



**Biospherical Instruments Inc.**

## **System Calibration Certificate**

**THE INSTRUMENTS REFERENCED BELOW WERE FACTORY TESTED AND CALIBRATED BY**

**BIOSPHERICAL INSTRUMENTS INC.**

**5340 Riley Street**

**San Diego, California 92110 USA**

**Instrument: C-OPS S/N 000411**

### **NIST-traceable Optical Calibrations:**

The instrument was calibrated using a 1000 Watt FEL lamp with serial number V-031. This lamp was calibrated on 3/3/15 against the NIST Standard of Spectral Irradiance F616. Traceability of lamps, the calibration set up (e.g., shunts, voltmeters, power supplies) and calibration procedures follow recommendations published by the National Bureau of Standards (US), specifically “NBS Special Publication 250-20 Spectral Irradiance Calibrations (1987)” and “NBS Publication 594-13 Optical Radiation Measurements: The 1973 Scale of Spectral Irradiance (1977).”

All calibration information provided on the following pages is a subset of calibration information stored internally in the instrument.



C-OPS

Serial Number: 000411

Date of Certificate 6/26/2015

Optical Channels, Irradiance (Ed0) Calibration

Acquisition Rate 5Hz
Aggregator Vin (Avg) 6.48 V
Aggregator Iin (Avg) 91.79 mA
Internal Temperature (Max) 23.749 °C
Aggregator Internal Temperature (Avg) 27.2 °C
Internal Temperature (Min) 22.895 °C
Aggregator Internal Pressure (Avg) 12.62 psi

Date of Calibration 6/25/2015
Calibration Engineer TPC

Standard of Spectral Irradiance V-031

Table with 11 columns: Channel, Wavelength (nm), Tag, Firmware Version, Offset High Gain (mV), Offset Medium Gain (mV), Offset Low Gain (mV), Signal/Noise Ratio, Immersion Coefficient, Responsivity in Air 1, Calibrated Units. Rows include channels from Ed0320 to Ed0PAR.

1: Volts/Calibrated Units



**C-OPS**

**Serial Number:** 000411

**Date of Certificate** 6/26/2015

**Optical Channels, Irradiance (Ed0) Calibration**

The values listed in the section below are common for all optical microradiometers

**Date of Calibration** 6/25/2015

**Calibration Engineer** TPC

<b>Model Number</b>	uRv2:3G	<b>Adc Rate</b>	Rate_125_Hz	<b>Ranging Mode</b>	Auto	<b>Switch Point High</b>	31000
<b>Firmware Version</b>	v:2.003 03/04/11 3Gain	<b>Adc Buffer Enabled</b>	False	<b>Ranging Delay High</b>	3	<b>Switch Point Low</b>	7782400
		<b>Adc Channel Type</b>	Primary Input	<b>Ranging Delay Medium</b>	3		
		<b>Adc Gain</b>	Gain_1	<b>Ranging Delay Low</b>	3		

**C-OPS**

**Serial Number:** 000411

**Date of Certificate** 6/26/2015

**Angle Channels, Irradiance (Ed0) Calibration**

Pitch and roll sensors zeroed according to manufacturer's specifications.

**Date of Calibration** 6/25/2015

**Calibration Engineer** TPC



