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SEASOFT COEFFICIENTS  
 FOR THE BIOSPHERICAL PAR LIGHT SENSOR  
 QCP-2300 S/N 70250

Your Sea-Bird Instrument has been configured to record light data from a BIOSPHERICAL Quantum sensor. The 0 – 5 volt output of this sensor corresponds on a logarithmic scale to light measurement over the measurement range.

Make the following entries in SEASOFT

M = 1.0  
 B = 0.0

From the Biospherical calibration sheet obtain:

$C_w$  = Wet Calibration Factor ( $\mu\text{Einsteins}/\text{cm}^2\text{-sec}''\text{amps}''$ )  
 =  $5.06\text{E} * 10^{-6}$   
 V = Average Dark Voltage (Volts)  
 = 0.0118

Calculate the following coefficients:

**Calibration Constant** = Seasoft Calibration Coefficient  
 =  $10^5 / C_w$   
 = **1.9763E+10**

**Offset** =  $-(10^4 * C_w * 10^V)$  (V is the dark voltage )  
 = **-0.051994**

**Multiplier** = 1

Set multiplier to 1 for output in  $\mu\text{Einsteins}/\text{m}^2\text{-sec}$ . See **Application Note 11 General** for information on output in units other than  $\mu\text{Einsteins}/\text{m}^2\text{ sec}$ .

Job No.: L 10367

Calibration Date: 03/12/09  
 Model Number: QCP2300  
 Serial Number: 70250  
 Operator: TPC  
 Standard Lamp: GS-1019(8/28/08)  
 Operating Voltage Range: 6 to 15 VDC (+)

Note: The QCP2300 output is a voltage that is proportional to the log of the incident irradiance.

To calculate irradiance, use this formula:

$$\text{Irradiance} = \text{Calibration factor} * (10^{\wedge}\text{Light Signal Voltage} - 10^{\wedge}\text{Dark Voltage})$$

Dry Calibration Factor: 2.89E+12 quanta/cm<sup>2</sup>-sec per volt      4.81E-06 μEinsteins/cm<sup>2</sup>-sec per volt  
 Wet Calibration Factor: 3.05E+12 quanta/cm<sup>2</sup>-sec per volt      5.06E-06 μEinsteins/cm<sup>2</sup>-sec per volt

Sensor Test Data and Results<sup>2)</sup>

Nominal Filter OD	Expected Transmission	Calibrated Trans.	Sensor Voltage	Expected Voltage	Measured Trans.	Transmission Error (%)	Test Irrad. (quanta/cm <sup>2</sup> -sec)
No Filter	100%	100.00%	3.497	3.497	100.00%	0.0	9.09E+15
0.3	50%	36.10%	3.058	3.055	36.37%	-0.7	3.31E+15
0.5	32%	27.60%	2.945	2.938	28.03%	-1.5	2.55E+15
1	10%	9.27%	2.484	2.464	9.68%	-4.2	8.79E+14
2	1%	1.11%	1.580	1.542	1.18%	-5.8	1.07E+14
3	0.10%	0.05%	0.423	0.225	0.05%	3.4	4.77E+12
RG780	0.00%	0.00%	0.012	0.012	0.00%	-100.0	8.01E+10

Dark Before: 0.012 Volts  
 Light - No Filter Hldr.: 3.497 Volts  
 Dark After - NFH: 0.012 Volts  
 Average Dark: 0.0118 Volts

Notes:

1. Annual calibration is recommended.
- 2) This section is for internal use and for more advanced analysis.