SRC-DO Typ2-WH

Wireless switching actuator (receiver) for wireless sensors

Datasheet

Subject to technical alteration
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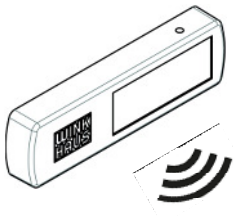

Radio contact FM.A

Radio contact FM.V

Application

The receiver SRC-DO type2-WH takes over the evaluation of wireless sensors of the type:

Radio contact FM.V (Winkhaus)

Radio contact FM.A (Winkhaus)

At choice a total of up to 20 wireless sensors can be taught-in on a receiver. In the process the relay output of the receiver serves as switching output of the sensors. In this way it can be used as signal contact for connection to controllers or intrusion detection systems, for instance.

All taught-in wireless contacts have a logical “AND” conjunction. The state of the AND conjunction is signaled via the potential-free relay of the radio receiver. If all taught-in radio contacts notify the state “window closed”, the signal relay of the wireless receiver is switched. In case any of the radio contacts gives the signal “window open”, the signal relay is / remains reset.

Norms and Standards

CE-Conformity:	2004/108/EG Electromagnetic compatibility
	R&TTE 1999/5/EC Radio and Telecommunications Terminal Equipment Directive
Product safety:	2001/95/EG Product safety
EMC:	EN 61000-6-2: 2005
	EN 61000-6-3: 2007
	ETSI EN 301 489-3:2001
	EN 61000-3-2:2006
	EN 61000-3-3: 1995+A1+A2
Product safety:	EN 60730-1:2002

The general registration for the radio operation is valid for all EU countries as well as for Switzerland.

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Important - Safety Note

Caution: The installation and assembly of electrical equipment may only be performed by a skilled electrician. Isolate installation before removal of cover (disconnect fuse) and protect against reconnection!

The modules must not be used in any relation with equipment that supports, directly or indirectly, human health or life or with applications that can result in danger for people, animals or real value.

Technical Data

Output switch contact	changeover contacts, floating, 24 V ~ / 3 A or 24 V = / 3 A
Radio technology	EnOcean (IEC 14543-3-10)
Frequency	868 MHz
Antenna	internal transmit- / receive antenna
Power supply	12-24 V = (±10%) or 12-24 V ~ (±10%)
Power consumption	typ. 1,5 W (24 V =) | 3,4 VA (24 V ~)
Enclosure	ABS, red, for standard flush box
Protection	IP20 according to EN 60529
Connection electrical	terminal block, max. 1,5 mm²
Ambient condition	-20..+60 °C, max. 85% rH, non-condensing
Weight	55 g
Mounting	installation in a standard flush box (Ø=55 mm)

Mounting Advice

The module housing is prepared for the installation in a standard flush box with blind cover and cable outlet. No separate external 868MHz receiving antenna is needed for operation.

The ideal mounting place (optimum transmitting range) is lying quite close to the radiator valve. It must be taken care, that a distance of at least 0,3 m to the metallic parts is observed, in order to avoid a compartmentalisation of the radio waves.

For the optimum location, please consider the “information on wireless technology” on the following pages.

Description of functions

Example:

Scenario “all windows closed”

- Relay output is closed (intrusion detection system can be armed)

Scenario “one or several windows open”

- Relay output is open (intrusion detection system triggers an alarm or cannot be armed)

The opening state of the window contacts is signaled via the potential-free relay of the radio receiver. A total of 20 wireless sensors can be taught in, all taught-in wireless contacts have a logical “AND” conjunction. If all taught-in radio contacts notify the state “window closed”, the signal relay of the wireless receiver is switched. In case any of the radio contacts gives the signal “window open”, the signal relay is / remains reset.

The device SRC-DO-type2-WH can be used in an intrusion detection system. This possibility means that the potential-free relay output of the receiver is integrated into a signal line.

Mixed connection of the radio contacts FM.V and FM.A is also possible. The wireless receiver supports two different EnOcean radio telegrams: it is able to process the 1BS as well as the 4BS radio telegram.

1BS telegram (EEP: D5-00-01): This radio telegram is used by the FM.A radio contact, transmitting only the states open /closed.

4BS telegram (EEP: A5-14-01): This radio telegram is standardly used by the FM.V radio contact, transmitting the states open / closed plus battery voltage.

Communication surveillance transmitter/receiver:

If the receiver does not receive any valid radio telegram of the taught-in sensors for a certain period of time, the sensor in question is marked “inactive” in the address memory. The duration of the monitoring time depends on the sensor. For the radio contact FM.V the admissible non-transmission period is max. 400 seconds, in the case of the FM.A radio contact it is 120 minutes. An interference is indicated by quick flashing of the LRN LED and additional switching of the relay output in intervals of 15 seconds.

As soon as a valid radio telegram is received again, the sensor is marked “active” enabling the receiver to continue its normal operation.

If the device is used in an intrusion detection system, a longer interruption of the radio connection with a radio contact may trigger off an alarm. For this reason please check after the installation of the system whether there is a reliable radio connection with all radio contacts. If the wireless connection is not stable, it is possible to optimise it by using repeaters.

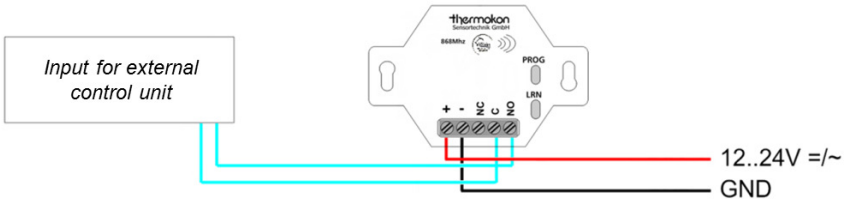
Electrical connection

The devices are designed to be operated with 12 – 24V AC/DC. Please observe the technical details of the devices when performing the electrical connection.

The devices must be used at a constant operating voltage. Users must make sure to avoid current and voltage peaks when switching on / off the operating voltage.

Application example

Signal contact for connection to controllers or intrusion detection systems



Monitoring the battery voltage of the radio contact FM.V

With each received radio telegram of the FM.V radio contact the receiver is indicated the current state of battery voltage. In the process the receiver supervises the battery voltage, emitting a warning when it is below the minimum voltage.

Dropping below an operating voltage of 2.6V: If the voltage of the radio contact FM.V is below 2.6 V, a battery replacement is recommended. The signal is given because falling short of the minimum voltage means the closure signal of the wireless contact in question is ignored by the radio receiver. The signal “window closed” thus cannot be achieved. There is a direct assignment “empty battery on window XY”. The actuator marks this radio contact “inactive” and consequently emits the following interference signal:

→ LRN LED is flashing

→ Signal contact dropping out

The receiver does not close the circuit via the potential-free signal relay any more. If an intrusion detection system is used, it cannot be armed any longer.

Dropping below the minimum battery voltage of 2.1 V: If the battery voltage of the FM.V radio contact drops below 2.1 V the radio contact is considered unable to perform its function. This second warning threshold is also important because in case of a continuously closed window the first warning threshold (2.6 V) would not take effect. The actuator marks this radio contact “inactive” triggering the following alert.

→ PROG LED is flashing

→ Signal contact dropping out

The receiver interrupts the circuit via the potential-free signal relay. If an intrusion detection system is used, this triggers off an alarm.

Resetting the battery alarm message: The alarm message is automatically reset after battery replacement on the radio contact in question has been performed.

Initial operation

1. Setting the receiver into the teach-in mode:

Keep pressing the LRN button on the receiver. After about 5 seconds the receiver automatically switches into the teach-in mode, the LRN LED is permanently illuminated and the LRN button can be released again. For confirmation the PROG LED flashes 5 times, after that both LEDs are permanently lit. Now the receiver is in the teach-in mode.

2. Teaching in the wireless sensor:

Press the Learn button on the radio sensor (transmitter). The transmitter assignment in the receiver is indicated by the LRN LED going out shortly (approx. 1 sec). After that the two LEDs are permanently lit again. It is now possible to teach in other sensors by pushing the corresponding Learn buttons. The receiver is able to manage a total of 20 sensors at a time.

Remark: If a transmitter, that has already been taught in, transmits its teach-in telegram again, the wireless sensor is deleted.

3. Leaving the teach-in mode:

If no other transmitter is taught in in the LEARN mode of the receiver within a period of 20 seconds, this mode is automatically exited. Both LEDs are off then and at the same time the receiver is ready for operation.

4. Deleting transmitters (if necessary):

Taught-in senders can be deleted. In the process the receiver must be set in the teach-in mode (see 1). If the Learn button of a taught-in transmitter is pressed, the transmitter is deleted. The deletion is indicated by means of a short extinction (approx. 1 sec) of the LRN LED.

5. Restoring the default delivery status (if necessary):

Keep pressing the LRN and PROG buttons on the receiver for about 5 seconds. The reset is activated as soon as both LEDs (LRN and PROG) are illuminated. The buttons can now be released. When all taught-in senders are deleted from the memory, the two LEDs go off.

Information on Wireless Sensors

Transmission Range

As the radio signals are electromagnetic waves, the signal is damped on its way from the sender to the receiver. That is to say, the electrical as well as the magnetic field strength is removed inversely proportional to the square of the distance between sender and receiver ($E,H \sim 1/r^2$).

Beside these natural transmission range limits, further interferences have to be considered: Metallic parts, e.g. reinforcements in walls, metallized foils of thermal insulations or metallized heat-absorbing glass, are reflecting electromagnetic waves. Thus, a so-called radio shadow is built up behind these parts.

It is true that radio waves can penetrate walls, but thereby the damping attenuation is even more increased than by a propagation in the free field.

Penetration of radio signals:

Material	*Penetration*
Wood, gypsum, glass uncoated	90...100%
Brick, pressboard	65...95%
Reinforced concrete	10...90%
Metal, aluminum pasting	0...10%

For the practice, this means that the building material used in a building is of paramount importance for the evaluation of the transmitting range. For an evaluation of the environment, some guide values are listed:

Radio path range/-penetration:

Visual contacts:
Typ. 30m range in passages, corridors, up to 100m in halls

Gypsum board walls/wood:
Typ. 30m range through max. 5 walls

Brick wall/Gas concrete:
Typ. 20m range through max. 3 walls

Reinforced concrete/-ceilings:
Typ. 10m range through max. 1 ceiling

Supply blocks and lift shafts should be seen as a compartmentalisation

In addition, the angle with which the signal sent arrives at the wall is of great importance. Depending on the angle, the effective wall strength and thus the damping attenuation of the signal changes. If possible, the signals should run vertically through the walling. Walling recesses should be avoided.

Other Interference Sources

Devices, that also operate with high-frequency signals, e.g. computer, audio-/video systems, electronical transformers and ballasts etc. are also considered as an interference source. The minimum distance to such devices should amount to 0,5m.

Selecting the best Device Mounting Position using field strength measuring instruments (e.g. Thermokon AirScan)
Instruments for measuring and indicating the received field strength (RSSI) of the EnOcean telegrams and interfering radio activity of transmission frequency during the planning phase and enable them to verify whether the installation of EnOcean transmitters and receivers is possible at the positions planned.
For this purpose, a field strength meter, a laptop with the software AirScan for example is placed at the point where the receiver is provided. The USB transceiver from AirScan then logs the messages of the sensors and displays the field strength. Color-coded values indicate the signal quality. By changing the sensor position there can the best possible mounting position located. Refer to the documentation "range planning EnOcean radio systems"

High-Frequency Emission of Wireless Sensors
Since the development of cordless telephones and the use of wireless systems in residential buildings, the influence of radio waves on people's health living and working in the building have been discussed intensively. Due to incomplete measuring results and long-term studies, very often great feelings of uncertainty exist with the supporters as well as with the critics of wireless systems.
A measuring expert certificate of the institute for social ecological research and education (ECOLOG) has confirmed that the high-frequency emissions of wireless keys and sensors based on EnOcean technology are **considerably lower** than comparable conventional keys.
Even conventional keys send electromagnetic fields, due to the contact spark. The emitted power flux density (W/m^2) is 100 times higher than using a wireless switch considering the total frequency range. In addition, a potential exposition by low frequency magnet fields emitted via used wires are reduced due to wireless keys. If the radio emission is compared to other high-frequency sources in a building such as DECT-telephones and basis stations, these systems are 1.500 times higher-graded than wireless switches.