DATA SHEET

PiMPro Tower Series

PiMPro Tower 1921

- Lightest full power portable PIM analyzer covering the 1710-1755 / 1850-1910 MHz (RX) and 1930-1945 / 1965-1995 / 2110-2155 MHz (TX) bands
- Real world 40 W × 2 radio power levels with highly accurate -135 dBm sensitivity
- Ultra-portable in a convenient and durable backpack enclosure and with over three hours of battery life
- Simultaneous Real Time PIM & Return Loss measurements
- Automatic GPS site location feature
- Distributed antenna system (DAS) test feature
- New PiMPoint feature (integrated) allows distance approximation to largest PIM source, in 50 ohm path and outside the antenna
- New Distance to Fault feature allows for simultaneous view of PiMPoint and Distance to Fault impedance reflections on the same graph
- New Cable Loss measurement capability
- Fully integrated Wi-Fi remote control using smart phone or tablet computer
- Instantaneous Measurement Modes for PIM and Return Loss, Frequency Sweep and PIM vs Time
- Easy to use graphic navigation tools with unique touch screen display
- Self-calibrating to industry standards
- Variable output power from 20 to 46 dBm x 2 (100mW to 40W x 2)
- Measures the 3rd and 5th reflective passive intermodulation
- Internal and external data storage
- Software and firmware updates downloadable via USB connection
- Universal and Basic 7–16 DIN component Accessory Kits available

Overview

CCI's PiMPro Tower Series is the first truly portable family of Passive Intermod (PIM) analyzers. All PiMPro Tower analyzers have real world 40W × 2 output power capability, with a sensitivity of -135 dBm, and can run on battery power for over three hours. The PiMPro Tower 1921 has the ability to cover the upper and lower 1921 MHz bands, both 1850-1995 MHz and 1710-2155 MHz. The analyzer's excellent measurement sensitivity (-135 dBm) as well as its ability to set transmit tone levels down to 20 dBm (100 mW) × 2 makes it the perfect resource for conventional cell sites as well as in-building Distributed Antenna System (DAS) requirements.

The Tower Series demonstrates the perfect synergy of CCI's world class in-house engineering design expertise for both filters and amplifiers. Each light weight and compact unit is protected by a reinforced backpack case which can easily strap to a climber's back for top-of-the-tower performance testing. The unit can be safely secured to most any tower structure with its integrated industrial grade clips. Each unit features a superior quality bright TFT capacitive large 8.0 inch (203 mm) screen that provides a very friendly user interface. CCI's simple GUI combined with a powerful CPU make for fast measurement acquisition and site data storage. The portable construction, designed with durable ruggedness and reliability first and foremost, PiMPro Tower Series will prove to be a valuable investment for years to come.

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Most LTE sites are configured with radios set at 40 watts or more per carrier and each site can have as many as four carriers per sector. This means that PIM testing at anything less than 40W × 2 will not accurately simulate live network traffic and is likely to understate actual site PIM levels. The PiMPro Tower Series' 40 watt × 2 power level allows for realistic PIM level testing in the field and at the tower top. The analyzer provides precise measurement of the 3rd and 5th order intermods of any system or component under high-power conditions. In addition to passive intermodulation measurements, the unit will provide VSWR and Return Loss values. PiMPro can be used to verify the integrity of individual passive components including connectors, cable assemblies, antennas, filters, making it an integral performance tool for site and tower technicians.
As a leading provider of wireless base station enhancement products, CCI set out to design and develop a reliable solution to system performance and enhancement challenges. PiMPro employs state-of-the-art technology and is built to meet the ever changing demands and needs of today's wireless suppliers.

Applications

- On site installation testing of antennas, filters, cable assemblies and other passive components
- Tower technicians can test antenna installations under real world 40W x 2 conditions at the tower top
- Mobile operators can isolate site performance issues and perform interference testing

Electrical Specifications

	PiMPro Tower 1921	
	Receive Frequency	RX1: 1710 - 1755 MHz; RX2: 1850 - 1910 MHz
	Transmit Frequency	TX1: 1965 - 1995 / 2110 - 2155 MHz; TX2 1930 - 1945 MHz
Transmitter	Frequency Accuracy	±1 ppm @ +23°C; Stability ±1 ppm -10°C to +55°C
	Frequency Aging	±1 ppm/yr
	Power Accuracy	0.3 dB
	Frequency Step Size	200 kHz
	Power Resolution	0.1 dB
	Adjustable Power Range	20 to 46 dBm x 2 (100 mW to 40 W x 2)
Receiver	Residual Intermod Level	-120 dBm (-125 dBm Typical)
	Measurement Range	-60 to -140 dBm
	Noise Floor	-136 dBm
	Reverse Power Protection	13 dBm (20 mW) continuous
Measurement Mode	Measurement Method	One Port, Reverse PIM
	Real Time PIM	3rd & 5th PIM
	Return Loss	Measured in dB
	PIM vs Time	3rd & 5th PIM
	PIM Location (PIMPoint)	Distance in Feet or Meters with VP Settings
	Distance to Fault/Cable Loss	One Port Open-Short Calibration
	RX Interference	Receive Only Mode - Noise Floor Measurements
	Noise Floor Measurement	Up-Link noise level with TX off
	Frequency Sweep	Frequency Response
	DAS Feature	Low power single tone trasmit to evaluate connectivity and path losses, or external interference
Measurement Range	Return Loss	Directivity >20 dB; Resolution >0.1 dB
	VSWR	Measurement Range 9:1 to 1.1:1; Resolution >0.1 dB
	Cable Loss	Measurement Range 0 to 12 dB; Resolution >0.1 dB
	Distance to Fault	VSWR Range 17:1 to 1.02:1; RL Range 0 to 40 dB
System	Battery	>3 hours (Full Charge)
	Power	AC & DC (AC 90 - 256 V, 50 - 60 Hz)
	Alarms	Audio & Visual Display
	Display Size & Type	8.0" (203.2 mm) Capacitive TFT
	Data Ports	3 - USB 2.0, 1 - Ethernet LAN Port
	Remote Control	WiFi Enabled (802.11n)
	Battery Power	28 VDC
	Battery Capacity	3.5 AH (99.4 WH)
	Battery Type	Li-Polymer Removable Battery Pack
Electrical	Max Power Consumption	<340 W

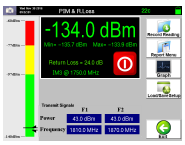
Mechanical

Weight	18.0 to 27 lbs. (8.5 to 12.5 kg.) (model dependant)
RF Output Connector	7-16 DIN Female
Dimensions (WxHxD)	14 x9 x4.5 in. (350 x 230 x 114 mm)
Operating Temperature	-10 to 45°C, 14 to 113°F, 95% RH
Storage Temperature	-30 to 60°C, -22 to 140°F, 95% RH

Measurement & Configuration

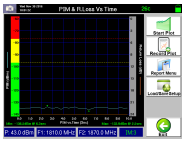
Main Screen

Main boot-up screen shows all measurement features in graphic icon format. Selecting the appropriate icon opens the associated measurement screen. This screen also provides access to the complete system configuration, report management and access to an abbreviated user manual.



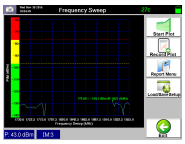
PIM & Return Loss

PiMPro's main measurement screen provides instantaneous PIM measurement in both dBc or dBm. The large display flashes to annunciate the presence of RF power at the output connector. Pass/Marginal/Fail Limits, Output Power, Frequency and IM settings originate from this screen. PiMPro's unique Return Loss diagnostic feature at high transmit (TX) power, quickly points out open cables.



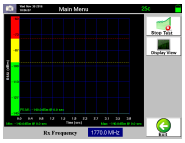
PIM vs Time Measurement

The PIM vs Time dynamic measurement mode features a graphical representation of PIM as a function of time. Time scale can be set from 10 seconds to 4 minutes. The PiMPro Return Loss feature is also available on this screen.



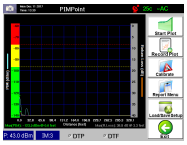
Frequency Sweep

PiMPro displays a swept receive (RX) PIM range by sweeping the TX carriers from end to end within the set frequency band. PIM frequency response is displayed, exposing the worst case PIM level and the contributing frequencies. Users can immediately transfer the graph to the PIM vs Time feature and run a new test to isolate the causes of the specific PIM.



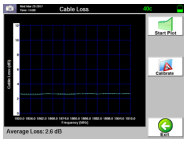
DAS Measurement

TX Function: Generates in the radio's DL frequency a low power single tone anywhere within the DAS network (usually from the head-end) to evaluate RF connectivity and path losses. With three hours of TX time a technician can roam a DAS installation with a spectrum analyzer and detect systemic RF anomalies
RX Function: Used as a receiver tool to evaluate ideal areas within a given location to position DAS antennas. Using a simple Yagi or planar antenna for external interference evaluation, a DAS antenna can be optimally positioned to locations where external interference is lowest.



Simultaneous DTF and PiMPoint Measurements

After a simple calibration procedure, the unit allows simultaneous measurements (superimposed on the same screen) of Distance to Fault and PiMPoint (PIM vs. Distance). All the measurements are done from a single port, no need to disconnect to a separate measurement port.



Cable Insertion Loss

Cable insertion loss measurements are accurately performed in the uplink of the PIM analyzers band. A simple open-short calibration is all that is required for this one port measurement. Much of the measurement error is removed with the displayed average insertion loss value.

Report Generator

Report data for all measurement modes can be stored in either, HTML or PDF file format. Users can concatenate a limitless series of measurements with different sector, feeder, color codes, as one single PDF file. Reports can be saved in PiMPro's internal memory or to external USB memory from the unit's front panel.

		Included In:			
		Sys Pkg	Econ Pkg	PPT-AK	PPT-EAK
PP-AK-CBL-DMDM	Low PIM Male DIN to Male DIN jumper cable 3/8" 3 m (10 ft) length	X	X	X	X
PP-AK-CBL-DMDF	Low PIM Male DIN to Female DIN jumper cable 3/8" 3 m (10 ft) length	X		X	
PP-AK-PSTAN-80	PIM Standard - 80 dBm	X	X	X	X
PP-AK-DMDM	Low PIM 7–16 DIN Male to Male Adapter	X		X	
PP-AK-DFDF	Low PIM 7–16 DIN Female to Female Adapter	X		X	
PP-AK-DMMF	Low PIM 7–16 DIN Male to 4.3-10 Female Adapter	X		X	
PP-AK-DMMM	Low PIM 7–16 DIN Male to 4.3-10 Male Adapter	X		X	
PPT-OS	Open - Short Standard				
PP-AK-LOAD	Low PIM Termination Load < -168 dBc with both Male and Female 7–16 DIN	X	X	X	X
PP-AK-TORW	Torque Wrench for 7–16 DIN Connector	X	X	X	X
PP-AK-ADJW	Adjustable Wrench	X	X	X	X
PP-AK-FIXW	Small 32 mm Wrench for 7–16 DIN	X		X	
PPT-AK-BATT1	Rechargeable Battery (28.8 VDC, 3450 mAh, 99.4 WH)	X		X	
PPT-AK-BATT	Rechargeable Battery (28.8 VDC, 4500 mAh, 130.0 WH)				
PP-AKT-CHRGR	Battery Charger	X		X	
AKC	PiMPro Tower Accessory Kit Case			X	X
PPT-TC	Tower Transport Case	X	X		
PPT-AC-ADPT	AC/DC Power supply				

** All accessory kit components and cables have low PIM connectors, with PIM level <-122 dBm*

Parts & Accessories

PIMPRO TOWER 1921	PiMPro Tower 1921
Accessories Included	Power Cord, Operation Manual
	Additional operational accessories available individually or in convenient Universal Kit configurations.
Tower 1921B SP	PiMPro Tower 1921 SP: Includes PiMPro Tower 1921, Tower Accessory Kit, Transport Case
PPT-11	Option 11 - GPS Capability
PPT-21	Option 21 - DTF Measurement, includes open/short standard
PPT-31	Option 31 - Wi-Fi Remote Control App
PPT-41	Option 41 - SCPI Programmability
PPT-TC	PiMPro Tower Transport Case
PPT-AK	PiMPro Tower Accessory Kit in soft carrying case
PPT-EAK	PiMPro Tower Economy Accessory Kit in soft carrying case
PPT-EAKTC	PiMPro Tower Accessory Kit in Transport Case
EW1	One year extended warranty for PiMPro Tower
EW2	Two year extended warranty for PiMPro Tower
EW4	Four year extended warranty for PiMPro Tower

STANDARDS & CERTIFICATIONS

Standards & Compliance

Safety	EN 60950-1, UL 60950-1
Emission	EN 55022, KN 11
Immunity	EN 55024, EN 61000-3-2, EN 61000-3-3, KN 61000-4-2, KN 61000-4-3, KN 61000-4-4, KN 61000-4-5, KN 61000-4-6, KN 61000-4-8,KN 61000-4-11

Certifications

Federal Communication Commission (FCC) Part 15 Class B, CE, KN, CSA US, ISO 9001