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# DDS Analyzer

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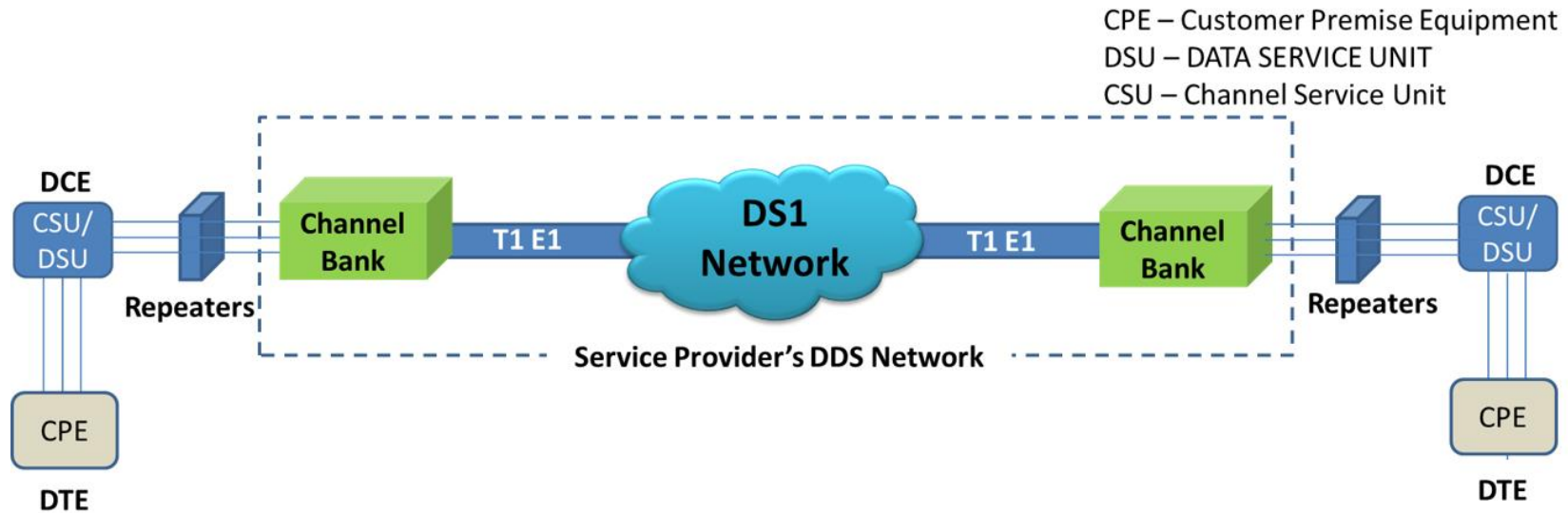


818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878  
Phone: (301) 670-4784 Fax: (301) 670-9187 Email: [info@gl.com](mailto:info@gl.com)  
Website: <https://www.gl.com>

# Overview

- DDS Networks and Testing Techniques
- DDS Protocol Analysis
- T1 Analyzer Hardware and Accessories
- Software Operation

# DDS Networks



# DDS Data Format

- Digital data rates are serviced at : 2.4kbps, 4.8kbps, 9.6kbps, 19.2kbps, 38.4kbps, 56kbps, 64kbps, N x 56kbps or N x 64kbps
- Rate multipliers above 56 kbps/ 64 kbps require a T1 circuit to the subscriber

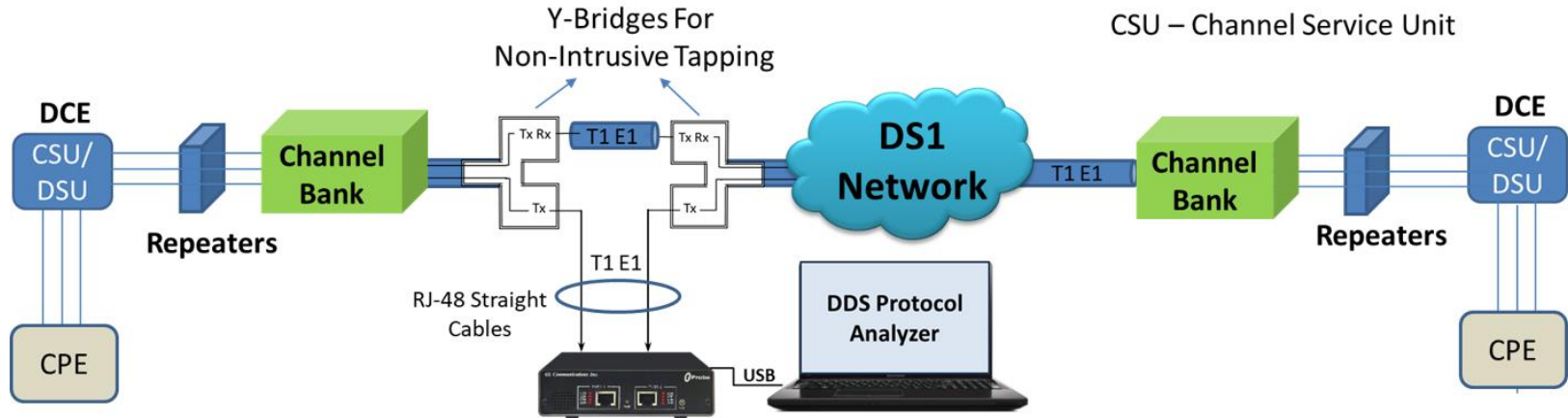
# DDS Testing Techniques

Normal testing methods used to verify DDS circuits are –

- BERT Testing at DS0 level with standard set of pseudorandom and fixed patterns
- Circuit sync at subscribed rate (4.8kbps, 9.6kbps, 19.2kbps, 64kbps, etc)
- Loopback or End-to-End tests to isolate faulty DDS circuits
- Non-Intrusive monitoring and analysis of frames at certain points within the network infrastructure or at customer premises

# DDS Protocol Analyzer

CPE – Customer Premise Equipment  
DSU – DATA SERVICE UNIT  
CSU – Channel Service Unit



# T 1 Analyzer Hardware



**tProbe™ - Portable USB based T1 E1 VF  
FXO FXS and Serial Datacom Analyzer**

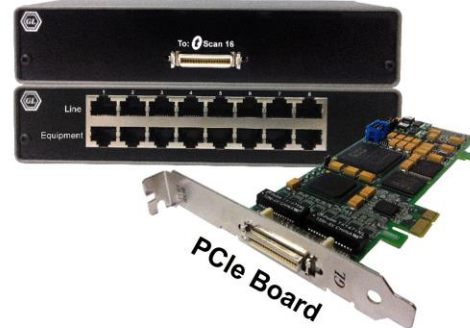


**Quad / Octal T1 E1 PCIe Card**



**Dual T1 E1 Express (PCIe) Board**

**tScan16™ with  
16-port T1 E1 Breakout Box**



# Hardware and Accessories



- Y-Bridge



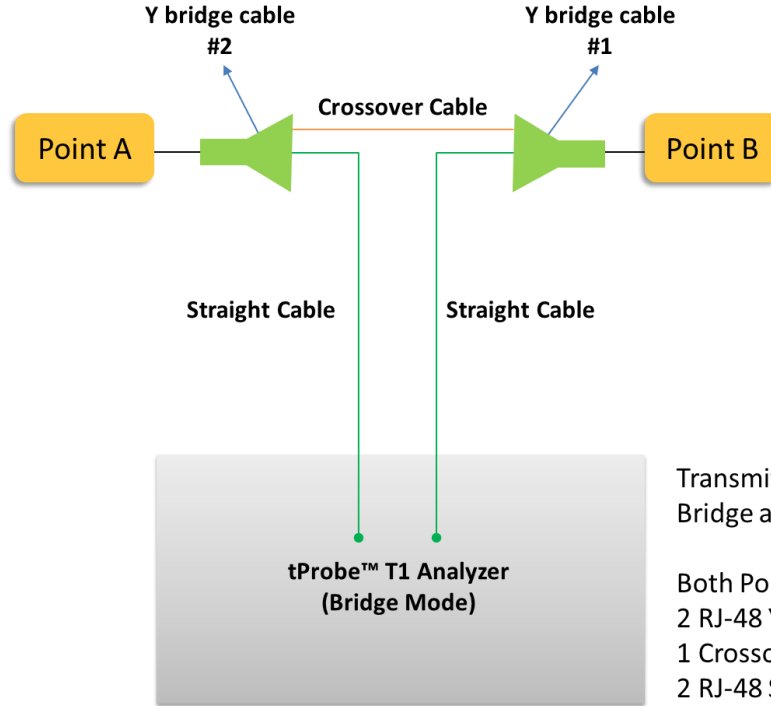
- RJ-48 Crossover Cable



- RJ-48 Straight Cable



# Operations



Transmitter is Disabled in  
Bridge and Monitor Modes

Both Ports are in Bridge Mode (Must not be in Terminate Mode)  
2 RJ-48 Y-Bridges (SA007e) are required  
1 Crossover Cable (SA007h) is required  
2 RJ-48 Straight Cable (SA007g) is required

- GL's T1 Analyzer Hardware non-intrusively taps the T1 line using Y-bridges to capture all frames

# Operations

T1 tProbe Analyzer 32-bit (Administrator)

File Config View Monitor IntrusiveTest **Special Applications** Window Help

Port	Framing	Loopback	Termination	Clock	B8ZS	Cross-port
1	ESF (193E)	No Loopback	Terminate	Internal	On	Normal
2	ESF (193E)	No Loopback	Terminate	Internal	On	Normal

Set all cards as selected  
< Double-click to change values

**T1/E1 Alarms**

Reset	All Ports	#1	#2
Sync Loss	✓	✓	✓
Bipolar Violation	✓	✓	✓
Carrier Loss	✓	✓	✓
Frame Error	✓	✓	✓
Blue Alarm	✓	✓	✓
Yellow Alarm	✓	✓	✓
AIS	✓	✓	✓

**T1/E1 Statistics**

	1544000	1544000
Frequency (Hz)	0.029	-0.029
Level (dBdsx)	0	0
BPV Errors	0	0
CRC Errors	0	0
Frame Errors	0	0
Transmit Under Run	0	0
Receive Over Run	0	0
==Bit/Frame Clock Slip==		

Ready

T1/E1 Sync Info

## Special Applications

Protocol Analysis

DDS Analysis

Windows Client Server (WCS)

Record to File

Dial Digits

Call Capture & Analysis

Physical Layer Testing

Echo Test Solutions

MCBERT, HDLC, TRAU

Facility Data Link

AudioBridge, StripChart

Voice Quality Assessment

# Card and Stream Selection

**Select Data Rate as 64 Kbps**

**Select Port and Channel on which the DDS frames are expected**

**Enable Octet Bit Reversion**

**PORT ACTIONS**

P...	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

**Data Transmission Rate**

Single Channel

☒ 64 kbps

56 kbps

Hyper-Channel

☐ Nx64 kbps

☐ Nx56 Kbps (bits 1-7)

☐ Nx56 Kbps (Bits 2-8)

Multiple Hyper-Channels

☐ 128, 192, ... kbps

**Subchannels 8-56 kbps**

DSO bits

☐ 8

☐ 16

☐ 24

☐ 32

☐ 40

☐ 48

☐ 56

All

None

**All Port Settings**

HDLC FCS

☒ 16 bits

☐ 32 bits

☐ None

Interface

☒ User

☐ Network

☐ Bit Inversion 1<->0

☒ Octet Bit Reversion (MSB <-> LSB)

**Row (Port) Select, Clear, Paste Operations**

Paste operations apply to the clipboard contents created by clicking on a row "C" (copy) button for the port which timeslot selection is served as the source for paste.

Select All

Clear All

Paste All

Paste Clipboard to Port List

Paste List

# Different Views

The screenshot displays the DDS Protocol Analysis software interface. The top section shows a table of captured frames. The middle section shows the decoded data for a selected frame. The bottom section shows a hex dump of the frame data.

Dev	TSlot	SubCh	Frame#	TIME (Relative)	Len	Error
✓ 1	2		42	00:41:50.246500	411	
✓ 1	3		43	00:42:20.699000	411	
✓ 1	0		44	00:42:41.681875	411	
✓ 1	2		45	00:45:10.427625	411	
✓ 1	6		46	00:45:26.277000	411	
✓ 1	2		47	00:46:03.320625	411	
✓ 1	4		48	00:47:26.436875	411	

Card1 TimeSlot=2 Frame=42 at 00:41:50.246500 OK Len=411  
HDLC Frame Data + FCS

===== DDS Layer =====

```
DDS = 202
DDS = A4- 36 ESN=029 2
DDS = (903) 203-4861 17:25 07/28/2017
DDS = 101
DDS = GUM SPRINGS RD - SE SECTOR
DDS = (903) 511-9812 WRIS
DDS = LONGVIEW TX
DDS =
DDS = WIRELESS-ATT MOBILITY
DDS = ALT#= TELCO=ATTMO
DDS = X=-94.7156023 CNF=000
DDS = Y=32.49131441 UNC=0
DDS =
DDS = VERIFY
DDS = VERIFY
```

Hex Dump of the Frame Data

Hex	ASCII
32 30 32 0D 41 34 2D 20 20 33 36 20 20 20 20 20	202 A4- 36
45 53 4E 3D 30 32 39 20 20 20 20 20 20 20 20	ESN=029
20 32 20 0D 28 39 30 33 29 20 32 30 33 2D 34 38	2 (903) 203-48
36 31 20 31 37 3A 32 35 20 30 37 2F 32 38 2F 32	61 17:25 07/28/2
30 31 37 0D 20 20 20 20 20 31 30 31 20 20 20 20	017 101
20 20 20 20 0D 47 55 4D 20 53 50 52 49 4E 47 53	GUM SPRINGS
20 52 44 20 2D 20 53 45 20 53 45 43 54 4F 52 20	RD - SE SECTOR

- **Summary View**

All captured DDS frames are displayed here

Right-click on decoded layer to copy content to clipboard

- **Detail View**

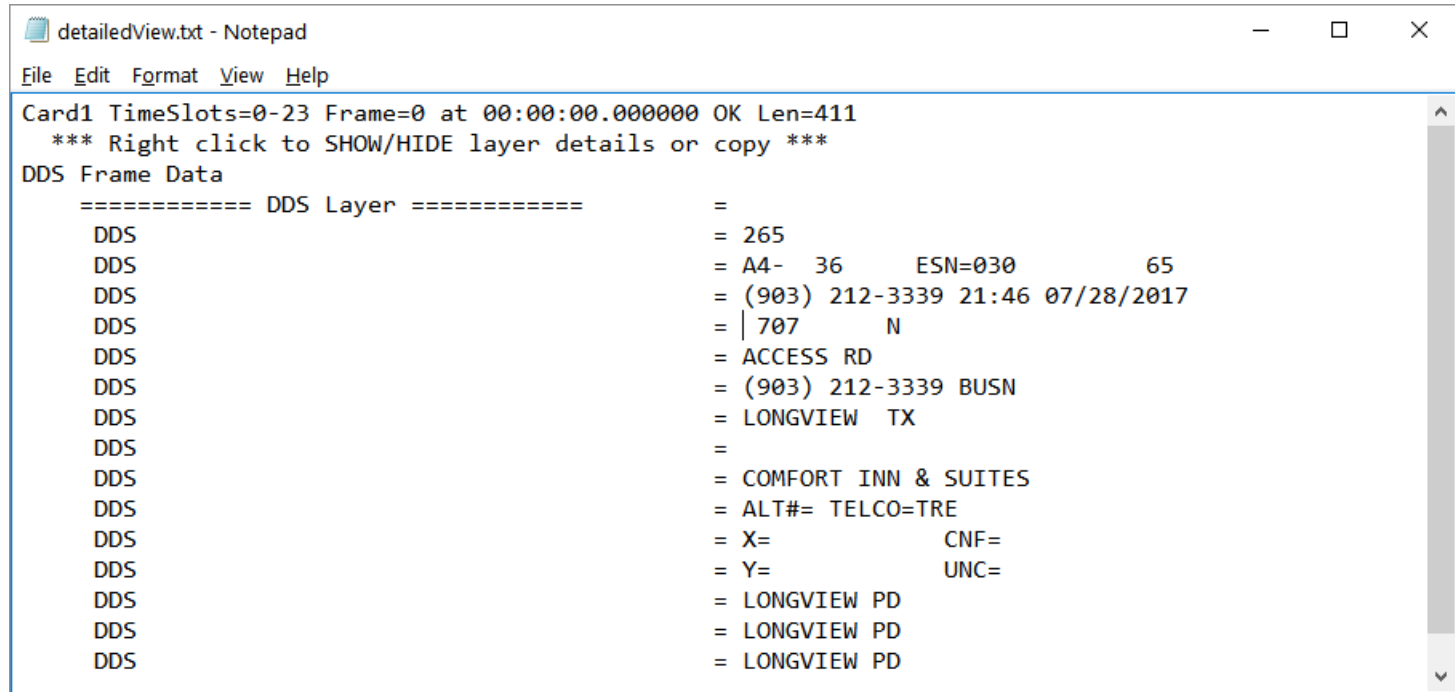
Displays the ASCII decode of selected DDS frame

- **Hex Dump View**

Displays Hex Dump Data

# Detail View

- Right-click on **Detail View** and copy layer contents to a notepad for further diagnosis and troubleshooting



```
detailedView.txt - Notepad
File Edit Format View Help
Card1 TimeSlots=0-23 Frame=0 at 00:00:00.000000 OK Len=411
*** Right click to SHOW/HIDE layer details or copy ***
DDS Frame Data
===== DDS Layer =====
DDS =
DDS = 265
DDS = A4- 36 ESN=030 65
DDS = (903) 212-3339 21:46 07/28/2017
DDS = 707 N
DDS = ACCESS RD
DDS = (903) 212-3339 BUSN
DDS = LONGVIEW TX
DDS =
DDS = COMFORT INN & SUITES
DDS = ALT#= TELCO=TRE
DDS = X= CNF=
DDS = Y= UNC=
DDS = LONGVIEW PD
DDS = LONGVIEW PD
DDS = LONGVIEW PD
```

Thank you