

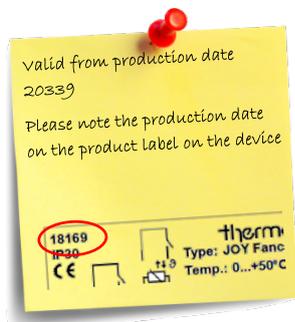
» JOY SR HC AO2DO | HC 3AO RS485 Modbus

Room Regulator
(from Version 2.6.x)

thermokon[®]
HOME OF SENSOR TECHNOLOGY

Datasheet

Subject to technical alteration
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» APPLICATION

JOY SR HC AO2DO (85..260 V ~)

The 230 V supplied type AO2DO controls the 230 V heating and cooling valve as a 2-point or thermal 230 V actuator via PWM. The analog output is also used to control a 6-way valve. Two configurable inputs can be used as sensor input, room occupancy or energy lock. In addition to wired valve drives and sensors, sensors and actuators can also be controlled by radio. In addition, as an alternative to wired sensors, an external radio temperature sensor, radio motion detector, a radio temperature sensor for changeover function and radio window contacts/handles can be learnt in. The override by radio is possible by means of higher-level controller profile and cable-bound via Modbus. Radio and wired sensors and actuators are processed identically and can be used in any combination. This guarantees individual and energy-efficient room air conditioning. The device (front of glass in white or black) has a monochrome display and touch-sensitive control buttons. It has a timer with three time channels of four time periods each. Mounting is designed for a flush-mounted box. For hotel applications, the device offers the option of an additional zone (bathroom heating) in conjunction with room temperature sensor and radio actuator SAB.

JOY SR HC 3AO (24 V =/~)

The 24 V supplied type 3AO has three 0..10 V outputs for controlling heating/cooling valves or a 6-way valve. The analog output is also used to control a 6-way valve. Two configurable inputs can be used as sensor input, room occupancy or energy lock. In addition to wired valve drives and sensors, sensors and actuators can also be controlled by radio. In addition, as an alternative to wired sensors, an external radio temperature sensor, radio motion detector, a radio temperature sensor for changeover function and radio window contacts/handles can be learnt in. The override by radio is possible by means of higher-level controller profile and cable-bound via Modbus. Radio and wired sensors and actuators are processed identically and can be used in any combination. This guarantees individual and energy-efficient room air conditioning. The device (front of glass in white or black) has a monochrome display and touch-sensitive control buttons. It has a timer with three time channels of four time periods each. Mounting is designed for a flush-mounted box. For hotel applications, the device offers the option of an additional zone (bathroom heating) in conjunction with room temperature sensor and radio actuator SAB.

» PRODUCT TESTING AND CERTIFICATION



Declaration of conformity

The declaration of conformity of the products can be found on our website <https://www.thermokon.de/>.

» SECURITY ADVICE – CAUTION



The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.



CAUTION! Risk of electric shock due to live components within the enclosure, especially devices with mains voltage supply (usually between 90..265 V).

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

» NOTES ON DISPOSAL



As a component of a large-scale fixed installation, Thermokon products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

» REMARKS TO ROOM SENSORS

Location and Accuracy of Room Sensors

The room sensor should be mounted in a suitable location for measuring accurate room temperature. The accuracy of the temperature measurement also depends directly on the temperature dynamics of the wall. It is important, that the back plate is completely flush to the wall so that the circulation of air occurs through the vents in the cover. Otherwise, deviations in temperature measurement will occur due to uncontrolled air circulation. Also the temperature sensor should not be covered by furniture or similar devices. Mounting next to doors (due to draught) or windows (due to colder outside wall) should be avoided. The temperature dynamics of the wall will influence the temperature measurement. Various wall types (brick, concrete, dividing and hollow brickwork) all have different behaviours with regards to thermal variations.

Surface and Flush Mounting

The temperature dynamics of the wall influence the measurement result of the sensor. Various wall types (brick, concrete, dividing and hollow brickwork) have different behaviours with regard to thermal variations. A solid concrete wall responds to thermal fluctuations within a room in a much slower way than a light-weight structure wall. Room temperature sensors installed in flush boxes have a longer response time to thermal variations. In extreme cases they detect the radiant heat of the wall even if the air temperature in the room is lower for example. The quicker the dynamics of the wall (temperature acceptance of the wall) or the longer the selected inquiry interval of the temperature sensor is the smaller the deviations limited in time are.

» DIAGNOSTICS MENU

To access the diagnostics menu, select the header in the startscreen of the parameter menu, and press the ENTER key. Here you will find various information, such as device type, software version, state of the inputs and outputs and controller state (current manipulated variable).

» MOUNTING ADVICES

Plasterboard boxes shall be covered by wall paper or paint to avoid that the plasterboard box's front rim will be partially visible underneath JOY. Maybe consider using white plasterboard boxes (i.e. Kaiser 9063-77)

» APPLICATION NOTICE

Boot Loader

A bootloader integrated in the device, makes it possible to install a new application (update, upgrade) using a MicroSD card. To insert the SD card, the upper part must be removed. If the boot loader is activated, the ring illumination blinks in a 1s cycle, while display is not triggered! After recognition of a MicroSD card with a valid application the update process is started. Now, ring illumination blinks fast in a 300ms cycle. After a successful update process (Duration approx. 20-30 seconds!), the new application is started automatically. Afterwards, SD card have to be removed! A firmware update can also performed via the Modbus interface. In this case, the program "Thermokon Bootloader" (as of version 2.0.0) and the corresponding firmware file are needed.

SD-Card

The parameterization of the receive channels for EasySens transmitter (i.e. SRW0x window contact) and the configuration of the device can be done with a MicroSD card. You can create a configuration file with the Thermokon tool uConfig. This means that sensors can be learned-in without having to press the LRN buttons of the relevant sensors.

The MicroSD card can also be used to read a configuration from the JOY. The MicroSD card can be plugged in during the current configuration or it can be used after the configuration has been completed. If a MicroSD card is inserted during the configuration, each learn / learn process is wrote directly into the file. If the MicroSD card is inserted after the configuration, the configuration file is automatically created on the card after a restart.

Note: EasySens receivers such as SAB or actuators need the ID of the transmitter (Joy) via manually initiated teach-in telegram. Only MicroSD cards formatted in the FAT file system can be used! NTFS and exFAT file systems are not supported.

Software uConfig

A detailed description of the parameter and the configuration software uConfig can be downloaded from our website.

» CONFIGURATION VIA UCONFIG | MICROSD-CARD OR MODBUS



Configuration software:

uConfig | *Windows 10 is required to use the uConfig configuration software*

The JOY room thermostat can be parameterised using the uConfig configuration software. An SD card is used to transfer the created configuration file to the device. For BUS devices, a live configuration can also be performed via the BUS interface.

The online installer for the configuration software can be found in our download center. The installer retrieves all necessary files and plug-ins from our web server. In this version an update function is integrated in the software.

→ [Download Online-Installer](#)

A separate offline installer is available for installations on PCs/Notebooks without internet connection. For an update of the software a recurring reinstallation is necessary.

→ [Download Offline-Installer](#)

» **TECHNICAL DATA**

Measuring values	temperature, humidity (optional)	
Network technology	RS485 Modbus	
Radio technology	EnOcean (IEC 14543-3-10), transmission power <10 mW	
Frequency	868 MHz	
Measuring range temp	0..+50 °C	
Accuracy temperature	±1 °C (typ. at 21 °C)	
Measuring range humidity (optional)	0..100% rH non-condensing	
Accuracy humidity (optional)	±2% between 10..90% rH (typ. at 21 °C)	
Control functions	setpoint adjustment +0..+50 °C	
Display	LCD 60x44 mm, 240x160 px, white backlighting	
Functions	integrated PI- and 2-point-/ 3-point-controllers, 2nd control loop: 2-point controller, MSG server for 2nd control loop via radio	
Enclosure	PC and glass, optional black or white	
Protection	IP30 according to EN 60529	
Connection electrical	Terminal 1..8 terminal block max. 1,5 mm ²	Terminal 9..12 terminal block max. 1.0 mm ²
Ambient condition	0..+50 °C, max. 85% rH non-condensing	
Weight	195 g	
Mounting	flush mounted with standard EU box (Ø=60 mm)	
Notes	there are 20 EnOcean transmit / receive channels available for various functions	

JOY SR HC AO2DO (85..260 V ~)

Output voltage	0..10 V =, max. load 5 mA, (for 6-way valves)	
Output switch contact	2x normally open contacts (heating/cooling), 240 V max. load 500 mA	
Power supply	85..260 V ~	
Power consumption	max. 2 VA (260 V ~)	
Inputs	DI 1 input for NTC 10 K or change-over sensor	DI 2 digital input for non-floating contact (230 V ~)

JOY SR HC AO2DO 3AO (24 V =/~)

Output voltage	3x 0..10 V, max. load 5 mA, 6-way valve control, heating & cooling	
Power supply	24 V = (±10%) or 24 V ~ (±10%) SELV	
Power consumption	max. 1,5 W (24 V =)	
Inputs	DI 1 1 input for NTC10K or floating contact	DI 2 1 input for floating contact

***Power supply**

When several BUS devices are supplied by one 24 V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) (=reference potential) are connected together (in-phase connection of field devices).

In case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device. The consequential short-circuit current flowing through this field may cause damage to it.

Therefore, pay attention to correct wiring.

» INFORMATION ABOUT EASYSSENS® (RADIO) / AIRCONFIG GENERAL USAGE



EasySens® - airConfig

Basic information about EasySens® radio and about general usage of our airConfig software, please download from our website.

» OVERVIEW OF THE RADIO TELEGRAMS



EEP

The structure of the data contained in the telegram can be found in the EEP (EnOcean equipment profile) list provided by the EnOcean Alliance.

» SUPPORTED PROFILES

Receiving profiles

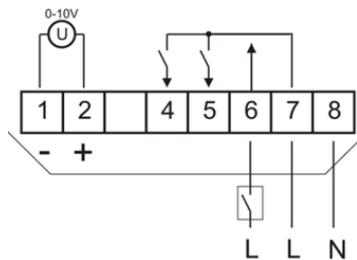
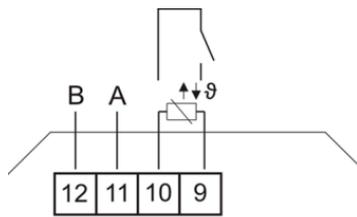
EnOcean-EEP	Type	Direction	Description	Thermokon Devices	Max. Quantity	LCD/ Funktion s-gruppe
F6-02-01	RPS	Rx	EnOcean button	Diverse	1	RPS
D5-00-01	1BS	Rx	Windows contacts	SRW01	max.5	SRW
F6-10-00	RPS	Rx	Windows handle	SRG02		SRG
A5-02-06	4BS	Rx	Temperature 0-50°C	SR65 VFG, SR65 TF, SR65 AKF, SR65	1	VFG
A5-02-16	4BS	Rx	Temperature 0-80°C			VFG
A5-02-05	4BS	Rx	Room Sensor (Temperature 0-40°C)	SR04, LC-SR04, SR07, SR65	1	EXT
A5-10-03	4BS	Rx	(Room Operating Panel) Temperatur, Set Point	SR07P, SR04P, SR06 2T/2T+		WRF
A5-07-01	4BS	Rx	Room Sensor (Occupancy)	SR-MDS Solar, SR-MOC Solar, SR-MOW Solar	max. 3	OCC
A5-08-01	4BS	Rx	Room Sensor (Occupancy, Light, Temperature)	SR-MDS		OCC
F6-04-01	RPS	Rx	Keycard	SR-KCS02, SR-KCS	1	KEY
A5-20-01	4BS	Rx/Tx	SAB	SAB+, SAB05	max. 6	SAB
A5-20-12	4BS	Rx	Superior Control Unt (Fan. Set Point, Controller, Energy Hold OFF/Dew point, Occup)		1	SUP

Transmitting profiles

EnOcean-EEP	Type	Direction	Description	Max. Quantity	LCD
A5-10-02 (V2.1.1 +)	4BS	Tx	Valid from Version 2.1.1 (up to 2.1.0: A5-10-01) Room operating panel (Fan,Temp, Sollwert, Occup)	1	WRF
A5-10-06 (V2.1.1 +)	4BS	Tx	Valid from Version 2.1.1 (up to 2.1.0: A5-10-05) Room operating panel (Temp, Sollwert, Occup)		
A5-11-02	4BS	Tx	Temperature Controller (Fan, Set point, alarming, Controller state, Energy Hold OFF, Occup)	1	OUT
A5-20-01	4BS	Rx/Tx	SAB	max. 5+1	SAB

» CONNECTION PLAN

JOY HC AO2DO (85..260 V ~)



1 GND (6-way valve)

2 0..10 V (6-way valve)

4 Cooling

5 Heating

6 Digital Input 2 (230V)

7 L

8 N

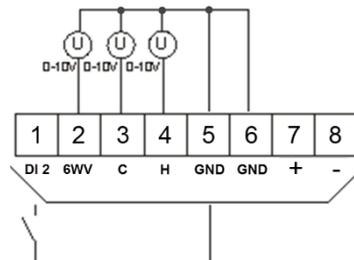
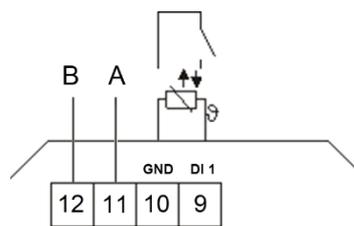
9 Digital Input 1 (or NTC10K)

10 GND DI 1

11 Digital Input 3

12 GND DI 3

JOY HC 3AO (24 V ~/=)



1 Digital Input 2

2 6-way valve (0..10 V)

3 Cooling (0..10 V)

4 Heating (0..10 V)

5 GND DI2

6 GND

7 24 V = ($\pm 10\%$) or 24 V ~ ($\pm 10\%$)

8 GND

9 Digital Input 1 (or NTC10K)

10 GND DI 1

11 Digital Input 3

12 GND DI 3

Note: Parallel connection of the potential-loaded inputs is not permitted!

If the operating mode (change-over DI) of several devices is to be switched together by one contact, the potential-free 230V input must be used (DI2, only possible with the 230V version). It must be ensured that the same phase is used for jointly switched devices.

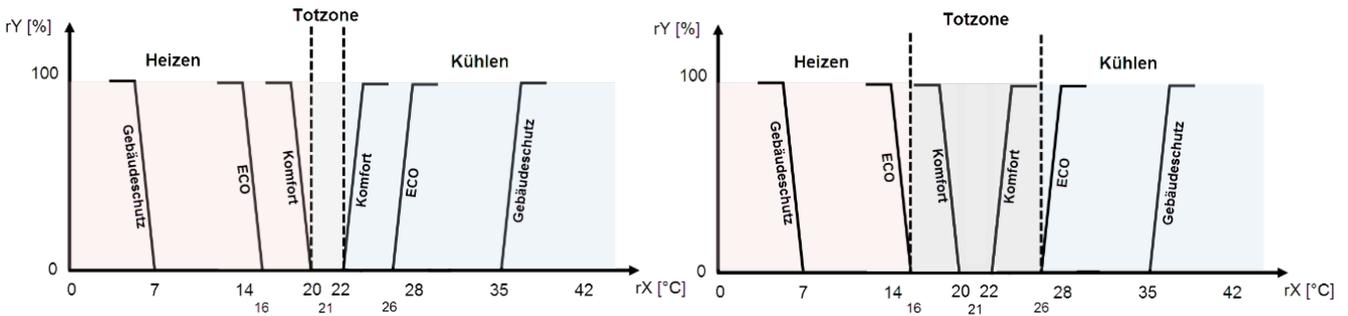
JOY HC AO2DO (85..260 V ~)	JOY HC 3AO (24 V ~/=)
PI controller (PWM) & 2-point/3-point controller <i>(configurable)</i>	PI controller (0..10 V)

6WV (PI-controller 0..10 V) (all types)

The manipulated variable is output as a proportional control signal at the output for the 6-way valve. The type of valve used is set via the configuration software. You can choose from 2..10 V / 2..10 V INV (Belimo), 0..10 V DN15 / DN15 INV, DN20 / DN20 INV (Sauter). There is also the possibility of a freely parameterizable 6-way valve (generic 6WV).

Heating/ cooling with 2-point-/ 3-point-controller (only HC AO2DO)

In the case of temperature control, the 2-point controller only knows the switching states heating ON and heating OFF. The 3-point controller also knows the switching state of cooling. Two - and three-point controller work with a hysteresis.



Heating/ cooling with PI-controller (PWM) (only HC AO2DO)

The time response of the PI control loop depends on the control parameters xp for the proportional area and tn for the reset time of the integral range. In case of an error, the P portion immediately changes the position value proportionally to the error variable, while the integral portion takes effect after a certain time.

The resulting actuating variable is output as a pulse-width-modulated signal directly to the outputs.

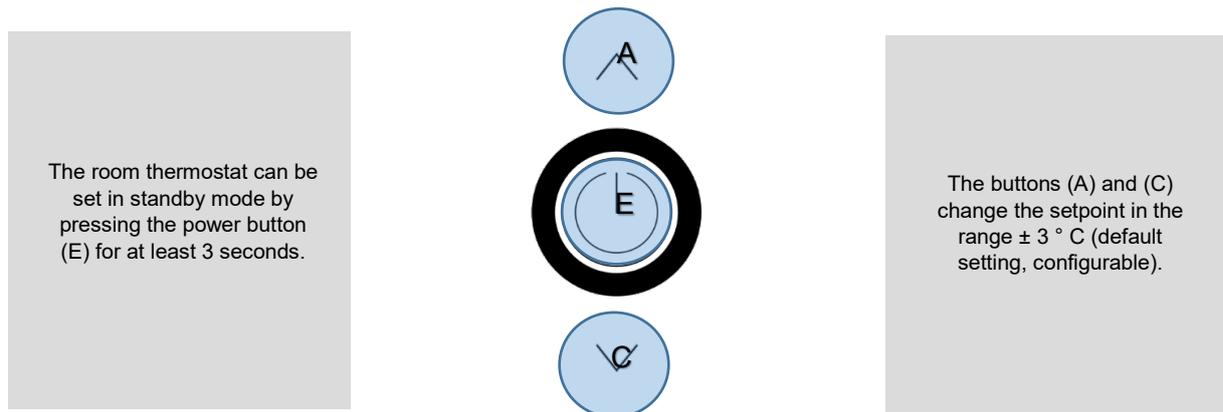
Heating/ cooling with PI-controller (0..10 V) (only HC 3AO)

The time response of the PI control loop depends on the control parameters xp for the proportional area and tn for the reset time of the integral range. In case of an error variable, the P portion immediately changes the position value proportionally to the error variable, while the integral portion takes effect after a certain time.

The resulting manipulated variable is output as an analogue 0..10 V signal directly to the outputs.

» FUNCTION DESCRIPTION - BUTTONS

On the touch-surface are the keys for setpoint adjustment. While pressing of these buttons, the white LED of the Power-button lights up for visual feedback.



The Power button (E) can be used to switch the room thermostat to standby mode (not possible if the Keycard switch function is used!) If the key is used as a presence key at the same time, the key must be pressed for at least 3s, in all other cases a short press is sufficient. In standby mode the display and all outputs are switched off (controller deactivated). The frost and heat protection monitoring remains active.

Modbus registers can still be read (e.g. room temperature).

Main screen/ Value display

The Display shows the measured value of the internal sensor. The value of an external sensor will be shown if connected and configured accordingly. The room thermostat controls in this case according to the external sensor.

Header →	13:41  06.08.25	13:41  06.08.25
Value display → (Humidity optional)	23.3 °C	56.6 %rH 23.3 °C
Footer →	 	 

Header

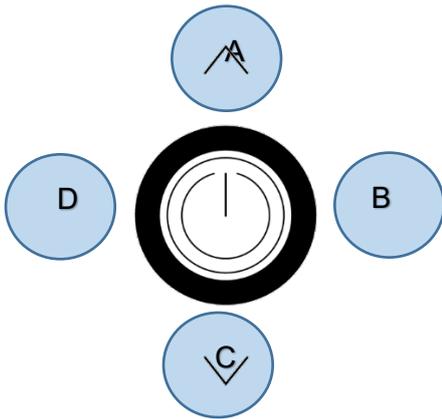
In the header line, the time, weekday and date are displayed. In addition, the ECO info symbol (sheet) is displayed here when the ECO mode is switched on. It is possible to show an alarm symbol (exclamation mark) in the display. This symbol is located at the same position as the ECO symbol. Since the alarm symbol has a higher priority, it overwrites the ECO symbol.

Footer - Symbols

Depending upon the heating or cooling mode, occupancy or window contact status, the corresponding symbols will be shown in the footer. The symbol "active timechannel" will be shown only if active. To enable the symbols, the corresponding parameters must be set via the configuration software or Modbus.

Occupancy		
Window contact/dewpoint		
Heating/Cooling		
Active timechannel		

» CONFIGURATION VIA THE DISPLAY MENU



Buttons

The configuration menu is called up by simultaneously pressing the buttons “up” (A), “left” (D) and “right” (B) for at least 3 seconds.

Menu navigation on the touch-surface is performed by pressing the buttons “up” (A), “down” (C), “left” (D), “right” (B) or the power button. Choose the desired parameter and press “right” (B) to open up the submenu. If no entry is made for 8 minutes, the parameter menu is left automatically. To exit the menu select the header line and press “left” (D)

Menu	
Timechannel	▷
Time/Date	▷
Sensor settings	▷
Common settings	▷
EnOcean list	▷
EnOcean configuration	▷

» MENU → TIME CHANNELS

In the Time Channels menu, setpoint and timer can be set. Up to 3 time channels with 4 time periods each can be parameterized. The time channels are prioritised. Channel 3 has the highest priority. After selecting the line of the time channel to be edited, the next submenu is called up with the "Right" key. It is possible to set any time period within one week in the first two lines with the "Left" (-) / "Right" (+) keys. In addition, the ECO mode is available in the menu sections. In ECO mode, the dead zone between heating and cooling is automatically set to the ECO dead zone configured in the "General Settings" menu (default: 10 K).

Timechannels		Timechannels/Timer1
Timechannel 1 Mo - Fr	▷	from day <-/+> Mo
Timechannel 2	▷	to day <-/+> Fr
Timechannel 3	▷	1: 06:00h - A - 22.0° ✓▷
		2: 08:30h - 1 - 20.0° ✓▷
		3: 16:00h - A - 22.0° ✓▷
		4: 22:30h - 0 - 22.0°ECO ✓▷
		Periods/Period1
		Start <-/+> 06:00h
		Temp <-/+> 22.0°
		ECO-Mode ✓

» MENU → TIME/DATE

Time, Date and display format can be configured in the menu settings. The room thermostat is equipped with a real-time clock so that it automatically adjusts for daylight-saving time. This function can be disabled in the datetime settings.

Menu		Datetime setting/Time	Datetime setting/Date
Timechannels	▷	Hour <-/+> 13	Day <-/+> 12
Time/Date	▷	Minute <-/+> 07	Month <-/+> 08
Sensor settings	▷	12h/24h <-/+> 24h	Year <-/+> 15
Common settings	▷	Daylight saving <-/+> CET	Presentation <-/+> T.M.J
EnOcean list	▷		
EnOcean configuration	▷	Date	

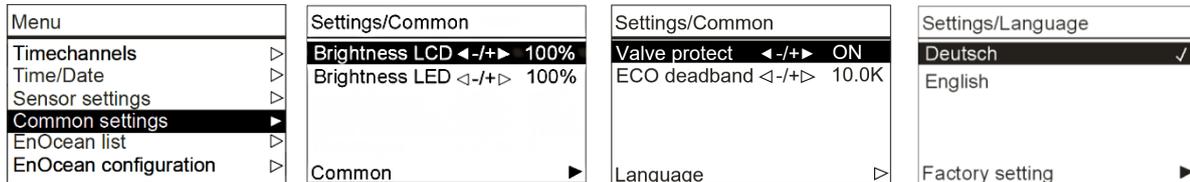
» MENU → SENSOR SETTINGS

Offset correction for internal and external sensor value. The temperature display can also be changed from °C to °F.

Sensor settings	
Offset int. <-/+>	0.6 K
Value int.	22.1°C
Offset ext. <-/+>	0.2 K
Value ext.	22.1°C
Unit <-/+>	Celsius

» **MENU → COMMON SETTINGS**

The common settings includes the brightness of the background lighting and the LED. Valve protection prevents the valves becoming ceased when they are switched off for long periods. If the valve protection function is activated, a valve-check is carried out every Friday at 11:00 am for the heating valve and 11:15 am for the cooling valve. The corresponding valve is triggered for 5 minutes, if not activated during the last 96 hours. The dead band can be adjusted (default 10.0 K, see timechannels). By selecting “Factory setting”, the room thermostat will be reset and restore the device to factory default settings.



» **PARAMETER MENU – MODBUS INTERFACE**

The configuration menu is activated by simultaneously pressing the buttons “up” (A) and “down” (C) for at least 5 seconds.

The menu is enabled during the first 60 minutes after switching on the supply voltage as long as the device is not actively involved in Modbus communication. As soon as the device receives a valid request addressed to the device from a DDC, access to the menu is blocked. Without valid communication, access is blocked after 60 minutes!



Modbus settings		
Address	◀-/▶	32
Baudrate	◀-/▶	19200
Parity	◀-/▶	Even

Address (default: 32)
Adjustable address (1-247)

Baud rate (default: 19200)
9600Bd | 19200Bd | 38400Bd | 57600Bd

Parity (default: even)
Non | odd | even

» **MENU → ENOCEAN LIST | ENOCENAN CONFIGURATION**

Two additional selection menus appear in the menu, <EnOcean list> and <EnOcean configuration>. The EnOcean list is a simple list display of the EnOcean sensors that have been taught in, in addition to the list, further information on the individual sensors can be called up.

EnOcean list

All channels with the learned sensors or actuators are displayed in this list.

With <Selection>, detailed information are displayed:

1 Rx	01-8C-03-98	EXT	!!
2 Rx	FF-81-CC-01	OCC	
3	FF-FF-FF-FF		
4 <i>rx</i>	FF-81-CC-03	SAB	
5 Rx	FF-81-CC-00	VFG	!!!
6 Rx	00-8B-CE-DA	KEY	
◀ Selection ▶			

Index: 2	ID: FF-81-CC-01
Dir: Rx	Typ: SAB
EEP: A5-20-01_B	SAB-Ch: 2
RSSI: -67dB	Time: 340s
Errors: 00001	Pending: Y
Sensor Channel: 2	
ENTER to acknowledge	

EnOcean configuration

In this menu item, the radio channels can be configured and individual information can be called up.

In the footer, various menu items can be selected with the LEFT / RIGHT keys and the corresponding menu item is selected with the ENTER key.

SAB valve actuators are learned in with the function <SET ACTOR>.

1	FF-FF-FF-FF		
2	FF-FF-FF-FF		
3	FF-FF-FF-FF		
4	FF-FF-FF-FF		
5	FF-FF-FF-FF		
6	FF-FF-FF-FF		
◀ LEARN SENSOR ▶			
EXIT	DELETE CHANNEL	SET ACTOR	SHOW CHANNEL

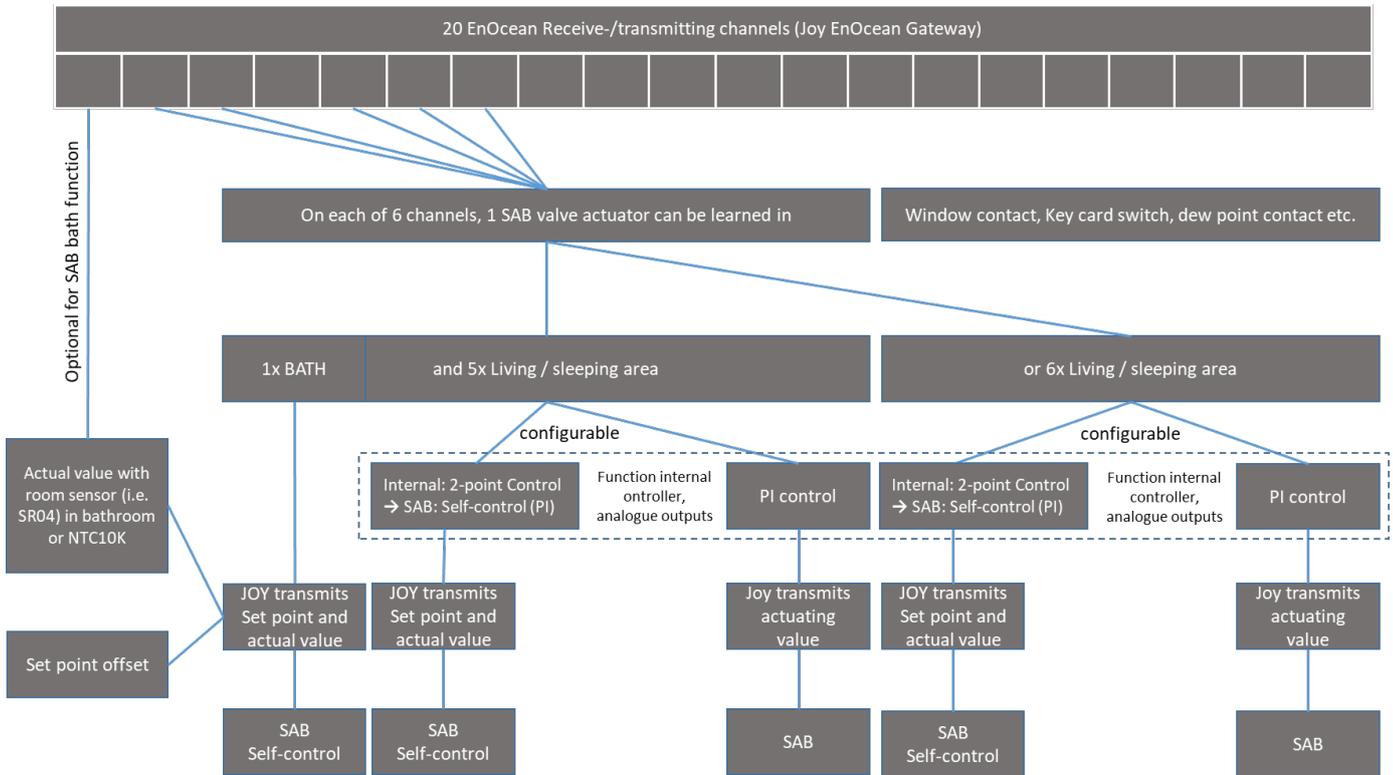
The access to the menu <EnOcean configuration> can be protected with a password via Modbus. The login remains unlocked in the EnOcean menu until 10 minutes after the last key press. Default password: 2030.

More detailed information for the configuration of the EnOcean channels can be found in the specification.

There are 20 channels available that can be assigned different functions. A channel can be configured as a receive channel, as a send channel or as a message server (SAB communication).

6 channels can be configured with SAB valve actuator, one of these can be set with the bath function. For the SAB with the bath function, an additional setpoint offset can be set. If SAB valve actuators are learned in, the analogue outputs to the internal controller remain active and can also be used.

Functional Overview SAB



The profiles used are divided into functional groups

SRW/SRG	Window contact and window handle. Both have an influence on the window contact function and are linked to the digital inputs or the Modbus default. Up to five sensors can be learned-in.
VFG	Sensor for changeover control. Only one changeover sensor can be learned in.
EXT/WRF	Receiving channel: Temperature preset by an external room temperature sensor. Overrides the internal temperature sensor. Max. one sensor can be learned in. An EnOcean room operating unit is displayed on the send channel.
OCC	Up to 3 motion sensors can be learned in and affect the occupancy function. The last changed value (Modbus, EnOcean, Button) will be accepted. If several EnOcean motion sensors have been learned-in, the "ROOM UNOCCUPIED" value will only be accepted once all sensors have signaled "ROOM UNOCCUPIED".
KEY	Controls the internal keycard function. When learning a key card switch, the card must not be plugged in AND pulled immediately during the learn-in process. It is necessary to wait at least 5 seconds until the second action is performed with the card. Only then will the switch be assigned as key card switch, otherwise it will be learned in as a radio rocker switch (function group RPS).
SUP	A superior control unit to override the internal functions.
SAB (5+1 Bath)	Up to 6 SAB's can be learned in. One pcs. can be assigned with the „Bath“ function. The other channels can be used optionally for heating or cooling. For each SAB channel, an offset for the setpoint can be configured via Modbus.
OUT	Only in direction of transmission. A controller status (A5-11-02) every 15 minutes (configurable) and with every change of any value.

» INPUTS

Up to 2 inputs are configurable for functions such as windows contact, dew point, occupancy, change-over or external sensor option.
The overview of possible combinations can be found in the software specification of the JOY.

Sensor (NTC10K)

The value of an external sensor will be shown if connected and configured accordingly. In this case, the room thermostat controls according to the external sensor. Alternatively, an external temperature sensor can be used at the universal input to protect floor heating. If a configured temperature is exceeded, the heating sequence is suspended.

Change-Over DI

Which controller is active depends on the state of the Change-Over contact. (Factory default: contact open heating controller active, contact closed cooling controller active). The terminals 4 and 5 are used as outputs for heating resp. cooling.

Change-Over Sensor

The Change-Over Sensor is used for switching between heating and cooling mode automatically. If the temperature is below 22 ° C, the controller is in cooling mode. If it is above 25 ° C, it is a heating mode.

If an input is configured as a change-over, the room thermostat is automatically in 2-pipe operating mode and both outputs (terminals 4 and 5) are used as outputs for heating resp. cooling.

Window contact/Energy hold off

If a window contact is enabled via the digital input, the reference will switch to a setback set point (Heat SP/Cool SP).

Dewpoint

An active dewpoint contact locks the cooling controller.

Occupancy

If occupancy-function is active, the symbol will be displayed automatically. In state of "unoccupied" the heating set point is reduced by 2K (default setting) resp. the cooling set point raised by 2K.

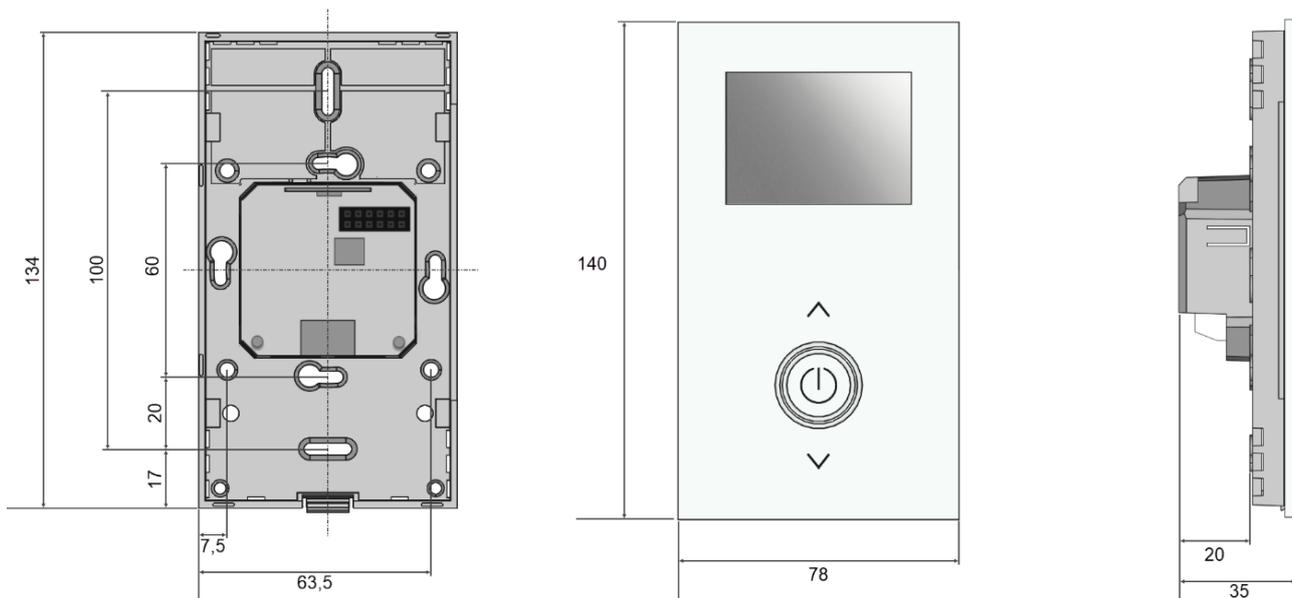
Keycard-Switch

When the card is not inserted, the device is switched in sleep mode. Operation of the keys is locked, the display is switched off and the controller adjusts to the nominal values of the "unoccupied"-State.

Alarm contact

An alarm symbol can be shown in the header of the display. The backlight flashes when the alarm is active. This symbol is in the same position as the ECO symbol. The alarm symbol has a higher priority and overwrites the ECO symbol!

» DIMENSIONS (MM)



» ACCESSORIES (OPTIONAL)

Converter RS485 Modbus - USB
 Decorative frame pure white for JOY
 Decorative frame black for JOY
 MicroSD card 2GB

Item No. 668293
 Item No. 681452
 Item No. 740951
 Item No. 500098