# ModBus Interface Description

## xBALL Controller / V4.0

Edition 2026-07

# Table of contents


| | | |
|---|---|---|
| **General notes** | | |
| | General information | 3 |
| | Power-on behaviour | |
| | Modbus RTU | |
| | Configuration | |
| | Register implementation | |
| | Supported commands | |
| | Interpret values in the registers | |
| **Register overview** | | |
| | Operation | 4 |
| **Coil overview** | | |
| | Operation | 7 |
| **Register descriptions** | | |
| | Control and general settings | 8 |
| **Coil descriptions** | | |
| | Control and general settings | 14 |

# General notes

## General information

| | |
|---|---|
| Date | 30.06.26 |
| Product Name | xBALL 4.0 |
| Product Model Number | X80..M...A4 |
| Protocol | ModBus RTU over RS-485 |

## Power-on behaviour

The initialization of the data after power fail takes up to 10 seconds.
All values remain 0 during power-on.

## ModBus RTU

| | |
|---|---|
| Transmission Formats | 1-8-N-2, 1-8-N-1, 1-8-E-1, 1-8-O-1, 1-8-E-2, 1-8-0-2 (Default: 1-8-N-2) |
| Baud Rates | 1'200, 2'400, 4'800, 9'600, 19'200, 38'400 Bd (Default: 19'200) |
| Address | 1...247 (Default: 19) |
| Number of Nodes | Max. 32 (without repeater) |
| Terminating Resistor | 120 Ω |

## Configuration

| | |
|---|---|
| Tool | xBALL Syncra |

## Register implementation

All data is arranged in a table and addressed by 1..n (Register No.) or 0..n-1 (Address).

## Supported commands

Standard commands:

| | |
|---|---|
| Read Coils [1] | Write Single Coil [5] |
| Read Discrete Inputs [2] | Write Single Register [6] |
| Read Holding Registers [3] | Write Multiple Coils [15] |
| Read Input Registers [4] | Write Multiple Registers [16] |

## Interpret values in the registers

All values in the register are signed integer data types.
Exceptions are marked with **). Signed integers are represented as two´s complement.

| Example unsigned integer: | Example signed integer: |
|---|---|
| Read (Function 03, 1 Register)<br>Value Register No. x<br>= $0001\ 1010\ 1100\ 1000_2$<br>= $6{,}856_{10}$ | Read (Function 03, 1 Register)<br>Value Register No. x<br>= $1111\ 1101\ 1111\ 0010_2$<br>= $-526_{10}$ |
| Actual value<br>= value * scaling factor * unit<br>= 6,856 * 0.01 * unit<br>= **68.56 unit** | Actual value<br>= value * scaling factor * unit<br>= −526 * 0.01 * unit<br>= **−5.26 unit** |

# Register overview

| No. | Address | Register | Access |
|---|---|---|---|
| R1 | 0 | Absolute Valve Position [°] | R |
| R2 | 1 | Percentage Valve Position [%] | R |
| R3 | 2 | Feedback Signal | R |
| R4 | 3 | Percentage Feedback Signal [%] | R |
| R5 | 4 | Regulation State | R |
| R6 | 5 | Evaporation Pressure Probe Measurement [barg] | R |
| R7 | 6 | Evaporation Pressure Probe Measurement [psig] | R |
| R8 | 7 | Suction Temperature Probe Measurement [°C] | R |
| R9 | 8 | Suction Temperature Probe Measurement [°F] | R |
| R10 | 9 | Evaporation Temperature [°C] | R |
| R11 | 10 | Evaporation Temperature [°F] | R |
| R12 | 11 | Superheat [K] | R |
| R13 | 12 | Superheat [°F] | R |
| | | | |
| R101 | 100 | Device PIN Info **) | R |
| R102 | 101 | Serial Number Device Info **) | R |
| R103 | 102 | Serial Number Device Info **) | R |
| R104 | 103 | Field 1 Of The Gearbox **) | R |
| R105 | 104 | Field 2 Of The Gearbox **) | R |
| R106 | 105 | Field 3 Of The Gearbox **) | R |
| R107 | 106 | Field 4 Of The Gearbox **) | R |
| R108 | 107 | Hardware Release Info **) | R |
| R109 | 108 | Firmware Release Info **) | R |
| R110 | 109 | HMI Release Info **) | R |
| R111 | 110 | Device Type Info **) | R |
| R112 | 111 | Operating Days Info **) | R |
| R113 | 112 | Operating Hours Info **) | R |
| R114 | 113 | Number Of Completed Cycles (high part) Info **) | R |
| R115 | 114 | Number Of Completed Cycles (low part) Info **) | R |
| R116 | 115 | Supply Voltage Frequency [Hz] **) | R |
| | | | |
| R201 | 200 | Manual Positioner Position | R / W |
| R202 | 201 | Machine Cooling Capacity [%] | R / W |
| R203 | 202 | Service 1 (self-resetting values) | R / W |
| R204 | 203 | Service 2 (non-self-resetting bit-fields) | R / W |
| R205 | 204 | PIN Entry Field **) | R / W |

**) unsigned integer

| No. | Address | Register | Access |
|---|---|---|---|
| R301 | 300 | Measurement System | R / W |
| R302 | 301 | Refrigerant | R / W |
| R303 | 302 | Configuration Index Of T Probe preset | R / W |
| R304 | 303 | .. | .. |
| R305 | 304 | .. | .. |
| R306 | 305 | Control mode | R / W |
| R307 | 306 | .. | .. |
| R308 | 307 | Regulation algorithm selection | R / W |
| R309 | 308 | Percent Valve Opening at Start [%] | R / W |
| R310 | 309 | Regulation Start Delay | R / W |
| R311 | 310 | Standby Opening Percentage Position [%] | R / W |
| R312 | 311 | Pressure Probe Type | R / W |
| R313 | 312 | Pressure Probe Time Constant Of Digital Filter | R / W |
| R314 | 313 | .. | .. |
| R315 | 314 | Pressure Probe Failure Recovery Action | R / W |
| R316 | 315 | Pressure Probe Failure Recovery Action Delay | R / W |
| R317 | 316 | Temperature Probe Type | R / W |
| R318 | 317 | Temperature Probe Time Constant Of Digital Filter | R / W |
| R319 | 318 | Temperature Probe Failure Recovery Action | R / W |
| R320 | 319 | Temperature Probe Failure Recovery Action Delay | R / W |
| R321 | 320 | LED ring configuration | R / W |
| R322 | 321 | Valve Model Optimisation | R / W |
| R323 | 322 | Service | R / W |
| R324 | 323 | .. | .. |
| R325 | 324 | .. | .. |
| R326 | 325 | RS-485 Network Address | R / W |
| R327 | 326 | RS-485 Speed | R / W |
| R328 | 327 | Parity | R / W |
| R329 | 328 | Stop Bits | R / W |
| R330 | 329 | Bus Communication Failure Recovery Action | R / W |
| R331 | 330 | Bus Communication Failure Recovery Action Delay | R / W |
| R332 | 331 | PID Proportional Gain | R / W |
| R333 | 332 | PID Integral Time | R / W |
| R334 | 333 | PID Derivative Time | R / W |
| R335 | 334 | LSH (low superheating) Protection Integral Time | R / W |
| R336 | 335 | LSH (low superheating) Protection Alarm Delay | R / W |
| R337 | 336 | LSU (low suction temperature) Protection Alarm Delay | R / W |
| R338 | 337 | LSU (low suction temperature) Protection Integral Time | R / W |

Definition Access: R = Read, W = Write

| No. | Address | Register | Access |
|---|---|---|---|
| R339 | 338 | LOP (low evaporation temperature) Protection Alarm Delay [s] | R / W |
| R340 | 339 | MOP (high evaporation temperature) Protection Alarm Delay [s] [10] | R / W |
| R341 | 340 | MOP (high evaporation temperature) Protection Alarm Delay [s] | R / W |
| | | | |
| R401 | 400 | Superheat Setpoint [K] | R / W |
| R402 | 401 | Maximum Pressure Probe Valve [barg] | R / W |
| R403 | 402 | Minimum Pressure Probe Valve [barg] | R / W |
| R404 | 403 | Pressure Probe Calibration Offset [barg] | R / W |
| R405 | 404 | Maximum Pressure Probe Alarm Value [barg] | R / W |
| R406 | 405 | Minimum Pressure Probe Alarm Value [barg] | R / W |
| R407 | 406 | Temperature Probe Calibration Offset [°C] | R / W |
| R408 | 407 | Maximum Temperature Probe Alarm Value [°C] | R / W |
| R409 | 408 | Minimum Temperature Probe Alarm Value [°C] | R / W |
| R410 | 409 | LSH (low superheat) protection threshold [°C] | R / W |
| R411 | 410 | LSU (low suction temperature) Protection Alarm Threshold [°C] | R / W |
| R412 | 411 | LOP (low evaporation temperature) Protection Threshold [°C] | R / W |
| R413 | 412 | MOP (high evaporation temperature) Protection Threshold [°C] | R / W |
| R414 | 413 | MOP (high evaporation temperature) Protection Suction Threshold [°C] | R / W |
| | | | |
| R501 | 500 | Superheat Setpoint [°F] | R / W |
| R502 | 501 | Maximum Pressure Probe Value [psig] | R / W |
| R503 | 502 | Minimum Pressure Probe Value [psig] | R / W |
| R504 | 503 | Pressure Probe Calibration offset [psig] | R / W |
| R505 | 504 | Maximum Pressure Probe Alarm Value [psig] | R / W |
| R506 | 505 | Minimum Pressure Probe Alarm Value [psig] | R / W |
| R507 | 506 | Temperature Probe Calibration Offset [°F] | R / W |
| R508 | 507 | Maximum Temperature Probe Alarm Value [°F] | R / W |
| R509 | 508 | Minimum Temperature Probe Alarm Value [°F] | R / W |
| R510 | 509 | LSH (low superheat) Protection Threshold [°F] | R / W |
| R511 | 510 | LSU (low suction temperature) Protection Alarm Threshold [°F] | R / W |
| R512 | 511 | LOP (low evaporation temperature) Protection Threshold [°F] | R / W |
| R513 | 512 | MOP (high evaporation temperature) Protection Evaporation Threshold [°F] | R / W |
| R514 | 513 | MOP (high suction temperature) Protection Suction Threshold [°F] | R / W |

All writeable registers >200 are persistent and are **not** supposed to be written on a regular basis. Designated registers are highlighted in colour in the document.

# Coil descriptions

| No. | Address | Coil | Access |
|---|---|---|---|
| C1 | 0 | Hardware alarm | R |
| C2 | 1 | Gearbox alarm | R |
| C3 | 2 | Bus Communication Alarm | R |
| C4 | 3 | Evaporation Pressure Probe Alarm | R |
| C5 | 4 | Suction Temperature Probe Alarm | R |
| C6 | 5 | LSH (low superheat) Alarm | R |
| C7 | 6 | LSU (low suction temperature) Alarm | R |
| C8 | 7 | LOP (low evaporation temperature) Alarm | R |
| C9 | 8 | MOP (high evaporation temperature) Alarm | R |
| C10 | 9 | LSH (low superheat) Protection Activation Notification | R |
| C11 | 10 | LOP (low evaporation temperature) Protection Activation Notification | R |
| C12 | 11 | MOP (high evaporation temperature) Protection Activation Notification) | R |
| C13 | 12 | Digital Input Activation Notification | R |
| C101 | 100 | Regulation Enabling | R / W |
| C102 | 101 | Evaporation Pressure Probe Alarm Enabling | R / W |
| C103 | 102 | Suction Temperature Probe Alarm Enabling | R / W |
| C104 | 103 | Start Adaption Procedure | R / W |
| C105 | 104 | Manual Positioner Enabling | R / W |
| C106 | 105 | Termination Resistor Enabling | R / W |

All writeable coils >100 are persistent and are **not** supposed to be written on a regular basis. Designated registers are highlighted in colour in the document.

# Register descriptions

## Control and general settings

These registers can be used to control and configure the fundamental functionalities and read the corresponding feedback values of the device.

| No. | Address | Description<br>Comment | Range,<br>enumeration | Unit | Scaling | Access |
|---|---|---|---|---|---|---|
| R1 | 0 | **Absolute valve position** | 0...10'000<br>Default: 0 | points | 1 | R |
| R2 | 1 | **Percentage valve position** | 0...100<br>Default: 0 | % | 1 | R |
| R3 | 2 | **Feedback signal** | 0...1'000<br>Default: 0 | V | 0.01 | R |
| R4 | 3 | **Percentage feedback signal** | 0...100<br>Default: 0 | % | 1 | R |
| R5 | 4 | **Regulation State** | 0: Disabled<br>10: Stop regulation<br>40: Closed valve<br>50: Stand-by<br>60: Moving<br>70: Moving<br>80: Moving<br>90: Wait<br>100: Regulation<br>Default: 0 | – | – | R |
| R6 | 5 | **Evaporation pressure probe measurement** | –200...2'000<br>Default: 0 | barg | 0.1 | R |
| R7 | 6 | **Evaporation pressure probe measurement** | –2'901...29'008<br>Default: 0 | psig | 0.1 | R |
| R8 | 7 | **Suction temperature probe measurement** | –850...2'000<br>Default: 0 | °C | 0.1 | R |
| R9 | 8 | **Suction temperature probe measurement** | –1'210...3'920<br>Default: 0 | °F | 0.1 | R |
| R10 | 9 | **Evaporation temperature** | –850...2'000<br>Default: 0 | °C | 0.1 | R |
| R11 | 10 | **Evaporation temperature** | –1'210...3'920<br>Default: 0 | °F | 0.1 | R |
| R12 | 11 | **Superheat** | –400...1'800<br>Default: 0 | K | 0.1 | R |
| R13 | 12 | **Superheat** | –400...3'560<br>Default: 0 | °F | 0.1 | R |

| No. | Address | Description<br>Comment | Range,<br>enumeration | Unit | Scaling | Access |
|---|---|---|---|---|---|---|
| R101 | 100 | **Device PIN info** | 0...65'535<br>Default: 0 | – | – | R |
| R102 | 101 | **Serial number device info**<br>4 most significant digits | 0...9'999<br>Default: 0 | – | | R |
| R103 | 102 | **Serial number device info**<br>4 less significant digits | 0...9'999<br>Default: 0 | – | – | R |
| R104 | 103 | **Field 1 of the gearbox S/N** | 0...65'535<br>Default: 0 | – | – | R |
| R105 | 104 | **Field 2 of the gearbox S/N** | 0...65'535<br>Default: 0 | – | – | R |
| R106 | 105 | **Field 3 of the gearbox S/N** | 0...65'535<br>Default: 0 | – | – | R |
| R107 | 106 | **Field 4 of the gearbox S/N** | 0...65'535<br>Default: 0 | – | – | R |
| R108 | 107 | **Hardware release info**<br>Format: 0xmmnnMM<br>Ex: 3.8.2 = 0x020803 | 0...65'535<br>Default: 0 | – | | R |
| R109 | 108 | **Firmware release info**<br>Format: 0x0A0102<br>Ex: 2.1.10 = 0x0A0102 | 0...65'535<br>Default: 0 | – | – | R |
| R110 | 109 | **HMI release info** | 0...0<br>Default: 0 | – | – | R |
| R111 | 110 | **Device type info** | 3...3<br>Default: 0 | – | – | R |
| R112 | 111 | **Operating days info** | 0...65'535<br>Default: 0 | days | – | R |
| R113 | 112 | **Operating hours info** | 0...24<br>Default: 0 | hours | – | R |
| R114 | 113 | **Number of completed cycles**<br>(high part) info | 0...65'535<br>Default: 0 | – | – | R |
| R115 | 114 | **Number of completed cycles**<br>(high part) info | 0...65'535 | – | | R |
| R116 | 115 | **Supply voltage frequency** | 0...100<br>Default: 0 | Hz | – | R |
| | | | | | | |
| R201 | 200 | **Manual positioner position** | 0...10'000<br>Default: 0 | points | – | R / W |
| R202 | 201 | **Machine cooling capacity** | 0...100<br>Default: 0 | % | – | R / W |
| R203 | 202 | **Service 1**<br>self-resetting values | 0...65'535<br>Default: 0 | – | – | R / W |
| R204 | 203 | **Service 2**<br>non-self-resetting bit-fields | -32'768...32'768<br>Default: 0 | – | – | R / W |
| R205 | R206 | **PIN entry field** | 0...65'535<br>Default: 0 | – | – | R / W |

| No. | Address | Description<br>Comment | Range,<br>enumeration | Unit | Scaling | Access |
|---|---|---|---|---|---|---|
| R301 | 300 | **Measurement system** | 1: International system<br>2: British Imperial system<br>Default: 1 | – | – | R / W |
| R302 | 301 | **Refrigerant** | 1: R1233zd(e)<br>2: R1234yf<br>3: R1234ze<br>4: R1270<br>5: R134a<br>6: R290<br>7: R32<br>8: R404a<br>9: R407A<br>11: R410a<br>12: R449A<br>13: R449C<br>14: R452A<br>15: R452B<br>16: R454A<br>17: R454B<br>18: R454C<br>19: R463A<br>20: R507a<br>21: R513A<br>22: R514A<br>23: R515B<br>24: R600<br>25: R600a<br>26: R744<br>Default: 5 | – | – | R / W |
| R303 | 302 | **Configuration index of P probe preset**<br>For app only | 0...16<br>Default: 1 | – | – | R / W |
| R304 | 303 | **..** | .. | .. | .. | .. |
| R305 | 304 | **..** | .. | .. | .. | .. |
| R306 | 305 | **Control mode** | 1: A/D mode<br>2: Bus mode<br>Default: 2 | – | – | R / W |
| R307 | 306 | **..** | .. | .. | .. | .. |
| R308 | 307 | **Regulation algorithm selection** | 1: SH regulation | – | – | R / W |
| R309 | 308 | **Percent valve opening at start** | 0...100<br>Default: 50 | % | – | R / W |
| R310 | 309 | **Regulation start delay** | 0...20'000<br>Default: 0 | s | – | R / W |
| R311 | 310 | **Standby opening percentage position** | 0...100<br>Default: 0 | % | – | R / W |
| R312 | 311 | **Pressure probe type** | 1: Electronic probe (4...20 mA)<br>2: Ratiometric probe (0/5 V)<br>Default: 2 | – | – | R / W |
| R313 | 312 | **Pressure probe time constant of digital filter** | 1...200<br>Default: 6 | s | – | R / W |
| R314 | 313 | **..** | .. | .. | .. | .. |

| No. | Address | Description<br>Comment | Range,<br>enumeration | Unit | Scaling | Access |
|---|---|---|---|---|---|---|
| R315 | 314 | **Pressure probe failure recovery action** | 1: No action<br>2: Forced closure<br>3: Fixed position<br>Default: 1 | – | – | R / W |
| R316 | 315 | **Pressure probe failure recovery action delay** | 0...20'000<br>Default: 0 | s | – | R / W |
| R317 | 316 | **Temperature probe type** | 1: NTC standard probe | – | – | R / W |
| R318 | 317 | **Temperature probe time constant of digital filter** | 1...120<br>Default: 6 | s | – | R / W |
| R319 | 318 | **Temperature probe failure recovery action** | 1: No action<br>2: Forced closure<br>3: Fixed position<br>Default: 1 | – | – | R / W |
| R320 | 319 | **Temperature probe failure recovery action delay** | 0...20'000<br>Default: 0 | s | – | R / W |
| R321 | 320 | **LED ring configuration «halo»** | 1: Always off<br>2: Moving direction<br>3: Opening percentage<br>Default: 2 | – | – | R / W |
| R322 | 321 | **Valve model optimisation** | 0: Generic<br>10: EXR10<br>20: EXR20<br>50: EXR50<br>Default: 0 | – | – | R / W |
| R323 | 322 | **Service** | 0...10'000<br>Default: 0 | – | – | R / W |
| R324 | 323 | **..** | .. | .. | .. | .. |
| R325 | 324 | **..** | .. | .. | .. | .. |
| R326 | 325 | **RS-485 network address** | 1...255<br>Default: 19 | – | – | R / W |
| R327 | 326 | **RS-485 speed**<br>Baud rate in bits per second | 1: 1'200<br>2: 2'400<br>3: 4'800<br>4: 9'600<br>5: 19'200<br>6: 38'400<br>Default: 5 | – | – | R / W |
| R328 | 327 | **Parity** | 1: None<br>2: Even<br>3: Odd<br>Default: 1 | _ | – | R / W |
| R329 | 328 | **Stop bits** | 1: 1 stop bit<br>2: 2 stop bits<br>1...2<br>Default: 2 | – | – | R / W |
| R330 | 329 | **Bus communication failure recovery action** | 1: No action<br>2: Regulation stop and disable manual posit<br>Default: 1 | – | – | R / W |
| R331 | 330 | **Bus communication failure recovery action delay** | 0...20'000<br>Default: 5 | s | – | R / W |

| No. | Address | Description<br>Comment | Range,<br>enumeration | Unit | Scaling | Access |
|---|---|---|---|---|---|---|
| R332 | 331 | **PID proportional gain** | 0...10'000<br>Default: 500 | points | 1 | R / W |
| R333 | 332 | **PID integral time** | 0...20'000<br>Default: 400 | s | 0.1 | R / W |
| R334 | 333 | **PID derivative time** | 0...20'000<br>Default: 10 | s | 0.1 | R / W |
| R335 | 334 | **LSH (low superheating) protection integral time** | 0...20'000<br>Default: 30 | s | 0.1 | R / W |
| R336 | 335 | **LSH (low superheating) protection alarm delay** | 0...20'000<br>Default: 300 | s | 1 | R / W |
| R337 | 336 | **LSU (low suction temperature) protection alarm delay** | 0...20'000<br>Default: 300 | s | 1 | R / W |
| R338 | 337 | **LSU (low suction temperature) protection integral time** | 0...20'000<br>Default: 40 | s | 0.1 | R / W |
| R339 | 338 | **LOP (low evaporation temperature) protection alarm delay** | 0...20'000<br>Default: 300 | s | 1 | R / W |
| R340 | 339 | **MOP (high evaporation temperature) protection integral time** | 0...20'000<br>Default: 100 | s | 0.1 | R / W |
| R341 | 340 | **MOP (high evaporation temperature) protection alarm delay** | 0...20'000<br>Default: 600 | s | 1 | R / W |
| | | | | | | |
| R401 | 400 | **Superheat setpoint** | –400...1'800<br>Default: 60 | K | 0.1 | R / W |
| R402 | 401 | **Maximum pressure probe valve** | –200...2'000<br>Default: 93 | barg | 0.1 | R / W |
| R403 | 402 | **Minimum pressure probe valve** | –200...2'000<br>Default: –10 | barg | 0.1 | R / W |
| R404 | 403 | **Pressure probe calibration offset** | –200...2'000<br>Default: 0 | barg | 0.1 | R / W |
| R405 | 404 | **Maximum pressure probe alarm value** | –200...2'000<br>Default: 93 | barg | 0.1 | R / W |
| R406 | 405 | **Minimum pressure probe alarm value** | –200...2'000<br>Default: –10 | barg | 0.1 | R / W |
| R407 | 406 | **Temperature probe calibration offset** | –200...200<br>Default: 0 | °C | 0.1 | R / W |
| R408 | 407 | **Maximum temperature probe alarm value** | –850...2'000<br>Default: 1'050 | °C | 0.1 | R / W |
| R409 | 408 | **Minimum temperature probe alarm value** | –850...2'000<br>Default: –500 | °C | 0.1 | R / W |
| R410 | 409 | **LSH (low superheat) protection threshold** | –850...2'000<br>Default: 20 | °C | 0.1 | R / W |
| R411 | 410 | **LSU (low suction temperature) protection alarm threshold** | –850...2'000<br>Default: –500 | °C | 0.1 | R / W |
| R412 | 411 | **LOP (low evaporation temperature) protection threshold** | –850...2'000<br>Default: –500 | °C | 0.1 | R / W |
| R413 | 412 | **MOP (high evaporation temperature) protection threshold** | –850...2'000<br>Default: 500 | °C | 0.1 | R / W |

| No. | Address | Description<br>Comment | Range,<br>enumeration | Unit | Scaling | Access |
|---|---|---|---|---|---|---|
| R414 | 413 | **MOP (high evaporation temperature) protection suction threshold** | –850…2'000<br>Default: 300 | °C | 0.1 | R / W |
| | | | | | | |
| R501 | 500 | **Superheat setpoint** | –400…3'560<br>Default: 428 | °F | 0.1 | R / W |
| R502 | 501 | **Maximum pressure probe value** | 2'901…29'008<br>Default: 1'349 | psig | 0.1 | R / W |
| R503 | 502 | **Minimum pressure probe value** | –2'901…29'008<br>Default: –145 | psig | 0.1 | R / W |
| R504 | 503 | **Pressure probe calibration offset** | 2'901…29'008<br>Default: 0 | psig | 0.1 | R / W |
| R505 | 504 | **Maximum pressure probe alarm value** | 2'901…29'008<br>Default: 1'349 | psig | 0.1 | R / W |
| R506 | 505 | **Minimum pressure probe alarm value** | 2'901…29'008<br>Default: –145 | psig | 0.1 | R / W |
| R507 | 506 | **Temperature probe calibration offset** | –360…360<br>Default: 0 | °F | 0.1 | R / W |
| R508 | 507 | **Maximum temperature probe alarm value** | –1'210…3'920<br>Default: 2'210 | °F | 0.1 | R / W |
| R509 | 508 | **Minimum temperature probe alarm value** | –1'210…3'920<br>Default: –580 | °F | 0.1 | R / W |
| R510 | 509 | **LSH (low superheat) protection threshold** | –1'210…3'920<br>Default: 356 | °F | 0.1 | R / W |
| R511 | 510 | **LSU (low suction temperature) protection alarm threshold** | –1'210…3'920<br>Default: –580 | °F | 0.1 | R / W |
| R512 | 511 | **LOP (low evaporation temperature) protection threshold** | –1'210…3'920<br>Default: –580 | °F | 0.1 | R / W |
| R513 | 512 | **MOP (high evaporation temperature) protection evaporation threshold** | –1'210…3'920<br>Default: 1'220 | °F | 0.1 | R / W |
| R514 | 513 | **MOP (high suction temperature) protection suction threshold** | –1'210…3'920<br>Default: 860 | °F | 0.1 | R / W |

# Coil descriptions

## Control and general settings

These coils can be used to control and configure the fundamental functionalities and read the corresponding feedback values of the device.

| No. | Address | Description<br>Comment | Range,<br>enumeration | Unit | Scaling | Access |
|---|---|---|---|---|---|---|
| C1 | 0 | **Hardware alarm** | 0...1<br>Default: 0 | – | – | R |
| C2 | 1 | **Gearbox alarm** | 0...1<br>Default: 0 | – | – | R |
| C3 | 2 | **Bus communication alarm** | 0...1<br>Default: 0 | – | – | R |
| C4 | 3 | **Evaporation pressure probe alarm** | 0...1<br>Default: 0 | – | – | R |
| C5 | 4 | **Suction temperature probe alarm** | 0...1<br>Default: 0 | – | – | R |
| C6 | 5 | **LSH (low superheat) alarm** | 0...1<br>Default: 0 | – | – | R |
| C7 | 6 | **LSU (low suction temperature) alarm** | 0...1<br>Default: 0 | – | – | R |
| C8 | 7 | **LOP (low evaporation temperature) alarm** | 0...1<br>Default: 0 | – | – | R |
| C9 | 8 | **MOP (high evaporation temperature) alarm** | 0...1<br>Default: 0 | – | – | R |
| C10 | 9 | **LSH (low superheat) protection activation notification** | 0...1<br>Default: 0 | – | – | R |
| C11 | 10 | **LOP (low evaporation temperature) protection activation notification** | 0...1<br>Default: 0 | – | – | R |
| C12 | 11 | **MOP (high evaporation temperature) protection activation notification** | 0...1<br>Default: 0 | – | – | R |
| C13 | 12 | **Digital input activation notification** | 0...1<br>Default: 0 | – | – | R |
| | | | | | | |
| C101 | 100 | **Regulation enabling** | 0...1<br>Default: 0 | – | – | R / W |
| C102 | 101 | **Evaporation pressure probe alarm enabling** | 0...1<br>Default: 1 | – | – | R / W |
| C103 | 102 | **Suction temperature probe alarm enabling** | 0...1<br>Default: 1 | – | – | R / W |
| C104 | 103 | **Start adaption procedure** | 0...1<br>Default: 0 | – | – | R / W |
| C105 | 104 | **Manual positioner enabling** | 0...1<br>Default: 0 | – | – | R / W |
| C106 | 105 | **Termination resistor enabling** | 0...1<br>Default: 0 | – | – | R / W |

# All inclusive.

Belimo is the global market leader in the development, production, and sales of field devices for the energy-efficient control of heating, ventilation and air-conditioning systems. The focus of our core Business is on damper actuators, control valves, sensors and meters.

Always focusing on customer value, we deliver more than only products. We offer you the complete product range for the regulation and control of HVAC systems from a single source. At the same time, we rely on tested Swiss quality with a five-year warranty. Our worldwide representatives in over 80 countries guarantee short delivery times and comprehensive support through the entire product life. Belimo does indeed include everything.

The “small” Belimo devices have a big impact on comfort, energy efficiency, safety, installation and maintenance.

In short: Small devices, big impact.

- 5-year warranty
- On site around the globe
- Complete product range
- Tested quality
- Short delivery times
- Comprehensive support

EN – 2026-07/A – Subject to technical modifications

**BELIMO Automation AG**
Brunnenbachstrasse 1, 8340 Hinwil, Switzerland
+41 43 843 61 11, info@belimo.ch, www.belimo.com

BELIMO