

NEPTUNE Thermal Measurement Array

Operation Instructions for Testing

A 12 volt source should be applied to the power jack running to the RS485 converter. The power required is under 100 mA and the connector centre post is negative. The RS485 to serial adaptor needs to be plugged into a computer serial port and HyperTerminal running at 9600 Baud will talk to the system. The required commands are:

- Typing the number "1" will return a string reporting a single set of temperature measurements.
- Typing the number "2" will begin polling of the sensors to report a string of temperature measurements once per second.
- Typing the number "3" will turn off polling of the sensors. Due to the bidirectional nature of the RS485 data, the "3" must be typed immediately after a set of temperature measurements is reported. Otherwise, the request to turn off polling will be corrupted when the system switches into transmit mode to send the next string of data.

It is important that the cables running to the master module go to the correct connectors. The master module has an "in" connection going to power and a host computer, and an "out" connection going to the slave modules. The sense of those two connections should not be reversed. The Master unit is marked as such. The slave modules are symmetrical in their cabling and they simply daisy chain together. It doesn't matter which connector is used for what on the slave units.

Calibration Notes

Testing Date: August 11, 2009

All units have been submerged in an ice water bath for 20 hours. The temperatures were measured using an OMEGA HH42 Calibrated Temperature Measurement Unit with an accuracy of 0.01°C.

The bath temperature was measured at the time of calibration as 0.01°C, measured throughout the bath volume to ensure consistent volumetric temperatures were being measured.

Unit Number	Measured Temperature Before Calibration	Calibration Constant	Measured Temperature After Calibration
1	-0.5	104	0.0
2	-0.5	109	0.0
3	-0.2	166	0.0
4	-0.2	165	0.0
5	-0.2	104	0.0
6	-0.6	94	0.0
7	-0.6	174	0.0
8	+0.2	144	0.0

All calibrated measurements were recorded for one hour.