Radio Frequency Exposure Evaluation Report

FOR:
Compology Inc.

Model Name:
SC01

Product Description:
Industrial container asset tracker/monitor.

FCC ID: 2AO44-SC01
IC ID: 23661-SC01

Per:
CFR Part1 (1.1307 &1.1310), Part 2 (2.1091),
FCC KDB 447498 D01 General RF Exposure Guidance v06
ISED RSS-102 Issue 5

Report number: EMC_COMPO_017_20001_FCC_ISED_MPE

DATE: 6/29/2020

***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

TABLE OF CONTENTS

1 Assessment

This RF Exposure evaluation report, provides evidence for compliance of the below identified device, with the RF Exposure limits for mobile devices, as defined in FCC CFR Part1 (1.1307 &1.1310), Part 2 (2.1091), and IC standard ISED RSS-102 Issue 5, under worst case conditions (measured or rated RF output power, antenna gain, distance towards human body. Multiple transmitter information as presented by the applicant). In addition, maximum antenna gain, or minimum distance towards the human body calculated respectively where relevant.

The device meets the limits as stipulated by the above given FCC and IC rule parts based on available specifications for worst case conditions at 20cm distance to the body.

Company	Description	Model Name
Compology Inc.	Industrial container asset tracker/monitor.	SC01

Report reviewed by: TCB Evaluator

Date	Section	Name	Signature
6/29/2020	Compliance	Cindy Li (Lab Manager)	Cindy Li Digitally signed by cindy.li@cetecom.com DN: CN=cindy.li@cetecom.com Reason: I am approving this document Location: Date: 2020-06-29 16:47:33

Responsible for the Report:

Date	Section	Name	Signature
6/29/2020	Compliance	Issa Ghanma (EMC Engineer)	Digitally signed by: Issa W Ghanma DN: CN = Issa W Ghanma email = Issaghanma@cetecom.com C = US O = CETECOM Inc. OU = EMC Date: 2020.06.29 11:59:06 -07'00'

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
Lab Manager:	Li, Cindy
Responsible Project Leader:	Baskaran, Akanksha

2.2 Identification of the Client / Manufacturer

Applicant's Name:	Compology Inc.
Street Address:	1045 Bryant Street, Suite 101
City/Zip Code	San Francisco, CA 94103
Country	USA

2.3 Identification of the Manufacturer

Manufacturer's Name:	AQS
Manufacturers Address:	47817 Fremont Blvd
City/Zip Code	Fremont, CA 94538
Country	USA

3 Equipment under Assessment

Model number:	SC01
Product name:	SC01 SkyCamera
FCC ID:	2AO44-SC01
IC ID:	23661-SC01
HVIN:	SC01
PMN:	SC01
FVIN:	newman-0004
HMN:	SC01
Product Description:	Industrial container asset tracker/monitor.
Power Supply/ Rated Operating Voltage Range:	Low 2.5 V DC, Nominal 3.6 V DC, High 3.9 V DC
Integrated Module Info:	❖ **BLE (transceiver):** ▪ Module name/number : Nordic nRF52840-QIAA-R7
H.W Version:	Rev04
S.W Version:	Newman-0004
Regulatory Band:	❖ **BLE (transceiver):** ▪ Frequencies : 2400 – 2483.5 ▪ Channel numbers : 0 – 39 (40 channels)
Antenna Type and Peak gain as declared:	Internal; Peak Realized Gain: 2.04 dBi
Maximum Conducted Output Power:	7.6 dBm / 0.006 W
Sample Revision:	☐ Prototype Unit; ☐ Production Unit; ■ Pre-Production

4 RF Exposure Limits and FCC and IC Basic Rules

For the specific described radio apparatus the following basic limits and rules apply for both, FCC and IC where not indicated differently.

4.1 Power Density Limits acc. to FCC 1.1310(e)/ RSS-102 i5, cl. 4:

FCC

Frequency Range (MHz)	Power density (mW/cm²)	Averaging time (minutes)
300 – 1500	f (MHz) /1500	30
1500 – 100.000	1.0	30

IC

300 – 6000	0.02619 x f (MHz) $^{0.6834}$	6

4.2 Routine Environmental Evaluation Categorical Exclusion Limits acc. to FCC 2.1091(c) / RSS-102, cl. 2.5 (rounded to 1 decimal point):

FCC
Operating frequency < 1.5GHz: excluded if ERP < 1.5W / 31.8 dBm (EIRP: 33.9);
Operating frequency > 1.5GHz: excluded if ERP < 3.0W / 34.8 dBm (EIRP: 36.9);

IC
300MHz < = operating frequency < 6 GHz: excluded if EIRP < 0.0131 x f (MHz) $^{0.6834}$ W

4.3 RF Exposure Estimation (MPE Estimation)

Having available the source, based average output power, and peak antenna gain, or the ERP/EIRP of the specified device, and for a known minimum distance of its radiating structures from the body of persons. According to its use cases (at least 20cm) the power density at that distance can be estimated by the following formula for plane-wave equivalent conditions (far-field conditions), when ground reflection is neglected.

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (mW/cm² or W/m²)
P = power input to the antenna (mW or W)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (cm or m)

5 Evaluation

5.1 Analysis to Exclude Routine RF Exposure evaluation for Stand Alone Operation

- Evaluation based on worst-case power density limits for Canada.
- Calculation made for 20cm.
- Evaluations are based on EIRP measured or calculated from known gain and conducted output power.

Band	Lowest frequency [MHz]	Max.Power Conducted [dBm \ W]	EIRP [dBm \ W]	FCC EIRP limit [dBm]	ISED EIRP limit [W]	Actual [W/m2]	ISED [W/m2]	FCC [W/m2]	Verdict
BLE	2402	7.6 \ 0.006	**9.64 \ 0.01**	36.90	2.24	**0.02**	5.35	10.00	Complies

Conclusion:

- The equipment is passing RF exposure requirements for 20cm distance.

6 Revision History

Date	Report Name	Changes to report	Report prepared by
6/29/2020	EMC_COMPO_017_20001_FCC_ISED_MPE	Initial Version	Issa Ghanma

<<< The End >>>