

ABB i-bus KNX in Residential Buildings

Functional Specification – Basic



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1. General Requirements

- The Intelligent Building Control System shall be designed and developed in accordance with the multi-vendor KNX standard and also in conformity to the following standards:
 - European Standard (CENELEC EN 50090 and CEN EN 13321-1)
 - International Standard (ISO/IEC 14543-3)
 - Chinese Standard (GB/T 20965)
 - US Standard (ANSI/ASHRAE 135)
- Systems which are single vendor based and run on proprietary protocols shall not be accepted. The system shall ensure that devices from different manufacturers are interoperable and compatible thus providing a future proof and flexible installation.
- The system should cover residential control requirements of one or more applications, such as lighting, HVAC, shading, etc.
- The system shall be completely decentralized and programmable. Each device will have its own intelligence. The parameters are configured using PC or notebook computer located anywhere in the system topology. Systems using centralized controllers or processors will not be accepted. In case of power failure all the configuration and status information have to be stored and retained in a non-volatile storage. This data shall be pushed back to the device once electrical current is back. System with additional built-in or external battery that needs to be changed periodically for information storage shall not be accepted.
- The communication cable that links all the devices shall have data and power residing on the same medium. It shall also be possible to lay the cable along the power mains. Systems requiring different communication cables for signal transmission and control power between the devices are not acceptable.
- The bus connection terminal of all the devices should have 4 bus connection possibilities for looping or branching of bus cable. The bus cable shall be laid in the building in all possible configurations, i.e. linear, star or tree architecture similar to the power mains. Systems requiring fixed wiring configurations shall not be acceptable. It is thereby possible to disconnect the devices without interrupting the bus line. Systems requiring special tools for crimping, lagging or special installation connectors, e.g. RJ45 bus connections, shall not be acceptable.
- Online programming of any device of the system should be possible without affecting the other devices on the system as well as offline programming prior to dispatching of the material to site. In the event of failure of a device in one line, only the control functions controlled by that device shall be affected and all other devices shall continue to operate normally.
- Each device shall operate via the 21...30 V DC made available on the KNX bus line. The power supply unit should deliver a 640 mA/320 mA/160 mA version depending upon the bus network density.
- The system shall communicate through CSMA/CA with parity checks in order to avoid collision in the bus thereby increasing the system flexibility and bandwidth allocation. Systems which work on polling or master-slave configurations shall not be accepted.

1.1. System Description

- The KNX system shall be programmed to provide the following applications typically found in apartments or other types of residential buildings:
 - Switching and dimming of lighting
 - HVAC control
 - Curtain/blind control
 - Security
 - Basic scene functions including the call of predefined brightness values
 - Audio door communication system
 - Further upgrades in terms of functionality shall be possible at any time

1.2. Control Devices

- Dedicated integrated controllers shall be provided to fit into a central automation distribution board for controlling lighting, curtain/blinds, etc. The controllers shall have decentralized intelligence and shall be independent of any centralized controller/software. For each application, such as HVAC/lighting/curtain control, dedicated controller or channels need to be used.

1.3. Control Elements

- Conventional push-button switches shall be used to control various loads and scenes in the apartment/building. The conventional push-button switches shall be interfaced to the KNX system by means of appropriate KNX binary inputs with contact scanning. Therefore, a decentralized KNX universal interface can be used which can be directly mounted behind the switch in standard back boxes to perform the connection to the KNX bus system. A second possibility is the connection to combined KNX input/output DIN rail devices, which are typically mounted in the central automation distribution. Combined KNX devices feature binary inputs with contact scanning and, additionally, outputs for switching loads.
- Presence or movement detectors shall be used to send commands to KNX actuators in the system.
- KNX control elements with an optional, integrated room temperature controller shall be used to control various loads and scenes in the building wherever room temperature control is demanded.

2. Residential Buildings – Basic Configuration

2.1. Switching of Lighting

- The lighting shall be controlled via appropriate switch actuators/combined devices. This allows a flexible switching independent from rigid hardware wiring due to the flexible, software-based connection of inputs and outputs. Furthermore, the lighting circuits shall be integrated into various applications, e.g. predefined scene control. The lighting circuits shall be optionally operated by a manual override directly on the control unit/actuator.
- Optionally, dimming via appropriate universal dim actuators shall be possible.
- Lighting shall be also controllable by means of a presence or movement detector, as per the requirement of the customer. The detectors shall be connected to the KNX system via bus coupler.

2.2. Basic Scene Control and Dimming

- It shall be possible to call a scene via conventional or KNX push-buttons and the smartphone/tablet control system in order to create several predefined modes for an easy and comfortable operation. This includes all functions of the Intelligent Building Control system.

2.3. Curtain and Blind Control

- Curtain and blind control shall be possible via conventional switches or KNX sensors. Motors are interfaced to appropriate actuators. Furthermore, the integration into scenes is also possible.

2.4. HVAC Control

- KNX shall be used for room-oriented temperature control or individual room temperature control. By detecting the actual temperature value and specifying a respective temperature setpoint with a control algorithm, the thermostat sends a control value to the actuator. This actuator controls a heating or cooling unit that changes the room temperature. The prerequisite is a water-based heating and cooling system. The following control types shall be available:
 - Heating radiator control with electrothermal or electromotor valve drive
 - AC split unit control (not part of this specification)
 - Blower/Fans
- The room temperature controller shall be fully integrated into the Intelligent Building Control system in order to control the shutter/blind system as well. If a room is unoccupied, the blinds can be driven down in cooling operation to prevent heating of the room due to sun radiance. In heating operation (e.g. during wintertime) the blinds shall be driven up in order to support a cost-efficient heating of the room.

2.5. Security System

- The security system shall cover smoke and heat detectors located wherever necessary. The detectors shall be connectable to the KNX bus via specialized relay modules being interfaced to appropriate binary inputs.

2.6. Door Communication

- It shall be possible to connect up to 99 apartments (audio and video units) to a door communication system. Every apartment shall be equipped with up to 4 audio or video indoor stations.

2.7. Control via Switches or Push-buttons

- Conventional push-button switches with floating contacts shall be integrated to the bus system via binary inputs with contact scanning. The binary input shall be configurable in terms of sending various types of commands, e.g. switching, dimming and values in order to fit several applications.
- KNX sensors with optionally integrated room temperature controllers shall be used to send various types of commands to the actuators in the system. They shall be freely programmable in order to fit several applications.

3. Control Devices – System Components

3.1. KNX Power Supply (160 mA/320 mA)

- Produces and monitors the KNX system voltage
- The voltage output is short-circuit- and overload-proof. The LEDs indicate the bus current consumption and the status of the line or device.
- Supply voltage: U_s 85...265 V AC, 50/60 Hz
- Bus voltage output: 1 line with integrated choke
- Rated voltage: U_N 30 V DC +1/-2 V, SELV
- Power consumption:
 - < 21 W (160 mA)
 - < 30 W (320 mA)
- Nominal power loss:
 - < 1.8 W (160 mA)
 - < 2.5 W (320 mA)
- Output voltage: 30 V DC +1/-2 V, SELV
- Nominal current: 160 mA/320 mA, short-circuit-proof
- Sustained short-circuit current:
 - < 0.5 A (160 mA)
 - < 0.8 A (320 mA)
- Mains failure back-up time: 200 ms
- Rated current: I_N 160 mA or 320 mA
- Connection:
 - Bus connection: Bus connection terminal
 - Supply connection: Screw terminals
- Type of protection: IP 20, IEC/EN 60 529
- Mounting: 35 mm mounting rail, IEC/EN 60 715
- Width: 4 modules at 18 mm
- Manufacturer: ABB
- Product type (dependent on current): SV/S 30.160.1.1, SV/S 30.320.2.1

3.3. System Controller Door Entry System

- Supply device and controller of the door communication system
- For connecting the indoor and outdoor stations
- For connecting an electronic door opener
- For switching the light or connecting a light relay
- Switching duration of the door opener and the light is adjustable
- Rated voltage: 230 V DC, $\pm 10\%$
- Output voltage: 28 V
- Rated frequency: 50...60 Hz
- Rated power: 42 W
- Type of protection: IP 20, IEC/EN 60 529
- Temperature range: -5 °C to 45 °C
- Dimensions (L x W x D): 90 mm x 216 mm x 65 mm
- Width: 12 modules at 18 mm
- Manufacturer: ABB
- Product type: 83300

4. Control Devices – Switching and Dimming

4.1. Input/Output Actuators

- The I/O Actuator, available as 4- and 8-fold device, is specially designed for purpose-built and industrial buildings, small commercial businesses and similar building structures. The IO/S 4.6.1.1 features 4/8 outputs for the control of lighting circuits.
- Furthermore, 4/8 floating binary inputs are available that can be used to operate the outputs. In addition, the binary inputs can be programmed as pure KNX devices and/or internally linked with the outputs.
- The application program of the device has the following features:
 - Internal link between inputs and outputs
 - Scanning of inputs (4 or 8), taking values by switch sensor or a forced value
 - Event synchronization can be done, with cyclic operation and reaction to defined events
 - Internal, software-based wiring available to switch without group addresses
 - Functions as an internal wiring, directly set in the parameters in addition to the normal programming
- Switch contacts: 4 or 8 contacts
 - Rated current: 6 A, 250 V AC
- Binary input: 4 or 8 inputs, contact scanning
 - Scanning current/voltage: 0.1 mA/32 V
- Connection:
 - Screw terminals
 - Bus: Screwless terminal
- Type of protection: IP 20, IEC/EN 60 529
- Mounting: 35 mm mounting rail, IEC/EN 60715
- Width: 4 or 8 modules at 18 mm
- Manufacturer: ABB
- Product type (dependent on number of channels): IO/S 4.6.1.1, IO/S 8.6.1.1

4.2. Room Master Device

- The Room Master provides, for defined functional areas (hotel room, apartment, school), all necessary electrical connections and control capabilities, simplifying considerably the design, installation and commissioning of the electrical systems.
- It features 8 outputs for control of lighting circuits. Furthermore, 8 floating binary inputs are available that can be used to operate the outputs. In addition, the binary inputs can be programmed as pure bus devices and/or internally linked with the outputs.
- The application program of the device has the following features:
 - Preconfigured application files are available for the quick installation and commissioning.
 - Incorporated functions for binary inputs: Switch sensor, dim sensor, blind sensor and value forced operation
 - Scene recall and standalone operation is possible.
 - Staircase lighting, delay and flashing applications can be done.
- Switch contacts: 8 contacts
 - Rated current: 6 A, 250 V AC
- Binary input: 8 inputs, contact scanning
 - Scanning current/voltage: 0.1 mA/32 V
- Connection:
 - Screw terminals
 - Bus: Screwless terminal
- Type of protection: IP 20, IEC/EN 60 529
- Mounting: 35 mm mounting rail, IEC/EN 60715
- Width: 8 modules at 18 mm
- Manufacturer: ABB
- Product type: RM/S 4.1

4.3. Room Master with Curtain/Blind Control

- The Room Master is a device specially designed to cater for hotels, guest houses, residential care homes, apartments, small business and shops.
- It features 4 outputs for control of lighting or power outlet circuits. Additionally, 4 blind outputs are available that can also be programmed as switch outputs. The individual blind outputs are mutually interlocked against one another on the hardware as changeover contacts. Furthermore, 12 floating, binary inputs are available that can be used to operate the outputs (switch and blind).
- The application program of the device has the following features:
 - Standalone operation without bus is possible.
 - Recall of entire room scenario possible with 1 group address by setting time (hours, mins, secs). The scenario can be changed and saved anytime.
 - A room scenario consists of two events. Thereby, one event will trigger up to seven telegrams immediately, and the other event can trigger the same seven telegrams via a delay set with a timer.
 - Debounce time can be enabled, and the distinction between long and short press is available.
 - Incorporated functions: Switch sensor, switch/dim sensor, blind sensor, value forced operation
- Switch contacts: 4 contacts
 - Rated current: 20 AX (16 A C-Load, AC3)
- Changeover contacts: 4 contacts
 - Rated current: 6 A, AC3
- Binary input :12 inputs, contact scanning
 - Scanning current/voltage: 0.1 mA/32 V
- Connection:
 - Screw terminals
 - Bus connection: Screwless terminal
- Type of protection: IP 20, IEC/EN 60 529
- Mounting: 35 mm mounting rail, IEC/EN 60715
- Width: 12 modules at 18 mm
- Manufacturer: ABB
- Product type: RM/S 3.1

4.4. Switch Actuator 6 A/10 A

- Uses potential-free contacts to independently switch electrical current loads via KNX.
- Manual operation and display of the switching status is possible. No separate supply voltage necessary. Especially suitable for switching of resistive, inductive and capacitive loads including fluorescent lighting loads according to IEC/EN 60 669.
- With only one application program the following functions for each output can be set separately:
 - Time functions, on/off delay
 - Staircase lighting function with preliminary warning and changeable staircase lighting time
 - Recall scenes/presets over 8-bit/1-bit commands
 - Logic functions AND, OR, XOR
 - Status response
 - Forced control and safety function
 - Reaction to threshold values
 - Control of electrothermal valve drives (continuous controller)
 - Selection of default position on bus voltage failure and recovery
 - Inversion of outputs
 - Parameterization of single outputs can be exchanged or copied
- Outputs: 2-12 potential-free floating contacts possible
- Rated current: 6 AX or 10 AX
- Switching capacity:
 - According to IEC/EN 60 947-4-1:
6 A/AC3 (6 A actuator); 10 A/AC1 (10 A actuator); 8 A/AC3 (on 230/400 V AC, 10 A actuator)
 - According to IEC/EN 60 669:
6 AX (6 A actuator); 10 AX (10 A actuator), max. capacitive load 140 µF
- Operation: Actuating levers for displaying the switch position and manual operation for each channel
- Connection:
 - Load side: Screw terminals with combination head screws for lines, 0.2...6.0 mm² unifilar
 - KNX: Screwless bus connector
- Type of protection: IP 20, IEC/EN 60 529
- Mounting: 35 mm mounting rail, IEC/EN 60 715
- Width: 2-12 modules at 18 mm
- Manufacturer: ABB
- Product type (dependent on number of channels):
 - 6 A actuator: SA/S 2.6.2.1, SA/S 4.6.2.1, SA/S 8.6.2.1, SA/S 12.6.2.1
 - 10 A actuator: SA/S 2.10.2.1, SA/S 4.10.2.1, SA/S 8.10.2.1, SA/S 12.10.2.1

4.5. Universal Dim Actuator

- KNX multichannel universal dimming actuator for controlling incandescent lamps, 230 V incandescent halogen lamps, low-voltage halogen lamps with conventional or electronic transformers, and dimmable energy-saving halogen lamps
- For dimmable retrofit LED lamps (LEDi)
- Parallel switching of channels for increasing the loads through wire bridges possible
- The outputs can be switched parallel in any combination
- Outputs automatically recognize the connected load
- In addition, the operating mode can be selected manually, with local operation.
- Status indication via LED
- The following applications are provided for the outputs:
 - Switching
 - Dimming
 - Value
 - Error message
 - Enable object
 - Light scene actuator
 - Sequence actuator
 - Staircase lighting
 - Delay
 - Preset
 - Cyclical telegram
 - Flashing
 - Logics (AND, OR, XOR, XNOR, NAND, NOR)
 - GATE
 - Min/max value transducers
 - Set value/hysteresis
 - PWM inverter
 - Priority
- Power supply: 230 V AC \pm 10 %, 50/60 Hz
- Connection:
 - Outputs: Screw terminals, 0.2...6.0 mm²
 - Multiple-wire: 0.5...2.5 mm²
 - KNX line: Bus connection terminal control element: Manual operation of ON brighter/Off darker and channel selection

- Display elements: Outputs status indication via LED
- Outputs: 4 or 6
- Rated power: Max. 210 W/VA, 315 W/VA, 600 W/VA per channel (dependent on used dim actuator type)
- Operating temperature range: -5° C to + 45° C
- Protection: Electronic short-circuit and overload protection
- Mounting: 35 mm mounting rail, IEC/EN 60715
- Width: 8 or 12 modules at 18 mm (dependent on rated power)
- Manufacturer: ABB
- Product type (dependent on number of channels and rated power):
6197/12-101-500, 6197/13-101-500, 6197/14-101-500, 6197/15-101-500

5. Control Devices – Curtain and Blind Control

5.1. Blind/Curtain/Shutter Control Actuator with Manual Operation

- To control up to 2, 4 or 8 independent blind and roller shutter drives or curtains and ventilation flaps (230 V AC) with manual operation and displaying LEDs for each channel. Mutually, mechanically interlocked outputs are available, and power supply is provided only via bus voltage.
- Functions of the application program:
 - Duplicating and changing channel functions
 - Time-delayed switching of drives for specific applications
 - Sending and switching delay after bus voltage recovery
 - Request status values via object and limited number of telegrams
 - Preferred position on bus voltage failure recovery, programming and reset
 - Disable/enable manual operation, deactivation by time
 - Safety function (3 x wind alarm, rain alarm, frost alarm with cyclical monitoring, block and forced operation and reaction on reset of safety function)
 - Direct commands for UP/DOWN, STOP/Slat Adjustment are available
 - Move to position height/slat 0...255
 - Move to/set preset position 1-4 and 8-bit scene
 - Dead times of blind/shutter adjustable
 - Tensioning function for awnings and slot positioning for roller shutters, for example
 - Limited travel range (adjustable for direct and/or automatic commands)
 - Change on direction and delay times for drives adjustable
 - Automatic sun protection (position height/slat at sun) and sun tracking
 - Heating/cooling automatic with overheat control
 - Status messages: Height/slat 0...255, upper/lower end position, operability, automatic, status information (2-byte)
 - Controlling ventilation flaps, switch mode with staircase lighting function
- Outputs: 2, 4 or 8 parallel relay outputs UP/DOWN
- Power consumption: < 250 mW
- Operating voltage: 21...30 V DC via KNX
- U_N rated voltage: Max. 230 V AC, 45...65 Hz
- I_N rated current: Max. 6 A
- Operating and displaying elements: 2 LEDs and push-buttons for each channel
- Connection
 - Outputs: Screw terminals with combination head screws
 - Bus: Screwless bus connection terminal
- Type of protection: IP 20, IEC/EN 60 529
- Mounting: 35 mm mounting rail, IEC/EN 60 715
- Width: 4 or 8 modules at 18 mm
- Manufacturer: ABB
- Product type (dependent on number of channels): JRA/S 2.230.2.1, JRA/S 4.230.2.1, JRA/S 8.230.2.1

6. Control Devices – HVAC

6.1. Standard Room Thermostat with Display

- For single-room temperature control in heating and air-conditioning technology
- With illuminated display for showing the actual room temperature and external actual-value default
- Comfort, standby, night operation or frost/heat protection operation can be selected via KNX. The set values can be parameterized.
- Display of the operation statuses with symbols
- Display of the date and time is possible
- The controller is a constant room temperature controller for ventilator convectors (fan coils) in 2-pipe and 4-pipe systems and conventional heating or cooling systems.
- The fan stage can be switched manually or in automatic mode.
- Setpoint adjustment using upper switch cover is possible.
- Comfort/standby switchover using lower switch cover is possible.
- The control output can optionally emit a continuous (PI control) or switching position signal (2-point or PWM).
- Support of KNX functions through innovative LED-color concept (yellow = lighting, blue = blind, orange = RTC, magenta = scene and white = neutral/no function assigned) or standard illumination red/green
- Color and function of the LED can be changed via ETS.
- Removal protection is possible with screw-on installation.
- With a maximum of 10 logic channels (logic gate, time delay, sequences, etc.). The logic functions of the channel can be freely selected.
- For flush-mounted bus coupler
- The following functions are provided for the application module:
 - Inputs: Switching, Continuous, Heating, Cooling, Time, Date
 - Outputs: Fan control, Light scene actuator, Sequence actuator, Staircase lighting, Delay, Preset, Cyclical telegram, Flashing, Logics (AND, OR, XOR, XNOR, NAND, NOR), GATE, Min/max value transducers, Set value/hysteresis, PWM inverter, Priority
- Room thermostat:
 - Connection:
 - Power supply: 10-pole multi-point connector
 - Control element: Switch contacts left/right for selecting setpoint and mode of operation
 - Display elements: LCD showing operation modes
 - Type of protection: IP 20, IEC/EN 60 529
 - Temperature range: -5 °C to 45 °C
 - Dimensions (L x W x D): 63 mm x 63 mm
 - Manufacturer: ABB
 - Product type: 6124/01

- Bus coupler:
 - For combining the installation bus KNX and the different application modules
 - For installation in surface-mounted or flush-mounted boxes
 - Connection:
 - KNX line: Bus connection terminal
 - Rated voltage: 24 V
 - Outputs:
 - Rated current: 24 mA
 - Type of protection: IP 20, IEC/EN 60 529
 - Temperature range: -5 °C to 45 °C
 - Dimensions (L x W x D): 50 mm x 45 mm x 23 mm
 - Manufacturer: ABB
 - Product type: 6120/12

6.2. Multi-Function Room Thermostat with Display and Control Elements

- For single-room temperature control in heating and air-conditioning technology
- With illuminated display for showing the actual room temperature
- With external actual-value default
- Comfort, standby, night operation or frost/heat protection operation can be selected via KNX. The set values can be parameterized.
- Display of the operation statuses with symbols
- Display of the date and time is possible
- The controller is a constant room temperature controller for ventilator convectors (fan coils) in 2-pipe and 4-pipe systems and conventional heating or cooling systems.
- The fan stage can be switched manually or in automatic mode.
- Setpoint adjustment using upper switch cover is possible.
- Comfort/standby switchover using lower switch cover is possible.
- The control output can optionally emit a continuous (PI control) or switching position signal (2-point or PWM).
- For transmitting switching, push-button, dimming and blind commands to KNX actuator
- Support of KNX functions through innovative LED-color concept (yellow = lighting, blue = blind, orange = RTC, magenta = scene and white = neutral/no function assigned) or standard illumination red/green
- Color and function of the LEDs can be changed via ETS.
- Removal protection is possible with screw-on installation.
- With a maximum of 10 logic channels (logic gate, time delay, sequences, etc.). The logic functions of the channel can be freely selected.
- For flush-mounted bus coupler
- The following functions are provided for the application module:
 - Inputs: LED
 - Outputs: Switching, Dimming, Blinds, Value, Push-button, Light scene extension unit, Step switch, Short/long operation, RTC operating mode switchover, Push-button switching, Push-button dimming, Push-button blind, Push-button value sender, Push-button step-type switch, Push-button multiple functions (max. 5 channels), Push-button value sender, 2 objects, Light scene actuator, Sequence actuator, Staircase lighting, Delay, Preset, Cyclical telegram, Flashing, Logics (AND, OR, XOR, XNOR, NAND, NOR), GATE, Min/max value transducers, Set value/hysteresis, PWM inverter, Priority, Continuous, Heating, Cooling, Fan control

- Room thermostat:
 - Connection:
 - Power supply: 10-pole multi-point connector
 - Control element: Switch contacts left/right, also for selecting setpoint and mode of operation
 - Display elements: LCD showing operation mode, temperature, time and date
 - Type of protection: IP 20, IEC/EN 60 529
 - Temperature range: -5 °C to 45 °C
 - Dimensions (L x W x D): 63 mm x 63 mm
 - Manufacturer: ABB
 - Product type: 6128/28
- Bus coupler:
 - For combining the installation bus KNX and the different application modules
 - For installation in surface-mounted or flush-mounted boxes
 - Connection:
 - KNX line: Bus connection terminal
 - Rated voltage: 24 V
 - Outputs:
 - Rated current: 24 mA
 - Type of protection: IP 20, IEC/EN 60 529
 - Temperature range: -5 °C to 45 °C
 - Dimensions (L x W x D): 50 mm x 45 mm x 23 mm
 - Manufacturer: ABB
 - Product type: 6120/12

6.3. Valve Drive Actuator

- To control thermoelectric valve drives (24...230 V AC) in heating/cooling systems via 6/12 independent semiconductor outputs
- General device functions:
 - Supply via bus voltage
 - Protection against overload and short-circuit
 - Manual operating keys and displaying LEDs for each channel
 - Block/enable manual operation, deactivation after time and status
 - Copy and exchange channels
 - Cyclical monitoring of the device
 - Sending and switching delay after bus voltage recovery
 - Request status values
 - Limited number of telegrams
- Software functionality for each channel:
 - Reaction on bus voltage recovery
 - Status message overload/short-circuit
 - Selection of valve drive (normally closed/normally open)
 - Control of outputs: Switching (1-bit) or continuous (1-byte, pulse width modulation)
 - Status message control value (1-bit or-1 byte)
 - Cyclic monitoring of control value (room temperature controller)
 - Preferred position and status message at controller fault
 - Security functions: Blocking and forced operation
 - Valve purge: Activation via object, adjustable duration, cyclic purge and status
 - Characteristic curve correction
 - Status byte
- Outputs: 6/12 semiconductor outputs
- Power consumption KNX: < 250 mW
- Operating voltage: 21...30 V DC via KNX
- U_N rated voltage: Max. 24...230 V AC, 45...65 Hz
- I_N rated current: Max. 160 mA
- Operating and displaying elements:
 - LED and push-button (ON/OFF) for each channel
 - LED overload/short-circuit and push-button reset
- Connection:
 - Outputs: Screw terminals with combination head screws
 - KNX: Screwless bus connection terminal
- Type of protection IP 20, IEC/EN 60 529
- Mounting: 35 mm mounting rail, IEC/EN 60715
- Width: 4 or 8 modules at 18 mm
- Manufacturer: ABB
- Product type (dependent on number of channels): VAA/S 6.230.2.1, VAA/S 12.230.2.1

6.4. Thermoelectric Valve Drive

- The thermoelectric valve drive is used to open and close valves in heating, cooling and air conditioning systems.
- The snap-on mounting on valves or in heating circuit distributors will be established by valve adapters.
- Version normally closed (NC)
- Voltage supply: 230 V AC, 50/60 Hz
- Type of protection: IP 54, IEC/EN 60 529
- Protection class: II
- Mounting: Snap-on mounting in all installation positions
- Connection cable: Pluggable, 2 x 0.75 mm², 1m
- Display elements: Function display
- Housing: White, RAL 9003
- Dimensions: 60 mm x 44 mm x 49 mm
- Manufacturer: ABB
- Product type: TSA/K 230.2

7. Control Devices – Security System

7.1. Smoke Alarm Detector

- For early detection of smouldering fires and open fires with smoke build-up indoors according to photo-optical measuring principal
- Permanently installed lithium battery with a service life of at least 10 years
- With test button and mute function
- VdS certification (German organization of property assurers)
- Tested according to DIN EN 14 604
- Audible alarm with 85 dBA at 3 m
- Dismantling safety
- Networkable via two-wire line for up to 20 detectors
- Networkable via radio module for up to 20 detectors
- "Q" certificate according to VdS 3131/vfdb directive 14-01
- Dimensions:
 - Diameter: 120 mm
 - Height: 47.50 mm
- Manufacturer: ABB
- Product type: 6833/01

7.2. Heat Alarm Detector

- Signal triggering when over 50°C
- Permanently installed lithium battery with a service life of at least 10 years
- With test button and mute function
- Audible alarm with 85 dBA at 3 m
- Dismantling safety
- Networkable via two-wire line for up to 20 detectors
- Networkable via radio module for up to 20 detectors
- Manufacturer: ABB
- Product type: 6835/01

7.3. Smoke Alarm Detector Relay

- Connection also for external systems, e.g. KNX
- Including RF module
- Relais contact: Changeover contact 230 V DC, max. 5A
- Connection terminals: Up to 2 x 2 x 1.5 mm²
- Rated voltage: 230 V DC
- Manufacturer: ABB
- Product type: 6829

8. Control Devices – Operation

8.1. Standard Control Element with Bus Coupler

- For transmitting switching, push-button, dimming and blind commands to KNX actuator
- LED colors for status or orientation light are programmable via ETS
- Removal protection is possible with screw-on installation
- With individual labelling area
- Bus coupler in delivery included (bundle)
- The following functions are provided for the application module:
 - Inputs: LED
 - Outputs: Switching, Dimming, Blinds, Value, Push-button, Light scene extension unit, Value sender, 2 objects
- Connection:
 - Power supply: 10-pole multi-point connector
- Control element: Rocker switch left/right
- Display elements: Two LED per rocker via separate communication object for status (Red/Green/OFF) or orientation light
- Type of protection: IP 20, IEC/EN 60 529
- Temperature range: -5 °C to 45 °C
- Dimensions (L x W x D): 63 mm x 63 mm
- Manufacturer: ABB
- Product type (dependent on number of rockers): 6125/01, 6126/01, 6127/01

8.2. Universal Interface

- The device has 2/4/12 channels that can be parameterized as inputs or outputs. It is possible to connect conventional push-buttons, floating contacts or LEDs. The scanning voltage for the contacts and the supply voltage for the LEDs are provided by the device. Series resistors for external LEDs are integrated into the device. The Universal Interface is a flush-mounted device and a low cost solution designed in such a way to fit inside conventional electrical back boxes.
- The following functions can be set for each channel separately:
 - Switching and dimming of lighting
 - Operation of blinds and roller shutters
 - Sending of arbitrary values, e.g. temperature values
 - Control and storing of light scenes
 - Triggering an electronic relay for control of electrothermal valve drive for heating valves
 - Control/flashing of an LED for feedback of an operation
 - Operation of different loads by multiple push-button actions
 - Operation of several loads in a fixed switching sequence
 - Reading out of technical contacts (e.g. relays)
- Input:
 - Scanning voltage: 20 V DC
 - Input current: 0.5 mA
- Output:
 - Output voltage: 3.3 V DC
 - Output current: Max. 2 mA, limited by series resistor
- Connection:
 - Inputs/Outputs:
 - 4 cables approx. 30 cm long (for 2-fold)
 - 6 cables approx. 30 cm long (for 4-fold)
 - 18 cables approx. 30 cm long (for 12-fold)
 - Each cable can be extended to a maximum of 10 m
 - Bus connection:
 - Bus connection terminal
- Type of protection: IP 20, IEC/EN 60 529
- Mounting: Flush-mounted, combined wall and joint box, 60 mm
- Manufacturer: ABB
- Product type (dependent on number of channels): US/U 2.2, US/U 4.2, US/U 12.2

8.3. KNX Movement Detector Sensor, Standard 180°

- Movement detector with up to 4 channels
- Parallel operation of several movement detectors is possible with cyclical turn-on commands
- Deactivation of a 90° detection area per channel per ETS software
- Twilight sensor and light-on time adjustable per ETS
- Flat design
- The following functions are provided for the application module:
 - Outputs: Switching, Value, Light scene actuator, Sequence actuator, Staircase lighting, Delay, Preset, Cyclical telegram, Flashing, Logics (AND, OR, XOR, XNOR, NAND, NOR), GATE, Min/max value transducers, Set value/hysteresis, PWM inverter, PriorityConnection:
 - Power supply: 10-pole multi-point connector
- Control element: Setting via ETS application
- Type of protection: IP 20, IEC/EN 60 529 Temperature range: -5 °C to 45 °C
- Detection range: Frontal: 6 m; Lateral: 6 m
- Brightness limit value: 5...150 Lux
- Detection angle: 180 °
- Dimensions (L x W x D): 63 mm x 63 mm x 18 mm
- Position for installation: Vertical
- Mounting height: 1.1 m
- Manufacturer: ABB
- Product type: 6122/01

8.4. Outdoor Audio Station

- Outdoor audio station, 1-/2-/3-/4-/6-/10-/15-fold
- For flush- and surface-mounting.
- Communication unit and key module are backlit
- Front plate made of 3 mm stainless steel, surface is brushed or white coated
- Dimensions (L x W x D): 205 mm x 135 mm x 29 mm (277 mm x 135 mm x 29 mm/ 277 mm x 235 mm x 29 mm)
- Type of protection:: IP 44, IEC/EN 60 529
- Temperature range: -25 °C to 55 °C
- Manufacturer: ABB
- Product type (dependent on number of units): 83101, 83102, 83105

8.5. Indoor Audio Station

- Indoor audio station with handset:
 - For surface-mounting
 - Volume of the handset is adjustable
 - Different bell sounds are adjustable for door and floor ringing; five polyphone bell sounds are available.
 - Volume of bell sounds is adjustable
 - Quick-access buttons for door openers, mute function and light
 - Floor call push-button connection
 - Type of protection: IP 30, IEC/EN 60 529
 - Temperature range: -5 °C to 40 °C
 - Dimensions(L x W x D): 198 mm x 81 mm x 38 mm
 - Manufacturer: ABB
 - Product type: 83205 AP

- Indoor audio station without handset:
 - For surface-mounting
 - Adjustable volume
 - Different bell sounds are adjustable for door and floor ringing; five polyphone bell sounds are available.
 - Volume of bell sounds is adjustable
 - Quick-access buttons for communication, door openers, mute function and light
 - Floor call push-button connection
 - Hands-free function
 - Type of protection: IP 30, IEC/EN 60 529
 - Temperature range: -5 °C to 40 °C
 - Dimensions (L x W x D): 175 mm x 81 mm x 22 mm
 - Manufacturer: ABB
 - Product type: 83210AP

- Indoor audio station with display:
 - For flush-mounting in two flush-mounted sockets
 - For integrating in switch ranges
 - Illuminated monochrome display for indicating the most important functions (e.g. bells, conversation, mute) and programming menu
 - Display size: 3.8 cm (1.5")
 - Hands-free function. Hands-free volume is adjustable.
 - Different bell sounds are adjustable for door and floor ringing; five polyphone bell sounds are available.
 - Volume of bell sounds is adjustable
 - Quick-access buttons for door openers, mute function and light
 - Type of protection: IP 30, IEC/EN 60 529
 - Temperature range: -5 °C to 40 °C
 - Manufacturer: ABB
 - Product type: 83200 U

Note:

The information in this Document contains best practice solutions to prescribe KNX installations in a specific application segment, but is of an exemplary nature only. The information may not represent the exact functional requirements with regard to specific local electrical installation requirements. Please note the Document also does not include the specification of legally required primary electrical protection devices i.e., circuit breakers, earth fault devices, etc., as these are highly dependent on national installation regulations.

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