

## NL-MRF-RX-CO2+RH | Receiver for wireless CO<sub>2</sub>/RH sensors

The receiver is used for receiving and processing measured data from wireless air quality sensors. One or more battery powered air quality sensors can be paired with the receiver.

Received data from sensors are converted to two independent analog outputs (one for CO<sub>2</sub> and second for RH). Complete data from all individual sensors are available via the RS485 serial line using the Modbus protocol. The receiver also has a pair of relays with NO-C-NC contact with the possibility of independent setting of relay trigger level for each monitored quantity by rotary selector. Set of wireless sensors consists of at least one or more battery powered wireless sensors and one receiver.

- › wirelessly receives measured values from up to 10 paired MRF sensors
- › 2x analog voltage/current output
- › 2x output relay, NO-C-NC contact
- › easy installation on a DIN rail
- › does not require maintenance during operation
- › long-term service life and stability

### Description

The receiver in connection with wireless sensors is used to control ventilation and heat recovery units. Based on the current air quality, the receiver then efficiently controls the ventilation systems.

Explanation of abbreviations and technical terms can be found on our website in the [Glossary](#) section.



For information on the communication protocol, use the document [NL-MRF-RX-modbus-communication](#).

### Technical data

Parameter	Value	Unit
Power supply	230	V AC
Power consumption	max. 2	W
Voltage outputs <sup>1)</sup>	2x 0 - 10	V DC
Current outputs <sup>1)</sup>	2x 0 - 20 / 4 - 20	mA
Max. switching voltage	250	V AC
Max. switching current	16	A AC
CO <sub>2</sub> relay hysteresis	100	ppm
RH relay hysteresis	5	% RH
Working humidity non condensing	0 - 95 %	RH
Working temperature	0 to +50	°C
Storage temperature	-20 to +60	°C
Expected lifetime	min. 10	years
Dimensions	110x62x53	mm

<sup>1)</sup> The desired type of analog output can be selected with jumpers.



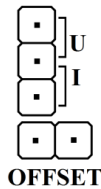
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### Receiver analog outputs

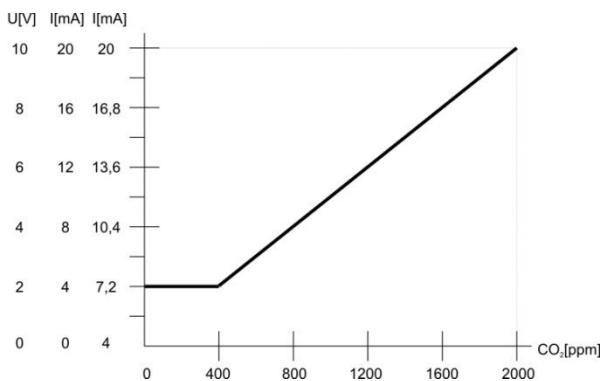
The receiver contains two separate analog outputs. Both of these outputs always correspond to the maximum value of the given monitored quantity from all connected sensors.

### Analog output type selection

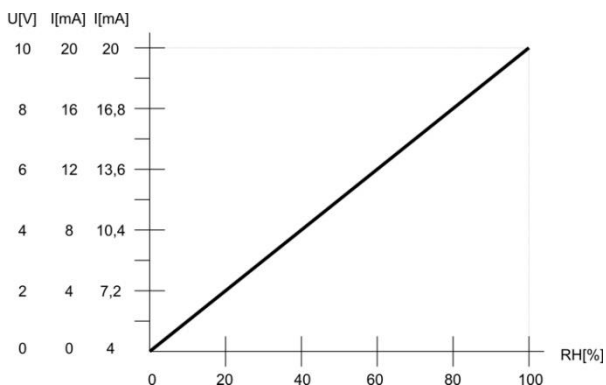
Jumper in U position – voltage output 0 to 10 V.  
Jumper in I position – current output 0 to 20 mA.  
Jumper in I and OFFSET positions at the same time, the 4 to 20 mA current output is selected.



### Output OUT1 - CO<sub>2</sub> analog signal



### Output OUT2 - RH analog signal



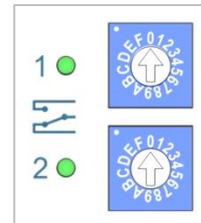
### Relays

The receiver is equipped with two NO-C-NC relays, one for ventilation control according to the current CO<sub>2</sub> concentration and the other for control according to the current relative air humidity. The relays switch when the set switching level is exceeded by the currently received value from any paired sensor of the same measured quantity.

### Relays switching levels

For the desired function of the relay, first it is necessary to set the switching level at which the relays will switch (separately for each relay). The switching levels are therefore set using a rotary selector - marked with the number of the corresponding output - for each relay separately.

Relay 1 switches according to CO<sub>2</sub>.  
Relay 2 switches according to RH.



### Assignment of switching values according to selectors

selector	1 - CO <sub>2</sub> [ppm]	2 - RH [%]
0	500	always OFF
1	600	10%
2	700	20%
3	800	30%
4	900	35%
5	1000	40%
6	1100	45%
7	1200	50%
8	1300	55%
9	1400	60%
A	1500	65%
B	1600	70%
C	1700	75%
D	1800	80%
E	1900	85%
F	2000	90%



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### LED indication

	RF	Lights up for 10s each time the receiver receives a valid telegram from any of the paired sensors.
	INFO	Together with POWER LED indicates the current status of the receiver.
	POWER	Lights up continuously when the receiver is running. In addition, together with the INFO LED, it also indicates the current status of the receiver.
	RELAY	LEDs of relay outputs 1 and 2. The corresponding LED lights up if the given output contact is closed. Output 1 corresponds to CO <sub>2</sub> . Output 2 corresponds to RH. The corresponding relay switches on when the preset value is exceeded.

### Description of indicated modes

time (s)		0	1	2	3	...	14	15	16	17
Normal mode	INFO					...				
	POWER					...				
Pairing mode	INFO					...				
	POWER					...				
No sensor is paired	INFO	- off continuously				...	- off continuously			
	POWER					...				
Sensor no. X has lost connection	INFO					...				
	POWER					...				
Number of pulses of INFO LED corresponds to the sensor number (in this example sensor no. 3), a delay follows and then the sensor no. is repeated.										

**Normal mode:** indicates, that the receiver is running and the broadcasting of all paired sensor is received.

**Pairing mode:** serves for pairing the wireless sensor with the receiver. Pairing will be indicated as soon as you put the receiver into pairing mode. Both LEDs flash until the sensor is paired or pairing mode is canceled.

**No sensor is paired:** POWER LED flashes, INFO LED is off. This state is indicated if there is no sensor paired with the receiver.

**Sensor number X has lost connection:** This mode is indicated in following cases.


- When the receiver has lost connection with a sensor (for example, due to the removal of batteries from the sensor or discharged batteries in the sensor or fundamental change in the position of the sensor).
- After turning on the power supply of the receiver to which the sensors are paired, this mode is indicated until the receiver receives valid data from all sensors in the longest expected time interval.

During this mode, the INFO LED indicates with the number of flashes the lowest serial number of the sensor affected by the loss of connection.



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### Pairing mode

Put the receiver in pairing mode by pressing the  button (for about 10s) until the corresponding LEDs will start to indicate the pairing mode.


Now we can trigger pairing on the sensor:

- Press and hold the PAIR button on the sensor until the sensor signals message was sent (about 10s).
- Then release the button and pairing is completed.


You can find out whether the sensor has been paired by the fact that the receiver indicates the reception of the pairing radio message with the RF indicator light and at the same time the receiver switches to and indicates the standard operating mode (the receiver automatically ends the pairing mode after successful pairing the sensor).

In the pairing mode, the receiver assigns a serial number 1-10 to individual sensors in ascending order, as sensors are gradually added.

### Cancelling the pairing mode

By briefly pressing the  button, pairing mode can be canceled at any time and the receiver will switch to normal mode.

### Unpairing sensors (deleting all paired sensors)

In pairing mode, press and hold the  button (for about 10s) until all LEDs on the receiver turn off for a moment. Then release the button. This will delete all previously paired sensors in the receiver. So then it is necessary to pair the selected sensors to the receiver again.

### Default settings

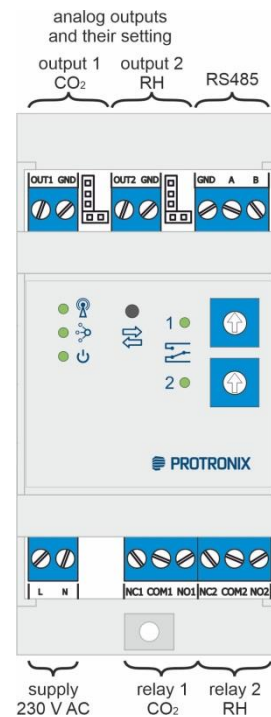
Analog output type 1 a 2: voltage 0 - 10V  
Relay 1 switching level: 1000 ppm CO<sub>2</sub>  
Relay 2 switching level: 65% RH

### Way to use

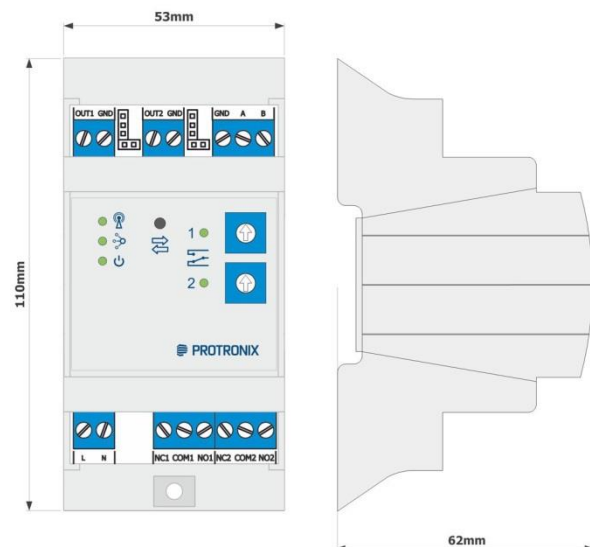
The product is intended for indoor use only. You can learn more about the [recommendations for sensor placement](#) on our web pages.

*The producer reserves the right of technical changes in order to product improvements its properties and functions without previous notice.*

### Terminals



### Dimensions



### End of product life

Discard the product in according to the electronic waste law and the EU directives.

