Mini-Circuits®

VECTOR NETWORK ANALYZER

eVNA-63+

Quick Start Guide

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Important Notice

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1. About the eVNA-63+

Mini-Circuits' eVNA-63+ is a high performance, software-controlled vector network analyzer (VNA). By moving the complex data processing and calculation required of vector network measurements out of the instrument and into an advanced software package, Mini-Circuits is able to offer a fully-featured but cost effective VNA for every test bench.
The product ships with Mini-Circuits' eVNA Studio software package, providing a powerful GUI which will feel familiar to any engineer with experience of VNA measurements.

1.1. Support Contacts

We are here to support you every step of the way. For technical support and assistance, please contact us at the email address below or refer to our website for your local support:

testsolutions@minicircuits.com
minicircuits.com/contact/worldwide_tech_support.html

1.2 About This Guide

This quick start guide is intended to summarize only the very basic steps required to get safely up and running with the eVNA-63+. For full operating instructions and measurement examples, please refer to the user guide and programming manual available from the Mini-Circuits website.

2. Safety & Cautions

The eVNA-63+ instrument and external AC / DC power adapter module contain no user serviceable parts and should not be opened. Discontinue use and contact Mini-Circuits in the event of visible damage to any parts.

Caution:
- Only use the AC / DC power supply adapter supplied with the instrument.

2.1. Maximum Input Levels

Adhere to the published maximum specifications on all ports as stated in the published datasheet.

Ports	Parameter	Specification Limit
Port 1 & 2	Input Power (below 10 MHz) Input Power (10 MHz to 6 GHz) DC Input Voltage	+15 dBm max per port +20 dBm max per port ±30 V max per port
Bias 1 & 2	DC Input Voltage DC Input Current	±30 V max per port 200 mA max per port
Trigger In	DC Input Voltage	5V Max
DC Input	DC Input Voltage	5.25 V max
Ref In	Nominal Impedance	50Ω

Caution:
- Observe ESD precautions when handling and connecting the eVNA-63+ to avoid damage.

2.2. Operating Environment

The eVNA-63+ is intended for testing of RF components in indoor laboratory or production test environments. Do not use in damp or excessively humid conditions, or in any other condition which exceeds the published environmental specifications.

Condition	Specification
Operating Temperature	+5 to +50°C
Storage Temperature	-35 to +75°C
Relative Humidity	5% to 85% (non-condensing)

3. Sofware Setup

3.1. Software Downloads & Resources

The full eVNA Studio software package including GUI and API is available for download from:

minicircuits.com/softwaredownload/evna.html

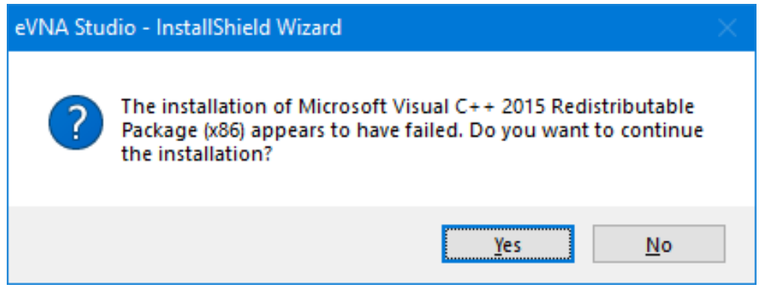
3.2. System Requirements

The minimum requirements for installation of the eVNA software package and API on the host PC are:

- Microsoft Windows 7 or 10 (64-bit)
- Intel i3 processor or equivalent
- 8 GB RAM
- USB 2.0 or later

3.3. eVNA Studio Software Installation

1. Run the eVNA_x.x.x_Setup.exe installation program.
2. Follow the on screen instructions to install the eVNA Studio software package
3. A warning may appear advising that the installation of Microsoft Visual C++ 2015 Redistributable Package appears to have failed. This usually indicates that a comparable package is already installed so click Yes to proceed with the installation.



In the event of any issues with installation, please refer to the full user guide on the Mini-Circuits website, or contact testsolutions@minicircuits.com.

4. Graphical User Interface (GUI) Overview

The GUI is laid out as shown in figure 1, with a structure that should be familiar to users of legacy VNA instruments. The control panel on the right-hand side provides access to the top-level options with a dynamic sub-panel just to the left providing the next level options based on the user's input. The same set of options are also available from the main menu at the top of the screen, to provide an interface familiar to users of PC software. Table 1 summarizes each of the key elements of the GUI display highlighted in figure 1.

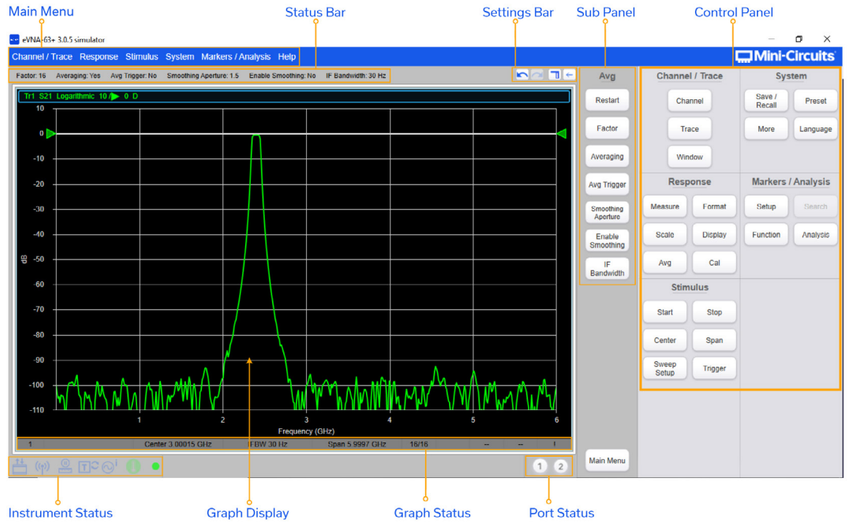


Figure 1: eVNA Studio GUI display

GUI Section	Description
Main Menu	Standard software menu bar with drill down options for all eVNA features.
Control Panel	Control panel with buttons for all top level and second level items accessible from the Main Menu. Provides the same functionality as the Main Menu in a format which should be more familiar to users of legacy VNAs.
Sub Panel	Dynamic panel of buttons which updates to show the relevant options based on the last selection from the Control Panel or Main Menu.
Status Bar	Read-out of the current settings for the last Control Panel / Main Menu selection
Settings Bar	Additional buttons or input fields to specify any parameters required by the Control Panel / Main Menu selection.
Instrument Status	Series of icons indicating the general configuration / status of the eVNA.
Port Status	Icons indicating which of the 2 ports is currently active as the stimulus signal.
Graph Display	Central graphical display showing the measured data and graphs.
Graph Status	Channel and trace parameters for the graph display.

Table 1: Summary of each main section on the eVNA Studio GUI display

4.1. Main Menu / Control Panel Groups

The main menu and control panel provide two different interfaces to the same set of features. Navigation through the 2 interface types should feel familiar to uses of Windows software and legacy VNA instruments respectively. The top-level groupings are:

1. Stimulus: Define frequency range or time span, power, sweep and trigger parameters. The start and stop frequency, center frequency, or frequency span can be specified.
2. Channel / Trace: Defines the number and arrangement of channels / traces on the data panel
3. Response: Defines the calibration of the DUT, the measurement of the DUT to the stimulus, and the set-up of the graphical display of measurement results.
4. Markers / Analysis: Defines the markers to be used in the graphic display. Markers can be used for peak statistical analysis of the waveform or to mark discrete time / frequency / data points.
5. System: Defines the hardware capabilities of the eVNA system, with options to save and recall different data sets.

4.2. Settings Bar & Status Bar

The Settings Bar updates dynamically to provide additional input options where required, for the last selection made through the Main Menu or Control Panel / Sub Panel.

The menu sequence below for example, displays an input box for “Num Traces” to allow the user to enter the number of active traces. The cross icon is used to cancel the input and the tick icon (when shown) or enter key to set the parameter.

Channel / Trace → Trace → Num Traces

The four buttons on the right-hand edge are always shown, from left to right they are:

1. Undo—Undo the last settings change
2. Redo—Re-apply any change in settings following an “Undo”
3. Toggle Panels—Toggle the GUI between showing:
   a. Trace + Control Panel + Sub Panel
   b. Trace + Sub Panel
   c. Trace only
4. Back—Go back to previous level on the sub panel (where it has previously been drilled down through selections made in the Control Panel or Top Menu)

The status bar is a static read-out of the current settings relevant to the latest menu section.

4.3. Instrument Status Icons

The instrument status bar at the bottom of the GUI, beneath the graphical display, contains a series of icons which are either “illuminated” or inactive to indicate the current status of the eVNA instrument. Table 2 summarizes the function of each GUI icon.

Icon	Function	Description
	Bias-tee	Internal bias-tee is enabled System → More → Bias Tee
	Display Updates	Updates to the graph display are enabled Response → Display → Update
	RF Output	RF output is enabled Stimulus → Sweep Setup → Power Menu → RF Out
	Measurement Status	Measurement is initializing or in progress
	Trigger Source	Trigger source selection (internal, external, manual or SCPI): Stimulus → Trigger → More → Trigger Source
	Reference Source	Reference source selection (internal or external) System → More → Reference Clock Source
	Temperature Status	Green (device up to temperature), yellow (device is warming up), or red (over temperature, device will shut down)
	Connection Status	eVNA-63+ instrument hardware or simulator mode is connected System → More → Connections

Table 2: Explanation of each instrument status icon

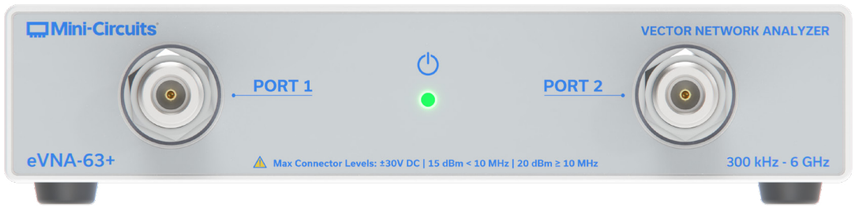
4.4. Graph Status Notifications

The graph status bar shows indicates some key parameters / settings for the active channel:

- Active channel number
- Start / Stop / Center / Span frequency
- IFBW—IF bandwidth of the sweep

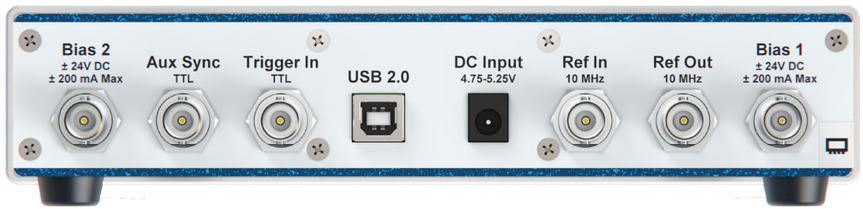
5. Hardware Setup

5.1. Front Panel Layout



Item Name	Type	Description
Power Indicator	**LED**	Indicates power and software connection status: • Red = Power on but the instrument has not been claimed by the eVNA Studio software on the host PC • Green = Power on and the instrument is assigned to the eVNA Studio software on the host PC (ready to measure)
Port 1	**N-type female**	RF source / receiver test port 1
Port 1	**N-type female**	RF source / receiver test port 2

5.2. Rear Panel Layout



Item Name	Type	Description
Bias 1	**BNC female**	DC voltage input port for bias-tee 1
Bias 2	**BNC female**	DC voltage input port for bias-tee 2
Aux Sync	**BNC female**	Auxiliary input (not currently in use)
Trigger In	**BNC female**	External trigger input
Ref In	**BNC female**	10 MHz reference input
Ref Out	**BNC female**	10 MHz reference output
USB 2.0	**USB type B**	USB control port
DC Input	**2.5 mm DC socket**	5V DC supply input

5.3. Initial Connection & Power-On

Note:

- Ensure the eVNA Studio software package is installed on the host PC before proceeding.

1. Connect the USB cable between the eVNA-63+ instrument and the host PC
2. Connect the supplied AC / DC power adapter between the eVNA-63+ and a suitable AC mains power source
3. The eVNA-63+ will power on as soon as the AC supply is turned on, RF measurement functions can then be enabled through the software
4. It is strongly recommended to allow the unit to warm up before calibration or test measurements are carried out. This takes approximately 15 minutes and the temperature indicator in the eVNA Studio GUI will appear green once the instrument has reached a stable temperature.

6. Hardware Connection

After connecting and powering on the eVNA-63+ instrument hardware it needs to be connected to the eVNA Studio GUI on the host PC.

1. Launch the eVNA Studio GUI
2. Find the instrument:
   System → More → Connections

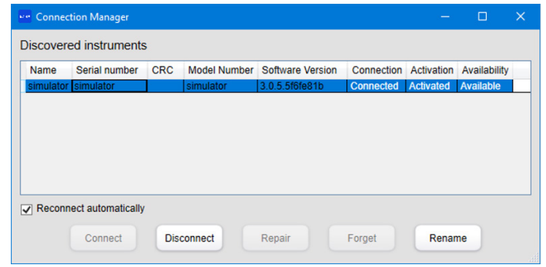


Figure 2: eVNA Studio connection screen showing all available instruments

3. If multiple eVNA-63+ instruments are connected to the PC, select the correct unit by serial number and click Connect
4. If no hardware is available then simulator can be selected instead.