Anritsu envision : ensure

Site Master™

Compact Handheld Cable & Antenna Analyzer with Spectrum Analyzer

S331E	2 MHz to 4.0 GHz	Cable and Antenna Analyzer
S332E	2 MHz to 4.0 GHz 9 kHz to 4 GHz	Cable and Antenna Analyzer Spectrum Analyzer
S361E	2 MHz to 6.0 GHz	Cable and Antenna Analyzer
S362E	2 MHz to 6.0 GHz 9 kHz to 6 GHz	Cable and Antenna Analyzer Spectrum Analyzer

Introduction

Anritsu introduces its eighth generation compact handheld Cable and Antenna Analyzers with Spectrum Analyzers for installation and maintenance of wireless networks. They feature the highest performance and the most capabilities ever offered by Anritsu in a compact handheld tester since introducing its first line sweeper in 1995.

Cable and Antenna Analyzer Highlights

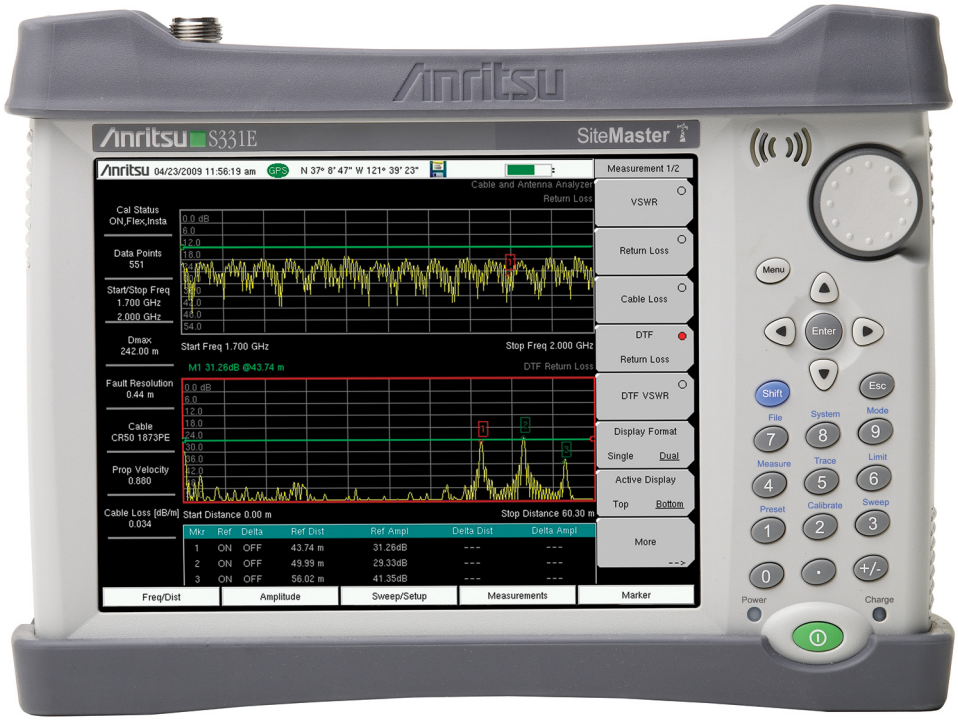
- Measurements: RL, VSWR, Cable Loss, DTF, Phase
- 2-port Transmission Measurement: High/Low Power
- Sweep Speed: 1 ms/data point, typical
- Display: Single or Dual Measurement Touchscreen
- Calibration: OSL, InstaCal™, and FlexCal™
- Bias Tee: 32 V internal

Spectrum and Interference Analyzer Highlights

- Measurements: Occupied Bandwidth, Channel Power, ACPR, C/I
- Interference Analyzer: Spectrogram, Signal Strength, RSSI, Signal ID, Interference Mapping
- Dynamic Range: > 95 dB in 10 Hz RBW
- DANL: –152 dBm in 10 Hz RBW
- Phase Noise: –100 dBc/Hz max @ 10 kHz offset at 1 GHz
- Frequency Accuracy: < ± 50 ppb with GPS On

Capabilities and Functional Highlights

- AM / FM / PM Analyzer
- CPRI LTE RF Measurements
- OBSAI LTE RF Measurements
- LTE/LTE-A FDD/TDD; MIMO (2x2, 4x4)
- EMF Test (S332E & S362E)
- High Accuracy Power Meter
- Up to 50 GHz USB Sensors
- PIM Alert Application (S332E & S362E)
- Master Software Tools™
- Line Sweep Tools™
- easyTest Tools™
- USB & Optional Ethernet (Option 413) for data transfer and instrument control
- Handheld Interference Hunter support (S332E & S362E)
- On-Screen Interference Mapping
- On-Screen Coverage Mapping
- GPS tagging of saved traces
- Increase throughput by automating repetitive or operator intensive tasks via Ethernet or USB. Remote programming provided via Ethernet (Option 413)
- 4.5 hour battery operation time
- Store 2000 Traces internally
- Touchscreen keyboard
- Quick Name Matrix
- < 5 minute warm-up time
- E-Learning Training
- Certified Line Sweep Training



Site Master™ S331E Cable & Antenna Analyzer featuring 8.4 inch Daylight Viewable Touchscreen
Compact Size: 273 mm x 199 mm x 91 mm (10.7 in x 7.8 in x 3.6 in), Lightweight: 2.71 kg (6.0 lb)

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Definitions

Specifications All specifications and characteristics apply to Revision 2[1] instruments under the following conditions, unless otherwise stated:
- After 5 minutes of warm-up time, where the instrument is left in the ON state
- Sweep mode set to Performance
- When using the internal reference signal

Typical Performance Typical performance is the measured performance of an average unit and is not warranted.

Calibration Cycle Calibration is within the recommended 12 month period.

All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu web site: www.anritsu.com

1.Applies to instruments with serial number ≥ 1606XXX.

Cable and Antenna Analyzer

Measurements

Measurements	VSWR Return Loss Cable Loss Distance-to-Fault (DTF) Return Loss Distance-to-Fault (DTF) VSWR 1-Port Phase Smith Chart (50/75 Ω selectable)

Setup Parameters

Measurement Display	Single/Dual Measurement Display with independent markers
Frequency	Start/Stop, Signal Standard, Start Cal
DTF	Start/Stop, DTF Aid, Units (m/ft), Cable Loss, Propagation Velocity, Cable, Windowing
Windowing	Rectangular, Normal Side Lobe, Low Side Lobe, Minimum Side Lobe
Amplitude	Top, Bottom Auto Scale, Full Scale
Sweep	Run/Hold, Single/Continuous, RF Immunity (High/Low), Data Points, Averaging/Smoothing, Output Power (High/Low), RF Pwr When Hold (On/Off)
Data Points	137, 275, 551, 1102, 2204
Markers	Markers 1-6 (On/Off), Delta Makers 1-6 (On/Off), Marker to Peak/Valley, Peak/Valley Auto, Marker Table (On/Off), All Markers Off
Traces	Recall, Copy to Display Memory, No Trace Math, Trace ± Memory, Trace Overlay (On/Off)
Limit Line	On/Off, Single Limit, Multi-segment Edit, Limit Alarm (On/Off), Pass Fail Message (On/Off), Pass/Fail (Unbounded/Bounded), Warning Limit Offset, Clear Limit
Calibration	Start Cal, Cal Type (Standard/FlexCal™), Disp Valid Cal Temp Range
Save/Recall	Setups, Measurements (.vna, .dat), Screen Shots (.jpg) (save only)
Application Options	Bias-Tee (On/Off), Impedance (50 Ω, 75 Ω, Other)

Frequency

Frequency Range	2 MHz to 4 GHz (S331E, S332E), 2 MHz to 6 GHz (S361E, S362E)
Frequency Accuracy	≤ ± 2.5 ppm @ 25 °C
Frequency Resolution	1 kHz (RF immunity low), 100 kHz (RF immunity high)

Output Power

High	0 dBm, typical
Low	2 MHz to 1.5 GHz: –40 dBm, typical >1.5 GHz to 4/6 GHz: –30 dBm, typical

Interference Immunity

On-Channel	+17 dBm @ > 1.0 MHz from carrier frequency
On-Frequency	0 dBm within ± 10 kHz of the carrier frequency

Measurement Speed

Return Loss	≤ 1.00 ms/data point, RF immunity low, typical
Distance-to-Fault	≤ 1.25 ms/data point, RF immunity low, typical

Return Loss

Measurement Range	0 dB to 60 dB
Resolution	0.01 dB

VSWR

Measurement Range	1:1 to 65:1
Resolution	0.01

Cable Loss

Measurement Range	0 dB to 30 dB
Resolution	0.01 dB

Distance-to-Fault

Vertical Range Return Loss	0 dB to 60 dB
Vertical Range VSWR	1:1 to 65:1
Fault Resolution (meters)	$(1.5 \times 10^8 \times vp) / \Delta F$ (vp = velocity propagation constant, ΔF is F2–F1 in Hz)
Horizontal Range (meters)	0 to (Data Points–1) x Fault Resolution, to a maximum of 1500 meters (4921 ft)

1-Port Phase

Measurement Range	–180° to +180°
Resolution	0.01°

Cable and Antenna Analyzer (continued)

Smith Chart

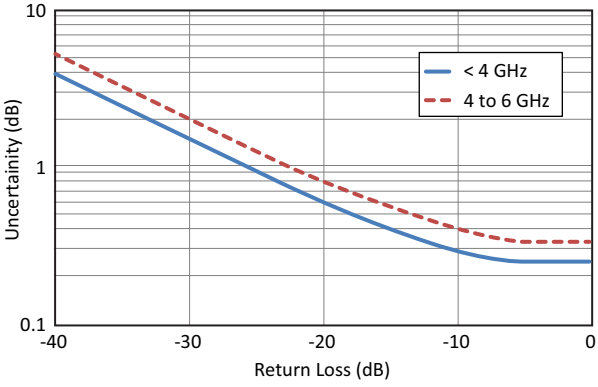
Resolution	0.01 50/75 ohm selectable

Measurement Accuracy

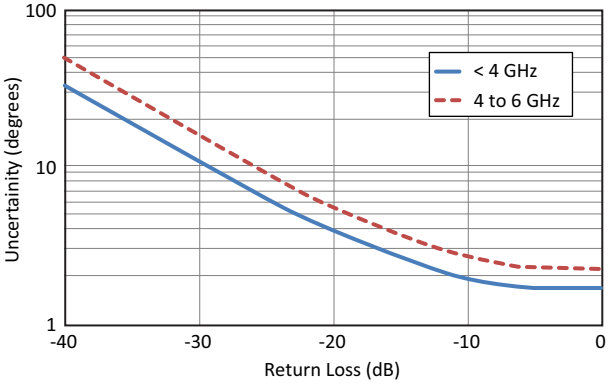
Corrected Directivity	> 42 dB, OSL Calibration > 38 dB, InstaCal™ Calibration

Measurement Uncertainty

Reflection Magnitude Uncertainty



Reflection Phase Uncertainty



2-Port Transmission Measurement (Option 21)

Frequency

Frequency Range	2 MHz to 4 GHz (S331E, S332E), 2 MHz to 6 GHz (S361E, S362E)
Frequency Resolution	10 Hz

Output Power

High	0 dBm, typical
Low	2 MHz to 1.5 GHz: –40 dBm, typical >1.5 GHz to 4/6 GHz: –30 dBm, typical

High Dynamic Range (On)

2 MHz to 4 GHz	80 dB, 95 dB, typical
4 GHz to 6 GHz	70 dB, 85 dB, typical
Application Options	Bias-Tee (On/Off), Impedance (50 Ω, 75 Ω, Other)

Bias-Tee (Option 10) (requires Option 21 for S331E and S361E)

Setup	On/Off, Voltage, Current (Low/High)
Voltage Range	+12 V to +32 V
Current (Low/High)	250 mA/450 mA, 1 A surge for 100 ms
Resolution	0.1 V

Spectrum Analyzer (S332E, S362E only)

Measurements

Smart Measurements	Field Strength (uses antenna calibration tables to measure dBm/m^2, dBmV/m, dBV/m, dBµV/m, Volt/m, Watt/m^2, dBW/m^2, A/m, dBA/m and Watt/cm^2) Occupied Bandwidth (measures 99 % to 1 % power channel of a signal) Channel Power (measures the total power in a specified bandwidth) ACPR (adjacent channel power ratio) AM/FM/SSB Demodulation (wide/narrow FM, USB and LSB), (audio out only) C/I (carrier-to-interference ratio) Emission Mask Coverage Mapping (requires Option 431) PIM Alert Application (available for download)

Setup Parameters

Frequency	Center/Start/Stop, Span, Frequency Step, Signal Standard, Channel #, Channel Increment
Amplitude	Reference Level (RL), Scale, Attenuation Auto/Level, RL Offset, Pre-Amp On/Off, Detection
Span	Span, Span Up/Down (1-2-5), Full Span, Zero Span, Last Span
Bandwidth	RBW, Auto RBW, VBW, Auto VBW, RBW/VBW, Span/RBW
File	Save, Recall, Delete, Directory Management
Save/Recall	Setups, Measurements, Limit Lines, Screen Shots (.jpg) (save only), Save-on-Event
Save-on-Event	Crossing Limit Line, Sweep Complete, Save-then-Stop, Clear All
Delete	Selected File, All Measurements, All Mode Files, All Content
Directory Management	Sort Method (Name/Type/Date), Ascend/Descend, Internal/USB, Copy, Format USB
Application Options	Bias-Tee (On/Off), Impedance (50 Ω, 75 Ω, Other)

Sweep Functions

Sweep	Single/Continuous, Sweep Mode (Fast, Performance, No FFT), Reset, Detection, Minimum Sweep Time, Trigger Type, Gated Sweep (see Option 90)
Detection	Peak, RMS, Negative, Sample, Quasi-peak
Triggers	Free Run, External, Video, Change Position, Manual

Trace Functions

Traces	Up to three Traces (A, B, C), View/Blank, Write/Hold, Trace A/B/C Operations
Trace A Operations	Normal, Max Hold, Min Hold, Average, # of Averages, (always the live trace)
Trace B Operations	A → B, B ↔ C, Max Hold, Min Hold
Trace C Operations	A → C, B ↔ C, Max Hold, Min Hold, A – B → C, B – A → C, Relative Reference (dB), Scale

Marker Functions

Markers	Markers 1-6 each with a Delta Marker, or Marker 1 Reference with Six Delta Markers, Marker Table (On/Off), All Markers Off
Marker Types	Style (Fixed/Tracking), Noise Marker, Frequency Counter Marker
Marker Auto-Position	Peak Search, Next Peak (Right/Left), Peak Threshold %, Set Marker to Channel, Marker Frequency to Center, Delta Marker to Span, Marker to Reference Level
Marker Table	1-6 markers frequency and amplitude plus delta markers frequency amplitude and offset

Limit Line Functions

Limit Lines	Upper/Lower, On/Off, Edit, Move, Envelope, Advanced, Limit Alarm, Default Limit
Limit Line Edit	Frequency, Amplitude, Add Point, Add Vertical, Delete Point, Next Point Left/Right
Limit Line Move	To Current Center Frequency, By dB or Hz, To Marker 1, Offset from Marker 1
Limit Line Envelope	Create Envelope, Update Amplitude, Points (41 max), Offset, Shape Square/Slope
Limit Line Advanced	Type (Absolute/Relative), Mirror, Save/Recall

Frequency

Frequency Range	9 kHz to 4 GHz (S332E), 9 kHz to 6 GHz (S362E) (useable to 0 Hz)
Tuning Resolution	1 Hz
Frequency Reference	Aging: ± 1.0 ppm/year Accuracy: ± 1.5 ppm (25 °C ± 25 °C) + aging, < ± 50 ppb with GPS On
Frequency Span	10 Hz to 4 GHz including zero span (S332E), 10 Hz to 6 GHz including zero span (S362E)
Sweep Time	Minimum 100 ms, 10 µs to 600 s in zero span
Sweep Time Accuracy	± 2 % in zero span

Bandwidth

Resolution Bandwidth (RBW)	10 Hz to 3 MHz in 1–3 sequence ± 10% (1 MHz max in zero-span) (–3 dB bandwidth)
Video Bandwidth (VBW)	1 Hz to 3 MHz in 1–3 sequence (–3 dB bandwidth) (auto or manually selectable)
RBW with Quasi-Peak Detection	200 Hz, 9 kHz, 120 kHz (–6 dB bandwidth)
VBW with Quasi-Peak Detection	Auto VBW is On, RBW/VBW = 1

Spectrum Analyzer (S332E, S362E only) (continued)

Spectral Purity

SSB Phase Noise @ 1 GHz	–100 dBc/Hz, –110 dBc/Hz typical @ 10 kHz offset
	–105 dBc/Hz, –112 dBc/Hz typical @ 100 kHz offset
	–115 dBc/Hz, –121 dBc/Hz typical @ 1 MHz offset

Amplitude Ranges

Dynamic Range	> 95 dB (2.4 GHz), 2/3 (TOI-DANL) in 10 Hz RBW
Measurement Range	DANL to +26 dBm (≥ 50 MHz)
	DANL to 0 dBm (< 50 MHz)
Display Range	1 dB to 15 dB/div in 1 dB steps, ten divisions displayed
Reference Level Range	–120 dBm to +30 dBm
Attenuator Range	0 dB to 55 dB in 5 dB steps
Maximum Continuous Input	+30 dBm
Amplitude Units	Log Scale Modes: dBm, dBV, dBmV, dBµV, dBW, dBA
	Linear Scale Modes: nV, µV, mV, V, kV, nW, µW, mW, W, kW, nA, µA, mA, A

Amplitude Accuracy

9 kHz to 100 kHz	± 2.0 dB typical (Preamp Off)
100 kHz to 4.0 GHz	± 1.25 dB, ± 0.5 dB typical
> 4.0 GHz to 6 GHz	± 1.50 dB, ± 0.5 dB typical

Displayed Average Noise Level (DANL)

	Preamp Off (Reference Level –20 dBm)		Preamp On (Reference Level –50 dBm)	
(RBW Normalized to 1 Hz, 0 dB attenuation)	Maximum	Typical	Maximum	Typical
10 MHz to 2.4 GHz	–141 dBm	–146 dBm	–157 dBm	–162 dBm
> 2.4 GHz to 4 GHz	–137 dBm	–141 dBm	–154 dBm	–159 dBm
> 4 GHz to 5 GHz	–134 dBm	–138 dBm	–150 dBm	–155 dBm
> 5 GHz to 6 GHz	–126 dBm	–131 dBm	–143 dBm	–150 dBm
(RBW = 10 Hz, 0 dB attenuation				
10 MHz to 2.4 GHz	–131 dBm	–136 dBm	–147 dBm	–152 dBm
> 2.4 GHz to 4 GHz	–127 dBm	–131 dBm	–144 dBm	–149 dBm
> 4 GHz to 5 GHz	–124 dBm	–128 dBm	–140 dBm	–145 dBm
> 5 GHz to 6 GHz	–116 dBm	–121 dBm	–133 dBm	–140 dBm

Spurs

Residual Spurious	< –90 dBm (RF input terminated, 0 dB input attenuation, > 10 MHz)
Input-Related Spurious	< –75 dBc (0 dB attenuation, –30 dBm input, span < 1.7 GHz, carrier offset > 4.5 MHz)
Exceptions, typical	< –70 dBc @ < 2.5 GHz, with 2072.5 MHz Input
	< –68 dBc @ F1 – 280 MHz with F1 Input
	< –70 dBc @ F1 + 190.5 MHz with F1 Input
	< –52 dBc @ 7349 – (2F2) MHz, with F2 Input, where F2 < 2437.5 MHz
	< –55 dBc @ 190.5 ± (F1/2) MHz, where F1 < 1 GHz

Third-Order Intercept (TOI)

	Preamp Off (–20 dBm tones 100 kHz apart, 10 dB attenuation)
800 MHz	+16 dBm
2400 MHz	+20 dBm
200 MHz to 2200 MHz	+25 dBm, typical
> 2.2 GHz to 5.0 GHz	+28 dBm, typical
> 5.0 GHz to 6.0 GHz	+33 dBm, typical

Second Harmonic Distortion

	Preamp Off, 0 dB input attenuation, –30 dBm input
50 MHz	–56 dBc
> 50 MHz to 200 MHz	–60 dBc, typical
> 200 MHz to 3000 MHz	–70 dBc, typical

VSWR

2:1, typical

Coverage Mapping (Option 431) (S332E, S362E only; requires Option 31 GPS)

Measurements

Indoor Mapping	RSSI, ACPR
Outdoor Mapping	RSSI, ACPR

Setup Parameters

Frequency	Center/Start/Stop, Span, Freq Step, Signal Standard, Channel #, Channel Increment
Amplitude	Reference Level (RL), Scale, Attenuation Auto/Level, RL Offset, Pre-Amp On/Off, Detection
Span	Span, Span Up/Down (1-2-5), Full Span, Zero Span, Last Span
BW	RBW, Auto RBW, VBW, Auto VBW, RBW/VBW, Span/VBW
Measurement Setup	ACPR, RSSI
Point Distance / Time Setup	Repeat Type Time Distance
Save Points Map	Save KML, JPEG, Tab Delimited
Recall Points Map	Recall Map, Recall KML Points only, Recall KML Points with Map, Recall Default Grid

Interference Analyzer (Option 25) (S332E, S362E only)

Measurements

Spectrum	Field Strength Occupied Bandwidth Channel Power Adjacent Channel Power Ratio (ACPR) AM/FM/SSB Demodulation (Wide/Narrow FM, Upper/Lower SSB), (audio out only) Carrier-to-Interference ratio (C/I)
Spectrogram	Collect data up to 72 hours
Signal Strength	Gives visual and aural indication of signal strength
Received Signal Strength Indicator (RSSI)	Collect data up to one week Gives visual and aural indication of signal strength
Signal ID (up to 12 signals)	Center Frequency Bandwidth Signal Type (FM, GSM, W-CDMA, CDMA, Wi-Fi) Closest Channel Number Number of Carriers
Signal-to-Noise Ratio (SNR)	> 10 dB
Interference Mapping	Triangulate location of interference with on-display maps
Application Options	Bias-Tee (On/Off), Impedance (50 Ω, 75 Ω, Other) Support for MA2700A Handheld Interference Hunter

GPS Receiver (Option 31) (antenna sold separately)

Setup	On/Off, Antenna Voltage 3.3/5.0 V, GPS Info
GPS Time/Location Indicator	Time, Latitude, Longitude and Altitude on display Time, Latitude, Longitude and Altitude with trace storage
High Frequency Accuracy	Spectrum Analyzer, Interference Analyzer, CW Signal Analyzers < ± 50 ppb with GPS On, GPS antenna connected, 3 minutes after satellite lock in selected mode
Connector	SMA, Female

Channel Scanner (Option 27) (S332E, S362E only)

Number of Channels	1 to 20 Channels
Measurements	Graph/Table, Max Hold (On/5 s/Off), Freq/Channel, Current/Max, Single/Dual Color
Scanner	Scan Channels, Scan Frequencies, Scan Customer List, Scan Script Master™
Amplitude	Reference Level, Scale
Custom Scan	Signal Standard, Channel, # of Channels, Channel Step Size, Custom Scan
Frequency Range	9 kHz to 4 GHz (S332E), 9 kHz to 6 GHz (S362E)
Frequency Accuracy	± 10 Hz + Time base error
Measurement Range	–110 dBm to +26 dBm
Application Options	Bias-Tee (On/Off), Impedance (50 Ω, 75 Ω, Other)

CW Signal Generator (Option 28) (S332E, S362E only; requires CW Signal Generator Kit, P/N 69793)

Setup Parameters

Frequency	Frequency, Signal Standard, Channel Number, Display Setup Help
Amplitude	Power Level (Low/High), Offset (dB)
Frequency Range	2 MHz to 2 GHz
Frequency Reference	Accuracy: ± 1.5 ppm (25 °C ± 25 °C) + aging, < ± 50 ppb with GPS On
Output Power	High 0 dBm typical, Low –30 dBm typical Attenuator (included in kit 69793): 0 to 90 dB in 1 dB steps

Gated Sweep (Option 90) (S332E, S362E only)

Mode	Spectrum Analyzer, Sweep
Trigger	External TTL
Setup	Gated Sweep (On/Off) Gate Polarity (Rising, Falling) Gate Delay (0 ms to 65 ms typical) Gate Length (1 µs to 65 ms typical) Zero Span Time

Electromagnetic Field Test (Option 444) (S332E, S362E only)

Measurements

Setup	Limit lines, axis dwell time, measurement time, auto-logging, measurement units, trace display
Spectrum Analyzer	Field strength is measured
Units	dBm/m^2, dBV/m, dBmV/m, dBuV/m, V/m, W/m^2, dBW/m^2, A/m, dBA/m, W/cm^2
Results	Maximum, minimum, and average of all measurements conducted
Display	Measurement status, number of measurements taken, pass/fail indicators

Frequency Range

Supported Antenna	
2000-1800-R	9 kHz to 300 MHz
2000-1792-R	30 MHz to 3 GHz
2000-1791-R	700 MHz to 6 GHz

Modes where EMF Measurements Available

Spectrum Analyzer

Ethernet Connectivity (Option 413)

Connector	RJ45
LAN Speed	10 Mbps
Mode	Static, DHCP
Static IP settings	IP address Subnet Mask IP Gateway
Remote Control	Remote capability provided with Web Remote Control and SCPI programming
Data Upload	With Line Sweep Tools through Ethernet connection

Power Meter (Option 29) (S332E, S362E only)

General

Frequency	Center/Start/Stop, Span, Frequency Step, Signal Standard, Channel #, Full Band
Amplitude	Maximum, Minimum, Offset, Relative On/Off, Units, Auto Scale
Average	Acquisition Fast/Med/Slow, # of Running Averages
Limits	Limit On/Off, Limit Upper/Lower
Frequency Range	10 MHz to 4 GHz (S332E), 10 MHz to 6 GHz (S362E)
Span	1 kHz to 100 MHz
Display Range	–140 dBm to +30 dBm, ≤ 40 dB span
Measurement Range	–120 dBm to +26 dBm
Offset Range	0 dB to +100 dB (External Gain or Loss)
VSWR	2:1 typical
Maximum Continuous Input Power	+30 dBm without attenuator
Accuracy	Same as Spectrum Analyzer
Application Options	Impedance (50 Ω, 75 Ω, Other)

High Accuracy Power Meter (Option 19) (requires external USB Power Sensors)

Amplitude	Maximum, Minimum, Offset, Relative On/Off, Units, Auto Scale
Average	# of Running Averages, Max Hold
Zero/Cal	Zero On/Off, Cal Factor (Center Frequency, Signal Standard)
Limits	Limit On/Off, Limit Upper/Lower

Power Sensor Model	MA24105A	MA24106A	MA24108A/18A/26A	MA24208A/18A	MA24330A/40A/50A
Description	Inline High Power Sensor	High Accuracy RF Power Sensor	Microwave USB Power Sensor	Microwave Universal USB Power Sensor	Microwave CW USB Power Sensor
Frequency Range	350 MHz to 4 GHz	50 MHz to 6 GHz	10 MHz to 8/18/26 GHz	10 MHz to 8/18 GHz	10 MHz to 33/40/50 GHz
Connector	Type N(f), 50 Ω	Type N(m), 50 Ω	Type N(m), 50 Ω (8/18 GHz) Type K(m), 50 Ω (26 GHz)	Type N(m), 50 Ω	Type K(m), 50 Ω (33/40 GHz) Type V(m), 50 Ω (50 GHz)
Dynamic Range	+3 dBm to +51.76 dBm (2 mW to 150 W)	–40 dBm to +23 dBm (0.1 µW to 200 mW)	–40 dBm to +20 dBm (0.1 µW to 100 mW)	–60 dBm to +20 dBm (1 nW to 100 mW)	–70 dBm to +20 dBm (0.1 nW to 100 mW)
Measurand	True-RMS	True-RMS	True-RMS, Slot Power, Burst Average Power	True-RMS, Slot Power, Burst Average Power	Average Power
Measurement Uncertainty	± 0.17 dB[a]	± 0.16 dB[b]	± 0.18 dB[c]	± 0.17 dB[d]	± 0.17 dB[e]
Data sheet (for complete specifications)	11410-00621	11410-00424	11410-00504	11410-00841	11410-00906

Notes:
a. Expanded uncertainty with K=2 for power measurements of a CW signal greater than +20 dBm with a matched load. Measurement results referenced to the input side of the sensor.
b. Total RSS measurement uncertainty (0 °C to 50 °C) for power measurements of a CW signal greater than –20 dBm with zero mismatch errors.
c. Expanded uncertainty with K=2 for power measurements of a CW signal greater than –20 dBm with zero mismatch errors.
d. Power uncertainty expressed with two sigma confidence level for CW measurement after zero operation. Includes calibration factor and linearity over temperature uncertainties, but not the effects of mismatch, zero set and drift, or noise.
e. Includes linearity over temperature uncertainties, but not the effects of calibration factor, mismatch, zero set and drift, and noise.

RF over Fiber Hardware (Option 759)

Must be ordered with either	Option 752: CPRI LTE RF measurements, or Option 753: OBSAI LTE RF measurements

Operating Temperature

Range	–10 °C to +45 °C

RF over Fiber Interface

Connector Port	Small form factor pluggable (SFP) optical transceiver port

CPRI LTE RF Measurements (Option 752) (requires Option 759)

Measurements (CPRI RF measurements support LTE technology)

Spectrum	Uplink or Downlink Spectrum
Spectrogram	Collects data up to one week
CPRI Alarms	Signal Level (Tx Power, Rx Power), Signal Loss, LOS, LOF, LSS, Remote LOS, Remote LOF, RAI, SDI, Reset
SFP Data	Reads device information
CPRI IQ Data Capture	Quick Save IQ Data, Playback IQ Data

Setup Parameters

Frequency	Center, Span (Span, Full Span), Signal Standard, Channel #, CF Reference (On/Off)[1]
Amplitude	Reference Level (RL), Scale, RL Offset
Bandwidth	RBW, Auto RBW, VBW, Auto VBW
Measurements	CPRI Configure, CPRI Spectrum, Spectrogram, CPRI Alarms, SFP Data (SFP Info/Compliance Info)
CPRI Configure	SFP Port Configure, Display Configure, AxC Trace Configure
SFP Port Configure	Line Rate, Radio Presets, Auto Detect
Display Configure	Display 1 and 2 CPRI BW, Display Mode (Single, Dual), Active Display
AxC Trace Configure	AxC 1, 2, 3, and 4 (Display, SFP Port, AxC Group, Sampling Rate (Default, Compress))
Radio Presets	Ericsson (Uplink/Downlink), Nokia/ALu (Uplink/Downlink), Huawei (Uplink/Downlink), Samsung (Uplink/Downlink), No Preset, Custom
Custom	IQ Bit Width, IQ Mapping (Method1, Method3), No. of Reserve Bits, Aggregation (On/Off)
Auto Detect	Radio Preset, IQ Bit Width, Reserve Bit, Aggregation, Start Auto Detect

Sweep Functions

Sweep	Single/Continuous, Sweep Once, Sweep 10 Averages

Trace Functions (AxC Trace 1 only)

Traces	Up to three Traces (A, B, C), View/Blank, Write/Hold, Trace A/B/C Operations
Trace A Operations	Normal, Max Hold, Min Hold, Average, # of Averages, (always the live trace)
Trace B Operations	A → B, B ← → C, Max Hold, Min Hold
Trace C Operations	A → C, B ← → C, Max Hold, Min Hold, A – B → C, B – A → C, Relative Reference (dB), Scale

Marker Functions (AxC Traces 1 through 4)

Markers	Markers 1-6 On/Off, Delta Marker On/Off, Marker Frequency to Center, Marker Table (On, Large, Off), All Markers Off
Marker Table	Markers 1-6 for frequency and amplitude, plus delta markers frequency offset and amplitude

Limit Line Functions

Limit Lines	Upper/Lower, On/Off, Move, Save/Recall Limit, Limit Alarm On/Off, Default Limit
Limit Line Move	Move Up/Down, to Amplitude

Display Functions

Active Display	Display 1 or 2 (Single Display or Dual Display)
Display Spectrum	Single or Dual
Single Spectrum Display	One, two, three, or four AxC traces displayed (color coded), same CPRI BW for AxC traces
Dual Spectrum Display	Any combination of the four available AxC traces, same CPRI BW per display and AxC trace
Display Spectrogram	Single or Dual
Single Spectrogram Display	One active AxC trace per waterfall display
Dual Spectrogram Display	Any combination of the four available AxC traces may be configured per display One active AxC trace per waterfall display
AxC Trace (1, 2, 3, 4)	Display 1, 2, or off AxC Group Sampling Rate (Default, Compress)

1. CF Reference is available only when Display 1 is active.

CPRI LTE RF Measurements (Option 752) (continued)

Bandwidth

Resolution Bandwidth (RBW)	300 Hz to 1 MHz in 1-3-10 sequence ±10 % (–3 dB bandwidth point) typical
Video Bandwidth (VBW)	30 Hz to 1 MHz in 1-3-10 sequence ±10 % (–3 dB bandwidth) typical
Line Bit Rate	Line bit rate 1: 614.4 Mbit/s Line bit rate 2: 1228.8 Mbit/s Line bit rate 3: 2457.6 Mbit/s Line bit rate 4: 3072.0 Mbit/s Line bit rate 5: 4915.2 Mbit/s Line bit rate 6: 6144.0 Mbit/s Line bit rate 7: 9830.4 Mbit/s Line bit rate 8: 10137.6 Mbit/s

CPRI Parameters

IQ Sample Width	10 bits, 12 bits, 15 bits, 16 bits
Bandwidth	5 MHz, 10 MHz, 15 MHz, 20 MHz
Aggregation	On/Off

OBSAI LTE RF Measurements (Option 753) (requires Option 759)

Measurements (OBSAI RF measurements support LTE technology)

Spectrum	Uplink or Downlink Spectrum
Spectrogram	Collects data up to one week
OBSAI Alarms	Signal Level (Tx Power, Rx Power), Signal Loss, LOS, LOF
SFP Data	Reads device information

Setup Parameters

Frequency	Center, Span (Span, Full Span), Signal Standard, Channel #, CF Reference (On/Off)[1]
Amplitude	Reference Level (RL), Scale, RL Offset
Bandwidth	RBW, Auto RBW, VBW, Auto VBW, LTE Bandwidth
Measurements	Start OBSAI, OBSAI Configure, OBSAI Spectrum, Spectrogram, OBSAI Alarms, SFP Data (SFP Info/Compliance Info)
Start OBSAI	Scans OBSAI link for active RP3 addresses; detects and sets link rate; configures first RP3 address and displays a Spectrum view.
OBSAI Configure	Link Rate, Display Configure, Carrier Trace Configure
Display Configure	Display 1 and 2 LTE BW, Display Mode (Single, Dual), Active Display
Carrier Trace Configure	Carrier Trace 1 (Display 1, 2, or off; RP3 Address) Carrier Trace 2 (Display 1, 2, or off; RP3 Address) Carrier Trace 3 (Display 1, 2, or off; RP3 Address) Carrier Trace 4 (Display 1, 2, or off; RP3 Address)
RP3 Address	RP3 list populated with Start OBSAI or plug-in of an active link Addresses removed from list upon fiber plug-out or Loss of Signal Address list is empty following power cycle or if no OBSAI carriers are found

Sweep Functions

Sweep	Single/Continuous, Sweep Once, Sweep 10 Averages

Trace Functions (Carrier Trace 1 only)

Traces	Up to three Traces (A, B, C), View/Blank, Write/Hold, Trace A/B/C Operations
Trace A Operations	Normal, Max Hold, Min Hold, Average, # of Averages, (always the live trace)
Trace B Operations	A → B, B ← → C, Max Hold, Min Hold
Trace C Operations	A → C, B ← → C, Max Hold, Min Hold, A – B → C, B – A → C, Relative Reference (dB), Scale

Marker Functions (Carrier Traces 1 through 4)

Markers	Markers 1-6 On/Off, Delta On/Off, Marker Freq to Center, Marker Table (On, Large, Off), All Markers Off
Marker Table	Markers 1-6 for frequency and amplitude, plus delta markers frequency offset and amplitude

Limit Line Functions

Limit Lines	Upper/Lower, On/Off, Move, Save/Recall Limit, Limit Alarm On/Off, Default Limit
Limit Line Move	Move Up/Down, to Amplitude

Display Functions

Active Display	Display 1 or 2 (Single Display or Dual Display)
Display Spectrum	Single or Dual
Single Spectrum Display	One, two, three, or four carrier traces displayed (color coded) Trace LTE BW must match display LTE BW to be visible
Dual Spectrum Display	Any combination of the four available carrier traces, same LTE BW per display and carrier trace
Display Spectrogram	Single or Dual
Single Spectrogram Display	One active carrier trace per waterfall display
Dual Spectrogram Display	Any combination of the four available carrier traces may be configured per display One active carrier trace per waterfall display
Carrier Trace (1, 2, 3, 4)	Display 1, 2, or off

Bandwidth

Resolution Bandwidth (RBW)	300 Hz to 1 MHz in 1-3-10 sequence ±10 % (–3 dB bandwidth point) typical
Video Bandwidth (VBW)	30 Hz to 1 MHz in 1-3-10 sequence ±10 % (–3 dB bandwidth) typical
Link Rate	1x: 768.0 Mbit/s 2x: 1536.0 Mbit/s 4x: 3072.0 Mbit/s 8x: 6144.0 Mbit/s
LTE Bandwidth	5 MHz, 10 MHz, 15 MHz[2], 20 MHz

1. CF Reference is available only when Display 1 is active.
2. Only supports Dual Bit Map algorithm for 15 MHz bandwidth signals.

AM/FM/PM Signal Analyzers (Option 509) (S332E, S362E only)

Measurements

Display Type	RF Spectrum AM/FM/PM	Audio Spectrum (AM)	Audio Spectrum (FM/PM)	Audio Waveform (AM)	Audio Waveform (FM/PM)	Summary (AM)	Summary (FM/PM)
Graphic Display	Power (dBm) vs. Frequency	Depth (%) vs. Modulation Frequency	Deviation (kHz/rad) vs. Modulation Frequency	Depth (%) vs. Time	Deviation (kHz/rad) vs. Time	None	None
Numerical Displays	Carrier Power Carrier Frequency Occupied Bandwidth	AM Rate RMS Depth (Pk-Pk)/2 Depth SINAD* THD* Distortion/Total Vrms*	FM/PM Rate RMS Deviation (Pk-Pk)/2 Deviation SINAD* THD* Distortion/Total Vrms*	AM Rate RMS Depth (Pk-Pk)/2 Depth SINAD* THD* Distortion/Total Vrms*	FM/PM Rate RMS Depth (Pk-Pk)/2 Depth SINAD* THD* Distortion/Total Vrms*	RMS Depth (AM) Peak + Depth Peak – Depth (Pk-Pk)/2 Depth Carrier Power Carrier Frequency Occupied Bandwidth AM Rate SINAD* THD* Distortion/Total Vrms*	RMS Deviation (FM/PM) Peak + Depth Peak – Depth (Pk-Pk)/2 Depth Carrier Power Carrier Frequency Occupied Bandwidth AM Rate SINAD* THD* Distortion/Total Vrms*

* Requires Sinewave modulation

Setup Parameters

Frequency	Center Freq, Span, Freq Step, Signal Standard, Channel, Channel Increment, Set Carrier Freq
Amplitude	Scale, Power Offset, Adjust Range
Setup	Demod Type (AM, FM, PM), IFBW, Auto IFBW
Measurements	RF Spectrum AM/FM/PM, Audio Spectrum (AM/FM/PM), Audio Waveform (AM/FM/PM), Summary (AM/FM/PM), Average
Marker	On/Off, Delta, Peak Search, Marker Freq to Center, Marker to Ref Lvl, Marker Table, All Markers Off

Specifications

AM	Modulation Rate: ± 1 Hz (< 100 Hz), ± 2% (> 100 Hz) Depth: ± 5% for (Modulation rates 10 Hz to 100 kHz)
FM	Modulation Rate: ± 1 Hz (< 100 Hz); ± 2% (100 Hz to 100 kHz) Deviation Accuracy: ± 5% (100 Hz to 100 kHz, IFBW must be greater than 95 % occupied BW)
PM	Modulation Rate: ± 1 Hz (< 100 Hz); ± 2% (100 Hz to 100 kHz) Deviation Accuracy: ± 5% (deviation 0 to 93 Rad, rate 10 Hz to 5 kHz, IFBW must be greater than 95 % occupied BW)
IF bandwidth	1 kHz to 300 kHz in 1-3 sequence
Frequency Span	RF Spectrum: 10 kHz to 10 MHz Audio Spectrum: 2 kHz, 5 kHz, 10 kHz, 20 kHz, 70 kHz, 140 kHz
RBW/VBW	30
Span/RBW	100
Sweep time	50 µs to 50 ms (Audio Waveform)

General Specifications

Setup Parameters		
	System	Status (Temperature, Battery Info, Serial Number, Firmware Version, Options Installed) Self Test, Application Self Test, GPS (see Option 31)
	System Options	Name, Date and Time, Brightness, Volume Language (English, French, German, Spanish, Chinese, Japanese, Korean, Italian, Russian, User defined) Reset (Factory Defaults, Master Reset, Update Firmware)
	File	Save, Recall, Delete, Directory Management
	Save/Recall	Setups, Measurements, Screen Shots (.jpg) (save only)
	Delete	Selected File, All Measurements, All Mode Files, All Content
	Directory Management	Sort Method (Name/Type/Date), Ascend/Descend, Internal/USB, Copy, Format USB
	Internal Trace/Setup Memory	2,000 traces, 2,000 setups
	External Trace/Setup Memory	Limited by size of USB Flash drive
	Mode Switching	Auto-Stores/Recalls most recently used Setup Parameters in the Mode
Connectors		
	RF Out	Type N, female, 50 Ω (Reflection In)
	RF Out Damage Level	23 dBm (+42 dBm typical), ± 50 VDC
	RF In	Type N, female, 50 Ω
	RF Input Damage Level	+30 dBm peak, ± 50 VDC, Maximum Continuous Input (≥ 10 dB attenuation)
	GPS	SMA(f)
	External Power	5.5 mm barrel connector, 12.5 VDC to 15 VDC, < 4.0 Amps
	USB Interface (2)	Type A (Connect USB Flash Drive and Power Sensor)
	USB Interface	5-pin mini-B (Connect to PC for data transfer)
	Ethernet Interface	RJ45 connector for Ethernet 10-Base T (available with Option 413 Ethernet)
	Headset Jack	3.5 mm mini-phone plug
	External Reference In	BNC, female, Maximum Input +10 dBm, 1 MHz, 5 MHz, 10 MHz, 13 MHz
	External Trigger/Clock Recovery	BNC, female, Maximum Input ± 50 VDC
	RF over Fiber	SFP/SFP+ compatible socket (available with Option 759)
Display	Type	Resistive Touchscreen
	Size	8.4" daylight viewable color LCD
	Resolution	800 x 600
	Pixel Defects	No more than five defective pixels (99.9989% good pixels)
Battery	Type	Li-Ion
	Battery Operation	4.5 hours, typical (S331E, S361E), 3.5 hours, typical (S332E, S362E)
Regulatory Compliance		
	European Union	EMC 2014/30/EU, EN 61326:2013, CISPR 11/EN 55011, IEC/EN 61000-4-2/3/4/5/6/8/11 Low Voltage Directive 2014/35/EU Safety EN 61010-1:2010 RoHS Directive 2011/65/EU
	Australia and New Zealand	RCM AS/NZS 4417:2012
	South Korea	KCC-REM-A21-0004
Environmental		MIL-PRF-28800F Class 2
	Operating Temperature Range	–10 °C to 55 °C
	Storage Temperature Range	–51 °C to 71 °C
	Maximum Relative Humidity	95 % RH at 30 °C, non-condensing
	Vibration, Sinusoidal	5 Hz to 55 Hz
	Vibration, Random	10 Hz to 500 Hz
	Half Sine Shock	30 g_n
	Altitude	4600 meters, operating and non-operating
	Explosive Atmosphere	MIL-PRF-28800F, Section 4.5.6.3 MIL-STD-810G, Method 511.5, Procedure 1
ESD	RF Port Center Pin	Withstands up to ± 15 kV
Size and Weight	Size	273 mm x 199 mm x 91 mm (10.7 in x 7.8 in x 3.6 in)
	Weight	2.71 kg, (6.0 lb), (S331E, S361E) 3.71 kg, (8.2 lb), (S332E, S362E)
Warranty	Duration	Standard three-year warranty One-year warranty on battery

Line Sweep Tools (for your PC)

Trace Capture	
Browse to Instrument	View and copy traces from the test equipment to your PC using Windows Explorer
Open Legacy Files	Open DAT files captured with Hand Held Software Tools v6.61
Open Current Files	Open VNA or DAT files
Capture Plots To	The Line Sweep Tools screen, DAT files, Database, or JPEG
Traces	
Trace Types	Return Loss, VSWR, DTF-RL, DTF-VSWR, Cable Loss, Smith Chart, and PIM
Trace Formats	DAT, VNA, CSV, PNG, BMP, JPG, HTML, Data Base, and PDF
Report Generation	
Report Generator	Includes GPS location along with measurements
Report Format	Create reports in HTML or PDF format
Report Setup	Report Title, Company, Prepared for, Location, Date and Time, Filename, Company logo
Trace Setup	1 Trace Portrait Mode, 2 Trace Portrait Mode, 1 Trace Landscape Mode
Trace Validation	
Presets	7 presets allow “one click” setting of up to 6 markers and one limit line
Marker Controls	6 regular Markers, Marker Peak, Marker Valley, Marker between, and frequency entry
Delta Markers	6 Delta markers
Limit Line	Enable and drag or value entry. Also works with presets
Next Trace Button	Next Trace and Previous trace arrow keys allow quick switching between traces
Tools	
Cable Editor	Allows creation of custom cable parameters
Distance to Fault	Converts a Return Loss trace to a Distance to Fault trace
Measurement Calculator	Converts Real, Imaginary, Magnitude, Phase, RL, VSWR, Rho, and Transmit power
Signal Standard Editor	Creates new band and channel tables
Renaming Grid	36 user definable phrases for creation of file names, trace titles, and trace subtitles
Connectivity	
Connections	USB cable, USB Memory Stick

easyTest Tools (for your PC)

Instrument Mode	Cable & Antenna Analyzer Mode
Commands	
Display Image	Allows putting a custom image on the instrument screen
Recall Setup	Places the instrument into a known state
Prompt	Displays instructional messages on the instrument screen
Save	Allows automatic or manual saving of traces
Connectivity	
Connections	Ethernet, USB cable or USB memory stick (Ethernet requires Option 413)

Master Software Tools (for your PC)

Mapping (GPS Required)

Spectrum Analyzer Mode	MapInfo, MapPoint
Mobile WiMAX OTA, LTE OTA Options	Google Earth, Google Maps, MapInfo

Folder Spectrogram (Spectrum Monitoring for Interference Analysis and Spectrum Clearing)

Folder Spectrogram – 2D View	Creates a composite file of multiple traces Peak Power, Total Power, Peak Frequency, Histogram, Average Power (Max/Min) File Filter (Violations over limit lines or deviations from averages) Playback
Video Folder Spectrogram – 2D View	Create AVI file to export for management review/reports
Folder Spectrogram – 3D View	Views (Set Threshold, Markers) - 3D (Rotate X, Y, Z Axis, Level Scale, Signal ID) - Playback (Frequency and/or Time Domain)

List/Parameter Editors

Traces	Add, delete, and modify limit lines and markers
Product Updates	Auto-checks Anritsu website for latest revision firmware
Pass/Fail	Create, download, or edit Signal Analysis Pass/Fail Limits
Languages	Add custom language or modify non-English language menus

Connectivity

Connections	Connect to PC using USB or Ethernet (Ethernet requires Option 413)
Remote Operation	Operate unit remotely with MST Remote Access Tool

Web Remote Control (requires Ethernet Option 413)

Control	Full instrument control through a browser – all instrument functions except power switch and rotary knob
Connections	RJ45 Ethernet jack Third party Wi-Fi router
Protocol	HTTP/TCP/IP
Physical Layer	Cat 5 Cable, Wi-Fi router compatible
Software Required	HTML 5 Compliant Browser – Newer versions of Chrome, Firefox, Internet Explorer and others
Operating System	iOS, Windows, Linux, Android operating systems that can host the HTML 5 Compliant browser
Remote Hardware	PCs, Tablets, and Smart Phones with Ethernet or Wi-Fi connections and a HTML 5 Compliant browser
Download	Individual instrument files downloaded via browser Multiple instrument files and directories zipped and downloaded via browser Screen capture capability
Display Modes	Normal: All modes & displays supported Fast: Spectrum traces update faster (up to 5 updates per second)
Password	The instrument can be password protected Passwords may be used to manage who is controlling the instrument
Users/Instruments	One user/device can view and control many instruments

Programmable Remote Control

Functionality	Many instrument functions are programmable. See the Programming Manual for details.
Programming Language	Standard Commands for Programmable Instruments (SCPI)
Interfaces	USB, Ethernet (with Option 413)
Available Drivers	LabView (visit NI.com for driver)

Ordering Information – Options

	S331E	S332E	S361E	S362E	Description
	2 MHz to 4 GHz	2 MHz to 4 GHz 9 kHz to 4 GHz	2 MHz to 6 GHz	2 MHz to 6 GHz 9 kHz to 6 GHz	Cable and Antenna Analyzer Spectrum Analyzer
	Options	**Options**	**Options**	**Options**	
	S331E-0021	S332E-0021	S361E-0021	S362E-0021	2-Port Transmission Measurement
	S331E-0010	S332E-0010	S361E-0010	S362E-0010	Bias-Tee (requires Option 21 for S331E /S361E)
	S331E-0019	S332E-0019	S361E-0019	S362E-0019	High-Accuracy Power Meter (requires External Power Sensor)
		S332E-0029		S362E-0029	Power Meter
		S332E-0025		S362E-0025	Interference Analyzer (recommend Option 31)
		S332E-0027		S362E-0027	Channel Scanner
		S332E-0028		S362E-0028	C/W Signal Generator (requires CW Signal Generator Kit, P/N 69793)
	S331E-0031	S332E-0031	S361E-0031	S362E-0031	GPS Receiver (requires Antenna)
		S332E-0090		S362E-0090	Gated Sweep
	S331E-0413	S332E-0413	S361E-0413	S362E-0413	Ethernet Connectivity
		S332E-0431		S362E-0431	Coverage Mapping (requires Option 31)
		S332E-0444		S362E-0444	EMF Measurements (requires Anritsu Isotropic Antenna)
		S332E-0509		S362E-0509	AM/FM/PM Analyzer
	S331E-0752	S332E-0752	S361E-0752	S362E-0752	CPRI LTE RF Measurements (requires Option 759)
	S331E-0753	S332E-0753	S361E-0753	S362E-0753	OBSAI LTE RF Measurements (requires Option 759)
	S331E-0759	S332E-0759	S361E-0759	S362E-0759	RF over Fiber hardware (requires Option 752 or 753)
	S331E-0098	S332E-0098	S361E-0098	S362E-0098	Standard Calibration to ISO17025 and ANSI/NCSL Z540-1. Includes calibration certificate.
	S331E-0099	S332E-0099	S361E-0099	S362E-0099	Premium Calibration to ISO17025 and ANSI/NCSL Z540-1. Includes calibration certificate, test report, and uncertainty data.

Standard Accessories (included with instrument)

Part Number	Description
2000-1654-R	Soft Carrying Case
2000-1691-R	Stylus with Coiled Tether
2000-1797-R	Screen Protector Film, 8.4 inch (2, one installed)
633-75	Rechargeable Li-Ion Battery
40-187-R	AC-DC Adapter
806-141-R	Automotive Power Adapter, 12 VDC, 60 W
3-2000-1498	USB A/5-pin mini-B Cable, 10 ft/305 cm

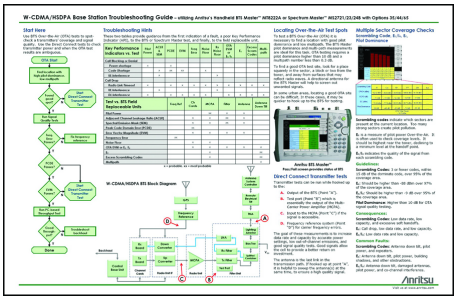
Power Sensors (for complete ordering information, see the respective data sheets of each sensor)

Part Number	Description
MA24105A	Inline Peak Power Sensor, 350 MHz to 4 GHz, +51.76 dBm
MA24106A	High Accuracy RF Power Sensor, 50 MHz to 6 GHz, +23 dBm
MA24108A	Microwave USB Power Sensor, 10 MHz to 8 GHz, +20 dBm
MA24118A	Microwave USB Power Sensor, 10 MHz to 18 GHz, +20 dBm
MA24126A	Microwave USB Power Sensor, 10 MHz to 26 GHz, +20 dBm
MA24208A	Microwave Universal USB Power Sensor, 10 MHz to 8 GHz, +20 dBm to –60 dBm
MA24218A	Microwave Universal USB Power Sensor, 10 MHz to 18 GHz, +20 dBm to –60 dBm
MA24330A	Microwave CW USB Power Sensor, 10 MHz to 33 GHz, +20 dBm
MA24340A	Microwave CW USB Power Sensor, 10 MHz to 40 GHz, +20 dBm
MA24350A	Microwave CW USB Power Sensor, 10 MHz to 50 GHz, +20 dBm
MA25100A	RF Power Indicator

Manuals (available at www.anritsu.com)

Part Number	Description
10100-00065	Product Information, Compliance, and Safety
10580-00252	Site Master User Guide
10580-00241	Cable and Antenna Analyzer Measurement Guide
10580-00242	2-Port Transmission Measurement Guide
10580-00349	Spectrum Analyzer Measurement Guide
10580-00240	Power Meter Measurement Guide
10580-00415	CPRI LTE RF Analyzer Measurement Guide
10580-00434	OBSAI LTE RF Analyzer Measurement Guide
10580-00256	Programming Manual

Troubleshooting Guides (available at www.anritsu.com)



Part Number	Description
11410-00473	Cable, Antenna and Components
11410-00551	Spectrum Analyzers
11410-00472	Interference

Optional Accessories

Calibration Components, 50 Ω

Part Number	Description
ICN50B	InstaCal™ Calibration Module, 38 dB, 2 MHz to 6.0 GHz, N(m), 50 Ω
OSLN50A-8	High Performance Type N(m), DC to 8 GHz, 50 Ω
OSLNF50A-8	High Performance Type N(f), DC to 8 GHz, 50 Ω
2000-1914-R	Precision Open/Short/Load, 4.3-10(f), DC to 6 GHz, 50 Ω
2000-1915-R	Precision Open/Short/Load, 4.3-10(m), DC to 6 GHz, 50 Ω
2000-1618-R	Precision Open/Short/Load, 7/16 DIN(m), DC to 6.0 GHz 50 Ω
2000-1619-R	Precision Open/Short/Load, 7/16 DIN(f), DC to 6.0 GHz 50 Ω
22N50	Open/Short, N(m), DC to 18 GHz, 50 Ω
22NF50	Open/Short, N(f), DC to 18 GHz, 50 Ω
SM/PL-1	Precision Load, N(m), 42 dB, 6.0 GHz, 50 Ω
SM/PLNF-1	Precision Load, N(f), 42 dB, 6.0 GHz, 50 Ω

Calibration Components, 75 Ω

Part Number	Description
22N75	Open/Short, N(m), DC to 3 GHz, 75 Ω
22NF75	Open/Short, N(f), DC to 3 GHz, 75 Ω
26N75A	Precision Termination, N(m), DC to 3 GHz, 75 Ω
26NF75A	Precision Termination, N(f), DC to 3 GHz, 75 Ω
12N50-75B	Matching Pad, DC to 3 GHz, 50 Ω to 75 Ω

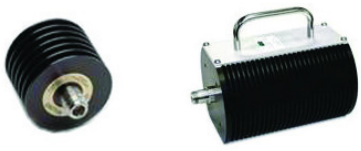
Adapters

Part Number	Description
1091-26-R	SMA(m) to N(m), DC to 18 GHz, 50 Ω
1091-27-R	SMA(f) to N(m), DC to 18 GHz, 50 Ω
1091-80-R	SMA(m) to N(f), DC to 18 GHz, 50 Ω
1091-81-R	SMA(f) to N(f), DC to 18 GHz, 50 Ω
1091-172-R	BNC(f) to N(m), DC to 1.3 GHz, 50 Ω
1091-433-R	Low PIM Adapter, 4.1-9.5(f) to 7/16 DIN(f), DC to 3.0 GHz, 50 Ω
1091-434-R	Low PIM Adapter, 4.1-9.5(m) to 7/16 DIN(f), DC to 3.0 GHz, 50 Ω
1091-465-R	Adapter, DC to 6 GHz, 4.3-10(f) to N(f), 50 Ω
1091-467-R	Adapter, DC to 6 GHz, 4.3-10(m) to N(f), 50 Ω
510-90-R	7/16 DIN(f) to N(m), DC to 7.5 GHz, 50 Ω
510-91-R	7/16 DIN(f) to N(f), DC to 7.5 GHz, 50 Ω
510-92-R	7/16 DIN(m) to N(m), DC to 7.5 GHz, 50 Ω
510-93-R	7/16 DIN(m) to N(f), DC to 7.5 GHz, 50 Ω
510-96-R	7/16 DIN(m) to 7/16 DIN (m), DC to 7.5 GHz, 50 Ω
510-97-R	7/16 DIN(f) to 7/16 DIN (f), DC to 7.5 GHz, 50 Ω
510-102-R	N(m) to N(m), DC to 11 GHz, 50 Ω, 90 degrees right angle

Precision Adapters

Part Number	Description
34NN50A	Precision Adapter, N(m) to N(m), DC to 18 GHz, 50 Ω
34NFNF50	Precision Adapter, N(f) to N(f), DC to 18 GHz, 50 Ω

Attenuators



Part Number	Description
3-1010-122	20 dB, 5 W, DC to 12.4 GHz, N(m) to N(f)
42N50-20	20 dB, 5 W, DC to 18 GHz, N(m) to N(f)
42N50A-30	30 dB, 50 W, DC to 18 GHz, N(m) to N(f)
3-1010-123	30 dB, 50 W, DC to 8.5 GHz, N(m) to N(f)
1010-127-R	30 dB, 150 W, DC to 3 GHz, N(m) to N(f)
3-1010-124	40 dB, 100 W, DC to 8.5 GHz, N(m) to N(f), Uni-directional
1010-121	40 dB, 100 W, DC to 18 GHz, N(m) to N(f), Uni-directional
1010-128-R	40 dB, 150 W, DC to 3 GHz, N(m) to N(f)

Optional Accessories (continued)

Phase-Stable Test Port Cables, Armored w/Reinforced Grip (recommended for cable & antenna line sweep applications)

Part Number	Description
15RNFN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to N(f), 50 Ω
15RDFN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 Ω
15RDN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 Ω
15RNFN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to N(f), 50 Ω
15RDFN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 Ω
15RDN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 Ω

Interchangeable Adapter Phase Stable Test Port Cables, Armored w/Reinforced Grip (recommended for cable and antenna line sweep applications. It uses the same ruggedized grip as the Reinforced grip series cables. Now you can also change the adapter interface on the grip to four different connector types.)

Part Number	Description
15RCN50-1.5-R	1.5 m, DC to 6 GHz, N(m), N(f), 7/16 DIN(m), 7/16 DIN(f), 50 Ω
15RCN50-3.0-R	3.0 m, DC to 6 GHz, N(m), N(f), 7/16 DIN(m), 7/16 DIN(f), 50 Ω

Phase-Stable Test Port Cables, Armored (recommended for use with tightly spaced connectors and other general purpose applications)

Part Number	Description
15NNF50-1.5C	1.5 m, DC to 6 GHz, N(m) to N(f), 50 Ω
15NN50-1.5C	1.5 m, DC to 6 GHz, N(m) to N(m), 50 Ω
15NDF50-1.5C	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 Ω
15ND50-1.5C	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 Ω
15NNF50-3.0C	3.0 m, DC to 6 GHz, N(m) to N(f), 50 Ω
15NN50-3.0C	3.0 m, DC to 6 GHz, N(m) to N(m), 50 Ω
15NNF50-5.0C	5.0 m, DC to 6 GHz, N(m) to N(f), 50 Ω
15NN50-5.0C	5.0 m, DC to 6 GHz, N(m) to N(m), 50 Ω
15N43M50-1.5C	Test Port Extension Cable, Armored, 1.5 meters, DC to 6GHz, N(m) to 4.3-10(m)
15N43F50-1.5C	Test Port Extension Cable, Armored, 1.5 meter, DC to 6GHz, N(m) to 4.3-10(f)
15N43M50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(m) to 4.3-10(m)
15N43F50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(m) to 4.3-10(f)
15NF43M50-1.5C	Test Port Extension Cable, Armored, 1.5 meters, DC to 6 GHz, N(f) to 4.3-10(m)
15NF43F50-1.5C	Test Port Extension Cable, Armored, 1.5 meters, DC to 6 GHz, N(f) to 4.3-10(f)
15NF43M50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(f) to 4.3-10(m)
15NF43F50-3.0C	Test Port Extension Cable, Armored, 3 meters, DC to 6 GHz, N(f) to 4.3-10(f)

Optional Accessories (continued)

Directional Antennas

Part Number	Description
2000-1411-R	824 MHz to 896 MHz, N(f), 12.3 dBi, Yagi
2000-1412-R	885 MHz to 975 MHz, N(f), 12.6 dBi, Yagi
2000-1413-R	1710 MHz to 1880 MHz, N(f), 12.3 dBi. Yagi
2000-1414-R	1850 MHz to 1990 MHz, N(f), 11.4 dBi, Yagi
2000-1415-R	2400 MHz to 2500 MHz, N(f), 14.1 dBi, Yagi
2000-1416-R	1920 MHz to 2170 MHz, N(f), 14.3 dBi, Yagi
2000-1659-R	698 MHz to 787 MHz, N(f), 10.1 dBi, Yagi
2000-1660-R	1425 MHz to 1535 MHz, N(f), 14.3 dBi, Yagi
2000-1715-R	Directional Antenna, 698 MHz to 2500 MHz, N(f), gain of 2 dBi to 10 dBi, typical
2000-1726-R	Antenna, 2500 MHz to 2700 MHz, N(f), 14.1 dBi, Yagi
2000-1747-R	Antenna, Log Periodic, 300 MHz to 7000 MHz, N(f), 5.1 dBi, typical
2000-1748-R	Antenna, Log Periodic, 1 GHz to 18 GHz, N(f), 6 dBi, typical
2000-1777-R	Portable Directional Antenna, 9 kHz to 20 MHz, N(f)
2000-1778-R	Portable Directional Antenna, 20 MHz to 200 MHz, N(f)
2000-1779-R	Portable Directional Antenna, 200 MHz to 500 MHz, N(f)
2000-1812-R	Portable Yagi Antenna, 450 MHz to 512 MHz, N(f), 7.1 dBi
2000-1825-R	Portable Yagi Antenna, 380 MHz to 430 MHz, N(f), 7.1 dBi

Isotropic Antennas

Part Number	Description
2000-1791-R	Isotropic Antenna, 700 MHz to 6000 MHz, N(m)
2000-1792-R	Isotropic Antenna, 30 MHz to 3000 MHz, N(m)
2000-1800-R	Isotropic Antenna, 9 kHz to 300 MHz, N(m)

Portable Antennas

Part Number	Description
2000-1200-R	806 MHz to 866 MHz, SMA(m), 50 Ω
2000-1473-R	870 MHz to 960 MHz, SMA(m), 50 Ω
2000-1035-R	896 MHz to 941 MHz, SMA(m), 50 Ω (1/2 wave)
2000-1030-R	1710 MHz to 1880 MHz, SMA(m), 50 Ω (1/2 wave)
2000-1474-R	1710 MHz to 1880 MHz with knuckle elbow (1/2 wave)
2000-1031-R	1850 MHz to 1990 MHz, SMA(m), 50 Ω (1/2 wave)
2000-1475-R	1920 MHz to 1980 MHz and 2110 MHz to 2170 MHz, SMA(m), 50 Ω
2000-1032-R	2400 MHz to 2500 MHz, SMA(m), 50 Ω (1/2 wave)
2000-1361-R	2400 MHz to 2500 MHz, 5000 MHz to 6000 MHz, SMA(m), 50 Ω
2000-1636-R	Antenna Kit (Consists of: 2000-1030-R, 2000-1031-R, 2000-1032-R, 2000-1200-R, 2000-1035-R, 2000-1361-R, and carrying pouch)

Mag Mount and Broadband Antennas

Part Number	Description
2000-1616-R	20 MHz to 21000 MHz, N(f), 50 Ω
2000-1645-R	694 MHz to 894 MHz 3 dBi peak gain, 1700 MHz to 2700 MHz 3 dBi peak gain, N(m), 50 Ω, 10 ft
2000-1646-R	750 MHz to 1250 MHz 3 dBi peak gain, 1650 MHz to 2700 MHz 5 dBi peak gain
2000-1647-R	Cable 1: 698 MHz to 1200 MHz, 2 dBi peak gain, 1700 MHz to 2700 MHz, 5 dBi peak gain, N(m), 50 Ω, 10 ft Cable 2: 3000 MHz to 6000 MHz, 5 dBi peak gain, N(m), 50 Ω, 10 ft Cable 3: GPS 26 dB gain, SMA(m), 50 Ω, 10 ft
2000-1648-R	1700 MHz to 6000 MHz 3 dBi peak gain, N(m), 50 Ω, 10 ft

Optional Accessories (continued)

Filters

Part Number	Description
1030-114-R	806 MHz to 869 MHz, N(m) to SMA(f), 50 Ω
1030-109-R	824 MHz to 849 MHz, N(m) to SMA(f), 50 Ω
1030-110-R	880 MHz to 915 MHz, N(m) to SMA(f), 50 Ω
1030-111-R	1850 MHz to 1910 MHz, N(m) to SMA(f), 50 Ω
1030-112-R	2400 MHz to 2484 MHz, N(m) to SMA(f), 50 Ω
1030-105-R	890 MHz to 915 MHz, N(m) to N(f), 50 Ω
1030-106-R	1710 MHz to 1790 MHz, N(m) to N(f), 50 Ω
1030-107-R	1910 MHz to 1990 MHz, N(m) to N(f), 50 Ω
1030-149-R	High Pass, 150 MHz, N(m) to N(f), 50 Ω
1030-150-R	High Pass, 400 MHz, N(m) to N(f), 50 Ω
1030-151-R	High Pass, 700 MHz, N(m) to N(f), 50 Ω
1030-152-R	Low Pass, 200 MHz, N(m) to N(f), 50 Ω
1030-153-R	Low Pass, 550 MHz, N(m) to N(f), 50 Ω
1030-155-R	2500 MHz to 2700 MHz, N(m) to N(f), 50 Ω
1030-178-R	1920 MHz to 1980 MHz, N(m) to N(f), 50 Ω
1030-179-R	777 MHz to 798 MHz, N(m) to N(f), 50 Ω
1030-180-R	2500 MHz to 2570 MHz, N(m) to N(f), 50 Ω
2000-1684-R	791 MHz to 821 MHz, N(m) to N(f), 50 Ω
2000-1734-R	Bandpass Filter, 699 MHz to 715 MHz, N(m) and N(f), 50 Ω
2000-1735-R	Bandpass Filter, 776 MHz to 788 MHz, N(m) and N(f), 50 Ω
2000-1736-R	Bandpass Filter, 815 MHz to 850 MHz, N(m) and N(f), 50 Ω
2000-1737-R	Bandpass Filter, 1711 MHz to 1756 MHz, N(m) and N(f), 50 Ω
2000-1738-R	Bandpass Filter, 1850 MHz to 1910 MHz, N(m) and N(f), 50 Ω
2000-1739-R	Bandpass Filter, 880 MHz to 915 MHz, N(m) and N(f), 50 Ω
2000-1740-R	Bandpass Filter, 1710 MHz to 1785 MHz, N(m) and N(f), 50 Ω
2000-1741-R	Bandpass Filter, 1920 MHz to 1980 MHz, N(m) and N(f), 50 Ω
2000-1742-R	Bandpass Filter, 832 MHz to 862 MHz, N(m) and N(f), 50 Ω
2000-1743-R	Bandpass Filter, 2500 MHz to 2570 MHz, N(m) and N(f), 50 Ω
2000-1799-R	Bandpass Filter, 2305 MHz to 2320 MHz, N(m) and N(f), 50 Ω
2000-1911-R	Bandpass Filter, 703 MHz to 748 MHz, N(m) and N(f), 50 Ω
2000-1912-R	Bandpass Filter, 788 MHz to 798 MHz, N(m) and N(f), 50 Ω
2000-1925-R	Bandpass Filter, 663 MHz to 698 MHz, N(m) and N(f), 50 Ω
2000-1926-R	Bandpass Filter, 776 MHz to 806 MHz, N(m) and N(f), 50 Ω

RF over Fiber Accessories

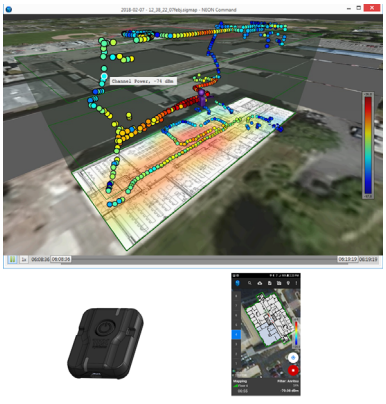
Part Number	Description
67-12-R	Optical Tap; Single Mode/Multi Mode 80/20 Tap
67-13-R	Optical Tap; Single Mode 80/20 Tap
67-14-R	Optical Tap; Single Mode/Multi Mode 50/50 Tap
67-15-R	Optical Tap; Single Mode 50/50 Tap
68-5-R	SFP (Optical Module), MM (Multi Mode) 4.25 Gbps, 850 nm, 500 m
68-6-R	SFP+ (Optical Module), MM (Multi Mode) 8 Gbps FC/10G SR 850 nm
68-7-R	SFP (Optical Module), SM (Single Mode) 2.7 Gbps, 1310 nm, 15 km
68-8-R	SFP+ (Optical Module), SM (Single Mode) 10 Gbps LR, 1310 nm
68-9-R	SFP (Optical Module), SM (Single Mode) 3.07 Gbps, 1310 nm
68-10-R	SFP (Optical Module), MM (Multi Mode) 3.7 Gbps, 850 nm
68-11-R	SFP+ (Optical Module), SM (Single Mode) 10.5 Gbps, 1310 nm
68-12-R	SFP+ (Optical Module), MM (Multi Mode) 10.5 Gbps, 850 nm
808-16-R	Fiber Optic Cable, 3 m, Duplex MM (Multi Mode) 1.6 mm LC/PC LC/PC 50 µm
808-17-R	Fiber Optic Cable, 3 m, Simplex MM (Multi Mode) 1.6 mm LC/UPC LC/UPC 50 µm
808-18-R	Fiber Optic Cable, 3 m, Ruggedized Simplex SM (Single Mode) LC/UPC LC/UPC
808-19-R	Fiber Optic Cable, 3 m, Ruggedized Duplex SM (Single Mode) LC/UPC LC/UPC
2100-29-R	Fiber Optic Cable, 3 m, Simplex SM (Single Mode) LC/UPC
2100-30-R	Fiber Optic Cable, 10 m, Simplex MM (Multi Mode) LC-SC
2100-31-R	Fiber Optic Cable, 3 m, Duplex SM (Single Mode) LC/UPC
971-14-R	Ferrule Cleaner, 2.5 mm SC
971-15-R	Ferrule Cleaner, 1.25 mm LC
971-16	Fiber Ferrule Cleaner
2000-1849-R	SFP 4-slot ESD Box

Optional Accessories (continued)

Miscellaneous Accessories

Part Number	Description
2000-1528-R	GPS Antenna, SMA(m) with 15 ft cable
2000-1652-R	GPS Antenna, SMA(m) with 1 ft cable
69793	CW Signal Generator Kit
2000-1689	EMI Near Field Probe Kit
2000-1374	External Charger for Li-Ion Batteries
633-75	7500 mAh High-capacity Battery Pack
2000-1371-R	Ethernet Cable, 213 cm (7 ft)
3-806-152	Cat 5e Crossover Patch Cable, 213 cm (7 ft)
MA2700A	Handheld Interference Hunter (For full specifications, refer to the MA2700A Technical Data Sheet 11410-00692)
2000-1884-R	PIM Hunter™ Test Probe (For full specifications, refer to the 2000-1884-R Technical Data Sheet 11410-00999)
2000-1797-R	Screen Protector Film, 8.4 inch
66864	Rack Mount Kit, Master Platform

MA8100A TRX NEON Signal Mapper (supported on S332E, S362E models only)



Model Number	Description
MA8100A-001	TRX NEON® Signal Mapper with Anritsu Integration and Tracking Unit. Includes 1 year TRX NEON Software License with 1 year of maintenance and support and 1 year of Cloud Service.
MA8100A-003	TRX NEON® Signal Mapper with Anritsu Integration and Tracking Unit. Includes 3 year TRX NEON Software License with 3 years of maintenance and support and 3 years of Cloud Service.
MA8100A-005	TRX NEON® Signal Mapper with Anritsu Integration and Tracking Unit. Includes 5 year TRX NEON Software License with 5 years of maintenance and support and 5 years of Cloud Service.
MA8100A-100	TRX NEON® Signal Mapper with Anritsu Integration and Tracking Unit. Includes Perpetual TRX NEON Software License with 3 years of maintenance and support and 3 years of Cloud Service.
2300-574	1 year TRX NEON Software License with 1 year of maintenance and support and 1 year of Cloud Service. Cannot be ordered separately from P/N MA8100A-001. See P/N 2300-612 for renewals.
2300-575	3 year TRX NEON Software License with 3 years of maintenance and support and 3 years of Cloud Service. Cannot be ordered separately from P/N MA8100A-003. See P/N 2300-613 for renewals.
2300-576	5 year TRX NEON Software License with 5 years of maintenance and support and 5 years of Cloud Service. Cannot be ordered separately from P/N MA8100A-005. See P/N 2300-614 for renewals.
2300-606	Perpetual TRX NEON Software License with 3 years of maintenance and support and 3 years of Cloud Service. Part number can also be used to order a perpetual license after a limited term license has expired.
2300-612	Renewal of 1 year TRX NEON Software License with 1 year of maintenance and support and 1 year of Cloud Service.
2300-613	Renewal of 3 year TRX NEON Software License with 3 years of maintenance and support and 3 years of Cloud Service.
2300-614	Renewal of 5 year TRX NEON Software License with 5 years of maintenance and support and 5 years of Cloud Service.

Backpack and Transit Case

Part Number	Description
67135	Anritsu Backpack (For Handheld Instrument and PC)
760-243-R	Large Transit Case with Wheels and Handle 56 cm x 45.5 cm x 26.5 cm (22.07" x 17.92" x 10.42")
760-271-R	Transit Case for Portable Directional Antennas and Port Extender 52.4 cm x 42.8 cm x 20.6 cm (20.62" x 16.87" x 8.12") (for 2000-1777-R, 2000-1778-R, 2000-1779-R, 2000-1798-R)

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