

Short Introduction for Version 3.00



**K1297-G20 Monitor
Protocol Tester**

C73000-M6076-C294-8

This document supports software version 3.00

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Contents

Preface	iii
About This Manual	iv
Conventions	v
Related Manuals and Online Documentation	vi
Service and Support	vii
Contacting Tektronix	viii
Basic Operations	1
Installing K1297-G20 Monitor Version 2.60	2
Starting K1297-G20 Monitor Version 2.60	3
Data Flow Window	4
Configuration	15
Monitor Window	26
Filter	39
Trigger	46
Applications	50
Tools	71
GPRS Monitoring	81
GPRS Applications	86
Appendix A: User Interface	A-1
Menu Bar	A-3
Shortcut Keys and Buttons	A-5

Preface

This guide helps you start using the K1297-G20 Monitor with version 3.00 software. Refer to the K1297-G20 Monitor online help system for more information about using the K1297-G20 Monitor.

NOTE. *Some of the screen shots have been modified and might not appear in exactly that form on your screen.*

To work with the K1297-G20 Monitor, you should have the following qualifications:

- Knowledge of the measurement application field as well as experience with communications test applications
- Familiarity with signaling protocols
- Knowledge of PC and Windows XP
- Familiarity with the safety requirements for electrical equipment for measurement, control and laboratory use
- Completion of a K1297-G20 training course

NOTE. *The participation in a K1297-G20 Monitor training course is recommended. Information on training courses is available from your local sales partner or via the support unit.*

About This Manual

This manual is divided into the following sections:

- *Preface* provides an overview of this manual.
- *Basic Operations* describes most of the features of the K1297-G20 Monitor and gives examples of how to use them.
- *GPRS Monitoring* describes how to configure GPRS measurements.
- *Appendix A* describes some features of the K1297-G20 user interface, such as tool bars, menu bars, short cuts and buttons.

NOTE. *More detailed information about each of the sections contained in these chapters can be found in the K1297-G20 Monitor Online Help.*

Conventions

The following text styles and markings have specific meaning in this manual:

Text style	Description
<i>Italics</i>	Italics fonts indicate menus and menu functions as well as commands, parameters and examples.
<Key>	Keys or key sequences are in angle brackets.
Bold	Bold fonts indicate buttons of the Graphical User Interface.
<i>RMC</i>	Right mouse click Instead of using the menu entries or toolbar buttons, you may use the right mouse click (RMC) anywhere in the program to shortcut certain functions.
<i>LMC</i>	Left mouse click
->	Refers to a menu name or entry

Related Manuals and Online Documentation

This manual is part of a document set of standard-accessory manuals and online documentation. See the following list for other documents supporting the K1297-G20 Monitor Protocol Tester:

- The user manual *K1297-G20 Monitor Protocol Tester* provides all user-relevant product information. It assists you when setting up and starting the protocol tester for the first time. This user manual is available in printed version and as a PDF online manual in the *\hlp* directory.
- A context sensitive online help system is the reference documentation for the graphical user interface of the K1297-G20 Monitor. To open the Help window, press <F1> from within a K1297-G20 Monitor application window.
- The Protocol Assistant is the detailed protocol reference documentation. To open it, press <F2> from within the monitor main window. The Protocol Assistant reflects the tester's software implementation of protocols.
- The Release Notes are delivered separately and contain the latest information on the current software version (readme.txt).
- Windows XP online help: To open the Windows XP online help, click in the taskbar on *Start: Help and Support*.

Service and Support

When you purchase a Tektronix product, Tektronix provides support to complete your solution. Technical support experts offer application-specific solutions and worldwide flexible support services, including on-site support, are designed to ensure that your instruments operate at peak performance. You will receive a timely response when you need it, where you need it.

NOTE. *The Windows XP installation is an OEM version. Therefore the Microsoft Support cannot be used. The Protocol Tester is supported by Tektronix only.*

Contacting Tektronix

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 Wernerwerkdamm 5
 13629 Berlin
 GERMANY

Web site www.tektronix.com

Technical support For hotline service support, call:

 +4930-386-22200
 (8:00 a.m. – 00:30 p.m. GMT + 01:00 and
 01:30 p.m. – 6:00 p.m. GMT + 01:00)

 or
 1-800-833-9200 (This phone number is toll free in North
 America. After office hours, please leave a voice mail
 message. Outside North America, contact a Tektronix
 sales office or distributor; see the Tektronix web site for a
 list of offices.)

Or fax:
+4930-386-22546

Or contact us by e-mail:
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Basic Operations

To run a measurement, you must configure hardware and software according to your desired measurement scenario.

Before you configure a measurement scenario, set up the device, install the measuring modules and switch on the device (therefore see the *Getting Started* chapter in the *User Manual K1297-G20 Monitor Protocol Tester*).

Installing K1297-G20 Monitor Version 3.00

For detailed instructions on how to install a new software version refer to the *Getting Started* chapter in the *User Manual K1297-G20 Monitor Protocol Tester*.

When installing version 3.00, differentiate between the following software types:

K1297-G20 Monitor Protocol Tester System Software V3.00

Existing configuration files created by older versions of the K1297-G20 Monitor software are - dependent on the stack - compatible with version 3.00. You should therefore save your configuration files before installing the new K1297-G20 Monitor version.

K12xx PC Monitoring Software

You can install K1297-G20 Monitor software on a PC running Windows NT 4.0 with Service Pack 6a, Windows 2000 or Windows XP Professional. You can either install the Record Viewer, which is provided on your K1297-G20 Monitor software CD, or you can obtain the PC Monitoring Software, which has a wider range of features.

The PC Monitoring Software package allows you to analyze K1103, K1205, and K1297 recording files off-line on your PC. The software includes the full functionality of the *Offline Scenarios* pipeline and the *Record Viewer* pipeline including all standard K1297-G20 Monitor applications, statistics, filtering, and triggering functions (refer to section *Online and Offline Pipelines*).

K12xx Record Viewer

The Record Viewer allows you to view and print recording files, to filter or zoom the recorded data stream, and to edit or create protocol stacks.

The functionality of the protocol stack editor and of the online help is not restricted. If used on your PC, the setup routine will require your K1297-G20 Monitor serial number and the file *keyfile.txt*¹ must be copied from the K1297-G20 Monitor keyfile diskette to the PC.

¹ The file is located in C:\WINNT on your K1297-G20 Monitor

Starting K1297-G20 Monitor Version 3.00

After switching on the K1297 the software starts automatically. If this feature was not selected during installation, you can start the K1297-G20 Monitor software manually by double-clicking on the K1297-Mon icon.



Status Window

The first window that opens is the *K1297-G20 Monitor Status Window*, which displays the status of the hardware installation and the boot process.

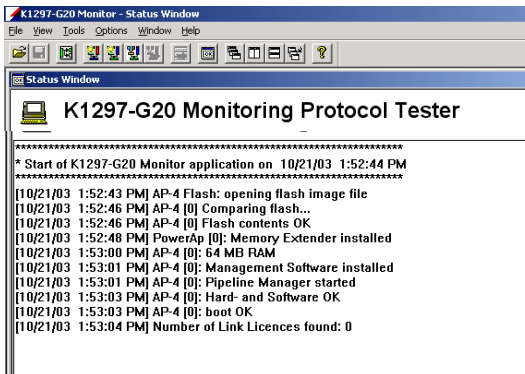


Figure 1: K1297-G20 Monitor Status Window

Data Flow Window

The main window is the *K1297-G20 Monitor – Data Flow* window which contains a graphical display of configured measuring tasks, called *online* and *offline* scenarios. Each scenario may contain several pipelines for the specific measuring tasks.

The left part of the window – *List of Scenarios* pane – contains a list of all the scenarios, each corresponding to a pipeline in the right part of the window, the *Measurement Scenarios* pane. The scenarios define such things as interface, port, timeslot, and bit-rate for the connected link.

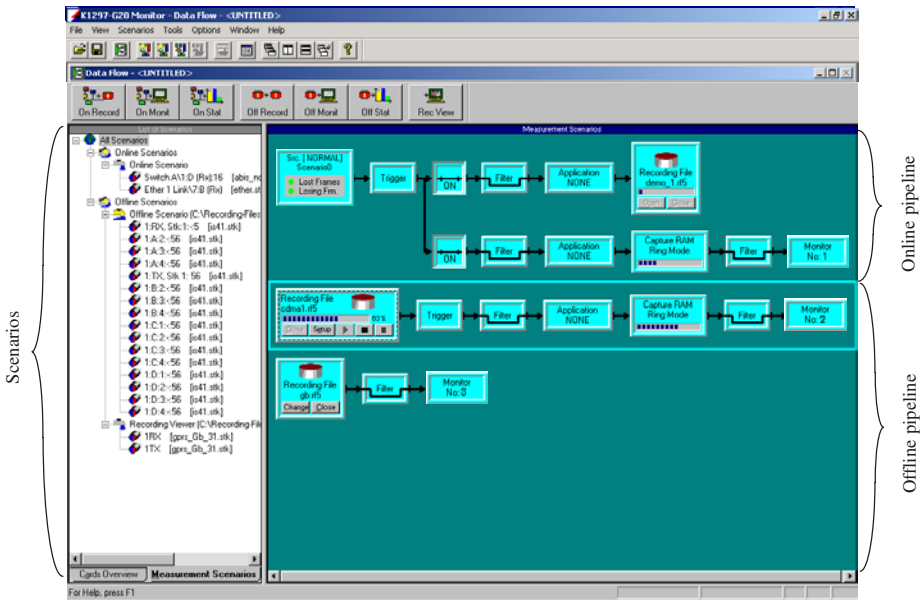
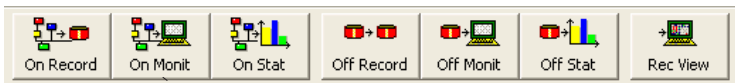


Figure 2: Data Flow window with pipelines

Online and Offline Pipelines

Different online and offline pipelines are available. Choose one, and drag it into the right window to create a new scenario, or connect it to an existing pipeline.



Drag & Drop

Figure 3: Pipeline buttons

Online measurements monitor live data as it is received; the K1297 is connected to the links being monitored. Offline measurements use data stored in recording files.

Online Pipeline: “On Record”. Online Recording means writing live data to a recording file. You can define recording files (the procedure is identical for online and offline pipelines) by clicking the **Open** or **Change** button.

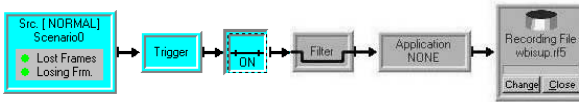


Figure 4: Online recording file pipeline switched ON

The following *Recording Write Configuration* window is displayed.

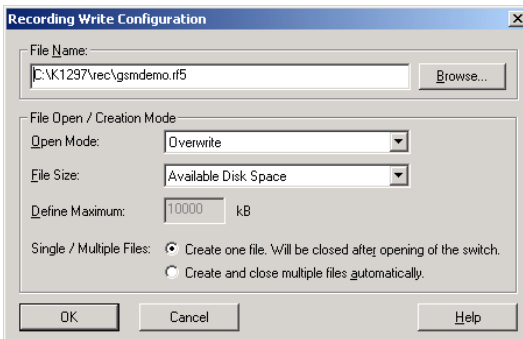


Figure 5: Recording Write Configuration window

Overwrite mode is the default if there is an existing file that can be overwritten.

Append mode is used to add data to the end of an existing file.



CAUTION. *A necessary prerequisite when using Append mode is, that the configuration of the pre-recorded data is the same as the one of the data to append. All old configurations (such as link-settings) will be overwritten.*

You can choose the size of the recording file and the total number of files used during a single session. For multiple files you can select the rule for creating a new file. New files will be created after:

- a certain size has been reached
- expiration of a certain time period
- closing of the switch

Next, choose the maximum number of files to be created and the format/mask for numbering of the filenames.

NOTE. *Recording files are limited to 2 GB space.*

Recording files can now be concatenated to create a single file out of two or more. You can thus have all relevant data from several pipelines in one recording file: use the Recordfile Merger tool, which is in *c:\K1297\tools* directory.

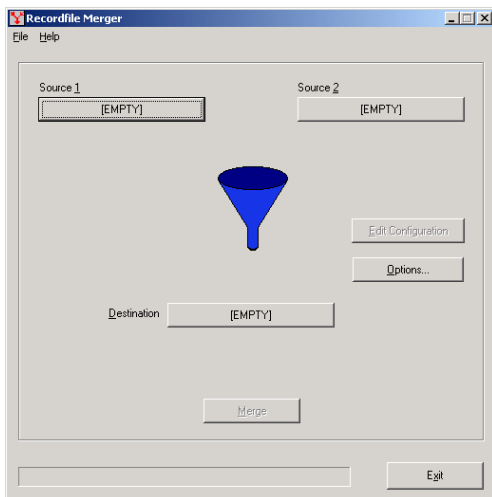


Figure 6: Recordfile Merger tool

Online Pipeline: “On Monit”. Online monitoring means analyzing data online in the *Monitor* window. The pipelines are activated (and the measurement is started) by clicking the *ON/OFF* switch in the *Measurement Window*. This works only if they are set up correctly. (refer to section *Manual Configuration*)

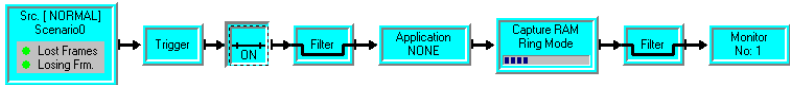


Figure 7: Online monitor pipeline switched ON

Online Pipeline “On Stat”. The Online Statistics measurement scenario helps you perform statistical analyses using data received online. Use the input filter to reduce the amount of data being analyzed.

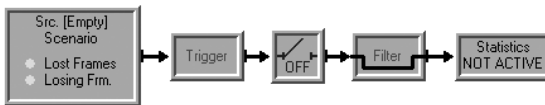


Figure 8: Online Statistics measurement scenario

For more in-depth analysis, the auxiliary program RealChart (see page 73) provides you with functions for graphically analyzing and evaluating data.

When using the Online Statistics scenario, you can simultaneously write data to a recording file (Online Recording) and analyze it using the Online Monitoring scenario by configuring appropriate pipeline branches.

Offline Pipeline “Off Record”. The *Off Record* pipeline allows you to re-record files after processing them offline with applications or filters. Set up the recording file the same way as described further above for the online pipeline.

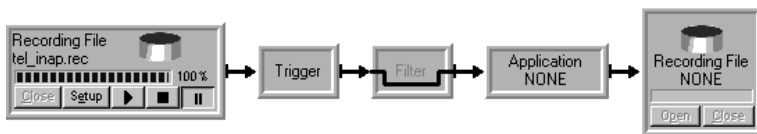


Figure 9: Offline recording pipeline

Offline Pipeline “Off Monit”. The playback pipeline *Off Monit* can playback pre-recorded files in real-time (as if online) or with a defined speed. With this feature you can view a recorded file offline with exactly the same conditions as if it were online. Applications (such as calltrace or sequencing) and filters may also be used.

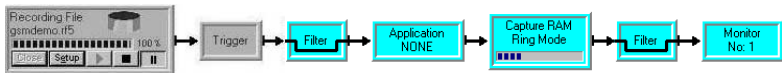


Figure 10: Active playback monitor pipeline

To play back a file, select the desired file in one of the offline pipelines by clicking the *Open* button. The *File Open* dialog box should pop up. The file type can be either from K1205, K1297-G20, or Net-X (.rf5), K1103 (.rec) or K1297 (.dat).

To start or continue the playback, click the triangle (play) button. To stop the playback, click the square. To pause, click the double lines. You can change the setup (playback speed) by clicking the **Setup** button.

The data is now shown in the *Monitor* window. To switch to the *Monitor* window, click the monitor symbol in the appropriate pipeline.

The *Record Viewer* allows you to scroll through a pre-recorded and decoded file. You can define filters for the screen output, but applications are not available.

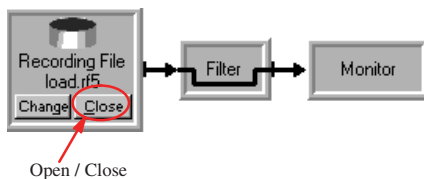


Figure 11: Record viewer pipeline

Offline Pipeline “Off Stat”. The Offline Statistics measurement scenario allows you to evaluate recorded data using the Statistics application.



Figure 12: Offline Statistics measurement scenario

For more in-depth analysis, the auxiliary program RealChart (see page 73) provides you with functions for graphically analyzing and evaluating data.

When using the Offline Statistics scenario, you can simultaneously write data to a new recording file (Offline Recording) and analyze it using the Offline Monitoring by configuring appropriate pipeline branches.

Scenarios

The *Measurement Scenarios* tab of the *Data Flow* window displays the current configured measurement scenarios and sources. This tab keeps you informed about the currently active parameter settings and system state at all times. The gray boxes in the pipelines represent measurement modules, and the connecting lines indicate the data flow between modules.

You can also perform all operations in the *Data Flow* window via the *Scenarios RMC* menu (refer to section *Manual Configuration*, Figure *Change the scenarios*):

- Configuring, renaming and removing scenarios
- Assigning, editing and removing pipelines or pipeline branches
- Adding, editing and removing logical links

Functions that are not available in the current situation are deactivated.

Capture RAM

The Capture RAM allows you to define the memory area reserved for buffering signaling data on the interface modules, either limiting the amount of data (*Linear Mode*) or writing received data continuously into the capture RAM (*Ring Mode*).

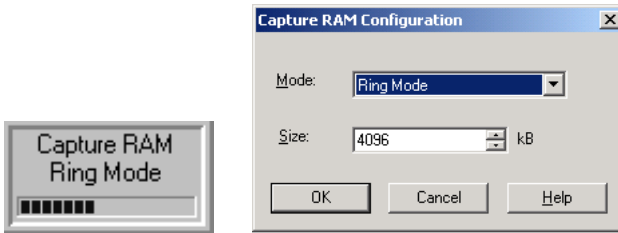


Figure 13: Capture RAM symbol and configuration

You can specify criteria for writing data to the capture RAM in the input filter. You can set the size of the capture RAM anywhere between 16 KB and 16384 KB (16 MB).

For example, if during a measurement an unexpected error suddenly occurs, but the recording pipeline is not activated, saving the Capture RAM will store this data for later processing in a Recording file: *RMC* on the capture RAM symbol → *Save Capture RAM*.

Configuration

Autoconfiguration

Using Autoconfiguration. The easiest way to configure the K1297-G20 Monitor is by pressing *Autoconfiguration* after the K1297-G20 Monitor software has started. Connected traffic to whether signalling in SS#7, LAPD / LAPV, Abis or TRAU running on E1/T1 is detected automatically.

After autoconfiguration, only the protocol stacks have to be set in order to define how to decode the input data (refer to section *Manual Configuration*).

If *Autoconfiguration* is not selected, choose a saved configuration or the default configuration. In this case you will have to configure the connected links manually (refer to section *Manual Configuration*).

After that has been done you can activate the pipeline (*LMC* on the switch symbol of the pipeline), and start decoding (*LMC* on the monitor symbol of the pipeline).

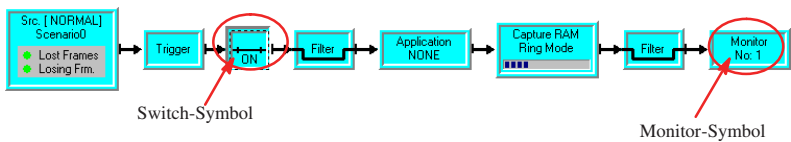


Figure 14: Monitor pipeline switched ON

Autoconfiguration Wizard. This feature allows you to limit the scan of the autoconfiguration to specific signaling types, ports and channels. In addition, the assignment of logical links to online scenarios is controlled. You can create and load different strategies depending on the measurement.

The K1297-G20 Monitor is delivered with a standard strategy, *standard.stg*. It is used if there is no other strategy in the system. You can use this file to create your own strategies.

For example, if you use the K1297-G20 Monitor only for GSM A interface monitoring, you can define the appropriate protocol stack as a standard.

The Autoconfiguration Wizard is located in → *Tools* → *Autoconfiguration Wizard*.

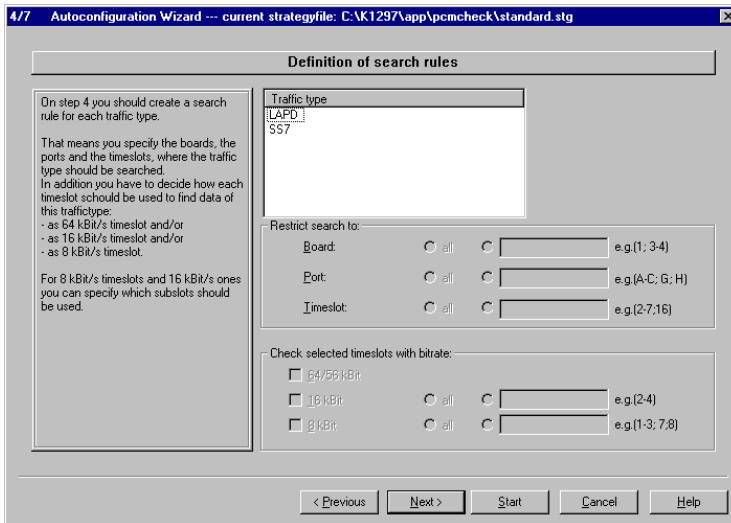


Figure 15: Autoconfiguration Wizard (one of the dialog windows)

Manual Configuration

To configure the K1297-G20 Monitor manually, follow these general steps:

1. Switch to the *Cards Overview* pane in the *Data Flow* window (see Figure 16). Use the *Cards Overview* tab on the lower left part of the screen.

NOTE. <ALT+A> and <ALT+M> are the easiest way to switch between *Cards Overview* and *Measurement Scenarios* view.

The installed interface cards will be displayed graphically. The following figure shows the display for one DS1/E1 monitoring board, one Ethernet board, one BAI board, and one V./X. board.

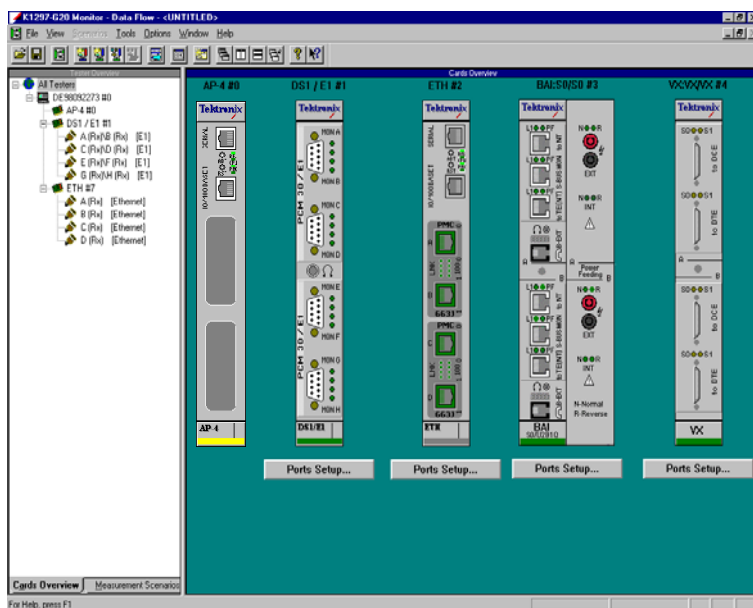


Figure 16: Card Overview window

2. Click on **Ports Setup...** to enter the dialog box for the settings of the interfaces.
3. Enter the physical settings for your connected links. The dialog box varies depending on the installed cards.

For example, choose E1 or DS1 frame type, impedance, and line code for the DS1/ES1 card.

Names for the ports can be assigned here, too. The default values match the imprint on the interface.

NOTE. *The Additional Processor Board (AP-4) is a single slot card that increases the K1297-G20 Monitor's processing power by a factor of 5 to 10 depending on the application. When using 3 or more measurement cards it is recommended to include the AP-4 card; it is necessary when using 5 or 6 boards in the K1297 benchtop device.*

The Ethernet board (ETH) is equipped with four 10BaseT or 100BaseTX ports and supports full and half duplex mode.

The following screenshots show port configuration examples:

Port Properties for DS1 / E1 #1

Port Name

Port A (Rx) Port C (Rx)

Port B (Rx) Port D (Rx)

Type:

E1 DS-1

Voice Data

Default Start Mode

Current Mode: Standard Mode

Next Mode:

Common Settings A (Rx) & B (Rx)

Framing Type:

Line Code:

Impedance:

Inverted bits

9a7/Bit - A 9a7/Bit - B

Common Settings C (Rx) & D (Rx)

Framing Type:

Line Code:

Impedance:

Inverted bits

9a7/Bit - C 9a7/Bit - D

Figure 17: Port configuration, properties for a DS1/E1 monitoring board

Port Properties for ETH #7 A (Rx)

Port Name

Port A (Rx) Operating Mode: Monitoring

Ethernet Addresses

Current Ethernet Address

Default Ethernet Address

Duplex Mode

Mode:

Current:

Bitrate

Mode:

Current:

Figure 18: Port configuration, properties for an Ethernet board

4. Confirm the settings and switch back to *Measurement Scenarios* pane (click the other small tab on the lower left part of the main screen).

Now that the ports are set up, the K1297-G20 Monitor has stored the characteristics of the signaling traffic. The next step is the definition of the logical links, which indicate where to expect the signaling and how to decode it (defined by the protocol stacks).

5. LMC on the *Online Scenario* button (refer to Figure 19) for the *Logical Link Setup* dialog box.



Figure 19: Logical Link Setup

The *Logical Link Setup* dialog box looks different depending on the chosen interface. A few of the main settings are defined in the following list:

- Monitor in Tx and Rx direction (with identical or different settings).
- Edit the name of this link for better overview later in the *Monitor* window. The chosen name will be displayed there.
- Choose correct protocol stack for decoding the signaling traffic.
- Choose the correct timeslot (default is TS 16) and subslots if available.

After defining one link, you can create more settings until all your connections are defined.

If you want to create a new logical link with settings identical to an existing one, select the appropriate logical link in the *Logical Links of Scenario* list. Then click *New*. Another way is to press <ALT+N> or <Insert>.

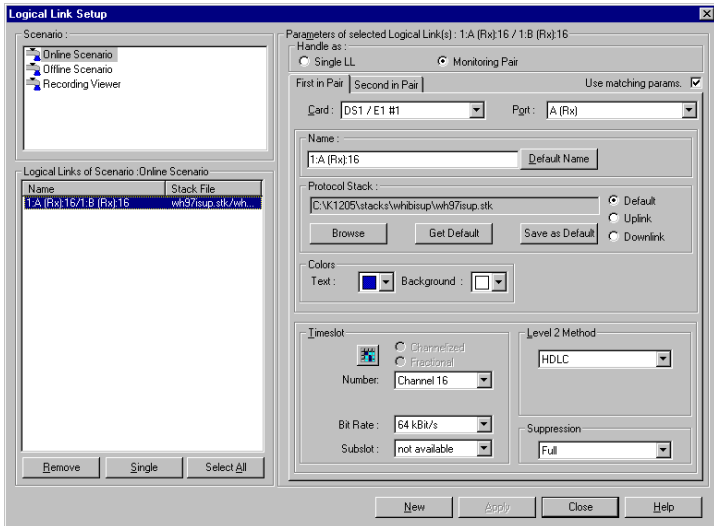


Figure 20: Logical Link configuration, example for a DS1/E1 interface

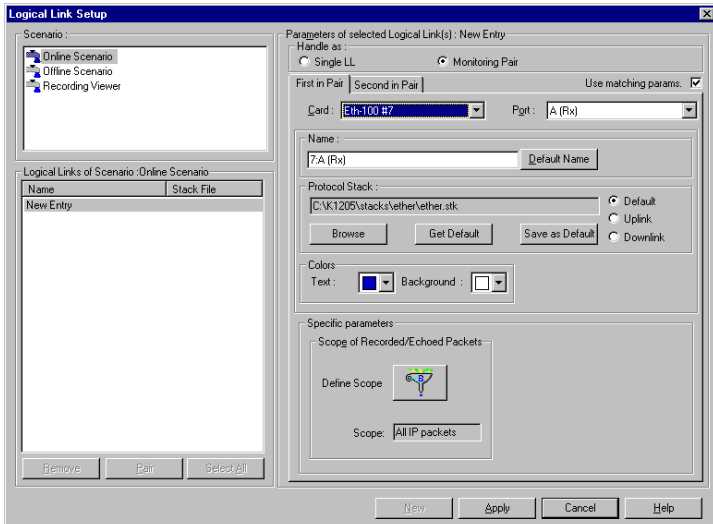


Figure 21: Logical Link configuration, example for an Ethernet board



Figure 22: Change the scenarios

Logical links may also be defined or added by RMC in the Scenario list. Press RMC in the left part of this window to access the context-menus to **add/remove/rename/change** the online and offline scenarios. Refer to section *Scenarios* and Figure *Logical Link Configuration (DS1/E1 Board)*.

With these settings it is possible to start the measurement. Activate the pipeline (refer to section *Configuration*):

6. Switch to the *Monitor* window by clicking on 

By default, the *Monitor* icons are identified serially numbered. This identifier is also displayed in the title bar of the *Monitor* window (monitor name) . To change the monitor name, press RMC on the *Monitor* icon and click *Edit Monitor Name*.

Saving and Loading Configurations

You can save configurations in setup files. You can save any number of configurations and load them individually as required.

How to Save the Current Configuration

Proceed as follows:

1. Choose → *File* → *Save System Configuration* or *File* → *Save System Configuration As* or press <CTRL + S> .
2. The *Save* dialog box opens and the *c:\K1297\config* directory is displayed. Enter the desired name for the configuration file. The file extension (*.s) is added automatically.
3. Confirm your entries with *Save*.

NOTE. *The system only saves settings for the currently installed interface cards. Information about previously installed interface cards is lost, if you load a configuration with hardware settings that do not correspond to the current installation and save this configuration again.*

The last used configuration is loaded automatically 30 seconds after the measurement software is started. During these 30 seconds, a dialog box is shown with which you can start the autoconfiguration or another setup file.

NOTE. *If the system cannot detect a saved configuration, the default configuration is activated.*

It is also possible to load a saved configuration (setup file) at a later point of time, such as after completing a measurement in order to begin a new one with different parameters.

How to Load a Saved Configuration

1. Select one of the setup files from the pick list in the *File* menu or choose → *File* → *Open System Configuration* or press <CTRL+O>.

The *Open* dialog box appears, and the directory *c:\K1297\config* is displayed.

2. Select the desired configuration file.
3. Confirm your selection by selecting *Open*.

Either accept the configuration as is or change the settings before starting a measurement.

NOTE. *If an error occurs while the system is loading a setup file, the most recently loaded configuration is reactivated.*

Auto Restart

The K1297-G20 Monitor will restart (such as after a power failure) with the last saved configuration (refer to section *Saving and Loading Configurations*) or the default configuration if you did not save a configuration.

When running un-monitored long-term measurements, measurement data may be saved in a recording file. If the measurements are interrupted by a power failure, for example, you may automatically continue with the measurement after restarting the K1297.

1. Set up a long term measurement.
2. Configure the measurement with an online recording pipeline.
3. Save the configuration.
4. Start the measurement.


NOTE. *To autostart your K1297-G20 Monitor after a power failure, select Start the K1297-G20 Monitor application at every system start-up in the K1297-G20 Monitor setup program. This copies the K1297-G20 Monitor program into the Autostart folder of WinNT. This may also be done manually if you want to change it after installation.*

Monitor Window

The *Monitor* window displays measurement data that is currently received or played back from a file.

The title bar of the *Monitor* window shows the type of scenario (e.g. Online/Offline), the monitor name, and the data source. To change the monitor name, press RMC on the *Monitor* icon in the pipeline and click *Edit Monitor Name*.

The display of the data is split in three panes with different display levels: *Short View*, *Frame View*, and *Packet View*. You can control these windows by dragging the frames and hide or show them with the buttons

 (refer to chapter *Appendix*).

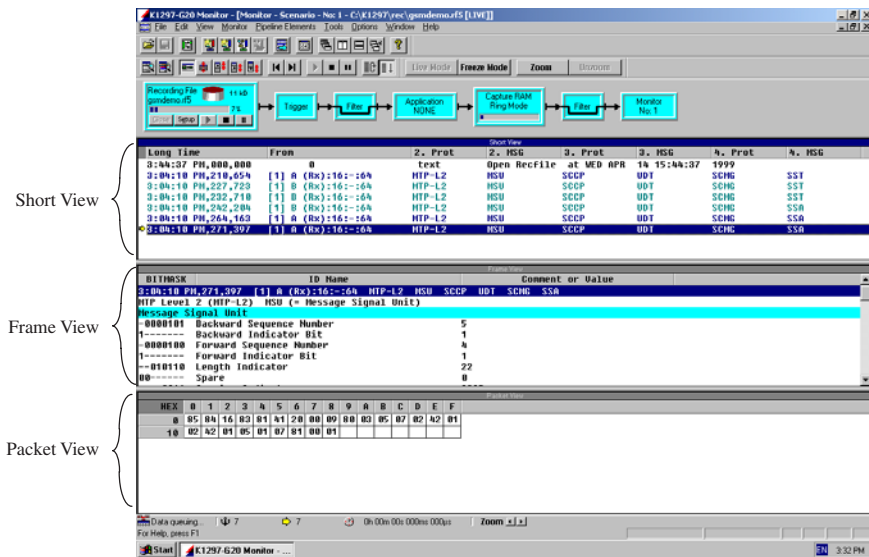


Figure 23: Monitor window

LIVE Mode and FREEZE Mode

Live Mode

Incoming frames are displayed immediately (live), and the screen scrolls automatically.


Freeze Mode

Scrolling is performed manually with the cursors. *Freeze* mode suppresses the continuous display of new data allowing a more detailed analysis of frames.

Switch between *Live Mode* and *Freeze Mode* with the buttons in the toolbar. *Freeze* is activated automatically when you open the *Monitor* window during a live measurement.

Frame View, Packet View and Short View

Frame View. The frame selected in the *Short View* is shown in the *Frame View* window pane. Here, it is displayed completely decoded down to the bit level. The first column shows the selected octet, the second column shows the name/meaning of the octet, and the third column shows the comment or value of the parameter. The protocol stacks loaded with the scenario determine which protocol parameters are shown.

Display level and color of the protocols can be changed in the *Frame View* for a better overview (*RMC*, *Monitor Setup*, *Display Level* or *Colors of Protocols*, or use the toolbar button ).

NOTE. When scrolling through the *Frame View* with the cursor keys, the scrolling will stop at the beginning or end of the marked frame. To switch to the previous / next frame press <CTRL+↑> or <CTRL+↓>.

How to Set the Display Level. To set the display level within the *Frame View* window pane, proceed as follows:

1. Select the desired protocol.
2. Select the desired level. The *Level* list box indicates the display level currently assigned to this protocol. The description file (.upd-file) assigned to the protocol determines which display levels are selected and which parameters are displayed:
 - Complete: display all protocol parameters (shortcut *CTRL+9*>)
 - Medium 1,2...: display some protocol parameters (shortkeys <*CTRL+1*, *CTRL+2*>)
 - Layer Only: reduced representation (shortcut <*CTRL+0*>)
 - Hidden: no protocol parameters displayed

To define the display level for further protocols, repeat these steps.

3. Confirm your settings with *OK*.

NOTE. *The display level setting for a specific protocol is applied to all open Monitor windows.*

Packet View. The *Packet View* window pane displays the frame selected in *Short View* in HEX or ASCII, HEX plus ASCII, Binary, or EBCDIC. If you select an individual protocol parameter in the *Frame View*, the corresponding values are highlighted in the *Packet View* matrix (refer to the online help for further details).

Short View. This *Short View* window pane lists the data packets (frames) recorded by the K1297-G20 Monitor, displaying signaling data in single rows and short form. The preset columns display the time stamps, logical links, protocol names, and messages of levels 2 to 4.

You can assign specific foreground and background colors to each logical link for a better overview. Assign the color settings when creating the logical link settings (refer to section *Manual Configuration*) or when opening a recording file. You can also change the settings by clicking the buttons *Setup* or *Change* in the pipeline (refer to Figure *Recording File Write Configuration* window).

Time	From	2. Prot	2. MSG	3. Prot	3. MSG	4. Prot	4. MSG	Called Party	Cause Value
11:46:57,867,772	1/0/16	SCCP	DT1	DTAP	IDRES				
11:46:57,873,841	1/0/16	SCCP	DT1	DTAP	CMSACC				
11:46:57,878,909	1/0/16	SCCP	DT1	DTAP	CMSACC				
11:46:57,882,333	1/0/16	SCCP	DT1	DTAP	REG	SUPS	SS		
11:46:57,882,398	1/0/16	SCCP	DT1	DTAP	REG	SUPS	SS		
11:46:57,892,592	1/0/16	SCCP	DT1	DTAP	RELC	SUPS	SS		
11:46:57,892,740	1/0/16	SCCP	DT1	DTAP	RELC	SUPS	SS		
11:46:57,896,093	1/0/16	SCCP	DT1	BSSH	CLCMD				Call control
11:46:57,896,226	1/0/16	SCCP	DT1	BSSH	CLCMD				Call control
11:46:57,899,834	1/0/16	SCCP	DT1	BSSH	CLCMP				
11:46:57,899,890	1/0/16	SCCP	DT1	BSSH	CLDHP				
11:46:57,912,332	1/0/16	SCCP	DT1	DTAP	SETUP			01779001333	
11:46:57,912,398	1/0/16	SCCP	DT1	DTAP	SETUP			01779001333	
11:46:57,927,835	1/0/16	SCCP	DT1	BSSH	ASCMP				
11:46:57,927,890	1/0/16	SCCP	DT1	BSSH	ASCMP				
11:46:57,935,579	1/0/16	SCCP	CR	BSSH	CL3I	DTAP	CMSREQ		
11:46:57,935,636	1/0/16	SCCP	CR	BSSH	CL3I	DTAP	CMSREQ		
11:46:57,952,462	1/0/16	SCCP	DT1	DTAP	IDRES				
11:46:57,952,520	1/0/16	SCCP	DT1	DTAP	IDRES				
11:46:57,958,221	1/0/16	SCCP	DT1	DTAP	CMSACC				
11:46:57,958,369	1/0/16	SCCP	DT1	DTAP	CMSACC				

Figure 24: Short View with colored logical links (gray scaled)

All data events and error messages of the logical link are displayed with these color settings in the *Monitor* window.

Column Configuration

The *Short View* lists the recorded data frames (data packets) in short form. The preset columns display the time stamps, logical links, protocol names, and messages of levels 2 to 4.

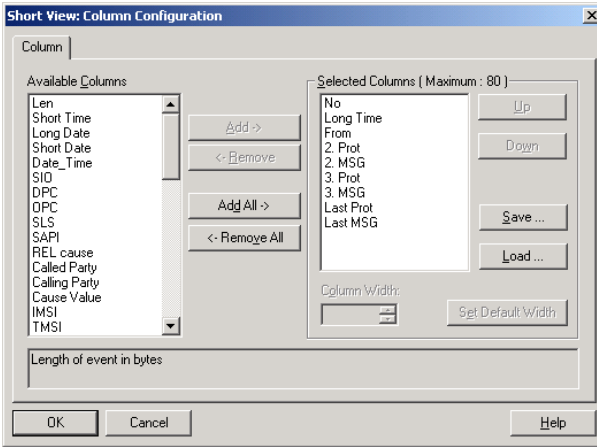



Figure 25: Column Configuration for Short View

With *RMC Column Setup* or  in the *Monitor* window, you can change the setup of the number and type of the columns in the *Short View*.

To display/remove the *Release Cause* in an ISUP connection, proceed as follows:

1. *RMC Column Setup*.
2. Scroll in *Available Columns* down to *REL cause* and select the entry (more entries may be selected if desired).
3. Click the *Add/Remove* button. The column will be moved to *Selected columns*.

You can move a selected single entry up and down by pressing the *Up* and *Down* buttons.

4. Confirm with *OK*. The *Short View* is updated and the new parameters are displayed.

You can also save the column configuration, allowing increased flexibility in analyzing data in the *Short View*. Use the *Save* and *Load* buttons for this. The files will be saved with the extension *.mcc*.

Zoom Function

You can use the zoom function to display all messages for a single connection, for example *ISUP: CIC; SCCP: reference number; TCAP: Transaction ID or IP MGCP: CMD/RSP Call Id; ISDN: SAPI/TEI/Callreference.*

The zoom function does not affect your display filter setting.

To activate zoom, use toolbar button **Zoom**, *RMC Zoom*, or press *z*; to undo zoom, use toolbar button **Unzoom**, *RMC Zoom* again, or press *<SHIFT+z>*.

The zoom function is currently available for GPRS, IP, ISUP, TUP, ISDN, SCCP (BSSMAP/DTAP), MAP, and INAP protocols.

Time	From	2. Prot	2. MSG	3. Prot	3. MSG	SAPI	TEI	
09:10:38,172,300	1Tx>	LAPD	INFO	ETSI	CALL_PROG	0	0	1
09:10:38,248,677	1Tx>	LAPD	INFO	ETSI	ALERT	0	0	1
09:10:38,323,930	1Tx>	LAPD	INFO	ETSI	CONN	0	0	1
09:12:54,887,299	1Rx<	LAPD	INFO	ETSI	SETUP	0	0	1
09:12:54,970,922	1Tx>	LAPD	INFO	ETSI	SETUP_ACK	0	0	1

Figure 26: Zoom results

Depending on the protocol a dialog box opens for setting the zoom parameters:

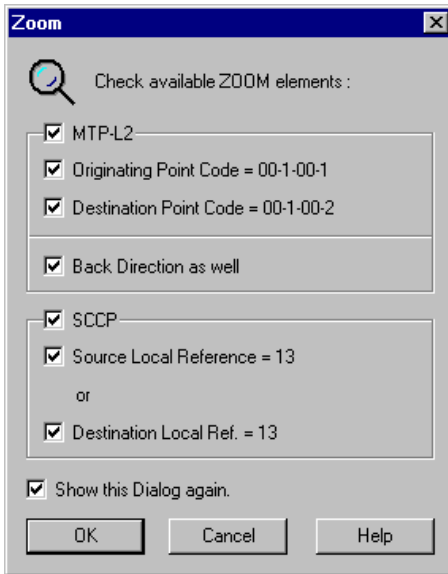


Figure 27: ZOOM Filter Configuration dialog box

SPC/CIC Grouping

Using the K1297-G20 Monitor for international traffic makes it necessary to adapt the SPC/CIC to the appropriate lengths and formats. To change the display, use *RMC Monitor Setup, SPC/CIC Grouping*.

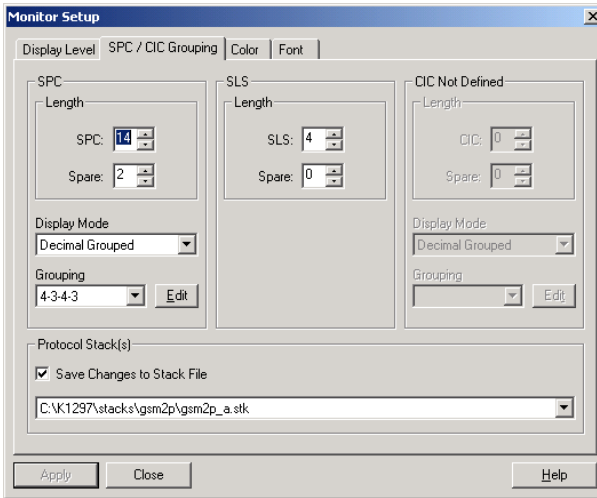


Figure 28: SPC/CIC Grouping definition

You can set the SPC Length to 14, 16, or 24. These options specify the number of bits used for the signaling point code of filter inputs.

The selected SPC length determines the selection options in the list box *SPC Grouping*. Use these settings for the SS#7, GSM and IN protocol stacks.

If the SPC length does not match the data, the K1297-G20 Monitor cannot decode the messages properly. The *SPC Grouping* setting affects only the display, and the number of bits must correspond to the actual SPC length.

You can choose the grouping from the predefined settings, or you can define custom needs (*Edit* button).

NOTE. *The setting in the Monitor window is temporary. To attach an SPC/CIC setting to a protocol stack, define SPC/CIC in the Protocol Stack Editor (refer to section Protocol stacks) with RMC Monitor Setup, Monitor Setup, SPC/CIC Grouping, and then check the Save to Stack File box.*

Timestamps

The K1297-G20 Monitor assigns a time stamp to each event received, indicating the time of reception. The stamp has the format *hh:mm:ss:ms:μs*. In *Freeze* mode, it is possible to evaluate this difference between single events.

To analyze the time difference between two recorded events, switch to *Freeze* mode.

Select the event in the *Short View* that is to serve as the reference point of the difference calculation and press F9, or select *Monitor* → *Reference for Timestamp* → *Set*.

Select the appropriate timestamp format (see figure below).

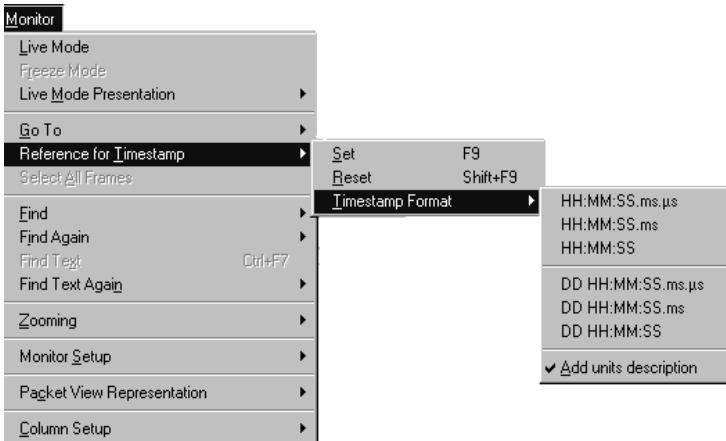


Figure 29: Timestamp format

The event set as the timestamp reference remains highlighted and is now indicated by the following anchor symbol.

Now select any other frame in the *Short View* to see the time difference. The frame number of the reference point, currently selected frame number, and timestamp difference (+/-) are displayed in the status line at the bottom of the *Monitor* window.

The screenshot displays the Monitor window interface. At the top, a list of frames is shown with columns for time (hh/mm/ss), protocol (MTP-L2), and various fields (MSU, ISUP, REL). The selected frame is highlighted in red and yellow. Below the frame list, a table shows BITMASK and ID Name. The Message Signal Unit section displays sequence and indicator bits. A hexadecimal dump table follows, showing the raw data bytes. At the bottom, a status bar shows the current frame number (21) and the selected frame number (23), along with a timestamp difference of 0h 00m 00s 034ms 236µs.

HEX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	B2	B0	09	85	D0	07	FA	00	55	03	09	00				

Figure 30: Timestamp data

The *Time difference* field indicates the difference in *hh:mm:ss:ms:µs*. A negative difference appears, if the starting point event occurs before the reference event.

Save or Print Marked Frames

The contents of the monitor or capture RAM may be saved or printed as decoded ASCII text or written undecoded in a K1297-G20 Monitor recording file:

1. With *RMC* in the *Monitor* window you can choose between *Save Marked Frames As...* and *Print Marked Frames*.
2. Desired frames can be marked/selected by pressing <*SHIFT*> and dragging the mouse.

NOTE. *The Find option jumps only to matching frames, and the Filter option hides all non-matching messages.*

Filter

Start the *Filter Setup* dialog box in the monitor pipeline by *LMC* on the symbol. You can either use the *Filter* before the *Capture RAM* or before the monitor application.

Depending on the stack, different filters in the data flow diagram are displayed at the bottom of the window (yellow and green) when changing the settings.

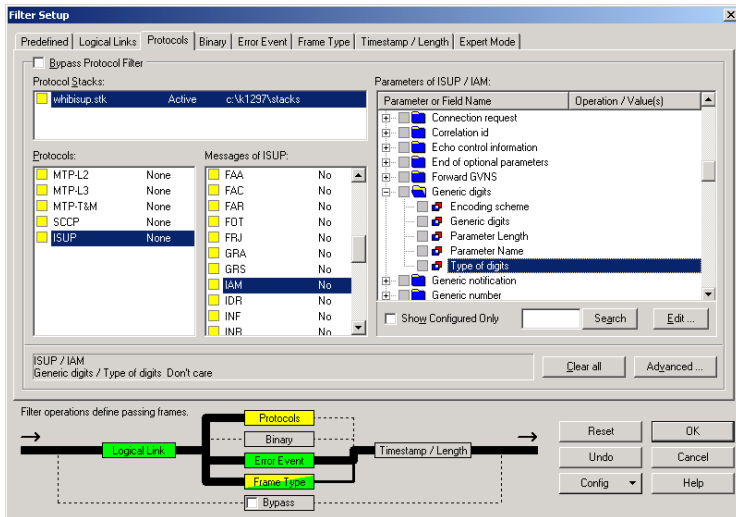


Figure 31: Filter Setup, Protocols tab

Example

Example of filtering an ISUP connection for all *Release* messages with the Release Cause *Normal Call Clearing* (use the file *wbisup.rf5* that comes with the software):

1. Click on the *Filter* symbol in the pipeline.
2. Click *Reset* to put the filter in a defined mode, and verify that the bypass option in the lower part of the dialog box is unchecked. This box will automatically become unchecked once a filter is properly configured and activated.
3. Select the *Protocols* tab. Uncheck the *Bypass Protocol Filter* box in the top left corner of the tab.
4. Press *No Protocols* below the *Protocols* pane. (*No Protocols* is a context-sensitive button that might appear as *All Protocols*. If not yet active, press the *All Protocols* button, first).
5. In the *Protocols* pane select *ISUP* (if the marker turns green, press *No Messages* below the *Messages of ...* pane).
6. Scroll down, and select *REL* in the *Messages of ...* pane (if the marker turns green, press *Ignore Message* below the *Messages of ISUP* pane).
7. Enter *cause* in the *Search for* field and press *Search* three times.
Parameter *Cause Value* will be marked in the *Parameters of ISUP/REL* pane.
8. Press *Edit*. The *Edit Parameter Value* dialog box appears.

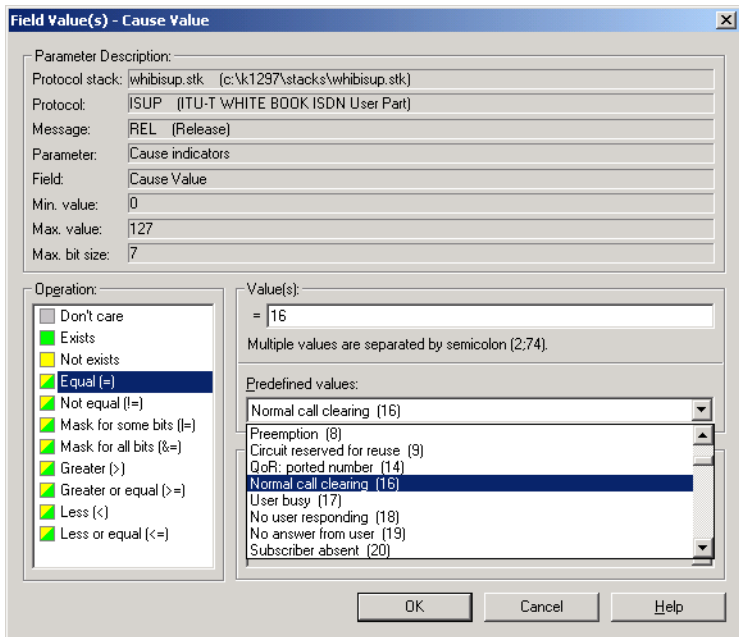


Figure 32: Edit filter parameter values

9. Select *Normal Call Clearing at Predefined Values* or choose *Dec at Value(s)* and enter *16* in the field directly.
10. Press *OK* and check the box of the parameter *Cause Value* and confirm with *OK*. The monitor will be updated and only the selected REL message will be displayed. Note that errored events will also be shown unless they are filtered out.

K1297-G20 Monitor version 3.00 has widened your possibilities to enter and edit filter parameter values.

If you want to enter a value range, select the *Dec, range* format. A range is represented as a set of two values in square brackets separated by a dash.

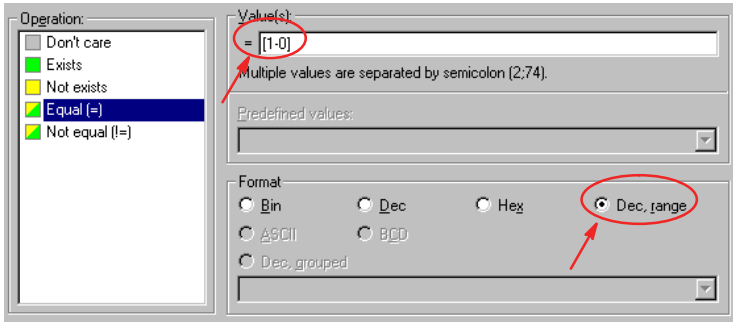


Figure 33: Editing value ranges

Enter parameters of MAC, IP4 , and IP6 in grouping format as shown in figure 34 below.



Figure 34: Editing values in *Hex, grouped* format

K1297-G20 Monitor version 3.00 checks for correctness of the entry in the *Value(s)* field. A yellow mark will appear, if size or range of the value are incorrect; in case of a syntax error the mark will turn red.

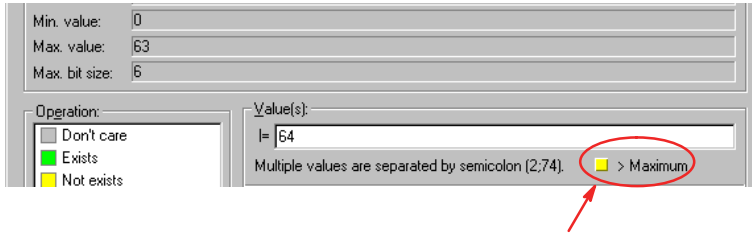


Figure 35: Warning information: Entered value is above maximum

NOTE. Filter configurations can be saved and loaded in separate files with the extension *.flt*. You can also copy one filter configuration to another via the system clipboard with the commands Copy and Paste. RMC on the Filter symbol in the pipeline.

You can reset a filter configuration with one click or disable the filter configuration temporarily by activating the *Bypass* checkbox in the filter dialog box.

The *Bypass* function is displayed graphically in the pipeline. If a filter is configured, its pipeline box shows a **bold** font. If it is bypassed, the graphic shows a wire that goes around the filter.

To quickly activate /deactivate the *Bypass* function, press <CTRL + b>.

NOTE. Filters are set to Bypass by default. This allows the K1297-G20 Monitor the fastest operation. To activate a filter, make sure the Bypass box is unchecked.

Expert Mode

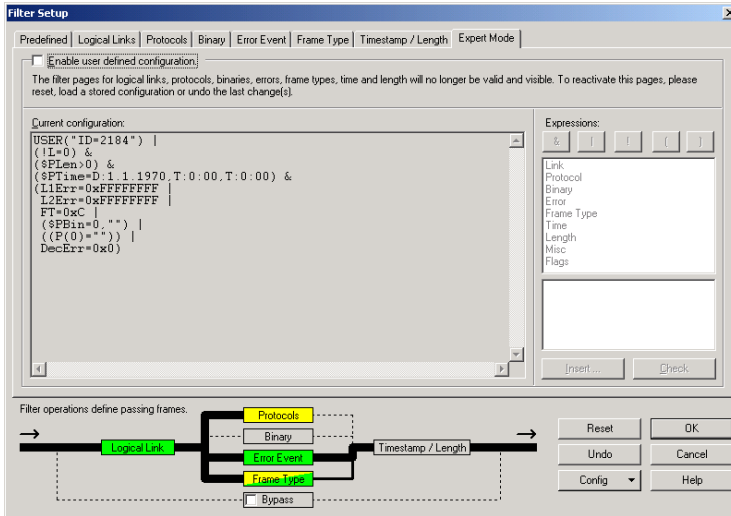


Figure 36: Filter Setup tab Expert Mode

The *Filter Setup* tab *Expert Mode* gives you full control on logical relations of filter settings.

By default, the *Current configuration* box is set to read-only (see example above). The script in this box shows the configuration as set in the other tabs of *Filter Setup*.

To edit the filter configuration in expert mode, click on *Enable user defined configuration*. Now, you can insert, edit, or delete expressions in the *Current configuration* box.

NOTE. *Once Expert Mode is enabled via clicking the Enable user defined configuration box, all other filter pages are deactivated. To reactivate those pages press Reset. This operation discards all unsaved configuration settings.*

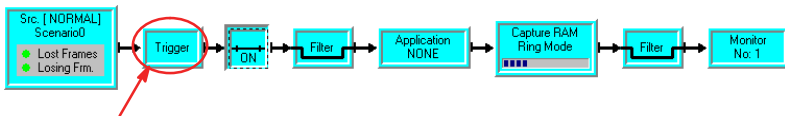
Trigger

You can use triggers to control measurement processes. A trigger connects an event with a predefined action. As soon as the event occurs (the trigger condition is fulfilled), the action is carried out. An event could be the receipt of a specific message. A trigger action could be the display of a user-specified message.

The settings of a trigger always refer to the data source (source or recording file) of the respective pipeline. Depending on the trigger definition, the trigger conditions could apply to the entire pipeline or to individual branches.

The configuration of triggers is similar to the configuration of the input filter, but a trigger lets all data frames pass through. If a specific data frame is received (an ISUP IAM) or a specific system state is reached (a certain point in time), the predefined action is carried out (termination of the measurement).

To configure triggers, click the trigger pipeline element.



Trigger element

Figure 37: Trigger pipeline element

Trigger settings are saved in the configuration file (refer to section *Saving and Loading Configurations*).

The following example explains how a trigger works. The trigger in this example (ISUP) accomplishes the following tasks:

- Triggers an IAM for a specific call number.
- After this specific IAM has been received, a recording file starts.
- The recording stops after one hour.

These tasks are graphically represented in the *Trigger Configuration* dialog box as follows:

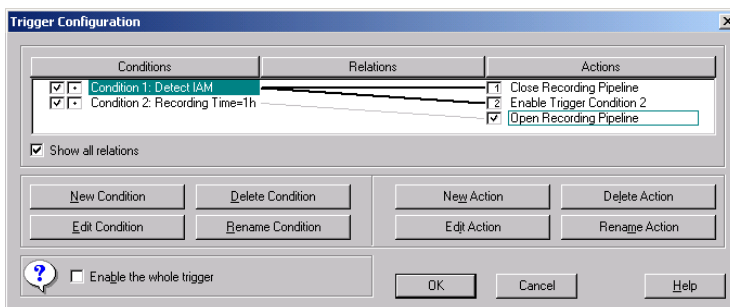


Figure 38: Trigger Configuration

The following is required for the configuration of the trigger:

- An *Online Recording* pipeline must be configured.
- In the corresponding data source, a logical link must be configured with a channel where signaling takes place.
- A recording file must be configured into which the data are written. Select *Create and Close multiple files automatically* as recording mode and a file size that will not limit the recording.

In order for the trigger to accomplish the tasks, two trigger conditions and three trigger actions must be defined. To create a relation, simply click and drag the condition to the desired action.

To change the order of the actions, LMC on each box in the action column to clear the order number; next, LMC on each box in the desired order of execution.

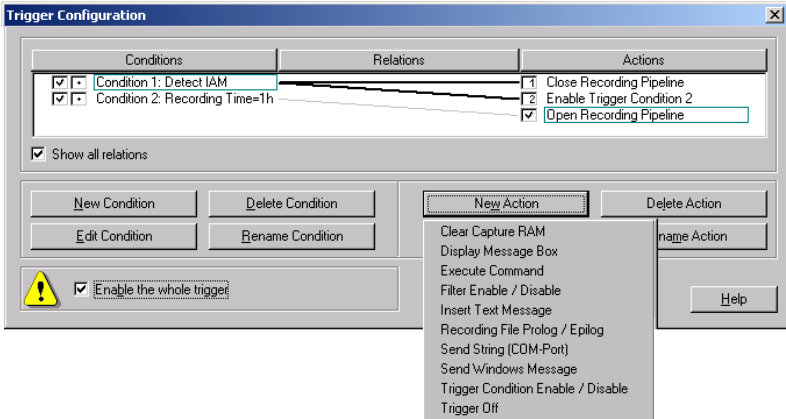


Figure 39: Trigger configuration

Trigger Condition 1

Protocol Filter:

The trigger must be configured to recognize the IAM. In order to detect the IAM, the appropriate protocol filter must be set as a trigger condition.

Two actions are linked to this condition.

Trigger Action 1:

Close the pipeline branch in which the recording file is configured.

Trigger Action 2:

Enable trigger condition 2: *Time Trigger*.

Trigger Condition 2

Time Trigger:

The data recording is to be terminated after one hour. To enable this function, a time trigger must be defined with a time period of one hour. As soon as this period has elapsed, the third and final action is carried out.

Trigger Action 3:

Open the pipeline branch in which the recording file is configured.

NOTE. *After conditions / actions configuration, always enable the trigger before closing the trigger window.*

Applications

The K1297-G20 Monitor software package includes applications for performing a wide variety of problem-based evaluations of signaling data. These applications are separate measurement programs and help, for example, analyzing protocol-specific information.

Overview

The available applications are:

- **Abis Monitor**
Monitor and graph Abis-Interface parameters such as RXLEV, RXQUAL, MS/BTS Power, Coverage, Interference, and Island.
- **CallMon (Traffic and Call Analysis)**
Creates an extensive statistical analysis of calls on all TUP (incl. BTNUP) and ISUP protocols. Analyzes up to 10 different telephone numbers or areas of telephone numbers resulting in a *csv-file* which can be viewed graphically - e.g. via MS Excel.
- **CallTrace / Sequencer**
Traces and recognizes calls on the basis of a partially specified or complete call number.
- **Calltrace (Multi-Interface)**
Traces one or more calls on several interfaces of a network, searches for parameters from different network interfaces simultaneously.
- **Decipher**
Deciphers signalling data on the GPRS-Gb interface.
- **GPRS MM/SM Statistics**
Displays details of events in GPRS MM/SM networks.
- **GPRS Gb Analyzer**
Displays details of events in GPRS networks.
- **IP Traffic Analyzer**
This application shows active communication flows characterized by IP addresses or specific protocol features over an IP network at high level. The user can configure the filter object in the K1297-G20 Monitor main application to monitor only the IP traffic of interest.

- Nortel Frame Number
This application calculates the frame number contained in the data flow of GPRS Nortel-type protocols.
- PCR (Preventive Cyclic Retransmission)
Enables you to filter out repeated MSUs from an offline pipeline by means of the PCR procedure.
- Service Profile Statistics
Provides an overview of the IP based TCP and UDP protocols' service profiles
- Statistics
Classifies and counts the received signalling data on the basis of different, changeable criteria. Graphical and alphanumerical evaluation.

The following predefined statistical applications can run without extensive configuration:

- Busy Hour Call Attempts
Counts the call attempts within a specified time period.
- Count All
Classifies and counts the received messages sorted according to protocols.
- Erlang Measurement
Measurement of the signaling load on the logical links.
- Traffic Channel Analysis
Analyzes a signaling channel and evaluates the traffic channel assignment.

These applications display their results in tables or graphically using *RealChart*. The results can be saved and exported to various database or spreadsheet applications.

All applications included with the K1297-G20 Monitor are located in the *c:\K1297\app* directory.

Starting an Application

Start any application by pressing the *Application* pipeline element, selecting the desired function, and pressing *OK*.

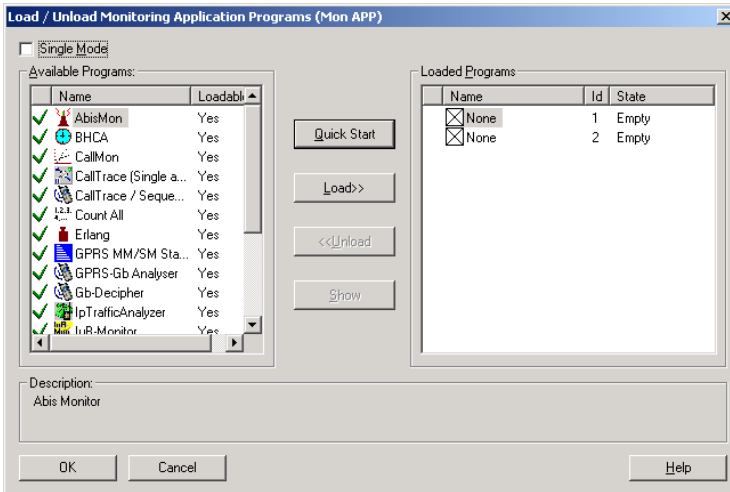


Figure 40: Load / Unload Application Programs

All applications can be initialized while the pipeline is inactive.

Run Two Applications in One Pipeline. It is possible to run two applications in one pipeline at the same time. Uncheck the *Single Mode* box. This activates the right right part of the window shown above. Select the appropriate function and click on *Load / Unload*. Loaded functions are now shown in the list box on the right. To start the applications, press *OK*.

NOTE. For detailed information on how to run applications, refer to the appropriate chapters in the *Online Help*.

Abis Monitor (AbisMon)

This application gives a statistical evaluation of the Measurement Report messages on the Abis-Interface. It monitors the parameters of the Abis-Interface, such as RXLEV, RXQUAL, MS/BTS Power, and creates graphical results such as Coverage, Interference, Island.

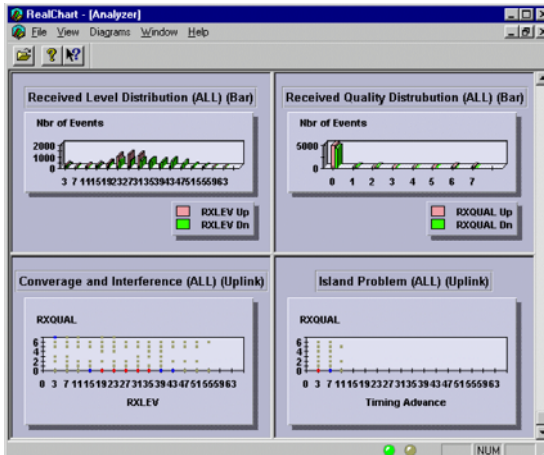


Figure 41: Abis Monitor results

Busy Hour Call Attempt Statistics

The Busy Hour Call Attempt (BHCA) application counts all the call attempts (IAM Messages) and calculates the number of call attempts within hours or days to get an overview of the call traffic on the connected lines.

The application analyzes all ISUP protocols.

CallMon (Traffic and Call Analysis)

This application creates an extensive statistical analysis of calls for ISUP, TUP, ISDN, and Abis protocols. It analyzes up to 10 different telephone numbers or areas of telephone numbers (e.g. all calls to Germany). Results are stored in a *.csv-file* which can be viewed and processed using MS EXCEL. The following parameters are created: Successful / non successful calls, average hold time, average conversation time, average PDD, ASR[%], Calls Res. in Alert[%], Calls Res. in Disconnect[%], and a number of the different Release Causes.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Date	Time	Number	Successful Calls	Non Successful Calls	Effective Call Attempts	Hangups while ringing	Average Hold Time[s]	Average Conversation Time[s]	Average PDD[s]	ASR[%]	Calls res. in Alert[%]	Calls res. in Disconnect[%]	Unallocated (unass.) number
1	01.01.70	00:00:00	*	110	0	110	0	0	0	0	100	100	0	0
2	26.02.98	11:25:11	*	110	0	110	0	0	0	0	100	100	0	0

Figure 42: CallMon results viewed in MS Excel

Calltrace and Calltrace Sequencer

This application is available for GPRS Gb, GPRS Gn / Gp, GPRS Gr / Gc, IP MGCP (Sequencer), ISUP, Abis and A-Interface (GSM900, GSM1800, PCS1900 and CDMA), INAP, ISDN, and TUP, depending on the software package(s) purchased.

Select this application (*LMC on Application* in the Pipeline), click on the appropriate protocol, and choose the desired number, parameter, or values (such as *CalledPartyNumber*, *TMSI*, *Release Cause*, etc.) depending on the protocol used.

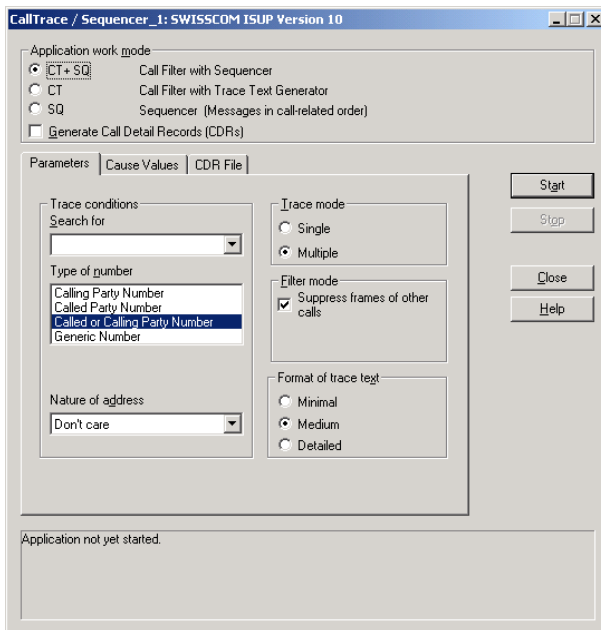


Figure 43: SWISSCOM ISUP Calltrace

You can set the *Filter Mode to suppress frames* if you want to see only those messages that belong to the traced calls. All other frames will be suppressed. The more precisely the trace numbers are specified, the more precise the filter can be. The text strings generated by the Calltrace application are completely displayed in the *Short View*.

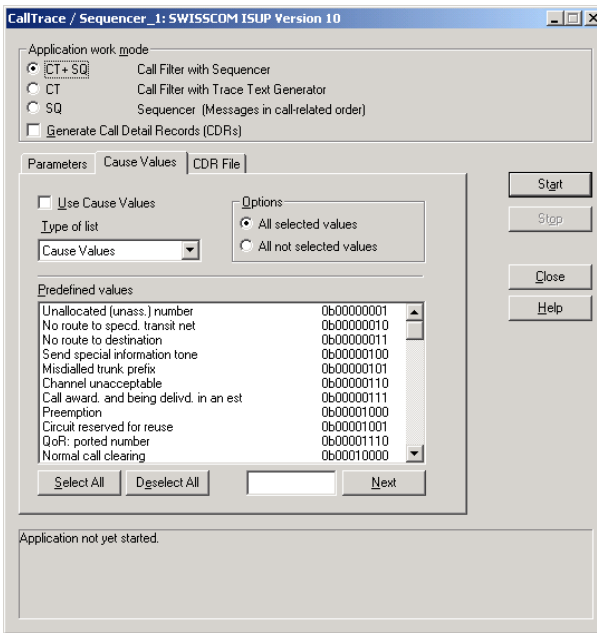


Figure 44: SWISSCOM ISUP Calltrace Cause Value

Four comma-separated numbers can be traced simultaneously. Each of the numbers can contain the wildcards *, ? and + anywhere in the number.

Start the measurement by *LMC Start*, and the result should be similar to the following illustration:


Time	From	2. Prot	2. MSG	3. Prot	3. MSG	4.
15:44:37,000,000	0	text	Open Recfile	at WED APR	14 15:44:37	19
15:05:35,073,936	[1] B (Rx):16:-:64	SCCP	CR	BSSH	CL3I	DT
15:05:35,096,764	[1] A (Rx):16:-:64	SCCP	CC	DTAP	CHSACC	
15:05:35,101,008	[1] A (Rx):16:-:64	SCCP	DT1	DTAP	TRCMD	
15:05:35,124,076	[1] B (Rx):16:-:64	SCCP	DT1	DTAP	SETUP	
15:05:35,124,076	[1] B (Rx):16:-:64	text	=== S T A R T ===			
15:05:35,124,076	[1] B (Rx):16:-:64	text	=== Number f	ound: Called	Party Numbe r	
15:05:35,130,817	[1] B (Rx):16:-:64	SCCP	DT1	DTAP	TRCMP	
15:05:35,149,267	[1] A (Rx):16:-:64	SCCP	DT1	DTAP	CPROC	
15:05:35,157,502	[1] A (Rx):16:-:64	SCCP	DT1	BSSH	ASREQ	
15:05:35,192,826	[1] B (Rx):16:-:64	SCCP	DT1	BSSH	ASCMP	
15:05:35,209,265	[1] A (Rx):16:-:64	SCCP	DT1	DTAP	ALERT	
15:05:35,316,389	[1] A (Rx):16:-:64	SCCP	DT1	DTAP	CONNECT	
15:05:35,316,389	[1] A (Rx):16:-:64	text	=== CALL CON	NECTED: Call	ed Party Num be	
15:05:35,336,574	[1] B (Rx):16:-:64	SCCP	DT1	DTAP	CONACK	
15:06:27,235,258	[1] B (Rx):16:-:64	SCCP	DT1	DTAP	DISC	
15:06:27,256,821	[1] A (Rx):16:-:64	SCCP	DT1	DTAP	RELEASES	
15:06:27,278,756	[1] B (Rx):16:-:64	SCCP	DT1	DTAP	RELCHP	
15:06:27,278,756	[1] B (Rx):16:-:64	text	=== E N D == =			
15:06:27,278,756	[1] B (Rx):16:-:64	text	=== CALL REL	EASED: Calle	d Party Numbe r	
15:06:27,299,572	[1] A (Rx):16:-:64	SCCP	DT1	BSSH	CLCMD	
15:06:27,319,882	[1] B (Rx):16:-:64	SCCP	DT1	BSSH	CLCMP	
15:06:27,340,317	[1] A (Rx):16:-:64	SCCP	RLSD			
15:06:27,357,381	[1] B (Rx):16:-:64	SCCP	RLC			
15:06:27,357,381	[1] B (Rx):16:-:64	text	=====			
15:06:27,357,381	[1] B (Rx):16:-:64	text	=== SCCP con	nection rele	ased:	
15:06:27,357,381	[1] B (Rx):16:-:64	text	=== OPC = 00	-1-00-2	DPC = 00-1-00-1	
15:06:27,357,381	[1] B (Rx):16:-:64	text	=====			
15:07:00,108,434	[1] B (Rx):16:-:64	SCCP	CR	BSSH	CL3I	DT
15:07:00,131,119	[1] A (Rx):16:-:64	SCCP	CC	DTAP	CHSACC	
15:07:00,135,364	[1] A (Rx):16:-:64	SCCP	DT1	DTAP	TRCMD	
15:07:00,150,000	[1] B (Rx):16:-:64	SCCP	DT1	DTAP	SETUP	

Figure 45: Example of a calltrace-result (detail)

Sequencer Application. The Sequencer application of the K1297-G20 Monitor simultaneously sorts all call related frames for up to 1000 ISUP connections. With the trace mode activated, one will get additional trace information about each call. Outputs are similar to the following illustration:

The sequencer evaluates calls as follows: the beginning of the message is the IAM and the end will be the RLC - or a timeout in case there is no RLC detected.

Call Detail Records. The CDRs application creates detailed call information, like the called / calling party number, call duration, hold time, wait time, response time, etc. Results are written into a CSV file (Comma Separated Value).

1. To activate the CDRs application, click on the *Generate Call Detail Records (CDRs)* box under *Application work mode*.
2. Select the *CDR* tab. Determine the *Filemode*: Choose *Overwrite* if you want to create a new file or overwrite an existing file. Choose *Append* if you want to add further data to an existing CSV file.
3. Click . The directory C:\K1297\log opens. Create a new CSV file, or select an existing one.
4. If required, make additional settings on other tabs and start the *Calltrace / Sequencer*.

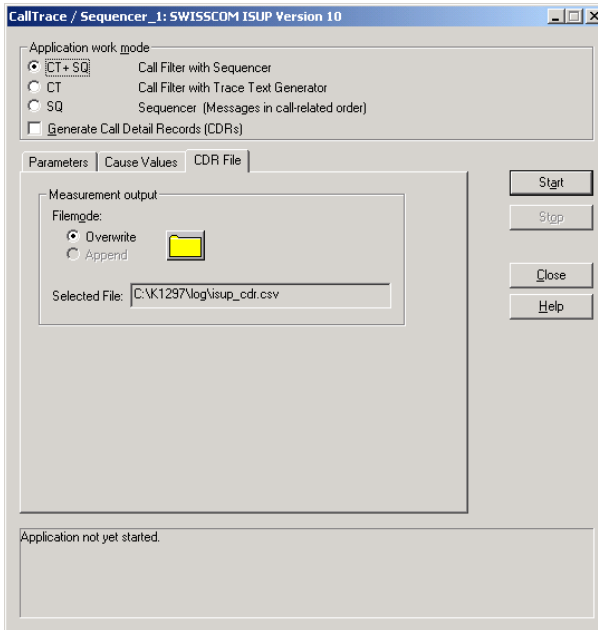


Figure 46: CDR tab

Calltrace (Multi-Interface) – MICT

Using the Single and Multi-Interface CallTrace (MICT) you can monitor up to 4 network interfaces. You can search for common parameters such as phone numbers and measure the time needed by specific network elements (Delay Measurement). The application provides scenarios for analyzing the following network interfaces and protocols:

- UMTS UTRAN: Iub, Iu-CS, and Iu-PS interface
- GPRS: Gb, Gn, and Gr interface
- GSM: Abis and A interface
- CDMA2000: A1, A10, A11 interface
- CDMA: IS-41 interface
- SS7: MAP, ISUP, and CAP (INAP)

NOTE. *At the moment, the Single and Multi-Interface CallTrace (MICT) supports maximal three different protocol stacks for each interface.*

You can run the Single and Multi-Interface CallTrace simultaneously with applications that have been loaded in other pipeline branches. You can also run several Multi-Interface Calltrace applications at the same time.

NOTE. *A number of functions of the Single and Multi-Interface CallTrace (MICT) are also available in the CallTrace / Sequencer application with which individual network interfaces can be analyzed. For performance reasons, the MICT does not support all of the search criteria that you can select in this application (e.g. release causes). Instead it supports search criteria that can be evaluated during the call setup phase. If you need more detailed search criteria for your measurements, you should therefore use the CallTrace / Sequencer.*

Count All

This application counts all the received messages and sorts them according to protocol and message type. The following diagram shows the *Overview* results.

Date	Time	isup163tr75_0498/MTP-L3	isup163tr75_0498/T&M	isup163tr75_0498/SCCP	isup163tr75_0498/ISUP
17.04.1998	16:22:55	0	0	0	299
17.04.1998	16:23:55	0	0	0	307
17.04.1998	16:24:55	0	0	0	352
17.04.1998	16:25:55	0	0	0	410
17.04.1998	16:26:55	0	0	0	442

Figure 47: Count All Overview results

Messages can also be sorted by specific protocol within a protocol stack.

Date	Time	IAM	SAM	ACM	ANM	REL	RLC	CPG
17.04.1998	16:22:55	36	115	32	27	42	39	8
17.04.1998	16:23:55	42	132	29	16	36	47	5
17.04.1998	16:24:55	43	176	33	21	37	37	5
17.04.1998	16:25:55	53	188	31	28	49	54	7
17.04.1998	16:26:55	57	207	41	29	45	54	9

Figure 48: Count All results for a specific protocol (ISUP)

Decipher

This application deciphers signaling data on the GPRS-Gb interface. Ciphred messages, for which the subscriber ID (IMSI) and key (Kc) are known, are replaced by deciphered messages and thus enable a further analysis of the signaling data.

On the GPRS-Gr interface, the Decipher application determines the IMSIs and keys (KCs) required to decipher the signalling data on the GPRS-Gb interface.

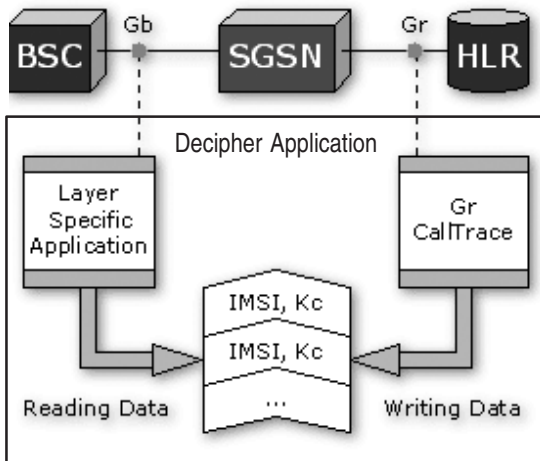


Figure 49: Deciphering on the Gb interface

The following configurations are possible when working with the Decipher application:

- You can configure a joint pipeline with logical links for the GPRS-Gb and GPRS-Gr interfaces. To do this, assign a respective suitable protocol stack to the logical links of this pipeline.
- You can configure two pipelines. The data sources of these pipelines are differing logical links with differing protocol stacks.

In the first pipeline, you must assign a protocol stack for the GPRS-Gb interface to the logical links. Now, the IMSIs and keys determined by Decipher are used via the LSA (Layer Specific Application) to decipher the signalling data transmitted via the Gb interface. In this pipeline, you can also use another application.

In the second pipeline, you must assign a protocol stack for the GPRS-Gr interface to the logical links and then start the Decipher application in this pipeline. Now, Decipher determines the IMSIs and keys transmitted via this interface.

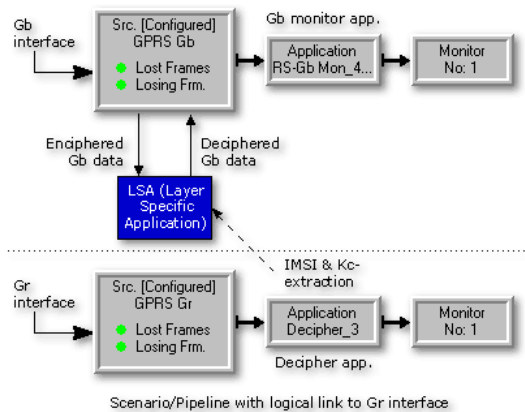


Figure 50: Decipher configuration with two pipelines

Erlang Measurements

The Erlang application is a pre-defined statistics application that measures the signaling load in the individual signaling channels.

This application analyses all protocols and protocol stacks.

GPRS MM/SM Statistics

The GPRS MM/SM Statistics application provides you with an overview of GPRS mobility and session management procedures for the entire GPRS network.

This application analyzes all protocol stacks that use GMM/SM as a protocol layer.

GPRS-Gb Analyzer

The GPRS-Gb Analyzer application provides you with an overview of the GPRS connections and requested connections, as well as their "Quality of Service Parameters" (QoS).

The data can be analyzed statistically during the current measurement. Filters can be set to exclude data of minor interest. The results of the GPRS-Gb Analyzer can be saved in a statistics file for later evaluation.

NOTE. For detailed information on how to run the GPRS-Gb Analyzer refer to the chapter GPRS Monitoring and to the Online Help.

IP Traffic Analyzer

The IP Traffic Analyzer maintains two views of communication in real time:

- IP View organizes the traffic by IP connection (i.e. between computers).
- Protocol View shows traffic organized by protocol layer (i.e. TCP, UDP, SCTP, M3UA, etc.), and then shows the IP addresses of the computers involved.

Therefore, the tool supports configurations for GPRS and GPRS_IP with GB_IP (NS_IP) and Gn with GTP; IPS7 (MAP_IP over SCTP) as well as VoIP systems running MGCP and SIP.

Host names are resolved from IP addresses by file hosts.txt. This file is not required, but if available, a text host name will be displayed instead of an IP address.

Sample of a hosts.txt file:

```
128.181.52.216           plccontrol1
128.181.117.254         amcemulator
128.181.141.162        w-meetab01
128.181.238.28         dhcp238-28
128.181.21.36          t-train06
128.181.39.71          jamaica13
128.181.239.6          dhcp239-6
```

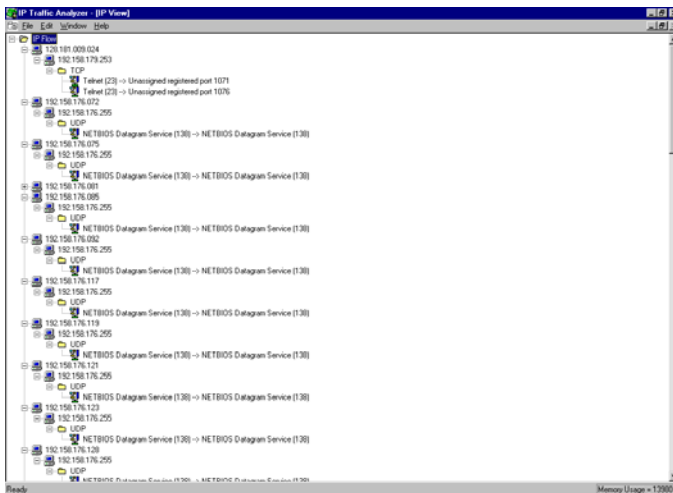


Figure 51: IP Traffic Analyzer - [IP View]

Nortel Frame Number

The Nortel Frame Number application can only be used for GPRS Nortel-type protocols.

It calculates the frame number (FN) implicitly contained in the data flow from the following parameters in the data flow:

- Multi frame number (MFN)
- Block number (BN)
- Number of idle bursts (Nib)

The calculated frame number (FN), status and error messages are fed into the pipeline as text messages and can be evaluated in the monitor.

PCR (Preventive Cyclic Retransmission)

The PCR application enables you to filter out repeated MSUs from an offline pipeline by means of the PCR procedure (preventive cyclic retransmission). You may want to remove these messages in order to obtain a smaller amount of data consisting of relevant data.

The use of this application only makes sense for offline pipelines if the recording file contains non-suppressed PCR MSUs. In online pipelines, the logical link can remove the PCR MSUs.

The application can be applied for all MTP-based protocols.

Service Profile Statistics

The Service Profile Statistics application provides you with an overview of the IP-based TCP and UDP protocols' service profiles.

The availability of the specific protocol layer in the protocol stack used is a condition for the use of the Service Profile Statistics application: The TCP or UDP protocol must, as a rule, be in the protocol stack. If this is not the case, you will be informed accordingly.

NOTE. *Only when the above-stated protocol layers are in the stacks of the configured links the Service Profile Statistics application can be started. Otherwise, configure the data source again (Source or Recording File), by assigning different stacks.*

Statistics

In the *Statistics* setup you can define your own counters based on specific protocols, logical links, errors, and/or frame lengths. The RealChart program allows you to change the display settings of each diagram. Data can be viewed as tabular, line, bar, or pie charts.

Open the *Application* Window in the pipeline with *LMC*, and select *Statistics*.

The *Statistics* window will open. Here you may define counters (*RMC*) for the desired events, messages, and so forth. They will be calculated and displayed as defined in the *RealChart* setup. Files can be saved in several formats.

The *Statistics* application allows you to evaluate and graphically display received signaling data or data from a recording file in real time. For each message that you want to evaluate, you can define a counter that counts messages of this type as they are received. You can also set counter limits (upper and lower limits) that cause a specific trigger action. The K1297-G20 Monitor reads and displays the value of each defined counter on the screen at adjustable time intervals. The counter is then reset, and the next interval starts.

A separate program, *RealChart*, displays the current counter states and also allows you to view measurement data in tables or graphical diagrams in real time. You can combine several counters in one table or diagram. All counters in a diagram belong to a group, of which several can be defined.

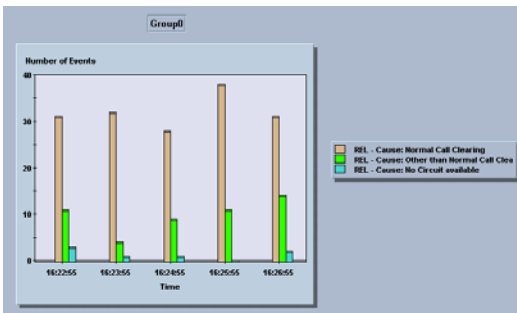


Figure 52: One of several output formats of the *Statistics* application

Traffic Channel Analysis

The Traffic Channel Analysis (TCA) application analyzes a signaling channel. The traffic channel (basic channel) assignment controlled by this signaling channel is evaluated. The application supports all ISUP, TUP, BT NUP protocols.

For configuring the Traffic Channel Analysis application proceed as follows:

1. Click the applications element in the pipeline.

2. Select *TCA* in the *Select Application Program* dialog box.

Two lists in the TCA dialog box display the protocol stacks assigned to the data source/recording file and the available protocols in these stacks.

3. Select the desired protocol stack in *Available stacks*.

The *Available protocols* list now displays the protocols (from this stack) that may be monitored.

4. Select the desired protocol.

5. In the *Refresh rate* field, specify a time period in which the measured values are to be displayed.

The *RealChart* tool displays the results of the *Traffic Channel Analysis* application in tables and diagrams. The table provides two display formats for the recorded data:

- *Currently used Channels*: Provides an overview of the number of currently used traffic channels per PCM. The monitored PCM links in this overview are organized in groups of 16.
- *Max. used Channels*: Provides an overview, displayed in lines and sorted according to time periods, of the maximum number of used traffic channels for each PCM link. The values are displayed in a separate column.

To switch to the display of bar charts, select *Diagrams* → *Max. used Channels* → *Bar* in the context menu, and choose the desired group of time slots.

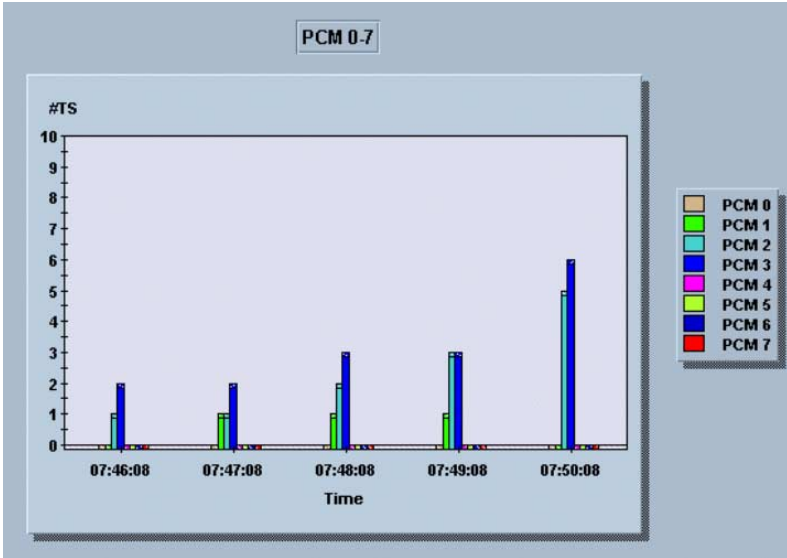


Figure 53: TCA output of Max. used channels

Tools

Traffic Analyzer

The Traffic Analyzer tool provides traffic information about each connected line. It analyzes the traffic by channel scanners based on each measurement board.

To run the Traffic Analyzer tool, select *Traffic Analyzer* from the *Tools* menu in the K1297-G20 Monitor main window. For more detailed information refer to the Online Help.

Load-Meter

While running measurements, you can use the *Load-Meter* program which provides capacity usage information on individual K1297 interfaces and the PC card.

In case of an overload situation (too much traffic on a link) the display will contain red bars.

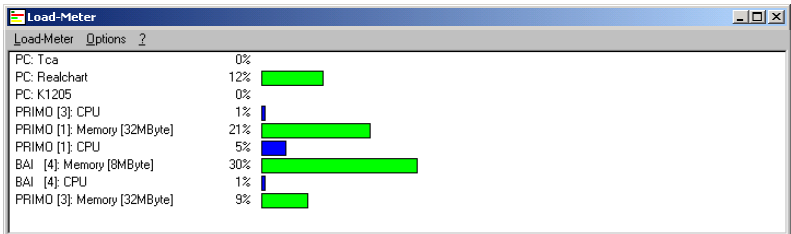


Figure 54: Load-Meter

NOTE. *If several interface cards are installed on the K1297, it is best to use all cards except for the first one to receive data. The system uses the memory area of the first card to manage the specified configuration. This configuration allows the optimum load distribution even when running the links at a high load.*

PCM Check

The PCM Check automatically detects and displays the type of signalling received on connected E1/DS1 links. Connected traffic to whether signalling in SS#7, LAPD /LAPV, Abis or TRAU is running on E1/T1 is detected automatically. This check is located in the menu *Tools* → *PCMCheck*.

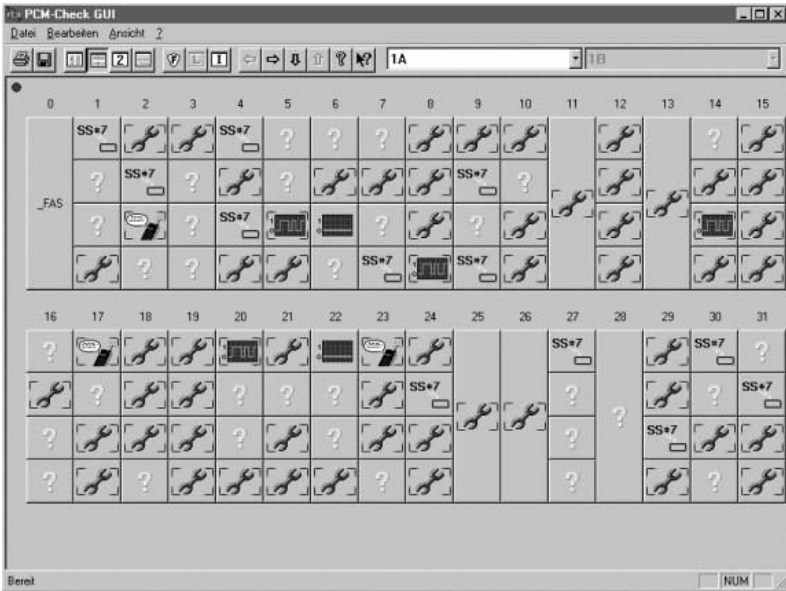


Figure 55: PCM Check

The PCM Check is useful only if the K1297-G20 Monitor is receiving real data over the interfaces. It can be used to provide a quick overview of the channel assignments within a PCM frame. An explanation of the symbols can be found in the K1297-G20 Monitor Help application.

Real Chart

The RealChart tool works only together with one of K1297 Monitor statistics applications (Abis Mon, BHCA, CallMon, CountAll, Erlang, GPRS MM/SM, Service Profile Statistics, Statistics, TCA, or UMTS IuX Statistics).

The tool evaluates tabular data in real time and displays it on-screen in various chart formats. Using RealChart, you can visually analyze and create presentations using measurement data.

The system transfers data for statistical analysis to RealChart, which then displays it either numerically (in tables) or in line, bar, or pie charts.

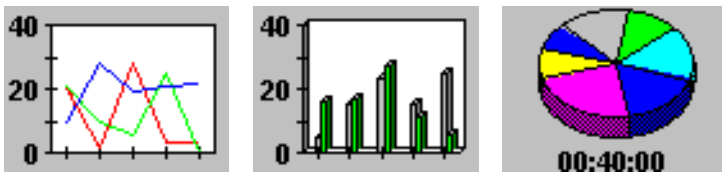


Figure 56: Real Chart diagram types

It is possible to run more than one statistical analysis simultaneously that transfer signaling data to RealChart. The results for each measurement scenario (pipeline branch) are displayed in a separate window of the RealChart program.

To run the RealChart tool, select RealChart from the *Tools* menu in the K1297 Monitor main window. The RealChart window opens.

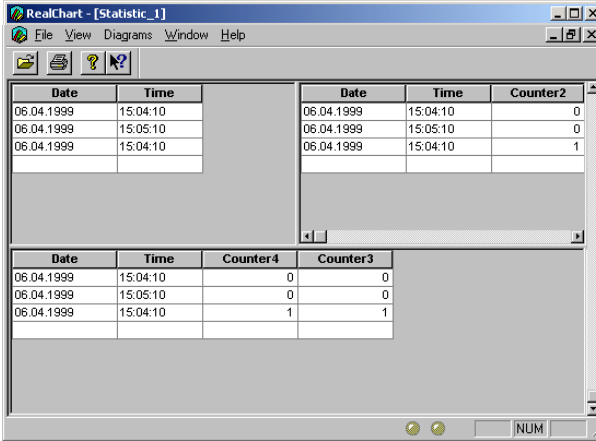


Figure 57: RealChart window

To define the display of RealChart diagrams, select *Properties* from the *Diagrams* menu. The *Edit Diagram* dialog box opens (refer to the Online Help for further details).

RealChart offers a number of additional display options for evaluations using the statistics application. The data values of each counter group defined in the statistics application are displayed in individual diagrams.

The *Diagrams* menu in the *Real Chart* window allows you to switch between groups and to define an individual display and diagram type for each group. Select the desired counter group in the *Diagrams* menu and the desired display in this group's submenu:

- *Number of Events*: Shows the number of messages.
- *Volume of Events*: Shows the number of transmitted bytes.

Select a diagram type and modify the display of a diagram type via *Properties...*

To print the current view, select *Print -> Table* or *Print -> Diagram* from the *File* menu in the *Real Chart* window.

To save statistical analyses, select *Save As...* from the *File* menu. The standard directory for RealChart files is \k1297\rcdata. Analysis files have the extension *.rcd

To export data in a foreign file format, choose the format in the Save as type list:

- *.csv Text file format
- *.xls Excel file format
- *.mdb Access file format
- *.dbf Dbase file format

When you reload a saved evaluation file, it appears in a new window.

DS1/E1 Default Start Mode

Using the DS1/E1 Default Start Mode tool, you can make presettings for the DS1/E1 (Primo) measuring board which will then be set as default values in the *Ports Setup* configuration dialog box.

The presettings become valid the next time you start the main program. If you load an already existing configuration file, that has settings deviating from the default settings here, the default settings will be overwritten by the configuration file's settings.

Key Manager

With the Key Manager tool you can administer license keys for the K1297 Monitor. You can view the installed keys, add newly licensed ones and remove expired, duplicate, or invalid keys.

NOTE. Before using the Key Manager, please ensure that the system date has been correctly set. You can open the system calendar by double-clicking the clock in the taskbar.

Make safety copies (for example on disk) of the licensed key files before using the Key Manager.

To call up the Key Manager tool, select the *Key Manager* entry from the *Tools* menu.

The Key Manager is started. When called up by the *Tools* menu, the key file used by the K1297 Monitor software is automatically opened.

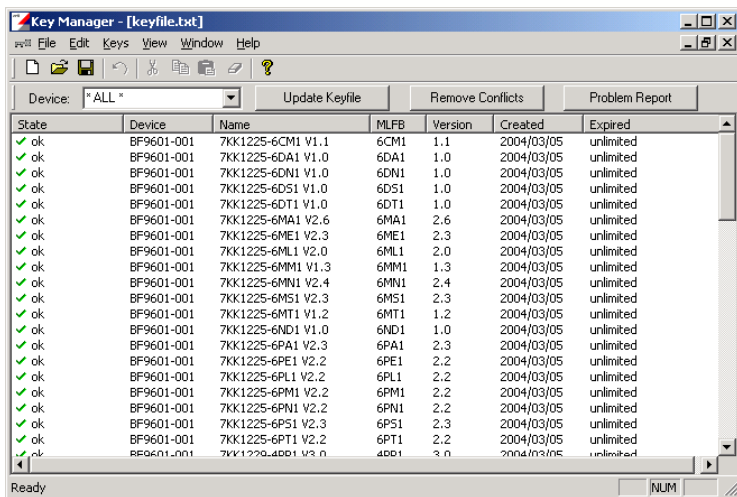


Figure 58: Key Manager dialog box

Each key is displayed in a separate line. Keys subject to a time limit, expired keys and invalid keys are displayed at the beginning of the list.

The title bar displays the number of expired, duplicate, or invalid keys.

Modified key files which have not yet been saved are displayed with the character * in the title bar. The individual columns have the following meaning:

- *State* displays the state of the individual keys. Refer to the Online Help for details.
- *Device* displays the device number (PC version: dongle number), for which the key is valid.
- *Name* displays the ordering number of the paket for which the key is valid.
- *MLFB* and *Version* display detail information about the paket.
- *Created* displays the creation date of the key. For time-limited pakets, the first valid date is displayed.
- *Expired* displays the last valid date for a time-limited key. For keys with unlimited validity, *unlimited* is displayed.

NTP Configuration

To monitor links on distant sites of a communications network it is necessary to carry out the measurement concurrently with two or more protocol testers. In order to evaluate and merge measurement data of several protocol testers, it is crucial to synchronize the system time of all involved protocol testers to a reference time source.

If the protocol tester is connected to a TCP/IP-based network, you may operate the NTP Configuration tool.

The NTP Configuration tool synchronizes the clock of K1297 Protocol Testers to an NTP reference clock. Using the NTP Configuration tool, it is possible to synchronize several protocol testers via the Internet and achieve an accuracy of down to 10 ms.

You can use the NTP Configuration tool to continuously correct the clock of a protocol tester.

GPRS Monitoring

K1297-G20 Monitor V 3.00 supports the monitoring of the GPRS-interfaces Gb, Gi, Gn, Gp, Gs as well as the MAP-based interfaces Gc, Gd, Gf and Gr.

Additionally, manufacturer specific GPRS Abis-interfaces are supported.

As the specifications for GPRS are still subject to changes, different versions of protocols will be delivered. All GPRS related protocol stacks can be found in the directories *c:\K1297\stacks\gprs* and *C:\K1297\stacks\ip_gprs*

The nomenclature follows the following rule:

gprs_<interface>_<smg#>.stk

Thus, *gprs_gb_29.stk* is the protocol stack for the Gb-interface according to SMG#29.

For the Abis-interfaces the following rule applies:

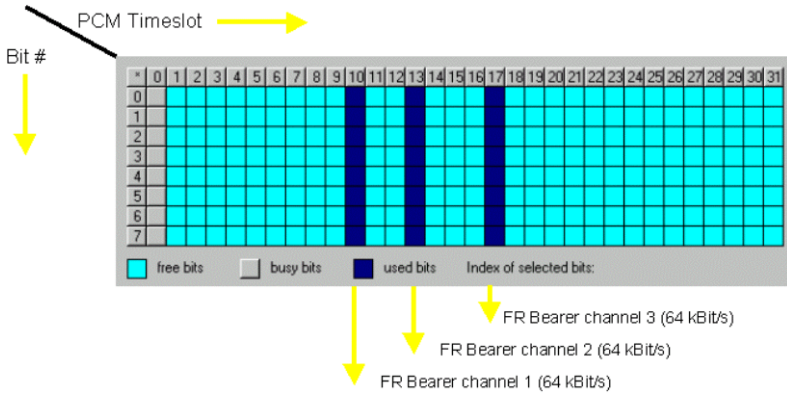
Abis_<manufacturer>_<smg#>_<u/d>.stk

So, *abis_xyz_smg29_u.stk* should be used for monitoring the Abis-interface of company XYZ in Uplink.

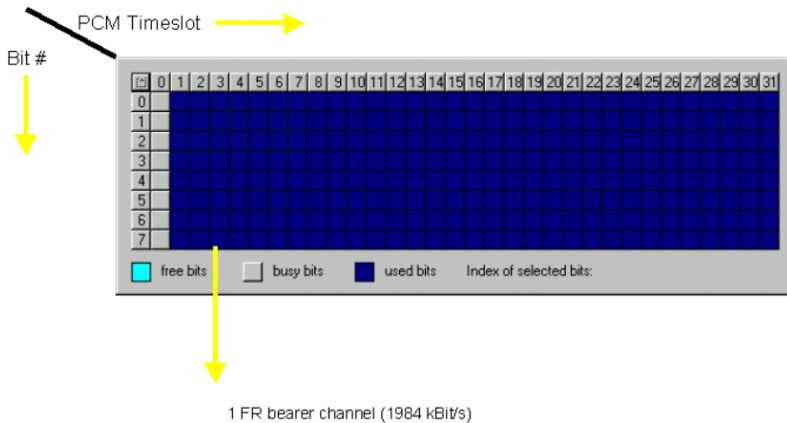
Logical Link Configuration for the Gb-Interface

The protocol stack for the Gb-interface is based on Frame Relay (FR) on a PCM30/PCM24 line. Frame Relay supports three different modes offering a bit rate of 8 kBit/s to 1984 kBit/s.

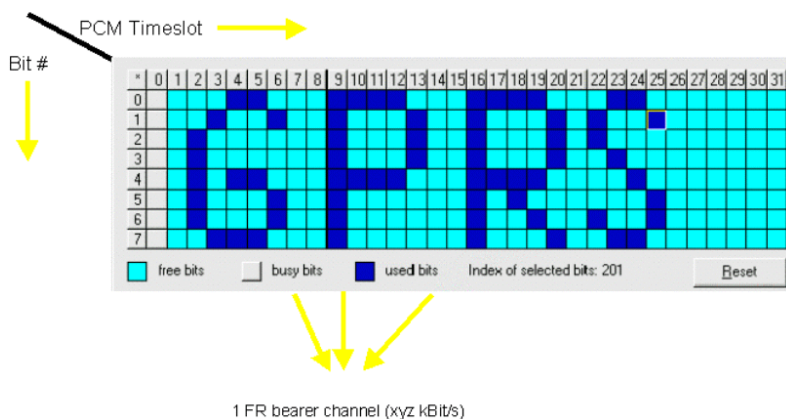
Channelized Mode. Each Frame Relay Bearer channel has a bit rate of 64 kBit/s.



Unchannelized Mode. The complete PCM line forms a Frame Relay Bearer channel offering a bit rate of 1984 bit/s for E1 lines (31 times 64 kBit/s, timeslot 0 is used for synchronization) and 1536 kBit/s for DS1 lines.

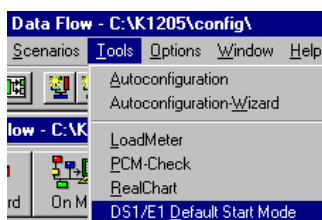


Fractional Mode. Using the fractional mode, any bit combination may be used to build a Frame Relay Bearer channel.

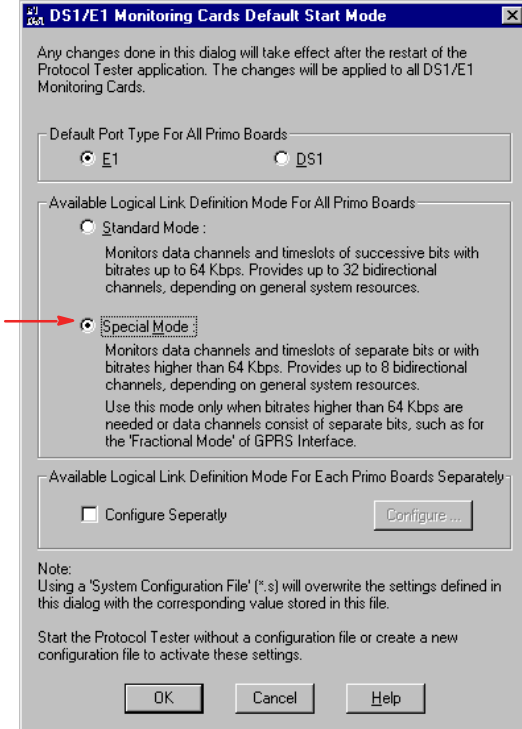


The K1297-G20 Monitor does support all of these three Frame Relay modes. In order to be able to monitor an Unchanneled or Fractional Frame Relay connection, each card / interface has to be configured for the so called *Special Mode*.

1. Therefore select menu item *DS1/E1 Default Start Mode* from the *Tools* menu.



The following dialog box appears:



2. Select the *Special Mode*, press the *OK* button, quit the K1297-G20 Monitor application, and start it again.

The interfaces will now work in the special mode and you will be able to select the Fractional Mode as level 2 method in the *Logical Link Configuration* dialog box. To change the cards back to the *Standard Mode*, simply change the setting in the dialog box and restart the K1297-G20 Monitor application.

Restrictions

- While the *Standard Mode* supports the configuration of up to 64 unidirectional (32 bi-directional) logical links with a bit rate of 64 kBit/s each, the *Special Mode* supports up to 16 unidirectional (8 bi-directional) logical links.
- Each bi-directional unchannelized Frame Relay connection takes away four unidirectional links, thus a total of four unchannelized Frame Relay connections can be set up for one DS1/E1 Monitoring board.

Channelized, fractional, and unchannelized Frame Relay connections could be mixed on one DS1/E1 Monitoring board, taking into account the maximum number of logical links in *Special Mode*.

GPRS Applications

K1297-G20 Monitor V 3.00 includes the following new features for GPRS measurements:

- Call Trace on different GPRS interfaces
- GPRS Gb Analyzer
- GPRS MM/SM Statistics

Realtime Single GPRS Calltraces

GPRS calltraces are now possible on the following interfaces:

- Gb interface
- Gn / Gp interface
- Gr / Gc interface

Available parameters for selection are *IMSI*, *Mobile Subscriber ISDN No.*, *MSRN*, *IMEI*, *TMSI*, *IP Address*, and *Cause Value*.

For further details, see section *Applications / Calltrace and Calltrace Sequencer*.

GPRS-Gb Analyzer

The GPRS-Gb Analyzer application provides you with an overview of the GPRS connections and requested connections, as well as their "Quality of Service Parameters" (QoS).

The data can be analyzed statistically during the current measurement. Filters can be set to exclude data of minor interest. The results of the GPRS-Gb Analyzer can be saved in a statistics file for later evaluation.

Setting Up a GPRS Gb Analyzer Application. To set up the application, proceed as follows:

1. Click the *Application* processing element in the pipeline.
2. Select *GPRS-Gb Analyzer* in the *Load / Unload Monitoring Application Programs (Mon APP)* dialog box. The *GPRS-Gb Analyzer* main window opens.

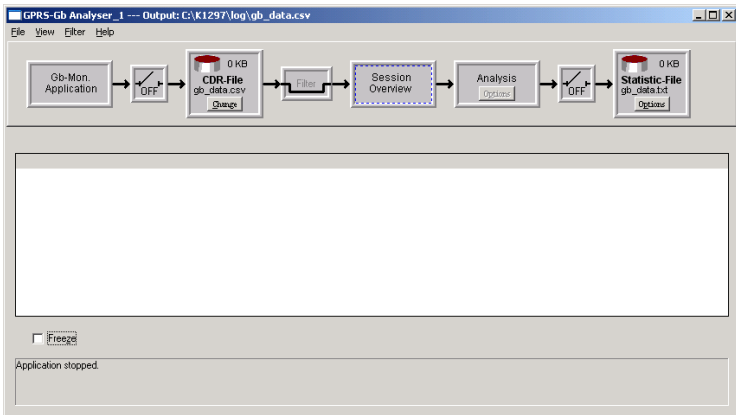


Figure 59: GPRS-Gb Analyzer main window

The current GPRS-Gb Analyzer pipeline will be displayed in the upper section of the main window. This visualizes the current configuration. Each processing element represents a part of the application.

The application is configured, started and monitored in this window.

- Switch off the *On/Off* switch in the GPRS-Gb Analyzer pipeline next to the CDR File processing element. The *Start* dialog box opens.

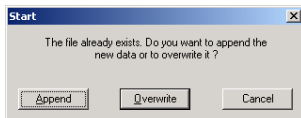


Figure 60: Start dialog box

Select *Append* if you want to add the new data to the end of the file or select *Overwrite* if old data can be overwritten.

- Switch on the *On/Off* switch next to the *CDR File* processing element. The contents of the CDR file are displayed in the *GPRS-Gb Analyzer* main window.

No.	Date/Time	Record Type	TLLI	IMSI	IMEI	PTMSI	Connect State	Source IP address
126	21.02.00 10:47:5...	2 Partial ...	0xc1600e76	262034012310028	-	-	Attached	-
127	21.02.00 10:47:5...	2 Partial ...	0xc1600e77	262034012310043	-	-	Attached	-
128	21.02.00 10:47:5...	2 Partial ...	0xc1600e79	262034012310044	-	-	Attached	-
129	21.02.00 10:47:5...	1 Partial ...	0xc1600d41	262034012310063	-	-	Closed (cut)	-
130	21.02.00 10:47:5...	0 Normal...	0xc1600d41	262034012310063	-	-	Closed (cut)	-
131	21.02.00 10:47:5...	1 Partial ...	0xc1600e9b	262034012310069	-	-	Attached	-
132	21.02.00 10:47:5...	1 Partial ...	0xc1600d42	262034012310081	-	-	Closed (cut)	-
133	21.02.00 10:47:5...	0 Normal...	0xc1600d42	262034012310081	-	-	Closed (cut)	-
134	21.02.00 10:47:5...	1 Partial ...	0xc1600e99	262034012310047	-	-	Attached	-
135	21.02.00 10:48:0...	2 Partial ...	0xc1600e7a	262034012310030	-	-	Attached	-
136	21.02.00 10:48:0...	2 Partial ...	0xc1600e6e	262034012310077	-	-	Attached (cut.)	111.10.0.24
137	21.02.00 10:48:0...	2 Partial ...	0xc1600e6f	262034012310080	-	-	Attached (cut.)	111.10.0.26
138	21.02.00 10:48:0...	2 Partial ...	0xc1600e7b	262034012310036	-	-	Attached	-
139	21.02.00 10:48:0...	2 Partial ...	0xc1600e7c	262034012310039	-	-	Attached	-
140	21.02.00 10:48:0...	2 Partial ...	0xc1600e7d	262034012310007	-	-	Attached	-
141	21.02.00 10:48:0...	2 Partial ...	0xc1600e7e	262034012310021	-	-	Attached	-
142	21.02.00 10:48:0...	2 Partial ...	0xc1600e7f	262034012310011	-	-	Attached	-
143	21.02.00 10:48:0...	2 Partial ...	0xc1600e80	262034012310045	-	-	Attached	-
144	21.02.00 10:48:0...	2 Partial ...	0xc1600e81	262034012310042	-	-	Attached	-
145	21.02.00 10:48:0...	2 Partial ...	0xc1600e82	262034012310024	-	-	Attached	-
146	21.02.00 10:48:0...	2 Partial ...	0xc1600e83	262034012310004	-	-	Attached	-

Freeze
 Connections already found: 89
 Connections not yet released: 58
 Free PDP contexts: 458

Figure 61: Loaded GPRS Gb Analyzer

5. To define filter options, click the *Filter* processing element in the GPRS-Gb Analyzer pipeline. The *Filter settings* dialog box opens.



Figure 62: GPRS-Gb Analyzer, Filter settings dialog box

Activate the *Filter On* check box and configure your desired filter options. For further details, refer to the Online Help.

Evaluating a GPRS Gb Analyzer Application. The results from the GPRS-Gb Analyzer application are displayed in the *GPRS-Gb Analyzer* main window (see figure 61).

Each line represents the connection state for each data record or a call detail record (CDR). You can also view details of a data record from the event list. Therefore, double-click on one of the data records in the main window. The *GPRS Gb Mon Detail View* dialog box opens.

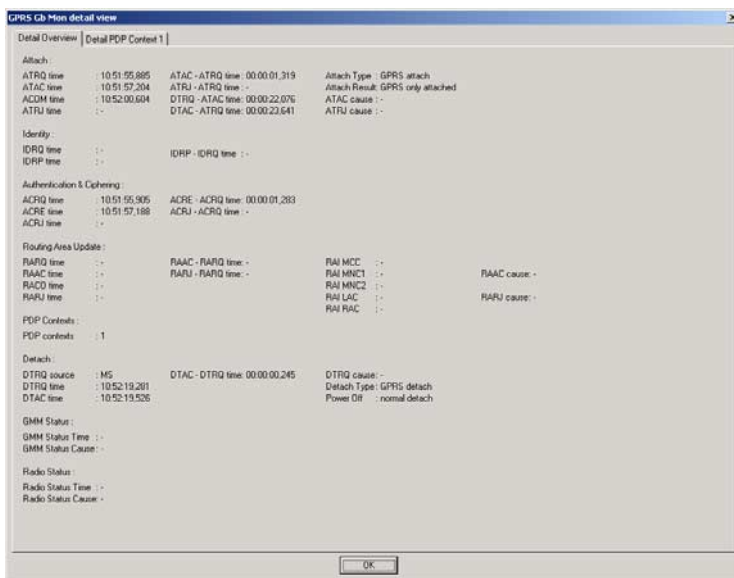


Figure 63: GPRS-Gb Analyzer, Detail view

You can also evaluate data records in the *Analysis* window of the GPRS-Gb Analyzer or record them in a statistics file as described below.

Evaluating the Results in the Analysis Window. *Analysis* is only selectable if you have installed the GPRS-Gb Analysis packet. Call up the *Analysis* window by clicking the *Analysis* element in the GPRS-Gb Analyzer pipeline.

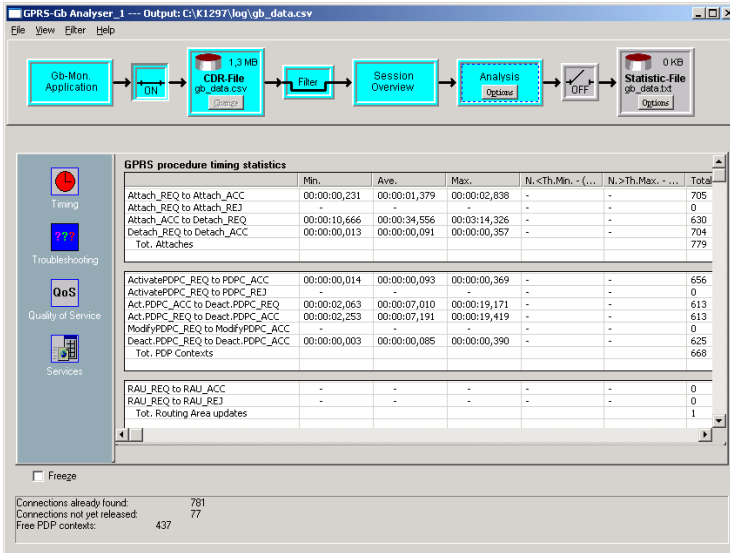


Figure 64: GPRS-Gb Analyzer, Analysis window

This window enables access to the following evaluations: Timing, Troubleshooting, Quality of Service and Service statistics. Select one of these statistics by clicking the corresponding button on the left toolbar of the *Analysis* pane.

You can also analyze failure causes in detail. To do this, click on the *Cause list* button next to the corresponding list entry. The *Cause List* dialog box opens displaying the detailed list of failure causes.

For further evaluation, select one or more specific causes from the list. Activate the appropriate check box of the desired entries. The *Matched Causes* dialog box opens. A list of assigned data records and their parameters will be displayed for each selected failure cause.

Evaluating the Results by Writing them in a Statistics File. The statistics created by the Analysis can be written in a statistics file. If you have configured a filter, only the data that were able to pass this filter will be stored in the file.

Supported output formats are *.txt and *.xml. You can open a statistics file from an external program that supports the formats *.txt or *.xml. For further information, refer to the appropriate topics in the Online Help.

To write the analysis in a statistics file, click the Options button of the Statistics-File processing element. The *Statistics File Option* dialog box opens.

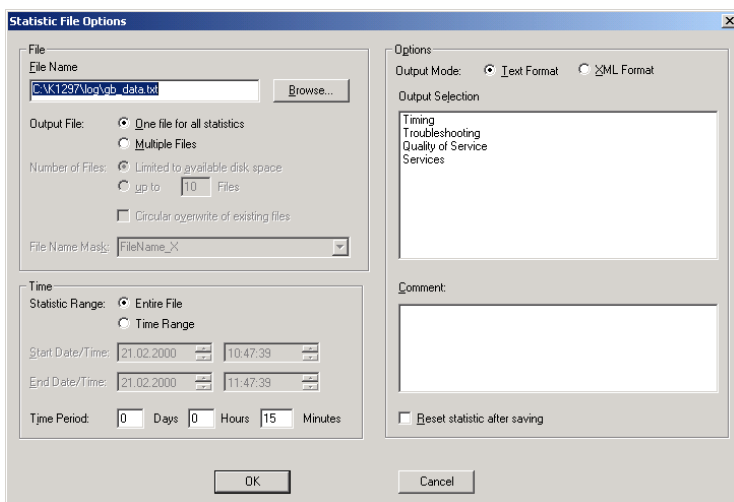


Figure 65: GPRS-Gb Analyzer, Statistics File Option dialog box

Define your desired statistics files in this dialog box. For further information, refer to the Online Help.

GPRS MM/SM Statistics

The GPRS MM/SM Statistics application provides you with an overview of GPRS mobility and session management procedures for the entire GPRS network.

This application analyzes all protocol stacks that use GMM/SM as a protocol layer.

Setting Up a GPRS MM/SM Application. To set up the application, proceed as follows:

1. Click the *Application* processing element in the pipeline.
2. Select *GPRS MM/SM Statistics*. in the *Load / Unload Monitoring Application Programs (Mon APP)* dialog box. The *GPRS MM/SM Statistics* dialog box opens.

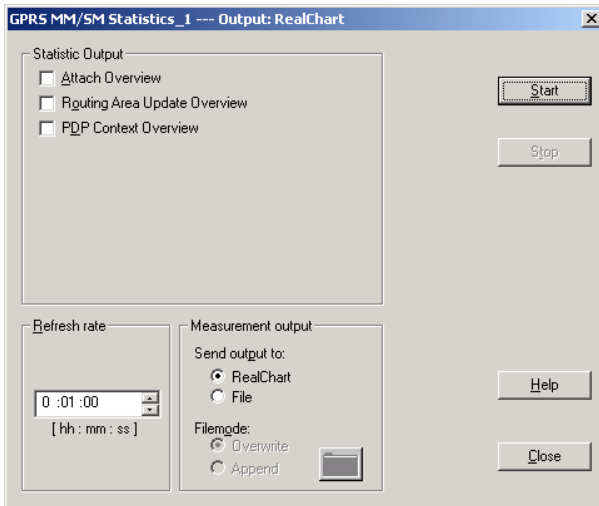


Figure 66: GPRS MM/SM Statistics dialog box

3. Determine the statistics that are to be displayed in the *Statistics Output* group box.
 - *Attach Overview* states the relation between the requested connection setups (Attach Req.) and those that are accepted (Attach Accept) or rejected (Attach Rej.). For this purpose, the MTRQ (Attach Request), ATAC (Attach Accept) and ATRJ (Attach Reject) messages are evaluated.
 - *Routing Area Update Overview* shows the temporal course of routing messages. These messages show all changes in the routing area of an MS (Mobile Station) within a GPRS network. For this purpose, the RARQ (Routing Area Update Request), RAAC (Routing Area Update Accept) and RARJ (Routing Area Update Reject) messages are evaluated.
 - *PDP Context Overview* shows the temporal course of the PDP context connections. For this purpose, the APCR/RPCA (Activate PDP Context Request/Request PDP Context Activation), APAC (Activate PDP Context Accept), APRJ/RPCR (Activate PDP Context Reject/Request PDP Context Activation Reject) and MPCA/MPCR (Modify PDP Context Accept/Modify PDP Context Request) messages are evaluated.
4. Determine a time period in which the measured values are to be read out in the *Refresh rate* field.
5. Select one of the options under *Send output to*. *Real Chart* transfers the results of the Erlang application to the RealChart tool. *File* saves the results in a *.csv (Comma Separated Value) file.
6. If you want to save the data in a file, determine whether they are to be written in a new file or in an existing one under *Filemode*.

To select location or file, click the *File* button. The *d:\k1297\log* directory opens. You can create a new *.csv file or select an existing one.
7. Confirm with **Start**.

Evaluating a GPRS MM/SM Application. You can follow the evaluation of the results in real time in the RealChart tool. After starting the application, RealChart starts up, displaying the measured values in a table. Per interval, one new table line with the current values is output.

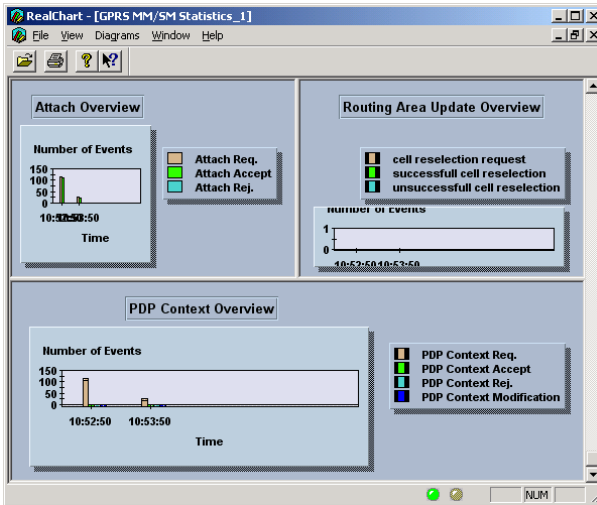


Figure 67: Evaluating a GPRS MM/SM application

The window gives you an overview of the individual protocols and messages. Three different representations are available:

- The *Attach Overview* displays the relation between the requested, accepted and rejected connection setups.
- The *Routing Area Update Overview* shows the temporal course of routing messages.
- The *PDP Context Overview* shows the temporal course of the PDP context connections.

You can choose between displaying the *Number of Events* or the data volume of data transmitted thereby in bytes (Volume of Events).

Appendix A: User Interface

This appendix describes some features of the K1297-G20 user interface, such as tool bars, menu bars, short cuts and buttons.

Common Toolbar

You can open and switch windows using the following buttons in the common toolbar:

Table A-1: Command Buttons























Button	Meaning	Button	Meaning
	Monitor Window(s)		Data Flow Window (main screen)
	Create a new MTP- based protocol stack		Create a new LAPx-based protocol stack
	Open the protocol stack editor.		Change between different protocol stack editors
	Switch between different monitor windows		Status Window
	Arrange Icons		Cascade Windows
	Tile Windows (vertical)		Tile Windows (horizontal)
	Monitor Setup		Change Column Configuration
	Show / Hide Pipeline Bar		Maximize Frame View
	Minimize Short View		Minimize Frame View
	Minimize Packet View		Go to first available frame
	Go to last available frame		Start Measurement

Table A-1: Command Buttons (Cont.)







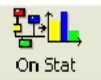


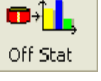



Button	Meaning	Button	Meaning
	Stop Measurement		Pause Measurement
	Display in Live Mode		Display in Ring Mode
Zoom	Activate display zoom	Unzoom	Undo display zoom
Live Mode	Display incoming frames in real-time, scroll automatically	Freeze Mode	Suppress display of incoming frames, scroll manually
 On Monit	Add Online Monitoring Pipeline	 On Record	Add Online Recording Pipeline
 On Stat	Add Online Statistics Pipeline	 Off Monit	Add Offline Monitoring Pipeline
 Off Record	Add Offline Recording Pipeline	 Off Stat	Add Offline Statistics Pipeline

Table A-2: Protocol Stack Editor

Icon	Meaning
	Call Add Protocol dialog box
	Delete Protocol from the selected protocol stack
	Call Protocol Setup dialog box

Menu Bar

This section describes functions available from the menu bar. For more information about these menus, see the Online Help.

The K1297-G20 Monitor software includes the following main menus accessible in all program situations:

Table A-3: Standard Main Menu

Menu	Function
File	Access to file functions (open, save, close, print). Access to already opened files.
View	Define display of toolbars.
Tools	Start the autoconfiguration. Access to supplementary programs (tools).
Options	Access to toolbars and window options of the K1297-G20 Monitor software.
Window	Access to currently open main windows. Commands for arranging windows on the screen.
Help	Access to K1297-G20 Monitor Online Help.

In addition, there are main menus for the program modules of the K1297-G20 Monitor software. These main menus are only displayed if the corresponding main window is in the foreground.

Table A-4: Additional Menus of the Program Modules

Window	Menu	Function
Data Flow	Scenarios	Configuration of online and offline scenarios. Adding / removing pipelines.
Protocol Stack Editor	Protocol Stack	Configuring protocol stacks. Editing protocol parameters.

Table A-4: Additional Menus of the Program Modules (Cont.)

Window	Menu	Function
Monitor	Monitor	Searching through messages. Restricting display. Setting data representation.
	Pipeline Elements	Access to the processing elements of the actual pipeline.
	Edit	Searching through messages and text messages; Copying data into the clipboard; Copying configuration of monitor window.

Context Menus

In many program situations, context menus feature the commands directly associated with an item on the screen. These context menus only appear temporarily and are closed once you have selected a command.

There are two ways of opening context menus:

- Select the relevant screen item (such as a processing element in a pipeline) and click the right mouse button.
- Select the relevant screen item and press < UP ARROW > + < F10 >.

Shortcut Keys and Buttons

Keyboard Layout

The K1297 keyboard was designed specifically for use with a measuring device and features special function keys. The function keys and key combinations are also listed in the individual Help topics.

Furthermore, you can operate the K1297 entirely via keyboard. For operators who are used to working with the mouse, the following list provides an overview of software operation if no mouse is available.

All menus, dialogs, options, lists or commands feature an underlined letter (access key). Pressing < ALT > + < ACCESS KEY > activates the desired menu, field, or function.

Table A-5: Programs and Windows

Action	Press
Switch between programs	< ALT > + < TAB >
Switch between main windows	< CTRL > + < F6 >
Switch between tabs in a main window	< CTRL > + < PAGE UP > or < CTRL > + < PAGE DOWN >
Switch between panes on a tab	< CTRL > + < TAB >
Open main menu	< ALT > + < ACCESS KEY >
Close program	< ALT > + < F4 >

Table A-6: Menus

Action	Press
Select menu	< ALT > + < ACCESS KEY >, for example, < ALT > + < W > for Window menu
Open menu	< UP ARROW > or < DOWN ARROW > + < RETURN >

Table A-6: Menus (Cont.)

Action	Press
Close menu	< ESC >
Open context menu	< UP ARROW > + < F10 >
Close context menu	< ESC >
Open system menu of main program	< ALT > + < SPACEBAR >

Table A-7: Processing Elements

Action	Press
Open the dialog of a selected processing element	< SPACEBAR >

Table A-8: Directory Trees

Action	Press
Open a directory tree level	< RIGHT ARROW > or < + >
Close a directory tree level	< LEFT ARROW > or < - >
Move cursor up / down in a directory tree	< UP ARROW > / < DOWN ARROW >

Table A-9: Dialogs

Action	Press
Select element, for example a text field	< ALT > + < ACCESS KEY >
Select next / previous field in the dialog	< TAB > / < UP ARROW > + < TAB >

Table A-9: Dialogs (Cont.)

Action	Press
Activate / deactivate check box option	< SPACEBAR >
Reverse selection of a dialog field	< ESC >
Select next element within group boxes	< DOWN ARROW >
Select previous element within group boxes	< UP ARROW>

Table A-10: Lists

Action	Press
Select entry in list boxes...	< SPACEBAR > after selecting entry using < UP ARROW > or < DOWN ARROW >
... and accept them for the input line of the list	< RETURN >
Select consecutive entries in a list	< UP ARROW > + < DOWN ARROW > or < UP ARROW > + < UP ARROW >
Select non-consecutive entries in a list	< CTRL > while selecting entry using < UP ARROW > or < DOWN ARROW > and confirm with < SPACEBAR >

Table A-11: List Boxes

Action	Press
Open	< DOWN ARROW >
Close	< ALT] + < UP ARROW]
Select entry	< DOWN ARROW] and < RETURN] to select entry

