

Technical Specification of Transient Recorder

1	Main Frame with Recording Modules for 16 Channel Recorders (Technical Requirements)	
1.A	Mainframe Assembly Capacity	Qty - (one set)
	No. of Analog Channels to support	16, with input modules
	No. of Digital Channels to support	16, with input modules
	Display	10.4 inch TFT colour LCD
	Display modes	Single, Dual, triad, Quad, Octal, hectal display, zooming should be available
	Sampling rate	Max up to 10M Sa/sec
	Time axis setting	100 μ s, 5 sec,... 10sec to 60 min, etc. in steps
	Time axis accuracy	$\pm 0.006\%$ or better
	Recorder Length	2.0MSa/Channel, or better (Total 40MSa or higher)
	Trigger modes	Auto, Normal, Single, Singl(N), Log
	Trigger Sources	Analog inputs, ext. & line inputs are available
	Trigger Types	Edge, event/patterns, Window trigger, OR trigger etc
	Built -in Printer	A4 size roll, 20m, Thermal line-dot printing, Real time printing, X - Y printing
	Real time printing/storing requirements	Print waveform in real time and save waveforms to 2.5 MW/Ch Memory, Printing speeds : 20mm/s to 20mm/hr, Single shot printing on 20cm, 50cm, 1m, or higher required
	External Printer to be supported	By using USB ports.
	Computation facility	addition, subtraction, multiplication, FFT etc for the wave forms
	Vertical & Horizontal axis cursors	Should be available. Interfaces GP-IB/RS232C/USB and Ethernet are to be provided
	Probe Power terminal	required for 4 measurement Hall effect type probes from OEM
	Power Supply	200-240V AC, 50/60Hz
1.B	Voltage Input Units	Qty: 6 Nos.
	Input Channels to support	2 per module
	Measurement of wave forms	upto 200V (AC or DC) 500mv to 200V range
	Input couplings	AC, DC GND
	A/D conversion resolution	12 bits or better
	Max. Sampling rate required	10MSa/sec or better
	DC accuracy	($\pm 0.5\%$) of 10Div
	Frequency bandwidth	DC to 2.5mHz or better
	Input impedance	0.8M ohms or higher
	Input Filters required	Off, 500Hz, 5kHz, 50kHz, 500kHz etc.
	1:1 BNC Safety adaptor lead along with adaptor required	To be Provided

1.C	<u>Acceleration/Voltage Input Module</u>	Qty: 1 No.
	Input Channels to support	2 per module
	Compatible Acceleration Sensors	Kistler/PCB/Endevco makes
	Input couplings	AC, DC GND
	Input range	50mV to 100V for voltage inputs
	A/D conversion resolution	16 bits or higher
	Max. Sampling rate required	100kSa/sec
	DC accuracy	($\pm 0.5\%$ of range)
	Frequency bandwidth	Acceleration(0.4Hz to 40kHz), Voltage (DC, up to 40kHz)
	Input impedance	0.8M ohms or better
	Input Filters required	Off, Auto(AAF), 40Hz, 400Hz, 4kHz etc. required
	1:1 BNC Safety adaptor lead along with adaptor required	To be Provided
1.D	<u>Frequency Input Module</u>	Qty: 1 No.
	Input Channels to support	2 per module
	Measurement ranges	0.01Hz to 200kHz, 1Hz to 500kHz with minimum measurement resolution of 50ns(20MHz)
	Measurable Parameters	Frequency(Hz), rpm, rps,period(sec)
	Input couplings	AC, DC
	Input voltage range	$\pm 1V$ to $\pm 50V$ (6 ranges)
	A/D conversion resolution	16 bits or higher
	Max. Sampling rate required	10MSa/sec
	Input impedance	0.8M ohms or better
	Input Filters required	Off, 100Hz, 1kHz, 10kHz, 100kHz etc.
	1:1 BNC Safety adaptor lead along with adaptor required	To be Provided
1.E	<u>Remote Controller with software for Data analysis</u>	Qty: 1 No.
	Easy remote operation through Ethernet connection required.	
	Data capture function for waveform parameters, graphs and spread sheets for report generation required using remote controller	
	Remote waveform monitoring and downloading of waveform data, start or stop a measurement.	
	Should have at least 2.66GHz core two duo Intel processor,6MB L2 Cache, 1066MHz FSB, 4GB-800 MHz RAM , NVDIA 9300M or equivalent graphics with 256 MB dedicated memory.	
	320 GB data storage drive and 8X Optitcal DVD drive	
	Remote controller to have 15-inch or more LCD/WXGA screen for waveform Antiglare display.	
	Web server functions required for data storage like FTP & Internet explorer applications	
	Suitable windows based control software with license for controlling the transient recorder, display of waveforms, report generation based on microsoft windows/office platform.	

	Integrated 10/100 Ethernet , Wireless Lan, Blue tooth data transfer	To be Provided
	Biometric Reader/Check	Biometric Reader required for remote controller
1.F	Guarantee/Warranty	At least 2 years warranty for the mainframe, all modules and remote controller with software i.e for items in SL.Nos.1A to 1E
2	Accessories	
2.A	Current Probe	Qty: 2 Nos.
	Frequency bandwidth	DC, to 2MHz or better
	Max. continuous input range	500Arms
	Amplitude accuracy	$\pm 1.0\%$ of rdg for 500A rms
	Suitable for above Transient Recorder	To be Provided
2.B	Differential Probe	Qty: 4 Nos.
	Bandwidth	DC, to 60MHz or better
	Input Attenuation ratio	1/100, 1/1000
	Max. allowable diff. voltage	1000Vrms
	Max. Common mode input voltage	1000Vrms
	Suitable for above Transient Recorder	To be Provided
2.C	High Accuracy Current Probe	Qty: 3 Nos.
	Bandwidth	DC, to 100kHz or better
	Input Current Range	0-600A(DC) / 0-600 peak(AC)
	Accuracy	High Precision fundamental accuracy: $\pm(0.06\%$ of rdg)
	Suitable for above Transient Recorder	To be Provided
2.D	Guarantee/Warranty	1 years warranty for the items in for in SI No. 2A to 2C
3	Connecting cables and the accessories (3A- Power Cord, 3B- Printer Paper, 3C- Carrying case, 3D- 1:1 Banana Alligator Cables, 3E-Necessary LAN & USB Cables	
3.F	Guarantee/Warranty	1 years warranty for the items in for in SI No. 3A to 3E
4	<u>List of deliverables</u>	Qty
1.A	Mainframe Unit	1 No.
1.B	Voltage Input Module	6 Nos.
1.C	Acceleration Input module	1 No.
1.D	Frequency Input Module	1 No.
1.E	Remote Controller	1 No.
2.A	Current Probe (500Arms)	2 Nos.
2.B	Differential Probe	4 Nos.
2.C	High Accuracy Current Probe(600A)	3 Nos.
3.A	Power cord	1 No.
3.B	Printer Paper roll (A4, 20m)	6 rolls

3.C	Carrying case	1No
3.D	1:1 Banana Alligator Cables	8 Nos.
3.E	Necessary LAN & USB Cables	1 set
5	<i>E & C at PMM Centre Corp. R&D Hyderabad and training for one day.</i>	
5.A	User Manuals, Main Frame Test & Callibration certificate, Test Report of modules	
5.B	Warrantee a menioned in SI Nos. 1F,2D & 3F above from date of erection and commisioning.	
6	<i>The list of customers in India and abroad for such equipment should also be enclosed</i>	
7	<i>The Technical brochure of transient recorder and its accersories should be enclosed</i>	
8	<i>The cost of spares like voltage input unit module, acceleration input module, frequency input modules are to be mentioned seperately</i>	
BHEL Corporate R&D, Vikasnagar, Hyderabad.		

Technical Compliance format of Transient Recorder			To be filled by the Supplier	
1	Main Frame with Recording Modules for 16 Channel Recorders (Technical Requirements)		Compliance Yes/No	Remarks
1.A	Mainframe Assembly Capacity	Qty - (one set)		
	No. of Analog Channels to support	16, with input modules		
	No. of Digital Channels to support	16, with input modules		
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	Display modes	Single, Dual, triad, Quad, Octal, hectal display, zooming should be available		
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	Time axis setting	100µs, 5 sec,... 10sec to 60 min, etc. in steps		
	Time axis accuracy	±0.006% or better		
	Recorder Length	2.0MSa/Channel, or better (Total 40MSa or higher)		
	Trigger modes	Auto, Normal, Single, Singl(N), Log		
	Trigger Sources	Analog inputs, ext. & line inputs are available		
	Trigger Types	Edge, event/patterns, Window trigger, OR trigger etc		
	Built -in Printer	A4 size roll, 20m, Thermal line-dot printing, Real time printing, X - Y printing		
	Real time printing/storing requirements	Print waveform in real time and save waveforms to 2.5 MW/Ch Memory, Printing speeds : 20mm/s to 20mm/hr, Single shot printing on 20cm, 50cm, 1m, or higher required		
	External Printer to be supported	By using USB ports.		
	Computation facility	addition, subtraction, multiplication, FFT etc for the wave forms		
	Vertical & Horizontal axis cursors	Should be available. Interfaces GP-IB/RS232C/USB and Ethernet are to be provided		
	Probe Power terminal	required for 4 measurement Hall effect type probes from OEM		
	Power Supply	200-240V AC, 50/60Hz		
1.B	Voltage Input Units	Qty: 6 Nos.		
	Input Channels to support	2 per module		
	Measurement of wave forms	upto 200V (AC or DC) 500mv to 200V range		
	Input couplings	AC, DC GND		
	A/D conversion resolution	12 bits or better		

	Max. Sampling rate required	10MSa/sec or better		
	DC accuracy	($\pm 0.5\%$) of 10Div		
	Frequency bandwidth	DC to 2.5mHz or better		
	Input impedance	0.8M ohms or higher		
	Input Filters required	Off, 500Hz, 5kHz, 50kHz, 500kHz etc.		
	1:1 BNC Safety adaptor lead along with adaptor required	To be Provided		
1.C	<u>Acceleration/Voltage Input Module</u>	Qty: 1 No.		
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	Measurable Parameters	Frequency(Hz), rpm, rps,period(sec)		
	Input couplings	AC, DC		
	Input voltage range	$\pm 1V$ to $\pm 50V$ (6 ranges)		
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	Bandwidth	DC, to 60MHz or better		
	Input Attenuation ratio	1/100, 1/1000		
	Max. allowable diff. voltage	1000Vrms		
	Max. Common mode input voltage	1000Vrms		
	Suitable for above Transient Recorder	To be Provided		

2.C	High Accuracy Current Probe	Qty: 3 Nos.		
	Bandwidth	DC, to 100kHz or better		
	Input Current Range	0-600A(DC) / 0-600 peak(AC)		
	Accuracy	High Precision fundamental accuracy: $\pm(0.06\%$ of rdg)		
	Suitable for above Transient Recorder	To be Provided		
2.D	Guarantee/Warranty	1 years warranty for the items in for in SI No. 2A to 2C		
3	Connecting cables and the accessories (3A- Power Cord, 3B- Printer Paper, 3C- Carrying case, 3D- 1:1 Banana Alligator Cables, 3E-Necessary LAN & USB Cables			
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1.E	Remote Controller with software	1 No.		
2.A	Current Probe (500Arms)	2 Nos.		
2.B	Differential Probe	4 Nos.		
2.C	High Accuracy Current Probe(600A)	3 Nos.		
3.A	Power cord	1 No.		
3.B	Printer Paper roll (A4, 20m)	6 rolls		
3.C	Carrying case	1No		
3.D	1:1 Banana Alligator Cables	8 Nos.		
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Signature & Stamp of the Supplier