

	<p style="text-align: center;">INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036</p> <p style="text-align: center;">Telephone: (044) 2257 4676 E-mail: aramesh@iitm.ac.in</p>	
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Prof. Ramesh A
Project Coordinator

Ref: ME/19-20/827/ECU
Dated: 17.04.2020

Limited Tender No: ME/19-20/827/ECU

Due Date: 12.05.2020, 3:00pm

Pre-Bid meeting: - Not required.

Bid opening meeting on Due Date: 12.05.2020, 4:00pm

Dear Sir/Madam,

On behalf of the Indian Institute of Technology Madras, offers are invited for the supply of “**ECU HARDWARE**” conforming to the specifications given in (**Annexure-I**).

Terms and Conditions of Limited Tender

1. **Preparation of Bids:** - The Limited tenders should be submitted under **one bid system** (i.e.) Technical-cum-Financial bid.
2. **Delivery of the tender:** - The tender shall be sent to the below-mentioned addresses either by post or by courier (duly sealed and super scribed on the envelope with the reference No and due date) so as to reach the following address before the due date and time specified in our Schedule:
**Prof. Ramesh A,
Department of Mechanical Engineering
IIT Madras
Chennai - 600 036.**
3. **Price:** - The price should be quoted in net per unit (after breakup) and must include all packing and delivery charges to **Department of Mechanical Engineering.**
 - a. The offer/bid should be exclusive of taxes and duties. The percentage of tax & duties should be clearly indicated separately. IIT Madras is eligible for concessional GST and relevant certificate will be issued.
 - b. In case of import supply, the price should be quoted without custom duty. IIT Madras is exempted from levy of IGST on Imports and eligible for concessional custom duty (not exceeding 5%) and the price should be quoted on EX-WORKS and CIP (stating the Cost, Insurance, Freight separately) and indicating the mode of shipment.
4. **Terms of Delivery:** - The item should be supplied to our Departments as per Purchase Order. In case of import supply, the item should be delivered at the cost of the supplier to our Institution. The Installation/Commissioning should be completed as specified in our important conditions.
5. **Catalogue:** Original catalogue (not any photocopy) of the quoted model duly signed must accompany the quotation in the Technical-cum-financial bid
6. **Late offer:** - The offers received after the due date and time will not be considered

7. **Payment:** - No Advance payment will be made for Indigenous purchase. However, 90% Payment against Delivery and 10% after installation are agreed to wherever the installation is involved. In case of import supplies the payment will be made only through 100% Letter of Credit i.e. (90% payment will be released against shipping documents and 10% after successful installation wherever the installation is being done).
8. **Advance Payment:** - No advance payment is generally admissible. In case of specific percentage of advance payment is required, the Vendor has to submit a Bank Guarantee from a Nationalized Bank of India equal to the amount of advance payment.
9. **On-site Installation:** - The equipment or machinery has to be installed or commissioned by the successful bidder within number of days (as prescribed by PI's) from the date of receipt of the item at site of IIT Madras.
10. **Warranty/Guarantee:** - The offer should clearly specify the warranty or guarantee period for the machinery/equipment.
11. **Validity:** Validity of Quotation not less than 60 days from the due date of tender
12. **Bid Opening:** The bid will be opened on **12.05.2020, 4:00pm** at the **Department of Mechanical Engineering, IIT Madras.**
13. **Accept /Reject:** IIT Madras reserves the full right to accept / reject any tender at stage without assigning any reason.
14. **Settlement of Disputes:** Any legal disputes arising out of any breach of contract pertaining to this tender shall be settled in the court of competent jurisdiction located within the city of Chennai in Tamil Nadu.
15. **Risk Purchase Clause:** - In the event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from other sources on the total risk of the supplier under risk purchase clause.
16. **Unsolicited offers:** "This notice is being published **for information only** and is not an open invitation to quote in this limited tender. Participation in this tender is by invitation only and is limited to the selected registered suppliers. Unsolicited offers are liable to be ignored. However, suppliers who desire to participate in such tenders in future may apply for registration as per procedure." The Website for Registration of vendors is <http://web.iitm.ac.in/supplier/> and the mail address for queries is "workflow@rt.iitm.ac.in".

Yours sincerely,

**Prof. Ramesh A,
Department of Mechanical Engineering
IIT Madras
Chennai - 600 036.**

ANNEXURE – I

SPECIFICATIONS OF OPEN ECU(1 Set)

Sl. No.	Items & functions	Description
1	Direct injection control and related functions	<p style="text-align: center;"><u>ECU Hardware:</u></p> <p>Solenoid Common Rail Injector Drivers: 8 or more.</p> <p>Turbocharger Control –based on DC motor /proportional vacuum solenoid with or without feedback from position sensor / boost pressure.</p> <p>EGR Control –based on DC motor / proportional vacuum solenoid with or without feedback from position sensor / air flow.</p> <p>Fuel Pressure Control: based on inlet metering of the Feed Pump Control/HP pump inlet metering/Rail Pressure Control Valve, with rail pressure feedback.</p> <p>Crank position based on VR/Hall sensors, Cam based on VR/Hall sensors.</p> <p>Air Flow based on HFM.</p> <p>Temperature inputs that can be displayed (should be used for control alarm) (Variable Resistance – RTD / NTC) – 08 or more,</p> <p>Lambda Sensor input function</p> <p>Driver demand by accelerator pedal position sensor</p> <p>Analog inputs spare whose values with units can be displayed (should be used for control)– 04 or more.</p> <p>Pump Relay, Fan Relay, Main Relay Control</p> <p>CAN Communication</p> <p style="text-align: center;"><u>Software:</u></p> <p>Injection Quantity Control – Speed Mode, Torque Mode</p> <p>Injection Timing Control – (Range 0-720 deg BTDC, Accuracy: 0.1 deg)</p> <p>Multiple Injections - 3 or more</p> <p>Boost Control – Closed Loop</p> <p>EGR Control – Closed Loop</p>

		Fuel Pressure Control – Closed Loop Speed Control – Closed Loop
2	Port fuel injection	Dual fuel 4 cylinder control with port fuel injectors with control over the injection timing and injection duration. (Option for Simultaneous Injection or sequential injection)
3	Software and additional Hardware	Laptop (i7,1Tb HDD,8Gb RAM) with the control software that can be directly connected to the ECU. The software must be exportable to any other PC / Laptop in case of a need and the ECU should have the capability to be coupled to the new PC/Laptop for online monitoring, and control, recording, offline analysis, data transfer, Error Diagnosis. CAN Cable to be provided for interface. Software must allow manual control/ for the following: <ul style="list-style-type: none"> a) All cylinder peak and hold Common Rail Injection timing of the pulses, number of injection pulses per cycle, injection duration of each of the injection pulses. b) Control over the current profile of the common rail injectors c) Control of the port fuel injectors of all the four cylinders in terms of injection timing and fuel pulse duration (saturation mode) The closed loop control must include the following: <ul style="list-style-type: none"> a) Rail pressure b) Boost pressure d) VGT position e) EGR quantity f) EGR actuator position
4	Accessories – Wiring Harness, Injector Driver	Wiring harness with standard connectors for all the ends, compatible for a given engine as will be specified at the time of installation and commissioning. Additional Drivers (4 Nos.) for common rail peak and hold Diesel Injectors – To be controlled externally.
5	Installation and Commissioning	Integration of Open ECU system to a given Engine.

The warranty period has to be for 3 years.

Important: Essential Supplier Qualification Requirements:

The supplier should have the experience of selling at least three numbers of similar or higher configuration products to IITs/IISc in the last three years. Copies of the supply orders should be enclosed as proof.