K1297-G20 Protocol Testers

▶ Base Units

Flexible, Comprehensive Protocol Testing

The K1297-G20 Protocol Testers provide a very flexible modular hardware and software platform for monitoring, simulating and emulating network traffic. A selection of interface modules and software packages allow testing of most interfaces in mobile, core and access networks.

Architecture Supports High Performance, Configurability

The K1297-G20 and K1297-G20 Monitor use an efficient hardware architecture that separates the user- and data-handling functions from the measurement applications and incorporates dedicated processors and communication controllers in each section.

The compact K1297-G20 utilizes a VME bus system with 5 (portable) or 8 (benchtop) slots that enable a broad variety of configuration options, as well as the ability to expand as needs grow.

Slot 1 contains a Pentium III 850 MHz, 512 MB PC System Processor, with 4 x USB 2.0, an external XVGA connection, SCSI interface, Ethernet connection for 10/100Base-T, as well as one serial and one parallel port. In addition to the system processor (PC) and application processor (AP) cards, the VME backplane also accommodates an assortment of test interface cards. The HDD size is 36.7 GB. K1297-G20 standard version is equipped with a high-contrast XVGA-compatible color TFT display keyboard, floppy and hard disk drives. The built-in Ethernet adapter makes the K1297-G20 available for remote control use in a network, while the USB and PCMCIA slots also accept various communication interfaces (e.g., WLAN, GPRS card or modem for remote operation). The Operation System is WinXP Embedded.

▶ Features & Benefits

Protocol Monitoring, Simulation and Emulation (K1297-G20) or Monitoring Only (K1297-G20 Monitor) in a Single Cost-effective Unit for Development, Operation and Maintenance Applications

Directly Address UMTS, TD-SCDMA, GPRS, GSM, cdma2000 and Other Mobile, Core, XoIP and Access Networks with More than 1800 Protocols – No Need for Separate Test Equipment

Powerful Tools for Development and Test of Network Elements Allow Earlier and Cost Effective Availability of Adjacent Network Node Functions

Adaptable – Selection of Protocols and Network Interface Modules Configurable for Current and Future Testing Needs

Powerful – Simultaneous Multi-layer Protocol Measurements at Multiple Different Interfaces – Support Interworking Tests, Valuable Tools for Identifying the Sources of Problems

Simple, Intuitive Environment for Operators, Flexible Programming Tools for Advanced Users, Covers All Needs with Low Risk of Errors

▶ Applications

Functional Testing of Protocol Implementations

System Testing of Network Nodes

Integration/Testing of New Products

Interoperability and Conformance Tests

Functional Testing to Reproduce Error Situations

Acceptance and Conformance Tests

Monitoring Networks for Error Detection and Analysis in the Field

Assessing Interoperability of Services Through the Different Access and Core Technologies such as UMTS, GPRS, GSM, CDMA, SS7, IN and IP

Network Element Emulation, for example, SGSN, BSS, HLR

Interworking and End-to-End Testing

A Wide Array of Measurement and Test Interface Boards

The K1297-G20 is specifically designed to offer the user exceptional flexibility and expandability. The 4 or 7 measurement slots, respectively, enable a broad variety of configuration options, as well as the ability to expand as needs grow.
The K1297-G20 may be equipped with measurement boards for monitoring, simulation and emulation applications. Available test hardware includes VME bus cards for DS1 (PCM24), E1 (PCM30), interfaces for broadband ATM and a 100 Mb/s Ethernet board.

Record Play Back

Each K1297-G20 offers offline analysis with the same features as are available online, for example, filter, call trace and statistics. This record play back with analysis is also available for use on a PC.

Simulation and Emulation Applications To Assess System Performance Under Controlled Conditions

Tools for Functional, System and Conformance Testing

The K1297-G20 Protocol Tester combines simulation and emulation tools, such as test suites and traffic generation, with monitoring capabilities to address functional testing applications. The K1297-G20 Protocol Tester is a comprehensive, configurable platform for intrusive and non-intrusive protocol testing and analysis in communication networks, especially in mobile networks. Its open, flexible architecture adapts the Protocol Tester to most measurement challenges and makes it easy to configure and operate. Test generation capabilities provide the means to simulate specific protocol layers and emulate all underlying layers automatically, or even to emulate the full function of network elements. The K1297-G20 features the ability to generate traffic on almost all interfaces and to mix technologies in one test scenario, a vital advantage in interworking and interoperability testing for the optimization of resources.

Simulation and Emulation Application Examples

Predefined Message Flows. The K1297-G20 is able to send an individual message or handle a predefined message flow, such as conformance tests or individually developed test cases.

Layer Emulation. The K1297-G20 provides the functionality of a specific protocol layer which behaves as the corresponding function in a network element.

Functional Tests. The K1297-G20 offers flexible protocol configuration mechanisms and a wide selection of programming and scripting tools, which allows test case definition on an abstract level as well as on a detailed protocol level.

Conformance Tests. A variety of different conformance tests can be executed, configured, and controlled via the TTCN execution environment or Message Sequence Charts.

Interoperability Tests. In today's telecommunication world, proof of interoperability of services through the different access and core technologies such as GSM, UMTS, SS7, IN, and IP is essential. The K1297-G20 offers an open platform that allows the free combination of all supported technologies and protocols in one test scenario. This saves time creating interoperability test suites or protocol converters involving different protocol families in one test/emulation.

Network Element Emulation. In the early development phase and in the beginning of trial phases, hardware versions of network elements are not always available or affordable. The K1297-G20 can replace missing network functionality by emulating individual interfaces of network elements such as BSS, HLR, or SGSN, or even whole portions of the network such as GGSN and the Internet. With its wide set of pre-developed network element emulations and a flexible configuration, the K1297-G20 substantially shortens time to market/operation in a continuously changing environment.

Monitoring Applications To Verify Performance and Troubleshoot Problems

Powerful, Yet Easy-to-Use Monitoring Tools For:

- Network Monitoring and Analysis of UMTS, TD-SCDMA, GPRS, GSM900, DCS1800, PCS1900, XoIP, cdma2000, SS7 and IP
- Interworking measurements
- In-service error detection for GPRS interfaces
- Detection of all activities in the core network
- Verification of protocol implementation (for manufacturers)

Sophisticated filters can be used to reduce the received data to the desired essential results. The K1297-G20 Protocol Tester provides several display formats. Message components are decoded online, interpreted, and issued in mnemonic form as well as binary or hexadecimal. Special search functions enable the targeting of any message components, such as call tracing with a subscriber number or an IMSI/TMSI (International/Temporary Mobile Subscriber Identification). Besides the provided protocol stacks, a powerful, graphical protocol stack editor allows users to easily compile the required protocols for each application out of the more than 1800 protocols available.

► Characteristics

Physical Characteristics (Base Unit)

PORTABLE UNIT

Dimensions[*1]	**mm**	**in.**
Height	290	11.4
Width	370	14.6
Depth	200	7.9
Weight	**kg**	**lbs.**
Net (approx.)	9 to 12[*2]	19 to 26[*2]

BENCHTOP UNIT

Dimensions[*1]	**mm**	**in.**
Height	320	12.6
Width	410	16.1
Depth	300	11.8
Weight	**kg**	**lbs.**
Net (approx.)	16 to 20[*2]	35 to 44[*2]

[*1] Keyboard attached; without carrying handle.

[*2] Depending on number of equipped Interface Boards.

Power Supply

Line Adapter – Safety class I (protective grounding).
Line Voltage –
Rated Range of Use: 100 V/240 V ±10%.
Automatic changeover.
Line Frequency – Rated Range of Use: 50/60 Hz, –6% to +5%.
Power Consumption – Maximum Value: 460 VA.

Environmental Characteristics

Ambient Temperature –
Reference Value: 23 ºC ±5% (73 ºF 5%).
Rated Range of Use: 4 ºC to 40 ºC (39 ºF to 104 ºF).
Limit Range for Storage and Transportation: –20 ºC to +55 ºC (–4 ºF to +131 ºF) at 85% relative humidity.
Barometric Pressure, Altitude –
Reference Value: 101.3 kPa (1013 mbar).
Rated Range of Use I: 70.0 to 106.0 kPa (up to 2200 m) (700 to 1060 mbar).
Limit Range of Operation: 53.3 to 106.0 kPa (up to 4300 m) (533 to 1060 mbar).
Safety –
UL3111-1, CSA1010.1, EN61010-1, IEC61010-1.

Measurement Modules

E1/DS1 Interface Board (PRIMO)

The PRIMO VME bus card contains four monitoring only interfaces, configured by the basic software to be DS1 or E1. The interfaces connect to transmission lines via DB9 connectors and matching adapter cables. The PRIMO board allows connection to protected or unprotected monitoring points and the software selects either high-impedance or low-impedance inputs. With six PRIMO modules installed (benchtop model), the K1297-G20 is capable of simultaneously monitoring 24 interfaces with 48 (full duplex) time slots.

E1/DS1 Monitoring/Simulation Boards (PRIME)

PRIME modules are available for two transmission rates, 1.554 Mb/s and 2.048 Mb/s. Four simulation sockets are provided – each containing a transmitter and receiver for PCM signals. For monitoring, a receiver from each of the two adjacent simulation sockets is combined on a single socket.

Each board has the ability to:

- ► Simulate on four ports (no monitoring)
- ► Simulate on two ports and monitor on one
- ► Monitor on two ports

Ethernet Board

The Ethernet board is equipped with two modules for special applications such as GPRS G_n/G_i. The modules comply with the IEEE 802.3 for 10Base-T and 100Base-T; and both full duplex and half duplex modes are supported.

Broadband (ATM) Boards

PCE I AAL Board

The main component of PCE I boards is the host processor board. The PCE I board can be equipped with one or two line interface boards.

PCE I STM-1/SONET OC-3: 155 Mb/s, Optical, LC Duplex Slim Line Interface

- ► ITU G.957-S1.1 optical ITU G.708
- ► SDH (SONET) section
- ► Two Rx, 1200 to 1600 nm (single- and multi-mode)
- ► Two Tx, single-mode, 1310 nm, typical

PCE I E1/T1 Line Interface

- ► E1/T1 switchable
- ► Four Rx, four Tx

Software Characteristics

Operating System – Windows XP Embedded.

Application Software

- Context-sensitive online help
- All tools required for passive monitoring and interactive protocol testing are provided
- Automatic configuration: Searches the signaling channels in the connected PCM sections automatically
- Unlimited monitoring links and a license for one simulation/emulation link are included in the base units

Software Tools for the Development of Test Cases/Emulations

The **Emulation Scenario Editor (ESE)** is the main control center for intrusive test configuration and execution. Its Diagram View offers a very flexible and easy-to-use process to configure the K1297-G20 hardware according to a given protocol stack and test configuration. It also offers Parameter View to configure the individual simulations/emulations and to trigger actions in the software modules.

The **Test Scenario Control Center (TSCC)** configures customized arrangements of parameters for specific applications. Large libraries of sample configurations of standard configurations and test applications are provided for both ESE and TSCC.

The **Message Building System (MBS)** allows the creation of message templates that will be sent or be compared graphically with received messages. Users are able to select and combine protocol elements to define messages, with the aid of protocol specific information that is presented graphically. The result is a message pool that can be used by the various test case development tools. For interactive testing, as well as for individual error intrusion, messages defined in a message pool can be directly sent via/to a layer emulation. This feature is important in the design and integration of new implementations.

The **Message Sequence Chart (MSC)** supports the full range of test scenarios from the very simple to the most complex. This development tool defines test sequences in an intuitive and graphic way by placing messages, timers, loops and other elements in a self-documenting message flow chart. The messages are simply selected from a message pool and dragged to the proper position in the flow chart.

FORTH Script Interpreter is a language that supports iterative interactive test script development. Commands are executed instantly as they are typed and they can be combined into complex state machines.

The **C-Programming language** supports direct programming of complex emulations or test scenarios in a familiar programming language and is commonly used during system integration and test. **SDL Development** tools may be used as a front end for the C-Programming language to implement emulations in a graphical format.

Software Tools for the Development of Automatic Test Programs

Remote Operation. The Tektronix Remote Operation Package features the Test Synchronization Protocol 1+ (TSP1+) and CORBA (Common Object Request Broker Architecture). It contains primitives and messages to remotely manage a complete test session.

Test Management System for Test Automation. With the Test Management System users can assemble their own test suites for local or remote automated and/or regression testing. The stand-alone graphical user interface can be operated from any Windows PC, and the communication with the K1297-G20 is established via a TCP connection. Change management is provided to fulfill ISO9000 requirements.

PC Development Environment. Physical measurement equipment is capital intensive and frequently in use, so it is important to have a tool that allows you to develop test programs without using the actual test hardware.

The K1297-G20 Offline Development Environment offers:

- Test case development (MBS, MSC, C, TTCN, FORTH)
- Test configuration (offline parameter of ESE and TSCC)
- Playback (decode, filter, monitoring applications) of trace files as if they were live
- Analysis of test automation log files
- Use of offline optimization tools

▸ Ordering Information

K1297-G20

Protocol Tester.

Base Units with Base Software

7KK1200-1PM11 – K1297-G20 Protocol Tester portable unit (4 slots), with basic software for monitoring applications (7KK1220-0SD).

7KK1200-1BM11 – K1297-G20 Monitor Protocol Tester bench top unit (7 slots), with basic software for monitoring applications (7KK1220-0SD).

7KK1200-1BT11 – K1297-G20 Protocol Tester; benchtop unit (7 slots), with basic software for monitoring, simulation and emulation applications (7KK1220-0SC), AP4 board.

7KK1200-1PT11 – K1297-G20 Protocol Tester; portable unit (4 slots), with basic software for monitoring, simulation and emulation applications (7KK1220-0SC), AP4 board.

7KK1200-1BU11 – K12xx HW Unit and System Software; Protocol Tester K1297-G20 with basic Software for simulation and monitoring applications (7KK1220-0SC); benchtop unit (7 slots), without AP, license for 1 log sim link, Pentium III CPU, TFT, 115/230 V, 1.44 MB FD, SCSI-HD, WIN-XP embedded.

7KK1200-1PU11 – K12xx HW Unit and System Software; Protocol Tester K1297-G20 with basic software for simulation and monitoring applications (7KK1220-0SC); portable unit (4 slots), without AP, license for 1 log sim link, Pentium III CPU, TFT, 115/230 V, 1.44 MB FD, SCSI-HD, WIN-XP embedded, transport box.

Boards

Order information is a separate delivery for customer installation. Substitute “11” in order code to “01” for ready-to-use installation in base unit. Example: 7KK1200-2MM01.

Application Processor Boards

7KK1200-4AF11 – VME Board AP-4 with 256 MB RAM.

Narrowband Interface Boards

7KK1200-2MM11 – PCM Board **PRIMO** for **E1/DS1** (2.048 Mb/s/1.544 Mb/s) Interface, 4x Monitoring.

7KK1200-2EE11 – Ethernet board with two 10/100 Mb modules (each module contains two Ethernet interfaces), CD and cable.

7KK1200-2PE11 – PCM board **PRIME** for **E1** interface (2.048 Mb/s), 4x Simulation or 2x Monitoring, with CD and cable.

7KK1200-2PT11 – PCM board **PRIME** for **DS1** (1.544 Mb/s) interface, 4x Simulation or 2x Monitoring, with CD and cable.

Broadband (ATM) Interface Boards

7KK1200-3CA11 – PCE I AAL2/5 Board; Packet and ATM Cell Processor supplied AAL2 and AAL5, OAM (FM), TM4.x (VBR, CBR, UBR).

7KK1200-3CB11 – ATM Line Interface for PCE I; STM1/OC3 optical, 2x Rx/Tx; fiber cables LC-SC; for later installation in K1297-G20.

7KK1200-3CC11 – ATM Line Interface for PCE I; E1/T1, 4x Rx/Tx; for later installation in K1297-G20.

7KK1200-3CD11 – K12xx HW ATM Mon Line Interface; PCE E1/DS1, 4x Rx/Rx; separate delivery for later installation; without cable; Prerequisite: 7KK1200-3CAxx, system version (7KK1220-0SCxx) ≥2.40.

7KK1200-3CE11 – K12xx HW ATM Line Interface; PCE STM1/OC3 optical, 2x Rx/Rx; includes fiber cables and connectors; separate delivery for later installation; Prerequisite: 7KK1200-3CAxx; system version (7KK1220-0SCxx) ≥2.40.

Accessories

Please refer to the Cable Selection Guide for a wide range of accessories including cables, adapters and more.

Offline Software Version

7KK1229-8PE11 – Tool for Monitoring/ Simulation/ Emulation offline; K1297-G20 development environment.

7KK1229-4PP11 – Record play back SW, analysis and play back of K1297-G20 record files.

K1297-G20 Protocol Testers

► Base Units

Contact Tektronix:

ASEAN / Australasia / Pakistan (65) 6356 3900
Austria +41 52 675 3777
Balkan, Israel, South Africa and other ISE Countries +41 52 675 3777
Belgium 07 81 60166
Brazil & South America 55 (11) 3741-8360
Canada 1 (800) 661-5625
Central East Europe, Ukraine and Baltics +41 52 675 3777
Central Europe & Greece +41 52 675 3777
Denmark 80 88 1401
Finland +41 52 675 3777
France & North Africa +33 (0) 1 69 81 81
Germany +49 (221) 94 77 400
Hong Kong (852) 2585-6688
India (91) 80-22275577
Italy +39 (02) 25086 1
Japan 81 (3) 6714-3010
Luxembourg +44 (0) 1344 392400
Mexico, Central America & Caribbean 52 (55) 56666-333
Middle East, Asia and North Africa +41 52 675 3777
The Netherlands 090 02 021797
Norway 800 16098
People's Republic of China 86 (10) 6235 1230
Poland +41 52 675 3777
Portugal 80 08 12370
Republic of Korea 82 (2) 528-5299
Russia, CIS & The Baltics 7 095 775 1064
South Africa +27 11 254 8360
Spain (+34) 901 988 054
Sweden 020 08 80371
Switzerland +41 52 675 3777
Taiwan 886 (2) 2722-9622
United Kingdom & Eire +44 (0) 1344 392400
USA 1 (800) 426-2200
USA (Export Sales) 1 (503) 627-1916
For other areas contact Tektronix, Inc. at: 1 (503) 627-7111

Last Updated 3 November, 2004

Our most up-to-date product information is available at:
www.tektronix.com

2/05 HB/WOW 2FW-15849-1

Tektronix
Enabling Innovation