



Radio Frequency Exposure Evaluation Report

FOR:

Angler Labs Inc.

Model Name:
AL-TRK-001

Product Description:
Bluetooth Low Energy Fish track logger that is placed on a fishing rod

FCC ID: 2A1MG-TRK001
IC ID: 21376-TRK001

Applied Rules and Standards:
CFR 47 Part 2.1093
FCC KDB 447498 D01 General RF Exposure Guidance v06
IC RSS-102 Issue 5

Report number: EMC_ANGLE-001-16001_SAR-EX

DATE: 2016-12-01



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CETECOM Inc.

411 Dixon Landing Road • Milpitas, CA 95035 • U.S.A.
Phone: + 1 (408) 586 6200 • Fax: + 1 (408) 586 6299 • E-mail: info@cetecom.com • <http://www.cetecom.com>
CETECOM Inc. is a Delaware Corporation with Corporation number: 2905571

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1. Assessment

The following device was evaluated against the limits for 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, and IC RSS-102 Issue 5.

The device meets the requirements for SAR exclusion as stipulated by the above given FCC/IC rules.

Company	Description	Model #
Angler Labs Inc.	Bluetooth Low Energy Fish track logger that is placed on a fishing rod	AL-TRK-001

Responsible for Testing Laboratory:

2016-12-01	Compliance	Franz Engert (Compliance Manager)
Date	Section	Name

Responsible for the Report:

2016-12-01	Compliance	Kris Lazarov (EMC Engineer)
Date	Section	Name

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:	Franz Engert
Responsible Project Leader:	Kris Lazarov

2.2. Identification of the Client / Manufacturer

Applicant's Name:	Angler Labs Inc.
Street Address:	940 Pearce Mill Rd
City/Zip Code	Wexford, PA 15090
Country	USA
Contact Person:	Landon Bloomer
Phone No.	412-691-0564
e-mail:	Landon@anglr.tech

3. Equipment under Assessment

Model No	TRK001
HW Version	Rev4
SW Version	1.0.6.968
FCC-ID	2A1MG-TRK001
IC ID	21376-TRK001
Product Description	MEMs-based fishing tracker with BLE communication to customer mobile app
Device Category	<input type="checkbox"/> Fixed Installation <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Mixed Mobile and Portable
Frequency Range / number of channels	Nominal band: 2402 – 2480; Center to center: 2402(ch 0) – 2480(ch 39), 40 channels
Type(s) of Modulation	Bluetooth version 4.0, Low Energy, GFSK modulation
Modes of Operation	Bluetooth LE
Max. declared antenna gain	Chip antenna max gain = 5.64dBi
Minimum distance of antenna or radiating parts to user	5mm or less
Max. declared conducted output power including tune up	Maximum conducted power 0 dBm + 1 dBm tolerance
Max. measured conducted output power	0.88 dBm
Power Supply/ Rated Operating Voltage Range	lithium battery pack Vmin: 3.0V / Vnom: 3.7V / Vmax: 4.2V DC
Operating Temperature Range	-20 °C to 60 °C
Other Radios included in the device	N/A
Co-located Transmitters/ Antennas	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Sample Revision	<input type="checkbox"/> Prototype <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production
Exposure Category	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled

4. FCC and IC 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 \leq 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR, and } \leq 7.5 \text{ for 10-g extremity SAR,30 where}$$

- $f(\text{GHz})$ 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 \leq 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.

4.2. IC SAR test exclusions are set by IC RSS-102 Issue 5

IC RSS-102 Section: 2.5.1 Exemption Limits for Routine Evaluation — SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in Table 1.

For a device operating at 2.45GHz the SAR evaluation exemption limit at distance 5mm or less is 4mW

5. Stand-Alone SAR Evaluation Exclusion

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

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

- The maximum RF channel power for the device under evaluation is 1mW.

Using the above equation:

$$[(1\text{mW}) / (5\text{mm})] \cdot [\sqrt{2.480}] = 0.3$$

Conclusion:

- SAR testing for FCC is excluded because the exclusion threshold of 0.3 is less than 3.0 FCC limit
- SAR testing for IC is excluded because the maximum power of 1mW is less than the 4mW IC limit

6. Revision History

Date	Report Name	Changes to report	Report prepared by
2016-12-01	EMC_ANGLE-001-16001_SAR-EX	Initial version superseding report # EMC_ANGLE-001-16001_MPE_Rev 1	Kris Lazarov