DECT Signalling Test Unit PTW15

Support in installation and maintenance of DECT networks

Main applications

- DECT coverage measurement (installation and test)
- DECT network control (maintenance and optimization of WLL networks and PABX systems)
- DECT software and hardware development
- Signalling unit for DECT audio tests according to CTR 10

Main functions

- Channel occupancy measurement:
  scanning and visualization of the air interface in the DECT frequency ranges Europe, China, South and Latin America; analysis of the scanned data by scanner postprocessing
- Built-in PT and FT reference implementation according to EN 300 444 (Generic Access Profile)
- Protocol monitoring and analysis between the DECT layers according to EN 300 444
- Designed for mobile and stationary operation

ROHDE & SCHWARZ

The sequel of the DECTective stories…

The powerful DECT Protocol Tester TS1220 from Rohde & Schwarz is seconded by the extremely favourably priced DECT Signalling Test Unit PTW15. This unit can be used wherever the full functionality of TS1220 is not required: in installation and maintenance of DECT WLL and PABX systems, in DECT audio tests according to CTR10 and in the field of DECT software development.

In the installation of DECT WLL networks or test networks, PTW15 produces data about the occupancy of the DECT frequency band including relevant statistics to support antenna positioning and assessment of various parameters of the DECT equipment (eg dynamic channel selection algorithm). Since most tests are carried out on site directly in the network, the unit

was designed for mobile use through its compact size and optional battery powering. For DECT audio tests to CTR10, PTW15 can be used as a DECT signalling unit that supports call setup to portable and fixed DECT radio terminations both in normal operation (generic access profile GAP according to EN 300 444) and in test standby mode by providing voice data at an analog and a digital interface. The required DECT reference implementations can also be used for DECT software development.

The DECT Signalling Test Unit comes with channel-occupancy software covering all DECT activities at the air interface as well as with a monitor mode for recording and analyzing selected DECT activities between user-defined fixed radio terminations (FT) and the associated portable radio terminations (PT).

System architecture

The unit is based on a 133 MHz AMD K5 processor with 32 Mbyte DRAM, an 8.4-inch colour display and further computer peripherals. The DECT-specific part is accommodated on a separate module, which in addition to the RF section contains the DECT baseband processor and the ADPCM coder/decoder as well as an additional chip developed by Rohde & Schwarz. It is this chip that enables channel-occupancy measurement and operation as a DECT monitor. The entire module is controlled by its own microcontroller

In addition to two RF connectors, the following **data interfaces** (eg for audio tests) are available for connection to external equipment:

- Analog input/output (may also be used to connect an external telephone receiver when simulating a portable or a fixed termination)
- 64 kbit/s PCM input/output (V.11)

The unit can be AC or DC powered from built-in or external batteries. The implemented DECT protocol stack is mapped on the hardware as follows: the time-critical physical layer (PHL) and medium access control layer (MAC) are implemented in the DECT-specific module. The data received between PHL and MAC at the point of observation are imaged in the processor kernel and displayed. The data link control layer and network layer, used for reference implementations, run as independent processes in the processor kernel.

All layers communicate via points of control and observation (PO/PCO).

The exchanged data are displayed in windows on the graphic user interface. The processor kernel uses the realtime Unix operating system LynxOS, which ensures smooth running of the various processes (DECT layers, display functions, user interface, etc). LynxOS is fully compatible with System V and Posix.

The graphic user interface allows convenient operation of the unit via the front-panel keypad supplied as standard or via the external keyboard plus mouse included in the comfort package. All test functions of PTW15 can be activated by hotkey or a mouse click on the matching symbol of the display.
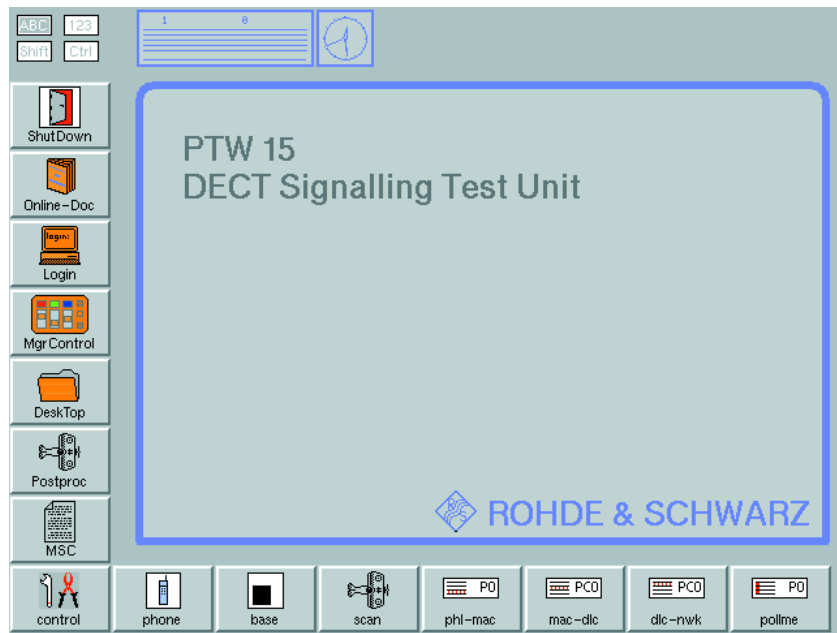
Main menu of PTW operating system

Measurement examples

Channel-occupancy measurement provides a quick and comprehensive overview of all signals received in the DECT frequency band.

There are 3 different options available for the frequency bands of Europe, China, South and Latin America, so

that all worldwide used DECT frequency bands are covered.

In addition to the radio signal strength levels for each DECT slot, other information such as identity, signal drift (referred to a user-defined fixed DECT termination) and bit position (referred to the same fixed termination) is displayed. All results can be stored for subsequent evaluation.

In **monitor mode** the unit synchronizes to a user-defined fixed DECT termination and records all data packets exchanged with portable terminations via the air interface, without actively participating in signalling. From the collected data, failed or successful handover and call-setup attempts or the number of actually occupied channels can be determined for instance.

All data are available both as visualization of the PO/PCO and in a message-sequence chart or as an ASCII file.

Simulation of fixed and portable terminations is implemented in line with EN 300 444 (GAP) and provides the functionality of a fixed or portable DECT termination. The user can set all identities. Each activity after starting simulation is stored in an easy-to-read trace file. The user can also take the PO/PCO and the message-sequence chart (MSC) for analysis and troubleshooting.
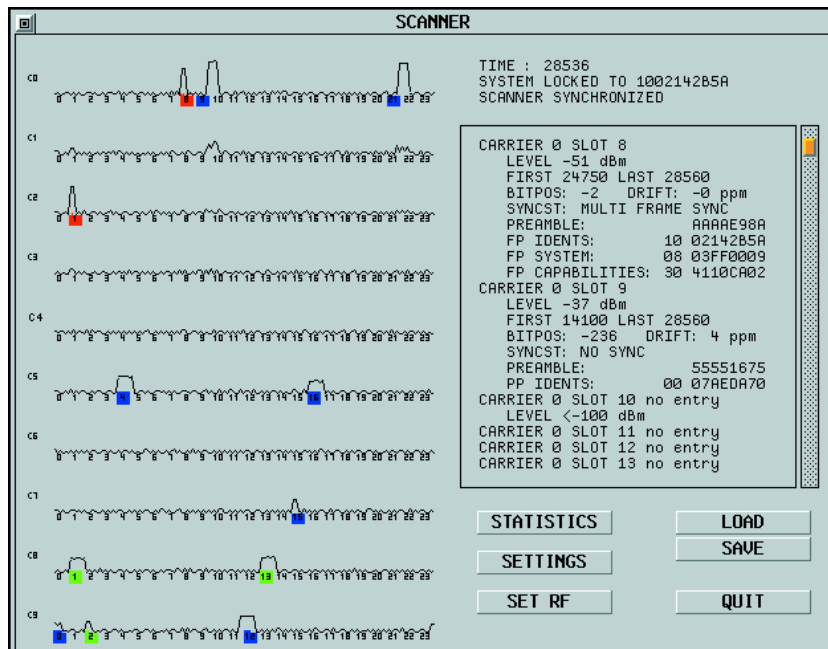
For channel monitoring purposes the activities on all DECT channels / slots are indicated numerically and graphically including information on field-strength, identities, drift, offset etc; the information is automatically stored in a database

The rest of the DECTective family at a glance

TS1220

customized DECT Protocol Tester for type approval tests of fixed and portable parts (CTR 22)

TS1210 DECT Type Approval Test System (CTR 10)

CMD 60, CMD 65

Digital Radiocommunication Testers for speedy and cost-effective measurements on DECT communication devices

CTS 60, CTS 65

Digital Radio Testers for fast and conclusive DECT measurements regarding RF parameters, power ramp and BER

TS8930 DECT Type Approval Test System (CTR 06)
TS 8930 is the worldwide standard for testing and developing the air interface of DECT devices

ETSI ◆ MEMBER
...making the right connections.

Certified Quality System
ISO 9001
DQS REG. NO 1954-04

Specifications

Basic instrument
Main board
CPU   AMD K5 (586), 133 MHz
RAM   32 MB

Display
LCD   8,4" TFT colour display
Surface   non-reflecting

Graphics
Built-in display   VGA standard: 640 x 480 pixels
For external monitors   max. 1024 x 768 pixels

Mass storage
Hard disk   >500 MB
Floppy disk drive   1.44 MB, 3½"

Interfaces
Available interfaces   4 x 16 bits, dimensions (L x H):
                             2 x ISA 330 mm x 140 mm
                             2 x ISA 312 mm x 140 mm
Serial   2 x RS-232-C
Parallel   1 x LPT (Centronix) for printer
Keyboard   DIN and PS/2 for keyboard incl.
                             trackball

Software
Operating system   LynxOS
User interface   MGR

Climatic loading
Rated temperature range   +15°C to +35°C
Operating temperature range 0 °C to +40°C
Storage temperature range   −25°C to +60°C
Temperature resistance   according to DIN IEC 68-2-1 and
                             DIN 68-2-2, MIL-T-2800D class 5
Relative humidity   95% at +40°C
                             according to DIN IEC 68-2-3

Mechanical resistance
Sinusoidal vibration   5 Hz to 150 Hz, max. 2 g at 55 Hz,
                             55 Hz to 150 Hz, 0,5 g const.,
                             according to DIN IEC 68-2-6, EN
                             61010-1/ DIN IEC 1010-1 as well as
                             MIL-T-28800D class 5
Random vibration   10 Hz to 300 Hz, 1.2 g rms accord-
                             ing to DIN IEC 68-2-36 and DIN
                             40046 T24
Shock   40 g shock spectrum,
                             DIN IEC 68-2-27, MIL-STD 810D,
                             Meth. 516.3 and MIL-T-28800D
                             class 3 and 5
Electromagnetic compatibility according to EN 55022 (1994, class
                             A), EN 61000-3-2 (1995),
                             EN 50081-1 (1992) and EN 50082-
                             2 (1995)
Electrical safety   according to EN 61010-1 (1993) and
                             EN 60950 (1992+A1 1993+ A2
                             1993 +A3 1995)
Quality assurance   developed and manufactured in line
                             with ISO 9001

Power supply
AC   100 V to 120 V ±10%, 50 Hz to
                             400 Hz ±5%, 1 A (max. 120 W) and
                             220 V to 240 V ±10%, 50 Hz to
                             60 Hz ±5%, 0.5 A (max. 120 W)
DC   10 V to 32 V

Dimensions (W x H x D)   412 mm x 198 mm x 380 mm
Weight   8 kg

RF Parameters

Operating frequency
  Europe   1881.792 MHz to 1897.344 MHz
Optional (exclusive options)
  China   1902.528 MHz to 1918.080 MHz
  South America   1911.168 MHz to 1926.720 MHz
  Latin America   1912.896 MHz to 1928.448 MHz
Carrier spacing   1.728 MHz
Carrier multiplex   TDMA
Duplexing   TDD

Bit rate   1152 kbps
Modulation method   GFSK (B x T = 0.5)

TX specifications
Normal transmitter power: 21 dBm ± 2 dBm
Nominal peak deviation (modulation): 288 kHz (acc. to CTR 06)
carrier frequency: DECT carrier frequency ± 30 kHz
                             (acc. to CTR 06)
Synthesizer: transmitter burst acc. to CTR06 (slow
                             synthesizer => 'blind slots'); hardware
                             signalling (PTW15 DECT Sig. Board)

RX Specifications
Sensitivity   −73 dBm for BER <0.00001
                             (acc. to CTR 06)
RSSI   −33 dBm to −93 dBm
Maximum level (without damage) 25 dBm
Maximum level (for measurements) 0 dBm

Channel occupancy measurement

RSSI (permanent)
Resolution time   <14 ms
Resolution level   1 dB
Range   0 dBm to −93 dBm
Data indication   graphically online, update rate 1/s
Scanning rate   min. 3 RSSI scanning loops covering
                             all DECT channels per second.

Database
Continuous recording of data packages
Classification   locked, coordinated, uncoordinated,
                             not classified

Permanent scan, simultaneous for fixed (FT)
and portable radio termination (PT)

Contents of database record time of recordings, number of record-
                             ings, preamble, level, bit position,
                             drift, identities, system parameters, etc

Assignment of database records to the graphical RSSI indication under con-
sideration of system identities, coordinated and uncoordinated fixed radio
terminations

Statistics
Channel occupancy statistics
Graphical indication (coloured)
Statistics referring to EN 300 175 Common Interface 'Channel selection
algorithm'

GPS data
NMEA 0183 Interface Standard can be connected to the serial interface;
GPS data will be displayed and included in the database file

Other features

- Continuous storage of received/calculated data on HD; automatic
  and/or manually
- Data transfer/data export is possible (via RS-232-C interface or option-
  ally via Ethernet or SCSI adapter)

Ordering information

DECT Signalling Test Unit (Europe)	PTW15	1074.6009.02
DECT Signalling Test Unit (China)	PTW15	1074.6009.03
DECT Signalling Test Unit (South and Latin America)[1]	PTW15	1074.6009.05

Options
Comfort package (ext. keyboard + adapter)	PTW-B1	1074.6509.02
Battery module for mobile operation	PSP-B3	1091.3740.02
Frequency range China (replaces module Europe)	PTW-B3	1115.2501.02
Frequency range South and Latin America (replaces module Europe)	PTW-B4	1115.2701.02

[1]   Frequency channel difference between adjustable in the software

Fax Reply (DECT Signalling Test Unit PTW15)

❏   **Please send me an offer**

❏   **I would like a demo**

❏   **Please call me**

❏   **I would like to receive your free-of-charge CD-ROM catalogs**

Others: _____
_____
_____

Name: _____

Company/Department: _____

Position: _____

Address: _____
_____
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Country: _____

Telephone: _____

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