FBR03-FTL Radio Room Controller

Application



The FBR03-FTL wireless room controllers are used within the DDC3000 and DDC4000 automation systems for individual room control.

The fieldbus is used for data communication with the DDC3xxx/ DDC4xxx controller.

For direct communication with technoLink® field devices, the FBR03-FTL is equipped with an integrated wireless interface. Wireless communication with the field devices takes place using the EnOcean wireless communication standard.

The FBR03-FTL makes received wireless signals available as fieldbus parameters.

Automatic control functions enable use even without a controller.

DDC software menus, such as optimize/heating; limiting value and Y Set, can extend the basic closed loop control function.

Additional separate antenna with magnetic base for improved radio communication.

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Important Information on Product Safety

Safety instructions

This document contains information on installing and commissioning the product “FBR03-FTL”. Each person who carries out work on this product must have read and understood this document. If you have any questions that are not resolved by this document, you can obtain further information from the supplier or manufacturer.

If the product is not used in accordance with this document, the protection provided could be impaired.

The applicable regulations must be observed when installing and using the devices. Within the EU, these include regulations regarding occupational safety and accident prevention as well as those from the VDE (German Association for Electrical, Electronic & Information Technologies). If the device is used outside of the EU, it is the responsibility of the plant engineer or operator to comply with local regulations.

Mounting, installation and commissioning work on the devices may only be carried out by qualified technicians. Qualified technicians are persons who are familiar with the described product and who can assess given tasks and recognize possible dangers based on their technical training, knowledge and experience, as well as their knowledge of the applicable regulations.

Symbol meanings



WARNING

Indicates a hazard of medium risk which can result in death or serious bodily injury if not avoided.



CAUTION

Indicates a hazard of low risk which can result in minor or medium bodily injury if not avoided.



CAUTION

Indicates a hazard which can result in material damage or malfunctions if not avoided.



NOTE

Indicates additional information that can simplify working with the product.

Notes on disposal

In accordance with the applicable laws and directives of the European Union countries, the product should not be disposed of with household waste. This ensures environmental protection and sustainable recycling or raw materials.

Commercial users should contact their supplier and observe the conditions of the purchase agreement. This device may not be disposed of together with other commercial waste.

The local and currently applicable laws must be observed.

Application

FBR03-FTL Wireless room controller for individual room control with integrated EnOcean wireless interface and separate antenna 2,5 m with magnetic base

Technical Data

Nominal voltage	DC 12 V ± 20%, 1.8 W
Inputs and outputs	■ Wireless room temperature sensor with EnOcean radiogram ■ Wireless remote adjuster for setpoint correction with EnOcean radiogram ■ 3 BI: Wireless input with EnOcean radiogram, or voltage-free contact input (can be configured independently) Fully configurable (e.g. extension of programmed times, presence detector, light switch, window contact, malfunction message, operating message) ■ 2 wireless outputs with EnOcean radiogram for controlling wireless actuators or 2 AO: DC 0 to 10 V, max. 5 mA ■ 1 BO: Voltage-free relay output AC 230 V; 8 (3) A ■ 1 BO: Transistor output for LED display; DC 12 V, 2 mA
Displays and controls	■ 2 external LEDs - Green “Data” LED: Flashes during fieldbus data transmission. - Red “Error” LED: Lights up when there is a fieldbus error. ■ 6 LEDs behind <System> cap (See chapter “Displays and Controls”, page 12.) ■ 2 buttons behind the<System> cap ■ Fieldbus address switch in the housing
Interfaces	Radio interface: ■ Radiogram: manufacturer-neutral EnOcean radiogram ■ Transmission and receiving frequency: 868.3 MHz ■ Transmission power: < 10 mW ■ Duty cycle: < 1% ■ Range: approx. 30 m in buildings (depending on building structure) Fieldbus, max. 2000 m, CAN bus Antenna socket: FME socket
Housing	Plastic housing, cover color RAL 9010 (pure white)
Degree of protection	IP20
Ambient temperature	0 °C to 45 °C
Mounting	Wall mounting
Weight	0.52 kg
Dimensions	WxHxD mm 205 x 110 x 54

CAUTION
The radio communication of the FBR only works if a nominal voltage of at least 9.9 V DC is applied to the device.

CAUTION

This product uses only EnOcean wireless telegrams.

Only devices that support the EncOcean radio standard can be used as radio partners.

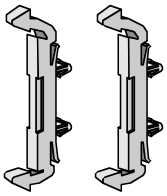
The following EnOcean Equipment Profiles (EEP) are supported:

- EEP A5-20-01 * (MD15-FTL)
- EEP A5-10-0C * (TC23)
- EEP A5-10-05 * (TCF23, TCF321-FTL)
- EEP D5-00-01 * (MK10W-FTL)
- EEP F6-02-011 * (LT10x-FTL)
- EEP D2-10-30 * (RPW4xx-FTL as of version 3.04)

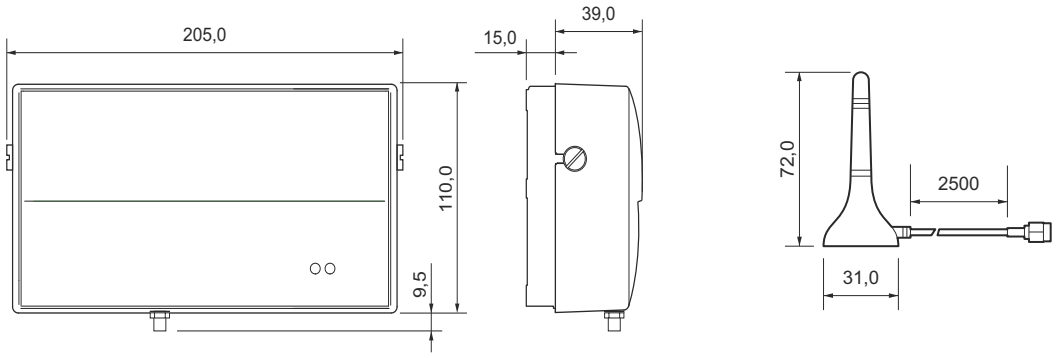
For information about the protocol description, visit
http://tools.enocean-alliance.org/EEPViewer/

Accessories (not included in delivery)

Z19 Standard rail bracket clip
For mounting on TH35-7.5 top hat rail



Dimensions



Connection

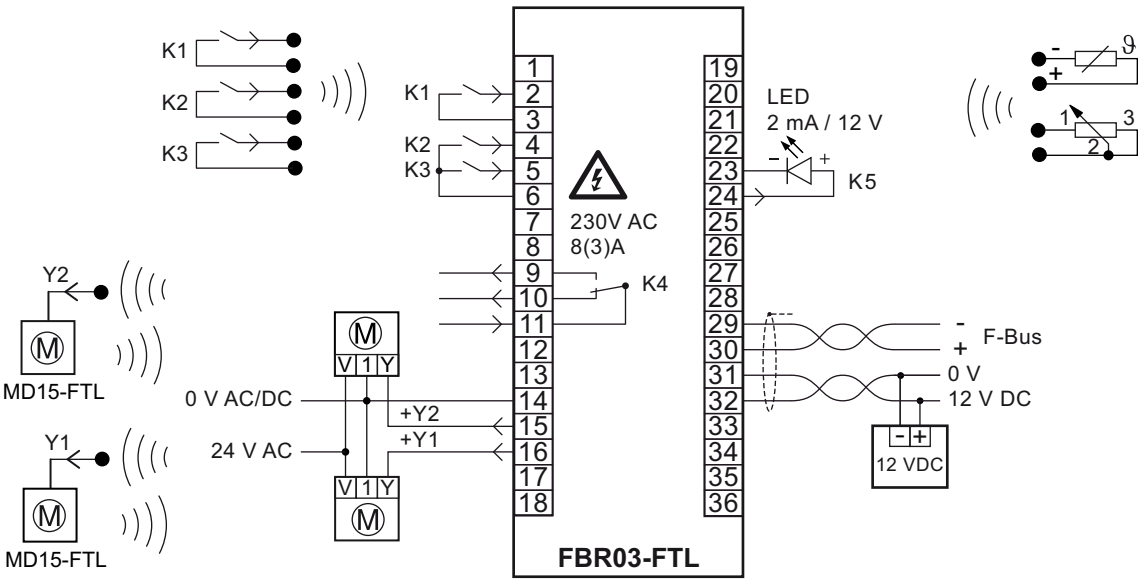
WARNING

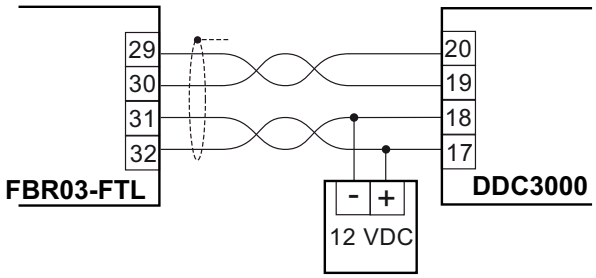
Contact with live parts of electrical domestic installation can cause death due to electric shock.

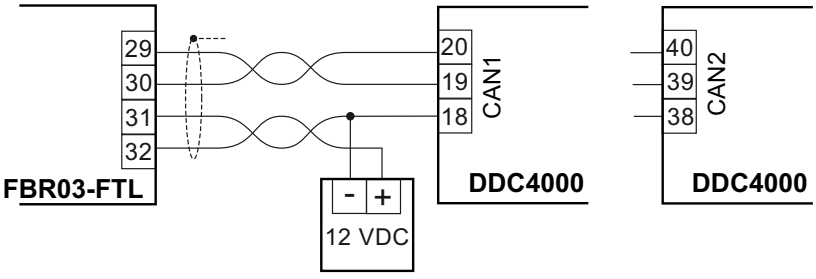
Only connect the device and switch on the power supply if you are qualified to do so. Be sure to comply with VDE guidelines and local wiring regulations.

Lines for the mains supply and fieldbus are to be laid together in one shielded cable, cable type at least 0.8 mm in diameter, with the wires twisted together in pairs. Here, one stranded pair of wires is to be used for the mains supply and the other for the fieldbus.

At the end of the fieldbus (furthest point from the DDC controller, max. 2000 m), the two connection lines must be fitted with a terminating resistor of about 180 ohm (terminating resistor is included with the DDC controller).







Binary input K1

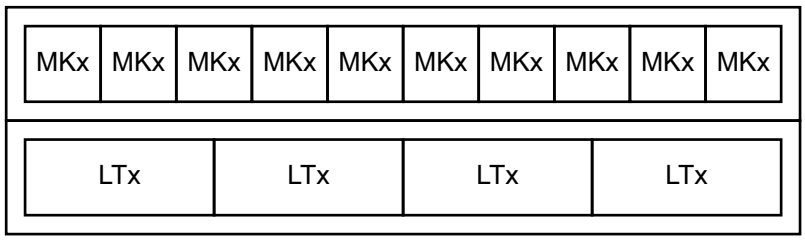
Each binary input (K1) can be connected with cable or wirelessly.

After you have successfully registered a TC23, TCF23, or RPW4xx-FTL unit, the occupancy button is permanently assigned to input K1.

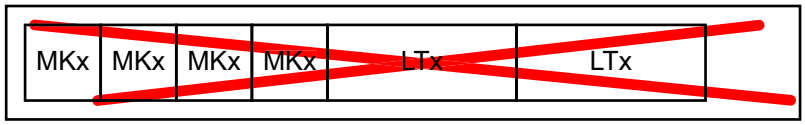
Binary inputs K1 to K3

Each binary input (K1, K2, K3) can be connected via cable or wirelessly.

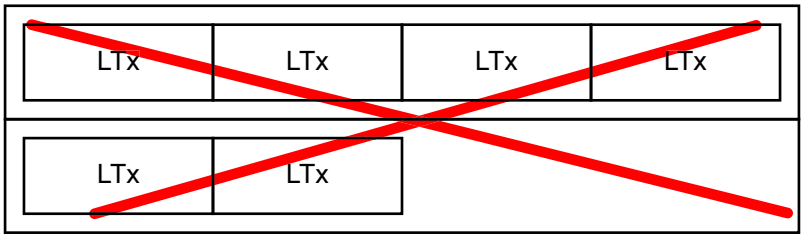
A maximum of ten MK10x-FTL SolarFunk window contacts or four LT10x-FTL wireless light switches can be connected to one binary input wirelessly.



It is not possible to connect a combination of MK10x-FTL SolarFunk window contacts and LT10x-FTL wireless light switches to a single binary input.



All LT10x-FTL wireless light switches must be connected to the same binary input. As such, a maximum of four LT10x-FTL wireless light switches can be connected for each FBR03-FTL.



MK10x-FTL SolarFunk window contacts can be connected to all binary inputs. As such, a maximum of 30 MK10x-FTL SolarFunk window contacts can be connected for each FBR03-FTL.



Binary output K4

CAUTION

Direct contact with light will damage the relay output K4.

To control light, use an external coupling relay that is specifically designed for light control.

Analog outputs Y1 and Y2

Each analog output (K1 or K2) can be connected via the cable or wirelessly.

A maximum of four MD15-FTL wireless small actuators can be connected wirelessly at an analog output.

NOTE

In combination with the MD15-FTL, we recommend parameterization of the room controller as a P loop controller.

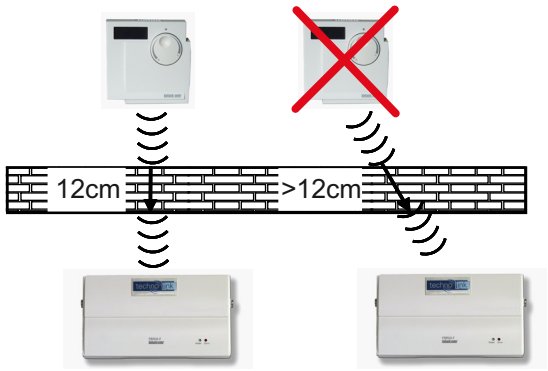
General installation instructions

It is not always possible to freely select the installation location of devices which communicate wirelessly, as wireless data transmission is influenced to a greater or lesser extent by structural or spatial factors.

Before installation and assembly, the building structure must be analyzed and a series of measurements must be made to determine the specific ranges within the building. The field strength meter “EPM 100” can be used for this purpose.

In order to establish communication paths that ensure operation and the function of the devices, the following aspects must be considered before and during planning:

- Structural factors restrict the transmission ranges which can be reached. Building materials and shielding elements (suspended ceiling elements, installation shafts, fire doors, etc.) must be taken into consideration during planning.
- Elevated humidity increases natural signal damping.
- Plan signal paths horizontally on a single level with max. 30 m between the transmitting and receiving modules.
- Adhere to the following minimum distances to potential sources of interference:
  - 0.5 m to high-frequency sources of interference (such as microwaves, transformers or computers)
  - 3.0 m to transmitters of other wireless radio systems (such as cordless telephone or headphones)
  - 0.1 m to metal and door frames
- Minimize the effects of wall thicknesses by ensuring that the wireless signal passes through the walls at as close to a right angle as possible.
- In order to make direct reception possible, select a mounting location outside of the deadspots caused by shielding building parts/ structures.
- Change the position of the transmitter/receiver slightly where the device is installed at the limits of reliability. (Reduce the overlapping effects of radio waves.)



NOTE

Use a separate antenna to improve radio communication.

Self-control program.

Use without a controller is possible. The **self-control program** is then responsible for the control functions of the FBR03-FTL. To use the self-control program, set the fieldbus address to “00”.

Use of the self-control program is indicated by the flashing red external LED.

In the self-control program, the FBR03-FTL regulates the system to a setpoint of a 15 °C night setpoint or 20 °C day setpoint, ± the configured setpoint correction of the room control module as a constant P loop controller.

The closed loop control function affects the heating (output Y1) and cooling (output Y2) sequences.

The contact K2 is used to switch between the night setpoint and day setpoint.

K2 open = night setpoint

K2 closed = day setpoint

NOTE

If a radio room control module RPW4xx-FTL is registered at the FBR03-FTL, contact K2 is obsolete.

In that case the day/night setpoint sent by the radio room control module RPW4xx-FTL will be used.

Bridging program

If communication with the automation station is interrupted, the FBR03-FTL continues to work with the current parameterization in the **bridging program**.

Use of the bridging program is indicated by the illuminated red external LED.

Mounting

WARNING

Contact with live parts of electrical domestic installation can cause death due to electric shock.

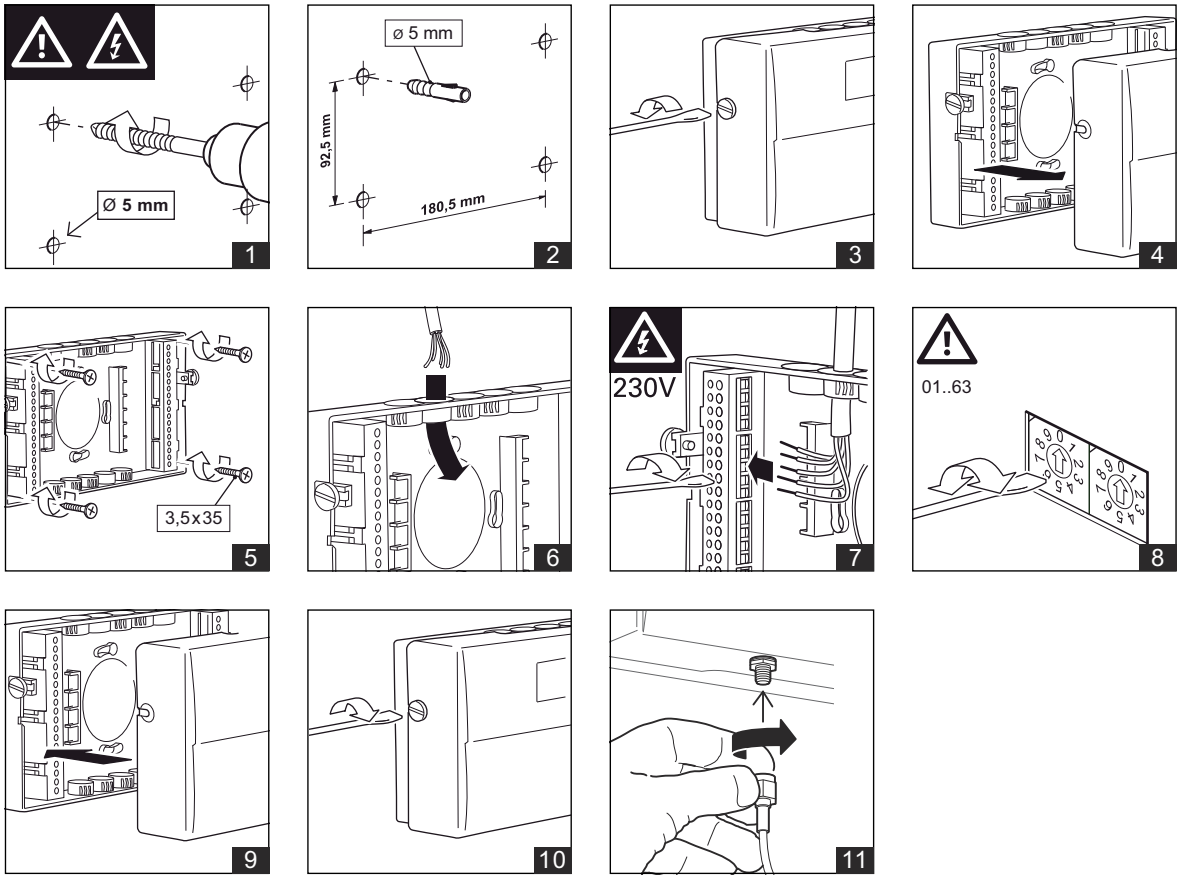
Mounting/removal may only be carried out when power is switched off.

CAUTION

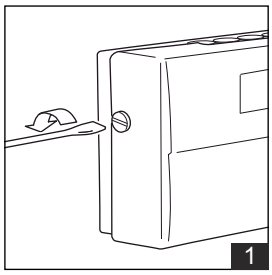
Switching on the power supply of unparameterized products can lead to unforeseen consequences such as malfunctions or material damage.

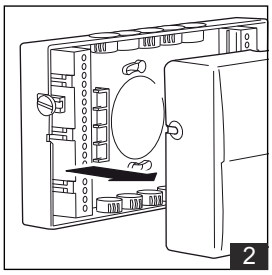
Switch on the power only after the device has been configured by the commissioning technician.

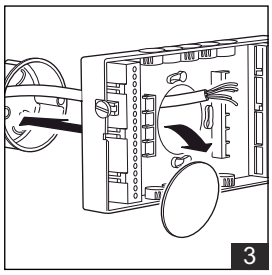
Wall mounting

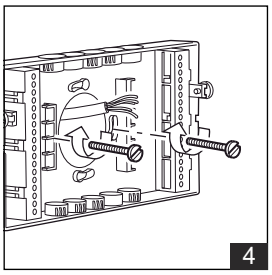


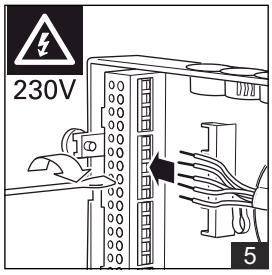
Flush mounting

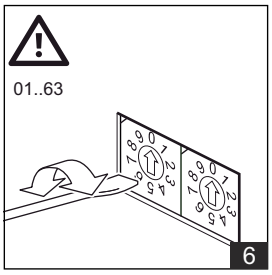


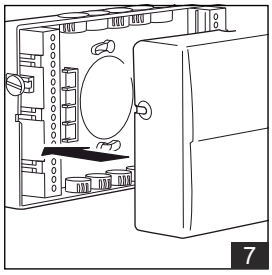


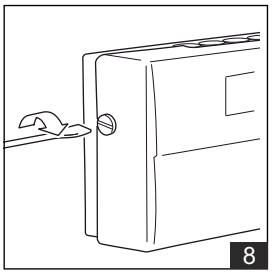


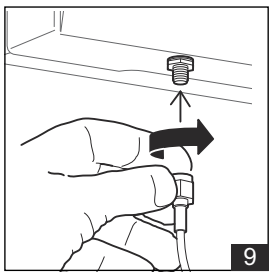












Setting the Fieldbus Address

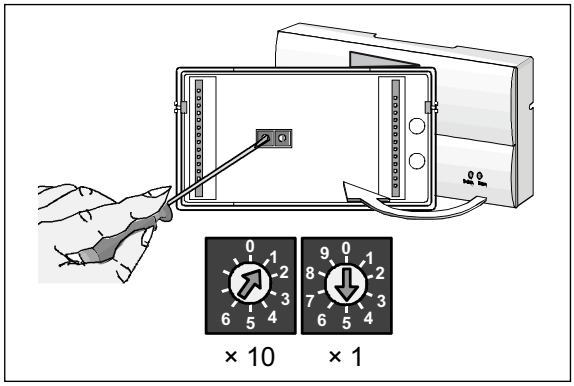
The rotary switches for setting the fieldbus are located inside the cover. Information on opening and closing the device can be found in the chapter "See chapter “Mounting”, page 10.

Set the first rotary switch to the first digit of the fieldbus address, the second rotary switch to the second digit.

The example shows the address 15.

Permitted range for the fieldbus address: 01 to 63

After setting **the address to 00** and switching on the power, the FBR03-FTL functions in the self-control program. (See chapter “Self-control program.”, page 9.)



By setting **the address to 99** and switching on the power, all saved device IDs of the wireless partners are deleted.

Commissioning

CAUTION

This product description describes specific settings and functions of the FBR03-FTL. In addition to these instructions, the product descriptions of other system components, such as radio partners, are to be observed.

CAUTION

If you are using a TC23, TCF23 or TCF321-FTL room temperature sensor or a room control module RPW4xx-FTL, you must register this unit on the FRR03-FTL unit as the first wireless partner.

NOTE

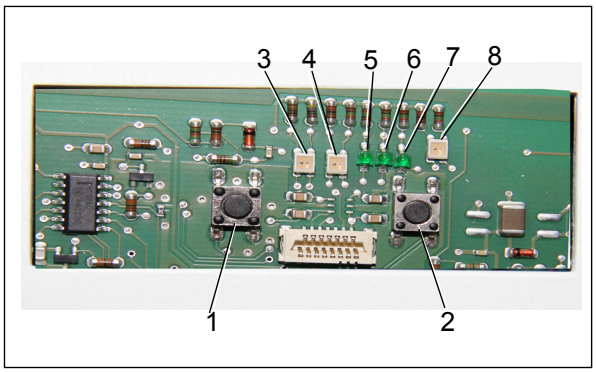
The FBR03-FTL makes received wireless signals available as fieldbus parameters.

Further parameterization information can be found in the project planning documentation.

Displays and Controls



The buttons and LED displays that are relevant for registering wireless partners (commissioning) are located behind the <System> cap. This cap is snapped open and can be removed by moving forwards.



(1) “Register” button
(2) “Channel” button
(3) Red/green “Wireless communication” LED
(4) Red/green “Wireless communication status” LED
(5) Green “Binary wireless input K1” LED
(6) Green “Binary wireless input K2” LED
(7) Green “Binary wireless input K3” LED
(8) Red/yellow/green “Field strength of the current
receiving wireless signal” LED

LED (3) “Wireless communication”

LED (3) flashes: A valid radiogram is currently being received. Radiograms from wireless partners which have not been registered are also displayed.

LED (4) “Wireless communication status”

LED (4) lights up green: Transmissions from all wireless partners which have been registered are being received successfully.

LED (4) flashes green: The FBR03-FTL is ready to register wireless partners. If the FBR03-FTL receives no radiogram within about 6 minutes, this mode is ended automatically.

LED (4) flashes red: The FBR03-FTL is ready to unregister wireless partners.

LED (4) lights up red: No transmission from one or more wireless partners has been received for more than three hours or after a power failure. LED (5), (6) and (7) display the malfunctioning channel(s). The display changes to green automatically if transmissions from all wireless partners have been received successfully.

LED (4) off: No wireless partners have been registered.

LED (5), (6) and (7) “Input” and “Output” display

These LEDs display the selected channel when registering or unregistering wireless partners:

LED (5)	LED (6)	LED (7)	Selected channel
●	●	●	Analog input for room temperature and setpoint correction
●	●	●	Binary input K1
●	●	●	Binary input K2
●	●	●	Binary input K3
●	●	●	Analog output Y1
●	●	●	Analog output Y2

“Quality of the field strength of the receiving wireless signal” LED (8) display

The field strength quality of the receiving wireless signal is indicated by when the color of the LED (8) changes to green = very good, yellow = sufficient and red = poor.

Switching on the Power

WARNING

Contact with live parts of electrical domestic installation can cause death due to electric shock.

Only connect the device and switch on the power supply if you are qualified to do so. Be sure to comply with VDE guidelines and local wiring regulations.

Before switching on the power, ensure that the device has been mounted correctly and check the electrical connection.

After switching on the power, the FBR03-FTL is ready to receive. If no wireless partner has been registered (LED (4) off), this must be done. (See chapter “Teaching in the radio partner”, page 15.)

Note the delayed data transmission due to the transmission intervals of the wireless signal paths. Wireless partners do not transmit signals constantly but cyclically or event-oriented. Controlled by intelligent transmission management, transmission cycles can vary within a range of 2 minutes to 30 minutes.

Wireless communication in the 868 MHz band is subject to a transmission/intermission ratio (“Duty Cycle”) that is stipulated by law, which does not permit frequent data transmission.

NOTE

After a power outage, the controller does not work properly until it has received a regular room temperature measurement value.

Teaching in the radio partner

The device IDs of the wireless partners are stored in the FBR03-FTL. Even after a power failure, stored device IDs of wireless partners remain saved.

Registering a room temperature sensor with/without setpoint adjustment/occupancy button or room control module

- Press the "Learn" button (1) for 2 seconds.

  LED (4) flashes green.
- Ensure that the analog input is selected for room temperature and nominal value correction.

  LED (5), (6) and (7) display the selected channel. (See chapter “Displays and Controls”, page 12.) If one of these LEDs lights up, a binary input is selected on which the room temperature sensor cannot be set. In this case, keep pressing the "Channel" button (2) until LED (5), (6) and (7) are off.
- Trigger a radiogram at the room temperature sensor, e.g. by pressing a register/reset button on the room temperature sensor. Details can be found in the documentation of the room temperature sensor.

  LED (4) flashes red and green for 5 seconds.

  LED (4) flashes green.
- Press the "Learn" button (1) briefly.

  LED (4) stops flashing.

NOTE

After you have successfully completed all previous registration steps, the occupancy button of a TC23, TCF23, TC321-FTL, or RPW4xx-FTL unit is registered and assigned to input K1.

Please note:
When using a TC23, TCF23, or TCF321-FTL, input K1 will be set to 1 (on) for 10 seconds after pressing the occupancy button. If you press the button again, the process is restarted.

Pushing the occupancy button switches the RPW4xx-FTL manually between comfort and economy operating modes. That means comfort mode K1 = 1 (occupied) and
economy mode K1 = 0 (not occupied).

CAUTION

If input K1 is assigned to another wireless partner, it is not possible to teach in a TC23/TCF23 unit on this input.

The teach-in step “LED (4) flashes red and green for 5 seconds” is not reached; the LED (4) remains off. (See chapter “Teaching in the radio partner”, page 15.)

CAUTION

If you are using a TC23, TCF23 or TCF321-FTL room temperature sensor or a room control module RPW4xx-FTL, you must register this unit on the FRR03-FTL unit as the first wireless partner.

Setting the Switch and Contacts

- Press the "Learn" button (1) for 2 seconds.
  LED (4) flashes green.
- Select the desired input with the "Channel" button (2).
  LED (5), (6) and (7) display the selected channel. (See chapter “Displays and Controls”, page 12.)
- Trigger a radiogram at the wireless partner, e.g. by pressing the register button on the window contact or by switching the light switch three times. Details can be found in the documentation of the wireless partner.
  LED (4) flashes red and green for 5 seconds.
  LED (4) flashes green.
- Repeat the previous step if you want to register more identical wireless partners on the same output.
- Press the "Learn" button (1) briefly.
  LED (4) stops flashing.

NOTE

After setting the maximum amount of wireless partners on one input the FBR03-FTL switches automatically to the next free channel.

Registering the wireless small actuator

- Press the "Learn" button (1) for 2 seconds.
  LED (4) flashes green.
- Select the desired Y output using the “Channel” button (2).
  LED (5), (6) and (7) display the selected input. (See chapter “Displays and Controls”, page 12.)
- Trigger a radiogram at the wireless partner, e.g. by pressing the register button on the wireless small actuator. Details can be found in the documentation for the wireless small actuator.
  LED (4) flashes red and green for 5 seconds.
  LED (4) flashes green.
- Repeat the previous step if you want to register more wireless partners on the same output.
- Press the "Learn" button (1) briefly.
  LED (4) stops flashing.

NOTE

After teaching in the maximum number of wireless partners on the Y output, the FBR03-FTL automatically switches to the next free channel.

NOTE

If all wireless inputs are fully assigned, the LED (4) lights up red in teach-in mode for about 5 minutes or teach-in mode is ended by pressing the push-button (1).

It is then not possible to teach in any more wireless partners.

Deleting the radio partner

- ▶ Press the "Learn" button (1) for 2 seconds.
  LED (4) flashes green.
- ▶ Press the "Learn" button (1) for 2 seconds.
  LED (4) flashes red.
- ▶ Select the desired input with the "Channel" button (2).
  LED (5), (6) and (7) display the selected channel. (See chapter “Displays and Controls”, page 12.)
- ▶ Press the "Learn" button (1) for 2 seconds.
  All wireless partners which were registered on a selected input are deleted.
- ▶ Repeat the two previous steps if you want to delete more wireless partners.
- ▶ Press the "Learn" button (1) briefly.
  LED (4) stops flashing.

NOTE

Alternatively, you can delete all wireless partners and settings by starting the FBR03-FTL with the set fieldbus address "99". (See chapter “Setting the Fieldbus Address”, page 11.)

“Sensor Failure” Simulation

When radio communication between FBR03-FTL and the room temperature sensor or room control module is disrupted, the FBR03-FTL simulates a "sensor failure":

- The FBR03-FTL generates a malfunction message which can be evaluated by the higher-level building management system.
- If no signal has been received from the room temperature sensor for more than 3 hours, the “Sensor failure” simulation is triggered.
- The room controller evaluates the room temperature sensor as invalid.
- The “Sensor failure” simulation is reset as soon as a valid radiogram has been received from the room temperature sensor.

The malfunctioning of the wireless communication is also displayed by LED (4) “Wireless communication status” on the FBR03-FTL. (See chapter “Displays and Controls”, page 12.)

Notes on using a room control module RPW4xx-FTL

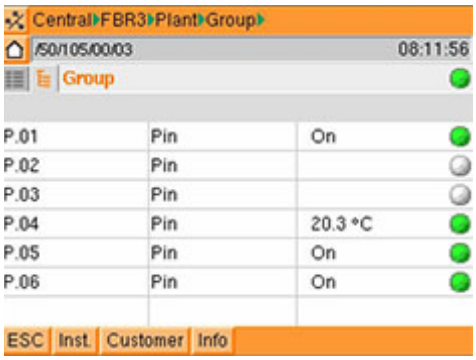
- The system time (time and date) of the DDC4000 system is applied to the RPW4xx-FTL.
  Time and date cannot be set directly on the room control module in that case and that menu item is disabled.
- The room control module's "Window Open" recognition will not work on the DDC3000 and DDC4000 systems.
- The "Window Open" recognition is activated in the self-control program and time and date can be set on the room control module.
- The sent setpoint is used in the self-control program by the room control module.

Profiling (utilization schedule/heating profile) PRW4xx-FTL with FBR03-FTL on the DDC4000e

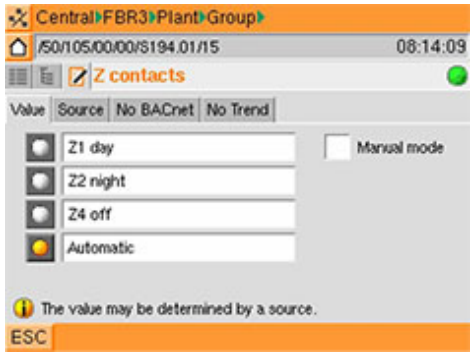
If the RPW4xx-FTL was taught in correctly, the room temperature is displayed at PIN4 in DDC4000e group 3 in the FBR menu.

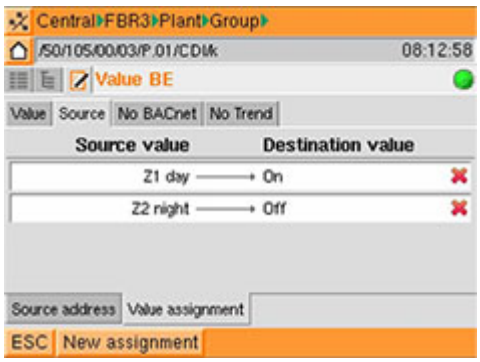
The Z-contact (15) from the basic program of FRB03-FTL is connected at PIN1.

Note: Contact K1 (PIN1) must not be used for anything else.



If heating is to be performed using the profiling, a value must be entered at PIN1 on the Z-contact; the corresponding Z-contact must be set to “automatic mode”.





The following operating modes are available:

- Z1 day = day mode
- Z2 night = night mode
- Z4 off = operating mode based on weekly schedule
- Automatic mode = profiling (utilization schedule/heating profile) of RPW4xx-FTL