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July 2016

ABB GPG Building Automation Webinar “Processing analogue signals with KNX”

Webinar “Processing analogue signals with KNX”

Agenda

- § New Analogue Actuators AA/X x.1.2
 - § Introduction
 - § Planning
 - § Installing
 - § Commissioning (ETS, i-bus[®] Tool)

- § Analogue Inputs AE/A 2.1 and AE/S 4.1.1.3
 - § Overview

Webinar “Processing analogue signals with KNX”

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- § Analogue Inputs AE/A 2.1 and AE/S 4.1.1.3
 - § Overview

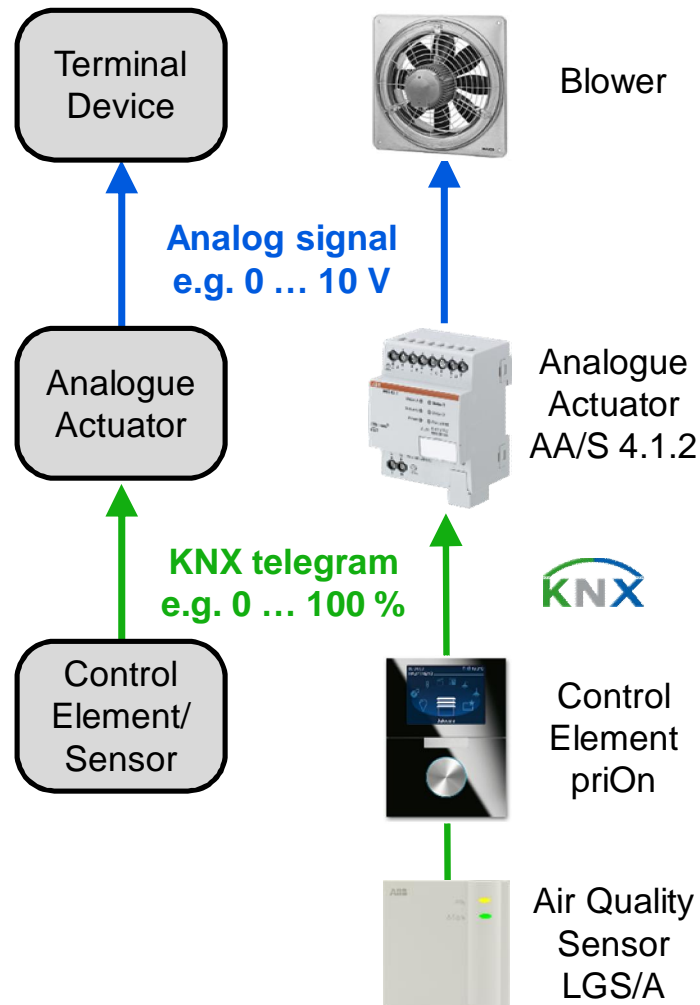
ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2



ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Overview



What is an Analogue Actuator ???

- § An Analogue Actuator converts received values via KNX telegrams into analog output signals (voltage or current)

Why do we need this actuator ???

- § These analog signals allow terminal devices in the heating, air-conditioning and ventilation technology or lighting technology to adapt their output variables using bus information and participate in control processes

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HVAC Applications



- § The Analogue Actuator is suitable for controlling ventilation flaps, valves, mixing valves in heating/cooling circuit distributors, frequency converters and control of Fan Coil Units with continuous fan in combination with Valve Drive Actuator VAA/S or Electronic Switch Actuator ES/S
- § A 0-10 V signal is normally used as a control variable (corresponding to, e.g., 0...100%)
- § This control signal can be used to
 - § Open or close valves or flaps by activating a motor
 - § Control a frequency converter with a motor that runs a fan in variable speed

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HVAC Applications



- § The control signal can also be used to specify set points via the 0-10 V output, for example to set the set temperature of a boiler or chiller
 - § Example: Possible temperature range 30 °C to 80 °C; here, a 5 V signal would correspond to an output temperature of 55 °C
- § The application allows to create a characteristic, which means that the system can also control complex variables such as those for 6-way valves or valves with an operating range of 2-10 V

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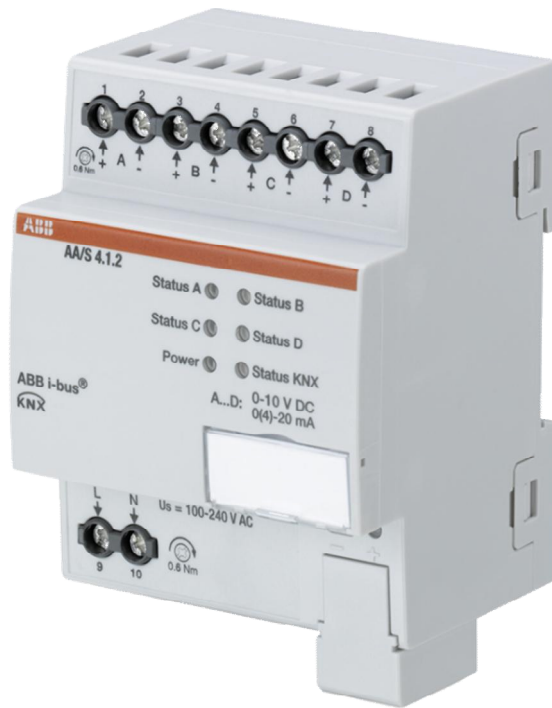
Lighting Applications



- § An Analogue Actuator, especially the 0...10 V interface, can also be used as a control signal for a lighting circuit to control brightness or LED color
 - § High-performance dimmer (kW)
 - § LED dimmer
 - § RGB driver

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Device technology



Analogue Actuator AA/S 4.1.2

- § Modular installation device (MDRC)
- § Width: 4 MW
- § 4 analogue outputs (individual parametrization)
 - § Voltage signals
0...1 / 0...5 / 0...10 / 1...10 V DC
 - § Voltage and current signals
0...20 / 4...20 mA DC
- § Indication elements (LEDs)
- § Operating voltage 100...240 V AC
- § Successor of Analogue Actuator AA/S 4.1

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Device technology

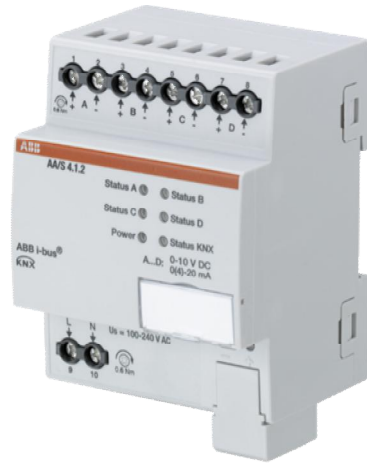


Analogue Actuator AA/A 2.1.2

- § Surface mounted (SM) for decentralized installation
- § Enclosure IP 54
- § 4 cable entries
- § 2 analogue outputs (individual parametrization)
 - § Voltage signals
0...1 / 0...5 / 0...10 / 1...10 V DC
- § Power supply via ABB i-bus® KNX – no additional auxiliary voltage is required

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Device features – Hardware



- § Galvanic isolation between analog outputs and KNX/operating voltage
- § The analogue outputs can be used independently of one another as current or voltage outputs with adjustable output signals
- § The required input format (1 byte ... 4 bytes) and how the output reacts to a reset, bus voltage recovery, etc., are specified for each output
- § Real 0V at analogue outputs (high accuracy)
- § Integration in the i-bus® Tool

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Device features – Software

1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold,
0-10 V, 0-20 mA, MDRC > Channel A > A: General

General	Type of output	0...10 V
Channel A	Input format	1 byte [0...100]% DPT 5.001
A: General	Create own characteristic	<input type="radio"/> No <input checked="" type="radio"/> Yes
A: Characteristic	Parameterize supports and limits on the page "Characteristic"	
A: Dimming	Enable function Dimming	<input type="radio"/> No <input checked="" type="radio"/> Yes
A: Scenes	Enable function 8-bit scene	<input type="radio"/> No <input checked="" type="radio"/> Yes
A: Forced operation	Enable function Forced operation	<input type="radio"/> No <input checked="" type="radio"/> Yes
Channel B	Activate cyclical monitoring	No
Channel C	Reaction on bus voltage failure or ETS programming	<input checked="" type="radio"/> Retain current output value <input type="radio"/> Adopt user-defined output value
Channel D	Reaction on bus voltage recovery	<input checked="" type="radio"/> As before bus voltage failure <input type="radio"/> Adopt user-defined output value
	Object value request on new start and bus voltage recovery	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Send status values	On change

§ The Engineering Tool Software ETS4 or ETS5 is used to parameterize the device

§ In addition to the standard parameters, there are additional parameters that enable the use of

§ Forced operation for higher priorities

§ Dimming function

§ Scene control

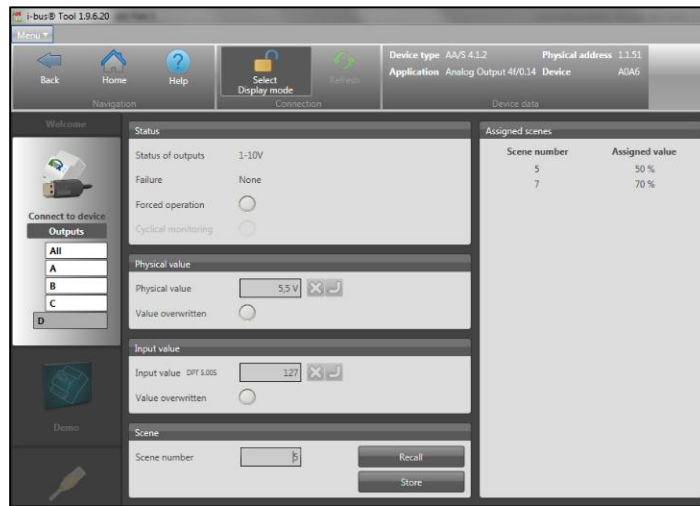
§ Monitoring input objects for a period of time

§ Set up a own output characteristic via value pairs (max. 11 value pairs)



ABB i-bus® KNX Analogue Actuator AA/x X.1.2



Product and functional overview



Integration in the i-bus® Tool

- § The device possesses an interface to the i-bus® Tool
- § The i-bus® Tool can be used to read out data and test functions on the connected device
- § The i-bus® Tool can be downloaded for free from our website:
www.abb.com/knx
- § A description of the functions can be found in the i-bus® Tool online help

ABB i-bus® KNX Analogue Actuator AA/x X.1.2 Comparison

	 AA/S 4.1.2	 AA/A 2.1.2
Design	Modular installation device (MDRC)	Surface mounted (SM)
Mains voltage	100...240 V AC	-
Outputs	4	2
Voltage signals*	0...1 V DC 0...5 V DC 0...10 V DC 1...10 V DC	0...1 V DC 0...5 V DC 0...10 V DC 1...10 V DC
Current signals*	0...20 mA DC 4...20 mA DC	-
List price	380,- €	275,- €

* Depending on parameterization (e.g. 2...6 V DC or 5...15mA)

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Marketing Material

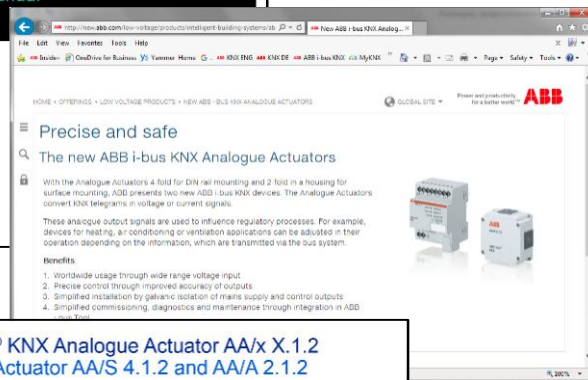
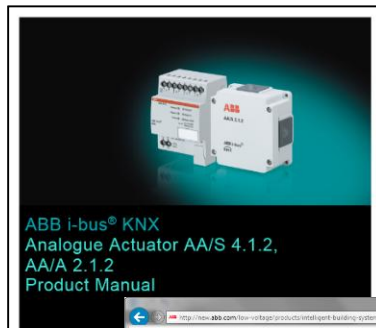


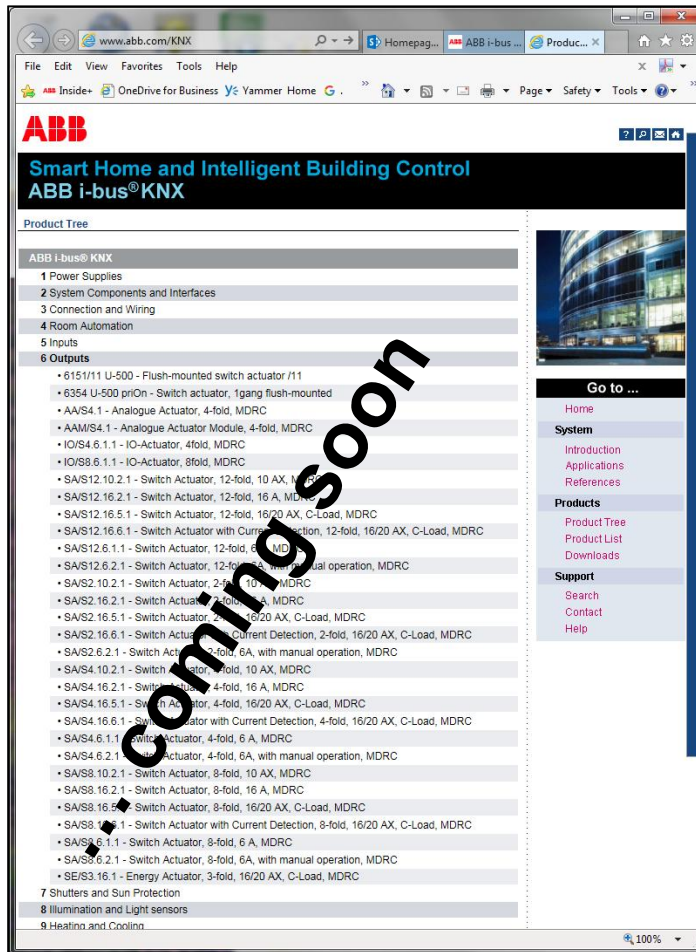
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Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2



- § Product Manuals
- § Technical Data
- § www.abb.com/knx
à Website
- § PowerPoint-Presentation
- § Recording Webinar
(MP4 file on Youtube)

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Marketing Material



www.abb.com/KNX
à **Product categories**
à **Outputs**
à **Analogue Actuator AA/x X.1.2**

- § Application Software ETS4 and ETS5
- § Product Manual
- § Technical Data
- § Installation and Operating Instructions
- § Specification Text
- § Product Information
- § Presentation Slides
- § CE Declaration of Conformity
- § • • •

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Market Introduction

§ Market Launch: Week 31/2016 (first week of August)

Ident No.	Type	Status
2CDG 110 202 R0011	AA/S 4.1.2 Analogue Actuator, MDRC	New
2CDG 110 203 R0011	AA/A 2.1.2 Analogue Actuator, SM	New
2CDG 120 005 R0011	AA/S 4.1 Analogue Actuator, MDRC	To be discontinued
2CDG 120 006 R0011	AAM/S 4.1 Analogue Actuator Module, MDRC	To be discontinued



AA/S 4.1.2



AA/A 2.1.2



AA/S 4.1



AAM/S 4.1

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Features and Value proposition

§ Hardware

- § Wide range supply voltage input 100 ... 240 V AC
à worldwide usage
- § Galvanic isolation between analog outputs and KNX/operating voltage
- § Surface mounted variant bus supplied
à easy installation next to the connected device
- § Outputs with higher accuracy à 0 V is really 0 V
à precise output values

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Features and Value proposition

§ Software

- § Integration in i-bus® Tool
 - à easy and unique commissioning and diagnostic tool
- § Creation of characteristic curve
 - à adaption to any kind of required output signals
- § Scenes
 - à for fast integration into superior functions
- § More input types (**DataPointTyp**)
 - à more flexibility and options to integrate

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Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2



ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Planning

- § The applicable standards, directives, regulations and specifications of the local country have to be observed when planning and setting up electrical installations
- § KNX International Standard
 - § ISO/IEC 14543 and EN 50090
- § IEC 60381-1 Analogue signals for process control systems
 - § Part 1: Direct current signals
- § IEC 60381-2: Analogue signals for process control systems
 - § Part 2: Direct voltage signals

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Technical data

Analogue Actuator AA/S 4.1.2

- § Power supply: ABB i-bus KNX
- § Operating voltage: 100...240 V AC +10 %/-15 %, 50/60 Hz
- § Analog outputs: 4, A...D
 - § Voltage signals: 0...1 V DC, 0...5 V DC, 0...10 V DC, 1...10 V DC and depending on parameterization (e.g. 2...6 V DC)
Signal load ≥ 1 kohm and output current max. 10 mA per channel
 - § Current signal: 0...20 mA DC, 4...20 mA DC and depending on parameterization (e.g. 5...15 mA DC)
Signal load ≤ 500 ohms and output current max. 20 mA per channel
- § Mounting: On 35 mm mounting rail
- § Dimensions: 90 x 70 x 64.5 mm (H x W x D), 4x 18 mm modules



ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Technical data

Analogue Actuator AA/A 2.1.2

- § Power supply: ABB i-bus KNX
- § Analog outputs: 2, A and B
 - § Voltage signals: 0...1 V DC, 0...5 V DC, 0...10 V DC, 1...10 V DC and depending on parameterization (e.g. 2...6 V DC)
 - § Signal load ≥ 5 kohm and output current max. 2 mA per channel
- § Surface mounted device, screw fixing
- § Dimensions: 117 x 117 x 51 mm (H x W x D)
- § Degree of protection: IP 54



ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Software functions

Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2

§ Input formats:

§ 1 byte

[0...100] % DPT 5.001, [0...255] DPT 5.005,
[-128...127] DPT 6.010

§ 2 bytes

[0...65,535] DPT 7.001, [-32,768...32,767] DPT 8.001,
[-1,000...1,000] floating point DPT 9.0XX

§ 4 bytes

[-1,000.00...1,000.00] IEEE754 floating point DPT 14.0XX

§ Create own characteristic to specify a particular output progression based on the input signal by using max. 11 value

§ Status byte device

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Software functions

Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2

- § Dimming (additional options that are used to dim output voltages)
- § 8-bit scene control
- § Forced operation 1 and 2 for higher priorities
- § Cyclical monitoring of “Input value” and/or object “Forced operation”
- § Reaction on bus voltage failure / recovery and ETS programming

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Functional description of a continuous fan control

- § Rocker 1 left off (0 V), right rocker max. speed (10 V)
- § Presence detector: In case of presence 80 % speed, no presence à fan off

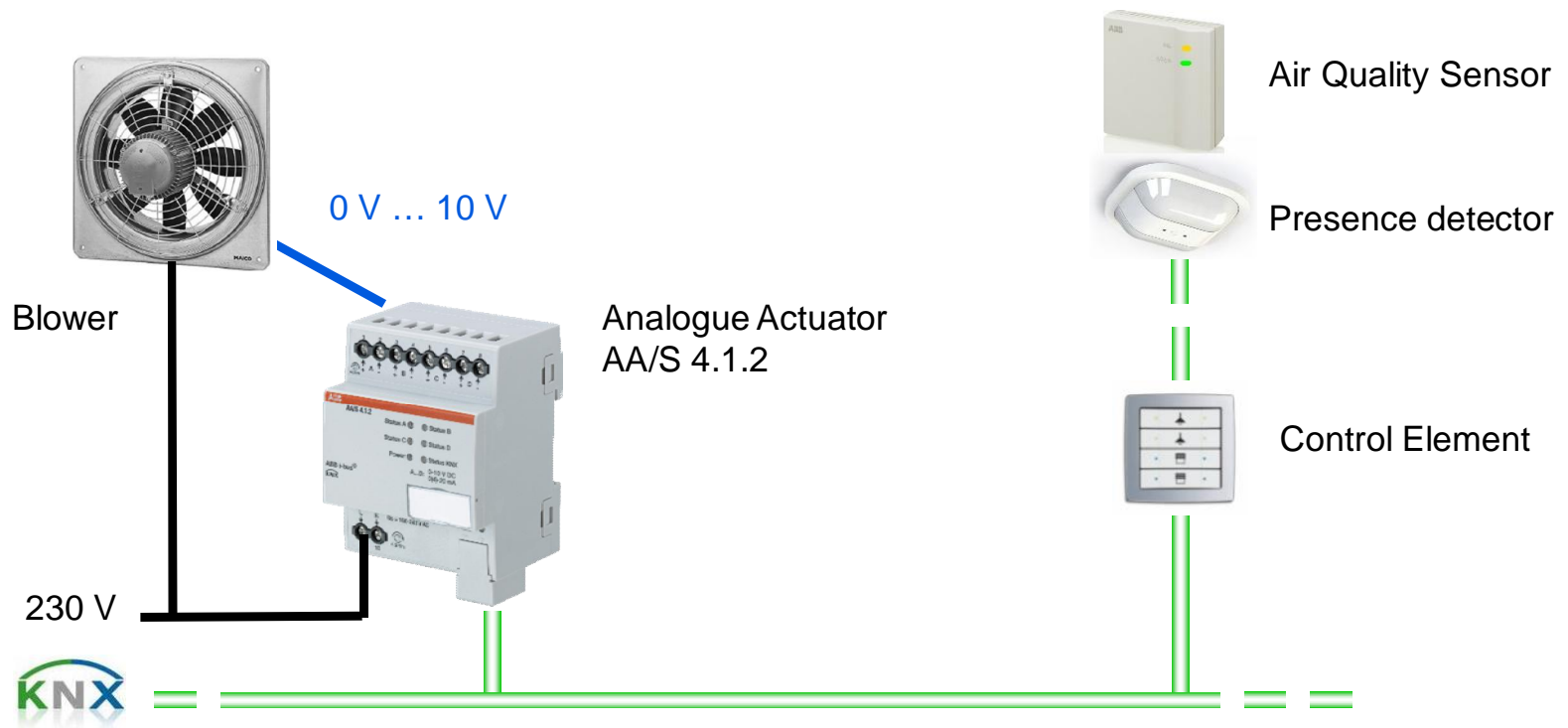


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Functional description of mixing valve control

- § A control value controls a 6-way valve both for heating and cooling
- § Depending on the value either the main heating circuit or main cooling circuit is active

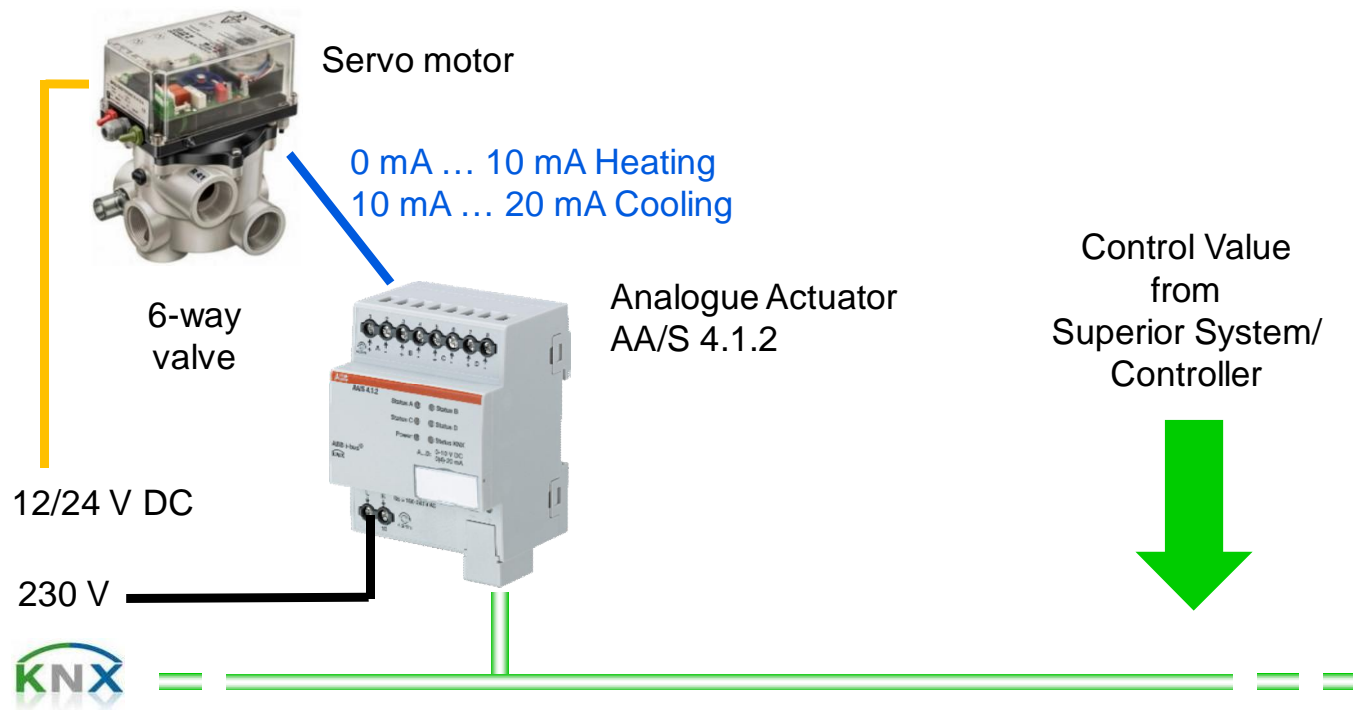


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Functional description of a light control

- § Rocker 1 switches the LED lighting on or off (1 bit)
- § Rocker 2 dims up and down (4 bit)
- § Presence detector sets a value (8 bit)

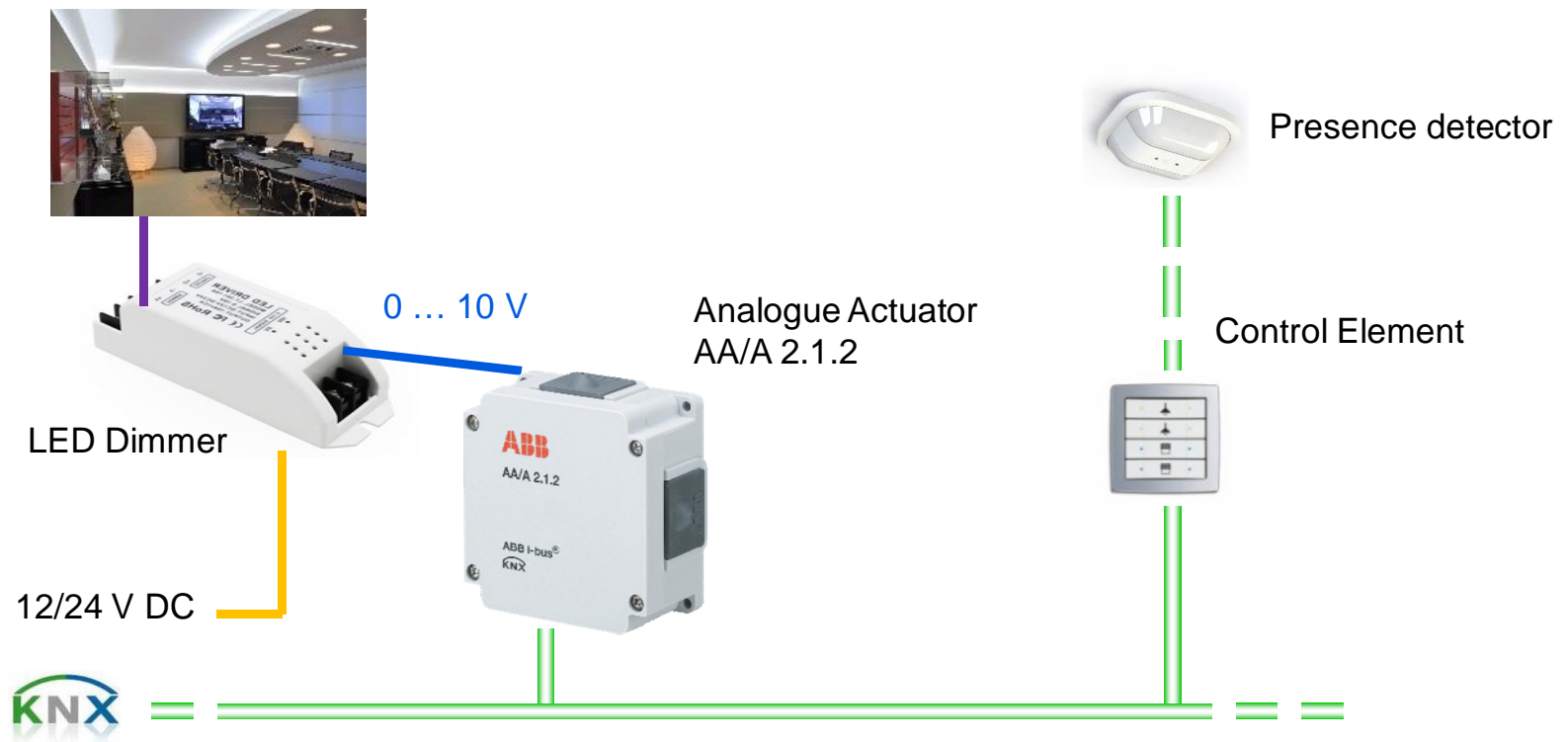


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Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2



ABB i-bus® KNX Analogue Actuator AA/x X.1.2 Installation



Montage- und Betriebsanleitung
Installation and Operating Instructions
Mode d'emploi
Instrucciones de montaje de servicio
Istruzioni per l'uso
Montage- en bedieningshandleiding
Instrukcja montażu i eksploatacji
Руководство по монтажу и эксплуатации
安装和操作手册

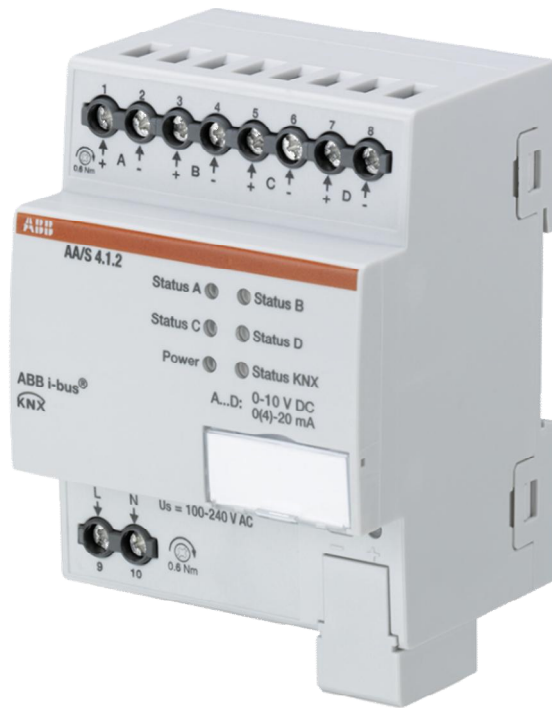
AA/S 4.1.2

- DE Analogaktor, 4-fach, 0-10 V, 0-20 mA, REG
- EN Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC
- FR Module 4 sorties analogiques, 0-10 V, 0-20 mA, MRD
- ES Actuador analógico, 4 canales, 0-10 V, 0-20 mA, MDRC
- IT Attuatore analogico, 4 canali, 0-10 V, 0-20 mA, MDRC
- NL Analoge aktor 4v 0-10V 0-20mA DIN-rail
- PL Wyjście analogowe, 4-krotne, 0-10 V, 0-20 mA, MDRC
- RU Аналоговый активатор, 4-кан, 0-10 V, 0-20 mA MDRC
- GB 模拟量驱动器, 4对, 0-10 V, 0-20 mA, 标准导轨安装

- § Warning! Hazardous voltage! Installation by person with electro technical expertise only
- § The appropriate standards, directives, regulations and specifications must be observed when planning and setting up electrical installations
- § The device must not be operated outside the specified technical data
- § A detailed description of Installation and commissioning can be found in the technical documentation and Installation and Operating Instructions of the device

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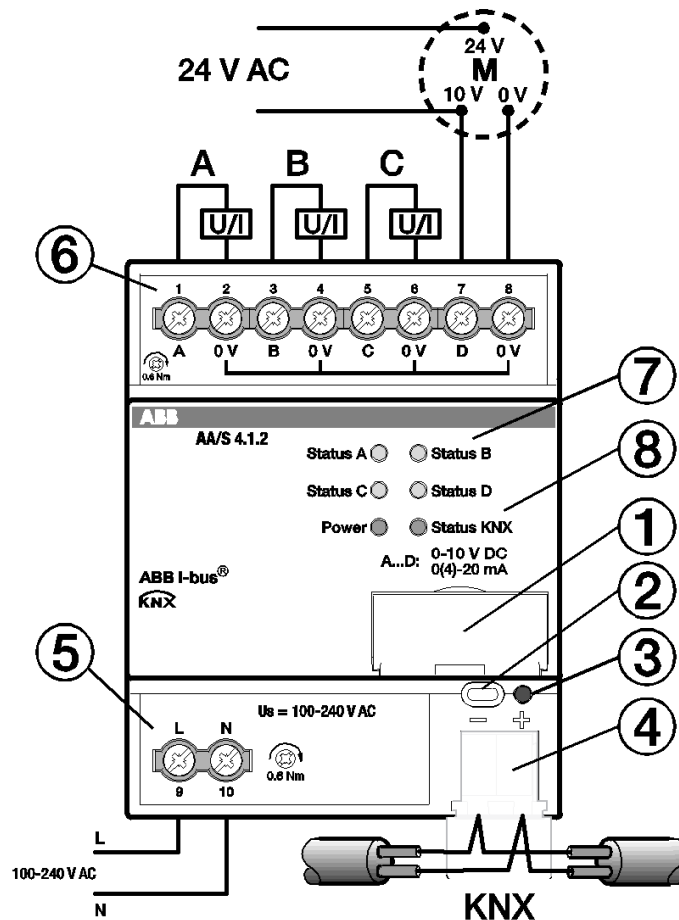
Installation AA/S 4.1.2



- § 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
- § Electrical connection is implemented using screw terminals
 - § 0.2...2.5 mm² fine stranded
 - § 0.2...4.0 mm² single core
- § The connection to the KNX is implemented using the supplied bus connection terminal

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation AA/S 4.1.2 – Hardware

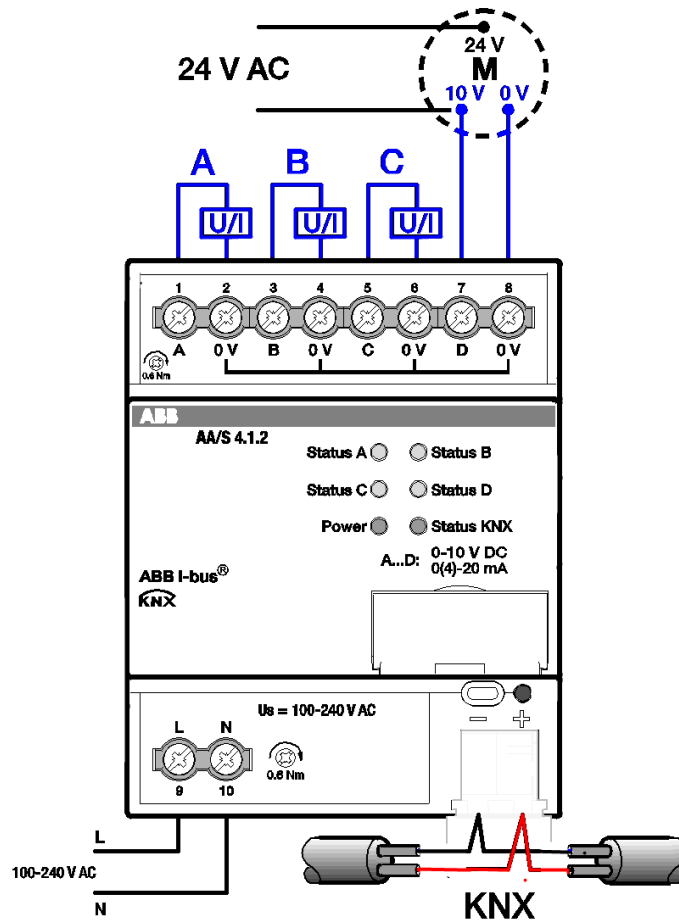


Connection diagram

No.	
1	Label carrier
2	Programming button
3	Programming LED
4	Bus connection terminal
5	Power supply connection U_s
6	Analog outputs
7	Status Channels A...D LED
8	Status KNX and Power LED

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation AA/S 4.1.2 – Hardware



Connection diagram

Terminal	
1	Analog Output A
2	0 V
3	Analog Output B
4	0 V
5	Analog Output C
6	0 V
7	Analog Output D
8	0 V
9	L Operating voltage
10	N Operating voltage
-	KNX “-”
+	KNX “+”

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation AA/S 4.1.2 – Display/Operating elements

LED	Function	Description
Status A...D LED (yellow)	ON	Channel output signal is not 0 (or not minimum output value)
	OFF	Channel output signal is 0 or output is deactivated (or is minimum output value)
	Flashing	Channel output fault: e.g. current mode: load too high
Status KNX LED (green)	ON	KNX voltage on, device ok
	OFF	Bus voltage failure
Power LED (green)	ON	Operating voltage present
	OFF	Operating voltage is not present
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

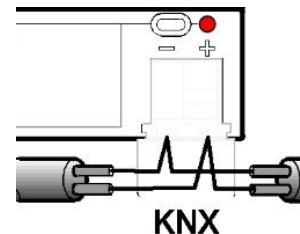
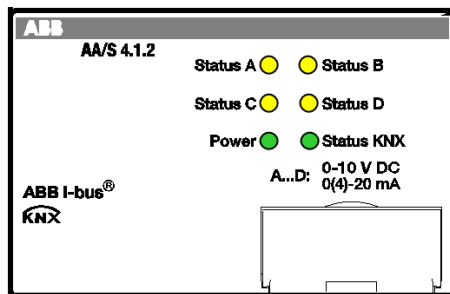
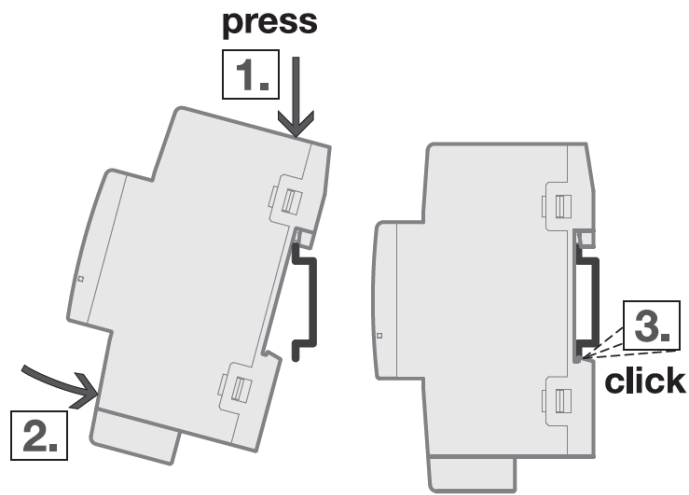
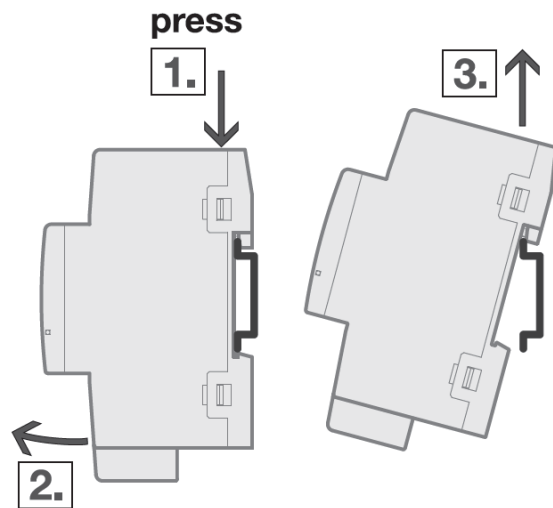


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation steps AA/S 4.1.2



§ Snap onto mounting rail



§ Remove from mounting rail

§ No screwdriver required!

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

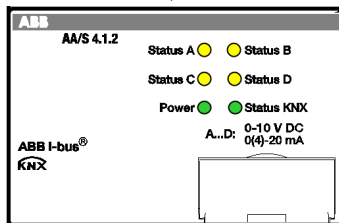
Installation steps AA/S 4.1.2

- § De-energize the electrical plant and prevent unintentional reclosing of the electrical plant
- § Snap device onto mounting rail
- § Connect the cables for
 - § Operating voltage
 - § KNX
 - § Analog control inputs of the related devices
 - § Note the output signal load
 - Voltage signal: $\geq 1\text{ k ohm}$, $\leq 10\text{ mA}$
 - Current signal: $\leq 500\text{ ohms}$, $\leq 20\text{ mA}$
- § ...

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation steps AA/S 4.1.2

- § Switch on operating voltage and KNX
 - à Start up of the device
- § The “Status KNX” LED lights green
- § The “Power” LED lights green
- § The “Channel Status A...D” LEDs can be on (yellow) or off. If a LED flashes, the output has a fault (e.g. current mode: load too high)

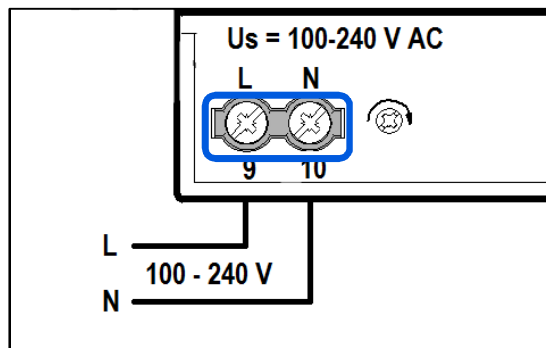
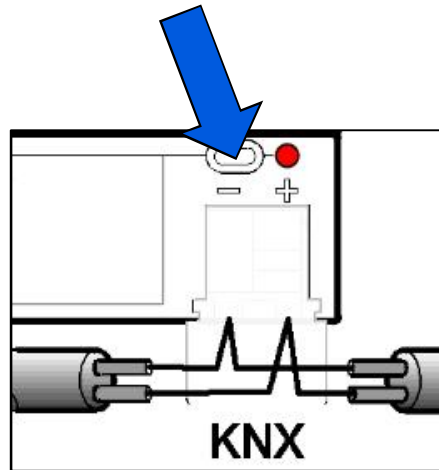


à Analogue Actuator is ready for operation and commissioning with ETS



ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting of AA/S 4.1.2



Test KNX

- § Press “Programming button”
 - à Programming LED lights red
 - KNX is OK, press again to switch off the LED
 - à Programming LED does not light: KNX failure
- Check whether KNX is available (e.g. using a digital meter and measure the bus voltage between the red and black core, 20-29 V DC)

Test operating voltage

- § Using a digital meter and measure the mains voltage between the “Power supply connection U_s ”

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

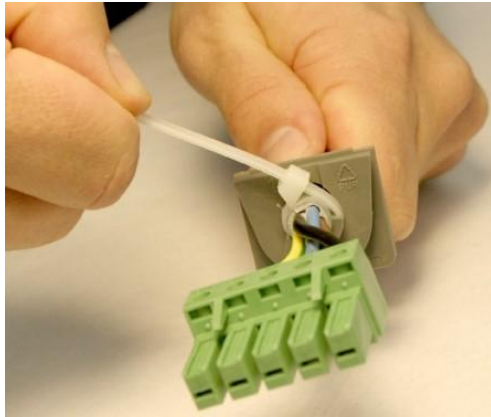
Installation AA/A 2.1.2



- § The device is suitable for surface mounting in any position
- § Four screws (enclosed) connect the device to a flat surface
- § Accessibility of the device for the purpose of operation, testing, visual inspection, maintenance and repair must be ensured
- § Electrical connection is implemented using pluggable screw terminals
 - § 0.08...1.5 mm² fine stranded
 - § 0.2...1.0 mm² single core
- § The connection to the KNX is implemented using the supplied bus connection terminal

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation AA/A 2.1.2



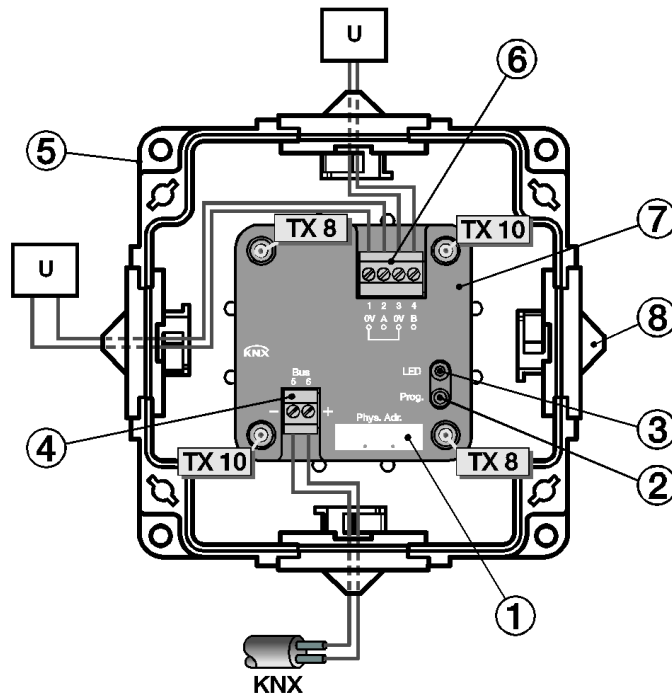
The strain relief is carried out on the cable entry

Scope of delivery

- § Analogue Output incl. four cable entries opened and two cable entries closed
- § Installation and operating instructions
- § Bus pluggable screw terminal
- § Pluggable screw terminal for the cables to the analog control inputs of the related devices
- § Four cable ties for strain relief
- § 4 x screws and 4 x S6 dowels

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation AA/A 2.1.2 – Hardware

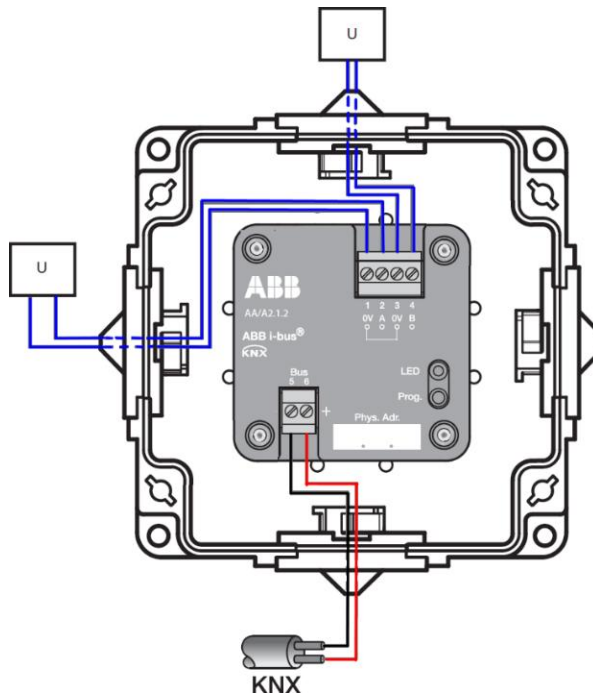


Connection diagram

No.	
1	Label carrier
2	Programming button
3	Programming LED (red)
4	KNX bus connection
5	Housing
6	Analog outputs
7	Device cover
8	4 x cable entry

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation AA/A 2.1.2 – Hardware



Connection diagram

Terminal	
1	0 V
2	Analog Output A
3	0 V
4	Analog Output B
5	KNX “-”
6	KNX “+”

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation AA/A 2.1.2 – Display/Operating elements

LED	Function	Description
Programming button PROG	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

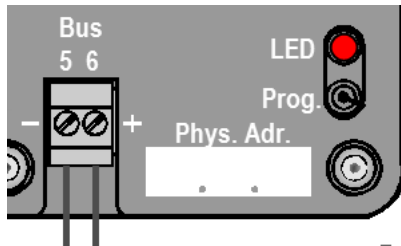


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation steps AA/A 2.1.2

- § De-energize the electrical plant and prevent unintentional reclosing of the electrical plant
- § Fix the housing with screws (enclosed) on a flat surface
- § Cables are routed to the device via cable entries and carried out the strain relief
- § Connect the cables for
 - § KNX
 - § Analog control inputs of the related devices
 - § Note the output signal load
Voltage signal: $\geq 5\text{k ohm}$, $\leq 2\text{ mA}$
- § ...

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Installation steps AA/A 2.1.2

- § Switch on KNX
 - à Start up of the device

- à Analogue Actuator is ready for operation and commissioning with ETS



ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2



ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Commissioning

- § Add an Analogue Actuator to the building/topology view
 - § Set the parameters according to the requirements of the installation
 - § Create and link group addresses to the group objects of the devices
 - § Download individual address and application
 - § Test the
 - § Settings of the Analogue Actuator (i-bus® Tool)
 - § Functional implementation
- Control element/Sensor – Analogue Actuator – Terminal Device

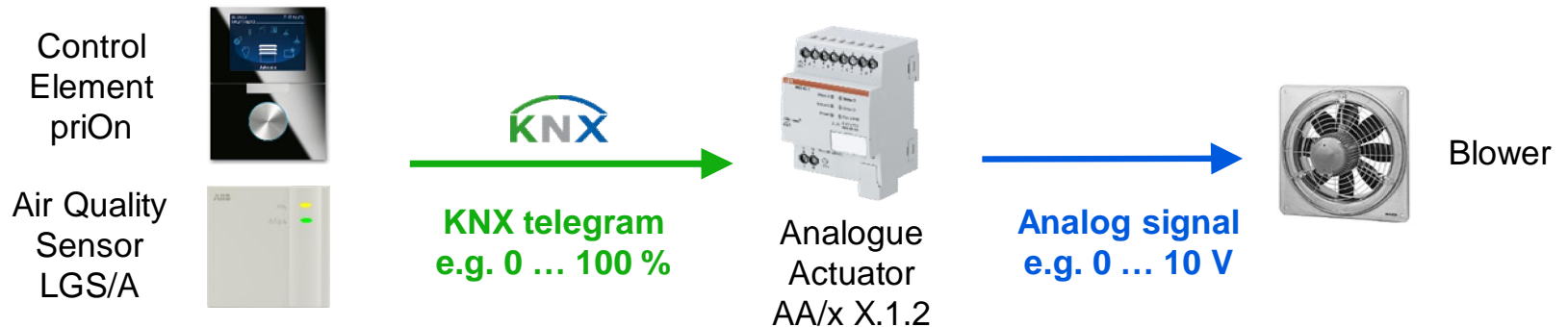


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – General

The screenshot displays the ETS software interface for configuring an ABB i-bus KNX Analogue Actuator AA/x X.1.2. The left sidebar shows the project topology with the following structure:

- Dynamic Folders
 - 1 Area 1
 - 1.1 Line 1
 - 1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC (Selected)
 - Kanal A
 - Kanal B
 - Kanal C
 - Kanal D

The middle pane shows the selected device's general settings:

1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > General

General

- + Channel A
- + Channel B
- + Channel C
- + Channel D

The right pane shows the configuration parameters for the selected device:

Send, swi. delay after volt. recov., download and ETS reset in s [2...255]: 2

State after expiration of sending and switching delay: ☒ Last value received ☐ Ignore received values

Limit number of telegrams: ☒ No ☐ Yes

Enable group object "In operation", 1 bit: ☒ No ☐ Yes

Enable group object "Request status values" 1 bit: ☒ No ☐ Yes

Enable group object "Status Auxiliary voltage" 1 bit: ☒ No ☐ Yes

Enable group object "Status byte device" 2 x 8 bits: ☒ No ☐ Yes

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – General

The screenshot displays the ETS software interface for configuring an ABB i-bus KNX Analogue Actuator AA/x X.1.2. The left sidebar shows the project topology, with the selected device being a 4-fold actuator. The central pane shows the 'General' parameters for this device, including settings for channels A, B, C, and D. The right pane shows a list of available values for the selected parameter.

Left Sidebar (Topology):

- Dynamic Folders
 - 1 Area 1
 - 1.1 Line 1
 - 1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC
 - 0: General - Request status values
 - 1: General - In operation
 - 2: General - Status Auxiliary voltage
 - 3: General - Status byte channel A/B
 - 4: General - Status byte channel C/D
 - Kanal A
 - Kanal B
 - Kanal C
 - Kanal D

Central Pane (General Parameters):

1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > General

General

- Send, swi. delay after volt. recov., download and ETS reset in s [2...255]: 2
- State after expiration of sending and switching delay: ☒ Last value received ☐ Ignore received values
- Limit number of telegrams: ☐ No ☒ Yes
- Max. number of telegrams [1...255]: 20
- In period: 1 s
- Enable group object "In operation", 1 bit: ☐ No ☒ Yes
- Send: ☐ Value 0 ☒ Value 1
- Sending cycle time in s [1...65,535]: 60
- Enable group object "Request status values" 1 bit: ☐ No ☒ Yes
- Request with object value: 1
- Enable group object "Status Auxiliary voltage" 1 bit: ☐ No ☒ Yes
- Enable group object "Status byte device" 2 x 8 bits: ☐ No ☒ Yes

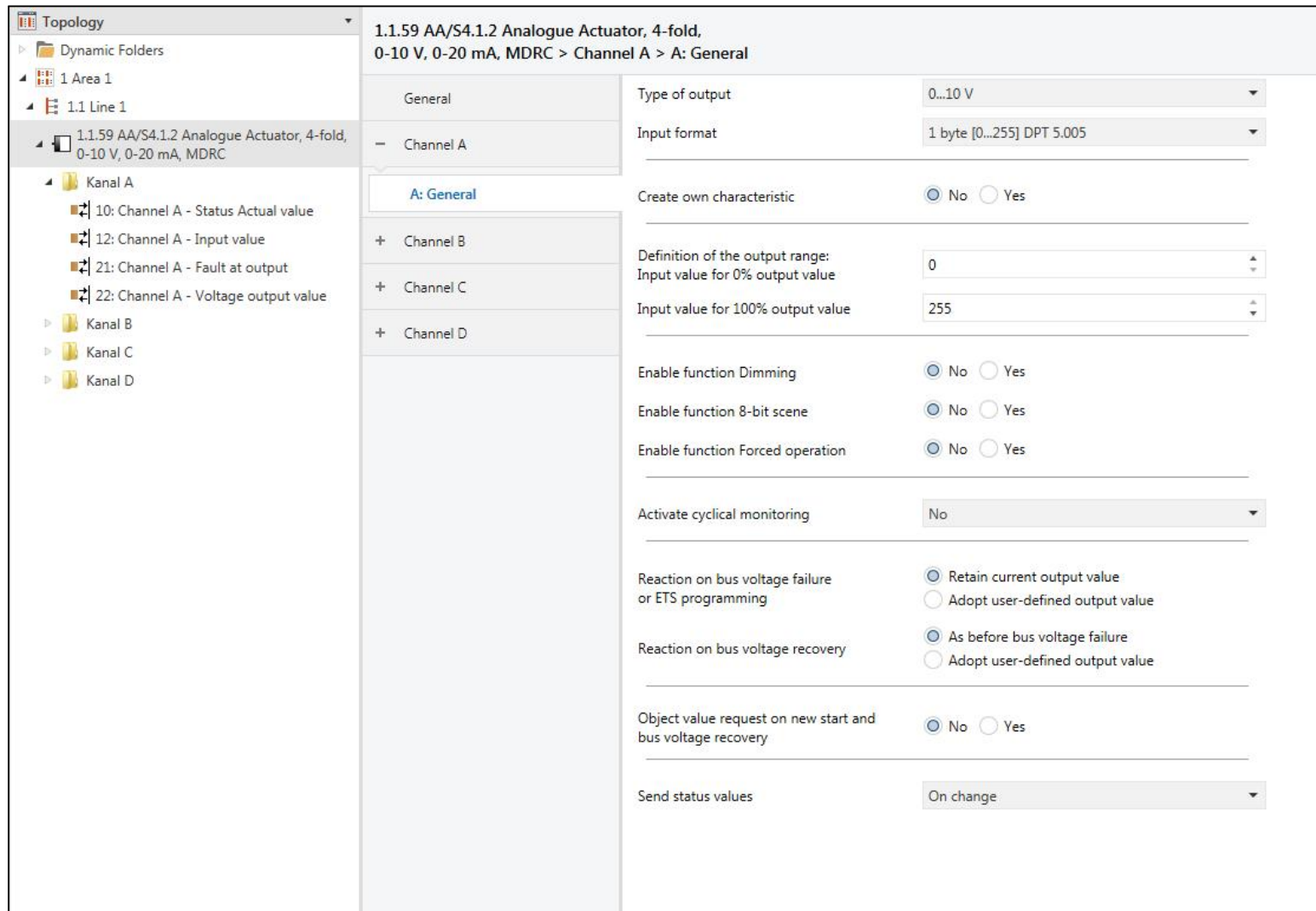
Right Pane (List of Values):

- 50 ms
- 100 ms
- 200 ms
- 500 ms
- 1 s**
- 2 s
- 5 s
- 10 s
- 30 s
- 1 min

- 0
- 1**
- 0 or 1

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: General



1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: General

General	Type of output	0...10 V
Channel A	Input format	1 byte [0...255] DPT 5.005
A: General	Create own characteristic	<input checked="" type="radio"/> No <input type="radio"/> Yes
Channel B	Definition of the output range:	0
Channel C	Input value for 0% output value	255
Channel D	Input value for 100% output value	
	Enable function Dimming	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Enable function 8-bit scene	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Enable function Forced operation	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Activate cyclical monitoring	No
	Reaction on bus voltage failure or ETS programming	<input checked="" type="radio"/> Retain current output value <input type="radio"/> Adopt user-defined output value
	Reaction on bus voltage recovery	<input checked="" type="radio"/> As before bus voltage failure <input type="radio"/> Adopt user-defined output value
	Object value request on new start and bus voltage recovery	<input checked="" type="radio"/> No <input type="radio"/> Yes
	Send status values	On change

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: General

1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: General

General

Channel A

A: General

A: Characteristic

A: Dimming

A: Scenes

A: Forced operation

Channel B

Channel C

Channel D

Type of output: 0...10 V

Input format: 1 byte [0...255] DPT 5.005

Create own characteristic: ☐ No ☒ Yes

Parameterize supports and limits on the page "Characteristic"

Enable function Dimming: ☐ No ☒ Yes

Enable function 8-bit scene: ☐ No ☒ Yes

Enable function Forced operation: ☐ No ☒ Yes

Activate cyclical monitoring: Object Input value

Time interval for cyclical monitoring in s [1...65,535]: 180

Output after exceeding the monitoring time in % [0...100]: 0

Reaction on bus voltage failure or ETS programming: ☐ Retain current output value ☒ Adopt user-defined output value

Output in % [0...100]: 0

Reaction on bus voltage recovery: ☐ As before bus voltage failure ☒ Adopt user-defined output value

Attention! Characteristic might limit this range!

Output in % [0...100]: 0

Object value request on new start and bus voltage recovery: ☐ No ☒ Yes

Send status values: On change

Deactivated

0...1 V

0...5 V

0...10 V

1...10 V

0...20 mA

4...20 mA

1 byte [0...255] DPT 5.005

1 byte [0...100]% DPT 5.001

1 byte [-128...127] DPT 6.010

2 bytes [0...65,535] DPT 7.00

2 bytes [-32,768...32,767] DPT 8.00

2 bytes (float:point) DPT 9.00

4 bytes (float: point) DPT 14

No

Object Input value

Object Forced operation

Object Input value and object forced operation

No, update only

On change

After a change or request

Cyclically and on change

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: Blower

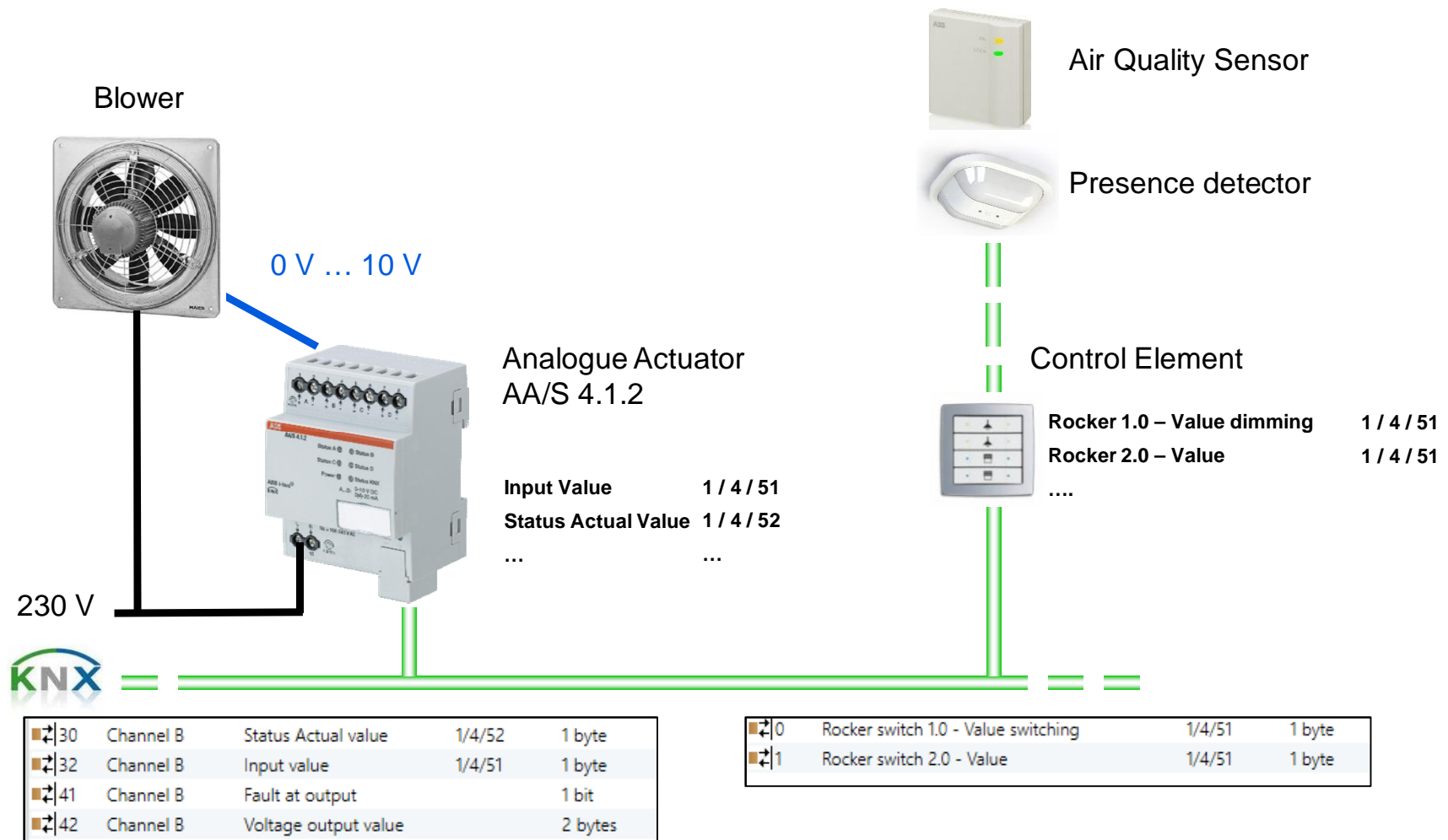


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: Valve control

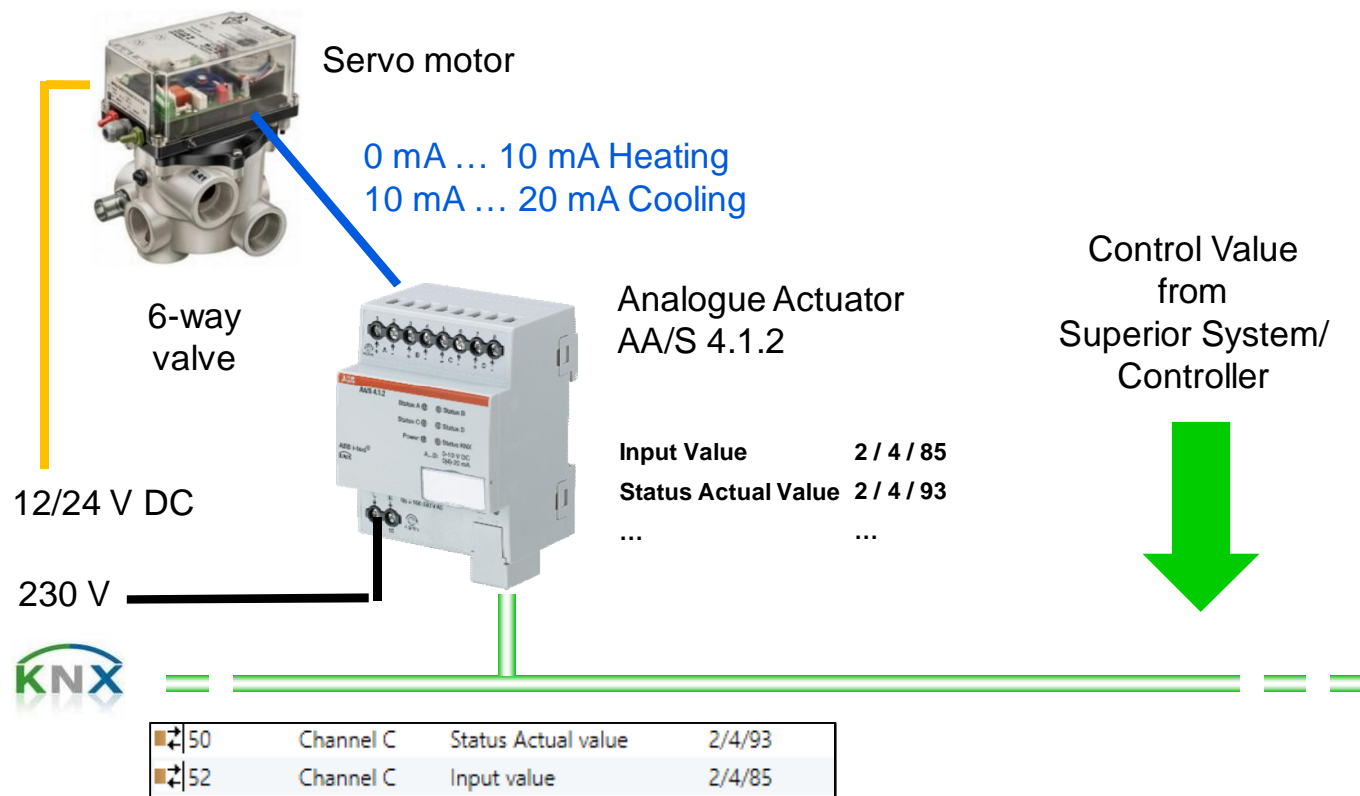


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: Dimming

Topology

- Dynamic Folders
 - 1 Area 1
 - 1.1 Line 1
 - 1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC
 - Kanal A
 - 10: Channel A - Status Actual value
 - 11: Channel A - Status Switch
 - 12: Channel A - Input value
 - 13: Channel A - Switch
 - 14: Channel A - Dimming
 - 21: Channel A - Fault at output
 - 22: Channel A - Voltage output value
 - Kanal B
 - Kanal C
 - Kanal D

1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: Dimming

General

Rel. dimming speed for [0...100%] and input value in s [0...255] 5

Switch on at

☐ User-defined value ☒ Last output value

Dimming speed for [0...100%] while switching in s [0...255] 0

A: Dimming

- + Channel B
- + Channel C
- + Channel D

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: Dimming

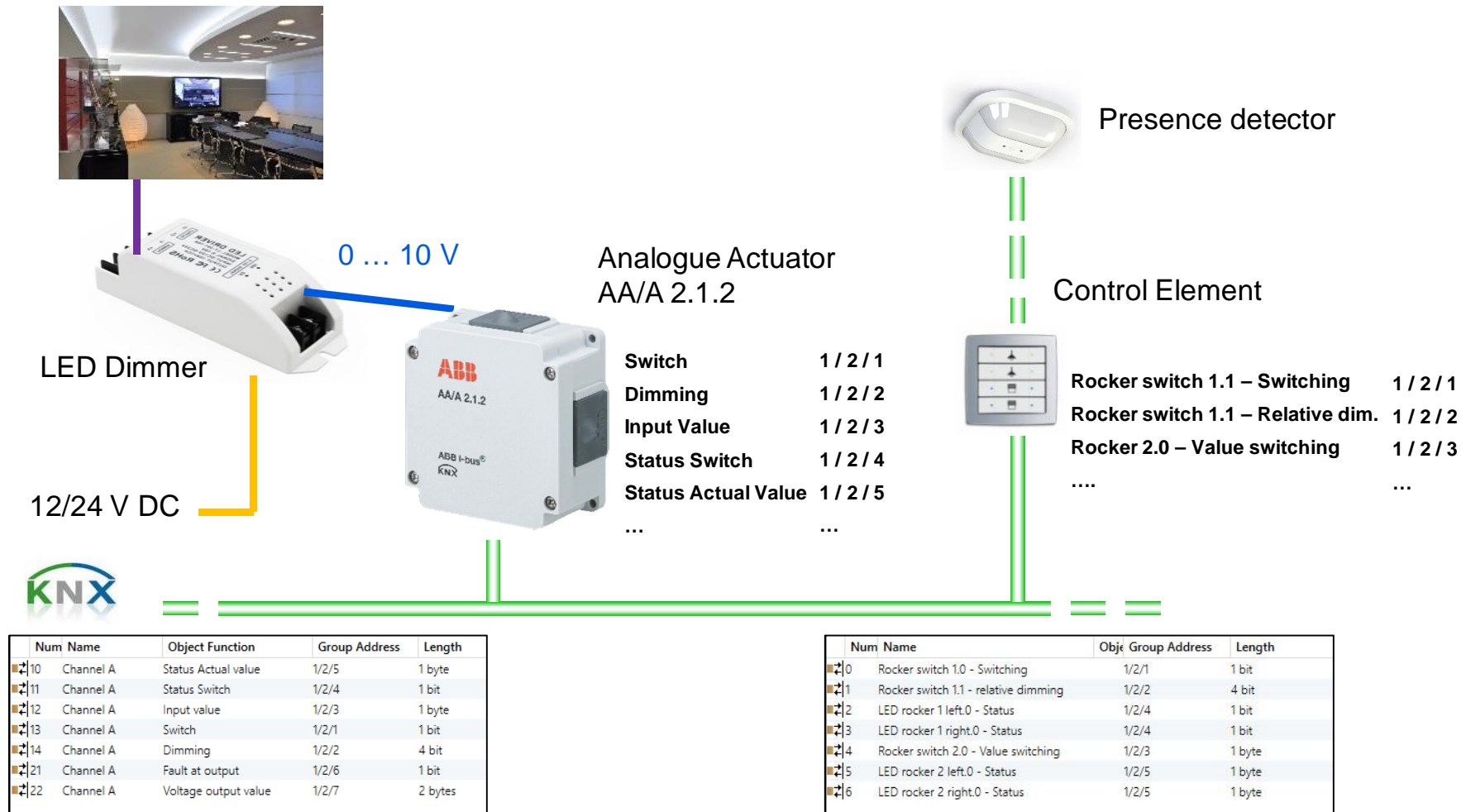


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: Scenes

Topology

- Dynamic Folders
 - 1 Area 1
 - 1.1 Line 1
 - 1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC
 - Kanal A
 - 10: Channel A - Status Actual value
 - 12: Channel A - Input value
 - 19: Channel A - 8-bit scene
 - 21: Channel A - Fault at output
 - 22: Channel A - Voltage output value
 - Kanal B
 - Kanal C
 - Kanal D

1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: Scenes

General

Channel A

A: General

A: Scenes

Channel B

Channel C

Channel D

Overwrite scenes on download ☐ No ☒ Yes

Attention! Observe input form., upp./ low. limits. See ch. A or A: Character.

Assignment 1 to scene number (No. 1...64, 0 = no assignment) 0

Assignment 1 input value in % [0...100] 0

Assignment 2 to scene number (No. 1...64, 0 = no assignment) 0

Assignment 2 input value in % [0...100] 0

Assignment 3 to scene number (No. 1...64, 0 = no assignment) 0

Assignment 3 input value in % [0...100] 0

Assignment 4 to scene number (No. 1...64, 0 = no assignment) 0

Assignment 4 input value in % [0...100] 0

Assignment 5 to scene number (No. 1...64, 0 = no assignment) 0

Assignment 5 input value in % [0...100] 0

Assignment 6 to scene number (No. 1...64, 0 = no assignment) 0

Assignment 6 input value in % [0...100] 0

Assignment 7 to scene number (No. 1...64, 0 = no assignment) 0

Assignment 7 input value in % [0...100] 0

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

ETS Parameters – Channel X: Forced Operation

Topology

- Dynamic Folders
 - 1 Area 1
 - 1.1 Line 1
 - 1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC
 - Kanal A
 - 10: Channel A - Status Actual value
 - 12: Channel A - Input value
 - 15: Channel A - Forced operation 1, 1 bit**
 - 21: Channel A - Fault at output
 - 22: Channel A - Voltage output value
 - Kanal B
 - Kanal C
 - Kanal D

1.1.59 AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: Forced operation

General

Channel A

A: General

A: Forced operation

Channel B

Channel C

Channel D

Attention! Observe output range

Use forced operation 1

Output value with forced operat. 1 in % of output range [0...100]

Use forced operation 2

Output value after cancellation of forced operation

Forced operation objects, 1 bit; 0 active

0

No

Current input value

No

Forced oper obj 1 bit; 0 active

Forced oper obj 1 bit; 1 active

Forced oper obj 2 bits

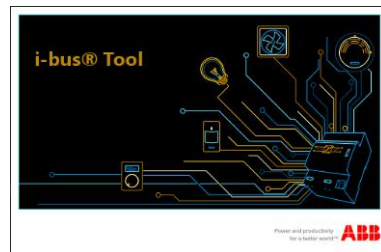
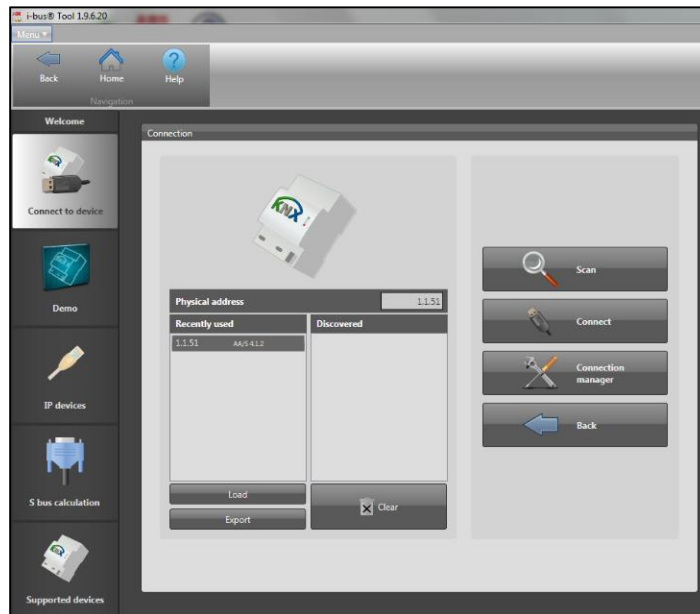
Value before forced operation

Current input value

Retain forced operation value

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting



i-bus® Tool – a professional Service Tool

- § Internal information and states of the device hardware and software applications are now available in a transparent manner
- § The i-bus® Tool is optional, i.e. the KNX devices must still be commissioned using just the ETS
- § The i-bus® Tool accesses a KNX device via a standard KNX interface (USB, IP) with the assistance of the individual address
- § The system integrator can trigger the desired functions, read values, simulate states and make settings for the connected device (e.g. scenes)

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting

i-bus® Tool – “Outputs All”

The screenshot shows the i-bus Tool 1.9.6.20 interface. The top navigation bar includes buttons for Back, Home, Help, Select Display mode, and Refresh. The right side of the top bar displays device information: Device type AA/S 4.1.2, Physical address 1.1.51, Application Analog Output 4f/0.14, and Device A0A6.

The main content area is divided into a left sidebar and a main panel. The sidebar contains a 'Welcome' section with a USB icon, a 'Connect to device' section with an 'Outputs' dropdown menu (where 'All' is selected), and a 'Demo' section with a circuit board icon. The main panel displays the 'Status of outputs' table.

	A	B	C	D
Status of outputs	0-10V	0-10V	4-20mA	1-10V
Output value	1,4 V	5,0 V	13,5 mA	5,5 V
Failure	None	Short circuit	None	None
Forced operation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cyclical monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting

i-bus® Tool – “Output A”

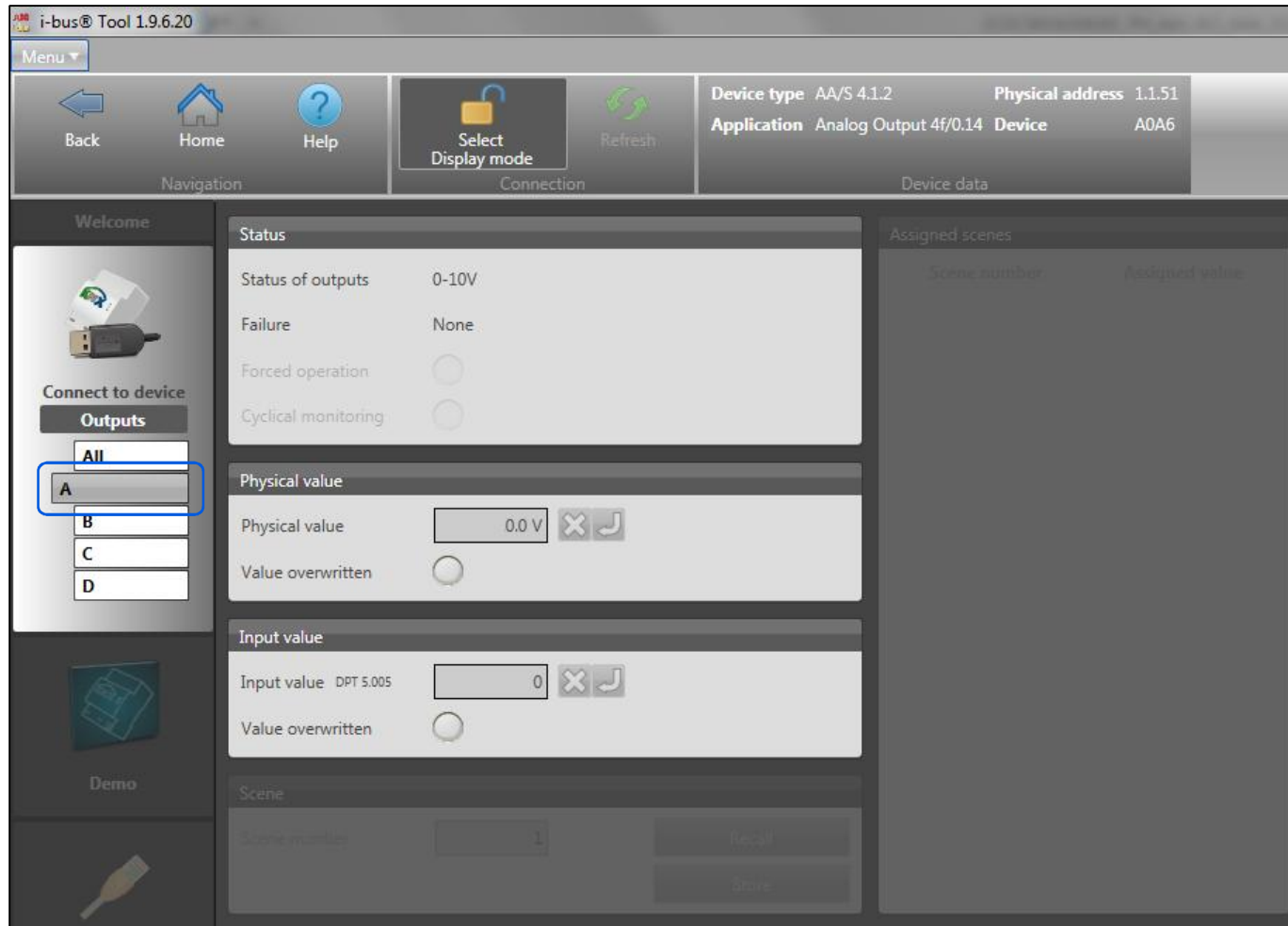


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting

i-bus® Tool – “Output B”

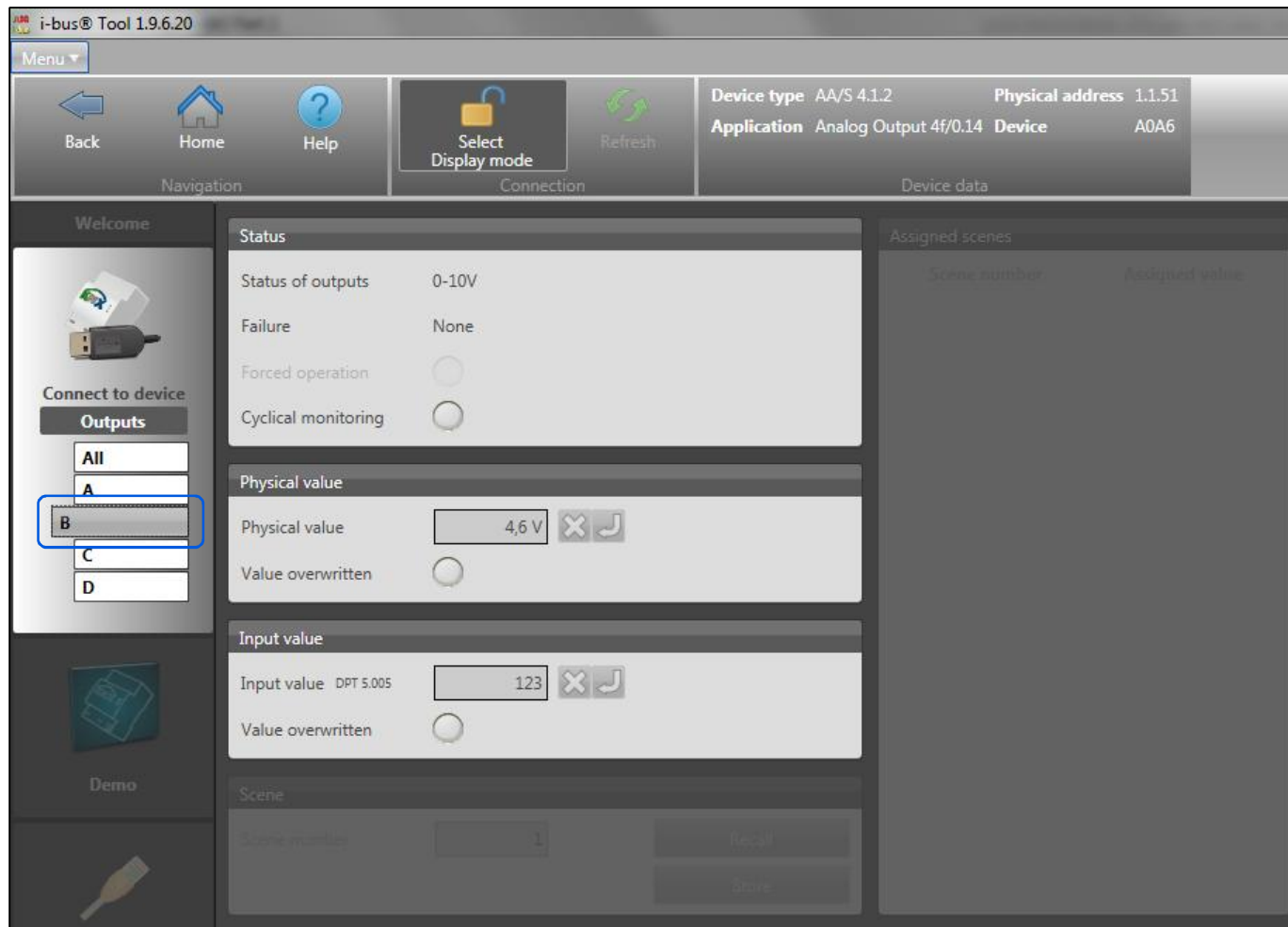


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting

i-bus® Tool – “Output C”

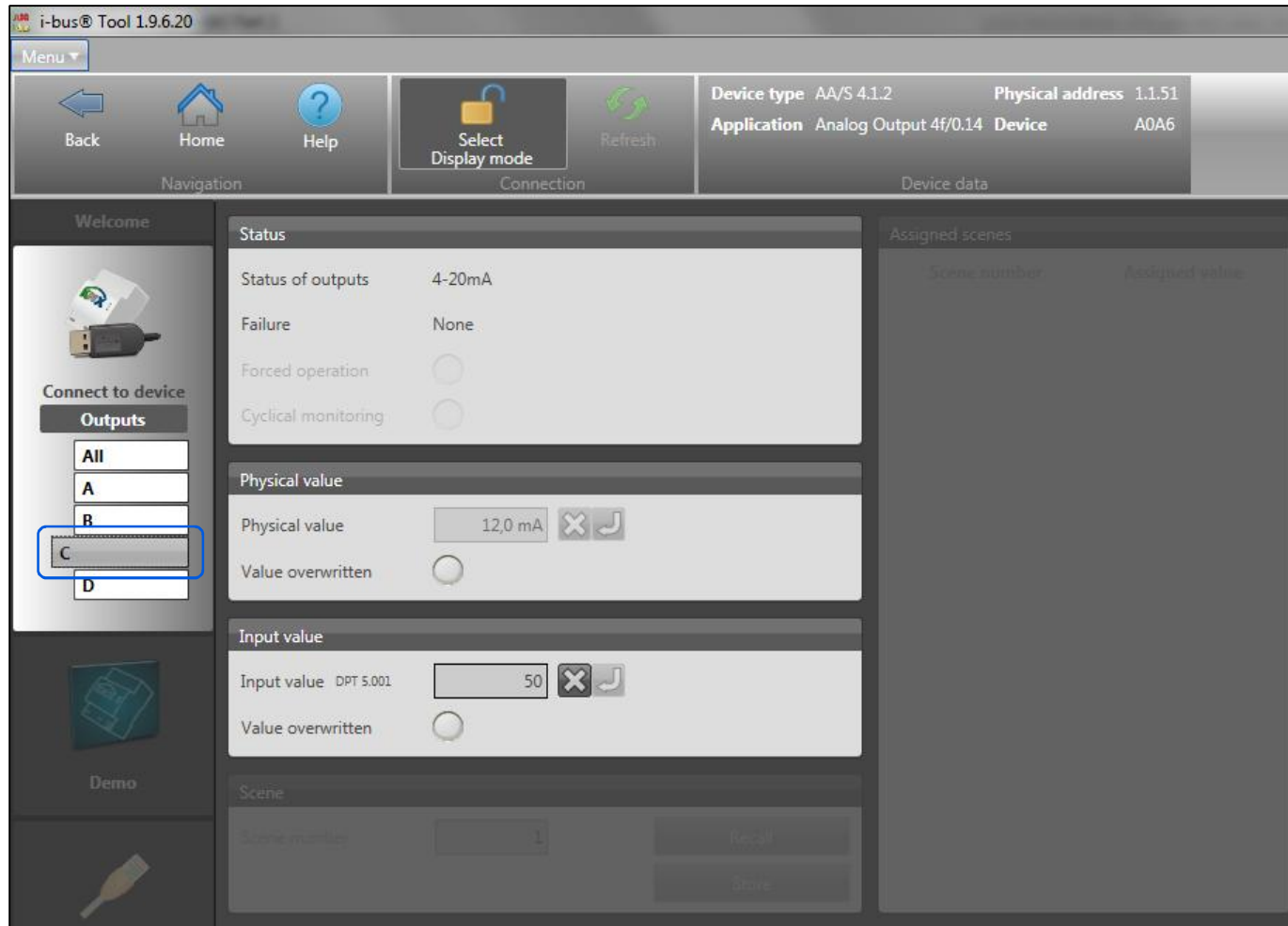


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting

i-bus® Tool – “Output C”

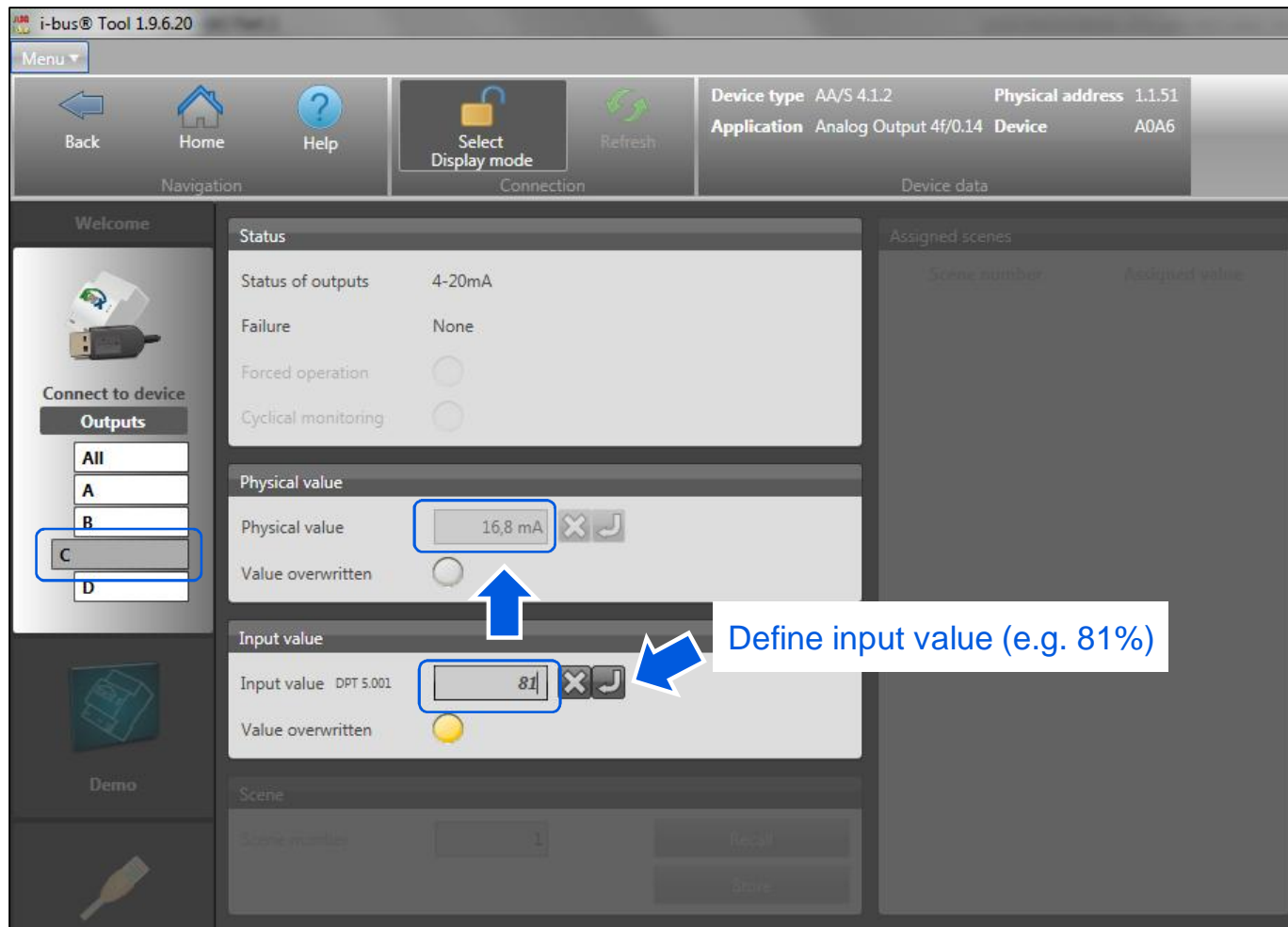


ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting

i-bus® Tool – “Output C”

i-bus® Tool 1.9.6.20

Menu

Back Home Help Select Display mode Refresh

Navigation Connection Device data

Device type AA/S 4.1.2 Physical address 1.1.51
Application Analog Output 4f/0.14 Device A0A6

Welcome

Connect to device

Outputs

All A B C D

Demo

Status

Status of outputs 4-20mA
Failure None
Forced operation ☐
Cyclical monitoring ☐

Physical value

Physical value 8.2

Value overwritten ☐

Input value

Input value DPT 5.001 59

Value overwritten ☐

Scene

Scene number 1

Assigned scenes

Scene number Assigned value

Define physical value to the output e.g 8.2 mA

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Testing and troubleshooting

i-bus® Tool – “Output D”

i-bus® Tool 1.9.6.20

Menu

Back Home Help Select Display mode Refresh

Navigation Connection Device data

Device type AA/S 4.1.2 Physical address 1.1.51
Application Analog Output 4f/0.14 Device A0A6

Welcome

Connect to device

Outputs

All A B C D

Demo

Status

Status of outputs 1-10V

Failure None

Forced operation ☐

Cyclical monitoring ☐

Physical value

Physical value 5,5 V

Value overwritten ☐

Input value

Input value DPT 5.005 127

Value overwritten ☐

Scene

Scene number 5

Assigned scenes

Scene number	Assigned value
5	50 %
7	70 %

call scene no. 5

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Analogue Actuator AA/S 4.1.2 and AA/A 2.1.2



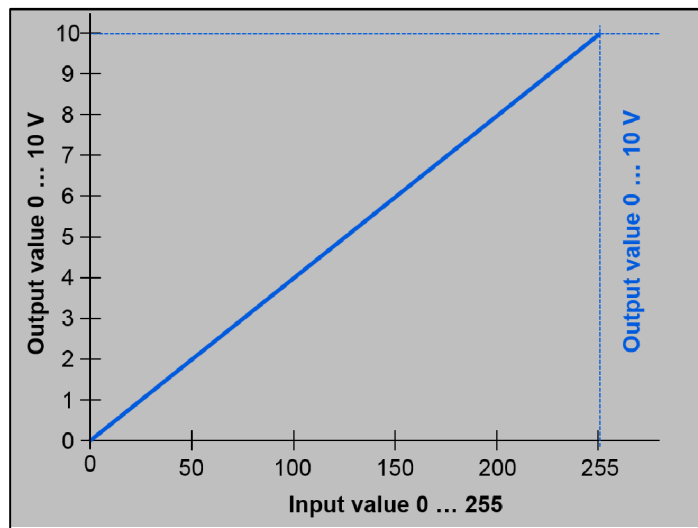
ABB i-bus® KNX Analogue Actuator AA/x X.1.2 Commissioning

1.1.53 Create own characteristic AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: General

General	Type of output	0...10 V
Channel A	Input format	1 byte [0...255] DPT 5.005
A: General	Create own characteristic	<input checked="" type="radio"/> No <input type="radio"/> Yes
Channel B	Definition of the output range:	
Channel C	Input value for 0% output value	0
Channel D	Input value for 100% output value	255

Create own characteristic

- § No own characteristic specified
- § Linear behavior between input value and out value



- § Input Format: 1 byte (0 ... 255)
- § Type of output: 0 ... 10 V

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Commissioning

1.1.53 Create own characteristic AA/S4.1.2 Analogue Actuator, 4-f 0-10 V, 0-20 mA, MDRC > Channel A > A: Characteristic

General	No of support points	2
Channel A	Attention! Observe selected input format!	
A: General		
A: Characteristic		
Channel B		
Channel C		
Channel D		

Support 1 input value, value between [0...255]

0

Support 1 output value, value in mV [0...10,000]

1000

Support 2 input value, value between [0...255]

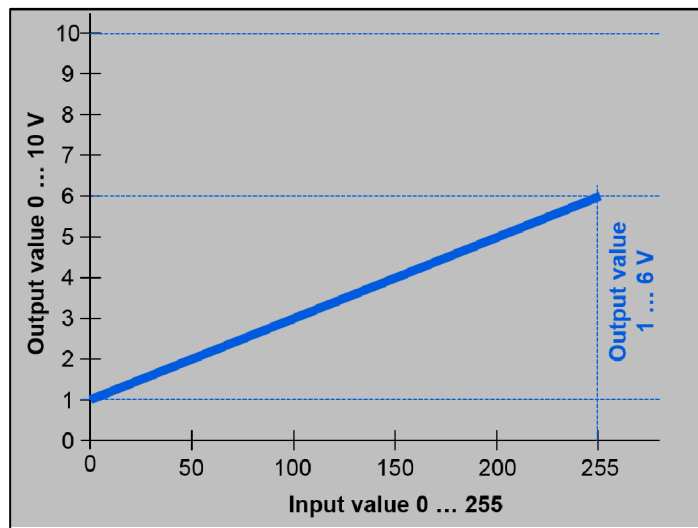
255

Support 2 output value, value in mV [0...10,000]

6000

Create own characteristic

§ Create own characteristic to specify a particular output progression based on the input signal by using max. 11 value pairs (support points)



For example:

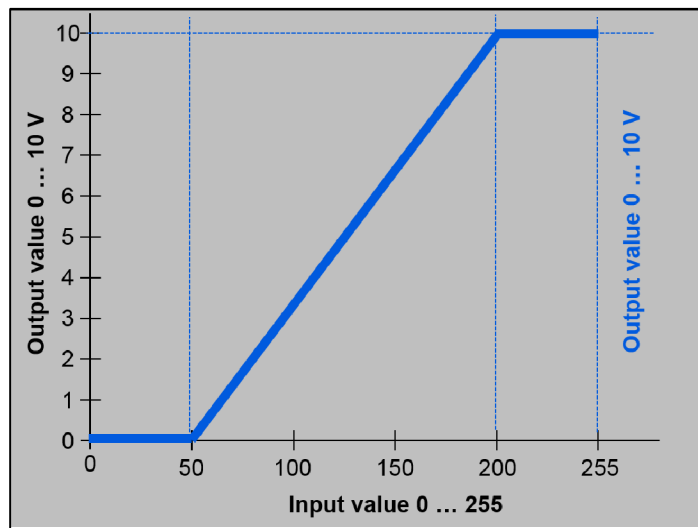
- § 2 value pairs
- § Input Format: 1 byte (0 ... 255)
- § Type of output: 0 ... 10 V

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Commissioning

1.1.53 Create own characteristic AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: Characteristic

General	No of support points	4
Channel A	Support 1 input value, value between [0..255]	0
A: General	Support 1 output value, value in mV [0..10,000]	0
A: Characteristic		
Channel B	Support 2 input value, value between [0..255]	50
B: General	Support 2 output value, value in mV [0..10,000]	0
Channel C	Support 3 input value, value between [0..255]	200
Channel D	Support 3 output value, value in mV [0..10,000]	10000
	Support 4 input value, value between [0..255]	255
	Support 4 output value, value in mV [0..10,000]	10000



Create own characteristic

§ Create own characteristic to specify a particular output progression based on the input signal by using max. 11 value pairs (support points)

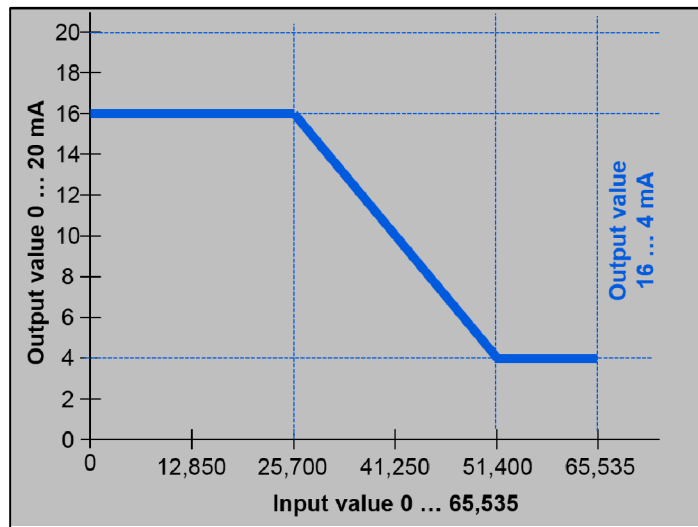
For example:

- § 4 value pairs
- § Input Format: 1 byte (0 ... 255)
- § Type of output: 0 ... 10 V

ABB i-bus® KNX Analogue Actuator AA/x X.1.2 Commissioning

1.1.53 Create own characteristic AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: Characteristic

General	No of support points	4
Channel A	Support 1 input value, value between [0...65,535]	0
A: General	Support 1 output value, value in μ A [0...20,000]	16000
A: Characteristic	Support 2 input value, value between [0...65,535]	25700
Channel B	Support 2 output value, value in μ A [0...20,000]	16000
B: General		
Channel C	Support 3 input value, value between [0...65,535]	51400
Channel D	Support 3 output value, value in μ A [0...20,000]	4000
	Support 4 input value, value between [0...65,535]	65535
	Support 4 output value, value in μ A [0...20,000]	4000



Create own characteristic

§ Create own characteristic to specify a particular output progression based on the input signal by using max. 11 value pairs (support points)

For example:

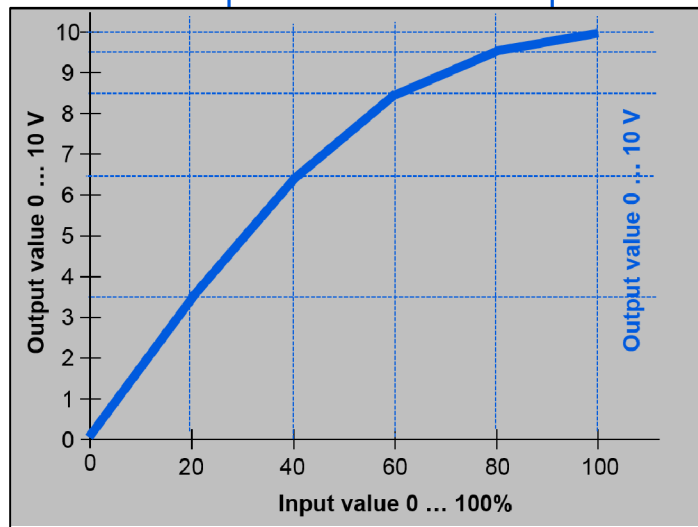
- § 4 value pairs
- § Input Format: 2 byte (0 ... 65,535)
- § Type of output: 0 ... 20 mA

ABB i-bus® KNX Analogue Actuator AA/x X.1.2

Commissioning

1.1.53 Create own characteristic AA/S4.1.2 Analogue Actuator, 4-fold, 0-10 V, 0-20 mA, MDRC > Channel A > A: Characteristic

General	No of support points	6
Channel A	Support 1 input value, value in % [0...100]	0
A: General	Support 1 output value, value in mV [0...10,000]	0
A: Characteristic	Support 2 input value, value in % [0...100]	20
Channel B	Support 2 output value, value in mV [0...10,000]	3500
B: General	Support 3 input value, value in % [0...100]	40
Channel C	Support 3 output value, value in mV [0...10,000]	6500
Channel D	Support 4 input value, value in % [0...100]	60
	Support 4 output value, value in mV [0...10,000]	8500
	Support 5 input value, value in % [0...100]	80



Create own characteristic

§ Create own characteristic to specify a particular output progression based on the input signal by using max. 11 value pairs (support points)

For example:

- § 6 value pairs
- § Input Format: 1 byte (0 ... 100%)
- § Type of output: 0 ... 10 V

Webinar “Processing analogue signals with KNX”

Agenda

- § New Analogue Actuators AA/x x.1.2
 - § Introduction and Overview
 - § Planning
 - § Installing
 - § Commissioning (ETS, i-bus[®] Tool)

- § Analogue Inputs AE/A 2.1 and AE/S 4.1.1.3
 - § Overview

ABB i-bus® KNX Analogue Inputs AE/A and AE/S

Analogue Input AE/S 4.1.1.3 and AE/A 2.1



ABB i-bus® KNX Analogue Inputs AE/A and AE/S

Overview AE/S 4.1.1.3

- § Registration and processing of 4 different analogue input signals
- § Integrated power supply to provide the sensors, 24 V DC / max. 300 mA
- § Wide Input Voltage Range 85...265 V AC
- § Connection of any sensor with 0...1 V, 0...5 V, 0...10 V, 1...10 V, 0...20 mA, 4...20 mA, 0...1000 Ohm, PT100, PT1000 and potential free contact



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ABB i-bus® KNX Analogue Inputs AE/A and AE/S

Overview AE/S 4.1.1.3

- § Free adjustable signals from sensor
- § Measured value visible as 1 bit, 1 byte, 2 byte, 4 byte
- § Filtering within 4, 16 or 64 measurements
- § Thresholds, 2 for each input with upper and lower limit
- § Comparator / arithmetic function / mean value
- § Offset temperature +/- 5°C
- § Line fault compensation at PT100/PT1000 resistance via cable length or via cable resistance
- § Auxiliary voltage for sensor supply
- § Integrated in the i-bus® Tool

ABB i-bus® KNX Analogue Inputs AE/A and AE/S

Overview AE/A 2.1

Differences to AE/S 4.1.1.3

- § Registration and processing of 2 different analogue input signals
- § Decentralized installation, housing with IP54
- § PT 100/PT 1000 in 2-wire technology only
- § KT and KTY temperature sensors
- § Power supply of the device via bus
- § Active sensors require an external power supply



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