REAL SMART HOME

REAL SMART HOME GmbH

APPMODULE

P-Charge App
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1 INTRODUCTION

Thank you for your trust, and the purchase of the **P-Charge**-app for the BAB **APP**MODULE. With the P-Batch app, you get a comprehensive integration of the EV Charge Control Basic (EM-CP-PP-ETH) functions in building automation. This documentation will help you get started with the 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 This entails the possibility that parts of this documentation might be out-of-date.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 app is an independent product, with no legal ties to Phoenix Contact. Neither **BAB** APP MARKET GmbH nor the developer of this app take any claim in the trademarks owned by Phoenix Contact. Individual descriptions of the adjustable functions of the EV Batch Control Basic in this documentation have been adopted from the user manual EV Charge Control Phoenix Contact.

2   P-CHARGE – FUNCTIONAL OVERVIEW

Connect the charge control EV Charge Control Basic (EM-CP-PP-ETH), Phoenix Contact, with the KNX®
bus. Easily change the settings in the EV Charge Control Basic via your KNX® clients and display the
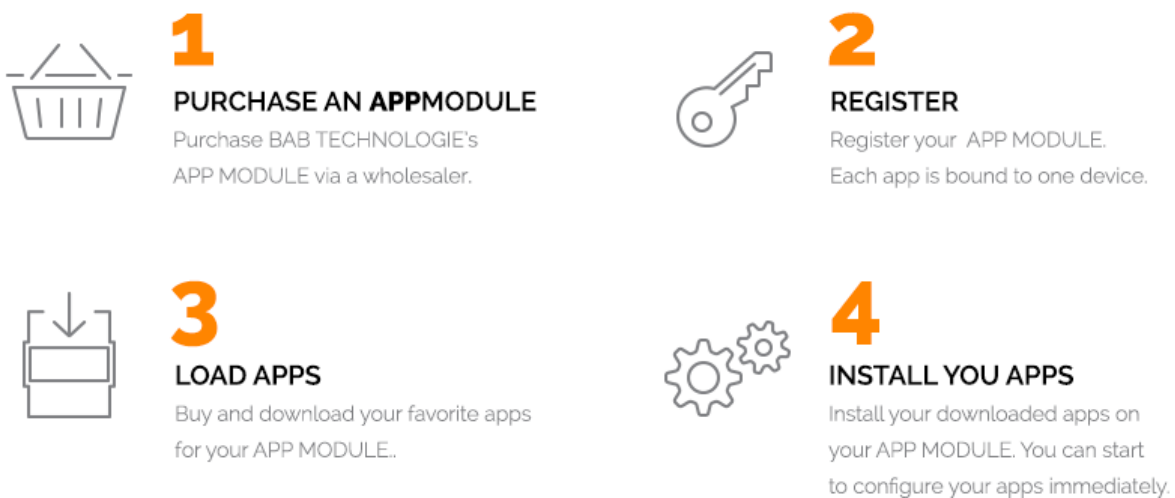data automatically or manually via the KNX® bus.

Highlights:

- Automatic (time individually adjustable) updating the data
- Manual updating of data
- All settings in the EV Charge Control can be made individually
- No knowledge of Modbus needed

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

The innovative, modular app concept for building automation. The **APP**MODULE brings the innovative, modular 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 apps from the dedicated **BAB** APP MARKET, the **APP**MODULE becomes a tailor-made integration unit for your building automation.

HOW IT WORKS

1 PURCHASE AN **APP**MODULE
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 apps for the **APP**MODULE BAB APP MARKET GmbH

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.

http://www.bab-tec.de/index.php/download_de.html

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   APP INSTALLATION / UPDATE

Please proceed as follows to install an App.

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

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

3.   Click on the menu entry "App Manager"

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

5.   Now click on "Select App"; a file selector window will appear. Choose the app »P-Charge« and click "OK". The Smart Home App "P-Charge" must first be downloaded from the BAB APP MARKET (www.bab-appmarket.de).

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

7.   To update an already installed app, click on the App icon in the "App Manager".

8.   The detail view of the App appears. Click on "Update App" to select the app package and start the update. The update version must be downloaded from the BAB APP MARKET.

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

Information
To configurate the App please use Google Chrome.

5 APP SETTINGS

This app makes it easy to retrieve all information and control an Electro Vehicle (EV) Charge Control Basic (EM-CP-PP-ETH) from Phoenix Contact via the KNX bus system. The communication between KNX and Modbus is automatically performed in the background. For communication with the P-Charge APP "active" and "passive" group addresses can be parameterized. Active addresses can be used to send instructions to the APP (read-out request or setting the charger) and passive group addresses are used by the APP to provide data read from the charger to the KNX bus.
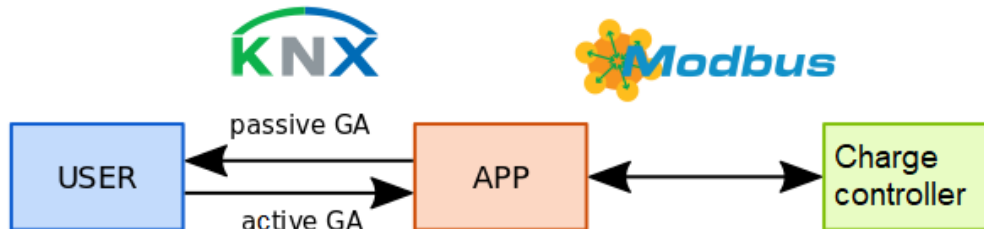
 Since the connection via Modbus TCP compared to the pure data transmission requires significant time, the P-Charge APP reads the complete memory dump of the charge controller on demand or after a set period of time and sends the information to programmable KNX group addresses. If writable registers are to be changed via KNX, this is executed immediately.

5.1 INSTANCE

Information
The browser-session expires after a period of 60 minutes due to inactivity. Unsaved changes to the configuration will be lost.

As soon as the 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 following symbol "Create Instance".

Instance Name:
Choose a name for this new instance.

Comment:
Insert a description what this instance does.

5.2 BASIC SETTINGS

The data of the EV Charge Control can be read out completely on request or at an individual interval and send on the KNX bus. For this purpose, the next four KNX group addresses are provided in the 'basic settings' area.

IPv4 address of the EV Charge Control Basic:

The IPv4 address of the EV Batch Control Basic in the APP MODULE is mandatory for the connection setup with the charger. Note that it is useful to assign a fixed IPv4 address to the charge control. In the delivery state, the system looks for a DHCP server. If the system does not find a DHCP server at startup, it automatically sets the default IP address 192.168.0.8. (See user manual EV Charge Control, chapter 8 - Configuration via the web interface)

Request data (active GA, EIS1):

If a 1 is sent to the group address 'Request data', the memory image of the EV Charge Control is read out completely and the output is sent to the group addresses to be parameterized in the following.

Feedback: Request data (passive GA, EIS1):

Once the polling of the charger has been initiated via the group request 'Request data (active GA, EIS1)', P-Charge sends a 1 to this group address to indicate that the charger is being read out. When the entire process is completed, the P-Charge sends a 0.

Automatic update (in minutes, active GA, EIS10u):

This group address 'automatic update (in minutes)' can be used to set up an automatic update by sending an integer value to the group address. The default setting is to read out the charge controller every 60 minutes. The automatic update can be switched off by sending a 0.

Waiting time between KNX telegrams (in milliseconds):

To avoid overloading the KNX bus, successive KNX telegrams are delayed by a waiting time (100 ... 1000 milliseconds) that can be set here.

'Send on Delta':

Only those data are written to the KNX bus, which have changed since the last query. This reduces the bus load.

Use default KNX group addresses (optional):

Preconfigured group addresses can be used for the charger. The main group used can be set under 'Main group for default GA' and addresses for the middle and subgroups are assigned such that they correspond to the number of the Modbus register. For example, register 107 is mapped to the group address x.1.07.

Main group address for default GA (optional):

Preconfigured group addresses can be used for the charger. The main group used can be set here.

5.3 MAPPING KNX AND MODBUS

Modbus defines four types of registers inputs, discretes, holdings and coils. Inputs and discretes are read-only, where holdings and coils are also writable, therefore two KNX group addresses are required. If P-Charge hears something on a group address marked with '(active GA)', the information is transferred to the charger via Modbus. On the group address indicated by '(passive GA)', the corresponding data read out by the charger can be queried as soon as the automatic (see 'Automatic update (in minutes)') or manual (see 'Request data') update is carried out. Passive and active group addresses are separated to avoid loops during processing.

5.4 INPUTS

An 'Input' denotes a 16-bit register in the Modbus protocol that is read-only. Several registers can be combined logically to form a register with more storage space.

EV status (passive GA, A-F, EIS15):

Vehicle status according to IEC 61851, which indicates the current status of the system charger and car. The encoded information is directly available via the following three group addresses. A detailed overview is available in the 'User Manual EV Control, Chapter 4.4 - Vehicle Status (Status A - F)'.

EV status: Is the car connected? (Passive GA, EIS1):

Is the car connected? 0 = no, 1 = yes.

EV status: Is charging possible? (Passive GA, EIS1):

Is charging possible? 0 = no, 1 = yes.

EV status: Description text (passive GA, EIS15):

Send a description text instead of a single character. A: Ready, B: Ready, C: Loads, D: Loads, E: Network problem, F: EVSE N / A.

Proximity charging current (passive GA, EIS5):

Charging current in amperes.

Charging time (passive GA, EIS15):

The charging time of the current charging process is converted into a string hh: mm: ss.

DIP switch configuration (passive GA, EIS10u):

Binary output of several switches, DIP 1 = least significant bit. Each switch corresponds to one bit. Bits 1-10 are used. A detailed overview is available in the 'User Manual EV Charge Control, Chapter 2.3 - DIP Switch 1-10'.

Firmware Version (passive GA, EIS15):

The firmware version is converted to a string x.x.xx.

Error codes (passive GA, EIS10u):

Possible causes of errors are coded by bit, the individual bits have the following meanings: (1) cable repellency 13 A and 20 A, (2) Cable repellency 13 A, (3) Invalid PP value, (4) Invalid CP value, (5) status F due to lack of availability of the charging station, (6) interlocking, (7) unlocking, (8) LD is disconnected during interlocking, (9) overcurrent disconnection, (10) communication problem charging control device with overcurrent disconnection activated, (11) status D, vehicle rejected (12) State A / B, voltage detection triggered, (13) on the vehicle side no diode in the control pilot circuit.

Display measuring instrument: voltage V1 (passive GA, EIS9):

Here, the voltage of phase 1 is displayed, either as an external line voltage or voltage against the neutral conductor, depending on the configuration and the data provided by the measuring instrument.

Display measuring instrument: voltage V2 (passive GA, EIS9):

Here, the voltage of phase 2 is displayed, either as an external line voltage or voltage against the neutral conductor, depending on the configuration and the data provided by the measuring instrument.

Display measuring instrument: voltage V3 (passive GA, EIS9):

Here, the voltage of phase 3 is displayed, either as an external line voltage or voltage against the neutral conductor, depending on the configuration and the data provided by the measuring instrument.

Display measuring instrument: current I1 (passive GA, EIS9):

Here, the current of phase 1 is displayed.

Display measuring instrument: current I2 (passive GA, EIS9):

Here, the current of phase 2 is displayed

Display measuring instrument: current I3 (passive GA, EIS9):

Here, the current of phase 3 is displayed

Display measuring instrument: active power (passive GA, EIS9):

Active power in watts.

Display measuring instrument: reactive power (passive GA, EIS9):

Reactive power in watts.

Display measuring instrument: apparent power (passive GA, EIS9):

Apparent power in watts.

Display measuring instrument: power factor (passive GA, EIS9):

Power factor / cos Phi

Display measuring instrument: energy (passive GA, EIS9):

Reading of a non-resettable counter in kWh

Display measuring instrument: maximal power (passive GA, EIS9):

Maximal power in watts.

Display measuring instrument: energy of current charging process (passive GA, EIS9):

Energy of current charging process.

Display measuring instrument: supply frequency (passive GA, EIS9):

Current supply frequency.

Display measuring instrument: maximal current I1 (passive GA, EIS9):

Maximum measured currents on the conductors L1-L3 during the current charging process.

Display measuring instrument: maximal current I2 (passive GA, EIS9):

Maximum measured currents on the conductors L1-L3 during the current charging process.

Display measuring instrument: maximal current I3 (passive GA, EIS9):

Maximum measured currents on the conductors L1-L3 during the current charging process.

Status of overcurrent protection (passive GA, EIS5):

Query the status of the overcurrent protection. Monitoring the charging currents, the charging control compares the measured charging currents with the maximum permissible charge currents specified by the PWM signal on the Control Pilot. In an overcurrent of 10-20% the charging process is terminated after 100s. In the case of an overcurrent> 20% the switch-off takes place after 10s. The charging control goes into an error state, the reset condition is the status A. Set to 'disabled': no monitoring of the charging current occurs.

Note on the meter:
The following settings can be made via the web interface of the charger.

- *Address:* Address of the corresponding measured value in the device in decimal representation

- *Number Registers (0-2):* Number of data words used to provide the measured value in the measuring device. If a "0" is entered here, the corresponding value is not read out. This is necessary if the meter does not provide the appropriate values. Measuring devices, which encode the measured values in more than two data words, cannot be read out with the charge control.

- *Unit/Value:* Conversion factor for read-out measured values for display on the web interface. Depending on the manufacturer type, the measured values are provided on measuring

instruments with different bit values. This factor is used to adapt to the specified units (V, A, W, kWh, Hz) for display on the web interface. The storage of the measured values in the Modbus registers of the load controller is independent of this value, here the data are stored as raw values. When commissioning a new measuring instrument with the load controller, we recommend a plausibility check of the displayed measured values and, if necessary, the adaptation of the conversion factors.

Since this is only the commissioning of the charger, the possibility of setting it with KNX has been dispensed with. (Not yet implemented: The P-Charge APP outputs the measured values converted according to the settings 'Unit / Value' to the KNX bus.)

5.5 DISCRETES

A 'Discrete' in the Modbus protocol is a 1-bit register, which can only be read out.

Digital Input EN (passive GA, EIS1):

(Enable) enable charging, activation via DIP switch 7.

Digital Input XR (passive GA, EIS1):

(External Release) system status F / availability charging station, activation via DIP switch 8.

Digital Input LD (passive GA, EIS1):

(Lock Detection) feedback interlock, activation via DIP switches. 6

Digital input ML (passive GA, EIS1):

(Manual Lock) manual interlocking, activation via DIP switches 4 and 9.

Digital Output CR (passive GA, EIS1):

(Charger Ready) programmable, default: set when PWM is switched on.

Digital Output LR (passive GA, EIS1):

(Locking Request) programmable, default: Set as long as the interlock is active.

Digital Output VR (passive GA, EIS1):

(Vehicle Ready) programmable, default: Set when the vehicle is ready (status C or D).

Digital Output ER (passive GA, EIS1):

(Error) programmable, default: Set if errors occur or when status is set as E or F.

5.6 HOLDINGS

A 'Holding' denotes a 16-bit register in the Modbus protocol that is read-only. Several registers can be combined logically to form a register with more storage space.

Get charging current (passive GA, PWM signal, EIS5):

Querying the charging current.

Set charging current (active GA, EIS5):

Set the current charging current. Permissible value range 6 ... 80 Ampere.

Definition output CR (passive GA, EIS5):

Querying the definition of the output „CR".

Definition output CR (active GA, EIS5):

Set the definition of output 'CR'. Allowed range of values 1...37. A detailed overview is available in the 'User Manual EV Charge Control, Table 9-3 - Function Assignment Output Register for the Digital Outputs'.

Definition output LR (passive GA, EIS5):

Querying the definition of the output „LR".

Definition output LR (active GA, EIS5):

Set the definition of output „LR". Allowed range of values 1...37. A detailed overview is available in the 'User Manual EV Charge Control, Table 9-3 - Function Assignment Output Register for the Digital Outputs'.

Definition output VR (passive GA, EIS5):

Querying the definition of the output „VR".

Definition output VR (active GA, EIS5):

Set the definition of output „VR". Allowed range of values 1...37. A detailed overview is available in the 'User Manual EV Charge Control, Table 9-3 - Function Assignment Output Register for the Digital Outputs'.

Definition output ER (passive GA, EIS5):

Querying the definition of the output „ER".

Definition output ER (active GA, EIS5):

Set the definition of output „ER". Allowed range of values 1...37. A detailed overview is available in the 'User Manual EV Charge Control, Table 9-3 - Function Assignment Output Register for the Digital Outputs'.

Get polling interval energy gauge (passive GA, EIS5):

Querying the polling cycle of the energy meter in [ms]. Time interval between two polling cycles. Note that a too short cycle time can have a negative effect on the performance of the system, such as ethernet communication.

Set polling interval energy gauge (active GA, EIS5):

Set the polling cycle of the energy meter in [ms]. Time interval between two polling cycles. Note that a too short cycle time can have a negative effect on the performance of the system, such as ethernet communication, default = 1000.

5.7 COILS

A 'coil' denotes a 1-bit register in the Modbus protocol that both can be read out and is writable.

Get: charging process enabled? (passive GA, EIS1):
Check whether charging is possible.

Enable charging process (active GA, EIS1):
Enable charging process.

Get: digital communication possible (passive GA, EIS1):

Querying the possibility of digital communication.

En-/Disable digital communication (active GA, EIS1):

En-/Disable digital communication.

Get: Charging station available? (passive GA, EIS1):

Check the availability of the charging station.

Set: Charging station available (active GA, EIS1):

En-/Disable availability of the charging station.

Get: Manual interlocking (passive GA, EIS1):

Querying manual interlocking.

Set: Manual interlocking (active GA, EIS1):

En-/Disable of manual interlocking.

Status DHCP (passive GA, EIS1):

Check usage of a DHCP server

DHCP En-/Disable (active GA, EIS1):

En-/Disable of DHCP. After changing it may take up to 10 seconds until the system is available again.

Output 1 (passive GA, EIS1):

Get Output 1.

Output 1 (active GA, EIS1)

Setting Output 1, see Table 9-3 (Manual Phoenix Contact) 'Function assignment Output register for the digital outputs'.

Output 2 (passive GA, EIS1):

Get Output 2.

Output 2 (active GA, EIS1):

Setting Output 2, see Table 9-3 (Manual Phoenix Contact) 'Function assignment Output register for the digital outputs'.

Output 3 (passive GA, EIS1):

Get Output 3.

Output 3 (active GA, EIS1):

Setting Output 3, see Table 9-3 (Manual Phoenix Contact) 'Function assignment Output register for the digital outputs'.

Output 4 (passive GA, EIS1):

Get Output 4.

Output 4 (active GA, EIS1):

Setting Output 4, see Table 9-3 (Manual Phoenix Contact) 'Function assignment Output register for the digital outputs'.

Get: overcurrent protection active? (passive GA, EIS1):

Check the status of the overcurrent protection.

Set overcurrent protection (active GA, EIS1):

Set overcurrent protection.

Get byte order (passive GA, EIS1):

Queries how the byte order is interpreted.

Set byte order (active GA, EIS1):

Setting how the byte order is interpreted: 0 = Little Endian, 1 = Big Endian.

Get function 'Voltage status A/B' (passive GA, EIS1):

Check whether the 'Voltage in status A / B' function is activated. This function can be used to check whether a voltage is detected at the vehicle interface in status A or B, e.g. due to malfunctions in the contactor. The use of this function requires the dynamics of the connected measuring device to be known. The charging control evaluates the voltage which is read out after four polling cycles ('polling cycle' parameter). 'Enabled': the device enters an error status when a voltage > 42 V is measured after completion of the charging process. The error status can be canceled by a reset of the charge control. 'Disabled': the voltage is not monitored after charging is completed.

Set function „Voltage status A/B "(active GA, EIS1):

En-/Disable of the function „Voltage status A/B ".

Get function 'status D: car rejected' (passive GA, EIS1):

Check whether the 'status D: car rejected' function is activated.

Get function 'status D: car rejected' (active GA, EIS1):

En-/Disable of the function 'status D: car rejected'.

Reset charge control (active GA, EIS1):

Resets the charge controller.

Get configuration ML input (passive GA, EIS1):

Get configuration ML input

Set configuration ML input (active GA, EIS1):

Set the configuration of the ML input: 0 = pulsed input signals and 1 = permanent input signals.

6 ATTACHMENT

function	EIS type	DPT	typical function	typical values	data	identifier
PriorityPosi-tion	EIS1	DPT 1*	Wind alarm	1=high and inhibit	1 Bit	1-bit
Switch	EIS1	DPT 1*	Light switching	0=Off; 1=On	1 Bit	1-bit
DimControl	EIS2	DPT 3*	Dimming	0=Off; 1=On xxxx=relative dimming 0-255=absolute dimming	1Bit 4Bit 8Bit	3-bit controlled
Time	EIS3	DPT 10*	Time	Hhh:mm:ss	3 Byte	Time
Date	EIS4	DPT 11*	Date	dd:mm:yyyy	3 Byte	Date
Value	EIS5	DPT 9*	Value	[-671088.64 ... 670760.96]	1Byte	2-byte float value
DimValue	EIS6	DPT 5*	Percent	0-100%	1Byte	8-bit unsigned value
DriveBlade Value	EIS6	DPT 5*	Position value	0-100%; 0-255	1Byte	8-bit unsigned value
DriveShutter Value	EIS6	DPT 5*	Position value	0-100%; 0-255	1Byte	8-bit unsigned value
Position	EIS6	DPT 5*	Control value Heating	0-100%; 0-255	1Byte	8-bit unsigned value
DriveMove	EIS7	DPT 1*	Move shutter	0=up 1=down	1Bit	1-bit
DriveStep	EIS7	DPT 1*	Adjusting the slat blind	0=up; 1= down; 0 or 1 during movement=stop	1Bit	1-bit
PriorityCont-rol	EIS8	DPT 2*	Priority	0,1 switch; 3=forced off; 4=forced on	2Bit	1-bit controlled
FloatValue	EIS9	DPT 14*	IEEE	Floating-point value	4 Byte	4-byte float value
Counter 16bit	EIS10	DPT 7*	Counter 16 bit	0 - 65.535	2Byte	2-byte unsigned value
Counter 16bit	EIS10	DPT 8*	Counter 16 bit with sign	-32.768 - 32.767	2Byte	2-byte signed value
Counter 32bit	EIS11	DPT 12*	Counter 32 bit	0 - 4.294.967.295	4Byte	4-byte unsigned value
Counter 32bit	EIS11	DPT 13*	Counter 32 bit with sign	0 - 4.294.967.295	4Byte	4-byte signed value
Access Control	EIS12	DPT 15*	Access control	Card number	4Byte	Entrance access
Char	EIS13	DPT 4*	ASCII characters	Character	1Byte	Character
Counter 8bit	EIS14	DPT 5*	Value	0 - 255	1Byte	8-bit unsigned value
Counter 8bit	EIS14	DPT 6*	Value with sign	-128 - 127	1Byte	8-bit signed value
String	EIS15	DPT 16*	String	max. 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)