RADIOSAFE (RS) series

Wireless safety logic signal transmission system

Transmitter **RSEF** / Receiver **RSRD** (HOUSING VERSION ONLY)



Installation and user manual







DRAFT R revision5

Page 1 / 44

TABLE OF CONTENTS

1	Sa	fety rules and general precautions	4
2	lde	entification of components	5
3	Pr	oduct operating principle	6
4	Cł	neck of functions, initial startup	7
	4.1	Parameters on delivery « ex-FACTORY »	.7
	4.2	Preliminary steps before installation	8
	42	1 Safety transmitter RSEF : terminal strip and test wiring diagram	8
	4.2.	2 Transmitter test wiring (does not take account of application)	. 8
	4.2.	3 Safety receiver RSRD : terminal strip and test wiring diagram	10
	4.2.	4 Assignment of inputs connected to transmitter RSEF and static outputs of receiver RSRD :	11
	4.2.	5 Power supply of outputs	11
	4.2. 4.2.	7 System test before installation	11
F	54	difuing the preduct configuration 4	2
ວ	IVIC	Dairying the product configuration1	3
	5.1	Transmitter RSEF1	13
	5.1.	1 General process	13
	5.1.	2 Configuring the radio transmit frequency	14 14
	5.1.	4 Radio channel programming table for 911-918MHz range	14
	5.1.	5 Configuring the check function for inputs E1 to E10 on power up	16
	5.1.	6 Configuring the restart mode of transmitter RSEF	17
	5.2	Receiver RSRD 1	18
	5.2.	1 General process	18
	5.2.	2 Safety delay	18
_	۱۸/:		
6	VV	iring the components1	9
6	vv 6.1	iring the components1 Wiring the transmitter RSEF 1	9 19
6	6.1	iring the components 1 Wiring the transmitter RSEF 1 Typical wiring diagram. 1	9 19 19
6	6.1 6.1. 6.1.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram 2 Example connection of a safety light curtain on transmitter safety input	9 19 19
6	6.1 6.1. 6.1. 6.1.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example).	9 19 19 19
6	6.1 6.1. 6.1. 6.1. 6.2	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram 2 Example connection of a safety light curtain on transmitter safety input 3 Example with static inputs (PLC for example) Wiring the receiver RSRD 2	9 19 19 19 19 20
6	6.1 6.1. 6.1. 6.1. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory.	9 19 19 19 20 20 20
6	6.1 6.1. 6.1. 6.1. 6.2 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used	 9 19 19 19 19 20 21 21 21 21 22 21 22 21 22 21 22 21 21 21 21 21 21 22 21 22 21 21
6	6.1 6.1. 6.1. 6.2. 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used. 4 Operation of safety relays RS1-RS2 of receiver RSRD	 9 19 19 19 19 20 20 20 20 20 21
6	6.1 6.1. 6.1. 6.2 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used. 4 Operation of safety relays RS1-RS2 of receiver RSRD 5 Monitoring of main contactors.	 9 19 19 19 20 20 20 20 21 21
6	6.1 6.1. 6.1. 6.2. 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used. 4 Operation of safety relays RS1-RS2 of receiver RSRD 5 Monitoring of main contactors. 6 Enabling handle : Wiring and operating mode	 9 19 19 19 19 20 20 20 20 21 <l< th=""></l<>
6	6.1 6.1. 6.1. 6.2. 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used. 4 Operation of safety relays RS1-RS2 of receiver RSRD. 5 Monitoring of main contactors. 6 Enabling handle : Wiring and operating mode. 7 Typical wiring diagram for receiver RSRD.	9 19 19 19 19 20 20 20 20 21 21 21 21 22
6	6.1 6.1. 6.1. 6.2. 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). 3 Wiring the receiver RSRD 1 Multi-strand wires: use of wire end ferrules is mandatory 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used. 4 Operation of safety relays RS1-RS2 of receiver RSRD 5 Monitoring of main contactors. 6 Enabling handle : Wiring and operating mode. 7 Typical wiring diagram for receiver RSRD 8 Example with wired emergency stop palmswitch. 9 Fxample with wired enabling handle	 9 19 19 19 19 20 20 20 20 21 21 21 22 23
6	6.1 6.1. 6.1. 6.2. 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 1 2 Example connection of a safety light curtain on transmitter safety input. 1 3 Example with static inputs (PLC for example). 1 Wiring the receiver RSRD 1 1 Multi-strand wires: use of wire end ferrules is mandatory. 1 2 Conductor wire sections to be observed. 1 3 USA/Canada specifications for installation and conductor wires to be used. 1 4 Operation of safety relays RS1-RS2 of receiver RSRD. 1 5 Monitoring of main contactors. 1 6 Enabling handle : Wiring and operating mode. 1 7 Typical wiring diagram for receiver RSRD. 1 8 Example with wired emergency stop palmswitch. 1 9 Example with wired enabling handle	 9 19 19 19 19 19 20 20 20 21 21 22 23 23 23
6	6.1 6.1. 6.1. 6.2. 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). 3 Example with static inputs (PLC for example). 4 Multi-strand wires: use of wire end ferrules is mandatory. 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used. 4 Operation of safety relays RS1-RS2 of receiver RSRD. 5 Monitoring of main contactors. 6 Enabling handle : Wiring and operating mode. 7 Typical wiring diagram for receiver RSRD. 8 Example with wired emergency stop palmswitch. 9 Example with ontactor monitoring function 10 Example with contactor monitoring function	 9 19 19 19 19 20 20 21 21 22 23 24
6 7	6.1 6.1. 6.1. 6.2 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 1 2 Example connection of a safety light curtain on transmitter safety input. 1 3 Example connection of a safety light curtain on transmitter safety input. 1 3 Example with static inputs (PLC for example). 2 Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 2 Conductor wire sections to be observed. 2 3 USA/Canada specifications for installation and conductor wires to be used. 2 4 Operation of safety relays RS1-RS2 of receiver RSRD 2 5 Monitoring of main contactors. 3 6 Enabling handle : Wiring and operating mode. 3 7 Typical wiring diagram for receiver RSRD 3 8 Example with wired emergency stop palmswitch. 3 9 Example with wired enabling handle. 3 10 Example with contactor monitoring function. 3 11 Wiring an indicator light column. 3	9 19 19 19 19 19 20 20 20 20 20 20 21 21 22 23 23 24 25
6 7	6.1 6.1. 6.1. 6.2. 6.2. 6.2. 6.2. 6.2. 6.2.	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 1 2 Example connection of a safety light curtain on transmitter safety input. 1 3 Example connection of a safety light curtain on transmitter safety input. 1 3 Example with static inputs (PLC for example). 2 Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 2 Conductor wire sections to be observed. 2 3 USA/Canada specifications for installation and conductor wires to be used. 2 4 Operation of safety relays RS1-RS2 of receiver RSRD 2 5 Monitoring of main contactors. 3 6 Enabling handle : Wiring and operating mode. 3 7 Typical wiring diagram for receiver RSRD 3 8 Example with wired emergency stop palmswitch. 3 9 Example with contactor monitoring function 3 10 Example with contactor monitoring function 3 11 Wiring an indicator light column 3 12 General information <th>9 19 19 19 19 20 20 21 21 22 23 24 25 25</th>	9 19 19 19 19 20 20 21 21 22 23 24 25 25
6 7	 6.1 6.1. 6.1. 6.2. 7.1 7.2 	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 2 Conductor wire sections to be observed. 2 3 USA/Canada specifications for installation and conductor wires to be used. 2 4 Operation of safety relays RS1-RS2 of receiver RSRD. 3 5 Monitoring of main contactors. 5 6 Enabling handle : Wiring and operating mode. 7 7 Typical wiring diagram for receiver RSRD. 3 8 Example with wired emergency stop palmswitch. 3 9 Example with wired enabling handle. 3 10 Example with contactor monitoring function. 3 11 Wiring an indicator light column. 3 12 General information 3 13 Example with contactor monitoring function. 3 14 Wiring an indica	9 19 19 19 19 20 20 21 21 22 23 24 25 25 25
6 7	 VVI 6.1 6.1. 6.2 6.2. 7.1 7.2 7.3 	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 Conductor wire sections to be observed. 3 USA/Canada specifications for installation and conductor wires to be used. 4 Operation of safety relays RS1-RS2 of receiver RSRD. 5 Monitoring of main contactors. 6 Enabling handle : Wiring and operating mode. 7 Typical wiring diagram for receiver RSRD. 8 Example with wired emapling handle. 10 Example with wired enabling handle. 10 Example with contactor monitoring function. 11 Wiring an indicator light column. 5 for safe installation and commissioning. 2 General information 2 Transmitter RSEF. 2 Receiver RSRD	9 19 19 19 19 20 20 21 22 23 24 25 25 25 25 25 25 25 25 25 25
7	 VVI 6.1 6.1 6.2 7.1 7.2 7.3 7.4 	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 1 2 Example connection of a safety light curtain on transmitter safety input. 1 3 Example with static inputs (PLC for example). 2 Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 2 Conductor wire sections to be observed. 2 3 USA/Canada specifications for installation and conductor wires to be used. 2 4 Operation of safety relays RS1-RS2 of receiver RSRD. 2 5 Monitoring of main contactors. 2 6 Enabling handle : Wiring and operating mode. 2 7 Typical wiring diagram for receiver RSRD. 2 8 Example with wired enabling handle. 2 9 Example with wired enabling handle. 2 10 Example with contactor monitoring function 2 11 Wiring an indicator light column 2 5 for safe installation and commissioning. 2 11 Wiring an indicator light column 2 <	9 19 19 19 19 20 20 21 21 22 23 24 25 25 26 26 26 27 26 27 27 27 27 27 27 27 27 27 27
6 7 8	 VVI 6.1 6.1. 6.2 6.2. 7.1 7.2 7.3 7.4 	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 2 Conductor wire sections to be observed. 3 3 USA/Canada specifications for installation and conductor wires to be used. 3 4 Operation of safety relays RS1-RS2 of receiver RSRD 2 5 Monitoring of main contactors. 5 6 Enabling handle : Wiring and operating mode 7 7 Typical wiring diagram for receiver RSRD 2 8 Example with wired emergency stop palmswitch. 2 9 Example with wired enabling handle. 2 10 Example with wired enabling function 2 11 Wiring an indicator light column 2 12 General information 2 13 Example with wired enabling function 2 14 Wiring an indicator light column </th <th>9 19 19 19 19 20 20 21 21 22 23 24 25 25 26 27 26 27 27 27 27 27 27 27 27 27 27</th>	9 19 19 19 19 20 20 21 21 22 23 24 25 25 26 27 26 27 27 27 27 27 27 27 27 27 27
6 7 8	 VVI 6.1 6.1. 6.2 6.2. 7.1 7.2 7.3 7.4 Of 	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 2 Conductor wire sections to be observed. 3 3 USA/Canada specifications for installation and conductor wires to be used. 4 4 Operation of safety relays RS1-RS2 of receiver RSRD 5 5 Monitoring of main contactors. 6 6 Enabling handle : Wiring and operating mode. 7 7 Typical wiring diagram for receiver RSRD. 6 8 Example with wired emergency stop palmswitch. 9 9 Example with wired enabling handle. 10 10 Example with contactor monitoring function 11 11 Wiring an indicator light column 10 12 General information 2 13 Example with wired enabling function 2 14 Wiring an indicator lig	9 19 19 19 20 20 21 22 23 24 25 25 26 27 2
6 7 8	 VVI 6.1 6.1. 6.2 6.2. 7.1 7.2 7.3 7.4 Or 8.1 	iring the components 1 Wiring the transmitter RSEF 1 1 Typical wiring diagram. 2 Example connection of a safety light curtain on transmitter safety input. 3 Example with static inputs (PLC for example). Wiring the receiver RSRD 2 1 Multi-strand wires: use of wire end ferrules is mandatory. 2 2 Conductor wire sections to be observed. 2 3 USA/Canada specifications for installation and conductor wires to be used. 3 4 Operation of safety relays RS1-RS2 of receiver RSRD. 2 5 Monitoring of main contactors. 3 6 Enabling handle : Wiring and operating mode. 3 7 Typical wiring diagram for receiver RSRD. 3 8 Example with wired emergency stop palmswitch. 3 9 Example with wired enabling handle. 3 10 Example with contactor monitoring function. 3 11 Wiring an indicator light column. 3 structions for safe installation and commissioning. 2 General information 3 3 Transmitter RSEF 3	9 19 19 19 20 20 20 20 20 20 20 20 20 20 20 20 20



9	Ante	ennas	. 28
9	.1 43	33-434MHZ bands	28
9	.2 9 [,]	11-918MHz bands	29
10	Diag	nosis	. 30
1	0.1	Transmitter RSEF : Messages given by indicator lights V1 and V2	30
1	0.2	Receiver RSRD : Error messages	31
11	Serv	ricing	. 32
12	MAI		.32
1	2.1	Replacement of a transmitter RSEF	32
1	2.2	Inspection and servicing of the receiver RSRD	33
13	War	ranty	.34
	500		
14	FCC	Rules & Regulations (Federal Communications Commission)	.35
15	IC R	egulations (Industry Canada)	.36
16	App	endices	. 37
1	6.1	Component dimensions (mm)	37
1	6.2	Technical characteristics	38
	16.2.1	Transmitter RSEF	38
	16.2.2	Receiver RSRD	39
1	6.3	Environmental data	40
1	6.4	Safety related parameters	40
	16.4.1 16.4.2	Characteristic data according to IEC 61508-1 till -7 and IEC 62061:2005 Characteristic data according to EN ISO 13849-1:2015	40 41
1	6.5	RSEF Transmitter case thermal capability	42
1	6.6	Residual risks	42
1	6.7	Forseeable misuse	42
1	6.8	Waste recycling and management	42
1	6.9	Products references	42
1	6.10	Warning, avoid any mutual disturbance	42
1	6.11	Countries limitation of the use	42
1	6.12	Manufacturer information	42
17	Decl	aration of conformity	.43



1 Safety rules and general precautions

The **RADIOSAFE (RS)** "wireless safety logic signal transmission 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 Radiosafe (RS) system.

- For maximum safety when using the system, the instructions given in this manual must be strictly observed.
- Radiosafe (RS) system operators must be appropriately trained and authorised to use the product.
- Radiosafe (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 **RSRD** in the same cabinet to prevent disruption of the receiver. If 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 palmswitch 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 60947-5-1:2004/A1:2009, EN ISO12100 and EN 60204-1:2016 standards.
- All **emergency stop plamswitches** used for the application, must comply with the requirements of EN 60947-5-1:2004/A1:2009 and EN 60204-1:2016 standards

The product described in this manual is designed to satisfy the requirements of Machinery Directive 2006/42/EC based on application of the following standards :

- EN ISO 13849-1:2015 for performance level PLe (Category 4)
- IEC 62061:2005+AC:2010 + A1:2013+A2:2015 for SIL 3



2 Identification of components

The "RADIOSAFE (RS) « Wireless safety logic signal transmission system » comprises the following components:

- > A safety transmitter ref. : **RSEF** (Fig.1), supplied with :
 - A SIM card (already installed in the transmitter)
 - A ¼ wave antenna, ref. : VUA00xx
 - o A BNC elbow, ref. : VUB060
 - A 50 cm antenna extender, ref. : VUB170
 - o An installation and user manual (on USB stick)



> A safety receiver, Housing version (Fig.2) ref. RSRDxxxx-0

- o supplied with :
 - A ¼ wave antenna, ref. : VUA00xx
 - A BNC elbow, ref. : VUB060
 - A 50 cm antenna extender, ref. : VUB170





3 Product operating principle

The RADIOSAFE (RS) « Wireless safety logic signal transmission system» is used to transmit logic safety signals from one point of an installation to another.

The transmitter **RSEF** is designed to radio-transmit the following signals to the receiver **RSRD** :

- An emergency stop signal in the event of a problem occurring in the installation
- Up to 10 command signals

The receiver **RSRD** is integrated in the control component of the machine ; it enables (or not) operation of the machine and transmits the possible commands assigned to the buttons connected to the transmitter **RSEF**.

The receiver **RSRD** stops operation of the machine when any of the following conditions are present :

Case 1: Deactivation of a safety input (for example : contact on a gate or an emergency stop) connected to the transmitter **RSEF**

 \rightarrow Safety interlock subsequent to stop request.

- Case 2: Action on emergency stop device wired to receiver **RSRD**. → Safety interlock subsequent to stop request.
- Case 3: Interruption of radio link during use When the system is in use, the transmitter **RSEF** has a continuous radio link with the receiver **RSRD**. Should this link be interrupted for more than the passive stop time, the receiver automatically triggers stopping of the installation.
 → Safety interlock prior to loss of control of stopping function.
- Case 4: Detection of a malfunction (see section : « Faults communicated by receiver »)

Schematic diagram :



*= emergency stop plamswitch must comply with the requirements of EN 60947-5-1:2004/A1:2009 and EN 60204-1:2016 standards



4 Check of functions, initial startup

This section details the procedure for familiarisation with the product. It will allow you to test operation of the equipment in its « ex-factory » configuration.

4.1 Parameters on delivery « ex-FACTORY »

Transmitter RSEF

Radio channel number	: No. 64 (434,675Mhz) or (918,2Mhz)
Radio transmit power level	: According to model of transmitter RSEF
Self check of inputs E1 to E10 on power up	: Yes
Transmitter restart mode	: Manual restart

Receiver RSRD

Safety delay ⁽¹⁾	:	0s
Passive stop time ⁽²⁾	:	1s

(1) Safety delay can be configured between 0 to 10s (set by step of 1s) with dedicated software*.

(2) Passive stop time can be configured between 0.3 to 1.5s with dedicated software*. IMPORTANT: According to Machinery directive section 4.1.1(EN ISO 13850:2015), this time delay must be determined by the risk assessment of the machine (see also CEI 60204-1 :2005, 9.2.5.4.2).

Notes :

The SIM card (in the transmitter) contains the complete configuration of the system :

- system operating frequency,
- Identity code of pair formed by transmitter RSEF + receiver RSRD,

In the event of a transmitter failure, the SIM card can be used in a backup transmitter.

To modify the basic parameters, refer to section 5.

* The dedicated programming software is available on JAY Electronique website. The use of the programming software is protected by a password, this password is only delivered to a skilled person "level 2" (a person who was trained by JAY Electronique, and who is authorized to modify RSRD receiver parameters).



4.2 **Preliminary steps before installation**

Once you have inserted the SIM card in the transmitter **RSEF**, proceed as follows to perform a quick test on the components before final installation.

4 5 Terminal Function Terminal Function 1 a a a 888 V- Inputs V- E.S. 16 1 V- E.S. 11 12 13 14 2 7 8 9 10 On / Restart V+ E.S 3 17 *** button input Δ V+ RSEF Input No.9 5 V- RSEF 18 Input No.7 RADIOSAFE 6 V- RSEF 19 RSEF 7 E.S. contact 1 20 Input No.5 **V**1 **V**3 Input No.3 8 21 E.S. contact 2 **V**2 000 9 22 E.S. mode V+ E.S. Input No.1 000 V- Input 10 23 Ind. light V2 0000 11 24 Input No.10 output 비리님 Ind. light V1 12 25 électronique Input No.8 output 13 Not used 26 Input No.6 EES 14 27 Input No.4 Not used *** (XXXXXX) V- Inputs 15 28 Input No.2 15 16 17 18 19 20 21 22 Ind. light Function 27 V1 (GREEN) "On", "Radio transmission", "Diagnostic" (RED) "Diagnostic" (ORANGE) "Power supply" V2 V3

4.2.1 Safety transmitter **RSEF** : terminal strip and test wiring diagram

4.2.2 Transmitter test wiring (does not take account of application)

this wiring is intended to test :

- a command input - and the « emergency stop » safety input :



• Step 1 Prepare a stabilized power supply, 24VDC (+/- 5 %) 500 mA minimum

- Step 2 Wire the transmitter as follows :
 - Connect the +24VDC of the stabilized power supply to terminals 3 and 4
 - Connect the ground of the power supply to the 3 terminals 1 and 5 and 15 (ground ref. of inputs)
 - Connect an NC double contact emergency stop button to terminals 7, 8, 9 and 10.
 - Connect an NO button "Restart" across the +24VDC and terminal No. 17.
 - Connect an NO button simulating an input across the +24VDC and terminal No. 22 (E1).
 - Possibly, indicator lights giving the same indication as indicator lights V1 and V2 of the transmitter may be connected to terminals 11 (V2) and 12 (V1) and 0V.
- Step 3 Supply the transmitter.



- Step 4 Activate the safety input (unlock Emergency stop).
- Step 5 Press on the Restart pushbutton. Indicator light V3 of the transmitter should come on steady, indicator light V1 should flash regularly (radio transmission) and indicator light V2 should be off; if this indicator light flashes, there is an error: refer to the error message table.
- Step 6 Switch off the supply to the transmitter. Proceed as instructed in the following pages to wire the safety receiver RSRD.



4.2.3 Safety receiver **RSRD**: terminal strip and test wiring diagram



RS1&RS2	Safety relays		
1	Red indicator light: status of safety relays RS1 and RS2		
2 Antenna BNC / antenna extension connector			
3	Radio module		
LD1	Yellow indicator light : Transceiver power supply OK		
LD2	Red indicator light: status of safety relays RS1 and RS2		
LD3	Green indicator light : Radio reception + Diagnostics		

J2 Terminal block : Safety Inputs and power supply					
Terminal Function					
12	Input for Enghling Handle Detection				
11	Input for Errabiling Flandle Detection				
10 Insult 2 for Enghling Llondlo					
09	Input 2 for Enabling Flandle				
08	Input 1 for Epobling Handle				
07					
06	Input 2 for omorgonou stop or sofety light curtain				
05	input 2 for entergency stop of safety light curtain				
04	Insuit 1 for amorganou atop or activitizat ourtain				
03	input i for energency stop of safety light curtain				
02 V- (GND)					
01 V+ 24VDC					

J1 Terminal block : Safety outputs					
Terminal	Function				
Y1	1st safety output (NO contact)				
Z3	TSI Salety bulput (NO contact)				
Y2	and safety output (NO contact)				
Z2					
Y3	and safety output (NO contact)				
Z1					

SW3/SW2 : Output power supply selection				
0 ← → 1	Position "1" : Output power supply connected on receiver RSRD 24VDC and GND (default)			
	Position "0" : Output power supply connected on external V+ and V-			

SW1 : Functioning mode							
1	Position "1" : Receiving mode (default)						
0	Position "0" : Programming mode						

J3 Terminal block : Communication, Static outputs and Indicators						
Function Terminals				Function		
RXD RS232*	1		2	not used / not connected		
TXD RS232*	3		4	Configuration INPUT*		
GND*	5		6	Configuration GND*		
Error message (red indicator light) +	7		8	Error message (red indicator light) -		
Radio reception status (orange indicator light) +	9		10	Radio reception status (orange indicator light) -		
Machine operating status (green indic. light) +	11		12	Machine operating status (green indic. light) -		
Input for main contactor monitoring function	13		14	Input for main contactor monitoring function		
Power supply of outputs V+	15		16	Power supply of outputs V-		
Output nb.1	17		18	Output nb.2		
Output nb.3	19		20	Output nb.4		

*(used with a dedicated software)



DRAFT R revision5

4.2.4 Assignment of inputs connected to transmitter **RSEF** and static outputs of receiver **RSRD** :

Receiver RSRD with assignment of « standard » outputs

		Assignment of outputs of receiver RSRD (terminal No.) 17 18 19 20			
Inputs of	E1	Х			
transmitter	E2		Х		
DEEE	E3			X	
RJEF	E4				Х

4.2.5 **Power supply of outputs**

There are two operating modes for outputs voltage 1-4. Isolated from the main supply voltage (isolated mode) or linked to the main supply voltage (non-isolated mode). In both cases, the maximum output current is 100mA per output.

Isolated mode:

SW3 and **SW2** must be in position "**0**" A continued supply voltage must be applied between points 15-16 of J3. This supply voltage must be between 5-30VDC. (input 15: V+ and input16 : V-) Insulation voltage : > 4400 VRMS.

Not isolated mode :

SW3 and **SW2** must be in position "1". Terminal points 15-16 of J3 must be unconnected. Power supply of the ouputs is the supply voltage of the receiver RSRD.

4.2.6 Receiver test wiring (does not take account of application)

This wiring is aimed at testing a command output and an « emergency stop » safety input :



• Step 4 Switch off the receiver. Perform the system test as detailed in the next section.



4.2.7 System test before installation

- Step A Supply the transmitter RSEF and the receiver RSRD The receiver RSRD should be ready to receive the transmitter RSEF frame and the indicator light LD1 comes on steady. The indicator light V3 on the transmitter RSEF comes on steady
- Step B Activate the safety input (unlock Emergency stop) on the transmitter RSEF The transmitter RSEF should be ready to transmit and its green indicator light V1 should come on steady.
- Step C On the safety transmitter RSEF: Press on the restart pushbutton (If the transmitter is in « manual » restart mode). The indicator light V2 should blink. On the receiver RSRD: The safety relays (RS1 and RS2) should engage.

The two indicator lights LD2 and LD3 should come on steady.

• Step D Press the emergency stop palmswitch connected to the transmitter RSEF The receiver RSRD safety relays should immediately deactivate.



5 Modifying the product configuration

5.1 Transmitter RSEF

5.1.1 General process

The various settings on the transmitter **RSEF** are made using a **DIP switch** and a validation button located inside the transmitter.



Remove the front panel to access these components:





DRAFT R revision5

5.1.2 Configuring the radio transmit frequency

To limit accidental cut-outs due to radio interference, it is important to choose an available radio channel (frequency). This choice is governed by the following principles:

- The receiver point of installation must be considered as the centre of the radio link,
- Estimate the maximum distance « D max » which there may be between the transmitter and the receiver,
- \blacktriangleright Identify the frequencies used for all the radio transmitters located within a radius of 2xD max.
- Chose a frequency which is as far as possible from those used by the nearest transmitters and which is not used by the transmitters identified.

The procedure described below is used to modify the radio channel of the transmitter **RSEF** and receiver **RSRD**. The receiver must be supplied throughout the channel modification procedure in order to receive the radio channel change command from the transmitter **RSEF**.

- **1-** Deactivate the safety input of the transmitter **RSEF** (1)
- 2- Select the new radio channel using micro-switches 1 to 6 (see correspondence table below)
- 3- Activate the safety input of the transmitter RSEF (2)
- The 2 indicator lights V1-V2 flash to indicate the new radio channel being programmed : Indicator light V1 (GREEN) indicates the units (0 = off steady, 1 = 1 flash, 2 = 2 flashes, etc...) Indicator light V2 (RED) indicates the tens (0 = off, 10 = 1 flash, 20 = 2 flashes, etc...) Example :



- 5- Once you have chosen the radio channel, press the validation button BPV
- 6- The two indicator lights, V1 and V2, flash simultaneously and the transmitter sends the receiver **RSRD** the radio channel change command (this action takes around 20 s., then indicator lights V1 and V2 go off).

Note : If the **validation** button **BPV** has not been pressed, you can cancel the frequency change by repositioning the micro-switches 1 to 6 to the initial radio channel code.

- 7- To exit the radio frequency setting modes, activate, then deactivate the safety input (1)(2).
- 8- If the transmitter is in « manual » restart mode, press the restart button wired to input 17

(1) If an emergency stop palmswitch is wired on this input, the component must be locked.

(2) If an emergency stop palmswitch is wired on this input, the component must be unlocked.

Note :

If the other setting has also been modified during this procedure (as "input check" or "restart mode"), each modified setting have to be performed one by one.

5.1.3 Radio channel programming table for 433-434MHz range

Note : For the « extended range » version, only channels 40 to 64 are accessible.

C 1	Frea.	Micro-switch position							
Chan.	(MHz)	1	2	3	4	5	6		
01	433,100	OFF	OFF	OFF	OFF	OFF	OFF		
02	433,125	ON	OFF	OFF	OFF	OFF	OFF		
03	433,150	OFF	ON	OFF	OFF	OFF	OFF		
04	433,175	ON	ON	OFF	OFF	OFF	OFF		
05	433,200	OFF	OFF	ON	OFF	OFF	OFF		
06	433,225	ON	OFF	ON	OFF	OFF	OFF		
07	433,250	OFF	ON	ON	OFF	OFF	OFF		
08	433,275	ON	ON	ON	OFF	OFF	OFF		
09	433,300	OFF	OFF	OFF	ON	OFF	OFF		
10	433,325	ON	OFF	OFF	ON	OFF	OFF		
11	433,350	OFF	ON	OFF	ON	OFF	OFF		
12	433,375	ON	ON	OFF	ON	OFF	OFF		
13	433,400	OFF	OFF	ON	ON	OFF	OFF		
14	433,425	ON	OFF	ON	ON	OFF	OFF		
15	433,450	OFF	ON	ON	ON	OFF	OFF		
16	433,475	ON	ON	ON	ON	OFF	OFF		
17	433,500	OFF	OFF	OFF	OFF	ON	OFF		
18	433,525	ON	OFF	OFF	OFF	ON	OFF		
19	433,550	OFF	ON	OFF	OFF	ON	OFF		
20	433,575	ON	ON	OFF	OFF	ON	OFF		
21	433,600	OFF	OFF	ON	OFF	ON	OFF		
22	433,625	ON	OFF	ON	OFF	ON	OFF		
23	433,650	OFF	ON	ON	OFF	ON	OFF		
24	433,675	ON	ON	ON	OFF	ON	OFF		
25	433,700	OFF	OFF	OFF	ON	ON	OFF		
26	433,725	ON	OFF	OFF	ON	ON	OFF		
27	433,750	OFF	ON	OFF	ON	ON	OFF		
28	433,775	ON	ON	OFF	ON	ON	OFF		
29	433,800	OFF	OFF	ON	ON	ON	OFF		
30	433,825	ON	OFF	ON	ON	ON	OFF		
31	433,850	OFF	ON	ON	ON	ON	OFF		
32	433,875	ON	ON	ON	ON	ON	OFF		

Chan	Freq.	Micro-switch position					
Chan.	(MHz)	1	2	3	4	5	6
33	433,900	OFF	OFF	OFF	OFF	OFF	ON
34	433,925	ON	OFF	OFF	OFF	OFF	ON
35	433,950	OFF	ON	OFF	OFF	OFF	ON
36	433,975	ON	ON	OFF	OFF	OFF	ON
37	434,000	OFF	OFF	ON	OFF	OFF	ON
38	434,025	ON	OFF	ON	OFF	OFF	ON
39	434,050	OFF	ON	ON	OFF	OFF	ON
40	434,075	ON	ON	ON	OFF	OFF	ON
41	434,100	OFF	OFF	OFF	ON	OFF	ON
42	434,125	ON	OFF	OFF	ON	OFF	ON
43	434,150	OFF	ON	OFF	ON	OFF	ON
44	434,175	ON	ON	OFF	ON	OFF	ON
45	434,200	OFF	OFF	ON	ON	OFF	ON
46	434,225	ON	OFF	ON	ON	OFF	ON
47	434,250	OFF	ON	ON	ON	OFF	ON
48	434,275	ON	ON	ON	ON	OFF	ON
49	434,300	OFF	OFF	OFF	OFF	ON	ON
50	434,325	ON	OFF	OFF	OFF	ON	ON
51	434,350	OFF	ON	OFF	OFF	ON	ON
52	434,375	ON	ON	OFF	OFF	ON	ON
53	434,400	OFF	OFF	ON	OFF	ON	ON
54	434,425	ON	OFF	ON	OFF	ON	ON
55	434,450	OFF	ON	ON	OFF	ON	ON
56	434,475	ON	ON	ON	OFF	ON	ON
57	434,500	OFF	OFF	OFF	ON	ON	ON
58	434,525	ON	OFF	OFF	ON	ON	ON
59	434,550	OFF	ON	OFF	ON	ON	ON
60	434,575	ON	ON	OFF	ON	ON	ON
61	434,600	OFF	OFF	ON	ON	ON	ON
62	434,625	ON	OFF	ON	ON	ON	ON
63	434,650	OFF	ON	ON	ON	ON	ON
64	434,675	ON	ON	ON	ON	ON	ON



5.1.4 Radio channel programming table for 911-918MHz range

Chan Freq. Micro-switch position						n	
Chan.	(MHz)	1	2	3	4	5	6
01	911,800	OFF	OFF	OFF	OFF	OFF	OFF
02	911,900	ON	OFF	OFF	OFF	OFF	OFF
03	912,000	OFF	ON	OFF	OFF	OFF	OFF
04	912,100	ON	ON	OFF	OFF	OFF	OFF
05	912,200	OFF	OFF	ON	OFF	OFF	OFF
06	912,300	ON	OFF	ON	OFF	OFF	OFF
07	912,400	OFF	ON	ON	OFF	OFF	OFF
08	912,500	ON	ON	ON	OFF	OFF	OFF
09	912,600	OFF	OFF	OFF	ON	OFF	OFF
10	912,700	ON	OFF	OFF	ON	OFF	OFF
11	912,800	OFF	ON	OFF	ON	OFF	OFF
12	912,900	ON	ON	OFF	ON	OFF	OFF
13	913,000	OFF	OFF	ON	ON	OFF	OFF
14	913,100	ON	OFF	ON	ON	OFF	OFF
15	913,200	OFF	ON	ON	ON	OFF	OFF
16	913,300	ON	ON	ON	ON	OFF	OFF
17	913,400	OFF	OFF	OFF	OFF	ON	OFF
18	913,500	ON	OFF	OFF	OFF	ON	OFF
19	913,600	OFF	ON	OFF	OFF	ON	OFF
20	913,700	ON	ON	OFF	OFF	ON	OFF
21	913,800	OFF	OFF	ON	OFF	ON	OFF
22	913,900	ON	OFF	ON	OFF	ON	OFF
23	914,000	OFF	ON	ON	OFF	ON	OFF
24	914,100	ON	ON	ON	OFF	ON	OFF
25	914,300	OFF	OFF	OFF	ON	ON	OFF
26	914,400	ON	OFF	OFF	ON	ON	OFF
27	914,500	OFF	ON	OFF	ON	ON	OFF
28	914,600	ON	ON	OFF	ON	ON	OFF
29	914,700	OFF	OFF	ON	ON	ON	OFF
30	914,800	ON	OFF	ON	ON	ON	OFF
31	914,900	OFF	ON	ON	ON	ON	OFF
32	915,000	ON	ON	ON	ON	ON	OFF

01	Freq.	Micro-switch position					
Chan.	(MHz)	1	2	3	4	5	6
33	915,100	OFF	OFF	OFF	OFF	OFF	ON
34	915,200	ON	OFF	OFF	OFF	OFF	ON
35	915,300	OFF	ON	OFF	OFF	OFF	ON
36	915,400	ON	ON	OFF	OFF	OFF	ON
37	915,500	OFF	OFF	ON	OFF	OFF	ON
38	915,600	ON	OFF	ON	OFF	OFF	ON
39	915,700	OFF	ON	ON	OFF	OFF	ON
40	915,800	ON	ON	ON	OFF	OFF	ON
41	915,900	OFF	OFF	OFF	ON	OFF	ON
42	916,000	ON	OFF	OFF	ON	OFF	ON
43	916,100	OFF	ON	OFF	ON	OFF	ON
44	916,200	ON	ON	OFF	ON	OFF	ON
45	916,300	OFF	OFF	ON	ON	OFF	ON
46	916,400	ON	OFF	ON	ON	OFF	ON
47	916,500	OFF	ON	ON	ON	OFF	ON
48	916,600	ON	ON	ON	ON	OFF	ON
49	916,700	OFF	OFF	OFF	OFF	ON	ON
50	916,800	ON	OFF	OFF	OFF	ON	ON
51	916,900	OFF	ON	OFF	OFF	ON	ON
52	917,000	ON	ON	OFF	OFF	ON	ON
53	917,100	OFF	OFF	ON	OFF	ON	ON
54	917,200	ON	OFF	ON	OFF	ON	ON
55	917,300	OFF	ON	ON	OFF	ON	ON
56	917,400	ON	ON	ON	OFF	ON	ON
57	917,500	OFF	OFF	OFF	ON	ON	ON
58	917,600	ON	OFF	OFF	ON	ON	ON
59	917,700	OFF	ON	OFF	ON	ON	ON
60	917,800	ON	ON	OFF	ON	ON	ON
61	917,900	OFF	OFF	ON	ON	ON	ÓN
62	918,000	ON	OFF	ON	ON	ON	ON
63	918,100	OFF	ON	ON	ON	ON	ÓN
64	918,200	ON	ON	ON	ON	ON	ON



5.1.5 Configuring the check function for inputs E1 to E10 on power up

This function is used to check the status of the contacts of the inputs on power up of the transmitter **RSEF**. If a contact is « closed» on power up, the transmitter will indicate an error by indicator lights **V1** and **V2** (4 flashes).

This function can be activated using micro-switch No. 7.

- 1- Deactivate the safety input of the transmitter **RSEF** (1)
- 2- Activate or deactivate the input check function using micro-switch No. 7 :



- 3- Activate the safety input of the transmitter **RSEF** (2); the two indicator lights, **V1** and **V2**, flash alternately to indicate the system is on standby for validation.
- 4- Press the validation button BPV ; indicator lights V1 and V2 go off.
- 5- To exit this configuration mode, deactivate, then activate the safety input (1)(2).
- 6- If the transmitter is in « manual » restart mode, press the restart button wired to input 17
- (1) If an emergency stop palmswitch is wired on this input, the component must be locked.
- (2) If an emergency stop palmswitch is wired on this input, the component must be unlocked.

Example of fault on input No. 3 (NO contact faulty) :



Error contact state of one or more inputs when transmitter **RSEF** is powered on

Note :

If the other setting has also been modified during this procedure (as "Radio channel number" or "restart mode"), each modified setting have to be performed <u>one by one</u>.



5.1.6 Configuring the restart mode of transmitter RSEF

This function defines the restart mode of safety transmitter (activation of the radio transmission) after a stop caused by deactivation of its safety input (i.e.: emergency stop button pressed) or cut of its power supply. By default ("ex-factory"), the transmitter restart mode is **« Manual »**.

« Manual » restart mode :

The safety transmitter is manually restarted (radio transmission activated) by pressing on a « Restart » pushbutton following deactivation and activation of its safety input.

 Automatic » restart mode : The safety transmitter is automatically restarted (radio transmission activated) following deactivation and activation of its safety input. IMPORTANT : Do not connect a restart button in this mode (input nb.17 not connected).

This function is configured using micro-switch No. 8

- 1- Deactivate the safety input of the transmitter **RSEF** (1)
- 2- Using micro-switch No. 8, select the transmitter restart mode : « Automatic » or « Manual » :



- 3- Activate the safety input of the transmitter **RSEF** (2); the two indicator lights, V1 and V2, flash alternately to indicate the system is on standby for validation.
- 4- Press the validation button (BPV) ; indicator lights V1 and V2 go off.
- 5- To exit this configuration mode, deactivate, then activate the safety input (1)(2).
- (1) If an emergency stop palmswitch is wired on this input, the component must be locked.
- (2) If an emergency stop palmswitch is wired on this input, the component must be unlocked.

Wiring diagram with restart button (« manual » restart mode) :

In the event of deactivation followed by activation of the safety input (emergency stop, for example), the transmitter will only be able to transmit provided the « restart » pushbutton has been pressed.



Note :

If the other setting has also been modified during this procedure (as "Radio channel number" or "restart mode"), each modified setting have to be performed <u>one by one</u>.



5.2 Receiver RSRD

5.2.1 General process

The « Functioning mode » switch SW1, allows to set the receiver RSRD on Programming or Receiving mode.

When Receiver is set to **Programming mode**, the configuration input (J3 Terminal block) allows to configure the RSRD receiver with dedicated software*.

To use the receiver **RSRD** in normally way, the « Functioning mode » switch SW1 must be set on position 1 « **Receiving mode** ».

5.2.2 Safety delay

The "Safety delay" allows to generate a delay before deactivation of the safety relays RS1 and RS2.

The purpose of this timer is to indicate a system stop and to manage an action before the complete shutdown.

This timer is activated after an emergency signal from the transmitter RSEF and also, after a passive stop (radio loss).

Total Tripping time = Active stop time or Passive stop time + Safety delay

This timer is not taken into account for these cases :

- during a local emergency stop (stop palmswitch wired to receiver RSRD J2-03,04,05,06),
- when using a wired enabling handle (connected to receiver RSRD J2-07,08,09,10,11,12)
- when a system error appears

This timer can be set with dedicated software* and can be programmed from 0 to 10s (set by step of 1s).

* The dedicated programming software is available on JAY Electronique website. The use of the programming software is protected by a password, this password is only delivered to a skilled person "level 2" (a person who was trained by JAY Electronique, and who is authorized to modify RSRD receiver parameters).



6 Wiring the components

6.1 Wiring the transmitter RSEF

NOTE 1: See description of connection terminals in section **4.2.1**. **NOTE 2:** See correspondence between inputs of transmitter **RSEF** and outputs of receiver **RSRD** in section **4.2.4**.

6.1.1 Typical wiring diagram

with emergency stop palmswitch connected to safety input and 10 dry-contact inputs (No pushbuttons).



6.1.2 Example connection of a safety light curtain on transmitter safety input



6.1.3 Example with static inputs (PLC for example)





6.2 Wiring the receiver RSRD

NOTE 1 : See description of connection terminals in section **4.2.3**.

NOTE 2 : See correspondence between inputs of transmitter **RSEF** and outputs of receiver **RSRD** in section 4.2.4.

CAUTION : The loads connected to the receiver outputs must not consume more than 100 mA with 24VDC.

6.2.1 Multi-strand wires: use of wire end ferrules is mandatory

Where flexible multi-strand wires are used, wire end ferrules must be used to avoid false contacts and short-circuits.



6.2.2 Conductor wire sections to be observed

Be sure to observe the min. /max. wire sections listed below for electrical connection an Terminal blocks :

J1 & J2	0,5 mm ² to 1,5 mm ²
J3	0,25 mm ² to 1,5 mm ²

6.2.3 USA/Canada specifications for installation and conductor wires to be used

- **Particularity for a wall installation:** A code inspector will allow a cord if it is not a long run and not likely to be damaged. It may be required to remove the cord and install conduit if the installation is under these clauses.
- The circuit breaker supplying the RSRD must be accessible and close to the RSRD.
- The type of wires used for wiring the J1 Terminal block (Safety relay outputs), is mandatory: class 1 size 18AWG with min temperature range -25°C to +60°C.
- Maximum switching voltage : 30 V rms, 42.4 V peak, or 60 V dc according to UL61010-1 3rd edition: 2012



6.2.4 Operation of safety relays RS1-RS2 of receiver RSRD

Interruption of the safety stop chain is ensured by safety relays RS1 and RS2 (internal to receiver **RSRD**) which control the contacts accessible by terminals Y1-Z3, Y2-Z2 and Y3-Z1.

The state of relays RS1 and RS2 depends on :

- the safety input of the transmitter **RSEF** ,
- the safety input of the receiver **RSRD**(a),
- possible faults detected,
- Possible loss of radio link.
- Possible loss of power supply of safety transmitter or safety receiver.
- Possible enabling handle status (b)
- (a)= An external safety stop device can be connected, such as an emergency stop palmswitch, or a gate control device wired to the inputs provided for this purpose on the receiver (connection terminals J2 03-04 / J2 05-06). The state of these inputs will act directly on relays RS1 and RS2.
- (b)= An enabling handle can be wired to the inputs provided for this purpose on the receiver (connection terminals J2 07-08 / J2 09-10 and J2-11-12). The state of these inputs will act directly on relays RS1 and RS2 and change the receiver operating mode, see chapter 6.2.6.

6.2.5 Monitoring of main contactors

The input connected to terminals **J3 07-08** is used to monitor the state of the contactor(s) connected to the **RS1-RS2** safety outputs.

The state of the contactor(s) contact(s) wired on this input must be closed in order to start the receiver **RSRD**.

IMPORTANT : This monitoring depends on the safety performance level required by the machine.

6.2.6 Enabling handle : Wiring and operating mode

IMPORTANT : The enabling handle must comply with the requirements of EN 60947-5-1:2004/A1:2009, EN ISO12100 and EN 60204-1:2016 standards.

The receiver RSRD is provided with six inputs dedicated to the wiring of an enabling handle.

In the case of enabling handle use, four of these inputs will be used for the connection of the double channel enabling device. The two other inputs will be used for detection of the enabling switch.

The wireless safety stop function is overwritten by using a dual channel enabling switch.

When the enabling handle is detected, the receiver will reset and the Radio is disabled (The enabling handle has higher priority than the radio mode)

The enabling handle has lower priority than the local emergency stop.

In the event of a faulty enabling device, the safety output relays shall be immediately deactivated.



6.2.7 Typical wiring diagram for receiver RSRD



6.2.8 Example with wired emergency stop palmswitch





6.2.9 Example with wired enabling handle

IMPORTANT : The enabling handle must comply with the requirements of EN 60947-5-1:2004/A1:2009, EN ISO12100 and EN 60204-1:2016 standards.



6.2.10 Example with contactor monitoring function





6.2.11 Wiring an indicator light column

An indicator light column should be wired to the receiver. The column will indicate the status of the equipment monitored and of the receiver **RSRD**. The indicator light status sheet should be fastened near to the indicator light column (Example given in last page of this user manual).

The consumption of each indicator light of the column must not exceed 100 mA with 24VDC. Should this be the case, the indicator lights must be controlled by auxiliary relays.

IMPORTANT : a standard indicator light column does not provide a safe information (no checking of its correct operating).

Status of indicator lights of indicator light column:



Ind. light column	On steady	Flashing	Off
Red	Equipment stopped	Red indicator lights flash a specific number of times in the event of a receiver malfunction (see chapter 8.2)	Equipment operating
Orange	active radio link between transmitter and receiver	/	/
Green	Equipment operating	/	Equipment stopped



7 Instructions for safe installation and commissioning

7.1 **General information**

Experience has shown that functional reliability basically depends on :

- the quality of the electrical power supply and protection systems,
- the characteristics of the components connected to the transmitter and receiver,
- the position of the transmission and reception antennas,
- The configuration and wiring of the various components.

7.2 Transmitter RSEF

The installer shall:

- Install the product near the control area.
- Provide, if necessary, a location for a transmitter restart button in order to start the transmitter following a malfunction or following an emergency stop condition.
- Connect a 0.5 amp delay-action fuse protection device in series on input Vin No. 4 (24V DC) of the transmitter.
- Familiarise yourself with all the characteristics given in the « technical characteristics » section.

7.3 Receiver RSRD

The installer shall:

- · Respect the sections and characteristics of the cables to be used, see the « technical characteristics » section
- Wire a cabled emergency stop device on the front panel of the unit.
- Secure, on the top of the unit, a 3-color indicator light column (green, orange, red) to indicate the operating status of the system.
- Fasten, near the indicator light column, a colour code sheet showing the meaning of the indicator light statuses (Example given in last page of this user manual).
- Connect a 250V/0.5 amp delay-action fuse protection device in series on input J2-01 (24V DC) of the receiver.
- Familiarise yourself with all the characteristics given in the « technical characteristics » section.



7.4 Positioning the components and antennas

Both the transmitter **RSEF** and receiver **RSRD** are supplied with an antenna, antenna extender and a BNC-BNC elbow.

- When installing multiple transmitters side by side, the respective radio transmission antennas should be spaced 70cm at least.
- If a metal electrical housing is used, the antenna should be remote-mounted on the top of the housing.
- If a plastic housing is used, the antenna can be connected directly on the product using the BNC elbow supplied.
- Under no circumstances, the receiver RSRD shall be positioned with its electronic components facing down.
- The receiver **RSRD** must be installed on a rigid frame (min. 3 mm thick sheet metal) fastened with 4 M5 screws in the recesses of the housing provided for this purpose.
- If poor radiowave propagation is observed, for example : closed area, the antenna should be remote-mounted.

See installation instructions:

Receiver **RSRD**:



Transmitter **RSEF**:



Do not remove the plastic insulating washer placed between the nut and the BNC connector mounted on the bracket of antenna extension (ref: **VUBxxx**).



IMPORTANT:

DRAFT R revision5

8 Options

8.1 Switch RF control option

For **RSEF** with sales reference: **RSEF**---1

This option allows to ensure continuous radio link in a congested RF environment (reflection, shadow zones...) by controlling an RF switch to transmit radio waves from two separate antennas.

We recommend using a RF switch type ZSDR-230+ for example.

The transmitter **RSEF** is fitted with 2 extra outputs, terminals **29** and **30**, which deliver the power supply for the RF switch and the TTL output to control the RF switch.

It is necessary to wire a 100 ohms 1/4 watts pull-up resistor between the TTL input and the 0v

IMPORTANT : The maximum length of the cables connecting the **RSEF** and the RF switch should not exceed 30m.



8.1.1 Wiring the RF switch:

RSEF Terminal	RF switch connection	Comments
14	TTL	It is necessary to wire a 100 Ohms pull-up resistor between the TTL input and the 0v
29	0 V	
30	+5 VDC	
RF Signal	СОМ	



9 Antennas

9.1 433-434MHZ bands





9.2 911-918MHz bands

Antenna reference: VUA001B Brand name: EBDS Frequency Range: 860-920 MHz Antenna gain: 1.5 dBi (need grounded 16x16cm) Type: straight, 1/4 wave, BNC connection Approximate length: 90mm	Antenna supplied as standard with the Transceiver
Antenna reference: VUA002B Brand name: PROCOM Frequency Range: 820-960 MHz Antenna gain: 5 dB (compared to 1/4 wave) Type: straight, 1/2 wave, BNC connection Approximate length: 200mm	
Antennas references: • VUA100BH (with 0,5m cable), VUA102BH (with 2m cable), VUA105BH (with 5m cable), VUA110BH (with 10m cable) Brand name: ASTEL Frequency Range: 860-960 MHz Antenna gain: 4 dBi Type: through insulated remote, 1/2 wave, BNC connection Approximate length: 190mm Required drill hole: 15mm	
Antennas references: • VUA103BM (with 3m cable), VUA105BM (with 5m cable) Brand name: ASTEL Frequency Range: 806-870 MHz Antenna gain: 5 dBi (need grounded 60x60cm) Type: insulated magnetic remote, tuned, BNC connection Approximate length: 320mm	
Antennas references: • VUA103BV (with 3m cable), VUA105BV (with 5m cable) Brand name: ASTEL Frequency Range: 900-920 MHz Antenna gain: 2 dBi Type: through uninsulated remote, 1/4 wave, BNC connection Approximate length: 100mm Required drill hole: 12mm or 19mm (ring 2 diameters supplied)	



10 Diagnosis

10.1 Transmitter RSEF : Messages given by indicator lights V1 and V2

To determine possible faults, the transmitter has two indicator lights on the front panel, V1 and V2.



Normal operation :

Transmitter status	V1 (green)	V2 (red)	Message indicated by indicator lights	Action
After transmitter power up	OFF	ON for 1 second, then OFF	Transmitter initialisation phase	/
On "manual" restart mode, after transmitter power up or after deactivation/activation of safety input	ON	OFF	On standby for action on restart button (restart mode programmed for « manual »)	- Press restart button to place transmitter in radio transmission mode
After transmitter power up or when restart button is pressed (restart function in « auto » mode)	Flash	OFF	RADIO transmission	/
In radio channel configuration mode	Flashes indicate number of units of new radio channel	Flashes indicate number of tens of new radio channel	Radio channel number indication	/
	2 flashes	2 flashes	Channel inaccessible with 10mW	Change radio channel (40 to 64)

Abnormal operation :

Transmitter status	V1 (green)	V2 (red)	V3 (orange)	Message indicated by indicator lights	Solution
After transmitter power up	OFF	OFF	OFF	Power supply problem, transmitter not supplied	 Check power supply voltage Check condition of protection fuse
After transmitter	OFF	OFF	ON	SIM card read error	 SIM card not present, SIM card incorrectly inserted or removed from its location SIM card faulty (must be replaced)
Or				Incorrect wiring of safety input	Check the wiring of safety input between terminals Nb. 7 and Nb. 10.
after activation of safety input	4 flashes	4 flashes	ON	 Input check » function has detected an error 	Check the transmitter wiring : NO contacts of inputs (nb 1 to nb 10) and restart button must be in «idle» position when transmitter is powered up.
	6 flashes	6 flashes	ON	Incorrect wiring of safety input	Check the wiring of safety input between terminals Nb. 8 and Nb. 9.
Operating	5 flashes	5 flashes	ON	Configuration micro-switches	Re-position configuration micro-switches to their initial positions and activate then deactivate the
Operating	6 flashes	6 flashes	ON	changed	safety input to clear the error.



DRAFT R revision5

10.2 Receiver RSRD : Error messages

Error messages are given by the indicator light (RED color on indicator light column) connected to **J3**-01-02 Terminals.

This indicator light blinks a specific number of times in the event of a receiver malfunction:

number of blinking	Message	Solution
1	Error on MCUs: Miscellaneous electronic fault	
2	Error on MCUs: RAM	
3	Error on MCUs: ROM	
4	Error on MCUs: Parameters	Check the configuration using dedicated software*
5	Error on MCUs: Link with MCU no2	
6	Error on MCUs: EEPROM	
7	Error on MCUs: LOW VOLTAGE	Check power supply
8	Error on MCUs: RADIO	
9	Error on MCUs: Safety relay	
Every second	Wired emergency stop button activated (pressed)	
Fast blinks	Error detected on wired emergency stop button	Repeat a complete emergency stop cycle to clear the error. If the error appears again, check the wiring and the emergency stop button.

* The dedicated programming software is available on JAY Electronique website. The use of the programming software is protected by a password, this password is only delivered to a skilled person "level 2" (a person who was trained by JAY Electronique, and who is authorized to modify RSRD receiver parameters).



11 Servicing

IMPORTANT : MAKE SURE TRANSMITTER AND RECEIVER POWER SUPPLIES ARE SWITCHED OFF BEFORE YOU PERFORM ANY SERVICING OPERATION

- The components can only be disassembled by a trained technician in a "controlled" environment; parts must only be replaced by genuine identical spare parts.
- Use only soap-based solutions when cleaning housings; do not use any aggressive cleaning products.

12 MAINTENANCE

12.1 Replacement of a transmitter RSEF

Without unwiring the product, proceed as detailed below :

- 1- Switch off the power supply
- 2- Remove the front panel from the product (Fig.1)
- 3- Transmitter RSEF : If the SIM card of the new transmitter does not contain the same information as the SIM card of the defective product, remove the SIM card and install it in the new product. (Fig.2)
- 4- Disconnect the removable terminals by applying a turning action using a flat tip screwdriver (Fig.3)
- 5- Re-program the new product identically to the old product (Fig.4)
 - > Micro-switches set identically for transmitter
- 6- Connect the removable terminals on the new product (Fig.5).
- 7- Connect and supply the new product and proceed with tests.







12.2 Inspection and servicing of the receiver RSRD

The receiver can be dismantled only by a trained staff, in a "controlled" environment, spare parts can be changed only by identical and original parts.

Visual inspection should be done during the regular maintenance interval of the machine.

- Check the antenna connection and check that it is clean and free of any oxidation.
- Check the wiring of the receiver to electrical unit on power supply and machine, and wiring of function outputs.
- Check the correct operation of stop circuits, active and passive.
- Once by year, it is necessary to check the function of Emergency stop and safety relays.

For the RSRD Housing:

- Check the condition of cover seal, tightening of screws and cable glands.
- Clean the receiver by eliminating any foreign body.
- Only use non aggressive cleaning product on base of soapy solution.



13 Warranty

All our products are guarantied two years as of date of shipment. Any repairs, changes or replacement of a product during the warranty period shall not result in extension of the warranty period.

Limit :

The warranty does not cover defects resulting from :

- transportation,
- false manoeuvres or failure to observe the wiring diagrams when installing and commissioning,
- insufficient monitoring or servicing, or any use not compliant with the specifications given in the technical manual and, as a general rule, any storage conditions, operating or environment conditions (atmospheric, chemical, electrical, mechanical or other) which are inappropriate or not covered by the order.

This warranty shall not apply where any modifications, disassembly or additions have been made by the customer without the written authorisation of JAY Electronique.

The responsibility of the JAY Electronique company during the warranty period is limited to material and construction defects; the warranty covers repair of the product in the JAY Electronique shops or free replacement of parts recognised to be faulty following expert investigation by the JAY Electronique "technical services". The warranty does not give right to any compensation for damages.

For any dispute relative to a supply or settlement thereof, the TRADE TRIBUNAL OF GRENOBLE shall be solely competent, even where an Appeal may be requested or where a plurality of defendants may exist.



14 FCC Rules & Regulations (Federal Communications Commission)

The OEM integrators are responsible for ensuring that the end-user has no manual instructions to remove or install module.

Any changes or modifications to this equipment not expressly approved by **JAY Electronique** may cause, harmful interference and void the FCC authorization to operate this equipment.

This equipment complies with FCC's radiation exposure limits set forth for an uncontrolled environment under the following conditions:

- 1. This equipment should be installed and operated such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and user's/nearby person's body at all times.
- 2. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Authorized antennas:

see chapter « Antennas/911-918MHz bands »

Antenna installation requirements:

see chapter « Positioning the components and antennas »

For class B Equipment:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

- -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- -Consult the dealer or an experienced radio/TV technician for help

Warning:

Those devices must be professionally installed.



15 IC Regulations (Industry Canada)

The OEM integrators are responsible for ensuring that the end-user has no manual instructions to remove or install module.

This equipment complies with RSS102's radiation exposure limits set forth for an uncontrolled environment under the following conditions:

- 1. This equipment should be installed and operated such that a minimum separation distance of 20cm is maintained between the radiator (antenna) and user's/nearby person's body at all times.
- 2. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This radio transmitter (IC: 3393A-RSEF) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Authorized antennas:

see chapter « Antennas/911-918MHz bands »

Antenna installation requirements:

see chapter « Positioning the components and antennas »

This device complies with Industry Canada's licence-exempt RSSs.

- Operation is subject to the following two conditions:
- 1. This device may not cause harmful interference; and
- 2. This device must accept any interference received, including interference that may cause undesired operation of the device.



16 Appendices

16.1 Component dimensions (mm)

Safety transmitter RSEF



Safety receiver RSRD (Housing version)



BNC plug-in antennas VUB ···





16.2 Technical characteristics

16.2.1 Transmitter RSEF

Mechanical and environment withstand characteristics
Housing material : Plastic
Protection index : IP 40 IMPORTANT : transmitter RSEF must be mounted in a housing with protection degree IP54 min.
Weight : 500 g
Operating temperature range : -20 °C to + 50 °C
Storage temperature range : - 30 °C to + 70 °C
Connection : Terminal strips (plug-in), screw-type for wires 0.08 mm ² to 2.5 mm ²
Antenna : ¼ wave, VUA001A plug-in on BNC connector
Radio characteristics
Radio transmission frequencies : (Interval between adjacent channels : 0.025 MHz)
RSEF40 : 64 frequencies, from 433.100 MHz to 434.675 MHz RSEF9- : 64 frequencies, from 911.800 to 918.20 MHz
Transmit power : ≤10 mW
Average range in typical industrial environment (1) :
RSEF40 : 150 m RSEF9- : 100 m
RSEF41 : 250 m
Transmitter duty cycle : class 4 up to 100%
Electrical and functional characteristics
Power supply voltage : 24 VDC SELV/PELV +/- 20% In according to chapter 9.4 of IEC / UL 61010-1 3rd edition, the product must be powered by class 2 power supply or by limited energy
Max. consumption : 100 mA (non-loaded static outputs and without any activated input) Max. consumption protected by fuse : 500 mA
Number of inputs : 13 - 2 safety inputs (for emergency stop, safety light curtain, etc.) - 10 function inputs - 1 « restart button » input
Low level on input : dc voltage < 2 V
High level on input : dc voltage > 3 V
Maximum voltage on an input with no damage : 30 V
Consumption of an input active at high level : < 20 mA
Maximum frequency of a signal on an input : 10 Hz max
Static outputs (not suitable for application requiring a safety level) :
Number and type of outputs : 2 PNP outputs (Images of indicator lights V1 and V2)
Output voltage : 24 VDC, 100 mA max.
Indication : 3 indicator lights

(1)= Range varies according to environment conditions of transmitter and of receiver antenna (frameworks, metal partitions, etc.).



DRAFT R revision5

16.2.2 Receiver RSRD

Mechanical and environment with	hstand characteristics								
Housing material: Polyamide 6/6 (PA	6/6), glass bead filled								
Protection index: IP 65	Protection index: IP 65								
Weight: 700 g (complete model with he	ousing)								
Operating temperature range: - 20 °C	C to + 60 °C								
Storage temperature range: - 30 °C t	o + 70 °C								
Connection: Spring – type plug in co Minimum Cable rated vo Conductor wire sections t J1 & J20,2 mm ² t J30,25 mm ² t	onnectors oltage of 250 VAC o be observed on T-blocks o 2,5 mm ² o 1,5 mm ²	:							
Antenna: 1/4 wave, VUA001A plug-in	on BNC connector								
Cable lead-out: - M16 cable gland - M25 cable gland	d for safety relays (tightenin d for power supply and othe	g torque to be respected = 2N r signals (tightening torque to	l.m) be respected = 5N.m)						
Electrical characteristics									
Power supply voltage : 24 VDC SELV In according to chapter 9.4 of IEC / UL	//PELV +/- 20% 61010-1 3rd edition, the pro	oduct must be powered by cla	ss 2 power supply or by limited energy						
Max. consumption protected by fuse	9 : 500mA			<u> </u>					
Contacts : 3 NO forcibly guided cont	acts								
Tripping time (reaction) : • Local emergency stop reaction tim • Active stop time following activation • Enabling switch reaction time : 30 • Passive stop time (1) : - 300 ms, for end to - 1.5 s, for a sa • Safety Delay (1) : - 0 to 10 sec s	te : 60 ms n of transmitter RSEF safe ms emergency stop according to afety stop according EN 602 et by step of 1 sec (default	ty input : 55 ms + Safety Delay o EN 60204-1:2016 204-32:2008 para 9.2.7, lf the 0s)	/ requirement of the risk analysis allows it						
Max. switching capacity :									
US/Canada specification	3.6 A 30 VAC	Resistive load	SAT 85 °C						
according to UL 60947-4-1A	2 A 30 VAC 1.5 A 30 VAC	Pilot Duty load Pilot Duty load	T. ambient 25 °C T. ambient 60 °C						
VDE 3.6 A 250 VAC 3.6 A 250 VAC 9.6 A 30 VDC 9.6 A 30 VDC Per AC15 : 2 A / 240 V for 1 NO contact loaded EN 60947-5-1:2004/A1:2009 9.6 Per AC15 : Per AC15 : 1.5 A / 240 V for all contacts loaded EN 60947-5-1:2004/A1:2009									
Static outputs (not secure) : N C Indication : 3 indicator lights	lumber and type of output Output voltage: 24 VDC, 10	ts : 4 PNP outputs 00 mA max.							

(1) = The passive stop time and the safety delay can be set with dedicated software*.

* The dedicated programming software is available on JAY Electronique website. The use of the programming software is protected by a password, this password is only delivered to a skilled person "level 2" (a person who was trained by JAY Electronique, and who is authorized to modify RSRD receiver parameters).



16.3 Environmental data

Mechanical: Product fulfils following standards vibrations as requested standards EN 60068-2-6:2008 and EN 60068-2-27:2009.

- 60068.2.6:2008, test FC, 0.7mm peak to peak from 10 to 57Hz 5g from 57 to 150Hz.
- Mechanical shock: 60068.2.27:2009, test Ea. 30g/11ms
- Mechanical bump test: 60068.2.27:2009, test Ea, 10g/16ms

Maximum relative humidity 80 % for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C

Maximum heights above sea level: 2000m max

Receiver RSRD lifetime: 20 years

16.4 Safety related parameters

Tests according to the test principles were conducted. Detailed reports are held in the laboratories files.

Function tests, error simulation, a review of the source code and documents are performed.

List of standards: see the document « Declaration of conformity » of the product

EN ISO 13849-1:2015 for performance level PLe (Category 4) and IEC 62061:2005+AC:2010 + A1:2013+A2:2015 for SIL 3 emergency stop function.

16.4.1 Characteristic data according to IEC 61508-1 till -7 and IEC 62061:2005

The calculation of these values is based on the following assumptions:

- Number of operating days per year: dop = 365d
- Number of operating hours per day: hop = 24h
- Operating frequency: 1/h

Product	Parameters	Results
Transmitter RSEF	Safety integrity level	SIL 3
	PFH[1/h]	1.6E-09
	Proof Test Interval T1	20 years

Product	Parameters	Results
Receiver RSRD	Safety integrity level	SIL 3
	PFH[1/h]	1.04E-09
	SFF	99.42%
	Proof Test Interval T1	20 years
	Туре	В
	Safe state	Open of at least one of the both safety relays



Other case.

The calculation of these values is based on the following assumptions :

- Number of operating days per year: dop = 365d
- Number of operating hours per day: hop = 24h
- Operating frequency: 600/h

Product	Parameters	Results
Receiver RSRD	Safety integrity level	SIL 3
	PFH	7.97E-08
	SFF	99.42%
	Proof Test Interval T1	20 years
	Туре	В
	Safe state	Open of at least one of the both safety relays

16.4.2 Characteristic data according to EN ISO 13849-1:2015

The calculation of these values is based on the following assumptions :

- Number of operating days per year: dop = 365d
- Number of operating hours per day: hop = 24h
- Operating frequency: 1/h

Product	Parameters	Results
Transmitter RSEF	Performance level	PL e
	Category	4
and and	MTTFD	186 years
	Diagnostic Coverage DC	98%

Product	Parameters	Results
Receiver RSRD	Performance level	PL e
<u>8</u>	Category	4
	MTTFD	838.32 years
	Diagnostic Coverage DC	99%
	CCF	80%

Other case.

The calculation of these values is based on the following assumptions :

- Number of operating days per year: dop = 365d
- Number of operating hours per day: hop = 24h
- Operating frequency: 600/h

Product	Parameters	Results
Receiver RSRD	Performance level	PL e
<u></u>	Category	4
	MTTFD	155.28 years
	Diagnostic Coverage DC	99%
	CCF	80%



16.5 **RSEF Transmitter case thermal capability**

Power supply, plus any input or output, 24VDC power supply, Pmaximum = 18watts.

16.6 Residual risks

The product being an element of the equipment, a risk analysis of the concerned application will allow to estimate these residual risks.

16.7 Forseeable misuse

Polarity inversions of the safety transmitter or safety receiver power supply : no starting up of products.

Other misuse of the safety transmitter **RSEF** : see Diagnosis paragraph 10.

Other misuse of the safety receiver RSRD : see Diagnosis paragraph 10.

16.8 Waste recycling and management



When the unit has reached the end of its service life, be sure to dispose of it appropriately. The unit can be disposed of in a specific waste collection centre as organised by the local authorities, or it can be turned over to a distributor who will handle proper disposal of the unit.

Electronic waste sorting will prevent possible negative impact on the environment resulting from inappropriate elimination of electronic waste and will allow proper processing and recycling of the materials forming the unit, representing significant savings in terms of energy and resources.

16.9 Products references

See the sales documentation of the product.

16.10 Warning, avoid any mutual disturbance

Be certain that the wireless System doesn't disturb other Systems and that it is not being disturbed itself by other Systems.

Use different codes and different frequencies.

16.11 Countries limitation of the use

See ERC/REC 70-03 for eventual limitation of the use of Annex 1 Band F1 (Non- Specific SRDs) 433.050-434.790 MHz (6 October 2010 edition Russian Federation Not implemented).

16.12 Manufacturer information



Head office and plant : ZAC la Bâtie, rue Champrond F38334 SAINT ISMIER cedex

Tel : +33 (0)4 76 41 44 00 **Fax :** +33 (0)4 76 41 44 44

www.jay-electronique.com



17 Declaration of conformity

Translated from French	ECLARATION OF CONFORMITY
<u>DI</u>	CELARATION OF CONFORMITT
The manufacturer JAY Electroniqu ZAC la Bâtie, ru 38334 ST ISMIE FRANCE	te e Champrond R Cedex
Declares that for the Transmitter / Receiver set d	described in its instructions, the declaration of conformity applies to the following devices:
	RSRDvvvv-v
Comply:	
 With the requirements specified for the m member states relative to machinery. According to EN ISO 13850 :2015 (achines defined in Appendix I of the Directive 2006/42/EC regarding the alignment of the legislation of the Clause 4.1.3 Stop category 0 and 1
To this end, the notified body No. 0123:	TÜV SÜD Rail GmbH Barthstr. 16 D-80339 München Germany
Has issued an EC-Type examination n° JS91616	6 C reflecting compliance with the following standards:
- EN ISO 13849-1 :2015 Requirements	s for performance level PL e (Category 4)
 EN 61508-1-7 :2010 Requirements for EN 62061 :2005 + Cor. :2010 + A1 	or SIL 3 :2013 + A2 : 2015 Requirements for SIL 3
- EN 60204-32 :2008 - EN 60204-1 :2006 + A1 :2009 + AC	:2010
The wireless safety stop (stop category 0 or 1), t in applications up to Category 4 (PLe) according EN 61508-1-7 :2010	he local emergency stop (stop category 0) and enabling switch function (stop category 0) of RSRD can be use g to EN ISO 13849-1 :2015 and SIL 3 according to EN 62061 :2005 + Cor. :2010 + A1 :2013 + A2: 2015 ar
With the requirements of the Directives 201 member states, relative to radio equipment a	4/53/EU of the Council of Europe of 16 April, 2014, concerning the alignment of the legislations of the and telecommunication terminals with special reference to:
 article 3.1 a, concerning the protecti Directive 2014/35/EU l'article 3.1 b, covering the requirement l'article 3.2, covering the requirement 	ion requirements of the health and safety of people and domestic animals, and the protection of property wi ents relative to protection as concerns electromagnetic compatibility, with Directive 2014/30/EU. Its relative to proper use of the radio-frequency spectrum.
To this end, the accredited body n°0573:	AEMC Lab 19, rue François Blumet ZI de l'Argentière 38360 SASSENAGE FRANCE
Conducted testing of the above units for Electron	magnetic Compatibility (3.1b) and for compliance with the spectrum (3.2), according to following standards:
 EN 301 489-3 V1.6.1 EN 301 489-1 V1.9.2 EN 61000-6-2 : 2005 EN 61326-1 :2013 & EN 61326-3-1 : EN 300 220-2 V3.1.1 EN 62479:2010 	:2008
included in the reports : nº nº R1611381R-E-A3	3, R1611381C-E
 With the general requirements of the stant With the requirements of the European Disubstances in electrical and electronic equ With the requirements of the European Dis(WEEE), (2012/19/EU). 	dard IEC 61010-1 :2010. Test report : E483765-D2000-IN-1-Original and E483765-D1000-IN-1-Original irective of the Council of Europe dated June 8, 2011, relative to the limitation of use of certain dangerous ipment (RoHS), (2011/65/EU). irective of the Council of Europe dated July 4, 2012, relative to electrical and electronic equipment waste
Signatory: Responsible person authorized to coo and empowered to draw up the declaration on be This declaration of conformity is issued under th Name: Pascal De Boissieu; Function: Technica Place and Date: JAY Electronique ZAC Bâtie S	mpile the technical file (2006/42 Annex II § 2), ehalf of the manufacturer (2006/42 Annex II § 10). e sole responsibility of the manufacturer: Il Manager. Street Champrond 38334 St Ismier France on 17/11/2017.
Signature: signed on original	
333190A (d.D)	333190A_RSRD_Declaration_de_conformite_FR-EN.do



DRAFT R revision5



Active radio link between transmitter and receiver

(Receiver indicator light feedback)









DRAFT R revision5

d.R

rev3