R&S®FS-Z10
Coherence Unit
For phase-coherent RF measurements

75 Years of Driving Innovation

ROHDE&SCHWARZ

Test&Measurement

Product Brochure | 01.01

R&S®FS-Z10 Coherence Unit

At a glance

The R&S®FS-Z10 coherence unit in combination with two Rohde&Schwarz R&S®FSQ or R&S®FSG signal and spectrum analyzers enables phase-coherent RF measurements such as measuring phase, timing and gain differences of two RF signals. Moreover, it can compensate the phase, timing and gain difference of the digitized RF signal for further calculations. The R&S®FS-Z10 focusses on measurements on multi-antenna systems in aerospace and defense as well as in mobile communications, for instance MIMO beamforming.

The R&S®FS-Z10 coherence unit comes with a control software running on a PC. It controls the complete test setup, and calculates and displays the test results.
It captures the I/Q data of the sampled RF signals from the analyzers and calculates the signal differences based on the I/Q data. This enables the compensation of the signal differences and saves the compensated or non-compensated I/Q data for further analysis.

The settings specified in the graphical user interface of the control software are used to configure the analyzers automatically. There are three different modes of operation:

- Calibration mode: automatic compensation of signal differences (phase, timing and/or amplitude) in the test set-up including cables for connecting the device under test
- Measurement mode: measurement of signal differences (phase, timing and/or amplitude) between the signals of device under test
- Compensation mode: compensation of signal differences (phase, timing and/or amplitude) of the device under test

The R&S®FS-Z10 coherence unit supports the R&S®FSQ or R&S®FSG signal and spectrum analyzers from Rohde&Schwarz. This concept reduces investment costs because it allows existing equipment to be reused without modification and provides accurate measurement results:

- High-performance signal analyzers with excellent RF performance
- Signal analysis bandwidth up to 120 MHz with low EVM

Key facts

- Frequency range 100 MHz to 6 GHz
- Phase-coherent two RF channel operation
- Design, test and calibration of multi-antenna systems
- Measurement of phase, timing and amplitude difference of RF signals
- Compensation of phase, timing and amplitude differences based on the I/Q data for further analysis

	Measurement Result	Calibration Result
Phase Difference (φ) between A and B	-156.42 °	+6.73 °
Timing Difference (τ) between A and B	+2.04 ns	+569.49 ps
Gain Difference (g) between A and B	+6.64 dB	+0.11 dB

The R&S®FS-Z10 control software lists all relevant results at a glance.

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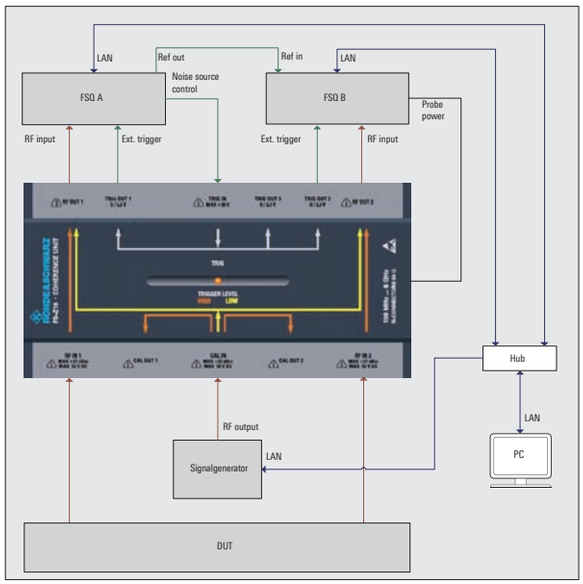
Hardware setup



Hardware setup

The Rohde&Schwarz measurement solution for phase-coherent measurement on RF signals consists of the following instruments:

- Two signal and spectrum analyzers (R&S®FSQ or R&S®FSG)
- R&S®FS-Z10 coherence unit
- R&S®FS-Z10 external coherence control software and desktop PC to run software
- Rohde&Schwarz signal generator to generate a reference signal (needed for calibration and during the measurement to align data acquisition of signal analyzers)

Specifications in brief

General data of the R&S®FS-Z10 coherence unit	
Supported signal and spectrum analyzers	R&S®FSQ, R&S®FSG
Frequency range	100 MHz to 6 GHz
Signal analysis bandwidth (depending on base instrument)	R&S®FSQ: 28 MHz (optional 120 MHz) R&S®FSG: 28 MHz
Inputs	RF in1, RF in2, Cal in, Trig in
Outputs	RF out1, RF out2, Cal out1, Cal out2, Trig out1, Trig out2, Trig out3
Accuracy	phase: <3°, nominal, timing: <8.33 ps, nominal (at 1 GHz) gain: <0.3 dB, nominal

R&S®FS-Z10 control software	
Numeric results	phase, timing and gain difference of measurement and calibration
Graphical results	capture buffer display
Compensation	phase, timing and gain (optional)
Modes of operation	calibration mode, compensation mode, measurement mode
High-accuracy mode	A specific high-accuracy data file comes with each R&S®FS-Z10. This file contains information about the gain and phase differences of the R&S®FS-Z10 paths over frequency and thus further improves the measurement accuracy of the overall test setup.

Ordering information

Designation	Type	Order No.
Coherence Unit for phase-coherent RF measurements (includes R&S®FS-Z10 control software)	R&S®FS-Z10	1171.6509.02

Your local Rohde&Schwarz expert will help you determine the optimum solution for your requirements and will be glad to provide you with a customized quotation.

To find your nearest Rohde&Schwarz representative, visit www.sales.rohde-schwarz.com

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Service you can rely on

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde&Schwarz

Rohde&Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde&Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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For data sheet, see
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and www.rohde-schwarz.com

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