

# PIM Master™ MW82119B

## Passive Intermodulation Analyzer with Site Master™ Cable & Antenna Analyzer Option

### Introduction

Anritsu introduces the first fully integrated Passive Intermodulation (PIM) Analyzer plus Cable and Antenna Analyzer (Option 331) suitable for commissioning and maintaining global wireless networks. This high performance, battery operated unit allows operators to fully characterize infrastructure quality by measuring Return Loss, VSWR, Cable Loss, Passive Intermodulation, Distance-to-Fault, and Distance-to-PIM with a single test instrument.

#### Passive Intermodulation (PIM) Analyzer Highlights

- Measurements: PIM vs. Time, Swept PIM, Noise Floor, Distance-to-PIM
- 3rd, 5th, and 7th order intermodulation products
- Test power: 20 dBm to 46 dBm
- Residual PIM: -125 dBm typical

#### Cable and Antenna Analyzer Highlights (Option 331)

- Measurements: RL, VSWR, Cable Loss, DTF, Phase
- Frequency range: 2 MHz to 3 GHz
- Sweep Speed: 1 ms/data point, typical
- Calibration: OSL and FlexCal™

#### Capabilities and Functional Highlights

- Integrated solution
- Battery operated: >3.0 hour run time
- Display: 8.4 in (213 mm) daylight viewable
- IP54 rated for dust and water spray
- MIL-STD-810G drop test rated
- Stainless steel lifting rings
- Padded soft case for extra protection
- Easy-to-use, menu driven user interface
- Quick Name Matrix simplifies naming in the field
- GPS tag measurements (Option 31)
- High Accuracy Power Meter (Option 19)



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**Definitions**

	All specifications and characteristics apply under the following conditions, unless otherwise stated:
Warm-Up Time	After 10 minutes of warm-up time, where the instrument is left in the ON state.
Typical Performance	Typical specifications that are not in parenthesis are not tested and not warranted. They are generally representative of characteristic performance. Typical specifications in parenthesis ( ) represent the mean value of measured units and do not include any guard bands or uncertainties. They are not warranted.
Uncertainty	A coverage factor of k=2 is applied to the measurement uncertainties.
Calibration Cycle	Recommended calibration cycle is 12 months.
	All specifications subject to change without notice. For the most current data sheet, please visit the Anritsu web site: <a href="http://www.anritsu.com">www.anritsu.com</a>



## General Specifications

### PIM Master Connectors

PIM Test Port	7/16 DIN, female, 50 Ω
Dual USB Type A	2x Type A (connect USB Flash Drive and USB Power Sensor)
USB Mini-B	1x Mini-B (connect to PC for data transfer)
GPS	SMA, female (with GPS option only)
External Power	2.1 mm x 5.5 mm barrel connector, 12 to 15 VDC, < 5.0 A
PIM Test Port Damage Level	+13 dBm (20 mW) continuous, (PIM Rx band) +35 dBm (3 W) continuous, (PIM Tx band)*
VNA Test Port	Type N, female, 50 Ω
VNA Test Port Damage Level	40 dBm continuous
*	Able to survive full reflection of 2 X 46 dBm PIM test tones generated by the MW82119B.

### Display

Size	213 mm (8.4 in) touch screen
Resolution	800 x 600

### Battery

Type	Li-Ion
Battery Operation	3.0 hours, typical
Charging Limits	While charging, battery must be 0 °C to +45 °C, Relative Humidity ≤ 80 %

### Power

AC/DC Adapter	Input: 100–240 VAC, 50/60 Hz, Output: 12 VDC
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### Electromagnetic Compatibility

European Union	CE Mark EMC Directive: 2004/108/EC Standards: • Emissions: EN 55011:2009 +A1:2010 Group 1 Class A • Immunity: EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-11
Australia and New Zealand	C-tick N274

### Safety

European Union	CE Mark Low Voltage Directive: 2006/95/EC Standard: EN 61010-1:2010 (when used with Anritsu Company supplied Power Supply meeting IEC 60950-1)
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### Environmental

Operating Temperature	-10 °C to 55 °C
Storage Temperature	-51 °C to 71 °C
Maximum Relative Humidity	95 %, Non-condensing
Ingress Protection (IP)	IP54, IP67 when enclosed in optional transit case
Mechanical Shock	MIL-PRF-28800F Class 2, (30G half-sine, 6 shocks each axis, while operating)
Transit Drop	MIL-STD-810G, Method 516.6, Procedure IV, 122 cm (48 in) drop height, each face, edge and corner, (26 drops total), in soft carry case.
Altitude	4600 meters (15092 ft), operating and non-operating

### ESD

PIM Test Port Connector Center Pin	Withstands up to ± 15 kV
VNA RF Out Connector Center Pin	Withstands up to ± 15 kV

### Size and Weight

Size	350 mm x 314 mm x 152 mm (13.8 in x 12.4 in x 6.0 in)
Weight	9.2 kg to 12.4 kg (20 lb to 27 lb), varies by frequency option.



## PIM Analyzer Specifications

### Measurements

Measurements	PIM vs. Time Noise Floor Distance-to-PIM Swept PIM
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### Setup Parameters

Frequency	Carrier F1, Carrier F2, Intermodulation Order
Amplitude	Ref Value, Scale, Auto Range (On/Off), Amplitude Tone (On/Off)
Setup	Output Power, Test Duration (1 s to 1,200 s)
Limit Lines	Limit (Upper/Lower), On/Off, Limit Move, Limit Alarm (On/Off, PASS/FAIL indicator)
Markers	Markers 1–6 (On/Off), Delta Markers 1–6 (On/Off), Marker to Peak/Valley, All Markers Off
GPS	On/Off, 3.3/5.0 V
DTP	Cable Velocity, Distance

### PIM Measurement Ranges

Test Method	Reverse (reflected) Passive Intermodulation (PIM) per IEC-62037-1
Intermodulation Order	3rd, 5th, and 7th order, when in receive band (user selectable)
RF Test Power	Two CW tones 20 dBm to 46 dBm, 0.1 dBm steps
Residual PIM Performance	<-117 dBm, <-125 dBm typical ( 2x 43 dBm test tones)
PIM Measurement Range	-70 dBm to -140 dBm

Option	Band	Frequency Range
Option 0700	LTE 700	Tx <sub>1</sub> : 734 MHz to 734.5 MHz, Tx <sub>2</sub> : 746 MHz to 768 MHz Rx <sub>Lower</sub> : 698 MHz to 717 MHz, Rx <sub>Upper</sub> : 777 MHz to 806 MHz
Option 0702	APT 700	Tx <sub>1</sub> : 768 MHz to 776 MHz, Tx <sub>2</sub> : 788 MHz to 807 MHz Rx <sub>Lower</sub> : 713 MHz to 738 MHz, Rx <sub>Upper</sub> : 825 MHz to 845 MHz
Option 0800	LTE 800	Tx <sub>1</sub> : 791 MHz to 795 MHz, Tx <sub>2</sub> : 811.5 MHz to 821 MHz Rx: 832 MHz to 862 MHz
Option 0850	Cellular 850	Tx <sub>1</sub> : 869 MHz to 871 MHz, Tx <sub>2</sub> : 881.5 MHz to 894 MHz Rx: 824 MHz to 849 MHz
Option 0900	E-GSM 900	Tx <sub>1</sub> : 925 MHz to 937.5 MHz, Tx <sub>2</sub> : 951.5 MHz to 960 MHz Rx: 880 MHz to 915 MHz
Option 0180	DCS 1800	Tx <sub>1</sub> : 1805 MHz to 1837 MHz, Tx <sub>2</sub> : 1857.5 MHz to 1880 MHz Rx: 1710 MHz to 1785 MHz
Option 0194	PCS/AWS	Tx <sub>1</sub> : 1930 MHz to 1945 MHz, Tx <sub>2</sub> : 1965 MHz to 1995 MHz, Tx <sub>3</sub> : 2110 MHz to 2155 MHz, Rx <sub>1</sub> : 1850 MHz to 1910 MHz (using Tx <sub>1</sub> and Tx <sub>2</sub> ), Rx <sub>2</sub> : 1710 MHz to 1755 MHz (using Tx <sub>1</sub> and Tx <sub>3</sub> )
Option 0210	UMTS 2100	Tx <sub>1</sub> : 2110 MHz to 2112.5 MHz, Tx <sub>2</sub> : 2130 MHz to 2170 MHz Rx <sub>Lower</sub> : 1920 MHz to 1980 MHz, Rx <sub>Upper</sub> : 2050 MHz to 2090 MHz
Option 0260	LTE 2600	Tx <sub>1</sub> : 2620 MHz to 2630 MHz, Tx <sub>2</sub> : 2650 MHz to 2690 MHz Rx: 2500 MHz to 2570 MHz

### PIM vs. Time

Description	IM product magnitude vs. time
Test Frequencies	F1, F2, and IM product frequencies fixed, user selectable
Measurements	Peak PIM over measurement duration, Instantaneous PIM

### Noise Floor

Description	Noise level vs. time at IM product frequency
Test Frequencies	IM product frequency fixed, user selectable
Measurements	Peak signal level over measurement duration, Instantaneous signal level

### Distance-to-PIM

Description	IM product magnitude vs. distance
Test Frequencies	F1 or F2 frequency swept to produce range of IM product frequencies for analysis
Fault Resolution	Varies by frequency option, <3 m (<10 ft) typical with Enhanced Resolution activated
Maximum Range	Varies by frequency option and number of Data Points selected
Markers	Standard marker functions plus Marker Table (On/Off)
Trace Overlay	DTP/DTP, DTP/DTP

### Swept PIM

Description	IM product magnitude vs. frequency
Test Frequencies	F1 and F2 frequencies swept to produce range of IM product frequencies
Measurements	Peak PIM over measurement duration, Instantaneous PIM



## Cable and Antenna Analyzer (Option 331)

### 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)
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### 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), RF Pwr When Hold (On/Off)
Data Points	137, 275, 551, 1102, 2204
Markers	Markers 1-6 (On/Off), Delta Markers 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	Impedance (50 Ω, 75 Ω, Other)

### Frequency

Frequency Accuracy	±1.0 ppm at 23 °C
Stability	±1.0 ppm from -10 °C to +55 °C, typical
Aging	±1.0 ppm/yr, typical

### Output Power

Power Level	-4 dBm, typical
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### 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 °

### Smith Chart

Resolution	0.01 50/75 Ohm Selectable
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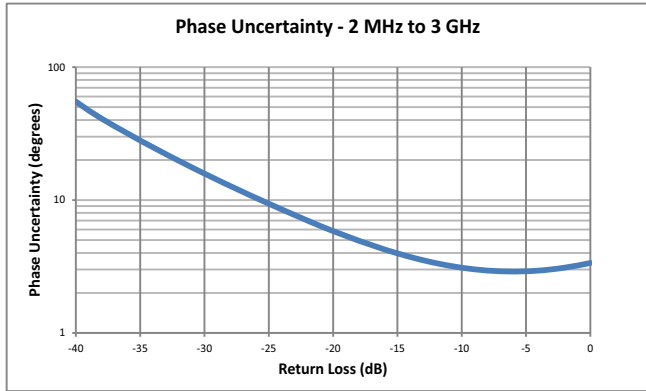
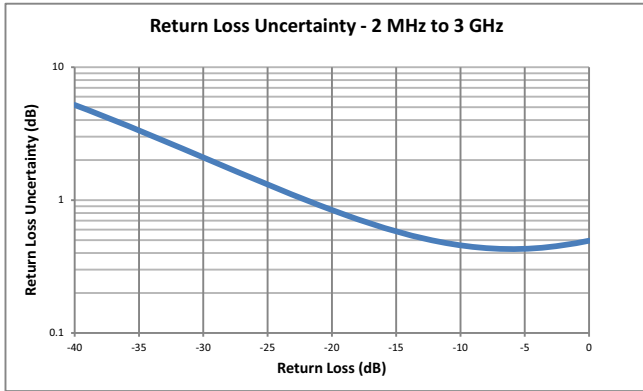


**Cable and Antenna Analyzer (Option 331)** (Continued)

**Measurement Accuracy**

Corrected Directivity > 42 dB, OSL Calibration

**Measurement Uncertainty**



**GPS Receiver Option** (Option 0031) (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
- Connector SMA, Female



## High Accuracy Power Meter (Option 0019) (Requires external USB Power Sensor)

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	PSN50 <sup>1</sup>	MA24105A	MA24106A	MA24108A/18A/26A
Description	High Accuracy RF Power Sensor	Inline Bi-Directional High Power Sensor	High Accuracy RF Power Sensor	Microwave USB Power Sensor
Frequency Range	50 MHz to 6 GHz	350 MHz to 4 GHz	50 MHz to 6 GHz	10 MHz to 8 GHz (MA24108A) 10 MHz to 18 GHz (MA24118A) 10 MHz to 26 GHz (MA24126A)
Connector	Type N(m), 50 Ω	Two Type N(f), 50 Ω	Type N(m), 50 Ω	Type N(m), 50 Ω (MA24108A/18A) Type K(m), 50 Ω (MA24126A)
Dynamic Range	-30 dBm to +20 dBm (0.001 mW to 100 mW)	+3 dBm to +51.76 dBm (2 mW to 150 W) – Avg +33 dBm to +54.77 dBm (2 W to 300 W) – Peak	-40 dBm to +23 dBm (0.1 μW to 200 mW)	-40 dBm to +20 dBm (0.1 μW to 100 mW)
VBW	100 Hz	100 Hz	100 Hz	50 kHz
Measurand	True-RMS	True-RMS, Peak	True-RMS	True-RMS, Slot Power, Burst Average Power
Measurement Uncertainty	± 0.16 dB <sup>2</sup>	± 0.17 dB <sup>3</sup>	± 0.16 dB <sup>2</sup>	± 0.18 dB <sup>4</sup>
Datasheet (for complete specifications)	11410-00414	11410-00621	11410-00424	11410-00504

## Notes:

1. The PSN50 sensor can be used only with Anritsu handheld instruments with Option 19. The MA241xxA sensors work with Anritsu instruments with Option 19 and also can be used separately with a PC.
2. Total RSS measurement uncertainty (0 °C to 50 °C) for power measurements of a CW signal greater than -20 dBm with zero mismatch errors.
3. 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.
4. Expanded uncertainty with K = 2 for power measurements of a CW signal greater than -20 dBm with zero mismatch errors.

**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 Current Files	Open PIM 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, PIM vs. Time, Swept PIM, Noise Floor, and DTP
Trace Formats	DAT, PIM, 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
PIM Report	Tabular summary report with pass/fail analysis

**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
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**easyTest Tools** (for your PC)

<b>Instrument Mode</b>	Cable & Antenna Analyzer Mode (Option 331)
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**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
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**Ordering Information**



<b>Model Number</b>	<b>Description</b>
MW82119B	PIM Master™ Passive Intermodulation Analyzer (must be ordered with ONE frequency option)
	<b>Frequency Options</b> (must order one, and only one)
MW82119B-0700	LTE 700
MW82119B-0702	APT 700
MW82119B-0800	LTE 800
MW82119B-0850	Cellular 850
MW82119B-0900	E-GSM 900
MW82119B-0180	DCS 1800
MW82119B-0194	PCS/AWS 1900/2100
MW82119B-0210	UMTS 2100
MW82119B-0260	LTE 2600
	<b>Other Options</b>
MW82119B-0019	High Accuracy Power Meter (requires USB power sensor)
MW82119B-0031	GPS Receiver (requires GPS antenna)
MW82119B-0331	Site Master™ Cable and Antenna Analyzer
MW82119B-0098	Standard Calibration to ISO 17025 and/or Z540.1
MW82119B-0099	Premium Calibration to ISO 17025 and/or Z540.1 plus test data

**Standard Accessories**



<b>Part Number</b>	<b>Description</b>
2000-1786-R	Soft Carrying Case, Screen Access
2000-1714-R	Shoulder Strap
2000-1691-R	Stylus with Coiled Tether
2000-1797-R	Screen Protector Film, 8.4 in.
1091-422-R	Adapter, 7/16 DIN(f) to 7/16 DIN(m), 50 Ω (Connector Saver)
2300-577	Anritsu Software Tool Box for Handheld RF Instruments Disc
633-75	High-capacity Li-Ion Battery Pack
40-187-R	AC/DC Power Supply
	(Country dependent) AC Power Cable
806-141-R	Automotive Power Adapter, 12 VDC, 60 W
2000-1371-R	Ethernet Cable, 7 ft/213 cm
3-2000-1498	USB A-Mini B Cable, 10 ft/305 cm
10920-00060	Handheld Instruments Documentation Disc Three-year warranty (battery one-year warranty) Certificate of Calibration

**Miscellaneous Accessories**



<b>Part Number</b>	<b>Description</b>
2000-1374	Dual Battery Charger
2000-1528-R	GPS Antenna, SMA(m) with 15 ft cable
2000-1652-R	GPS Antenna, SMA(m) with 1 ft cable
2000-1760-R	GPS Antenna, SMA(m), 25 dB gain
67135	Backpack for Accessories
760-259-R	Transit Case (holds MW82119A/B PIM Analyzer only)
760-265-R	Transit Case (holds MW82119A/B PIM Analyzer plus accessories)

Miscellaneous Accessories (continued)

**Power Sensors** (For complete ordering information, see the respective datasheet of each sensor)



Model Number	Description
	<b>Requires an instrument with Option 19.</b>
PSN50	High Accuracy RF Power Sensor, 50 MHz to 6 GHz, -30 dBm to +20 dBm
	<b>Requires instrument with Option 19, or may be used separately with a PC.</b>
MA24105A	Inline Peak Power Sensor, 350 MHz to 4 GHz, +3 dBm to +51.76 dBm
MA24106A	True-RMS Power Sensor, 50 MHz to 6 GHz, -40 dBm to +23 dBm
MA24108A	True-RMS USB Power Sensor, 10 MHz to 8 GHz, -40 dBm to +20 dBm
MA24118A	True-RMS USB Power Sensor, 10 MHz to 18 GHz, -40 dBm to +20 dBm
MA24126A	True-RMS USB Power Sensor, 10 MHz to 26 GHz, -40 dBm to +20 dBm

**Attenuators** (Recommended for power measurements only. Not Low PIM.)

Part Number	Description
3-1010-122	Attenuator (Bi-directional), 20 dB, 5 Watt, DC to 12.4 GHz, N(m) to N(f)
3-1010-123	Attenuator (Bi-directional), 30 dB, 50 Watt, DC to 8.5 GHz, N(m) to N(f)
3-1010-124	Attenuator (Bi-directional), 40 dB, 100 Watt, DC to 8.5 GHz, N(m) to N(f)

PIM Analyzer Accessory Kits

Part Number	Description
2000-1745-R	PIM Master Backpack Accessory Kit (Includes common items below plus 67135 backpack)
2000-1746-R	PIM Master Hard Case Accessory Kit (Includes common items below plus 760-260-R transit case)



Qty	Part Number	Items Common to Both Accessory Kits
1	2000-1626-R	PIM Test Cable, 3.0 m, 7/16 DIN(m) to 7/16 DIN(m), 50 Ω
1	2000-1749-R	Low PIM Termination, 700 MHz to 2600 MHz, 10 W, 7/16 DIN(m), 7/16 DIN(f), 50 Ω
1	1091-390-R	PIM Standard, -80 dBm ±3 dB at 1775 MHz, with 2x 20 W, 7/16 DIN(m) to 7/16 DIN(f), 50 Ω
2	1091-425-R	Low PIM Adapter, 7/16 DIN(f) to N(f), DC to 3.0 GHz, 50 Ω
2	1091-426-R	Low PIM Adapter, 7/16 DIN(f) to N(m), DC to 3.0 GHz, 50 Ω
1	1091-427-R	Low PIM Adapter, 7/16 DIN(f) to 7/16 DIN(f), DC to 3.0 GHz, 50 Ω
1	01-510	Adjustable Wrench
1	01-513-R	1-1/4 in Torque Wrench
1	971-9-R	Cleaning Wipes
1	971-10-R	Cleaning Swabs
1	11410-00726	Equipment Verification Guide

**Optional PIM Analyzer Accessories**



Part Number	Description
16DD50-2.75-R	Armored PIM Test Cable, 2.75 m, 7/16 DIN(m) to 7/16 DIN(m), 50 Ω
16DD50-4.0-R	Armored PIM Test Cable, 4.0 m, 7/16 DIN(m) to 7/16 DIN(m), 50 Ω
2000-1626-R	PIM Test Cable, 3.0 m, 7/16 DIN(m) to 7/16 DIN(m), 50 Ω
2000-1783-R	PIM Test Cable, 3.0 m, 7/16 DIN(m) to 7/16 DIN(f), 50 Ω
2000-1724-R	Low PIM Termination, 700 MHz to 2600 MHz, 40 W, 7/16 DIN(m), 7/16 DIN(f), 50 Ω
2000-1749-R	Low PIM Termination, 700 MHz to 2600 MHz, 10 W, 7/16 DIN(m), 7/16 DIN(f), 50 Ω
1091-390-R	PIM Standard, -80 dBm ±3 dB at 1775 MHz, with 2 x 20 W, 7/16 DIN(m) to 7/16 DIN(f), 50 Ω
1091-421-R	Low PIM Adapter, 7/16 DIN(m) to 7/16 DIN(m), DC to 3.0 GHz, 50 Ω
1091-422-R	Low PIM Adapter, 7/16 DIN(m) to 7/16 DIN(f), DC to 3.0 GHz, 50 Ω
1091-423-R	Low PIM Adapter, 7/16 DIN(m) to N(m), DC to 3.0 GHz, 50 Ω
1091-424-R	Low PIM Adapter, 7/16 DIN(m) to N(f), DC to 3.0 GHz, 50 Ω
1091-425-R	Low PIM Adapter, 7/16 DIN(f) to N(f), DC to 3.0 GHz, 50 Ω
1091-426-R	Low PIM Adapter, 7/16 DIN(f) to N(m), DC to 3.0 GHz, 50 Ω
1091-427-R	Low PIM Adapter, 7/16 DIN(f) to 7/16 DIN(f), DC to 3.0 GHz, 50 Ω
1091-431-R	Low PIM Adapter, 45°, 7/16 DIN(m) to 7/16 DIN(f), DC to 3.0 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
01-510	Adjustable Wrench
01-513-R	1-1/4 in Torque Wrench
971-9-R	Cleaning Wipes
971-10-R	Cleaning Swabs

**Optional Cable & Antenna Analyzer Accessories**

**Calibration Components, 50 Ω** (These components are not designed to withstand PIM test power levels. Suitable for Cable and Antenna Analyzer measurements only.)



Part Number	Description
OSLN50-1	Precision Open/Short/Load, N(m), 42 dB, 6.0 GHz, 50 Ω
OSLNF50-1	Precision Open/Short/Load, N(f), 42 dB, 6.0 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
SM/PLNF-1	Precision Load, N(f), 42 dB, 6.0 GHz

**Optional Cable & Antenna Analyzer Accessories** (continued)

**Phase-Stable Test Port Cables, Armored w/Reinforced Grip** (Recommended for cable and antenna line sweep applications only. Not low PIM.)



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 Adaptor Phase Stable Test Port Cables, Armored w/Reinforced Grip** (Recommended for cable and antenna line sweep applications. Not low PIM. It uses the same ruggedized grip as the Reinforced Grip series cables. Now you can also change the adaptor 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 cable and antenna line sweep applications only. Not Low PIM. 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

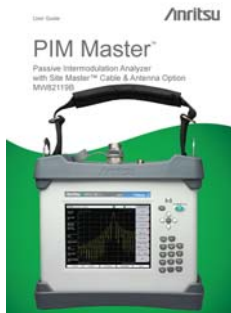
**Optional Cable & Antenna Analyzer Accessories** (continued)

**Precision Adapters** (Recommended for cable and antenna line sweep applications only. Not Low PIM.)



Part Number	Description
34NN50A	N(m) to N(m), DC to 18 GHz, 50 Ω
34NFF50	N(f) to N(f), DC to 18 GHz, 50 Ω
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
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

**Manuals** (Soft copy included on Handheld Instruments Documentation Disc and at [www.anritsu.com](http://www.anritsu.com))



Part Number	Description
10920-00060	Handheld Instruments Documentation Disc
10580-00400	PIM Master User Guide
10580-00402	PIM Master Measurement Guide
10580-00403	PIM Master Programming Manual
10580-00241	Cable and Antenna Analyzer Measurement Guide
10580-00240	Power Meter Measurement Guide - High Accuracy Power Meter
11410-00473	Troubleshooting Guide – Cable, Antenna, and Components

**Anritsu Training** [www.anritsu.com/training](http://www.anritsu.com/training)

Part Number	Description
10580-00045	Site Master™ Certified Line Sweep
10580-00370	PIM Master™ Certified PIM Measurement







The Master Users Group is an organization dedicated to providing training, technical support, networking opportunities and links to Master product development teams. As a member, you will receive the Insite Quarterly Newsletter with user stories, measurement tips, new product news and more. Visit us to register today: [www.anritsu.com/mug](http://www.anritsu.com/mug)



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List Revision Date: 20140624



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