

Honeywell Analytics Asia Pacific Co., Ltd.

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Wireless Certification Agency and Relevant National Officer

c.c.

UL Verification Services Inc. (formerly UL CCS)

Certification Division

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To whom it may concern:

Honeywell Analytics Asia Pacific Co., Ltd. is applying the wireless certificate of gas detector, whose product name is Sensepoint XRL. In this letter, I would like to explain the EMC test samples, part number format of Sensepoint XRL and the engineering rationale for EMC test sample.

Introduction to Sensepoint XRL



Sensepoint XRL is a single sensor fixed gas detector, which supports the following interfaces dependent on the model – Analogue output (4-20 mA), Digital output (Modbus RTU) and Mobile output (Bluetooth Low Energy). Sensepoint XRL is available for the detection of the following gases:

- Oxygen (O₂)
- Toxic gases (CO, H₂, H₂S, NO₂)
- Combustible gases

Hardware Configuration of Sensepoint XRL

Sensepoint XRL consists of two PCB Assembly (Main PCB and Power PCB) and each PCB assembly can be categorized as following:

NO	Gas Sensor Types	Possible interfaces	PCBs	
			Main PCB BOM Schematic	Power PCB BOM Schematic
1	Electro Chemical Cell (O2 and Toxic)	4-20 mA and Bluetooth	3017B0554 3017C0504	Toxic 3017B0555, O2 3017B0572 3017C0505
1-1	Electro Chemical Cell (O2 and Toxic)	Modbus and Bluetooth	3017B0554 3017C0504	Toxic 3017B0556, O2 3017B0573 3017C0506
2	Flammable Catalytic and Infrared	4-20 mA and Bluetooth	3017B0554 3017C0504	3017B0557 3017C0507
2-1	Flammable Catalytic and Infrared	Modbus and Bluetooth	3017B0554 3017C0504	3017B0558 3017C0508

Part Number Format of Sensepoint XRL

Sensepoint XRL has 14 digits part number to identify detail configuration. The following shows the detailed description of part number format per each digit:

	Name	Type	Gas	Bluetooth	Output	Relay	Color	Entry	Certification	Buffer1	Buffer2
Digit	3	1	2	1	2	NA	1	1	1	1	1

		EMC Concerns
Name:	1) SPL	NA (just product name)
Type:	1) I: Explosion-proof version	NA (metallic enclosure)
Gas:	1) O1: O2 2) C1: CO 3) H1: H2S (L) 4) H2: H2S (H) 5) G1: H2 6) N1: NO2 7) F6: CH4 (CAT) 8) FR: CH4 (IR)	Three difference sensors for EMC concern 1) Electro-chemical cell 2) Flammable catalytic sensor 3) Infrared sensor
Bluetooth:	1) B: Bluetooth	Bluetooth as a full load condition
Output:	1) A: mA 2) M: Modbus	Two different outputs for EMC
Relay:	X: No Relay	No relay
Color:	C: Charcoal Y: Yellow	NA (Enclosure color)
Entry:	N: ¾ NPT M: M20	NA

Certification:	N: General	NA
Buffer 1:	Z	NA
Buffer 2:	Z	NA

Part Number Example:

SPLIC1BAXCNNZZ:

Sensepoint XRL

- 1) Explosion-proof version
- 2) CO Gas
- 3) Bluetooth
- 4) mA Output
- 5) No Relay
- 6) Charcoal enclosure
- 7) NPT $\frac{3}{4}$ Entry
- 8) General certification

Rationale of EMC Test Sample

Based on the part number format of Sensepoint XRL, EMC concerns for each part number category is summarized in the above table. Gas sensors are important in EMC concerns as there are three different sensor types in Sensepoint XRL. The output option (mA or Modbus) is one of key difference because we have different PCB model for each mA and Modbus output.

Detail of gas sensor types:

1. Electro-chemical cell (ECC)

Basically, ECC is chemical type that reacts to the target gas. When ECC is exposed to the target gas, an oxidation-reduction reaction happens in ECC and finally ECC generates the current signal. This current signal is usually μA or nA , so this current signal is amplified in gas detector's PCB by proper resistance. In conclusion, ECC is chemical so ECC is not a source of EMC noise and/or is not affected by external EMC noise. In Sensepoint XRL, we have 6 kinds of ECC: O₂, CO, H₂S(L), H₂S(H), H₂ and NO₂. We will test O₂ and CO model because these two models are the most widely used in gas detector business.

2. Flammable catalytic sensor (FL-CAT)

There is a thin filament in FL-CAT sensor. The filament is burning very slightly in the normal ambient air by reacting with the catalytic surrounding the filament. When the flammable gas exist, the filament burns more which results in more voltage output from FL-CAT sensor. In Sensepoint XRL, we have only 1 type of FL-CAT sensor – this sensor is tested for EMC

3. Infrared sensor (IR sensor)

There is an Infrared signal source and receiver in IR sensor. When the target gas exists, the spectrum of infrared signal is changed so infrared signal receiver can monitor the difference of infrared spectrum. In Sensepoint XRL, we picked up IR sensor to be EMC tested.

Detail of output types:

Following two different outputs are considered significant to Sensepoint XRL's EMC test. Two different output types were EMC tested separately:

- 1) 4-20 mA: analogue output in current is proportional to the gas concentration
- 2) Modbus: digital signal for the industrial standard of Modbus

EMC Test Samples

As described in part number format of Sensepoint XRL, there are so many configuration in Sensepoint XRL. In terms of EMC test, there could be **16** models because of gas sensors (**8 sensors**) and output types (**2 output types**). Due to the limited resources, it is impossible to test all **16** models for EMC. Therefore, Honeywell Analytics has reviewed the design of Sensepoint XRL and picked below samples as a representative of EMC test sample:

- 1) SPLIC1BAXCMNZZ: CO gas/mA
- 2) SPLIF6BAXCMNZZ: CH4 (CAT)/mA
- 3) SPLIFRBAXCMNZZ: CH4 (IR)/mA
- 4) SPLIO1BMXCMNZZ: Oxygen /Modbus
- 5) SPLIF6BMXCMNZZ: CH4 (CAT)/Modbus
- 6) SPLIFRBMXCMNZZ: CH4 (IR)/Modbus

We believe these EMC test samples can cover the entire models of Sensepoint XRL.

Sincerely Yours,



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