

User Guide

Remote Spectrum Monitor MS27201A

High-Performance RF Spectrum Monitor



Anritsu

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Chapter 1 — General Information

1-1 Introduction

The MS27201A Remote Spectrum Monitor (RSM) User Guide is part of a set of manuals that cover all of the instrument functions and their use. This manual covers the instrument overview, system functions, and other common features, along with a brief guide to basic measurement concepts and setups. Most instrument operations are covered in specific chapters of this manual as listed below. Remote programming is covered in the programming manual. Additionally, the MS27201A RSM offers a remote PC software that replicates the instrument user interface on your PC screen and allows network connection to an instrument or the ability to recall data and perform on-screen measurement analysis without a connection to an instrument (refer to “MS27201A PC Software” on page 2-4).

Before You Begin

- Read the *Remote Spectrum Monitor Product Information, Compliance, and Safety Guide* (PN: 10100-00064) for important safety, legal, and regulatory notices before operating the equipment.

Additional Documentation

Table 1-1. Related Manuals

Document Part Number	Description
10100-00064	Product Information, Compliance, and Safety Notices
11410-02833	MS27201A Remote Spectrum Monitor Technical Data Sheet
10580-00481	MS27201A Remote Spectrum Monitor Programming Manual
10580-00418	Vision™ MX280001A Spectrum Monitoring Application Software User Guide
10580-00447	Field Master Series Spectrum Analyzer Measurement Guide Zero Span IF Output (Option 89) Gated Sweep (Option 90) AM/FM Modulation Measurement (Option 509)
10580-00448	Field Master Series Real-Time Spectrum Analyzer (RTSA) Measurement Guide (Option 199)
10580-00449	Field Master Series 5G NR Measurement Guide (Option 888) GNSS Receiver (Option 31) Gated Sweep (Option 90)
10580-00450	Field Master Series LTE Signal Analyzer Measurement Guide (Option 883) Gated Sweep (Option 90)
10580-00451	Field Master Series Pulse Analyzer Measurement Guide (Option 421)
10580-00490	Field Master Series IQ Capture/Streaming Measurement Guide (Options 124/126 and Options 125/127)

For additional information and literature covering your product, visit the product page of your instrument and select the Library tab:

<https://www.anritsu.com/en-US/test-measurement/products/ms2720xa>

For more information and literature on Vision Spectrum Monitoring Application Software visit the product page and select the Library tab:

<https://www.anritsu.com/en-us/test-measurement/products/mx280001a>

Document Conventions

The following conventions are used throughout the MS27201A documentation set.

Instrument Identification

When identifying a frequency option for the MS27201A, that option number is appended after the model number; example: MS27201A-0709.

User Interface

The MS27201A user interface consists of menus, buttons, toolbars, and dialog boxes.

User Interface Navigation

Elements in navigation paths are separated as follows: MARKER > PEAK SEARCH > NEXT PEAK.

1-2 Instrument Description

The MS27201A RSM is a synthesizer-based spectrum monitor that provides quick and accurate measurement results. The instrument is designed for monitoring, measuring, and analyzing signal environments. Measurements can easily be made by using the main instrument functions: frequency, span, amplitude, and bandwidth. A full range of marker capabilities (such as peak, center, and delta functions) are provided for faster, more comprehensive analysis of displayed signals. Upper and lower multi-segmented limit lines are available to create quick, simple pass/fail measurements.

Time and date stamping of measurement data is automatic. The internal memory provides for the storage and recall of up to 1000 measurement setups and up to 1000 traces. Measurements and setups can be stored internally on the instrument or on a USB memory device for later recall.

Note

Not all after-market USB memory devices are compatible with Remote Spectrum Monitor. The USB memory device must contain a single partition using FAT32, exFAT, NTFS and ext4 file formats.

Available Models

Table 1-2 lists the frequency options available with the MS27201A RSM.

Table 1-2. Remote Spectrum Monitor Frequency Options

Model	Frequency Range
MS27201A-0709	Remote Spectrum Monitor, 9 kHz to 9 GHz
MS27201A-0714	Remote Spectrum Monitor, 9 kHz to 14 GHz
MS27201A-0720	Remote Spectrum Monitor, 9 kHz to 20 GHz
MS27201A-0726	Remote Spectrum Monitor, 9 kHz to 26.5 GHz
MS27201A-0732	Remote Spectrum Monitor, 9 kHz to 32 GHz
MS27201A-0743	Remote Spectrum Monitor, 9 kHz to 43.5 GHz
MS27201A-0754	Remote Spectrum Monitor, 9 kHz to 54 GHz

Available Options

Available options for the Remote Spectrum Monitor are listed in [Table 1-3](#).

Table 1-3. Available Options

Option	Description
MS27201A-0031	GNSS Receiver (requires external GPS antenna)
MS27201A-0089	Zero Span IF Output
MS27201A-0090	Gated Sweep
MS27201A-0104	110 MHz Analysis Bandwidth
MS27201A-0124	IQ Waveform Capture
MS27201A-0125	IQ Waveform Streaming (requires Option 124)
MS27201A-0126	IQ Waveform Capture (non-export-controlled)
MS27201A-0127	IQ Waveform Streaming (non-export-controlled) (requires Option 126)
MS27201A-0128	Vector Signal Analysis enabled (requires Option 124 or 26)
MS27201A-0199	Real-Time Spectrum Analyzer
MS27201A-0400	Vision Monitor enabled
MS27201A-0407	Vision High-Speed Port Scanner enabled
MS27201A-0421	Pulse Analyzer
MS27201A-0509	AM/FM Modulation Measurement
MS27201A-0883	LTE FDD/TDD Measurements (requires GNSS Receiver MS27201A-0031)
MS27201A-0888	5GNR Downlink Measurements (requires GNSS Receiver MS27201A-0031)
MS27201A-xxxx-0097	Accredited Calibration to ISO17025 and ANSI/NCSL Z540-1 (xxxx is the frequency Option number)
MS27201A-xxxx-0098	Standard Calibration to ISO17025 and ANSI/NCSL Z540-1 (xxxx is the frequency Option number)
MS27201A-xxxx-0099	Premium Calibration to ISO17025 and ANSI/NCSL Z540-1 plus test data (xxxx is the frequency Option number)

1-3 Instrument Care and Preventive Maintenance

Instrument care and preventive maintenance consist of proper operation in a suitable environment, occasional cleaning of the instrument, and inspecting and cleaning the RF connectors and all accessories before use. Clean the instrument with a soft, lint-free cloth dampened with water or water and a mild cleaning solution.

Caution To avoid damaging the case, do not use solvents or abrasive cleaners.

Ventilation and Cooling

The Remote Spectrum Monitor provides active cooling of the internal components to prevent damage from overheating. The airflow vents on the edges and bottom of the instrument must be kept clear and unobstructed while the instrument is powered on. When using the Remote Spectrum Monitor on a desktop, bench or the instrument can be placed flat on its back to facilitate increased airflow.

Caution Do not operate or store the Remote Spectrum Monitor in extreme environments. Refer to the instrument Technical Data Sheet for the specified operating and storage conditions.

Connector Care

Clean the RF connectors and center pins with a cotton swab dampened with denatured alcohol. Visually inspect the connectors. The fingers of the N(f) and K(f) connectors and the pins of the N(m) and K(m) connectors should be unbroken and uniform in appearance. If you are unsure whether the connectors are undamaged, gauge the connectors to confirm that the dimensions are correct. Visually inspect the test port cable(s). The test port cable should be uniform in appearance and not stretched, kinked, dented, or broken.

To prevent damage to your instrument, do not use pliers or a plain wrench to tighten the Type-N and Type-K connectors. The recommended torque is 12 lbf · in to 15 lbf · in (1.36 N · m to 1.70 N · m). Inadequate torque settings can affect measurement accuracy. Over-tightening connectors can damage the cable, the connector, the instrument, or all of these items.

Visually inspect connectors for general wear, cleanliness, and for damage such as bent pins or connector rings. Repair or replace damaged connectors immediately. Dirty connectors can limit the accuracy of your measurements. Damaged connectors can harm the instrument. Connection of cables carrying an electrostatic potential, excess power, or excess voltage can damage the connector, the instrument, or both.

Connecting Procedure

1. Carefully align the connectors. The male connector center pin must slip concentrically into the contact fingers of the female connector.
2. To tighten, turn the connector nut, not the connector body. Major damage can occur to the center conductor and to the outer conductor if the connector body is twisted.
3. If you use a torque wrench, initially tighten by hand so that approximately 1/8 turn or 45 degrees of rotation remains for the final tightening with the torque wrench.
4. Relieve any side pressure on the connection (such as from long or heavy cables) in order to assure consistent torque. Use an open-end wrench to keep the connector body from turning while tightening with the torque wrench. Do not over-torque the connector.

Disconnecting Procedure

1. If a wrench is needed, use an open-end wrench to keep the connector body from turning while loosening with a second wrench.
2. Complete the disconnection by hand, turning only the connector nut.
3. Pull the connectors straight apart without twisting or bending.

ESD Caution

The Remote Spectrum Monitor, like other high performance instruments, is susceptible to electrostatic discharge (ESD) damage. Coaxial cables and antennas often build up a static charge, which (if allowed to discharge by connecting directly to the instrument without discharging the static charge) may damage the Remote Spectrum Monitor input circuitry. Instrument operators must be aware of the potential for ESD damage and take all necessary precautions.

Operators should exercise practices outlined within industry standards such as JEDEC-625 (EIA-625), MIL-HDBK-263, and MIL-STD-1686, which pertain to ESD and ESDS devices, equipment, and practices. Because these apply to the Remote Spectrum Monitor, it is recommended that any static charges that may be present be dissipated before connecting coaxial cables or antennas to the instrument. This may be as simple as temporarily attaching a short or load device to the cable or antenna prior to attaching to the Remote Spectrum Monitor. It is important to remember that the operator may also carry a static charge that can cause damage. Following the practices outlined in the above standards will ensure a safe environment for both personnel and equipment.

1-4 Calibration and Verification

The Remote Spectrum Monitor comes fully calibrated from the factory and there are no field-adjustable components. Anritsu recommends annual calibration and performance verification by local Anritsu service centers.

1-5 Contacting Anritsu for Sales and Service

To contact Anritsu, visit the following URL and select the services in your region:

<http://www.anritsu.com/contact-us>

Chapter 2 — Instrument Overview

2-1 Introduction

This chapter provides an overview of the Anritsu MS27201A RSM. It describes the instrument hardware features, general system settings and instrument configurations, and the connector panels. The Remote Spectrum Monitor uses a remote PC for the user interface. The interface menus can vary depending on the current measurement configuration, installed options, and selected instrument function. For detailed information on the instrument's user interface and functions, refer to spectrum analyzer measurement guide (PN: 10580-00447).

2-2 Connector Panels

The MS27201A Remote Spectrum Monitor uses two connector panels to provide for all physical IO. These panels use a variety of connector types intended for their purpose.

RF Connectors

The main RF input connector can be Type N or Type K, depending on the frequency option that is installed. These are ruggedized 50 Ω connectors. Type N connectors are female and Type K are male. Additional IO is provided with SMA style connectors. The SMA connectors are 50 Ω female connectors.

Caution	To prevent damage to your instrument, do not use pliers or a plain wrench to tighten the connectors. Do not overtighten the connector. The recommended torque for Type K is 8 lbf·in (0.9 N·m or 90 N·cm). The recommended torque for Type N is 12 lbf·in (1.35 N·m or 135 N·cm).
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Front Panel

Figure 2-1 shows the front connector panel on the MS27201A.

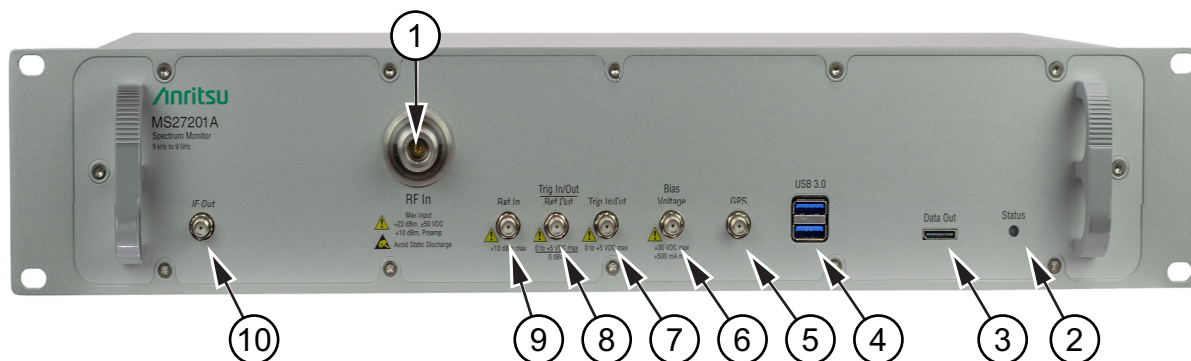


Figure 2-1. Front Panel Connectors

1. RF In Port

This is a 50 Ω ruggedized connector of the following:

- Type N female with options 709 and 720
- Type K male with option 743

Maximum Input: ± 50 VDC, +23 dBm, +13 dBm with Preamp On

To prevent damage to your instrument, do not try to mate incorrect connector types or use pliers or a plain wrench to tighten the connector. Do not overtighten the connector. The recommended torque for Type K is 8 lbf in (0.9 N·m or 90 N·cm). The recommended torque for Type N is 12 lbf in (1.35 N·m or 135 N·cm).

2. Status Indicator

The status indicator illuminates when power is applied to the instrument.

3. Data Out Port

The Data Out port is used for IQ Streaming. Refer to IQ Capture/Streaming Measurement Guide (PN: 10580-00490) for detailed information. This is a multi-purpose, hot pluggable input/output (I/O) interface.

4. USB 3.0 Interface – Type A

The Remote Spectrum Monitor has two Type A USB connectors that accept USB storage devices for saving measurements, setup data, and screen images. To ensure the device or its data does not become corrupted, click the eject icon to eject (unmount) the USB device before it is unplugged from the USB port (see [Section 2-9 “Title Bar” on page 2-15](#)).

5. GPS Antenna Connector

The GPS antenna connection on the Remote Spectrum Monitor is type SMA female. This connector also provides 5.0/3.3 VDC for an active GPS antenna.

6. Bias Voltage

The bias voltage connection is type SMA female. The power supply is set up to provide 1 V to 34 V with a resolution of 0.1 V. The maximum current is 1 A, but with at total maximum power of 15 W.

7. Trigger In/Out

A TTL signal that is applied to the external trigger 50 Ω SMA connector causes a single sweep to occur. In spectrum analysis, triggering is generally used in zero span, and triggering occurs on the rising edge of the signal. After the sweep is complete, the resultant trace is displayed until the next trigger signal arrives.

8. Trigger In/Out / Ref Out (10 MHz)

This port can be configured as a trigger in/out as above or as a reference output. The reference output port is a 50 Ω SMA female connector that provides 10 MHz at approximately -7 dBm to 0 dBm.

9. Ref In

The external reference input port is a 50 Ω SMA connector that provides for input of an external frequency reference. Refer to your technical data sheet for valid frequencies. The instrument automatically selects the frequency reference in the following order of priority: external, GPS, then the internal time base.

10. IF Out

This 50 Ω SMA connector provides internal IF output. The nominal frequency range is 325 MHz with FFT capture bandwidth ≤ 32 MHz and 300 MHz with FFT capture bandwidth = 100 MHz. The nominal RF output level is -4 dBm with a 10 MHz, -20 dBm input, and with 0 dB input attenuation and preamp off. The spectrum can be inverted in certain RF input bands.

Rear Panel

Figure 2-2 shows the real connector panel on the MS27201A.



Figure 2-2. Real Panel Connectors

1. External Power

This is a 2.5 mm by 5.5 mm barrel connector, 14-16 VDC, 5 A, center positive, used to power the instrument.

Warning

When using the AC-DC Adapter, always use a three-wire power cable that is connected to a three-wire power line outlet. If power is supplied without grounding the equipment in this manner, the user is at risk of receiving a severe or fatal electric shock.

Refer to [“Turning On the MS27201A RSM” on page 2-4](#).

2. LAN Connection

The RJ-45 connector is used to connect the Remote Spectrum Monitor to a local area network or directly to a PC with an Ethernet crossover cable. See [“Ethernet Connection” on page 2-24](#) for more details.

3. Service Port

The service port is for Anritsu customer service use only.

4. Cooling Fan

The cooling fan ventilates the internal heat from the instrument. Keep the fan inlet and exhaust ports clear of obstructions at all times for proper ventilation and cooling of the instrument.

5. Security Lock

The security lock slot accepts standard laptop cable locks.

2-3 Turning On the MS27201A RSM

The Anritsu MS27201A RSM is operated from a 15 VDC source connected to the rear panel. This can be achieved with either the Anritsu AC-DC adapter or the automotive power adapter, which can be purchased as an optional accessory. Refer to the instrument Technical Data Sheet for more options and accessories.

Caution	When using the Automotive Power Adapter, always verify that the supply is rated for a minimum of 75 watts @ 15 VDC, and that the socket is clear of any dirt or debris. If the adapter plug becomes hot to touch during operation, discontinue use immediately.
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The Remote Spectrum Monitor automatically turns on when power is applied to the rear panel power input port and takes approximately 60 seconds to completely power-up and to load the instrument software. At the completion of this process, the instrument is ready for use.

Note	Keep the fan inlet and exhaust ports clear of obstructions at all times for proper ventilation and cooling of the instrument.
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2-4 MS27201A PC Software

The MS27201A PC software provides remote access to a network connected instrument and displays the MS27201A user interface, instrument controls, and live measurement data on the computer screen. The software also allows you to load measurement and setup data from saved files and then perform measurement analysis on the recalled traces, even when instrument hardware is not available or is not connected to the PC by using the localhost (refer to [“Connecting to the MS27201A or Localhost” on page 2-7](#)). The user interface provides the same functionality when an instrument is connected with the exception that file operations will interface with the PC file system rather than on the instrument, and save on event operations will be saved to the instrument memory (refer to [“Files” on page 2-36](#)).

Connecting to the localhost is like connecting to an instrument so there is no expectation of carrying over settings or trace data from one to the other. The localhost will include option controlled functionality with most options automatically enabled (refer to [“GUI Overview” on page 2-8](#)).

Vision Monitor

Vision Monitor is a PC user interface for monitoring remote spectrum activity. Measurement data is provided in a variety of formats including spectrum trace data, spectrograms, tables and plots. Real-time spectrum measurements can be accessed from anywhere in the network where multiple monitors are deployed.

The Vision Monitor application is fully automated. Measurements can be captured and periodically uploaded to a database for further processing. Depending on need and storage capacity, users can store spectrum history over many months or years.

All spectrum measurement databases are searchable, allowing the user to quickly locate patterns of signal activity relevant to an investigation. The spectrum history can also potentially be used in legal proceedings for documenting illegal or unlicensed broadcast activity. Other functions provided by Vision Monitor include the following:

- Management functions for all remote spectrum monitors deployed
- Threshold and trace mask settings for alarm generation
- Reporting on spectrum integrity on a daily or weekly basis
- Visualization capability for probe positions using Google Maps™ or OpenStreetMap™
- Control capabilities for each spectrum monitor probe
- Alarm reporting showing location on map where violation occurred
- Email alerts
- Signal ID for Broadcasters

For more information and literature on Vision Spectrum Monitoring Application Software visit the product page and select the Library tab:

<https://www.anritsu.com/en-us/test-measurement/products/mx280001a>

2-5 PC Requirements for MS27201A

Minimum computer requirements are listed below:

- Intel Core i5 or higher processor
- 8 GB RAM
- Windows 10, 64-bit
- 1 GB disk space
- Open GL (ES) 2.0 support
- Display resolution 1280 x 800
- Ethernet cable (for connecting to an MS27201A instrument)

2-6 Installation

1. Download the MS27201A software from the product page:
<http://www.anritsu.com/en-US/test-measurement/products/ms2720xa>
2. Launch the MS27201A executable file and follow the on-screen instructions after selecting YES on the User Account Control dialog box.

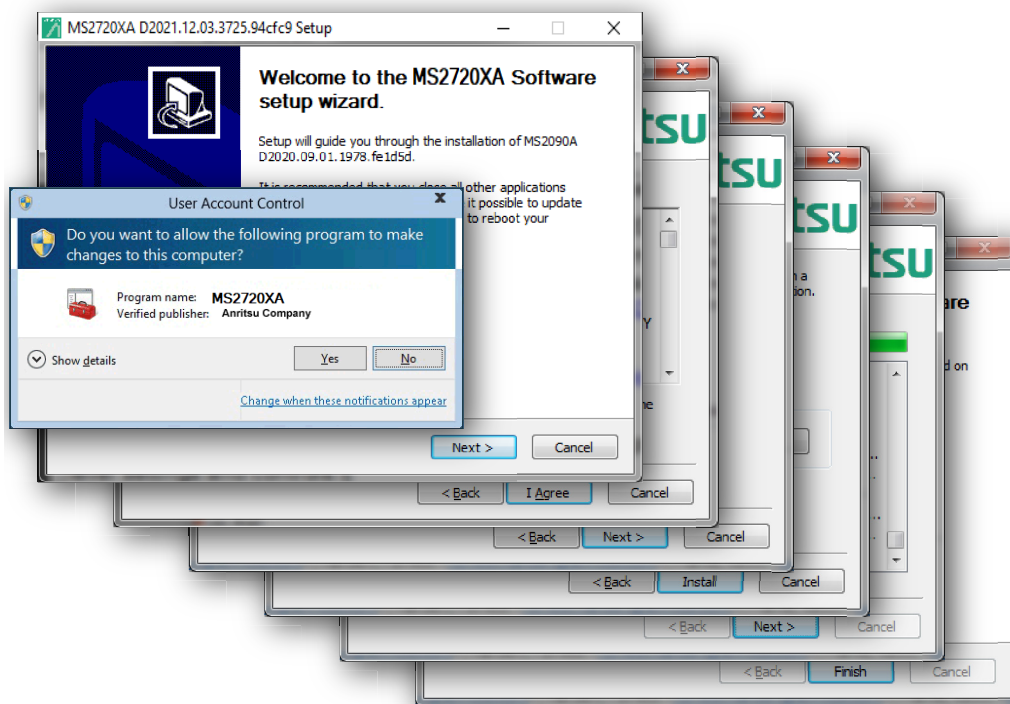
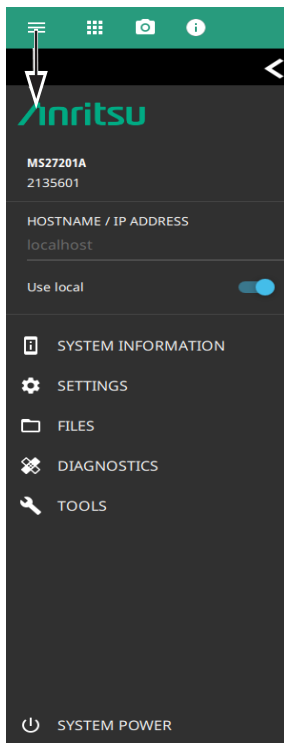


Figure 2-3. MS27201A Installation

2-7 Connecting to the MS27201A or Localhost

Connecting to a networked instrument or to the localhost is established via the System menu. Insert the USB memory device into the instrument and wait for about 10 seconds. Insert the USB memory device onto a PC, then open the ip.txt file and copy the IP address in the HOSTNAME/IP ADDRESS field on the MS27201A software. Otherwise use the static IP address (10.0.0.2) that is shipped with the unit.



The System menu identifies the instrument model and serial number.

HOSTNAME/IP ADDRESS: This field is used to specify the IP address or hostname of an instrument that is connected to the network.

When **Use local** (localhost) is toggled on, the software will connect locally to provide some UI functionality.

Note that some of the system menus have limited functionality when the software is connected to the localhost. When connected to an instrument, refer to [“System Menu” on page 2-17](#).

SYSTEM INFORMATION: Displays information about the instrument and software.

SETTINGS: Provides access to setting the display color theme and screenshot capture settings (refer to [“Display Settings” on page 2-19](#)).

FILES: Opens the Windows file explorer. Refer to [“Files” on page 2-36](#).

DIAGNOSTICS: Opens [“Remote Files” on page 2-37](#)

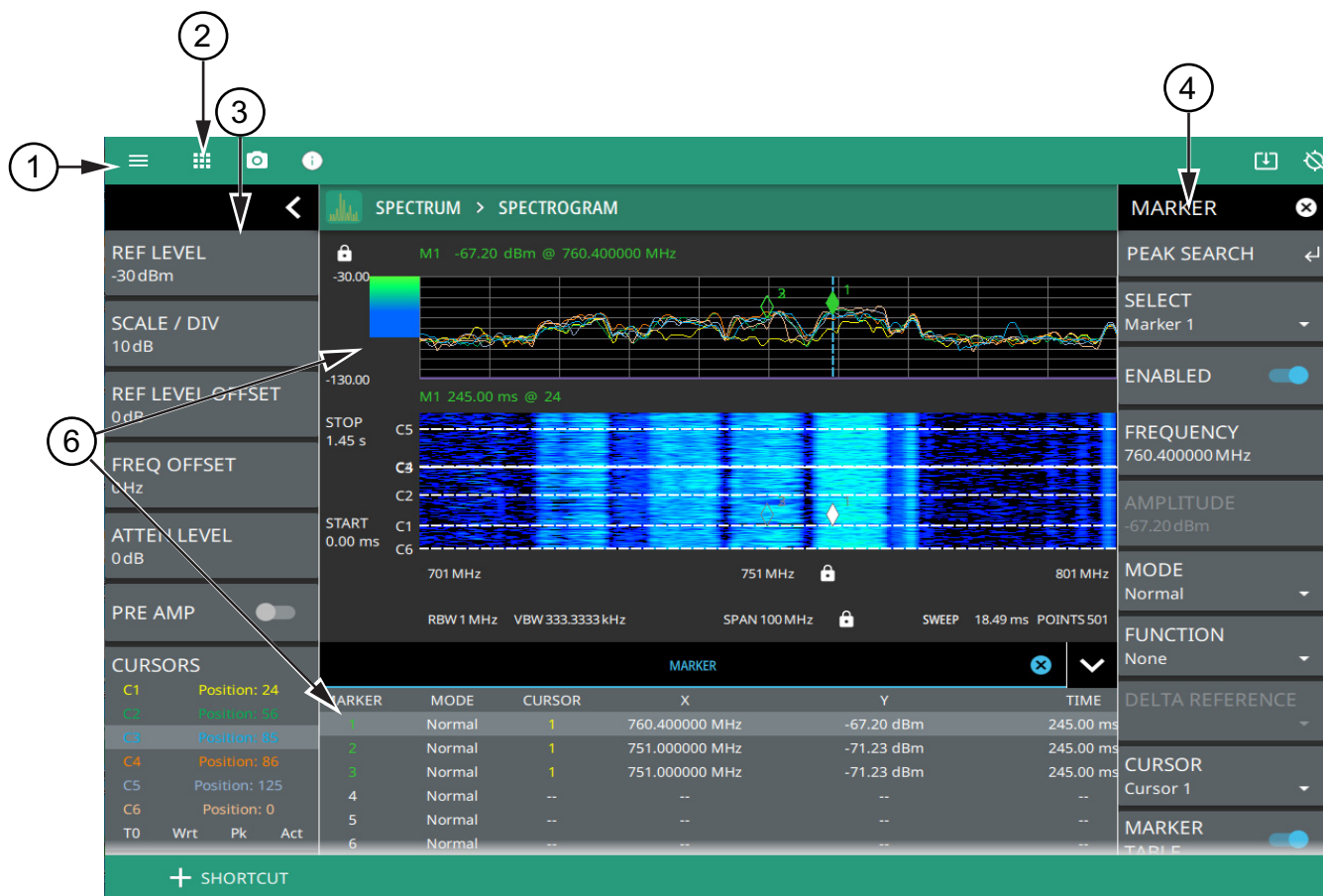
TOOLS: Opens the [“Tools Menu” on page 2-40](#).

SYSTEM POWER: Opens a dialog to RESTART or POWER OFF the instrument.

Refer to [Section A-7 “System Override” on page A-18](#) if the instrument does not respond to SCPI commands and needs to be reset remotely.

2-8 GUI Overview

The MS27201A Remote Spectrum Monitor software controls all instrument functions. The software runs on a user-supplied PC. The figure below identifies the main display areas, which are each described in more detail later in this chapter.



1. The system menu provides quick access to the system settings, measurement mode selection and informational dialogs.
2. 9-dot icon provides access for selecting the analyzers.
3. The status and trace panel is used to show common settings and controls, and to provide trace and cursor information. The information displayed on this panel depends on the current measurement and view settings. Refer to the appropriate chapter in this guide for information about this panel.
4. Menus are used to configure measurement settings such as frequency, amplitude, and bandwidth, and to enable measurement modes such as OBW, ACP, and SEM measurements and views such as Normal and Spectrogram views.
5. The main menu provides access to setting menus and other instrument controls.
6. The upper area typically displays graphical data such as spectrum trace and spectrogram plots. The lower area typically displays tabular measurement data such as marker data, or other measurement data depending on the selected measurement.

Figure 2-4. GUI Overview (sample display elements)

Common GUI Controls

The following lists common controls that you will encounter when working with the Remote Spectrum Monitor.


















	The 3-line icon provides quick access to system information, settings, file management, and built-in diagnostic tools. Refer to Section 2-11 “System Menu” on page 2-17 .
	The 9-dot icon provides access for selecting the analyzers. Refer to Section 2-10 “Selecting the Analyzer” on page 2-16
	The camera icon will capture a screen image and save it in the selected directory location of the PC. Refer to “Screenshot Setup” on page 2-28 .
	The notification icon provides access to informational and error messages. If displayed, the number indicates the number of notifications. Refer to “Notifications” on page 2-18 and Appendix A, “Notification Messages and Troubleshooting” .
	The USB eject icon is displayed when the instrument detects one or more USB devices. Selecting this icon ejects the USB device, or presents a dialog to select which USB device to eject when more than one device is detected.
	The software update icon is displayed when the instrument detects a valid software package. Selecting this icon opens an updated dialog to select the software to install. Refer to Section 2-16 “Software Update” on page 2-47 .
	The local host icon is displayed only on the MS27201A PC application when connected to the localhost instead of an instrument. The icon is not functional. Refer to “MS27201A PC Software” on page 2-4 .
	The GPS icon shows connection status (no connection, no fix, good fix, using last good fix). Selecting the icon opens the GPS/GNSS settings menu. Refer to “GNSS (GPS) Settings (Option 31)” on page 2-26 .
	The close icon is used to close menus and other dialogs.
	The chevron will expand and collapse the status and table displays. A similar chevron on the virtual keyboard may be for capital letters or to scroll through key sets.
	Toggle icon will enable and disable the feature. When highlighted in blue, the item is enabled.
	The drop-down icon exposes a list of items from which to choose.
	The refresh icon will restart a process, such as a sweep or averaging count.
	The edit icon allows editing of a feature or label.
	The enter icon accepts an entry. A similar icon is found on menu buttons to indicate an additional menu.
	Select the padlock icon next to center frequency on the graticule to change the frequency by dragging, when using a touch-screen enabled PC. Touch the padlock icon next to SPAN to change the span by pinching, when using a touch-screen enabled PC. You can toggle on DRAG and PINCH options by selecting GESTURES in Frequency menu. Refer to GESTURES menu in the Field Master Series spectrum analyzer measurement guide (10580-00447). Reference Level padlock icon by default, locks the reference level that is accidentally prone to swiping when using a touch-screen enabled PC.
	Shortcut icon used to create a shortcut of a desired application from current settings or an existing setup file.

Figure 2-5. Common GUI Controls

Data Entry

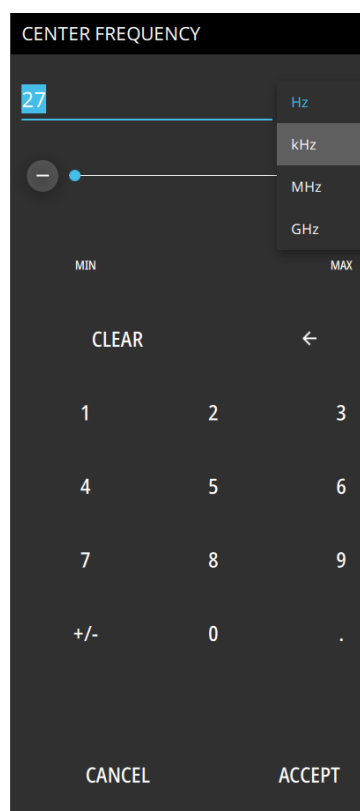
User input can be in the form of numeric values for instrument or measurement settings, selected values from a preset list, or alphanumeric text when entering file names, for example. To view or change a parameter value, access the appropriate menu or control, then enter data using menus.

Invalid Entries

When setting parameters or entering other types of data, if an entry is out of range or is otherwise invalid, Remote Spectrum Monitor will shade the background display and may provide a message indicating a valid range. In this case, clear or cancel the entry and enter a valid value or change the units by using either the drop-down selection next to the data entry window, or with the unit terminators to the left of the keypad.

Numeric Values

To modify a numeric parameter setting that is displayed on a menu or annotated field, click the item to make it active and to display the numeric keypad data entry control and enter the new value.



The keypad typically provides controls to:

- Enter new values directly, such as frequency entries in Hz, kHz, MHz, or GHz. There are two places on the keypad to enter unit terminators when applicable, on left side pop-out that occurs as frequency keypad entries are selected, or on the top right corner drop-down of the entry field.
- Drag a parameter value within its settable range using a sliding control.
- Increment the parameter value up or down. At each end of the slider are plus (+) and minus (–) controls that increment the parameter value. Most parameters have a fixed increment, such as bandwidth that follows a 1:3:10 sequence and span that follows a 1:2:5:10 sequence. In the case of frequency, you can set a custom frequency step increment value. Once the entry is complete, click the desired unit or click ACCEPT to complete the entry.
- Set the parameter to the maximum or minimum possible value.
- CLEAR the entire entry.
- Left arrow to backspace and delete the entry
- CANCEL to terminate any entries made for that particular setting. Note that clicking the "X" to close the keypad is the same as clicking cancel. Selecting CANCEL will restore settings back to the state they were in before the keypad opened, even if changes from the +/- controls are already reflected in the data display.
- ACCEPT to operate with the settings displayed on the keypad.

Figure 2-6. Menu Keypads

Selection Lists

Some parameters and instrument functions are selectable from a list. These list boxes display the available selections and value limits as applicable. Scroll through the list and select the desired entry.

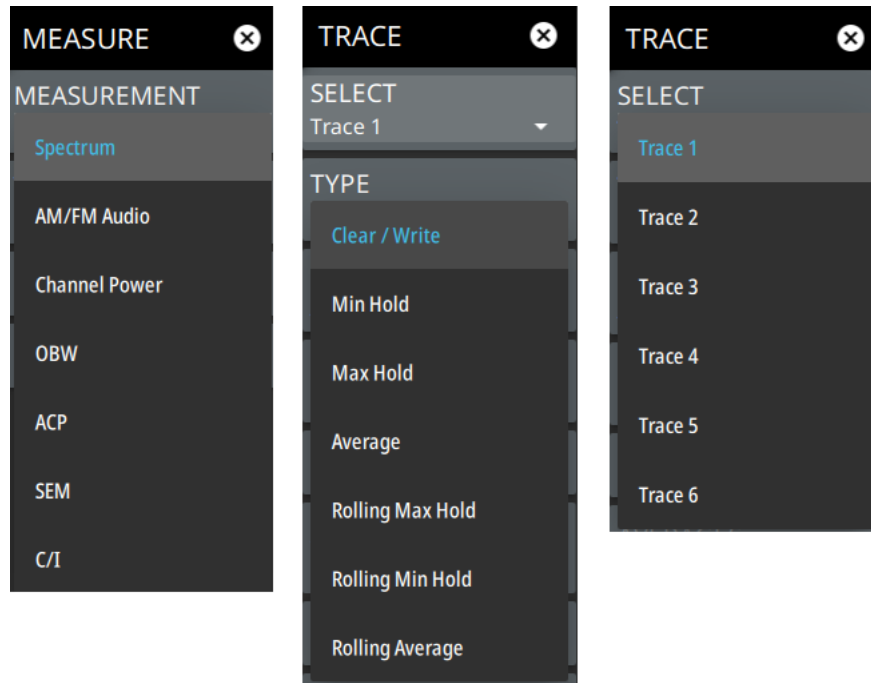


Figure 2-7. Menu Selection Lists

To cancel the selection, click somewhere else on the display or close the menu (X).

Scroll Indication

In some cases, menus, status panels, or other lists contain more information than can be displayed in the available area. In these cases, the top or bottom of the panel will have a fade-to-white appearance as shown below. You can scroll the control to move it up or down to expose the hidden information.



1. The fade-to-white at the bottom of the status panel and marker table here indicates that there is more information below the display area. The panel can be scrolled by dragging it upward to expose more information.
2. The fade-to-white at the top of the menu here indicates that there is more information above the display area. The menu can be scrolled by dragging it downward to expose the information.

Figure 2-8. Scroll Indication

Note If the display is set to another color theme, the fade effect remains the same but the color may fade to a dark shade.

Text Entry and EZ Keyboard

When an instrument function requires you to enter text, such as entering an Ethernet hostname, a virtual alphabetic keyboard is displayed. See [Figure 2-9](#). Select the “?123” key to switch to the digits and symbols keyboard. Use the left arrow key (backspace) to delete the character to the left of the insertion point. The insertion point can be moved to a clicked position in the data entry field. You can enable caps lock by double clicking the shift key.

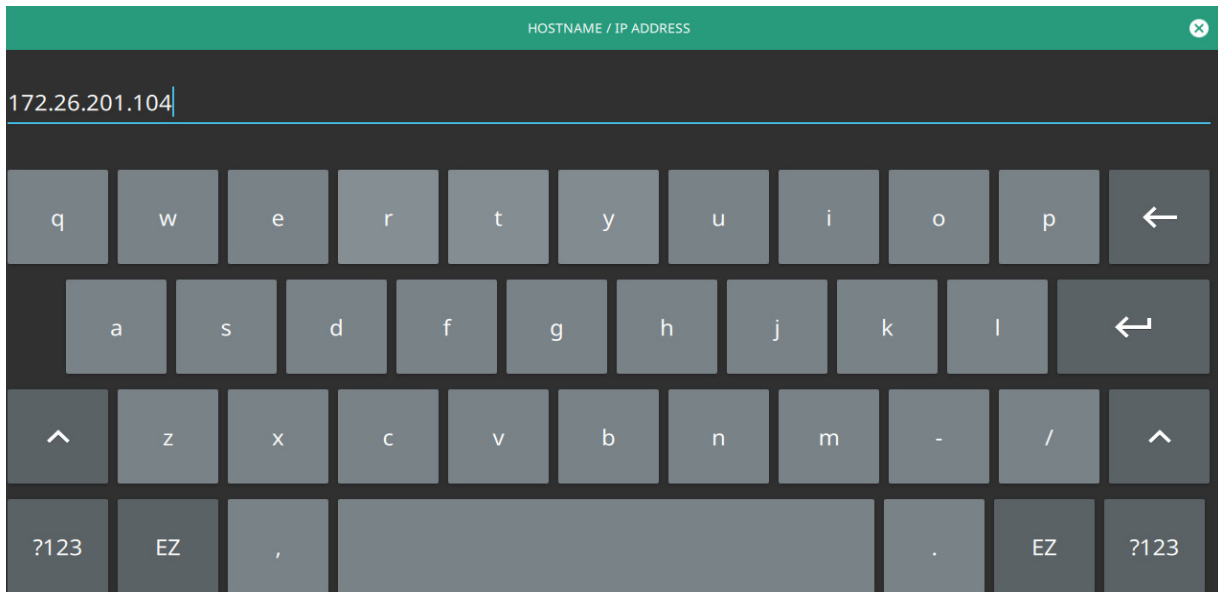


Figure 2-9. On-Screen Keyboard

The EZ key switches to a configurable EZ keyboard, illustrated below.

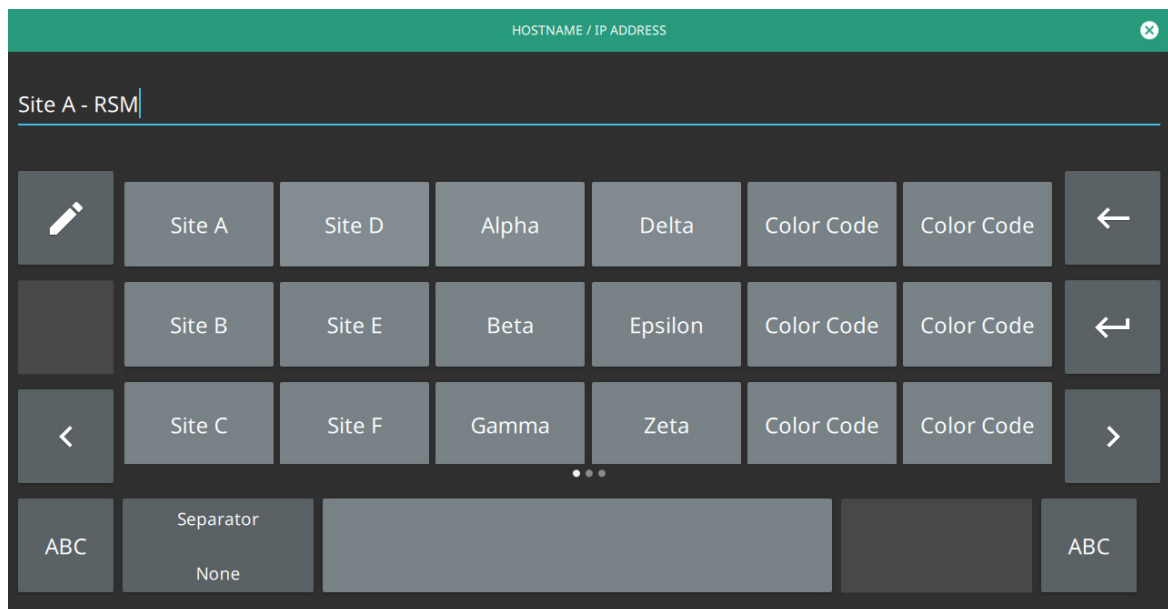


Figure 2-10. On-Screen EZ Keyboard

Use the EZ keyboard to enter frequently used text strings with a single screen tap. The EZ keyboard is initially populated with default values. Each key enters the entire string as shown on the key. For convenience, you can set an automatic Separator character to be placed between each EZ key string.

To change a key's value:

1. Select the pencil (edit) key. The EZ keys will become highlighted.

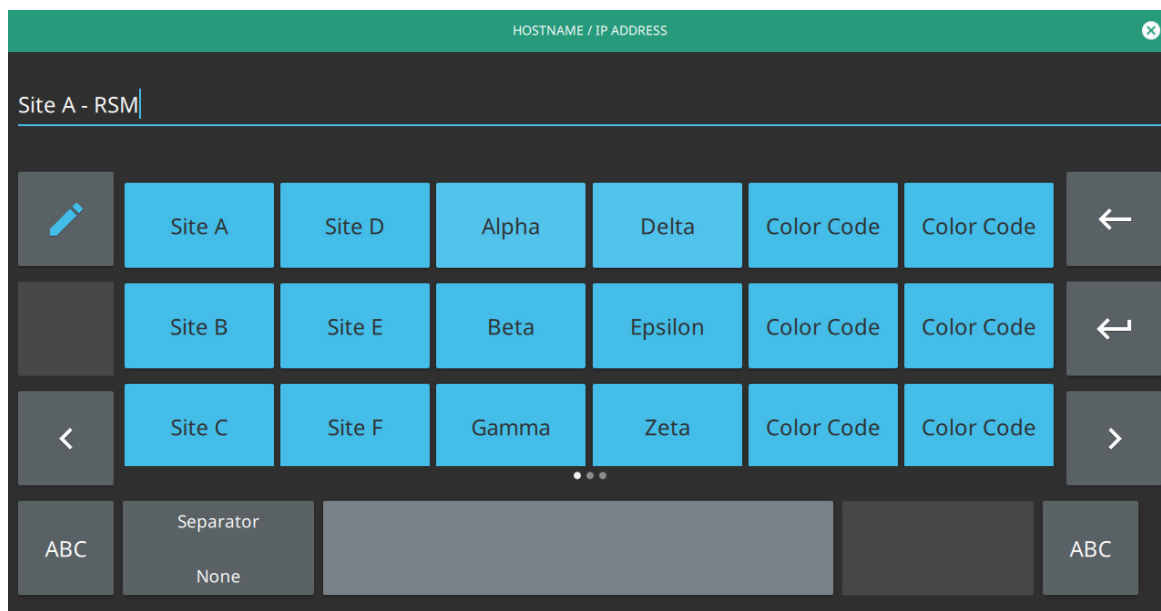


Figure 2-11. On-Screen EZ Keyboard

2. Select the key to be edited. This will display the standard keyboard for entering a new EZ key value.

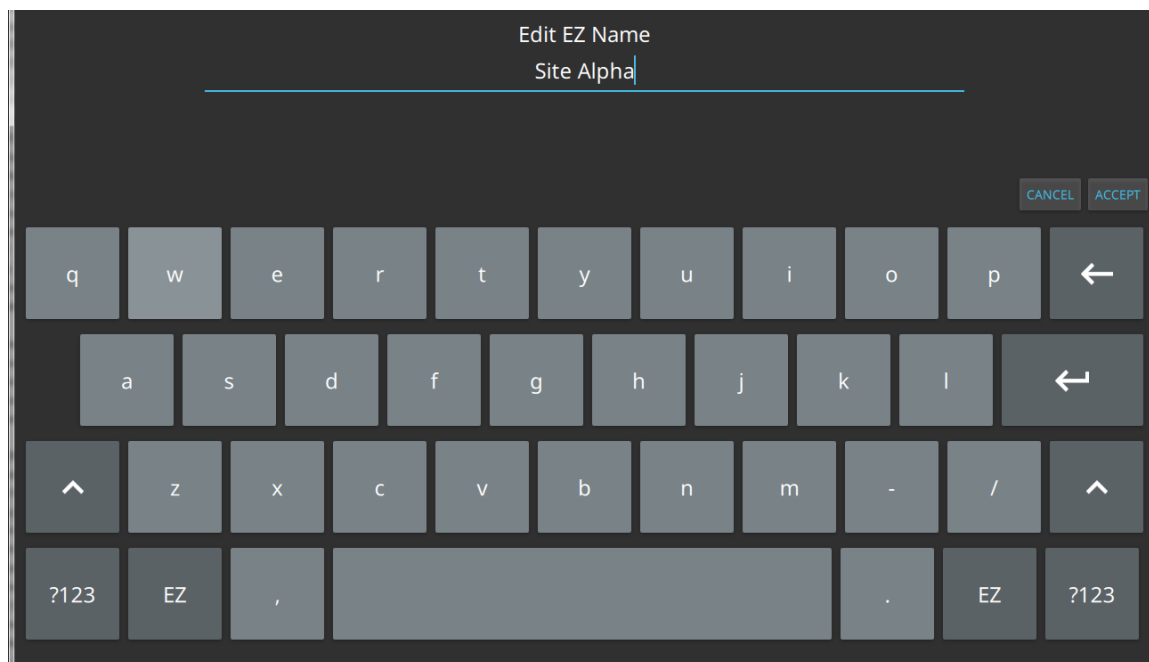


Figure 2-12. On-Screen EZ Keyboard

3. Enter the new value, then click ACCEPT to assign the new value to the EZ key, or click CANCEL.

2-9 Title Bar

The title bar is located at the top of the interface screen. It displays icons that provide access to information and user actions as described below. All of the icons are active and will open the appropriate menu or item when clicked.



1. Select the 3-line icon to display the [System Menu](#). The instrument model with frequency option and its serial number are also displayed.
2. The 9-dots icon is used for [Selecting the Analyzer](#).
3. Select the camera icon to capture a screen shot of the current display. The image file is saved in PNG format with the following naming scheme: screenshot_yymmdd_hhmmss.png (year, month, day, hour, minute, second). Using the [Screenshot Setup](#), you can set the screen capture region, color theme, annotations, and destination directory.
4. Notifications are generated when an error is detected or an activity such as a screen shot has taken place. The number of unread notifications appears next to the icon. Select the icon to display the [Notifications](#) list.
5. Displayed when a USB device is attached. To ensure the device or it's data does not become corrupted, click this icon to eject (unmount) the USB device before it is unplugged from the USB port. A similar icon can be accessed via [Section 2-13 "Files" on page 2-36](#).
6. Displayed when a USB device contains an installable software package or one is found from an Internet resource. Selecting the icon launches the ["Software Update" on page 2-47](#).
7. Select the GPS icon to view the [GNSS \(GPS\) Settings \(Option 31\)](#). If toggled on, the GPS coordinates will also display here.
8. The right side of the instrument title bar displays the system date and time. Selecting this field opens the [Date Time Settings](#).

Figure 2-13. Title Bar

2-10 Selecting the Analyzer

The instrument analyzers are selected from the 9-dot icon or the current measurement icon. To select an analyzer, press the 9-dot icon in the title bar or the current measurement icon to display the available analyzers, as illustrated in [Figure 2-14](#). Simply click the desired icon to load the new analyzer. The analyzers available for selection depend on the options that are installed and activated on your instrument. Some measurements and views are accessed via other measurement setup menus.

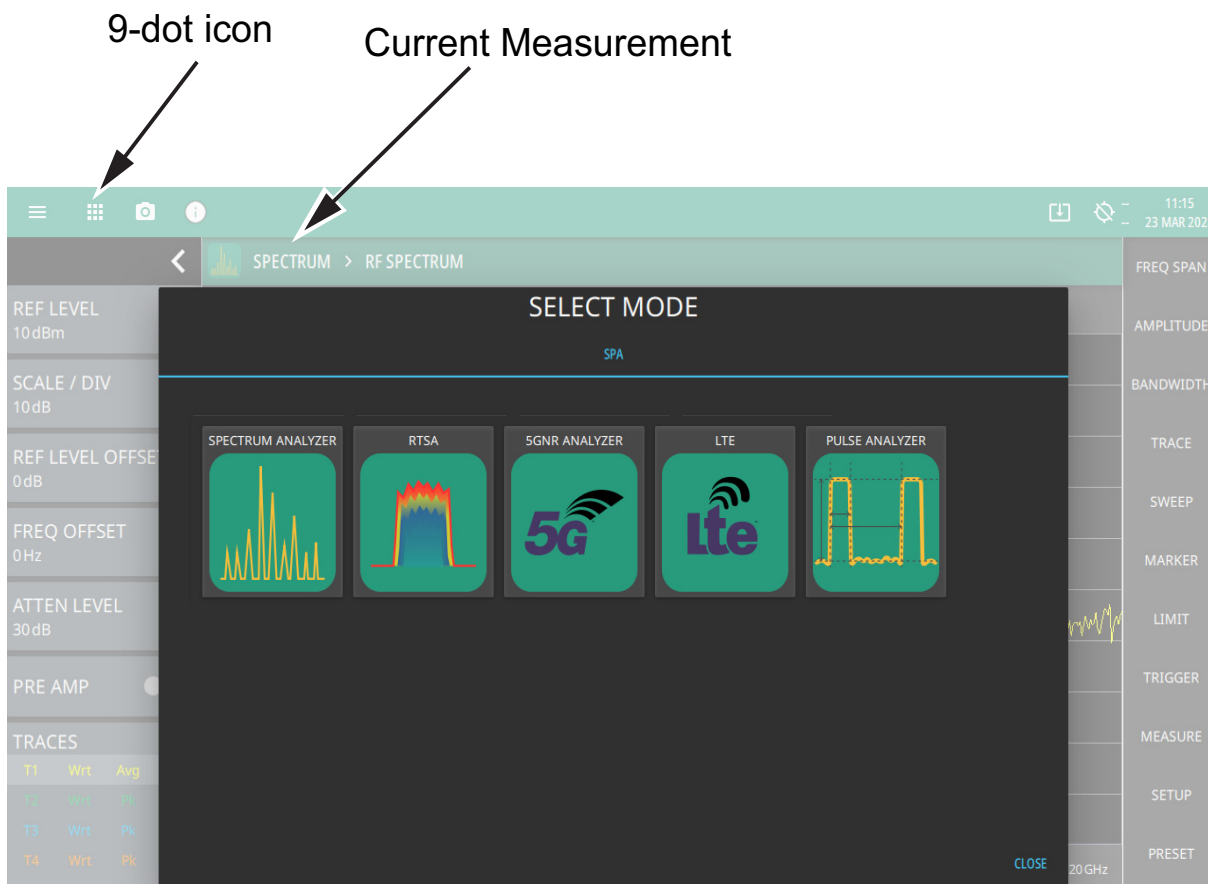
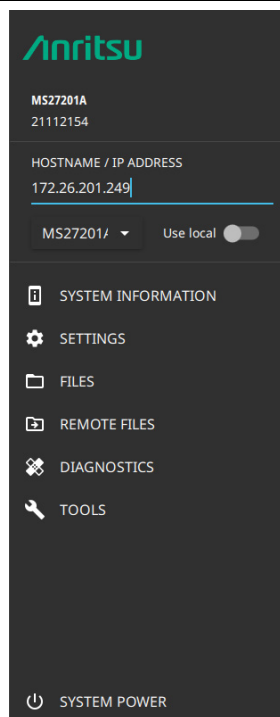


Figure 2-14. Example Analyzers

2-11 System Menu



The System menu identifies the instrument model and serial number.

HOSTNAME/IP ADDRESS: Displayed only on the MS27201A PC application. This field is used to specify the IP address or hostname of an instrument that is connected to the network. When **Use local** (localhost) is toggled on, the software will connect locally to provide some UI functionality. Refer to [“MS27201A PC Software” on page 2-4](#) for details.

SYSTEM INFORMATION: Opens the [System Information](#) panel showing instrument, software, and network connection details.

SETTINGS: Opens the [“Settings Menu” on page 2-18](#), providing access to all system level settings and controls.

FILES: Opens [“Files” on page 2-36](#). Note that the file management menus are different from the right-side FILE menu. Use file management to organize, copy, and rename files. Use the right side FILE menu to save and recall measurement data, instrument setup files, or to save a screenshot.

REMOTE FILES: Opens the [“Remote Files” on page 2-37](#).

DIAGNOSTICS: Opens [“Remote Files” on page 2-37](#).

TOOLS: Opens [“Tools Menu” on page 2-40](#).

SYSTEM POWER: Opens a dialog to RESTART or POWER OFF the instrument.

Figure 2-15. System Menu

System Information

The System Information panel shows all information about the instrument hardware, software, and connectivity. From here, you can also toggle software update checking when connected to the Internet and start a software update when one is available. If web updates are toggled on, the instrument will automatically check for updates once every 24 hours or when the user clicks the "CHECK" button.

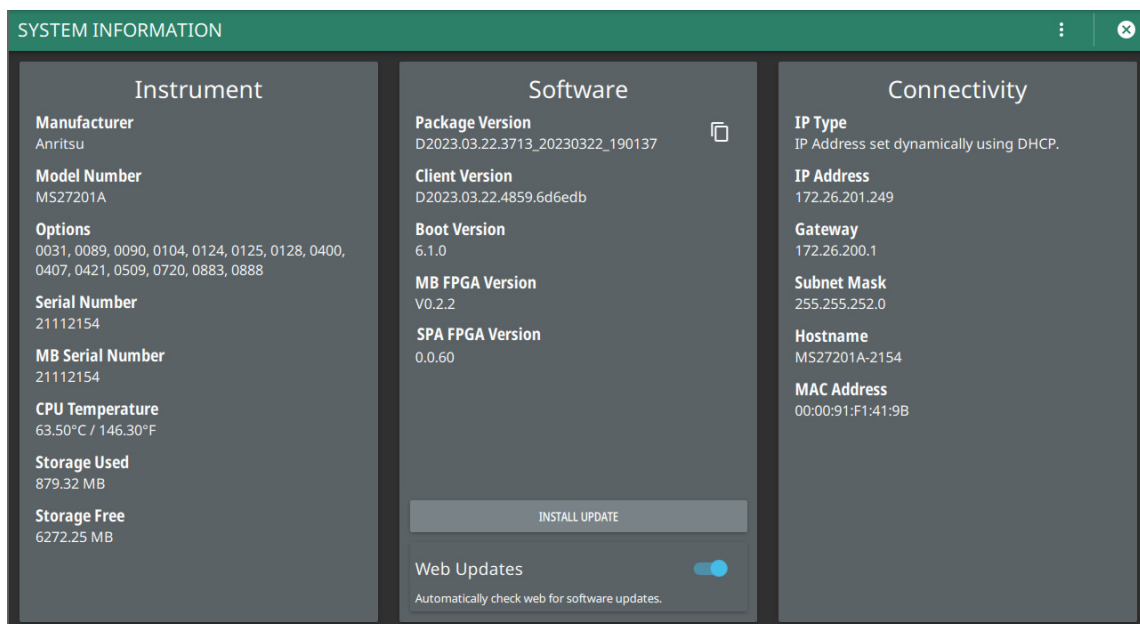


Figure 2-16. System Information

Notifications

The notification area is where all dynamic notifications are presented. These notifications are generally information messages to the user and not hardware failure messages. Refer to “[Self Test](#)” on page 2-38 and [Appendix A, “Notification Messages and Troubleshooting”](#) for more diagnostic information.

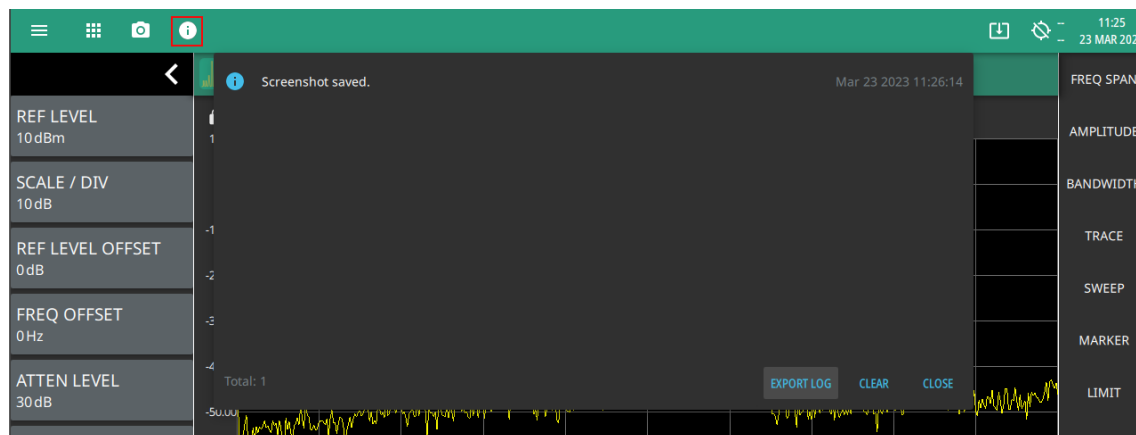


Figure 2-17. Notification Icon

2-12 Settings Menu

The system settings menu provides access to all instrument system-level settings such as network, GPS/GNSS, date and time, and display.

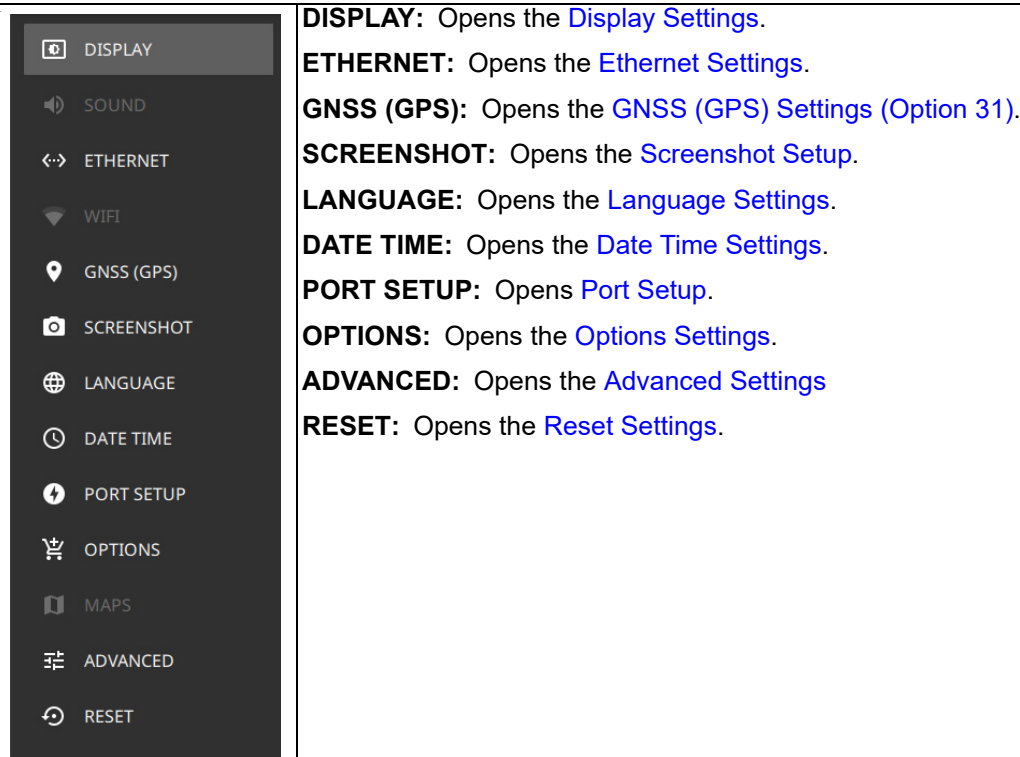


Figure 2-18. Settings Menu

Display Settings

The DISPLAY settings allow you to set the display to a Default or Light color scheme, the latter of which may be more suitable for viewing in bright ambient conditions.

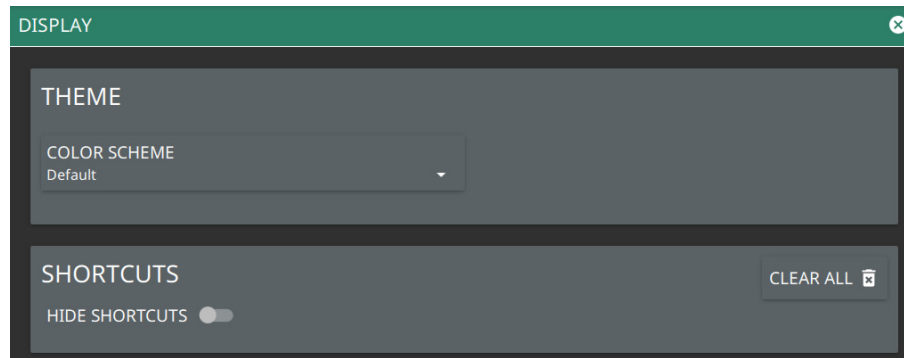


Figure 2-19. Display Settings

Theme

Under **THEME** option select **COLOR SCHEME** drop-down menu and select either **Default**, **Light**, **Black on White** or **Night Vision** to set the display color scheme of your choice. If the **THEME** is set to **Light** it may be more suitable for viewing in bright ambient conditions. But if the **THEME** is set to **Night Vision** it may be suitable for viewing in a poorly lit night time conditions.

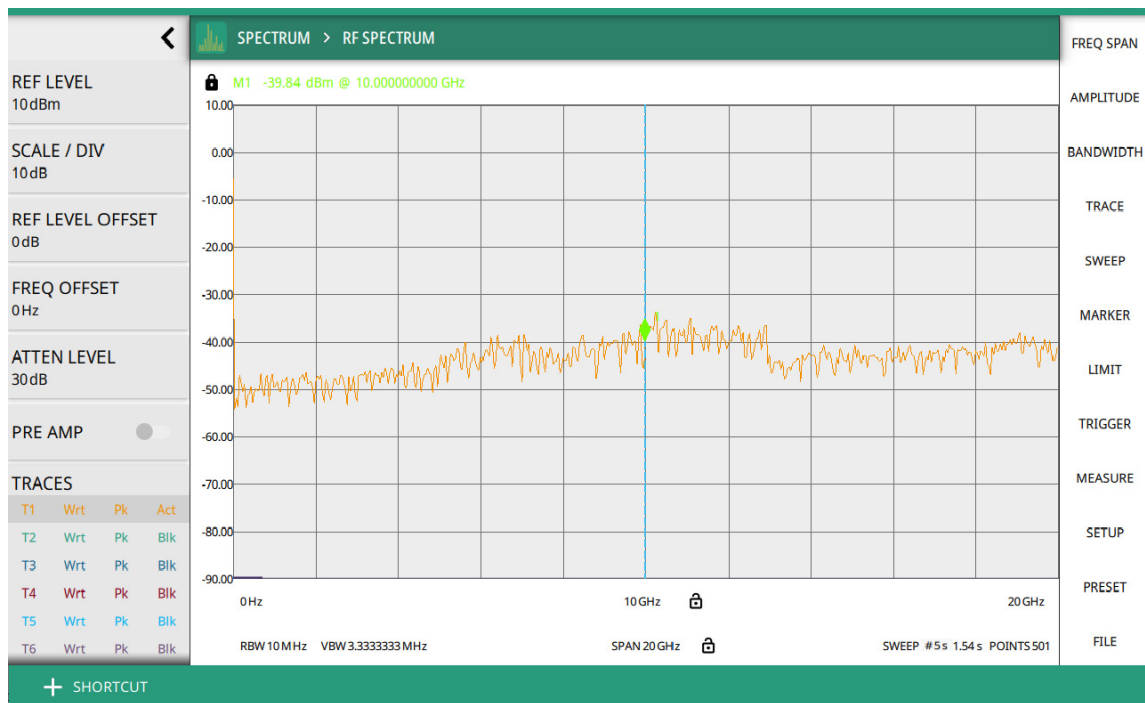


Figure 2-20. Light Color Scheme

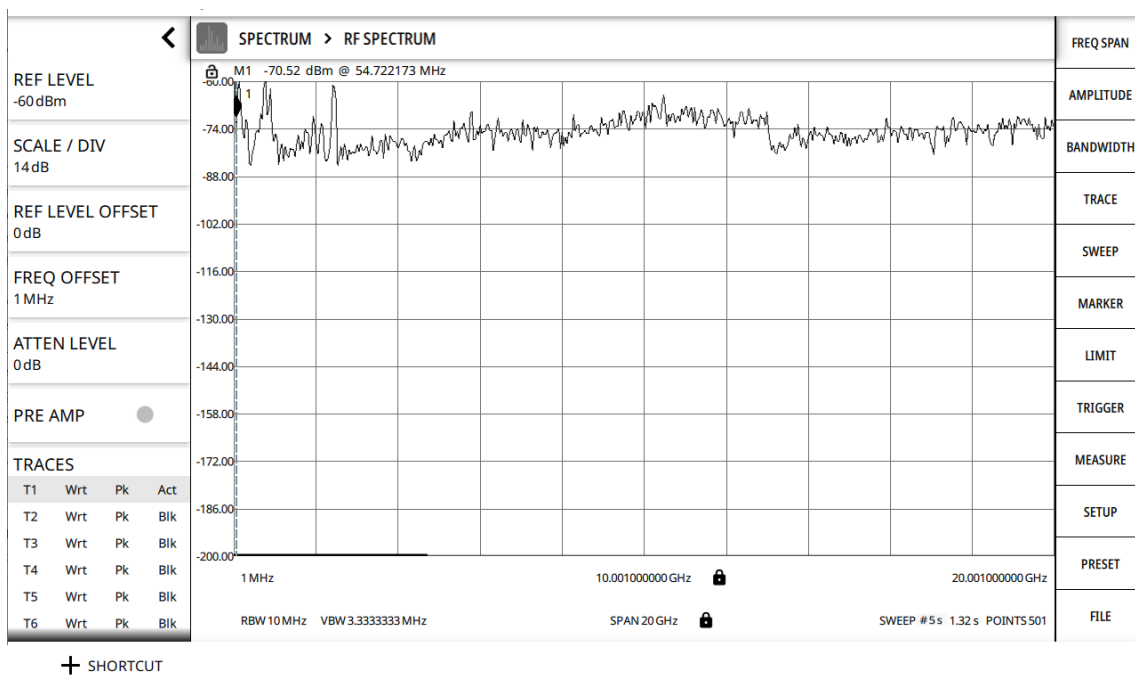


Figure 2-21. Black on White Color Scheme

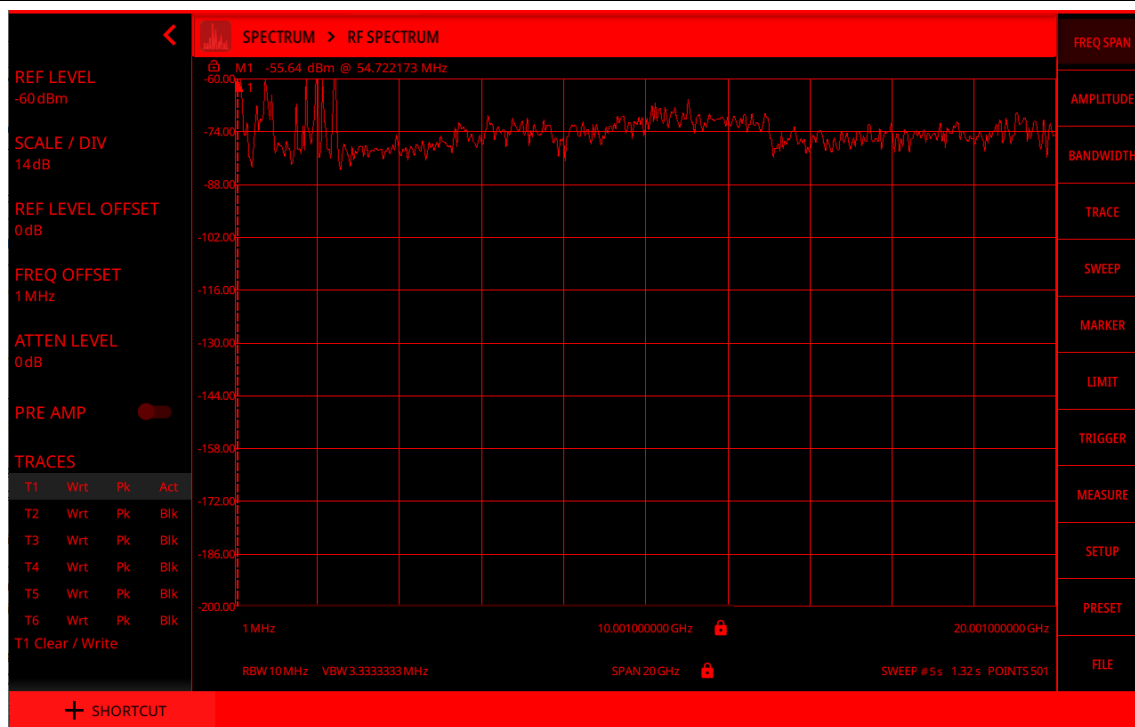


Figure 2-22. Night Vision Color Scheme

Shortcuts

Under the SHORTCUTS option, toggle the HIDE SHORTCUTS button to view or hide the shortcuts.

Select + SHORTCUT button located at the bottom left of the display screen to create or save specific settings of an application.

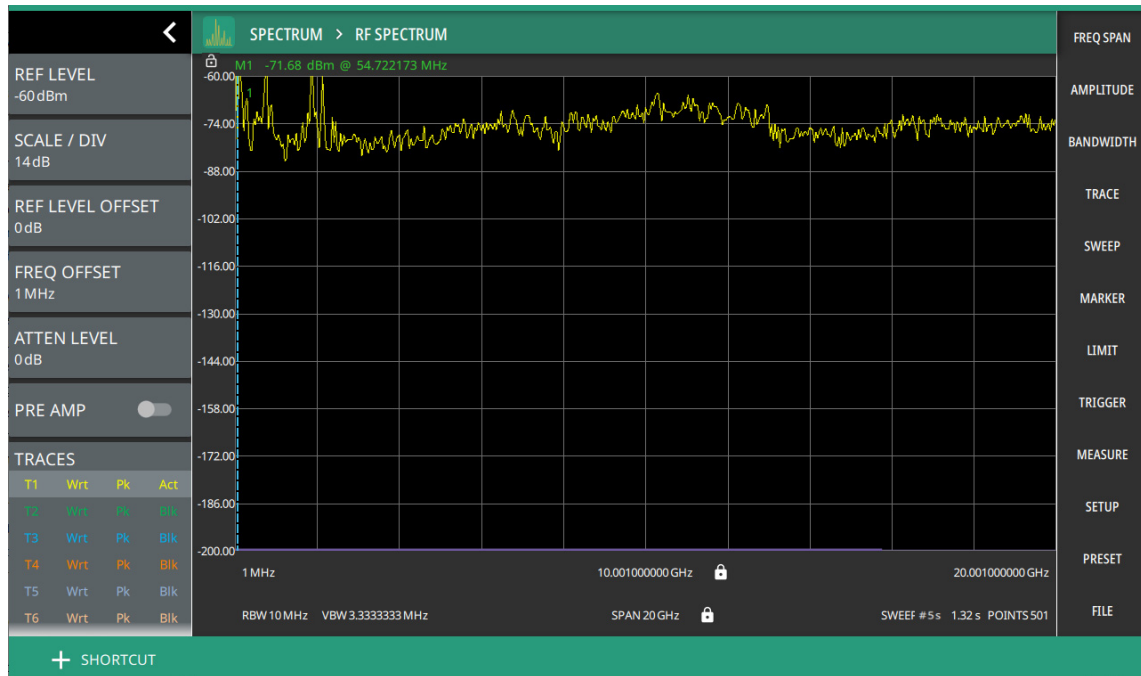


Figure 2-23. Shortcut Button

Follow the steps below to create/load/rename a shortcut:

1. Select +SHORTCUT button at the bottom left of the PC display screen.

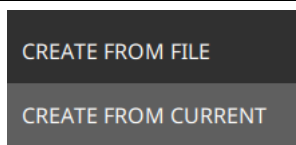


Figure 2-24. +Shortcut button

2. Select CREATE FROM FILE option to create a new shortcut from an already saved setup file.
3. Otherwise, select CREATE FROM CURRENT option to create a shortcut of the current (trace) settings of the instrument.
4. Enter the shortcut name which is optional, and select CONTINUE.

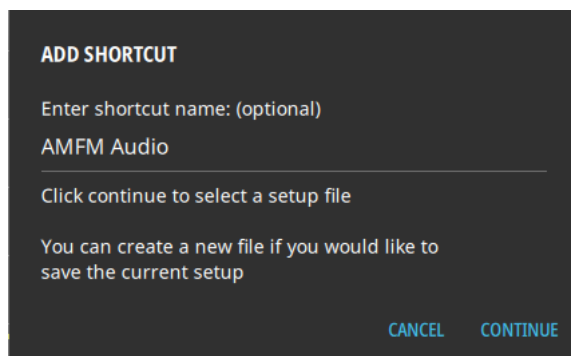


Figure 2-25. Add Shortcut Dialog

5. Enter a file name to save the current setup, and select **SAVE**.

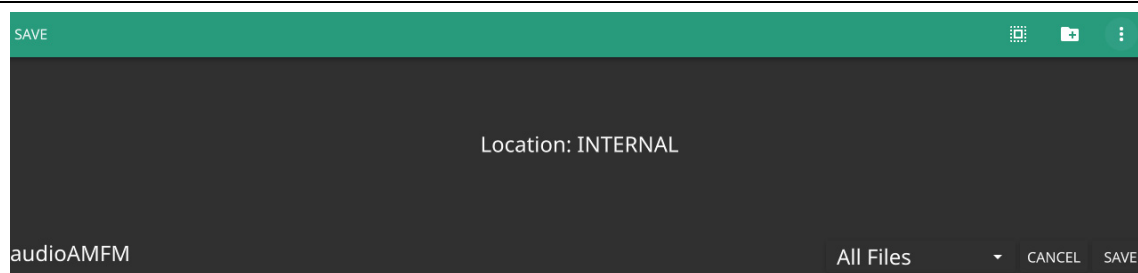


Figure 2-26. File Save As

6. Select the newly created shortcut to recall the saved setup file.

To delete all the shortcuts, select **SYSTEM MENU** (3-line icon), go to **SETTINGS** menu, select **DISPLAY** settings and select **CLEAR ALL** button at the bottom right of the PC display.

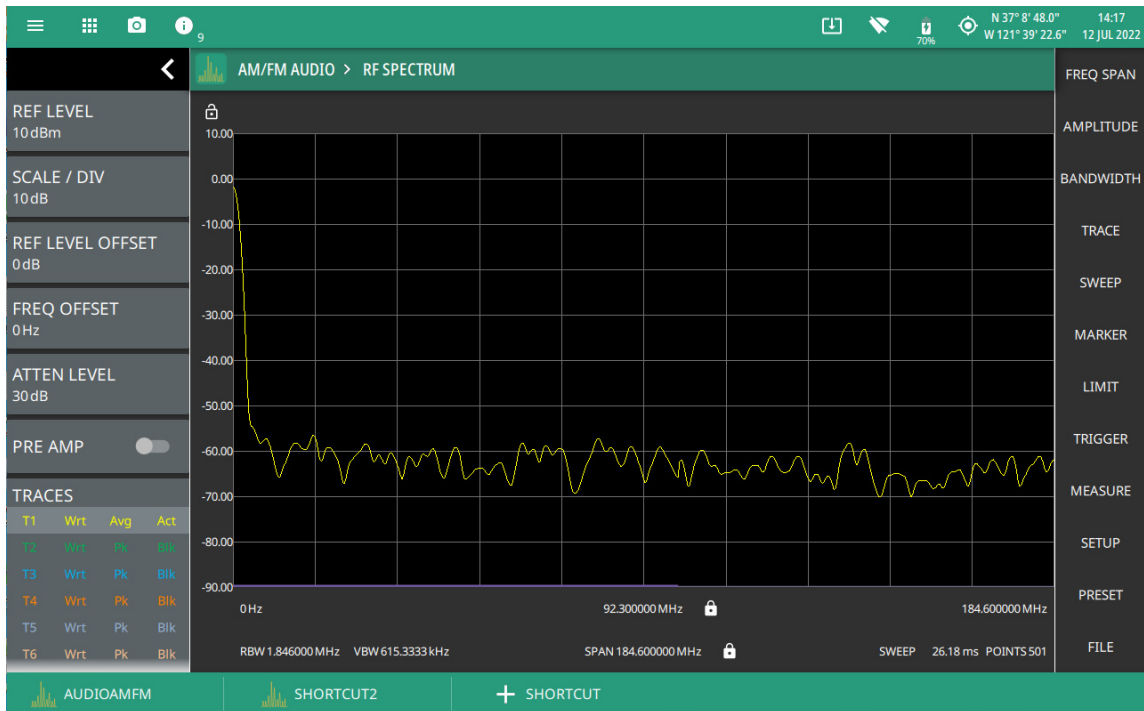


Figure 2-27. Recalled Setup File: Shortcut Button

Network Settings

The MS27201A uses Ethernet to communicate remotely with a controller. Most instrument functions (except power on/off) can be controlled via a network connection to a PC connected directly (with an Ethernet cross-over cable) or through a network. The instrument software supports the TCP/IP raw socket network protocol.

Ethernet networking uses a bus or star topology in which all of the interfacing devices are connected to a central cable called the bus, or are connected to a hub. Ethernet uses *Carrier Sense Multiple Access/Collision Detection* (CSMA/CD) access method to handle simultaneous transmissions over the bus. This standard enables network devices to detect simultaneous data channel usage, called a *collision*, and provides for a contention protocol. When a network device detects a collision, the CSMA/CD standard dictates that the data is retransmitted after waiting a random amount of time. If a second collision is detected, the data is again retransmitted after waiting twice as long. This is known as exponential back off.

The TCP/IP setup requires the following:

- **IP Address:** Every computer and electronic device in a TCP/IP network requires an IP address. An IPv4 address has four numbers (each between 0 and 255) separated by periods. For example: 128.111.122.42 is a valid IP address.
- **Subnet Mask:** The subnet mask distinguishes the portion of the IP address that is the network ID from the portion that is the station ID. The subnet mask 255.255.0.0, when applied to the IP address given above, would identify the network ID as 128.111 and the station ID as 122.42. All stations in the same local area network should have the same network ID, but different station IDs.
- **Default Gateway:** A TCP/IP network can have a gateway to communicate beyond the LAN identified by the network ID. A gateway is a computer or electronic device that is connected to two different networks and can move TCP/IP data from one network to the other. A single LAN that is not connected to another LAN requires a default gateway setting of 0.0.0.0. If you have a gateway, then the default gateway would be set to the appropriate value of your gateway.

- **Ethernet Address:** An Ethernet address, or *Media Access Control (MAC)* address, is a unique 48-bit value that identifies a network interface card to the rest of the network. Every network card has a unique Ethernet address permanently stored in its memory.
- Remote programming and operation between the instrument and remote program is accomplished via a TCP/IP raw socket connection to port 9001. The remote program must establish a TCP/IP raw socket connection at port 9001 to the MS27201A.
- The remote program may connect to the instrument IP address or to its `HOSTNAME` (Ethernet only). If using DHCP instead of a static IP, using the `HOSTNAME` may be more reliable for finding an instrument on a network.
- You may need to contact your network administrator to ensure network security policies, anti-virus, and firewall settings do not block access to the controlling computer and its ports.

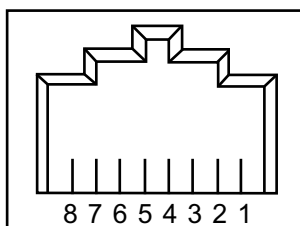
The MS27201A can be configured for *Dynamic Host Configuration Protocol (DHCP)*, an Internet protocol that automates the process of setting IP addresses for devices that use TCP/IP, and is the most common method of configuring a device for network use.

To determine if a network is set up for DHCP, connect the instrument to the network and select DHCP protocol. Power cycle the instrument. If the network is set up for DHCP, the assigned IP address should be displayed in the network settings.

Ethernet Connection

Interface between the instrument and other devices on the network is via a category five (CAT-5) interface cable connected to a network. This cable uses four twisted pairs of insulated copper wires terminated into an RJ45 connector. CAT-5 cabling is capable of supporting frequencies up to 100 MHz and data transfer speeds up to 1 Gbps, which accommodates 1000Base-T, 100Base-T, and 10Base-T networks. CAT-5 cables are based on the EIA/TIA 568 Commercial Building Telecommunications Wiring Standard developed by the Electronics Industries Association. A pinout diagram is shown in [Table 2-1](#).

Table 2-1. 8-pin Ethernet RJ45 Connector Pinout Diagram



Pin	Name	Description	Wire Color
1	TX+ or BI_DA+	Transmit or bidirectional data	White/Green
2	TX- or BI_DA-	Transmit or bidirectional data	Green
3	RX+ or BI_DB+	Receive or bidirectional data	White/Orange
4	BI_DC+	Not used (common mode termination) or bidirectional	Blue
5	BI_DC-	Not used (common mode termination) or bidirectional	White/Blue
6	RX- or BI_DB-	Receive or bidirectional data	Orange
7	BI_DD+	Not used (common mode termination) or bidirectional	White/Brown
8	BI_DD-	Not used (common mode termination) or bidirectional	Brown

Integrated into the RJ45 connector are two LEDs that illuminate as follows:

- LED 1 Off: 10 Mbit/s LAN connection
- LED 1 Orange: 100 Mbit/s LAN connection
- LED 1 Green: 1000 Mbit/s LAN connection
- LED 2 Amber/Yellow: On or blinking indicates LAN traffic

The instrument IP address and its `HOSTNAME` are set via the System menu (upper left corner) and accessing the ETHERNET settings menu.

TCP/IP connectivity requires setting up the parameters described at the beginning of this section. The following is a brief overview of how to set up a general LAN connection on the MS27201A.

Note You may need to consult your network documentation or network administrator for assistance in configuring your network setup.

Ethernet Settings

Refer to “Theme” on page 2-19 for general network setup and information.

1. Access the System menu (3-line icon in the upper left corner).
2. Select SETTINGS to access the instrument settings menu, then select ETHERNET to view the current network settings (IP address, `HOSTNAME`, etc.).

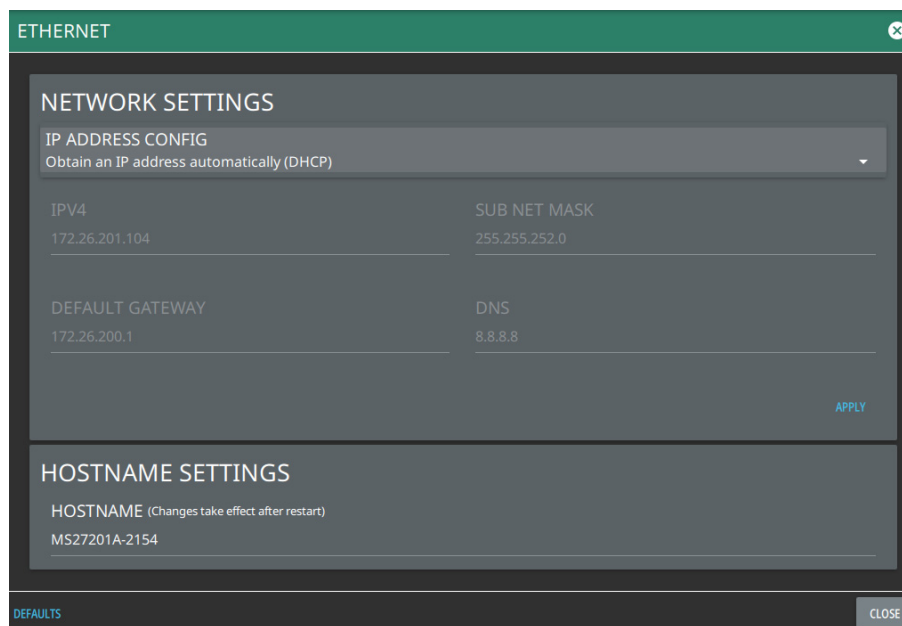


Figure 2-28. Ethernet Settings

The instrument IP address can be set automatically using DHCP or manually by entering the desired IP address, gateway address, and subnet mask.

Note If an active Ethernet cable is connected to the instrument while it is turned on, a reboot may be required to establish a DHCP connection. If the port becomes inactive, verify that an active Ethernet cable is attached to the instrument, then cycle the instrument power off and on.

GNSS (GPS) Settings (Option 31)

The MS27201A RSM is available with a built-in global positioning receiver feature (Option 31) that can provide latitude, longitude, altitude, and UTC timing information. This option also enhances frequency reference oscillator accuracy. When the global positioning receiver is actively locked to satellites, this information is saved with all saved measurements.

Note The MS27201A RSM Data Sheet provides a list of the options and measurements that require GPS (Option 31). In addition to having Option 31 installed, a GPS antenna is required. Refer to the instrument Technical Data Sheet for compatible GPS antennas.

The MS27201A supports the following global positioning satellite systems:

- **GPS:** The United States Global Positioning System (GPS). GPS is currently the world's most utilized satellite navigation system.
- **GNSS:** Global Navigation Satellite System, a term used worldwide. This term includes GPS, GLONASS, and Galileo. Accessing multiple satellites provides increased accuracy, redundancy, and availability at all times.

Activating the GPS Feature

Attach the GPS antenna to the GPS connector in the front of the instrument.

1. Access the System menu (3-line icon in the upper left corner).
2. Select SETTINGS to access the instrument settings menu, then select GPS to open the GPS settings and info window.

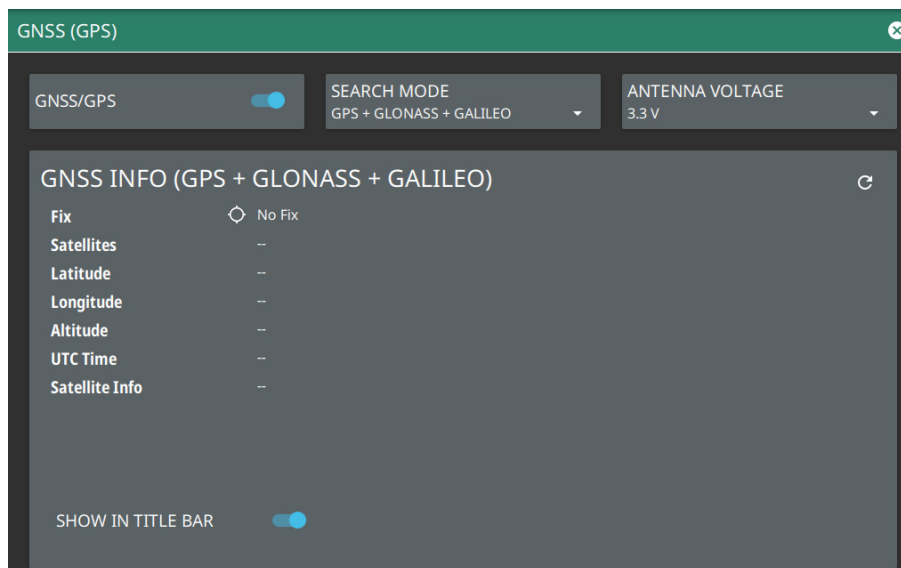


Figure 2-29. GPS Settings

3. Activate the GPS by sliding the GPS/GNSS toggle switch to on.
4. Set ANTENNA VOLTAGE to 3.3 or 5.0 V.
5. When the GPS receiver has established a “good fix”, the GPS icon is displayed with a center dot and the following information is kept updated:
 - Fix status
 - Tracked satellites
 - Latitude
 - Longitude
 - Altitude

- UTC timing information

6. Toggling SHOW IN TITLE BAR shows the GPS coordinates in the title bar at the top of the display.

After GPS location fix is attained, the internal reference oscillator begins to correct its frequency to match the GPS standard. After the internal frequency is adjusted to match the GPS standard, the status is indicated by “GPS High Accuracy” showing in the Status menu, which is displayed on the left side of the measurement display. When the GPS feature is not enabled, the reference source displays either “Internal Standard Accuracy” or a user-selected external reference frequency in the Status menu.

Within three minutes of satellite acquisition, the reference oscillator will have an accuracy of better than 25 PPB (parts per billion). The OCXO internal standard accuracy is ± 0.3 PPM. The correction factor applied to the internal OCXO allows the instrument to maintain GPS frequency accuracy for three days at better than 50 PPB, even when the instrument is obstructed from receiving signals from the GPS satellites.

In order to acquire data from the GPS satellites, you must have line-of-sight to the satellites, or the antenna must be placed outside with no obstructions.

If no GPS is connected for at least three days, the Frequency Reference annotation reads Int Std Accy.

Screenshot Setup

1. Access the System menu (3-line icon in the upper left corner).
2. Select SETTINGS to access the instrument settings menu, then select SCREENSHOT to open the screenshot setup menu.

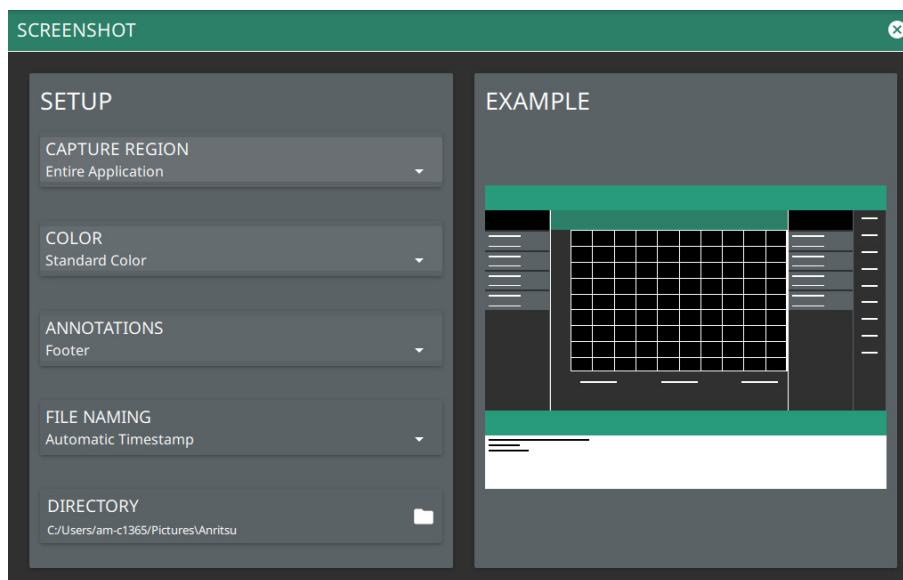


Figure 2-30. Screenshot Setup

Screenshot setup lets you configure the following:

- CAPTURE REGION: entire window or graph area only
- COLOR: standard or printer-friendly
- ANNOTATIONS: may be placed at top (header) or bottom (footer) of captured image
- FILE NAMING: automatic time stamp or manual time stamp
- DIRECTORY: directory path to destination folder where the file is to be saved

Note Screenshots can be previewed on a web browser. Refer to [“Remote Files” on page 2-37](#).

Language Settings

Follow the steps below to access language settings in order to change a selected display language:

1. Access the System menu (3-line icon in the upper left corner).
2. Select **SETTINGS** to access the instrument settings menu, then select **LANGUAGE** to open the language menu.

Note

If you select a different language, the primary menus and the screen annotation gets updated, but the keyboard used for file naming and similar tasks, notification messages and specific system menu names remain in the English language.

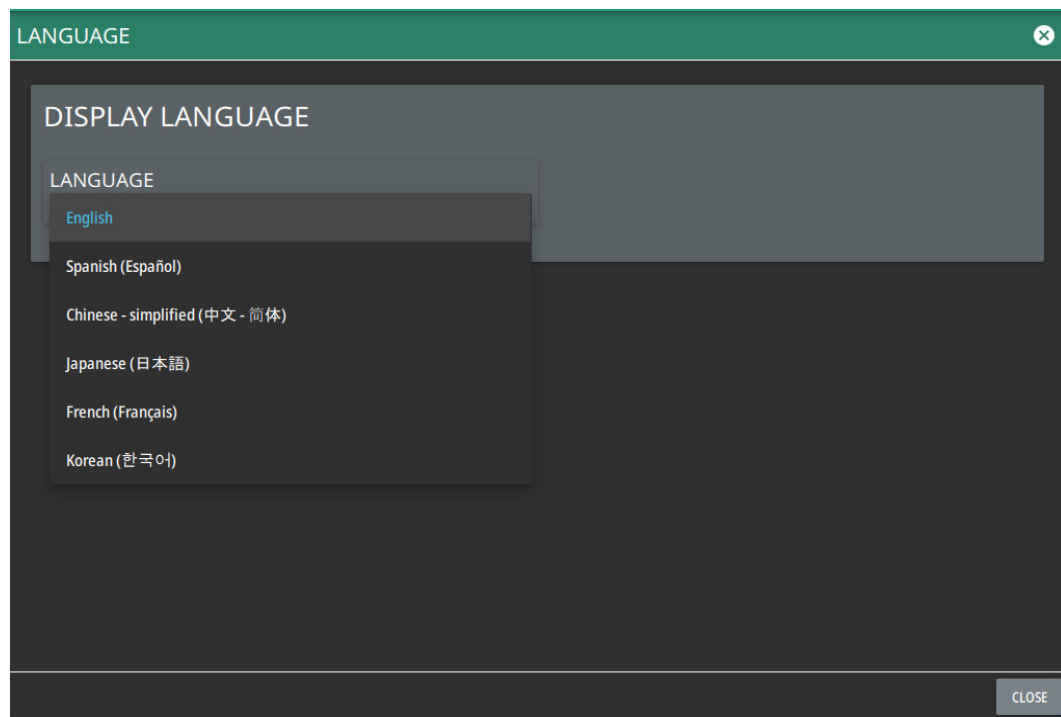


Figure 2-31. Language Settings

3. Select the **LANGUAGE** drop-down menu and select a desired display language as shown in the [Figure 2-31](#).

Date Time Settings

1. Access the System menu (3-line icon in the upper left corner).
2. Select SETTINGS to access the instrument settings menu, then select DATE TIME to display the current date and time settings.

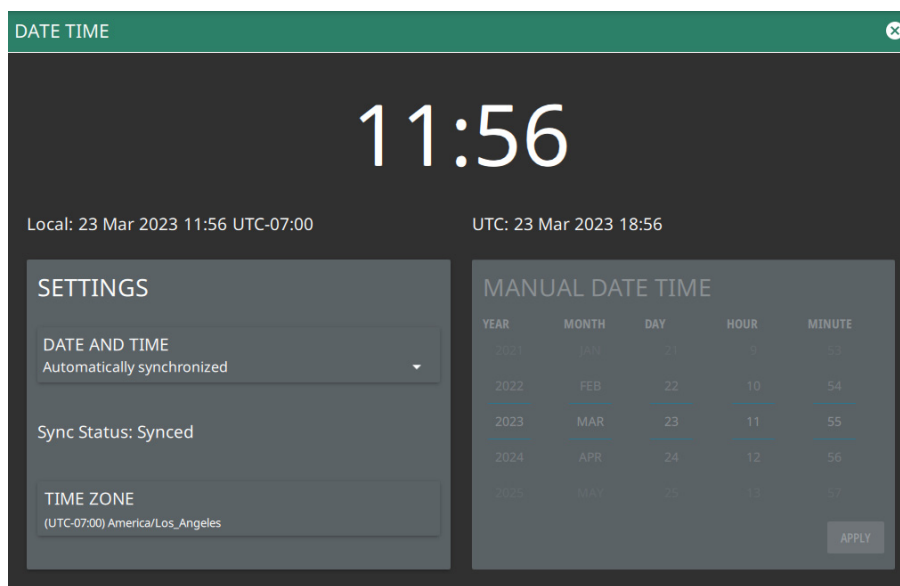


Figure 2-32. Date Time Settings

The Date Time setup lets you set the current date and time and the time zone.

- Date and Time: Manually set or automatically synchronized. When synchronized (Sync Status: Synced), the system uses the network time; if the instrument also has a GPS location fix, the system will determine and use the more accurate of the two, between network and GPS time. Select Manually set to activate the MANUAL DATE TIME window. Here you can scroll to a selectable year, month, day, hour, and minute.
- Time Zone: Lists the selectable time zones.

Port Setup

The Port Setup menu allows you to configure the external ports.

Bias Voltage

Bias Voltage setup provides controls to set the voltage level and to monitor the precise voltage and current, and trip state.

1. Access the System menu (3-line icon in the upper left corner).
2. Select SETTINGS to access the settings menu, then select PORT SETUP to display the top panel bias voltage output settings.

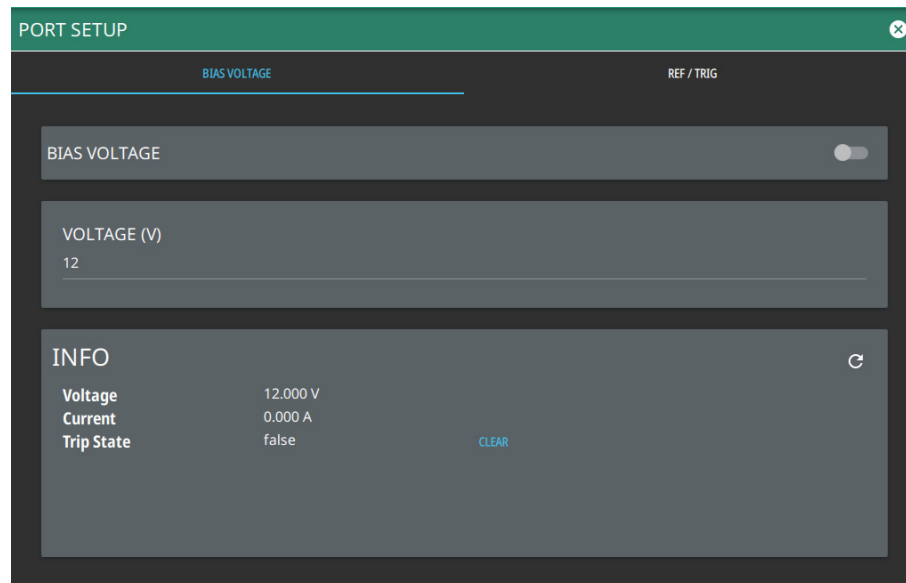


Figure 2-33. Bias Voltage Port Settings

3. Manually set the voltage in the range of 0 V to 34 V.
4. Toggle the bias voltage on or off.

Reference and Trigger

The reference and trigger setup provides controls to set the functionality of the configurable top panel reference and trigger ports.

1. Access the System menu (3-line icon in the upper left corner).
2. Select **SETTINGS** to access the instrument settings menu, then select **PORT SETUP > REF / TRIG** to display the top panel reference and trigger port settings.

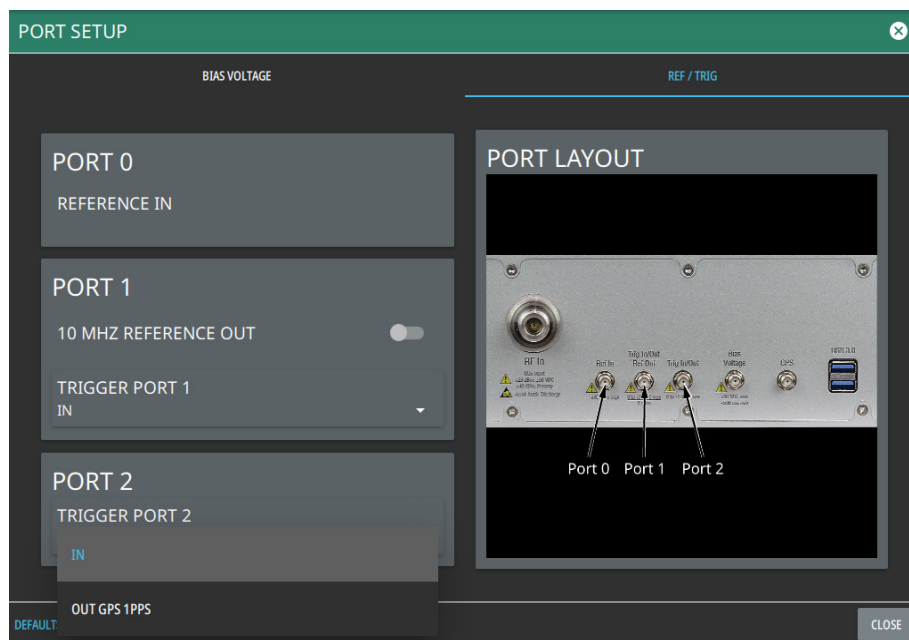


Figure 2-34. Reference/Trigger Port Settings

Note PORT 0 is always a reference in port.

3. To set PORT 1 as a reference output, toggle 10 MHz REFERENCE OUT on. Otherwise, PORT 1 can be selected as a trigger input or trigger output by using the drop-down selection.
4. Use the drop-down selections to select PORT 2 as a trigger input or GPS 1PPS output.

Options Settings

To view the installed and available options, follow the steps below:

1. Access the System menu (3-line icon in the upper left corner).
2. Navigate to **SETTINGS** to access the instrument settings menu.
3. Select **OPTIONS** to view the list of currently installed options in the left tab, and available options in the right tab. Time-limited options will show the expiration date in the **EXPIRATION** column.
4. Some options can be installed using only a software file. Others may require additional hardware. Contact your local sales or service representative for information on ordering or installing new options. Refer to [Appendix B, “Software Option Upgrades”](#) for more information.

Note

Not all instrument models offer every option. For example, AM/FM Modulation Measurement Option (0509) is offered as a 90-day time limited option by ordering Option 9509. The option start time begins when the user first activates the option. Please refer to the Technical Data Sheet of your instrument for information on purchasing limited options

5. To upgrade your instrument with a specifically purchased option, select **INSTALL OPTIONS FROM WEB** to install options available on the web. Ensure that the unit is connected to the Internet.
6. Select **ENABLE OPTIONS USING FILE** to install options file saved in USB memory device.
7. Select **SAVE CONFIG** to export the config file to Anritsu.

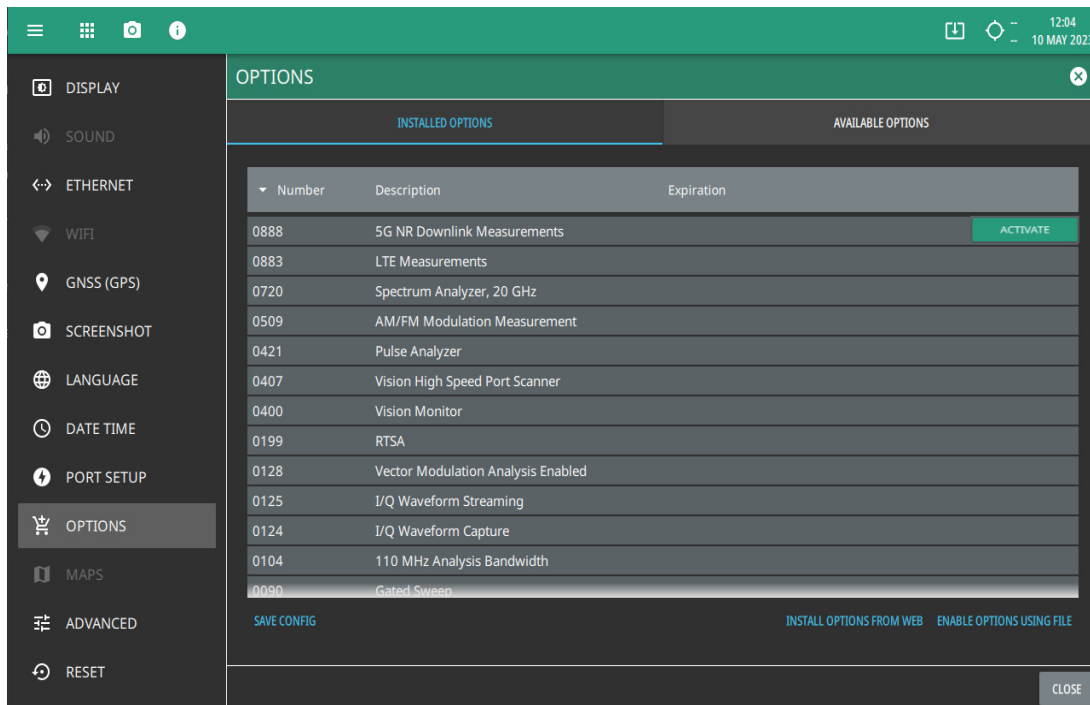


Figure 2-35. Options Settings

Caution

Once a time limited option is activated, the 90-day time period begins countdown and cannot be halted. Ensure you intend to activate the option before selecting Activate.

To activate the installed time-limited options select the **ACTIVATE** button to begin the 90-day trial.

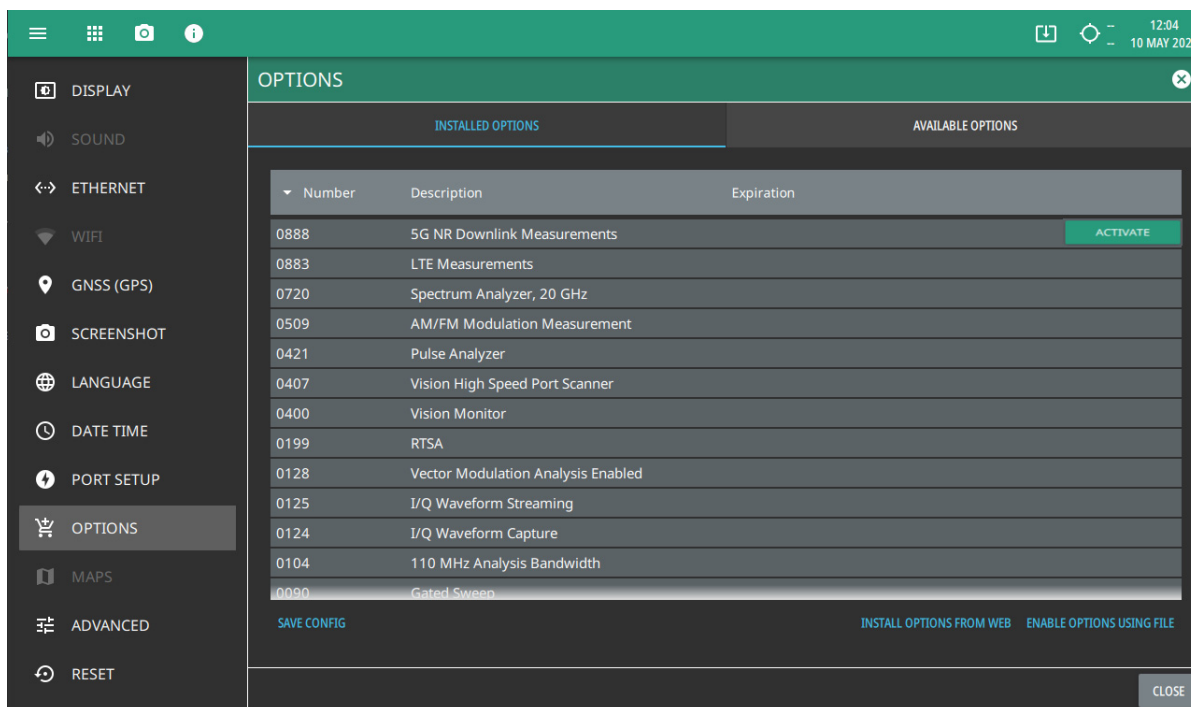


Figure 2-36. Options Settings

Advanced Settings

1. Access the System menu (3-line icon in the upper left corner).
2. Select **SETTINGS** to access the instrument settings menu.
3. Select **ADVANCED** to display the RF Safe Mode. Toggle the **ENABLE** option to enable the **RF SAFE MODE**.

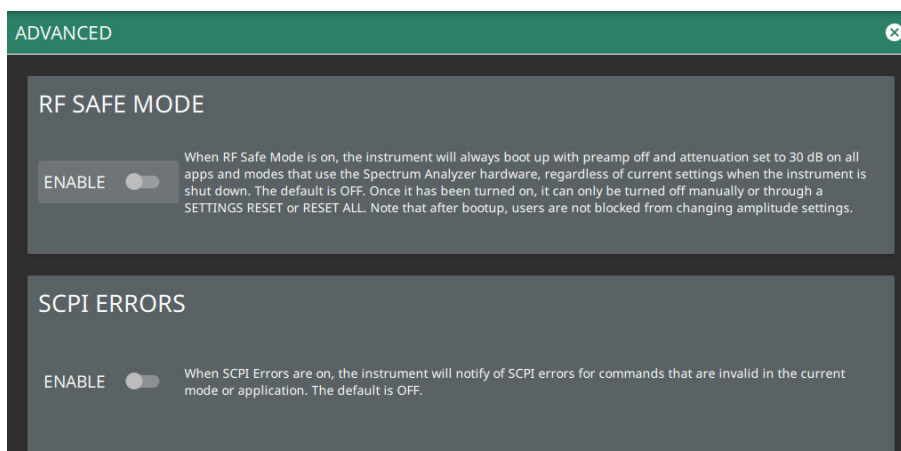


Figure 2-37. Advanced Settings

Reset Settings

1. Access the System menu (3-line icon in the upper left corner).
2. Select SETTINGS to access the instrument settings menu.
3. Select RESET to open the Reset menu.

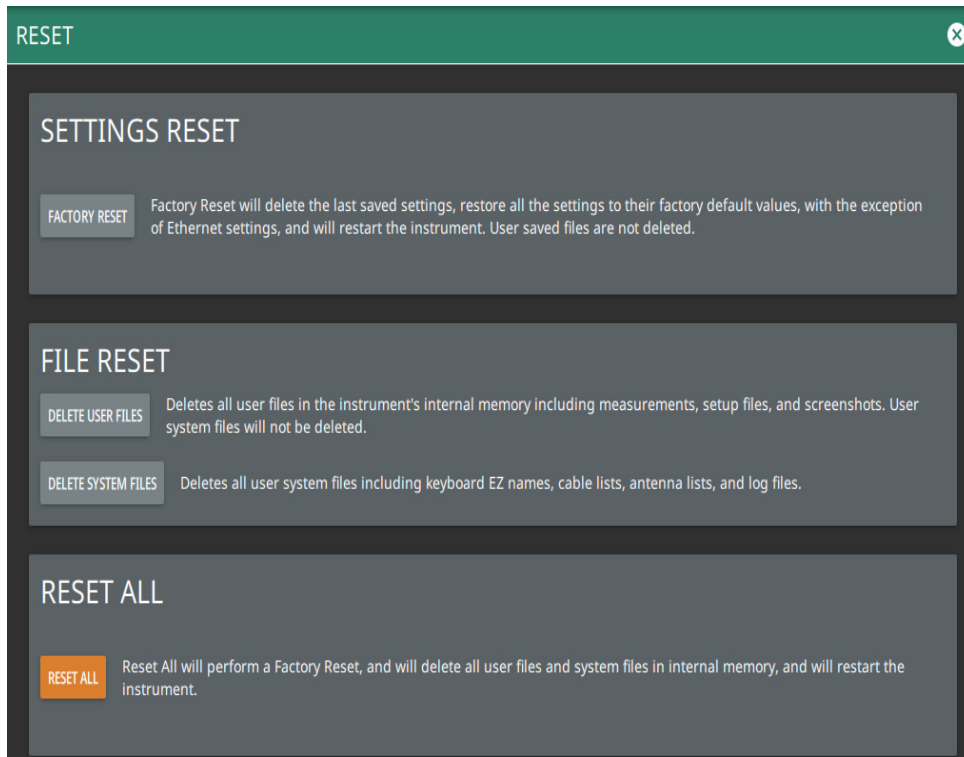


Figure 2-38. Reset Settings

The following reset options are available:

SETTINGS RESET

- **FACTORY RESET:** Restores the instrument to the factory default settings for all measurement modes and system settings, including the language, display and audio settings. Ethernet settings and user saved files are not affected. The instrument will automatically restart.

FILE RESET

- **DELETE USER FILES:** Deletes all user files from the instrument's internal memory, including measurement, setup, and screenshot files. System files are not affected.
- **DELETE SYSTEM FILES:** Deletes all user system files from the instrument's internal memory, including keyboard EZ names, cable and antenna lists, and log files. Other user files are not affected.

RESET ALL

- **RESET ALL:** Performs a Factory Reset as described above and deletes all user files and system files from the instrument's internal memory. The instrument will automatically restart.

2-13 Files

1. Access the System menu (3-line icon in the upper left corner).
2. Select FILES to access the local PC file system by opening the Windows file explorer.

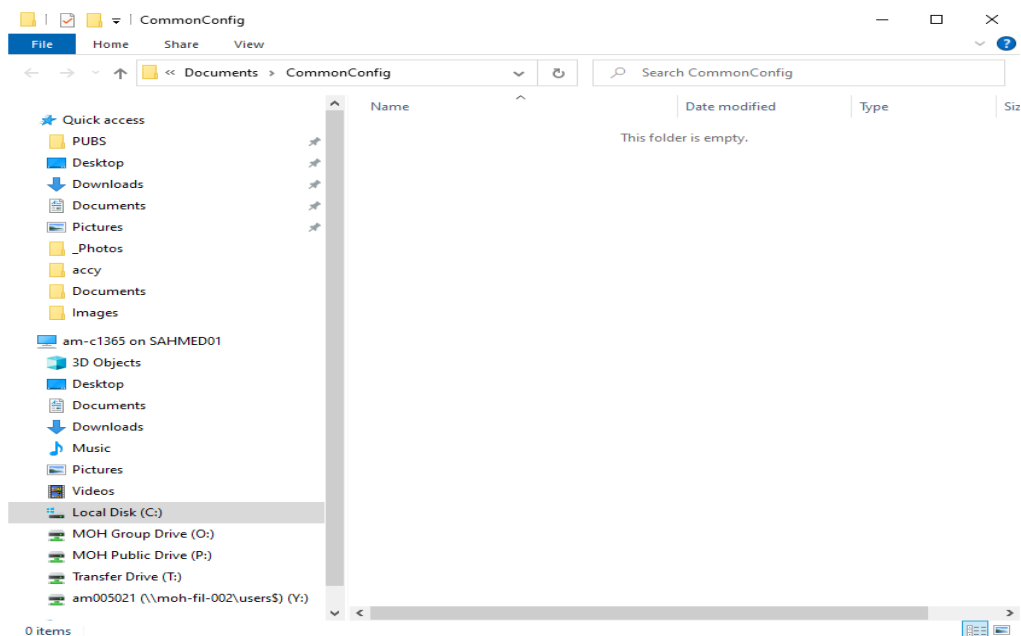


Figure 2-39. Files Menu

Note To access the target file system, the user requires the use of the SCPI commands or an FTP client.

FTP Access

An FTP server has been included in the instrument to allow direct access to files stored on the instrument (or on a USB memory device connected to the instrument) from a remote computer. To access the FTP server:

1. Connect the instrument to a network.
2. Use an FTP client of choice (such as Windows Explorer or File Explorer) and enter "ftp://" and the IP address of the instrument as the host. For example: ftp://172.155.1.2
3. Enter the user name: ftp
4. Enter the password: serial number of the instrument
The serial number can be obtained from the System Information menu or through SCPI using the "*IDN?" command.

Remote Files

1. Access the System menu (3-line icon in the upper left corner).
2. Select SETTINGS to access the settings menu, then select REMOTE FILES to open the default browser and download the internally saved files for e.g. screenshots. See [Figure 2-40](#).
3. Select the desired file from the list and download the content as needed.

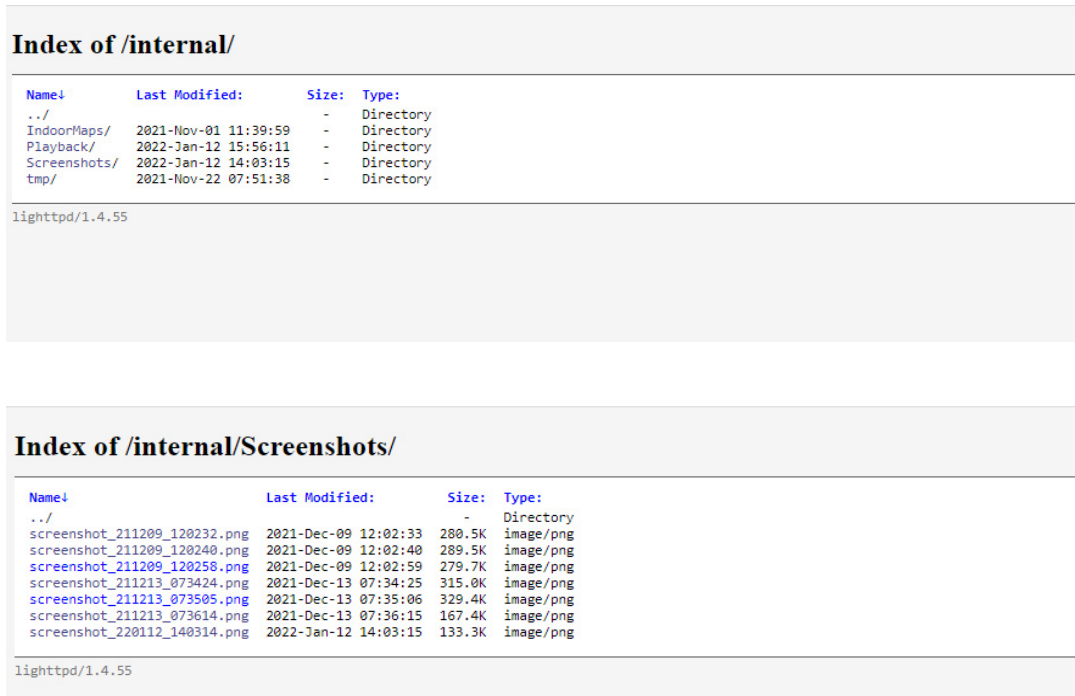
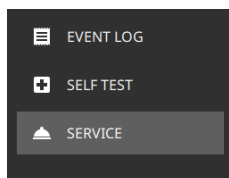


Figure 2-40. Remote Files Menu

2-14 Diagnostics

1. Select the System menu (3-line icon in the upper left corner).
2. Select DIAGNOSTICS to access the instrument diagnostics menu, then select the diagnostic menu that you wish to open.



Event Log: Opens the [Event Log](#).

Self Test: Opens the [Self Test](#).

Service: Opens the [Service Mode](#).

Figure 2-41. Diagnostics Menu

Event Log

The event log allows you to save the event log as a file. This log file is a binary file that may be used by customer service.

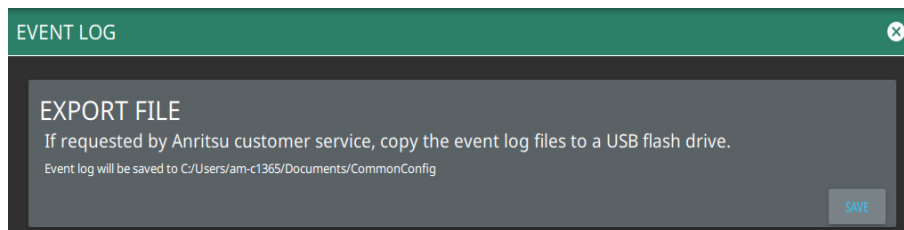


Figure 2-42. Event Log

Self Test

Self test is run when the self test feature is accessed. Basic system results are shown initially. The individual test result can be displayed with test data and a pass/fail status by clicking the desired system or application. The self test results can be saved to a file for future reference. Refer to [Appendix A, “Notification Messages and Troubleshooting”](#) for more information.

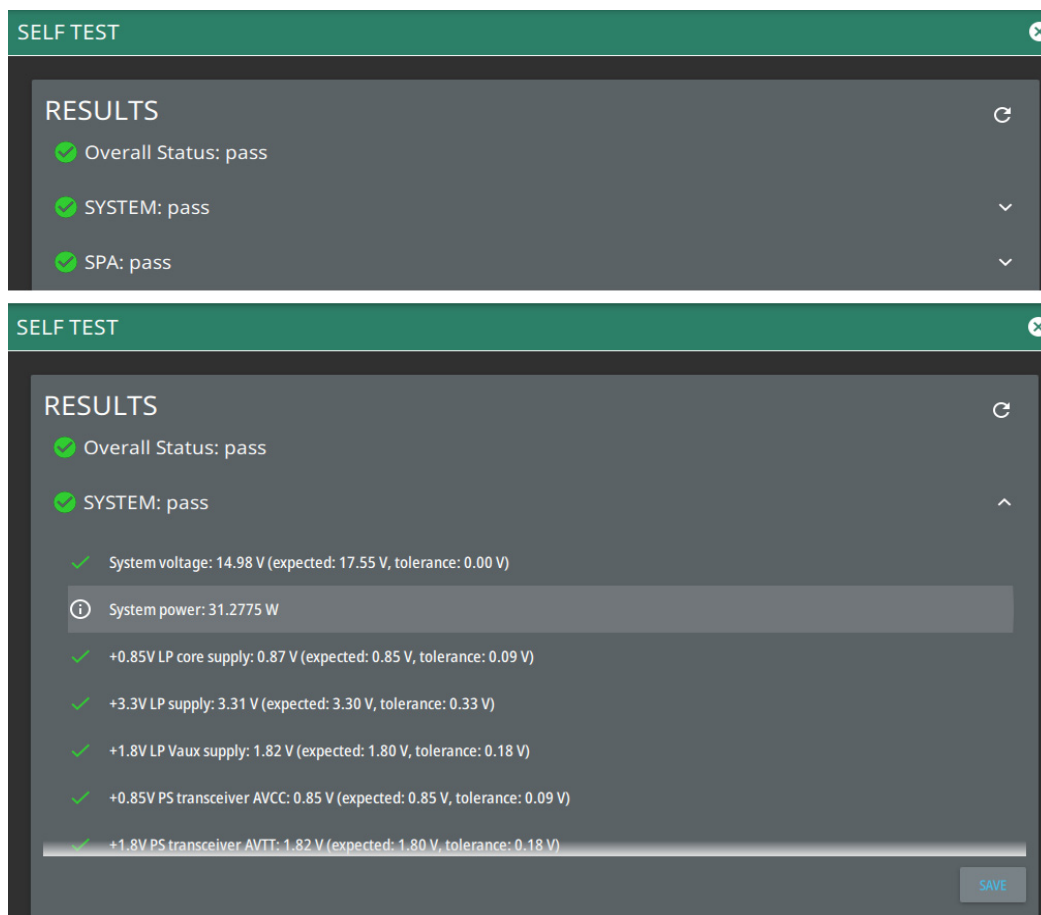


Figure 2-43. Self Test

Service Mode

The service mode is for Anritsu customer service use only.

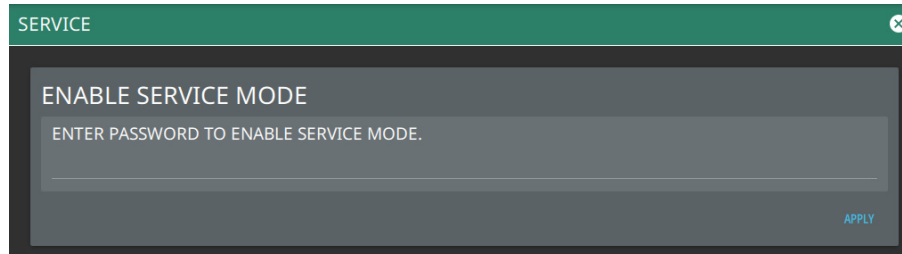
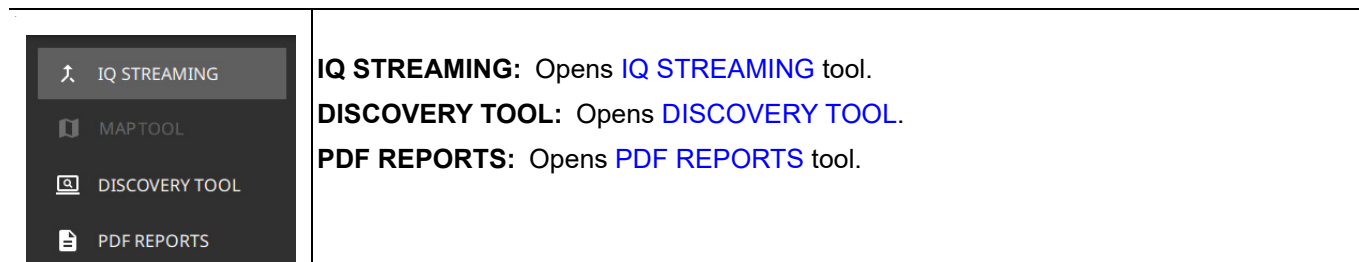


Figure 2-44. Service Mode

2-15 Tools Menu

1. Access the System menu (3-line icon in the upper left corner).
2. Select TOOLS to access the instrument tools menu, then select the tool menu that you wish to open.



IQ STREAMING: Opens [IQ STREAMING](#) tool.

DISCOVERY TOOL: Opens [DISCOVERY TOOL](#).

PDF REPORTS: Opens [PDF REPORTS](#) tool.

Figure 2-45. TOOLS Menu

IQ STREAMING

The IQ STREAMING menu allows you to concatenate an existing IQ metadata file (.dgzm) with a session of IQ data files (.dgz) that were streamed to a USB device after the stream operation is complete. The data files must all come from the same stream session.

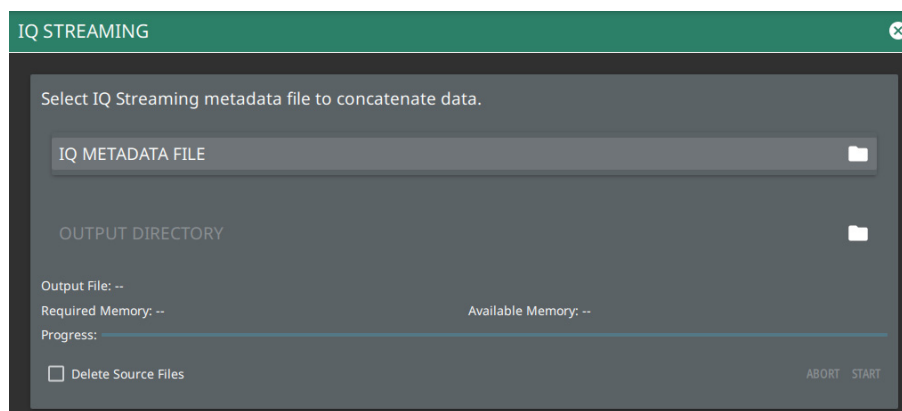


Figure 2-46. IQ STREAMING Menu

1. Select IQ METADATA FILE and then select the file that you wish to concatenate with IQ data streams. All of the data stream files in the selected directory will be concatenated with the metadata file.
2. Select the OUTPUT DIRECTORY and select the destination for the concatenated files. If desired, select Delete Source Files.
3. Select START to begin the concatenation. The progress bar will indicate relative progress.
4. Select ABORT to abort the concatenation process.

Note

Concatenating files can be time consuming depending on the streaming parameters and time. The process can be much faster if performed on a PC using the MS27201A PC application. Refer to ["MS27201A PC Software"](#) on page 2-4 for details on using this application.

DISCOVERY TOOL

The DISCOVERY TOOL menu displays all the compatible units on the local network and allows to connect with any one of the instruments.

Select on the desired model and select CONNECT to connect with that instrument.



The screenshot shows a window titled "DISCOVERY TOOL" with a close button (X) in the top right corner. Below the title bar is a green header area containing a "REFRESH" button on the left, a "Filter" input field in the center, and a "CONNECT" button on the right. The main area is a table with the following columns: Model, Serial Number, Hostname, IP Address, and Software Version. The table lists several instruments, with the second row highlighted in blue.

Model	Serial Number	Hostname	IP Address	Software Version
MS27201A	2135602	SWEPT200-196	172.26.200.196	D2023.03.22.3713_20230...
MS27201A	21112154	MS27201A-2154 - CURRE...	172.26.201.249	D2023.03.22.3713_20230...
MS2090A	22102053	raptor-ericc	172.26.203.18	D2022.10.14.3073_20221...
MS2090A	2122021	MS2090A-2122021	172.26.202.83	V2022.9.2
MS2090A	91720434	SWEPT200.184	172.26.200.184	E2023.03.15.3680_20230...
MS2090A	90420110	raptor-jll	172.26.202.30	E2023.03.22.3710_20230...
MS2090A	1849014	swept200-198	172.26.200.198	E2023.03.21.3703_20230...
MS2090A	1908035	sid	172.26.202.81	E2023.03.10.3665_20230...
MS2090A	1851106	MS2090A-1851106	172.26.202.37	T2023.3.1.3680
MS2090A	91720458	ahraptor	172.26.201.163	D2023.03.22.3707_20230...

Figure 2-47. Discovery Tool

Refer to the instructions as described in [Section A-6 “UDP Discovery Tool Firewall Settings”](#) on page A-16, to modify the computer’s firewall settings if the Discovery Tool is not responding.

PDF REPORTS

The PDF REPORTS tool allows the user to generate a PDF report or HTML report.

1. Select OPEN REPORT GENERATOR to open REPORT GENERATOR – CONFIG window.



Figure 2-48. PDF Reports Tool

2. In REPORT GENERATOR – CONFIG window you can load a template to populate the given fields.
 - Select LOAD TEMPLATE to use a customized template
 - Select SAVE TEMPLATE to save the template.
 - Select REPORT NAME to enter the name of the report.
 - To have the traces in black and white, toggle on the BLACK & WHITE GRAPHS button.
 - Toggle off the following buttons to exclude the information from the generated report:
 - Work Order Number
 - Technician ID
 - Prepared By
 - Approved By
 - Select CLEAR TEMPLATE to delete the preloaded template.

The screenshot displays the 'REPORT GENERATOR - CONFIG' window. At the top, there are three buttons: 'LOAD TEMPLATE...' (with a folder icon), 'SAVE TEMPLATE...' (with a save icon), and 'CLEAR TEMPLATE' (with a trash icon). Below these are two rows of controls: 'REPORT FOLDER' (with a folder icon and path 'C:/Users/am-c1365/Documents/Reports'), 'REPORT NAME' (with an edit icon and value 'Site 5A Test Report'), and a 'BLACK & WHITE GRAPHS' toggle switch. The main area is divided into two columns. The left column contains text input fields for 'TITLE' (Site 5A Test Report), 'SITE INFORMATION' (Tower 5 low power fault), and 'SITE LOCATION' (Morgan Hill). Below these is a 'LOGO' section with a file selection icon and 'MAX FILE SIZE: 30 MB', and a 'LOGO ALIGNMENT' dropdown menu. The right column contains toggle switches for 'WORK ORDER NO' (112-111-2303), 'TECHNICIAN ID' (am-1365), 'PREPARED BY', and 'APPROVED BY'. At the bottom, there are three buttons: 'CONFIG', 'SETUP', and 'PREVIEW', with left and right navigation arrows.

Figure 2-49. Report Generator - Config Window

3. Select SETUP button in the bottom to add setup or trace files in REPORT GENERATOR - SETUP window.
 - Select the blue + ADD FILE (S) button in the upper right to add image files (.png, jpeg, jpg) to the PDF report.
 - To delete a file select the minus button next to the file name, alternately select CLEAR ALL.
 - To include a specific note in your report, type the note into the text box located under the graph. Note that you need to select an image file before adding a note. Select SAVE NOTE button to save the note. Look for the green tick symbol in the lower right corner of the text box once the note is saved successfully.

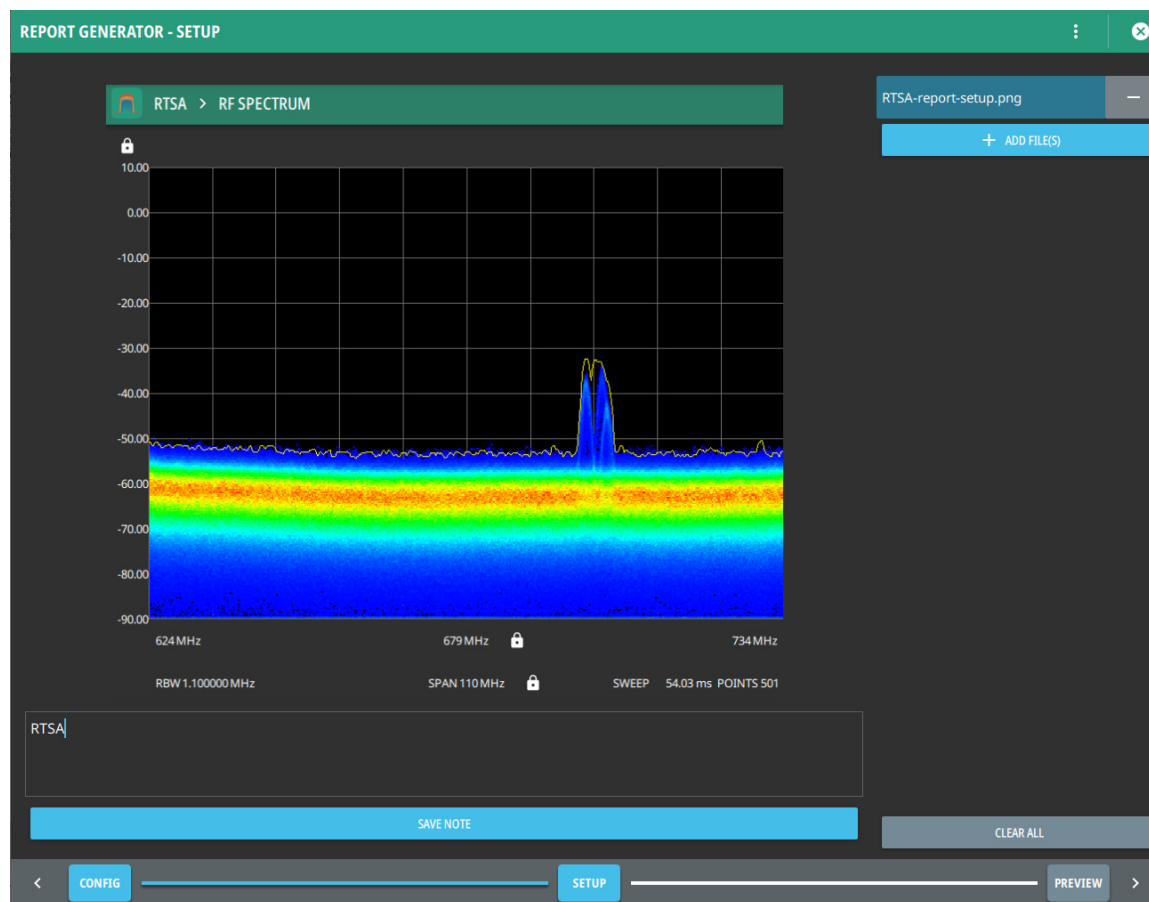


Figure 2-50. Report Generator - Setup Window

4. Select PREVIEW button to see the preview of the generated report in a web browser as shown in [Figure 2-52](#).

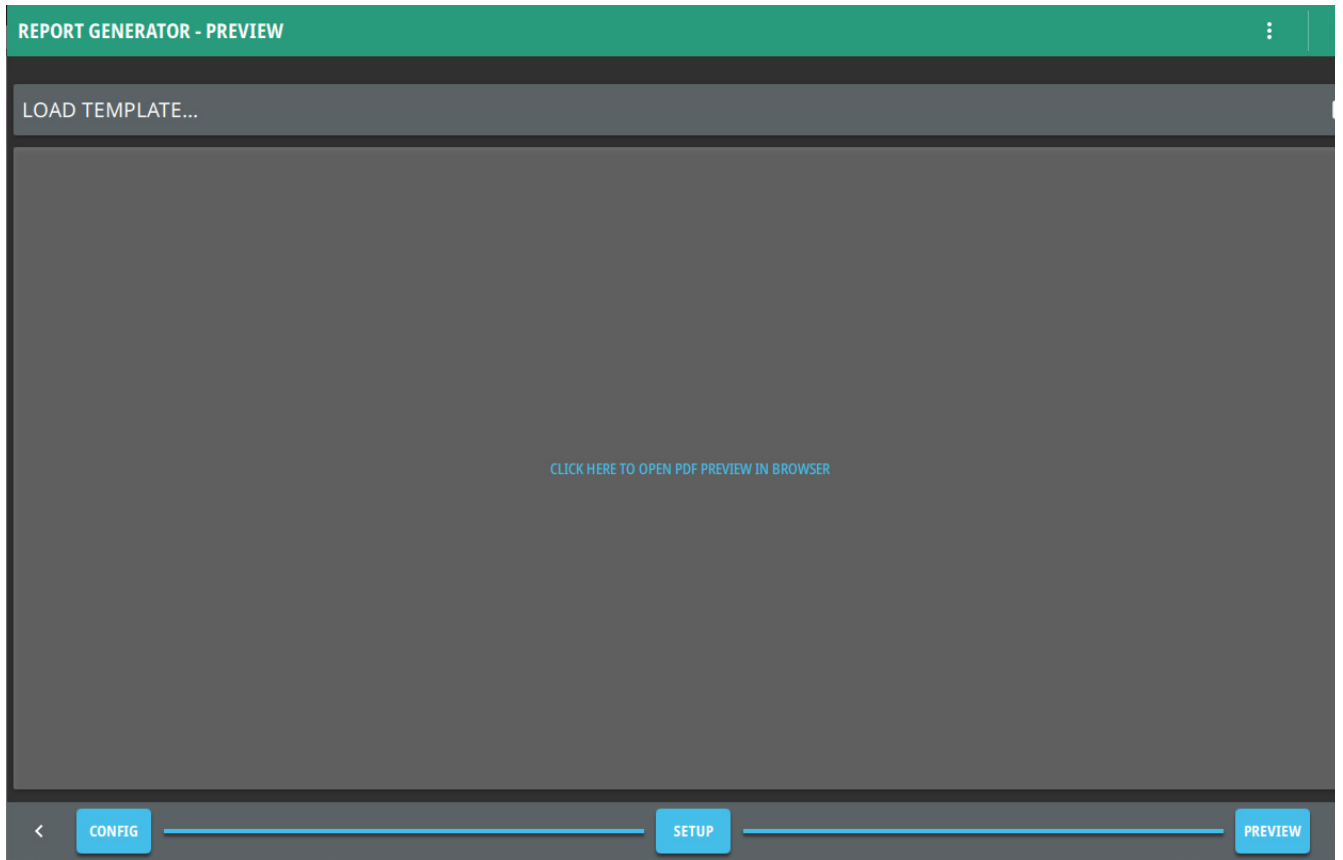
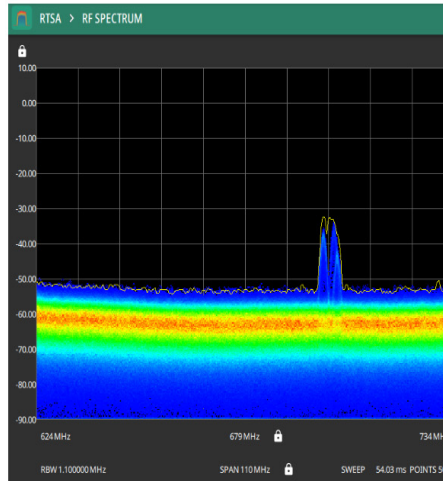


Figure 2-51. Report Generator - Preview Window



Site SA Test Report

DATE: Wed May 3 09:54:23 2023
LOCATION: Morgan Hill
SITE INFORMATION: Tower 5 low power fault



WORK ORDER NO: 112-111-2303
TECHNICIAN ID: am-1365
PREPARED BY:
APPROVED BY:

NOTES



Figure 2-52. Report Generator - Preview on Web Browser

2-16 Software Update

To update the MS27201A PC software, use a high quality USB memory device with at least 1 GB of memory space and FAT32 file system format, and follow the instructions below:

1. Insert the USB memory device into your PC or laptop.
2. From a browser, go to the following Anritsu products page:
<http://www.anritsu.com/en-US/test-measurement/products/ms2720xa>
3. On the product page, click Downloads and select Drivers/Firmware/Software.
4. Select the software update for your product and download it to the USB memory device.
5. Insert the USB memory device into the one of the MS27201A USB ports.

Installing the Software

1. Start the software update via one of the two ways below (see [Figure 2-53](#)):
 - Access the upper left [System Menu](#) (3-line icon), then Select SYSTEM INFORMATION > SOFTWARE UPDATE.
 - Select the software update icon on the [Title Bar](#).
2. Select the latest available update from the drop-down selections and Select Install.
 - A dialog will appear stating Software Update in Progress.
3. When the installation is complete, see [Verify the Software Update](#).

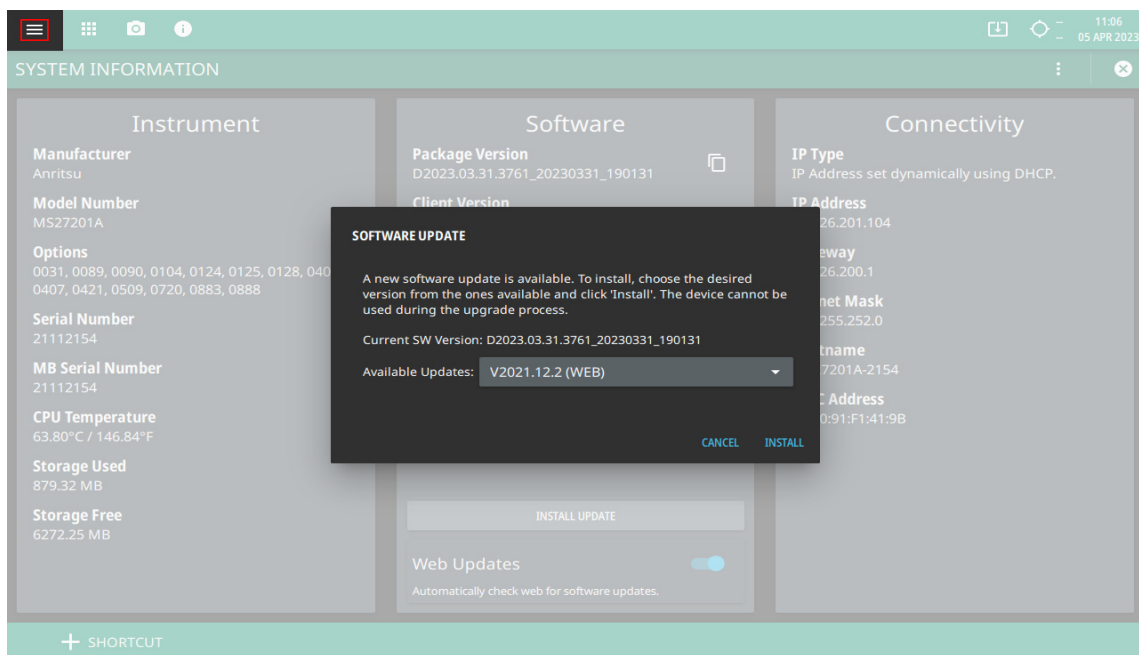


Figure 2-53. Updating the Software

Note

You can connect to a different instrument or update the existing Hostname/IP address by clicking system menu icon on the top.

Verify the Software Update

1. Once the software update is complete, power off the MS27201A.
2. Power on the MS27201A.
3. Select the System menu icon (3-line icon) from the MS27201A to display the [System Menu](#).
4. Select the [System Information](#) menu (see [Figure 2-54](#)).
5. Verify the Software Package Version displayed is the most current version installed.

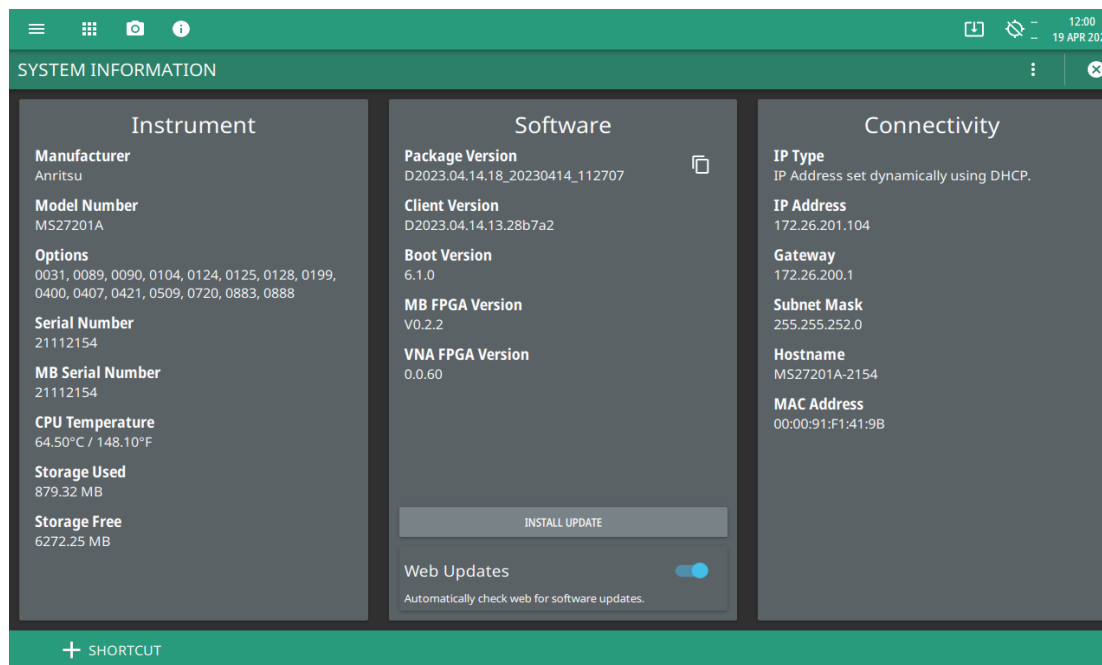


Figure 2-54. System Information Menu

Appendix A — Notification Messages and Troubleshooting

A-1 Introduction

This appendix provides a list of notification messages and their meaning. If any error condition persists, contact your local Anritsu Service Center (<http://www.anritsu.com/contact-us>).

Remote Spectrum Monitor displays the following message types:

- [Self-Test Messages](#), indicating self-test pass or fail conditions.
- [Informational Notifications](#), such as notification of a screen capture.
- [Warning Notifications](#), such as an ADC over-range warning.
- [Error Notifications](#), such as an internal instrument fault.

Messages have the following display characteristics:

- Transient messages appear briefly and then fade away.
- Persistent messages remain on the display and require user intervention to correct the condition.
- Some messages are logged but not displayed, such as messages in the event log.
- Messages may be displayed either in the Title bar or in a pop-up window.

Follow the [“UDP Discovery Tool Firewall Settings”](#) to change the Windows firewall settings if Discovery Tool is unresponsive.

Refer to [“System Override”](#) if the instrument does not respond to SCPI commands and needs to be reset remotely.

A-2 Self-Test Messages

Remote Spectrum Monitor has built-in diagnostics that allow you to run a built-in self test. The test results can be viewed on the screen and saved to a log file. To run self test, use the 3-line menu to access DIAGNOSTICS, then select SELF TEST and RUN SELF TEST. Below is a sample list of self tests with passing results:

TEST DATE: 2019-03-21 09:51:47 MDT

OVERALL STATUS : PASS

SYSTEM : OVERALL STATUS : PASS

System voltage : 13.00 V, 4.00 V ,15.01 V (PASS)

System power : 32.2083 W

External current : 2.50 A, 2.50 A ,2.32 A (PASS)

+0.85V LP core supply : 0.85 V, 0.09 V ,0.85 V (PASS)

+3.3V LP supply : 3.30 V, 0.33 V ,3.25 V (PASS)

+1.8V LP Vaux supply : 1.80 V, 0.18 V ,1.82 V (PASS)

+1.8V LP IO supply : 1.80 V, 0.18 V ,1.81 V (PASS)

+0.85V FP core supply : 0.85 V, 0.09 V ,0.85 V (PASS)

+1.8V DDR PLL supply : 1.80 V, 0.18 V ,1.81 V (PASS)

+0.85V PS transceiver AVCC : 0.85 V, 0.09 V ,0.85 V (PASS)

+1.8V PS transceiver AVTT : 1.80 V, 0.18 V ,1.83 V (PASS)

+2.5V DDR SODIMM supply : 2.50 V, 0.25 V ,2.49 V (PASS)

+1.2V DDR SODIMM supply : 1.20 V, 0.12 V ,1.20 V (PASS)

+0.85V FPGA core supply : 0.85 V, 0.09 V ,0.86 V (PASS)

+0.9V transceiver AVCC supply : 0.90 V, 0.09 V ,0.90 V (PASS)

+1.2V transceiver AVTT supply : 1.20 V, 0.12 V ,1.21 V (PASS)

+1.0V Ethernet supply : 1.00 V, 0.10 V ,0.99 V (PASS)

+1.8V FPGA supply : 1.80 V, 0.18 V ,1.79 V (PASS)

+2.5V FPGA supply : 2.50 V, 0.25 V ,2.48 V (PASS)

+3.3V FPGA supply : 3.30 V, 0.33 V ,3.29 V (PASS)

+5.0V USB/misc supply : 5.00 V, 0.50 V ,5.00 V (PASS)

+3.9V analog supply : 3.90 V, 0.39 V ,3.96 V (PASS)

+5.7V analog supply : 5.70 V, 0.57 V ,5.67 V (PASS)

-5.7V analog supply : -5.70 V, 0.57 V , -5.26 V (PASS)

+12.8V analog supply : 12.80 V, 1.28 V ,12.82 V (PASS)

+24.0V analog supply : 24.00 V, 2.40 V ,23.92 V (PASS)

Backlight voltage : 22.00 V, 4.40 V ,19.56 V (PASS)

Backlight current : 0.20 A, 0.20 A ,0.18 A (PASS)

12.0V for fan : 12.00 V, 1.20 V ,12.00 V (PASS)

CPU Temperature : 61.0 C

Motherboard Temperature : 46.5 C

Fan speed, percent of full speed : 7 %

Fan speed : 2638 RPM

Temperature at Reference : 45.3 C

SPA : OVERALL STATUS : PASS

+12VG : 12.00 V, 1.20 V ,11.90 V (PASS)

+5V_PREAMP : 5.00 V, 0.50 V ,4.99 V (PASS)

+5VA : 5.00 V, 0.50 V ,5.02 V (PASS)

+5VG : 5.00 V, 0.50 V ,4.99 V (PASS)

+5VH : 5.00 V, 0.50 V ,5.02 V (PASS)

+5VI : 5.00 V, 0.50 V ,5.05 V (PASS)

+5V_VCO : 5.00 V, 0.50 V ,5.09 V (PASS)

+5VM : 5.00 V, 0.50 V ,5.01 V (PASS)

+5VP : 5.00 V, 0.50 V ,5.05 V (PASS)

+5V_SAW : 5.00 V, 0.50 V ,4.99 V (PASS)

+3V3_HBPA : 3.30 V, 0.33 V ,3.31 V (PASS)

+3V3_IF : 3.30 V, 0.33 V ,3.29 V (PASS)

+3V6 : 3.60 V, 0.36 V ,3.55 V (PASS)

+3V3_CAL : 3.30 V, 0.33 V ,3.36 V (PASS)

+3V3G : 3.30 V, 0.33 V ,3.33 V (PASS)

+3V3H : 3.30 V, 0.33 V ,3.29 V (PASS)

+3V3M : 3.30 V, 0.33 V ,3.32 V (PASS)

+3V3P : 3.30 V, 0.33 V ,3.33 V (PASS)

ADC_AVDD3_3V3 : 3.30 V, 0.33 V ,3.33 V (PASS)

+3V3IFA : 3.30 V, 0.33 V ,3.33 V (PASS)

+3V3DET : 3.30 V, 0.33 V ,3.35 V (PASS)

+3V3IFC : 3.30 V, 0.33 V ,3.37 V (PASS)

+3V3IFD : 3.30 V, 0.33 V ,3.35 V (PASS)

+3V3IF_OUT : 3.30 V, 0.33 V ,3.33 V (PASS)

SPARE : 0.00 V, 1.00 V ,0.00 V (PASS)

-5V : -5.00 V, 0.50 V ,-5.13 V (PASS)

+24VH : 24.00 V, 2.40 V ,24.18 V (PASS)

+3V3D : 3.30 V, 0.33 V ,3.27 V (PASS)

+2V5D : 2.50 V, 0.25 V ,2.50 V (PASS)

ADC_AVDD2_2V5 : 2.50 V, 0.25 V ,2.50 V (PASS)

ADC_AVDD1_1V25 : 1.25 V, 0.13 V ,1.25 V (PASS)

ADC_DRVDD_1V25 : 1.25 V, 0.13 V ,1.25 V (PASS)

DCM Not Available For This Option : 0.00 V, 0.00 V ,0.00 V (PASS)

Thermal Sensor 1 (Mid-band 1st IF) : 35.00 C, 90.00 C ,44.75 C (PASS)

Thermal Sensor 2 (Mid-band 2nd IF) : 35.00 C, 90.00 C ,46.00 C (PASS)

Thermal Sensor 3 (Low-band RF) : 35.00 C, 90.00 C ,42.00 C (PASS)

DCM Temperature Not Available For This Option : 0.00 C, 0.00 C ,0.00 C (PASS)

ADC Thermal Sensor : 35.00 C, 90.00 C ,39.93 C (PASS)

If any self test fails, try resetting the instrument with **Reset All** button found in **Settings** menu, and run the test again. If the condition persists, contact your local Anritsu Service Center (<http://www.anritsu.com/contact-us>).

A-3 Informational Notifications

Cannot start measurement without a connected Antenna

In Title bar, Not Logged, Persistent

Cannot turn power cal on.

In Title bar, Not Logged, Transient

Concatenation has been aborted.

When user aborts concatenation of streaming metadata files

Connecting to access point.

In Title bar, Not Logged, Persistent

Custom SEM File Imported.

In Title bar, Logged, Transient

Density data not available in playback.

In Title bar, Not Logged, Transient

External reference detected - switching reference source to external.

In Title bar, Logged, Transient

External reference disconnected – switching reference source to GPS.

In Title bar, Logged, Transient

External reference disconnected – switching reference source to internal.

In Title bar, Logged, Transient

External reference disconnected – switching reference source to Internal High.

In Title bar, Logged, Transient

File Does Not Exist.

In Title bar, Not Logged, Transient

File Recall Failed

In Title bar, Not Logged, Transient

File Recalled Successfully

In Title bar, Not Logged, Transient

File Save Failed

In Title bar, Not Logged, Transient

File Saved Successfully

In Title bar, Not Logged, Transient

File successfully saved as: filename

When saving a file (e.g., trace, setup)

File <filename> import successfully

In Title bar, Not Logged, Transient. X represents the filename.

File <filename> export successfully

In Title bar, Not Logged, Transient. X represents the filename.

Frequency setting is outside sensor range. Measurement performance is not guaranteed outside the range of sensor. It is recommended to keep start and stop frequencies within range listed on sensor

Pop-up, Not Logged, Transient

The following options will expire in less than 24 hours (9xxx)

In Notifications bar

GPS reference detected - acquiring GPS

In Title bar, Logged, Transient

GPS reference acquired - switching reference source to GPS

In Title bar, Logged, Transient

GPS reference disconnected – switching reference source to Internal

In Title bar, Logged, Transient

GPS reference no longer available – switching reference source to Internal High

In Title bar, Logged, Transient

IF Gain Cal completed

In Title bar, Logged, Transient

Internal High reference no longer valid – switching frequency reference source to Internal

In Title bar, Logged, Transient

Internal High reference no longer valid – switching time reference source to Internal

In Title bar, Not Logged, Transient

Insufficient data. A map point is skipped. Setting a higher distance or increasing sweep time can help.

In Title bar, Not Logged, Persistent

Input greater than DMax: <value>

In Title bar, Not Logged, Transient. The value can be start or stop.

IQ STREAM - Sweep paused while IQ stream is in progress

In Title bar, Not Logged, Persistent

IQ CAPTURE - Sweep paused while IQ capture is in progress

In Title bar, Not Logged, Persistent

Language successfully updated to <Language Name>

In Title bar, Logged, Transient.

Language failed to update to <Language Name>

In Title bar, Logged, Transient.

Limit recall initiated

When a limit setup file is selected for recall.

Limits are not available for circular graphs

In Title bar, Not logged, Transient

Measurement changed. Trace recording stopped

In Title bar, Logged, Transient

Measurement changed. Trace playback stopped

In Title bar, Logged, Transient

Measurement changed. Trace recording in csv stopped

In Title bar, Logged, Transient

Missing GPS data. Ensure good GPS fix or directional antenna connection

In Title bar, Not Logged, Persistent

No bearing from directional antenna. Check connection and try again

In Title bar, Not Logged, Transient

No application loaded. Factory reset required

In Title bar, Logged, Persistent

Options upgraded. Please restart the instrument to use new features

In Title bar, Not Logged, Transient

Preset Completed

In Title bar, Not Logged, Transient

Presetting Instrument

In Title bar, Not Logged, Transient

Rebooting Instrument

In Title bar, Not Logged, Transient

Rebooting instrument into Recovery mode

In Title bar, Not Logged, Transient

Recall initiated

When a file is selected for recall

Reset Completed

In Title bar, Logged, Transient

Resetting Instrument

In Title bar, Logged, Transient

Recording In Progress

In Title bar, Logged, Persistent

Recording Complete. File saved as <filename>

In Title bar, Logged, Transient

Remove any RF input signal to the external sensor

Pop-up, Not Logged, Transient

RF Attenuation Auto must be OFF or Reference Level must be below -40dBm to enable Preamp

In Title bar, Logged, Transient

Successfully concatenated <N> files

When the concatenation of streaming metadata files is complete.

Successfully connected to access point

In Title bar, Not Logged, Transient

Screenshot saved

When saving a screenshot is successful

Scale adjusted to accommodate user change

In Title bar, Not logged, Transient

<Name of Setting> range adjusted to accommodate user change

In Title bar, Not logged, Transient. The setting can be distance, time and frequency.

Self test Passed

In Title bar, Logged, Transient

Self test Failed

In Title bar, Logged, Transient

Software update files found on USB

In Title bar, Not Logged, Transient

Stopped saving sweeps after sweep complete

When the save on event triggers are disabled after end-of-sweep.

Stopped saving sweeps after limit crossing

When the save on event triggers are disabled after a limit fails.

Trigger delay updated to minimum allowable value for selected bandwidth and bit format

In Title bar, Not Logged, Transient

The selected mode is not yet available

When an unavailable mode is selected.

USB drive <name> ejected

In Title bar, Not Logged, Transient

A-4 Warning Notifications

ADC Overrange

In Title bar, Logged, Persistent

Antenna information invalid

In Title bar, Not Logged, Persistent

Booted from backup SW slot. Reinstall SW to clear this message

Popup, Logged, Persistent

Could not read from input file. Please verify that the storage device is still accessible and try again

In Title bar, Not Logged, Transient

Could not create output file. Please verify that the device is accessible and can be written to

In Title bar, Not Logged, Transient

Current settings do not allow for simultaneous sweep and audio output

In Title bar, Not Logged, Persistent

Device transfer speed insufficient for gapless transfer at current BW/bit depth settings; some samples will be missed

In Title bar, Logged, Persistent

Error occurred during concatenation. Error code: <code>

Popup, Not Logged, Transient

Failed to recall limit

When the limit setup file selected for recall could not be accessed.

Failed to save file: filename

When any other error occurred while trying to save a file.

Failed to save screenshot. Device may be full.

When saving a screenshot fails.

IF Gain Calibration is off

In Title bar, Logged, Persistent

IF Shape Calibration is off

In Title bar, Logged, Persistent

Invalid frequency setup for this antenna

In Title bar, Logged, Transient

Limit recall initiated

When a limit setup file is selected for recall.

Not enough available space to save file: <filename>

When the entire file could not be written.

One or more shortcuts are no longer valid: <shortcut name>. File (s) cannot be found.

In Title bar, Logged, Persistent

Playback file corrupted, stopping playback

In Title bar, Logged, Transient

RBW changed: cannot be greater than IF bandwidth

In Title bar, Logged, Transient

Recall file does not exist

When the file selected for recall could not be accessed

Record CSV file failed to open

In Title bar, Logged, Transient

Reference Level Calibration is off

In Title bar, Logged, Persistent

Remote Lockout Warning: Warning Instrument Is Under Remote Control. Press “Return to Local” to exit remote control and enable on-screen

Popup, Not Logged, Persistent

Restart required for new settings to take effect.

Persistent. When hostname or options (in the Debug menu) are changed.

RF or Reference Level must be below <value> to enable Preamp

In Title bar, Logged, Transient

Setting change detected; unloading playback file

In Title bar, Logged, Transient

Save failed. File size exceeds save limits. Adjust setup and try again

In Title bar, Logged, Transient

Simulated Test Signal data being displayed

In Title bar, Logged, Persistent

Spectrogram view not available

In Title bar, Logged, Transient

Segment gate length too short. Increase RBW or VBW setting for segments (X)

In Title bar, Logged, Persistent. X indicates the incorrect segments.

Temperature High Warning

In Title bar, Logged, Persistent

The selected mode is not yet available.

When an unavailable mode is selected.

The ALC Cal Data is incorrect for the attached microwave module

In Title bar, Logged, Persistent

The following options will expire in less than 24 hours <Option Number>. Reboot required. The system will reboot at X.

In Title bar, Logged, Persistent. X denotes the date and time.

The following options have expired <Option Number>. Reboot required. The system will reboot at X

Popup, Logged, Transient. X denotes the date and time.

The following options have expired <Option Number>

In Title bar, Logged, Transient

The following options have expired <Option Number>

Popup, Logged, Transient

Quasi-peak detection selected. Sweep will be slower

In Title bar, Logged, Transient

Zero Span is not available

In Title bar, Logged, Transient

<Name of setting> <Value of setting> exceeds the min/max range <minimum value - maximum value>

In Title bar, Logged, Transient

A-5 Error Notifications

Antenna disconnected. Terminating measurement

In Title bar, Logged, Transient

ALC Unlevel Error (X) @ Y Hz

In Title bar, Logged, Transient. X represents the ALC that failed and Y represents the specific frequency value at which the failure occurred.

Attempt to reboot instrument into Recovery mode failed

In Title bar, Logged, Transient

Cannot start measurement without a connected Antenna

In Title bar, Logged, Transient

Cannot set auto RBW ON due to exceeding IF bandwidth. RBW set to IF bandwidth

In Title bar, Not Logged, Transient

Command Error

In Title bar, Logged, Persistent

Could not lock to internal reference

In Title bar, Logged, Persistent

Could not lock to external reference - check connection and try again

In Title bar, Logged, Transient

Failed to connect to hardware

Persistent. When the connection to the hardware (server) could not be established.

Failed to recall limit

When the limit setup file selected for recall could not be accessed.

Failed to save file: filepath/filename

When any other error occurred while trying to save a file or when the connection to the hardware (server) is broken.

Failed to save screenshot. Device may be full.

When saving a screenshot fails.

HW communication problem: SPA app unloaded

In Title bar, Logged, Persistent

IQ capture complete. File saved

In Title bar, Logged, Transient

IQ capture file failed to save

In Title bar, Logged, Transient

IQ Capture Aborted

In Title bar, Logged, Transient

Not enough available space to save file: filepath/filename

When the entire file could not be written

Out of Range

In Title bar, Not Logged, Transient

Options upgrade failed due to <specific reason>

In Title bar, Logged, Transient

Options upgraded. Please restart the instrument to use new features.

In Title bar, Not Logged, Transient

Options <value> are not valid for the currently installed firmware version. The device might not function properly

In Title bar, Logged, Persistent

PLL Unlock Error (X)

In Title bar, Logged, Persistent. X represents either LO1, LO2, SLO or a combination of them.

PLL Unlock Error (X) @ Y Hz

In Title bar, Logged, Persistent. X represents the PLL that failed and Y represents the specific frequency value at which the failure occurred. The frequency range of Y is from 30,000.00 Hz to 54,000,000,000 Hz.

Query Error

In Title bar, Not Logged, Transient

Recall file does not exist

When the file selected for recall could not be accessed.

SPA FPGA Programming Error

In Title bar, Logged, Persistent

Setting mismatch; cannot display memory trace

In Title bar, Logged, Transient

To minimize distortion on higher level signals, please add external attenuation

In Title bar, Not Logged, Persistent

The selected custom mask is invalid

In Title bar, Logged, Transient

Trace playback not available

In Title bar, Logged, Transient

Trace recording not available

In Title bar, Logged, Transient

Trace has not been copied to memory

In Title bar, Logged, Transient

Unexpected software exception. Reboot required.

When the instrument software requires a reboot due to unknown error, Persistent

Options <value> are not valid. Running without any options

In Title bar, Not Logged, Persistent. This error may occur after a firmware update. Indicates that invalid option numbers were detected (<value> indicates the invalid option numbers).

Options listed <value> are not valid. Restored to previous options

In Title bar, Not Logged, Transient. This error may occur when upgrading options from an options upgrade file fails due to an invalid option configuration. The options will be restored to the previous options numbers.

Failed to upgrade options. Restored to previous options #

In Title bar, Not Logged, Transient. This error may occur when upgrading options from an options upgrade file fails due to an unknown reason. The options will be restored to the previous options numbers.

Zero Sensor Error, remove any RF input signal to the external sensor

In Title bar, Logged, Transient

A-6 UDP Discovery Tool Firewall Settings

Follow the instructions below if the Discovery tool is not responding:

1. Go to Control Panel and open Windows Defender Firewall settings.
2. Select Allow an app or feature through Windows Defender Firewall.

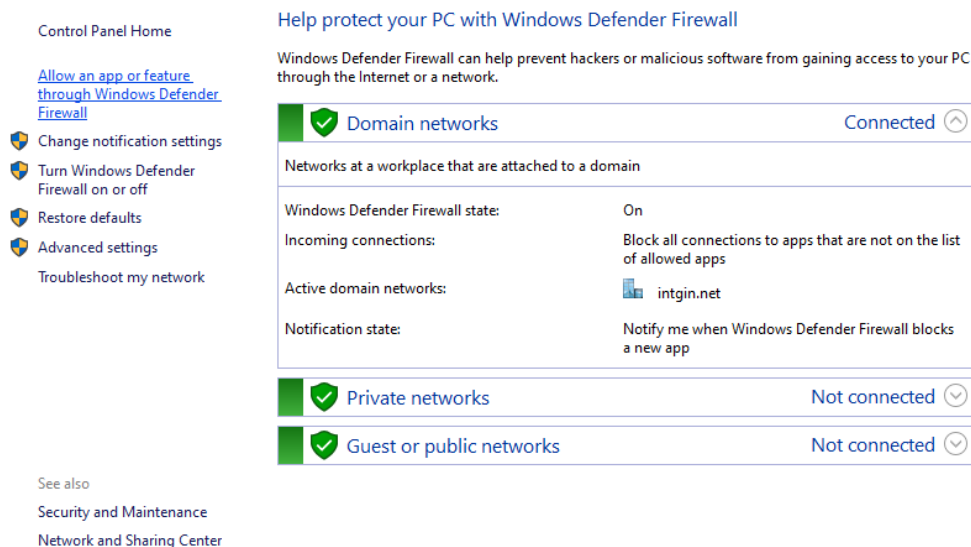


Figure A-1. Windows Defender Firewall window

3. Select Change Settings button.

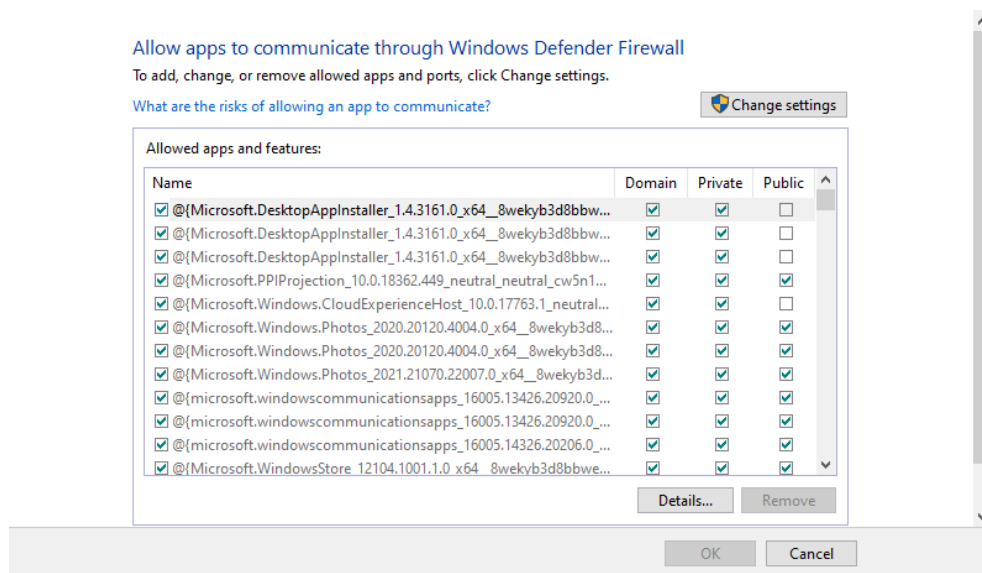


Figure A-2. Allow apps to communicate through Windows Defender Firewall window

4. Find `fieldmaster_base` in the list of apps, and make sure that the `fieldmaster_base` box and Domain box are checked. Private and Public boxes may also need to be checked depending on where the instruments are on the network.
5. Select OK. Note that if the `fieldmaster_base` is missing, click Allow an app or feature through Windows Defender Firewall, and search for `fieldmaster_base.exe` file available in the installation directory.

Note that if more than one fieldmaster product is installed, multiple entries will need to be enabled.

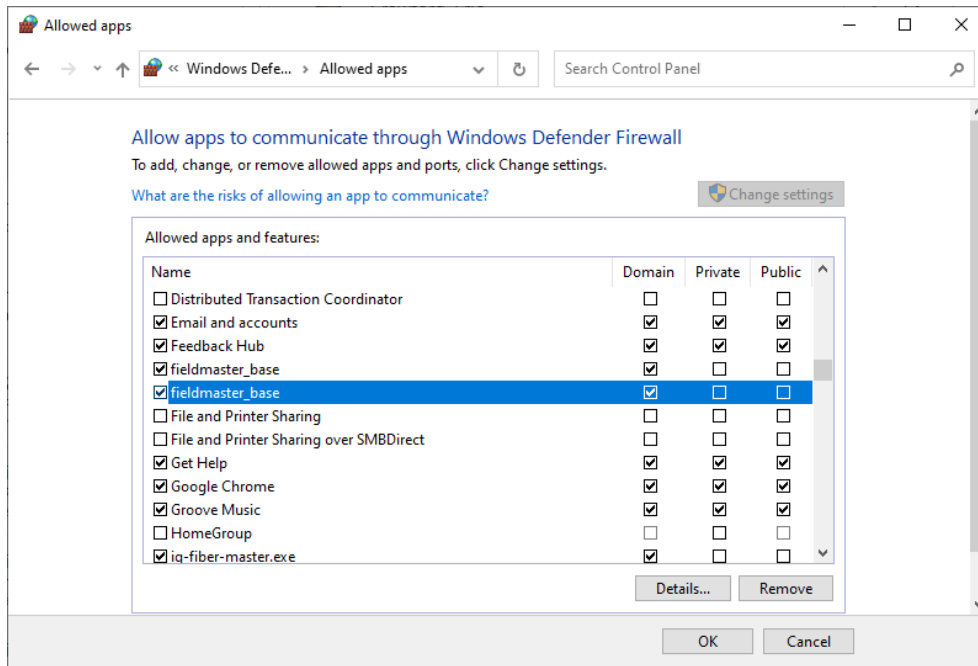


Figure A-3. Field master base app

A-7 System Override

In the event that the instrument does not respond to SCPI commands (due to circumstances like a long sweep used in conjunction with *OPC?) and needs to be reset remotely, the system override feature can be used. System override can be accessed through TCP port 8001 of the instrument. All commands except a password reset will require the instrument's password to be sent. The default password for an instrument is the MAC address interleaved with the word "system" between MAC address pairs. As an example, an instrument with the MAC address "1a:2b:3c:4d:5e:6f" will have a default password of "1as2by3cs4dt5ee6fm". Currently, system override supports the commands as described below:

1. Reboot the instrument:

To reboot the instrument, send the following string to the instrument through port 8001:

```
"force_reboot,<instrument_password>"
```

Replace <instrument_password> with the password of the instrument. After the command has been sent, the instrument will respond with "ok" if the command has been successfully processed. If the password is incorrect, "password_match_fail" will be returned.

2. Set a new password:

To set a new password for the instrument, the following string should be sent through port 8001:

```
"change_password,<old_instrument_password>,<new_instrument_password>"
```

Note that the max length of a password is 50 characters. If the new password has been successfully set, "ok" will be returned. If the password is too long, a "password_over_50_characters_fail" will be returned. If the old password does not match, a "password_set_fail" message will be returned.

3. Reset the password:

In the case where the system override password needs to be reset to default, the following command can be sent through port 8001:

```
"reset_password"
```

Note that this command DOES NOT require the instrument password. If the password has been successfully reset, "ok" will be returned.

4. Disconnect SCPI connections:

This command causes all currently established SCPI connections (on TCP port 9001) to be disconnected.

```
reset_scp_connection
```

It can be used to immediately clean up connections that were left open due to network interruption (e.g. close handshake packets were dropped, client thinks it is disconnected but the instrument thinks the connection is still there) or to establish sole control of an instrument by forcing all other clients to reconnect. This command is automatically executed when secure mode is turned on.

If an improperly formatted command is sent to the instrument, a "command_match_fail" will be sent back.

To use dbutil:

1. Open a command window in Windows.
2. Enter the command:

dbutil /f ip_address where ip_address is the address of the RSM. Then the DNS name can be used instead of the ip_address.

Appendix B — Software Option Upgrades

B-1 Introduction

Upgrading software options on MS27201A consists of two main steps:

1. Export and send the unit's configuration file to Anritsu.
2. Import the new license file provided by Anritsu.

B-2 Exporting a Software Configuration File

Exporting the configuration file:

1. Insert a USB memory device.
2. Open the System menu from the upper left 3-line icon.
3. Navigate to **SETTINGS > OPTIONS** menu.
4. Select **SAVE CONFIG** at the lower left of **INSTALLED OPTIONS**.
5. Save the configuration file to a USB memory device, preserving the default filename. The filename will be in the format of **MS27201A_XXXXXXX.config** on the USB memory device when the operation is complete.
6. Email the file to [Anritsu] (example@example.com).

B-3 Importing Software License

Importing a new license file:


1. After receiving a new license file from Anritsu, place the file on the USB memory device in the top (root) level, not in any directory.
2. Open the System menu from the upper left 3-line icon.
3. Navigate to **Settings > Options** menu.
4. Select **ENABLE OPTIONS USING FILE** at the lower right of **INSTALLED OPTIONS**.

The instrument will search for a valid license file on the USB memory device and apply the changes to the system.

5. Reboot the instrument and ensure all changes are applied.

Anritsu



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