

Versatile and precise signals for the production of wireless devices

The R&S®CMW500 wideband radio communication tester generates complex signals exhibiting maximum precision, speed and flexibility – characteristics that are of utmost importance for calibrating and testing the quality of frontends in the production of wireless devices.

The specialist for production

Modern production of wireless devices requires versatile and accurate signals. The R&S®CMW500 wideband radio communication tester, featuring a highly precise RF module and the R&S®CMW-B110A baseband generator module hardware option, is ideally equipped for this purpose. Its frequency range up to 3.3 GHz or 6 GHz (R&S®CMW-KB036 option) and its transmit-side IF bandwidth of 70 MHz meet virtually any requirement and also offer ample room for future wireless communications standards. The baseband generator module has two operating modes, the *arbitrary waveform mode (ARB generator)* and the *realtime mode* for the *online generators*.

ARB generator

In ARB waveform mode, the instrument processes I/Q data available as waveform files, allowing users to generate any application-specific modulation signals they desire. The R&S®WinIQSIM2 waveform creation tool can create waveform files conveniently and directly. I/Q data can also be generated using commercial software tools such as MATLAB®, Mathcad® or ADS®, but this data must then be converted to the waveform file format with the help of the MATLAB® transfer tool-box or the I/Q wizard from Rohde&Schwarz.

The use of multisegment waveform files makes it possible to achieve minimum switchover times between different modulation modes. To this end, the ARB generator provides various modes that control switching from one segment to another as required. In combination with a user-configurable frequency/level list (that can contain up to 2000 entries), the ARB generator offers solutions for all production-typical requirements, e. g. for fast alignment of the wireless device receiver via pre-defined test sequences using the modern R&S®Smart Alignment concept. You can switch from one entry to another in the frequency/level list in different ways, e. g. time-controlled (variable dwell time per list entry), or by means of marker signals contained in the waveform file, or by internally generated trigger signals from other firmware applications (FIG 1). A generously dimensioned waveform RAM offers sufficient memory capacity for playing even long and wideband signals.

The R&S®CMW500 wideband radio communication tester is fast, precise and highly scalable for use in production. Featuring a frequency range of up to 6 GHz and an IF bandwidth of 40 MHz/70 MHz (analyzer/generator), the production tester is excellently primed for future technological developments (see News from Rohde&Schwarz (2008) No. 195, pp 4 to 9).



Online generators

In addition to the ARB generator, the R&S®CMW500 also provides online generators (R&S®CMW-KGxyz software options, FIG 2) – generator firmware applications that use the real-time mode of the baseband generator module. The network-specific signals can be configured online via a graphical user

interface and output promptly over a wide RF frequency and level range. These downlink signal sources are especially easy to operate and highly flexible. Moreover, they generate complex signals with high data volume, without violating memory limits. They are therefore of particular interest when preparing for production, performing regression tests and for development in the lab.

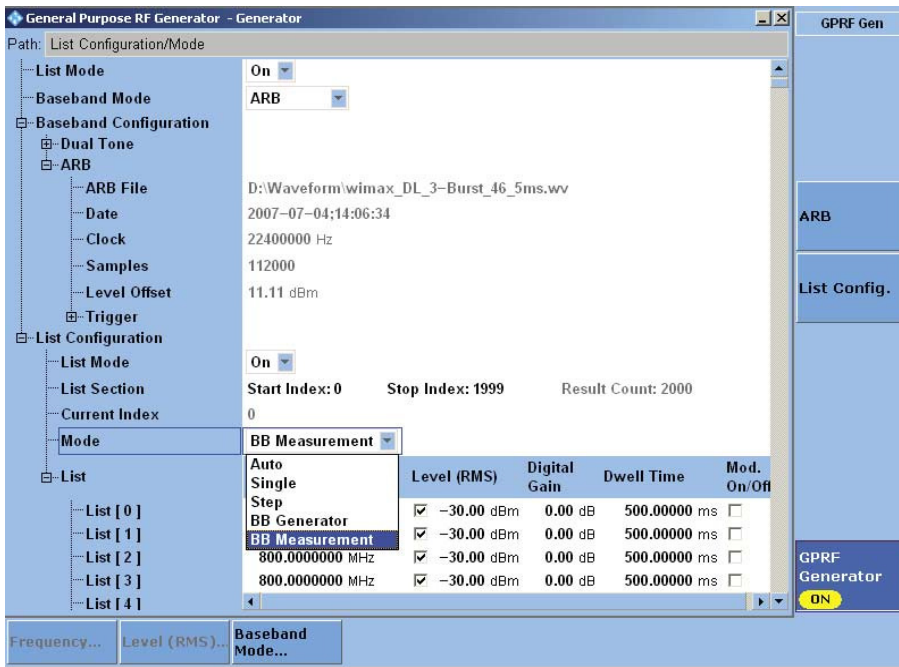


FIG 1 The ARB generator provides different modes for controlling the user-configurable frequency/level list.

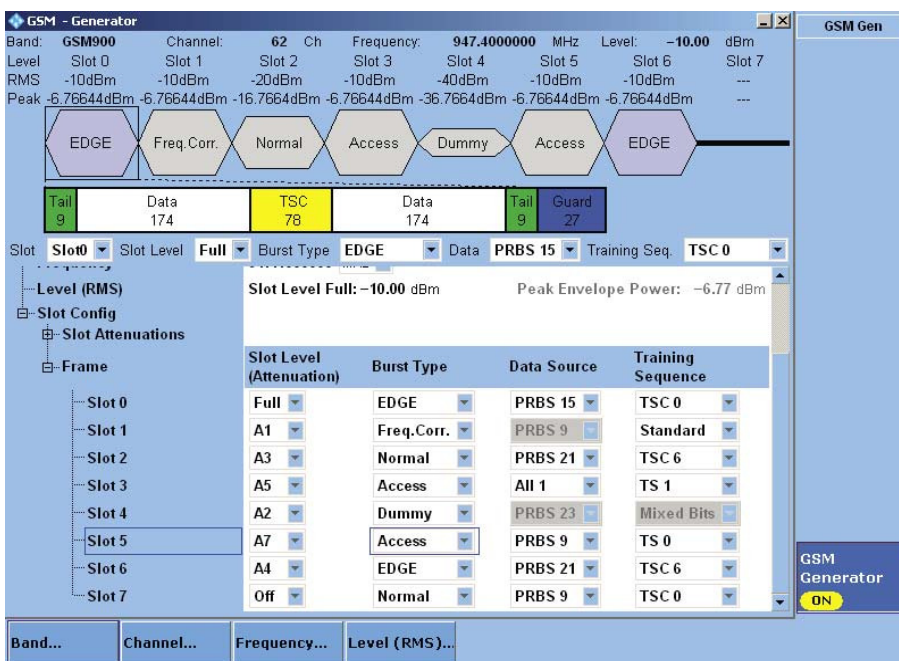


FIG 2 The graphical visualization of the timeslot structure of the online generator for GSM/GPRS/EDGE provides a good overview of the settings.

Online generators for GSM/GPRS/EDGE (R&S®CMW-KG200 option) and 3GPP FDD (R&S®CMW-KG400/401 option) are currently available (FIG 3), and others will follow.

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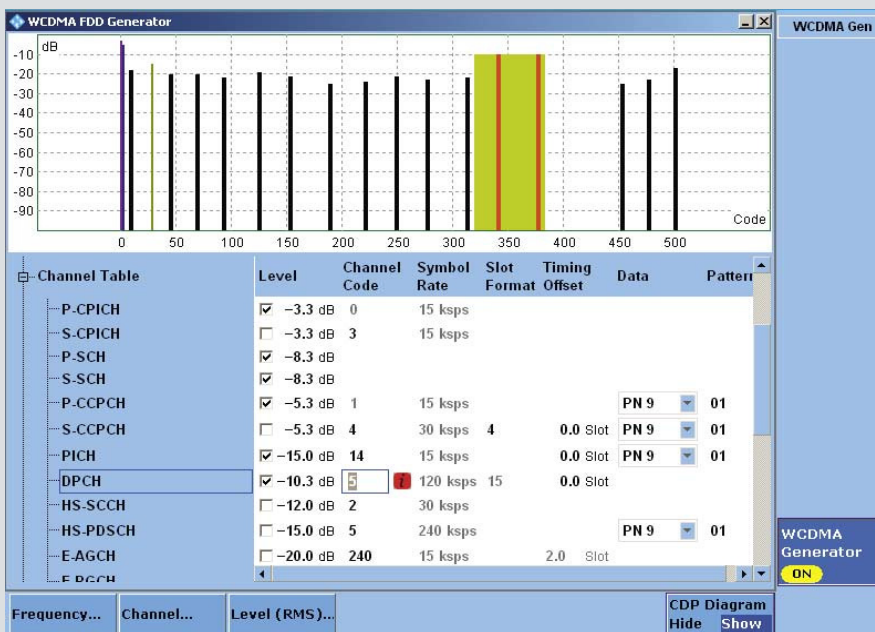
Options	Type designation
Hardware	
ARB + Realtime Baseband Generator Module	R&S®CMW-B110A
Optional online generators	
GSM / GPRS / EDGE, Downlink	R&S®CMW-KG200
WCDMA, Downlink	R&S®CMW-KG400
WCDMA HSPA Extension, Downlink	R&S®CMW-KG401
R&S®WinIQSIM2 waveforms	
GSM / EDGE	R&S®CMW-KW200
WCDMA	R&S®CMW-KW400
WCDMA HSDPA Extension	R&S®CMW-KW401
WCDMA HSUPA Extension	R&S®CMW-KW402
WiMAX™ (IEEE 802.16)	R&S®CMW-KW700
TD-SCDMA	R&S®CMW-KW750
CDMA2000®	R&S®CMW-KW800
1xEV-DO	R&S®CMW-KW880

FIG 3 Generator options for the R&S®CMW500.

Example: online generator for 3GPP FDD (R&S®CMW-KG400 option)

The R&S®CMW-KG400 software option provides the online generator for 3GPP FDD, which generates a downlink signal in line with Release 99 of the 3GPP FDD specification. It supports the most common physical channels and fills them with transport channel information, making it possible, for example, to select the predefined reference measurement channels in line with 3GPP TS25.101 (RMC 12.2 kbit/s, 64 kbit/s, 144 kbit/s, 384 kbit/s); see FIG 4.

The realtime mode of the baseband generator module allows the 3GPP FDD online generator to generate the transmit power control (TPC) bits in realtime and feed them to the control information of the dedicated physical channel (DPCH). The wireless device under test can thus be controlled via different power profiles (in line with 3GPP TS34.121 5.4.2, for example) and checked by measurement.



The R&S®CMW-KG401 option expands the 3GPP FDD online generator to a downlink signal source in line with Release 5/6. Five fixed-reference measurement channels standardized in line with 3GPP TS 25.101 are available for HSDPA. For HSUPA, on the other hand, three flexibly configurable downlink channels can be used.

FIG 4 Typical channel setup of the 3GPP downlink generator with RMC 384 kbit/s and OCNS. The code domain diagram makes it easier for users to configure the channel table and immediately reveals code conflicts.