

[v0.2.2 - Back From Christmas Update](#)

 [mihjtjel](#) released on Jan 11 2020

Update 17/01/2020: **New .exe for 0.2.2-1** uploaded, which fixes a crash when running a continuous sweep after calibration is done.

Finally time for a little update to NanoVNA-Saver - my Christmas and New Year holiday was busier than anticipated, and I haven't done much to the software during that period! None the less, here is an update.

New feature: Device management and screenshots

There is now a "Manage" button next to the "Connect to NanoVNA" button, which will let you see a few more details about the connected device, as well as - if supported by the firmware - grab screenshots of the device screen. This is a work in progress.

New marker values: Polar coordinates.

You can now set the markers to display S11/S21 polar coordinates.

New feature: Sweep names

You can put in a sweep name (find it under Sweep Settings) which is displayed in the charts. This was requested by some users.

New feature: Zoom in TDR charts

This is fairly self-explanatory: You can zoom in on the TDR charts. :-)


Bug fix: Through calibration value

The through calibration was apparently set up to expect a reflected value, not a transmitted value - which skewed the calibration values. This has been changed - I will be happy to hear if it's working for you!

Code cleanup:

Holger has helped me a lot by cleaning up the marker code, and is working on even more changes. The code looks less like a prototype as each day passes. ;-)

[v0.2.1 - Advent update](#)

 [mihjtjel](#) released this on Dec 4 2019

This release is a minor update to the 0.2.0 release:

New feature: Capacitance and Inductance charts

These new charts display the calculated series equivalent Capacitance and Inductance against frequency.

New feature: Panning and modified zooming

You can now hold the middle mouse button to pan a zoomed chart, or hold shift or control to only zoom the value or frequency axis when zooming using the mouse wheel.

Moving markers using the arrow keys


After placing a marker on a chart by clicking with the mouse, it's now possible to move the marker immediately using the arrow keys.

Experimental feature: Port extension/Offset delay

The calibration window has a new experimental feature. You can set an offset delay, which I'm told is useful for compensating for cables used when measuring without doing a full calibration. The value is applied immediately when changed, and is not connected to the other calibration features. Feedback on this feature is specifically requested.

Additionally, a number of bugfixes have been made, based on your feedback - Thank you! A lot of tidying has happened on the back end of the code, as well as the introduction of some automatic testing - thanks to Holger Müller and David Hunt!

[v0.2.0 - Zoom, zoom, zoom!](#)

 [mihtjel](#) released this on Nov 12 2019

New feature: Zooming

This release adds the ability to "zoom" on the frequency-based charts: Use your mouse's scroll wheel to zoom in and out - or hold the control button and drag a box on the chart to zoom into.

New chart type: Group Delay

Group delay can now be displayed as a chart, and can also be enabled for the marker data display for both S11 and S21.

New chart type: Permeability

A new chart, R/ω & X/ω , is available for determining permeability characteristics of toroids. Thanks to David, F4HTQ, for requesting and helping out with this.

Logarithmic Y-scale:

The VSWR and Permeability charts now have the option of having the Y-scale shown as Linear or Logarithmic.

Changes to markers:

- Now able to display Group Delay for S11 and S21
- Markers can be filled or "hollow"
- Markers can be shown centered, or with the point at the tip
- Markers can be locked from mouse control by selecting the radio button next to "Show/Hide data"

Time-delay reflectometry:


- Min/max impedance values can be manually set
- There's a movable marker to measure distance in the TDR chart

New scaling function for values:

Holger Müller, DG5DBH, contributed new code to show values more correctly, using SI-prefixes. David Hunt provided further changes to avoid losing precision when displaying frequencies for sweep settings.

Also included: Several bug fixes!

[v0.1.5 - Configurable markers and impedance analysis](#)

 [mihjtjel](#) released this on Nov 5 2019

This release, after a short break in the release schedule, offers a few new features and improvements:

Configurable Markers

There are a number of new configuration options for markers:

- The size of the markers can be changed under Display Setup,
- Marker numbers can be displayed in the charts,
- Marker data box headings can be coloured or not, depending on user preference,
- The data displayed for markers is now configurable

Impedance Analysis

The Time Domain Reflectometry window now has a display of an impedance transform, showing the calculated impedance of the transmission line the NanoVNA is looking at from the calibration plane onwards.

New analyses - and automatic running

The Analysis window has two new analysis options, peak search and VSWR analysis. It also adds the option to run the analysis automatically whenever new data is acquired, for example for adjusting filters.

Frequency display changed

DG5DBH kindly sent me updated functions to display frequencies on GitHub. You can still enter frequencies in the manner you are used to, as Hz, kHz or MHz, but now calculated or read frequencies should more consistently be displayed in a nicely formatted way.

For those running from the Python source, "scipy" is now a required library! Running "pip install ." should fetch it automatically.

[v0.1.4 - All the markers you need!](#)

 [mihjtjel](#) released this on Oct 23 2019

This release adds a number of new features, some bug fixes, and some internal reorganisation:

Adding markers:

You can now add or remove markers, allowing you as many as you can fit on your screen. In fact, the software does not stop there: You can even add markers which you can't fit on your screen!

New charts:

A number of new chart types have been added, allowing you to plot $|Z|$, $|S_{11}|$ and $|S_{21}|$ in linear format, S_{11} and S_{21} logarithmic on the same chart at the same time, and the raw S_{11} and S_{21} real/imaginary S-parameter values.

Calibration updates:

The calibration assistant has become more talkative, and should be better at telling you what has gone wrong when it won't apply a calibration. When applying a new calibration, or applying after changing to a different calibration standard set, the previous sweep is immediately updated to show the effect of the new values. This should be useful for finding the right values for calibration standard sets.


Bugfixes:

Line thickness and point size should now load correctly and apply to charts after you restart the software.

SWR marker colours should similarly also load correctly.

The software should now be able to run and attempt to check for updates, and not crash when you don't have an internet connection.

[v0.1.3 - Popout charts and VSWR markers](#)

 [mihtjel](#) released this on Oct 16 2019

This release adds a couple of much requested features:

Popout charts

All charts can now be popped out as separate windows: Right click them, and select "Popout chart" to get a copy of it. As a side effect of implementing this, the main window can now also contain multiple charts of the same type. Want a zoomed in version of an existing chart next to it? Now you can.

VSWR markers

Under Display setup, you now have the option of adding a number of VSWR markers, to be shown on both the S_{11} Smith chart, the S_{11} Return Loss chart, and obviously the S_{11} VSWR chart. The colour can be selected, and you can add however many you need. The markers are saved between startups.

Logarithmic frequency span

All frequency-dependent charts can now be changed to show logarithmic frequency span instead of linear. Right click, select Frequency axis, and choose linear or logarithmic.

Shortcuts


You can now start a new sweep by pressing Ctrl-W, or stop a sweep by pressing Escape while within the main window.

Line thickness and point size

Line thickness and point size can now be configured within the Display setup window. Default values are 1 pixel for lines, 2 pixels for data points.

Additionally, there are minor changes, such as -60 dB points being automatically estimated from -10 dB and -20 dB points when doing filter analysis, and a number of bugfixes and stability improvements.

[v0.1.2 - Firmware support fixes](#)

 [mihtjel](#) released this on Oct 11 2019

This version primarily implements a new hardware abstraction layer, which allows the software to identify the correct commands to use for scanning with the various firmware versions.


It also includes a new "About" window, which shows the NanoVNA firmware version, if available.

Also included is a new function to automatically check if there are new versions of NanoVNA-Saver available, either on program start, or from a button in the About window.

Other changes:

- Additional colour for secondary reference traces, for the R+jX chart
- A first version of a bandstop filter analysis function
- Updated octave/decade roll-off for filters to show the roll-off between -10dB and -20dB
- New load/save boxes for S1P and S2P files, which should now automatically set the extension for these files.

[v0.1.1 - Analysis mode](#)

 [mihtjel](#) released this on Oct 8 2019

Welcome to release 0.1.1 of NanoVNA-Saver!

New features:


- Analysis mode. Analyse low-pass, high-pass and band-pass filters directly within the application. Finds -3 dB, -6 dB and -60 dB points.
- Sweeping of bands. Select the band you want to sweep from the sweep settings window to quickly get the band limits set as sweep limits.
- Phase chart can now be "unwrapped" to show a continuous change of phase (rather than jumping from +180 to -180 degrees).
- Calibration standard sets can now be deleted.
- Charts can now be zoomed in further, with min/max values no longer limited to

integers.

Bug fixes:

- Return Loss and Gain charts should no longer be offset from the true values.
- Slowed down sweeping to not go foul of NanoVNA firmware 0.2.2 limitations. (A new fix will be out soon which will increase speed again for supported firmware versions).

[v0.1.0 – Calibration standards, stability improvements and screenshots](#)

 [mihtjel](#) released this on Oct 2 2019

This release primarily includes a number of improvements to the stability of the software. Users should see fewer crashes after upgrading, and several parts of the code have been improved to make them easier to maintain and keep free of errors.


New features include the ability to save calibration standard sets, for those users who have characterized sets, as well as the ability to save images of charts with data directly by right clicking.

The save/load functionality for calibration files has been reworked, and there is now a field for notes, which are saved and loaded along with the file.

The phase charts now support display limits on the data and frequency span.

Touchstone files from RFSim99 should now be imported correctly, and I am told there is also a method available to export compatible Touchstone files from Elsie.

[v0.0.12 - Scaling for plots, band display in plots and calibration assistant](#)

 [mihtjel](#) released this on Sep 27 2019

This release of NanoVNA-Saver offers a number of new features, all of which have been widely requested.

First of all, there's now the option of scaling the plots: right click them for a menu, where it's possible to set the maximum and minimum values for the frequency and data axes. Sadly not yet ready for the polar plots, and mouse control of zoom is also pushed to a future release.


Second, it's now possible to have "bands" displayed in the frequency based plots: Select "Display setup" to find the option for this. The default data is for amateur radio bands - or you can put in your own.

Thirdly, the calibration procedure has received a new "calibration assistant": A series of popup messages prompting you to switch between calibration standards, and code to

automatically sweep them for you and store the results.

Finally, there's as always a number of bugfixes and stability improvements. I look forward to hearing what you all think about this 0.0.12 release!

[v0.0.11 - Averaging, resistance/reactive chart and small screen improvements](#)

 [mihtjel](#) released this on Sep 22 2019


This release brings averaging as a new feature: Press "Sweep settings" to select between running a single sweep (of optionally multiple segments), a continuous (live) sweeping of the range, or to average several sweeps from the NanoVNA. You can configure how many averages to make, and optionally, how many of the sample points to discard, based on which deviate the most from the rest, and are least likely to contribute signal.

Also added is a new Resistance/Reactance chart, which shows both the R and X component of $R+jX$. This brings the challenge of showing two traces for the same data - added is therefore the option of picking a secondary colour for sweeps under "Display settings".

There are further improvements to UI sizing, meaning the interface now fits - tightly - on a 1366x768 screen, at least on Windows.

A few quality of live improvements made it in: Press escape in any of the pop out windows to close them instantly. The calibration window now shows more clearly when the source of calibration data is loading from a file, and also the number of points loaded. A few crash bugs were fixed.

[v0.0.10 - Quality of Life and Debug Logging](#)

 [mihtjel](#) released this on Sep 18 2019

0.0.10 offers a number of quality of life changes:


- Customizable background/foreground colours
- Adjustable font size
- More settings are saved to the settings file

There's a couple of new features/changes:

- Loading of Magnitude-Angle Touchstone files
- TDR readout in feet and inches in the TDR window
- Debug logging (-d to enable, and/or -D to log to a file)

And finally, bugfixes to bugs you all have reported since 0.0.9.

[v0.0.9 - NanoVNA-Saver, Friday Edition](#)

 [mihtjel](#) released this on Sep 13 2019

This edition has focused a lot on the markers: You can now pick which marker to control using the mouse by radio buttons; and if you hold shift, you can drag around the nearest marker on the charts. The markers have their own data readout panel, which can be hidden, if you want more room to marvel at the charts. They also now have more data display options, including Q and parallel equivalent R and C/L. Additionally, when you enter a marker frequency manually, the markers are updated immediately, without needing to press enter.


Sweep controls now include a center/span option, and both start/end and center/span update the other fields as you update them.

Some of the TDR functionality has been moved to a separate window (selecting cable types), and now also shows a graph of response vs distance.

An icon was added, and in the true tradition of VNA software, it features a Smith chart. Of course.

Lastly, support for high-resolution monitors was improved.

[v0.0.8 - Continuous sweeping and saved settings](#)

 [mihtjel](#) released this on Sep 10 2019


This version introduces a brand new feature, continuous sweeping. Have the app continuously load new data from the NanoVNA - either as one sweep updated often, or multiple sweeps, updated in sequence.

It also introduces saving of settings. The settings saved are window size, colours selected, charts selected for display, dark mode and line mode.

Minor changes:

- Markers now display the frequency of the data point they use
- Many more cable types are available for TDR (Thanks, Larry!)
- There is an early version of a "quality factor" chart.

[v0.0.7 - Sunday Night NanoVNA](#)

 [mihtjel](#) released this on Sep 8 2019

Offers new display settings, including a setting to show lines between data points, and a dark mode for night time VNA work.

Includes a beta version of calibration using imperfect calibration standards. If you requested


this, and know how to test it - please do!

Supports loading of Touchstone files in kHz, MHz and GHz (still only real/imag, though - not magnitude/angle)

Mouse control of "mouse marker" is now in the Smith/Polar charts as well.

Bugfixes!


[v0.0.6 - New options for displaying charts, and quality of life upgrades](#)

 [mihtjel](#) released this on Sep 5 2019

This version supports selecting which charts to display where, and displaying as little as one, or as many as 6 simultaneous charts. It adds phase charts and VSWR charts. The application window title now displays the source of sweep and reference, as well as the number of points. The markers now display a reactive equivalent in nF or nH, as applicable.

- Added 32-bit build

[v0.0.5 - Latest and greatest! New UI! New markers! 2-port calibration!](#)

 [mihtjel](#) released this on Sep 4 2019

Today's release (Yes, it really is daily at this point) has a bunch of new features, a new layout, and a better internal structure to support "pip" for installing.


A mouse-controlled marker is now available, and all markers have a Better graphic to show them more clearly.

2-port 1-path calibration is now available in the application, and calibrations can be saved and loaded.

The UI has been changed in an attempt to further adapt for small screen users.

I thank Ohan and Olgierd, who have both contributed code to this release.


[v0.0.4 - For smaller screens, and with more features](#)

 [mihtjel](#) released this on Sep 3 2019

- Main window is now scrollable for small monitors
- File-handling is in a separate pop-out window
- A basic mouse-adjustable cursor has been added to log-mag charts
- In-app 1-port calibration is now available
- Automatically finds relevant serial ports


- Touchstone files can now be imported as sweeps as well as reference

[v0.0.3 - Reference sweeps](#)

 [mihtjel](#) released this on Sep 2 2019


This release adds the ability to store the result of a sweep as a reference, or to load a Touchstone 1-port or 2-port file as a reference sweep, to be displayed along with live data from the NanoVNA.

[v0.0.2 - TDR and 2-port Touchstone files](#)

 [mihtjel](#) released this on Sep 1 2019


This release adds the popular feature of time-domain reflectometry, allowing for measurement of cable lengths. It also adds support for 2-port Touchstone files.

[v0.0.1](#)

 [mihtjel](#) tagged this on Aug 30 2019

Merge remote-tracking branch 'origin/master'

[v0.0.1-a - First public release](#)

 [mihtjel](#) released this on Aug 30 2019

This is a very early first public release version of the NanoVNASaver. Use at your own risk. Exporting function fixed in update a.