S1103450

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

LIGO Laboratory / LIGO Scientific Collaboration

LIGO- E1100333-v2 | *Advanced LIGO* | 6 April 2011

Test Procedure for Slow Controls Concentrator RF Amplifiers

Daniel Sigg

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of the LIGO Laboratory.

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1 Overview

Twelve RF amplifiers, RF frequency dividers or RF frequency doublers can be connected to the concentrator and will be connected to the EtherCAT system with a single cable. A DB25 cable connects the RF amplifiers, but only 2 signals are read from each RF amplifiers: the M1 analog readback and the OK TTL readback. The EtherCAT uplink is connected through a single DB37 cable.

2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	
	Sine wave	
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5 V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

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1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
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	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

S1103459

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

LIGO Laboratory / LIGO Scientific Collaboration

LIGO- E1100333-v2 | *Advanced LIGO* | 6 April 2011

Test Procedure for Slow Controls Concentrator RF Amplifiers

Daniel Sigg

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1 Overview

Twelve RF amplifiers, RF frequency dividers or RF frequency doublers can be connected to the concentrator and will be connected to the EtherCAT system with a single cable. A DB25 cable connects the RF amplifiers, but only 2 signals are read from each RF amplifiers: the M1 analog readback and the OK TTL readback. The EtherCAT uplink is connected through a single DB37 cable.

2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +V5

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) +5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass

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1 Overview

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2 Test Equipment

- Oscilloscope
- Function generator
- Tester for RF amplifier concentrator
- DC power supplies

3 Documentation

- Schematic—D1100262-v1
- Tester—D1100000-v1

4 Tests

Power up the measurement equipment and connect the Tester to the DUT. One DB37 cable is permanently attached, whereas the DB25 cable is switch from port 1 through 12 on the concentrator.

4.1 Power

Check the VCC voltage on the concentrator port. The voltage should be within 5% of nominal.

TP6 (+ 5V) 4.5V

4.2 Signals

Set the function generator to a 20Vpp sine wave at 1kHz. Connect it to the BNC RF amplifier input of the tester. Connect the oscilloscope to the first BNC EtherCAT output of the tester. Exercise the switch on the RF amplifier side of the tester and watch the corresponding LED on the EtherCAT side. make sure only one LED is changing. Note the status. Now look at the oscilloscope and make sure that the analog signal is propagated unchanged. Also look at the neighboring channels and make sure it isn't present there. Note the status. Repeat this procedure for each RF amplifier port of the concentrator.

Port	Signal	Pass/Fail
1	Switch/LED	Pass
	Sine wave	Pass
2	Switch/LED	Pass
	Sine wave	Pass
3	Switch/LED	Pass
	Sine wave	Pass
4	Switch/LED	Pass
	Sine wave	Pass
5	Switch/LED	Pass
	Sine wave	Pass
6	Switch/LED	Pass
	Sine wave	Pass
7	Switch/LED	Pass
	Sine wave	Pass
8	Switch/LED	Pass
	Sine wave	Pass
9	Switch/LED	Pass
	Sine wave	Pass
10	Switch/LED	Pass
	Sine wave	Pass
11	Switch/LED	Pass
	Sine wave	Pass
12	Switch/LED	Pass
	Sine wave	Pass