



NATIONAL INSTITUTE OF TECHNOLOGY
ROURKELA-769008 (ODISHA)
(An Institute of National Importance under Ministry of HRD, GOI)

NOTICE INVITING TENDER

Tender Notification No: NITR/PW/EC/2020/192

Dated: 14/08/2020

The National Institute of Technology, Rourkela invites bids from the eligible bidders for procurement of **Setting up of Internet of Things (IoT) Lab** at NIT Rourkela.

Last date of Submission of Bid : **04/09/2020 by 03:00 PM**

Opening date of Techno-commercial Bid: **07/09/2020 at 03:00 PM**

For Details: http://nitrkl.ac.in/OldWebsite/Jobs_Tenders/9Equipment/Default.aspx

Contact: Professor D.P.Acharya
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Bidding through: <https://eprocure.gov.in/eprocure/app>

Sd/-
REGISTRAR



**NATIONAL INSTITUTE of TECHNOLOGY
ROURKELA – 769 008, ODISHA**

(OPEN TENDER NOTICE NO.: NITR/PW/EC/2020/192

Dated: 14/08/2020)

(Procurement of Testing and Measurement Instrument for IoT Lab)

DETAILED TECHNICAL SPECIFICATION AND QUANTITY

(Purchase of testing – measurement instrument for IOT Lab)

Sl. No.	Description of Goods/Service	Quantity
1.	Digital Multimeter.	10
2.	50 MHz Digital Storage Oscilloscope.	02
3.	70 MHz Digital Storage Oscilloscope.	01
4.	25 MHz Arbitrary /Function Generator	01

Specification and Accessories for Sr. No. 1, 2, 3 & 4.

SR. No 01. Digital Multimeter:-

Features include:

- Resistance, continuity, frequency, capacitance, and diode test
- Measures 10 A (20 A overload for 30 seconds)
- Large white LED backlight to work in poorly lit areas
- Compact ergonomic design for one-handed operation
- Compatible with optional magnetic hanger (ToolPak™)
- True-rms for accurate measurements on non-linear loads
- Min/Max/Average with elapsed time to record signal fluctuations
- CAT III 600 V safety rated

Accuracy specifications

Measurement	Range	Resolution	Accuracy \pm ([% of reading] + [counts])
DC millivolts	600.0 mV	0.1 mV	0.5 % + 2
DC volts	6.000 V 60.00 V 600.0 V	0.001 V 0.01 V 0.1 V	0.5 % + 2
Auto volts	600.0 V	0.1 V	2.0 % + 3 (dc, 45 Hz to 500 Hz) 4.0 % + 3 (500 Hz to 1 kHz)
AC millivolts ₁ true-rms	600.0 mV	0.1 mV	1.0 % + 3 (dc, 45 Hz to 500 Hz) 2.0 % + 3 (500 Hz to 1 kHz)
AC volts ₁ true-rms	6.000 V 60.00 V 600.0 V	0.001 V 0.01 V 0.1 V	1.0 % + 3 (45 Hz to 500 Hz) 2.0 % + 3 (500 Hz to 1 kHz)
Continuity	600 Ω	1 Ω	Beeper on < 20 Ω off > 250 Ω ; detects opens or shorts of 500 μ s or longer.
Ohms	600.0 Ω 6.000 k Ω 60.00 k Ω 600.0 k Ω	0.1 Ω 0.001 k Ω 0.01 k Ω 0.1 k Ω	0.9 % + 1

	6.000 MΩ 40.00 MΩ	0.001 MΩ 0.01 MΩ	
Diode test	2.000 V	0.001 V	0.9 % + 2
Capacitance	1000 nF 10.00 μF 100.0 μF 9999 μF 100 μF to 1000 μF > 1000 μF	1 nF 0.01 μF 0.1 μF 1 μF	1.9 % + 2
Lo-Z capacitance	1 nF to 500 μF		10 % + 2 typical
AC amps true-rms (45 Hz to 500 Hz)	6.000 A 10.00 A	0.001 A 0.01 A	1.5 % + 3 20 A overload for 30 seconds max.
DC amps	6.000 A 10.00 A	0.001 A 0.01 A	1.0 % + 3 20 A overload for 30 seconds max.
Hz (V or A input)	99.99 Hz 999.9 Hz 9.999 kHz 50.00 kHz	0.01 Hz 0.1 Hz 0.001 kHz 0.01 kHz	0.1 % + 2

Sr. No. 02: 50 MHz Digital Storage Oscilloscope:-

Specification:

INPUT CHANNELS

Type of input channels	Analog
Number of Analog Channels	2
Record Length Per Analog Channel Simultaneously	100K points
Sampling Rate Per Analog Channel Simultaneously	1 GS/sec
Digital Channels	no
Number of Digital Channels	NA
Record Length Per Digital Channel Simultaneously	NA
Sampling Rate Per Digital Channel Simultaneously	NA

PERFORMANCE FEATURES

Bandwidth	50 megaHertz
Bandwidth Upgradability	no
Operating System	Non -Windows

DISPLAY

Display Type	colour TFT
Minimum Display Size	7 inch

MEASUREMENTS FEATURES

Vertical Sensitivity	500μV/Div to 10 V/div
Vertical Resolution	8 bit
Frequency Analysis Feature	no
In-built Frequency Counter	yes
In-built Function Generator	no
Time Base Range	5 ns/div to 50 s/div
Time Base Accuracy	100 parts per million

GENERIC

Minimum Detectable Pulse Width	10 nanosecond
Memory Upgradability	no
Segmented Memory Feature Availability	no
Waveform Update Rate (Waveform/sec)	50000
Coupling	AC,DC,GND
Trigger Types	Edge,pulse width,video,External,pattern
Measurements	Math function-Add, subtract, multiply, divide,Automatic Measurements of Amplitude and time,FFT (phase),low-pass filter,Time & Voltage cursors,FFT (magnitude)
Acquisition Modes	Normal,Peak Detect,Averaging,High Resolution
I/O Interface	USB
Any other features,if applicable	Integrated 3-digit Digital Voltmeter Meter and 5 – digit Frequency counter → Built-in training signals, that enable users to quickly learn to capture and analyze simple (e.g. sine wave) or complex (e.g. radar pulse) signals with controlled real-time signal generation and It includes dynamic teaching labs contains an array of built-in training signals,

OPERATING CONDITION

Minimum Operating Temperature	0 degree Celsius
Maximum Operating Temperature	50 degree Celsius
Operating Humidity (RH)	95 percent

SERVICE

Warranty	3 year
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ACCESSORIES

Standard Accessories to be supplied	<ul style="list-style-type: none"> • Two Nos. 1:1/10:1 Switchable 75MHz Passive Probe, • Power Chord, • Certificate of calibration, • A comprehensive oscilloscope lab guide, • A tutorial written specifically for undergraduate students, and • An oscilloscope fundamentals PowerPoint slide set for professors and lab assistants.
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Sr. No. 03: 70 MHz Digital Storage Oscilloscope.:-

Key performance specifications

- 70 MHz bandwidth models
- 2-channel models
- Up to 2 GS/s sample rate on all channels
- 2.5k point record length on all channels
- Advanced triggers including pulse and line-selectable video triggers

Key features

- 7 inch WVGA (800X480) Active TFT Color Display
- 34 automated measurements
- Dual window FFT, simultaneously monitors both the time and frequency domains
- Built-in waveform limit and TrendPlot™ testing
- Dual channel frequency counter
- Zoom Function
- Automated, extended data logging feature
- Autoset and auto-ranging functions

Vertical system – Analog channels

Vertical resolution	8 bits
Input sensitivity range	2 mV to 5 V/div on all models with calibrated fine adjustment
DC gain accuracy	±3%, from 10 mV/div to 5 V/div
Maximum input voltage	300 V _{RMS} CAT II; derated at 20 dB/decade above 100 kHz to 13 V _{p-p} AC at 3 MHz and above
Offset range	2 mV to 200 mV/div: ±1.8 V > 200 mV to 5 V/div: ±45 V
Bandwidth limit	20 MHz
Input coupling	AC, DC, GND
Input impedance	1 MΩ in parallel with 20 pF
Vertical zoom	Vertically expand or compress a live or stopped waveform

Horizontal system — Analog channels

Time base range

70 MHz models	5 ns to 50 s/div
Time base accuracy	50 ppm
Horizontal zoom	Horizontally expand or compress a live or stopped waveform

Input/Output ports

USB interface	USB host port on front panel supports USB flash drives. USB device port on back of instrument supports connection to PC.
GPIB	interfaceOptional

Data storage

Nonvolatile storage

Reference waveform display	2.5K point reference waveforms
Waveform storage without USB flash drive	2.5K point
Maximum USB flash drive size	64 GB
Waveform storage with USB flash drive	96 or more reference waveforms per 8 MB
Setups without USB flash drive	10 front-panel setups
Setups with USB flash drive	4000 or more front-panel setups per 8 MB

Screen images with USB flashdrive 128 or more screen images per 8 MB

Save All with USB flash drive 12 or more Save All operations per 8 MB

A single Save All operation creates 3 to 9 files (setup, image, plus one file for each displayed waveform)

Acquisition system

Acquisition modes

Peak Detect High-frequency and random glitch capture. Captures glitches as narrow as 12 ns (typical) at all time base settings from 5 μ s/div to 50 s/div.

Sample Sample data only

Average Waveform averaged, selectable: 4, 16, 64, 128

Single Sequence Use the Single Sequence button to capture a single triggered acquisition sequence

Roll At acquisition time base settings of >100 ms/div

Trigger system

External trigger input Included on all models

Trigger modes Auto, Normal, Single Sequence

Trigger types

Edge (Rising/Falling) Conventional level-driven trigger. Positive or negative slope on any channel. Coupling selections: AC, DC, Noise Reject, HFReject, LF Reject

Video Trigger on all lines or individual lines, odd/even or all fields from composite video, or broadcast standards (NTSC, PAL, SECAM)

Pulse Width (or Glitch) Trigger on a pulse width less than, greater than, equal to, or not equal to, a selectable time limit ranging from 33 ns to 10 s

Trigger source Two channel models: CH1, CH2, Ext, Ext/5, AC Line

Trigger view Displays trigger signal while Trigger View button is depressed.

Trigger signal frequency readout Provides a frequency readout of the trigger source.

Frequency counter

Resolution 6 digits

Accuracy (typical) + 51 parts per million including all frequency reference errors and +1 count errors.

Frequency range AC coupled, 10 Hz minimum to rated bandwidth

Frequency counter signal source Pulse width or edge selected trigger source.

Frequency counter measures selected trigger source at all times in pulse width and edge mode, including when the oscilloscope acquisition is halted due to changes in run status, or acquisition of a single shot event has completed. The frequency counter does not measure pulses that do not qualify as legitimate trigger events. Pulse Width mode: Counts pulses of enough magnitude inside the 250 ms measurement window that qualify as trigger able events(e.g. all narrow pulses in a PWM pulse train if set to "<" mode and the limit is set to a relatively small number).Edge Trigger mode: Counts all pulses of enough magnitude.

Channels 2 channel

Accessories

Standard accessories

Accessory	Description
Passive probes, one per channel	TPP0101: 100 MHz passive probe for: TBS1072B-EDU
Power cord	(Please specify plug option)
NIM/NIST	Traceable certificate of calibration
Printed documentation	Installation and safety manual(English, Japanese, and Simplified Chinese)
CD with customer documentation and software	Customer documentation including detailed user manuals (English, French, German, Italian, Japanese, Korean,Portuguese, Russian, Simplified Chinese, Spanish, Traditional Chinese), Courseware PC Software, exampleCourseware labs, ABC's of Probes application note, XYZ's of Oscilloscopes application note, Courseware PCSoftware download link, www.tek.com Education landing page
5-year warranty	Covers labor and parts for defects in materials and workmanship for 5 years, excluding probes and accessories(probes and accessories are not covered by the oscilloscope warranty and service

	offerings. refer to the data sheet of each probe and accessory model for its unique warranty and calibration term
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Sr. No. 04: 25 MHz Arbitrary /Function Generator: -

MEASUREMENT FEATURES

Frequency Bandwidth (Sine Wave)	10 mHz to 25 MHz
Number of channels	1
Standard Waveforms	Sine, Square, Pulse, Ramp, Noise, Sin(x)/x, Exponential rise/fall, Gaussian, DC Offset
Band Width of Arbitrary Waveform Generator	10 mHz to 50 MHz
Sample Rate of Arbitrary Waveform Generator (Mega Samples/sec)	250
Record Length of Arbitrary Waveform Generator (Kilo Points)	128
Waveform Memory of Arbitrary Waveform Generator (Waveforms)	4
Vertical Resolution	14 bit
Amplitude Range (at 50 ohm impedance)	10mV to 10 V pp
Modulation	AM, FM, PM, FSK, Burst, PWM, Sweep

GENERIC

Interface	USB, GPIB, LAN
Display Type	LCD
Display Size	4.3 inch
Any others features, if applicable	na

ACCESSORIES

Details of Standard Accessories To be supplied with the devices	power chord
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POWER SOURCE

Power Requirements	230 V +/-10% AC, 50 Hz +/- 3%
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OPERATING CONDITION

Minimum Operating Temperature	0 degree Celsius
Maximum Operating Temperature	55 degree Celsius
Operating Humidity (RH) at 40 deg C non condensing (%)	80

SERVICE

Warranty	3 years
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- Quantity required : As mentioned above (All information provided in technical specification with name of testing – measurement instrument)**
- Delivery: Within 30 days from the date of purchase order.**
- Last Date of submission of Bid: 04/09/2020 by 03:00 PM**

4. **Date of opening of Techno-commercial bid: 07/09/2020 at 03:00 PM**
5. The firm should not have been black listed at any time.
6. The submission of following bids by the tender should be through <https://eprocure.gov.in/eprocure/app>. Please follow the guidelines as per the portal.

Procurement of Testing and measurement Instrument at NIT Rourkela (Open Tender Notice No.: NITR/PW/EC/2020/192 ; Dated- 14/08/2020) Due on 04/09/2020 by 03:00 PM
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7. Liquidated damage clause will be charged for any delay in supply of goods.
8. The validity of the tender shall be **120 days** from the date of opening of the bids.
9. Detailed advertisement including all tender documents is also available in our website at http://nitrkl.ac.in/OldWebsite/Jobs_Tenders/9Equipment/Default.aspx.
10. NIT reserves the right to qualify or deny pre-qualification of any or all applicants without assigning any reasons.

REGISTRAR
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