Calibration Units

R&S® ZV-Z51
1164.0515.30 / 1164.0515.70

R&S® ZV-Z52
1164.0521.30

R&S® ZV-Z53
1164.0473.32 / 1164.0473.72

R&S® ZV-Z54
1164.0467.92

R&S® ZV-Z55
1164.0480.42

ROHDE&SCHWARZ
Test and Measurement

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.

To maintain this condition and to ensure safe operation, you must observe all instructions and warnings given on this page.

USB Connection to the Analyzer

- The calibration unit is intended for direct connection to network analyzers of the R&S® ZVAB family following the procedure described on the following pages and in the analyzer's help system. Do not connect the unit to other USB hosts, e.g. a PC, or insert any USB hubs between the analyzer and the unit, as this may cause damage to the unit or the host.

- The length of the connecting USB cable should not exceed 1 m. It is recommended to use the cable delivered with the calibration unit.

- You can connect several calibration units to the different USB ports of the analyzer. You can also 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.

ESD Protective Measures

To protect the calibration unit against Electrostatic Discharge (ESD) damage use the wrist strap and grounding cord supplied with the network analyzer and connect yourself to the GND connector at the front panel. For details refer to the Quick Start Guide of your analyzer.

RF Connection

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

Automatic Calibration

A calibration unit is an integrated solution for automatic calibration of several network analyzer ports.

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. The number of standards to be connected quickly increases with the number of ports.

- 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.

NOTE

This Technical Information gives a brief introduction to the unit's connection and use. For detailed information refer to the help system of your network analyzer.

The calibration units R&S ZV-Z51 … R&S ZV-Z55 cover different frequency ranges; they also differ in the number of calibration ports and the connector types. For an overview refer to the data sheet.

USB Connection to the Network Analyzer

The calibration unit provides the following connectors:

- A USB type B connector at the rear, used to power-supply and control the unit. A USB cable for connection to the network analyzer is provided with the calibration unit.

- Two or four RF connectors numbered 1 to 4, to be connected to the test ports 1 to 4 of the analyzer. The connector type is equal for all ports. Depending on the calibration unit model, it is either type N (f), 3.5 mm (f), 2.92 mm (f) or 2.4 mm (f).

To connect the unit...

1. Switch on and start-up your network analyzer.

2. Wear a grounded wrist strap; see *ESD Protective Measures* on the previous page.

3. Connect the USB type A connector of the USB cable to any of the USB type A connectors on the front or rear panel of the analyzer. You can also connect the unit before switching on the analyzer.

4. Wait until the operating system has recognized and initialized the new hardware. When the unit is connected for the first time, this may take longer than in normal use.

The unit is ready to be used as outlined below.

Performing an Automatic Calibration

After connection and initialization, you can use the calibration unit as follows:

1. Connect n analyzer ports (n = 1 to 4, depending on your analyzer and calibration unit model and the number of ports to be calibrated) to n arbitrary ports of the calibration unit. Terminate all unused ports (no. n + 1 to 4) with a 50 Ω match.

2. Perform the automatic calibration for the selected number of ports using the *Measurement Wizard* or the *Start Calibration* menu. For details refer to the analyzer's help system.

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

Accuracy Considerations

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

- Unused ports of the calibration unit must be terminated with a 50 Ω match.

- No adaptors must be inserted between the calibration unit and the test ports.

- After connecting the unit to the USB port, allow for a sufficient warm-up time (see data sheet) before starting the calibration.

- To ensure best accuracy the analyzer automatically reduces the source power to −10 dBm. If the test setup contains a large attenuation, deactivate *Automatic Power Reduction for Calibration Unit* in the initial tab of the *System Config* dialog and ensure an input power of −10 dBm at the ports of the calibration unit (please also refer to the data sheet).

The calibration type depends on the number of ports. If a single port is calibrated, the analyzer uses full one port calibration. For 2 and more ports, you can choose among several calibration types.