



<i>Title:</i> NEON Command, Control, and Configuration (C3): Photosynthetically Active Radiation (PAR)		<i>Date:</i> 05/16/2022
<i>NEON Doc. #:</i> NEON.DOC.000416	<i>Author:</i> M. SanClements	<i>Revision:</i> B

NEON SENSOR COMMAND, CONTROL AND CONFIGURATION (C3) DOCUMENT: PHOTOSYNTHETICALLY ACTIVE RADIATION (PAR)

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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. The raw data are compensated by the DAS, but received at HQ for further processing as L0 unfiltered and uncorrected data product until its associated algorithms are applied to produce a QA/QC'd L1 data product in Standard Scientific Units.

1.2 Scope

The expectation is that the Kipp & Zonen PQS 1 PAR Quantum Sensor (NEON P/N: 0300040000; no firmware required) will be used to make measurements of photosynthetically active radiation (PAR). The reference document for the Kipp & Zonen PQS 1 PAR Quantum Sensor is RD [03].

This document specifies the command, control, and configuration that are needed for operating this sensor. It does not provide implementation details, except for cases where these stem directly from the sensor conditions as described here.



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2 RELATED DOCUMENTS AND ACRONYMS

2.1 Applicable Documents

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.XXXXXX	PAR ATBD (TBW)

2.2 Reference Documents

RD [01]	NEON.DOC.000008	NEON Acronym List
RD [02]	NEON.DOC.000243	NEON Glossary of Terms
RD [03]	Kipp & Zonen (2010) Instruction Sheet for the PQS 1 PAR Quantum Sensor V1008. Kipp & Zonen B.V.P.O. Box 507, 2600 AM Delft. The Netherlands	

2.3 Acronyms

Acronym	Explanation
ATBD	Algorithm Theoretical Basis Document
C ³	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
PAR	Photosynthetically Active Radiation

2.4 Verb Convention

“Shall” is used whenever a statement expresses a convention that is binding. The verbs “should” and “may” express non-mandatory provisions. “Will” is used to express a declaration of purpose on the part of the design activity.



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3 INTRODUCTION

The sensor configuration and sensor command and control described here are related to the incident and reflected photosynthetically available radiation (PAR) data product (FIU.0.0020.001) (AD[04]). A description of how sensor readings shall be converted to standard PAR units of $\mu\text{mol/s/m}^2$ is presented in the associated ATBD (AD[05])



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4 OVERVIEW OF SENSOR CONFIGURATION

The PAR data from the sensor shall be unfiltered and uncorrected μV .

Table 1. Sensor configuration settings.

Parameter	Default Setting
Heater	NA
Temperature compensation	NA
PAR measurement: Acquisition Rate	1 Hz
Data acquired from the sensor	PAR (μV)
Measurement mode	Run
Sensor error message	NA



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5 COMMAND AND CONTROL

5.1 Error Handling

This sensor provides no error notification.

5.2 Sensor Device Controls Specification

This sensor has no associated devices.



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6 APPENDIX & BIBLIOGRAPHY

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