



# DeepVNA 101

## 产品说明书

**D**

登录官网[www.deepelec.com](http://www.deepelec.com)获取最新版本说明书

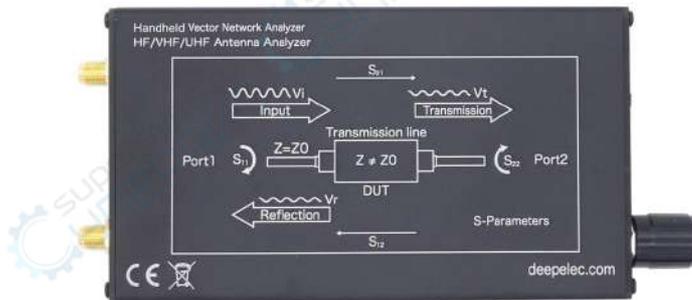
Visit [www.deepelec.com](http://www.deepelec.com) for the latest version of the manual

使用前请仔细阅读说明书，并妥善保管

Please read this manual carefully before use and keep it in a safe place



DeepVNA 101



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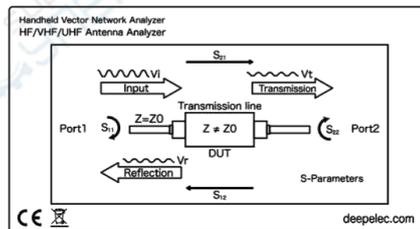
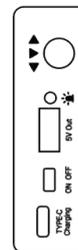
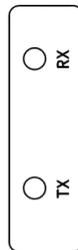
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### ⚠ Caution

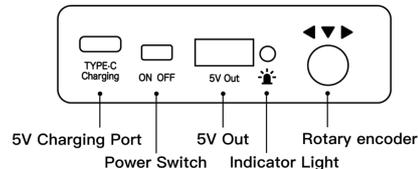
- This image apply to machines with Rotary encoder Hardware.
- This image does not apply to machines with Push-button or Trackwheel Hardware. Visit [www.deepelec.com](http://www.deepelec.com) to know other version of appearance.

Icon/icon name	Description
	Use for charging
	Power On or Off
	5V/1A Output
	Red Blink : Charging Red : Full charged Blue : Discharge Blue Blink : Low battery
	Rotary encoder



### Operation panel

Rotary encoder version:



## Accessory

1. DeepVNA 101 host 4.3 inch (with screen protective film) × 1
2. USB-A to USB Type-C cable × 1
3. 20cm SMA male to male RG316 RF cable × 2
4. SMA male calibration kit - OPEN × 1
5. SMA male calibration kit - SHORT × 1
6. SMA male calibration kit - LOAD × 1
7. SMA-JJ male to male connector × 1
8. SMA-KK female to female connector × 1
9. SMA-JKW male to female right angle connector × 1
10. Quick Start Guide × 1
11. Foldable machine stand × 1
12. Resistive screen touch pen × 1
13. EVA protective bag × 1

## O

### Start a measurement

1. Set the frequency range (  → **D**  or **t " "**  )
2. Calibration (According to actual needs, refer to the next chapter)

3. Select display format and channel ( **1 D** → **D t D "** )
4. Save the parameters for the next measurement.

( **t D** → **D "** → )

You can change the display format and channel selection at any time.

In the normal test mode, tap the right area of the screen or press the multifunctional switch to call up the menu. Tap the screen or turn the multifunctional switch to select a menu item.

### Select the display trace and display format/channel

The menu **1 D** → **Dt "** item can choose to open (activate) or close the corresponding display curve. When the background color of the curve name is consistent with the curve color, it indicates that the curve is active. The items **D**, **tD "**, and **t D "** are only valid for this curve. **1 D** → **tD "** can adjust the scale, **1 D** → **t D "** can select the measured port.

### Setting the frequency range

The frequency range of a channel can be expressed by three groups of parameters: Start Frequency, Center Frequency and Stop Frequency.

If any of the parameters change, the others will be adjusted automatically in order to ensure the coupling relationship among

them.  $f_{center} = (f_{start} + f_{stop})/2$   $f_{span} = f_{stop} - f_{start}$  Where  $f_{span}$  is the SPAN.

Set the center frequency point of the current screen through the

→ **F** of the menu, and display the values of the center frequency and sweep span, respectively, to the left and right of the bottom of the grid. In the lower-right corner of the pop-up Settings value screen, click to eject the soft keyboard and enter the frequency value via the soft keyboard.

Please pay attention to the following points: The start and stop frequencies will vary with changes to the center frequency when the span is constant. In Zero Span, the start frequency, stop frequency and center frequency are always set to the same value. Now, you can use PORT1 as a signal source for a fixed output amplitude, but it is important to note that this machine uses the clock signal generator Si5351 as the signal source, the output signal is square wave, contains a larger odd harmonic.

Set the frequency range through the  → **D** of the menu, display the center frequency and sweep span values on the left and

right sides of the grid, and click on the lower right corner of the pop-up settings value screen to eject the soft keyboard and enter the frequency values through the soft keyboard.

Please pay attention to the following points: The start and stop frequency vary with the span when the center frequency is constant. When the span is set to the maximum, the analyzer enters full span mode. In Zero Span, the start frequency, stop frequency and center frequency are always set to the same value.

Set the start frequency through the  → **D** of the menu and display the start frequency and stop frequency values on the left and right sides of the grid, respectively. Click on the bottom right corner of the pop-up settings screen to eject the soft keyboard and enter the frequency value through the soft keyboard.

Please pay attention to the following points: The span and center frequency vary with the start frequency when the span does not reach the minimum (The parameters vary with the span, please refer to "Span"); In Zero Span, the start frequency, stop frequency and center frequency are always the same value.

Set the stop frequency through the  →  of the menu, and display the start frequency and stop frequency values on the left

and right sides of the grid, respectively, in the lower right corner of the pop-up Settings screen, click to eject the soft keyboard and enter the frequency value through the soft keyboard. Please pay attention to the following points: The span and center frequency vary with the stop frequency. The change of the span will affect other system parameters. For more details, please refer to "Span".

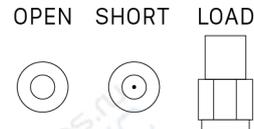
In Zero Span, the start frequency, stop frequency and center frequency are always the same value. For more test examples, please visit [www.deepelec.com](http://www.deepelec.com).

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## Calibration and Normalization

The VNA Master is a field portable unit operating in the rigors of the test environment. In order to ensure measurement accuracy, RF calibration (SOLT) must be performed prior to making a measurement in the field. Calibrating with the specified mechanical calibration requires three calibration parts: open, short, and match(load) and one RG316 RF cable. Calibration data is saved as user calibration data. It can be saved to status 0/1/2/3/4, which will be automatically loaded at the next boot and can be also be loaded via the RECALL menu.

The figure below shows the OPEN, SHORT, and LOAD calibration components that are standard with the DeepVNA 101.



**o**

**1**

**D**

- 1) Open **tD** menu and press **" "**
- 2) Open **tD o D** menu
- 3) Connect SMA Open to PORT1 wait more than 3 seconds (wait for the screen to stabilize) and press **" "**
- 4) Connect SMA Short to PORT1 wait more than 3 seconds (wait for the screen to stabilize) and press **[ ]**
- 5) Connect SMA Load to PORT1 wait more than 3 seconds (wait for the screen to stabilize) and press **D1**
- 6) Connect SMA Load to PORT1, connect second Load to PORT2, wait more than 3 seconds (wait for the screen to stabilize) and press **[ ]**  
if you don't have second Load, just leave PORT2 open.
- 7) Connect RF cable from PORT1 to PORT2 wait more than 3 seconds (wait for the screen to stabilize) and press **[ ]**
- 8) Press **1 [ ]**, save to 0/1/2/3/4 one of them.

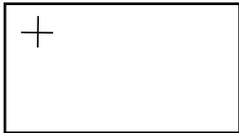
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See more: [www.deepelec.com/support](http://www.deepelec.com/support)

### calibrate the touch screen

- 1) Enter menu **t** → **t tD**
- 2) Use a toothpick or other sharp object to click the center of the cross that appears in order.

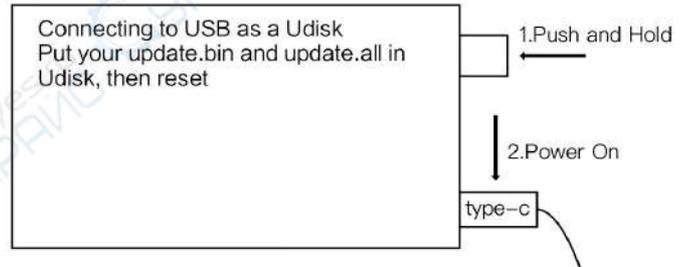


- 3) **t** → **v**.

Download & Points to: <https://www.deepelec.com>

- 0) Download and unzip the update. You should have a file and .

- 1) Connect your DeepVNA 101 to a PC's USB port using Type-C USB socket on the device. Press the middle of the three way buttons and keep it down, while powering up the device. The LCD displays the following prompt, indicating that the boot-loader is active.
- 2) Then at PC side, the device will act as a disk drive, which should appear in File Explorer. Copy you new and into the root directory of that disk.



- 3) Power the device off and on, and the boot-loader will run automatically, and update your DeepVNA 101. Re-power for normal operation.

## D

1) Connect your DeepVNA 101 to a PC's USB port using Type-C USB socket on the device. Press the selector switch and keep it down, while powering up the device. The LCD displays the following prompt, indicating that the boot-loader is active.

2) Then at PC side, the device will act as a disk drive, which should appear in File Explorer. Copy your callsign.txt into the root directory of that disk, then re-power the device.

## t

<http://deepelec.com/files/en.stsw-stm32102.zip>

Install the appropriate 32 or 64bit driver. Turn ON the nano, attach to any USB port, and wait for the computer to give the "Installing driver" message. Wait until it completes.

We haven't released official PC software at this time, we recommend using nanovna-saver (by Rune B. Broberg), a powerful NanoVNA PC software.

<https://github.com/mihtjel/nanovna-saver>

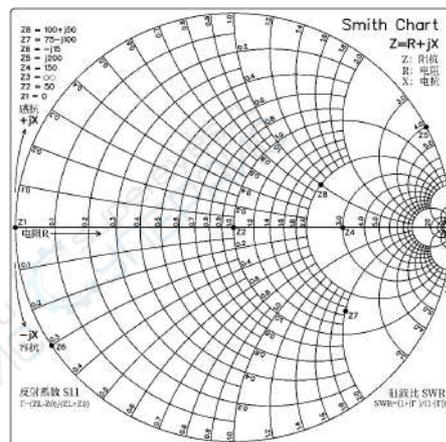
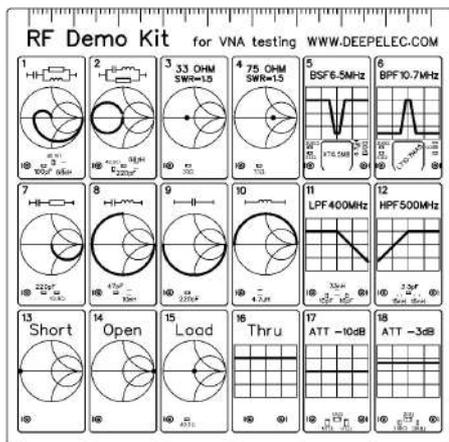
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If you received DeepVNA 101 with or switched to Chinese language.

1) You can follow these steps as figure to change the language to English.

设置 → 语言 → 英文

## 其他产品 / Other Product :



## RF Demo Kit

RF Demo Kit 是由 BH5HNU 自主设计的 NanoVNA 射频测试板，尺寸 10\*10CM，用于学习矢量网络分析仪使用。

背面印刷了史密斯圆图，可以用于学习识读史密斯圆图，学习阻抗匹配基本原理。

测试板有 18 种电路。了解更多：[deepelec.com/rf-demo-kit](http://deepelec.com/rf-demo-kit)

The RF Demo Kit is a NanoVNA RF test board independently designed by BH5HNU, with a size of 10 \* 10CM. It is used to learn the use of a vector network analyzer.

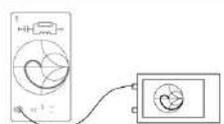
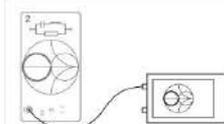
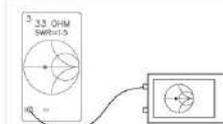
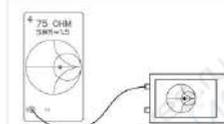
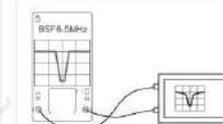
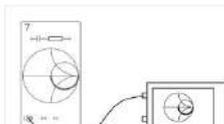
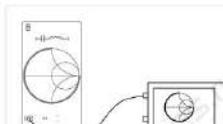
The Smith chart is printed on the back, which can be used to learn to read the Smith chart and learn the basic principles of impedance matching.

The test board has 18 kinds of circuit. More visit : [deepelec.com/rf-demo-kit](http://deepelec.com/rf-demo-kit)

**⚠ Two steps must be performed before testing:**  
**Step 1. Connect the two 20CM SMA to IPEX adapter cables to the NanoVNA-F machine.**  
**Step 2. Recalibrate the machine using the 13 Short, 14 Open, 15 Load, and 16 Thru circuits on the test board, and save the parameters to SAVE 0.**

# RF Demo Kit Quick start guide

Designed By: BHSHNU & June  
 Date: 15 July 2020  
 Release: 2.0

 <p><b>Circuit 1. RLC Series-parallel circuit</b>                  Display S11 Smith Chart, START=50kHz, STOP=600MHz</p>	 <p><b>Circuit 2. RLC Series-parallel circuit</b>                  Display S11 Smith Chart, START=50kHz, STOP=600MHz</p>	 <p><b>Circuit 3. 3.3 Ohm Resistance</b>                  Display S11 Smith Chart &amp; SWR, START=50kHz, STOP=1000MHz</p>	 <p><b>Circuit 4. 75 Ohm Resistance</b>                  Display S11 Smith Chart &amp; SWR, START=50kHz, STOP=1000MHz</p>	 <p><b>Circuit 5. 6.5MHz Ceramic Trap</b>                  Display S21 LOGMAG, START=5.5MHz, STOP=7.5MHz</p>
 <p><b>Circuit 6. 10.7MHz Ceramic filter</b>                  Display S21 LOGMAG, START=9.7MHz, STOP=11.7MHz</p>	 <p><b>Circuit 7. RC series circuit</b>                  Display S11 Smith Chart, START=50kHz, STOP=300MHz</p>	 <p><b>Circuit 8. LC series circuit</b>                  Display S11 Smith Chart, START=50kHz, STOP=600MHz</p>	 <p><b>Circuit 9. Capacitance</b>                  Display S11 Smith Chart, START=50kHz, STOP=300MHz</p>	 <p><b>Circuit 10. Inductance</b>                  Display S11 Smith Chart, START=50kHz, STOP=300MHz</p>
 <p><b>Circuit 11. 400MHz Low-pass filter</b>                  Display S21 LOGMAG, START=100MHz, STOP=600MHz, SCALE=-2dB</p>	 <p><b>Circuit 12. 500MHz High-pass filter</b>                  Display S21 LOGMAG, START=1MHz, STOP=1000MHz, SCALE=10dB</p>	 <p><b>Circuit 13. Short</b>                  Display S11 Smith Chart, START=50kHz, STOP=1000MHz</p>	 <p><b>Circuit 14. Open</b>                  Display S11 Smith Chart, START=50kHz, STOP=1000MHz</p>	 <p><b>Circuit 15. 50 Ohm Load</b>                  Display S11 Smith Chart, START=50kHz, STOP=1000MHz</p>
 <p><b>Circuit 16. Thru</b>                  Display S21 LOGMAG, START=50kHz, STOP=1000MHz</p>	 <p><b>Circuit 17. 10dB Attenuation</b>                  Display S21 LOGMAG, START=50kHz, STOP=1000MHz</p>	 <p><b>Circuit 18. 3dB Attenuation</b>                  Display S21 LOGMAG, START=50kHz, STOP=1000MHz</p>	<p><b>RF Demo Kit</b> MADE IN CHINA                  For VNA Testing                  More Detail : <a href="http://deepelec.com/rf-demo-kit">deepelec.com/rf-demo-kit</a>  <a href="http://deepelec.aliexpress.com">deepelec.aliexpress.com</a>  <a href="https://groups.io/g/nanovna-f">groups.io/g/nanovna-f</a>                  Facebook Group : NanoVNA-F</p> <p>Hangzhou Minghong Electronic Technology Co., Ltd.  <a href="http://www.deepelec.com">www.deepelec.com</a></p> 	



杭州冥鸿电子科技有限公司

HANGZHOU MINGHONG ELECTRONIC TECHNOLOGY CO., LTD.

Version : 3.1

Website : [www.deepelec.com](http://www.deepelec.com)

Support : [support@deepelec.com](mailto:support@deepelec.com)

Facebook Group : NanoVNA-F & DEEPELEC (Need to answer Membership Questions)

Groups.io : <https://groups.io/g/nanovna-f>

QQ 群 : 522796745

注：产品若有技术改进，会编进新版电子手册中，恕不另行通知，请访问官方网站查询。产品外观、颜色如有改动，以实物为准。

Note : If there are technical improvements to the product, it will be compiled into the new version of the electronic manual without notice.

Please visit the official website for inquires. If the appearance and color of the product are changed, the actual product shall govern.