

# Anritsu

 envision : ensure

## PIM Master™

Passive Intermodulation (PIM) Analyzer with  
Site Master™ Cable & Antenna Analyzer Option

700 MHz, 800 MHz, 850 MHz, 900 MHz, 1800 MHz,  
1900/2100 MHz, 2100 MHz, 2600 MHz



# From the leader in Cable and Antenna Analysis Anritsu introduces the next generation PIM Master™

The PIM Master, with Site Master™ option, provides an integrated test solution, capable of certifying both, passive intermodulation (PIM) and line sweep performance with a single test instrument. The new PIM Master offers the same ease of use, ruggedness, and familiar menus as its predecessor, along with new features to enhance productivity and speed site testing.

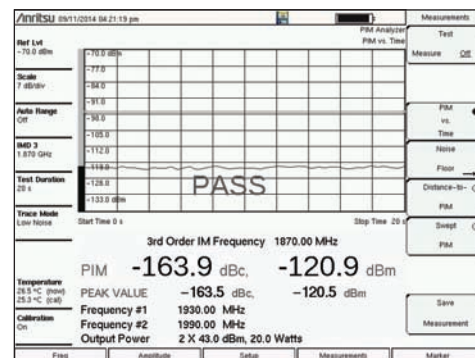


- Integrated PIM and sweep testing
- Trusted performance
- Designed for field use

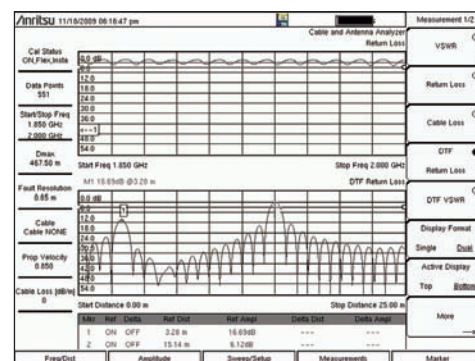
Contractors and maintenance technicians now only need to carry one tool, to fully certify cable and antenna system performance.

## Features

- Return Loss, VSWR
- Cable Loss
- Distance-to-Fault
- PIM
- Distance-to-PIM



PIM Analyzer



Cable and Antenna Analyzer (Option 331)

# Passive Intermodulation (PIM) analyzer with optional Site Master™ Line Sweep capability

## Integrated Test Solution



### Passive Intermodulation Analyzer Features

Feature	Description
Measurement Frequencies	700 MHz (APT), 700 MHz (North America), 800 MHz, 850 MHz, 900 MHz, 1800 MHz, 1900 MHz, 1900/2100 MHz, 2100 MHz, 2600 MHz
Measurements	PIM versus Time, Swept PIM, Noise Floor, Distance-to-PIM (DTP)
IM products	3 <sup>rd</sup> , 5 <sup>th</sup> and 7 <sup>th</sup> order IM products, (Option 902 also measures 2 <sup>nd</sup> order IM)
Test power	20 dBm (0.1 Watt) to 46 dBm (40 Watt)
Low Residual PIM	-117 dBm max / -125 dBm typical
Internal DTP	Fully integrated, no external modules required

### Cable and Antenna Features (Option 331)

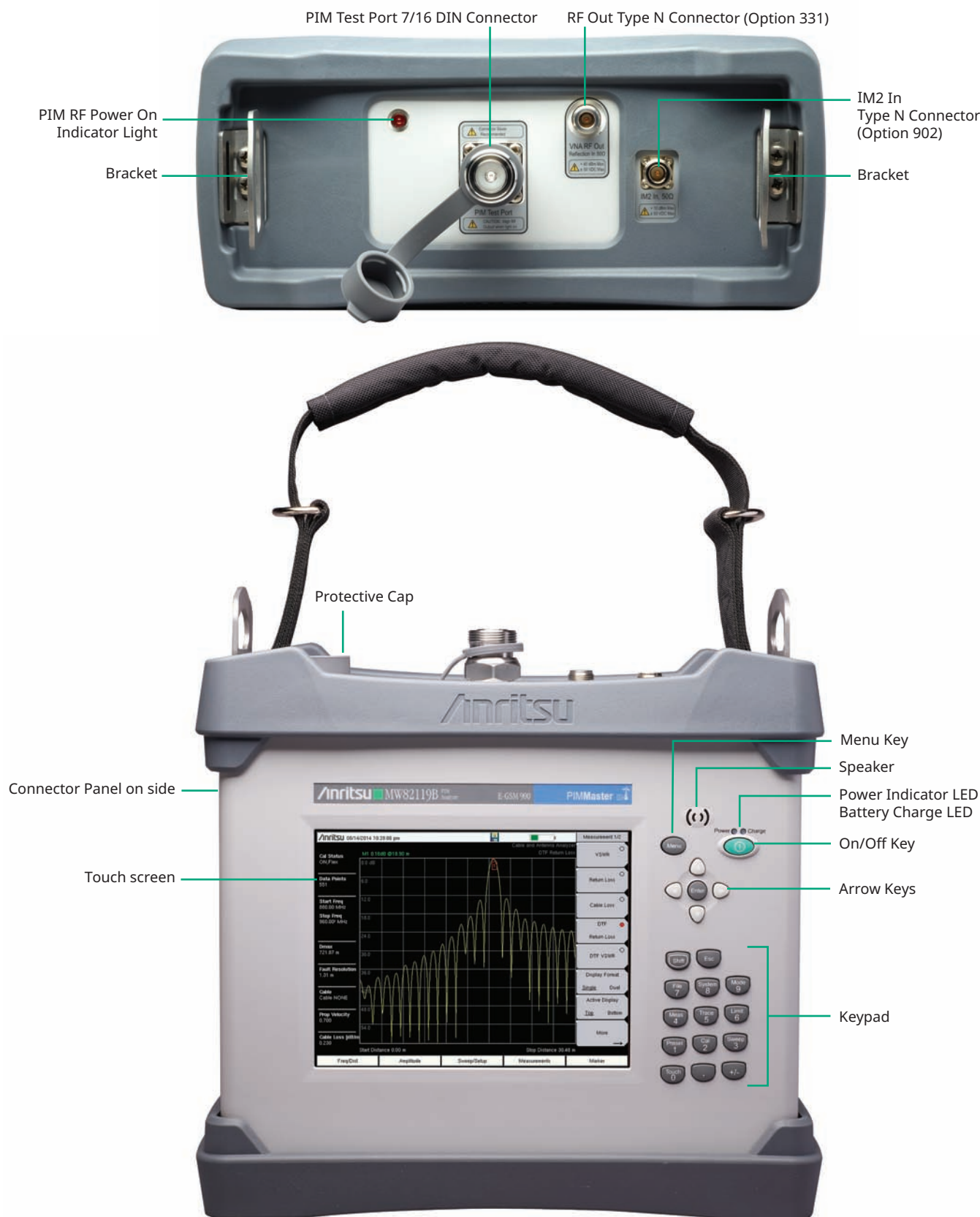
Feature	Description
Measurement Frequency	2 MHz to 3 GHz
Measurements	Return Loss, VSWR, Cable Loss, Distance-to-Fault (DTF), Phase, Smith Chart
High measurement accuracy	> 42 dB directivity, OSL calibration
High interference immunity	0 dBm within $\pm 10$ kHz of carrier frequency

### Features

Feature	Description
Battery operated	12 VDC Li-ion Battery, >3.0 hr. run time per battery
Small size	350 mm x 314 mm x 152 mm (13.8 in x 12.4 in x 6.0 in)
Lightweight	9.2 kg to 12.4 kg (20 lb to 27 lb), varies by frequency option
Touch screen display	8.4 in (213 mm) daylight viewable
Operating temperature range	-10 °C to +55 °C
Ingress Protection	IP54 rated for dust and water spray, IP67 inside transit case
Shock Resistant	MIL-STD-810G drop tests inside soft carry case, 26 drops, 48 in (122 cm) drop height
Remote control	>300 ft (>100m) with external WiFi router
GPS data tagging	Option 31, requires GPS antenna
High Accuracy Power Meter	Option 19, requires USB power sensor



## Designed for the Field

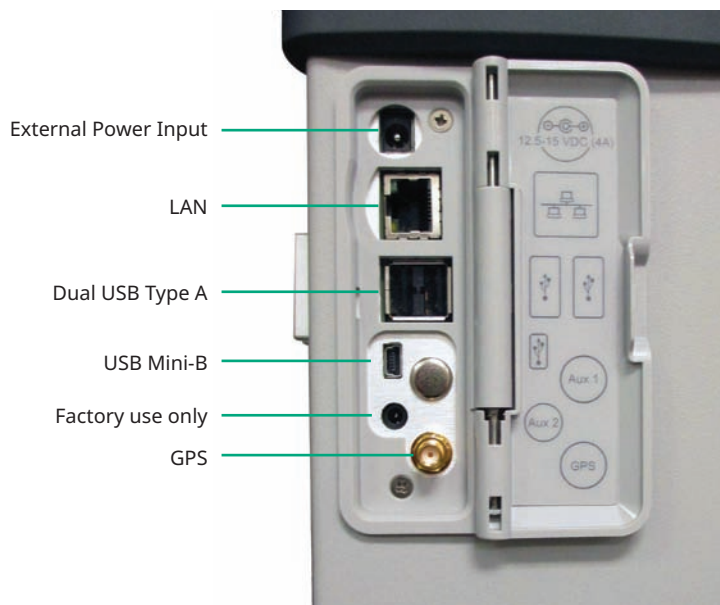


Size: 350 mm x 314 mm x 152 mm (13.8 in x 12.4 in x 6.0 in)  
 Lightweight: 9.2 kg to 12.4 kg (20 lb to 27 lb), varies by frequency option

## Convenient user access to screen and I/O ports



Softcase opens in front for easy access and use.



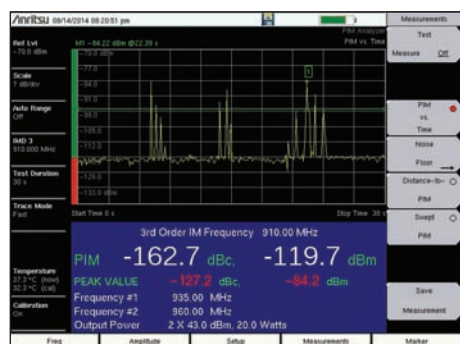
Connector panel on the left side of the MW82119B PIM Master



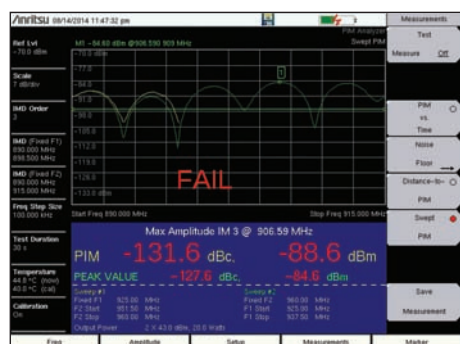
MW82119B with sturdy Tilt Bail

# PIM Master Passive Intermodulation (PIM) Analyzer Features

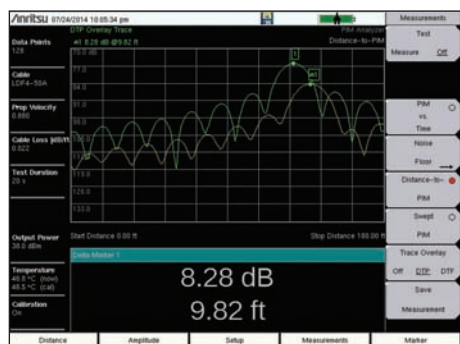
PIM Master is a battery-operated, high power Passive Intermodulation (PIM) testing solution supporting major wireless standards in use around the world. PIM is a form of interference generated by components such as connectors, cable assemblies, filters, and antennas. When subjected to the downlink signals at a cell site, these normally linear components can generate spurious signals. PIM Master is a specialized test instrument able to measure system linearity and identify fault locations both inside the cable system and beyond the antenna.



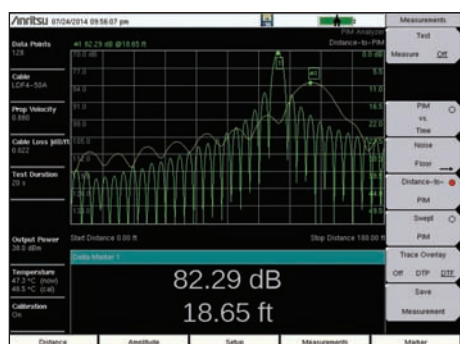
PIM vs. Time



Swept PIM



Trace Overlay - DTP/DTF



Trace Overlay - DTP/DTF

## PIM vs. Time

PIM vs. Time is a fixed frequency test that displays PIM magnitude over time. This measurement is particularly useful for dynamic PIM tests since it captures the peak PIM value for pass / fail analysis, as well as provides a visual indication of the stability of the system under test.

## Swept PIM

Swept PIM tests measure IM product magnitude versus frequency. The test is conducted by holding one test frequency fixed while varying the second test frequency, causing the IM product to "sweep" across the receive band of the system.

When multiple PIM sources are present on a line, it is possible for the signals to combine out of phase, creating low PIM readings at some frequencies and high PIM readings at others. A Swept PIM test evaluates a range of IM product frequencies, giving users a clearer picture of the true PIM performance of a system.

## Distance-to-PIM (DTP)

Distance-to-PIM (DTP) is similar to Distance-to-Fault (DTF), first introduced on the Anritsu Site Master™ in 1997. DTP quickly and accurately identifies the location of PIM faults both inside the feed system as well as beyond the antenna. This capability eliminates the guesswork involved in isolating PIM sources and speeds site repairs.

## Trace Overlay

Trace overlay is a feature that allows real time comparison between the active DTP measurement and a previously recorded DTP or DTF trace. Knowing where a PIM source is located relative to a known "PIM marker" or known RF connection simplifies troubleshooting for faster fault identification.

DTP/DTF overlays can show whether a PIM fault is inside the feed system or beyond the antenna. Placing a known PIM source, such as steel wool, on the antenna radome and running DTP creates a marker at the antenna radiating surface that can be stored and compared to the system DTP trace. If the system DTP peak is farther away, the PIM is beyond the antenna.

Two DTF measurements are typically required for site certification. One, with a short circuit at the end of the cable, used to measure the cable length, and a second, with a precision load at the end of the cable, used to evaluate connection quality. DTP/DTF overlays, provide a "map" on the instrument screen to accurately show connector locations when evaluating PIM issues.

## Noise Floor

Noise Floor measurements are available that monitor the full Rx band or the current IM product frequency with the PIM Master transmitters turned off. This allows the user to quickly check to make sure the spectrum is clear of interference before performing a PIM test.

## 2 x 40 W Test Capability

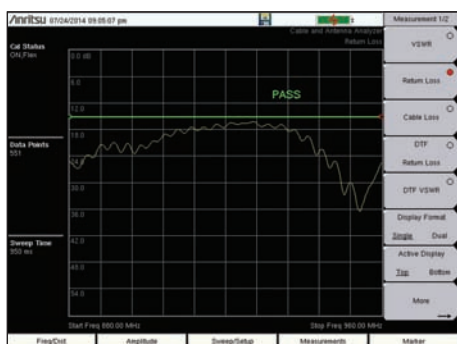
PIM Master allows operators to adjust the test power from 20 dBm (0.1 Watts) for indoor DAS testing to 46 dBm (40 Watts) for macro site testing. In both indoor and outdoor systems, PIM interference is highly dependent on the power level in use. By matching the PIM test power level more closely to the actual power level used at the site, operators will gain a clearer understanding of the true interference generated by both the RF infrastructure and the antenna environment.



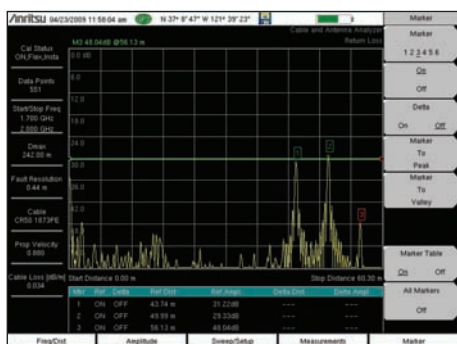
# Site Master Cable and Antenna Analyzer Features (Option 331)

The Anritsu Site Master™ is a trusted site commissioning tool that for nearly two decades has set the standard for Cable and Antenna Analysis. Using Return Loss (VSWR) as a quality metric, the Site Master is able to accurately detect sources of high reflections, caused by pinched cables, loose or corroded connectors, lightning strikes, and bullet holes. Left un-repaired, these defects can damage transmitters, reduce cell coverage, and lower data transmission rates.

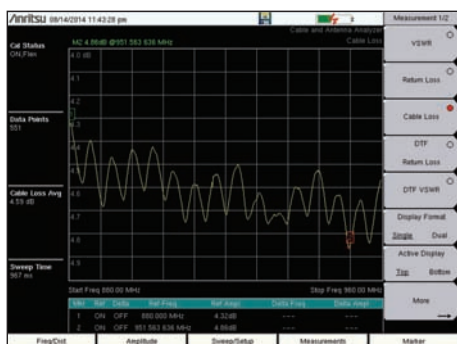
With the Site Master option installed, the PIM Master gains the single port measurement capabilities of an Anritsu S331E Site Master. This powerful combination provides the ability to measure Return Loss, VSWR, Cable Loss, Distance-to-Fault, PIM, and Distance-to-PIM with a single test instrument.



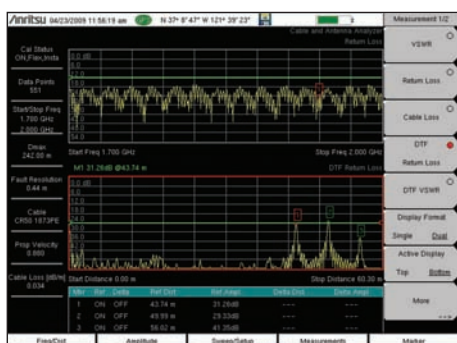
Return Loss / VSWR



Distance-to-Fault



Cable Loss



Dual Display

## Return Loss / VSWR

Use the Site Master option to make accurate return loss and VSWR measurements to certify that the cable and antenna system conforms to performance specifications.

## Cable Loss

With a short installed at the end of the cable, the Site Master option measures and displays the average cable loss of the system. Excessive cable loss not only reduces radiated power, but also masks return loss issues in the system.

## Distance-to-Fault (DTF)

While measuring return loss is an accurate way to verify system health, Distance-to-Fault (DTF) is a useful troubleshooting tool for locating system problems. The Site Master option's DTF measurement uses the fast Fourier transform to convert frequency data to the time domain and displays signal anomalies with respect to distance.

DTF is also useful for measuring the cable length. By placing a short circuit at the end of the cable, and knowing the cable properties, the length of the cable can be accurately measured. The Site Master option includes an extensive cable library, and allows users to quickly find and apply the correct cable parameters for distance measurements.

## Standard OSL Calibration

Open-Short-Load (OSL) calibration comes standard with the Site Master option. Calibration allows for accurate vector-corrected measurements by mathematically removing source match, directivity and frequency response errors. Directivity is the main contributor to measurement uncertainty, and corrected directivity of 42 dB or better is common using Anritsu precision components.

## FlexCal™

The Site Master option's FlexCal™ broadband calibration feature allows users to change the start and stop frequencies after calibration without having to recalibrate the instrument.

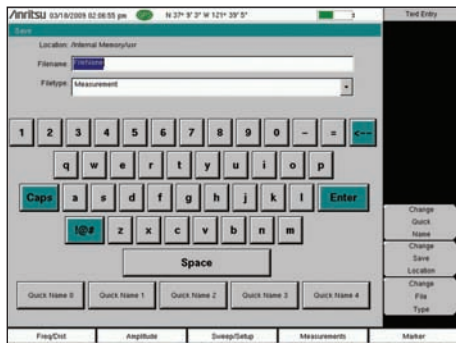
## RF Immunity

The Site Master option includes Anritsu's unique RF immunity algorithms enabling users to make accurate cable and antenna measurements even in the presence of strong RF activity from co-located cell sites.

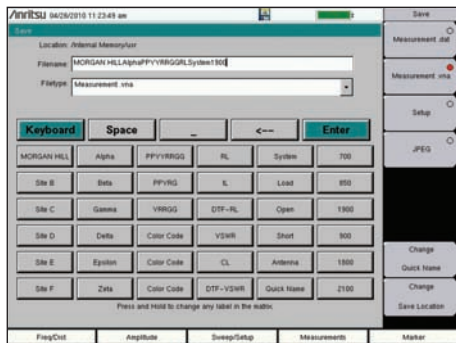
## Dual Display

The dual display enables users to view two cable and antenna measurements on the same display. Since the top and bottom displays can be controlled independently, users can set different markers and limit lines on each display. This results in significant time savings for measurements such as Cable Loss and Cable length that both require the same physical set-up.

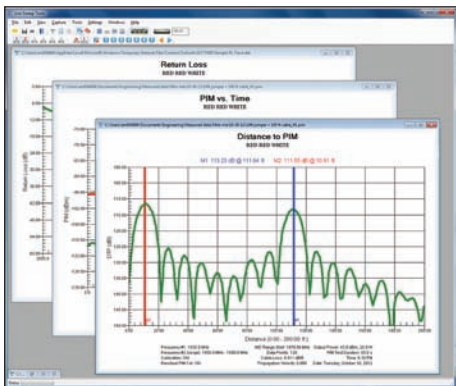
# Valuable Options and Features



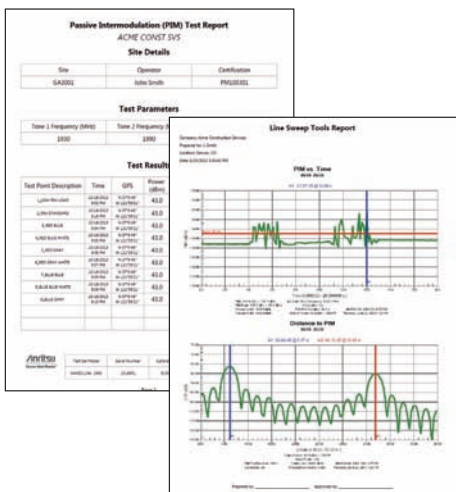
Built-in Keyboard



Quick Name Matrix



Line Sweep Tools (LST) utilized for report generation on a PIM trace



Test Reports generated using Line Sweep Tools (LST)

## Built-in keyboard

The built-in touch screen keyboard gives access to a fully functional keyboard for entering detailed test descriptions.

## Quick Name Matrix

The quick name matrix enables users to store commonly used words or phrases for fast file naming. Long file names containing cell site ID, sector information, color coding, measurement type, frequency, and termination can be generated in seconds with only a few button pushes.

## Local Language Support

Nine languages are included standard: English, Japanese, Chinese, Italian, French, German, Spanish, Russian and Korean. One custom user-defined language can be uploaded into the instrument using Anritsu Master Software Tools.

## Display appearance options

Five different screen settings are available to enhance visibility in different operating environments. This includes a Black & White setting to improve readability in direct sunlight as well as a Night Vision setting to reduce screen brightness for nighttime operation.

## File transfer

Measurement files can be easily transferred between the PIM Master and a PC for trace validation, report generation, and archiving. Transfer can happen by copying or saving the trace directly to a USB memory stick. Data can also be transferred over a USB or Ethernet cable.

## Line Sweep Tools (LST)

Line Sweep Tools increases productivity for people who deal with dozens of Cable and Antenna traces and Passive Intermodulation (PIM) traces, every day.

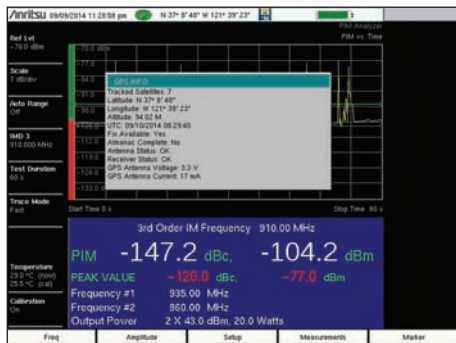
- Familiar user interface and short learning curve for users of Anritsu's Handheld Software Tools.
- Marker and Limit Line Presets make a quick task of applying markers and a limit line to similar traces, as well as validating traces, a quick task.
- Renaming Grid makes changing file names, trace titles, and trace subtitles from field values to those required for a report much quicker than manual typing and is less prone to error.
- Report Generator will generate a professional looking PDF of all open traces with additional information such as contractor logos and contact information.
- PIM Report Generator will generate a tabular summary report of all open PIM vs. Time, Noise Floor, and/or Swept PIM measurements complete with pass/fail analysis and summary of instrument settings.

## easyTest Tools

Anritsu's easyTest Tools allows experienced users to Create, Deliver, and Display work instructions that appear on the instrument screen. These work instructions make life easier for less experienced PIM and line sweep operators. Direct benefits include accurate testing, repeatable results, and less rework.



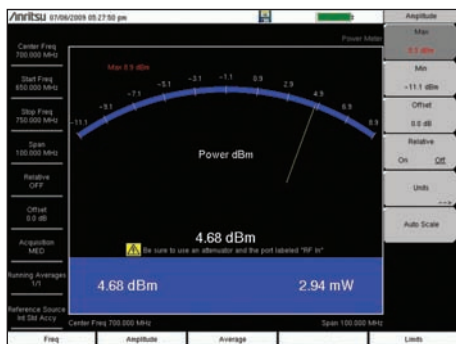
# Valuable Options and Features



GPS dialog

## GPS Option (Option 31)

PIM Master's GPS option can be used to confirm the exact measurement location (longitude, latitude, altitude) and Universal Time (UT) information. Each trace can be stamped with location information to ensure you are taking measurements at the right location.



High Accuracy Power Meter

## High Accuracy Power Meter (Option 19)

Anritsu's high accuracy power meter option enables you to make high accuracy RMS measurements. This capability is perfect for measuring both CW and digitally modulated signals such as CDMA/EV-DO, GSM/EDGE, WCDMA/HSPA+, and P25. You can select from a wide range of USB sensors delivering better than  $\pm 0.16$  dB accuracy. An additional benefit of using the USB connection is that a separate DC supply (or battery) is not needed since the necessary power is supplied by the USB port.

### USB Power Sensor (requires instrument with Option 19)

PSN50 High Accuracy Power Sensor, 50 MHz to 6 GHz,  
-30 dBm to +20 dBm

### USB Power Sensors (require instrument with Option 19 or may be used separately with a PC)

MA24105A Inline Dual Directional High Power Sensor, 350 MHz to 4 GHz,  
+3 dBm to +51.76 dBm

MA24108A Microwave USB Power Sensor, 10 MHz to 8 GHz,  
-40 dBm to +20 dBm

MA24118A Microwave USB Power Sensor, 10 MHz to 18 GHz,  
-40 dBm to +20 dBm

MA24126A Microwave USB Power Sensor, 10 MHz to 26 GHz,  
-40 dBm to +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



High Accuracy Power Sensors

## Certified Training

Instructor led training courses are available for both PIM and Line Sweep measurements. Classes cover measurement theory, safety, best practices, assessing results, and hands-on, practical measurement exercises. Students passing the written and practical exams receive a Certificate of Completion and Wallet-sized certification card.

## Remote control

The PIM Master can be configured for remote control via WiFi to support a variety of testing scenarios. Line of site distances of  $> 100$  m ( $> 328$  ft) have been achieved allowing a person on the ground to control the test equipment while a person at the top of the mast makes connections. For PIM tests, this capability is also useful for rooftop testing, allowing one person to control the test remotely while following the cable run and performing dynamic PIM tests.



Remote Access Tool for Tower Top Testing

## Ordering Information



### Model Number

MW82119B

### Description

PIM Master™ Passive Intermodulation Analyzer  
(must be ordered with ONE frequency option)  
(must order one, and one only)

### Frequency Options

MW82119B-0700 LTE 700  
MW82119B-0701 APT 700  
MW82119B-0800 LTE 800  
MW82119B-0850 Cellular 850  
MW82119B-0900 E-GSM 900  
MW82119B-0902 E-GSM 900 w/ IM 2  
MW82119B-0180 DCS 1800  
MW82119B-0194 PCS/AWS 1900/2100  
MW82119B-0210 UMTS 2100  
MW82119B-0260 LTE 2600

### Other Options

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 (included with PIM Master)



### Part Number

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

### Description

Soft Carrying Case, Screen Access  
Shoulder Strap  
Stylus with Coiled Tether  
Screen Protector Film, 8.4 in.  
Adapter, 7/16 DIN(f) to 7/16 DIN(m), 50 Ω (Connector Saver)  
Anritsu Software Tool Box for Handheld RF Instruments Disc  
High-capacity Li-Ion Battery Pack  
AC/DC Power Supply  
AC Power Cable  
Automotive Power Adapter, 12 VDC, 60 W  
Ethernet Cable, 7 ft/213 cm  
USB A-mini B Cable, 10 ft/305 cm  
Handheld Instruments Documentation Disc  
Three-year warranty (battery one-year warranty)  
Certificate of Calibration

## Miscellaneous Accessories



### Part Number

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)

### Description

Dual Battery Charger  
GPS Antenna, SMA(m) with 15 ft cable  
GPS Antenna, SMA(m) with 1 ft cable  
GPS Antenna, SMA(m), 25 dB gain  
Backpack for Accessories  
Transit Case (holds MW82119A/B PIM Analyzer only)  
Transit Case (holds MW82119A/B PIM Analyzer plus accessories)

# Ordering Information continued

## 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
1091-446-R	PIM Standard, -80 dBm ±3 dB @ 1730 MHz, with 2x 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
1091-432-R	Low PIM Adapter, 45°, 7/16 DIN(f) 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
1091-435-R	Low PIM Adapter, 4.1/9.5(f) to N(m), DC to 3.0 GHz, 50 Ω
1091-436-R	Low PIM Adapter, 4.1/9.5(m) to N(m), DC to 3.0 GHz, 50 Ω
1091-440-R	Low PIM Adapter, 4.3/10(f) to 7/16 DIN(f), DC to 3.0 GHz, 50 Ω
1091-441-R	Low PIM Adapter, 4.3/10(m) to 7/16 DIN(f), DC to 3.0 GHz, 50 Ω
1091-442-R	Low PIM Adapter, 4.3/10(f) to N(m), DC to 3.0 GHz, 50 Ω
1091-443-R	Low PIM Adapter, 4.3/10(m) to N(m), DC to 3.0 GHz, 50 Ω
01-510	Adjustable Wrench
01-513-R	1¼" Torque Wrench
971-9-R	Cleaning Wipes
971-10-R	Cleaning Swabs

## PIM Analyzer Accessories Kits



Qty	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)
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	1091-446-R	PIM Standard, -80 dBm ±3 dB at 1730 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 Process



# Ordering Information continued

## Optional Power Measurement Accessories

**USB Power Sensor** (requires instrument with Option 19)

Part Number	Description
PSN50	High Accuracy RF Power Sensor, 50 MHz to 6 GHz, -30 dBm to +20 dBm

**USB Power Sensors** (require instrument with Option 19 or may be used separately with a PC)



Part Number	Description
MA24105A	Inline Bi-Directional Peak Power Sensor, 350 MHz to 4 GHz, +3 dBm to +51.76 dBm
MA24108A	Microwave USB Power Sensor, 10 MHz to 8 GHz, -40 dBm to +20 dBm
MA24118A	Microwave USB Power Sensor, 10 MHz to 18 GHz, -40 dBm to +20 dBm
MA24126A	Microwave USB Power Sensor, 10 MHz to 26 GHz, -40 dBm to +20 dBm
MA24208A	Microwave Universal USB Power Sensor, 10 MHz to 8 GHz, -60 dBm to +20 dBm
MA24218A	Microwave Universal USB Power Sensor, 10 MHz to 18 GHz, -60 dBm to +20 dBm

**Attenuators** (Recommended for power measurement applications 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)

## Optional Cable & Antenna Analyzer Accessories

**Calibration Components, 50  $\Omega$**  (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 $\Omega$
OSLNF50-1	Precision Open/Short/Load, N(f), 42 dB, 6.0 GHz, 50 $\Omega$
2000-1618-R	Precision Open/Short/Load, 7/16 DIN(m), DC to 6.0 GHz 50 $\Omega$
2000-1619-R	Precision Open/Short/Load, 7/16 DIN(f), DC to 6.0 GHz 50 $\Omega$
22N50	Open/Short, N(m), DC to 18GHz, 50 $\Omega$
22NF50	Open/Short, N(f), DC to 18 GHz, 50 $\Omega$
SM/PL-1	Precision Load, N(m), 42 dB, 6.0 GHz
SM/PLNF-1	Precision Load, N(f), 42 dB, 6.0 GHz

**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 $\Omega$
15RDFN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 $\Omega$
15RDN50-1.5-R	1.5 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 $\Omega$
15RNFN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to N(f), 50 $\Omega$
15RDFN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to 7/16 DIN(f), 50 $\Omega$
15RDN50-3.0-R	3.0 m, DC to 6 GHz, N(m) to 7/16 DIN(m), 50 $\Omega$

## Ordering Information continued

### Optional Cable & Antenna Analyzer Accessories

**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

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



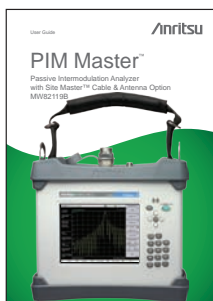
Part Number	Description
34NN50A	N(m) to N(m), DC to 18 GHz, 50 Ω
34NFnF50	N(f) to N(f), DC to 18 GHz, 50 Ω
1091-26-R	SMA(m) to N(m), DC to 18 GHz, 50 Ω
1091-27-R	SMA(f) to N(m), DC to 18 GHz, 50 Ω
1091-80-R	SMA(m) to N(f), DC to 18 GHz, 50 Ω
1091-81-R	SMA(f) to N(f), DC to 18 GHz, 50 Ω
1091-172-R	BNC(f) 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, 50Ω, 90 degrees right angle

## Ordering Information continued

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

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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
10580-00240	Power Meter Measurement Guide - High Accuracy Power Meter
10580-00241	Cable and Antenna Analyzer Measurement Guide
11410-00821	PIM Master Technical Data Sheet
11410-00473	Troubleshooting Guide - Cable, Antenna, and Components

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

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

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## Notes



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