StreamStor LVDS16-2 Daughter Board

User Manual

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About This Manual

This manual is intended to serve the following purposes:

- to provide an overview of the StreamStor LVDS16-2 daughter board;
- to act as a reference for the operator; and
- to provide guidance on software capabilities and choices.

It is suggested that you periodically check the Conduant web site for the most recent software updates, application notes, and technical bulletins.

If you are unable to locate the information you need, please feel free to contact us by e-mail or phone.

Overview

The StreamStor LVDS16-2 daughter board is a mezzanine IO board that can be used with some StreamStor controllers such as the StreamStor Amazon and the Big River LTX controllers. Adding this daughter board provides 2 high-speed data interfaces that provide both a 16 bit LVDS record port and a 16 bit LVDS playback port.

The LVDS16-2 daughter board provides 2 interfaces each made up of 16 differential inputs or outputs, a clock and flow control signals.

Interface Electronics

Interface electronics and termination values on StreamStor are those recommended by the ANSI standard. In reading the following sections on using this daughter board, it is important to be familiar with the American National Standard entitled "Electrical Characteristics of Low Voltage Differential Signaling (LVDS) Interface Circuits" (ANSI/TIA/EIA-644-A-2001). For information, please visit the Telecommunications Industry Association's website at www.tiaonline.org.

For data recording, the data source must supply up to 16 data bits, a clock signal and a "DATA VALID" signal. When the StreamStor recorder is in record mode, the LVDS16-2 board will capture one 16 bit value on each clock rising edge if the DATA VALID signal is active. The SUSPEND signal is output from the board and indicates whether or not it is ready to receive data. During an active transfer, the SUSPEND signal provides a 16 clock advance notice to the sending system to allow time for de-assertion of DATA VALID before a data overflow condition is reached.

For data playback, the board will output 16 data bits, a clock signal and a DATA VALID signal. The board will also monitor a SUSPEND input signal that indicates if the receiving system is ready to receive data. If the DATA VALID signal is active the board will have output data stable at the rising edge of the output clock signal.

Data Formats

The LVDS16-2 provides two point-to-point 16-bit connections. Data is stored or played back in order as received and is unframed.

Connector / Cabling

The LVDS16-2 board has two connectors on the front panel. The record (input) connector is designated "J8/RX" on the PCB and is labeled "J8-IN" on the faceplate. The playback (output) connector is designated "J9/TX" on the PCB and is labeled "J8-OUT" on the faceplate. In a standard PCI/PCIe card slot the playback connector is the upper connector on the rear faceplate. If installed in an LTX system the playback connector is on the left when facing the front of the unit.

The LVDS16-2 utilizes the Samtec VRDPC-68-01-M-RA connector on the printed circuit board for J8 and J9. You can order standard cables from Conduant in 1 and 3 meter lengths. These cables are wired with pin 1 to pin1 (i.e. no signal rotation). If building your own cables, you will need to modify a Samtec™ cable, manufacturer's part number VPSTP-24-XXXX (where XXXX is the length in millimeters, i.e., 1000, 2000, 3000 or 5000). Some custom cable configurations may be available from Conduant, please contact your sales agent for more details.

Conduant standard cables:

- 300000208 – Cable, LVDS16-2, 1 meter
- 300000210 – Cable, LVDS16-2, 3 meter

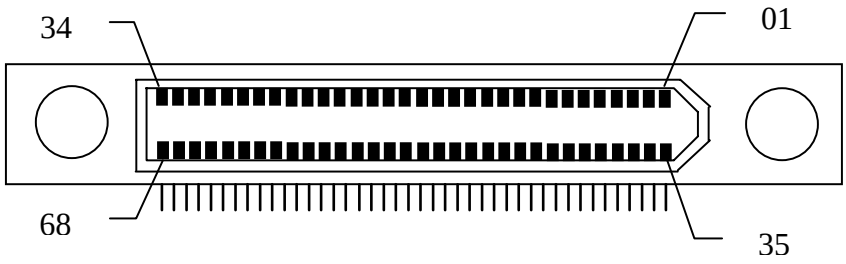

Figure 1 – J8/J9 Pin Numbering

J8 (Input) Connector pin assignment

Pin number	Signal name	Description
1	GND	Ground
2	GND	
3	IN_0+	Input data (bit 0), LVDS
4	IN_0-	
5	IN_1+	Input data (bit 1), LVDS
6	IN_1-	
7	IN_2+	Input data (bit 2), LVDS
8	IN_2-	
9	GND	Ground
10	GND	
11	IN_3+	Input data (bit 3), LVDS
12	IN_3-	
13	IN_4+	Input data (bit 4), LVDS
14	IN_4-	
15	IN_5+	Input data (bit 5), LVDS
16	IN_5-	
17	GND	Ground
18	GND	
19	IN_6+	Input data (bit 6), LVDS
20	IN_6-	
21	IN_7+	Input data (bit 7), LVDS
22	IN_7-	
23	IN_8+	Input data (bit 8), LVDS
24	IN_8-	
25	GND	Ground
26	GND	
27	IN_9+	Input data (bit 9), LVDS
28	IN_9-	
29	IN_10+	Input data (bit 10), LVDS
30	IN_10-	
31	IN_11+	Input data (bit 11), LVDS
32	IN_11-	
33	GND	Ground
34	GND	
35	GND	Ground
36	GND	
37	IN_12+	Input data (bit 12), LVDS
38	IN_12-	

Pin number	Signal name	Description
39	IN_13+	Input data (bit 13), LVDS
40	IN_13-	
41	IN_14+	Input data (bit 14), LVDS
42	IN_14-	
43	GND	Ground
44	GND	
45	IN_15+	Input data (bit 15), LVDS
46	IN_15-	
47	IN_DAV+	Data Valid signal, LVDS
48	IN_DAV-	
49	OUT_SSPND+	Suspend signal, LVDS
50	OUT_SSPND-	
51	GND	Ground
52	GND	
53	IN_CLK+	Clock, LVDS
54	IN_CLK-	
55	RSV	Reserved
56	RSV	
57	RSV	Reserved
58	RSV	
59	GND	Ground
60	GND	
61	RSV	Reserved
62	RSV	
63	RSV	Reserved
64	RSV	
65	RSV	Reserved
66	RSV	
67	GND	Ground
68	GND	

J9 (Output) Connector pin assignment

Pin number	Signal name	Description
1	GND	Ground
2	GND	
3	OUT_0+	Output data (bit 0), LVDS
4	OUT_0-	
5	OUT_1+	Output data (bit 1), LVDS
6	OUT_1-	
7	OUT_2+	Output data (bit 2), LVDS
8	OUT_2-	
9	GND	Ground
10	GND	
11	OUT_3+	Output data (bit 3), LVDS
12	OUT_3-	
13	OUT_4+	Output data (bit 4), LVDS
14	OUT_4-	
15	OUT_5+	Output data (bit 5), LVDS
16	OUT_5-	
17	GND	Ground
18	GND	
19	OUT_6+	Output data (bit 6), LVDS
20	OUT_6-	
21	OUT_7+	Output data (bit 7), LVDS
22	OUT_7-	
23	OUT_8+	Output data (bit 8), LVDS
24	OUT_8-	
25	GND	Ground
26	GND	
27	OUT_9+	Output data (bit 9), LVDS
28	OUT_9-	
29	OUT_10+	Output data (bit 10), LVDS
30	OUT_10-	
31	OUT_11+	Output data (bit 11), LVDS
32	OUT_11-	
33	GND	Ground
34	GND	
35	GND	Ground
36	GND	
37	OUT_12+	Output data (bit 12), LVDS
38	OUT_12-	

Pin number	Signal name	Description
39	OUT_13+	Output data (bit 13), LVDS
40	OUT_13-	
41	OUT_14+	Output data (bit 14), LVDS
42	OUT_14-	
43	GND	Ground
44	GND	
45	OUT_15+	Output data (bit 15), LVDS
46	OUT_15-	
47	OUT_DAV+	Data Valid signal, LVDS
48	OUT_DAV-	
49	IN_SSPND+	Suspend signal, LVDS
50	IN_SSPND-	
51	GND	Ground
52	GND	
53	OUT_CLK+	Clock, LVDS
54	OUT_CLK-	
55	RSV	Reserved
56	RSV	
57	RSV	Reserved
58	RSV	
59	GND	Ground
60	GND	
61	RSV	Reserved
62	RSV	
63	RSV	Reserved
64	RSV	
65	RSV	Reserved
66	RSV	
67	GND	Ground
68	GND	

Programming

Configuring LVDS with XLRSetDBMode

The `XLRSetDBMode` function provided by the StreamStor API is used to set most of LVDS parameters and options (see the SDK User Manual). Table 1 lists the supported modes for this daughter board. Note that the board must be in a compatible mode for the StreamStor operation being requested (i.e., receive mode for `XLRRecord`).

TABLE 1 - LVDS16-2 Modes

XLRSetDBMode Mode	Description
`SS_LVDS16MODE_RECV`	Receive data.
`SS_LVDS16MODE_XMIT`	Transmit data.

Table 2 details the supported daughter board options. Currently, the LVDS16-2 has only a flow control option.

TABLE 2 – LVDS16-2 Options

XLRSetDBMode Option	Description
`SS_DBOPT_LVDS16_FLOWCONTROL`	Enables flow control. By default, it is not enabled.

Setting the Channel Mode

The function `XLRSetMode` is used to set the input/output path on the StreamStor. The only valid channel mode for an LVDS daughter board is `SS_MODE_SINGLE_CHANNEL`. This is the default mode. In this mode, data is received over a single channel.

Binding Input/Output Channels

The input and output data ports are considered separate channels and must be bound into the StreamStor controller before recording or playback will occur from that port. By default, the PCI bus is bound as the input and output port in single channel mode.

The StreamStor API function `XLRBindInputChannel` or `XLRBindOutputChannel` must be called to define an input or output port if other than the PCI bus. Table 3 defines the constants to use to select the appropriate channel for your application. Since the LVDS16-2 daughter board has only a single record interface you should call `XLRBindInputChannel` for channel 30 to record from the external LVDS 16 bit interface. Likewise you should call

`XLRBindOutputChannel` for channel 31 to playback over the LVDS output port. Note that `XLRClearChannel` should be used to clear any existing bindings before setting an input or output channel binding.

TABLE 3 - LVDS16-2 Channel definitions	
Channel Number	**Channel Description**
`0`	PCI
`30`	LVDS record port
`31`	LVDS playback port

Setting Clock Speeds

The LVDS16-2 daughter board provides programmable clock speeds at the playback interface. When setting a frequency, it is applied to the playback port. The default clock setting is 200MHz.

Predefined Frequencies using XLRSetPortClock

The `XLRSetPortClock` function is used to set a predefined frequency for playing back. Table 4 lists the available clock settings. For other clock settings please contact Conduant customer support.

TABLE 4 – Predefined Clock Settings	
XLRSetPortClock clock	**Actual clock Speed (MHZ)**
`SS_LVDSCLOCK_20MHZ`	20
`SS_LVDSCLOCK_31_25MHZ`	31.25
`SS_LVDSCLOCK_62_5MHZ`	62.5
`SS_LVDSCLOCK_95MHZ`	95
`SS_LVDSCLOCK_100MHZ`	100
`SS_LVDSCLOCK_125MHZ`	125
`SS_LVDSCLOCK_150MHZ`	150
`SS_LVDSCLOCK_160MHZ`	160
`SS_LVDSCLOCK_190MHZ`	190
`SS_LVDSCLOCK_200MHZ`	200

Technical Support

Conduant wants to be sure that your StreamStor system works correctly and stays working correctly. In the event, however, that you are unable to get your system to work properly, or if a working system ceases to function, we will do all that we can to get your system back online.

Solving the problem is largely a matter of data collection and steps that must be taken one at a time. In order for us to better serve you, we ask that you take the time to perform the following steps prior to calling us. This way, you can provide us with the most meaningful information possible that will help us solve the problem.

Is the problem one that obviously requires replacement parts due to physical damage to the system? If yes, then please gather the information described below and report the problem to tech support, by phone or through the Conduant web site.

Have you confirmed that no cabling has been inadvertently disconnected or damaged while working around the equipment?

Is the StreamStor card properly seated in the PCI (CPCI/PXI) slot?

Do all the systems have good power connections and voltages?

Does the confidence test sscfg.exe (on Windows) or ssopen/sstest (on Linux) run OK?

Has the software installation been corrupted? Try re-installing software.

Have you checked the Conduant web site for technical bulletins?

Have you recently installed a new Linux kernel or compiler or a new Windows Service Pack?

If the above steps did not resolve the problem, then please initiate a trouble ticket on the support section of the Conduant website at www.conduant.com. Click on "Support" and then click on "Submit a Ticket." Please provide as much information about your system and the problem as possible. We will do all that we can to resolve the problem as quickly as possible.

Contacting Technical Support

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