

Serial Number: _____

Date: _____

Tech: _____

LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY

-LIGO-

CALIFORNIA INSTITUTE OF TECHNOLOGY

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Document Type	DCC Number	September 18, 2006
	T060227-00-C	
AdL SEI Capacitive Position Sensor Interface Board Test Plan		
J. Heefner		

Distribution of this draft:
This is an internal working note of the LIGO Laboratory

California Institute of Technology	Massachusetts Institute of Technology
LIGO Project – MS 18-33	LIGO Project – MS 20B-145
Pasadena, CA 91125	Cambridge, MA 01239
Phone (626) 395-2129	Phone (617) 253-4824
Fax (626) 304-9834	Fax (617) 253-7014
E-mail: info@ligo.caltech.edu	E-mail: info@ligo.mit.edu

www: <http://www.ligo.caltech.edu/>

Serial Number: _____

Date: _____

Tech: _____

1 Introduction

The tests described below are required to verify the correct operation of the AdL SEI Capacitive Position Sensor Interface Board (D050434, Rev 00). The transfer function of this board is a 3rd order, 800 Hz Butterworth low pass filter.

2 Test Equipment

Dynamic Signal Analyzer
Oscilloscope
Power supplies

3 Tests

3.1 Input Power

Record the input voltage and current in the table below. Values should be +/-20mA of the nominal values. Input power should be applied using test points TP1, TP3 and TP2 for +15V, -15V, and ground, respectively.

Supply	Nominal Current	Actual	Pass/Fail
+15 V	0.050 A		
-15 V	0.050 A		

3.2 Filter Response

The nominal response of each channel is a 3rd order, 800 Hz Butterworth low pass filter. For these tests JP1, JP2, JP3 and JP4 should have jumpers installed in their nominal pin 1 and pin 2 locations.

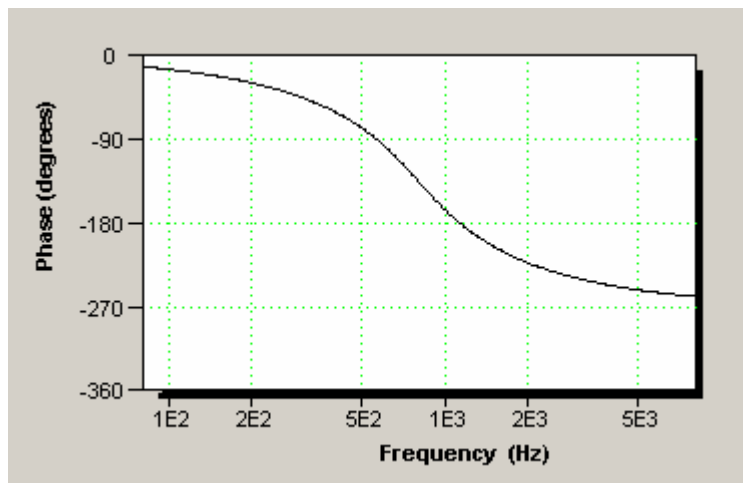
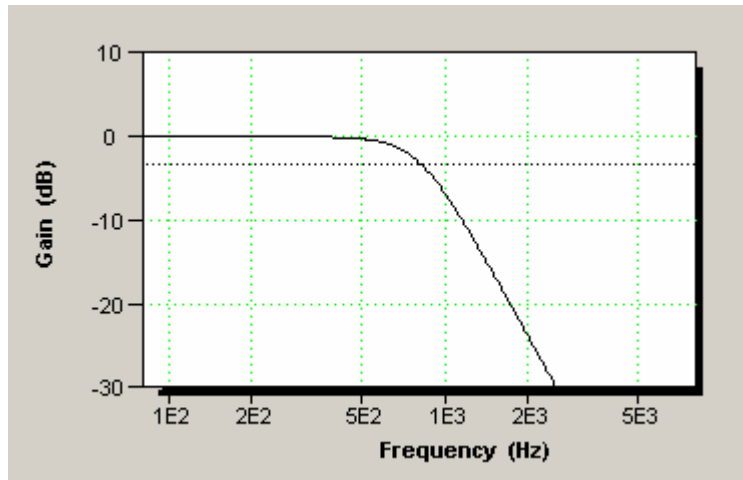
Chan	Input	Output	Gain/ Phase at 100Hz Nominal= 0 dB/ -14 deg	Gain/ Phase at 800Hz Nominal= -3.0 dB/ -135 deg	Gain/ Phase at 8 KHz Nominal= -60 dB/ -259 deg	Pass/ Fail
1	P1-A15 P1-C15	J3-1 J3-9				
2	P1-A16 P1-C16	J3-2 J3-10				
3	P1-A17 P1-C17	J3-6 J3-14				
4	P1-A18 P1-C18	J3-7 J3-15				

Serial Number: _____

Date: _____

Tech: _____

Plots of the nominal transfer function are shown in the figures below.



3.3 Noise Tests

The input to each channel should be terminated with 50 ohms and the output noise measured using the dynamic signal analyzer. The output noise for all channels should be below 500nV/ $\sqrt{\text{Hz}}$ for all frequencies from 10 Hz to 10KHz and less than 2 $\mu\text{V}/\sqrt{\text{Hz}}$ at 1 Hz.. Using the table below, record the highest noise measured and the approximate frequency of the noise peak for frequencies from 10Hz to 10KHz.

Chan	Input	Output	Highest Output Noise Measured 10Hz to 10KHz	Frequency of Noise Peak
1	P1-A15 P1-C15	J3-1 J3-9		
2	P1-A16 P1-C16	J3-2 J3-10		
3	P1-A17 P1-C17	J3-6 J3-14		
4	P1-A18 P1-C18	J3-7 J3-15		