



os3500 IP67 Test Report

Test Date: August 5, 2015

Sensors tested: DEV009
DEV011
DEV012

Test Equipment: Pressure Chamber
ControlAir Inc. Type 700 Pressure Regulator
McDaniel Controls Inc. Precision pressure gauge
Micron Optics Inc. sm125 Optical Interrogator, SN: SIA886

Relevant Test Criteria: ANSI/IEC 60529 IP67

Test Description:

The Micron Optics sm125 was zeroed against a high reflectivity mirror. Each os3510 sensor was connected to the sm125 to record peak level and center wavelength of the 2 FBG. The measurement was then repeated from the other end of the sensor.

The sensor was placed in the bottom of the pressure tank filled with water. The top of the sensor was 15 inches below the surface of the water. The tank was sealed and an additional .91 psi of air pressure was added to the tank to simulate 1 meter of water above the sensor. The sensor was left to soak for 30 minutes then the pressure was relieved from the tank and the sensor removed.

The sensor was again connected to the sm125 to record peak level and center wavelength of the 2 FBG. The measurement was then repeated from the other end of the sensor. These readings were compared with the initial readings.

This process was then repeated for the other two sensors.


Results:

Pre-Test									
Connector 1					Connector 2				
Sensor	FBG1 Level	FBG2 Level	FBG1 WL	FBG2 WL	FBG1 Level	FBG2 Level	FBG1 WL	FBG2 WL	
DEV009	-1.8	-1.1	1532.107	1535.373	-2.0	-1.0	1532.107	1535.373	
DEV011	-2.8	-2.1	1551.823	1556.195	-1.8	-1.9	1551.803	1556.155	
DEV012	-1.7	0.9	1562.512	1565.797	-0.9	0.5	1562.504	1565.797	
Post-Test									
Connector 1					Connector 2				
Sensor	FBG1 Level	FBG2 Level	FBG1 WL	FBG2 WL	FBG1 Level	FBG2 Level	FBG1 WL	FBG2 WL	
DEV009	-1.7	-1.1	1532.035	1535.376	-2.1	-1.1	1532.037	1535.383	
DEV011	-2.3	-1.5	1551.817	1556.216	-1.9	-1.9	1551.826	1556.285	
DEV012	-1.8	-0.9	1562.432	1565.807	-0.9	-0.4	1562.470	1565.810	
Change									
Connector 1					Connector 2				
Sensor	FBG1 Level	FBG2 Level	FBG1 WL	FBG2 WL	FBG1 Level	FBG2 Level	FBG1 WL	FBG2 WL	
DEV009	0.2	0.0	-0.072	0.003	-0.1	-0.1	-0.070	0.010	
DEV011	0.5	0.6	-0.006	0.021	-0.1	0.0	0.023	0.130	
DEV012	-0.1	-1.8	-0.080	0.010	0.0	-0.9	-0.034	0.013	

Summary:

The 3 sensors showed no significant change in characteristics before and after the test. Most of the wavelength change is probably due to the fact that the temperature was not controlled.

Sensor DEV012 was later fatigue tested > 57 x 10⁶ cycles @ +/- 1,550 $\mu\epsilon$ with no adverse effect from the water immersion.

