



<i>Title:</i> NEON Sensor Command, Control and Configuration (C3) Document: Submersible PRT – Water Temperature		<i>Date:</i> 03/08/2022
<i>NEON Doc. #:</i> NEON.DOC.001059	<i>Author:</i> J. Vance	<i>Revision:</i> B

## NEON SENSOR COMMAND, CONTROL AND CONFIGURATION (C3) DOCUMENT: SUBMERSIBLE PRT, WATER TEMPERATURE

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## Change Record

REVISION	DATE	ECO #	DESCRIPTION OF CHANGE
A	07/01/2016	ECO-03967	Initial Release
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NEON Doc. #: NEON.DOC.001059	Author: J. Vance	Revision: B

## TABLE OF CONTENTS

<b>1</b>	<b>DESCRIPTION.....</b>	<b>1</b>
1.1	Purpose.....	1
1.2	Scope.....	1
<b>2</b>	<b>Related documents and acronyms.....</b>	<b>2</b>
2.1	Applicable Documents.....	2
2.2	Reference Documents.....	2
2.3	Acronyms.....	2
<b>3</b>	<b>Submersible PRT Introduction (AB039500XX).....</b>	<b>3</b>
<b>4</b>	<b>Submersible PRT Overview of Sensor configuration (AB039500XX).....</b>	<b>4</b>
<b>5</b>	<b>Submersible PRT Command and Control (AB039500XX).....</b>	<b>5</b>
5.1	Error handling.....	5
5.2	Sensor controls specification.....	5
<b>6</b>	<b>Assembly integration.....</b>	<b>6</b>
<b>7</b>	<b>Appendix.....</b>	<b>7</b>
7.1	List of Level 0 data product.....	7

## LIST OF TABLES

<b>Table 1.</b>	Sensor configuration settings.....	4
<b>Table 2.</b>	L0 data streams from Submersible PRT (AB039500XX) at a frequency of 1 Hz.....	4
<b>Table 3.</b>	List of Level 0 data product associated with DPName: Temperature (PRT) in surface water.....	7



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NEON Doc. #: NEON.DOC.001059	Author: J. Vance	Revision: B

## 1 DESCRIPTION

### 1.1 Purpose

This document specifies the command, control, and configuration details for operating a NEON sensor used for instrumental observations. It includes a detailed discussion of all necessary requirements for operational control parameters, conditions/constraints, set points, and any necessary error handling. All Level 0 Data Products generated by the sensor should be identified.

### 1.2 Scope

This document specifies the command, control, and configuration that are needed for operating the Thermometrics Submersible PRT for the measurement of water temperature at NEON AQU sites. It does not provide implementation details, except for cases where these stem directly from the sensor conditions as described here.

A complete set of the Level 0 data products generated in this document can be found in appendix.

The Submersible PRT assembly will consist of following Data Generating Device (DGD) based on Data Generating Device DGD List and Hierarchies doc (AD [05]):

DGD Agile PN	DGD Agile Description
AB03950006	Assembly, Cable, PRT Submersible, 6 Feet
AB03950012	Assembly, Cable, PRT Submersible, 12 Feet
AB03950040	Assembly, Cable, PRT Submersible, 40 Feet
AB03950075	Assembly, Cable, PRT Submersible, 75 Feet

Further detailed sensor info under each DGD is as following:

1. Under AB03950006:
  - a. AB03950006, Assembly, Cable, PRT Submersible, 6 Feet does not have any associated firmware
2. Under AB03950012:
  - a. AB03950012, Assembly, Cable, PRT Submersible, 12 Feet does not have any associated firmware
3. Under AB03950040:
  - a. AB03950040, Assembly, Cable, PRT Submersible, 40 Feet does not have any associated firmware
4. Under AB03950075:
  - a. AB03950075, Assembly, Cable, PRT Submersible, 75 Feet does not have any associated firmware



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NEON Doc. #: NEON.DOC.001059	Author: J. Vance	Revision: B

## 2 RELATED DOCUMENTS AND ACRONYMS

### 2.1 Applicable Documents

Applicable documents contain information that shall be applied in the current document. Examples are higher level requirements documents, standards, rules and regulations.

AD [01]	NEON.DOC.000001	NEON Observatory Design (NOD) Requirements
AD [02]	NEON.DOC.000291	NEON Configured Sensor List
AD [03]	NEON.DOC.005003	NEON Scientific Data Products Catalog
AD [04]	NEON.DOC.005005	NEON Level 0 Data Products Catalog
AD [05]	NEON.DOC.001104	Data Generating Device DGD List and Hierarchies
AD [06]	NEON.DOC.001316	NEON Algorithm Theoretical Basis Document – Surface Water Temperature

### 2.2 Reference Documents

Reference documents contain information complementing, explaining, detailing, or otherwise supporting the information included in the current document.

RD [01]	NEON.DOC.000008	NEON Acronym List
RD [02]	NEON.DOC.000243	NEON Glossary of Terms

### 2.3 Acronyms

Acronym	Explanation
ATBD	Algorithm Theoretical Basis Document
C <sup>3</sup>	Command, Control, and Configuration Document
SOP	Standard Operating Procedures
QA/QC	Quality Assurance/Quality Control
TIS	Terrestrial Instrument System
L0	Level 0
L1	Level 1
ENG	NEON Engineering group
CI	NEON Cyberinfrastructure group
DPS	NEON Data Products group
CVAL	NEON Calibration, Validation, and Audit Laboratory



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### **3 SUBMERSIBLE PRT INTRODUCTION (AB039500XX)**

The sensor configuration and sensor command and control described here are related to the submersible PRT (of varying cable length) and the surface water temperature data product. A description of how sensor readings shall be converted to L1 DPs is presented in the associated ATBD (AD[06]). The AIS assembly used to generate the data product consists of a single PRT with a water-tight molded cable that allows for complete submersion of the probe.

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NEON Doc. #: NEON.DOC.001059	Author: J. Vance	Revision: B

#### 4 SUBMERSIBLE PRT OVERVIEW OF SENSOR CONFIGURATION (AB039500XX)

The PRT temperature sensor does not require any direct configuration. However raw data shall be acquired from the sensor at the rate given in **Table 1**.

**Table 1.** Sensor configuration settings.

Parameter	Default Setting
Temperature measurement: Acquisition rate	1 Hz
Raw data acquired from sensor	Resistance, Ohms, $\Omega$

**Table 2.** LO data streams from Submersible PRT (AB039500XX) at a frequency of 1 Hz

fieldName	description	Units
PRTResistance	Resistance of Platinum Resistance Thermometer (PRT) at temperature T	ohm



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## **5 SUBMERSIBLE PRT COMMAND AND CONTROL (AB039500XX)**

### **5.1 Error handling**

There is no active error monitoring for this sensor.

### **5.2 Sensor controls specification**

N/A





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## 6 ASSEMBLY INTEGRATION

N/A



Title: NEON Sensor Command, Control and Configuration (C3) Document: Submersible PRT – Water Temperature		Date: 03/08/2022
NEON Doc. #: NEON.DOC.001059	Author: J. Vance	Revision: B

## 7 APPENDIX

### 7.1 List of Level 0 data product

**Table 3.** List of Level 0 data product associated with DPName: Temperature (PRT) in surface water

DGD Agile PN	DPNumber	fieldName	description	Acquisition frequency (Hz)	dataType	units
AB039500XX	NEON.DOM.SITE.DP0.20053.001.01325.HOR.VER.000	PRTResistance	Resistance of Platinum Resistance Thermometer (PRT) at temperature T	1 Hz	real	ohm