

UbiNetics

TM500 HSDPA Test Mobile



The TM500 Test Mobile is the ideal tool for infrastructure equipment developers to test evolving 3G mobile communications networks. It offers all the capabilities of an HSDPA WCDMA mobile terminal, together with additional advanced test interfaces and features.

- HSDPA WCDMA test mobile conforming to 3GPP Release 5 specifications
- Advance testing of high data rate services up to 13.97 Mbps
- Full support of Layer 1 and 2 Release 5 functionality
- Comprehensive measurements and real-time graphical charting features
- Optional Layer 3 and NAS, providing full protocol capabilities with AT command interface

The TM500 provides full support of 3GPP Release 99 and Release 5 Layer 1/2 functionality, including HSDPA with data rates up to 13.97 Mbps. By offering a layered approach, the user can test a range of scenarios from detailed Layer 1 configurations through to TCP/IP streaming high-rate data demonstrations. A built-in AMR voice codec allows voice calls to be configured in parallel with data applications. The optional Layer 3 and NAS functionality enhances the TM500 to provide full protocol stack support, enabling the support of circuit and packet-switched calls, a USIM interface, SMS and cell broadcast services.

Enables comprehensive network testing

The TM500 gives network equipment developers a far greater degree of control and visibility than provided by regular consumer mobiles or internally built test harnesses. Open, script-driven interfaces are provided at Layers 1 and 2, allowing TM500 users to follow an incremental approach in their testing schedule. Detailed testing may be performed on the key blocks in isolation before running full system analysis, thus allowing engineers to track down and eliminate faults quickly.

The script-driven interfaces enable users to control critical events so that thorough low-level testing can be carried out. Scripted controls allow the user to configure Release 99 and HSDPA physical channels, FEC coding parameters, plus MAC and RLC functionality. Additionally, the user may force overridden values for data sequences such as CQI and HARQ responses on the HS-DPCCH or R99 uplink TPC or FBI bits. Interfaces in the RF architecture allow synchronization of the TM500 with an external 10 MHz reference and the use of a direct analog IQ baseband interface.



The TM500 provides a comprehensive suite of measurements and statistics for the analysis of Layer 1 and Layer 2 information. Key parameters such as RSSI, cell-search information, Release 99 and HSDPA statistics may be logged via the Mobile Data Logger GUI software running on the host PC. Graphical charting of measurements allows the user to monitor selected measurements in real time, while all measurements can be logged to file for later off-line analysis. With the L3/NAS protocol option, additional tools are provided to record and display protocol signalling in the form of a Message Sequence Chart. User-defined message filters allow the user to isolate specific messages in the protocol log. Configuring calls and services with the L3/NAS protocol option is made simple via a dedicated phone dialler application.

Above all, the TM500 has the advantage of being independent of network equipment developers' activities. Aeroflex has built upon the success of the TM100 3G Test Mobile to ensure that the TM500 has the proven interoperability that the worldwide 3G community expects and needs.

Future-proof design

The TM500 product roadmap is continually updated based upon market research and customer requirements. Current options include the TM500 Multi-UE, targeted at Node B scheduler validation and stress testing, plus support of High Speed Uplink Packet Access functionality.



TM500 - Rear panel connections

SPECIFICATION

3GPP SPECIFICATION

Specification version

3GPP Release 5 (June 2004)

Operational modes

HSDPA WCDMA FDD

HSDPA UE Category

Category 1-12

L1 FEATURES

HSDPA physical channels

HS-PDSCH (up to 15 codes), HS-SCCH (up to 4 channels), HS-DPCCH

R99 physical channels

CPICH, SCH, P-CCPCH, S-CCPCH, DPDCH, DPCCH, PDSCH, PRACH, AICH, PICH

Transport channels

BCH, DCH, PCH, RACH, FACH, DSCH, HS-DSCH

Equalization

NLMS, SWCE

Compressed mode

SF reduction, higher layer scheduling

Transmit diversity

Open loop (TSTD, STTD), closed loop (mode 1)

Power control

Closed loop (uplink and downlink), open loop (uplink), outer loop (downlink)

L2 FEATURES

Logical channels

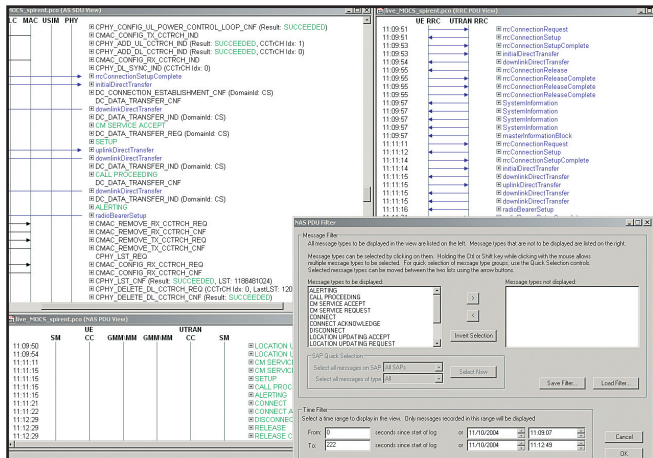
DTCH, DCCH, CTCH, CCCH, BCCH, SCCH, PCCH

MAC

Full MAC support for Release 99 and Release 5

RLC

RLC-TM, RLC-UM, RLC-AM



The protocol message analyzer displays messages in a message sequence chart and allows the application of message filters.

Experienced 3G Test Mobile Support team

Aeroflex has built an experienced and knowledgeable Customer Support team to assist TM500 customers. Members of Aeroflex's Customer Support team are able to provide both on-site and email support.

A TM500 training course is also available.

L3/NAS FEATURES (OPTIONAL)

Protocol layers

RRC, BMC, PDCP & NAS

USIM/UICC

Supported via external UICC card reader

Services

Support of circuit-switched voice and data services. Support of packet-switched data services

Handover support

Softer, soft and hard handover

UE Service capabilities (via NAS)

Emergency call, SMS, cell broadcast, supplementary services

MEASUREMENTS AND STATISTICS

HSDPA L1 measurements

HS-SCCH detection and parameter information, HS-DSCH decode statistics, HS-DPCCH information

R99 L1 measurements

Support of 25.215 measurements, plus detailed cell search and dedicated channel information

Layer 2

MAC and RLC transmission and reception measurements, frame throughput and statistics

TEST FUNCTIONS

Open interface

Scripted control of the TM500 at L1

Variable parameters

Power control, channel coding, UL transport channel data, transmitted channel power, number and power of RACH preambles, control over key timers, expiry times and more

USER INTERFACE

Mobile Data Logger (MDL)

Graphical application for the control of the TM500 and display of logged data

L1 Script Editor (LISE)

Graphical application for creating and editing TM500 control scripts

Protocol logging tool (PCO+)

Application for the control of SAPs used to observe and display logged data in a message sequence chart. Filters can be applied to aid analysis and debugging. Provided with L3/NAS option

Phone application

Provides graphical phone dialler and windows for SMS, PDCP, supplementary services and scripted control. Provided with L3/NAS option

Protocol Manipulation and Interaction (PMI)

Optional protocol extensions tool to enable thorough and repeatable testing and analysis

Includes support for generating error scenarios and forced/rogue behavior

AMR CODEC

Internally fitted AMR codec

Supports 12.20kbps, 10.20kbps, 7.95kbps, 7.40kbps, 6.70kbps, 5.90kbps, 5.15kbps, 4.75kbps

RF

Transmit

1920 MHz – 1980 MHz

Receive

2110 MHz – 2170 MHz

Duplex

Variable duplex

Power class

3 (+24 dBm)

SAFETY & EMC

Low Voltage Directive

73/23/EEC as amended by 93/68/EEC

Electromagnetic Compatibility Directive

89/336/EEC as amended by 92/31/EEC & 93/68/EEC

DIMENSIONS

Height x width x depth

310mm x 480mm x 460mm

ENVIRONMENTAL

Weight

1.8 kgs

Operational temperature

0°C to 45°C

Storage temperature

-40°C to 70°C

Vibration

IEC 68-2-6 and IEC 68-2-36

Bump and shock

IEC 68-2-27

Relative Humidity

10%-80% Non-condensing

Altitude

-200 m to 2000 m

POWER SUPPLY

AC input voltage range

100 – 250 V

AC frequency range

50 – 60 Hz

Power consumption

250 VA max

INTERFACES

Ethernet

10/100 Base T

RS232

9 Way D Type Male

RF in/out

Female N type connector

IQ analog interface

6 x SMC Male connectors

External frequency reference input

10 MHz \pm 50 Hz Male SMC

Power in

IEC

MINIMUM PC SPECIFICATION (PC NOT SUPPLIED)

Processor

IBM® or fully compatible PC with a 2.8 GHz Intel Pentium® 4 processor or higher

Operating system

Microsoft Windows® 2000/XP

Memory

512 Mbytes RAM (recommended 1 Gbyte)

Hard disk space

10 Gbytes (recommended 60 Gbytes)

External interfaces

Ethernet (100 Base T), RS-232

Display

SVGA color monitor or DSTN laptop screen capable of resolution of 1024 x 768 pixels, with 256 colors, or higher

User input

Microsoft compatible mouse or keyboard

Sound card

To support audible alerts

Graphics card

32 Mbytes graphics card

VERSIONS, OPTIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

Ordering

| Numbers | Version |
|----------|-------------------------------------|
| TM500-01 | TM500 3G Test Mobile with AMR codec |

| Options | |
|----------|---|
| TX105-01 | TM500 Protocol (L2, L3, NAS) with USIM/UICC card reader |
| TX109 | HSDPA WCDMA antenna with N-type connector |

| Support | |
|---------|--------------------------|
| SA057 | Standard support package |
| SA059 | On-Site support add-on |
| SA061 | Loan unit support add-on |

| Training | |
|----------|-----------------|
| SA055 | Training course |

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.