# VMBGPO-20

## Touch panel with Oled display for VELBUS system

Binairy format:

&lt;SOF-SID10...SID0-RTR-IDE-r0-DLC3...0-DATABYTE1...DATABYTEn-CRC15...CRC1-CRCDEL-ACK-ACKDEL-EOF7...EOF1-IFS3...IFS1&gt;

| 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:*
- Channel status
- Sensor output status
- Module status
- Sensor status
- Sensor temperature
- Sensor settings
- Module type and subtype
- Bus error counter status
- First, second and third part of the channel names
- Memory data
- Memory data block (4 bytes)
- Real-time clock status
- Date status
- Daylight savings status
- Program step
- Power up

*The module can transmit the following commands:*
- 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
- Counter status request
- Remote sensor status request
- Remote sensor temperature request
- Remote sensor settings request
- Remote sensor set temperature settings
- Remote sensor set heating mode
- Remote sensor set cooling mode
- Remote sensor set comfort mode
- Remote sensor set day mode
- Remote sensor set night mode
- Remote sensor set safe mode

- Remote sensor set default sleep time
- Remote Analog Sensor readout request

***The module can receive the following messages:***
- Linked push button status
- Power up
- 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
- Counter log dump request
- Counter status
- Write memory data
- Write memory data block (4 bytes)
- 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
- Read program step
- Write program step
- Sensor temperature request
- Sensor settings request
- Set sensor zone
- Set heating mode
- Set cooling mode
- Set default sleep time
- 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 to comfort mode
- Switch to day mode
- Switch to night mode
- Switch to safe temperature mode
- Counter status
- Remote sensor module status
- Remote sensor status
- Remote Sensor temperature

- Remote sensor settings
- Readout of the remote analog sensor
- Memo text
- Switch the open collector output off or on
- Start a timer on the open collector output

*Transmits power up message:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
RTR = 0
DLC3...DLC0 = 2 data byte to send
DATABYTE1 = COMMAND_POWER_UP (0xAB)
DATABYTE2 = module address

*Transmits real time clock status request:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
RTR = 0
DLC3...DLC0 = 1 data byte to send
DATABYTE1 = COMMAND_REALTIME_CLOCK_STATUS_REQUEST (0xD7)

*Transmits the global real time clock status:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
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 global date status:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
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 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, sub-address1, sub-address2 or sub-address3
> 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

*Transmits the sensor output switch status:*
> SID10-SID9 = 00 (highest priority)
> SID8...SID1 = Sub-address 4
> 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 (0x57 = VMBGPO-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 (0x57 = VMBGPO-20)
    DATABYTE3 = High byte of serial number
    DATABYTE4 = Low byte of serial number
    DATABYTE5 = Subaddress1 (0xFF sub-address disabled)
    DATABYTE6 = Subaddress2 (0xFF sub-address disabled)
    DATABYTE7 = Subaddress3 (0xFF sub-address disabled)
    DATABYTE8 = Subaddress4 (0xFF 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 0x4FFF

*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 0x4FFC = memory map


*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 (0x5000 – 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...33 or 42 (channel 33 = temperature sensor name,  42 for output name)
    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…33 or 42 (channel 33 = temperature sensor name, 42 for output name)
    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…33 or 42 (channel 33 = temperature sensor name,  18 for output name)
    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 0xFF.

*Transmits the module status:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address, sub address1, sub address2 or sub address3
    RTR = 0
    DLC3...DLC0 = 8 data bytes to send for master address, 7 data bytes to send for sub addresses
    DATABYTE1 = COMMAND_MODULE_STATUS (0xED)
    DATABYTE2 = channel 1 to 8 status (1 = pressed / 0 = released)
    DATABYTE3 = enabled/disable channel status (1 = enabled / 0 = disabled)
    DATABYTE4 = open collector locked & temperature sensor

| Contents | Display status & open collector |
|---|---|
| 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 | Alarm /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' | Alarm 1 off |
| B'xxxxx1xx' | Alarm 1 on |
| B'xxxx0xxx' | Local alarm 1 |
| B'xxxx1xxx' | Global alarm 1 |
| B'xxx0xxxx' | Alarm 2 off |
| B'xxx1xxxx' | Alarm 2 on |
| B'xx0xxxxx' | Local alarm 2 |
| B'xx1xxxxx' | Global alarm 2 |
| B'x0xxxxxx' | Sunrise disabled |
| B'x1xxxxxx' | Sunrise enabled |
| B'0xxxxxxx' | Sunset disabled |
| B'1xxxxxxx' | Sunset enabled |

DATABYTE8 = oled display status (only for master address)

| Contents | Display status |
|---|---|
| B'xx000000' | Button page 1 |
| … | … |
| B'xx000111' | Button page 8 |
| B'xx001000' | Counter 1 page |
| … | … |
| B'xx001111' | Counter 8 page |
| B'xx010000' | Local temperature page |
| B'xx010001' | Remote temperature 1 page |
| … | … |
| B'xx011100' | Remote temperature 12 page |
| B'xx011101' | Analog sensor 1 page |
| … | … |
| B'xx100000' | Analog sensor 4 page |
| B'xx100001' | Clock  page |
| B'xx100010' | Menu pages |
| B'x0xxxxxx' | Screensaver off |
| B'x1xxxxxx' | Screensaver on |
| B'0xxxxxxx' | Display off |
| B'1xxxxxxx' | Display on |

*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)

*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…170 / 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 (only allowed for button channels) |
| 1 | 1s Pulse (only allowed for button channels) |
| 2 | 2s Pulse (only allowed for button channels) |
| ... | ... |
| 119 | 1min59s Pulse (only allowed for button channels) |
| 120 | 2min Pulse (only allowed for button channels) |
| 121 | 2min15s Pulse (only allowed for button channels) |
| ... | ... |
| 131 | 4min45s Pulse (only allowed for button channels) |
| 132 | 5min Pulse (only allowed for button channels) |
| 133 | 5min30s Pulse (only allowed for button channels) |

| | |
|---|---|
| ... | ... |
| 181 | 29min30s Pulse (only allowed for button channels) |
| 182 | 30min Pulse (only allowed for button channels) |
| 183 | 31min Pulse (only allowed for button channels) |
| ... | ... |
| 211 | 59min Pulse (only allowed for button channels) |
| 212 | 1h Pulse (only allowed for button channels) |
| 213 | 1h15min Pulse (only allowed for button channels) |
| ... | ... |
| 227 | 4h45min Pulse (only allowed for button channels) |
| 228 | 5h Pulse (only allowed for button channels) |
| 229 | 5h30min Pulse (only allowed for button channels) |
| ... | ... |
| 237 | 9h30min Pulse (only allowed for button channels) |
| 238 | 10h Pulse (only allowed for button channels) |
| 239 | 11h Pulse (only allowed for button channels) |
| ... | … |
| 246 | 18h Pulse (only allowed for button channels) |
| 247 | Press (only allowed for button channels) |
| 248 | Long Press (only allowed for button channels) |
| 249 | Release (only allowed for button channels) |
| 250 | Lock |
| 251 | Unlock |
| 252 | Thermostat safe mode (only allowed for temperature sensor channel) |
| 253 | Thermostat night mode (only allowed for temperature sensor channel) |
| 254 | Thermostat  day mode (only allowed for temperature sensor channel) |
| 255 | Thermostat comfort mode (only allowed for temperature sensor channel) |

DATABYTE8 = Channel

| Contents | Channel |
|---|---|
| 1 | Channel 1 |
| 2 | Channel 2 |
| ... | … |
| 31 | Channel 7 |
| 32 | Channel 8 |
| 33 | Temperature sensor |
| 42 | Open collector output |

*Transmit 'counter status request' command:*

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Counter address
RTR = 0
DLC3...DLC0 = 3 data bytes received
DATABYTE1 = COMMAND_ENERGY_COUNTER_STATUS_RQ (0xBD)
DATABYTE2 = counter channel 1 to 8

| *Contents* | *Description* |
|---|---|
| B'xxxxxxx1' | Channel 1 |
| B'xxxxxx1x' | Channel 2 |
| B'xxxxx1xx' | Channel 3 |
| B'xxxx1xxx' | Channel 4 |
| B'xxx1xxxx' | Channel 5 |
| B'xx1xxxxx' | Channel 6 |
| B'x1xxxxxx' | Channel 7 |
| B'1xxxxxxx' | Channel 8 |

DATABYTE3 = auto send interval

     10…255s fixed interval

     5…9 = auto send on change with 5s as minimum interval

     1…4 = auto send on change disabled

     0 = no change on auto send interval

Remark: the auto send interval is common for all channels

*Transmit 'Remote Sensor status request' command:*

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_MODULE_STATUS_REQUEST (0xFA)
DATABYTE2 = don't care

*Transmit 'Remote Sensor temperature request' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 2 data bytes to send
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)

*Transmit 'Remote Sensor settings request' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 2 data bytes to send
DATABYTE1 = COMMAND_TEMP_SENSOR_SETTINGS_REQUEST (0xE7)
DATABYTE2 = don't care

*Transmit 'Remote Sensor Set temperature' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 3 data bytes to send
DATABYTE1 = COMMAND_SET_TEMP (0xE4)
DATABYTE2 = Pointer to temperature variable (0...20)

| Contents | Temperature variable |
|---|---|
| 0 | 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 |
| 7 | Comfort temperature set for cooling |
| 8 | Day temperature set for cooling |
| 9 | Night temperature set for cooling |
| 10 | Safe temperature set for cooling |

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 |

Remark: Wait at least 100ms for sending a next command on the velbus.

*Transmit 'Remote Sensor Set heating mode' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0

DLC3...DLC0 = 2 data bytes to send
DATABYTE1 = COMMAND_SET_HEATING_MODE (0xE0)
DATABYTE2 = don't care


*Transmit 'Remote Sensor Set cooling mode' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 2 data bytes to send
DATABYTE1 = COMMAND_SET_COOLING_MODE (0xDF)
DATABYTE2 = don't care


*Transmit 'Remote Sensor Switch to comfort mode' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 3 data bytes to send
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.


*Transmit 'Remote Sensor Switch to day mode' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 3 data bytes to send
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.


*Transmit 'Remote Sensor Switch to night mode' command:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master Address
RTR = 0
DLC3...DLC0 = 3 data bytes to send
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.

*Transmit 'Remote Sensor Switch to safe temperature mode' command:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Remote Sensor Master Address
    RTR = 0
    DLC3...DLC0 = 3 data bytes to send
    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.

*Transmit 'Set default sleep time' command:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Remote Sensor Master address
    RTR = 0
    DLC3...DLC0 = 3 data bytes to send
    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 100ms for sending a next command on the velbus.

*Transmit 'Remote Analog Sensor readout request' command:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Remote Analog Sensor Address
    RTR = 0
    DLC3...DLC0 = 3 data bytes to send
    DATABYTE1 = COMMAND_SENSOR_TEMP_REQUEST (0xE5)
    DATABYTE2 = VMB4AN remote analog sensor channel
                (9 = analog sensor 1)
                (10 = analog sensor 2)
                (11 = analog sensor 3)
                (12 = analog sensor 4)
             VMBMETEO sensor channel
                (2 = rain sensor 1)
                (4 = light sensor 2)
                (8 = wind sensor 3)
    DATABYTE3 = Auto send time interval into seconds
                (valid range: 10…255s)
                (5…9 = auto send on temperature change)
                (1…4 = auto send disabled)
                (0 = no change on auto send interval)

**'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 bytes 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 received
DATABYTE1 = COMMAND_REALTIME_CLOCK_STATUS_REQUEST (0xD7)

**'Local  real time clock status request' command received:**
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
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…33 or 42 (channel 33 = temperature sensor name, 18 for output name)

    Remark: channel = 0xFF for all 32 channel names, temperature sensor name & output channel name

**'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 | Not valid |
| 0x03 | Oled 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, subaddress1, subaddress2 or subaddress3
    RTR = 0
    DLC3...DLC0 = 2 data bytes received
    DATABYTE1 = COMMAND_CLEAR_LED (0xF5)
    DATABYTE2 = LEDs to clear (a one clears the corresponding LED of the channel)

*'Set channel LED' command received:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address, subaddress1, subaddress2 or subaddress3
    RTR = 0
    DLC3...DLC0 = 2 data bytes received
    DATABYTE1 = COMMAND_SET_LED (0xF6)
    DATABYTE2 = LEDs to set (a one sets the corresponding LED of the channel)

*'Slow blink channel LED' command received:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address, subaddress1, subaddress2 or subaddress3
    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 the channel)

*'Fast blink channel LED' command received:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address, subaddress1, subaddress2 or subaddress3
    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 the channel)

*'Very fast blink channel LED' command received:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address, subaddress1, subaddress2 or subaddress3
    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 the channel)

*'Update channel LEDs' command received:*
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address, subaddress1, subaddress2 or subaddress3
    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 the channel)
    DATABYTE3 = LEDs to blink slow (a one blinks slow the corresponding LED of the channel)
    DATABYTE4 = LEDs to blink fast  (a one blinks very fast the corresponding LED of the channel)

    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 0x4FFF

*'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 0x4FFC
    address range: 0x0000 to (0x5000 – 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 for 'data memory byte' feedback before sending a next command on the velbus.
    Address range: 0x0000 to 0x4FFF
    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 data byte1 to write
    DATABYTE5 = memory data byte2 to write
    DATABYTE6 = memory data byte3 to write
    DATABYTE7 = memory data byte4 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 0x4FFC for standard CAN response
address range: 0x0000 to (0x5000 – 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 bytes received
    DATABYTE1 = COMMAND_BUS_ERROR_COUNTER_STATUS_REQUEST (0xD9)


**'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…32, 33 or 42 (33 for temperature sensor, 42 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…32, 33 or 42 (33 for temperature sensor, 42 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…32, 33 or 42 (33 for temperature sensor, 42 for open collector output)

    Remark: channel number = 0xFF for all channels

**'Disable Channel Program' command received:**
    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address
    RTR = 0
    DLC3...DLC0 = 5 data bytes received
    DATABYTE1 = COMMAND_DISABLE_PROGRAM (0xB1)
    DATABYTE2 = Channel number 1…32, 33 or 42 (33 for temperature sensor, 42 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 | Group 1 (Summer) |
| 2 | Group 2 (Winter) |
| 3 | 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 (H'E3')
    DATABYTE2 = High byte of the default sleep time
    DATABYTE3 = Low byte of the default sleep time into minutes
                  (valid range H'0001' to H'FEFF' 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 | 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 |

| | |
|---|---|
| 23 | Pump delayed off time |
| 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 time:

| Contents | Operating mode |
|---|---|
| 00000000 | No switching time protection |
| 00000001 | 1 minute switching time protection |
| 00000010 | 2 minute switching time protection |
| … | … |
| 11111110 | 254 minute switching time protection |
| 11111111 | Default 1 minute 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.

**'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…162)
    DATABYTE3 = Program group number (1…3)
    DATABYTE4 = Channel number1…32,33 or 42 (33 for temperature sensor name, 42 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…170)
    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 (only allowed for button channels) |
| 1 | 1s Pulse (only allowed for button channels) |
| 2 | 2s Pulse (only allowed for button channels) |
| ... | ... |
| 119 | 1min59s Pulse (only allowed for button channels) |
| 120 | 2min Pulse (only allowed for button channels) |
| 121 | 2min15s Pulse (only allowed for button channels) |
| ... | ... |
| 131 | 4min45s Pulse (only allowed for button channels) |
| 132 | 5min Pulse (only allowed for button channels) |
| 133 | 5min30s Pulse (only allowed for button channels) |
| ... | ... |
| 181 | 29min30s Pulse (only allowed for button channels) |
| 182 | 30min Pulse (only allowed for button channels) |
| 183 | 31min Pulse (only allowed for button channels) |
| ... | ... |
| 211 | 59min Pulse (only allowed for button channels) |
| 212 | 1h Pulse (only allowed for button channels) |
| 213 | 1h15min Pulse (only allowed for button channels) |
| ... | ... |
| 227 | 4h45min Pulse (only allowed for button channels) |
| 228 | 5h Pulse (only allowed for button channels) |
| 229 | 5h30min Pulse (only allowed for button channels) |
| ... | ... |
| 237 | 9h30min Pulse (only allowed for button channels) |
| 238 | 10h Pulse (only allowed for button channels) |
| 239 | 11h Pulse (only allowed for button channels) |
| ... | … |
| 246 | 18h Pulse (only allowed for button channels) |
| 247 | Press (only allowed for button channels) |
| 248 | Long Press (only allowed for button channels) |
| 249 | Release (only allowed for button channels) |
| 250 | Lock |
| 251 | Unlock |
| 252 | Thermostat safe mode (only allowed for temperature sensor channel) |
| 253 | Thermostat night mode (only allowed for temperature sensor channel) |
| 254 | Thermostat  day mode (only allowed for temperature sensor channel) |
| 255 | Thermostat comfort mode (only allowed for temperature sensor channel) |

DATABYTE8 = Channel

| Contents | Channel |
|----------|---------|
| 1 | Channel 1 |
| 2 | Channel 2 |
| ... | … |
| 7 | Channel 7 |
| 8 | Channel 8 |
| 9 | Temperature sensor |
| 18 | Open collector output |

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

**'Counter status' command received:**

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Counter Module address
RTR = 0
DLC3...DLC0 = 8 data bytes received
DATABYTE1 = COMMAND_ENERGY_COUNTER_STATUS (0xBE)
DATABYTE2 = counter channel 1 to 4 & number of pulses/Unit (kWh-l-m$^3$) divide by 100

| Contents | Description |
|---|---|
| B'xxxxxx00' | Channel 1 |
| B'xxxxxx01' | Channel 2 |
| B'xxxxxx10' | Channel 3 |
| B'xxxxxx11' | Channel 4 |
| B'000001xx' | 100 pulses/Unit |
| B'000010xx' | 200 pulses/Unit |
| … | … |
| B'001000xx' | 800 pulses/Unit |
| … | … |
| B'001010xx' | 1000 pulses/Unit |
| … | … |
| B'010100xx' | 2000 pulses/Unit |
| … | … |
| B111111xx' | 6300 pulses/Unit |

DATABYTE3 = most significant byte of pulse counter
DATABYTE4 = upper byte of pulse counter
DATABYTE5 = high byte of pulse counter
DATABYTE6 = low byte of pulse counter
DATABYTE7 = high byte of period in ms between 2 pulses
DATABYTE8 = low byte of period in ms between 2 pulses

Remark:  a period counter contents of 0xFFFF means overflow
Counter pulses in Units (kWh-l-m$^3$) = DATABYTE[3…6] / (DATABYTE2[pulses/Unit factor] * Multiplier)
Power in W = 1000 * 1000 * 3600 / (DATABYTE[7..8] * DATABYTE2[pulses/Unit factor] * Multiplier)

**'Counter value' command received:**

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 8 databytes to send
DATABYTE1 = COMMAND_COUNTER_VALUE (0xA4)
DATABYTE2 = counter channel 1 to 8 & value index

| Contents | Description |
|---|---|
| B'0000xxxx' | Counter channel 1 |
| … | |
| B'0111xxxx' | Counter channel 8 |
| B'xxxxbbbb' | Highest nibble (bits 19…16) of Power |

DATABYTE3 = high byte of power
DATABYTE4 = low byte of power
DATABYTE5 = most significant byte of energy counter
DATABYTE6 = upper byte of energy counter
DATABYTE7 = high byte of energy counter
DATABYTE8 = low byte of energy counter

**'Counter status request' command received:**

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Counter address
RTR = 0
DLC3...DLC0 = 3 data bytes received
DATABYTE1 = COMMAND_ENERGY_COUNTER_STATUS_RQ (0xBD)
DATABYTE2 = counter channel 1 to 8

| Contents | Description |
|----------|-------------|
| B'xxxxxxx1' | Channel 1 |
| B'xxxxxx1x' | Channel 2 |
| B'xxxxx1xx' | Channel 3 |
| B'xxxx1xxx' | Channel 4 |
| B'xxx1xxxx' | Channel 5 |
| B'xx1xxxxx' | Channel 6 |
| B'x1xxxxxx' | Channel 7 |
| B'1xxxxxxx' | Channel 8 |

DATABYTE3 = auto send interval
        10…255s fixed interval
        5…9 = auto send on change with 5s as minimum interval
        1…4 = auto send on change disabled
        0 = no change on auto send interval

Remark: the auto send interval is common for all channels

**'Load counter' command received:**

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Counter address
RTR = 0
DLC3...DLC0 = 7 data bytes received
DATABYTE1 = COMMAND_RESET_COUNTER (0xAD)
DATABYTE2 = counter channel 1 to 8

| Contents | Description |
|----------|-------------|
| 0 | Counter 1 |
| 1 | Counter 2 |
| 2 | Counter 3 |
| 3 | Counter 4 |
| 4 | Counter 5 |
| 5 | Counter 6 |
| 6 | Counter 7 |
| 7 | Counter 8 |

DATABYTE3 = don't care
DATABYTE4 = highest byte of 32-bit counter value
DATABYTE5 = third byte of 32-bit counter value
DATABYTE6 = second byte of 32-bit counter value
DATABYTE7 = lowest byte of 32-bit counter value

**Remote sensor module status received:**

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master address
RTR = 0
DLC3...DLC0 = 7 data bytes to send or 8 data bytes received
DATABYTE1 = COMMAND_MODULE_STATUS (0xED)
DATABYTE2 = channel 1 to 8 status (1 = pressed / 0 = released)
DATABYTE3 = enabled/disable channel status (1 = enabled / 0 = disabled)
DATABYTE4 = normal or inverted mode for VMBGPx
DATABYTE4 = open collector locked & temperature sensor for VMBELx

| Contents | open collector & temperature sensor |
|---|---|
| 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 = oled display status for VMBELO

| Contents | Display status |
|---|---|
| B'xx000000' | Button page 1 |
| … | … |
| B'xx000111' | Button page 8 |
| B'xx001000' | Counter 1 page |
| … | … |
| B'xx001011' | Counter 4 page |
| B'xx001100' | Local temperature page |
| B'xx001101' | Remote temperature 1 page |
| … | … |
| B'xx011000' | Remote temperature 12 page |
| B'xx011001' | Analog sensor 1 page |
| … | … |
| B'xx011100' | Analog sensor 4 page |
| B'xx011101' | Clock  page |
| B'xx1xxxxx' | Menu pages |
| B'x0xxxxxx' | Screensaver off |
| B'x1xxxxxx' | Screensaver on |
| B'0xxxxxxx' | Display off |
| B'1xxxxxxx' | Display on |

*Remote Sensor status received:*

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master address
RTR = 0
DLC3...DLC0 = 8 data bytes received
DATABYTE1 = COMMAND_TEMP_SENSOR_STATUS (0xEA)
DATABYTE2 = Operating mode

| Contents | Operating mode |
|---|---|
| xxxxxxx1 | Mode push button locked |
| xxxxxxx0 | Mode push button unlocked |

| Xxxxx11x | Disable mode |
|---|---|
| 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 1available |
| xxxx0xxx | No sensor program group 2 |
| 0xxxx1xxx | 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 = target 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 0x0000, the sleep timer is deactivated.
If the sleep timer contains a value between 0x0001 and 0xFEFF (1 to 65.279min), the sleep timer is running for that time.
If the sleep timer contains 0xFFFF, the sensor is in manual mode.


*Remote Sensor temperature received:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master address
RTR = 0
DLC3...DLC0 = 7 data bytes received
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 are don't care


*First part of the remote sensor settings received:*
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master address
RTR = 0
DLC3...DLC0 = 8 data bytes received
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 |


*Second part of the remote sensor settings received:*

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master address
RTR = 0
DLC3...DLC0 = 8 data bytes received
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)

***Third part of the remote sensor settings received:***
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master address
RTR = 0
DLC3...DLC0 = 8 data bytes received
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

***Fourth part of the remote sensor settings received:***
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Sensor Master 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°)

***Readout of the remote analog sensor received:***
SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Remote Analog Sensor address
RTR = 0
DLC3...DLC0 = number of data bytes received
DATABYTE1 = COMMAND_TEXT (H'AC')
DATABYTE2 = remote analog sensor channel
DATABYTE3 = text start position
DATABYTE4 = character 1
DATABYTE5 = character 2
DATABYTE6 = character 3
DATABYTE7 = character 4

DATABYTE8 = character 5

Remark:
valid text start position: 0…15
maximum 15 characters are allowed
shorter text stings must be ended with a zero value

*Memo text received:*

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = number of data bytes received
DATABYTE1 = COMMAND_TEXT (H'AC')
DATABYTE2 = don't care
DATABYTE3 = text start position
DATABYTE4 = character 1
DATABYTE5 = character 2
DATABYTE6 = character 3
DATABYTE7 = character 4
DATABYTE8 = character 5

Remark:
valid text start position: 0…63
maximum 64 characters are allowed
The last character must be zero

## Memory map version 4 Build2346

| Address | Contents | Address | Contents |
|---------|----------|---------|----------|
| 0x0000 | Touch init: main control | 0x0001 | Touch init: sensisitivy |
| 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 |
| ... | ... | ... | ... |
| 0x00A8 | Channel 32 name character 1 | 0x00A9 | Channel 32 name character 2 |
| ... | ... | ... | ... |
| 0x0296 | Channel 32 name character 15 | 0x0297 | Channel 32 name character 16 |
| 0x0298 | Channel 32 reaction time | 0x0299 | Channel 32 start function |
| 0x029A | Channel 32 end function | 0x029B | Channel 32 mode |
| 0x029C | Not used | 0x029D | Not used |
| 0x029E | Not used | 0x029F | Not used |
| 0x02A0 | Long pressed delay | 0x02A1 | Dual function long pressed time |
| 0x02A2 | Key beep, edge-lit screensaver, memo text, navigation & wake-up direct action | 0x02A3 | Memo display pages |
| 0x02A4 | screensaver page | 0x02A5 | Screensaver activation time |
| 0x02A6 | screensaver animation | 0x02A7 | Startup page |
| 0x02A8 | Oled intensity | 0x02A9 | Feedback led brightness for GPx series |
| 0x02AA | Language | 0x02AB | reserved |
| 0x02AC | Not used | 0x02AD | Not used |
| 0x02AE | Not used | 0x02AF | Not used |
| 0x02B0 | Display pages 0…7 | 0x02B1 | Display pages 8…15 |
| 0x02B2 | Display pages 16…23 | 0x02B3 | Display pages 24…31 |
| 0x02B4 | Display pages 32, 33 & menu | 0x02B5 | Not used |
| 0x02B6 | Not used | 0x02B7 | Not used |
| 0x02B8 | reserved | 0x02B9 | reserved |
| ... | ... | ... | … |
| 0x059F | reserved | 0x059F | reserved |
| 0x05A0 | Not used | 0x05A1 | Not used |
| 0x05A2 | Not used | 0x05A3 | Alarm clock configuration |
| 0x05A4 | Wake up 1 hour (0…23) | 0x05A5 | Wake up 1 minutes (0…59) |
| 0x05A6 | Go to bed 1 hour (0…23) | 0x05A7 | Go to bed 1 minutes (0…59) |
| 0x05A8 | Wake up 2 hour (0…23) | 0x05A9 | Wake up 2 minutes (0…59) |
| 0x05AA | Go to bed 2 hour (0…23) | 0x05AB | Go to bed 2 minutes (0…59) |
| 0x05AC | Sunrise hour at 21 December (0…23) | 0x05AD | Sunrise minutes at 21 December (0…59) |
| 0x05AE | Sunrise 21 January – sunrise 5 January (-128'..127') | 0x05AF | Sunrise 5 February – sunrise 21 January (-128'..127') |
| 0x05B0 | Sunrise 21 February – sunrise 5 February (-128'..127') | 0x05B1 | Sunrise 5 March – sunrise 21 February (-128'..127') |
| 0x05B2 | Sunrise 21 March – sunrise 5 March (-128'..127') | 0x05B3 | Sunrise 5 April – sunrise 21 March (-128'..127') |
| 0x05B4 | Sunrise 21 April – sunrise 5 April (-128'..127') | 0x05B5 | Sunrise 5 May – sunrise 21 April (-128'..127') |
| 0x05B6 | Sunrise 21 May – sunrise 5 May (-128'..127') | 0x05B7 | Sunrise 5 June – sunrise 21 May (-128'..127') |
| 0x05B8 | Sunrise 21 June – sunrise 5 June (-128'..127') | 0x05B9 | Sunrise 5 July – sunrise 21 June (-128'..127') |
| 0x05BA | Sunrise 21 July – sunrise 5 July (-128'..127') | 0x05BB | Sunrise 5 August – sunrise 21 July (-128'..127') |
| 0x05BC | Sunrise 21 August – sunrise 5 August (-128'..127') | 0x05BD | Sunrise 5 September – sunrise 21 August (-128'..127') |

| | | | |
|---|---|---|---|
| 0x05BE | Sunrise 21 September – sunrise 5 September (-128..127) | 0x05BF | Sunrise 5 October – sunrise 21 September (-128'..127') |
| 0x05C0 | Sunrise 21 October – sunrise 5 October (-128'..127') | 0x05C1 | Sunrise 5 November – sunrise 21 October (-128'..127') |
| 0x05C2 | Sunrise 21 November – sunrise 5 November (-128'..127') | 0x05C3 | Sunrise 5 December – sunrise 21 November (-128'..127') |
| 0x05C4 | Sunrise 21 December – sunrise 5 December (-128'..127') | 0x05C5 | Sunrise 5 January – sunrise 21 December (-128'..127') |
| 0x05C6 | Not used | 0x05C7 | Not used |
| 0x05C8 | Sunset hour at 21 December (0…23) | 0x05C9 | Sunset minutes at 21 December (0…59) |
| 0x05CA | Sunset 21 January – sunset 5 January (-128'..127') | 0x05CB | Sunset 5 February – sunset 21 January (-128'..127') |
| 0x05CC | Sunset 21 February – sunset 5 February (-128'..127') | 0x05CD | Sunset 5 March – sunset 21 February (-128'..127') |
| 0x05CE | Sunset 21 March – sunset 5 March (-128'..127') | 0x05CF | Sunset 5 April – sunset 21 March (-128'..127') |
| 0x05D0 | Sunset 21 April – sunset 5 April (-128'..127') | 0x05D1 | Sunset 5 May – sunset 21 April (-128'..127') |
| 0x05D2 | Sunset 21 May – sunset 5 May (-128'..127') | 0x05D3 | Sunset 5 June – sunset 21 May (-128'..127') |
| 0x05D4 | Sunset 21 June – sunset 5 June (-128'..127') | 0x05D5 | Sunset 5 July – sunset 21 June (-128'..127') |
| 0x05D6 | Sunset 21 July – sunset 5 July (-128'..127') | 0x05D7 | Sunset 5 August – sunset 21 July (-128'..127') |
| 0x05D8 | Sunset 21 August – sunset 5 August (-128'..127') | 0x05D9 | Sunset 5 September – sunset 21 August (-128'..127') |
| 0x05DA | Sunset 21 September – sunset 5 September (-128'..127') | 0x05DB | Sunset 5 October – sunset 21 September (-128'..127') |
| 0x05DC | Sunset 21 October – sunset 5 October (-128'..127') | 0x05DD | Sunset 5 November – sunset 21 October (-128'..127') |
| 0x05DE | Sunset 21 November – sunset 5 November (-128'..127') | 0x05DF | Sunset 5 December – sunset 21 November (-128'..127') |
| 0x05E0 | Sunset 21 December – sunset 5 December (-128'..127') | 0x05E1 | Sunset 5 January – sunset 21 December (-128'..127') |
| 0x05E2 | Not used | 0x05E3 | Not used |
| 0x05E4 | Sensor name character 1 | 0x05E5 | Sensor name character 2 |
| ... | ... | ... | ... |
| 0x05F2 | Sensor name character 15 | 0x05F3 | Sensor name character 16 |
| 0x05F4 | Temp.  sensor: zone | 0x05F5 | Temp. sensor: calibration offset |
| 0x05F6 | Temp. sensor: calibration gain | 0x05F7 | Temp. sensor: hysteresis |
| 0x05F8 | Temp. sensor: boost difference | 0x05F9 | Temp. sensor: Pump delayed on |
| 0x05FA | Temp. sensor: pump delayed off | 0x05FB | Temp. sensor: min switching time |
| 0x05FC | Temp. sensor: default sleep time byte 0 (low) | 0x05FD | Temp. sensor: default sleep time byte 1 (high) |
| 0x05FE | Temp. sensor: default sleep time byte 2 | 0x05FF | Temp. sensor: default sleep time byte 3 (msb) |
| 0x0600 | Temp. sensor: heater lower temperature range low byte | 0x0601 | Temp. sensor: heater lower temperature range high byte |
| 0x0602 | Temp. sensor: heater upper temperature range low byte | 0x0603 | Temp. sensor: heater lower temperature range high byte |
| 0x0604 | Temp. sensor: heater safe temperature set | 0x0605 | Temp. sensor: heater night temperature set |
| 0x0606 | Temp. sensor: heater day temperature set | 0x0607 | Temp. sensor: heater comfort temperature set |
| 0x0608 | Temp. sensor: cooler lower temperature range low byte | 0x0609 | Temp. sensor: cooler upper temperature range high byte |
| 0x060A | Temp. sensor: cooler upper temperature range low byte | 0x060B | Temp. sensor: cooler upper temperature range high byte |
| 0x060C | Temp. sensor: cooler safe temperature set | 0x060D | Temp. sensor: cooler night temperature set |
| 0x060E | Temp. sensor: cooler day temperature set | 0x060F | Temp. sensor: cooler comfort temperature set |
| 0x0610 | Temp. sensor: alarm 1 temperature set | 0x0611 | Temp. sensor: alarm 2 temperature set |
| 0x0612 | Temp. sensor: alarm 3 temperature set | 0x0613 | Temp. sensor: alarm 4 temperature set |
| 0x0614 | Temp. sensor settings | 0x0615 | Temp. sensor alarm 1 & 2 settings |
| 0x0616 | Temp. sensor alarm 3 & 4 settings | 0x0617 | Not used |
| 0x0618 | Open collector output name character 1 | 0x0619 | Open collector output name character 2 |
| ... | ... | ... | ... |
| 0x0626 | Open collector output name character 15 | 0x0627 | Open collector output name character 16 |
| 0x0628 | Counter 1 Address | 0x0629 | Counter 1 channel |
| 0x062A | Counter 1 multiply factor | 0x062B | Counter 1 units |
| 0x062C | Counter 1 name character 1 | 0x062D | Counter 1 name character 2 |
| ... | ... | ... | ... |
| 0x063A | Counter 1 name character 15 | 0x063B | Counter 1 name character 16 |
| ... | ... | … | … |
| 0x06B4 | Counter 8 Address | 0x06B5 | Counter 8 channel |
| 0x06B6 | Counter 8 multiply factor | 0x06B7 | Counter 8 units |
| 0x06B8 | Counter 8 name character 1 | 0x06B9 | Counter 8 name character 2 |
| ... | ... | ... | ... |
| 0x06C6 | Counter 8 name character 15 | 0x06C7 | Counter 8 name character 16 |
| 0x06C8 | Remote Temperature sensor 1 master address | 0x06C9 | Remote Temperature sensor 1 sub address |
| 0x06CA | Reserved | 0x06CB | Reserved |
| 0x06CC | Remote Temperature sensor 1 name character 1 | 0x06CD | Remote Temperature sensor 1 name character 2 |
| B2 | ... | ... | ... |
| 0x06DA | Remote Temperature sensor 1 name character 15 | 0x06DB | Remote Temperature sensor 1 name character 16 |
| ... | ... | | … |
| 0x07A4 | Remote Temperature sensor 12 master address | 0x07A5 | Remote Temperature sensor 12 sub address |
| 0x07A6 | Reserved | 0x07A7 | Reserved |
| 0x07A8 | Remote Temperature sensor 12 name character 1 | 0x07A9 | Remote Temperature sensor 12 name character 2 |
| ... | ... | ... | ... |
| 0x07B6 | Remote Temperature sensor 12 name character 15 | 0x07B7 | Remote Temperature sensor 12 name character 16 |
| 0x07B8 | Remote Analog sensor 1 address | 0x07B9 | Remote Analog sensor 1 channel |
| 0x07BA | Reserved | 0x07BB | Reserved |

| 0x07BC | Remote Analog sensor 1 name character 1 | 0x07BD | Remote Analog sensor 1 name character 2 |
|---|---|---|---|
| ... | ... | ... | ... |
| 0x07CA | Remote Analog sensor 1 name character 15 | 0x07CB | Remote Analog sensor 1 name character 16 |
| ... | ... | ... | … |
| 0x07F4 | Remote Analog sensor 4 address | 0x07F5 | Remote Analog sensor 4 channel |
| 0x07F6 | Reserved | 0x07F7 | Reserved |
| 0x07F8 | Remote Analog sensor 4 name character 1 | 0x07F9 | Remote Analog sensor 4 name character 2 |
| ... | ... | ... | ... |
| 0x0806 | Remote Analog sensor 4 name character 15 | 0x0807 | Remote Analog sensor 4 name character 16 |

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

*Valid reaction times*

| Contents | Reaction time |
|---|---|
| 0x01 | immediatly (default) |
| 0x0E | 0.5s |
| 0x1C | 1s |
| 0x38 | 2s |
| 0x54 | 3s |
| 0xFF | Channel disabled |

*Channel x start/end function*

| Contents | Function |
|---|---|
| 1 | Channel 1 (default) |
| 2 | Channel 2 (default) |
| 3 | Channel 3 (default) |
| 4 | Channel 4 (default) |
| 5 | Channel 5 (default) |
| ... | ... |
| 31 | Channel 31 (default) |
| 32 | Channel 32 (default) |

**Remark:**
For a normal one function button, the start and end function channel are the same.
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 & write protected) |
| B'xxxxxx1x' | Multi-function auto reset enabled |
| B'xxxxx0xx' | Led backlight off (default) |
| B'xxxxx1xx' | Led backlight on |
| B'xxxx0xxx' | Led feedback off |
| B'xxxx1xxx' | Led feedback on (default) |
| B'xxx0xxxx' | Slow blinking led feedback off |
| B'xxx1xxxx' | Slow blinking led feedback on (default) |
| B'xx0xxxxx' | Fast blinking led feedback off |
| B'xx1xxxxx' | Fast blinking led feedback on (default) |
| B'x0xxxxxx' | Very fast blinking led feedback off |
| B'x1xxxxxx' | Very fast blinking led feedback on (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 |

*Key beep, edge-lit screensaver, navigation, custom edge-lit during screensaver, memo text & wake-up direct action*

| Contents | Description |
|----------|-------------|
| B'xxxxxx0' | Key beep off |
| B'xxxxxx1' | Key beep enabled (default) |
| B'xxxxxx0x' | Edge-lit on during screensaver (default) |
| B'xxxxxx1x' | Edge-lit off during screensaver |
| B'xxxxx0xx' | Navigate through all pages (default) |
| B'xxxxx1xx' | Navigate only through pages of the same group |
| B'xxxx0xxx' | Low priority custom edge-lit color normal operation during screensaver (default) |
| B'xxxx1xxx' | Low priority custom edge-lit color always on even during screensaver |
| B'xxx0xxxx' | Mid priority custom edge-lit color normal operation during screensaver (default) |
| B'xxx1xxxx' | Mid priority custom edge-lit color always on even during screensaver |
| B'xx0xxxxx' | High priority custom edge-lit color normal operation during screensaver (default) |
| B'xx1xxxxx' | High priority custom edge-lit color always on even during screensaver |
| B'x0xxxxxx' | Memo text during screensaver on all pages (default) |
| B'x1xxxxxx' | Only memo text during screensaver on selected memo display pages |
| B'0xxxxxxx' | Wake-up display with no direct actions on the buttons |
| B'1xxxxxxx' | Wake-up with direct actions on buttons  (default) |

*Memo Display pages*

| Contents | Description |
|----------|-------------|
| B'xxxxxx0' | Memo text not displayed into button page 1 (default) |
| B'xxxxxx1' | Memo text displayed into button page 1 |
| B'xxxxxx0x' | Memo text not displayed into button page 2 (default) |
| B'0xxxxx1x' | Memo text displayed into button page 2 |
| B'1xxxx0xx' | Memo text not displayed into button page 3 (default) |
| B'xxxxx1xx' | Memo text displayed into button page 3 |
| B'xxxx0xxx' | Memo text not displayed into button page 4 (default) |
| B'xxxx1xxx' | Memo text displayed into button page 4 |
| B'xxx0xxxx' | Memo text not displayed into button page 5 (default) |
| B'xxx1xxxx' | Memo text displayed into button page 5 |
| B'xx0xxxxx' | Memo text not displayed into button page 6 (default) |
| B'xx1xxxxx' | Memo text displayed into button page 6 |
| B'x0xxxxxx' | Memo text not displayed into button page 7 (default) |
| B'x1xxxxxx' | Memo text displayed into button page 7 |
| B'0xxxxxxx' | Memo text not displayed into button page 8 (default) |
| B'1xxxxxxx' | Memo text displayed into button page 8 |

*Screensaver page*

| Contents | Description |
|----------|-------------|
| 0 | Screensaver page 0 (button page 1) |
| 1 | Screensaver page 1 (button page 2) |
| 2 | Screensaver page 2 (button page 3) |
| 3 | Screensaver page 3 (button page 4) |
| 4 | Screensaver page 4 (button page 5) |
| 5 | Screensaver page 5 (button page 6) |
| 6 | Screensaver page 6 (button page 7) |
| 7 | Screensaver page 7 (button page 8) |
| 8 | Screensaver page 8 (counter 1) |
| 9 | Screensaver page 9 (counter 2) |
| 10 | Screensaver page 10 (counter 3) |
| 11 | Screensaver page 11 (counter 4) |

| 12 | Screensaver page 12 (counter 5) |
|---|---|
| 13 | Screensaver page 13 (counter 6) |
| 14 | Screensaver page 14 (counter 7) |
| 15 | Screensaver page 15 (counter 8) |
| 16 | Screensaver page 16 (local temperature sensor) |
| 17 | Screensaver page 17 (remote temp. sensor 1) |
| 18 | Screensaver page 18 (remote temp. sensor 2) |
| 19 | Screensaver page 19 (remote temp. sensor 3) |
| 20 | Screensaver page 20 (remote temp. sensor 4) |
| 21 | Screensaver page 21 (remote temp. sensor 5) |
| 22 | Screensaver page 22 (remote temp. sensor 6) |
| 23 | Screensaver page 23 (remote temp. sensor 7) |
| 24 | Screensaver page 24 (remote temp. sensor 8) |
| 25 | Screensaver page 25 (remote temp. sensor 9) |
| 26 | Screensaver page 26 (remote temp. sensor 10) |
| 27 | Screensaver page 27 (remote temp. sensor 11) |
| 28 | Screensaver page 28 (remote temp. sensor 12) |
| 29 | Screensaver page 29 (analog sensor 1) |
| 30 | Screensaver page 30 (analog sensor 2) |
| 31 | Screensaver page 31 (analog sensor 3) |
| 32 | Screensaver page 32 (analog sensor 4) |
| 33 | Screensaver page 33 (clock) |
| 127 | Screensaver page  = current page |

*Screensaver activation time*

| Contents | Description |
|---|---|
| 15 | Screensaver activation time = 15 s (default) |
| … | … |
| 255 | Screensaver activation time = 255 s |

*Screensaver animation*

| Contents | Description |
|---|---|
| 0 | Screensaver blank (default) |
| 1 | Screensaver vertical scrolling |
| 2 | Screensaver square |
| 3 | Screensaver slats |

*Startup page*

| Contents | Description |
|---|---|
| 0 | Start-up page 0 (button page 1) |
| 1 | Start-up page 1 (button page 2) |
| 2 | Start-up page 2 (button page 3) |
| 3 | Start-up page 3 (button page 4) |
| 4 | Start-up page 4 (button page 5) |
| 5 | Start-up page 5 (button page 6) |
| 6 | Start-up page 6 (button page 7) |
| 7 | Start-up page 7 (button page 8) |
| 8 | Start-up page 8 (counter 1) |
| 9 | Start-up page 9 (counter 2) |
| 10 | Start-up page 10 (counter 3) |
| 11 | Start-up page 11 (counter 4) |
| 12 | Start-up page 12 (counter 5) |
| 13 | Start-up page 13 (counter 6) |
| 14 | Start-up page 14 (counter 7) |
| 15 | Start-up page 15 (counter 8) |
| 16 | Start-up page 16 (local temperature sensor) |
| 17 | Start-up page 17 (remote temp. sensor 1) |
| 18 | Start-up page 18 (remote temp. sensor 2) |
| 19 | Start-up page 19 (remote temp. sensor 3) |
| 20 | Start-up page 20 (remote temp. sensor 4) |

| 21 | Start-up page 21 (remote temp. sensor 5) |
|---|---|
| 22 | Start-up page 22 (remote temp. sensor 6) |
| 23 | Start-up page 23 (remote temp. sensor 7) |
| 24 | Start-up page 24 (remote temp. sensor 8) |
| 25 | Start-up page 25 (remote temp. sensor 9) |
| 26 | Start-up page 26 (remote temp. sensor 10) |
| 27 | Start-up page 27 (remote temp. sensor 11) |
| 28 | Start-up page 28 (remote temp. sensor 12) |
| 29 | Start-up page 29 (analog sensor 1) |
| 30 | Start-up page 30 (analog sensor 2) |
| 31 | Start-up page 31 (analog sensor 3) |
| 32 | Start-up page 32 (analog sensor 4) |
| 33 | Start-up page 33 (clock) |
| 127 | Start-up page = current page |

*Oled intensity*

| Contents | Led intensity |
|---|---|
| 0x00 | Minimum |
| … | ... |
| 0x9B | Mid (default) |
| … | ... |
| 0xFF | Maximum |

**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 |

*Language*

| Contents | Description |
|---|---|
| 0 | English (default) |

| | |
|---|---|
| 1 | Français |
| 2 | Nederlands |
| 3 | Espanõl |
| 4 | Deutsch |
| 5 | Italiano |

*Display pages 0…7*

| Contents | Description |
|---|---|
| B'xxxxxxx0' | Display button page 0 not allowed |
| B'xxxxxxx1' | Display button page 0 allowed (default) |
| B'xxxxxx0x' | Display button page 1 not allowed (default) |
| B'0xxxxx1x' | Display button page 1 allowed |
| B'1xxxx0xx' | Display button page 2 not allowed (default) |
| B'xxxxx1xx' | Display button page 2 allowed |
| B'xxxx0xxx' | Display button page 3 not allowed (default) |
| B'xxxx1xxx' | Display button page 3 allowed |
| B'xxx0xxxx' | Display button page 4 not allowed (default) |
| B'xxx1xxxx' | Display button page 4 allowed |
| B'xx0xxxxx' | Display button page 5 not allowed (default) |
| B'xx1xxxxx' | Display button page 5 allowed |
| B'x0xxxxxx' | Display button page 6 not allowed (default) |
| B'x1xxxxxx' | Display button page 6 allowed |
| B'0xxxxxxx' | Display button page 7 not allowed (default) |
| B'1xxxxxxx' | Display button page 7 allowed |

*Display pages 8…15*

| Contents | Description |
|---|---|
| B'xxxxxxx0' | Display counter 1 disabled (default) |
| B'xxxxxxx1' | Display counter 1 enabled |
| B'xxxxxx0x' | Display counter 2 disabled (default) |
| B'xxxxxx1x' | Display counter 2 enabled |
| B'xxxxx0xx' | Display counter 3 disabled (default) |
| B'xxxxx1xx' | Display counter 3 enabled |
| B'xxxx0xxx' | Display counter 4 disabled (default) |
| B'xxxx1xxx' | Display counter 4 enabled |
| B'xxx0xxxx' | Display counter 5 disabled (default) |
| B'xxx1xxxx' | Display counter 5 enabled |
| B'xx0xxxxx' | Display counter 6 disabled (default) |
| B'xx1xxxxx' | Display counter 6 enabled |
| B'x0xxxxxx' | Display counter 7 disabled (default) |
| B'x1xxxxxx' | Display counter 7 enabled |
| B'0xxxxxxx' | Display counter 8 disabled (default) |
| B'1xxxxxxx' | Display counter 8 enabled |

*Display pages 16…23*

| Contents | Description |
|---|---|
| B'xxxxxxx0' | Display local temperature disabled (default) |
| B'xxxxxxx1' | Display local temperature enabled |
| B'xxxxxx0x' | Display remote temperature 1 disabled (default) |
| B'xxxxxx1x' | Display remote temperature 1 enabled |
| B'xxxxx0xx' | Display remote temperature 2 disabled (default) |
| B'xxxxx1xx' | Display remote temperature 2 enabled |
| B'xxxx0xxx' | Display remote temperature 3 disabled (default) |
| B'xxxx1xxx' | Display remote temperature 3 enabled |
| B'xxx0xxxx' | Display remote temperature 4 disabled (default) |
| B'xxx1xxxx' | Display remote temperature 4 enabled |
| B'xx0xxxxx' | Display remote temperature 5 disabled (default) |
| B'xx1xxxxx' | Display remote temperature 5 enabled |
| B'x0xxxxxx' | Display remote temperature 6 disabled (default) |
| B'x1xxxxxx' | Display remote temperature 6 enabled |
| B'0xxxxxxx' | Display remote temperature 7 disabled (default) |

| | |
|---|---|
| B'1xxxxxx' | Display remote temperature 7 enabled |

**Display pages 24…31**

| Contents | Description |
|---|---|
| B'xxxxxxx0' | Display remote temperature 8 disabled (default) |
| B'xxxxxxx1' | Display remote temperature 8 enabled |
| B'xxxxxx0x' | Display remote temperature 9 disabled (default) |
| B'xxxxxx1x' | Display remote temperature 9 enabled |
| B'xxxxx0xx' | Display remote temperature 10 disabled (default) |
| B'xxxxx1xx' | Display remote temperature 10 enabled |
| B'xxxx0xxx' | Display remote temperature 11 disabled (default) |
| B'xxxx1xxx' | Display remote temperature 11 enabled |
| B'xxx0xxxx' | Display remote temperature 12 disabled (default) |
| B'xxx1xxxx' | Display remote temperature 12 enabled |
| B'xx0xxxxx' | Display analog sensor 1 disabled (default) |
| B'xx1xxxxx' | Display analog sensor 1 enabled |
| B'x0xxxxxx' | Display analog sensor 2 disabled (default) |
| B'x1xxxxxx' | Display analog sensor 2 enabled |
| B'0xxxxxxx' | Display analog sensor 3 disabled (default) |
| B'1xxxxxxx' | Display analog sensor 3 enabled |

**Display pages 32, 33 & menu**

| Contents | Description |
|---|---|
| B'xxxxxxx0' | Display analog sensor 4 disabled (default) |
| B'xxxxxxx1' | Display analog sensor 4 enabled |
| B'xxxxxx0x' | Display clock disabled (default) |
| B'xxxxxx1x' | Display clock enabled |
| B'xxxxx0xx' | Display menu disabled |
| B'xxxxx1xx' | Display menu enabled (default) |

**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 |

**Temp. 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 |

***Temp. sensor calibration gain:***

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

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

***Temp. sensor hysteresis (resolution 0.5°):***

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

***Temp. 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 |

***Temp. 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 |

***Temp. sensor default sleep time into minutes***
valid range H'0001' to H'FEFF' or 1min to 65.279min

***Temp. sensor lower, upper, 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 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 |
| B'xxxx0xxx' | Local control thermostat do not starts sleep timer (default) |
| B'xxxx1xxx' | Local control thermostat control starts sleep timer |
| B'xxx0xxxx' | Local control of thermostat unlocked (default) |
| B'xxx1xxxx' | Local control of thermostat locked |
| B'xx0xxxxx' | Local control thermostat at short key press (default) |
| B'xx1xxxxx' | Local control thermostat at long key press |
| B'x0xxxxxx' | Show local control thermostat |
| B'x1xxxxxx' | Hide local control thermostat |

*Temp. 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'0xxxxxxx' | Temperature alarms 2 absolute (default) |
| B'1xxxxxxx' | Temperature alarms 2 relative |

*Temp. 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 |

*Counter channel*

| Contents | Description |
|---|---|
| B'00000001' | Counter channel 1 |
| B'00000010' | Counter channel 2 |
| B'00000100' | Counter channel 3 |
| B'00001000' | Counter channel 4 |
| B'00010000' | Counter channel 5 |
| B'00100000' | Counter channel 6 |
| B'01000000' | Counter channel 7 |
| B'10000000' | Counter channel 8 |

*Counter multiply factor*

| Contents | Description |
|---|---|
| B'xxxxxx00' | Multiply factor x 1 (default) |
| B'xxxxxx01' | Multiply factor x 2.5 |
| B'xxxxxx10' | Multiply factor x 0.05 |
| B'xxxxxx11' | Multiply factor x 0.01 |

*Counter units*

| Contents | Counter unit |
|---|---|
| 0 | reserved |
| 1 | liter |
| 2 | $m^3$ |
| 3 | kWh (default) |

*Analog channel*

| Contents | Channel |
|---|---|
| 2 | VMBMETEO rain channel |
| 4 | VMBMETEO light channel |
| 8 | VMBMETEO wind channel |
| 9 | VMB4AN analog sensor 1 |
| 10 | VMB4AN analog sensor 2 |
| 11 | VMB4AN analog sensor 3 |
| 12 | VMB4AN analog sensor 4 |

| Address | Contents | Address | Contents |
|---------|----------|---------|----------|
| 0x0808 | Links in use byte 0 (LSB) | 0x0809 | Links in use high byte1 |
| 0x080A | Links in use low byte 2 | 0x080B | Links in use low byte 3 (MSB) |
| 0x080C | Linked Push button 1 module address | 0x080D | Linked Push button 1 bit number |
| 0x080E | Linked Push button 1 action | 0x080F | Linked Push button 1 parameter 1 |
| 0x0810 | Linked Push button 1 parameter 2 | 0x0811 | … |
| ... | ... | ... | ... |
| 0x0B9E | … | 0x0B9F | Linked Push button 184 module address |
| 0x0BA0 | Linked Push button 184 bit number | 0x0BA1 | Linked Push button 184 action |
| 0x0BA2 | Linked Push button 184 parameter 1 | 0x0BA3 | Linked Push button 184 parameter 2 |

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

Action

| Action number | Action | Parameter 1 | Parameter 2 |
|---------------|--------|-------------|-------------|
| 0 | Switch status led indication | - | Channel 1...32 |
| 1 | Lock channel at closed switch | - | Channel 1...32, 33 or 42 |
| 2 | Lock channel at opened switch | - | Channel 1...32, 33 or 42 |
| 3 | Lock channel | Timeout | Channel 1...32, 33 or 42 |
| 4 | Lock/unlock channel | Timeout | Channel 1...32, 33 or 42 |
| 5 | Unlock channel | - | Channel 1...32, 33 or 42 |
| 6 | Disable channel program at closed switch | - | Channel 1...32, 33 or 42 |
| 7 | Disable channel program at opened switch | - | Channel 1...32, 33 or 42 |
| 8 | Disable channel program channel | Timeout | Channel 1...32, 33 or 42 |
| 9 | Disable/enable channel program | Timeout | Channel 1...32, 33 or 42 |
| 10 | Enable channel program | - | Channel 1...32, 33 or 42 |
| 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 | Open collector momentary | - | - |
| 47 | Open collector off | - | - |
| 48 | Open collector on | - | - |
| 49 | Open collector toggle | - | - |
| 50 | Open collector start/stop timer | timeout | - |

| 51 | Open collector restartable timer | timeout | - |
|---|---|---|---|
| 52 | Open collector non retriggerable timer | timeout | - |
| 53 | Open collector 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 | Short press sleep time |
| 56 | Sensor: Night mode | Short press sleep time | Short press sleep time |
| 57 | Sensor: Safe mode | Short press sleep time | Short press sleep time |
| 58 | Sensor: Heating mode | - | - |
| 59 | Sensor: Cooling mode | - | - |
| 90 | Force screensaver to blank screen | - | - |
| 91 | Cancel force screensaver to blank screen | - | - |
| 92 | Lock page | timeout | Unlock at keypress / Page |
| 93 | Unlock page | - | - |
| 94 | Unlock page at release | - | - |
| 95 | Sensor: Forced Safe mode at closed switch | - | - |
| 96 | Sensor: Forced Safe mode at open switch | - | - |
| 97 | Sensor: Forced Safe mode | Timeout | - |
| 98 | Sensor: Forced or Cancel Forced Safe mode | Timeout | - |
| 99 | Sensor: Cancel Forced Safe mode | - | - |
| 106 | Output pulse (Build1927 or higher) | Timeout (multiple of 10ms) | - |
| 107 | Output logical OR (Build1927 or higher) | | |
| 108 | Output logical NOR (Build1927 or higher) | | |
| 109 | Output logical AND (Build1927 or higher) | | |
| 110 | Output logical NAND (Build1927 or higher) | | |
| 111 | Output logical XOR (Build1927 or higher) | | |
| 112 | Output logical XNOR (Build1927 or higher) | | |
| 113 | Output pulse interval at closed switch (Build1927 or higher) | 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 |
| ... | |
| 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 |

| 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) |
| ... | ... |
| 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 |

| 255 | Infinite |
|---|---|

*Unlock page at keypress/lock page*

| Contents | Description |
|---|---|
| B'0xxxxxxx' | Unlock page at keypress disabled |
| B'1xxxxxxx' | Unlock page at keypress enabled |
| B'x0000000' | Lock page 0 (button page 1) |
| B'x0000001' | Lock page 1 (button page 2) |
| B'x0000010' | Lock page 2 (button page 3) |
| B'x0000011' | Lock page 3 (button page 4) |
| B'x0000100' | Lock page 4 (button page 5) |
| B'x0000101' | Lock page 5 (button page 6) |
| B'x0000110' | Lock page 6 (button page 7) |
| B'x0000111 | Lock page 7 (button page 8) |
| B'x0001000' | Lock page 8 (counter 1) |
| B'x0001001' | Lock page 9 (counter 2) |
| B'x0001010' | Lock page 10 (counter 3) |
| B'x0001011' | Lock page 11 (counter 4) |
| B'x0001100' | Lock page 12 (counter 5) |
| B'x0001101' | Lock page 13 (counter 6) |
| B'x0001110' | Lock page 14 (counter 7) |
| B'x0001111' | Lock page 15 (counter 8) |
| B'x0010000' | Lock page 16 (local temperature sensor) |
| B'x0010001' | Lock page 17 (remote temp. sensor 1) |
| B'x0010010' | Lock page 18 (remote temp. sensor 2) |
| B'x0010011' | Lock page 19 (remote temp. sensor 3) |
| B'x0010100' | Lock page 20 (remote temp. sensor 4) |
| B'x0010101' | Lock page 21 (remote temp. sensor 5) |
| B'x0010110' | Lock page 22 (remote temp. sensor 6) |
| B'x0010111' | Lock page 23 (remote temp. sensor 7) |
| B'x0011000' | Lock page 24 (remote temp. sensor 8) |
| B'x0011001' | Lock page 25 (remote temp. sensor 9) |
| B'x0011010' | Lock page 26 (remote temp. sensor 10) |
| B'x0011011' | Lock page 27 (remote temp. sensor 11) |
| B'x0011100' | Lock page 28 (remote temp. sensor 12) |
| B'x0011101' | Lock page 29 (analog sensor 1) |
| B'x0011110' | Lock page 30 (analog sensor 2) |
| B'x0011111' | Lock page 31 (analog sensor 3) |
| B'x0100000' | Lock page 32 (analog sensor 4) |
| B'x0100001' | Lock page 33 (clock) |
| B'x1111111' | Lock current page |

| Address | Contents | Address | Contents |
|---------|----------|---------|----------|
| 0x0BA4 | Program steps used byte 0 (LSB) | 0x0BA5 | Program steps used byte 1 |
| 0x0BA6 | Program steps used byte 2 | 0x0BA7 | Program steps used byte 3 (MSB) |
| 0x0BA8 | Program step 1 byte1 | 0x0BA9 | Program step 1 byte2 |
| 0x0BAA | Program step 1 byte3 | 0x0BAB | Program step 1 byte4 |
| 0x0BAC | Program step 1 byte5 | 0x0BAD | Program step 1 byte6 |
| … | .. | .. | .. |
| 0x0F9E | Program step 170 byte1 | 0x0F9F | Program step 170 byte2 |
| 0x0FA0 | Program step 170 byte3 | 0x0FA1 | Program step 170 byte4 |
| 0x0FA2 | Program step 170 byte5 | 0x0FA3 | Program step 170 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'x1xxxxxx' | Program group 2 (Winter program) |
| B'1xxxxxxx' | 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) |
| 1 | 1s Pulse (only allowed for button channels) |
| 2 | 2s Pulse (only allowed for button channels) |
| ... | ... |
| 119 | 1min59s Pulse (only allowed for button channels) |
| 120 | 2min Pulse (only allowed for button channels) |
| 121 | 2min15s Pulse (only allowed for button channels) |
| ... | ... |
| 131 | 4min45s Pulse (only allowed for button channels) |
| 132 | 5min Pulse (only allowed for button channels) |
| 133 | 5min30s Pulse (only allowed for button channels) |
| ... | ... |
| 181 | 29min30s Pulse (only allowed for button channels) |
| 182 | 30min Pulse (only allowed for button channels) |
| 183 | 31min Pulse (only allowed for button channels) |
| ... | ... |
| 211 | 59min Pulse (only allowed for button channels) |
| 212 | 1h Pulse (only allowed for button channels) |
| 213 | 1h15min Pulse (only allowed for button channels) |
| ... | ... |
| 227 | 4h45min Pulse (only allowed for button channels) |
| 228 | 5h Pulse (only allowed for button channels) |
| 229 | 5h30min Pulse (only allowed for button channels) |
| ... | ... |
| 237 | 9h30min Pulse (only allowed for button channels) |
| 238 | 10h Pulse (only allowed for button channels) |
| 239 | 11h Pulse (only allowed for button channels) |
| ... | … |
| 246 | 18h Pulse (only allowed for button channels) |
| 247 | Press (only allowed for button channels) |
| 248 | Long Press (only allowed for button channels) |
| 249 | Release (only allowed for button channels) |
| 250 | Lock |
| 251 | Unlock |
| 252 | Thermostat Safe mode (only allowed for temperature sensor channel) |
| 253 | Thermostat Night mode (only allowed for temperature sensor channel) |
| 254 | Thermos (only allowed for temperature sensor channel)tat Day mode |
| 255 | Thermostat Comfort mode (only allowed for temperature sensor channel) |

| Contents program byte6 | Channel |
|---|---|
| 1 | Channel 1 |
| 2 | Channel 2 |
| .. | … |
| 31 | Channel 31 |
| 32 | Channel 32 |
| 33 | Thermostat |
| 42 | Open collector output |

| Address | Contents | Address | Contents |
|---------|----------|---------|----------|
| 0x0FA4 | Location id low byte | 0x0FA5 | Location id high byte |
| 0x0FA6 | Group id low byte | 0x0FA7 | Group id high byte |
| 0x0FA8 | Module name character 1 | 0x0FA9 | Module name character 2 |
| … | .. | .. | .. |
| 0x0FE6 | Module name character 63 | 0x0FE7 | Module name character 64 |

| Address | Contents | Address | Contents |
|---------|----------|---------|----------|
| 0x0FE8 | Size of page 1 bitmap low byte | 0x0FE9 | Size of page 1 bitmap high byte |
| ... | … | … | … |
| 0x0FF6 | Size of page 8 bitmap low byte | 0x0FF7 | Size of page 8 bitmap high byte |
| 0x0FF8 | Page 1 bitmap data byte 1 | 0x0FF9 | Page 1 bitmap data byte 2 |
| … | … | ... | … |
| 0x17F6 | Page 1 bitmap data 2047 | 0x17F7 | Page 1 bitmap data byte 2048 |
| 0x17F8 | Page 2 bitmap data byte 1 | 0x17F9 | Page 2 bitmap data byte 2 |
| … | … | ... | … |
| 0x1FF6 | Page 2 bitmap data 2047 | 0x1FF7 | Page 2 bitmap data byte 2048 |
| 0x1FF8 | Page 3 bitmap data byte 1 | 0x1FF9 | Page 3 bitmap data byte 2 |
| … | … | ... | … |
| 0x27F6 | Page 3 bitmap data 2047 | 0x27F7 | Page 3 bitmap data byte 2048 |
| 0x27F8 | Page 4 bitmap data byte 1 | 0x27F9 | Page 4 bitmap data byte 2 |
| … | … | ... | … |
| 0x2FF6 | Page 4 bitmap data 2047 | 0x2FF7 | Page 4 bitmap data byte 2048 |
| 0x2FF8 | Page 5 bitmap data byte 1 | 0x2FF9 | Page 5 bitmap data byte 2 |
| … | … | ... | … |
| 0x37F6 | Page 5 bitmap data 2047 | 0x37F7 | Page 5 bitmap data byte 2048 |
| 0x37F8 | Page 6 bitmap data byte 1 | 0x37F9 | Page 6 bitmap data byte 2 |
| … | … | ... | … |
| 0x3FF6 | Page 6 bitmap data 2047 | 0x3FF7 | Page 6 bitmap data byte 2048 |
| 0x3FF8 | Page 7 bitmap data byte 1 | 0x3FF9 | Page 7 bitmap data byte 2 |
| … | … | ... | … |
| 0x47F6 | Page 7 bitmap data 2047 | 0x47F7 | Page 7 bitmap data byte 2048 |
| 0x47F8 | Page 8 bitmap data byte 1 | 0x47F9 | Page 8 bitmap data byte 2 |
| … | … | ... | … |
| 0x4FF6 | Page 8 bitmap data 2047 | 0x4FF7 | Page 8 bitmap data byte 2048 |
| 0x4FF8 | Not used | 0x4FF9 | Not used |
|  |  |  |  |
| 0x4FFE | Not used | 0x4FFF | Used for flash writing |