

# **VMBGP4PIR-20**

**Motion detector with four touch  
buttons module for VELBUS system**

Binary format:

<SOF-SID10...SID0-RTR-IDE-r0-DLC3...0-DATABYTE1...DATABYTE<sub>n</sub>-CRC15...CRC1-CRCDEL-ACK-ACKDEL-EOF7...EOF1-IFS3...IFS1>

<i>bits</i>	<i>Description</i>
SOF	Start Of Frame (always 0)
SID10 & SID9	Priority (00: highest ... 11: lowest priority)
SID8...SID1	Address
SID0	Always 0
RTR	Remote Transmit Request
IDE	Identifier Extension (always 0)
r0	reserved (always 0)
DLC3...DLC0	Data Length Code (0...8)
Databyte1	Command
Databyte2	Parameter
Databyte3	Parameter
Databyte4	Parameter
Databyte5	Parameter
Databyte6	Parameter
Databyte7	Parameter
Databyte8	Parameter
CRC15...CRC1	Cyclic Redundancy Checksum
CRCDEL	CRC Delimiter (always 1)
ACK	Acknowledge slot (transmit 1 readback 0 if received correctly)
ACKDEL	Acknowledge Delimiter (always 1)
EOF7...EOF1	End Of Frame (always 1111111)
IFS3...IFS1	InterFrame Space (always 111)

*The module can transmit the following messages:*

- Power up message
- Channel status
- Thermostat channel status
- Module status
- Temperature sensor status
- Thermostat settings
- Current temperature
- Module type and subtype
- Bus error counter status
- First, second and third part of the channel names
- Memory data
- Memory data block (4 bytes)
- Program step info
- Real-time clock status
- Date status
- Daylight savings status
- Real-time clock status request
- Clear linked push button led
- Set linked push button led
- Slow blink linked push button led
- Fast blink linked push button led

*The module can receive the following messages:*

- Power up

*The module can receive the following commands:*

- Linked push button status
- Module type request
- Module status request
- Channel name request
- Clear channel led
- Set channel led

- Slow blink channel led
- Fast blink channel led
- Very fast channel led
- Update channel leds
- Read memory data
- Read memory data block (4 bytes)
- Memory dump request
- Write memory data
- Write memory data block (4 bytes)
- Read program step info
- Write program step
- Bus error counter status request
- Real-time clock status request
- Set real-time clock
- Set date
- Set daylight savings
- Enable/disable global sunrise/sunset related actions
- Enable/disable local sunrise/sunset related actions
- Set local alarm clock
- Set global alarm clock
- Lock channel
- Unlock channel
- Disable channel program
- Enable channel program
- Select program
- Temperature request
- Thermostat settings request
- Set thermostat heating mode
- Set thermostat cooling mode
- Set temperature sensor zone
- Set thermostat default sleep time
- Set thermostat target, safe, night, day, comfort and alarm1 to alarm 4 temperature set
- Set thermostat hysteresis
- Set thermostat temperature difference for boost output
- Set temperature sensor calibration offset and gain
- Enable/disable valve and pump unjamming
- Reset minimum and maximum temperature
- Set thermostat temperature range
- Set thermostat minimum switching time
- Switch thermostat to safe, night, day or comfort mode
- Switch the open collector output off or on
- Start a timer on the open collector output

***Transmits power up message:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 2 data byte to send  
 DATABYTE1 = COMMAND\_POWER\_UP (0xAB)  
 DATABYTE2 = module address

***Transmits real time clock status request:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 1 data byte to send  
 DATABYTE1 = COMMAND\_REALTIME\_CLOCK\_STATUS\_REQUEST (0xD7)

***Transmits the real time clock status:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 4 data bytes to send  
 DATABYTE1 = COMMAND\_REALTIME\_CLOCK\_STATUS (0xD8)  
 DATABYTE2 = Day

Contents	Day
0	Monday
1	Tuesday
2	Wednesday
3	Thursday
4	Friday
5	Saturday
6	Sunday

DATABYTE3 = Hour (0...23)  
 DATABYTE4 = Minute (0...59)

***Transmits the date status:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 5 data bytes to send  
 DATABYTE1 = COMMAND\_DATE\_STATUS (0xB7)  
 DATABYTE2 = Day (1...31)  
 DATABYTE3 = Month (1...12)  
 DATABYTE4 = High byte of Year  
 DATABYTE5 = Low byte of Year

***Transmits the daylight savings status:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 2 data bytes to send  
 DATABYTE1 = COMMAND\_DAYLIGHT\_SAVING\_STATUS (0xAF)  
 DATABYTE2 = 0 =disabled / 1 = enabled

**Transmits the channel switch status:**

SID10-SID9 = 00 (highest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 4 data bytes to send

DATABYTE1 = COMMAND\_PUSH\_BUTTON\_STATUS (0x00)

DATABYTE2 = Channel just pressed

DATABYTE3 = Channel just released

DATABYTE4 = Channel long pressed

Contents	Channel number
B'00000001'	Button 1
B'00000010'	Button 2
B'00000100'	Button 3
B'00001000'	Button 4
B'00010000'	Dark / Light output
B'00100000'	Motion output
B'01000000'	Light depending motion output
B'10000000'	Absence output

**Transmits the sensor output switch status:**

SID10-SID9 = 00 (highest priority)

SID8...SID1 = Sub-address

RTR = 0

DLC3...DLC0 = 4 data bytes to send

DATABYTE1 = COMMAND\_OUTPUT\_STATUS (0x00)

DATABYTE2 = Output channel just activated (1 = just activated)

Contents	Output channel
xxxxxxx1	Heater just activated
xxxxxxx1x	Boost heater/cooler just activated
xxxxx1xx	Pump just activated
xxxx1xxx	Cooler just activated
xxx1xxxx	Temperature alarm 1 just activated
xx1xxxxx	Temperature alarm 2 alarm activated
x1xxxxxx	Temperature alarm 3 just activated
1xxxxxxx	Temperature alarm 4 alarm activated

DATABYTE3 = Outputs just deactivated (1 = just deactivated)

Contents	Output channel
xxxxxxx1	Heater just deactivated
xxxxxxx1x	Boost heater/cooler just deactivated
xxxxx1xx	Pump just deactivated
xxxx1xxx	Cooler just deactivated
xxx1xxxx	Temperature alarm 1 just deactivated
xx1xxxxx	Temperature alarm 2 alarm deactivated
x1xxxxxx	Temperature alarm 3 just deactivated
1xxxxxxx	Temperature alarm 4 alarm deactivated

DATABYTE4 = always zero

**Transmits the module type:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 8 data bytes to send  
 DATABYTE1 = COMMAND\_MODULE\_TYPE (0xFF)  
 DATABYTE2 = type (0x5F = VMBGP4PIR-20)  
 DATABYTE3 = High byte of serial number  
 DATABYTE4 = Low byte of serial number  
 DATABYTE5 = Memory map version  
 DATABYTE6 = Build year  
 DATABYTE7 = Build week  
 DATABYTE8 = Properties

Contents	Output channel
B'xxxxxxx0'	Terminator open
B'xxxxxxx1'	Terminator closed
B'xxxx000x'	Hardware version number
B'xxx0xxxx'	Velbus connection type
B'xx0xxxxx'	Only standard CAN allowed
B'xx1xxxxx'	CAN FD support

**Transmits the module subtype:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 8 data bytes to send  
 DATABYTE1 = COMMAND\_SUBTYPE (0xB0)  
 DATABYTE2 = type (0x5F = VMBGP4PIR-20)  
 DATABYTE3 = High byte of serial number  
 DATABYTE4 = Low byte of serial number  
 DATABYTE5 = Subaddress1 (H'FF' sub-address disabled)  
 DATABYTE6 = Subaddress2 (H'FF' sub-address disabled)  
 DATABYTE7 = Subaddress3 (H'FF' sub-address disabled)  
 DATABYTE8 = Subaddress4 (H'FF' sub-address disabled)

**Transmit: Bus error counter status**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 4 data bytes to send  
 DATABYTE1 = COMMAND\_BUSERROR\_COUNTER\_STATUS (0xDA)  
 DATABYTE2 = Transmit error counter  
 DATABYTE3 = Receive error counter  
 DATABYTE4 = Bus off counter

**Transmits the memory data:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 4 data bytes to send  
 DATABYTE1 = COMMAND\_MEMORY\_DATA (0xFE)  
 DATABYTE2 = High memory address  
 DATABYTE3 = LOW memory address  
 DATABYTE4 = memory data

Remark: address range: 0x0000 to 0x06BB

**Transmits memory data block (4 bytes):**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 7 data bytes to send  
 DATABYTE1 = COMMAND\_MEMORY\_DATA\_BLOCK (0xCC)  
 DATABYTE2 = High start address of memory block  
 DATABYTE3 = LOW start address of memory block  
 DATABYTE4 = memory data1  
 DATABYTE5 = memory data2  
 DATABYTE6 = memory data3  
 DATABYTE7 = memory data4

Remark: address range: 0x0000 to 0x06B8

**Transmits memory data block (5...60 bytes)(only allowed for CAN FD frames):**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = number of data bytes to send

<i>Contents</i>	<i>Number of data bytes</i>
0x09	12 data bytes
0x0A	16 data bytes
0x0B	20 data bytes
0x0C	24 data bytes
0x0D	32 data bytes
0x0E	48 data bytes
0x0F	64 data bytes

DATABYTE1 = COMMAND\_MEMORY\_DATA\_BLOCK (0xCC)  
 DATABYTE2 = High start address of memory block  
 DATABYTE3 = LOW start address of memory block  
 DATABYTE4 = memory block length (5...60)  
 DATABYTE5 = memory data 1  
 ...  
 DATABYTE12 = memory data 8 (end of data for DLC3...DLC0 = 0x09)  
 ...  
 DATABYTE16 = memory data 12 (end of data for DLC3...DLC0 = 0x0A)  
 ...  
 DATABYTE20 = memory data 16 (end of data for DLC3...DLC0 = 0x0B)  
 ...  
 DATABYTE24 = memory data 20 (end of data for DLC3...DLC0 = 0x0C)  
 ...  
 DATABYTE32 = memory data 28 (end of data for DLC3...DLC0 = 0x0D)  
 ...  
 DATABYTE48 = memory data 44 (end of data for DLC3...DLC0 = 0x0E)  
 ...  
 DATABYTE64 = memory data 60 (end of data for DLC3...DLC0 = 0x0F)

Remark:  
 Contents of unused data bytes = 0x55  
 Address range: 0x0000 to (0x06BC – memory block length)

***Transmits the first part of channel name:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 8 data bytes to send  
DATABYTE1 = COMMAND\_CHANNEL\_NAME\_PART1 (0xF0)  
DATABYTE2 = channel number 1...4, 9 or 18 (channel 9 = temperature sensor, channel 18 = output)  
DATABYTE3 = Character 1 of the channel name  
DATABYTE4 = Character 2 of the channel name  
DATABYTE5 = Character 3 of the channel name  
DATABYTE6 = Character 4 of the channel name  
DATABYTE7 = Character 5 of the channel name  
DATABYTE8 = Character 6 of the channel name

***Transmits the second part of the channel name:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 8 data bytes to send  
DATABYTE1 = COMMAND\_CHANNEL\_NAME\_PART2 (0xF1)  
DATABYTE2 = Channel number 1...4, 9 or 18 (channel 9 = temperature sensor, channel 18 = output)  
DATABYTE3 = Character 7 of the channel name  
DATABYTE4 = Character 8 of the channel name  
DATABYTE5 = Character 9 of the channel name  
DATABYTE6 = Character 10 of the channel name  
DATABYTE7 = Character 11 of the channel name  
DATABYTE8 = Character 12 of the channel name

***Transmits the third part of the channel name:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 6 data bytes to send  
DATABYTE1 = COMMAND\_CHANNEL\_NAME\_PART3 (0xF2)  
DATABYTE2 = channel number 1...4, 9 or 18 (channel 9 = temperature sensor, channel 18 = output)  
DATABYTE3 = Character 13 of the channel name  
DATABYTE4 = Character 14 of the channel name  
DATABYTE5 = Character 15 of the channel name  
DATABYTE6 = Character 16 of the channel name

Remarks:

Unused characters contain H'FF'.



**Transmits the module status:**

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 8 data bytes to send

DATABYTE1 = COMMAND\_MODULE\_STATUS (0xED)

DATABYTE2 = channel 1 to 8 status (1 = pressed / 0 = released)

<i>Contents</i>	<i>Channel number</i>
B'00000001'	Button 1
B'00000010'	Button 2
B'00000100'	Button 3
B'00001000'	Button 4
B'00010000'	Twilight(light/dark) output
B'00100000'	Motion output
B'01000000'	Light depending motion output
B'10000000'	Absence output

DATABYTE3 = test modus, button enabled/disable

<i>Contents</i>	
B'xxxxxxx0'	Button 1 disabled
B'xxxxxxx1'	Button 1 enabled
B'xxxxxx0x'	Button 2 disabled
B'xxxxxx1x'	Button 2 enabled
B'xxxxx0xx'	Button 3 disabled
B'xxxxx1xx'	Button 3 enabled
B'xxx0xxx'	Button 4 disabled
B'xxx1xxx'	Button 4 enabled
B'0xxxxxxx'	Motion test modus disabled
B'1xxxxxxx'	Motion test modus enabled

DATABYTE4 = open collector locked &amp; temperature sensor

<i>Contents</i>	<i>open collector &amp; temperature sensor</i>
B'xxx0xxx'	Edge color not inhibited
B'xxx1xxx'	Edge color inhibited
B'xx0xxxx'	Temperature sensor program enabled
B'xx1xxxx'	Temperature sensor program disabled
B'x0xxxxx'	Open collector output program enabled
B'x1xxxxx'	Open collector output program disabled
B'x0xxxxx'	Open collector output unlocked
B'x1xxxxx'	Open collector output locked
B'0xxxxxxx'	Open collector output off
B'1xxxxxxx'	Open collector output on

DATABYTE5 = locked channel status (0 = unlocked / 1 = locked)

DATABYTE6 = disabled channel program status (0 = program enabled / 1 = program disabled)

DATABYTE7 = alarm &amp; program selection

<i>Contents</i>	<i>Selected program</i>
B'xxxxxx00'	None
B'xxxxxx01'	Program group 1 (Summer)
B'xxxxxx10'	Program group 2 (Winter)
B'xxxxxx11'	Program group 3 (Holiday)
B'xxxxx0xx'	Clock alarm 1 off
B'xxxxx1xx'	Clock alarm 1 on
B'xxx0xxx'	Local clock alarm 1
B'xxx1xxx'	Global clock alarm 1
B'xx0xxxx'	Clock alarm 2 off
B'xx1xxxx'	Clock alarm 2 on
B'x0xxxxx'	Local clock alarm 2
B'x1xxxxx'	Global clock alarm 2
B'x0xxxxx'	Sunrise disabled
B'x1xxxxx'	Sunrise enabled
B'0xxxxxxx'	Sunset disabled
B'1xxxxxxx'	Sunset enabled

DATABYTE8 = light value auto send interval time  
(Valid range: 10...255s)

(5...9 = auto send on light value change with min interval 5...9s)  
(<5 = auto send disabled)

**Transmit the sensor status:**

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 8 data bytes to send

DATABYTE1 = COMMAND\_TEMP\_SENSOR\_STATUS (0xEA)

DATABYTE2 = Operating mode

Contents	Operating mode
xxxxxxx1	Mode push button locked (not used)
xxxxxxx0	Mode push button unlocked (not used)
xxxxx11x	Forced to safe mode (locked)
xxxxx01x	Manual mode
xxxxx10x	Sleep timer mode
xxxxx00x	Run mode
xxx1xxx	Auto send sensor temperature enabled
xxx0xxx	Auto send sensor temperature disabled
x100xxxx	Comfort mode
x010xxxx	Day mode
x001xxxx	Night mode
x000xxxx	Safe temp mode (anti frost)
1xxxxxxx	Cooler mode
0xxxxxxx	Heater mode

DATABYTE3 = Program step mode

Contents	Program step mode
xxxxx0xx	No sensor program group 1
xxxxx1xx	Sensor program group 1 available
xxx0xxx	No sensor program group 2
xxx1xxx	Sensor program group 2 available
0xxxxxxx	No sensor program group 3
1xxxxxxx	Sensor program group 3 available
x100xxxx	Comfort program step received
x010xxxx	Day program step received
x001xxxx	Night program step received
x000xxxx	Safe temperature program step received
xxxxxx1x	Enable unjamming heater valve
xxxxxx0x	Disable unjamming heater valve
xxxxxxx1	Enable unjamming pump
xxxxxxx0	Disable unjamming pump

DATABYTE4 = Output status (1 = activated)

Contents	Output channel
xxxxxxx0	Heater off
xxxxxxx1	Heater on
xxxxxx0x	Boost heater/cooler off
xxxxxx1x	Boost heater/cooler on
xxxxx0xx	Pump off
xxxxx1xx	Pump on
xxx0xxx	Cooler off
xxx1xxx	Cooler on
xx0xxxx	Temperature alarm 1 off
xx1xxxx	Temperature alarm 1 on
xx0xxxx	Temperature alarm 2 off
xx1xxxx	Temperature alarm 2 on
x0xxxxx	Temperature alarm 3 off
x1xxxxx	Temperature alarm 3 on
0xxxxxx	Temperature alarm 4 off
1xxxxxx	Temperature alarm 4 on

DATABYTE5 = Current sensor temperature into two's complement format (resolution 0.5°)

Contents	Current sensor temperature
01111111	63.5°C

00000001	0.5°C
00000000	0°C
11111111	-0.5°C
10010010	-55°C

DATABYTE6 = Current temperature set (resolution 0.5°)

Contents	Current temperature set
01101100	54°C
00101000	20°C
00000010	1°C
00000001	0.5°C
00000000	0°C
11111111	-0.5°C
11000000	-32°C

DATABYTE7 = High byte of the sleep timer

DATABYTE8 = Low byte of the sleep timer into minutes

Remark:

[DATABYTE7][DATABYTE8] contains a 16-bit sleep timer into minutes (1 to 65.279min).

If the sleep timer contains H'0000', the sleep timer is deactivated.

If the sleep timer contains a value between H'0001' and H'FEFF' (1 to 65.279min), the sleep timer is running for that time.

If the sleep timer contains 0xFFFF, manual mode is selected.

#### ***Transmit the sensor temperature:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 7 data bytes to send

DATABYTE1 = COMMAND\_SENSOR\_TEMPERATURE (0xE6)

DATABYTE2 = High byte current sensor temperature

DATABYTE3 = Low byte current sensor temperature into two's complement format (resolution 0.0625°)

DATABYTE4 = High byte minimum sensor temperature

DATABYTE5 = Low byte minimum sensor temperature into two's complement format (resolution 0.0625°)

DATABYTE6 = High byte maximum sensor temperature

DATABYTE7 = Low byte maximum sensor temperature into two's complement format (resolution 0.0625°)

High byte	Low byte	Current sensor temperature
01111111	111xxxxx	63.5°C
00000001	000xxxxx	0.5°C
00000000	100xxxxx	0.25°C
00000000	010xxxxx	0.125°C
00000000	001xxxxx	0.0625°C
00000000	000xxxxx	0°C
11111111	111xxxxx	-0.0625°C
11111111	110xxxxx	-0.125°C
11111111	100xxxxx	-0.25°C
11111110	000xxxxx	-0.5°C
10010010	000xxxxx	-55°C

Remark:

The 5 least significant bits of the low byte are don't care.

**Transmit the first part of the sensor settings:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 8 data bytes to send  
 DATABYTE1 = COMMAND\_TEMP\_SENSOR\_SETTINGS\_PART1 (0xE8)  
 DATABYTE2 = Current temperature set (resolution 0.5°)  
 DATABYTE3 = Comfort temperature set for heating mode (resolution 0.5°)  
 DATABYTE4 = Day temperature set for heating mode (resolution 0.5°)  
 DATABYTE5 = Night temperature set for heating mode (resolution 0.5°)  
 DATABYTE6 = Anti frost temperature set for heating mode (resolution 0.5°)  
 DATABYTE7 = Boost temperature difference set (resolution 0.5°)  
 DATABYTE8 = Hysteresis temperature set

Contents	Hysteresis
xxx11111	15.5°C
Xxx00001	0.5°C
Xxx00000	0°C

**Transmit the second part of the sensor settings:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 8 data bytes to send  
 DATABYTE1 = COMMAND\_TEMP\_SENSOR\_SETTINGS\_PART2 (0xE9)  
 DATABYTE2 = Comfort temperature set for cooling mode (resolution 0.5°)  
 DATABYTE3 = Day temperature set for cooling mode (resolution 0.5°)  
 DATABYTE4 = Night temperature set for cooling mode (resolution 0.5°)  
 DATABYTE5 = Safe temperature set for cooling mode (resolution 0.5°)  
 DATABYTE6 = High byte of the default sleep timer  
 DATABYTE7 = Low byte of the default sleep timer into minutes (1 to 65.279min)  
 DATABYTE8 = Default auto send temperature time interval into seconds  
 (Valid range: 10...255s)  
 (5...9 = auto send on temperature change with min interval 5...9s)  
 (<4 = auto send disabled)

**Transmit the third part of the sensor settings:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 8 data bytes to send  
 DATABYTE1 = COMMAND\_TEMP\_SENSOR\_SETTINGS\_PART3 (0xC6)  
 DATABYTE2 = Temperature alarm 1 setting (resolution 0.5°)  
 DATABYTE3 = Temperature alarm 4 setting (resolution 0.5°)  
 DATABYTE4 = Lower temperature range cool mode (resolution 0.5°)  
 DATABYTE5 = Upper temperature range heat mode (resolution 0.5°)  
 DATABYTE6 = Calibration offset factor (resolution 0.5°)

Contents	Calibration factor
00001111	Calibration factor +7.5°C
00000001	Calibration factor +0.5°C
00000000	Calibration factor +0°C
11111111	Calibration factor -0.5°C
11110000	Calibration factor -8°C

DATABYTE7 = Zone number  
 DATABYTE8 = Calibration gain factor

**Transmit the fourth part of the sensor settings:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 8 data bytes to send  
 DATABYTE1 = COMMAND\_TEMP\_SENSOR\_SETTINGS\_PART4 (0xB9)  
 DATABYTE2 = Minimum switching time (0...255s)  
 DATABYTE3 = Pump delayed on time (0...255s)  
 DATABYTE4 = Pump delayed off time (0...255s)  
 DATABYTE5 = Temperature alarm 2 setting (resolution 0.5°)  
 DATABYTE6 = Temperature alarm 3 setting (resolution 0.5°)  
 DATABYTE7 = Lower temperature range heat mode (resolution 0.5°)  
 DATABYTE8 = Upper temperature range cool mode (resolution 0.5°)

**Transmit: Clears LEDs on a linked push button module:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Address of the linked push button module for clearing LEDs  
 RTR = 0  
 DLC3...DLC0 = 2 data bytes to send  
 DATABYTE1 = COMMAND\_CLEAR\_LED (0xF5)  
 DATABYTE2 = LED bit numbers (1 = clear LED)

**Transmit: Sets LEDs on a linked push button module:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Address of the linked push button module for setting LEDs on  
 RTR = 0  
 DLC3...DLC0 = 2 data bytes to send  
 DATABYTE1 = COMMAND\_SET\_LED (0xF6)  
 DATABYTE2 = LED bit numbers (1 = set LED)

**Transmit: Blinks LEDs slowly on a linked push button module:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Address of the linked push button module for slowly blinking LEDs  
 RTR = 0  
 DLC3...DLC0 = 2 data bytes to send  
 DATABYTE1 = COMMAND\_SLOW\_BLINKING\_LED (0xF7)  
 DATABYTE2 = LED bit numbers (1 = slow blink LED)

**Transmit: Blinks LEDs fast on a linked push button module:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Address of the linked push button module for fast blinking LEDs  
 RTR = 0  
 DLC3...DLC0 = 2 data bytes to send  
 DATABYTE1 = COMMAND\_FAST\_BLINKING\_LED (0xF8)  
 DATABYTE2 = LED bit numbers (1 = fast blink LED)

**Transmit the light raw value:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 3 data bytes to send  
 DATABYTE1 = COMMAND\_SENSOR\_RAW\_DATA (0xA9)  
 DATABYTE4 = High byte current light value  
 DATABYTE5 = Low byte current light value

**Transmits program step info:**

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 8 data bytes to send  
 DATABYTE1 = COMMAND\_PROGRAM\_STEP\_INFO (0xC1)  
 DATABYTE2 = Program step number (1...66 / 255 step not found)  
 DATABYTE3 = Program reference

Contents	Description
000xxxxx	Disable program step

001xxxxx	Absolute time
010xxxxx	Wake up time 1 + relative time
011xxxxx	Go to bed time 1 + relative time
100xxxxx	Wake up time 2 + relative time
101xxxxx	Go to bed time 2 + relative time
110xxxxx	Sunrise + relative time
111xxxxx	Sunset + relative time
xxx01111	Rel. time = 3h45min
...	
xxx00001	Rel. time = 15min
xxx00000	Rel. time = 0
xxx11111	Rel. time = -15min
...	
xxx10000	Rel. time = -4h

DATABYTE4 = Program step month & four least significant bits of day

<i>Contents</i>	<i>Description</i>
xxxx0000	Weekly program
xxxx0001	January
xxxx0010	February
xxxx0011	March
xxxx0100	April
xxxx0101	May
xxxx0110	June
xxxx0111	July
xxxx1000	August
xxxx1001	September
xxxx1010	October
xxxx1011	November
xxxx1100	December
xxxx1101	Monthly program
xxxx1110	Monthly program
xxxx1111	Monthly program

<i>Contents byte6</i>	<i>Contents byte4</i>	<i>Description</i>
00xxxxxx	0000xxxx	Never
00xxxxxx	0001xxxx	Day 1 of the month
00xxxxxx	0010xxxx	Day 2 of the month
...	...	...
01xxxxxx	1111xxxx	Day 31 of the month
10xxxxxx	0000xxxx	Never
10xxxxxx	0001xxxx	Every Monday
10xxxxxx	0010xxxx	Every Tuesday
...	...	...
10xxxxxx	0111xxxx	Every Sunday
10xxxxxx	1000xxxx	Every weekend (sa & su)
10xxxxxx	1001xxxx	Every working day (mo...fr)
10xxxxxx	1010xxxx	Every day except Sunday
10xxxxxx	1011xxxx	Every day
10xxxxxx	1100xxxx	Never
...	...	...
11xxxxxx	1111xxxx	Never

DATABYTE5 = Program step hour & group number

<i>Contents</i>	<i>Description</i>
xxx00000	0h
xxx00001	1h
...	...
xxx10111	23h
xx1xxxxx	Program group 1 (Summer program)
x1xxxxxx	Program group 2 (Winter program)

1xxxxxxx	Program group 3 (Holiday program)
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DATABYTE6 = Program step minute & every flag & msb of day

<i>Contents</i>	<i>Description</i>
xx000000	0min
xx000001	1min
...	...
xx111011	59min

<i>Contents byte6</i>	<i>Contents byte4</i>	<i>Description</i>
00xxxxxx	0000xxxx	Never
00xxxxxx	0001xxxx	Day 1of the month
00xxxxxx	0010xxxx	Day 2of the month
...	...	...
01xxxxxx	1111xxxx	Day 31of the month
10xxxxxx	0000xxxx	Never
10xxxxxx	0001xxxx	Every Monday
10xxxxxx	0010xxxx	Every Tuesday
...	...	...
10xxxxxx	0111xxxx	Every Sunday
10xxxxxx	1000xxxx	Every weekend (sa & su)
10xxxxxx	1001xxxx	Every working day (mo...fr)
10xxxxxx	1010xxxx	Every day except Sunday
10xxxxxx	1011xxxx	Every day
10xxxxxx	1100xxxx	Never
...	...	...
11xxxxxx	1111xxxx	Never

DATABYTE7 = Program step action

<i>Contents</i>	<i>Action</i>
0	0s25 Pulse (only allowed for button channels)
1	1s Pulse (only allowed for button channels)
2	2s Pulse (only allowed for button channels)
...	...
119	1min59s Pulse (only allowed for button channels)
120	2min Pulse (only allowed for button channels)
121	2min15s Pulse (only allowed for button channels)
...	...
131	4min45s Pulse (only allowed for button channels)
132	5min Pulse (only allowed for button channels)
133	5min30s Pulse (only allowed for button channels)
...	...
181	29min30s Pulse (only allowed for button channels)
182	30min Pulse (only allowed for button channels)
183	31min Pulse (only allowed for button channels)
...	...
211	59min Pulse (only allowed for button channels)
212	1h Pulse (only allowed for button channels)
213	1h15min Pulse (only allowed for button channels)
...	...
227	4h45min Pulse (only allowed for button channels)
228	5h Pulse (only allowed for button channels)
229	5h30min Pulse (only allowed for button channels)
...	...
237	9h30min Pulse (only allowed for button channels)
238	10h Pulse (only allowed for button channels)
239	11h Pulse (only allowed for button channels)
...	...
246	18h Pulse (only allowed for button channels)
247	Press (only allowed for button channels)
248	Long Press (only allowed for button channels)
249	Release (only allowed for button channels)

250	Lock
251	Unlock
252	Thermostat safe mode (only allowed for temperature sensor channel)
253	Thermostat night mode (only allowed for temperature sensor channel)
254	Thermostat day mode (only allowed for temperature sensor channel)
255	Thermostat comfort mode (only allowed for temperature sensor channel)

DATABYTE8 = Channel

Contents	Channel
1	Button 1
2	Button 2
3	Button 3
4	Button 4
5	Twilight (light/dark) channel (only lock/unlock action)
6	Motion channel (only lock/unlock action)
7	Light depending motion channel (only lock/unlock action)
8	Absence channel (only lock/unlock action)
9	Temperature sensor (only lock/unlock & thermostat actions)
18	Open collector output (only lock/unlock action)



***‘Linked push button status’ received:***

SID10-SID9 = 00 (highest priority)  
 SID8...SID1 = Address of the linked push button module  
 RTR = 0  
 DLC3...DLC0 = 4 data bytes received  
 DATABYTE1 = COMMAND\_PUSH\_BUTTON\_STATUS (0x00)  
 DATABYTE2 = Linked push buttons just pressed (1 = just pressed)  
 DATABYTE3 = Linked push buttons just released (1 = just released)  
 DATABYTE4 = linked push buttons long pressed (1 = longer than 0.85s pressed)

***‘Power up message’ received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 2 data byte received  
 DATABYTE1 = COMMAND\_POWER\_UP (0xAB)  
 DATABYTE2 = module address

***‘CAN FD enable command’ received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 2 data byte received  
 DATABYTE1 = COMMAND\_SET\_CLR\_LEARN\_RF\_CODE (0xB5)  
 DATABYTE2 = enable/disable (0 = disable CAN FD / 1 = enable CAN FD)

***‘Real time clock status request’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 1 data byte to send  
 DATABYTE1 = COMMAND\_REALTIME\_CLOCK\_STATUS\_REQUEST (0xD7)

***‘Set real time clock’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 4 data bytes received  
 DATABYTE1 = COMMAND\_SET\_REALTIME\_CLOCK (0xD8)  
 DATABYTE2 = Day of week

<b><i>Contents day of week’</i></b>	<b><i>Description</i></b>
H’00’	Monday
H’01’	Tuesday
H’02’	Wednesday
H’03’	Thursday
H’04’	Friday
H’05’	Saturday
H’06’	Sunday

DATABYTE3 = Hours (0...23)  
 DATABYTE4 = Minutes (0...59)

***‘Set date’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 5 data bytes received  
 DATABYTE1 = COMMAND\_SET\_REALTIME\_DATE (0xB7)  
 DATABYTE2 = Day (1...31)  
 DATABYTE3 = Month (1...12)  
 DATABYTE4 = High byte of Year  
 DATABYTE5 = Low byte of Year

***‘Set daylight savings’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 2 data bytes received  
 DATABYTE1 = COMMAND\_SET\_DAYLIGHT\_SAVING (0xAF)  
 DATABYTE2 = 0 = disabled / 1 = enabled

***‘Enable/disable global sunrise/sunset related actions’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 3 data bytes received  
 DATABYTE1 = COMMAND\_ENA\_DIS\_SUNRISE\_SUNSET (0xAE)  
 DATABYTE2 = Channel (0xFF)  
 DATABYTE3 = enable/disable flags

<b><i>Contents</i></b>	<b><i>Description</i></b>
B'xxxxxxxx0'	Disable sunrise related actions
B'xxxxxxxx1'	Enable sunrise related actions
B'xxxxxx0x'	Disable sunset related actions
B'xxxxxx1x'	Enable sunset related actions

***‘Enable/disable local sunrise/sunset related actions’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 3 data bytes received  
 DATABYTE1 = COMMAND\_ENA\_DIS\_SUNRISE\_SUNSET (0xAE)  
 DATABYTE2 = Channel (0xFF)  
 DATABYTE3 = enable/disable flags

<b><i>Contents</i></b>	<b><i>Description</i></b>
B'xxxxxxxx0'	Disable sunrise related actions
B'xxxxxxxx1'	Enable sunrise related actions
B'xxxxxx0x'	Disable sunset related actions
B'xxxxxx1x'	Enable sunset related actions

***‘Set global clock alarm’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = 0x00  
 RTR = 0  
 DLC3...DLC0 = 7 data bytes received  
 DATABYTE1 = COMMAND\_SET\_ALARM\_CLOCK (0xC3)  
 DATABYTE2 = Alarm number (1 or 2)  
 DATABYTE3 = Wake up hour (0...23)  
 DATABYTE4 = Wake up minute (0...59)  
 DATABYTE5 = Go to bed hour (0...23)  
 DATABYTE6 = Go to bed minute (0...59)  
 DATABYTE7 = Clock alarm enable flag (0 = disabled / 1 = enabled)

***‘Set local clock alarm’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = Module address  
 RTR = 0  
 DLC3...DLC0 = 7 data bytes received  
 DATABYTE1 = COMMAND\_SET\_ALARM\_CLOCK (0xC3)  
 DATABYTE2 = Alarm number (1 or 2)  
 DATABYTE3 = Wake up hour (0...23)  
 DATABYTE4 = Wake up minute (0...59)  
 DATABYTE5 = Go to bed hour (0...23)  
 DATABYTE6 = Go to bed minute (0...59)  
 DATABYTE7 = Clock alarm enable flag (0 = disabled / 1 = enabled)

***‘Module type request’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 1  
DLC3...DLC0 = 0 data bytes received

***‘Module status request’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_MODULE\_STATUS\_REQUEST (0xFA)  
DATABYTE2 = don't care

***‘Channel name request’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_CHANNEL\_NAME\_REQUEST (0xEF)  
DATABYTE2 = channel number 1...4, 9 or 18 (9 for temperature sensor name, 18 for output name)

Remark: channel = 0xFF for all 4 channel names, temperature sensor name & output channel name

***‘Light value request’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes to send  
DATABYTE1 = COMMAND\_LIGHT\_VALUE\_REQUEST (H'AA')  
DATABYTE2 = Auto send interval time into seconds  
(valid range: 10...255s)  
(5...9 = auto send on change)  
(1...4 = auto send disabled)  
(0 = no change on auto send interval time)

***‘Set or Clear test mode’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_SET\_CLR\_LEARN\_MODE (H'B5')  
DATABYTE2 = Operating mode

<i>Contents</i>	<i>Operating mode</i>
0x00	Normal
0x01	Touch test mode
0x02	PIR sensor test mode

Remark:

After changing the operating mode, the module sends his status.  
There is a timeout of 30 minutes for the test mode.

***‘Clear channel LED’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Linked module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_CLEAR\_LED (0xF5)  
DATABYTE2 = LEDs to clear (a one clears the corresponding LED of channel 1 to 8)

***‘Clear channel LED’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_CLEAR\_LED (0xF5)  
DATABYTE2 = LEDs to clear (a one clears the corresponding LED of channel 1 to 8)

***‘Set channel LED’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_SET\_LED (0xF6)  
DATABYTE2 = LEDs to set (a one sets the corresponding LED of channel 1 to 8)

***‘Slow blink channel LED’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_SLOW\_BLINK\_LED (0xF7)  
DATABYTE2 = LEDs to blink slow (a one blinks slow the corresponding LED of channel 1 to 8)

***‘Fast blink channel LED’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_FAST\_BLINK\_LED (0xF8)  
DATABYTE2 = LEDs to blink fast (a one blinks fast the corresponding LED of channel 1 to 8)

***‘Very fast blink channel LED’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_VERY\_FAST\_BLINK\_LED (0xF9)  
DATABYTE2 = LEDs to blink very fast (a one blinks very fast the corresponding LED of channel 1 to 8)

***‘Update channel LEDs’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 4 data bytes received  
DATABYTE1 = COMMAND\_UPDATE\_LED\_STATUS (0xF4)  
DATABYTE2 = LEDs to set (a one sets the corresponding LED of channel 1 to 8)  
DATABYTE3 = LEDs to blink slow (a one blinks slow the corresponding LED of channel 1 to 8)  
DATABYTE4 = LEDs to blink fast (a one blinks very fast the corresponding LED of channel 1 to 8)

Remark:

The ‘LEDs to set’ status overrides the blinking modes.  
Very fast blinking if slow & fast blinking are set.

***‘Read data from memory’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 3 data bytes received  
DATABYTE1 = COMMAND\_READ\_DATA\_FROM\_MEMORY (0xFD)  
DATABYTE2 = High memory address  
DATABYTE3 = LOW memory address

Remark: address range: 0x0000 to 0x06BB

***‘Read data block from memory’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 3 data bytes received / 4 data bytes for CAN FD response  
DATABYTE1 = COMMAND\_READ\_MEMORY\_BLOCK (0xC9)  
DATABYTE2 = High memory address  
DATABYTE3 = LOW memory address  
DATABYTE4 = memory block length (5...60)

Remark:

address range: 0x0000 to 0x06B8

address range: 0x0000 to (0x06BC – memory block length) for CAN FD response

***‘Memory dump request’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 1 data bytes received  
DATABYTE1 = COMMAND\_MEMORY\_DUMP\_REQUEST (0xCB)

***‘Write data to memory’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 4 data bytes received  
DATABYTE1 = COMMAND\_WRITE\_DATA\_TO\_MEMORY (0xFC)  
DATABYTE2 = High memory address  
DATABYTE3 = LOW memory address  
DATABYTE4 = memory data to write

Remark:

Wait at least 10ms for sending a next command on the velbus.

Address range: 0x0000 to 0x06BB

Terminate always with a write command at the last memory location.

***‘Write memory block’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 7 data bytes received  
DATABYTE1 = COMMAND\_WRITE\_MEMORY\_BLOCK (0xCA)  
DATABYTE2 = High memory address  
DATABYTE3 = LOW memory address  
DATABYTE4 = memory databyte1 to write  
DATABYTE5 = memory databyte2 to write  
DATABYTE6 = memory databyte3 to write  
DATABYTE7 = memory databyte4 to write

Or

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Address of the module

RTR = 0

DLC3...DLC0 = number of data bytes to send

<i>Contents</i>	<i>Number of data bytes</i>
0x09	12 data bytes
0x0A	16 data bytes
0x0B	20 data bytes
0x0C	24 data bytes
0x0D	32 data bytes
0x0E	48 data bytes
0x0F	64 data bytes

DATABYTE1 = COMMAND\_WRITE\_MEMORY\_BLOCK (0xCA)

DATABYTE2 = High memory address

DATABYTE3 = LOW memory address  
 DATABYTE4 = memory block length (5...60)  
 DATABYTE5 = memory data 1 to write  
 ...  
 DATABYTE12 = memory data 8 to write (end of data for DLC3...DLC0 = 0x09)  
 ...  
 DATABYTE16 = memory data 12 to write (end of data for DLC3...DLC0 = 0x0A)  
 ...  
 DATABYTE20 = memory data 16 to write (end of data for DLC3...DLC0 = 0x0B)  
 ...  
 DATABYTE24 = memory data 20 to write (end of data for DLC3...DLC0 = 0x0C)  
 ...  
 DATABYTE32 = memory data 28 to write (end of data for DLC3...DLC0 = 0x0D)  
 ...  
 DATABYTE48 = memory data 44 to write (end of data for DLC3...DLC0 = 0x0E)  
 ...  
 DATABYTE64 = memory data 60 to write (end of data for DLC3...DLC0 = 0x0F)

Remark:

Wait for 'memory data block' feedback before sending a next command on the velbus.

address range: 0x0000 to 0x06B8 for standard CAN response

address range: 0x0000 to (0x06BC – memory block length) for CAN FD response

Contents of unused data bytes = 0x55

Terminate always with a write command at the last memory location.

***'Bus error counter status request' command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 1 data byte received

DATABYTE1 = COMMAND\_BUS\_ERROR\_COUNTER\_STATUS\_REQUEST (H'D9')

***'Unlock channel' command received:***

SID10-SID9 = 00 (highest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 2 data bytes received

DATABYTE1 = COMMAND\_CANCEL\_FORCED\_OFF (0x13)

DATABYTE2 = Channel number 1...8, 9 or 18 (9 for temperature sensor, 18 for open collector output)

Remark: channel number = 0xFF for all channels

***'Lock channel' command received:***

SID10-SID9 = 00 (highest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 5 data bytes received

DATABYTE1 = COMMAND\_FORCED\_OFF (0x12)

DATABYTE2 = Channel number 1...8, 9 or 18 (9 for temperature sensor, 18 for open collector output)

DATABYTE3 = high byte of delay time

DATABYTE4 = mid byte of delay time

DATABYTE5 = low byte of delay time

Remark:

Channel number = 0xFF for all channels

[DATABYTE3][DATABYTE4][DATABYTE5] contain a 24-bit time in seconds

The command will be skipped when the time parameter contains zero.

When the time parameter contains 0xFFFFFFFF then the channel will be permanently locked.

***'Enable Channel Program' command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 2 data bytes received

DATABYTE1 = COMMAND\_ENABLE\_PROGRAM (0xB2)

DATABYTE2 = Channel number 1...8, 9 or 18 (9 for temperature sensor name, 18 for open collector output)

Remark: channel number = 0xFF for all channels

***‘Disable Channel Program’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 5 data bytes received

DATABYTE1 = COMMAND\_DISABLE\_PROGRAM (0xB1)

DATABYTE2 = Channel number 1...8, 9 or 18 (9 for temperature sensor name, 18 for open collector output)

DATABYTE3 = high byte of delay time

DATABYTE4 = mid byte of delay time

DATABYTE5 = low byte of delay time

Remark:

Channel number = 0xFF for all channels

[DATABYTE3][DATABYTE4][DATABYTE5] contain a 24-bit time in seconds

The command will be skipped when the time parameter contains zero.

When the time parameter contains 0xFFFFFFF then the channel program will be permanently disabled.

***‘Select Program’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 2 data bytes received

DATABYTE1 = COMMAND\_SELECT\_PROGRAM (0xB3)

DATABYTE2 = Program mode

<i>Contents</i>	<i>Selected program</i>
0	None
1	Program group 1 (Summer)
2	Program group 2 (Winter)
3	Program group 3 (Holiday)

***‘Sensor temperature request’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 2 data bytes received

DATABYTE1 = COMMAND\_SENSOR\_TEMP\_REQUEST (0xE5)

DATABYTE2 = Auto send time interval into seconds

(Valid range: 10...255s)

(5...9 = auto send on temperature change  $\geq 0.5^{\circ}$ )

(1...4 = auto send disabled)

(0 = no change on auto send interval)

***‘Sensor settings request’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 2 data bytes received

DATABYTE1 = COMMAND\_TEMP\_SENSOR\_SETTINGS\_REQUEST (0xE7)

DATABYTE2 = don't care

***‘Set heating mode’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 2 data bytes received

DATABYTE1 = COMMAND\_SET\_HEATING\_MODE (0xE0)

DATABYTE2 = don't care

***‘Set cooling mode’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_SET\_COOLING\_MODE (0xDF)  
DATABYTE2 = don't care

***‘Set sensor zone number’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_SET\_SENSOR\_ZONE\_NUMBER (0xC5)  
DATABYTE2 = Zone number (0= no zone / 1...7 = valid zone)

***‘Set default sleep time’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 3 data bytes received  
DATABYTE1 = COMMAND\_SET\_DEFAULT\_SLEEP\_TIME (0xE3)  
DATABYTE2 = High byte of the default sleep time  
DATABYTE3 = Low byte of the default sleep time into minutes  
(Valid range 0x0001 to 0xFEFF or 1min to 65.279min)

Remark: Wait at least 20ms for sending a next command on the velbus



**'Set temperature' command received:**

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 3 data bytes received

DATABYTE1 = COMMAND\_SET\_TEMP (0xE4)

DATABYTE2 = Pointer to temperature variable (0...20)

Contents	Temperature variable
0	Current target temperature set
1	Comfort temperature set for heating
2	Day temperature set for heating
3	Night temperature set for heating
4	Safe temperature set for heating
5	Temperature difference for turbo output
6	Hysteresis (0°...15.5°C)
7	Comfort temperature set for cooling
8	Day temperature set for cooling
9	Night temperature set for cooling
10	Safe temperature set for cooling
11	Calibration offset factor (-8°...+7.5°C)
12	Reset minimum/maximum temperature
14	enable/disable anti-block valve/pump
15	Temperature alarm 1 set
16	Temperature alarm 4 set
17	Lower temperature range cool mode
18	Upper temperature range heat mode
21	Minimum switching time
22	Pump delayed on time (0...255 s)
23	Pump delayed off time (0...255 s)
24	Temperature alarm 2 set
25	Temperature alarm 3 set
26	Lower temperature range heat mode
27	Upper temperature range cool mode
28	Calibration gain factor

DATABYTE3 = Temperature set (resolution 0.5°)

Contents	Temperature set
01111111	63.5°C
00101000	20°C
00000010	1°C
00000001	0.5°C
00000000	0°C
11111111	-0.5°C
10010010	-55°C

DATABYTE3 = Reset minimum/maximum temperature

Contents	Reset temperature
xxxxxxx1	Reset minimum temperature
xxxxxxx1x	Reset maximum temperature

DATABYTE3 = Enable/disable unjamming heater valve & pump

Contents	Enable/disable unjamming valve and pump
xxxxxx00	Disable unjamming heater valve & pump
xxxxxx01	Disable unjamming heater valve & enable unjamming pump
xxxxxx10	Enable unjamming heater valve & disable unjamming pump
xxxxxx11	Enable unjamming heater valve & pump

DATABYTE3 = Minimum switching or pump delayed on/off time:

Contents	Operating mode
00000000	No switching time protection
00000001	1 seconds switching time protection
00000010	2 seconds switching time protection

...	...
11111110	254 seconds switching time protection
11111111	255 seconds switching time protection

Remark:

Valid hysteresis range = 0 ...15.5°C

Valid calibration factor range = -8 ...7.5°C

Wait at least 10ms for sending a next command on the velbus.

***‘Switch to comfort mode’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 3 data bytes received

DATABYTE1 = COMMAND\_SWITCH\_TO\_COMFORT\_MODE (0xDB)

DATABYTE2 = High byte of the sleep time

DATABYTE3 = Low byte of the sleep time into minutes

Remark:

If the sleep time contains 0xFF00, the command is a program step.

A sleep time between 0x0001 and 0xFEFF (1 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.

A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore and local control is disabled.

A value of zero for the sleep time cancels the manual mode or sleep timer.

***‘Switch to day mode’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 3 data bytes received

DATABYTE1 = COMMAND\_SWITCH\_TO\_DAY\_MODE (0xDC)

DATABYTE2 = High byte of the sleep time

DATABYTE3 = Low byte of the sleep time into minutes

Remark:

If the sleep time contains 0xFF00, the command is a program step.

A sleep time between 0x0001 and 0xFEFF (1 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.

A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore and local control is disabled.

A value of zero for the sleep time cancels the manual mode or sleep timer.

***‘Switch to night mode’ command received:***

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 3 data bytes received

DATABYTE1 = COMMAND\_SWITCH\_TO\_NIGHT\_MODE (0xDD)

DATABYTE2 = High byte of the sleep time

DATABYTE3 = Low byte of the sleep time into minutes

Remark:

If the sleep time contains 0xFF00, the command is a program step.

A sleep time between 0x0001 and 0xFEFF (1 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.

A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore and local control is disabled.

A value of zero for the sleep time cancels the manual mode or sleep timer.

***‘Switch to safe temperature mode’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 3 data bytes received  
DATABYTE1 = COMMAND\_SWITCH\_TO\_SAFE\_MODE (0xDE)  
DATABYTE7 = High byte of the sleep time  
DATABYTE8 = Low byte of the sleep time into minutes

**Remark:**

If the sleep time contains 0xFF00, the command is a program step.

A sleep time between 0x0001 and 0xFEFF (1 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.

A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore and local control is disabled.

A value of zero for the sleep time cancels the manual mode or sleep timer.

***‘Switch open collector output off’ command received:***

SID10-SID9 = 00 (highest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_SWITCH\_RELAY\_OFF (0x01)  
DATABYTE2 = channel bit = don't care

***‘Switch open collector output on’ command received:***

SID10-SID9 = 00 (highest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 data bytes received  
DATABYTE1 = COMMAND\_SWITCH\_RELAY\_ON (0x02)  
DATABYTE2 = channel bit = don't care

***‘Start open collector timer’ command received:***

SID10-SID9 = 00 (highest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 5 data bytes received  
DATABYTE1 = COMMAND\_START\_RELAY\_TIMER (0x03)  
DATABYTE2 = channel bit = don't care  
DATABYTE3 = high byte of delay time  
DATABYTE4 = mid byte of delay time  
DATABYTE5 = low byte of delay time

**Remark:**

[DATABYTE3][DATABYTE4][DATABYTE5] contain a 24-bit time in seconds

The command will be skipped when the time parameter contains zero.

When the time parameter contains 0xFFFFFFFF then the open collector output are permanently switched on.

***‘Read program step’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 5 data bytes received  
DATABYTE1 = COMMAND\_READ\_PROGRAM\_STEP (0xC0)  
DATABYTE2 = Start program step number (1...66)  
DATABYTE3 = Program group number (1...3)  
DATABYTE4 = Channel number 1...8, 9 or 18 (9 for temperature sensor name, 18 for open collector output)  
DATABYTE5 = Search direction (1 = search for next matched step / 0 = search for previous matched program step)

***‘Write program step’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0

DLC3...DLC0 = 8 data bytes received

DATABYTE1 = COMMAND\_WRITE\_PROGRAM\_STEP (0xC2)

DATABYTE2 = Program step number (1...66)

DATABYTE3 = Program reference

<i>Contents</i>	<i>Description</i>
000xxxxx	Disable program step
001xxxxx	Absolute time
010xxxxx	Wake up time 1 + relative time
011xxxxx	Go to bed time 1 + relative time
100xxxxx	Wake up time 2 + relative time
101xxxxx	Go to bed time 2 + relative time
110xxxxx	Sunrise + relative time
111xxxxx	Sunset + relative time
xxx01111	Rel. time = 3h45min
...	
xxx00001	Rel. time = 15min
xxx00000	Rel. time = 0
xxx11111	Rel. time = -15min
...	
xxx10000	Rel. time = -4h

DATABYTE4 = Program step month & four least significant bits of day

<i>Contents</i>	<i>Description</i>
xxxx0000	Weekly program
xxxx0001	January
xxxx0010	February
xxxx0011	March
xxxx0100	April
xxxx0101	May
xxxx0110	June
xxxx0111	July
xxxx1000	August
xxxx1001	September
xxxx1010	October
xxxx1011	November
xxxx1100	December
xxxx1101	Monthly program
xxxx1110	Monthly program
xxxx1111	Monthly program

<i>Contents byte6</i>	<i>Contents byte4</i>	<i>Description</i>
00xxxxxx	0000xxxx	Never
00xxxxxx	0001xxxx	Day 1 of the month
00xxxxxx	0010xxxx	Day 2 of the month
...	...	...
01xxxxxx	1111xxxx	Day 31 of the month
10xxxxxx	0000xxxx	Never
10xxxxxx	0001xxxx	Every Monday
10xxxxxx	0010xxxx	Every Tuesday
...	...	...
10xxxxxx	0111xxxx	Every Sunday
10xxxxxx	1000xxxx	Every weekend (sa & su)
10xxxxxx	1001xxxx	Every working day (mo...fr)
10xxxxxx	1010xxxx	Every day except Sunday
10xxxxxx	1011xxxx	Every day
10xxxxxx	1100xxxx	Never
...	...	...
11xxxxxx	1111xxxx	Never

DATABYTE5 = Program step hour & group number

<i>Contents</i>	<i>Description</i>
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