User Manual

WirelessReceiver

LSCONTROL

Wireless Receiver Highlights

Wireless receiver is used with our Wireless Sensors.

As most Air Handling Units (AHUs) and heat pumps are build in metal cabinets, which block the signal from wireless sensors, we are supplying the Wireless Receiver in and external box, which is placed outside the unit and thereby works as an antenna.

When the receiver is communicating via ModBus it is possible to connect and regulate on the signal from up to 16 wireless sensors per receiver.

If the receiver is to be used in a small installation, it is possible to read the signal from the analogue 0-10V output signal. However only 1 wireless sensor per receiver can be connected.

The receiver can also be used to emulate up to 5 wired sensors. This however, requires that the receiver is set up for ModBus communication.

Content

This manual is primarily to be used by technicians whom are to set-up and use the Wireless Receiver in an installation.

It posits that personnel installing this product are in possession of necessary practical experience and education within the area the product is to be used and also hold necessary authorizations to install installation materials.

Safety Precautions

• Please read the entire manual before installing and using the PressureBox.
• In case the instructions in this manual are not followed it may harm the product and suspend any guarantee.

Be careful not to harm the product during unpacking.

Be sure to follow rules for tools when mounting.

Do not touch product with wet hands.

Do not store or use product outside recommended temperature area, and do not expose it to UV-light.

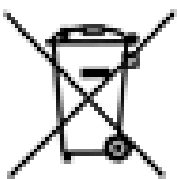Do not wash product with water or any other liquids.

Product is only to be used in non-condensing environment.

Product must not be exposed to direct sunlight.

Make sure to be ESD-discharged before installing the product.

Product must not be disposed of in refuse collection.

Product must be disposed of according to local regulations regarding disposal of small electronic products.

Manufacturer

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Standards and Directives

Wireless Receiver complies to below standards and directives:

- DS/EN 60335-1:2012 Household and similar electrical appliances (LDV) - safety - Part 1: General requirements.

- DS/EN 60335-1:2012/A14:2019 Household and similar electrical appliances (LDV) - safety - Part 1: General requirements.

- DS/EN 60335-1:1012/A1:2019 Household and similar electrical appliances (LDV) - safety - Part 1: General requirements.

- DS/EN 60335-1:2012/A11:2014 Household and similar electrical appliances (LDV) - safety - Part 1: General requirements.

- DS/EN 60335-1/AC:2014 Household and similar electrical appliances (LDV) - safety - Part 1: General requirements.

- DS/EN 60335-1:2012/A15:2021 Household and similar electrical appliances (LDV) - safety - Part 1: General requirements.

- EN 61000-6-1:2007 - Electromagnetic compatibility (EMC) – Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments.

- EN 61000-6-3:2007 - Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.

- EN 61000-6-3/A1:2011 - Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.

- EN 61000-6-3/A1/AC:2012 - Electromagnetic compatibility (EMC) - - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments.

This product complies to RoHS directive, Directive 2011/65/EU.

The manufacturer of this product is a member of the compulsory recycling system under the WEEE directive

Technical Specifications

Supply Voltage:	15-24V DC
Enclosure:	IP20
Weight:	200 g
Operating Temperature:	0ºC to +40ºC non-condensing
Dimensions (HxWxD):	86x154x34mm
Number of 0-10V output:	4
Communication Protocol:	ModBus
Communication Interface:	MiWi 868MHz

Size and Meassures

Front:

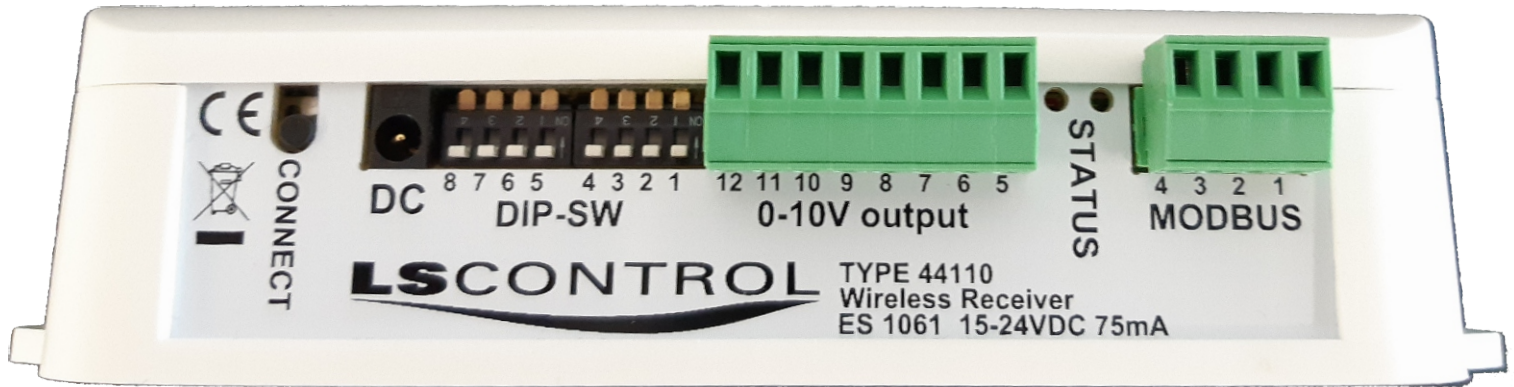

23 mm
43 mm
86 mm
133 mm
143 mm
154 mm

Side:

34 mm
86 mm
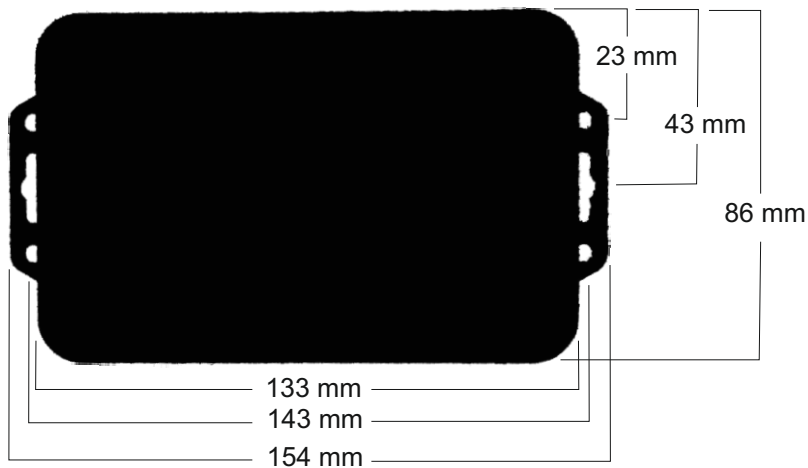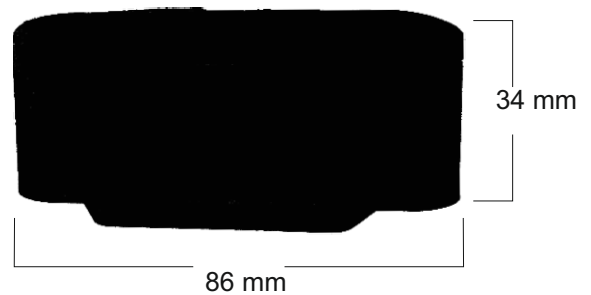
Mounting and Connection

Wireless Receiver must be mounted on a level, stable non-moving nor vibrating surface in a non-condensating environment outside the cabinet of the unit. Refer to the below overview and description for connection to the terminals.

Description of the terminals

0-10V Output

Terminal	Description
5	0-10V out. Temperature (0-50°C)
6	GND (0V)
7	0-10V out. Relative Humidity (0-100%)
8	GND (0V)
9	0-10V out. CO_2 (0-2000ppm)
10	GND (0V)
11	0-10V (No function - for future use
12	GND (0V)

ModBus

Terminal	Description
1	ModBus A (D+)
2	ModBus B (D-)
3	GND (0V)
4	15-24V DC (Connection to terminal 4 is omitted if DC plug is used for supply voltage)

Connecting Sensors to the Receiver

Press the Connect button shortly to open for connection of sensors for 10 seconds. (LED flashes with red light). If LED is constantly lit, then maximum numbers of sensors is already connected to the receiver.

Continuous pressing the Connect button for 10 seconds will erase all existing connections and open for new sensor connections for 10 seconds.

ModBus Setting

If Wireless sensors are to be used with ModBus the DIP switches must be set for choice of Baud rate, Node-Id, Parity and Stop bits.

If more Wireless Receivers are connected to same unit, they must be assigned diffent Node-Ids. Connection between sensor and Node-Id is determined when sensor is connected to the receiver.

Baud rate	DIP SW1
9600	OFF
19200	ON

Mode	RTU
Data bits	8

Parity	Stop Bit	DIP SW6	DIP SW5
Even	1	OFF	OFF
ODD	1	OFF	ON
NONE	2	ON	OFF
NONE	1	ON	ON

Changing the Definition on the Temperature Portal

Number of decimals on Temp	DIP SW8
2-decimals	OFF
1-decimal	ON

Emulation of Wired ModBus Sensors

If you want to replace one or more wired ModBus Sensors with Wireless sensors, the receiver can be setup to emulate wired sensors. It is possible to emulate up to 5 wired sensors when setting up the receiver to emulation mode.

DIP switches for choice of NodeId must at emulation mode be set as below.

	Node-ID	DIP SW2	DIP SW3	DIP SW4
Emulation mode	102 - 106 (see note)	OFF	OFF	OFF

Note emulation mode:
ID102 = Sensor 1   ID103 = Sensor 2   ID104 = Sensor 3   ID105 = Sensor 4   ID106 = Sensor 5

ModBus Register at Emulation Mode

Register	Description	Formatting
30000	CO_2 level (0-2000ppm)	ppm
30001	Temperature (0.0-50.0°C)	°C med 2 decimals (5000=50.00°C) / 1 decimal (500=50.0°C)
30002	RF (0-100%)	%RF (0=0%RF, 100=100%RF)
30003	Bat. Voltage	Volt with 3 decimals (4500=4.500V)
30004	Firmware Version	

Note: No response if data from sensor is older than 10 minutes.

Setting of NodeId at Normal Wireless Sensor Connection

Receiver can either be set to emulate up to 5 wired sensors or to receive and communicate the signal from up to 16 wireless sensors. Depending on if the receive is setup for emulation mode or normal mode. One receiver cannot have bothe normal wireless sensor connection and at the same time emulate wired sensors.

At normal wireless sensor connection the NodeId is set by setting the DIP switches as described below. If a 0-10V output signal is to be used, the DIP switches must be in Normal mode. Note that the 0-10V output can only be used for sensor 0 and not simultaneously with emulation mode.

	Node-ID	SW2	SW3	SW4
Normal Mode	102	ON	OFF	OFF
	103	OFF	ON	OFF
	104	ON	ON	OFF
	105	OFF	OFF	ON
	106	ON	OFF	ON
	4	OFF	ON	ON
	5	ON	ON	ON

ModBus Register in Normal Mode

Sensor 0

Register	Description	Formatting
30000	How old is data	Seconds
30001	Sensor type ID	1=RF Temp, 2=CO2 RF TEMP
30002	Sensor DIP SW	
30003	CO_2 level (0-2000ppm)	ppm
30004	Temperature (0.0-50.0°C)	°C med 2 decimals (5000=50.00°C) / 1 decimal (500=50.0°C)
30005	RF (0-100%)	%RF (0=0%RF, 100=100%RF)
30006	Bat. Voltage	Volt with 3 decimals (4500=4.500V)
30007	Firmware Version	
30008	Spare	
30009	LQI	
30010	RSSI	
30011	Sensor Item Number	44120 = RF Temp, 44121 = CO2 RF Temp
30012	Payload size	
30013	Spare	
30014	Spare	
30015	Spare	

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ModBus Register in Normal Mode continued

Sensor 1

Register	Description	Formatting
30016	How old is data?	Seconds
30017	Sensor type ID	1=RF Temp, 2=CO2 RF TEMP
30018	Sensor DIP SW	
30019	CO_2 Level 0-2000PPM	ppm
30020	Temperature (0.0-50.0°C)	°C med 2 decimals (5000=50.00°C) / 1 decimal (500=50.0°C)
30021	RF (0-100%)	%RF (0=0%RF, 100=100%RF)
30022	Bat. Voltage	Volt with 3 decimals (4500=4.500V)
30023	Firmware Version	
30024	Spare	
30025	LQI	
30026	RSSI	
30027	Sensor Item Number	44120 = RF Temp, 44121 = CO2 RF Temp
30028	Payload size	
30029	Spare	
30030	Spare	
30031	Spare	

Sensor 2

Register	Description	Formatting
30032	How old is data?	Seconds
30033	Sensor type ID	1=RF Temp, 2=CO2 RF TEMP
30034	Sensor DIP SW	
30035	CO_2 Level 0-2000PPM	ppm
30036	Temperature (0.0-50.0°C)	°C med 2 decimals (5000=50.00°C) / 1 decimal (500=50.0°C)
30037	RF (0-100%)	%RF (0=0%RF, 100=100%RF)
30038	Bat. Voltage	Volt with 3 decimals (4500=4.500V)
30039	Firmware Version	
30040	Spare	
30041	LQI	
30042	RSSI	
30043	Sensor Item Number	44120 = RF Temp, 44121 = CO2 RF Temp
30044	Payload size	
30045	Spare	
30046	Spare	
30047	Spare	

Register continue consecutively from sensor to sensor up to maximum number of sensors per receiver (sensor 15).

Sensor 15

Register	Description	Formatting
30240	How old is data?	Seconds
30241	Sensor type ID	1=RF Temp, 2=CO2 RF TEMP
30242	Sensor DIP SW	
30243	CO_2 level 0-2000PPM	ppm
30244	Temperature (0.0-50.0°C)	°C med 2 decimals (5000=50.00°C) / 1 decimal (500=50.0°C)
30245	RF (0-100%)	%RF (0=0%RF, 100=100%RF)
30246	Bat. Voltage	Volt with 3 decimals (4500=4.500V)
30247	Firmware Version	
30248	Spare	
30249	LQI	
30250	RSSI	
30251	Sensor Item Number	44120 = RF Temp, 44121 = CO2 RF Temp
30252	Payload size	
30253	Spare	
30254	Spare	
30255	Spare	

Connection of Wireless Sensor to Receiver via ModBus

Register	Description
40090	1 = Open for connection of sensor in 10 seconds (Equals short pressing the Connect button). 12345 = Erase all existing connections and open for new sensor connection for 10 seconds (Equals 10 seconds continouos pressing the Connect button).

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