

Master Software Tools

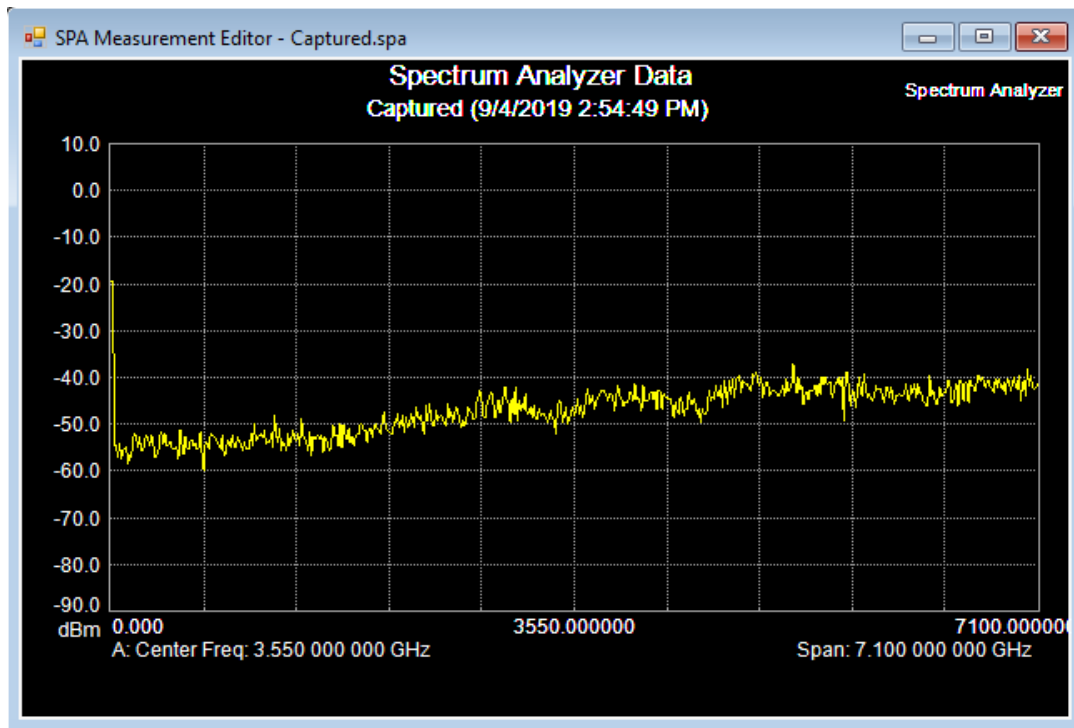


Table of Contents

Chapter 1—General Information

1-1	Introduction	1-1
1-2	Features, Options, and Capabilities	1-1
1-3	System Requirements	1-2

Chapter 2—Quick Start--copy

2-1	Introduction	2-1
2-2	Installation of MST	2-1
2-3	Connection Methods	2-1
2-4	Connection and Configuration Using LAN	2-2
	Ethernet LAN Connections	2-2
	Configure the Test Instrument's IP Address with DHCP	2-4
	Configure the Test Instrument's IP Address Manually	2-6
	Configure the Computer's IP Address	2-8
	Configure MST	2-13
	Direct Ethernet Crossover Cable Connection	2-14
2-5	Connection and Configuration with Other Methods	2-21
	USB Connection and Configuration	2-21
	Serial Connections and Configuration	2-22

Chapter 3—Graphical User Interface (GUI)

3-1	Introduction	3-1
3-2	Main Screen	3-1
3-3	Menu Bar	3-3
	File	3-3
	Edit	3-6
	View	3-7
	Connection	3-8
	Sync	3-9
	Tools	3-10
	Window	3-12
	Help	3-13
3-4	Toolbar	3-14
3-5	Graphic Display Edit Toolbar	3-17
3-6	Active Measurement Window	3-19
3-7	File Resource Group	3-19
	Local File Resource Directory Window	3-20
	Device File List Window	3-20
	Open File List Window	3-20
	Network Window	3-21
3-8	Measurement Preview/File Summary Windows	3-21
3-9	Status Bar	3-21

Table of Contents (Continued)

3-10	Context Menus & Plot Setup	3-22
	Common Context Menu Command Lines and Plot Setup Configurations	3-22
	Spectrum Analyzer (SPA)	3-28
	Cable and Antenna Analyzer (Vector Network Analyzer - VNA)	3-29
	WCDMA	3-29
	Interference Analyzer (IA)	3-30
	JPEG File	3-32
	Limit Line Node	3-32
	Power Meter, High Accuracy Power Meter, Fixed WiMAX, Mobile WiMAX, WCDMA . . .	3-33
	TD-SCDMA Signal Analyzer	3-34
	Channel Scanner	3-34
3-11	File Editors, Tools, and Other Miscellaneous Windows	3-35
	Print All Measurements	3-35
	Antenna Editor	3-35
	Cable Editor	3-36
	Signal Standard Editor	3-36
	Language Editor	3-38
	Pass Fail Editor	3-38
	XML Parameter File Editor	3-39
	SPA and VNA Plot Setup: Common Settings	3-39
	VNA Additional Plot Setup Settings	3-42
	Power Meter and High Power Accuracy Meter Plot Setup	3-44
	Enter IP Address	3-44
	Measurement Calculator (VNA)	3-45
	DAT File Conversion Tool	3-45
	Distance-To-Fault	3-45
	Trace Rename Utility	3-46
	Product Updates	3-47
3-12	Program Options	3-47
	General Tab	3-48
	Report Generator	3-50
	Internet Settings	3-51
	Serial Port Settings	3-51
	Languages	3-52
	MST File Indexing – Trace Catalog	3-53
	Archive Options – Trace Catalog	3-54
	Optional File Tasks	3-55

Chapter 4—Using MST

4-1	Introduction	4-1
-----	------------------------	-----

Table of Contents (Continued)

4-2	General File Management	4-1
	Downloading and Uploading Measurement Files	4-1
	Standard File Commands	4-2
	Export	4-3
	Exporting S2P-Formatted VNA Files	4-3
	Creating Measurement Reports	4-3
	Saving JPEG Images from Open Measurements	4-3
	Saving Folder as DAT	4-4
	Printing All Open Measurements	4-4
4-3	Editing Measurements	4-4
4-4	Overlays	4-4
	Overlay Issues	4-5
	Dragging from the Device File List	4-5
	Dragging Open Measurement Files	4-5
	Frequency Range of Base Measurement File	4-5
	Overlay File Name	4-5
4-5	Edit Graph (Plot Setup Dialog Box)	4-5
4-6	Common Options	4-6
	Autoscale	4-6
	Undo Zoom	4-6
	Marker Table	4-6
	Marker Shape	4-6
	Plot Range	4-6
	Plot Mode	4-6
	Measurement Overlays	4-7
	Trace Math	4-7
	Trace Smoothing	4-7
4-7	Working with Limit Lines and Markers	4-8
	Working with Limit Lines in the Active Measurement Window	4-8
	Working with Markers in the Active Measurement Window	4-9
4-8	Annotating Graphs	4-11
4-9	Remote Access Tool	4-13
4-10	3D Spectrogram	4-17
	Marker Table	4-19
	Signal ID Table	4-20
	Signal ID Summary	4-20
	3D Spectrogram	4-21
	Top View	4-21
	Single Plane Frequency Domain or Time Domain View	4-21
	Miscellaneous Controls	4-22
4-11	Script Master Editor	4-25
	GSM/WCDMA Script Master	4-25
	Channel Scanner Script Master	4-27

Table of Contents (Continued)

4-12	VNA Master Measurement Window	4-31
	General Instrument Setting Summary	4-32
	Trace Setting Summary Panel	4-32
	Graph Display Window	4-32

Chapter 5—Support File Management

5-1	Introduction	5-1
5-2	Antenna Editor (antenna.txt)	5-1
5-3	Signal Standard Editor (SignalStd.sig)	5-2
5-4	Cable Editor (Cablelist.txt)	5-3
5-5	Pass/Fail Test Editor (TestModels.txt)	5-3
5-6	Setup Files (*.stp)	5-3
5-7	Calibration Files (Cal*.txt)	5-3
5-8	JPEG Files (*.jpg)	5-4
5-9	Reports (.pdf and .html)	5-4
5-10	Exported Files (*.csv, *.txt)	5-7
5-11	Folder Spectrogram Files (*.fsg)	5-7
	Spectrogram	5-9
	Color Selection Configuration Window	5-10
	Folder Spectrogram Context Menu	5-11
5-12	Trace Indexing and the Trace Catalog	5-12
	Trace Catalog	5-12
	Trace Catalog-Spectrum Analyzer Window	5-13
	Trace Catalog-Spectrum Analyzer Toolbar	5-13
5-13	Filter Editor for ISDB-T (*.isdb)	5-18

Chapter 6—Advanced Features

6-1	Introduction	6-1
6-2	Advanced Tools and Program Options	6-1
	Group Edit	6-1
	Full Trace Retrieval	6-1
	VNA Measurement Calculator	6-1
	DAT File Conversion Tool	6-1
6-3	Trace Rename Utility	6-2
6-4	Modifying or Defining a Language	6-7
6-5	Group Edit	6-7

Chapter 7—Instrument Update

7-1	Introduction	7-1
7-2	Internet Settings Configuration	7-1
7-3	Product Updates Window	7-3
7-4	Updating MST Software	7-5

Table of Contents (Continued)

7-5	Updating Instrument Firmware	7-6
	Update an Instrument's Firmware Directly	7-6
	Update Instrument Firmware with USB from MST	7-7
	Firmware Update from an Anritsu Website File	7-9
7-6	Emergency Repair Procedure	7-12
7-7	Generating an Instrument Config File and Installing A New License File.	7-13

Appendix A—Applications and Files

A-1	Supported Anritsu Instruments	A-1
A-2	Supported File Types	A-1

Appendix B—FAQs

B-1	Intermittent Boot-up Problems with Dell Docking Stations	B-1
	Dell Latitude D620 Series Laptops	B-1
	Dell Latitude D630 Series Laptops	B-3
B-2	Activating a Different Language	B-3
B-3	Instrument Password Protection Feature	B-4

Chapter 1 — General Information

1-1 Introduction

Anritsu Master Software Tools (MST) is a Microsoft Windows compatible program for transferring, editing, and saving measurements, markers, and limit lines from an Anritsu instrument to a PC or laptop (hereafter referred to as “the computer”). It does not function on earlier versions (prior to XP) of the Microsoft Windows operating system. Refer to “[System Requirements](#)” on page 1-2 for complete system requirements.

To use MST and this guide to their full advantage, users should be familiar with their Anritsu instruments and the various measurements that they can make.

1-2 Features, Options, and Capabilities

MST provides these features, options, and capabilities:

- Download measurements from the test instrument’s memory to the computer for storage and analysis.
- Capture live traces on the computer. Files saved on an instrument can be retrieved through MST.
- Upload saved measurements from the computer to the test instrument.
- Compare multiple, Spectrum Analyzer measurement traces using drag, drop, Trace Math, and trace overlay features.
- Add, delete, and modify the scale of, Limit Lines and Markers of graphs.
- Modify the instrument’s Cable List with the Cable Editor.
- Modify the instrument’s Antenna List with the Antenna Editor.
- Modify the instrument’s Signal Standard List with the Antenna Editor.
- Create, upload, download, or edit Pass/Fail mode lists for many measurement modes including: WCDMA/HSDPA, GSM/GPRS/EDGE, Fixed & Mobile WiMAX, CDMA, EV-DO, LTE, and TD-LTE.
- Create, upload, download, or edit Script Master Files for GSM/WCDMA.
- Display power level, calibration status, and GPS information along with a measurement, in one report.
- Create and upload custom language files to the instrument to customize soft key labels and messages.
- Export measurement data as text files for use in spreadsheets or other documents.
- Create reports in HTML format for use in many applications.
- Export measurements as graphic files (.jpg format).
- Export measurements as CSV (Comma Separated Values) files.
- Update the instrument with the latest firmware available from: <http://www.anritsu.com>.
- Store an unlimited number of data traces to a computer, easing the task of analyzing and monitoring historical performance.
- Connect to a computer using USB, Ethernet LAN, or a Direct Ethernet connection.
- Display measurement locations using Microsoft Map Point and GPS location mapping.
- Convert DAT files from Anritsu Handheld Software Tools into Anritsu MST file formats.
- Combine spectrum analyzer traces into one spectrogram with the Folder Spectrogram tool. It does combine spectrograms into a “super spectrogram.”
- Create files with the Script Master to set up measurement parameters and create automated test procedures that aid field technicians or FAEs with measurement testing.
- Context menus simplify access to many functions that are available on the pull-down menus and toolbar buttons, or to functions, commands, and options specific to the active measurement window.

1-3 System Requirements

The minimum requirements and recommendations are:

- Windows XP, Service Pack 2 or higher
- Windows Vista (32 bit or 64 bit)
- Windows 7 (32 bit or 64 bit)
- Windows 8 (32 bit or 64 bit)
- Windows 10 (32 bit or 64 bit)
- 1G of RAM minimum
- 1G of available hard disk space
- A USB port (USB 1 required, USB 2.0 recommended) and/or an Ethernet 10/100 Base T connection for communication with certain test instruments.

Chapter 2 — Quick Start--copy

2-1 Introduction

This Quick Start chapter provides instruction about installing MST and describes the various connection methods for Anritsu instruments. The use and application of the features of MST are covered in more depth in later chapters.

2-2 Installation of MST

Follow these steps to install MST on a computer. Refer to “[System Requirements](#)” on page 1-2 for requirements for installation.

1. Download the MTS software package with the Anritsu Tool Box from this site:
<https://www.anritsu.com/en-US/test-measurement/support/downloads/software/dwl19049>
2. Make sure that .Net 3.5 and .Net 4.7 are installed prior to installing MST.
3. Install MST by running this file: Anritsu_SWT_Full_Installer_Vn.nn.exe from the download folder in Step 1 where n.nn are the version and release. For example, Anritsu_SWT_Full_Installer_V1.18.exe.
4. Follow the prompts. When this guide refers to folders, it uses the defaults provided by the installation wizard. The location of your files might be different.
5. Test the MST installation by running it from the Start menu, a desktop shortcut, the Anritsu Toolbox, or the Taskbar.

2-3 Connection Methods

There are several methods of connecting an Anritsu instrument to a computer and to MST.

- The [methods](#) of connecting Anritsu test instruments through a LAN to MST (instruments must have an Ethernet port):
 - Ethernet through a LAN using DHCP
 - Ethernet through a LAN (with manual IP address)
 - Direct Ethernet (using a crossover cable with manual IP address)
- These are the [methods](#) of connecting Anritsu test instruments that do not use a LAN:
 - USB
 - Serial-to-serial
 - USB-to-serial

Each method is diagrammed and its required settings explained.

Note Not all connection methods are compatible with all instruments.

2-4 Connection and Configuration Using LAN

This section describes how to connect a BTS Master instrument (as a representative of Anritsu's advanced instruments) to MST using LAN connection methods listed in [“Connection Methods”](#). For information and instruction for other instruments, refer to [“Connection and Configuration with Other Methods”](#) on page 2-21.

Ethernet LAN Connections

Connect the Instrument to the Computer through a LAN

Use standard Ethernet cables to connect the test instrument and the computer to a LAN (using an Ethernet hub). There are two LEDs integrated into the Ethernet port on the test instrument. The amber LED indicates the presence of LAN voltages—a live LAN connection—and the green LED flashes to show that LAN traffic is present.



Figure 2-1. Ethernet LAN Setup

Continue with [manually](#) configuring IP address of the test instrument.

Connect the Instrument to the Computer through a LAN to use DHCP

Use this section to set up the instrument and computer to allow the network to choose the IP address for the instrument.

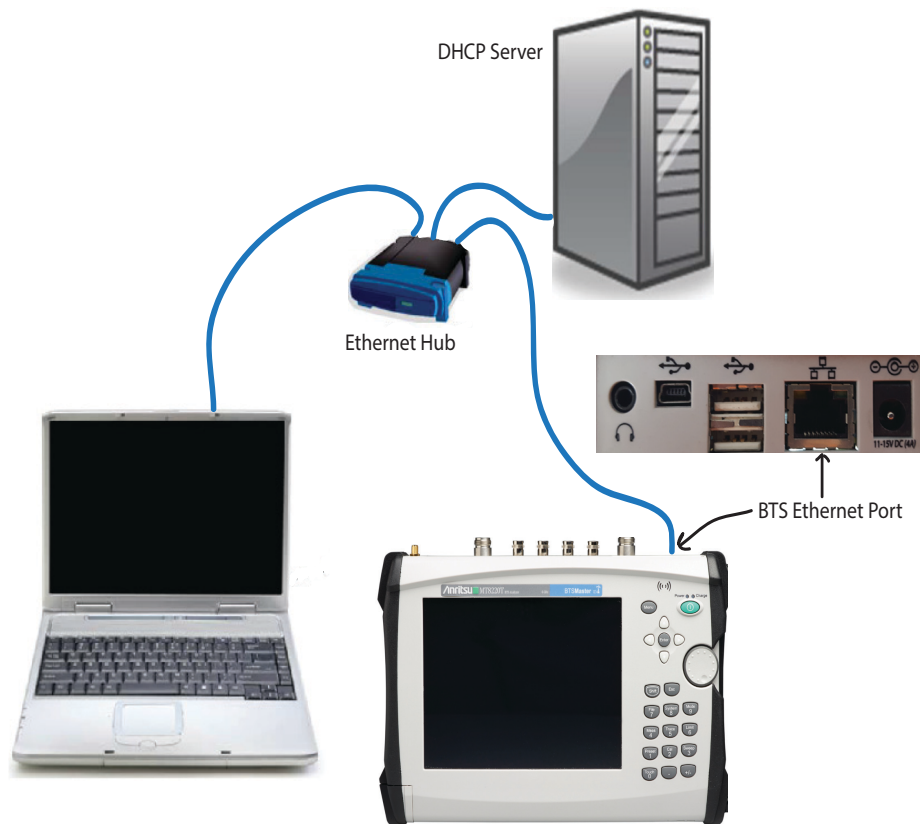


Figure 2-2. Ethernet Hardware Setup

Continue with [manually](#) setting IP address or with [DHCP](#) IP address allocation.

Configure the Test Instrument's IP Address with DHCP

Note The address might change each time the instrument is booted; in these cases, you enter a new address for each MST session.

To configure an instrument's IP address using DHCP:

1. Connect the computer and instrument to a LAN which is connected to a DHCP server. See [Figure 2-2](#).
2. On the test instrument, press the **Shift** key, then the **System [8]** key. The test instrument's System menu displays.
3. Press the System Options soft key, and then the Ethernet Config soft key. The Ethernet Editor window displays.

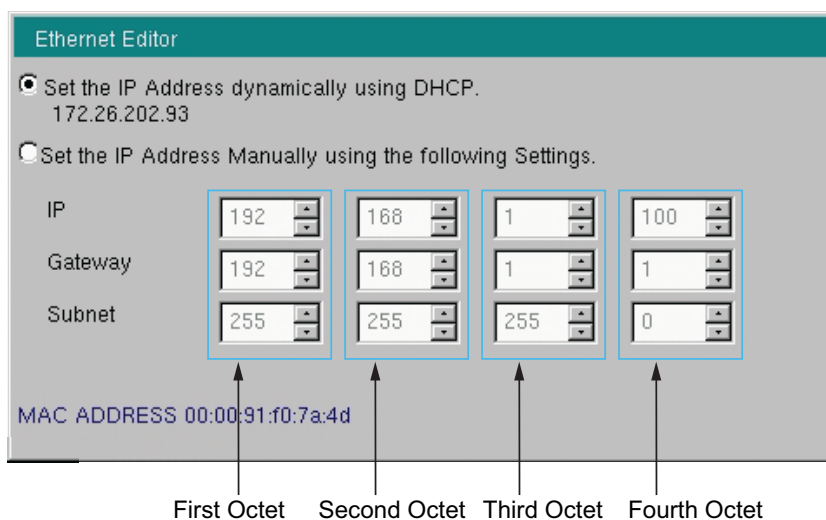


Figure 2-3. Ethernet Editor Window: DHCP

4. Press the Type soft key to select DHCP; DHCP will be underscored. See [Figure 2-4](#).



Figure 2-4. Type Soft Key Showing DHCP Selected

5. Check for an IP address at this time in the Ethernet Editor window. If an address appears, the instrument is ready for connection to MST. Skip to [“Configure MST” on page 2-13](#).
6. Press the **Enter** button. The test instrument is ready to obtain an IP address from the DHCP Server.
7. Power cycle the test instrument.

8. Immediately after the re-boot the IP Address obtained from the DHCP Server momentarily displays near the top left portion of the screen. Write down the IP address.

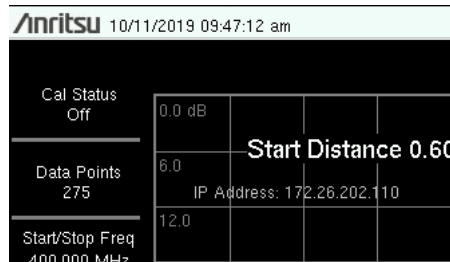


Figure 2-5. IP Address Display on Instrument

If you miss seeing the IP address, you can view the IP Address from the System menu. Choose **a** or **b** to view the IP address.

- a. Press the **Shift** key followed by the **System [8]** key, then press the **Status** soft key. The Status window opens. The IP address is listed first.

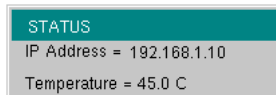


Figure 2-6. IP Address in Instrument Status Display

OR

- b. Press the **System Options** soft key followed by **Ethernet Config** soft key. The Ethernet Editor window displays the IP address, as shown in the picture below.

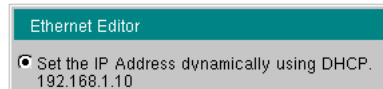


Figure 2-7. IP Address Display in Ethernet Editor Dialog

Either way, make note of the IP address so that you can enter it in MST. Continue with [“Configure MST” on page 2-13](#)

Configure the Test Instrument's IP Address Manually

Note

The IP address and the Gateway and Subnet masks in the following figure are examples only. Request address information from your IT administrator.

If the Ethernet Editor window does not display, this is because your instrument does not support an Ethernet connection; in this case try connecting with a USB or serial cable.

To configure an instrument's IP address manually:

1. On the test instrument, press the **Shift** key, then the **System [8]** key. The test instrument's System menu displays, see [Figure 2-8](#) (left).

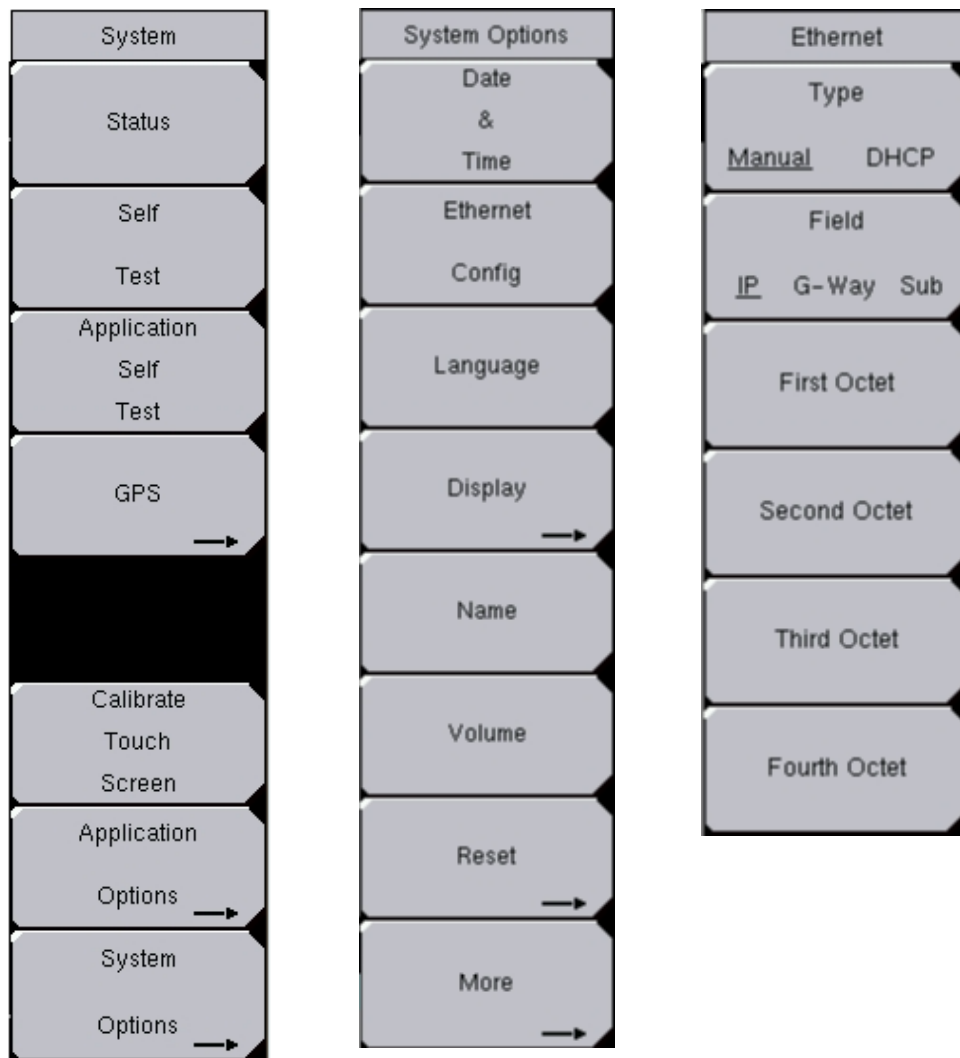


Figure 2-8. BTS Master Instrument System, System Options, Ethernet Menus

- Press the System Options soft key, see [Figure 2-8](#) (left), then the Ethernet Config soft key, see [Figure 2-8](#) (middle). The Ethernet Editor displays and the Ethernet menu, see [Figure 2-8](#) (right) displays along the right side of the instrument display.

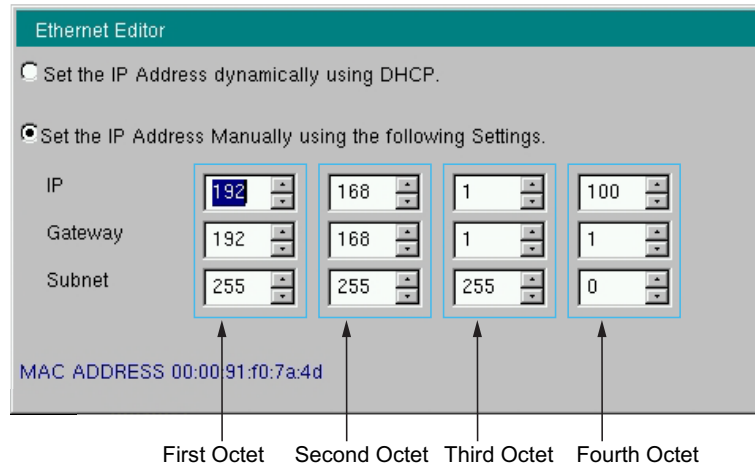


Figure 2-9. Ethernet Editor Dialog

- Press the Type soft key to select Manual (it shows as underscored). The cursor moves to the IP address row and the First Octet field.



Figure 2-10. Type Soft Key

- Set the IP address to 192.168.1.100 or use the address your local IT administrator supplies. Use the number keypad, the up/down arrow keys, or the rotary knob to change the value in the octet field. After the value is entered in the First Octet field, use the octet soft keys, see [Figure 2-11](#), or the left/right arrow keys to move to the next octet field.



Figure 2-11. Octet Soft Keys

5. Press the Field soft key so that G-Way is underscored. The cursor moves to the First Octet field of the Gateway address row.



Figure 2-12. Field Soft Key: G-Way Underscored

6. Set the Gateway address to 192.168.1.1 or use the address your local IT administrator supplies. Use the number keypad, the up/down arrow keys, or the rotary knob to change the value in the Octet field. After the value is entered in the First Octet field, use the Octet soft keys, see [Figure 2-11](#), or the left/right arrow keys to move to the next Octet field.
7. Press the Field soft key so that Sub is underscored. The cursor moves to the First Octet field of the Subnet address row.

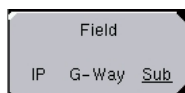


Figure 2-13. Field Soft Key: Sub Underscored

8. Set the Subnet address to 255.255.255.0. Use the number keypad, the up/down arrow keys, or the rotary knob to change the value in the octet field. After the value is entered the First Octet field, use the Octet soft keys, see [Figure 2-11](#), or the left/right arrow keys to move to the next Octet field.
9. Press **Enter** to accept the changes or **Esc** to discard.

Configure the Computer's IP Address

1. On the computer, go to the Ethernet Settings dialog.

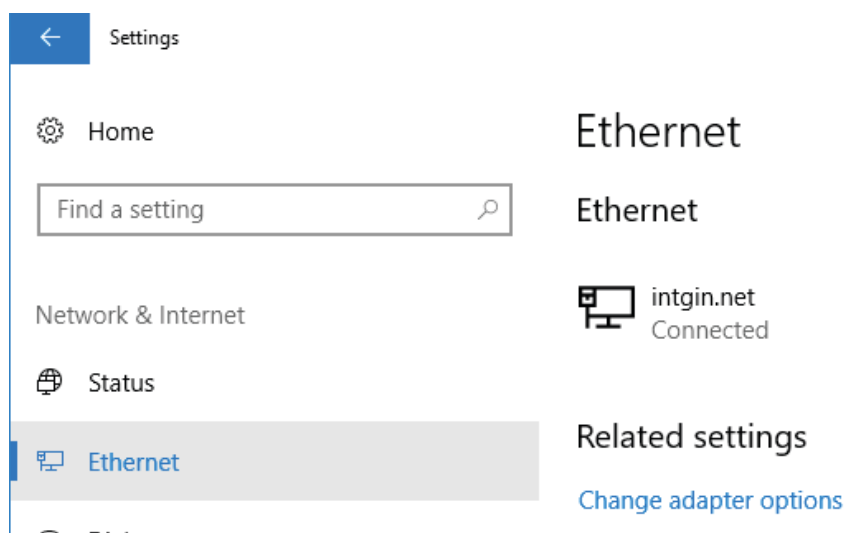


Figure 2-14. Windows Network Connections Selection

2. Click Ethernet. The Network Connections dialog displays.

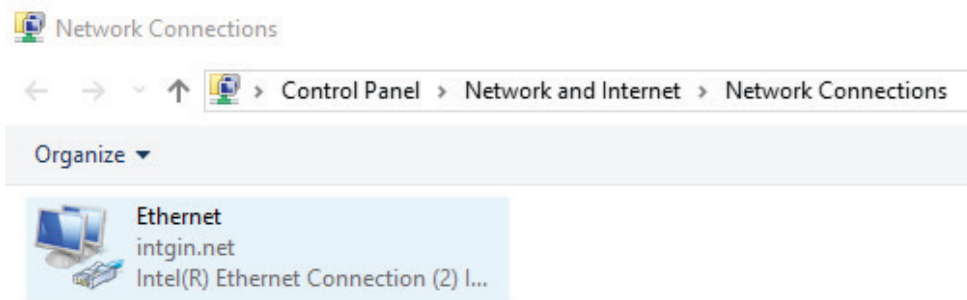


Figure 2-15. Choosing Ethernet from Network Connections

3. Click Ethernet. The Ethernet Status dialog displays.

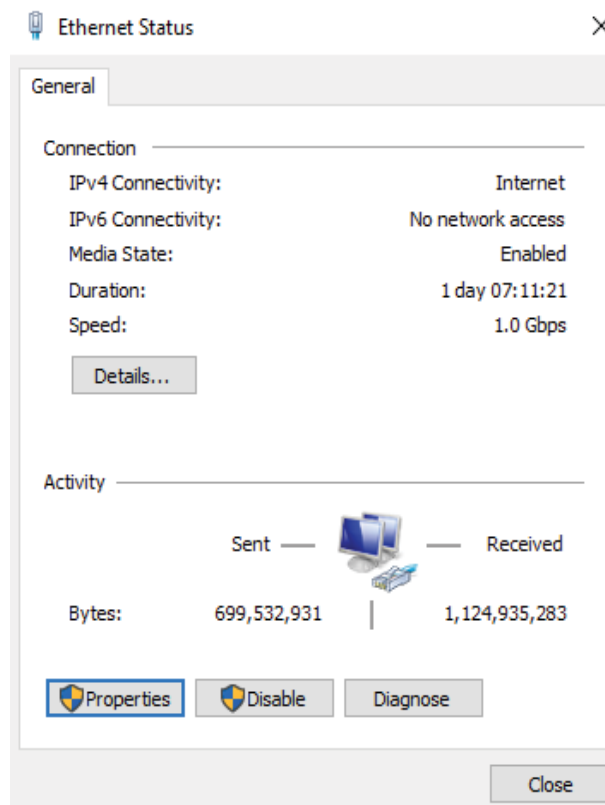


Figure 2-16. Ethernet Status Dialog

4. Click Properties. The Ethernet Properties dialog displays.

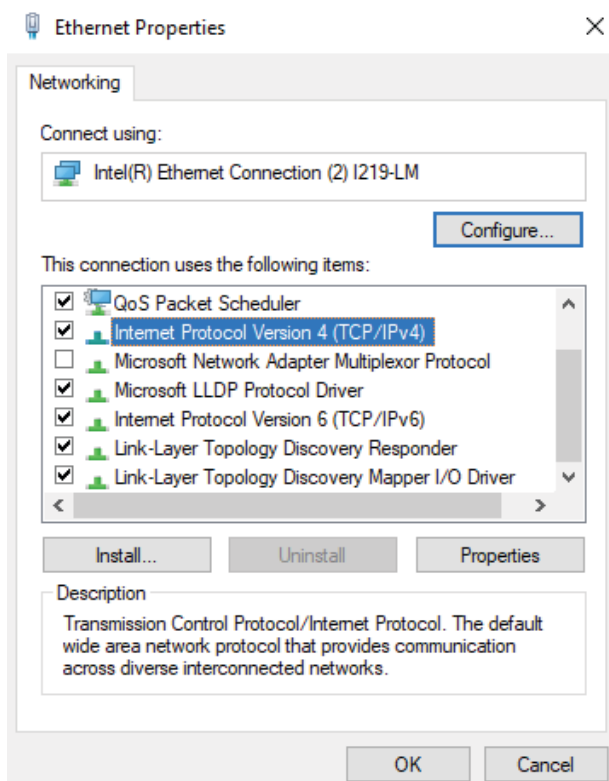
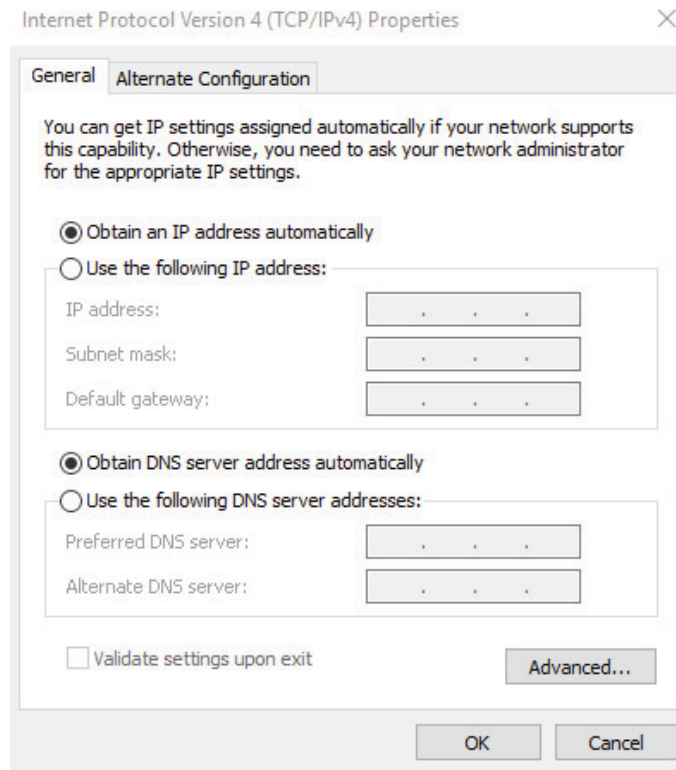


Figure 2-17. Ethernet Properties: Networking Dialog

5. Select IPV4 and click Properties. The Internet Protocol Version 4 (TCP/IPv4) Properties dialog displays.



6. If you are using DHCP, click Obtain an IP Address automatically and click Obtain DNS server address automatically and skip to ["Configure MST" on page 2-13](#). Otherwise, continue with Step 7.

7. Click the **Use the following IP address:** button and enter the IP, Subnet mask, and Default gateway information (that your network administrator provides):

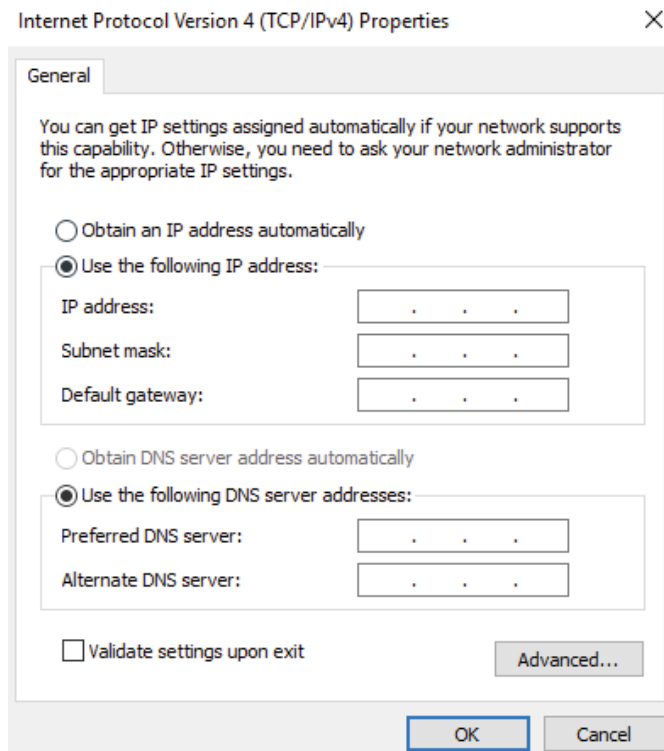


Figure 2-18. Internet Protocol (TCP/IP) Properties Dialog

- a. Set the IP address to the value your local IT administrator supplies.
 - b. Set the Default gateway address to the value used in [Step 6](#) of “[Configure the Test Instrument’s IP Address Manually](#)” on [page 2-6](#).
 - c. Set the Subnet mask to the value used in [Step 8](#) of “[Configure the Test Instrument’s IP Address Manually](#)” on [page 2-6](#).
8. If you are using DNS, then provide that information as well (that your network administrator provides).
 9. Click OK.
 10. Close all windows that are open.
 11. Reboot both the computer and the test instrument.

Notes

- For quick access to instruments, the connection drop-down list in the MST toolbar records the last ten units to which it was connected. Clicking an entry in this list directs MST to attempt to re-establish that connection.
- MST cannot, at this time, accommodate IPV6 addresses.

12. Continue with “[Configure MST](#)” on [page 2-13](#)

Configure MST

This section provides instructions to connect MST with the IP address of the instrument.

1. Start MST.
2. In MST, click Connection>Enter IP Address.

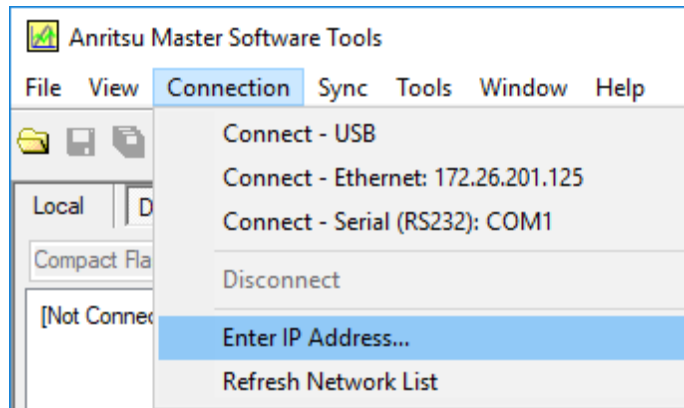


Figure 2-19. Preparing to enter the IP address of the instrument.

3. The Enter IP Address dialog displays.

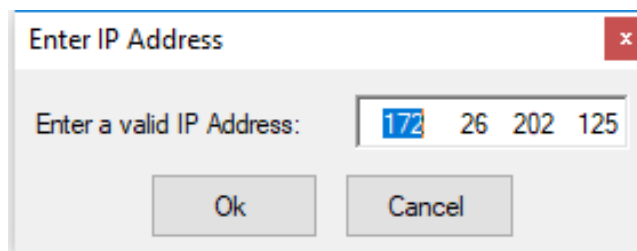
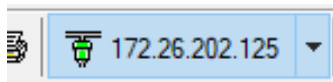


Figure 2-20. Entering the IP address of the instrument.

4. Enter the IP address of the test instrument as displayed in its Ethernet Editor Dialog box. This is the address whether manually entered or LAN DHCP assigned.
5. Click OK. The Connect: Ethernet icon changes from red



to green when connection is established.



Note

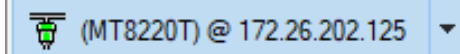
For quick access, the connection drop-down list in the MST toolbar keeps a history of the last ten addresses that it connected to. Click an entry to tell MST to try to reconnect to that address.

With the Status Bar turned on, a message at the bottom displays a Connected to message when communication is established.



Connected to TCPIP0::172.26.202.125::inst0::INSTR

An alternative way of connecting to a device is to double-click the matching IP address of a test instrument to establish a connection to that test instrument. If the connection was made by selecting from the Network list, the message in the Status Bar is slightly different:



(MT8220T) @ 172.26.202.125

Direct Ethernet Crossover Cable Connection

Use an Ethernet crossover cable to connect directly between the computer and the test instrument. Then set the test instrument's IP address and the computer's IP address to use this basic Ethernet connection.

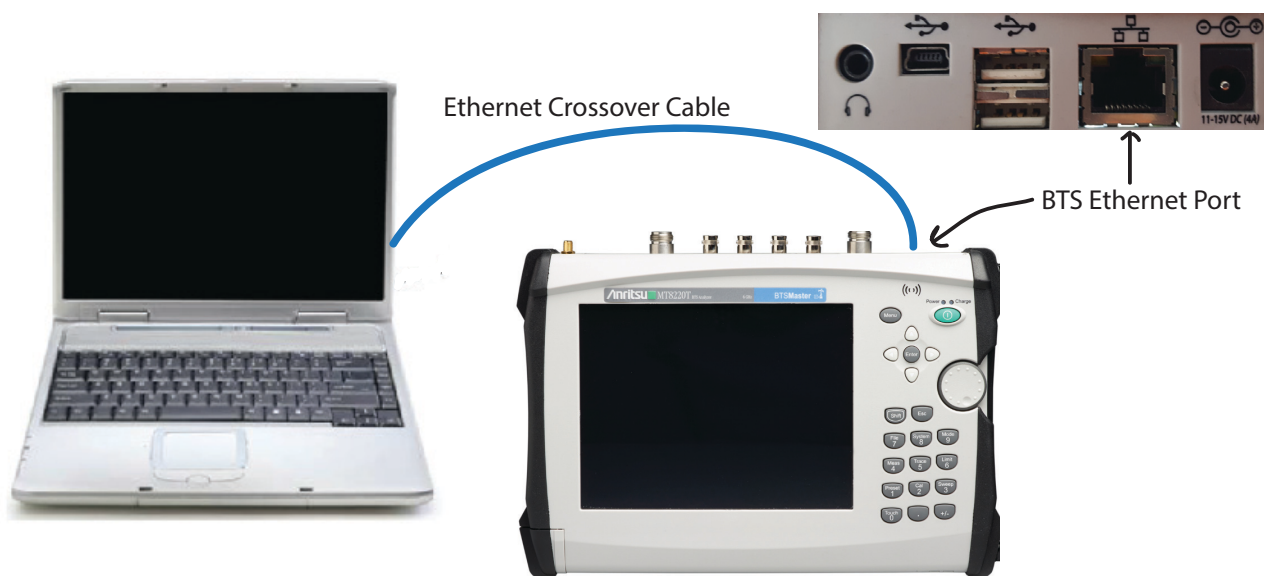


Figure 2-21. Direct Ethernet Connection Setup

Configure the Instrument's IP Address

Note

The IP address and the Gateway and Subnet masks in the following figure are examples only. Request address information from your IT administrator.

If the Ethernet Editor window does not display, this is because your instrument does not support an Ethernet connection; in this case try connecting with a USB or serial cable.

To configure an instrument's IP address manually:

1. On the test instrument, press the **Shift** key, then the **System [8]** key. The test instrument's System menu displays.

- Press the System Options soft key, The Ethernet Editor displays and the Ethernet menu displays along the right side of the instrument display.

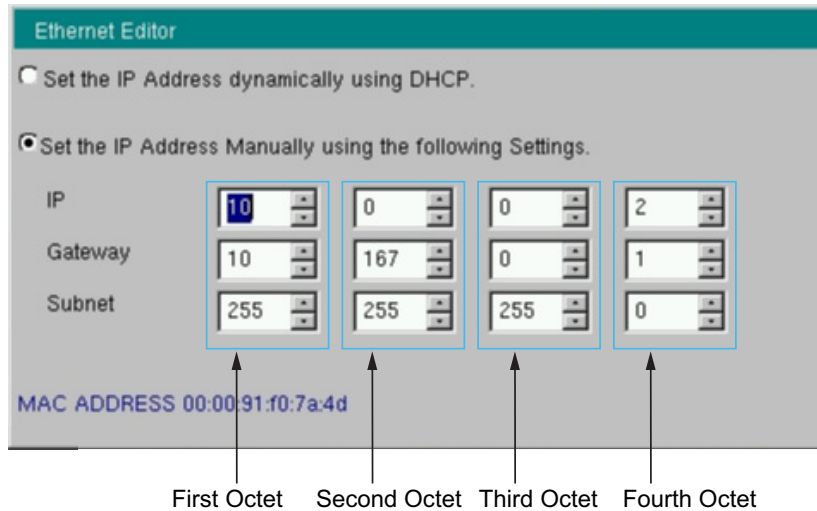


Figure 2-22. Ethernet Editor Dialog

- Press the Type soft key to select Manual (it shows as underscored). The cursor moves to the IP address row and the First Octet field.

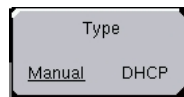


Figure 2-23. Type Soft Key

- Set the IP address to 10.0.0.2 or to the address your local IT administrator supplies. This address will be used in MST to complete the connection (see Step 14 on page 2-19). Use the number keypad, the up/down arrow keys, or the rotary knob to change the value in the octet field. After a value is entered in the First Octet field, use the Octet soft keys, see Figure 2-24, or the left/right arrow keys to move to the next octet field.



Figure 2-24. Octet Soft Keys

5. Press the Field soft key so that G-Way is underscored. The cursor moves to the First Octet field of the Gateway address row.



Figure 2-25. Field Soft Key: G Way Underscored

6. Set the Gateway address to 10.167.0.1 or to the address your local IT administrator supplies. Use the number keypad, the up/down arrow keys, or the rotary knob to change the value in the Octet field. After the value is entered in the First Octet field, use the Octet soft keys, see [Figure 2-24](#), or the left/right arrow keys to move to the next and subsequent Octet fields.
7. Press the Field soft key so that Sub is underscored. The cursor moves to the First Octet field of the Subnet address row.

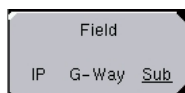


Figure 2-26. Field Soft Key: Sub Underscored

8. Set the Subnet address to 255.255.255.0. Use the number keypad, the up/down arrow keys, or the rotary knob to change the value in the octet field. After the value is entered the First Octet field, use the Octet soft keys, see [Figure 2-24](#), or the left/right arrow keys to move to the next and subsequent Octet fields.
9. Press **Enter** to accept the changes or **Esc** to discard.

Configure the Computer's IP Address

1. On the computer, go to the Ethernet Settings dialog.

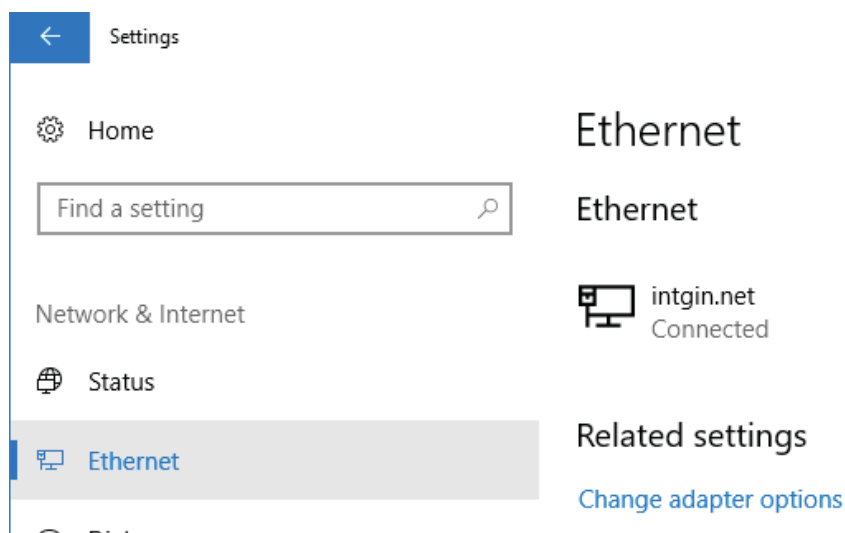


Figure 2-27. Windows Network Connections Selection

2. Click Ethernet.
3. Click Change adapter options.

4. The Network Connections dialog displays.

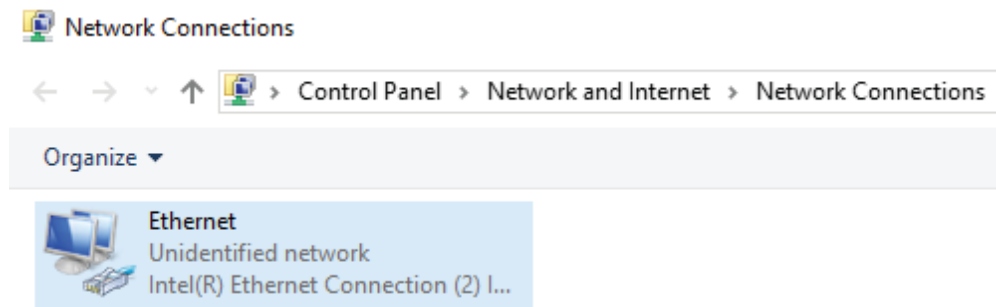


Figure 2-28. Choosing Ethernet from Network Connections

5. Double-click Ethernet Unidentified network. The Ethernet Status dialog displays.

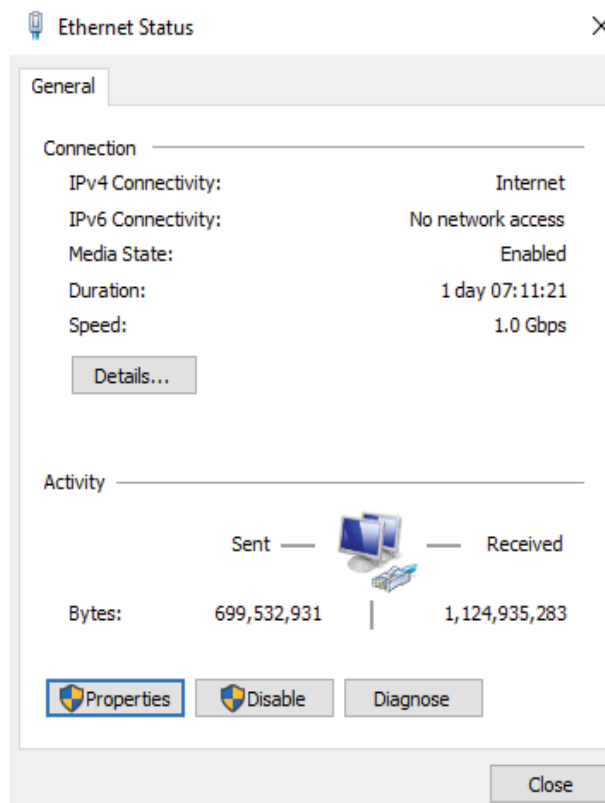


Figure 2-29. Ethernet Status Dialog

6. Click Properties.

7. The Ethernet Properties dialog displays.

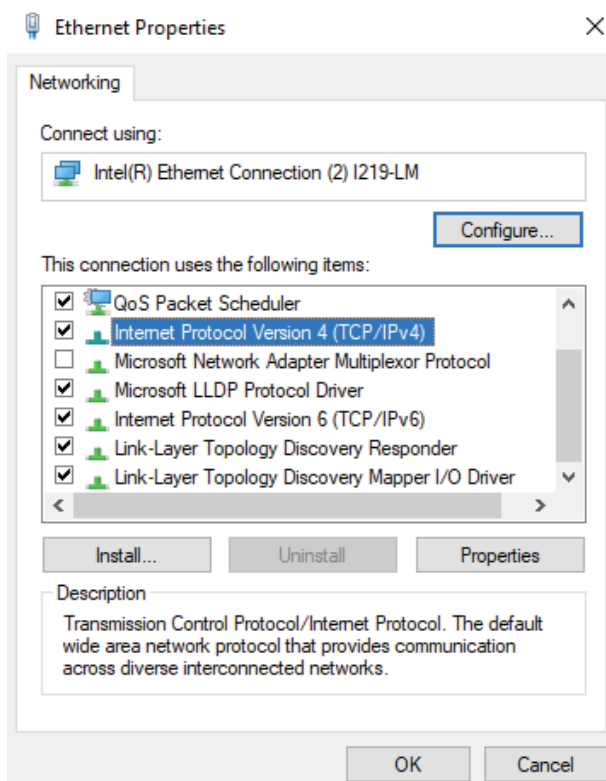


Figure 2-30. Ethernet Properties: Networking Dialog

8. Select Internet Protocol Version 4 (TCP/IP v4) and click Properties.

9. The Internet Protocol Version 4 (TCP/IPv4) Properties dialog displays.

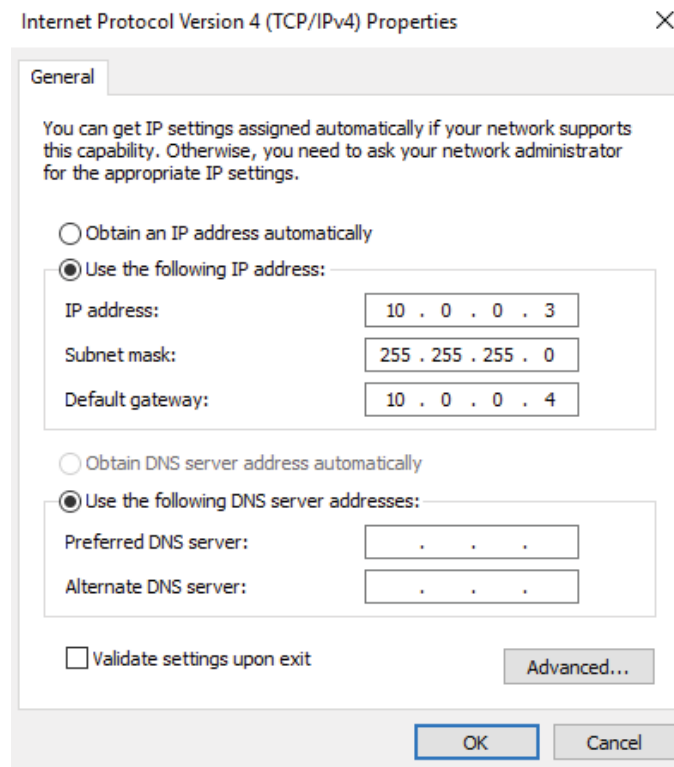


Figure 2-31. TCP/IP Properties

10. Click the Use the following IP address: button and enter the IP, Subnet mask, and Default gateway information (that your network administrator provides):
 - a. Set the IP address to the value your local IT administrator supplies.
 - b. Set the Default gateway address to the value used in [Step 6](#) of “Configure the Test Instrument’s IP Address Manually” on page 2-6.
 - c. Set the Subnet mask to the value used in [Step 8](#) of “Configure the Test Instrument’s IP Address Manually” on page 2-6.
11. (Optional) Click Use the following DNS server addresses and input addresses. This example leaves them blank.
12. Click OK.
13. Close all windows that are open.

Notes

- For quick access to instruments, the connection drop-down list in the MST toolbar records the last ten units to which it was connected. Clicking an entry in this list directs MST to attempt to re-establish that connection.
- MST cannot, at this time, accommodate IPV6 addresses.

14. Return to MST
15. Input the IP address from [Step 2](#) on page 2-15.

16. Check the connection in the Connection drop-down and by capturing a measurement.



Figure 2-32. Crossover Cable Connection Confirmation

If it is not connected:

- a. Ensure the instrument's IP address is the same as inputted in [Step 2](#) on page [2-15](#) and let MST try to connect.
- b. If still not connected, you might have to reboot the computer, the instrument, and/or MST.

2-5 Connection and Configuration with Other Methods

This section describes how to connect these—BTS Master, Cell Master, and Spectrum Master—Master series instruments to MST using the non-LAN connection methods listed in “[Connection Methods](#)”.

Note Use Anritsu’s Line Sweep Tool to do the same tasks with Site Master. For complete information, visit: www.anritsu.com/en-US/test-measurement/products/lst .

USB Connection and Configuration

Use the USB cable supplied with the test instrument to make this connection.

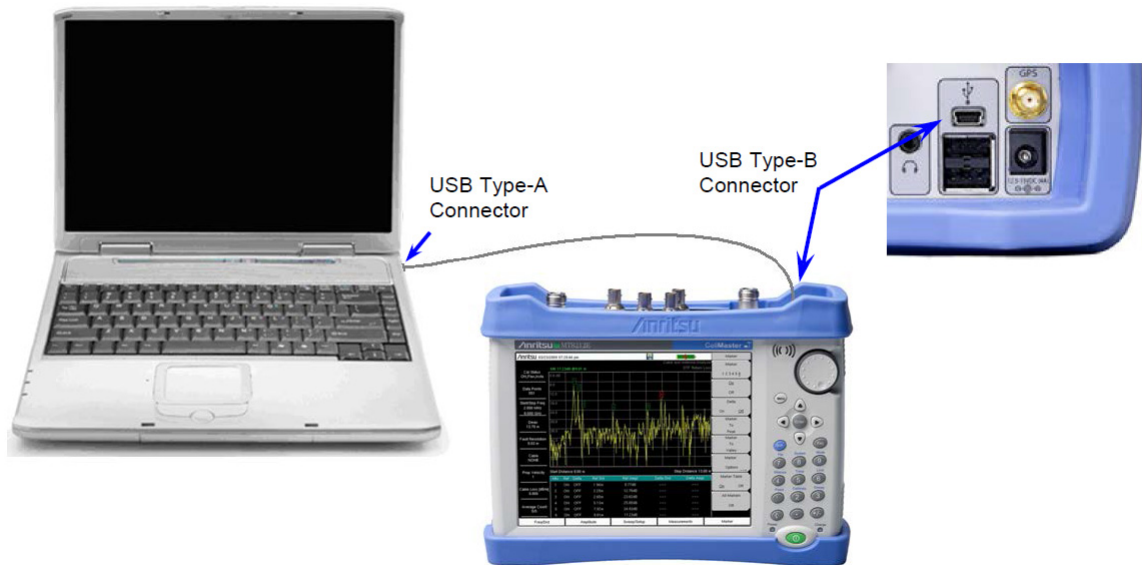


Figure 2-33. USB Connection Setup

1. Connect the USB cable between the USB Type-A connector on the computer and the USB Type-B connector on the test instrument.
2. Turn on the test instrument. Wait for it to display a measurement.
3. Run the MST on the computer.
4. From the MST pull-down on the Connection menu, click **Connect - USB**. This establishes communication to the test instrument.

In the Toolbar, the Connect/Disconnect pull-down menu displays USB and the connector icon turns green. Disconnecting the cable or through software turns the connector icon red.

[Figure 2-34](#), “[USB Connection Message](#)” shows the message that the instrument is connected also displays on the Status bar located at the bottom left corner of the MST application window.

Connected to USB0::0x0B5B::0xFF9::1338036_1784_56::INSTR

Figure 2-34. USB Connection Message

Serial Connections and Configuration

Serial-to-Serial Connection

Use the RS232 Serial cable supplied with the test instrument to make this connection.

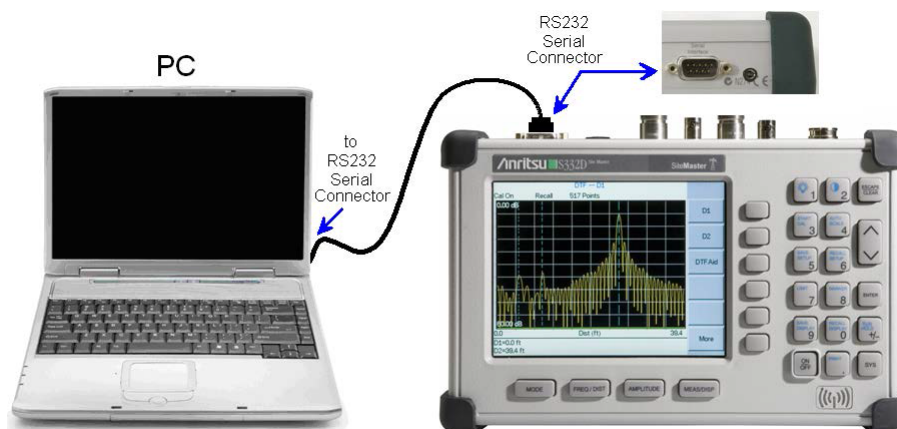


Figure 2-35. Serial Connection Setup

1. Connect the RS232 Serial cable between the RS232 Serial connector on the computer and the Serial Interface connector on the test instrument.
2. Turn on the test instrument. Run the MST program on the computer.
3. Go to [“Configure the Computer for Serial Connections”](#) on page 2-25.

Serial-to-USB Connection

This setup uses an RS232 Serial cable with an RS232-to-USB Adaptor cable to connect between the test instrument and a computer. (Contact Anritsu customer service and ask for part number 551-1691.) This requires installing the software drivers for the RS232 to USB Adaptor first and then configuring the COM port settings for computer.

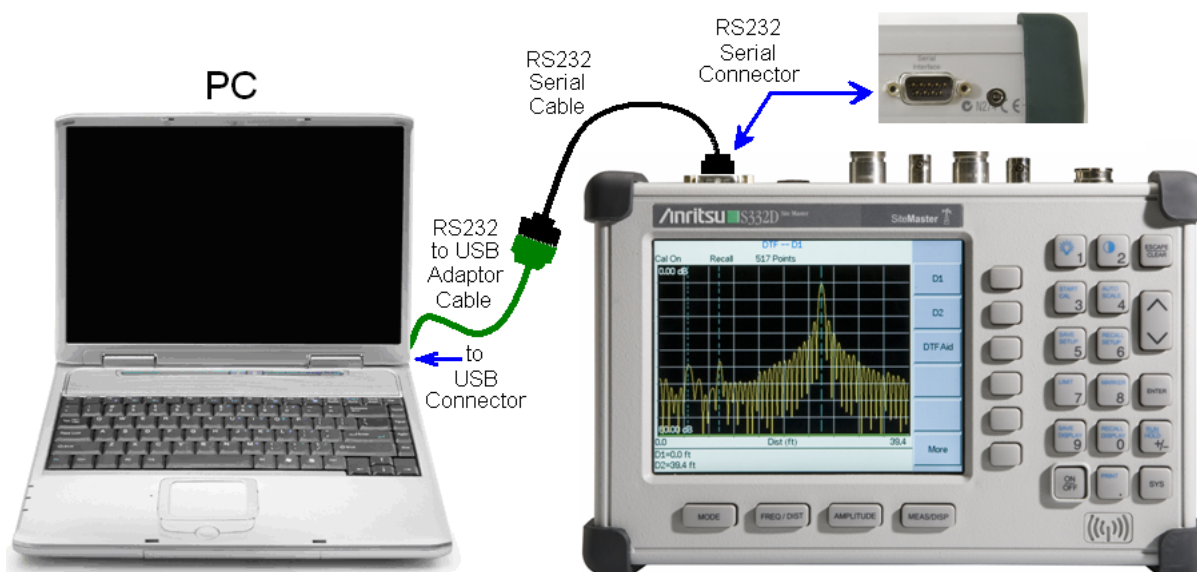


Figure 2-36. Serial to USB Connection Setup

To install the Serial-to-USB Adapter software:

1. Connect the RS232 cable from the device to the Serial-to-USB adapter and the adapter to the computer.
2. Place the Serial-to-USB Configuration Adapter CD into the computer's CD/DVD drive.
3. Connect the USB end of the USB/Serial adapter into the computer.

Note The images you see and steps you use might be different depending upon the adapter you install.

4. If the installation software does not automatically start, bring up File Explorer and navigate to the Windows folder.

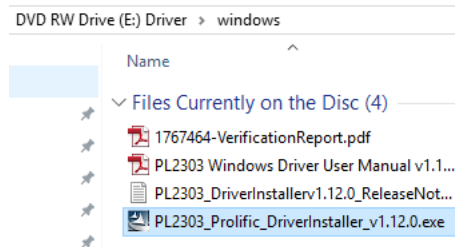


Figure 2-37. Serial-to-USB Driver Installer Program

5. Double-click to start the install program. The Installation wizard displays.

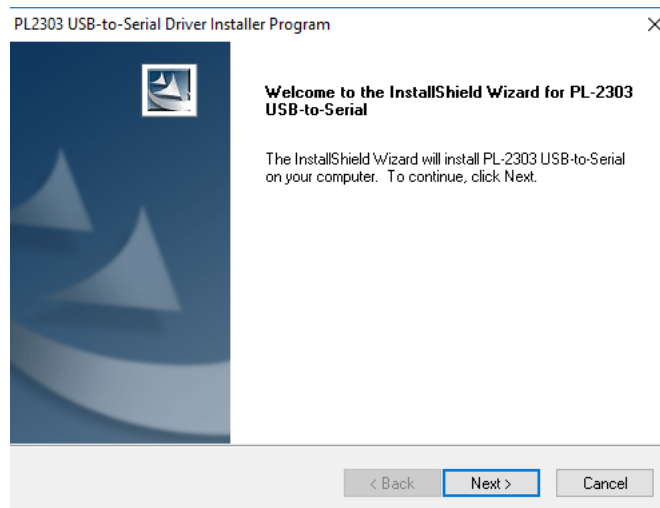


Figure 2-38. Hardware Wizard Dialog

6. Click Next.

7. The progress window displays.

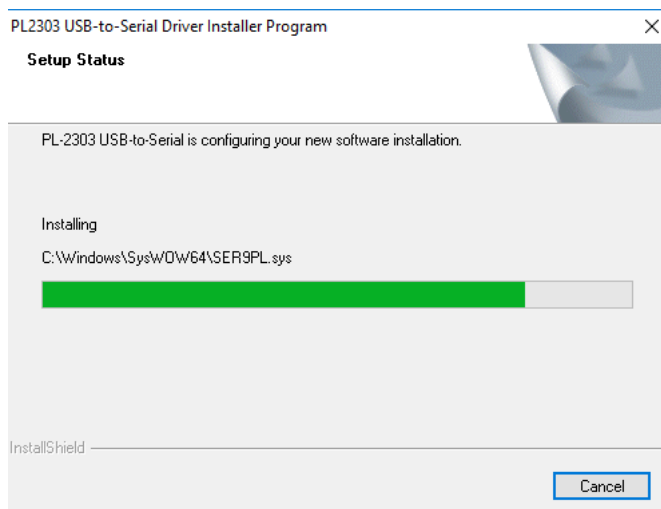


Figure 2-39. Driver Installation Progress

8. When the software installation completes, this window displays.

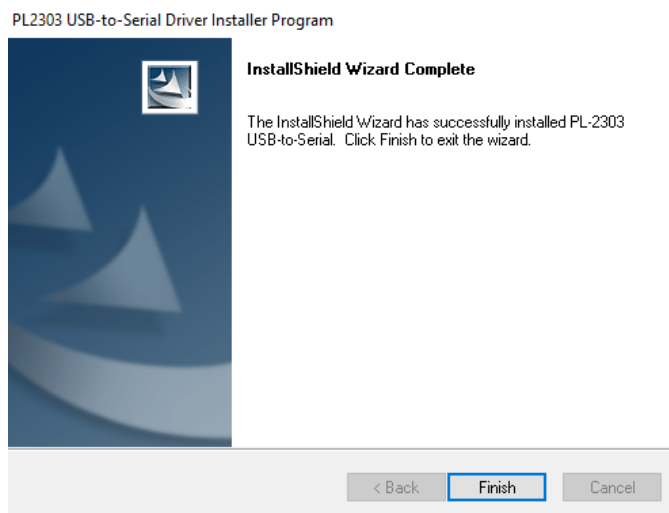


Figure 2-40. Completing Hardware Installation

9. Press the Finish button. Continue with [“Configure the Computer for Serial Connections”](#) on page 2-25.

Configure the Computer for Serial Connections

Note The images presented in this section might be different from those you see, depending upon the release of Windows installed on your machine. Use the COM port configured for your connection type.

1. Press the Start button. Search for Settings and click Bluetooth and other devices.

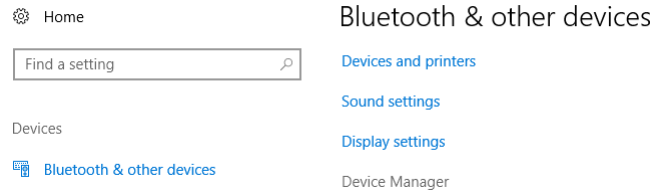


Figure 2-41. Computer Setup

2. Click Device Manager to bring up the Device Manager window.

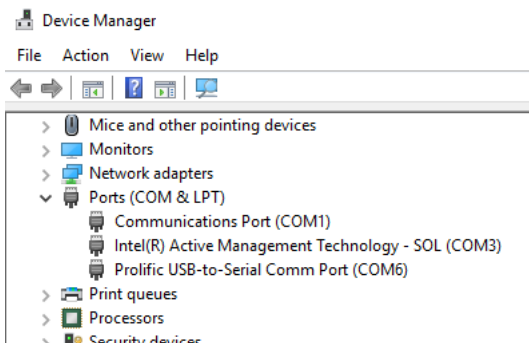


Figure 2-42. Hardware Setup

3. Double-click the communications port (COMn) to display Communications Port (COMn) Properties.

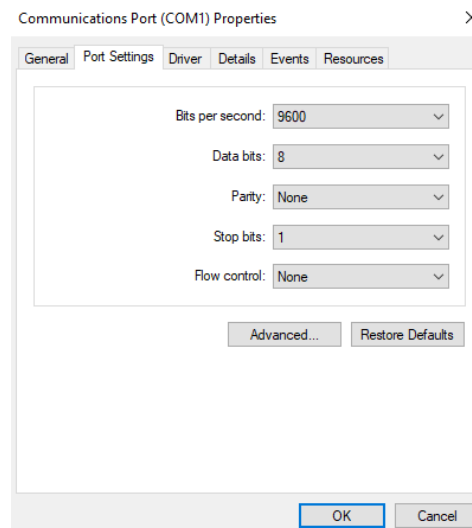


Figure 2-43. COMn Port Setup

- Click the Port Settings tag and make sure that all the parameters are exactly the same as those expected by MST for this port. See “Configure MST” on page 2-27. (Use the highest BAUD rate that the connection will support.)

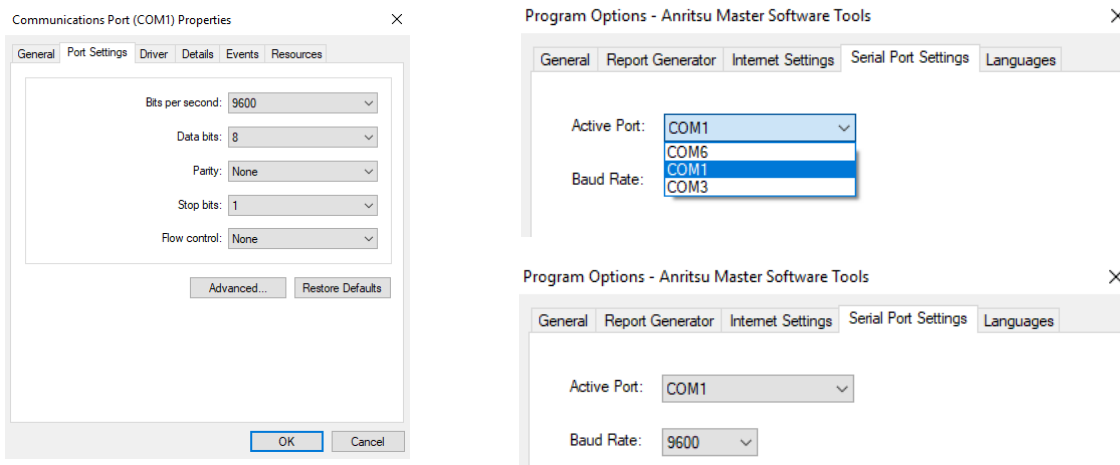


Figure 2-44. Port Settings: Computer (left); MST (right)

- Click OK to return to the Device Manager window.
- Select Communications Port (COMn).
- Press right mouse button.
- Click Scan for hardware changes.

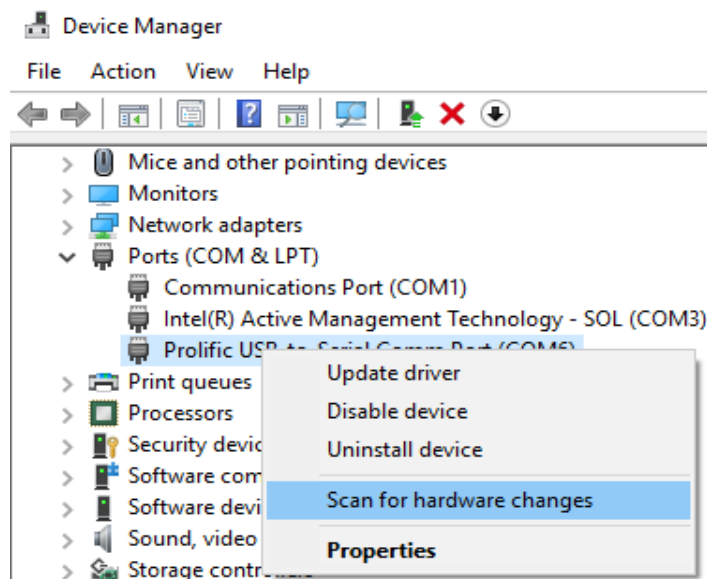


Figure 2-45. Com Port Setup

Note You might need to reboot the computer or laptop in order for Windows to see the new port.

9. The Device Manager window updates the COMn port settings. You can close Device Manager.

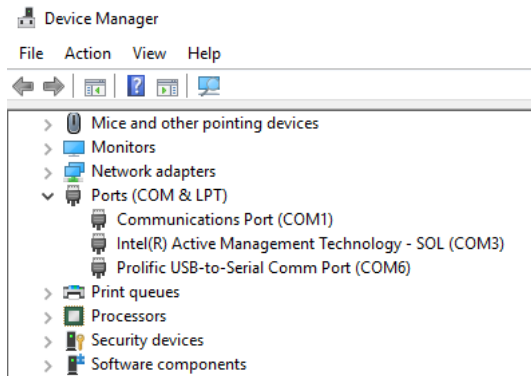


Figure 2-46. Available Serial Ports

10. Continue with [“Configure MST”](#) on page 2-27.

Configure MST

1. Power on the instrument.
2. Connect the male connector of the USB Serial Adapter to the female connector of the serial cable attached to the test instrument (if this connection not already established).
3. Start MST.
4. Click Program Options under the Tools menu. The Program Options window opens.
5. Click the Serial Port Settings tab.

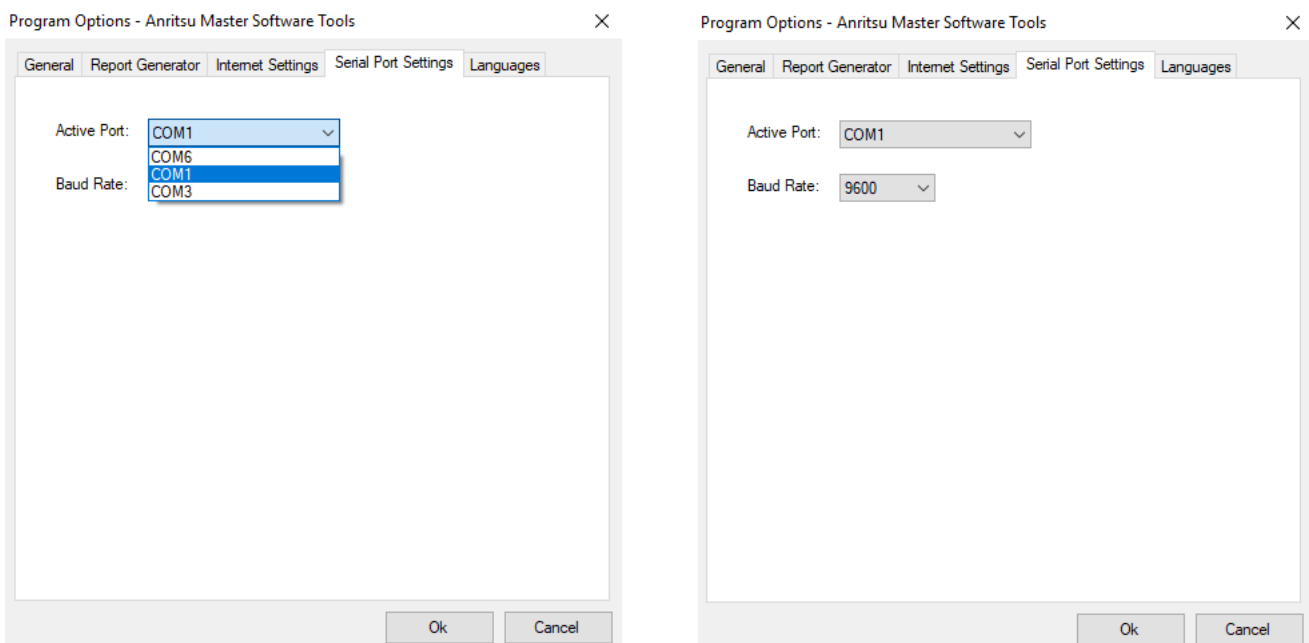


Figure 2-47. Program Options: Serial Port and Baud Rate Settings

6. From the Active Port pull-down menu, click the COM that supports the connection mode: Serial cable or Serial-to-USB cable.
7. Then set the Baud Rate to the same as what was established in the Device Manager for that port.

8. Press the OK button.
9. Continue with “[Test the Serial Connection to the Instrument](#)” on page 2-28.

Test the Serial Connection to the Instrument

1. Click Connect – Serial (RS232): COMx in the Connection menu. Note the command line is checked and grayed. The connection list menu displays SERIAL and the connector symbol turns green.

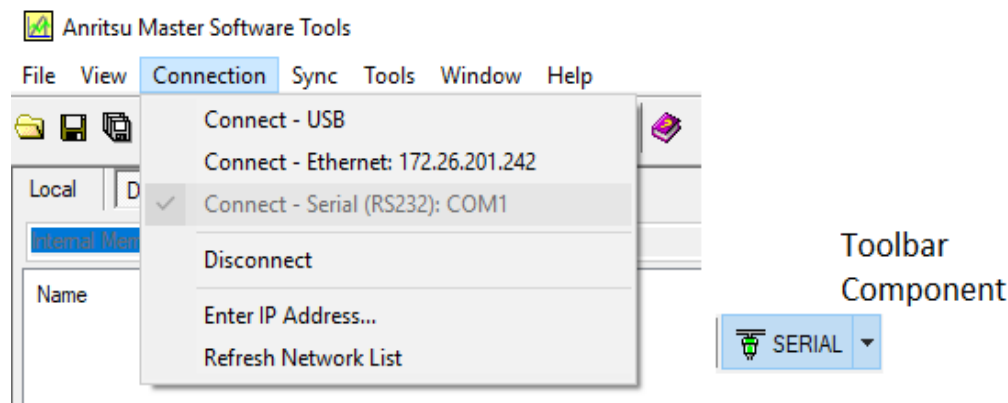


Figure 2-48. Connection Menu: Serial Connection

2. The Status line of the MST display should show a status similar to this graphic:

SERIAL | File: c:\program files (x86)\anritsu\master software tools\archives\captured(5).spa

Figure 2-49. Serial Status Message

3. Click the Capture Measurement button, on the toolbar. If MST captures the display screen from the instrument and displays it in the active measurement space in MST, connection testing shows a good connection and the test is complete.

Chapter 3 — Graphical User Interface (GUI)

3-1 Introduction

This chapter defines and describes the MST graphical user interface (GUI) to operate MST and view the measurement files and other data obtained through it.

3-2 Main Screen

The main screen displays the MST operational features. Opening the main screen provides the Menu Bar, Toolbar, context menus, edit menus, and measurement panels.

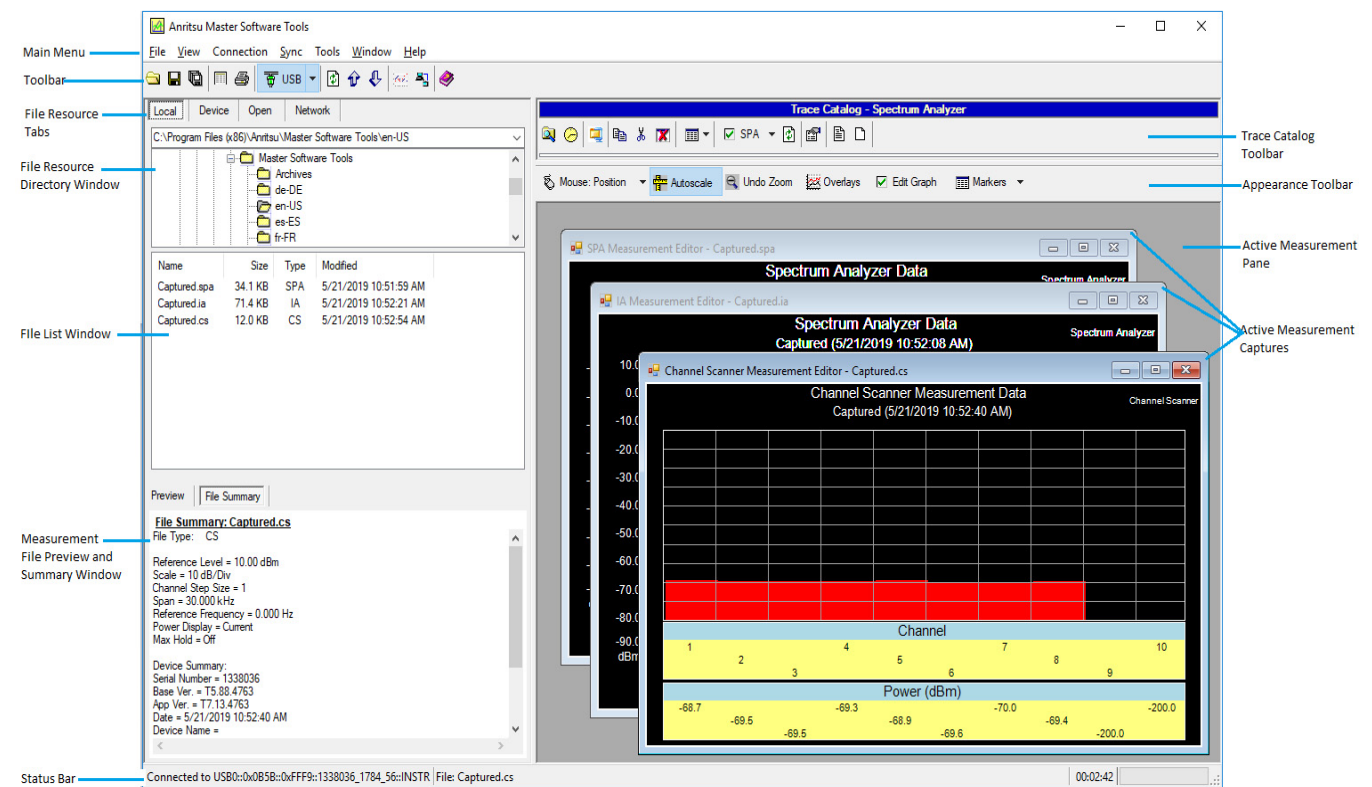


Figure 3-1. MST Graphical User Interface

Window	Description
Main Menu	Contains the menus - File, View, Sync, Tools, Window, Mode, and Help.
Toolbar	Displays tool icons used for file management, instrument connectivity, and trace management.
File Resource Tabs	Use to select the source of the measurement file to be displayed
File Resource Directory Window	Displays the directory and folder of the measurement file displayed.
File List Window	Displays the content of the folder.
Measurement File Preview and Summary Window	Allows you to select a thumbnail view of the measurement or file summary.
Status Bar	Displays connection and measurement file information.
Trace Catalog Toolbar	Tools to manage the measurement files.
Appearance Toolbar	Tools to edit the measurement files.
Active Measurement Pane	Displays the measurements captured from instruments.
Active Measurement Captures	The measurements as captured from instruments.

3-3 Menu Bar

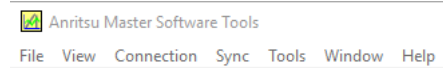


Figure 3-2. MST Menu Bar

File

Opens a list of file management commands. Open, Save, Save As, Print command lines are standard file management commands.

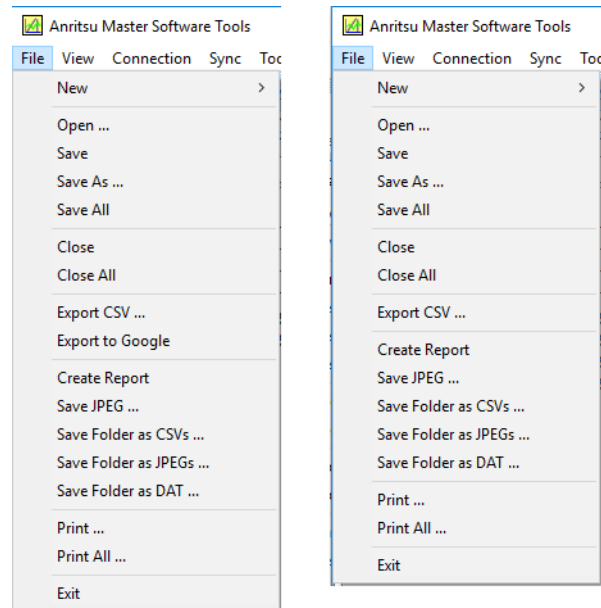


Figure 3-3. File Menus showing export differences

Save All: Saves changes to all open measurement window panels in the Active Measurement window and any Master Software Tool supported files that are open, being edited, or being created, such as .spa, .vna, .txt, .png, etc.

Close All: Closes the measurement window panels and any Master Software Tool supported files that are open, being edited or being created, such as .spa, .vna, .txt, etc. If Remote Access Tools is open, it is also closed.

Export CSV: Outputs the current Active Measurement data to a Comma Separated Value formatted file. This text based format is supported by Microsoft Excel and most spreadsheet programs.

Export s2p: (For VNA measurement files only). Exports the current file to S2P file format. S2P files are ASCII text files that can be viewed or edited in any standard text editor.

Create Report: Creates a report from the current Active Measurement displayed. Refer to “Report Generator” on page 3-50 and to “Reports (.pdf and .html)” on page 5-4 for more information about generating reports.

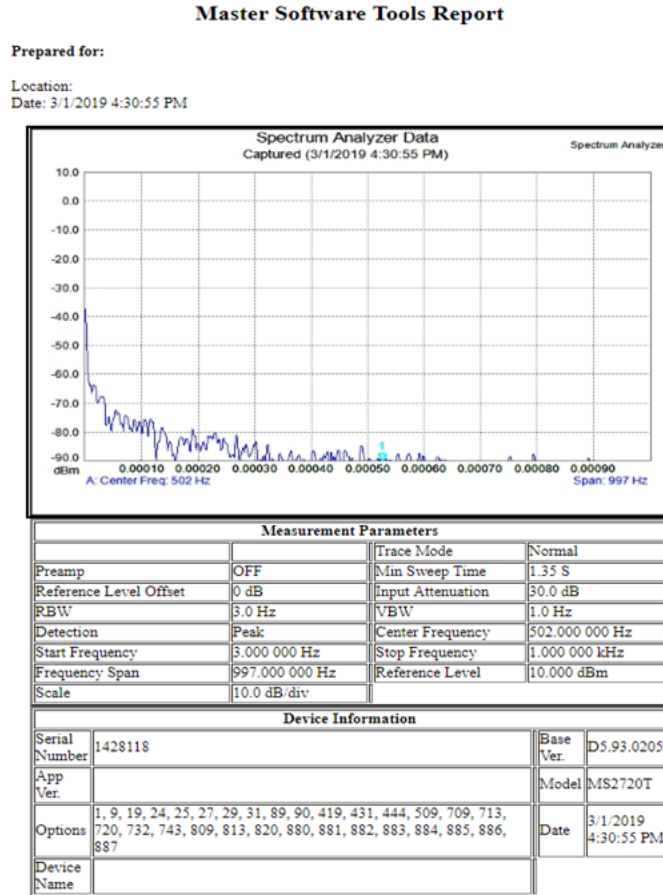


Figure 3-4. Generated Report Sample

Save JPEG: Saves the currently displayed Active Measurement as a JPEG file.

Save Folder as CSVs: Creates CSV files from all the measurements in selected folder.

Save Folder as JPEGs: Creates a JPEG image from all measurements in a selected folder.

Save Folder as DAT: Converts selected VNA or SPA files into DAT files and stores them in the selected folder.

Print All: Opens the Print All Measurement window. If Remote Access Tools is open, it will not be printed along with the other measurement window panels.

Exit: Closes all open measurement window panels, disconnects any instrument connected to the MST program, and exits MST.

The following commands are only available in the File menu when the Language Editor or Signal Standard Editor windows is the active window panel in the Active Measurement Pane.

Load ZNC file for comparison F10: When the Language Editor is open, this command loads ZNC files to compare to an existing ZNC file and add new words into the current file and load it into the instrument.

Load CSV file for comparison F10: When the Language Editor is open, this command loads CSV files to compare to an existing CSV file and add new words into the current file.

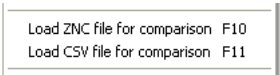


Figure 3-5. Generated Report Sample

- New: Opens a sub-menu for creating or editing MST-related files.
- Antenna File: Opens the Antenna Editor window for creating a new antenna list.
- Cable File: Opens the Cable Editor window to create a new cable list.
- Signal Standard File: Opens the Signal Standard Editor window.

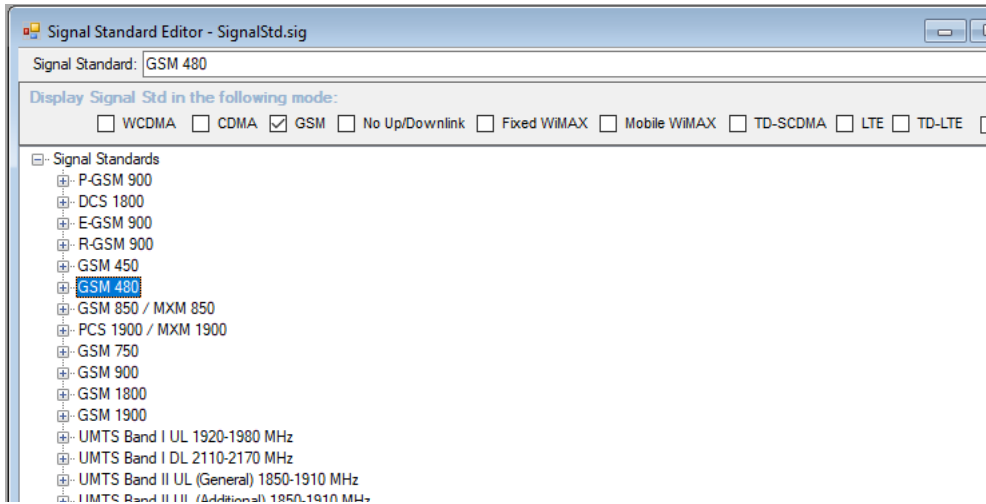


Figure 3-6. Signal Standard Editor

Pass/Fail File: Opens the Pass/Fail Editor after downloading the file from the test instrument or after dragging a Test Models list file into the Active Measurement Window. This editor is used for editing the these Pass/Fail file types: GSM/EDGE/GPRS, WCDMA/HSDPA, Fixed WiMAX, Mobile WiMAX, CDMA, EV-DO, TD-SCDMA, LTE, and TD-LTE. Click the type of Pass/Fail file to be created and the Pass/Fail Editor window opens.

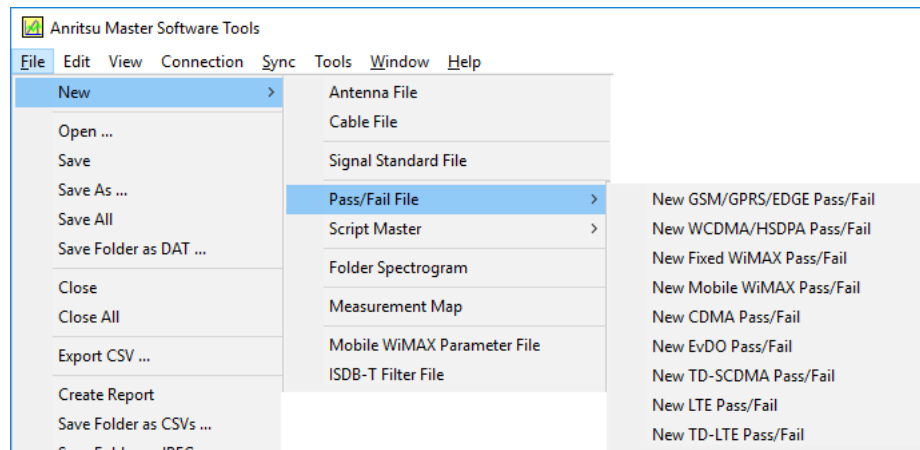


Figure 3-7. Pass/Fail File Types

Script Master: Lists a submenu to select a measurement file type to be created or edited. File types include GSM/WCDMA files or Channel Scanner files.

Folder Spectrogram: Creates a Spectrogram from the selected folder of measurement traces.

Measurement Map: Opens the Measurement Map window.

Mobile WiMAX Parameter File: Opens the XML Parameter File Editor.

ISDB-T Filter File: Opens the Filter Editor for editing and creating ISDB-T filters. Refer to [“Filter Editor for ISDB-T \(*.isdb\)”](#) on page 5-18.

Edit

The Edit menu is available only when the Language Editor or Signal Standard Editor windows is the active window panel in the Active Measurement Window. Click the desired file type and the Script Master window opens.

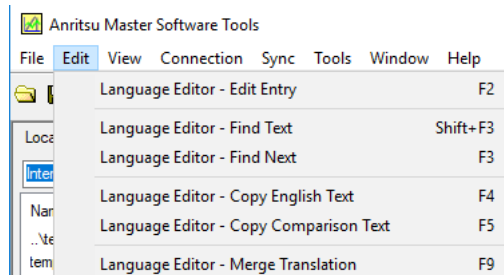


Figure 3-8. Edit Menu for Language Editor of *.znc Files

Language Editor-Edit Entry: Highlights the foreign language word for editing.

Language Editor-Find Text: Opens an entry window to search for an English word.

Language Editor-Find Next: Continues the search for the word entered in Find Text.

Language Editor-Copy English Text: Copies the English text from column 2 to column 1.

Language Editor-Copy Comparison Text: Copy Compare string (3rd column) to translation (1st column).

Language Editor-Merge Translation: Merges the new language entries into the current Language file.

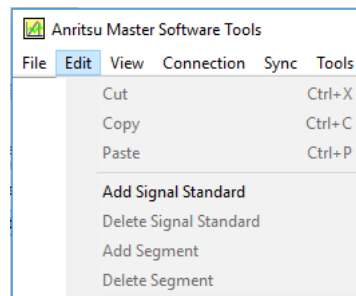


Figure 3-9. Edit Menu for Signal Standard Editor

Add Signal Standard: Adds a new signal standard at the bottom of the list to be edited.

Delete Signal Standard: Deletes the signal standard currently highlighted.

Add Segment: Adds a segment to the currently highlighted signal standard.

Delete Segment: Deletes the highlighted segment from the current signal standard.

View

Command lines for Trace Catalog, Measurement Preview/Summary Window, Toolbar and Status Bar are toggle switches to display or not to display those items. Additional command lines are listed when specific windows are active in the Active Measurement Window.

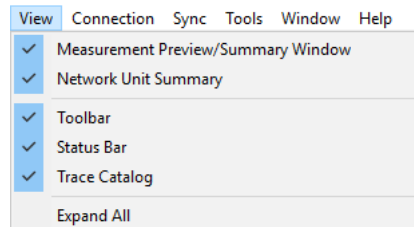


Figure 3-10. View Menu

Network Unit Summary: Shows a summary of test instrument options when a unit is selected from the Network list (the list of units is available over an active Ethernet connection).

Language Editor

Language Editor Commands are listed only when the Language Editor is the current active window panel.

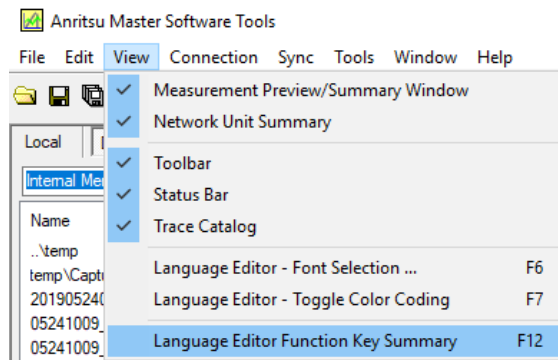


Figure 3-11. View Menu with the Signal Editor as the Active Window

Language Editor-Font Selection: Opens the Font window to change the font style of the highlighted text.

Language Editor-Toggle Color Coding: Toggles the color coding of the Language Editor page on and off.

Language Editor Function Key Summary: Opens a list of Function Key definitions.

Signal Standard

Signal Standard Editor Commands are listed only when the Signal Standard Editor is the current active window panel.

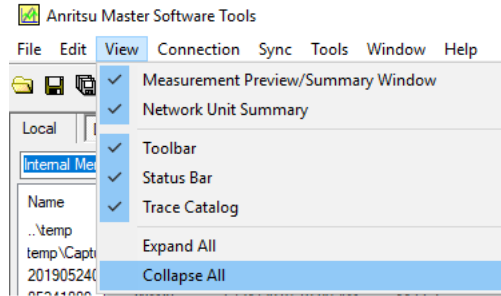


Figure 3-12. Signal Standards View Menu

Expand All: Expands the list of signal standards and their subsequent segments.

Collapse All: Collapses the signal standards list and segments to only show Signal Standards.

Connection

This menu is used for setting up communication to a computer via USB or Ethernet.

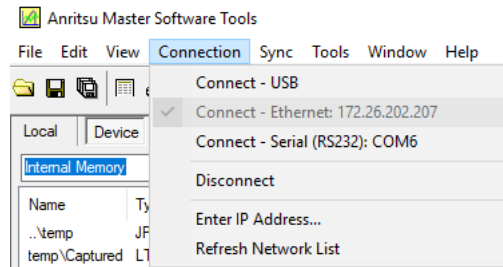


Figure 3-13. Connection Menu

Connect-USB: Initiates communication between the test instrument and computer via a USB connection. (USB to USB).

Connect-Ethernet: Initiates communication between the test instrument and computer via an Ethernet connection.

Connect-Serial (RS232): Initiates communication between test instruments with serial ports to the computer. (Serial-to-Serial or USB-to-Serial).

Disconnect: Disconnects any communication between the test instrument and computer.

Enter IP Address: Opens the input window to enter the IP address of the test instrument.

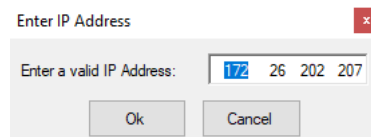


Figure 3-14. Address Entry Window

Refresh Network List: Refreshes the Network Device list. This is a list of Anritsu test instruments visible on the LAN. The Query Network for Instruments button accomplishes the same function.

Sync

This menu contains commands to manipulate data files between the test instrument and the computer.

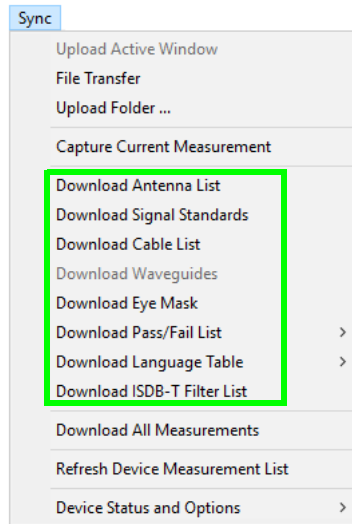


Figure 3-15. Sync Menu

Upload Active Window: Copies the measurement data from the Active Measurement window panel to the internal memory of the test instrument.

File Transfer: Opens the Transfer Files to Handheld Device.

Upload Folder: Opens the Upload Files to Handheld Device window.

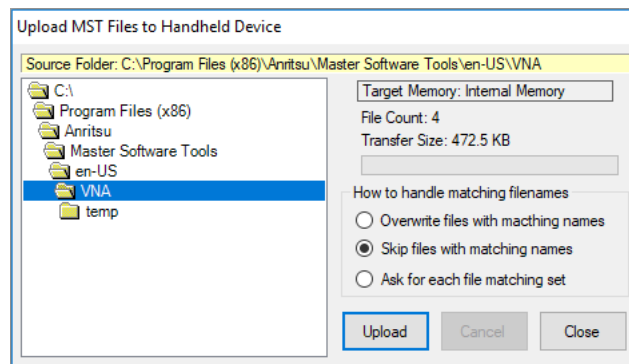


Figure 3-16. Upload Files to Handheld Device Window

Capture Current Measurement: Downloads the measurement data and screen display currently on the test instrument to MST and creates a measurement screen display panel in the Active Measurement window.

Download File List: (**File** denotes any one of the commands highlighted in the green box in [Figure 3-15, “Sync Menu”](#).) Downloads associated files from the instrument to be saved on the computer in the Anritsu MST folder.

Download All Measurements: Copies all files from the internal memory of the test instrument onto the Anritsu MST folder or a folder specified by the user. Note: There is a limit of 1001 files that are allowed to be downloaded at one time.

For very large number of files that need to be copied from the instrument to the computer, Anritsu recommends a USB memory stick to transfer files from the instrument to the computer.

Refresh Device Measurement List: Refreshes the list of saved measurements shown for the currently connected test instrument.

Device Status and Options: Commands in this submenu allow access to the test instrument status data, to download Config file and upload License file, and to stop and start measurements.

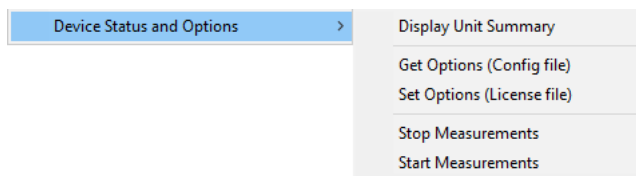


Figure 3-17. Device Status and Options List

Tools

This menu contains various file management and test instrument commands.

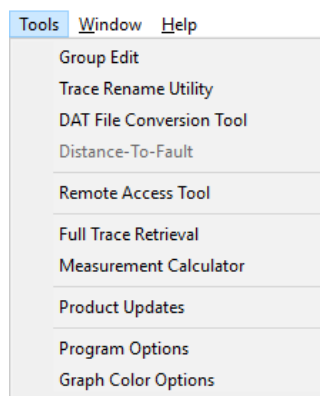


Figure 3-18. Tools Menu

Group Edit: Allows the changing of the measurement title, subtitles, and common features such as plot scaling, markers, and limit lines simultaneously on a large set of similar measurement files.

Trace Rename Utility: Opens the MST Rename Utility to rename measurement traces.

DAT File Conversion Tool: Opens the DAT File Conversion Tool window to convert legacy file types from Anritsu Handheld Software Tools (HST) format to the file format supported by MST. Refer to [Figure 3-29, “DAT File Conversion Tool Window”](#) on page 3-16.

Warning Conversion of a HHST data file to the MST data file is unidirectional; keep the old file for archives.

Distance-To-Fault: Opens the DTF window to convert a VNA Return Loss file to a DTF-Return Loss file.

Remote Access Tool (RAT): Opens a fully functional software emulator that remotely controls the connected test instrument. (This function requires an Ethernet connection.)

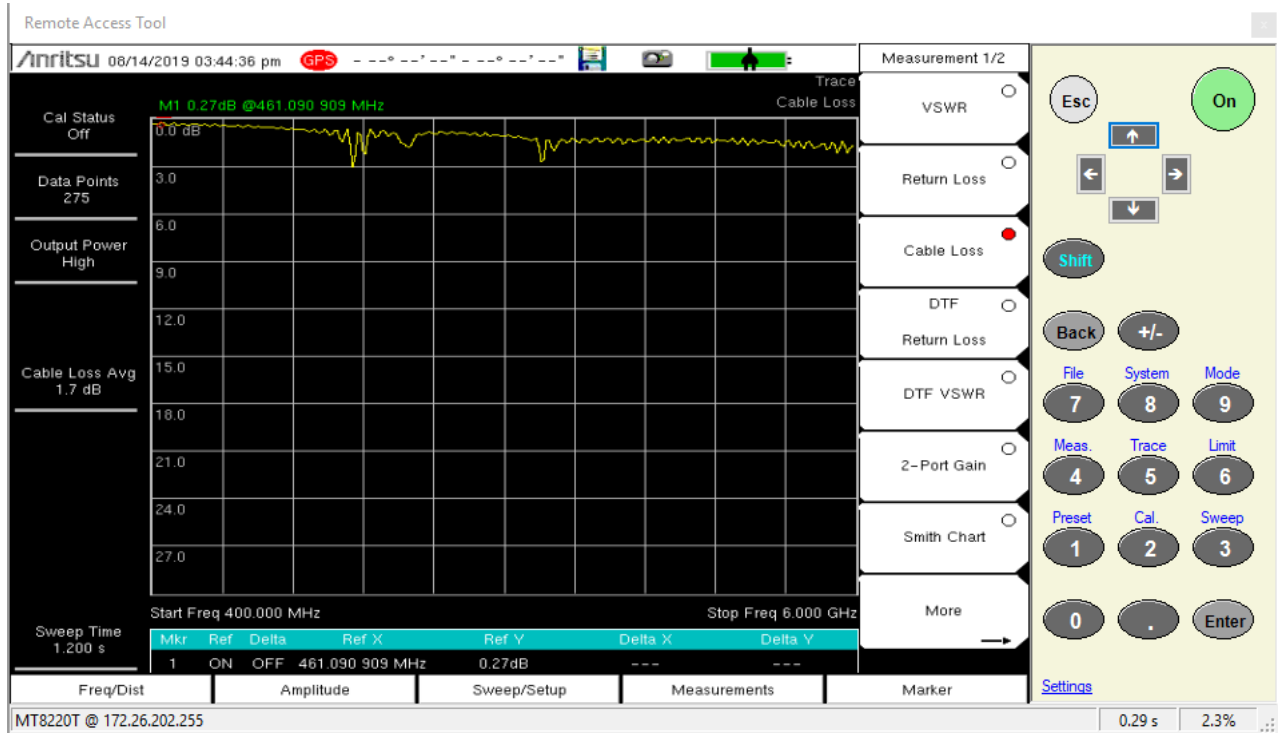


Figure 3-19. Remote Access tool

Use the Settings link in the RAT window to set the refresh rate..

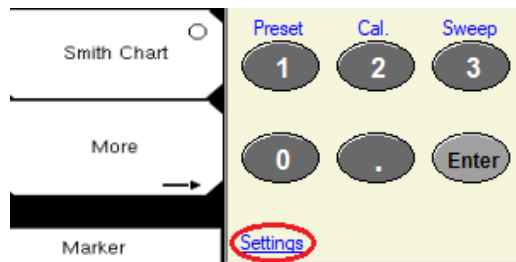


Figure 3-20. Refresh Rate Menu

The Connection Settings dialogs displays. Use the up/down arrows to select a refresh rate.

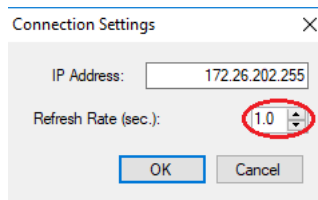


Figure 3-21. Refresh Rate Dialog

Note Anritsu recommends using the most recent remote access software Wireless Remote Access Tool. Go to the Anritsu Website to download this software:
<https://www.anritsu.com/en-us/test-measurement/products/wrt>

Full Trace Retrieval: Similar to the command line Download All in the Sync menu, this function retrieves all files stored in the internal memory space of the connected instrument. This can be faster, especially on older instruments, than Download All but it requires an Ethernet connection. USB is not supported.

Measurement Calculator: This tool translates certain values into other units. It can show Real and Imaginary values, Magnitude, Phase, Return Loss, Reflection Coefficient, and Transmission Power. Enter a value in any field, and the other fields are adjusted automatically.

Product Updates: Opens the Product Updates window, used to update, repair, or recover files in the internal memory of the test instrument.

Program Options: Opens the Program Options window to set parameters for Program Elements, File Transfer and Confirmations, JPEG Save Options, Measurement Print Options, Report Generator and Internet Settings.

Window

This menu controls the open measurement window panels. Cascade, Tile Vertical, and Tile Horizontal organize the measurement panels in the Active Measurement window. Measurement panels open in the Active Measurement window are listed beneath the Close All command. The currently active window panel is checked in this menu.

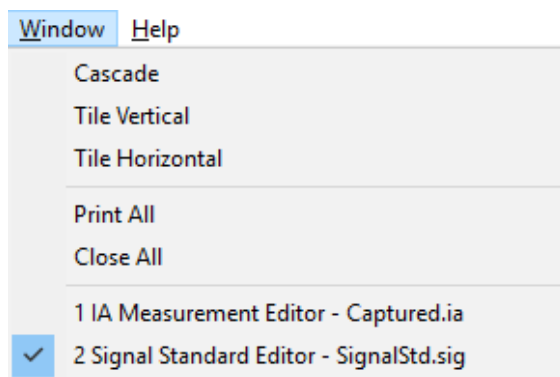


Figure 3-22. Window Menu

Cascade: Stacks the window panels diagonally, layered one on top of the other.

Tile Vertical: Places the window panels one above the other.

Tile Horizontal: Places the measurement window panels side by side.

Print All: Opens the Print All Measurements window. If Remote Access Tools is open, it will not be printed along with the other measurement window panels.

Close All: Closes the measurement window panels and any Master Software Tool supported files that are open, being edited or being created, such as .spa, .vna, .txt, etc. If the Remote Access Tool is open, it too is closed.

Help

Help Contents: Opens the *Master Software Tools User Guide* (this guide) in the Adobe Acrobat Reader (if the Reader is installed on the computer).

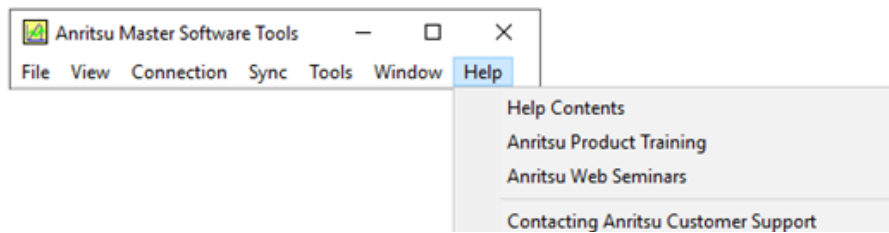


Figure 3-23. Help Menu

Contacting Anritsu Customer Support: Opens the Contacting Anritsu window with information on contacting Anritsu Customer Support.

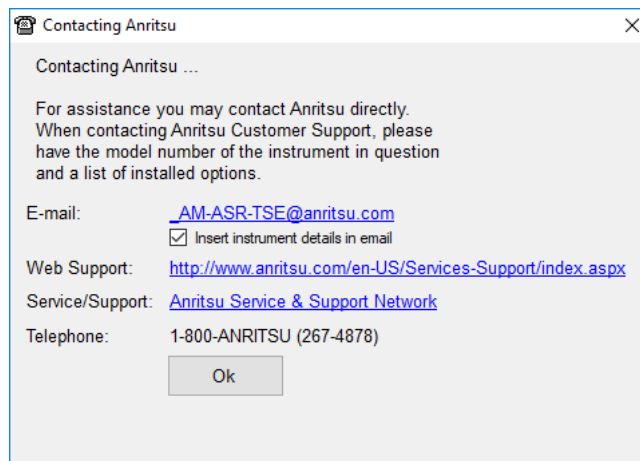


Figure 3-24. Anritsu Contact Window

Anritsu on the Web: Click this web link go to the Anritsu Customer Support Internet site.

About Master Software Tools: Opens the About MST window that displays the current version of software and copyright information.



Figure 3-25. MST Version and Copyright Window

3-4 Toolbar

This graphic shows the main toolbar for MST. The tools are described from left to right

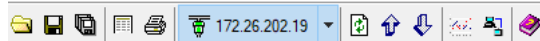


Figure 3-26. Main MST Toolbar

Open File: Opens the Open Measurement File window to load a measurement file into MST.

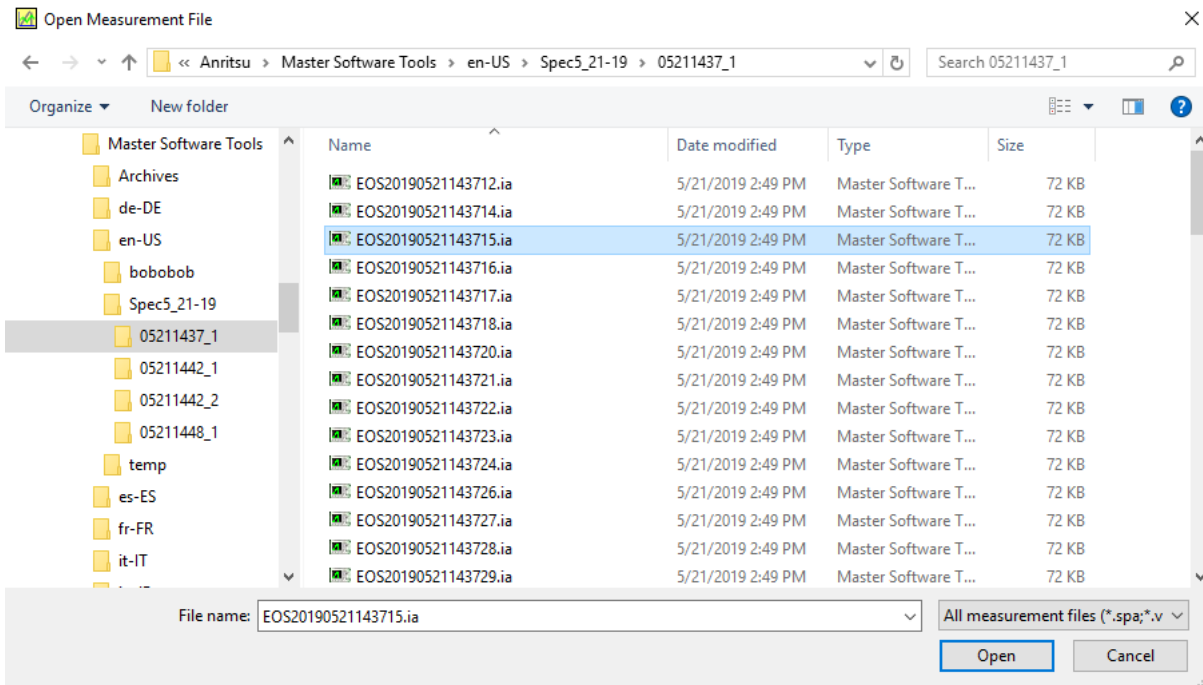


Figure 3-27. Open Measurement File Window

Save File: Saves the data from the active measurement window panel to file.

Save All: Saves changes to all open measurement window panels in the Active Measurement window and any MST-supported files that are open, being edited or being created, such as: .spa, .vna, .txt, etc.

Report Generator: Generates a report from the Active Measurement window panel. See “[Reports \(.pdf and .html\)](#)” on page 5-4 for more about reports.

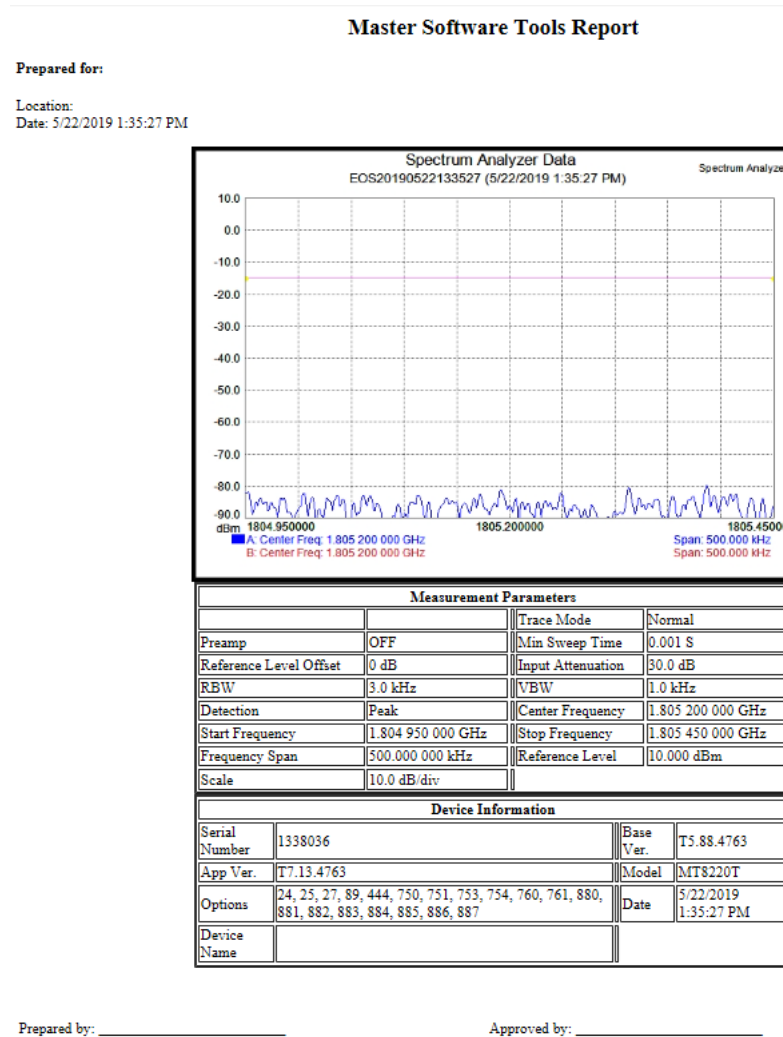


Figure 3-28. Generated Report Sample

Print Report: Generates a report from the Active Measurement window panel then prints it.

Connect/Disconnect: Initiates communication between the computer and test instrument. The communication type displays. After both systems handshake, the connector turns green.

Refresh Device Measurement List: Refreshes the list of saved measurements shown for the test instrument connected.

Upload Measurement: Uploads all measurement window panel data to the connected test instrument as files.

Capture Current Measurement: Downloads the measurement data and screen display currently on the connected instrument to MST and creates a measurement screen display panel in the Active Measurement window.

Launch the DAT File Conversion Tool: Opens the DAT File Conversion Tool window. Converts supported file types from Anritsu Handheld Software Tools format to the file format supported by MST. The DAT-to-MST file conversion is irreversible.

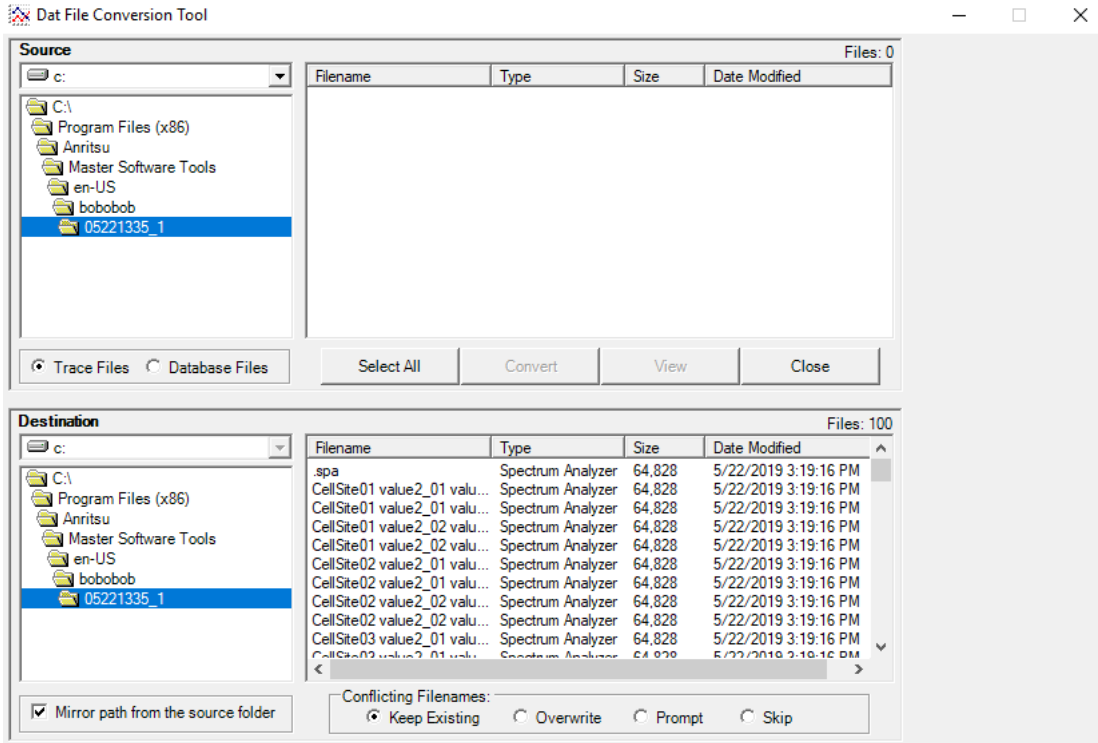


Figure 3-29. DAT File Conversion Tool Window

Open the Remote Access Tool Window: Runs the Remote Access Tools program.

Note Anritsu recommends using the most recent remote access software Wireless Remote Access Tool. Go to the Anritsu Website to download this software:
<https://www.anritsu.com/en-us/test-measurement/products/wrt>

3-5 Graphic Display Edit Toolbar

This graphic shows the tools available for the Active Measurement display window. The tools are described from left to right.



Figure 3-30. Graphics Display Editor Toolbar

Mouse Function: Opens a menu that controls the function of the mouse while in the Active Measurement window. The label on the toolbar button for the mouse function changes to indicate which of the four functions has been selected by appending the function title after the word mouse. For example, when Position is selected, the button label changes to Mouse: Position. The drag overlay function is abbreviated as Mouse: Overlay.

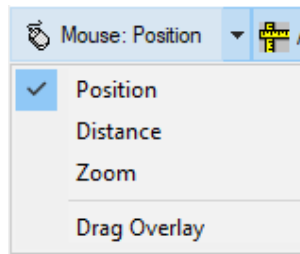


Figure 3-31. Mouse Functions Pull-down Menu

Position: Displays the x and y coordinates of the graph in Frequency and Amplitude. For DTF measurements, Distance and Amplitude values are displayed. Drag the mouse while holding the left mouse button and the coordinate display will indicate changing measurement values as the mouse position changes.

Distance: Displays the difference in frequency between two points. Click when moved horizontally from the original start point, or the difference in Amplitude when moved vertically from the original start point.

Zoom: Expands the selected section of the graph for closer analysis of a trace. (Default)

Histogram: When editing scope files, the Histogram function replaces Zoom. In this mode, a rectangular histogram can be drawn on the active measurement panel.

Drag Overlay: Grabs a trace from a similar type graph and places it on the desired graph.

Autoscale: Expands the vertical scale to spread the measurement over 70% to 80% of the active measurement window panel. This reduces the number of horizontal graticule lines by an amount that depends upon the vertical spread of the measurement being auto-scaled.

Undo Zoom: Returns the graph to its original view.

Overlays: Toggles any overlaid traces on the Active Measurement window panel on and off.

Edit Graph: Opens the Plot Setup dialog associated with the active measurement window panel.

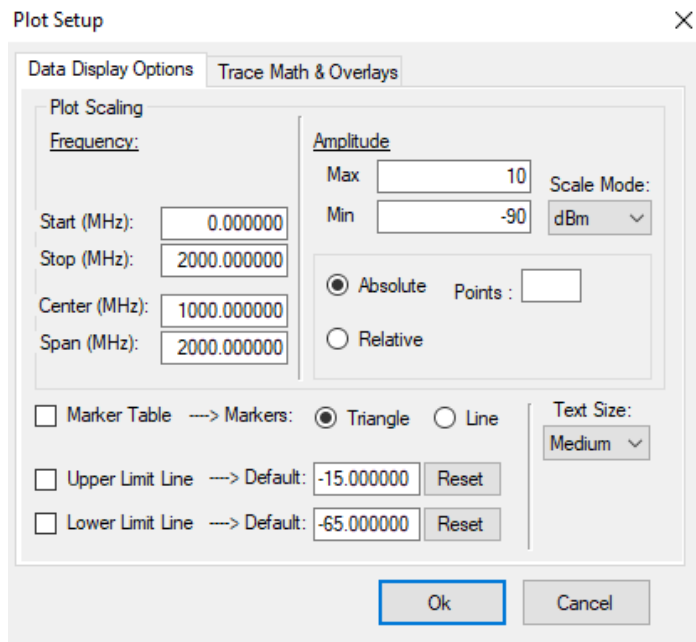


Figure 3-32. Sample Plot Setup Window

Markers: Lists the marker table under the active measurement graph for selecting and setting up markers. Clicking the pull-down menu opens a sub-menu to set a Marker To Peak, set a Marker To Valley, set a marker to Peak Between Markers, or set a marker to Valley Between Markers. Highlighting either Marker To Peak or Marker To Valley opens another sub-menu to select a marker. Peak Between Markers and Valley Between Markers lists a sub-menu of markers to position between a marker pair.

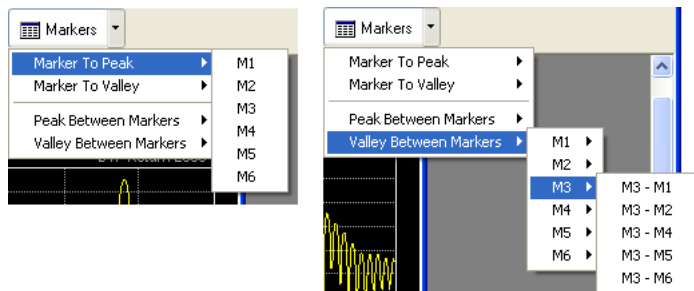


Figure 3-33. Markers Pull-down Menu

Active Trace: Displays a list that allows you to choose between traces.

3-6 Active Measurement Window

This is the display space for all active measurement panels. A new active measurement panel is placed in front of other panels and its title bar is highlighted a darker color.

Note TD-SCDMA Signal Analyzer measurement panel cannot be saved nor displayed through MST except as a .JPG file.

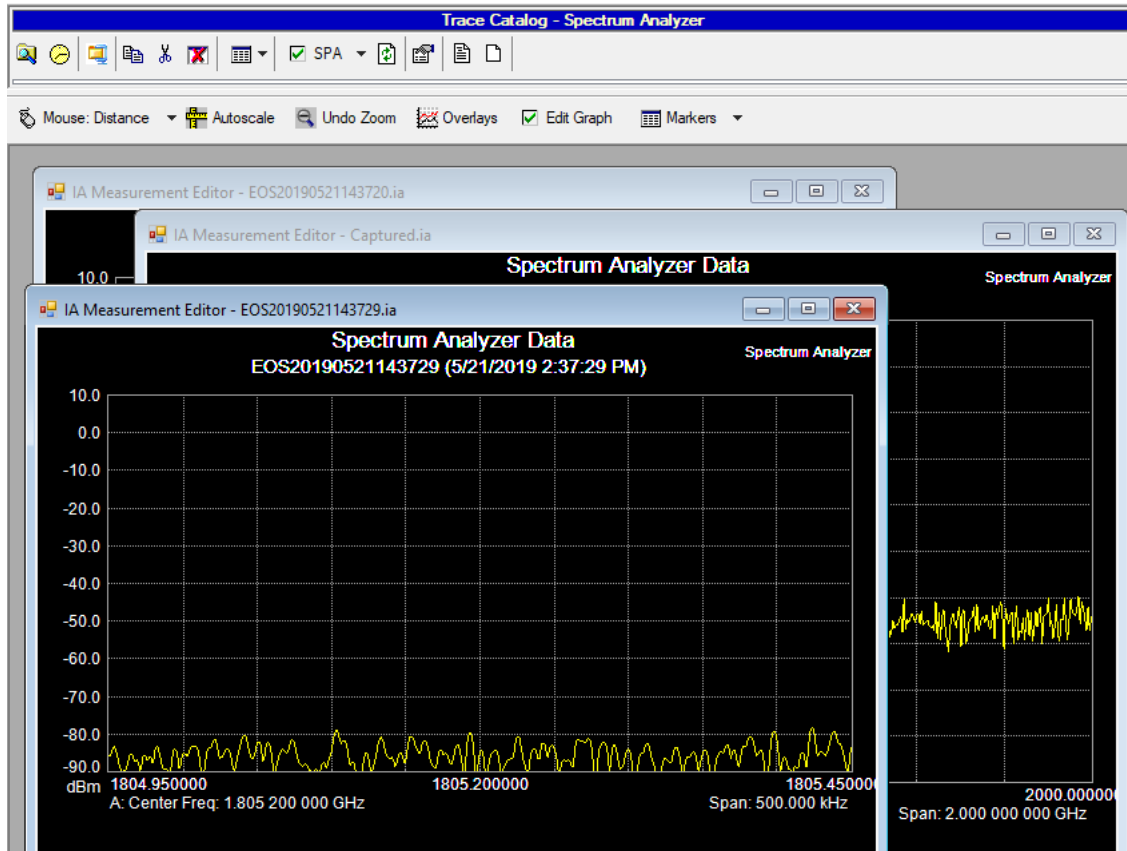


Figure 3-34. Active Measurement Window

3-7 File Resource Group

This group of controls, governed by the File Resource tabs, includes the Device File Resource window, the Open File List window, and the Network window, they display information about the resources available to MST.

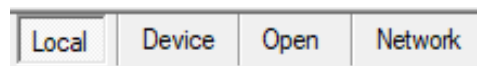


Figure 3-35. File Resource Tabs

Local File Resource Directory Window

When the Local tab is clicked, the File List window displays a list of measurement files stored on the computer.

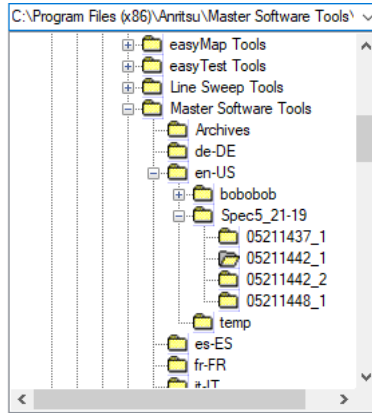


Figure 3-36. File List Window showing Local File Resource directory

Device File List Window

When Device tab is clicked, the Device File List window shows a list of measurement files available to MST from the instrument’s internal memory, from a compact flash card, or USB memory attached to the instrument.

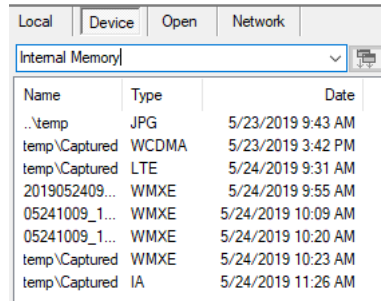


Figure 3-37. File List Window showing internal files on an instrument

Open File List Window

When the Open tab is clicked, this window shows the list of files that are currently open in the Active Measurement window.

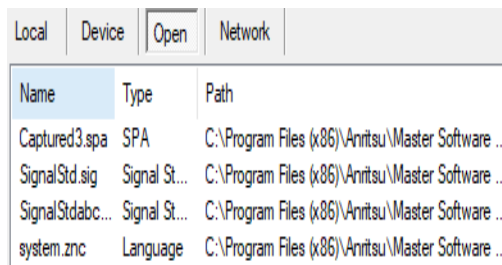


Figure 3-38. File List Window--showing open files in Active Measurement window

Network Window

When the Network tab is clicked, this window shows the list of instruments that are currently available through the LAN.

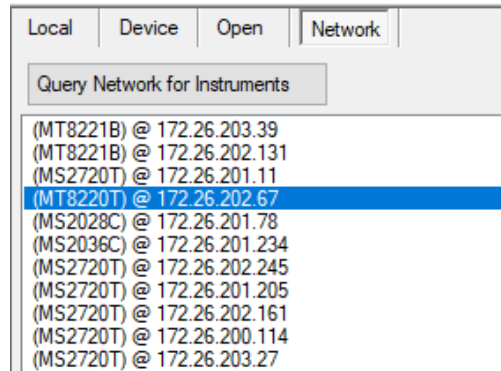


Figure 3-39. File List Window--showing open files in Active Measurement window

3-8 Measurement Preview/File Summary Windows

When a file in the File List window is highlighted, its trace data displays in graphical format when the Preview tab is clicked or its metadata displays when the File Summary tab is clicked. Use the View>Measurement Preview/Summary Window main menu choice to hide or show this window.

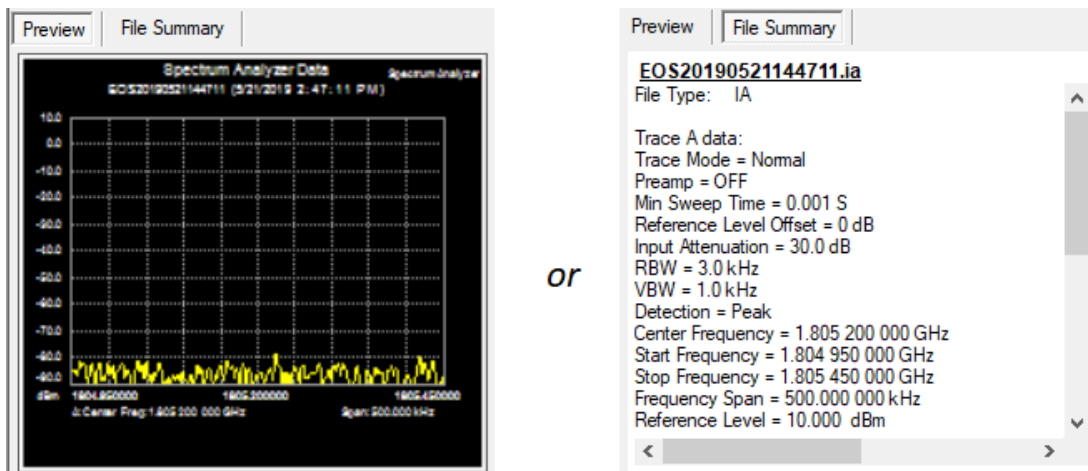


Figure 3-40. Measurement File Preview/Summary Window

3-9 Status Bar

The Status Bar displays information about the connection from MST to the instrument showing the type of connection used, the number of measurement files in the instrument (Remote Count), and how long MST and the instrument have been connected.

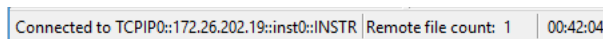


Figure 3-41. Status Bar

3-10 Context Menus & Plot Setup

Context Menus are menus that open when you place the mouse cursor over an active measurement panel and right-click.

There are common command lines and plot setup options in the context menus of several analyzers and editors. For specific options not included here, refer to the section of this User Guide specific to the measurement of interest.

Common Context Menu Command Lines and Plot Setup Configurations

Right-click on a measurement panel to bring up the context menu.

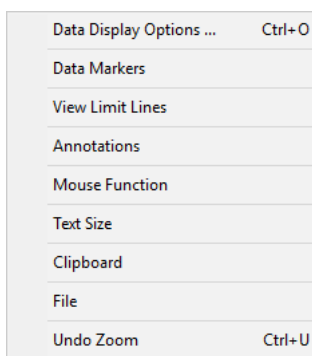


Figure 3-42. Example Context Menu

Data Display Options: Displays the Plot Setup dialog.

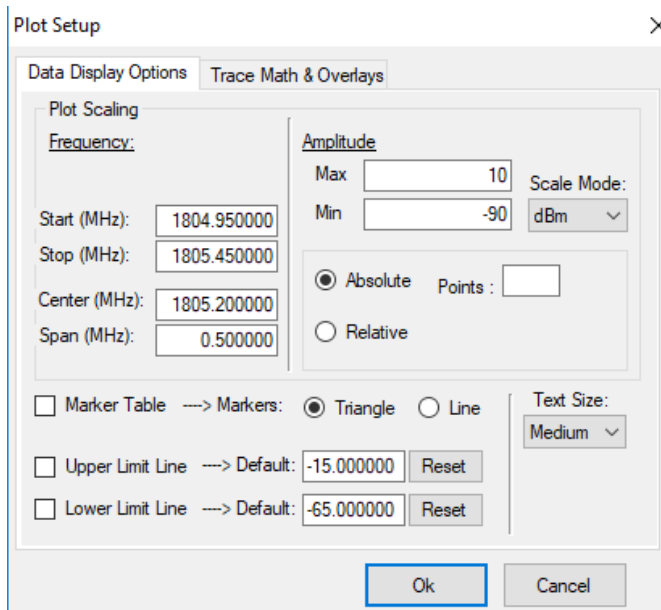


Figure 3-43. Example Plot Setup dialog

Data Markers: Opens a list of marker commands.

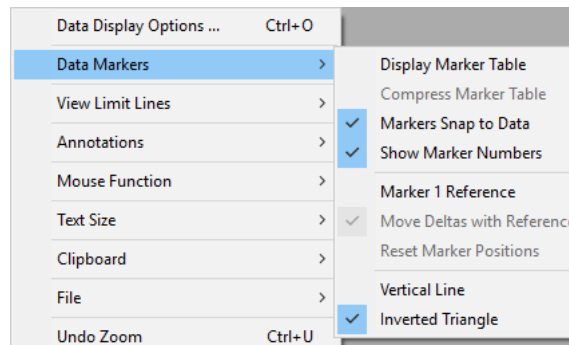


Figure 3-44. Data Markers Pull-down Menu

Display Marker Table: Displays a Table of Markers underneath the graphical display.

Compress Marker Table: Compresses the marker table to display only used Markers. Markers not in use or invisible are not shown.

Markers Snap to Data: When enabled, dragging a marker moves from a data point to the next data point. When disabled, dragging the marker allows movement between data points on the line.

Show Marker Numbers: Displays the sequence number of the Marker when initially added.

Marker 1 Reference: Sets Marker 1 as a reference to the six delta markers.

Move Deltas with Reference: Enables the six delta markers to move with Marker 1.

Reset Marker Positions: If moved, resets all markers to their original positions.

Vertical Line: Toggles the Marker to show as a vertical line instead of an inverted triangle.

Inverted Triangle: Toggles the Marker to show as an inverted triangle instead of a vertical line.

View Limit Lines: Opens a list of Limit Line controls. Many measurement types support upper and lower limit lines on data plots. In the Plot Setup dialog box, the limit lines can be turned on or off (upper and lower separately) and can be reset to specified values. When a limit line is reset, it is reduced to two nodes spanning 90% of the x-axis range and is set above or below the vertical data range. A special context menu is associated with each node in a limit line.

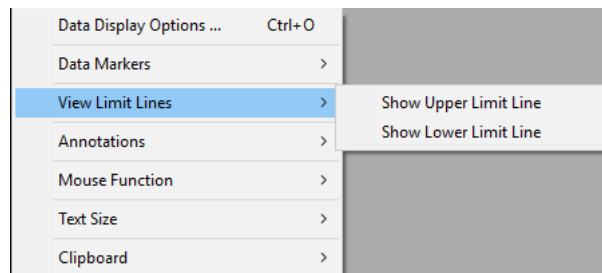


Figure 3-45. View Limit Line Controls Menu

Show Upper Limit Line: Toggles the Upper Limit Line on and off.

Show Lower Limit Line: Toggles the Lower Limit Line on and off.

Annotations: Opens a sub-menu to manage notes on the Active Measurement Window Panel list.

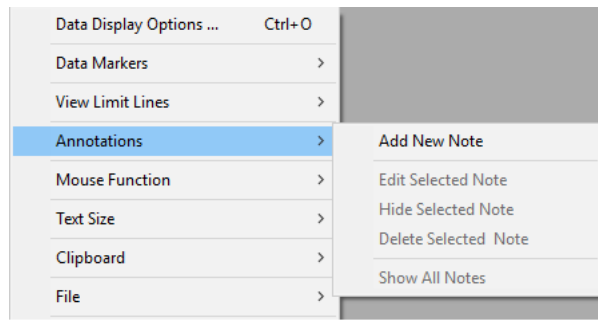


Figure 3-46. Annotation Controls Menu

Add New Note: Allows placement of notes on the Active Measurement Window Panel. Notes are displayed as text in yellow rectangles, as shown below.

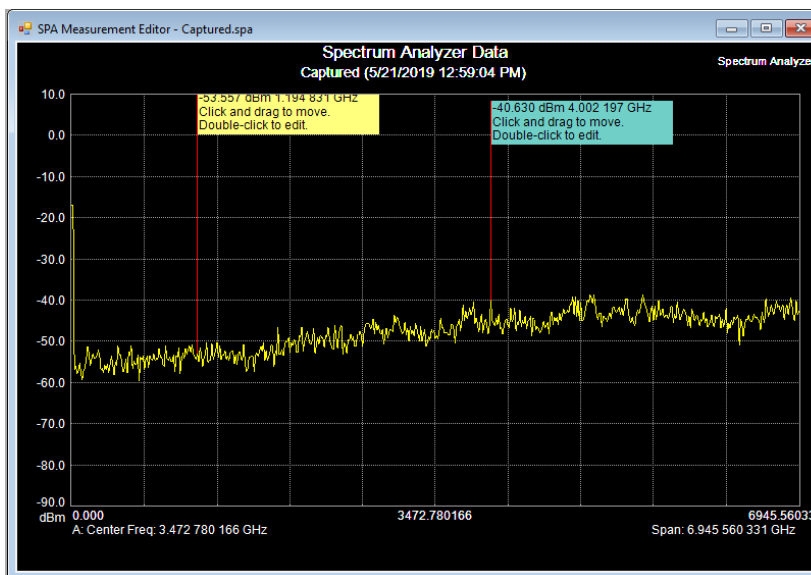


Figure 3-47. Active Measurement Window Panel with Annotations

Edit Selected Note: Opens the Note Entry window to edit the message in the Note and show or hide the frequency and power values.

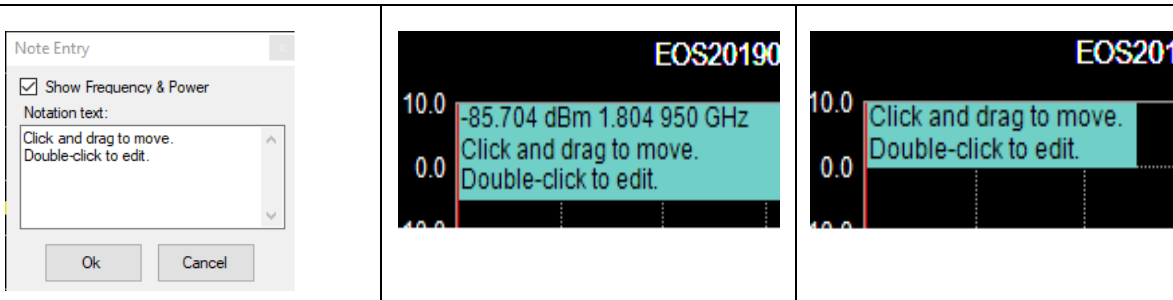


Figure 3-48. Annotation Entry Window and the effect of Show Frequency & Power

Hide Selected Note: Hides the currently selected Note.

Delete Selected Note: Deletes the currently selected Note.

Show All Notes: Displays all hidden Notes.

Mouse Function: Opens a list of mouse functions. These commands are also accessible by clicking the Mouse: menu on the Graphic Toolbar.

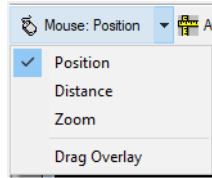


Figure 3-49. Mouse Function Menu

The label on the toolbar button for the mouse function displays which of the four functions is selected by appending the function title after the word **Mouse**. For example, when **Position** is selected, the button label changes to **Mouse: Position**.

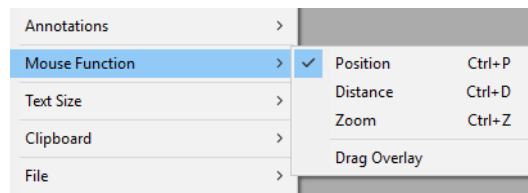


Figure 3-50. Mouse Functions Menu

Position: Displays the x and y coordinates of the graph in Frequency and Amplitude. For DTF measurements, Distance and Amplitude values are displayed. Drag the mouse while holding the left mouse button and the coordinate display will indicate changing measurement values as the mouse position changes.

Distance: Displays the absolute value of the difference in Frequency when the mouse pointer is clicked and dragged horizontally from a starting point, or the difference in Amplitude when clicked and dragged vertically from a starting point.

Zoom: Expands a selected section of the graph. Use this feature for closer analysis of a trace. Use Cntl+U, or the Undo Zoom command on page 3-27.

Drag Overlay: Grabs a trace from a similar type graph and places it on the desired graph.

Text Size: Opens a menu to change the text size of the Active Measurement Window. The default text size can be adjusted for all measurement windows. If a window is reduced to a size that is too small for the selected text size, the text size is automatically reduced, but is automatically enlarged again to the selected value if the window is enlarged sufficiently.

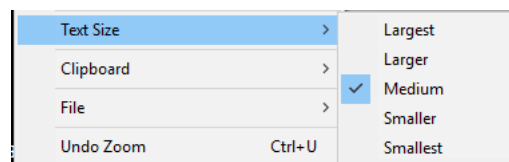


Figure 3-51. Text Size Selection

Clipboard: Opens a sub-menu of copy commands.

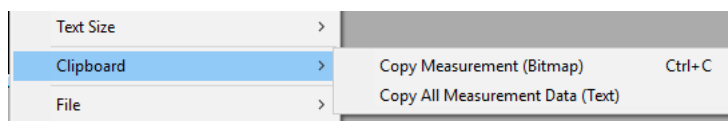


Figure 3-52. Copy to Clipboard Functions

Copy Measurement (Bitmap): Copies a bitmap of the graph in the active measurement screen to the clipboard.

Copy All Measurement Data (Text): Copies the data of the active measurement window panel to the clipboard in .txt file format.

File: Opens a list of file management and edit commands.

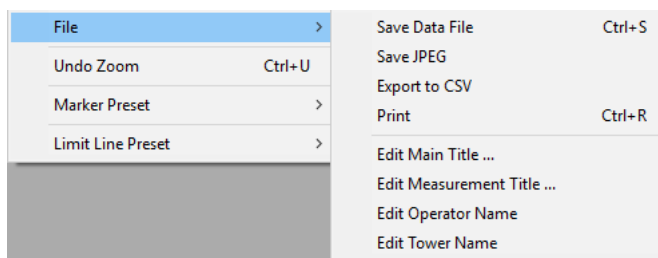


Figure 3-53. File Management Window

Save Data File: Save the current measurement with the appropriate file type.

Save JPEG: Saves the currently displayed Active Measurement as a JPEG file.

Export to CSV: Saves the data file as a CSV (comma-separated values) file that can be imported into a spreadsheet application.

Print: Sends the active measurement window graph and data to the printer.

Edit Main Title: Opens the Enter Title entry dialog to change the main title of the active measurement window.

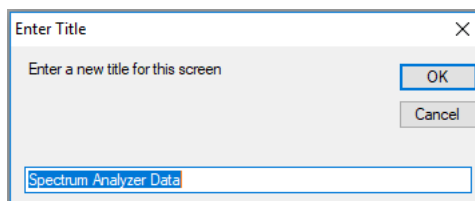


Figure 3-54. Enter Title Entry Window

Edit Measurement Title: Opens the Enter Subtitle entry dialog to change the subtitle of the active measurement window.

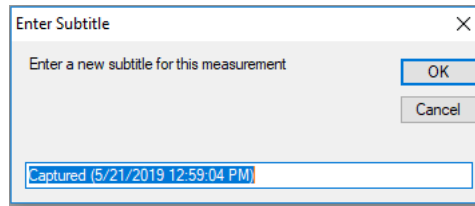


Figure 3-55. Enter Subtitle Entry Window

Edit Operator Name: Opens the Edit Operator Name dialog. Type the name, press OK or press Cancel.

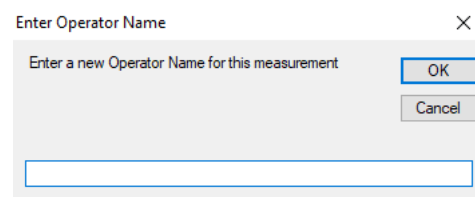


Figure 3-56. Enter Operator Name

Edit Tower Name: Opens the Edit Tower Name dialog. Type the name, press OK or press Cancel.

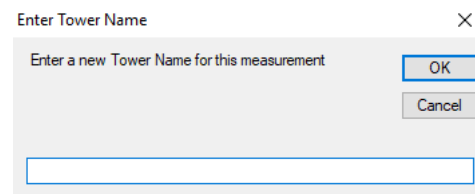


Figure 3-57. Enter Tower Name

Undo Zoom: Undoes the previous zoom operation.

Spectrum Analyzer (SPA)

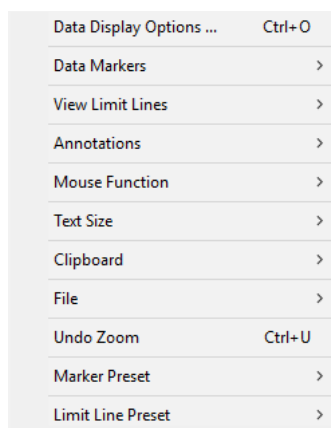


Figure 3-58. Spectrum Analyzer Context Menu

Data Display Options: Opens this version of the Plot Setup dialog.

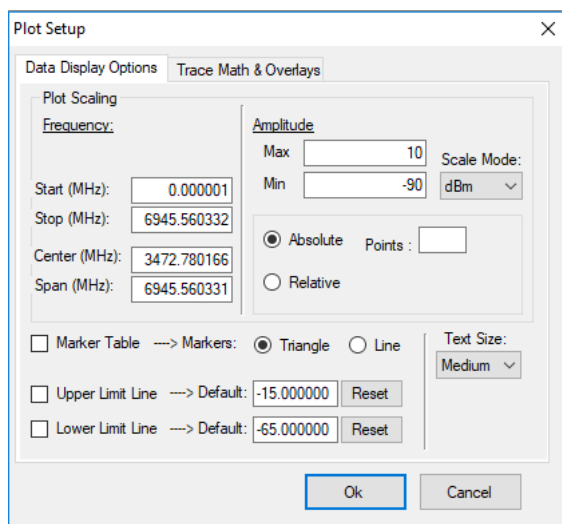


Figure 3-59. Spectrum Analyzer Plot Setup Dialog: Data Display Options

Cable and Antenna Analyzer (Vector Network Analyzer - VNA)

Opens a sub-menu to edit the Limit Lines and Markers.

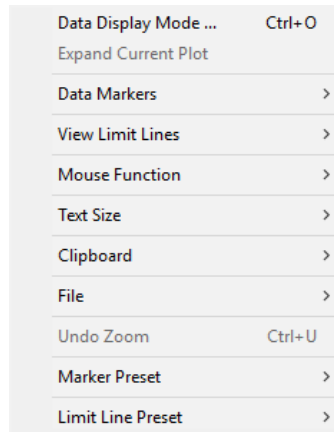


Figure 3-60. VNA Context Menu

Data Display Mode (Vector Network Analyzer): Opens this version of the Plot Setup dialog:

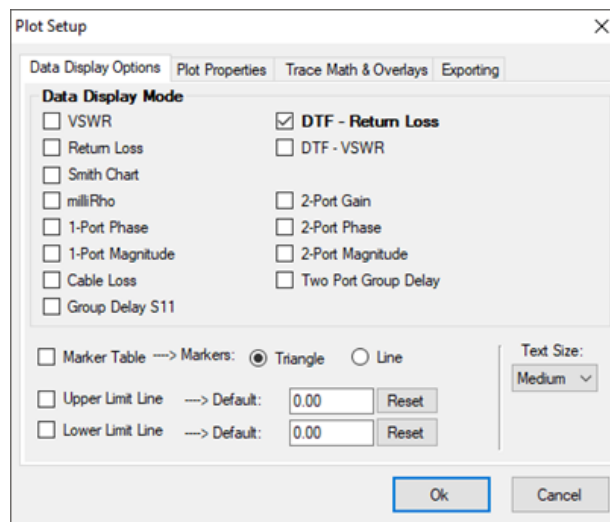


Figure 3-61. VNA Plot Setup Window

Expand Current Plot (Vector Network Analyzer): If the current VNA graph contains four views, one of them can be expanded by clicking this command.

WCDMA

The Plot Setup from the WCDMA context menu open a sub-menu to edit the Limit Lines.

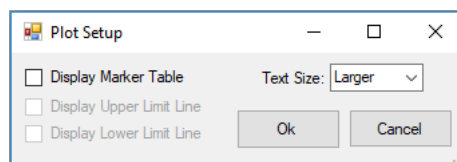


Figure 3-62. WCDMA Plot Setup Window

Interference Analyzer (IA)

Opens a sub-menu to save an .IA file in different file formats. The measurement window shows a composite of all traces in a spectrogram. Each data set is shown as a single row of pixels with color variation to indicate amplitude. There is a cursor on the spectrogram that allows selection of a single line from the spectrogram which is then displayed as a normal trace below the spectrogram. In the image shown, the cursor is a red line at the very top of the spectrogram. Between the spectrogram and the individual trace graph is the number of the highlighted trace along with its date and time stamp. GPS and UTC data will be displayed for measurements taken with GPS and UTC data.

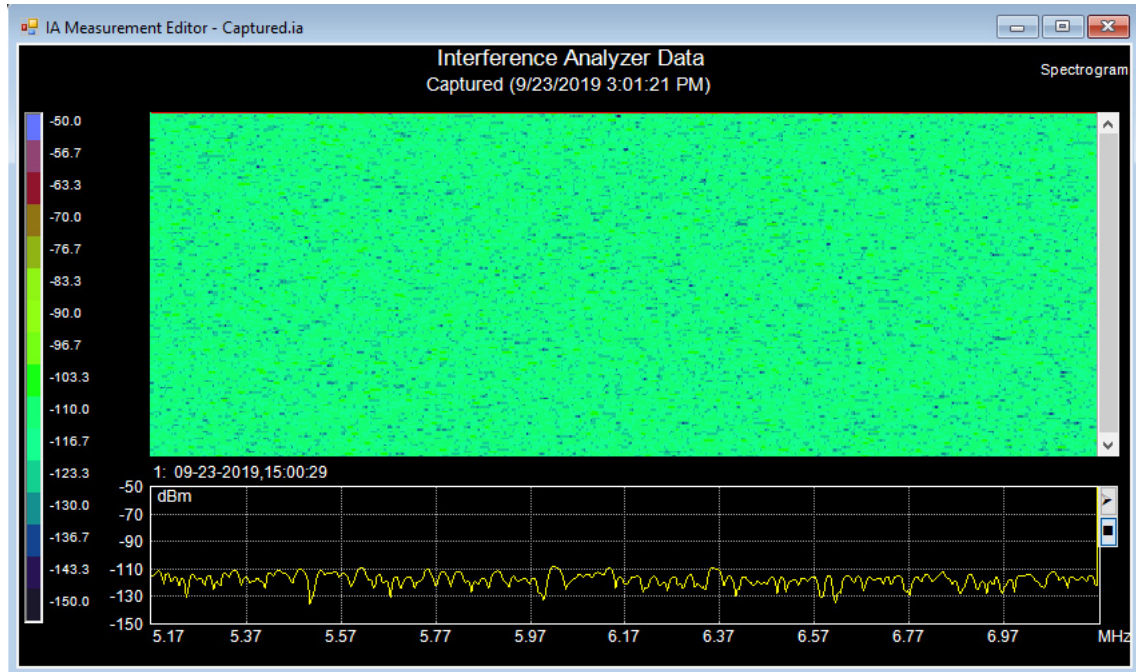


Figure 3-63. IA Measurement Editor

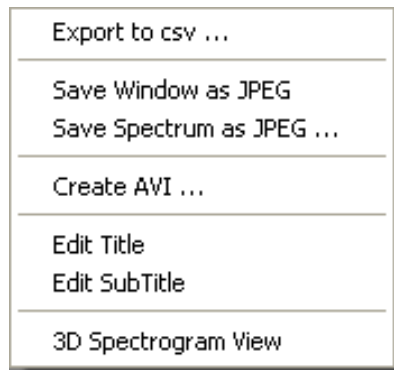


Figure 3-64. IA Context File Menu

Export to CSV: Opens the Save As window to save the data file as a CSV (comma separated values) file that can be imported into a spreadsheet application.

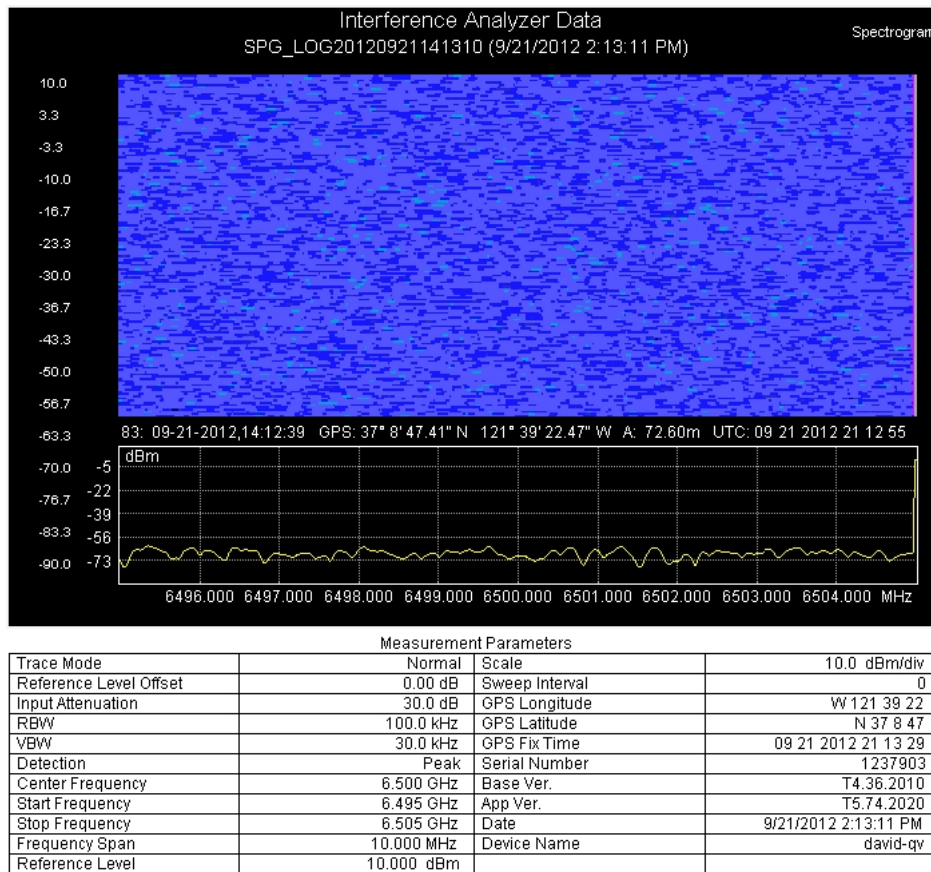


Figure 3-65. Active Measurement Window Saved as JPEG Sample

Save Window as JPEG: Saves both the Spectrogram and the currently selected trace below it in a single JPEG image.

Save Spectrum as JPEG: Saves only the selected trace in a normal x-y plot and does not include the spectrogram. In both cases, a table of measurement parameters is appended below the graph.

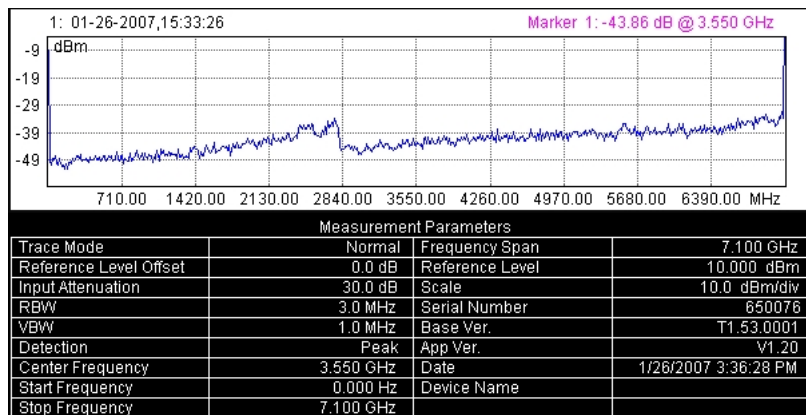


Figure 3-66. Active Measurement Spectrum Only Saved as JPEG Sample

Create AVI: Opens the Create AVI dialog box to begin creation of the AVI.

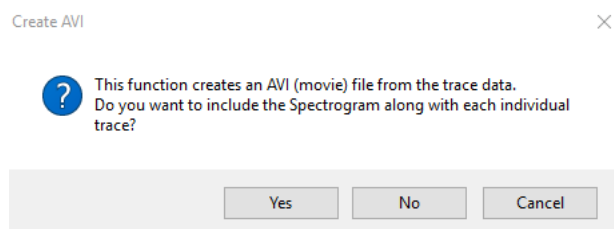


Figure 3-67. Create AVI Dialog Box

Edit Title: Opens the Enter Title dialog box to enter a new title for the measurement. Press the OK button when done.

Edit SubTitle: Opens the Enter Subtitle dialog box to enter a new title for the measurement. Press the OK button when done.

3D Spectrogram View: Opens the Create AVI dialog box to begin creation of the AVI.

JPEG File

Opens a file management sub-menu.

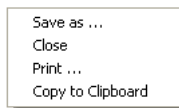


Figure 3-68. JPEG File Management Controls

Save As: Opens the Save As window to name and store the file.

Close: Closes the JPEG file.

Print: Prints the file as JPEG.

Copy to Clipboard: Copies the file to the clipboard so it can be pasted in other documents.

Limit Line Node

Opens a sub-menu to edit the Limit Lines.

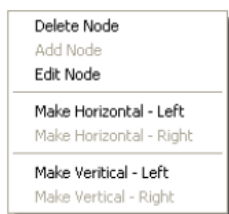


Figure 3-69. Limit Line Node Controls Context Menu

Delete Node: Deletes the limit line node the cursor is on.

Add Node: Adds a node to the limit line.

Edit Node: Opens the Edit Limit Line Node entry box to change the Frequency and Power values.

Make Horizontal - Left: Changes the Power value of the highlighted node equal to the Power value of the node to its left.

Make Horizontal - Right: Changes the Power value of the highlighted node equal to the Power value of the node to its right.

Make Vertical - Left: Changes the Frequency value of the highlighted node equal to the Frequency value of the node to its left.

Make Vertical - Right: Changes the Frequency value of the highlighted node equal to the Frequency value of the node to its right.

Power Meter, High Accuracy Power Meter, Fixed WiMAX, Mobile WiMAX, WCDMA

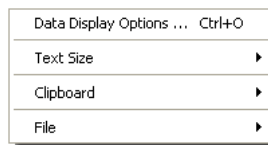


Figure 3-70. Context Menu for Power Meter, Hi-Accuracy Power Meter, Fixed WiMAX, Mobile WiMAX, WCDMA

Data Display Options (for Power Meter and High Accuracy Power Meter): Opens the Plot Setup window.

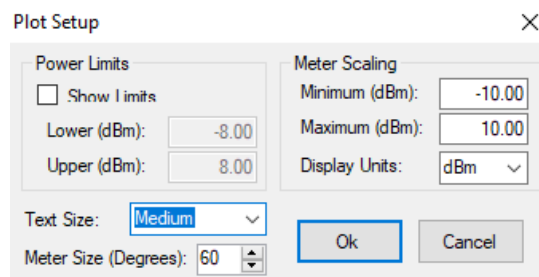


Figure 3-71. Power Meter and High Power Accuracy Meter Plot Setup Window

Data Display Options (Fixed WiMAX, Mobile WiMAX): Opens the dialog window to change the text size of the Fixed WiMAX and Mobile WiMAX Editor window.

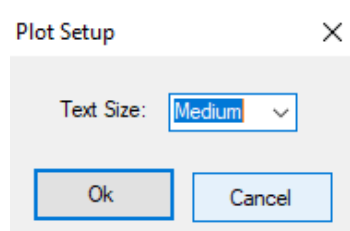


Figure 3-72. Fixed & Mobile WiMAX Plot Setup Window

TD-SCDMA Signal Analyzer

Because the TD-SCDMA Signal Analyzer does not use Limit Line or Marker editing features, no context menu opens for this measurement type.

Channel Scanner

This context menu displays when clicking the right mouse button and the Plot Setup dialog displays when you click Data Display Options.

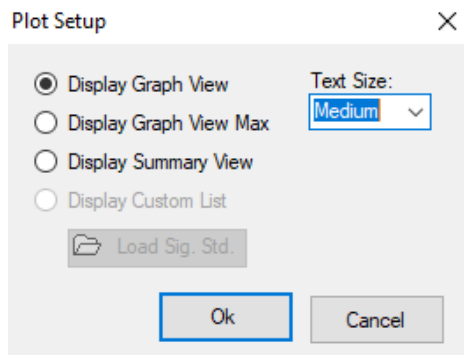


Figure 3-73. Channel Scanner Context Menu and Plot Setup dialog

3-11 File Editors, Tools, and Other Miscellaneous Windows

Print All Measurements

Print All command only prints measurement files. Lists (antenna, cable, etc.), JPG and other non-measurement files are not printed.

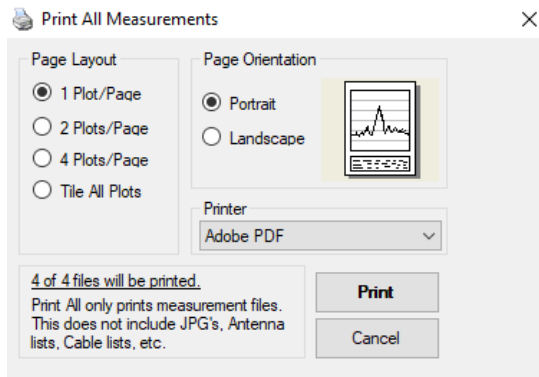


Figure 3-74. Print All Measurements Window

Page Layout: Select the number of plots from the Active Measurement Window to be printed per page.

Page Orientation: Places the plot in a Portrait (vertical) or Landscape (horizontal) format.

Printer: Select the printer to handle the printing of the measurement files.

x of y: States the number of measurement files x of y open files to be printed.

Print: Click Print to print files.

Antenna Editor

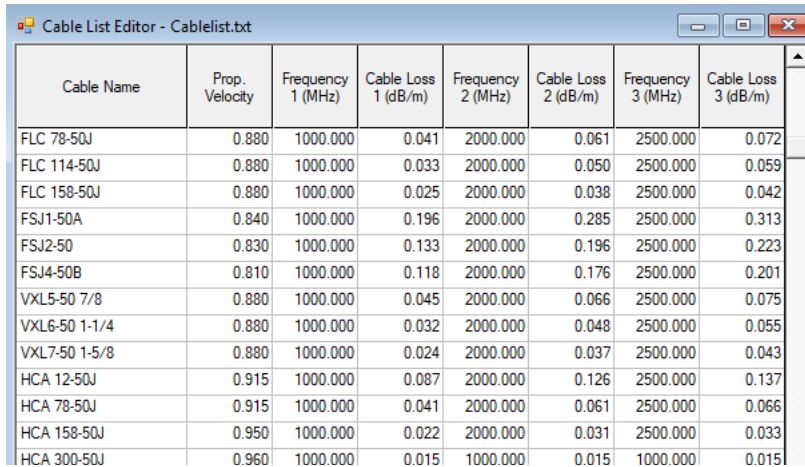
Opens immediately after downloading and saving a file from the test instrument or after dragging an Antenna List file into the Active Measurement Window. After an antenna list window is open, use **Sync>Upload Active Window** to upload the new antenna list to the instrument. The blank box in the Antennas column is for a new antenna entry. When highlighted, a row of blank boxes will appear in the window on the right. Enter the antenna's Frequency (MHz), Antenna Factor (dB), and Antenna Gain (dBi) in the respective boxes.

Antennas	#	Frequency (MHz)	Antenna Factor (dB)	Antenna Gain (dBi)
Anritsu_2000-1030				
Anritsu_2000-1031	1	1,710.00	32.730	2.158
Anritsu_2000-1032	2	1,715.00	32.760	2.154
Anritsu_2000-1200	3	1,720.00	32.780	2.159
Anritsu_2000-1035	4	1,725.00	32.810	2.154
Anritsu_2000-1361_Maxrad	5	1,730.00	32.830	2.159
Anritsu_2000-1361-R_Low	6	1,735.00	32.860	2.154
Anritsu_2000-1361-R_High	7	1,740.00	32.880	2.159
Anritsu_2000-1411	8	1,745.00	32.910	2.154
Anritsu_2000-1412	9	1,750.00	32.930	2.159
Anritsu_2000-1413	10	1,755.00	32.960	2.154
Anritsu_2000-1414	11	1,760.00	32.980	2.159
Anritsu_2000-1415	12	1,765.00	33.000	2.163
Anritsu_2000-1416	13	1,770.00	33.030	2.158
Anritsu_2000-1473	14	1,775.00	33.050	2.162
Anritsu_2000-1474	15	1,780.00	33.080	2.157
Anritsu_2000-1475_Low	16	1,785.00	33.100	2.161

Figure 3-75. Antenna Editor Window

Cable Editor

Opens immediately after downloading the file from the test instrument or after dragging a Cable List file into the Active Measurement Window. A row of blank boxes are available at the end of the list. Scroll down to these boxes. Enter the new cable name and associated parameters.



Cable Name	Prop. Velocity	Frequency 1 (MHz)	Cable Loss 1 (dB/m)	Frequency 2 (MHz)	Cable Loss 2 (dB/m)	Frequency 3 (MHz)	Cable Loss 3 (dB/m)
FLC 78-50J	0.880	1000.000	0.041	2000.000	0.061	2500.000	0.072
FLC 114-50J	0.880	1000.000	0.033	2000.000	0.050	2500.000	0.059
FLC 158-50J	0.880	1000.000	0.025	2000.000	0.038	2500.000	0.042
FSJ1-50A	0.840	1000.000	0.196	2000.000	0.285	2500.000	0.313
FSJ2-50	0.830	1000.000	0.133	2000.000	0.196	2500.000	0.223
FSJ4-50B	0.810	1000.000	0.118	2000.000	0.176	2500.000	0.201
VXL5-50 7/8	0.880	1000.000	0.045	2000.000	0.066	2500.000	0.075
VXL6-50 1-1/4	0.880	1000.000	0.032	2000.000	0.048	2500.000	0.055
VXL7-50 1-5/8	0.880	1000.000	0.024	2000.000	0.037	2500.000	0.043
HCA 12-50J	0.915	1000.000	0.087	2000.000	0.126	2500.000	0.137
HCA 78-50J	0.915	1000.000	0.041	2000.000	0.061	2500.000	0.066
HCA 158-50J	0.950	1000.000	0.022	2000.000	0.031	2500.000	0.033
HCA 300-50J	0.960	1000.000	0.015	1000.000	0.015	1000.000	0.015

Figure 3-76. Cable Editor Window

Signal Standard Editor

Opens immediately after downloading the file from the test instrument or after dragging a .SIG file into the Active Measurement Window. This editor is used for editing signal standard file types – WCDMA, CDMA, GSM, No Uplink/Downlink, Fixed WiMAX, Mobile WiMAX, TD-SCDMA, and LTE.

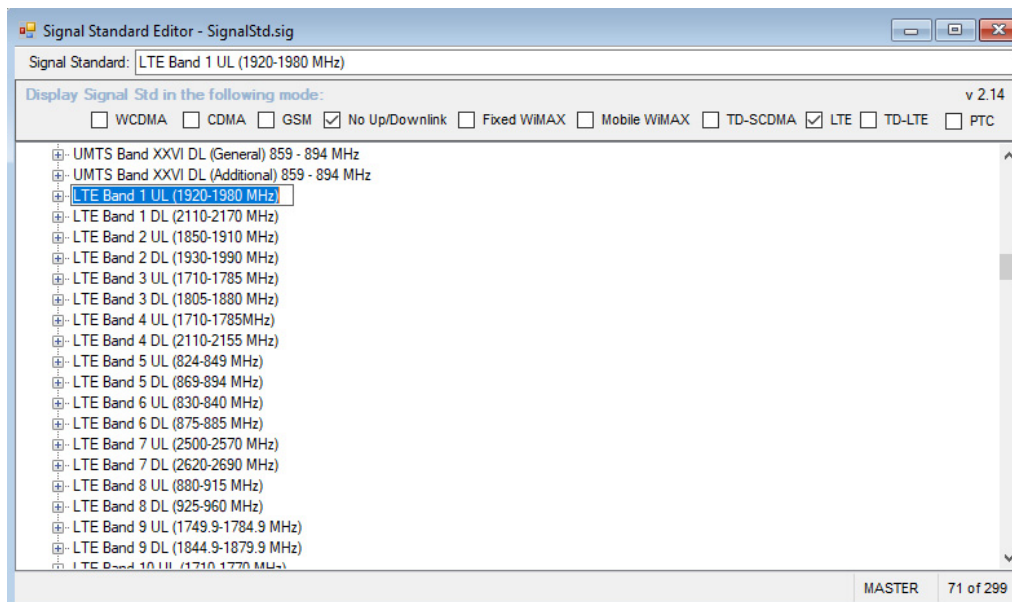


Figure 3-77. Signal Standard Editor

The context menu for list of Signal Standards.

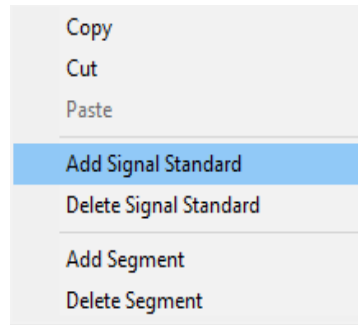


Figure 3-78. Signal Standard Editor Context Menu

Copy: Copies the highlighted signal or segment to the clipboard.

Cut: Removes the highlighted branch from the list of signal standards.

Paste: Pastes a signal from the clipboard under the highlighted signal branch. Adds the current segment in the clipboard to the list of segments in the highlighted signal branch.

Add Signal Standard: Adds a signal branch to be edited to the bottom of the list.

Delete Signal Standard: Deletes the highlighted signal standard.

Add Segment: Adds a segment branch under the highlighted signal standard.

Delete Segment: Deletes the highlighted segment standard.

Language Editor

Opens immediately after downloading the file from the test instrument and stores the file xxx.znc locally in C:\Program Files\Anritsu\Anritsu Master Software. The Language Editor allows for modification of the language that is already in the instrument (except English) and also provides the ability to add two custom languages to the instrument.

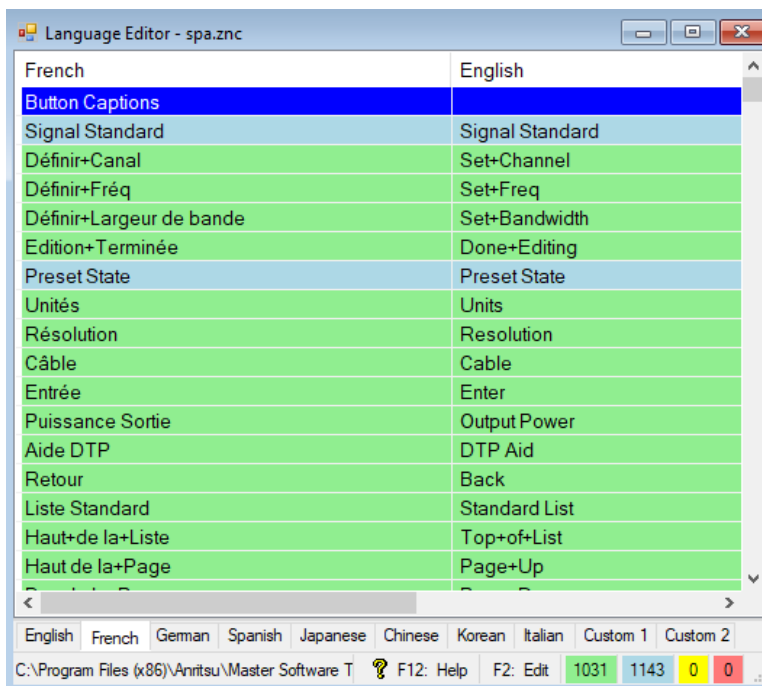


Figure 3-79. Language Editor Window

Pass Fail Editor

Opens immediately after downloading the file from the test instrument or after dragging a Test Models list file into the Active Measurement Window. This editor edits these Pass/Fail file measurement types: GSM/GPRS/EDGE, WCDMA/HSDPA, Fixed WiMAX, Mobile WiMAX, CDMA, EV-DO, TD-SCDMA, TD-LTE, and LTE. The blank box in the Models column at the end of the list is for a new model entry. When highlighted, a row of blank boxes will appear in the window on the right. Enter the associated parameter in each box.

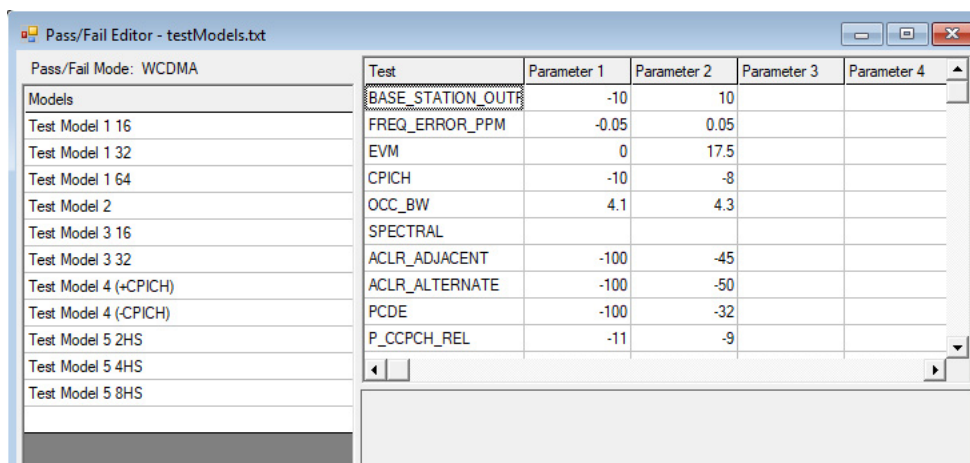


Figure 3-80. Pass/Fail Editor Window

XML Parameter File Editor

Click File>New>Mobile WiMax Parameter File to open this dialog. Simple DL-MAP editor to edit current DL-MAP files or create DL-MAP files in MST. When editing or creating a file is completed, use the Upload button to transfer the file back into the instrument. For more information, please refer to the MX370105A Mobile WiMAX IQ producer documentation.

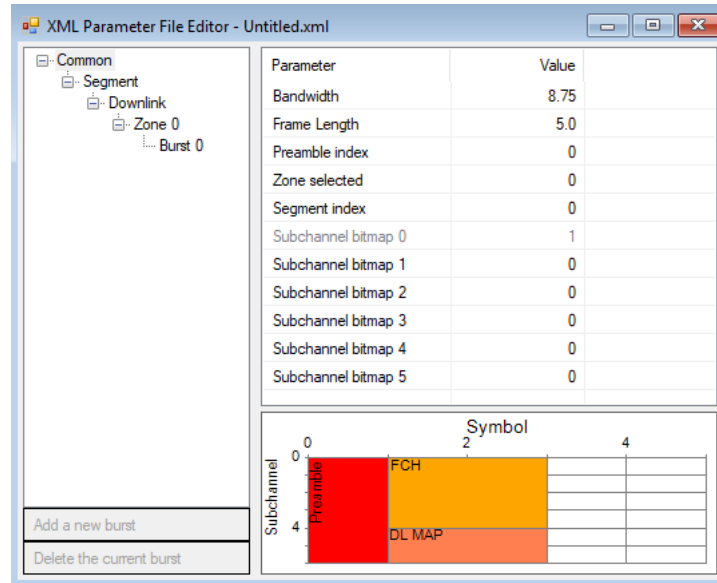


Figure 3-81. XML Parameter File Editor

SPA and VNA Plot Setup: Common Settings

Right-click a .spa or .vna display in the measurement window and choose Data Display Options or Data Display Mode.

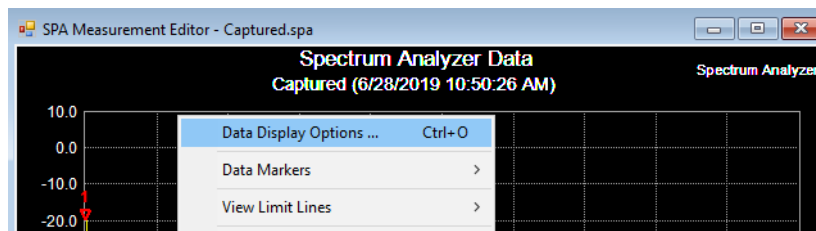


Figure 3-82. Spectrum Analyzer and Vector Network Analyzer Plot Setup

The Plot Setup dialog displays and use it for changing various plotting parameters.

Data Display Options

The Data Display Options tab contains parameters for plot scaling and marker and limit line settings

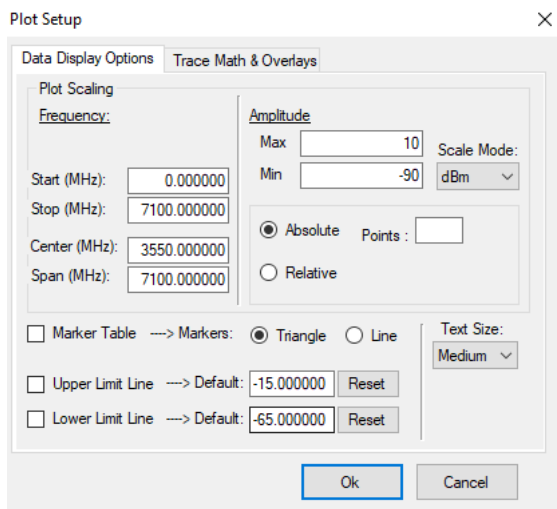


Figure 3-83. SPA and VNA Data Common Display Options

- Plot Scaling
 - Frequency: Enter the minimum and maximum frequency plot boundaries.
 - Amplitude: Enter the minimum and maximum amplitude plot boundaries.
 - Marker Table: Check this box to display the marker table below the graph.
- Marker and Limit Line settings
 - Marker Table: Turns on or off the marker table.
 - Markers: Toggles the markers to be displayed as inverted triangles or lines.
 - Upper Limit Line: Toggles the Upper Limit Line on or off in the active measurement window.
 - Lower Limit Line: Toggles the Lower Limit Line on or off in the active measurement window.
 - Reset: If the Limit Lines were moved, the Reset button returns the lines to their original value.
 - Text Size: Changes the text size in the active measurement window.

Trace Math & Overlays Tab

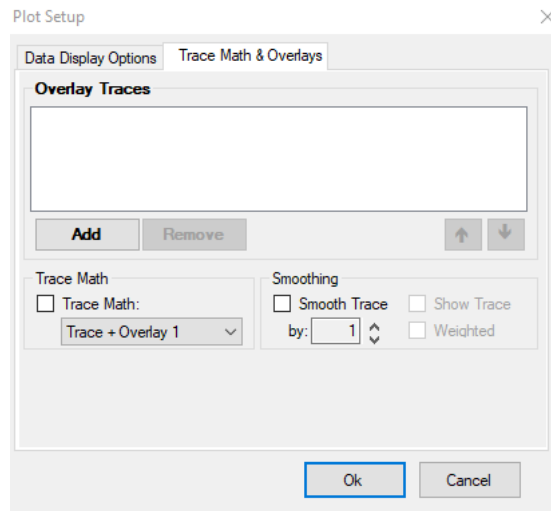


Figure 3-84. SPA and VNA Data Display Options

Trace Math is a tool for comparing two traces. You can upload traces using MST, store those traces in memory, and compare the stored traces with a more recent trace.

- Overlay Traces

Add: Opens a .SPA or a .VNA File List dialog from which to select traces for overlaying.

Remove: Removes the selected trace from the current Overlay Traces window.

- Trace Math

Trace Math: When a second set of data is overlaid on a measurement trace, normally both data sets are displayed simultaneously, but in different colors. If Trace Math is active, then only a single trace is shown, and that single trace is either the sum or difference, taken point by point, of the original data set and the overlaid data set. There are three options for Trace Math: Trace + Overlay, Trace – Overlay, and Overlay – Trace.

Because up to five overlays can be active at once, trace math is always defined as being the original trace and the first overlay. The arrows in the Overlay dialog box move the overlays up and down in order, to select which of the five to use in trace math.

- Smoothing

Smooth Trace: Allows the user to smooth a trace by a percentage determined by the number in the box. The default is set to 1%.

Show Trace: Smoothing uses a moving average to even out bumps in the data trace. If Show Trace is selected, the original trace is shown in a faint color behind the ‘smoothed’ trace to show the effect of the smoothing.

Weighted: When smoothing a trace, the default is to use a square averaging window, meaning that the new value of a point will be the average value of X number of points to each side. A square window gives each point in the average the same weight, and is considered no weighting. If Weighting is checked, then adjacent data points are given more weight in the average than points further away.

VNA Additional Plot Setup Settings

There are two additional tabs for VNA measurement files.

Plot Properties Tab

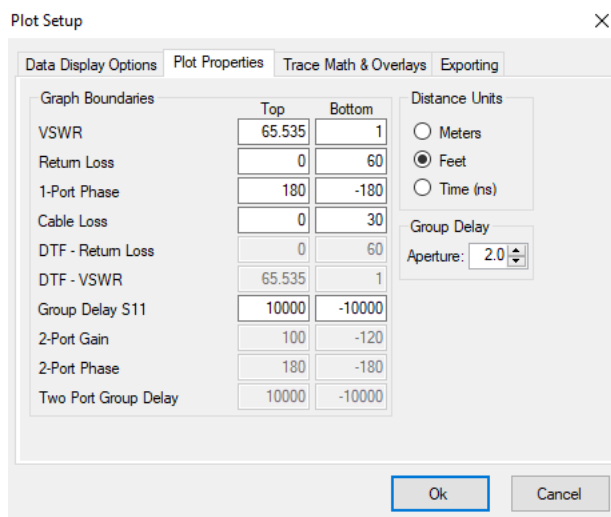


Figure 3-85. VNA Plot Properties

- Graph Boundaries: The following parameters dictate the boundaries of the plot. Parameters active for the file type are highlighted in black. Inactive parameters are grayed out. Adjust the boundaries by entering the Top and Bottom Limits of the plot.

For the S11 group:

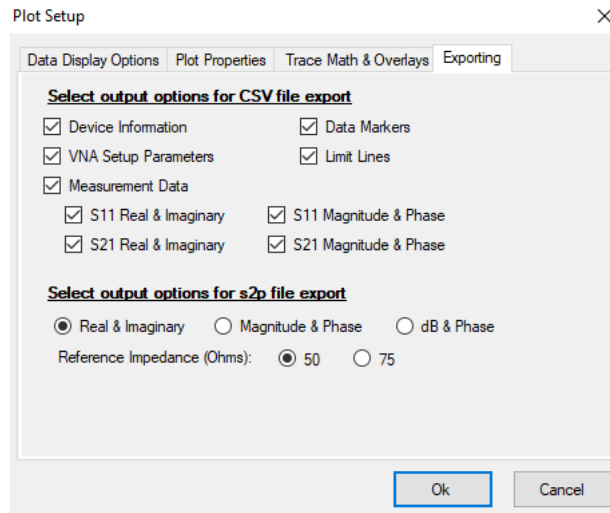
- VSWR
- Log Magnitude
- Phase
- Cable Loss
- Log Mag. Fault Location
- DTF VSWR
- Two Port Group Delay

For the S21 group:

- Log Magnitude
- Phase
- Group Delay

- Distance Units:
 - Meter
 - Feet
 - Time (ns)
- Group Delay:
 - Aperture

Exporting Tab:

**Figure 3-86.** VNA File Exporting Setup

- Select output options for CSV file export:
The following are parameters that can be included in an exported CSV file. Check the desired parameters.
 - Device Information
 - VNA Setup Parameters
 - Data Markers
 - Limit Lines
 - Measurement Data
 - S11 Real & Imaginary
 - S21 Real & Imaginary
 - S11 Magnitude and Phase
 - S21 Magnitude and Phase
- Select output options for s2p file export:
The following are parameters that may be included in an exported .s2p file. Check the desired parameters.
 - Real & Imaginary
 - Magnitude & Phase
 - dB & Phase
 - Reference Impedance (Ohms) — choose 50 or 75 Ohms.

Power Meter and High Power Accuracy Meter Plot Setup

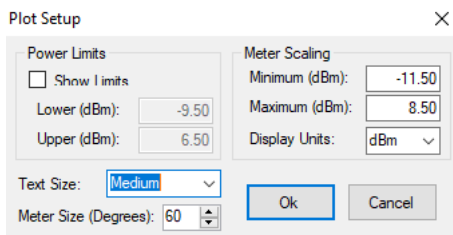


Figure 3-87. Power Meter and High Power Accuracy Meter

- Power Limits
 - Show Limits: Select to show the Limits. Enter the values of the Lower and Upper Power Limits
 - Lower (dBm)
 - Upper (dBm)
- Meter Scaling: Enter the values of the Minimum and Maximum Scales of the Meter.
 - Minimum (dBm)
 - Maximum (dBm)
 - Display Units: Select dBm, dBV, dBmV, dBuV, V or mW.
- Text Size: Changes the text size in the active measurement window.
- Meter Size (Degrees): Changes the arc angle of the meter.

Enter IP Address

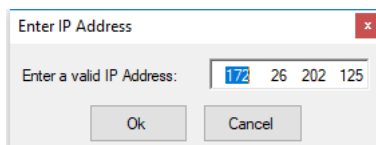


Figure 3-88. IP Address Entry Box for Setting Up an Ethernet Connection

Measurement Calculator (VNA)

This Tools menu command translates certain values into other units. It can show: Real, Imaginary, Magnitude, Phase, Return Loss, Reflection Coefficient, and Transmission Power.

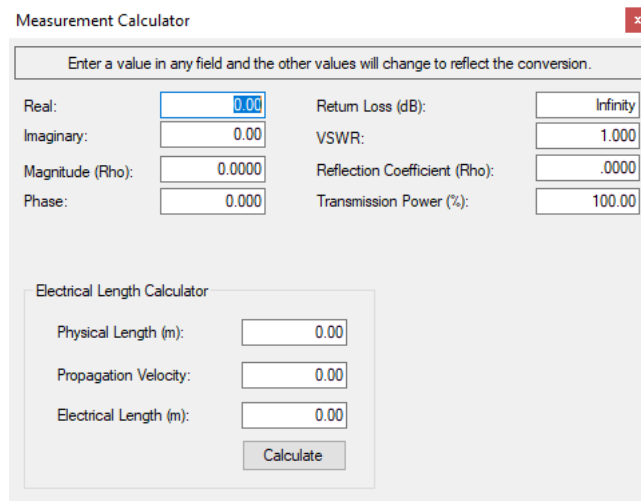


Figure 3-89. Measurement Calculator

DAT File Conversion Tool

Converts supported file types from Anritsu Handheld Software Tools (HHST) format to the file format supported by MST. File conversion is one-way. Refer to [Figure 3-29, “DAT File Conversion Tool Window”](#) on page 3-16.

Distance-To-Fault

Converts RL and VSWR plots to DTF plots.

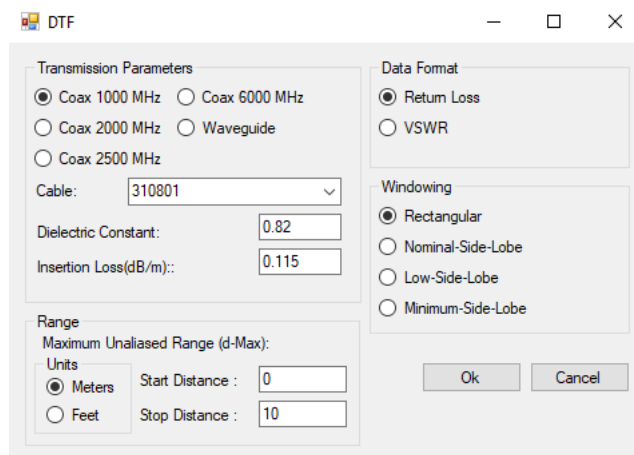


Figure 3-90. DTF Window

Transmission Parameters: Select a coax cable, the waveguide, or a cable from the pull-down menu. Enter a dielectric constant and insertion loss values for cables not selected from the pull-down menu.

Data Format: Displays the plot type to be converted to DTF.

Range: Enter the start and stop distances of the measurement.

Units: Select the desired distance unit of measure – Meters or Feet.

Windowing: Select the type of windowing method to be used on the plot.

Trace Rename Utility

Utility window to rename measurement traces.

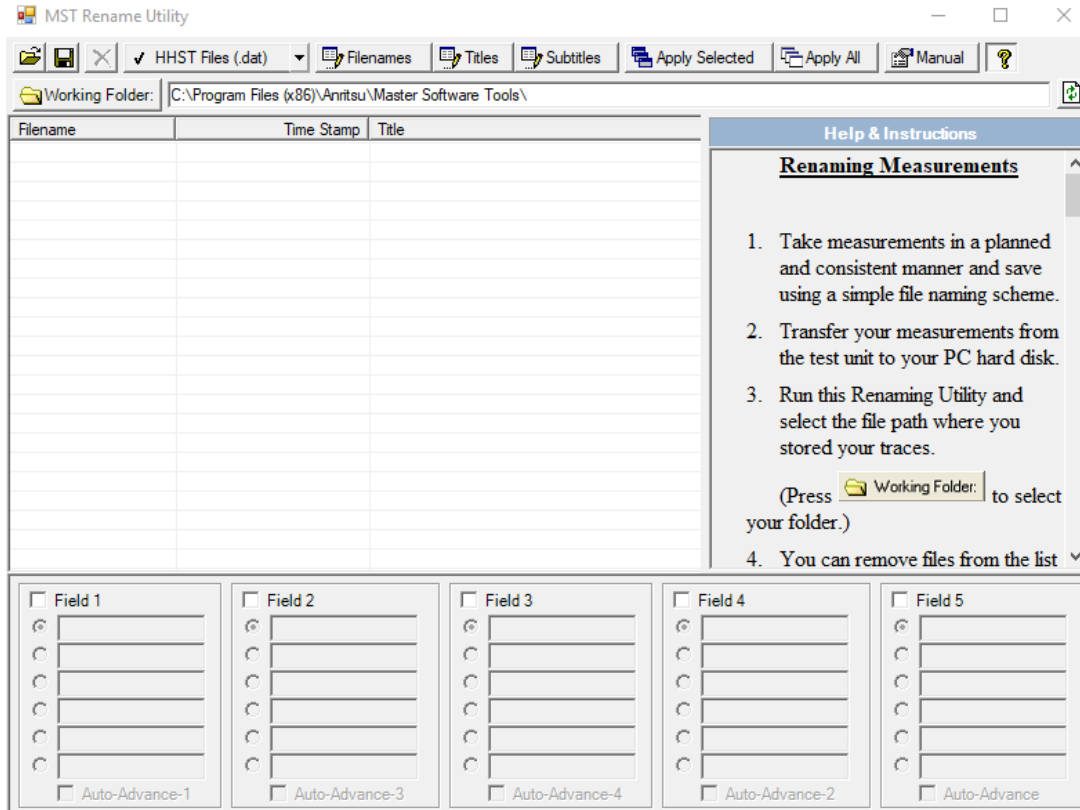


Figure 3-91. MST Rename Utility Window

Product Updates

This feature is used to update MST and instrument software. Refer to [Figure 6, “Advanced Features” on page 6-1](#) for complete information.

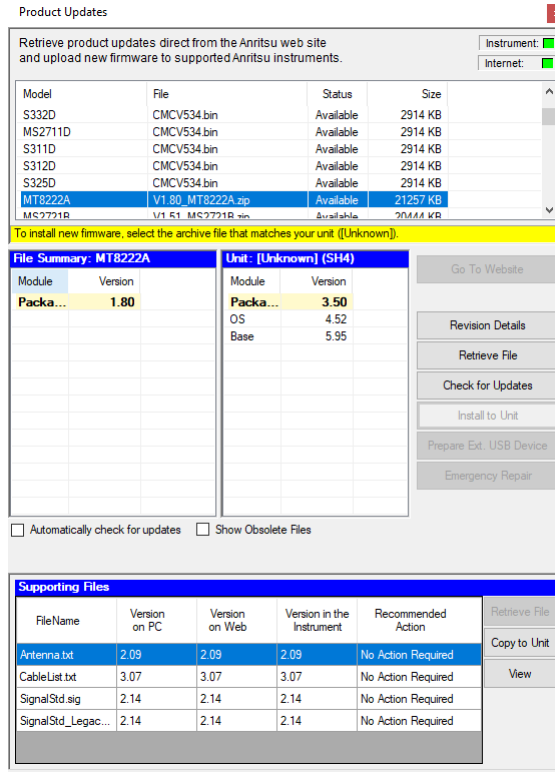


Figure 3-92. Product Updates Window

3-12 Program Options

This window sets the parameters for General, Report Generator, Internet Settings, Serial Port Settings, and Languages.



Figure 3-93. Tabs of the Program Options Window

The sections that follow describe the tabs in detail.

General Tab

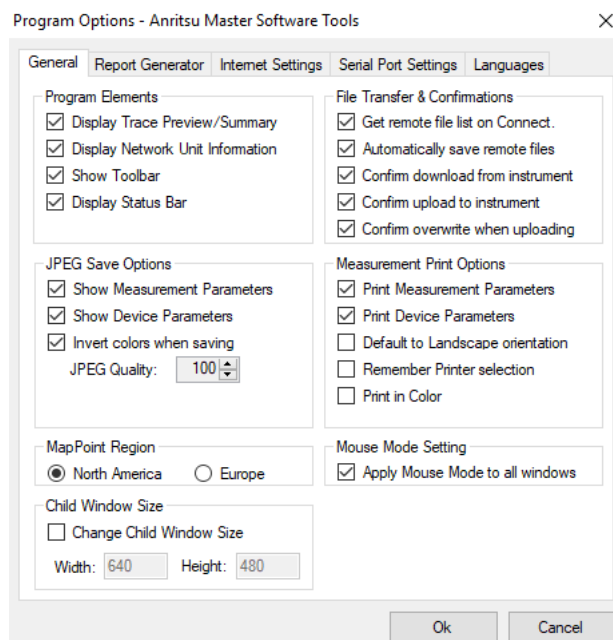


Figure 3-94. Program Options Window Showing General Tab

- Program Elements
 - Display Trace Preview/Summary – This window, on the bottom-left of the screen, can be toggled between showing the selected measurement and showing information about the file, such as File type, last saved, size, modified, and location on the network or hard drive.
 - Display Network Unit Information – When browsing units on the network, this option displays the unit information in the File Summary window under the browser.
 - Show Toolbar – This option allows displaying the toolbar in the top part of the display.
 - Display Status Bar – This option allows displaying the status bar located at the very bottom of the MST window.
- JPEG Save Options
 - Show Measurement Parameters – This option displays the following information as part of the JPG file: Trace mode, reference level offset, input attenuation, resolution bandwidth (RBW), video bandwidth (VBW), type of detection, start frequency, center frequency, stop frequency, frequency span, reference level, and scale.
 - Show Device Parameters – This option displays information on the device that collected the data, including the serial number, base version, software version, when the data was taken, and the device name, if applicable.
 - Invert Colors When Saving – This option inverts all of the colors, so black becomes white or yellow becomes blue, for better visibility and more economical printing.
 - JPEG Quality – This option allows the user to select the quality level of JPEG images when stored.
- File Transfers & Confirmations
 - Get Remote File List On Connect – When selected, MST automatically retrieves the file list when an instrument is selected. Some test instruments may have hundreds (or thousands) of stored traces, so selecting this option can slow access time when connecting and retrieving the device file list. If not selected, MST does not automatically retrieve information about the files on the test instrument.

- **Automatically Save Remote Files** – If this option is checked, files that are downloaded from the test instrument are automatically saved to the local hard drive and placed in the currently selected local directory.
- **Confirm Download From the instrument** – This option displays a message when the download has been completed.
- **Confirm Upload From the instrument** – This option displays a message when the upload has been completed.
- **Confirm overwrite when uploading** – This option displays a message when files that are uploaded to the test instrument are being overwritten.
- **Measurement Print Options**
 - **Print Measurement Parameters** – When a measurement is displayed, relevant measurement parameters are shown in the File Summary box at the lower left-hand side of the application window. When this option is selected, this same measurement summary information is included in a table below the printed measurement.
 - **Print Device Parameters** – When selected, this option includes the following information on the print-out: test instrument serial number, base firmware version, applications firmware version, date and time that the measurement was saved, and the user-defined test instrument name.
 - **Default to Landscape Orientation** – Printed measurements default to Landscape Orientation when this option is selected. This option must be changed in the Print Properties dialog box each time that a measurement is printed. This selection affects only the default setting in this dialog box.
 - **Remember Printer Selection** – This option enables MST to remember previous printer selections. Otherwise, the system default printer is automatically selected. If a preferred printer is desired for MST (other than the system default printer) this option allows that printer to be the default for this application only.
- **MapPoint Region**

Measurements that contain GPS location information can be displayed with Microsoft MapPoint in MST. When a map window is initially opened, any measurements that contain GPS data and are currently open are automatically placed on the map. The measurement is placed at the geographic location on the map that is indicated by the GPS data. Microsoft MapPoint must be purchased separately. Choices are: North America or Europe.
- **Mouse Mode Settings**

Apply Mouse Mode to All Windows – When selected, this option applies the current mouse mode to all open windows. When the mouse mode is changed (for instance, from position to distance) in any open measurement window, that change can be applied to any open window with this option. If this option is set to off, then each measurement window can have a different mouse mode setting.
- **Change Child Window**

Check the **Change Child Window Size** box and set **Width** and **Height** parameters to establish the default size for child windows displayed in the Measurement Window space.

Report Generator

The Report Generator facility is covered in detail in [“Reports \(.pdf and .html\)” on page 5-4.](#)

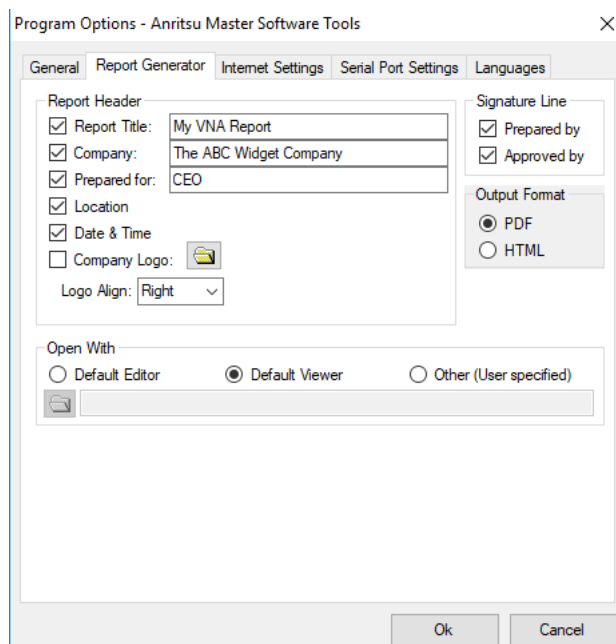


Figure 3-95. Program Options Window with the Report Generator Tab Selected

- **Report Header**
The Report Header section controls the these features on the report:
 - Report Title
 - Company
 - Prepared For
 - Location
 - Date & Time
 - Company Logo: Click the folder button to display a file browser, to locate the logo file.
 - Logo Align (left-, right-, or center- aligned)
- **Open With**
 - Default Editor (Microsoft Word, FrontPage, etc.)
 - Default Viewer (Internet Explorer, Chrome, etc.)
 - Other (User Specified) Click the folder button, which engages a file browser, to find the appropriate application, or enter the full path.
- **Signature Line**
This option appends the requested signature lines.
 - Prepared By
 - Approved By
- **Output Format**
Select the file type to be generated.
 - PDF
 - HTML

Internet Settings

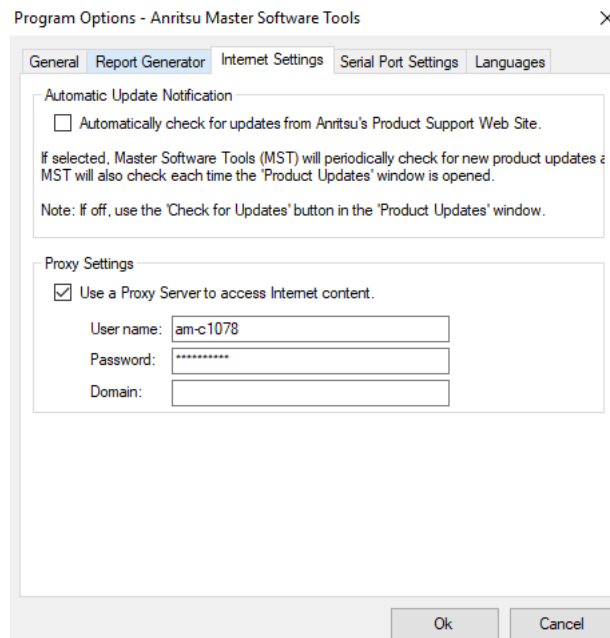


Figure 3-96. Program Options Window with the Internet Settings Tab Selected

- **Automatic Update Notification**
This option automatically checks for updates from the Anritsu Product Support Internet site.
- **Proxy Settings**
Use a Proxy Server to access Internet content. If Internet access is through a proxy server, then a user-name, password, and domain are required. This information is generally available from the system administrator.

Serial Port Settings

These settings are used for Serial-to-Serial and for USB-to-Serial connections. See [“Serial-to-Serial Connection” on page 2-22](#) and [“Serial-to-USB Connection” on page 2-22](#) for more information.

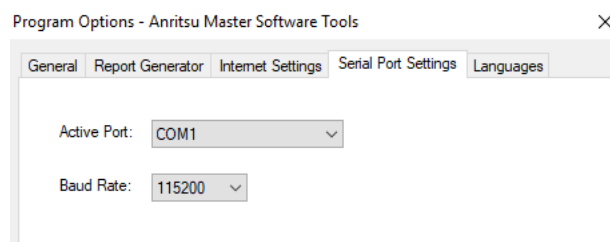


Figure 3-97. Program Options Window with the Internet Settings Tab Selected

- **Active Port**
Pull down this menu to select the COM port that you set up in the Systems of the Control Panel to communicate with the Anritsu test instrument.
- **Baud Rate**
Set the baud rate to 115200. If you have problems with communications between MST and the test instrument, then lower the baud rate to the next speed.

Languages

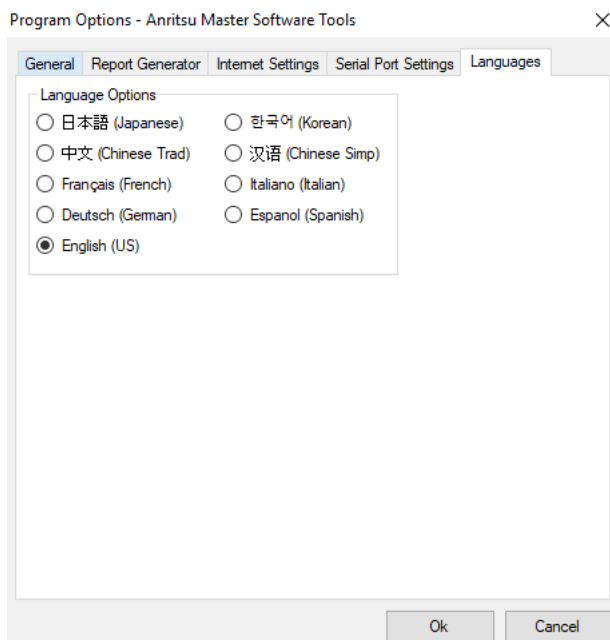


Figure 3-98. Program Options Window with the Languages Tab Selected

This window allows you to set the language font style in MST for window titles, menu titles, command lines, and options lists. The list of language fonts includes Japanese, Korean, Chinese Traditional, Chinese Simple, French, Italian, German, Spanish, and English. Usually, the default font is set to English. To change from the current language font, click the radio button of the desired language font. Fonts will change accordingly. If your computer does not support Asian language fonts, which are the top four languages fonts on the list, the text next to each radio button will display as little rectangles. To install the East Asian language fonts, refer to [“Activating a Different Language” on page B-3](#).

MST File Indexing – Trace Catalog

Use this dialog to set scheduling and other indexing parameters for selected files. See also [Figure 5-15](#) for information about the use of this dialog.

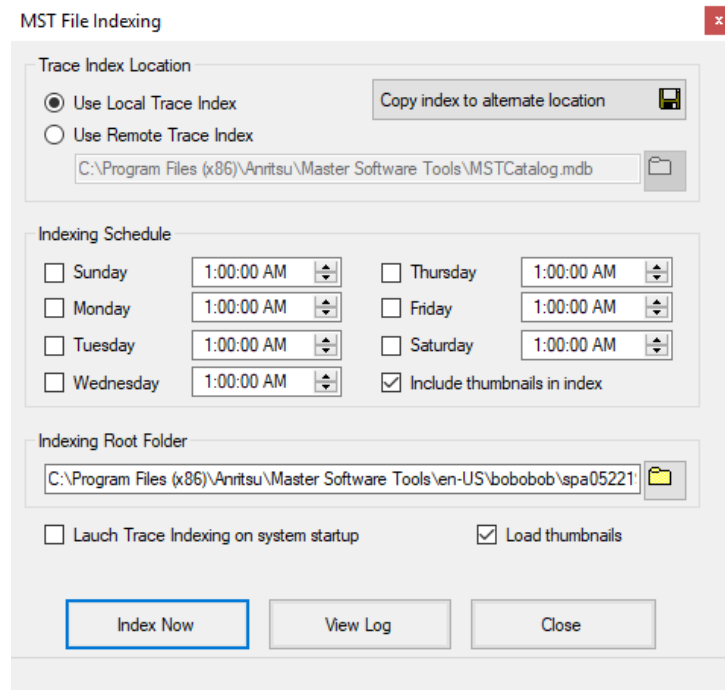


Figure 3-99. MST File Indexing Setup Window

- Trace Index Location

Select either Use Local Trace Index or Use Remote Trace Index to catalog files. Copy index to alternate location displays the Browse for Folder dialog from which you can select an existing folder or create a new one.

- Indexing Schedule

Use the options in this section to:

- select the day or days Trace Indexing should occur.
- set the time for Trace Indexing to begin.
- decide whether to include thumbnail pictures of the plot when indexing.

- Indexing Root Folder

Select the directory that contains the files of Traces to be indexed.

- Launch Trace Indexing on system startup – Runs the Trace Index program on startup and places the application icon on the Taskbar.
- Load thumbnails – Loads thumbnails when displaying the list of indexed traces.

Window Buttons

Index Now – Begin indexing immediately, rather than wait for the scheduled indexing set time.

View Log – Opens a .txt file in Notepad to view all the indexing data – start date and time, elapsed time, and file types with the number of files indexed.

Archive Options – Trace Catalog

Use this dialog to select the files to archive. See [Figure 5-16](#) for more information about the use of this dialog.

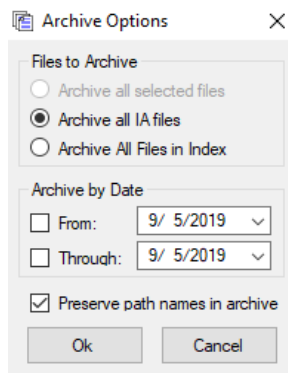


Figure 3-100. Archiving Options Setup Window

- Files to Archive

Archive all selected files: Archives all highlighted files in the Trace Catalog window.

Archive all .XXX files: Archives all files of the type selected. .XXX denotes the different file types supported by MST.

Archive All Files in Index: Indexes all files in the Indexing root folder.

- Archive by Date

From: Enter the start date for archiving.

Through: Enter the end date for archiving.

Preserve path names in archive: Runs the Trace Index program on startup and places the application icon on the MST taskbar. This option allows you to choose whether to include path names in the archive.

The Trace Indexer finds and lists all supported file types on the selected hard disk. This will give a list, for instance, of all VNA files on the disk regardless of where they are located, and allow sorting and selection based on certain defined measurement parameters. For purposes of backup, or to send a large file set to another location, the selected files can all be compressed (archived) into a ZIP file. A ZIP file can store original relative pathnames, so when it is unzipped the original folder structure is also rebuilt. Alternatively, the path names can be left out of the ZIP file so that when it is unzipped all the files end up in a single folder regardless of their original relative locations on the source disk.

Optional File Tasks

Right-click on a measurement window; then select File to access the functions in this section. Not all functions described are available to all measurement types.

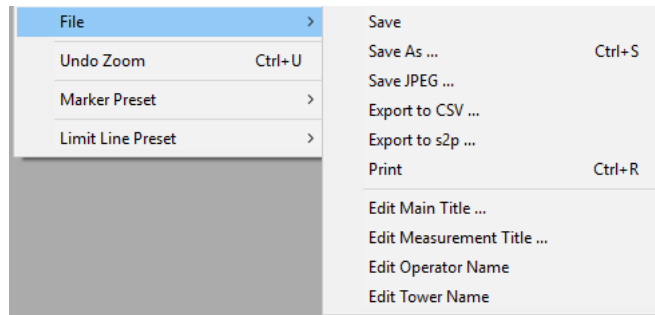


Figure 3-101. Optional Measurement File Tasks

Edit Main Title

Opens the Enter Title dialog to change the main title of the active measurement window panel. The dialog prefills the field with the title from the measurement window.

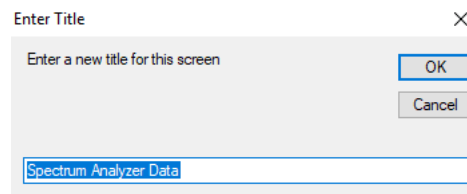


Figure 3-102. Title Entry Window

Edit Measurement Title

Opens the Enter Subtitle dialog to change the subtitle of the active measurement window panel. The dialog prefills the field with the subtitle from the measurement window.

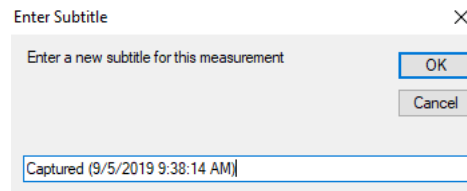


Figure 3-103. Subtitle Entry Window

Edit Operator Name

Opens the Enter Operator Name dialog to change the name of the operator.

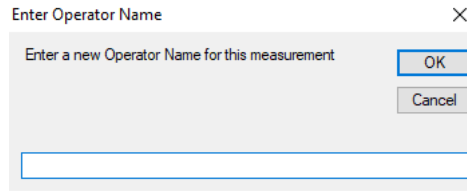


Figure 3-104. Subtitle Entry Window

Edit Tower Name

Opens the Enter Tower Name dialog window to change the name of the tower on which this file is stored.

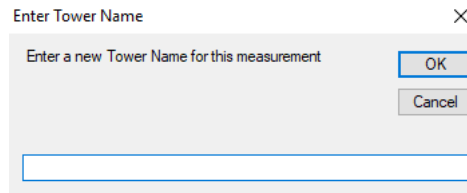


Figure 3-105. Subtitle Entry Window

Chapter 4 — Using MST

4-1 Introduction

The core function of MST is to view and edit measurement files that are collected by supported Anritsu test instruments. The first step in using MST is opening a measurement file. Measurement files may come from many sources, but usually are captured as active measurements from a connected test instrument. Other ways to obtain them are: download them as stored measurement file from a connected test instrument or as a measurement file already stored on a local hard disk (or accessible network drive). The first step is to establish a connection. See [“Connection and Configuration Using LAN” on page 2-2](#) and [“Connection and Configuration with Other Methods” on page 2-21](#).

4-2 General File Management

Downloading and Uploading Measurement Files

After connecting, the software is ready to retrieve stored measurements or to capture the current measurement on a connected test instrument. The status bar along the window's bottom edge shows the status of the connection. The Connection button of the main toolbar also shows the status of the connection: green means connected; red means disconnected.

To capture the current measurement, click Capture Current Measurement button in the main toolbar (it is the arrow pointing downward). Alternatively, click Sync>Capture Current Measurement. This retrieves the measurement from the unit and displays it. The measurement appearance is similar to the measurement as displayed on the test instrument, so that users are not required to learn two entirely different display styles. In order to upload a measurement to a connected test instrument, press the Upload active window to instrument button (the icon is the arrow pointing upward) on the main toolbar. In the Sync menu, this function is labeled Upload Active Window. This automatically determines the file type and stores it in the appropriate location on the test instrument.

The test instrument has three different memory locations where files can be stored. An instrument may potentially have stored traces on internal RAM, an inserted compact flash card, or on an inserted USB memory stick. Select the appropriate location before downloading or uploading. By default, the internal memory in the test instrument is used.

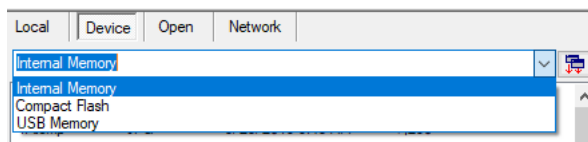


Figure 4-1. Instrument Memory Location Selection

Some instruments provide a Compact Flash slot and a USB slot to add additional memory space for storing traces. When a connection is established to an instrument with MST, it displays a list of measurement files from internal memory, a compact flash, or a USB stick. The drop-down list in MST allows selection of which memory device to view. When files are downloaded or uploaded to/from an instrument, the currently selected memory space is used.

After a connection is established, MST searches the test instrument for a file list. This file list displays along the left side of the application window under the Device tab. To open any file in this list, double-click with the mouse, or select the file and press **Enter** on the keyboard.

By default, whenever a file from the test instrument is opened, a local copy is retrieved and stored on the local hard disk. The location where this file is stored is found under the Local tab along the left side of the application window. This tab displays a folder and a file list. Browse to the desired location for file storage. Double-click a file in this Local list to open it in MST.

At the bottom, to the left of the application window, is a Measurement Preview/File Summary window. Whenever a file is selected, either in the Device or in a Local file list, a preview is generated and displayed. For most measurement modes, this is a picture indicating approximately how the file will appear when opened. For some file types, such as Antenna and Cable lists, no such graphical preview is available. In this case, the File Summary window shows an overview of the file contents. The Measurement Preview/File Summary attempts to track the program focus. When a file is selected either in the Device or in the Local file list, the preview shows that selected file. When an open measurement window is selected, the File Summary is for the measurement in the selected window.

Tabs just under the main menu bar have the following labels: Local, Device, Open, and Network. These tabs allow access to local files (on the local computer), available devices (internal memory, compact flash, or USB memory), open files (currently open measurements in the MST window), and network devices (test instruments that are connected to the available network).

The Network device list contains a list of all supported devices on the LAN. This list is not automatically generated and must be manually refreshed. Press the Query Network for Instruments button to populate or refresh this list. The Query Network for Instruments button is available only when the Network device list is open. A device that shows up in this list is not necessarily available. Each test instrument can maintain only one Ethernet connection, so if a device is busy when a connection is initiated, then MST fails to connect. Double-clicking a device in this list initiates a connection request.

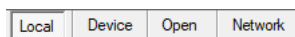


Figure 4-2. File Resource Tabs

A summary of each network device may be selected. The summary will appear in the File Summary area below the list. By default, this feature is turned OFF. Because many devices may already be in use, significant time can be consumed waiting for the Device Summary request to time-out.

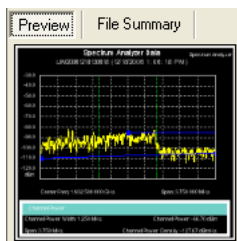


Figure 4-3. Measurement Preview

To turn on the Display Trace Preview/Summary feature, use the Program Options dialog that is found under the Tools main menu.

Standard File Commands

These standard Windows operating system commands for handling files are included in the File main menu: Open, Save, Save As (with a changed name), Print, and Close. These are standard operations and behave in a manner similar to other Windows applications.

A few file operations are specific to MST and are described in the following sections.

Export

When exporting measurement data from MST, the measurement file is saved in a standard text-based file format that can be read by other common applications. This is a CSV (Comma Separated Value) format that is supported by Microsoft Excel and by other spreadsheet and data programs.

The CSV format changes slightly in different countries, depending upon customary use of commas and decimal points when expressing numbers. The Export dialog box has a File Type drop-down list with four options. Select the option that is appropriate for the file destination.

MST CSV Format Options:

- CSV (Comma delimited: `###,###`)(* .CSV), where a period indicates the decimal, and a comma separates the numbers.
- CSV (Semi-colon delimited: `###;###`)(* .CSV), where a comma indicates the decimal, and a semicolon separates the numbers.
- Text (Tab delimited: `### [Tab]###`)(* .txt), where a period indicates the decimal, and a tab separates the numbers.
- Text (Tab delimited: `### [Tab] ,###`)(* .txt), where a comma indicates the decimal, and a tab separates the numbers.

The File Type drop-down selection defaults to the file type that is appropriate for the Regional Setting of the computer. If many files are being sent to another area, then the Regional Setting could be changed in order to take advantage of the default test instrument setting. Some measurement types, such as VNA, have a number of additional options for exporting measurement data. These options are available by clicking the Edit Graph button in the Measurement Toolbar, which opens the Plot Setup dialog box.

Exporting S2P-Formatted VNA Files

The Anritsu VNA also has a specific export function for exporting S2P-formatted data files. This option is available under the File main menu only when a VNA file is open and active. Select this function for a standard Save File dialog box. Choose a filename and a destination and then press **OK** to export the measurement in *.S2P format. The S2P format is an industry standard that is recognized by many simulation programs. S2P files are ASCII text files and can be viewed or edited by any standard text editor. The data in the files is not case sensitive.

Creating Measurement Reports

MST can create standard reports from any open measurement file in PDF or HTML format. Reports are also available for non-measurement files, such as antenna lists, cable lists, language tables, and so forth. Reports are formatted in PDF format (and viewed with the Acrobat Reader) HTML files that are intended to be viewed in an Internet browser. Several options determine what is included in a report, such as company name, company logo, and a signature line. These options are selected from the Program Options dialog box, which is available under the Tools main menu. Refer to [Section 5-9 “Reports \(.pdf and .html\)” on page 5-4](#) for complete information on reports.

Saving JPEG Images from Open Measurements

A picture of a measurement can be captured as a JPEG image. This function is available under the File menu, but it is available only if the active window supports this function. Options are available for the saving of JPEG images, such as image quality and compression level, and whether or not to invert the colors in order to save on printer ink and toner. These options are available from the Program Options dialog box in the Tools main menu. A menu option is also available to create JPEG images from all measurements that are in a specified folder. This is an automatic process. When this option is selected, the test instrument prompts for a folder pathway for the folder that contains the measurement files to be processed. Then, using the JPEG settings that are found under Program Options, MST opens each file in the selected folder and creates a JPEG image. The output images are stored in an Image sub-folder under the specified source folder.

Saving Folder as DAT

For HHST users migrating to MST, this command is used to convert the MST measurement file back to a DAT file. Former users of HHST, importing files from their instruments into MST, will have their measurement files automatically converted to the MST format. To export those same files back into the instruments use the DAT File Conversion Tool.

Printing All Open Measurements

Select the **Print All** option under the File menu to print all of the open measurements. A dialog box opens to allow specification of the layout and the number of measurements per page. The number of measurements to be printed on each page is not limited by the software, but needs to be set to an appropriate number for resolution and readability. Unless directed otherwise, MST automatically sets the size and format of each measurement for optimal printing. If many measurements are desired on a page, space can be conserved by turning off marker tables.

4-3 Editing Measurements

Each measurement type has a specific set of parameters that can be edited. Many of these parameters are common across most measurement types, and they are described briefly in the following section. Functions and Edits that are specific to each measurement type are described in later sections for those modes.

The Measurement toolbar, across the top of the Display Window, contains common functions available to most (but not all) measurement types. When a function is not applicable for the active window, the associated toolbar button is disabled.

4-4 Overlays

Clicking this button toggles any overlaid traces ON or OFF. If no traces have been overlaid, then no action occurs. Overlay files must be of the same file type and should have the same frequency range. The base measurement is used to determine the automatic frequency range. If a measurement that does not overlap in frequency is overlaid, then the overlapping measurement does not show in the plot without manually adjusting the plot range in the Plot Setup dialog box. Overlays may be added to a measurement in several ways.

- Drag from Local File List

Click and drag a similar measurement file from the Local File list onto the measurement window where the overlay is desired. The mouse does not need to be in Drag Overlay mode for this operation.

- Drag from Windows Explorer

Click and drag a similar measurement file from Windows Explorer or from the Windows Desktop onto the desired measurement window. MST does not distinguish the file source, but responds as long as the file is a compatible (same measurement type) file.

- Drag a Similar Measurement

To drag an open measurement, the mouse must be in Drag Overlay mode. Otherwise, the mouse function will be to show plot coordinates, distance scale, or zooming. With the mouse in Drag Overlay mode, click anywhere on the source measurement and drag it over the target measurement. If MST determines that the files are not compatible, then no change occurs.

- Edit Graph (The Plot Setup Dialog Box) Using Master Software Tools

Browse for overlay measurement files in the Plot Setup dialog box. Overlay files may also be selected by using the file browser in the Plot Setup dialog box. To access this screen, click the **Edit Graph** button in the Measurement Toolbar and select the **Trace Math & Overlays** tab page. From this tab, up to 6 files may be selected for overlay.

Individual overlay files are listed in the Overlay Traces section of the dialog box and may be turned on and off without disassociating the files. Clicking the **Overlays** button on the Measurement Toolbar toggles all of the check boxes in this window on and off.

Overlay Issues

Measurement overlays require that specific conditions be met, either to allow the overlay to occur or to allow the overlaid measurement to be displayed.

Dragging from the Device File List

In MST, when an overlay is added to a measurement, the overlay filename is stored in the original measurement file. Files with an overlay association can be saved and reloaded while maintaining the file overlay associations. If the files are moved together, then the overlays are still associated and are shown when the base file is reloaded. In other words, a file cannot be overlaid directly from the device: it must be copied to the local computer disk space first so that a local filename exists to be associated with the base file.

Dragging Open Measurement Files

Establishing an overlay association among files sometimes cannot be achieved by dragging open measurement files inside the Display Window. Depending upon the options that have been selected, opening a device file may or may not automatically save the file in the local disk space. (By default, all files that are opened from a connected test instrument are saved locally.) If this option is turned off, then a remote file can be opened directly without creating a local copy of the measurement file. In this situation, this measurement cannot be overlaid onto another measurement because no local filename is associated with the measurement.

Frequency Range of Base Measurement File

MST uses the base measurement file to set the frequency (x-axis) range when displaying data. If, after an overlay request, the frequency range of the overlaid measurement does not overlap the frequency range of the base measurement, then the overlaid measurement does not show on the plot screen. The x-axis range can be reset in the Plot Setup dialog box.

Overlay File Name

When a measurement is overlaid, its filename appears across the top-left corner of the graph in the measurement window. If no filename appears, then the file did not overlay correctly, either because the file does not exist in the local disk space, or because it is an incompatible file type.

4-5 Edit Graph (Plot Setup Dialog Box)

This Measurement Toolbar button opens a Plot Setup dialog box. This dialog box is different for different measurement types, offering more choices for some than for others. Each Measurement window also has a context menu (mouse menu) that is accessible by right-clicking the graph. Many of the settings on the context menu are duplicated in the Plot Setup dialog box. If a single option is being changed, then the context menu is convenient to use. When changing more options or changing advanced options that are not available on the context menu, the Plot Setup dialog box is more efficient.

Note A measurement must be saved locally before it can be overlaid.
--

4-6 Common Options

These options are common to almost all supported measurement types and are described here in general terms. For specific options not included here, refer to the section of this User Guide specific to the measurement type of interest.

Autoscale

Autoscale expands the vertical scale to spread the measurement over 70% to 80% of the measurement window. When this is done, the number of horizontal graticule lines is reduced by an amount that depends upon the vertical spread of the measurement that is being auto-scaled.

Undo Zoom

Regardless of how many times the user has zoomed in on a measurement, clicking the Undo Zoom button sets the active measurement window to display the entire sweep. Zoom steps are not undone one at a time, but all at once.

Marker Table

Many measurement types support data markers. When monitoring a supported measurement type, the visibility of the marker table can be toggled on and off. The marker table must be visible in order to turn specific markers on and off, but the position of markers can be adjusted without using the marker table.

Marker Shape

Marker shape can be either a line or an inverted triangle. This sets the shape of the data markers that are displayed on the graph.

Plot Range

For measurements that consist of x/y data sets, the x-axis and y-axis ranges can be set in the Plot Setup dialog box. Some measurements have fixed ranges. Generally, if the range can be changed on the test instrument, then the range can also be changed in MST. If the range is fixed in the test instrument, then it is fixed in MST.

For measurement types with variable plot limits, the display can also be varied using the mouse in Zoom mode. The plot limits that are set in the Plot Setup dialog box are not the visible zoom limits, but are the limits to which a plot is reset when using the undo zoom function (via the Undo Zoom button in the tool bar).

When a measurement is saved in MST, the zoom range is not saved. Any changes made to the plot limits in the Plot Setup dialog box are saved and become the default limits if the measurement is recalled, either in MST or on a test instrument.

Plot Mode

In several cases, a data set that is stored on a test instrument may contain valid data for more than one view mode. For example, GSM measurements are taken in one of four modes, and the saved measurement file contains valid data for all four views. In this example, the Plot Setup dialog box allows the selection of alternate views from the data. In other cases, data can be translated into alternate views. VNA data sets that are stored as x/y data can be translated into Smith chart data. Similarly, some VNA measurements can be converted to Group Delay measurements even though this is not the view that was originally saved. These alternate views are accessed through the Plot Setup dialog box.

Measurement Overlays

Measurement types that support overlays have a tab in the Plot Setup dialog box for choosing overlay files and for turning on and off specific overlay associations. To add an overlay, click the Add button and browse to the desired file. To remove an overlay, select it in the list and press the Remove button. An overlay can be temporarily hidden by unchecking it in the list.

Overlay files can also be moved up and down in the overlay list. This is useful for measurement types (SPA and VNA) that allow trace math because the trace math typically is performed between the base trace and the first overlay.

Trace Math

This option is currently available only for SPA and VNA traces. When Trace Math is active, the base trace is added to the first overlay, the base trace is subtracted from the first overlay, or the first overlay is subtracted from the base trace.

Trace Smoothing

This option is available only for SPA and VNA traces, and is normally useful only with VNA data. This option allows for the trace to be smoothed by a simple moving average. The smoothing shape is either rectangular or weighted. A weighted smoothing gives more weight in the averaging of points that are closer (along the x-axis) to the original point.

The smoothing window is set with a percent value. When set to 2% for example, the smoothing window is 2% of the total trace width. If the trace would have 500 points (in this example), then the smoothing window would have 10 points (2% of 500), which means that each point would be averaged with 5 points on each side of it.

The original trace and the smoothed trace can be on screen together, which gives a clear overview of the effect of the smoothing. Smoothing affects trace math. Both can be on simultaneously, and the trace that is a result of the trace math is smoothed.

Note

Saving a file in MST does not save every change made to a measurement. Typically, these files exist as an image of a stored measurement on a test instrument. Only parameter changes that could have been changed on the test instrument are saved in the measurement file. For example, a change of text size is not saved in the measurement file, but edits to limit lines are saved.

4-7 Working with Limit Lines and Markers

Working with Limit Lines in the Active Measurement Window

Limit lines are defined by a series of nodes. All limit lines must have at least two nodes, a beginning node and an ending node. Segmented limit lines have more than two nodes and can take on more complex shapes. To edit a limit line, select a node and right-click for the Node context menu. This provides a number of options to quickly set or reset limit lines, and to add, move, and remove nodes. Nodes are sometimes difficult to select. When the mouse pointer is directly over a limit line node, the node changes shape.

Many measurement types support limit lines. To turn on limit lines, use the Plot Setup dialog box (Edit Graph button on the measurement toolbar) or use the Limit Line menu options on the measurement context menu.

Limit lines can be edited in several ways.

Method 1 (Enter the Value of the Limit Line)

1. Turn on the limit line.
2. Right-click the Display Window.
3. Highlight Data Display Mode... or Data Display Options... and click.
4. Enter the value of the upper limit line, lower limit line, or both. This deletes all but the beginning and ending nodes.
5. Click OK when done.

Method 2 (Enter the Value of the Nodes)

1. Turn on the limit line.
2. Place the mouse cursor on the start node or end node and click once on the node.
3. Right-click and select Edit Node.
4. Enter the frequency and the amplitude of the start node.
5. Click OK.
6. Move the cursor to the end node.
7. Right-click and select Edit Node.
8. Enter the frequency and the amplitude of the end node.
9. Click OK.

Method 3 (Drag the Start and End Points)

1. Turn on the limit line.
2. Place the cursor on the start node and drag it to the desired position.
3. Place the cursor on the end node and drag it to the desired position.

Method 4 (Editing Segmented Limit Lines)

Segmented limit lines can be created in MST.

1. Right-click the Display Window and select View Limit Lines.
2. Right-click the start and select Add Node in order to add a node or select Delete Node in order to delete a node. Deleting the end node deletes the limit line.
3. Use the left mouse button and drag the new node to its new location, or right-click and select Edit Node and enter the desired amplitude and frequency values of the node.

Working with Markers in the Active Measurement Window

Markers are supported for many graph types. If a test instrument measurement mode supports markers, then MST also supports markers for those measurements. A marker table can be turned on at the bottom of the measurement window through the measurement context menu or by using the Plot Setup dialog box.

1. Display the Marker Table.

- Using the Toolbar Icon:

Click the **Markers** icon on the Graph Edit Toolbar.

- Using the Context Menu:

- a. Place the mouse cursor over the active measurement display.

- b. Press the right mouse button. Scroll down to **Data Markers** to open the sub-menu for enabling and setting up the markers.

- c. Click **Display Marker Table**.

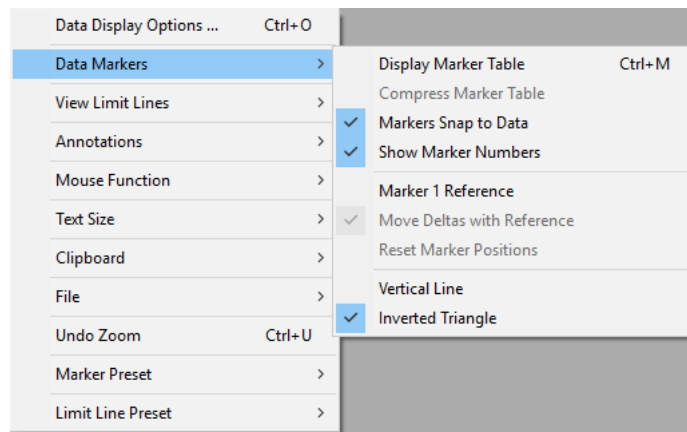


Figure 4-4. Context Menu: Display Data Marker Table

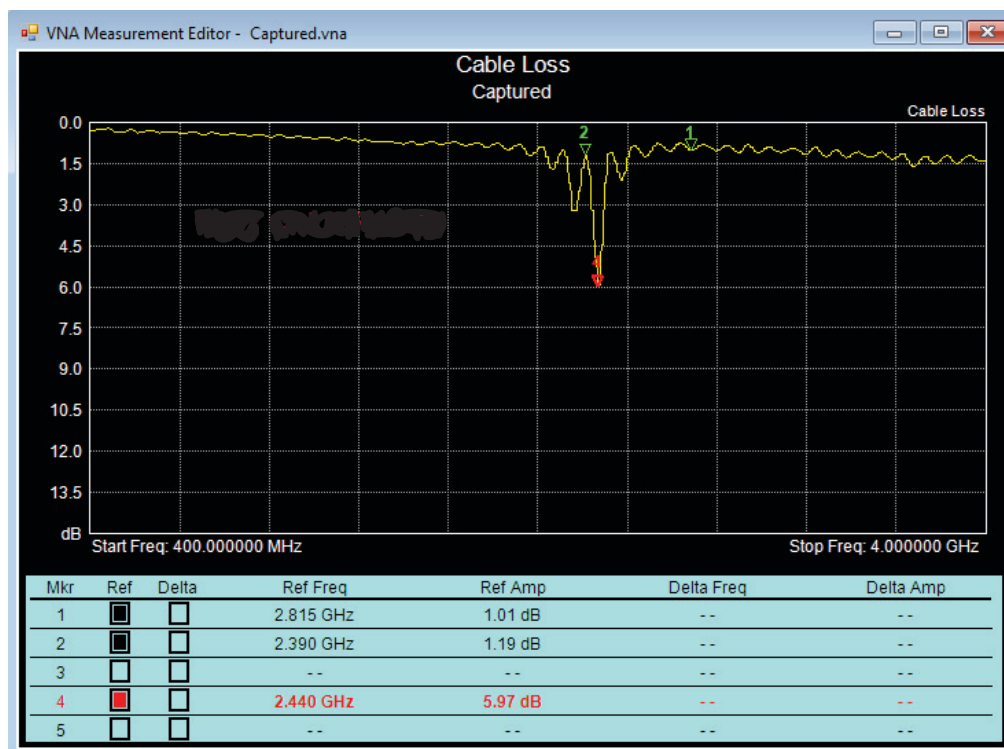


Figure 4-5. Trace Display with Data Marker Table Below

2. Click the box in the **Ref** column of the marker table to place markers on the measurement window. A red marker and red box denotes the active the marker, which can be moved or set to another position of the trace or between multiple traces.
3. There are multiple ways of moving and setting markers. Use the following procedures to:
 - Move a Marker
 - a. To easily grab the marker, place the cursor on the marker label and hold down the left mouse button.
 - b. Drag the marker to the new position. Release the mouse button.
 - Move a Marker to Peak
 - a. Press the **Markers** pull-down arrow button.
 - b. Highlight **Marker to Peak** and click the desired marker.
 - Move a Marker to Valley
 - a. Press the **Markers** pull-down arrow button.
 - b. Highlight **Marker To Valleys** and click the desired marker.
 - Activate/Deactivate a Delta Marker
 - a. Click the **Markers** tab to display **Markers** table below trace.
 - b. Check the desired **Delta** marker of the corresponding active marker.
 - c. Move the delta marker by placing the cursor on the delta marker label and holding down the left mouse button.
 - d. Drag the delta marker to the new position. Release the mouse button.

- Place a Marker on a Peak between Selected Markers
 - a. Press the Markers pull-down arrow button.
 - b. Highlight Peak Between Marker.
 - c. Select a marker, M1-M6.
 - d. Click the desired marker pair where the peak is to be found.
- Place Marker in a Valley between Selected Markers
 - a. Press the Markers pull-down arrow button.
 - b. Highlight Valley Between Markers.
 - c. Select a marker, M1-M6.
 - d. Click the desired marker pair where the valley is to be found.

4-8 Annotating Graphs

SPA (Spectrum Analyzer) and IA (Interference Analyzer) measurements support Graph annotations. A graph annotation is a note that is added to a graph in a rectangular area, which is connected to a specific point on the measurement curve by a vertical line. Text is added to an annotation by double-clicking the annotation box with the mouse. The annotation can automatically include the frequency and power level at the referenced location. Notes can be edited, hidden and deleted. All hidden notes can be displayed by clicking the Show All Notes command line.

To add an annotation:

1. Select Annotations on the measurement context menu (the mouse menu).

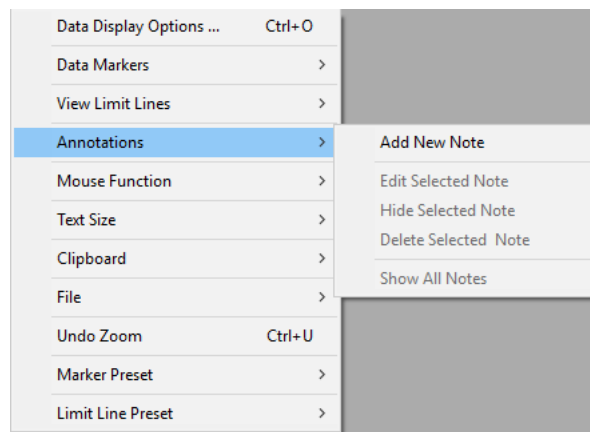


Figure 4-6. Annotation Controls Menu

2. Select Add New Note from the Annotations sub-menu. A yellow Note is placed in the top left corner of the graph.

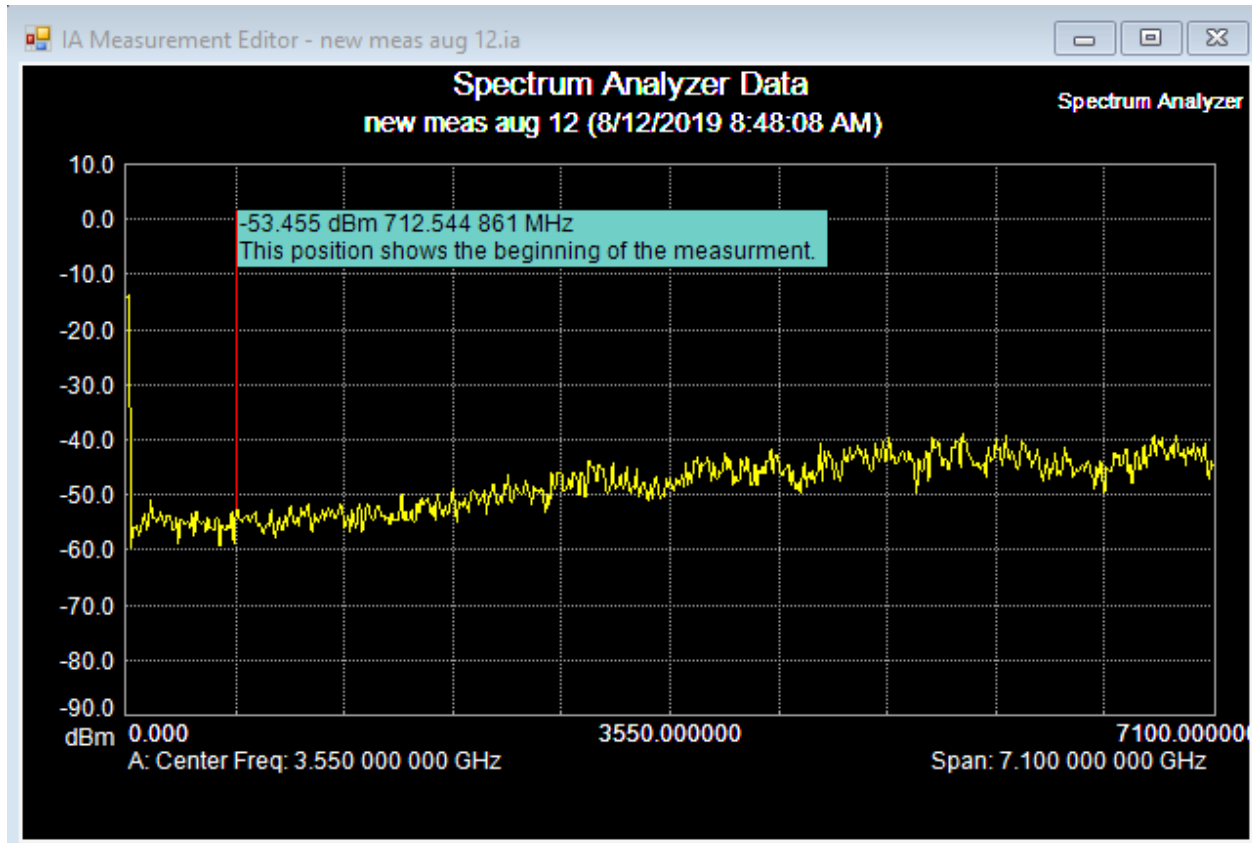


Figure 4-7. Active Measurement Window Panel with Annotations

3. Annotations can be added, removed, and hidden. Hidden annotations do not show on the display, but they do not lose their place or their text. To position an annotation box, click and hold with the left mouse button while dragging it to the desired location.

To edit an annotation:

1. Place the cursor over the Note to be edited. Click the right mouse button.
2. Pull down the Annotations menu.
3. Select Edit Selected Note on the context menu (the mouse menu). The Note Entry window pops up.

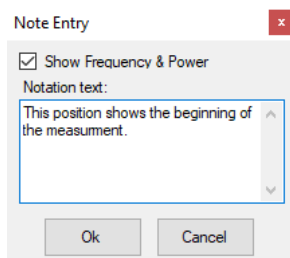


Figure 4-8. Annotation Entry Window

4. Enter new text in the dialog box.

5. To remove the frequency and power values from the Note, uncheck the Show Frequency & Power check box.
6. Click OK. The measurement window displays the new text.

To delete an annotation:

1. Place the cursor over the Note to be deleted and click the right mouse button.
2. Pull down the Annotations menu.
3. Select Delete Selected Note on the context menu (the mouse menu).
4. The Note is deleted from window. Deleted Notes cannot be recovered.

4-9 Remote Access Tool

Remote Access Tool is a fully functional software emulator that remotely controls the test instrument connected to the computer. All supported instruments are displayed with their specific front panel. Hard buttons, soft buttons and graphic display emulate the test instrument.

Note Anritsu recommends using the most recent remote access software Wireless Remote Access Tool. Go to the Anritsu Website to download this software:
<https://www.anritsu.com/en-us/test-measurement/products/wrt>

Remote Access Tool only works with a LAN or direct Ethernet connection.

1. Open the Tools menu, and click the Remote Access Tool command line. A generic test instrument front panel displays in the Active Measurement Window.

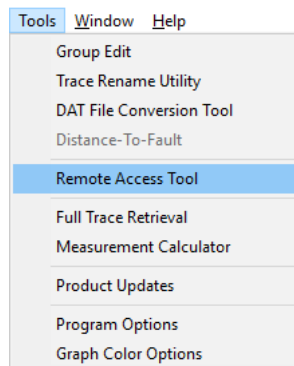


Figure 4-9. Tools Menu

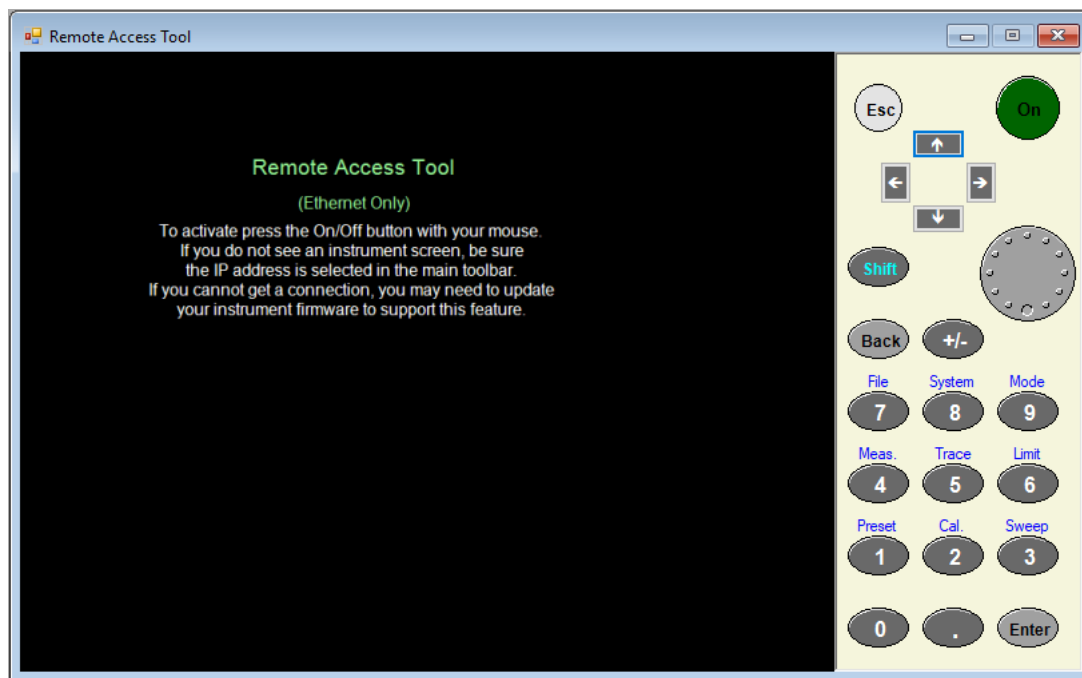


Figure 4-10. Initial Generic Test Instrument Panel

2. Click the dark green ON button in the top right corner. The first sentence in the test instrument screen changes to “The instrument screen should display in a moment” indicating the software emulator is being loaded.

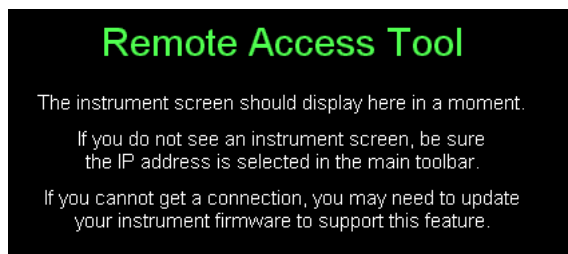


Figure 4-11. Text Close Up

3. The test instrument front panel for the test instrument connected to the computer displays. If the test instrument front panel display does not appear, verify that the IP address is selected in the main

toolbar. If the connection cannot be established, verify that the test instrument firmware has been updated to support the Remote Access Tool.

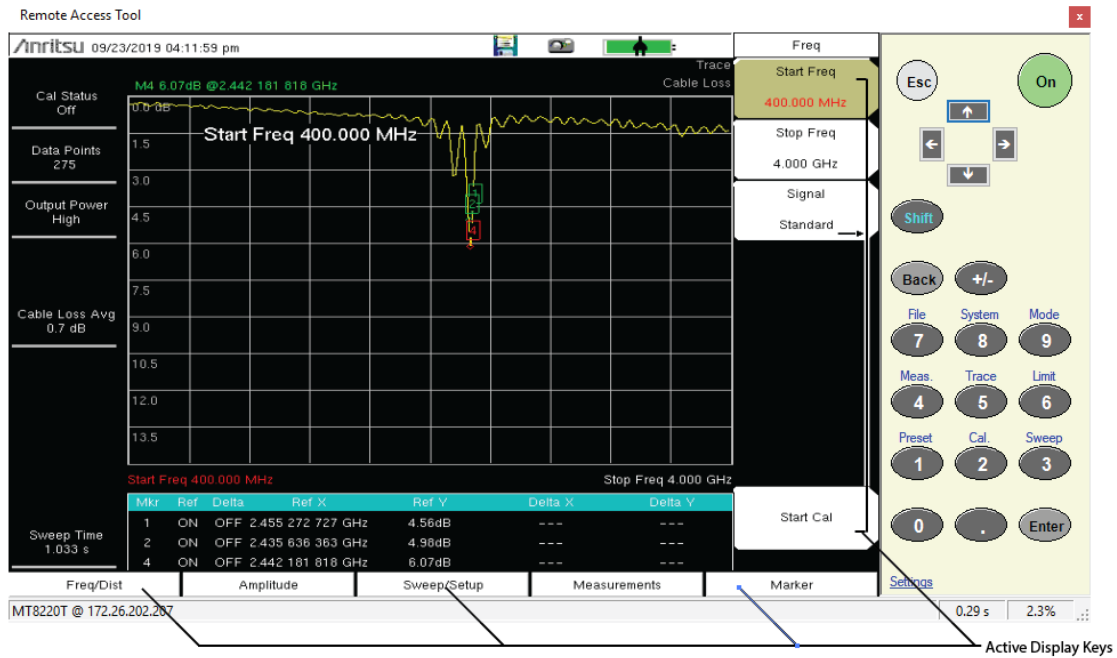


Figure 4-12. BTS Master MT8222A Emulator Example

4. Refer to the specific User Guide for the test instrument for more information on setting up and taking measurements.

If the computer mouse has a scroll wheel, place the cursor over the rotary knob and use the scroll wheel to rotate the knob. This feature is useful in changing the graph scale or scrolling through a menu. Clicking the left mouse button on the rotary knob acts as an Enter button.

All hard keys on the test instrument emulator operate like the hard keys on the test instrument. In the case of the soft keys, use the mouse to push the soft-key labels and function hard keys directly. The cursor will change from cross-hairs to a pointer when active.

Remote Access Tools provides the ability to use the test instrument emulator with MST in the connected or disconnected mode. See Fig. 4-10.

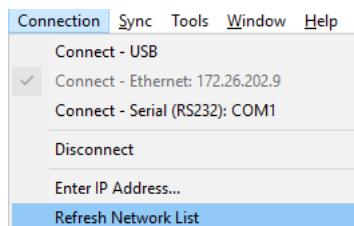


Figure 4-13. Ethernet Currently Software Connected

The Ethernet cable is connected in either mode. With MST connected to the test instrument, that single user is able to manipulate that test instrument via Remote Access Tools. Disconnect the software by clicking Connection>Disconnect command line in the menu. All of the emulator test instrument's buttons are disabled.

Multiple users are able to monitor the testing done and the measurements taken by the test instrument. When multiple users are monitoring the test instrument, consider lengthening the refresh rate for updating information from the test instrument. If too many users are monitoring the test instrument with a short refresh rate, the test instrument's main function will be updating the users rather than taking measurements. Select a longer rate that would accommodate the multiple users monitoring the test instrument.

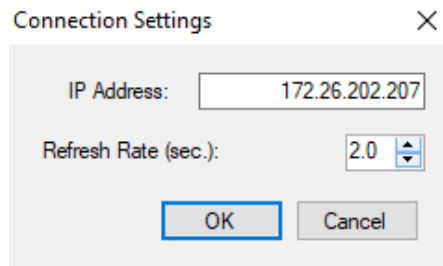


Figure 4-14. Refresh Rate Default Set to 2 Seconds

Also, the more users monitoring the test instrument the more slowly the data processing takes place. Multiple users consume the test instrument's resources thereby slowing down the test and measurement processes.

4-10 3D Spectrogram

The 3D Spectrogram function allows you to view a folder of measurement traces in true 3 dimensions – frequency, time, and amplitude. Use markers to select or point out specific frequencies and amplitudes. With Signal ID, you can view specific types of signals and their SNR. To access 3D Spectrogram first open a Folder Spectrogram window.

To open the Folder Spectrogram window:

1. Click File>New>Folder Spectrogram.
2. The Browse for Folder dialog displays. Navigate to the folder containing the files that you want MST to display a spectrogram. These files may be copied from any source, including an Anritsu instrument.

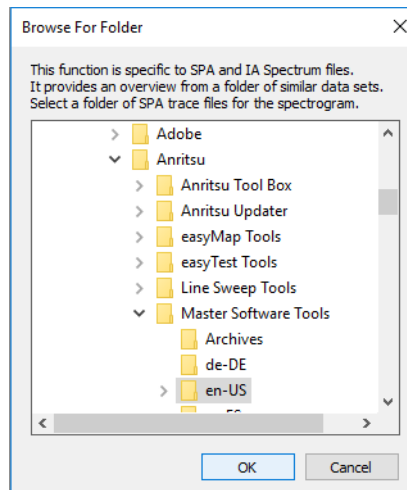


Figure 4-15. Browse for Files for New Spectrogram

3. Click OK. The SPA or IA files dialog displays. Select the button appropriate to the files you want to see.

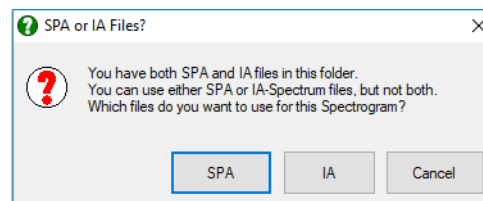


Figure 4-16. SPA or IA Dialog

4. The Folder Spectrogram measurement window displays.

If there are unknown or extraneous files in the directory, you might see this message:

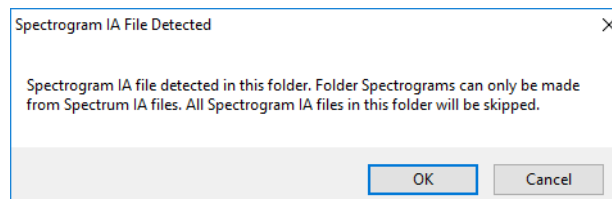


Figure 4-17. Message warning of extraneous files present in selected folder

Follow the next procedure to generate a full spectrogram.

To access 3D Spectrogram with a Folder Spectrogram window open:

1. Right-click the Folder Spectrogram window to list the context menu.

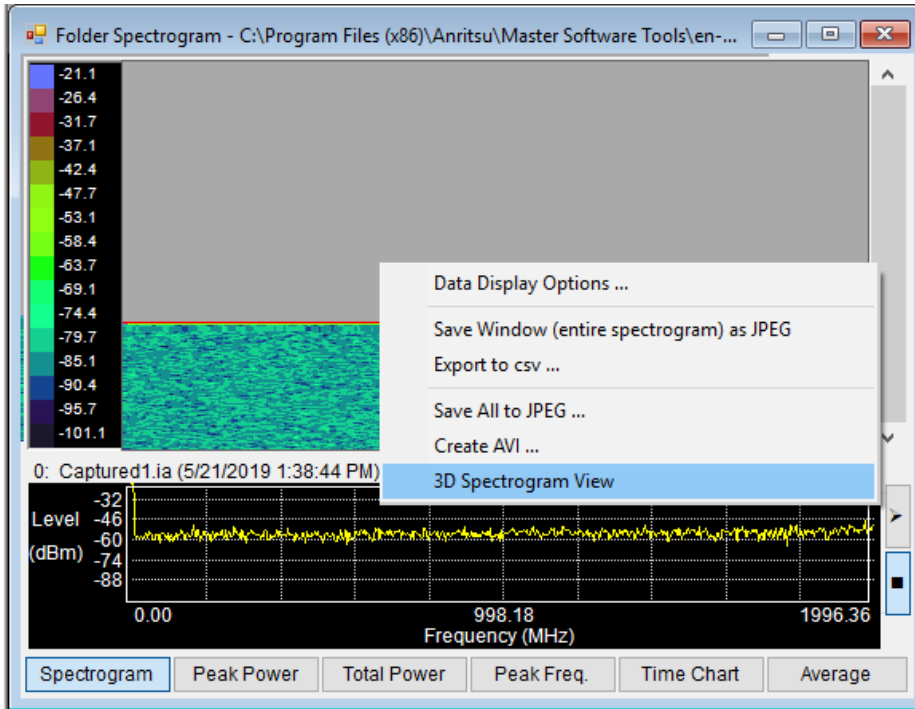


Figure 4-18. Folder Spectrogram Window with the Context Menu Listed

2. Click the command line 3D Spectrogram View. The 3D Spectrogram window opens.

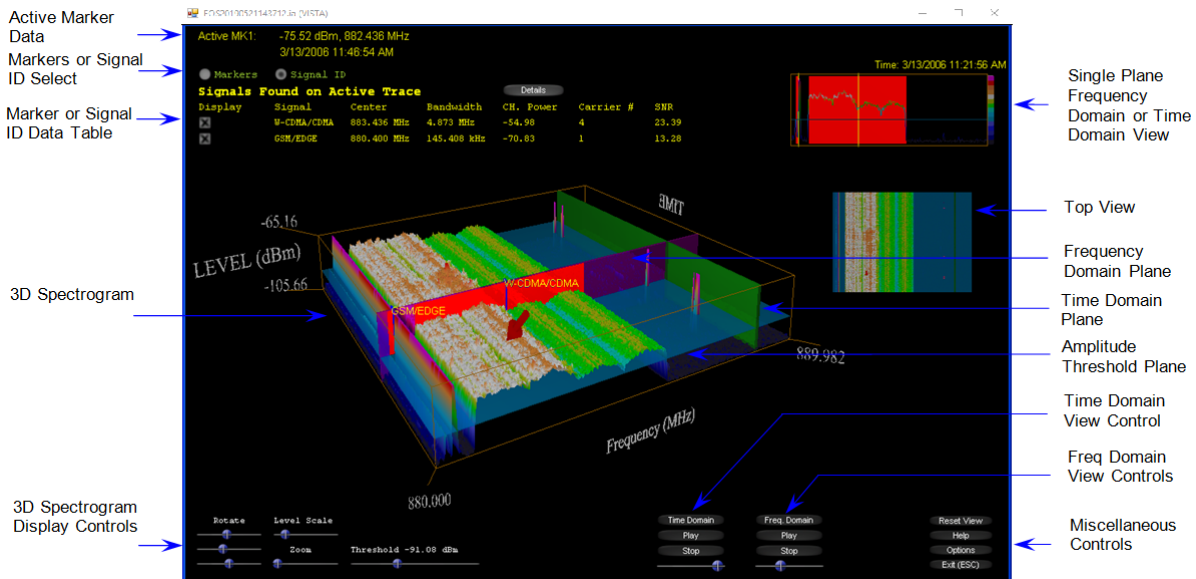


Figure 4-19. 3D Spectrogram Window: Signal ID view

Active Marker Data: Displays the data for the marker selected in the Active column of the Marker table. Data includes frequency, amplitude, date, time, and, if applicable, the GPS stamp. Right-click on this view to cycle through the three view: spectrogram, single plane, and top view.

Marker Table

Click the Markers radio button to show the marker table of the 3D spectrogram view.

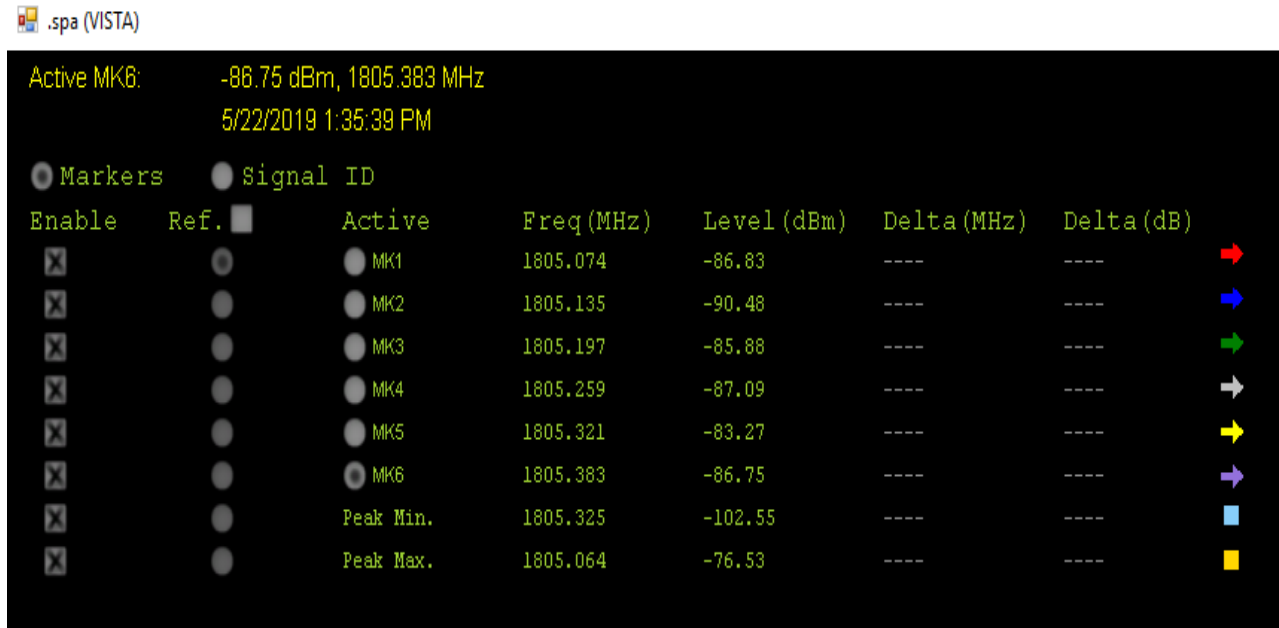


Figure 4-20. 3D Spectrogram Window: Marker Table view

The columns are:

Enable: Click to place an X in the box to make a marker available for use. The marker will appear in the field of the spectrogram, and may be manipulated by dragging around the graph. Click on the X to turn off the marker.

Ref: Use this function to choose a marker as the reference value against which the deltas are calculated. Click the box to the right of Ref. to enable the reference function. Click the Ref. radio button for the enabled marker you want to use as the reference. All delta information is in relation to the selected reference marker, Peak Min, or Peak Max value.

Active: Selects a marker to work with. Information for that marker is highlighted in yellow in the top left corner of the window and titled Active MKx. If the GPS function was on during the measurement, GPS data also display.

Freq (MHz): Displays the frequency of the enabled markers.

Level (dBm): Displays the power level of the enabled markers and peak level planes.

Delta (MHz): Displays the frequency difference between the frequency of the selected reference marker to the other enabled markers frequencies.

Delta (dB): Displays the difference in power between the reference marker and reference peak level to the other enabled markers and peak level reference.

Marker Color: This rightmost column displays the color-coded marker associated with each marker.

Signal ID Table

Click the Signal ID radio button to view the Signal ID table. It shows various attributes of the signals detected in the spectrogram.



Figure 4-21. Signal Table

The columns and buttons are:

Display: Click to place an X in the box to make a marker available for use.

Signal Name: Lists the identified signals found on the single measurement trace.

Center Freq: Displays the center frequency of the identified signal.

Bandwidth: Displays frequency bandwidth of the identified signal.

CH Power: Displays the channel power level of the identified signal.

Carrier #: Displays the number of carriers for the identified signal

SNR: Displays the difference in power between the reference marker or reference peak level to the other enabled markers and peak level reference.

Details Button: Opens the Signal ID Summary table.

Signal ID Summary

Click the Details button in the Signal ID table view of the spectrogram. The Signal ID Summary window allows you to sort and filter measurements in the 3D Spectrogram.

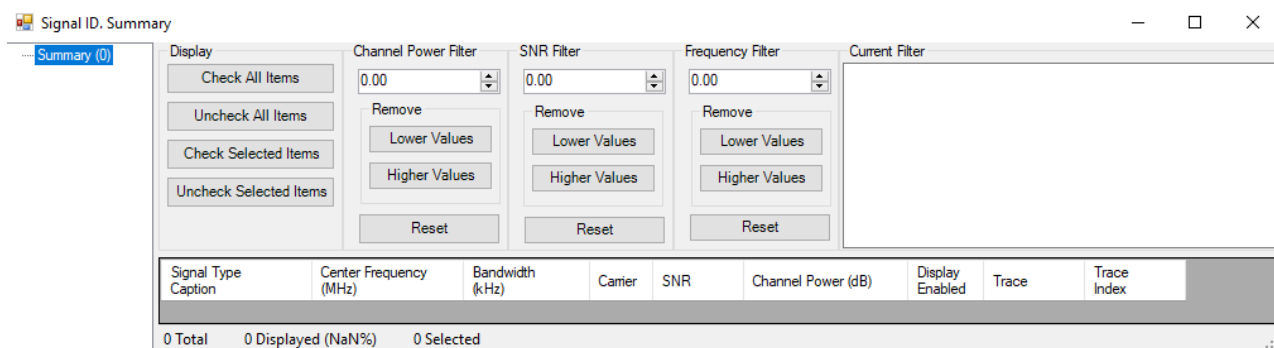


Figure 4-22. Signal ID Summary Window

The Summary tree, displays all types of Signal IDs. Figure 4-17 shows there are 464 FM signals and 39 WLAN signals in this measurement folder. You can analyze these measurements by filtering them using Channel Power Filter, SNR Filter, and Frequency Filter. You can also sort these measurements in ascending or descending order by pressing the desired column title bar, e.g. Center Frequency.

3D Spectrogram

The three-dimensional view of the list of measurement displayed in amplitude, frequency, and time.

3D Spectrogram Display Controls

Rotate: Rotate has three control bars. The top control bar rotates the 3D Spectrogram forward and back. The middle control bar rotates the 3D Spectrogram on the horizontal plane. In addition, the bottom control bar rotates the 3D Spectrogram clock-wise and counter-clock-wise.

Level Scale: Use this control bar to increase or decrease the power level magnitude scale.

Zoom: Zoom in or zoom out of the 3D view.

Threshold xx.yy dBm: Raise or lower the Amplitude Threshold Plane.

Top View

Shows the 3D Spectrogram from the top. You can see the movement of either Frequency Domain Plane or Time Domain Plane. This view also displays the markers. See [Figure 4-19, “3D Spectrogram Window: Signal ID view” on page 4-18.](#)

Single Plane Frequency Domain or Time Domain View

Displays a single measurement in Frequency Domain or Time Domain. The Frequency Domain displays the amplitude of a single frequency. In the Time Domain, the center frequency is highlighted in yellow and the bandwidth in red. See [Figure 4-19, “3D Spectrogram Window: Signal ID view” on page 4-18.](#)

Time Domain View Controls

Time Domain: Places the single plane view to Time Domain.

Play: Starts the automatic sweep of the frequencies.

Stop: Stops the automatic sweep of the Time Domain panel.

Manual Control: Use this control to manually move the Time Domain panel left to right, right to left.

Frequency Domain View Controls

Frequency Domain: Places the single plane view to Frequency Domain.

Play: Starts the automatic sweep of the signal amplitude.

Stop: Stops the automatic sweep of the Frequency Domain panel.

Manual Control: Use this control to manually move the Frequency Domain panel front to back, back to front.

Miscellaneous Controls

Reset: Resets the 3D Spectrogram to the default view.

Help: Displays the default Keyboard/Mouse controls window.

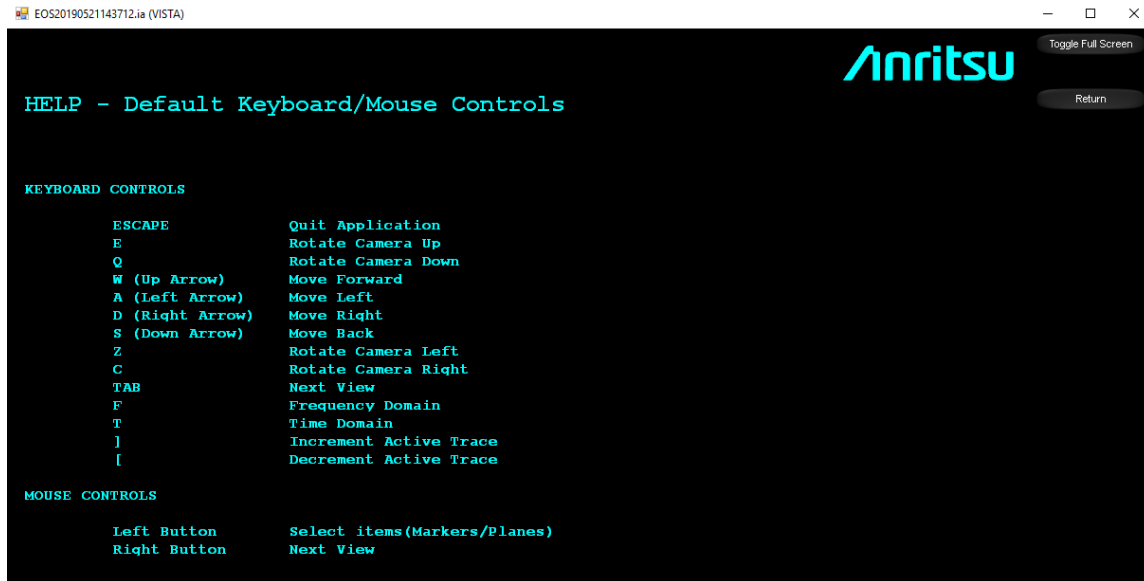


Figure 4-23. Keyboard & Mouse Default Configuration Window

Options: Displays the Control Configuration window. See [“Dialog Options” on page 4-23](#).

Exit (ESC): Exits 3D Spectrogram and returns to the Folder Spectrogram view.

Dialog Options

Select the desired portion of the 3D Spectrogram window to configure – Graph, View 1, View 2, View 3, Markers, and Signal ID. The large Middle Options Panel title and setup parameters change accordingly.

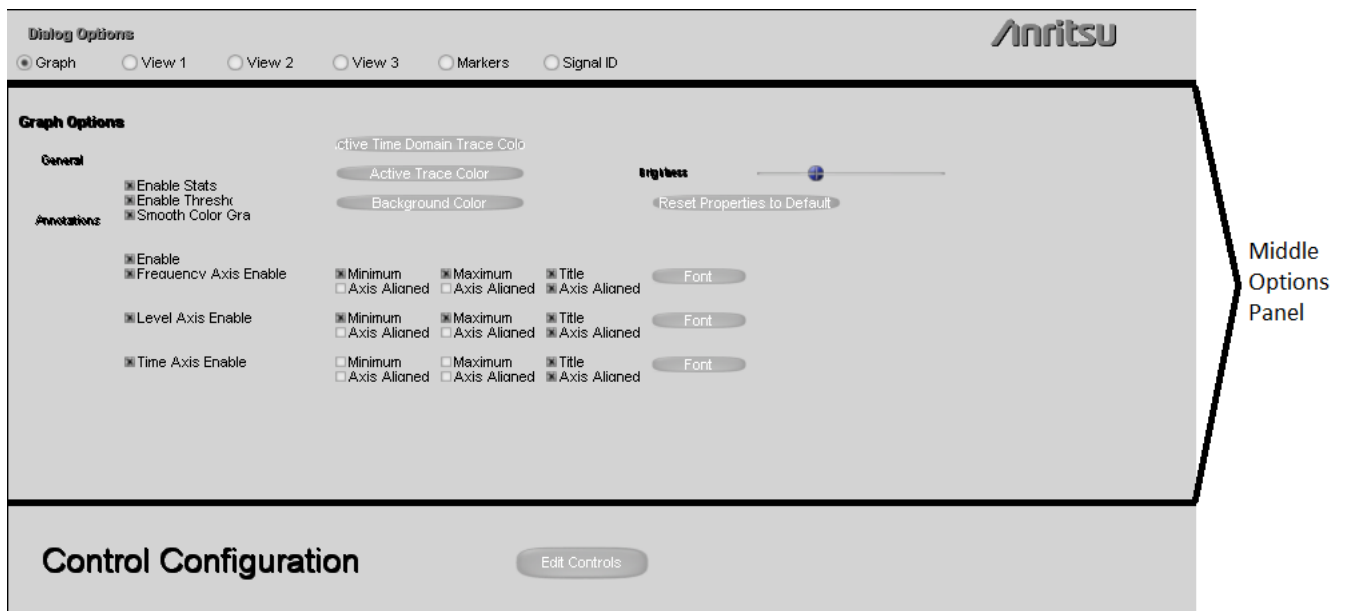


Figure 4-24. Spectrogram Setup Window

Middle Options Panel

Defines the keyboard keys for additional movement control through the 3D Spectrogram. The setup parameters deal with configuring text, background, dialog, and graph lines annotations. Set these features as desired.

Edit Controls:

Press this button to configure keyboard and mouse keys used in the 3D Spectrogram window.



Figure 4-25. Keyboard & Mouse Configuration Window

Keyboard: Defines the keyboard keys for additional movement control through the 3D Spectrogram window. To make changes in controls, follow the instructions in the Information panel. Press OK to keep changes, press Cancel to exit and discard changes.

Mouse: Defines the mouse keys for additional movement control through the 3D Spectrogram window. To make changes in controls, follow the instructions in the Information panel. Press OK to keep changes, press Cancel to exit and not make any changes.

4-11 Script Master Editor

The Script Master Editor provides a means of creating measurement setups, sequences, and processes within a Script File that can be uploaded into an instrument. These Script Files can be setup and measurement test sequence only or they can be interactive with the instrument user. An interactive Script File could prompt the user for real-time measurement parameters or for test sequence changes.

Currently, Script Master generates Script Files for the measurement mode types – GSM/GPRS/EDGE, WCDMA/HSDPA, and Channel Scanner. The Script Master function is found in the File menu.

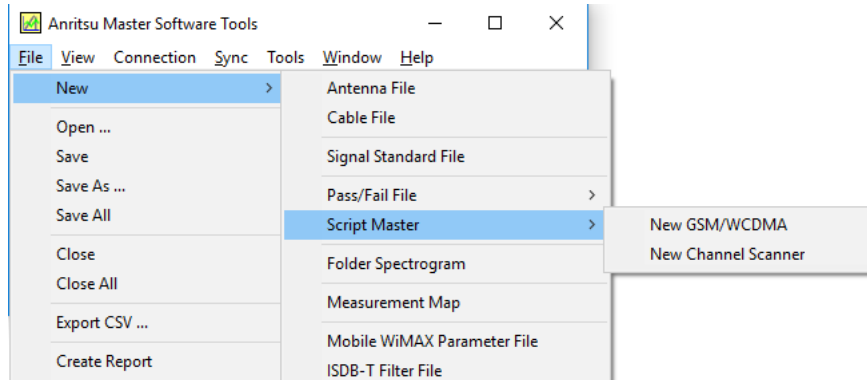


Figure 4-26. Script Master Command Line Listed Under File Menu

GSM/WCDMA Script Master

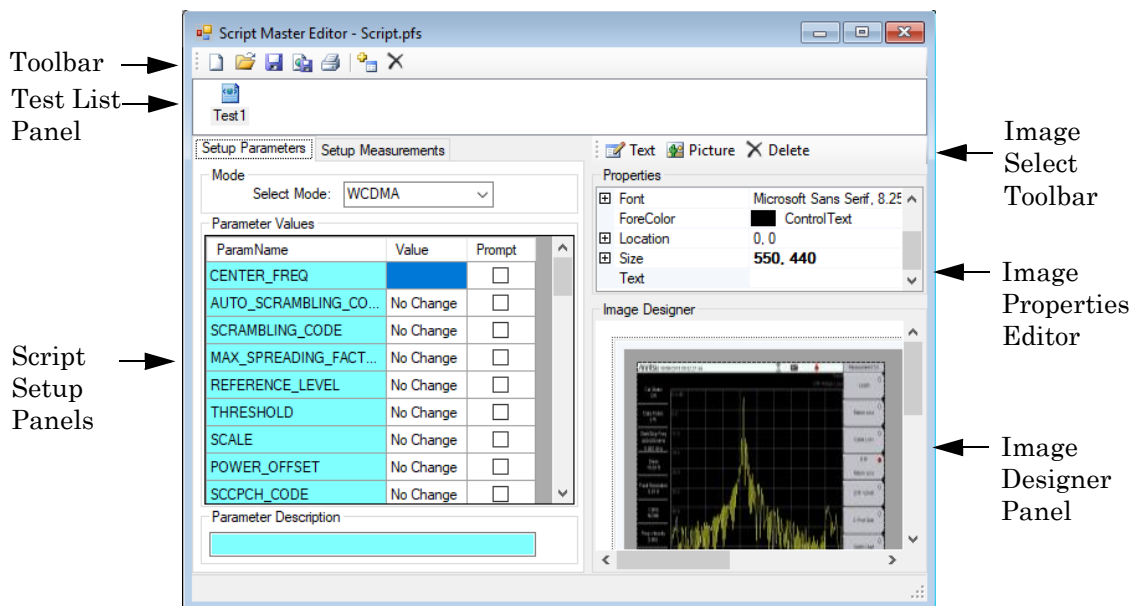









Figure 4-27. GSM/WCDMA Script Master Editor

Toolbar

	New	Clears the Properties and Image Designer Window to create a new test.
	Open	Opens a list window to select for editing previously created Script files.
	Save	Saves the current file to the computer.
	Save As	Saves the file with a new filename and .pfs extension.
	Print	Prints the file to the default printer.
	Add Test	Adds a new test to the Test Panel. The new test is a blank form ready for editing.
	Delete Test	Deletes the highlighted test from the Test Panel.

Test List Panel

Contains the list of individual tests that make up the testing procedure.

Script Setup Panels

- **Setup Parameters**
Used to change parameters on the instrument and to prompt the user of these changes if necessary.
Mode: Press the down arrow of the Select Mode: list box to select either GSM (GSM/GPRS/EDGE) or WCDMA (WCDMA/HSDPA) measurement mode testing.
Parameter Values: These are the test parameters specific to the measurement mode selected in the Select Mode list box.
ParamName: The name of the measurement parameter.
Value: Enter a value to change that parameter value in the instrument. Leaving the value as No Change, defaults to the value in the instrument.
Prompt: A checked box prompts the user of the instrument of the changes taking place with the edited parameter.
Parameter Description: A brief description of the selected parameter displays.
- **Setup Measurements**
Used to change measurement settings on the instrument. and to prompt the user of these changes if necessary.
Selected Measurements: text.
Param Name: Press the down arrow to list the measurements of the selected mode. Highlight and click the desired parameter for editing.
Value1 - Value4: Entry boxes for value editing of the selected measurement.
Possible Value: Displays the possible values for the selected measurement.
Description: Displays the limits and units for the selected measurement. Some measurements do not have values such as the Spectral measurement.

- Image Select Toolbar

Text: Click to open the text Input window. Enter a label name. Press OK and the labeled text box will be placed on the Image Designer window.

Picture: Click to open the Picture dialogue window to select a picture from the computer. Highlight the desired picture and press the Open button; the picture displays in the Image Designer window.

Delete: Deletes the active text or picture box in the Image Designer window.

Image Properties Editor

The Properties Editor window displays different types of editing fields, depending on the needs of particular property. These edit fields include edit boxes and drop-down lists.

Use this window to define the active text or active picture box in the Image Designer window. When a text or picture box is placed in the Image Designer, properties for that box are listed in the editor. Highlight the desired property to edit.

Image Designer Pane

Create visual notes or instructions to be loaded into the test instrument for the field tech or FAE taking measurements. You can resize and position text and picture boxes using the dragging feature.

Channel Scanner Script Master

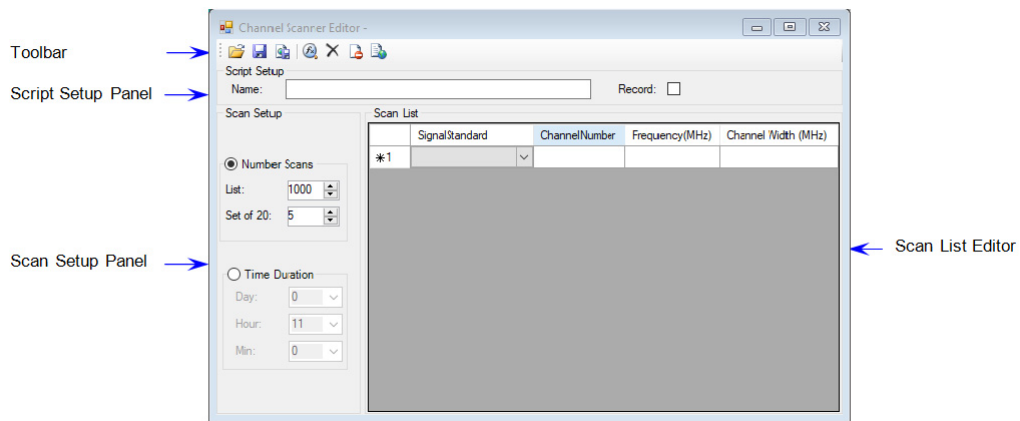









Figure 4-28. Channel Scanner Script Editor

Toolbar

The icons of the toolbar for the Channel Scanner Editor:

Open		Opens a list window to select for editing previously created Script files.
Save		Saves the current file to the computer.
Save As		Saves the file with a new filename with a .smcs extension.
Open Wizard Dialog		Opens the Populate Wizard for creating the Scan List. Select either Scan Channels or Scan Frequency as the desired method of creating the Scan List. Refer to "Dialog Options" on page 4-23.

Delete		Deletes the highlighted channel from the Scan List.
Clear Channel Scanner Scan List		Clears the Scan List for creating a new Channel Scanner list.
Open Signal Standard File		Opens the Signal Standard file for editing.

Script Setup Panel

Name: Displays the name of an opened Script file.

Record: Sets the parameter for the Record button in the instrument to the On position.

Scan Setup Panel

Click the desired radio button to select setting up the test duration using either Number of Scans or Time Duration. If the Number of Scans is selected for the test duration, then the test will end after the Scan List has been repeated the total number of List scans and Set of 20 scans.

If Time Duration is used, then testing occurs for that time. If the test time of the Scan List is shorter than the Time Duration set, the Scan List will continue and repeat testing until the end of the set Time Duration. If the test time of the Scan List is longer than the Time Duration set, the tests beyond the Time Duration period will not be tested.

Number Scans: Set the number of scans with List and Set of 20.

List: Enter the number of repetitions the channels in the Scan List are to be tested. (Maximum 1000 repetitions.)

Set of 20: Enter the number of repetitions a set of 20 channels are to be tested. (Maximum 5 repetitions.)

Time Duration: Set the duration that the in which scans must complete.

Day: Enter the number of days the Scan List is to be tested.

Hour: Enter the number of hours the Scan List is to be tested.

Min: Enter the number of minutes the Scan List is to be tested.

Scan List Editor

Create a Scan List using the Open Wizard Dialog or manually enter individual Signal Standards and corresponding ChannelNumber, Frequency, and ChannelWidth values.

SignalStandard: Press the pull-down arrow to select a signal standard. Click Channel Number and its value along with Frequency, and ChannelWidth will be entered automatically.

ChannelNumber: Double-click the entry box and press the down arrow key to open the entry window. Enter a Channel Number within the range of channels listed. Frequency and ChannelWidth will be entered automatically.

Frequency: Automatically entered during SignalStandard set up or ChannelNumber set up.

ChannelWidth: Automatically entered during SignalStandard set up or ChannelNumber set up.

Measurement Log File

After the **Channel Scanner** measurement is complete, a log file or multiple log files are created. A log file is created for the number of List repetitions set. If List is set to 1, then there is only one log file created. If List is set to the maximum number of 1000, then 1000 log files are created.

The log file name format is SCRIPT_MASTER_LOG followed by a string of numbers that represent year, month, date, hour, minute, and seconds that is expressed as YYYYMMDDHHMMSS - year (YYYY), month (MM), date (DD), hour (HH), minute (MM), and second (SS).

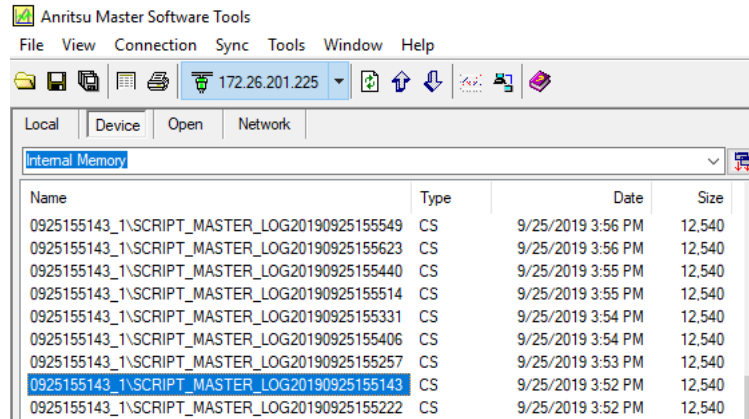


Figure 4-29. Device List of Log Files

Double-click on a log file entry in the list to display in the Log Viewer.

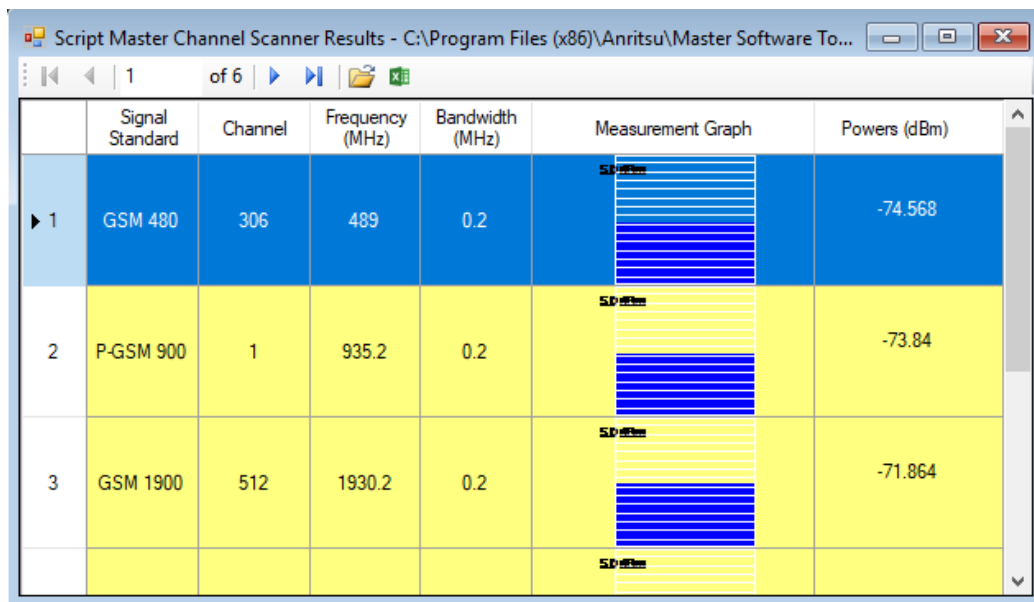


Figure 4-30. Measurement Log Viewer

Table Definitions






The commands in the toolbar of the Log Viewer are described in this table:

Move First Returns to the first measurement in the Scan List and highlighted in dark blue.



Move Previous Moves the counter to the previous measurement.



Select Measurement		Displays the current measurement number. To jump directly to a measurement, enter the number of the desired measurement into the entry window and press Enter on the keyboard.
Move Next		Moves to the next measurement.
Move Last		Moves the counter and the cursor to the last measurement.
Open Channel Scanner File		Open a file on the computer into the Log Viewer.
Export to CSV		Opens the Export file dialog.

Row Color

Dark Blue: Highlighted row that corresponds to the measurement number in the Scan List counter.

Yellow: A set of twenty measurements. This list may be less than twenty if it is at the end of the measurement list.

Light Blue: A set of twenty measurements. This list may be less than twenty if it is at the end of the measurement list.

Measurement Graph

Displays the level of power for each Set measurement in a graph. For example, if the Set of 20: parameter is set to 4, four graph bars are displayed.

Powers (dBm)

Displays the numeric value for each Set measurement in a column. For example, if the Set of 20: parameter is set to 4, four values bars are displayed in a column.

4-12 VNA Master Measurement Window

The VNA Master Measurement Window in MST replicates the display window on the VNA Master instruments. Both real-time measurements and previously captured and saved measurements will be viewed as though they were on the instrument. The measurement window also allows you to set the number of graph display panels and set the number of traces viewed.

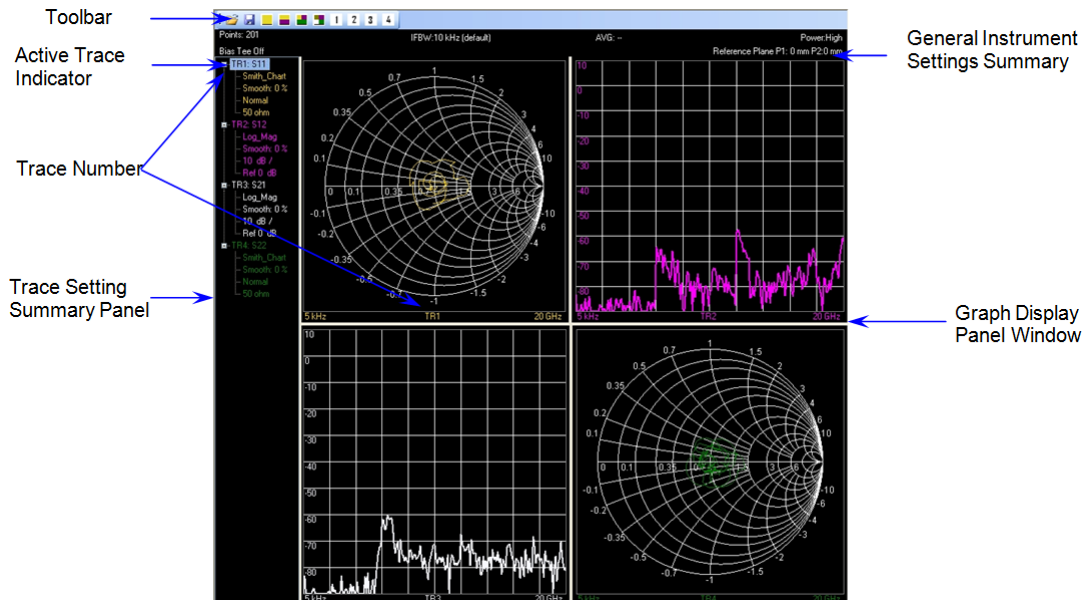


Figure 4-31. VNA Master Trace Window

Toolbar

Open Opens a list window to select for viewing previously saved VNA measurement files.



Save Saves the current file to the computer.



Number of Graph Display Panels Select



Press one of the four boxes to set the number of graphic display panels.

Yellow: Utilizes the full display area for one Display Panel.

Yellow/Purple: Splits the display area vertically for two Display Panels.

Yellow/Purple/Green: Divides the display area into three panels: graph display panel 1 at the top left quadrant, graph display panel 2 in the top right quadrant, and graph display panel 3 utilizing the bottom two quadrants.

Yellow/Purple/Green/White: Divides the display area into four quadrants: graph display panel 1 at the top left quadrant, graph display panel 2 in the top right quadrant, graph display panel 3 in the bottom left quadrant, and graph display panel 4 in the bottom right quadrant.

Set the Number of Traces for Display

Sets the number of traces to be displayed in the selected number of graph display panels. Traces are color-coded to match its data in the Trace Information section.



Note

The file downloaded from the instrument can have one to four traces displayed. This setting in MST can only limit the number of traces displayed on the computer. For example, if the instrument only had two traces, then MST can display one or two traces but not more.

General Instrument Setting Summary

Displays the setting information that is common to all traces: Number of Points, IF Bandwidth, Sweep Averaging, Power, Reference Plane Extension for Port 1 and Port 2, and Bias Tee status.

Trace Setting Summary Panel

Displays the information of each of the number of traces set for display. Information included are S-parameter, graph type, smoothing %, and scale settings – resolution/division, and reference value.

Active Trace Indicator: Highlights the active trace with a light blue rectangle.

Graph Display Window

Displays one through four graph display panels depending on the selection made on the Toolbar for the Number of Graph Display Panels.

Example Views – Multiple Combinations of Number of Graphs and Number of Traces.

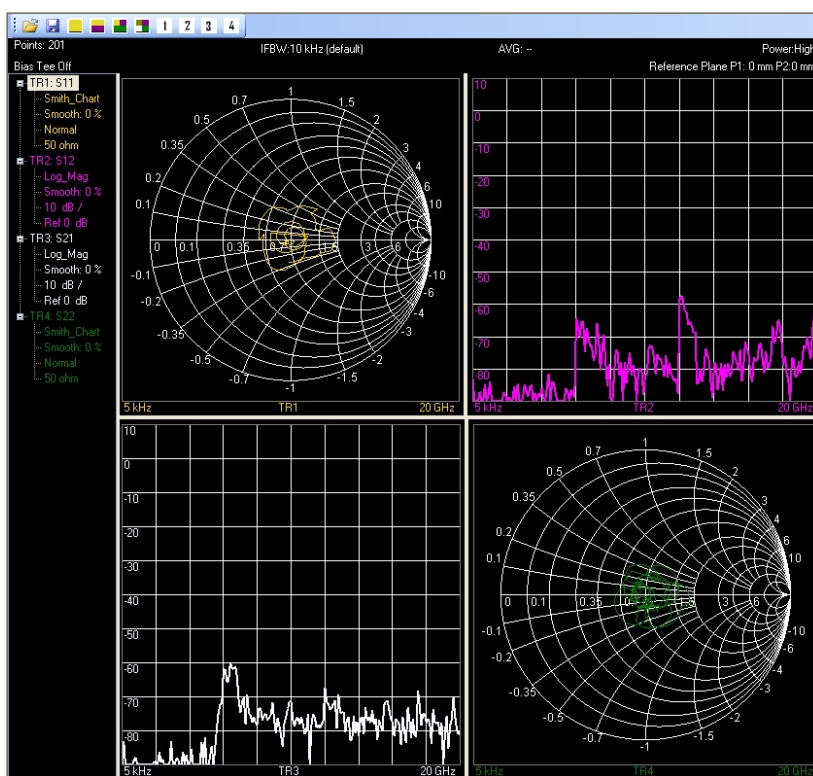


Figure 4-32. Four Graphs with Four Traces

The display file supports up to four live traces. MST can open and display all four traces as shown in Fig 4-44 above. The image shows four traces, each in its own graph display panel. Click the Yellow button on the toolbar to change MST to show all four traces on a single graph as shown below, [Figure 4-33](#).

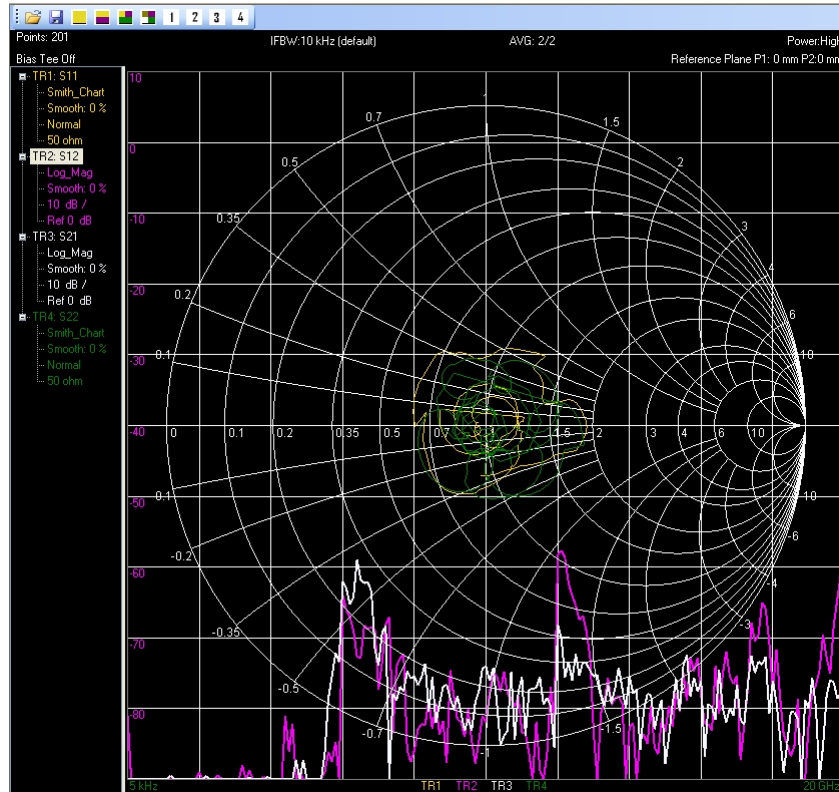


Figure 4-33. Single Graph with Four Traces

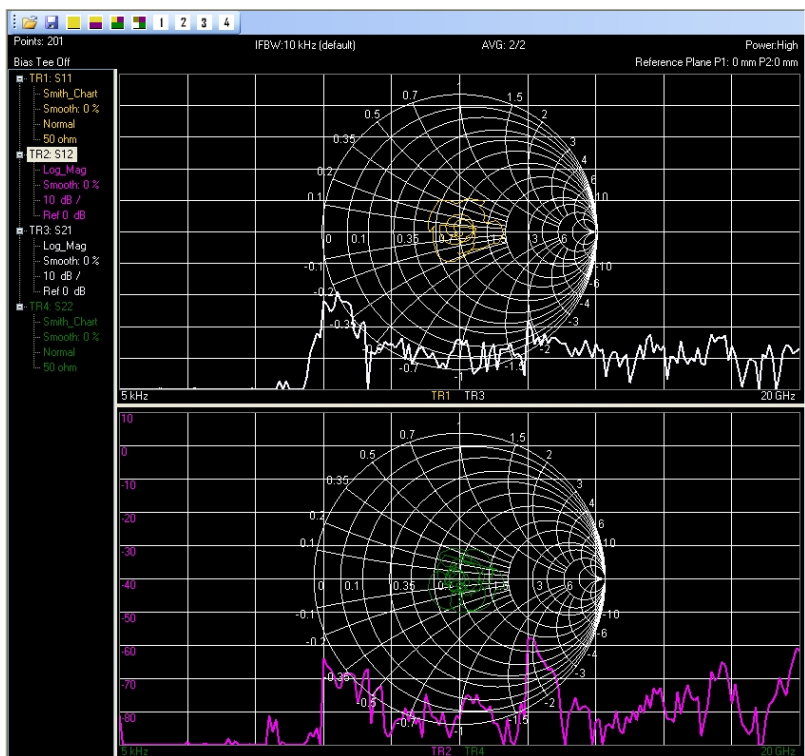


Figure 4-34. Two Graphs with Four Traces

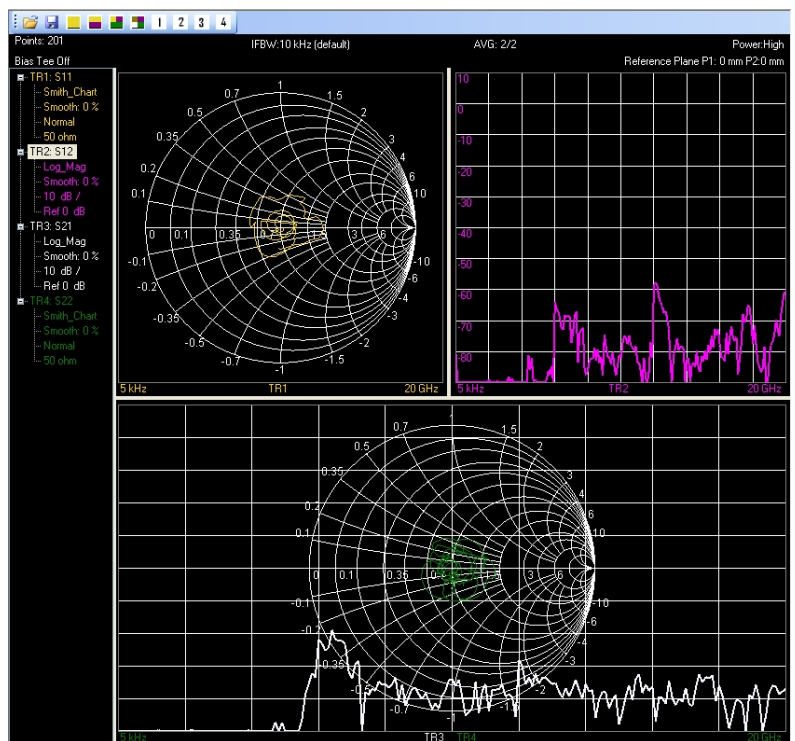


Figure 4-35. Three Graphs with Four Traces

Also, in MST you can change the number of traces from the maximum available down to one. In the case where four traces are available, as shown above, you can change the number of traces to three, two, or one as shown below.

Note

MST follows the same trace numbering procedure found in the instrument. When displaying one trace, TR1 is shown. When displaying two traces, TR1 and TR2 are shown. When displaying three traces, TR1, TR2, and TR3 are shown. When displaying four traces, TR1, TR2, TR3, and TR4 are shown. You cannot display TR2, TR3, or TR4 as a single trace in MST.

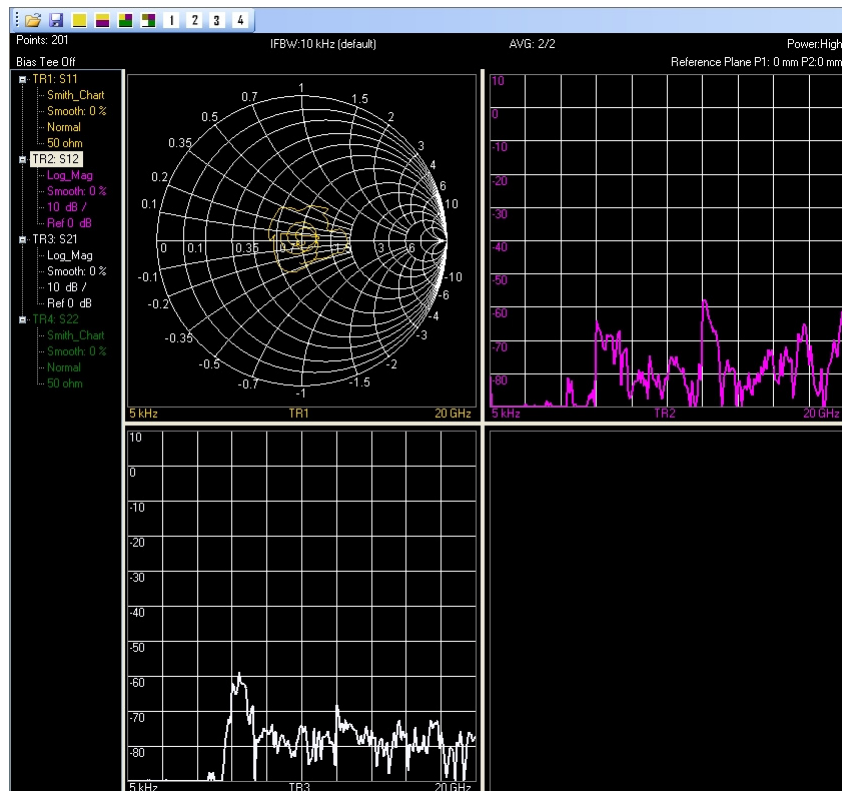


Figure 4-36. Three Traces Displayed, Four Graphs Selected

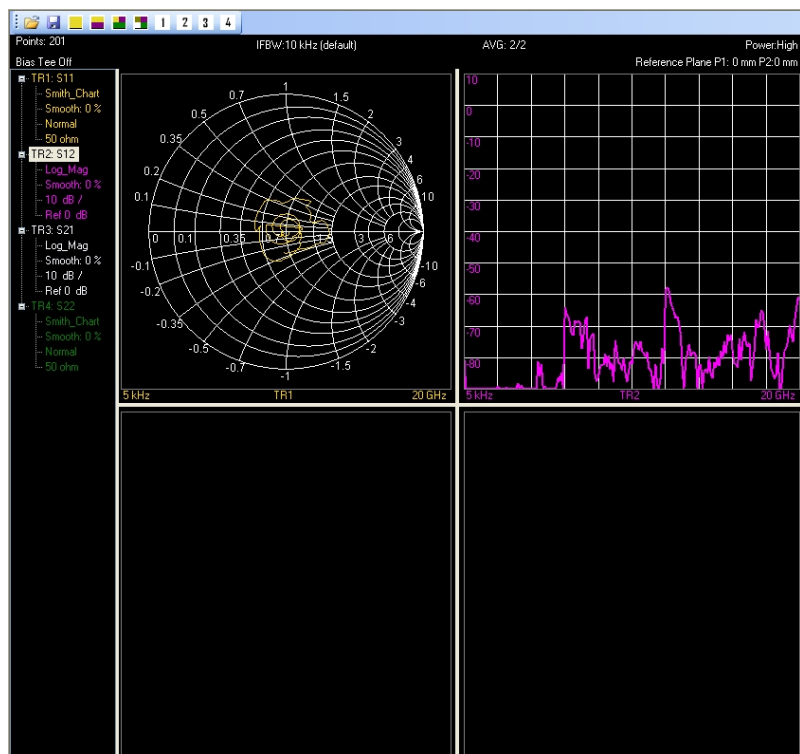


Figure 4-37. Two Traces Displayed, Four Graphs Selected

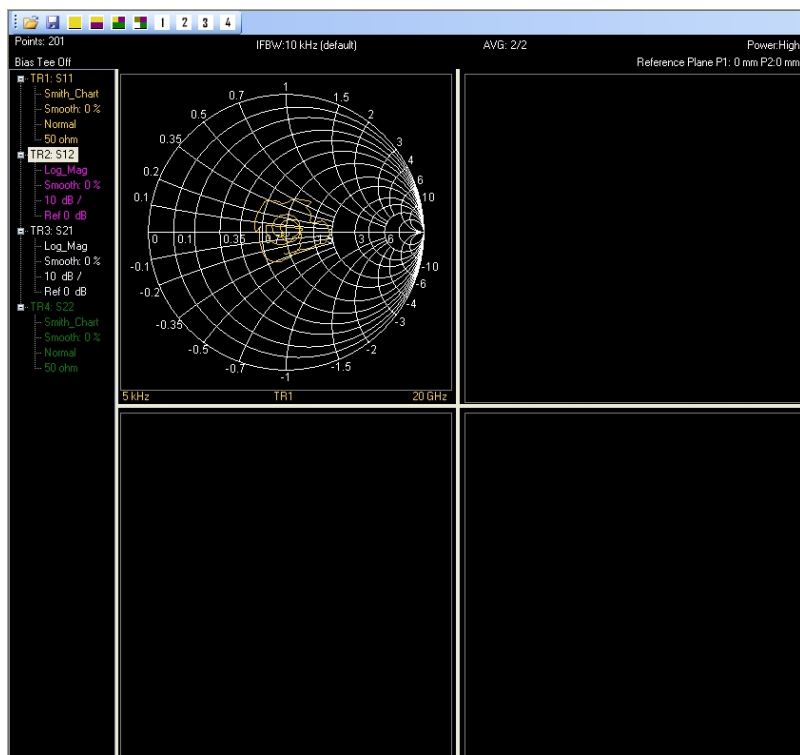


Figure 4-38. One Trace Displayed, Four Graphs Selected

MST also allows you to choose the active trace by clicking the trace number - TR1, TR2, TR3, or TR4 in the Trace Setting Summary Panel. The selected active trace is highlighted with a light blue rectangle. The reason to choose an active trace is for cases when you have more than one trace overlaid in the same display panel. MST can only display the y-axis scale information for one trace, the Active Trace. In Fig. 4-51 below, TR1 is highlighted in the left hand column, indicating it as the active trace. Therefore, the y-axis scale shown is associated with Trace 1 (yellow). In Fig. 4-52, TR2 is the active trace and the y-axis scale is changed to match the TR2 settings (purple).

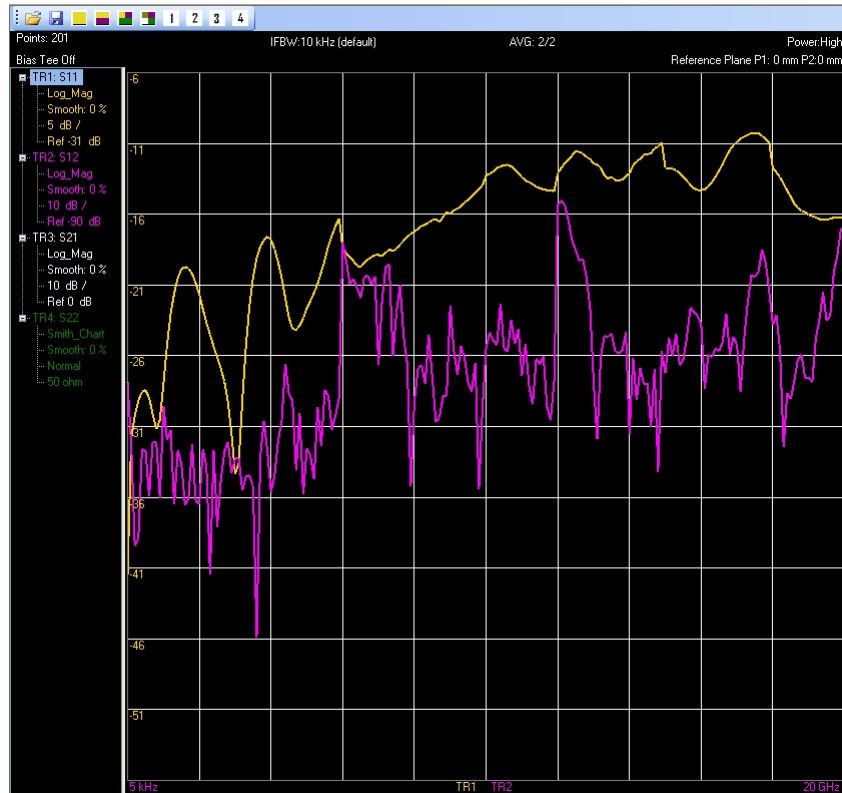


Figure 4-39. TR1 Selected as the Active Trace

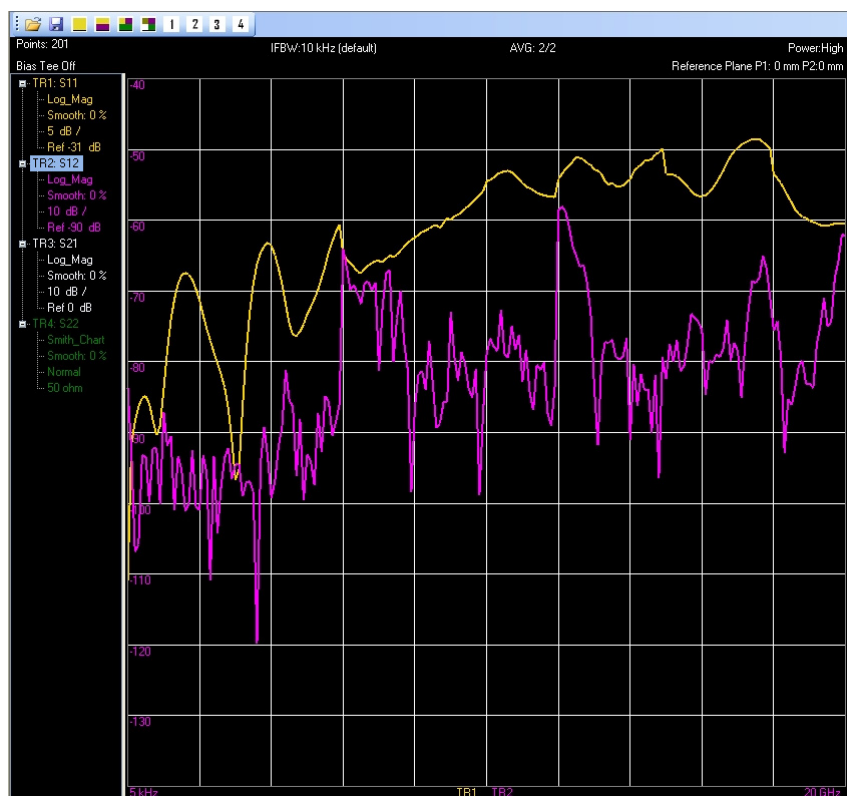


Figure 4-40. TR2 Selected as the Active Trace

Note

1. MST supports markers and limits for the VNA Master. That is, any files you download today will be able to display markers and limits including VNA Master files, for example, DTF-Return Loss, Cable Loss, Return Loss, 2-Port Gain files.
2. The Trace Catalog function in MST supports the VNA Master files, for example, DTF-Return Loss, Cable Loss, Return Loss, 2-Port Gain files.
3. MST downloads the trace data from the instrument after post processing.
4. MST creates a folder named TEMP in the INTERNAL MEMORY of the instrument to store files while downloading them to the computer. MST will view and download any folder or file in TEMP.

Chapter 5 — Support File Management

5-1 Introduction

Support files for measurements include:

- Antenna lists
- Cable lists
- Language tables
- Calibration files
- Reports
- Folder Spectrogram files
- Signal standard files
- Pass/Fail test definitions
- Instrument setup files
- JPEG images
- Exported files
- Measurement map files

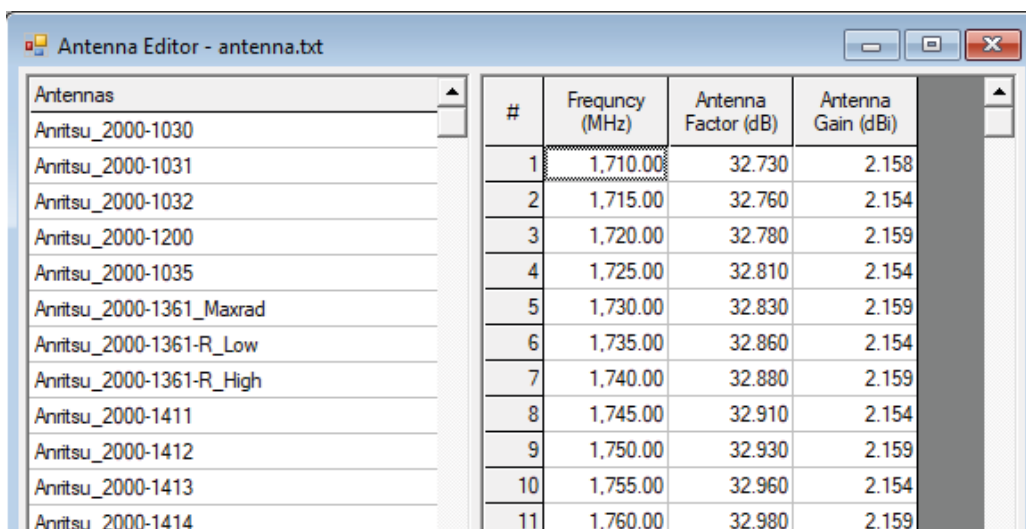
Some of these files originate on the test instrument and can be edited in MST and uploaded back to the test instrument in order to change test instrument behavior. Other files are created as MST files and cannot be uploaded to a test instrument. Each file type has an associated view or editor. These files have characteristics in common, both with each other and with standard measurement files.

In general, any file that can be opened in MST can be saved, printed, exported, and turned into a report. In the unusual case where one or more of these options are not available, the option is either not shown or is shown disabled (menu option grayed out). If a file can be uploaded, the Upload button is enabled when the file is active and an active device connection exists.

The following descriptions describe how to edit a file from a connected test instrument, because this is the most common situation. These files can be saved locally and then recalled by using the File >Open... menu function, or by pressing the Open button on the main toolbar. The File>Open... menu function or the Open command in the main tool bar opens the Open Measurement File dialog box.

5-2 Antenna Editor (antenna.txt)

The Antenna Editor is used to edit antenna lists. All measurement modes on an Anritsu test instrument share one antenna file. This antenna file has multiple antenna definitions, each of which has a triplet of frequency-antenna factor-antenna gain values that define the antenna response characteristics.



The screenshot shows the 'Antenna Editor - antenna.txt' window. It features a list of antennas on the left and a table of their characteristics on the right. The table has columns for '#', 'Frequency (MHz)', 'Antenna Factor (dB)', and 'Antenna Gain (dBi)'. The data is as follows:

#	Frequency (MHz)	Antenna Factor (dB)	Antenna Gain (dBi)
1	1,710.00	32.730	2.158
2	1,715.00	32.760	2.154
3	1,720.00	32.780	2.159
4	1,725.00	32.810	2.154
5	1,730.00	32.830	2.159
6	1,735.00	32.860	2.154
7	1,740.00	32.880	2.159
8	1,745.00	32.910	2.154
9	1,750.00	32.930	2.159
10	1,755.00	32.960	2.154
11	1,760.00	32.980	2.159

Figure 5-1. Antenna Editor Window

To edit an antenna file, download the file from a test instrument by clicking Sync>Download Antenna List.

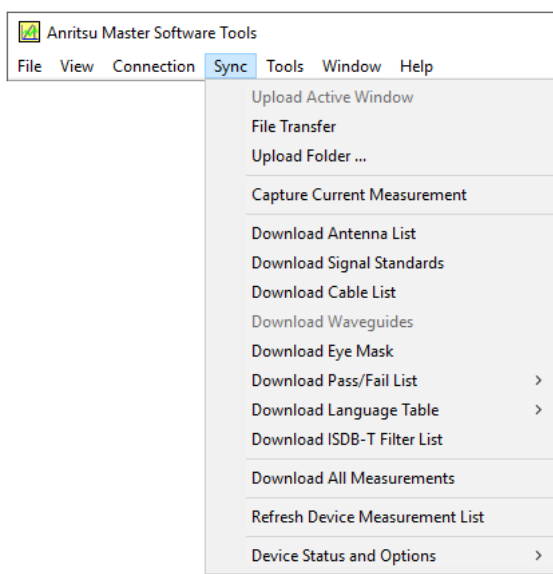


Figure 5-2. Sync Pull-down Menu

MST retrieves the antenna list and opens it. Unless the Auto-save feature under Program Options has been turned off, the file will automatically be saved to a local disk using the path shown in the File Summary preview (under the Local tab on the left side of the application window).

The antenna file on the test instrument is named antenna.txt, and this is the default name that used by MST. The antenna list can be edited and saved on a local computer under any desired filename, but when uploaded to the instrument, it must be named antenna.txt, or the test instrument will not recognize it.

To add a new antenna to the list:

1. Drag the file antenna.txt from the File List Window to the Active Measurement/Edit Window. The Antenna Editor window immediately opens the list of antennas.
2. In the column listed Antennas, scroll down to the bottom of list.
3. Highlight the empty box.
4. Enter the new antenna name in that box.
5. Add frequency, antenna factor, and gain values to the antenna definition by entering the values in the list. Either Antenna Factor (dB) or Antenna Gain (dBi) values can be added. The editor will calculate the other to match. For faster entry, the Antenna editor automatically advances to the next field in the current amplitude column as you type values and press **Enter**.
6. To upload an antenna file, open it and then press the upload icon. Regardless of the name of the file, MST will try to upload it as antenna.txt and will ask you whether to overwrite the remote file.
7. After the upload, power off the instrument, then on.

5-3 Signal Standard Editor (SignalStd.sig)

The signal standards editor is organized in a tree structure. When a signal standards file is opened, the standards are shown in a connected list with a + sign to the left. To edit an entry, expand the definition by clicking the + symbol. Standard editing functions are available in a right-click context menu. This feature provides Cut, Copy, and Paste operations, as well those to add new signal standards and delete unwanted entries.

To edit a value, select it in the list and type the new value. You may use the edit box at the top of the window for convenience. Press **Enter** after editing the value in order to automatically shift focus to the next field. Save the file using Save to keep the original SignalStd.sig name or Save As to save with a different name.

To upload a signal standards file open it and then press the upload icon. Regardless of the name of the file, MST will try to upload it as SignalStd.sig and will ask you whether to overwrite the remote file.

5-4 Cable Editor (Cablelist.txt)

The cable editor provides a list of cable definitions. To edit a cable definition, select the field to be modified and enter a new value. New cables can be added by entering the values in the last row, which is empty. To remove a cable, select it and press **Delete**. The software prompts for confirmation.

As with antennas and signal standards, the cable list file must have the expected filename in order to be recognized and used by the test instrument. The test instrument name for this file is Cablelist.txt. This is the name of any cable list that is downloaded from an Anritsu test instrument.

To upload a cable list file, open it and then press the upload icon. Regardless of the name of the file, MST will try to upload it as Cablelist.txt and will ask you whether to overwrite the remote file.

5-5 Pass/Fail Test Editor (TestModels.txt)

The WCDMA/HSDPA, GSM/GPRS/EDGE, Fixed WiMAX, Mobile WiMAX, CDMA, EV-DO, TD-SCDMA, LTE, and TD-LTE measurement modes support a Pass/Fail measurement mode. In order to edit the Pass/Fail test definition file, connect to the test instrument and set it to one of the measurement modes.

From the toolbar select Sync > Download Pass/Fail List sub-menu, choose either GSM/GPRS/EDGE Pass/Fail List, WCDMA/HSDPA Pass/Fail List, Fixed WiMAX Pass/Fail List, Mobile WiMAX Pass/Fail List, CDMA Pass/Fail List, EV-DO Pass/Fail List, TD-SCDMA Pass/Fail List, LTE Pass/Fail List, or TD-LTE Pass/Fail List.

To edit, select the field to be modified and enter a new value. The Pass/Fail editor attempts to present all possible parameters and values in a simple grid. As different rows are selected, the column headings change in order to reflect the values and units of the selected parameter. Some test parameters have fewer constraints than others do, so some field values are blank. The bottom of the Pass/Fail Editor provides information about parameter types and units.

To upload a Pass/Fail file, open it and then press the upload icon. Regardless of the name of the file, MST will try to upload it as testModels.txt and will ask you whether to overwrite the remote file.

5-6 Setup Files (*.stp)

Setup files, which can be saved and recalled on a test instrument, can also be downloaded into MST. Downloaded setup files can be stored and can be used to upload a common setup file to a number of test instruments to ensure that they are all configured in the same manner.

These files cannot be edited, but they can be viewed, saved, printed, exported, and a report can be created from a setup file. When a setup file is opened, only the file header is presented. The window may be resized to show other parameters, but these parameters are not in an easily readable format and cannot be edited.

5-7 Calibration Files (Cal*.txt)

As with setup files, calibration files cannot be edited in MST. For calibration files, MST has no facility for printing, exporting, or creating reports. No benefit is derived from uploading a calibration file from one test instrument into another or from recalling a calibration file in MST, but these files are stored in the user memory space and have a common syntax and a .txt extension. These files may be viewed. The filename syntax (Cal*.txt) allows quick identification of the file type.

5-8 JPEG Files (*.jpg)

The test instruments that are supported by MST all provide a function to capture the current screen and save the displayed measurement as a JPEG image file. These files are in the Device File list and can be seen when a test instrument is connected to MST. The viewer provides a method to see these stored image files. A JPEG file cannot be edited in MST, but can be printed from MST. Refer also to JPEG Save Options in the Program Options window for additional information about saving JPEG files.

5-9 Reports (.pdf and .html)

All measurement files and most support files can be saved in reports. Reports provide a useful way to create hard copies of complete measurements, which contain more information than by printing the measurements themselves.

There are two formats to choose from, HTML or PDF. The report formatted in HTML can be displayed in an Internet browser. To view a PDF file you will need Adobe Acrobat Reader. You can obtain this free software by going to <http://www.adobe.com/downloads/> and click **Adobe Reader**. Follow the instructions for downloading and installing it to your computer.

Reports typically have a header with company name, logo, date and time stamp, and GPS coordinates (only if GPS was on and locked) of the measurement. This header is followed by a picture of the measurement, a table of relevant parameters for the measurement, and the test instrument on which the measurement was captured. An optional signature line is at the bottom.

All of the items in the header and the signature line may be eliminated or pre-configured by using the settings on the Report tab of the Program Options dialog box.

To configure the report and file type:

1. Pull down the Tools menu and click the command Program Options. The Program Options window opens.

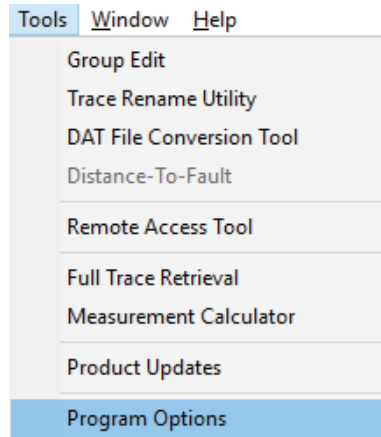


Figure 5-3. Tools Pull-down Menu

2. Click the Report Generator tab.

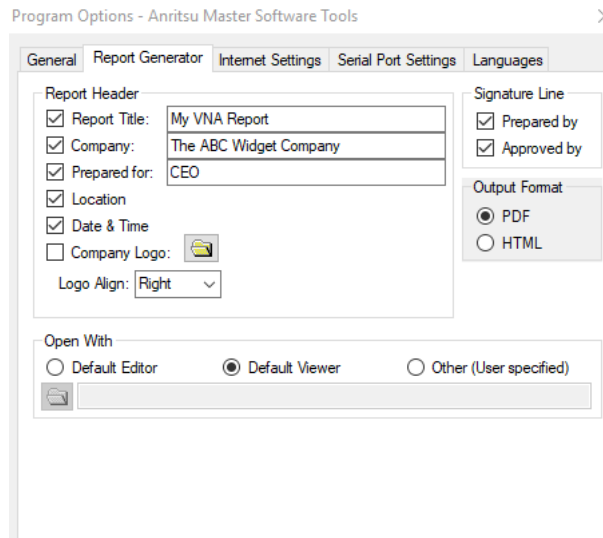


Figure 5-4. Program Options Window

3. Configure the report as desired using these settings:

Report Header: Selects the elements for the report header:

- Report Title—The title placed at the top of the report. Type up to 40 characters.
- Company—The name of the client company. Type up to 40 characters.
- Prepared For—The name of the measuring company/personnel. Type up to 40 characters.
- Location—The GPS coordinates of the measurement if the GPS feature was active.
- Date & Time—The data and time of the measurement, not of the report.
- Company Logo— Click the folder button, to find the logo file through a file browser.
- Logo Align (left, right, or center aligned)

Open With: Selects the default viewer

- Default Editor (Microsoft Word, Front Page, etc.) (only for HTML reports).
- Default Viewer (Internet Explorer, Acrobat Reader, etc.).
- Other (User Specified). Click the folder button, which opens a file browser, to find the appropriate application, or enter the full path.

Signature Line: Appends a signature line to the report with Prepared By and Approved By lines.

Output Format: Selects the file type to be generated.

- PDF—Adobe Acrobat format. Cannot be paired with a default editor. A report is not generated in this case.
- HTML—Hypertext Markup Language.

To generate a report:

1. Set report settings.
2. Click File>Create Report in MST main window.

To store a report, use Save As (or other function, depending upon browser or viewer) to a different location.

The main section of the report contains a JPEG image of the measurement. This image is created in the same location where the active measurement file is located in the local disk space.

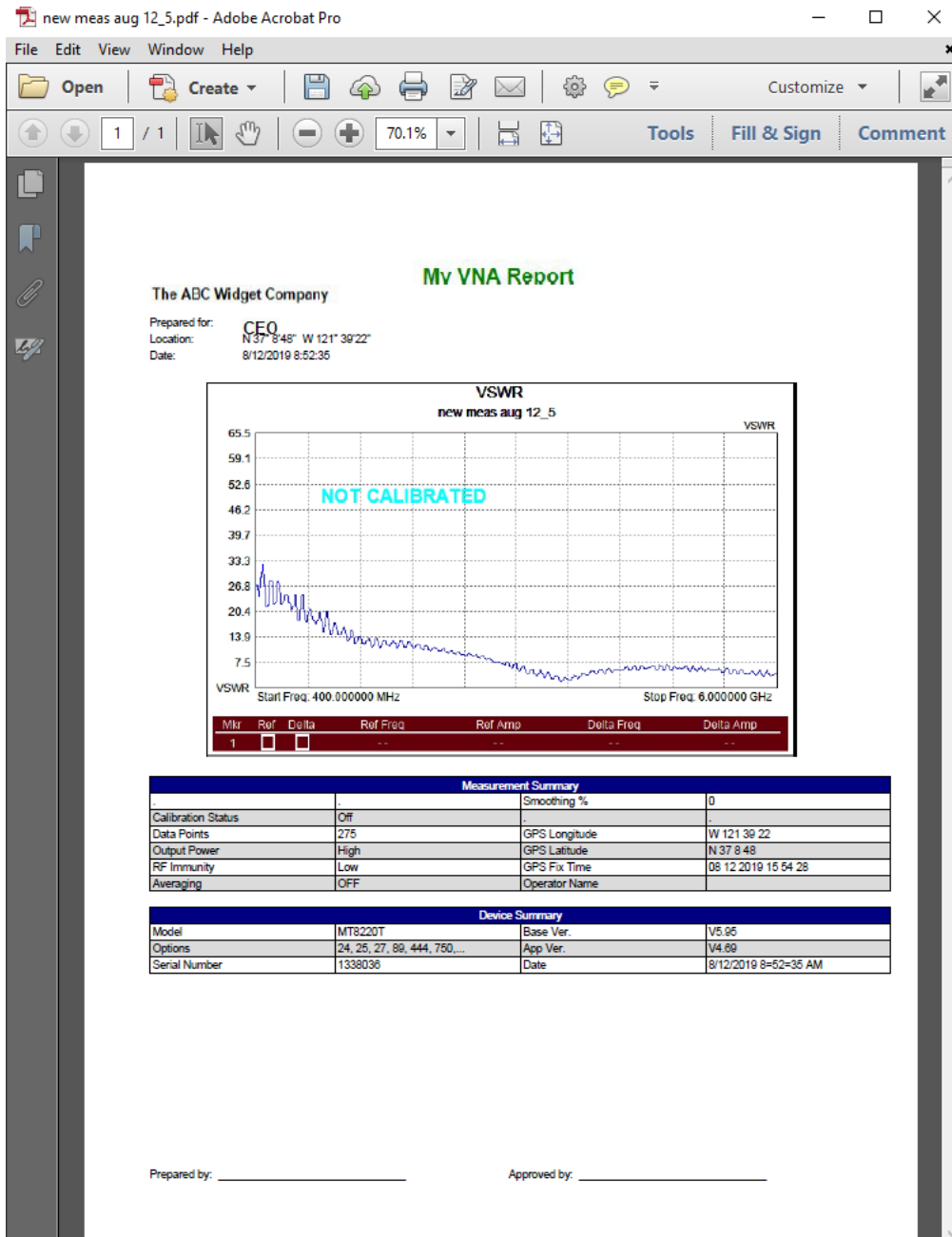


Figure 5-5. PDF Version of a Measurement Report

5-10 Exported Files (*.csv, *.txt)

Exported files may have either *.csv or *.txt filename format, depending upon the method chosen to create the export file. When exporting a file, select the correct option from the Save as type: drop-down list. The options are designed to assist with differences across cultural and geographic world regions. Choose among the following: comma delimited, semicolon delimited, tab delimited with a period for decimal separator, and tab delimited with a comma for decimal separator.

These file conventions are chosen to work well with Microsoft Excel when using different regional settings. MST is designed to default to the most likely option based upon the regional settings of the computer. If the exported file is intended for another part of the world, different settings may be required in order for the files to be opened correctly.

5-11 Folder Spectrogram Files (*.fsg)

A Folder Spectrogram file is a special composite-file created from all of the SPA or IA spectrum measurement files contained in a selected folder. All of the files (that are to be used) in the folder are assumed to have the same frequency range, which is the frequency range of the first file.

A Folder Spectrogram file is especially useful to get a composite view of a large number of traces that are stored using **Save on Event**. This mode of the test instrument allows a spectrum analyzer trace to be stored each time that a set criterion is met, such as peak amplitude above some preset limit, or at the end of each trace sweep. Many thousands of saved traces can quickly accumulate this way, and viewing and evaluating each one is difficult.

Folder Spectrogram files allows a user to quickly review all traces and pick out the specific traces of interest. Several different graphs are provided to review the composite data sets, and post-capture filtering can be done based upon specified criteria.

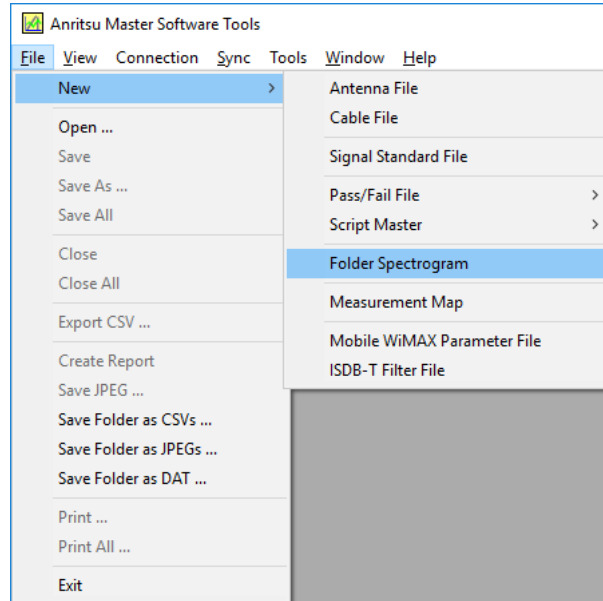


Figure 5-6. File Menu to Select Folder Spectrogram

To create a Folder Spectrogram file:

1. Pull down the File menu.
2. Highlight New and click Folder Spectrogram in the sub-menu. The Browse For Folder dialog window opens. Take note of the message at the top of the dialog window.

3. Read carefully the note at the top of the dialog window.

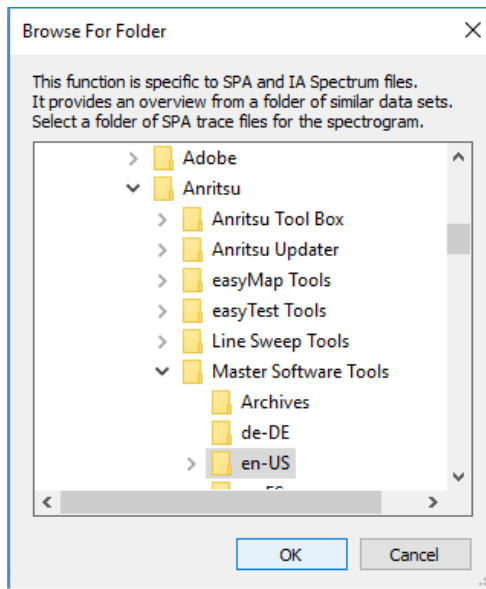


Figure 5-7. Program Options Window

4. Highlight the folder that contains either the SPA or IA spectrum files and click OK. MST opens each trace file and creates a single composite file containing all of the trace data. The spectrogram window then opens in the Average view.

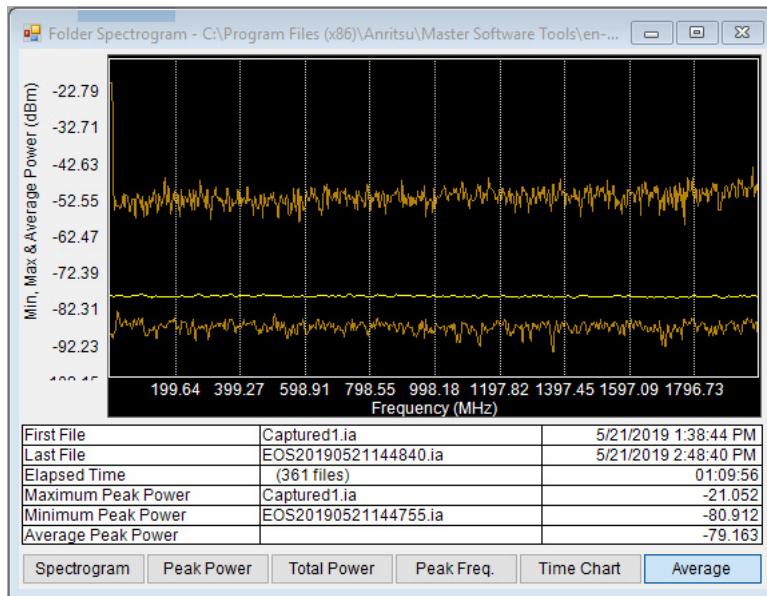


Figure 5-8. Average View Window - Default Window

MST will open each file and create a single composite file containing all of the data. All of the trace data are sorted according to the measurement time stamp, and a spectrogram display is presented. Depending upon the number of files, creation of the composite spectrogram file may take from approximately 5 seconds to 30 seconds.

Spectrogram

A spectrogram shows signal versus time in a simulated three-dimensional top view, with the x-axis being frequency, the y-axis being time, and color showing power. Below the spectrogram is a view of the currently selected trace. The selected trace is indicated by a red line on the spectrogram. To select a different trace, use the mouse or cursor keys to move the red line. To the right of the spectrogram is a bar that adjusts the contrast of the spectrogram.

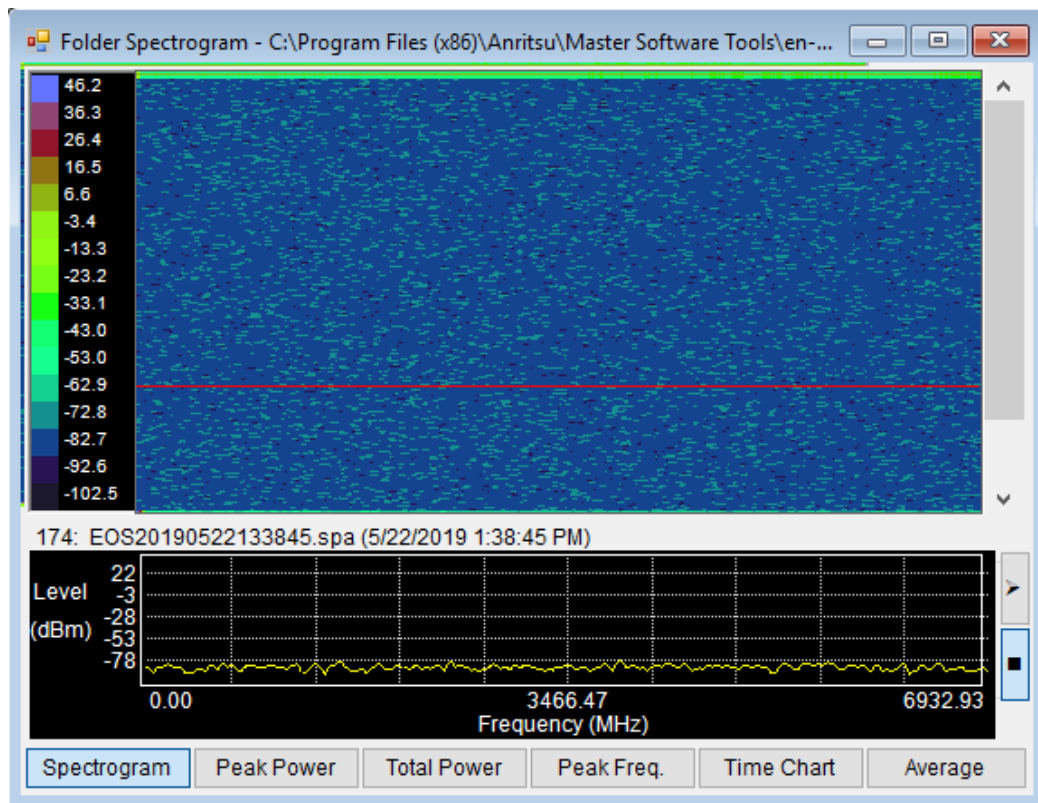


Figure 5-9. Two-Pane Spectrogram Window

Color Selection Configuration Window

The Color Selection window allows you to configure the color bar and spectrogram color parameters. Place the mouse on the color bar left of the spectrogram and click the left mouse button. The Color Selection window opens.

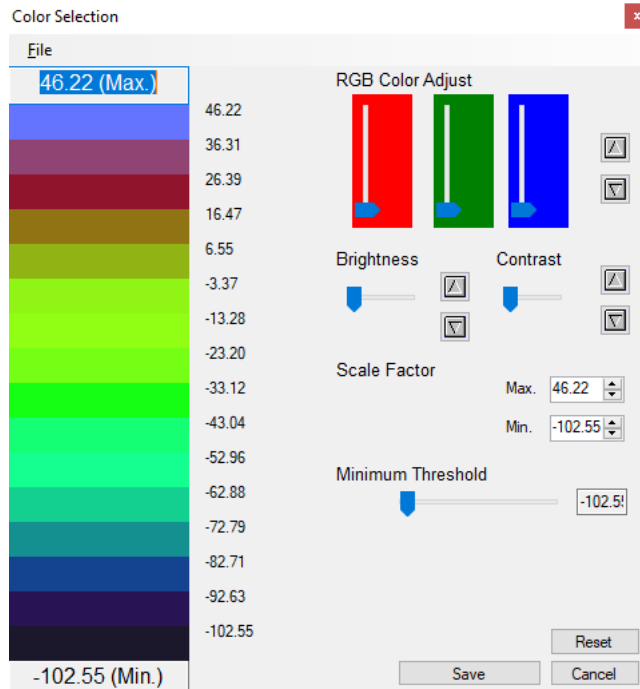


Figure 5-10. Color Selection Window

Color Bar: You can customize the colors of the color bar. Place the cursor on the desired color to change. Click the left mouse button and the Color window opens. Click the desired new color and press **OK**. The previous color is replaced by the new.

RGB Color Adjust: There are three primary color controls – red, green, and blue. They control the overall color tone of the color bars. Use the Up/Down arrow adjacent to the blue control to increase or decrease the tone setup in the RGB controls.

Brightness: Lightens or darkens the colors on the color bar.

Contrast: Defines or blends the lines between colors.

Scale Factor: Use this feature to increase or decrease the dBm scale value and number of dBms per color.

Minimum Threshold: Raises or lowers the minimum threshold value.

Save: Saves the new color bar settings.

Reset: Returns all changes made in the Color Selection configuration window to the default setting.

Cancel: Cancel any changes made and closes the Color Selection configuration window.

Folder Spectrogram Context Menu

Select the context menu (mouse menu) by right-clicking the mouse over the Folder Spectrogram Window. This gives access to a menu of advanced options and features.

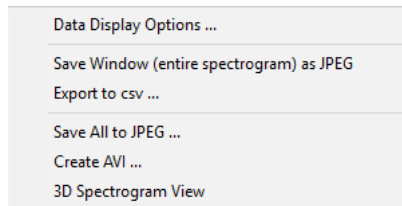


Figure 5-11. Folder Spectrogram Context Menu

- **Data Display Options...**

File Filter: Filtered files are displayed in the box to the right of the selections. The filtered file list is sorted based upon the selected column, either filename or frequency of peak or measurement time stamp. Filtered files show up in red in the spectrogram and time chart display modes.

None: No Filtration.

Limit Line from a measurement: Shows only traces that go above or below the set limit lines.

Deviation from the average (dB): Filters out files that deviate from the average by more than a specified amount of dB. Upper and lower ranges are set in addition to the filter window width.

JPEG and AVI Settings: These settings set up the parameters for saving measurement files as JPEGs (stills) and AVIs (videos).

JPEG Options: Choose between Small (320x240), Medium (640x480), Large (1024x768), or customized ratio. The Quality may also be selected.

AVI Options: Choose between Small (320x240), Large (640x480), or customized ratio. The frame rate may also be changed as desired. One frame is one trace.

- **Save Window (entire spectrogram) as JPEG**

Saves the current window as a JPEG image file.

- **Export to csv (Spreadsheet)**

Saves the Folder Spectrogram composite data file as a CSV (comma separated values) file, to a location and file name of your choosing, that can be imported into a spreadsheet application.

- **Save All to JPEG**

Saves all traces in JPEG format. This action creates a sub-folder named Images, where all images are stored. This command's progress is a bar at the bottom of the Folder Spectrogram window.

- **Create AVI**

Creates an AVI video file of the traces. This action creates a file called Folder.avi in the same folder as the trace files. When done creating the file, a message displays asking if the file should be played on the default video player.

- **3D Spectrogram View**

Opens the 3D Spectrogram window to view the list of traces in 3-dimensions – frequency, time, and amplitude. Refer to [Chapter 4, “Using MST”](#).

- Folder Spectrogram Buttons

The buttons shown in [Figure 5-12](#) change the view of the data in the window.

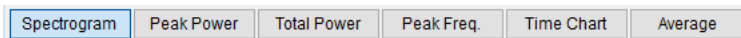


Figure 5-12. Folder Spectrogram Buttons

Peak Power: Peak power shows the highest power at each frequency.

Total Power: Total power shows how much power is present over time in that band.

Peak Freq: Peak frequency shows which frequency has delivered the highest power over time.

Time Chart: The time chart shows the number of occurrences per time increment. The number of time increments depends upon the size of the window. The earliest and latest measurements set the start and stop time increments with the intervening increments being uniformly distributed (in time).

Average: Average shows the lowest, highest, and average power levels of all frequencies.

5-12 Trace Indexing and the Trace Catalog

The Trace Index is a database containing the location and key parameters of all measurement files that are on the local hard disk. This is a convenient way to organize, locate, and manipulate measurements when many measurement files are spread across a number of folders.

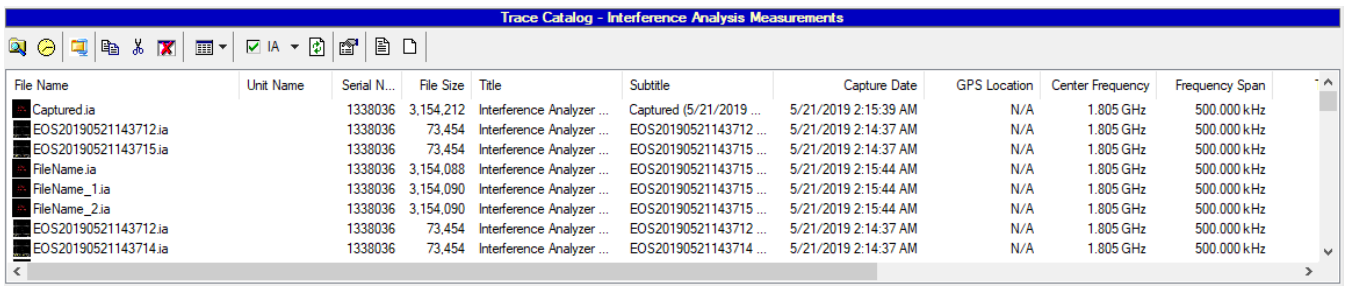
Trace Catalog

With the Trace Catalog, a user can perform the following tasks:

- Index all supported files on the hard disk.
- Index measurement files on a network drive.
- Store multiple indexes for different clients or regions.
- Perform automated indexing on a fixed schedule.
- View files in either a detailed list or as thumbnails.
- Archive files (Zip) from multiple folders.
- Cut and copy measurement files.
- Open measurements for editing.
- Select just the measurement types that are of interest.
- Sort measurements by name, date, or key measurement parameters.
- View statistics on number and location of all supported file types.
- Locate missing measurements that are hard to find.

Trace Catalog-Spectrum Analyzer Window

Beneath the Trace Catalog toolbar buttons is the Trace Catalog File List window. This window displays files that have been indexed. Files are listed in the format selected using the Display Format button.




File Name	Unit Name	Serial N...	File Size	Title	Subtitle	Capture Date	GPS Location	Center Frequency	Frequency Span
Captured.ia		1338036	3,154,212	Interference Analyzer ...	Captured (5/21/2019 ...	5/21/2019 2:15:39 AM	N/A	1.805 GHz	500.000 kHz
EOS20190521143712.ia		1338036	73,454	Interference Analyzer ...	EOS20190521143712 ...	5/21/2019 2:14:37 AM	N/A	1.805 GHz	500.000 kHz
EOS20190521143715.ia		1338036	73,454	Interference Analyzer ...	EOS20190521143715 ...	5/21/2019 2:14:37 AM	N/A	1.805 GHz	500.000 kHz
FileName.ia		1338036	3,154,088	Interference Analyzer ...	EOS20190521143715 ...	5/21/2019 2:15:44 AM	N/A	1.805 GHz	500.000 kHz
FileName_1.ia		1338036	3,154,090	Interference Analyzer ...	EOS20190521143715 ...	5/21/2019 2:15:44 AM	N/A	1.805 GHz	500.000 kHz
FileName_2.ia		1338036	3,154,090	Interference Analyzer ...	EOS20190521143715 ...	5/21/2019 2:15:44 AM	N/A	1.805 GHz	500.000 kHz
EOS20190521143712.ia		1338036	73,454	Interference Analyzer ...	EOS20190521143712 ...	5/21/2019 2:14:37 AM	N/A	1.805 GHz	500.000 kHz
EOS20190521143714.ia		1338036	73,454	Interference Analyzer ...	EOS20190521143714 ...	5/21/2019 2:14:37 AM	N/A	1.805 GHz	500.000 kHz

Figure 5-13. Trace Catalog Analyzer Toolbar

Trace Catalog-Spectrum Analyzer Toolbar

These are the toolbar tools:

Refresh Index:  Clicking this command displays this message. Click Yes to index the files. This action refreshes the trace index based on selections made in the Index and Scheduling Options dialog, [Figure 5-15](#).

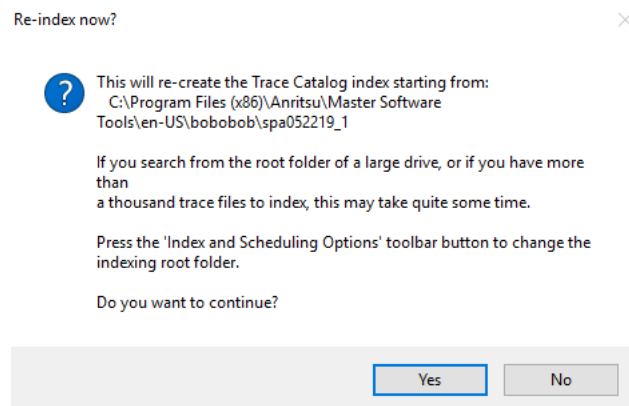


Figure 5-14. Re-index now Dialog

Index and Scheduling Options:  Opens the MST File Indexing window. See also the description for [Figure 3-99](#) for more information about this dialog.

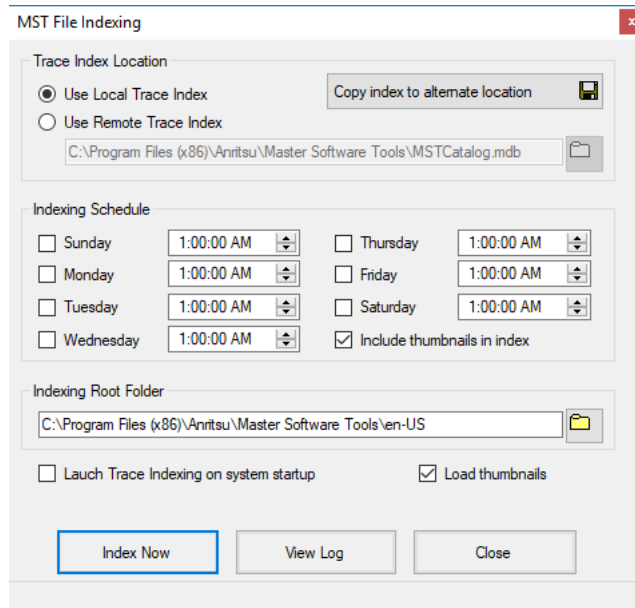



Figure 5-15. MST File Indexing Window

Archive Index Database:  Opens the Archive Options window to create a Zip file archive from the database.

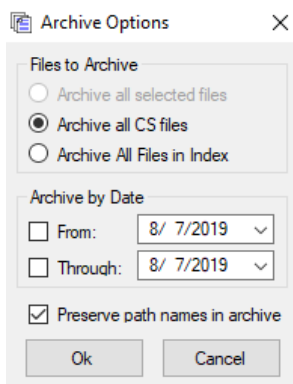





Figure 5-16. Archives Options Window

Copy:  Copies files to clipboard.

Cut:  Removes files from index only.

Delete:  Deletes selected file from index permanently.

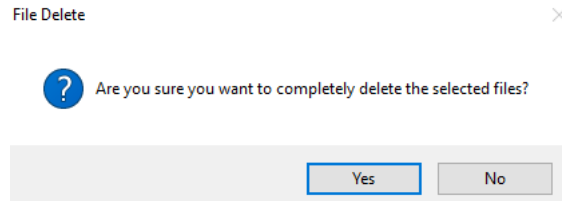



Figure 5-17. Delete File Message Dialog

Display Format Button:  Controls how data file is listed: Details, Small Icons, or Large Icons.

Details: See Fig. 3-36 Trace Catalog Analyzer Toolbar.

List- Small Icons: List files with the graph picture as small icons.

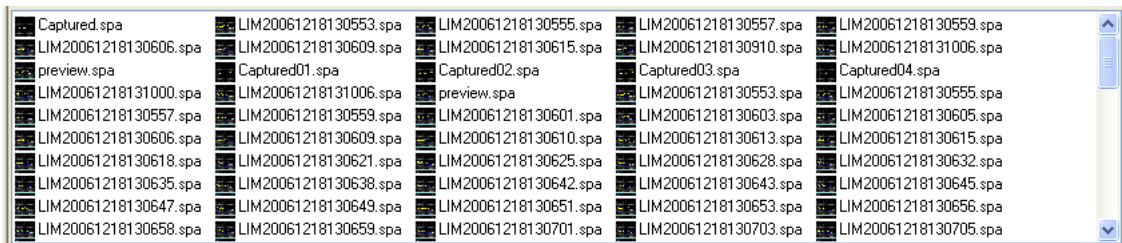


Figure 5-18. List File Display as Small Icons

List - Large Icons: List files with the graph picture as large icons.

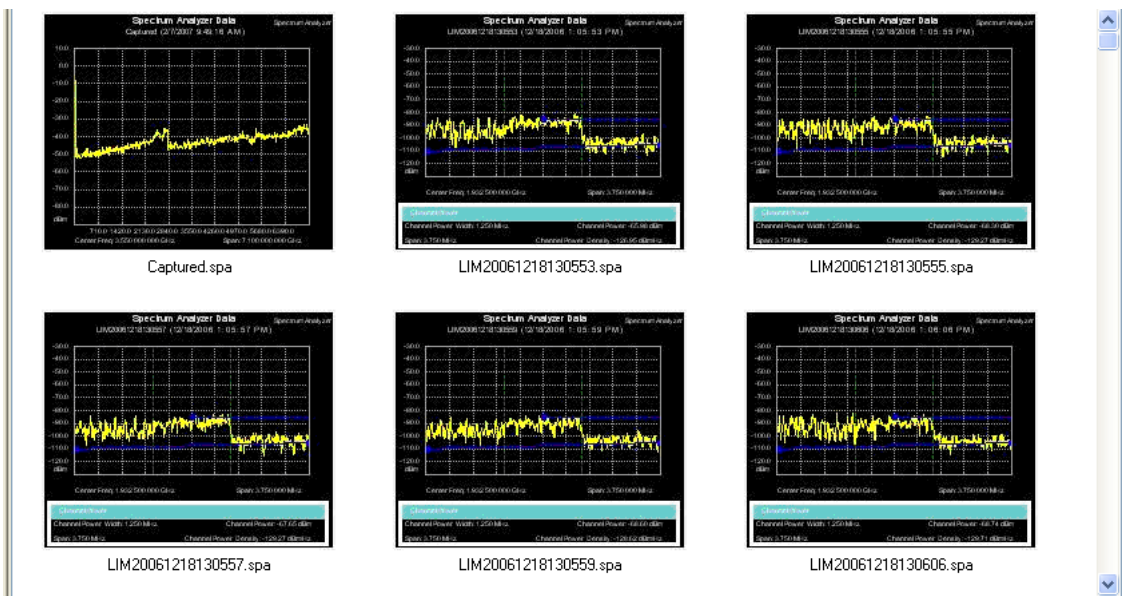


Figure 5-19. Trace Files Displayed as Large Icons

Select File Type: Drop down menu to select indexed file types to be displayed in the Trace Catalog window.

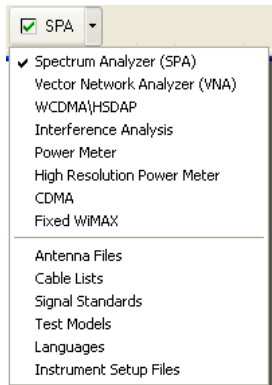



Figure 5-20. File Type Selection List

Load/Reload the File List:  Initially loads the file/files into the Trace Catalog window. Reloads and updates to the list additional files that have been indexed.

Show Summary:  Opens the Catalog Database Summary window. Click OK to close the summary.

Catalog Database Summary



	Indexed on Wednesday, May 22, 2019 1:20:46 PM
File size:	6,373,376 Bytes
File count:	372
SPA:	0
VNA:	0
WCDMA:	3
GSM/Edge:	0
IA:	366
CPRI:	0
CS:	3
PM:	0
T1:	0
E1:	0
CDMA:	0
EvDO:	0
HiPM:	0
Fixed WiMAX:	0
O-Scope:	0
CW Signal Gen.:	0
TestModels:	0
Antennas:	0
Cables:	0
SigStds:	0
SigStds:	0
Languages:	0
Setups:	0

Figure 5-21. Catalog Database Summary


View Indexing Log File:  The log file is in .txt format so, the text file opens in Notepad.

```

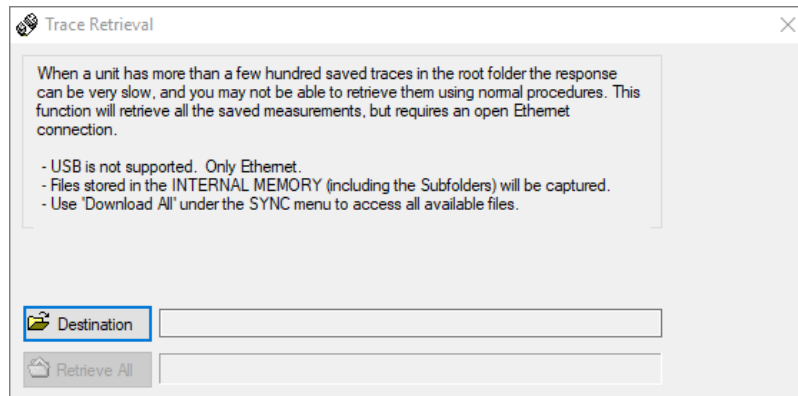
index.log - Notepad
File Edit Format View Help
Indexing started at: 5/22/2019 1:16:34 PM (elapsed time: 0:01:38)
SPA: 0; VNA: 0; WCDMA: 3; GSM/Edge: 0; IA: 366; CPRI: 0;
CS: 3; PM: 0; T1: 0; E1: 0; CDMA: 0; EvDO: 0;
HiPM: 0; Fixed WiMAX: 0; O-Scope: 0; CW Signal Gen.: 0; TestModels: 0; Antennas: 0;
Cables: 0; SigStds: 0; SigStds: 0; Languages: 0; Setups: 0; Sequencing: 0;
EyeMask: 0; TD-SCDMA: 0; DVB-T/H: 0; DVB-T/H SFN: 0; LTE: 0; TD-LTE: 0;

```

Figure 5-22. Trace Rename Log File

Clear Log File:  Clears the indexing log file.

From the Main Menu, select **Tools>Full Trace Retrieval** to open the Trace Retrieval Dialog box. This dialog displays:



Two buttons, **Destination** and **Retrieve All**, are provided, each accompanied by a text box for entering a path and filename.

For saving a measurement, click **Destination**, and the **Browse For Folder** window opens. The window message reads:

“Select a folder to save the remote measurement files to.”

A menu tree of folders and files is provided for the selection. Select a folder from which to retrieve files and the **Retrieve All** button activates. Clicking starts the retrieval of all the files from that folder. Click **Cancel** at anytime to stop the action.

Note

This feature is only supported by Ethernet connection; neither USB nor serial connections are permitted.

5-13 Filter Editor for ISDB-T (*.isdb)

The Filter Editor is used to edit or create ISDB-T filter files. These files are accessed in the instrument when the Filter Selection submenu key is pressed and the Select Filter dialog opens.

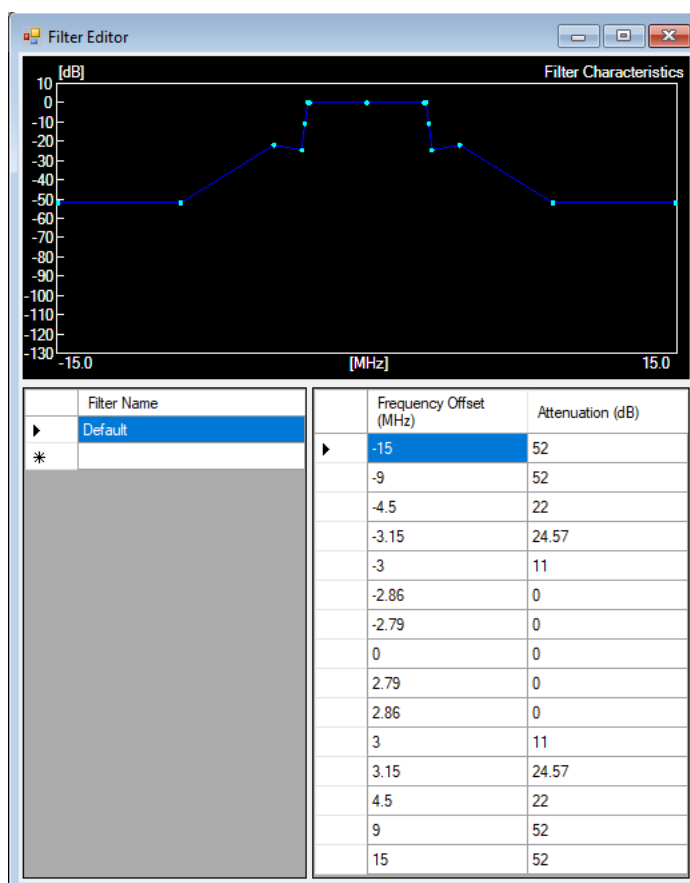


Figure 5-23. ISDB-T Editor Window

To create a new ISDB-T file within MST, pull down the File menu click New and then click ISDB-T Filter File.

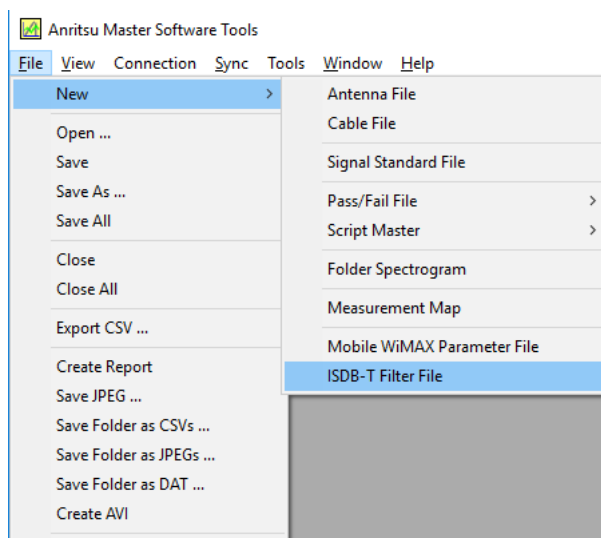


Figure 5-24. New Pull-down Menu

To edit a filter file on the instrument, download the file into MST by pulling down the Sync Menu and clicking Download ISDB-T Filter List.

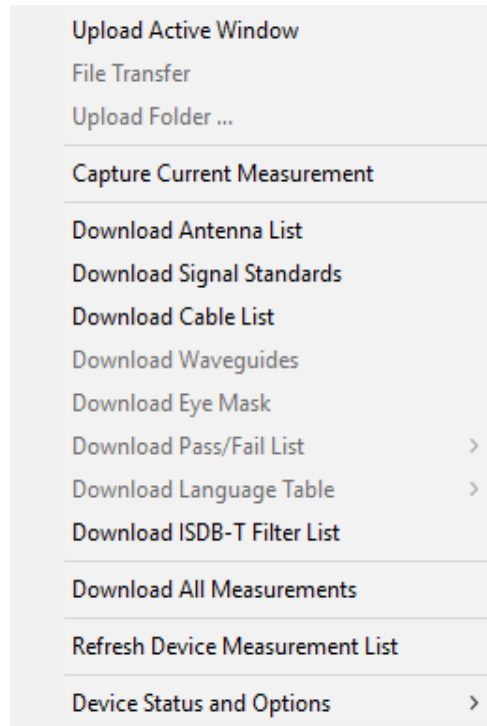


Figure 5-25. Sync Pull-down Menu

Both created or downloaded files will contain a Default filter on the list. Edit either default filters by clicking the desired node value - Frequency Offset or Attenuation. Type in the new value and press the **Enter** button on the computer keyboard.

The downloaded file contains one Default filter and three user filters – User1, User2, and User3. As with the Default filter, Filter Names, Frequency Offset, and Attenuation values can be changed by clicking the filter name or desired value. Type in the new value and press the **Enter** button on the computer keyboard.

Upload the edited filter file by pressing the Upload button on the Toolbar. Closing the edited files automatically saves these files to the default directory in the computer.

Chapter 6 — Advanced Features

6-1 Introduction

This chapter describes the advanced features and program options of MST.

6-2 Advanced Tools and Program Options

The following advanced features and program options are available under the Tools main menu.

Group Edit

This tool allows modification of a large number of measurement files at one time.

All of the following attributes can be reset:

- Measurement title
- Measurement subtitles
- Limit lines
- Marker positions
- Plot scaling

Specify a particular file type on which to operate and choose whether to modify files in a specified folder or to modify all currently open measurement files. When modifying open files, changes can be viewed as they occur. The changes are temporary unless the files are saved.

Full Trace Retrieval

This tool simplifies the retrieval of large numbers of traces from a test instrument into a user-specified directory via an Ethernet connection. When a test instrument contains many measurement files, this tool can be used to retrieve all measurements in one step. The process can be slow if the number of existing measurements exceeds several hundred.

VNA Measurement Calculator

This tool translates certain values into other units. It can show Real and Imaginary values, Magnitude, Phase, Return Loss, Reflection Coefficient, and Transmission Power. Enter a value in any field, and the other fields are adjusted automatically.

DAT File Conversion Tool

This utility is used to convert saved traces (.dat files) from Handheld Software Tools to the format that is used by MST. This conversion is not a reversible process because no equivalent utility exists to convert newer traces to the older format. The utility does not delete trace files in the old format and in the new format uses different filename extensions, .spa or .vna. (The old traces remain available for use with the Handheld Software Tools program.)

To convert a .dat to a MST compatible file:

1. Open the Tools menu in MST and select DAT File Conversion Tool.
2. In the Source area at the top area of the window, navigate to the directory that contains the traces that are to be converted.
3. In the Destination area, select the directory into which the converted traces are to be placed.

4. Select the **Conflicting Filenames** option that is to be used – **Keep Existing**, **Overwrite**, **Prompt** (for a decision), or **Skip** (skip the conversion of the file for which a conflict exists).
5. Select the measurement or measurements to be converted.
6. Click the **Convert** button. Note that the new traces appear in the destination window. Before the conversion, select **View** to preview the file in the new format, if desired. See Fig. 3-21 DAT File Conversion Tool Window

6-3 Trace Rename Utility

This utility application can be used to quickly rename (filename, measurement title, and/or measurement subtitle) a large set of measurement files in a very systematic way. To use this utility effectively requires some forethought in how the measurements are taken.

Step 1: Transfer the list of files from your test instrument to the computer

1. Pull down the **Sync** menu and click the command line **Download All Measurements**.

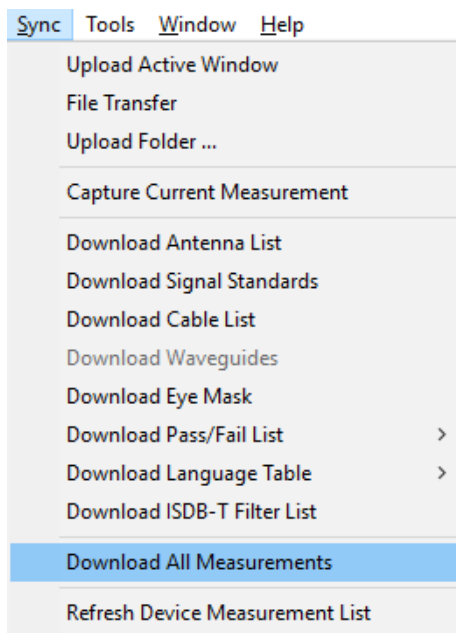


Figure 6-1. Sync Menu

The **Browse For Folder** window opens.

2. Select a folder where the traces will be stored or make a new folder by clicking the Make New Folder button.

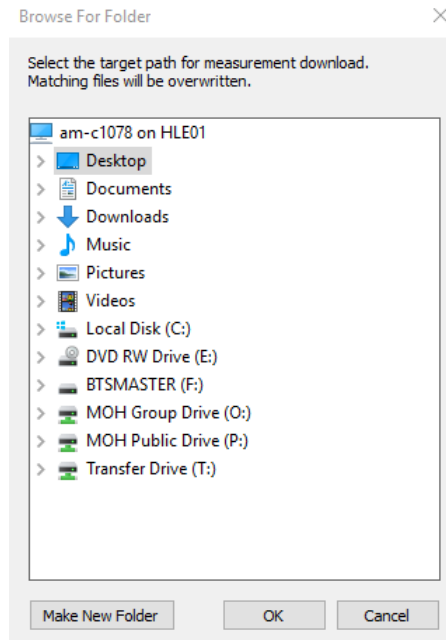


Figure 6-2. Browse For Folder

3. After the destination folder has been selected or created, click OK. Downloading the file begins.

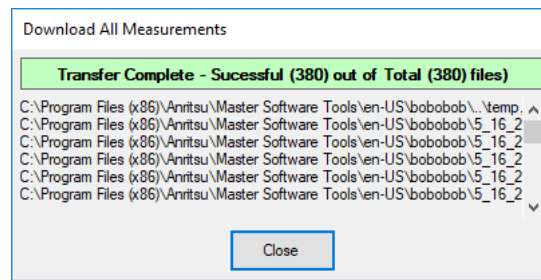


Figure 6-3. Download All Measurements Dialog

4. Click the **Close** button when the statement Transfer Complete displays.

Step 2: Rename the Traces That Have Been Retrieved

1. Pull down the Tools Menu and click Trace Rename Utility.

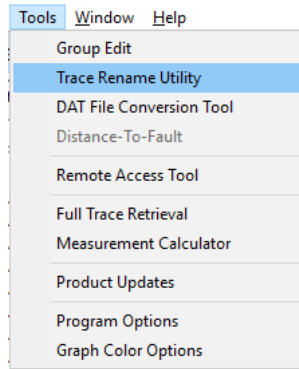


Figure 6-4. Tools Menu

2. The MST Rename Utility application opens.

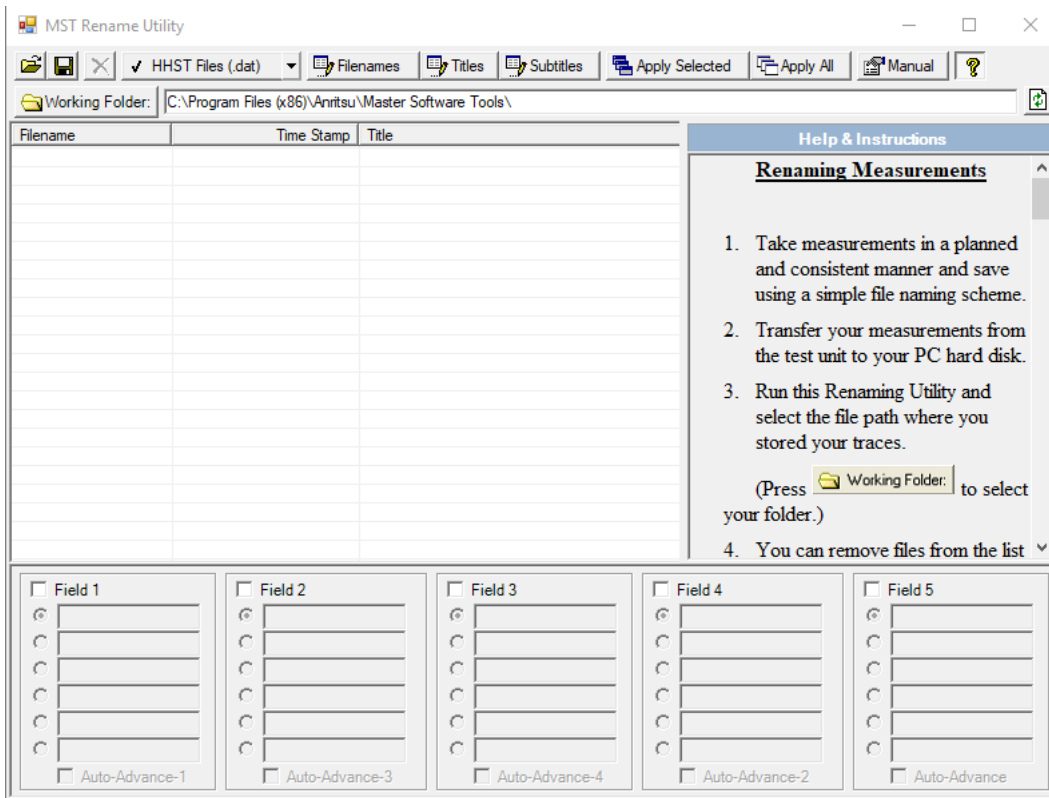


Figure 6-5. Trace Rename Utility

3. Click the Working Folder button. This is the folder where the traces-to-be-renamed are located and will be stored.

4. Place the cursor on the pull down menu and select the type of file to be renamed. Those traces are loaded into the utility.

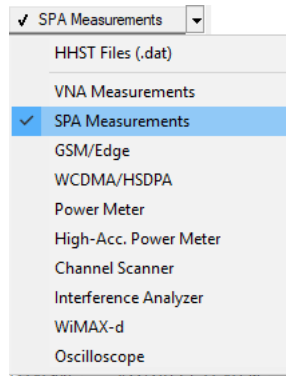


Figure 6-6. Trace Type Selection Menu

5. Highlight any traces not to be renamed and click the **Delete** button. The selected traces are removed from the list.
6. Activate a rename field by clicking the box for that Field column.
7. Enter names in each active field.

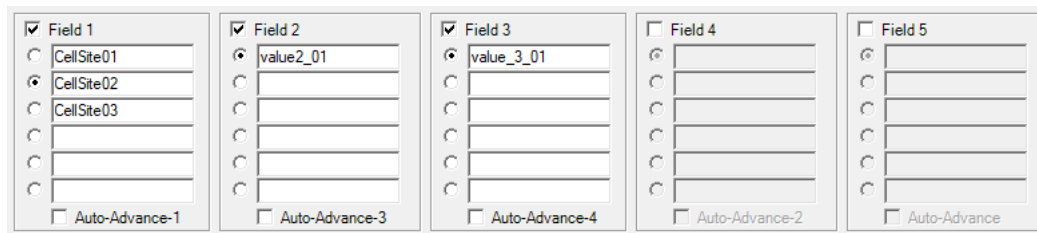


Figure 6-7. Trace Rename Table

8. If you want to the program to cycle through each parameter:
 - a. Check the Auto-Advance button. The order you click the Auto-Advance check box determines the order the fields will cycle.
 - b. Turn off Auto-Advance for all fields.
 - c. Turn them on in the order of precedence. A number will appear in the Auto-advance label indicating the field's order. The field marked Auto-Advance (1) will cycle through its values first then when it cycles back to the top value, the Auto-Advance (2) field cycle to its next value and so forth.
9. From the toolbar select the object that you want renamed – Filename, Titles or sub-Titles.
10. After you've activated your fields, names, and Auto-Advance selections, you can rename each trace manually or automatically.
 - a. **Rename Manually**
 To activate Manual Renaming of measurements, select the **Manual** toolbar button:
 - When in Manual mode, double-click a file, or select a file and press Enter.
 - The change will take place immediately.
 - Auto-advance fields will advance each time.
 - If you use the Enter key, the file selection will move down automatically.

b. Rename Automatically

To process many files at once:

- Select the target files and press the Apply Selected button,

or

- Press the Apply All button, to change all the filenames in the list.

Note

The changes are immediate and cannot be undone in the classic sense; but they can be redone easily to correct any mistakes.

Filename	Time Stamp	Title	Subtitle
.spa	5/22/2019 1:35:22 PM		
EOS20190522133523.spa	5/22/2019 1:35:24 PM		
CellSite02 value2_01 val...	5/22/2019 1:35:25 PM		
EOS20190522133526.spa	5/22/2019 1:35:26 PM		
CellSite03 value2_01 val...	5/22/2019 1:35:27 PM		
CellSite01 value2_02 val...	5/22/2019 1:35:28 PM		
CellSite02 value2_02 val...	5/22/2019 1:35:29 PM		
CellSite03 value2_02 val...	5/22/2019 1:35:30 PM		
CellSite01 value2_01 val...	5/22/2019 1:35:32 PM		
CellSite02 value2_01 val...	5/22/2019 1:35:33 PM		
CellSite03 value2_01 val...	5/22/2019 1:35:34 PM		
CellSite01 value2_02 val...	5/22/2019 1:35:35 PM		
CellSite02 value2_02 val...	5/22/2019 1:35:36 PM		
CellSite03 value2_02 val...	5/22/2019 1:35:37 PM		
CellSite01 value2_01 val...	5/22/2019 1:35:38 PM		
EOS20190522133539.spa	5/22/2019 1:35:39 PM	value2_01 value_3_02	value2_01 value_3_02
EOS20190522133541.spa	5/22/2019 1:35:41 PM	value2_01 value_3_02	value2_01 value_3_02
EOS20190522133542.spa	5/22/2019 1:35:42 PM	value2_01 value_3_02	value2_01 value_3_02
EOS20190522133543.spa	5/22/2019 1:35:43 PM	value2_01 value_3_02	value2_01 value_3_02
EOS20190522133545.spa	5/22/2019 1:35:45 PM	value2_01 value_3_02	value2_01 value_3_02
EOS20190522133546.spa	5/22/2019 1:35:46 PM	value2_01 value_3_02	value2_01 value_3_02
EOS20190522133547.spa	5/22/2019 1:35:47 PM	value2_01 value_3_02	value2_01 value_3_02

Figure 6-8. Trace Rename Log File

Trace filenames in this example have been renamed. They have been immediately stored with the new names in the working folder file. This procedure can be used to rename the trace's title and subtitle.

6-4 Modifying or Defining a Language

The Language Editor allows for modification of the language that is already in the instrument (except English) and also provides the ability to add two custom languages to the test instrument.

The standard language files that are provided in the test instrument may be modified, except for the default English file. In addition, two Custom files are available (in English) that may be completely rewritten in another language if desired. For most entries, a limit exists on message length because of the need to fit the message on a soft key or in a message box. The fonts that are used for the on-screen messages are proportional, meaning that different characters can take different amounts of space. Some creativity may be necessary in order to fit the words into the allotted space. Ideally, the customized language message should not take up significantly more space than the English equivalent. Always test the customized language by uploading it into the test instrument and reviewing the menus to be sure that the key labels fit into the available space and are fully discernible.

To modify a language file, select the Sync menu, select Download Language Table, and select System Language File. Select the language to be modified from the choices at the bottom of the editor.

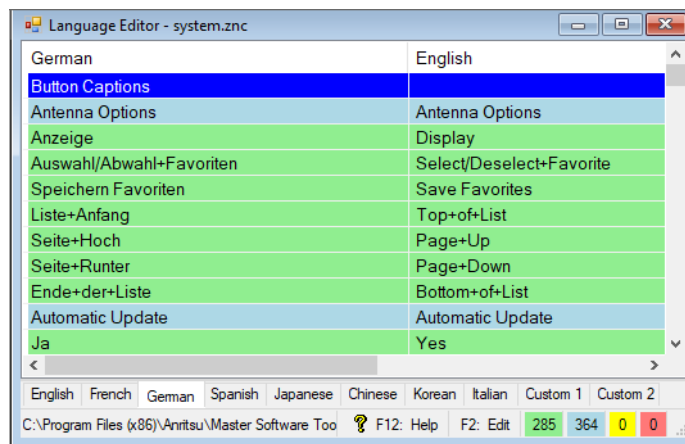


Figure 6-9. Selecting a Language to Modify

The file tree expands to show the three groups of labels that are available for editing. Select the group of labels you want to edit: Button Captions, Generic Text, and Parameter Names.

In order to change the label of a parameter, click to select the Parameter you want to change and type the new text in the bottom window. Save the modified language file to the computer hard disk, and then upload it into the test instrument.

Note

Special fonts for some languages must be installed on the system in order to edit those languages. Please contact your font vendor for specifics.

Before uploading to the test instrument, the files are to be saved as vna.znc for the VNA language file, and system.znc for the system language file.

6-5 Group Edit

This utility application allows you to rename titles, subtitles, and parameters of measurement files grouped together within a directory or selected by measurement type. To use this utility effectively requires some forethought in how the measurements were taken.

1. Pull down the **Tools** menu and click Group Edit.

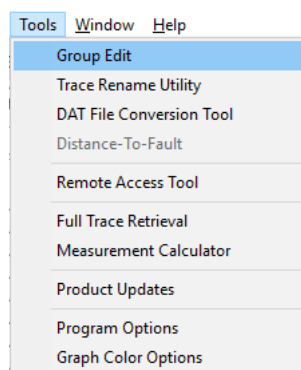


Figure 6-10. Tools Menu, Group Edit Command Line Highlighted

The MST – Measurement Group Edit window opens.

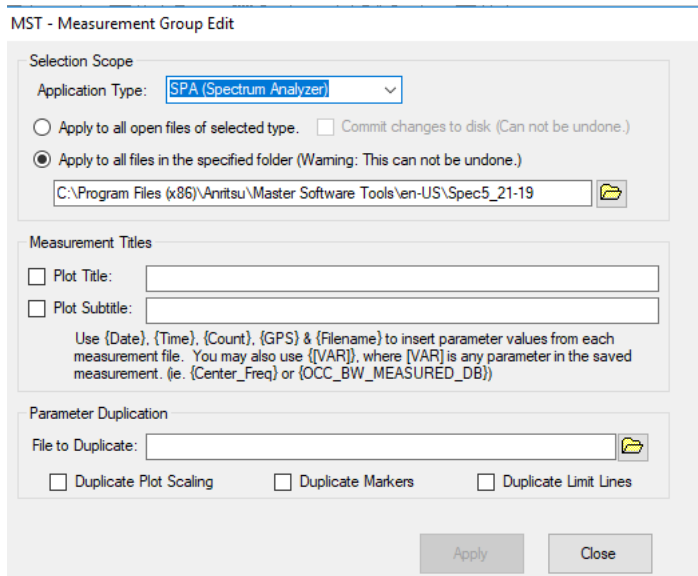


Figure 6-11. Trace Rename Log File

2. Selection Scope - Select the location of the files to be edited.
 - a. Apply to all open files of selected type. This selection edits a group of files, file type determined in Application Type: in the Active Measurement Window. Placing a check in the box, next to Commit Changes to Disk save all changes which cannot be undone.
 - b. Apply to all files in the specified folder. This selection edits a group of files in the folder.
3. Measurement Titles – Check the box next to the Plot Title or Plot Subtitle that you desire to change. Enter the new title or subtitle into the entry boxes. Use {date}, {time}, {count}, {GPS}, and {filename} to insert parameter values from each measurement file. You may also use {[VAR]}, where [VAR] is any parameter in the saved measurement. (i.e. {Center_Freq} or {OCC_BW_MEASURED_DB}).
4. Parameter Duplication –
 - a. Check the desired parameter box that you want to duplicate.
 - b. Browse the folder for the file with the parameter to be duplicated. Select it and its name displays in the entry box.
5. Press Apply button. Titles and parameters are saved as set up in steps 2 through 4.

Chapter 7 — Instrument Update

7-1 Introduction

Occasionally, Anritsu places updated software, firmware, and documentation on its Product Support Web Site. The website can be queried for MST-supported updates.

7-2 Internet Settings Configuration

To query the Anritsu website for updates, you must configure the MST Internet Settings.

1. On the Tools menu, click **Program Options**.

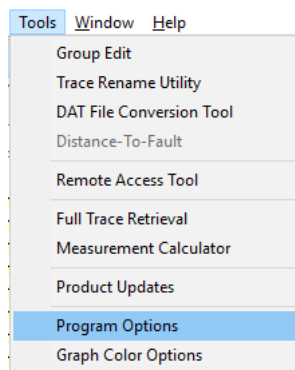


Figure 7-1. Tool Menu: Program Options Command

2. The Firmware Update Tip dialog opens. It informs you of an improved method of updating USB-enabled handheld instruments (“[Firmware Update from an Anritsu Website File](#)” on page 7-9). Press the OK button when done.

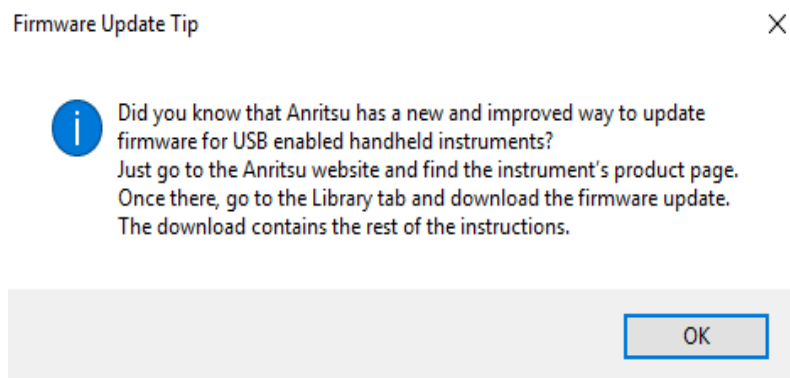


Figure 7-2. Firmware Update Tip Dialog

The Program Options window opens.

3. Click the **Internet Settings** tab.

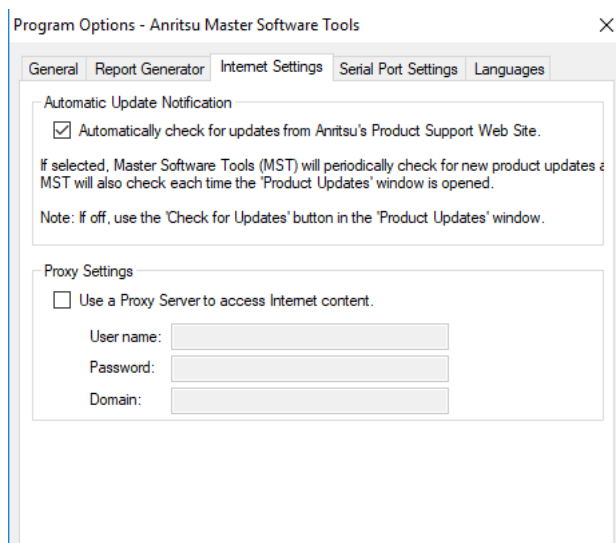


Figure 7-3. Internet Settings

4. Check the box labeled **Automatically check for updates from Anritsu's Product Support Web Site** to receive updates automatically from Anritsu.
5. Then in the **Proxy Settings** box, click the check box preceding the statement – **Use a Proxy Server to access the Internet content**.
6. Enter your username, password, and network domain name in the respective entry boxes. You may need to ask your IT administrator for the domain name if you do not know it.
7. Click **OK**.
8. Close and restart **MST**.
9. Returning to the **Tools** menu, click **Product Updates**.

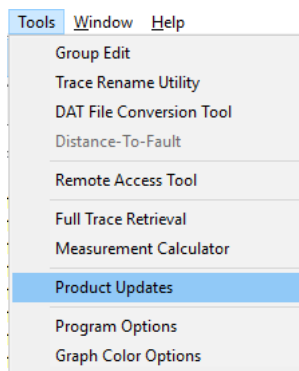


Figure 7-4. Tools Menu: Product Updates Selected

10. This message is displayed. After reading it, click OK.

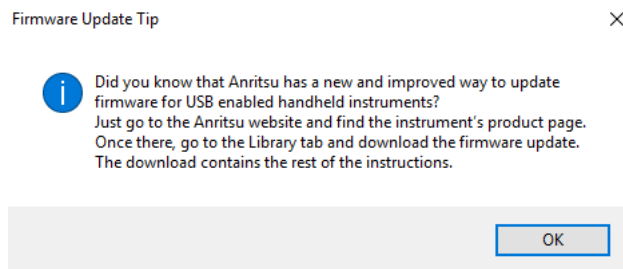


Figure 7-5. Product Update Message

The “[Product Updates Window](#)” opens.

7-3 Product Updates Window

There are a few ways to use this window:

- If the file status for the firmware update is Ready and the Install to Unit button active, the firmware may be installed directly. See “[Update an Instrument's Firmware Directly](#)” on page 7-6
- If the file status for the firmware update is Ready and the Prepare Ext. USB Device button is active, you may download the firmware to the USB and update the firmware. See “[Update Instrument Firmware with USB from MST](#)” on page 7-7. This method might be good if you have several of the same instrument to update.
- If the entry in the File column says Use Go To Website Button, there is only one way to update the firmware and that is to prepare a USB following the instructions on the Anritsu Web page. See “[Firmware Update from an Anritsu Website File](#)” on page 7-9.

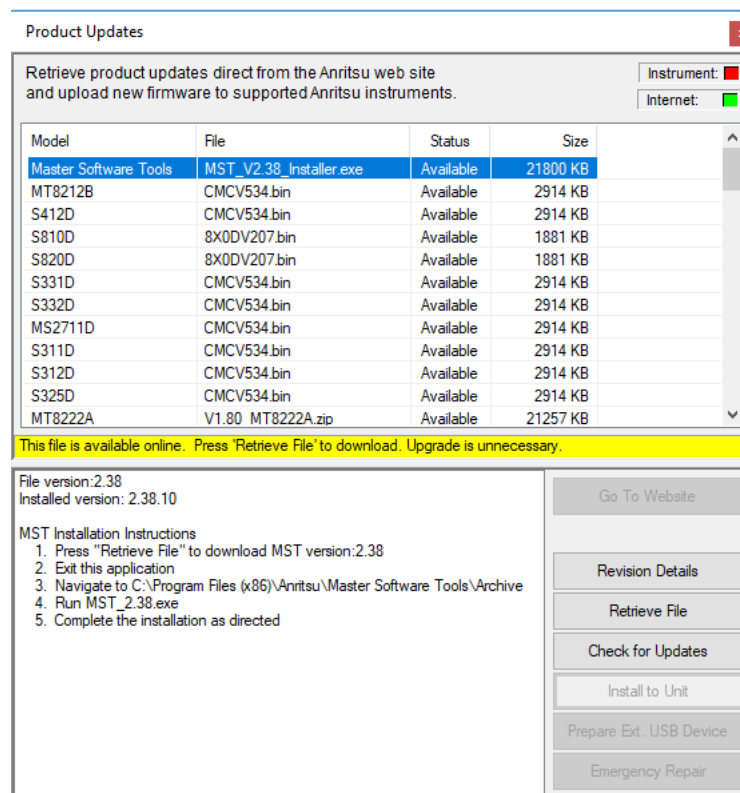


Figure 7-6. Program Updates Window

Notice in the top, right corner of the window, a box labeled Internet. Confirm that the box is colored green. If so, there is an active Internet connection. If red, return to the Program Options window and re-enter your correct Username, Password and network Domain information. The actions that can be done from this window, through buttons are described here:

- **Go To Website** – This button is active only for those rows which contain the text Use “Go To Website” Button in the File column. Pressing this button opens the Anritsu firmware page for the family of instruments related to the instrument. Select the correct update method for updating your instrument and follow any subsequent instructions.
- **Revision Details** – This button is not active for those rows which contain the text Use “Go To Website” Button in the File column. It opens the Customer Service Revision text file for the instrument selected. This file contains pertinent information regarding the instrument such as general features, firmware updates, a history of changes, and fixes.
- **Retrieve File** – This button is active for those rows which contain which contain a .zip filename in the File column. If the instrument’s file highlighted Status is Available, use this button to retrieve a file from the Web to place on your computer. When the file is on the computer, its status will change to Ready.
- **Check for Updates** – This button is active only for instruments that show Use “Go To Website” Button. It checks for recent versions of firmware placed on the Anritsu Website.
- **Install to Unit** – This button is only active when the file status for the highlighted firmware is Ready and if the instrument is connected. **Emergency Repair** – This feature allows you to recover from corrupted operating system firmware. This feature is only available for instruments that have the Ready status; the button will be grayed out for all that cannot use this feature (i.e. Available status). By pressing this button, a OS Recovery dialogue opens with a list of instructions. Refer to [Section 7-6 “Emergency Repair Procedure”](#) on page 7-12 for complete procedure instructions.

7-4 Updating MST Software

1. On the Tools menu, click Program Updates.

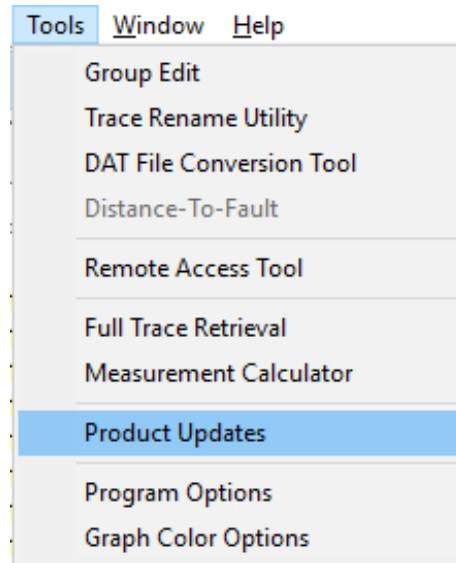


Figure 7-7. Tools Menu: Product Updates Command

2. The Firmware Update Tip dialog opens. It informs you of an improved method of updating USB-enabled handheld instruments (“[Firmware Update from an Anritsu Website File](#)” on page 7-9). Press the OK button when done.

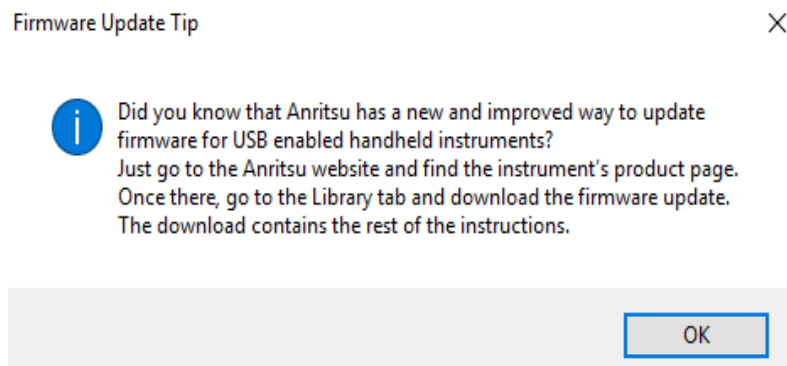


Figure 7-8. Firmware Update Tip Dialog

3. Click MST entry in the Product Update window.

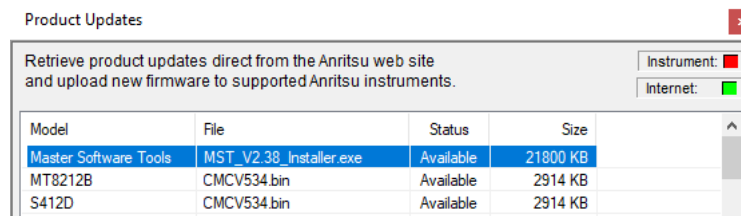


Figure 7-9. Firmware Update Tip Dialog

4. Click Retrieve File and follow the instructions in the window.

7-5 Updating Instrument Firmware

Note

MST does not directly support E-Series instruments. Support for them is only through a USB memory device that is prepared from the files available from the appropriate Anritsu Website instrument page. After the USB memory device is prepared, review your instrument's User Guide for instructions regarding updating the firmware with the USB memory device.

Update an Instrument's Firmware Directly

1. On the Tools menu, click Program Updates.

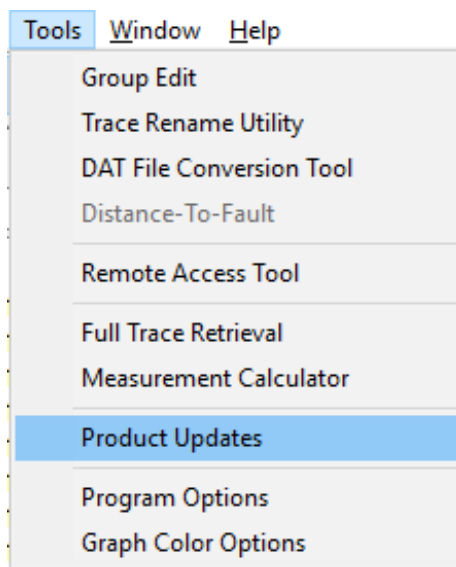


Figure 7-10. Tools Menu: Product Updates Command

2. The Firmware Update Tip message dialog opens. It informs you of an improved method of updating USB-enabled handheld instruments ([“Firmware Update from an Anritsu Website File”](#) on page 7-9). Press the OK button when done.

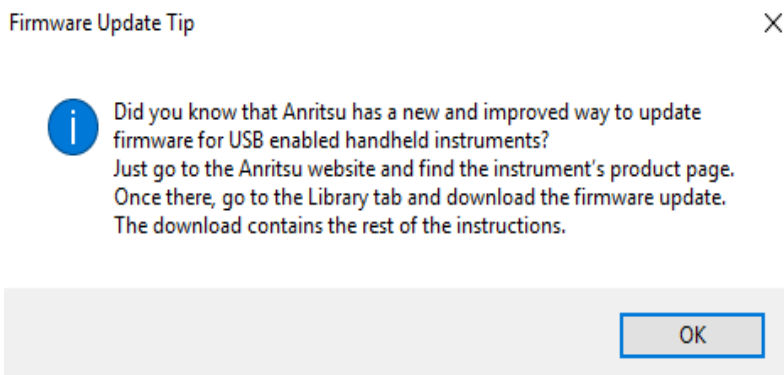


Figure 7-11. Firmware Update Tip Dialog

3. Click Retrieve File.
4. After the status changes to Ready, click the now active Install to Unit button. The test instrument is updated with the new firmware.

There may be instances after opening the Products Update window when you do not find the file you are looking for. In that case:

- a. Click Check for Updates. MST checks for the latest updates in the Anritsu's Product Support Web Site. New updates found will be listed in the File menu.
 - b. Click Retrieve File. MST transfers the file from the website to computer.
 - c. If the file you need is still not listed contact Anritsu support.
5. At this point, click Install to Unit (certain legacy instruments).

Update Instrument Firmware with USB from MST

Note

Anritsu strongly recommends that you remove from the memory stick, any preloaded software files put there by the manufacturer. To accomplish this, format the memory stick as a FAT 32 drive.

1. Place a blank, high-quality USB memory device into your computer's USB slot.

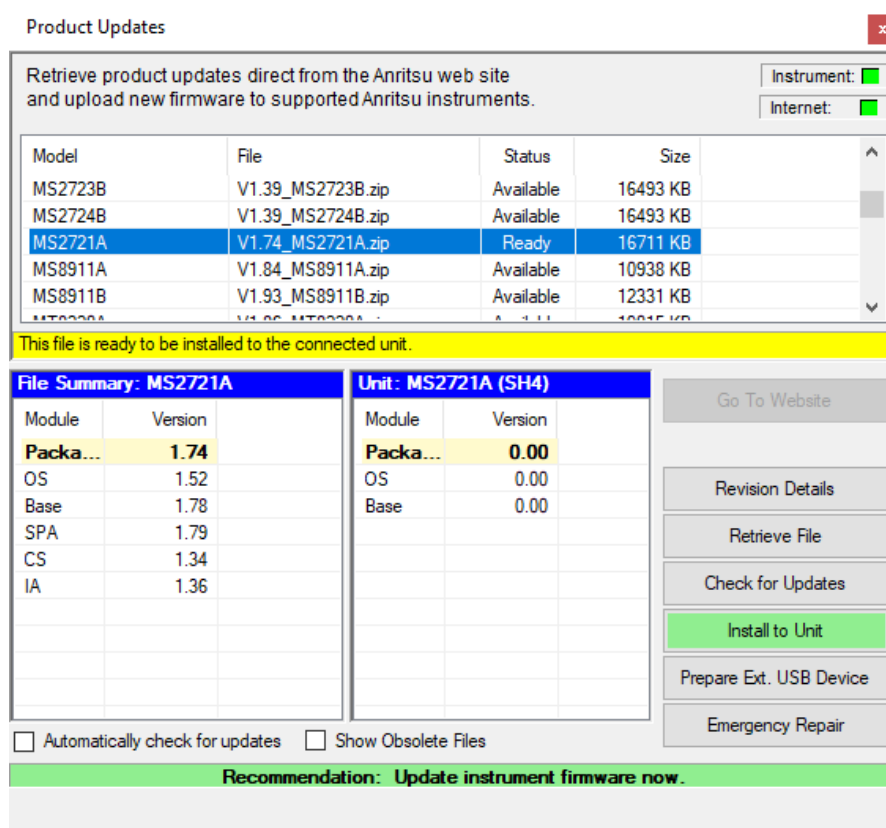


Figure 7-12. Firmware Ready to Install to Unit

2. Click Prepare Ext. USB Device. Click OK on the information dialog.
3. Select the USB drive in the Browse For Folder dialog.

- Click Make New Folder to begin the device preparation.

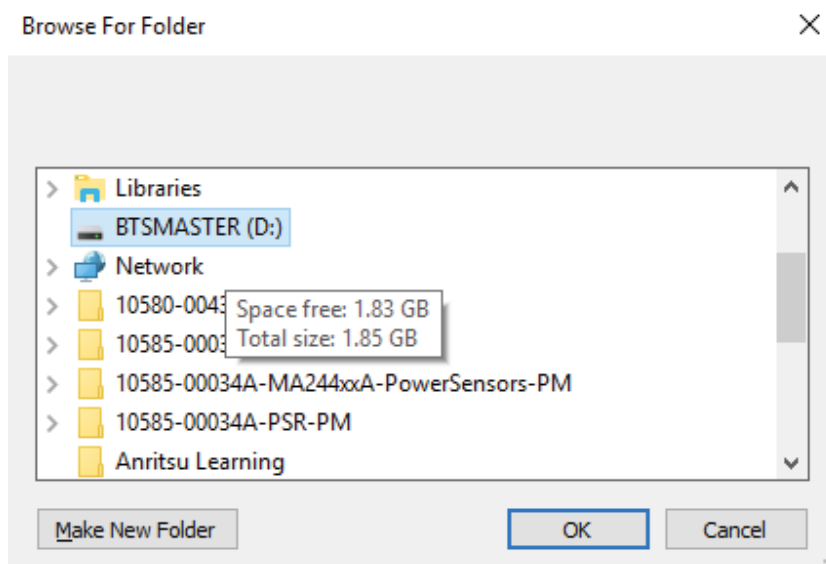


Figure 7-13. Browse for Folder Dialog

- Give the folder any name you want. Press Enter to accept the new folder.
- Click OK to copy the files. Continuing progress is indicated by the Progress monitor.



Figure 7-14. Progress for USB preparation

- A Code Loading Instructions dialog opens after the image creation on the USB memory stick is complete.

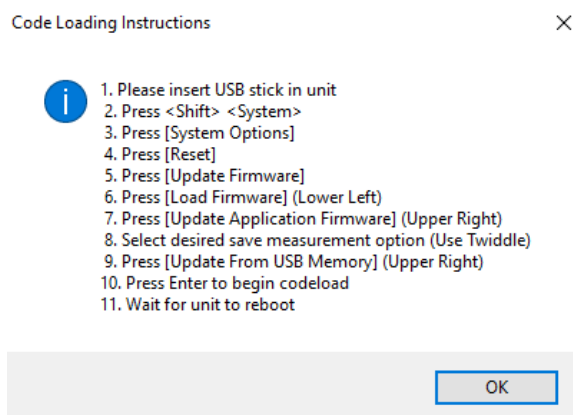


Figure 7-15. Code Loading Instructions Dialog

- Place the USB Memory stick in the instrument's USB Port and follow the Code Loading Instructions.
- When done, Click OK on the Code Loading Instructions dialog.

Firmware Update from an Anritsu Website File

To update your Anritsu instrument firmware, use a blank, high-quality USB memory device with at least 250 MB of free space and FAT32 file system format. This procedure applies only to instruments with USB ports and only to instruments with Use “Go To Website” Button in the File column. Instruments without USB ports might need to use the firmware update procedure found in the instrument’s user guide.

1. Insert the memory device into your computer.
2. From a browser, go to the Anritsu.com, and search “modelnumber update”.

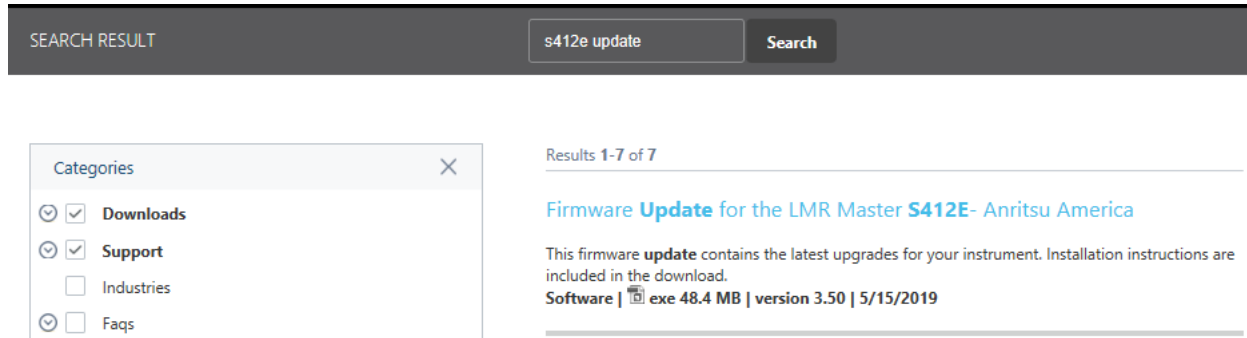


Figure 7-16. Search for Firmware Update

3. Check both Downloads and Support. The result of the search should bring the appropriate link near the top of the list. Click the link.
4. On the product page, click the Downloads button.

Firmware Update for the LMR Master S412E

This firmware update contains the latest upgrades for your instrument. Installation instructions are included in the download.

File Details

File Name:	S412E_V3.50_USBLoader.exe
File Size:	48.4 MB
File Type:	Drivers Software Downloads
Version:	3.50
Release Date:	5/15/2019

DOWNLOAD

Figure 7-17. Download the Firmware

You can, optionally, follow the [Release History](#) link to download a document detailing current and past firmware changes.

Related Links

[Release History >](#)

Figure 7-18. Update History

5. Choose to **Save** or **Save A** the file. Do not run the executable file directly from the Web page.
6. Go to the save location designated in [Step 5](#) and double-click to run the installer file, *Model_Ver_USBLoader.exe*.
7. In the Firmware Update dialog, click to review, then accept the software license agreement.
8. Click **Browse** and select the removable disk drive where the USB device is inserted.
9. Click **Prepare USB Memory Stick** to create the firmware update USB device.
10. After the firmware update tool has finished, click through the final steps in the Firmware Update dialog to close the installer program.
11. Eject the USB memory device from the computer.

Note	The file structure created on the USB memory device by the installer program is necessary for a successful firmware update and must not be altered in any way.
-------------	--

12. Turn off the instrument and insert the USB memory device into the instrument.
13. Make sure the instrument is plugged into an AC power source and not running on battery alone; then turn on the instrument.
14. During bootup, the instrument should detect new firmware on the USB device and ask if you want to upgrade. Press **Yes**.
15. The Automatic Firmware Update dialog should open at this time. If it does, skip to [Step 16](#).

Note	If the same version code as contained on the USB device is already loaded on the instrument, a message indicating that firmware update is skipped will display briefly on the instrument screen. If the firmware update on the memory device does not match your instrument model, an error message will display briefly, indicating that it is not compatible.
-------------	--

If there is no error but the instrument does not enter upgrade mode automatically:

- a. Press **Shift > System (8) > System Options > Reset > Update Firmware**.
 - b. Press **Load Firmware** at the bottom left of the instrument screen.
 - c. Press **Update Application Firmware**.
 - d. The Firmware Update dialog opens.
16. Use the up/down arrow keys or the rotary knob to select one of the Save modes.
 - **Save none:** No attempt is made to save any user data.
 - **Save user data:** User data is saved to the selected external media device.
 - **Save & restore user data:** User data is saved to the selected external media device. The instrument also attempts to restore the files to the instrument after the update.

Warning	The same USB device used to do the firmware update will be the temporary holding device for all traces on the instrument. If the number and size of the saved files on the instrument exceeds the available space on the USB device, user data will be lost.
----------------	--

17. Press **Enter**.

To cancel the operation, press **Esc**. In this case, you need to press **Shift > Mode (9)** and select an application from the Mode Selector list in order to exit upgrade mode and resume normal instrument operation.

18. Press **Enter** again to confirm your intention to proceed with the firmware upgrade.

Warning You cannot stop the upgrade after it has started. To avoid potential permanent damage, do not turn off the instrument nor remove the USB memory device during the firmware update.

19. After the update is complete, the instrument should reboot automatically.

If the instrument turns off but does not restart on its own, remove the USB memory device and perform a master power reset:

- Note**
1. Press and hold the **System (8)** key.
 2. Press the **Power** button and release it.
 3. Hold **System (8)** key until the Anritsu splash screen displays; then release it.

Be sure to use this procedure to perform a master power reset while turning on the instrument. Pressing the **Power** button alone may put the instrument into an unrecoverable error state.

7-6 Emergency Repair Procedure

If you have problems with booting up or updating firmware on the test instrument, use the following steps to resolve the problem.

1. Power off the instrument.

Warning It is vital that the correct instrument model firmware is downloaded during the following step or irreversible damage to the instrument can occur.

2. Prepare a firmware update USB device as described “[Firmware Update from an Anritsu Website File](#)” on page 7-9, and insert it into the instrument. Double-check that you have the correct model firmware.
3. Power up the instrument into bootstrap mode, choose either:
 - On touchscreen instruments, hold **Shift**, **4**, and **0** keys while powering up.
or
 - On non-touchscreen instruments, hold the **1st**, **3rd** and **5th** soft keys, located right of the display directly below the **Esc** key, while powering up.

The Bootstrap screen (similar to below) will appear after a few seconds.



Figure 7-19. Option Upgrade Complete Notification Window

4. Press **Load All**. The instrument will reload available applications and FPGA firmware and return to the above screen when complete.

Note Use the other choices only as directed by Anritsu customer service.

5. Press and hold the System (8) key.
6. Press the Power button and release it.
7. Continue to hold the System (8) key until the Anritsu splash screen displays; then release the button.
8. Reboot and the instrument should start up normally.

7-7 Generating an Instrument Config File and Installing A New License File

The config file is the essential first step prior to receiving a license file from Anritsu customer service.

To automatically query the Anritsu website for updates, you must configure the MST Internet Settings.

1. Run the MST program.
2. Connect to the instrument.
3. Generate a Config File:
 - a. Pull down the Sync menu and highlight Device Status and Options to open the sub-menu.

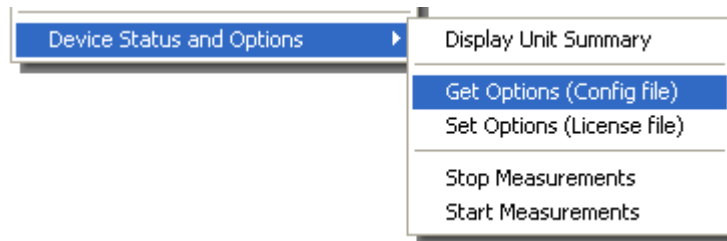


Figure 7-20. Get Options Dialog

- b. Click Get Options (Config File). The Save Config File window opens.
- c. Navigate to the folder containing the configuration file.

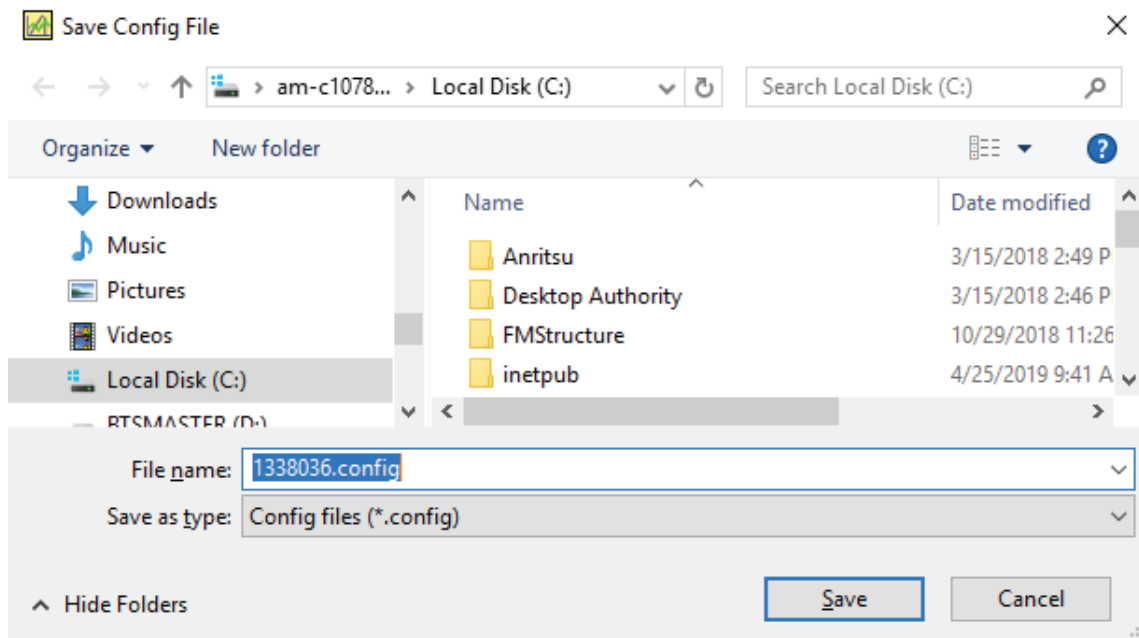


Figure 7-21. Save Config File Dialog

- d. Select the desired folder or create a new folder to save the config file. Use the file name given in the entry box. (The filename format is predetermined: Model-space-serialnumber.config).

4. Send the config file to Anritsu customer service, who generates and returns a license file.
5. Install a license file using the instructions provided with the license file. For the E series and T series products, the license file is copied to a USB memory stick and inserted into the unit. When powering on the unit, a message temporarily appears stating the options have been updated and a restart is necessary to use the new options. For other models, if no instructions came with the license file, follow these steps:
 - a. Pull down the Sync menu and highlight Device Status and Options to open the sub-menu.

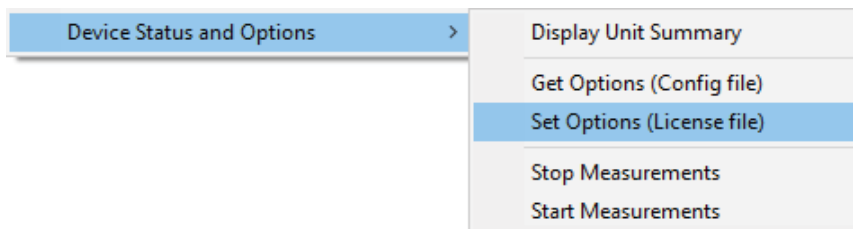


Figure 7-22. Set Options Selected

- b. Click Set Options (License File). The Open License File window opens.

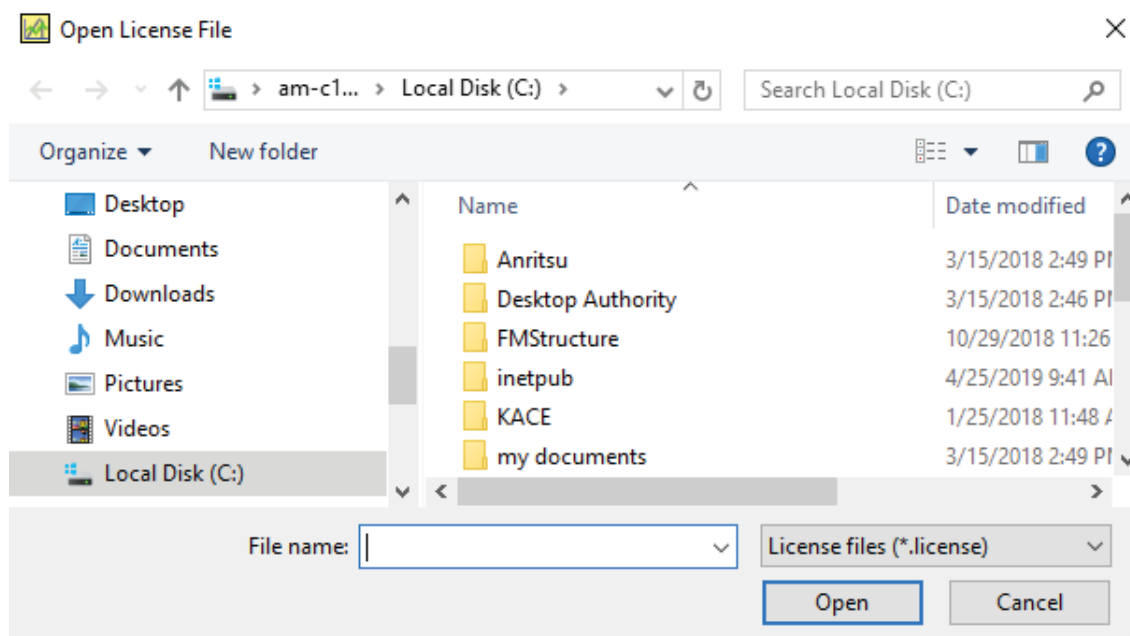


Figure 7-23. Open License File Dialog

- c. Navigate to the folder where you saved the license file supplied by Anritsu customer service.
 - d. Select the file and click **Open**. The filename format is model-space-serialnumber.license.

- e. MST installs the new license into the instrument. After the installation is complete, the following dialog appears.



Figure 7-24. Option Upgrade Complete

- f. Follow the instructions in the message.
- g. Verify the new options are listed on the System Status screen.

Appendix A — Applications and Files

A-1 Supported Anritsu Instruments

For the most recent list of supported instruments, go to Master Software Tools in the Anritsu Website <https://www.anritsu.com/en-us/test-measurement/products/mst>.

A-2 Supported File Types

These measurement and data file types are the ones supported by MST.

File Type	Extension
Antenna, Cable, Signal Standards	*.txt
CDMA Standard files	*.cdma
Channel Scanner files	*.cs
CW Generator files	*.cswg
Display Histogram files	*.cpp
DVBTH files	*.dvb
DVBTHSFN files	*.dsfn
E1 Measurement files	*.e1
EV-DO Standard files	*.evdo
Fixed WiMAX measurement files	*.wmxd
Folder Spectrogram files	*.fsg
GSM/GPRS/EDGE files	*.edg
Hi-Accuracy Power Meter files	*.hipm
Interference Analyzer files	*.ia, *.iac
JPEG files	*.jpg
LTE files	*.lte
Language files	*.znc
Legacy Database files	*.mdb
Legacy Trace files	*.dat
Limit Line files	*.lim
Mobile WiMAX measurement files	*.wmxe
Mobile WiMAX parameter files	*.xml
Power Meter files	*.pm
SPA files	*.spa
Setup files	*.stp
Signal Standard files	*.sig
T1 Measurement files	*.t1
TD-SCDMA files	*.tds
TM (Transmission Measurement) files	*.tm
VNA files	*.vna
WCDMA/HSDPA files	*.wcd

These output file types are supported by MST:

File Type	Extension
Comma files	*.csv
Export files	*.s2p
Google Map Export files	*.kml
MapPoint Export files	*.dut, *.ptm
Report files	*.html
Report files	*.pdf
Script Master – Channel Scanner files	*.smcs
Script Master – GSM/WCDMA files	*.pfs, *.c
Spectrogram files	*.avi
Trace Copy files	*.bmp

Appendix B — FAQs

B-1 Intermittent Boot-up Problems with Dell Docking Stations

Note

This is only for those instruments which can be updated directly through MST. If you choose to update with a USB stick, then disregard this section.

Intermittent boot-up problems have occurred with Anritsu instruments after code loading using MST on Dell Latitude D620 and D630 laptops. Problems are related to code loading when the laptop is attached to the docking station or with the Integrated USB hub BIOS setting. These problems affect code loading with either USB or Ethernet connections. Please follow the steps for your Dell model laptop below to avoid these problems.

Dell Latitude D620 Series Laptops

1. Power off the laptop and remove it from the docking station.
2. Attach either a USB or an Ethernet cable to your laptop.
3. Turn the laptop power on.
4. During the laptop BIOS boot up process, before the Windows screen, press **F2**.
 - a. The BIOS page opens.

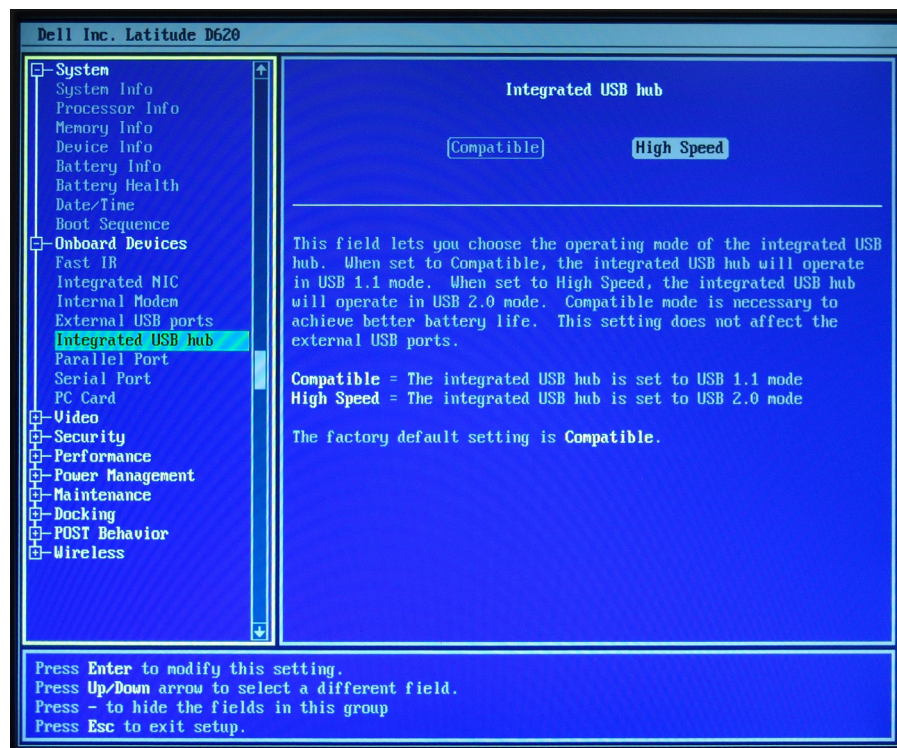


Figure B-1. BIOS Window for USB Hub

- b. Scroll down to Onboard Devices using the Down arrow.
 1. Press **Enter** to expand the list.
 2. Scroll down to Integrated USB hub.

3. Press **Enter** to modify this setting.
 4. Highlight High Speed using the Left/Right arrow.
 5. Press **Enter** when done modifying this field.
- c. Press **Esc** to exit the BIOS Setup.
 - d. Press the **Left/Right** arrow to select **Exit**.
 - e. Press **Enter**.

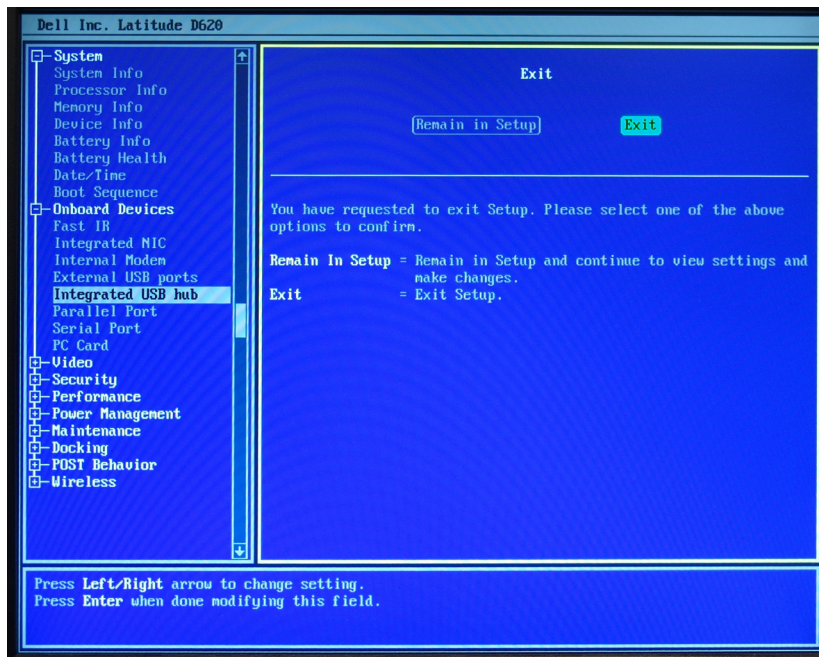


Figure B-2. Exit BIOS

5. Run **MST**. Follow the instructions for Code Loading in MST. For additional information regarding this topic, go to the MST Help menu and click the **Help Contents** command line. This opens the Help.pdf file. Go to Chapter 7 Instrument Files Update.
6. After successfully code loading the Anritsu instrument, power down the laptop, detach the communication cable from the laptop, and re-dock the laptop into the docking station.
7. You have the option to return the Integrated USB hub parameter to the factory default setting Compatible or keep the new setting, High Speed.

Note

If you are using or suspect to be using known USB 1.1 rev devices e.g. mouse, keyboard, or have intermittent problems with this new setting, follow the instructions in step 4 above to reset Integrated USB hub to Compatible. When in the Integrated USB hub field, use the Left/Right arrow to highlight Compatible.

Leave the Integrated USB hub setting at High Speed if no USB 1.1 rev devices are in use or no USB communication problems occur.

Dell Latitude D630 Series Laptops

1. Power off the laptop and remove it from the docking station.
2. Attach either a USB or an Ethernet cable to your laptop.
3. Turn the laptop power on.
4. Run **MST**. Follow the instructions for Code Loading in MST. For additional information regarding this topic, go to the MST Help menu and click the **Help Contents** command line. This opens the Help.pdf file. Go to Chapter 7 Instrument Files Update.
5. After successfully code loading the Anritsu instrument, power down the laptop, detach the communication cable from the laptop, and re-dock the laptop into the docking station.

B-2 Activating a Different Language

The following procedure text are for MST users whose computers are in other countries or users who prefer to work with their computers in a different language.

Note

These instructions are for a computer running Windows 10. The actual steps for your computer might be different if it has a different version of the OS installed.

1. Open the Control panel.
2. Under Clock, Language and Region, click Add a language.

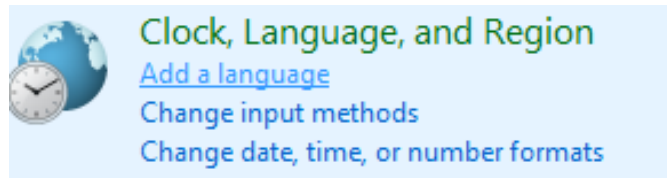


Figure B-3. Clock, Language, and Region

3. The Change your language preferences dialog displays.

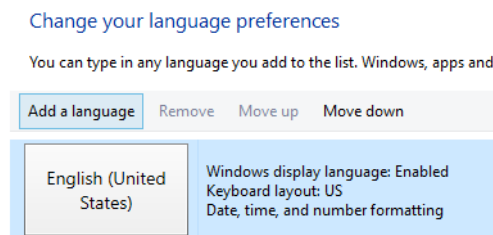


Figure B-4. Change your language preferences

4. Click Add a language. The Add a language dialog displays.

5. Select a language and click Open.

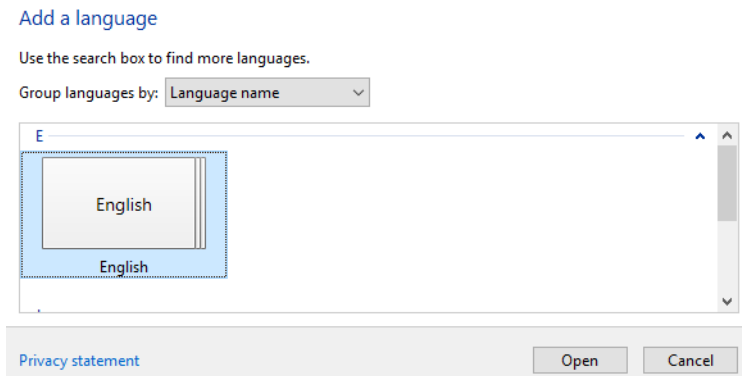


Figure B-5. Add a language

B-3 Instrument Password Protection Feature

Some customers require a secure line when using an Ethernet connection between their instrument and MST. The password feature is implemented on the instrument. If active, the window in [Figure B-6](#) opens when attempting to connect to the instrument from MST. Enter the password and press the **OK** button. (For more information regarding Remote Access Password, please refer to your instrument's user guide.)

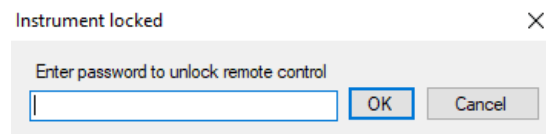


Figure B-6. Instrument Locked Input Dialog

Anritsu



10580-00439



B

Anritsu Company
490 Jarvis Drive
Morgan Hill, CA 95037-2809
USA
<http://www.anritsu.com>