

INVITATION FOR EXPRESSION OF INTEREST (EOI) FROM ELIGIBLE SUPPLIERS OF INDUSTRIAL ROBOTS, COLLABORATIVE ROBOTS, AUTOMATIC GUIDED VEHICLES, CONVEYORS AND SMART PALLETS

1. Background:

1.1 The Indian Institute of Science (IISc) invites an Expression of Interest (EOI) from suppliers of Industrial Robots (IR), Collaborative Robots (Cobot), Automated Guided vehicles (AGV), Conveyers and Smart Pallet Systems. The broad intended uses of these systems are in the following:

- Demonstrate the capabilities of Smart Manufacturing Systems
- Research and Development
- Provide training to industries in the mainstream and MSME sectors
- Teaching of courses related to Smart Manufacturing

1.2 IISc wishes to establish an international supplier base for equipment with broad characteristics that are detailed below. A formal tender will be issued at a subsequent date soon, once IISc completes preliminary interaction with all possible suppliers.

2. Eligibility to respond to this EOI

2.1 All Suppliers responding to this EOI should have demonstrated capability to supply and provide extended services to equipment of the broad classes indicated in Section 3 inclusive of reputed academic institutions in India and other countries.

2.2 Item 2.1 requires that suppliers responding to this EOI provide a list of equipment supplied by them that corresponds to the requirements of Section 3 and to whom this equipment were sold, with relevant contact information of buyers.

3. Description of equipment

3.1 IISc seeks to acquire Industrial Robots (IR), Collaborative Robots (Cobot), Automated Guided vehicles (AGV), Conveyers and smart pallet systems for the intended use as mentioned in Para 1.1.

3.2 IISc at this time has not specifically decided which type of equipment(s) it will acquire. IISc's decision will be based on the capability of each type of equipment, after interaction with potential suppliers. However, the broad outline specifications of Robot (IR), Collaborative Robots (Cobot), Automated Guided vehicles (AGV), and Conveyers and smart pallet systems are enclosed in the **Appendix** to this document.

3.3 Suppliers should indicate flexibility available in the equipment.

3.4 Suppliers should indicate the Industrie 4.0 compatibility of their products, i.e. provisions (e.g. hardware, software, standards or protocols needed/provided) for connecting the machine into a standard, industrial Industrie 4.0 platform.

3.5 Suppliers should indicate equipment data acquisition systems.

- 3.6 IISc may also consider the acquisition of refurbished equipment, should that prove to be cost-effective. Suppliers may indicate possibility of supplying refurbished equipment.
- 3.7 Suppliers should indicate mechanisms, procedures and arrangements for long term maintenance of the equipment,
- 3.8 Suppliers are expected to provide lead times for the supply of the equipment
- 3.9 As a reputed research organization IISc is also willing to consider collaboration with suppliers on innovative process development, as well as utilization of the equipment by suppliers for demonstration or use of the equipment to and for third parties.
- 3.10 Suppliers are expected to provide budgetary costs of various equipment options, an estimate of annual maintenance costs and expected terms of payment in their responses to this EOI.

4. Response to EOI

- 4.1 IISc seeks a response to this **EOI by 17:00 hours, August 10, 2018**. Responses after this time and date will not be considered
- 4.2 Along with the response to the EOI, suppliers are requested to indicate suitable dates and times for **interaction with the IISc technical team in the week starting 6th August 2018 and extending to 10th August 2018**. Suppliers that do not visit IISc for interactions will not be considered further.
- 4.3 Suppliers should also indicate clearly the requirement for any export clearance processes for supplying such equipment and any end use declarations that may be sought for this purpose. Any ambiguity in export clearances may disqualify a supplier from future tendering action.
- 4.4 Suppliers are requested to email their response to Mr Venu Allam, Program Manager, at venuallam@iisc.ac.in.

5. Tender Process

- 5.1 Based on this EOI, the responses and interaction, and supplier's interest and capability in supplying equipment of characteristics as indicted in Sections 2 and 3, and IISc will short list a set of potential suppliers by a technical team constituted by competent authority of IISc.
- 5.2 A formal tender with detailed specifications will be issued to such short-listed firms.
- 5.3 The formal tender shall consist of a two-bid process. A technical bid and price bid shall be supplied in separate covers. IISc will first examine the technical bid and further short-list those firms that meet all technical specifications. The price bid of only the final short-listed firms will be opened, and only the firm with the lowest price bid and meeting all technical specifications shall be invited for contract finalization.
- 5.4 IISc will endeavor to complete contract finalization by the last week of August 2018.
- 5.5 IISc reserves the right to reject any/or all the EOI's without assigning any reasons whatsoever.

Appendix

(5 Tables)

Industrial Robot Technical Specifications			
SI No	Parameter	Specifications	Essential/Desirable
1	Pay load	10 Kg (At Least)	Essential
2	Vertical and Horizontal Reach	1 Meter (At least)	Essential
3	Degree of freedom	6 (At least)	Essential
4	Data logging and connectivity	LAN and WiFi	Essential
5	Accuracy	±0.1 mm (At least)	Essential
6	Repeatability	±0.1 mm (At least)	Essential
7	Mechanical Brakes	All axis	Essential
8	Mounting Method	Floor	Essential
9	Type of drive system	Electric	Essential
10	Controller	Should be able to communicate with other devices like Sensors , AGV, Robots, Cobots , safety devices, machine tools etc.	Essential
11	Programming	Teach pendant and offline programming capabilities preferably with high level programming languages	Essential
12	Interfacing and communication	Digital I/O ports, should be able to connect with external applications and devices. LAN and WiFi and other industry standard connectivity	Essential
13	Speed	To be indicated by the Bidder	Essential
14	Motion Control	Path Control and Velocity Control	Essential
		Force Control	Desirable
15	Industry Standards	Comply with relevant industrial standards like ISO	Essential
16	Typical Applications	Material Handling/Palletizing, Machine Loading/Unloading, Gluing/Sealing ,Processing operations, Assembly, Inspection	Essential
17	Power Supply	As per industry standards	Essential

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COBOT Technical Specifications

Sl No	Parameter	Specifications	Essential/Desirable
1	Reach	0.5 meter (At least)	Essential
2	Payload	5 Kg (At Least)	Essential
3	Data logging and connectivity	LAN and WiFi	Essential
4	Task Accuracy	±0.1 mm (At least)	Essential
5	Task Repeatability	±0.1 mm (At least)	Essential
6	Degree of Freedom	6 (At Least)	Essential
7	Power Supply	230 V AC	Essential
8	Motion Control	Force control	Essential
		path control and velocity control	Essential
9	Industry Standards	Comply with relevant industrial standards like ISO	Essential
10	Controller	Should be able to communicate with other devices like Sensors . AGV, Robots, Cobots , safety devices, machine tools etc.	Essential
11	Programming	Teach pendant and offline programming capabilities preferably with high level programming languages	Essential
12	Interfacing and communication	Digital I/O ports, should be able to connect with external applications and devices. LAN and WiFi and other industry standard connectivity	Essential
13	Typical Applications	Material Handling/Palletizing, Machine Loading/Unloading, Gluing/Sealing ,Processing operations, Collaborative Assembly, Inspection	Essential

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AGV Technical Specifications			
SI No	Parameter	Specifications	Essential/Desirable
1	Pay Load	Should carry Up to 120 Kg	Essential
2	Running Time	10 Hrs Minimum	Essential
3	Travel Speed	0.02 m/s to 1 m/s	Essential
4	Data logging and connectivity	LAN and WiFi	Essential
5	AGV Type	Unit load carrier	Essential
6	Guidance Type	Free Ranging	Essential
7	Load Transfer	Automatic/Manual	Essential
8	Remote Control	Required	Essential
9	Conveyor Coupling	Required	Desirable
10	Laser Bumper	Required	Desirable
11	Guidance Precision	Less than ± 10 mm	Essential
12	Power Supply	As per industry standards	Essential
13	Range and Proximity sensing	To be indicated by supplier	Desirable
14	Industry Standards	Comply with relevant industrial standards like ISO	Essential

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CONVEYOR Technical Specifications			
SI No	Parameter	Specifications	Essential/Desirable
1	Load Type	Unit loads and discreet components	Essential
2	Transfer Surface	Roller and/or Belts	Essential
3	Drive Arrangement	Active and Passive	Essential
4	Interfacing and communication	Active components must be interfaceable and programmable for automation tasks	Essential
5	Industry Standards	Comply with relevant industrial standards like ISO	Essential
6	Modularity and Flexibility	Complete physical reconfiguration after initial setup	Desirable
7	Accessories	Programmable direction & orientation changers, sorters, and other modular units to increase the flexibility of the conveyor line	Desirable

SMART PALLET Technical Specifications			
SI No	Parameter	Specifications	Essential/Desirable
1	Load Type	Unit loads and discreet components	Essential
2	Identification	Unique identification	Essential
4	Interfacing and communication	Interfaceable and programmable for automation tasks	Essential
5	Sensors	Sensing capabilities like weight, location etc.	Desirable
6	Industry Standards	Comply with relevant industrial standards like ISO	Essential