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JNTUH COLLEGE OF ENGINEERING HYDERABAD

(AUTONOMOUS)

KUKATPALLY, HYDERABAD – 500 085, TELANGANA STATE, INDIA

CENTRE OF EXCELLENCE - DISASTER MANAGEMENT (TEQIP-II)

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The following equipment is proposed to be purchase under CoE (TEQIP-II)
Name of Equipment: **Multi Domain Oscilloscope**
Specifications: MDO3104-3 Six in one Oscilloscope

	CHARACTERISITCS	SPECIFICATION
1	Analog Channels	4
2	Digital Channels (Optional)	16
3	RF Channels	1
4	Instrument Features	Should have following capabilities: - Time Domain Analysis - Inbuilt dedicated Spectrum Analyzer - Logic Analysis - Inbuilt Digital Voltmeter - Arbitrary Function Generator (50MHz)
Analog Characteristics		
5	Analog Bandwidth	1 GHz on all Channels
6	Analog Waveform Capture Rate	> 235,000 Wfms/Sec
7	Record Length	10 Mpoints per channel
8	Analog Channel Sample Rate	2.5 GSa/s on all channel
9	Rise Time	≤ 1.15 ns
10	DC Gain Accuracy	±1.5% for 5 mV/div and above
11	Vertical Resolution	8 bits (> 11 bits in HI-RES mode)
12	Horizontal System Time base Range	1ns to 1000s
13	Input Impedance & Coupling	AC, DC 1 MΩ ±1%, 50 Ω ±1%, 75 Ω ±1%
14	Vertical Sensitivity	1 MΩ 1 mV/div to 10 V/div 50 Ω 1 mV/div to 1 V/div
15	Time Base Accuracy	±10 ppm

16	Math	Should have provision to define extensive algebraic expressions including waveforms, reference waveforms, math functions. FFT Points : Up to 1 Mpts Spectrum Math: Add or subtract frequency-domain
17	Modes	Sample, Average, Hi-RES, Peak Detect, Envelope, Roll & FastAcq
Arbitrary Function Generator Characteristics		
18	Frequency Range (Sine Wave)	0.1 Hz to 50MHz
19	Standard Functions	Sine, Square, Pulse, Ramp/Triangle, DC, Noise, Sin(x)/x (Sinc), Gaussian, Lorentz, Exponential Rise, Exponential Decay, Haversine, Cardiac, and Arbitrary
20	Amplitude Range	Hi-Z : 20 mVp-p to 5 Vp-p 50 Ω : 10 mVp-p to 2.5 Vp-p
21	Square/Pulse Waveform Frequency	0.1 Hz to 25 MHz
22	Duty Cycle	10% to 90% or 10 ns minimum
23	Duty Cycle Resolution	0.10%
24	Minimum Pulse Width	10 ns
25	Rise/Fall Time	5 ns (typ.) 10% to 90%
26	Arbitrary Waveform Length	1 to 128 k
27	Repetition Rate	0.1 Hz to 25 MHz
28	Sample Rate	250 MSa/s
29	Arbitrary Waveform Software	Should have compatibility with the remote software in which any arbitrary waveform can be defined and can be exported to AFG.
Digital Channels Characteristics		
30	Maximum Sample Rate	500 MS/s (2 ns resolution)
31	Maximum Record Length	10M points
32	Maximum Sample Rate (High Speed)	8.25 GSa/s (121.2 ps resolution) 10k points centered around the trigger
33	Minimum Detectable Pulse Width	2 ns
34	Max Input Peak Digital Channel Voltage	±42Vpeak
35	Channel to Channel Skew	500 ps
RF Characteristics		
36	Frequency range	9KHz to 1 GHz
37	Frequency Upgradation	Should have provision to upgrade the RF channel Frequency to 3GHz
38	Span Range	9KHz to 1GHz
39	Resolution Bandwidth	20 Hz - 150 MHz in a 1-2-3-5 sequence
40	Vertical Scale Range	1 dB/div to 20 dB/div in a 1-2-5 sequence
41	Capture Bandwidth	1GHz
42	DANL (Without PreAMP)	9 kHz - 50 kHz < -105 dBm/Hz

		50 kHz – 5 MHz < -125 dBm/Hz 5 MHz – 1GHz < -135 dBm/Hz
43	DANL (With PreAMP) (Quote Optionally)	9 kHz - 50 kHz < -115 dBm/Hz 50 kHz – 5 MHz < -135 dBm/Hz 5 MHz – 1GHz < -145 dBm/Hz
44	Frequency Domain Trace Types	Normal, Average, Max Hold, Min Hold, Spectrogram
45	Detectors	+Peak, -Peak, Average, Sample
46	Markers	11 peaks identified based on user-adjustable threshold and excursion values. Manual Markers Two manual markers indicating frequency, amplitude, noise density, and phase noise. Marker Readouts Absolute or Delta
47	FFT Window selection	Kaiser, Rectangular, Hamming, Hanning, Blackman-Harris, Flat-Top
48	Interference Analysis	Should have provision for Spectrogram display. Also should have feature to see the updated slices.
49	Automated Measurements	Channel Power, Adjacent Channel Power Ratio (ACPR), and Occupied Bandwidth (OBW)
Digital Voltmeter Characteristics		
50	Source of Channel	Any Analog Channel of the Oscilloscope (Channel 1, Channel 2, Channel 3, Channel 4)
51	Measurement Types	AC RMS, DC, AC+DC RMS (reads out in volts or amps); Frequency
52	Resolution	ACV, DCV: 4 digits Frequency: 5 digits
53	Frequency Accuracy	± 10 ppm
54	Measuring Rate	100 times/second; measurements updated on the display 4 times/second
55	Vertical Setting Autorange	Automatic adjustment of vertical settings to maximize measurement dynamic range; available for any non-trigger source
56	Graphical measurement	Graphical indication of minimum, maximum, current value, and five second rolling range
General Characteristics		
57	I/O Ports	USB2.0 HS Host Port,10/100/1000 Mbp/s LAN Port, USB2.0 Device Port, XGS Video Port, External Reference in

58	Trigger Selections	Edge, Sequence, Logic, Pulse Width, Runt, Multi channel set-up and hold, Rise/Fall Time, Video, Parallel bus (optionally - I2C, SPI, CAN, RS-232/422/485)
59	Trigger Coupling	DC, AC, HF reject (attenuates >50 kHz), LF reject (attenuates <50 kHz), noise reject (reduces sensitivity)
60	Trigger Hold Off Range	20ns to 8s
61	Serial Trigger Options	I2C, SPI, RS232, UART, 422, 485
62	Warranty	3 Years
63	Standard Accessories	Power Card, 500 MHz probes (4 Nos.), Calibration certificate, Manual, PC Software.

The vendors are requested to submit the details of their firms to the Principal on or before 15/03/2015, so as to send the invitations to their firm for the purchase of the above equipment.

Sd/-
Coordinator

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The following equipment is proposed to be purchase under CoE (TEQIP-II)

Name of Equipment: **Core Module Sensor Node**

Specifications

Zigbee Embedded RF module that uses ZigBee PRO feature set. , Memory 32 KB flash, 2 KB RAM, RF Data Rate: 250 Kbps, range: indoor-300ft, outdoor-2 miles, Adjustable power, frequency band - 2.4 GHz.

The vendors are requested to submit the details of their firms to the Principal on or before 15/03/2015, so as to send the invitations to their firm for the purchase of the above equipment.

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