KDB447498 D03
IEEE C95.1
47 C.F.R. Part 1, Subpart I, Section 1.1310
47 C.F.R. Part 2, Subpart J, Section 2.1091

RF EXPOSURE REPORT

For

Icontrol One Link

Model: CH-1000

Trade Name: iControl

Issued to

iControl Networks Inc.
555 Twin Dolphin Drive, Suite 280, Redwood City, CA 94065

Issued by

Compliance Certification Services Inc.
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
http://www.ccsrf.com
service@ccsrf.com
Issued Date: June 30, 2015

Testing Laboratory
1309

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	2015/06/30	Initial Issue	ALL	Kelly Cheng

TABLE OF CONTENTS

1. LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

2. EUT SPECIFICATION

EUT	Icontrol One Link		
Model	CH-1000		
RF Module (WLAN)	MEDIATEK	Model:	MT7620A
RF Module (Z-Wave)	SIGMA DESIGNS	Model:	SD3503A-CNE3
Model Discrepancy	N/A		
Frequency band (Operating)	☒ 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz 802.11n HT40: 2.422GHz ~ 2.452GHz ☒ 902MHz ~ 928MHz ☐ Others		
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others		
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)		
Antenna Specification	For 2.4G Dipole Antenna Gain : 2.25 dBi (Numeric gain 1.68) Dipole Antenna Gain : 1.79 dBi (Numeric gain 1.51) For Z-Wave Monopole Antenna Gain : -0.89 dBi (Numeric gain 0.81)		
Maximum Average output power	IEEE 802.11b Mode: 18.94 dBm (78.343 mW) IEEE 802.11g Mode: 18.58 dBm (72.111 mW) IEEE 802.11n HT 20 Mode: 22.11 dBm (162.555 mW) IEEE 802.11n HT 40 Mode: 21.59 dBm (144.212 mW) Z-Wave: 2.00 dBm (1.585 mW)		
Maximum Tune up Power	IEEE 802.11b Mode: 20.00 dBm (100.000 mW) IEEE 802.11g Mode: 20.00 dBm (100.000 mW) IEEE 802.11n HT 20 Mode: 23.00 dBm (199.526 mW) IEEE 802.11n HT 40 Mode: 23.00 dBm (199.526 mW) Z-Wave: 2.00 dBm (1.585 mW)		
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A		

3. TEST RESULTS

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter
P = Power in Watts
G = Numeric antenna gain
d = Distance in meters
S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***Equation 1***

Where d = Distance in cm
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

4. MAXIMUM PERMISSIBLE EXPOSURE

Substituting the MPE safe distance using d = 20 cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm²	Limit (mW/cm2)
1	2412	100	1.68	20	0.0334	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm²	Limit (mW/cm2)
6	2437	100	1.68	20	0.0334	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm²	Limit (mW/cm2)
6	2437	199.526	1.68	20	0.0667	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm²	Limit (mW/cm2)
6	2437	199.526	1.68	20	0.0667	1

Z-Wave:

Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm²	Limit (mW/cm2)
908	1.585	0.81	20	0.0003	1