

Simplifying FM radio transceiver testing

Solution featuring the R&S®CMA180 radio test set and R&S®CMARun automation software



Your task

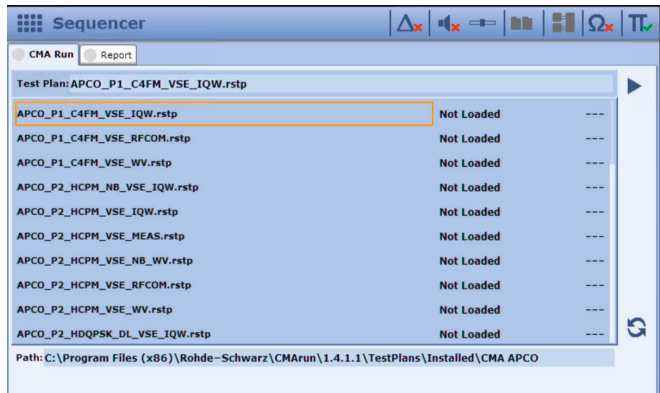
Wireless communications devices such as mobile phones, cordless phone sets, handheld two-way radios and mobile two-way radios consist of a transceiver as their base design. A transceiver is a combination of transmitter and receiver in a single package. It is therefore necessary to test both the transmitting and receiving capability of the radios. It is also necessary to convert the test specification into an automated system for both R&D and production to characterize the design as well as to speed up the testing processes. Manufacturers of such devices need to test huge quantities of radios with great accuracy. In order to achieve these requirements, a simple and flexible automated solution using a high-performance radio tester with user-friendly automation software offers the best solution.

Rohde & Schwarz solution

The R&S®CMA180 is a unique radio tester that operates in the 100 kHz to 3 GHz range, covering the frequency ranges of most commercial transceivers. The technology behind the R&S®CMA180 is based on advanced digital signal processing and computing to enable fast measurements and high accuracy. It supports the FM, AM and PM analog standards as well as digital standards such as APCO, DMR and many more. Together with intuitive operation and efficient measurement capabilities, the R&S®CMA180 is an indispensable tool for performing radio measurements.

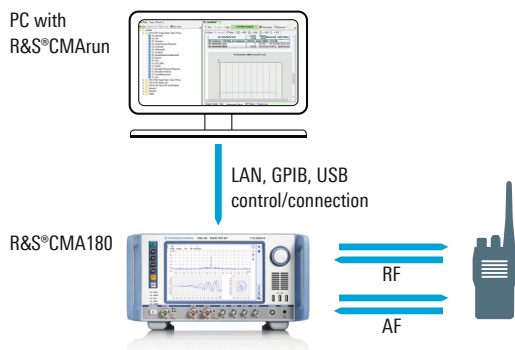
To simplify testing, R&S®CMARun is used to automate the measurements performed by the R&S®CMA180. This flexible and user-friendly software allows user to freely configure the test setup to characterize their device under test (DUT).

R&S®CMARun can be installed on an external PC and controls the R&S®CMA180 radio tester via LAN, GPIB or USB. The R&S®CMARun user-defined sequence file can be saved and copied into the sequencer in the R&S®CMA180. This built-in sequencer lets users run the test setup at the press of a button. Such a setup is ideal in a production environment, giving operators an easy, foolproof way to test the devices.



User-defined test cases in R&S®CMARun sequencer

FM radio transceiver testing application



Flexibility to configure test setups in the R&S[®]CMArun software

Transmitter testing

- Power
- RF signal quality
- Modulation sensitivity
- Frequency deviation
- Modulation frequency
- Response

Receiver testing

- Sensitivity
- Squelch
- Audio frequency response
- AF signal quality

CMA-KT051 Analog Radio Tests CMArun	
<input type="checkbox"/>	AF_Generator
<input type="checkbox"/>	Dx_Test
<input type="checkbox"/>	RF_Generator
<input type="checkbox"/>	Rx_AudioFrequencyResponse
<input type="checkbox"/>	Rx_HumNoise
<input type="checkbox"/>	Rx_IFBandwidth
<input type="checkbox"/>	Rx_Sensitivity
<input type="checkbox"/>	Rx_SignalDisplacementBandwidth
<input type="checkbox"/>	Rx_Squelch
<input type="checkbox"/>	Rx_Test
<input type="checkbox"/>	Tx_ACP_OBW
<input type="checkbox"/>	Tx_FindRF
<input type="checkbox"/>	Tx_ModulationFrequencyResponse
<input type="checkbox"/>	Tx_ModulationSensitivity
<input type="checkbox"/>	Tx_PowerMeasurement
<input type="checkbox"/>	Tx_Test

Series of FM transmitter and receiver test cases for users to select in the R&S[®]CMArun-KT501 option

Connections
Generator: RF COM High Power Attenuator
Measurement: AF1 IN

Generator

RF Signal
Frequency Selection: Manually
Frequency: 100.000000 MHz
Level: -60.00 dBm
External Attenuation: 0.00 dB
Digital Gain: 0.00 dB

Modulation
Mode: FM
Freq. Deviation: 2.400 kHz
Interferer:
Δ-Freq: 0.000000 MHz
Δ-Level: -3.00 dB

AF Signal
Tone Type: Single Tone
Frequency: 1000 Hz

Measurement
Audio Settings
AF1 IN Max. Level: Auto mV
Measurement Results
 Measurement Report Settings
 AF Signal Quality
 AF Level
 AF Spectrum

Advanced Settings
Filters Limits Control

Complete configuration of the R&S[®]CMA180 radio tester via the R&S[®]CMArun user interface

CMA Complete Test					
Generator Settings:					
AF Connector = AF1 OUT					
AF Frequency = 1000.0 Hz					
AF Level = 10.00 mV					
Measurement Settings:					
RF Connector = RF COM					
RF Frequency = 145.000000 MHz					
RF Expected Power = 30.00 dBm					
RF External Attenuation = 0.00 dB					
Demodulation = FM					
CMA used: Rohde&Schwarz,CMA,1173.2000k18/000000,1.0.10.20 beta					
Demodulation Results	Lower Limit	Upper Limit	Measured	Unit	Status
Demodulation: FM					
Frequency Deviation, RMS	---	40.00	0.66	kHz	Passed
Frequency Deviation, RMS * Sqrt(2)	---	---	0.93	kHz	
Frequency Deviation, + Peak	---	48.00	0.44	kHz	Passed
Frequency Error, - Peak	-48.00	---	-1.27	kHz	Passed
Frequency Error, + Peak/2	---	---	0.83	kHz	

Automatic report generation based on the user-defined test sequences in the R&S[®]CMArun software

Ordering information

Designation	Type	Order No.
Radio test set	R&S [®] CMA180	1173.2000K18
Analog radio tests, R&S [®] CMArun	R&S [®] CMA-KT051	1209.5603.02

See also

www.rohde-schwarz.com/product/CMA180

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