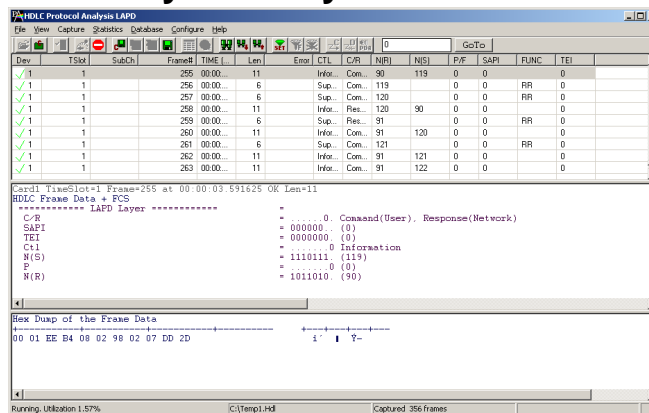


HDLC Analysis / Playback / Simulation



Record, Analyze and Transmit HDLC Data

Non-Intrusive Analysis Using GL's T1/E1 Analyzers

Supports LAPF, LAPD, LAPD+IP, LAPX+IP, X.25 Protocols

Summary, Detail, Hex-dump, and Statistics Views

Search & Filtering Capabilities

Real-time & Offline Analysis

HDLC Playback Transmits Recorded Trace Files

HLIU Injects Errors and Simulate Real-time Network

Statistics Based on Frame-count, Byte-count, and more

Overview

The HDLC is a protocol operating at the data link layer. The HDLC protocol embeds information in a data frame allowing data flow control and error correction. HDLC data is formatted into frames separated by one or more flags. Each flag consists of eight bits (01111110). At the end of the frame, a Frame Check Sequence (FCS) is used to verify the data integrity and optional error correction. The FCS also known as cyclic redundancy check (CRC) is calculated using polynomial $x^{16} + x^{12} + x^5 + 1$ (FCS 16 bits) or $x^{32} + x^{22} + x^{16} + x^{12} + x^5 + 1$ (FCS 32 bits). Idle periods in the data stream contain only flags.

GL's HDLC protocol analyzer provides the capability to capture, and analyze HDLC data on a full duplex T1 or E1 line. It supports the following types of HDLC analyzers:

- Real-time HDLC Analyzer (Pre-requisites: GL's T1/E1 internal cards or USB T1/E1 external units, required licenses and Windows XP (or higher) Operating System)
- Remote/Offline HDLC Analyzers (Pre-requisites: Hardware Dongles and Windows XP (or higher) Operating System)

In addition, GL offers HDLC Playback, HDLC Impairment Utility, and HDLC Tx/Rx Test applications. These applications further help in transmitting and capturing pre-defined HDLC frames.

For more details, please visit our web page <http://www.gl.com/hdlc.html>.

Main Features

- Displays Summary, Detail, Hex-dump, and Statistics Views
- Supports decoding of LAPF, LAPD, LAPD+IP, LAPX+IP, X.25, Cisco HDLC Protocols
- Summary View displays timeslot, sub channel, frame#, device#, LAPD, LAPF specific information and IP information like source/destination IP address, TCP source port, TCP destination port, and so on in a tabular format.
- Supports filtering and search based on C/R, SAPI, TEI, CTL, P/F, N(S), N(R) and FUNC.
- Recorded trace files can be played back using HDLC playback option.
- Simultaneous decode of multiple streams of HDLC on different T1/E1 channels.
- Streams can be captured on the selected time slots (contiguous or non-contiguous), sub-channels or full bandwidth. Frames can be transmitted/captured in either n x 64 kbps, or n x 56 kbps data channels (hyper-channels).
- Remote monitoring capability using GL's Network Surveillance System.
- Exports Summary View information to a comma delimited file for subsequent import into a database or spreadsheet.
- Capability to export detailed decode information to an ASCII file.
- Any protocol field can be added to the summary view, filtering, and search features providing users more flexibility to monitor required protocol fields
- Captured frames can later be used for traffic simulation using HDLC Transmit/Receive/Playback application.



GL Communications Inc.

818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A

(Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com

Summary, Detail, Hex dump, and Statistics Views

The analyzer displays Summary, Detail, Hex dump and Statistics views in different panes. The Summary View displays Frame Number, Time, Length, C/R, SAPI, and so on. The user can select a frame in the Summary View to analyze and decode each frame in the Detail View. The Hex dump View displays the frame information in HEX and ASCII octet dump format. The Statistics View helps to study the performance and trends in the HDLC network based on protocol fields and different parameters.

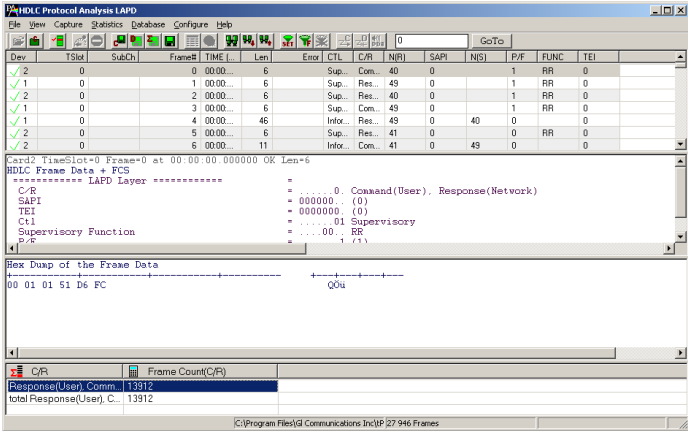


Figure: Summary, Detail, Hex dump, & Statistics Views

Real-time, Remote, and Offline Analysis

Users can capture and analyze HDLC frames using either real-time or remote analyzers, and record all or filtered traffic into a trace file.

The recorded trace file can be used for offline analysis or exported to a comma-delimited file, or ASCII file. Real-time capturing requires user to specify timeslots, bit inversion, octet bit reversion, user/network side, FCS, and data transmission rate. Recorded trace file can be played back on T1/E1 using the HDLC file Playback application.

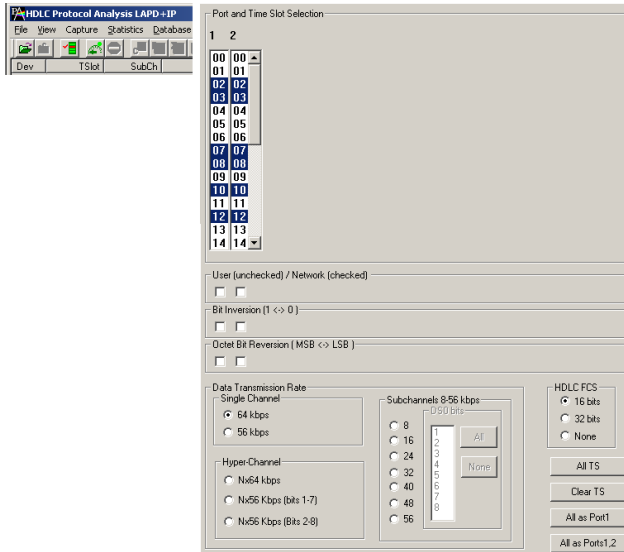


Figure: Stream / Interface Selection

Filtering and Search

Users can record all or filtered traffic into a trace file. Filter and search capabilities adds as another powerful feature to the HDLC analyzer. These features isolate required frames from all the captured frames in real-time/remote/offline.

Users can specify custom values for frame length to filter frames during real-time capture. The frames can also be filtered after completion of capture based on LAPD, and other application layers.

Similarly, search capability helps user to search for a particular frame based on specific search criteria.

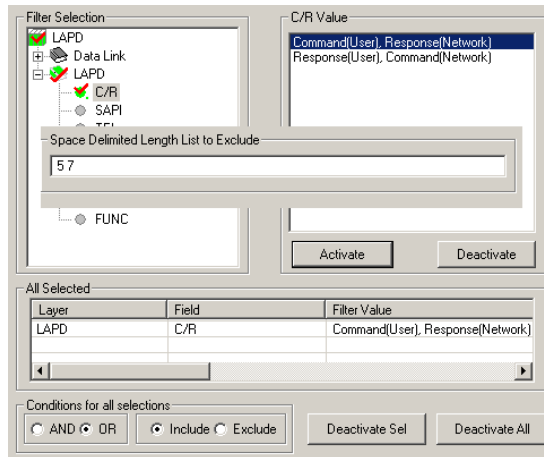


Figure: Real-time and Offline Filter

Save/Load All Configuration Settings

Protocol Configuration window provides a consolidated interface for all the important settings required in the analyzer. This includes various options such as protocol selection, startup options, stream/interface selection, filter/search criteria and so on. Any protocol field can be added to the summary view, filtering, and search features from this GUI providing the users more flexibility to monitor required protocol fields. All the configuration settings can be saved to a file and then loaded for future operations, or user may just revert to the default values using the default option.

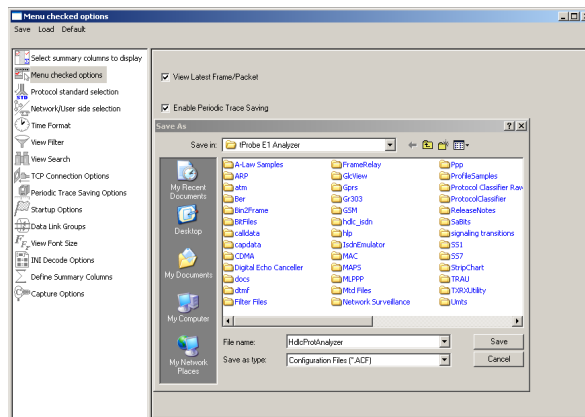


Figure: Save / Load Configuration



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
 (Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com

HDLC Playback Application

The HDLC Playback application is used to transmit HDLC frames in the pre-recorded files over T1/E1 channels. The frames can be transmitted on selected time slots (contiguous or non-contiguous), sub-channels or full bandwidth. The HDLC frames may also be transmitted on just one, or n x 64 kbps, or n x 56 kbps hyper channels.

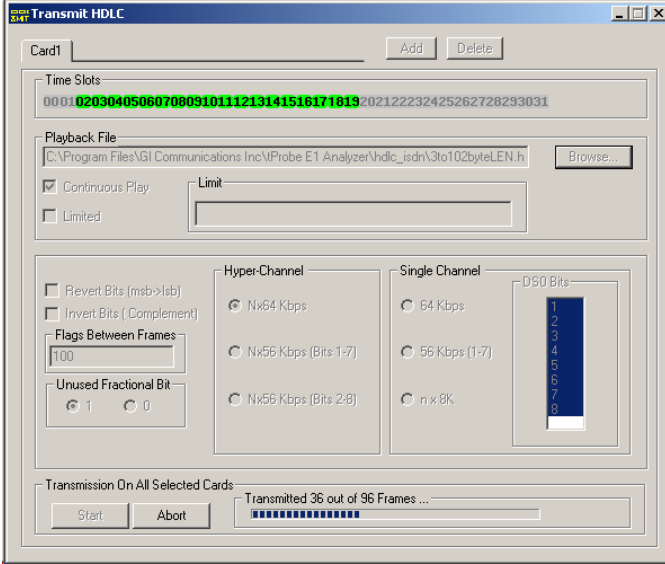


Figure: HDLC Playback

HDLC Link Impairment Utility

The HDLC Link Impairment Utility offers various options to 'impair' (inject errors) specific HDLC frames, thus simulating various scenarios taking place in a real-time network.

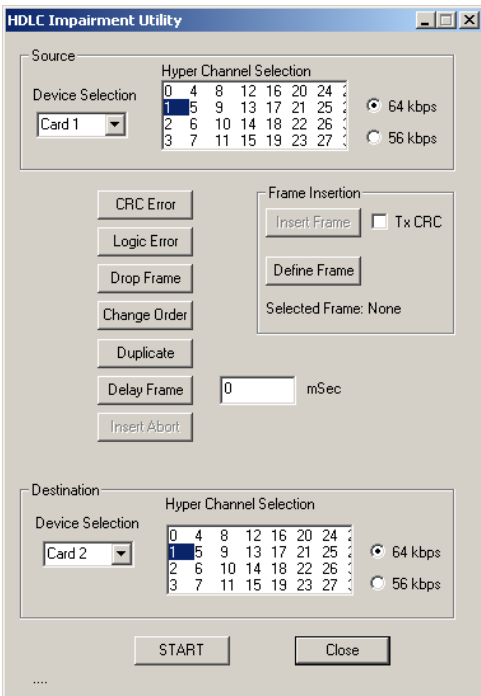


Figure: HDLC Link Impairment Utility

HDLC Tx / Rx Test

The HDLC Automated Test System consists of two applications: Transmitter application and Receiver application. Each application has real-time and off-line features. The Transmitter application generates HDLC test frames using special algorithms, transmits them over T1/E1 or records them to an HDL file for subsequent use with other applications.

The Receiver application can receive frames in real-time over T1/E1 or can verify an off-line HDL file for correct frame order and data integrity.

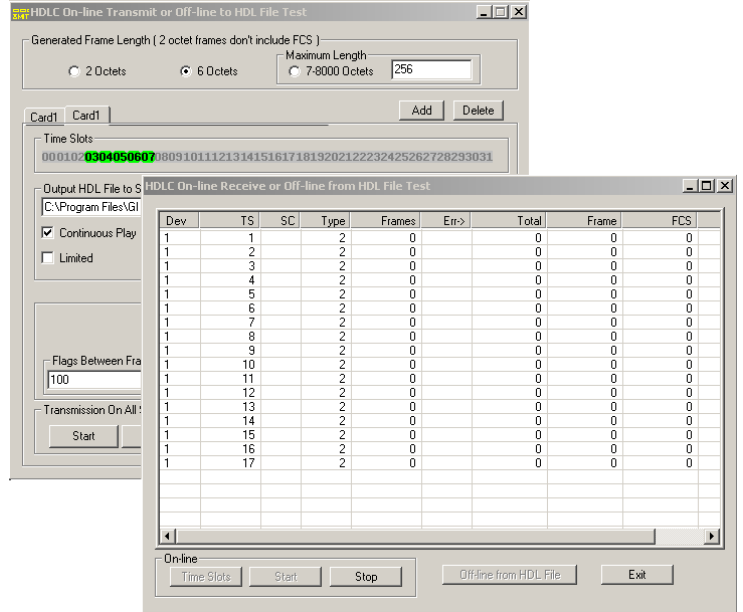


Figure: HDLC TX and RX

Automated HDLC Testing using Client-Server

The File based HDLC Record/Playback (Hdlfunc) module is an optional application that allows HDLC Traffic Capture/Playback. It also allows transmission/reception of *.HDL frames files located on the server and on client. For details, visit <http://www.gl.com/hdlctrxinwcs.html>.

The HDLCTerr module performs multi-channel HDLC emulation and analysis. It permits frame error testing and transmission of memory generated sequences of fixed or variable length HDLC frames, GL *.HDL Trace file frames, and various bandwidth streams.

The HDLChpio module performs file-based HDLC record and playback actions. It permits receive / transmit of HDLC streams of various bandwidth (hyper channel, timeslot, and multiple sub-channel streams per timeslot). For details, visit <http://www.gl.com/hdlchpioandterr.html>.



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
 (Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com

Supported Protocol Standards

The supported protocol standards in HDLC analyzer are LAPF, LAPD, LAPD+IP, LAPX+IP, X.25, Cisco HDLC Protocols

| Supported Protocols | Specification Used |
|---------------------|---|
| LAPD | CCITT Q.920/921 |
| LAPF | ITU-T Q.922 |
| IP | RFC 791 |
| TCP | RFC 793 |
| UDP | RFC 768 |
| ICMP | RFC 792 |
| STUN | RFC 3489 |
| DNS | RFC 1035 |
| DHCP | RFC 1533, 2131 |
| HTTP | RFC 2616 |
| FTP | RFC 959 |
| SNMP | RFC 1157,1155,1902,3416,2863,2578,3418,2011,2012 etc |
| Cisco HDLC | http://www.protocols.com/pbook/bridge.htm#CISCOROUTER |
| ARP | RFC 826 |
| LAPB | ITU-T Recommendation X.25 |

Buyer's guide

XX090- T1/E1 Real-Time HDLC Decode/Store/Impairment/Rx-Tx Test Applications

OLV090-Offline HDLC Protocol Analyzer

Related Hardware

PTE001 - tProbe™ Dual T1 E1 Laptop Analyzer (Require Basic Software)

HTE001 - Universal T1/E1 Card (Require Basic Software)

UTE001 - Portable USB based Dual T1 or E1 Laptop Analyzer (Require Basic Software)

Related Software

XX100- ISDN Analysis Software (T1 or E1)

XX600 – Basic Windows Client/Server Scripted Control Software

XX640– File based HDLC Record/Playback

XX641 - File based HDLC Remote Record/Playback

XX634 - Multi-Channel HDLC Emulation and Analysis & File based High Throughput HDLC Record/Playback

*Specifications and features subject to change without notice.



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A
 (Web) <http://www.gl.com/> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) gl-info@gl.com