Wireless M-Bus and OMS Indoor Climate Sensor

RelAir ICS

Temperature and relative humidity

User Manual

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www.relay.de

1 Functional description

The Relay radio humidity and temperature sensor RelAir ICS can be integrated into an existing wireless M-Bus OMS network and provides reliable temperature measurement data. The room temperature and humidity can be monitored wirelessly at any time. A further advantage of the room climate sensor is its easy assembly. The configuration can be done local via dip switches. The battery life is up to 10 years for this device depending on the transmit interval. The two AA batteries are easily replaceable and have a reverse polarity protection. The following graphic shows an application of the sensor:

2 Scope of delivery

Equipment supplied:

- OMS radio humidity and temperature sensor with casing and mounting plate
- 2 AA-size alkaline batteries
- Mounting set consisting of 2 dowels (5mm) and 2 screws (3 x 30mm)
- Mounting instruction

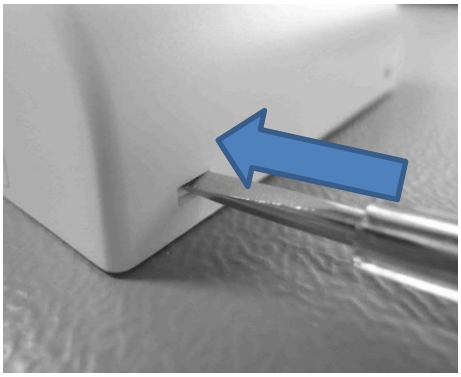
2 Mounting

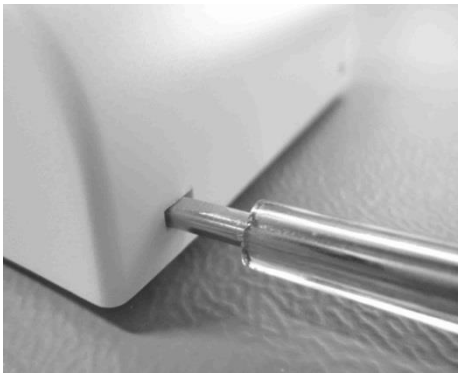
2.1 Where to install

The OMS radio humidity and temperature sensor should not be exposed to direct sunlight. In addition, the sensor should not be mounted on an outside wall, near to an outer door or at a distance of less than 1m to a heater. The distance from the floor should be at least 1,5m. This device is designed for wall mounting or mounting on an in-wall box (60 mm).

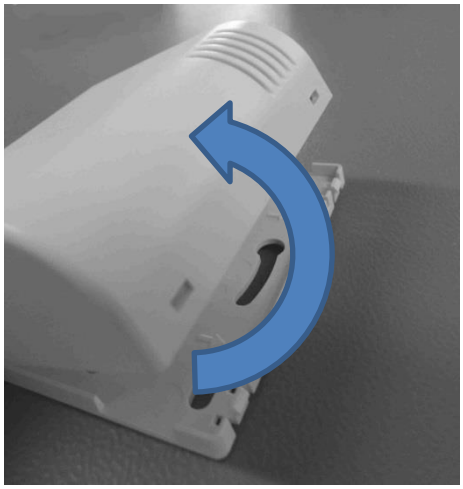
2.3 Open housing

Before the case is ready for mounting it has to be opened. The locks at the bottom of the casing must be released one after another. For that a slotted screwdriver is put into the upper part of the opening.





Repeat this process at the second lock. After that the front cover can be lifted from the mounting plate.



2.4 Mounting plate

The mounting plate is marked with UP and DOWN for the correct orientation. It can now be mounted on the wall with the help of the supplied dowels and screws.

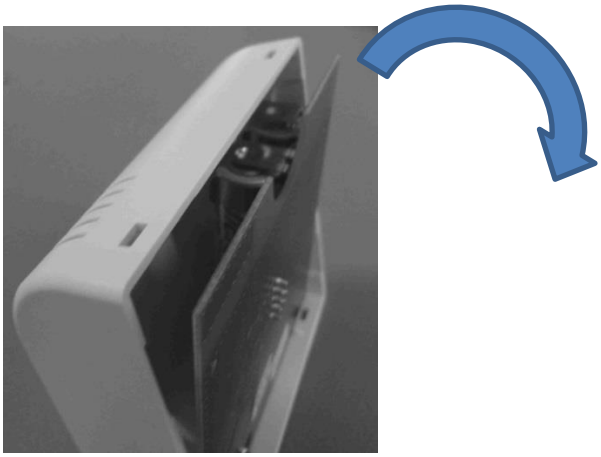
The screw head may not extend beyond the edge of the mounting plate, otherwise the electronics can be damaged when closing the housing!

The long holes arranged in a circle at a distance of 60mm can be used for easy mounting on a flush-mounting or wall mount box.

2.5 Circuit board

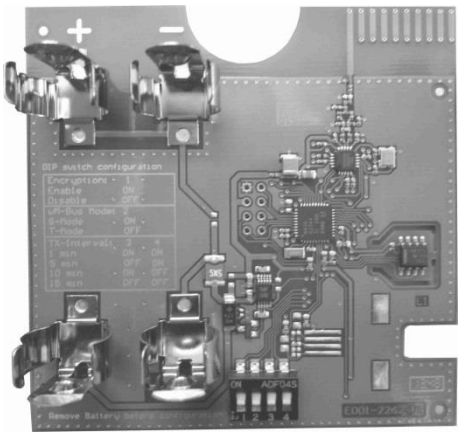
2.5.1 Remove the Circuit board

Now the printed circuit board is tilted out of the front cover by pulling at the edge of the semicircular cavity.



2.5.2 Configuration

The configuration of the OMS in house /humidity and temperature sensors can be done via DIP switch. The functions of the DIP switch are shown in a table below the battery at the PCB (between the battery holders). Before changing a configuration, the batteries should be removed. Then the configuration can be customized via the DIP switches. After that the batteries can be inserted again. The changes are applied with transmission of the next telegram or with the restart of the sensor.

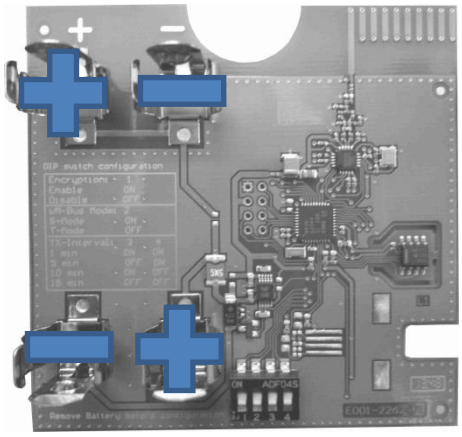


Encryption	1	
Enable	ON	
Disable	OFF	
wM-Bus Mode	2	
S-Mode	ON	
T-Mode	OFF	
TX Interval	3	4
1 min	ON	ON
5 min	OFF	ON
10 min	ON	OFF
15 min	OFF	OFF

Between taking out the batteries and re-insert should be at least 30 seconds to secure that the device has done a reboot safely. Please contact us by email to info@relay.de to ask for the key if you want to use the encryption..

2.5.3 Insert batteries

Now the batteries will be inserted. Therefor it is important to secure the correct polarity. Here standard AA cells with a voltage of 1.5 V are used.



2.5.4 PCB mounting

Thereafter the circuit board with the batteries ahead is placed back into the front cover.

Attention on the orientation! On the circuit board and on the label of the Front cover it is marked with arrows up.

2.5.5 Front Cover

As a last step, the front cover together with the electronics is clipped on the mounting plate. For that the front Cover is hinged to the upper edge of the mounting plate and then pressed firmly.

3 Telegram description

The telegram has a specific basic structure (without checksum):

Field	Description	Value
L-Field	Length of telegram 46 Byte	2Eh
C-Field	Type of telegram: SND_NR	44h
M-Field	Manufacturer-ID: REL = Relay GmbH „REL“ is identical with the part „Manufacturer ID“ of the serial number at the equipment indicator.	ACh
M-Field		48h
A-Field	Serial number: ID = e.g. 08154711 Identical with the part „Fabrication Number“ of the serial number at the equipment indicator.	11h
A-Field		47h
A-Field		15h
A-Field		08h
A-Field	Version: 2; Identical with the part „Fabrication Block“ of the serial number at the equipment indicator.	02h
A-Field	Type of device: Room sensor	1Bh
Ci-Field	Control field: „Response from Device”	7Ah
AccNo	Access number: e.g. 65. Is increased by 1 at each transmission with updated data.	41h
Status	Status field: Normally 0. In case of „battery empty“ the „LowPower“ and the „Permanent error“ bit are set.	00h
Config.Word	Configuration field: NNNNCCHHb If encryption is deactivated then 00h, otherwise the number of encrypted blocks (e.g. 1 block = 10h).	00h
Config.Word	Configuration field: BAS0MMMMb If encryption is deactivated then 00h, otherwise encryption mode 5 (05h). If potential for synchronous release the S bit is set additionally.	00h
AES Ver.	AES verification	2Fh
AES Ver.	AES verification	2Fh
DR1	DIF: 0Ah = 4 Digit BCD coded	0Ah
DR1	VIF: 66h = temperature * 10^(-1) °C	66h
DR1	Value: e.g. 23,7°C	37h
DR1		02h
DR2	DIF: 0Ah = 4 Digit BCD coded	0Ah
DR2	VIF: FBh = First extension table	FBh
DR2	VIFE: 1Ah = relative humidity * 10^{-1} %	1Ah
DR2	Value: e.g. 37,8%	78h
DR2		03h

DR3	DIF: 02h = 16Bit Integer / Binary	02h
DR3	VIF: FDh = Second extension table	FDh
DR3	VIFE0: 97h = Error Flags	97h
DR3	VIFE1: 1Dh = Standard Conform	1Dh
DR3	Normally 0000h. In case „battery empty“ the „Battery low“ bit is set.	00h
DR3		00h
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
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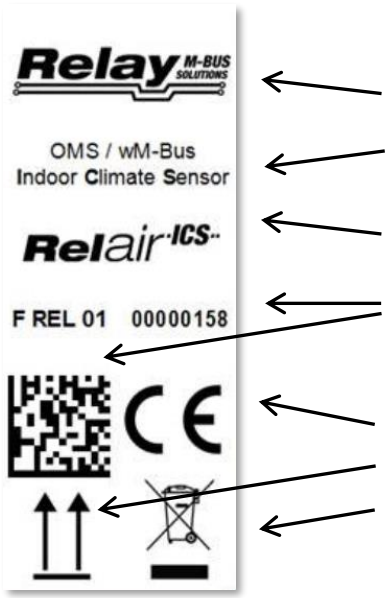
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh
Fill	Fill byte	2Fh

4 Label

A Label is applied on the packaging and on the casing of the device. This contains the following information:



Logo of Relay company
Description of device
Name of device
Order number
Serial number according to DIN 43863-5, also as data matrix code
CE conformity
Orientation arrows
WEEE conformity

5 Technical Data

5.1 General

Mounting	Wall mounting or mounting on an in-wall box (60 mm)
Material	ABS, white
W x L x H	(80 x 80 x 25) mm
Protective class	IP40
Operating temperature	-10°C to +55°C
Storage temperature	-20 to +70°C
Humidity	10% to 80% (not condensing)

5.2 Wireless M-Bus Interface

Standard	EN13757-4 and EN13757-3, compatible to OMS
Transmit mode	S1 or T1 (unidirectional) / Frame Format A
Encryption	Mode 0 (not encrypted) or Mode 5
Transmit interval	Configurable by DIP switches: 1 min, 5 min, 10 min, 15 min

5.3 Power Supply

Battery	2 replaceable AA alkaline cells (industrial grade) in scope of supply
Batterie lifetime	Transmit interval 15 min. / up to 10 years

5.4 Sensors

Temperature range	-10°C to +55°C
Temperature accuracy	± 0.3 °C
Temperature resolution	0.1 °C
Humidity range	20% RH to 80% RH
Humidity accuracy	± 2% RH
Humidity resolution	0.1% RH

5.5 Ordering Information

RelAir ICS	Wireless M-Bus Indoor Climate Sensor (Temperature + Humidity)

6 CE Declaration

www.relay.de

EU DECLARATION OF CONFORMITY

for RelAir ICS

We the company **Relay GmbH**
Stettiner Str. 38
D-33106 Paderborn

declare that the product **RelAir ICS**
Wireless M-Bus / OMS indoor sensor for temperature and humidity

is compliant with the requirements of the following directives:

R&TTE Directive (1995/5/EC)
RoHS Directive (2011/65/EU)

The product has been tested in accordance with the following standards:

EN 300220-1 V3.1.1	Radio equipment (SRD) in the frequency range 25 MHz to 1 GHz Part 1: Technical characteristics and methods of measurement
EN 300220-2 V3.1.1	Radio equipment (SRD) in the frequency range 25 MHz to 1 GHz Part 2: Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU for non specific radio equipment
EN 301489-1 V2.2.0	EMC for radio equipment and services, Part 1: technical requirements
EN 301489-3 V2.1.1	EMC and ERM for radio equipment and services, Part 2: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz
EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC:2011 + A2:2013	Information technology equipment – Safety – Part 1: General requirements
EN 62479: 2011-09	Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz - 300 GHz)

Paderborn, 04.03.2019

Matthias Rüther (Development Manager)

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Notes: