

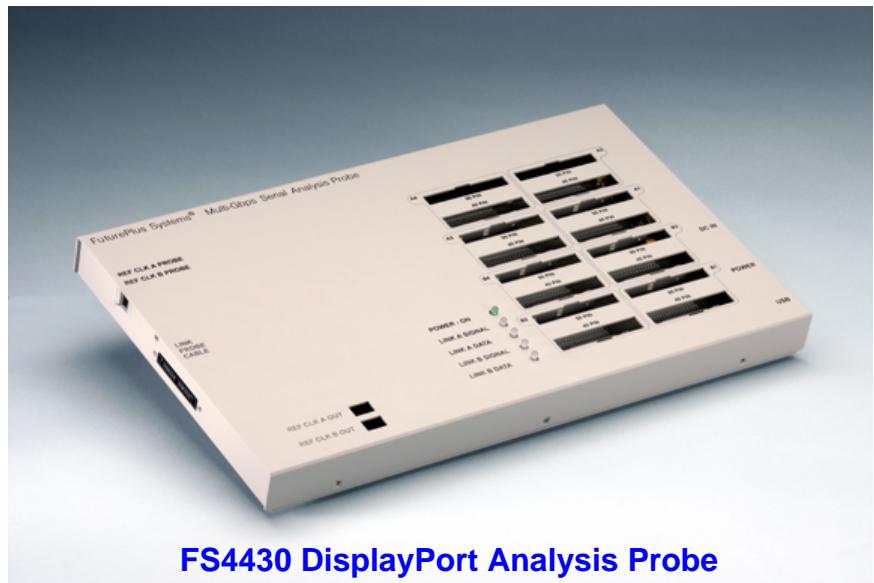
DisplayPort Analysis Probe

For use with Agilent Logic Analyzers

FuturePlus® Systems

Power Tools for Bus Analysis

- Low cost DisplayPort analysis
- Supports Agilent 16900-series logic analyzers
- Includes protocol-decode software, probe configuration software, and automatic logic analyzer configuration software



FS4430 DisplayPort Analysis Probe

Key Features

- Supports X1, X2, and X4 DisplayPort
- Data acquisition up to 2.7 GT/s
- Probe Manager software controls FS4430 via USB link and defines complex protocol aware filters for use with the logic analyzer
- Quad state LED's display instant port activity status
- Powerful Protocol Decode software decodes and displays Main Link and Auxiliary channel activity on the Agilent logic analyzer
- Choose 1/2 size footprint, interposer, or flying leads adapter cables to connect FS4430 to your target system
- Probe Manager software allows instant lane reversal and polarity inversion

Straightforward, Reliable DisplayPort Analysis

The FuturePlus FS4430 DisplayPort Analysis Probe provides a mechanical, electrical and software interface between an Agilent logic analyzer and the DisplayPort, a digital display interface standard supported by the Video Electronics Standards Association (VESA). The FS4430 is used to design and debug computer motherboards, monitors, home theater systems, and silicon chips incorporating DisplayPort technology.

Helping you Design Tomorrow's Computers, Today

FuturePlus Systems is the technology leader in protocol analysis tools for the computer design industry. Our analysis probes and software help you monitor and verify complex activities on your advanced technology computer bus design. FuturePlus systems offerings include bus-analysis solutions for most popular computer buses. Visit www.futureplus.com for more information.



Agilent Technologies

Channel Partner

Main Link Native Agilent Protocol Decode

[Offline] Agilent Logic Analyzer - [...\Config Files\DisplayPortGoodDataRGB_1.ala] - [Listing-1]

File Edit View Setup Tools Markers Run/Stop Listing Window Help

Horizontal blanking indicator

M1 to M2 = -785.738 us

Sample Number Time Protocol Decode Lane0 Lane1 Lane2 CLK L0S[5,4]

Sample Number	Time	Protocol Decode	Lane0	Lane1	Lane2	CLK	L0S[5,4]
-2	-8 ns	Dummy Data	000	000	000	X	=
-1	-6 ns	Dummy Data	000	000	000	0	
0	0 ns	MSA SS	15C	15C	15C	0	
1	4 ns	MSA SS	15C	15C	15C		
2	6 ns		001	001	001		
3	8 ns		0EF	0EF	0EF		
4	12 ns	Mvid[23:0] #1 = 0x01EF3C	03C	03C	03C		
4.1		Mvid[23:0] #2 = 0x01EF3C					
4.2		Mvid[23:0] #3 = 0x01EF3C					
4.3		Mvid[23:0] #4 = 0x01EF3C					
5	16 ns		005	001	004	008	0
6	20 ns	Hor. Total(Pixels) = 001344	040	028	000	000	0
6.1		Hor. Start(Pixels) = 000296					
6.2		Hor. Width(Pixels) = 001024					
7	24 ns	Nvid = 0x080000	003	000	000		
8	28 ns	Ver. Total(Line Count) = 806	026	000	000		
8.1		Ver. Start (Line Count) = 35					
8.2		Ver. Height(Line Count) 768					
8.3		MISCO = 0x21					
8.4		Link & Stream Ciks: Synchronous,					
8.5		Comp Format: RGB,					
8.6		Dynamic Range: VES,					
8.7		YCbCr Colorimetry: ITU-R BT601-5,					
8.8		Bit Depth Per Color: 8 Bits					
9	32 ns	MISC1 = 0x0	080	080	000	000	0
9.1		# Of Interlaced Lines: Is Odd #,					
9.2		Stereo Video Attr: No Stereo Video					
10	36 ns	Hor. Sync Polarity: Active Low Pulse	088	006	000	000	0
10.1		Hor. Sync Width(Pixels) = 16520					
10.2		Ver. Sync Polarity: Active Low Pulse					
10.3		Ver. Sync Width(Pixels) = 16390					
11	40 ns	MSA SE	1FD	1FD	1FD	1FD	0
12	44 ns	Dummy Data	000	000	000	000	0
13	48 ns	Dummy Data	000	000	000	000	0
14	52 ns	Dummy Data	000	000	000	000	0

Overview Listing-1 Status... Offline

Symbols such as Blanking Start and Content Protection Scrambler Reset appear often in DisplayPort traffic

Horizontal blanking indicator

The tool gives an index number to each pixel and identifies its color value

These event codes are handy for triggering and logic analyzer post processing

Aux Port Protocol Analysis

Offline] Agilent Logic Analyzer - [...\Sample Captures\AUX_4_with_IA.ala] - [AUX Listing]

File Edit View Setup Tools Markers Run/Stop Listing Window Help

M1 to M2 = -5.2767 us

Aux Port is a bidirectional half duplex 1Mb/sec communication channel

Time	Sample Number	COMMAND	Address	Command
60.000 us	-1	Aux Read request, Address = 1 Byte Count = 1	0 0001	Aux RE
	0	Aux ACK		
130.000 us	0.1	Max link rate= 2.7Gbps		
60.004 us	1	Aux Read request, Address = 2 Byte Count		
	2	Aux ACK		
	2.1	Max lane count = 4 lanes		
	2.2	Enhanced Frame cap = 1		
24.296312 ms	3	Aux Read request, Address = 600 Byte Count = 1		
62.000 us	4	Aux ACK		
	4.1	SET POWER		
	4.2	Set Power sink ctrl(DPCD ver.1.1) = DO Normal opera		
80.000 us	5	Aux Write request, Address = 600 Byte Count = 1		
10.000 us	6			
	6.1	SET POWER		
	6.2	Set Power sink ctrl(DPCD ver.1.1) = DO Normal opera		
52.004 us	7	Aux ACK all Data bytes written	0 0000	Aux ACK
138.000 us	8	Aux Read request, Address = 206 Byte Count = 1	0 0005	Aux RE
62.000 us	9	Aux ACK		
	9.1	VOLTAGE SWING AND EQUALIZATION SETTINGS		
	9.2	Voltage Swing lane0 = Level 0		
	9.3	Pre-emphasis lane0 = Level 2		
	9.4	Voltage swing lane1 = Level 0		
	9.5	Pre-emphasis lane1 = Level 2		
80.000 us	10	Aux Read request, Address = 207 Byte Count = 1		
60.004 us	11	Aux ACK		
	11.1	VOLTAGE SWING AND EQUALIZATION SETTINGS		
	11.2	Voltage Swing lane2 = Level 0		
	11.3	Pre-emphasis lane2 = Level 2		
	11.4	Voltage swing lane3 = Level 0		

The serial data is deserialized into a 48 bit wide bus and clocked to the logic analyzer. This wide bus makes triggering easy

Aux Port communicates configuration data between the monitor and the host PC

Diagnostic mode information is also communicated over the Aux Port

Overview AUX Listing AUX Waveform

Help, press F1 Status... Offline] Agilent L...

start 1.00.0000 1.00.0000 InstallShield Express DisplayPort - Micr... [Offline] Agilent L... 12:07

Ordering Information

FS4430 – DisplayPort Analysis Probe for Main Link and Aux Port

FS4432 - DisplayPort Analysis Probe for Aux Port

One of the following is required to connect the FS4430 to the target system:

FS1032 – ½ Midbus footprint Cable Adapter

FS1036 – Flying Leads Cable Adapter

FS1040 – Interposer Cable Adapter

The FS4432 includes the connection to the target system.

Software included with the FS4430 and FS4432:

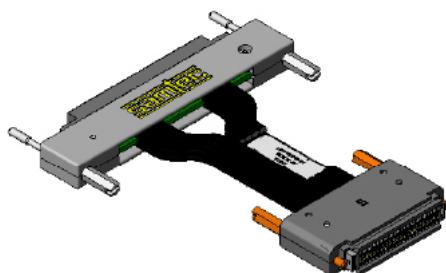
Probe Manager, runs on a PC or the logic analyzer

Configuration files for the Agilent logic analyzer

Protocol Decoder software, runs on the Agilent logic analyzer

Logic Analyzer Requirements

- 68 channels required for X1-X4 Main Link, 270 MHz state acquisition.
- 68 channels required for Aux Port, 100 KHz state acquisition.
- Both 40 and 90 pin logic analyzer pods are supported.
- The Agilent logic analyzer plugs directly into the FS4430.



FS1032 ½ Size Midbus Cable Adapter



FS1036 Flying Leads Cable Adapter



FS1040 Interposer Cable Adapter

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