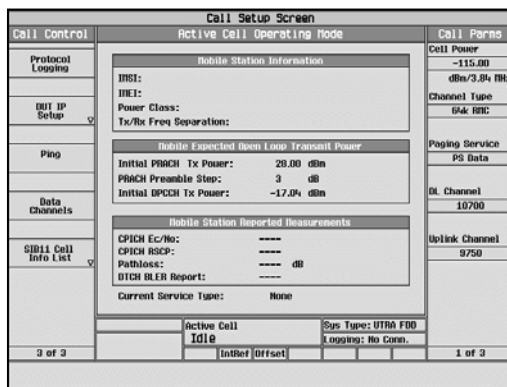


# Agilent 8960 Series 10

## Data Sheet

For the E5515B/C/T mainframes  
and the E6703A W-CDMA lab application  
and the E6785A GSM/GPRS/W-CDMA lab application



### Overview of W-CDMA lab application functionality

- 64 kbps UMTS/GPRS IP data connection for data transfer between a device under test and a network
- soft and softer handoffs including partially configurable second cell and configurable event reporting
- advanced protocol logging with the E6583A W-CDMA wireless protocol advisor including support for W-CDMA to GSM hard handoff
- W-CDMA to GSM hard handoff
- circuit-switched data connection using PPP and UDI 64 kbps RAB
- all features from E1963A W-CDMA mobile test application such as:
  - PRACH Tx on/off and inner loop power measurements
  - 384 kbps DL RMC
  - in-call spectrum analysis

### W-CDMA services

- radio bearer test mode (TC connection)
- UMTS/GPRS packet-switched data
- CS data

### Radio bearer test mode

**Channels:** 12.2, 64 and 384 kbps reference measurement channels (RMC)

**Loopback:** type 1

**Settable DL DTCH data contents:** all zeros, all ones, PRBS-9, PRBS-15, incrementing count

### 64 kbps UMTS/GPRS packet-switched data service

Packet-switched (PS) transfer of IP data between a device under test and a network with full PDP context activation.

**Test your device's IP data functionality:** WAP or web browsing, FTP throughput rates with local or remote servers, serial or USB modem functionality, e-mail and data downloads to PC via data port

**Data rates:** 64 kbps DL and UL

**Ping:** test set ping of device under test or other device on a network or network ping of test set or device, with settable number of pings, timeout and packet size

**Data counters:** Tx and Rx counts of packets and bytes transferred

### Circuit-switched data service

**Network connectivity:** IP traffic to UE using PPP

**Radio access bearer configuration:** UDI 64 kbps (UDI 1B)

**PPP mode:** settable as asynchronous, synchronous with octet stuffing or synchronous with bit stuffing

## W-CDMA wireless protocol advisor logging software

**WPA operating modes:** real time or post capture

**Traffic overview:** single-line display of individual protocol messages in sequential order as received

- **configurable display columns:** message number, message direction, system time, timestamp (based on PC's real-time clock), message name, protocol, repeat count and more based on individual field parameters

**Decode view:** display of detailed message contents

- **display choices:** individual octets of message or line per field of each parameter in the message
- **configurable display columns:** octet number, decimal value, binary value, hexadecimal value, field description (English)

**Measurement setup view:** graphical block diagram of logging software with indication of which triggers and filters are currently selected

**Filters:** three types, all individually configurable by the user. Configurations can be saved and recalled for later use.

- **test set filters:** pass filters that limit the amount of information sent over the LAN with choices of MAC\_broadcast, MAC\_traffic, MAC\_signalling, RLC\_traffic, RLC\_signalling, RRC, GMM/SM, RR/CC/MM/TC, PDCP, SMS, MTAL and IP
- **log filters:** pass filters that limit the amount of information contained in the log. Extremely flexible user configurations based on individual field parameters of all layers. Filters can be combined using AND and OR operations.

- **view filters:** pass filters that limit the amount of information displayed, but do not affect the amount of information actually logged. Extremely flexible user configurations based on individual field parameters of all layers. Filters can be combined using AND and OR operations for each view used.

**Triggers:** user-configurable conditions that define when to start and stop logging. Triggers can be configured to pre-capture or post-capture a specific number of messages. Configurations can be saved and recalled for later use. Four types of trigger configurations are available:

- **event trigger:** start or stop logging when message dropped, message received or received message overflow event occurs
- **message match trigger:** start or stop logging when received message matches or does not match user-selected message or message parameter(s)
- **time trigger:** start logging on specific timestamp and day based on PC's real-time clock
- **trigger counts:** number of start trigger occurrences before log capture begins

### Requirements for optimal performance

**Hardware requirements:** at least a Pentium® III 700 MHz PC with 128 Mbytes of memory, 500 Mbytes of free disk space and a TCP/IP LAN port

**Supported operating systems:** Windows 98®, Windows NT® 4.0 (with at least service pack four), Windows 2000®, Windows XP®

**Connection requirements:** 10 Mbit/sec 10 base T Ethernet (RJ-45 connector) using a crossover cable for direct connection to the PC or a standard cable through a switch or hub

## W-CDMA call processing

- BS origination to W-CDMA from camp on W-CDMA cell for radio bearer test mode and PS data
- BS release from W-CDMA call to W-CDMA cell
- location update
- GPRS attach and detach
- **hard handoffs:** intra-cell DL and UL UARFCNs, W-CDMA TC to GSM voice
- soft handoff
- inter-system handoff to GSM

### Soft handoff

**Second cell:** CPICH, DPCH, OCNS, P-CCPCH/SCH with settable power level, primary scrambling code, time offset and power control mode

**UE measurement events:** set and trigger six independent events with settable state, reporting range, hysteresis and 'W' value

**UE analysis:** perform loopback BER measurements during soft/softer handoff

**UE reports:** event number, CPICH  $E_c/N_o$ , CPICH RSCP and pathloss for cells 1 and 2 and DTCH BLER

### Inter-system handoff

**W-CDMA to GSM system handoff:** hand down from a W-CDMA TC connection to a GSM voice call

## W-CDMA signalling

**resident format:** W-CDMA FDD, R99, June 2001 release

**CDMA modulation type:** QPSK per 3GPP standard

**UL MS Tx power:** settable and maintained by closed-loop power control

**UL scrambling code:** 0 to 38399

## Frequency ranges

- U.S. cellular band (824 to 849 MHz UL, 869 to 894 MHz DL)
- GSM/E-GSM band (880 to 915 MHz UL, 925 to 960 MHz DL)
- DCS1800/PCS band (1710 to 1785 MHz UL, 1805 to 1880 MHz DL)
- U.S. PCS band (1850 to 1910 MHz UL, 1930 to 1990 MHz DL)
- IMT-2000 band (1920 to 1980 MHz UL, 2110 to 2170 MHz DL)

## Cell parameters in active cell operating mode

- settable MCC, MNC, LAC, RAC
- ATT (IMSI attach) flag set or not set
- repeat paging on or off
- primary CPICH Tx power of -10 to +50 dBm
- uplink interference of -110 to -70 dBm
- constant value of -35 to -10 dBm

## Radio link and cell configuration

**Radio access bearers (channel types):** 12.2 kbps symmetrical RMC, 64 kbps symmetrical RMC, 384 kbps DL RMC, 64 kbps UL/DL PS RAB, 64 kbps UL/DL CS RAB

**DL PICH contents:** all indications set to 1 (page) or all indications set to 0 (no page)

**DL PICH data in FDD test operating mode:** all zeros, all ones

**Primary scrambling code:** settable as 0 to 511 in 64 groups (secondary sync code pattern is linked to the scrambling code group and all channels use the same scrambling code)

**SRB configurations in active cell operating mode:** 2.2 kbps DCCH, 2.3 kbps DCCH, 13.6 kbps DCCH

**BLER repetition intervals in active cell operating mode:** 250, 500, 1000, 2000, 3000, 4000, 6000, 8000, 12000, 16000, 20000, 24000, 28000, 32000, 64000 msec

**DL TFCI in FDD test operating mode:** settable pattern

**AWGN interference source:** settable power level

**OCNS interference source:** 16 channels per table C.6 in appendix C of 3GPP TS 25.01 or table E.3.6 in annex E of 3GPP TS 34.121

## CDMA channels

Channel	Default assignmt.	Alternate choices
CPICH	256, 0	
P-CCPCH	256, 1	
S-CCPCH	64, 7	6, 9, 16, 17, 26, 57
AICH	256, 10	6 to 9, 11
PICH	256, 16	14, 15, 17
DPCH, 12.2K RMC	128, 9	6, 10, 20, 29, 37, 45, 54, 60, 63, 70, 76, 87, 93, 112, 118
DPCH, 64K RMC	64, 6	10, 12, 14, 16, 18, 20, 22, 24 to 27
DPCH, 3.4k SRB	256, 12	13, 20, 21, 40, 43, 58, 126, 127, 142, 153, 174, 235, 255
OCNS (test model 1)	Spreading factor of 128 at the fixed OVFSF codes of 2,11,17, 23,31,38,47,55,62,69,78,85, 94,113,119,125	

## Overhead channels

**Common pilot:** fixed at OVFSF 256, 0

**Primary sync:** fixed to primary sync code

**Secondary sync:** code pattern determined by cell primary scrambling code (one of 64 patterns to indicate long code set)

**Primary CCPCH:** valid SIBs (1, 2, 3, 4, 7 and 11) and MIB in active cell operating mode, carries broadcast channel with valid SFN where broadcast channel data consists of 2<sup>9</sup>-1 PRBS in FDD test operating mode

## Security settings in active cell operating mode

- security operations: none, authentication and integrity, authentication only
- authentication algorithm: test 34.108, Rijndael
- settable authentication key, operator variant authentication algorithm, RAND and AMF values

- operator variant parameter type: OPc, OP
- user-initiated reset of authentication SQN

## Security results in active cell operating mode

- authentication results of MM and GMM
- MS reported failure cause

## SIB11 cell information list in active cell operating mode

- SIB11 cell information list absent or present
- intra-frequency second cell scrambling code of 0 to 511
- intra-frequency third cell scrambling code of 0 to 511
- inter-frequency first cell scrambling code of 0 to 511
- inter-frequency first cell UL channel
- inter-frequency first cell DL channel

## Generated power level information reported

- current and desired levels of cell 1 power, AWGN power and total RF power
- current and desired levels of cell 2 power in active cell operating mode

## Downlink code channel information reported

- primary scrambling code in FDD test operating mode
- current and desired levels, spreading factor and channel code for cell 1 CPICH, P-CCPCH/SCH, PICH, DPCH and composite OCNS
- current and desired levels, spreading factor and channel code for cell 1 S-CCPCH and AICH in active cell operating mode
- current and desired levels, spreading factor and channel code for cell 2 CPICH, P-CCPCH/SCH, S-CCPCH, AICH, PICH, DPCH and composite OCNS in active cell operating mode

## Uplink closed-loop power control parameters

- modes of active bits, alternating bits, all up bits, all down bits and 10 up/down bits
- algorithm 1 or 2 with settable step size in algorithm 1 in active cell operating mode
- user-initiated sending of step up or step down TPC bit pattern in active cell operating mode

## Uplink parameter settings in active cell operating mode

- PRACH power step of 1 to 8 dB
- PRACH signature of 0 to 15
- PRACH scrambling codeword of 0 to 15
- PRACH  $B_c/B_d$  automatically set or manually set with  $B_c$  of 2 to 15 and  $B_d$  of 0 to 15
- UL timing offset of  $\pm 256$  chips
- PRACH preambles of 1 to 64
- PRACH ramplng cycles of 1 to 32
- PRACH preamble step size of ????
- 0 to 12 available subchannels
- UL DPCH scrambling code of 0 to 38399
- UL DPCH  $B_c/B_d$  automatically set or manually set with  $B_c$  of 2 to 15 and  $B_d$  of 0 to 15

## Mobile station information reported in active cell operating mode

- IMSI
- IMEI
- power class
- Tx/Rx frequency separation
- initial PRACH open-loop Tx power
- initial DPCH open-loop Tx power
- CPICH  $E_c/N_0$
- CPICH RSCP
- pathloss
- DTCH BLER

## Technical specifications

Specifications apply to the following hardware and software.

- E5515B mainframes with option 003
- E5515C mainframes with option 003
- E5515T mainframes with option 003
- E6703A W-CDMA lab applications with firmware revision A.01.20
- E6785A GSM/GPRS/W-CDMA lab application with firmware revision A.01.20

## For more information

All technical specifications are included in the E1963A W-CDMA mobile test application data sheet on the web at:

[www.agilent.com/find/8960](http://www.agilent.com/find/8960)

## Ordering information

For the most up-to-date ordering information, please visit the Agilent site at:

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