

# RF Exposure Evaluation Report

**Product** : ECH relay  
**Trade mark** : ECH  
**Model/Type reference** : Refer to chapter 4.3  
**Serial Number** : N/A  
**Report Number** : EED32J00120204  
**FCC ID** : 2AJOC-EHC1  
**Date of Issue** : Oct. 20, 2017  
47 CFR Part 1.1307  
**Test Standards** : 47 CFR Part 1.1310  
KDB447498D01v06  
**Test result** : PASS

Prepared for:

**ECH (Changzhou) Medical Instrument Co., Ltd.**  
**No. 65, West Huiling Rd., Zouqu County Zhonglou**  
**District, Changzhou, Jiangsu**

Prepared by:

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Date:

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## 2 Version

| Version No. | Date          | Description |
|-------------|---------------|-------------|
| 00          | Oct. 20, 2017 | Original    |
|             |               |             |
|             |               |             |

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## 4 General Information

### 4.1 Client Information

|                          |                                                                              |
|--------------------------|------------------------------------------------------------------------------|
| Applicant:               | ECH (Changzhou) Medical Instrument Co., Ltd.                                 |
| Address of Applicant:    | No. 65, West Huiling Rd., Zouqu County Zhonglou District, Changzhou, Jiangsu |
| Manufacturer:            | ECH (Changzhou) Medical Instrument Co., Ltd.                                 |
| Address of Manufacturer: | No. 65, West Huiling Rd., Zouqu County Zhonglou District, Changzhou, Jiangsu |
| Factory:                 | Shanghai Chenguo Electronic Technology Co., Ltd.                             |
| Address of Factory:      | Shanghai Fengxian Fengpu Industrial Zone, 518 Far East Road                  |

### 4.2 General Description of EUT

|                                  |                                                                                   |
|----------------------------------|-----------------------------------------------------------------------------------|
| Product Name:                    | ECH relay                                                                         |
| Model No.(EUT):                  | Refer to chapter 4.3                                                              |
| Test Mode No.:                   | ECH-c1-WLSD-C, ECH-c1-LSD-C                                                       |
| Trade Mark:                      | ECH                                                                               |
| EUT Supports Radios application: | BT: 4.0 BT Signal mode, 2402-2480MHz<br>Wi-Fi: 802.11 b/g/n(20M), 2412MHz-2462MHz |

### 4.3 Product Specification subjective to this standard

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Frequency Range:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BT: 4.0 BT Signal mode, 2402-2480MHz<br>Wi-Fi: 802.11 b/g/n(20M), 2412MHz-2462MHz                             |
| Modulation Type:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | BT: GFSK<br>Wi-Fi: DSSS, OFDM                                                                                 |
| Test Power Grade:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | N/A                                                                                                           |
| Test Software of EUT:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | N/A                                                                                                           |
| Antenna Type:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | PCB antenna                                                                                                   |
| Antenna Gain:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3dBi                                                                                                          |
| Power Supply:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | DC 5V by USB port                                                                                             |
| Conduct Peak Power:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 22.00dBm<br>The Maximum Conduct Peak Power data refer to the maximum tolerances declared by the manufacturer. |
| USB Micro-B Plug cable:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 137.5cm(Unshielded)                                                                                           |
| Sample Received Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Jun. 16, 2017                                                                                                 |
| Sample tested Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Jun. 16, 2017 to Sep. 13, 2017                                                                                |
| <p>The tested sample(s) and the sample information are provided by the client.</p> <p>According to whether there are Ethernet, they can be divided into two categories. There are the Ethernet for one kind, the other kind without Ethernet. The models without the Ethernet, there will be the Bluetooth and WLAN. The models with the Ethernet also have Bluetooth and WLAN. but if the Ethernet is connected to the router, the WLAN will can't transfer data by firmware. Except the color and the appearance are different, all of them are the same.</p> <p>The Model No. Below with the Ethernet, only the model ECH-c1-WLSD-C was tested, since except the color of appearance are different, all the others are the same.</p> <p>Model No.: ECH-c1-WLSD-C, ECH-c1-WLSD-B, ECH-c1-WL-C, ECH-c1-WL-B, ECH-c1-WLD-B, ECH-c1-WLD-C, ECH-c1-WSD-B, ECH-c1-WSD-C, ECH-c1-W-B, ECH-c1-W-C, ECH-c1-WD-C, ECH-c1-WD-B.</p> |                                                                                                               |

The Model No. Below without the Ethernet, only the model ECH-c1-LSD-C was tested, except the color of appearance are different, all the others are the same.

Model No.: ECH-c1-LSD-C, ECH-c1-LSD-B, ECH-c1-L-C, ECH-c1-L-B, ECH-c1-LD-C, ECH-c1-LD-B.

The model ECH-c1-WLSD-C were fully tested, the model ECH-c1-LSD-C was only tested the Output Power and the Radiated Spurious Emissions, other tests data please refer to the model ECH-c1-WLSD-C.

#### 4.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

**FCC Designation No.: CN1164**

**FCC-Registration No.: 886427**

Centre Testing International Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 886427.

#### 4.5 Deviation from Standards

None.

#### 4.6 Abnormalities from Standard Conditions

None.

#### 4.7 Other Information Requested by the Customer

None.

## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—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> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 0.3–3.0 .....                                                  | 614                           | 1.63                          | * (100)                             | 6                        |
| 3.0–30 .....                                                   | 1842/f                        | 4.89/f                        | * (900/f <sup>2</sup> )             | 6                        |
| 30–300 .....                                                   | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300–1500 .....                                                 | .....                         | .....                         | f/300                               | 6                        |
| 1500–100,000 .....                                             | .....                         | .....                         | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3–1.34 .....                                                 | 614                           | 1.63                          | * (100)                             | 30                       |
| 1.34–30 .....                                                  | 824/f                         | 2.19/f                        | * (180/f <sup>2</sup> )             | 30                       |
| 30–300 .....                                                   | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300–1500 .....                                                 | .....                         | .....                         | f/1500                              | 30                       |
| 1500–100,000 .....                                             | .....                         | .....                         | 1.0                                 | 30                       |

A rough estimation of the expected exposure in power flux density on a given point can be made with the following equation:

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R= distance to the centre of radiation of the antenna

EIRP = P\*G

The antenna of the product, under normal use condition is at least 20 cm away from the body of the user.

Warning statement to the user for keeping at least 20cm separation distance and the prohibition of operating to a person has been printed on the user's manual. Therefore, the S of the device is calculated with R=20cm, and if it is below the limit S, then we can conclude the device complies with the rules.

### 5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually.

### 5.1.3 EUT RF Exposure Evaluation

**Antenna Gain:** 3dBi

Output Power Into Antenna & RF Exposure Evaluation Distance:

| Max Conducted Peak<br>Output Power(dBm) | Gain<br>(dBi) | EIRP*<br>(dBm) | EIRP<br>(mW) | R<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | Limit<br>(mW/cm <sup>2</sup> ) | Result |
|-----------------------------------------|---------------|----------------|--------------|-----------|----------------------------|--------------------------------|--------|
| 22.00                                   | 3             | 25.00          | 316.23       | 20        | 0.063                      | 1.0                            | Pass   |

**Note:** The Maximum Conduct Peak Power data refer to the maximum tolerances declared by the manufacturer.

## PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32J00120202 for EUT external and internal photos.

\*\*\* End of Report \*\*\*

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