NEON SENSOR COMMAND, CONTROL AND CONFIGURATION (C3) DOCUMENT: SECONDARY PRECIPITATION – TIPPING BUCKET

PREPARED BY	ORGANIZATION	DATE
Josh Roberti	FIU	4/02/2012

APPROVALS	ORGANIZATION	APPROVAL DATE
Kate Thibault	SCI	05/16/2022

RELEASED BY	ORGANIZATION	RELEASE DATE
Tanisha Waters	CM	05/16/2022

See configuration management system for approval history.

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Change Record

REVISION	DATE	ECO #	DESCRIPTION OF CHANGE
A	5/17/2012	ECO-00412	Initial Release
B	05/16/2022	ECO-06815	• Revised logo and added fine print

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1 DESCRIPTION

1.1 Purpose

This document specifies the command, control, and configuration details for operating NEON's secondary precipitation tipping buckets. It includes a detailed discussion of all necessary requirements for operational control parameters, conditions/constraints, set points, and any necessary error handling.

1.2 Scope

Met One's model 372 (non-heated; NEON P/N: 0308070001) and model 379 (heated; NEON P/N: 0308070003) tipping buckets (RD [03], RD [04]) will be used throughout NEON's Observatory to monitor secondary precipitation. Sites prone to freezing temperatures will use the 379 model; while sites not prone to freezing temperatures will use 372. There is no firmware associated with these sensors. This document specifies the command, control, and configuration that are needed for operating these sensors. It does not provide implementation details, except for cases where these stem directly from the sensor conditions as described here.

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

2.2 Reference Documents

RD [01]	NEON.DOC.000008 NEON Acronym List
RD [02]	NEON.DOC.000243 NEON Glossary of Terms
RD [03]	Met One Instruments. 2005. Operational Manual: Model 375C 8" Rain Gauge. Document # 375C-9800.
RD [04]	Met One Instruments. 2010. 370 – 380 Series Precipitation Gauges (datasheet).

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
P/N	Part Number

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.

3 INTRODUCTION

This document describes the configuration, command and control related with the secondary precipitation tipping buckets and their corresponding data products (FIU.0.0006). For information regarding maintenance or topics concerning computer algorithms, please refer to the SOP (AD [#]) and ATBD (AD [#]) documents, respectively.

4 OVERVIEW OF SENSOR CONFIGURATION

Met One's 372 and 379 precipitation gauge configurations are presented in **Table 1**.

Table 1. Sensor configuration settings. Parameters only applicable to model 379 are denoted with *.

Parameter	Default Setting
Heater*	Off
Data acquisition streams	Tip (Reed closure)
Acquisition rate	2 Hz maximum
Tipping threshold	0.5mm

5 COMMAND AND CONTROL

5.1 Error Handling

Given that the tipping buckets do not acknowledge any errors, there are no command and control requirements for either the 372 or 379 models. The detection of errors will be managed entirely through state of health monitoring through the DAS by CI at headquarters.

5.2 Heater Controls

The thermostat set point is 4.4°C. Once the temperature falls (rises) to this set point the heater will automatically be turned on (off). The temperature set point cannot be overridden.