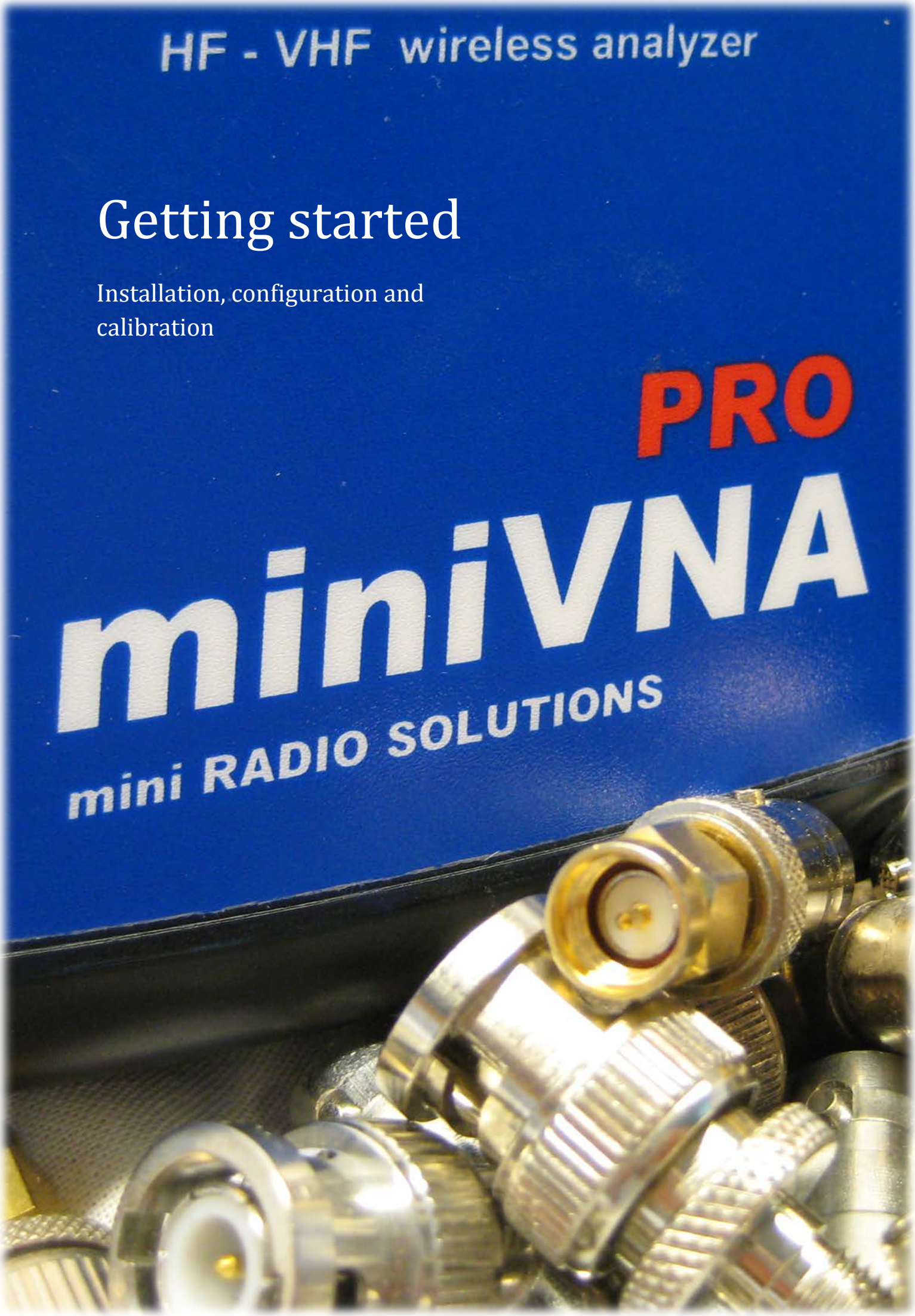


Getting started

Installation, configuration and calibration

Requirements

The miniVNA PRO program was originally written in Delphi 7 and later developed on the Delphi Xe platforms. It's compiled as a 32-bit executable file, and will run on Windows Xp and later Windows versions. It will run on both 32- and 64-bit operating system. The only extra requirement is the Virtual Communication Port driver from FTDI, the latest version can be downloaded here: http://www.ftdichip.com/Drivers/VCP.htm. To make life easy, download the "Setup executable" version of the driver!

Installation

Driver

Connect the unit and start the "Setup executable" and driver will be installed. Check the "Device manager", item "Ports(USB and LPT). If the drive has been installed successfully, an "USB Serial Port (COMxx)" will probably show up.

Software

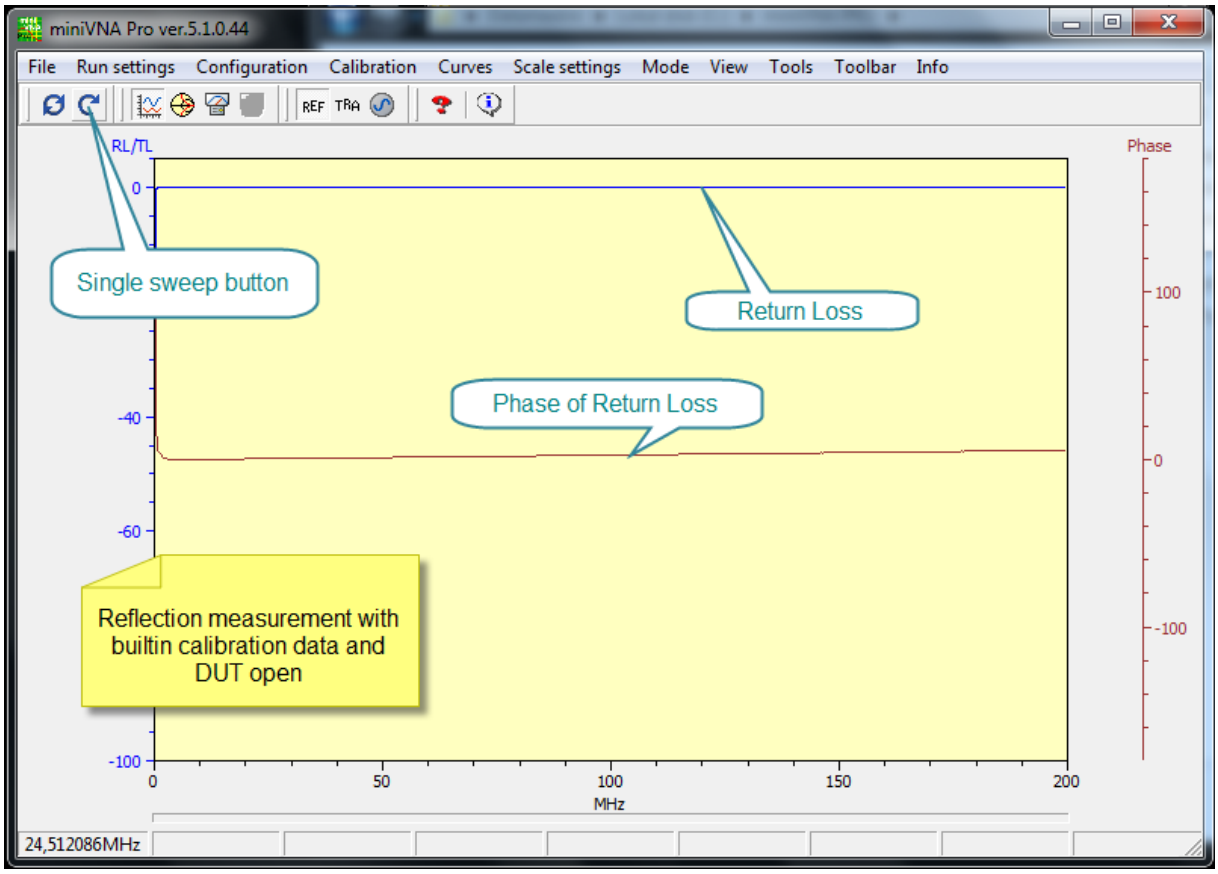
Just make a new folder and call it what ever you want and copy the executable file to this folder. Make a shortcut on the desktop if you want an easy access to start the program.

Configuration

Now it's time to start the program for the first time. The program will make all necessary folders and show two warnings about missing calibration files. A default calibration set is built into the program, but should not be used as measurements done with these calibration data will only give an indication of what to expect when doing measurements!

First of all, we have to configure the VCP. Select "Configuration" in the main menu and "Communications". Use the dropdown menu and select the "COMxx (USB Serial Port)" and save the selection.

To confirm it's working, click the "Single Sweep" button. Reflection mode is the default startup mode and one measurement will be performed and the "Return Loss" and "Phase of RL" will be shown as almost straight lines, one blue and one brown.



Screendump of the first measurement

Calibration

The unit must have it's own calibration data. A calibration set is unit specific, and should only be used together with that specific unit to get reliable data. To make full advantage of the unit, three calibrations have to be done.

DDS

First we have to calibrate the DDS, this could be done in three different ways. The simplest one is just to write the value of the DDS clock written on the label, attached to the back of the unit. In most cases, this will be good enough. Just be aware of units of the first series have another DDS clock than newer ones. Serial numbers >35 have a DDS clock frequency of 520MHz.

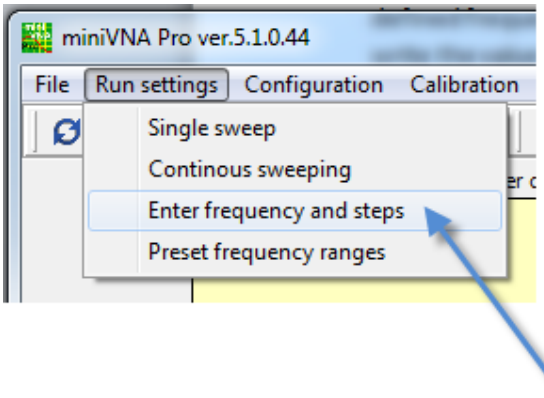
The "Normal" DDS calibration is done by putting the unit in generator mode and program it for a user defined frequency at both outputs. Use a frequency counter to measure the output frequency and write the value to the "Actual freq." . Save the value and you are finished. Be sure to let the unit have a sufficient time to warm-up the box to get a stable frequency. A very slow drift in frequency might occur.

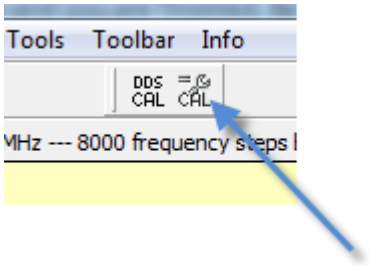
The "Zero beat" method is also an easy task. Use an Rx and tune to a known broadcast station's frequency. Enter this value to the "DUT output" too. Adjust to zero beat by clicking "Up" and "Down" buttons. The "Step rate" may also be changed to get smaller/bigger steps when adjusting. Just click "Save" when you are satisfied.

The next steps to be done, is the Reflection and Transmission calibration. For this we need three calibration standards, one for open, one for short and one for 50 ohm load required in the Reflection calibration and a short cable for the Transmission calibration.

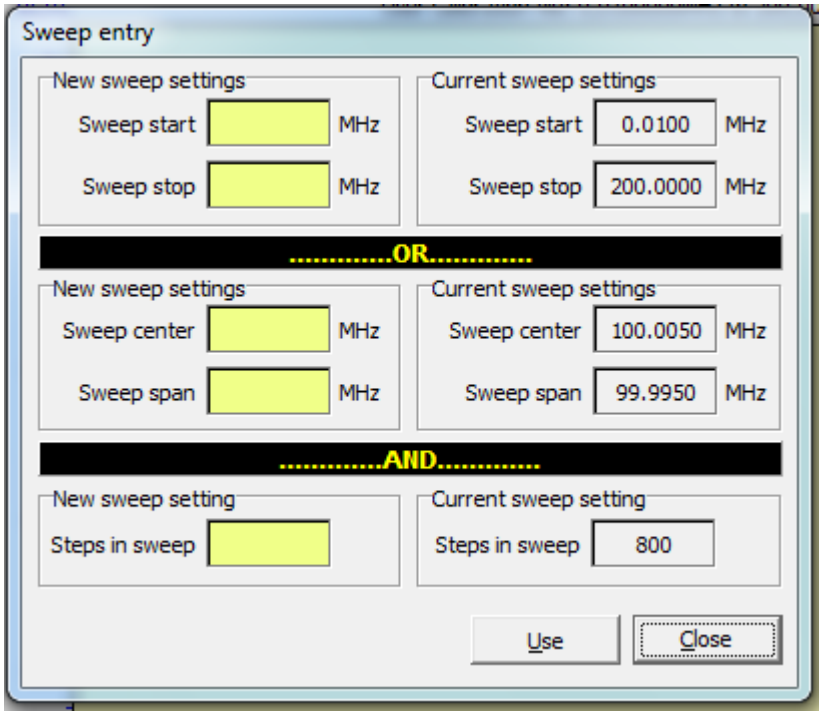
Reflection

First it's necessary to enter the "Sweep entry" window. This can be done by use of the main menu, the calibration button, if "Calibration" is selection in "Toolbar" is checked or just press the "s" on the keyboard.



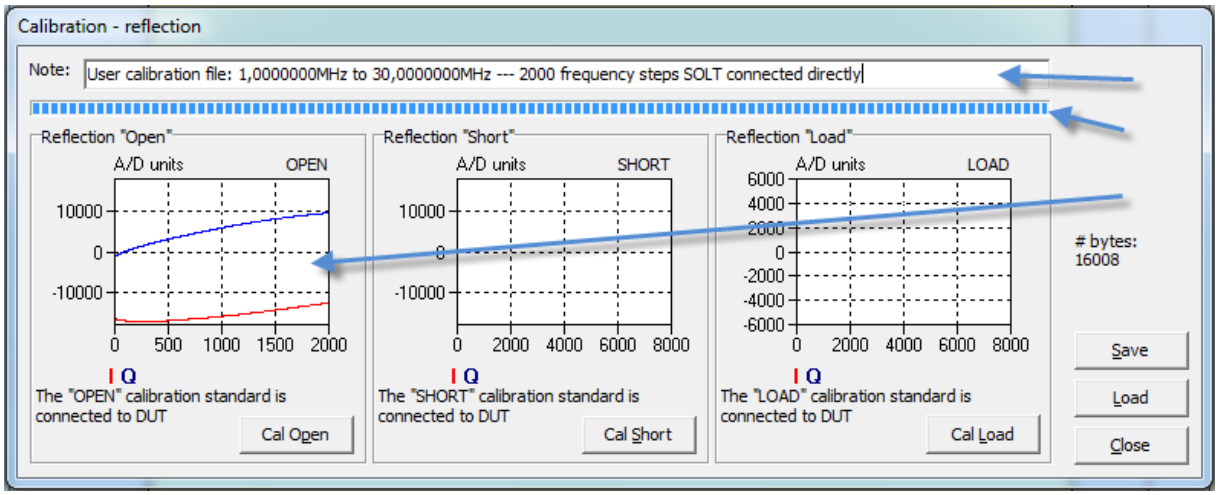


The "Sweep entry" window.



Here the "Sweep Start" and "Sweep Stop" can be entered OR "Sweep center" and "Sweep span". To give reliable measurements and "smooth" curves, especially by lower frequencies, please use up to 8000 number of steps. A high number of steps is also required if a long cable is a part of the calibration data. Click "Use" when finished.

Before selecting "Calibration" be sure that "Ref" mode is selected – then Reflection calibration window will be opened when "Calibration" is selected. A new window will open.

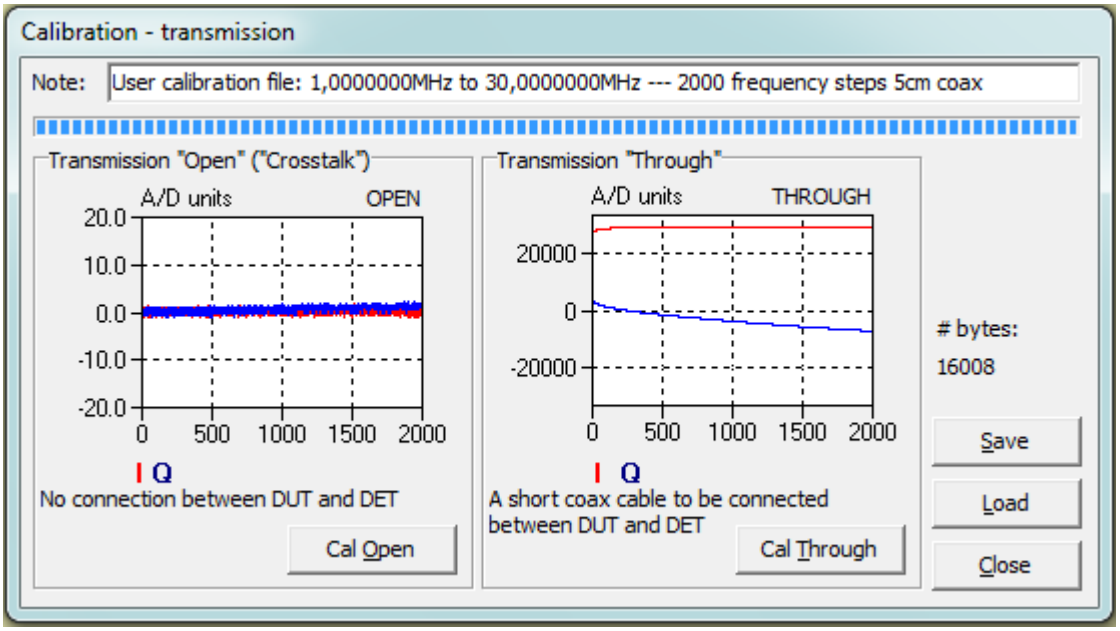


The top arrow points to a “Note” edit box where a description of the calibration set will occur automatic. User may change the whole text or add additional text. Connect the calibration standards, one at the time, and click the corresponding button. A progress bar will indicate transfer of data from the unit, and at the top, when transfer of data is finished, two curves will occur in the graphical window as shown in the screen dump above. The above sample is for a limited area (1-30MHz). If sweeping a bigger frequency area or if the calibration plane is moved to the end of a cable, the curves will be more or less sinusoidal curves.

Save the calibration data set when all three set of curves are performed. All calibration data sets are saved in a simple database and can be retrieved and used later.

Transmission

This calibration is done in the same way as described above. The only difference is that this calibration only requires “open” and “through” calibration data.



Reduce the number of steps to sweep before doing measurements!