

Annexure A: Technical Specification and Evaluation criteria(MANDATORY REQUIREMENTS)

The Authority is mandated to perform investigation functions at remotely located sites and inaccessible areas. The Authority requires specialised multi-function portable devices capable analysing radio frequency emissions from 100 kHz up to 26.5 GHz.

1. General Specifications

1.1.1. Ruggedized portable device

1.1.2. Less than 5 Kg including batteries

1.1.3. Dimensions are not to exceed 30 cm (H) x 40 cm (w) x 15cm. –
Bidder to state the size and weight in the offer.

1.1.4. Operating Temperature Range: 0°C to + 45°C.

1.1.5. Operating Humidity 10% - 90% @ 30°C non-condensing

1.1.6. EMC Standards

1.1.6.1. Emission

CISPR Pub 11 Group 1, class B, Group 1 limit of CISPR 11:203/EN
55011:2007

1.1.6.2. Immunity

IEC 61000-4-2,3,4,5,6,11 or equivalent

1.1.6.3. Safety

IEC 610101: 2001 or equivalent

1.1.6.4. Environmental

MIL-PRF-28800F Class 2 or equivalent

1.2. Hardware Specifications RF

1.2.1. Input impedance: 50Ω.

1.2.2. VSWR: ≤ 2.5 ($f \leq 1\text{GHz}$) and <2.0 ($f > 1.0\text{ GHz}$).

1.2.3. Maximum Input Power: +20dBm.on RF input

1.2.4. DC on RF input without damage, 50 VDC minimum

1.2.5. N type connector

1.2.6. 3.5mm, SMA or adapter > 10 GHz Bidder to state the options in the offer

1.2.7. Audio output socket

1.3. Power Requirements

1.3.1. Battery operated: Standard

1.3.2. Battery type: Rechargeable Lithium-ion

1.3.3. Battery life: > 3 hours continuous operation on full charge

1.3.4. External AC Power Supply connection or adaptor: 220V@ 50Hz nominal

1.3.5. External DC Supply connection or adaptor: 12V to 15V DC

1.3.6. Vehicle lighter adapter / charger included

1.3.7. South African Type 15A plug to be fitted to mains cord of charger

1.4. Spectrum Analyser Frequency Requirements

- 1.4.1. Frequency Range: 100 kHz to 26.5 GHz (no gaps)
- 1.4.2. Reference frequency: Aging ≤ 1 ppm aging/ Yr. without GPS reference
- 1.4.3. Better than 0.05 ppm with GPS reference
- 1.4.4. Temperature drift ≤ 1 ppm (0°C to +40°C)
- 1.4.5. Frequency Span 10 kHz to 26.5 GHz
- 1.4.6. Centre Frequency resolution setting 1Hz
- 1.4.7. Phase noise: better than -90 dBc/Hz at 10 kHz from carrier
- 1.4.8. Resolution Bandwidth: selectable from 10 Hz to 3 MHz :
Accuracy better than $\pm 10\%$
- 1.4.9. Video Bandwidth: selectable from 100 Hz to 300 kHz

1.5. **Amplitude Requirements**

1.5.1. DANL better than -140 dBm @ 1GHz, 10Hz RBW

1.5.2. Spurious response better than -90 dBm

1.5.3. 3rd Order IMD better than or -70dBc at optimal mixer setting

1.5.4. Second Order harmonic better than - 60dBc

1.5.5. TOI better than +5dBm

1.5.6. User selectable Pre-amplifier of ≥ 10 dB to cover entire frequency range.

1.5.7. Detectors: Max, Min, Peak, RMS, average, sample

1.5.8. Level units display in dBm, dBmV, dB μ V, W, V, A, dBmA, dB μ A

1.6. Display and Trace Requirements

1.6.1. Colour display at least 250 mm measured diagonally

1.6.2. Display resolution at least VGA (640x 480)

1.6.3. Backlit display required

1.6.4. Anti-glare type required

1.6.5. Functional settings

1.6.5.1. Max hold

1.6.5.2. Min hold

1.6.5.3. Average

1.6.5.4. Spectrogram / waterfall

1.6.5.5. Adjustable persistence display

1.6.5.6. Ability to display of Power / Freq vs. Time

1.6.5.7. Ability to display of GPS data

1.6.6. Ability to record and display Date and Time on recordings

1.6.7. User selectable markers in both in amplitude, frequency and time domains

1.7. Vector Analyser Requirements

1.7.1. 2 port type

1.7.2. S- Parameter (S11, S12, S21, S22) measurements

1.7.3. Display of dB Magnitude, Lin Magnitude, VSWR, Smith Chart, Polar, real Z, Imaginary Z, Group delay.

1.7.4. Calibration methods: Quick Cal 1 port and Quick 2 port, one path 2 port, full 1 port and full 2 port

1.7.5. Multiple user selectable markers and limit lines

1.7.6. Storage on machine and export of multiple traces

1.7.7. Maximum input levels required on Ports + 23dBm

1.7.8. Max DC on port 1 and 2 Input without damage, 50V DC

1.7.9. Quick N type or SMA 50 Ω (Calibration) Cal kit to be supplied if applicable

1.7.10. Full 2 port N Type Calibration kits to be supplied up to 26.5GHz

1.7.11. Full 3.5mm (male) 2 port Cal kit to be supplied up to 26.6 GHz

1.7.12. N-type(male) to N-type(male) type 50 Ω N-type Cal test cable >500mm to be supplied

1.7.13. 3.5mm(male) to 3.5mm(male) type 50 Ω type Cal test cable >500mm to be supplied

1.7.14. N (male) to 3.5mm(female) type 50 Ω N type Cal test cable >500mm to be supplied

1.8. Power Measurement Requirements

1.8.1. Internal or external Probe/ Sensor, Bidder to state the option in the offer.

1.8.2. Frequency range of meter 100kHz – 26.5 GHz

1.8.3. Maximum Level on probe without damage +10dBm

1.9. . GPS Requirements

1.9.1. Internal or external GPS, Bidder to state the option in the offer

1.9.2. To be used for frequency reference and geo-tagging

1.9.3. External antenna connection required

1.10. . Tracking Generator Requirements

1.10.1. Frequency range of generator 100kHz – 26.5 GHz

1.10.2. Mode: CW or Tracking

1.10.3. Output level > -15dBm over entire frequency range

1.10.4. Output accuracy +- 2dB over entire frequency range @

1.11. Additional Requirements

1.11.1. Spectrogram display option is required

1.11.2. Real time Spectrum Analysis is required

1.11.2.1. 10 MHz Real Time Bandwidth minimum

1.11.2.2. 100% Probability of intercept signal duration: 20uS

1.11.2.3. RBW 1Hz to 100kHz

1.11.3. Ability to measure Occupied Bandwidth and Adjacent Power

1.11.4. Ability to measure Distance to fault on cables, connectors and antennas

1.11.5. AM and FM demodulation

1.11.6. Storage of traces on device and export to external devices

1.11.7.	Compatible headphones need to be included.
1.11.8.	Internal and external measurement triggers must be standard
1.11.9.	SANAS Calibration certificate to be provided
1.11.10.	1-year warranty
1.11.11.	Carry case to be included
1.12.	1x Additional battery to be included in Bid

2 Evaluation Criteria (MANDATORY REQUIREMENTS)

Bidders will be evaluated on

- a) Mandatory requirements,
- b) price/B-BBEE. Only bidders who meet all the mandatory requirements will be considered further for price evaluation. All bid proposals submitted will be evaluated in accordance with the 80/20 procurement principle.

Table 1 Evaluation criteria

Mandatory Requirements per Category	Yes	No
1. User manuals on the devices, that guide users on basic operation of the units, simple troubleshooting and maintenance of the units to be provided in hard or soft copies and in English.		
2. Calibration certificates available from a SANAS accredited laboratory.		

<p>3. Meeting <u>all</u> the technical specifications of the Authority for each of the required items below:</p> <ul style="list-style-type: none"> • Spectrum Analyser • 2- Port Vector Network Analyser • Tracking generator • Distance to fault and cable analysis • Real time Spectrum Analysis • Power measurement, with or without and external probe • Storage of measured data • Extra battery 		
<p>4. Provide at least 3 references where such products were successfully deployed by you in South Africa</p>		
<p>5. Written proof that you have the support from the Original Equipment Manufacturer (OEM) regarding the availability of spares and parts and their repair facilities.</p>		

--End of Specification--