


Government eProcurement System		Government eProcurement System	
Tender Details		Tender Details	
		Date : 31-Jan-2020 05:01 PM	
Print			
<b>Basic Details</b>			
Organisation Chain	Council of Scientific and Industrial Research  CSIO-Chandigarh - CSIR  Purchase-CSIO - CSIR		
Tender Reference Number	CSIO/5(157)/2019-PUR		
Tender ID	2020_CSIR_41773_1		
Tender Type	Open Tender	Form of contract	Supply
Tender Category	Goods	No. of Covers	2
General Technical Evaluation Allowed	No	ItemWise Technical Evaluation Allowed	No
Payment Mode	Offline	Is Multi Currency Allowed For BOQ	No
Is Multi Currency Allowed For Fee	No	Allow Two Stage Bidding	No
<b>Payment Instruments</b>		<b>Cover Details, No. Of Covers - 2</b>	
Offline	S.No	Instrument Type	Cover No
	1	Direct Credit	Cover
	2	Bank Guarantee	Document Type
	3	Demand Draft	Description
	4	FDR	1
	5	NEFT	2
			Fee/PreQual/Technical .pdf
			Finance/BOQ .xls
			PLC AND HMI BASED 2 AXIS INDUSTRIAL SERVO SYSTEM AS PER ANNEXURE-A OF NIT DOCUMENT
			PLC AND HMI BASED 2 AXIS INDUSTRIAL SERVO SYSTEM AS PER ANNEXURE-A OF NIT DOCUMENT
<b>Tender Fee Details, [Total Fee in ₹ * - 0.00]</b>		<b>EMD Fee Details</b>	
Tender Fee in ₹	0.00	EMD Amount in ₹	10,000
Fee Payable To	Nil	EMD through BG/ST or EMD Exemption Allowed	Yes
Fee Payable At	Nil	EMD Fee Type	fixed
Tender Fee Exemption Allowed	No	EMD Percentage	NA
		EMD Payable To	DIRECTOR, CSIR-CSIO
		EMD Payable At	CHANDIGARH
<b>Work /Item(s)</b>			
Title	CSIO/5(157)/2019-PUR		

<b>Work Description</b>	PLC AND HMI BASED 2 AXIS INDUSTRIAL SERVO SYSTEM AS PER ANNEXURE-A OF NIT DOCUMENT				
<b>Pre Qualification Details</b>	Please refer Tender documents.				
<b>Independent External Monitor/Remarks</b>	NA				
<b>Show Tender Value in Public Domain</b>	Yes				
<b>Tender Value in ₹</b>	0.00	<b>Product Category</b>	Electronics Equipment	<b>Sub category</b>	NA
<b>Contract Type</b>	Tender	<b>Bid Validity(Days)</b>	90	<b>Period Of Work(Days)</b>	45
<b>Location</b>	CHANDIGARH	<b>Pincode</b>	160030	<b>Pre Bid Meeting Place</b>	NA
<b>Pre Bid Meeting Address</b>	NA	<b>Pre Bid Meeting Date</b>	NA	<b>Bid Opening Place</b>	PURCHASE SECTION
<b>Should Allow NDA Tender</b>	No	<b>Allow Preferential Bidder</b>	No		

**Critical Dates**

<b>Publish Date</b>	31-Jan-2020 05:10 PM	<b>Bid Opening Date</b>	19-Feb-2020 03:30 PM
<b>Document Download / Sale Start Date</b>	31-Jan-2020 05:10 PM	<b>Document Download / Sale End Date</b>	18-Feb-2020 03:00 PM
<b>Clarification Start Date</b>	31-Jan-2020 05:10 PM	<b>Clarification End Date</b>	17-Feb-2020 05:00 PM
<b>Bid Submission Start Date</b>	31-Jan-2020 05:10 PM	<b>Bid Submission End Date</b>	18-Feb-2020 03:00 PM

**Tender Documents**

<b>NIT Document</b>	<b>S.No</b>	<b>Document Name</b>	<b>Description</b>	<b>Document Size (in KB)</b>
	1	Tendernotice_1.pdf	PLC AND HMI BASED 2 AXIS INDUSTRIAL SERVO SYSTEM AS PER ANNEXURE-A OF NIT DOCUMENT	5350.58

<b>Work Item Documents</b>	<b>S.No</b>	<b>Document Type</b>	<b>Document Name</b>	<b>Description</b>	<b>Document Size (in KB)</b>
	1	BOQ	BOQ_44960.xls	PLC AND HMI BASED 2 AXIS INDUSTRIAL SERVO SYSTEM AS PER ANNEXURE-A OF NIT DOCUMENT	280.00

**Bid Openers List**

<b>S.No</b>	<b>Bid Opener Login Id</b>	<b>Bid Opener Name</b>	<b>Certificate Name</b>
1.	bhatnagar.eproc@csir.res.in	Brijender Bhatnagar	BRIJENDER KUMAR BHATNAGAR
2.	madan.eproc@csir.res.in	Madan Sharma	MADAN SHARMA
3.	ramesh.eproc@csir.res.in	Ramesh Kumar	RAMESH KUMAR
4.	satya.eproc@csir.res.in	Satya Prakash Prabhakar	SATYA PRAKASH PRABHAKAR

**Tender Inviting Authority**

<b>Name</b>	STORES AND PURCHASE OFFICER
<b>Address</b>	CSIR-CSIO, SECTOR-30, CHANDIGARH

**Tender Creator Details**

<b>Created By</b>	Brijender Bhatnagar
<b>Designation</b>	SO



स्पीड पोस्ट/पंजीकृत डाक

सीईएसआईआर - केन्द्रीय वैज्ञानिक उपकरण संगठन  
CSIR-Central Scientific Instruments Organisation  
सैक्टर 30 सी चंडीगढ़ Sector-30C, Chandigarh 160 030

निविदा संख्या / Tender No.	CSIO/5(157)/2019-Pur	दिनांक / Issue Date:	30-01-2020
निविदा प्राप्त का अंतिम समय एवं दिनांक / Date & time of receipt of tender	18-02-2020, 3.00 P.M. तक।	निविदा खोलने का समय एवं दिनांक / Date & time of opening of Tender	19-02-2020, 3.30 P.M.

E-Tender with EMD and 5F

महोदय,

हम निम्नानुसार उपस्कर/सामग्री खरीदने के इच्छुक हैं। कृपया अपनी कोटेशन निदेशक, सी.एस.आई.ओ. के नाम ई-टेंडर द्वारा भेजें। जिसे निर्धारित समय पर आपूर्तिकर्ताओं के प्रतिनिधियों (जो भी सवेच्छा से उपस्थित हों) के समक्ष खोला जाएगा।

We are interest to purchase the below given/attached items. Kindly send your Tender/Quotation/Proforma Invoice through E-Tender mode only. Tenders/quotation will be opened in the presence of supplier's representatives who wish to present themselves at that time.

क्र. सं.	सामग्री का विवरण	मात्रा	बिड टाईप
1.	PLC & HMI based 2 axis Industrial Servo System Detailed specifications as per attached "Annexure-A"	One	Two Bid (EMD of Rs. 10000.00)

**Note:-**

1. Please carefully refer all the T&C before submission of Tender to avoid rejection.
2. Bidder who doesn't manufacture the goods it offers to supply shall submit Manufacturer's Authorization Form (MAF) using the form specified in the bidding document to demonstrate that it has been duly authorized by the manufacturer of the goods to quote and/or supply the goods, failing which offer will not be considered/rejected.
3. Two Bid Type – Please upload your Technical and Financial Bid separately on CPPP Portal. For Financial Bid, please fill BOQ. The tender through e-mail, Fax and hard copies will not be considered.
4. The EMD either may be submitted in CSIO's SB Account No. 30267029400 (State Bank of India, Sector-30, Chandigarh) and the proof should be enclosed with the offer or by DD/BG/FDR. The DD/BG/FDR in favour of Director, CSIR-CSIO, Chandigarh in **original should reach us before Opening date of Tender.**

Tender has been issued on [www.etenders.gov.in](http://www.etenders.gov.in). Prospective bidders are requested to registered themselves at [www.etenders.gov.in](http://www.etenders.gov.in) for future also and have to quote through E-Tender mode only. (No hard copy will be entertained) for Financial bid please fill BOQ.

भवदीय (Regards)

एस. पी. प्रभाकर (S. P. Prabhakar)

भण्डार एवं क्रय अधिकारी (Stores and Purchase Officer)

For & on behalf of CSIR-CSIO

वेबसाईट: [www.csio.res.in](http://www.csio.res.in) ई-मेल: [cosp@csio.res.in](mailto:cosp@csio.res.in), [spo@csio.res.in](mailto:spo@csio.res.in) फोन: 91-172-2652651, फैक्स: 91-172-2652651

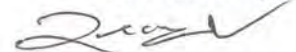
## TERMS & CONDITIONS

1. The quotation/tender must be in the form furnished by the Purchaser/as per tender specifications and should be free from corrections/erasures. In case there is any unavoidable correction it should be properly attested. If not the quotation will not be considered. **Hand written Quotations will not be considered.**
- (a) Where there is no mention of packing, forwarding, freight, insurance charges, taxes etc. **such offer shall be rejected as incomplete. As such clearly mention these charges.**
- (b) The bidder should give a clear cut break up of ex-works, FOB/FCA, CIF/CIP price to facilitate the proper comparison **failing which the bid would be summarily ignored/rejected.** CSIR reserves the right to order on the basis of any of the incoterms. The Exchange selling rates will be taken from [www.xe.com](http://www.xe.com).
- (c) The gross weight of the consignment may be intimated in the Quotation/Tender/Proforma Invoice to decide the mode of dispatch.
2. **The E-Tenders will be accepted through online only. The tender received in any other mode or physical tender will not be accepted and will be ignored. This is not applicable for E-Publish Tender Notice.**
3. It may kindly be noted that your bid should
  - A) Be in **single part. (single part / two part bidding) (retain one only)**
  - B) Accompany Bid Security (EMD)/5F (Annexure) of Rs..... **(retain only if applicable)**
  - C) on the event of award of Contract in your favour, you need to submit a Performance Bank Guarantee for 10% of order value valid for a period of 2 Months beyond the Warranty period of..... **(retain only, if applicable)**
4. Each quotation/Tender in case of E-Publish Tender sent by post is to be enclosed in double cover addressed to **The Director, CSIO, Sector-30, Chandigarh-160 030.** Quotations delivered personally should be put in the tender box kept in the office of Stores & Purchase Officer. The late/delayed and unsigned quote will not be considered at all.
5. The acceptance of the quotation will rest with the competent authority of **Central Scientific Instruments Organization, Sector-30, Chandigarh** who does not bind himself to accept the lowest quotation and reserves the right to himself to reject, or partially accept any or all the quotations received without assigning any reason.
6. **Price & Validity:** Price quoted should be net (separately mention required charges as Sr.No. 1(a,b) above) and valid for a minimum period of **90 days** from the date of opening of the quotation, **failing which the offer will be ignored/rejected.**
7. The bidder must submit the applicable Price Schedule Form as Annexed to the tender document available on the website.
8. Complete specification with manufacturer's name and address should be given while quoting. Literature/Pamphlets should also be enclosed wherever applicable.
9. Prices are required to be quoted in units indicated in the enquiry. When quotations are given in terms of other units, relationship between two sets of units should be furnished. Quantity discounts, if any should also be indicated. The items should be quoted indicating the serial No. of our RFQ.
10. In cases of agents quoting on behalf of their foreign manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. **One manufacturer can also authorize only one agent/dealer.** There can be only one bid from the following:
  1. The foreign manufacturer directly or through one Indian agent on his behalf; or
  2. Indian/foreign agent on behalf of only one principal.
11. Please indicate the name and address of the agents in India if any, the details of service to be rendered by them & the percentage of commission payable to them. Agency commission payable to the Indian Agent should be clearly indicated. The Agency commission would be payable only in Indian Rupees after acceptance. Further an Indian Agent cannot quote on behalf of two different foreign suppliers. If they submit two offers on behalf of two different foreign suppliers, **their offers may not be considered. If the offer is submitted by the Authorised Dealer/Agent/Distributors, it should be along with Authorization Certificate, failing which the offer will be ignored/rejected.** The offer submitted through authorization on behalf of the principal, the terms & conditions settled by the Agent with buyer will be binding on their principal.
12. **Taxes as are applicable should be indicated clearly failing which the offer shall not be considered and rejected.** This lab/Instt is registered with Dept. of Scientific & Industrial Research, Govt. of India and concessional customs duty and GST & IGST are leviable vide notification no. Custom Duty under Govt. Notification No. 51/96-Custom dated 23.07.1996 and No. 43/2007-Customs dated 30.06.2017 and Govt. Notification No. 45/2017-Central Tax (rate) & No. 45/2017-Integrated Tax (rate) dated 14.11.2017. Only basic duty is applicable under this notification, hence bidders will have to submit their offer accordingly. We are exempted from payment of Customs Duty under notification No.51/96 dated 23.07.1996. Hence IGST and Customs Duty, if any, should be shown separately. No other charges than those mentioned clearly in the quotation will be paid.
13. The mode of dispatch/transportation of the items must be by **Air/Sea/Rail/Road only. (Retain one only).**
14. In case the items in the enquiry are covered by any rate contract or running contract finalised by any other state or central Government, it should be specified in your quotation and accepted contract rates should also be mentioned.
15. **Delivery period** required for supplying the material should be invariably specified in the quotation. The offered delivery period shall have to be strictly adhered to in case an order is placed.

Continue on next page.....

16. **Liquidated Damages Clause for delays:** The applicable rate is 0.5% per week and maximum deduction is 10% of the contract price.
  17. If the deliveries are not maintained and due to that account the purchaser is forced to buy the material at your risk and cost from elsewhere, the loss or damage that may be sustained there by will be recovered from the defaulting supplier.
  18. All supplies are subject to inspection and approval before acceptance. Manufacturer warranty certificates and manufacturer/Government approved lab test certificate shall be furnished along with the supply, wherever applicable. Please mention the warranty period of equipment, which should be from the date of satisfactory installation. **The offer received for lesser warranty, as asked for in the tender, will be rejected/ignored.**
  19. TDS would be recovered as per rules in case of Fabrication/ Servicing/ Maintenance jobs/Installation charges etc.
  20. Kindly furnish your PAN & GST Number etc. in your quotation for our records. Our GST No. is 04AAATC2716R1ZN
  21. Our normal payment terms are 100% (hundred percent) within 30 (thirty) days on receipt and acceptance of material at our site in good condition. Please inform your Bank details for RTGS payment. Banking details should be available on Bill/invoice.
  22. **Reasonability of Prices/Fall Clause**
    - i) Please quote best minimum prices applicable for a premiere Research Institution, leaving no scope for any further negotiations on prices.
    - ii) The quoting party should give a certificate to the effect that the quoted prices are the minimum and they have not quoted the same item on lesser rates than those being offered to CSIO to any other customer nor they will do so till the validity of offer or execution of the purchase order, whichever is later.
    - iii) Copies of at least two recently supplied orders of the last two years received from other customers along with details of such supply orders preferably in India for the same item/model may be submitted with the offer giving reasons of price difference of their supply order & those quoted to us, if any. The party must give details of identical or similar equipment, if any, supplied to any CSIR lab during the last three years along with the final price paid and Performance certificate from them.
  23. **Installation/commissioning:** Equipment/Instruments are required to be commissioned/installed/demonstrated successfully immediately or within 30 days from the date of receipt of the system in CSIO by the Principal or by their authorized Agent, **failing which the Liquidated Damage Clause will be applicable as mentioned above.**
  24. Certificate of undertaking that the equipment is of latest technology & will not be obsolete within 5 years after warranty will be attached with the offer. All essential spares parts of the offered equipment will available with the manufacturer or in India with your Indian Agents for a period of at least 5-7 years after warranty period which will be required at later stage
  25. MSME benefits will be given to the eligible supplier as per the Govt. guidelines subject to submission of proper document as per policy or Udyog Adhar Udyog Memorandum in respective category
  26. Code of Integrity has to be maintained by Bidders/Suppliers/Contractors by maintaining highest standards of ethics in the Procurement process and prohibits corrupt practice/Fraudulent practice/Anti- Competitive practice / Coercive Practice/ Conflict of Interest and Obstructive practice either directly or indirectly during the process of contract.
  27. All disputes shall be settled in the courts of **Chandigarh Jurisdiction** only.
  28. Tender conditions (printed on the reverse), if any, or otherwise sent along with the tender shall not be binding on us.
  29. All the above instructions and our standard terms and conditions must be complied failing which your offer may be liable for rejection.
  30. As per Govt. of India procurement policies (under Make in India (MII))
    - a. The purchaser intends to give purchase preference to local suppliers\* in case the cost of procurement is in the range of more than Rs 5.00 lakhs and up to Rs. 50.00 lakhs.
    - b. The eligibility of the supplier is restricted to Indian Suppliers or there is no restriction on the eligibility of the suppliers. **(retain any one only)**
    - c. The procuring entity intends to give purchase preference to products/goods manufactured by micro, small and medium enterprises.
- \*"Local supplier" means a supplier or service provider whose product or service offered for procurement meets the minimum local content as prescribed in DIPP Order No.P-45021/2/2017-PP (BE-II) dated 28<sup>th</sup> May, 2018 or by the competent Ministries/Departments in pursuance of this order.
- 'Local content' means the amount of value added in India which shall, unless otherwise prescribed by the Nodal Ministry, be the total value of the items procured (excluding net domestic indirect taxes) minus the value of imported content in the item (including all customs duties) as a proportion of the total value, in percent.
31. Instructions to Bidders, General Conditions of Contract applicable to limited tenders originating from S&P Division along with different formats can be viewed on our website [www.csio.res.in](http://www.csio.res.in) under the heading tenders.

Yours faithfully,



SPO

For & on behalf of CSIR-CSIO.

**Bid-Securing Declaration Form***(Refer para 5.1.2 (ix)(d) & 6.1.1 (02) of the CSIR Manual)*

Date: \_\_\_\_\_

Bid No. \_\_\_\_\_

To

Director,  
CSIR-CSIO,  
Sector-30, Chandigarh.

I/We. The undersigned, declare that:

I/We understand that, according to your conditions, bids must be supported by a Bid Securing Declaration.

I/We accept that I/We may be disqualified from bidding for any contract with you for a period of one year from the date of notification if I am /We are in a breach of any obligation under the bid conditions, because I/We

have withdrawn/modified/amended, impairs or derogates from the tender, my/our Bid during the period of bid validity specified in the form of Bid; or

having been notified of the acceptance of our Bid by the purchaser during the period of bid validity (i) fail or reuse to execute the contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the Instructions to Bidders.

I/We understand this Bid Securing Declaration shall cease to be valid if I am/we are not the successful Bidder, upon the earlier of (i) the receipt of your notification of the name of the successful Bidder; or (ii) thirty days after the expiration of the validity of my/our Bid.

Signed: (insert signature of person whose name and capacity are shown) in the capacity of (insert legal capacity of person signing the Bid Securing Declaration).

Name: (insert complete name of person signing the Bid Securing Declaration)

Duly authorized to sign the bid for an on behalf of : (insert complete name of Bidder)

Dated on \_\_\_\_\_ day of \_\_\_\_\_(insert date of signing)

Corporate Seal (where appropriate)

(Note: In case of a Joint Venture, the Bid Securing Declaration must be in the name of all partners to the Joint Venture that submits the bid)

## PLC & HMI Based 2 axis Industrial Servo system Specifications:

### Important notes:

1. Technical drawing of electrical circuit also need along with mechanical drawing of critical parts.
2. Critical hardware spares parts of mechanical and electrical.
3. All the products are to be provided with suitable plug in/out features for control wiring.
4. PLC, HMI, SERVO AMPLIFIER must be make of any one of these Siemens, Fuji, Mitsubishi, Omron and Allen Bradley (same make shall be considered for PLC HMI SERVO AMPLIFIRE & Servo Motor). All other components or Electrical hardware may be use of make Keyence, Schneider, Teknic, Omron, SELEC, Anchor, Havells, Syska, V-Guard, Wago, Phoenix, C&S , **etc. (any reputed brand)**
5. Vendor has to specify the make with catalogue and authorization letter from these companies.
6. Hard copy & soft copy of the Training Manual of kit & technical specifications of devices used shall be provided along with the Trainer kit.
7. All the control provided on control box shall be separately available on HMI Screen also. Also provide the important controlling data on HMI Screen. Separate page must be made as per Example needed at HMI Screen with data logging of critical parameters.
8. As best as possible the kit should be working in PNP nature.
9. Servo Motor must be compatible with Servo Amplifire.
10. Apart of the examples required in this sheet, please ensure other example related to Servo system which are essential as per training aspect for students, which will help them to explore the Industrial Servo and its capabilities.
11. Trainer kit to be assembled on site & installed at the appropriate place. (office opens 5days/week)
12. Detail Training on the kit to be provided after successful installation of the Trainer kit with elaborating hardware function at kit, (also documented in power point)
13. Single software package needed of HMI, PLC, and Servo Programming software.
14. One year of Comprehensive Warranty on all the components of the Trainer kit and 2 free detailed training programs with in the complete package/Kit.
15. As per availability preference must be given to USB programming cable over other types of programming cables.

<b>PLC &amp; HMI Based 2 axis Industrial Servo System Trainer Kit Specifications</b>			
1.1	<b>PLC</b>		Quantity
	a. No. of Inputs:	at least 24	1
	b. No. of Outputs:	at least 16	
	c. Input Type:	24 VDC Sink/Source	
	d. Output Type	Transistor (source)	
	e. Analog output:	at least 1	
	f. Analog Input:	at least 2	
	g. Supply :	24VDC	
	a. Programming Cable+1Spare at least 3meter length		2
1.2	<b>Human Machine Interface</b>		
	a. Display Size	at least 7"	1
	b. Keyboard Type	Touch Screen	
	c. Screen Aspect	Landscape	
	d. SD/USB Card support	Yes for data logging	
	e. Power supply	24VDC	
	f. Buzzer output	Single Tone	
	a. Programming Cable+1Spare at least 3meter length		2
	b. HMI to PLC communication cable		1
1.3	<b>AC Servo setup (for X &amp; Y axis)</b>		
	AC Servo Amplifire:		2

	a. Power supply: 3-Phase 220VAC b. Rated Output kW: 0.75 c. Command : Pulse Train, Analog Voltage d. Control: Position, Speed, Torque	
	a. Programming Cable+1Spare at least 3meter length	2
1.4	<b><u>AC Servo Motor (for X &amp; Y axis)</u></b>	
	a. Rated output kW: 0.75 b. Brake: Yes	2
1.6	<b><u>Essential Electrical Hardware</u></b>	
	a. Relay Card/module with both NO+NC support, Transparent & easily removable Function: Relay Card to be use for protecting all Digital transistor Output.	As per required
	b. Alarm Tower with Yellow, Red, Green Indication 220vac Function: <i>Yellow-Standby, Red-Any fault alarm, Green- Healthy run</i> Indications for the kit.	1
	c. All wiring shall be use of Copper material ducting and conduiting must be done of any good brand.	As per required
	d. Push button box having Push buttons Diameter 22; Functions: Green Start-NO Block, Black Stop-NC Block, Yellow Fault reset-NO Block, Emergency stop Red & Yellow color Mushroom type NC block, Safety curtain bypass Switch-NO Block, Selector switch Auto & Manual both with NO block , PID on/off Switch NO block type.	1 (each)
	e. All Examples operations have both auto & manual software buttons at HMI, on their respective pages.	As per required
	f. Kit shall have 3 phase on/ off switch and ELCB or RCCB protect	1
	g. 24V DC power supply shall be of good brand.	As per required
	h. External PID Controller Function: To control Water tank of one liter capacity, with Thermocouple feedback and to control output device Heater via Solid State Relay.	1
	i. Domestic Heater of low wattage 250W	1
	j. Solid state Relay ( specifications as per 250W Heater and control output from PID) , 24VDC input	1
	k. Thermocouple for temp sensing	1
	l. Separate MCB Protection for DC 24V power supply	As per required
	m. Separate MCB protection for 220V AC control Supply	As per required
	n. Single Phase protection and phase sequence protection for the Kit Power +1spare	2
	o. Port potentiometer for Analog Input	As per required
	p. One Voltmeter for Analog Output	As per required
	q. Dedicated MPCB for both Servo motor with proper Trip current values+1 Spare	3
	r. Contactor shall be use of good brand.	As per required
	s. Introduction of Light Curtain sensor for safety of operator while machine operation	1
	t. On one liter water tank there shall be high & low level water sensors	As per required
	u. Proper written stickers shall be provided on each hardware and button on control box control panel and visible hardware.	As per required
1.7	<b><u>Essential Mechanical Hardware</u></b>	2 nos.
	a. Kit shall have easy mechanical attachments for speed, torque and position control etc. examples.	As per required
	b. Both servo systems must have to control Lead Screw based pointers (In X & Y axis) on linear motion having dedicated steel scales in X and Y axis and also attachments should have to hold Standard Pen or Marker to plot result on bottom surface may be on fixed board.	
	c. Both servo system's mechanical attachment shall be such kind that servos could be able to run dependently to generate combine result like plotting etc. & also able to work independently to generate separate result like displacement control as per steel scales.	
	d. Mechanical limits must be duly control by sensors and servo control (if limit sensor fails).	
	e. Any part used in the examples shall be reusable and no functional plastic components.	

	f.	Kit shall have protective Acrylic sheet with hinge support to open/ close for installing mechanical attachments/ adjustment for particular exercise, interlock shall be given to plc if any one Acrylic sheet remain open, HMI screen shall highlight "Safety Door Open".	
	g.	Kit shall have wheels with locking arrangements so as to prevent movement while operation.	
	h.	Kit size shall not be above 1180mmx1180mm floor area and height shall be like easy to use/ operate while standing. (average height people e.g. 5 feet 4 inch)	
	i.	Panel must be fix Vertically at the bottom part (nonfunctional area) of the kit	
	j.	Any part used in Exercise shall with stand under maximum values of torque, speed and position control. Also provide sufficient no's of spares sample components used in Exercise.	As per required
	k.	One liter water tank must be easily removable and hold able with easy handling of sensors and heater.	As per required

**Example Needed on the parameters mentioned below**

1.	Command
	a. Pulse Train
	b. Analog Voltage
2.	Control
	a. Position Mode
	b. Speed Mode
	c. Torque Mode
3.	Two Axis Dependent Servo Control
4.	Single Axis Independent Servo Control
5.	External PID controller controlling heating by using Thermocouple values of small water heating tank of one liter capacity. The PID controller shall be on/off controlling to heater. (Alarm of Temp low/high shall be linked with PLC controller for High low alarm on HMI Screen.
6.	Water tank must have High & low level indications on HMI, & if level is low then PLC output must stop operation of Solid state relay. And when level in between High & low then Solid state relay can be operable.
7.	Data Logging of critical parameters at each HMI screen as per Example.
8.	Simple analog example: Turing the potentiometer 0-10V (analog I/p) the manipulated output shall visible on voltmeter (analog O/p) 0-10V Scale. (only if feasible)
9.	Reading Home positions
10.	Increment decrement the X Y positions of servo.

