Biospherical Instruments Inc.

CALIBRATION CERTIFICATE for PRR Spectroradiometer

Calibration Date: 8/19/2010 **Job:** R10727

Model Number: PRR-600

Serial Number: 9620

Operator: TPC

Standard Lamp: GS1019(8/28/08)

Ch	Tag	λ (nm)	Lamp Irradiance @ 50 cm	Immersion Coefficient (Type P6-2)	Calibration Voltage - Dark[3]	Calibration Voltage - Light	Calibration Factor - Dry (V/µW)	Calibration Factor - Wet (V/µW)	Max E (Dry)	
DOWNWELLING IRRADIANCE CHANNELS						**Irradiance Units: µW/cm²·nm, E = Irradiance**				
1	0	412	2.436	0.677	0.000129	-0.078923	-0.032453	-0.021962	308.1	
2	0	443	3.776	0.682	-0.000305	-0.122012	-0.032229	-0.021982	310.3	
3	0	490	6.314	0.690	0.000003	-0.232243	-0.036780	-0.025383	271.9	
4	0	510	7.525	0.694	0.000105	-0.260750	-0.034664	-0.024042	288.5	
5	0	555	10.378	0.701	0.000114	-0.340019	-0.032775	-0.022986	305.1	
6	0	665	16.871	0.720	-0.000001	-0.607817	-0.036028	-0.025949	277.6	
7	0	PAR	0.01509	0.697	0.000219	-0.250194	-16.592919	-11.573017	0.603	[4]
8	0	Gnd.[5]	0.000048	Volts						

Calibration Factor: WET = ((Light - Dark) x Immers. Coeff.)/Lamp Output

DRY = (Light - Dark)/Lamp Output

Ch	Tag	λ (nm)	Lamp Irradiance @ 50 cm	Immersion Coefficient (BK7 type)	Plaque Reflectivity 11-17-03	Radiance[6]	Calibration Voltage - Dark	Calibration Voltage - Blocked[3]	Calibration Voltage - Light	Calibration Factor - Wet (V/µW)	Max L (Wet)
UPWELLING RADIANCE CHANNELS						**Radiance Units: µW/cm²·nm·sr, L = Radiance**					
1	1	412	2.436	1.747	0.986	0.0232	-0.000097	-0.000090	-0.025948	-0.638002	15.7
2	1	443	3.776	1.742	0.991	0.0361	-0.000062	-0.000053	-0.030393	-0.482213	20.7
3	1	490	6.314	1.735	0.992	0.0605	-0.000115	-0.000107	-0.133980	-1.275991	7.8
4	1	510	7.525	1.733	0.992	0.0721	0.000323	0.000326	-0.092773	-0.745570	13.4
5	1	555	10.378	1.729	0.992	0.0994	0.000318	0.000305	-0.189795	-1.106153	9.0
6	1	665	16.871	1.721	0.992	0.1615	0.000113	0.000118	-0.314514	-1.131690	8.8
7	1	683	17.756	1.720	0.991	0.1699	-0.000044	-0.000046	-0.427901	-1.464139	6.8
8	1	Gnd.[5]	0.000076	Volts							

Dry Radiance = (Lamp Output x Plaque Reflectivity x Lamp Distance Factor)π

Lamp Distance Factor = $(50\ cm)^2/(295.2\ cm)^2$

Calibration Factor: WET = (Light - Dark)/(Dry Radiance x Immersion Coefficient)

9	0	**TEMPERATURE[7]**	**Temperature (°C) = (Voltage - Offset)/Scale**
		Scale	**0.0266**
		Offset	**0.0036**
10	0	**PRESSURE/DEPTH[8]**	**Pressure/Depth (dbars or meters) = (a x Voltage²) + (b x Voltage) + c**
		Scale Factor "a"	**1.0297**
		Scale Factor "b"	**91.9904**
		Offset "c"	**25.0719**

NOMINAL TO ACTUAL VOLTAGE CONVERSION FACTORS (For use with external sensors, only, see manual)

	Irr. Array	Rad. Array
Scale Factor	**1.066403**	**1.070664**
Offset	**0.000214**	**-0.000119**
Full Scale Voltage	**9.3773**	**9.3400**

FIRMWARE VERSION(S)

	Tag 0	Tag 1
Underwater ROM	**1957HA**	**2043HA**

Notes:

1. Annual calibration is recommended.
2. Calibrations were performed at approximately 20 to 30 °C.
3. "Dark" irradiance and "Blocked" radiance values represent a blocking of the calibration source. These values should not be used as the "Offset" when entering values into the calibration file. Use the totally dark sensor values obtained at the temperature where the instrument will be used.
4. PAR irradiance units are µEinsteins/cm²·sec.
5. Nominal/Typical value(s).
6. For conversion of area to solid angle, a factor (divisor) of Pi is incorporated.
7. Water temperature sensor.
8. A change in depth of 1 meter in seawater corresponds to approximately a 1 dbar change in pressure.