Radio Frequency Exposure Evaluation Report

FOR:
Hanchett Entry Systems, Inc.

Model:
CER

Product Description:
The DR80 is an access control device that provides access via relay actuation when activated from BLE credentials or RFID credentials.

FCC ID: VC3DR80
IC: 7160ADR80

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

Report number: EMC_HANC1_007_22001_FCC_ISED_MPE_Rev1

DATE: 2023-02-14

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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 Part 1 (1.1307 &1.1310), Part 2 (2.1091) and IC standard 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 is 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 #
Hanchett Entry Systems, Inc.	The DR80 is an access control device that provides access via relay actuation when activated from BLE credentials or RFID credentials.	CER

Report reviewed by: TCB Evaluator

		Arndt Stoecker	
2023-02-14	Compliance	(Director of Regulatory Services)	
Date	**Section**	**Name**	**Signature**

Responsible for the Report:

		Cheng Song	
2023-02-14	Compliance	(EMC Engineer)	
Date	**Section**	**Name**	**Signature**

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:	Arndt Stoecker
Responsible Project Leader:	Cathy Palacios

2.2   Identification of the Client / Manufacturer

Client's Name:	Hanchett Entry Systems, Inc.
Street Address:	10027 S. 51st St., Suite 102
City/Zip Code	Phoenix, AZ 85044
Country	USA

Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3   Equipment under Assessment

Model No:	CER
HW Version :	1.6
SW Version :	nrf52_6.1.1_softdevice
FCC-ID :	VC3DR80
IC:	7160ADR80
PMN:	Centrios
Product Description:	The DR80 is an access control device that provides access via relay actuation when activated from BLE credentials or RFID credentials.
Radio Information:	**Bluetooth & Zigbee:** • Module: Nordic Semi nRF52840 SoC **RFID:** • Module: NXP CLRC66303
Antenna Information as declared:	**Bluetooth & Zigbee:** • Ignion NN01-102, SMD mounting • 2400MHz – 2480MHz, Peak Gain: 1.7dBi
Power Supply/ Rated Operating Voltage Range:	12 V (min) / 24 V (max)
Operating Temperature Range	Tmin: -40 ºC / Tmax: 60 ºC / Tnom: 20 ºC
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 – 100000	1.0	30

IC

Frequency Range (MHz)	Power density (W/m²)	Averaging time (minutes)
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 / 31.8dBm (EIRP: 33.9 dBm);
operating frequency > 1.5GHz: excluded if ERP < 3.0W / 34.8dBm (EIRP: 36.9 dBm);

$$P_{th}(mW) = ERP_{20\,cm}(mW) = \begin{cases} 2040f & 0.3\,\text{GHz} \le f < 1.5\,\text{GHz} \\ 3060 & 1.5\,\text{GHz} \le f \le 6\,\text{GHz} \end{cases}$$

IC
300MHz < = operating frequency < 6 GHz: excluded if EIRP < 0.0131 x f (MHz) $^{0.6834}$ W
Below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance).

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 Evaluations

5.1 Analysis of RF Exposure

<u>FCC:</u>
BLE
Operating frequency > 1.5GHz, ERP20cm Limit = 3060mW = 3.06W
Actual ERP = 0.004W < 3.06W; Excluded.

Zigbee
Operating frequency > 1.5GHz, ERP20cm Limit = 3060mW = 3.06W
Actual ERP = 0.004W < 3.06W; Excluded.

<u>IC:</u>
BLE
EIRP Limit = $0.0131 \times f \ (MHz)^{0.6834} = 2.68W$
Actual EIRP = 0.006W < 2.68W; Excluded.

Zigbee
EIRP Limit = $0.0131 \times f \ (MHz)^{0.6834} = 2.68W$
Actual EIRP = 0.006W < 2.68W; Excluded.

RFID
EIRP Limit = 1W
Actual EIRP = 0 < 1W; Excluded.

5.2 Conclusion:

BLE and RFID radio comply with routine environmental evaluation requirements for RF exposure.

6   Revision History

Date	Report Name	Changes to report	Prepared by
2023-01-12	EMC_HANC1_007_22001_FCC_ISED_MPE	Initial Release	Cheng Song
2023-02-14	EMC_HANC1_007_22001_FCC_ISED_MPE_Rev1	Updated Section 5 Evaluations	Cheng Song

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