

**GOVERNMENT ENGINEERING COLLEGE , THRISSUR  
NOTICE INVITING TENDER**

No.D2/6397/17/GECTCR

Dated: 08/01/2018

**Tender No. : D2/134/17-18**

Superscription : Digital Storage Oscilloscope, Arbitrary Function Generator, DC Regulated Power Supply and Power Scope for Electronics and Communication Engineering Department.

Bidding fee : Rs.2508/-(Rs.2125/- +18%Tax)

EMD required : Rs.11400/-

Address of the Officer to whom hardcopy is to be sent. : THE PRINCIPAL, GOVERNMENT ENGINEERING COLLEGE, THRISSUR-680009

**Specification Details**

SL.No	Item	Specifications	Quantity
1	Digital Storage Oscilloscope	50 MHz, Two Channels DSO. Display 7" TFT Colour Max. Real-Time Sampling Rate 1 GSa/s Time Base-5nS/div to 50S/div Waveform Update Rate-50,000waveforms/sec Frequency response analyzer-Plot gain and phase VS frequency Inbuilt function generator-20MHz (Sine, Square, Triangle, Ramp, DC, Noise) Interfaces-USB 2.0 device port and USB 2.0 host port Input power - 100V - 240V, 50Hz Warranty - Three Years Product brochure required <b>(Detailed specifications attached)</b>	6
2	Arbitrary Function Generator	60MHz, dual channel arbitrary function generator with technical specifications mentioned below: Amplitude - 1mV to 10V at 50Ohm impedance and 2mV to 20V in High impedance mode. Modulation - PWM with both internal and external frequencies. Modulation should supports on both channels, hence two independent PWM signals can be taken out at the same time. Warranty : 5 Years Product brochure required <b>(Detailed specifications attached)</b>	6
3	DC Regulated Power Supply	Multi-output DC regulated power supply: 1. At least 4 Independent Isolated Outputs with 4 inch LCD Display to display each channel. 2. Two channels with output 0-30V and 0-3 A, & 0-15V/1A one & 0-5V/1A. For 30V channels, <= 0.02% + 5mV load and Line Regulation in constant voltage operation and <=0.3%+3 mA load and line regulation in constant current operation. 3. Warranty Three years 4. Product brochure required <b>(Detailed specifications attached)</b>	6

4	Power Scope	30 MHz Dual Channel Power Scope: Band width-DC to 30MHz Two in one operation- normal mode and differential mode Normal input-400V Differential input- 1500V Time base-20ns to 0.2 sec, Variable hold off: 10:1 Frequency counter- 40MHz Over scan indicator Vertical- 2mV/div to 20V/div component tester, 2 level calibrator 2mv/Div sensitivity	9
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**60MHz, 2Channel Arbitrary Function generator**

Frequency	: Sine 1 $\mu$ Hz to 60 MHz
No. of channels	: 2
Out puts	: Should be independent settable on both channels and option to synchronise phase and frequency.
Waveforms	: Sine, Square, Pulse, Ramp, Noise, DC, and 45 FU arbitrary waveforms
Amplitude flatness	: 0.2dB @ <10MHz, 0.3dB @ >10MHz
THD	: <0.2%(10Hz to 20KHz)
Phase noise	: 1MHz; <-110dBc/Hz@ 10KHz offset, 1V
<u>Square</u>	: 1 $\mu$ Hz to 30 MHz
Rise/Fall time	: <10nS
Jitter(RMS)	: <500ps
<u>Ramp</u>	: 1 $\mu$ Hz to 2MHz
Linearity	: $\leq$ 0.1% of peak output
Symmetry	: 0.0% to 100.0%
<u>Pulse</u>	: 1 mHz to 30 MHz
Pulse width	: 17.00 ns to 999Ks, $\geq$ 1 MHz, 50% fixed
Edge transition time	: <10 ns fixed
Resolution	: 10pS or 5 digits
Jitter	: <500ps
Overshoot	: <5%
Noise Bandwidth	: (-3 dB)50 MHz
Noise Type	: White Gaussian
DC (into 50 $\Omega$ )	: -5 V to +5 V, -10 to 10V at High Z
<b>Arbitrary Waveform</b>	<b>: 1 <math>\mu</math>Hz to 30 MHz</b>
<b>Effective analog bandwidth</b>	<b>: 60MHz</b>
<b>Non-volatile memory</b>	<b>: 64 MByte</b>
<b>Memory Sample rate</b>	<b>: 2 to 8192: 125 MS/s</b>
<b>Vertical resolution</b>	<b>: 14 bits</b>
Amplitude	: @50 $\Omega$ load :1mVp-p to 10 Vp-p(<25MHz) : @High impedance mode: 2 mVp-p to 20 Vp-p(<25MHz)
Amplitude Resolution	: 1 mVp-p, 1 mVRMS, or 4 digits
DC offset	: 5Vpk at 50 $\Omega$ /10Vpk at High impedance

Frequency Resolution : 1  $\mu$ Hz or 12 digits  
 Aging :  $\pm 1$  ppm per year  
**Frequency Counter : Inbuilt 100 mHz to 200 MHz**  
 Function : Frequency, period, positive pulse width, duty cycle  
 Frequency resolution : 6 digits  
 Coupling mode : AC, DC  
 Amplitude : up to 100MHz; 5Vpp, 200MHz 3Vpp  
**Modulation : AM, FM, PM, FSK, ASK, PSK, PWM**  
**Out puts : All modulations should be available from both channels on independent settings**  
 Carrier Waveforms : Sine, square, ramp, arbitrary, except DC and noise  
 Source : Internal/External  
 Internal Modulating : Sine, Square, Ramp, Noise, ARB  
 Internal ModuFreq : 2 mHz to 20.00 kHz for AM, FM, PM and 100KHz for FSK, ASK,PSK  
  
 Max Deviation for FM : 30 MHz  
 AM Modulation Depth : 0.0% to 100.0%  
 Phase Deviation: 0° to 180°  
 FSK rate : 2 mHz to 100 kHz  
 Other modes : Sweep and Burst  
 Sweep time : 1 ms to 500 s  $\pm$  0.1%  
 Burst Start phase : -360° to +360°  
 Burst Types : Count (1 to 1,000,000 cycles), infinite, gated  
  
 I/O connectivity : Ext Modulation In, Ext Trigger In, Ext Ref Clock In, Ext Ref Clock Out,  
 USB(host&Device)  
  
 Display : 3.9" Colour 65K, TFT LCD display with 480x320 resolutions to display waveforms  
 Items to be supplied : Quick-start user manual printed, power cord, programmer manual, LabView and IVI drivers, CD-ROM with ArbExpress™ software, and NIST-traceable calibration certificate, CD-Rom, **Fuse cartridge 2A and 4A, USB cable;Type A to Type B, BNC cable-2 nos**  
 Warranty : **5Years standard**

### 50MHz Digital storage Oscilloscope with Built-in Function generator

Bandwidth	:	50MHz
Max. Real-Time Sampling Rate	:	1GSa/s
Analog channels	:	2
Display	:	7" TFT LCD color
Record Length	:	100Kpoints
Time Base	:	5nS/div to 50S/div
Waveform Update Rate	:	50,000waveforms/sec
Acquisition Modes	:	Normal, Peak Detect Averaging, High Resolution mode
Input sensitivity	:	500 $\mu$ V/div to 10V/div
Vertical Control knobs	:	Dedicated controls per channel
Trigger Source	:	Ch 1, Ch 2, line, wave generator and External
Trigger Types	:	Edge, Video, Pulse width & Pattern
Waveform Math	:	FFT, ch1-ch2, ch1+ch2, ch1*ch2, ch1/ch2, low pass filter
Automatic Measurements	:	24 automatic measurements
Serial protocol analysis (optional)	:	I <sup>2</sup> C, UART/RS232
Display modes	:	YT, XY, roll, persistence
Cursor Measurements	:	Both amplitude and time cursors available
Training signals	:	Basic training signals are available
Inbuilt function generator	:	20MHz (Sine, Square, Triangle, Ramp, DC, Noise)
Frequency response analyzer	:	Plot gain and phase VS frequency
Interfaces	:	USB 2.0 device port and USB 2.0

		host port
Voltmeter & Frequency Counter	:	3 digit voltmeter and 5 digit frequency counter
Data logging	:	Data can be logged through free software Benchvue
Warranty	:	3Years
Input Power	:	100V - 240V, 50/60Hz

### MULTIOUTPUT POWER supply

1. At least 4 Independent Isolated Outputs with 4inchLCD Display to display each channel
2. Two channels with output 0-30V and 0-3 A,& 0-15V/1A one & 0-5V/1A, for 30V channels,  $\leq 0.02\% + 5\text{mV}$  load and Line Regulation in constant voltage operation and  $\leq 0.3\% + 3\text{ mA}$  load and line regulation in constant current operation
3. For the 0-30 V, 0-3 A channels , Low Ripple and Noise a) in constant voltage operation :  $\leq 2\text{mV rms}$  , 5Hz ~ 1MHz b)in constant current operation: ripple  $\leq 6\text{ mA rms}$
4. Auto Series/Parallel Operation of channels with output 0-30V and 0-3 A giving 0-60 V and 0-6 A respectively
5. Output ON/OFF Switch
6. Tracking Operation
7. AC source: 230 V, 50 Hz.

Superscription - Tender No D2/134/17-18 for Purchase of Digital Storage Oscilloscope, Arbitrary Function Generator, DC Regulated Power Supply and Power Scope for Electronics and Communication Engineering Department	
Due date and time for receipt of tender	16.01.2018 04.00 pm
Date and time for opening of tender	20.01.2018 11.00 am
Date upto which the rates are to be firm	90 days from opening of tender
Price of tender form	Rs.2508/- (Rs.2125/- +18%Tax)
Price of duplicate copy	
Address of Officer from whom tender forms are to be obtained and to whom tenders are to be sent:	E tender only

### General conditions

1. Price: Should include all charges and taxes specifically stated.
2. Payment will be made only after the successful supply, installation and testing.
3. F.O.R: Govt. Engineering College, Thrissur.
4. Agreement: Preliminary Agreement in Rs.200/- Kerala Stamp Paper.
5. Date of opening of tender: In case the proposed date declared as holiday, the tender will be opened on the next working day.
6. After E-tendering the hard copy of all documents should be submitted before the date of opening of the tender to the Principal, Government Engineering College, Thrissur.
7. Items to be supplied at Electronics and Communication Engineering Department of Govt. Engineering College, Thrissur.
8. The items should have a minimum guarantee period of one year from the date of installation and successful performance.
9. Installation, successful demonstration and training required.
10. Delivery Period: Immediately after the date of receipt of supply order.
11. Agreement & 5% Security deposit needed.

NB: The Tender procedure will be made as per Rules mentioned in the Revised Store Purchase Manual. The bidders should participate this tender through E-Tendering System. Tender cost and EMD should be submitted only through online. For more details Contact Ph.0487 2334144