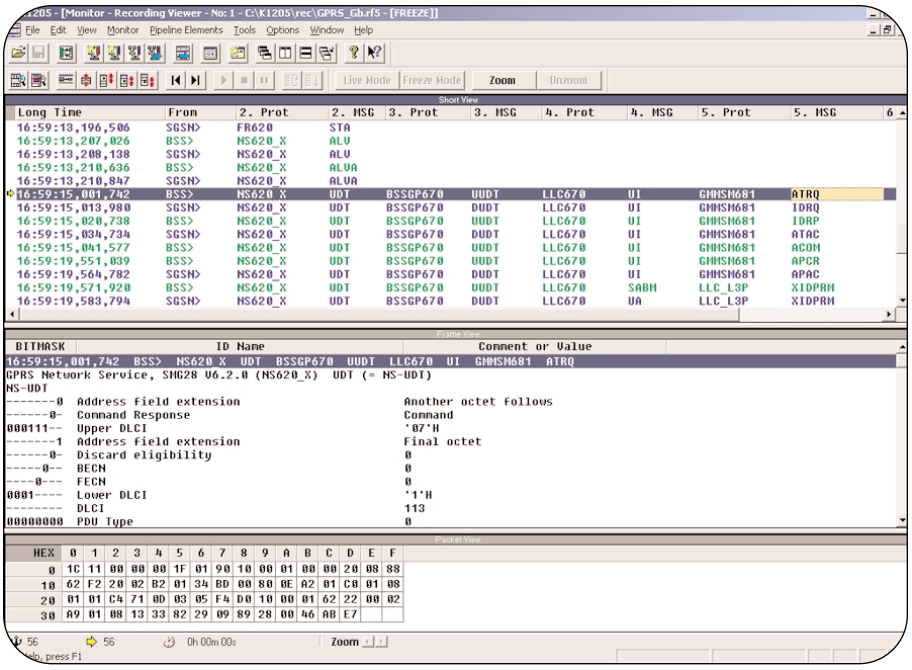
K1297/K1205 Series Protocol Tester

GPRS Software



GPRS Software

Tektronix GPRS software offers complete test solutions for functional tests of GPRS network elements, monitoring and analysis of GPRS networks and end-to-end service quality testing. A combination of monitoring, simulation and emulation functions, as well as capability of conformance and interoperability testing is provided, chiefly needed during design and installation/deployment of GPRS networks. This also includes monitoring and analysis functions needed during field trials, operation and maintenance and network optimization.

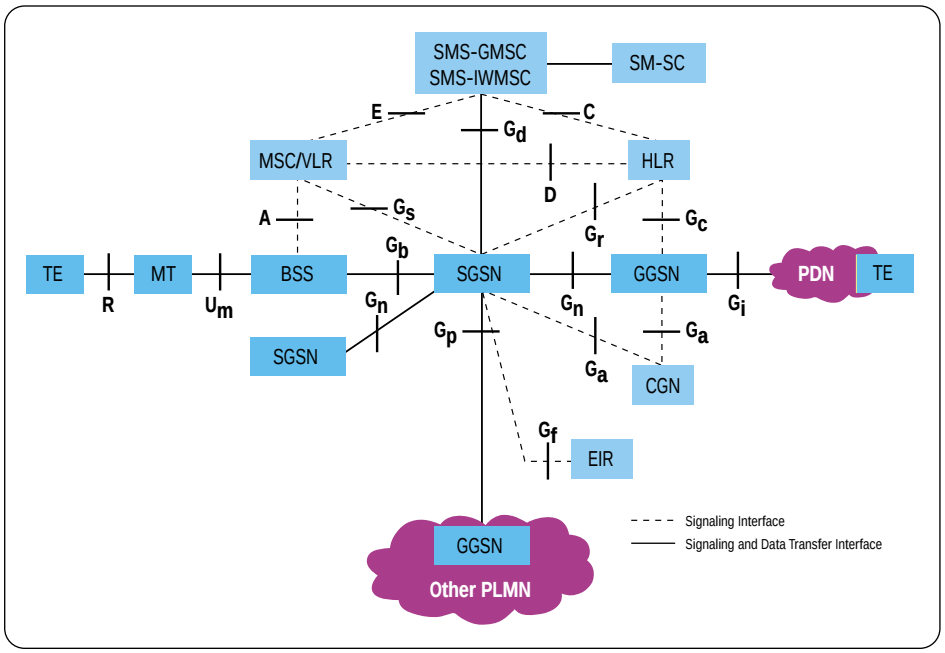


Figure 1. *GPRS reference model.*

Features & Benefits

Simultaneous Monitoring on All G_x-interfaces (G_a, G_b, G_c, G_d, G_f, G_i, G_n, G_p, G_r, G_s)

Monitoring on A_{bis}-interfaces (Alcatel, Ericsson, Lucent, Motorola, Nokia, Nortel, Siemens)

Call and Transaction Trace on G_b-, G_n-, G_r-, G_c-, G_p-interface

Deciphering on G_b-interface up to a Value of 5000 Users

Monitoring and Analysis of GPRS Sessions and Crucial QoS Parameters at the G_b-interface (GPRS G_b Monitor/Analyzer)

RLC/MAC Reassembling on GPRS A_{bis}

Simulation and Emulation of All Network Elements (BSS, SGSN, GGSN, VLR, HLR)

Simulation of an Entire GPRS Network Switching Subsystem (NSS) Including Internet Access

Traffic Generation Across the GPRS Network for End-to-End Diagnostics

Simulation of More Than 10,000 Subscribers (BSS or SGSN) Per Each Interface Module

Applications

Network Optimization and Troubleshooting

Functional and Interoperability Testing

Evaluate Delays and Transmission Rates

Conformance Testing

Replace a Network Element (e.g., HLR) by a Protocol Tester

Replace a Network Subsystem by a Protocol Tester

Tektronix
Enabling Innovation

Solutions for Network Monitoring and Optimization

Monitoring

GPRS network managers struggle with the difficult problems of network installation, deployment and optimization. GPRS software for the K1297 and K1205 consists of the necessary GPRS features and applications that help users overcome their most difficult network issues. They can be carried out in off-line mode and online mode.

Call and Transaction Traces

Call and Transaction Traces allow a fast overview about all data and messages related to a call/transaction. This offers fast and easy analysis of subscriber-related problems.

Deciphering

GPRS network operators transmit ciphered data between GPRS terminals and the network more often then they previously have. Whenever enciphering is switched on in GPRS networks, all signaling data and payload above the protocol layer Logical Link Control (LLC) are encrypted. K1297-G20 and K1205 Protocol Testers supply the first deciphering test and observation tools, enabling analysis and processing of all data above the protocol layer LLC.

RLC/MAC Reassembling

The RLC/MAC reassembling application picks up frames at the GPRS A_{bis} interface that are cut into slices of different sizes depending on the coding scheme and then assembles them to the original frame. This comprises LLC frames and RLC control frames.

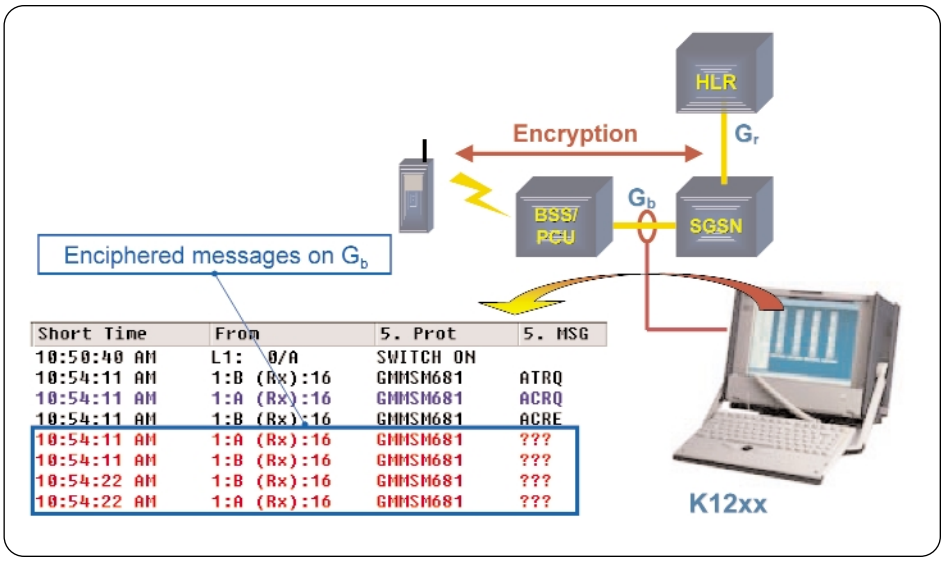


Figure 2. *K1205/K1297 Deciphering solution – enciphered messages.*

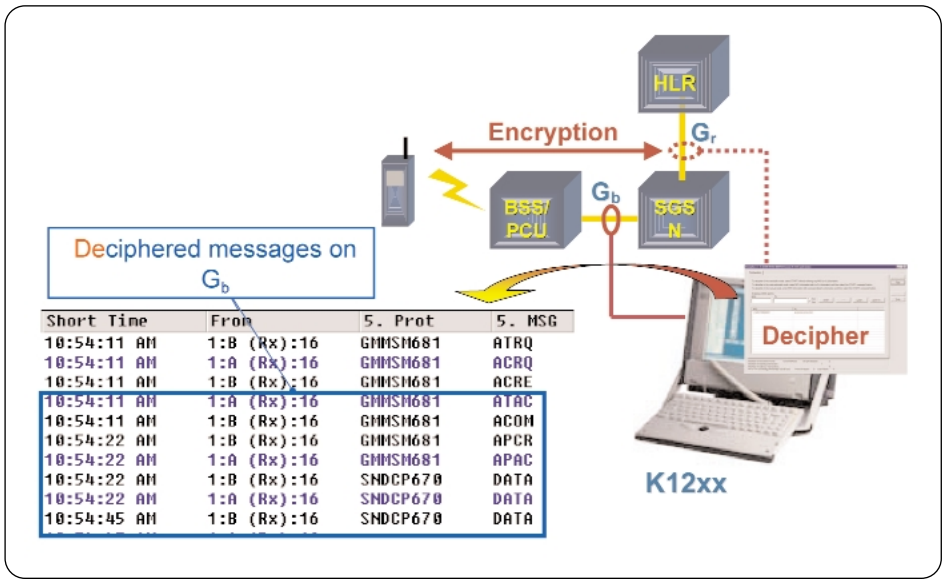


Figure 3. *K1205/K1297 Deciphering solution – deciphered messages.*

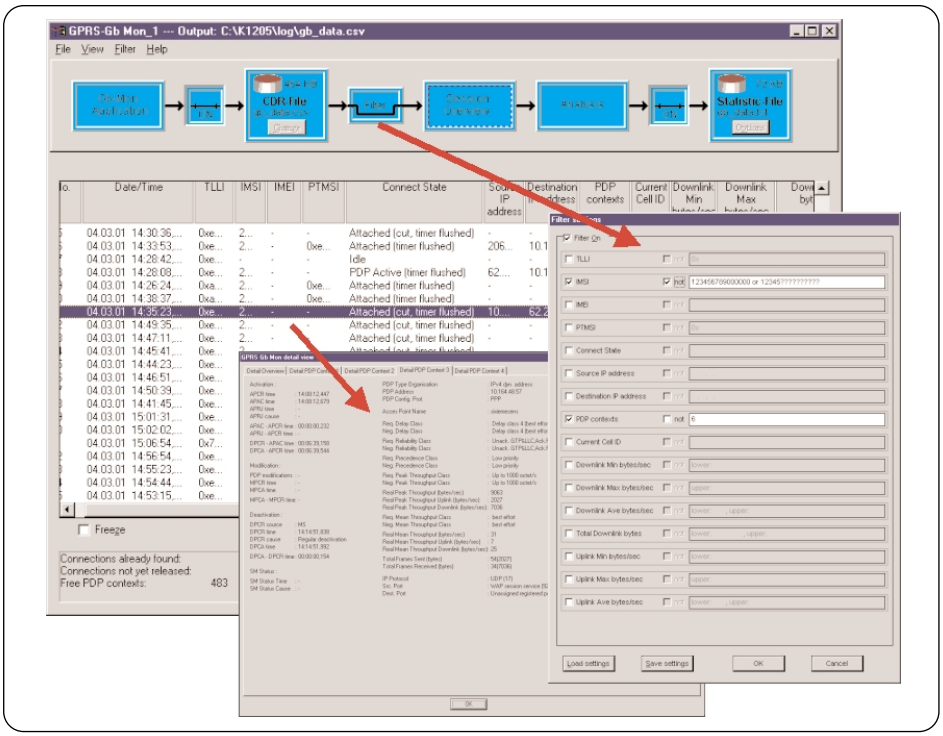


Figure 4. *GPRS G_b monitor.*

GPRS G_b Monitor/Analyzer

The GPRS G_b Monitor application provides an extensive overview on the traffic that is actually running on the G_b-interface of a GPRS network. Numerous filter possibilities, including cell ID, IMEI, IMSI and IP addresses, are available; measurement of Quality of Service (QoS) parameters, such as throughput and response time, is easily accomplished.

The GPRS G_b Analyzer application, which is placed on top of the GPRS G_b Monitor, provides crucial statistics, detects failed GMM, SM procedures and enables easy and rapid troubleshooting.

Solutions for Active Testing

Simulation/Emulation of GPRS Network Elements

Create and emulate functioning network elements for test purposes. Emulate multiple network elements (NE) in parallel to real NE for complex test scenarios. Compare reaction of emulated and real NE.

Home Location Register Emulation

Replace expensive Home Location Register (HLR) in test networks. Take advantage of features such as fault tolerant reaction and fast reset capability. Parameters are easy to set.

Base Station Subsystem and Mobile Emulation

Emulate thousands of mobiles (MS) on multiple Base Station Subsystems (BSS) with one K1297 Protocol Tester. By emulating MS and BSS, you'll be able to identify Network Switching Subsystem (SGSN, GGSN, HLR, PDN) problems quickly and easily.

Network Switching Subsystem Emulation

Browse the Web with a GPRS mobile and BSS connected to K1297-G20 Protocol Tester, replacing the entire GPRS core network. Find BSS or mobile problems by reducing error possibilities by emulating the complete Network Switching Subsystem (NSS).

Short Message Service Testing

Ensure Short Message Service (SMS) functionality via GPRS G_b- and G_d-interface.

Integrated Test Functions

Integrated test functions in Mobile/Base Station Subsystem provide fast and easy testing and execution of:

- GPRS attach/detach
- IMSI attach/detach
- Combined GPRS/IMSI attach/detach
- Location area updates
- Routing area updates
- Cell reselection
- PDP Context activation/modification/deactivation
- Transfer of IP data
- Paging for CS and PS

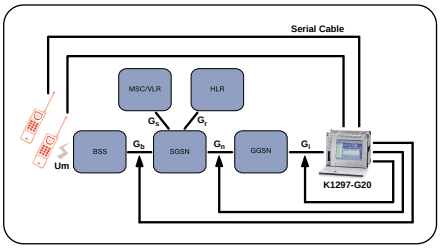
GPRS End-to-End Tests for K1297-G20 Protocol Analyzer

A major concern for deployment of GPRS services is how to improve QoS. Today, GPRS service providers operate on a best effort basis and do not guarantee any specific service level with regard to packet loss, throughput and packet delay.

The GPRS end-to-end test application reports QoS levels in GPRS networks by measurement of end-to-end transfer delay through the GPRS network. Throughput, the amount of traffic that can get across the network, can also be determined.

Features

- Connect up to 2 GPRS mobile stations via serial cable to K1297-G20
- Measure QoS parameters on G_b-, G_n- and/or G_i-interface
- Test uplink and downlink path (generate or compare data traffic via a GPRS mobile station)
- Determine the amount of packet size to be transmitted (from 20 to 1600 bytes)



▶ ***Figure 5.*** *GPRS End-to-End tests for K1297-G20 Protocol Tester.*

Enhanced Test Tools

The enhanced Test Management System enables local and/or remote automated and regression testing with the K1297-G20, reducing manual test time. ISO Standards require change management support; with the "shared file system approach," users can fulfill these requirements and successfully complete regression testing according the ISO standards. An automatic generation of recording files for all test cases provides test results in full detail down to the bit level, if needed.

▶ Ordering Information

Please refer to the K1297/K1205 Protocol Tester for further information.

Please note that besides the following ordering numbers additional packages, upgrades and off-line software are available.

GPRS Software for K1205 (selection)

7KK1205-6SP11 – K1205 SW Monitoring GPRS; G_b-, G_i-, G_n-, G_s-, G_c-, G_d-, G_r-, G_r-, G_a-interfaces; including G_b Monitor and SMS over GPRS.

7KK1205-6SQ11 – K1205 SW Monitoring for all GSM and GPRS signaling interfaces.

7PK1205-6GF11 – K1205 SW Monitoring GPRS Deciphering enhancement for 7KK1205-6SP11 or 7KK1205-6SQ11.

GPRS Software for K1297-G20 (selection)

7KK1221-6SP11 – K1297-G20 SW Monitoring GPRS; G_b-, G_i-, G_n-, G_s-, G_c-, G_d-, G_r-, G_r-, G_a-interfaces; including G_b Monitor and SMS over GPRS.

7KK1221-6SQ11 – K1297-G20 SW Monitoring for all GSM and GPRS signaling interfaces.

7KK1221-7SP11 – K1297-G20 SW Mon/Sim/Emu GPRS Interfaces; G_b-, G_i-, G_n-, G_s-, G_c-, G_d-, G_r-, G_r-, G_a-interfaces; including SMS over GPRS.

7PK1221-6GF11 – K1297-G20 SW Monitoring GPRS Deciphering; enhancement for 7KK1221-6SP11 or 7KK1221-6SQ11.

7PK1221-6JJ11 – K1297-G20 SW Monitoring IP; including NBSS; NBDG; NBNS; NFS; DNS; SMNP; Telnet; FTP; Radius; MIP; IKE and others.

7PK1221-7GB11 – K1297-G20 Protocol SW Mon/Sim/Emu GPRS G_b; including NS (GSM08.16); BSSGP (GSM08.18); LLC (GSM04.64); SNDCP (GSM04.65); GMM/SM (GSM04.08; TS24.008).

7PK1221-7GN11 – K1297-G20 SW Mon/Sim/Emu 2.5G and 3G Mobile G_n, G_p, G_a, Iu-PS; GTP (GSM09.60; TS29.060).

7PK1221-7GS11 – K1297-G20 SW Mon/Sim/Emu GPRS G_s; including BSSAP+ (GSM09.18; TS29.018).

7PK1221-7MM11 – K1297-G20 SW Mon/Sim/Emu 2.5G and 3G Mobile MAP; including MAP (GSM09.02; TS29.002) and TCAP 6.x and higher.

7PK1221-7MS11 – K1297-G20 SW Mon/Sim/Emu Mobile SMS; (TS 24.011, TS 23.040, GSM 03.40, GSM 04.11 and IS637 CDMA).

7PK1221-7TP11 – K1297-G20 SW Mon/Sim/Emu Transport Packet Data; including X.25, LAP B, FR, IPv4, ARP/RARP, TCP and UDP, ICMP, IEEE802.3 MAC.

7KK1226-7GG11 – K1297-G20 GPRS End-to-End Tests.

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