectral gradient)		√	
16.	Minimum Transmission		√	
17.	Spectral Resolution (FWHM) in the overall Spectral Range		√	
18.	Mechanical Characteristics			√
19.	Environmental Qualification Test Requirement			√

## 2. Eligibility Criteria:

Based on the response to EOI, the firm would be evaluated as per the following eligibility criteria. The firm should furnish relevant documents in support of their claims for each points.

The broad criteria for vendor qualification should be in following terms:

### I. **Technical Capabilities:**

- a. The vendor should have successfully developed and delivered minimum one set of Opto-mechanical module in last 5 years with similar complexity to any Indian Government Organisation.
- b. Expertise in space grade opto-mechanical design and design & fabrication of space grade including light weight primary mirror, grating and order sorting filter.

- c. In house capability of assembly of opto-mechanical component of space grade materials
- d. Expertise in Finite Element Analysis & Design tools such as SolidWorks, NX Nastran, Ansys, Code5 or equivalent and availability of these tools.

## **II. Manufacturing and Infrastructure Facilities**

- a. Facility of high precision manufacturing of components (Optics & Mechanical) having size 450 mm in each direction x, y & z. (Essential)
- b. Fabrication of space grade opto-mechanical components including light weight primary mirror, grating and order sorting filter.
- c. In-house Manufacturing machine Tools such as CNC machines, Single Point Diamond Turning (SPDT) machine and facility for grinding of Optical components (Optics & Mechanical) having size 450 mm in each direction x, y & z.
- d. Facilities for Qualification Tests

## **III. Availability of Expertise Man Power**

- a. Expertise in Optical design & Design tools such as Code5.
- b. Expertise in Mechanical design of the space grade Opto-Mechanical Systems

## **IV. Financial Capabilities**

- a. Average annual turnover of at least INR 10 crores for the last 3 financial years i.e. FY 2017-18, FY2018-19 and FY2019-20.
- b. Experience of having successfully completed at least one similar project complexity & costing not less than Rs. 10 crores during last 5 years.

## **V. Quality and Project Management Capabilities [ Desirable]**

- a. Quality Management System, Quality Control System: Quality Standards/ Certifications obtained by the Vendor (AS9100, Rev C/ ISO 9001:2008/ Others)
- b. Previous record of compliance with the intended delivery schedule.

The firms will be evaluated based on brief technical compliance and Vendor Qualification Criteria.

### **3. General Terms and Conditions**

- a) Firms are required to send their response to this EoI to **The Director, IRDE, Raipur Road, Dehradun – 248008** on or before the date & time as given in the advertisement, with the details as required in para 2 above of EoI.
  
- b) This EoI is not to be treated as a request for quotation/proposal and is issued with no commitment. IRDE reserves the right to withdraw the EoI or change or vary any part thereof at any stage. IRDE also reserves the right to disqualify any firm/proposal, should it be so necessary at any stage.
  
- a) By submitting a proposal, each firm shall be deemed to acknowledge of having fully and carefully read the EoI, and understood all the terms and conditions.
  
- b) The Firm shall compulsorily enclose all proofs as Annexures to response to EoI. Responses which are not in compliance with our EoI conditions will be rejected, without assigning any reasons thereof. IRDE reserves the right to request for any additional information, if required. Failure to furnish all requisite information or and/or documents shall result in repudiation of the EoI, without assigning any reasons thereof.
  
- c) The Firm should have a valid GST registration. The Firm should submit self-attested copy(ies) of the Certificates of Incorporation and other certificates that are legally required for carrying out its business activities.
  
- d) Income Tax Returns of the last three years, duly certified by a Chartered Accountant, have to be submitted.

- e) An undertaking (self-certificate) is to be submitted that, the firm hasn't been blacklisted by any Central/State Government Department/Central Government Funded Organizations/ State Government funded organizations/ World Bank, or other World Bank organizations and is not under any illegal expression by Government of India.
- f) An undertaking (self-attested) is to be submitted that there has been no outstanding bankruptcy, judgment or pending legal proceedings against the firm as on date of submission of response to EoI.
- g) The brief description in EoI is provided to understand the requirements by the Vendor and does not reflect the final design parameters. Detailed specifications and design inputs will be shared with shortlisted firms after signing a **Non-Disclosure Agreement (NDA)**.
- h) After receiving the response to EoI, a DRDO Vendor Evaluation Committee (VEC) will evaluate the vendor's suitability based on the eligibility criteria defined in para 2.
- i) All hardware and software design, under the scope of work, will be the sole property of DRDO and DRDO will have the IPR for the same.
- j) Further, the firm must not quote any of these works in any publications or to any of their customers without explicit permission from IRDE and adhere to strict confidentiality.
- k) The vendors Qualified by the VEC shall be allowed to participate in the tender to be floated for the same in due course.
- l) The Vendor shall be willing for development time of 10-12 Months from the placement of firm supply order.

#### 4. Response to EOI format :

The proposal and all correspondences/documents shall be written in English

Sl. No	Contents	Page No
i.	Covering Letter	
	<b>Part-I</b>	
ii.	General Details of the Firm	
iii.	Technical Capabilities	
iv.	Manufacturing and Infrastructure Facilities	
v.	Availability of Expertise Man Power	
vi.	Financial Capabilities	
vii.	Quality and Project Management Capabilities	
	<b>Part-II</b>	
viii.	Compliance Matrix to be filled by the firm	

#### 5. List of Annexures (To be enclosed by vendor)

a)	Annexure- A	Brief Profile
b)	Annexure-B	Technical Capabilities
c)	Annexure-C	Manufacturing and Infrastructure Facilities
d)	Annexure-D	Availability of Expertise Man Power
e)	Annexure-E	Financial Capabilities
f)	Annexure- F	Quality and Project Management Capabilities
g)	Annexure- G	Any other Details

The vendors have to upload their proposal on the CPP portal and/or submit enclosed in a sealed envelope and superscribed “**Expression of Interest: “Space Qualified Opto-mechanical Assembly for Hyperspectral Payload”**”.

**The prospective vendors are requested to submit the proposal by 02 Nov, 2020 before 1000 Hrs.** For assistance, clarifications and questions regarding this EoI, you are welcome to contact:

<b>Name</b>	Mr. Manvendra Singh	Mr Saralesh Yadav
<b>Designation</b>	Scientist 'G'	Scientist 'E'
<b>Ph</b>	0135-2782384	0135-2782383
<b>Fax</b>	0135-2787161, 0135-2787128	0135-2787161, 0135-2787128
<b>Email</b>	manvendra@irde.drdo.in	saralesh@irde.drdo.in

**EOI Response Format**

##### Cover Letter  
(Firm's letterhead)

[Date]

To  
**THE HEAD, MMG  
Instruments Research & Development Establishment (IRDE)  
Raipur Road, Dehradun - 248008**

Dear Sir,

**Ref: Expression of Interest: "Space Qualified Opto-mechanical Assembly for Hyperspectral Payload".**

Having examined the Expression of Interest (Eoi), the receipt of which is hereby duly acknowledged, we, the undersigned, intend to submit our response to the Expression of Interest: Space Qualified Opto-mechanical Assembly for Hyperspectral Payload,

Primary and Secondary contacts for our company are:

	<b>Primary Contact</b>	<b>Secondary Contact</b>
Name:		
Title:		
Firm's Name:		
Address:		
Phone :		
Mobile:		
Fax :		
E – mail :		

We fully understand and agree to comply that, on verification, if any of the information provided here is found to be misleading the short listing process, we are liable to be dismissed from the selection process or termination of the contract during the execution of the contract.

We agree for unconditional acceptance of all the terms and conditions set out in the Eoi document.

It is hereby confirmed that I / We are entitled to act on behalf of our company/corporation/ firm / organization and empowered to sign this document as well as such other documents, which may be required in this connection.

Dated this  
(Signature)  
(Name)

(In the capacity of)

Duly authorized to sign the Eoi Response for and on behalf of:  
(Name and Address of Company) Seal / Stamp of the Firm(Firm's Seal)

**Part-I**

**General Details of the Firm:**

1	Name of the firm		
2	Year of Establishment		
3	Core capabilities of the firm	Type brief profile of the firm in Annexure A (without referring to attachment of any report/s)	
	<b>(Tick the appropriate box from the following)</b>		
	No. of years of experience in Development of electro-optic payloads for Aerospace sector / PSUs/ DPSUs/ Government agency / Defense sector	<input type="checkbox"/>	
	Others	<input type="checkbox"/>	
4	Head office location and address with contact number & email id:		
5	Addresses of manufacturing and/or operational setup in India <b>(Highlight the address where IRDE representatives/VEC will visit for audit)</b>	1. 2. 3.	
6	Corporate website URL:		
<b>Quality Management:</b>			
7	<b>State the Quality Policy of the firm (max in 200 words)</b>	(Mention overall Quality management system and about quality department reporting, non-conformance management system, quality control practices, records maintenance, onsite activity QMS, internal review mechanism)	
8	Quality Standards/ certifications obtained by the Vendor (Tick the appropriate box (provide certification copy in Annexure-B))	AS9100, Rev C	<input type="checkbox"/>
		ISO 9001:2008	<input type="checkbox"/>
		Others (if others kindly mention)	<input type="checkbox"/>
9	<b>Experience in technical supply of IR sensor to Aerospace PSUs/ DPSUs/Government agency/ Defense sector</b> In case the firm is having/had any Purchase order/work order/Contract value greater than or equal to Rs. 5 crores for last five years, the details of the same to be provided in the format specified below:		

**Space Grade Opto-mechanical Assembly supplied:**

<b>Name of the Service</b>	<b>Army</b>	<b>Navy</b>	<b>Air Force</b>	<b>Any other</b>
Type of System*				
Application**				
Scope of Work	Y/N	Y/N	Y/N	Y/N
PO Date				
PDC of PO				
Present Status of the PO / Date of completion of PO				

\*Indicate whether it is Optics/Mechanical/Opto-mechanical or any other system.

\*\* Mention if the system is for Space borne or any other use.

10) Are you an offset Partner/subcontractor to any foreign Industry (Prime contractor). If yes provide the details in the format given below:

<b>Sl. No</b>	<b>Name of the Foreign Industry with Address</b>	<b>Name of the project (specify total contract value)</b>	<b>Responsibility of Prime Contractor</b>	<b>Responsibility of offset partner (your firm) (specify total subcontractvalue)</b>

**I. Technical Capabilities:**

The vendor should have successfully developed and delivered minimum one set of Opto-mechanical module in last 5 years with similar\* complexity to any Government Organisation.

[\*The word "Similar" above means]:

- Manufacturing of high precision Opto-mechanical components involving structural materials such as Invar-36, Titanium alloy, Kovar, CFRP, Zerodur, Fused Silica & Zinc Sulphide.
- Facility for manufacturing & Inspection of Opto-mechanical components having size 450 mm in direction x, y & z.

- Facility for gluing of Opto-mechanical components in given precision which could survive given qualification requirements.
- Facility for Integration of Opto-mechanical module which includes class 10,000 clean room & Optical infrastructure to assist the assembly procedure.

The vendor should provide the details of technical capability compliance (along with the relevant documents in support of their compliance), as per format given below:

**Table 1:**

SI No	Parameters	Response Matrix	Vendor Remark
1.	Expertise in space grade opto-mechanical design and design & fabrication of space grade grating (dispersive element). (Essential)	Yes/No	
2.	Expertise in Manufacturing on CNC machines, Single Point Diamond Turning (SPDT) machine and grinding of Optical components (Optics & Mechanical) having size 450 mm in each direction x, y & z. (Essential)	Yes/No	
3.	Expertise in Polishing & Thin film coating of Optical components (Essential)	Yes/No	
4.	Expertise of 3D CMM measurement of components of size more than 450 mm in each direction x, y & z. (Essential)	Yes/No	
5.	In house capability of assembly of opto-mechanical component of space grade materials. (Essential)	Yes/No	
6.	Expertise in Finite Element Analysis & Design tools such as SolidWorks, NX Nastran, Ansys, Code5 or equivalent. (Essential)	Yes/No	
7.	Expertise in gluing of high precision opto-mechanical components using space grade adhesives in specified precision. (Essential)	Yes/No	

**Note: Vendor must qualify all essential requirements.**

## **II. Manufacturing and Infrastructure Facilities:**

The Vendor should provide the details of manufacturing and infrastructure test facilities (**in-house/tie-up**)(along with the relevant documents in support of their compliance), as per format given below:

**Table 2:**

<b>SI No</b>	<b>Parameters</b>	<b>Response Matrix</b>	<b>Vendor Remark</b>
1.	Facility of high precision manufacturing of components (Optics & Mechanical) having size 450 mm in each direction x, y & z. (Essential)	Yes/No	
2.	Fabrication of space grade grating (dispersive element)	Yes/No	
3.	In-house Manufacturing machine Tools such as CNC machines, Single Point Diamond Turning (SPDT) machine and facility for grinding of Optical components (Optics & Mechanical) having size 450 mm in each direction x, y & z. (Essential)		
4.	Facility of 3D CMM capable of measuring components of size more than 450 mm in each direction x, y & z. (Essential)	Yes/No	
5.	Class 10000 Clean room facility for the Opto-Mechanical Assembly (Essential)	Yes/No	
6.	Facilities for Qualification Tests (Essential)	Yes/No	
7.	Availability of FEA Analysis & Design tools such as SolidWorks, NX Nastran, Ansys, Code5 or equivalent (Essential)	Yes/No	

**Note: Note: Vendor must qualify all essential requirements**

## **III. Availability of Expertise Man Power:**

The vendor should provide the details expertise man-power strength [**employed/contracted**], along with the relevant documents in support of their compliance, as per format given below:

**Table 3:**

SI No	Expertise Area	Response Matrix	Vendor Remark
1.	Expertise in Optical design & Design tools such as Code5 (Essential)	Yes/No	
2.	Expertise in Mechanical design of the Opto-Mechanical Systems. (Essential)	Yes/No	
3.	Expertise in fabrication of precision Optical components (Essential)	Yes/No	
4	Expertise in fabrication of Mechanical components (Essential)	Yes/No	
5.	Expertise of Finite Element Analysis (Essential)	Yes/No	
6.	Expertise in Assembly & Gluing of the Opto-Mechanical components (Essential)	Yes/No	
7.	Expertise in Environmental Stress Screening (Desirable)	Yes/No	

**Note: Note: Vendor must qualify all essential requirements.**

#### **IV. Financial Capabilities:**

The Vendor should submit its firm's financial status (ITR, balance sheet, profit & loss account) of the last 3 financial years, i.e. for FY 2017-18, FY2018-19 and FY2019-20 (to be attached for verification). The vendor should provide the details of financial capabilities compliance (along with the relevant documents in support of their compliance), as per format given below:

**Table 4:**

SI No	Parameters	Response Matrix	Vendor Remark
1.	At least one successful development and realization of space qualified Opto-mechanical module for from any Government Agency		

2.	Average annual turnover of at least INR 10 crores for the last 3 financial years i.e. FY 2017-18, FY2018-19 and FY2019-20. (Essential)	Yes/No	
3.	Experience of having successfully completed at least one similar project complexity & costing not less than Rs. 10 crores during last 5 years (Essential)	Yes/No	
4.	Profit making Company for last 3 years (Desirable)	Yes/No	

Vendor to furnish at least one copy of previous supply order for successful development and realization of space qualified Opto-mechanical module based on QA plans from any Government Agency and also submit information in following format.

**Details of Purchase Order (PO) [Essential]:**

Name of the Government Agency	
Type of System*	
Application**	
Scope of Work	
PO Date	
PDC of PO	
Present Status of the PO / Date of completion of PO	

*\*Indicate whether it is Optics/mechanical/Opto-mechanical or any other system*

*\*\* Mention if the system is for Space borne or any other use*

**Note: Note: Vendor must qualify all essential requirements**

**V. Quality and Project Management Capabilities [Desirable]**

The Vendor should provide the details of project management and quality capabilities compliance (along with the relevant documents in support of their compliance), as per format given below:

**Table 5:**

SI No	Parameters	Response Matrix	Vendor Remark
1.	Quality Management System, Quality Control System: Quality Standards/ Certifications obtained by the Vendor (AS9100, Rev C/ ISO 9001:2008/ Others)	Yes/No	
2.	In-house quality management standards	Yes/No	
3.	Previous record of compliance with the intended delivery schedule	Yes/No	

**Part-II**

**a) Acceptance to Compliance Matrix – to be filled by the firm**

<b>Compliance Matrix</b>			
Refer Para No.	Description	Compliance (Yes/No)	Remark
1	Acceptance to EoI Scope of work (brief)		
2	Acceptance to general Terms & Conditions of EoI		
3	EoI Response Format duly filled		
4	List of Annexure as per EoI format		