REAL SMART HOME

REAL SMART HOME GmbH

APPMODULE

Maximum Guard

Smart Home App Documentation

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1 INTRODUCTION

Thank you for your trust, and the purchase of the **Maximum Guard** -Smart Home App for the BAB **APP**MODULE. With «**Maximum Guard**» enables you to implement peak shaving or load capping for load control in the energy industry. In this case, power peaks are capped by means of load shedding.

This documentation will help you get started with the Smart Home App and aims to improve your setup experience.

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IMPORTANT INFORMATION ON THE OPERATING INSTRUCTIONS

We reserve the right continually improve the product. This entails the possibility that parts of this documentation might be out-of-date. You will find the latest information at:

www.bab-appmarket.de

This Smart Home App is an independent product, with no legal ties to other manufacturers. Neither **BAB** APPMARKET GmbH nor the developer of this Smart Home App take any claim in the trademarks owned by named brands.

2 MAXIMUM GUARD SMART HOME APP FUNCTIONAL OVERVIEW

With «**Maximum Guard**» enables you to implement peak shaving or load capping for load control in the energy industry. In this case, power peaks are capped by means of load shedding. By using «**Maximum Guard**», a significant reduction of the power price component of the grid utilisation fee can be achieved. The app switches off individual consumers or lines (groups of consumers) in time to permanently comply with the specified power limit.
The Smart Home App replicates a maximum guard that controls compliance with load peaks.
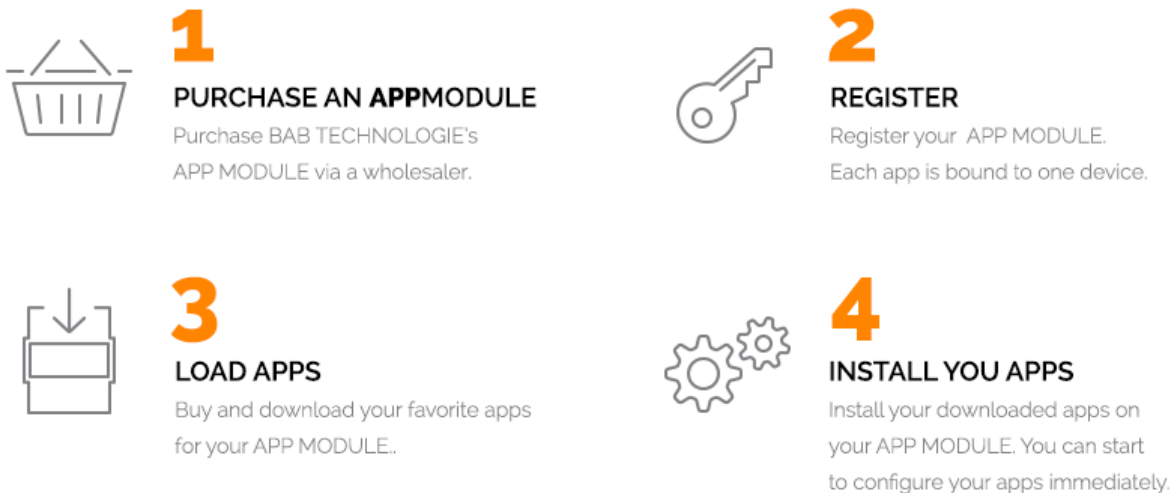
App Highlights

- Input synchronization pulse of the energy supplier
- Status query and enable input for synchronization pulse for maintenance purposes
- Power input data via KNX and Modbus TCP
- Up to 255 load shedding objects with priorities configurable
- Consideration of maximum switch-off times
- Forecast displaying

3 THE INNOVATIVE, MODULAR SMART HOME APP-CONEPT FOR THE BUILDING AUTOMATION

The innovative, modular Smart Home App concept for building automation. The **APP**MODULE brings the innovative, modular Smart Home App concept into building automation. You can mix and match any of the diverse applications that are available to ingrate third-party solutions. With these Smart Home Apps from the dedicated **BAB** APPMARKET, the **APP**MODULE becomes a tailor-made integration unit for your building automation.

HOW IT WORKS

1 PURCHASE AN APPMODULE
Purchase BAB TECHNOLOGIE's APP MODULE via a wholesaler.

2 REGISTER
Register your APP MODULE. Each app is bound to one device.

3 LOAD APPS
Buy and download your favorite apps for your APP MODULE..

4 INSTALL YOU APPS
Install your downloaded apps on your APP MODULE. You can start to configure your apps immediately.

Manufacturer of the **APP**MODULE BAB TECHNOLOGIE GmbH

Distribution of all Smart Home Apps for the **APP**MODULE BAB APPMARKET GmbH

Smart Home App developer REAL SMART HOME GmbH

3.1 INFORMATION ABOUT THE APPMODULE

Please refer to the separate product documentation of the **APP**MODULE for a detailed product description and setup instructions.

https://bab-tec.de/appmodule#downloads

Product variants:
The **APP**MODULE is available in three variants:

- **APP**MODULE KNX/TP – for stand-alone use on KNX/TP Bus
- **APP**MODULE EnOcean – for stand-alone use in the EnOcean wireless network
- **APP**MODULE IP – for use in an IP-based KNX installation (KNXnet/IP) or as extension for an EIB**PORT**

4 SMART HOME APP INSTALLATION / UPDATE

Please proceed as follows to install a Smart Home App.

1. Open the **APP**MODULE web page: Enter <IP Address of **APP**MODULE > into your browser's address bar and press Enter. The **APP**MODULE web interface will appear.

2. Log in with your user credentials. Please refer to the **APP**MODULE documentation for login details.

3. Click on the menu entry "App Manager"

4. You are now on the page where already installed Smart Home Apps are listed. The list will be empty if no Smart Home Apps have been installed. Click "Install App" in order to install a new Smart Home App.

5. Now click on "Select App"; a file selector window will appear. Choose the Smart Home App » **Maximum Guard** « and click "OK".

The Smart Home App » **Maximum Guard** « must first be downloaded from the **BAB** APPMARKET (www.bab-appmarket.de).

After the message "Installation successful" appears, click "OK". You are ready to configure the Smart Home App.

To update a Smart Home App manually you have to proceed as follows

1. To update an already installed Smart Home App, click on the App icon in the "App Manager".

2. The detail view of the Smart Home App appears. Click on "Update App" to select the Smart Home App package and start the update. The update version must be downloaded from the **BAB** APPMARKET.

After the message "Installation successful" appears, click "OK". The Smart Home App has been updated. Your instance configurations will remain unchanged.

The Smart Home App can also be updated directly in the web interface. Without having to download the Smart Home App from the **BAB**APPMARKET first.
In the "App Manager" available Smart Home App updates are reported

Information
To configurate the Smart Home App please use Google Chrome.

5   MAXIMUM GUARD SETTINGS

The «**Maximum Guard**» enables you to implement peak shaving or load capping for load control in the energy industry. In this case, power peaks are capped by means of load shedding. By using «**Maximum Guard**», a significant reduction of the power price component of the grid utilisation fee can be achieved.

5.1   INSTANCE

Note:
After inactivity of 60 minutes the browser session is automatically closed. Unsaved changes will be lost.

As soon as the Smart Home App is installed, you can create so called "Instance". An Instance is one of several objects of the same class.

In order to create an instance, click on the symbol "Create Instance".

Instance Name:

Choose a name for this new instance.

Comment:

Insert a description what this instance does.

5.2   POWER LIMIT

With the Smart Home App **Maximum Guard** you can manage services that reduce your overall energy consumption.
The **Maximum Guard** Smart Home App detects overloads that would cause a maximum performance value to be exceeded. These overloads are determined and discarded in measurement periods.
Safety-relevant or switching-critical loads are to be supplemented in combination with other logics. The load shedding can be controlled directly via the group addresses, but it is very useful to consider additional releases of the respective loads.

Static Power Limit in kW (1-1000)

Amount of the power limit set by the energy supply company, above which the tariff costs surge. The power limit can be optionally altered at app instance runtime (see "Dynamic Power Limit").

Info: Existing overloads are determined on the basis of measurement periods, which are thrown off according to your further configuration. Keep this in mind when configuring your values.

Dynamic Power Limit

Choose this option if you want to alter the power limit at app instance runtime.
When activated, further settings are displayed (*).

*Power Limit Input (EIS 10 1–1000)

Insert the group address for altering the power limit at run-time. The power limit is going to be altered when a new telegram with a valid value arrives at this group address.

<u>*Initial Power Limit Value</u>

Choose the initial value for the power limit. If there is no valid telegram value present at the address for group address for "Power Limit Input", the value for "Static Power Limit in kW" will always be used initially.
- Default: Value for „Static Power Limit in kW"
- Telegram value at „ Power Limit Input"

Difference Power Limit/ Average Power: Group Address

Insert the group address for the difference between the power limit and the average power in the current measuring period. A negative telegram value at this group address indicates that the current average power is exceeding the power limit.
Note: This value is updated every second.

Info: The difference display for the power limit takes place in relation to a calculated mean value of the power, also taking time intervals into account. Large differences in performance (maximum and minimum value) and long intervals lead to large fluctuations in this difference value.
The difference display can be used to track changes in performance and thus also the load shedding or the cancellation of load shedding. The interval of the telegram is very short, so that a high level of communication occurs when it is sent via the KNX bus.

Difference Power Limit/ Average Power: Data Type

Selected data type for this group address.
- EIS5: 2 Byte Float
- EIS9: 4 Byte Float

Difference Power Limit/ Current Power: Group Address

Insert the group address for the difference between the power limit and the current power. A negative telegram value at this group address indicates that the current power is exceeding the power limit.
Note: This value is updated every second.

Info: With this difference display, the input power is set in relation to the current power limit.

Difference Power Limit/ Average Power: Data Type

Selected data type for this group address.
- EIS5: 2 Byte Float
- EIS9: 4 Byte Float

5.3   POWER SENSORS

Interface

Select what kind of interface will be used for the current power input.
- KNX IP/TP
- Modbus TCP

5.3.1   POWER SENSORS - SETTINGS INTERFACE KNX IP/TP

Current power Input group address

Insert the group address for the current consumed power.

Current Power input: Data Type

Select the data type of the current power input
- EIS1: 1 Bit
- EIS5: 2 Byte Float
- EIS6: 0...100%
- EIS9: 4 Byte Float
- EIS10u; 2 Byte 0...65535
- EIS10s: 2 Byte -32768...32767
- EIS11u: 4 Byte 0...4294967295
- EIS11s; 4 Byte -2147483648...2147483647
- EIS14u: 1 Byte (0...255)
- EIS14s: 1 Byte (-128...127)

5.3.2   POWER SENSORS - SETTINGS INTERFACE MODBUS TCP

Modbus TCP-Host

The IP address of the Modbus TCP gateway to which you want this app instance to connect.

Modbus TCP-Port (0–65536)

The TCP port number of the Modbus TCP gateway to which you want this app instance to connect.

Modbus TCP Unit ID (0–255)

The unit/slave ID of the Modbus TCP gateway to which you want this app instance to connect.

Swap Bit Order

Enable: Swap the bit order from big endian (high bit first) to little endian (non-standard).

Swap Byte Order

Enable: Swap the byte order from big endian (high byte first) to little endian (non-standard).

Swap Word Order

Enable: Swap the word order from big endian (high byte first) to little endian (non-standard).

Register Type

The register type determines whether to write from Modbus to the group address (Input), or from the group address to Modbus (Output).

- Coil
- Discrete Input
- Input Register
- Holding register

Datatype

Select the datatype, in which the data is going to be read or written from a register.

- Boolean
- Unsigned byte
- Signed byte
- 2 byte unsigned integer
- 2 byte signed integer
- 4 byte unsigned integer
- 4 byte signed integer
- 2 byte floating point
- 4 byte floating point

Register (0–65536)

The Modbus register from which to read the value.

Offset

The offset will be added to the read value.

Factor

The read value will be multiplied with this factor.

KNX Redirect

Insert the group address to which the Modbus value will be sent to via KNX.

KNX Redirect Data Type

Select the data type for KNX redirect group address.

- EIS1: 1 Bit
- EIS5: 2 Byte Float
- EIS6: 0…100%
- EIS9: 4 Byte Float
- EIS10u; 2 Byte 0…65535
- EIS10s: 2 Byte -32768…32767
- EIS11u: 4 Byte 0…4294967295
- EIS11s; 4 Byte -2147483648…2147483647
- EIS14u: 1 Byte (0…255)
- EIS14s: 1 Byte (-128…127)

5.4   LOAD SHEDDINNGS AND SWITCHING ACTIONS

Switching Distance in Seconds (10–3600)

Minimum time interval in seconds between two consecutive switching actions.

Countdown Until Switching Action Clearance (EIS 10 0–3600)

Insert the group address for the countdown in seconds until switching actions clearance. A "0" as telegram value means that the next switching actions can be executed as soon as conditions are met.

Most Recent Load Shedding Priority (EIS 14 0–255)

The priority value (1 to 255) of the most recent load shedding, triggered by this app instance, will be sent as a telegram to this group address. A "0" will be sent if no load sheddings are present at the moment.

Load Shedding Settings

Here you open a submenu to add, copy, edit or delete load shedding configurations.
With the configuration of the load shedding you determine the properties and the switching behaviour of your loads (devices or systems). You use the priority to determine the order of priority of the loads in order to guarantee the specified power limitation (power limit). Insofar as the automatic load shedding and renewed connection is interrupted by manual (external) switching, this can lead to overloads that are determined and shed during measurement periods.

Name

Assign a name to the load shedding.

Priority (1–255)

Prioritise the load shedding. A load shedding with lower priority value will it be triggered first before load shedding with a higher priority values are.

Info: The prioritization does not necessarily have to be continuous. After the load has been shed, the disconnected loads are switched on (released) in the opposite direction. In addition to the priorities, the switch-on and switch-off times required for the device or system are also configured, which specify an additional forced operation.

Load Shedding Control Address

Insert the group address with which the load shedding can be triggered or cancelled.

Info: Due to the use of a selection of data types, certain settings (default values) of your loads can be achieved (switch off / power reduction or switch on / power increase).

Note: This control address of the load shedding is evaluated separately in the behaviour of the control unit. It is specified whether a switching command comes from the controller or whether it was triggered externally. If external access to this group address is permitted, this must be taken into account in the further configuration.

Load Shedding Status Address

Insert the group address where telegrams are going to be sent to when the load is switched on or off.

Info: The **Maximum Guard** receives the status of the load via the feedback object.

Data Type

Select a data type for the telegram values sent to the group addresses above.
(Load Shedding Control Address and Load Shedding Status Address)

- EIS1: 1 Bit
- EIS5: 2 Byte Float
- EIS6: 0…100%
- EIS9: 4 Byte Float
- EIS10u; 2 Byte 0…65535
- EIS10s: 2 Byte -32768…32767
- EIS11u: 4 Byte 0…4294967295
- EIS11s; 4 Byte -2147483648…2147483647
- EIS14u: 1 Byte (0…255)
- EIS14s: 1 Byte (-128…127)

Value: Trigger Load Shedding (Switch Off Load)

Define the telegram value (Load Shedding Control Address and Load Shedding Status Address) which triggers the load shedding or indicates that the load was switched off.

Value: Undo Load Shedding (Switch On Load)

Define the telegram value (Load Shedding Control Address and Load Shedding Status Address) which cancels the load shedding or indicates that the load was switched on.

Switch-On Action after external Switch-Off

If this load shedding was not triggered by app instance prior to the arrival of a telegram containing the value configured for "Switch Off Load" at group address "Load Shedding Status Address", it will be considered that the load was switched off externally. In this case, it may be desirable that the load cannot be switched back on by app instance. Select "do not switch on" if you want this behaviour to be applied without exceptions. Select "switch on once at the beginning of instance" if an exception is to be made in case the "Switch Off Load" telegram value is present at app instance start. Select "switch always on" if the load can be switched back on irrespective of telegram value at group address "Load Shedding Status Address".
- do not switch on
- switch on once at the beginning of instance
- switch always on

Consider Switch-Off Duration Limit

Select whether a switch-off duration limit must be considered for this load shedding, Some devices or machines must not remain switched off for an indefinite period of time, but should for example be switched on again after 30 minutes at the latest.
When enabled, further settings are displayed (*).

*Maximum Switch-Off Duration in Minutes (0–1440)

Insert the maximum switch-off duration in minutes.

Minimum Switch-Off Duration in Minutes (0–1440)

Insert the minimum switch-off duration in minutes. Some devices or machines must not be switched on again immediately, but should for example remain switch off for a few minutes at least.

Switch-On Duration Limit in Minutes (0–1440)

Insert the switch-on duration limit in minutes. Some devices or machines must remain switched on for at least a certain amount of time, for example if they take a very long time for start-up.

Info: The maximum and minimum switch-off and switch-on durations serve the operational safety of your systems. If settings are necessary, overloads are determined and discarded in measurement periods.

Minimum Power in kW

Insert the minimum load shedding power in kW. The more precise the information, the more effectively the load shedding can be planned.

Average Power in kW

Insert the estimated average load shedding power in kW. The more precise the information, the more effectively the load shedding can be planned.

Maximum Power in kW

Insert the maximum load shedding power in kW. The more precise the information, the more effectively the load shedding can be planned.

Info: The performance data for load shedding are used to prevent the load from being switched on again too early. Pay particular attention to the possible maximum power. Otherwise, a load will be permanently switched on and off due to the necessary measuring periods of a possible overload.

5.5 MEASURING PERIOD SYNCHRONIZATION

Measuring Period Length in Minutes (1–60)

Time interval between requests for the energy consumed, specified by the electric supply company. With this interval the electric supply company sends regular synchronization pulses, which must be forwarded to this app instance by telegram (see "Synchronization Pulse Input"). With each pulse the app instance ends the current measuring period and initiates the next one. If no pulse is registered after this time interval, the app instance ends the current measurement period and will switch to the internal time. All measurements periods are then only initiated or ended by the app instance itself after each time interval. Synchronization by pulse can then only be enabled again by telegram (see "Enable Synchronization by Pulse").

Synchronization Pulse: Input (EIS 1)

Insert the group address to which the synchronization pulse by the electric supply company will be forwarded to.

Synchronization Pulse Timeout in Seconds (0–60)

Configure the synchronization pulse timeout in seconds. A synchronization pulse is still considered valid if it is registered within this time frame after the expected point of time.

Synchronization Pulse: Status (EIS 14 0–3)

Insert the group address for the current synchronization pulse status. Possible values are as follows. A "0" if synchronization pulses are registered and processed by the app instance. A "1" if the last expected synchronization failed and measurement periods are now handled by the internal timer. A "2" if a registered synchronization pulse has been rejected because synchronization with it has not yet been enabled. A "3" if the state is unknown (if no synchronization pulse has been registered within the measurement period interval either since the app Instance was started or since the synchronization pulse was enabled again).

Enable Synchronization Pulse (EIS 1)

Insert the group address for enabling the synchronization of the measuring period by synchronization pulse. Enabling only takes place if a "1" is sent to this address as a telegram value.

First Measuring Period after Enabling

Select when the first measuring period after enabling the synchronization by synchronization pulse will be started, "Immediately" means that the current measurement period must be ended prematurely. With "After end of current period" the current measurement period (which has started by the internal timer) will finish regularly.
- Immediately
- After end of current period

6   MAXIMUM GUARD - INSTANCES

You can use additional functions via the main menu of your **Maximum Guard** instances:

▶ ❚❚ Start and stop instance

✏ Edit the instances

🕘 Display and export the log-files of the instance

🗑 Delete instances
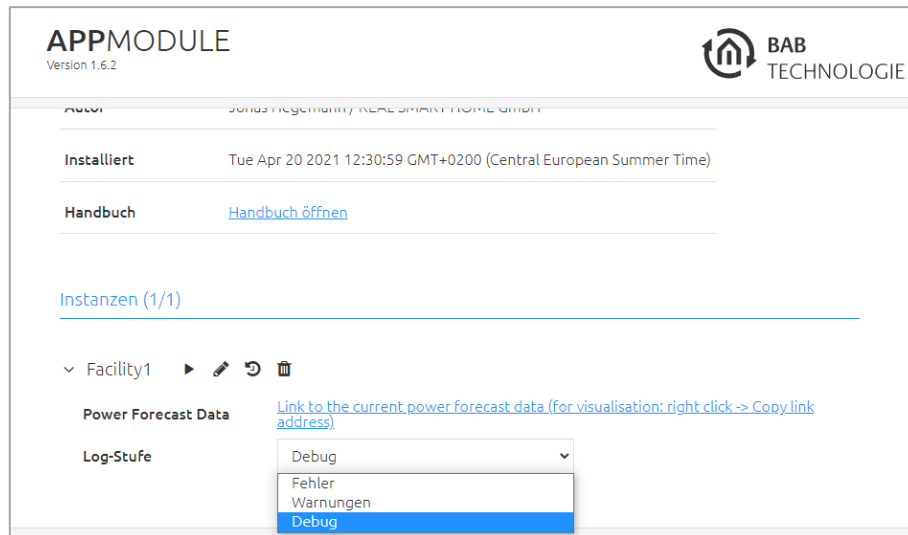
You will also find here the link for the performance forecast data, which can be integrated into the visualization for a graphical evaluation.

Log level: A filter (errors, warnings, debug) for the log data can be activated via the selection menu. This data can provide important information for support questions.

6.1 GRAPHICAL EVALUATIONS

For the evaluation of the power recording a trend calculation is carried out using the predetermined and measured values. The evaluation is a power forecast by data output via link and can also be displayed in graphical form. To do this, close the instance and go to the instance overview (main page) of the **Maximum Guard**.
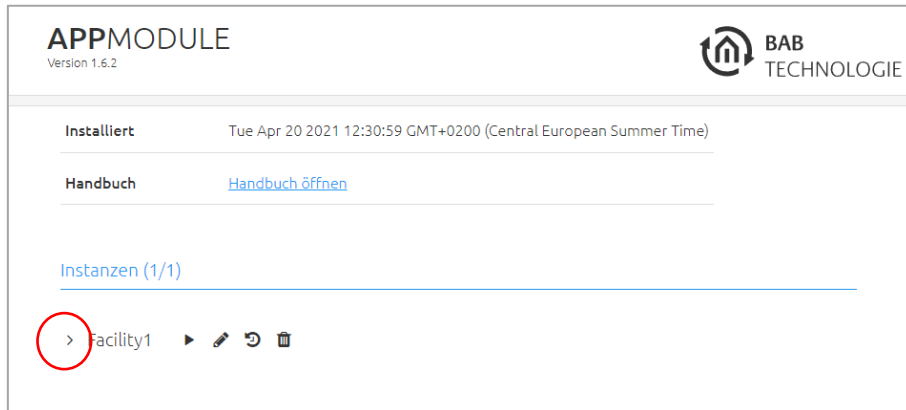
Clicking on the left extension icon will open you more options.
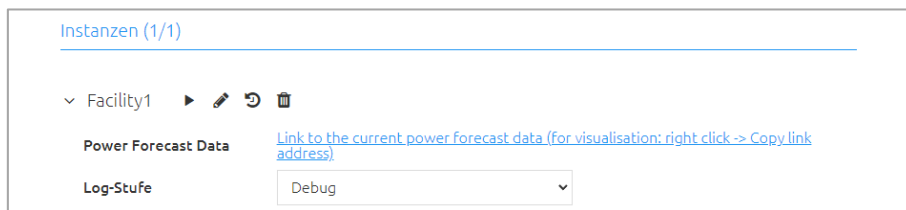
You will see the link of power forecast data. You can include this link in a visualization. For the visualization in the EIB**PORT**, the graphical evaluation and presentation is prepared under CONTROL L. Copy the link, like example:

 http://<IP Your APPMODULE>/scripts/rest/scripts/MaxGuard/INSTANCE_2/http/?data=predictionData

to the Graph visualization element, where the element must be activated beforehand.

Note: The "Log Level" is used for the selection for displaying the logs in order to display specific information about the respective Smart Home app.

7   ATTACHMENT

7.1   DATAPOINT TYPES

Function	EIS type	Data point type	Typical value	Data	Identifier
Switching	EIS 1	DPT 1.yyy	[0] = Off | FALSE; [1] = On | TRUE	1 Bit	1-bit
Relative Dimming	EIS 2	DPT 3.yyy	„Dimming steps": [[0],[2...7]] Darker [2, 4, 8, 16, 32, 64] -Steps and [[1],[2...7]] Brighter [2, 4, 8, 16, 32, 64]-Steps „Start/Stop Diming": [0,8] Stop; [1] Darker und [9] Brighter	4 Bit	4-bit
Time	EIS 3	DPT 10.yyy	hh:mm:ss	3 Byte	Time
Date	EIS 4	DPT 11.yyy	dd:mm:yyyy	3 Byte	Date
Floating point number (short)	EIS 5	DPT 9.yyy	-671 088,64 ... 670 433,28	2 Byte	2-byte float value
Percent, Position, Brightness, ...	EIS 6	DPT 5.yyy	0 ... 100%	1 Byte	8-bit unsigned value
Blinds Drive/adjust	EIS 7	DPT 1.yyy	[0] = up; [1] = down When driving [0,1] = stop	1 Bit	1-bit
Priority	EIS 8	DPT 2.yyy	[0], [1] Switch on, off; [3] = Forced off; [4] = Forced on	2 Bit	1-bit controlled
IEEE Floating point number (long)	EIS 9	DPT 14.yyy	4-Octet float value; IEEE 754	32 Bit	4-byte float value
Counter 16 Bit Unsigned	EIS 10u	DPT 7.yyy	0 ... 65.535	16 Bit	2-byte unsigned value
Counter 16 Bit Signed	EIS 10	DPT 8.yyy	-32.768 ... 32.767	16 Bit	2-byte signed value
Counter 32 Bit Unsigned	EIS 11u	DPT 12.yyy	0 ... 4.294.967.295	32 Bit	4-byte unsigned value
Counter 32 Bit Signed	EIS 11	DPT 13.yyy	-2.147.483.648 ... 2.147.483.647	32 Bit	4-byte signed value
Access control	EIS 12	DPT 15.yyy	Access data	4 Byte	Entrance access
ASCII Character	EIS 13	DPT 4.yyy	Char	1 Byte	Character
Counter 8 Bit Unsigned	EIS 14u	DPT 5.yyy	0 ... 255	8 Bit	8-bit unsigned value
Counter 8 Bit Signed	EIS 14	DPT 6.yyy	-128 ... 127	8 Bit	8-bit signed value
String	EIS 15	DPT 16.yyy	14 Characters	14 Byte	Character string

EIB/KNX devices exchange fixed prescribed data formats with each other. These are defined in types.
The old designations of the types are EIS (EIB Interworking Standard). The new designations are DPT (Data Point Type)