



# 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: 2AIMG-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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**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)	 <small>Digitally signed by Franz Engert DN: cn=Franz Engert, c=US, o=CETECOM, ou=Compliance, email=franz.engert@cetecom. com</small>
Date	Section	Name	Signature

**Responsible for the Report:**

2016-12-01	Compliance	Kris Lazarov (EMC Engineer)	 <small>Digitally signed by Kris Lazarov DN: cn=Kris Lazarov, o, ou, email=kris.lazarov@cetecom.com, c=US</small>
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.  
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## 2. Administrative Data

### 2.1. Identification of the Testing Laboratory Issuing the Test Report

<b>Company Name:</b>	CETECOM Inc.
<b>Department:</b>	Compliance
<b>Street Address:</b>	411 Dixon Landing Road
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<b>Telephone:</b>	+1 (408) 586 6200
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<b>Compliance Manager:</b>	Franz Engert
<b>Responsible Project Leader:</b>	Kris Lazarov

### 2.2. Identification of the Client / Manufacturer

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

### 3. Equipment under Assessment

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