



Radio Frequency Exposure Evaluation Report

FOR:
Plenty Unlimited, Inc.

Model Number:
800-00004808

Product Description:
Collects environmental data from our industrial farm.

FCC ID: 2AR2K-0002017

Applied Rules and Standards:
CFR 47 Part 2.1093
FCC KDB 447498 D01 General RF Exposure Guidance v06

Test Report #: SAR_EX_PLENT-002-19001_FCC

DATE: 2020-10-28



A2LA Accredited

IC recognized #
3462B-2

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1. Assessment

The following device meets the limits of general population uncontrolled exposure specified in CFR 47 Part 2.1093 according to SAR evaluation exclusion requirements specified in FCC regulation as listed in KDB 447498, as it has been evaluated against the standards mentioned above under this section.

Responsible for Testing Laboratory:

2020-10-28	Compliance	C Cindy Li (EMC Lab Manager)	
Date	Section	Name	Signature

Responsible for the Report:

2020-10-28	Compliance	Yuchan Lu (Test Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3. CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

2. Administrative Data

2.1. Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
Country	USA
Telephone:	+1 (408) 586 6200
Fax:	+1 (408) 586 6299
Compliance Manager:	Cindy Li
Responsible Project Manager:	Sangeetha Sivaraman

2.2. Identification of the Client

Client's Name:	Plenty Unlimited, Inc.
Street Address:	570 Eccles Avenue
City/Zip Code	South San Francisco, CA 94080
Country	USA

2.3. Identification of the Manufacturer

Applicant's Name:	Same as Client
Street Address:	
City/Zip Code	
Country	

3. Equipment under Assessment

Model No:	800-00004808
Hardware Version:	0.3
Software Version:	0.3
FCC ID	2AR2K-0002017
HVIN:	800-00004808
PMN:	Sprinkles 2
Minimum distance of antenna or radiating parts to user	5mm
Firmware Version Identification Number (FVIN):	N/A
Power Supply/ Rated Operating Voltage Range:	Low 3.0 VDC, Nominal 5.0 VDC, High 6.0 VDC
Operating Temperature Range:	Low 0°C, Nominal 25°C, High 40°C
Modes of Operation:	Bluetooth LE
Radios included in the device:	<ul style="list-style-type: none">❖ Bluetooth LE:<ul style="list-style-type: none">▪ Module Name: Apollo3 Blue SoC▪ Module Number: AMA3B1KK-KBR▪ Antenna P/N: 2450AT18D0100▪ Tuning Max Peak Gain: 2.9 dBi
EUT Dimensions(mm):	65(diameter) x 40 (height)
Weight(grams):	61
Co-located Transmitters/ Antennas:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Exposure Category:	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled
Device Category:	<input type="checkbox"/> Fixed Installation <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Mixed Mobile and Portable
EUT Diameter	<input checked="" type="checkbox"/> < 60 cm <input type="checkbox"/> Other _____
Sample Revision	<input type="checkbox"/> Prototype Unit; <input checked="" type="checkbox"/> Production Unit; <input type="checkbox"/> Pre-Production

4. FCC Exemption Limits for Routine Evaluation

4.1. FCC SAR test exclusions are set by KDB 447498 D01 General RF Exposure Guidance v06

KDB 447498 Section: 4.3.1. Standalone SAR test exclusion considerations

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- The values 3.0 and 7.5 are referred to as *numeric thresholds* in step b) below

The test exclusions are applicable only when the minimum *test separation distance* is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

5. Stand-Alone SAR Evaluation Exclusion

5.1. Justification for using the 5 mm Distance

The conservative distance of 5 mm is an estimate of how close a human body can be to the device in its typical application.

5.2. SAR Exclusion Calculation Table

According to KDB 447498, SAR evaluation can be excluded if the following equation is satisfied:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR}$

FCC Standalone Transmission SAR Exclusion Calculations										
Band	Frequency [GHz]	Max Conducted Output Power [dBm]	Antenna Gain [dBi]	Max Output Power [mW]	Source Based Duty Cycle	Load based duty cycle based on Maximum payload	Distance [mm]	Effective Time Average Max Power [mW]	P/D*SQRT (F) at $\leq 5\text{mm}$	1-g ≤ 3.0
BTLE	2.48	3.84	2.9	4.72	1.00	1.00	5	4.72	1.486612687	Yes

- F: Frequency [GHz]
- P1: Max. Measured Output Power [mW]
- D: Distance [mm]
- SQRT(F): Square root(Frequency[GHz])

6. Revision History

Date	Report Revision	Changes to report	Prepared by
2020-10-28	SAR_EX_PLENT-002-19001_FCC	Initial Version	Yuchan Lu

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