

श्री चित्रा तिरुनाल आयुर्विज्ञान एवं प्रौद्योगिकी संस्थान, जैवचिकित्सकीय प्रौद्योगिकी स्कंध  
**SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY**  
**BIO MEDICAL TECHNOLOGY WING**



(एक राष्ट्रीय महत्व का संस्थान, विज्ञान एवं प्रौद्योगिकी विभाग, भारत सरकार)  
(An Institution of National Importance, Dept. of Science and Technology, Govt. of India)

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**TENDER NOTICE**

**Tender No. BMT/OTE/PRF-WO/2022-23/1**

**Dated: 11.01.2023**

Sealed Tender in **TWO BID** system is invited from the service providers/bidders having experience in carrying out the retrofitting works for the equipment mentioned below.

Sl. No	Particulars	Tender No.
1	<b>Retrofitting the CNC Control system of the</b> <b>a. SCHAUHLIN 28 CCN Milling Machine and</b> <b>b. SCHAUHLIN 125 CCN Lathe Milling Machine</b>	<b>BMT/OTE/PRF-WO/2022-23/1</b>

<i>Last date and time of submission of <b>Original EMD, Techno-Commercial Bid, Price bid along with supporting documents.</b></i>	<b>31.01.2023 at 05:00 PM</b>
<i>Date of Techno-Commercial Bid Opening</i>	<b>02.02.2023 at 3:30 PM</b>
<i>Date of price bid Opening</i>	Will be informed later
<i>Contact Person</i>	Senior Purchase & Stores Officer, Email: <a href="mailto:bmtstp@sctimst.ac.in">bmtstp@sctimst.ac.in</a> / <a href="mailto:bmpurind4@sctimst.ac.in/bmtoss@sctimst.ac.in">bmpurind4@sctimst.ac.in/bmtoss@sctimst.ac.in</a> Ph: 0471-2520228/328/457

Interested bidders are advised to download the complete Tender Enquiry document from the websites [www.sctimst.ac.in](http://www.sctimst.ac.in).

Bids should be accompanied by **Earnest Money Deposit (EMD) of Rs. 4,00,000/-**. EMD may be in the form of an account payee demand draft, fixed deposit receipt, or banker's cheque in favour of Director, SCTIMST or a bank guarantee. The Earnest Money Deposit shall be valid for a period of **forty-five (45) days** beyond the validity period of the bid. The validity period of Bid is **180 days** from date of Techno-Commercial Bid opening and hence the Earnest Money Deposit shall be valid

for 225 days from Techno-Commercial Bid opening date. **The EMD should be enclosed with Techno-Commercial Bid only.**

The EMD will be waived based on the relevant certificate for the tendered items on production of documents such as DGS &D, NSIC Registration Certificate etc. for the specific category of item and should remain valid for the period required for EMD.

Clarifications, if any with regard to tender documents may be communicated /sought well in advance before the closing date of the tender

The Director of the Institute reserves the right to accept / reject the offer all in whole or in part without assigning any reason thereof and does not bind itself to accept lowest quotations.

**Important Note: Tenders not accompanied with equivalent EMD shall stand rejected.**

### **TERMS & CONDITIONS**

1. The tender(s) must be submitted as per the below terms and conditions and should be free from corrections/erasures. In case there is any unavoidable correction(s), it should be properly attested. If not, the tender(s) will not be considered. Further, tender(s) written in pencil will not be considered.
2. (a) The bidder should declare whether they are manufacturer, accredited Agents, or sole representative (indicating the name of Principal) on the top of the Bid.  
(b) In case of agents quoting on behalf of their principal manufacturer(s), one agent cannot represent two manufacturers or quote on their behalf in particular tender. One manufacturer can authorize only one agent / dealer. Only one bid, either from principal manufacturer directly or through one Indian agent on his behalf or Indian / foreign agent on behalf of principal manufacturer shall be entertained.  
**All offers should be accompanied with detailed specifications, relevant documents as elaborated in Annexure 1 & 2.**
3. **Bidders having experience in carrying out retrofitting of SCHAUBLIN machines and having SCHAUBLIN/OEM authorization for carrying out similar retrofitting work on SCHAUBLIN machines will be given preference. Document evidence should be provided by the bidder for their claim.**
4. In case the items coming under the provisions of Drugs & Cosmetics Act & Rules, the following should be submitted :
  - a) For imported items: Central Drugs Controller Certificate from Central Drugs Standard Control Organization, New Delhi.
  - b) For indigenously manufactured items: Certificate issued by State Drugs Controller
5. **The Techno-Commercial Bid will be opened and evaluated first. Price bid of technically qualified bidders will be opened on prior intimation. The lowest offer will be arrived on**

**adding basic cost, GST applicable, incidentals (if any). Negotiation will be conducted with the lowest qualified tenderer only, if required.**

6. The prices quoted should be “FOR Trivandrum” for delivery/work at destination/Institute in INR. Rates quoted should not be revised till the supplies/installation are completed and the rate shall be valid for 180 days from the date of opening of bid.
7. In case of no quotes against a particular item in the tender(s), this should be clearly mentioned along with reasons. The prices quoted should not be revised till the works are completed. The rates should be quoted in words and figures. In case of difference in quote(s) written in figure and words arise, the amount written in words will be treated as quoted rate. Rates quoted should be free delivery/service at our institute including all charges otherwise the tender is likely to be rejected. If there is no indication regarding the FOR, in the tender, then it will be considered as FOR destinations/Institute. Price quoted should be net and valid for a minimum period of six months from the date of opening of the tender. GST applicable should be mentioned separately and if no indication regarding GST is recorded in the tender, the GST will be considered as included in the quote(s).
8. The Bidder shall give an affidavit as under:

"We hereby certify that if at any time, information furnished by us is proved to be false or incorrect, we are liable for any action as deemed fit by the purchaser in addition to forfeiture of the earnest money."

The manufacturer (bidder)/Indian Agent shall furnish Satisfactory Performance Certificate in respect of above, along with the tender.
9. The purchaser reserves the right to ask for a free demonstration of the work at a pre-determined place acceptable to the purchaser for technical acceptability as per the tender specifications, before the opening of the Price bid.
16. For all supplies / contract above rupees one lakh, the successful tenderer should furnish a performance guarantee / security deposit @ 3 percent of workorder/purchase order value excluding GST against the item with warranty in the form of Fixed Deposit or Bank Guarantee from a nationalized /scheduled bank having a validity period of 60 days beyond the completion of all contractual obligations of the supplier.The valid EMD can also be substituted for security deposit and balance amount if any shall be furnished by the successful tenderer.
17. Selected bidder shall have to confirm the work order/Purchase Order within seven days from the date of receipt of the same otherwise the work order will deemed to be accepted by vendor. In case the selected bidder notices any mistake in the contents of the order, he/they must bring the same to the notice of the Institute and seek clarifications. However, Selected bidder will have to bear the responsibility for failure to take this action.

18. Delivery period required for supplying the material should be invariably specified in the bid. The consignment/work should be delivered/installed/commissioned at the user department SCTIMST, Bio Medical Technology Wing, Poojappura, Trivandrum between 9:00 AM to 4 PM during the working days.
19. This Institute reserves the right to modify the quantity/nature of work specified in this tender.
20. The acceptable payment modes is Electronic Transfer (NEFT) within 30 days of satisfactory installation and commissioning of system.

**21. Penalty clause:**

**(I) Delay in Delivery**

(i) If the works is not completed within the due date as specified in the purchase order, the Director, SCTIMST will have the right to impose penalty at 0.5 percent per week subject to a maximum of 10 percent of order value.

**(II) Performance (during Warranty period)**

Supplier should ensure uninterrupted service delivery of the equipment or product during the warranty period. In this regard following conditions also may be noted:

- a) In case of failure of equipment or its components, breakdown call has to be attended within 48 hours of intimation. If any part or component found to be defective during the warranty period, the same should be replaced without any additional cost.
- b) The defect should be rectified within two days after the call is attended, failing which replacement or standby equipment should be provided for uninterrupted services.
- c) In case of non-adherence to clause (a) or (b) above, downtime penalty will be realised a sum equivalent either the repairing charges met by the Institute to set right the equipment or 0.1 percent per day of cost of the equipment, whichever is higher, from the date of report of breakdown by way of deductions from SD/Performance Bank Guarantee.
- d) The time spent on the repair work will be added to the warranty period of the equipment.

**22. Liquidated Damages:**

If the supplier fails to deliver or install/commission any or all of the goods or fails to perform the services within the time frame(s) incorporated in the Work Order, the institute shall, without prejudice to other rights and remedies available to the institute under the contract, deduct from the contract price, as liquidated damages, a sum equivalent to 0.5% per week of delay or part thereof on delayed supply of goods, installation, commissioning and/or services until actual delivery or performance subject to a maximum of 10% of the contract price. Once the maximum is reached Purchaser may consider termination of the contract.

If any delay by the supplier in maintaining its contractual obligations towards delivery of goods and performance of services shall render the supplier liable to any or all of the following sanctions:

- (i) Imposition of liquidated damages
- (ii) Forfeiture of its Performance Security and
- (iii) Termination of the Contract for default

23. **Recovery Clause:** All losses liquidated or otherwise due to the violation of terms and conditions of the work order or defective documentation will be to the supplier/agent's account.
24. In case the quote is not according to the above terms and conditions, the same will be summarily rejected. Further, false certification in the compliance statement and misrepresentation of facts may attract blacklisting of tenderer.
25. All correspondence after tender submission will be by e-mail only and the companies should provide their valid e-mail Id and should keep it updated.
26. The bidder submitting the tender would be deemed to have considered and accepted all the terms and conditions. An affidavit containing the same shall be submitted.
27. Dispute clause: Any dispute relating to the enquiry shall be subject to the jurisdiction of the court at Thiruvananthapuram only.

**ANNEXURE-I**

**Detailed Specification/requirement of Retrofitting the CNC Control system of SCHAUBLIN 28 CCN Milling Machine**

Retrofitting the existing SCHAUBLIN 28 CCN Milling machine with the supply of new Fanuc CNC 0i-MF or higher suitable system with 10.4” or higher colour display monitor (TFT/LCD), servo package (CNC system, relays power supplies electrical cabinet switch gear and all other parts) including Service Charges towards Wiring, Interfacing and Development of PLC & Commissioning of Drives, Assembly of Motors with Required Modifications in the machine and training.

The vendor should have experience of having successfully carried out CNC retrofitting work on Precision Machines in India and they should provide document evidences such as previous years’ work completion report/performance certificate issued by the customer for retrofitting CNC machines to support their experience in the field. Bidders having experience in carrying out retrofitting of SCHAUBLIN machines and having SCHAUBLIN/OEM authorization for carrying out similar retrofitting work on Schaublin machines will be given preference. Document evidence should be provided by the bidder for their claim.

**Note:-Vendors are advised to visit SREE CHITRA TIRUNAL INSTITUTE FOR MEDICALSCIENCES & TECHNOLOGY-Biomedical Technology Wing, Poojapura, Trivandrum to study the existing machine and assess the work content before submission of quotation. An Affidavit in this regard (mentioned below) may be submitted along with the tender.**

**“We hereby certify that we have seen/assessed the present condition of existing machine and submitting the tender for retrofitting”**

Sl.No	Item Description	Compliance Yes/No	Deviation/Remarks
	<b>MATERIAL SUPPLY &amp; WORK</b>		
<b>1</b>	<b>CNC SYSTEM</b>		
<b>1.1</b>	-Fanuc 0i MF or higher suitable version with 10.4” or higher size colour (TFT/LCD)display monitor. -CNC Package:- Fanuc 0i MF or higher suitable version of CNC system with full -Alphanumeric keyboard and 10.4”or higher colour TFT/LCD display. -CNC make: FANUC. -The CNC system shall have the following features: -All Milling operations and shall cater all existing machine features. -Graphic machining simulation of tool path in part programs and real time simulation. -Manual measurement and automatic storage of tool offsets in tool offset memory. -Rigid tapping, Bi-Directional pitch error compensation, Manual Guide -Standard CNC data transfer via RS232C & USB , Compact flash card, Ethernet interfaces is a must. -CF card or PCMCIA card along with it’s reader- each 2 nos.		

	<ul style="list-style-type: none"> <li>-USB editing/ operation with Additional CNC user memory on USB disk</li> <li>-Backlash and lead screw compensation facility,</li> <li>-Block search with calculation (T, S, F, M, position)</li> <li>-Machine alarm diagnosis, operation wizard to teach with the help of a graphical guide.</li> <li>-PLC in Ladder diagram / STL format should be provided. Ladder program should be viewable on the monitor of CNC. Status of various signal should be indicated in ladder diagram.</li>   <li>-CNC user memory for program and data should be 2MB or more.</li> <li>-Features like Single block, Optional Stop, Block Search, DRY run, Rapid Feed On/OFF,</li> <li>-Programmable keys should be available through USER/ Pre-defined keys.</li> </ul> <p><b>MACHINE OPERATOR PANEL</b></p> <ul style="list-style-type: none"> <li>-Machine Operator panel for Mode selection, Feed override, Spindle override, Cycle START/ STOP, Spindle START/ STOP along with keyboard.</li> <li>-Electronic Hand wheel &amp; Hand wheel interface (if required) on operator panel for all the axis with axes hand wheel selector switch.</li> <li>-TFT/LCD/LED mounted type Control unit with USB interface is required.</li> <li>-Interface port for connecting with PC and CNC system with RS232 port or by the latest system.</li> <li>-Input/ Output board for 96 inputs &amp; 64 outputs or more as required with min 4 I/O left free for future use.</li> <li>- Channel fusible Relay boards each consisting of required relays to be provided &amp; commissioned for driving the PLC outputs to the machine. All PLC outputs to be routed through these relay boards to machine.</li> <li>-All Software along with communication cables for data back-up &amp; restoration</li> <li>-Axes emergency By-pass push button should be provided on operator panel.</li> </ul>		
<b>2</b>	<b>AC SERVO MOTORS:</b>		
2.1	<p>AC servo motor (Fanuc series) with suitable rating for X axis should be offered to replace the existing motor. The AC Servo motor with encoder should have torque and max speed rating and other motor parameters of the existing motor equal to or higher than the motor presently installed on the machine. <i>The type number / model of the servo motor selected should be indicated in the offer and its technical</i></p>		

	<i>details should be enclosed.</i>		
2.2	AC servo motor (Fanuc series) with suitable rating for Y axis should be offered to replace the existing motor. The AC Servo motor with encoder should have torque and max speed rating and other motor parameters of the existing motor equal to or higher than the motor presently installed on the machine. <i>The type number / model of the servo motor selected should be indicated in the offer and its technical details should be enclosed.</i>		
2.3	AC servo motor (Fanuc series) with suitable rating for Z axis should be offered to replace the existing motor. The AC Servo motor with encoder should have torque and max speed rating and other motor parameters of the existing motor equal to or higher than the motor presently installed on the machine. <i>The type number / model of the servo motor selected should be indicated in the offer and its technical details should be enclosed.</i>		
2.4	Supply of intermediate flanges, couplings and any mechanical interfacing arrangement required to match the new motor with the existing mechanical drive system should be included in the offer.		
2.5	AC spindle motor of suitable capacity to replace the old spindle motor. The parameters of the offered motor to match with the existing motor and suitable to be interfaced with the CNC system offered. The type number / model of the motor selected should be indicated.		
<b>3</b>	<b>AC SERVO DRIVES</b>		
3.1	AC Servo drives for Feed motor control of X,Y& Z axes. The rating of the drive module should be suitable to selected servo motor of the respective axis. The details of the drives to be provided by the vendor.		
3.2	AC servo drives offered above should consist of Active Interface module, Active Line module, Control module with BOP, Sensor module etc. required to interface the servo motor /servo drive etc. to the supplied CNC system. The technical leaflet should be enclosed. Suitably rated Line filter with Choke for all axes drives should be included in the offer.		
3.3	Motor Encoder cables of suitable length for X-Axis encoder, Y-Axis encoder, Z-Axis encoder and spindle Encoder to be replaced and interfaced with the new CNC system with necessary cables and connectors.		
3.4	Power cables( reputed brands) of suitable length for all AC Servo motors.		
3.5	All connecting cables, connectors, and Interface card etc. for interfacing the drives with supplied CNC system should be		



	included in the offer.		
3.6	Shield terminal plates and earthing schematic for all the modules should be provided and suitably mounted.		
	Note:- Input supply of 415 V AC power supply is available. UPS power supply is available for the machine.		
<b>4</b>	<b>MECHANICAL</b>		
4.1	Motor Mounting brackets / plates for all servo motors to be fabricated as per mounting requirement. It should have sufficient space to mount all the feed drives and Spindle drive along with all switch gears of drives, PLC and other accessories.		
4.2	Couplings, Mounting brackets, mounting plates etc. for mounting of position feedback encoders and other items if required will be vendor's scope.		
<b>5</b>	<b>ELECTRICAL FEATURES</b>		
5.1	Existing Electrical cabinet should be replaced with New Electrical cabinet having sufficient space to mount all the feed drives and Spindle drive along with all switch gears of drives, PLC and other accessories.		
5.2	Operator Pendant plate for new controller, Emergency, MCP & MOP to be provided and it should look aesthetic.		
5.3	Suitable rating MCCB of SIEMENS/ Schneider/ABB or equivalent make as per new schematic of panel & machine.		
5.4	Suitable MPCB/ MCB of SIEMENS/ Schneider/ABB or equivalent make for all overload protection. The complete LV switchgear (reputed make) of the machine including overloads, relays, contactors, MPCBs and MCBs etc for feed drives, Spindle drive, CNC, PLC, all accessories and to cover all other machine functionalities to be supplied, mounted & interfaced as per new electrical schematic. Proper routing and wiring should be ensured with proper earthing connection.		
5.5	Fanuc Manual Pulse Generator with axis selector switch for individual axis selection with suitable length cable and adapter as required.		
5.6	Additional Keys, Push-buttons with indication lamps, Indicator lamps / lamp holder & Selector switches required on the operator panel for operation of the machine to be provided.		
5.7	DC Regulated Power Supply SMPS 24V DC, 20 Amps or Suitable Amps for CNC system & Input/Outputs. DC Regulated Power Supply SMPS 24V DC, 20 Amps or Suitable Amps for machine elements.		
5.8	Sealed machine light of reputed make for machine illumination to be installed with suitable protection from machined chips and coolant entry.		
5.9	The entire machine has to be rewired, Wires & Conduits preferably of LAPP or equivalent make for rewiring of the		

	entire machine including Control, Signal & Power cables, switchgears cables, and field elements cables etc. Except for Input Power Supply to the machine		
5.9.1	Terminal boxes, screwed terminal blocks, bus bars, transformers etc. as required as per the new electrical scheme should be provided of reputed makes vendor should specify the make.		
5.9.2	All existing operational features of the machine should be retained in the new electrical schematic of the machine		
5.9.3	Oil, chip & dust-proof Metallic/ PVC Cable drag chains and end covers/ brackets of reputed make.		
5.9.4	Lubrication oil motor and coolant tank motor to be interfaced.		
5.9.5	Reputed make hose pipes, DIN rails, cable ducts, insulated lugs, printed ferrules, and other material required for the wiring & tagging of machine field elements and panel to be supplied by the vendor.		
5.9.6	Vendor has to supply all clamps, fixtures and fasteners required to complete the retrofitting work.		
5.9.7	Channel Relay boards with fuse holders should be provided for driving the PLC outputs to the machine. All PLC outputs to be routed to the machine through these Relay boards only.		
5.9.8	Any other material not mentioned above but found necessary to complete the retrofitting work, will be in Vendor's scope of supply.		
5.9.9	All the panels, Junction boxes, devices should have nomenclature and individual laminated wires ferruled as per the electrical schematics. Long lasting nameplates viz. Laser etched etc. shall be fixed on each component as well as on the walls of panels etc. to indicate permanent location of the component.		
<b>6</b>	<b>SCOPE OF WORK:</b>		
6.1.1	Dismantling of old items in electrical panel including dismantling/removal of all drives (X,Y & Z), switch gears, CNC, PLC, along with Dismantling of axes feed motors and all electrical Items to be removed.		
6.1.2	Dismantling of old CNC controller on operator Control panel and Installation of new CNC controller.		
6.2	Mounting and installation of All new feed motors (X,Y& Z). Design, Modification / reengineering,manufacturing of pulley, flanges and encoder couplings etc. for feed motors, position feedbacks as per requirement.		
6.3	Cabling and wiring of CNC, PLC I/O, Drive system, control panels and field devices. Entire Cabling including Position Feedback of the machine is to be replaced with the new cabling.		

	Laying and routing of new conduits, cables from electrical cabinet to machine and CNC operator panel through new conduits. Refurbishment and rewiring of all the terminal boards, Junction Boxes as per requirement. Routing of the new cables through drag chain. The cables passing through the drag chain will be inside the conduits of reputed make.		
6.4	Interfacing of new CNC controller.		
6.4.1	Interfacing of the existing coolant unit, lubrication unit with the new electrical schematic.		
6.4.2	Interfacing & commissioning of the CNC, PLC, Position feedback devices, Main spindle drive, Feed drives, Machine lights, Field elements etc.		
6.4.3	Existing machine functions have to be retained in the new PLC Program. In case the vendor perceives that more Inputs/Outputs are required for completion for the work as per their designed and conceived electrical scheme, the same should be included in the scope of supply.		
6.5	Laser calibration and ball bar test to be conducted from a reputed agency having valid calibration certificate for instruments. The readings to be provided and suitable error compensation to be carried out.		
6.6	Supply of necessary timing belts and pulley for all axes, V belts/multirib belt for spindle drive.		
6.7	Prove-out of all existing main functions Axes, Spindle and auxiliary functions like Coolant system, Lubrication, etc. to run in auto cycle, MDI & JOG.		
6.8	Supply of any Electrical panel (If required)for mounting the drives, power supply units and other switchgears is under vendor's scope. The panel should be metal enclosed, free from flaws and dents. Proper gaskets for mating surfaces.		
6.9	<i>At present CIMATRON CAD/CAM software is used for generation of NC commands and are transmitted via RS232.</i> In case a new postprocessor is required to match the CIMATRON software to the new Fanuc controller the same shall be done and the charges to be borne by the vendor and the same to be included in the offer.		
<b>7</b>	<b>COMMISSIONING:</b>		
7.1	New PLC program should incorporate all the drive signals, all possible alarms, suitable interlocking and their display on CNC screen with remedial actions related to the alarms and messages.		
7.2	Existing machine logic and technological processes have to be retained.		
7.3	Machine should be laser calibrated after changing CNC and the results should be within the limits of machine specifications.		
<b>8</b>	<b>ACCEPTANCE:</b>		

8.1	<p>Final Acceptance will be after:</p> <p>a) completion of the scope of supply at SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES &amp; TECHNOLOGY.</p> <p>b) Final acceptance will include clearance of all pending issues related to the work contract.</p> <p>c) Successful Commissioning &amp; Demonstration of various cycles and control functions as envisaged in the technical scope. Vendor will demonstrate operation of all parts of the system supplied along with all the features as specified above.</p> <p>d) Successful trial machining of one component as provided by customer.</p>		
<b>9</b>	<b>DELIVERY</b>		
9.1	<p>To be completed in 5-6 months or at the earliest.</p> <p>Late Delivery Penalty will be applicable for delay in execution of work as per our purchase rules.</p>		
<b>10</b>	<b>DOCUMENTATION:</b>		
	<p>CNC system manuals in hard &amp; soft copy comprising of Installation.- 2 sets  Programming Manuals 2 Set  Commissioning and service manuals of CNC system-2 Set  PLC program hard copy with comments in English &amp; cross-reference list-2 sets  PLC program on CD/DVD in installable &amp; printable formats.-2 sets  New electrical schematic and wiring diagram of the machine in hard copy as well as in soft copy.  Instructions for data back-up &amp; restoration for CNC &amp; PLC.  All documentation, ghost backup / Image of CNC system, Drive parameters &amp; back on CD/DVD  List &amp; Service catalogues of all bought-out items.- 2 sets  Drawings of all mechanical modifications, mountings, flanges &amp; couplings.</p>		
<b>11</b>	<b>WARRANTY:</b>		
	<p>3 Years from Successful commissioning of machine.</p> <p>The CNC system being offered shall be available in the market for next 10 years and spares/service support shall be available for the next 10 years.</p> <p>All features available in the old CNC system of the machine shall be made available in the new CNC being offered.</p> <p>Service support shall be available in India. Details of the service centre facility available in India to be provided.</p>		
<b>12</b>	<b>TRAINING:</b>		
	<p>Vendor will impart 10 days training to customer, for operation, programming &amp; maintenance of the system supplied by them after installation &amp; commissioning of the machine at SCTIMST.</p>		

<b>13</b>	<b>General</b>		
13.1	Any other work or material related to electrical, mechanical and electronics not mentioned in this scope of supply but required for successful commissioning the machine shall be provided by the vendor free of charge.		
13.2	Complete specifications such as part no./Model/Type, power, torque, rated and maximum RPMs, rated and maximum currents of the motor and drive controllers shall be stated in the offer by the party. Ordering brochure/catalogue should be attached.		
13.3	Prove out and demonstration of all existing machine functions and programming features of new CNC System including manual control of the machine. Test Piece machining to be carried out.		
13.4	Vendor should bring all types of hand tools including pneumatic/electrical drill machines, Laser equipment's, and grinders along with general purpose measuring instruments and testing equipment with them for successful commissioning of the machine. Vendor must comply with all the Covid-19 guidelines issued by the State government and by the Institute.		
13.5	Compliance statement shall be submitted by the party with reference to the above scope of supply against each clause with relevant details & comments. Non-compliance to any of the clauses can lead to dis-qualification of the offer.		

## ANNEXURE-2

### Detailed Specification/requirement of Retrofitting the CNC Control system of SCHAUBLIN 125 CCN LatheMachine

Retrofitting the existing Schaubline 125 CCN Lathe machine with the supply of new Fanuc CNC 0i-TF or higher suitable system with 10.4” or higher colour display monitor(TFT/LCD), servo package (CNC system, relays power supplies electrical cabinet switch gear and other all parts) including Service Charges towards, Wiring, Interfacing and Development of PLC &Commissioning of Drives, Assembly of Motors with Required Modifications in the machine and training.

The vendor should have experience of having successfully carried out CNC retrofitting work on Precision Machines in India and they should provide document evidences such as previous years’ work completion report/performance certificate issued by the customer for retrofitting CNC machines to support their experience in the field. Bidders having experience in carrying out retrofitting of SCHAUBLIN machines and having SCHAUBLIN/OEM authorization for carrying out similar retrofitting work on Schaublin machines will be given preference. Document evidence should be provided by the bidder for their claim.

**Note:-Vendors are advised to visit SREE CHITRA TIRUNAL INSTITUTE FOR MEDICALSCIENCES & TECHNOLOGY-Biomedical Technology Wing, Poojapura, Trivandrum to study the existing machine and assess the work content before submission of quotation. An Affidavit in this regard (mentioned below) may be submitted along with the tender.**

**“We hereby certify that we have seen/assessed the present condition of existing machine and submitting the tender for retrofitting”**

Sl.No	Item Description	Compliance Yes/No	Deviation /Remarks
	<b>MATERIAL SUPPLY &amp; WORK</b>		
<b>1</b>	<b>CNC SYSTEM</b>		
<b>1.1</b>	Fanuc 0i TF or Higher/ suitable version with 10.4” or higher size colour (TFT/LCD) display monitor. -CNC Package:- Fanuc 0i TF or Higher/ suitable version of CNC system with full -Alphanumeric keyboard and 10.4”or higher colour TFT/LCD display -CNC make: FANUC. -The CNC system shall have the following features: -All Turning, threading operations and shall cater all existing machine features. -Graphic machining simulation of tool path in part programs and real time simulation. -Manual measurement and automatic storage of tool offers in tool offset memory. -Rigid tapping, Bi-Directional pitch error compensation, Manual Guide -Standard CNC data transfer via RS232C & USB , Compact flash card, Ethernet interfaces is a must. -CF card or PCMCIA card along with it’s reader- each 2 nos. -USB editing/ operation with Additional CNC user memory on USB disk		

	<ul style="list-style-type: none"> <li>-Backlash and lead screw compensation facility,</li> <li>-Block search with calculation (T, S, F, M, position)</li> <li>-Machine alarm diagnosis, operation wizard to teach with the help of a graphical guide.</li> <li>-PLC in Ladder diagram / STL format should be provided. Ladder program should be viewable on the monitor of CNC. Status of various signal should be indicated in ladder diagram.</li>   <li>-CNC user memory for program and data should be 2MB or more.</li> <li>-Features like Single block, Optional Stop, Block Search, DRY run, Rapid Feed On/OFF,</li> <li>-Programmable keys should be available through USER/ Pre-defined keys.</li> </ul> <p><b>MACHINE OPERATOR PANEL</b></p> <ul style="list-style-type: none"> <li>-Machine Operator panel for Mode selection, Feed override, Spindle override, Cycle START/ STOP, Spindle START/ STOP along with keyboard.</li> <li>-Electronic Hand wheel &amp; Hand wheel interface (if required) on operator panel for all the axis with axes hand wheel selector switch.</li> <li>-TFT/LCD/LED mounted type Control unit with USB interface is required.</li> <li>-Interface port for connecting with PC and CNC system with RS232 port or by the latest system.</li> <li>-Input/ Output board for 96 inputs &amp; 64 outputs or more as required with min 4 I/O left free for future use.</li> <li>- Channel fusible Relay boards each consisting of required relays to be provided &amp; commissioned for driving the PLC outputs to the machine. All PLC outputs to be routed through these relay boards to machine.</li> <li>-All Software along with communication cables for data back-up &amp; restoration</li> <li>-Axes emergency By-pass push button should be provided on operator panel.</li> </ul>		
<b>2</b>	<b>AC SERVO MOTORS:</b>		
2.1	AC servo motor (Fanuc series) with suitable rating for X axis should be offered to replace the existing motor. The AC Servo motor with encoder should have torque and max speed rating and other motor parameters of the existing motor equal to or higher than the motor presently installed on the machine. <i>The type number / model of the servo motor selected should be indicated in the offer and its technical details should be enclosed.</i>		
2.2	AC servo motor (Fanuc series) with suitable rating for Z axis should be offered to replace the existing motor. The AC Servo motor with encoder should have torque and max speed rating and other motor parameters of the existing motor equal to or higher than the motor presently installed on the machine. <i>The type number / model of the servo motor selected should be indicated in the offer and its technical details should be enclosed.</i>		
2.3	Supply of intermediate flanges, couplings and any other parts required		

	for mounting of motors		
2.5	AC spindle servo motor of suitable capacity to replace the old spindle motor. The parameters of the offered motor to match with the existing motor and suitable to be interfaced with the CNC system offered. The type number / model of the motor selected should be indicated.		
<b>3</b>	<b>AC SERVO DRIVES</b>		
3.1	AC Servo drives for Feed motor control of X,& Z axes. The rating of the drive module should be suitable to selected servo motor of the respective axis. The details of the drives to be provided by the vendor		
3.2	AC servo drives offered above should consist of Active Interface module, Active Line module, Control module with BOP, Sensor module etc. required to interface the servo motor /servo drive etc. to the supplied CNC system. The technical leaflet should be enclosed. Suitably rated Line filter with Choke for all axes drives should be included in the offer.		
3.3	Motor Encoder cables of suitable length for X-Axis encoder, Z-Axis encoder and spindle Encoder to be replaced and interfaced with the new CNC system with necessary cables and connectors.		
3.4	Power cables( reputed brands) of suitable length for all AC Servo motors.		
3.5	All connecting cables, connectors, and Interface card etc. for interfacing the drives with supplied CNC system should be included in the offer.		
3.6	Shield terminal plates and earthing schematic for all the modules.		
	Note:- Input supply of 415 V AC power supply is available. UPS power supply is available for the machine.		
<b>4</b>	<b>MECHANICAL</b>		
4.1	Motor Mounting brackets / plates for all servo motors to be fabricated as per mounting requirement. It should have sufficient space to mount all the feed drives and Spindle drive along with all switch gears of drives, PLC and other accessories.		
4.2	Couplings, Mounting brackets, mounting plates etc. for mounting of position feedback encoders and other items if required will be vendor's scope.		
<b>5</b>	<b>ELECTRICAL FEATURES</b>		
<b>5.1</b>	Existing Electrical cabinet should be replaced with New Electrical cabinet having sufficient space to mount all the feed drives and Spindle drive along with all switch gears of drives, PLC and other accessories.		
5.2	Operator Pendant plate for new controller, Emergency, MCP & MOP to be provided also it should look aesthetic.		
5.3	Suitable rating MCCB of SIEMENS/ Schneider/ABB or equivalent make as per new schematic of panel & machine.		
5.4	Suitable MPCB/ MCB of SIEMENS/ Schneider/ABB or equivalent make for all overload protection. The complete LV switchgear (reputed make) of the machine including overloads, relays, contactors, MPCBs and MCBs etc. is to be supplied & interfaced as per new electrical schematic. Proper routing and wiring		



	should be ensured with proper earthing connection.		
5.5	Fanuc Manual Pulse Generator with axis selector switch for individual axis selection with suitable length cable and adapter as required.		
5.6	Additional Keys, Push-buttons with indication lamps, Indicator lamps / lamp holder & Selector switches required on the operator panel for operation of the machine to be provided.		
5.7	DC Regulated Power Supply SMPS 24V DC, 20 Amps or Suitable Amps for CNC system & Input/Outputs. DC Regulated Power Supply SMPS 24V DC, 20 Amps or Suitable Amps for machine elements.		
5.8	Sealed machine light of reputed make for machine illumination to be installed with suitable protection from machined chips and coolant entry.		
5.9	The entire machine has to be rewired, Wires & Conduits preferably of LAPP make for rewiring of the entire machine including Control, Signal & Power cables, switchgears cables, and field elements cables etc. Except for Input Power Supply to the machine		
5.9.1	Terminal boxes, screwed terminal blocks, bus bars, transformers etc. as required as per the new electrical scheme should be provided of reputed makes vendor should specify the make.		
5.9.2	All existing operational features of the machine should be retained in the new electrical schematic of the machine		
5.9.3	Oil, chip & dust-proof Metallic/ PVC Cable drag chains and end covers/ brackets of reputed make.		
5.9.4	Lubrication oil motor and coolant tank motor to be interfaced.		
5.9.5	Reputed make hose pipes, DIN rails, cable ducts, insulated lugs, printed ferrules, and other material required for the wiring & tagging of machine field elements and panel to be supplied by the vendor.		
5.9.6	Vendor has to supply all clamps, fixtures and fasteners required to complete the retrofitting work.		
5.9.7	Channel Relay boards with fuse holders should be provided for driving the PLC outputs to the machine. All PLC outputs to be routed to the machine through these Relay boards only.		
5.9.8	Any other material not mentioned above but found necessary to complete the retrofitting work, will be in Vendor's scope of supply.		
5.9.9	All the panels, Junction boxes, devices should have nomenclature and individual laminated wires ferruled as per the electrical schematics. Long lasting nameplates viz. Laser etched etc. shall be fixed on each component as well as on the walls of panels etc. to indicate permanent location of the component.		
<b>6</b>	<b>SCOPE OF WORK:</b>		
6.1	Dismantling of old items in electrical panel including dismantling/removal of all drives (X, Z), switch gears, CNC, PLC, along with Dismantling of axes feed motors and all electrical Items to be removed.		
6.1.2	Dismantling of old CNC controller on operator Control panel and Installation of new CNC controller.		
6.2	Mounting and installation of All new feed motors (X, Z). Design, Modification / reengineering, manufacturing of pulley, flanges and		

	encoder couplings etc. for feed motors, position feedbacks as per requirement.		
6.3	Cabling and wiring of CNC, PLC I/O, Drive system, control panels and field devices. Entire Cabling including Position Feedback of the machine is to be replaced with the new cabling. Laying and routing of new conduits, cables from electrical cabinet to machine and CNC operator panel through new conduits. Refurbishment and rewiring of all the terminal boards, Junction Boxes as per requirement. Routing of the new cables through drag chain. The cables passing through the drag chain will be inside the conduits of reputed make.		
6.4	Interfacing of new CNC controller.		
6.4.1	Interfacing of the existing coolant unit, lubrication unit with the new electrical schematic.		
6.4.2	Interfacing & commissioning of the CNC, PLC, Position feedback devices, Main spindle drive, Feed drives, Machine lights, Field elements etc.		
6.4.3	Existing machine functions have to be retained in the new PLC Program. In case the vendor perceives that more Inputs/Outputs are required for completion for the work as per their designed and conceived electrical scheme, the same should be included in the scope of supply.		
6.5	Laser calibration and ball bar test to be conducted from a reputed agency having valid calibration certificate for instruments. The readings to be provided and suitable error compensation to be carried out.		
6.6	Supply of necessary timing belts and pulley for all axes, V belts/multirib belt for spindle drive.		
6.7	Prove-out of all existing main functions Axes, Spindle and auxiliary functions like Coolant system, Lubrication, etc. to run in auto cycle, MDI & JOG.		
6.8	Supply of any Electrical panel (If required) for mounting the drives, power supply units and other switchgears is under vendor's scope. The panel should be metal enclosed, free from flaws and dents. Proper gaskets for mating surfaces.		
6.9	<i>At present CADEM'S- CAPSTURN NC SOFTWARE and NC Lite DNC software is used for generation of NC commands.</i> In case a new postprocessor is required to match the CADEMS's CAPSTURN software to the new Fanuc controller the same shall be done and the charges to be borne by the vendor and the same to be included in the offer.		
<b>7</b>	<b>COMMISSIONING:</b>		
7.1	New PLC program should incorporate all the drive signals, all possible alarms, suitable interlocking and their display on CNC screen with remedial actions related to the alarms and messages.		
7.2	Existing machine logic and technological processes have to be retained.		
7.3	Machine should be laser calibrated after changing CNC and the results should be within the limits of machine specifications.		
<b>8</b>	<b>ACCEPTANCE:</b>		
8.1	Final Acceptance will be after:		

	<p>a) completion of the scope of supply at SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES &amp; TECHNOLOGY.</p> <p>b) Final acceptance will include clearance of all pending issues related to the work contract.</p> <p>c) Successful Commissioning &amp; Demonstration of various cycles and control functions as envisaged in the technical scope. Vendor will demonstrate operation of all parts of the system supplied along with all the features as specified above.</p> <p>d) Successful trail machining of one component as provided by customer.</p>		
<b>9</b>	<b>DELIVERY</b>		
9.1	<p>To be completed in 5-6 months or at the earliest.</p> <p>Late Delivery Penalty will be applicable for delay in execution of work as per our purchase rules.</p>		
<b>10</b>	<b>DOCUMENTATION:</b>		
	<p>CNC system manuals in hard &amp; soft copy comprising of Installation.- 2 sets</p> <p>Programming Manuals 2 Set</p> <p>Commissioning and service manuals of CNC system-2 Set</p> <p>PLC program hard copy with comments in English &amp; cross-reference list-2 sets</p> <p>PLC program on CD/DVD in installable &amp; printable formats.-2 sets</p> <p>New electrical schematic and wiring diagram of the machine in hard copy as well as in soft copy.</p> <p>Instructions for data back-up &amp; restoration for CNC &amp; PLC.</p> <p>All documentation, ghost backup / Image of CNC system, Drive parameters &amp; back on CD/DVD</p> <p>List &amp; Service catalogues of all bought-out items.- 2 sets</p> <p>Drawings of all mechanical modifications, mountings, flanges &amp; couplings.</p>		
<b>11</b>	<b>WARRANTY:</b>		
	<p>3 Years from Successful commissioning of machine.</p> <p>The CNC system being offered shall be available in the market for next 10 years and spares/service support shall be available for the next 10 years.</p> <p>All features available in the old CNC system of the machine shall be made available in the new CNC being offered.</p> <p>Service support shall be available in India. Details of the service centre facility available in India to be provided.</p>		
<b>12</b>	<b>TRAINING:</b>		
	<p>Vendor will impart 10 days training to customer, for operation, programming &amp; maintenance of the system supplied by them after installation &amp; commissioning.</p>		
<b>13</b>	<b>General</b>		
13.1	<p>Any other work or material related to electrical, mechanical and electronics not mentioned in this scope of supply but required for successful commissioning the machine shall be provided by the vendor</p>		

	free of charge.		
13.2	Complete specifications such as part no./Model/Type, power, torque, rated and maximum RPMs, rated and maximum currents of the motor and drive controllers shall be stated in the offer by the party. Ordering brochure/catalogue should be attached.		
13.3	Prove out and demonstration of all existing machine functions and programming features of new CNC System including manual control of the machine. Test Piece machining to be carried out.		
13.4	Vendor should bring all types of hand tools including pneumatic/electrical drill machines, Laser equipment's, and grinders along with general purpose measuring instruments and testing equipment with them for successful commissioning of the machine. Vendor must comply with all the Covid-19 guidelines issued by the State government and by the Institute.		
13.5	Compliance statement shall be submitted by the party with reference to the above scope of supply against each clause with relevant details & comments. Non-compliance to any of the clauses can lead to disqualification of the offer.		

**Sd/-**

**DIRECTOR**