

The Model 401B Personal Spectrum Analyzer.

The BANTAM INSTRUMENTS Model 401B Personal Spectrum Analyzer is expressly designed to make EMC radiated pre-compliance measurements simple and straightforward. Measurements are calibrated in dB $\mu$ V/m. All the user has to do is select the EMC specification to be measured against and enter the distance to the device to be tested.

The goal is to easily and inexpensively make EMC pre-compliance measurements during the design phase of a product so that there is a high likelihood of the product passing during final compliance testing. This is critically important as time-to-market is reduced and costly product redesigns can be avoided.

Use of the 401B design makes these measurements so simple and straightforward that personnel unfamiliar with RF measurements and/or EMC specifications can easily determine if their design is likely to pass compliance.

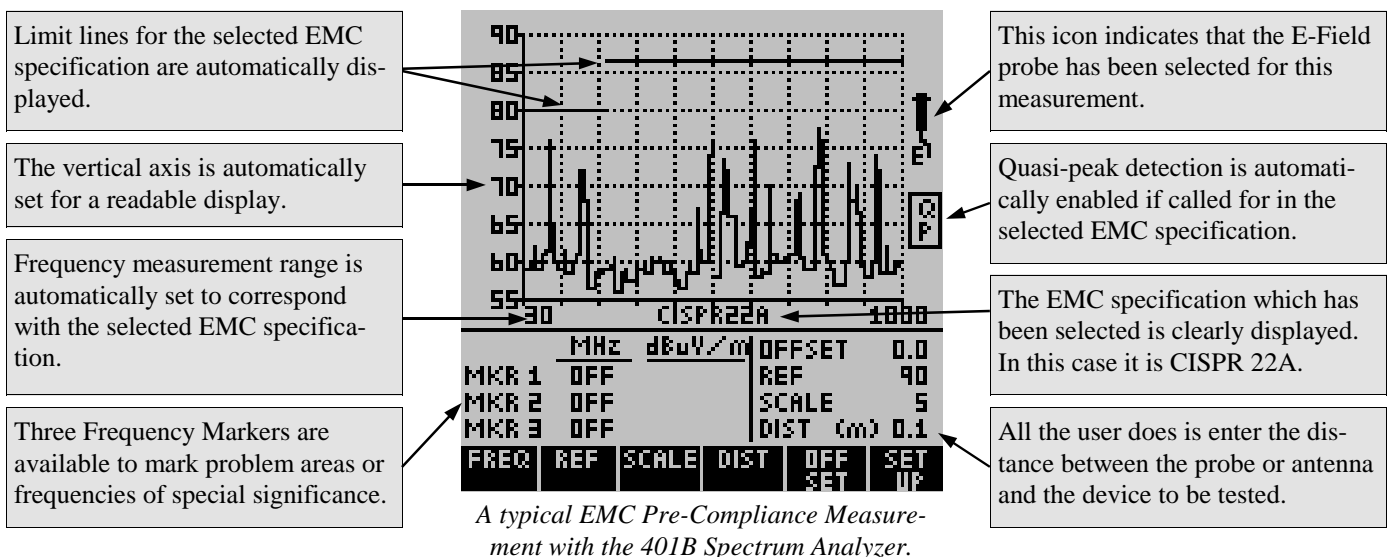
The key to the design of the Model 401B Spectrum Analyzer is that the EMC limit lines are stored within the spectrum analyzer. In addition, when the accessory antenna and probes are used, the measurements are automatically calibrated in dB $\mu$ V/m. No external calibration set up is required.

The 401B has the following six specification limit lines stored internally:

- FCC Part 15 Class A and B
- CISPR 11 – EN55011 Class A and B
- CISPR 22 – EN55022 Class A and B

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### SEE HOW EASILY PRE-COMPLIANCE MEASUREMENTS ARE MADE WITH THE 401B



The Model 401B has four measurement accessories applicable to pre-compliance testing. Each has internal active components which are powered directly by the 401B.

- P101A Active E-Field Probe
- P201A Active H-Field Probe
- ANT01A Active Antenna
- PA01A Preamplifier

### Use of the Probes

The E-Field Probe is far more sensitive to E-Fields while the H-Field Probe is far more sensitive to H-Fields. E-Fields are commonly generated by digital signals such as microprocessor clocks and address lines and high frequency (RF) analog signals. H-Fields are commonly generated by circuits with large currents such as switching power supplies and magnetic components such as inductors and transformers.

The generated E or H field will be strong near the source (near field), but at a distance from the source (far field) the ratio between the E and H field will be a constant, making it difficult to identify whether the signal originates from an E or H field source.

Both the E and H field probes have a frequency range of 30 MHz to 1024 MHz. The E field probe has a sensitivity of approximately 57 dB $\mu$ V/m across the band. The H-Field probe has a sensitivity of 57 dB $\mu$ V/m at 1024 Mhz and decreases to about 87 dB $\mu$ V/m at 30 MHz.

*A probe can be used to identify the source of leakage on a printed circuit board.*



### The Active Antenna

The Active Antenna is very similar in design to the E-Field probe except that it is omni-directional. Like the probe, it has a frequency range of 30 MHz to 1024

MHz and a sensitivity of 57 dB $\mu$ V/m. It is ideal for measuring devices which are intentional radiators.



*The Model 401B with the active antenna which covers the frequency range of 30 MHz to 1024 MHz.*

### The Preamplifier

The preamplifier is intended for use with EMC measurement antennas. The gain is nominally 26 dB and the frequency range is 1 Mhz to 1024 MHz. The input is type N male which interfaces directly with most antennas. The SMA female output is connected to the 401B via an SMA male-male cable.



*The Preamplifier in use with a measurement antenna.*

When the 401B is used in this configuration it is uncalibrated as the antenna factor of the measurement antenna is unknown. The user can do the calibration himself by downloading the data through the serial port to a personal computer and then adding the antenna factor to the measurement data.

This measurement approach is provided for experienced compliance lab personnel wishing to use the 401B for far field measurements. The accessory antenna and probes for the 401B are more than adequate for pre-compliance measurements.

No other product on the market today offers such straightforward pre-compliance measurements at such an affordable price. To download the 401B data sheet or operating manual, visit the Bantam Instruments web site at [www.BantamInstruments.com](http://www.BantamInstruments.com).