KNX-GW2-IP-2TE

Manual / Data Sheet

arcus-eds

KNX

KNX-GW-II-IP-2TE	Article	Description	Article No.
		Document: 7031_e3_KNX-GW2-IP-2TE.pdf	
		IP gateway for coupling the KNX bus to Ethernet networks. Use: ETS programming / tunneling / Routing / freely programmable / visualization / special solutions	
	KNX-GW2-IP-2TE	Memory RAM: 1GB, Memory FLASH: 8GB Operating voltage: 9 .. 30 VDC / 1.5W Operating temperature: -25 .. +55 ° C REG housing: 2TE (35 mm) IP20	40400003

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1 Getting Started

By confirming the IP address in the address line of your browser, you will get to the overview.
In order to be able to use the gateway, the connections KNX + ETHERNET + POWER or KNX + USB must be established. If a DHCP server is available you can connect the device by name (e.g. ArcusIPGW-II.fritz.box).
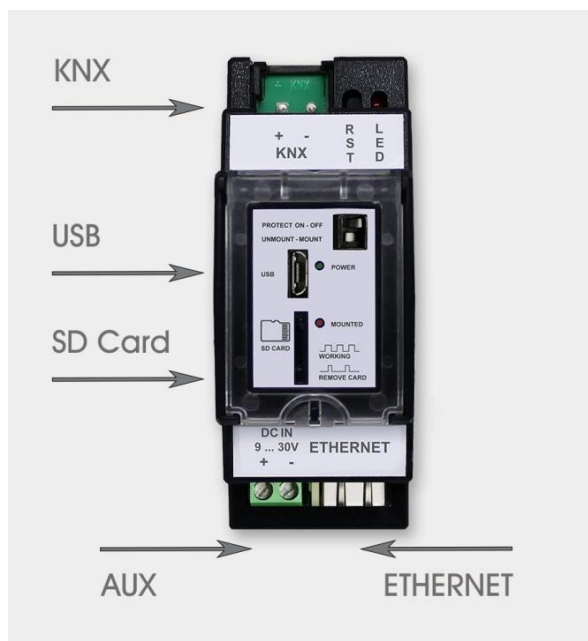
As soon as all connections are established and your router or a server in your network is working as a DHCP server (Dynamic Host Configuration Protocol), the IP gateway in your ETS can be selected as a possible connection.

Gefundene Verbindungen

Realtek PCIe GBE Family Controller (3) - 224.0.23.12

ArcusIPGW - 192.168.1.188 (MAC: 00:04:A3:E3:D3:47)

The default name on delivery is *ArcusIPGW-II*. In addition, a sticker is attached to the device itself, which bears the unique MAC address, so an assignment via the MAC address is possible if several KNX IP gateways are used.
In this example, the IP gateway has been assigned the *IP address 192.168.1.188.*
Further settings can then be made directly via the device's web interface. To do this, the standard browser of the PC is opened and the IP address is entered in the address line.
If the name server is working, the gateway can also be reached under *'IP-Gateway-Name'.your.domainname.*
(e.g. *ArcusIPGW.fritz.box* with a fritzbox as a name server).

Ethernet over USB:
When the gateway is connected to a PC via USB, a network 169.254.1.x is established and the device can be reached via the IP address 169.254.1.1. Here the gateway is the DHCP server, the connection does not require any further settings.

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2 Overview

The appearance of the following pages can change depending on the software version. By confirming the IP address in the address line, you get to the overview.

This view provides an overview of the general functions and options. The left tabs are used to navigate through the device's setting options; the following window appears once per session:

Under factory settings the Username and password are not assigned. To continue, press Enter or Log In. If no settings pages can be opened, the safety switch may be deactivated. Enable it for unrestricted access.

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3 Network Settings

Device name in the network (standard: *ArcusIPGW-II*) can be changed as required and is used for identification in the network.
MAC address: Cannot be changed and corresponds to the address attached to the outside of the gateway.

DHCP: Active / Inactive can be selected
No manual intervention required. The following fields are only used to display the current configuration. The values are provided by the DHCP server.

DHCP inactive:
Manual configuration required. IP address, gateway address, network mask and DNS name server must be configured manually. Please ask your system administrator for the permissible settings.

OPEN-VPN:
Open-VPN is pre-installed and can be used to integrate the gateway into remote networks. An Open VPN configuration file (.ovpn) provided by the system administrator can be used for the setup.

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Softether VPN:
Softether vpn offers an easy way to set up and use ad-hoc networks. The gateway can then be reached in the virtual network using the VPN server address to be entered. Caution: Depending on the setting, Softether can bypass firewalls ("hole punching"). This should definitely be approved by the responsible system administrators. "Reset server" deletes all defined connections, these must then be created again. Utilities are available at www.softether.org.

Start page:
It can be specified which page is used as the start page (e.g. "/ visu / index"), without specifying "/overview.html" is used.

After changes have been made in the input fields, these must be confirmed with "Save" in order to be adopted.

4 KNX-IP

Port:
The standard port for KNX-IP is 3671. If there is a change, the automatic detection by the ETS will not work. However, you can also adjust the port in the communication settings of the ETS and thus set up an individual KNX-IP network.

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Multicast address:
The standard multicast address for KNX IP routing is 224.0.23.12. This address is reserved. If there is a change, the standard routing will not work. However, if you operate several devices with a different address, you can set up an individual KNX-IP routing network.

Physical addresses:
Up to 16 physical addresses can be created for tunneling connections. So 16 connections can be open at the same time.
The default settings for the *physical addresses* are *15.0.0* and *15.0.1*.
These must be adapted to your KNX topology.

Tunneling:
Tunneling can be deactivated. Then no tunneling connection is possible.

Routing:
Routing can be activated. The default setting is 'deactivated' to avoid unwanted effects when operating multiple gateways without correct routing tables.

Discovery:
Discovery is activated so that the device can be localized in the network using the ETS.
If automatic detection is not possible, the connection must be configured manually in the ETS.

Local group storage:
If the group cache is activated, the telegrams are answered directly by the gateway in the event of a read request with low priority, provided that data is already available. In the ETS you will find telegram responses in the group monitor. No responses are displayed in the HTML group monitor, which reproduces the telegrams on the bus.

Initialize at startup:
"Initialize at start" fills the group cache with the last values of the data logger when restarting.

Clear cache:
"Empty cache" completely resets the group cache.

After changes have been made in the input fields, these must be confirmed with "Save" in order to be adopted.

Bus voltage monitoring:
The bus voltage can be read periodically and saved to a fictitious group address in the data logger. The value is also available in the group monitor of the web view.

.esf / .xml project file:
In order to be able to select the group addresses by name in some input fields, an .esf file or an XML file from the ETS can be loaded onto the device.

Additional software:
Additional software packages are available for activation under Extra Software.
These can be from third-party providers (e.g. Node Red) or enable internal functions (e.g. Arcus visualization)..

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5 Address Tables

All settings related to acknowledge, logging and routing tables are made in this tab.

Acknowledge tables
Acknowledge tables are helpful when it comes to reducing the traffic on the KNX bus. As soon as a telegram is not confirmed in the KNX bus, it is sent again up to 5 times. This unnecessary bus load disrupts the process and, in the worst case, data packets can be lost.

Logging tables
Logging tables determine which addresses are recorded and saved in the KNX bus. The data is backed up on a 32 GB μSD card, which is inserted into the front of the device. Alternatively, the data can be stored in the internal memory (not recommended for high bus traffic). By default, all traffic is saved. (μSD card not included in delivery)

Cache exception table:
Group addresses from the exception table are not saved in the local group memory,
every group request is forwarded to the bus.

Routing tables:
Routing tables are only active when routing is activated (KNX-IP).
Routing tables are required as soon as KNX values are to be transferred to the IP or from IP to KNX. This filtering regulates the traffic so that only specially selected objects are forwarded. Any further communication is excluded.

The parameterization for the acknowledge and routing tables can be done for group addresses and for physical addresses.

.html routing file:
A filter table from the ETS can be uploaded in HTML format.
The routing information is transferred to the tables via "Use"

Examples for valid table syntaxes:

//*	All telegrams
1/1/0	Filtering on the group address 1/1/0
1/1/0 1/5/0	Filtering on the group addresses 1/1/0 and 1/5/0
1/1/*	Filtering on the subgroup 1/1 / xxx
1/1,3,22/*	Filtering on the subgroups 1/1 / xxx, 1/3 / xxx and 1/22 / xxx
1/1-6/4,5,30	Filtering on the group addresses 1/1/4, 1/1/5, 1/1/30, 1/2/4, 1/2/5, 1/2/30, 1/3/4, 1/3/5, 1 / 3/30, 1/4/4, 1/4/5, 1/4 / 30,1 / 5/4, 1/5/5, 1/5/30, 1/6/4, 1/6 / 5, 1/6/30

6 Time Server Settings

The KNX-IP gateway can obtain its time from an NTP time server (Network Time Protocol) if an NTP time server can be reached.
By choosing the correct time zone and specifying the automatic daylight saving time, the local time is set relative to UTC time (formerly GMT).
The gateway can be used as a KNX time server. The date and time are then sent regularly at the following intervals:

▪ Don't send
▪ Every minute
▪ Every hour
▪ 1x daily

When sending every minute, it is sent at the beginning of the minute, with daily sending around 2:00 a.m. As soon as the addresses for time and date have been inserted in the format *(x / x / xxx)*, the time server is active.

The correct connection to the time server can be checked using the time stamp. If the time server cannot be reached from the network, the time should be synchronized with the computer time using the Set Time button.

If there is no permanent network connection, the internal clock continues to run even in the event of a power failure. However, a lower accuracy must be expected.

CAUTION **!**
For correct data logging, the time must be set or an NTP server must be accessible!

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7 Security & Reboot

Change login and passwords
The login name and password are unset by default, but should be changed individually.
An independent user and password is required to use SSH / SFTP. Then the device can be reached via telnet or putty as well as an sftp client.
A separate password can be selected for the visualization.

Update
As soon as software-updates are available, they can be downloaded from our website (www.arcus-eds.de).
Customer-specific adaptations are also delivered as updates via packed files.

Action safety switch
All selected functions are switched off when the safety switch is actuated (see detailed front view).
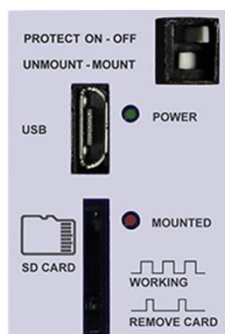
Restart
A complete system restart is carried out. The device can no longer be addressed for a few seconds.

Configuration
System settings can be saved and restored.
System settings contain all settings from the following tabs:
• Network settings
• KNX-IP
• Address tables
• Time server settings
• Security & restart
• Automation
• visualization

The power LED lights up as soon as AUX is connected. If the LED does not light up, please check the supply terminal.
The µSD card is inserted and mounted using a switch.
Status LED µSD card indicates the current status:

off	µSD not available
Short blink	µSD on mount/unmount process
Flashing steadily	µSD trying to mount new card
Permanently on	µSD is mounted and ready for use

8 KNX-Group Monitor
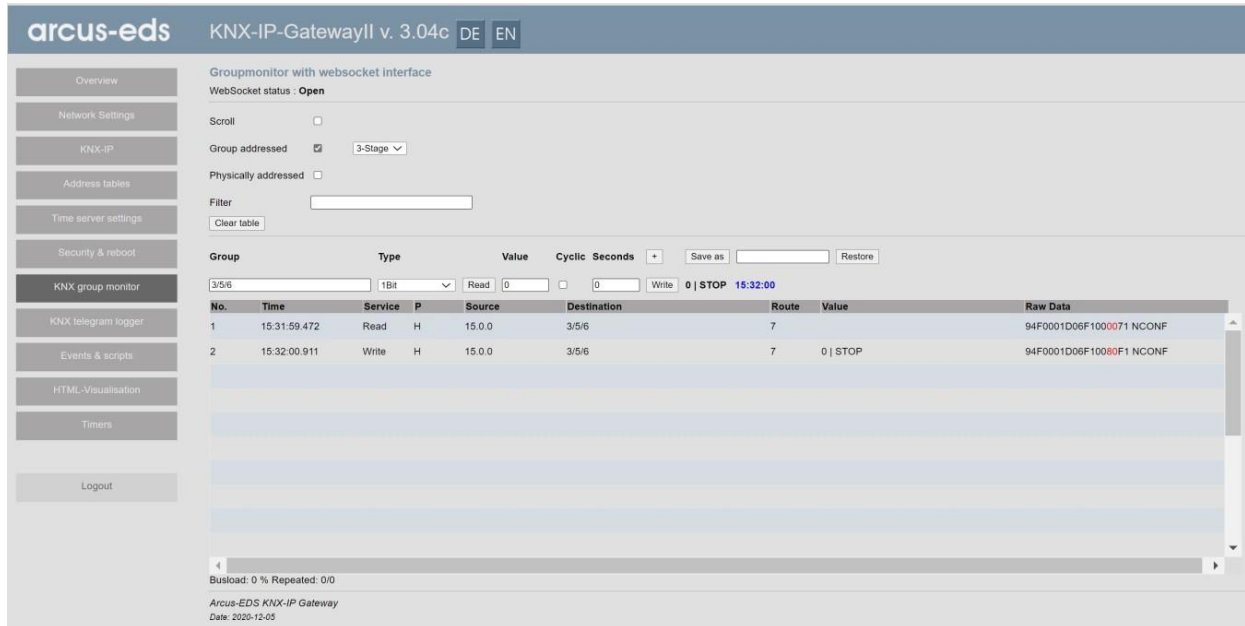
With the KNX group monitor it is possible to monitor or send telegrams on the KNX bus in real time. The side of the KNX group monitor is divided into a configuration area and a telegram area.

In order to operate the browser must support websockets.

A 2-level or 3-level addressing can be selected in the configuration and the communication of the physical addresses can be hidden.

Automatic scrolling can be activated or deactivated for the display and an address filter can be set to monitor specific addresses. The filter can be applied to individual addresses, entire main groups and subgroups or to address ranges.

Filter examples:

[empty]	All telegrams are displayed
1/1/0	Only telegrams with group address 1/1/0 are displayed.
1/1/0 1/5/0	All telegrams of the group address 1/1/0 and 1/5/0 are displayed.
1/1/*	All telegrams of subgroup 1/1 / are displayed.
1/1,3,22/*	All telegrams of the subgroups 1/1 /, 1/3 / and 1/22 / are displayed.
1/1-6/4,5,30	All telegrams of the group address are 1/1/4, 1/1/5, 1/1/30, 1/2/4, 1/2/5, 1/2/30, 1/3/4, 1/3/5, 1 / 3/30 1/4/4, 1/4/5, 1/4/30, 1/5/4, 1/5/5, 1/5/30, 1/6/4, 1/6/5, 1 / 6/30 displayed.

In the group monitor itself, several lines (maximum 100 lines) can be displayed for different group addresses. A value can be written or read to the respective group address per line. The last written value is then at the end of the line with a time stamp. In addition to sending once, cyclical sending is also possible. For recurring tasks, the configuration can be saved by a name (locally on the PC) and restored later.

The table below the lines shows all telegrams that match the set filter. The approximate bus load and the number of repetitions are displayed every second under the table.

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9 KNX Telegram Logger

The KNX IP gateway is able to save telegrams.
This can be done internally on the eMMC of the gateway or on a used SD card.
The internal storage must be confirmed with a tick "Internal (eMMC)".
The stored telegrams can be called up, they can be filtered by time period and address.

The number of lines to be loaded can be entered in the "Lines" control field and the lines loaded last are displayed when "Scroll" is activated.

The loading of the telegrams is started via "Retrieve data" and the number of x lines is loaded. When you click on "More", the next x lines are loaded. Alternatively, the data can be downloaded to the PC in CSV format.

Up to ten different group addresses can be output in a graph to visualize the data.
A separate y-axis can be used for each address or the axis of the first curve is used.

The diagram is generated after loading the telegrams using the "Diagram" button.
If data has been reloaded, the graphs must be updated.

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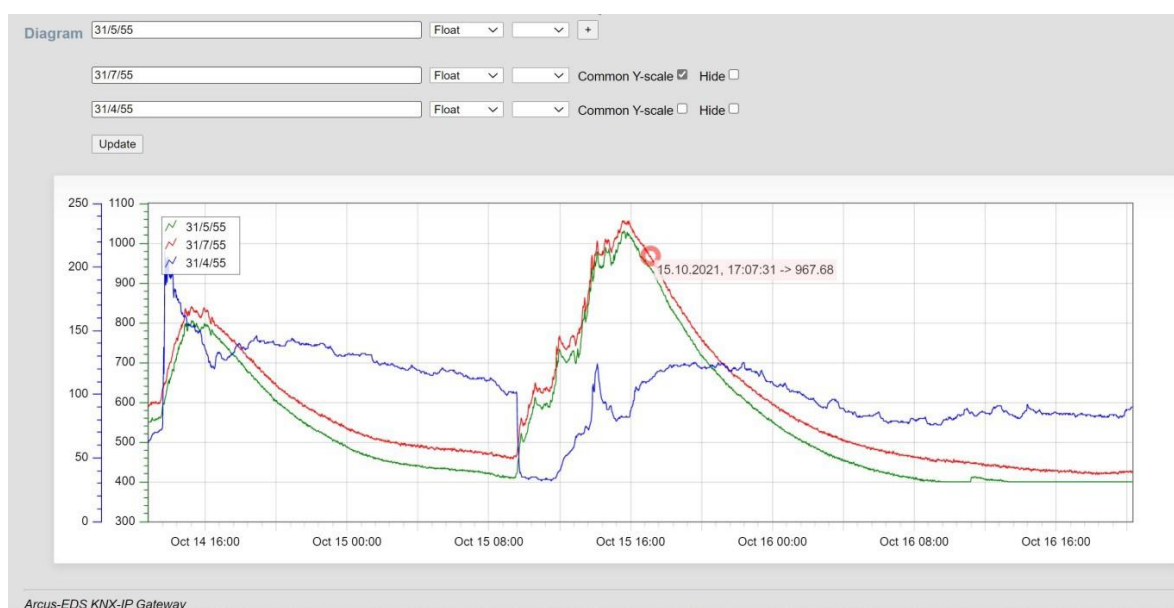
10 Events & Automation

In order to receive notifications, an e-mail and / or XMPP messenger client must be configured. For the correct setting of the SMTP server, ask your system administrator or your provider. If an SMTP connection is configured, a service mail can be sent to an e-mail address in the event of problems with the µSD card.

Attention!
If the configuration is incorrect, it is not possible to send an e-mail or an instant message!

E-Mail / XMPP

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Presence simulation

Stored group telegrams can be played back with an offset of a maximum of 28 days, provided that data from the data logger is available. This is activated or deactivated using a group address. The group addresses (or address ranges) to be sent must be set.

Events

A maximum of 11 event-controlled actions can be implemented. Either the command to be executed is written directly into the "Execute" line or the corresponding script file is selected. Linux Bash or Python are available as scripting languages for the user.

Events are: Time-controlled daily or hourly
                    Object-controlled in the event of an update or change with an object value equal to zero or not equal to zero
                    Once at system start (after X minutes)

The event can be executed by pressing the "Test" button.

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Script files

Here you select the available scripts. Please note that Dos2Unix is ticked. If you remove this check mark, conversion errors between Windows and the operating system of the IP gateway can occur. As a result, your transferred scripts will not be executed correctly. The only exeption would be a compiled program. The script files can also be downloaded for modification.

HTTP request scripts

The "myrequest" script can be executed via the address <my-gateway> / http / myrequest. This can also return data.

Timer

Timer groups can be created in these groups, timers are defined to output values on the bus. Once created, they can be activated and changed on the "Timer" page (see Timer result).

Timer result

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11 Visualization

The gateway can link HTML pages with KNX data and visualize them on any browser, provided it supports web sockets.

The visualization can be reached at ***http: // 'gatewayname' / visu /*** or ***http: //'gatewayname'/visu/index.html***.

(Example: ***http://arcusipgw.fritz.box/visu/*** or ***http://arcusipgw.fritz.box/visu/index.html***)

Elements

A page index.html must exist, further pages can be added as required.
The pages are precompiled and can include a higher-level structure page (main.html in the example).
The appearance can be individually designed using a stylesheet "style.css".
The KNX elements are HTML input elements that are filled with data via a script (smvisu.js).
The sample files can be downloaded to the PC and modified.
Some single icons and icon sequences are available for standard KNX applications.
The KNX data can be processed and sent out using Javascript using input elements of the 'hidden' type.

Any web designer with HTML knowledge can be consulted for a professional design.

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Icons

Pseudoelemente

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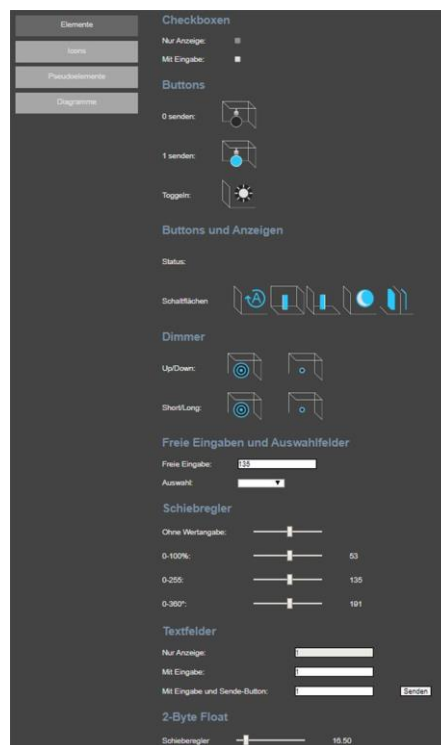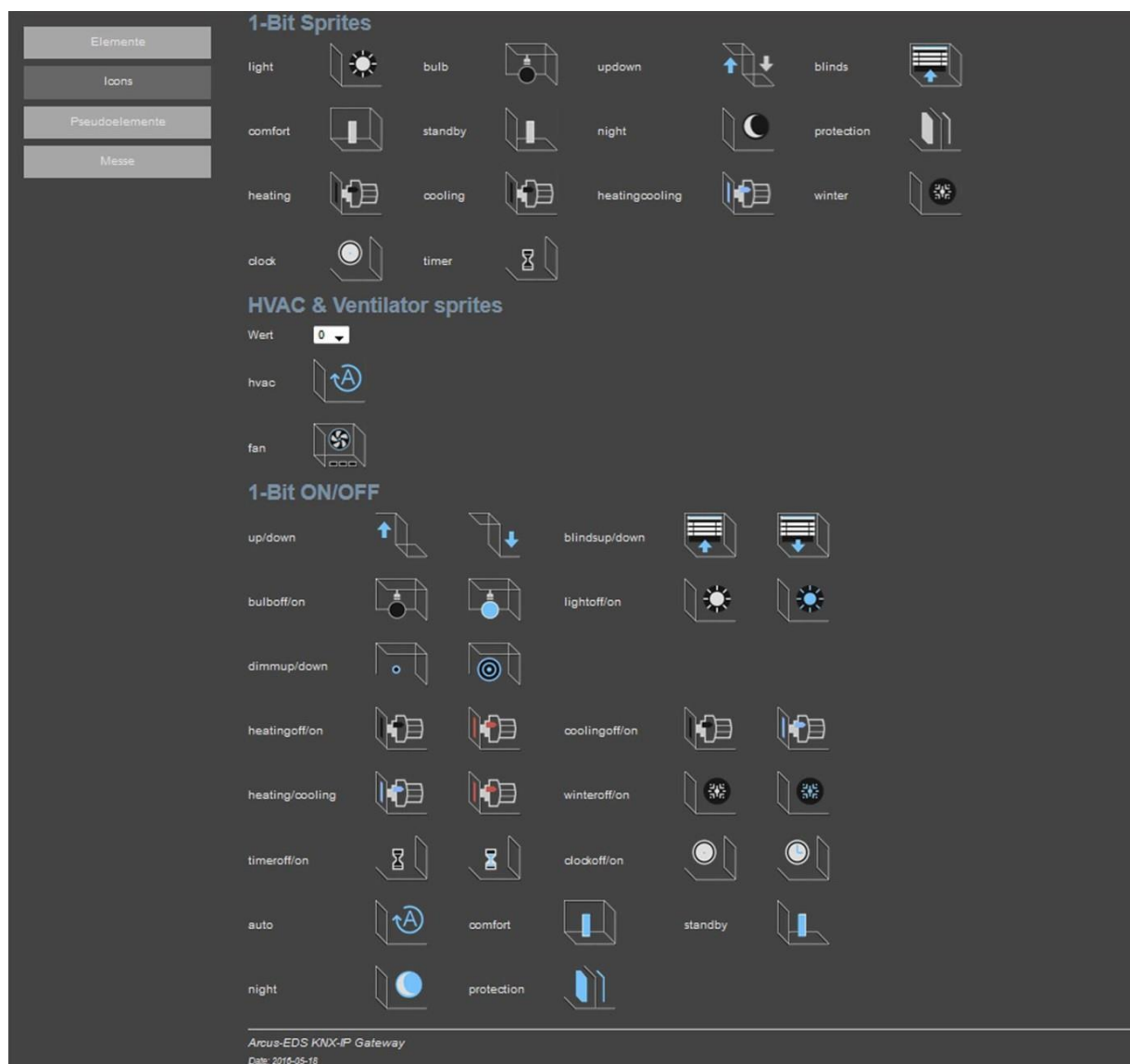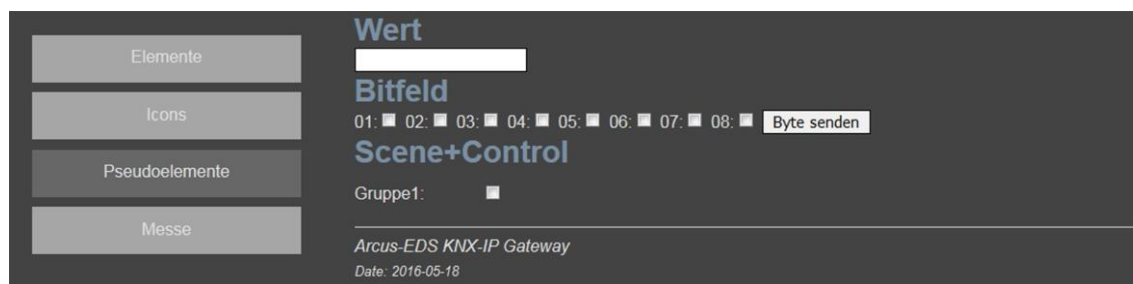
Example for a simple HTML visualization
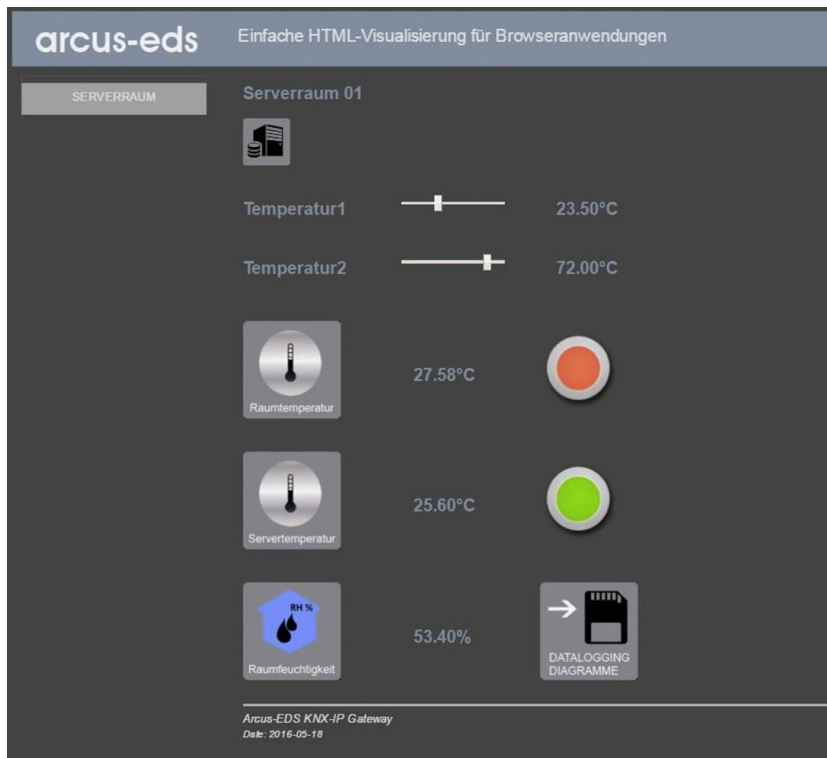
12 Dynamic Visualization

As soon as the use of the Arcus visualization is activated on the KNX-IP side (**see point 4 KNX-IP Additional Software**), the browser-parameterizable visualization can be started under Overview → Dynamic visualization.
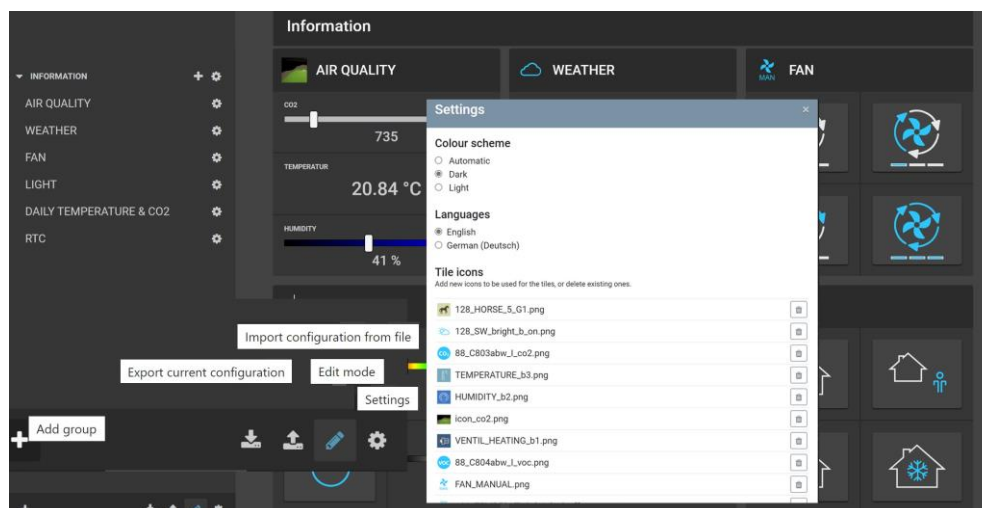
Organize your devices by adding them to tiles. You can then combine the different tiles again in groups.
Move existing tiles or entire groups via drag and drop within the sidebar.
You can load and save configuration as *.json

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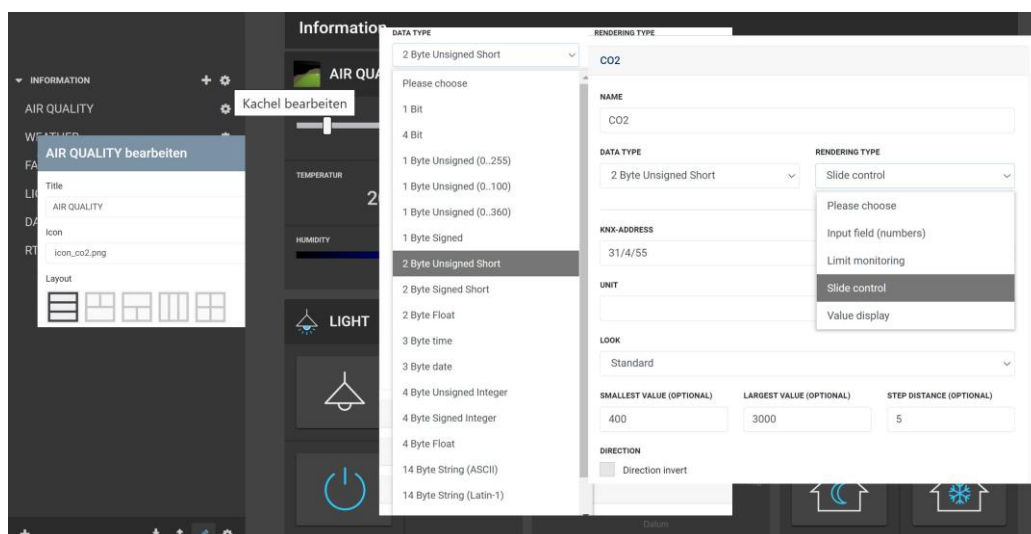
Each tile has a heading, an individual icon and various layout options for the individual devices.
You can add up to four different devices to each tile.
Each KNX device or data source requires an individual configuration. First select a data type.
You receive a selection of suitable display options for each data type. These differ fundamentally for each data type.
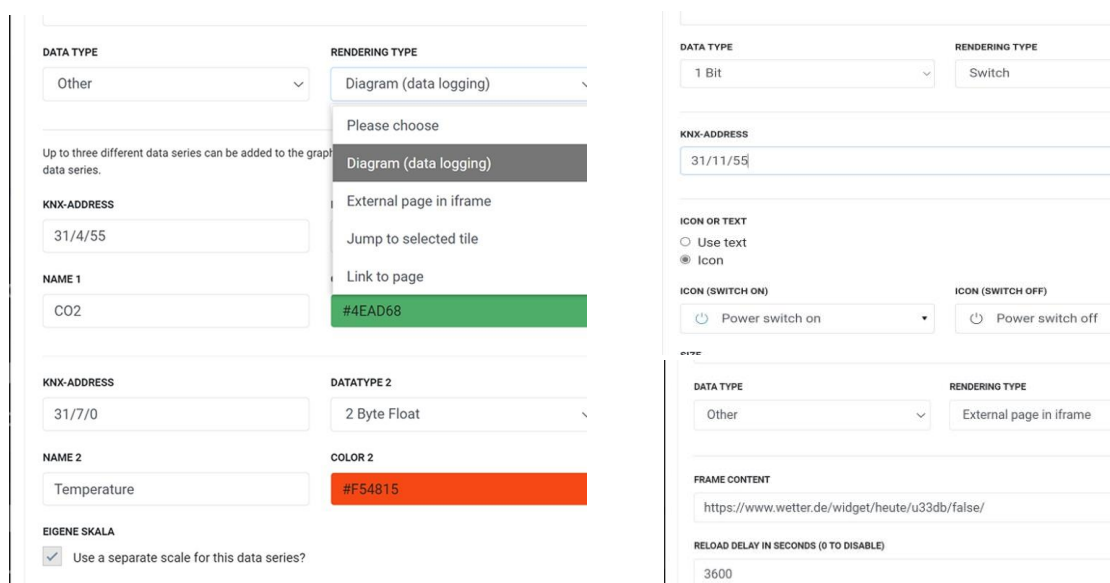
The maximum number of tiles that fit next to each other (per group) depends on the resolution of the end device.
In addition, the number of tiles can be gradually influenced with "Ctrl + +" and "Ctrl + -".

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13 Installation Instructions

KNX-GW2-IP-2TE

Article   40400003

The KNX-GW-II-IP-2TE is used to couple the ETS (PC software tool) via Ethernet to the KNX bus for addressing and programming KNX components.

With the integrated KNX group monitor it is possible to monitor or send telegrams on the KNX bus in real time. The side of the KNX group monitor is divided into a configuration area and a telegram area.

The KNX IP gateway is able to save telegrams. The KNX telegram logger lists the stored telegrams. Both the time period and the group addresses can be filtered for this.

Up to three different group addresses can be output in a graph to visualize the data.

The gateway can link HTML pages with KNX data and visualize them on any browser, provided it supports web sockets.

All selected functions are switched off when the safety switch is operated.

14 Technical Data

Technical data - KNX-GW2-IP-2TE

Operating voltage	9 .. 30VDC max. 1.5W 2-pole screw terminal
Bus voltage connection	KNX 2-pole terminal (red / black)
Power consumption (KNX)	ca. 120mW (bei 24VDC)
Ambient temperature	Storage -25 .. + 85 ° C Operation -25 . + 55 °
Ethernet	10/100 Mbit/s RJ45
USB	Ethernet-Over USB Device
Protection class	IP20
Montage	DIN rail mounting
Housing	Plastic REG housing 2TE (35 mm) black
Artikelnummer	40400003

15 General Information

In order to be able to use the group monitor and the telegram logger, your browser must support web sockets. If this is not the case, a message will appear on the relevant pages.

Under unfavorable circumstances, especially if the device is switched off immediately after a configuration change, the configuration data can be lost. The red RESET LED then flashes periodically when the system is restarted. The device must now be reset to the factory settings by holding down the RST button during start-up until the RESET LED briefly lights up and then goes out again. After changing the configuration, to be on the safe side, always wait 10 seconds before disconnecting the device from the supply voltage. Back up your configuration so that you can restore it without any loss.

To mount a µSD card, insert the card with the mount switch deactivated and then set the switch to "Mount". If no µSD card is mounted, set the switch to "Unmount" again, remove the card and repeat the process.

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Imprint

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Safety rules

Caution! Installation and assembly of electrical devices may only be carried out by a qualified electrician.
The buyer / operator of the system must ensure compliance with the relevant safety regulations of the VDE, TÜV and the responsible energy supply company. No guarantee is given for defects and damage caused by improper use of the devices or non-compliance with the operating instructions.

Guarantee

We provide warranty within the scope of the legal provisions.
In the event of a fault, please contact us and send the device with a description of the fault to our company address below.

Manufacturer

Registered trademarks

The CE mark is a free trade mark that is addressed exclusively to the authorities and does not guarantee any properties.

Registered trademark of the Konnex Association

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