



TFN PM1200 Radio Communication Tester



Product Introduction

The PM1200 Handheld Radio Test Set is a versatile, all-in-one instrument designed for field maintenance and troubleshooting of wireless communication systems. Covering a frequency range from 2 MHz to 1300 MHz, it integrates over 20 test functions including RF signal generation, spectrum analysis, power measurement, audio analysis, and cable fault location. Ideal for shortwave, VHF, and UHF radios, the PM1200 supports AM, FM, and SSB modulation. With a large 10.4-inch touchscreen, rugged alloy housing, and multiple power options (AC/DC/battery), it delivers lab-grade accuracy in a portable form. This radio communication tester dramatically improves testing efficiency for military, aviation, and commercial radio equipment.

Product Key Selling Points

☒ All-in-One Multifunctionality – Replace Multiple Instruments

The PM1200 combines an RF synthesizer, spectrum analyzer, RF power meter, frequency counter, modulation meter, audio generator, distortion meter, SINAD meter, oscilloscope, and cable fault locator into one handheld device. This eliminates the need to carry multiple bulky instruments, saving space and reducing equipment costs. Technicians can perform complete transmitter and receiver tests, duplex measurements, and antenna analysis with a single tool, streamlining workflow and accelerating troubleshooting in the field.

☒ Wide Frequency Coverage and High Accuracy

Covering 2 MHz to 1300 MHz, the PM1200 handles virtually all tactical communication bands including HF, VHF, and UHF. It delivers frequency error $\leq \pm (0.5 \text{ ppm} + 1 \text{ Hz})$ and power measurement accuracy within $\pm 1 \text{ dB}$. Such precision ensures reliable characterization of radio performance – from carrier frequency stability to adjacent channel power. Whether testing airborne transceivers or portable two-way radios, users get lab-quality results that meet rigorous military and industry standards.

☒ Advanced Duplex Testing for Efficient Radio Alignment

Unlike simple single-function testers, the PM1200 supports simultaneous transmitter and



receiver testing in duplex mode. This enables real-time measurement of transmit power, frequency error, modulation quality, and receiver sensitivity without swapping cables or changing setups. Field technicians can align repeaters, base stations, and mobile radios twice as fast, reducing downtime and ensuring optimal communication link performance in mission-critical environments.

☒ Built-in Antenna and Cable Analysis – Fault Location Down to Meters

The VSWR and DTF (Distance-to-Fault) mode allows users to measure VSWR, return loss, cable loss, and distance to fault up to 300 meters with <1 meter resolution. This quickly identifies damaged antennas, loose connectors, or water ingress in feedlines. No external reflectometer is needed. For maintenance teams responsible for tower-mounted antennas or buried cables, the PM1200 turns hours of guesswork into minutes of pinpoint diagnosis, preventing unnecessary replacements and reducing operational costs.

☒ Rugged, Portable, and Easy to Use in Harsh Environments

Weighing only 3.7 kg and with a compact A4-size footprint, the PM1200 is designed for field deployment. Its alloy casing, waterproof touchscreen cover, and military-grade reliability (MTBF ≥ 5000 hours) ensure operation from -10°C to 55°C . The 10.4-inch capacitive touchscreen offers smartphone-like navigation, while a long-life lithium battery supports >4 hours of continuous work. Technicians can perform outdoor tests confidently without worrying about power outlets or fragile equipment.

Product Specifications

Parameter	Specification
General	
Frequency range	2 MHz ~ 1300 MHz
Operating temperature	$-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$
Storage temperature	$-50^{\circ}\text{C} \sim +70^{\circ}\text{C}$
Power supply	AC 220V $\pm 10\%$, 50Hz $\pm 5\%$ via adapter; DC 24V $\pm 10\%$, 5A; Internal Li-ion battery ($\geq 4\text{h}$ operation, $\leq 6\text{h}$ charge)
Power consumption	$\leq 30\text{W}$
Dimensions (W×H×D)	321 mm × 226 mm × 70 mm
Weight	≤ 4.0 kg (including battery)
Display	10.4-inch TFT LCD, 1024×768 pixels, touchscreen
Interfaces	RF I/O (N female), Antenna (N female), SWR (N female), Audio in/out (BNC), DVM (BNC), Handset jack, LAN, RS-232 (Mini-B), DC power inlet, fuse holder
RF Signal Generator	
Frequency range	2 MHz ~ 1300 MHz
Frequency error	$\leq \pm(0.5\text{ ppm} + 1\text{ Hz})$
Frequency resolution	1 Hz
Output amplitude range (T/R port)	-125 dBm ~ -50 dBm
Output amplitude error	$\pm 2\text{ dB}$ ($\geq -100\text{ dBm}$); $\pm 3\text{ dB}$ ($< -100\text{ dBm}$)



Output impedance	50 Ω (nominal)
VSWR (T/R port)	≤ 1.4
Harmonic content	≤ -30 dBc
Non-harmonic spurious	≤ -40 dBc (≥ 20 kHz offset)
SSB phase noise	≤ -90 dBc/Hz @20 kHz offset
Residual FM	<30 Hz (300 Hz~3 kHz BW)
Residual AM	<3%
FM deviation range	0 ~ 100 kHz
FM deviation error	$\leq \pm 5\%$ (2~50 kHz dev, 150 Hz~5 kHz mod)
AM depth range	0 ~ 100%
AM depth error	$\leq \pm 5\%$ (10~90% depth, 150 Hz~5 kHz mod)
SSB carrier & sideband suppression	≥ 20 dBc
RF Signal Analyzer	
Frequency error measurement range	± 500 kHz
Resolution	1 Hz
Broadband power (T/R port)	0.1 W ~ 20 W continuous; 30 W (10s/min)
Narrowband power (T/R port)	-20 dBm ~ +43 dBm continuous
Power measurement error	$\leq \pm 1$ dB (broadband); $\leq \pm 2$ dB (narrowband)
FM deviation measurement range	0.5 kHz ~ 100 kHz
AM depth measurement range	5% ~ 100%
CTCSS/DCS decode	Yes
Audio Generator (dual internal)	
Frequency range	20 Hz ~ 20 kHz
Frequency resolution	0.1 Hz
Output amplitude	1 mVrms ~ 1.57 Vrms
Distortion	$\leq 1\%$ (1 kHz, BPF 300 Hz~3 kHz)
Audio Analyzer	
Frequency range (audio in)	15 Hz ~ 20 kHz
Voltage range (DVM)	10 mVrms ~ 30 Vrms
Voltage error	$\leq \pm (3\% \text{ reading} + 1 \text{ mVrms})$
Distortion measurement	0 ~ 100%, error $\leq \pm (5\% \text{ reading} + 0.1\%)$
SINAD measurement	0 ~ 40 dB, error $\leq \pm 1.5$ dB (8~40 dB)
Spectrum Analyzer	
Frequency range	2 MHz ~ 1300 MHz
Span	10 kHz ~ 1000 MHz (1-2-5 sequence)
Display average noise level	≤ -130 dBm (typical, 10 kHz BW)
VSWR & Cable Test	
SWR range	1.00 ~ 20.00
SWR resolution	0.02
DTF range	10 m ~ 300 m
Return loss range	0 ~ -50 dB
Cable loss range	0 ~ -50 dB



Oscilloscope	
Bandwidth	DC ~ 20 kHz
Voltage scale	10 mV/div ~ 20 V/div
Time base	0.1 ms/div ~ 100 ms/div

Product Features

Feature 1: Comprehensive Transmitter Testing – Ensure Your Radio Transmits Perfectly

The PM1200 eliminates the need for separate power meters, frequency counters, and modulation analyzers. In transmitter test mode, it simultaneously measures carrier frequency error, broadband/narrowband RF power, and modulation characteristics (FM deviation, AM depth, or SSB suppression). The built-in audio analyzer can then decode CTCSS/DCS tones and measure distortion of the demodulated audio. This means a technician can verify that a two-way radio is transmitting on the correct frequency, at rated power, with clean modulation – all in one connection. Pain points solved: No more carrying multiple instruments or swapping cables; no more uncertainty whether a failed transmission is due to frequency drift, low power, or distorted audio. The PM1200 gives a complete pass/fail picture in seconds, drastically reducing bench time and improving field maintenance efficiency.

Feature 2: Receiver Sensitivity & Audio Performance Validation

Testing a receiver's sensitivity, squelch threshold, and audio output traditionally requires a separate signal generator and an audio voltmeter. The PM1200 combines an RF synthesizer with a precise audio analyzer. In receiver test mode, you generate a calibrated AM/FM/SSB signal at a specified level, then measure the receiver's audio frequency, voltage, SINAD, and distortion. By adjusting the RF level until SINAD reaches 12 dB, you directly obtain the receiver's sensitivity. Additionally, you can verify the receiver's squelch hysteresis and maximum audio output. This solves the pain of guessing whether a weak receive issue is due to antenna, front-end damage, or misaligned demodulator. Field engineers can quickly certify repaired radios or troubleshoot intermittent reception problems with confidence.

Feature 3: Duplex Testing – Cut Alignment Time in Half for Repeaters and Base Stations

Duplex systems like repeaters and base stations simultaneously transmit and receive on different frequencies. Traditional single-function testers force you to test the transmitter, then disconnect and reconnect to test the receiver – a slow and error-prone process. The PM1200's duplex test mode activates both the internal RF generator and analyzer at the same time. You can set the generator to the repeater's receive frequency while the analyzer monitors the repeater's transmit frequency. This real-time duplex measurement reveals the repeater's transmit power, frequency accuracy, modulation quality, and its receiver sensitivity in one session. The pain eliminated: tedious cable swapping, long downtime, and the risk of misalignment due to different test setups. For public safety and military communication networks, the PM1200 ensures that repeater sites are fully optimized in minutes rather than hours.



Feature 4: Antenna and Feedline Diagnostics – Locate Faults Before They Fail

Poor antenna VSWR or damaged cables are the number one cause of poor radio range. The PM1200 includes a built-in one-port vector reflectometer mode. In VSWR/cable test mode, you can measure return loss, VSWR, and cable loss over 2-1300 MHz. But the most powerful feature is Distance-to-Fault (DTF). By setting the cable type (e.g., RG-58, RG-213) or entering the velocity factor, the PM1200 computes the physical distance to an impedance discontinuity. With resolution down to ~1 meter, you can pinpoint a crushed cable, loose connector, or water ingress up to 300 meters away. The pain addressed: Instead of replacing entire cable runs or climbing towers for visual inspection, you know exactly where to dig or which section to replace. This saves days of labor and prevents unnecessary material waste.

Feature 5: Spectrum Analysis & Interference Hunting

Field engineers often face the problem of unknown interference – a nearby transmitter bleeding into their channel, or a harmonic causing spurious responses. The PM1200's spectrum analyzer mode provides a clear graphical view of the RF environment from 2 MHz to 1300 MHz. You can set center frequency, span, reference level, and marker to measure signal strength and frequency. The peak hold and video averaging functions help capture intermittent signals. By scanning the band, you can quickly identify whether a communication problem is due to an external interferer or an internal radio fault. The pain solved: No more guessing “is it my radio or the environment?” With the PM1200, you can perform site surveys, verify clean spectrum before deploying critical links, and prove interference sources to regulatory authorities. This turns a vague troubleshooting nightmare into a data-driven, rapid resolution.

Applications & Pain Points Solved

Scenario	Customer Pain Point	How PM1200 Solves It
Military field maintenance of tactical radios	Soldiers need to quickly verify that handheld and vehicle-mounted radios (HF/VHF/UHF) are operational before a mission. Carrying heavy, fragile test equipment is impractical.	PM1200 is lightweight (3.7 kg), rugged, and battery-powered. One-button transmitter/receiver tests provide instant pass/fail feedback, ensuring communication reliability without logistical burden.
Public safety repeater site alignment	Technicians spend hours adjusting duplexers and measuring transmitter/receiver performance separately, causing extended system downtime.	Duplex mode allows simultaneous Tx/Rx testing. The technician aligns the repeater's receive sensitivity while watching transmit power – all in one connection. Downtime reduced by >50%.
Airport ground-to-air VHF comms troubleshooting	A sudden increase in noise or drop in range could be due to antenna damage, cable fault, or interference. Diagnosing requires	Use the PM1200 to measure cable VSWR and DTF (locate fault to within 1 meter) without climbing. Then switch to spectrum analyzer to hunt



	multiple instruments and tower climbs.	for interfering signals. Solves in one trip.
Two-way radio repair shop	Workshop must test dozens of radios daily for output power, frequency error, modulation, and receiver sensitivity. Separate instruments slow down throughput.	The PM1200 integrates all needed functions. A single connection to the radio's antenna port performs full transmitter and receiver characterization in under 2 minutes. Doubles repair throughput.
Shipboard radio system verification	Corrosive marine environment degrades antennas and cables. Periodic checks require portable, corrosion-resistant test gear that can operate in tight spaces.	Compact size, alloy casing, and protective cover make the PM1200 ideal for shipboard use. VSWR and DTF functions quickly identify degrading feedlines before they fail during a voyage.

Q&A

Q1: What types of radios can the PM1200 test?

A1: The PM1200 is designed for FM, AM, and SSB radios operating from 2 MHz to 1300 MHz, including shortwave (HF), VHF (airband, marine, public safety), and UHF (military, trunked, GMRS) transceivers. It supports both analog and CTCSS/DCS squelch systems.

Q2: Does the PM1200 require an external PC for operation?

A2: No. It is a standalone instrument with a built-in 10.4-inch touchscreen. All measurements are displayed directly. However, remote control via RS-232 or LAN is available for automated test systems, and stored data can be exported to a PC.

Q3: How accurate is the power measurement?

A3: Broadband power (0.1-20W continuous) has an accuracy of $\leq \pm 1$ dB. Narrowband power (signal strength) accuracy is $\leq \pm 2$ dB. The wide dynamic range allows measurement from -110 dBm to +44.8 dBm depending on the input port.

Q4: Can I measure distance to a cable fault?

A4: Yes. In DTF (Distance-to-Fault) mode, the PM1200 calculates the location of impedance mismatches up to 300 meters. You simply select a standard cable type (RG-58, RG-213, etc.) or enter the velocity factor, and the display shows fault distance with approximately 1-meter resolution.

Q5: What accessories come with the PM1200?

A5: The standard package includes the test set, AC power adapter and cord, handset (speaker/mic), dual-N cable, N-to-SMA adapter, two foldable SMA antennas (450 MHz and 800 MHz), calibration standards (open, short, load), fuse, and a user manual on CD.

Package Contents



Item	Description	Quantity
1	PM1200 Radio Test Set main unit	1
2	User manual (CD-ROM)	1
3	Handset (speaker/microphone)	1
4	Dual N-type cable, 0.5m	1
5	N to SMA adapter (jack-plug)	1
6	Foldable SMA antenna, 450 MHz	1
7	Foldable SMA antenna, 800 MHz	1
8	Power adapter 24V/5A	1
9	Power cord	1
10	N-type male 50 Ω load (calibration)	1
11	N-type male short (calibration)	1
12	N-type male open (calibration)	1
13	Certificate of conformity	1
14	Packing list	1
15	Desiccant silica gel	2 bags
16	Fuse (5A)	1

For OEM/ODM inquiries or bulk orders, please contact our sales team for customized solutions.