

# RF EXPOSURE REPORT

**REPORT NO.:** SA140813E03

**MODEL NO.:** TP72-HUB

**FCC ID:** MQT-TP72HUB

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**TESTED:** Sep. 09, 2014

**ISSUED:** Sep. 16, 2014

**APPLICANT:** XAC AUTOMATION CORP.

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## RELEASE CONTROL RECORD

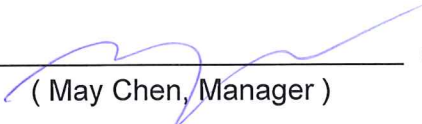
| ISSUE NO.   | REASON FOR CHANGE | DATE ISSUED   |
|-------------|-------------------|---------------|
| SA140813E03 | Original release  | Sep. 16, 2014 |

## 1. CERTIFICATION

**PRODUCT:** HUB  
**BRAND NAME:** XAC  
**MODEL NO.:** TP72-HUB  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**APPLICANT:** XAC AUTOMATION CORP.  
**TESTED DATE:** Sep. 09, 2014  
**STANDARDS:** FCC Part 2 (Section 2.1091)  
KDB 447498 D03  
IEEE C95.1

The above equipment (Model: TP72-HUB) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY** :  , **DATE:** Sep. 16, 2014  
( Claire Kuan, Specialist )

**APPROVED BY** :  , **DATE:** Sep. 16, 2014  
( May Chen, Manager )

## 2. RF EXPOSURE LIMIT

### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| FREQUENCY RANGE (MHz)                                 | ELECTRIC FIELD STRENGTH (V/m) | MAGNETIC FIELD STRENGTH (A/m) | POWER DENSITY (mW/cm <sup>2</sup> ) | AVERAGE TIME (minutes) |
|-------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE |                               |                               |                                     |                        |
| 300-1500                                              | ...                           | ...                           | F/1500                              | 30                     |
| 1500-100,000                                          | ...                           | ...                           | 1.0                                 | 30                     |

F = Frequency in MHz

### 3. MPE CALCULATION FORMULA

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

r = distance between observation point and center of the radiator in cm

### 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

| Brand | Model No.     | Antenna Type | Antenna Connector | Gain(dBi) | Frequency range (MHz to MHz) |
|-------|---------------|--------------|-------------------|-----------|------------------------------|
| ACX   | AT3216-T24PAA | Chip         | NA                | 1.5       | 2400~2500                    |

## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

### For Bluetooth:

#### BT-EDR

| FREQUENCY BAND (MHz) | CONDUCTED POWER (mW) | ANTENNA GAIN (dBi) | DISTANCE (cm) | POWER DENSITY (mW/ cm <sup>2</sup> ) | LIMIT (mW/cm <sup>2</sup> ) |
|----------------------|----------------------|--------------------|---------------|--------------------------------------|-----------------------------|
| 2402-2480            | 1.845                | 1.5                | 20            | 0.00052                              | 1.00                        |

#### BT-LE

| FREQUENCY BAND (MHz) | CONDUCTED POWER (mW) | ANTENNA GAIN (dBi) | DISTANCE (cm) | POWER DENSITY (mW/ cm <sup>2</sup> ) | LIMIT (mW/cm <sup>2</sup> ) |
|----------------------|----------------------|--------------------|---------------|--------------------------------------|-----------------------------|
| 2402-2480            | 2.858                | 1.5                | 20            | 0.0008                               | 1.00                        |

### For WLAN (Mini USB Dongle / FCC ID: MQ4WU5501):

| FREQUENCY BAND (MHz) | MAX POWER (mW) | ANTENNA GAIN (dBi) | DISTANCE (cm) | POWER DENSITY (mW/cm <sup>2</sup> ) | LIMIT (mW/cm <sup>2</sup> ) |
|----------------------|----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462            | 96.383         | 2                  | 20            | 0.03039                             | 1.00                        |

### CONCLUSION:

Both of the Bluetooth and WLAN can transmit simultaneously, the formula of calculated the MPE is:

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is  $0.03039 / 1 + 0.0008 / 1 = 0.031$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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