

# MD1230/MP1590 Family Option-16

## 10GbE Link Fault Signaling

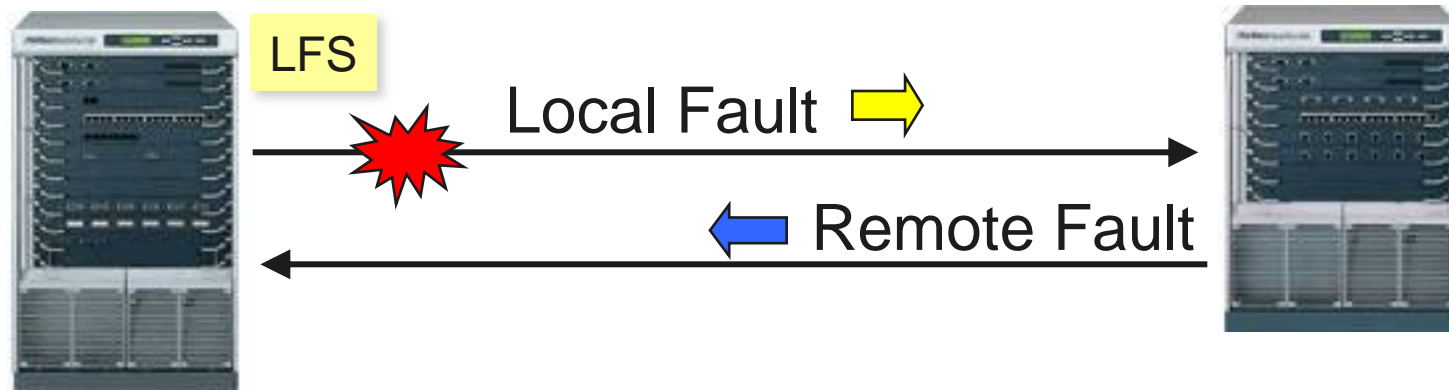
MD1230B/MP1590B (MU120138A-03)  
**10GbE Link Fault Signaling**  
**Product Introduction**

IP Network Measurement Division  
Anritsu Corporation

# Link Fault Signalling

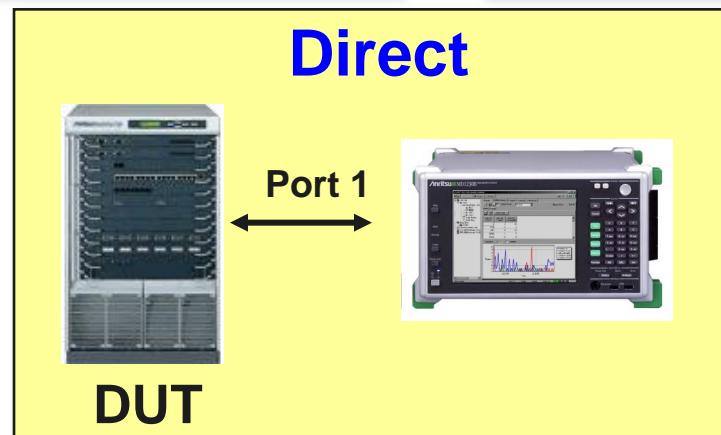
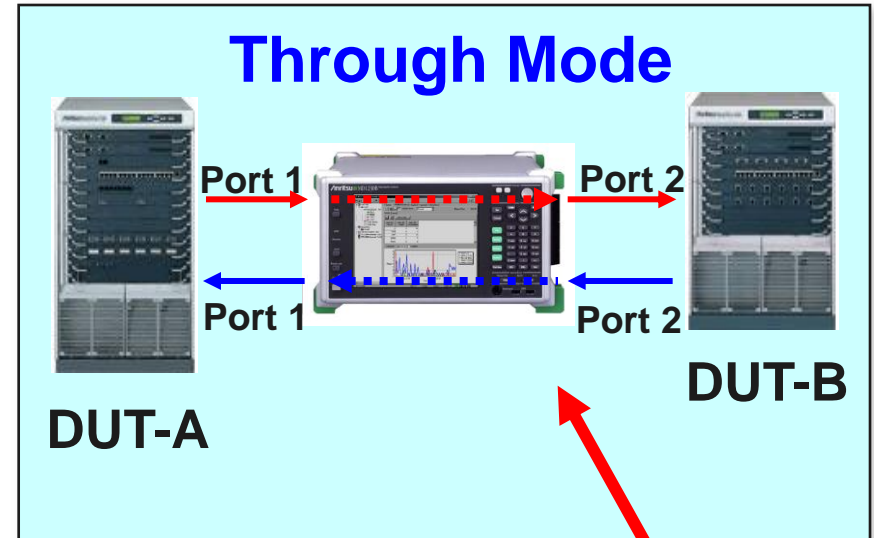
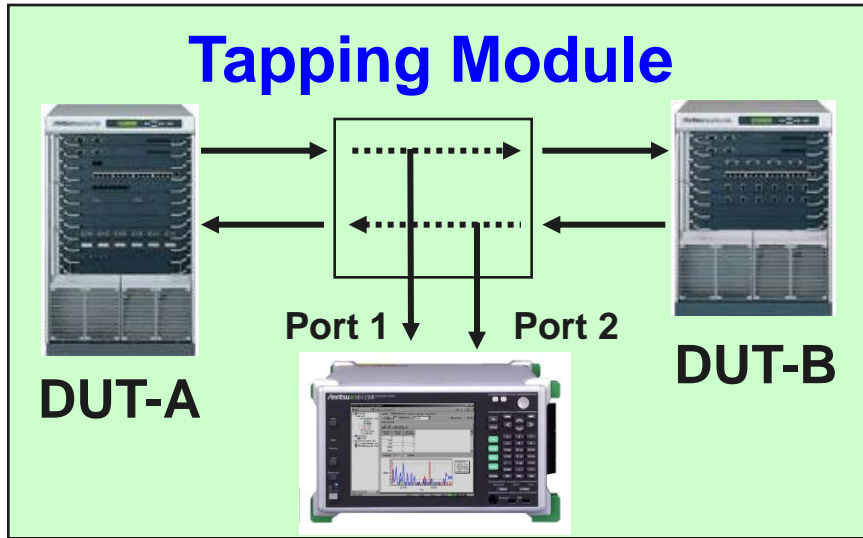
## ➤ Overview

- ✓ Traditional Ethernet has no function for detecting network faults.
- ✓ This issue is important for 10 Gbps WAN applications.
- ✓ 10 GbE has a function for detection and notification of physical layer faults.
  - ✗ Link Fault Signalling (LFS)
- ✓ Link Fault Signalling (LFS) sends physical layer alarms.
  - ✗ LF (Local Fault) signal
  - ✗ RF (Remote Fault) signal
- ✓ The MD1230B family measures LFS using software Option-16



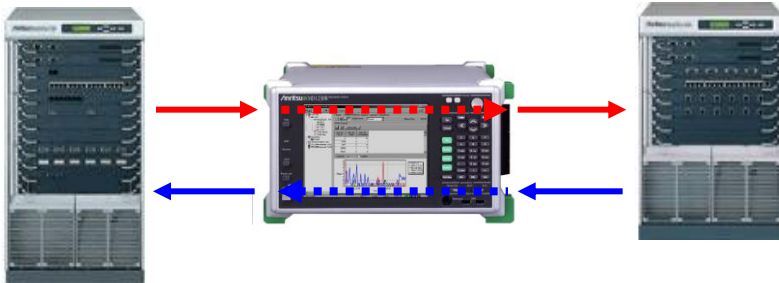
# Connection

## ➤ Supports Three Connection Types



No separate tapping module required

## LFS Monitoring



- Check LFS sequence
- Test interoperability
- Troubleshooting

## Transmit LF & RF Signals



- Check LFS sequence
- Perform abnormality tests

## LFS Emulation

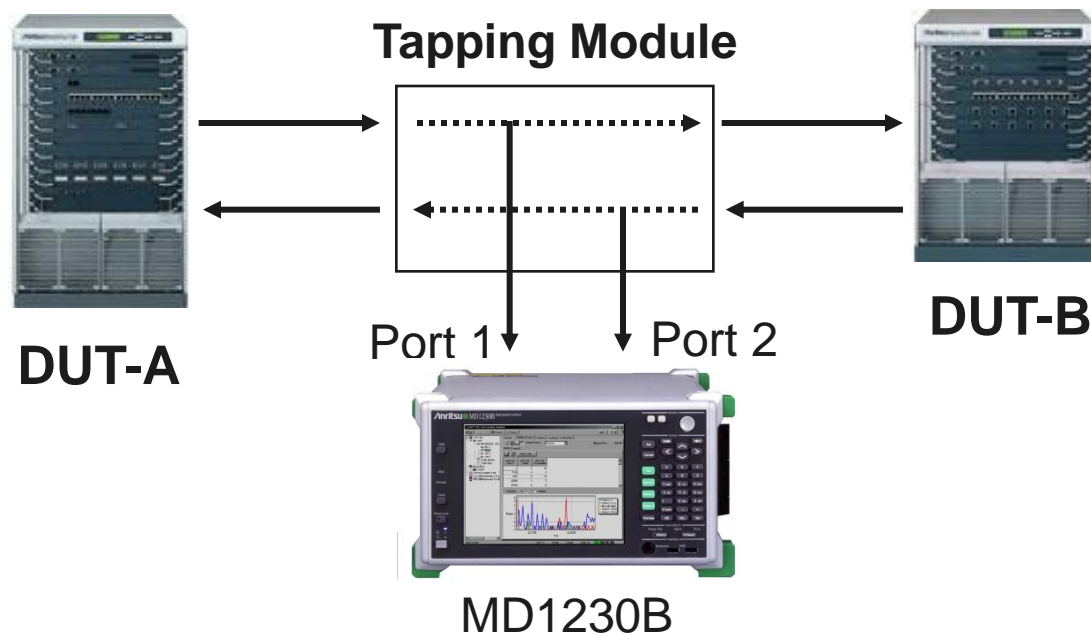


- Connect to equipment supporting LFS

# LFS Monitoring

## ➤ Applications

- ✓ Captures and analyzes LFS data
  - ✗ Supports both Tapping Module and Through Mode capture
- ✓ Generates and analyzes IP and Ethernet frames simultaneously



# LFS Monitoring

## ➤ LFS Alarm and Counters

The screenshot shows a network monitoring interface with a table of counters and a control panel. The control panel includes buttons for 'Alarm', 'Error', 'P.Fail', 'History', and 'H.Reset'. The 'Alarm' button is circled in blue. A callout box points to the 'Alarm' button with the text 'Alarm ON at LFS detection'. The main table shows various counters for 'Unit1:1:2' (Current) and 'Unit1:1:2' (Accumulated). The 'Transmitted LF Signal' counter is highlighted with a yellow icon.

Name	Unit1:1:2 Current	Unit1:1:2 Accumulated
Transmitted Bit Rate (bit/s)	20,193bit/s	57,496bit/s
Transmitted Bit Rate (%)	9.00%	57,477.00%
Transmitted Rate (%)	19,932.00%	81,268.00%
Transmitted Byte	29,352	Overflow
Transmitted Frame	31,982	Overflow
Transmitted Frame (fps)	26,979fps	59,826fps
Transmitted IPv4 Packet	27,200	81,309
Transmitted IPv4 Packet (pps)	1,620pps	57,344pps
Transmitted ARP Reply	189	55,261
Transmitted ARP Request	16,100	95,166
Transmitted PING Reply	19,812	80,265
Transmitted PING Request	30,648	39,462
Transmitted LF Signal	2,599	73,850
Transmitted RF Signal	20,136	97,182
Received Bit Rate (bit/s)	6,582bit/s	77,545bit/s
Received Bit Rate (%)	38.00%	74,965.00%
Received Rate (%)	25,452.00%	83,932.00%
Received Byte	11,369	116,006
Received Frame	7,328	Overflow
Received Frame (fps)	21,49	
Flow Control	3	

Alarm ON at LFS detection

■ Check condition of 10 GbE networks by long-term LFS counting

Transmitted LF Signal	2,599	73,850
Transmitted RF Signal	20,136	97,182
Received LF Signal	4,680	50,441
Received RF Signal	9,198	46,468

# LFS Monitoring

## ➤ Capture and Decode

- ✓ Capture and analyze LFS signals
- ✓ Analyze XGMII data
  - ✗ Idle code
  - ✗ Start code
  - ✗ others ...

The screenshot shows the software interface for LFS monitoring. At the top, there are two buttons: 'Start/Stop' and 'Trigger setting'. Below these is a control panel with a 'Port' dropdown set to 'Port 1&2', a green play button, a red stop button, a trigger icon, and a save icon. The main area is a table of captured data with the following columns: No., Port, RXC (0-3), and RXD (Lane 0-3). Row 6 is highlighted in blue. Below the table is a 'Decode view' section showing details for 'No.:6 Port:1'.

No.	Port	RXC (0-3)	RXD (Lane 0-3)
1	1	1111	07070707
2	1	1111	07070707
3	1	1111	07070707
4	1	1111	07070707
5	1	1111	07070707
6	1	1000	9C000001
7	1	1111	07070707
8	1	1111	07070707
9	1	1111	07070707
10	1	1111	07070707
11	1	1111	07070707
12	1	1111	07070707
13	1	1111	07070707
14	1	1111	07070707
15	1	1111	07070707
16	1	1111	07070707
17	1	1111	07070707
18	1	1111	07070707
19	1	1111	07070707
20	1	1111	07070707
21	1	1111	07070707
22	1	1111	07070707

**List of captured data**

**Decode view**

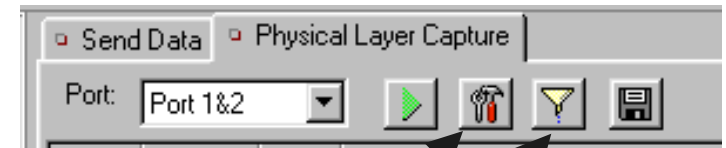
Lane	RXC	RXD	Code Sequence
0	1	9C	Sequence
1	0	0	Data
2	0	0	Data
3	0	1	Data



# LFS Monitoring

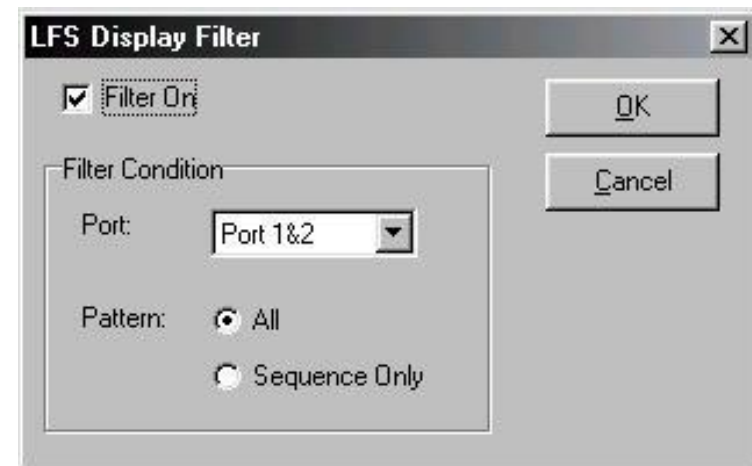
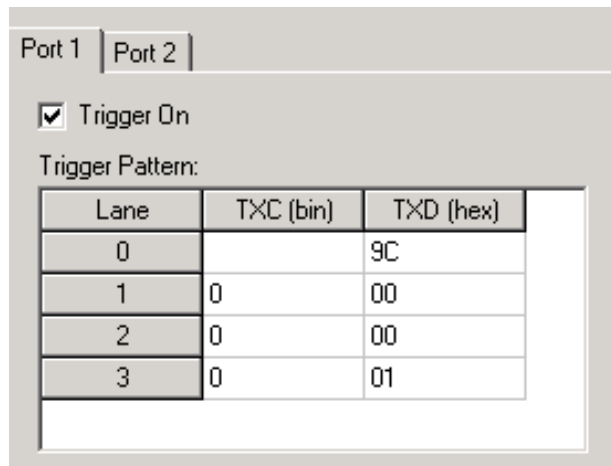
## ➤ Efficient Troubleshooting

- ✓ Trigger and filter functions select important data
- ✓ Solve problems quickly and efficiently



Trigger setting

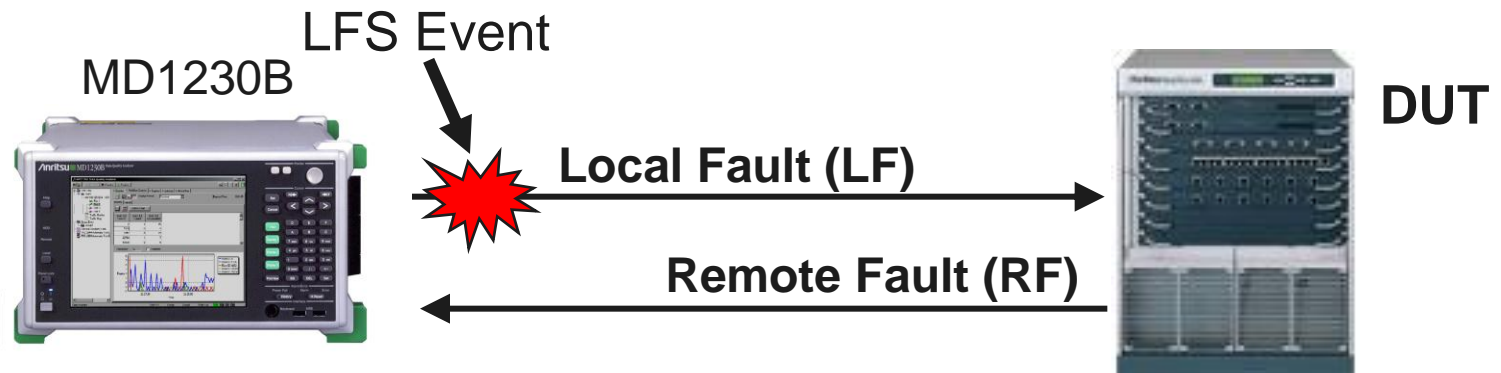
Screen filter



# XGMII Code Transmission

## ➤ Functions

- ✓ Complete LFS event by transmitting LF or RF signals
- ✓ Check functionality by transmitting edited XGMII code sequence



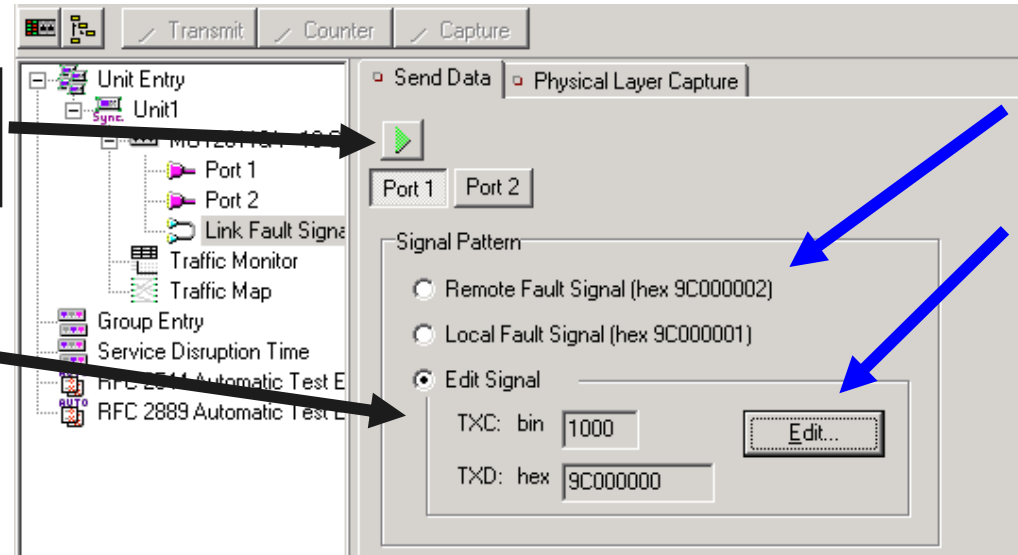
- Check LFS sequence
- Perform abnormality tests

# XGMII Code Transmission

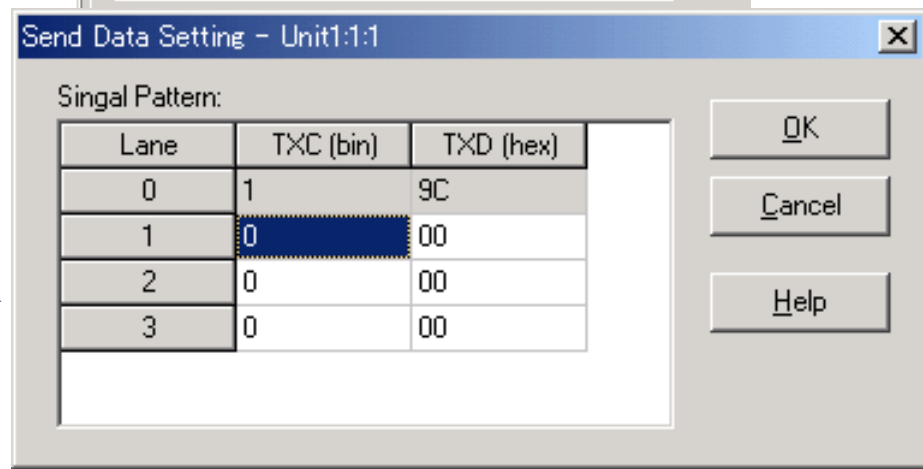
Transmit On/Off

Choose transmit codes

Transmit code edit screen



- Choose LF or RF signal
- Select "Edit Signal" to edit any code sequence



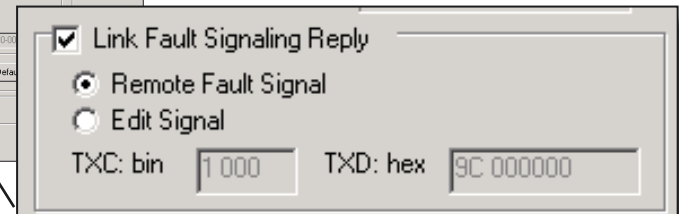
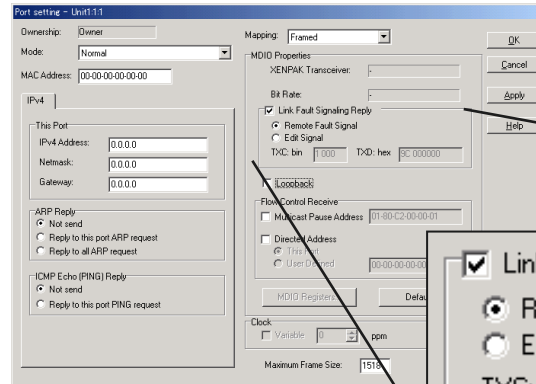
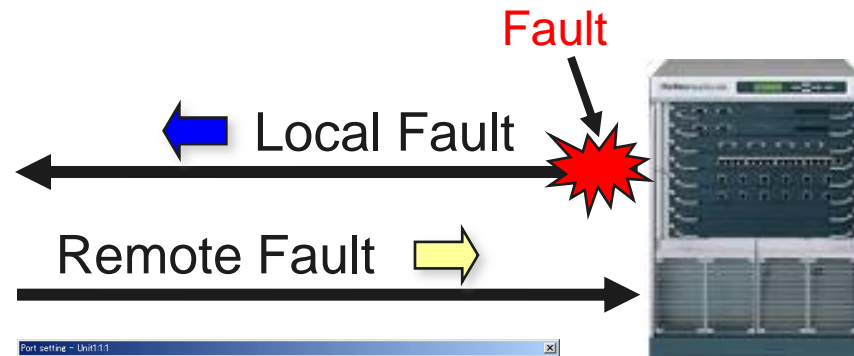
# LFS Emulation

## ➤ Connect to Equipment Supporting LFS

### ✓ Respond to received LF signal

- ✗ Send RF
- ✗ Send edited signal
- ✗ Send nothing

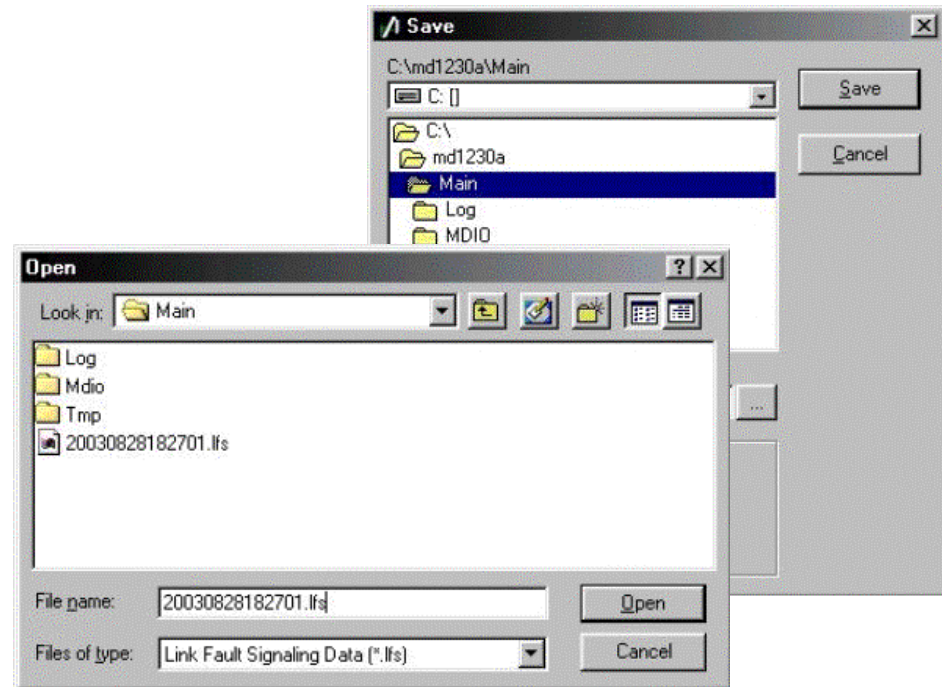
MD1230B



## ➤ Save and Load

No.	Port	RXC (0-3)	RXD (Lane 0-3)
77	1	0	FF83DF17
78	1	0	32094ED1
79	1	0	E7CD4EC2
80	1	0	9DC635C0
81	1	0	B8362589
82	1	0	2AE44656
83	1	1111	FD070707
84	1	1111	07070707
85	1	1111	07070707
86	1	1000	FB555555
87	1	0	555555D5
88	1	0	00000000
89	1	0	00000000
90	1	0	00000000
91	1	0	08004500
92	1	0	00000002
93	1	0	40004000
94	1	0	3CCE7F00
95	1	0	00017F00
96	1	0	0001F6F6
97	1	0	2828000C
98	1	0	FF83DF17
99	1	0	32094ED1
100	1	0	E7CD3C41

Excel  
sample



- “Capture Summary” saved as .csv file
- Easy import into Excel for reports

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