



MAY 2020

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Online Learning Session – Competence Center Europe – Smart Buildings

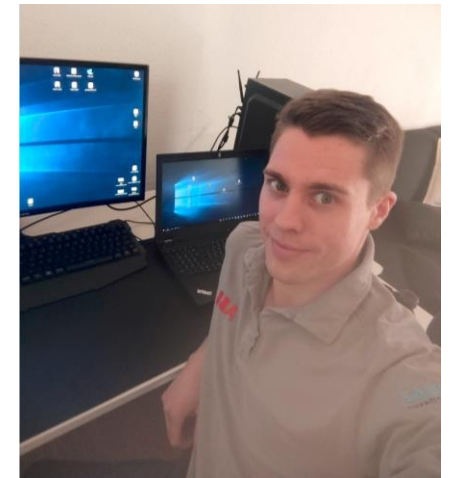
Thorsten Reibel, Jürgen Schilder, Stefan Grosse, Martin Wichary & Olaf Stutzenberger

# Online Learning Session – Competence Center Europe - Smart Buildings

*From home office to home office*



ABB STOTZ-KONTAKT GmbH  
Heidelberg / Germany



---

# Agenda

Introduction

Temperature and ventilation control of a BBQ Smoker

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter in a BBQ Grill

---

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control

## KNX Smart home and building solutions

KNX for every kind of project

KNX is the Standard (CEN, US, GB/T, ISO/IEC,...)

Guaranteed Interoperability through neutral certification

One Tool – the Engineering Tool Software ETS

Support for different transmission media

Easy coupling to other systems

Worldwide more than 91,000 partners and 500 training centres

Fit for use in **ALL** applications in home and building control

- Lighting
- Shutter and blinds
- HVAC
- ...
- BBQ Grilling & Smoking



---

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Introduction

Outdoor grilling and smoking is becoming increasingly popular

Smoking takes place over several hours at low temperatures

Smoking meat or fish in a BBQ Smoker can take up to 12 hours and requires supervision (e.g. manual temperature control)

The following shows how a BBQ Smoker can be conveniently integrated into ABB i-bus KNX

- Temperature measurement
- Blower control depending on the temperature (threshold function)
- Display and control with the mobile phone (Busch-ControlTouch®)



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### BBQ Smoker – low and slow

A barbecue smoker is a wood or coal-fired oven in which food is cooked or smoked in hot smoke

Unlike when grilling, the food is not directly over the embers or fire

The typical cooking space temperature for a barbecue is between 90° and 130° Celsius

Classic dishes that are prepared in a barbecue smoker are, above all, spare ribs (pork ribs), pulled pork (pork shredded or chopped from the neck or shoulder after cooking) and beef brisket

- Barrel Smoker (the most common form of BBQ smoker)
- Reverse Flow Smoker
- Ugly Drum Smoker UDS
- Water Smoker
- ...



Original barbecue in the pit  
18<sup>th</sup> and 19<sup>th</sup> centuries



Barrel Smoker with side firebox  
and cooking chamber



Smoker truck



Water Smoker



UDS

Source: Internet

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### How a UDS – Ugly Drum Smoker works

The UDS consists of a steel barrel (200 liters)

The smoker is created by installing a charcoal basket, adjustable ventilation openings (ball valve) and one or more grill grates

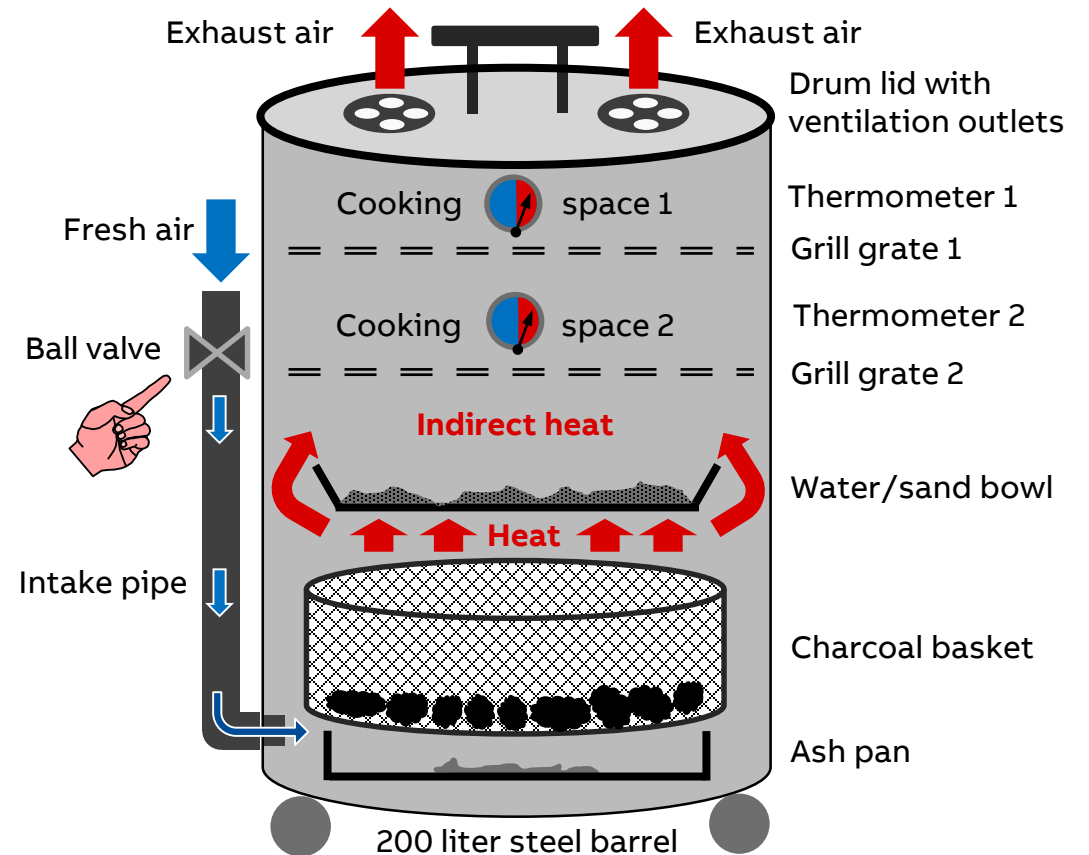
A water or sand bowl serves as a heat store and to compensate for temperature fluctuations

The cooking space temperature is checked with thermometers

The lighting is done with charcoal or briquettes

The coals slowly glow for hours

By controlling the air supply at the adjustable air inlets at floor level of the barrel, often ball valves arranged evenly around the barrel are used, the temperature inside can be regulated relatively accurately and stably



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### How a UDS – Ugly Drum Smoker works

The UDS consists of a steel barrel (200 liters)

The smoker is created by installing a charcoal basket, adjustable ventilation openings (ball valve) and one or more grill grates

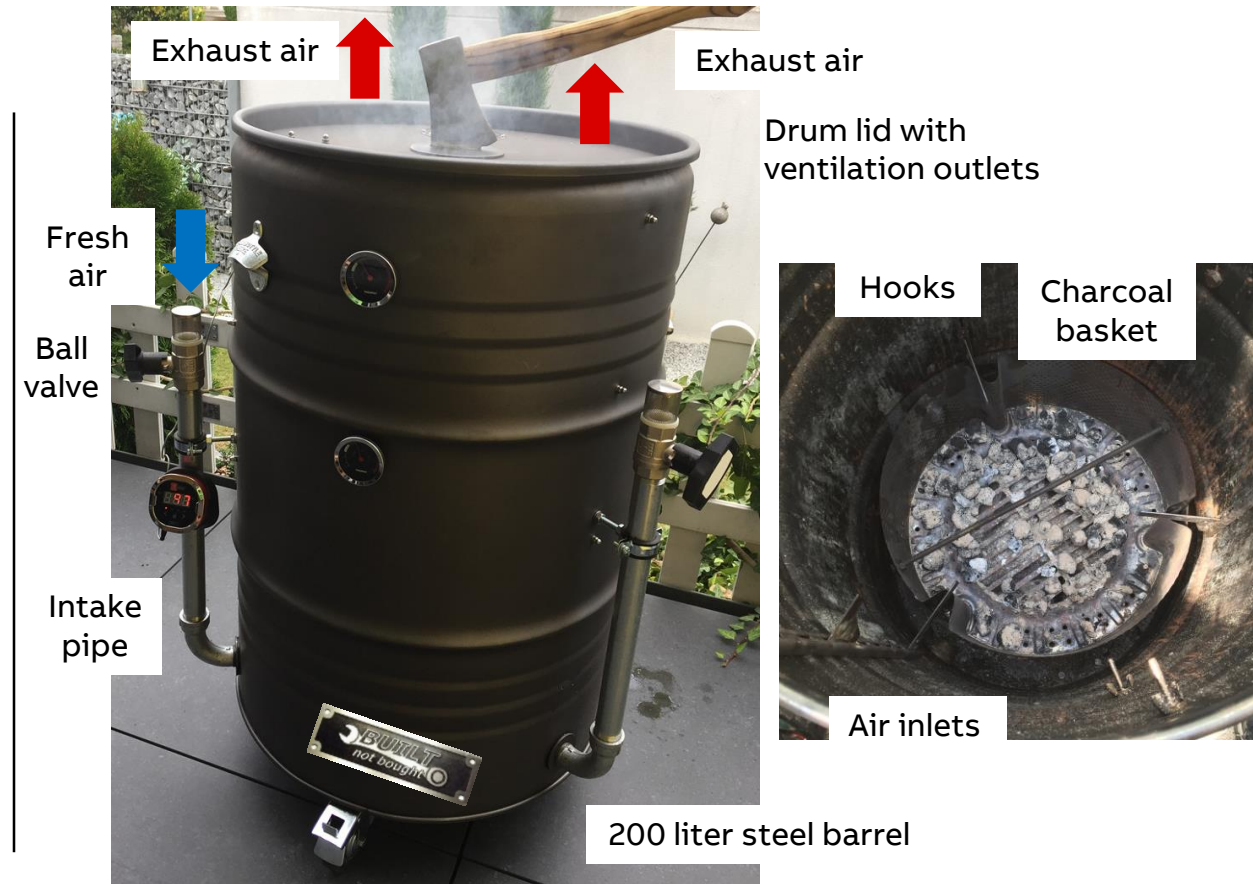
A water or sand bowl serves as a heat store and to compensate for temperature fluctuations

The cooking space temperature is checked with thermometers

The lighting is done with charcoal or briquettes

The coals slowly glow for hours

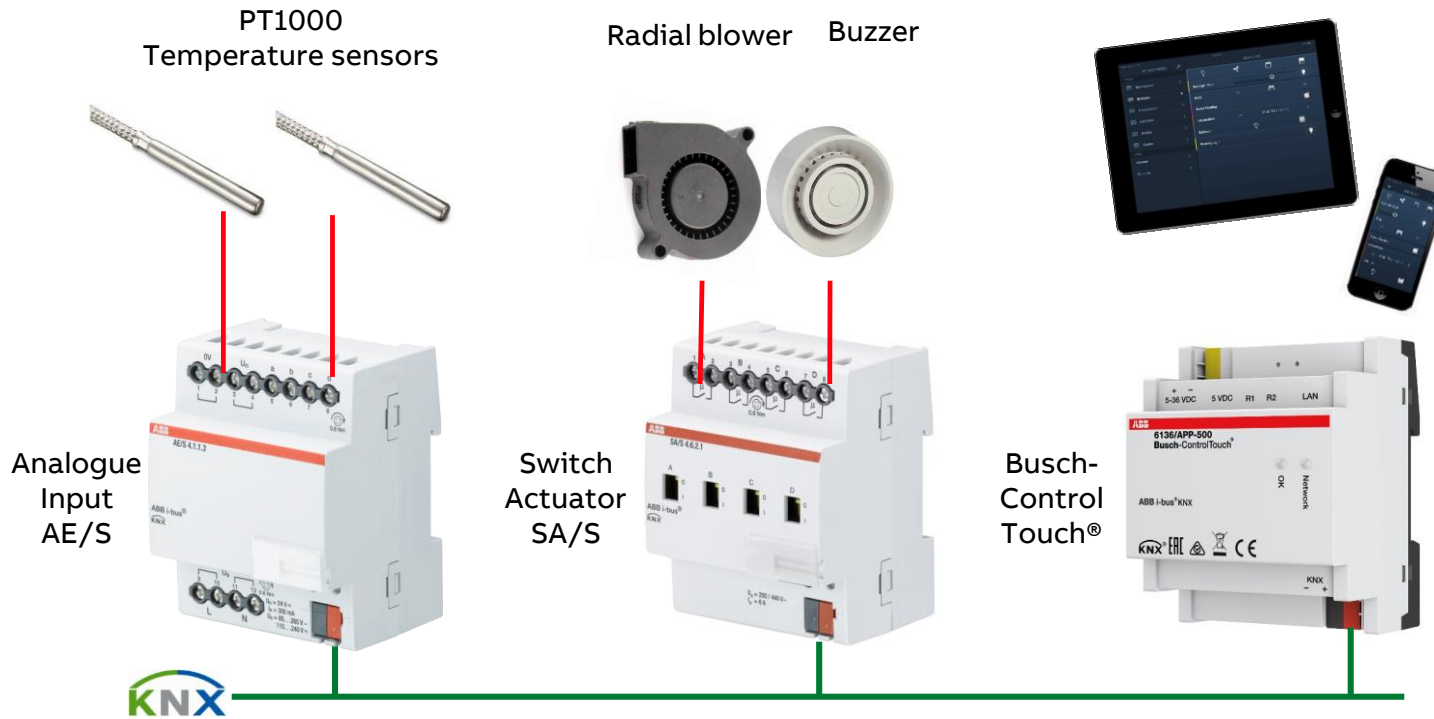
By controlling the air supply at the adjustable air inlets at floor level of the barrel, often ball valves arranged evenly around the barrel are used, the temperature inside can be regulated relatively accurately and stably



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control

## Device overview



UDS – Ugly Drum Smoker

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

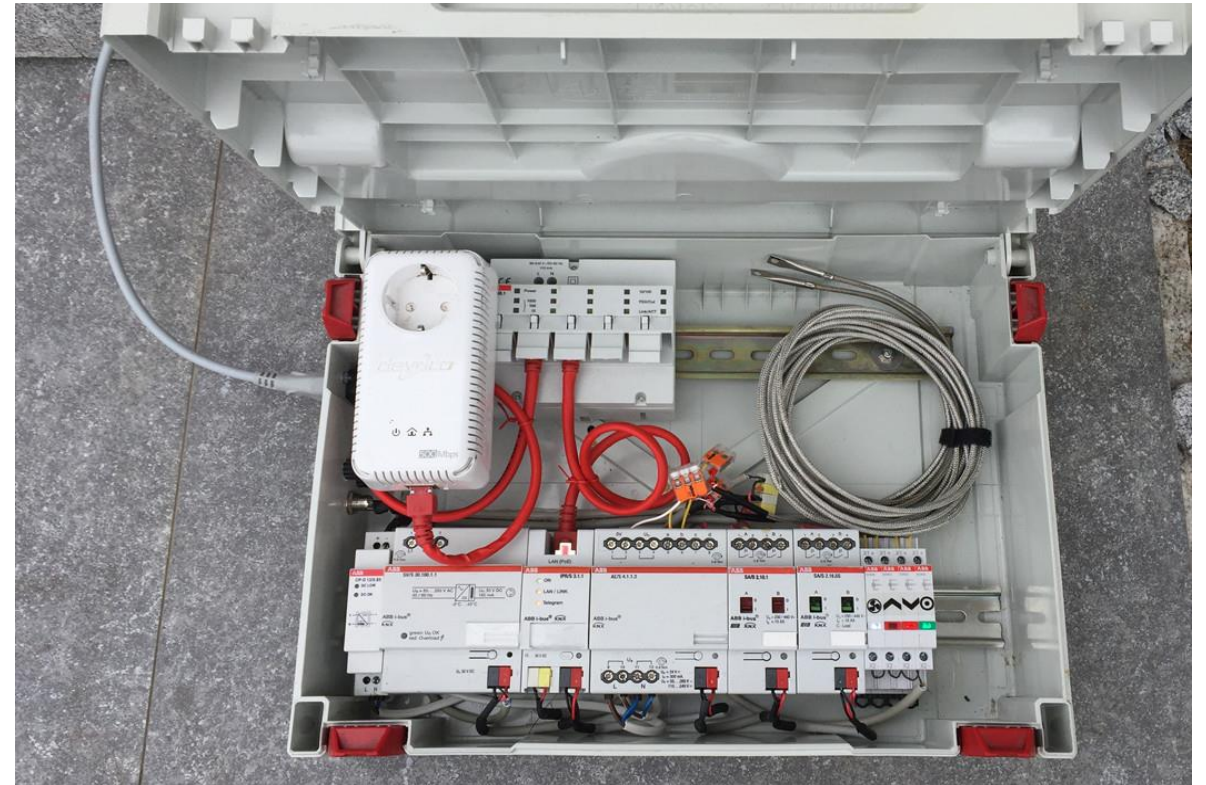
Temperature and ventilation control

## KNX BBQ Controller Box

Separate KNX line (outside the building)

Communication takes place with powerline adapter via the existing power network (PowerLAN)

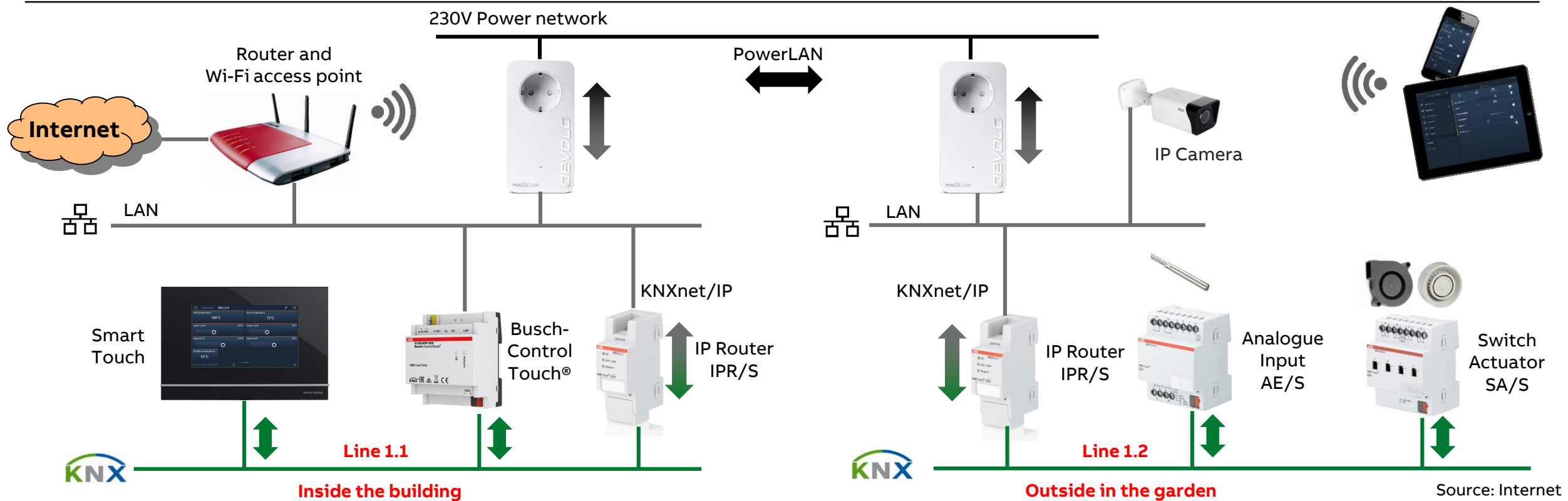
- KNX Power Supply SV/S
- 12V Power Supply CP-D
- IP Router IPR/S
- Analogue Input AE/S
- Switch Actuator SA/S
- Indicator lights E219



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control

## KNX outside of the building – Powerline LAN adapter: Internet in any room and in the garden

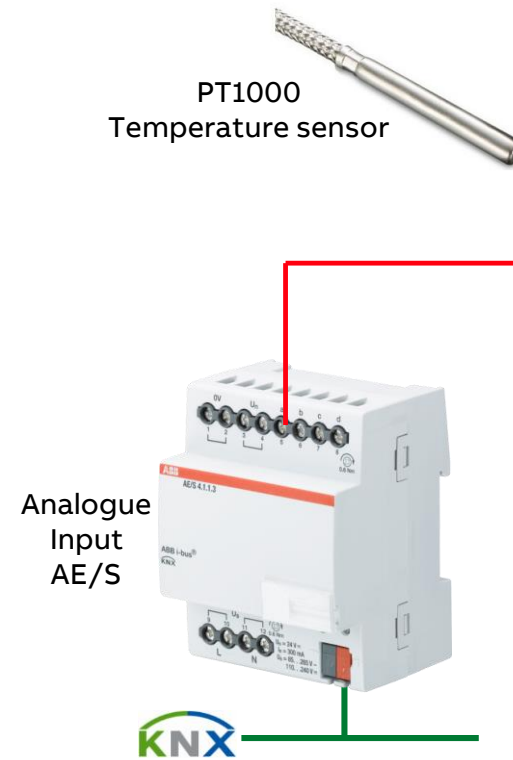


# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Analog Input: Measuring temperatures

The temperature in a BBQ Smoker can be measured with temperature sensors on an Analogue Input AE/S or AE/A



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Analog Input: Measuring temperatures

The temperature in a BBQ Smoker can be measured with temperature sensors on an Analogue Input AE/S or AE/A

When directly connecting temperature sensors (PT100, PT1000, KTY,...) to an Analogue Input, temperatures between -50°C ... +150°C can be measured

This is sufficient for low temperature smokers (90°C ... 130°C)

The temperature is sent to the KNX as a 2-byte float value (DPT 9.001 temperature °C)

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > a: General

General	Use input	<input type="radio"/> No <input checked="" type="radio"/> Yes
a: General	<u>Sensor type</u>	Temperature-dependent resistance
a: Output	Sensor output	PT1000 2-cond. technology [-50...+150 °C]
a: Threshold 1	Send output value as	PT100 2-cond. technology [-50...+150 °C]
a: Threshold 1 Output	Temp. offset in 0.1 K [-50...+50]	PT1000 2-cond. technology [-50...+150 °C] ✓
a: Threshold 2	Line fault compensation	PT100 3-cond. technology [-50...+150 °C]
a: Threshold 2 Output		PT1000 3-cond. technology [-50...+150 °C]
b: General		KT/KTY [-50...+150 °C]
		none

Nur	Name	Object Function	Length	Data Type
0	Input a	Output value	2 bytes	temperature (°C)

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Analog Input: Threshold functions

It is possible to set two thresholds per input

The thresholds each have an upper and lower limit which can be set independently

The sending behavior when falling below/exceeding can be set

Data type of threshold object can be a 1-bit or 1-byte value

→ The group object *"Input x Threshold"* appears

The thresholds themselves can be changed via KNX

→ The group objects *"Input x Threshold lower limit - Modify"* and *"Input x Threshold upper limit - Modify"* appears

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > a: Threshold 1

General	Use threshold	<input type="radio"/> No <input checked="" type="radio"/> Yes
a: General	Tolerance band lower limit Input in 0.1 °C	-500
a: Output	Tolerance band upper limit Input in 0.1 °C	1500
<u>a: Threshold 1</u>	Limits modifiable via bus	<input type="radio"/> No <input checked="" type="radio"/> Yes
a: Threshold 1 Output	Data type of threshold object	<input checked="" type="radio"/> 1-bit <input type="radio"/> 1-byte [0...+255]
<u>a: Threshold 2</u>	Send if threshold fallen below	Send OFF telegram
a: Threshold 2 Output	Min. duration of the undershoot	None
b: General	Send if threshold exceeded	Send ON telegram
	Min. duration of the overshoot	None

Nur	Name	Object Function	Length	Data Type
3	Input a Threshold 1	Threshold	1 bit	switch, switch
4	Input a Threshold 1 lower limit	Modify	2 bytes	temperature (°C), temperature (°C)
5	Input a Threshold 1 upper limit	Modify	2 bytes	temperature (°C), temperature (°C)
6	Input a Threshold 2	Threshold	1 byte	counter pulses (0..255)
7	Input a Threshold 2 lower limit	Modify	2 bytes	temperature (°C), temperature (°C)
8	Input a Threshold 2 upper limit	Modify	2 bytes	temperature (°C), temperature (°C)

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

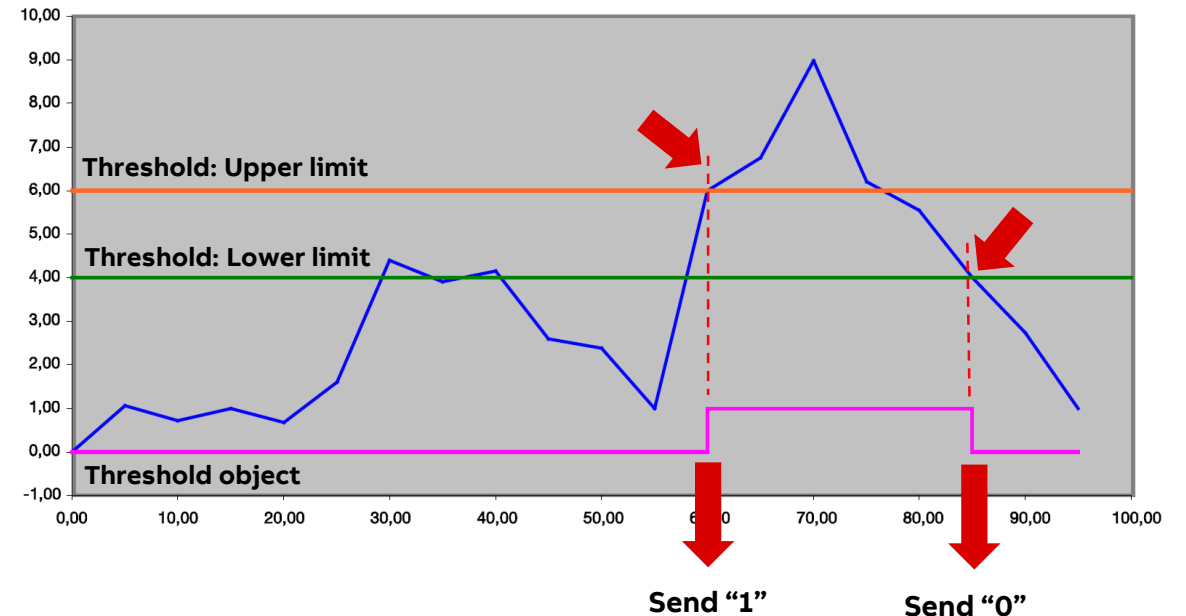
### Analog Input: How does the threshold function work?

ETS default settings

- Data type of threshold object is set to a 1-bit value
- An “ON” telegram is sent with an overshoot of the threshold and an “OFF” telegram is sent with an undershoot of the threshold

As soon as the measured value exceeds the upper limit of threshold 1, the group object *“Threshold – Input a Threshold 1”* will change value to “1”

The group object *“Threshold – Input a Threshold 1”* will remain “1” until the measured value falls back below the lower limit of threshold 1



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Analog Input - Threshold function: Blower control

The temperature is regulated by blowing in air

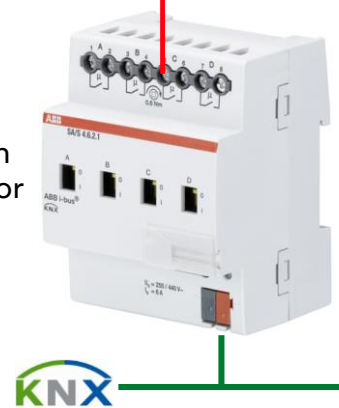
A blower is switched via a Switch Actuator SA/S and controlled via the threshold function of the Analog Input AE/S

If the temperature falls below the lower limit, a blower is switched on and blows air into the smoker → the temperature rises

If the temperature exceeds the upper limit, a blower is switched off → temperature falls down



Radial blower  
(3D-printer)



Switch  
Actuator  
SA/S



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Analog Input - Threshold function: Blower control

The temperature is regulated by blowing in air

A blower is switched via a Switch Actuator SA/S and controlled via the threshold function of the Analog Input AE/S

If the temperature falls below the lower limit, a blower is switched on and blows air into the smoker → the temperature rises

If the temperature exceeds the upper limit, a blower is switched off → temperature falls down

ETS parameter

- Tolerance band lower limit Input: 122°C
- Tolerance band upper limit Input in 128°C
- Send if threshold fallen below: Send “ON” telegram → blower ON
- Send if threshold exceeded: Send “OFF” telegram → blower OFF

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > a: Threshold 1

General	Use threshold	<input type="radio"/> No <input checked="" type="radio"/> Yes
a: General	Tolerance band lower limit Input in 0.1 °C	1220
a: Output	Tolerance band upper limit Input in 0.1 °C	1280
a: <b>Threshold 1</b>	Limits modifiable via bus	<input type="radio"/> No <input checked="" type="radio"/> Yes
a: Threshold 1 Output	Data type of threshold object	<input checked="" type="radio"/> 1-bit <input type="radio"/> 1-byte [0...+255]
a: Threshold 2	Send if threshold fallen below	Send ON telegram
a: Threshold 2 Output	Min. duration of the undershoot	None
b: General	Send if threshold exceeded	Send OFF telegram
b: Output	Min. duration of the overshoot	None

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

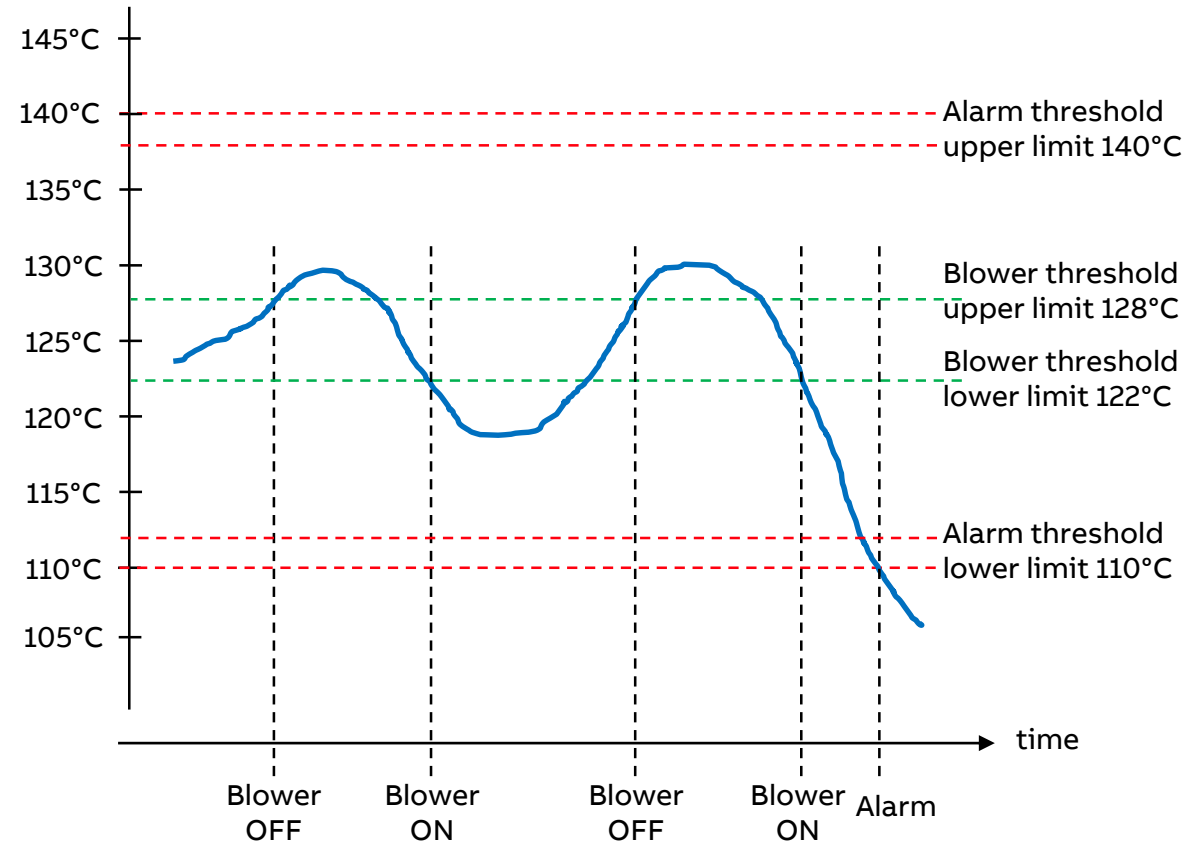
## Temperature and ventilation control

### Analog Input - Threshold function: Alarm notification

The temperature limit values are also monitored with further threshold functions

Alarm messages are sent to the smartphone via push notifications and a buzzer is switched on via a switch actuator

- If the upper temperature limit is exceeded  
140°C → blower does not switch off and continues to blow air into the smoker
- When the temperature falls below the lower temperature limit  
110°C → fire goes out



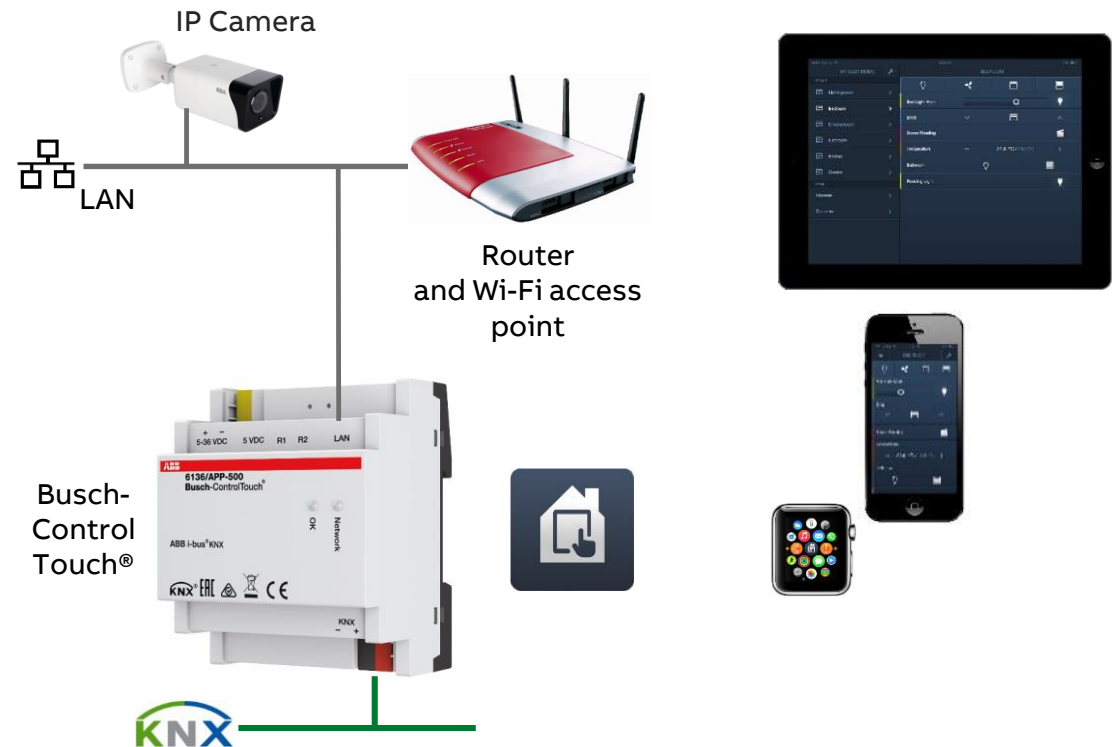
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Busch-ControlTouch®

KNX visualization for smartphones, tablets and Windows computers

- Display of
  - Temperature
  - Threshold upper or lower limit
  - ON/OFF status of the blower
  - IP cameras
- Set the threshold limits
  - Lower limit: Switch blower ON
  - Upper limit: Switch blower OFF
- Messages via push notifications to the smartphone
  - Alarm when the limit temperatures are exceeded
  - Information when the core temperature is reached



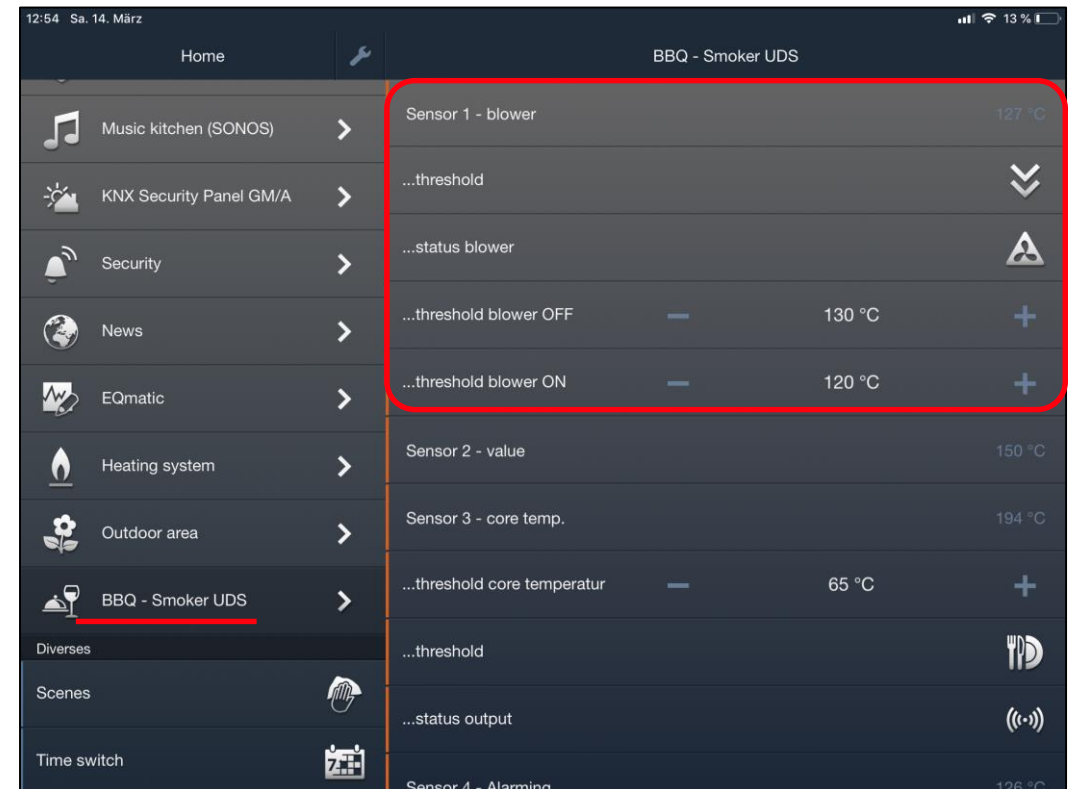
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Busch-ControlTouch®

KNX visualization for smartphones, tablets and Windows computers

- Display of
  - Temperature
  - Threshold upper or lower limit
  - ON/OFF status of the blower
  - IP cameras
- Set the threshold limits
  - Lower limit: Switch blower ON
  - Upper limit: Switch blower OFF
- Messages via push notifications to the smartphone
  - Alarm when the limit temperatures are exceeded
  - Information when the core temperature is reached



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Busch-ControlTouch®

KNX visualization for smartphones, tablets and Windows computers

- Display of
  - Temperature
  - Threshold upper or lower limit
  - ON/OFF status of the blower
  - IP cameras
- Set the threshold limits
  - Lower limit: Switch blower ON
  - Upper limit: Switch blower OFF
- Messages via push notifications to the smartphone
  - Alarm when the limit temperatures are exceeded
  - Information when the core temperature is reached



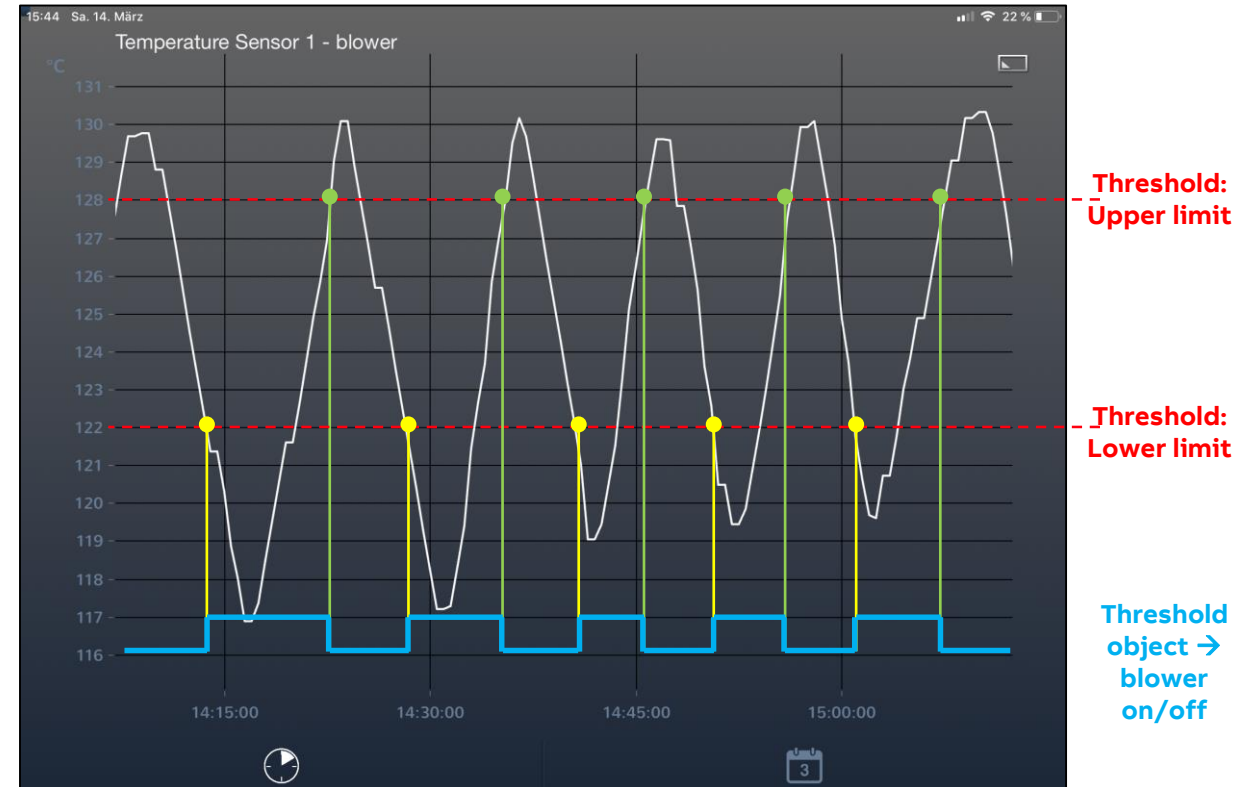
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Busch-ControlTouch®

KNX visualization for smartphones, tablets and Windows computers

- Display of
  - Temperature
  - Threshold upper or lower limit
  - ON/OFF status of the blower
  - IP cameras
- Set the threshold limits
  - Lower limit: Switch blower ON
  - Upper limit: Switch blower OFF
- Messages via push notifications to the smartphone
  - Alarm when the limit temperatures are exceeded
  - Information when the core temperature is reached



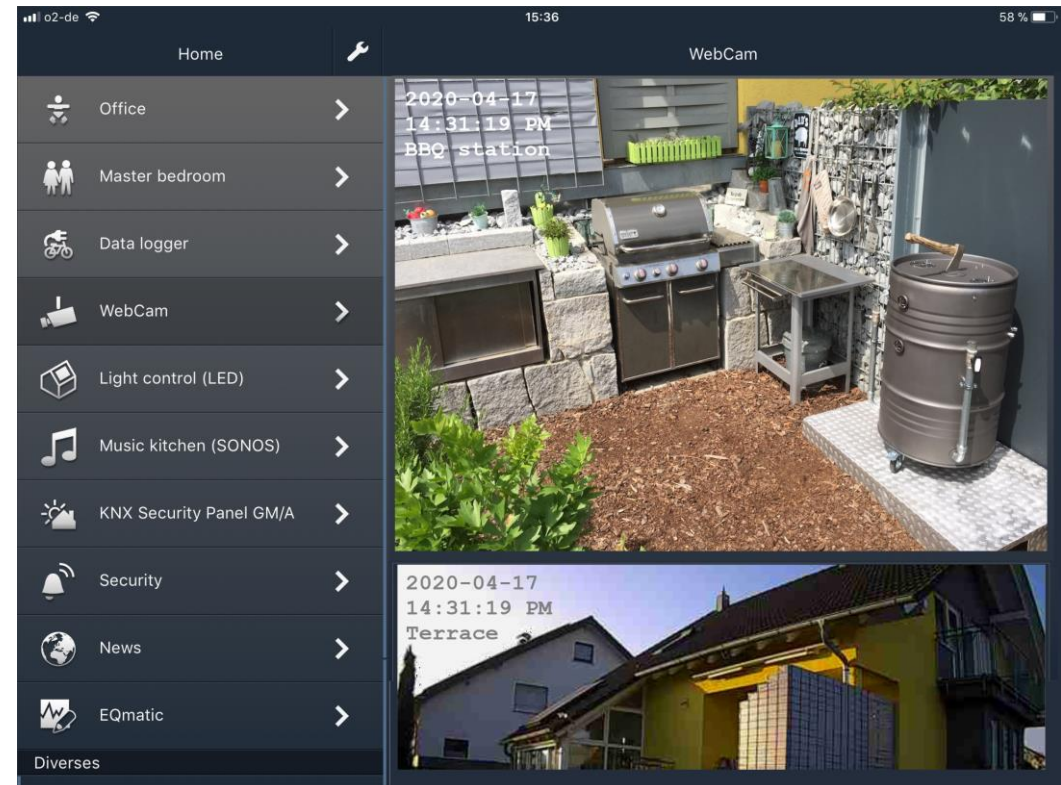
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Temperature and ventilation control

### Busch-ControlTouch®

KNX visualization for smartphones, tablets and Windows computers

- Display of
  - Temperature
  - Threshold upper or lower limit
  - ON/OFF status of the blower
  - IP cameras
- Set the threshold limits
  - Lower limit: Switch blower ON
  - Upper limit: Switch blower OFF
- Messages via push notifications to the smartphone
  - Alarm when the limit temperatures are exceeded
  - Information when the core temperature is reached



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control – Example: Assignment of Group Addresses



<b>Analogue Input AE/S 4.1.1.3</b>	<b>Input A</b>	Output value (2 byte)
		Threshold 1 (1 bit)
		Threshold 1 lower limit – modify (2 byte)
		Threshold 1 upper limit – modify (2 byte)
		...
	<b>Input B</b>	Output value (2 byte)
		Threshold 1 (1 bit)
		Threshold 1 lower limit – modify (2 byte)
		Threshold 1 upper limit – modify (2 byte)
		Threshold 2 (1 bit)
		Threshold 2 lower limit – modify (2 byte)
		Threshold 2 upper limit – modify (2 byte)
	...	

Input A: Blower control  
Input B: Alarm notification

Switch (1 bit)	<b>Output A</b>	<b>Switch Actuator SA/S</b>
Status Switch (1 bit)		
...		
Switch (1 bit)	<b>Output B</b>	
Status Switch (1 bit)		
...		



**Busch-ControlTouch®**

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

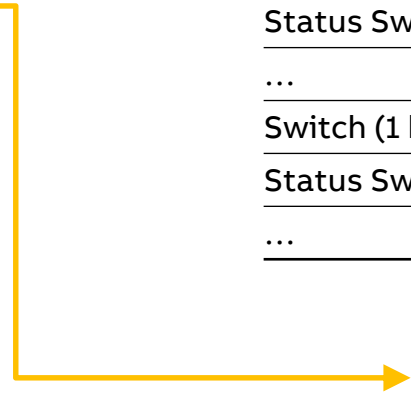
Temperature and ventilation control – Example: Assignment of Group Addresses



<b>Analogue Input AE/S 4.1.1.3</b>	<b>Input A</b>	Output value (2 byte)
		Threshold 1 (1 bit)
		Threshold 1 lower limit – modify (2 byte)
		Threshold 1 upper limit – modify (2 byte)
		...
	<b>Input B</b>	Output value (2 byte)
		Threshold 1 (1 bit)
		Threshold 1 lower limit – modify (2 byte)
		Threshold 1 upper limit – modify (2 byte)
		Threshold 2 (1 bit)
		Threshold 2 lower limit – modify (2 byte)
		Threshold 2 upper limit – modify (2 byte)
		...

Input A: Blower control  
Input B: Alarm notification

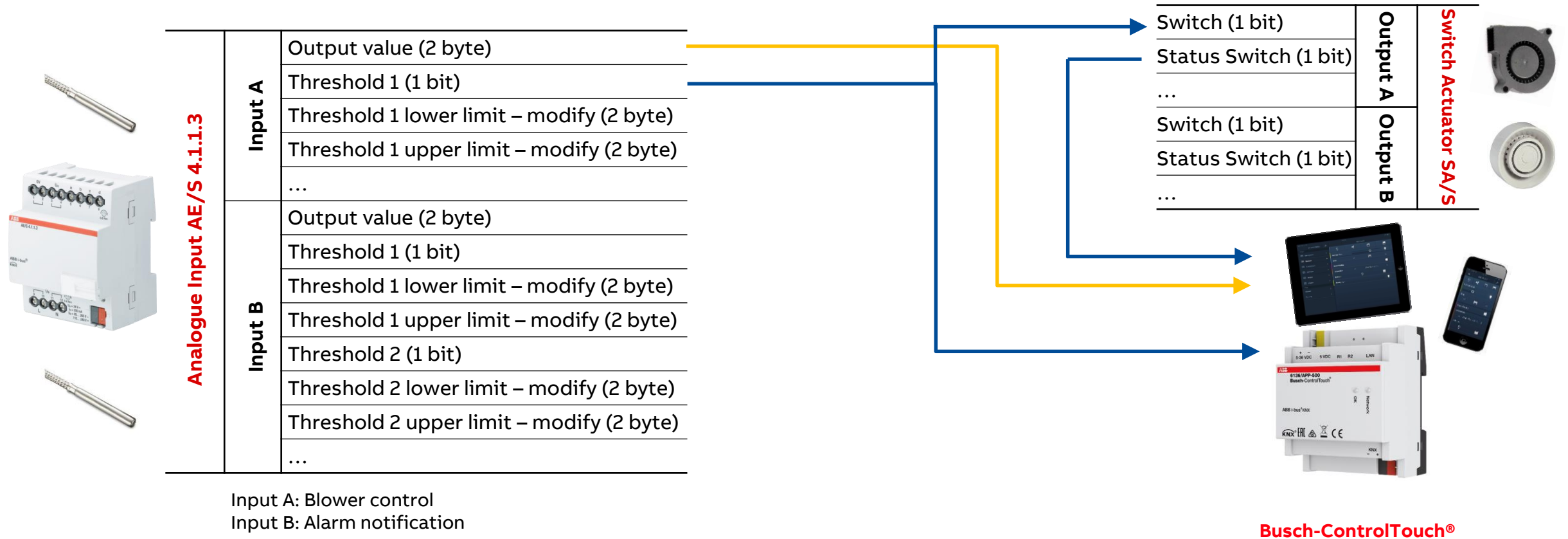
Switch (1 bit)	<b>Output A</b>	<b>Switch Actuator SA/S</b>
Status Switch (1 bit)		
...		
Switch (1 bit)	<b>Output B</b>	
Status Switch (1 bit)		
...		



Busch-ControlTouch®

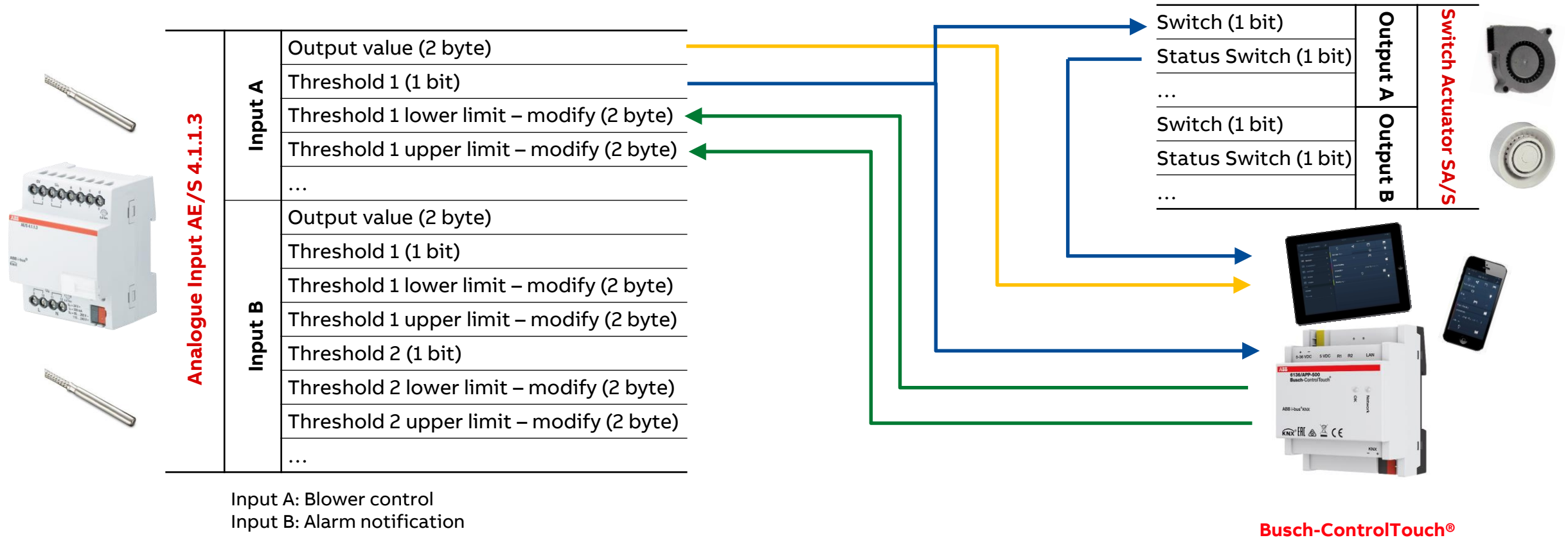
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control – Example: Assignment of Group Addresses



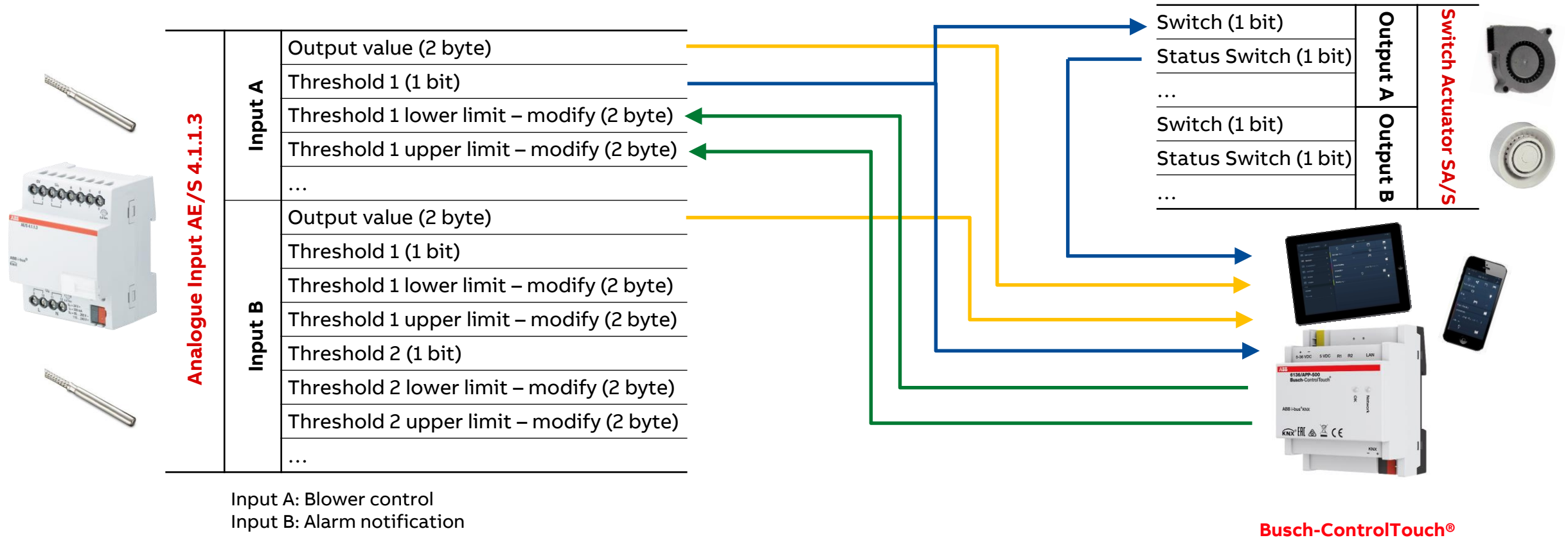
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control – Example: Assignment of Group Addresses



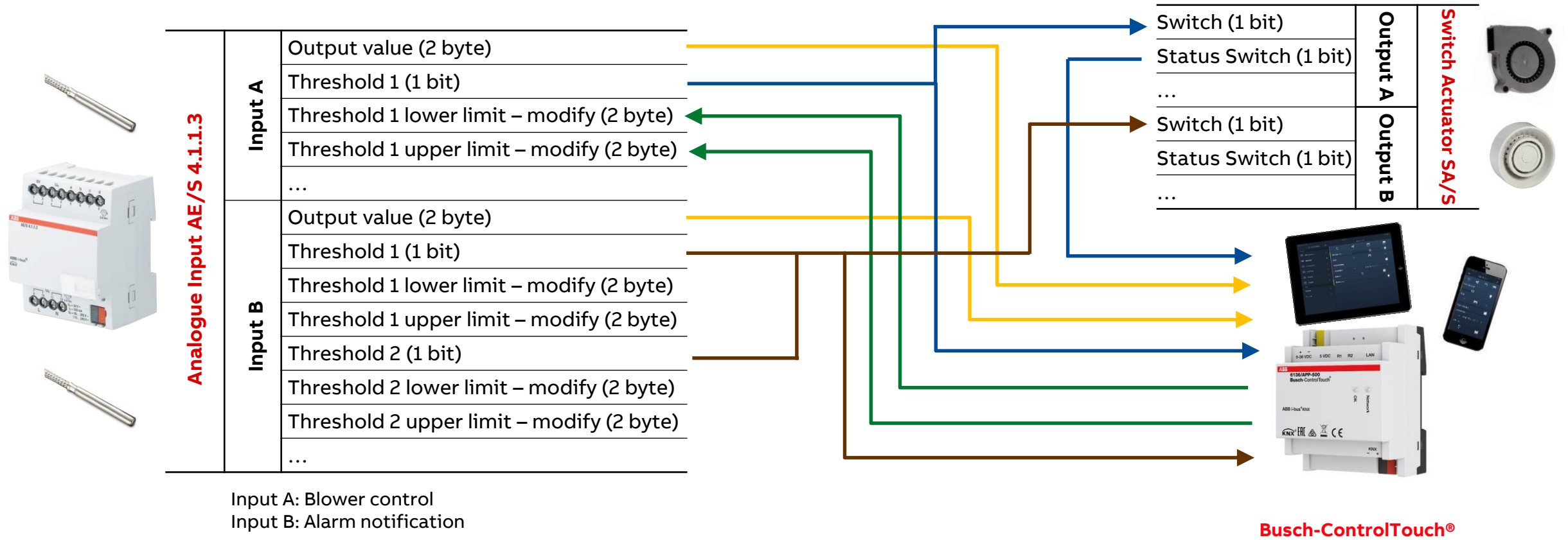
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control – Example: Assignment of Group Addresses



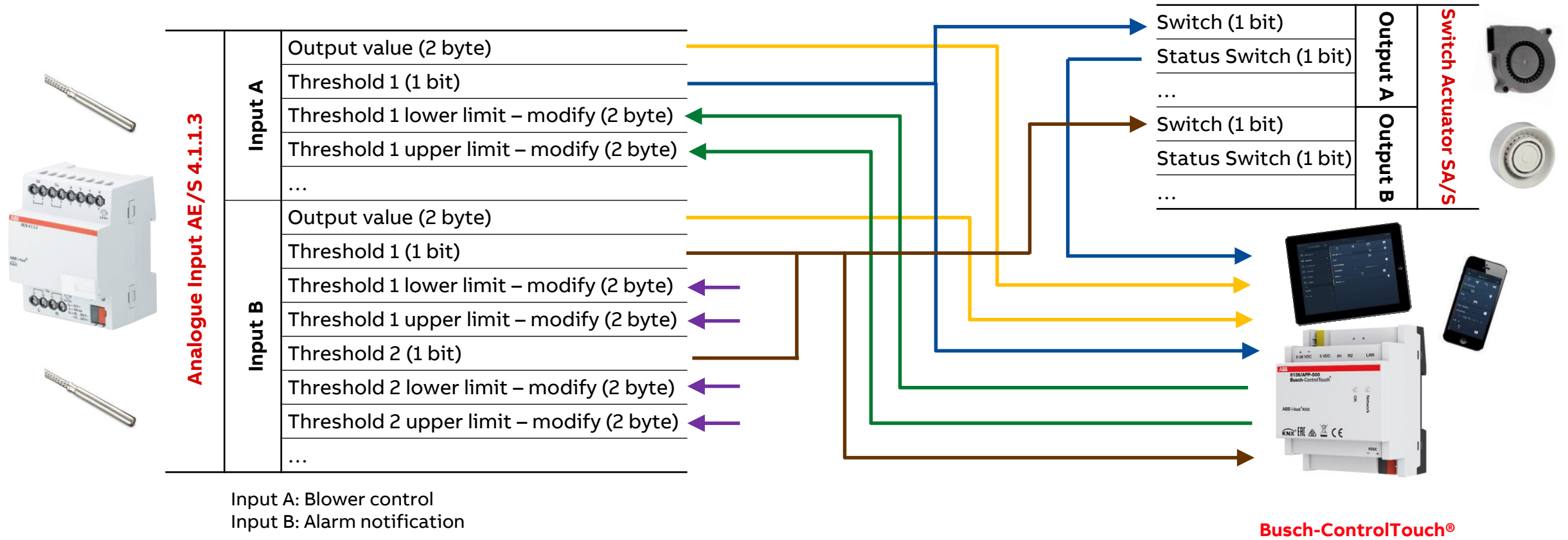
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control – Example: Assignment of Group Addresses



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Temperature and ventilation control – Example: Assignment of Group Addresses



---

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input and additional analogue transmitter in a BBQ Grill

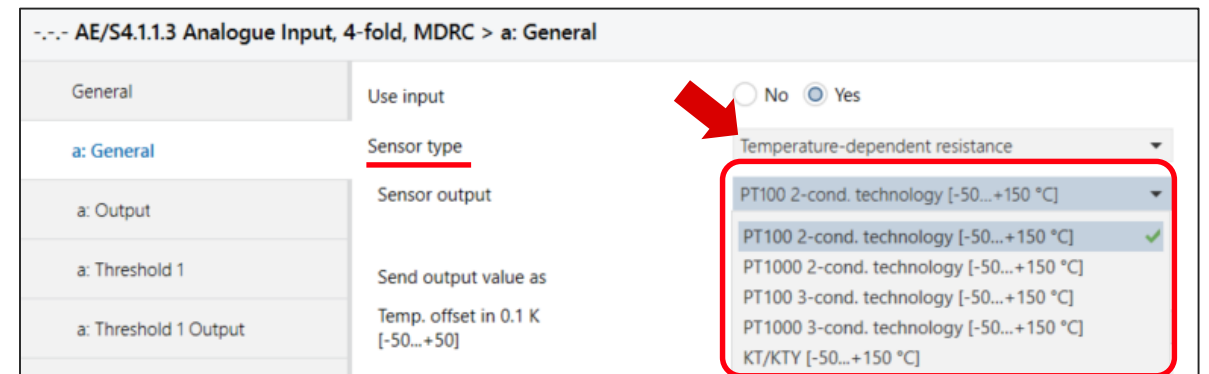
# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Temperature measurement in a BBQ Grill

When directly connecting temperature sensors (PT100, PT1000, KTY,...) to a KNX Analogue Input AE/S, temperatures between -50°C ... +150°C can be measured

In special applications, temperatures above 150°C must be measured, e.g. 200°C grill temperature of chicken drumsticks, cherry cheese cake, salmon, bread, ...



Source: Internet

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Temperature measurement in a BBQ Grill

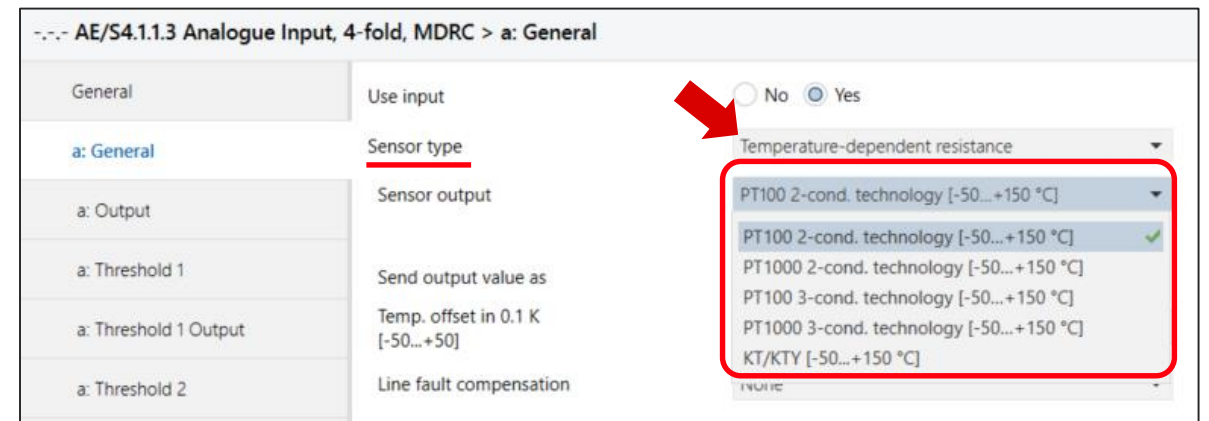
When directly connecting temperature sensors (PT100, PT1000, KTY,...) to a KNX Analogue Input AE/S, temperatures between -50°C ... +150°C can be measured

In special applications, temperatures above 150°C must be measured, e.g. 200°C grill temperature of chicken drumsticks, cherry cheese cake, salmon, bread, ...

Measuring high temperatures is also required in other applications, e.g. combustion engines

The temperature range of an Analogue Input AE/S can be expanded with analogue transmitter

Depending on the temperature sensor used, temperatures in a measuring range of e.g. -100°C ... +50°C, 0°C ... +200°C or 0°C ... +400°C can be measured



Source: [www.sensorshop24.de](http://www.sensorshop24.de)

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Analogue transmitters

Analogue transmitters are available with various analog output signals, e.g.

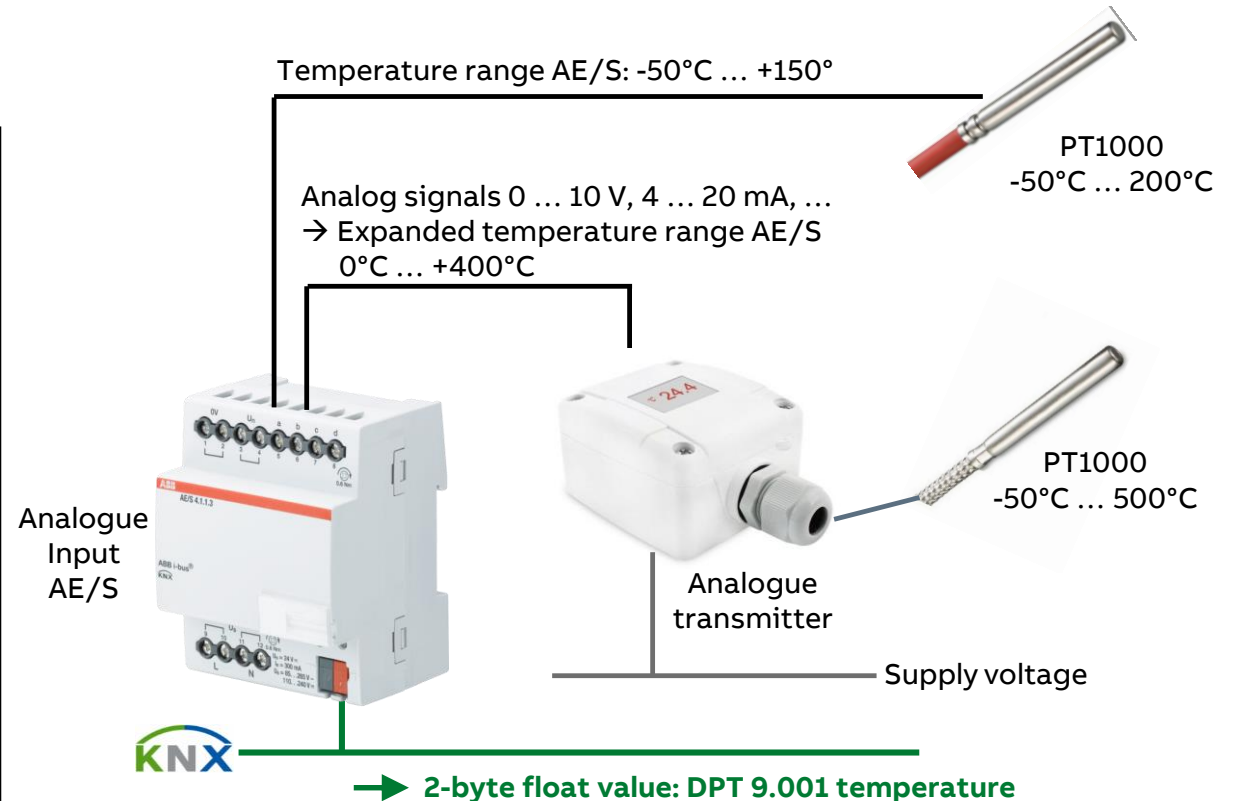
- 0 ... 10 V
- 4 ... 20 mA

They must be supplied with a voltage (12/24 V AC/DC)

Depending on the measuring range of the sensor, different measuring ranges can be set using DIP switches

The set measuring range is mapped to the analog signal

Measuring range	1	2	3	4	5
-100°C ... +50°C	OFF	OFF	OFF	OFF	OFF
-30°C ... +70°C	OFF	ON	ON	OFF	OFF
0°C ... +400°C	ON	OFF	ON	OFF	ON
...	...	...	...	...	...



Source: [www.sensorshop24.de](http://www.sensorshop24.de)

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Analogue Input AE/S: Parameter settings

- Set measuring range of the analogue transmitter  
e.g. 0°C ... +400°C

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > b: General

General	Use input	<input type="radio"/> No <input checked="" type="radio"/> Yes
a: General	Sensor type	Current/Voltage/Resistance ▼
a: Output	Sensor output	0...10 V ▼
a: Threshold 1	Send output value as	2-byte (floating point) ▼
a: Threshold 1 Output	Measuring range definition	
a: Threshold 2	Lower meas. limit in x % of meas. range end value	0 ▲▼
a: Threshold 2 Output	Output value to be sent for lower measuring limit [-1,000...+1,000]	0 ▲▼
b: General	Upper meas. limit in x % of meas. range end value	100 ▲▼
b: Output	Output value to be sent for upper measuring limit [-1,000...+1,000]	400 ▲▼
b: Threshold 1	Factor for the output values and thresholds	1 ▼

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Analogue Input AE/S: Parameter settings

- Set measuring range of the analogue transmitter  
e.g. 0°C ... +400°C
- Sensor type “Current/Voltage/Resistance”

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > b: General

General	Use input	<input type="radio"/> No <input checked="" type="radio"/> Yes
<u>a: General</u>	Sensor type	Current/Voltage/Resistance
a: Output	Sensor output	0...10 V
a: Threshold 1	Send output value as	2-byte (floating point)
a: Threshold 1 Output	Measuring range definition	
a: Threshold 2	Lower meas. limit in x % of meas. range end value	0
a: Threshold 2 Output	Output value to be sent for lower measuring limit [-1,000...+1,000]	0
b: General	Upper meas. limit in x % of meas. range end value	100
b: Output	Output value to be sent for upper measuring limit [-1,000...+1,000]	400
b: Threshold 1	Factor for the output values and thresholds	1

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Analogue Input AE/S: Parameter settings

- Set measuring range of the analogue transmitter  
e.g. 0°C ... +400°C
- Sensor type “Current/Voltage/Resistance”
- Sensor output (voltage or current) depends on the device variant of the analogue transmitter (0...10V)

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > b: General

General	Use input	<input type="radio"/> No <input checked="" type="radio"/> Yes
<u>a: General</u>	Sensor type	Current/Voltage/Resistance
a: Output	Sensor output	0...10 V
a: Threshold 1	Send output value as	2-byte (floating point)
a: Threshold 1 Output	Measuring range definition	
a: Threshold 2	Lower meas. limit in x % of meas. range end value	0
a: Threshold 2 Output	Output value to be sent for lower measuring limit [-1,000...+1,000]	0
b: General	Upper meas. limit in x % of meas. range end value	100
b: Output	Output value to be sent for upper measuring limit [-1,000...+1,000]	400
b: Threshold 1	Factor for the output values and thresholds	1

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Analogue Input AE/S: Parameter settings

- Set measuring range of the analogue transmitter  
e.g. 0°C ... +400°C
- Sensor type “Current/Voltage/Resistance”
- Sensor output (voltage or current) depends on the device variant of the analogue transmitter (0...10V)
- The output value is sent as “2-byte float value” (DPT 9.001 temp.)

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > b: General

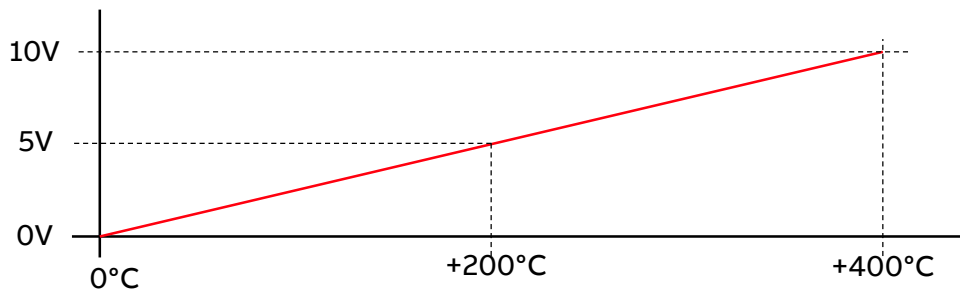
General	Use input	<input type="radio"/> No <input checked="" type="radio"/> Yes
<u>a: General</u>	Sensor type	Current/Voltage/Resistance
a: Output	Sensor output	0...10 V
a: Threshold 1	Send output value as	2-byte (floating point)
a: Threshold 1 Output	Measuring range definition	
a: Threshold 2	Lower meas. limit in x % of meas. range end value	0
a: Threshold 2 Output	Output value to be sent for lower measuring limit [-1,000...+1,000]	0
b: General	Upper meas. limit in x % of meas. range end value	100
b: Output	Output value to be sent for upper measuring limit [-1,000...+1,000]	400
b: Threshold 1	Factor for the output values and thresholds	1

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Analogue Input AE/S: Parameter settings

- Set measuring range of the analogue transmitter  
e.g. 0°C ... +400°C
- Sensor type “Current/Voltage/Resistance”
- Sensor output (voltage or current) depends on the device variant of the analogue transmitter (0...10V)
- The output value is sent as “2-byte float value” (DPT 9.001 temp.)
- Define measuring range: 0V = 0°C and 10V = +400°C



- Furthermore, the threshold functions can also be used

2.2.31 AE/S4.1.1.3 Analogue Input, 4-fold, MDRC > b: General

General	Use input	<input type="radio"/> No <input checked="" type="radio"/> Yes
<b>a: General</b>	Sensor type	Current/Voltage/Resistance
a: Output	Sensor output	0...10 V
a: Threshold 1	Send output value as	2-byte (floating point)
a: Threshold 1 Output	Measuring range definition	
a: Threshold 2	Lower meas. limit in x % of meas. range end value	0
a: Threshold 2 Output	Output value to be sent for lower measuring limit [-1,000...+1,000]	0
b: General	Upper meas. limit in x % of meas. range end value	100
b: Output	Output value to be sent for upper measuring limit [-1,000...+1,000]	400
b: Threshold 1	Factor for the output values and thresholds	1

A red arrow points to the 'a: Threshold 1' row. A red box highlights the input fields for 'Lower meas. limit in x % of meas. range end value' (0), 'Output value to be sent for lower measuring limit' (0), 'Upper meas. limit in x % of meas. range end value' (100), and 'Output value to be sent for upper measuring limit' (400).

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of high temperatures with an Analogue Input AE/S and additional analogue transmitter

## Overview – Temperature measurement in a BBQ Grill



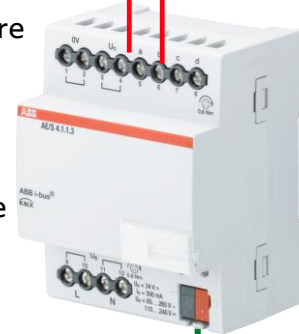
Grill temperature



Analogue transmitter

Core temperature

Analogue Input AE/S



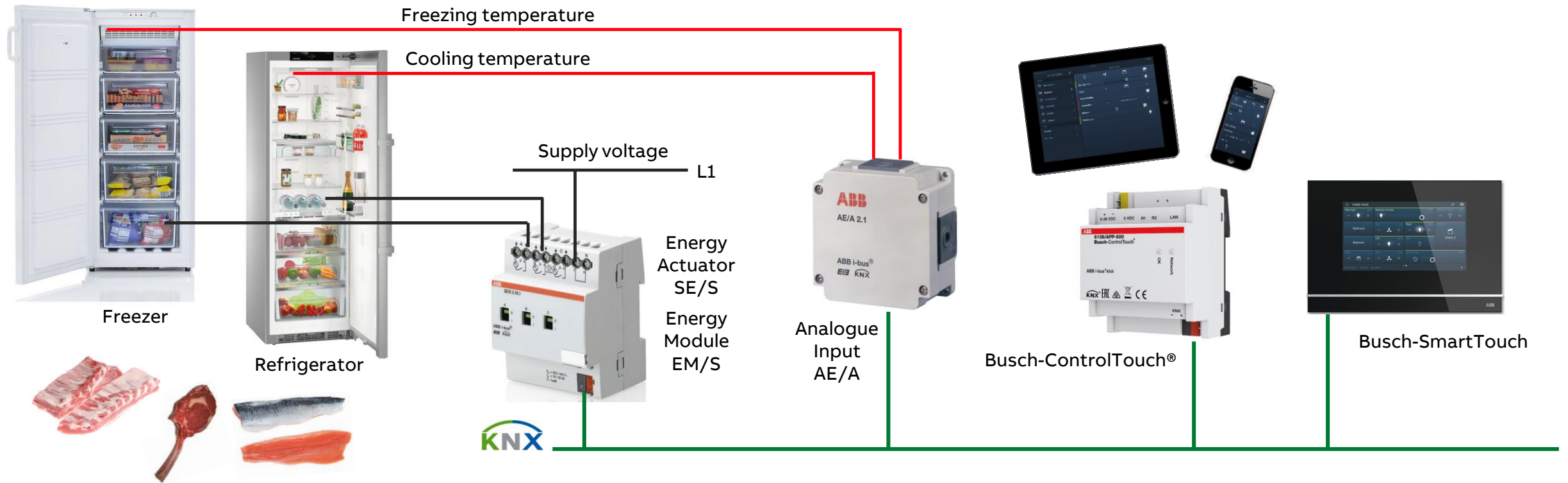
Busch-SmartTouch

- Display values
- Set threshold
- Message (acoustic signal)

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Measurement of temperatures with an Analogue Input AE/S and Energy Actuator/Energy Module

## Overview – Temperature and energy monitoring of a refrigerator and freezer (threshold of power consumption, ...)



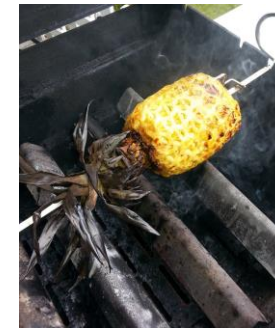
Source: Internet

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Online Learning Session

### Summary – Grilling is more fun thanks to KNX

- High level of comfort  
Automatic temperature control does not require manual supervision and operation
- Energy efficiency  
Reduce your energy consumption for charcoal
- A safe system  
Thresholds monitor the temperature and send push notifications to protect your meat from harm
- Increased flexibility  
Depending on the type and quantity of meat, the threshold values for the grill temperature can be adjusted
- Keep an eye on everything  
Busch-ControlTouch® visualisation for smartphones and tablets shows all states



---

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

Online Learning Session

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Online Learning Session

### Homepage

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

→ Products and Downloads

→ ...

- Product Manual
- CAD Drawing
- Installation and Operating Instructions
- Specification Text
- ETS Application
- Selection Table
- CE & RoHS Declaration of Conformity
- ...

**ABB** HOME → OFFERINGS → LOW VOLTAGE PRODUCTS → HOME AND BUILDING AUTOMATION → ABB I-BUS KNX → LIGHTING CONTROL GLOBAL SITE ▼

### Lighting Control

Modern light management

ABB i-bus® KNX ensures optimum lighting of industrial and office buildings as well as private dwellings. The lighting requirement is monitored and controlled. In addition, subsystems (such as 1-10 V lighting control, DALI) and their interfaces are supported.

**Main benefits**

- Increases energy efficiency by constant lighting and presence dependent control
- Improves comfort with light scenes
- More flexibility through reprogramming or adding devices while in operation to meet changing needs

**Main features**

- Universal dimming actuators for controlling loads of 210 VA up to 2400 VA
- Switch/dim actuators for switching and dimming electronic ballasts with 1-10 V control interfaces
- DALI Gateways for integration of DALI ballasts into KNX bus

**Products and Downloads**

All products	DALI Gateways and Light Controllers	1-10V Switch / Dim Actuators and Light Controllers	Universal Dim Actuators	LED Dimmers	Light Level Sensors
--------------	-------------------------------------	--	-------------------------	-------------	---------------------

Filters Search options

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Online Learning Session

### Product Range Overview

Smarter Solutions for Home and Building Automation

ABB i-bus KNX

Product Range Overview 2019/2020

[LINK](#)




**Smarter Solutions for Home and Building Automation**  
**ABB i-bus® KNX**  
**Product Range Overview 2019/2020**

Product description, quick and easy selection of product codes


62 PRODUCT RANGE OVERVIEW 2019/2020 BAKK107492A3188 REV. B

### ABB i-bus® KNX Lighting Control – DALI



**DALI Gateway Basic, MDRC**  
The device is used to interface between DALI and KNX installations and incorporates the DALI power supply. One/Two DALI output(s) for up to 64/2x 64 DALI Slaves. Control and status feedback is carried out via KNX per DALI slave (64/2x 64), with lighting groups (16/2x 64), together in broadcast or per scenes (16/2x 16). Extensive fault and error messages are available. Self-contained emergency converter (64/2x 64) acc. EN 62386-202 will be supported. By means of KNX and emergency converter, different emergency tests (e.g. function and duration test) can be triggered. Feedback is sent. Slave-, staircase-, force-, block- and scene- function are integrated. DALI telegram rate can change. For diagnostic use and individual change of the DALI address or group assignment a separate ABB i-bus® Tool is available.

Description	Mod. width	Order details		Price		Pack unit
		Type code	Order code	€	kg	
1-fold	4	DG/S 1.64.1.1	ZCDG10199R0011	0.133	1	
2-fold	4	DG/S 2.64.1.1	ZCDG10199R0011	0.15	1	



**DALI Gateway Colour, MDRC**  
For controlling DALI devices via the ABB i-bus® KNX. One/Two DALI output(s) for up to 64/2x 64 DALI slaves. DALI power supply is integrated. Control and status feedback is carried out via KNX per DALI slave (64/2x 64), with lighting groups (16/2x 16), together in broadcast or per scenes (16/2x 16). DALI devices type DTZ (Self-contained emergency converter acc. EN 62386-202) and type DT8 (colour temperature Tc / tunable white acc. EN 62386-209) will be supported. Extensive fault and error messages are available. By means of KNX and DTZ converter different emergency tests (e.g. function and duration test) can be triggered, test results are transferred back to KNX. With DT8 devices DimWarm, HCL, set and dim colour temperature are possible. Slave-, staircase-, force-, block- and scene- function are integrated. Feedback is sent. DALI telegram rate can change. For diagnostic use and individual change of the DALI address or group assignment a separate Software-Tool is available. Available January 2020.

Description	Mod. width	Order details		Price		Pack unit
		Type code	Order code	€	kg	
1-fold	4	DG/S 1.64.5.1	ZCDG10278R0011	0.133	1	
2-fold	4	DG/S 2.64.5.1	ZCDG10278R0011	0.15	1	

# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Online Learning Session

### Further information

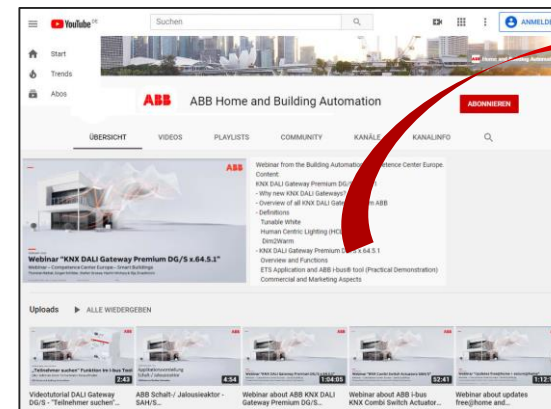
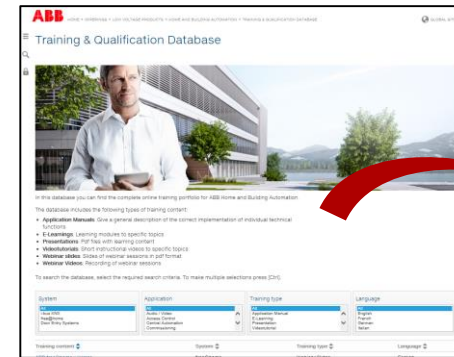
#### Training & Qualification Database

– The database includes the following types of training content:

- Application Manuals
- E-Learnings
- Presentations
- Video tutorials
- Webinar slides and videos
- [www.abb.com/knx](http://www.abb.com/knx) or <https://go.abb/ba-training>

#### Youtube

- Channel “ABB Home and Building Automation”
- <https://www.youtube.com/user/ABBibusKNX>



# Temperature Control of a BBQ Smoker with ABB i-bus KNX

## Online Learning Session

### Training & Qualification Calendar

In addition to the online modules and the traditional training programs offered by your local ABB sales team, we offer a variety of on-site trainings conducted by our specialists at different ABB training facilities

In this Training & Qualification Calendar you can find the educational events that are taking place during 2020

If you are interested in a training please click the training und you will be forwarded to register in “ABB MyLearning”

[www.abb.com/knx](http://www.abb.com/knx) or <https://go.abb/ba-training>

→ Training and Qualification

→ Training Calendar



ABB HOME • OFFERINGS • LOW VOLTAGE PRODUCTS • HOME AND BUILDING AUTOMATION • TRAINING AND QUALIFICATION • TRAINING & QUALIFICATION CALENDAR GLOBAL SITE

### Training & Qualification Calendar

In addition to the online modules and the traditional training programs offered by your local ABB sales team, we offer a variety of webinars and on-site trainings conducted by our specialists at different ABB Competence Centers.

In this Training & Qualification Calendar you can find the educational events that are taking place during 2018.

If you are interested in a training please [REGISTER HERE](#).

To search the Calendar, select the required search criteria. To make multiple selections press [Ctrl].

System	Date	Location
All	All	Webinar
Door Entry Systems	January 2018	Heidelberg, Germany
Free@home	February 2018	Lödenscheid, Germany
Fire Alarm Systems	March 2018	s. Palomba (Rome), Italy
I-bus KNX	April 2018	Vittuone (Milan), Italy

Content	Date	Location	Language
KNX for Commercial Building	05.04.2018 - 06.04.2018	Lödenscheid, Germany	EN
Building Automation Light + Building 2018	10.04.2018	Webinar	EN
KNX in Hotels	19.04.2018 - 20.04.2018	Heidelberg, Germany	EN
HVAC Automation	23.04.2018 - 24.04.2018	Heidelberg, Germany	EN

**ABB MyLearning**

HOME CATALOG PROFILE ADMINISTER REPORTS MY LEARNING

**CERTIFIED KNX BASIC COURSE**  
Code : 9CSC007151-GLB-EN-20190218\_22  
Certified KNX Basic Course at ABB in Heidelberg, Germany, 5 days  
★★★★★ | Share

---

# Disclaimer

The information in this document is subject to change without notice and should not be construed as a commitment by ABB. ABB assumes no responsibility for any errors that may appear in this document.

In no event shall ABB be liable for direct, indirect, special, incidental or consequential damages of any nature or kind arising from the use of this document, nor shall ABB be liable for incidental or consequential damages arising from use of any software or hardware described in this document.

© Copyright [2020] ABB. All rights reserved.

**ABB**