

NATIONAL INSTITUTE OF TECHNOLOGY

TIRUCHIRAPPALLI – 15

Department of Electrical and Electronics Engineering.

Web: www.nitt.edu

Phone: 0431 – 2503363.



TENDER DOCUMENT

Tender Notification No.: NITT/R&C/NLC/EEE/KS/396-003/2018-19.

Dated: 14.05.2018.

Name of the component	: SCADA and cloud based Electronification of Conveyor and GWC pump.
Quantity required	: ONE.
EMD Amount	: Rs. 42,000 /-
Cost of the Tender Document	: Nil.
Delivery	: Within 1 month.
Last Date of submission of Tender	: 05-06-2018 up to 02.30 pm.
Address for submission of Tender	: The Director, National Institute of Technology- Tiruchirappalli, Tiruchirappalli – 620015, Tamilnadu, India Kind Attn. to: Dr.K.Srinivasan Associate Professor/ICE. Phone: 0431-250-3363. Email: srinikkn@nitt.edu.
Date of opening of technical bid	: 05-06-2018 at 03.00 pm.



**NATIONAL INSTITUTE OF TECHNOLOGY
TIRUCHIRAPPALLI – 15**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING.

Tender Notification No.: NITT/R&C/NLC/EEE/KS/396-003/2018-19. **Dated:** 14-05-2018.

NOTICE INVITING TENDER

The National Institute of Technology, Tiruchirappalli (NITT) is an autonomous body under MHRD, GOI, imparting Technical Education and engaged in Research Activities. It is proposed to procure the following component for the Departmental academic/research activities.

Sealed bids under **two bid system** are invited for the following component subject to the following terms and conditions, from the reputed manufacturers or their authorized dealers so as to reach this office on or before scheduled date and time. The technical cover will be opened on the same day in the presence of bidders or their authorized agents who may choose to be present.

Name of the component : **SCADA and cloud based
Electronification of Conveyor and
GWC pump.**

Quantity required : **ONE.**

EMD : **Rs. 42,000 /-**

Cost of the Tender Document : **Nil.**

Time for completion of supply after placing purchase order : **Within 01 Month.**

Last Date of submission of Tender : **05-06-2018 up to 02.30 pm.**

Address for submission of Tender: The Director,
National Institute of Technology- Tiruchirappalli,
Tiruchirappalli – 620015, Tamilnadu, India
**Kind Attn. to: Dr.K.Srinivasan,
Associate Professor/ICE.
Phone: 0431-250-3363.
Email: srinikn@nitt.edu.**

Place, Date and time of opening of bid :

Date: **05-06-2018**

Time: **03.00 pm**

Venue: **R & C Office.**

Note: The Institute shall not be responsible for any postal delay about non-receipt / non delivery of the bids or due to wrong addressee.

INSTRUCTIONS TO BIDDERS

1. This document set contains the following:
 - a) Terms and conditions of the Tender
 - b) Details of the Firm offering this Quote
 - c) Technical Compliance Form
 - d) Quotation form (Price Bid)
 - e) Currency Form (quoted on behalf of the foreign suppliers)
 - f) NIT-T's check list copy
2. The bidder's copy is for your future records. Please fill in and return only NIT-T's copy.
3. The bidder should give details of their technical soundness and provide list of customers of previous supply of similar items to Universities, Institutes or Government Departments/Undertakings/public sectors with contact details. The details of the agency/profile should be furnished along with the copy of all related documents.
4. Read through the terms and conditions given and affix your signature and seal if you find them acceptable. Any deviations may be recorded. Read carefully list of specifications that we have enclosed.
5. Fill in the questionnaire regarding the Firm.
6. The downloaded documents '**Technical Compliance Form**' and '**Quotation Form (Price Bid)**' should be **TYPE WRITTEN USING CAPITAL LETTERS ONLY**. At the time of filling the "**Quotation Form (Price Bid)**" make sure that you have not missed anything. Specify the model number & specification for each item. The form should be filled item-wise. Do not leave blank fields. If you are not quoting for a specific item, you should specify "**NOT QUOTING**".
7. **Do not use** ambiguous terms like "**yes**", "**complied**" or "**available**". Specifically mention the matching specification of the product offered by you. Make sure that you have affixed your signature with date and seal on all the documents.
8. Please send the tenders in a sealed envelope super scribed as "**QUOTATIONS AGAINST TENDER NOTIFICATION NO: " NITT/R&C/NLC/EEE/KS/396-003/2018-19 "**" so as to reach "The Director, National Institute of Technology, Tiruchirappalli - 620 015, India" on or before **05-06-2018 at 02.30 pm along with a Softcopy of the Technical Compliance form (along with cover-2) and Quotation Forms (along with cover-3) in MS-Excel file format in a CD/DVD or USB drive.**
9. For any further clarifications, contact by E-Mail: srinikkn@nitt.edu or by written request to "The Registrar, National Institute of Technology, Tiruchirappalli - 620 015, India"

Last Date for receipt of tender at NIT-T : 05-06-2018 up to 02.30 pm.

Opening Date for technical bid : 05-06-2018 up to 03.00 pm.

CHECKLIST TO BE FILLED IN BY BIDDER	
List of documents to be enclosed	Completed & Signed
1. Terms and Conditions form	YES / NO
2. Details of the Firm offering this Quote	YES / NO
3. NIT-T's Quotation form (Technical & Price Bid)	YES / NO
4. Currency Form(quoted on behalf of the foreign suppliers)	YES / NO
5. Other technical specifications & pamphlets	YES / NO

- Note:** 1. "Cover" should contain the following:
- a. Form of "**Acceptance of Terms and Conditions**".
 - b. Form of "**Firm details**"
 - c. Pamphlets, if any (in a separate sealed cover)
 - d. Quotation Form (Technical, Price Bid and Currency Form)

Please retain this page with you for your future reference.

SECTION: 1 – TWO BID TENDER

Cover 1: EMD and Tender cost

(Should be super scribed as 'EMD and tender cost cover' duly indicating the Tender reference No. and the due date of opening)

Earnest Money Deposit (EMD) and tender cost are to be submitted by way of Demand Draft/FDR drawn on any Nationalized bank in India in favor of "The Director, NIT, Trichy" payable at Trichy. The bids submitted without EMD or tender cost will be treated as non-responsive and will be rejected. EMD shall bear no interest.

Cover 2: Technical Bid

(Should be super scribed as 'Technical Bid' duly indicating the Tender reference No. and the due date of opening)

Should contain:

- a. Technical pamphlets
- b. Detailed technical specification
- c. Copy of license certificate for manufacture/supply of the item*
- d. Income Tax PAN Number & GST number.*
- e. Last three years balance sheet approved by the CA and the IT clearance certificate.*
- f. Warranty period offered for the tendered item to be specified. If the warranty period is not conforming to the schedule of requirements given in section 3 of the Tender document, the bid is liable to be treated as non-responsive and will be rejected.
- g. Duly filled up technical questionnaire, if any
- h. Duly filled up deviation schedules to technical specifications, if any
- i. Copy of supply orders completed during the last three years

* Appropriately pertaining to the country of origin.

Cover 3: Price Bid

(Should be super scribed as 'Price Bid' duly indicating the Tender reference No. and the due date of opening)

Should contain:

- a. Price bid as per the format in Section-4 of the tender document
- b. Break-up price as per the format in Annexure-A

Note:

- a. If the prices are revealed in cover 1 or in cover 2, the offer will be summarily rejected.
- b. Each Cover shall be sent in a double sealed cover. The inner covers (Cover 1, Cover 2 and Cover 3) should be sealed individually with the Sellers's distinctive seal and super scribed with the tender reference No. and due date of opening. All inner covers shall be placed in a common outer cover which shall also be sealed with seller's distinctive seal and super scribed with the tender reference No. and due date of opening.
- c. Mention "Kind Attention **Dr.K.Srinivasan**, and submit at the address given in the Notice Inviting Tender.
- d. Cover 1 & 2 will be opened on the scheduled date and time mentioned in the tender enquiry.
- e. Cover 3 of the technically and commercially suitable offers alone will be opened on a date which will be intimated to the qualified bidders.

SECTION: 2 – TERMS AND CONDITIONS FORM

**IMPORTANT: READ THE FOLLOWING TERMS AND CONDITIONS AND
SIGN THE ACCEPTANCE CLAUSE FOLLOWING IT**

1. The offers should be addressed to “The Director, National Institute of Technology, Tiruchirappalli 620015, India” and should be sent in a sealed envelope super scribed BID **AGAINST TENDER NOTIFICATION No.: NITT/R&C/NLC/EEE/KS/396-003/2018-19** so as to reach us **on or before 05-06-2018 at 02.30 pm.**
2. Each offer should be sent in a sealed cover with the tender documents. Tenders received through email or FAX will not be considered. **Softcopy of the Technical Compliance form and Quotation Forms should be submitted along with the tender in MS-Excel file format in a CD/DVD or USB drive. However, if there is any dispute between Hard copy and Soft copy, Hard copy will be taken.**
3. The tenders will be opened on **05-06-2018 at 03.00 pm** in the presence of the vendors present with authorization letter from the respective companies / firms. Suppliers intending to attend the tender opening should intimate us in advance.
4. Full technical specifications and pamphlets should be sent along with the tenders. **Offers without proper technical specifications will be rejected.**
5. The rate quoted should be on unit basis excluding Taxes. Taxes and other charges should be quoted separately, considering exemptions if any.
6. All offers should indicate unit price (excluding taxes and duties applicable), Taxes and other charges should be mentioned separately, if any. Additional charges for packing, forwarding, freight, insurance etc., if any, should be clearly mentioned. Clearance at Customs will be arranged by us.
7. NIT-T is paying concessional Customs & Excise duty under Government of India Notification No.51/96for Central Customs and 10/97 for Central Excise Duty vide Certificate No.TU/V/RG-CDE(183)/2011 dt.10.10.11. Currently the purchaser is paying 5% Basic Customs Duty, and additional cess on BCD.
8. NIT-T is paying concessional IGST/CGST/SGST at 5%/2.5%/2.5% vide Government of India Notification No.47/2017/-Integrated Tax (Rate) and 45/2017/-Central Tax (Rate), dated 14/11/2017 for the supply of Scientific and technical instruments, apparatus, equipment (including computers); accessories, parts, consumables ... etc. for research purposes.
9. In case the offered items are to be imported, the rates should be quoted in foreign currency on C.I.F. Chennai Airport basis, and it should include the Freight up to Chennai airport and the insurance cover should be up to National Institute of Technology, Tiruchirappalli. NIT-T shall pay Customs duty if any.
10. If the price quoted is in foreign currency and if the order value is more than US\$10,000 and requested by the bidder then 100% payment will be made through **Letter of Credit (LC) at sight on acceptance. The bank charges outside India should be borne by the Supplier / Beneficiary. Part shipment not allowed.**
11. If the price quoted is in Indian Rupees, then 100% payment will be made only after installation and commissioning. **No advance payment will be made.**
12. No revision of the price bid will be allowed once the price bids are opened. In case of foreign currency, the agency should mention the % of currency fluctuations they can bear.
13. No increase in price will be allowed after our firm orders are placed.
14. **Payment of GST (on ultimate products)** as applicable on the closing date of tender will be to the supplier's / contractor's account. Any statutory variation (both plus and minus) in the rate of **GST** after closing date of tender/revised price bid but before the expiry of the contractual delivery / completion period will be to the account of the office.
The bidder(s) should indicate, in their bid, the amount with exact rate of the **GST** on ultimate finished product, as applicable at tendering stage, separately in the bid. In case the above information subsequently proves wrong, incorrect or misleading (a) this Institute will have no

liability to reimburse the excess in the difference in rates of the item under which the duty/tax assessed finally (b) this Institute will have the right to recover the difference in case the rate of duty / tax finally assessed is on the lower side. Any increase in **GST** during extended period of the contract / supply order will be to supplier's / contractor's account where such extension in delivery of the materials/completion of the project was on the request of supplier / contractor. However, any decrease in **GST** during extended period of the contract / supply order, will be to the account of this Institute.

15. The warranty period should be clearly mentioned. The maintenance charges (AMC) under different schemes after the expiry of the warranty should also be mentioned.
16. Quote should come from authorized dealer or distributor or reseller for each of the product quoted. An authorization letter should accompany your quote for each product quoted; otherwise it may lead to rejection.
17. The delivery period and other terms should be clearly mentioned.
18. **Eligibility:** Quotation from registered firms/company's / manufacturer under GST / other statutory bodies alone will be considered. Any Manufacturer / Supplier / Dealer who has been declared ineligible by World Bank/Government of India shall not be eligible to participate in this bid. Any fraudulent practices including concealing of facts at the time of submission of bid and there after shall lead to disqualification. List of beneficiaries especially from Educational Institutions / R & D Institutions should also be enclosed with the quotations.
19. For those instruments Cost exceeding Rs. 5,00,000/- the company should have (i) Three similar works, each of value not less than 40% of the estimated cost put to tender, or (ii) Two similar works, each of value not less than 50% of the estimated cost, or (iii) One similar work of value not less than 80% of the estimated cost, all amounts rounded off to a convenient full figure, in the last 7 years ending on the last day of the month previous to the one in which the tenders are invited.
20. Complete user, technical and service documentation and spare parts catalogue are to be provided along with the supply of the item.
21. The vendors are informed that they should not call us over phone or contact us in person. All clarifications can be obtained through E-Mail/FAX/Post. Vendors shall not make attempts to establish unsolicited and un-authorized contact with us after the opening of the offers and prior to the notification of the award. Any attempt by any vendor to bring to bear extraneous pressures on us shall be sufficient reason to disqualify the vendor.
22. Delay / loss in postal transit or due to other reasons will not be NIT-T's responsibility.
23. We are not responsible for accidental opening of the covers that are not properly super scribed and sealed before the time scheduled for opening.
24. The tender should be made only on the FORM which is available in our website, otherwise it shall lead to rejection. The FORM should be duly filled up (preferably **TYPE WRITTEN IN CAPITAL LETTERS**) and should clearly mention the features offered by the bidder against each specification.
25. Authorized signatory should sign on all the pages. Bids without authorized signatures or seal of the firm will be rejected.
26. The manufacturers of the quoted make of the product must be of National / International repute and having ISO /BIS certificate.
27. **Liquidated damages:** If the bidder/supplier, after accepting the Purchase Order, fails to deliver any or all of the Goods within the period specified in the Order, NIT-T shall, without prejudice to its other remedies under the Rules of Purchase, proceed to cancel the order or agree to accept a delayed delivery on the condition of payment of liquidated damages by the bidder / supplier a sum equivalent to 0.50% of the total cost as indicated in the Purchase Order (which will be deemed as agreed price) for each week or part thereof of delay until actual delivery or performance is completed and such penal charges shall be limited to a maximum of 5% of the total cost. Once the maximum is reached NIT-T may proceed on its own to consider the termination / cancellation of the order.

28. **The vendors are informed that they should sign a stamp paper agreement with us, for Warranty, AMC, etc. before placing the final purchase order as per our terms & conditions and 10% of purchase order value in the form of bank guarantee with a validity beyond 60 days of date of completion of warranty period towards performance security. The bank guarantee will be returned to the supplier after the successful completion of supply, installation, and the warranty period.**
29. Failure to comply with all the terms and conditions mentioned herein would result in the tender being summarily rejected.
30. Vendors are informed that once the companies are shortlisted based on the technical specification, only then the price bids of the firms that meet NIT-T's Technical specification / requirements would be compared.
31. The order will be based on the actual requirement at the time of ordering, optional items may also be ordered based on the actual requirements at the time of ordering. Not quoting for this may result in disqualification.
32. NIT-T reserves the right to modify or alter the specifications after short listing of tenderers.
33. NIT-T reserves the right to change the order quantity or split the orders among multiple vendors without assigning any reason(s) whatsoever.
34. NIT-T reserves the right to reject any or all the tenders without assigning any reasons whatsoever.
35. NIT-T reserves the right to purchase decreased number of quantity of the item to be purchased.
36. The agencies should submit their rate as per the format given in Section 4 of the Notice Inviting Tender in this cover. All the pages of the bid should be signed affixing the seal. All corrections and overwriting should be initialed.
37. The tender will be acceptable only from the manufacturers or its authorized supplier.
38. The bid shall be in the format of price schedule given in Section 4. The contract form as per format given in section 5 shall be submitted. Incomplete or conditional tender will be rejected.
39. Details of quantity and the specifications are mentioned in Section 3 appended to this Notice Inviting Tender.
40. The item to be used is strictly according to the specification and subject to test by the Institute/concerned authorities. It must be delivered and installed in good working condition.
41. The Contractor/Supplier shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the work/supply in full but he did not derive in consequence of the foreclosure of the whole or part of the works.
42. In case of dispute, the matter will be subject to Tiruchirappalli, Tamil Nadu Jurisdiction only.

Release of EMD: The EMD will be released after receipt of performance security from successful bidder.

Validity of bids: The rate quote should be valid for a minimum of 120 days. No claim for escalation of rate will be considered after opening the Tender.

Imports: In case, goods are to be imported, the Indian agent should furnish authorization certificate by the principles abroad for submission of the bid in response to this Notice Inviting Tender.

Clarification of Tender Document: A prospective bidder requiring any clarification of the Tender document may communicate to the contact person given in this notice inviting tender.

Amendment of tender document: At any time prior to the last date of receipt of bids, Institute may for any reason, whether at its own initiative or in response to a clarification requested by prospective bidder, modify the Tender document by an amendment.

The Institute may at its own discretion extend the last date for the receipt of bids.

The bids shall be written in English language and any information printed in other language shall be accompanied by an English translation, in which case for the purpose of interpretation of the bid, the English translation shall govern.

The Institute reserves the right of accepting any bid other than the lowest or even rejecting all the bids without assigning any reasons therefor. The decision of the Institute Purchase Committee is final in all matters of tender and purchase.

The bidder should give the following declaration while submitting the Tender.

ACCEPTANCE

We accept the above terms and conditions and shall comply with them strictly.

NAME OF THE VENDOR:

ADDRESS:

Signature and seal

“DETAILS OF THE FIRM OFFERING THIS QUOTE”
(Write or print or type in block letters)

1. Name of the firm: _____
2. Date of incorporation: _____
2. Nature of the company (tick one): Government / Public / Private Company / Partnership / Proprietorship
3. Specify the number of years in this line of activity by the Company: ∴
4. Quantity of sales in the last three years for the “.....” (same model that you have quoted):

2015-2016	2016-2017	2017-2018

5. Turnover in the last three years (Lakh Indian Rupees):

2015-2016	2016-2017	2017-2018

6. Provide the postal address, telephone & fax numbers, and email address of the nearest service center.
7. Number of service engineers in the above location trained on the product quoted along with their educational qualification, certification and designation (applicable only for instruments):
8. Assured response time for service calls in hours:
9. Delivery period from the date an official purchase order placed (in weeks):
10. Enclose the list of customers to whom you have supplied “.....” during the last 3 years ending 31/03/2018 with full postal address and name of the contact person with phone, FAX numbers, and E-Mail id. Certificate regarding satisfactory performance of the “.....” from the minimum three end users should be furnished.
11. Are you the authorized dealer or distributor or reseller for the products quoted?
12. Have you supplied “.....” to National Institute of Technology, Tiruchirappalli in the last 3 years? If yes, specify the quantity supplied in the last 3 years and last PO reference:
13. Was there any elapse or delay in supplying the goods ordered or any service related issue during the warranty period for the products ordered by NIT-T with your firm? If yes, provide details.
14. On Manufacturer’s Side to whom NITT have to contact in case of delayed in supply and other issues committed by the authorized dealer / distributor / reseller :

Contact Person Name:	
Address:	
E-mail ID:	Telephone / Cell Phone:

DECLARATION

I/we have not tampered/modified the tender forms in any manner. In case, if the same is found to be tampered/modified, I/we understand that my/our tender will be summarily rejected and full Earnest Money Deposit (EMD) will be forfeited and I/we am/are liable to be banned from doing business with NIT, Trichy and /or prosecuted.

Signature of the Bidder :

Name and Designation :

Business Address :
.....
.....

Place:
Date :

Seal of the Bidder's Firm

SECTION: 3 – SCHEDULE OF REQUIREMENTS, SPECIFICATIONS AND ALLIED DETAILS

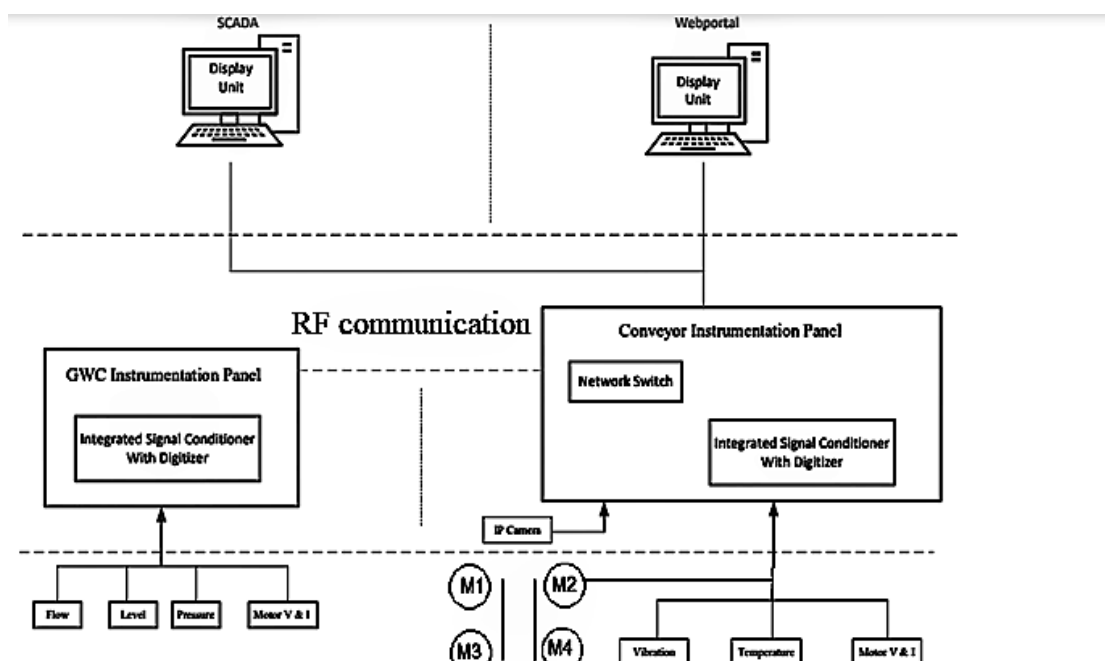
Specification for SCADA and cloud based Electronification of Conveyor and GWC pump.

GENERAL REQUIREMENT:

Production areas in mines always demand a constant provision for continuous material transport. Conveyor systems are used for this purpose of transport of mined coal and sand. Conveyors are usually equipped with heavy duty motors with respective gear boxes. The online condition monitoring of these conveyor belts, driving motors, rollers and drive need to be cautiously done to evaluate the performance and avoid plant failure. Vibration, temperature, current and voltage parameters of the conveyor drive motors need to be continuously monitored and controlled for this purpose.

Open cast mining involves the complexity of underground water to be pumped out effectively. The ground water control system which comprises of bore well water pumps, storm water pumps and allied pipe line network should be operated depending on the pumping requirements. Parameters such as level, pump inlet and outlet pressure, current and voltage of the motor, flow of underground water need to be monitored carefully in order to know the condition of the running pump. This avoids the pump to be run at dry conditions. The online monitoring and control of conveyor system and the ground water control system need to be done both by SCADA based as well as IoT enabled Web portal based.

SYSTEM ARCHITECTURE:



Detailed technical specification requirements of SCADA based and Web portal-based monitoring and control is given in forthcoming sections.

1. Data Acquisition and Signal Conditioning:

- Shall have individual local instrumentation panel separately for conveyor system and ground water control system respectively.
- Instrumentation panel shall have individual data acquisition module and controller to acquire data from the field sensors.
- Shall be capable of acquiring vibration, motor current, voltage and temperature data from the sensors of the conveyor setup.
- Shall acquire pressure, flow, level, motor current and voltage data from sensors of Ground water setup.
- Shall have inbuilt signal conditioning circuits and digitizers for all the measured parameters with anti-aliasing and configurable digital filters for noise removal in measurements with cut off frequency up to 1 KHz.
- Shall have hard rigid aluminum or steel case.

Detailed technical requirement of signal conditioning and digitizing of all measurement parameter is given below.

1.1 Signal conditioning and digitizing module for vibration, pressure, flow, level, motor voltage and current:

- Shall provide signal conditioning with inbuilt digitizer for vibration measurement.
- Shall provide 4 Nos. of 8 channel analog input signal conditioning with 2 digital input and 2 digital output provisions.
- The module shall be capable of acquiring input in the form of +/- 10 V and 4-20 mA.
- Input impedance of the module shall be greater than minimum of 1 Megaohms.
- Signal to noise ratio of the signal conditioning shall be greater than 100 dB at 100 Hz and greater than 120 dB at 1 Hz.
- ADC of the signal conditioning shall have resolution of 24 bit per channel.
- Shall have a sampling rate of 10 KHz per analog input channel.
- Shall have anti-aliasing filter of 2KHz of third order, variable digital filter like IIR, Low pass, High pass, Band pass of 4th order.
- Filter shall have cut off frequency of 1 Hz to 1 KHz in steps of 1,2 and 5.
- Shall have 3 pole galvanic isolation of 500 VDC.
- Shall support RS 485 2 wire communication interface.
- Shall support MODBUS RTU, Profibus DP and ASCII communication protocols.
- Data transfer rate shall be maximum of 20 Mbps.
- Operating temperature shall be between 0 Deg. Celsius to 50 Deg. Celsius.

1.2 Signal conditioning and digitizing module for temperature:

- Shall provide signal conditioning with inbuilt digitizer for temperature measurement.
- Shall provide 4 Nos. of 4 analog Channel signal conditioning module capable of connecting 2 wire or 3 wire or 4 wire RTD.
- Shall support PT100, PT500 and PT1000 type RTDs.
- Measurement range shall be between -250 to 800 Deg. Celsius.
- Input impedance of the module shall be greater than minimum 400 Kilo ohms.

- ADC of the signal conditioning shall have resolution of 24 bit per channel.
- Shall have a sampling rate of 10 KHz reduced by averaging to 10Hz per analog input channel.
- Shall have anti-aliasing filter of 2KHz of third order, variable digital filter like IIR, Low pass, High pass, Band pass of 4th order.
- Shall have 3 pole galvanic isolation of 500 VDC.
- Shall support RS 485 2 wire communication interface.
- Shall support MODBUS RTU, Profibus DP and ASCII communication protocols.
- Data transfer rate shall be maximum of 20 Mbps.
- Operating temperature shall be between -30 deg. Celsius to 50 Deg. Celsius.

2. SCADA based monitoring and control

Data from the sensors shall be communicated to the local instrumentation panel. Wired medium of transmission of data from the field sensors to the local instrumentation panel shall be implemented. Data from the panel of the ground water control system shall be communicated to the conveyor system instrumentation panel by wireless RF medium. Conveyor system instrumentation system shall act as the master instrumentation panel. All the process parameters data shall be sent to the SCADA from the master panel via wired or wireless medium of communication. Monitoring and control should be robust enough to withstand all harsh environmental conditions such as thundering, lightening.

2.1 Master SCADA Controller: Quantity – 1 No.

- Standalone embedded controller supporting high level programming languages shall be provided.
- Processing speed shall be minimum of 1.5 GHz with 1 GB RAM with 4 GB Flash memory.
- Shall have battery buffered RTC.
- Shall have minimum of 2 slots of RS485 interface and 2 ethernet slots with 1 Gigabit data transmission rate.
- Should support minimum of 12 modules to be connected.
- Removable USB drives, SD Card slot and Flash memory devices shall be able to be connected to this processor.
- Shall have data handling rate of 2048 byte data (512 variables read/ 512 variables write).
- Shall possess bus throughput rate of 24 Mbps speed for module to controller and 1 Gigabit for controller throughput rate.
- Shall have OPC UA based software to support interlinked communication with other devices.
- Shall be compatible for both Linux and Windows Operating system.
- Shall have two kernels – one RT kernel and the other User kernel.
- Shall have provision to upgrade to the system operating software if necessary in future.
- Shall have software capability to communicate cloud-based storage system.
- Shall support OPC UA based client-server interface to enable web portal communication.

- Shall provide web client license for minimum of 1 user to enable remote access of the entire setup.
- Shall support a minimum of 200 external tags for communication.
- Should be able to automate the control of the conveyor setup and the ground water control system based on the sensor information from the data acquisition system.
- ON and OFF, PID control Etc. of conveyor motors should be made feasible.
- Shall take necessary control action at the right time to pump the water from the ground level.
- Should provide provisions to bring the process parameters within threshold limits when the acquired data crosses a predefined limit.
- Future predictive control of the acquired parameters to avoid failure of the equipment.
- Fault identification and control of conveyor system and ground water control need to be implemented.
- Shall provide suitable enclosures, wiring and cable glands suiting the system

2.2 Communication:

- Shall acquire data via ethernet/MODBUS/Profibus communication modes.
- Shall support TCP/IP, UDP, MODBUS RTU and MODBUS TCP-IP communication protocols necessarily.
- Shall possess system synchronization time of +/- 1 microsecond.
- Shall employ master slave principle and IRIG 2 standard of synchronization mode.
- Shall employ a fully redundant network connection for interface with all data acquisition modules with a data transmission speed of 1 Gigabit.
- Shall employ robust communication facility of Ground Water control system and the Conveyor system so that no failure of a single module should affect the communication interface on the whole.
- Wireless medium of communication to continuously update data to the web portal shall be made.
- Both intranet server and internet web portal communication facility should be enabled
- Shall comply to the automation control IEC 60870-5 standard.

2.3 RF Modem

- Shall provide 2 Nos. of RF transceiver modem for communication between GWC and Conveyor systems.
- 5 GHz modem one acting as the transmitter and the other as the receiver shall be placed in GWC and conveyor system respectively.
- RF modem shall cover a distance up to 25 Kms in open space.
- Data transmission speed shall be 300 Mbps.
- Shall include 802.11 a/n radio (Atheros 600 MHz).
- Shall have a transmission power up to 27dBm.
- Shall have integrated firewall security.
- Shall have 19dBi dual polarized panel directional antenna.

2.4 Data logging and visualization:

- Data shall be recorded simultaneously and continuously from all the sensors with time stamp details in chronological order.

- Shall be capable of recording a minimum of 100 process parameters simultaneously.
- Data file shall be compatible in MS excel format or shall have .csv extension.
- Sensor data of the last 30 minutes shall be presented to the user in the screen.
- A minimum of three-month duration of data shall be available in the data logger at the storage for the user to be retrieving it at a later time.
- Shall provide two level user authenticated access to the data.
- Data logger shall have reliable battery for power backup of minimum 2 hours.
- Logged data shall be visually presented in numeric, digital and real time graphical format.
- Provisions for the user to view any specific required sensor data of a specific time duration shall also be provided.
- Excel compatible report generation should also be feasible.

3. Web portal-based monitoring and control

- Web portal based standalone data acquisition from sensors and control of conveyor system and GWC need to be implemented.
- Shall provide 2 Nos. of LTE modem as a part of the data acquisition module.
- The real time status of the entire set up should be communicated in the web portal continuously using the LTE Modem.
- Shall incorporate 1 No. of LTE circular type antenna with amplifying capacity of 5dB.
- Shall provide web portal setup and license for effective webhosting of the measured parameters.
- Shall continuously update the live status of the measured process parameters in the web portal.
- Monitoring and control should be robust enough to withstand all harsh environmental conditions such as thundering, lightning and heavy rainfall.

3.1 LTE modem and Antenna

- The real time status of the entire set up should be communicated in the web portal continuously using the LTE Modem.
- Shall have EDGE/HSPA/LTE type of mobile radio router.
- Upload speed shall be 500 Mbit per second and Download speed shall be up to maximum of 100 Mbit per second.
- Shall have a frequency band of 900/1800 MHz for GSM/GPRS/EDGE and 900/1800/210 MHz for UMTS and 800/900/1800/2100/2600 MHz for LTE.
- Shall incorporate integrated GPS for synchronization of time.
- Shall have integrated firewall security.
- Shall have 2 slots provision for SIM with one for primary SIM and the other slot for redundant SIM.
- Shall have minimum of 2 Ethernet ports of 100Mbps and 1 USB 2.0 port, WiFi 802.11 a/b/n/g/ac with AP/STA
- Shall include one micro SD card holder and provision for 1 I/O module.
- Shall incorporate 2 Nos. of LTE circular type external antenna with LTE Wireless.
- Antenna Connection shall be of MAIN, DIV, GP.
- Frequency range of antenna shall be between 698-960 MHz, 1710-2700 MHz.

- Operational band of antenna shall be for LTE 700, AMPS/GSM850, GSM900, GSM 1800, WiFi 2.4 GHz, 2.6GHz LTE.
- Antenna shall be of omni-directional pattern with vertical polarization.
- Shall include IP67 standard housing proof.

3.2 Data logging and visualization:

- Shall develop independent real time analysis platform for data logging and recording.
- Continuous data logging and recording of the measured process parameters at the back end of the web portal need to be feasible.
- Web portal shall have a chart-based display of the process parameters values of the last 30 minutes with flexible intervals upto 24 hours.
- Past historical values of the process parameters shall be available in an excel format in the back-end storage by exporting the function in different aggregated resolutions (e.g. raw values, 15min average, 1h average, 1d average)
- Web page display shall be auto refreshed every one minute User shall be provided with the facility to refresh the page at his convenience too.
- Automated decentralized data storage of a capacity to store a minimum of three months data shall be provided. Other data should be available as “cold storage” and be able to be imported into data base on demand for further analysis. “data replay function”.
- Web portal shall have provisions to automatically store and present the data in numerical, digital format and real time graphical format.
- User should be able to modify dashboard, charts, tables on his own; no limitation of dashboards should be given.
- Shall have provisions for report generation in html / pdf / excel format, performance analysis report and chart or table view of measured data.

3.3 Monitoring and Control

- Real time continuous monitoring of the sensor values of both ground water control and conveyor system shall be made feasible.
- IoT enabled remote control of the conveyor system and the ground water control need to be developed.
- Control signal generated from the web portal need to be sent to the real time system via the LTE modem and Antenna.
- Shall provide wireless remote monitoring and control for a minimum distance of 2 kilometers.
- Predictive identification of faults that are likely to occur shall be made possible.
- Alert indication in case of system failure or warning shall be made feasible through SMS alert, email notification and call notifications to the registered operators.
- SMS alert notification different level of operators (nearly 10 SMS – Level I and 40 SMS –Level 2 operators) shall be provided.
- Shall be able to be monitored and controlled remotely using smart phones and Tablets.

3.4 User Authentication:

- Shall provide high data security with two level of user authentication.
- Shall have provisions for encryption and decryption of data to enhance system security.

- Device & user Management should be included; Multi-tenant option available to make user groups and access rights.
- Shall have provisions for encryption and decryption of data to enhance system security via Web-socket communication.

4. General Requirements

- Vendor shall visit the existing prototype setup at NIT, Trichy and the original system at NLC India Limited.
- Vendor shall provide best suitable quote for the above specified technical requirements of SCADA and Web portal-based monitoring and control for a distance of nearly 2 Kilometers for both GWC system and conveyor system at NIT Trichy. Suitable required sensors for the above setup shall be provided by NIT, Trichy.
- Suitable required sensors for the above setup shall be provided by NIT, Trichy. Sensor mounting and commissioning shall be included as a part of vendor's scope.
- A scalable version of PLC based monitoring and control of Electronification of Ground water control system and conveyor systems in NLC shall also be provided by the vendor which covers a minimum distance of 10 km.
- Vendor shall submit a report in detail highlighting the pros and cons and budgetary cost estimate of implementing SCADA and Web portal-based monitoring and control of GWC and conveyor system in NLC India Limited.
- Procurement and implementation of the PLC based monitoring and control of GWC and Conveyor system in NLC India Limited shall be done if needed after detailed discussion and approval of technical experts at NLC India Limited.
- It is mandatory for the vendors to have deep insight of the current scenario and inherent challenges of mining industries.
- Vendors should have carried out similar three numbers of industrial automation related projects in industries worth Rs. 20 Lakhs or single purchase order of more than 1 crore in the past 5 years. Proof of such orders shall be submitted along with the technical quotation.
- A minimum warranty of 5 years and comprehensive warranty of 3 years for the entire set up after the general warranty expires shall be provided by the vendor compulsorily.
- A 3 days training session shall be provided by the vendor to the staff, students and research scholars after approval of purchase order. Vendor shall provide 2 days and single day training post one and two years respectively.

Quantity : ONE.

Any other details/requirement: Nil

Warranty period required (years): 05 Years.

Delivery schedule expected after release of purchase order (in weeks): 04 weeks.

EMD (in Rupees): 42,000 /-

Performance Security to be given by the successful bidder after release of purchase order (in Rupees):10 % of the total order cost

SECTION: 4 – PRICE SCHEDULE

To be used by the bidder for submission of the price bid

1. Component Name:
2. Specifications (confirming to Section 3 of Tender document-enclose additional sheets if necessary):
3. Currency and Unit cost (excluding Taxes):
4. Quantity:
5. Item cost (Sl.No.3 * Sl.No.4) (in Indian Rupee):
6. Taxes and other charges:
 - (i) Specify the type of taxes and duties in percentages and also in figures
 - (ii) Specify other charges in figures
7. Total cost (Inclusive of all taxes) :
8. Warranty period (confirming to the Section 3 of Tender document. This should be mentioned in Technical bid also in order to get qualified for price bid):
9. Delivery Schedule (confirming to the Section 3 of Tender document):
10. Name and address of the firm for placing purchase order:

11. Name and address of Indian authorized agent (in case of imports only):

Signature of the Bidder :

Name and Designation :

Business Address :

Place:

Date :

Seal of the Bidder's Firm

(Note: All column should be filled. No column should be left blank. If any column is not filled-in properly or left empty then the bid will be rejected.)

SECTION: 5 – CONTRACT FORM

To be provided by the bidder in their business letter head

[Name of the Supplier’s Firm] hereby abide to deliver theby the delivery schedule mentioned in the Section 3 of the Tender document for supply of the items if the purchase order is awarded.

The item will be supplied conforming to the specifications stated in the tender document without any defect and deviations.

Warranty will be given for the period mentioned in the tender document and service will be rendered to the satisfaction of NIT, Trichy during this period.

Signature of the Bidder :

Name and Designation :

Business Address :

Place :

Date :

Seal of the Bidder’s Firm

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPALLI

Annexure-A

MODEL PRICE BID FORMAT FOR INDIAN BIDDERS

Tender No. & Date:

Bidder's Offer No. & Date:

S. No.	Description of item	Unit (SET /No)	QTY	Rate /Qty in Rs. (excluding of all taxes)	GST In %	Total Value in Rs. (inclusive of all taxes)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Supply portion (The price indicated shall be exclusive of all accessories, spares etc. as given in the scope of supply)					
2	Other accessories /spares etc as given in scope of supply(Individual item-wise break-up price shall be attached as an Annexure to this price bid format.)					
3	Installation & Commissioning (extra, if any)					
4	Packing & Forwarding charges (extra, if any)					
5	FOR Dispatching station value in Rs.					
6	Freight & Transit insurance charges, extra, if any					
7	Total all inclusive price delivered, installed and commissioned at NITT					
8	Value of Annual Maintenance Contract after the expiry of warranty period					
9	Net cost to be paid by NITT					

* GST concession please refer section 2 Point no.8

Signature & Seal of Vendor

Note: The price bid should be submitted only as per the above format. No row shall be left blank. Please indicate NA, in case the item is "Not Applicable". If this format is not used or any column is left blank, then the bid will be rejected.