



## *Enabling Australia's Field Technicians to build, troubleshoot and maintain better communications networks.*



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**FREECALL 1800 680 680**

**8631**

## Telecom Protocol Analyzer



### Key Features

- **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, and Ethernet using laptop's Ethernet interface.
- **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 all 863x Telecom Protocol Analyzers**
- **Same GUI, same handling as 8635 Telecom Protocol Analyzer**

The JDSU 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, SS#7 and Ethernet 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.

### Protocol Analyzer Application

These decoding and post-processing features are the same for on-line and off-line usage and included in both packages: 8631 protocol analyzer and 8631 off-line protocol analyzer.

#### 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
- User preferences for customizing the summary view:
  - Timestamp format and reference start time
  - Font
  - Display depth of "message contents" column: user-definable information at protocol, message and information element level
  - Protocol identification: different colors for different protocols
  - Signaling point code/circuit identification code display selectable (names, hex, decimal)

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- User definable columns: order of columns selectable  
Columns displaying user-defined information can be added
- Display settings can be saved

**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**

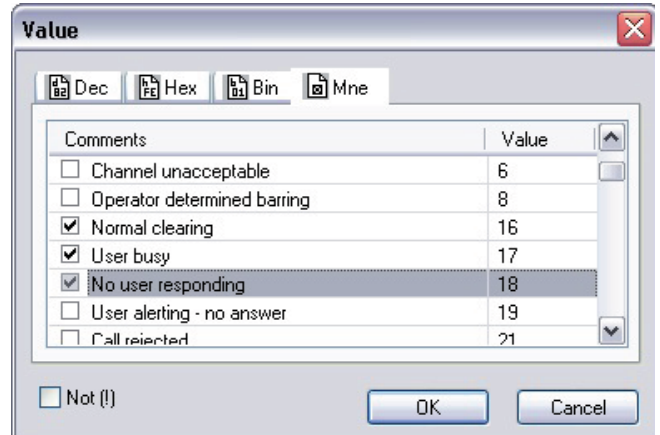
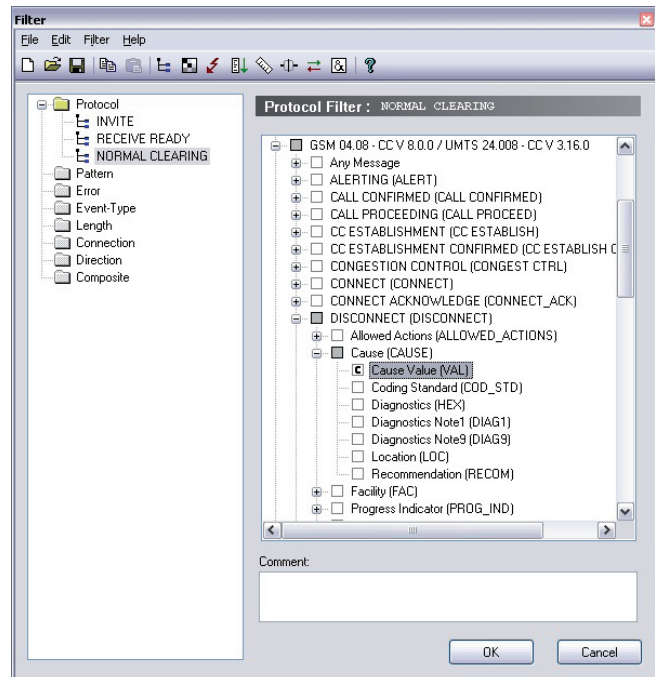
In a huge amount of data this feature helps quick and easy location of any specified parameter below.

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

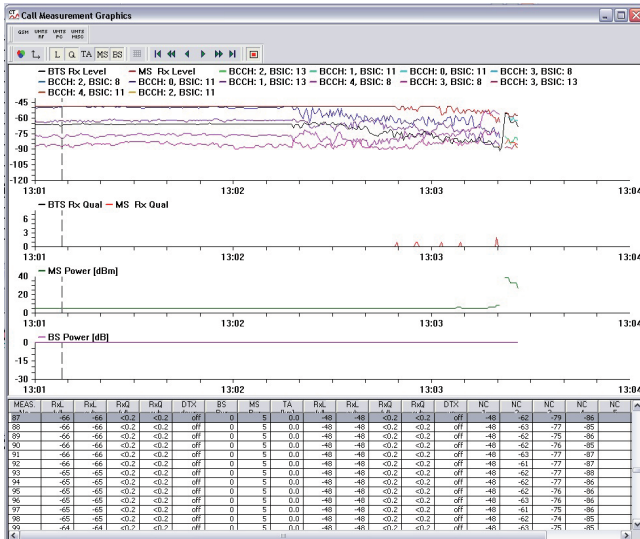
**Filter**

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

- Filter categories:
  - Protocol filter: on all protocol layers, at messages level, information elements level, down to information element contents level (decimal, binary or mnemonic values).
  - Link filter
  - Error filter
  - Event type filter
  - Pattern filter
  - Length filter
  - Direction filter
  - Composite filter



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- 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 settings 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 (8631, 8620 and MA-10 format)
- Export to Tektronix file 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
- Call trace result window is enhanced with Graphical window (Abis only)
  - Tabular call trace window (Abis only) and Rec. File Format (optional)
- Simultaneous graphical view for call trace on Abis 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.

S	Called Number	Calling Number	Release Cause	Time
	"90001"		Normal clearing	13:04:0>
				13:04:0>
				13:04:4>
				13:04:4>
				13:04:5>
				13:04:5>
	"004...8320"		User busy	13:05:1>
				13:05:1>
				13:05:1>
				13:05:1>

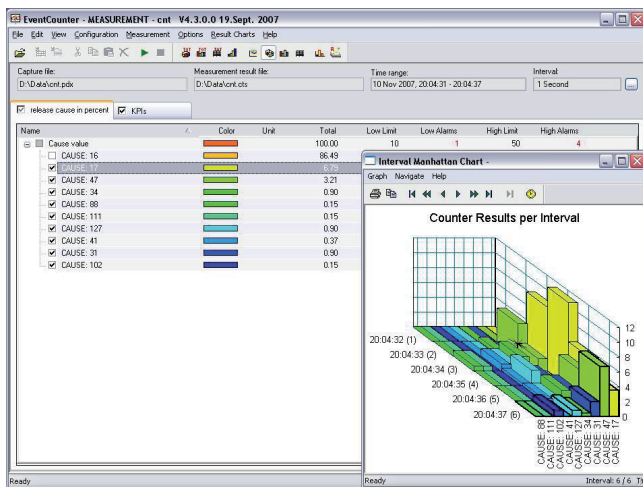
- Created on-line and off-line
- Expansion of a CDR contains all frames of a call (call trace)/session (session trace based on a PDP context).
- Contain following information elements per call, depending on monitoring interface:
  - Start time Duration
  - Stop time Status of call
  - Call setup time Call release time
  - OPC (originated point code)/DPC
- 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 Counter** is a powerful and flexible application which supports the user in reporting as well as troubleshooting tasks. Any event or message 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



### Supported Counter Types

**Filtered Counters**, counting for occurrences of specific protocol elements. All kinds of protocol elements are possible.

**Dynamical Counters**, can be set to any protocol element. For each new value of the selected protocol element a new counter is generated. Thus, the total of different values will be counted.

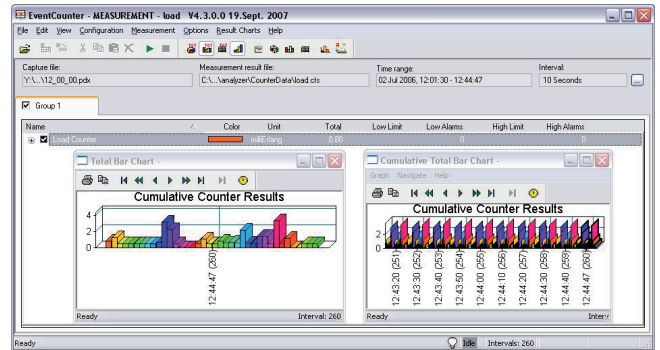
**Load Counters**, counter which analyses the traffic load, either in Erlang or kbit/s.

**Calculated Counter**, counter which results from an arithmetic operation between counters.

**Field Value Counter**, counter which calculates min, max, average and sum of array contents.

### 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 timeslots
- 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 and UMTS analysis

#### Reassembly

This function operates at Abis and IuB interfaces. With RLC/MAC reassembling of PCU frames, these protocols can be decoded and analyzed.

### 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
- Messages
- Information elements
- Information element contents

#### Record start modes

- Manual
- Automatic at predefined start time



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**Record stop modes**

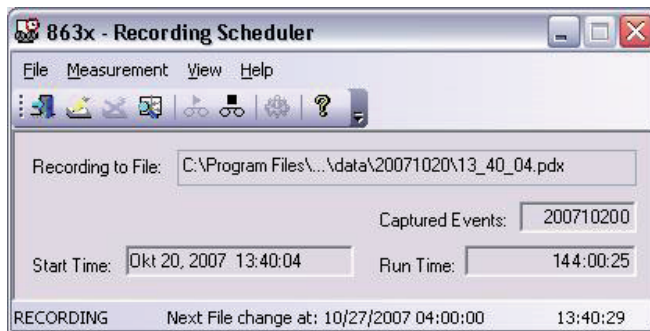
- Manual
- Automatic at predefined stop time
- Automatic when remaining hard disk space reaches predefined value

**Online display information**

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

**Recording scheduler**

The Recording Scheduler allows a 24/7 recording, based on user-defined time interval and capture of new recording files with new file name. The completed capture file can be uploaded to a fileserver automatically.



With this function permanent monitoring is easy for the user. Files are generated and stored in an automated way making monitoring more efficient.

**Time stamps**

- The time stamp resolution is 1  $\mu$ s.
- Time stamps are synchronized across multiple interfaces, whatever the type of interface (E1/T1 PCM, FastEthernet, STM-1/OC-3).
- 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 Abis interface:

- 64/56 kb/s: FAS/NFAS, signaling, PCM idle pattern, static pattern

- 16 kb/s: Idle speech TRAU, speech TRAU, data TRAU, O&M TRAU, static pattern, signaling
- 8 kb/s: Speech TRAU, data TRAU, O&M TRAU, static pattern

**Alarm monitor**

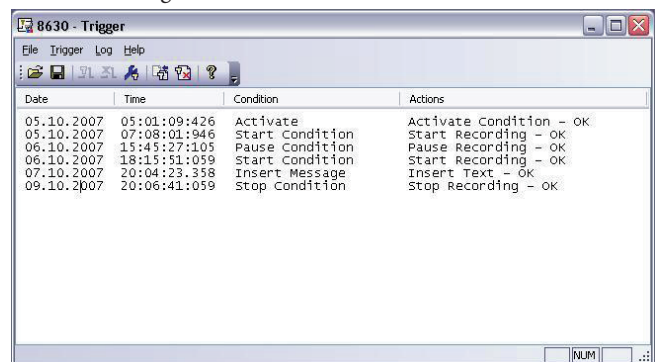
Layer 1 problems are monitored to determine problems with the basic connection to the system under test.

- Two software indicators (Rx1, Rx2) per PCM/Ethernet/STM-1/OC-3c 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

**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 non-useful 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



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## Specifications

## Hardware

Recommended PC	Pentium-M, 1.8 GHz or equivalent, 1 GB RAM, 20 GB free HD space
Operating system	Windows XP
<b>Connectors</b>	2 × RJ45C 1 × RJ45 (LAN connector from the laptop)

## Technical specifications

<b>Board</b>	PCMCIA type II card with 2 × Rx
<b>Network interfaces</b>	One configurable T1 or E1s (ANSI T1.408, ITU-T G.703) for monitoring up to 16 channels
<b>T1/E1 frame formats</b>	Double frame CRC mutiframe Super frame (SF) Extended super frame (ESF)
<b>T1/E1 line codes</b>	HDB3 B8ZS AMI, AMI (ZCS)
<b>T1/E1 signaling types</b>	Common channel
<b>Clocking sources</b>	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	ETS 300019-1
Storage	Class IE 12 <sup>(1)</sup>	Class 1.1 <sup>(1)</sup>
Transport	Class IE 23 with 2M3	Class 2.3 with 2M3
Operation	Class IE 72 with 7M3 <sup>(2)</sup>	Class 7.1 with 7M2 <sup>(2)</sup>

(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/m<sup>3</sup>. Restriction: Not splash proof.

Table 1: Environmental classification for 8631.

Effect	Test standard IEC/EN	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/m <sup>3</sup>	<30°C: 5% to 95% ≥ 30°C: 29 g/m <sup>3</sup>	Extended to <30°C: 5% to 95% ≥ 30°C: 29 g/m <sup>3</sup>
Condensation		Permissible	Permissible	Permissible
Vibration	60068-2-6	9 Hz to 200 Hz: 5 m/s <sup>2</sup>	9 Hz to 200 Hz: 20 m/s <sup>2</sup> 200 Hz to 500 Hz: 40 m/s <sup>2</sup>	9 Hz to 200 Hz: 20 m/s <sup>2</sup> 200 Hz to 500 Hz: 40 m/s <sup>2</sup>
Shock	60068-2-27		1000 m/s <sup>2</sup> (6 ms) 300 m/s <sup>2</sup> (11 ms)	1000 m/s <sup>2</sup> (6 ms) 300 m/s <sup>2</sup> (11 ms)
Continuous shocks	60068-2-29		400 m/s <sup>2</sup> (6 ms)	250 m/s <sup>2</sup> (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

## Specifications

### JDSU 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<sub>bis</sub>, 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<sub>bis</sub> 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<sub>bis</sub> decoding in combination with the manufacturer-specific A<sub>bis</sub> PCU decoder package

##### Payload decoder package BT22629343

decodes FTP, HTTP, SMTP, WAP, DNS, DHCP, RADIUS, PPP ...  
requires the GPRS BT 22629311 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<sub>bis</sub> 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 BT22629341

#### troubleshooting software

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.



**Ordering information**
**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**

8635/8631 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.

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