Acterna 8631

Telecom Protocol Analyzer

The Acterna 8631 is a protocol analyzer based on a PCMCIA card that can be plugged in any standard notebook. It is used for testing of all fixed interfaces of mobile radio networks, access networks and SS#7 networks.

It offers powerful applications for detailed analysis and statistical evaluation of signaling information on-line and off-line and that makes it the ideal solution for maintenance and troubleshooting testers in the field.

Highlights

- Maximum mobility: Notebook PC with PCMCIA type II card allows measurements to be made anywhere.
- Open concept: Uses your existing notebook PC.
- Capacity: One E1/T1 PCM interface can be monitored.
- Protocol analysis/monitor:
  - Simultaneous monitoring on various interfaces (multi protocol capability)
  - Operation simplified by auto configuration and selectable depth of protocol decode display
- Capture files exchangeable with 863x Telecom Protocol Analyzer
- Same GUI, same handling as 8630 Telecom Protocol Analyzer

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Protocol Analyzer Application

These features are the same for on-line and off-line usage.

Protocol viewer

The protocol viewer is the main function of the analyzer. In summary and detail view the decoded information of the monitored link is displayed.

Summary view

This window provides:

- One event per line
- Event parameters listed in columns per default: Direction, physical link (trunk, timeslot), logical link, call identifier, message contents, timestamp
- Hiding and unhiding of columns
- User preferences for customizing the summary view:
  - Timestamp format
  - Font
  - Display depth of “message contents” column: user-definable suppression of less relevant information at protocol level, message level, message level and information element level)
  - Protocol identification: different colors for different protocols
  - Signaling point code/circuit identification code display selectable (names, hex, decimal)
- User definable columns: order of columns selectable
  Columns displaying user-defined information can be added
- Settings can be saved for future operation depending on user and point of measure

Detail view

This window provides:

- Complete plain text and parametric decoding of all messages and information elements
- Binary view
- Hex view
- User preferences for customizing the detail view
  - Display depth: User definable suppression of less relevant information at protocol level, message level, and information element level
  - Binary view on/off
  - Timestamp format
  - Font
  - Protocol identification: different colors for different protocols
  - Signaling point code/circuit identification code display selectable (names, hex, decimal)
  - Hex view font and color settings
  - Settings can be saved

“Find” function

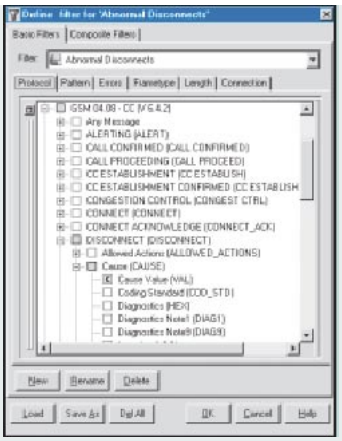
In a huge amount of data this feature helps quick and easy location of any specified parameter below.

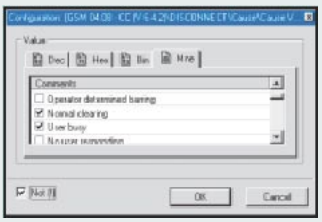
- Protocol messages, information elements and information element contents (e.g. calling party number)
- Frame number
- Date/time

Filter

With filters down to bit level the displayed information is custom tailored and reduced to what is of main interest for the user.

- Filter categories:
  - Protocol filter: on all protocol layers, at message level, information elements level, down to information element contents level (decimal, binary or mnemonic values).
  - Link filter
  - Error filter
  - Frame type filter
  - Pattern filter
  - Length filter
- Filters can be combined logically using the operators AND, OR, NOT
- Short cut buttons for frequently used filters grouped as:
  - Suppress filters
  - Show filters
- Filter conditions can be saved





Data export

Frames in summary and detail view can be marked to:

- Export marked frames to ASCII
- Export marked frames to CSV
- Export marked frames to binary (8630 and MA-10 format)

Call trace

By one mouse click the call trace assembles the signaling information related to one specific call/session and displays it in a separate window.

- Can be activated for message selected in the summary view or detail view
- Can be triggered (depending on protocols) by called/ calling party number, called+calling party number, original number, redirecting number, redirection number, called/calling SCCP number, called+calling SCCP number, IMSI, TMSI, SCCP number
- Three different call trace windows can be displayed:
  - Call trace result window
  - Graphical window (A_{bis} only)
  - Tabular call trace window (A_{bis} only)
- Simultaneous graphical view for call trace on A_{bis} interface of up to 5 parameters (axes are scalable):
  - RxLev (for BTS, MS and neighbor cells)
  - RxQual (for BTS and MS)
  - Timing Advance
  - MS Power (in dBm)
  - BS Power (in dB)

Call data records

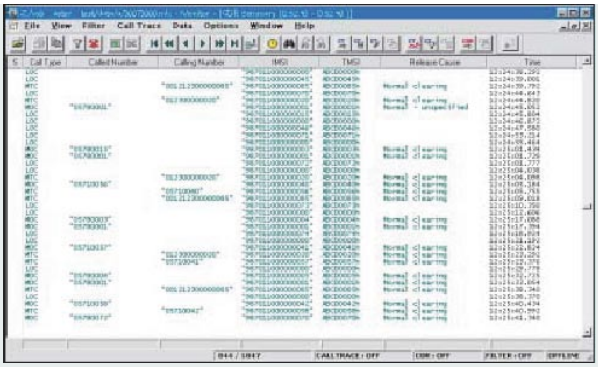
Call data records show a summary of main information of all calls/sessions at a glance. The tabular overview provides the user with parameters on "per call" basis.

- Created on-line and off-line
- Expansion of a CDR contains all frames of a call (call trace)/session (session trace based on a PDP context).
- Contain following information elements per call:
  - Start time
  - Duration
  - Stop time
  - Status of call
- Can optionally contain:
  - Called/calling party number
  - Original/redirecting/redirection number
  - Release cause
  - Call type
  - Transmission medium requested
  - IMSI, TMSI, BVCI, TLLI, ...
- User-defined columns as in the summary view can be added
- Columns can be hidden or changed in order
- Filters on CDR information elements possible
- Event counters on CDR information elements possible

Event Counter

Event Counters are a powerful and flexible tool which supports the user in reporting as well as troubleshooting tasks. Any event can be defined for counting. By setting thresholds to a maximum or minimum level, the occurrence of critical numbers of events are easily determined and corrective actions can be taken.

- Identical for on-line (real-time statistics) and off-line (post processing) use
- Event counters can be set per timeslot. The configured timeslots are automatically detected and displayed.
- Fully user-definable event counters, with the possibility for any element of a protocol or CDR to be counted.
- User-defined measurement interval selection down to a minimum of 1 second
- User-definable counter categories
- Counters defined using the standard filter dialog (see filter description for settings)
- Filters can be imported and used as counter definition, counters can be exported and used as filter definition.
- Counter definitions can be saved and ex- or imported to/from other 863x.
- User-definable upper and lower threshold values
- Alarm generated if the counter value exceeds the threshold. An alarm log is generated to track triggering event.
- Display formats:
  - Bar chart
  - Manhattan chart
  - Pie chart
  - Table
  - Timeline
- Graphical display of min/max alarm
- Data export in CSV format, for reuse of statistics in reports (spreadsheet, word processor, etc.)
- Graphical printout, for reuse of statistics in reports



Load Analysis

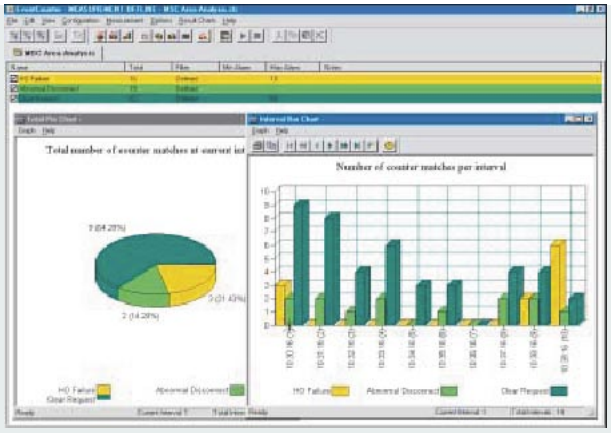
Load Analysis measures the signaling load of monitored links and allows fast determination of traffic and capacity problems in the network.

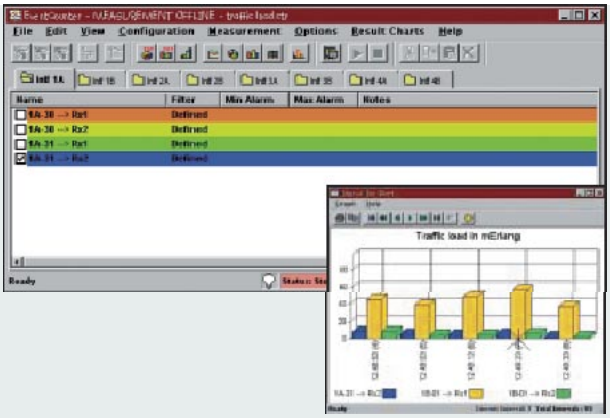
- Analysis of load per signaling timeslot in mErlang
- Auto-detection and display of time-slots
- Graphical display of load:
  - Tabular
  - Bar chart
  - Manhattan chart
  - Timeline
- Displayed channels can be selected
- Graphical display of min/max alarm

Special functions for GPRS analysis

Reassembly

This function operates on the A_{bis} interface. By RLC/MAC reassembling of PCU frames, the GPRS protocols can be decoded and analyzed not only on Gb but also on the A_{bis} interface.





Applications for on-line analysis

These features are included in the 8631 protocol analyzer and are only required for on-line analysis.

Recorder

Starting the recorder captures all data to HDD. By setting filters prior to recording the amount of stored data can be reduced. Several recorders can run simultaneously.

Record filters for

- PCR
- FISUs, LSSUs
- Messages
- Information elements
- Information element contents

Record start modes

- Manual
- Automatic at predefined start time

Record stop modes

- Manual
- Automatic at predefined stop time
- Automatic when remaining hard disk space reaches predefined value

Online display information

- Elapsed time
- Start time
- Number of captured events and size of capture file
- Name of capture file

Time stamps

- The time stamp resolution is 1 ms.
- Time stamps per frame are displayed in the summary view. The display setting can be in absolute time or relative to a selected frame.

Automatic configuration

The 8631 automatically detects and configures the number of installed cards and interfaces. Timeslots are detected automatically if they are HDLC frames.

Configuration of

- System level
- Card level
- Interface level

Scanner

Automatic detection of signaling channel contents on A_{bis} interface:

- 64 kbps: FAS/NFAS, signaling, PCM idle pattern, static pattern
- 16 kbps: Idle speech TRAU, speech TRAU, data TRAU, O&M TRAU, static pattern, signaling
- 8 kbps: Speech TRAU, data TRAU, O&M TRAU, static pattern

Alarm monitor

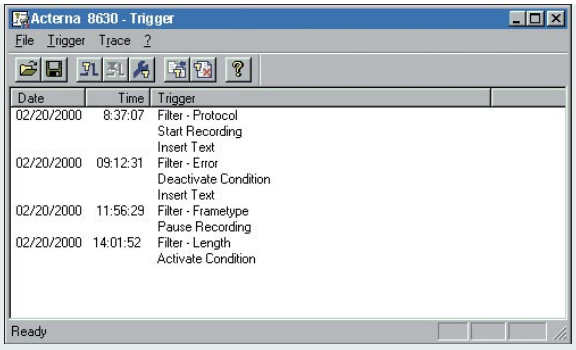
Layer 1 problems are monitored to determine problems with the basic connection to the system under test.

- Two software indicators (Rx1, Rx2) per PCM/Ethernet/STM-1 link, i.e. 16 software indicators when four E1/T1 boards are fitted
- Software indicator is red if link is not connected or an alarm occurs. Software indicator is green if link is connected and no alarm occurs.
- Click on software indicator to get a receiver-specific detail view of layer 1 alarms
- Alarms indicated: No signal, AIS, no synchronization, remote alarm, CRC alarm.

Triggers

By using triggers the user is able to carry out monitoring tasks in an automated way. Recording e.g. can be started only when a certain message occurs, eliminating the capturing of uncritical information and increasing the efficiency of the evaluation.

- Combination of a specified condition and one or more predefined actions
- Conditions:
  - Length of a frame
  - Frame type
  - Errors
  - Protocol elements
- Actions:
  - Activate condition
  - Activate condition once
  - Insert text message into data file
  - Start recording
  - Stop recording
  - Pause recording



Specifications

Hardware

Recommended PC: Pentium III, 64 MB, or faster
Operating systems: Windows 98™, Windows 2000 or Windows XP

Connectors	2 × RJ45C

Technical specifications

Board: PCMCIA type II card with 2 × Rx
Network interfaces: One configurable T1 or E1s (ANSI T1.408, ITU-T G.703) for monitoring up to 8 channels

T1/E1 frame formats:

Double frame
CRC mutliframe
Super frame (SF)
Extended super frame (ESF)

T1/E1 line codes:

HDB3
B8ZS
AMI, AMI (ZCS)

T1/E1 signaling types: Common channel

Clocking sources:

On-board oscillator
Incoming T1/E1 span

Electromagnetic compatibility:

Emission (PS 011/03/01)	EN 50081-1:1992 (CISPR 22 class B)
Immunity (PS 011/03/01)	EN 50082-1:1997

Miscellaneous data

Dimensions (width×height×depth) in mm	
PC card	approx. 54 × 5 × 86
Connector	approx. 22 × 22 × 300
Weight	approx. 200 g

General specifications

Safety	
Instrument safety (PS 011/03/01)	IEC 61010-1
Safety of connection to telephone network	EN 41003 and Section 6 of IEC/EN 60950

Power supply is from the mainframe as per the PC card standard.

Climatic and mechanical environmental conditions

Application	Environment class as per IEC 721-3	Environment class as per ETS 300019-1
Storage	Class IE 12(1)	Class 1.1(1)
Transport	Class IE 23 with 2M3	Class 2.3 with 2M3
Operation	Class IE 72 with 7M3(2)	Class 7.1 with 7M2(2)

(1) Temperature range extended to –25°C to +45°C
(2) Temperature range extended to 0°C to +55°C, relative humidity range <30°C extended to: 5% to 95%; ≥30°C: 29g/m³. Restriction: Not splash proof.

Table 1: Environmental classification for 8631.

Effect	Test standard IEC/IEN	Application Storage	Transport	Operation
Temperature	60068-2-1 and 60068-2-2	Extended to –25°C to +45°C	–40°C to +70°C	Extended to 0°C to 55°C
Relative humidity	60068-2-56	<30°C: 5% to 95% ≥30°C: 29 g/m³	<30°C: 5% to 95% ≥30°C: 29 g/m³	Extended to <30°C: 5% to 95% ≥30°C: 29 g/m³
Condensation		Permissible	Permissible	Permissible
Vibration	60068-2-6	9 Hz to 200 Hz: 5 m/s²	9 Hz to 200 Hz: 20 m/s² 200 Hz to 500 Hz: 40 m/s²	9 Hz to 200 Hz: 20 m/s² 200 Hz to 500 Hz: 40 m/s²
Shock	60068-2-27		1000 m/s² (6 ms) 300 m/s² (11 ms)	1000 m/s² (6 ms) 300 m/s² (11 ms)
Continuous shocks	60068-2-29		400 m/s² (6 ms)	250 m/s² (6 ms)
Drop	600-68-2-31		1.2 m	1 m
Toppling	60068-2-31		All edges	All edges

Table 2: Main parameters of environmental classifications in table 1

Ordering Information

Acterna 8631

8631 Protocol Analyzer **BT226801**
Composing one E1/T1 PCMCIA card and base software to be installed on any notebook. Together with at least one protocol decode package it can be configured as test solution for SS#7, GSM, CDMA, GPRS and access (V5.x, ISDN) networks.
Includes:

- PCM alarm monitor
- Auto configuration and scanner (providing a dynamic display of the usage of every PCM timeslot)
- PDF format manual
- For all protocol decodes (requires at least one decoder option):
  - Protocol viewer
  - Powerful call trace function
  - Comprehensive filters
  - Event counters
  - Call data records
  - Triggers
  - Load analysis

Protocol Decodes

GSM/CDMA decoder package **BT22629301**
A_{bis}, A, IOS, IS-41 and MAP (includes CAMEL) interface protocol decoding of GSM 900/1800, DCS1900 or CDMA networks
Includes O&M decoder ETSI base
Full manufacturer specific O&M decoding and/or A_{bis} PCU decoding additionally requires one of the following decoder extensions:

Lucent extension	BT22629302
Nokia extension	BT22629303
Ericsson extension	BT22629304
Siemens extension	BT22629305
Alcatel extension	BT22629306
Motorola extension	BT22629307
Huawei extension	BT22629308
Nortel extension	BT22629309

CS core decoder package **BT22629310**
Decodes all SS#7 protocols conforming to ITU-T:
MTP, SCCP, ISUP, TUP, INAP (ITU-T Q.1218), with various national variants

GPRS decoder package **BT22629311**
Gb, Gc, Gd, Gf, Gr, Gs, Gp interface protocol decoding, A_{bis} decoding in combination with the manufacturer-specific A_{bis} PCU decoder package

Payload decoder package **BT22629343**
decodes FTP, HTTP, SMTP, WAP, DNS, DHCP, RADIUS, PPP ...
requires the GPRS 2262/93.11 decoder package

Access decoder package **BT22629312**
decodes all V5.1, V5.2, ISDN PRI and GR303 TMC protocols

Post Processing Software

Off-line protocol analyzer **BT22629337**
Intended for stand-alone use. Software can be installed on any PC with Windows operating system and includes

- PDF format manual
- For all protocol decoders (requires at least one decoder option):
  - Protocol viewer
  - Comprehensive filters
  - Reassembly on A_{bis} interface
  - Powerful call trace function
  - Call data records
  - Event counters
  - Load analysis
  - Trigger

Operates only with additional decoder packages, to be selected from the above.

GSM/GPRS troubleshooting software **BT22629341**
Allows troubleshooting, monitoring and optimization of GSM 900/1800 and GPRS networks

ISDN partner **BN 7519/10**
For off-line expert analysis and test result management.
Expert system to troubleshoot ISDN signaling.

Accessories

Calibration report 8631 **BT22629002**

Operating manual

(Operating manual: on-line help and PDF manual included free of charge)
Printed operating manual for 8631

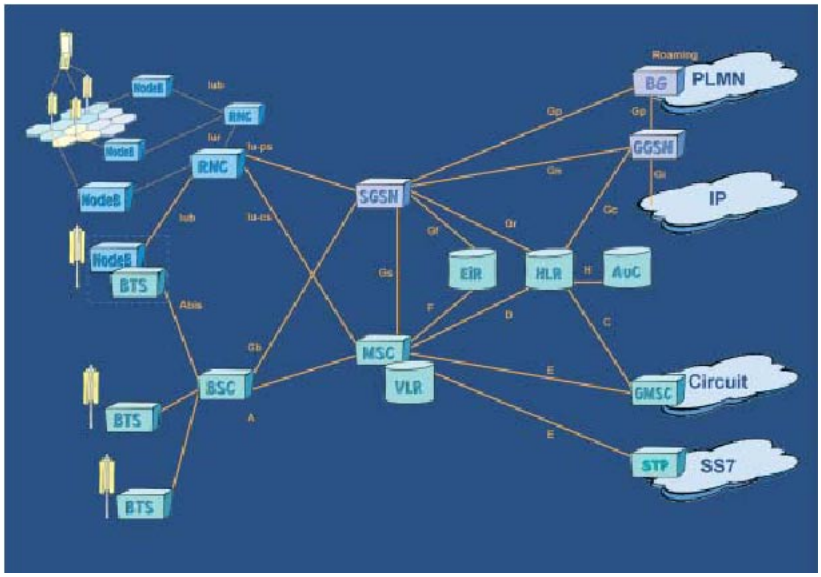
English	BT22629821

Training courses

8630/8631 workshop
Signaling system SS#7
V5.1/V5.2 protocol seminar
GSM – mobile radio communication system
GPRS – the mobile internet
UMTS – the mobile communication system of the future
Please contact your local sales office for more information.

Software subscription

Yearly software subscription including regular software upgrades and updates for base software and decoder packages.
Please contact your local sales office for more information.



Acterna is the world's largest provider of communications test solutions for telecommunications and cable network operators. A trusted communications test partner for more than eight decades, Acterna offers an unmatched portfolio of awardwinning instruments, systems, software and services that help its customers reduce network costs while improving performance and reliability. Headquartered in Germantown, Maryland, USA – with European and Asia-Pacific operations based in Eningen, Germany and Hong Kong – Acterna serves nearly every major communications service provider and equipment manufacturer around the world through a skilled sales and support organization in 31 countries.

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