

# OPERATING INSTRUCTIONS

Version 12/06



## **Wireless door/window contact sensor „FS20 TFK“**

Item no. 62 03 46



	Page
<b>1. Introduction</b> .....	<b>4</b>
<b>2. Prescribed use</b> .....	<b>5</b>
<b>3. Scope of delivery</b> .....	<b>6</b>
<b>4. Explanation of icons</b> .....	<b>6</b>
<b>5. Safety instructions</b> .....	<b>7</b>
a) General information .....	7
b) Batteries and rechargeable batteries .....	8
<b>6. Installation</b> .....	<b>9</b>
a) General notes on installation .....	9
b) Controls .....	9
c) Assembling the 'FS20 TFK', inserting the batteries .....	10
d) Installing the magnet contact .....	11
e) Installing the external contacts .....	12
<b>7. Initial operation</b> .....	<b>12</b>
a) Basic functions .....	12
1. Buttons .....	12
2. Switching contact .....	13
b) Quick installation with factory settings .....	13
<b>8. The FS20 address system</b> .....	<b>15</b>
<b>9. Integrating the 'FS20 TFK' in the address system</b> .....	<b>17</b>
a) Setting the house code .....	17
b) Setting the addresses .....	18
1. Setting a single address .....	18
2. Assigning function groups and master addresses .....	19
<b>10. Individual settings</b> .....	<b>22</b>
a) Setting the on-time .....	22
b) Setting the transmission interval .....	24
c) Programming the receiver timer .....	26
d) Using several transmitters .....	26
e) Resetting to factory settings .....	27
1. Complete reset (including addresses and house code) .....	27
2. Resetting, but retaining addresses/house code .....	28

	Page
11. Replacing the batteries .....	28
12. Information on the range .....	29
13. Handling .....	30
14. Maintenance and cleaning .....	30
15. Disposal .....	31
a) General information .....	31
b) Batteries and rechargeable batteries .....	31
16. Technical specifications .....	31
17. Declaration of conformity (DOC) .....	32
18. Appendix:	
Operating the device with more than one switching contact .....	32

# 1. Introduction

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Dear customer,

Thank you for purchasing this product.

**This product meets the requirements of both current European and national guidelines.**

In order to preserve this condition and ensure the safe operation of the product we kindly ask you to carefully follow these operating instructions!

Please read the operating instructions completely and observe the safety and operation notes before using the product!

**All company names and product names contained herein are trademarks of the respective owners. All rights reserved.**

**Should you have any further questions, please contact our technical advisory service:**

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## 2. Prescribed use

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The 2-channel door/window contact 'FS20 TFK' is a component in the FS20 wireless control system. It can control up to 2 radio receivers in the FS20 system with separately adjustable criteria.

The high range of up to 100 m (free-field) allows the device to be used to transmit over long distances. The system uses the 868 MHz ISM band.

### The door/window contact has the following functions:

- Contact open and close alerts for 2 internal magnetic contacts or externally attached contacts. These may monitor doors, windows or other shutters, drawers, locks, normally closed or normally open contacts
- Integration in the encoding and addressing system of the FS20 system enables clear separation from neighbouring systems, as well as, for instance, the control of multiple individual receivers

Both switching channels have the following separate adjustable criteria:

- each channel may be activated separately
- selectable receiver switch behaviour (transmit command)
- power-on command with programmable on-time (0.25 seconds to 4.25 hours)
- programmable transmission interval (transmission repeat) for power-on command (0.25 seconds to 4.25 hours)
- optional receiver timer programming (1 second to 4.5 hours)
- manual switching of the receiver via the control button on the 'FS20 TFK'



The 'FS20 TFK' is only certified for use in dry indoor areas. The device is not protected against water! It must not get damp or wet.

Batteries must be used to power the device.

Any use other than the one described above may damage the product and can also increase the risk of short-circuit, fire, electric shock, etc.

No part of the product may be modified or adapted.



All the safety instructions and installation notes in this manual must be observed without fail.

### 3. Scope of delivery

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- Wireless door/window contact sensor 'FS20 TFK'
- Magnetic contact
- Assembly material
- User manual

### 4. Explanation of icons

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The icon with a lightning flash in a triangle is used to alert you to potential personal injury hazards such as electric shock.



The icon with an exclamation mark in a triangle points to important instructions in this user manual that must be observed.



The 'hand' symbol provides special information and advice on operating the device.

## 5. Safety instructions

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The product's guarantee becomes invalid, if the product is damaged as a result of failure to observe these operating instructions! We do not assume any liability for any resulting damages!

Nor do we assume liability for damage to property or personal injury caused by improper use or failure to observe the safety instructions. In such cases the product's guarantee becomes invalid.

Dear customer, the following safety instructions are intended to protect you as well as the device. Please read carefully through the following points.

### a) General information

- Do not use this product in hospitals or medical institutions. Although the product emits only relatively weak radio signals, these may cause life-support systems to malfunction. This may also be the case in other areas.
- For safety and licensing (CE) reasons any unauthorised alterations to and/or modification of the product are not permitted.
- Make sure that the product does not get damp or wet. It is only suitable for installation and operation in dry indoor areas.
- This product is not a toy and should be kept out of the reach of children.
- Do not leave packaging material lying around. This may become a dangerous plaything in the hands of children.
- Handle the product with care; knocks, blows or even a fall from a low height can damage it.
- If, during mounting, connection or installation you are not sure or have doubts about how to proceed, contact a skilled technician.

## b) Batteries and rechargeable batteries

- Keep batteries/rechargeable batteries out of the reach of children.
- Make sure that the polarity is correct when inserting the batteries/rechargeable batteries.
- Do not leave batteries/rechargeable batteries lying around as they could be swallowed by children or pets. In such case seek immediate medical care.
- Leaking or damaged batteries/rechargeable batteries may cause acid burns, if they come into contact with skin. Therefore, please make sure you use suitable protective gloves.
- Make sure that batteries/rechargeable batteries are not short-circuited or thrown into a fire. They might explode!
- Never disassemble batteries/rechargeable batteries!
- Conventional batteries must not be recharged. They might explode!
- If the device is not used for a longer period of time (when stored, for example), remove the inserted batteries/rechargeable batteries to prevent them from leaking and causing damage.



The product may be powered using rechargeable batteries. However, due to their lower voltage (rechargeable battery = 1.2V, battery = 1.5V) and lower capacity, the period of operation and range are reduced.

Therefore, to ensure safe operation, please only use high-quality alkaline batteries (for instance, Conrad item no. 650105, AAA batteries).



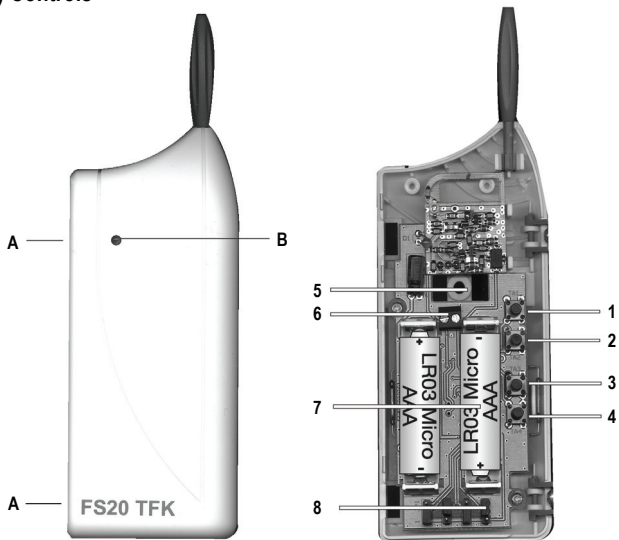
## 6. Installation

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### a) General notes on installation

- When using the 'FS20 TFK' internal contacts, the device may be mounted directly on the door or window which is to be monitored (from here on we will refer to all installation areas as windows for the sake of simplicity).
- When using the external contacts, the 'FS20 TFK' may be mounted wherever you wish; in a hidden place, for example. A potential-free normally closed or normally open contact can be used as an external contact.
- The installation location should be chosen taking the wireless range into account. Sufficient distance from large metal objects (such as radiators) and electronic devices (such as computers) should be maintained.

### b) Controls



- A Opening catch
- B Transmission control lamp (LED)
- 1 Control button 1
- 2 Control button 2
- 3 Control button 3
- 4 Control button 4
- 5 Cable bushing and screw hole
- 6 Screw terminal for external contact
- 7 Batteries (2 x AAA)
- 8 Plug jumpers for setting switching behaviour

### **c) Assembling the 'FS20 TFK', inserting the batteries**

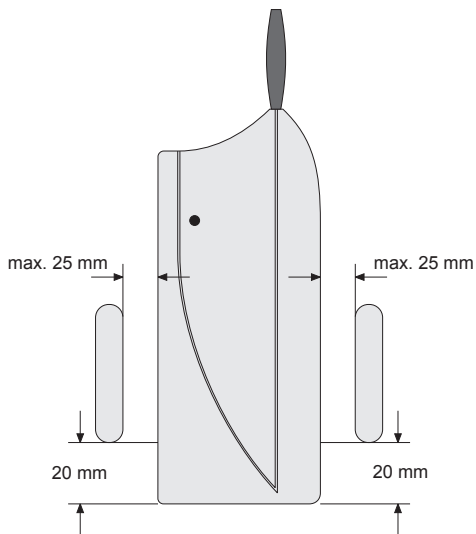
- Open the housing by carefully pushing the two opening catches (A) on the left of the device inward with a suitable tool, for example a screwdriver, and simultaneously pulling this part of the lid toward you.
- If an external contact is to be connected, this should now be connected to the screw terminal following the instructions in section 6. e).
- Should you wish to define settings for the 'FS20 TFK' other than the factory settings, you will be able to do this easily once the batteries have been inserted.
- The 'FS20 TFK' requires 2 AAA batteries.
- Insert the batteries with the correct polarity (plus/+ und minus/-) according to the markings on the battery holder (see figure in section 6. b).
- Now mount the device in the desired location, either using a screw through the screw hole or a strip of double-sided tape. If using adhesive tape, make sure the surface it is applied to is clean, dry and free of grease and oils.
- Close the device. Make sure the housing catches snap together.
- If the internal contacts will not be used, the installation location near the monitor contact may be freely chosen, taking into account the instructions in section 6. a).
- When using the internal contacts, the actuator magnet is usually mounted onto the moving part (window sash) and the 'FS20 TFK' onto the immobile part (frame).



The instructions on this found in the next section ('Installing the magnets') should be followed.

Before you begin mounting the 'FS20 TFK' and magnet, test whether the chosen arrangement is functional.

#### d) Installing the magnet contact



- The figure depicts the alignment of the magnet with the 'FS20 TFK'.  
To obtain the maximum range, the height in relation to the bottom edge of the 'FS20 TFK' should be exactly 20mm.  
The distance between the magnet and the 'FS20 TFK' should not be more than 25mm.
- Fasten the magnet into place using double-sided adhesive tape or screws, positioning it so that it passes the 'FS20 TFK' without touching it when the window is opened.

## e) Installing the external contacts

- The external contact should be attached to the window following the instructions in its user manual.
- The contact connection cable should be inserted through the cable opening in the back of the 'FS20 TFK' housing.
- A cable chute on the back of the housing allows you to feed the cable away to the left or right underneath the housing.



If connecting more than one contact, please follow the instructions in section 18 at the end of this user manual.

## 7. Initial operation

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### a) Basic functions

#### 1. Buttons

The buttons on the 'FS20 TFK' are only used for setting up and programming the device; switching commands may also be transmitted manually if required (for example, to test the device during set-up):

- Briefly pressing the button (<1 second) sends a switching command.
- Pressing down longer (maximum 5 seconds) sends a dim command.
- Buttons **1** and **2** are assigned to channel 1, buttons **3** and **4** to channel 2.
- Button **1** (or button **3** for channel 2) sends a power-off or dim-down, button **2** (or **4**) a power-on or dim-up command.
- The control indicator on the front of the 'FS20 TFK' briefly lights up to signal that a command has been transmitted.



Please note:

The dim commands (which are not transmitted continuously) do not serve to dim a receiver (dimmer), but are necessary for programming certain functions in some receivers.

Pressing the power-on button transmits the power-on command without transmission repeat and without on-time, regardless of the settings.

Transmitting a power-off command with the corresponding button turns off the transmission repeat timer on the respective channel, if this is activated.

## 2. Switching contact

The 'FS20 TFK' is typically controlled by **one** switching contact, that is with **one** of the two internal **or** with the external switching contact. For more information on this, read section 18.

The switching contacts are mounted as described in section 6 'Installation'.

- Using the plug jumpers JP1 to JP4, the switching behaviour of both channels may be configured as depicted in the figure below.
- Position jumper JP1 to JP4 depending on the desired function of each:

### Channel 1

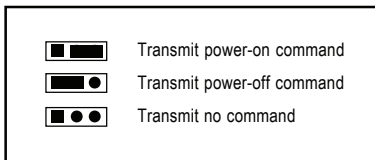
1 JP1  
 Open

1 JP2  
 Close

### Channel 2

1 JP3  
 Open

1 JP4  
 Close



## a) Quick installation with factory settings

The 'FS20 TFK' is immediately ready for operation with the factory settings. The transmission signals are encrypted using a house code that is randomly assigned when the batteries are inserted and the address group 11 (control of several receivers with one transmitter possible).

For the initial operation of the transmission path to the receiver, the house code and the addresses must first be transmitted to the receiver.

- Set your receiver, based on the user manual of your particular receiver, in the address programming mode.
- Now press buttons **1** or **2** (for channel 2: buttons **3** or **4**) on the keypad of the 'FS20 TFK'.
- The receiver's indicator LED goes out.
- Test the switching function by briefly pressing buttons **2** or **1** (channel 2: button **4** or button **3**) on the 'FS20 TFK'. The receiver should switch on or off.
- Now the 'FS20 TFK' is ready for operation with the factory settings.

- If you do not wish to set any further individual preferences, close the housing. Please ensure that the side catches close with an audible click.

### **Preset factory settings:**

The 'FS20 TFK' comes with the following settings:

House code:	random
Address channel 1:	11 11
Address channel 2:	11 12
Switch-on time channel 1/2:	deactivated
Transmission repeat channel 1/2:	deactivated



Settings may be changed as described in this user manual. Your settings are saved in a nonvolatile memory and are retained when the battery is changed.

Please note:

If a programming sequence is not completed, that is if not all digits for a particular setting are entered, the programming session is automatically ended 30 seconds after the last digit is entered (control indicator ceases to blink) and the previously entered digits are ignored.

## 8. The FS20 address system

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The FS20 address system is based on a house code which allows a number of radio-controlled systems to be operated simultaneously.

256 different addresses can be set within a house code. These addresses divide into four address types with 225 individual addresses, 15 function group addresses, 15 local master addresses and a global master address.

One address from each address type can be assigned to each receiver. This means that each receiver can respond to up to four different addresses, but only ever to one address per address type.

If you need a receiver to respond to more than one transmitter, you can program the transmitters to the same address or, if different transmitter address types have been set, you can program the receiver consecutively to these different addresses.

The individual address types have the following functions (this explanation applies globally to the entire FS20 system and not just to individual components):

### **Single addresses**

Each receiver should be set to a single address so that it can be controlled separately.

### **Function group addresses**

Several receivers are defined as a functional unit by being assigned to a function group address. If, for example, all the lamps in a house are assigned to a function group, then all the lamps in the entire house can be switched on or off by pressing one button.

### **Local master addresses**

Several receivers are spatially defined as one unit and controlled via the local master address. If, for example, all the receivers in a room are each allocated to a local master address, then all you need to do is press one button when leaving the room to switch off all the consumer loads in the room.

### **Global master address**

Several receivers are assigned to the global master address and are jointly controlled via this address. All the consumer loads can easily be switched off simply by pressing one single button when leaving a house, for example.

This address system opens up a variety of possibilities.

You can even implement access authorisations; by assigning three gates to different single addresses and a joint function group ('gates'), for example.

Several people can then each be given a hand-held transmitter with a relevant single address for one garage door, while all the garage doors can be opened via a hand-held transmitter with a programmed function group address or all the doors can be automatically closed in the evening via a FS20 timer.

The various address types and addresses are only set on the transmitter and these settings are transmitted to the receivers via the address assignment.



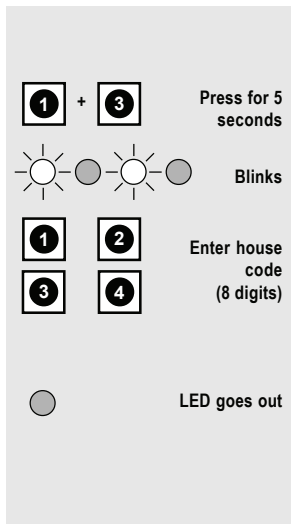
## 9. Integrating the 'FS20 TFK' in the address system

The house code, an address group and a subaddress are used for coding the transmitters and their individual buttons. You can also use special address group assignments to program the remote control, in this case the 'FS20 TFK', as a local or global master.

The 8-digit house code, the 2-digit address group and the 2-digit subaddress are entered using the numerals and buttons 1, 2, 3 and 4 (for the allocation of buttons to numerals, please see the figure in section 6 b).

This addressing makes 225 single addresses, 15 function groups, 15 local master addresses and 1 global master address available within each house code to the 'FS20 TFK'.

### a) Setting the house code



When the batteries are first inserted, the device sets a randomly chosen house code.

The house code can be changed as follows:

- Press buttons 1 and 3 and hold them down for 5 seconds, until the indicator LED begins to blink slowly, around once a second.
- Enter the eight-digit house code of your system using buttons 1, 2, 3 and 4. This code must be identical for all the remote control transmitters in the same wireless control system (as a precaution, make a note of this code and keep it safe), for example 12341234.
- The programming mode ends automatically once you have entered the eighth digit. This is indicated by the status LED going out.

**The house code is valid for both channels of the 'FS20 TFK' simultaneously!**

## b) Setting the addresses

A channel's address comprises a two-digit address group and a two-digit subaddress.

The address group '11' is factory set for all channels.

If several transmitters are to be operated at the same time and control different receivers, then different addresses need to be set on the transmitters.

### 1. Setting a single address

**1** + **2** CH1  
or  
**3** + **4** CH2

Press for 5 seconds

Blinks

Enter Address group (2 digits) and subaddress (2 digits)

LED goes out

- To set an address group and subaddress, press the respective button combination simultaneously for around 5 seconds until the indicator LED begins to blink slowly (around once a second).

- for channel 1 (CH1), buttons **1** and **2**
- for channel 2 (CH2), buttons **3** and **4**

- Now enter a two-digit address group and a two-digit subaddress using the **1**, **2**, **3** and **4** buttons.

Example:

1431 (address group 14, subaddress 31)

- The programming mode ends automatically once you have entered the fourth digit. This is indicated by the status LED going out.

The following address combinations are factory set to the button combinations:

Button combination 1 (buttons **1** + **2**):

address 11 11

Button combination 2 (buttons **3** + **4**):

address 11 12



#### Please note:

The address group 44 and the subaddress 44 both have a particular meaning (see the following section)!

## 2. Assigning function groups and master addresses

- **Function groups (44xx)**

If you enter 44 as the address group, then the subaddress (provided this is not also set to 44; see the following section) is defined as a function group. 15 different function groups between 4411 and 4443 can then be defined.



Possible are: 4411, 4412, 4413, 4414, 4421, 4422, 4423, 4424, 4431, 4432, 4433, 4434, 4441, 4442, 4443

- **Local master (xx44)**

If you only set the subaddress to 44, then this channel functions as a local master within the set address group. All receivers that are programmed with this local master address are controlled simultaneously.



Possible are: 1144, 1244, 1344, 1444, 2144, 2244, 2344, 2444, 3144, 3244, 3344, 3444, 4144, 4244, 4344

- **Global master (4444)**

If you set the address group and subaddress of a channel to 44, then this channel functions as a global master. All receivers that are programmed with this global master address are controlled simultaneously.

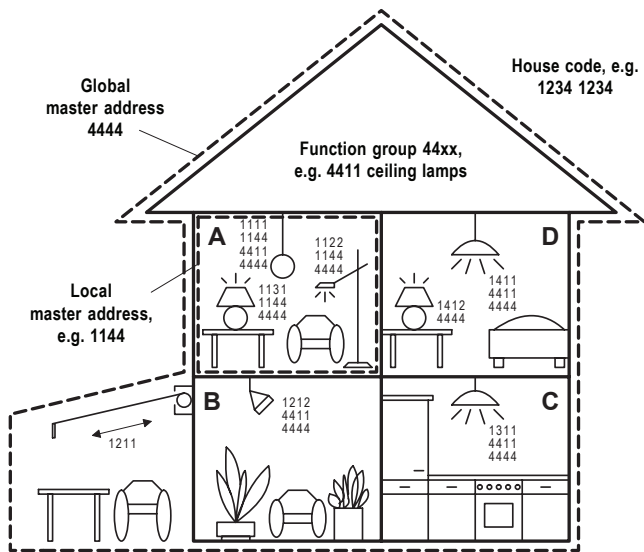


The only global master is 4444.

For a large, extended system it is advisable to select addresses systematically so that you have an overview of the addresses that have already been assigned, and so that you can jointly control the programmed receivers simply and meaningfully in groups.



An example is provided on the next page.



In order to distribute the address areas evenly across the house, a different address group has been assigned to each room in the house: room A: 11, room B: 12, room C: 13, room D: 14. The awning has been allocated to the room next to it, room B.



Altogether the following 15 address groups are possible: 11, 12, 13, 14, 21, 22, 23, 24, 31, 32, 33, 34, 41, 42, 43

In order to be able to separately control each receiver, you need to program each receiver to a single address. A subaddress is also required in addition to the address group that is already selected.



In total, the following 15 subaddresses are possible for each address group: 11, 12, 13, 14, 21, 22, 23, 24, 31, 32, 33, 34, 41, 42, 43

In the example the awning is programmed to the single address 1211, which is comprised of the address group 12 and its subaddress 11.

All the receivers in room A have also been programmed to a local master address. For the local master address 44 is always set as the subaddress, while one of the 15 local master addresses is selected via the address group. The range available for the address group is once again between 11 and 43 (11, 12, 13, 14, 21, 22, 23, 24, 31, 32, 33, 34, 41, 42, 43).

In addition, all the lamps in the house can be controlled via the global master address 4444. The awning was not programmed to this address and can therefore only be controlled via its single address.

The ceiling lamps in all the rooms are also combined in a function group and can therefore be jointly controlled.

To select one of the 15 function groups, you need to set 44 as the address group and a value between 11 and 43 (11, 12, 13, 14, 21, 22, 23, 24, 31, 32, 33, 34, 41, 42, 43) as the subaddress.

In the example the ceiling lamps have the function group address 4411.

## 10. Individual settings

In addition to the factory settings (see section 7. b), various individual settings may be programmed to suit your needs.

The 'FS20 TFK' can control two different channels of the FS20 system.

These may be set separately (except for the house code, see section 9).



In the following instructions, the buttons in brackets apply to channel 2.

### a) Setting the on-time

The on-time of the FS20 receiver controlled components is programmable from 0.25 seconds to 4.25 hours; a continuous setting is also available.

The diagram illustrates the control panel for setting the on-time. It shows two rows of buttons. The first row has two buttons labeled '1' and '3' in square boxes, with the text 'or' between them. Below these buttons are two circular LEDs, each with a sunburst icon, and the text 'blinks'. The second row has four buttons labeled '1', '2', '3', and '4' in square boxes. Below these buttons is a single circular LED and the text 'LED goes out'. To the right of the buttons, the text 'Press for 5 seconds' is aligned with the first row, and 'Enter on-time' is aligned with the second row.

- Press button **1** (or for channel 2, button **3**) for around 5 seconds, until the indicator LED begins to blink.

- Enter the desired on-time using four digits with buttons **1**, **2**, **3** and **4**, using the table below.

- When the fourth digit is entered, the indicator LED goes out.

The first two digits provide the numerical value and the following two digits a multiplier with the appropriate time unit.

For example (factory setting): 1 minute

Enter 44 21 = 15 x 4 seconds = 60 seconds

Digit combination to be entered	Numerical value 1st + 2nd digit	Multiplier 3rd + 4th digit
11	Continuous	0.25 s
12	1	0.5 s
13	2	1 s
14	3	2 s
21	4	4 s
22	5	8 s
23	6	16 s
24	7	32 s
31	8	64 s = 1.07 min
32	9	128 s = 2.13 min
33	10	256 s = 4.27 min
34	11	512 s = 8.53 min
41	12	1024 s = 17.07 min
42	13	1024 s = 17.07 min
43	14	1024 s = 17.07 min
44	15	inactive*

\* The receiver is turned on without an on-time. This allows a timer function to be used with the receiver. For more information on this, read section 10 c).

## b) Setting the transmission interval

The transmission interval defines the interval at which the power-on command is repeated.

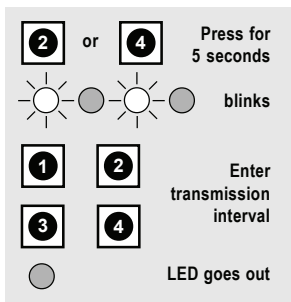
The repetition only applies to commands triggered by a switching contact, not to the transmission of a power-on command using button 2 (or button 4 for channel 2).

This means if a power-on command is transmitted because a switching contact is opened or closed, a timer becomes active in the 'FS20 TFK'. When this expires, the last power-on command transmitted is repeated.

Every change to the switching contact resets the timer. If a change to the switching contact (opening or closing) is set to trigger a power-off command or no command, then this is transmitted, the timer is deactivated and no further repeat power-on commands are sent.

If the change is set to trigger a power-on command, this is transmitted and the repeat interval timer is reset.

A power-off command triggered by pressing the off button also stops the timer.



- Press button 2 (or for channel 2, button 4) for around 5 seconds, until the indicator LED begins to blink.

- Enter the desired transmission interval using four digits with buttons 1, 2, 3 and 4, using the table below.

- When the fourth digit is entered, the indicator LED goes out.



Digit combination to be entered	Numerical value 1st + 2nd digit	Multiplier 3rd + 4th digit
11	Continuous	0.25 s
12	1	0.5 s
13	2	1 s
14	3	2 s
21	4	4 s
22	5	8 s
23	6	16 s
24	7	32 s
31	8	64 s = 1.07 min
32	9	128 s = 2.13 min
33	10	256 s = 4.27 min
34	11	512 s = 8.53 min
41	12	1024 s = 17.07 min
42	13	1024 s = 17.07 min
43	14	1024 s = 17.07 min
44	15	1024 s = 17.07 min

The 'on-time' and 'transmission interval/transmission repeat' functions make the 'FS20 TFK' very flexible and, in combination with the configuration of the plug jumpers, allow you to set a wide range of different switching patterns.

One possible use would be to ensure that the receiver cannot be continuously switched on. This could be achieved, for example, by selecting an on-time of 1024 seconds and a transmission interval of 960 seconds.

As long as the contact remains in the corresponding position, the 'FS20 TFK' keeps repeating the power-on command and the receiver remains permanently on.

If the switching contact status changes, the power-on command is no longer repeated and (depending on the configuration) a power-off command is sent.

Even if the power-off command is **not** received, the receiver only remains on for a maximum of 1024 seconds (programmed on-time).

To ensure that the receiver remains permanently on, the repeat command may be transmitted repeatedly during the set on-time. This means the receiver stays on, even if a repeat command is missed due to interference to the wireless reception.



Setting transmission repeats with very short intervals will reduce battery life.

To minimise the impact on the battery, the transmission interval function (insofar as it is used at all) should be set to the longest transmission intervals possible for your purposes.

The switching commands should also be configured so that, in the position in which the switching contact is usually required, the power-on command is **not** sent repeatedly.

### c) Programming the receiver timer

To use the receiver's internal timer, program as follows:

- The allocated button combination on the 'FS20 TFK' (channel 1: button **1** and **2**, channel 2: button **3** and **4**) are pressed and held down **simultaneously** (but not longer than 5 seconds!).

This procedure is used to start, as well as end, the timer setting measurement.

The LED on the receiver blinks during the time measurement. For information on how to program the timer, see the instructions in the receiver's user manual.



Please note:

The timer function can only be used when the 'FS20 TFK' on-time is set to 'inactive' (factory setting).

### d) Using several transmitters

In the delivery state each transmitter in the FS20 system has its own, randomly set house code.

If you want to jointly control one or several receivers via different transmitters, you first need to coordinate the transmitters' house codes. The house code must be set for each transmitter according to the instructions in section 9 a).

The codes must be coordinated before the receivers are first linked, as the house code is transmitted to the receiver during this procedure.

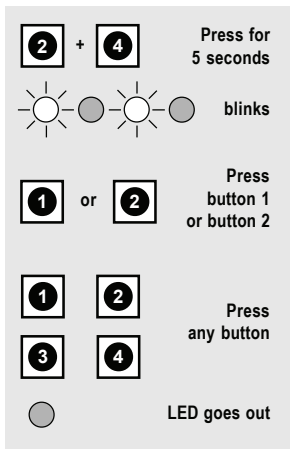
The transmitters' channels are factory set to the same addresses and only need to be changed if required, see section 9 b).

## e) Resetting to factory settings



There are two ways of resetting the 'FS20 TFK' to the factory settings:

- Complete reset (including addresses and house code!)
- Resetting the operating parameters only

### 1. Complete reset (including addresses and house code)




**2** + **4**      Press for 5 seconds

       blinks

**1** or **2**      Press button 1 or button 2

**1**      **2**  
**3**      **4**      Press any button

      LED goes out

Press button **2** and **4** simultaneously for around 5 seconds until the indicator LED begins to blink.

Press button 1 or 2.

Press any button. Please note that in this case the 'FS20 TFK' will **not** return to normal operation within 30 seconds if no other button is pressed!

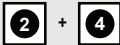
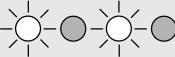
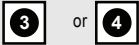

The indicator LED goes out.



This indicates that the factory settings (see section 7. b) have been restored. All settings, including house code and addresses, have been deleted.

The 'FS20 TFK' must now be programmed from the very beginning.

## 2. Resetting, but retaining addresses/house code

	<b>Press for 5 seconds</b>	Press button <b>2</b> and <b>4</b> simultaneously for around 5 seconds until the indicator LED begins to blink.
	<b>blinks</b>	
	<b>Press button 3 or button 4</b>	Press button <b>3</b> or <b>4</b> .
	<b>LED goes out</b>	The indicator LED goes out.

## 11. Battery replacement

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When the batteries are used up, switching operations may not be carried out or the range may be reduced, leading to bad reception (for example, unreliable switching).

To change the batteries, follow the instructions in section 6. c).



All settings are retained whilst the batteries are changed.

## 12. Information on the range

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### Ranges and interference

- The FS20 wireless control system (and therefore also the 'FS20 TFK') uses the 868MHz range, which is also used by other radio services. Therefore devices that operate on the same or neighbouring frequencies may restrict both its operation and its range.
- The specified range of 100m is the free-field range, which means the range with visual contact between the transmitter and receiver. In practice however, there are ceilings, walls, garages or adjoining buildings between the transmitter and the receiver that affect and reduce the range accordingly.

A repeater is available to increase the range of the FS20 system. This forwards the radio commands it receives from the FS20, which results in a greater wireless range.

- The actual attainable distance between the transmitter and receiver in normal operation depends very much on the installation location and the environment.

As a rule – when mounted in a family home, for example – all components should operate faultlessly and experience no radio reception problems.

### Other causes of reduced ranges:

- All types of high-frequency interference
- Any buildings or vegetation
- Conductive metal parts that are located near the devices or within or near their transmission path, for instance, radiators, metallised insulation glass windows, reinforced concrete ceilings, etc.
- Influence on the radiation pattern of antennas due to the distance from the transmitter or receiver to conductive surfaces or objects (also to human bodies or the ground)
- Broadband interference in urban areas that reduces the signal-to-noise ratio; the signal is no longer recognised due to this 'noise'
- Interference radiation resulting from insufficiently shielded electronic devices, for example, operating computers or similar

## 13. Handling

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Take note of all safety instructions and information relevant to installation and operation in this user manual.

- The appliance is designed for indoor use. It must not get damp or wet.
- Avoid dust or direct sunlight.
- The product is not a toy and should be kept out of the reach of children.

Do not install or operate the product within the reach of children; the product contains small parts which may be swallowed, glass parts (display) and batteries or rechargeable batteries.

## 14. Maintenance and cleaning

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The product requires no servicing except for battery replacement. Never open or disassemble the product (apart from when replacing the batteries).

Any repairs should be carried out by a skilled technician or professional workshop!

Clean the surface of the product using a soft, clean, dry and lint-free cloth. To remove heavier dirt, use a cloth which is slightly moistened with lukewarm water.

Do not use any aggressive or solvent-based cleaning agents as these may damage the plastic casing (removing lettering or causing discoloration).

## 15. Disposal

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### a) General information



Do not dispose of electric and electronic products via the household rubbish.

When the product is no longer usable, dispose of it in accordance with the applicable statutory regulations.

### b) Batteries and rechargeable batteries

As the consumer, you are legally obliged to return all your used batteries and rechargeable batteries. **Do not dispose of your used batteries via the household rubbish!**



Batteries/rechargeable batteries containing harmful substances are marked with the following icons, which alert you to the fact that disposal via the household rubbish is prohibited. The identifiers for the respective heavy metals are: **Cd**=cadmium, **Hg**=mercury, **Pb**=lead (identifier is on the battery/rechargeable battery, for example, under the rubbish bin icons on the left).



You can return your used batteries/rechargeable batteries free of charge to any authorised disposal station in your area, in our stores or in any other store where batteries/rechargeable batteries are sold.

By doing so you comply with your legal obligations and also make a contribution to environmental protection.

## 16. Technical specifications

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- Frequency: ..... 868.35MHz
- Range: ..... Up to 100m (free-field, see section 12)
- Batteries: ..... 2 x AAA (LR03)
- Dimensions (W x H x D): ..... 55 x 165 x 25mm

## 17. Declaration of conformity (DOC)

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We, Conrad Electronic, Klaus-Conrad-Straße 1, D-92240 Hirschau (Germany), hereby declare that this product complies with the fundamental requirements and other relevant regulations of directive 1999/5/EG.



You can find the declaration of conformity for this product at [www.conrad.com](http://www.conrad.com)

## 18. Appendix: Operating the device with more than one switching contact

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The 'FS20 TFK' has two internal magnetic contacts as well as a connection option for an external contact.

All three switching contacts trigger the same, configurable actions.

As configurations are conceivable in which, for example, one window sash is monitored by the internal magnet contact and the other with the external contact, it should be borne in mind that the closed contact always has the highest priority.

**Here are two examples of applications in which two window sashes are to be monitored:**

### **Version 1:**

The 'FS20 TFK' is configured as follows:

- When the contact is closed, the power-on command is sent
- When the contact is opened, the power-off command is sent
- 'FS20 TFK', magnet and external contact should be mounted so that both contacts are open in the normal position (both window sashes closed).

If one window sash is now opened, the power-on command is transmitted. If the second sash is opened, no reaction is triggered. In this case the device is always switched on as soon as at least one window sash is opened.

A power-off command is not sent until both window sashes are closed.



## Version 2:

The application remains the same as for version 1, but now the contacts are installed so that both switching contacts are closed in the normal position (both window sashes closed).

If one window sash is opened and then closed again, no reaction is triggered.

A power-off command is not sent until **both** window sashes are opened. If one of the two window sashes is subsequently closed, a power-on command is transmitted.

In this case the device is always switched on, as long as at least one window sash is closed.

The switching patterns may be reversed by laying the plug jumpers accordingly, allowing the switching pattern to be tailored to the application purpose.

Several normally closed or active normally open contacts with sequential or parallel switching, depending on the application purpose, may serve as an external contact.



For this it should be noted that the internal contacts are always parallel to the external contacts.

## Summary:

- **All switching contacts in series:**

All contacts are closed, one is opened -> open

All contacts except for one are closed, that one closes -> close

- **All switching contacts in parallel:**

All contacts except for one are open, this opens -> open

All contacts are open, one closes -> close







100%  
recycling  
paper.

Bleached  
without  
chlorine.

## Imprint

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