


क्र. L-13011/2(AAP-VIII)/14-WS
भारत सरकार / Government of India
गृह मंत्रालय / Ministry of Home Affairs
समन्वय निदेशालय / Directorate of Coordination
पुलिस बेतार / Police Wireless

खण्ड 9, सी. जी. ओ. कॉम्प्लेक्स,
लोधी रोड, नई दिल्ली-110003
दिनांक : 11.10.2019

To,
All the Vendors,

Subject :- Request for Comments of Vendors on Specifications / QRs of 18 Nos. of Test / Measuring Equipments.

Directorate of Coordination Police Wireless plans to procure Test / Measuring Instruments for strengthening its testing infrastructure. In this connection, this Directorate has framed specifications / QRs in r/o 18 Nos. of Test / Measuring Equipments. The comments of Vendors / Firms are invited on specifications / QRs. The interested parties may forward their comments on the enclosed Specifications / QRs within 15 days from the date of upload at the websites to the undersigned.


Vidyadhar,
Dy. Director(WS),
Room No.605, 6th Floor,
DCPW, Block No.9, C.G.O. Complex,
Lodhi Road, New Delhi-110003.
e-mail : vidyadhar@dcpw.gov.in
Mob: 9971321978

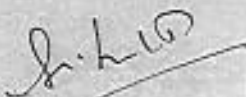
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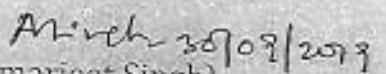
- 1) AD(IT) - May kindly upload on DCPW website.
- 2) Web Information Manager / Joint Secy (C & PG)
Central Secretariat A-Block, CGO Complex,
New Delhi - 110001. With request to upload on MHA Website.
- 3) Section Officer (IT Cell),
MHA, Room No.10,
North Block, New Delhi-110001.
Tel: 23093059
Email : soit@mha.gov.in

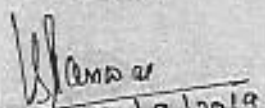
24.	Assorted Connectors, Adaptor and Cables	Category of Accessories and hence generic QRs are not available.
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3. The Committee also recommends that the Central Workshop may decide the appropriate requirement of Assorted Connectors, Adaptors and cables required for the testing of Communication Equipments as conforming to the equipment to be tested / testing at appropriate stage.
4. The generic QRs/Specifications in the form of recommendations are enclosed in the report from Annexure-1 to Annexure-17.
5. Further, the Committee is of the view that in order to have a state of the art testing facility, a turnkey project is better solution. For this, a Request for Proposal (RFP) may be floated.


(R.K. Singh)
AD (Cord. & Store)


(H.S. Srihari)
AD (POLNET Hub)


(Amarjeet Singh)
AD (W/S)


(Vikram Singh Panwar)
Deputy Director (C)

Annexure-1

QRs of Programmable Function Generator, Dual/ Single Channel

SL No.	Parameter	Specification Proposed
1	Frequency Bandwidth	1 Hz to 50 MHz
2	No. of Channel	One/two
3	Standard Waveforms :	Sine, square, pulse, ramp, triangle, noise, sin(x)/x, exponential rise/fall, Gaussian, DC Offset Facility.
4	Memory	256K Points
5	Vertical Resolution	12 Bit or better
6	Amplitude Range	50mV to 10 Vpp
7	Modulation	AM, FM, PM, PWM, FSK, Burst, Sweep(Linear / Logarithmic)
8	Interface	USB /LAN
9	Display	LCD
10	Operating Temperature Range	5 °C to 40 °C
11	Power Requirement	230 V +/- 10% AC, 50 Hz
12	Ageing/Year	1 ppm
13	Inbuilt Display	Required
14	Warranty	3 Years

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Annexure-2

QRs of Stabilized variable Power Supply 0-30 VDC 30 A

SL No.	Parameter	Specification Proposed
1	Input voltage	220 V 50 Hz
2	Outputs: Voltage and current	0-30 V and 0-30 A
3	Timer control	Required
4	Digital Voltmeter	Required
5	memories	Required
6	Protection	Over-voltage protection
7	Two level of control for both current and voltage outputs	Course and fine for ease of use
8	USB Control	Required
9	Output enable and disable	Required
10	LCD display	Required

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QRs of Radio Frequency Power Meter terminated

Sl No.	Parameter	Specification Proposed
1	Frequency Range	2 MHz to 2GHz
2	Measurement Power Range	100 mW to 100 W
3	Type of connector	N type connector
4	Reading Measurement	Full scale QC type
5	Termination impedance	50ohms

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QRs of Digital Video Signal Generator



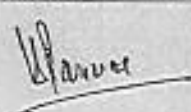
S N	Parameter	Specification Proposed
1	Audio standard and interface	
	Supported interfaces	HDMI, AUDIO DIG OUT
	Audio source	File (AVG), sine wave generator(internal)
	Frequency range	100 Hz to 20000 Hz
	Level range	0dBFS (full scale) to -99.9 dBFS
	Format	PCM 16 bit,20bit,24bit
	Sampling rate	32 KHz, 44.1 KHz, 48 KHz
	Modes	Mono, stereo, up to 8 channels
	2	AV signal generator extension
Video memory		Size - 4 GB Length - 387 frames (12 bit) to 1031 frames (8bit) at 1920x1080 pixel
Stream library		AV extension
Resolution		1080p
Color space		ITU.709, RGB, RGB_TV, xvYCC
Sequences		Live Sequences: Bernina cinemascope (1,2,3,4), colored indoor (1,2,3) Artificial test patterns horizontal grid, motion artefacts
3.	AVG pattern import	
	i- Supported output formats	
	Video	*.BMP,*.TIFF,*.YUV10,*.YUV16,*.V210,*.QNT
	Audio	*.WAV: multi channel audio up to 8 channels
	ii-Supported output formats	
	Format	*.AVG, for DVSG- K10
	File size	Up to 4GB
	iii- Video	
	Resolutions acc. CEA-861 ID	1,4,5,6,7,16,17,18,19,20,21,22,31,33,34,41,44: 2D and 3D formats
	3D formats	Side-by-side, top-bottom, frame parking
	Color space	RGB, RGB TV, ITU601, ITU709,xvYCC
	Color depth	8bit, 10bit, 12bit
	Color sampling	4:2:0,4:2:2, 4:4:4
	iv- Audio	
	Frequency range	100 Hz to 20000 Hz
Level range	0dBFS (full scale) to -99.9dBFS	
Format	PCM 16 bit,20bit,24bit	
Sampling rate	32 KHz,44.1 KHz, 48 KHz	
Modes	Mono, stereo, up to 8 channels (in line with CEA-861-D)	

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4.	AV signal player	
	Custom pattern	
	Format	MPEG-2 transport stream In line with ISO/IEC 1-13818
	File type	TS, TRP, GTS, AVP.
	Video coding	MPEG-2 H.264/AVC
	Audio coding	MPEG-1/MPEG-2 layer 1, AC3
	Max. length of moving pictures	Up to hard disk volume.
5.	TS Player and recorder	
	Format	
	File type	MPEG-2 transport stream.
	Storage medium	Hard Disk.
6.	Playing of TS and binary bit stream	
	Max. data rate	Buffer - 214 Mbit/s. Hard disk - Min 90 Mbit/s.
	Interface characteristics	
	Supported interfaces	Simultaneous output- 2x ASI/SMPTE 310 M, 1X SPI.
	Number of signal that can be replayed /generated simultaneously	1
	Endless replay	Frame - exact cut at transition from end of file to beginning of file.
	Seamless loop	Selectable- Continuity counter PCR/PTS/DTS TOT/TDT
7.	Recording of TS bit stream	
	File type	MPEG-2 transport stream (binary format) - 8 bit, 10 bit
	TS packet length	In line with recorded signal- 188/204 byte.
	Max. file size	Limited only by size of hard disk
	Minimum data rate	125 kbit/s
	Max. data rate	Buffer- 214 Mbit/s
8.	Transport stream Libraries and tools	
	SDTV sequences	Selection of transport streams for testing MPEG-2 SDTV (25 Hz, 29.97 Hz) signal processing ; general DVB and ATSC transport stream testing.
	HDTV sequences	Selection of transport streams for testing MPEG-2 HDTV signal processing
	H.264 stream library	Selection of transport streams for testing H.264 SDTV and HDTV signal processing
	DVB-H stream library	Selection of transport streams for testing entire DVB-H signal processing chain.

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	Test card M sequences	Selection of transport streams for testing various DTV receiver and decoder STV functions
	ISDB-T stream library	Selection of transport streams for testing SDTV and HDTV signal processing
	MediaFLO Streams	Selection of transport streams for testing Flo TV receivers
	ISDB-T Streams	Selection of transport streams for testing ISDB-Tb receivers
	CMMB Streams	Selection of transport streams for testing CMMB receivers
	ATSC Mobile DTV Streams	Selection of transport streams for testing ATSC MDTV receivers
	Advanced stream combiner	Comprehensive software tool for generating transport system files in GTS or TRP format.
9.	System Data	
	System	Operating system- PC platform Windows XP Embedded 250 Gbyte internal Hard disk.
	Local control	Display- VGA 640 x 480 pixel Control- rotary knob , hardkey and soft keys
	Extended local control	External mouse and keyboard via USB
	Remote control	Command set- SCPI 1999.5 Interface Ethernet 10/100 Base T
	Ethernet	RJ-45, rear
	USB	USB 2.0, front and rear.
	AC Supply input	IEC 60320c14, rear
10.	Operating Data	
	Power supply	100 V to 240 V $\pm 10\%$ 50 Hz to 60 Hz $\pm 5\%$
	Electromagnetic compatibility	In line with EN55011 Class B, EN 61326 In line with EN 61000-3-2
	Operating Temperature range	+5°C to 45°C
	Storage Temperature	-20°C to +60°C
	Climatic resistance	85 % rel. humidity.
	Vibration	MIL 810 or equivalent

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QRs of GNSS Signal Generator (GPS Simulator)

Sl.no	Specifications	Specification Proposed
1.	No. of Channels:	24 min. & extension to 48 or more should be supported with option to upgrade in the same box
2.	Frequency	L1/E1/B1/SAR (1539 to 1627 MHz), L2/L2C (1192 to 1280 MHz), L5/E5/B2: (1148 to 1236 MHz), E6:(1224 to 1312 MHz)
3	Constellation Required	GPS, BeiDou, IRNSS (Optional QZSS, GLONASS, Galileo, QZSS)
4	O/P signal level	-65 to -160 dBm
5.	Signal Resolution	0.1dB step or better
6.	Power Accuracy	+1dB
7.	Spurious Transmission	<-40dBc
8	Altitude	1000m (Min)
9.	Velocity	100 m/ Sec. (Min)
10.	Acceleration	2g (Min)
11.	Antenna	Compatible Antenna for above
12.	Positional Simulation	User can change date, time, position, trajectory, number of satellite, satellite power level and atmospheric model.
13.	Comm. port:	Ethernet & USB
14.	Power	100 to 240 V AC
15.	Include the Functionalities	1. Addition of AWGN, Interferer, Atmospheric effects. 2. Possibility to create log files of the data simulated for comparison with the Rx performance. 3. Should support KML Files or other open source files formats.
16.	Operating temperature	0 to 50°C

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QRs of Insulation Tester

Sl No.	Parameter	Specification Proposed
1	Test Voltage	500V,1KV,5KV,7.5KV,10KV
2	Voltage Accuracy	± 5%
3	Short circuit current	3 mA
4	Resistance Range	0.01MΩ to 10 GΩ
5	Programmable timer	0 to 99 Min
6	Current measurement	3 mA
7	AC/DC Voltage measurement	0 to 600 Volt
8	Capacitance measurement	1nF to 50μF
9	PC Interface	USB & RS 232
10	Display	LCD display
11	Power supply	Both Mains & Battery
12	Operating Temperature	0 to 50 °C
13	Storage Temperature	±10 to 60 °C (min-max)





QRs of Hand Held Cable & Antenna Analyzer

SL No.	Parameters	Specification Proposed
1	Frequency Range	2 MHz to 3GHz
2	Frequency Resolution	1 Hz or better
3	Output Power	0 dBm to -30 dBm
4	Returns Loss	Measurement Range: 0 to 60 dB Resolution: 0.01dB
5	VSWR	Measurement Range: 0 to 65 Resolution: 0.01
6	Cable Loss	Measurement Range: 0 to 30dB Resolution: 0.01 dB
7	Ability to locate distance to fault in co-axial cables	Vertical- 1 to 60 dB Horizontal- 0 to (# of data points -1) X horizontal resolution Maximum= 155 Meters or better
8	Data Port	USB & Ethernet Port
9	Power Supply	230 \pm 10 % VAC, 50 Hz Battery operation of 3 Hour3
10	Operating Temperature	0°C to +50°C
11	Battery	Inbuilt & Removable , Battery Operating Time of 3 Hours or more.
12	Display	Inbuilt Display
13	Bias Tees	Required or Not
14	Storage	Inbuilt or in external media
15	Essential Accessories	Calibration Kit with Open , Short, Match & Through.
16	GPS optional	Inbuilt Functionality to Show Latitude & Longitude of measurement site on test reports.
17	Configurator & Report	Ease of Documentation.





Annexure-9 (A)

QRs of Battery Capacity Tester for VRLA/ SLA

Sl No.	Parameters	Specifications
1	Nominal Voltage Ranges	Up to 12 V
2	Battery Types	VRLA/ SLA
3	Battery Sizes	Up to 12 V 100 Ah
4	Display Type	LCD Display
5.	Tests Offered	i) Capacity 0% to 100% ii) No load Voltage iii) Internal Resistance.
6	Repeat Test Operation	Yes
7	Min. Input Voltage	4 V
8	Max. Input Voltage	20 V
09	AH Selection	Up to 100 Ah
10	Ah Capacity Test	Simulated 20 hour (C20) load test to 10.50VDC.

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QRs of Power Supply Tester

Parameter	Specification
Input Characteristics	
Power input	Shall be up to 150 Watt or better
Current input	Shall be up to 0-15 A
Voltage input	Shall be up to 60 V
CC Mode Accuracy	0-15 A \pm 0.2% of FSD or better
CR Mode Accuracy	1-15 K Ohm \pm 0.2% of FSD or better
CV Mode Accuracy	0-60 V \pm 0.1% of FSD or better
CP Mode Accuracy	0-75 W : \pm 0.1% of FSD or better 0-300 W : \pm 0.1% of FSD or better
Protection Testing	
Over Voltage Protection (OVP) Voltage Source Accuracy	0-24 V, 4A or better
Over Current Test	15 A or better
Max. Output Voltage	500 VA, 50 Hz
AC Voltage Meter Accuracy	0-300 Vrms \pm 0.3% of FSD or better
AC Current Meter Accuracy	0-1 A \pm 0.5% of FSD or better
AC Power Meter Accuracy	0 to 100 Watt \pm 0.5% of FSD or better
Timing Measurement & Control	
Interface	USB
Weight	\leq 30 Kg
Test Mode	Auto & Manual
Environmental	Operating Temperature: -20 °C to 50°C Storage Temperature : -20 °C to 50°C Humidity : 95% \pm 5% max (non-condensing)



QRs of Battery Capacity Tester for Hand Held Radios

Sl. No.	Parameters	Specifications
1	Range	To test Hand held Batteries 7.2/7.4 Volt with Capacity up to 3000 mAh or Higher
2	Pockets/ Adaptor	4 or more with adaptor to connect any battery pack
3	Charge/Discharge Rate	C/1, C/2, C/3, C/5 and C/10 (Selectable)
4	Chemistries	Should be able to test the following: 1. Ni-MH 2. Li-Ion 3. Li-poly 4. Ni-Cd
5	Charge Methods	Shall be able to test under mentioned methods: 1. Constant voltage with Current limit. 2. Constant current with Reverse Load Charge adjustable 3. Provision for Temperature controlled 4. Automatic full charge detection
6	Discharge Methods	1. Constant current 2. Provision to select Depth of Discharge (DOD) of the battery
7	Display	Charging/Discharging: Current, Voltage & Time shall be displayed
8	Power Failure Recovery	Charging/Discharging cycles shall be resumed on power restoration
09	Software	PC Interface Software with media

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Annexure-10

QRs of Through line Wattmeter Along with RF Elements HF/VHF/UHF 25 W /100 W.

Sl No.	Parameter	Specification Proposed
1	Frequency Range	2MHz to 1000 MHz.
2	Power Forward & Reverse	Up to 100Watt
3	Impedance	50 Ω
4	Insertion Loss	0.1 dB Max

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QRs of Multiport coaxial switch

SL No.	Parameter	Specification Proposed
1	Frequency Range	dc to 4 GHz
2	Insertion loss	0.3dB + 0.015 x Freq.
3	Isolation	100 dB Min.
4	SWR	1.2 Max
5	Repeatability	0.03dB Max
6	Maximum Applied Voltage	Maximum withstand Voltage 60 Volt
7	Current capacity	150 mA
8	Maximum On Resistance	2.5 Ω
9	Maximum Off Resistance	10 G Ω
10	Switch Configuration	SPDT
11	Maximum Power Rating	50 Watt peak
12	Operating Temp.	-25 to 75 $^{\circ}\text{C}$
13	Storage Temp.	-55 to 85 $^{\circ}\text{C}$

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QRs of LCR Meter

Sl No.	Parameter	Specification Proposed
1	Frequency Range	20 Hz to 02 MHz
2	Test Signal Level	0 to 2 Vrms/0 to 20 mArms
3	Auto Level Control (ALC)	Required
4	DC Source	+ 8 to 10 V
5	Web browser Control	Required
6	Basic Accuracy	0.1% @ short 0.05 % @ Med/Long
7	Storage Devices	Internal and USB

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QRs of Current Probe

SL No.	Parameter	Specification Proposed
1	Frequency Bandwidth	150 Hz to 50 MHz
2	Max continuous input current	25 A or better
3	Max Peak Current	40 A or better
4	Minimum Sensitivity	10mA
5	Coupling	AC,DC, GND
6	Interface	1 Mega Ohm
7	Cable Length	1.5 Mtr

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Annexure-14

QRs of RF Power Adaptor for 3,5,10 dB

SL No.	Parameter	Specification Proposed
1	Frequency	DC to 5 GHz
2	Power	5 W
3	Package type	Connectorized
4	Connector	N Type male/ female
5	Impedance	50 Ω
6	I/P VSWR	1.20:1, 1.25:1
7	Attenuation Accuracy	0.3 dB to 0.5dB
8	Operating temperature	-50 to 90 $^{\circ}$ C

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QRs of Line Impedance Stabilization Network

SL No.	Parameters	Specifications
1	Frequency Range	9 KHz - 30 MHz
2	Maximum Load Current	10 A
3	Maximum In Put Voltage	230V/50Hz
4	AMN Impedance	$(50\mu\text{H} + 5\Omega) \parallel 50\Omega$ $\pm 20\%$
5.	Pre Filter Choke	250 μH
6	Measurement Connector	50 Ω BNC
7	Mains Input and Output Terminals	Indian Socket

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QRs of Active Rod Antenna

Sl No.	Parameters	Specifications
1	Frequency Range	9 KHz – 30 MHz
2	Polarization	Liner/ Vertical
3	Nominal Impedance	50 Ohm
4	VSWR	<1.6
5.	RF Connector	N Female
6	Antenna factor in normal mode	10 dB Tolerance \pm 3 dB or better.
7	Antenna factor in attenuation mode	20 dB Tolerance \pm 3 dB or better.
8	Lower limit field strength in normal mode	<-40dB μ V/m (1Hz)
9	Upper limit field strength Normal Mode: Attenuation mode:	125dB μ V/m 135dB μ V/m
10	Destructive field strength	10 KHz to 30 MHz >50 V/m
11	MTBF	>250000h
12	Power Supply (Via co-axial cable)	+ 24V DC -3v/ \pm 1v (Max. 150 mA)
13	Calibration report	Needs to be supplied.
14	Power Supply / Bias Unit	Needs to be supplied.
15	Tripod for Installation	Needs to be supplied.

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QRS OF RF COMBINER

Sl No.	Parameters	Specification
1	Category	Passive
2	Power	20 Watt or More
3	Number of Ports	3 (2-input, 1-output)
4	Frequency Range	2 MHz to 1GHz
5	Isolation	12dB or Better
6	Impedance	50 ohm
7	Insertion loss	Less than 0.5 dB
Mechanical Specification		
8	Connectors	Stainless steel with mini SMA to BNC
9	Contact Pin	Beryllium Copper Gold Plate
10	Housing	Aluminum , Clear Iride
11	Operating Temperature	0°C to +50°C
	Storage Temperature	0°C to +50°C

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