

# JOY HC AO2DO RS485 Modbus

Room Regulator (from Version 4.x)

**thermokon**<sup>®</sup>  
HOME OF SENSOR TECHNOLOGY

## Datasheet

Subject to technical alteration  
Issue date: 12.05.2026 • A165



## » APPLICATION

Room thermostat in an appealing design for heating/cooling (24 V) and controlling a 6-way valve. Used for individual control of temperature in commercial and residential buildings. The device combines a modern design with a 2,5" touch surface, which enables the single room controller to be used intuitively. 3 time channels with 4 periods of time can be configured via the menu. This device is suitable for a flush mount box.

## » 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.

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

## » TECHNICAL DATA

|                                                      |                                                                                        |
|------------------------------------------------------|----------------------------------------------------------------------------------------|
| Measuring values                                     | temperature, humidity* ( <i>optional</i> ), CO <sub>2</sub> * ( <i>optional</i> )      |
| Network technology                                   | RS485 Modbus RTU, <b>Fail-safe Biasing required</b>                                    |
| Measuring range temp                                 | 0..+50 °C                                                                              |
| Accuracy temperature                                 | ±1 K (typ. at 21 °C)                                                                   |
| Measuring range humidity ( <i>optional</i> )*        | 0..100% rH non-condensing                                                              |
| Accuracy humidity ( <i>optional</i> )                | ±2% between 10..90% rH (typ. at 21 °C)                                                 |
| Measuring range CO <sub>2</sub> ( <i>optional</i> )* | 0..2.000 ppm                                                                           |
| Accuracy CO <sub>2</sub> ( <i>optional</i> )         | (5% of measuring value) + 50 ppm                                                       |
| 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 |
| Enclosure                                            | PC, glass, optional black or white                                                     |

\*Humidity and CO<sub>2</sub> measured values are not processed internally. The values are displayed and can be read out by higher-level systems for evaluation and further use.

|                       |                                                                 |                                                                  |
|-----------------------|-----------------------------------------------------------------|------------------------------------------------------------------|
| Protection            | IP30 according to EN 60529                                      |                                                                  |
| Connection electrical | <b>Terminal 1..8</b><br>terminal block max. 1,5 mm <sup>2</sup> | <b>Terminal 9..12</b><br>terminal block max. 1.0 mm <sup>2</sup> |
| Ambient condition     | 0..+50 °C, max. 85% rH non-condensing                           |                                                                  |
| Weight                | 195 g                                                           |                                                                  |
| Mounting              | flush mounted with standard EU box (Ø=60 mm)                    |                                                                  |

|                       |                                                                 |                                                                |
|-----------------------|-----------------------------------------------------------------|----------------------------------------------------------------|
| Output voltage        | 0..10 V =, max. load 5 mA (for 6-way valves)                    |                                                                |
| Output switch contact | 2x normally open contacts (heating/cooling), 24 V max. load 3 A |                                                                |
| Power supply          | 24 V = (±10%) or 24 V ~ (±10%)                                  |                                                                |
| Power consumption     | max. 2,5 W (24 V ~)                                             |                                                                |
| Inputs                | <b>DI1</b><br>input for NTC 10 K or floating contact            | <b>DI2</b><br>digital input for non-floating contact (230 V ~) |

#### \*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.**

## » MOUNTING ADVISE ROOM SENSORS

The Accuracy of the room sensors are influenced by the technical specifications as well as the positioning and the installation type.

#### During Assembly:

- Seal mounting box (if present).
- Installation type, air draught, heat source, radiation heat or direct sunlight can affect the measurement.
- Building material specific properties of the installation place (*brick-, concrete-, partition wall, cavity wall, ...*) can affect the measurement.

#### Assembly not recommendet in...

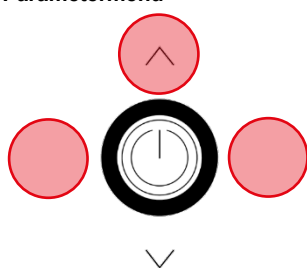
- Air draught (e.g.: close to windows / doors / fans ...)
- Near heating sources,
- Direct sunlight
- Niches / between furniture / ...

## » MOUNTING ADVICES JOY

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).

## » CONFIGURATION

#### » Paramettermenu



Access to Paramettermenu:  
Press buttons for 3 seconds simultaneously

| Menu            |   |
|-----------------|---|
| Timechannels    | ▷ |
| Time/Date       | ▷ |
| Sensor settings | ▷ |
| Common settings | ▷ |

If no entry is made for 8 minutes, the parameter menu is left automatically.

## » JOY MODBUS SOFTWARE MANUAL



Detailed information on device functions and software  
<https://www.thermokon.de/direct/files/joy-rs485-modbus-manual.zip>

## » 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

## » CONFIGURATION VIA UCONFIG | MICROSD-CARD OR MODBUS



### Configuration software:

uConfig | Microsoft Windows is required to use the uConfig configuration software.

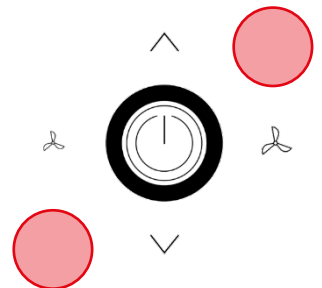
The JOY room thermostat can be parameterised using the uConfig configuration software. An SD card is used to transfer the created configuration file to the device. For BUS devices, a live configuration can also be performed via the BUS interface.

The installer for the configuration software can be found in the Download-Section on our website. 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-Section** <https://www.thermokon.de/download>

## » CO2 FACTORY SETTING

To reset the sensor to factory settings, use the key combination.  
 This key combination only works in the CO2 sensor settings menu.



## » PRODUCT TESTING AND CERTIFICATION

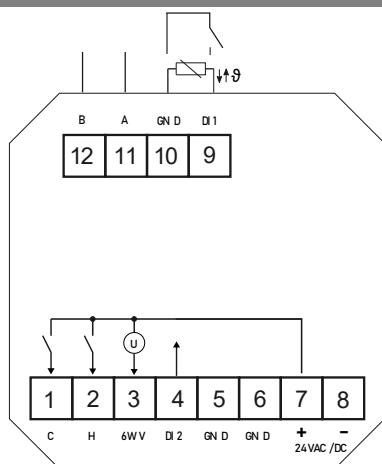


### Declaration of conformity

The declaration of conformity of the products are available on our website  
<https://www.thermokon.de/direct/en-gb/categories/joy-hc>

## » CONNECTION PLAN

### JOY HC AO2DO (24 V ~/=)



#### 1 Cooling

#### 2 Heating

#### 3 0..10 V (6-way valve)

#### 4 Digital Input 2

#### 5 GND

#### 6 GND

#### 7 24 V = (±10%) or 24 V ~ (±10%)

#### 8 GND

Use twisted and shielded cables in pairs to supply the devices and control line (e.g., J-Y(ST)Y 2x2xØ0.8).

No parallel connection of inputs.  
Exception: DI2.

Switching element contacts (changeover, window contact, dew point, etc.) must be designed in accordance with EN/IEC 60947-5-1 (precious metal).

For multiple devices connected together:  
AC power supply: Connect + / - in phase.

#### 9 Digital Input 1 (or NTC10K)

#### 10 GND DI 1

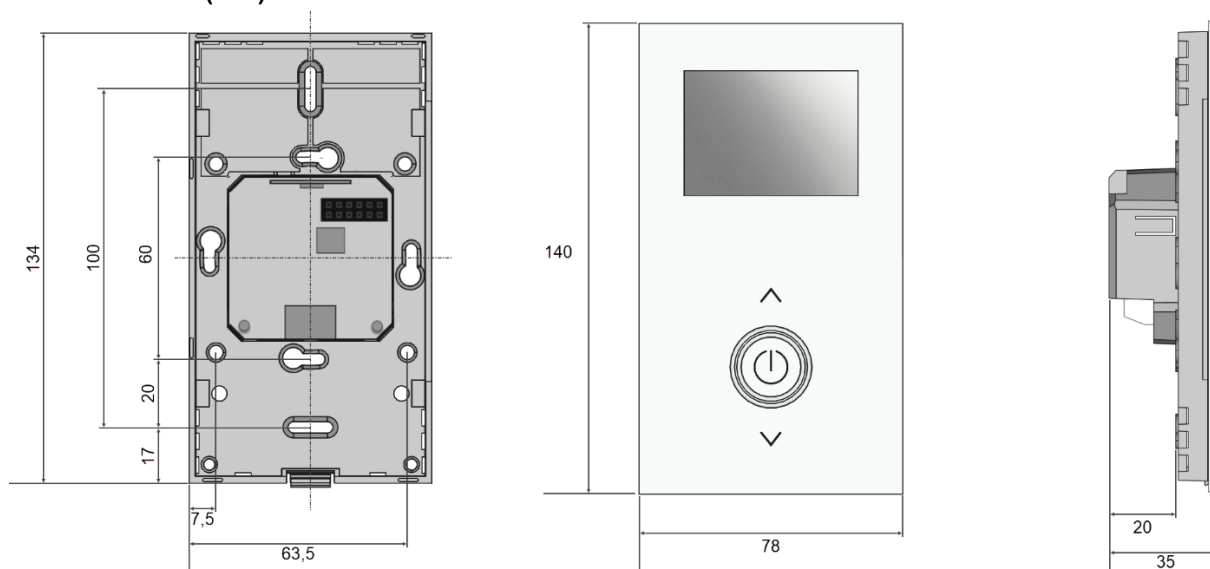
#### 11 A

#### 12 B

DC power supply: Connect the "-" terminals of all connected devices with low impedance.

For different power supplies, connect the GND ("-") terminals to each other.

## » DIMENSIONS (MM)



## » ACCESSORIES (OPTIONAL)

Frame for surface mounting JOY pure white  
Frame for surface mounting JOY black  
Decorative frame pure white for JOY  
Decorative frame black for JOY  
MicroSD card 2GB

Item No. 760201  
Item No. 760195  
Item No. 681452  
Item No. 740951  
Item No. 500098

RS485 Biasing Adapter  
USB RS485 Modbus RTU Logger  
Converter RS485 Modbus - USB

Item No. 811378  
Item No. 809917  
Item No. 668293

## » NOTES ON DISPOSAL



The crossed-out wheeled bin symbol indicates that the product or removable batteries must not be disposed of with household or commercial waste. Within the EU, you are legally obliged to dispose of the product separately and appropriately in accordance with the national laws of your country. Alternatively, please contact your supplier or Thermokon Sensortechnik GmbH. Further information can be found at: [www.thermokon.com](http://www.thermokon.com)