Short Introduction for Version 2.30

Tektronix

K1205
Protocol Tester

C73000-M6076-C294-7

This document supports software version 2.30.

Contents

Contents

About this Guide

This guide helps you start using the K1205 with version 2.30 software. You should be already familiar with signaling protocols. Refer to the K1205 online help system for more information about using the K1205.

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

Explanation of the symbols and abbreviations used in this guide:

Text style	Description
->	Refers to a menu name or entry
RMC	Right mouse click
LMC	Left mouse click

Installing K1205 Version 2.30

K1205 Version Upgrade

Existing configuration files created by older versions of the K1205 software are - dependant on the stack - compatible with version 2.30. You should therefore save your configuration files before installing the new K1205 version.

K1205 Software on a PC

You can install K1205 Software on a PC running Windows 98 SE, Windows NT 4.0, or Windows 2000. You can either install the Record Viewer, which is provided on your K1205 software CD, or you can obtain the PC Monitoring Software, which has a wider range of features.

Record Viewer

The Record Viewer allows you to do the following:

- View recording files

- Print recording files

- Filter or zoom the recorded data stream

- 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 K1205 serial number and the file *keyfile.txt* [1] must be copied from the K1205 keyfile diskette to the PC.

PC Monitoring Software

The PC Monitoring Software package allows you to analyze K1103, K1205, and K1297 recording files off-line on your Windows NT or Windows 2000 PC. The software includes the full functionality of the *Offline Scenarios* pipeline and the *Record Viewer* pipeline including all standard K1205 applications, statistics, filtering, and triggering functions (refer to section *Online and Offline Pipelines*).

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[1] The file is located in C:\WINNT on your K1205

Monitoring with K1205 Version 2.30

This chapter describes most of the features of the K1205 and gives examples of how to use them.

Starting K1205 Version 2.30

After switching on the K1205 the software starts automatically (if this feature was selected during installation). You can start the K1205 software manually by double-clicking on the K1205 icon.

Status Window

The first window that opens is the *K1205 Status Window*, which displays the status of the hardware installation and the boot process.

Figure 1: K1205 Status Window

Right Mouse Click (RMC)

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.

Data Flow Window

The main window is the 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 contains a list of all the scenarios, each corresponding to a pipeline in the right part of the window. The scenarios define such things as interface, port, timeslot, and bit-rate for the connected link.
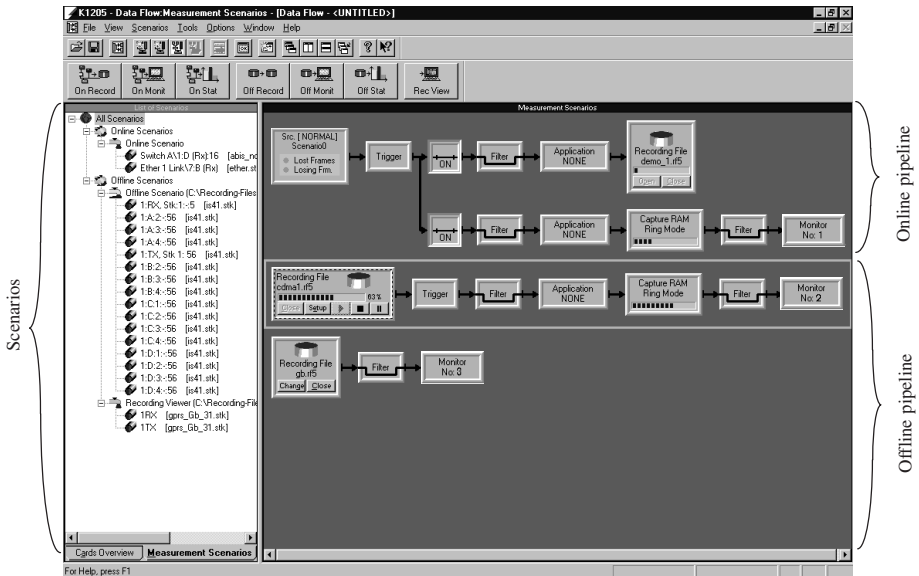
Figure 2: Data Flow window with pipelines

Online and Offline Pipelines

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

Drag and drop
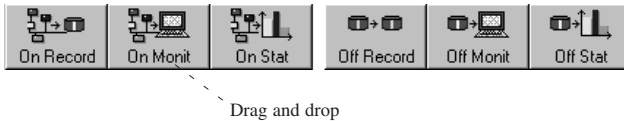
Figure 3: Pipeline buttons

Online measurements monitor live data as it is received; the K1205 is connected to the links being monitored. Offline measurements use data stored in recording files.

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*)
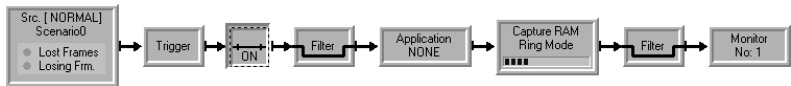
Figure 4: Online monitor pipeline switched ON

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.
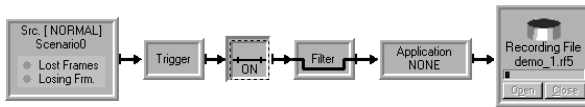
Figure 5: Online recording file pipeline switched ON

The following *Recording Write Configuration* window is displayed.
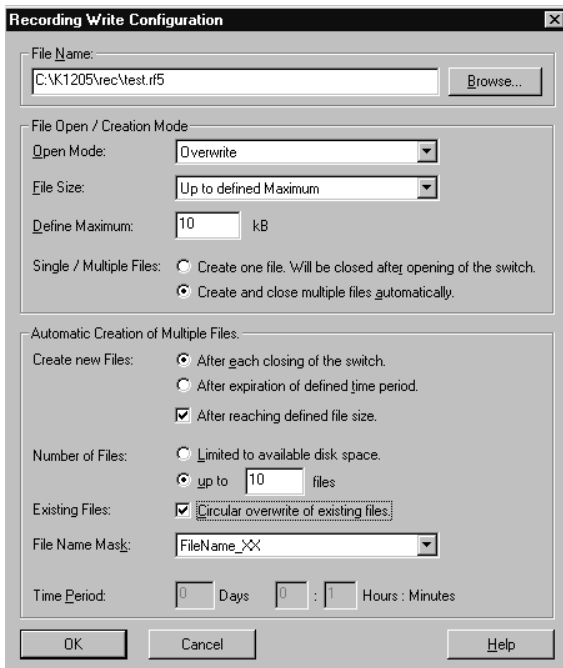
Figure 6: Recording Write Configuration window (*Multiple Files* selection)

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:\k1205\tools directory.
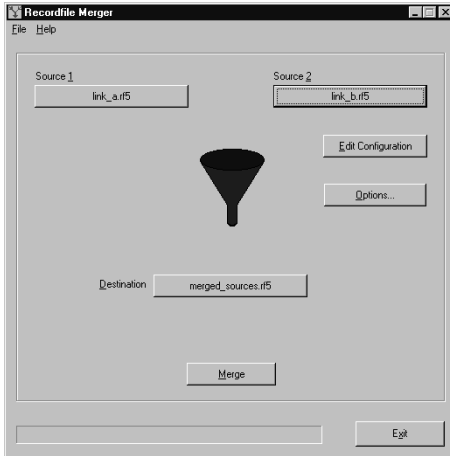
Figure 7: Recordfile Merger tool

Offine Pipelines. 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 8: 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 (.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.

Open / Close
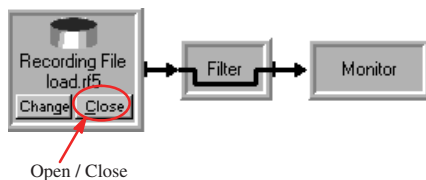
Figure 9: Record viewer pipeline

The Offline Recording 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.
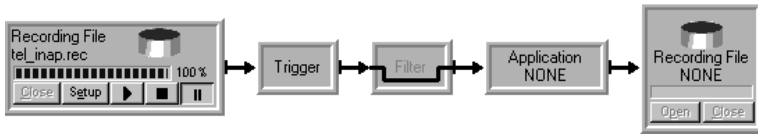
Figure 10: Offline recording pipeline

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*).
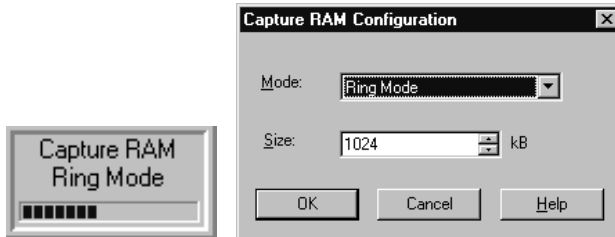
Figure 11: Capture RAM symbol and configuration

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 4096 KB (4 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 K1205 is by pressing *Autoconfiguration* after the K1205 software has started. Connected traffic to whether signalling in SS#7, LAPD / LAPV, Abis or TRAU is 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).
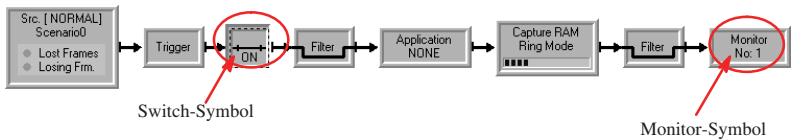
Figure 12: Monitor pipeline switched ON

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 K1205 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 K1205 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*.
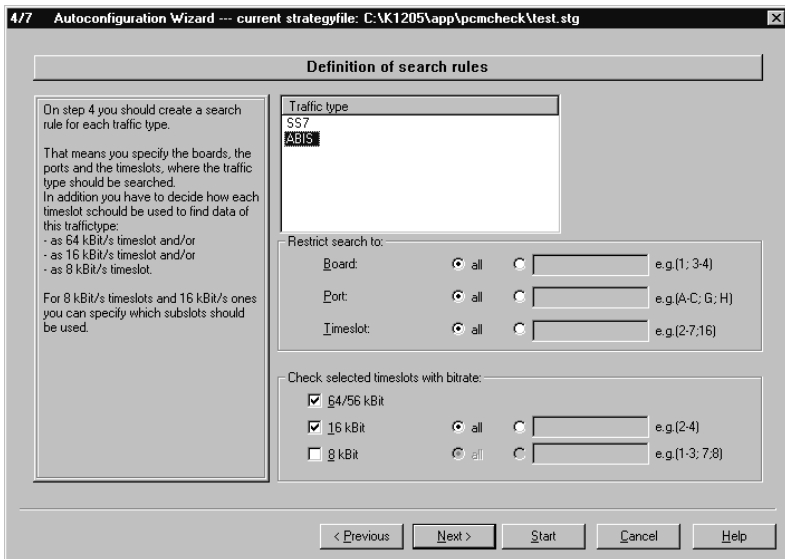
Figure 13: Autoconfiguration Wizard (one of the dialog windows)

Manual Configuration

To configure the K1205 manually, follow these general steps:

1. Switch to the *Cards Overview* in the Data Flow window (refer to Figure *Card Overview*). 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.
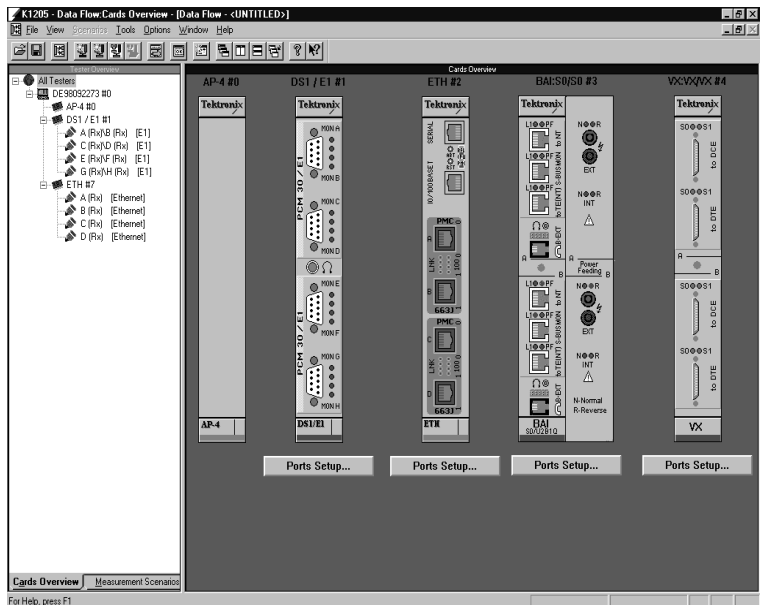
Figure 14: Card Overview window

2. Click on `Ports Setup...` to enter the dialog for the settings of the interfaces.

3. Enter the physical settings for your connected links. The dialog 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 K1205'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 K1205 Plus.*

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

The following screenshots show port configuration examples:

Figure 15: Port configuration, properties for a DS1/E1 monitoring board

Figure 16: Port configuration, properties for an Ethernet board

4. Confirm the settings and switch back to *Measurement Scenarios* (click the other small tab on the lower left part of the main screen).
Now that the ports are set up, the K1205 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 *Logical Link Setup*) for the *Logical Link Setup* dialog window.

Figure 17: Logical Link Setup

The dialog window 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>.
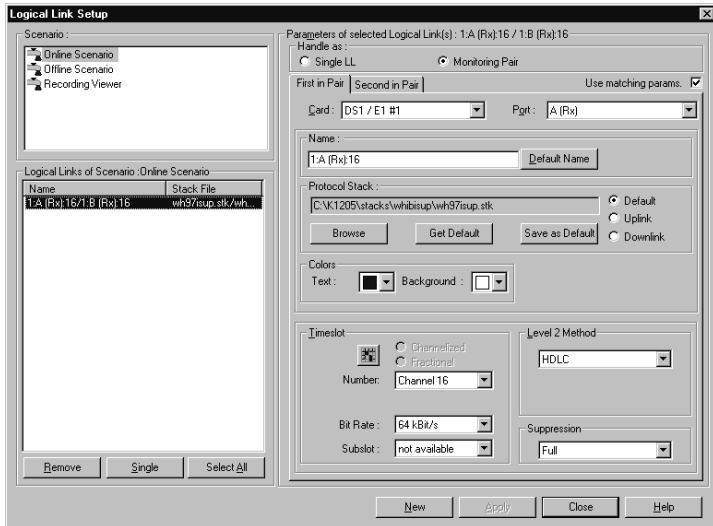
Figure 18: Logical Link configuration, example for a DS1/E1 interface
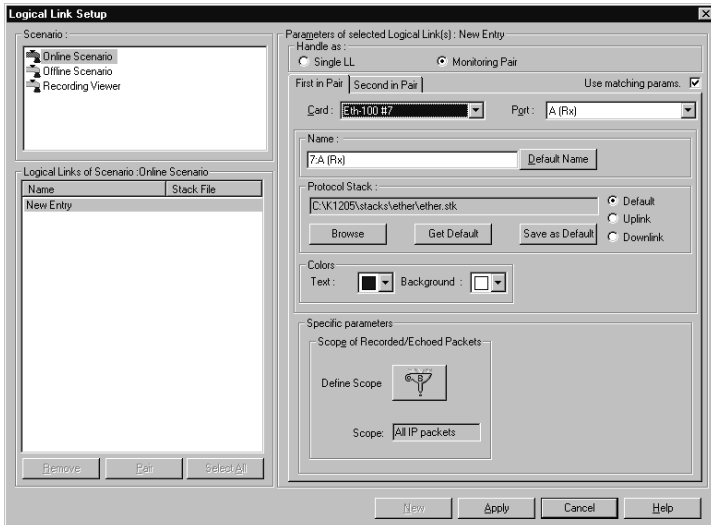
Figure 19: Logical Link configuration, example for an Ethernet board

Figure 20: 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 ▭ Monitor No: 1

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 opens and the *c:\k1205\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 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 appears, and the directory *c:\k1205\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 K1205 will restart (such as after a power failure) with the <u>last saved configuration</u> (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 K1205.

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 K1205 after a power failure, select* Start the K1205 application at every system start-up *in the K1205 setup program. This copies the K1205 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 titelbar 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 21: 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 (shortkey *CTRL+9>*)

- Medium 1,2...: display some protocol parameters (shortkeys *<CTRL+1, CTRL+2>*)

- Layer Only: reduced representation (shortkey *<CTRL+0>*)

- Hidden: no protocol parameters displayed

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

3. Confirm your settings with *OK*.

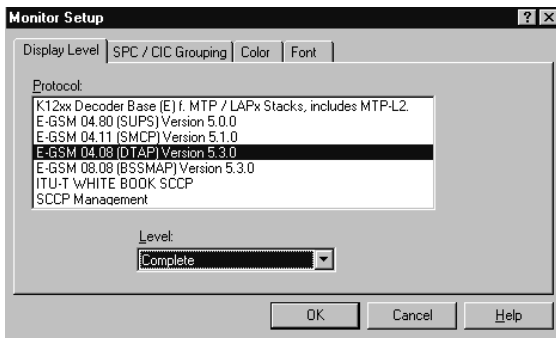**NOTE**. *The display level setting for a specific protocol is applied to all open* Monitor *windosw.*

Figure 22: Display Level window

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 K1205, 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/D/16	SCCP	DT1	DTAP	IDRES				
11:46:57,873,841	1/C/16	SCCP	DT1	DTAP	CMSACC				
11:46:57,873,989	1/B/16	SCCP	DT1	DTAP	CMSACC				
11:46:57,882,333	1/A/16	SCCP	DT1	DTAP	REG	SUPS	SS		
11:46:57,882,398	1/D/16	SCCP	DT1	DTAP	REG	SUPS	SS		
11:46:57,892,592	1/C/16	SCCP	DT1	DTAP	RELC	SUPS	SS		
11:46:57,892,740	1/B/16	SCCP	DT1	DTAP	RELC	SUPS	SS		
11:46:57,896,093	1/C/16	SCCP	DT1	BSSM	CLCMD				Call control
11:46:57,896,226	1/B/16	SCCP	DT1	BSSM	CLCMD				Call control
11:46:57,899,834	1/A/16	SCCP	DT1	BSSM	CLCMP				
11:46:57,899,890	1/D/16	SCCP	DT1	BSSM	CLCMP				
11:46:57,912,332	1/A/16	SCCP	DT1	DTAP	SETUP			01779001333	
11:46:57,912,398	1/D/16	SCCP	DT1	DTAP	SETUP			01779001333	
11:46:57,927,835	1/A/16	SCCP	DT1	BSSM	ASCMP				
11:46:57,927,890	1/D/16	SCCP	DT1	BSSM	ASCMP				
11:46:57,935,579	1/A/16	SCCP	CR	BSSM	CL3I	DTAP	CMSREQ		
11:46:57,935,636	1/D/16	SCCP	CR	BSSM	CL3I	DTAP	CMSREQ		
11:46:57,952,462	1/A/16	SCCP	DT1	DTAP	IDRES				
11:46:57,952,520	1/D/16	SCCP	DT1	DTAP	IDRES				
11:46:57,958,221	1/C/16	SCCP	DT1	DTAP	CMSACC				
11:46:57,958,369	1/B/16	SCCP	DT1	DTAP	CMSACC				

Figure 23: 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.
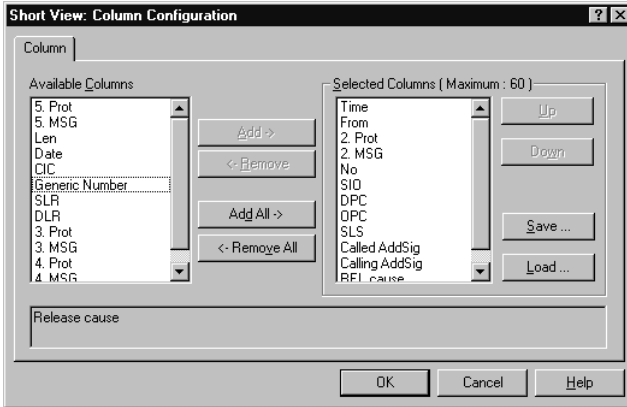

Figure 24: Column Configuration for Short View

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 flexiblity 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_PROC	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 25: Zoom results

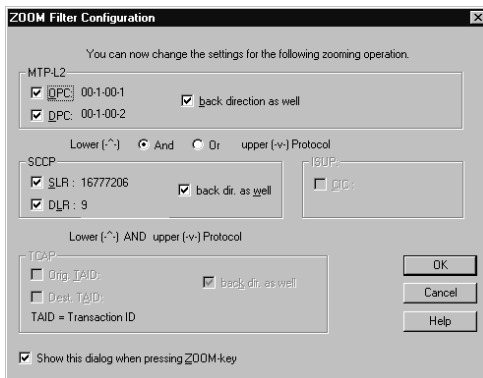Depending on the protocol a window opens for setting the zoom parameters:

Figure 26: ZOOM Filter Configuration window

SPC/CIC Grouping

Using the K1205 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*.
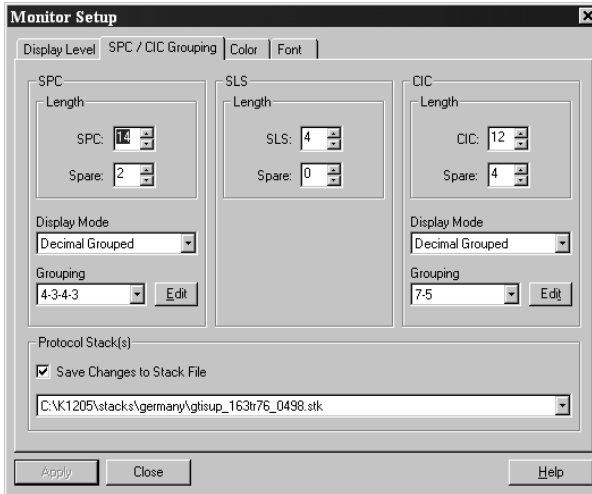
Figure 27: SPC/CIC Grouping definition

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 K1205 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.*
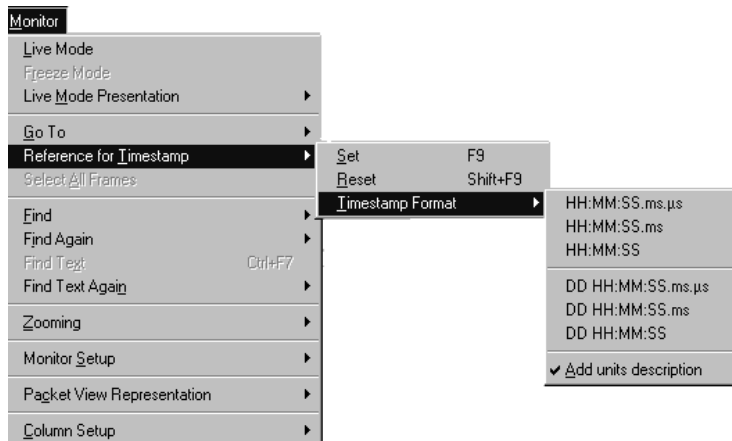

Timestamps

The K1205 assigns a time stamp to each event received, indicating the time of reception. The stamp has the format *hh:mm:ss:ms:*μ*s*. 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 28: 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.

Figure 29: Timestamp data

The *Time difference* field indicates the difference in *hh:mm:ss:ms:*μ*s*. 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 K1205 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 dialog 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.
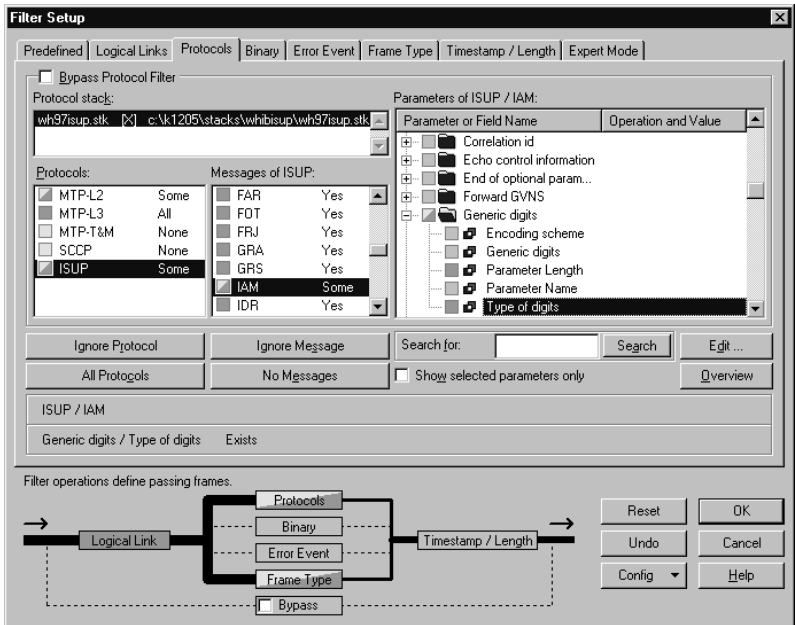

Figure 30: Filter Setup, Protocols tab

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 is <u>unchecked</u>.
   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.
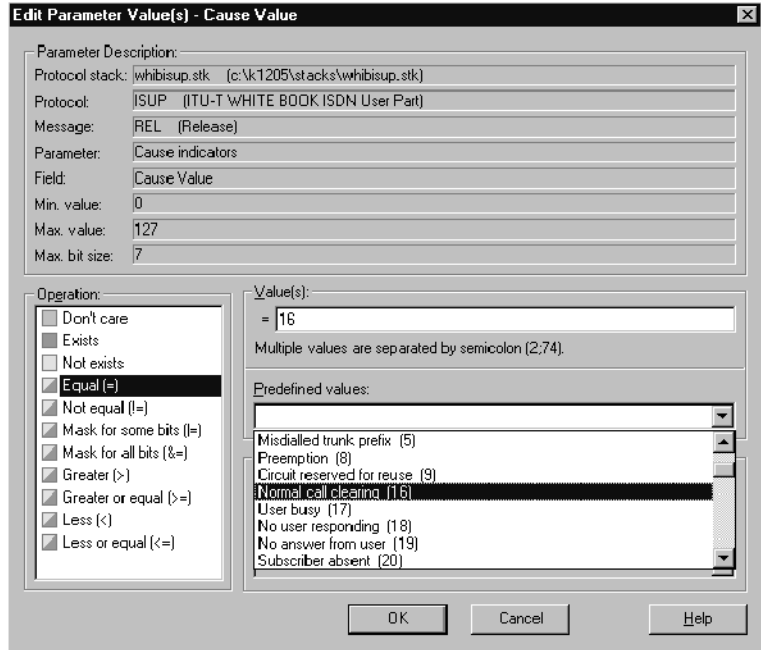
Figure 31: Edit filter parameter values

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.

K1205 version 2.30 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.
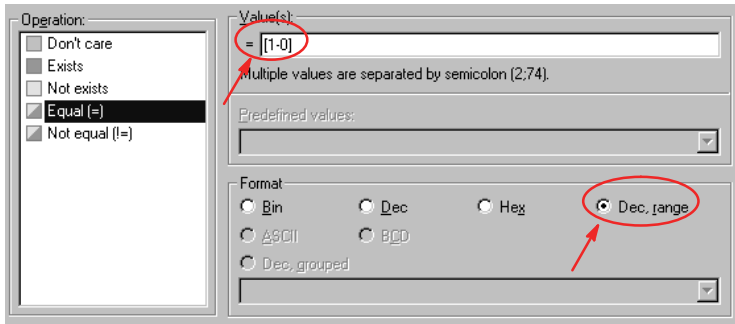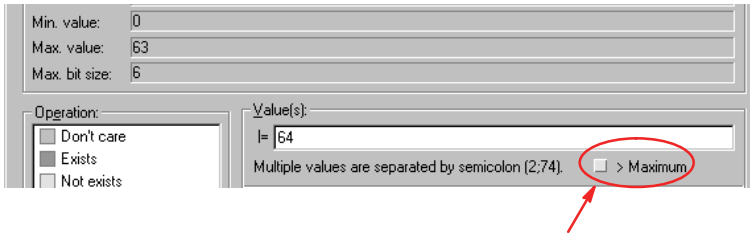

Figure 32: Editing value ranges

To enter parameters of MAC, IP4 , and IP6 in grouping format as shown in figure 33 below.

Figure 33: Editing values in *Hex, grouped* format

K1205 version 2.30 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 34: 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.

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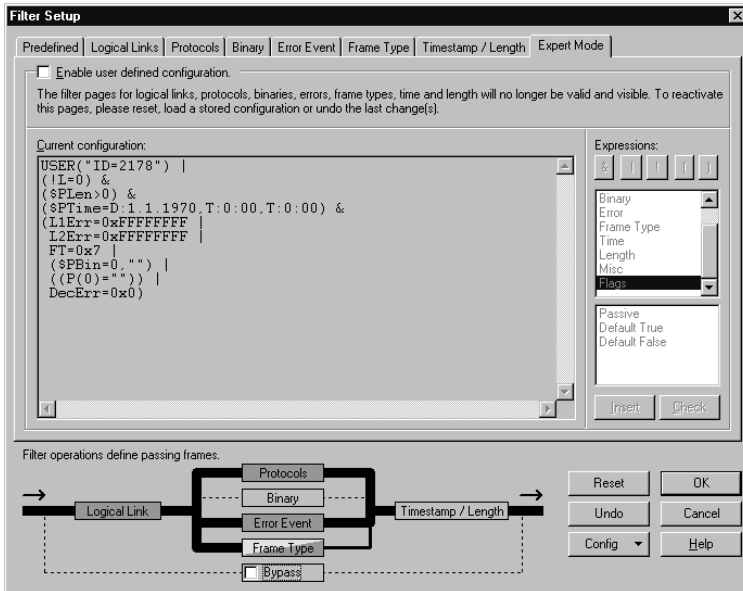To quickly activate /deactivate the *Bypass* function, press *<CTRL + b>*.

NOTE. *Filters are set to* Bypass *by default. This allows the K1205 the fastest operation. To activate a filter, make sure the* Bypass *box is* unchecked.

Expert Mode

Figure 35: Filter Setup tab Expert Mode

The new *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.*
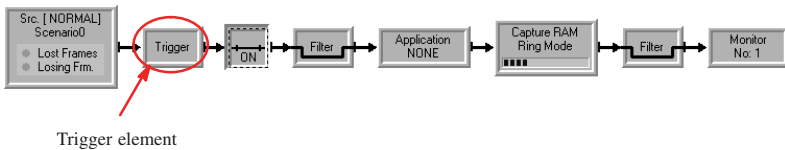
Trigger

You can use the 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 36: 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 as follows:
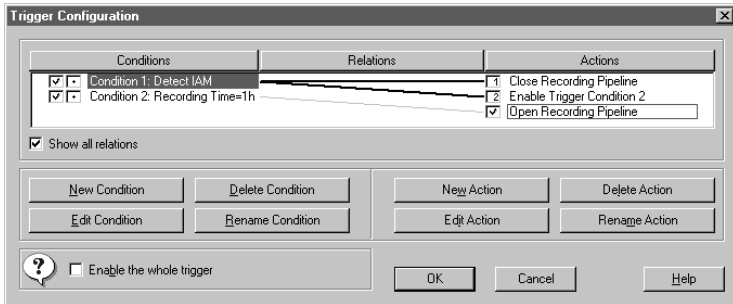
Figure 37: Trigger Configuration

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.
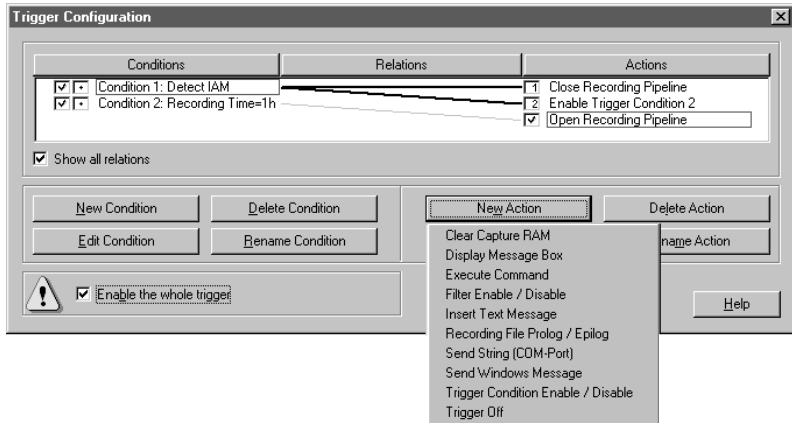

Figure 38: Trigger configuration

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 K1205 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 (e.g. all calls to Germany).

- CallTrace / Sequencer
  Traces and recognizes calls on the basis of a partially specified or complete call number.

- Decipher
  Enables you to decode online an offline ciphered data on GPRS Gb interface by recognition of IMSI and Kc parameters. For further details, see section *GPRS Monitoring / Decipher*.

- GPRS Gb Mon:
  Creates an extensive statistical analysis of calls on GPRS protocols. For further details, see section *GPRS Monitoring / GPRS Gb Mon*.

- GPRS MM/SM Statistics
  Classifies and counts the received signalling data. For further details, see section *GPRS Monitoring / GPRS MM/SM Statistics*.

- 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 K1205 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 Suppression
  Enables you to filter out repeated MSUs by means of the preventive cyclic retransmission procedure.

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

- Statistic
  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:

- BHCA - Busy Hour Call Attempts:
  Counts the call attemps 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.

- TCA - 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 K1205 are located in the *c:\k1205\app* directory.

1. Start any application by pressing the *Application* pipeline element, selecting the desired function, and pressing *OK*.
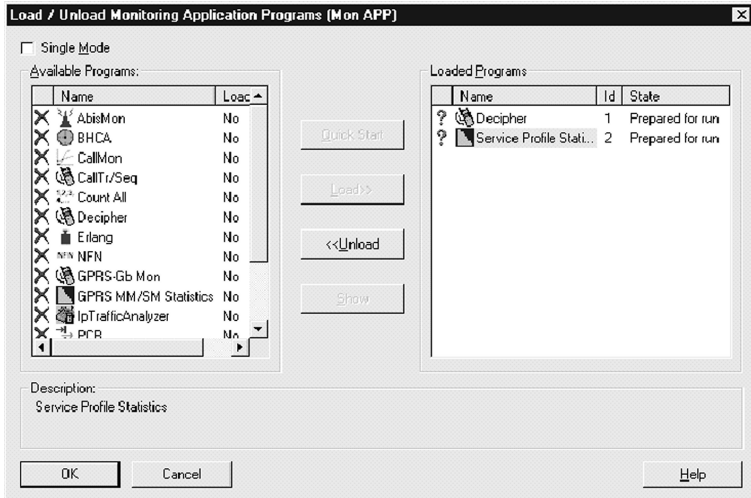
Figure 39: Load / Unload Application Programs

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*.

Abis Monitor (AbisMon)

This application gives a statistical evaluation of the Measurement Report messages on the Abis-Interface.

 AbisMon

AbisMon monitors the parameters of the Abis-Interface, such as RXLEV, RXQUAL, MS/BTS Power, and creates graphical results such as Coverage, Interference, Island.
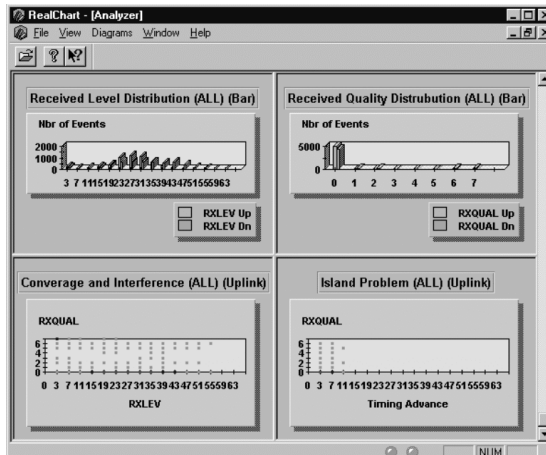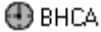

Figure 40: Abis Monitor results

Busy Hour Call Attempt Statistics

BHCA

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.

CallMon (Traffic and Call Analysis)

This application creates an extensive statistical analysis of calls for ISUP, TUP, ISDN, and Abis protocols.

CallMon

CallMon 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
1	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
2	01.01.70	00:00:00	*	0	0	0	0	0	0	0	0	0	0	0
3	26.02.98	11:25:11	*	110	0	110	0	0	0	0	100	100	100	0

Figure 41: 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.

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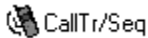
Select this application (*LMC* on *Application* in the Pipeline), click on the appropriate protocol, and choose the desired number, parameter, or values (such as *CalledPartyNumber*, *TMSI*, *Release Cause*, etc.) depending on the protocol used.
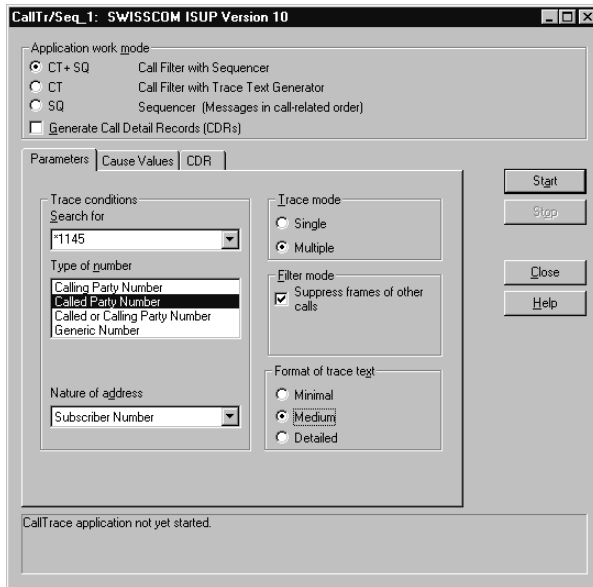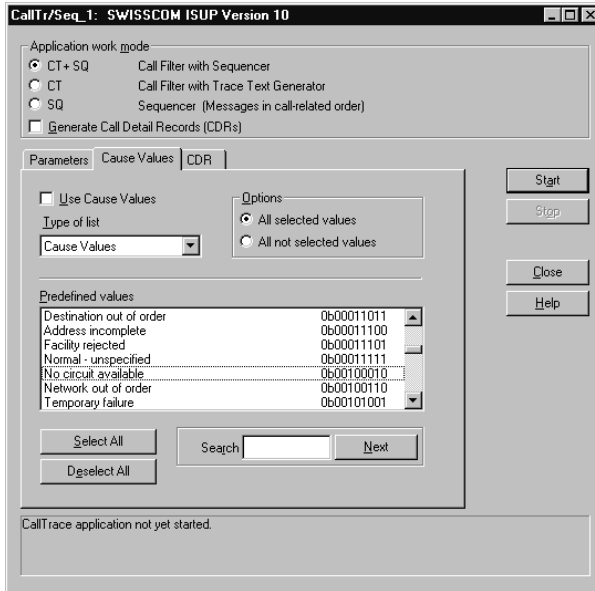

Figure 42: SWISSCOM ISUP Calltrace

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 43: 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:

```
                                          Short View
 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            BSSM        CL3I          DT
 15:05:35,096,764  [1] A (Rx):16:-:64  SCCP   CC            DTAP        CMSACC
 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] B (Rx):16:-:64  SCCP   DT1           DTAP        CPROC
 15:05:35,157,502  [1] A (Rx):16:-:64  SCCP   DT1           BSSM        ASREQ
 15:05:35,192,826  [1] B (Rx):16:-:64  SCCP   DT1           BSSM        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        RELEAS
 15:06:27,278,756  [1] B (Rx):16:-:64  SCCP   DT1           DTAP        RELCMP
 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 Numb er
 15:06:27,299,572  [1] A (Rx):16:-:64  SCCP   DT1           BSSM        CLCMD
 15:06:27,319,882  [1] B (Rx):16:-:64  SCCP   DT1           BSSM        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            BSSM        CL3I          DT
 15:07:00,131,119  [1] B (Rx):16:-:64  SCCP   CC            DTAP        CMSACC
⇨15:07:00,135,364  [1] A (Rx):16:-:64  SCCP   DT1           DTAP        TRCMD
```

Figure 44: Example of a calltrace-result (detail)

Sequencer Application. The *Sequencer* application of the K1205 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:\K1205\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.*
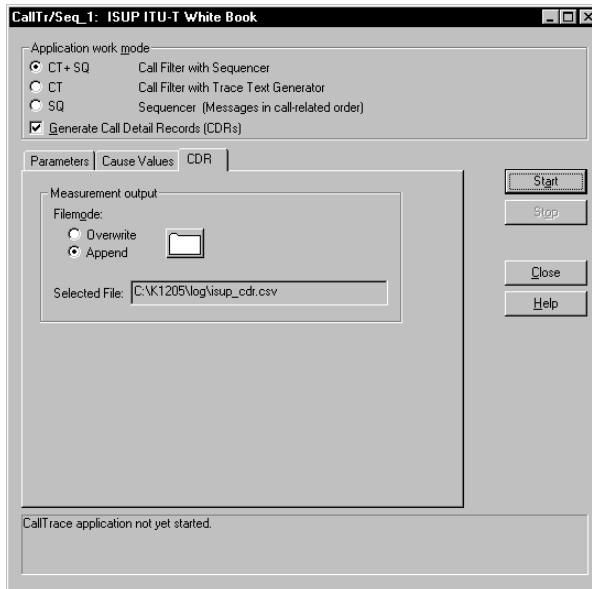
Figure 45: CDR tab

Count All

This application counts all the received messages and sorts them according to protocol and message type.

 Count All

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 46: 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 47: Count All results for a specific protocol (ISUP)

Erlang Measurements

 Erlang

This application calculates the load for each logical link of the pipeline.

IP Traffic Analyzer

 IpTrafficAnalyzer

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
```
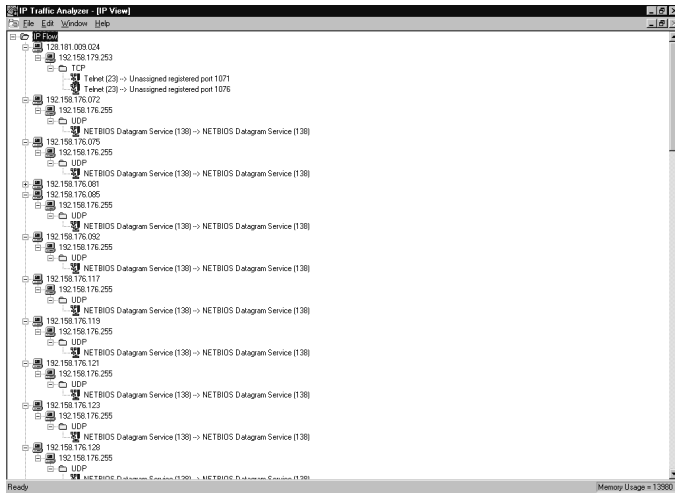
Figure 48: IP Traffic Analyzer - [IP View]

Nortel Frame Number

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

NFN NFN

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 (BF)

- 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 Suppression

The *PCR Suppression* application enables you to filter out repeated MSUs from an offline pipeline by means of the PCR procedure (preventive cyclic retransmission).

PCR

You may want to remove these messages in order to obtain a smaller amount of data consisting of relevant data. 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 used in a network. Open the *Application* Window in the pipeline with *LMC*, and select *Service Profile Statistics.*

Service Profile Statistics

The availability of the specific protocol layer, i.e. either TCP or UDP, in the protocol stack is a condition for the use of the application.

Determine the statistics to be displayed in the *Service Profile Statistics* output dialog box. To add or modify services to the *Statistic Output* list, press *Select output ... . The Service Profile Output Configuration* window appears.
Select the desired service from the *Available Services* list on the left and press *Add*. The new service to be measured will now appear in the *Selected Services* list on the right.
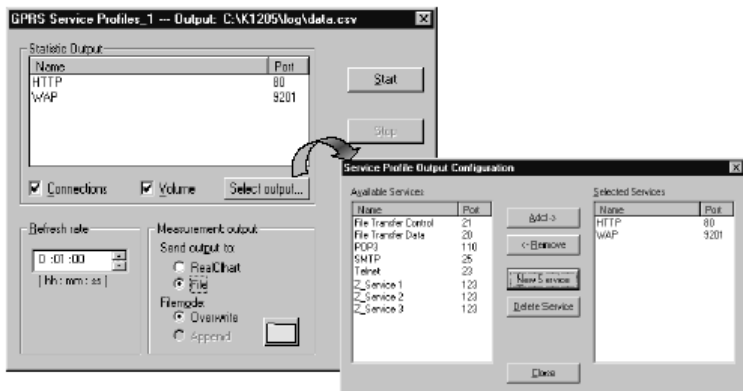
Figure 49: Service Profiles Configuration

Statistic

In the *Statistic* setup you can define your own counters based on specific protocols, logical links, errors, and/or frame lengths. Open the *Application* Window in the pipeline with *LMC*, and select *Statistic*.
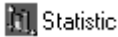
⚏ Statistic

The *Statistic* 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 *Statistic* 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 K1205 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.

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.
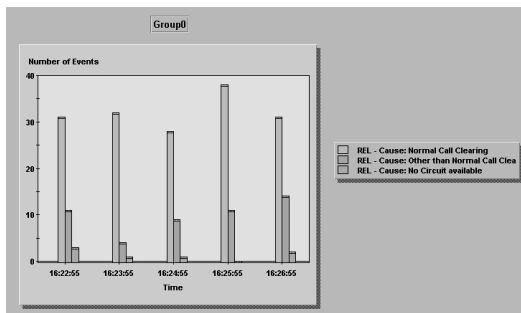
Figure 50: One of several output formats of the Statistics application

TCA - 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.

 TCA

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.

   Two lists in the TCA dialog 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.
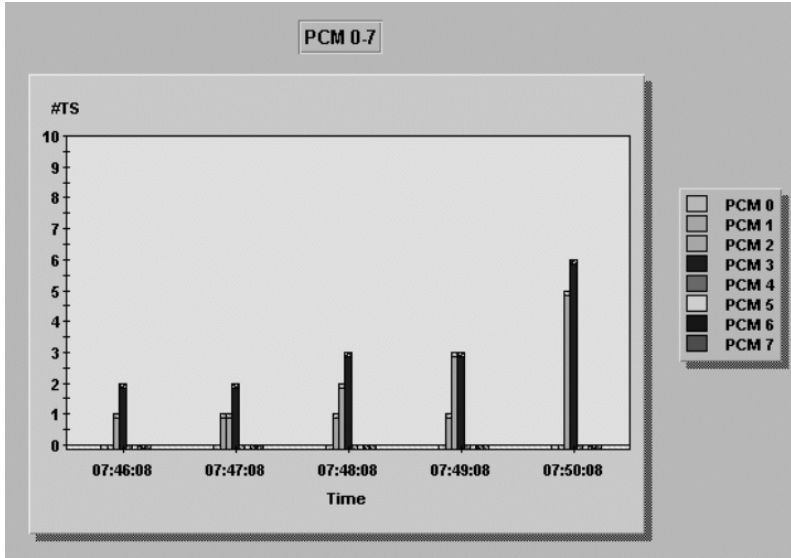
Figure 51: TCA output of Max. used channels

Tools

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*.
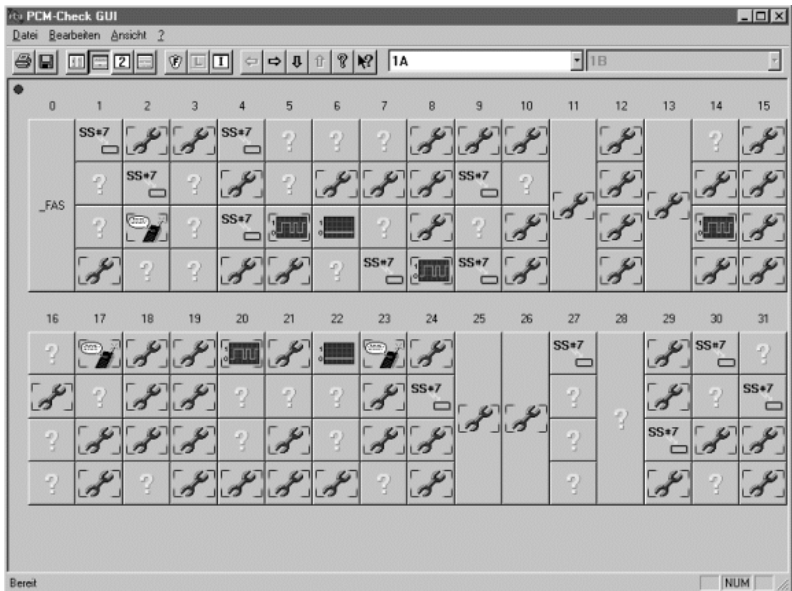
Figure 52: PCM Check

The *PCM Check* is useful only if the K1205 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 K1205 Help application.

Load-Meter

While running measurements, you can use the *Load-Meter* program which provides capacity usage information on individual K1205 interfaces and the PC card.

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

Figure 53: Load-Meter

*NOTE. If several interface cards are installed on the K1205, 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.*

GPRS Monitoring

Features

K1205 v2.30 provides the following features:

- Deciphering on GPRS Gb- interface (up to 1000 subscribers)

- Extensive GPRS statistics (network/cell-, subscriber-, service- based)

- Measurement of QoS parameters (delay, throughput)

- GPRS call trace capability on Gb-, Gn-, Gp-, Gr-, Gc- interface

- Monitoring of all GPRS Gx-interface (Gb, Gn, Gi, Gs, Gr, Gf, Gc, Gd, Ga)

- Monitoring of a huge number of vendor specific GPRS Abis interfaces (Alcatel, Ericsson, Lucent, Motorola, Nokia, Nortel, Siemens)

- Monitoring of all protocol layers regarding signaling and transmission plane including a huge number of protocol versions of Rel. 97, Rel. 98 and Rel. 99

- Technology Interworking

General

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:\k1205\stacks\gprs* and *C:\K1205\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.
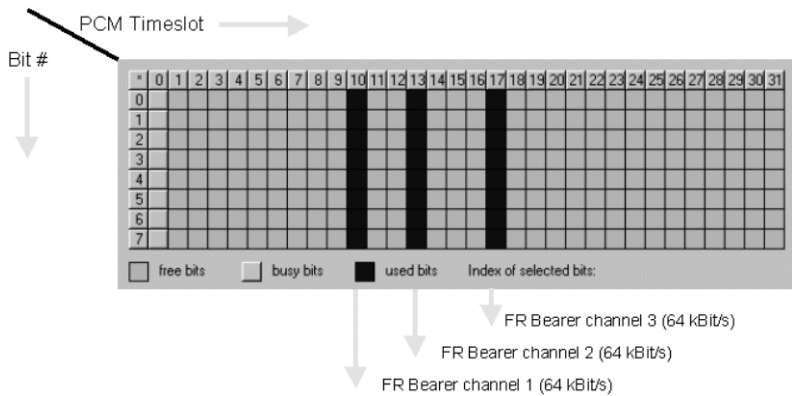
Unchannelized Mode. The complete PCM line forms a Frame Relay Bearer channel offering a bit rate of 1984 bit/s for E1 lines (31 times 64 kBit/s, timeslot 0 is used for synchronization) and 1536 kBit/s for DS1 lines.
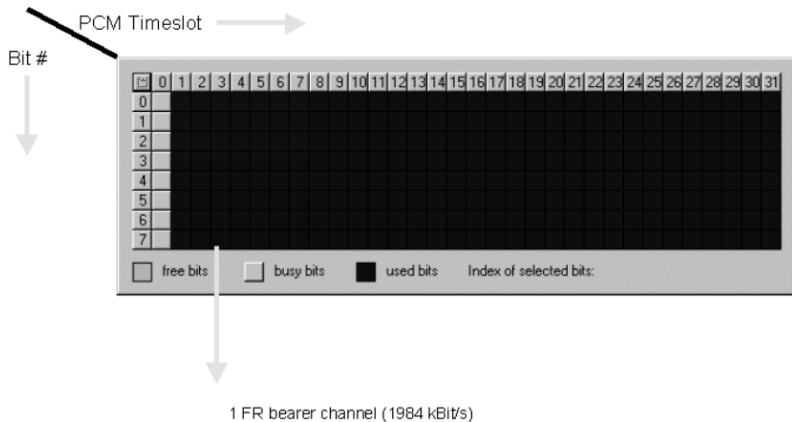
Fractional Mode. Using the fractional mode, any bit combination may be used to build a Frame Relay Bearer channel.

1 FR bearer channel (xyz kBit/s)
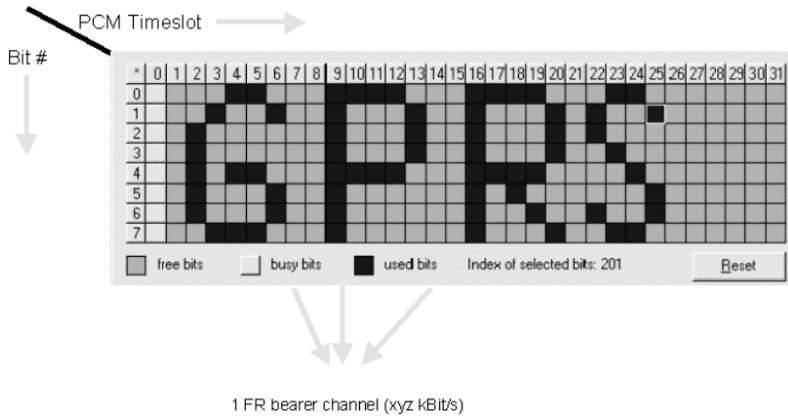
The K1205 does support all of these three Frame Relay modes. In order to be able to monitor an Unchannelized or Fractional Frame Relay connection, each card / interface has to be configured for the so called *Special Mode*.

1. Therefore select menu item *DS1/E1 Default Start Mode* from the *Tools* menu.
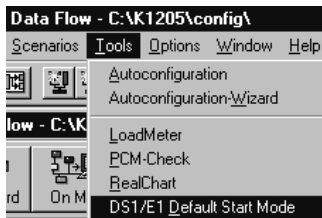
The following dialog appears:
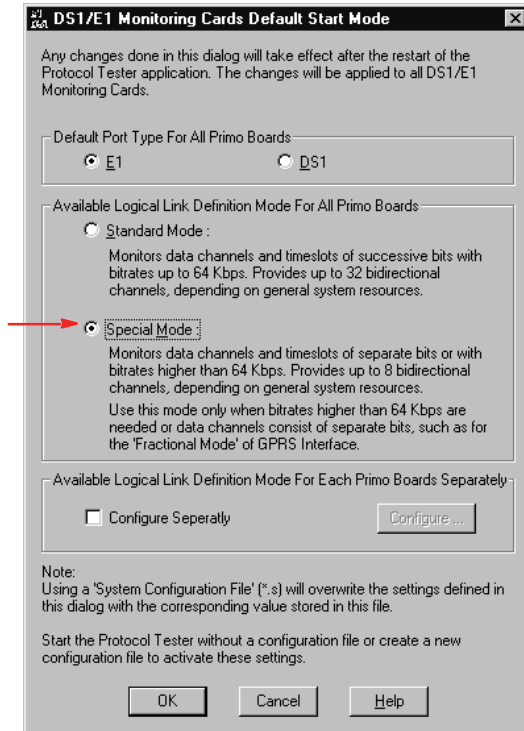
2. Select the *Special Mode*, press the *OK* button, quit the K1205 application, and start it again.

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. To change the cards back to the *Standard Mode*, simply change the setting in the dialog and restart the K1205 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

K1205 V 2.30 includes the following new features for GPRS measurements:

- Deciphering on GPRS Gb interface

- Extensive GPRS statistics (network/cell-, subscriber-, service- based)

- Call Trace on different GPRS interfaces

- GPRS Monitoring of all GPRS Gx interfaces

Decipher (Deciphering on GPRS Gb Interface)

The deciphering application on K1205 enables you to decode online and offline ciphered by recognition of IMSI and Kc parameters.

Decipher

Transmission of ciphered data between GPRS terminals and the network is becoming more and more crucial for GPRS network operators. Whenever enciphering is switched on in GPRS networks all signaling data and payload above the protocol layer Logical Link Control (LLC) are encrypted. The deciphering application on K1205 enables you to decipher these data and thus carry out analysis and processing of all data above the LLC protocol layer.

GPRS Encryption Algorithm 1 and GEA 2 are supported. Deciphering can be run both in online and offline mode. The deciphering solution supports 3 operation modes:

- Full Automatic Mode
  Automatic recognition of up to 1000 IMSIs and their corresponding Kc value(s) at the same time.

- Half Automatic Mode
  Automatic recognition of all Kc value(s) after manual input of up to 1000 IMSIs.

- Manual Mode
  Manual input of up to 1000 IMSIs and their corresponding Kc value(s).

The diagram below shows configuration of *Half Automatic Mode* in the *Decipher* configuration box:

Service Profile Statistics

The *Service Profile Statistic* application displays an overview on the actually used services in a GPRS network (e.g. HTTP, FTP, WAP).

 Service Profile Statistics

For further details, see section *Applications / Service Profile Statistics*.

GPRS MM/SM Statistics

The application *GPRS MM/SM Statistics* provides statistical information on attaches, PDP context procedures and service profiles on the GPRS Gb interface.

The selectable statistical output depends on specific layers in the protocol stack: Both *Attach Overview* and *PDP Context Overview* require that the GMMSM layer is part of the stack, *Service Profiles* requires the TCP layer. Results can be displayed using *Real Chart* or can be stored in a *.csv-file*
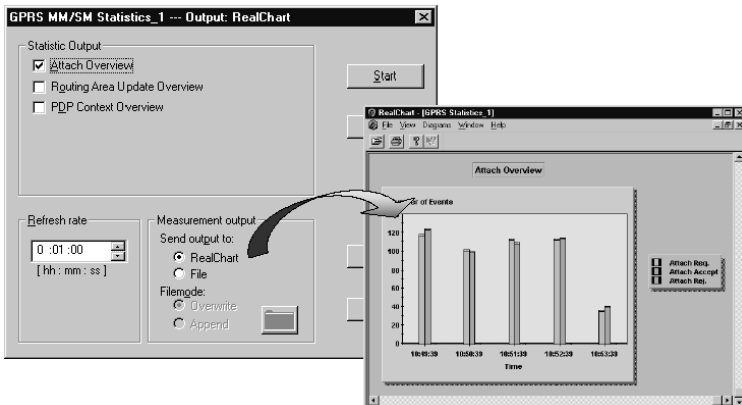
- Attach Overview states the relation between the requested connection setups (attach request) and those that are accepted (attach access) or rejected (attach reject).

- PDP Context Overview shows the temporal course of the PDP context connections. The following values are displayed: PDP context request, PDP context accept, PDP context reject, PDP context modification.

- Service Profiles show, in the temporal course, which, and to extent, services are demanded. The following services can be displayed: WAP, SMTP, POP3, HTTP, FTP.

GPRS-Gb Mon

This application gives you detailed information about all attach / detach procedures and PDP context procedures. Results are displayed in a *Session Overview* window and can be stored in a *.csv-file.*

 GPRS-Gb Mon
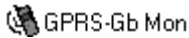
Session Overview displays the following settings for each event: Number (No.), Temporary Logical Link identity (TLLI), International Mobile Subscriber Identity (IMSI), International Mobile Subscriber Identity (IMSI), Temporary Mobile Subscriber Identity (TMSI), Packet TMSI (PTMSI), Connection State, Source IP Address, Destination IP Address, PDP Contexts, Current Cell ID.

Further details of a selected event are shown in the *Detail View* window.

Calltrace Capability on Gb, Gn, Gp, Gr, and Gc Interfaces

 CallTr/Seq

While monitoring different interfaces of a GPRS network, it is often necessary to limit the data stream to the information from only one or a group of subscribers. Powerful calltraces on GPRS interfaces provide this possibility. GPRS calltraces are now possible on the follwing interfaces:

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

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

Appendix A: Command Buttons

Table A–1: Command Buttons

Button	Meaning	Button	Meaning
	Data Flow Window (main screen)		Protocol Stack(s)
	Monitor Window(s)		
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
	Maximize Frame View		Minimize Short View
	Minimize Frame View		Minimize Packet View
	Display in Live Mode		Display in Ring Mode
	Arrange Icons		Cascade Windows
	Tile Windows (vertical)		Tile Windows (horizontal)
	Show / Hide Pipeline Bar		Status Window
	Monitor Setup		Change Column Configuration
	Go to first available frame		Go to last available frame

Table A–1: Command Buttons (Cont.)

Button	Meaning	Button	Meaning
▶	Start Measurement	■	Stop Measurement
❚❚	Pause Measurement		