



1- Typical applications

● Industrial equipment :

- Status transfer of isolated detectors to control room
- Status transfer of position detectors or alarm to programmable controller
- Status transfer of wire-guided trolleys or any other mobile equipment
- Remote control from control station to machines
- Remote control from machines to machines
- Transmission of statuses and controls from control panels to machines

● Industrial lifting :

- Anticollision on travelling cranes
- Remote control from fixed control panel / control room
- Control of mobile equipment to open doors

● Farm equipment :

- Status transfer concerning fill-height level of silos, tanks
- Remote pump control
- Feeder control
- Farm machinery
- Alarms

● Infrastructure :

- Remote control of lighting, ventilation
- Gate opening/closure control using mobile devices
- Parking sensor status indication

2- Description of the ISIS Series

The use of unidirectional or bidirectional radio logic state transfers allows to get rid of electric cables between various equipment of an installation.

ISIS Series enables to :

- ➡ Lower your installation costs (wiring, civil engineering,).
- ➡ Increase the reliability of mobile equipment by eliminating the need for wear parts..
- ➡ Increase the flexibility of your installations.
- ➡ Decrease your operating costs related to maintenance.

● Compliance with European directives :

- Hertzian equipment and telecommunication terminals (low voltage, EM compatibility, radiofrequency spectrum)

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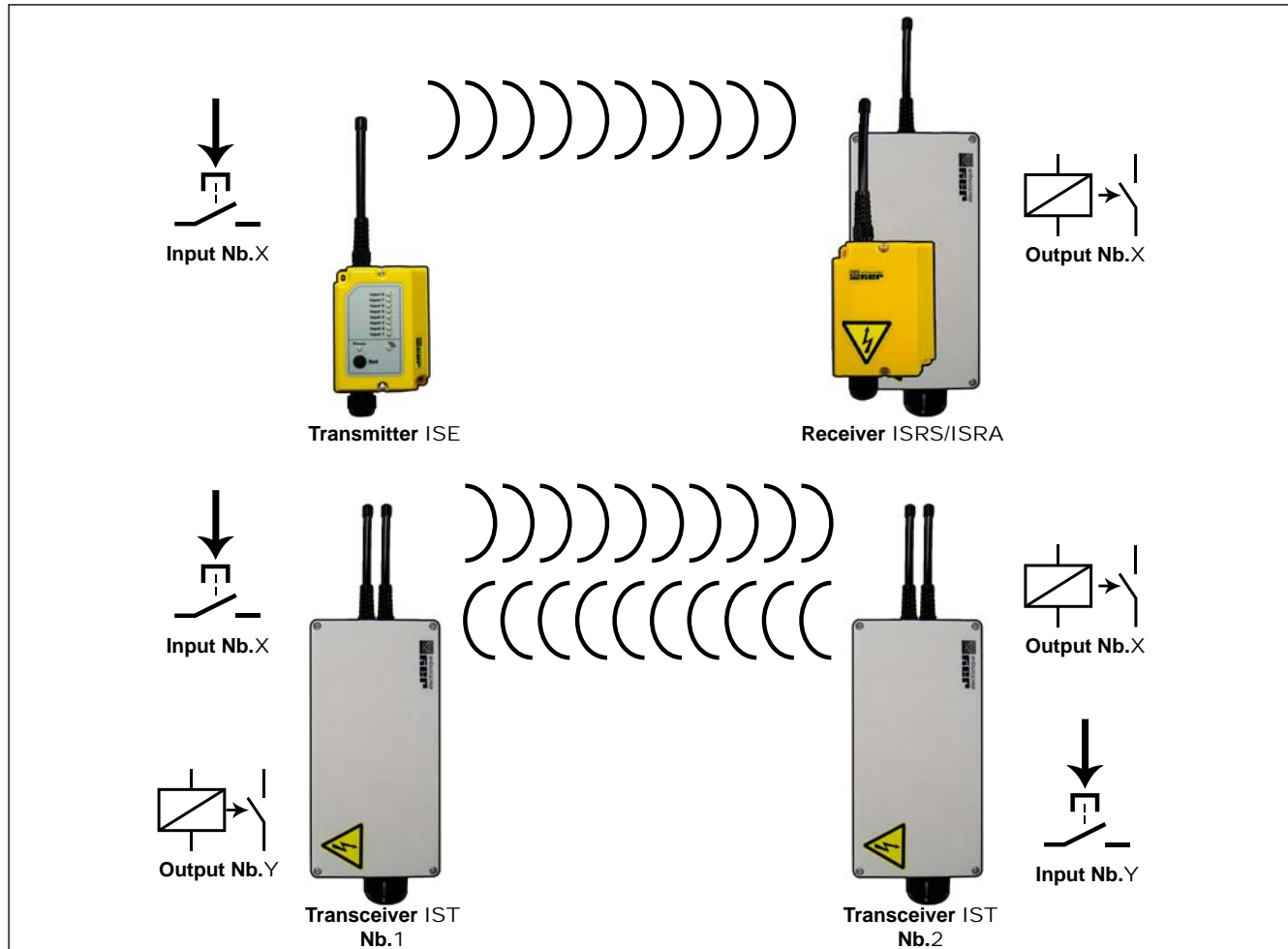
3- Operating principle

The ISIS data transmission system is designed to transmit 8 logic states from one point of an installation to another.

The **ISE** transmitter sends the logic states of its inputs by radio to the receivers **ISRS** or **ISRA** which decode the states and restore them on their relay outputs (unidirectional transmission).

Transceivers **IST** include in a single housing a transmitter module and a receiver module. These devices send and receive the logical states in both directions (bidirectional transmission).

The logic states are transmitted on a radio channel with a coded identifier (identity code).



4- Safety aspects

To ensure reliable information transmission, the ISIS Series is defined with the following features :

- A radio link with non-directional and non metallic obstacle insensitivity characteristics ensuring optimum installation availability.
- A «Radio Quality» output on receiver and transceiver for real time evaluation of radio link quality.
- A specific identity code to each transmitter / receiver pair or transceivers pair (user programmable).
- A response time compatible with most controlled industrial equipment.
- A permanent radio link mode ensuring «positive» security (all interference is handled as an interruption of the signal transmitted on the inputs, generating a transition to the OFF state of «Radio Quality» then of the function outputs).
- A momentary radio link mode (1), made possible by use of a microswitch, enabling to combine several transmitters to a single receiver.

(1) = radio transmission mode not compatible with transceiver **IST**.

5- Product setting

For easier installation, the ISIS system is delivered «**ready to use**» (1). However, if the installation is in a harsh environment (other radio systems present, long range....), the «factory» parameters (working radio frequency, identity code, transmitting mode, radio transmit power) can be easily modified by the user via DIP-switches inside the transmitter or inside the transceiver.



Working radio frequency

The ISIS Series has 18 radio channels in the frequency bands 433-434MHz :

Radio channel nb.:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Frequency (MHz)	433,1	433,2	433,3	433,4	433,5	433,6	433,7	433,8	433,9	434	434,1	434,2	434,3	434,4	434,5	434,6	434,7	434,74



Transmitter radio transmit power

The ISIS Series can operate with two different radio transmit powers : 1mW (2) or 10mW
The choice of radio transmit power will depend on the application in which the ISIS product is used.

■ **1 mW radio transmit power (2) :**

If the installation has many radio systems and the range between the ISIS transmitter and receiver is short or if the response time of an output must be fast (less than 60ms max), it is preferable to select a transmit power of 1 mW (2).

■ **10 mW radio transmit power :**

If the range of the ISIS transmitter-receiver or between transceivers **IST** is long and/or if the installation has many radio systems in 433-434MHz frequency band, it is preferable to choose a radio transmit power of 10 mW.



Radio transmission modes

The ISIS transmitter can operate with two different radio transmission modes :

Intermittent transmission (2) or **Continuous transmission**, the choice of transmission mode will depend on the application in which the ISIS product is used.

■ **Intermittent radio transmission (2) :**

The transmitter only transmits provided at least one of its inputs is active.

This mode is recommended for applications where several transmitters are associated to a single receiver.

■ **Continuous radio transmission :**

The transmitter or the transceiver transmits whatever the state of its inputs.

This mode is recommended for applications where it is necessary to monitor the availability of the radio link.



«Radio quality» RM relay

To check the state of the radio link between ISIS units, an output «Radio quality» is available on the receiver and on the transceiver (relay «RM»).

■ **«RM» relay activated :**radio link is good between units.

■ **«RM» relay deactivated :**no radio link between units.

Note :

This function is only valid in continuous or intermittent transmission mode (2) as soon as an input is active.

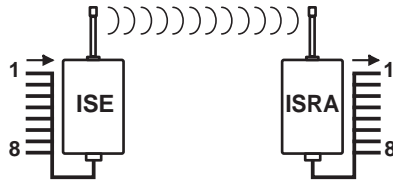
(1) = except for transceivers IST where a simple setting must be performed before use.
(2) = intermittent radio transmission mode is not available for transceivers IST.

6- ISIS unit associations

Several configurations are possible with **ISE** transmitter (8 logic inputs) and **ISRA** receiver (8 relay outputs) or **ISRS** receiver (4 relay outputs) and also transceivers **IST** (8 logic inputs / 8 relay outputs):

Case nb.1

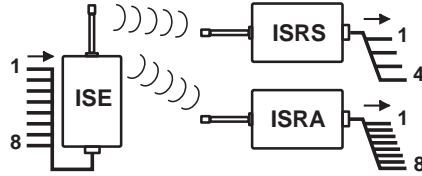
1 **ISE** transmitter
with 1 **ISRA** receiver



- Inputs 1 to 8 of transmitter are transferred to outputs 1 to 8 of the receiver.
- The radio link can be in permanent or intermittent mode on active input.
- The working frequency and the identity code are the same for both ISIS units.

Case nb.2

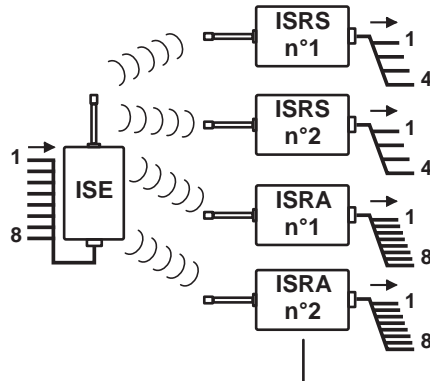
1 **ISE** transmitter
with 1 **ISRS** receiver
and 1 **ISRA** receiver



- Inputs 1 to 4 of transmitter are transferred to outputs 1 to 4 of ISRS receiver.
- Inputs 1 to 8 of transmitter are transferred to outputs 1 to 8 of ISRA receiver.
- The radio link can be in permanent or intermittent mode on active input.
- The working frequency and the identity code are the same for all ISIS units.

Case nb.3

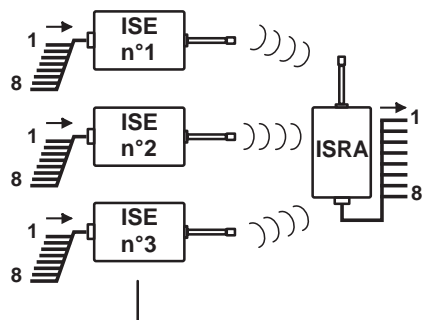
1 **ISE** receiver
with N **ISRS** receivers
or with N **ISRA** receivers



- **Case for ISE / N ISRS :**
Inputs 1 to 4 of transmitter are transferred to outputs 1 to 4 of receiver nb.1 to nb.N.
- **Case for ISE / N ISRA :**
Inputs 1 to 8 of transmitter are transferred to outputs 1 to 8 of receiver nb.1 to nb.N.
- The radio link can be in permanent or intermittent mode on active input.
- The working frequency and the identity code are the same for all ISIS units.
- An infinite number of receivers can be attributed to the transmitter.

Case nb.4

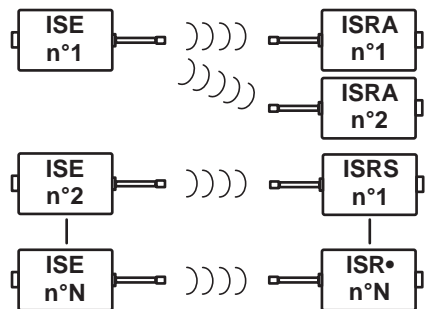
N **ISE** transmitters
with 1 **ISRA** receiver
or with 1 **ISRS** receiver



- Inputs 1 to 8 of transmitter are transferred to outputs 1 to 8 of ISRA receiver.
- Inputs 1 to 4 of transmitter are transferred to outputs 1 to 4 of ISRS receiver.
- For this configuration, you must check that :
- The transmitters cannot transmit simultaneously.
- The information to be sent is of short duration.
- The best way to get around these constraints is to ensure that the transmitters can only transmit in turn, one after the other.
- The radio link is necessarily in intermittent mode.
- The working frequency and the identity code are the same for all ISIS units.

Case nb.5

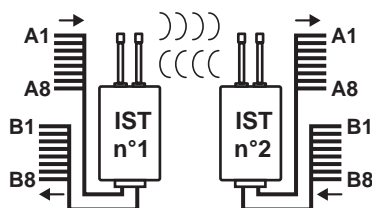
N **ISE** transmitters
with N **ISRA** receivers
or with N **ISRS** receivers



- Inputs of transmitter nb.1 are transferred to outputs of receiver nb.1 and so on.
- All the transmitters can transmit at the same time with no mutual interference provided a different radio channel and a different identity code are used for each pair.

Case nb.6

2 transceivers **IST**



- Inputs of transceiver nb.1 are transferred to outputs of transceiver nb.2.
- Inputs of transceiver nb.2 are transferred to outputs of transceiver nb.1.
- The transceivers must use a different radio channel and a different identity code.

Note: the assignment input / output is fixed and cannot be changed.

7- Product installation

General information

- Any obstacle between the transmitter antenna and the receiver antenna or between transceivers antennas will reduce the range of the assembly.
- The radio waves do not travel through metal walls. The antennas must therefore not be placed in an enclosure forming a shield, such as a metal cabinet, a reinforced concrete wall, a steel structure or metal wall, etc. In such cases, the antenna must be entirely exposed. Failure to do so will result in strongly downgraded performance (BNC antenna kit must be used in this case, ref.: OWR01, see next page).

Particular cases

If several several radio systems coexist on the same site, precautions for installation should be taken. Please contact our technical support to help you validate your installation.

8- Technical characteristics

	Transmitter ISE	Receiver ISRS	Receiver ISRA	Transceiver IST
Housing material	ABS			
Housing color	Yellow		Gray	
Housing tightness	IP65			
Dimensions	92 x 123 x 50 mm		240 x 120 x 100 mm	
Weight	270 g	350 g	1,2 kg	1,3 kg
Cable lead-outs	1 cable gland PG 13,5 (Ø 8 to 12 mm)		1 cable gland M32 (Ø 20 to 26 mm) + plastic cap for a possible cable gland M16 (Ø 5 to 7 mm)	
Effective radiated power	1mW or 10 mW (depending selection)	NA	NA	10 mW
Radio channels	18 user-programmable radio channels			
Frequency band	ISM 433-434Mhz			
Modulation	FM			
Tuner sensitivity	NA	< 2µV		
Average range in unobstructed area (1)	200 m (1W mode) 350 m (10mW mode)			350 m
Average range in typical industrial environment (1)	80m (1W mode) 100m (10mW mode)			100 m
Antenna(s)	Fixed (standard) or BNC external type ref.: VUB084 with kit ref.: OWR01			
Operating temperature range	-20°C to +50°C			
Storage temperature range	-30°C to 70°C			
Power supply	1 version : DC 9 to 30 VDC	1 DC / AC version : 12VDC (9 to 20 VDC) 24VDC (20 to 75 VDC) 24 VAC (+10%/-5%) 48 VAC (+10%/-15%)	1 DC version : 12VDC (9 to 20 VDC) 24VDC (20 to 28 VDC) 1 AC version : 24 VAC (+10%/-15%) 48 VAC (+10%/-15%)	
Min consumption	100 mA	23 mA (12 VDC) 350 mW (24 VDC) 350 mW (24-48 VAC)	23 mA (12 VDC) 350 mW (24 VDC) 9 W (24-48 VAC)	123 mA (12 VDC) 1,8 W (24 VDC) 9 W (24-48 VAC)
Max consumption	200 mA	200 mA (12 VDC) 2 W (24 VDC) 2 W (24-48 VAC)	300 mA (12 VDC) 3 W (24 VDC) 16 W (24-48 VAC)	500 mA (12 VDC) 6 W (24 VDC) 16 W (24-48 VAC)
Consumption of an input active in the high state	+12mA	NA	NA	+12mA (12 VDC) +180 mW (24 VDC) + 200 mW (24-48 VAC)
Consumption of an active relay output	NA	+20 mW (12 VDC) + 275 mW (24 VDC) + 275 mW (24-48 VAC)	+20 mW (12 VDC) + 275 mW (24 VDC) + 300 mW (24-48 VAC)	
Power supply protection (rated in accordance with power supply voltage and receiver models)	1 fuse on support	2 fuses on support		3 fuses on support
Low level on input	DC voltage < 2 V	NA	NA	DC voltage < 2 V
High level on input	DC voltage > 3 V	NA	NA	DC voltage > 3 V
Maximum voltage level on an input with no damage	30 V	NA	NA	30 V
Maximum frequency of a signal on an input	10 Hz max (1 mW) 0,5 Hz max (10 mW)	NA	NA	0,5 Hz max
Response time of an output when an input is activated or deactivated	NA	< 60 ms (1 mW) < 500 ms (10 mW)		< 500 ms
Passive shutdown time (radio jamming)	2 seconds on a function relay 1,9 second on the «Radio quality» relay (RM)			

(1) = Range will vary according to environment conditions of transmitter and reception antenna (metal frameworks, walls ...). The range will be decreased if one of the products is mounted on a moving equipment.

Receiver and transceiver relay characteristics :

- Contacts : AgNi 0,15
- Max. power at $\cos\phi=1$: 2000 VA
- Max. current switching : 8 A
- Max. voltage switching : 400 VAC
- Minimum Current / Voltage advised switching : 100 mA / 12 VDC
- 100 000 switching cycles at 250 VAC, 8 A, $\cos\phi=1$
- 50 000 switching cycles at 24 VDC, 8 A
- Tests per EN 60947-5-1 :
DC13 - 0,5 A / 24 VDC
AC15 - 3 A / 250VAC

Number of switching cycles on various contactors :

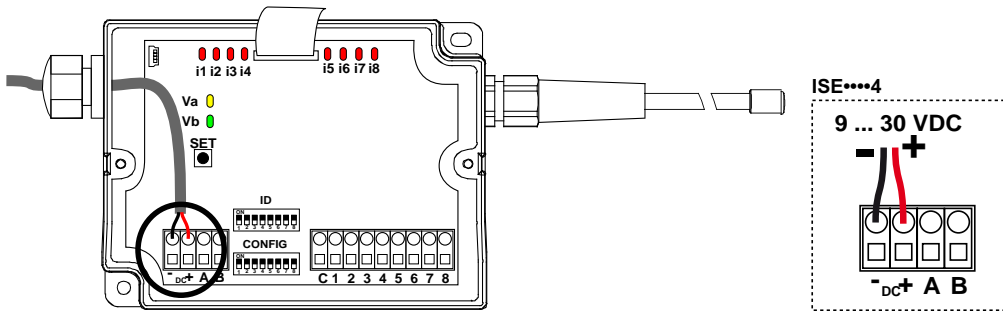
Contactor	Physical unit switched by relay	Number of switching cycles for output relays
CA2DN LC1D09 LC1D18 LC2D09	Switching under 230VAC (70VA, $\cos\phi=0,75$)	2×10^6
	Switching under 110VAC, (70VA, $\cos\phi=0,75$)	1×10^6
	Switching under 48VAC (70VA, $\cos\phi=0,75$)	$0,5 \times 10^6$

9- Electrical connections

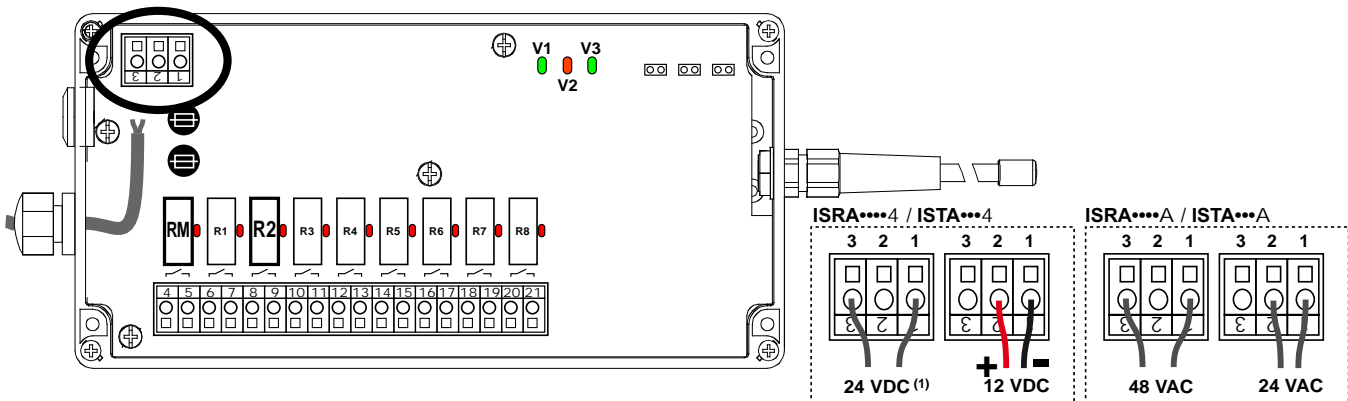
IMPORTANT :

The electrical connections should be made such that when the main switch is off, the receiver ISR or the transceiver IST is also deactivated.

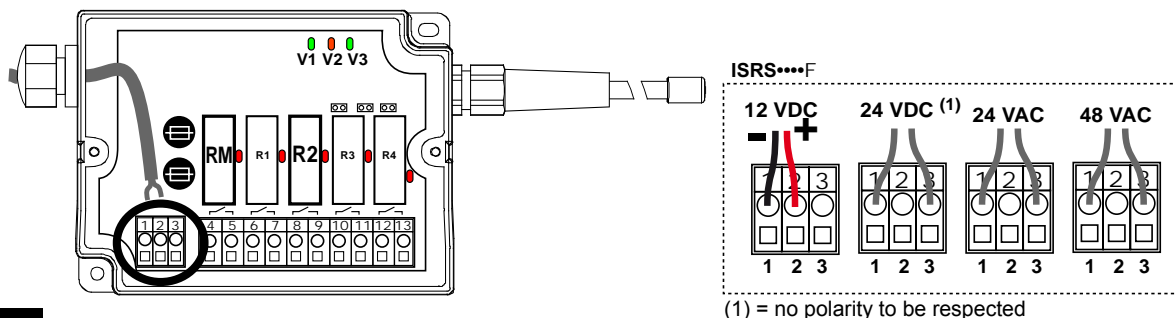
ISE transmitter power supply :



ISRA receiver or IST transceiver power supply :



ISRS receiver power supply :

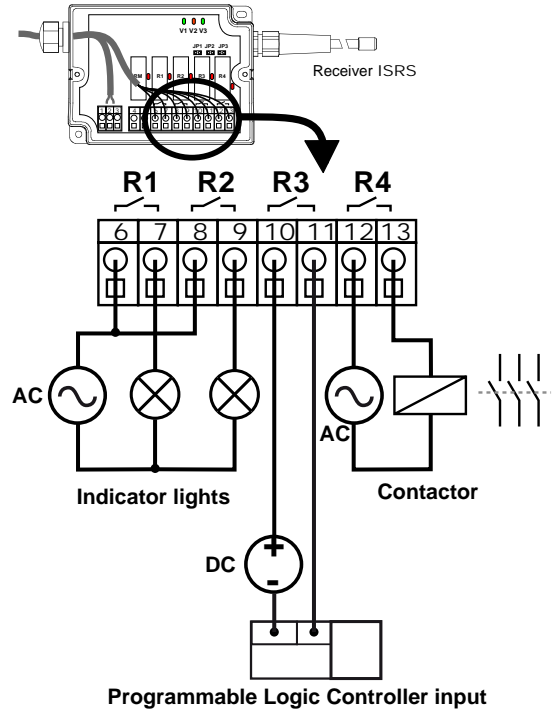
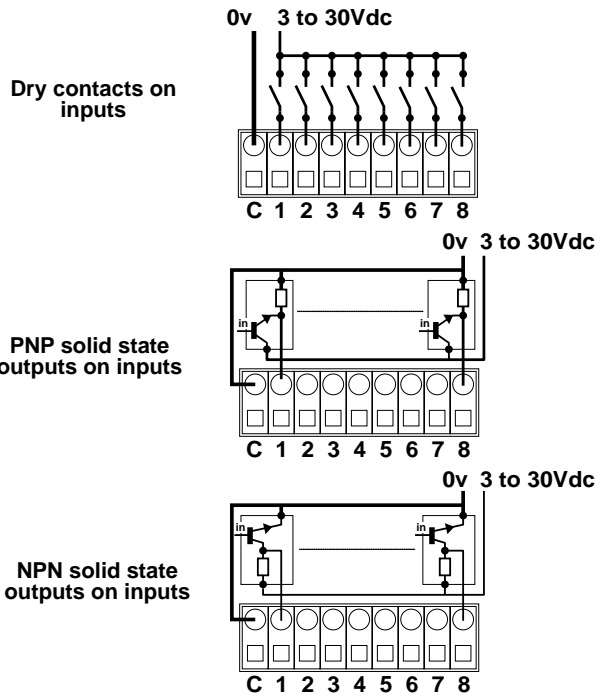
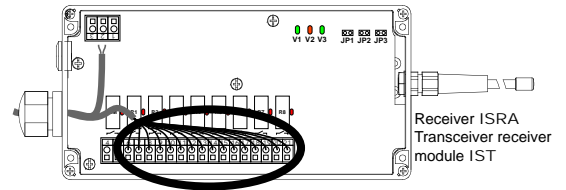
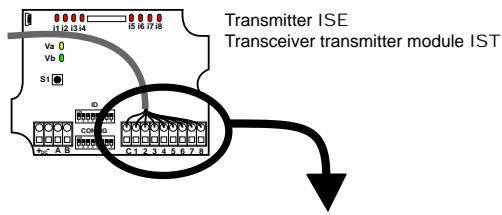


(1) = no polarity to be respected

Connection of inputs on transmitter or transceiver : Connection of outputs on receiver or transceiver :

Here are the various possibilities of input connections :

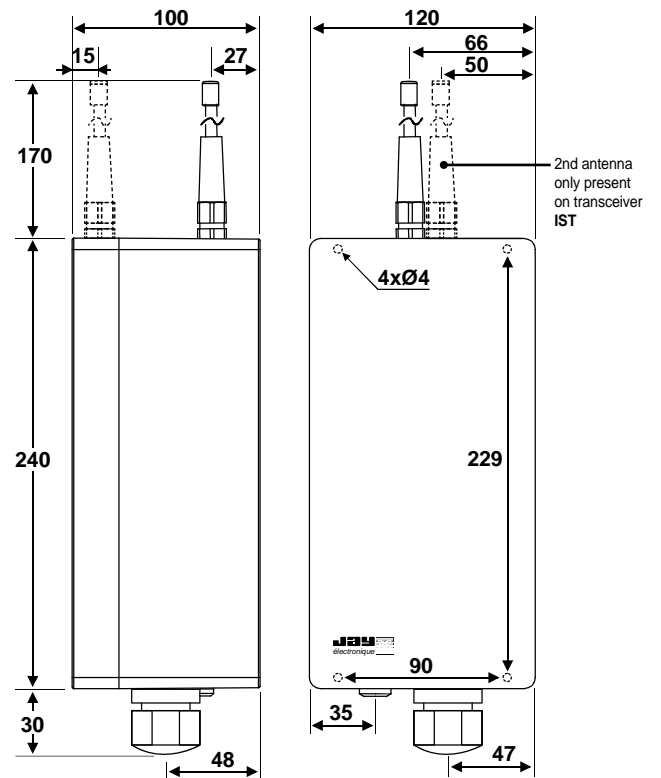
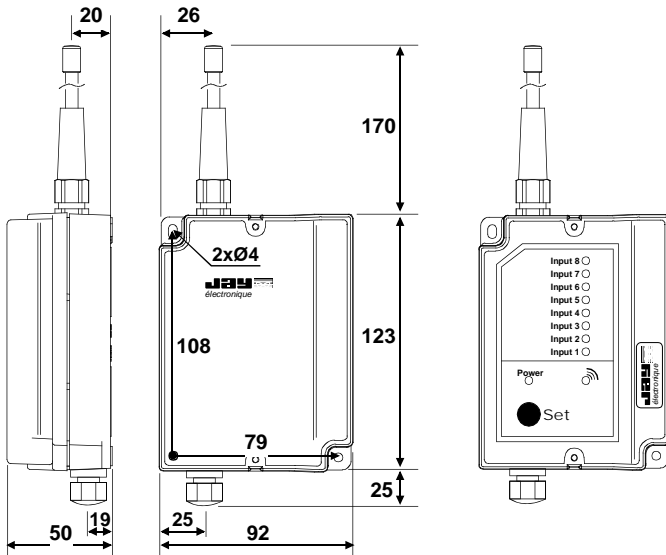
Example of use of the receiver relay outputs :



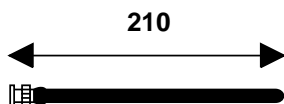
10- Dimensions

ISE transmitter and ISRS receiver :

ISRA receiver / IST transceiver :









VUB084 Plug-in BNC antenna :
(To be used with BNC kit ref. : OWR01)



11- Selection guide, references for ordering

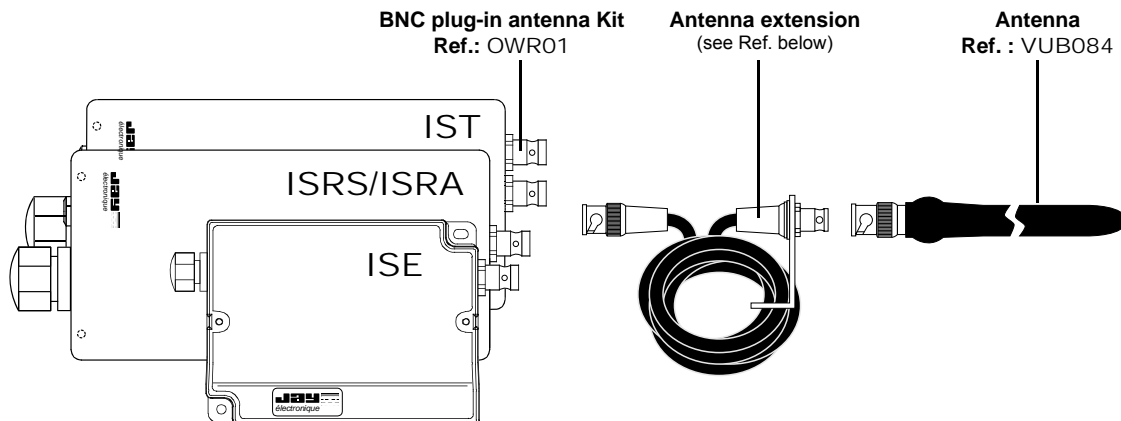
Sales references for ISIS units

References		Description
ISES8L14		Transmitter 8 Logic inputs, 433-434MHz, 12-24VDC
ISRS42L1F		Receiver 4 relay outputs, 433-434 MHz, 12-24VDC & 24-48VAC
ISRA82L14		Receiver 8 relay outputs, 433-434 MHz, 12-24VDC
ISRA82L1A		Receiver 8 relay outputs, 433-434 MHz, 24-48VAC
ISTA8L14		Transceiver 8 Logic inputs / 8 relay outputs, 433-434 MHz, 12-24VDC
ISTA8L1A		Transceiver 8 Logic inputs / 8 relay outputs, 433-434 MHz, 24-48VAC

Accessories :

External antenna :

Transmitters, receivers and transceivers are delivered with fixed antenna(s), if the optimum installation conditions are not observed (installation in cabinet, for example), it is necessary to use an external antenna with extension cord (BNC connector).



- OWR01BNC plug-in antenna Kit
- VUB084.....BNC plug-in antenna, 1/4 wave 433-434MHz
- VUB170.....0,5m extension (BNC connector), without bracket
- VUB105.....2m extension (BNC connector), with bracket
- VUB125.....5m extension (BNC connector), with bracket
- VUB131.....10m extension (BNC connector), with bracket

IMPORTANT :

JAY Electronique shall not be liable for use made of any other extensions or antennas other than those recommended above. The performance of the transmit antenna may not satisfy the requirements of the currently applicable standards.

Other accessories :

- UDWR38Fastening Kit for ISIS unit by 4 magnetic contacts (installation on metal surface)

The products presented in this document are subject to change. Product descriptions and characteristics are not contractually binding. Please go to our internet site www.jay-electronique.fr to download the most recent updates to our documentation.

E830 B - 1210

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