

R&S[®] ZN-Z103 Calibration Unit User Manual




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This User Manual describes the one-port calibration unit R&S®ZN-Z103, order no. 1321.1828.02

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1 Introduction

The calibration unit R&S®ZN-Z103 is an integrated solution for automatic reflection calibration of a single network analyzer port.

The unit contains calibration standards that are electronically switched when a calibration is performed. The calibration kit data for the internal standards is stored in the calibration unit, so that the analyzer can calculate the error terms and apply the calibration without any further input.

Automatic calibration is generally faster and more secure than manual calibration:

- There is no need to connect several standards manually.
- Invalid calibrations due to operator errors (e.g. wrong standards or improper connections) are almost excluded.
- No need to handle calibration kit data.
- The internal standards do not wear out because they are switched electronically.

NOTICE**Scope of this document**

This User Manual gives a brief introduction to the unit's connection and use. For detailed information refer to the operating manual or help system of your network analyzer.

2 Safety Instructions

This calibration unit has been designed and tested in accordance with the EC Certificate of Conformity and has left the manufacturer's plant in a condition fully complying with safety standards.

⚠ CAUTION**General safety considerations**

To maintain this condition and to secure safe operation, you must observe all instructions and warnings given in this manual and in the user manual of the Rohde & Schwarz network analyzer.

3 Connecting the Calibration Unit

The calibration unit is designed for a direct USB connection to a network analyzer, primarily of the R&S® Cable Rider ZPH family.



Analyzers of the R&S®ZNx family with firmware version 2.80 or higher also support the calibration unit.

The calibration unit provides the following connectors:

- A mini-B USB connector
This is used to power-supply and control the unit. A USB cable for connection to the network analyzer is provided with the calibration unit.

- A single RF connector type N (m).

USB Connection to the Analyzer

Follow the steps below and the instructions given in the analyzer's operating manual.

1. Switch on and start up your network analyzer.
2. Connect the USB type A connector of the USB cable to any of the USB type A connectors of the network analyzer. You can also connect the unit before switching on the analyzer.
3. Wait until the operating system has recognized and initialized the new hardware. After the initialization is completed, the status LED will turn green.

The unit is now ready to be used in an automatic calibration, as outlined below.



- The length of the connecting USB cable should not exceed 3 m. It is recommended to use the cable delivered with the calibration unit.
 - You can connect cal units and other devices (mouse, USB memory stick etc.) simultaneously.
 - An unused calibration unit may remain connected to the USB port while the network analyzer is performing measurements. It must be disconnected during a firmware update.
 - It is safe to connect or disconnect the calibration unit while the network analyzer is operating. Never connect or disconnect the unit while data is being transferred between the analyzer and the unit. Never connect the unit during a firmware update.
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RF Connection

See [Chapter 5, "Performing an Automatic Calibration"](#), on page 6.

The maximum RF input power of the calibration unit is beyond the RF output power range of a network analyzer, so there is no risk of damage if the device is directly connected to the test ports.

NOTICE**Excessive Input Power**

If you use an external power amplifier, make sure that the maximum RF input power of the calibration unit quoted in the data sheet is never exceeded.

4 Function of the Status LED

The LED on top of the calibration unit informs about the actual status of the device. The different states have the following meaning:

OFF	The calibration unit is not connected or defective.
Red	The microcontroller is running but there is no USB communication with the network analyzer. With an actual network analyzer firmware this status should only appear for a short time after connecting the calibration unit.
Green	The calibration unit is ready use.
Blinking orange	Data transfer between the calibration unit and the network analyzer. Do not disconnect the USB cable.
Blinking blue	Calibration in progress.

5 Performing an Automatic Calibration

The analyzer uses a reflection calibration type (e.g. Full One Port / Refl OSM). For details refer to your analyzer's operating manual or help system.

After establishing an [USB Connection to the Analyzer](#) and initialization, you can use the calibration unit as follows:

1. Connect an RF port of the analyzer to the RF port of the calibration unit.
2. Perform the reflection calibration of the selected port using the automatic calibration function of the analyzer. For details refer to the analyzer's operating manual or help system.

3. Remove the test cable from the unit, connect your DUT instead and perform calibrated measurements.



Accuracy Considerations

To ensure an accurate calibration, please observe the following items:

- No adaptors must be inserted between the calibration unit and the test port.
 - After connecting the unit to the USB port, allow for a sufficient warm-up time (see data sheet) before starting the calibration.
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6 Maintenance

In case of a potential damage or malfunction of the unit as well as for verification or recalibration of the device please contact your nearest Rohde & Schwarz service center.