



SATEC

RX100 – Récepteur - Pour zones à risques ATEX

RX100 – Receiver – For Ex-hazardous areas

RX100 radio receiver provides solutions to the wide range of functional needs involved in secure industrial applications. This highly flexible product integrates today's cutting edge technology for optimum performance. This receiver is designed for use in zone 1, 2, 21 and 22 explosible atmospheres.

MAIN FEATURES:

- > Modular unit with a large choice of functions
- > Configurable, intelligent bi-directional radio link exchanges information while adapting to the radio environment.
- > Internal, unique SIM card contains all the receiver and transmitter parameters linked to the application, and:
 - allows a transmitter to associate to a receiver by recovering the application configuration,
 - allows you to quickly replace a receiver if necessary.
- > Quick and easy product configuration by mini-B USB connector and thanks our software (labels, feedback information, alarms, mapping for control devices and outputs, interlockings, network functions, access PINs codes).
- > Cable glands on receiver for easy installation.
- > Spring-type, plug-in terminal strips facilitate wiring and maintenance



BUREAU
VERITAS

ATEX manufacturer 2014/34/EU

EC type certificate issued by LCIE

FULLY COMPLIANT WITH SAFETY AND SECURITY STANDARDS:

Machinery directive 2006/42/EC:

Emergency stop

> SIL 3 per EN 61508

> Performance level PL e
per EN ISO 13849-1 and -2

EC type certificate issued by TÜV
NORD



Radio and telecommunication terminal
equipment

(low voltage, electromagnetic
compatibility, radio spectrum)





FCC part 15

ARCEP certificate

Radio Equipment Directive (RED)

DEFINITION OF MARKINGS ON ATEX - IECEx PRODUCTS

Since April 20, 2016, all Ex products must satisfy the requirements of the directive ATEX 2014/34/UE, the evolution of the standard 60079-0 leads to a new product marking presented in the following tables :

Transceiver + cable link	Transceiver	Connection interface unit	Output BNC antenna kit with intrinsic safety barrier
 <p> 1 2 3 C € 0081 Ex II 2 (1) GD 4 5 6 7 Ex d [ia Ga] IIB T6 Gb 8 9 10 7 Ex tb [ia Da] IIIC T85°C Db 14 Um ≤ 125 VAC 13 Uo:5.9V ; Io:210mA, Po:310mW Co:1000µF ; Lo:3.22mH, Lo/Ro: 460µH/Ω LCIE 14 ATEX 3005 X 11 IECEX LCIE 14.0014 X 12 </p>	 <p> 1 2 3 C € 0081 Ex II 2 GD 4 5 6 7 Ex d IIB T6 Gb 8 9 10 7 Ex tb IIIC T85°C Db 14 Um ≤ 250 VAC LCIE 14 ATEX 3005 X 11 IECEX LCIE 14.0014 X 12 </p>	 <p> 1 2 3 C € 0081 Ex II 2 GD 4 5 6 7 Ex e IIC T6 Gb 8 9 10 7 Ex tb IIIC T85°C Db LCIE 14 ATEX 3011 X 11 IECEX LCIE 14.0013 X 12 </p>	 <p> 1 2 3 C € 0081 Ex II 1 GD 4 5 7 Ex ia IIC Ga 8 9 7 Ex ia IIIC Da Ex I M1 Ex ia I Ma LCIE 14 ATEX 3004 U 11 IECEX LCIE 14.0006 U 12 </p>

Below are the tables to understand the ATEX marquing :

1 Device group

Device group	Application
Group I	Electrical devices intended for use in firedamp mines. (underground work in the mines and parts of ground installations) => Protection against firedamp
Group II	Electrical devices intended for all other explosible atmospheres than firedamp mines (ground industries) => Protection against explosions

2 3 ATEX classification

Category of equipment	Flammable substances	Degree of protection	Description
1	G Gas D Dust	Very high level	Devices capable of operating in the atmospheres where the risk of explosion is permanent or almost permanent (zones 0, 1, 2 and 20, 21, 22)
2	G Gas D Dust	High level	Devices capable of operating in the atmospheres where the risk of explosion is frequent (zones 1, 2 and 21, 22)
3	G Gas D Dust	Normal	Devices capable of operating in the atmospheres where the risk of explosion is occasional (zones 2 and 22)

(.) : The information in brackets indicates that it is possible to connect the cable link option to an operator module which is certified in category 1.

4 Protection modes for electrical equipment in gaseous atmospheres

Protection mode		Standard	Basic principle	Application in ZONE		
				0	1	2
d	Explosion proof enclosure	ENIEC 60079-1	The extremely heavy duty enclosure contains the explosion inside the device. The explosion proof seals of the device prevent any propagation of the flame outside the enclosure. The seals are regularly serviced.		●	●
e	Enhanced safety	ENIEC 60079-7	The components inside the enclosure must not produce arcs, sparks or dangerous temperatures under normal utilization conditions. The enclosure must be tight to IP 54 and withstand impacts.		●	●
i	Intrinsic safety	ia ENIEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●	●
		ib ENIEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.		●	●
m	Encapsulation	ENIEC 60079-18	For this protection mode, all the electronics is encapsulated in an insulating material to prevent electrical arcs or electrical sparks.		●	●
n	Zone 2	ENIEC 60079-15	This protection mode is only suitable for devices intended for zone 2 where the risk of explosion is low. It combines the enhanced safety mode "e" with lower protection requirements.			●
o	Immersion in oil	ENIEC 60079-6	The material or the electrical circuit is immersed in oil. The explosive mixture is located above the liquid and cannot be ignited by the electrical circuit.		●	●
p	Internal overpressure	ENIEC 60079-2	A pressurized gas is introduced in the enclosure to prevent the possibly-explosive surrounding atmosphere from entering the enclosure.		●	●
q	Powdery filler	ENIEC 60079-5	For this protection mode, all the electronics is encapsulated in an inert powdery material to prevent electrical arcs or electrical sparks.		●	●

[] : The information in brackets indicates the type of protection and the level of protection for the cable link option.

5 Classification of gases and fumes by explosion groups (non-exhaustive list)

Group IIA		Group IIB		Group IIC
Propane	Acetone	Ethylene	Ethyl oxide	Acetylene
Ethane	Hexane	Diethylene	Sulphuretted hydrogen	Hydrogen
Butane	Methanol	Ethyl ether	Ethanol	Carbon disulfide
Benzene	Paint thinners	Cyclopropane		
Pentane	Natural gas	Butadiene 1-3		
Heptane		Propylene oxide		

6 Gas temperature classes

The safe use of equipment in dangerous areas requires knowledge of the gas group and compare the temperature auto-ignition of gaseous mixtures treated to the temperature of equipment marking.

The maximum surface temperature of the material must always be less than the autoignition temperature of the gas present in the dangerous area.

Temperature class	MAXIMUM surface temperature of electrical equipment	Ignition temperatures of FLAMMABLE materials
T1	450°C	> 450°C
T2	300°C	> 300°C
T3	200°C	> 200°C
T4	135°C	> 135°C
T5	100°C	> 100°C
T6	85°C	> 85°C

7 Equipment protection level (EPL)

Traditional relationship between level of protection and areas / categories (without additional risk assessment).

Equipment protection level (EPL)	Normal range of application	Category (2014/34/UE)
Ga	0 (and 1 and 2)	1G
Gb	1 (and 2)	2G
Gc	2	3G
Da	20 (and 21 and 22)	1D
Db	21 (and 22)	2D
Dc	22	3D
Ma / Mb	mines	M1 / M2

8 Protection modes for electrical equipment in dusty atmospheres

Protection mode			Standard	Basic principle	Application in ZONE		
					20	21	22
i	Intrinsic safety	ia	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.	●	●	●
		ib	EN/IEC 60079-11	The actual design of the circuit, where the energy is limited at the entry by a Zener barrier or a galvanic insulator makes it impossible for arcs or electrical sparks to form, subdivided into "ia" resists 2 defects: suitable for zone 0, and "ib" resists 1 defect: suitable for zones 1 and 2.		●	●
m	Encapsulation		EN/IEC 60079-18	For this protection mode, all the electronics is encapsulated in an insulating material to prevent electrical arcs or electrical sparks.		●	●
p	Internal overpressure		EN/IEC 60079-2	A pressurized gas is introduced in the enclosure to prevent the possibly-explosive surrounding atmosphere from entering the enclosure.		●	●
t	Explosion proof enclosure		EN/IEC 60079-31	The extremely heavy duty envelope contains the explosion inside the device. The explosion proof seals of the device prevent any propagation of the flame outside the enclosure. The seals are regularly serviced.		●	●

9 Classification of dust by explosion groups

Explosion groups	Type of dust	Fundamental principle
Group IIIA	Combustible dust in suspension	Very fine solid particles of nominal size of about 500 microns or less, can be suspended in the air, which can be deposited because of their own weight and that can burn or be consumed in the air and are susceptible to form explosive mixtures with air under conditions of atmospheric pressure and normal temperature.
Group IIIB	Non-conductive dust	Combustible dust electrical resistivity greater than $10^3 \Omega.m$. Size < 500 μm
Group IIIC	Conductive dust	Combustible dust electrical resistivity at or below $10^3 \Omega.m$. Size < 500 μm

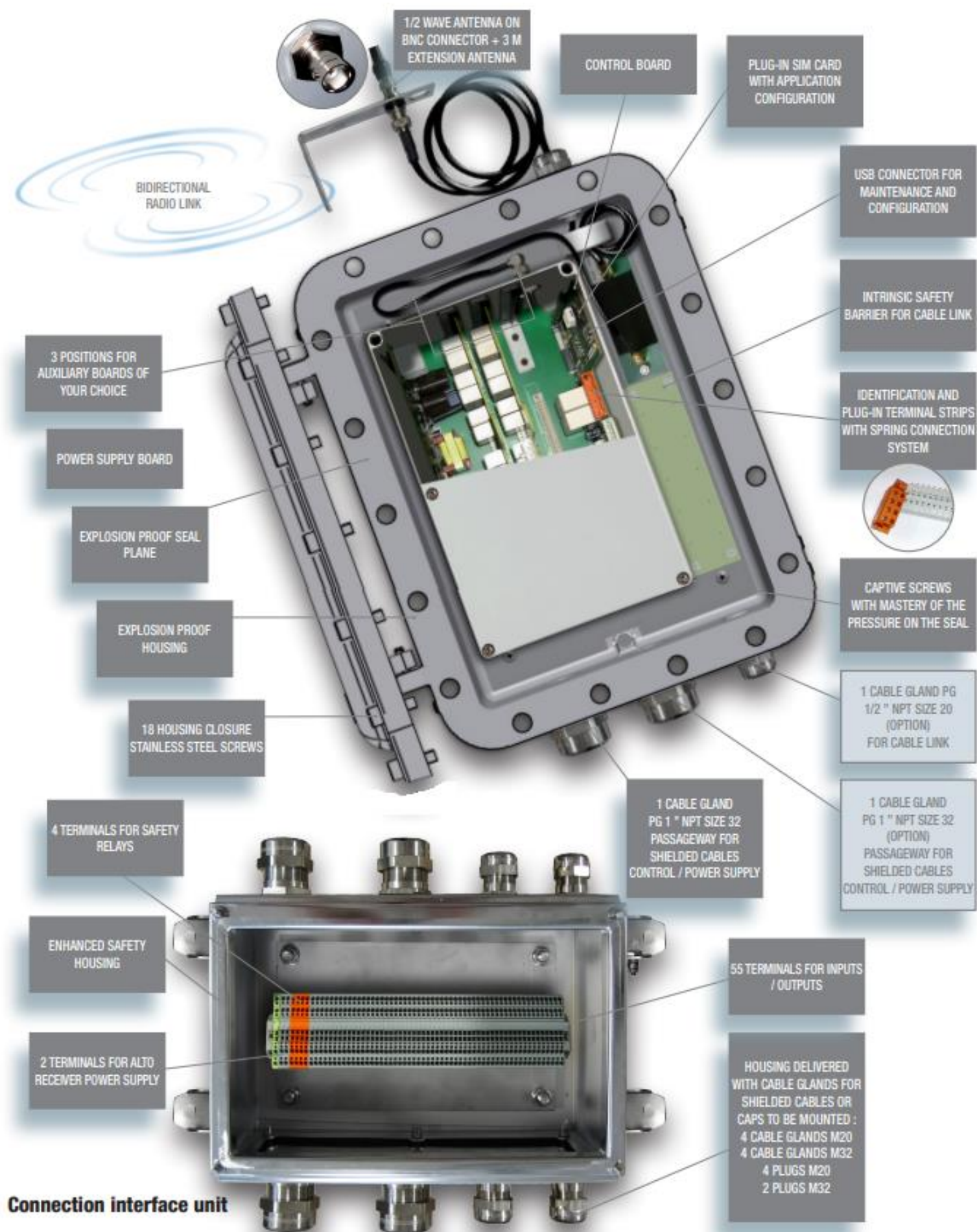
10 Maximum surface temperature for dusty atmospheres

11 LCIE : certificate of EC type examination number

12 LCIE : IECEx certificate number

13 Intrinsic safety parameters of cable link

14 Maximum power supply voltage



DESCRIPTION

The modular receiver is formed by boards which connect into the unit's motherboard.

The unit is systematically equipped with :

- > 1 power supply board
- > 1 control board containing safety relays RS1 & RS2 / On relay / Auxiliary relay / 1 logic input / 1 analog input / 1 RS485 Modbus serial link
- 3 positions are provided to receive, in accordance with your application :
 - > 1 board with 12 On/Off relays
 - > 1 board with 12 logic inputs + 2 analog inputs
 - > 1 board with 6 analog outputs + 1 bypass output
- > 1 BUS board

Wireless HMI Control (WHC)

Displaying text messages or graphic images on the screen of the transmitter from CANopen or Modbus network.

TECHNICAL CHARACTERISTICS

MECHANICAL CHARACTERISTICS AND ENVIRONMENTAL WITHSTAND CAPACITY

Housing material	Aluminium alloy marine grade
Tightness	IP 66
Weight	26kg (approx.)
Dimensions	340 x 415 x 258,3 mm max (without antenna)
Operating temperature range	-20°C to +55°C
Storage temperature range	-30°C to +70°C
Cable lead-out	- 1 cable gland PG 1" NPT Size 32 passageway for shielded control cables / power supply - 1 cable gland PG 1" NPT Size 32 passageway for shielded control cables / power supply (in OPTION) - 1 cable gland PG 1/2" NPT Size 20 for cable link (in OPTION)
Cable gland material	Brass with nickel plating
Wiring connection	Spring-type plug-in connectors

RADIO CHARACTERISTICS

Frequency	- 64 programmable frequencies on 433-434 MHz band - 12 programmable frequencies on 869 MHz band - 64 programmable frequencies on 911-918 MHz band
Transmit power	< 10 mW (license free)
Modulation	FM
Antenna	plug-in antenna on BNC connector
Average range (1)	100 m in industrial environment 300 m in open space

ELECTRICAL CHARACTERISTICS OF POWER SUPPLY BOARD

Power supply voltage	- 115-230VAC (-15% / Max voltage = $U_{in} \leq 250VAC$, Max current = $I_{in} \leq 4A$ per connection) (2) - 24-48VAC (+/- 25%) - 12-24VDC (+/- 15%)
Maximum consumption	15 W
USB interface	mini-B 5-contact USB connector
Indication	- yellow indicator lights : power on
Number of relays	30
controllable according to power supply	

ELECTRICAL CHARACTERISTICS OF CONTROL BOARD

Contact type	2 relays with linked contacts
Contacts and connection	3 connection points, 1 Contact Spring-type plug-in connectors
Indication	- 1 green indicator light : Radio status and quality - 1 yellow indicator light : Power on - 1 red indicator light : fault and diagnostic
Active stop time	100 ms
Passive stop time	adjustable 0.5 to 2 sec

ON CONTROL BOARD

1 Logic input

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
1 active input consumption	< 10mA
Voltage	0 to 30VDC
Lowlevel on input	< 2VDC
Highlevel on input	> 3VDC

1 Analog input

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Max. input level	10V or 4-20mA
1 active input consumption	< 12mA

1 RS485 serial link

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Protocol	Modbus RTU slave
Data rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps
Parity	none / even / odd
Slave address	1 to 247

ADDITIONAL OPTIONS

ELECTRICAL CHARACTERISTICS OF BOARD WITH 12 CONTROL RELAY OUTPUTS

Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Outputs	Independent relays - Category DC13 0,5A / 24VDC, AC15 2A / 230VAC - Interrupting capacity: 2000VA - Max. current: 6A (control relay), 6A (safety relay) - Min. current: 10 mA (12 Vmin.) - Max. voltage: 250VAC - On startup: 0.5s max - On command: 200ms typical
Response time	

ELECTRICAL CHARACTERISTICS OF BOARD WITH 12 LOGIC INPUTS + 2 ANALOG INPUTS

Logic inputs	
Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
1 active input consumption	< 10mA
Voltage	0 to 30VDC
Low level on input	< 2VDC
High level on input	> 3VDC
Analog inputs	
Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Max. input level	10V or 4-20mA
1 active input consumption	< 12mA

ELECTRICAL CHARACTERISTICS OF BOARD WITH 6 ANALOG OUTPUTS + 1 BYPASS OUTPUT

Analog outputs	
Contacts and connection	2 connection points, 1 Contact Spring-type plug-in connectors
Output level	0 / 10V -10V / 0 / +10V 3V / 0V / 9V 6V / 12V / 18V
Voltage output	
max. current	10mA

ELECTRICAL CHARACTERISTICS OF BOARD WITH OUTPUT BUS

CANopen slave compliant CJA 401	
Connection	2 connection points, Spring-type plug-in connectors
Data rate	20, 50, 100, 125, 250, 500, 800 kbaud/s and 1 Mbaud/s
Slave address	1 to 127

RECOVERY CONTROL BY CABLE LINK COMPATIBLE WITH PIKA AND MOKA TRANSMITTERS

EQUIPMENT SYNCHRONIZATION

(1) Range varies according to environment conditions around transmitter and reception antenna (steel works, metal walls ...).