DSI-600 EMI TEST & Measurement Receiver

Product Brochure

December 2017

Dynamic Sciences International, Inc.

DSI 600 Series EMI Test & Measurement Receiver System

The DSI-600 EMI Test and Measurement Receiver System is a step into the future of fully compliant test equipment. The powerfully integrated receiver technology provides the user with the combined computational strength of the on-board computer, high speed data acquisition, enhanced spectrum analyzer display, and DSII's EMIT software. The DSI-600 is an all-in-one multifunctional resource that provides fast and accurate test results and reports.

Features

Frequency Ranges of Operation 2.0, 4.0 12.5, 26.5 & 40.0 GHz

Receiver Measurement Accuracy state-of-the-art receiver technology

EMIT Test Suites fully compliant to CISPR 16-1, FCC, ANSI, DO-160, EN, MIL-STD 461

Display integrated 8.5" TFT color screen

GUI
intuitive user-friendly interface

Remote Operation
via standard SCPI command set

Test Preparation / Report Generation powerful integrated test plan module annotated results files/graphs for export AC & DC Powered

Simultaneous detection modes
peak, quasi peak, average, RMS, CISPR RMS/AVG

Powerful Embedded PC
processor to handle complex embedded algorithms

DSI-600 EMI Test Receiver

- The DSI-600 state-of-the-art super heterodyne receiver operates from 20 Hz to 2,12.5, 26.5 or 40 GHz depending on the model selected.

- The IF frequencies of the instrument are at 21.4 MHz, 550 MHz and 1450 MHz with IF bandwidths from 10 Hz to 15 MHz.

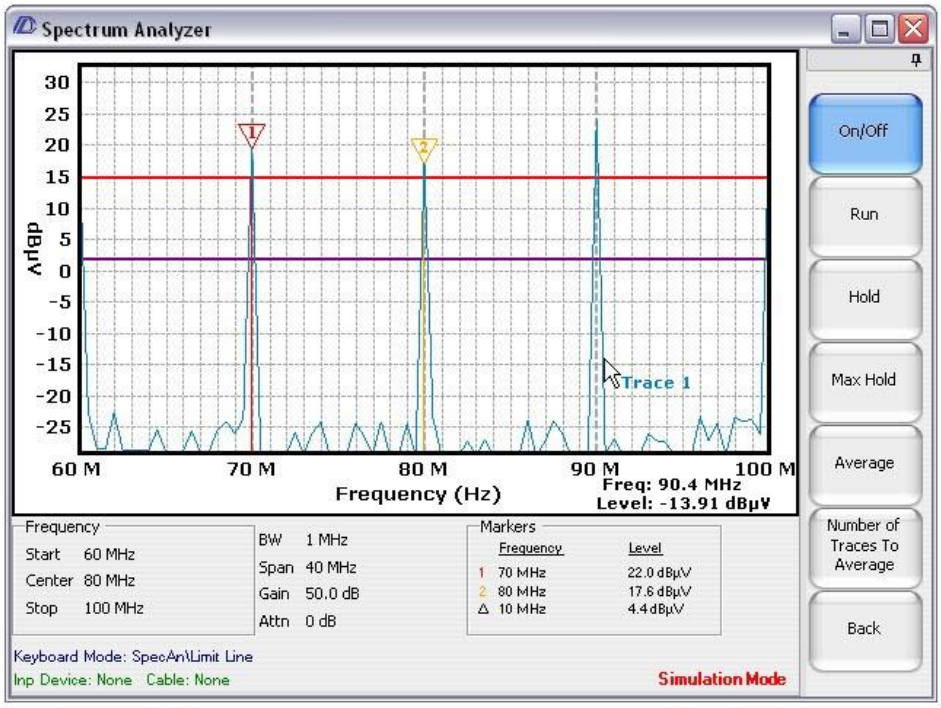
- The frequency stability of the instrument is maintained by an oven-controlled oscillator at 0.05 ppm with an aging factor of 1 ppm per year. Excellent low noise figures are exhibited by the platform, normally at 10 dB.

- The noise floor of the instrument in a 200 Hz bandwidth typically –37 dB/uV or at 9 kHz typically at – 17 dB/uV. There is 80 dB rejection over the entire frequency range of the receiver.

The DSI-600 Series may be operated in any one of three modes: Spectrum Analyzer "SpecAn" mode, Receiver mode and Remote mode.

SpecAn Mode

The 600 series unit provides the user with a compact and versatile spectrum analyzer capability in the SpecAn mode. In the Spectrum Analyzer mode the System is transformed into a free running analyzer. This platform has the capability to perform the basic functions: setting to a center frequency, adjusting gain, attenuation, frequency span and bandwidth parameters seen in the picture below.

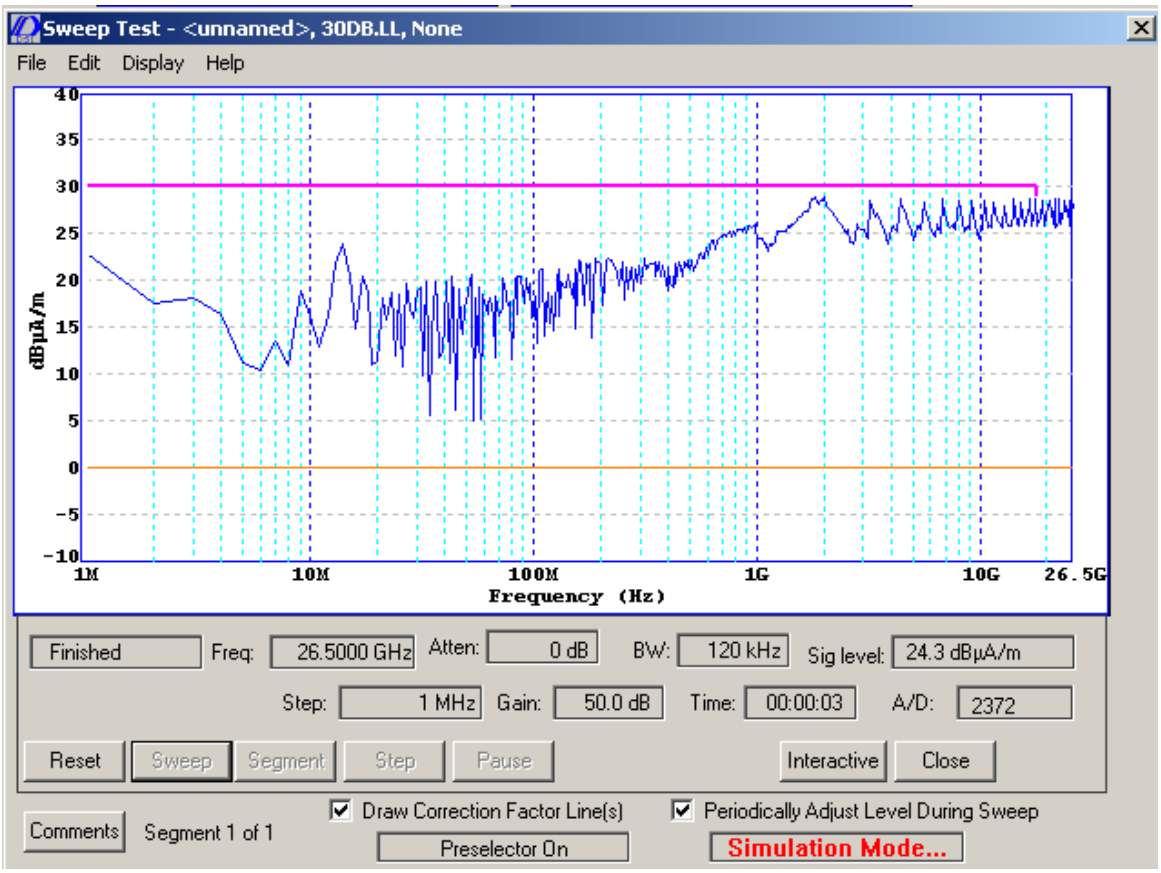


SpecAn Mode

Two on screen markers and delta markers are presented clearly with the db, dBm, dBmV levels being refreshed on each scan. In Spectrum Analyzer mode the user interface is facilitated via the front panel keyboard, up/down buttons and rotary dial, allowing for the selection and entry of desired parameters. Limit lines can be called up and displayed on the screen. A Save current set-up display along with any limit lines configured allows saving the desired screen to a file. A Recall feature allows for recalling previously saved information. It is also possible to incorporate correction files either for transducers or as composite files.

Receiver Mode

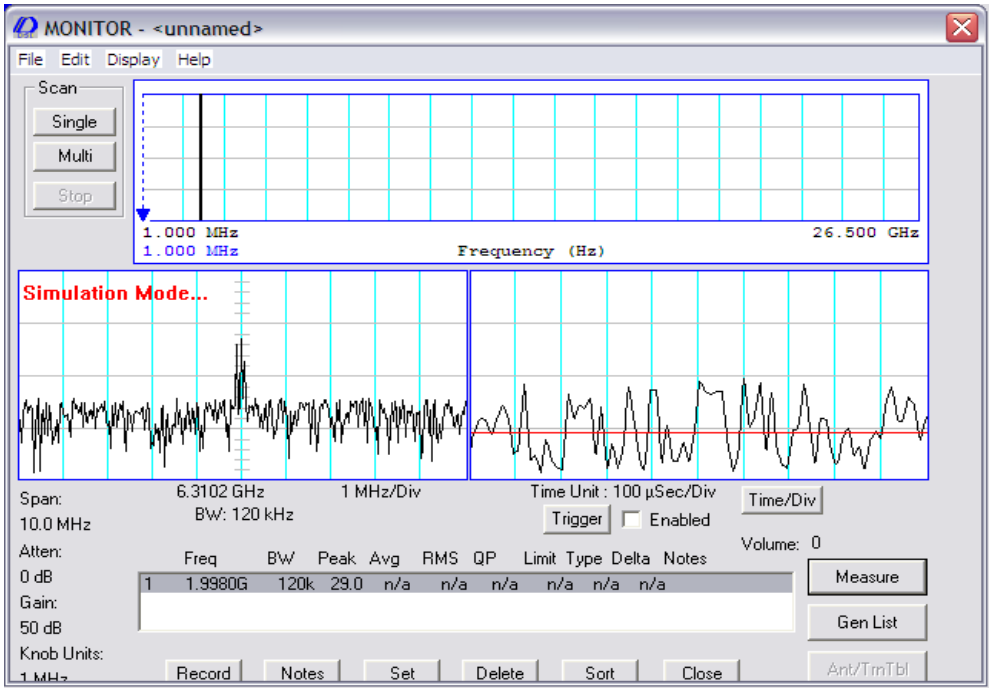
In Receiver Mode, the system is a Turn-Key Emissions test receiver. It is in this mode that the 600 series excels as an exceptional RF measurement device while exhibiting excellent sensitivity and accuracy. The receiver combines flexible signal collection, storage, retrieval, editing and reporting capabilities. The Receiver Mode offers fully automated testing via standard scripted application specific software modules or the user can define test parameters and limits as desired. Versatile detection is provided by means of standard Simultaneous Peak, Quasi-Peak, Average & RMS measurements. An added capability in the form of a frequency and time domain screen is available for mitigation work. An integrated list generation feature allows for easy access to files on demand minimizing test times. Auto-ranging of gain and attenuation under computer control to maximize resolution of signal is also possible. Likewise this feature can be modified by the operator to establish minimum values and reduce the time to complete tests.



Sweep Screen

The sweep test storage feature allows the user to enter and store a number of frequency sweep tests for future use. Each may contain up to twenty segments. The software directory structure may also be modified by the operator to enable storing of groups of tests together in the same folder. Other test results may be handled in the same fashion. Automatic transducer switching occurs during sweep tests that allows for transducer selection and manipulation. Any number of transducers may be contained in the transducer file. Correction files can be applied to a single transducer and are applied automatically during the test for the transducer selected. Transducers are selected at the appropriate test segment by prompting operator intervention.

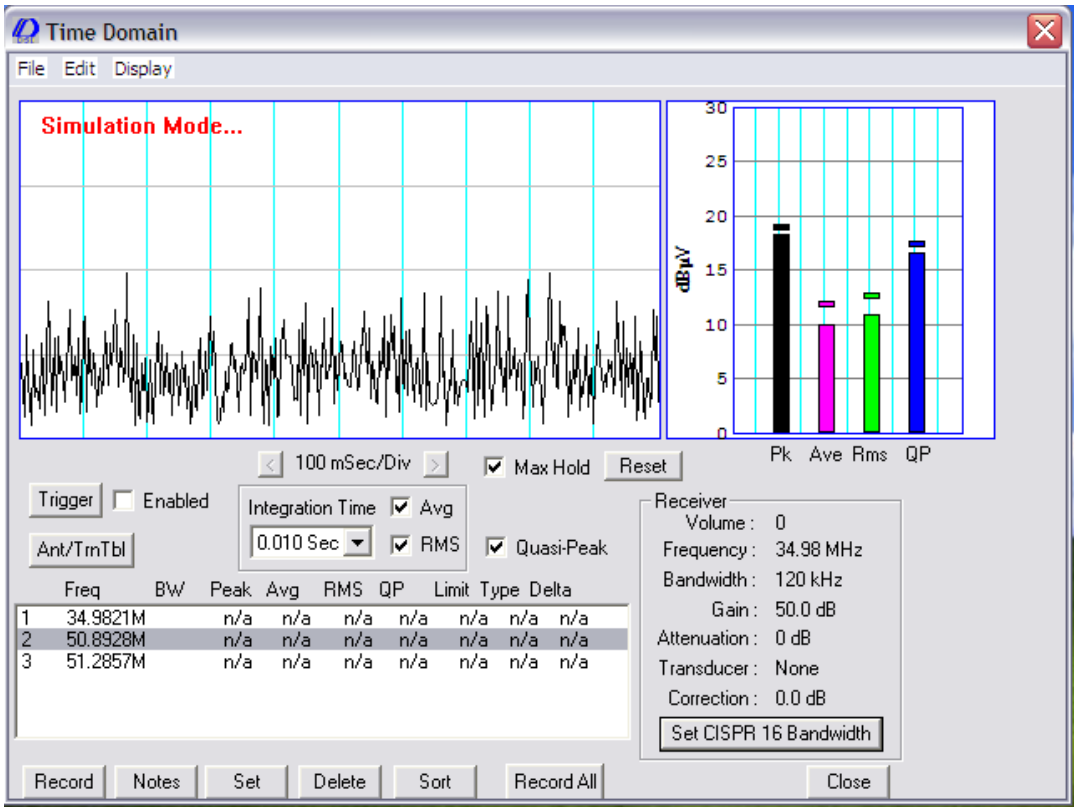
A Paused Sweep Mode allows the operator to assume control during a sweep test for a closer examination of specific frequencies of interest. The sweep test may be continued at any time with no loss of information. While the test has been paused, the following sub-modes are available. The local mode is where the operator has local control of the receiver parameters, such as gain, attenuation, bandwidth, etc. The interactive mode is where the computer is still controlling the receiver, but the operator has a manual override to control parameters via the screen and may sweep up, down or dwell at any desired frequency point to examine signal strength vs. time or operating mode.



Monitor Screen

GPIB drivers are available for a variety of devices. Correction factors for transducers in your test set-up are easily inserted into the test program. Also available are interface drivers for antenna masts and turntables.

Displays of sweep measurements are presented in log or linear frequency scales. Graphing of test results may be selected by the operator or left in auto scale where the Receiver will fit the scale to the results. After storing the sweep results the graph can be re-scaled and re-plotted to show any portion of the result on any scale selected by the operator. Sweep test result files can be stored and recalled anytime during testing or report output to a file or limit-lines for report output to a file or printer. Graphs may also be stored as a bitmap file for later export to a word processor document.



Measure Screen

Receiver System Screens

Sweep Testing mode seen in Figure 1 permits precision measurements with controlled and repeatable conditions. Test parameters are created with the test generator from previously run tests or prepared on the spot by the user. Limit lines can be created, recalled and displayed. The appearance of the screen may be tailored to the user's preference. While the automatic scaling feature insures display of all data, the user can intervene and set plot parameters as the test proceeds. While the automatic scaling feature insures display of all data, the user can intervene and set plot parameters as required.

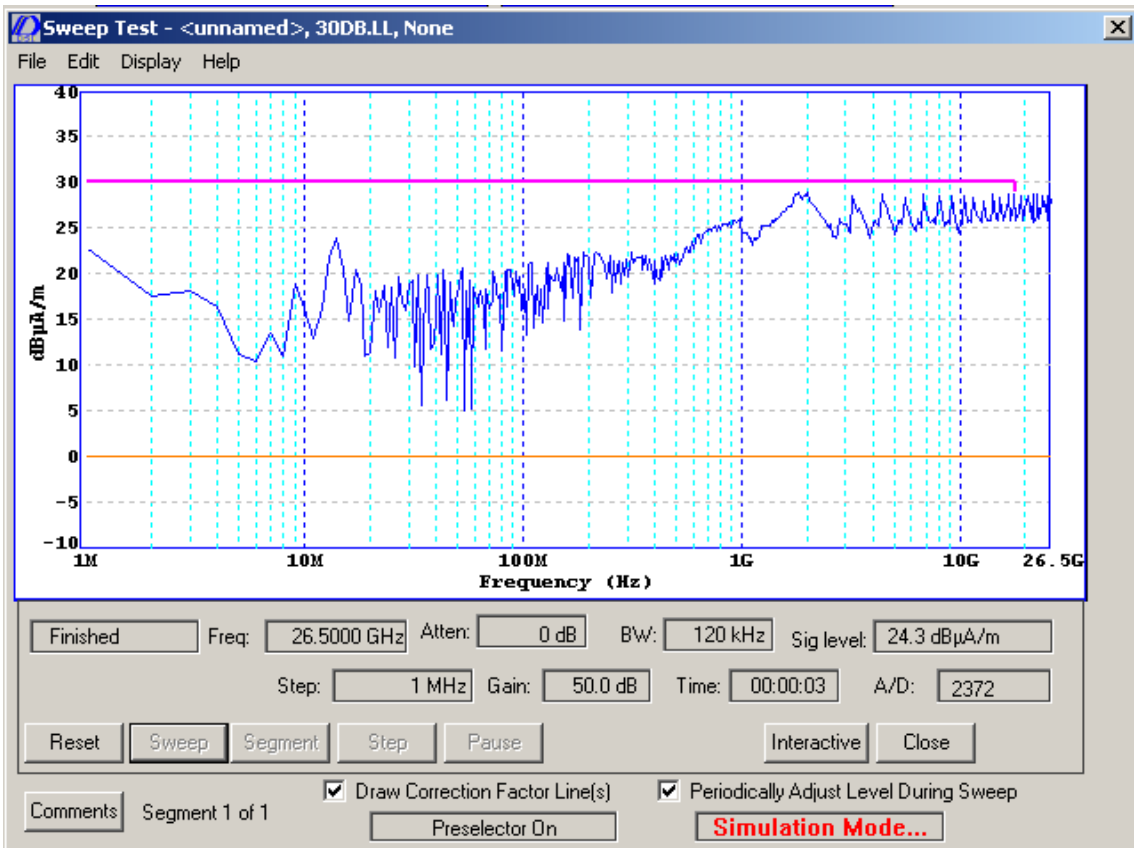


Figure 1

Frequency and time domain displays replicate the functions of a spectrum analyzer and an oscilloscope, permitting rapid scanning of the environment precise viewing of a span surrounding the tuned frequency, and simultaneous time-domain display of the detected signal. To view the Monitor Screen, see Figure 2.

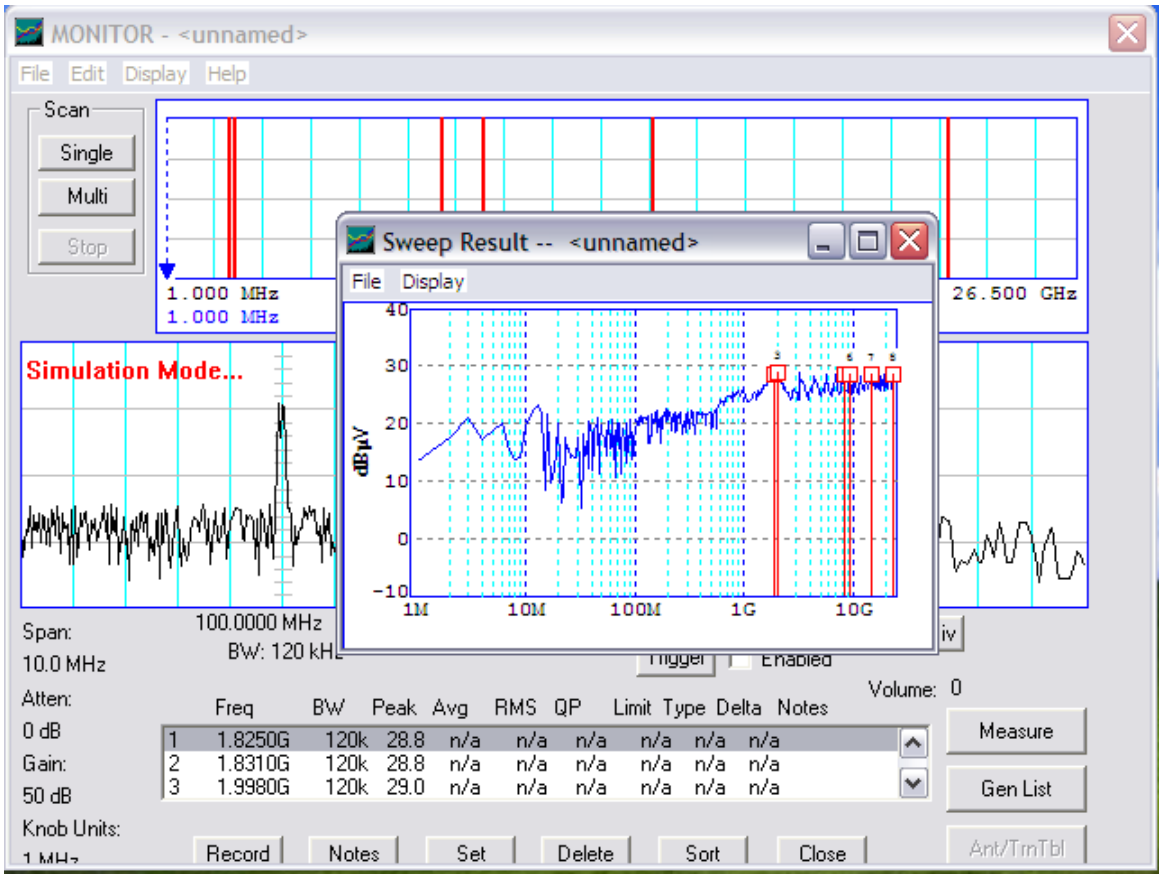


Figure 2

The major elements of this display are:

Data Log: shown at the bottom center of the screen may be imported from an automatically generated file or entries made by double clicking on points on the fast sweep. Each entry contains receiver, sensor, mast and turntable settings for the measurement taken at that frequency.

Fast Scan Display: This panel shown on the top center of the screen displays a fast scan of any selected frequency range. The panel may display one scan or continuously repeated scans.

Spectral Display: The left center panel shows the frequency spectrum in the vicinity of the tuned frequency, with a span selected by the operator.

Time Domain Display: The right center panel shows an oscilloscope type display of detector signal. Variable time-base and trigger controls are available.

Time Domain Screen

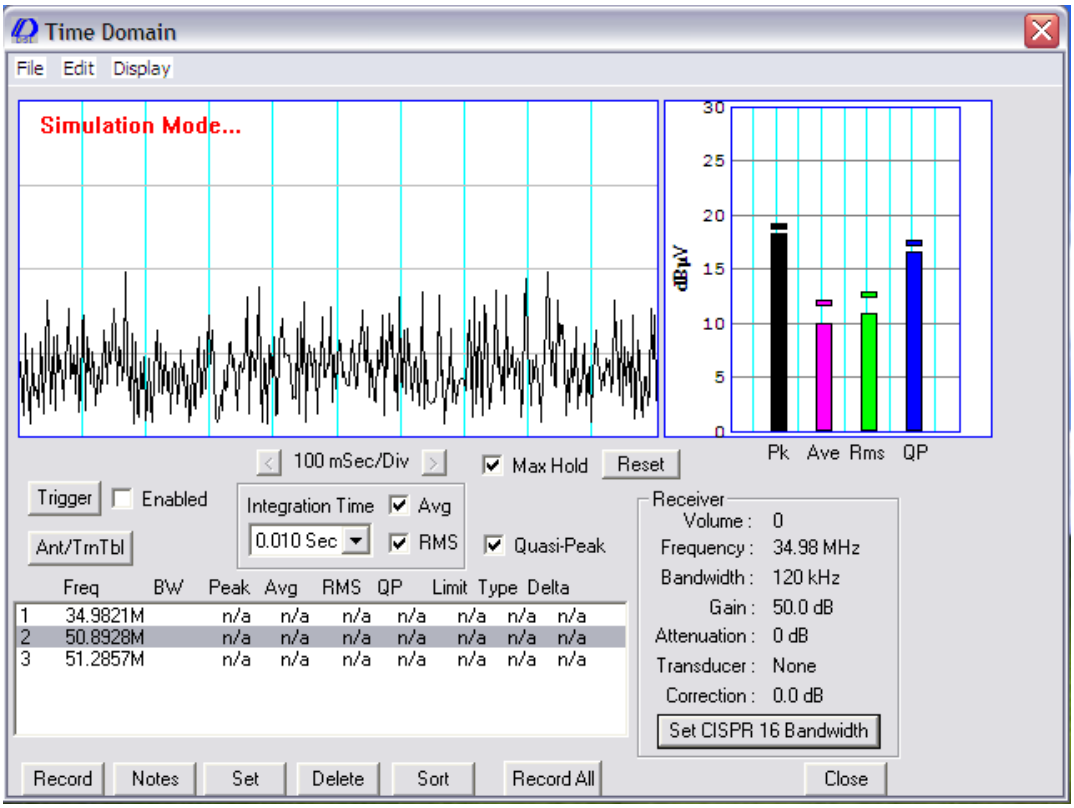


Figure 3

The Time Domain display seen in Figure 3, is activated by selecting Measure on the Monitor screen it permits selection of any combination of Quasi Peak, Average, RMS detectors for measurement, display and recording. The measurements are displayed and recorded in units determined by the transducer definition. Limit lines can also be shown and the display will automatically re-scale when signal levels change to maintain maximum resolution.

Mast/Turntable Control Screen

In the Receiver Mode, the DSI-600 may automatically control an antenna mast and turntable. Drivers for commercially manufactured models are available in the system software and may be selected during system configuration. When prompted, maximum emission points will be displayed. Figure 4 shows the Antenna Mast and Turntable Control Screen.

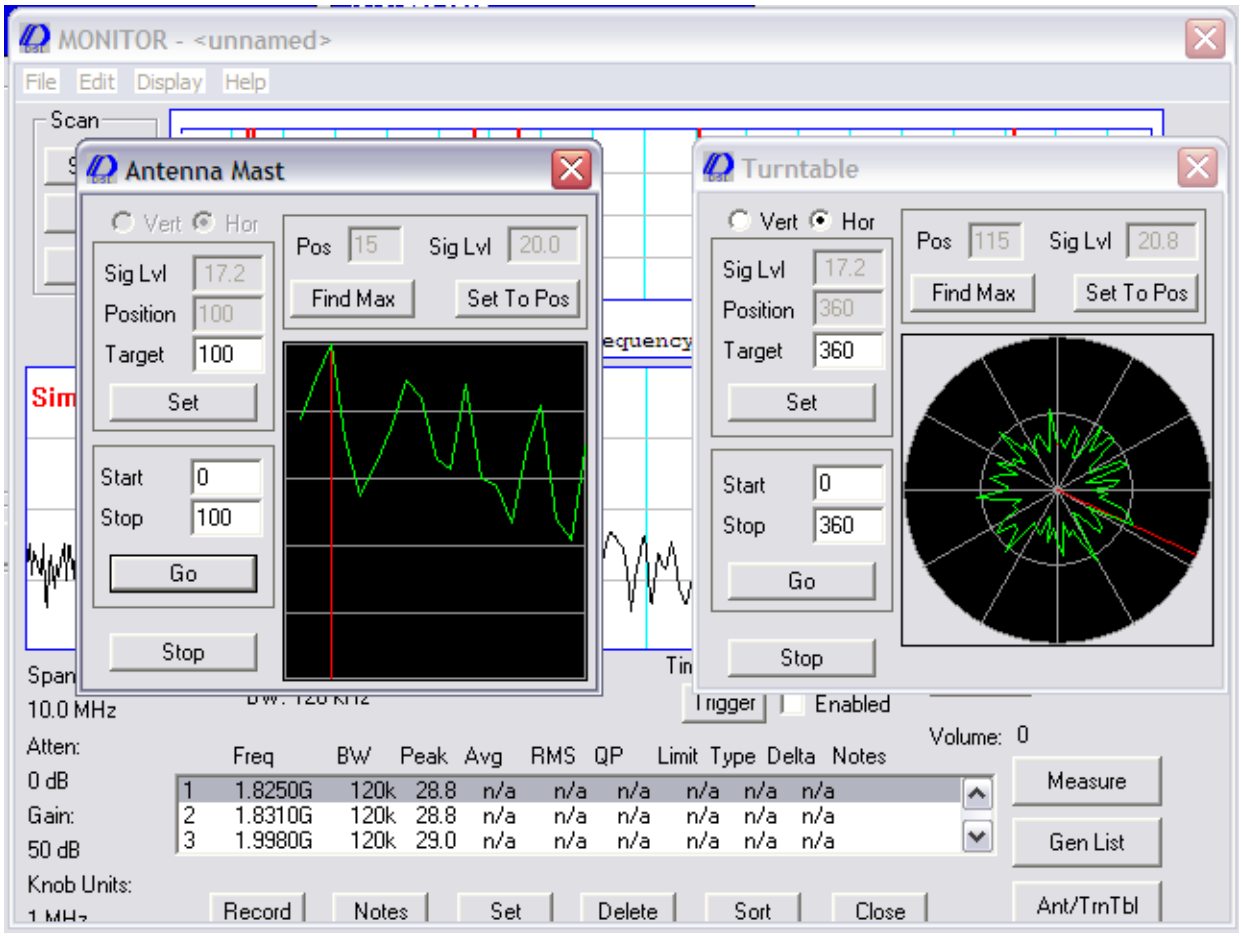
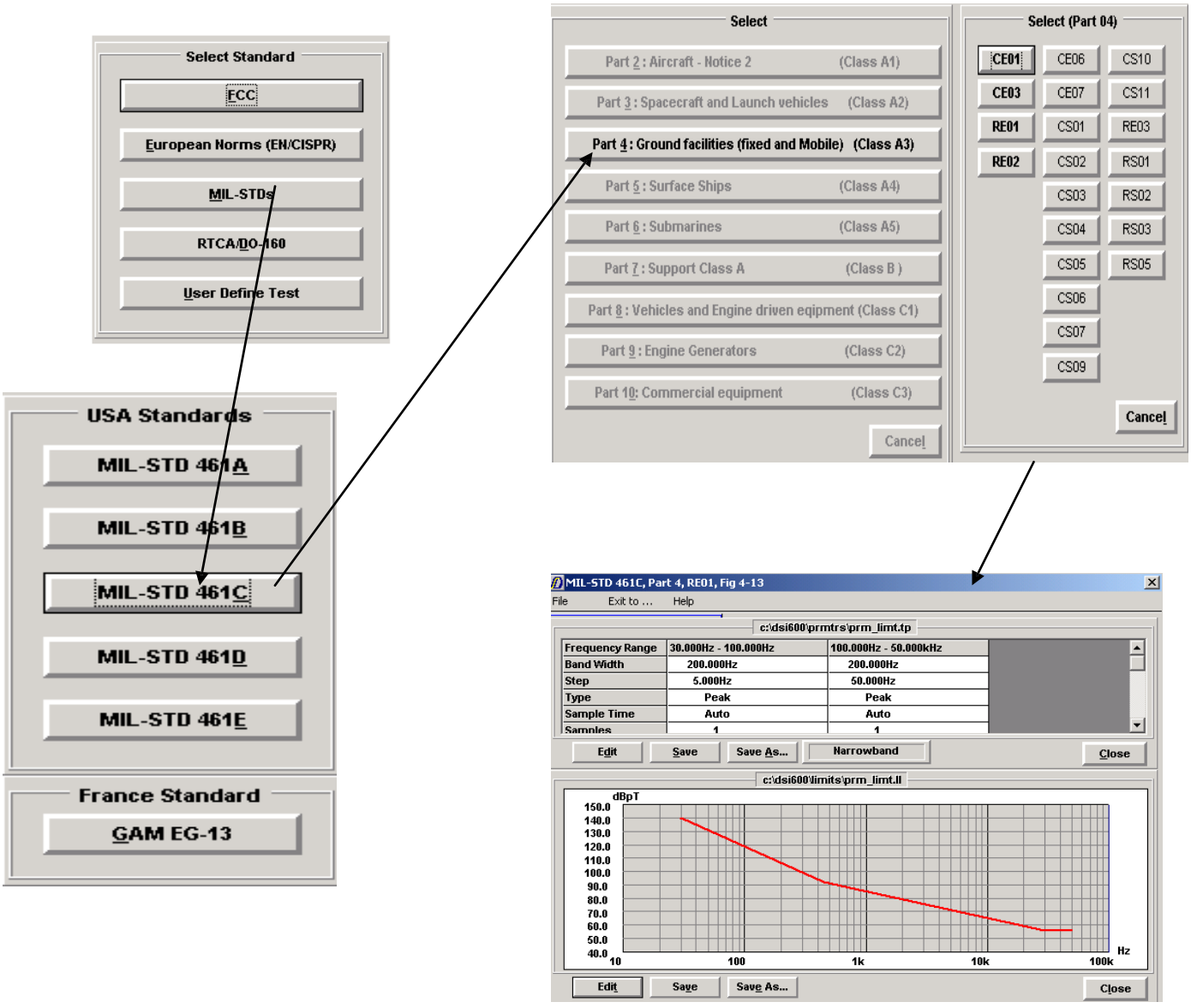


Figure 4

Set-up Screens

Creation of a test involves specification of frequency range, sensor(s), bandwidth(s), step size, number of samples/steps, etc. Limits must be applied to a standard test and often custom parameters are introduced.

The operator may select from a set of standards CISPR, FCC, ANSI, DO-160, EN, MIL-STD or user defined tests and will be prompted to enter information regarding the unit tested and conditions of the test. This is seen below.



Report Screen

Flexible report generation tools needed to create quality documentation and data are standard. Previously store test data may be recalled, scaled, printed, plotted or saved. Multiple curves may be super imposed, with limit lines separately selected. Results of two tests can be compared to show differences. Plot appearance can be changed to tailor characteristics of the plots and portions of the graph may be captured to the Windows clipboard for inclusions in documents.

This is seen in Figure 6.

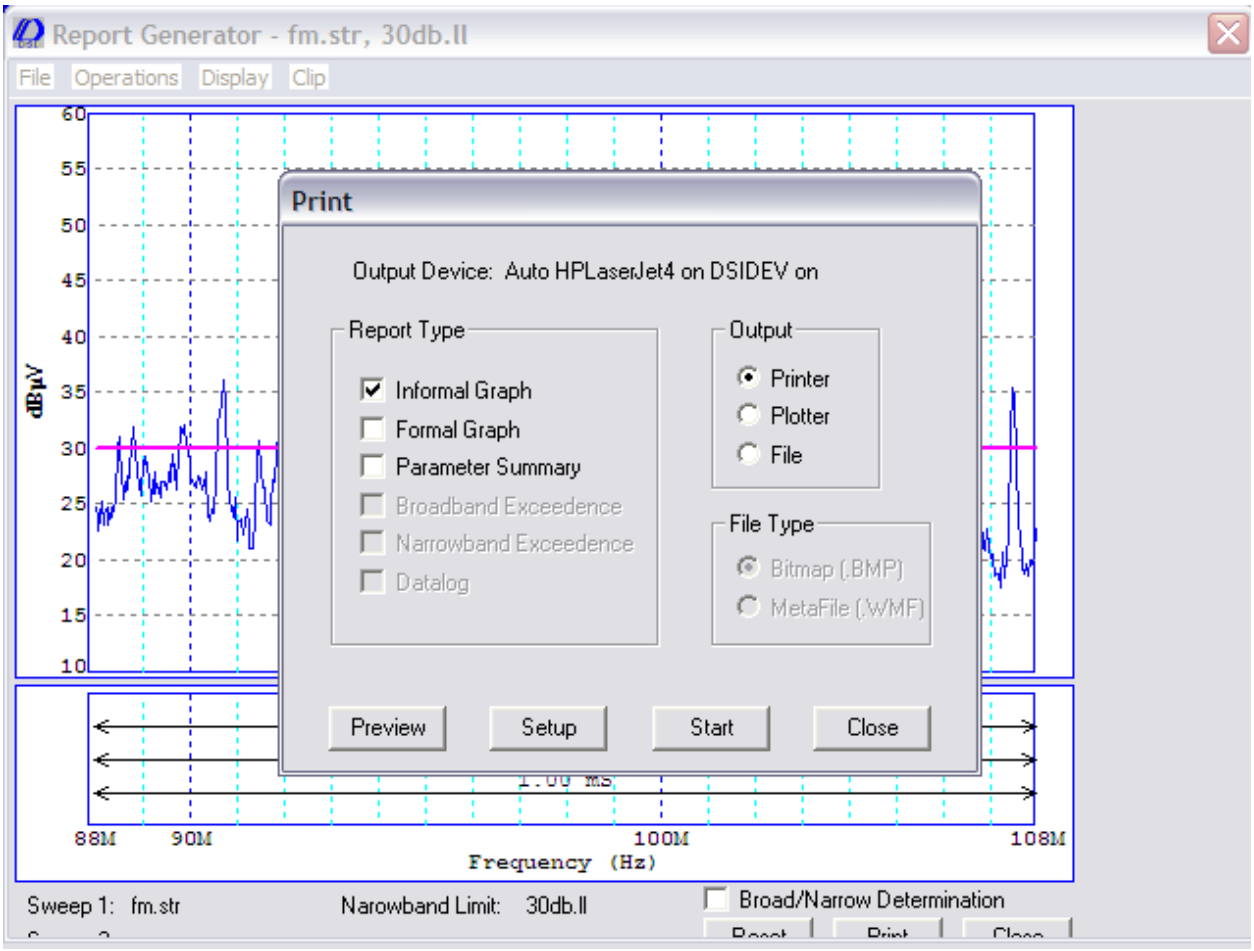
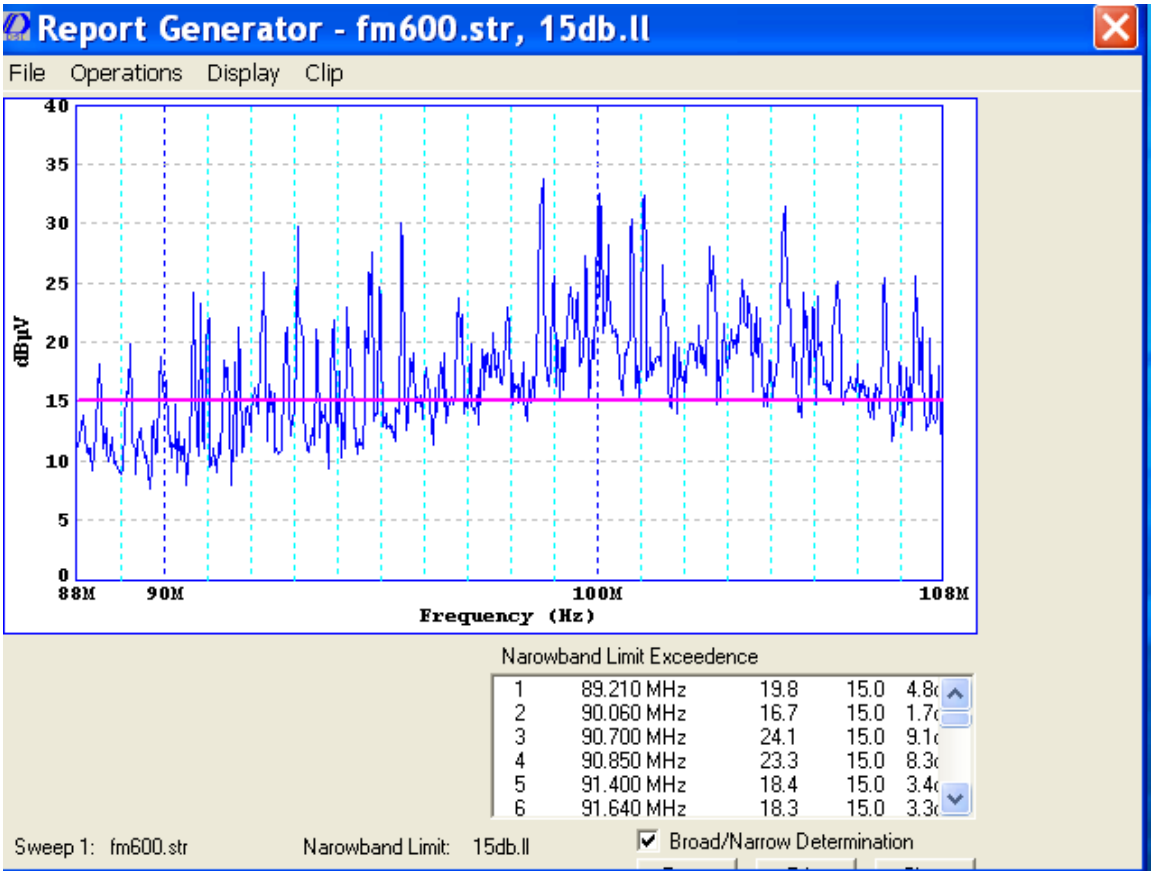


Figure 6

Broadband and Narrowband Determination

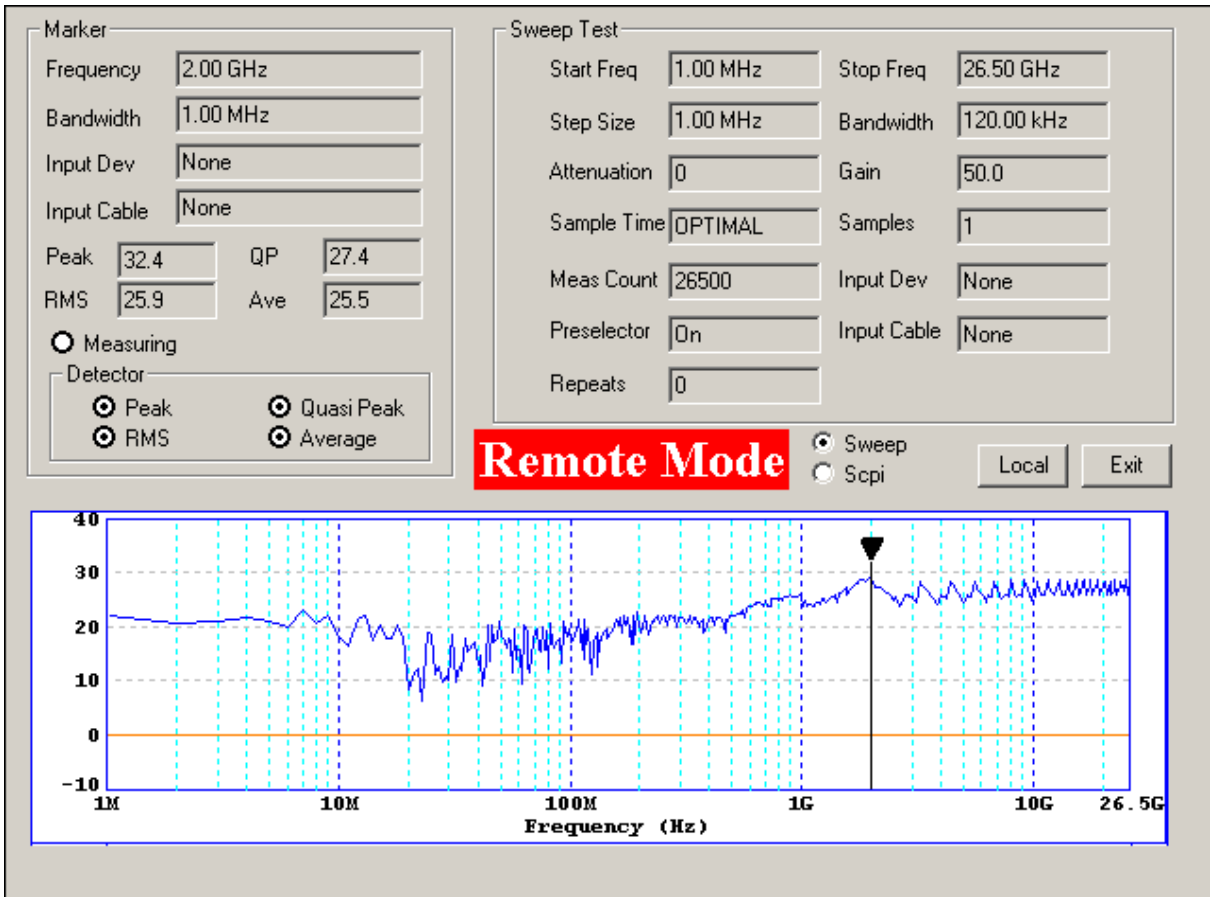
Broadband and Narrowband Determination features characteristics that proved the plot and generate an exceedance list. The Formal and Informal report options yield professional print-outs. In addition, graphical reports, parameter summaries, data log files, limit line exceedances, and narrowband lists can be printed and stored. See the example shown in Figure 7.



Figur e 7

Remote Mode

In the Remote Mode, the DSI-600 may be interfaced to a user's EMI existing compliant software. The DSI-600 interfaces with the users host software via the Standard Commands for Programmable Instrumentation (SCPI). During the operation in the Remote Mode, the Remote Mode Display screen displays the DSI-600 monitor.



Remote Mode

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