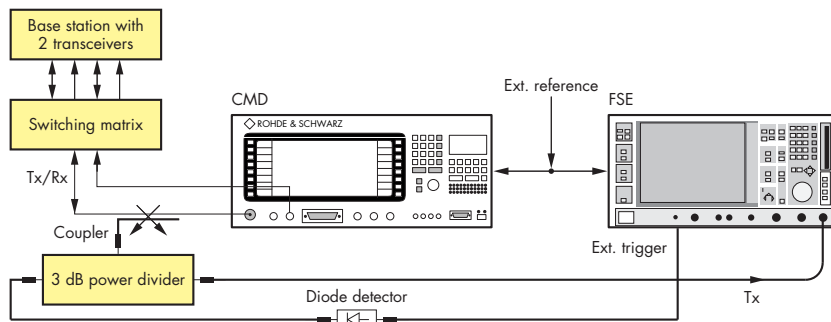
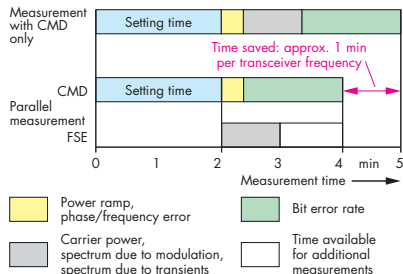


Reducing time to test GSM base stations

Besides high accuracy and reproducibility of results, speed is of vital importance for in-production testing of GSM900/1800/1900 base stations. The following transmitter measurements are specified for the transceiver module of a base station: phase/frequency error, carrier power, power ramp, spectrum due to transients and spectrum due to modulation. For the receiver, the bit error rate is to be determined.

Measurements must be carried out at different channel frequencies (usually three). **Digital Radio-communication Tester CMD** performs these measurements sequentially, taking about 5 min per test frequency including the setup time for the base station. If **Spectrum Analyzer FSE with GSM Application Firmware FSE-K11** is used in addition, the total measurement time for a base station can be considerably reduced by parallelization of test sequences. Prior to starting measurements,



the base station is configured by means of CMD, which then performs the time-consuming BER measurements. To obtain reproducible results, a sufficient number of frames must be evaluated due to the random distribution of bit errors. Assuming that 3000 frames are evaluated, which makes for sufficiently low fluctuation, the measurement time of CMD will be about 1 min, or 2 min in the case of two receiver inputs (normal and diversity). During this time FSE can perform the transmitter measurements of carrier power, spectrum due to transients and spectrum due to modulation.

By optimizing the test sequences with Software FSE-K11, a measurement time of 64 s is achieved for the measurements carried out by FSE. This is only slightly longer than the time taken by CMD but it does not contribute to the total measurement time. The remaining time window allows additional

measurements to be carried out, for instance partial measurement of spurious emissions or spectrum due to modulation in the transmit frequency band. This makes for enhanced test depth without extending the total measurement time. The high sensitivity of FSE makes it possible to measure spurious emissions or the spectrum due to modulation in the transmit frequency band without the use of any additional equipment (eg bandstop filters) in line with GSM11.20/11.21 limit values. For further information see Application Note 1MA06_0E, "Reduced Measurement Time for Testing GSM Base Stations through Parallel Use of CMD and FSE/FSE-K11", which is available from all Rohde & Schwarz representatives.

Roland Minihold

Reader service card 158/16 (CMD),
158/17 (FSE + FSEK11)