

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/cm ² ·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

BK7 = (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/cm ² ·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)⁷⁾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 Voltage ²) + (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 μEinstein/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.