The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (<u>D1102414-v1</u>).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests 512 00 537

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Check that the LED on the front panel and the 3 LEDs on the rear panel are lit.

Front panel LED \\(\frac{1}{2} \)

Rear panel LEDs Yes

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail	
PZT 1X HV	PZT readback	Pass	
PZT 1X Sensor	PZT readback	P255	
PZT 1Y HV	PZT readback	Pess	
PZT 1Y Sensor	PZT readback	P655	
PZT 2X HV	PZT readback	Pass	
PZT 2X Sensor	PZT readback	Pass	ï
PZT 2Y HV	PZT readback	Pass	
PZT 2Y Sensor	PZT readback	Pass	·
Temp Laser	Temperature control	Ress	
Temp Doubler	Temperature control	Pass	

			Pass/Fail		
Cable 1			DUT	2 <sup>nd</sup> co	ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC I	Lass	655	I KSCS	Pess	Pess
BNC 2	Pass	1555	Pess	P=55	Pasa
BNC 3	P.55	Ge55	Pass	1055	Pess
BNC 4	0-55	1955	Pass	Pess	Pass

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests 51200538

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Front panel LED_	URS.	Rear panel LEDs
		<del>- 7</del>

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail	
PZT 1X HV	PZT readback	Pass	
PZT 1X Sensor	PZT readback	Pass	
PZT 1Y HV	PZT readback	Pass	
PZT 1Y Sensor	PZT readback	Pass	
PZT 2X HV	PZT readback	Pass	
PZT 2X Sensor	PZT readback	Pass	
PZT 2Y HV	PZT readback	Pass	
PZT 2Y Sensor	PZT readback	Ass	
Temp Laser	Temperature control	Pess	
Temp Doubler	Temperature control	Pass	

			Pass/Fail		
Cable 1	DUT		DUT	2 <sup>nd</sup> concentrator	
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	R55	Pess	Pass	Pess
BNC 2	P6->5	Pess	Pass	Pess	Pess
BNC 3	Pass	Pass	Pass	Pess	1/255
BNC 4	De 55	Pess	Pess	Pass	Pess

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—<u>D1102045-v1</u>

# 4 Tests 5 1200539

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

#### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Front panel LED_	Yes	Rear panel LEDs /e.s
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Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	tas s
PZT 1X Sensor	PZT readback	Pass
PZT 1Y HV	PZT readback	PSS
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	Q.ss
PZT 2X Sensor	PZT readback	Pass
PZT 2Y HV	PZT readback	Pass
PZT 2Y Sensor	PZT readback	Pass
Temp Laser	Temperature control	Pe55
Temp Doubler	Temperature control	Pess

		Pass/Fail				
Cable 1			DUT	2 <sup>nd</sup> co	ncentrator	
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4	
BNC 1	Pass	PESS	Pas 5	Pass	Pass	
BNC 2	Pass	Pass	Pass	P255	Pass	
BNC 3	Pess	P255	Pass	Pass	Pass	
BNC 4	P=55	P.55	Pass	12,5	Pass	

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—<u>D110</u>2045-v1

# 4 Tests 51200540

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with  $50\Omega$  terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Front panel LED	ye5
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Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail	
PZT 1X HV	PZT readback	Pass	
PZT 1X Sensor	PZT readback	Pass	
PZT 1Y HV	PZT readback	255	
PZT 1Y Sensor	PZT readback	Pass	
PZT 2X HV	PZT readback	Pass	
PZT 2X Sensor	PZT readback	Pass	
PZT 2Y HV	PZT readback	Pass	
PZT 2Y Sensor	PZT readback	Pass	
Temp Laser	Temperature control	Pass	
Temp Doubler	Temperature control	Pess	

	Pass/Fail					
Cable 1		DUT		2 <sup>nd</sup> concentrator		
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4	
BNC 1	Pass	Pass	Pa>5	P655	Pass	
BNC 2	Poss	Pess	Pass	Pass	P255	
BNC 3	Pass	Pass	Pess	Pass	Pess	
BNC 4	Pars	Poss	Piss	Pasa	Pess	

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

#### 3 Documentation

• Schematics—<u>D1102045-v1</u>

# 4 Tests 5 1200541

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with  $50\Omega$  terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	Pass
PZT 1X Sensor	PZT readback	Pais
PZT 1Y HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	P255
PZT 2X Sensor	PZT readback	P255
PZT 2Y HV	PZT readback	Pess
PZT 2Y Sensor	PZT readback	Pess
Temp Laser	Temperature control	PSS
Temp Doubler	Temperature control	Pass

			Pass/Fail		
Cable 1			DUT		ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	P=>5	Pass	Pass	Pass
BNC 2	Pass	P05	Pasa	P=>5	Pe >5
BNC 3	Pass	Pass	Pess	Pass	Pess
BNC 4	Pess	Pass	Pars	Pass	Pe>x

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

#### 3 Documentation

• Schematics—<u>D1102045-v1</u>

4	Tests	5120654	$\mathcal{C}$
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Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

TP6 (+5V) 
$$+5V$$

TP8 (+15V)  $+15$ 

TP3 (-15V)  $-15$ 

TP9 (OK)  $+3$ 

#### 4.2 LED

Front panel LED_	\185	Rear panel LEDs	es	·
	/	· · · · · ·		

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail	
PZT 1X HV	PZT readback	tess	
PZT 1X Sensor	PZT readback	Pa>s	
PZT 1Y HV	PZT readback	Pass	
PZT 1Y Sensor	PZT readback	Pass	
PZT 2X HV	PZT readback	Pess	
PZT 2X Sensor	PZT readback	Pess	
PZT 2Y HV	PZT readback	Pass	
PZT 2Y Sensor	PZT readback	Pess	
Temp Laser	Temperature control	lass	
Temp Doubler	Temperature control	Pess	

			Pass/Fail		
Cable 1			DUT		ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pazs	Pass	Pass	Pess	Pess
BNC 2	Pass	P255	Pass	P255	Pers
BNC 3	PLSS	Pers	Pass	Pess	Poss
BNC 4	Pass	Pess	Pess	Pesi	Pess

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

4 Te	ests	S1200003	51200543
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Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with  $50\Omega$  terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

TP6 (+5V)	+5
TP8 (+15V)_	415
TP3 (-15V)	`15
TP9 (OK)	+3

#### 4.2 LED

Check that the LED on the front panel and the 3 LEDs on the rear panel are lit.

Front panel LEDs //25

Rear panel LEDs

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	1255
PZT 1X Sensor	PZT readback	Pc55
PZT 1Y HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	Pass
PZT 2X Sensor	PZT readback	Pess
PZT 2Y HV	PZT readback	Pas >
PZT 2Y Sensor	PZT readback	Pess
Temp Laser	Temperature control	Pe>c
Temp Doubler	Temperature control	Poss

			Pass/Fail		
Cable 1			DUT		ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pc Ss	Pass	Pass	Pags	Pass
BNC 2	Pass	P=55	0235	8->>	P<>1
BNC 3	P->5	P-55	Pass	Pess	Piss
BNC 4	P-35	Pess	Pezj	P->>	Pas

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (<u>D1102414-v1</u>).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests 51200544

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

## 4.1 Power < € 1

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

### 4.2 LED

Check that the LED on the front panel and the 3 LEDs on the rear panel are lit.

Front panel LED Yes

Rear panel LEDs Yes

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail	
PZT 1X HV	PZT readback	Pass	
PZT 1X Sensor	PZT readback	PESS	
PZT 1Y HV	PZT readback	Pess	
PZT 1Y Sensor	PZT readback	Pess	
PZT 2X HV	PZT readback	Pess	•
PZT 2X Sensor	PZT readback	Pess	
PZT 2Y HV	PZT readback	Pess	-
PZT 2Y Sensor	PZT readback	Pass	_
Temp Laser	Temperature control	Pass	
Temp Doubler	Temperature control	Pess	

			Pass/Fail		
Cable 1			DUT		ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	P2>5	P > 5	Pe 55	Pass
BNC 2	Pass	Pess	Pe55	655	P255
BNC 3	Pe55	Pess	Pass	P2.55	Pess
BNC 4	8255	Pes 5	Pess	Pass	Pass

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

#### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests S1200545

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

#### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail	
PZT 1X HV	PZT readback	Pass	-
PZT 1X Sensor	PZT readback	Pass	•
PZT 1Y HV	PZT readback	P255	-
PZT 1Y Sensor	PZT readback	255	
PZT 2X HV	PZT readback	Pass	
PZT 2X Sensor	PZT readback	Pess	
PZT 2Y HV	PZT readback	Pess	_
PZT 2Y Sensor	PZT readback	Pc SS	
Temp Laser	Temperature control	Pass	
Temp Doubler	Temperature control	Poss	

	Pass/Fail				
Cable 1			DUT	2 <sup>nd</sup> concentrator	
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	lass	Rus	1255	hess
BNC 2	Pass	Pass	Pasi	Pass	ess
BNC 3	Po55	Pass	Pe35	Pass	255
BNC 4	Poss	Pass	P->5	Pess	Pass

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

#### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests 51200546

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

#### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	Pass
PZT 1X Sensor	PZT readback	Pass
PZT 1Y HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	Pas 5
PZT 2X Sensor	PZT readback	Pess
PZT 2Y HV	PZT readback	Cass
PZT 2Y Sensor	PZT readback	Pass
Temp Laser	Temperature control	Pess
Temp Doubler	Temperature control	Pess

			Pass/Fail		
Cable 1			DUT		ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	P255	Past	J& 55	Pass
BNC 2	Pass	Pass	Pass	lass	P455
BNC 3	Pas 5	Pess	Pass	Pass	Pass
BNC 4	Q155	Pc 55	Poss	Pass	Pass

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (<u>D1102414-v1</u>).
- DC power supplies.

### 3 Documentation

• Schematics—<u>D1102045-v1</u>

# 4 Tests 51200547

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail	
PZT 1X HV	PZT readback	Pass	
PZT 1X Sensor	PZT readback	P-55	
PZT 1Y HV	PZT readback	PST	•
PZT 1Y Sensor	PZT readback	Pist	
PZT 2X HV	PZT readback	Pesc	
PZT 2X Sensor	PZT readback	Pess	
PZT 2Y HV	PZT readback	Pess	
PZT 2Y Sensor	PZT readback	Pass	
Temp Laser	Temperature control	Post	
Temp Doubler	Temperature control	V-5	

	Pass/Fail					
Cable 1	D		DUT	2 <sup>nd</sup> co	concentrator	
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4	
BNC 1	P=55	P-55	1-51	Pess	Pess	
BNC 2	Pess	P-S	1.55	Pess	f-ss	
BNC 3	1.5	Pes,	6-55	Pess	855	
BNC 4	1-55	Pess	P-55	P. 85	Pers	

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

4 Tests 512 005	18
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Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Front panel LED	yes	Rear panel LEDs_	Ves_
	,		·

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	Pass
PZT 1X Sensor	PZT readback	Pass
PZT IY HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	Pass
PZT 2X Sensor	PZT readback	Pass
PZT 2Y HV	PZT readback	Pass
PZT 2Y Sensor	PZT readback	Pass
Temp Laser	Temperature control	Fass
Temp Doubler	Temperature control	Pass

	Pass/Fail				
Cable 1		]	DUT		ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	Pass	Pass	Pass	Pass
BNC 2	Russ	Pass	Pass	Pass	Pass
BNC 3	Pass	Pass	Pass	Pass	lass
BNC 4	lass	Pass	Pass_	Hass	Pass

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests S1200549

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Front panel LED_	/es
	7

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	ass
PZT 1X Sensor	PZT readback	Pass
PZT 1Y HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	RSS
PZT 2X HV	PZT readback	Pass
PZT 2X Sensor	PZT readback	Pass
PZT 2Y HV	PZT readback	Pass
PZT 2Y Sensor	PZT readback	Pass
Temp Laser	Temperature control	Pass
Temp Doubler	Temperature control	Pass

		_	Pass/Fail		
Cable 1			DUT	2 <sup>nd</sup> co	ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	Pass	Pass	Pass	Pass
BNC 2	Pass	Pass	Pass	Pass	86.55
BNC 3	Pess	Pess	Pass	Pass	Pass
BNC 4	Pass	Pess	P=55	P255	Pass

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests 3/200550

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with  $50\Omega$  terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### **4.2 LED**

Front panel LED_	Yes_	Rear panel LEDs_	Yes
	•		

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	Pas 5
PZT 1X Sensor	PZT readback	(Pass
PZT IY HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	Pass
PZT 2X Sensor	PZT readback	Pass
PZT 2Y HV	PZT readback	Pass
PZT 2Y Sensor	PZT readback	Pass
Temp Laser	Temperature control	lass
Temp Doubler	Temperature control	Pass

			Pass/Fail		
Cable 1			DUT	2 <sup>nd</sup> co	ncentrator
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4 Pass
BNC 1	Pass	Pass	Pass	Pas	Pass
BNC 2	Pass	Pass	Pass	(255	Pass
BNC 3	Pass	Pass	Pass	Pass	Pass
BNC 4	12.55	Pass	Pass	Pass	Pas

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

4 Tests 51200551

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with 50Ω terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

TP6 (+5V) + 15

TP8 (+15V) + 15

TP3 (-15V) - 15

TP9 (OK) +3

### 4.2 LED

Check that the LED on the front panel and the 3 LEDs on the rear panel are lit.

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	fass
PZT 1X Sensor	PZT readback	Pass
PZT 1Y HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	lass
PZT 2X HV	PZT readback	Pass
PZT 2X Sensor	PZT readback	- Rss
PZT 2Y HV	PZT readback	Pass
PZT 2Y Sensor	PZT readback	RSS
Temp Laser	Temperature control	RSS
Temp Doubler	Temperature control	Pass

			Pass/Fail			
Cable 1		DUT 2 <sup>n</sup>		2 <sup>nd</sup> co	concentrator	
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4	
BNC 1	Pa.55	Pass	Pass	RSS	Pe>>	
BNC 2	Pass	RSS	Pass	Pass	Pass	
BNC 3	Pass	Pass	Pass	Pass	Pess	
BNC 4	Poss	Pass	Ve55	Pus	Pess	

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

### 3 Documentation

• Schematics—D1102045-v1

# 4 Tests 3/200552

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with  $50\Omega$  terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

#### 4.2 LED

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	fass
PZT 1X Sensor	PZT readback	Pass
PZT 1Y HV	PZT readback	Pass
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	Pass
PZT 2X Sensor	PZT readback	P255
PZT 2Y HV	PZT readback	Pass
PZT 2Y Sensor	PZT readback	PESS
Temp Laser	Temperature control	Pess
Temp Doubler	Temperature control	Pess

			Pass/Fail		
Cable 1			DUT	2 <sup>nd</sup> co	ncentrator
	Cable 2	PDMon PDMon+		PDMon	PDMon+4
BNC 1	Pc>5	Pass	Pass	Pass	1255
BNC 2	Pass	Pess	Pass	Pass	Pc.>>
BNC 3	Pass	Pa>5	Pass	P255	P2>5
BNC 4	Pass	Pass	Pass	Pass	Pa >5

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

# 2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

#### 3 Documentation

• Schematics—<u>D1102045-v1</u>

# 4 Tests 51200553

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with  $50\Omega$  terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

#### 4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

TP6 (+5V) +5

TP8 (+15V) +15

TP3 (-15V) - 15

TP9 (OK) + 3

#### 4.2 LED

Check that the LED on the front panel and the 3 LEDs on the rear panel are lit.

Front panel LED\_\_\_\_\_\_

Rear panel LEDs / S

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	Pass
PZT 1X Sensor	PZT readback	Pass
PZT 1Y HV	PZT readback	Pess
PZT 1Y Sensor	PZT readback	Pass
PZT 2X HV	PZT readback	Pass
PZT 2X Sensor	PZT readback	Pess
PZT 2Y HV	PZT readback	Pass
PZT 2Y Sensor	PZT readback	Pess
Temp Laser	Temperature control	Pess
Temp Doubler	Temperature control	Pess

			Pass/Fail		
Cable 1		DUT		2 <sup>nd</sup> concentrate	
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Pass	655	Pess	Pess	Pess
BNC 2	Pess	Pess	P=55	Pers	Pars
BNC 3	Pess	8255	Pass_	Pess	1955
BNC 4	Pess	PESS	Pess	Pass	Pess

The slow controls concentrator auxiliary 2 supports 8 photodiodes, 2 temperature control outputs and 4 axes of PZT readbacks.

2 Test Equipment

- Multimeter, scope and signal generator.
- Second slow controls concentrator auxiliary 2 (<u>D1102045-v1</u>).
   Replace the 2 quad photodiode breakout boards with 2 quad TNC/GND breakouts.
- 2 test cables DB9 to 4xBNC (D1102414-v1).
- DC power supplies.

3 Documentation

• Schematics—D1102045-v1

4 Tests 51200554

Power up the measurement equipment and connect open the lid of the DUT. Connect a DB37 cable (male-male) between the DUT and the second slow controls concentrator. Equip the TNC inputs (but not the BNC inputs) of the DUT with  $50\Omega$  terminators. Connect a DB15 (male-female) between "PD DC 1-4 Out" and "PD DC 5-8 IN". Connect the test cables to "PD DC 1-4 IN" and "PD DC 5-8 OUT".

4.1 Power

Check the voltages on the concentrator power board. The voltage should be within 5% of nominal. Test that the OK signal is a TTL low (<0.8V).

TP8 (+15V) +15

TP3 (-15V)\_\_ - ( S

TP9 (OK) \_\_ + \_\_\_\_\_

4.2 LED

Check that the LED on the front panel and the 3 LEDs on the rear panel are lit.

Front panel LED\_\_\_\_\_\_\_

Rear panel LEDs Ves

Use an Ohmmeter and check the continuity of the signal lines between the two slow controls concentrators. Each tested signal should read  $50\Omega$ .

Concentrator	Signal	Pass/Fail
PZT 1X HV	PZT readback	Pass
PZT 1X Sensor	PZT readback	P255
PZT 1Y HV	PZT readback	Pess
PZT 1Y Sensor	PZT readback	PESS
PZT 2X HV	PZT readback	Ges 5
PZT 2X Sensor	PZT readback	V555
PZT 2Y HV	PZT readback	Pess
PZT 2Y Sensor	PZT readback	Res
Temp Laser	Temperature control	1255
Temp Doubler	Temperature control	Pess

			Pass/Fail		
Cable 1		DUT		2 <sup>nd</sup> concentrator	
	Cable 2	PDMon	PDMon+4	PDMon	PDMon+4
BNC 1	Y255	PESS	Pass	1255	Pess
BNC 2	P255	Pass	Pass	Pass	Pass
BNC 3	Pass	Pass	Pess	8655	Pess
BNC 4	Pe55	Pass	Pess	Pass	Pess