

ABB GPG Building Automation, November 2016

ABB i-bus[®] KNX

Logic Controller ABA/S 1.2.1

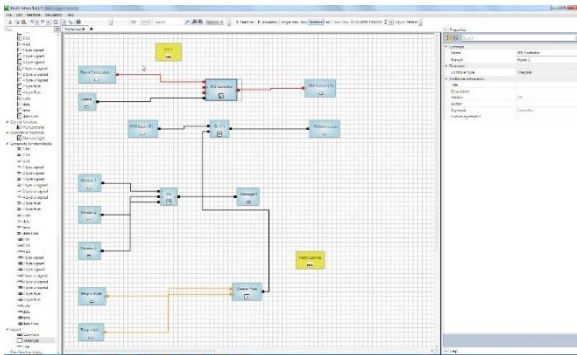
Logic Controller ABA/S 1.2.1 Overview



The new Logic Controller is an extremely powerful device for almost unlimited **customized logic** functions.

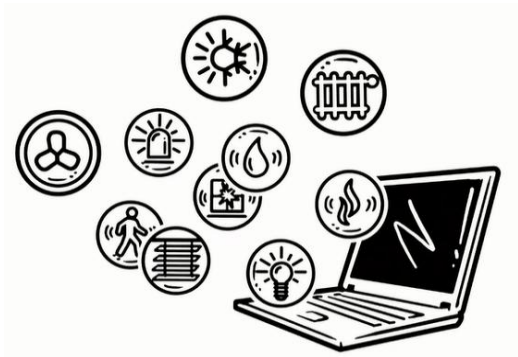
It can easily and reliably accommodate **altered or extended functionality** requests during construction or usage of the building.

The Logic Controller opens new application for the KNX systems (e.g. **HVAC**)



Logic Controller ABA/S 1.2.1

What's new?



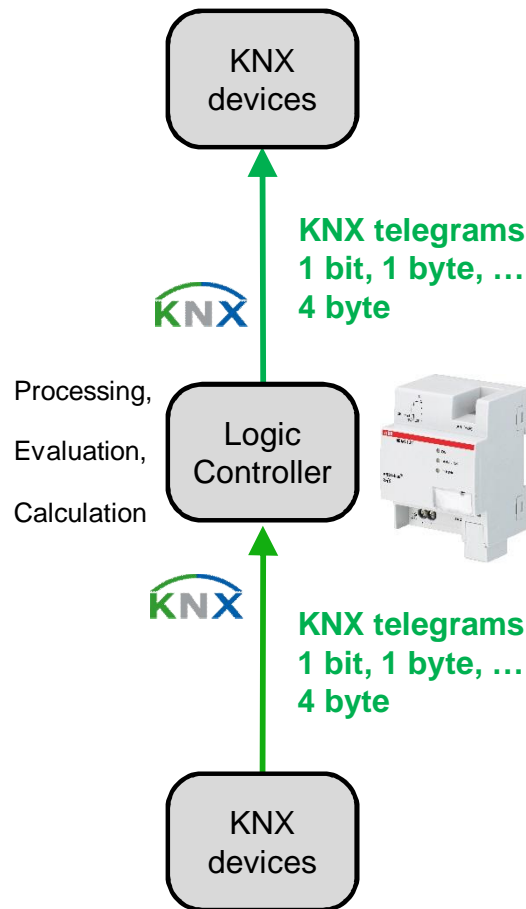
- § One device for all **solutions** providing you the **certainty** that all requirements can be covered
- § Up to 3000 function elements (ABL/S: 140)
- § Extensive logic functions, like
 - Mathematics
 - Calendar and timers
 - Room temperature control
- § Simulation (offline and online)
- § Composite function blocks
- § IP interface for fast programming
- § Simple Web Server for editing values

ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1

- § Introduction
- § Planning
- § Installation
- § Commissioning

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

What it is...



What is a Logic Controller ?

- § A Logic Controller provides numerous functions like logic, timer, mathematical functions, PID controller
- § It works more as a superior intelligence to implement powerful solutions with sensors and actuators in KNX building automation

Why do we need a Logic Controller ?

- § The functional requirements are growing continuously in intelligent buildings, not always feasible with the existing KNX devices, but can be covered by the Logic Controller efficiently

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Device technology - Hardware

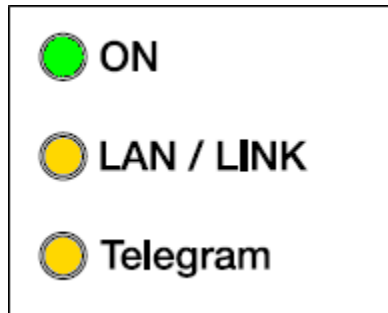


Logic Controller ABA/S 1.2.1

- § Modular installation device (MDRC)
- § Width: 4 MW
- § Power supply:
 - § 24 V DC or PoE (LAN connection)
- § Bus connection terminal behind cover
- § LAN connection
 - § PoE (Power supply), WebUI, Download Application, Monitor
- § LEDs (ON, LAN/Link, KNX telegram)

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Device technology - Hardware



LED's

§ ON

- § Flashes slowly while the system is booting or Logic engine stopped
- § Lit up continuously when the system has been initialized permanently
- § Flashes rapidly when an error has occurred in the logic processing or the logic processing was stopped

§ LAN/LINK

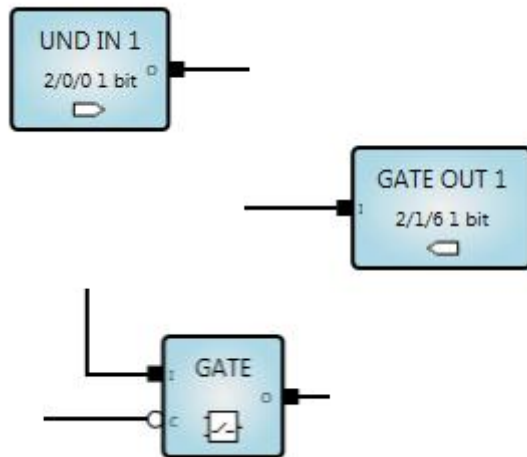
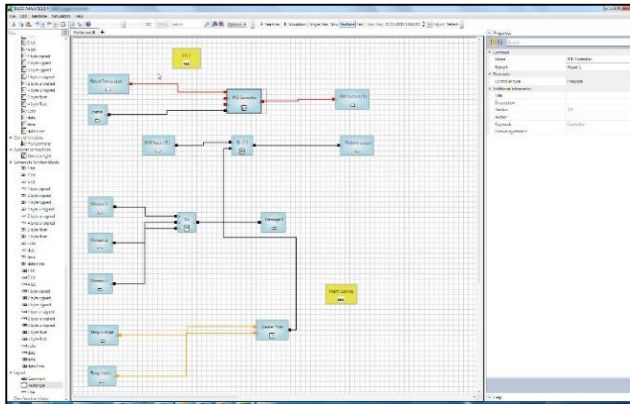
- § Lit up continuously when the auxiliary voltage is present and the router is connected to an IP network
- § Flashes with data traffic via LAN

§ Telegram

- § When booting is complete, lit up continuously when the auxiliary voltage is present and the router is connected to KNX
- § Flashes with data traffic via KNX/TP

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Device technology - Software



Description	Maximum Number
Functional Elements	3000
KNX In/Outputs	500
Group Addresses	2000
Web UI In/Outputs	60

- § Functional Element: Any type which is available
- § KNX IN/Outputs à Group Objects
- § Group Addresses: each address counts, also identical
- § Web UI: Input and indication of values via Web browser

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Device technology – Software ETS

Menu and Functions (Left Panel): Lists various logic elements such as bit logic, mathematics, and conversion functions.

Worksheet (Main Area): Contains the logic diagram with elements like **UND IN 1**, **UND IN 2**, **AND 1**, **GATE IN 1**, **GATE**, **Release with '0'**, **FILTER**, **UND OUT 1**, and **GATE OUT 1**.

Simulation (Top Right): Includes a toolbar with options like **Realtime**, **Simulation**, **Single Step**, **Slow**, **Fast**, and **Next Step**.

Properties (Parameter) of a Block (Right Panel): Shows details for a selected block, including Name (GATE), Remark, Parameter, and Additional information.

Input, **Function Element**, **Output**, **Comment**, and **Grid** are also labeled within the workspace.

Introduction



ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Device technology - Software

Number	Name	Object Function	Description	Group Address	Length
502	Device clock	Request object			1 bit
503	Device clock	Date			3 bytes
504	Device clock	Time			3 bytes
505	Device clock	Date/Time			8 bytes

The screenshot shows the ETS software interface. On the left, a logic controller configuration is visible with various modules and connections. On the right, a 'Properties' dialog box is open, showing settings for the device. The 'IP' tab is selected, and the following information is displayed:

- Obtain an IP address automatically:
- Use a static IP address:
- IP Address: 255.255.255.255
- Subnet Mask: 255.255.255.255
- Default Gateway: 255.255.255.255
- MAC Address: 00:0C:DE:19:80:09
- Routing Multicast Address: 224.0.23.12

The screenshot shows the ABA/S WebUI interface. The title is 'ABA/S WebUI'. Below the title, there are two tabs: 'Input' and 'Output'. The 'Input' tab is selected. The interface displays a table with the following columns: 'Communication Object Number', 'Name', 'First Group Address', 'Value', and 'Unit'. The table contains three rows of data:

Communication Object Number	Name	First Group Address	Value	Unit
0	WEB IN 2	False	<input type="checkbox"/>	1"
0	WEB IN 1	False	<input type="checkbox"/>	1"
0	WEB Gate IN 1	False	<input type="checkbox"/>	1"

At the bottom of the table, there are two buttons: 'Start refreshing' and 'Save'.

§ Application for ETS4 and ETS5 (not ETS3 any more !)

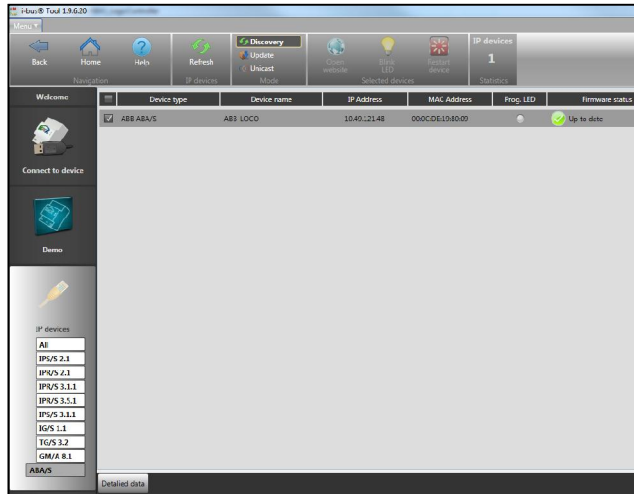
§ Application fully integrated in ETS, no separate software required

§ User friendly graphical environment in ETS

§ Optional: Accessing selected functions via Web UI, only web browser needed, covering partly typical i-bus tool functionality (Simulation and testing)

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Device technology - Software



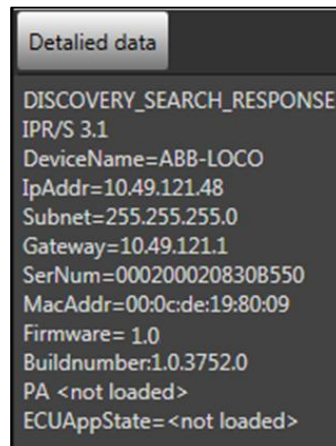
§ Integration in the i-bus® Tool

§ Detection of connected Logic Controller with display of data

§ Device Name, Firmware

§ IP Data: IP address, MAC address

§ Firmware update possible



§ Operation and test via ETS Plug in and Web UI

ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1

Function Elements

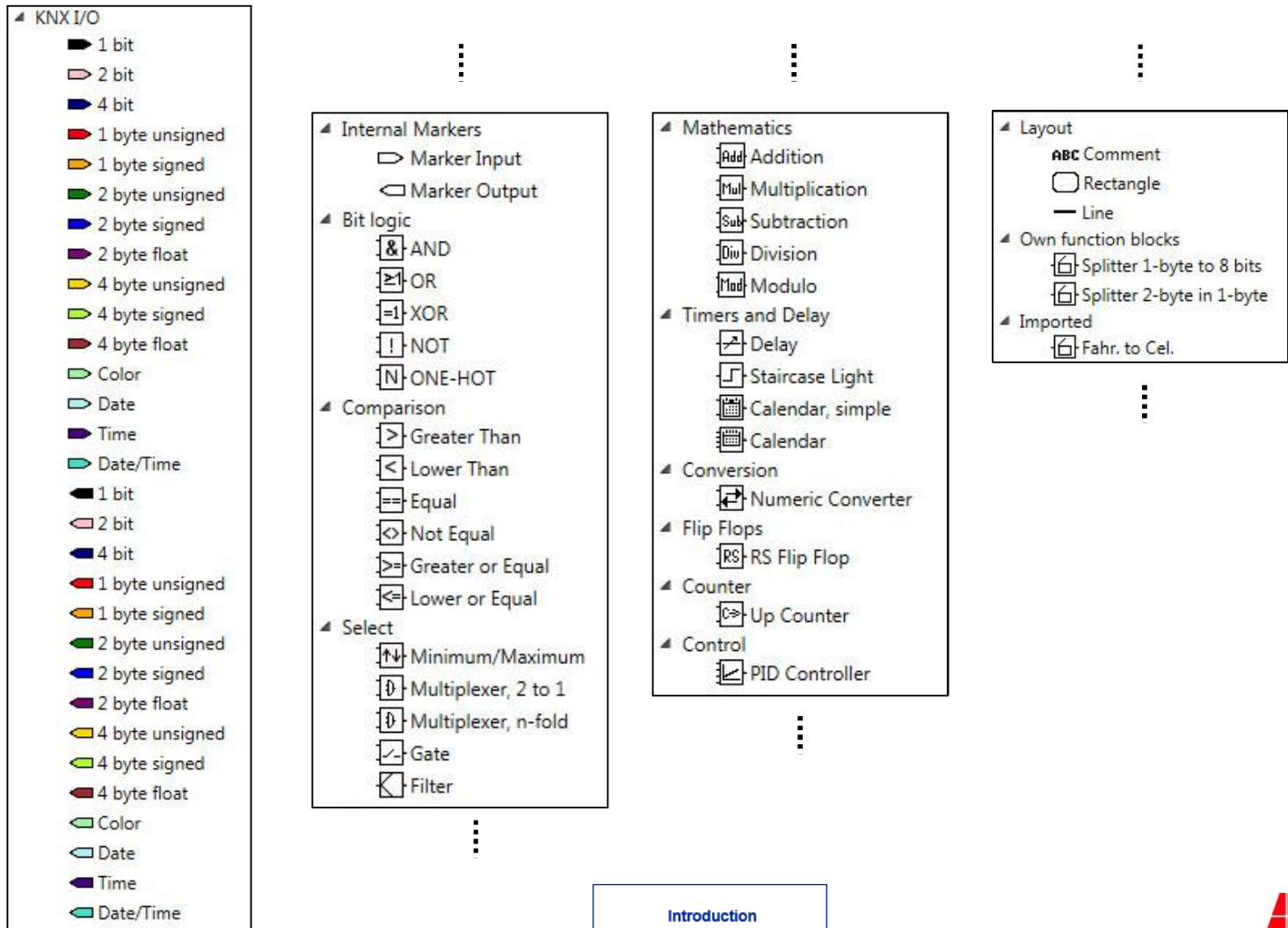


ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1 Composite Function Block

The Logic Controller allows to create own Function Blocks.

These Composite Function Blocks can be saved and imported into other projects.

If required, they even can be protected against unauthorized access.

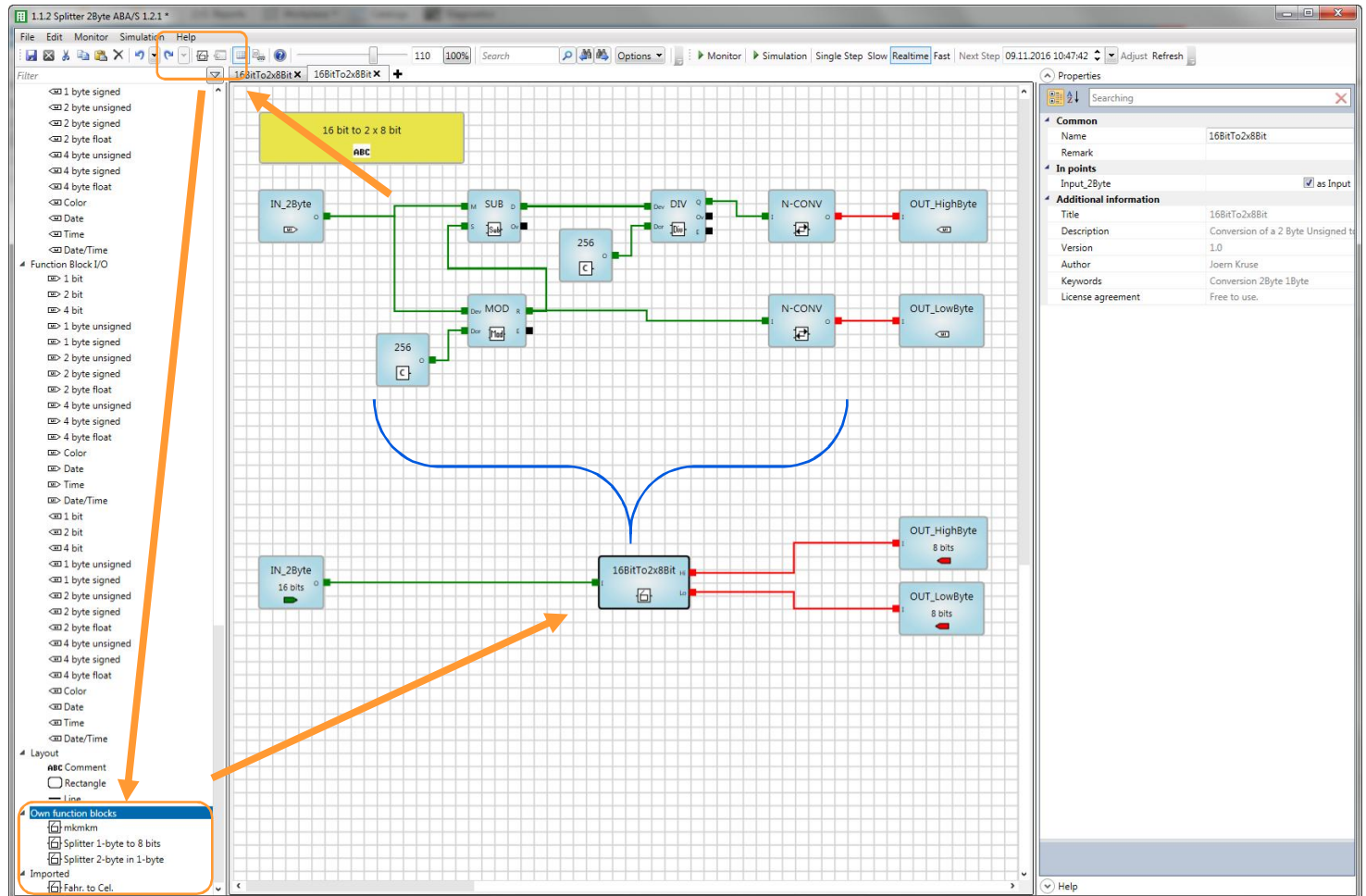


ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1

Offline Simulation

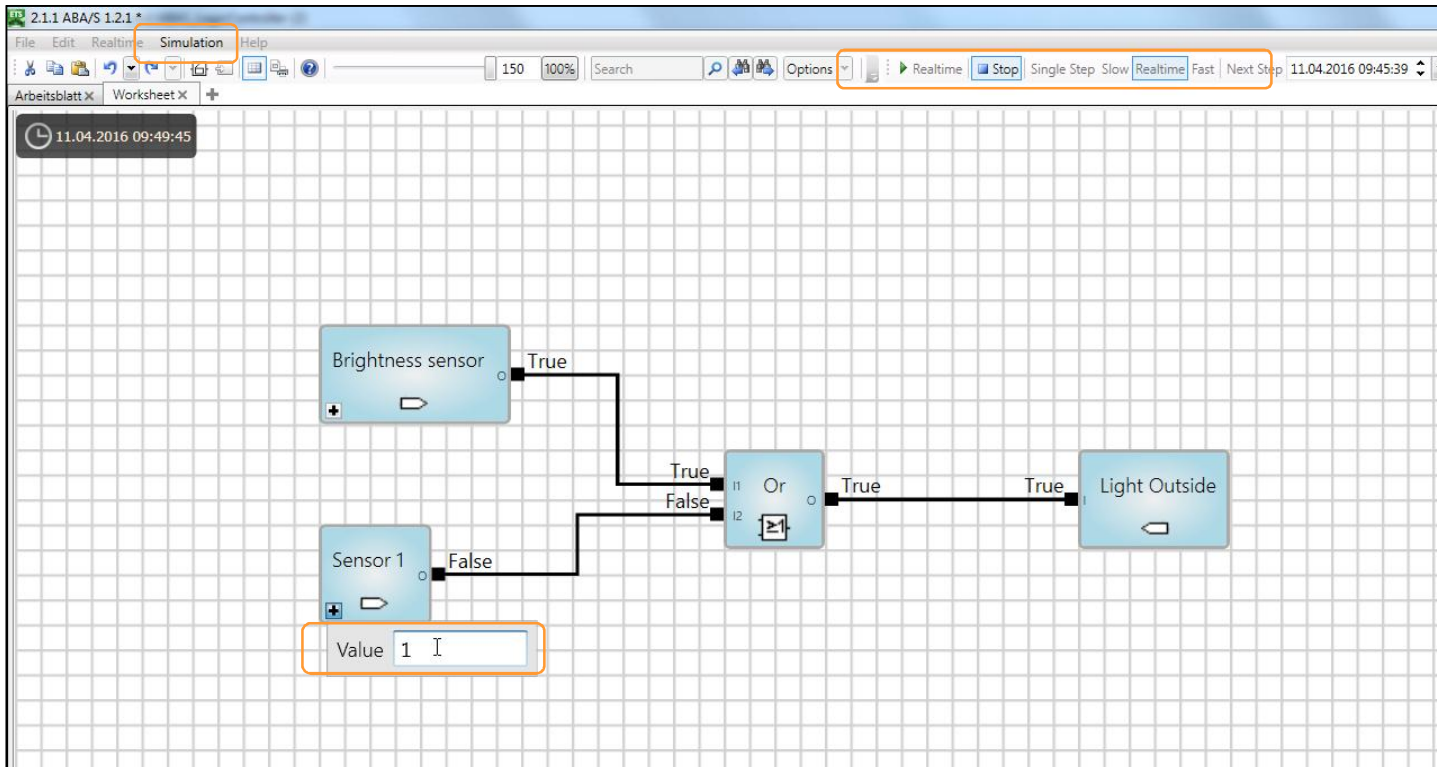


ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1 WebUI

Input		Output	
Index	Name	Value	Data Sub Type
1	Room 1 temperature	<input type="text" value="20.5"/>	9.*
2	Room 2 temperature	<input type="text" value="21.0"/>	9.*
3	Start heating at	<input type="text" value="05:15:00"/>	10.* [hh:mm:ss]

- § 60 In- or Outputs accessible via WebUI for operation or overwriting of values, e.g. change of a comparison value or change of parameter of a PID controller
- § Please note: Not comparable with a visualisation

Logic Controller ABA/S 1.2.1

Benefits I



- + **Graphical programming interface** in ETS software environment without the need to install additional software avoiding additional maintenance effort and group address depreciation
- + Comprehensive list of function elements for all typical building applications allowing to serve diverse project requirements with a single device
- + It is possible to create self-defined function blocks. They can be stored and reused in future projects saving time and enhancing reliability
- + WebUI for changing and displaying values

Logic Controller ABA/S 1.2.1

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Logic Controller ABA/S 1.2.1

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Logic Controller ABA/S 1.2.1

Benefits II



- + **Inbuilt simulator** facilitates efficient and reliable commissioning on the project's site. All functions can be tested before going live ensuring a safe operation
- + Current live state of the logic can be monitored in real-time facilitating troubleshooting and diagnostics
- + Short power failures (< 1min) will be bridged by the internal energy buffer thus the previous system state can be restored after voltage recovery
- + Fast download of application program by utilizing LAN interface saving time during commissioning

Logic Controller ABA/S 1.2.1

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Logic Controller ABA/S 1.2.1

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Logic Controller ABA/S 1.2.1

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Logic Controller – Launch Concept Complete Range for Logic Control



Logic Module LM/S 1.1	Application Unit Logic ABL/S 2.1	Application Unit Time ABZ/S 2.1	Logic Controller ABA/S 1.2.1
149.50 €	599 €	438.50 €	699 €

Important: Logic Controller ABA/S 1.2.1 does not replace any existing device handling logic, time functions or other superior intelligent functions !

ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1

- § Introduction
- § **Planning**
- § Installation
- § Commissioning

ABB i-bus® KNX Logic Controller ABA/S 1.2.1 Hardware

Technical data (extract)	
Auxiliary voltage (required)	24 V DC (-15% / +20%) or PoE (IEEE 802.3 af class 1) 3.0 W max.
Power loss	3.0 W max.
Current consumption Auxiliary voltage	60 mA typical 120 mA peak current
Current consumption KNX	< 10 mA
Connection terminals Auxiliary voltage	Screw terminals 0.2...2.5 mm ² fine stranded, 0.2...4 mm ² single core
Tightening torque	Max. 0.6 Nm
KNX connection	Bus connection terminal
LAN connection	10/100 BaseT, IEEE 802.3 via RJ45 plug
Temperature range in operation (T ₀)	- 5 °C ... + 45 °C
Storage	- 25 °C ... + 55 °C
Transport	- 25 °C ... + 70 °C
Atmospheric pressure	Atmosphere up to 2,000 m
Maximum air humidity	95 %, no condensation allowed
Protection degree	IP 20 according to DIN EN 60 529
Protection class	II according to DIN EN 61 140
Overtoltage category	III according to DIN EN 60 664-1
Pollution degree	2 according to DIN EN 60 664-1

- § From the installation point of view the Logic Controller is easy to plan
- § No classical in/outputs to be observed
- § Power supply 24 V DC or PoE
- § Space in DB (4MW)

ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1 Software

Description	Maximum Number
Logic Elements	3000
KNX In/Outputs	500
Group Addresses	2000
Web UI In/Outputs	60

- § Is a ABA/S necessary or possible to use other solutions like ABL/S 2.1 ?
- § Planning concerning software and capacity
 - § Which functions ?
 - § Directly available or to be created ?
 - § How many ?
- § Often one device is sufficient due to the big number of functions per device
- § In case of known comprehensive functionality (quantity) more than one ABA/S might be required

ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1 Software

Description	Maximum Number
Logic Elements	3000
KNX In/Outputs	500
Group Addresses	2000
Web UI In/Outputs	60

- § Decentralized installation to reduce bus traffic can be considered
- § Practically, the number of KNX Datapoints will be the limit (500 KNX IO's)
- § In case of expected but in the planning phase not yet known functionality a Logic Controller should be budgeted already
- § Please note: Commissioning can take some time, to be considered (Costs and time)

ABB i-bus® KNX Logic Controller ABA/S 1.2.1 Software



§ Summary for Planner:

The Logic Controller ABA/S 1.2.1 is with its extraordinary capability for almost every functional requirement the right choice.

Simple installation, clear and user friendly commissioning with graphical environment in the ETS, a dedicated hardware for the task it was made for with direct connection to KNX TP in the line ensures a successful implementation and a well running solution.

Basic	Planning
	Installing
	Commissioning

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

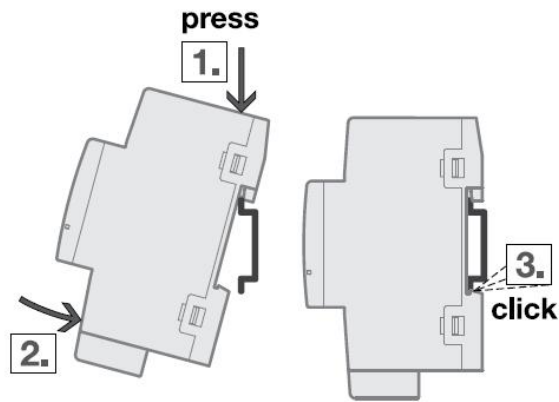
- § Introduction
- § Planning
- § **Installation**
- § Commissioning

ABB i-bus® KNX Logic Controller ABA/S 1.2.1 Installation



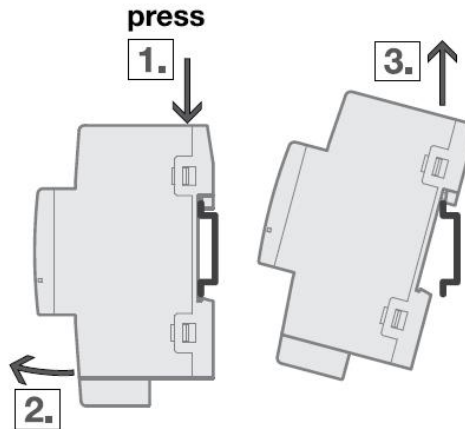
- § The device is suitable for installation in distribution units or small housings on a 35 mm mounting rail according to EN60715 (any position)
- § Accessibility of the device for the purpose of operation, testing, visual inspection, maintenance and repair must be ensured
- § Power supply (if not PoE):
24 V DC via screw terminals
- § The connection to the KNX is implemented using the supplied bus connection terminal
- § The connection to the IP network is established using an RJ 45 plug

ABB i-bus® KNX Logic Controller ABA/S 1.2.1 Installation



§ Thanks to the new way to snap KNX devices from ABB on the rail in a distribution board especially dismounting is very simple without screwdriver and thus user friendly

§ Snap onto mounting rail



§ Remove from mounting rail

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Display/Operating elements

LED	Function	Description
ON (green)	ON	System has been initialized permanently
	Flashing slowly	System is booting
	Flashing quickly	Error has occurred in the logic processing or the logic processing was stopped
LAN / LINK (yellow)	ON	Auxiliary voltage is present and device is connected to an IP network
	Flashing	Data traffic via LAN
Telegram (yellow)	ON	Booting complete, auxiliary voltage present and device is connected to KNX
	Flashing	Data traffic via KNX/TP
Programming button	Press	Assignment of the individual address
Programming LED (red)	ON	The LED comes on when the Programming button is pressed, in order to assign a individual address

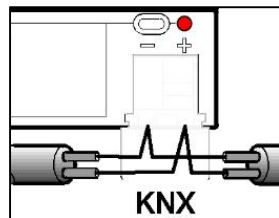
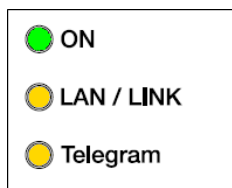


ABB i-bus® KNX Logic Controller ABA/S 1.2.1

- § Introduction
- § Planning
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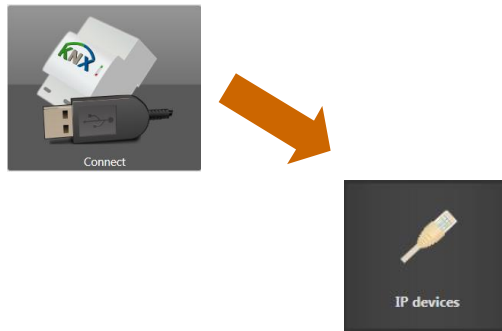
ABB i-bus® KNX Logic Controller ABA/S 1.2.1 First Steps

§ see [First Steps](#) in the online manual



ABB i-bus® KNX Logic Controller ABA/S 1.2.1

i-bus® Tool



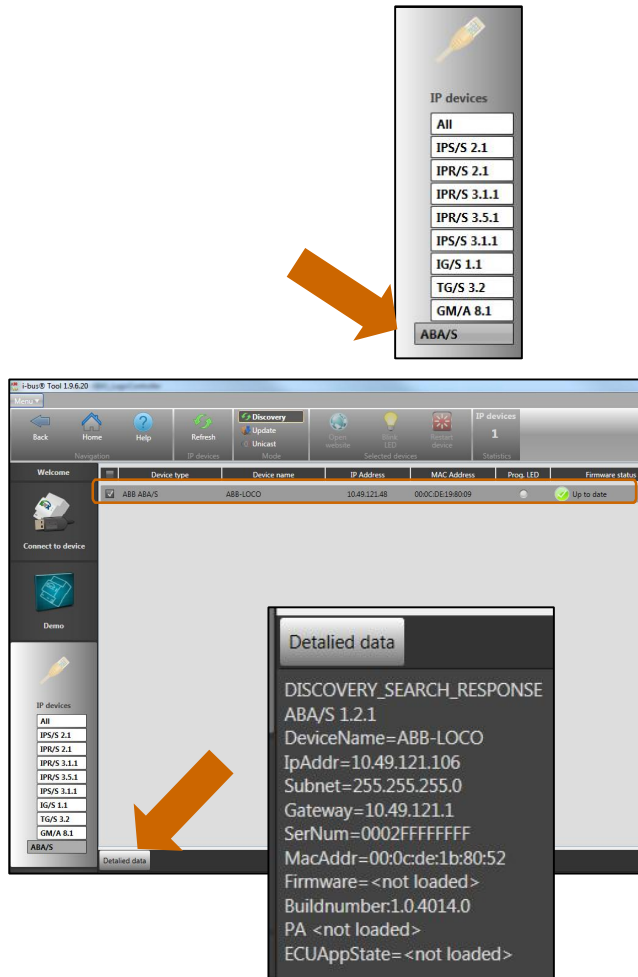
- § For Firmware update or if IP data (e.g. IP address for Web UI access) is needed
- § PC with i-bus® tool has to be linked via IP connection of ABA/S
- § After Start of i-bus® tool click on à 'Connect' and à 'IP devices'
- § All supported ABB IP devices will be displayed

The screenshot shows the i-bus Tool software interface. The main window displays a table of connected devices with the following columns: Device type, Device name, Individual address, IP Address, MAC Address, TTL, Prog. ID, and Firmware. The table lists various ABB IP devices, including ABB IP Router, ABB-LOGO, and ABB-IP interface.

Device type	Device name	Individual address	IP Address	MAC Address	TTL	Prog. ID	Firmware
ABB IP S11		81200	159.254.1213	080C.D080.4E99	-		N/A
ABB IP S11		81200	159.254.18.219	080C.D080.4CE3	-		N/A
ABB IP S11		01200	159.254.119.237	080C.D116.5C11	N/A CC		N/A
ABB IP Router	ABB IP Router	11110	159.254.121.02	080C.D080.8C47	OK		up to date
ABB IP S11	ABB IP S11	11135	159.254.121.160	080C.D080.5C99	OK		N/A
ABB-LOGO	ABB-LOGO		159.254.121.18	080C.D080.8C09	-		up to date
ABB-IP interface		15.14.206	159.254.121.184	080C.D080.8C01	-		N/A
ABB-IP interface		1125	159.254.121.186	080C.D116.5C8D	OK		N/A
ABB-IP interface		N/A	159.254.121.174	080C.D116.5C18	116		N/A
ABB-IP Router	ABB-IP Router	11110	159.254.121.18	080C.D080.8C06	OK		up to date
ABB-IP interface		11110	159.254.121.23	080C.D080.5C19	UK		up to date
ABB-IP interface		15.12.226	159.254.121.191	080C.D080.8C81	-		N/A

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

i-bus® Tool



§ By selecting on the left side 'ABA/S' only this device will be shown with

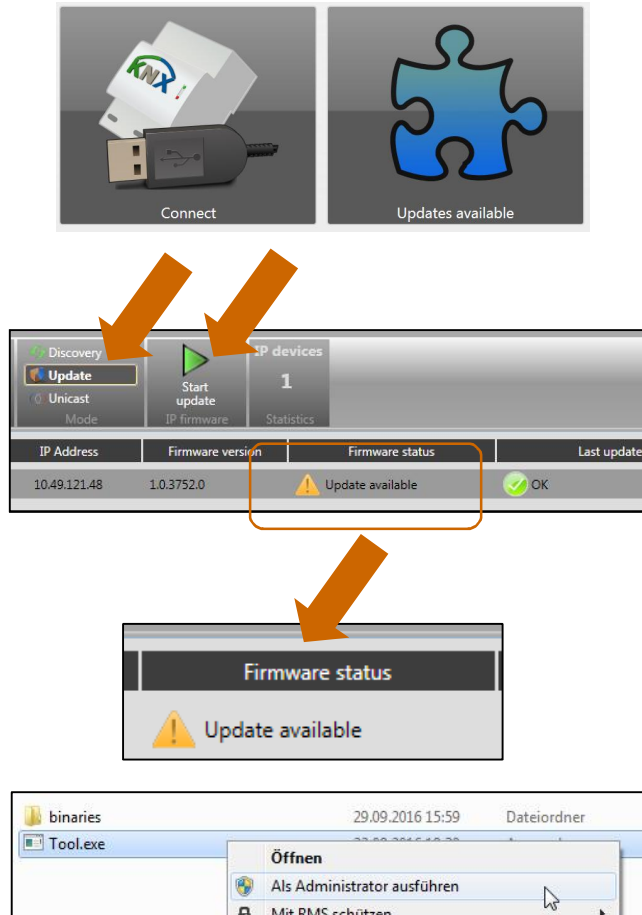
§ Name, Firmware (Status and version)

§ IP Data: IP address, MAC address

§ Button 'Detailed data' gives more related information

ABB i-bus[®] KNX Logic Controller ABA/S 1.2.1

i-bus[®] Tool

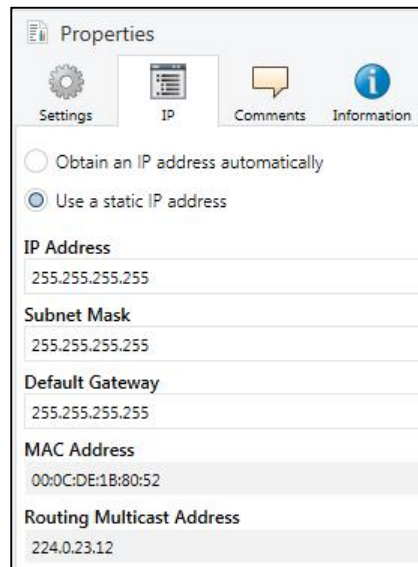


- § Firmware update: In case of new firmware version an update is feasible with i-bus[®] Tool
- § Update Information and option to download in i-bus[®] Tool
- § The firmware update can be triggered à update à Start update
- § For firmware update Logic Controller has to be linked via LAN connection

Note: In case of firmware update i-bus tool has to be started as administrator

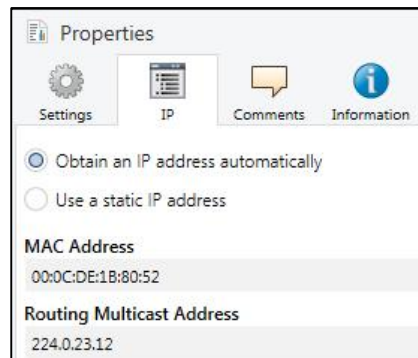
ABB i-bus® KNX Logic Controller ABA/S 1.2.1

IP adjustments



The screenshot shows the 'Properties' window for the IP configuration. The 'IP' tab is selected. The 'Use a static IP address' radio button is selected. The fields are filled with the following values:

Field	Value
IP Address	255.255.255.255
Subnet Mask	255.255.255.255
Default Gateway	255.255.255.255
MAC Address	00:0C:DE:1B:80:52
Routing Multicast Address	224.0.23.12



The screenshot shows the 'Properties' window for the IP configuration. The 'IP' tab is selected. The 'Obtain an IP address automatically' radio button is selected. The fields are filled with the following values:

Field	Value
MAC Address	00:0C:DE:1B:80:52
Routing Multicast Address	224.0.23.12

§ Static IP address

§ IP address, Subnet Mask and Default Gateway can be entered manually

§ Dynamic IP address

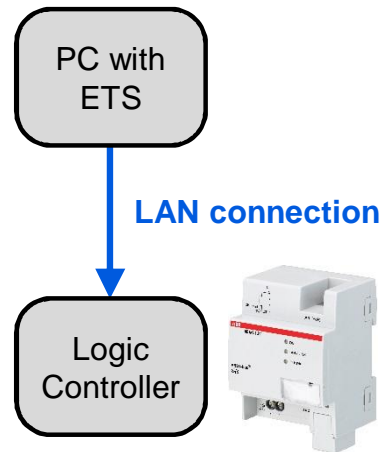
§ IP address will be assigned automatically (DHCP)

§ LAN connection for

§ PoE (Power supply), WebUI, Download Application, Monitor

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Download via IP connection



§ ABA/S 1.2.1 has an integrated LAN interface for ...

§ WebUI access

§ Supply via PoE

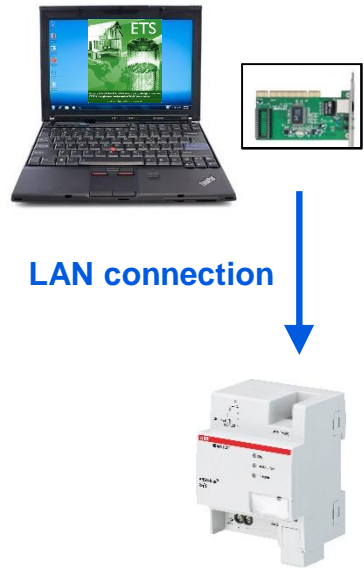
§ Monitor

§ Fast application download

§ In case of comprehensive data to be downloaded it is recommended to use the LAN interface for direct download independent of the KNX bus cable

ABB i-bus® KNX Logic Controller ABA/S 1.2.1

Download via IP connection



- § In order to avoid the KNX bus cable as a bottle neck download of application via ETS has to be carried out in IP Routing Mode
- § In this case the network interface of the PC acts as an direct access to the Logic controller resulting in a quick download
- § Please note: Download of physical address of ABA/S has to be done the classical way (USB or IP tunneling)

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