

## R&amp;S®CMU200 Universal Radio Communication Tester

## WCDMA/HSDPA data applications

**Two new options expand the functionality of the R&S®CMU200 to enable it to test WCDMA/HSDPA data applications (data end-to-end) in development and production.**

**Test setup made very easy**

The new V4.20 version of the WCDMA firmware and the two new options R&S®CMU-K64 and -K60 now enable the R&S®CMU200 to handle HSDPA data applications in addition to WCDMA data applications. In HSDPA data end-to-end operation, the same extensive setting capabilities as in the HSDPA test mode are thus available. Depending on the options installed on the mobile radio tester and the capabilities of the DUT, transmission rates in the megabit range are achieved in the downlink.

The R&S®CMU200 includes the ping and FTP server data applications for providing initial results quickly. The DUT is connected to the tester and to a PC that handles network dial-in. A dial-up connection that addresses the DUT as a modem is established on the PC. In the case of successful dial-in and thus setup of a data end-to-end connection, you can already send an echo request with a ping command to the R&S®CMU200.

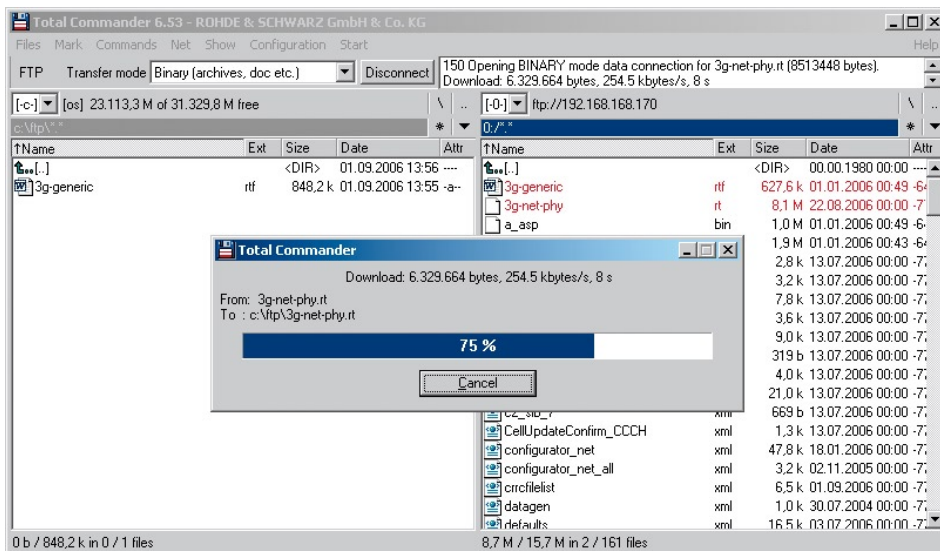
If the connection has been set up properly, the tester responds to the request accordingly.

With the FTP server in the R&S®CMU200 (FIG 1), you can then exchange large files. Since the FTP server allows you to access some files in the tester, it is possible to immediately start download without previously uploading a file. This simple test setup is sufficient for testing downlink transmission rates in the megabit range.

For further data applications, the tester is connected to a network. Since all TCP/IP settings can be easily adapted, you can integrate the R&S®CMU200 into a network (FIGs 2 and 3) without any problems. This setup allows you to use data applications available from your own network, e.g. HTTP transfer, video streaming, and MMS, thus enabling the R&S®CMU200 to also test DUT-internal applications such as web browser, multimedia player, and the MMS function (FIG 4).

**Extensive measurements**

Extensive setting and measurement capabilities are also available for HSDPA data end-to-end connections. Handover to another frequency or band can be performed, for example, and the various RF parameters can be configured. In addition to the transmitter measurements you are already familiar with, you can also carry out HSDPA measure-



**FIG 1**  
File transmission from the internal FTP server of the R&S®CMU200. The downlink transmission rate here is 2 Mbit/s.

ments. For example, the Receiver Quality / HSDPA ACK measurement enables the tester to display the current data throughput for layer 1 as well as the ACK, NACK and DTX values of the data end-to-end connection.

Since the Receiver Quality / RLC BLER measurement has been expanded significantly, it is now possible to display data throughput versus time (FIG 5). At the same time, the tester displays statistics about the transmitted proto-

col data units (PDUs) and service data units (SDUs) of the radio link controller (RLC). This provides you with an informative analysis of data transmission in the downlink and uplink at a glance.

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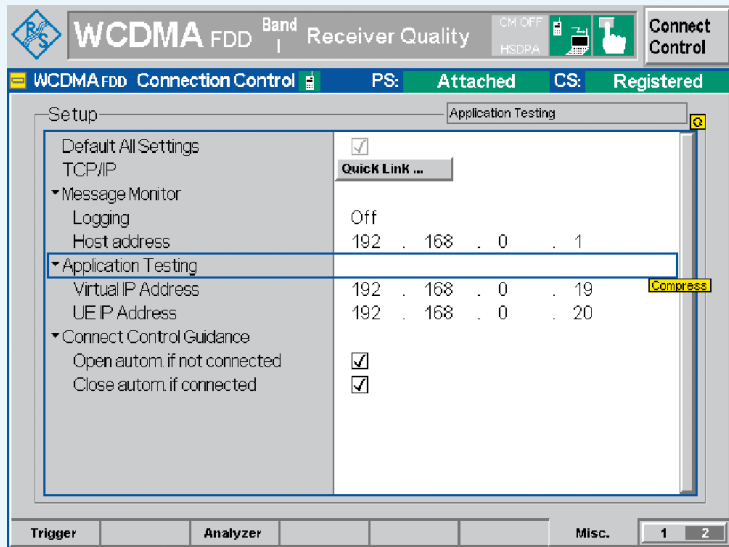


FIG 2 IP settings for application testing: The virtual IP address is required for data transport between the WCDMA protocol stack and the Ethernet interface of the R&S®CMU-B21v14 universal signaling unit. The UE IP address is assigned to the DUT during connection setup with the R&S®CMU 200.

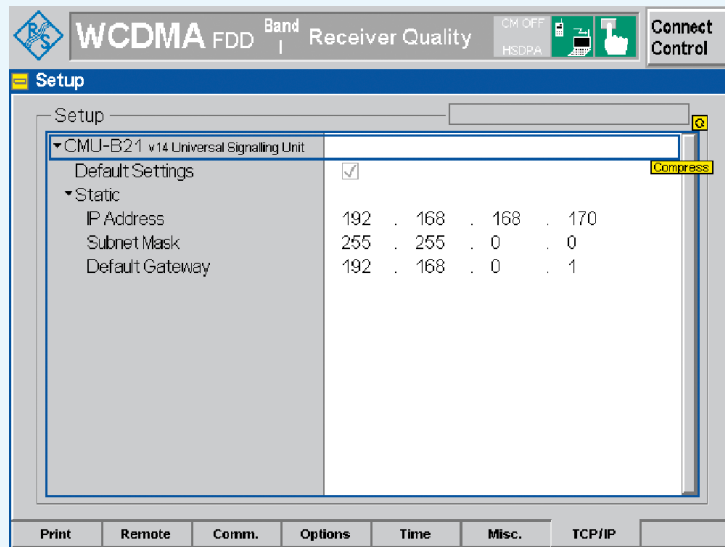


FIG 3 The IP settings of the R&S®CMU-B21v14 universal signaling unit.

FIG 4 Example of test setup for checking the video stream application between a mobile phone and an external video streaming server.

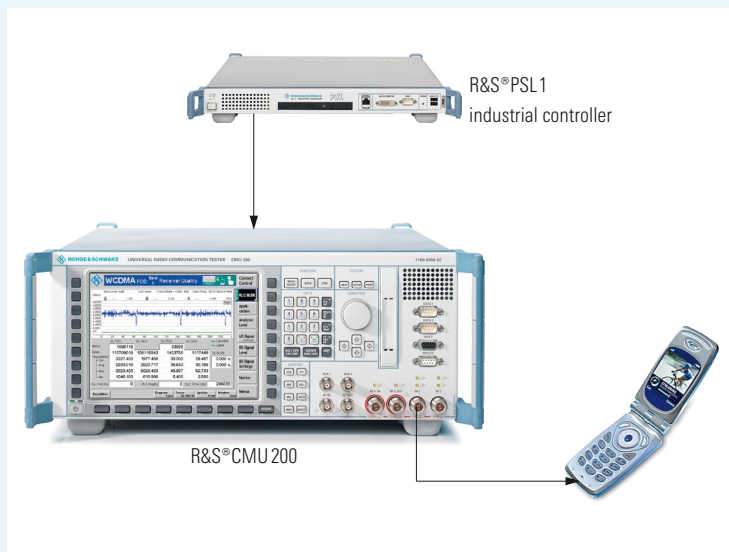


FIG 5 Example of Receiver Quality / RLC BLER measurement during an HSDPA data end-to-end connection.

