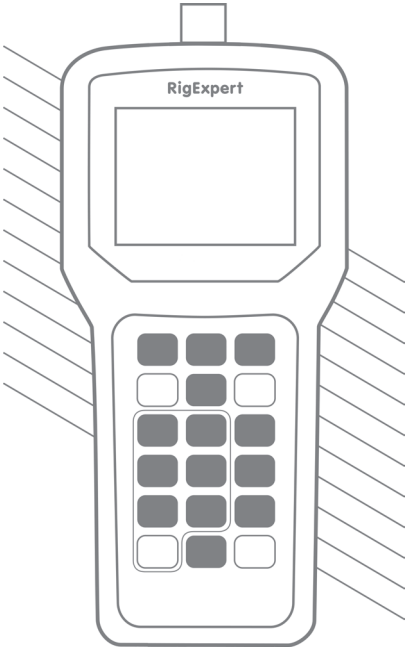
ZOOM series

Antenna and cable analyzer

RigExpert®



Software manual

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1. Connecting RigExpert Antenna Analyzer to your computer

RigExpert Antenna Analyzer can be connected to a computer running Windows 2000/2003/XP/Vista/7/8/10, as well as Mac OS (version 10.6 or higher) operating systems.

The latest version of the software may be found at the **Downloads** section of the *rigexpert.com* website. Windows and Mac OS are available as separate downloads.

Important:

To avoid damage caused by possible electrostatic discharge, always follow this sequence:

1. Connect the coaxial cable to the antenna connector of your analyzer.

2. Connect the analyzer to the USB port of your computer.

2. Updating the firmware

A **Firmware update tool** available at the **Downloads** section of our website will automatically download latest versions of the firmware. Just run the program and follow on-screen instructions.

You may also download binary files of the firmware for the off-line updating, if necessary.

The LCD of the analyzer will flash during the firmware update process.

Notice:

It is safe for the analyzer to cancel the firmware update process at any time, and then start it over.

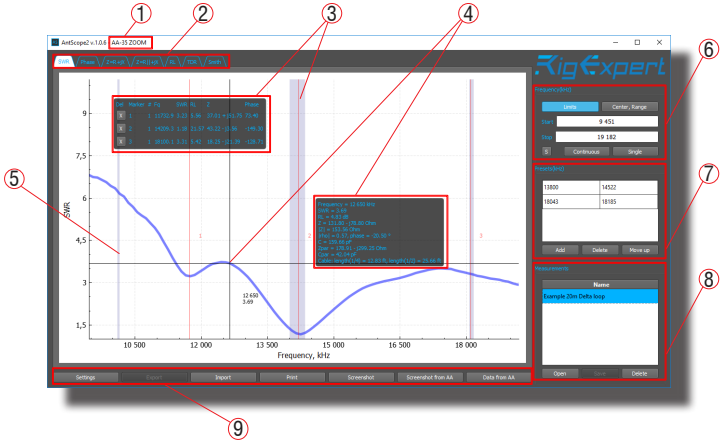
3. AntScope2 program

The main function of the **AntScope2** program is to show measurement results on the "big screen". The AntScope2 is a great companion to your RigExpert analyzer which adds functions previously available in expensive, professional grade equipment only.

3.1. Quick start

1. Connect your analyzer to the PC as described in section 1 of this manual. Make sure the analyzer is turned on.
2. Run AntScope2. Under Windows, the program will automatically detect the analyzer type. The analyzer name will be dispayed at the window's title bar near the version of the AntScope2.
3. Enter start and stop frequencies in the **Frequency** window. You can click **Center,Range** button and enter center frequency and measurement range instead of limits.Next click **Single** to perform scan.Any further scans will be added to the **Measurements** list and stay on display to perform comparison easily. They can be saved or removed any time later.
4. After the scan is complete, use **F1** to **F7** keys to switch between charts displaying various parameters (or click appropriate tab): SWR, phase angle, complex impedance (parallel and serial models), return loss, impulse and step responses, and reflection coefficient at Smith chart.
5. You can freely zoom the chart by pressing **+** and **-** keys or scrolling the **mouse wheel**. To change vertical zoom just hold the **Ctrl** key and press **+** and **-** keys or scroll the **mouse wheel**. You can pan/zoom chart using the cursor moving keys.

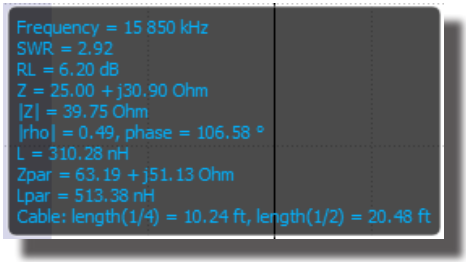
The screen shot below shows a typical AntScope2 screen:



1. Window header. Connected analyzer model is shown here.
2. Charts type selection tab.
3. Markers and markers information window.
4. Mouse cursor position and detailed parameters window.
5. HAM radio bands markup.
6. Analyzer measurement controls. Active only while analyzer is connected.
7. Presets list for quick measurements.
8. List of displayed measuremens. You can display several graphs simultaneously.
9. Toolbar.

3.2. Data window

There is a pop-up data window when the cursor is moved over the graph, displaying various parameters of a load:

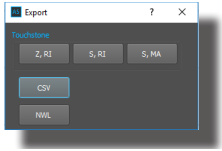


3.3. Saving/loading data

Click **Save** button in **Measurements** section to save current measurement to a file, then click **Open** button to retrieve the saved data. You can load multiple measurements to perform on-screen comparison. Selected measurement will be displayed as a bold line.

Please notice that data is saved in native AntScope2 format (**.asd** files), which cannot be open in other programs. Use **Export** button to export data in various formats.

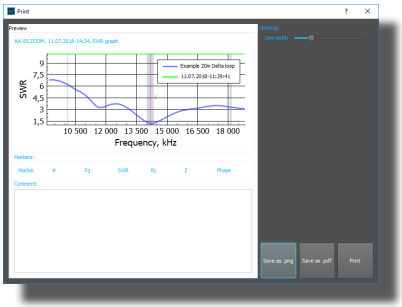
For instance, CSV data can be easily exported into a *Microsoft Excel* sheet. **R** and **X** (active and reactive parts of impedance) values are saved into the CSV file for each point on the graph. To calculate SWR or other parameters, use corresponding formulas.



3.4. Saving images

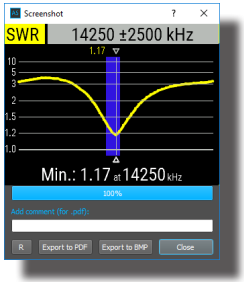
To paste the graph to other software (such as *Microsoft Word*, a graphical editor, or an e-mail message editor), just use **Screenshot** button, it will save exact screenshot of the AntScope2 window.

You may use te **Print** button to save or print only graph data.



3.5. Analyzer screen shots

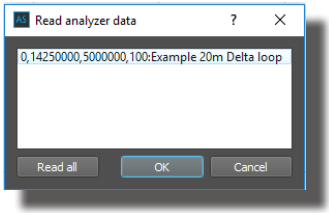
To take a screen shot of the analyzer, click the **Screenshot from AA** button. The screen shot is placed to the clipboard automatically and may be saved to file.



3.6. Analyzer memory

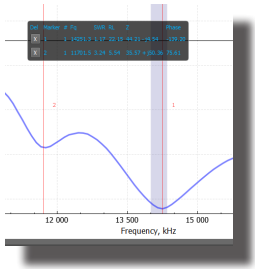
You may download a previously save graph from one of memory slots of your analyzer. Make sure the analyzer is connected to your computer, then click **Data from AA** button.

Press **Read all** button or select a memory slot from the list then press **OK** to download the data.



3.7. Markers

Click the chart window to create a new marker then click to select the marker position. Markers is enumerated sequentally from one (1,2,3, ... etc.).



There is floating window showing marker's data:

To remove marker just click **X** button in the markers window.

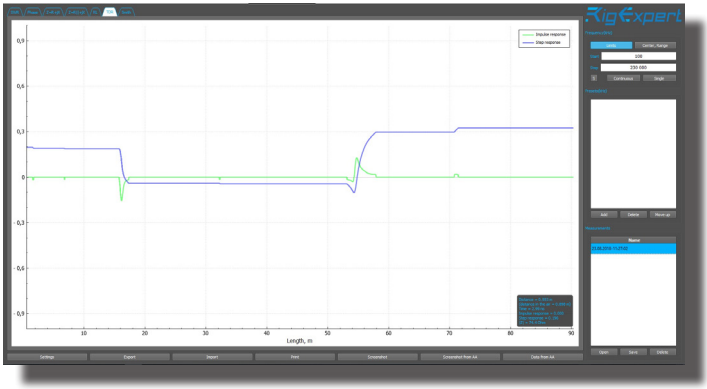
Markers data is also present in the images, produced by the **Print** function (see p.3.4 for more data).

3.8. Time domain reflectometer (TDR) mode

This mode (press **F6**) displays **impulse response** and **step response** graphs which show how electromagnetic wave reflects from discontinuities in a cable. Additionally, a tool tip near the cursor shows estimated value of the impedance of a cable at the corresponding distance. This will let you know if your cable is in a good or a bad condition.

For best results, perform a scan over the full frequency range with 1000 or more points. Make sure the characteristic impedance and the velocity factor of the cable are set in the **Settings – Cable** window. This will let you see the exact distance to the discontinuity. For TDR measurements, it is not important if the cable ends with antenna, open circuit or short circuit.

The following screen shot was taken in the real measurement. It shows 16 meters of 75 Ohm coaxial cable, antenna switching relay, and additional 37 meters of cable ending with an HF antenna.



If the discontinuity is found, impulse response and step response graphs will not let you know the exact reason of the problem, but will help in finding its location. You could see how discontinuities of different nature affect impulse response and step response graphs by experimenting with various cables, connectors and loads.

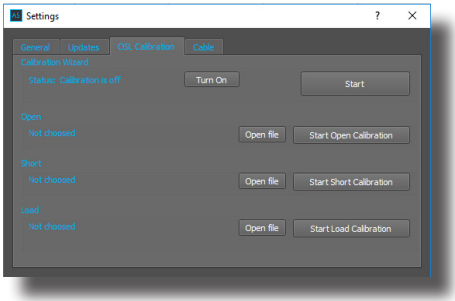
3.9. Calibration mode

Although RigExpert analyzers are designed to provide suitable precision without any calibration, a simple "**open-short-load**" calibration method may be used to improve the result. Moreover, this method may be used to remove the effects of a cable, so accurate measurements at the far end of the cable become possible.

For this method, three calibration standards are required: an "**open**", a "**short**" and a "**load**" (usually, a 50-Ohm load). For better results, these standards should be of a good quality. Additionally, physical length of all loads should be the same.

To perform OSL calibration just press **Settings** button, select **OSL Calibration** tab then press **Start** button and follow on-screen instruction.

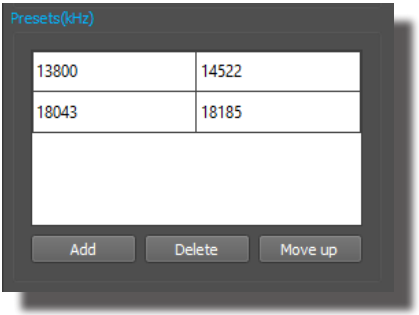
You can turn on and off OSL calibration any time just pressing **Turn On/Off** button in **Settings - OSL Calibration** window.



3.10. Presets

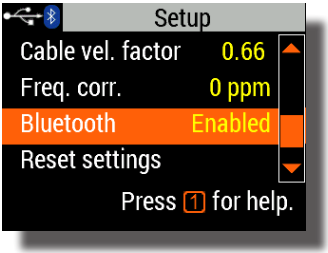
You can save frequently used bands to quickly pick them later. Just enter band as usual typing start and stop frequencies or zooming the graph then press **Add** button in **Presets** window.

To retreive saved preset just double click on it in the **Presets** list. The graph will be zoomed to selected band automatically.



4. Bluetooth option

AA-55 ZOOM analyzer has Bluetooth option. Turn on Bluetooth connection in the **Setup** menu of the analyzer.



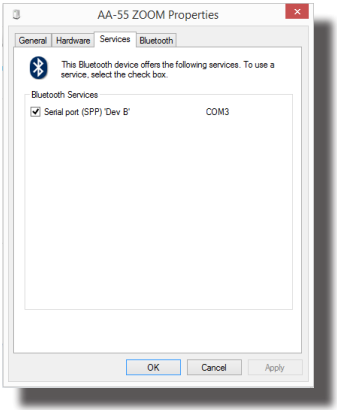
Important:

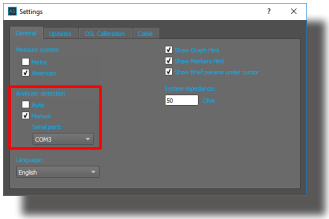
*The pairing PIN-code is **1234***

4.1 Bluetooth on Windows PC

Once paired **AA-55 ZOOM option Bluetooth** analyzer detects by Windows as usual COM-port.

You can discover this port number in the **Services** tab of **AA-55 ZOOM device properties** window in **Device and printers** explorer:





In the Antscope2 **Setup** window select the **Manual analyzer detection** checkbox and choose this port number.

Work with analyzer as it is connected directly to PC by cable.

4.2 Bluetooth on Android

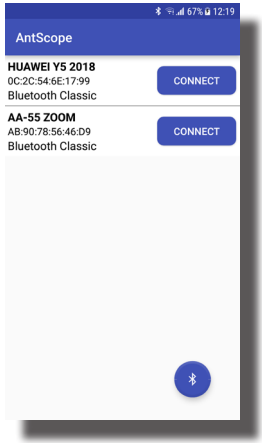
Dowload and install **Antscope** for Android from Google Play Maket

GET IT ON Google Play

Start discoveryng the bluetooth analyzer by pressing round button with bluetooth logo.

Press **Connect** button when **AA-55 ZOOM** analyzer appears in the list of bluetooth devices nearby.

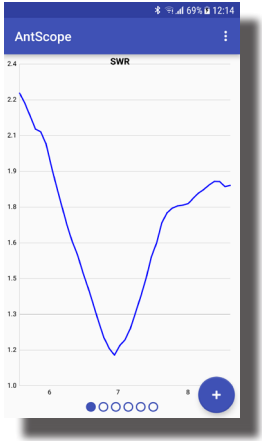
Be sure analyzer is turned on and bluetooth is enabled.

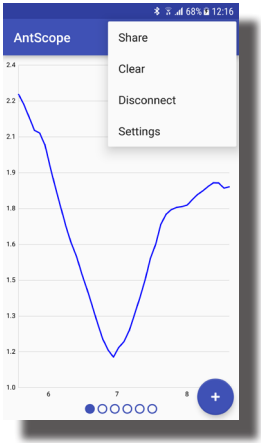


Pressing the **+** button starts a new measurement.

You may freely **pan** and **zoom** chart to examine interesting range. Measurements will be performed in visible range.

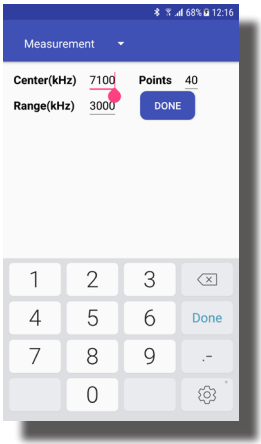
You may **swipe** the pages **left** and **right** to change the chart type. This is similar to Antscope2 chart type selection tabs.





You may share the chart by choosing the Share item in the drop-down menu.

Then the chart picture will be sent to the selected channel (email, messenger, etc.).



For the access to the **Setup screen** coose **Setup** item in drop=down menu.

- **Center** - sets the center frequency.
- **Range** - sets the measurement range.
- **Points** - sets the number of points in one scan.

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