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09.10.2020

Department of Electrical Engineering

Corrigendum-1

Tender Reference no: ELE/2020/022/RADH/5G DRIVETEST

Name of the Item: DRIVE TEST TOOLS for multiple quantities

Corrigendum details: Extension of Bid Submission date & Changes in Technical specifications

Extension of Bid Submission Date:

The due date for the submission of bids has been extended to 20/10/2020 @ 5 PM & the technical bid opening is 21/10/2020 @ 3 PM.

Changes in Technical Specifications: (Changes have been marked in red)

Terms & Conditions Applicable to all Items

- 1) Any accessories, equipment, software required for an item should be self-contained.
- 2) OEMs or Authorized Distributor with valid authorization letter from the OEM will be permitted to submit the offer.
- 3) Vendor should have operated in India (have an office and a service center) for the last 5 years and should have supplied equipment to reputed institutes and labs in India. Evidence for the same should be provided.
- 4) Vendor should share details of similar equipment supplied to reputed **companies**, institutes, labs in India with the contact details of the users. User satisfaction reports may be sought directly by the committee and a vendor might be disqualified based on the report.
- 5) Vendor should have **basic** repair facilities in India ensuring timely services for repairs in future.
- 6) All equipment should work with Indian power supplies, 240V and 50 Hz. Appropriate power connectors should be provided.
- 7) The quoted product should be supported till 30th Sep. 2025. The product should be serviceable, repairable, spare parts be available and technical support can be provided by the vendor. A letter authenticated by the OEM company for the same should be provided for each item (and sub-equipment) quoted by the vendor.

- 8) Free firmware/software upgrades from the date of delivery on the product features purchased for three years.
- 9) Vendor should quote 3-year warranty or as specified in the equipment list, whichever is higher. **The handset and connecting laptops/desktops should have at least one year warranty.**

Evaluation Criteria:

- The final L1 for will be based on the total cost of all the items.
- The Institute will place its order(s) for the item at the L1 price for the item as determined above.
- The institute reserves the right to negotiate for each item with the L1 vendor determined as appropriate.

Please provide a compliance table for the above conditions.

If a vendor desires partial shipment, it will be permitted.

1. 5G stand-alone outdoor drive test tool kit for measurement of air interface parameters in wireless networks must support FR1 & FR2 Band
 - a. 5G stand-alone outdoor drive test tool kit - 1 Unit
 - i. 5G mobile handset for the band n78 (3.5 GHz) 1- Unit
 - ii. 5G mobile handset for the band n258 (26.4 GHz) 1-Unit
 - iii. (Or instead of (i) and (ii)) 5G mobile handset supporting both the frequency band of n78&n258 - 1 Unit
 - b. 5G Drive test log post processing tool kit for measurement of air interface parameters in wireless networks must support FR1 & FR2 Band
 - i. 5G Drive test log post processing tool kit - 1 Unit

Drive Test Tool Specifications

Specification	Parameters
5G band Support	N78
Sub Carrier Spacing (KHz)	15,30,60 (for N78)
Channel Bandwidth	Up to 100 MHz
Max number of beams per channel	8
5G band Support	N257 & N258
Sub Carrier Spacing (KHz)	60,120,240 (for N257 & N258)
Channel Bandwidth	Up to 400 MHz
Max number of beams per channel	64
Modulation Scheme	QPSK, 16 QAM, 64 QAM, 256 QAM
Radio frame	10 ms
Duplex mode	TDD
Access scheme	Downlink: CP-OFDMA Uplink: CP-OFDMA & DFT-S-OFDM
MIMO Scheme	Max of two code word mapped to Max number of layers up to 8 in Downlink Max of two code word mapped to Max number of layers up to 4 in Uplink
Supporting massive MIMO and Beam forming measurement	Yes
Standards	As per latest 3GPP release R15 (Supporting Bandwidth part (BWP), Short message service, QoS flow, 5QI, NR Dual carrier, Carrier aggregation, etc.)
Field measurement Specification	
Cell measurement and Current cell information	Cell Type (Pcell, Scell),
	Channel bandwidth,
	NR ARFCN,
	Physical channel ID (PCI),
	Beam index / Type,
	Timing offset,

	SSB NR ARFCN,
	PSS,
	SSS,
	Sub carrier spacing SCS,
Bandwidth part -BWP measurement	BWP ID (Initial & Dedicated),
	BWP numerology,
	BWP bandwidth,
	BWP ARFCN,
	BWP PRB
Physical layer measurements	SS-RSRP,
	SS-RSRQ,
	RS-SINR,
	CSI-RSRP,
	CSI-SINR
UL power control measurement	Initial PUSCH Tx power,
	PUCCH Tx power,
Synchronization signal block – SSB measurement	SSB index,
	Frequency,
	SCS,
	5G NR mode,
	Number SSB beam,
	RSSI measurement,
	PSS (RSRP, SINR, Pathloss),
	PBCH measurement (RSRP, SINR, Pathloss),
	Serving Cell SSB Beam SINR,
	Serving Cell <1-4> Detected SSB Beam (Index, RSRQ, RSRP, SINR) Serving Cell <1-4> Detected SSB Beam (Index, RSRQ, RSRP, SINR) Serving Cell <1-4> Detected SSB Beam (Index, RSRQ, RSRP, SINR)
Random access procedure, RACH parameters and RACH measurement	Serving cell,
	PRACH configuration,
	Type,
	Preamble format,
	initial Tx power,
	Response Window Size,
	RA- RNTI,
	Preamble count,
	Preamble back off,
	Preamble Success,
	Contention resolution failure,
	RACH failure
Physical Channel information	PDSCH Throughput,
	PUSCH Throughput,
	PDSCH/ PUSCH resource block allocation,
	PDSCH/ PUSCH resource allocation type
Link adaptation and Measurement	Scheduling parameters for UL/DL- Rank, PRB's

	Scheduled modulation per codeword (DL), DCI count UL/DL, PUSCH Rank, PDSCH rank, PUSCH PRB, PDSCH PRB, PUSCH modulation, PDSCH modulation, PUSCH MCS, PDSCH MCS, PUSCH TBS, PDSCH TBS, PRB utilization and PRB index
MAC	UL/DL Throughput measurement
RLC	UL/DL Throughput measurement
PDCP	UL/DL Throughput measurement
Additional measurement and Reports for analysis	Layer 2, Layer 3 measurement message (MIB, SIB1 to SIB9), Application layer, Report generation of drive test analysis and KPI. Data analysis, reporting, bench marking & advanced troubleshooting
	Real-time voice quality testing, Signaling measurement, Measurement report and events, SMS, RTT, Latency, SQI , QoS

Post Processing tool Kit Specifications:

Parameters	Specification
5G Band	Must support Sub band 6GHz (n78) & mm Wave band (n257/ n258). Can be separate devices or same device.
Standards	As per 3GPP release R15
Post processing of Drive test log Measurement analysis	1. Physical layer measurement: Physical channel and Reference signal
	2. Layer 2 measurement – MAC, RLC, PDCP
	3. Layer 3 measurement- RRC signaling and NAS signaling. Layer 3 decoding with Event identification3. Layer 3 measurement- RRC signaling and NAS signaling. Layer 3 decoding with Event identification3. Layer 3 measurement- RRC signaling and NAS signaling. Layer 3 decoding with Event identification
	4. Application layer
Map plot for analysis	SS- RSRP, SS-RSRQ, SS-SINR, CSI-RSRP, CSI-RSRQ, CSI-SINR , Signal Coverage and Quality analysis. Data throughput- UL/DL
NR Ue capability measurement	Initial Cell Acquisition Band , NR DL ARFCN, NR Serving cell PCI, SSB Index, L1 measurements RSRP, RSRQ, SINR
Physical channel measurement	PBCH, PRACH, PDCCH, PDSCH, PUSCH
Initial access and Resource allocation measurement and analysis	SSB
	BWP
	Frequency and Time RB allocation
	PRB
	CQI
	MCS
	Modulation type

	RNTI information
	RRC information elements
	TBS
	-PDCCH DCI Format Info 12, -PDCCH DCI Format Info
	PDSCH/ PUSCH mapping type
	Beam forming measurement,
	Carrier aggregation
	NR Dual carrier,
	TDD UL/DL configuration parameters
	RRC state: Idle, inactive, Connected
	echRRC signaling msg configuration -SRB/DRB
Uplink / Down link data measurement	Throughput, block error rates, re-transmission of transport blocks , PDCP Layer throughput, RLC layer throughput, MAC layer throughput, PDSCH BLER, PUSCH BLER
System Information	MIB, SIB1 to SIB9

All other terms and conditions remain the same.

Tender Inviting Authority:

The Senior Manager,
Project Purchase,
IC&SR Building, IIT Madras
Chennai 600036