COM-POWER CORPORATION

Preamplifier
PAM-103

Features

- **Wide Frequency Range**
  1 MHz to 1 GHz
- **Internal Battery** or **AC Adapter Operation**
  operates >13 hours per charge
- **High Gain, Low Noise Figure**
  33 dB Gain (typical)
  3.3 dB Noise Figure
- **Individual Calibration Included**

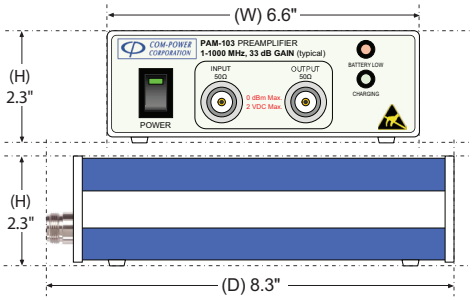
Description

The PAM-103 is a broadband, high gain, low-noise preamplifier operating over the frequency range of 1 MHz to 1 GHz. Its high gain (33 dB ±3 dB) and low noise figure (<3.3 dB) make the PAM-103 Preamplifier the ideal choice for optimizing your EMI measurement system, whether it be for an absorber lined test chamber, open area test site or tem-cell.

The PAM-103 can be powered by its internal, rechargeable battery packs, or by its AC to DC Power Adapter/Battery Charger. On a full charge, the preamp will operate on battery power for over 13 hours. The battery low indicator light will let you know when it is time to plug it in; and the charging indicator light will let you know that its charging. If you are unable to plug it in, you can feel confident in continuing your test, as the PAM-103 will turn itself off well before the battery voltage reaches the point at which the gain could become unstable. Whether it's operating on battery power or external power; if the amp is on, you can rest assured that the output is stable and that the gain will remain constant.

Construction

The durable enclosure for the PAM-103 is designed to withstand years of punishment in any laboratory environment. It is constructed from rugged, high-quality aluminum, with an external powder coat.

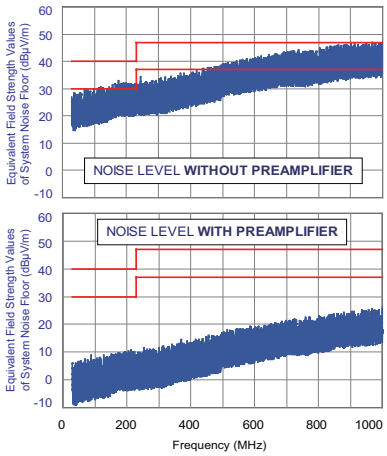


The RF input and output ports are each fitted with an N-type (female) connector. The battery packs, should they need to be replaced, can be accessed via the removeable panel on the underside of the enclosure.

Why is a Preamplifier Needed?

Nearly all measurement systems for radiated EMI tests require preamplification in order to achieve the necessary sensitivity. The sensitivity is determined by system noise floor level, which usually appears as a thick 'fuzz' across its frequency range. The upper extreme of the 'fuzz' represents the bottom end of the instrument's dynamic range (for the respective instrument bandwidth setting) throughout its frequency range. The noise floor level increases/decreases proportionately (10 dB per decade of bandwidth change

Signals below the noise floor level are essentially masked (hidden). In addition, signals with amplitudes near the level of the noise floor typically measure higher than actual. Therefore, for the best measurement accuracy, the noise floor should be as far below the spec limit as is possible.



The graphs to the left represent typical measurement system noise floor levels **with** *and* **without** *the PAM-103 preamplifier. The noise levels are shown in relation to the CISPR 22, Class A/B limits. As you can see, the noise levels on the upper plot (without preamp) actually exceed the Class B limits. Typical errors using this measurement system would likely include false failures (<450 MHz), and non-detection of EUT emissions in excess of the limit (>450 MHz). As shown on the lower plot (with preamp), the noise floor is well below both limits.*

Calibration

Each preamplifier is individually calibrated with NIST traceability. The calibration data and certificate is provided. ISO/IEC 17025 accredited calibration is available upon request.

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Specifications

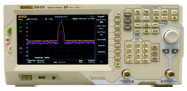
Frequency Range	**1 MHz to 1 GHz**
Preamplifier Gain	**33 dB** (±3 dB)
Linear RF Input Range	**< -30 dBµV to 89 dBµV**
P_{OUT} @ 1 dB Compression	**18.3 dBm**
P_{OUT} @ 3 dB Intercept (IP3)	**32 dBm**
Noise Figure	**< 3.3 dB**
Input Sensitivity	**< -30 dBµV** (< 31.6 nV)
VSWR (RF Input/Output Ports)	**1.69:1** (maximum), **1.25:1** (average)
Return Loss (RF Input/Output Ports)	**29.5 dB** (minimum), **44 dB** (average)
RF Connectors (Input/Output Ports)	**50Ω N-Type** (female)
Reverse Isolation	**>40 dB** (output port to input port)
Operating Temperature Range	**0° to 40° C** (32° to 104° F)
Absolute Max. RF Input Ratings	**107 dBµV** (225 mV), **0 dBm** (1 mW), **2 V_{DC}**
Battery Runtime	**>13 Hours** (with new, fully-charged batteries)
Power Input	**15 V_{DC}, 500 mA** (unregulated)
Dimensions (Height x Width x Depth)	**2.3" x 6.6" x 8.3"** (6 cm x 16.7 cm x 21 cm)
Weight	**3.2 lbs** (1.45 kg)

All specifications are subject to change without notice.
All values are typical, unless specified.

Related Com-Power Products:

AL-100 Log Periodic Antenna

AB-900 Biconical Antenna

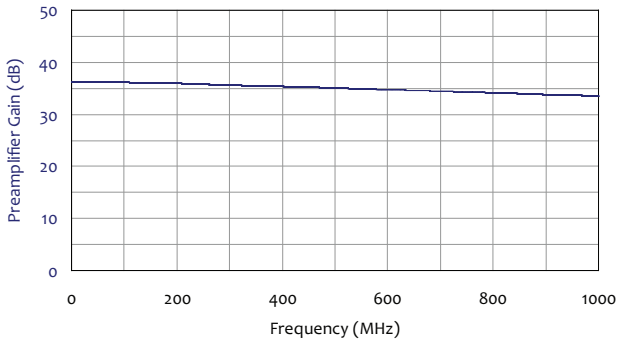


SPA-800 Spectrum Analyzer

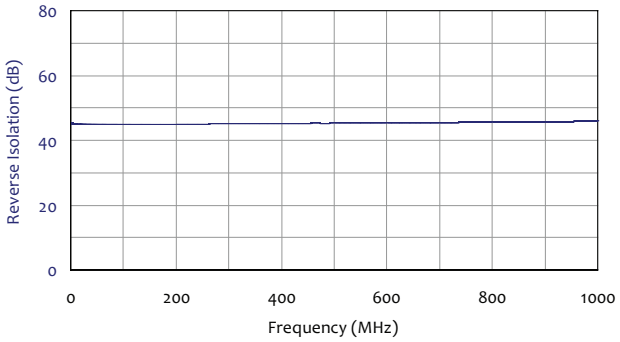
Also Available:

PAL-010, PAM-118A, PAM-840A Preamplifiers
AC-220 CombiLog Antenna **AL-130** Loop Antenna
ABF-900 Collapsible Biconical Antenna
ALC-100, ALP-100 Log Periodic Antennas

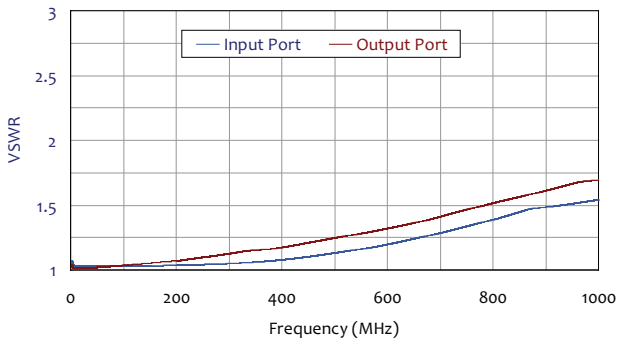
Preamplifier Gain



Reverse Isolation (RF output to RF input)



VSWR (RF input/output ports)



Return Loss (RF input/output ports)