



# WinCoMeT

## - User - Manual -

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## **I Warranty for WinCoMeT**

The WinCoMeT software was designed and tested by bda connectivity GmbH with the relevant careflessness.

However, according to the actual state of the art one cannot keep out, that computer software runs errorless under all applications or hardware combinations.

bda connectivity GmbH does not guaranty that the software runs everywhere on every computer continuously and errorless. Especially does bda connectivity GmbH not guaranty that the software will fulfil the requirements and the intensions of the user and does not guaranty that the software runs in combination with other software on the user's PC.

Calculations within the software for the relevant test procedures are taken from the current international standards. Information's about those calculations are given by the button "Info".

bda connectivity GmbH is not responsible for misleading or wrong interpretation of the test results.

Calculations included in the software for the representation of the test results may use approximations, which will cover reality only within the inherent limits. Calculations and graphs may therefore give wrong or deviating results.

Warranty for all direct and indirect damage or injury, consequential damage or third damage is excluded unless otherwise regulated by law.

It is not the obligation of bda connectivity GmbH to replace any damage or injury, consequential damage or third damage, (including loss of benefit, loss of data or damage by virus disease), due to the use of the software or due to the lack of using the software.

In any case, warranty is limited to the price which was paid for the lincence of the software.



## II Documentation of the WinCoMeT Software for the CoMeT test set-up

### 1 General

The WinCoMeT software was designed to support RF-measurements and measurements of screening effectiveness at communication cables and connectors as well as for documentation and storage of measured values.

The software is a helpful accessory for the measurements, but does not release the operator to check the validity of the test results against mistakes or malfunction, existing standards or the state of the art.

bda connectivity GmbH is not responsible for any mistake, malfunction or misinterpretation, see also item 4.4, Warranty.

#### 1.1 Vector Network Analyzer (VNA)

To achieve RF-measurements the software is designed to control vector network analyzer (VNA) of different manufacturers.

Setup/Program Setup/Analyzer-Type shows the current list of VNAs which can be controlled by the WinCoMeT software.

Further types of VNAs may be included upon request to bda connectivity GmbH.

#### 1.2 Functionality

Since the reaction of NVAs may vary with different versions, additional options or with firmware updates, functionality cannot be guaranteed in general.

Functionality of VNAs with the WinCoMeT software shall be verified by detailed tests by user.

## 2 System requirements

### 2.1 Minimum system requirements to display test documents

- State of the art processor with at least 4 GB of memory
- Graphic board with at least 1024 x 768 pixels.
- Operating system: Windows 7, Windows 8.1 or Windows 10,
- PDF- document reader

### 2.2 Minimum system requirements to control a network analyzer (NWA) / achieve measurements

- National Instruments GPIB-card (NI488.2) or installed VISA software suite<sup>1</sup>.
- National Instruments GPIB driver NI488.2 current version (from Windows 7 Version 3.0 or above).
- Recommended operating system: Windows 7, Windows 8.1 or Windows 10,
- VISA National Instruments VISA-Driver or Keysight- IO- Libraries (not tested)

## 3 Basic settings

### 3.1 Program settings

Available via menu: **Setup/Program Setup**.

In this menu, basic settings are made and stored.

In the field Analyzer the network analyzer in use is to set.

Different HP VNAs optional work with a S-Parameter Test Set as separate (additional) device.

It is possible to achieve measurements without S-Parameter Test Set if the Check-**Box all measurements without S-PARAMETER TEST SET as B to R-measurement** is active.

In this case, all measurements are achieved as B to R-measurements.


Depending on the settings of the Analyser field, the possible settings of the required interface (IEEE-bus respectively GPIB-bus or RS 232) will be shown and may be matched to the installed hardware.

For the RS 232 interface the only possible settings are COM-Port and Baud-Rate.

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<sup>1</sup> The VISA software suite is not included with WinCoMeT, i.e. there are additional license costs



For the IEEE-bus respectively GPIB-bus this will be the analyzer address. If the analyzer address is not known, IEEE-bus may be scanned by pressing the tool- button  and the required address may be chosen from the table of found devices.

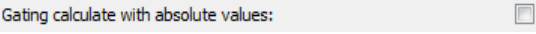
In the field **Representation** the following options are given:

New test documents will start as maximized window when the relevant Check-Box is checked, i. e. the full available window will be used for the new test documents display representation.

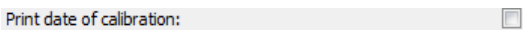
The operator **language** of the WinCoMeT-Software may be changed between English and German.

During the measurement, the duration is visualized by a Progress Bar. Remark: The true duration of the measurement depends on the NWA type. (Since the NWA does not interact with the software, the true measurement duration can only be estimated). WinCoMeT offers the possibility with the field **Progress bar correction** to adapt the speed of the tool bar to the speed of the physical device.

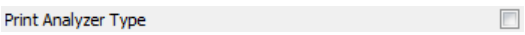
The selection  gives the user of a multi screen environment the ability to define the screen where WinCoMeT is placed after the program was started.

The selection  instructs WinCoMeT to use absolute values when calculating gating results.

The menu part **Print form** defines some rules regarding the printing of the measurements data, as follows:

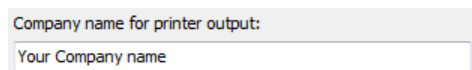
The  controls whether the calibration date and calibration time should be printed together with the test results.

The  controls whether the output is black and white or in colors. The graphic measurement curve may be printed colored or black and white.

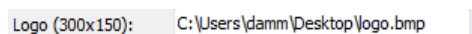
The  is the possibility to permit the output of the analyzer type.

The switch  gives the option to print the file name with full pathname or without pathname.

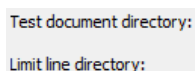
If the companies name should appear on the printed document, fill out the field:



Another option is to define a logo which gives the option to build your measurement document which is easy to identify as your companies document. The logo is placed in the upper right corner of the document. Use bitmap files (ending .bmp) and with a preferred resolution of 300 x 150 pix.



The menu part Directory's gives the ability to define two different directories:



In the field **Documents** the document Directory of the stored test documents will be given and the limit line directory is the storage region with the defined limit lines. The values may be adapted to the local environment of the user.

The menu part **Clipboard copy** defines three values:

- Graphical Width (in pix)
- Graphical Height (in pix)
- Copy colors (Yes/No)

If **Copy colors** = Yes the picture will be taken in defined colors (see chapter 3.2), otherwise black/white.

### 3.2 Color configuration of graphics

Available via Menu: Setup/Graphical Color Configuration.

Color configuration of graphics will modify the colors of the test documents graphics.

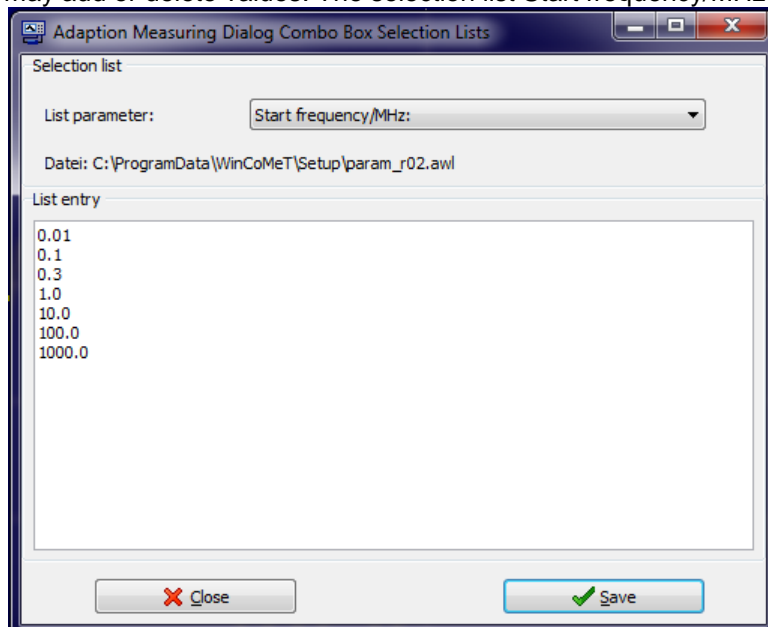
If you want to see the result of your changes (also if a document is already open) press the button

**Preview.**

### 3.3 Measuring Dialog Lists

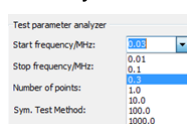
Available via Menu: Setup/Adaption Measuring Dialog Lists.

In the test parameter view/edit form, the values of all adjustable test parameters may be edited or you may add or delete values. The selection list Start frequency/MHz serves as an example (see Picture 1).



Picture 1 Selection list Start frequency /MHz

To edit the preset values, first select the corresponding measurement parameter under **Selection list parameters**. Then the selection list of the selected measurement parameter can be filled or changed under selection list content. The display area is editable. For example, it is also possible to copy data directly from a Microsoft Office application such as Excel (text copy) into the opened window.



After saving the selection list, it is available in the measurement parameter form for the corresponding measurement parameter. Note: Pressing the Save field does not close the window. The proper exit of the Edit menu of the selection list is only possible via the Close selection.

Picture 2 Selection list of the test parameter menu

## 4 Information

### 4.1 Program information

Available via: **Information/Program-Information.**

This selection shows the current Version number of the WinCoMeT Software. Furthermore, this window provides all necessary address details to contact bda connectivity GmbH.

## 4.2 Global calibration data information

Available via menu: **Information/Global calibration data information**.

Calibration data's are generally stored together with the test data in the measurement document file (file extension = .mdo).

Furthermore the latest calibration of the test set-up is stored global, so that the latest calibration is available for all test documents.

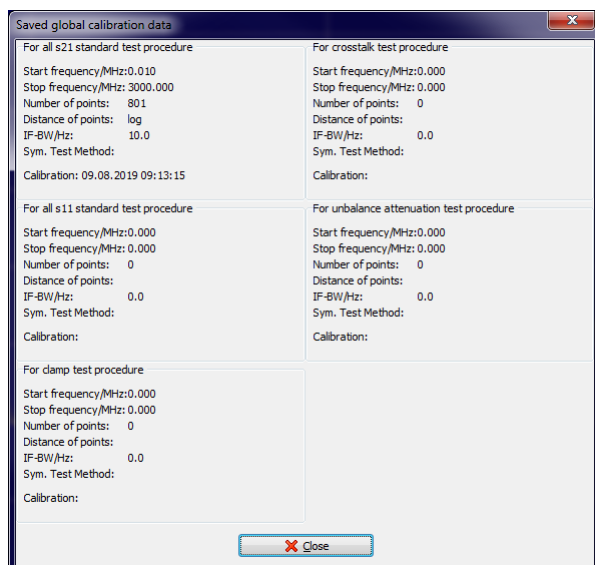
If the latest calibration was done with the same parameters for: start frequency, stop frequency, number of points, IF-BW and distance of points, as the current measurement, the calibration data may be assigned to the current measurement.

This is done by clicking the Check-Box **Use calibration data of last measurement** in the start measurement dialog.

That means either the in the .mdo- file stored calibration data of each test document or the global stored (in the computer's memory) calibration data of the last measurement may be used for the current measurement by operators decision.

The user has to take care, that the conditions of calibration fit to the new measurement.

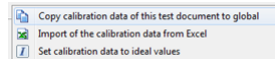
Global calibration data is stored separate for S21-, S11- measurement, as well as for crosstalk-, unbalance measurement and for the clamp test procedure (see picture 3).



Picture 3 Global calibration data

Global calibration data information shows, which calibration datas are valid for the different test parameters (start frequency, stop frequency, number of points, IF-BW and distance of points).

The calibration data of this measurement document can be copied to the global area by right-clicking with the mouse in the button bar (tool-button bar) of a measurement document (see Fig. 4).



Picture 4 Copy calibration data of the test document to global

## 4.3 GPIB-Bus Information

Available via: **Information/GPIB-Bus Information**.

The GPIB- Bus Monitor records all data that will be transmitted via GPIB-Bus as well as all commands of the GPIB- Bus card driver.

This will ease necessary debugging and shows the analyzer <—> PC- communication in a transparent manner.

## 4.4 Warranty

Available via menu: **Information/License agreement, warranty, Lizenzvereinbarung, Gewährleistung**.

This item gives information about warranty respectively license agreement in a split window (German / English).



## 5 Help

### 5.1 Program help

Available via: **Help/Program Help**.

The Program help will show the text of this document by calling an external PDF reader.

### 5.2 Tube

Available via: **Help/Measuring Tube**.

The Measuring tube help explains the use of the measurement setup (tube, triaxial cells or cables).

### 5.3 Mixed Mode S Parameters

Accessible via menu: **Help/Mixed-Mode S-Parameters**.

Here an overview of the nomenclature of the S-parameters for multiport network analyzers is displayed on the screen.

### 5.4 Test procedure

Available via: **Help/Test Procedure**.

Different pdf- files explains the test procedures which are included in the WinCoMeT-Software installation.

## 6. Language

Accessible via menu: **Language**.

In the Language menu, the language of the program interface and the program outputs can be switched very easily and quickly between the available languages (currently English and German).

## 7 Tools

### 7.1 Damping calculator

Accessible via menu: **Tools/Attenuation Calculator**.

Some cable manufacturers use various cable attenuation models to calculate the attenuation characteristics of cables. For these models, the characteristic coefficients are given in the data sheet of the corresponding cable. With the help of the attenuation calculator of the WinCoMeT software, a attenuation value for a certain frequency can be calculated for known coefficients. On the other hand, the attenuation coefficients can also be calculated from a few damping values.

### 7.2 Opening the configuration directory

Accessible via menu: **Tools/Open setup directory**.

Here you can directly access the configuration directory. The configuration files are stored in this directory. This provides a quick and easy way to make backup copies of these files for e necessary restore ore for a new installation on a new computer.

## 8 Open test document

### 8.1 Open test document from the MS-Windows explorer

Test document may be opened direct after double - click the test document file (.mdo) in the MS-Windows explorers file list.

While opening the first test document, the WinCoMeT-Software will be started. Further test documents will be loaded into the same instance of the WinCoMeT-Software without restarting the WinCoMeT-Software again.

### 8.2 Open test document

Available via: **Open Test Document**.





If you select the open test document menu option you are able to load an already existing test document (.mdo file). A few test documents may be opened one after the other. They will stay opened and may be depicted at the same time on the screen. The number of documents that can be opened at the same time depends on the respective hardware of the computer (resources).

### 8.3 Open test document from list

Available via: **List**.

List shows all test documents which are in the relevant folder as an overview.

The shown directory may be changed by clicking Directory.

Preselected is the standard document directory.

The test document list contains columns for order no., product no., date of measurement, test procedure, cable type, sample length and filename. This list may be sorted by clicking the relevant button on the head of the column. Double clicking on any row or selection of a row by marking it, (row will be highlighted in blue color) and following clicking of Open test document will open the required test document.

Extend of the row may be varied. The new extend of the row will be stored.

### 8.4 New test document

Available via: **New Test Document**.

With **New Test Document** a new, empty test document may be created. Since different parameters shall be set it is recommended, to open an already existing test document (template), overwrite it with the new data and settings and store it under a new name.

## 9 Window

Available via: **Window**.

If more than one test documents are opened, they may be shown overlapping, side by side or one on top of the other. Furthermore, one of the already opened test documents may be selected via the selection numbered list in the Window menu.

## 10 Test document

### 10.1 General

The test document is the graphical depiction of the measurement data's and gives different additional information's. The status line shows date and time of the calibration and measurement.

Also status line shows the status of change of the test document. Changes at test parameters are direct recognizable at the status of change, which is either Original or Changed. Some changes at the test parameters, e.g. number of points, require a new calibration. This requirement is shown direct in the status line field calibration and measurement. This information fields shows now: Required.

By turning the mouse wheel, the shown graphs may be zoomed. Forward turning enlarges the graph size, whereas backwards turning reduces the size.

For zoom of the Y-axis additionally the STRG- key shall be pressed and hold down.

Zooming of Y-axis is possible only, if in the menu selection **Prepare test parameter (F4)** / Diagram magnitude **from** and Diagram magnitude **to** is not set to auto.

Additionally to the test result graph it is also possible to show intermediate results, extended data's, limit lines or other helpful graphs on the screen.

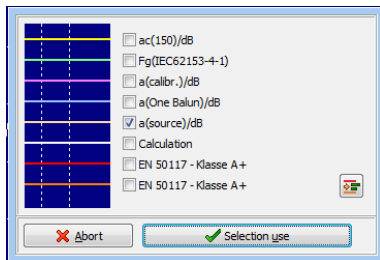
This may be done either by the tool button **switch lines on or off (F8)** or by the popup-menu of test document.

The user interface icon for displaying optional graphs is:



Another option is to use the Mouse, if it's over the graphic screen section. After a right click, the popup menu opens directly and allows selecting all available graphs for this test procedure by using the check boxes. Furthermore, this popup menu shows the relationship between shown graph and relevant color.

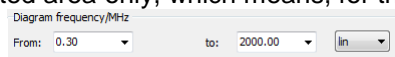
The designation of each shown curve is as close as possible placed to the respective curve by finding a free area near the curve (see picture 3).



Picture 5 Pop-Up window

If no free place was found, possibly other curves may be overwritten by text parts. This may be prevented by setting the Y-axis iteratively by hand.

The test procedures Attenuation (S21) and Attenuation (open, short) allows to show a square balance function. The calculation is done for the depicted area only, which means, for the range from **Diagram frequency from** to **Diagram frequency to**.



## 10.2 Tool-Bar

Each test document contains a Tool-Bar with all Tool-Buttons which contains the functions which may be used in combination with the opened test document.

If the mouse pointer stays longer than half a second over one of a tool buttons, a short info text will be displayed, which describes the function of the affected button.

The test document contains the following tool-buttons:



**Load test document from file (F2):** The test document is loaded overwriting the visible data's. It is no additional test document loaded, but the current open test document will be filled with the content from the .MDO- file loaded via this function.



**Save test document to file (F3):** all data's of the test document will be stored. These are all test parameter as well as calibration data's and (if applicable) defined limit values. In this way, one may switch between different test procedures (transmission, screening attenuation and transfer impedance).



**Prepare test parameter (F4):** the test parameter-form is opened and the test parameter may be changed. Changes will be valid direct after closing of the test parameter form. The new graphic depiction is shown. The status line info of the test document is also matched to the new settings.



**Measurement (F5):** A new calibration procedure respectively a new measurement is started with this button.



**Linear or logarithmic frequency scale (F6):** the X-axis respectively the frequency axis may be switched between lin and log scale.



**Linear or logarithmic magnitude scale (F7):** the Y-axis respectively the magnitude axis may be switched between lin and log scale.



**Auto-scaling on/off (Strg+A):** The scaling of the amplitude axis can be switched directly between automatic scaling and fixed scaling values. The fixed scaling is defined in the measurement parameter form. If the automatic scaling has already been selected in the measurement parameter form, a corresponding changeover cannot take place. If a fixed scaling is selected here, the Auto-Scaling button is pressed repeatedly to switch between this fixed scaling and the Auto-Scaling and the screen graphic is adapted accordingly.



**Switch lines on or off (F8):**

Additionally to the test result itself, also intermediate results, extended data and limit lines may be shown as graph on the screen. It may be switched on or off with the tool button **Switch lines on or off**.



**Show marker data (F9):** In the form **Test parameters** in the field **Marker frequencies** frequency values of the marker may be set. The related values of the Y-axis are calculated and shown as graph.

Remark: In case of measurement of Impedance (open, short) and when the graphic  $Z_w(Z(L)=Z(K))$  is active, this will be done automatically for all points where  $Z(L)=Z(K)$ .

If more than one curve is shown in one graphic window, the marker calculation is related to the first activated graph. Markers are shown as small circles around the calculated point.



**Get graph from other test set document (F10):** This function can be used to display individual

graphs from different measurement documents within one selected measurement document. To do this, first open two or more measurement documents which are measured according to the same measurement procedure. All graphs to be displayed must be switched on now, i.e. made visible, within these open measurement procedures. Now individual graphs from other measurement documents can be selected using the Get graph from other measurement document function and thus displayed within this measurement document.



**Add or subtract graphs (Ctrl+G):** In a few measurement methods (e.g. shielding attenuation

Ed.2 or coupling attenuation) a sum or difference graph can be calculated and displayed. If such a kind of measurement method is selected, this button is visible. The label text for this graph can be freely defined, i.e. there is an input field for this variable.

The output graphs can be any graphs from different measurement documents with any measurement method. The corresponding measurement documents only have to use the same measurement frequencies. "Same measurement frequencies" means using the same values for start frequency, stop frequency, number of points and linear or logarithmic point spacing.

To use this function, first open the corresponding measurement documents. Then select the two corresponding graphs in the target measurement document. Once the two graphs have been selected, the sum or difference graph can be switched on or off under Switch graphs on or off and displayed.



**Analyzer calibration with CALIBRATION-UNIT (F12):** For some network analyzers, automatic

calibration functions can be performed by connecting a CALIBRATION-UNIT. If such a network analyzer is set in WinCoMeT, this button is visible.

In this case, an analyzer calibration can be triggered from WinCoMeT. The parameters set in the measurement document (start frequency, stop frequency, IF bw, etc.) are used for calibration.



**Print test document (String + P):** All relevant information of the highlighted test document is

assembled and printed out as a test protocol to paper or to a pdf-file. Remark: The company name and/or logo may be set respectively changed by Setup/**Program setup** for print out to the document.



**Copy test document to clipboard (Strg+C):** The measurement document graphic is copied to

the clipboard. The colors defined for the printer are used for this (see Chapter 3.2 Graphic color configuration). The measurement document graphic is copied in black and white if this has been specified under Basic Settings/**Program setup**. The default size of the copied graph in pixels can also be specified here (default settings). After corresponding mouse click: Copy to clipboard, the boundary conditions of the clipboard copy can be changed or adapted again in the "pop-up" window. Copy size (in pixels), copy in color or as black and white graphic, with or without heading, axis designation or curve text and various font size adjustments are adjustable. This parameter set can be saved and reloaded later. This is done using the two available buttons Save currently set parameters and Load last saved parameter set.



**Transfer data to Excel (STRG-E):** Frequency, measured values and results of calculations are exported into a MS-Excel sheet. MS-Excel is started and the necessary columns are filled with the relevant data's.

Information to test procedure: the test of the help function help/test procedure opens in accordance with the selected test procedure. In this way, one gets direct information to the selected test procedure, e.g. transfer impedance.



**Information about the test procedure (F1):** The PDF file with the help text for the currently selected measuring procedure is opened context-sensitive. This gives a direct explanation of the selected measuring method (e.g. coupling resistance method). Remark: The help text for the different measuring methods is created step by step. In a few cases it is possible that no PDF file is available, yet. This does not indicate a deficiency of the software.



**Close test document:** The test document is closed. In case of changed test parameter, they will be stored after you select "Yes".

With the right button of the mouse over the tool bar the function **Copy calibration data of this test document to global** may be achieved. With this function it is possible to transfer calibration data's from one test document to another test document (see also 4.2 Global calibration data information).

## 11 Test parameter

Available by the tool-button: **Prepare test parameter.**

In the test parameter input screen of the menu, all parameters which are necessary may be set for the relevant test procedure.

Furthermore, additional information may be registered here. Each test parameter may be loaded from a pre-selected dropdown-list.

These dropdown-lists may be prepared by Setup/Adaption Measuring Dialog Lists.

The fields Start frequency/MHz, Stop frequency/MHz, Display frequency from, Display frequency to may contain shortened units like (H, k, G). Instead of 2000 also 2G for 2GHz or 9k instead 0.009 for 9kHz may be set.

## 12 Achieve measurements

### 12.1 Measurement



Available by the tool-button: **measurement (F5).**

By clicking the button measurement, a new measurement and/or a new calibration procedure is started.

Necessary instructions are given at each step of the measurement.

The progress bar estimates the duration of each step. The real duration depends on the used NWA and may vary in a wide range.

Since the NWA gives no feedback to the software, this duration can only be estimated.

Adjusting of the progress bar may be done by: Setup/Program Setup.

### 12.2 Check box Perform calibration

If the calibration of the set-up for the test document is already done, a new calibration can be skipped by deactivation this with the check box **Perform calibration.**

### 12.3 Check box Use calibration data of last measurement

If the latest calibration has been achieved with the same parameters for start frequency, stop frequency, number of points, if-bw and distance of points, the calibration data's may be used for the current measurement by activating the Check-Box **Use calibration data of last measurement.** This is also valid, when the calibration has been done with another test document. In this case, the user has to take care, that the conditions of calibration fit to the current measurement, (see also 4.2 Global calibration data information).



## 12.4 Check box Analyzer was calibrated manually

Different VNA offer the possibility of extended calibration, which is more accurate than the standard calibration of the WinCoMeT software.

To use this extended calibration of the VNA, the check box Analyzer was calibrated manually shall be set after a calibration with e.g. an ECAL was done.

This will lead to the following:

- The calibration measurements of the WinCoMeT software will be skipped
- The calibration data in WinCoMeT will be set to ideal values (e.g. in case of S21 measurement the real part will be set to 1.0 and the imaginary part will be set to 0.0 (which equals 0 dB)).
- No pre set of the VNA will be done before the measurement is stored. So the data's of the manual achieved calibration remains in the VNA and will be calculated with the test results in the VNA.

## 13 Definition and display of limit lines

Available in the test document via tool button **Prepare test parameter** / button **Set limit lines**.

Two limit lines may be created and used per test document. To create limit lines, the test parameter form of the test document shall be opened and the button **Set limit lines** shall be set. Each limit line may be addressed with a specific name, e.g. "as-limit 85 dB".

Both lines are defined in two text arrays.

One point of each line is specified per row.

Frequencies may be set by abbreviations, k for kHz, M for MHz and G for GHz. Without any letter, MHz will be set as default value.

Frequency values shall be with a semicolon, then the Y-axis value shall be set and the line shall be closed by a return:

The definition of each point of the limit line is as follows: Frequency-value, semicolon, Y-axis value, return (e.g.: 300k;-25 "<cr>").

The number of points of a limit line is in principle as much as the number of measuring point.

Limit curves may be established as step-function or as a line.

Examples of limit curves are already stored as: line mode example.lim, step mode example.lim.

In step mode the magnitude of point (n) and point (n+1) is the same.

In line mode the line between point (n) and point (n+1) is a direct connection.

Limit lines may be shown via the tool button Switch lines on or off in the test document or by the popup menu of the test document.

Both of the limit lines are stored together with the test document; additionally the limit lines may be stored alone. This is achieved by pressing the button **Save limit lines to file** in the form of the limit line.

Limit lines may be loaded by the Button Load limit lines from file of the form of the limit lines.

It is possible to establish and store a set of different limit lines for different applications and load them, when needed.

## 14 Contact

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
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Dokumentation of Software WinCoMeT - Dokumentenversion vom 08.08.2019 (Roland Reimann)


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## Appendix 1: Typical measurement with WinCoMeT

First, you open with

 Open Test Document


a suitable template. In our case we use a file from the directory with the installed demo data:

 RG 058 3m log      24.05.2018 10:35      WinCoMeT Docu...      78 KB

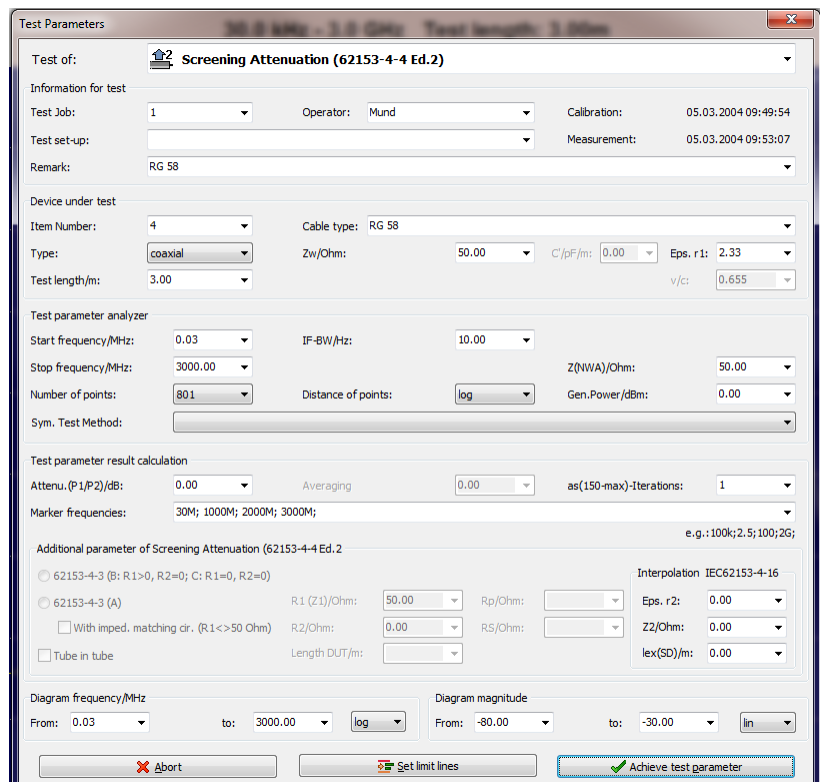
You should first save this file in a directory of your choice under a unique file name. Then edit the input fields of the measurement parameter input form, which you can reach either by pressing the function key F4 or the symbol.

Adjust all fields according to the upcoming measurement task by editing or revising the values stored in the template:  
 Item number, type, Test length, Eps r, Test parameter: Start frequency, stop frequency, Number of points, Distance of points [lin/log], IF-BW, Z(NWA), etc.

Under certain circumstances it is advisable to include the limit value curves here.

 Load limit lines from file

Before the measurement is started, you should make sure that the test specimen has been properly completed. A simple DC measurement with an ohmmeter is completely sufficient. Only if this measurement is successful, a meaningful measurement can be initiated via the WinCoMeT software.



The measurement run can be started by pressing the F4 function key or tool button. Here a decision has to be made regarding the calibration.



The choice  Perform test setup calibration is intended for the normalization of the measuring cables, i.e. the damping of these cables is taken into account by the software in the calculation of the results after the measurement of this parameter.

If the network analyzer, including the measuring cables used, has already been manually calibrated according to a procedure suitable for the later measurement, WinCoMeT can be selected by selecting can be adjusted accordingly.

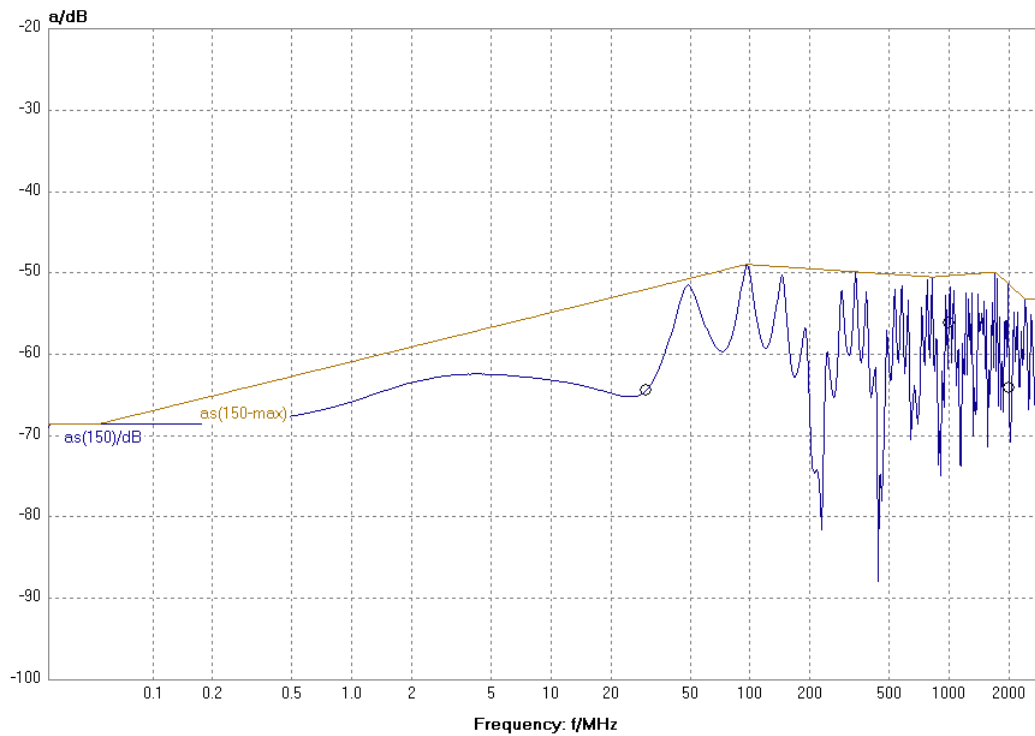
The button goes one step further. All calibration data contained in the .MDO file are overwritten with ideal values, i.e. there is no correction of the measured values which goes back to a calibration. After selecting the appropriate option, the following sequence can be started with.



Depending on the selection, statements that appear on the screen may have to be implemented. Here you are guided step by step to the result.

## Screening Attenuation (62153-4-4 Ed.2) RG 58

30.0 kHz - 3.0 GHz Test length: 3.00m



After visual inspection, the file must be saved if the graph meets the requirements and has a plausible appearance.

Saving is done either via the function key **F3** or the selection field.

