# RF Exposure Evaluation Declaration

| | |
|---|---|
| **FCC ID:** | 2ANOT-MC10 |
| **IC:** | 23166-MC10 |
| **APPLICANT:** | Alliance Laundry Systems LLC |
| **Application Type:** | Certification |
| **Product:** | MC10 Transceiver Control Panel |
| **Model No.:** | MC10 |
| **Brand Name:** | Alliance, UniMac, Huebsch, Primus, IPSO |
| **FCC Classification:** | Digital Transmission System (DTS) |
| **Test Procedure(s):** | KDB 447498 D01 General RF Exposure Guidance v06 |

Reviewed By: Sunny Sun
( Sunny Sun )

Approved By: Robin Wu
(Robin Wu)

# Revision History

| Report No. | Version | Description | Issue Date | Note |
|---|---|---|---|---|
| 1907RSU023-U2 | Rev. 01 | Initial Report | 08-14-2019 | Valid |
| | | | | |

# 1. PRODUCT INFORMATION

## 1.1. Equipment Description

| | |
|---|---|
| Product Name: | MC10 Transceiver Control Panel |
| Model No.: | MC10 |
| Brand Name: | Alliance, UniMac, Huebsch, Primus, IPSO |
| Wi-Fi Specification: | 802.11b/g/n-HT20 |

## 1.2. Product Specification Subjective to this Report

| | |
|---|---|
| Frequency Range: | 802.11b/g/n-HT20: 2412MHz ~ 2462MHz |
| Channel Number: | 802.11b/g/n-HT20: 11 |
| Type of Modulation: | 802.11b: DSSS<br>802.11g/n: OFDM |
| Data Rate: | 802.11b: 1/2/5.5/11Mbps<br>802.11g: 6/9/12/18/24/36/48/54Mbps<br>802.11n: up to 72.2Mbps |
| Maximum Conducted Output Power: | 802.11b: 14.79dBm<br>802.11g: 11.52dBm<br>802.11n-HT20: 11.49dBm |
| Antenna Type: | Dipole Antenna |
| Antenna Gain: | 2.0dBi |

## 1.3. Working Frequencies for this report

802.11b/g/n-HT20

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|
| 01 | 2412 MHz | 02 | 2417 MHz | 03 | 2422 MHz |
| 04 | 2427 MHz | 05 | 2432 MHz | 06 | 2437 MHz |
| 07 | 2442 MHz | 08 | 2447 MHz | 09 | 2452 MHz |
| 10 | 2457 MHz | 11 | 2462 MHz | -- | -- |

# 2. RF Exposure Evaluation

## 2.1. Limits

According to FCC 1.1310: 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 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density ($mW/cm^2$) | Averaging Time (Minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/ Control Exposures | | | | |
| 0.3-3.0 | 614 | 1.63 | *100 | 6 |
| 3.0-30 | 1842/f | 4.89/f | *900/f2 | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1,500 | -- | -- | f/300 | 6 |
| 1,500-100,000 | -- | -- | 5 | 6 |
| (B) Limits for General Population/ Uncontrolled Exposures | | | | |
| 0.3-1.34 | 614 | 1.63 | *100 | 30 |
| 1.34-30 | 824/f | 2.19/f | *180/f2 | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1,500 | -- | -- | f/1500 | 30 |
| 1,500-100,000 | -- | -- | 1.0 | 30 |

f= Frequency in MHz

* = Plane-wave equivalent power density

Calculation Formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where

Pd = power density in $mW/cm^2$

Pout = 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

Pd is the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

## 2.2. Test Result of RF Exposure Evaluation

| | |
|---|---|
| Product | MC10 Transceiver Control Panel |
| Test Item | RF Exposure Evaluation |

Antenna Gain: Refer to Clause 1.2 of antenna description.

| Test Mode | Frequency Band (MHz) | Maximum Total Average Output Power (dBm) | Power Density at R = 20 cm ($mW/cm^2$) | Limit ($mW/cm^2$) |
|---|---|---|---|---|
| 802.11b/g/n-HT20 | 2412 ~ 2462 | 14.79 | 0.0095 | 1 |

**CONCLUSION:**

The Max Power Density at R (20 cm) = 0.0095$mW/cm^2$ < 1$mW/cm^2$.
So the EUT complies with the requirement.

The End

# Appendix - EUT Photograph

Refer to “1907RSU023-UE” file.