BUILDING AUTOMATION CONTROL TECHNOLOGY SENSORS



# b@home system manual



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#### 1. What is b@home?

## The b@home system – the intelligent remote control for heating and cooling

Use the b@home system from alre to control and monitor your heating and cooling at any time and from any location. Smartphone/tablet app or web browser – the intuitively simple control allows you to access the rooms individually or all together. And remote control of the b@home system is incredibly simple too: If you are out and about, you can use the Internet for mobile access but if you are at home, you can simply use your home network.

The b@home gate is the central component of the b@home system and the interface between the alre wireless system and WLAN/LAN router. Existing alre wireless systems can also be retrofitted. The optional b@home control unit provides central access to the settings of all channels and/or heating/cooling zones. It can be used as a central control unit or as a room control unit and works with all common switch ranges.



#### 2. Components of the b@home system

## An overview of the b@home components which can be controlled remotely

The b@home system can be used to remotely control all heating and cooling systems: electric systems, such as electric underfloor heating, infrared heating or mobile heaters as well as water-based systems, such as hot water-based underfloor heating, radiators or cooling ceilings.

#### b@home gate



**Type:** MGCBB-064.360 **Function:** wireless room temperature management system, interface between alre wireless system and WLAN/LAN router, surface mounting, network cable for connecting to router and wall power supply are included in the scope of delivery



The b@home app: free for iOS and Android available

## b@home control unit



**Type:** various variants (Fig. FTRCUd 210.021#21) **Function:** sensor for recording and setting the room temperature and control unit for other active channels, any modifications undertaken are displayed with the b@home app or b@home portal, flush mounting, 230 V~, works with all common switch ranges as available in various variants (50 x 50 mm, 55 x 55 mm, pure white, traffic white, pearl white, matt, gloss)

#### Sensors (also transmitters and/or wireless room temperature sensors)



**Type:** FTRFB-280.101 **Function:** sensor for recording room temperature, very flat surface mounting, batteries included in the scope of delivery



**Type:** FTRFB-280.119 **Function:** sensor for recording and setting room temperature, very flat surface mounting, batteries included in the scope of delivery

#### Actuators (also receivers and/or wireless temperature controllers)



**Type:** various variants (Fig. HTFRL-214.140) **Function:** multi-channel wireless temperature controller (heating) for fitting in heating circuit distributor, 4 or 8 channels, includes pump module, IP 20 or IP 65, 230 V~



**Type:** HTFMA-180.161

**Function:** 1-channel wireless temperature controller for heater valves, M30 x 1.5 connection, adapter for Danfoss RA, RAV, RAVL and batteries included in the scope of delivery



**Type:** HTFRU-110.124

**Function:** 1-channel wireless temperature controller for flush mounting in junction box, optional external sensor for underfloor temperature control or underfloor temperature monitoring, 230 V~



#### **Type:** HTFRA-010.101

**Function:** 1-channel wireless temperature controller with Schuko plug adapter for mobile heaters, 3000 W switching power (e.g. electric heaters), 230 V~



**Type:** various variants (Fig. KTFRL-315.125) **Function:** multi-channel wireless climate controller (heating/cooling) for fitting in heating circuit distributor, 4 or 8 channels, includes pump module,IP 20 or IP 65, 230 V~



## Type: HTFRB-010.101

**Function:** 1-channel wireless temperature controller, surface mounting, 3000 W switching power (e.g. electric heaters), 230 V~



## Type: HTFRU-010.101

**Function:** 1-channel wireless temperature controller for e.g. natural stone heating, flush mounting, 230 V~

#### Repeater



## Type: MRCOA-014.201 Function: plug-in wireless repeater for alre wireless systems with Schuko plug adapter

## Accessories



**Type:** ZBOOA-010.100 **Function:** electrothermal valve actuator, 230 V~, closed when de-energised



**Type:** JZ-25 **Function:** external antenna for multichannel actuators (JZ-26 antenna cable not included in scope of delivery)



**Type:** HF-8/4-K2 **Function:** optional external underfloor sensor for HTFRU-110.124



**Types:** TPS 1, TPS 2, TPS3 **Function:** optional dew point sensor for b@home control unit



**Type:** PFC47 **Function:** optional radiation sensor for b@home control unit as swing sensor



Type: STF-2

**Function:** optional radiation sensor for b@home control unit in surface-mounted housing



## Type: JZ-24

**Function:** magnetic attachment set for simple and secure attachment of multichannel actuators on metallic base (e.g. heating circuit distributor)

**Type:** JZ-26 **Function:** antenna cable to connect the JZ-25 external antenna with the multichannel actuator



**Type:** THF **Function:** protective sleeve for optional external underfloor sensor HF-8/4-K2



**Type:** BTF2-C47-0000 **Function:** optional surface-mounted room sensor for b@home control unit



Type: ALF-2 Function: optional contact sensor for b@home control unit



Type: KF-22 Function: optional cable sensor for b@home control unit

## This manual provides information about the following:

- 1. Assembling and connecting the b@home gate
- 2. Setting up b@home system
- 3. Basic information about wireless installations and optimum placing of the b@home components

Information about assembly and connecting the sensors and actuators to the power supply can be found in the relevant operating instructions.

Further information can be accessed from the following locations:









alre Website

## 3. Safety information

The applicable safety regulations should be observed. After installation, the installation company should instruct the operator in how the control system works and how to operate it. The operating instructions must be stored somewhere freely accessible to operating and maintenance staff.



Operating the system in the vicinity of devices, which do not comply with the EMC regulations, may affect the device functions.

Do not open the b@home gate or wall power supply under any circumstances.

The b@home gate, FTRFB-280.1xx sensors and HTFMA-180.161 and HTFRA-010.101 actuators must not be disposed of in general household waste.

## 4. Quick start instructions

- 1.) Fit b@home gate (see Section 12.).
- 2.) Use Ethernet cable to connect b@home gate to a free LAN port on the router (see Section 13.).
- 3.) Use wall power supply to connect b@home gate's power supply (see Section 13.).
- 4.) Open b@home-app on an end device logged onto the home network (see Section 14.1.2).
- 5.) Define system function (see Section 14.3).
- 6.) Set up rooms (see Section 14.6.).
- 7.) Enter switching times and temperatures of automatic programs (see Section 14.7).
- 8.) Set up Internet access (see Section 14.9.).

## 5. Scope of delivery

- 1 b@home gate MGCBB-064.360
- 1 wall power supply
- 1 Ethernet cable, cat. 5, approx. 3 m long
- 1 assembly equipment pack (comprising 2 screws with dowels)
- 1 set of quick start instructions
- 1 drilling template

Carefully check whether damage to the packaging suggests that your b@home gate or the accessories supplied have been damaged during transport!

#### 6. System requirements

- Router with free Ethernet port (LAN), automatic IP address allocation must be activated (DHCP)
- IPv4
- Freely accessible power socket (230 V/50 Hz)
- Internet access for accessing from outside the home network
- Mobile end device (iOS 7.0 or Android 2.2 or higher) or computer with browser (Internet Explorer Version 10 or higher, Firefox Version 23 or higher, Chrome Version 29 or higher, Opera Version 20 or higher, Safari Version 5.1.7 or higher)

## 7. How the b@home system works

The b@home gate can be used to control, monitor or reprogram the alre wireless heating/cooling system at any time and from any location. The b@home gate is the interface between the alre wireless system and your router. This allows both new alre wireless systems needing to be set up and existing systems to be controlled via the Internet or home network. The system is operated using the b@home app (iOS/Android) or b@home portal via a web browser on a notebook/PC. A minimal system with the b@home gate must include at least one sensor (transmitter or wireless room temperature sensor) and one actuator (receiver or wireless room temperature controller) and a router with a free Ethernet port (LAN). One b@home gate can be used to monitor and control up to 32 rooms and/or heating/cooling zones. If necessary, more b@home gates can be operated in the same network (see Section 14.2).



## 8. Displays and control elements



The b@home gate has illuminated displays (LED) on the front to indicate the various operating statuses.

Lamp	Type of display	Status designation	Description	Duration of display
(T) (T)	Flashing red	Train sensor	The b@home gate has been asked to accept a train telegram for a sensor.	30 seconds, on standby for training then ends
« <b>1</b> »	Lit up green	Sensor has been trained	A training telegram was received when in "Train sensor" status.	3 seconds, confirmation that training was successful
« <b>r</b> »	Flashing red	Cancel sensor	The b@home gate has been asked to remove a sensor, which is transmitting a cancel telegram.	30 seconds, on standby to cancel then ends
<b>*</b> *	Lit up red	Sensor has been cancelled	A cancel telegram was received when in "Cancel sensor" status.	5 seconds, confirmation that cancellation was successful
(**) 1	Flashing yellow	Train actuator	The b@home gate has been asked to transmit training telegrams for an actuator	5 seconds, during this time, the b@home gate transmits train telegrams
율	Flashing blue	Device authentication	An unknown end device (e.g. smartphone) or a PC is attempting to access the b@home gate and is asking for writing approval	1 minute
((e)) I	Lit up yellow	Check system	The b@home gate is reporting a status, which should be remedied by the user (lost connection, battery flat) – the user should establish a connection with the b@home gate (e.g. via a smartphone) for more information	Permanently, until the status is remedied
* <b>*</b> *	Flashing blue	Firmware update	The firmware is being updated.	Until the firmware update is complete
格	Lit up red	No portal connection	Even though the user has confirmed he or she wants to use the b@home portal, the b@home gate is not able to establish a connection with the portal server	Permanently, until the status is remedied
* <b>*</b> *	Flashing red (both lamps in turn)	Factory reset	The b@home gate has been asked to reset all settings to the state they were in upon delivery and waits for confirmation in the form of a button being pressed	10 seconds, request is ignored after this time
*** = ==	Lit up green	Start initialisation	Initialisation phase after the b@home gate has been connected to the power supply.	Until initialisation is complete
(19) 남 문국	Lit up red or flashing	Device defect	An unknown error has occurred. Please contact your installation company or your dealer.	Permanently, until the status is remedied
((†)) (	Lit up blue	Duty cycle reached	The b@home gate is reporting that the wireless transmission is being paused due to the duty cycle limit.	Permanently until the duty cycle is no longer exceeded after an hour at the latest (see Section 16.8)

10. Technical data	
Operating voltage: Tolerance range: Power consumption: Ports:	+5 VDC ±5 % max. 300 mA RJ45 Ethernet 10/100 Mbit, USB 2.0 Micro-B bush
Radio frequency: Range:	868.3 MHz 150 m line of sight or up to 30 m in buildings (depending on structure)
Duty cycle:	max. 1 % per hour
Control elements:	confirmation button
Displays:	2 signal lights
Type of protection according to DIN 40050:	IP 30
Protection class:	
Storage temperature:	-20 +70 °C
Ambient temperature:	0 +40 °C
Permissible air humidity:	max. 95 % r. H., non-condensing
Weight (just b@home gate):	approx. 67 g
Mounting:	surface mounting / wall mounting
Design:	Berlin 2000
Housing dimensions:	78 x 83 x 27 (WxHxD in mm)
Housing material:	plastic ABS
Housing colour:	pure white (similar to RAL 9010) matt
Safety and EMC:	in accordance with DIN EN 60950-1 and DIN EN 300220

ALRE-IT Regeltechnik GmbH hereby declares that the MGCBB-064.360 wireless system corresponds to the 2014/53/EU Directive. The complete text of the EU declaration of conformity is available at: www.alre.de

## 11. Mounting location

The b@home gate has been developed so that all connected actuators and sensors can be reached in your home or apartment. In exceptional circumstances, faults and excessive distances may result in outages.

The mounting location should be selected so that all devices to be connected with the b@home gate can be reached. A site located centrally with regard to where these devices are installed is best for the b@home gate.

Generally speaking, the transmission and receipt characteristics of the b@home components are highly dependent on spatial circumstances. For example, the range is reduced by e.g. reinforced walls, ceilings, metal housings, flooring/coatings containing metal etc. You will find more information about this under Section 16.

## 12. Mounting

The gate is either surface-mounted or wall-mounted using the equipment pack enclosed, comprising 2 screws and dowels.









- 1. Use drill template provided to drill the holes
- 2. Insert dowels
- 3. Screw in screws approx. 3 mm
- 4. Insert b@home gate at an angle and turn into final position

#### 13. Router/power supply connection

Ensure the Ethernet cable and power supply are connected in the right order (see information below).

Only use the wall power supply included in the scope of delivery.

If several b@home gates are to be operated in the same network, it is essential that the devices are connected with the network and set up one after another. For more information about this, go to Section 14.2.

- Step 1: Use Ethernet cable to connect b@home gate to a free LAN port on the router.
- Step 2: Use wall power supply to connect b@home gate's power supply. Once the power supply is connected, the two lamps light up green for a short time. As soon as the lamps go out, the b@home gate is ready and the system can be set up.



#### 14. Setting up system

After the b@home gate has been connected as described under Section 13, the b@home gate is ready for operation (both lamps off) and the system can be set up.

## 14.1 User interfaces

Some of the settings listed below can be undertaken using the b@home app, the configuration interface of the b@home gate or the b@home portal. These symbols show which settings can be undertaken via the respective user interfaces:



For reasons of security, Internet access can only be set up and the network name can only be changed via the b@home gate's configuration interface. We recommend using the b@home app for all other steps needed to set up the system.

#### 14.1.1 b@home gate configuration interface

```
Gate
```

(i)

Enter <u>http://bathomegate/</u> in the browser address line of one of the devices in your home network and press the Enter key - the b@home gate in your home network is displayed. Now follow the on-screen instructions.

- For security reasons, authentication is required each time you access the system (see on-screen instructions). You will be automatically logged off 10 minutes after your last input and you will then need to authenticate yourself again.
- (i) If you are operating several b@home gates in the same network, rather than <u>http://bathomegate/</u> enter the destination address you have changed (see Section 14.2).
- Alternatively, you can also enter the IP address of the b@home gate in the browser address line of one of the devices in the home network. If you are not using a Windows network, in some cases this may be absolutely necessary. You can use the b@home app installed on the mobile end device logged onto the home network to find

the IP address of the b@home gate.



i If you are not able to establish a connection to the b@home gate, check the network connection and the settings of your router (also see Section 6. System requirements).

## 14.1.2 b@home app

Арр

The b@home app is available for free from the App Store (iOS 7.0 or higher) or Google Play Store (Android 2.2 or higher).





- For security reasons, the mobile end device has to be authenticated. This is a one-off process (see on-screen instructions).
- i If you are not able to establish a connection to the b@home gate, check your network connection and/or the settings of your router (also see Section 6. System requirements).

## 14.1.3 b@home portal

# Portal

Once you have set up Internet access via the b@home gate's configuration interface (see 14.9), you can go to https://www.klimaregler.de on the b@home portal to undertake settings on your system.

## 14.2 Name in network (host name)

(i) If you are using just one b@home gate in your network, no changes are needed.

If further b@home gates are to be operated in the same network, before starting up another b@home gate, you need to change the destination address <u>http://bathomegate/</u> (e.g. into <u>http://bathomegate1/</u>) because the same destination addresses are not permitted in a network.



## 14.3 System functions

State the functions your temperature control system can perform:

- heating
- cooling
- heating and cooling

These settings depend on the type of temperature control system and the actuators (receivers) used. An incorrect selection may result in damage to the system and increased energy consumption.



## 14.4 Designation of the b@home gate

Any name can be entered and is displayed in the b@home app and b@home portal.



## 14.5 Date and time settings

The date and time should be taken from the system time of the computer/end device. An automatic changeover between summer and winter time can also be activated here.

Automatic changeover between summer and winter time: standard summer time in the European Union runs from 2 am CET on the last Sunday of March until 3 am CEST on the last Sunday of October (Directive 2000/84/EC of the European Parliament and Council). The time of the b@home gate changes automatically on these dates. The automatic changeover between summer and winter time can be deactivated for time changes on other dates or in regions without daylight saving time.



## 14.6 Setting up rooms

If retrofitting in existing alre wireless systems, all receiver channels must be deleted before the actuators are trained. Information about how to do this can be found in the respective actuator operating instructions

## 14.6.1 Room name

i

The room name entered is also displayed in the b@home app, b@home portal and b@home control unit. Identical room names can be entered but this is not recommended.

**i**) Special characters entered here may be displayed differently in the b@home control unit.



## 14.6.2 Training sensor (wireless room temperature sensor/transmitter)

At least one sensor should be trained for each room. Once you have pressed the "Train sensor" button, the training function must be triggered on the sensor within 15 seconds. To do this with FTRFB-280.1xx sensors, briefly press the training button once. With the FTRFB-280.101 sensor, the training button can only be pressed when the housing is open.



More information about the training function for the sensors can be found in the relevant operating instructions.

The following combinations and quantities of sensors can be trained per room:

Image	Function type	Sensor description	Quantity
• •	001	Wireless room temperature sensor	71)
+ (ant a)	002	Wireless room temperature sensor with setpoint adjuster	1 <sup>2)</sup>
de la construction de la constru	003	Wireless room temperature sensor with setpoint adjuster and comfort mode/energy-saving mode operating mode switch	1 <sup>2)</sup>
12.34	020	b@home control unit	1 <sup>2)</sup> / <sup>3)</sup>

1) When training more than one sensor of this type per room and/or when also training for the 002, 003 or 020 function types, an average value is calculated from the individual room temperature measurements (e.g. for large rooms).

2) Only one sensor of the 002, 003 or 020 function type can be trained. If a second sensor of this function type is trained, the previous one is deleted. The last trained sensor applies.

3) No more than 16 b@home control units (020 function type) in total may be operated on one b@home gate.

If using sensors with a setpoint adjuster (002 and 003 function types), the setpoint which can be adjusted on the sensor cannot be changed as standard with the b@home app, b@home portal or b@home control unit. You can activate adjustment of the setpoint in the b@home app and the settings in the b@home app, b@home portal or b@home control unit then apply.

(i) The operating mode switch for sensors of the 003 function type does not work in the b@home system.



(i)

i

## 14.6.2.1 Central control unit

One central FTRCUd-210.021 b@home control unit can be trained on the b@home gate. If a second, central control unit is trained, the previous device is deleted. The last trained device of the same type applies.

As the central control unit, the FTRCUd-210.021 provides access for central influence over the b@home gate. Depending on the setting on FTRCUd-210.021, this can be used as a potential-free "ECO", "Standby" (frost protection), "Heating/cooling changeover" contact input and/or as an "Upstream sensor" or "Dew point sensor" sensor input. Any change to the status on the input affects all rooms.

If no b@home control unit is used, no settings are needed here.

i) More information about the b@home control unit can be found in the corresponding operating instructions.



## 14.6.3 Cancelling sensor (wireless room temperature sensor/transmitter)

Press the "Cancel sensor" button. Within 15 seconds, the training button on the sensor (001, 002, 003 or 004 function types) now has to be pressed and/or the cancel function (020 function type) has to be started. Alternatively, you can select the desired sensor on the configuration interface of the b@home gate and thereby cancel off.



(i) If sensors are cancelled, note that if there are no longer any transmitters trained with the 001, 002, 003 or 020 function type, a trained actuator will shift to emergency mode. More information about emergency mode can be found in the respective actuator operating instructions.

More information about the training button and/or triggering the cancel function on the sensor can be found in the relevant operating instructions.



(i)

## 14.6.4 Training actuator (wireless room temperature controller/receiver)

At least one actuator should be trained for each room. Once you have pressed the "Train actuator" button, the training function must be triggered on the actuator within 15 seconds. To do this, briefly press the training button once. If using multi-channel actuators, the corresponding channel must first be selected with the channel selection button. Any combinations and quantities of actuators can be trained per room.



- More information about training actuators can be found in the respective actuator operating instructions.
  - Trained sensors are displayed in the b@home app, b@home portal or on the user interface (HTML page) of the b@home gate while actuators are not.
- Possible manual settings on actuators, such as central control or exclusion of channels from cooling mode, must be reset to the factory settings before training.



## 14.6.5 Cancelling actuator (wireless room temperature controller/receiver)

To cancel, press and hold the actuator's training button until the lamp lights up red permanently after around 10 seconds. The lamp of the deleted channel lights up red permanently to indicate that the entire receive channel has been successfully deleted. Control is now deactivated.

**i** If using multi-channel actuators, the corresponding channel must first be selected with the channel selection button.

More information about cancelling actuators (deleting entire receive channel) can be found in the respective actuator operating instructions.

## 14.6.6 Connection test

(i)

Pressing the "Connection test" button allows the correct wireless connection between b@home gate and actuators to be tested. If the connection is correct, the lamp on the actuator/channel briefly lights up green and then lights up green for a further approx. 15 seconds.

The description of the connection test in the operating instructions for the sensors and actuators may differ from this.

**i**) The HTFMA-180.161 actuator does not support the connection test.



## 14.6.7 Deleting room

You can use this function to remove the room from the list of rooms. This deletes all settings and trained sensors.



## 14.7 Automatic program

The switching times can be set in 15-minute intervals and setpoint temperatures programmed for this room. The switching times can be transferred to other days of the week.



## **14.8 Central functions**

These functions affect all rooms. Operating modes can thereby be quickly changed for the entire system, functions such as party or holiday can be quickly activated or system settings quickly undertaken.



## 14.9 Setting up Internet access

In order to operate the b@home system outside your home network, you need to create a new user account or assign an existing account to your b@home gate. To do this, open the configuration interface of the b@home gate (see Section 14.1.1).

Once a user account has been set up/assigned, the b@home system can be controlled and monitored from any location using the b@home app or b@home portal by going to https://www.klimaregler.de.

When establishing the connection to the b@home portal, the system time set of the b@home gate is used to determine the time zone for automatic time corrections. Ensure that the correct time has been set in the b@home gate (see Section 14.5) before taking this step.



## 14.10 Factory settings

This function either partially or completely resets user settings. Follow the corresponding on-screen instructions.



## 14.11 Firmware update

Here you can view the installed firmware version of the b@home gate and look for updates. We always recommend installing the most recent version. While an update is taking place, the two lamps on the b@home gate flash blue. If necessary, once the update is complete, you can return to the previous firmware version.

While an update is taking place, do not disconnect the power supply or Internet connection to your b@home gate because under certain circumstances, this may damage the system.



## 14.12 User account

The following changes can be undertaken to the user account: user name, password and e-mail address. The created user account can also be deleted.



15. Further information

For information about setting up and operating your b@home system and all further b@home components, please go to http://alre.de/de/service/download/:

More information about the b@home system is available online at http://alre.de/b-at-home/de/home/: The aim of the following information is to provide a basic overview of the technology and functions involved in wireless transmission in the b@home system and to assist with planning the assembly of individual components.

### 16.1 Radio waves

Wireless signals are electromagnetic waves, which spread equally in all directions at the speed of light. Electromagnetic waves include radio waves, microwaves, infrared radiation, visible light, UV radiation, X-ray radiation and gamma radiation. The various types of waves differ in terms of their frequency and therefore their wavelength.

In contrast to light waves, radio waves can penetrate walls, ceilings and furniture.

The field strength of radio waves decreases quadratically as the distance between the transmitter and receiver increases, i.e. if the distance between the transmitter and receiver doubles, the signal is just a quarter of its original strength.

## 16.2 Frequency band

Frequency ranges are assigned by the German Federal Network Agency. There are specified frequency ranges for every application, e.g. for radio, TV, amateur radio, aircraft radio, taxi radio, police radio or mobile radio. There are specified distances between these frequency ranges to prevent overlaps and resulting transmission issues.

Wireless components from alre transmit in what is known as the ISM range (Industrial, Scientific and Medical) with a frequency of 868.3 MHz. This range has been allocated for high-frequency devices in industry, science and medicine but also for domestic applications.

Using this range, b@home components operated in an open area can achieve ranges of at least 150 metres and in buildings up to 30 metres.

The maximum permitted transmission power in this range within the milliwatt range is 10 mW. By way of comparison, mobile phones work continuously with peak power outputs of up to 2000 mW.

Designation	Abbreviation	Frequency range	Wavelength	Example application
Low frequency	LF	3 Hz – 3 kHz	100 000 – 100 km	Line voltage (50 Hz)
Long waves	LW	30 – 300 kHz	10 – 1 km	Long-wave radio
Medium waves	MW	0.3 – 3 MHz	1000 – 100 m	Medium-wave radio
Short waves	SW	3 – 30 MHz	100 – 10 m	Short-wave radio
Ultra short wave	USW	30 – 300 MHz	10 – 1 m	USW radio, TV, aircraft radio
Ultra-high frequency	UHF	0.3 – 3 GHz	10 – 1 dm	WLAN, Bluetooth, DVB-T
Super high frequency	SHF	3 – 30 GHz	10 – 1 cm	Radar, WLAN
Infrared radiation	IR	0.3 – 385 THz	0.78 – 1000 µm	Temperature measurements
Visible light	VIS	385 – 750 THz	400 – 780 nm	Lighting, optical fibres

#### Examples of frequency ranges:

## Explanation

## The Hertz unit:

- Named after the physicist Heinrich Hertz
- Number of recurring processes in one periodic signal per second.
- In antenna technology, this describes the number of recurring vibrations (positive and negative half-waves).
- Wireless or radio waves are stated using this unit as are sound waves in acoustics, for example

## Prefixes to the unit:

Designation	Unit	Factor	Is the equivalent of
Hertz	Hz	1	1 Hz
Kilohertz	kHz	10 <sup>3</sup>	1000 Hz
Megahertz	MHz	10 <sup>6</sup>	1000 000 Hz
Gigahertz	GHz	10 <sup>9</sup>	1000 000 000 Hz
Terahertz	THz	10 <sup>12</sup>	1000 000 000 000 Hz

## 16.3 Signal strength / absorption

The signal strength is reduced by materials on the transmission path between the transmitter and receiver. This is known as signal attenuation. The degree of attenuation is greatly dependent on the type, thickness and density of the material.

Material	Penetration	Example
Wood / wood with plasterboard	Very good	Internal partitions
Plastic	Very good	Plastic windows
Glass normal, metallised	Good	Window panes
Bricks	Average	External wall
Water	Average	People, aquariums
Concrete with steel reinforcements	Poor	Solid walls
Metal	Very poor	Fire doors

Additional attenuation from the following may also have to be taken into consideration:

- Installation of wireless components in a flush-mounted socket
- Metal coatings, e.g. on furniture and wall coverings
- Planted areas
- High air humidity

## **16.4 Shielding**

Metallic building parts, furniture, wall coverings etc. shield electromagnetic waves. This produces what are known as radio pockets where direct reception is not possible. Receivers can no longer receive the transmitter signals directly.



Radio pockets caused by a metal cabinet, for example

## 16.5 Reflexion / reflection

Furthermore, radio waves can be reflected by metal objects or surfaces. When this happens, they can either be allowed to pass with great losses or reflected in full (and with a delay). In most cases, reflections are annoying and not desired. They trigger polarisation and interference (see below).

However, the radio waves can still reach their destination by diverting to certain objects. Longer transmission paths in particular can be bridged using reflexion.

Whether this works in your particular situation, depends greatly on the prevailing conditions and should be tested on a case-by-case basis.

Examples of reflective media:

- Reinforced concrete walls
- Metal cabinets
- Mirrors with metallic surface



## **16.6 Polarisation**

Transmitting and receiving aerials have a particular vibration direction. With vertical polarisation, the radio waves vibrate from top to bottom. With horizontal polarisation, the wave vibrates from left to right. The direction of polarisation is determined by the direction of the line of electric flux.

Reflexion, e.g. on a wall, may rotate the vibration direction by 90° in a worst-case scenario, then the transmitter and receiver can no longer communicate.

## **16.7 Interference**

Interference may occur during reflexions. In other words, a signal is boosted and/or superimposed by another one (constructive). In a worst-case scenario, an interference signal may go so far as to obliterate the superimposed signal (destructive). The phasing of both signals is then shifted by 180°, i.e. the negative half-wave of signal 1 lies above the positive half-wave of signal 2.

## **Constructive interference:**

#### **Destructive interference:**



## 16.8 Duty cycle

In the frequency band used, the maximum transmission time of any device is 1% per hour (the equivalent of 36 seconds an hour). In particular cases, e.g. when starting up or installing an extensive b@home system, the duty cycle can be reached by the frequently initiated training processes. The "Wireless" lamp (see Section 8.) on the b@home gate lights up blue to indicate that the duty cycle has been reached.

When the maximum transmission time is reached, the devices affected stop transmitting wireless telegrams and changes in the system are not taken into consideration for a short period (max. 1 hour).

## 16.9 Installation tips

The following tips should be noted when installing the wireless components:

- The transmission path should be as short as possible
- The number of times the wireless signal passes through ceilings and walls should be reduced as much as possible
- The angle of incidence through the wall or ceiling also affects the signal attenuation



Floor plan showing signal passing through 3 walls and/or doors

The central component of the b@home gate should be positioned **centrally** in the building to avoid large distances and to reduce the number of times that walls and ceilings have to be passed through.

Furthermore, the transmitter and receiver should **not** be fitted on the same wall side. We would recommend installing them on opposite walls.



Floor plan showing short transmission paths and passing through a small number of walls



Cross-section of house with centrally positioned b@home gate

The angle at which the radio waves penetrate an obstacle also affects the range of transmission. In the best-case scenario, the transmitter and receiver should be positioned such that the transmission path does not pass through walls or ceilings at an angle.

Note: An inclined entrance angle means that more material has to be passed through!



In addition to the number of walls and ceilings passed through, material thickness and metallic objects, there are other sources of interference for wireless transmission. Keep as far away as possible from potential sources of interference to avoid negative impact.

Potential sources of interference include:

Desktop PCs

- Microwave devices
- DECT and/or cordless phones
- WLAN routers
- TVs
- routers
   Devices with an LTE data connection

- Wireless headsets
- Baby monitors
- Amateur radio equipment

A distance of  $\geq$  50 cm should be maintained from these components.

Our customer service is happy to answer any questions you may have. You can e-mail us at support@klimaregler.de.

#### 18. FAQ

#### What is https://www.klimaregler.de?

https://www.klimaregler.de is the b@home portal for the alre b@home system. You can access all your connected b@home systems on the b@home portal. Using a browser with a connection to the Internet, you can view your room temperatures and undertake settings from any location. More information about the b@home system can be found on our homepage <a href="http://www.alre.de">http://www.alre.de</a>.

#### I don't have a user account. Where can I set one up?

You can only access the b@home portal if you own a b@home gate. It is only via the gate that you can set up access to the b@home portal.

I've forgotten my password. What can I do? On the b@home portal log-on page, there is a link ("Forgotten password") to a function for resetting your password.

## Which operating systems are compatible with the b@home app?

The free b@home app is available for iOS and Android.

How many smartphones/tablets can be used to access a b@home system via the b@home app? The b@home system can be operated by any number of smartphones/tablets with the installed b@home app.

#### Can you block access from smartphones/tablets that have already been authorised? (If lost, for example)

Yes. Authorisation for a device can be withdrawn by deleting the b@home app from this device. All authorisations are withdrawn by a complete factory reset of the b@home gate.

What happens if two or more smartphones/tablets access the same b@home gate at the same time? No-one is blocked, in other words, the last setting undertaken applies.

## I've lost my Internet connection. Will my control system continue to work?

Yes. Control of the b@home system is not dependent on an Internet connection. The Internet connection is only used to access the b@home system when not connected to your home network. If the b@home gate is not connected to the Internet, only mobile use of the system is lost.

## What happens if I interrupt the power supply to my b@home gate, overnight for example?

The b@home gate is the central component for room control in the b@home system. The power supply to the b@home gate should therefore not be disconnected. If it is, the control function ceases to work.

## Why are trained actuators not displayed in the b@home app in the same way that the trained sensors are?

The actuators receive the information they need for control purposes from the gate. To extend the battery life, for example, and to keep costs for the device as low as possible, the actuators do not have a transmit function. The b@home app does not therefore contain any information about which actuators are present. A correct connection between the b@home gate and actuators can however be checked at any time using the connection test (see Section 14.6.6 Connection test).

#### I've deleted my b@home app. How can I restore the settings?

The settings for the b@home system are saved in the b@home gate and remain there. If you re-install the b@home app, you simply have to restore access authorisation.

What is the range of the b@home components?

150 m line of sight or up to 30 m in buildings depending on structure.

I already have an alre wireless system, can I use the components in the b@home system?

With a few exceptions, all alre wireless system devices can be used in the b@home system. To find out if this applies in your particular case, please contact our customer service at <a href="mailto:support@klimaregler.de">support@klimaregler.de</a>.

## I have a question and cannot find the answer on this page. Who can I contact?

You will find more information in the respective operating instructions for your b@home components. Our customer service will also be happy to answer any questions you may have. You can e-mail us at <a href="mailto:support@klimaregler.de">support@klimaregler.de</a>.

#### 19. Liability

The technical data we have provided was obtained under laboratory conditions in accordance with generally valid test specifications, in particular DIN specifications. Characteristics are only guaranteed to this extent. The customer is responsible for checking the suitability of their intended use and/or usage under the ambient conditions; we do not accept any liability for this. We reserve the right to amendments.



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