REACT

Belimo – Modbus settings

20231003

Content

Swegon

REACT V BMB

Variable flow damper.

Communication settings

Actuator type:	LMV-D3-M/B SWN NMV-D3-M/B SWN SMV-D3-M/B SWN
Protocol:	Modbus RTU (RS-485)
Max. number of nodes:	32 (without repeater)
Communication rate:	9600 / 19200 / 38400 / 76800 / 115200 **Standard: 38400**
Address:	0...247 **Standard: 1**
Bit sequence:	MSB/LSB
Bit format:	1-8-N-2 1-8-N-1 1-8-E-1 1-8-O-1 **Standard: 1-8-N-2**
Termination resistance:	120 Ohm
Parameterisation tool:	ZTH EU

Values for communication rate, parity, stop bits and delay can be changed.

Function code

Function code	Name	Description
03h	Read holding address	Unit parameter / actual read value (integer/floating point)
06h	Write individual holding address	Unit parameter / single words written

Error codes

Error code	Name	Description
01h	Illegal function	The received function code is not allowed to be used in communication with the unit.
02h	Illegal data adress	The requested register is not available. Alternatively, the register is only a read address.
03h	Illegal data value	The written value is not permitted.
06h	Slave device busy	The unit is busy.

High and Low value in address 10, 11 & 112, 113

The values that exceed 65535 are stored in two consecutive registers (LowWord and HighWord) and must be interpreted as "Little endian" LSW (least significant words). For example:

Absolute air flow = 1259735 = $0000'0000'0001'0011'0011'1000'1101'0111_2$

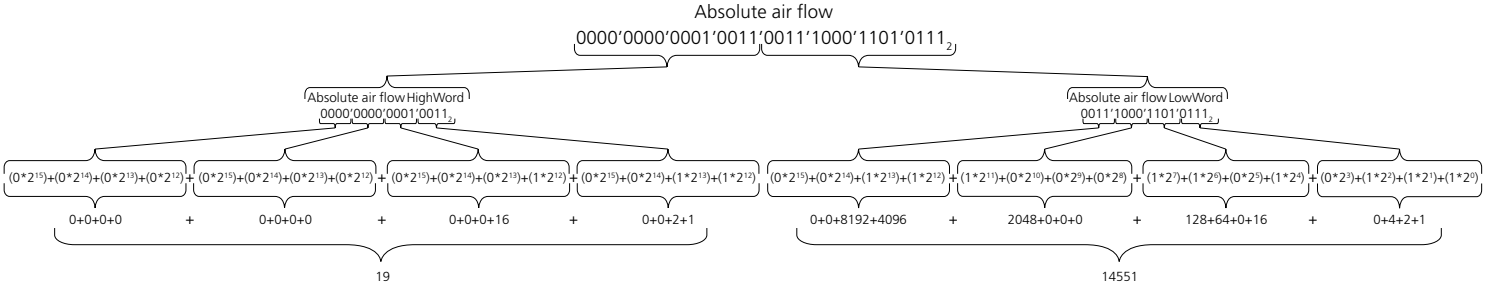
Absolute air flow = (Absolute air flow HighWord * 65356) + Absolute air flow LowWord

Absolute air flow LowWord (Address 10) = 14551 = $0011'1000'1101'0111_2$

Absolute air flow HighWord (Address 11) = 19 = $0000'0000'0001'0011_2$

Absolute air flow = (19*65356) + 14551 = 1259735

Actual value = Value * Scale factor * Set unit = 1259735 * 0.001 * l/h = 1,259,735 l/h



Deactivated register

If a register is not supported by a unit or by a unit setting, this is indicated with 65535 ($1111'1111'1111'1111_2$).

Modbus Register

Holding adress

Name	Address	Value	Unit	Read/ Write	Description
Set point	0	0…10000 Standard: 0	%	R/W	Air flow demand as a percentage between Vmin and Vmax. 0 = 0% (Vmin) and 10000 = 100% (Vmax). Only read value if address 118 = 0.
Forced control	1	0: Auto mode 1: Open 2: Closed 3: Min. flow rate 4: Intermediate value 5: Max. flow rate Standard: 0 (auto mode)	-	R/W	Overrides the basic function with predefined choices. The intermediate flow rate is preset to 50% of Vnom. Can be changed via the hand-held terminal ZTH EU or PC-Tool.
Relative position	4	0…10000	%	R	Current damper position as a percentage. 0 = 0% and 10000 = 100%.
Absolute position	5	0…Max. angle	°	R	Current damper position in degrees. 0 = 0° and 100 = 100°.
Relative air flow	6	0…10000	%	R	Current air flow as a percentage of Vnom. 0 = 0% and 10000 = 100%.
Absolute air flow	7	0…Vnom	m^3/h	R	Current air flow in m^3/h.
Absolute air flow LowWord	10		Selected unit	R	Current air flow in selected unit, Unit selector (address 117). See example, page 2. Scale factor 0.001.
Absolute air flow HighWord	11		Selected unit	R	Current air flow in selected unit, Unit selector (address 117). See example, page 2. Scale factor 0.001.
Analogue set point	12	0…10000	%	R	The air flow demand as a percentage if the actuator is controlled analogously (address 118 = 0).

All addresses above 100 are permanent and the value is saved in the event of a power failure. Permanent addresses have limitations regarding the number of writes, max. 1 million.

Name	Address	Value	Unit	Read/ Write	Description
Bus termination	99	0: Inactive 1: Active Standard: 0 (inactive)		R/W	Setting bus termination (120 Ω). Bus termination can be set with Modbus, ZTH EU or PC-Tool.
Error message & Service info	104	Bit1: Working range exceeded Bit2: Actuator blocked Bit8: Internal test Bit9: Release button pressed Bit10: Loss of communication		R	**Working range exceeded:** The actuator has moved outside its set working range. **Actuator blocked:** The actuator is mechanically overloaded. **Internal test:** The actuator carries out an internal test run, end position calibration, etc. **Release button pressed:** The actuator is released, can be operated manually. **Loss of communication:** Communication fault detected when the timeout time has expired without the values having been updated.
Vmin	105	0…Vmax Standard: 0	%	R/W	Min. air flow as a percentage of the nominal air flow. 0 = 0%, 10000 = 100% (Vnom). Vmin must be ≤ Vmax.
Vmax	106	Vmin…10000 Standard: 10000	%	R/W	Max. air flow as a percentage of the nominal air flow. 0 = 0%, 10000 = 100% (Vnom). Vmax must be ≥ Vmin > 20% of Vnom.
Position for loss of communication	108	0: Most recent set point value 1: The damper closes 2: The damper opens 3: The damper moves to the intermediate value Standard: 0 (Most recent set point value)		R/W	Modbus communication is not monitored as standard. In the event of a loss of communication, the actuator retains is current set point value. The bus implementation monitors the Modbus communication. If Set point (address 1) or Forced control (address 2) is not updated before the timeout time (address 109) has expired, the actuator will go to the set value for position in the event of a loss of communication (address 108). Alarms regarding loss of communication will be detected in Error message & Service info (address 104).
Timeout time loss of communication (Bus Watchdog)	109	Standard: 0 (Position in case of communication (address 108 = 0) Standard: 120 (Position in case of loss of communication (address 108 = 1,2,3)	s	R/W	Time frame for communication monitoring. Set value in seconds before a loss of communication is detected. Timeout time = 0 (function deactivated). When the timeout time has expired, Position in case of loss of communication (address 108) is activated.
Vnom	110		m^3/h	R	Set nominal air flow in m^3/h.
Vnom LowWord	112		Selected unit	R	Nominal air flow in selected unit, Unit selector (address 117). See example, page 2. Scale factor 0.001.
Vnom HighWord	113		Selected unit	R	Nominal air flow in selected unit, Unit selector (address 117). See example, page 2. Scale factor 0.001.
Control mode	116	0: Position 1: Air flow Standard: 1 (air flow)		R/W	The control mode must be set to air flow for correct function. Position: Regulated by position (not used). Air flow: Regulated by air flow.
Unit selector	117	0: m^3/s 1: m^3/h 2: l/s 3: l/min 4: l/h 5: gpm 6: cfm Standard: m^3/h		R/W	Selected unit in which the air flow is reported. Absolute air flow (L) (address 10). Absolute air flow (H) (address 11). Vnom (L) (address 112). Vnom (H) (address 113).
Set point source	118	0: Analogue 1: Bus Standard: 0 (analogue)		R/W	Analogue: Set point from analogue control signal 0…10 V (no. 3, input Y). Bus: The set point is written via communication, Set point (address 0).

REACT Parasol Zenith

Comfort module with integrated variable flow regulation.

Communication settings

Actuator type:	LMV-D3-MOD-F SWN
Protocol:	Modbus RTU (RS-485)
Max. number of nodes:	32 (without repeater)
Communication rate:	9600 / 19200 / 38400 / 76800 / 115200 **Standard: 38400**
Address:	0...118 **Standard: 1**
Bit sequence:	LSB
Bit format:	1-8-N-2 1-8-N-1 1-8-E-1 1-8-O-1 **Standard: 1-8-N-2**
Termination resistance:	120 Ohm (external)

Values for communication rate, parity, stop bits and delay can be changed.

Function code

Function code	Name	Description
03h	Read holding address	Unit parameter / actual read value (integer/floating point)
06h	Write individual holding address	Unit parameter / single words written

Error codes

Error code	Name	Description
01h	Illegal function	The received function code is not allowed to be used in communication with the unit.
02h	Illegal data adress	The requested register is not available. Alternatively, the register is only a read address.
03h	Illegal data value	The written value is not permitted.
06h	Slave device busy	The unit is busy.

Modbus Register

Holding adress

Name	Address	Value	Unit	Read/ Write	Description
Set point	0	0…10000 Standard: 0	%	R/W	Air flow demand as a percentage between Vmin and Vmax. 0 = 0% (Vmin) and 10000 = 100% (Vmax). Only read value if address 118 = 0.
Forced control	1	0: Auto mode 1: Open 2: Closed 3: Min. flow rate 4: Intermediate value 5: Max. flow rate Standard: 0 (auto mode)	-	R/W	Overrides the basic function with predefined choices. The intermediate flow rate is preset to 50% of Vnom. Can be changed via the hand-held terminal ZTH EU or PC-Tool.
Initiation	2	0: None 1: End position check 2: Test 3: Synchronisation 4: Resetting Standard: 0 (none)	-	R/W	Check. Initiation of the actuator's function.
Actuator type	3	0: No actuator connected 1: Air/Water 2: VAV/EPIV 3: Fire 4: Energy valve 5: 6-way EPIV	-	R	Actuator type.
Relative position	4	0…10.000	%	R	Current damper position as a percentage. 0 = 0% and 10000 = 100%.
Absolute position	5	0…Max. angle	°	R	Current damper position in degrees. 0 = 0° and 100 = 100°.
Relative air flow	6	0…10000	%	R	Current air flow as a percentage of Vnom. 0 = 0% and 10000 = 100%.
Absolute air flow	7	0…Vnom	m^3/h Pa	R	Current air flow in m^3/h.
Input value from Sensor 1	8	0...65535	mV 0 / 1	R	Sensor 1 value. Current value from sensor 1, dependent on sensor setting.
Absolute air flow LowWord	10		Selected unit	R	Current air flow in selected unit, Unit selector (address 117). See description in Belimo Modbus document.
Absolute air flow HighWord	11		Selected unit	R	Current air flow in selected unit, Unit selector (address 117).
Analogue set point	12	0…10000	%	R	The air flow demand as a percentage if the actuator is controlled analogously (address 118 = 0).

All addresses above 100 are permanent and the value is saved in the event of a power failure. Permanent addresses have limitations regarding the number of writes, max. 1 million.

Name	Address	Value	Unit	Read/ Write	Description
Bus termination	99	0: Inactive 1: Active Standard: 0 (inactive)		R/W	Setting bus termination (120 Ω). Bus termination can be set with Modbus, ZTH EU or PC-Tool.
Error message & Service info	104	Bit1: Working range exceeded Bit2: Actuator blocked Bit8: Internal test Bit9: Release button pressed Bit10: Loss of communication		R	**Working range exceeded:** The actuator has moved outside its set working range. **Actuator blocked:** The actuator is mechanically overloaded. **Internal test:** The actuator carries out an internal test run, end position calibration, etc. **Release button pressed:** The actuator is released, can be operated manually. **Loss of communication:** Communication fault detected when the timeout time has expired without the values having been updated.
Vmin	105	0…Vmax Standard: 0	%	R/W	Min. air flow as a percentage of the nominal air flow. 0 = 0%, 10000 = 100% (Vnom). Vmin must be ≤ Vmax.
Vmax	106	Vmin…10000 Standard: 10000	%	R/W	Max. air flow as a percentage of the nominal air flow. 0 = 0%, 10000 = 100% (Vnom). Vmax must be ≥ Vmin > 20% of Vnom.
Sensor 1 type	107	0: None 1: Active/Hybrid 4: Switch Standard: 0 (none)		R/W	Sensor 1 type.
Timeout time loss of communication	108	0: Most recent set point value 1: The damper closes 2: The damper opens 3: The damper moves to the intermediate value Standard: 0 (most recent set point value)		R/W	Modbus communication is not monitored as standard. In the event of a loss of communication, the actuator retains is current set point value. The bus implementation monitors the Modbus communication. If Set point (address 1) or Forced control (address 2) is not updated before the timeout time (address 109) has expired, the actuator will go to the set value for position in the event of a loss of communication (address 108). Alarms regarding loss of communication will be detected in Error message & Service info (address 104).
Timeout time loss of communication (Bus Watchdog)	109	0…3600 Standard: 0 (Position in case of communication (address 108 = 0) Standard: 120 (Position in case of loss of communication (address 108 = 1,2,3)	s	R/W	Time frame for communication monitoring. Set value in seconds before a loss of communication is detected. Timeout time = 0 (function deactivated). When the timeout time has expired, Position in case of loss of communication (address 108) is activated.

Name	Address	Value	Unit	Read/ Write	Description
Vnom	110		m^3/h	R	Set nominal air flow in m^3/h.
Vnom (L)	112		Selected unit	R	Nominal air flow in selected unit, Unit selector (address 117).
Control mode	116	0: Position 1: Air flow Standard: 1 (air flow)		R/W	The control mode must be set to air flow for correct function. Position: Regulated by damper position (not used). Air flow: Regulated by air flow.
Unit selector	117	0: m^3/s 1: m^3/h 2: l/s 3: l/min 4: l/h 5: gpm 6: cfm Standard: 0 (m^3/h)		R/W	Selected unit in which the air flow is reported. Absolute air flow (L) (address 10). Absolute air flow (H) (address 11). Vnom (L) (address 112).
Set point source	118	0: Analogue 1: Bus Standard: 0 (analogue)		R/W	Analogue: Set point from analogue control signal 0…10 V (no. 3, input Y). Bus: The set point is written via communication, Set point (address 0).