LCIE SUD EST
Laboratoire de Moirans
Z.I. Centr'Alp
170, Rue de Chatagnon
38430 MOIRANS - FRANCE

GENERAL INFORMATION

FCCID: **OQMRSEFBOX**

1.1. Product description

Safety rules and general precautions

The **RS** system is considered as a control and a safety component ensuring an emergency stopping function under the terms of the European Machinery Directive. The following safety rules apply to installation and use of the RS system.

- For maximum safety when using the system, the instructions given in this manual must be strictly observed.
- RS system operators must be appropriately trained and authorised to use the product.
- RS system operators must have uninterrupted visibility at all times when performing manoeuvres.
- Where several systems are implemented on a single site, different radio frequencies must be used. These should be spaced by at least 2 channels (for example, channels 5, 7, 9, ...) or by 5 channels when several systems are operating within a radius of 10 meters.
  Please contact us for the case of dense installations.
- It is not advisable to install the safety transmitter **RSEF** and safety receiver **RSRG** in the same cabinet to prevent disruption of the receiver. If you need to install these two elements in the vicinity, please contact us.
- In the event of a malfunction, the installation should be immediately shut down by pressing any emergency stop pushbutton and particulary that connected to the safety transmitter **RSEF**.
- If an **enabling handle** is used for the application, this device must comply with the requirements of EN 60947-5-5:2016, EN ISO12100 and EN 60204-1:2016 standards.
- All **emergency stop pushbuttons** used for the application, must comply with the requirements of EN 60947-5-5:2016 and EN 60204-1:2016 standards
  - **if the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired**

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1.2. Tested System Details

Power supply:

Name	Type	Rating	Reference / Sn	Comments
Supply1	DC	24VDC	/	/

NC: Not communicated by provider

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Comments
Supply1	2 Wires Industrial connector	3	No	No	/
Access1	Industrial connector16C:Power supply - 4 dry Contacts - 4Inputs-2 outputs- RS232-Earth	1.8	No	No	/
Access2	2 RF outputs - N connector	/	No	Yes	/

NC: Not communicated by provider

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
Laptop LENOVO	L460	/	/
Boitier Jaune	/	/	Emergency stop- RS232 access -2 inputs - 2 Light Indicators

NC: Not communicated by provider

Equipment information (declaration of provider):

Chipset / RF Module	SX1280 Semtech
Frequency band:	[2400 – 2483.5] MHz
Spectrum Modulation:	DSSS (Tested like it – international agreements)
Number of Channel:	64
Spacing channel:	1.25MHz
Channel bandwidth:	1MHz
Antenna Type:	External with connector
Antenna connector:	Permanent external
Transmit chains:	2*
Receiver chains	0 - transmitter only

* :An internal switch of the antennas allows for sequential transmission on one and then the other, never both simultaneously.

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Chan.	Freq. (MHz)
01	2402.00
02	2403.25
03	2404.50
04	2405.75
05	2407.00
06	2408.25
07	2409.50
08	2410.75
09	2412.00
10	2413.25
11	2414.50
12	2415.75
13	2417.00
14	2418.25
15	2419.50
16	2420.75
17	2422.00
18	2423.25
19	2424.50
20	2425.75
21	2427.00
22	2428.25
23	2429.50
24	2430.75
25	2432.00
26	2433.25
27	2434.50
28	2435.75
29	2437.00
30	2438.25
31	2439.50
32	2440.75

Chan.	Freq. (MHz)
33	2442.00
34	2443.25
35	2444.50
36	2445.75
37	2447.00
38	2448.25
39	2449.50
40	2450.75
41	2452.00
42	2453.25
43	2454.50
44	2455.75
45	2457.00
46	2458.25
47	2459.50
48	2460.75
49	2462.00
50	2463.25
51	2464.50
52	2465.75
53	2467.00
54	2468.25
55	2469.50
56	2470.75
57	2472.00
58	2473.25
59	2474.50
60	2475.75
61	2477.00
62	2478.25
63	2479.50
64	2480.75

Cmin = Canal 01
Cmid = Canal 32
Cmax = canal 64

DATA RATE			
Available	**Data Rate (Mbps)**	**Modulation Type**	**Worst Case Modulation**
☑	8 Kb/s	Proprietary spread spectrum modulation that is similar to an derivative of chirp spread spectrum (CSS) modulation.(LoRa)	☑

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Antenna Characteristic			
Antenna reference	Gain (dBi)	Frequency Band (	Impedance(Ω)
Solwise MNT-2409N	9	2.4 – 2.5GHz ISM Band	50
Pasternack PE51OM1026	8	2.4 – 2.5GHz	50
Amphenol CXL 2400-3LW/m	5.2	2.4 – 2.6GHz	50

Hardware information				
Highest internal frequency (PLL, Quartz, Clock, Microprocessor…):		**$F_{Highest}$:**	**52**	**MHz**
Firmware (if applicable):		**V:**	15	
Software (if applicable):		**V:**	/	
Equipment intended:	Fixed			
Type of equipment:	Stand-alone			
Equipment sample:	Production model			
Duty cycle:	Continuous duty			
Operating temperature range:	T_{min}:	-20 °C		
	T_{nom}:	20°C		
	T_{max}:	+45 °C		
Operating voltage:	V_{nom}:	24VDC		

NC: Not communicated by provider

1.3. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 or/and ANSI C63.10, FCC Part 15 SubPart 15B and 15C.
Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.4. Test facility

Tests have been performed: **March 05, 2024 to March 21, 2024**

This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4 or/and ANSI C63.10.
This test facility has also been accredited by COFRAC (French accreditation authority for European Union test lab accreditation organization) according to NF EN ISO/IEC 17025, as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and EN55032/CISPR32 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.