

Training ClimaECO, 2020

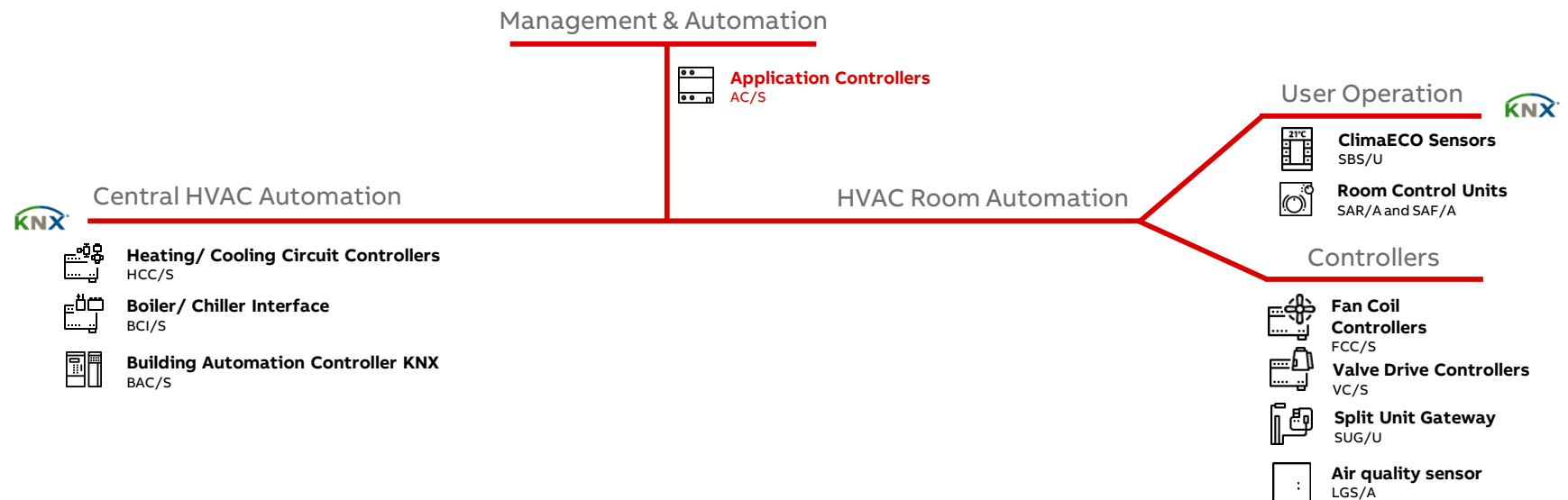
# Application Controller AC/S 1.x.1

ClimaECO

Thorsten Reibel, Competence Center Europe

# Application Controller AC/S 1.x.1

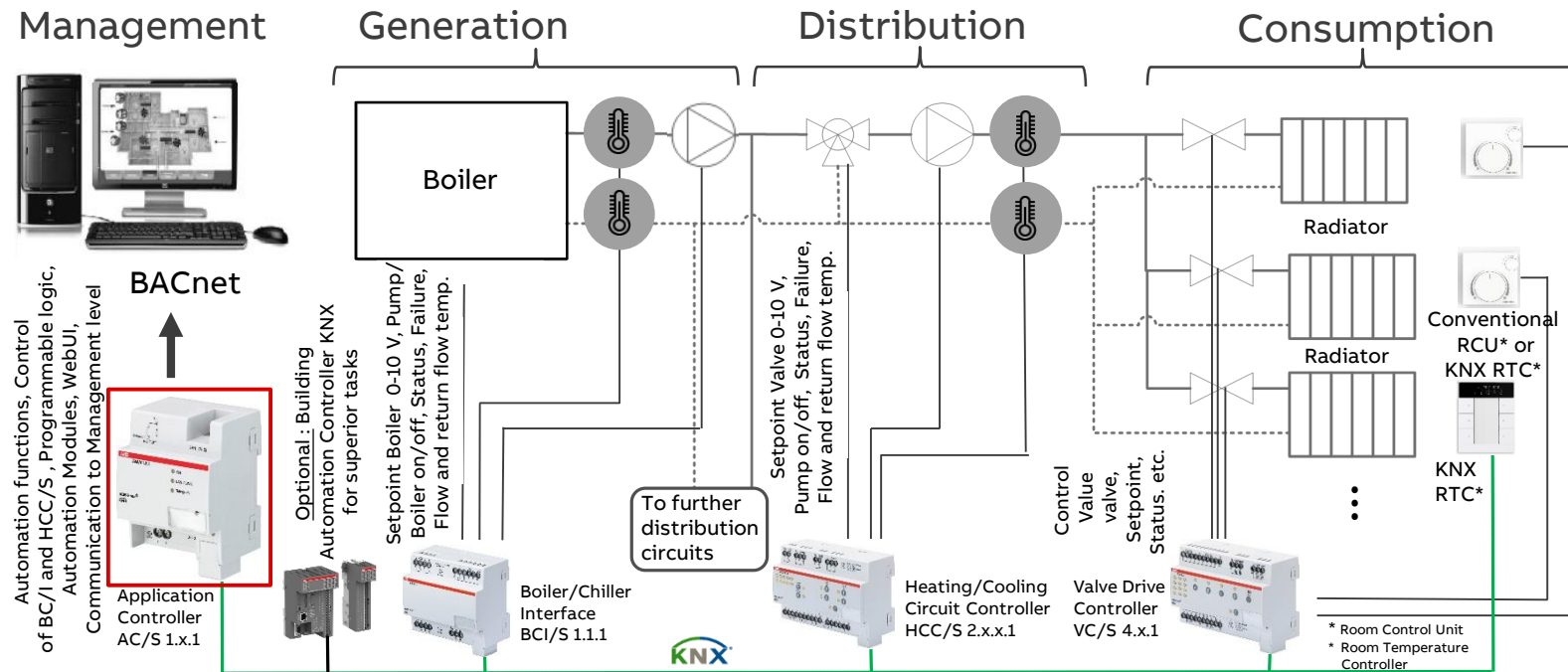
## Overview ClimaECO: New Products



A holistic HVAC Building Automation System, over 30 new devices

# Application Controller AC/S 1.x.1

## Overview ClimaECO: ABB i-bus® KNX HVAC Solutions



# Application Controller AC/S 1.x.1

## Introduction

### Why Application Controller in a Heating/Cooling System?

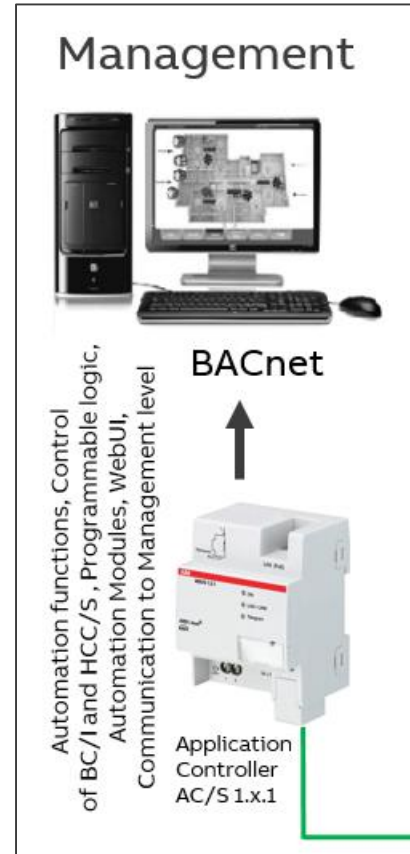
In a heating/cooling system a superior intelligent unit is required for numerous tasks

Functions like controller capability, collecting and processing data, mathematical functions, interfacing, calculation of control values or displaying and setting of states via web browser belong to it

Device needs connection to KNX and Ethernet, but no physical In- and Outputs

As in many HVAC systems BACnet is used an optional BACnet interface is essential

→ For a holistic approach AC/S 1.x.1 with or without BACnet interface from ABB based on KNX



# Application Controller AC/S 1.x.1

## Introduction

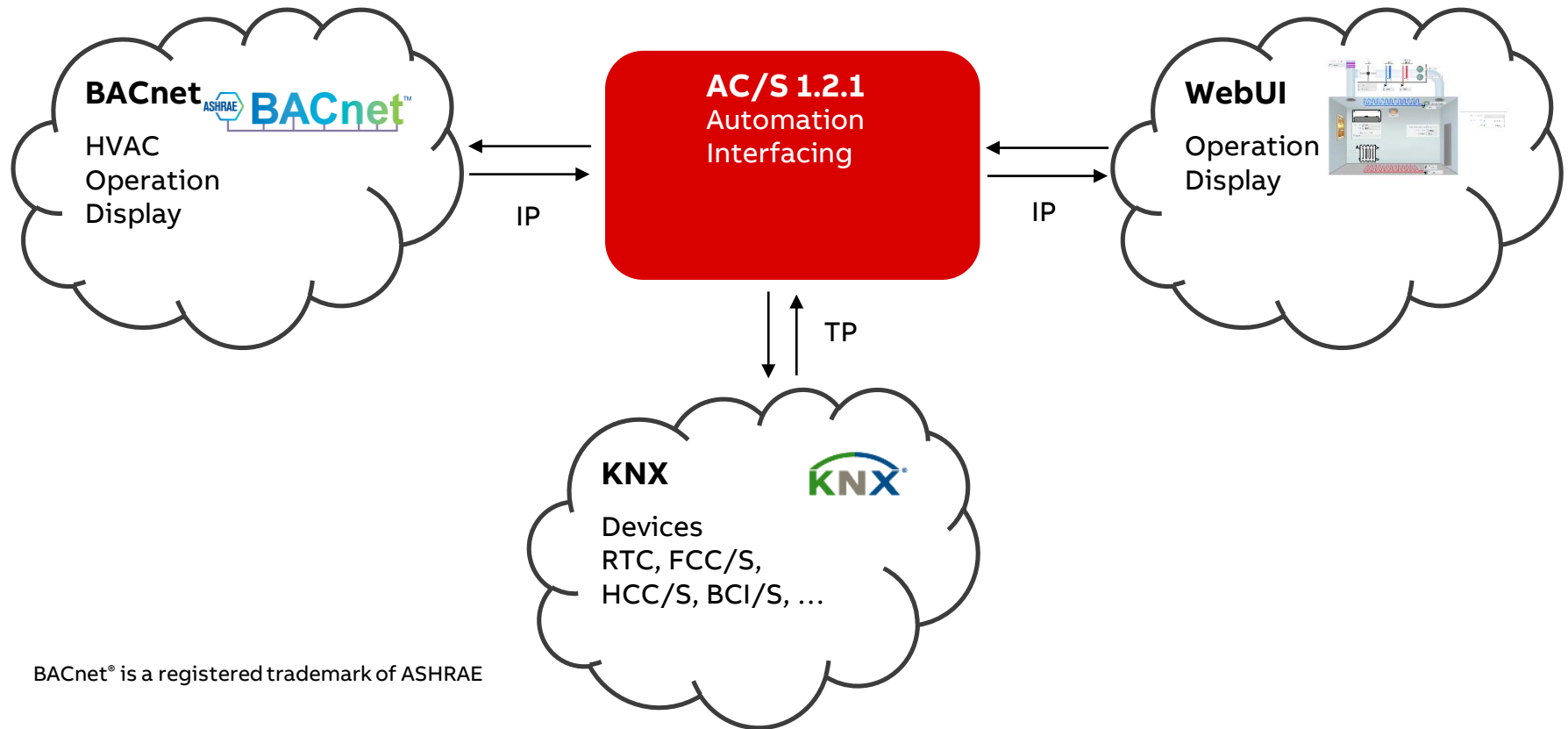
### Motivation – Features

- Control of the complete HVAC system from distribution to generation
- Expansion of ABB i-bus KNX to Automation level
- Expansion of ABB i-bus KNX to Management level
- Managing the boiler/chiller
- Managing the Heating/Cooling circuit control
- Necessary for a consistent solution of a HVAC system completely with ABB i-bus KNX which is demanded from customers
- Being competitive compared with other KNX solutions or various non KNX solutions



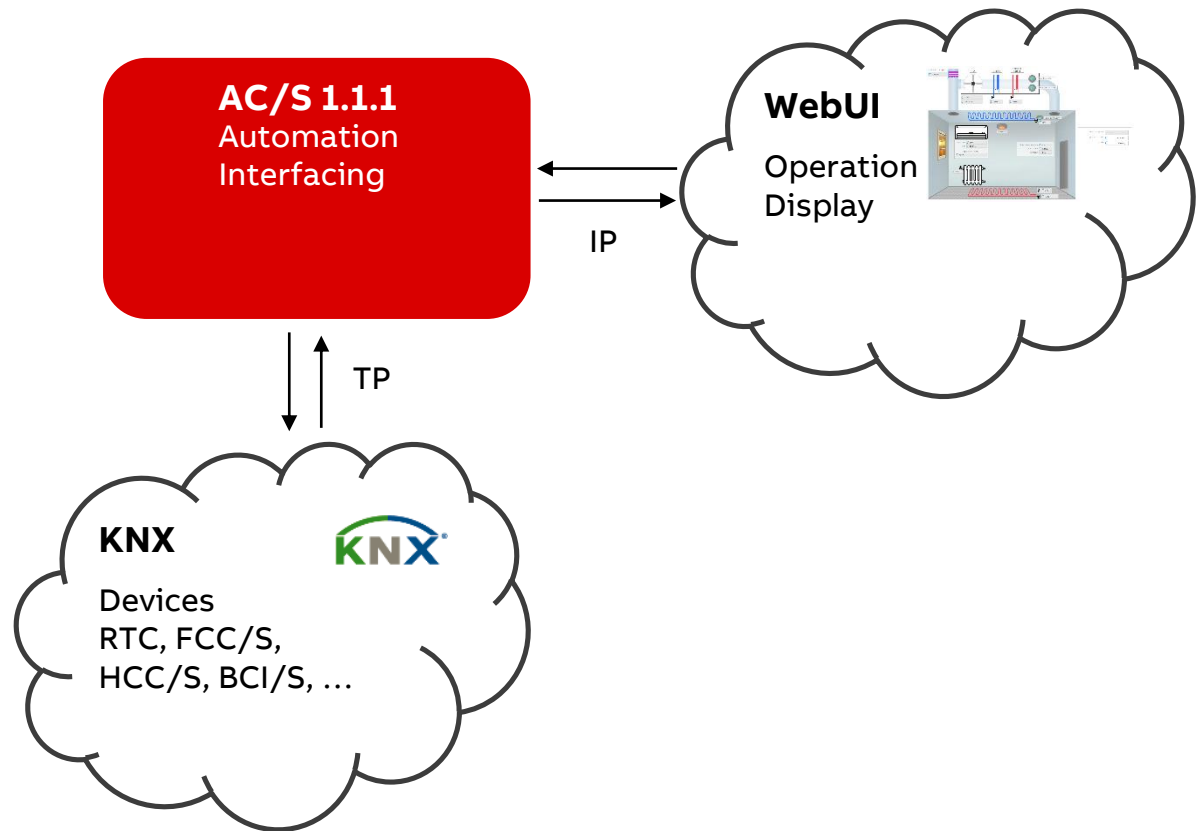
# Application Controller AC/S 1.x.1

## Principle



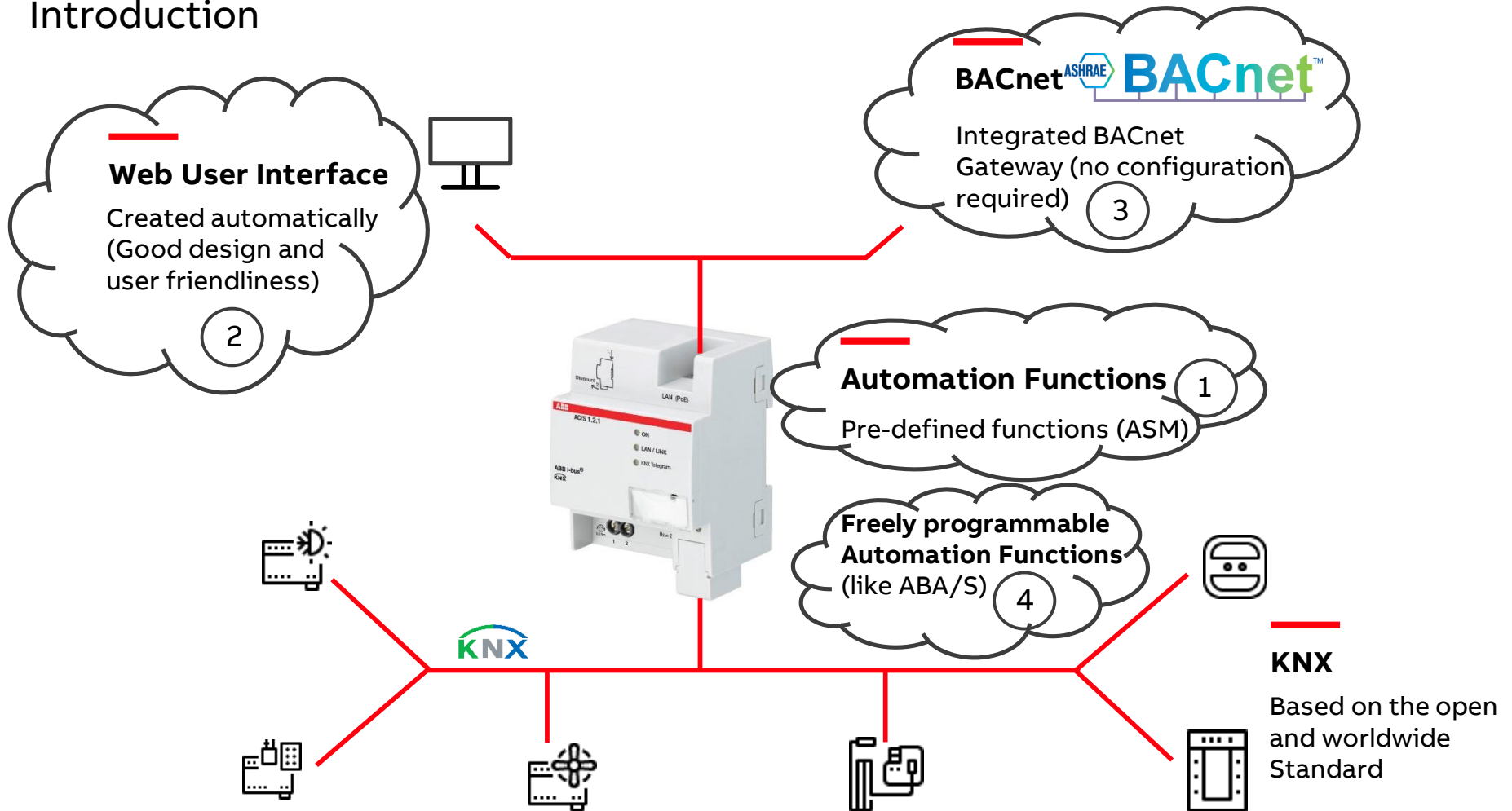
# Application Controller AC/S 1.x.1

## Principle



# Application Controller AC/S 1.x.1

## Introduction



BACnet® is a registered trademark of ASHRAE

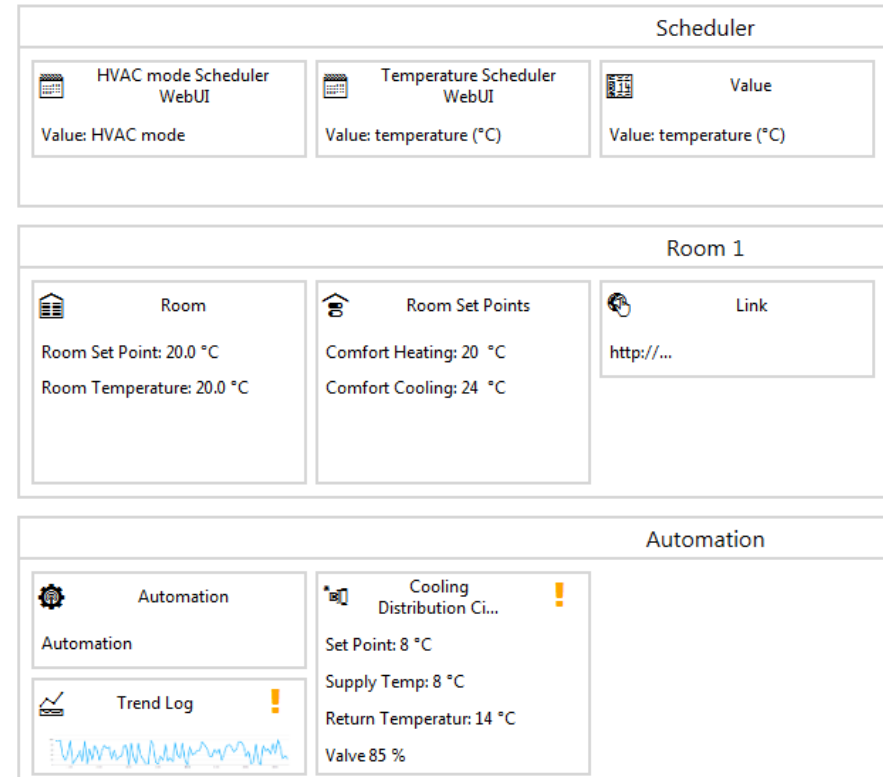


# Application Controller AC/S 1.x.1

## Introduction

### Software Features

- Predefined Automation Modules for a holistic HVAC Automation Solution from Central HVAC to Room Automation to meet Energy Efficiency objectives like EN 15232 or LEED
- Time scheduler
- Trend Log to record data up to three years for further processing like maintenance
- Automation modules for rooms, chiller, heating and cooling circuits and more
- Logic functions and more with simulation online and offline, well known from Logic Controller ABA/S 1.2.1
- Decentral solution, more reliable compared to run automation functions on PC based SCADA or BMS Systems



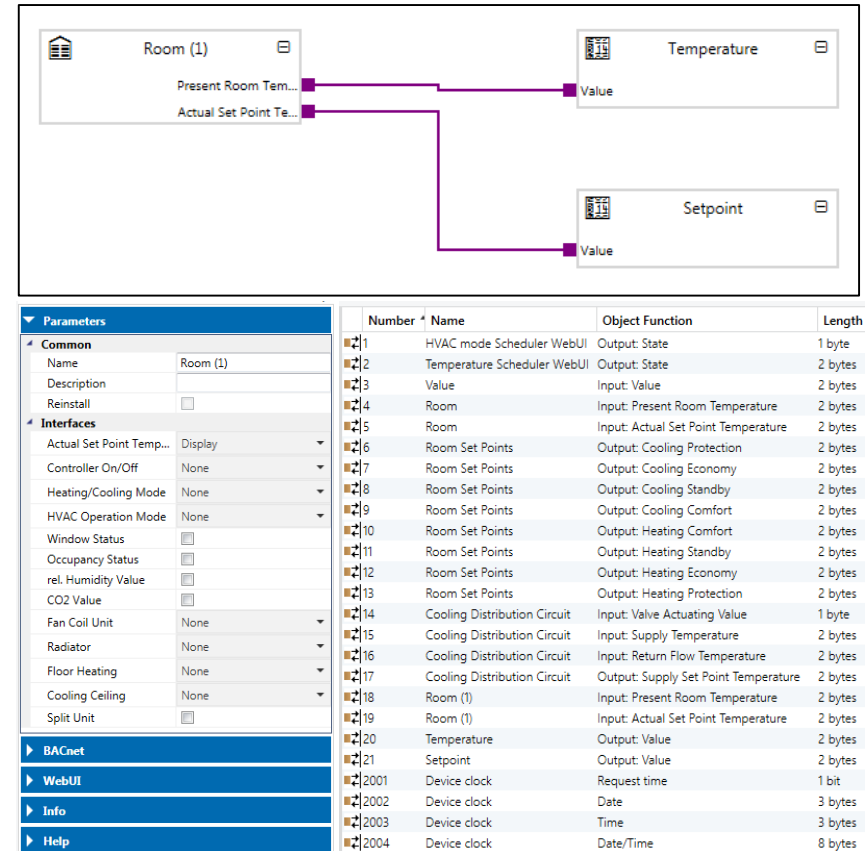
# Application Controller AC/S 1.x.1

## Introduction

### 1. Application Specific Modules

#### Predefined Automation Modules

- ASM → **A**pplication **S**pecific **M**odule
- Represent specific functionality, can execute function by itself or together with other ASM's e.g. room set points or heating/cooling circuit control
  - In- and/or outputs (sockets)
  - Parameters
  - Group objects
  - Linking view with sockets to be connected to KNX objects, WebUI, BACnet or other ASM's

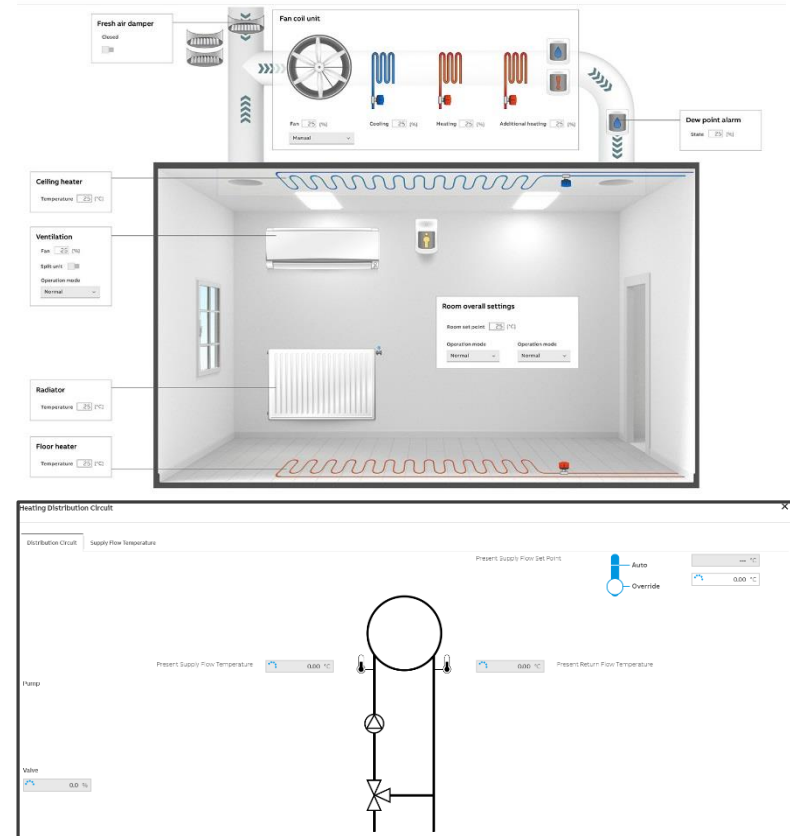


# Application Controller AC/S 1.x.1

## Introduction

### 2. Web User Interface (WebUI)

- The WebUI is automatically created based on the selected Automation Modules and it is predefined in Layout and functions
- A simple but powerful sophisticated user interface, also sufficient as small Visualization for some projects
- In addition to SCADA/BMS systems in big projects as backup interface for commissioning and maintenance
- For access only browser and IP address of AC/S required

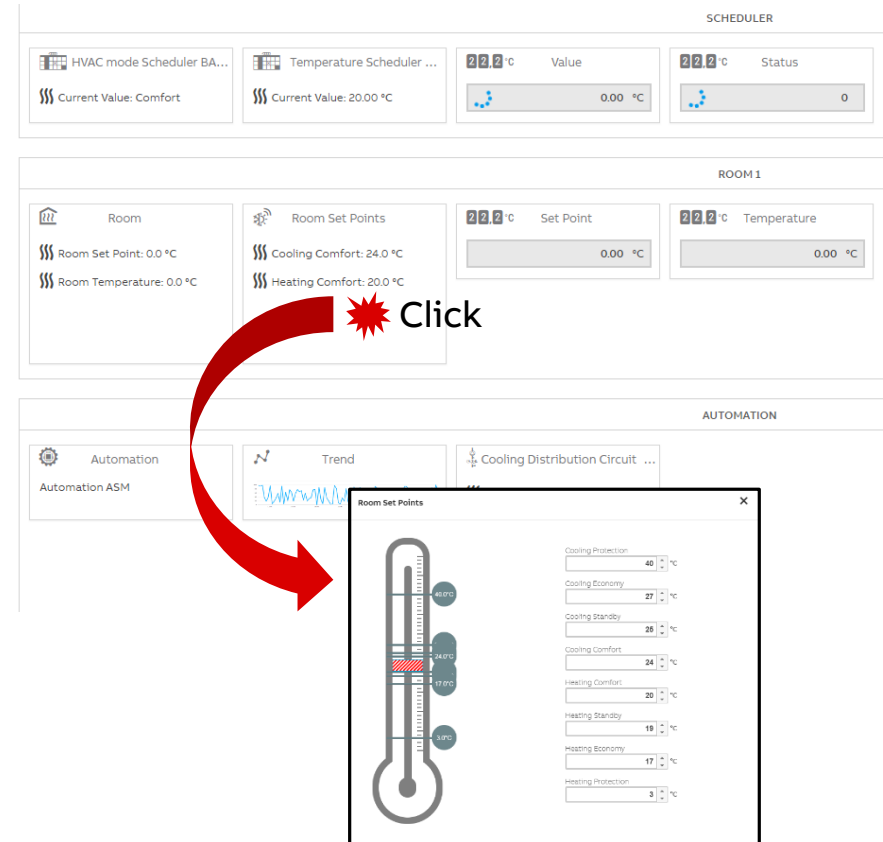


# Application Controller AC/S 1.x.1

## Introduction

### Web User Interface (WebUI)

- All ASM's from ETS are displayed as a box to have an overview
- View can be structured in ETS
- Some values of the ASM (e.g. set point) are directly visible in the box
- Some ASM's can be opened by clicking on a box to have a detailed view with the option to adjust values



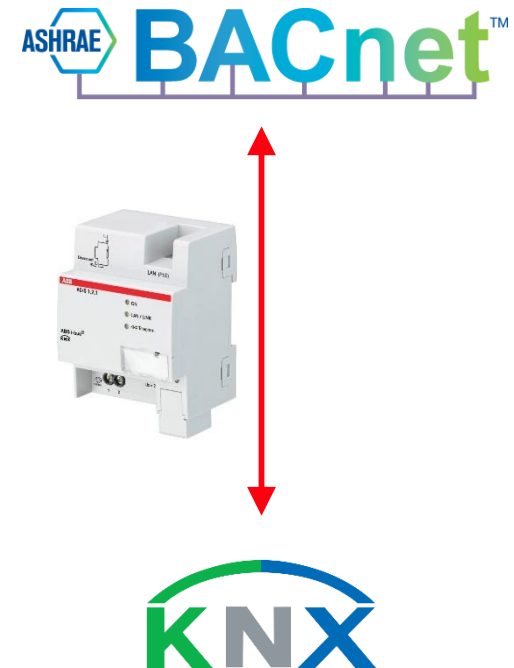
# Application Controller AC/S 1.x.1

## Introduction

### BACnet

#### BACnet

- Integrated KNX-BACnet Gateway to link the KNX System with the Building Management System (BMS)
- Bi-directional Data Exchange between KNX Twisted Pair (TP) and BACnet/IP (Ethernet)
- No BACnet Knowledge required, fully integrated in ETS
- No configuration: predefined BACnet Objects in the Automation Modules
- Generic BACnet Objects with wide range of supported data point types



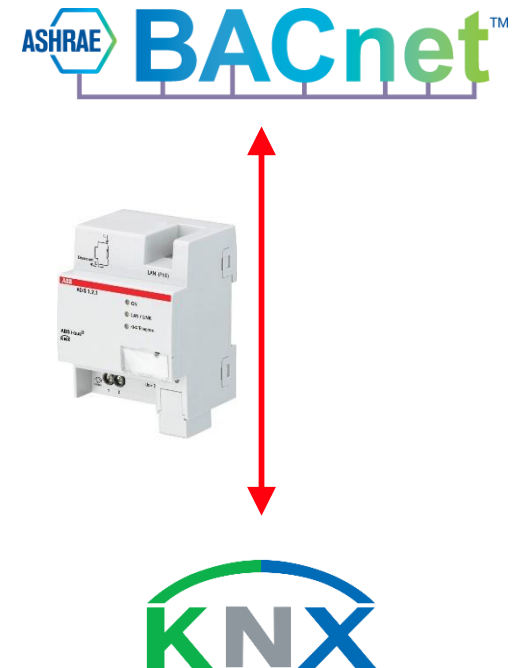
BACnet® is a registered trademark of ASHRAE

# Application Controller AC/S 1.x.1

## Introduction

### BACnet

- BACnet calendar and schedule: Set your schedule by BACnet. The execution of the schedule is done reliably by the Application Controller AC/S
- Each BACnet object value can be displayed and set by Web User Interface
- BACnet can write via AC/S into KNX
- Application Controller provides values (Server) to be processed by BACnet (Client)
- BACnet BTL Tests successfully executed



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# Application Controller AC/S

## Introduction

### BACnet

#### Conformance Certificate

Further documents available on the homepage:

- BACnet Testing Laboratories Product Listing
- BACnet Protocol Implementation Conformance Statement

AC/S 1.2.1 – BACnet certified product



**BACnet  
CONFORMANCE  
CERTIFICATE**



**No. BTL-30330**

WSPCert attests the conformance of the following BACnet implementation to the BACnet standard ISO 16484-5 protocol revision 1.14. The attested conformance refers to the BACnet Interoperability Building Blocks (IBBs) listed on the BTL Listing bearing the above-mentioned BTL-number.

The BACnet implementation has fulfilled the requirements according to the test standard ISO 16484-6, the BTL Test Plan 15.0 and the BTL Testing Policies, see Test Report number TC-100503 of DIAL.

Product name (B-AAC)
<b>AC/S 1.2.1</b>
Model(s) <b>AC/S 1.2.1 Application Controller, BACnet</b>
Software version
<b>1.0</b>
Vendor
<b>ABB Control Products</b>
<b>Motorgrand 20</b>
<b>Vasteras, 721 61, Sweden</b>

This certificate is valid until **31-Mar-2024**.

**11-Sep-2018**  
Date of Initial Certification


  
Dipl.-Ing. G. Weinmann  
Head of Certification Body

Issued on behalf of BACnet International  
1657 Powers Ferry Road, Building 14, Suite 100  
Atlanta GA 30329, USA

Certification by WSPCert  
Dr.-Ing. Frank Blier  
Kaiserlingweg 7, 10245 Berlin, Germany  
Phone: +49 (0)30 2530220, email: info@wspcert.de

# Application Controller AC/S

Communication in all Directions → KNX - WebUI - BACnet



Value KNX/BACnet  
WebUI  
Value: temperature (°C)

**Interfaces**

Template	freely configurable
Socket	Output
WebUI	Display + Set
KNX	Input + Output
<b>BACnet</b>	read + writable by BACnet
Main Data Point Type	9.xxx [2-byte float value]
Sub Data Point Type	9.001 [temperature (°C)]

Number ^	Object Function	Name	Description	Group Address	Length
1	In-/Output: Value	BACnet <--> KNX <--> WebUI		3/3/3	2 bytes



# Application Controller AC/S

Communication in all Directions → KNX - WebUI - BACnet

The image displays two overlapping software interfaces. The top interface is the ABB AC/S1.2.1 Application Controller WebUI, showing a navigation menu on the left and a main area with a temperature display of 2.24 °C. The bottom interface is the BACnet configuration tool, showing a list of objects and a detailed configuration for 'Analog Value' with a present value of 2.24.

**WebUI**

**BACnet**

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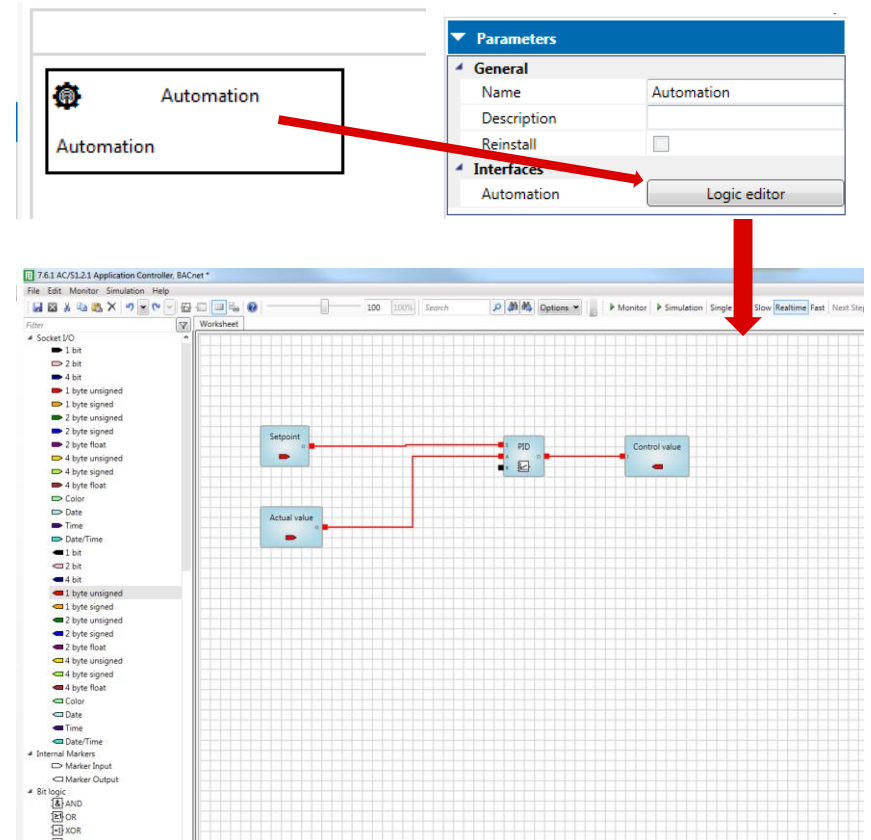
#	Time	Service	Flags	Prio	Source Add	Source Name	Destination	Destination Name	Route Type	DPT	Info
1	3/9/2018 10:21:08.236...	from bus		Low	7.6.20	AE/S4.1.1.3 Analogue Input, 4-fol...	3/3/3	New group address	6	GroupValueW...	9.001 em... 18 1C   2.24 °C

# Application Controller AC/S 1.x.1

## Introduction

### Automation

ASM Automation: Freely programmable Logic like Logic Controller ABA/S 1.2.1



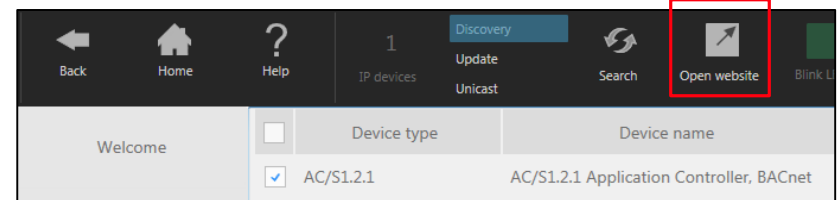
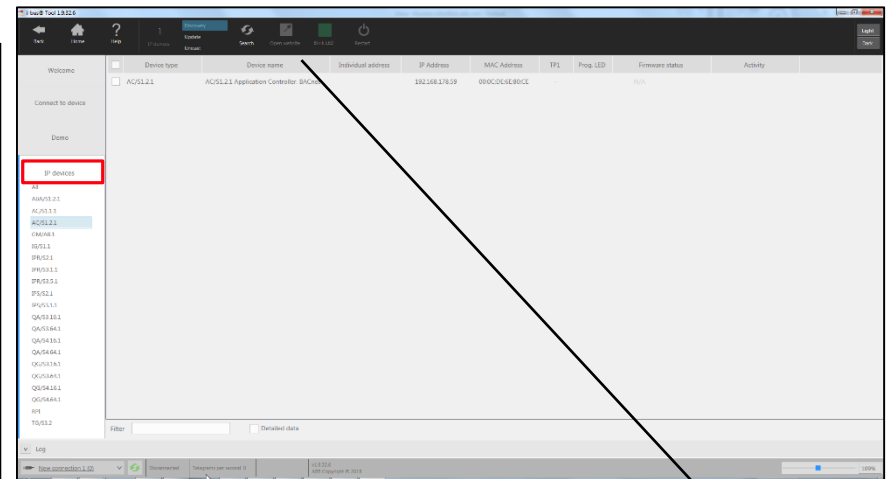
# Application Controller AC/S 1.x.1

## Introduction

### ABB i-bus tool

Support with ABB i-bus tool similar to Security Panel GM/A 8.1:

- AC/S must be connected to Ethernet
- Page IP Devices
- AC/S will be displayed with
  - IP Address
  - MAC Address
  - Name and phys. Address
  - ...
- By clicking on button *Open Website* WebUI of AC/S will be opened in browser



# Application Controller AC/S 1.x.1

## Introduction

### Hardware

- Modular installation device (MDRC)
- Width: 4 MW
- Power supply
  - 24 V AC/DC or PoE (LAN connection)
- Bus connection terminal behind cover
- Reset button behind labelling cover
- LAN connection
  - PoE (Power supply), WebUI, BACnet, fast ETS Application Download, Monitor
- LEDs (ON, LAN/Link, KNX telegram)
- Internal clock

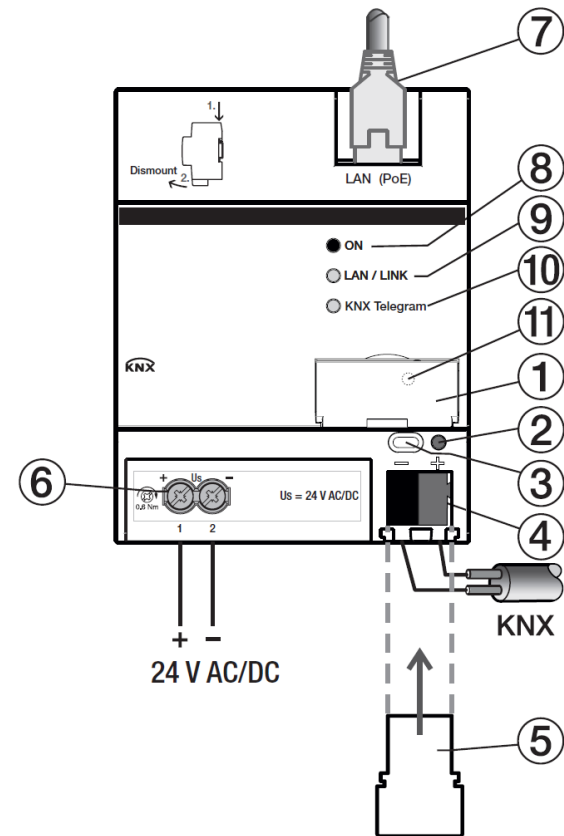


# Application Controller AC/S 1.x.1

## Introduction

### Hardware

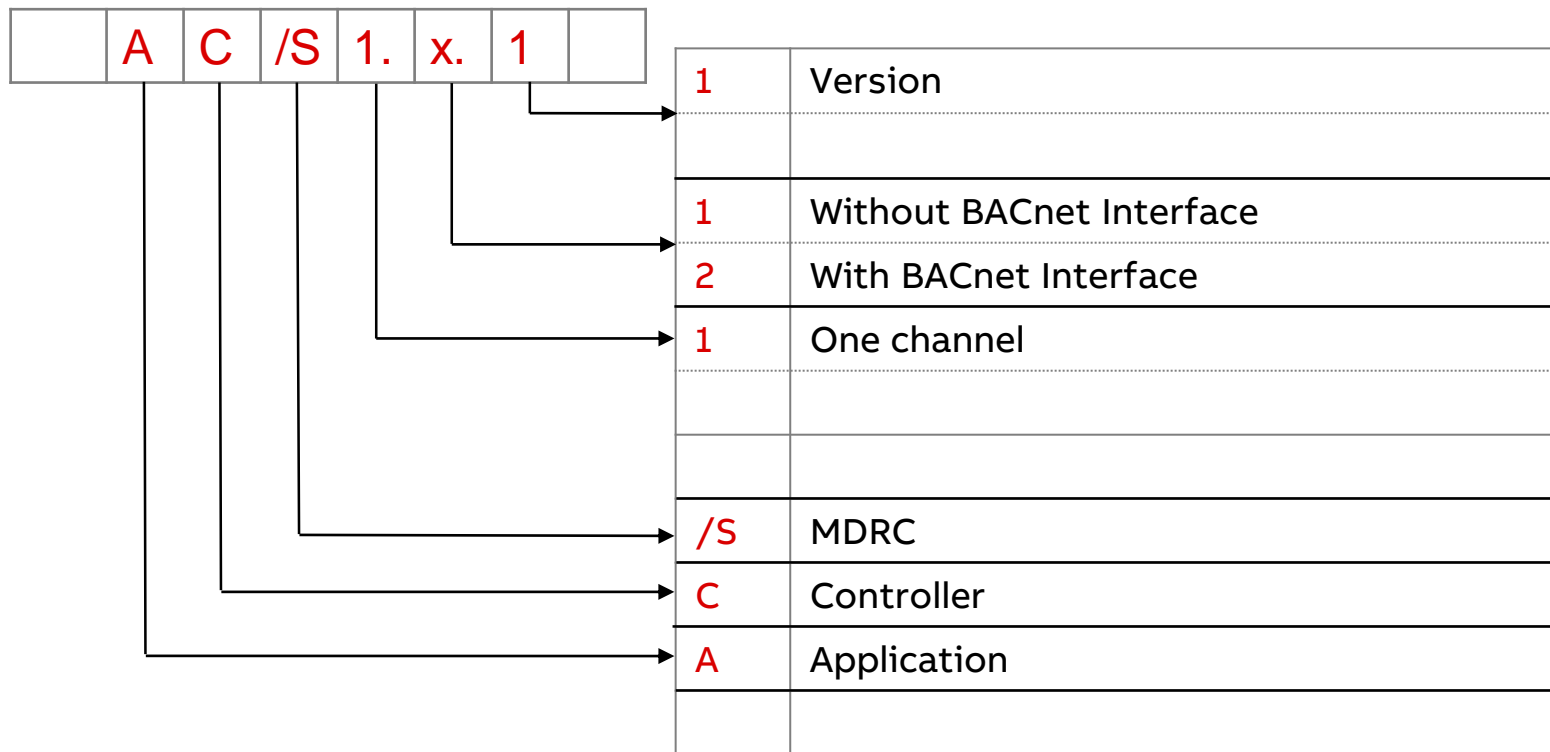
1. Label carrier
2. Programming LED
3. Programming button
4. KNX Connection
5. Cover cap
6. Power supply connection
7. LAN/PoE Connection
8. Power ON
9. LAN/Link
10. KNX Telegram LED
11. Reset Button



# Application Controller AC/S 1.x.1

Product range

## AC/S 1.x.1 – Type Description



# Application Controller AC/S 1.x.1

## Performance

### Overview

Feature	Quantity
Application Specific Modules (ASM)	500
ASM Scheduler	15
ASM central HVAC (Heating Distribution Circuit, Cooling Distribution Circuit, Boiler, Chiller)	15
ASM Trend (10 ASM each 5 trends ... 50 ASM each one trend)	50
Duration up to ...	3 years
KNX group objects	2,000
Additional group objects for clock functions	4
Group addresses in total	16,000
BACnet objects	500
Maximum number of WebUI accesses	5



# Application Controller AC/S 1.x.1

## Performance

### Overview

Feature	Quantity
Automation ASM (Logic like ABA/S), more than one possible, but in total ...	
Logic elements	1,000
Socket In- and Outputs	200
WebUI In- and Outputs	30

#### Utilization monitored in ETS:

	Current	Maximum
ASMs used	2	500
KNX group objects used	6	2000
BACnet objects used	0	500
ASM Schedules count	0	15
Central HVAC, ASM count	1	15
ASM Trend count	0	50





# Application Controller AC/S 1.x.1

## Commercial Aspects

### Family AC/S 1.x.1

- AC/S 1.1.1 (Application Controller Basic)
  - 2CDG 110 205 R0011
- AC/S 1.2.1 (Application Controller BACnet)
  - 2CDG 110 206 R0011



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# Application Controller AC/S

## Technical documents

[www.abb.com/KNX](http://www.abb.com/KNX)

→ Product category

→ Heating, Ventilation, Air Conditioning

→ AC/S

- Product Manual
- Technical datasheet
- Installation and operating instructions
- Specification Text
- ETS Application
- Application Note
- CE declaration of conformity
- . . .

**ABB** PRODUCT PAGE 18015

### Detailed information for: AC/S1.2.1

This page contains technical data sheet, documents library and links to offering related to this product. If you require any other information, please contact us using form located at the bottom of the page.

[Print...](#) [Print to Pdf...](#)

[Data Sheet](#) [Documentation](#)


#### AC/S1.2.1

**General Information**

Extended Product Type:	AC/S1.2.1
Product ID:	2CDG110206R0011
EAN:	4016779015806
Catalog Description:	AC/S1.2.1 Application Controller BACnet

**Long Description:**

Automation Controller with pre-defined Automation Modules for a holistic Heating, Ventilation and Air Conditioning (HVAC) Automation Solution from Central HVAC to Room Automation to meet the Energy Efficiencies Objectives like EN 15232 or LEED. Automation Modules for example Schedule, Set Point Calculation, Heat Curve Calculation, Data Logging and Device Monitoring. Own Automation Modules can be created by a graphical Logic Editor. The Controller has an automatic generated web based User Interface to monitor and manage the KNX System. Built in BACnet/IP Gateway to connect the KNX System with Building Management Systems (BMS). Bidirectional data exchange between KNX and BACnet.



### Downloads for Application Controllers

Available documents:

[→ Advanced search](#) [→ Documents in all languages](#)

Brochure (2)

Certificate (3)

Data sheet (1)




Declaration of conformity (1)

Drawing (2)

Manual (1)

Movie (2)

Operating instruction (1)

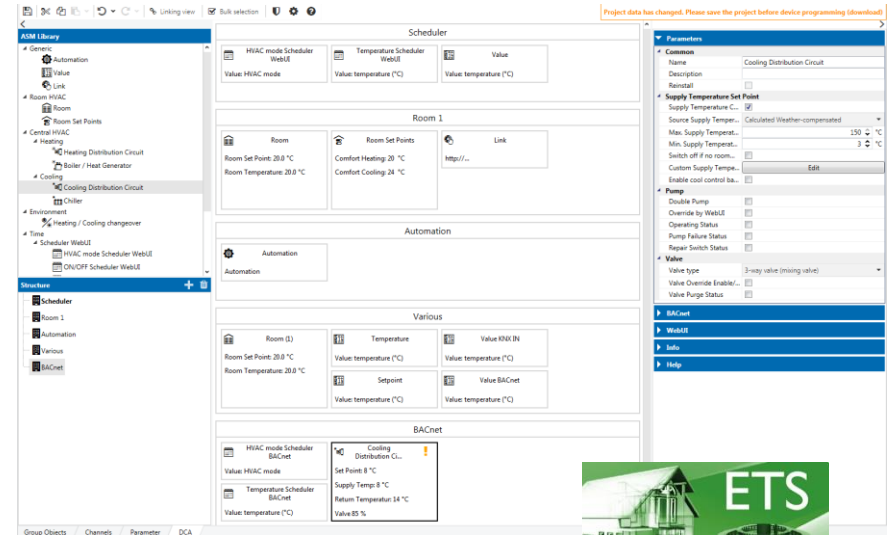
- |   |  |
|---|--|
|   | <b>Certificate (.PDF) [XX] AC/S1.2.1 BACnet BTL Listing</b><br>Summary: No summary available<br>German, English, Spanish, French, Italian, Dutch, Polish, Russian - 2018-09-20 - 0,08 MB <a href="#">PDF</a>   |
|  | <b>Certificate (.PDF) [XX] AC/S1.2.1 BACnet Certificate</b><br>Summary: No summary available<br>German, English, Spanish, French, Italian, Dutch, Polish, Russian - 2018-09-20 - 1,12 MB <a href="#">PDF</a>   |
|  | <b>Certificate (.PDF) [XX] AC/S1.2.1 BACnet PICS Document</b><br>Summary: No summary available<br>German, English, Spanish, French, Italian, Dutch, Polish, Russian - 2018-09-20 - 0,15 MB <a href="#">PDF</a> |

# Application Controller AC/S 1.x.1

ETS

## Features

- Fully integrated in ETS (V. 5.6.5 or higher), no external Software required
- Reliable KNX Twisted Pair (TP) Communication
- Fast ETS Download over Ethernet (IP)
- Time synchronization either via
  - BACnet
  - KNX
  - NTP
- All Functions (ASM, Parameter, Linking view) integrated in DCA (Device Configuration App)
- The free of charge DCA has to be installed in the ETS and can be downloaded from the KNX Online Shop or ABB homepage at the product



# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 1

What are the functions of the Application Controller AC/S 1.x.1?

- A** BACnet interface, Visualisation, predefined and freely programmable automation functions
- B** WebUI, LON and M-Bus interface, automation functions
- C** BACnet interface, WebUI, predefined and freely programmable automation functions

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 1

What are the functions of the Application Controller AC/S 1.x.1?

- ☐ A BACnet interface, Visualisation, predefined and freely programmable automation functions
- ☐ B WebUI, LON and M-Bus interface, automation functions
- ☒ C BACnet interface, WebUI, predefined and freely programmable automation functions

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 2

What is the difference between the 2 versions of Application Controller AC/S 1.x.1?

**A**

BACnet interface

**B**

WebUI

**C**

Amount of freely programmable automation functions

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 2

What is the difference between the 2 versions of Application Controller AC/S 1.x.1?

**A**

BACnet interface

**B**

WebUI

**C**

Amount of freely programmable automation functions

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 3

Which Application Specific Modules (ASM) are available in the Application Controller AC/S 1.x.1?

- A** Trend Logger and Scheduler
- B** VAV controller and chiller module
- C** Chiller module and cooling circuit control



# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 3

Which Application Specific Modules (ASM) are available in the Application Controller AC/S 1.x.1?

- ☒ A Trend Logger and Scheduler
- ☐ B VAV controller and chiller module
- ☒ C Chiller module and cooling circuit control

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 4

The Ethernet connection of AC/S 1.x.1 is for ...

- A** ... Power supply via PoE, WebUI, fast application download, KNX communication
- B** ... Power supply via PoE, WebUI, fast application download, monitor of logical functions
- C** ... BACnet communication, WebUI, fast application download, monitor of logical functions

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 4

The Ethernet connection of AC/S 1.x.1 is for ...

- ☐ A ... Power supply via PoE, WebUI, fast application download, KNX communication
- ☒ B ... Power supply via PoE, WebUI, fast application download, monitor of logical functions
- ☐ C ... BACnet communication, WebUI, fast application download, monitor of logical functions

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 5

The WebUI of AC/S 1.x.1 has these feature ...

- A** ... an adjustable visualization for a KNX system
- B** ... Easy access (operation and display) to application specific modules in the Application Controller AC/S 1.x.1
- C** ... structured overview of all automation modules with the option to open a detailed view

# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 5

The WebUI of AC/S 1.x.1 has these feature ...

- ☐ A ... an adjustable visualization for a KNX system
- ☒ B ... Easy access (operation and display) to application specific modules in the Application Controller AC/S 1.x.1
- ☐ C ... structured overview of all automation modules with the option to open a detailed view

# Application Controller AC/S 1.x.1

ETS

## DCA (Device Configuration App)

The screenshot displays the DCA (Device Configuration App) interface for configuring a Scheduler. The interface is divided into several sections:

- Left Panel (Navigation):** Contains a tree view under "ASM Library" with categories like Generic, Automation, Room HVAC, Room Set Points, Central HVAC, Heating, Cooling, Environment, Time, and Maintenance. Below this is a "Structure" panel showing a hierarchy: Scheduler > Room 1 > Automation > Various > BACnet.
- Top Panel (Scheduler):** Shows a "Scheduler" section with three sub-sections: "HVAC mode Scheduler WebUI" (Value: HVAC mode), "Temperature Scheduler WebUI" (Value: temperature (°C)), and "Value" (Value: temperature (°C)).
- Middle Panel (Room 1):** Displays "Room 1" configuration with three sub-sections: "Room" (Room Set Point: 20.0 °C, Room Temperature: 20.0 °C), "Room Set Points" (Comfort Heating: 20 °C, Comfort Cooling: 24 °C), and "Link" (http://...).
- Bottom Panel (Automation):** Shows an "Automation" section with a single "Automation" sub-section.
- Right Panel (Parameters):** Displays a "Parameters" section with a "Common" sub-section. The "Common" sub-section includes fields for Name (Cooling Distribution Circuit), Description, Reinstall, and a "Supply Temperature Set Point" section. The "Supply Temperature Set Point" section includes fields for Supply Temperature C... (checked), Source Supply Temper... (Calculated Weather-compensated), Max. Supply Temperat... (150 °C), Min. Supply Temperat... (3 °C), Switch off if no room... (checked), Custom Supply Tempe... (Edit), and Enable cool control ba... (checked). Below this is a "Pump" section with fields for Double Pump, Override by WebUI, Operating Status, Pump Failure Status, and Repair Switch Status. At the bottom is a "Valve" section with fields for Valve type (3-way valve (mixing valve)), Valve Override Enable/... (checked), and Valve Purge Status (checked).

The bottom of the interface features a navigation bar with tabs: Group Objects, Channels, Parameter, and DCA.

# Application Controller AC/S 1.x.1

ETS

## DCA (Device Configuration App)

### Device Settings

- IP Network (DNS Server address)
- KNX (Telegram rate limitation)
- BACnet (Device object instance and name)
- WebUI (Reset passwords of users)
- Clock (KNX, NTP, BACnet)

The screenshot shows the 'Device Settings' window with the following sections:

- General**: Clock synchronization source (KNX), Time zone ((UTC+01:00) Amsterdam, Berlin, Bern, Rom, Stockholm...)
- IP Network**: The IP Address of the Device is set in the ETS Device Properties Panel. Options: ☒ Obtain DNS server address automatically, ☐ Use following DNS server address.
- KNX**: Telegram rate (Do not limit) telegram(s) / s.
- BACnet**: BACnet Device Object Instance No. (666), BACnet Device Object Name (AC/S1.2.1 Application Controller, BACnet).
- Users**: Table of users and their reset passwords.

User name	Password
admin	Reset password
expert	Reset password
user	Reset password
viewer	Reset password

# Application Controller AC/S 1.x.1

ETS

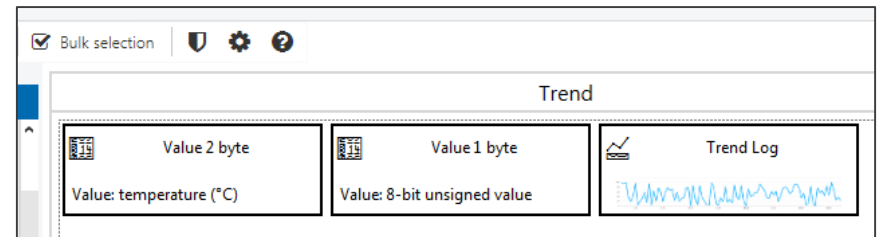
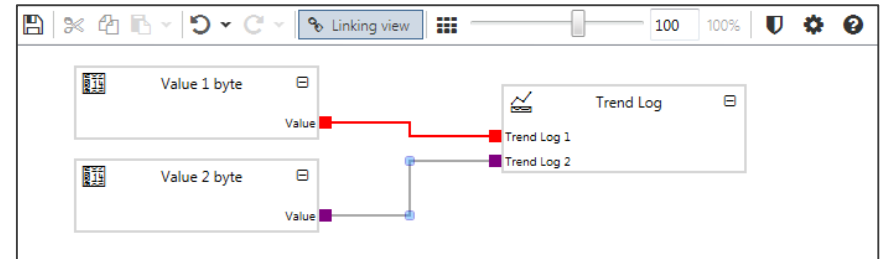
## DCA (Device Configuration App)

### Linking View

- Display of selected ASM's with sockets to be linked with each other

### Bulk selection

- Allows to mark ASM's to be shown together in linking view
- Alternative: Ctrl + click on ASM





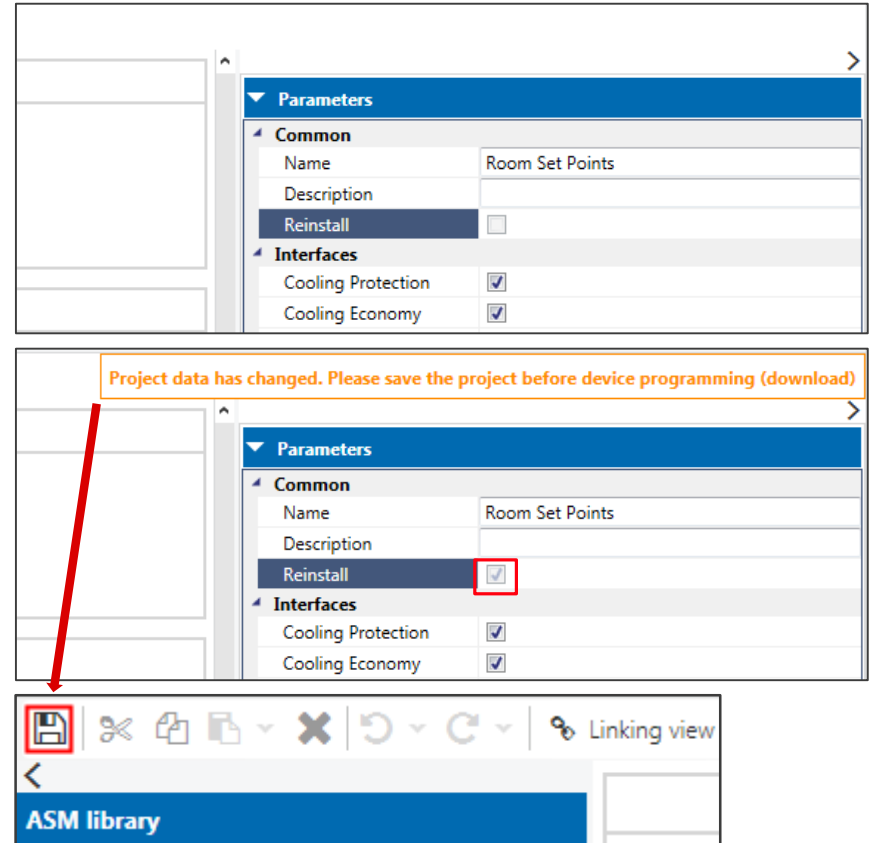
# Application Controller AC/S 1.x.1

ETS

## DCA (Device Configuration App)

### Reinstall

- After application download parameter adjustments are blocked
- To enable parameter changes again 'Reinstall' has to be activated
- Please note: Information indicates any changes done and project has to be saved prior to the next application download



# Application Controller AC/S 1.x.1

ETS

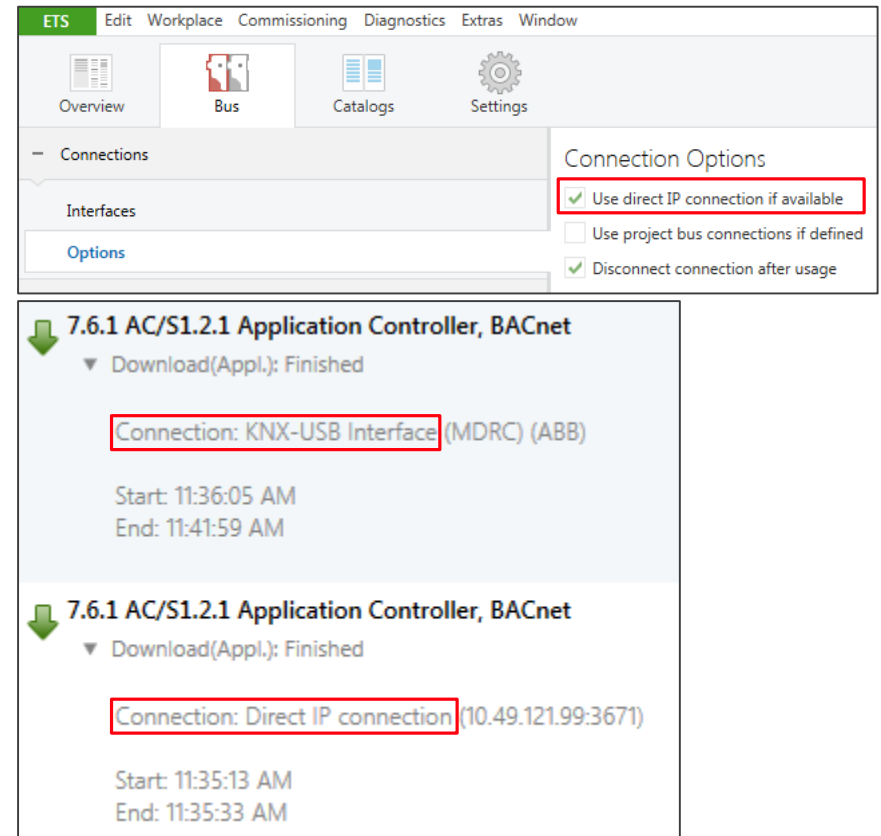
## Download Application

Application Download either via USB or IP

For IP download activate ETS parameter 'Use direct IP connection if available'

Significant time difference for application download (Example: 20 s <-> 354 s)

Communication to other KNX devices runs over KNX TP!



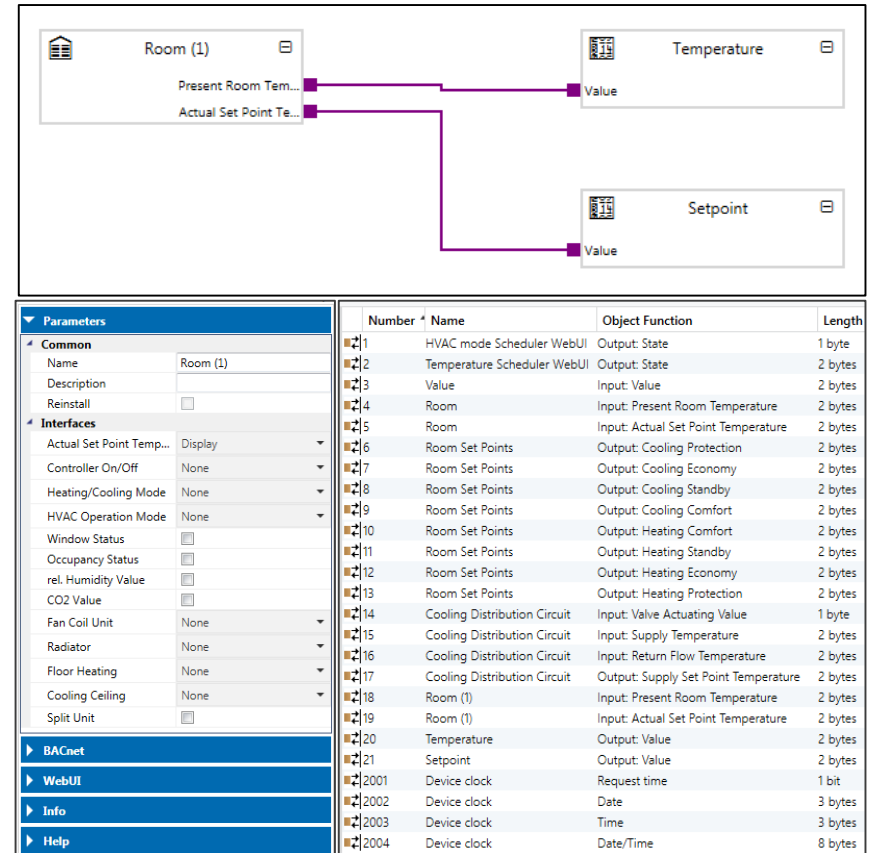
# Application Controller AC/S 1.x.1

ETS

## Application Specific Modules (ASM)

### Predefined Automation Modules

- ASM → **Application Specific Modules**
- Represent specific functionality, can execute function by itself or together with other ASM's e.g. room setpoints or heating/cooling circuit control
  - In- and/or outputs (sockets)
  - Parameters
  - Group objects
  - Linking view with sockets to be connected to KNX objects, WebUI, BACnet or other ASM's



# Application Controller AC/S 1.x.1

## ASM

### Value

ASM Value allows to communicate (send and receive values) to all interfaces in both directions

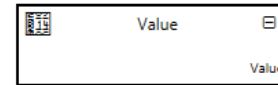
- KNX, WebUI, BACnet
- Other ASM's via Sockets

#### ASM Value as **output**

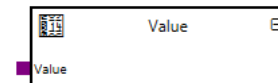
- Value comes from **Outside** (KNX, BACnet, WebUI) and goes in (AC/S, other ASM) to be processed
- Socket on the right side

#### ASM Value as **input**

- Value comes from **Inside** (AC/S, other ASM) and goes out (KNX, BACnet, WebUI) to be processed
- Socket on the left side



Parameters	
Common	
Name	Value
Description	
Reinstall	<input checked="" type="checkbox"/>
Interfaces	
Template	KNX to ASM Outputsocket
Socket	Output
WebUI	Display
KNX	Input from KNX
BACnet	None



Parameters	
Common	
Name	Value
Description	
Reinstall	<input checked="" type="checkbox"/>
Interfaces	
Template	Socket to KNX
Socket	Input
Aggregate function	None
WebUI	Display
KNX	Output to KNX
BACnet	None

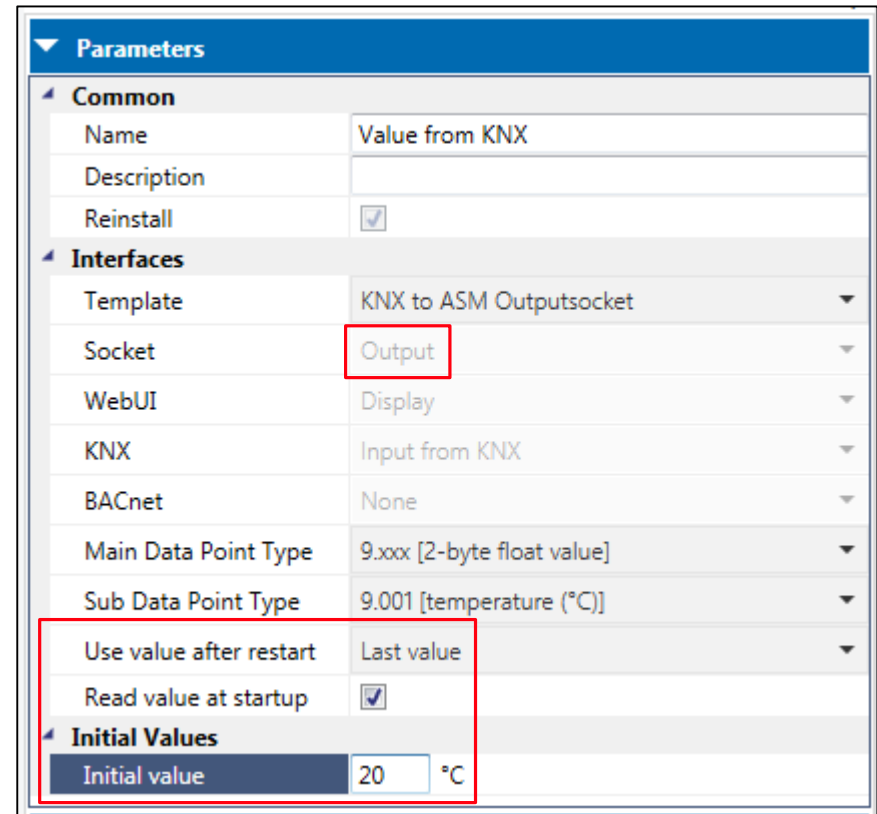
# Application Controller AC/S 1.x.1

ASM

## Value

Parameter Value as output

- Use value after restart
  - Last or initial value
- Read value at startup



Parameters	
<b>Common</b>	
Name	Value from KNX
Description	
Reinstall	<input checked="" type="checkbox"/>
<b>Interfaces</b>	
Template	KNX to ASM Outputsocket
Socket	Output
WebUI	Display
KNX	Input from KNX
BACnet	None
Main Data Point Type	9.xxx [2-byte float value]
Sub Data Point Type	9.001 [temperature (°C)]
Use value after restart	Last value
Read value at startup	<input checked="" type="checkbox"/>
<b>Initial Values</b>	
Initial value	20 °C

# Application Controller AC/S 1.x.1

ASM

## Value

Parameter Value as input

- Use value after restart
  - Last or initial value
- Read value at startup
- Sending value in case of change or cyclically

Parameters	
<b>Common</b>	
Name	Value to KNX
Reinstall	<input checked="" type="checkbox"/>
<b>Interfaces</b>	
Template	Socket to KNX
Socket	Input
Aggregate function	None
WebUI	Display
KNX	Output to KNX
BACnet	None
Data Point Type	9.xxx [2-byte float value]
Sub Data Point Type	9.001 [temperature (°C)]
Use value after restart	Last value
Send value to KNX by a change of	1 °C
Send cyclically values to KNX	<input checked="" type="checkbox"/>
Send cyclically values to KNX every	01:00:00
<b>Initial Values</b>	
Initial value	0 °C

# Application Controller AC/S 1.x.1

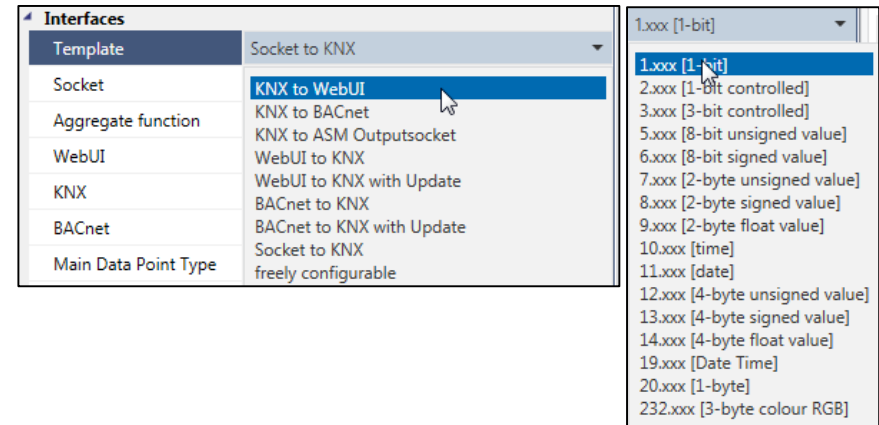
ASM

## Value

Available (Communication)-Templates

- KNX tom WebUI ...
- Freely configurable

Data point types from 1 bit to 3 byte RGB control



Template	Socket	WebUI	KNX	BACnet
<u>KNX to WebUI</u>	Output	Display	Input	None
KNX to BACnet	Output	Display	Input	readable
KNX to Socket	Output	Display	Input	None
<u>WebUI to KNX</u>	Output	Display+Set	Output	None
WebUI to KNX with Update	Output	Display+Set	Input+Output	None
BACnet to KNX	Output	Display	Output	read+writable
BACnet to KNX with Update	Output	Display	Input+Output	read+writable
Socket to KNX	Input	Display	Output	None
freely configurable	last state	last state	last state	last state

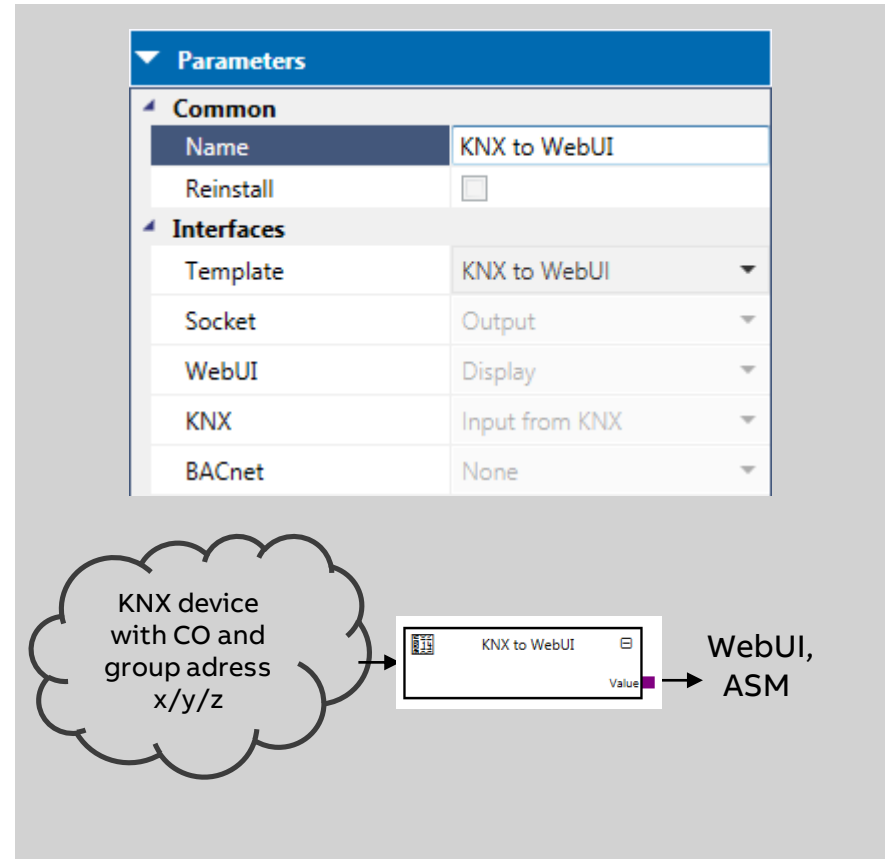
# Application Controller AC/S 1.x.1

ASM

## Value

Template: KNX to WebUI

- A value received via KNX is displayed on WebUI and can be forwarded to another ASM





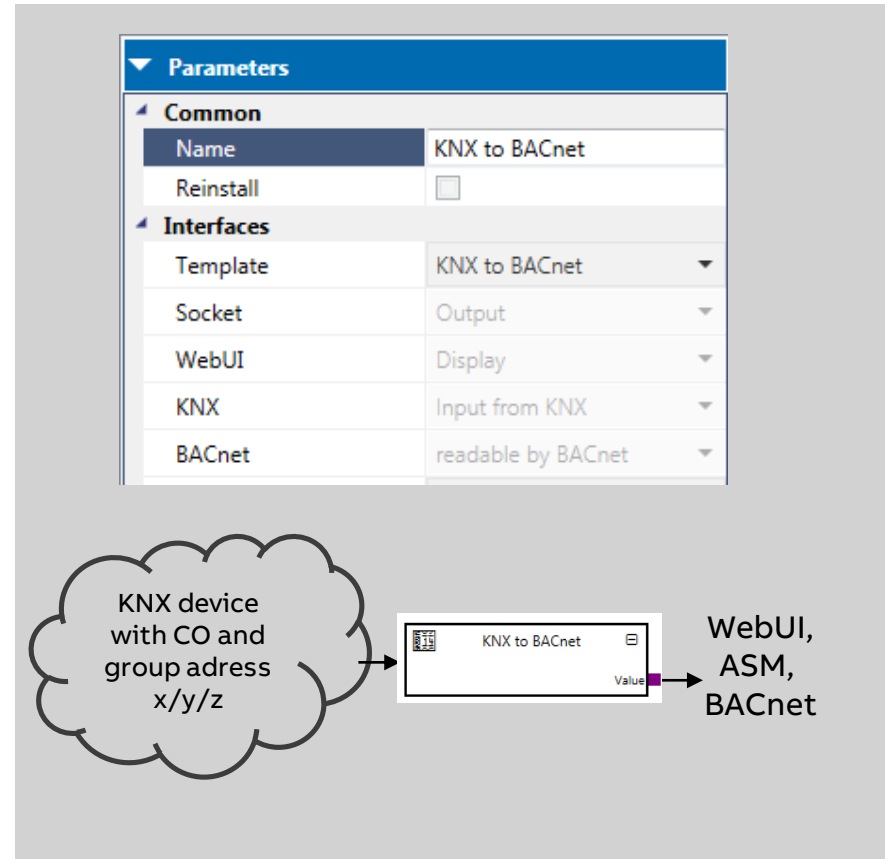
# Application Controller AC/S 1.x.1

ASM

## Value

Template: KNX to BACnet

- A value received via KNX is readable by BACnet, displayed on WebUI and can be forwarded to another ASM



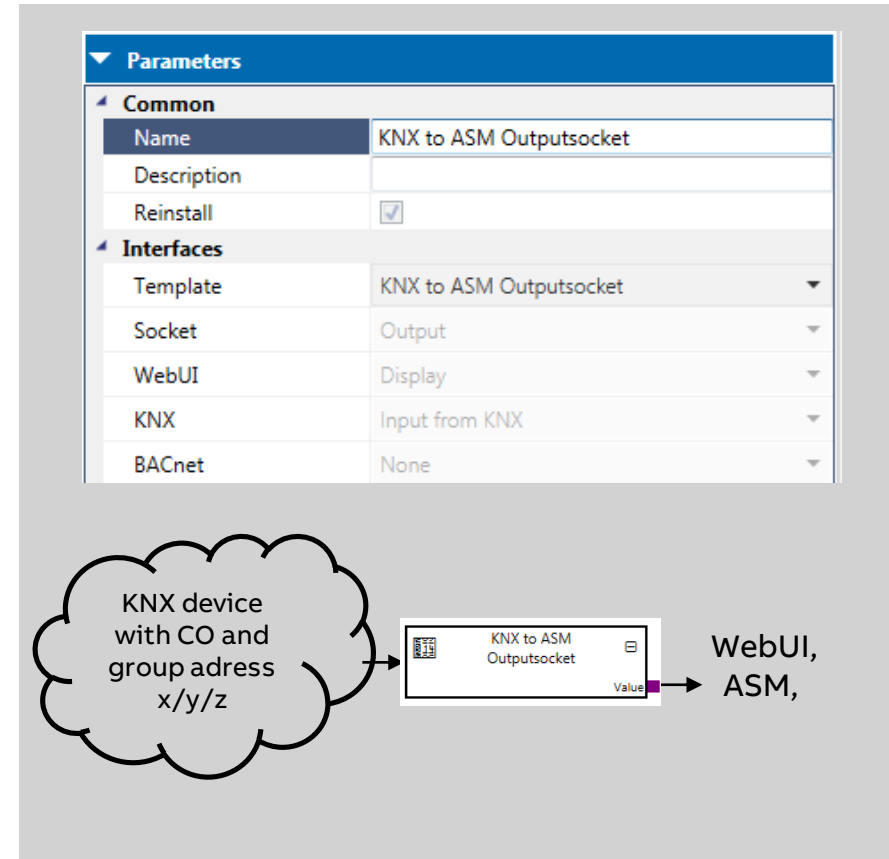
# Application Controller AC/S 1.x.1

## ASM

### Value

Template: KNX to ASM Outputsocket

- A value received via KNX is displayed on WebUI and can be forwarded to another ASM



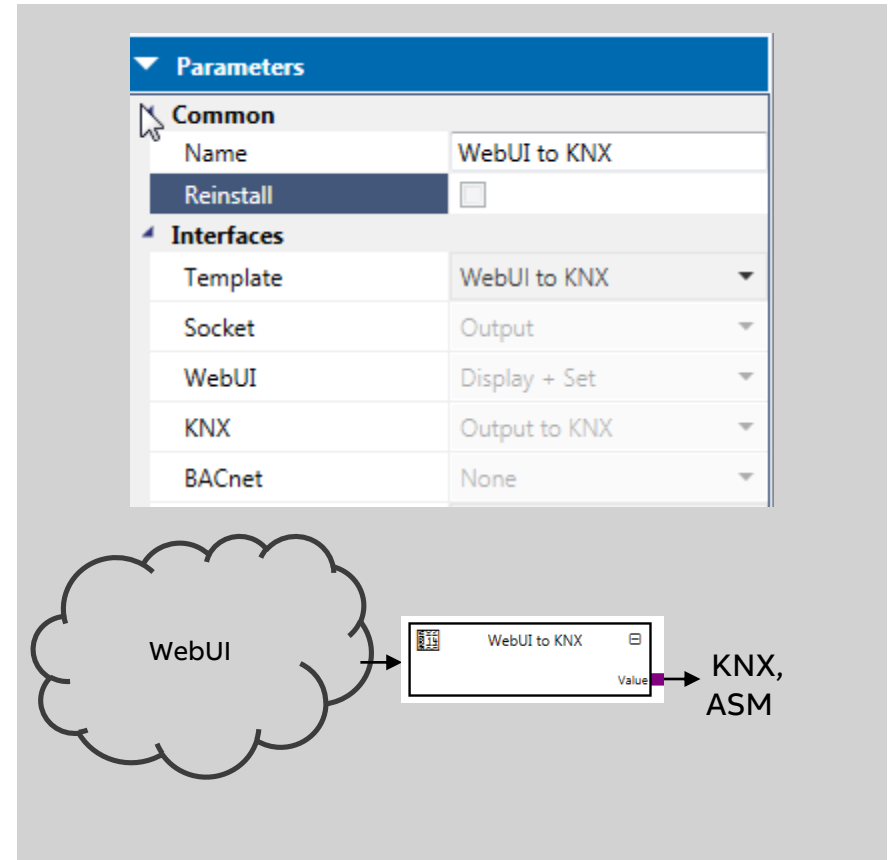
# Application Controller AC/S 1.x.1

ASM

## Value

Template: WebUI to KNX

- Values can be changed via WebUI, sent to KNX and can be forwarded to another ASM.



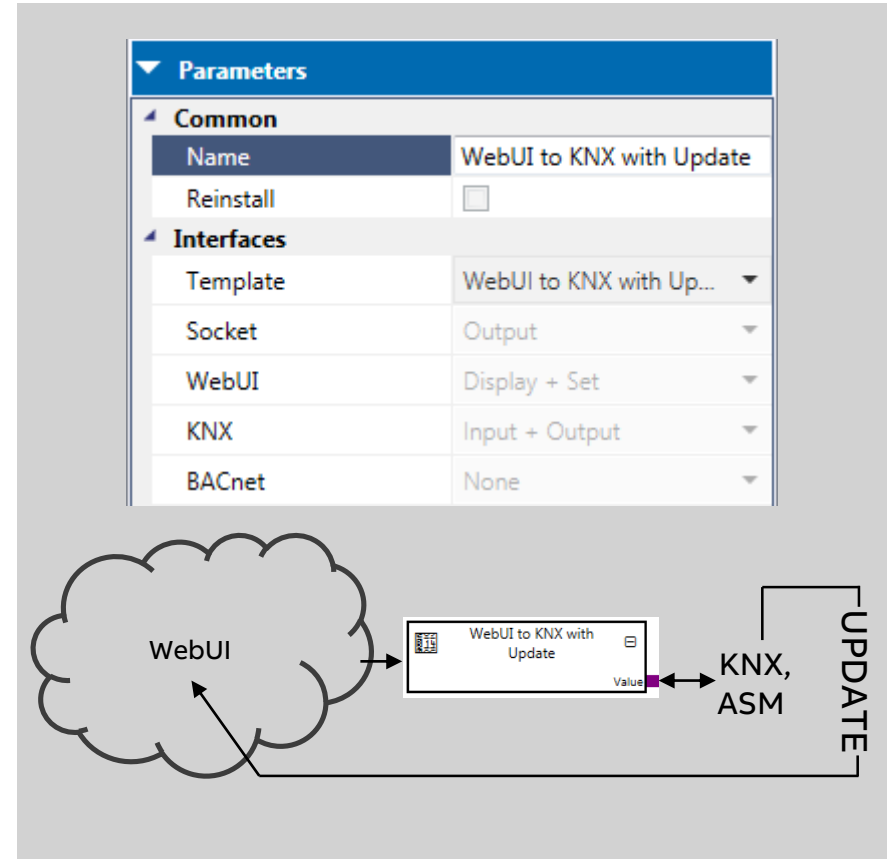
# Application Controller AC/S 1.x.1

## ASM

### Value

Template: WebUI to KNX with Update

- Values can be changed via WebUI, sent to KNX and can be forwarded to another ASM.
- Value received from KNX updates the value on WebUI



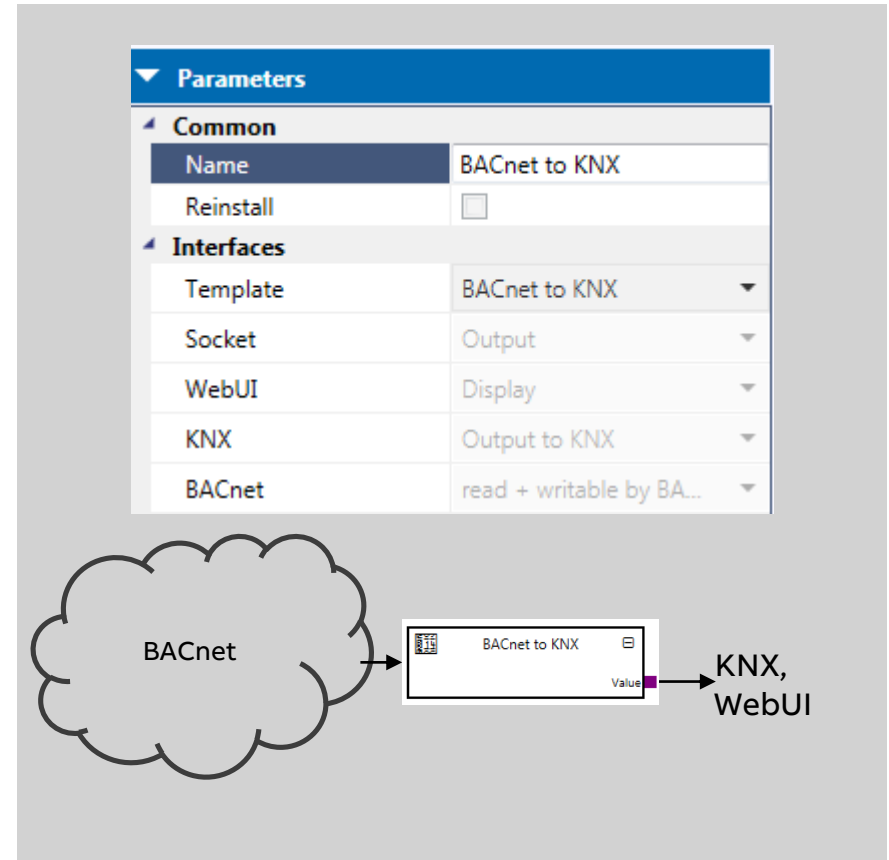
# Application Controller AC/S 1.x.1

ASM

## Value

Template: BACnet to KNX

- Values received from BACnet is displayed on WebUI, sent on KNX and can be forwarded to another ASM



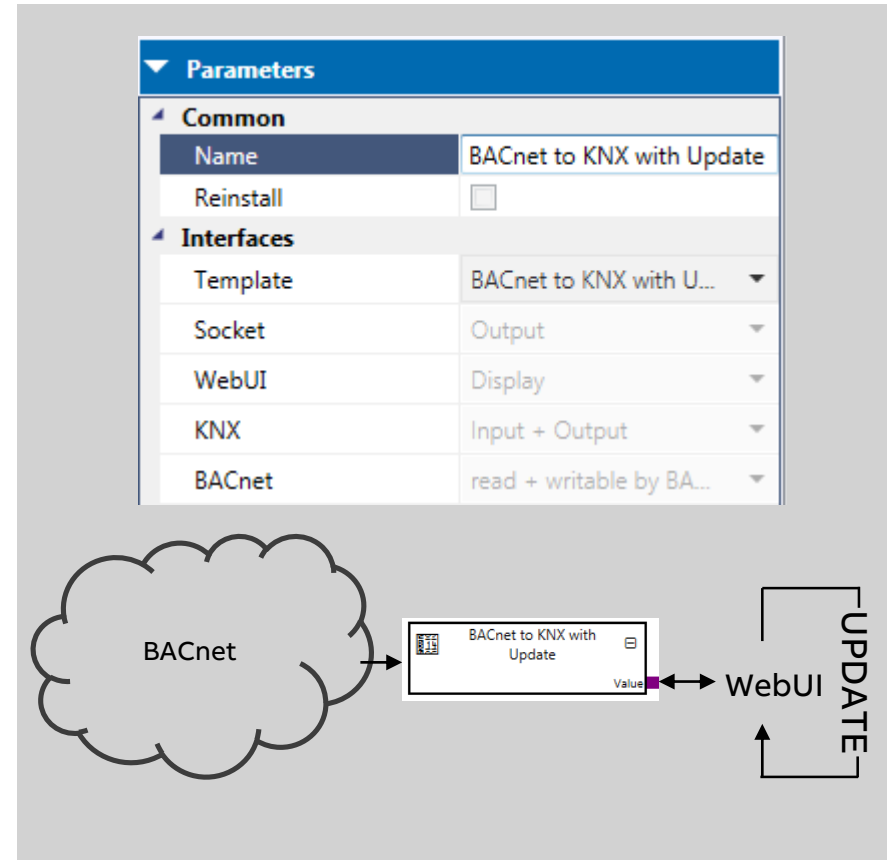
# Application Controller AC/S 1.x.1

ASM

## Value

Template: BACnet to KNX with Update

- Values received from BACnet is displayed on WebUI, sent on KNX and can be forwarded to another ASM
- Value received from KNX updates the value on WebUI



# Application Controller AC/S 1.x.1

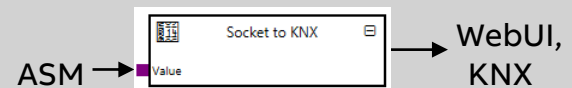
## ASM

### Value

Template: Socket to KNX

- Values received from another ASM is displayed on WebUI and sent on KNX

Parameters	
Common	
Name	Socket to KNX
Reinstall	<input type="checkbox"/>
Interfaces	
Template	Socket to KNX ▼
Socket	Input ▼
Aggregate function	None ▼
WebUI	Display ▼
KNX	Output to KNX ▼
BACnet	None ▼



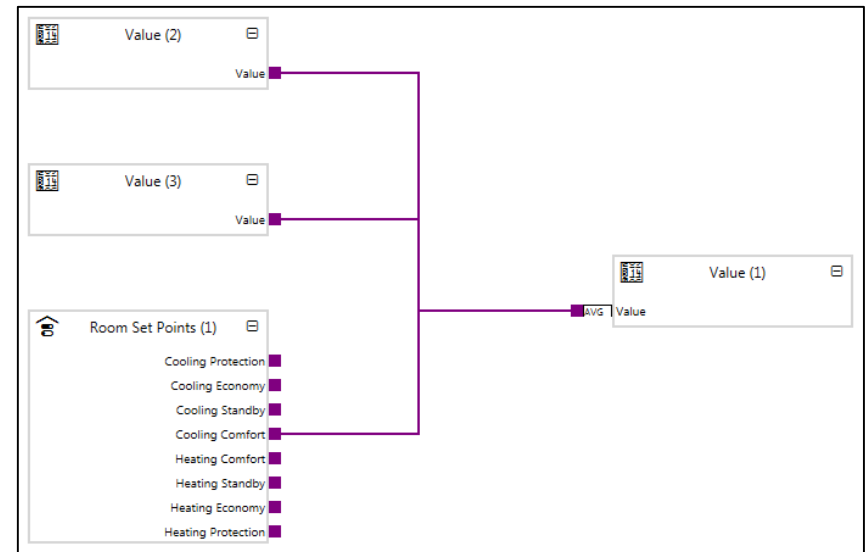
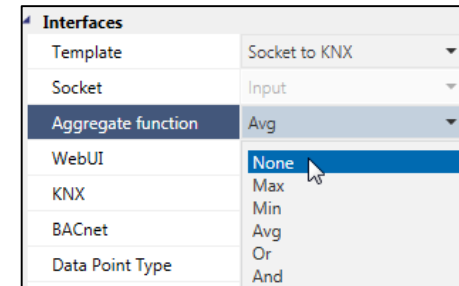
# Application Controller AC/S 1.x.1

## ASM

### Value

Template: Socket to KNX – Aggregate function

- Values received from other ASM's are able to be evaluated the ASM 'Socket to KNX'
- Calculation can be
  - Maximum
  - Minimum
  - Average
  - OR-function
  - AND-function





# Application Controller AC/S 1.x.1

ASM

## Value

Template: freely configurable

- Communication to Socket, Aggregate function, WebUI, KNX and BACnet can be configured independent from each other
- Socket can be either input or output
  - Depending on in- or output different options, e.g. only input has aggregate function

Interfaces	
Template	freely configurable
Socket	Input
Aggregate function	Avg
WebUI	Display
KNX	Output to KNX
BACnet	None

Interfaces	
Template	freely configurable
Socket	Output
WebUI	Input
KNX	Output


Interfaces	
Template	freely configurable
Socket	Output
WebUI	Display
KNX	Display
BACnet	Display + Set

Interfaces	
Template	freely configurable
Socket	Output
WebUI	Display
KNX	Input from KNX
BACnet	Input from KNX
Data Point Type	Input + Output
Sub Data Point Type	Output to KNX

Interfaces	
Template	freely configurable
Socket	Output
WebUI	Display
KNX	Input from KNX
BACnet	None
Data Point Type	readable by BACnet
Sub Data Point Type	read + writable by BACnet

# Application Controller AC/S

Communication in all Directions → KNX - WebUI - BACnet



Value KNX/BACnet  
WebUI  
Value: temperature (°C)

**Interfaces**

Template	freely configurable
Socket	Output
WebUI	Display + Set
KNX	Input + Output
<b>BACnet</b>	read + writable by BACnet
Main Data Point Type	9.xxx [2-byte float value]
Sub Data Point Type	9.001 [temperature (°C)]

Number ^	Object Function	Name	Description	Group Address	Length
1	In-/Output: Value	BACnet <--> KNX <--> WebUI		3/3/3	2 bytes

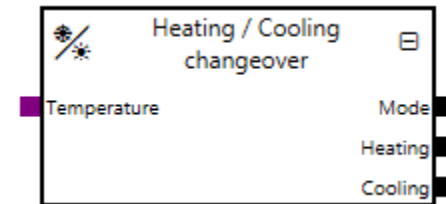
# Application Controller AC/S 1.x.1

ASM

## Heating/Cooling Changeover

This module provides switch over between heating and cooling depending on a defined temperature

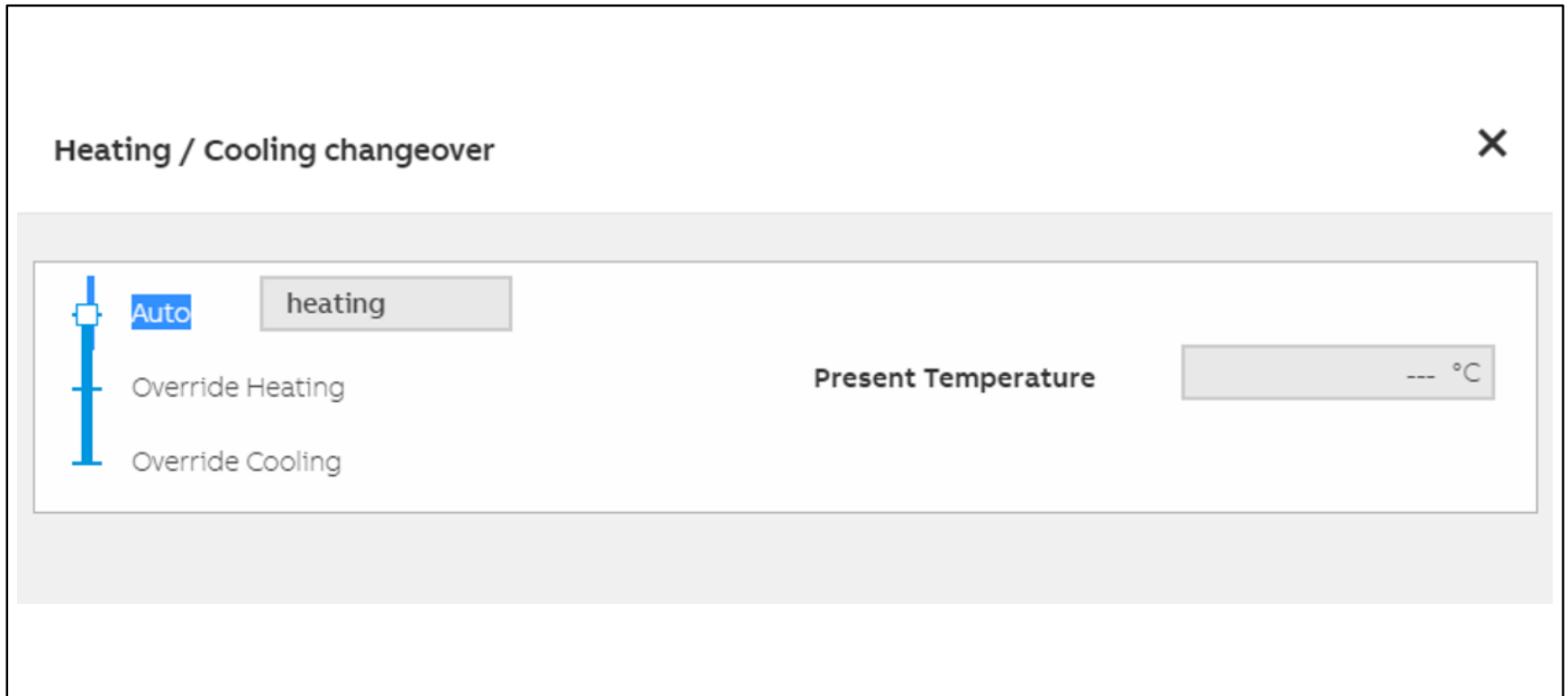
- Temperature can be outside temperature or supply flow temperature of the circuit
- Output telegrams are
  - Mode (0 = cooling, 1 = heating)
  - Heating (yes=1, no=0)
  - Cooling (yes=1, no=0)



Parameters	
<b>Common</b>	
Name	Heating / Cooling changeover
Reinstall	<input type="checkbox"/>
<b>Interfaces</b>	
Change over based on	Outside temperature ▼
Cooling if greater than	24 °C
Heating if less than	17 °C
<b>Initial Values</b>	
Initial value	Heating ▼

# Application Controller AC/S 1.x.1

ASM Heating/Cooling change over Distribution Circuit in WebUI



# Application Controller AC/S 1.x.1

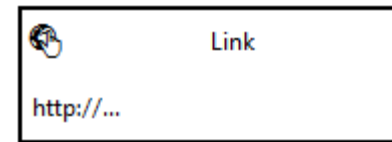
## ASM

### Link

This module provides in WebUI a button to jump to

- WebUI of another Application Controller, when more than one AC/S in one project
- Mail account, e.g. to inform technical support
- Any URL, e.g. to access a manual

Support of usual URL formats like ftp, mail to, file, http(s)



Parameters	
Common	
Name	Link
Interfaces	
URL	(http://   https://   ftp://   mailto:) enter your url here...

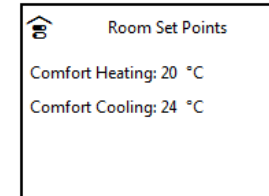
# Application Controller AC/S 1.x.1

## ASM

### Room Set Points

This module allows to adjust various setpoints as fixed values for different operating modes

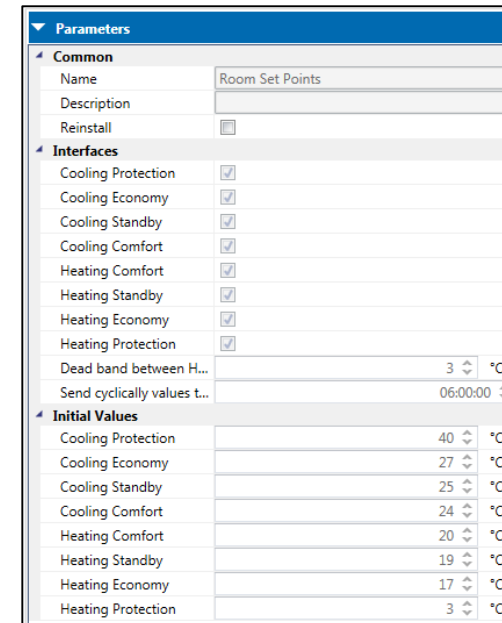
- Values can be between 0...50 ° Celsius
- Values can be changed in WebUI and transmitted to KNX via ASM 'Value' (typically socket to KNX)
- Temperatures to be parametrized as follows:
  - Cooling Protection  $\geq$  Cooling Economy  $\geq$  [..]  $\geq$  Heating Economy  $\geq$  Heating Protection
- Deadzone: Temperature difference between heating and cooling comfort setpoint minimum adjustable in WebUI
- Example: Deadzone 4K, Heating Comfort 20 ° Celsius  $\rightarrow$  any Cooling setpoint minimum 24 ° Celsius
- Cyclical sending of set points to KNX possible



Room Set Points

Comfort Heating: 20 °C

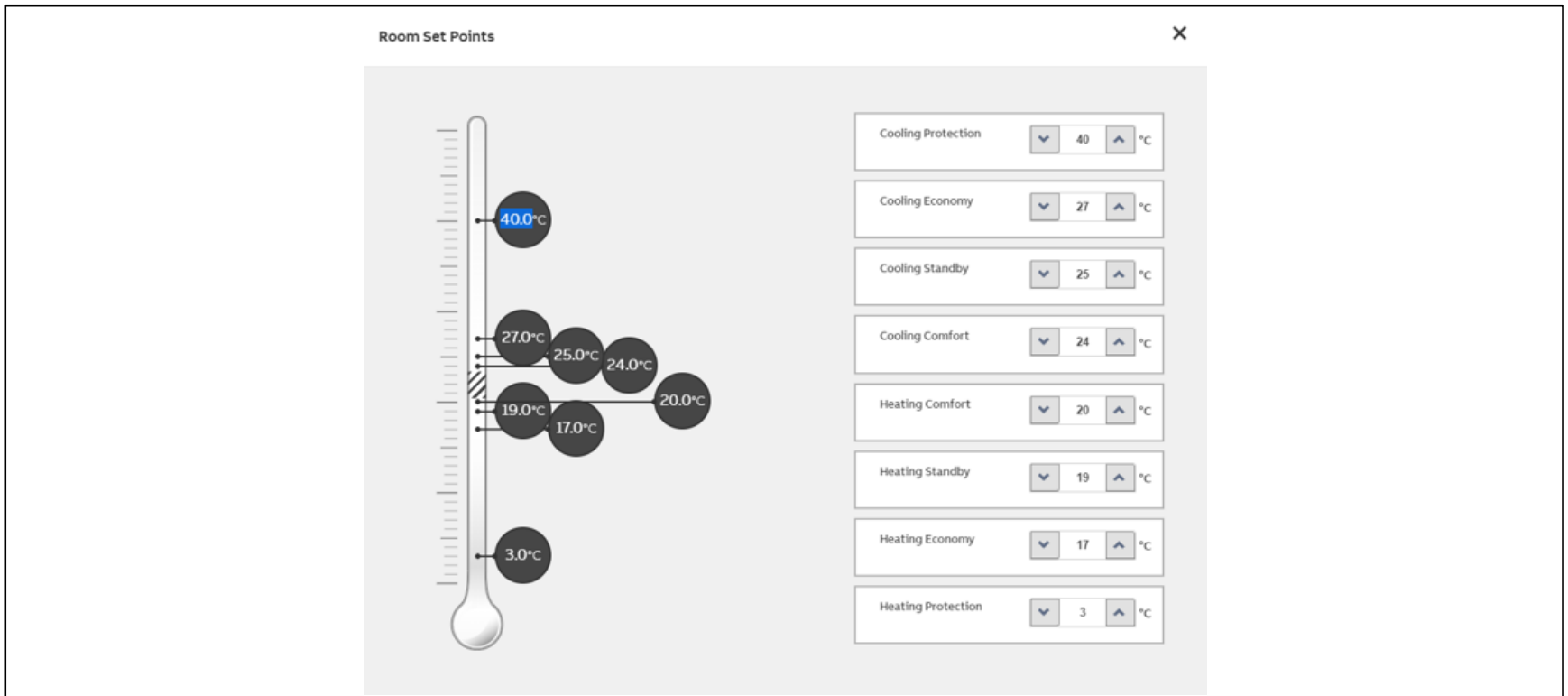
Comfort Cooling: 24 °C



Parameters	
<b>Common</b>	
Name	Room Set Points
Description	
Reinstall	<input type="checkbox"/>
<b>Interfaces</b>	
Cooling Protection	<input checked="" type="checkbox"/>
Cooling Economy	<input checked="" type="checkbox"/>
Cooling Standby	<input checked="" type="checkbox"/>
Cooling Comfort	<input checked="" type="checkbox"/>
Heating Comfort	<input checked="" type="checkbox"/>
Heating Standby	<input checked="" type="checkbox"/>
Heating Economy	<input checked="" type="checkbox"/>
Heating Protection	<input checked="" type="checkbox"/>
Dead band between H...	3 °C
Send cyclically values t...	06:00:00
<b>Initial Values</b>	
Cooling Protection	40 °C
Cooling Economy	27 °C
Cooling Standby	25 °C
Cooling Comfort	24 °C
Heating Comfort	20 °C
Heating Standby	19 °C
Heating Economy	17 °C
Heating Protection	3 °C

# Application Controller AC/S 1.x.1

## ASM Room Set Points in WebUI



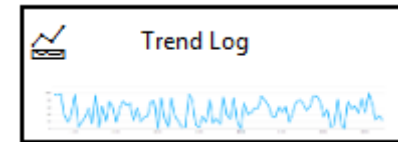
# Application Controller AC/S 1.x.1

## ASM

### Trend

This module is able to record dynamic values to be displayed in WebUI in a graphical way (line or bar graph)

- Each Trend ASM can record up to 5 Values, in total 50 trends
- Data type from 1 bit to 4 byte
- Values can be changed in WebUI and transmitted to KNX via ASM 'Value' (typically socket to KNX)
- Resolution: from value every 5 s of 24 hours (17280 values) to 1 hour of 3 years (26280 values)
- For correct recording time has to be synchronized (BACnet, KNX or NTP)
- Values can be exported, e.g. pdf or xls format



Parameters	
Common	
Name	Trend Log
Description	
Reinstall	<input checked="" type="checkbox"/>
Interfaces	
Range	Every 5 seconds of the last 24 hours
Number of inputs	3
Trend Log 1	
Name	Value 1 byte:Value
Data Point Type	5.xxx [8-bit unsigned value]
Sub Data Point Type	5.*
Trend Log 2	
Name	Value 2 byte:Value
Data Point Type	9.xxx [2-byte float value]
Sub Data Point Type	9.001 [temperature (°C)]
Trend Log 3	
Name	Trend3
Data Point Type	9.xxx [2-byte float value]
Sub Data Point Type	9.001 [temperature (°C)]



# Application Controller AC/S 1.x.1

## ASM Trend in WebUI



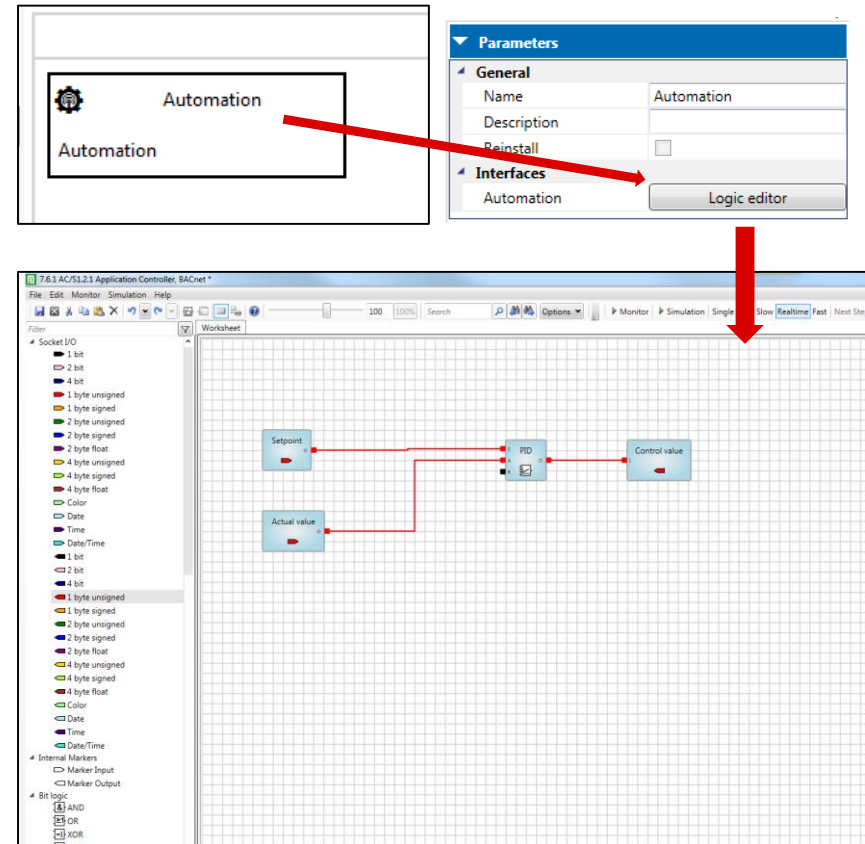
# Application Controller AC/S 1.x.1

## ASM

### Automation

ASM Automation: Freely programmable Logic like Logic Controller ABA/S 1.2.1

- Proven and known from ABA/S
- Main differences to ABA/S:
  - One worksheet
  - Up to 1000 logic elements
  - Monitor can be enabled in WebUI additionally
  - More than one ASM Automation useable, but with following limits:
    - Max. 1000 logic elements
    - Max. 200 I/O Sockets
    - Max. 30 WebUI I/O



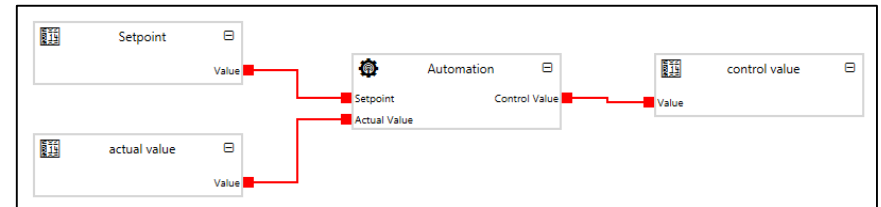
# Application Controller AC/S 1.x.1

## ASM

### Automation

ASM Automation: Freely programmable Logic like Logic Controller ABA/S 1.2.1

- Logic created to be connected to Value ASM or other ASM's (sockets) to communicate
- Example: PI-Controller with communication to and from KNX, group objects in ETS
  - Setpoint, Actual value: Output, KNX to socket
  - Control Value: Input, socket to KNX
- Further communication to BACnet, WebUI or other ASM's possible → Template freely configurable



Number	Name	Object Function	Length	Description	Group Address
1	Setpoint	Value	1 byte		
2	Actual value	Value	1 byte		
3	Control value	Value	1 byte		

The screenshot shows the 'Parameters' configuration window for the 'Setpoint' object. The 'Common' tab is active, showing the object name as 'Setpoint'. The 'Interfaces' section is expanded, showing various communication options:

Interface	Configuration
Template	freely configurable
Socket	Output
WebUI	Display
KNX	Input from KNX
BACnet	None
Main Data Point Type	5.xxx [8-bit unsigned value]

# Application Controller AC/S 1.x.1

## ASM Automation in WebUI

### Automation

Logic can be triggered in WebUI if value ASM is enabled accordingly (e.g. freely programmable, WebUI display + set)

The AUTOMATION control panel contains four main components: an 'Output Gate' button with a blue square icon and a 'False' dropdown; an 'enable' button with a blue square icon and a 'True' dropdown; an 'Automation' button with a gear icon and the text 'Automation ASM'; and an 'Input Gate' button with a blue square icon and a 'False' dropdown.

The Automation configuration window has a close button (X) in the top right corner. It features two tabs: 'Web' and 'Sockets', with 'Sockets' currently selected. The window is divided into two sections: 'Input Sockets' and 'Output Sockets'. Each section contains a table with columns for INDEX, NAME, and VALUE.

INDEX	NAME	VALUE
1	Input Gate	False ▼
2	Enable	True ▼

INDEX	NAME	VALUE
3	Output Gate	False ▼

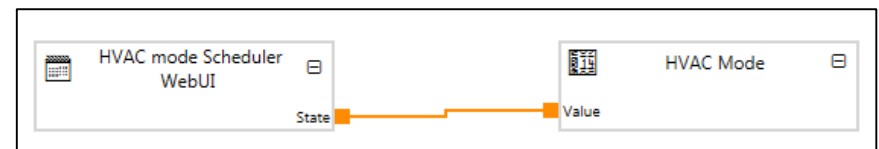
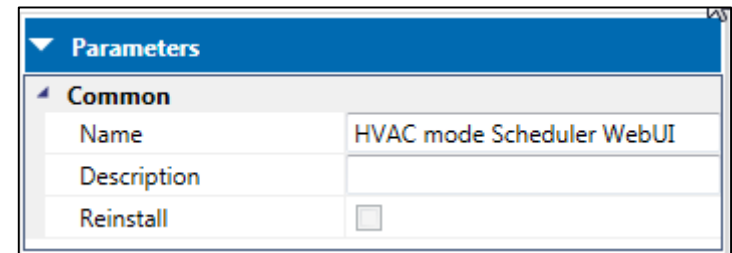
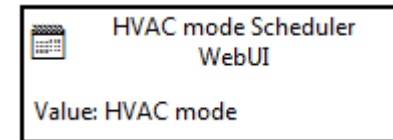
# Application Controller AC/S 1.x.1

## ASM

### HVAC Mode Scheduler WebUI

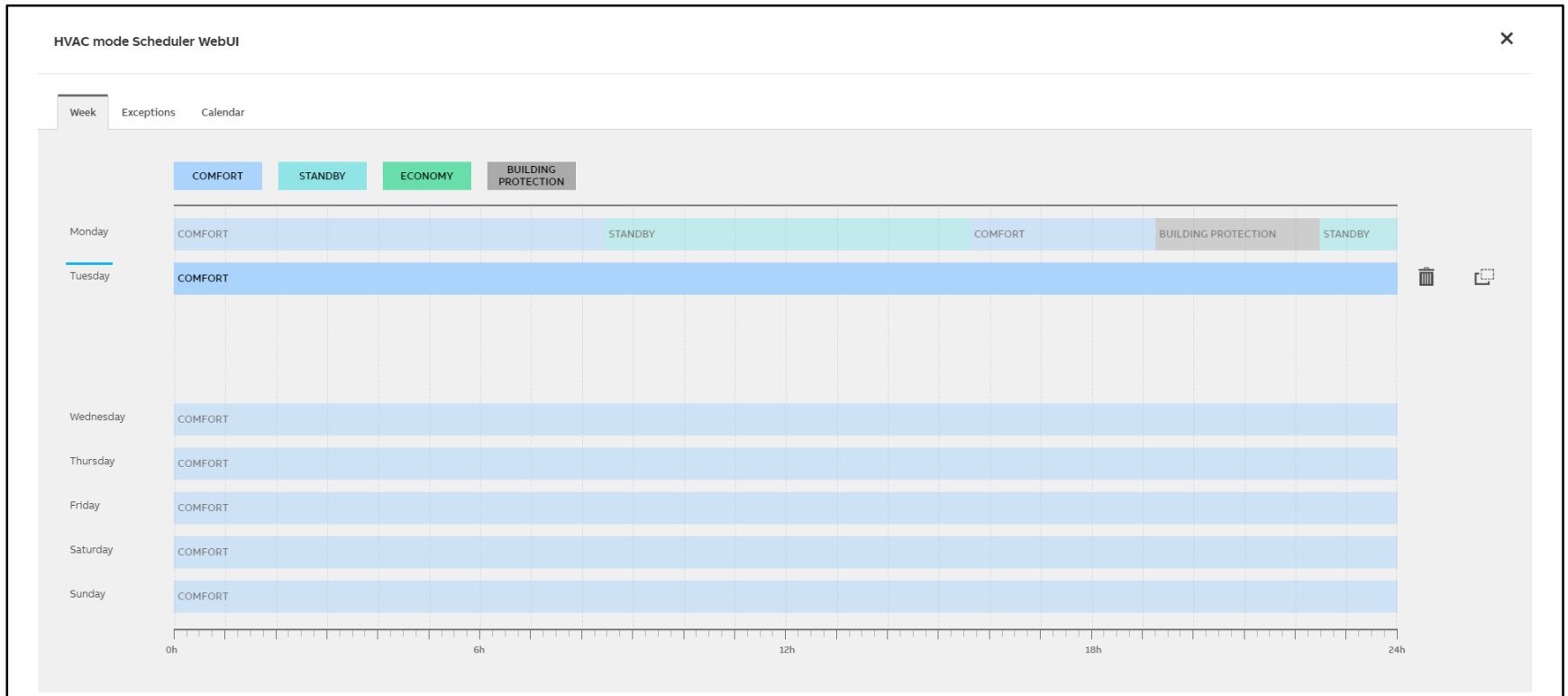
This ASM provides in WebUI a comfortable user-friendly scheduler to switch between the different HVAC modes depending on time

- Comfort
- Standby
- Economy
- Building protection (Frost- and heat protection)
- Mode can be sent to KNX, BACnet or another ASM within Application Controller
- Communication object: 1 byte HVAC Mode
- No Parameters needed



# Application Controller AC/S 1.x.1

## ASM HVAC Mode Scheduler in WebUI



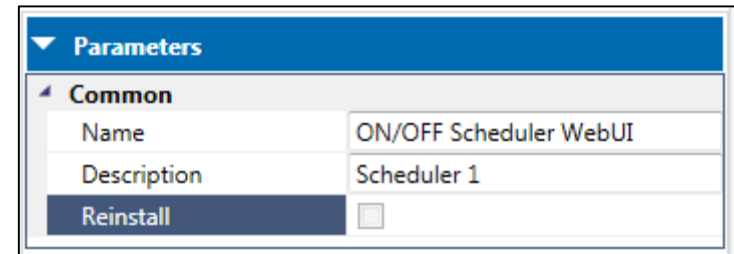
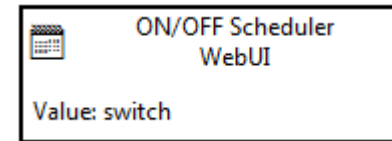
# Application Controller AC/S 1.x.1

ASM

## ON/OFF Scheduler WebUI

This ASM provides in WebUI a comfortable user-friendly scheduler for ON/OFF commands

- ON/OFF can be sent to KNX, BACnet or another ASM within Application Controller
- Communication object: 1 bit on/off
- No Parameters needed



# Application Controller AC/S 1.x.1

## ASM ON/OFF Scheduler in WebUI





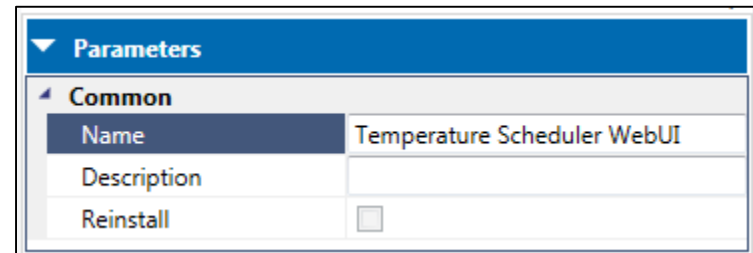
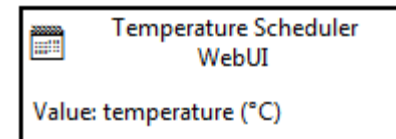
# Application Controller AC/S 1.x.1

ASM

## Temperature Scheduler WebUI

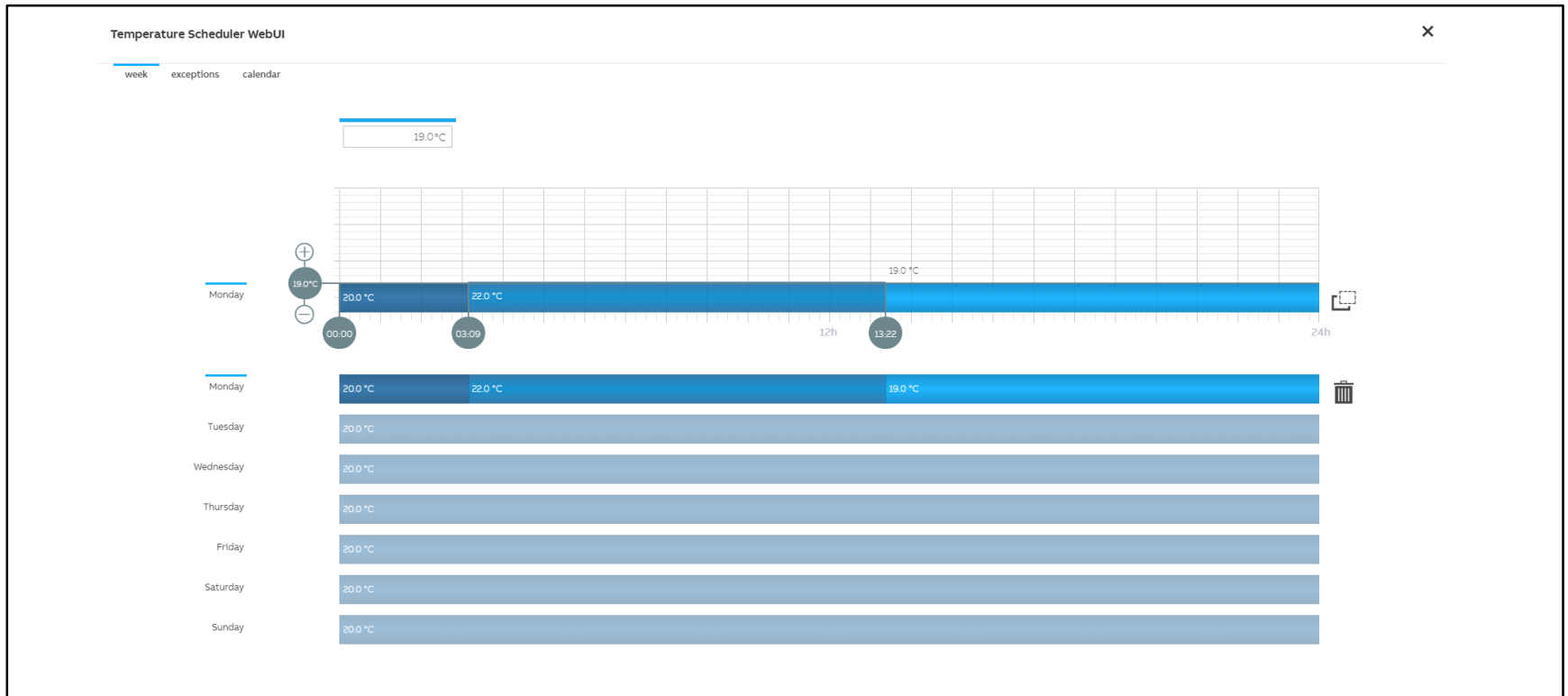
This ASM provides in WebUI a comfortable user-friendly scheduler for setting temperature setpoints

- Values can be sent to KNX, BACnet or another ASM within Application Controller
- Communication object: 2 byte floating
- No Parameters needed



# Application Controller AC/S 1.x.1

## ASM Temperature Scheduler in WebUI



# Application Controller AC/S 1.x.1

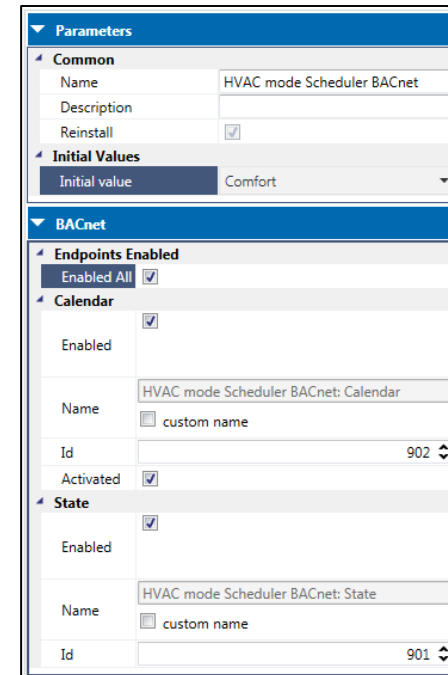
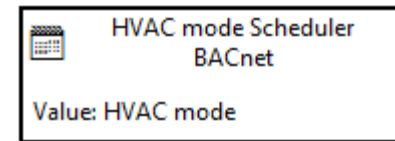
## ASM

### HVAC Mode Scheduler BACnet

This ASM displays in WebUI a scheduler administrated in BACnet to switch between the different HVAC modes depending on time

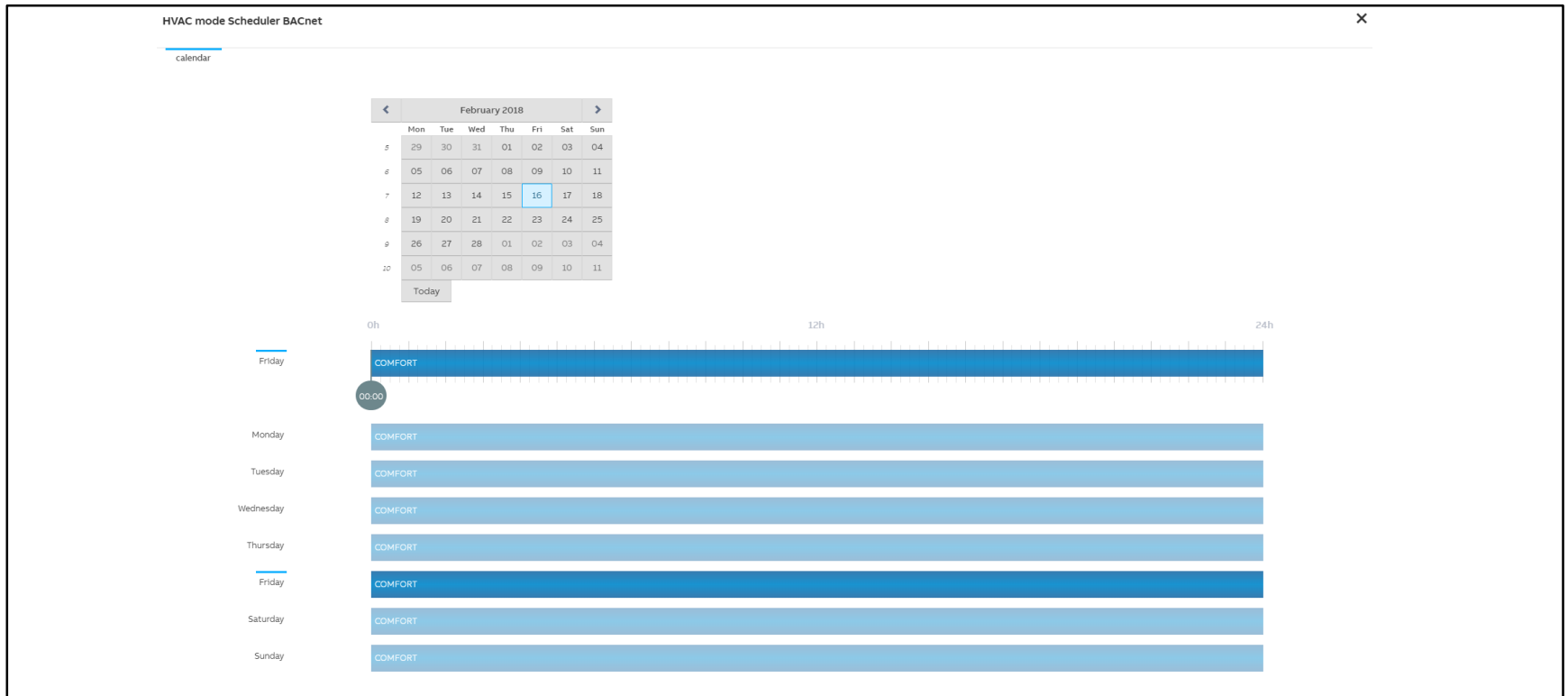
The switching times are parametrised in BACnet, but the execution of the schedule is done reliably by the Application Controller AC/S. The switching times can be viewed only in the WebUI

- Automatic, Comfort, Standby, Economy, Building protection
- Mode can be sent to WebUI, KNX, BACnet or another ASM within Application Controller
- No modification of time by WebUI
- Communication object: 1 byte HVAC Mode
- Parameter: Enable scheduler in BACnet

A screenshot of a web-based configuration interface for BACnet. It features two main sections: "Parameters" and "BACnet". The "Parameters" section includes a "Common" subsection with fields for "Name" (HVAC mode Scheduler BACnet), "Description", and "Reinstall" (checked). It also has an "Initial Values" subsection with a dropdown for "Initial value" set to "Comfort". The "BACnet" section includes an "Endpoints Enabled" subsection with "Enabled All" checked. Below this is a "Calendar" subsection with "Enabled" checked, a "Name" field (HVAC mode Scheduler BACnet: Calendar), a "custom name" checkbox, an "Id" field (902), and an "Activated" checkbox (checked). At the bottom is a "State" subsection with "Enabled" checked, a "Name" field (HVAC mode Scheduler BACnet: State), a "custom name" checkbox, and an "Id" field (901).

# Application Controller AC/S 1.x.1

## ASM HVAC Mode Scheduler BACnet in WebUI



# Application Controller AC/S 1.x.1

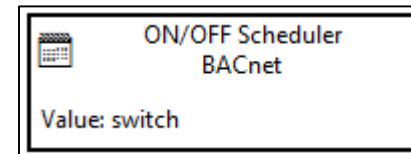
## ASM

### ON/OFF Scheduler BACnet

This ASM displays in WebUI a scheduler administrated in BACnet to switch on or off

The switching times are parametrised in BACnet, but the execution of the schedule is done reliably by the Application Controller AC/S. The switching times can be viewed only in the WebUI

- Command can be sent to WebUI, KNX, BACnet or another ASM within Application Controller
- No time modification by WebUI
- Communication object: 1 bit on/off
- Parameter: Enable scheduler in BACnet



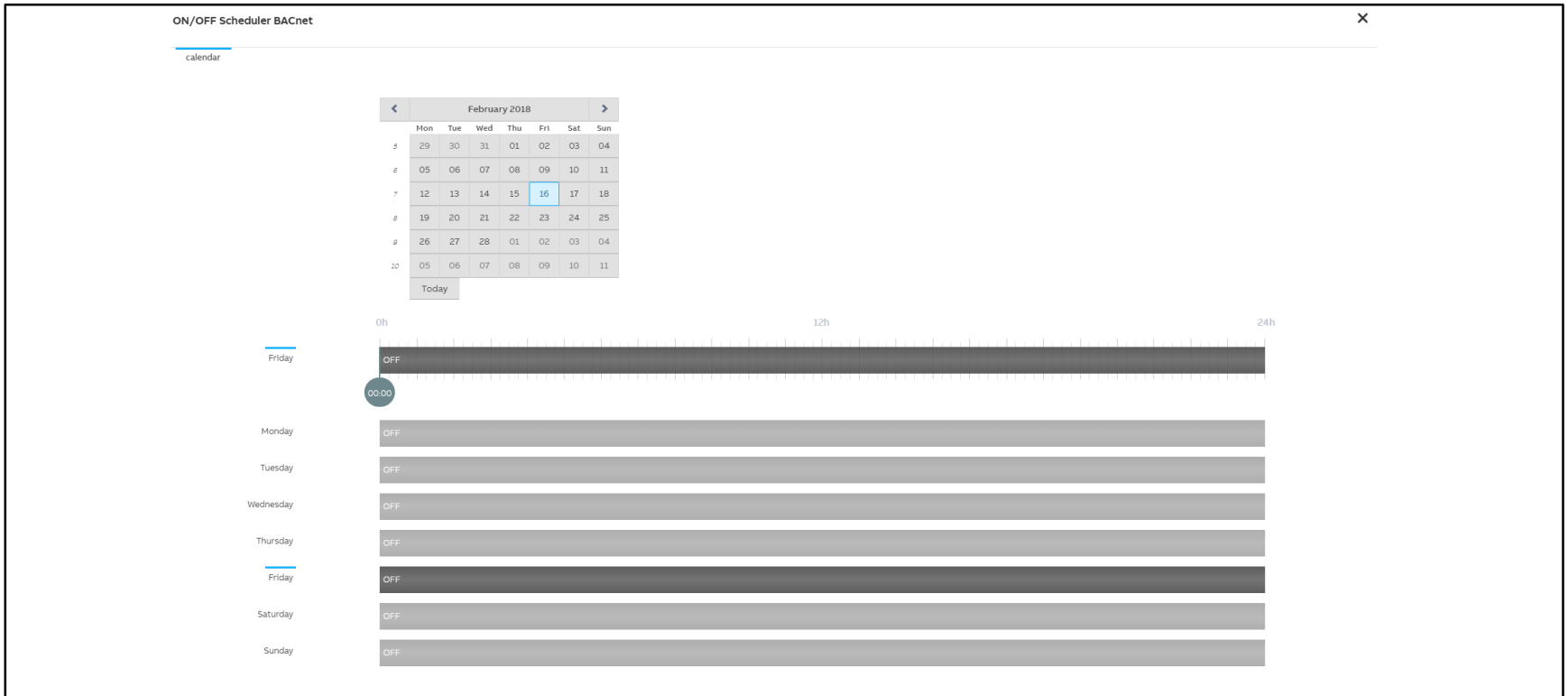
The image shows a screenshot of a web-based configuration interface for an "ON/OFF Scheduler BACnet". The interface is organized into sections with expandable/collapsible headers. The "Parameters" section is expanded, showing sub-sections for "Common" and "Initial Values". The "BACnet" section is also expanded, showing sub-sections for "Endpoints Enabled", "Calendar", and "State". Each sub-section contains various configuration options, some with checkboxes and some with text input fields or dropdown menus. The "Calendar" and "State" sections show a "Name" field with a "custom name" checkbox and an "Id" field with a numeric value and a dropdown arrow.

Parameters	
Common	
Name	ON/OFF Scheduler BACnet
Description	
Reinstall	<input type="checkbox"/>
Initial Values	
Initial value	Off

BACnet	
Endpoints Enabled	
Enable...	<input checked="" type="checkbox"/>
Calendar	
Enabled	<input checked="" type="checkbox"/>
Name	ON/OFF Scheduler BACnet: Calendar
	<input type="checkbox"/> custom name
Id	2102
Activat...	<input checked="" type="checkbox"/>
State	
Enabled	<input checked="" type="checkbox"/>
Name	ON/OFF Scheduler BACnet: State
	<input type="checkbox"/> custom name
Id	2101

# Application Controller AC/S 1.x.1

## ASM ON/OFF Scheduler BACnet in WebUI



# Application Controller AC/S 1.x.1

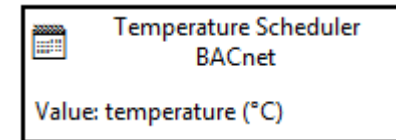
## ASM

### Temperature Scheduler BACnet

This ASM displays in WebUI a the scheduler administrated in BACnet for setting temperature setpoints

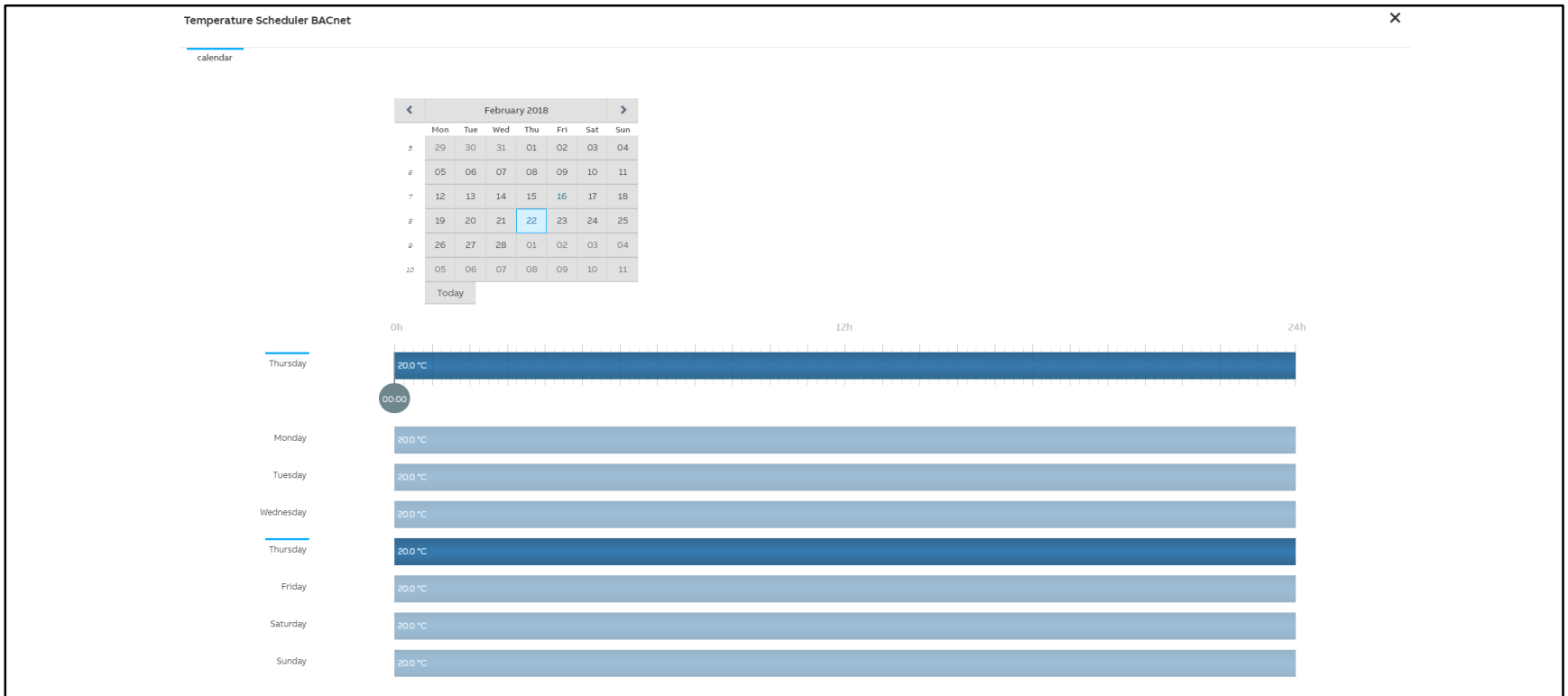
The switching times are parametrised in BACnet, but the execution of the schedule is done reliably by the Application Controller AC/S. The switching times can be viewed only in the WebUI

- Values can be sent to WebUI, KNX, BACnet or another ASM within Application Controller
- No time modification by WebUI
- Communication object: 2 byte floating
- Parameter: Enable scheduler in BACnet

A screenshot of a web-based configuration interface. It features a blue header bar with the text "Parameters". Below this, there are two main sections: "Common" and "BACnet". The "Common" section includes fields for "Name" (Temperature Scheduler BACnet), "Description", "Reinstall" (checked), and "Initial Values" (Initial value: 20 °C). The "BACnet" section includes "Endpoints Enabled" (checked), "Calendar" (checked), "Name" (Temperature Scheduler BACnet: Calendar), "Id" (1002), "Activated" (checked), "State" (checked), "Name" (Temperature Scheduler BACnet: State), and "Id" (1001). Each section has a blue arrow icon to its left, indicating it can be expanded or collapsed.

# Application Controller AC/S 1.x.1

## ASM Temperature Scheduler BACnet in WebUI






# Application Controller AC/S 1.x.1

## ASM

### Room


This ASM represents all HVAC related in- and outputs of a room whose values or states are interesting to be shown or to be changed

- Values can be sent to KNX, BACnet or to another ASM within Application Controller,
- Change of values/States possible via WebUI or KNX by means of communication objects

 Room Edison

Room Set Point: 20.0 °C

Room Temperature: 20.0 °C

 Room Edison

Controller On/Off

Present Room Tem...

Actual Set Point Te...

Heating/Cooling M...

HVAC Operation M...

Window Status

Occupancy Status

rel. Humidity Value

CO2 Value

Fan Coil Unit Valve...

Fan Coil Unit Valve...

Fan Coil Unit Fresh...

Fan Coil Unit Fan Sp...

Fan Coil Unit Fan M...

Radiator Valve

Floor Heating Valve

Parameters	
Common	
Name	Room Edison
Description	
Reinstall	<input checked="" type="checkbox"/>
Interfaces	
Actual Set Point Temp...	Display
Controller On/Off	Display
Heating/Cooling Mode	Display+Set (Slave)
HVAC Operation Mode	Display
Window Status	<input checked="" type="checkbox"/>
Occupancy Status	<input checked="" type="checkbox"/>
rel. Humidity Value	<input checked="" type="checkbox"/>
CO2 Value	<input checked="" type="checkbox"/>
Fan Coil Unit	4-pipe Heating + Cooling
Fan Coil Unit Addition...	None
Fan Coil Unit Fresh Air...	Open/Closed
Fan Coil Unit Fan Speed	Display
Fan Coil Unit Type of F...	On/Off
Fan Coil Unit Dew Poin...	<input type="checkbox"/>
Fan Coil Unit Level Sen...	<input type="checkbox"/>
Radiator	On/Off
Floor Heating	0...100%
Floor Temperature Sen...	<input type="checkbox"/>
Cooling Ceiling	None
Split Unit	<input type="checkbox"/>

# Application Controller AC/S 1.x.1

ASM

## Room

Changeable values in WebUI are set point, controller On/Off, heating/cooling mode, HVAC operation mode and fan speed

- Display and set (Slave) DPT 9.001/9.002: new unified RTC concept
- Display and set (Slave) DPT 6.010: existing unified RTC concept

The screenshot displays the 'Parameters' section of the Room configuration interface. It is divided into two main categories: 'Common' and 'Interfaces'.

**Common Parameters:**

Parameter	Value
Name	Room Edison
Description	
Reinstall	<input checked="" type="checkbox"/>

**Interfaces Parameters:**

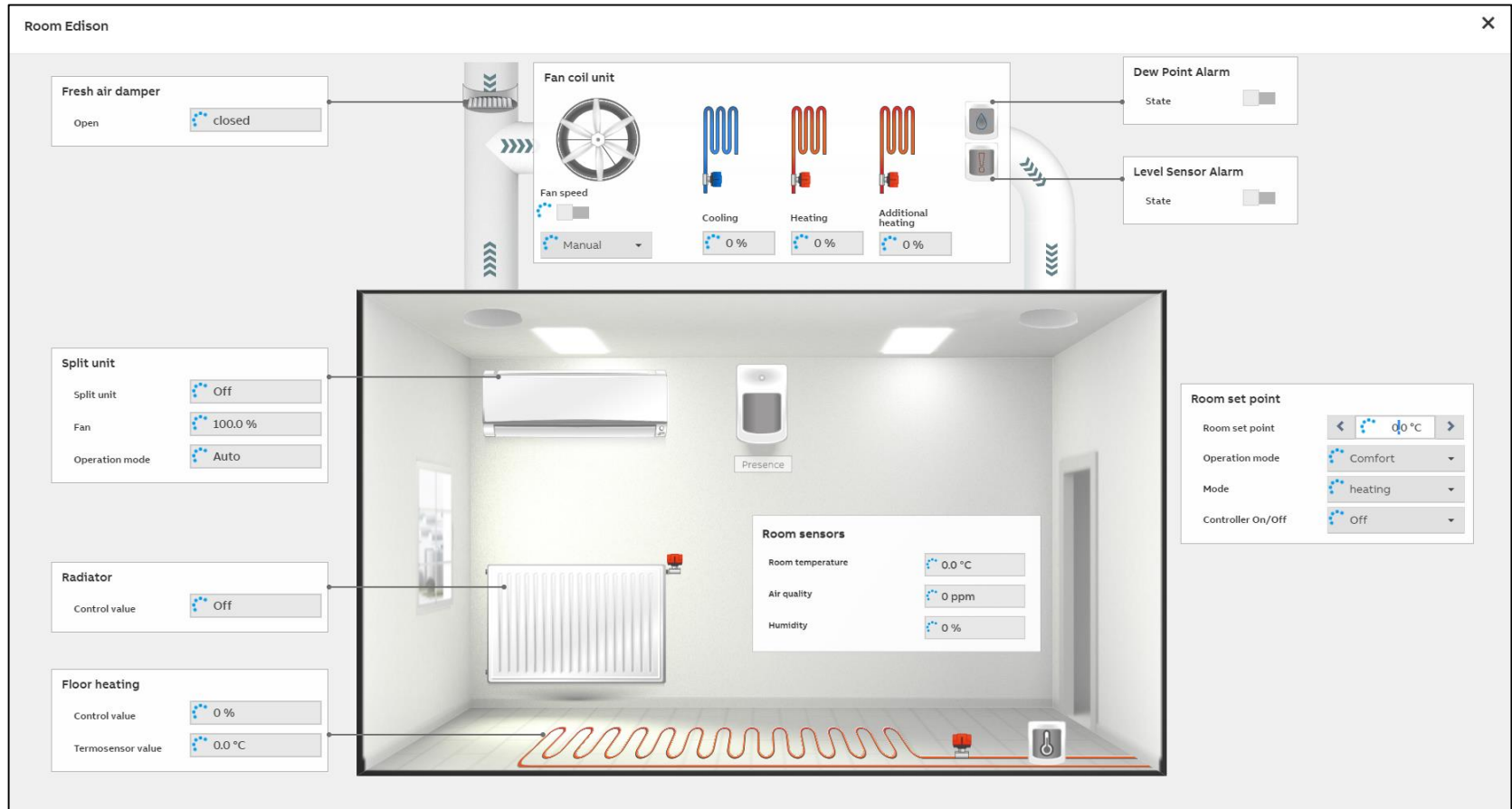
Parameter	Value
Actual Set Point Temp...	Display
Controller On/Off	Display
Heating/Cooling Mode	Display+Set (Slave) DPT 9.001/DPT 9.002
HVAC Operation Mode	Display+Set (Slave) DPT 6.010

Below the main parameter list, there is a detailed view of the 'Actual Set Point Temperature' parameter, showing its configuration options and status:

Parameter	Value
Actual Set Point Temperature	Display+Set (Slave) DPT...
Room Set Point Temperature Type	Absolute Set Point Temp...
Controller On/Off	Display+Set (Slave)
Heating/Cooling Mode	Display+Set (Slave)
HVAC Operation Mode	Display+Set (Slave)
Window Status	<input checked="" type="checkbox"/>
Occupancy Status	<input checked="" type="checkbox"/>
rel. Humidity Value	<input checked="" type="checkbox"/>
CO2 Value	<input checked="" type="checkbox"/>
Fan Coil Unit	4-pipe Heating + Cooling
Fan Coil Unit Additional Heating Stage	None
Fan Coil Unit Fresh Air Damper Positi...	Open/Closed
Fan Coil Unit Fan Speed	Display+Set (Slave) 5.001

# Application Controller AC/S 1.x.1

## ASM Room in WebUI



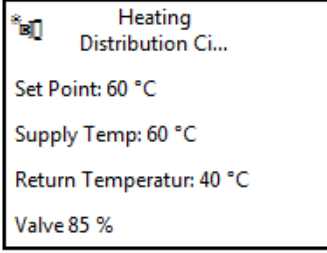
# Application Controller AC/S 1.x.1

ASM

## Heating Distribution Circuit

This ASM with adjustable intelligence inside works together with Heating Cooling Circuit Controller HCC/S 1.x.x.1

- Control of flow temperature of a heating circuit depending on outside temperature and optional depending on room demands (Position of valve in each room)
- Curve (Flow temperature depending on outside temperature) can be adjusted
- For room demand evaluation the valve with the most open position is relevant
- ECO Mode depending on scheduler or on current room setpoints (Max. Value)



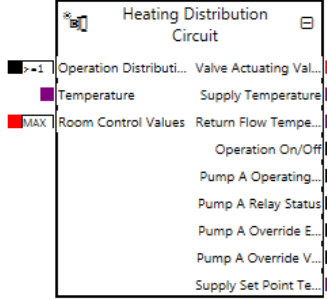
Heating Distribution Ci...

Set Point: 60 °C

Supply Temp: 60 °C

Return Temperatur: 40 °C

Valve 85 %



Heating Distribution Circuit

Operation Distributi... Valve Actuating Val...

Temperature Supply Temperature

Room Control Values Return Flow Tempe...

Operation On/Off

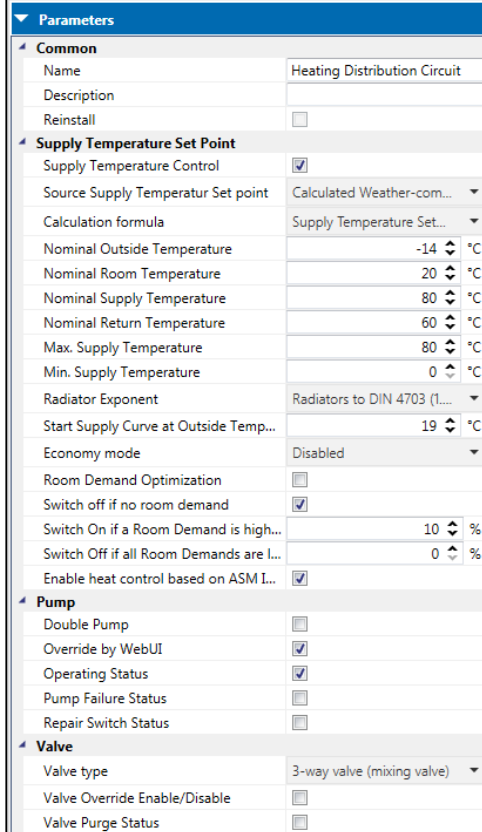
Pump A Operating...

Pump A Relay Status

Pump A Override E...

Pump A Override V...

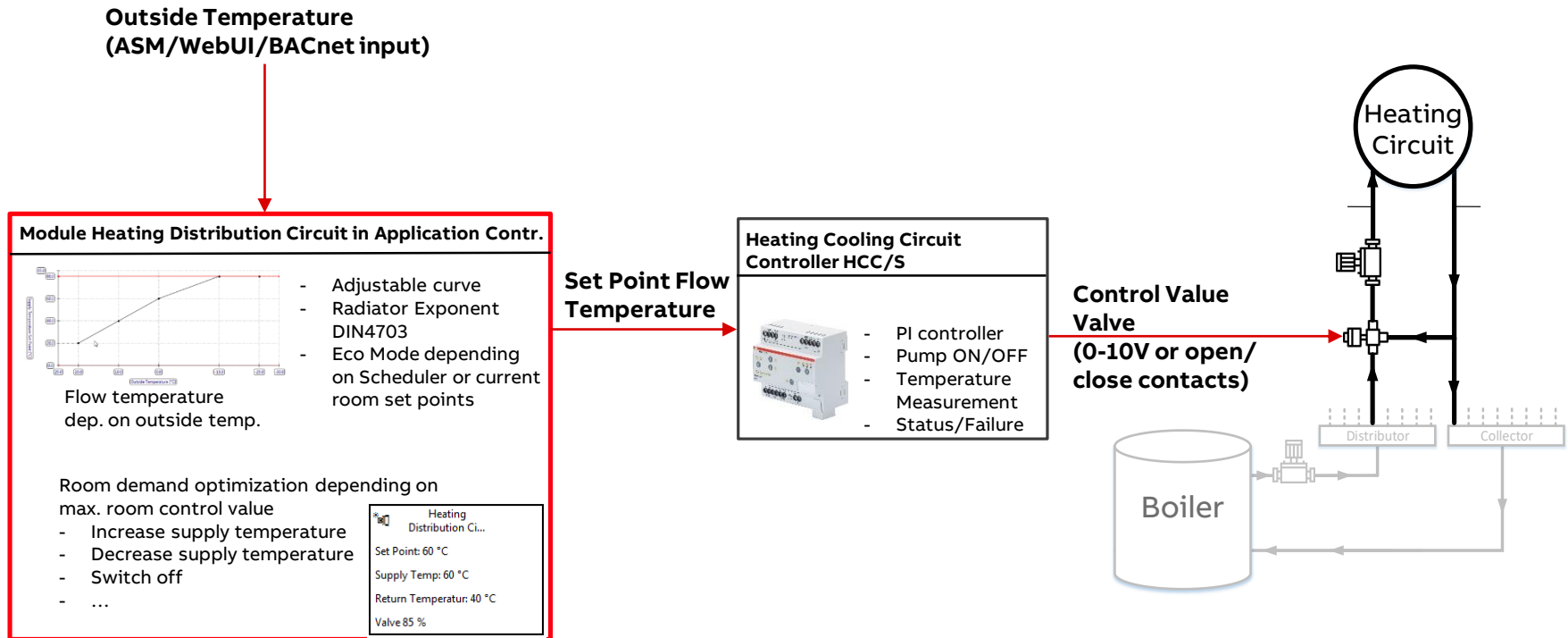
Supply Set Point Te...



Parameters	
Common	
Name	Heating Distribution Circuit
Description	
Reinstall	<input type="checkbox"/>
Supply Temperature Set Point	
Supply Temperature Control	<input checked="" type="checkbox"/>
Source Supply Temperatur Set point	Calculated Weather-com...
Calculation formula	Supply Temperature Set...
Nominal Outside Temperature	-14 °C
Nominal Room Temperature	20 °C
Nominal Supply Temperature	80 °C
Nominal Return Temperature	60 °C
Max. Supply Temperature	80 °C
Min. Supply Temperature	0 °C
Radiator Exponent	Radiators to DIN 4703 (1...
Start Supply Curve at Outside Temp...	19 °C
Economy mode	Disabled
Room Demand Optimization	<input type="checkbox"/>
Switch off if no room demand	<input checked="" type="checkbox"/>
Switch On if a Room Demand is high...	10 %
Switch Off if all Room Demands are l...	0 %
Enable heat control based on ASM I...	<input checked="" type="checkbox"/>
Pump	
Double Pump	<input type="checkbox"/>
Override by WebUI	<input checked="" type="checkbox"/>
Operating Status	<input checked="" type="checkbox"/>
Pump Failure Status	<input type="checkbox"/>
Repair Switch Status	<input type="checkbox"/>
Valve	
Valve type	3-way valve (mixing valve)
Valve Override Enable/Disable	<input type="checkbox"/>
Valve Purge Status	<input type="checkbox"/>

# Application Controller AC/S 1.x.1

## Function ASM Heating Distribution Circuit in context

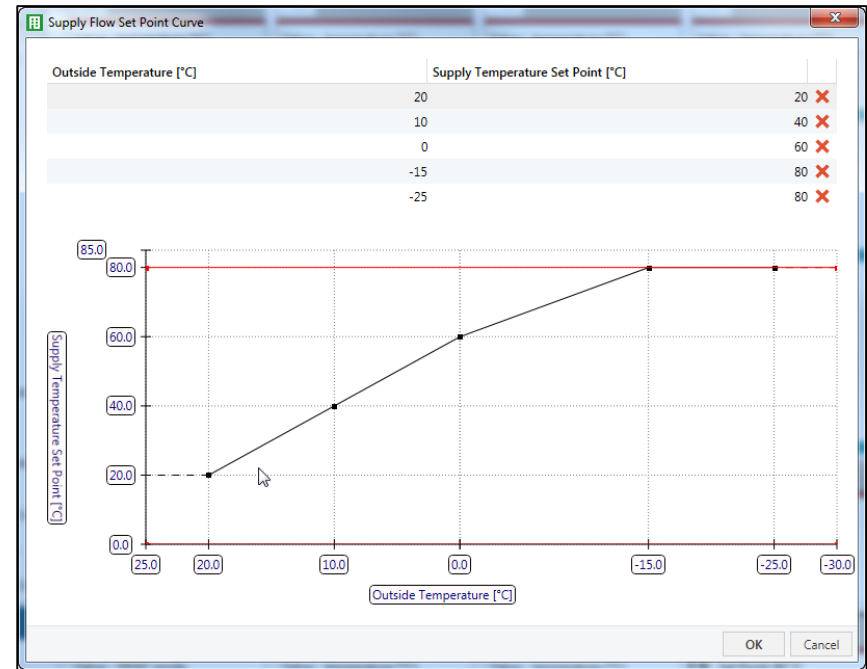


# Application Controller AC/S 1.x.1

ASM

## Heating Distribution Circuit

Supply flow set point curve can be adjusted, both in ETS and in WebUI



# Application Controller AC/S 1.x.1

ASM

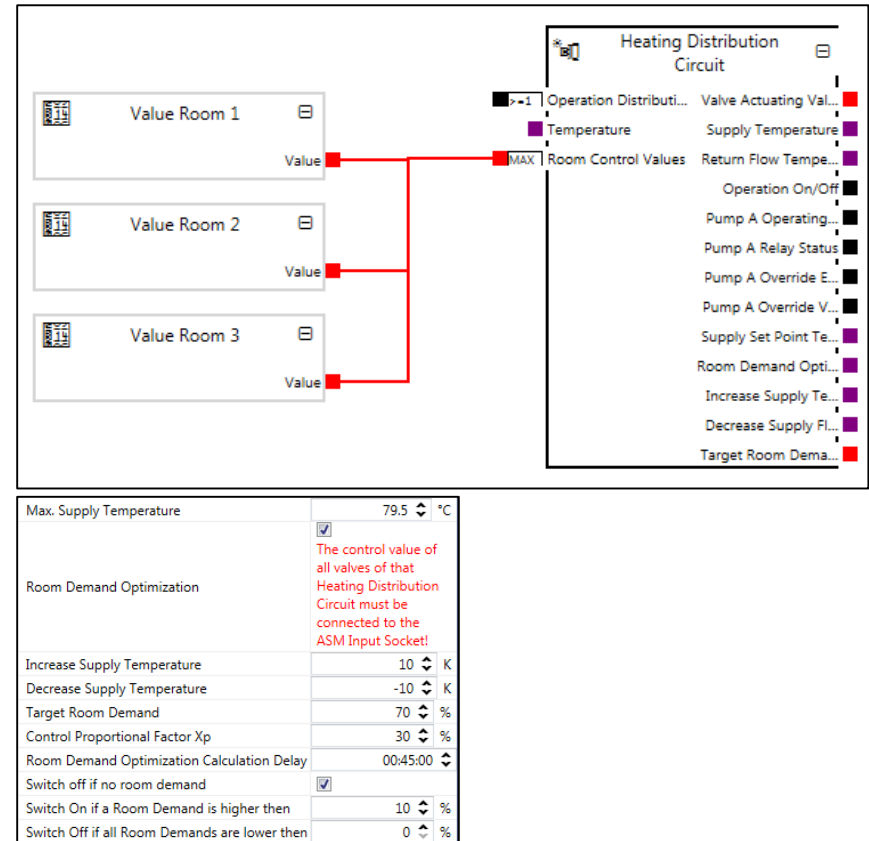
## Heating Distribution Circuit

Room demand optimization: Evaluation of valve position by means of the valve with highest position

Heating curve is automatically adapted depending on parameter adjustment visible now

### Example:

- Target room demand 70 %
- Present situation: Valves with more than 70 % control value detected
- Supply temperature is increased by 10K
- P-factor of controller increased by 30%
- After 45 min new calculation



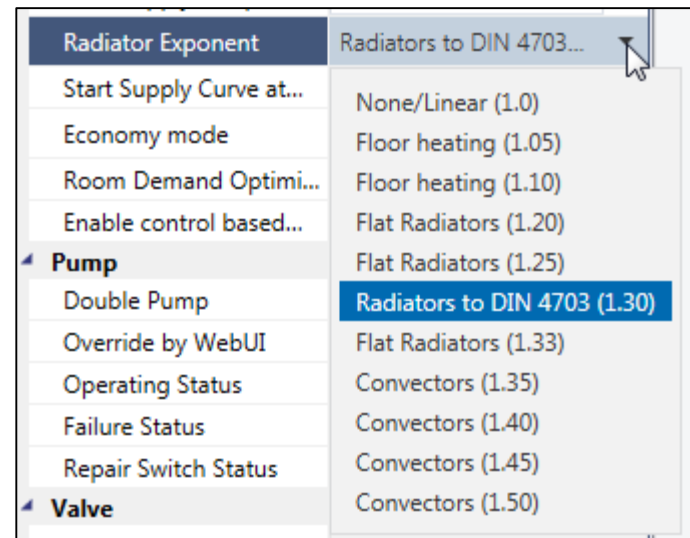
# Application Controller AC/S 1.x.1

ASM

## Heating Distribution Circuit

### Radiator Exponent

- By selecting the standard curve (Flow temperature depending on outside temperature) it is possible to select the type of radiator/convector/floor heating according to DIN 4703 for an adapted curve and precise room temperature control
- The radiator exponent describes the ratio of the rising flow temperature to the disproportionately increasing heat output into the room
- Information comes from the manufacturer

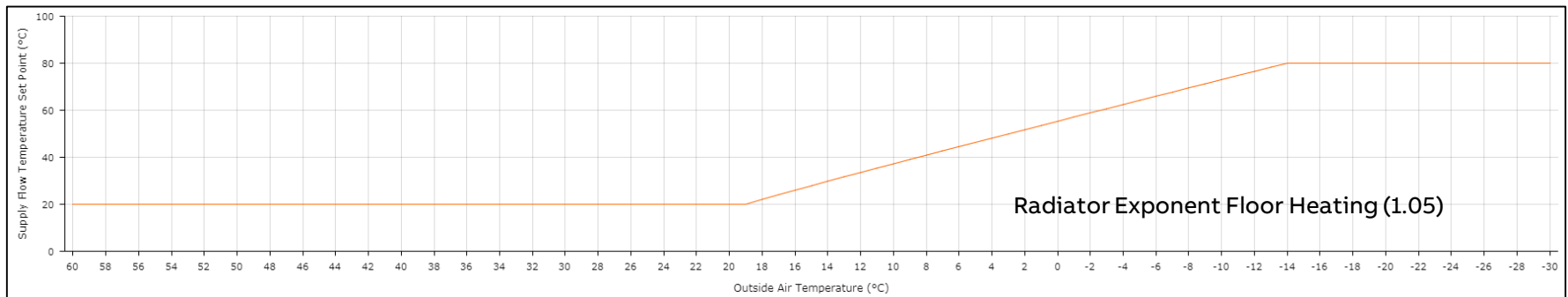
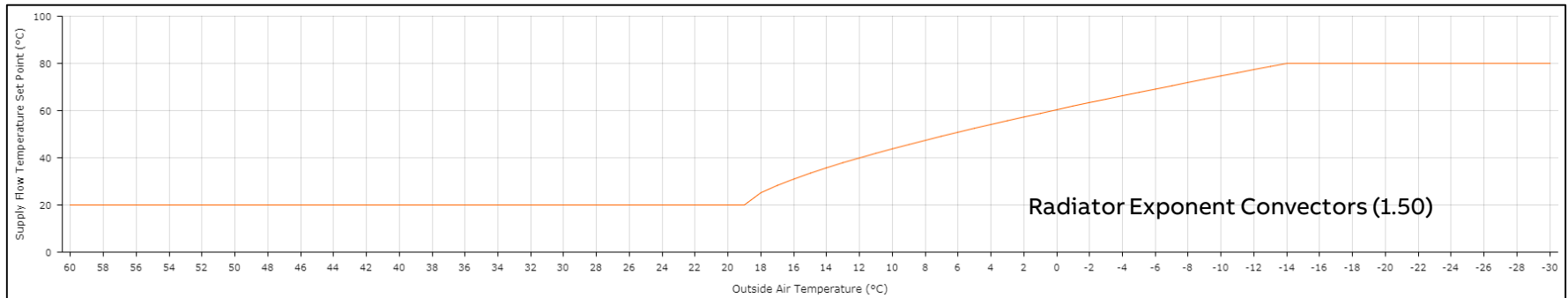




# Application Controller AC/S 1.x.1

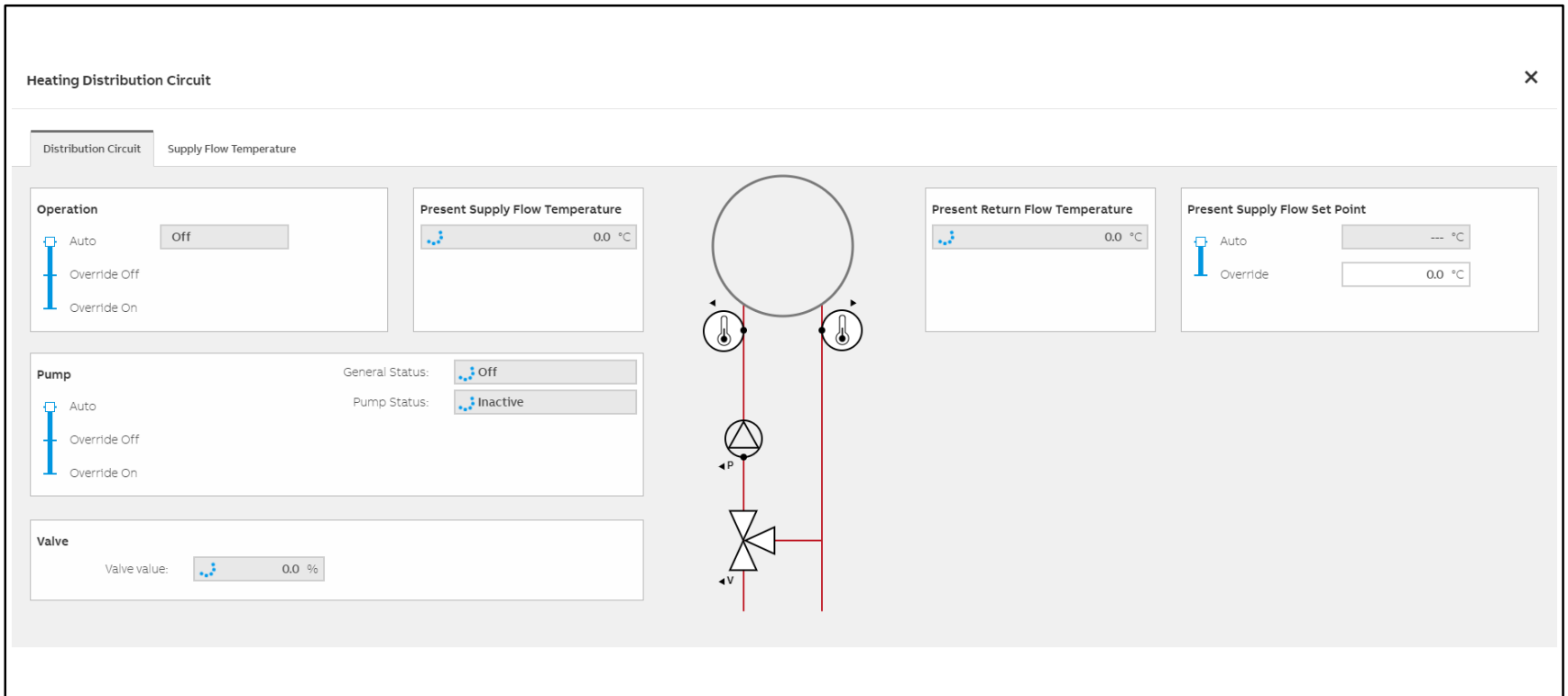
## ASM Heating Distribution Circuit in WebUI

### Heating curve depending on Radiator Exponent



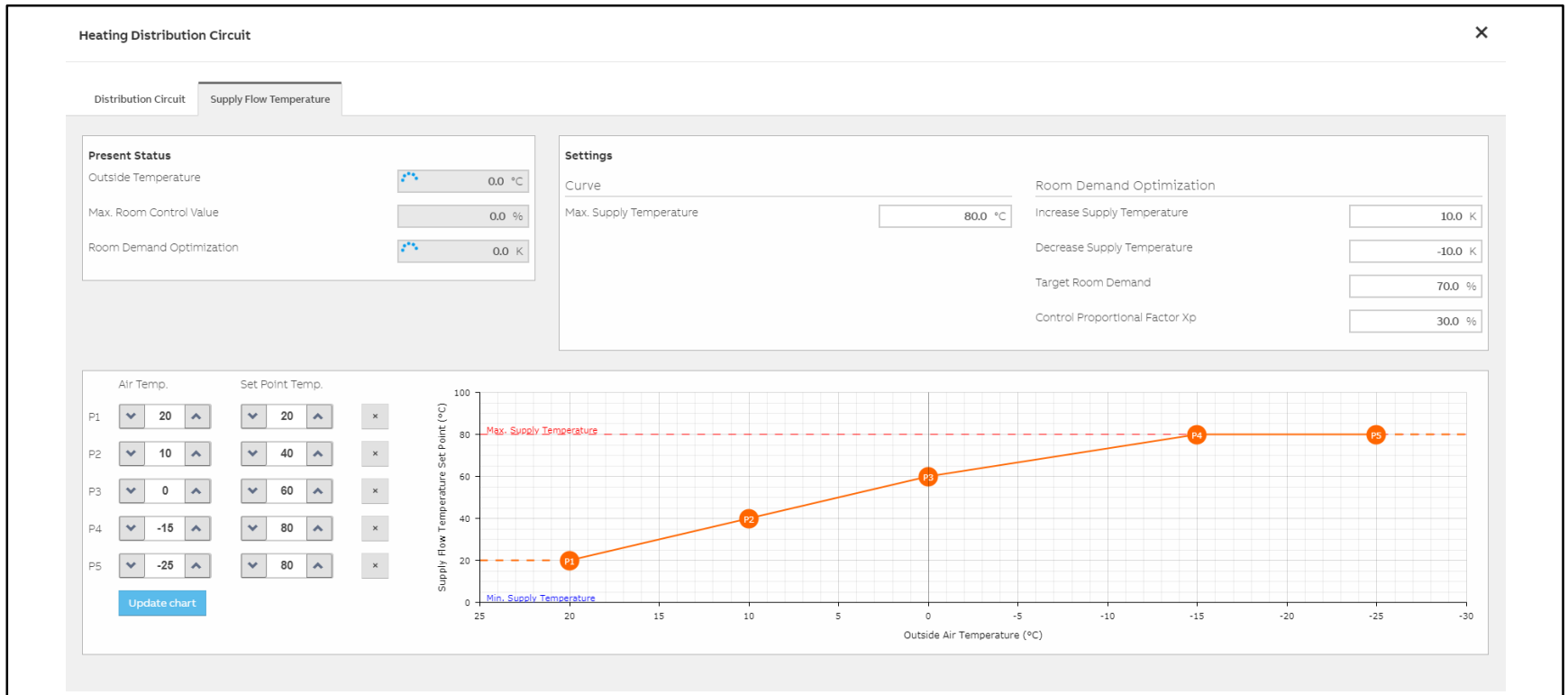
# Application Controller AC/S 1.x.1

## ASM Heating Distribution Circuit in WebUI



# Application Controller AC/S 1.x.1

## ASM Heating Distribution Circuit in WebUI



# Application Controller AC/S 1.x.1

ASM

## Cooling Distribution Circuit

This ASM with adjustable intelligence inside works together with Heating Cooling Circuit Controller HCC/S 1.x.x.1

- Control of flow temperature of a cooling circuit depending on outside temperature
- Curve (Flow temperature depending on outside temperature) can be adjusted

**Cooling Distribution Circuit (1)**

Temperature Valve Actuating Val...  
Supply Temperature  
Return Flow Tempe...  
Pump A Operating...  
Pump A Relay Status  
Pump A Failure Stat...  
Pump A Repair Swit...  
Pump A Override E...  
Pump A Override V...  
Pump B Operating...  
Pump B Relay Status  
Pump B Failure Status  
Pump B Repair swit...  
Pump B Override En...  
Pump B Override V...  
Supply Set Point Te...

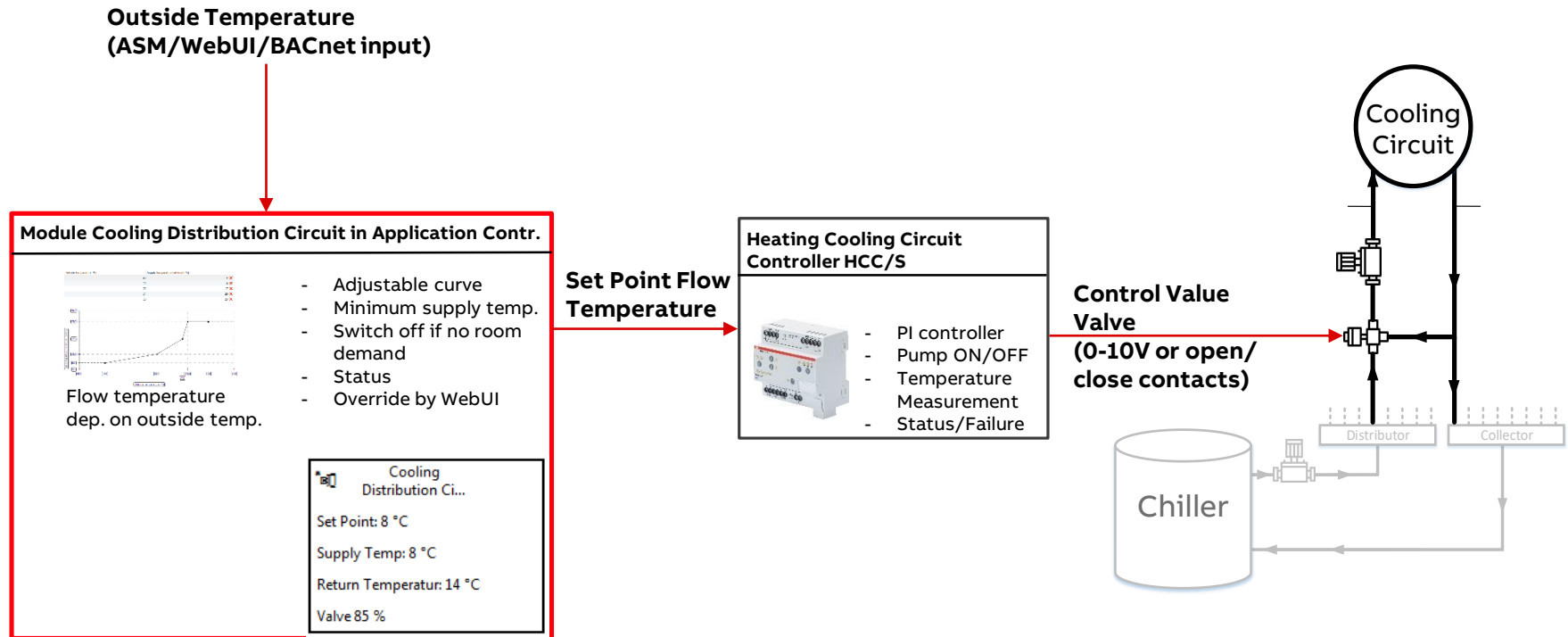
**Cooling Distribution Ci...**  
Set Point: 8 °C  
Supply Temp: 8 °C  
Return Temperatur: 14 °C  
Valve 85 %

**Parameters**

- Common**
  - Name: Cooling Distribution Circuit (1)
  - Description:
  - Reinstall: ☐
- Supply Temperature Set Point**
  - Supply Temperature C...: ☒
  - Source Supply Temper...: Calculated Weather-co...
  - Max. Supply Temperat...: 150 °C
  - Min. Supply Temperat...: 3 °C
  - Switch off if no room...: ☐
  - Custom Supply Tempe...:
  - Enable cool control ba...: ☐
- Pump**
  - Double Pump: ☒
  - Override by WebUI: ☒
  - Operating Status: ☒
  - Pump Failure Status: ☒
  - Repair Switch Status: ☒
- Valve**
  - Valve type: 3-way valve (mixing val...)
  - Valve Override Enable/...: ☐
  - Valve Purge Status: ☐

# Application Controller AC/S 1.x.1

## Function ASM Cooling Distribution Circuit in context

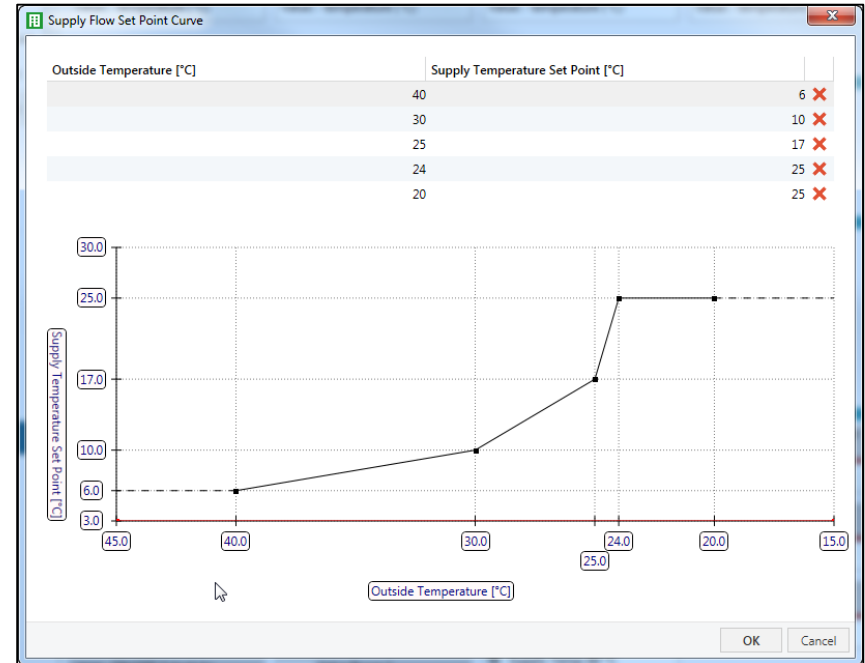


# Application Controller AC/S 1.x.1

ASM

## Cooling Distribution Circuit

Supply flow setpoint curve can be adjusted, both in ETS and in WebUI



# Application Controller AC/S 1.x.1

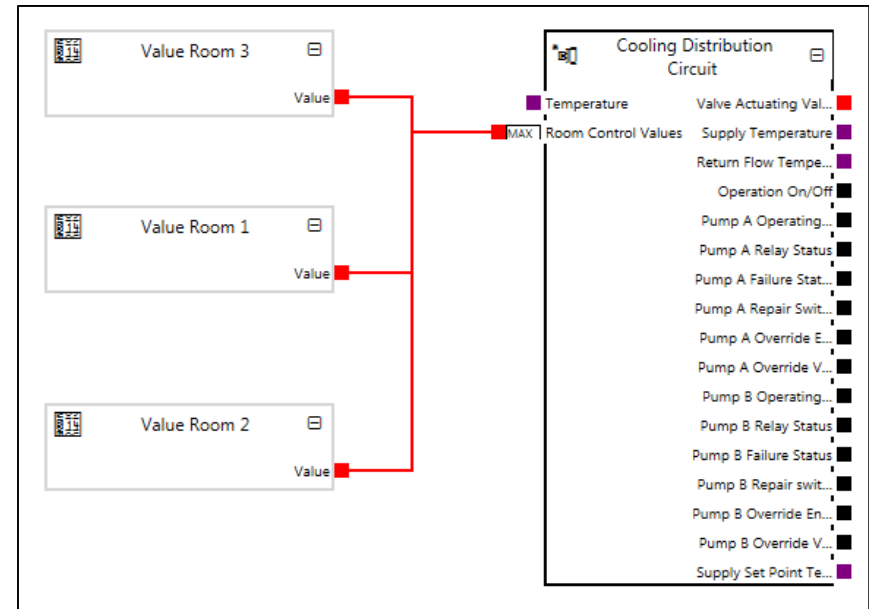
ASM

## Cooling Distribution Circuit

Room demand optimization: Evaluation of valve position by means of the valve with highest position

Cooling circuit will be switched off if there is no room demand (Minimum one valve > 0)

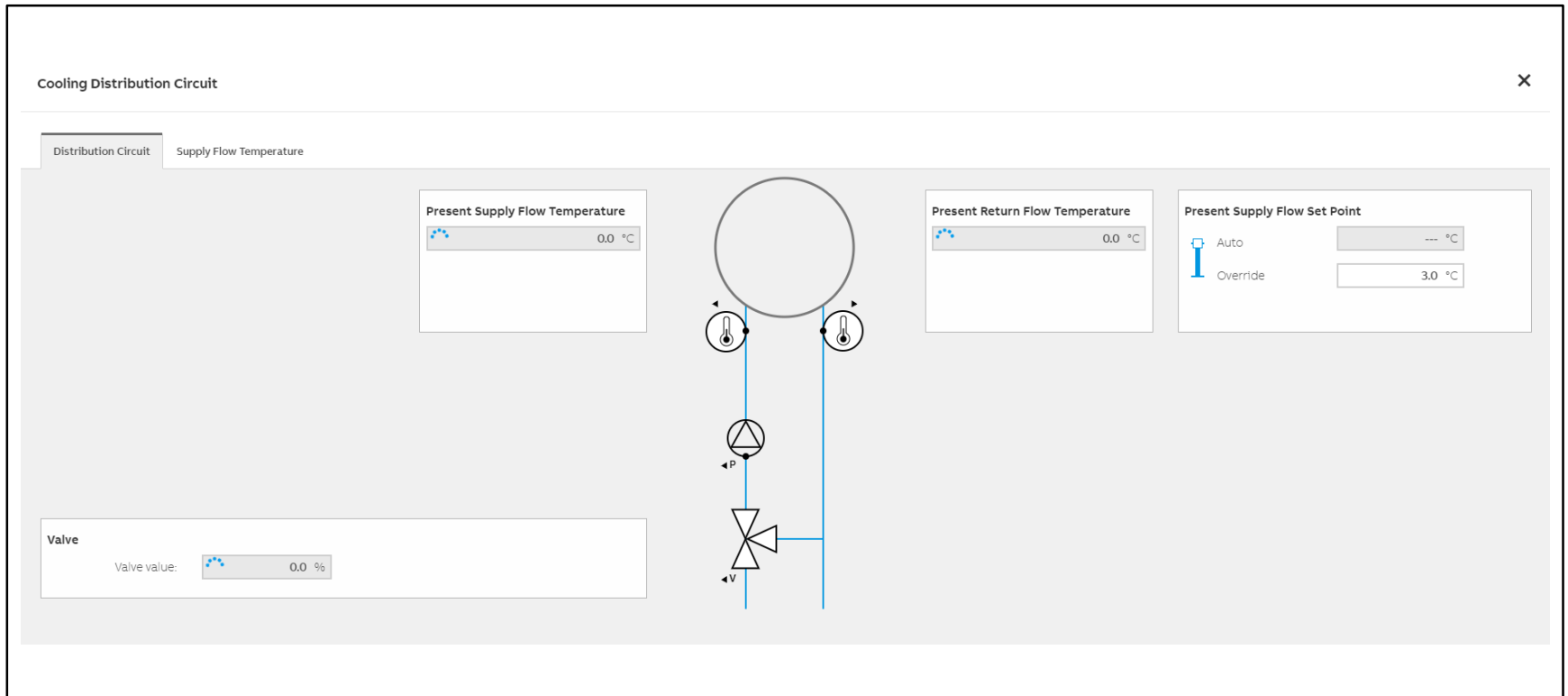
Limits for switch on and off adjustable



Switch off if no room demand	<input checked="" type="checkbox"/>
Switch On if a Room Demand is higher then	10 %
Switch Off if all Room Demands are lower then	0 %

# Application Controller AC/S 1.x.1

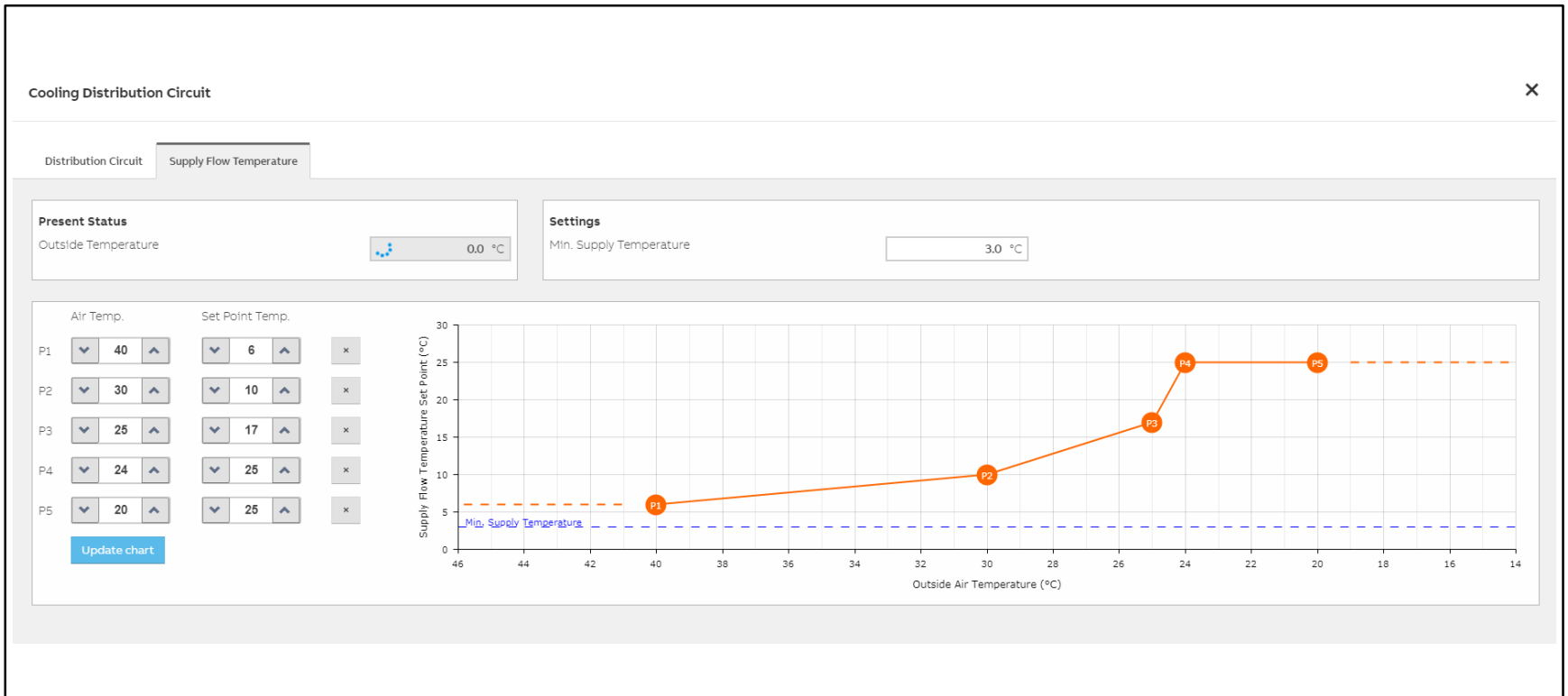
## ASM Cooling Distribution Circuit in WebUI





# Application Controller AC/S 1.x.1

## ASM Cooling Distribution Circuit in WebUI



# Application Controller AC/S 1.x.1

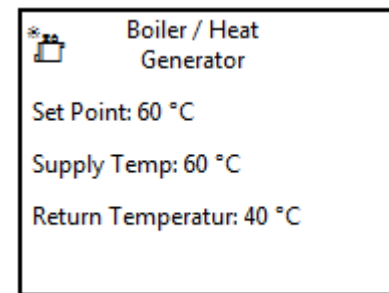
ASM

## Heat Generator

The ASM calculates the boiler temperature set point and send it to the BCI/S Boiler Chiller Interface device which is connected to a heat generator like boilers, heat pumps, ...

The ASM shows as well the status of the field devices and gives the possibility to override the outputs of the Device by WebUI

Functionality is in principle similar to ASM Heating distribution circuit except integrated PI Controller

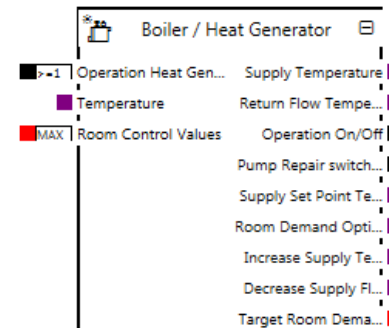


Boiler / Heat Generator

Set Point: 60 °C

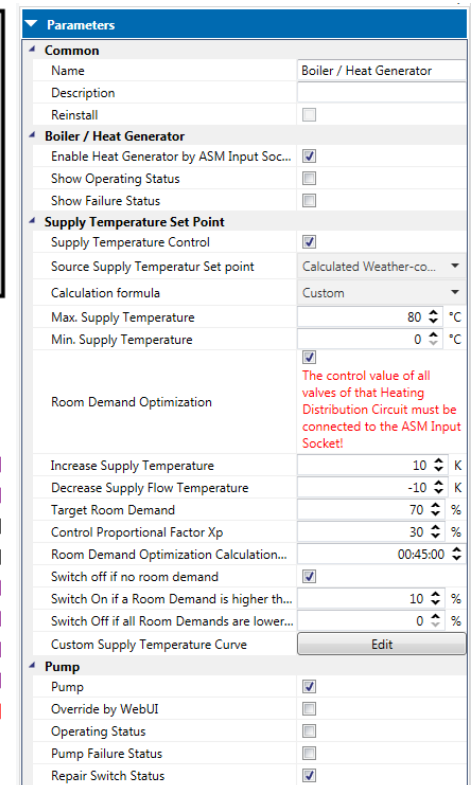
Supply Temp: 60 °C

Return Temperature: 40 °C



Boiler / Heat Generator

- Operation Heat Gen... Supply Temperature
- Temperature Return Flow Temperature
- Room Control Values Operation On/Off
- Pump Repair switch...
- Supply Set Point Temperature
- Room Demand Optimization
- Increase Supply Temperature
- Decrease Supply Flow Temperature
- Target Room Demand



Parameters

Common

Name: Boiler / Heat Generator

Description:

Reinstall:

Boiler / Heat Generator

Enable Heat Generator by ASM Input Socket:

Show Operating Status:

Show Failure Status:

Supply Temperature Set Point

Supply Temperature Control:

Source Supply Temperature Set point:

Calculation formula:

Max. Supply Temperature:

Min. Supply Temperature:

Room Demand Optimization

Increase Supply Temperature:

Decrease Supply Flow Temperature:

Target Room Demand:

Control Proportional Factor Xp:

Room Demand Optimization Calculation...

Switch off if no room demand:

Switch On if a Room Demand is higher than:

Switch Off if all Room Demands are lower than:

Custom Supply Temperature Curve:

Pump

Pump:

Override by WebUI:

Operating Status:

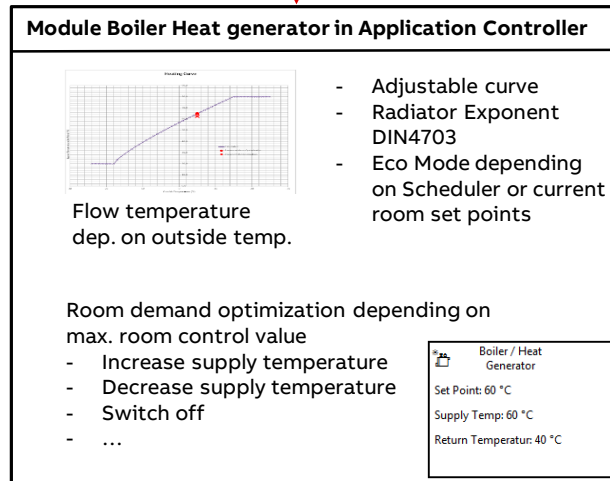
Pump Failure Status:

Repair Switch Status:

# Application Controller AC/S 1.x.1

## Function in Context with Heating (Boiler Control **without** Heating Circuit Control (HCC/S))

Outside Temperature  
(or ASM/WebUI/BACnet input)



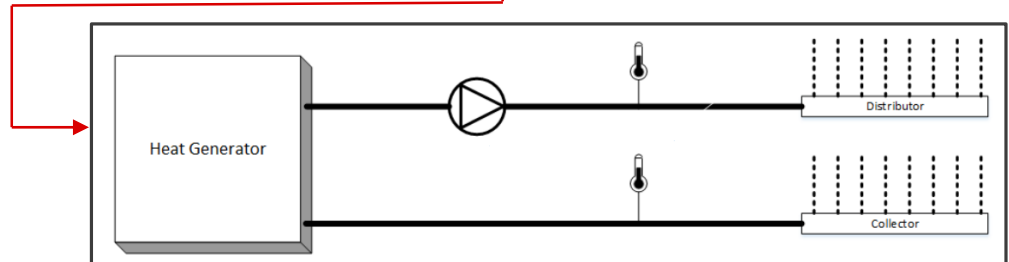
**Control Value  
Boiler  
Power or  
Temperature**

**Boiler Chiller interface BCI/S**



- Boiler ON/OFF
- Pump ON/OFF
- Temperature Measurement
- Status/Failure

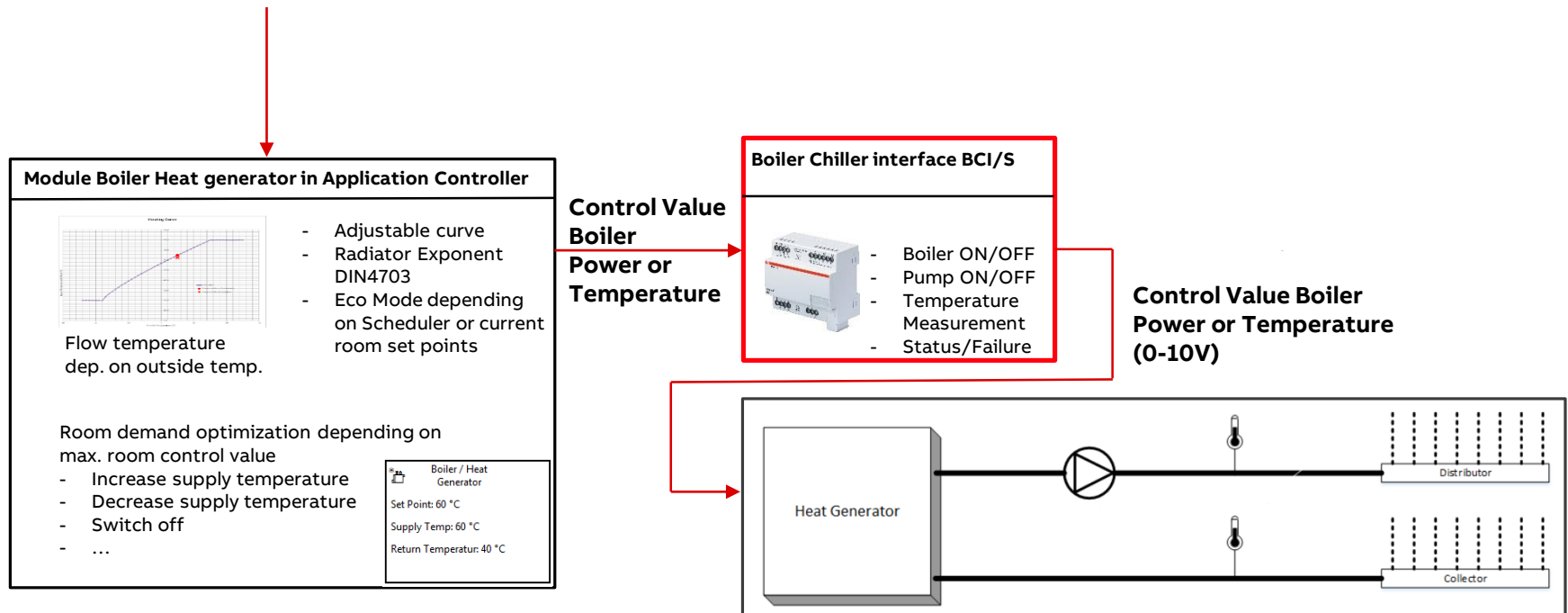
**Control Value Boiler  
Power or Temperature  
(0-10V)**



# Application Controller AC/S 1.x.1

## Function in Context with Heating (Boiler Control **with** Heating Circuit Control (HCC/S))

ASM Input: Maximum Control Value  
from the actuators in the rooms

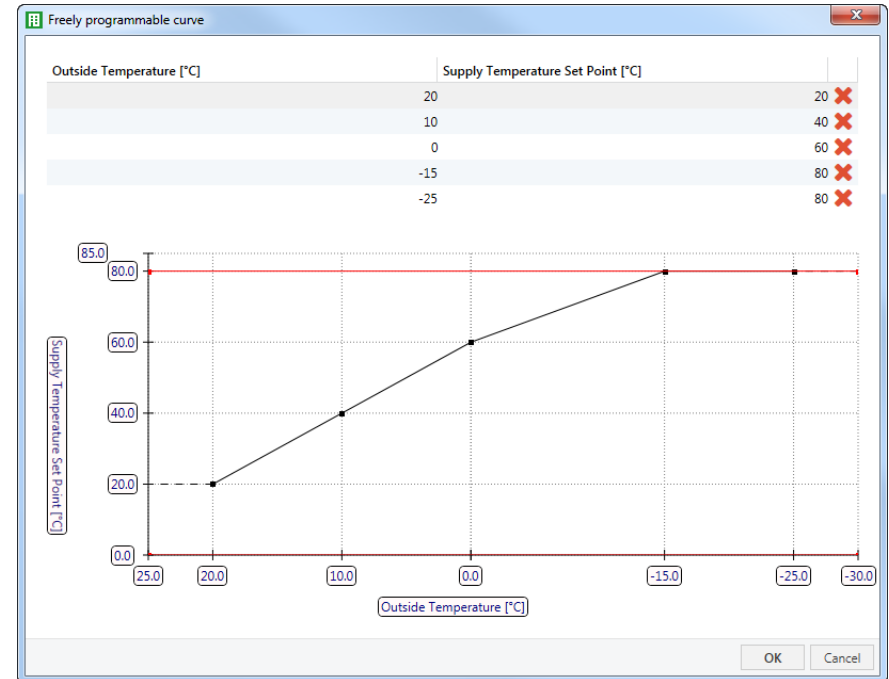


# Application Controller AC/S 1.x.1

ASM

## Heat Generator

Supply temperature set point curve can be adjusted, both in ETS and in WebUI



# Application Controller AC/S 1.x.1

ASM

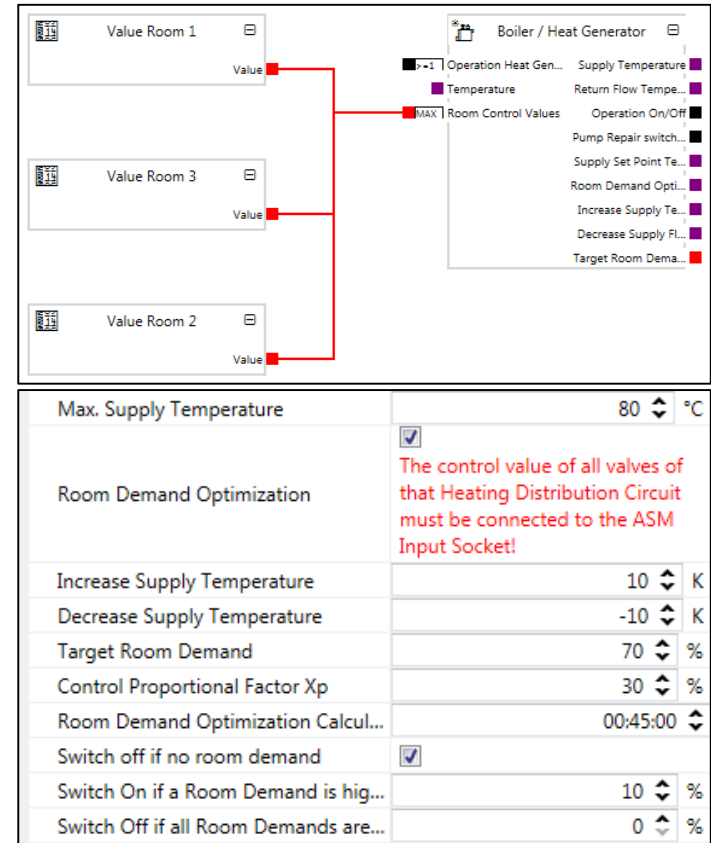
## Heat Generator

Room demand optimization: Evaluation of valve position by means of the valve with highest position

Heating curve is automatically adapted depending on parameter adjustment visible now

Example:

- Target room demand 70 %
- Present situation: Valves with more than 70 % control value detected
- Supply temperature is increased by 10K
- P-factor of controller increased by 30%
- After 45 min new calculation

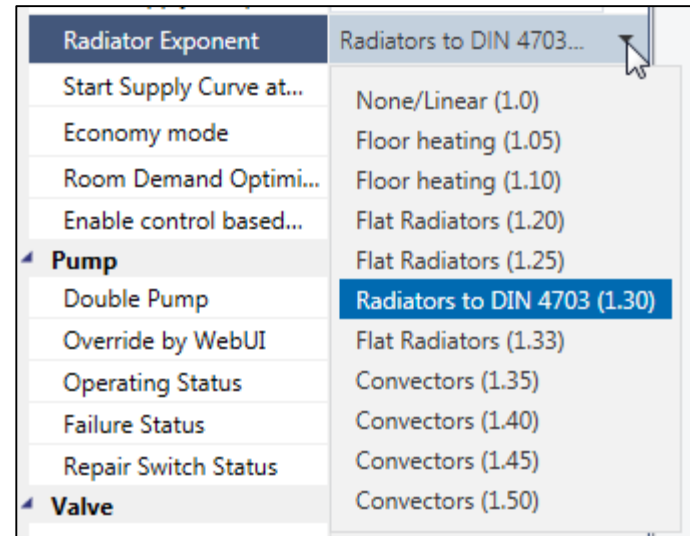


# Application Controller AC/S 1.x.1

ASM

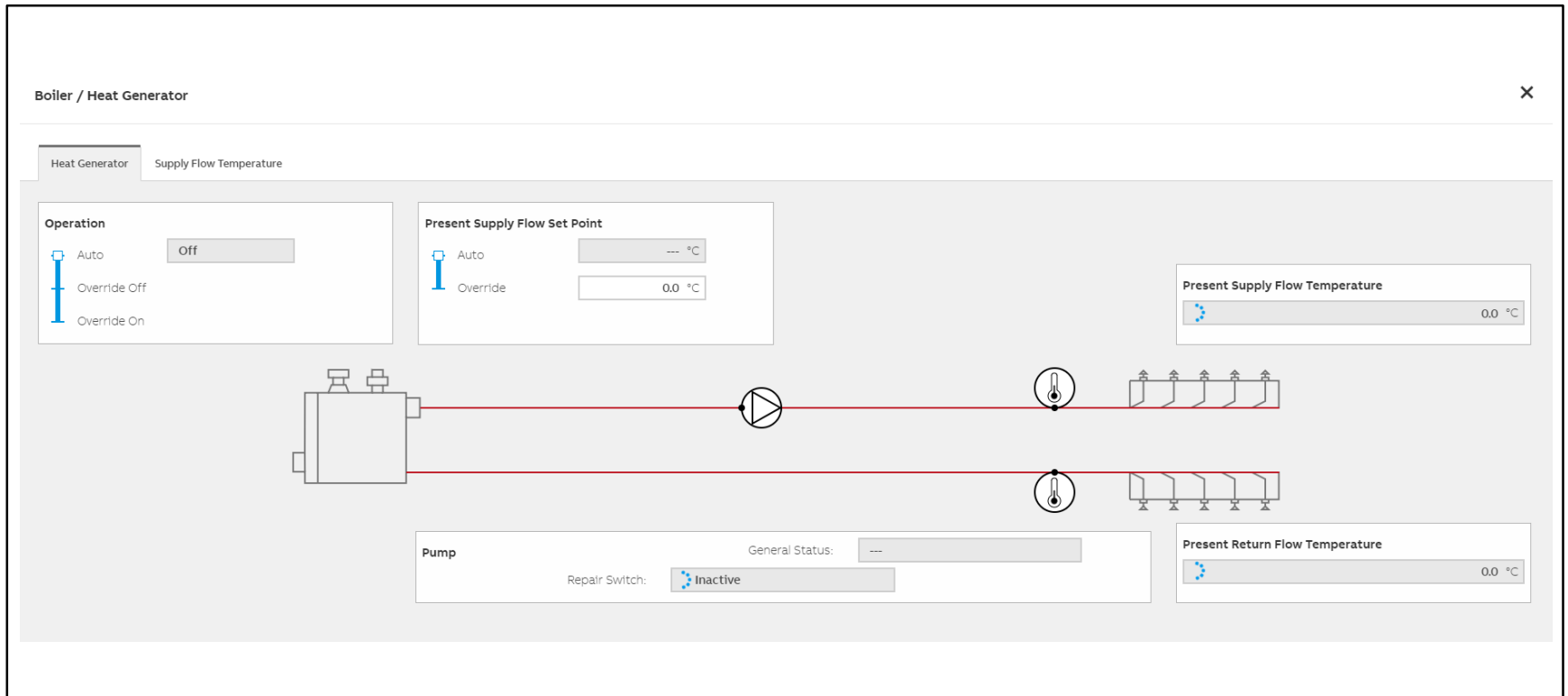
## Heat Generator

By selecting the standard curve (Flow temperature depending on outside temperature) it is possible to select the type of radiator/convector/floor heating according to DIN 4703 for an adapted curve and precise room temperature control



# Application Controller AC/S 1.x.1

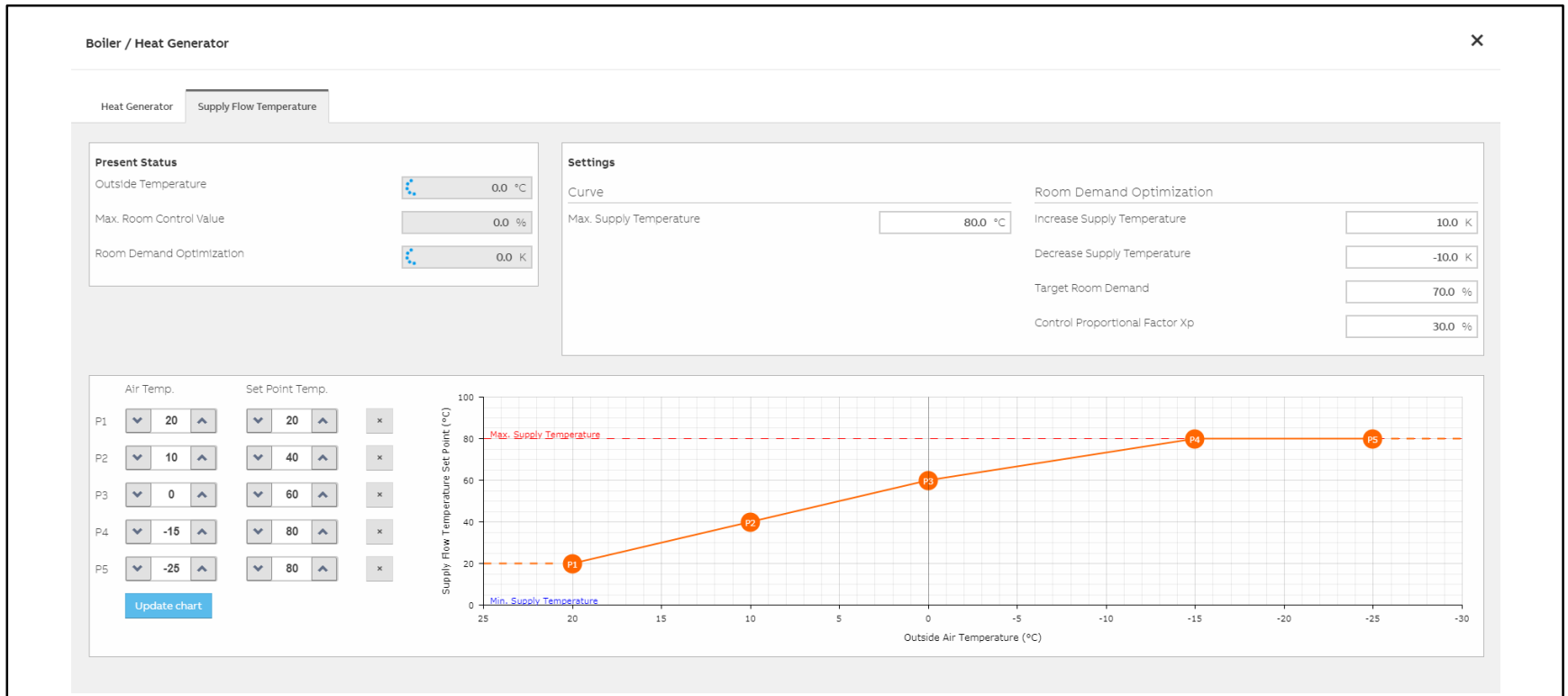
## ASM Heat Generator in WebUI





# Application Controller AC/S 1.x.1

## ASM Heat Generator in WebUI



# Application Controller AC/S 1.x.1

ASM

## Chiller

The ASM calculates the chiller temperature set point and send it to the BCI/S Boiler Chiller Interface field device which is connected to a Cool generator like chillers, Heat Pumps, ...

The ASM shows as well the status of the field devices and gives the possibility to override the Outputs of the Device by WebUI

Functionality is in principle the same as in ASM Cooling distribution circuit except integrated PI Controller

The image displays two screenshots of the Chiller application interface. The top screenshot shows a summary view with the following data:

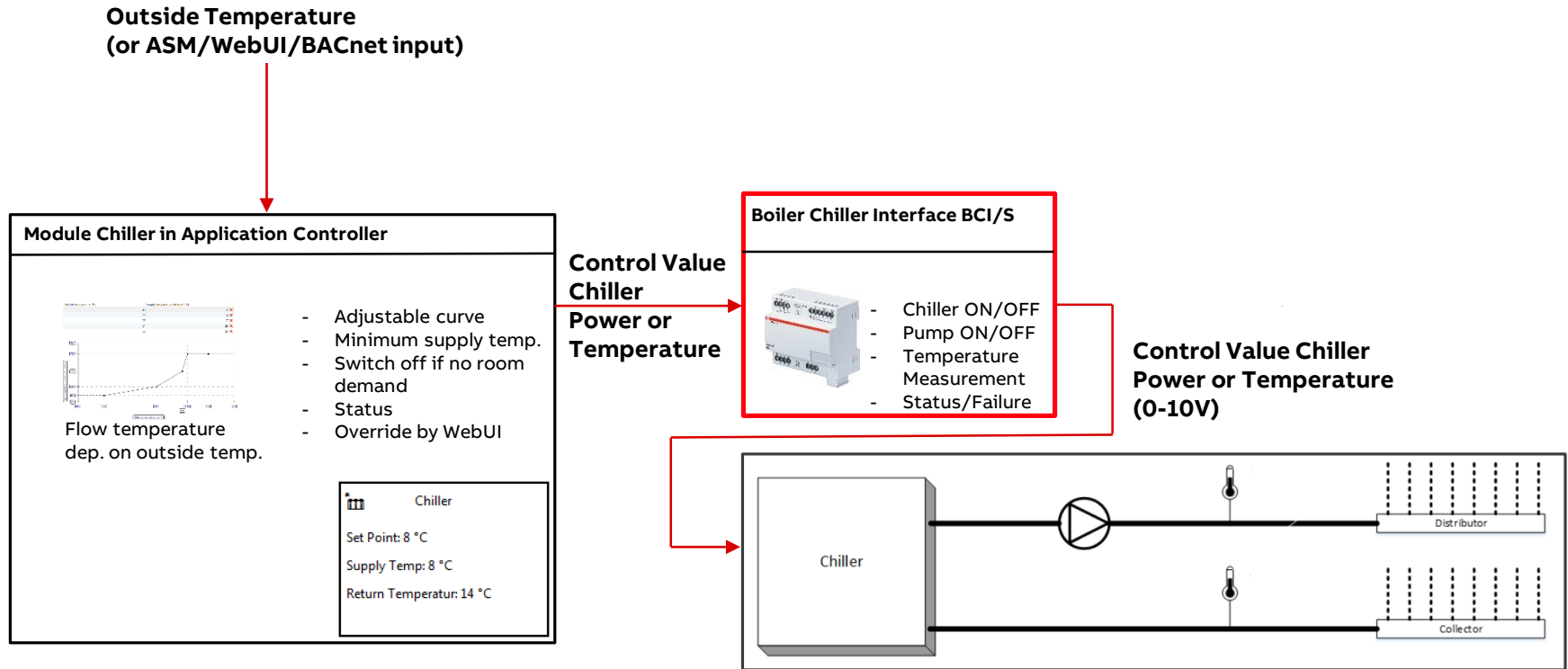
- Set Point: 8 °C
- Supply Temp: 8 °C
- Return Temperatur: 14 °C

The bottom screenshot shows a detailed parameter configuration window for the Chiller. The parameters are organized into sections:

- Common**
  - Name: Chiller
  - Description:
  - Reinstall: ☐
- Chiller**
  - Enable chiller by ASM I...: ☐
  - Show Operating Status: ☐
  - Show Failure Status: ☐
- Supply Temperature Set Point**
  - Supply Temperature C...: ☒
  - Source Supply Temper...: Calculated Weather-compensated
  - Max. Supply Temperat...: 150 °C
  - Min. Supply Temperat...: 3 °C
  - Switch off if no room...: ☐
  - Custom Supply Tempe...:
- Pump**
  - Pump: ☒
  - Override by WebUI: ☒
  - Operating Status: ☒
  - Pump Failure Status: ☐
  - Repair Switch Status: ☒

# Application Controller AC/S 1.x.1

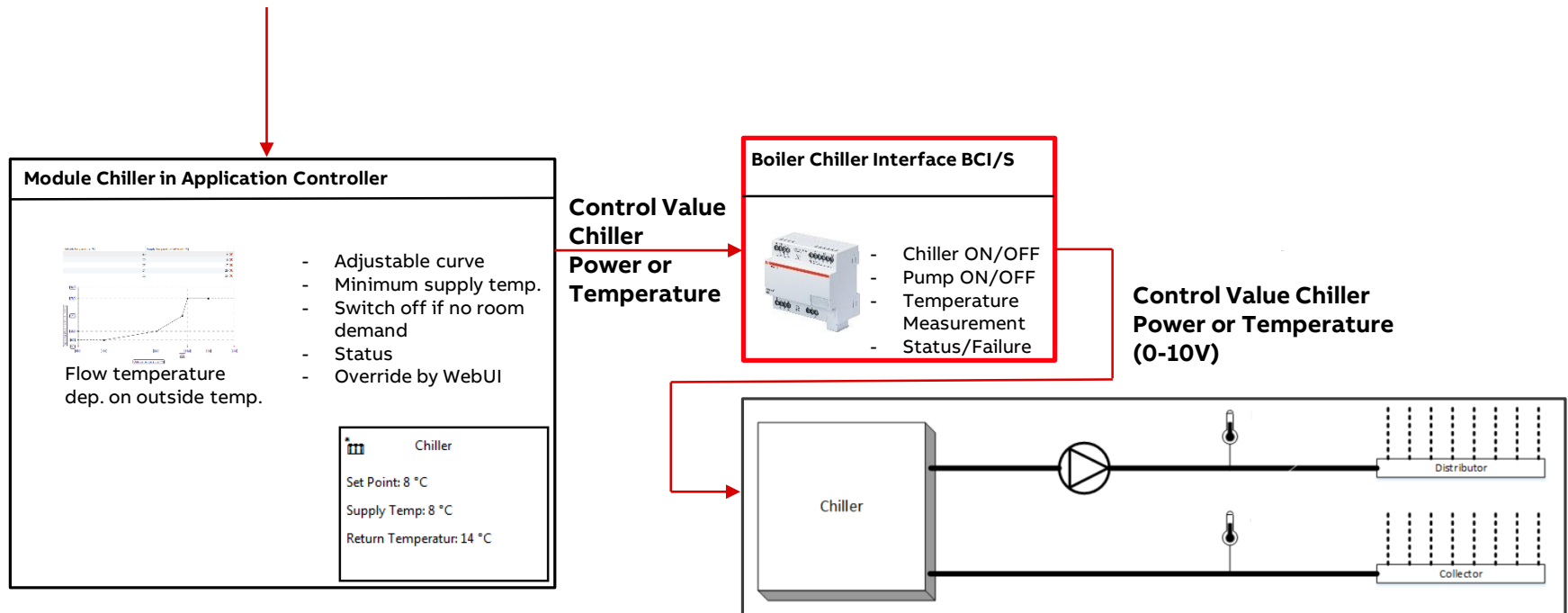
## Function in context with Cooling (Chiller Control **without** Cooling Circuit Control HCC/S)



# Application Controller AC/S 1.x.1

Function in context with Cooling (Chiller Control **with** Cooling Circuit Control HCC/S))

ASM Input: Minimum Control Value  
from the actuators in the rooms

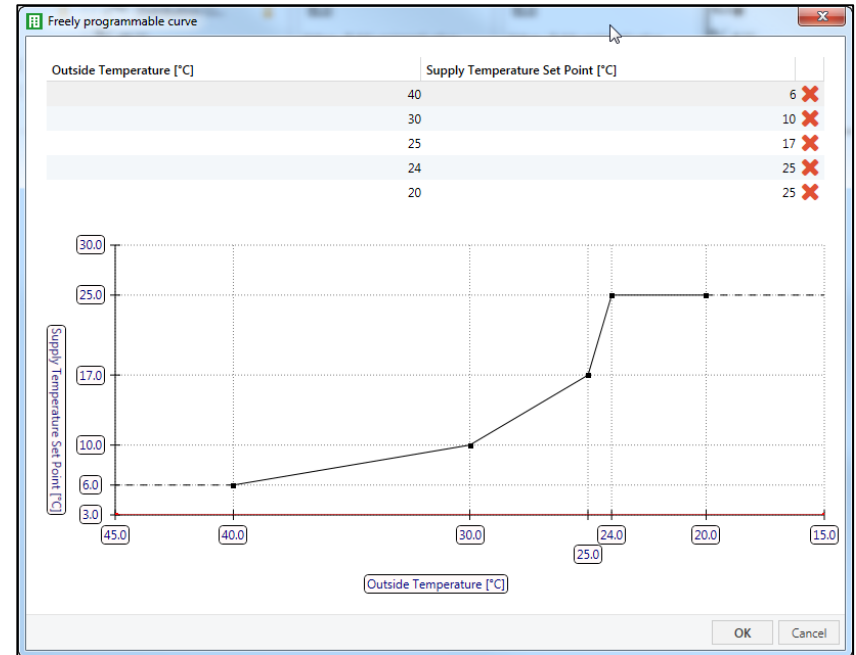


# Application Controller AC/S 1.x.1

ASM

## Chiller

Supply flow setpoint curve can be adjusted



# Application Controller AC/S 1.x.1

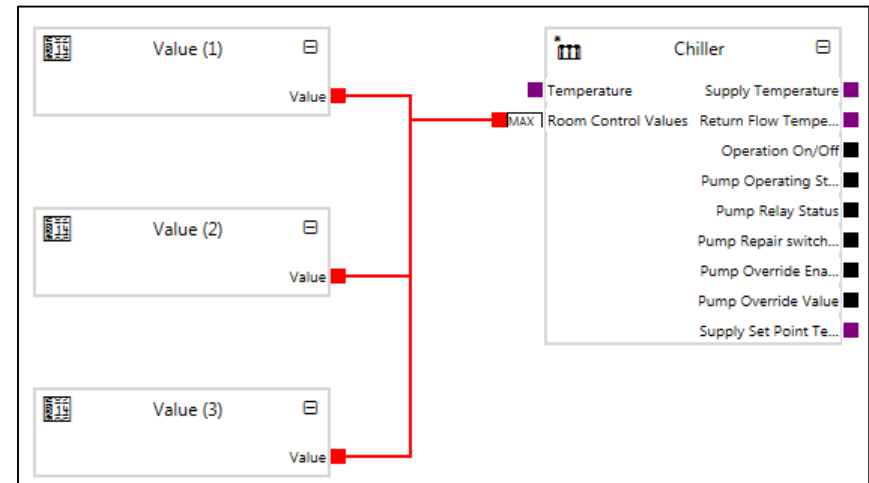
ASM

## Chiller

Room demand optimization: Evaluation of valve position by means of the valve with highest position

Cooling circuit will be switched off if there is no room demand (Minimum one valve > 0)

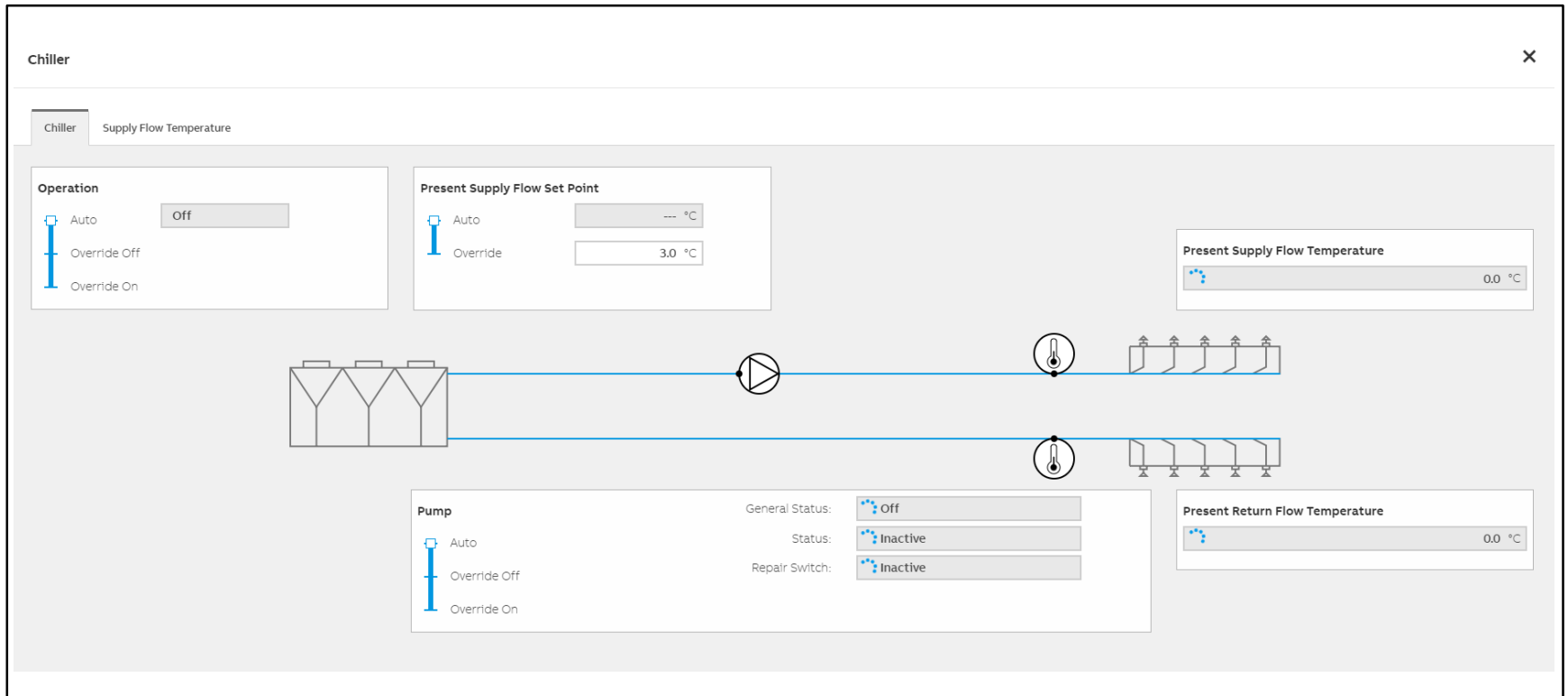
Limits for switch on and off adjustable



Switch off if no room demand	<input checked="" type="checkbox"/>
Switch On if a Room Demand is higher then	10 %
Switch Off if all Room Demands are lower then	0 %

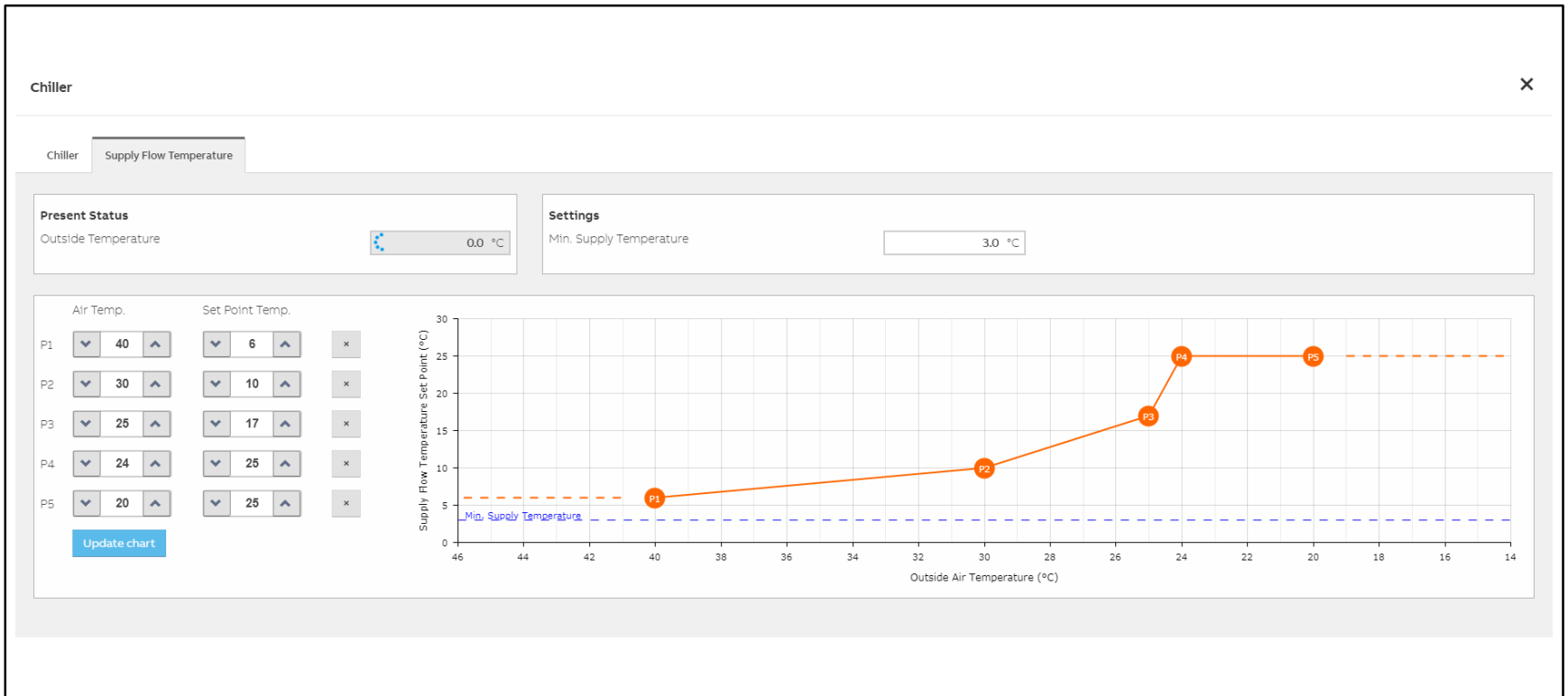
# Application Controller AC/S 1.x.1

## ASM Chiller in WebUI



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# Application Controller AC/S 1.x.1

Which answer is correct?

## Question 1

What is the Device Configuration App (DCA)?

- A** A KNX configuration App available for Android and iOS
- B** An App integrated in ETS5 to replace the standard Parameter view
- C** An App integrated in ETS5 to provide an additional powerful environment for parametrization instead of using external tools

# Application Controller AC/S 1.x.1

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# Application Controller AC/S 1.x.1

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## Question 2

The Application Specific Module (ASM) Value can ...

- ☐ **A** be an Input, Output or both
- ☐ **B** be only used to display a KNX value in WebUI
- ☐ **C** can communicate to/from KNX, BACnet and WebUI

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# Application Controller AC/S 1.x.1

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Every Application Specific Module (ASM) Value has ...

- ☐ **A** Parameters and mostly group objects
- ☐ **B** Connectable sockets with linking view
- ☐ **C** a freely programmable logic

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## Question 5

Application Specific Module (ASM) Value as Output , what is true?

- A** Socket on the right side
- B** Value comes from **Outside** (KNX, BACnet, WebUI) and goes **in** (AC/S, other ASM) to be processed
- C** Value comes from **Inside** (AC/S, other ASM) and goes **out** (KNX, BACnet, WebUI) to be processed

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# Application Controller AC/S 1.x.1

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## Question 6

Application Specific Module (ASM) Value as Input , what is true?

- A** Socket on the top side
- B** Value comes from **Inside** (AC/S, other ASM) and goes **in** (KNX, BACnet, WebUI) to be processed
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# Application Controller AC/S 1.x.1

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# Application Controller AC/S 1.x.1

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Application Specific Module (ASM) Value adjusted as read + writable by BACnet, what does it mean?

- A** Incoming BACnet value, outgoing KNX value
- B** Bi-directional communication, BACnet system has to read the status or value from the ASM or send data actively to the ASM
- C** Incoming KNX value, outgoing BACnet value

# Application Controller AC/S 1.x.1

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# Application Controller AC/S 1.x.1

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## Question 8

Application Specific Module (ASM) Automation, what is true?

- A** It is the same in quantity and quality like Logic Controller ABA/S
- B** It is a freely programmable controller based on existing function elements
- C** Text oriented programming like IFTTT

# Application Controller AC/S 1.x.1

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# Application Controller AC/S 1.x.1

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## Question 9

Application Specific Module (ASM) Room, what are the features?

- A** It offers in WebUI a representation of all HVAC functions in a room
- B** It is made for displaying values in WebUI but not changing it
- C** It has communication sockets for all relevant functions and needs no group objects

# Application Controller AC/S 1.x.1

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# Application Controller AC/S 1.x.1

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## Question 10

**Application Specific Module (ASM) Cooling Circuit Controller, what does it?**

- A** It works together with Heating/Cooling Circuit Controller HCC/S
- B** It has all necessary software functions of HCC/S
- C** It provides software functionality to control the mixing valve in a cooling circuit depending on outside temperature and a temperature curve

# Application Controller AC/S 1.x.1

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# Application Controller AC/S 1.x.1

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## Question 11

**Application Specific Module (ASM) Chiller, what are the functions?**

- A** It can control depending on room demand the water temperature or power of a chiller
- B** Overriding values of the outputs, e.g. via WebUI, is possible
- C** It provides the chiller temperature set point and send it to the Boiler Chiller Interface BCI/S which is connected to a chiller

# Application Controller AC/S 1.x.1

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