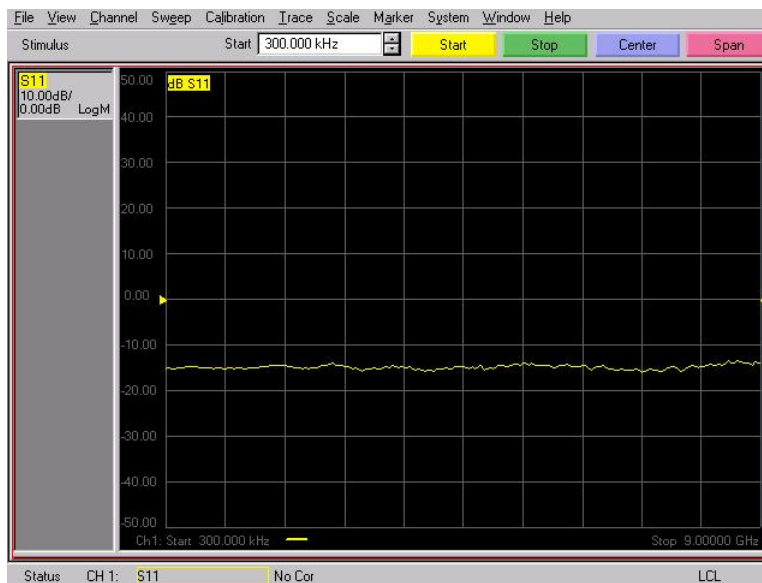


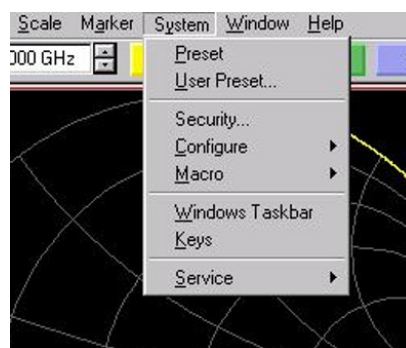
Agilent E8358A VNA quick guide

Measurement guide

After logging in and launch the VNA software, you should see something similar to



As you might share a VNA with many other fellow engineers in your future career, being uncertain about the current state of the VNA, you should always *preset* the VNA to default state. Go to **System > Preset**.

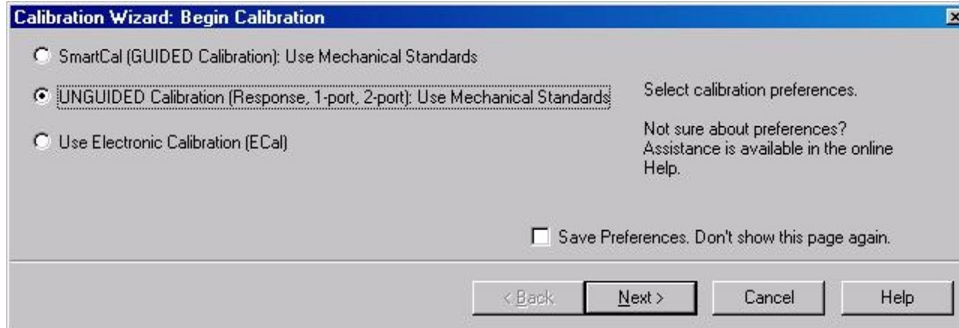


Now input your frequency range of interest, you can either go to **Channel > Start/Stop** and enter your start/stop frequencies or just use the Stimulus toolbar. You can also input the frequency range by defining its **Center** and **Span**.



Also, specify how many data points you want to collect under **Sweep > Number of points**. Now you are ready to perform the calibration.

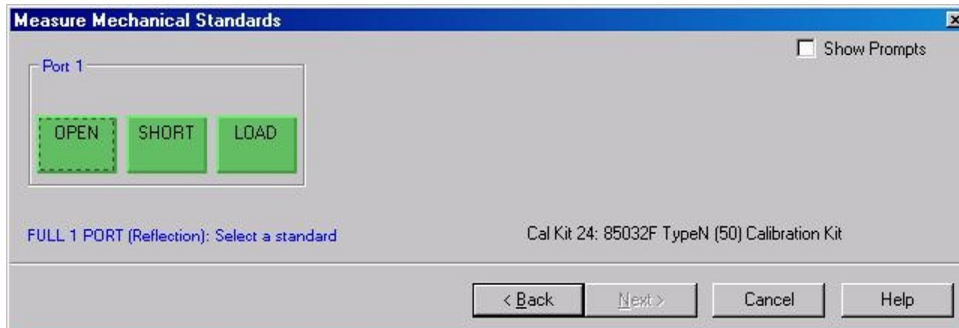
Under *Calibration > Calibration Wizard*. Calibration wizard window will pop up.



There two options, namely **GUIDED calibration** or **UNGUIDED calibration**, are doing exactly the same function, that is walking us through the calibration process. However, **GUIDED** option gives you a clearer visualization about what you should do. For example, below is what you would see if you choose **GUIDED** option. The image only shows the first step of the calibration process, (i.e. connect a female N-type open to port 1 and measure it).



Whereas if you choose **UNGUIDED** option, you are introduced to the window below in which you can see all 3 standards are to be measured in 1-port calibration, no illustration here.



Now, getting back to the Calibration Wizard. Select either **GUIDED** or **UNGUIDED** option and hit **Next**. Follow the calibration wizard. Make sure that you select the proper connector type and gender for each port. The gender needs to be selected is the gender of the standards, not that of the port test set.

After you finish, it is always a good practice to measure the standard itself to verify you have a good calibration. If it is not, plenty of sources of errors might have been introduced during your calibration process (for example, loose connections, cable bends, cable movements, etc.). Repeat the calibration process if you feel you could do a better calibration.

If you have a good calibration, it is time to connect your DUT and obtain the data.

Under *Trace > Measure*, select which parameter you want to view (**S11**, **S12**, **S21** or **S22**). For a specific parameter you are looking at, you can switch between various representation by going to *Trace > Format* and select the desired format (polar, Smith chart, ..). There are more features that you can explore yourself.

To save S-paramter, go to **File** > **Save** and save the measurement data using the appropriate format (.slp, .s2p).

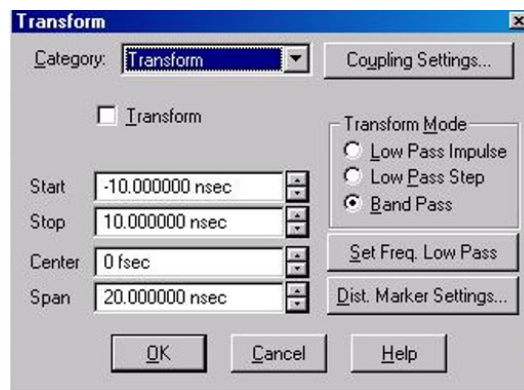
Time-domain Reflectometry (TDR) measurement using Agilent E8358A VNA

VNA is most likely used to collect frequency-domain data. But it is easy to transform frequency-domain information into time-domain data using signal processing knowledge. This is actually how the VNA perform TDR measurement. Follow the below step to perform TRD measurement using Agilent E8358A VNA.

- **Preset** the VNA (as always).
- Change **Number of Points** to 801. It is just for better resolution
- Go to **Trace > Transform**. A new toolbar will pop up under the Stimulus toolbar.



- Click on **More...**, a Transform window with full features will pop up,



- Click on **Set Freq. Low Pass**. This will set the **Start** frequency to a lower value. Then choose **Low Pass Impulse** or **Low Pass Step** for "Transform Mode" depending on which TDR response you want to collect¹. Press **OK** to close the current window.
- Now, perform 1 port calibration.
- Connect your DUT then **Check** on **Transform**: to activate TDR engine and observe response.
- Adjust the **Transform Start** and **Stop times** (on the Tranform toolbar) to make it visible for your reading. Change the display format to **S11 real**. Now, put markers where it is necessary.

¹**Band Pass** mode is more applicable for a different type of TDR measurement, not what we are doing in the lab