BROADFRAME
BROADBAND NETWORK TOOLS

DSLscope
DSL Protocol Analyzer

Introduction

DSLscope from Broadframe provides a cost-effective in-line ADSL/SHDSL Protocol Analyzer for monitoring or trouble-shooting DSL line installations and developing and testing DSL equipment. DSLscope plugs directly into the DSL line to be analyzed connected in-circuit between the DSL Access Multiplexer (DSLAM) and an DSL modem (CPE). DSLscope provides a powerful protocol analysis capability for use in capturing, decoding and displaying all the ATM cells and AAL5 packets that are transmitted in both directions across an DSL line.

Functional Description

DSLscope consists of a Protocol Analyzer chassis with plugs for connecting telephone lines from the DSL CPE and the DSLAM. The Protocol Analyzer chassis connects to a recording PC via standard 10BT Ethernet.

Interface adapter cards plug into the chassis providing specific DSL interfaces featuring Alcatel and other major chipsets (future).

The embedded processor cards feature an advanced communications microcontroller, ROM, RAM and FLASH memory. The user interface for this system is established over the Recording PC via the 10BT Ethernet connection.

A simple, intuitive Protocol Analysis Graphical User Interface (GUI) runs on the Recording PC. This utility allows the user to control the recording and display of raw ATM cells and reassembled AAL5 packets.

An easy-to-use Configuration and Status GUI also runs on the Recording PC and is used to quickly setup IP addresses, DSL line parameters and perform DSL chipset microcode FLASH updates and DSLscope firmware FLASH updates.

DSLscope is available with ADSL or SHDSL interfaces.

Features

- The world's first protocol analyzer that connects directly in-line between DSL CPE and DSLAM.
- Captures and displays every ATM cell that passes across the line in both directions.
- Reassembles AAL5 packets from cells for user-specified ATM VPI/VCI pairs.
- Decodes key DSL-related protocols such as
  - Raw ATM cells of all AAL-types (AAL0, AAL2, AAL5, etc).
  - RFC1483/2684 LLC/SNAP.
  - RFC 2364 PPPoA VC MUX/LLC NLPID.
  - RFC 2316 PPPoE.
  - TCP/IP, UDP, ARP, LCP, and PPP.
  - PAP/CHAP and IPCP.
- User-Friendly Protocol Analyzer GUI.
  - A summary line for each cell and packet.
  - Summary sub-window displays a single packet.
  - Detail sub-window shows a complete decode of the currently selected cell or packet.
  - Recording may be searched or filtered to simplify analysis.
  - DSL encapsulation protocols are automatically detected.

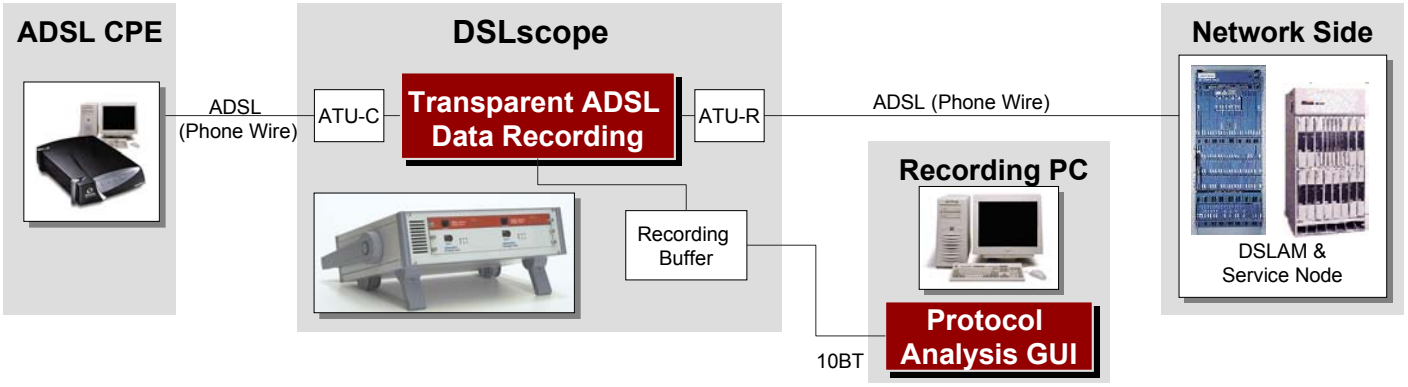


Figure 1 - System Diagram for DSLscope

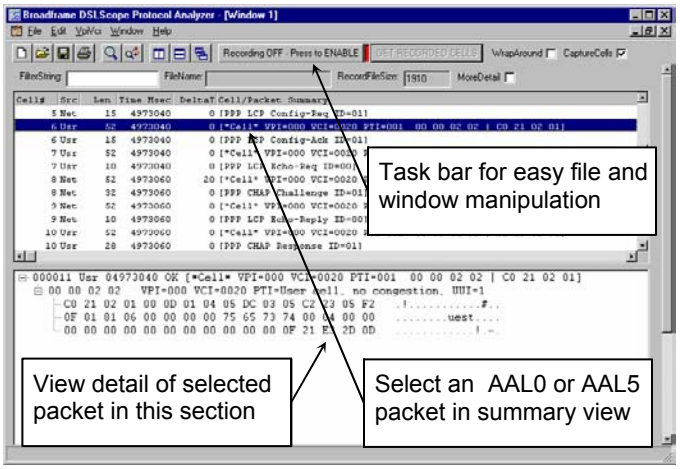


Figure 2 - DSLscope Protocol Analyzer GUI

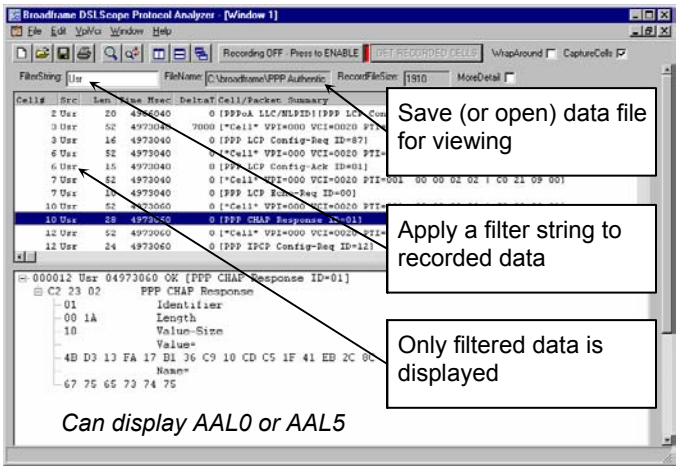


Figure 3 - GUI file and filter features

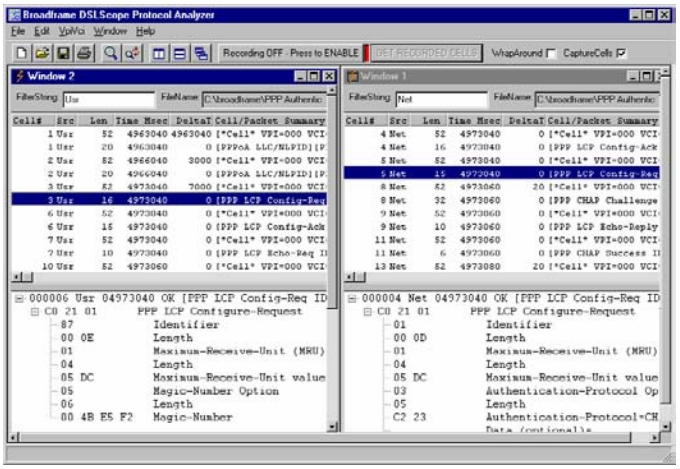


Figure 4 - View packet recordings side-by-side

Applications

DSLscope is portable and very easy to use, which makes it ideal for many DSL applications.

- Monitoring of DSL lines
- Legal interception on DSL lines
- Troubleshooting DSL line installations and connections.
- Developing DSL equipment.
- Interoperability testing of CPE and DSLAM equipment.
- Conformance testing of CPE and DSLAM equipment.
- Debugging broadband applications software.

Developers use DSLscope to debug and regression-test their complex encapsulation protocol software for such protocols as PPPoA and PPPoE.

DSLscope shows all the bytes and protocol layers in packets travelling across an DSL line which are critical in quickly resolving DSL networking and interoperability issues.

Graphical User Interface (GUI)

The Protocol Analyzer GUI records, filters, and displays ATM cells of all AAL types as well as AAL5 packets on an DSL connection. The interface is simple to use and similar to other popular protocol analyzer interfaces.

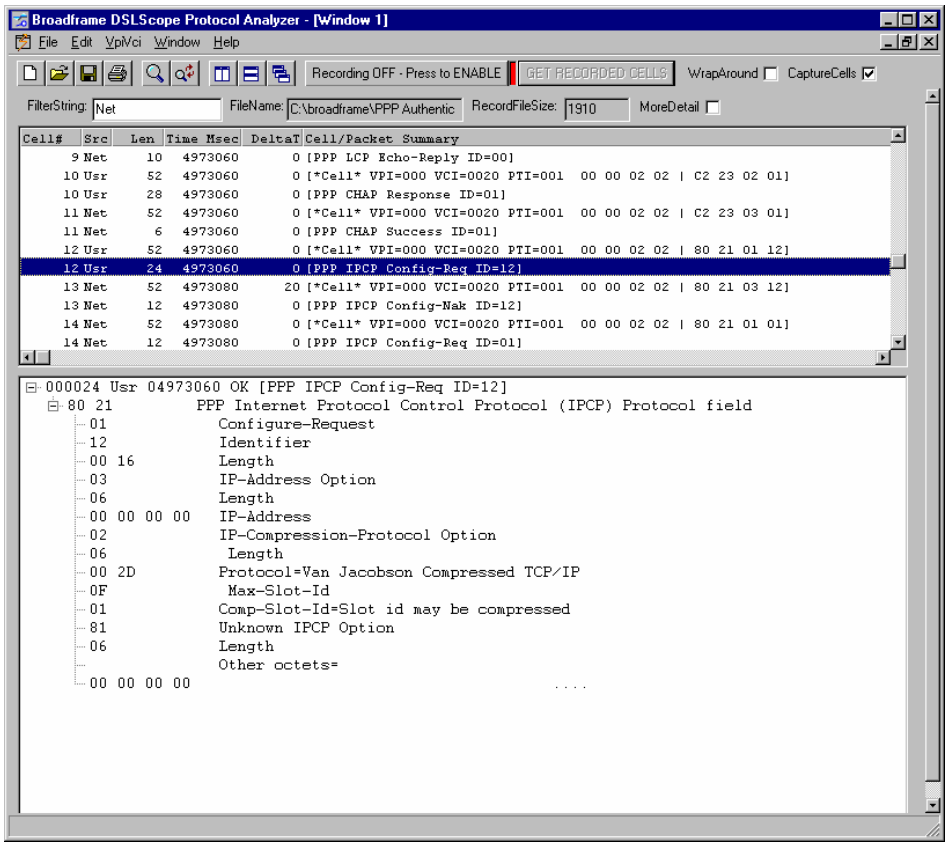
- The window for viewing packets provides the user with two different perspectives.
  - Summary view displays summary line for each cell or packet and allows users to quickly navigate to the information of interest.
  - The currently selected summary cell or packet is decoded in detail. The raw hex contents and the descriptive text for each protocol header are displayed.
- Two record modes are supported. "Wrap-around mode" or "Record until full mode"
- Specify which VPI/VCI values should be used for ATM cell to AAL5 packet reassembly.
- 2 Mbyte recording buffer.
- Flexible filtering quickly reduces large recording files to retain only cells or packets of interest.
- Find utility allows quick navigation.
- “More Detail” feature lets users quickly switch between levels of detail in the summary sub-window.
- Multiple Window/File functions.
  - Packet recording files can be saved to disk at any stage of filtering and analysis.
  - Previously saved files may be opened in multiple decode windows as needed.
  - Multiple decode windows can be tiled to simultaneously display packet recordings side-by-side.
  - Print the currently selected decode window screen display contents or some or all of the summary sub-window contents.

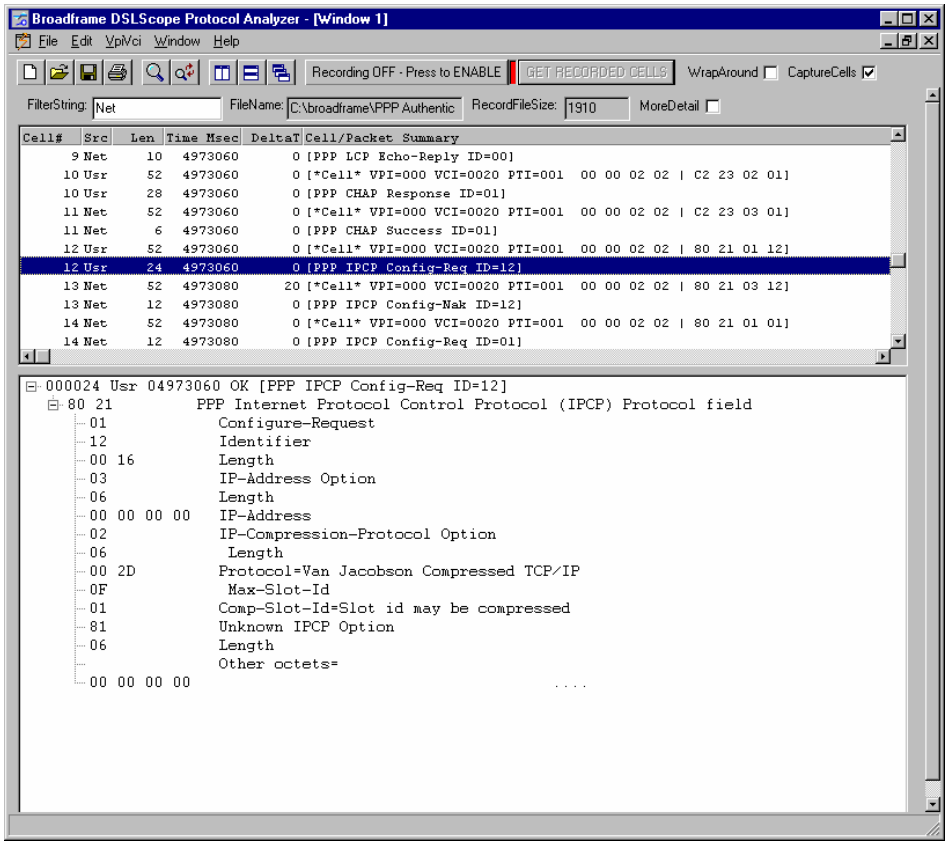
GUI Icons

- - Open a new viewing window.
- - Open a saved trace file.
- - Save a trace file to disk
- - Print a trace file to printer
- - Find a string in summary section
- - Filter for string in summary
- - Tile windows vertically
- - Tile windows horizontally
- - Cascade windows

Other Menu Items

- **File** pull down - contains many of the file commands found in GUI (open, save, etc).
- **Edit** pull down - contains the search commands in GUI
- **VPI/VCI** pull down - allows user to select 8 VPI/VCI pairs to reconstruct AAL5 packets
- **Window** pull down - Contains commands for window display
- **Help pull down** - On line help for running the units.
- **Recording Options**
  - Click the recording button to enable.
  - When data is collected, click on "get recorded packets"
  - Record until full (2MB) or select "WrapAround" to record last 2MB of trace data.
  - Capture reconstructed AAL5 data, or select "CaptureCells" to capture raw ATM data.

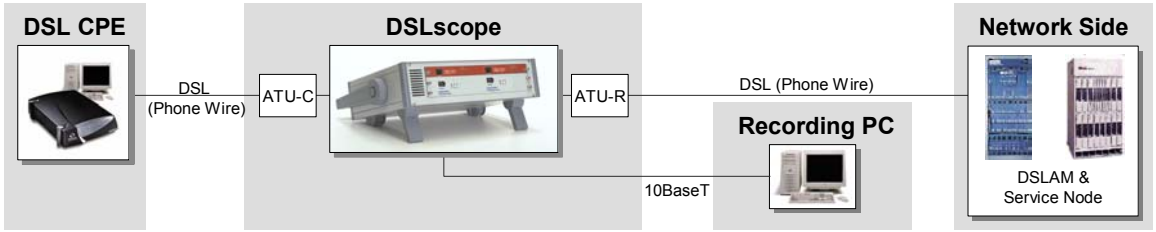




DSLscope Product Family

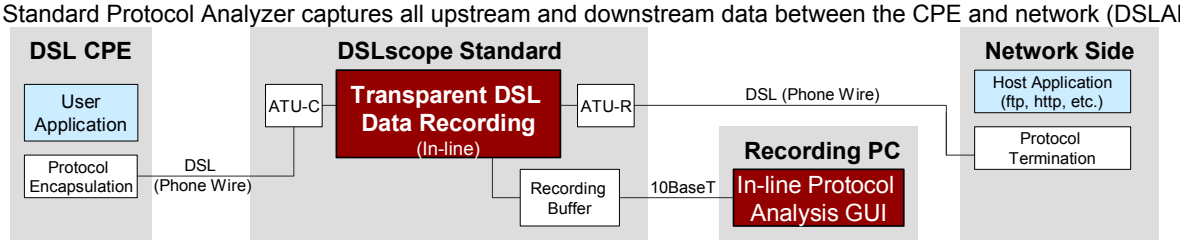
Standard System Configuration

DSLscope normally connects between a DSL modem and DSLAM. Network simulation is an optional feature. A separate recording PC is used to configure and control the protocol analysis.



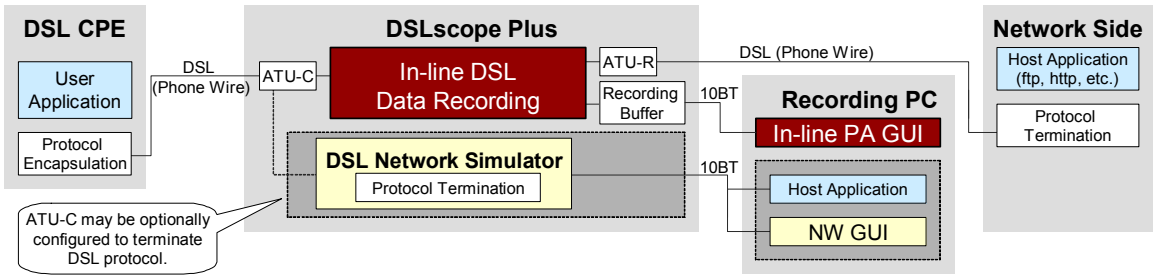
DSLscope Standard

DSLscope Standard Protocol Analyzer captures all upstream and downstream data between the CPE and network (DSLAM).



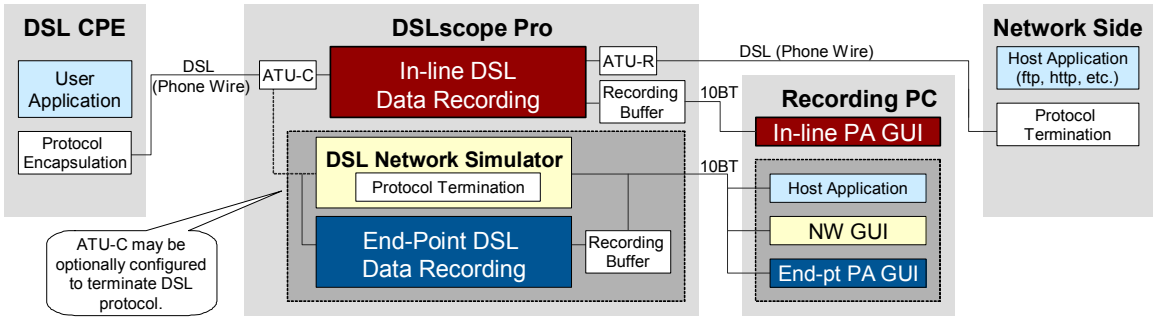
DSLscope Plus

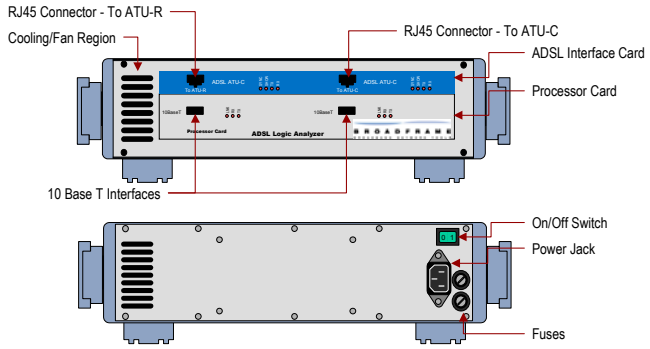
DSLscope Plus adds an option to configure the ATU-C to terminate network protocols (.MPoA, PPPoE, PPPoA). See the Liberator datasheet for details.



DSLscope Pro

DSLscope Pro adds an end-point protocol analyzer to the network simulator option. A separate user interface on the recording PC configures and controls protocol analysis. DSLscope Pro is the most flexible tool allowing the analysis of protocols in a live network (DSLAM) or simulation of the network in a self-contained environment.





Mechanical/Electrical

Item	Limit
Power	
Voltage	100-240 VAC
Frequency	50/60 Hz
Power	100W (Maximum)
Fuses	2 x 2A, 250V fuse
Operating Environment	
Temperature	0 – 40°C
Humidity	10% to 90%, non-condensing
Dimensions and Weight	
Height *	3.46” (88.05 mm)
Width *	13.5” (343 mm)
Depth *	9.64” (245mm)
Weight	9 lbs (4.1 Kg)
Certification	
FCC	Complies with FCC Part 15 Paragraph 15.103(c)

* Excludes external handle dimensions.

PC Requirements

The Broadframe DSLscope is controlled with a user-supplied CO PC. The CO PC configuration is defined below.

Item	Minimum	Recommended
CPU	Pentium II or Athlon	Pentium III or equivalent
Operating System	Windows 98	Windows 98, ME, 2000, or XP
Memory	128 MB	128 MB
HDD	1 GB free space	2 GB free space
Communications	10 Base T Ethernet & Hub	10/100 Ethernet & Hub
Misc.	CD-ROM drive	CD-ROM drive

Warranty

DSLscope is provided with a 90-day warranty, including parts and labor.

Contact Information

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Order Information

Part No.	Product Name	In-Line DSL Protocol Analysis	Network Simulation Pkg	LLC/SNAP, MPoA, PPPoE, PPPoA	End-point Protocol Analyzer	ST Micro (Alcatel) ADSL Chipset	Conexant (Globespan) SHDSL Chipset
D200-2	DSLscope **Standard** ADSL Protocol Analyzer	✓				✓	
D200-3	DSLscope **Plus** ADSL Protocol Analyzer	✓	✓	✓		✓	
D200-4	DSLscope **Pro** ADSL Protocol Analyzer	✓	✓	✓	✓	✓	
D201-2	DSLscope **Standard** SHDSL Protocol Analyzer	✓					✓
D201-3	DSLscope **Plus** SHDSL Protocol Analyzer	✓	✓	✓			✓
D201-4	DSLscope **Pro** SHDSL Protocol Analyzer	✓	✓	✓	✓		✓