October 2018

Application Controller AC/S
Webinar – Competence Center Europe – Building Automation

Ilija Zivadinovic, Martin Wichary, Juergen Schilder, Stefan Grosse, Thorsten Reibel
Webinar “Application Controller AC/S”

Agenda

**ClimaECO – new Devices**

Webinar “Application Controller AC/S”
- Introduction and Functions
- Web User- and BACnet interface
- Pre-defined and freely programmable automation functions
- Practical demonstration
- Integration in ClimaECO
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Overview ClimaECO: New Products

A holistic HVAC Building Automation System, over 30 new devices
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Overview ClimaECO: ABB i-bus® KNX HVAC Solutions
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
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Introduction

**BACnet**
- HVAC
- Operation
- Display

**AC/S 1.2.1**
Automation Interfacing

**WebUI**
- Operation
- Display

**KNX**
- Devices
  - RTC, FCC/S,
  - HCC/S, BCI/S, ...

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Introduction

AC/S 1.1.1
Automation Interfacing

WebUI
- Operation
- Display

KNX
- Devices
  RTC, FCC/S,
  HCC/S, BCI/S, …

IP

TP
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Introduction

Web User Interface
Created automatically
(Good design and user friendliness)

BACnet®
Integrated BACnet Gateway (no configuration required)

Automation Functions
Pre-defined functions (ASM)

Freely programmable Automation Functions
(like ABA/S)

KNX
Based on the open and worldwide Standard

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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
1. Application Specific Modules

Predefined Automation Modules

- ASM -> Application Specific Module
- 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
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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
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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
3. 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

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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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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**
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Communication in all Directions → KNX - WebUI - BACnet
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Communication in all Directions → KNX - WebUI - BACnet

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Introduction

4. Automation

ASM Automation: Freely programmable logic like Logic Controller ABA/S 1.2.1
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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.
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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, fast ETS Download Application, Monitor
- LEDs (ON, LAN/Link, KNX telegram)
- Internal clock
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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
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Product range

AC/S 1.x.1 – Type Description

<table>
<thead>
<tr>
<th>A</th>
<th>C</th>
<th>/S</th>
<th>1.x.1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. Version

1. Without BACnet Interface

2. With BACnet Interface

1. One channel

/S MDRC

C Controller

A Application
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## Performance

### Overview

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

[Image of the product AC/S 1.2.1]
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Performance

Overview

<table>
<thead>
<tr>
<th>Feature</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation ASM (Logic like ABA/S), more than one possible, but in total ...</td>
<td></td>
</tr>
<tr>
<td>Logic elements</td>
<td>1,000</td>
</tr>
<tr>
<td>Socket In- and Outputs</td>
<td>200</td>
</tr>
<tr>
<td>WebUI In- and Outputs</td>
<td>30</td>
</tr>
</tbody>
</table>

Utilization monitored in ETS:

<table>
<thead>
<tr>
<th>Current</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASMs used</td>
<td>2 500</td>
</tr>
<tr>
<td>KNX group objects used</td>
<td>6 2000</td>
</tr>
<tr>
<td>BACnet objects used</td>
<td>0 500</td>
</tr>
<tr>
<td>ASM Schedules count</td>
<td>0 15</td>
</tr>
<tr>
<td>Central HVAC, ASM count</td>
<td>1 15</td>
</tr>
<tr>
<td>ASM Trend count</td>
<td>0 50</td>
</tr>
</tbody>
</table>
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Commercial Aspects

**Family AC/S 1.x.1**

- **AC/S 1.1.1 (Application Controller Basic)**
  - 2CDG 110 205 R0011
  - List price: 850 Euro
  - available

- **AC/S 1.2.1 (Application Controller BACnet)**
  - 2CDG 110 206 R0011
  - List price: 1,100 Euro
  - available

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Technical documents

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
- ...

Downsloads for Application Controllers

- Certificate (PDF) [X] AC/S1.2.1 BACnet BTL, Listing
- Certificate (PDF) [X] AC/S1.2.1 BACnet Certificate

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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 (Network Time Protocol)
- All Functions (ASM, Parameter, Linking view) integrated in DCA (Device Configuration App)
- The free of charge DCA has to be downloaded from the KNX Online Shop
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KNX Certified Training
Certified KNX Courses in Heidelberg
– Tutor Course: 22th to 26th Oct.
– Basic Course: 05th to 09th Nov.
And many more training courses in the calendar “International Training Dates 2018”

www.abb.com/knx or
https://go.abb/ba-training
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Next Webinar

**Busch-VoiceControl**

**Busch-VoiceControl - Talk to the KNX system**

- General Introduction
- Features
- Use-Cases
- Commissioning

**Wednesday 17th October 2018**

- Morning 09:00 am Europe Time (Berlin, UTC + 2h)
- Afternoon 03:00 pm Europe Time (Berlin, UTC + 2h)
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