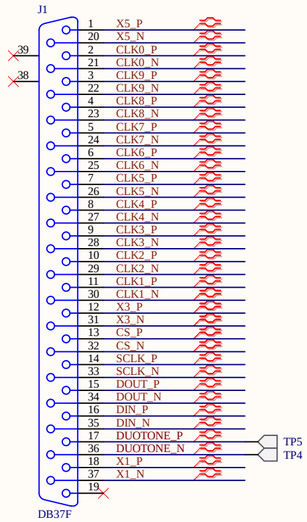
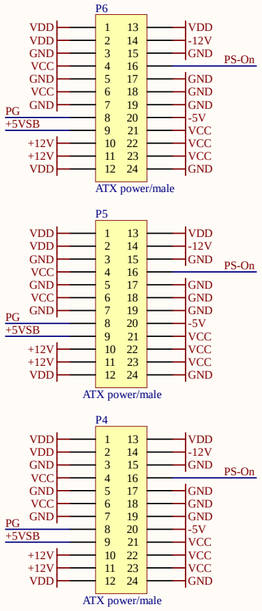
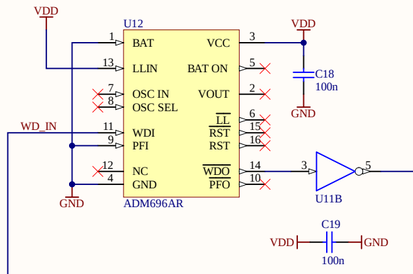
Timing FPGA



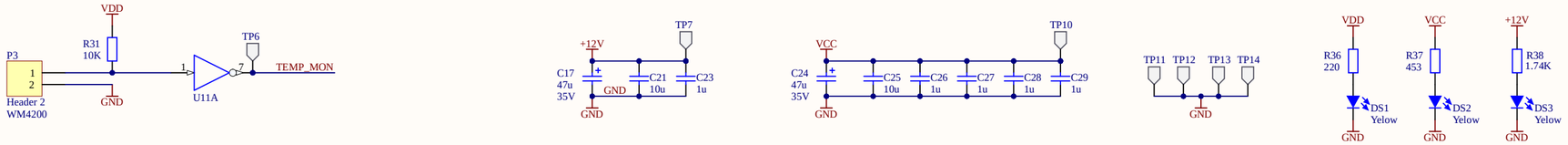
Main Power Terminal

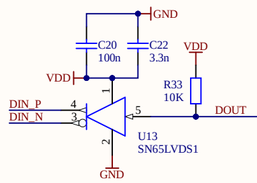


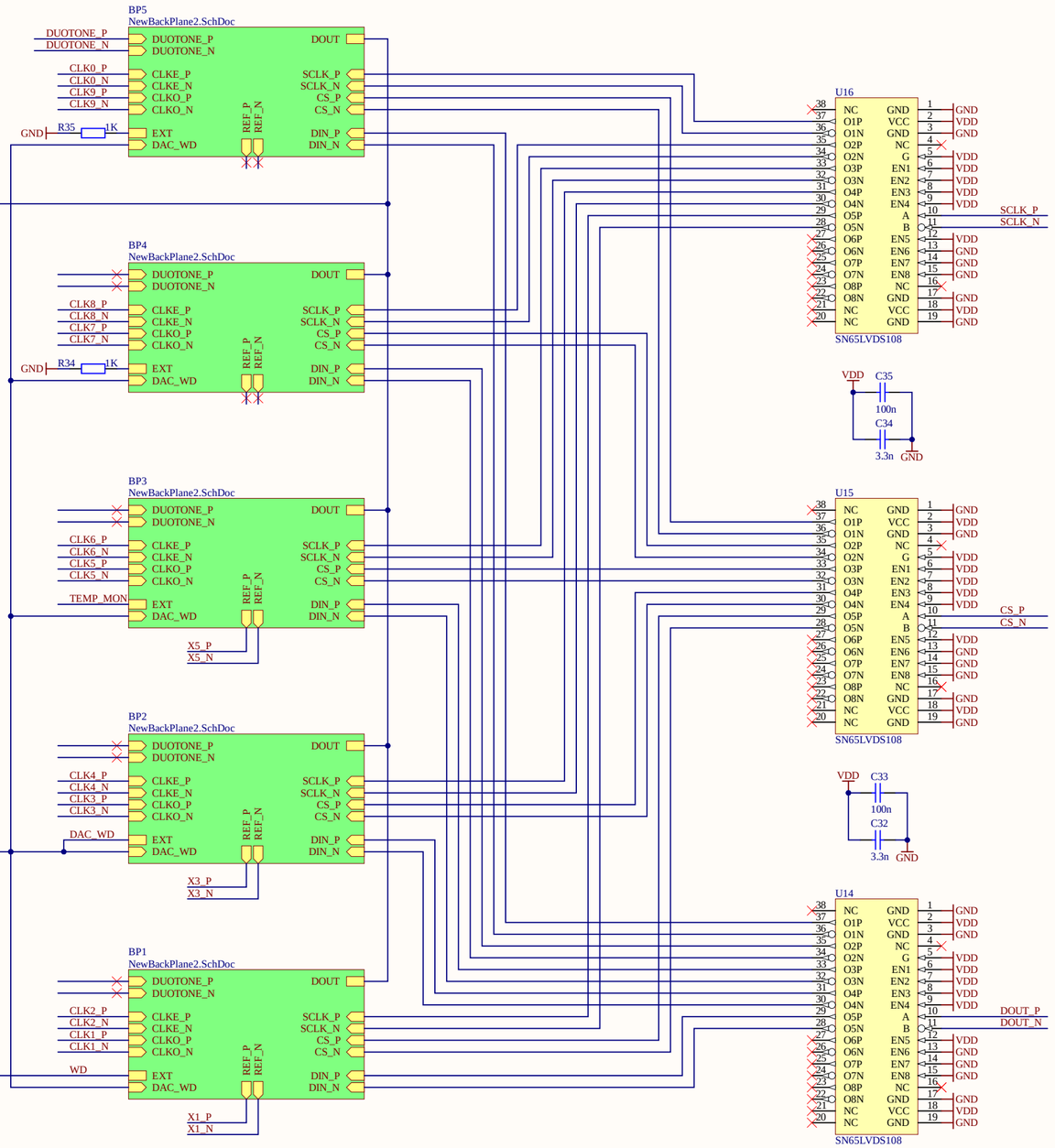
Watchdog Circuit (1.6 sec Nominal)



Remote Temperature Switch Monitor Input







Slot 10

Slot 9

Slot 8

Slot 7

Slot 6

Slot 5

Slot 4

Slot 3

Slot 2

Slot 1

Title	New IO Interface Backplane	
Size: C	Number: D2000297	Revision: 1
Date: 6/23/2020	Sheet 1 of 2	
File: C:\Users\..\NewBackplane1.SchDoc	Drawn By: Daniel Sigg	

New fast LVDS clock lines

Option 1: Old type TTL ADC/DAC clock (1 per slot)
Option 2: Fast LVDS clock (1 per slot)
Option 3: Fast LVDS clock and sync lines
(shared on neighboring slots)

BIT1/2: new binary IO pins

SPI IO Address:

Slot 1/2: 1, slot 3/4: 2, etc.

External BIO:

Slot 1/2: Watchdog (output)
Slot 3/4: Watchdog readback
Slot 4/6: Temperature alarm
Slot 7/8 & 9/10: Tied to ground

IO pins are 3.3V only

Even SLOT

Odd SLOT

Title	New IO Interface Backplane		
Size: C	Number: D2000297	Revision: 1	
Date: 6/23/2020	Sheet 2of 2		
File: C:\Users\..\NewBackplane2.SchDoc	Drawn By: Daniel Sigg		

P1A P2A P1B P2B P1C P2C P1D P2D P1E P2E

B1 A1 B2 A2

SLOT 1 SLOT 2 SLOT 3 SLOT 4 SLOT 5 SLOT 6 SLOT 7 SLOT 8 SLOT 9 SLOT 10

INSTALL 1ST DAC IN SLOT 9

INSTALL 1ST ADC IN SLOT 10

P4 P6 P3 P7 P5 U13 DS2 DS1 J1 J2 C19 C22

19 1 37 20

LIGO

New IO Interface Backplane
D2000297

rev. 1

8700.00
7025.00
5140.00
4250.00
3090.00
1950.00

2180.00
4185.00
6445.00
5780.00
7380.00
8695.00
9390.00
8980.00
10185.00
10580.00
11782.23

Bill of Materials — LIGO Project — D2000297 — Revision 1

Project: NewBackplane.PrjPcb
Author: Daniel Sigg

Number of boards	1

Report Date: 6/23/2020 11:13 AM
Print Date: 23-Jun-20 11:13:47 AM

Quantity	Distributor	Part Number	Comment	Description	Designator	Footprint	Assembly Type	Extra	Excess	Adjust	Quantity to Order
46	Digi-Key	311-1140-1-ND	100n	Capacitor, surface mount	C1A, C1B, C1C, C1D, C1E, C2A, C2B, C2C, C2D, C2E, C4A, C4B, C4C, C4D, C4E, C5A, C5B, C5C, C5D, C5E, C9A, C9B, C9C, C9D, C9E, C13A, C13B, C13C, C13D, C13E, C15A, C15B, C15C, C15D, C15E, C16A, C16B, C16C, C16D, C16E, C18, C19, C20, C31, C33, C35	CC2013-0805		5	0%	5	60
25	Digi-Key	PCC1780CT-ND	4.7n	Capacitor, surface mount	C3A, C3B, C3C, C3D, C3E, C6A, C6B, C6C, C6D, C6E, C7A, C7B, C7C, C7D, C7E, C12A, C12B, C12C, C12D, C12E, C14A, C14B, C14C, C14D, C14E	CC1608-0603		5	0%	5	30
20	Digi-Key	1276-2928-1-ND	1u	Capacitor, surface mount	C8A, C8B, C8C, C8D, C8E, C10A, C10B, C10C, C10D, C10E, C11A, C11B, C11C, C11D, C11E, C23, C26, C27, C28, C29	CC2013-0805		5	0%	5	30
2	Digi-Key	399-3905-1-ND	47u	Tantalum capacitor, surface mount	C17, C24	TC7343-2917		5	0%	5	10
2	Digi-Key	1276-6767-1-ND	10u	Capacitor, surface mount	C21, C25	CC3216-1206		5	0%	5	10
4	Digi-Key	PCC1778CT-ND	3.3n	Capacitor, surface mount	C22, C30, C32, C34	CC1608-0603		5	0%	5	10
3	Digi-Key	160-1406-1-ND	Yelow	Panel mount LED	DS1, DS2, DS3	LED-1206		5	0%	5	8
1	Digi-Key	A32130-ND	DB37F	Receptacle Assembly, 37 Position, Right Angle, .318 Series	J1	DB37F-RA	TH	1	0%	1	2
10	Digi-Key	A112714-ND	PCI_BackplaneConnector	PCI Backplane Connector	P1A, P1B, P1C, P1D, P1E, P2A, P2B, P2C, P2D, P2E	PCI_Backplane_SMD		5	0%	5	15
1	Digi-Key	WM4200	Header 2	Header, 2-Pin	P3	WM4200	TH	1	0%	1	2
2	Digi-Key	23-0039299246-ND	ATX power/male	Header, 12-Pin, Dual row, ATX power, board	P4, P5	ATX24Pin_M	TH	1	0%	1	3
1	Digi-Key	WM21362-ND	ATX power/male	Header, 12-Pin, Dual row, ATX power, board right-angle	P6	ATX24PIN_M_RA	TH	1	0%	1	2
15			NL	Resistor, surface mount	R1A, R1C, R1E, R2B, R2D, R3B, R3C, R4A, R4D, R4E, R5D, R5E, R6A, R6B, R6C	CR1608-0603		5	0%	5	20
17	Digi-Key	311-1.00KHRCT-ND	1K	Resistor, surface mount	R1B, R1D, R2A, R2C, R2E, R3A, R3D, R3E, R4B, R4C, R5A, R5B, R5C, R6D, R6E, R34, R35	CR1608-0603		5	0%	5	30
113	Digi-Key	311-10.0KCRCT-ND	10K	Resistor, surface mount	R7A, R7B, R7C, R7D, R7E, R8A, R8B, R8C, R8D, R8E, R11A, R11B, R11C, R11D, R11E, R12A, R12B, R12C, R12D, R12E, R13A, R13B, R13C, R13D, R13E, R14A, R14B, R14C, R14D, R14E, R15A, R15B, R15C, R15D, R15E, R16A, R16B, R16C, R16D, R16E, R17A, R17B, R17C, R17D, R17E, R18A, R18B, R18C, R18D, R18E, R19A, R19B, R19C, R19D, R19E, R20A, R20B, R20C, R20D, R20E, R21A, R21B, R21C, R21D, R21E, R22A, R22B, R22C, R22D, R22E, R23A, R23B, R23C, R23D, R23E, R24A, R24B, R24C, R24D, R24E, R25A, R25B, R25C, R25D, R25E, R26A, R26B, R26C, R26D, R26E, R27A, R27B, R27C, R27D, R27E, R28A, R28B, R28C, R28D, R28E, R29A, R29B, R29C, R29D, R29E, R30A, R30B, R30C, R30D, R30E, R31, R32, R33	CR2012-0805		0	5%	6	120
10	Digi-Key	311-100CRCT-ND	100	Resistor, surface mount	R9A, R9B, R9C, R9D, R9E, R10A, R10B, R10C, R10D, R10E	CR2012-0805		5	0%	5	20
1	Digi-Key	311-220FRCT-ND	220	Resistor, surface mount	R36	CR3216-1206		5	0%	5	10
1	Digi-Key	311-453FRCT-ND	453	Resistor, surface mount	R37	CR3216-1206		5	0%	5	10
1	Digi-Key	311-1.74KFRCT-ND	1.74K	Resistor, surface mount	R38	CR3216-1206		5	0%	5	10
26	Digi-Key	36-5017CT-ND	Testpoint	Testpoint,SMD, micro miniature	TP1A, TP1B, TP1C, TP1D, TP1E, TP2A, TP2B, TP2C, TP2D, TP2E, TP3A, TP3B, TP3C, TP3D, TP3E, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14	TP2		5	0%	5	31
6	Digi-Key	296-13278-1-ND	SN74LVC3G04	Triple inverter	U1A, U1B, U1C, U1D, U1E, U11	SSO-G8/SM8		5	0%	5	11
5	Digi-Key	296-46334-1-ND	SN65LVDT390	Quad LVDS Receiver with 100 Ohm termination	U2A, U2B, U2C, U2D, U2E	TSSOP16		5	0%	5	10
5	Digi-Key	MCP23S17T-E/SSCT-ND	MCP23S17	16-Bit I/O Expander with Serial Interface	U3A, U3B, U3C, U3D, U3E	SSO-G28/C6.8		5	0%	5	10
10	Digi-Key	296-26359-1-ND	SN65LVDS104	1:4 LVDS Clock Fanout Buffer	U4A, U4B, U4C, U4D, U4E, U5A, U5B, U5C, U5D, U5E	TSSOP16		5	0%	5	15
10	Digi-Key	296-SN74HC05APWRCT-ND	SN74HC05	Hex Inverter with Open-Drain Outputs	U6A, U6B, U6C, U6D, U6E, U7A, U7B, U7C, U7D, U7E	TSSOP14		5	0%	5	15
10	Digi-Key	296-6896-1-ND	SN65LVDT2	Single LVDS Receiver with 100 Ohm termination	U8A, U8B, U8C, U8D, U8E, U9A, U9B, U9C, U9D, U9E	SO-G5/E2.4		5	0%	5	15
5	Digi-Key	296-4350-1-ND	SN74ACT04	Hex Inverter	U10A, U10B, U10C, U10D, U10E	TSSOP14		5	0%	5	10
1	Digi-Key	ADM696ARZ-ND	ADM696AR	Microprocessor Supervisory Circuit	U12	SO-G16W		5	0%	5	6
1	Digi-Key	296-6919-1-ND	SN65LVDS1	Single LVDS Driver	U13	SO-G5/E2.4		5	0%	5	6
3	Digi-Key	296-48655-1-ND	SN65LVDS108	1:8 LVDS Clock Fanout Buffer	U14, U15, U16	TFSOP38		5	0%	5	8
357	Total pieces										

Summary per Board

Total # of unique parts	30
SMT Placements per board	352
Thru-Hole placement per board	5
Fine pitch placement per board	0
BGA placement per board	0
Mechanical placement per board	0