WEINZIERL

Interface and ObjectServer between LAN and KNX

KNX IP BAOS 777

Operating manual

KNX IP BAOS 777 Art. No. 5193

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Content

1 Application

The KNX IP BAOS 777 is a universal IP interface and IP gateway for the KNX installation bus. BAOS stands for "Bus Access and Object Server" and provides an interface to KNX installations both at telegram level (KNXnet/IP tunneling) and at data point level (KNX group objects / application layer) with semantic metadata for rooms and functions. Using an integrated web server, the device can visualize buildings, rooms and functions in a standard web browser on a PC or mobile device.

It provides several options for installation:

As **Programming Interface**

- at the telegram level (KNXnet/IP tunneling)
- can be used as bus interface for the ETS® (version 4.2 or higher)

As **Residential Gateway**

- via KNX IP BAOS Binary Protocol
- via KNX IP BAOS Web Services
- via KNX IP RESTful Web Services
- by using a web browser

Via a **Web Application**

- accessible by using a web browser

1.1 KNX IP BAOS 777 as Programming Interface

The KNX IP BAOS 777 can be used as an interface to the bus at telegram level. It is compatible with the KNXnet/IP specifications and can be used as bus interface for ETS® or other programs that support KNXnet/IP tunneling. It supports up to 8 simultaneous connections. The basic settings for the interface (e.g. IP configuration) can be made with all ETS product entries available for this device. Also helpful is the storage of all data point values - even if the device is not connected.

1.2 KNX IP BAOS 777 as Residential Gateway

The KNX system is based on a special protocol that is difficult to implement for non-KNX devices. Using the proven BAOS architecture, the BAOS device maps KNX data to an IT-friendly API (Application Programming Interface). This reduces the effort to connect external applications such as control systems or visualizations with KNX.

The KNX BAOS architecture allows not only access to the runtime data but also to the structure of the KNX installation. All information about rooms of a building as well as the available functions can be read out by a client as metadata. With the help of ETS®, the rooms and the functions that should be available to the user are defined.

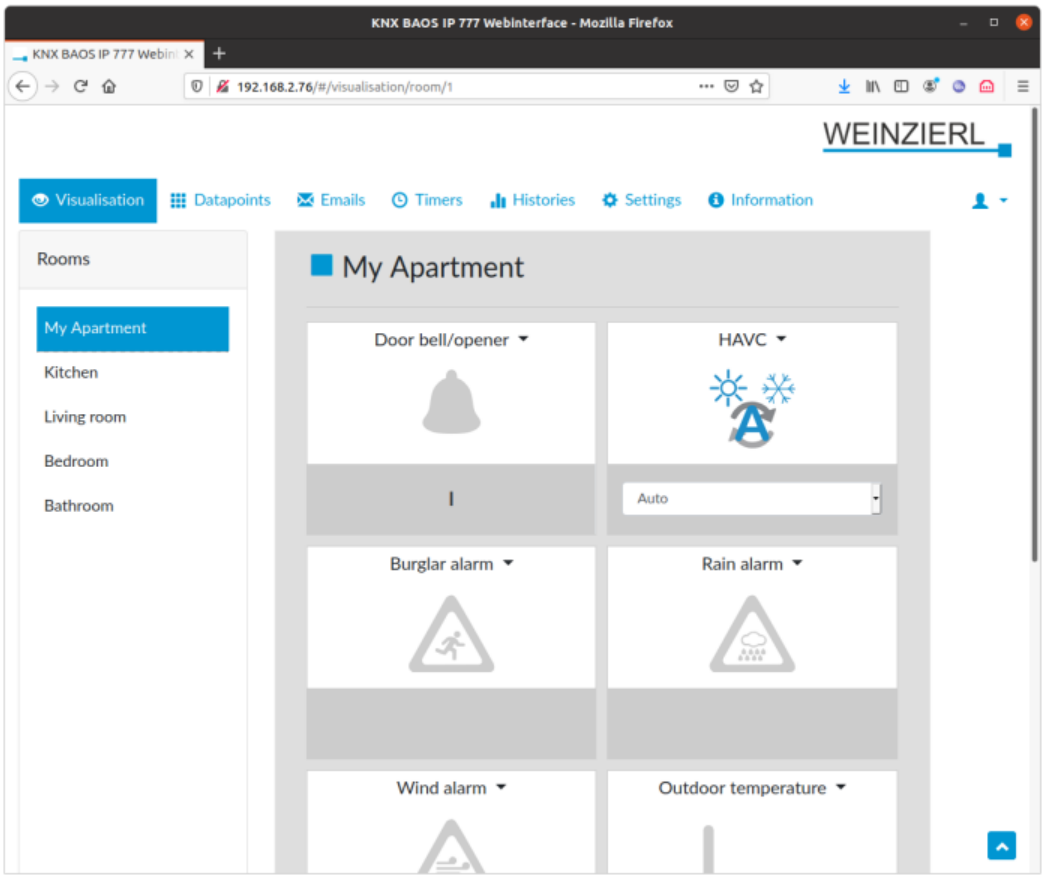
The KNX IP BAOS protocol is available in three different versions:

- KNX IP BAOS Binary
  A binary protocol that is particularly suitable for small microcontrollers.
- KNX IP BAOS Web Services
  A URL-based protocol with JSON syntax, compatible with KNX IP BAOS 771 / 772 / 773 / 774.
- KNX IP BAOS RESTful Web Services
  A URL-based protocol with RESTful JSON syntax that can be integrated into browser-based Web applications.

The device also offers time and recording functions, which are available via the BAOS protocol.

1.3 KNX IP BAOS 777 in Web Browser

The KNX IP BAOS 777 has an integrated web server that allows access to the device settings via a web browser. Using the ETS database with building structure, the web server also provides a visualization for the entire KNX installation divided into rooms.



The data from the residential gateway is displayed graphically in the browser and the functions can be operated directly. Time functions, time histories and email notifications are also available via the web interface.

1.4 KNX IP BAOS 777 as application specific Gateway

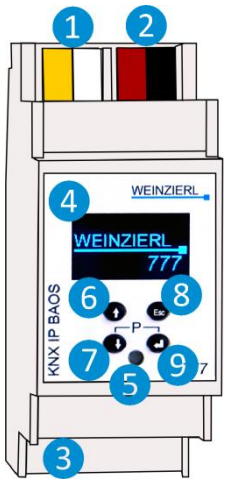
The KNX IP BAOS 777 can be used as an application specific gateway for connection to non-KNX systems. It can be used, for example, to integrate heating systems or audio applications with ETS integration into the KNX system. For development, the generic ETS database is available, which offers up to 2 000 data points as a flat list. The data point types can be configured individually via ETS parameters. Of course, own ETS databases can be developed.

1.5 BAOS SDK

The BAOS protocol must be implemented in the client both for the use of the KNX IP BAOS 777 as a residential gateway and for the development of application-specific solutions. For fast and easy integration of the BAOS Binary Services into own projects a free SDK is available. Further information about the BAOS SDK and the free download can be found at www.weinzierl.de.

2 Installation and Commissioning

The KNX IP BAOS 777 is mounted on DIN rail and has a space requirement of 2 units (36 mm). It has the following operating elements (6 7 8 9) and displays (4 5):



1. External supply 12-30 V DC
2. KNX Bus Connection
3. LAN socket with PoE
4. OLED Display b/w
5. Programming LED
6. Up Button
7. Down Button
8. Escape Button
9. Enter Button

The device can be supplied with power either via the external power supply 1 or the LAN socket 3. When supplied via LAN, the connected switch or router must support Power over Ethernet (PoE).

2.1 Factory Settings

In delivery state or after a master reset the device is loaded with the following configuration:

- KNX individual addresses:

Device address		15.15.255
KNXnet/IP	tunnel 1	15.15.240
KNXnet/IP	tunnel 2	15.15.241
KNXnet/IP	tunnel 3	15.15.242
KNXnet/IP	tunnel 4	15.15.243
KNXnet/IP	tunnel 5	15.15.244
KNXnet/IP	tunnel 6	15.15.245
KNXnet/IP	tunnel 7	15.15.246
KNXnet/IP	tunnel 8	15.15.247

- No data points and functions are configured
- IP address assignment is done via DHCP
- Username and password for logging into the web interface is **`admin`**

  These should be changed via a download in the ETS®.

- All services are active

2.2 Settings

The device settings can be made as follows, although the setting options also differ:

On the Device

- Switching the programming mode on or off
- Change IP address assignment
  (DHCP, manual)
- Change IP configuration
  (IP address, subnet mask, default gateway) with manual assignment

With the ETS® (version 4.2 or higher)

- Change device name
- Change individual address of the device
- Changing the individual address of KNXnet/IP tunneling connections
- Change IP address assignment
  (DHCP, manual)
- Change IP configuration
  (IP address, subnet mask, default gateway) with manual assignment
- Switching display synchronization on or off
- Change username and password
  required for the login to the web interface
- Enable or disable device services
- Configure building structure
  for structured ETS database
- Configure functions of the rooms
  for structured ETS database
- Configure data points
  for generic ETS database
- Configure parameters
  for generic ETS database

3 Operation on the Device

3.1 Programming mode

The programming mode can be switched on or off on the device by simultaneously pressing the keys 7 and 9.

The active programming mode is indicated by the illuminated programming LED (5).

3.2 The Display

Device start

During the start-up process, the display shows the IP address of the device.

Main Screen

After the start, the individual address, the status of the application, the IP address and the device name are shown on the display. The status can have one of the following values:

- **No Bus**: KNX TP bus is not connected
- **Running**: The application is loaded and running
- **Stopped**: The application is stopped
- **Unloaded**: The application is not loaded
- **Loading**: The application is loading by the ETS
- **Pending**: Waiting for the application to load or completing the loading process
- **Ready**: Waiting for application start

If the network cable is not connected properly, **`No LAN`** is displayed instead of the IP address.

After 10 minutes of inactivity, the unit enters screen saver mode (blank screen with a dot) to increase the life of the display. Pressing any key will switch the display back on.

Main Menu

From the **main screen,** press 7 (Down) to access the **main menu** of the device. Pressing the 9 (Enter) key will bring up the **submenus**. Within the menus use 6 (Up) and 7 (Down) to **navigate**, 9 (Enter) to **confirm** and 8 (Escape) to go back one level or higher.

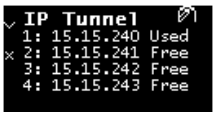
Submenu "IP Config"

Select **DHCP** or **Manual** for the IP configuration. If **Manual** is selected, you can change the IP address, subnet mask and gateway. Use 6 and 7 for navigation, the dotted frame indicates the currently selected item. After selecting with 9, frame is now solid, the corresponding value can be changed with 6 and 7 and then confirmed with 9. The IP settings are only accepted in the device after confirmation via ACCEPT.

If the IP address is changed, you will have to log in again in the web interface under the new address.

These settings are overwritten by a subsequent ETS download.

Submenu "IP Tunnel"



The KNX IP BAOS 777 supports 8 simultaneous KNXnet/IP tunneling connections. In this submenu, their physical KNX address and current status are displayed on two pages.

Submenu "IP BAOS"

The currently used and maximum available BAOS Binary UDP and TCP connections are displayed here.

Submenu "System Info"

This submenu provides information about the serial number, app ID, app status, firmware version and MAC address of the device.

Submenu "Dev Reset"

With this menu the device can be restarted or reset to factory settings. Select one of the options and then press and hold 9 until the animation ends and a waiting message is displayed.

After resetting to factory settings, a new ETS® download must be performed.

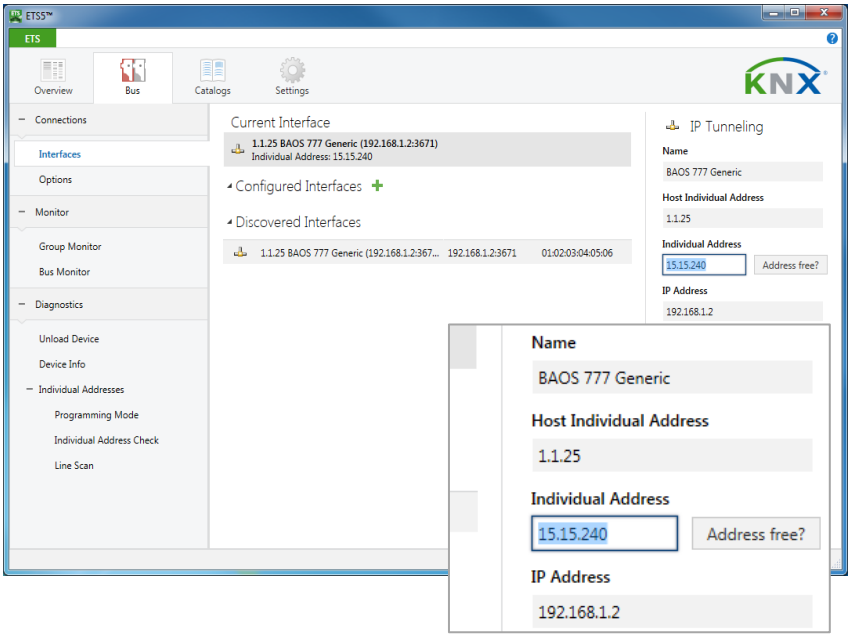
Main Menu "Contrast"

With this entry in the main menu the display contrast can be adjusted in four steps. By pressing the 9 key, you can switch through the different levels.

4 ETS® Connection Manager

After you have connected your interface to the LAN, the KNX bus and the supply voltage, it should automatically appear by the ETS® in the menu item Bus under "Found connections".

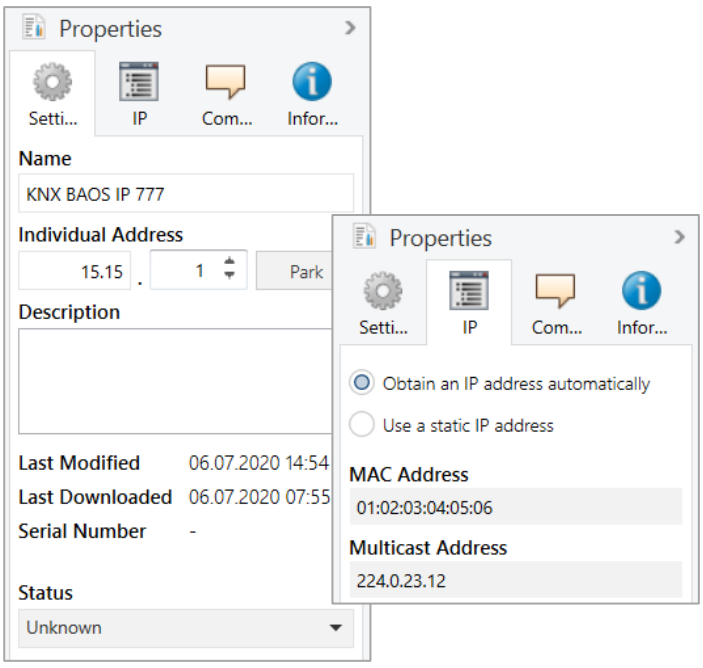
By clicking on the found interface, it is selected as the current interface. Connection-specific information and options then appear on the right-hand side of the ETS window.



The displayed **Name** of the device and the H**ost Individual Address** can then be changed within your ETS project.

In the **Individual Address** section, the physical KNX address of the currently used KNXnet/IP tunneling connection can be changed. To check whether the desired individual address does not already exist in your KNX installation, the **Free address?** button can be used.

The physical KNX device address as well as the physical KNX addresses for the additional tunneling connections can be changed within your ETS project after you have added the device to your project.



To do so, select the KNX IP BAOS 777 in the tree structure of the topology view of your ETS project. On the right side of the ETS window the **Properties** overview appears. The device name of the KNX IP BAOS 777 can be changed under **Properties** menu item **Settings**.

The **Individual Address** area contains the list of all assigned physical KNX addresses. The device address is also displayed in the tree structure of the Topology View of your ETS project. The additional addresses 1 to 8 correspond to the physical KNX addresses of the KNXnet/IP tunneling connections of the KNXIP BAOS 777.

To change the individual addresses, select the corresponding entry in the list and enter the desired address in the text field. If the frame of the text field changes its color to red after you have made your entry, this indicates that the address you have entered is already in use.

Make sure that none of the above addresses are already used in your KNX installation.

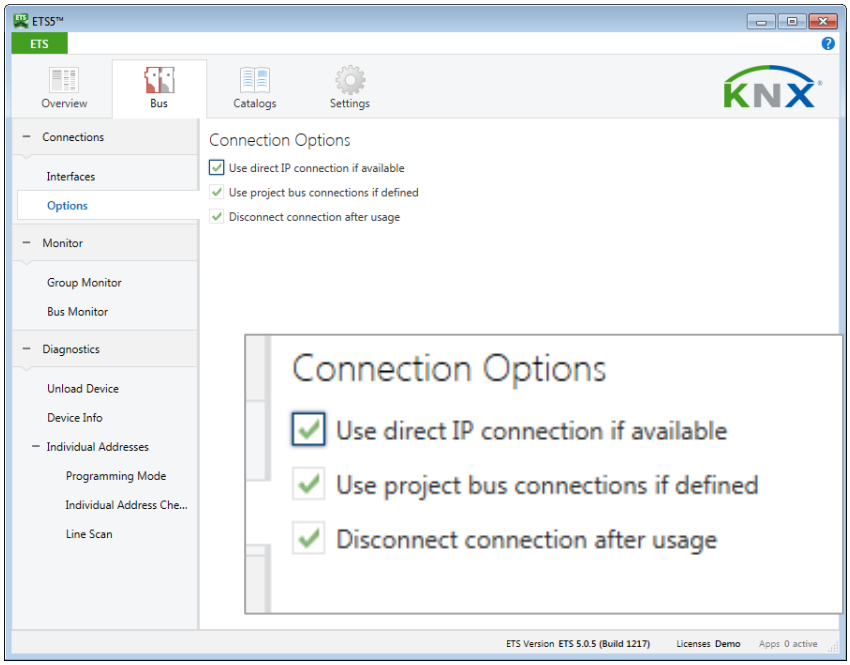
IP specific options of the KNX IP BAOS 777 can be changed under the menu item **IP**.

By switching from "Obtain an IP address automatically" (via DHCP) to "Use a static IP address" (static IP address), the IP address, subnet mask and default gateway can- be freely selected.

The changes made in the properties menus only become effective after an application download.

4.1 Fast download over IP

As with all devices for the KNX bus (twisted pair), the download can be done via the bus.



The KNX IP BAOS 777 also has a LAN interface, which can be used for a fast download directly over IP.

In this case, no additional KNX interface is required for transmission. Download via IP must be activated in the connection options of the ETS®.

The setting **Use direct IP connection if available** speeds up the transfer between ETS and the device considerably, because IP is used and not TP.

Due to the significantly shorter transmission times, it is recommended to perform downloads via IP.

4.2 Configuration of the object server and the web interface

The functional core of KNX IP BAOS devices is the so called object server. This object server creates KNX group objects for communication with the building installation via the KNX bus. The connection to other KNX devices is done via group address assignment in the ETS.

The object server stores the values of all configured group objects. Technically, the object server contains the process image for the building control system. For client access, the KNX IP BAOS device offers a number of APIs (Application Programming Interfaces) for reading and writing the object values. This decouples the client application from the time constraints of the physical bus.

The standard ETS entry for the KNX IP BAOS 777 allows the configuration of group objects in connection with the structure of the building. This creates semantic metadata that can be used by the client application.

The data configured in the KNX IP BAOS 777 represents the interface or "face" of the installation system for the user or the non-KNX part of the installation. While there are many devices and functions in a complex installation, only a part of them should be displayed or visualized for the user.

With the KNX IP BAOS 777 parameter set, the installer can configure the functions to be exported. A function is not limited to a single group object, as a function is usually a series of objects. A lamp with status feedback is implemented by a function containing two objects: one controls the lamp and the other monitors the current status. This relationship is very important for the use of the data.

All functions are related to rooms or to the building as such. This is done independently of the actual devices in the network. For example, it is important for the user to know whether there is a lamp in the living room - he is not interested in the fact that switching this lamp is done by a specific actuator in the switch cabinet.

For the complete configuration only the ETS® is required. No additional editor is needed. All information configured in KNX IP BAOS 777 is available to the connected client application. Typical applications are third-party visualization tools.

The KNX IP BAOS 777 has an integrated web visualization, which uses the same configuration for the automatically generated graphical user interface. It can be used by the installer to test all functions even when no client is connected.

The KNX IP BAOS 777 has a very flexible architecture and can work with different ETS product entries. In the following, the standard database with building structure is discussed.

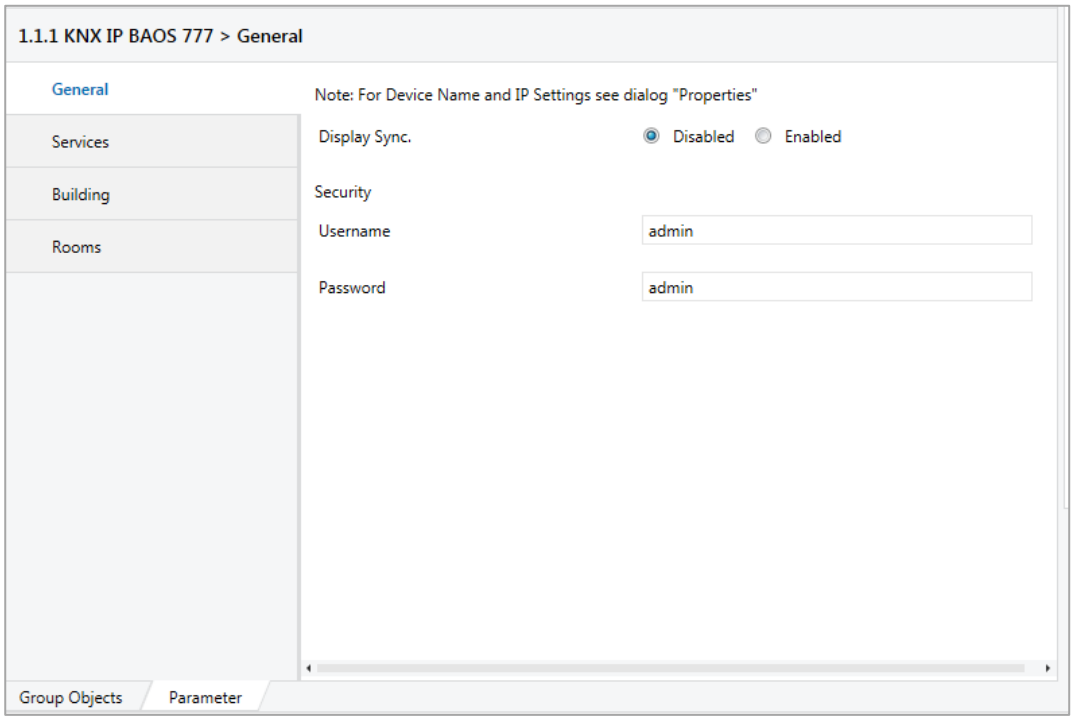
> *A generic product database is available for development purposes. This is described in a separate document. Further information can be found in the download area at www.weinzierl.de.*

The following chapter describes the configuration of the object server and the relationship to the integrated web visualization.

When inserting a new device instance into a project, no group objects are visible. All functions can be activated via the parameter settings. All functions and group objects can be configured via the device settings in the ETS®. This information can be used by every client connected to the KNX IP BAOS 777. It is also used internally for the setup of the visualization application in the WebFrontend. As the visualization controls are directly related to the functions selected in the ETS parameters, screenshots show the corresponding controls.

General

This page allows the basic settings of the device.



Display Synchronization (Enabled / Disabled)

If activated, the group object "Display synchronization - Trigger" appears. Every Weinzierl device with a display in this product series offers this possibility. As soon as the device wakes up from sleep mode, the corresponding group telegram is sent to the KNX bus. This telegram activates all devices whose group object is connected to this address.

Group object	Type KNX	Size	Direction
1201: Display synchronization - Trigger	1.017	1 bit	From / To KNX

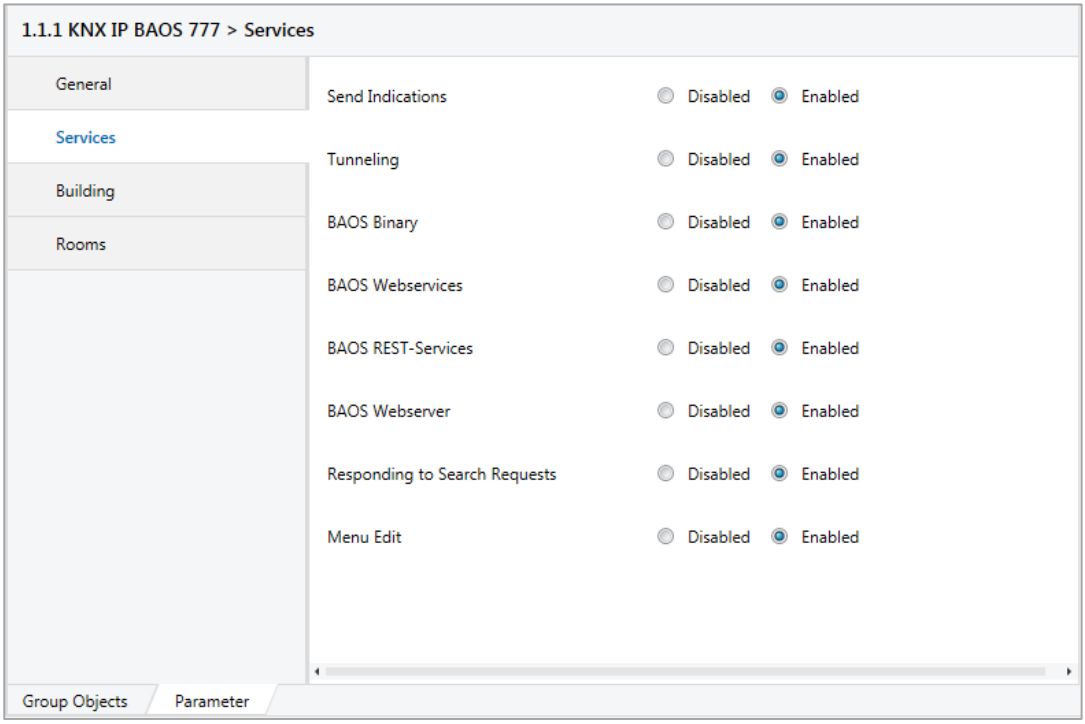
Security / Username and password

Here you set the login data for the web interface. To open the web interface of the KNX IP BAOS 777, enter the IP address as URL in the address field of the web browser. The current IP address is shown on the start screen of the device display.

Services

This page allows you to enable or disable the various access options to the device, such as tunneling, BAOS Binary, BAOS Web services, and many more.

For security reasons, access options that are not required should be deactivated.



Sending notifications
If this setting is deactivated, connected clients are not notified of changes in the value of data points.

Tunneling
Deactivation switches off the KNXnet/IP tunneling connections of the KNX IP BAOS 777.

The ETS® software uses the KNXnet/IP tunneling protocol to establish a connection to the KNX bus via IP. After deactivating the tunneling connections, the KNX IP BAOS 777 can no longer be used as an ETS programming interface!

BAOS Binary
After deactivation, access to the Object Server data points via the BAOS Binary Protocol is no longer possible.

Any client application that uses the BAOS Binary Protocol will not work anymore!

BAOS Web Services
After deactivation, access to the Object Server data points through the BAOS web services is no longer possible.

Any client application that uses the BAOS Web Services will not work anymore!

BAOS REST Services
After deactivating the BAOS REST services, the Object Server data points can no longer be accessed through the BAOS REST services.

Any client application using the BAOS REST services will not work anymore! The BAOS REST services are also used by the WEBINTERFACE. The WEBINTERFACE will also be deactivated!

BAOS Web Server

The web server of the KNX IP BAOS 777 can be deactivated here.

The web server hosts the WEBINTERFACE. If the web server is deactivated, the WEBINTERFACE is also deactivated!

Response to Search Requests

After deactivation, no KNXnet/IP search requests will be answered.

When deactivated, the ETS® software is no longer able to find the KNX programming interface of the IP BAOS 777 automatically.

Input on the device

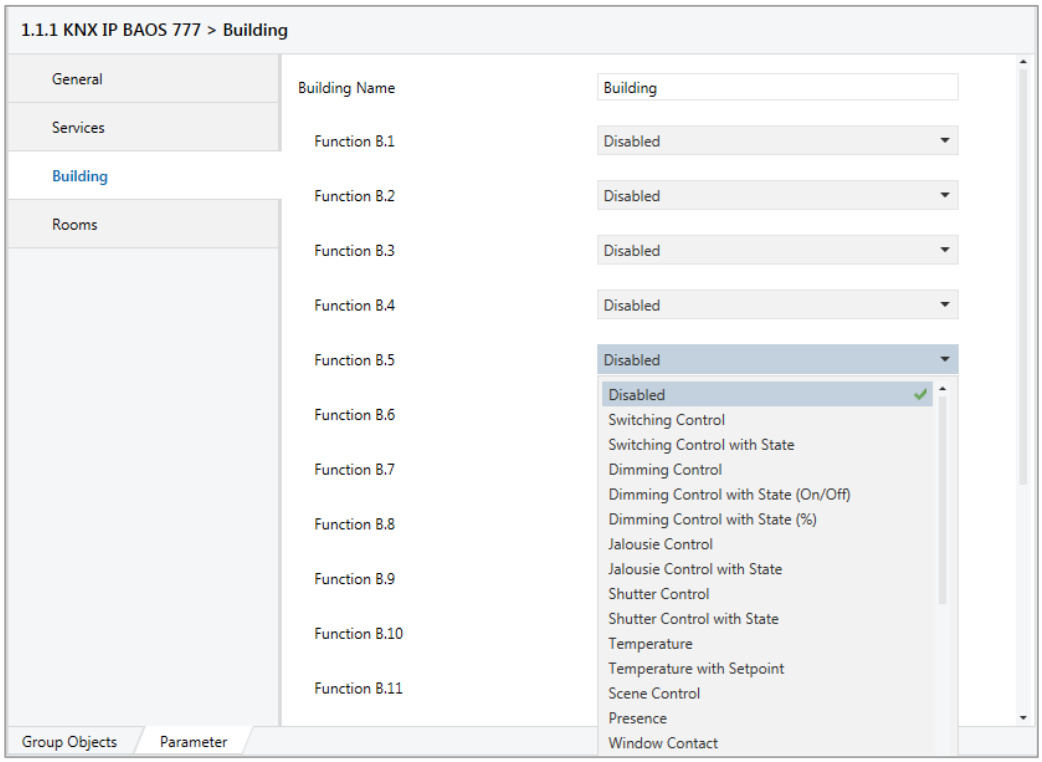
The device menu can be deactivated here.

When deactivated, no more configuration via the device menu is possible.

Building

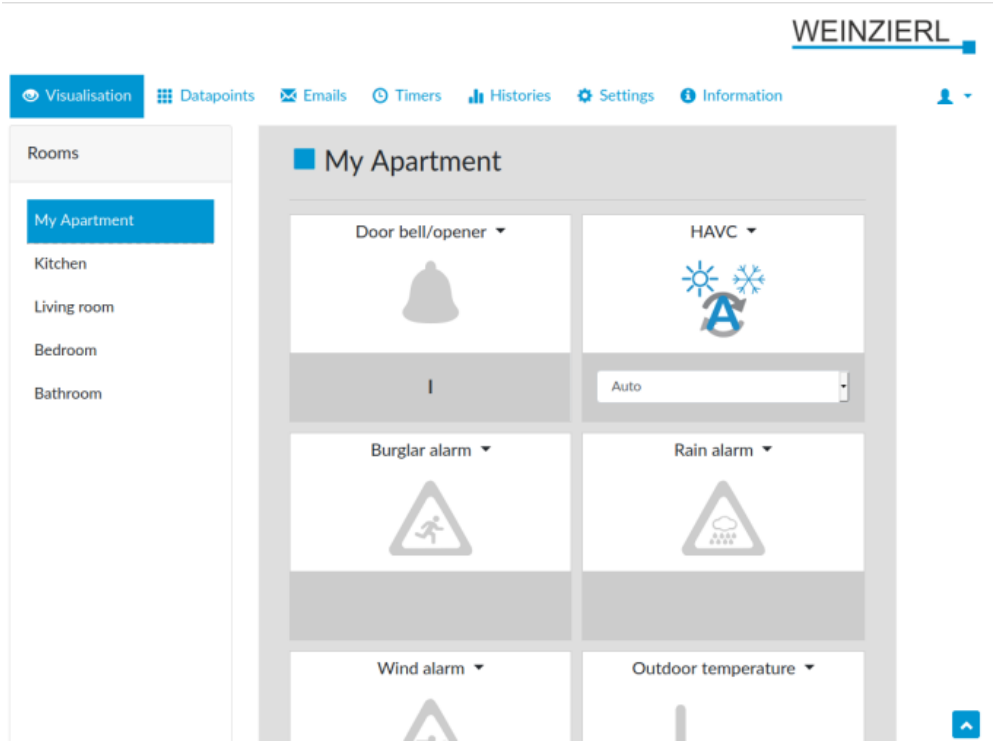
This page contained functions that cannot be assigned to individual rooms but to the building in general.

For example, the date and time are valid for the whole building. The same applies to warnings against wind and rain. Controlling the exterior lighting would also be conceivable here.



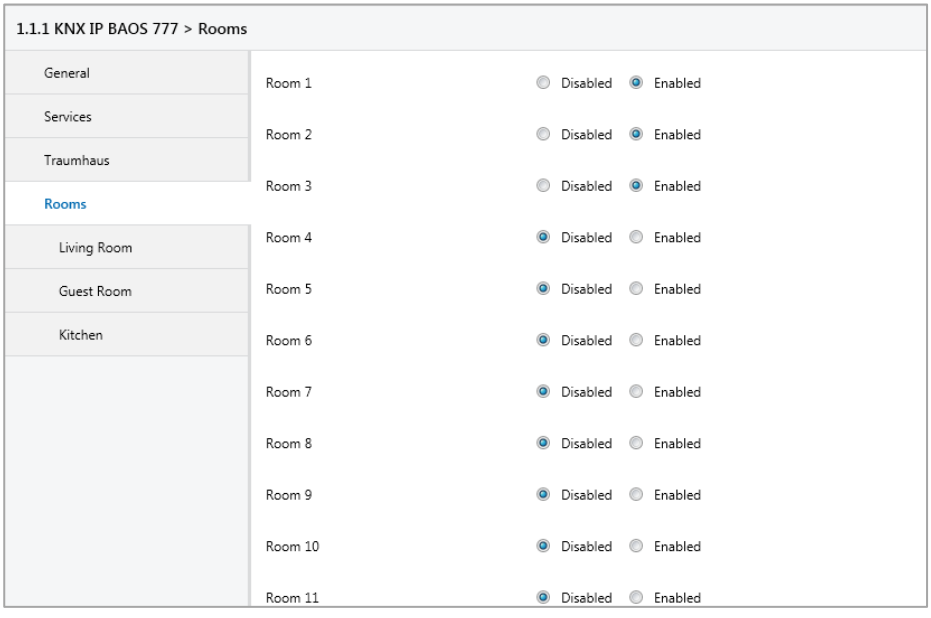
Building name (free text field)
The name of the building can be chosen freely. The maximum length of the name is 20 characters. The name is used by the Web frontend and is made available using the Web services.

Function B.1, B.2, ..., B.xx
This page offers 16 building functions that can be configured individually. Depending on the configuration, the web interface visualizes the building functions:



Rooms

This page shows all functions that are assigned to specific rooms. Each room allows the setup of a maximum of 10 basic functions and a maximum of 6 advanced functions. In total, up to 24 rooms can be set up.



Overview of all available functions

Building functions (max. 16 per building)

Switching
Switching Control with Stat
Dimming
Dimming Control with State (On/Off)
Dimming Control with State (%)
Jalousie Control
Jalousie Control with Stat
Shutter Control
Shutter Control with Stat
Temperature
Temperature with Setpoint
Scene Control
Presence
Window Contact
Door contact
Smoke Al
Water
RGB Control with Stat
Time
Date
HVAC Mode
Doorbell/ opener
Burglary
Rain
Wind
Outdoor temperature
Universal 1 bit Stat
Universal Scaling Control
Universal Scaling
Universal Scaling Control Stat
Universal 2 Byte Floatvalue Stat
Universal 4 Byte Floatvalue Stat

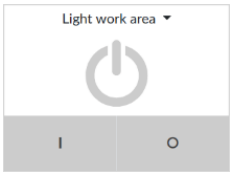
Standard room functions (max. 10 per room)

Switching
Switching Control with Stat
Dimming
Dimming Control with State (On/Off)
Dimming Control with State (%)
Jalousie Control
Jalousie Control with Stat
Shutter Control
Shutter Control with Stat
Temperature
Temperature with Setpoint
Scene Control

Extended room functions (max. 6 per room)

Switching
Switching Control with Stat
Dimming
Dimming Control with State (On/Off)
Dimming Control with State (%)
Jalousie Control
Jalousie Control with Stat
Shutter Control
Shutter Control with Stat
Temperature
Temperature with Setpoint
Scene Control
Presence
Window Contact
Door contact
Smoke Al
Water
RGB Control with Stat
Universal 1 bit Stat
Universal Scaling Control
Universal Scaling
Universal Scaling Control Stat
Universal 2 Byte Floatvalue Stat
Universal 4 Byte Floatvalue Stat

Switching Control

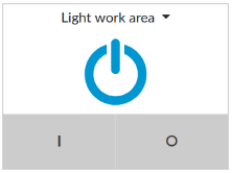


This function controls a switching actuator.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Switching - On/Off	1.001	1 bit	To KNX

Switching Control with State

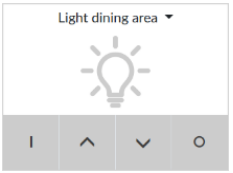


This function controls a switching actuator with feedback.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Switching - On/Off	1.001	1 bit	To KNX
Function B.x : Switching - State	1.001	1 bit	From KNX

Dimming Control

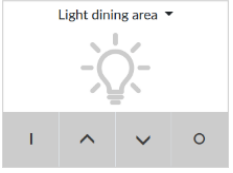


This function controls a dimming actuator.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Dimming - On/Off	1.001	1 bit	To KNX
Function B.x : Dimming - Relative	3.007	4 bits	To KNX

Dimming Control with State (On/Off)

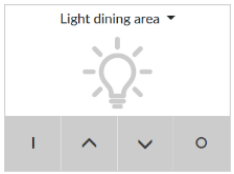


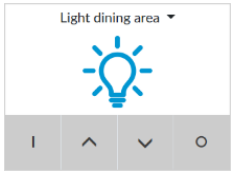
This function controls a dimming actuator with feedback.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Dimming - On/Off	1.001	1 bit	To KNX
Function B.x : Dimming - Relative	3.007	4 bits	To KNX

Dimming Control with State (%)



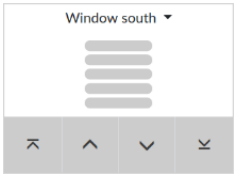


This function controls a dimming actuator with feedback.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Dimming - On/Off	1.001	1 bit	To KNX
Function B.x : Dimming - Relative	3.007	4 bits	To KNX
Function B.x : Dimming - State	1.001	1 bit	From KNX

Jalousie Control

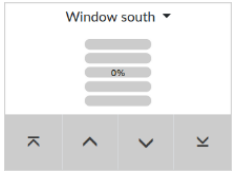


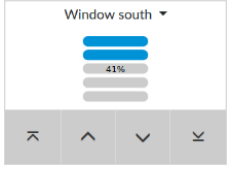
This function controls a jalousie actuator.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Jalousie - Up/Down	1.008	1 bit	To KNX
Function B.x : Jalousie - Step/Stop	1.007	1 bit	To KNX

Jalousie Control with State



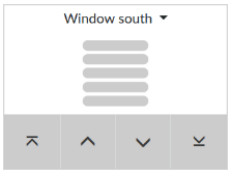


This function controls a jalousie actuator with feedback.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Jalousie - Up/Down	1.008	1 bit	To KNX
Function B.x : Jalousie - Step/Stop	1.007	1 bit	To KNX
Function B.x : Jalousie - State	5.001	1 bit	From KNX

Shutter Control

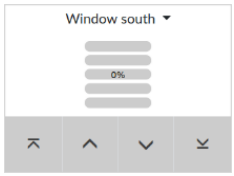


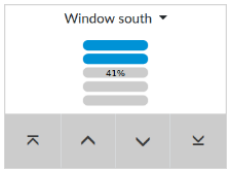
This function controls a shutter actuator.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Shutter - Up/Down	1.008	1 bit	To KNX
Function B.x : Shutter - Step/Stop	1.010	1 bit	To KNX

Shutter Control with State



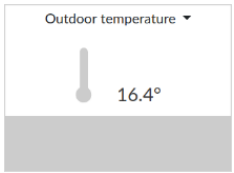


This function controls a shutter actuator with feedback.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Shutter - Up/Down	1.008	1 bit	To KNX
Function B.x : Shutter - Step/Stop	1.010	1 bit	To KNX
Function B.x : Shutter - State	5.001	1 bit	From KNX

Temperature

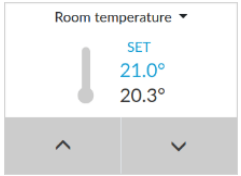


This function monitors a temperature sensor.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Temp. - State	9.001	2 bytes	From KNX

Temperature with Setpoint

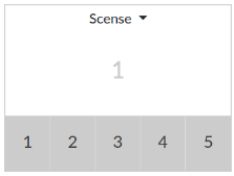


This function controls a temperature sensor with actuating value/setpoint.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Temp. - State	9.001	2 bytes	From KNX
Function B.x : Temp. -Setpoint	9.001	2 bytes	To KNX

Scene Control

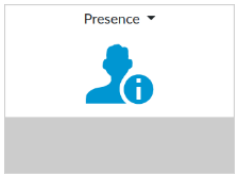


This function controls scenes.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Scene - Number	18.001	1 bit	To KNX

Presence



This function monitors a presence detector.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Presence - State	1.002	1 bit	To KNX

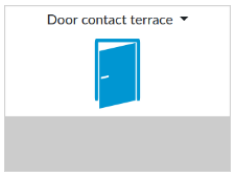
Window Contact

This function monitors a window contact.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Contact - State	1.002	1 bit	To KNX

Door contact



This function monitors a door contact.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : C - State	1.002	1 bit	To KNX

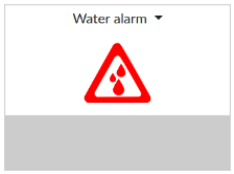
Smoke Alert

This function monitors a smoke alert sensor.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Smoke Alert - State	1.002	1 bit	From KNX

Water Alert

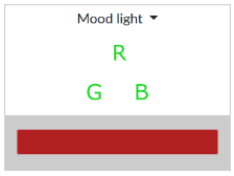


This function monitors a water alert sensor.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Water Alert - State	1.002	1 bit	From KNX

RGB Control with State

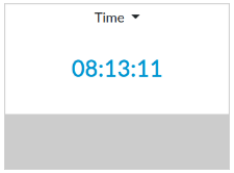


This function controls a RGB light.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : RGB - Control	232.600	3 bytes	To KNX
Function B.x : RGB - State	232.600	3 bytes	From KNX

Time

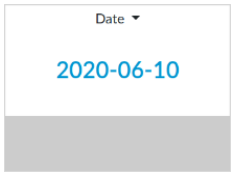


This function displays the current clock.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Time	10.001	3 bytes	From KNX

Date

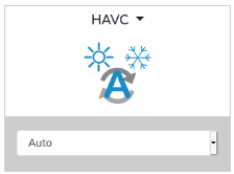


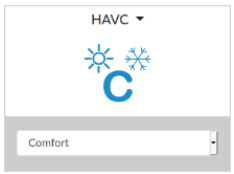
This function displays the current date.

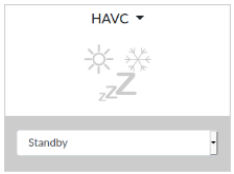
Available group objects:

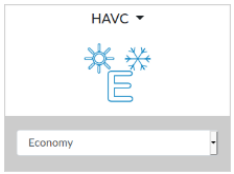
Group object	Type KNX	Size	Direction
Function B.x : Date	11.001	3 bytes	From KNX

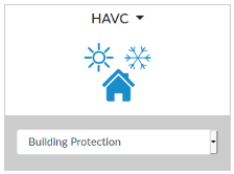
HVAC Mode









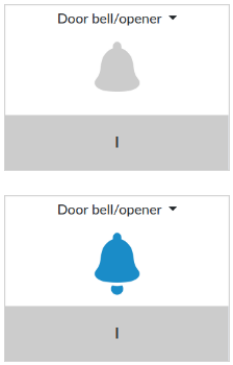


This function controls the ventilation/heating/air conditioning.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Belt/Heat/Climate	20.102	3 bytes	To KNX

Doorbell/ opener



This function controls a door opener and monitors the doorbell. When the door opener is activated, it automatically sends an "off" telegram after 5 seconds.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Door opener	1.009	1 bit	To KNX
Function B.x : Doorbell	1.001	1 bit	From KNX

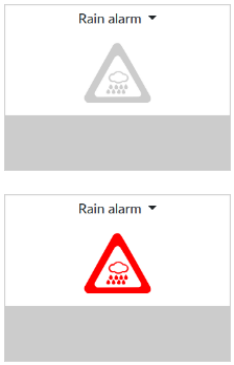
Burglary Alert

This function monitors an alarm system or motion detector.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Burglary Alert - State	1.002	1 bit	From KNX

Rain Alert

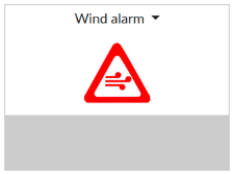


This function monitors a rain sensor.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Rain Alert - State	1.001	1 bit	From KNX

Wind Alert

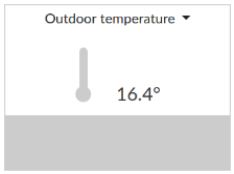


This function monitors a wind sensor.

Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Wind Alert - State	1.002	1 bit	From KNX

Outdoor temperature



This function monitors a outdoor temperature sensor.

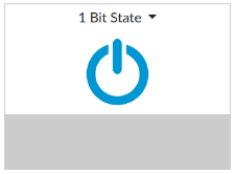
Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Temp. - State	9.001	2 bytes	From KNX

With 26 predefined functions, the KNX IP BAOS 777 offers powerful control and monitoring functions for a wide range of home automation applications.

If further applications are required that cannot be mapped with the 26 predefined functions, the device offers 6 universal functions that can be configured individually according to your needs:

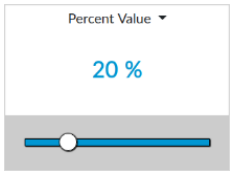
Universal 1 bit State



Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : State	1.XXX	2 bytes	From KNX

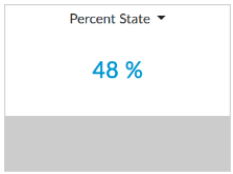
Universal Scaling Control



Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : Various	5.XXX	1 byte	To KNX

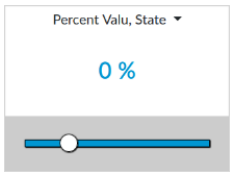
Universal Scaling State

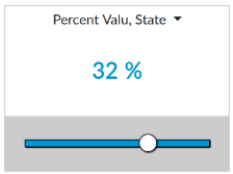


Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : State	5.XXX	1 byte	To KNX

Universal Scaling Control State

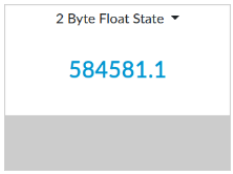




Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : State	5.XXX	1 byte	From KNX
Function B.x : Control	5.XXX	1 byte	To KNX

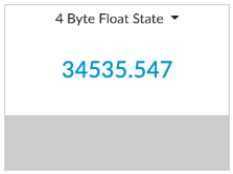
Universal 2 Byte Floatvalue State



Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : State	9.XXX	2 bytes	From KNX

Universal 4 Byte Floatvalue State

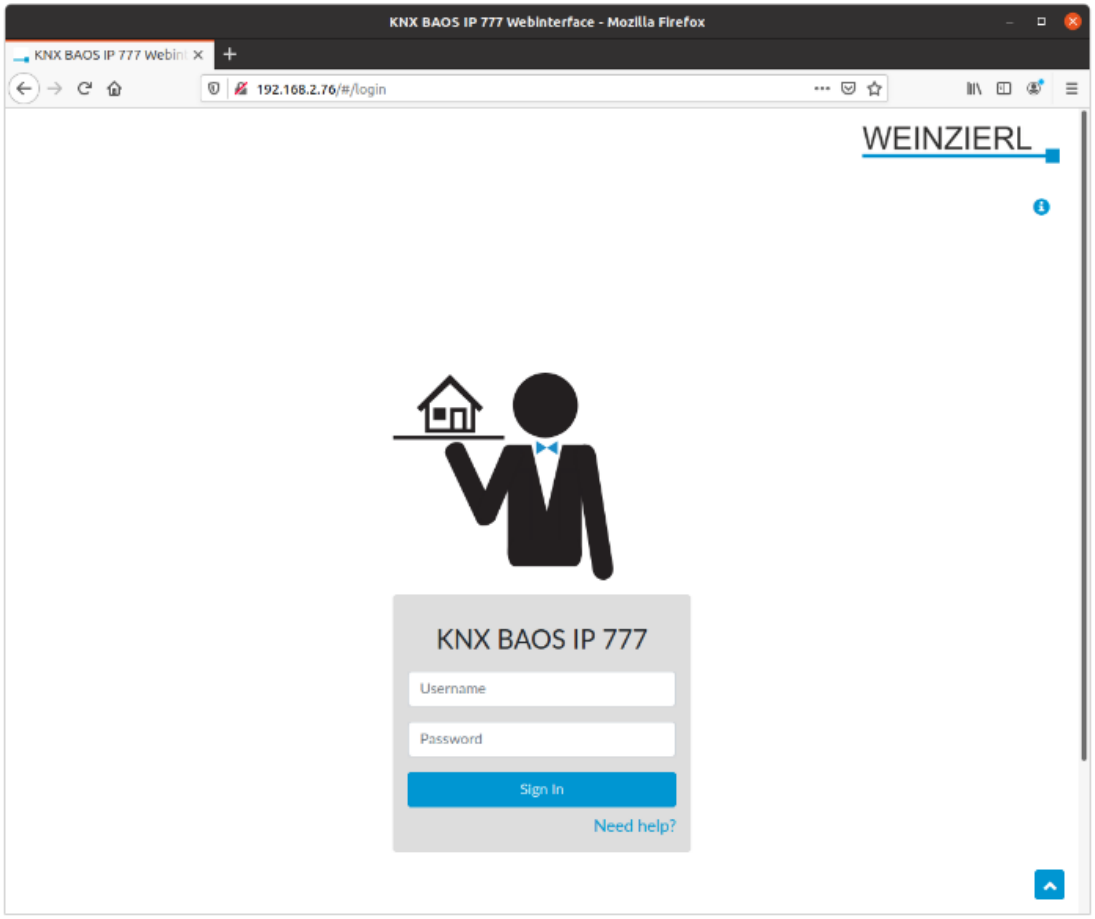


Available group objects:

Group object	Type KNX	Size	Direction
Function B.x : State	14.XXX	4 bytes	From KNX

5 The Web Interface

The web interface can be accessed by entering the IP address of the device **(http://<IP_Address>)** in a browser. If the IP address is not known, it can be found in the *Main Screen* of the KNX IP BAOS 777 display.

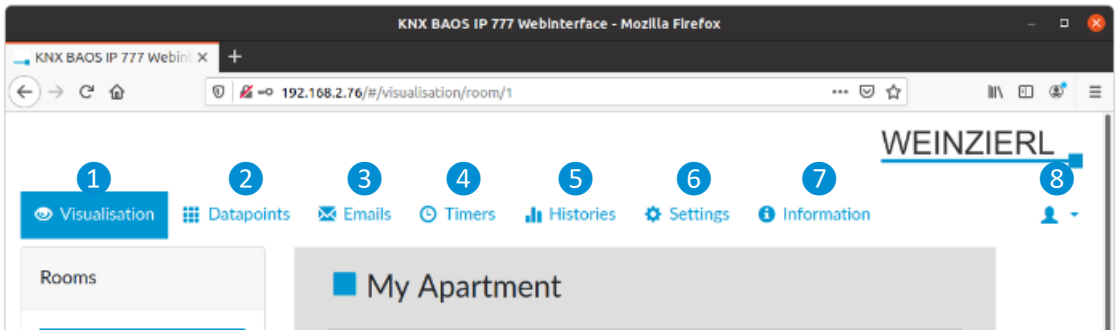


Before you get to the actual web site you have to log in on the login page. To do so, use your configured login data (user name, password) or the factory settings (see page 7 Factory Settings) if these have not yet been changed.

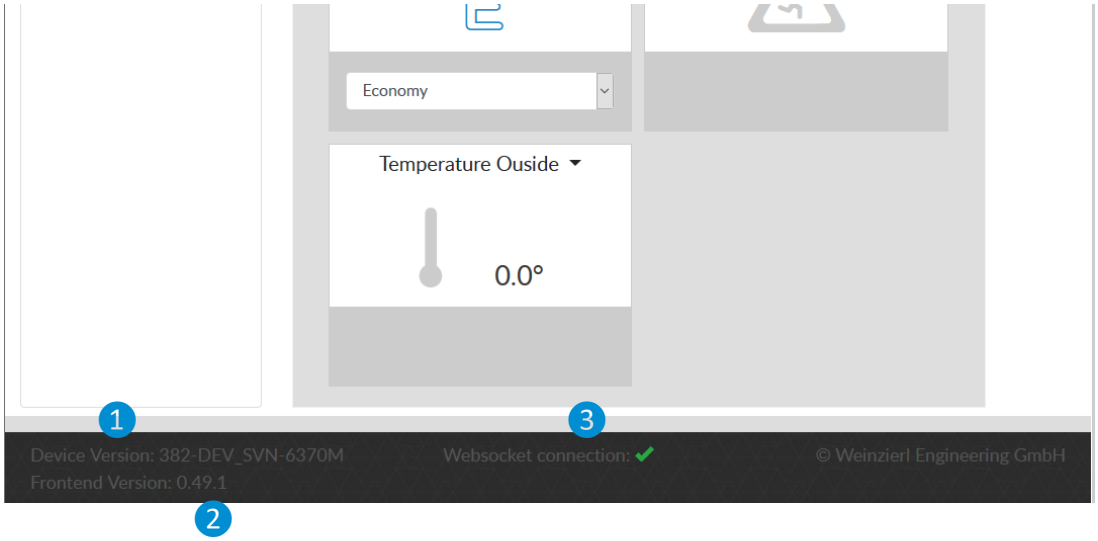
It is strongly recommended that you change the credentials during initial installation to prevent unauthorized persons from accessing your device.

These settings are overwritten by a subsequent ETS download.

Main Menu Items

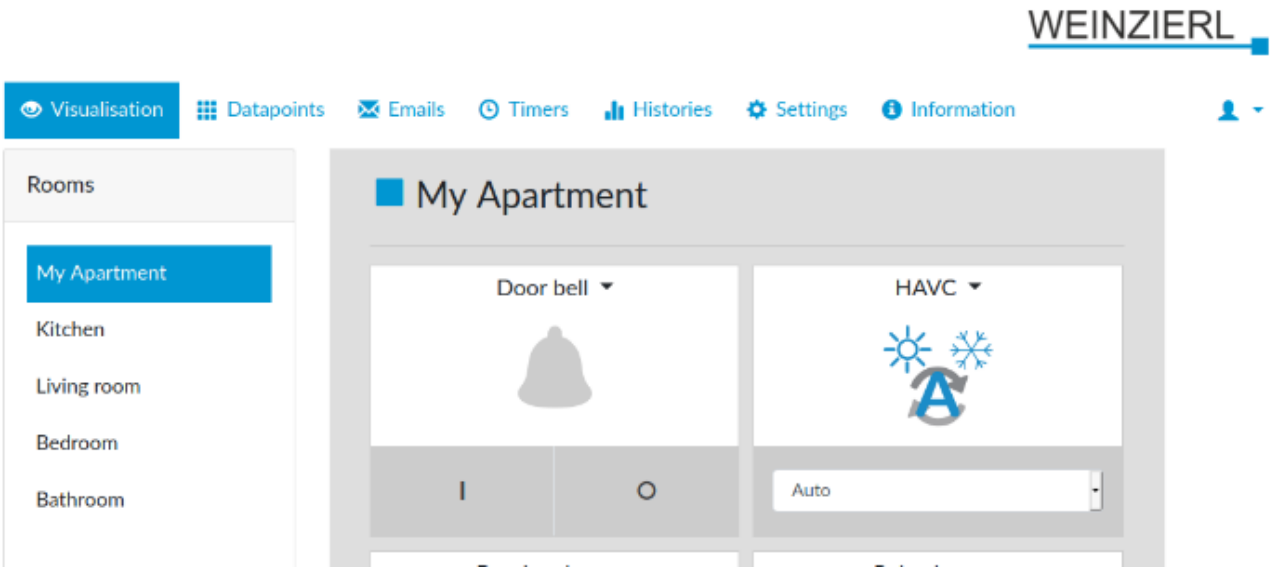


The web interface contains up to **8 main menu items** (depending on the loaded ETS database).



At the bottom of the screen, the current device version 1, front end version 2 and the status of the web socket connection 3 are always displayed.

5.1 Visualization



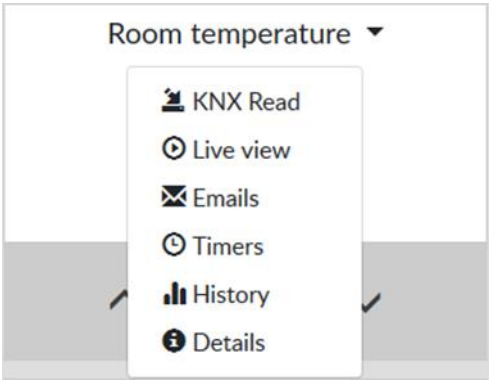
This menu item is only available for the structured database (standard database).

Here, the complete building structure is displayed on the left-hand side and the functions of the selected room in the middle. Depending on the functions, its values are displayed here and can be sent to the KNX bus.

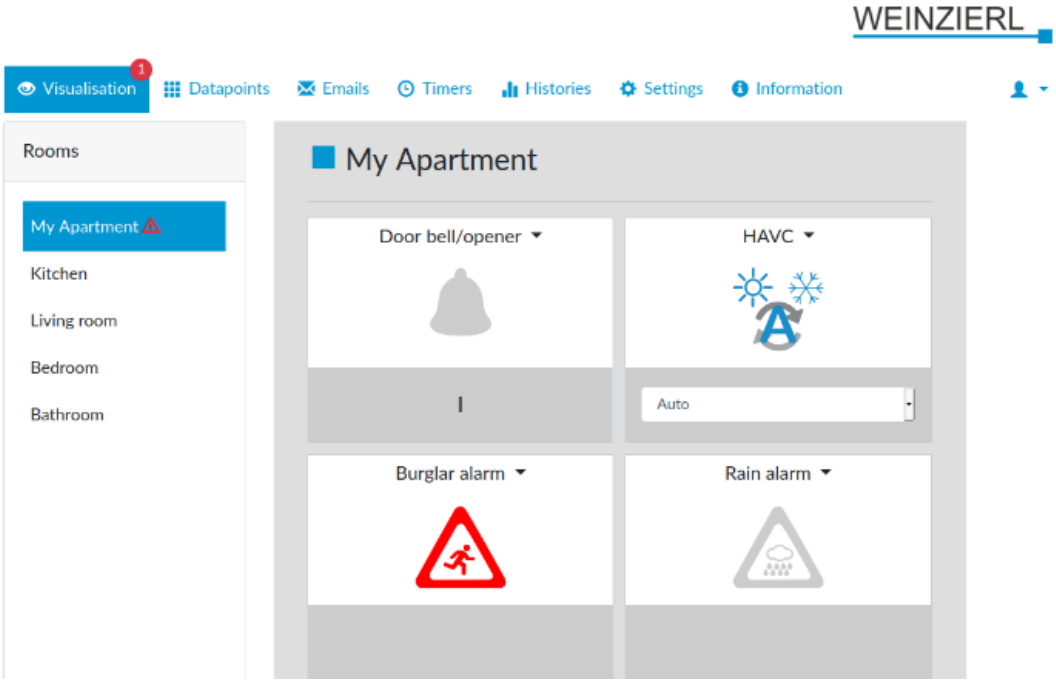
In the mobile version, the room selection is located as a drop-down menu above the functions.

A detailed description of the functions and their visualization can be found above under Rooms.

Clicking on the function name (here "Room temperature") opens a drop-down menu with submenus for the respective function:



*Active alarm functions are not only displayed in the function of the corresponding room, but also always at the top of the **Visualisation** tab, with the number of alarms, and on the left in the corresponding room of the building structure, as an icon.*

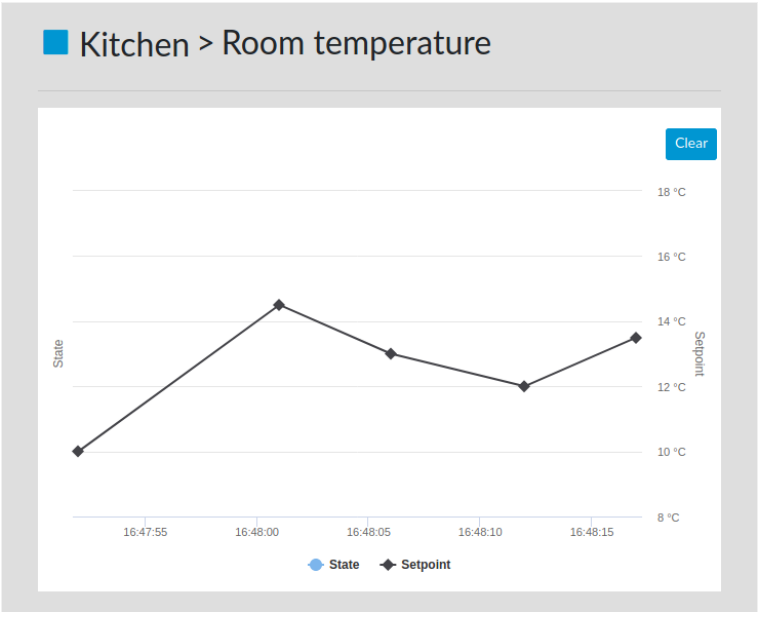


KNX Read

This allows the current value to be read by the system.

*For reading, at least the flags **Communication, Read, Update** and a **Group Address** for the group object belonging to the data point must be configured in the ETS®.*

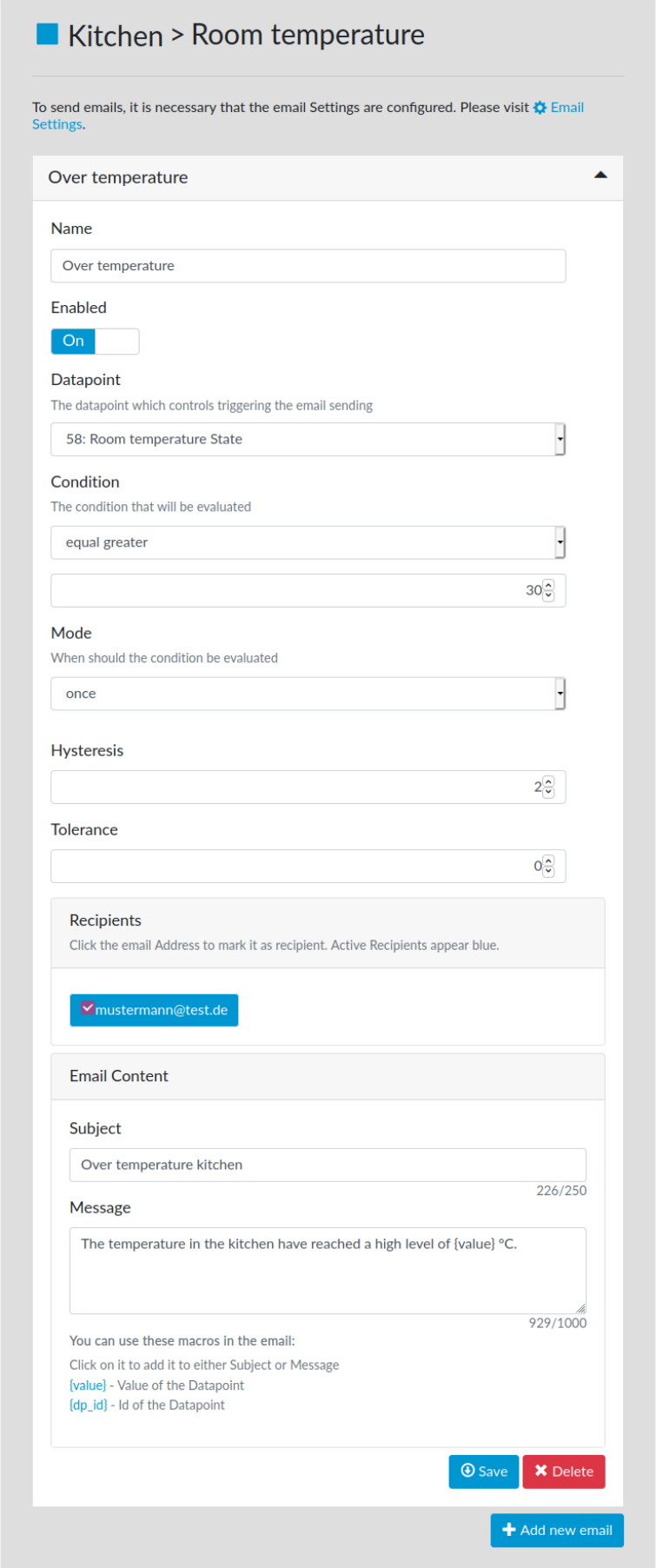
Live View



Here the last ten values since the Live View, function/data point was loaded are displayed as a graph or table.

With the button **Clear** the values can be deleted. For graphs, you can zoom in by opening a window and switch back to the original view via **Reset zoom.**

Emails



Here you can create, change or delete email notifications. The configured emails are always sent when the value of the selected data point meets the configured condition. In the web interface, the individual emails can be opened and closed to provide a better overview.

New notifications can be created using the button **Add new email**, a maximum of 100 notifications can be created via email. After any changes, these must be saved with **Save**. They can be deleted with **Delete**.

Name

Any name with a maximum of 128 characters can be entered here for the corresponding email notification. This name is only used for a better overview for the user.

Enabled

This can be used to enable/disable the notification. This way you can e.g. only switch it on if you are on vacation and want to stay informed about a data point. In this case, the email does not have to be constantly reconfigured.

Datapoint

The data point that triggers the sending of the email is selected here. If you have selected this email via a function, the corresponding data points are available - otherwise only the selected one.

Condition
Selection of the comparison operator and the value with which the received data point value is to be compared. The following comparison operators are available for selection:

- **any**
- **is equal**
- **not equal**
- **greater**
- **equal greater**
- **less**
- **equal less**

> *The selection options of the comparison operator and the input of the possible threshold value differ depending on the data point type.*

Mode
With the mode the triggering behavior can be changed on the basis of the last state of the condition or the received value. The following modes are available:

- **once**
  The email is only triggered once if the condition is true, it is only triggered again if the condition was false at least once in between.
- **on change**
  The email is only triggered if the condition is true and the datapoint value has changed since the last time.
- **on update**
  The email is triggered each time the condition is true.

Hysteresis
A hysteresis value can be specified here to change the threshold value according to the previous correct condition. Depending on the comparison operator, this is added in different directions (positive, negative).

Tolerance
A tolerance can be added to the threshold value here.

Recipients
Here you can select the recipients of the email notification. Only recipients that were previously specified under "Settings/Email/Recipients" are available for selection.

Subject
The subject of the email can be entered here, a maximum of 250 characters are available. With {value} the received datapoint value and with {dp_id} the datapoint ID can be inserted.

Message
The message of the email can be entered here, a maximum of 1000 characters are available for this purpose. With {value} the received data point value can be inserted and with {dp_id} the data point ID.

Timers

Timers, that set data points when triggered, can be created, changed or deleted here. In the web interface the timers can be expanded or collapsed to get a better overview. New timers can be created with the button **Add new timer**. After changes, they must be saved with **Save**. They can be deleted with **Delete**.

Name

Any name with a maximum of 128 characters can be entered here for the corresponding timer. This name only serves to provide a better overview for the user.

Enabled

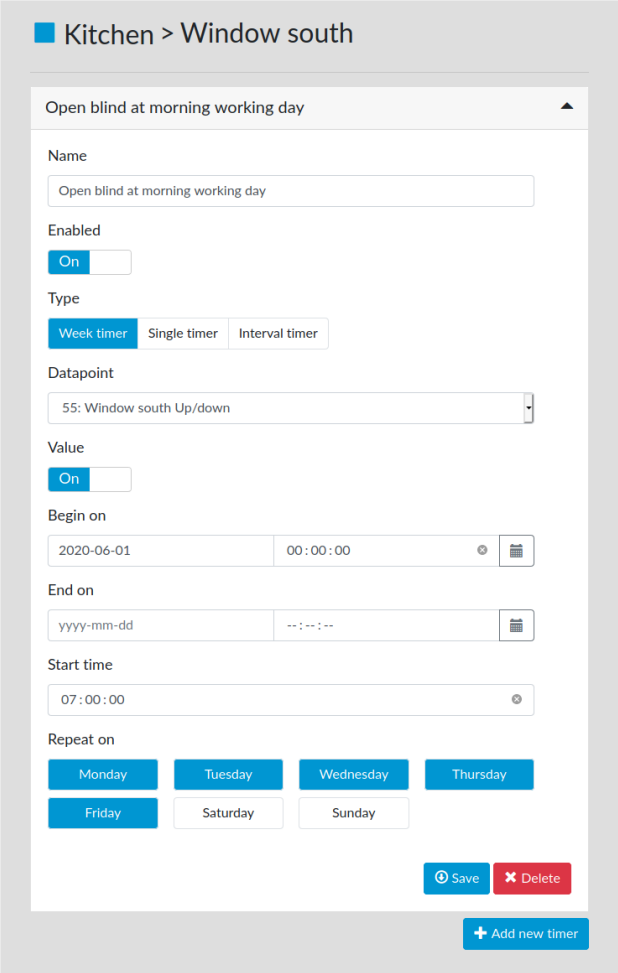
This can be used to enable/disable the timer. Thus, for example, it can only be switched on if you are on holiday and you want to switch the light off and on as a kind of presence simulation and do not always want to reconfigure it.

Type

Here you can choose between the three available timer types. A detailed description of the types can be found below.

Datapoint

The data point to be set is selected here. If you have selected this timer via a function, the corresponding data points are available, otherwise only the selected one.



Value

The value of the data point that is sent to the bus. This differs depending on the data point type.

Type Week timer

This timer is always triggered at the set time and weekdays and then sends the specified value to the KNX bus. The execution can also be limited in time.

Begin on

Specifies the date and time from which the timer should be active. If you do not want to set a start time, the date and time can be deleted.

End on

Specifies the date and time until when the timer should be active. The date and time can be deleted to avoid setting an end time.

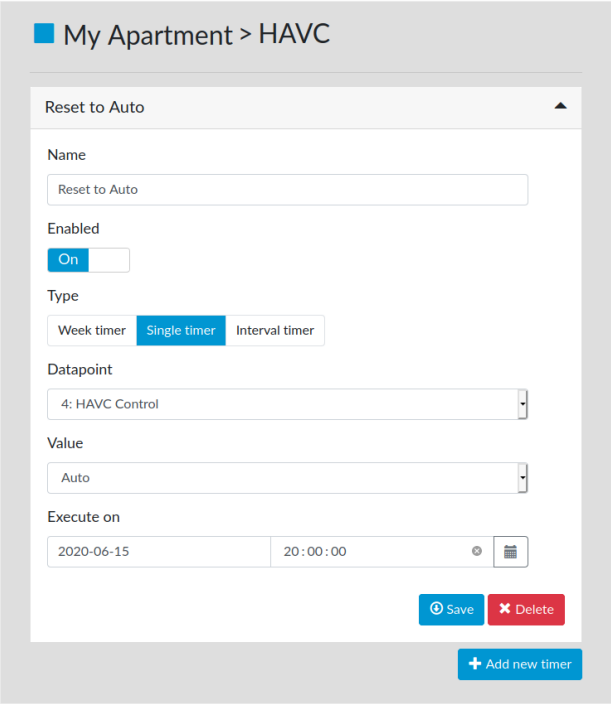
Start time

The time at which the data point value is sent to the bus.

Repeat on

The days of the week on which the timer should be active.

Type Single timer

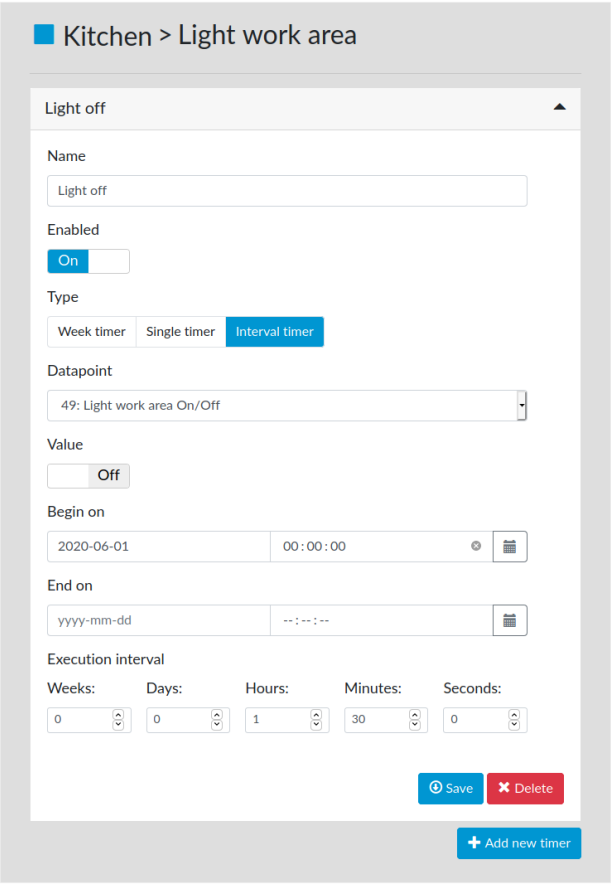


This timer is triggered only once at a certain date and time and then sends the specified value to the KNX bus.

Execute on

Specifies the date and time at which the timer is to trigger.

Type Interval timer



This timer is triggered cyclically after the specified time and then sends the specified value to the KNX bus. The execution can also be time-limited.

Begin on

Specifies the date and time from which the timer should be active. If you do not want to set a start time, the date and time can be deleted.

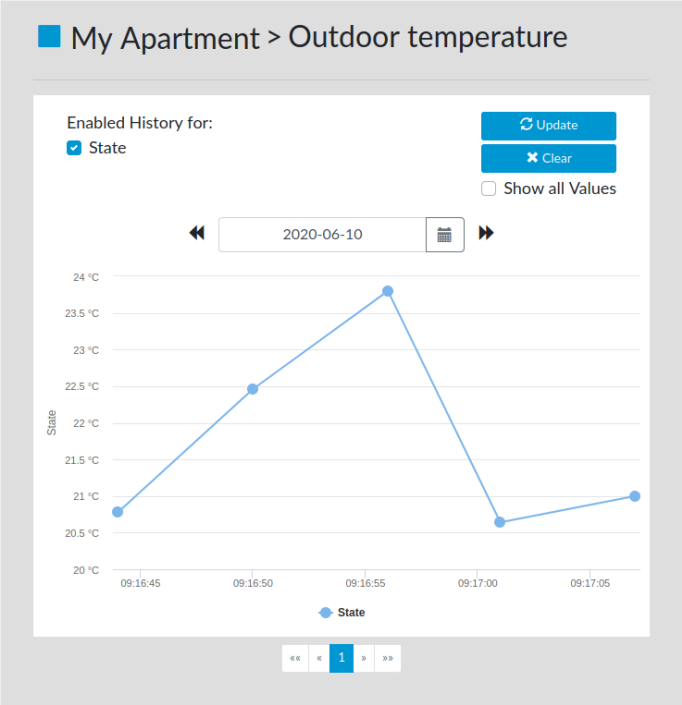
End on

Specifies the date and time until when the timer should be active. The date and time can be deleted to avoid setting an end time.

Execution interval

Here the interval, which runs cyclically, is specified in weeks, days, hours, minutes and seconds.

History



With the history function the data point values can be stored and displayed at any time using a graph or table (depending on the data point type).

By default, the history is deactivated for all data points. It can be activated/deactivated via **Enabled History for**. To refresh the values the button **Update** must be pressed.

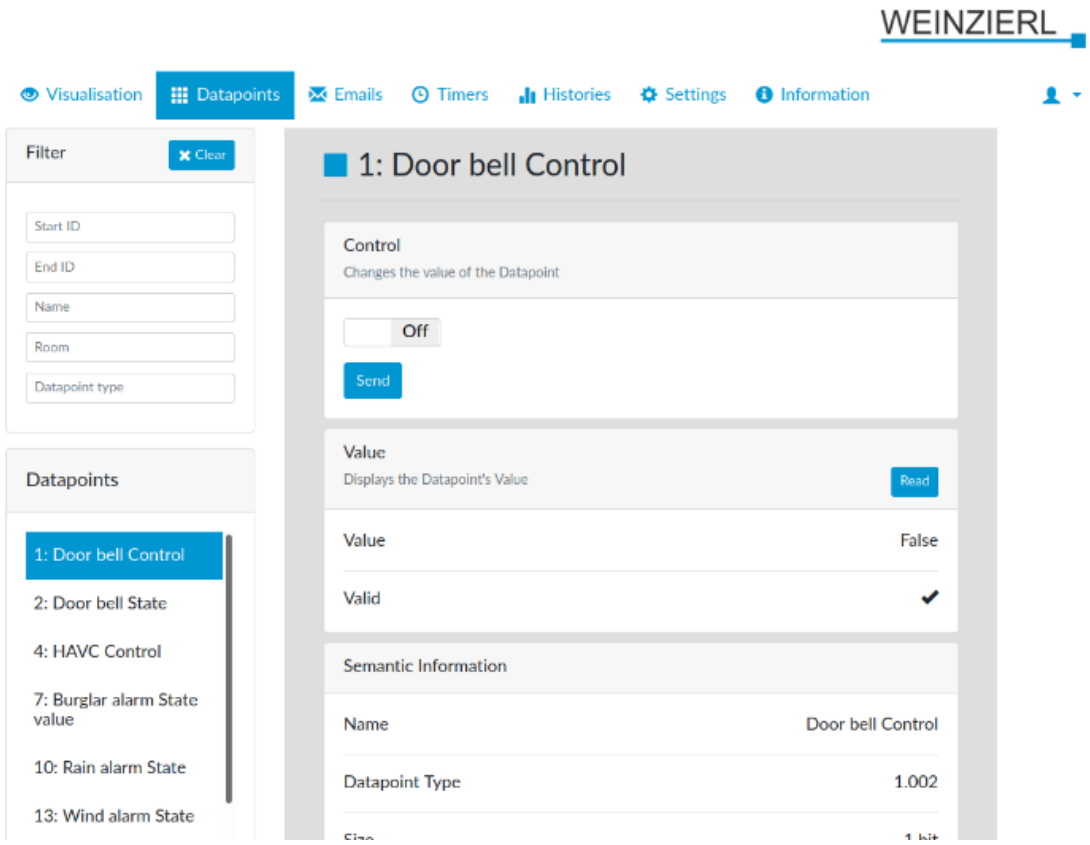
With **Clear** all entries can be deleted. When the view is opened, the current day is selected, which means that only the entries for that day are displayed. Another day for the view can be selected via the date selection or all entries of the data point can be displayed with **Show all Values**.

At graphs, you can zoom in by opening a window and then reset the zoom to the original view by clicking **Reset zoom.**

Details

This switches to Datapoints (detail view), whereby the first data point of the function is also selected.

5.2 Datapoints



In this menu, each configured data point can be displayed in detail and partially adjusted.

Filter

In order to find the desired data point faster, various filters are available in the upper left corner:

- **Start ID**
- **End ID**
- **Name**
- **Room**.
- **Datapoint type**

The Clear button can be used to reset all filters.

In the mobile version the filters are located above the data point list.

Datapoint List

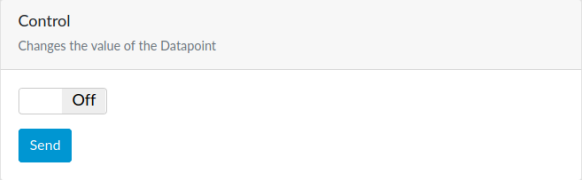
At the bottom left you can select the data point to be displayed in the filtered list, if applicable.

In the mobile version, the data point list is located as a drop-down menu above the detail area.

Detailed Area

In the middle area of the site all details of the selected data point are displayed.

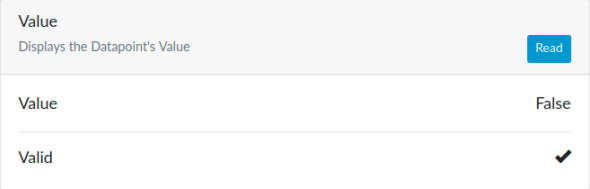
Control



Here a value can be sent to the KNX bus via the corresponding data point using the **Send** button. Depending on the data point type, the input mask for the value to be sent is different.

*For sending, at least the flags **Communication**, **Write**, **Transmit** and a **Group Address** for the group object belonging to the data point must be configured in the ETS®.*

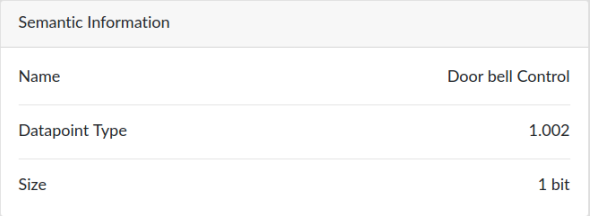
Value



The last received value of the data point is displayed here, as well as whether at least one valid value was received. With the **Read** button the current value can be read from the system.

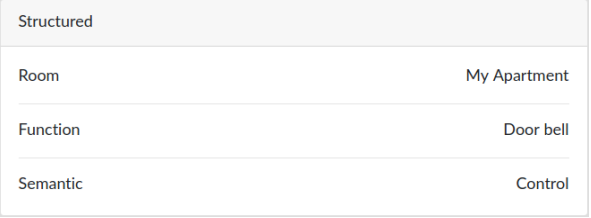
*For reading, at least the flags **Communication**, **Read**, **Update** and a **Group Address** for the group object belonging to the data point must be configured in the ETS®.*

Semantic information



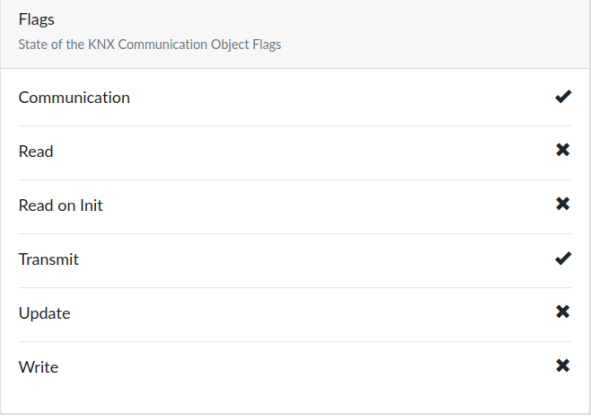
Here the datapoint **Name**, the **Datapoint Type** and its size **Size** are displayed.

Structured



Here the **Room** and the **Function** to which the data point is assigned as well as the **Semantic** within the function are displayed.

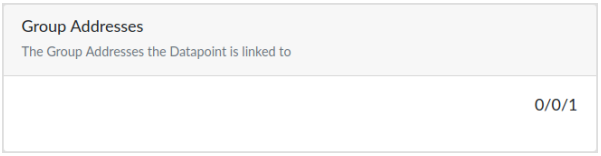
Flags



The ETS flags set for the data point are displayed here.

- **Communication**
- **Read**
- **Read on Init**
- **Transmit**
- **Update**
- **Write**

Group Addresses



Here the group addresses of the data point are listed.

Live View

See Live View above.

History

See histories above.

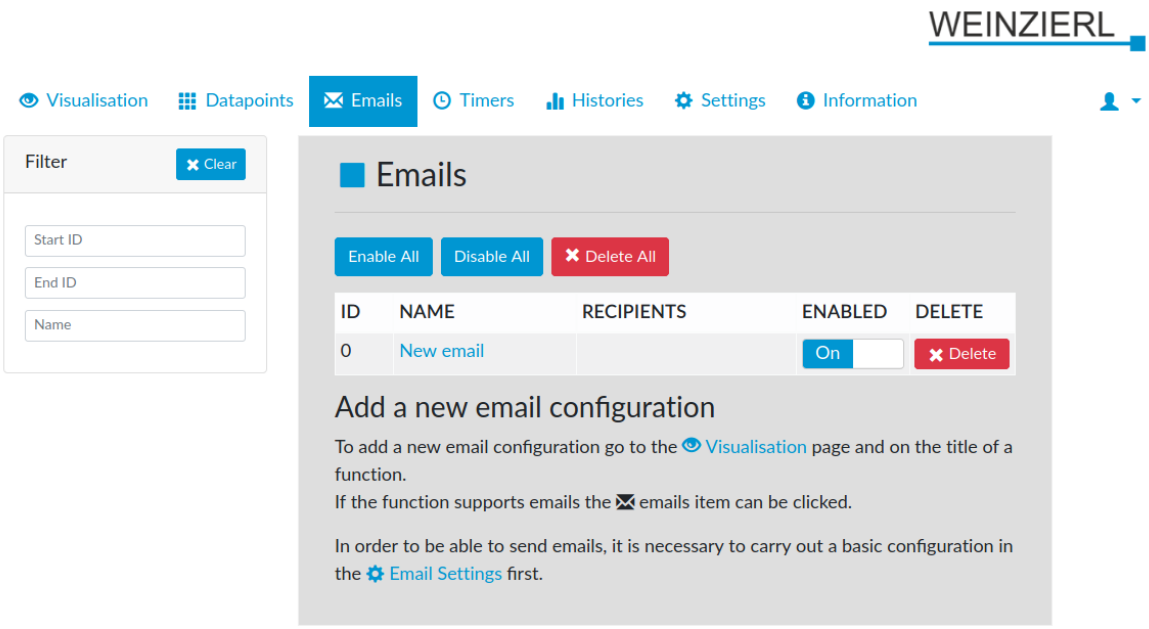
Timers

See Timers above.

Emails

See Emails above.

5.3 Emails



In this menu all email notifications are listed in an overview. Individual (via buttons in the respective line) or all email notifications (via the buttons **Enable All**, **Disable All** and **Delete All**) can be quickly activated, deactivated or deleted here. By clicking on the name you can access the configuration of the respective email notification.

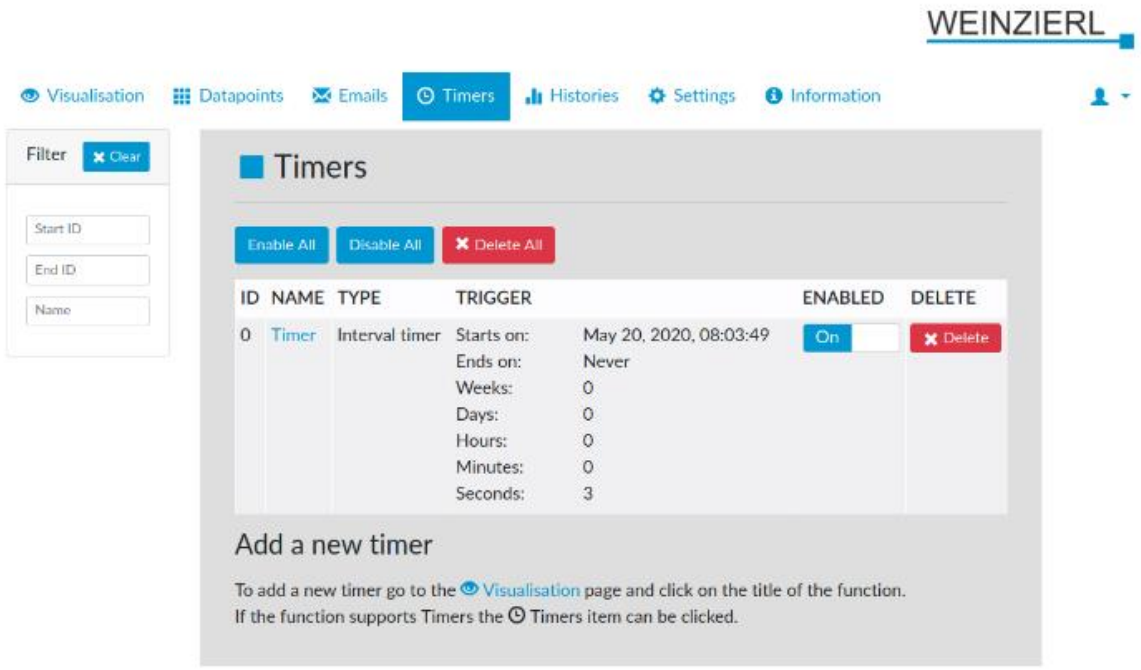
On the left side, the email notifications can still be filtered according to the following criteria:

- **Start ID**
- **End ID**
- **Name**

The **Clear** button can be used to reset all filters.

In the mobile version, the filters are located above the email list.

5.4 Timers



In this menu all timers are listed with general information. Individual timers (via buttons in the respective line) or all timers (via the buttons **Enable All**, **Disable All** and **Delete All**) can be quickly activated, deactivated or deleted here. By clicking on the name you can access the configuration of the respective timer.

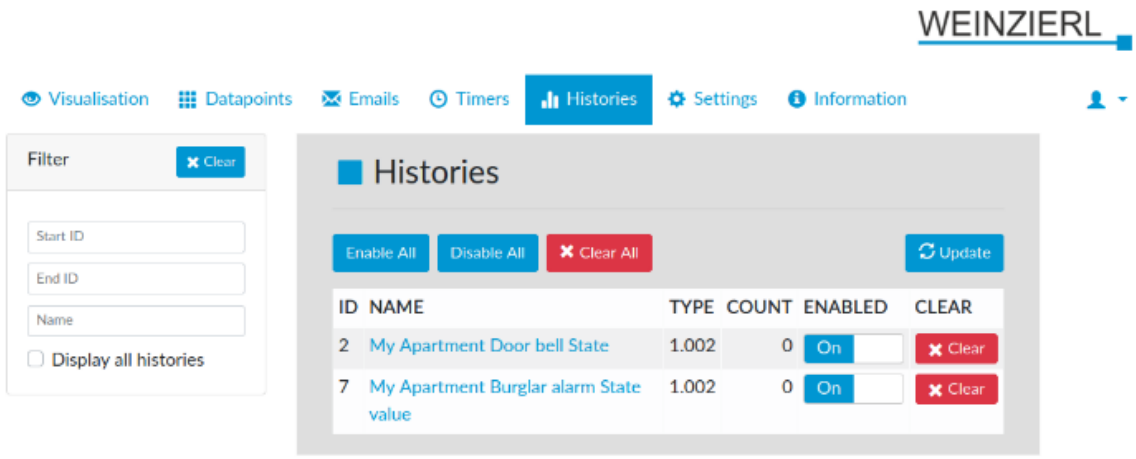
On the left side the timers can still be filtered according to the following criteria:

- **Start ID**
- **End ID**
- **Name**

The **Clear** button can be used to reset all filters.

In the mobile version the filters are located above the timer list.

5.5 Histories



In this menu all data points are listed with general information about their history entries. When opening or updating this tab, only data points with activated history are displayed.

The filter **Display all histories** can be used to display all data points. Individual histories (via buttons in the respective line) or all histories (via the buttons **Enable All**, **Disable All** and **Delete All**) can be quickly activated, deactivated or deleted here. By clicking on the name you can access the detailed view of the respective history.

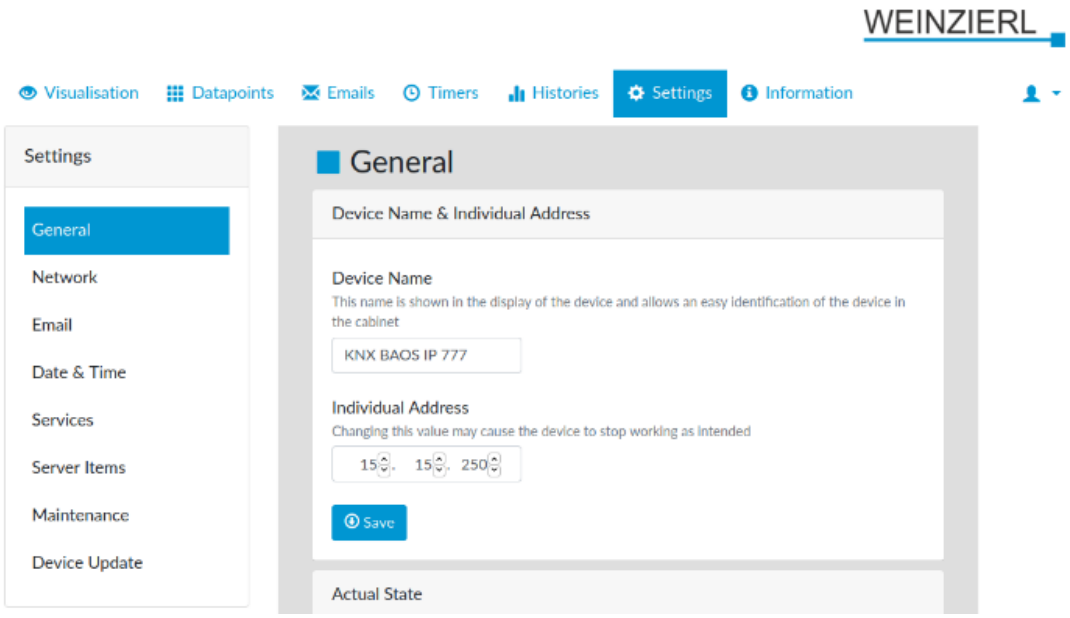
On the left side the histories can still be filtered by the following criteria:

- **Start ID**
- **End ID**
- **Name**
- **Display all histories**

The **Clear** button can be used to reset all filters.

In the mobile version the filters are located above the histories list.

5.6 Settings



This menu contains some settings, some of which can also be set with ETS® and some of which can only be set via the web interface. The settings are, in the left area, again grouped in sub items.

In the mobile version, the sub-items are located as a drop-down menu above the settings.

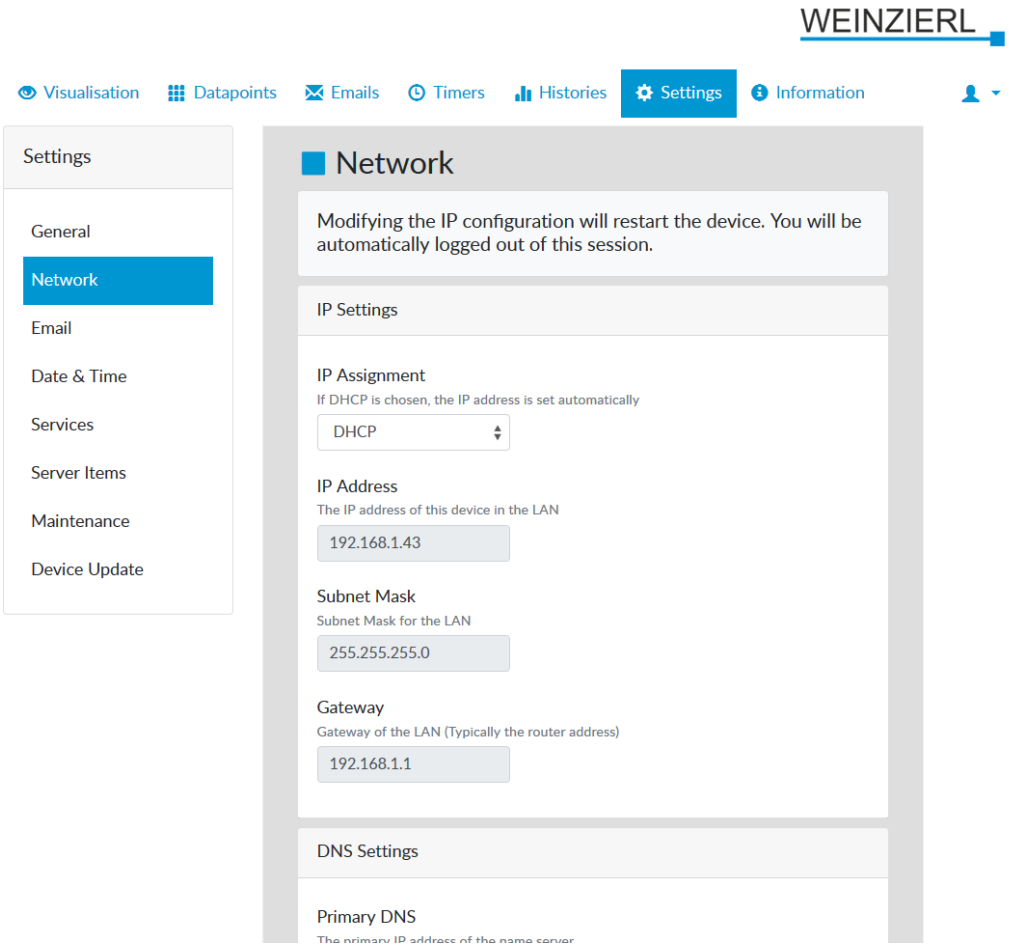
General

The device name and the physical KNX device address can be changed here. After the change has been made, it must be saved in the device using the **Save** button.

These settings are overwritten by a subsequent ETS download.

Furthermore, the programming mode can be switched on or off and the status of the KNX bus connection is displayed.

Network



Here you can change the IP address assignment (DHCP, Manual). The MAC address of the device is also displayed.

With DHCP assignment (**IP Assignment**) the current IP address, subnet mask and gateway are displayed, with manual assignment these can also be changed.

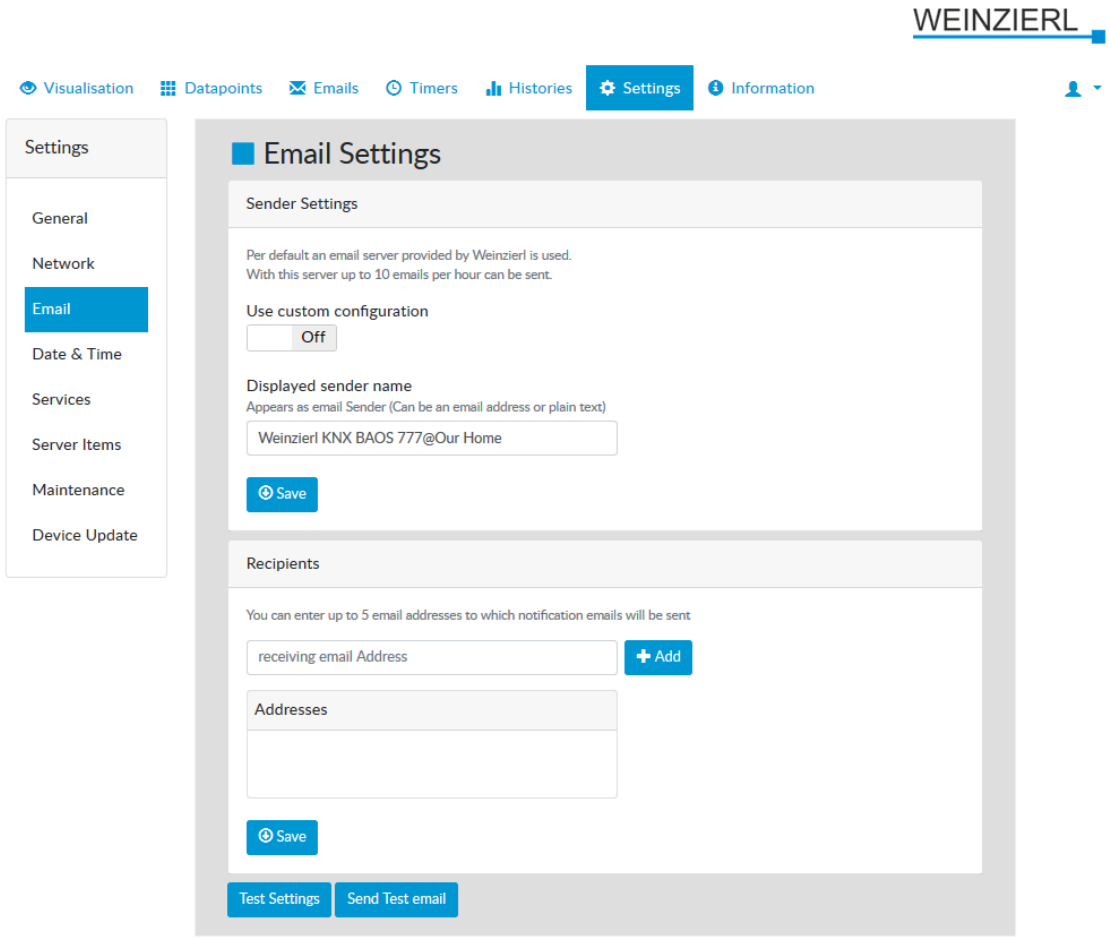
> *If the IP address changes, the client must be reconnected to the web interface. These settings will be overwritten by a subsequent ETS download.*

Under the item **DNS Settings,** three IP addresses can be assigned for DNS servers. If **dhcp** is specified, the DNS server is used from the DHCP server and if **gateway** is specified, this will be used as DNS server. In addition, the MAC address of the device is displayed below the **MAC Address** item.

After a change has been made, it must be saved in the device using the **Save** button.

> *After saving the changes, the device is restarted.*

Email



Here you configure the settings for sending notifications via email.

Sender Settings

Use custom configuration Off

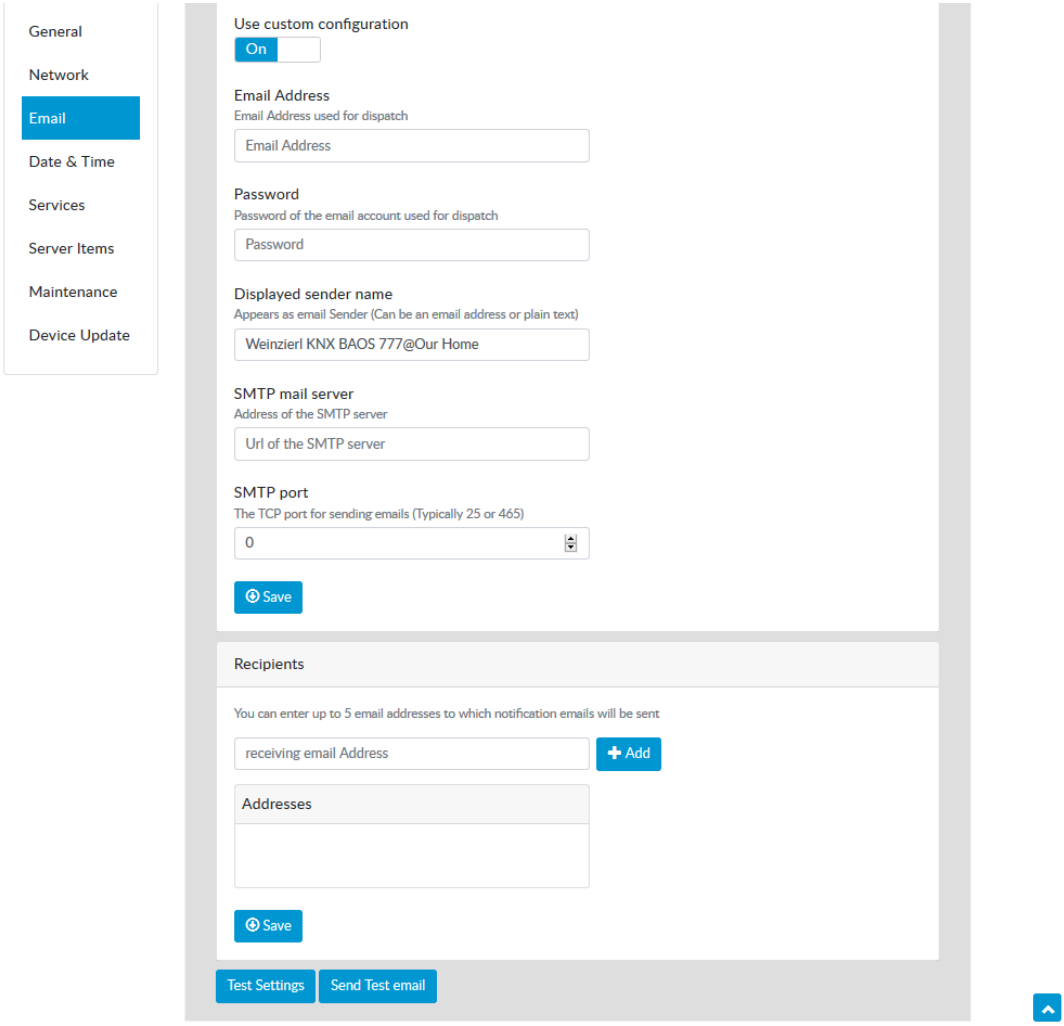
By default the integrated Weinzierl email server is selected, through which up to 10 emails per hour can be sent without further configuration and costs.

With **Displayed sender name** the name under which the email is sent can be changed. This enables the recipient to better assign the received email.

Recipients allows you to create up to 5 email recipients - these can be selected later in the individual email notifications.

Addresses shows the currently stored addresses of the email recipients - they can be deleted individually using the "Minus" symbol.

Sender Settings
Use Custom Configuration On



To use your own email account, you must enter the **Email Address** and **Password**. With **Displayed sender name** you can change the name under which the email is sent. This enables the recipient to better assign the received email.

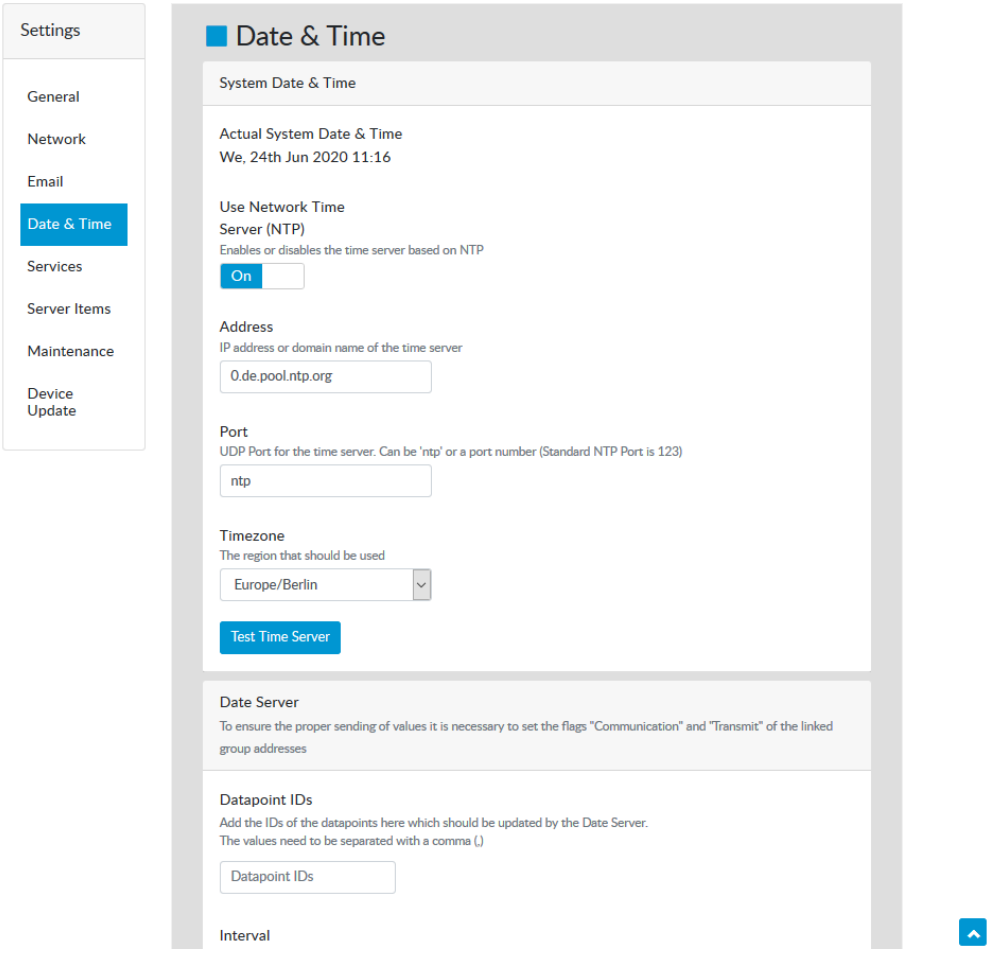
Under **SMTP mail server** and **SMTP port** the data of the own email provider will be specified. After the change has been made, it must be saved in the device using the **Save** button.

Under **Recipients** the **email addresses of up to five recipients** can be added, changed or deleted. After a change, it must be saved in the device using the **Save** button. The **Addresses** field shows the currently configured recipients.

With the **Test Settings** button the connection to the SMTP server and the login data are checked with the current data. The **Send Test email** button sends a test email to each specified recipient in addition to the check.

> *Subsequent changes to the recipient list do NOT affect email notifications that have already been created.*

Date & Time



The current date and time of the device (**Actual System Date & Time)** are displayed here. Furthermore, these can be set either **manually** or via an **NTP (Network Time Protocol) server.**

If set manually, there is a **Today** button that sets the date and time to the current value.

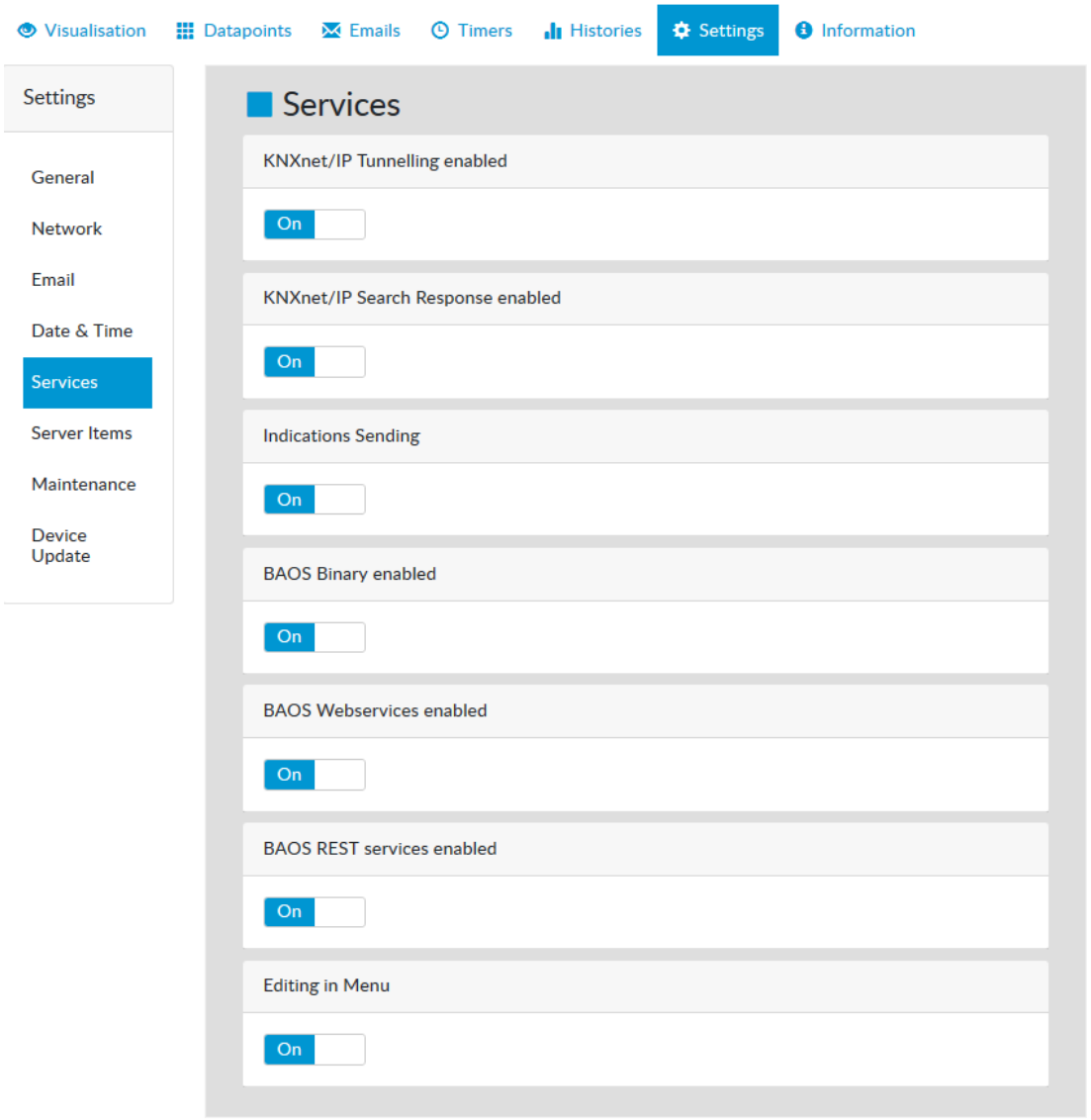
When using the NTP server, its address (**Address** - IP address or Domain Name) and **Port** must be specified and the **Timezone** to be used must be set. With the button **Test Time Server** the settings can be checked.

With the **Date Server** and the **Time Server** the current date or time can be sent cyclically via data points. For configuration, one or more **Datapoint IDs**, on the basis of which the value is sent, and the **Interval** must be specified in minutes.

The data point type must be a DPT 11 (Date) for the date and DPT 10 (Time) for the time. To switch off the corresponding server again, set the cycle time to 0.

After the changes have been made, they must be saved in the device using the **Save** button.

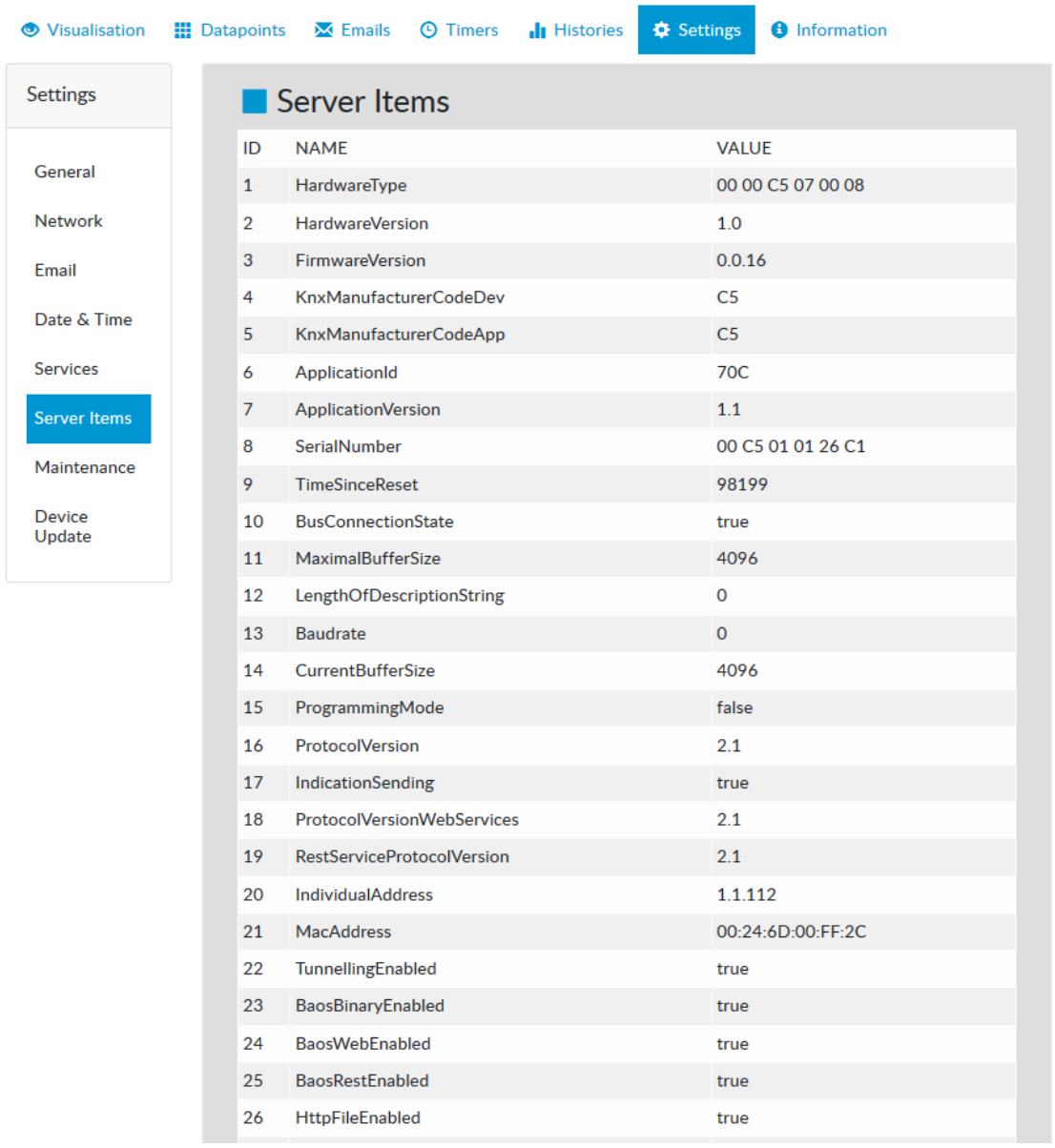
Services



This page shows the different ways of accessing the device:

- **KNXnet/IP Tunnelling**
- **KNXnet/IP Search Response**
- **indication sending**
- **BAOS Binary**
- **BAOS Web Services**
- **BAOS REST services**
- **Editing in Menu on**

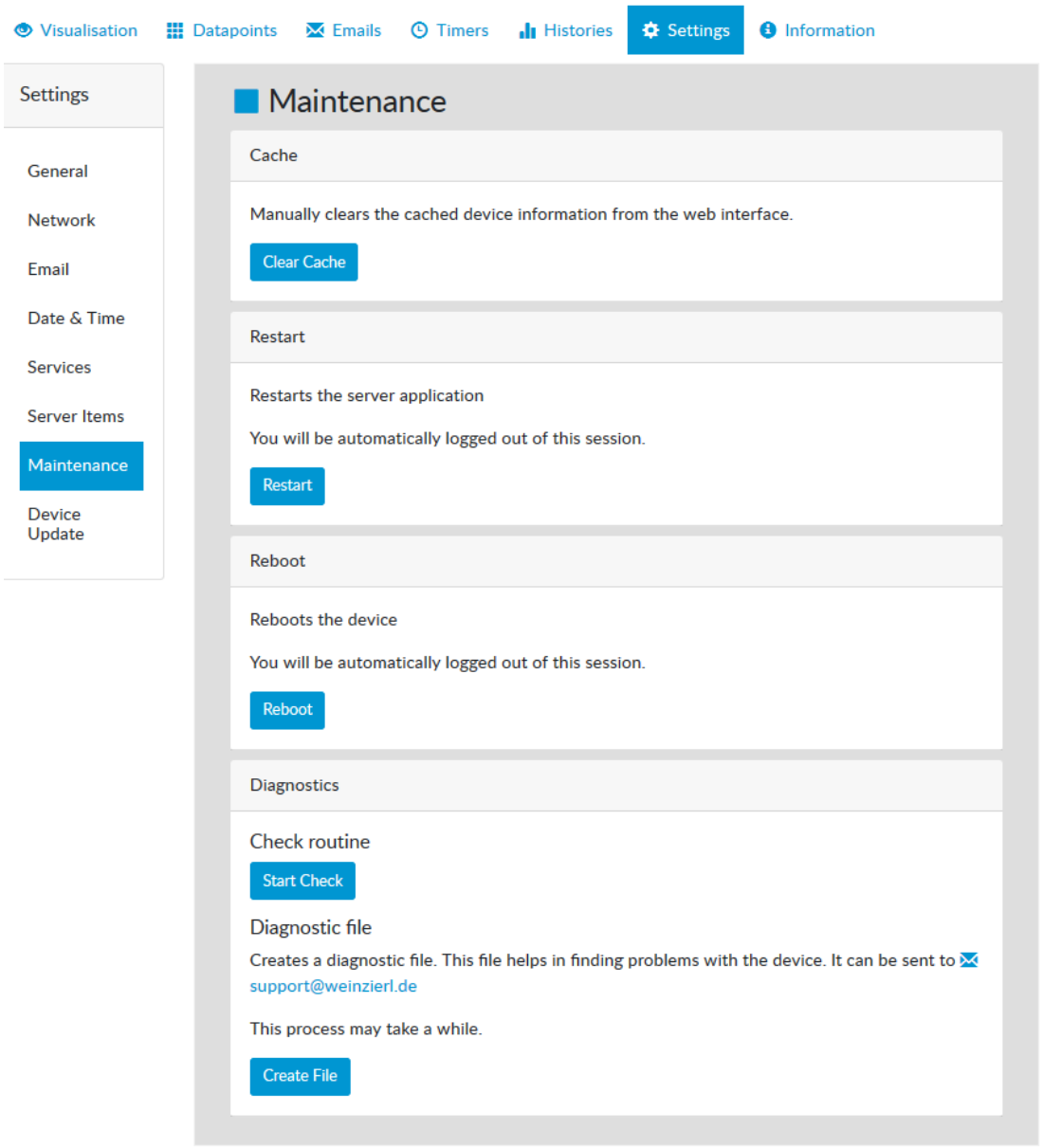
Server Items



ID	NAME	VALUE
1	HardwareType	00 00 C5 07 00 08
2	HardwareVersion	1.0
3	FirmwareVersion	0.0.16
4	KnxManufacturerCodeDev	C5
5	KnxManufacturerCodeApp	C5
6	ApplicationId	70C
7	ApplicationVersion	1.1
8	SerialNumber	00 C5 01 01 26 C1
9	TimeSinceReset	98199
10	BusConnectionState	true
11	MaximalBufferSize	4096
12	LengthOfDescriptionString	0
13	Baudrate	0
14	CurrentBufferSize	4096
15	ProgrammingMode	false
16	ProtocolVersion	2.1
17	IndicationSending	true
18	ProtocolVersionWebServices	2.1
19	RestServiceProtocolVersion	2.1
20	IndividualAddress	1.1.112
21	MacAddress	00:24:6D:00:FF:2C
22	TunnellingEnabled	true
23	BaosBinaryEnabled	true
24	BaosWebEnabled	true
25	BaosRestEnabled	true
26	HttpFileEnabled	true

In this submenu all server items of the device are displayed.

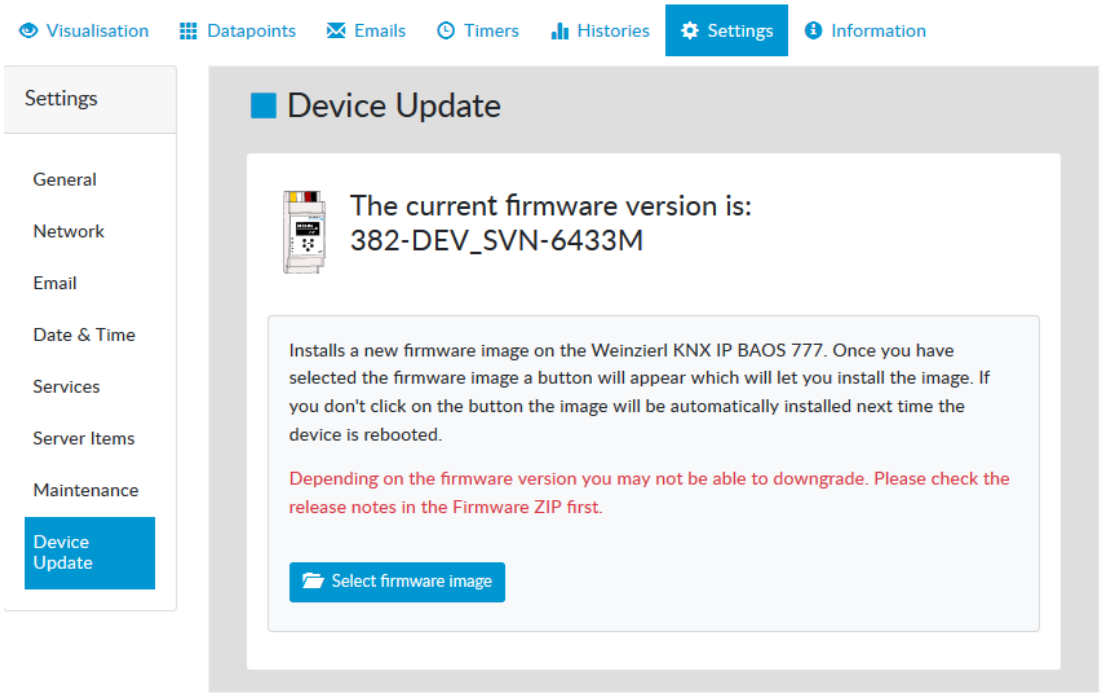
Maintenance



Services for the maintenance of the device are available here. Among other things, you can empty the Web **Cache** of the browser, **Restart** the application or **Reboot** the device.

To find possible configuration errors, various parameters are checked with the check routine (**Start Check**) and displayed if necessary. In order to be able to identify possible errors in support requests, we usually require device-specific information, which can be downloaded from the device using the diagnostic file (**Create File**). This file can then be sent to Weinzierl by email to support@weinzierl.de.

Device Update



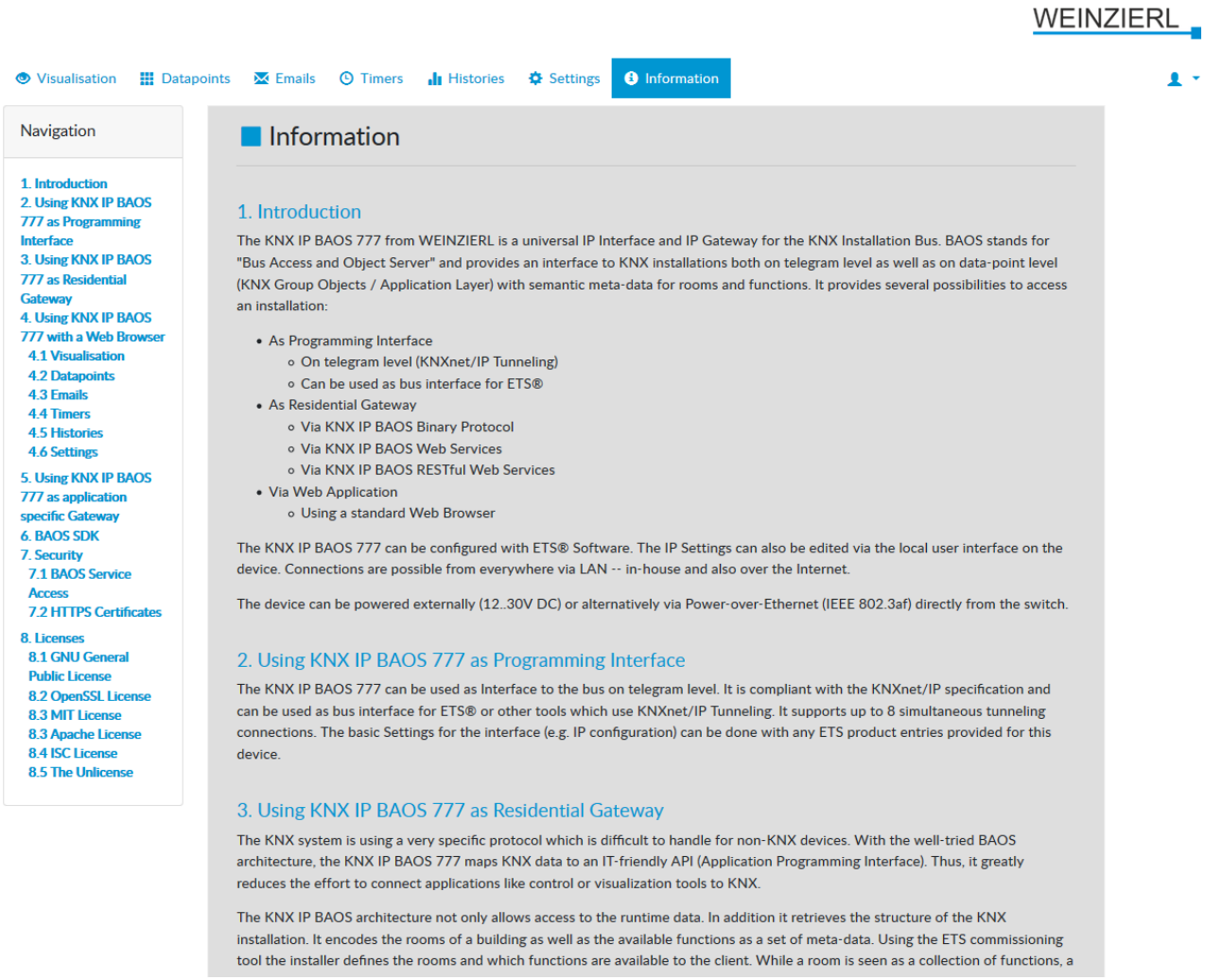
The firmware of the KNX IP BAOS 777 can be updated by the user. For this purpose, a firmware file can be selected by clicking on the button **Select firmware image** or drag and drop it onto the button. Firmware updates can be downloaded from the Internet at www.weinzierl.de/de/products/777.

After successfully uploading the firmware file to the device, the **Install** button appears and the actual installation of the update is started.

The update takes a few minutes and the device restarts. Do not disconnect the device from power or the KNX bus during the update.

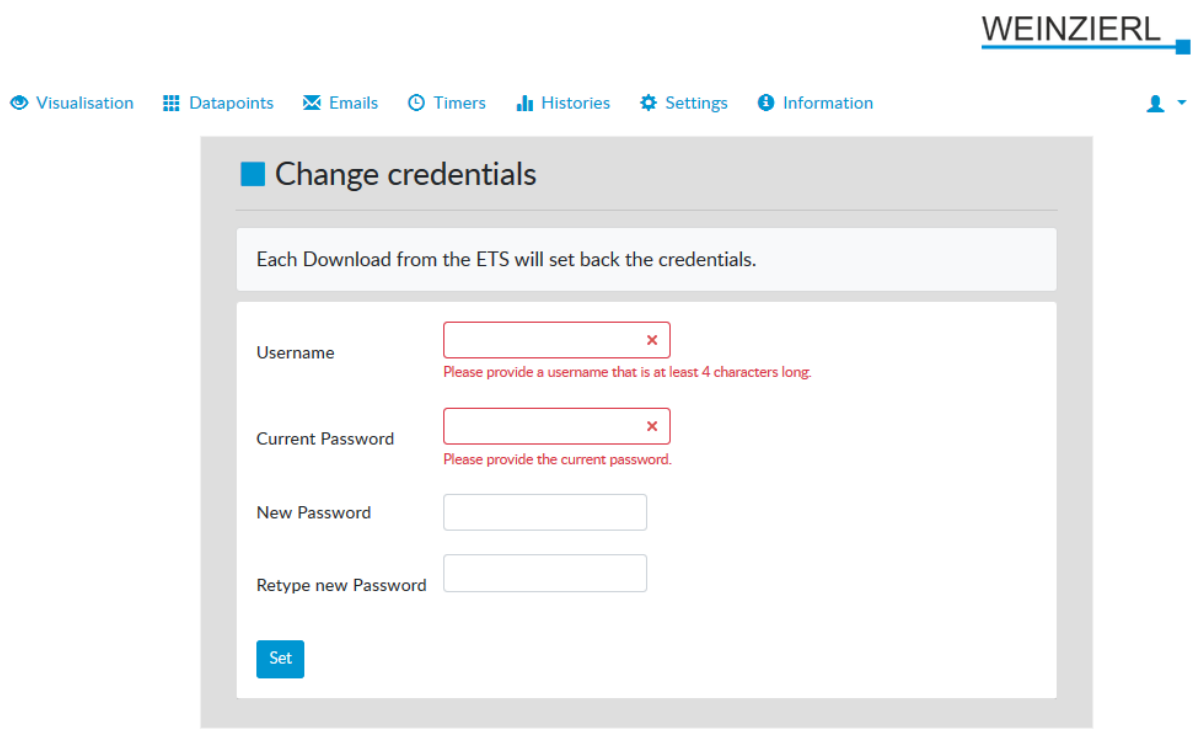
After an update, restart or reboot you have to log in again in the web interface.

5.7 Information



Here you will find information and the operating instructions for the device and its web interface.

5.8 User



In this dropdown menu the user name and password can be changed via **Change credentials.** You also can **Log out** of the web interface.

These settings are overwritten by a subsequent ETS download.

6 Open Source Licenses

The firmware used in this product is based on several important open source software packages. These are available under the General Public License, version 2 (GPLv2) and/or other open source licenses. To obtain the complete source code of software used under an open source license, we offer the following contact options:

Email: support@weinzierl.de

By mail: Weinzierl Engineering GmbH
Achatz 3
DE-84508 Burgkirchen / Alz
GERMANY

A request should include the product name and firmware version. The full text of the GPLv2 and the OpenSSL license can be found later in this document.

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Version 2, June 1991

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www.weinzierl.de/en/products/777/ets5

Data sheet
www.weinzierl.de/en/products/777/datasheet

CE declaration
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