# KDB 447498 D03
## 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

## SPX Sandpiper Digital Display

## Model: CP10

## Trade Name: Connectpoint

Issued to

## Connectpoint Inc.
## 175 Cremona, Suite 160 Goleta California 93117 United States

Issued by

## Compliance Certification Services Inc.
## Wugu Laboratory
### No.11, Wugong 6th Rd., Wugu Dist.,
### New Taipei City, Taiwan. (R.O.C.)
### Issue Date: June 24, 2021

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Report No.: T210324W01-MF1

# Revision History

| Rev. | Issue Date | Revisions | Effect Page | Revised By |
|------|-----------|-----------|-------------|------------|
| 00 | June 9, 2021 | Initial Issue | ALL | Allison Chen |
| 01 | June 24, 2021 | See the following Note Rev.(01) | P.8 | Allison Chen |

**Note**
**Rev.(01)**
1. Add remark description.

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# 1. TEST RESULT CERTIFICATION

## We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247.

The test results of this report relate only to the tested sample EUT identified in this report.

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULT** |
| KDB 447498 D03<br>47 C.F.R. Part 1, Subpart I, Section 1.1310<br>47 C.F.R. Part 2, Subpart J, Section 2.1091 | No non-compliance noted |
| **Statements of Conformity** | |
| Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty. | |

Approved by:

Kevin Tsai
Deputy Manager
Compliance Certification Services Inc.

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## 2. 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.

§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), except in the case of portable devices which shall be evaluated according to the provisions of FCC part 2.1093 of the chapter.

### 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$^2$) | Averaging time (minutes) |
|---|---|---|---|---|
| (A) Limits for Occupational/Controlled Exposure | | | | |
| 0.3-3.0 | 614 | 1.63 | * 100 | 6 |
| 3.0-30 | 1842/f | 4.89/f | * 900/f$^2$ | 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 Exposure | | | | |
| 0.3-1.34 | 614 | 1.63 | * 100 | 30 |
| 1.34-30 | 824/f | 2.19/f | * 180/f$^2$ | 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

Note 1 to Table 1: Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Note 2 to Table 2: General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

## 3. EUT SPECIFICATION

| | |
|---|---|
| **EUT** | SPX Sandpiper Digital Display |
| **Model** | CP10 |
| **Model Discrepancy** | N/A |
| **Frequency band (Operating)** | ☒ 802.11b/g/n HT20: 2412MHz ~ 2462 MHz<br>☒ 802.11n HT40: 2422MHz ~ 2452MHz<br>☐ 802.11a/n HT20: 5180MHz ~ 5240MHz / 5260 ~ 5320MHz<br>　　　　　　　　　　5500 ~ 5700MHz / 5745MHz ~ 5825MHz<br>　　802.11n HT40: 5190MHz ~ 5230MHz / 5270 ~ 5310MHZ<br>　　　　　　　　　5510 ~ 5670MHz / 5755MHz ~ 5795MHz<br>　　802.11ac VHT80: 5210MHz / 5290MHz / 5530MHz / 5775MHz<br>☐ Others |
| **Device category** | ☐ Portable (<20cm separation)<br>☒ Mobile (>20cm separation)<br>☐ Others |
| **Exposure classification** | ☐ Occupational/Controlled exposure (S = 5mW/cm$^2$)<br>☒ General Population/Uncontrolled exposure<br>　(S=1mW/cm$^2$) |
| **Antenna Specification** | PCB Antenna<br> 2.4GHz:　Directional Gain : 4.00 dBi　(Numeric gain: 2.51)　Worst |

| | | | |
|---|---|---|---|
| **Maximum Measurement Average Power** | 2.4GHz | | |
| | IEEE 802.11b Mode: | 21.45 dBm | (139.637 mW) |
| | IEEE 802.11g Mode: | 19.60 dBm | (91.201 mW) |
| | IEEE 802.11n HT 20 Mode: | 19.53 dBm | (89.743 mW) |
| | IEEE 802.11n HT 40 Mode: | 19.78 dBm | (95.060 mW) |

| | | | |
|---|---|---|---|
| **Maximum tune up power** | 2.4GHz | | |
| | IEEE 802.11b Mode: | 22.00 dBm | (158.489 mW) |
| | IEEE 802.11g Mode: | 20.50 dBm | (112.202 mW) |
| | IEEE 802.11n HT 20 Mode: | 20.50 dBm | (112.202 mW) |
| | IEEE 802.11n HT 40 Mode: | 20.50 dBm | (112.202 mW) |

| | |
|---|---|
| **Evaluation applied** | ☒ MPE Evaluation*<br>☐ SAR Evaluation<br>☐ N/A |

## 4.  TEST RESULTS

**No non-compliance noted.**

**<u>Calculation</u>**

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

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

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

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

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## 5. 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 / $cm^2$

### IEEE 802.11b mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|-----|-----------|--------|-------------|--------|------------------------------|----------------|
| 6 | 2437 | 158.489 | 2.51 | 20 | 0.0792 | 1 |

### IEEE 802.11g mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|-----|-----------|--------|-------------|--------|------------------------------|----------------|
| 6 | 2437 | 112.202 | 2.51 | 20 | 0.0560 | 1 |

### IEEE 802.11n HT20 mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|-----|-----------|--------|-------------|--------|------------------------------|----------------|
| 6 | 2437 | 112.202 | 2.51 | 20 | 0.0560 | 1 |

### IEEE 802.11n HT40 mode:

| Ch. | Frq.(MHz) | P (mW) | Gain (num.) | D (cm) | Power density in mW / $cm^2$ | Limit (mW/cm2) |
|-----|-----------|--------|-------------|--------|------------------------------|----------------|
| 6 | 2437 | 112.202 | 2.51 | 20 | 0.0560 | 1 |

**Remark:**
The WIFI function could not be trasmitted with WWAN simultaneously.

**--End of Report--**