COPPER MOUNTAIN®
TECHNOLOGIES

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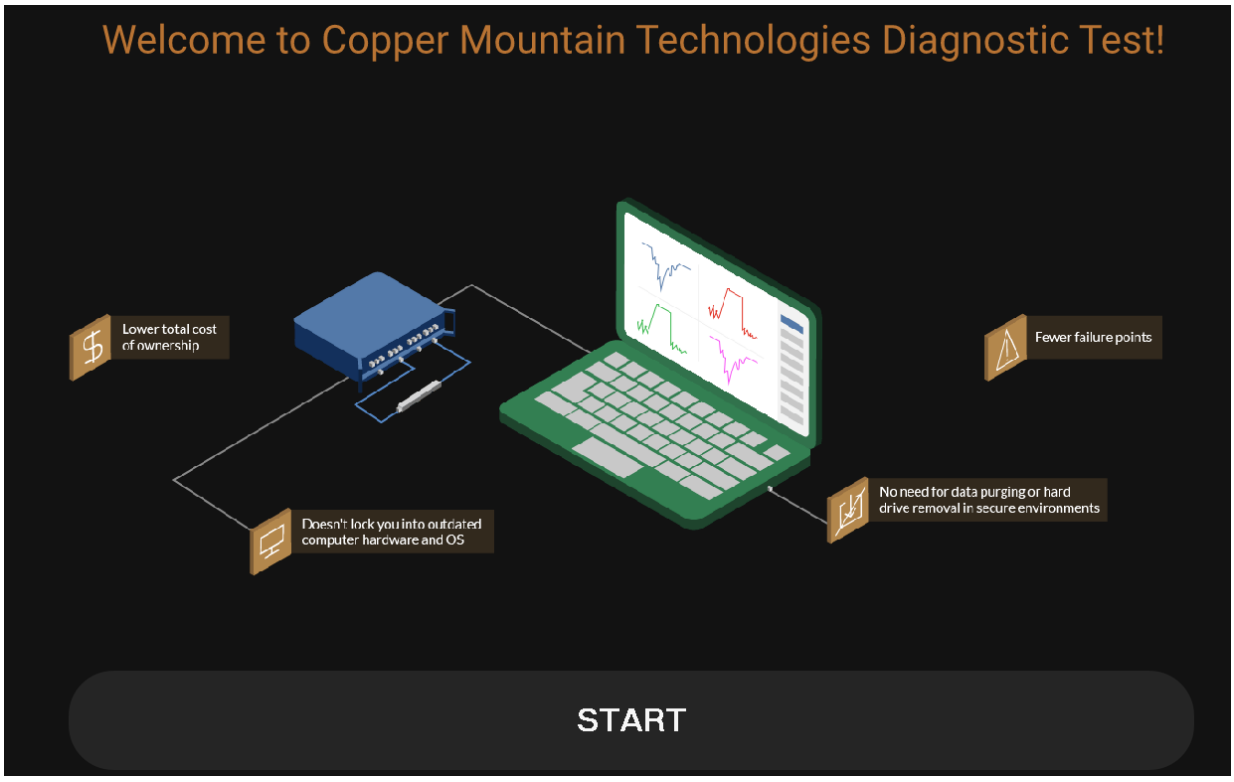
VNA Diagnostic Tool

Operating Manual



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Introduction

VNADT (Vector Network Analyzer Diagnostic Test) is a program designed to guide the user through basic diagnostic tests. The application generates a diagnostic report that allows the CMT support team to assess any Analyzer malfunctions much quicker.

The program provides step by step instructions for visual inspections, connection checks, USB checks, limit tests, and ACM checks. It then generates a diagnostic report in PDF form to be emailed to CMT support at support@coppermountaintech.com.

Installation and Start Up

To install the VNADT program, go to the Repair section on the Copper Mountain Technologies website.

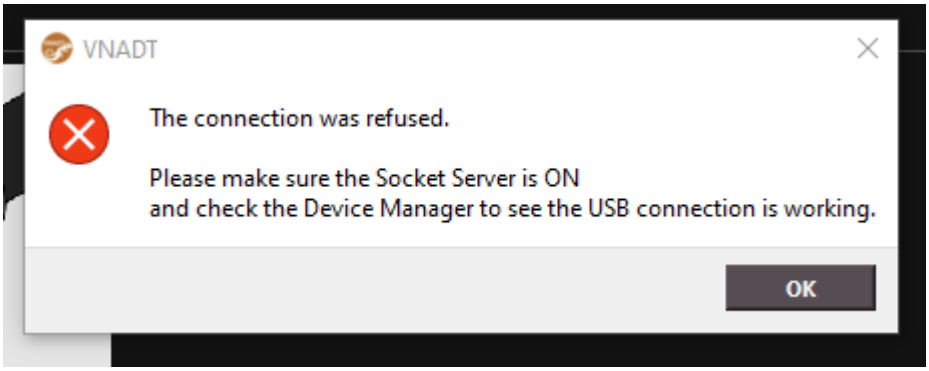
Before launching the program, make sure your Analyzer is ON, and that your VNA program (for example, S2VNA) is running. Once the program is downloaded, connect your Analyzer to your computer using a USB cable and launch the application.

The Introduction page contains a large **Start** button. Click the **Start** button to begin. A pop-up window will appear as a reminder to connect your Analyzer to the computer before proceeding.

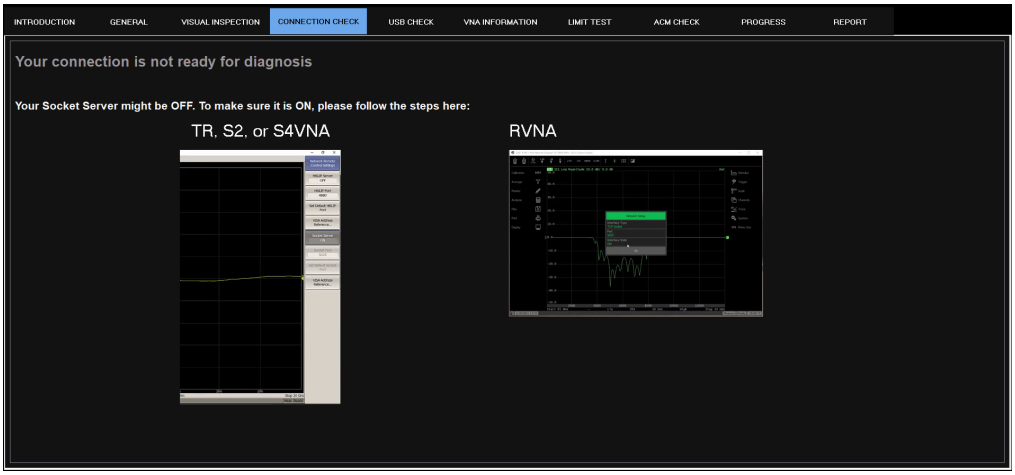
Start Button Pop-up

Click **OK** to proceed to the **General** page.

If you do not have an Analyzer connected or if the Socket Server on your device is turned OFF, a window will pop up stating that the connection was refused. Clicking **OK** on this window will take you to the **General** page. Click **Next** on the **General** page and then again on the **Visual Inspection** page to proceed to instructions on how to turn the Socket Server ON, if it is off. This page is labeled as **Connection Check**. This tab will show up as **VNA Information** if your device is properly connected.



Connection Refused Pop-up



Connection Check Help Page

The GIFs on this page guide you through the process of turning on the Socket Server depending on your Analyzer software type:

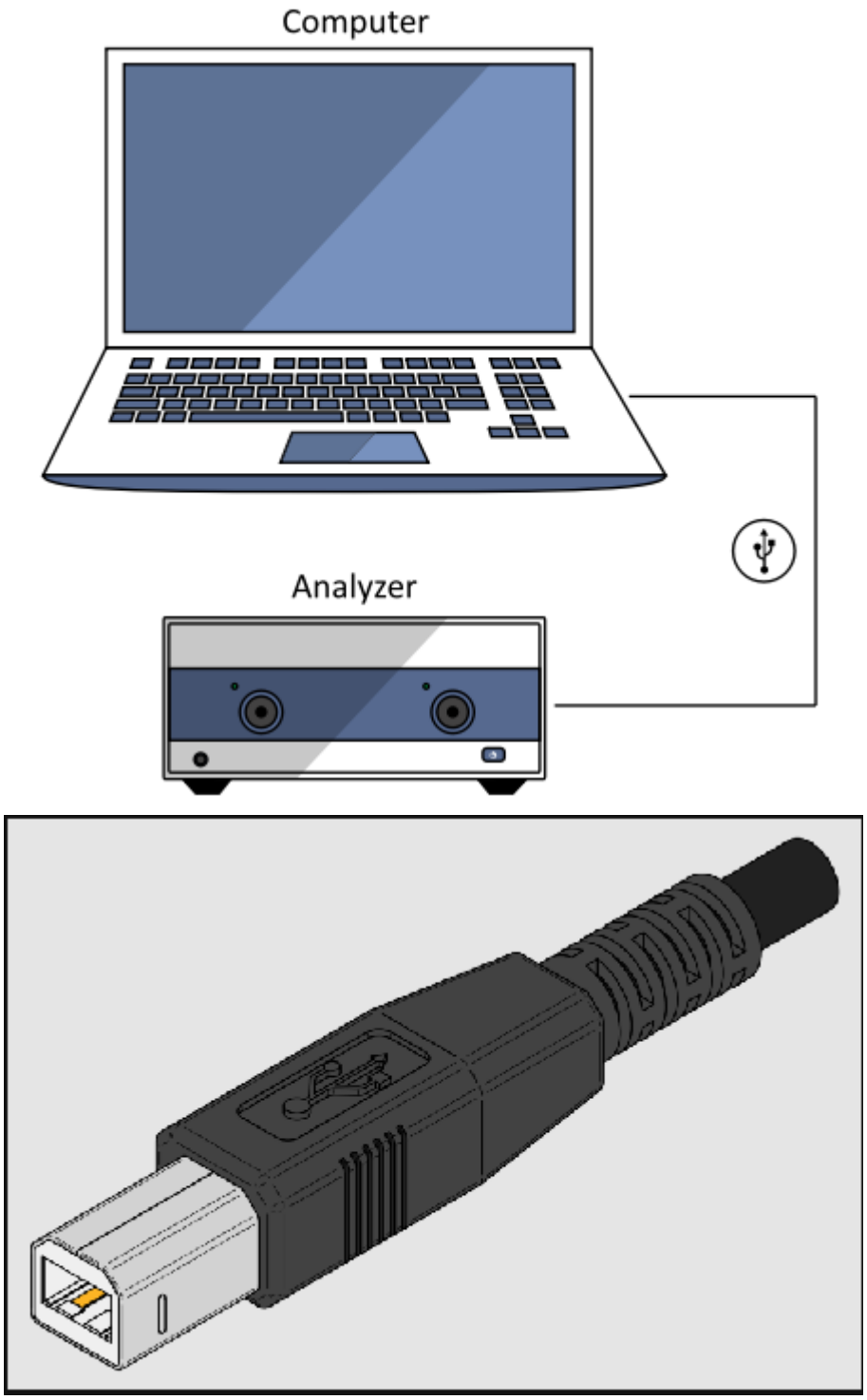
- TR, S2, S4: **System > Misc Setup > Network Remote Control Settings > Socket Server**
- RVNA: **System > Network Setup > Interface State**

Make sure that the Socket Server selected is the 5025. This is shown in the softkey right below **Socket Server**, labeled **Socket Port**.

Once the Socket Server is ON and the Analyzer is connected, use the **Back** button on the bottom right to return to the **General** page and begin the diagnostic test.

General

The General page covers a Basic Setup Check. It shows a picture of the correct VNA Setup and of the correct USB cable needed to perform the diagnostic test.



VNA Setup (left) and USB cable (right)

The Basic Setup Check steps are as follows:

- Only conduct the diagnosis while the Analyzer is plugged into a computer via USB.
- Check that the power supply of the Analyzer is fully functional, with no broken or tilted pieces.
- Check that the power adapter for compact units - or AC cable for full size units - is properly connected to the AC main outlet and the rear panel of the Analyzer.
- Check that the cables connected to the VNA are intact and not damaged in any way.

At the bottom of the **General** page, there is a **Comment** section where you can describe in more detail if any of the above-mentioned parts have malfunctioned or are damage.

Fill out the **Comment** section with your issues, if you have any. If everything is undamaged so far, proceed to the **Visual Inspection** page by clicking Next.

Visual Inspection

The Visual Inspection page contains several text boxes that must be filled out according to the state of your Analyzer.

The first text box is where the user can note any sounds coming from inside the housing from possible loose components. If there are no extraneous sounds, simply enter "No" into the text box. If there are any sounds, describe them in this box.

The second text box is where the user can note any deep scratches or dents in the housing. If there are no scratches or dents, simply enter "No" into the text box. If there are scratches or dents, describe them in this box.

The third text box is where the user can note any pin damage. If there is no pin damage, simply enter "No" into the text box. If there is pin damage, describe it in this box. An example of an undamaged pin is shown below.

Example of undamaged pin

The fourth text box is where the user can note any other mechanical damage. If there is no other mechanical damage, simply enter "No" into the text box. If there is mechanical damage, describe it in this box.

In the bottom left corner of the page, there is a place where the user can upload any photos of the damage described in the text boxes, or any other photos that may be pertinent to the repair diagnosis. These photos will be included in the final PDF report. To upload a photo, click on the Upload button. This will open a File Explorer window where you can select the photos for upload.

To proceed to the **VNA Information** page, click **Next**.

VNA Information

This page will display the basic overview information about your Analyzer. The fields will auto-populate based on the Analyzer you have connected to the software.

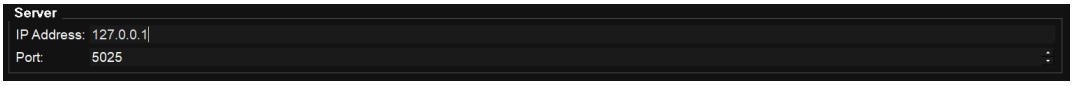
For example, here is what the screen will look like if the device connected is an SC5048:

VNA Information

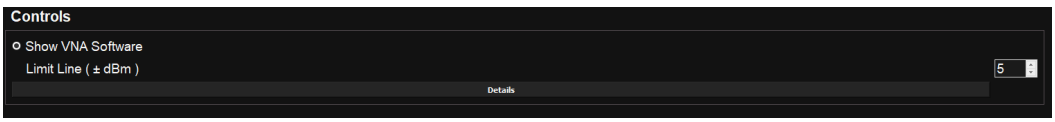
The information on this page shows:

- VNA Type
- Model
- Serial Number
- Software Version
- Temperature
- Demo Mode ON/OFF status
- Frequency Extender(s) YES/NO

There is also a box labeled Server, which shows the IP Address and the Port. The Port number can be changed using the arrow keys on the right side of the box.



The section labeled **Controls** is for use by CMT engineers only, so it cannot be changed unless the user is a CMT engineer.



Controls (CMT use only)

The bottom of the page contains a line for inputting SCPI commands. This is also for CMT engineers only, and cannot be edited unless the user is a CMT engineer.

SCPI command box (CMT use only)

To proceed to the **Limit Test**, click **Next**.

Limit Test

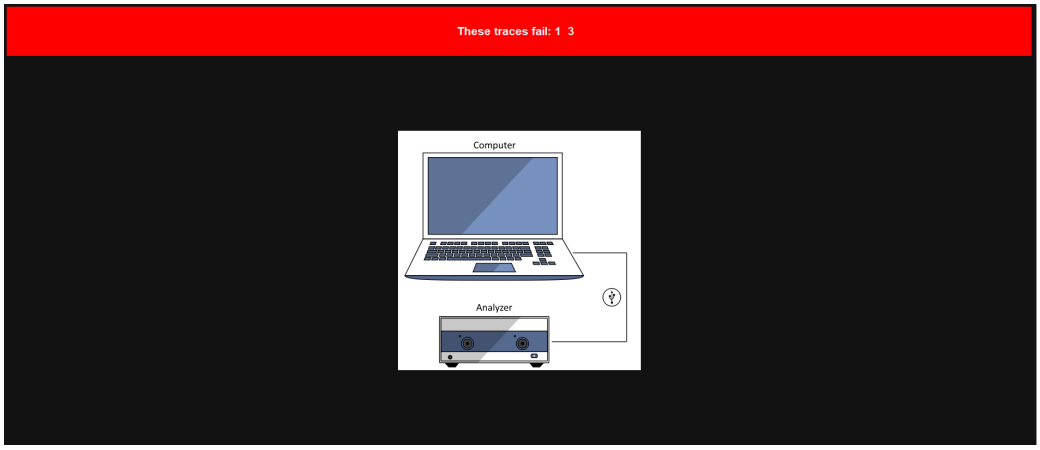
This page performs the limit test.

Make sure there is nothing connected to the ports of your VNA.To begin the limit test, press **Start**.

If the test is successful, a large green check mark will appear on-screen.

Limit Test Pass

If the limit test fails, a red bar will appear, indicating which traces failed.



Limit Test Fail

To proceed to the **ACM Check** page, click **Next**.

ACM Check

This page checks for an ACM (Automatic Calibration Module), and displays the information on the ACM if there is one connected.

Once an ACM is connected, the following fields will auto-populate:

- ACM Type
- ACM Model
- Serial Number
- Temperature
- Start Frequency
- Stop Frequency

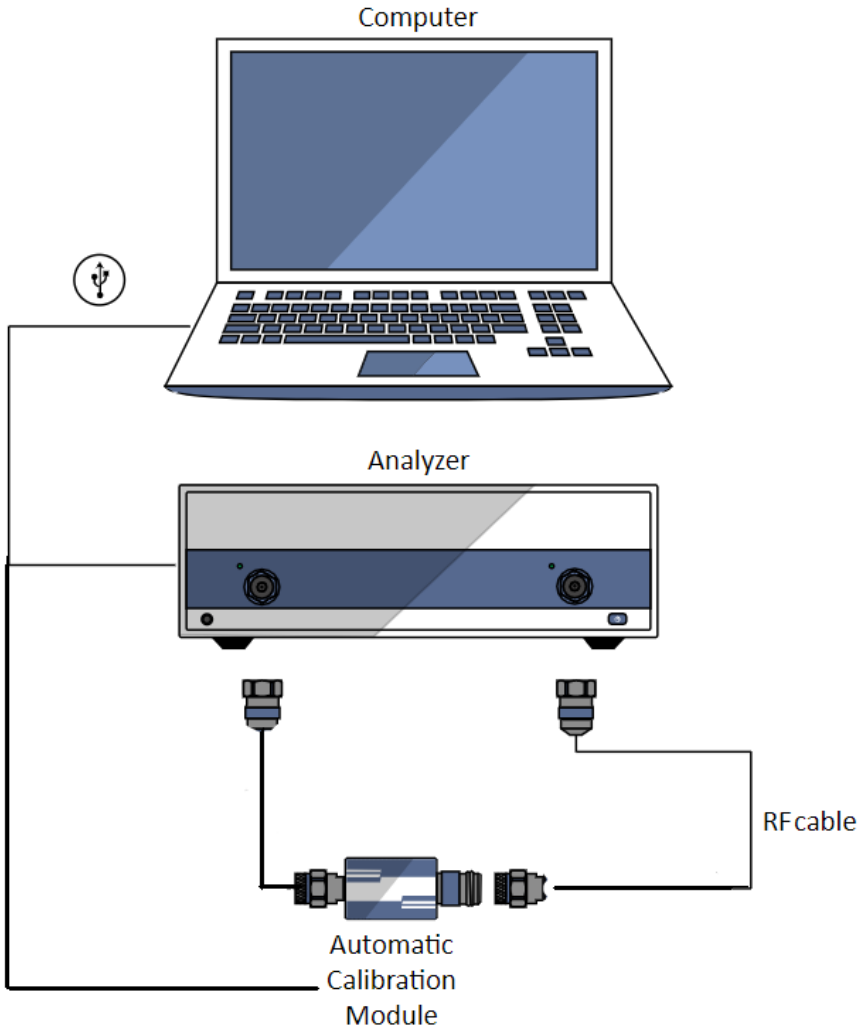
Right under these fields is a text box with the question "Any issue/damage on the ACM?". Use this text box to add any additional comments on the ACM if necessary.

If you do not have an ACM, simply click No in the Controls section.

ACM Controls

If you do have an ACM, use the appropriate cables to attach it to the VNA and then click **Yes** in the Controls section.

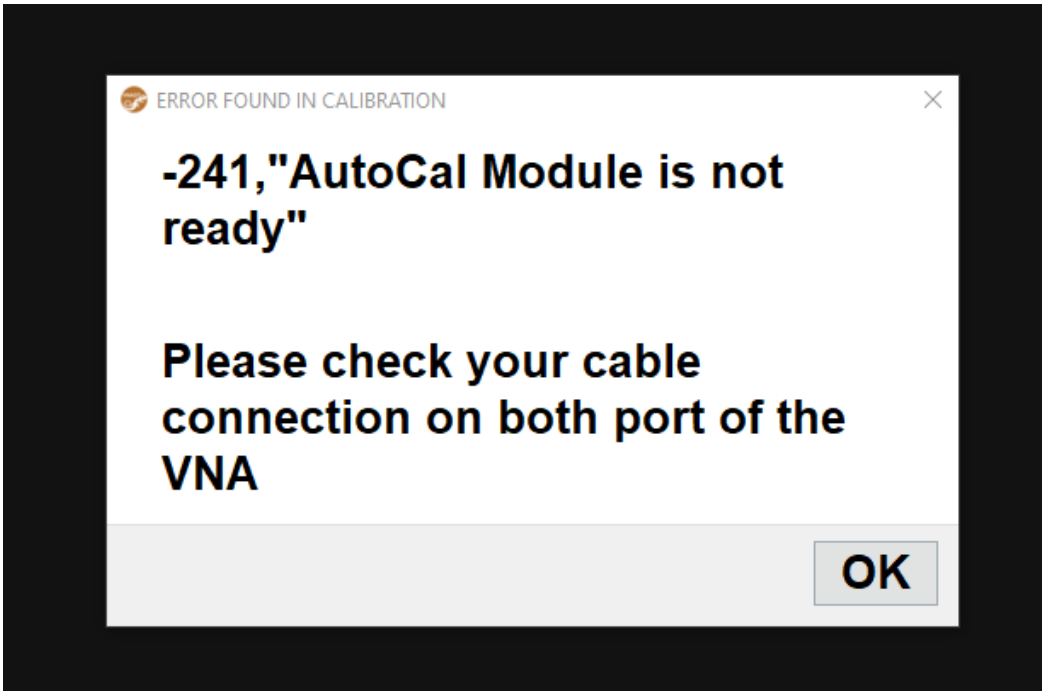
If the ACM is not properly attached, a diagram will pop up to instruct you on how to properly attach the ACM.



ACM connection diagram

Once you have re-attached the ACM, click **Perform Confidence Check** to test the connection again. If the connection is not successful, the yellow message below the confidence check button will turn blue. If the connection is successful, the ACM Check will begin.

The program will automatically switch to the **Progress** tab as the check is performed, and any errors will appear in a pop-up window.



Error message example

If an error message appears, the program will automatically proceed to the **Report** section.

Report

The Report page contains a large Save Report button that allows you to save all the data gathered by the diagnostic tool, so that the information can be sent to CMT support.

Clicking the Save Report button will open up a pop-up window where you can select where to save the PDF report.

Once you have saved the generated report, email it to support@coppermountaintech.com.