



## MP-Bus Data-Pool Values

MP  BUS®

**Room Sensors**  
**Room Operating Units**  
**..22RT..-1..-1/-2**

Edition 2023-04 / V1.01

**BELIMO**®

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# Data-Pool general notes

## General information

- The device supports the MP Data-Pool functional profile. All available datapoints are managed in a data pool and accessible with MP read/write commands.
- This document describes all public data pool values of the device. It's divided into process values and configuration values.
- The MP Data-Pool functional profile is specified in the MP Cooperation Documentation. The document is provided to Belimo MP-Partners.
- See the technical datasheet for technical information about the device itself.

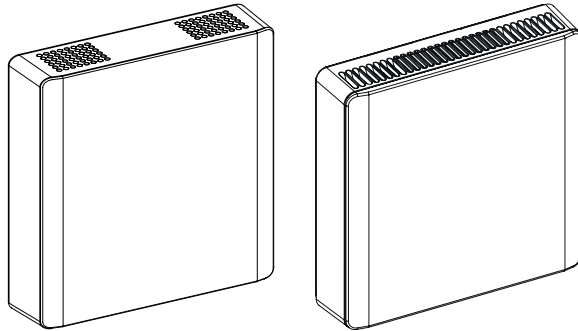
## Power-on behaviour

The initialization of sensor data takes up to 10 seconds.  
The sensor values remain 0 during power-on.

## Identification

The connected type can be identified by its series number:

Prefix	Profile type	Profile category	Type	Remark
2	2	11	22RT-19-1	Room sensors (RS) from legacy series (before May 2022); see appendix
2	3	11	22RTH-19-1	
2	4	11	22RTM-19-1	
2	5	11	22RT-19-1	Room sensors (RS) (from May 2022)
2	6	11	22RTH-19-1	
2	7	11	22RTM-19-1	
2	6	11	P-22RTH-1900A-1	Room operating units (ROU) without display, Analog/MP
2	7	11	P-22RTM-1900A-1	
2	11	11	P-22RTH-1U00A-2	Room operating units (ROU) without display, MOD/BAC/MP
2	12	11	P-22RTM-1U00A-2	
2	5	12	P-22RT-1900D-1	Room operating units (ROU) with display, Analog/MP
2	6	12	P-22RTH-1900D-1	
2	7	12	P-22RTM-1900D-1	
2	11	12	P-22RTH-1U00D-2	Room operating units (ROU) with display, MOD/BAC/MP
2	12	12	P-22RTM-1U00D-2	



Left: Legacy series with punched ventilation opening.  
Right: Actual series with slotted ventilation opening.

## Configuration

Configuration data are not password protected.

## Address range

Up to 16 units on MP (MP1...MP16)  
If a mixed line with MP actuators is realized, the number of units is limited to 8 devices.

## Timing of MP-Bus queries

Client implementations typically poll the servers in cycles (MP1, MP2, MP3, ...).  
Reading all data pool values of a node in one cycle is not recommended, because it would reduce the overall MP-Bus performance.

## Signed integer

Signed integers are represented as two's complement.

Example:

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Value of ID40 = 1111 1101 1111 0010<sub>2</sub> = -526<sub>10</sub>

Actual value  
= value \* scaling factor \* unit  
= -526 \* 0.01 \* unit  
= **-5.26 unit**



All writeable data-pool values with ID >100 (configuration data) are persistent and are not supposed to be written on a regular basis.

## Data-Pool values overview

### Process

ID	Name	Access	RS	ROU	
				..-1	..-2
11	Error state	R	■	■	■
14	Room temperature [°C]	R	■	■	■
16	Relative humidity [%]	R	■	■	■
17	CO <sub>2</sub> value [ppm]	R	■	■	■
21	Air quality status	R	■	■	■
23	Digital input	R			■
..	..	–			
30	Status Device	R	■	■	■
33	Dew point temperature [K]	R	■	■	■
..	..	–			
38	Display warning icon	R / W		■	■
39	Display window icon	R / W		■	■
..	..	–			
70	Room temperature setpoint [°C]	R / W		■	■
71	Ventilation stage [%]	R / W		■	■
72	System operation mode	R / W		■	■
73	Ventilation stage control mode	R / W		■	■
74	Heating/cooling application status	R / W		■	■
77	Enable local adjustment	R / W		■	■
..	..	–			
80	Relative room temperature setpoint [°C]	R / W		■	■

Definition Access: R = Read, W = Write



Room sensors (RS) provide only a subset of the data-pool values supported by room operating units (ROU). Values not marked as supported are not functional but can still be read/written. This allows to use the same template for integration of RS and ROU into BACS.

## Configuration

ID	Name	Access	RS	ROU	
				..-1	..-2
110	Offset temperature [°C]	R / W	■	■	■
111	Offset humidity [%]	R / W	■	■	■
112	Offset CO <sub>2</sub> [ppm]	R / W	■	■	■
..	..	–			
126	CO <sub>2</sub> limit "Good"	R / W	■	■	■
127	CO <sub>2</sub> limit "Moderate"	R / W	■	■	■
128	Air quality indication	R / W	■	■	■
..	..	–			
154	Unit for temperature on display	R / W		■	■
..	..	–			
200	Display background color	R / W		■	■
201	Display room temperature	R / W		■	■
202	Display relative humidity	–			
203	Display CO <sub>2</sub> value	R / W		■	■
204	Display heating/cooling icon	R / W		■	■
205	Warning icon function	R / W		■	■
206	Window icon function	R / W		■	■
..	..	–			
208	Temperature display mode	R / W		■	■
209	Display ventilation stages	R / W		■	■
210	Eco button mode	R / W		■	■
211	Display boost button	R / W		■	■
212	On/off button mode	R / W		■	■
..	..	–			
220	Temperature setpoint type	R / W		■	■
221	Default room temperature setpoint	R / W		■	■
222	Temperature setpoint range	R / W		■	■
223	Ventilation stage configuration	R / W		■	■
224	Ventilation control mode	R / W		■	■

# Data-Pool values

## Sensor values

The various measured values can be read out via the data-pool values below.

No.	Description Comments	Unit	Scaling	Values	Size	Access
14	<b>Room temperatur in °C</b>	°C	0.01	0...50	2	R
16	<b>Relative humidity in %</b>	%	0.01	0...100	2	R
17	<b>CO<sub>2</sub> value in ppm</b>	ppm	1	0...2'000	2	R
33	<b>Dew point temperature in °C</b>	°C	0.01	-50...50	2	R

## Offset/correction values

These data-pool values can be used to specify offset/correction values for the individual measured values.

No.	Description Comments	Unit	Scaling	Values	Size	Access
110	<b>Room temperatur offset in K</b> Offset applied to measured temperature in K	K	0.01	-15...15	2	R / W
111	<b>Relative humidity offset in %</b> Offset applied to measured relative humidity in percent	%	0.01	-20...20	2	R / W
112	<b>CO<sub>2</sub> offset in ppm</b> Offset applied to measured CO <sub>2</sub> content in ppm	ppm	1	-500...500	2	R / W

## Temperature unit selection

No.	Description Comments	Unit	Scaling	Values	Size	Access
154	<b>Unit for temperature on display</b>	-	1	0: °C 1: - 2: °F	1	R / W

## Temperature setpoint

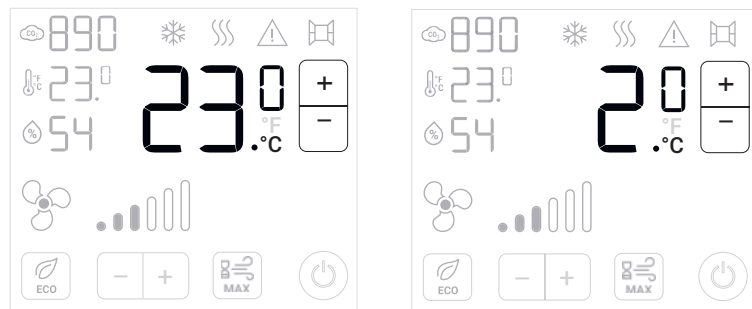


Figure 1: Left: Room temperature setpoint (in °C). Right: Relative room temperature setpoint

No.	Description Comments	Unit	Scaling	Values	Size	Access
70	<b>Room temperatur setpoint [°C]</b>	°C	0.01	5...45	2	R / W
80	<b>Relative room temperature setpoint [°C]</b>	°C	0.01	-5.6...5.6	2	R / W
220	<b>Temperature setpoint type</b> Set the temperature setpoint type between absolute setpoint (e.g., 23°C) and the relative setpoint or setpoint shift (e.g. + 3°C).	–	1	0: Absolut 1: Relative	1	R / W
221	<b>Default room temperature setpoint [°C]</b> Set the base temperature for the Belimop Display App	°C	0.01	15...35	2	R / W
222	<b>Temperature setpoint range [°C]</b> Set the adjustable temperature setpoint range around the base temperature for the Belimop Display App	°C	1	0...5	1	R / W



## Ventilation setpoint

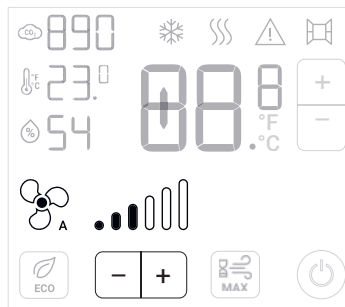
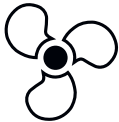


Figure 2: Ventilation setpoint

No.	Description Comments	Unit	Scaling	Values	Size	Access
71	<b>Ventilation stage</b> Set desired ventilation stage in room/zone in percent.	%	0.01	0...100	2	R / W
73	<b>Ventilation stage control mode</b> Set ventilation mode to automatic control or manual control (applies if hybrid control mode is activated, see ID 224).	-	1	0: Manual ventilation stages control 1: Automatic ventilation stages control	1	R / W
223	<b>Ventilation stage configuration</b> Set the number of adjustable ventilation stages on the display.	-	1	0: - 1: - 2: 3 stages 3: 4 stages 4: 7 stages	1	R / W
224	<b>Ventilation control mode</b> Set the ventilation control functionality between manual mode only and automatic and manual mode combined.	-	1	0: Manual mode only 1: Hybrid control mode, setpoint invisible in auto mode	1	R / W

## Display configuration

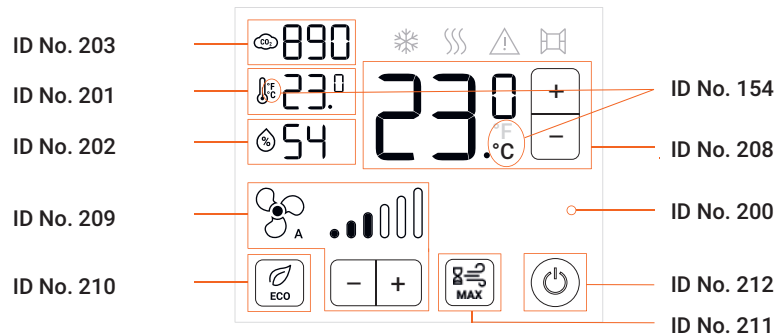


Figure 3: Display configuration options

No.	Description Comments	Unit	Scaling	Values	Size	Access
77	<b>Enable local adjustment</b> Allow or prohibit the room occupant to adjust settings on the room operating unit.	-	1	0: Disabled 1: Enabled	1	R / W
200	<b>Display background color</b> Set the display background color either white (0) or black (1).	-	1	0: Black on white 1: White on black	1	R / W
201	<b>Display room temperature</b>	-	1	0: Invisible 1: Visible	1	R / W
202	<b>Display relative humidity</b>	-	1	0: Invisible 1: Visible	1	R / W
203	<b>Display CO<sub>2</sub> value</b>	-	1	0: Invisible 1: Visible	1	R / W
208	<b>Temperature display mode</b> Set the functionality of the large temperature indicator on the display.	-	1	0: Invisible 1: Actual room temperature 2: Room temperature setpoint	1	R / W
209	<b>Display ventilation stages</b> Set/reset the display of the ventilation stages.	-	1	0: Invisible 1: Visible	1	R / W
210	<b>Eco button mode</b> Set the functionality of the Eco mode icon on the display.	-	1	0: Invisible 1: Status (no user interaction) 2: Setpoint	1	R / W
211	<b>Display Boost button</b> Set/reset Boost/Max icon on the display.	-	1	0: Invisible 1: Visible	1	R / W
212	<b>On/off button mode</b> Set the functionality of the on/off icon on the display.	-	1	0: Invisible 1: Status (no user interaction) 2: Setpoint	1	R / W

### Status icons on display

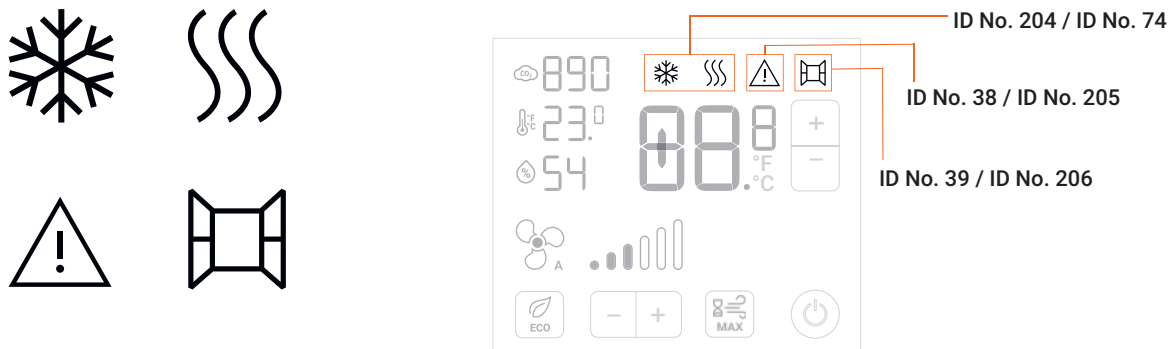


Figure 4: Status icons configuration options

No.	Description Comments	Unit	Scaling	Values	Size	Access
38	<b>Display warning icon</b> (Applies if ID 205 is set to 1)	-	1	0: Invisible 1: Visible	1	R / W
39	<b>Display window icon</b> (Applies if ID 206 is set to 1)	-	1	0: Invisible 1: Visible	1	R / W
74	<b>Heating/cooling application status</b> Appearance of heating or cooling icons on the display	-	1	0: None 1: Heating 2: Cooling	1	R / W
204	<b>Display heating/cooling icon</b> Set/reset the display of the heating and cooling icons.	-	1	0: Invisible 1: Visible	1	R / W
205	<b>Warning icon function</b> Set the functionality of the warning icon on the display.	-	1	0: Invisible 1: According to "Display warning icon" 2: According to "Device Error Status"	1	R / W
206	<b>Window icon function</b> Set the functionality of the window icon on the display	-	1	0: Invisible 1: According to "Display window icon" setting 2: -	1	R / W

## Building operation mode

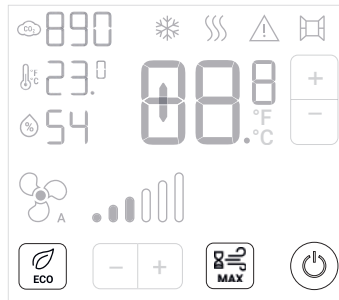


Figure 5: Switching between modes using the "ECO", "MAX" and "On/Off" button.

No.	Description Comments	Unit	Scaling	Values	Size	Access
72	<b>System operation mode</b> Set HVAC building operation mode	-	1	0: Off/Protection 1: On/Comfort 2: Eco Mode 3: Boost Mode	1	R / W

## Digital input

No.	Description Comments	Unit	Scaling	Values	Size	Access
23	<b>Digital Input</b> Feedback of the digital input	-	1	0: Open 1: Closed	1	R

# Data-Pool values

## Air quality traffic light



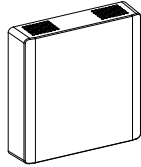
Figure 6: CO<sub>2</sub> traffic light for different models.

No.	Description Comments	Unit	Scaling	Values	Size	Access
21	<b>Air quality status</b> Status of measured air quality in the room/zone	–	1	0: Deactivated 1: Ok 2: Warning 3: Alarm	1	R
126	<b>CO<sub>2</sub> limit for good air quality</b> Set threshold value of CO <sub>2</sub> concentration to switch between "good" (green LED) and "moderate" (yellow LED) state.	ppm	1	600...1'249	2	R / W
127	<b>CO<sub>2</sub> limit for moderate air quality</b> Set threshold value of CO <sub>2</sub> concentration to switch between "moderate" (yellow LED) and "poor" (red LED) state.	ppm	1	1'250...2'000	2	R / W
128	<b>Air quality indication</b> Enable/disable CO <sub>2</sub> traffic light	–	1	0: Disabled 1: Enabled	1	R / W

## Device state

No.	Description Comments	Unit	Scaling	Values	Size	Access
11	<b>Error State</b> Error status of the device	–	1	Bit 0: Temperature sensor error Bit 1: Humidity sensor error Bit 2: CO <sub>2</sub> sensor error Bit 3: Dewpoint calculation error The flag is reset automatically if the condition disappears.	1	R
30	<b>Status Device</b>	–	1	Bit 0: reserved Bit 1: reserved Bit 2: Sensor summary error (see ID 11 for details) Bit 3: reserved Bit 4: reserved Bit 5: reserved Bit 6: Sensors initializing (up to 10 s after power-up) The flag is reset automatically if the condition disappears.	2	R

## Appendix: Data-Pool values for legacy room sensor series



This section contains the data-pool description for 22RT-19-1, 22RH-19-1 and 22RTM-19-1 produced before May 2022.

Legacy units can be visually identified by their punched ventilation opening.

No.	Description Comments	Unit	Scaling	Values	Size	Access
11	<b>Error State</b> Error status of the device	–	1	Bit 0: Temperature sensor fault Bit 1: RH sensor fault Bit 2: CO <sub>2</sub> sensor fault  The flag is reset automatically if the condition disappears.	1	R
14	<b>SensTemp [UnitSel]</b> Temperature in selected unit (ID 153)	UnitSel	0.01	0...50 (32...122°F)	2	R
16	<b>SensRelHumid</b> Relative humidity in percent	%	0.01	0...100	2	R
17	<b>SensCO2</b> CO <sub>2</sub> content in ppm	ppm	1	0...2'000	2	R
23	<b>DigitalIn</b> Digital input (e.g. presence detector)	–	–	0: (Open) 1: (Closed)	1	R
30	<b>Status device</b>	–	1	Bit 0: Reserved Bit 1: Reserved Bit 2: Sensor summary error (see ID 11 for details) Bit 3: Reserved Bit 4: Reserved Bit 5: reserved Bit 6: Sensors initializing (up to 20 s after power-up)  The flag is reset automatically if the condition disappears.	2	R
33	<b>DewPointTemp [UnitSel]</b> Temperature of calculated dew point in selected unit (ID 153)	UnitSel	0.01	0...50 (32...122°F)	2	R
100	<b>Position</b> Alphanumeric character string to store the location of the device (optional, helpful for maintenance and troubleshooting).	–	–	One byte per character The string is not null terminated. Fill up unused bytes with 0x20 (space character).	64	R / W
110	<b>OffsetTemp [UnitSel]</b> Offset applied to measured temperature in selected unit	UnitSel	0.01	-15...15 (-27...27°F)	2	R / W
111	<b>OffsetHumidity [%]</b> Offset applied to measured relative humidity in percent	%	0.01	-20...20	2	R / W
112	<b>OffsetCO2 [ppm]</b> Offset applied to measured CO <sub>2</sub> content in ppm	ppm	1	-500...500	2	R / W
113	<b>OffsetDewPointTemp [UnitSel]</b> Offset applied to calculated dew point temperature in selected unit	UnitSel	0.01	-15...15 (-27...27°F)	2	R / W
153	<b>Unit Selection Temp Communication</b> Unit applied for temperature values	–	1	0 = °C 1 = °F Default: 0 = °C	1	R / W

# All inclusive.

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