



LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

LIGO Laboratory / LIGO Scientific Collaboration

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Test Procedure for IO Interface Backplane

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1 Introduction

The following Test Procedure describes the test of proper operation of the PCIe Timing Interface.

S/N _____ Tester _____

Date _____

2 Test Equipment

- Voltmeter
- Oscilloscope
- Fiber from a Timing Master/Fanout (optional),
- Windows PC with open motherboard with at least 1 PCIe slot free. Alternatively, use a PC with a PCIe extender like the Adnaco.
- Extra PC ATX power supply
- Adapter: Dual PSU power supply 24-pin adapter cable for ATX motherboard, and
- 2 test adapter board for backplane, [D2100184](#).
- Breakout Boards – DB25 if needed

3 Preparations

- PC needs to run Windows 10, 64-bit, no secure boot.
- Install the device driver for LIGO Timing.
- Install the LIGOTimingApp program.
- Install a PCIe timing board in the PC and make sure the driver is loaded (it should show up in the Device Manager as “Timing > LIGO Timing Device”).

4 Caution

When connecting test adapters, backplanes and daughter cards, it is important that the correct FPGA program is loaded. Otherwise, it is possible to short two outputs together which can potentially damage the board.

- The backplane, [D20000297](#), daughter board, [D2000331](#), and the GPS expansion module, [D2000301](#), require the FPGA timing code, [E2000337](#).

5 Backplane Test

Setup the backplane with the extra ATX power supply and with the dual PSU Power Supply 24-pin adapter cable. Turn on the power.

1) Check the voltages and LEDs on the backplane.

TP7 (+12V) _____

TP3 (+3.3V) _____

TP10 (+5V) _____

- LED DS1 (green)
- LED DS2 (green)
- LED DS3 (green)

2) Insert PCIe board into PC, connect the DB37 cable.

Run the LIGO Timing App program and make sure it is running.

Set the frequencies of the backplane slots (Converter tab) to 16, 17, 18, 19, 20, 0, 15, -1, 14, and 13. Enable all slots. Set Out1 and Out 2 in the fields with white background.

Slot #	Type	Active	Running	Enable	Frequency	Hertz	Phase	Phase (*)	Invert	Start PPS	Start Idle	Pull High	Use LVDS	ADC DT	ADC Mon 1	ADC Mon 2	DAC DT	DAC Mon	Out 1	Bit 1	Mon 1	Out 2	Bit 2	Mon 2
1	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	16	65536	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	17	131072	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	18	262144	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	19	524288	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	20	1048576	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0	1	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	15	32768	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	-1	0.5	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	14	16384	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Backplane	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	13	8192	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Interrupt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Interrupt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Interrupt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Interrupt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	1	0x00000000	0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1: Device driver connected

Nominal: green

Make sure the backplane is enabled:

2: All enabled

Nominal: check

3: All running

Nominal: green

4: Press watchdog button, and check the watchdog go green for ~2 sec.

5: Watchdog indicator

Nominal: 2sec-green

6: Short pins 1 & 2 on P3 header

Nominal: Temp Alarm goes red

The screenshot shows the 'LIGO Timing' application window with the 'Backplane' tab selected. The interface includes several status indicators and control elements:

- All Running:** Green indicator, circled in red with a red '3' next to it.
- All Active:** Green indicator, circled in red with a red '3' next to it.
- Present:** Green indicator, circled in red with a red '3' next to it.
- Enable A:** Checked checkbox, circled in red with a red '2' next to it.
- Start on PPS:** Unchecked checkbox, circled in red with a red '2' next to it.
- Start from Idle:** Unchecked checkbox, circled in red with a red '2' next to it.
- Temp. Alarm:** Green indicator.
- Watchdog:** Red indicator, circled in red with a red '5' next to it.
- DuoTone:** Checked checkbox.
- Watchdog Reset on Time Read:** Unchecked checkbox.
- X1, X3, X5:** Green, Green, and Unchecked indicators respectively.
- Buttons:** 'SPI Reset' and 'Watchdog Reset' buttons are visible, with the 'Watchdog Reset' button circled in red with a red '4' next to it.
- Revision:** A text box containing the value '0'.

The status bar at the bottom displays: 'GPS Time: 1308965248.135' and 'Status: Device \\?\PCI#VEN10EE&DEV_D8C6&SUBSYS_D8C610EE&REV_01#4&267c08a6&0&00E4#(9ad87c8b-d169)'. A small green indicator is present at the end of the status bar.

3) Install two backplane adapter boards into slots 1 and 2, then equip them with DB25 breakout boards.

Toggle Slot 1/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 1
Toggle Slot 2/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 2
Toggle slot 1/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 1
Toggle slot 2/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 2
Toggle slot 1/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 1
Toggle slot 2/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 2
Toggle slot 1/Bit 2:	<input type="checkbox"/> Nominal: Turns on 4 th LED in slots 1 & 2
Toggle 1 st switch in slot 1:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 1
Toggle 1 st switch in slot 2:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 2
Toggle 2 nd switch in slot 1:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 1
Toggle 2 nd switch in slot 2:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 2
Toggle 3 rd switch in slot 1:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 1
Toggle 3 rd switch in slot 2:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 2

Use a clip to probe the pins on the DB25 breakouts. Repeat after toggling “Use LVDS”. Pin 13 can be used as a ground.

Pin 1/slot 1:	<input type="checkbox"/> Nominal: 65536 Hz with LVDS on
Pin 2/slot 1:	<input type="checkbox"/> Nominal: 65536 Hz with LVDS on
Pin 3/slot 1:	<input type="checkbox"/> Nominal: 131072 Hz with LVDS on
Pin 4/slot 1:	<input type="checkbox"/> Nominal: 65536 Hz with LVDS off
Pin 5/slot 1:	<input type="checkbox"/> Nominal: 65536 Hz with LVDS off
Pin 1/slot 2:	<input type="checkbox"/> Nominal: 131072 Hz with LVDS on
Pin 2/slot 2:	<input type="checkbox"/> Nominal: 65536 Hz with LVDS on
Pin 3/slot 2:	<input type="checkbox"/> Nominal: 131072 Hz with LVDS on
Pin 4/slot 2:	<input type="checkbox"/> Nominal: 131072 Hz with LVDS off
Pin 5/slot 2:	<input type="checkbox"/> Nominal: 131072 Hz with LVDS off

With an Ohmmeter check short between pin 8 on slots 1 & 2:	<input type="checkbox"/> Short
With an Ohmmeter check short between pin 21 on slots 1 & 2:	<input type="checkbox"/> Short
With a scope check for DuoTone on pin 7 in slot 1:	<input type="checkbox"/> On
With a scope check watchdog on pin 25 in slot 1 (press watchdog button!):	<input type="checkbox"/> On
With a scope check watchdog on pin 25 in slot 2 (press watchdog button!):	<input type="checkbox"/> On

4) Install two backplane adapter boards into slots 3 and 4, then equip them with DB25 breakout boards.

Toggle Slot 3/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 3
Toggle Slot 4/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 4
Toggle slot 3/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 3
Toggle slot 4/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 4
Toggle slot 3/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 3
Toggle slot 4/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 4
Toggle slot 3/Bit 2:	<input type="checkbox"/> Nominal: Turns on 4 th LED in slots 3 & 4
Toggle 1 st switch in slot 3:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 3
Toggle 1 st switch in slot 4:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 4
Toggle 2 nd switch in slot 3:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 3
Toggle 2 nd switch in slot 4:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 4
Toggle 3 rd switch in slot 3:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 3
Toggle 3 rd switch in slot 4:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 4

Use a clip to probe the pins on the DB25 breakouts. Repeat after toggling “Use LVDS”. Pin 13 can be used as a ground.

Pin 1/slot 3:	<input type="checkbox"/> Nominal: 262144 Hz with LVDS on
Pin 2/slot 3:	<input type="checkbox"/> Nominal: 262144 Hz with LVDS on
Pin 3/slot 3:	<input type="checkbox"/> Nominal: 524288 Hz with LVDS on
Pin 4/slot 3:	<input type="checkbox"/> Nominal: 262144 Hz with LVDS off
Pin 5/slot 3:	<input type="checkbox"/> Nominal: 262144 Hz with LVDS off
Pin 1/slot 4:	<input type="checkbox"/> Nominal: 524288 Hz with LVDS on
Pin 2/slot 4:	<input type="checkbox"/> Nominal: 262144 Hz with LVDS on
Pin 3/slot 4:	<input type="checkbox"/> Nominal: 524288 Hz with LVDS on
Pin 4/slot 4:	<input type="checkbox"/> Nominal: 524288 Hz with LVDS off
Pin 5/slot 4:	<input type="checkbox"/> Nominal: 524288 Hz with LVDS off

With an Ohmmeter check short between pin 8 on slots 3 & 4:	<input type="checkbox"/> Short
With an Ohmmeter check short between pin 21 on slots 3 & 4:	<input type="checkbox"/> Short
With a scope check watchdog on pin 25 in slot 1 (press watchdog button!):	<input type="checkbox"/> On
With a scope check watchdog on pin 25 in slot 2 (press watchdog button!):	<input type="checkbox"/> On

5) Install two backplane adapter boards into slots 5 and 6, then equip them with DB25 breakout boards.

Toggle Slot 5/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 5
Toggle Slot 6/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 6
Toggle slot 5/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 5
Toggle slot 6/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 6
Toggle slot 5/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 5
Toggle slot 6/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 6
Toggle slot 5/Bit 2:	<input type="checkbox"/> Nominal: Turns on 4 th LED in slots 5 & 6
Toggle 1 st switch in slot 5:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 5
Toggle 1 st switch in slot 6:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 6
Toggle 2 nd switch in slot 5:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 5
Toggle 2 nd switch in slot 6:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 6
Toggle 3 rd switch in slot 5:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 5
Toggle 3 rd switch in slot 6:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 6
Toggle 4 th switch in slot 6:	<input type="checkbox"/> Nominal: X1 goes off (backplane tab)

Use a clip to probe the pins on the DB25 breakouts. Repeat after toggling “Use LVDS”. Pin 13 can be used as a ground.

Pin 1/slot 5:	<input type="checkbox"/> Nominal: 1048576 Hz with LVDS on
Pin 2/slot 5:	<input type="checkbox"/> Nominal: 1048576 Hz with LVDS on
Pin 3/slot 5:	<input type="checkbox"/> Nominal: 1 Hz with LVDS on
Pin 4/slot 5:	<input type="checkbox"/> Nominal: 1048576 Hz with LVDS off
Pin 5/slot 5:	<input type="checkbox"/> Nominal: 1048576 Hz with LVDS off
Pin 1/slot 6:	<input type="checkbox"/> Nominal: 1 Hz with LVDS on
Pin 2/slot 6:	<input type="checkbox"/> Nominal: 1048576 Hz with LVDS on
Pin 3/slot 6:	<input type="checkbox"/> Nominal: 1 Hz with LVDS on
Pin 4/slot 6:	<input type="checkbox"/> Nominal: 1 Hz with LVDS off
Pin 5/slot 6:	<input type="checkbox"/> Nominal: 1 Hz with LVDS off

With an Ohmmeter check short between pin 8 on slots 5 & 6:	<input type="checkbox"/> Short
With an Ohmmeter check short between pin 21 on slots 5 & 6:	<input type="checkbox"/> Short
With a scope check watchdog on pin 25 in slot 1 (press watchdog button!):	<input type="checkbox"/> On
With a scope check watchdog on pin 25 in slot 2 (press watchdog button!):	<input type="checkbox"/> On

6) Install two backplane adapter boards into slots 7 and 8, then equip them with DB25 breakout boards.

Toggle Slot 7/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 7
Toggle Slot 8/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 8
Toggle slot 7/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 7
Toggle slot 8/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 8
Toggle slot 7/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 7
Toggle slot 8/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 8
Toggle slot 7/Bit 2:	<input type="checkbox"/> Nominal: Turns on 4 th LED in slots 7 & 8
Toggle 1 st switch in slot 7:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 7
Toggle 1 st switch in slot 8:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 8
Toggle 2 nd switch in slot 7:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 7
Toggle 2 nd switch in slot 8:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 8
Toggle 3 rd switch in slot 7:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 7
Toggle 3 rd switch in slot 8:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 8
Toggle 4 th switch in slot 8:	<input type="checkbox"/> Nominal: X3 goes off (backplane tab)

Use a clip to probe the pins on the DB25 breakouts. Repeat after toggling “Use LVDS”. Pin 13 can be used as a ground.

Pin 1/slot 7:	<input type="checkbox"/> Nominal: 32768 Hz with LVDS on
Pin 2/slot 7:	<input type="checkbox"/> Nominal: 32768 Hz with LVDS on
Pin 3/slot 7:	<input type="checkbox"/> Nominal: 0.5 Hz with LVDS on
Pin 4/slot 7:	<input type="checkbox"/> Nominal: 32768 Hz with LVDS off
Pin 5/slot 7:	<input type="checkbox"/> Nominal: 32768 Hz with LVDS off
Pin 1/slot 8:	<input type="checkbox"/> Nominal: 0.5 Hz with LVDS on
Pin 2/slot 8:	<input type="checkbox"/> Nominal: 32768 Hz with LVDS on
Pin 3/slot 8:	<input type="checkbox"/> Nominal: 0.5 Hz with LVDS on
Pin 4/slot 8:	<input type="checkbox"/> Nominal: 0.5 Hz with LVDS off
Pin 5/slot 8:	<input type="checkbox"/> Nominal: 0.5 Hz with LVDS off

With an Ohmmeter check short between pin 8 on slots 7 & 8:	<input type="checkbox"/> Short
With an Ohmmeter check short between pin 21 on slots 7 & 8:	<input type="checkbox"/> Short
With a scope check watchdog on pin 25 in slot 1 (press watchdog button!):	<input type="checkbox"/> On
With a scope check watchdog on pin 25 in slot 2 (press watchdog button!):	<input type="checkbox"/> On

7) Install two backplane adapter boards into slots 9 and 10, then equip them with DB25 breakout boards.

Toggle Slot 9/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 9
Toggle Slot 10/ADC DT:	<input type="checkbox"/> Nominal: Turns off 1 st LED in slot 10
Toggle slot 9/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 9
Toggle slot 10/DAC DT:	<input type="checkbox"/> Nominal: Turns off 2 nd LED in slot 10
Toggle slot 9/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 9
Toggle slot 10/Bit 1:	<input type="checkbox"/> Nominal: Turns on 3 rd LED in slot 10
Toggle slot 9/Bit 2:	<input type="checkbox"/> Nominal: Turns on 4 th LED in slots 9 & 10
Toggle 1 st switch in slot 9:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 9
Toggle 1 st switch in slot 10:	<input type="checkbox"/> Nominal: ADC Mon 1 comes on in slot 10
Toggle 2 nd switch in slot 9:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 9
Toggle 2 nd switch in slot 10:	<input type="checkbox"/> Nominal: ADC Mon 2 comes on in slot 10
Toggle 3 rd switch in slot 9:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 9
Toggle 3 rd switch in slot 10:	<input type="checkbox"/> Nominal: DAC Mon 1 comes on in slot 10

Use a clip to probe the pins on the DB25 breakouts. Repeat after toggling “Use LVDS”. Pin 13 can be used as a ground.

Pin 1/slot 9:	<input type="checkbox"/> Nominal: 16384 Hz with LVDS on
Pin 2/slot 9:	<input type="checkbox"/> Nominal: 16384 Hz with LVDS on
Pin 3/slot 9:	<input type="checkbox"/> Nominal: 8192 Hz with LVDS on
Pin 4/slot 9:	<input type="checkbox"/> Nominal: 16384 Hz with LVDS off
Pin 5/slot 9:	<input type="checkbox"/> Nominal: 16384 Hz with LVDS off
Pin 1/slot 10:	<input type="checkbox"/> Nominal: 8192 Hz with LVDS on
Pin 2/slot 10:	<input type="checkbox"/> Nominal: 16384 Hz with LVDS on
Pin 3/slot 10:	<input type="checkbox"/> Nominal: 8192 Hz with LVDS on
Pin 4/slot 10:	<input type="checkbox"/> Nominal: 8192 Hz with LVDS off
Pin 5/slot 10:	<input type="checkbox"/> Nominal: 8192 Hz with LVDS off

With an Ohmmeter check short between pin 8 on slots 9 & 10:	<input type="checkbox"/> Short
With an Ohmmeter check short between pin 21 on slots 9 & 10:	<input type="checkbox"/> Short
With a scope check watchdog on pin 25 in slot 1 (press watchdog button!):	<input type="checkbox"/> On
With a scope check watchdog on pin 25 in slot 2 (press watchdog button!):	<input type="checkbox"/> On

6 Pass/Fail

Pass

Fail

Comments:
