

# R&S® CMW500 Wideband Radio Communication Tester TD-SCDMA RF testing

The R&S®CMW500 marks the launch of a new generation of Rohde & Schwarz test equipment. It enables users to test today's and tomorrow's wireless devices – ranging from basic mobile phones up to the most sophisticated PDAs – quickly and precisely in a production environment.



**75** Years of  
Driving  
Innovation

  
**ROHDE & SCHWARZ**

# R&S®CMW500

## Wideband Radio Communication Tester

### At a glance

#### Future-safe test platform designed to handle all major technologies

In the fast-paced world of wireless communications, existing technologies are continuously being optimized and new standards are adopted. A tester designed for the future must therefore be able to handle tomorrow's requirements today. Owing to its large transmit and receive bandwidths, a frequency range up to 6 GHz, exceptional measurement accuracy and support of a variety of applications, the R&S®CMW500 is clearly a sound investment.

The multitechnology platform already supports GSM, WCDMA, CDMA2000<sup>® 1)</sup>, TD-SCDMA and LTE TDD/FDD today. Other standards to be added in the near future include HSPA+ and EDGE Evolution.

In the development and production of mobile phones in line with the TD-SCDMA (time division synchronous code division multiple access) standard, the R&S®CMW500 wideband radio communication tester offers comprehensive test and measurement capabilities.

#### Designed for high first pass yield

The R&S®CMW500 has been specially designed for production applications: Top priority was placed on accuracy, repeatability and linearity. These parameters have a direct impact on production yield: The better the instrument's performance in terms of these parameters, the lower the number of DUTs that are found to be faulty even though they comply with specifications.

#### Significant reduction in test time owing to R&S®Multi-Evaluation measurement

The R&S®CMW500 can perform various measurements (for example, spectrum emission mask, code domain power, error vector magnitude and more) in parallel on the same signal sample. This yields a drastic reduction in mea-

surement time as compared to the conventional sequential approach.

#### Shortest possible alignment times owing to R&S®Smart Alignment

In the R&S®CMW500, predefined frequency/power sequences can be stored in list format exactly as done in the mobile phone's chipset. After being started in sync, the mobile phone and the tester follow the sequence without requiring any further interaction. The calibration time during production can thus be reduced down to 10% of the original value.

#### Reliable receiver test in non-signaling mode

Featuring single-ended BER and loop-based BER analysis, the R&S®CMW500 offers two alternatives for testing receiver quality in the non-signaling mode. The mobile phone's chipset must support both methods. In single-ended BER analysis, the BER is evaluated on the mobile phone by comparing it to the expected signal. In loop-based BER analysis, the mobile phone decodes a channel-coded data stream and returns it to the mobile radio tester for evaluation.

#### Dual-channel mode – two in one

The R&S®CMW500 can be operated in either the single-channel or the dual-channel mode. In the dual-channel mode, two mobile phones can be tested simultaneously yet fully independently of one another, even while applying different standards.

#### TX/RX measurements

The implementation of the transmitter and receiver measurements in the R&S®CMW500 is based on the 3GPP TS 25.102 and 3GPP TS 34.122 test specifications. The following transmitter measurements are supported:

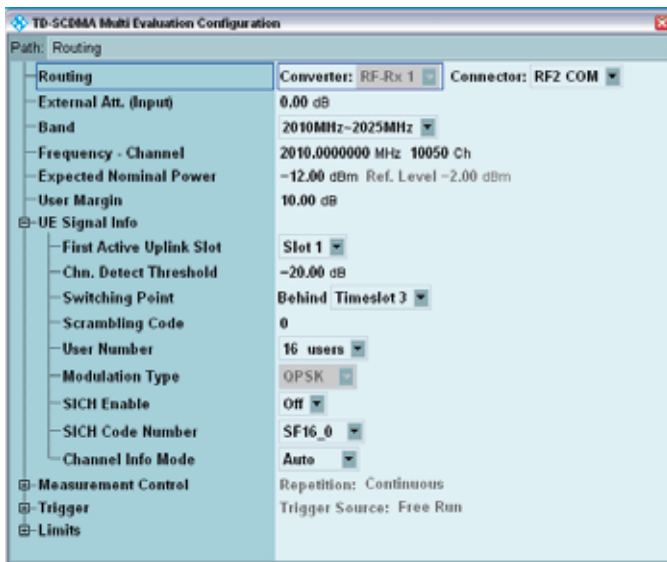
- Power measurements
- Spectrum measurements
- Modulation accuracy measurements

Receiver measurements rely on loop-based BER analysis. A channel-coded data stream is decoded by the mobile phone and then returned to the R&S®CMW500 for evaluation.

#### TX/RX calibration and verification

Compared to the test time involved when using conventional measurement methods, the test time required when performing standard-compliant verification of the transmitter and receiver can be drastically reduced by dispensing with a complete network entry process. All tests – ranging from calibration and verification up to the final functional test – to which a mobile phone is subjected during production can thus be performed by using the R&S®CMW500 in the non-signaling mode.

<sup>1)</sup> CDMA2000<sup>®</sup> is a registered trademark of the Telecommunications Industry Association (TIA -USA).



Users can adapt the measurement and testing of a TD-SCDMA mobile phone to their individual requirements by choosing from a large number of alternatives for setting parameters. In addition to the RF characteristics and parameters for channel coding, other settings such as the trigger conditions and limit values for the individual measurements can be defined as required in each case.



Based on data sets of identical signal samples, the R&S®Multi-Evaluation measurement allows the simultaneous evaluation of a variety of signal parameters. The following transmitter measurements are supported: power measurements, i.e. transmitter output power, code domain power (CDP) and power versus time, spectrum measurements, i.e. adjacent channel leakage ratio (ACLR), spectrum emission mask (SEM) and occupied bandwidth (OBW) as well as modulation accuracy measurements, i.e. error vector magnitude (EVM), magnitude error, code domain error (CDE), peak code domain error (PCDE), phase error, I/Q origin offset, I/Q imbalance, frequency error, transmit time error and waveform quality.

The R&S®Multi-Evaluation measurement offers not only these transmitter measurements but also a receiver test relying on loop-based BER analysis. A channel-coded data stream is decoded by the mobile phone and then returned to the R&S®CMW500 for evaluation.

# Ordering information

## Typical configuration of a TD-SCDMA tester used in production and development

Designation	Type	Order No.
<b>Wideband Radio Communication Tester</b>	R&S®CMW500	1201.0002K50
Wideband Radio Communication Tester, Mainframe,	R&S®CMW-PS502	1202.5408.02
Frequency Range 70 MHz to 3.3 GHz		
Baseband Interconnection Board (fixed link)	R&S®CMW-S550A	1202.4801.02
RF Frontend Module	R&S®CMW-S590A	1202.5108.02
Selection: Front Panel with Display/Keypad	R&S®CMW-S600B	1201.0102.03
ARB + Realtime Baseband Generator Module	R&S®CMW-B110A	1202.5508.02
TD-SCDMA R&S®WinIQSIM2™ Waveform	R&S®CMW-KW750	1203.1406.02
TD-SCDMA Enhanced R&S®WinIQSIM2™ Waveform	R&S®CMW-KW751	1203.1458.02
TD-SCDMA TX Measurements	R&S®CMW-KM750	1203.2554.02

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](http://www.sales.rohde-schwarz.com)

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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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\*0.14 €/min within German wireline network; rates may vary in other networks (wireline and mobile) and countries.