# VMBEL1PIR
# VMBEL1PIR-20
# VMBEL2PIR
# VMBEL2PIR-20

**Edge-lit Motion detector with one or two touch button module for VELBUS system**

Binairy format:

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

| ***bits*** | ***Description*** |
|---|---|
| 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
- Set edge custom palette colors
- Set edge color

***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' | Virtual button 1 for VMBELPIR(-20) or button 2 for VMBEL2PIR(-20) |
| B'00000100' | Dark output |
| B'00001000' | Light output |
| B'00010000' | Motion output |
| B'00100000' | Light depending motion 1 output |
| B'01000000' | Light depending motion 2 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 |
| xxxxxx1x | 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 |
| xxxxxx1x | 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 (0x38 = VMBELPIR / 0x53 = VMBEL1PIR-20 / 0x47 = VMBEL2PIR / 0x5C = VMBEL2PIR-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 (0x38 = VMBELPIR / 0x53 = VMBELPIR-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

| *Contents* | *Number of data bytes* |
|---|---|
| 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…2 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…2 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…2 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)

| ***Contents*** | ***Channel number*** |
|---|---|
| B'00000001' | Button 1 |
| B'00000010' | Virtual button 1 for VMBELPIR(-20) or button 2 for VMBEL2PIR(-20) |
| B'00000100' | Dark output |
| B'00001000' | Light output |
| B'00010000' | Motion output |
| B'00100000' | Light depending motion 1 output |
| B'01000000' | Light depending motion 2 output |
| B'10000000' | Absence output |

DATABYTE3 = test modus, button enabled/disable

| ***Contents*** | |
|---|---|
| B'xxxxxxx0' | Button 1 disabled |
| B'xxxxxxx1' | Button 1 enabled |
| B'xxxxxx0x' | Virtual button 1 / button 2 disabled |
| B'xxxxxx1x' | Virtual button 1 / button 2 enabled |
| B'0xxxxxxx' | Motion test modus disabled |
| B'1xxxxxxx' | Motion test modus enabled |

DATABYTE4 = open collector locked & temperature sensor

| ***Contents*** | ***open collector & temperature sensor*** |
|---|---|
| B'xxxx0xxx' | Edge color not inhibited |
| B'xxxx1xxx' | Edge color inhibited |
| B'xxx0xxxx' | Temperature sensor program enabled |
| B'xxx1xxxx' | Temperature sensor program disabled |
| B'xx0xxxxx' | Open collector output program enabled |
| B'xx1xxxxx' | Open collector output program disabled |
| B'x0xxxxxx' | Open collector output unlocked |
| B'x1xxxxxx' | 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 & program selection

| ***Contents*** | ***Selected program*** |
|---|---|
| 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'xxxx0xxx' | Local clock alarm 1 |
| B'xxxx1xxx' | Global clock alarm 1 |
| B'xxx0xxxx' | Clock alarm 2 off |
| B'xxx1xxxx' | Clock alarm 2 on |
| B'xx0xxxxx' | Local clock alarm 2 |
| B'xx1xxxxx' | Global clock alarm 2 |
| B'x0xxxxxx' | Sunrise disabled |
| B'x1xxxxxx' | 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 |
| xxxx1xxx | Auto send sensor temperature enabled |
| xxxx0xxx | 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 |
| xxxx0xxx | No sensor program group 2 |
| xxxx1xxx | 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 |
| xxxx0xxx | Cooler off |
| xxxx1xxx | Cooler on |
| xxx0xxxx | Temperature alarm 1 off |
| xxx1xxxx | Temperature alarm 1 on |
| xx0xxxxx | Temperature alarm 2 off |
| xx1xxxxxx | Temperature alarm 2 on |
| x0xxxxxx | Temperature alarm 3 off |
| x1xxxxxx | Temperature alarm 3 on |
| 0xxxxxxx | Temperature alarm 4 off |
| 1xxxxxxx | 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

| *Contents* | *Description* |
|---|---|
| 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 |

| *Contents byte6* | *Contents byte4* | *Description* |
|---|---|---|
| 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 |

DATABYTE5 = Program step hour & group number

| *Contents* | *Description* |
|---|---|
| xxx00000 | 0h |
| xxx00001 | 1h |
| … | … |
| xxx10111 | 23h |
| xx1xxxxx | Program group 1 (Summer program) |
| x1xxxxxx | Program group 2 (Winter program) |
| 1xxxxxxx | Program group 3 (Holiday program) |

DATABYTE6 = Program step minute & every flag & msb of day

| *Contents* | *Description* |
|---|---|
| xx000000 | 0min |
| xx000001 | 1min |
| … | … |
| xx111011 | 59min |

| *Contents byte6* | *Contents byte4* | *Description* |
|---|---|---|
| 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

| Contents | **Action** |
|---|---|
| 0 | 0s25 Pulse |
| 1 | 1s Pulse |
| 2 | 2s Pulse |
| ... | ... |
| 119 | 1min59s Pulse |
| 120 | 2min Pulse |
| 121 | 2min15s Pulse |
| ... | ... |
| 131 | 4min45s Pulse |
| 132 | 5min Pulse |
| 133 | 5min30s Pulse |
| ... | ... |
| 181 | 29min30s Pulse |
| 182 | 30min Pulse |
| 183 | 31min Pulse |
| ... | ... |
| 211 | 59min Pulse |
| 212 | 1h Pulse |
| 213 | 1h15min Pulse |
| ... | ... |
| 227 | 4h45min Pulse |
| 228 | 5h Pulse |
| 229 | 5h30min Pulse |
| ... | ... |
| 237 | 9h30min Pulse |
| 238 | 10h Pulse |
| 239 | 11h Pulse |
| ... | … |
| 245 | 17h Pulse |
| 246 | Press |
| 247 | Long Press |
| 248 | Release |
| 249 | Lock |
| 250 | Unlock |
| 251 | Set color |
| 252 | Thermostat safe mode |
| 253 | Thermostat night mode |
| 254 | Thermostat day mode |
| 255 | Thermostat comfort mode |

DATABYTE8 = Channel

| Contents | Channel |
|---|---|
| 1 | Button 1 |
| 2 | Virtual button 1 |
| 3 | Dark channel (only lock/unlock action) |

| | |
|---|---|
| 4 | Light channel (only lock/unlock action) |
| 5 | Motion channel (only lock/unlock action) |
| 6 | Light depending motion 1 channel (only lock/unlock action) |
| 7 | Light depending motion 2 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

| ***Contents day of week'*** | ***Description*** |
|---|---|
| H'00' | Monday |
| H'01' | Tuesday |
| H'02' | Wednesday |
| H'03' | Thursday |
| H'04' | Friday |
| H'05' | Saterday |
| 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

| ***Contents*** | ***Description*** |
|---|---|
| B'xxxxxxx0' | Disable sunrise related actions |
| B'xxxxxxx1' | 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

| ***Contents*** | ***Description*** |
|---|---|
| B'xxxxxxx0' | Disable sunrise related actions |
| B'xxxxxxx1' | 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…2 or 18 (9 for temperature sensor name, 18 for output name)

Remark: channel = 0xFF for all 2 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

| *Contents* | *Operating mode* |
|---|---|
| 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

| *Contents* | *Number of data bytes* |
|---|---|
| 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 0xFFFFFF 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 number1…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 0xFFFFFF 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

| *Contents* | *Selected program* |
|---|---|
| 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 >= 0.5°)
(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 |
| xxxxxx1x | 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 0xFFFFFF then the open collector output are permanently switched on.

***'Set Custom Color' command received:***

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 6 data bytes received
DATABYTE1 = COMMAND_SET_PB_BACKLIGHT (0xD4)
DATABYTE2 = custom palette index (0…31)
DATABYTE3 = white/saturation

| ***Contents*** | ***Description*** |
|---|---|
| 0xxxxxxx | RGB-color |
| 1xxxxxxx | White (r=g=b) |
| x0000000 | Minimum saturation |
| ... | … |
| x1111111 | Maximum saturation |

DATABYTE4 = red value (0…255)
DATABYTE5 = green value (0…255)
DATABYTE6 = blue value (0…255)

***'Set Edge Color' command received:***

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_SET_PB_BACKLIGHT (0xD4)
DATABYTE2 = background/feedback color

| ***Contents*** | ***Description*** |
|---|---|
| xxxxxxx0 | do not apply to background color |
| xxxxxxx1 | apply to background color |
| xxxxxx0x | do not apply to continuous feedback color |
| xxxxxx1x | apply to continuous feedback color |
| xxxxx0xx | do not apply to slow blinking feedback color |
| xxxxx1xx | apply to slow blinking feedback color |
| xxxx0xxx | do not apply to fast blinking feedback color |
| xxxx1xxx | apply to fast blinking feedback color |
| 0xxxxxxx | Default color palette |
| 1xxxxxxx | Custom color palette |

DATABYTE3 = Page/edge

| ***Contents*** | ***Description*** |
|---|---|
| xxxxxxx0 | do not apply to left edge |
| xxxxxxx1 | apply to left edge |
| xxxxxx0x | do not apply to top edge |
| xxxxxx1x | apply to top edge |
| xxxxx0xx | do not apply to right edge |
| xxxxx1xx | apply to right edge |
| xxxx0xxx | do not apply to bottom edge |
| xxxx1xxx | apply to bottom edge |
| 0000xxxx | apply to button page 1 (only for feedback light) |
| 0001xxxx | apply to button page 2 (only for feedback light) |
| 0010xxxx | apply to button page 3 (only for feedback light) |
| 0011xxxx | apply to button page 4 (only for feedback light) |
| 0100xxxx | apply to button page 5 (only for feedback light) |
| 0101xxxx | apply to button page 6 (only for feedback light) |
| 0110xxxx | apply to button page 7 (only for feedback light) |
| 0111xxxx | apply to button page 8 (only for feedback light) |
| 1000xxxx | Apply to all button pages (only for feedback light) |
| ... | … |
| 1111xxxx | Apply to all button pages (only for feedback light) |

DATABYTE4 = blink/priority/color palette index

| *Contents* | *Description* |
|---|---|
| 0xxxxxxx | Background not blinking/Feedback not blinking |
| 1xxxxxxx | Background blinking/Feedback blinking |
| x00xxxxx | Default color palette & feedback blinking mode |
| x01xxxxx | Custom color with lowest priority |
| x10xxxxx | Custom color with mid priority |
| x11xxxxx | Custom color with highest priority |
| xxx00000 | Color palette index 0 |
| xxx00001 | Color palette index 1 |
| … | …1 |
| xxx11111 | Color palette index 31 |

***'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 number1…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

| *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

| *Contents* | *Description* |
|---|---|
| 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 |

| ***Contents byte6*** | ***Contents byte4*** | ***Description*** |
|---|---|---|
| 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 |

DATABYTE5 = Program step hour & group number

| ***Contents*** | ***Description*** |
|---|---|
| xxx00000 | 0h |
| xxx00001 | 1h |
| … | … |
| xxx10111 | 23h |
| xx1xxxxx | Program group 1 (Summer program) |
| x1xxxxxx | Program group 2 (Winter program) |
| 1xxxxxxx | Program group 3 (Holiday program) |

DATABYTE6 = Program step minute & msb of day & every flag

| ***Contents*** | ***Description*** |
|---|---|
| xx000000 | 0min |
| xx000001 | 1min |
| … | … |
| xx111011 | 59min |

| ***Contents byte6*** | ***Contents byte4*** | ***Description*** |
|---|---|---|
| 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

| Contents | **Action** |
|---|---|
| 0 | 0s25 Pulse |
| 1 | 1s Pulse |
| 2 | 2s Pulse |
| ... | ... |
| 119 | 1min59s Pulse |
| 120 | 2min Pulse |
| 121 | 2min15s Pulse |
| ... | ... |
| 131 | 4min45s Pulse |
| 132 | 5min Pulse |
| 133 | 5min30s Pulse |
| ... | ... |
| 181 | 29min30s Pulse |
| 182 | 30min Pulse |
| 183 | 31min Pulse |
| ... | ... |
| 211 | 59min Pulse |
| 212 | 1h Pulse |
| 213 | 1h15min Pulse |
| ... | ... |
| 227 | 4h45min Pulse |
| 228 | 5h Pulse |
| 229 | 5h30min Pulse |
| ... | ... |
| 237 | 9h30min Pulse |
| 238 | 10h Pulse |
| 239 | 11h Pulse |
| ... | … |
| 246 | 18h Pulse |
| 247 | Press |
| 248 | Long Press |
| 249 | Release |
| 250 | Lock |
| 251 | Unlock |
| 252 | Thermostat safe mode |
| 253 | Thermostat night mode |
| 254 | Thermostat  day mode |
| 255 | Thermostat comfort mode |

DATABYTE8 = Channel

| Contents | Channel |
|---|---|
| 1 | Channel 1 |
| 2 | Channel 2 |
| 3 | Dark channel (only lock/unlock action) |
| 4 | Light channel (only lock/unlock action) |
| 5 | Motion channel (only lock/unlock action) |
| 6 | Light depending motion 1 channel (only lock/unlock action) |
| 7 | Light depending motion 2 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) |

Remark:
Erase program step if channel parameter is equal with zero.

## Memory map version 4 (Build2320 or higher):

| *Address* | *Contents* | *Address* | *Contents* |
|---|---|---|---|
| 0x0000 | Touch init: main control | 0x0001 | Touch init: sensistivity |
| 0x0002 | Touch init: config 1 | 0x0003 | Touch init: sensor enable |
| 0x0004 | Touch init: sensor config 1 | 0x0005 | Touch init: sensor config 2 |
| 0x0006 | Touch init: average sampling | 0x0007 | Touch init: interrupt enable |
| 0x0008 | Touch init: repeat enable | 0x0009 | Touch init: mtp config |
| 0x000A | Touch init: mtp pattern config | 0x000B | Touch init: mtp pattern |
| 0x000C | Touch init: recal config | 0x000D | Touch init: sensor 1 threshold |
| 0x000E | Touch init: sensor 2 threshold | 0x000F | Touch init: sensor 3 threshold |
| 0x0010 | Touch init: sensor 4 threshold | 0x0011 | Touch init: sensor 5 threshold |
| 0x0012 | Touch init: sensor 6 threshold | 0x0013 | Touch init: sensor 7 threshold |
| 0x0014 | Touch init: sensor 8 threshold | 0x0015 | Touch init: noise threshold |
| 0x0016 | Touch init: standby channel | 0x0017 | Touch init: standby config |
| 0x0018 | Touch init: standby sensitivity | 0x0019 | Touch init: standby threshold |
| 0x001A | Touch init: config 2 | 0x001B | Touch init: not used |
| 0x001C | Channel 1 name character 1 | 0x001D | Channel 1 name character 2 |
| ... | ... | ... | ... |
| 0x002A | Channel 1 name character 15 | 0x002B | Channel 1 name character 16 |
| 0x002C | Channel 1 reaction time | 0x002D | Channel 1 start function |
| 0x002E | Channel 1 end function | 0x002F | Channel 1 mode |
| 0x0030 | Channel 2 name character 1 | 0x0031 | Channel 2 name character 2 |
| ... | ... | ... | ... |
| 0x003E | Channel 2 name character 15 | 0x003F | Channel 2 name character 16 |
| 0x0040 | Channel 2 reaction time | 0x0041 | Channel 2 start function |
| 0x0042 | Channel 2 end function | 0x0043 | Channel 2 mode |
| 0x0044 | Long pressed delay | 0x0045 | Dual function long pressed time |
| 0x0046 | Key beep (1 = enabled) | *0x0047* | *Feedback led brightness for GPx series* |
| 0x0048 | Dark value low byte | 0x0049 | Dark value high byte |
| 0x004A | Light value low byte | 0x004B | Light value high byte |
| 0x004C | Light to dark reaction time (default 1 min) | 0x004D | Dark timer mode = non restartable timer (fixed) |
| 0x004E | Dark timeout (default momentary) | 0x004F | Dark flags:<br>Bit 0: cycling protect non-restartable timer (default on)<br>Bit 1: external overwrite non-restartable timer (default off) |
| 0x0050 | Dark to light reaction time (default 1 min) | 0x0051 | Light timer mode = non restartable timer (fixed) |
| 0x0052 | Light timeout (default momentary) | 0x0053 | Light flags:<br>Bit 0: cycling protect non-restartable timer = off (fixed)<br>Bit 1: external overwrite non-restartable timer (default off) |
| 0x0054 | Motion reaction time = 0 sec (fixed) | 0x0055 | Motion timer mode = restartable timer (fixed) |
| 0x0056 | Motion timeout (default 2 min) | 0x0057 | Motion flags:<br>Bit 0: cycling protect<br>Bit 1: external overwrite restartable timer (default off) |
| 0x0058 | Dark value low byte for light depending motion 1 | 0x0059 | Dark value high byte for light depending motion 1 |
| 0x005A | Light value low byte for light depending motion 1 (0.98*motion 1 dark value) | 0x005B | light value high byte for light depending motion 1 |
| 0x005C | Dark reaction time for light depending motion 1 = 0 sec (fixed) | 0x005D | Dark timer mode for light depending motion 1 = non restartable timer (fixed) |
| 0x005E | Dark timeout for light depending motion 1 = momentary (fixed) | 0x005F | Dark flags for light depending motion 1:<br>Bit 0: cycling protect = off (fixed)<br>Bit 1: external overwrite off (fixed) |
| 0x0060 | Light depending motion 1 reaction time = 0 sec (fixed) | 0x0061 | Light depending motion 1 timer mode = restartable timer (fixed) |
| 0x0062 | Light depending motion 1 timeout (default 2 min) | 0x0063 | Light depending motion 1 flags:<br>Bit 0: cycling protect<br>Bit 1: external overwrite (default off) |
| 0x0064 | Dark value low byte for light depending motion 2 | 0x0065 | Dark value high byte for light depending motion 2 |
| 0x0066 | Light value low byte for light depending motion 2 (0.98*motion 2 dark value) | 0x0067 | Light value high byte for light depending motion 2 |
| 0x0068 | Dark reaction time for light depending motion 2 = 0 sec (fixed) | 0x0069 | Dark timer mode for light depending motion 2 = non restartable timer (fixed) |
| 0x006A | Dark timeout for light depending motion 2 = momentary (fixed) | 0x006B | Dark flags for light depending motion 2:<br>Bit 0: cycling protect = off (fixed)<br>Bit 1: external overwrite off (fixed) |
| 0x006C | Light depending motion 2 reaction time = 0 sec (fixed) | 0x006D | Light depending motion 2 timer mode = restartable timer (fixed) |

| | | | |
|---|---|---|---|
| 0x006E | Light depending motion 2 timeout (default 2 min) | 0x006F | Light depending motion 2 flags:<br>Bit 0: cycling protect<br>Bit 1: external overwrite (default off) |
| 0x0070 | Absence timeout | 0x0071 | Absence output mode |
| 0x0072 | Not used | 0x0073 | Not used |
| 0x0074 | Color time (into seconds) byte 0 | 0x0075 | Color time byte 1 |
| 0x0076 | Color time low byte 2 | 0c0077 | Color time byte 3 |
| 0x0078 | Color palette color 0: saturation (0…127) - white (on/off) | 0x0079 | Color palette color 0: red-value (0…255) |
| 0x007A | Color palette color 0: green-value (0…255) | 0x007B | Color palette color 0: blue-value (0…255) |
| 0x007C | Color palette 0 name character 1 | 0x007D | Color palette 0 name character 2 |
| ... | … | … | … |
| 0x008A | Color palette 0 name character 15 | 0x008B | Color palette 0 name character 16 |
| ... | ... | … | … |
| 0x02E4 | Color palette color 31: saturation (0…127) - white (on/off) | 0x02E5 | Color palette color 31: red-value (0…255) |
| 0x02E6 | Color palette color 31: green-value (0…255) | 0x02E7 | Color palette color 31: blue-value (0…255) |
| 0x02E8 | Color palette 31 name character 1 | 0x02E9 | Color palette 31 name character 2 |
| ... | … | … | … |
| 0x02F6 | Color palette 31 name character 15 | 0x02F7 | Color palette 31 name character 16 |
| 0x02F8 | Left edge dark backlight color (palette 0…31) | 0x02F9 | Top edge dark backlight color (palette 0…31) |
| 0x02FA | Right edge dark backlight color (palette 0…31) | 0x02FB | Bottom edge dark backlight color (palette 0…31) |
| 0x02FC | Left edge backlight color (palette 0…31) | 0x02FD | Top edge backlight color (palette 0…31) |
| 0x02FE | Right edge backlight color (palette 0…31) | 0x02FF | Bottom edge backlight color (palette 0…31) |
| 0x0300 | Left edge continuous feedback color (palette 0…31) | 0x0301 | Top edge continuous feedback color (palette 0…31) |
| 0x0302 | Right edge continuous feedback color (palette 0…31) | 0x0303 | Bottom edge continuous feedback color (palette 0…31) |
| 0x0304 | Left edge slow blinking feedback color (palette 0…31) | 0x0305 | Top edge slow blinking feedback color (palette 0…31) |
| 0x0306 | Right edge slow blinking feedback color (palette 0…31) | 0x0307 | Bottom edge slow blinking feedback color (0…31) |
| 0x0308 | Left edge fast blinking feedback color (palette 0…31) | 0x0309 | Top edge fast blinking feedback color (palette 0…31) |
| 0x030A | Right edge fast blinking feedback color (palette 0…31) | 0x030B | Bottom edge fast blinking feedback color (0…31) |
| 0x030C | Not used | 0x030D | Not used |
| 0x030E | Not used | 0x030F | Alarm clock configuration |
| 0x0310 | Wake up 1 hour (0…23) | 0x0311 | Wake up 1 minutes (0…59) |
| 0x0312 | Go to bed 1 hour (0…23) | 0x0313 | Go to bed 1 minutes (0…59) |
| 0x0314 | Wake up 2 hour (0…23) | 0x0315 | Wake up 2 minutes (0…59) |
| 0x0316 | Go to bed 2 hour (0…23) | 0x0317 | Go to bed 2 minutes (0…59) |
| 0x0318 | Sunrise hour at 21 December (0…23) | 0x0319 | Sunrise minutes at 21 December (0…59) |
| 0x031A | Sunrise 21 January – sunrise 5 January (-128'...127') | 0x031B | Sunrise 5 February – sunrise 21 January (-128'...127') |
| 0x031C | Sunrise 21 February – sunrise 5 February (-128'...127') | 0x031D | Sunrise 5 March – sunrise 21 February (-128'...127') |
| 0x031E | Sunrise 21 March – sunrise 5 March (-128'…127') | 0x031F | Sunrise 5 April – sunrise 21 March (-128'...127') |
| 0x0320 | Sunrise 21 April – sunrise 5 April (-128'…127') | 0x0321 | Sunrise 5 May – sunrise 21 April (-128'...127') |
| 0x0322 | Sunrise 21 May – sunrise 5 May (-128'…127') | 0x0323 | Sunrise 5 June – sunrise 21 May (-128'...127') |
| 0x0324 | Sunrise 21 June – sunrise 5 June (-128'…127') | 0x0325 | Sunrise 5 July – sunrise 21 June (-128'...127') |
| 0x0326 | Sunrise 21 July – sunrise 5 July (-128'…127') | 0x0327 | Sunrise 5 August – sunrise 21 July (-128'...127') |
| 0x0328 | Sunrise 21 August – sunrise 5 August (-128'...127') | 0x0329 | Sunrise 5 September – sunrise 21 August (-128'...127') |
| 0x032A | Sunrise 21 September – sunrise 5 September (-128...127') | 0x032B | Sunrise 5 October – sunrise 21 Sept. (-128'...127') |
| 0x032C | Sunrise 21 October – sunrise 5 October (-128'…127') | 0x032D | Sunrise 5 November – sunrise 21 Oct. (-128'...127') |
| 0x032E | Sunrise 21 November – sunrise 5 November (-128'...127') | 0x032F | Sunrise 5 December – sunrise 21 Nov. (-128'...127') |
| 0x0330 | Sunrise 21 December – sunrise 5 December (-128'...127') | 0x0331 | Sunrise 5 January – sunrise 21 December (-128'...127') |
| 0x0332 | Not used | 0x0333 | Not used |
| 0x0334 | Sunset hour at 21 December (0…23) | 0x0335 | Sunset minutes at 21 December (0…59) |
| 0x0336 | Sunset 21 January – sunset 5 January (-128'...127') | 0x0337 | Sunset 5 February – sunset 21 January (-128'...127') |
| 0x0338 | Sunset 21 February – sunset 5 February (-128'...127') | 0x0339 | Sunset 5 March – sunset 21 February (-128'...127') |
| 0x033A | Sunset 21 March – sunset 5 March (-128'...127') | 0x033B | Sunset 5 April – sunset 21 March (-128'...127') |
| 0x033C | Sunset 21 April – sunset 5 April (-128'...127') | 0x033D | Sunset 5 May – sunset 21 April (-128'...127') |
| 0x033E | Sunset 21 May – sunset 5 May (-128'...127') | 0x033F | Sunset 5 June – sunset 21 May (-128'...127') |
| 0x0340 | Sunset 21 June – sunset 5 June (-128'...127') | 0x0341 | Sunset 5 July – sunset 21 June (-128'...127') |
| 0x0342 | Sunset 21 July – sunset 5 July (-128'...127') | 0x0343 | Sunset 5 August – sunset 21 July (-128'...127') |
| 0x0344 | Sunset 21 August – sunset 5 August (-128'...127') | 0x0345 | Sunset 5 September – sunset 21 August (-128'...127') |
| 0x0346 | Sunset 21 September – sunset 5 September (-128'...127') | 0x0347 | Sunset 5 October – sunset 21 September (-128'...127') |
| 0x0348 | Sunset 21 October – sunset 5 October (-128'...127') | 0x0349 | Sunset 5 November - sunset 21 October (-128'...127') |
| 0x034A | Sunset 21 November – sunset 5 November (-128'...127') | 0x034B | Sunset 5 December - sunset 21 Nov. (-128'...127') |
| 0x034C | Sunset 21 December – sunset 5 December (-128'...127') | 0x034D | Sunset 5 January – sunset 21 December (-128'...127') |
| 0x034E | Not used | 0x034F | Not used |
| 0x0350 | Sensor name character 1 | 0x0351 | Sensor name character 2 |
| ... | ... | ... | ... |
| 0x035E | Sensor name character 15 | 0x035F | Sensor name character 16 |
| 0x0360 | Temp. sensor: zone | 0x0361 | Temp. sensor: calibration offset |
| 0x0362 | Temp. sensor: calibration gain | 0x0363 | Temp. sensor: hysteresis |

| | | | |
|---|---|---|---|
| 0x0364 | Temp. sensor: boost difference | 0x0365 | Temp. sensor: Pump delayed on |
| 0x0366 | Temp. sensor: pump delayed off | 0x0367 | Temp. sensor: min switching time |
| 0x0368 | Temp. sensor: default sleep time byte 0 (low) | 0x0369 | Temp. sensor: default sleep time byte 1 (high) |
| 0x036A | Temp. sensor: default sleep time byte 2 | 0x036B | Temp. sensor: default sleep time byte 3 (msb) |
| 0x036C | Temp. sensor: heater lower temperature range low byte | 0x036D | Temp. sensor: heater lower temperature range high byte |
| 0x036E | Temp. sensor: heater upper temperature range low byte | 0x036F | Temp. sensor: heater lower temperature range high byte |
| 0x0370 | Temp. sensor: heater safe temperature set | 0x0371 | Temp. sensor: heater night temperature set |
| 0x0372 | Temp. sensor: heater day temperature set | 0x0373 | Temp. sensor: heater comfort temperature set |
| 0x0374 | Temp. sensor: cooler lower temperature range low byte | 0x0375 | Temp. sensor: cooler upper temp. range high byte |
| 0x0376 | Temp. sensor: cooler upper temperature range low byte | 0x0377 | Temp. sensor: cooler upper temp. range high byte |
| 0x0378 | Temp. sensor: cooler safe temperature set | 0x0379 | Temp. sensor: cooler night temperature set |
| 0x037A | Temp. sensor: cooler day temperature set | 0x037B | Temp. sensor: cooler comfort temperature set |
| 0x037C | Temp. sensor: alarm 1 temperature set | 0x037D | Temp. sensor: alarm 2 temperature set |
| 0x037E | Temp. sensor: alarm 3 temperature set | 0x037F | Temp. sensor: alarm 4 temperature set |
| 0x0380 | Temp. sensor settings | 0x0381 | Temp. sensor alarm 1 & 2 settings |
| 0x0382 | Temp. sensor alarm 3 & 4 settings | 0x0383 | Not used |
| 0x0384 | Open collector output name character 1 | 0x0385 | Open collector output name character 2 |
| ... | ... | ... | ... |
| 0x0392 | Open collector output name character 15 | 0x0393 | Open collector output name character 16 |

**Remark:**
Unused locations contain H'FF'

***Valid reaction times***

| *Contents* | *Reaction time* |
|---|---|
| 0x01 | immediately (default) |
| 0x0E | 0.1s |
| 0x1C | 1s |
| 0x38 | 2s |
| 0x54 | 3s |
| 0xFF | Channel disabled |

***Channel x start/end function***

| *Contents* | *Function* |
|---|---|
| 1 | Channel 1 (default) |
| 2 | Channel 2 (default) |
| ... | ... |
| 7 | Channel 7 (default) |
| 8 | Channel 8 (default) |

**Remark:**
For a normal one button function, the start and end function channel are the same.
For a multi-function button, the start function channel must be less than the end function. At every press the next channel will be send. When the end function channel is reached, the start channel will be send again at the next press.
For a dual function button, the start function channel will be send at a short press or the end function will be send at a long press.

***Channels mode***

| *Contents* | *Description* |
|---|---|
| B'xxxxxxx0' | Dual function disabled (default) |
| B'xxxxxxx1' | Dual function enabled |
| B'xxxxxx0x' | Multi-function auto reset disabled (default) |
| B'xxxxxx1x' | Multi-function auto reset enabled |
| B'xxxxx0xx' | Led backlight off |
| B'xxxxx1xx' | Led backlight on |
| B'xxxx0xxx' | Led monitor mode |
| B'xxxx1xxx' | Led feedback mode (default) |
| B'xxx0xxxx' | Slow blinking led feedback disabled |
| B'xxx1xxxx' | Slow blinking led feedback enabled (default) |
| B'xx0xxxxx' | Fast blinking led feedback disabled |
| B'xx1xxxxx' | Fast blinking led feedback enabled (default) |
| B'x0xxxxxx' | Very fast blinking led feedback disabled |
| B'x1xxxxxx' | Very fast blinking led feedback enabled (default) |

**Remark:**
When auto reset is enabled, the start function will be loaded again after 3 seconds inactivity of the channel.
For a dual function button, the start function channel will be send at a short press or the end function will be send at a long press.
The dual function overwrites the multi-function mode.

***Valid long pressed delay***

| *Contents* | *Reaction time* |
|---|---|
| 0x17 | 0.8s (default) |
| 0x2E | 1.6s |

***Valid dual function long pressed times***

| *Contents* | *Long pressed time* |
|---|---|
| 0x1C | 1s |
| 0x38 | 2s (default) |
| 0x54 | 3s |

***Feedback led brightness for GPx series***

| *Contents* | *Brightness* |
|---|---|
| *B'xxxx0000'* | *0% Minimum brightness* |
| *B'xxxx0001'* | *7% Minimum brightness* |
| *B'xxxx0010'* | *9% Minimum brightness* |
| *B'xxxx0011'* | *11% Minimum brightness* |
| *B'xxxx0100'* | *14% Minimum brightness* |
| *B'xxxx0101'* | *17% Minimum brightness* |
| *B'xxxx0110'* | *20% Minimum brightness* |
| *B'xxxx0111'* | *23% Minimum brightness* |
| *B'xxxx1000'* | *26% Minimum brightness* |
| *B'xxxx1001'* | *30% Minimum brightness* |
| *B'xxxx1010'* | *35% Minimum brightness* |
| *B'xxxx1011'* | *40% Minimum brightness* |
| *B'xxxx1100'* | *46% Minimum brightness* |
| *B'xxxx1101'* | *53% Minimum brightness* |
| *B'xxxx1110'* | *63% Minimum brightness* |
| *B'xxxx1111'* | *77% Minimum brightness* |
| *B'0000xxxx'* | *7% Maximum brightness* |
| *B'0001xxxx'* | *9% Maximum brightness* |
| *B'0010xxxx'* | *11% Maximum brightness* |
| *B'0011xxxx'* | *14% Maximum brightness* |
| *B'0100xxxx'* | *17% Maximum brightness* |
| *B'0101xxxx'* | *20% Maximum brightness* |
| *B'0110xxxx'* | *23% Maximum brightness* |
| *B'0111xxxx'* | *26% Maximum brightness* |
| *B'1000xxxx'* | *30% Maximum brightness* |
| *B'1001xxxx'* | *35% Maximum brightness* |
| *B'1010xxxx'* | *40% Maximum brightness* |
| *B'1011xxxx'* | *46% Maximum brightness* |
| *B'1100xxxx'* | *53% Maximum brightness* |
| *B'1101xxxx'* | *63% Maximum brightness* |
| *B'1110xxxx'* | *77% Maximum brightness* |
| *B'1111xxxx'* | *100% Maximum brightness* |

***Alarm clock configuration***

| *Contents* | *Channel locked/unlocked* |
|---|---|
| B'xxxxxxx0' | Alarm 1 disabled (default) |
| B'xxxxxxx1' | Alarm 1 enabled |
| B'0xxxxx0x' | Local alarm 1 (default) |
| B'1xxxxx1x' | Global alarm 1 |
| B'xxxxx0xx' | Alarm 2 disabled (default) |
| B'xxxxx1xx' | Alarm 2 enabled |
| B'xxxx0xxx' | Local alarm 2 (default) |
| B'xxxx1xxx' | Global alarm 2 |

| | |
|---|---|
| B'xxx0xxxx' | Sunrise disabled |
| B'xxx1xxxx' | Sunrise enabled (default) |
| B'xx0xxxxx' | Sunset disabled |
| B'xx1xxxxx' | Sunset enabled (default) |
| B'x0xxxxxx' | Day light savings disabled |
| B'x1xxxxxx' | Day light savings enabled (default) |

***Temp. sensor zone***

| *Contents* | *Zone* |
|---|---|
| 0' | No zone |
| 1. | Zone 1... |
| ... | ... |
| 7 | Zone 7 |

***Temperature sensor flags***

| *Contents* | *Description* |
|---|---|
| B'xxxxxxx0' | Pump unjamming disabled (default) |
| B'xxxxxxx1' | Pump unjamming enabled |
| B'xxxxxx0x' | Heater valve unjamming disabled (default) |
| B'xxxxxx1x' | Heater valve unjamming enabled |
| B'xxxxx0xx' | Independent temperature alarms (default) |
| B'xxxxx1xx' | Dependent temperature alarms |

***Temperature sensor calibration offset (resolution 0.5°):***

| Contents | Calibration offset |
|---|---|
| 00001111 | Calibration offset +7.5°C |
| … | … |
| 00000001 | Calibration offset +0.5°C |
| 00000000 | Calibration offset +0°C (default) |
| 11111111 | Calibration offset -0.5°C |
| … | … |
| 11110000 | Calibration offset -8°C |

***Temperature sensor calibration gain:***

| Contents | Calibration gain |
|---|---|
| 0 | Calibration gain |
| … | … |
| 128 | Calibration gain (default) |
| … | … |
| 255 | Calibration gain |

Calibrated Temperature = (gain/128) * sensortemperature + offset

***Temperature sensor hysteresis (resolution 0.5°):***

| Contents | Hysteresis |
|---|---|
| 00011111 | 15.5°C |
| | |
| 00000001 | 0.5°C |
| 00000000 | 0°C |

***Temperature sensor boost difference (resolution 0.5°):***

| Contents | Temperature difference |
|---|---|
| 00010100 | +10°C |
| | |
| 00000001 | +0.5°C |
| 00000000 | 0°C |
| 11111111 | -0.5°C |
| | |
| 11101100 | -10°C |

***Temperature sensor pump delayed on, pump delayed off & valve minimum switching time:***

| Contents | Time |
|---|---|
| 00000000 | 0 |

| | |
|---|---|
| 00000001 | 1 sec |
| 00000010 | 2 sec |
| … | … |
| 11111110 | 254 sec |
| 11111111 | 255 sec |

***Temperature sensor default sleep time into minutes***
valid range 0x0001 to 0xFEFF or 1min to 65.279min

***Temperature sensor lower range, upper range, safe, night, day, comfort or alarm set (resolution 0.5°):***

| Contents | Temperature set |
|---|---|
| 01111000 | 60°C |
| | |
| 00101000 | 20°C |
| | |
| 00000010 | 1°C |
| 00000001 | 0.5°C |
| 00000000 | 0°C |
| 11111111 | -0.5°C |
| | |
| 11000000 | -32°C |

***Temperature sensor Alarm1 & 2 modes***

| ***Contents*** | ***Description*** |
|---|---|
| B'xxxxx000' | Low temperature alarm 1 |
| B'xxxxx001' | High temperature alarm 1 (default) |
| B'xxxxx010' | Anti-frost mode alarm 1 |
| B'xxxxx011' | Night mode alarm 1 |
| B'xxxxx100' | Day mode alarm 1 |
| B'xxxxx101' | Comfort mode alarm 1 |
| B'xxxxx110' | Night, Day or Comfort mode alarm 1 |
| B'xxxxx111' | Day or Comfort mode alarm 1 |
| B'xxxx0xxx' | Temperature alarms 1 absolute (default) |
| B'xxxx1xxx' | Temperature alarms 1 relative |
| B'x000xxxx' | Low temperature alarm 2 |
| B'x001xxxx' | High temperature alarm 2 (default) |
| B'x010xxxx' | Anti-frost mode alarm 2 |
| B'x011xxxx' | Night mode alarm 2 |
| B'x100xxxx' | Day mode alarm 2 |
| B'x101xxxx' | Comfort mode alarm 2 |
| B'x110xxxx' | Night, Day or Comfort mode alarm 2 |
| B'x111xxxx' | Day or Comfort mode alarm 2 |
| B'0xxxxxx' | Temperature alarms 2 absolute (default) |
| B'1xxxxxx' | Temperature alarms 2 relative |

***Temperature sensor Alarm3 & 4 modes***

| ***Contents*** | ***Description*** |
|---|---|
| B'xxxxx000' | Low temperature alarm 3 |
| B'xxxxx001' | High temperature alarm 3 (default) |
| B'xxxxx010' | Anti-frost mode alarm 3 |
| B'xxxxx011' | Night mode alarm 3 |
| B'xxxxx100' | Day mode alarm 3 |
| B'xxxxx101' | Comfort mode alarm 3 |
| B'xxxxx110' | Night, Day or Comfort mode alarm 3 |
| B'xxxxx111' | Day or Comfort mode alarm 3 |
| B'xxxx0xxx' | Temperature alarms 3 absolute (default) |
| B'xxxx1xxx' | Temperature alarms 3 relative |
| B'x000xxxx' | Low temperature alarm 4 |
| B'x001xxxx' | High temperature alarm 4 (default) |
| B'x010xxxx' | Anti-frost mode alarm 4 |

| | |
|---|---|
| B'x011xxxx' | Night mode alarm 4 |
| B'x100xxxx' | Day mode alarm 4 |
| B'x101xxxx' | Comfort mode alarm 4 |
| B'x110xxxx' | Night, Day or Comfort mode alarm 4 |
| B'x111xxxx' | Day or Comfort mode alarm 4 |
| B'0xxxxxxx' | Temperature alarms 4 absolute (default) |
| B'1xxxxxxx' | Temperature alarms 4 relative |

***Color palette saturation - white***

| *Contents* | *Description* |
|---|---|
| B'x0000000' | Minimum saturation (no light) |
| | … |
| B'x1111111' | Maximum saturation |
| B'0xxxxxxx' | RGB-color |
| B'1xxxxxxx' | White (R-value = G-value = B-value) |

***Color palette Red – Green – Blue values***

| *Contents* | *Description* |
|---|---|
| 0 | Minimum color value |
| … | … |
| 255 | Maximum color value |

Remark:
Color palette index 0 is always black (saturation = R = G = B = 0)
Color palette index 31 is same as ambient (saturation = R = G = B = don't care)
The RGB values must be equal for white

***Reaction time (light to dark, dark to light, motion & light depending motion)***

| *Contents* | *Reaction time* |
|---|---|
| 0 | 0s |
| 1 | 1s (factory default for motion & light depending motion) |
| 2 | 2s |
| ... | |
| 59 | 59s |
| 60 | 1min (factory default for light to dark & dark to light) |
| 61 | 1min1s |
| ... | |
| … | |
| 119 | 1min59s |
| 120 | 2min |
| 121 | 2min15s |
| ... | |
| 131 | 4min45s |
| 132 | 5min |
| 133 | 5min30s |
| ... | |
| 181 | 29min30s |
| 182 | 30min |
| 183 | 31min |
| ... | |
| 211 | 59min |
| 212 | 1h |

***Timer mode (dark, light, motion & light depending motion)***

| *Contents* | *Timer mode* |
|---|---|
| 0x00 | non restartable timer (for dark & light) |
| 0xFF | restartable timer (for motion & light depending motion) |

***Timeout (light to dark, dark to light, motion & light depending motion)***

| *Contents* | *Timeout* |
|---|---|
| 0 | 0 = momentary (factory default for dark, light & motion) |

| | |
|---|---|
| 1 | 1s |
| 2 | 2s |
| ... | |
| 119 | 1min59s |
| 120 | 2min (factory default for light depending motion) |
| 121 | 2min15s |
| ... | |
| 131 | 4min45s |
| 132 | 5min |
| 133 | 5min30s |
| ... | |
| 181 | 29min30s |
| 182 | 30min |
| 183 | 31min |
| ... | |
| 211 | 59min |
| 212 | 1h |
| 213 | 1h15min |
| ... | |
| 227 | 4h45min |
| 228 | 5h |
| 229 | 5h30min |
| ... | |
| 237 | 9h30min |
| 238 | 10h |

Absence timeout

| Time parameter | Timeout |
|---|---|
| 60 | 1min |
| 61 | 1min1s |
| 62 | 1min2s |
| ... | |
| 119 | 1min59s |
| 120 | 2min |
| 121 | 2min15s |
| ... | |
| 131 | 4min45s |
| 132 | 5min |
| 133 | 5min30s |
| ... | |
| 152 | 15min (default) |
| ... | |
| 181 | 29min30s |
| 182 | 30min |
| 183 | 31min |
| ... | |
| 211 | 59min |
| 212 | 1h |
| 213 | 1h15min |
| ... | |
| 227 | 4h45min |
| 228 | 5h |
| 229 | 5h30min |
| ... | |
| 237 | 9h30min |
| 238 | 10h |
| 239 | 11h |
| ... | |
| 251 | 23h |
| 252 | 1d |

Absence output mode

| Contents | Absence output mode |
|---|---|
| 0x00 | Momentary (default) |
| 0xFF | 1 second pulse |

***Dark flags***

| *Contents* | *Timer mode* |
|---|---|
| B'xxxxxxx0' | Cycling protection non-restartable timer disabled |
| B'xxxxxxx1' | Cycling protection non-restartable timer enabled (default) |
| B'xxxxxx0x' | External overwrite disabled (default) |
| B'xxxxxx1x' | External overwrite enabled |

***Light flags***

| *Contents* | *Timer mode* |
|---|---|
| B'xxxxxxx0' | Cycling protection non-restartable timer disabled (fixed) |
| B'xxxxxxx1' | Cycling protection non-restartable timer enabled |
| B'xxxxxx0x' | External overwrite disabled (default) |
| B'xxxxxx1x' | External overwrite enabled |

***Motion flags***

| *Contents* | *Timer mode* |
|---|---|
| B'xxxxxxx0' | Cycling protection disabled -> time-out interruptable |
| B'xxxxxxx1' | Cycling protection enabled -> time-out not interruptable |
| B'xxxxxx0x' | External overwrite disabled (default) |
| B'xxxxxx1x' | External overwrite enabled |

***Light depending motion flags***

| *Contents* | *Timer mode* |
|---|---|
| B'xxxxxxx0' | Cycling protection disabled -> time-out interruptable |
| B'xxxxxxx1' | Cycling protection enabled -> time-out not interruptable |
| B'xxxxxx0x' | External overwrite disabled (default) |
| B'xxxxxx1x' | External overwrite enabled |

| *Address* | *Contents* | *Address* | *Contents* |
|---|---|---|---|
| 0x0394 | Links in use byte 0 (LSB) | 0x0395 | Links in use high byte1 |
| 0x0396 | Links in use low byte 2 | 0x0397 | Links in use low byte 3 (MSB) |
| 0x0398 | Linked Push button 1 module address | 0x0399 | Linked Push button 1 bit number |
| 0x039A | Linked Push button 1 action | 0x039B | Linked Push button 1 parameter 1 |
| 0x039C | Linked Push button 1 parameter 2 | ... | … |
| ... | ... | ... | ... |
| … | … | 0x04D3 | Linked Push button 64 address |
| 0x04D4 | Linked Push button 64 bit number | 0x04D5 | Linked Push button 64 action |
| 0x04D6 | Linked Push button 64 parameter 1 | 0x04D7 | Linked Push button 64 parameter 2 |

**Remark:** Unused locations contain 0xFF

Action

| **Action number** | **Action** | **Parameter 1** | **Parameter 2** |
|---|---|---|---|
| 0 | Switch status led indication | - | Channel 1...8 |
| 1 | Lock channel at closed switch | - | Channel 1...8, 9 or 18 |
| 2 | Lock channel at opened switch | - | Channel 1...8, 9 or 18 |
| 3 | Lock channel | Timeout | Channel 1...8, 9or 18 |
| 4 | Lock/unlock channel | Timeout | Channel 1...8, 9 or 18 |
| 5 | Unlock channel | - | Channel 1...8, 9 or 18 |
| 6 | Disable channel program at closed switch | - | Channel 1...8, 9 or 18 |
| 7 | Disable channel program at opened switch | - | Channel 1...8, 9 or 18 |
| 8 | Disable channel program channel | Timeout | Channel 1...8, 9 or 18 |
| 9 | Disable/enable channel program | Timeout | Channel 1...8, 9 or 18 |
| 10 | Enable channel program | - | Channel 1...8, 9 or 18 |
| 11 | Select no programs | - | - |
| 12 | Select program group 1 | - | - |
| 13 | Toggle program group 1 | - | - |
| 14 | Select program group 2 | - | - |
| 15 | Toggle program group 2 | - | - |
| 16 | Select program group 3 | - | - |
| 17 | Toggle program group 3 | - | - |
| 18 | Enable Alarm 1 at closed switch | - | - |
| 19 | Enable Alarm 1 at open switch | - | - |
| 20 | Disable Alarm 1 at closed switch | - | - |
| 21 | Disable Alarm 1 at open switch | - | - |
| 22 | Enable Alarm 1 | - | - |
| 23 | Enable/Disable Alarm 1 | - | - |
| 24 | Disable Alarm 1 | - | - |
| 25 | Enable Alarm 2 at closed switch | - | - |
| 26 | Enable Alarm 2 at open switch | - | - |
| 27 | Disable Alarm 2 at closed switch | - | - |
| 28 | Disable Alarm 2 at open switch | - | - |
| 29 | Enable Alarm 2 | - | - |
| 30 | Enable/Disable Alarm 2 | - | - |
| 31 | Disable Alarm 2 | - | - |
| 32 | Enable Sunrise at closed switch | - | - |
| 33 | Enable Sunrise at open switch | - | - |
| 34 | Disable Sunrise at closed switch | - | - |
| 35 | Disable Sunrise at open switch | - | - |
| 36 | Enable Sunrise | - | - |
| 37 | Enable/Disable Sunrise | - | - |
| 38 | Disable Sunrise | - | - |
| 39 | Enable Sunset at closed switch | - | - |
| 40 | Enable Sunset at open switch | - | - |
| 41 | Disable Sunset at closed switch | - | - |
| 42 | Disable Sunset at open switch | - | - |
| 43 | Enable Sunset | - | - |
| 44 | Enable/Disable Sunset | - | - |
| 45 | Disable Sunset | - | - |
| 46 | Output momentary | - | - |
| 47 | Output off | - | - |
| 48 | Output on | - | - |
| 49 | Output toggle | - | - |
| 50 | Output start/stop timer | timeout | - |

| | | | |
|---|---|---|---|
| 51 | Output restartable timer | timeout | - |
| 52 | Output non retriggerable timer | timeout | - |
| 53 | Output trigger on release timer | timeout | - |
| 54 | Sensor: Comfort mode | Short press sleep time | Long press sleep time |
| 55 | Sensor: Day mode | Short press sleep time | Long press sleep time |
| 56 | Sensor: Night mode | Short press sleep time | Long press sleep time |
| 57 | Sensor: Safe mode | Short press sleep time | Long press sleep time |
| 58 | Sensor: Heating mode | - | - |
| 59 | Sensor: Cooling mode | - | - |
| 60 | Override color at closed switch | Edge | Color number/priority/blink |
| 61 | Override color at open switch | Edge | Color number/priority/blink |
| 62 | Override color | Edge | Color number/priority/blink |
| 63 | Override color timer | Edge | Color number/priority/blink |
| 64 | Undo override color | Edge | - |
| 65 | Set ambient color at closed switch | Edge | Color number/priority/blink |
| 66 | Set ambient color at open switch | Edge | Color number/priority/blink |
| 67 | Set ambient color | Edge | Color number/priority/blink |
| 68 | Set ambient color timer | Edge | Color number/priority/blink |
| 69 | Set ambient default color | Edge | - |
| 70 | Set feedback color at closed switch | Edge | Color number/priority/blink |
| 71 | Set feedback color at open switch | Edge | Color number/priority/blink |
| 72 | Set feedback color | Edge | Color number/priority/blink |
| 73 | Set feedback color timer | Edge | Color number/priority/blink |
| 74 | Set feedback default color | Edge | - |
| 75 | Set continuous feedback color at closed switch | Page/Edge | Color number/priority/blink |
| 76 | Set continuous feedback color at open switch | Page/Edge | Color number/priority/blink |
| 77 | Set continuous feedback color | Page/Edge | Color number/priority/blink |
| 78 | Set continuous feedback color timer | Page/Edge | Color number/priority/blink |
| 79 | Set continuous feedback default color | Page/Edge | - |
| 80 | Set slow blink feedback color at closed switch | Page/Edge | Color number/priority/blink |
| 81 | Set slow blink feedback color at open switch | Page/Edge | Color number/priority/blink |
| 82 | Set slow blink feedback color | Page/Edge | Color number/priority/blink |
| 83 | Set slow blink feedback color timer | Page/Edge | Color number/priority/blink |
| 84 | Set slow blink feedback default color | Page/Edge | - |
| 85 | Set fast blink feedback color at closed switch | Page/Edge | Color number/priority/blink |
| 86 | Set fast blink feedback color at open switch | Page/Edge | Color number/priority/blink |
| 87 | Set fast blink feedback color | Page/Edge | Color number/priority/blink |
| 88 | Set fast blink feedback color timer | Page/Edge | Color number/priority/blink |
| 89 | Set fast blink feedback default color | Page/Edge | - |
| 90 | Sensor: Forced Safe mode at closed switch | - | - |
| 91 | Sensor: Forced Safe mode at open switch | - | - |
| 92 | Sensor: Forced Safe mode | Timeout | - |
| 93 | Sensor: Forced or Cancel Forced Safe mode | Timeout | - |
| 94 | Sensor: Cancel Forced Safe mode | - | - |
| 95 | Toggle override color | Edge | Color number/priority/blink |
| 96 | Inhibit side leds at closed switch | - | - |
| 97 | Inhibit side leds mode at open switch | - | - |
| 98 | Inhibit side leds | Timeout | - |
| 99 | Inhibit side leds or cancel inhibit side leds | Timeout | - |
| 100 | Cancel inhibit side leds | - | - |
| 101 | Reset Absence timer at closed switch | - | - |
| 102 | Output pulse | Timeout (multiple of 10ms) | - |
| 103 | Output logical OR | | |
| 104 | Output logical NOR | | |
| 105 | Output logical AND | | |
| 106 | Output logical NAND | | |
| 107 | Output logical XOR | | |
| 108 | Output logical XNOR | | |
| 109 | Output pulse interval at closed switch | Pulse time (multiple of 10ms) | Pause time (multiple of 10ms) |

Time parameter

| Time parameter | Timeout |
|---|---|
| 0 | 0s (no timer) |
| 1 | 1s |
| 2 | 2s |
| 3 | 3s |
| ... | |

| Sleep time parameter | Action |
|---|---|
| 0 | No action |
| 1 | Select until next program step execution |
| 2 | Select for default sleep time (see sensor config.) |
| 3 | Select for 15 min (auto return to program) |
| 4 | Select for 30 min (auto return to program) |

| | |
|---|---|
| 119 | 1min59s |
| 120 | 2min |
| 121 | 2min15s |
| ... | |
| 131 | 4min45s |
| 132 | 5min |
| 133 | 5min30s |
| ... | |
| 181 | 29min30s |
| 182 | 30min |
| 183 | 31min |
| ... | |
| 211 | 59min |
| 212 | 1h |
| 213 | 1h15min |
| ... | |
| 227 | 4h45min |
| 228 | 5h |
| 229 | 5h30min |
| ... | ... |
| 237 | 9h30min |
| 238 | 10h |
| 239 | 11h |
| ... | |
| 251 | 23h |
| 252 | 1d |
| 253 | 2d |
| 254 | 3d |
| 255 | Infinite |

| | |
|---|---|
| ... | ... |
| 17 | Select for 3h45 min (auto return to program) |
| 18 | Select for 4h min (auto return to program) |
| 19 | Select for 4h30 min (auto return to program) |
| ... | ... |
| 33 | Select for 11h30 min (auto return to program) |
| 34 | Select for 12h (auto return to program) |
| 35 | Select for 13h (auto return to program) |
| ... | ... |
| 45 | Select for 23h (auto return to program) |
| 46 | Select for 1 day (auto return to program) |
| 47 | Select for 1 day 12h (auto return to program) |
| ... | ... |
| 57 | Select for 6 days 12h (auto return to program) |
| 58 | Select for 7 days (auto return to program) |
| 59 | Select for 8 days (auto return to program) |
| ... | ... |
| 96 | Select for 45 days (auto return to program) |
| 97 | Select and ignore all program steps |

Edge parameter

| ***Contents*** | ***Page/edge*** |
|---|---|
| 00000001 | Left edge |
| 00000010 | Top edge |
| 00000100 | Right edge |
| 00001000 | bottom edge |

Blinking/Priority/color palette index

| ***Contents*** | ***Blinking/priority/color*** |
|---|---|
| 0xxxxxxx | Background not blinking/feedback not blinking |
| 1xxxxxxx | Background blinking/feedback blinking |
| x00xxxxx | Default color palette & feedback blinking mode |
| x01xxxxx | Color lowest priority |
| x10xxxxx | Color mid priority |
| x11xxxxx | Color highest priority |
| xxx00000 | Color palette index 0 |
| xxx00001 | Color palette index 1 |
| ... | ... |
| xxx11111 | Color palette index 31 |

Channel

| Contents | Channel |
|---|---|
| 1 | Channel 1 |
| 2 | Channel 2 |
| 3 | Dark channel |
| 4 | Light channel |
| 5 | Motion channel |
| 6 | Light depending motion 1 channel |
| 7 | Light depending motion 2 channel |
| 8 | Absence channel |
| 9 | Temperature sensor |
| 18 | Open collector output (only lock/unlock action) |

| *Address* | *Contents* | *Address* | *Contents* |
|---|---|---|---|
| 0x04D8 | Program steps used byte 0 (LSB) | 0x04D9 | Program steps used byte 1 |
| 0x04DA | Program steps used byte 2 | 0x04DB | Program steps used byte 3 (MSB) |
| 0x04DC | Program step 1 byte1 | 0x04DD | Program step 1 byte2 |
| 0x04DE | Program step 1 byte3 | 0x04DF | Program step 1 byte4 |
| 0x04E0 | Program step 1 byte5 | 0x04E1 | Program step 1 byte6 |
| … | .. | .. | .. |
| 0x066E | Program step 68 byte1 | 0x066F | Program step 68 byte2 |
| 0x0670 | Program step 68 byte3 | 0x0671 | Program step 68 byte4 |
| 0x0672 | Program step 68 byte5 | 0x0673 | Program step 68 byte6 |

| *Contents program byte1* | *Description* |
|---|---|
| B'000xxxxx' | Disable program step |
| B'001xxxxx' | Absolute time |
| B'010xxxxx' | Wake up time 1 + relative time |
| B'011xxxxx' | Go to bed time 1 + relative time |
| B'100xxxxx' | Wake up time 2 + relative time |
| B'101xxxxx' | Go to bed time 2 + relative time |
| B'110xxxxx' | Sunrise + relative time |
| B'111xxxxx' | Sunset + relative time |
| B'xxx01111' | Rel. time = 3h45min |
| … | |
| B'xxx00001' | Rel. time = 15min |
| B'xxx00000' | Rel. time = 0 |
| B'xxx11111' | Rel. time = -15min |
| … | |
| B'xxx10000' | Rel. time = -4h |

**Remark:** Wake up, Go to bed, sunrise & sunset time are only allowed for weekly programs

| *Contents program byte2* | *Description* |
|---|---|
| B'xxxx0000' | Weekly program |
| B'xxxx0001' | January |
| B'xxxx0010' | February |
| B'xxxx0011' | March |
| B'xxxx0100' | April |
| B'xxxx0101' | May |
| B'xxxx0110' | June |
| B'xxxx0111' | July |
| B'xxxx1000' | August |
| B'xxxx1001' | September |
| B'xxxx1010' | October |
| B'xxxx1011' | November |
| B'xxxx1100' | December |
| B'xxxx1101' | Monthly program |
| B'xxxx1110' | Monthly program |
| B'xxxx1111' | Monthly program |

| *Contents program byte3* | *Description* |
|---|---|
| B'xxx00000' | 0h |
| B'xxx00001' | 1h |
| … | … |
| B'xxx10111' | 23h |
| B'xx1xxxxx' | Program group 1 (Summer program) |
| B'x1xxxxx' | Program group 2 (Winter program) |
| B'1xxxxxx' | Program group 3 (Holiday program) |

| *Contents program byte4* | *Description* |
|---|---|
| B'xx000000' | 0min |
| B'xx000001' | 1min |
| … | … |
| B'xx111011' | 59min |

| *Contents program byte4* | *Contents program byte2* | *Description* |
|---|---|---|
| B'00xxxxxx' | B'0000xxxx' | Never |
| B'00xxxxxx' | B'0001xxxx' | Day 1of the month |
| B'00xxxxxx' | B'0010xxxx' | Day 2of the month |
| … | … | … |
| B'01xxxxxx' | B'1111xxxx' | Day 31of the month |
| B'10xxxxxx' | B'0000xxxx' | Never |
| B'10xxxxxx' | B'0001xxxx' | Every Monday |
| B'10xxxxxx' | B'0010xxxx' | Every Tuesday |
| … | … | … |
| B'10xxxxxx' | B'0111xxxx' | Every Sunday |
| B'10xxxxxx' | B'1000xxxx' | Every weekend (sa & su) |
| B'10xxxxxx' | B'1001xxxx' | Every working day (mo…fr) |
| B'10xxxxxx' | B'1010xxxx' | Every day except Sunday |
| B'10xxxxxx' | B'1011xxxx' | Every day |
| B'10xxxxxx' | B'1100xxxx' | Never |
| … | … | … |
| B'11xxxxxx' | B'1111xxxx' | Never |

| *Contents program byte5* | **Action** |
|---|---|
| 0 | 0s25 Pulse (only allowed for button channels CH1 & CH2) |
| 1 | 1s Pulse (only allowed for button channels CH1 & CH2) |
| 2 | 2s Pulse (only allowed for button channels CH1 & CH2) |
| ... | ... |
| 119 | 1min59s Pulse (only allowed for button channels CH1 & CH2) |
| 120 | 2min Pulse (only allowed for button channels CH1 & CH2) |
| 121 | 2min15s Pulse (only allowed for button channels CH1 & CH2) |
| ... | ... |
| 131 | 4min45s Pulse (only allowed for button channels CH1 & CH2) |
| 132 | 5min Pulse (only allowed for button channels CH1 & CH2) |
| 133 | 5min30s Pulse (only allowed for button channels CH1 & CH2) |
| ... | ... |
| 181 | 29min30s Pulse (only allowed for button channels CH1 & CH2) |
| 182 | 30min Pulse (only allowed for button channels CH1 & CH2) |
| 183 | 31min Pulse (only allowed for button channels CH1 & CH2) |
| ... | ... |
| 211 | 59min Pulse (only allowed for button channels CH1 & CH2) |
| 212 | 1h Pulse (only allowed for button channels CH1 & CH2) |
| 213 | 1h15min Pulse (only allowed for button channels CH1 & CH2) |
| ... | ... |
| 227 | 4h45min Pulse (only allowed for button channels CH1 & CH2) |
| 228 | 5h Pulse (only allowed for button channels CH1 & CH2) |
| 229 | 5h30min Pulse (only allowed for button channels CH1 & CH2) |
| ... | ... |
| 237 | 9h30min Pulse (only allowed for button channels CH1 & CH2) |
| 238 | 10h Pulse (only allowed for button channels CH1 & CH2) |
| 239 | 11h Pulse (only allowed for button channels CH1 & CH2) |
| ... | … |
| 246 | 18h Pulse (only allowed for button channels CH1 & CH2) |
| 247 | Press (only allowed for button channels CH1 & CH2) |
| 248 | Long Press (only allowed for button channels CH1 & CH2) |
| 249 | Release (only allowed for button channels CH1 & CH2) |
| 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) |

| *Contents program byte6* | **Channel** |
|---|---|
| 1 | Button 1 |
| 2 | Virtual button 1 |
| 3 | Dark channel (only action 250 & 251 allowed) |
| 4 | Light channel (only action 250 & 251 allowed) |
| 5 | Motion channel (only action 250 & 251 allowed) |
| 6 | Light depending motion 1 channel (only action 250 & 251 allowed) |
| 7 | Light depending motion 2 channel (only action 250 & 251 allowed) |
| 8 | Absence channel (only action 250 & 251 allowed) |
| 9 | Temperature sensor (only action 250…255 allowed) |
| 18 | Open collector output (only action 250 & 251 allowed) |

| *Address* | *Contents* | *Address* | *Contents* |
|---|---|---|---|
| 0x0674 | Location id low byte | 0x0675 | Location id high byte |
| 0x0676 | Group id low byte | 0x0677 | Group id high byte |
| 0x0678 | Module name character 1 | 0x0679 | Module name character 2 |
| … | .. | .. | .. |
| 0x06B6 | Module name character 63 | 0x06B7 | Module name character 64 |
| 0x06B8 | Not used | 0x06B9 | Not used |
| 0x06BA | Not used | 0x06BB | Used for flash writing |