



RADIO MODULES

Z-LINK1-NM, Z-LINK1-LO, Z-AIR-1, RM169-1, RTURADIO-169

With its experience in interface technology, the SENECA proposal for radio and radiomodem modules is one of the key elements of automation and communication systems, in particular in the transport of signals from a few meters to tens of kilometres. The use of UHF / VHF devices allows the reaching of distances of multiple km with maximum reliability.

It also allows remote control functions, remote interrogations and diagnostics of devices in the field through point-to-point and multipoint connections, broadcasting, signal repetition.

The Radio devices comply with the essential requirements of the RED Directive (Radio Equipment Directive) 2014/53/EU and can be freely marketed within the European Union.

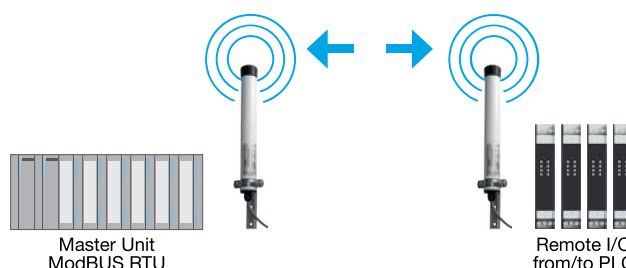
Modulation NBFM / GFSK 	Interfaces RS232/RS485 	Vac/dc extended power supply 	I/O integrated 	Transmission power 25..500 mW 	Technologies ModBUS and LoRa Modbus LoRa	Operating bands 169/869 Mhz 	Versions for outdoors and for extreme environments
--------------------------------------	--------------------------------------	---	---------------------------	---	--	---	---

Z-AIR-1 ANTENNA WITH RADIOMODEM 868 - 870 MHZ INTEGRATED

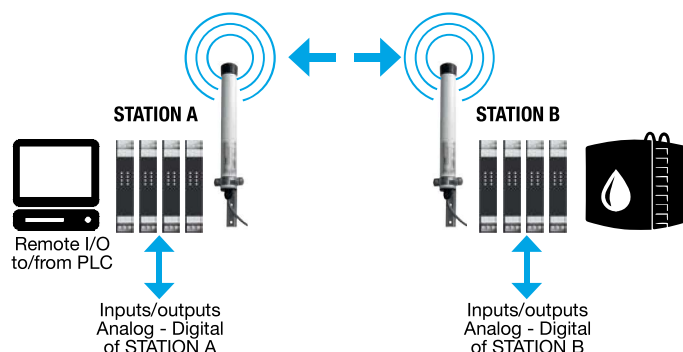


Radio frequency: License free
External protection degree: IP65
Configuration: Via software (Z-AIR-1-SETUP)
Axial antenna: Incorporated
Power supply: 8-32 Vdc
Operating band: 868 - 870 MHz
Modulation: NBFM / GFSK
Transmission power: 25 / 150 / 500 mW
Integrated I/O
Interfaces: RS485
Operating mode:
 Point-to-Point, Point-to-Multipoint, Broadcasting, Digipeater, LBT (Listen Before Talk), Agility

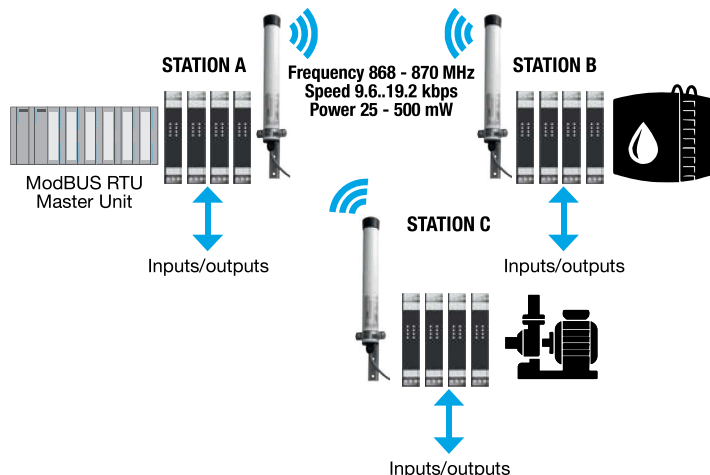
Data transmission from Master controller



Trasmissione dati punto-punto (es. Ripetizione I/O)



Point- multipoint data transmission



Glossary

AGILITY

A system that combines multiple radio communication technologies with security systems, alarm management, remote control, web applications and smartphones.

BROADCASTING

Transmission of information from a transmitting system to a set of receiving systems not defined a priori, typically by a radio transmitter of great power and with a high number of receivers. Broadcast transmission is unidirectional.

The information is sent from the transmitter to the receivers, without a return channel and without security that the same can be delivered.

DIGIPEATER (Digital repeater)

Use of the device for the receipt and retransmission of a signal typically at a higher power so that its propagation can be guaranteed even over long distances or to overcome obstacles without excessive attenuation / degradation of the signal.

GFSK (Gaussian Frequency Shift Keying)

Numerical frequency modulation technique or scheme, in which the modulating signal containing information shifts the frequency of the carrier in output from one to the other of two predetermined values.

LBT (Listen Before Talk)

Data transmission technique in which the initial monitoring on the radio channel is foreseen. If this is occupied by another transmitter, it cannot be transmitted. In the licensed bands, the radio station scheduler decides who to allocate the transmission resources to.

NBFM (Narrow Band Frequency Modulation)






Narrowband modulation able to reduce disturbances on the frequency of interest by reducing the receipt channel of the radio receiver and consequent limitation of the listening channel.

POINT-TO-MULTIPOINT

Connection mode in which a single network segment communicates with multiple stations serving a series of users (clients) from a central location.

POINT-TO-POINT

ISO/OSI model link level network protocol, commonly used to establish straight line connections between two nodes.

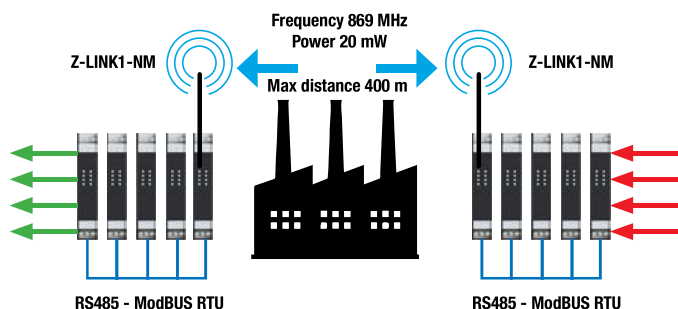
	Z-LINK1-NM	Z-LINK1-LO	Z-AIR-1	RM169-1	RTURADIO-169
					
	869 MHz radio modem with RS232/RS485 interface	869 MHz radio modem with RS232 / RS485 interface and LoRa technology	Radiomodem simplex/half duplex, 868 - 870 MHz with integrated antenna	Radiomodem 169 MHz, aluminium case, RS232/RS485 interface	Radiomodem 169 MHz, aluminium housing, integrated I/O, RS485 interface
GENERAL DATA					
Power supply	10..40 Vdc; 19..28 Vac	10..40 Vdc; 19..28 Vac	9..32 Vdc	9..32 Vdc	9-32 Vdc with limited power source; 3.3-4.8 Vdc with battery power supply
External modules supply	No	No	No	No	Yes
Absorption	1W @ 12 Vdc	1W @ 12 Vdc	30 mA (Rx) / 200 mA (Tx) @ 12Vdc	30 mA (Rx) / 200 mA (Tx) @ 12Vdc	30 mA (Rx) / 600 m (Tx); <10 µA (DTR OFF)
State indicators	Power Supply / Error / Rx Tx Data	Power Supply / Error / Rx/Tx Data	ONAIR/On	ONAIR / On / Data	ONAIR / On / Data / I/O
Operating band	g3, annex 1 ERC 70-03 (869.4 MHz – 869.650 MHz)	g3, annex 1 ERC 70-03 (869.4 MHz – 869.650 MHz)	868 – 870 MHz	169.400 – 169.475 Mhz	169.400 - 169.475 MHz
N° canali			3 @ CH 25 kHz , 6 @ CH 12.5 kHz – European Resolution 2005/928/EC	3 @ CH 25 kHz , 6 @ CH 12.5 kHz – European Resolution 2005/928/EC	3 @ CH 25 kHz , 6 @ CH 12.5 kHz – European Resolution 2005/928/CE
Channelling			12.5 kHz or 25 kHz	12.5 kHz or 25 kHz	12.5 kHz or 25 kHz
Modulation	GFSK	DSSS	9K00F1D (@ 12.5 kHz of channelling); 18K00F1D (@ 25 kHz of channelling)	9K00F1D or 18K0F1D (NBFM / GFSK)	9K00F1D or 18K0F1D (NBFM / GFSK)
Data speed (radio)	-	-	9.6 kbps (@ 25 kHz of channelling); 19.2 kbps(@50kHz of channelling)	4.8 kbps (@ 12.5 kHz of channelling); 9.6 kbps (@ 25 kHz of channelling); 19.2 kbps(@50kHz of channelling)	4.800 bps @ 12.5 kHz – 9.600 bps @ 25 kHz
Frequency stability	-	-	± 1 ppm/°C	±500 Hz	±500 Hz
Encryption	AES 128 bit	AES 128 bit	AES 128 bit	AES 128 bit	AES 128 bit
RTC	-	-	-	Integrated on board for custom applications	Integrated on board for custom applications
Antenna	ANT Mag (standard) SMA male , ANT-LINK1-MG (opt)	ANT Mag (standard) SMA male , ANT-LINK1-MG (opt)	λ/2 integrated	λ/4 - λ/2 or 3 elements Yagi	Short vertical stylus λ/2 / λ/4 / Yagi with 3 elements
Connectors	RJ10 connector for RS232 serial port Connector for antenna Stereo jack connector for programming IDC10 connector for Seneca bus Screw removable terminals for conductors, 3-way	RJ10 connector for RS232 serial port Connector for antenna Stereo jack connector for programming IDC10 connector for Seneca bus Screw removable terminals for conductors, 3-way	9-pin connector for VCC/GND/RTX/RS 485/On air/GND and PWR ON	Screw removable terminals	Screw removable terminals
Dimensions	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	Ø 40 x L 320 mm	90 x 100 x 40 mm	140 x 110 x 50 mm
Operational Temperature	0..55°C	0..55°C	-30..+70 °C	-30..70°C	-30..70°C
Weight	200 g	200 g	750 g	210 g	330 g
Container	PA6, black	PA6, black	IP65 Fibreglass	Aluminium	Aluminium
Degree of protection	IP20	IP20	IP65 (suitable for outdoor installation)	IP20	IP20
Assembly	DIN Guide 35 mm (IEC IEN 60715)	DIN Guide 35 mm (IEC IEN 60715)	Wall mounting bracket stainless steel (included)	On plate/wall	On plate/wall
Integrated I/O	-	-	-	No. 1 Digital Input, 5-24 Vdc or 3.50-20 Vac, Zinp. 2.2 kΩ (opto-isolated) Nr.1 Relay output, N.O. 28 Vac @ 0.5 A or 60 Vdc @ 1 A	No. 4 Digital Inputs, No. 4 PNP 0-12 Vdc + 1 Counter 10Hz Nr. 2 Relay outputs, N.O. 28 Vac @ 0.5 A or 60 Vdc @ 1 A Nr.2 Analog inputs (4-20 mA) Nr.2 Analog outputs (4-20 mA)
Mode of operation	Point-to-point, Point-to-multipoint, I/O repeater	Point-to-point, Point-to-multipoint, I/O repeater, Bridge, Remote IO	Point-to-point, Multipoint, broadcasting, digirepeat; routing table support for addressing	Point-to-point, Multipoint, broadcasting, digirepeat; routing table support for addressing	Point-to-point, point-to-multipoint, broadcasting, Modbus (master/ slave), support for Mesh networks (static)
Programming	EASY SETUP, DIP-switch	EASY SETUP, DIP-switch	Z-AIR SETUP	RM169-SETUP	RTURADIO-SETUP
COMMUNICATION					
Interfaces	No.1 RS232, No. 1 RS485	No.1 RS232, No. 1 RS485	RS485	RS232 / RS485	RS485
Protocol	ModBUS RTU	ModBUS RTU	Transparent to the protocol (max 1024 buffer bytes)	Transparent to the protocol (max 1024 buffer bytes)	Transparent to the protocol (max 448 buffer bytes)
Data speed	From 1,200 to 115,200 bps	From 1,200 to 115,200 bps	From 1.2 to 57.6 kbps	From 1.2 to 57.6 kbps	From 2,400 to 57,400 bps
Output power	20 mW	40mW	25/150/500 mW based on the operational sub-band	0.2 WERP - 0.5 WERP	500 mWERP
Receiver	-	-	CLASS 2 - LBT and AGILITY BER <10 ⁻³ @ 9,600 bps < -107 dBm @ 25 kHz	CLASS 2 - LBT and AGILITY <-110 dBm @ 12.5 kHz - <-107 dBm @ 25 kHz BER 10-2	CLASS 1 - LBT and AGILITY <-110 dBm @ 9,600 bps
Communication Mode / Data Format	Half Duplex	Half Duplex	Simplex Half - Duplex / asynchronous communication	Simplex or half-duplex	Simplex or half-duplex
Coverage	Up to 400 m in free field with BER <10-3 @ 57.6 kbaud (fixed conditions in free zone and with antenna 2 m above ground)	Up to 1,000 m in free field with BER <10-3 @ 9.6 kbaud (fixed conditions in free zone and with antenna 2 m above ground)	Up to 7 km in open field with directive antenna in a dominant position	Up to 10 km in open field with directive antenna	Up to 10 km in open field with directive antenna
STANDARD					
Approval	CE, ETSI	CE, ETSI	EC	EC	EC
Regulations	ETSI EN 300 220-2 V2.1.2 (2007-06) ETSI EN 301 489-3 V1.4.1 (2002-08) CEI EN 61010 Electromagnetic compatibility directive 2004/108/EC Low Voltage equipment directive 2006/95/EC ERC REC 70-03	ETSI EN 300 220-2 V2.1.2 (2007-06) ETSI EN 301 489-3 V1.4.1 (2002-08) CEI EN 61010 Electromagnetic compatibility directive 2004/108/EC Low Voltage equipment directive 2006/95/EC ERC REC 70-03	EN 50401, EN 60950-1, EN 301489-1/3, EN 300220-1/2 v 2.3.1, ERC 70-03, RED Directive (Radio Equipment Directive) 2014/53/UE, Direttiva 1999/5/CE, 2012/19/EU Directive	EN 300 220-1 v2.3.1 , EN 300 220-2 v2.3.1, RED Directive 2014/53/EC	EN 300 220-1 v2.3.1 EN 300 220-2 v2.3.1

The technical data and the diagrams in this document are indicative and not binding.

APPLICATION EXAMPLES

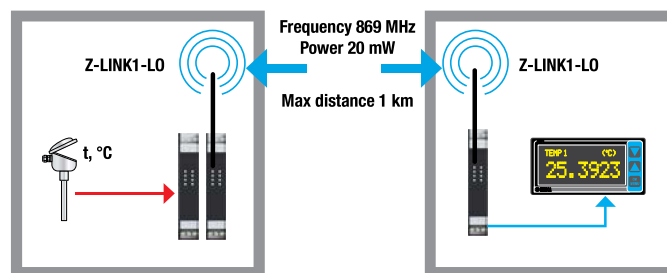
Z-LINK1-NM

CONVERSION AND RETRANSMISSION OF ANALOG SIGNALS



Z-LINK1-LO

«SHORT RANGE» SIGNAL REPETITION



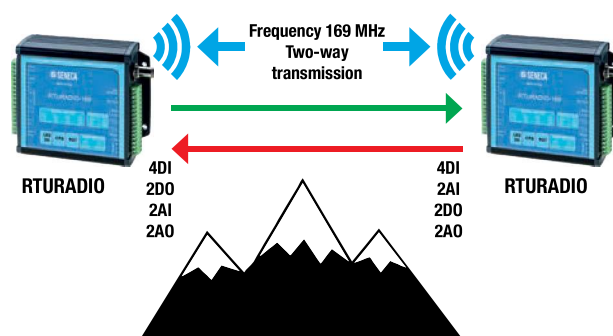
RM169-1

EXPANSION MODBUS I/O - POINT / MULTI-POINT



RTURADIO

MIRRORING I/O - REPLICA REMOTELY OF SIGNALS



ORDER CODE

Code	Description
Z-LINK1	
Z-LINK1-NM	869 Mhz radio modem with RS232/RS485 interface
Z-LINK1-LO	869 MHz radio modem with RS232 / RS485 interface and LoRa technology
CS-RJ10-DB9F	Serial cable RS232 serial cable (RJ10 / DB9F)
Z-PC-DIN2-17.5	Support for rapid assembly on DIN guide 2 slot pitch 17.5 mm
Z-PC-DINAL2-17.5	Support for rapid assembly on DIN guide head + 2 slot pitch 17.5 mm
A-DIR-10-869	Directive external antenna for 10 elements UHF 824-960 MHz
A-DIR-6-869	Directive external antenna for 6 elements UHF 824-960 MHz
ANT-LINK1-MG	SMA 4 dbi dual band magnetic outdoor antenna, 2.5 m cable
EASY SETUP	Configuration software
Z-AIR	
Z-AIR-1	Radiomodem 868-870 MHz with integrated antenna, IP65 protection degree, RED directive
S107USB	Serial converter USB/RS485 portable
Z-AIR-1-SETUP	Z-AIR radiomodem configuration software
RM169-1	
RM169-1	Radiomodem 169MHZ 0.2W, 1DI,1DO,1 RS485 BNC F connector, RED directive
RM169-1-169DV12	Radiomodem 169MHZ 0.2W, 1DI,1DO,1 RS485 + antenna dip. vert. $\lambda/2$ (A-169DV12) and 5 m. cable RG58U
RM169-1-169YAGI	Radiomodem 169MHZ 0.2W, 1DI,1DO,1 RS485 + antenna Yagi 3 elements (A-169DVYAGI) and 10m. cable RG58U
RM169-1-169DV14	Radiomodem 169MHZ 0.2W, 1DI,1DO,1 RS485 + antenna stylus vert. $\lambda/4$ (A-169DV14)
A-169DV12	Antenna 169MHz, vertical dipole $\lambda/2$, BNC M, 5 m low loss cable, bracket
A-169DV14	Antenna 169MHz, vertical stylus $\lambda/4$, BNC M, L=450 mm, without cable
A-169YAGI	Antenna 169MHz, Yagi with 3 elements, BNC M, 10 m low loss cable, bracket
RM169-SETUP	RM169 radiomodem configuration software
RTURADIO-169	
RTURADIO-169	Rtu Radio 169MHZ 0.5W, 4DI, 2 DO, 1 meter,2 AO,2 AI,1 RS485, BNC-F connector
RTURADIO-169DV14	Rtu Radio 169MHZ 0.5W, 4DI, 2 DO, 1 meter,2 AO,2 AI,1 RS485, connector BNC-F+front stylus vert. $\lambda/4$ (A-169DV14)
RTURADIO-169DV12	Rtu Radio 169MHZ 0.5W, 4DI, 2 DO, 1 meter,2 AO,2 AI,1 RS485, connector BNC-F+front dip. vert. $\lambda/2$ (A-169DV12)+5m cable
RTURADIO-169YAGI	Rtu Radio 169MHZ 0.5W, 4DI, 2 DO, 1 meter,2 AO,2 AI,1 RS485, connector BNC-F+front Yagi 3 elem. (A-169YAGI)+10 m cable
S117P1	Serial converter RS232-TTL-RS485/USB portable
RTURADIO-SETUP	RTURADIO radiomodem configuration software