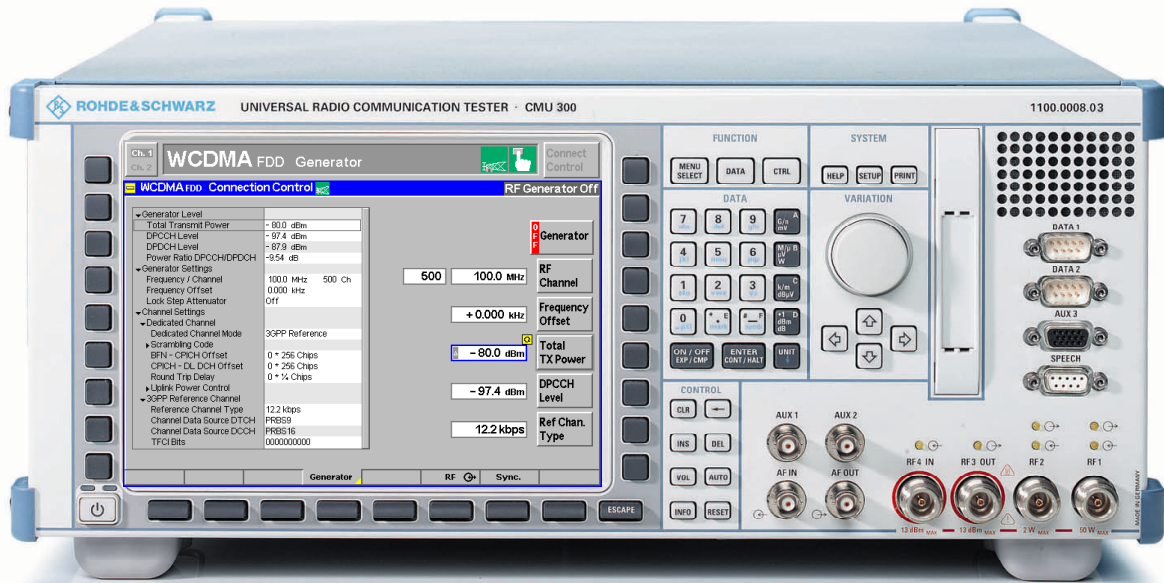


Technical Information



WCDMA Generator (3GPP FDD, Release 99, Uplink) for Universal Radio Communication Tester CMU300

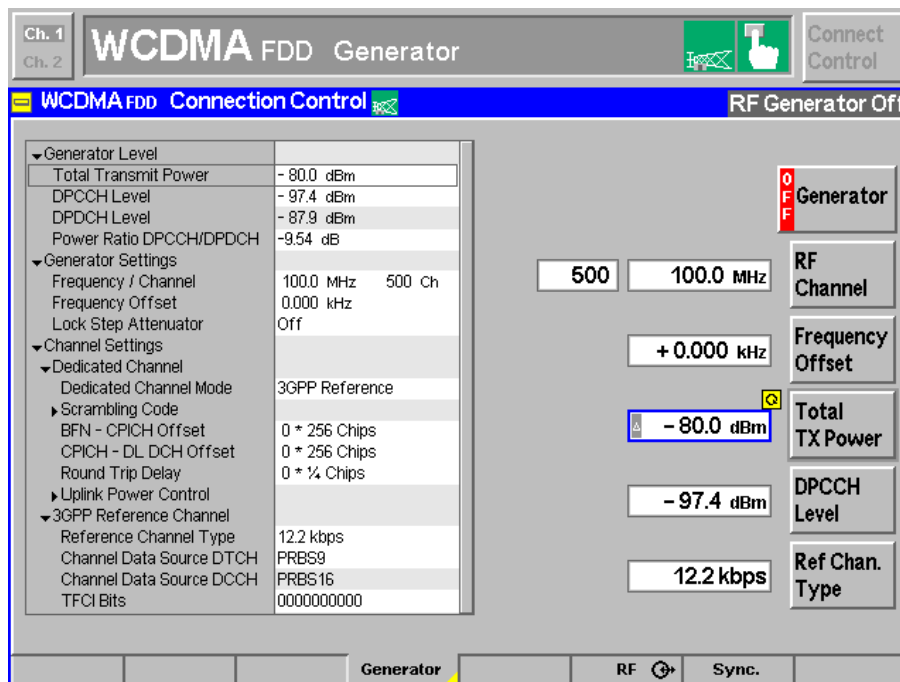


Functionality

To enable sensitivity measurements on WCDMA node B receivers, the R&S CMU300 can be equipped with an RF generator that, for the first time worldwide, supports all reference measurement channels (RMC) as set forth in specification 3GPP TS 25.141 for data rates up to 2 Mbps.

Main arguments for the R&S CMU300:

- **Already supports 2 Mbps data rates (RMC 2048 kbps)!**
- **Provides real-time signal generation with test sequence data length up to PN16 (Pseudo-Random Noise) as a prerequisite for continuous receiver measurements!**
- **Equipped with an easy-to-use MMI for quickly setting the uplink transmission parameters!**
- **Responds ultra-quickly to the entry of new parameters if the RF signal is enabled , i.e. the transmission signal is recalculated in a matter of seconds, thus eliminating time-consuming “Power OFF” phases!**



Settings for RMC 12.2 kbps in menu “Connection Control / Generator”

WCDMA functions in the R&S CMU300 are available with software version 3.06. The generator supports two operating modes. The Reference Channel Mode provides all RMCs from 12.2 kbps to 2048 kbps as set forth in the specification mentioned above. In addition, the R&S CMU300 can be operated in the Physical Channel Mode in order to feed test data directly into the physical data channels (DPDCHs; 15 kbps to 6*960 kbps). Two types of test data are available: pseudo random bit sequences (PN9, PN11, PN15, PN16) and fixed data (00000..., 11111..., 010101...).

General setting options:

- Frequency (channel number)
- Frequency offset
- Scrambling code (type, value)
- Total transmit power
- DPCCH level (which automatically determines the setting of the DPDCH level)
- Power ratio DPCCH / DPDCH (possible only in the physical channel mode; otherwise, automatically calculated in accordance with specification)
- BFN - CPICH offset (T_Cell)
- CPICH - DL DCH offset (Chip offset)
- Round trip delay
- Uplink power control mode

Setting options in the reference channel mode:

- Channel type
- Data source
- TFCI bits (soon available)
- TPC settings¹ can be entered at the physical level (DPCCH)

Setting options in the physical channel mode:

- DPCCH: selectable TFCI code word (available soon)
- DPCCH: TPC settings¹
- DPDCH: channel type
- DPDCH: data source

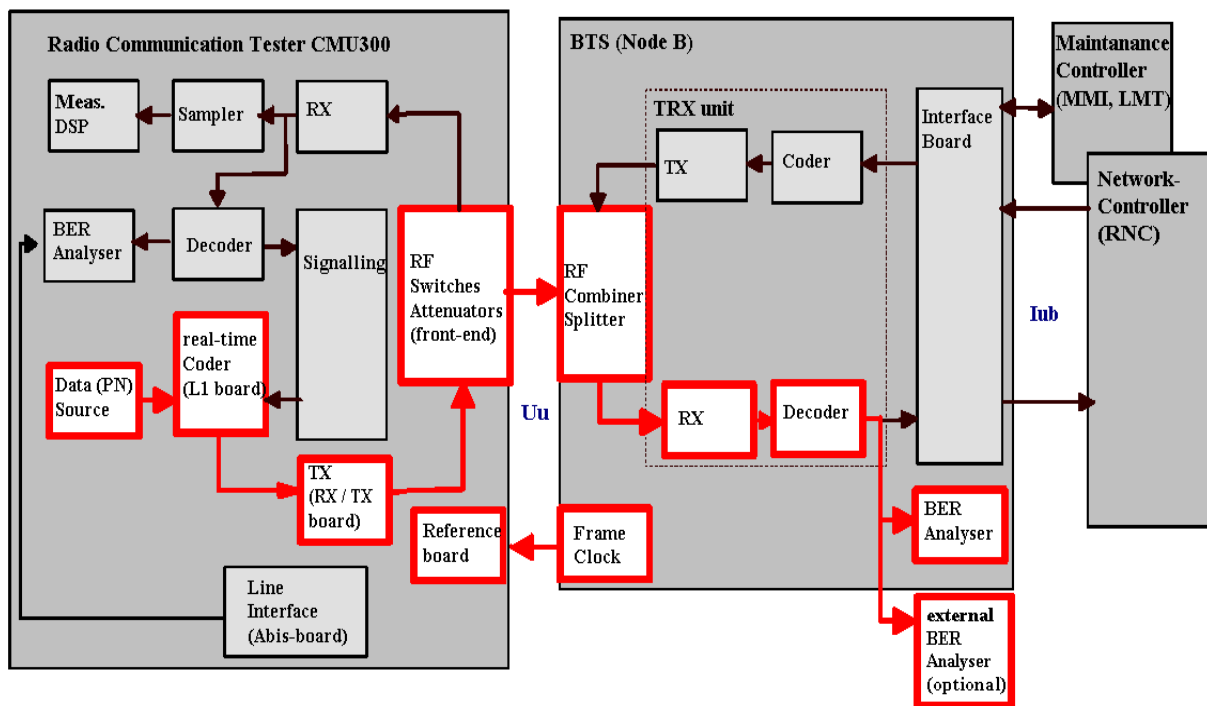
¹ The CMU does not respond to transmit power control (TPC) commands, which the base station transmits "downlink". The uplink TPC settings of the CMU generators can be used to control the transmit power of the BTS.

Main Application

The main application is the testing of node B receivers and their modules (see figure below). The bit error rate measurement (physical layer or transport layer) to be performed determines the type of BTS trigger signals required for synchronizing the CMU:

- the physical channel mode requires the 10 ms frame trigger
- the reference channel mode requires the transmission time interval (TTI) of 20 ms, 40 ms or 80 ms, depending on the RMC used

The bit error rate must be evaluated in either the BTS itself or the RNC, or else by means of an external test instrument.



Test path

Node B receiver measurements with R&S CMU300; block diagram

Ordering Information

The WCDMA generator requires that the options CMU-B76 (hardware) and CMU-K76 (3GPP FDD software) be installed. All existing GSM / EDGE options can be combined with the WCDMA options.

Type	Stock No.	Designation
CMU-B76	1150.0601.02	HARDWARE OPTION FOR CMU300: LAYER 1 BOARD FOR WCDMA
CMU-K76	1150.3300.02	SOFTWARE OPTION FOR CMU300: WCDMA GENERATOR (3GPP FDD, UL), CMU-B76 REQUIRED
CMU-U76	1150.0701.02	UPGRADE KIT FOR CMU300: LAYER 1 BOARD FOR WCDMA (3GPP FDD, UL), INCL. SN250

When existing instruments are to be upgraded, option CMU-**U**76 must be used in place of CMU-**B**76.

WCDMA Specifications – Base Station Test

Standard	3GPP FDD
Symbol rate	3.84 MHz
Trigger input	15 pin D-SUB connector AUX 3, pin 6, TTL level
Required trigger signals	Physical channel mode: 10 ms frame trigger Reference channel mode: TTI trigger (20 ms, 40 ms, 80 ms)

RF Generator (3GPP FDD, Release 99, Uplink Signal)

Physical channels (1*DPCCH, 1 to 6*DPDCH)	15 kbps, 30 kbps, 60 kbps, 120 kbps, 480 kbps, 1*960 kbps, 2*960 kbps, 3*960 kbps, 4*960 kbps, 5*960 kbps, 6*960 kbps
Amplitude ratio of β_c and β_d	15/15, 14/15, 13/15, 12/15, 11/15, 10/15, 9/15, 8/15, 7/15, 6/15, 5/15, 4/15, 3/15, 2/15, 1/15, DPDCH Off
Reference measurement channel	12.2 kbps, 64 kbps, 144 kbps, 384 kbps, 2048 kbps (3GPP TS 25.141)

Frequency range	1850 MHz to 1910 MHz 1920 MHz to 1980 MHz
------------------------	--

Frequency resolution	0.1 Hz
-----------------------------	--------

Output level range	
RF1	-130 dBm to -40 dBm
RF2	-130 dBm to -23 dBm
RF3 OUT	-90 dBm to 0 dBm

Output level uncertainty		
	+20°C to +35°C	+5°C to +45°C
RF1, RF2: ≥ -125 dBm	<0.6 dB	<0.9 dB
RF3 OUT: ≥ -80 dBm	<0.8 dB	<1.0 dB

Signal quality	
Error vector magnitude (EVM)	<8 % ²

² Global EVM for UL 3GPP reference measurement channels