

VMBIN

**One channel input module
for VELBUS system**

Binary format:

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

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

The module can transmit the following messages:

- Power up message
- Channel status
- Module status
- Module type
- 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
- 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
- Program step info

The module can receive the following commands:

- Power up message
- Linked push button status
- Module type request
- Module status request
- Channel name request
- Clear channel led
- Set channel led
- Slow blink channel led
- Fast blink channel led
- Very fast channel led

- Update channel leds
- Read memory data
- Read memory data block (4 bytes)
- Memory dump request
- Write memory data
- Write memory data block (4 bytes)
- 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

Transmits power up message:

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

Transmits real time clock status request:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
RTR = 0
DLC3...DLC0 = 1 data byte to send
DATABYTE1 = COMMAND_REALTIME_CLOCK_STATUS_REQUEST (0xD7)

Transmits the real time clock status:

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

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

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

Transmits the date status:

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

Transmits the daylight savings status:

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

Transmits the channel switch status:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes to send
DATABYTE1 = COMMAND_PUSH_BUTTON_STATUS (0x00)
DATABYTE2 = Channel just pressed
DATABYTE3 = Channel just released
DATABYTE4 = Channel long pressed

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 = VMBIN type (0x43)
 DATABYTE3 = High byte of serial number
 DATABYTE4 = Low byte of serial number
 DATABYTE5 = Memory map version
 DATABYTE6 = Build year
 DATABYTE7 = Build week
 DATABYTE8 = Terminator (0 = open / 1 = closed)

Transmits the module status:

SID10-SID9 = 11 (lowest priority)
 SID8...SID1 = Module address
 RTR = 0
 DLC3...DLC0 = 7 data bytes to send
 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/inverted channel status (1 = normal / 0 = inverted)
 DATABYTE5 = locked channel status (0 = unlocked / 1 = locked)
 DATABYTE6 = disabled channel program status (0 = program enabled / 1 = program disabled)
 DATABYTE7 = alarm & program selection

| <i>Contents</i> | <i>Selected program</i> |
|-----------------|-------------------------|
| B'xxxxxx00' | None |
| B'xxxxxx01' | Program group 1 |
| B'xxxxxx10' | Program group 2 |
| B'xxxxxx11' | Program group 3 |
| 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'0xxxxxxxx' | Sunset disabled |
| B'1xxxxxxxx' | Sunset enabled |

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_BUSERRORCOUNTER_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 0x03FF

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 0x03FC

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...8
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...8
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...8
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.

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...70 / 255 step not found)

DATABYTE3 = Program reference

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

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

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

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

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

DATABYTE5 = Program step hour & group number

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

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

| Contents | Description |
|-----------------|--------------------|
| xx000000 | 0min |
| xx000001 | 1min |
| ... | ... |
| xx111011 | 59min |

| Contents byte6 | Contents byte4 | Description |
|-----------------------|-----------------------|--------------------|
| 00xxxxxx | 0000xxxx | Never |
| 00xxxxxx | 0001xxxx | Day 1of the month |
| 00xxxxxx | 0010xxxx | Day 2of the month |
| ... | ... | ... |
| 01xxxxxx | 1111xxxx | Day 31of the month |
| 10xxxxxx | 0000xxxx | Never |
| 10xxxxxx | 0001xxxx | Every Monday |

| | | |
|----------|----------|-----------------------------|
| 10xxxxxx | 0010xxxx | Every Tuesday |
| ... | ... | ... |
| 10xxxxxx | 0111xxxx | Every Sunday |
| 10xxxxxx | 1000xxxx | Every weekend (sa & su) |
| 10xxxxxx | 1001xxxx | Every working day (mo...fr) |
| 10xxxxxx | 1010xxxx | Every day except Sunday |
| 10xxxxxx | 1011xxxx | Every day |
| 10xxxxxx | 1100xxxx | Never |
| ... | ... | ... |
| 11xxxxxx | 1111xxxx | Never |

DATABYTE7 = Program step action

| Contents | Action |
|----------|----------------|
| 0 | 0s25 Pulse |
| 1 | 1s Pulse |
| 2 | 2s Pulse |
| ... | ... |
| 119 | 1min59s Pulse |
| 120 | 2min Pulse |
| 121 | 2min15s Pulse |
| ... | ... |
| 131 | 4min45s Pulse |
| 132 | 5min Pulse |
| 133 | 5min30s Pulse |
| ... | ... |
| 181 | 29min30s Pulse |
| 182 | 30min Pulse |
| 183 | 31min Pulse |
| ... | ... |
| 211 | 59min Pulse |
| 212 | 1h Pulse |
| 213 | 1h15min Pulse |
| ... | ... |
| 227 | 4h45min Pulse |
| 228 | 5h Pulse |
| 229 | 5h30min Pulse |
| ... | ... |
| 237 | 9h30min Pulse |
| 238 | 10h Pulse |
| 239 | 11h Pulse |
| ... | ... |
| 245 | 17h Pulse |
| 246 | 18h Pulse |
| 247 | Press |
| 248 | Long press |
| 249 | Release |
| 250 | Lock |
| 251 | Unlock |
| 252 | No action |
| 253 | ... |
| 255 | No action |

DATABYTE8 = Channel

| Contents | Channel |
|----------|-----------|
| 1 | Channel 1 |
| 2 | Channel 2 |
| ... | ... |
| 7 | Channel 7 |
| 8 | Channel 8 |

'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
 DATA BYTE1 = COMMAND_PUSH_BUTTON_STATUS (0x00)
 DATA BYTE2 = Linked push buttons just pressed (1 = just pressed)
 DATA BYTE3 = Linked push buttons just released (1 = just released)
 DATA BYTE4 = linked push buttons long pressed (1 = longer than 0.85s pressed)

'Power up message' received:

SID10-SID9 = 11 (lowest priority)
 SID8...SID1 = 0x00
 RTR = 0
 DLC3...DLC0 = 2 data byte received
 DATA BYTE1 = COMMAND_POWER_UP (0xAB)
 DATA BYTE2 = module address

'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
 DATA BYTE1 = 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 to send
 DATA BYTE1 = COMMAND_SET_REALTIME_CLOCK (0xD8)
 DATA BYTE2 = Day of week

| <i>Contents day of week'</i> | <i>Description</i> |
|------------------------------|--------------------|
| 0 | Monday |
| 1 | Tuesday |
| 2 | Wednesday |
| 3 | Thursday |
| 4 | Friday |
| 5 | Saturday |
| 6 | Sunday |

DATA BYTE3 = Hours (0...23)
 DATA BYTE4 = Minutes (0...59)

'Set date' command received:

SID10-SID9 = 11 (lowest priority)
 SID8...SID1 = 0x00
 RTR = 0
 DLC3...DLC0 = 5 data bytes to send
 DATA BYTE1 = COMMAND_SET_REALTIME_DATE (0xB7)
 DATA BYTE2 = Day (1...31)
 DATA BYTE3 = Month (1...12)
 DATA BYTE4 = High byte of Year
 DATA BYTE5 = Low byte of Year

'Set daylight savings' command received:

SID10-SID9 = 11 (lowest priority)
 SID8...SID1 = 0x00
 RTR = 0
 DLC3...DLC0 = 2 data bytes to send
 DATA BYTE1 = COMMAND_SET_DAYLIGHT_SAVING (0xAF)
 DATA BYTE2 = 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 to send

DATABYTE1 = COMMAND_ENA_DIS_SUNRISE_SUNSET (0xAE)

DATABYTE2 = Channel (0xFF)

DATABYTE3 = enable/disable flags

| Contents | Description |
|--------------|---------------------------------|
| B'xxxxxxxx0' | Disable sunrise related actions |
| B'xxxxxxxx1' | Enable sunrise related actions |
| B'xxxxxx0x' | Disable sunset related actions |
| B'xxxxxx1x' | Enable sunset related actions |

'Enable/disable local sunrise/sunset related actions' command received:

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 3 data bytes to send

DATABYTE1 = COMMAND_ENA_DIS_SUNRISE_SUNSET (0xAE)

DATABYTE2 = Channel (0xFF)

DATABYTE3 = enable/disable flags

| Contents | Description |
|--------------|---------------------------------|
| B'xxxxxxxx0' | Disable sunrise related actions |
| B'xxxxxxxx1' | Enable sunrise related actions |
| B'xxxxxx0x' | Disable sunset related actions |
| B'xxxxxx1x' | Enable sunset related actions |

'Set global clock alarm' command received:

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = 0x00

RTR = 0

DLC3...DLC0 = 7 data bytes to send

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 to send

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...8 (255 for all channels)

'Clear channel LED' command received:

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

'Set channel LED' command received:

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

'Slow blink channel LED' command received:

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

'Fast blink channel LED' command received:

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

'Very fast blink channel LED' command received:

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

'Update channel LEDs' command received:

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 4 data bytes received

DATABYTE1 = COMMAND_UPDATE_LED_STATUS (0xF4)

DATABYTE2 = LEDs to set (a one sets the corresponding LED of channel 1 to 8)

DATABYTE3 = LEDs to blink slow (a one blinks slow the corresponding LED of channel 1 to 8)

DATABYTE4 = LEDs to blink fast (a one blinks very fast the corresponding LED of channel 1 to 8)

Remark:

The 'LEDs to set' status overrides the blinking modes.

Very fast blinking if slow & fast blinking are set.

'Read data from memory' command received:

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 3 data bytes received

DATABYTE1 = COMMAND_READ_DATA_FROM_MEMORY (0xFD)

DATABYTE2 = High memory address

DATABYTE3 = LOW memory address

Remark: address range: 0x0000 to 0x03FF

'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)

'Read data block from memory' command received:

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 3 data bytes received

DATABYTE1 = COMMAND_READ_MEMORY_BLOCK (0xC9)

DATABYTE2 = High memory address

DATABYTE3 = LOW memory address

Remark: address range: 0x0000 to 0x03FC

'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 (0x00...0xFF)

DATABYTE4 = memory data to write

Remark:

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

Address range: 0x0000 to 0x03FF

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

'Write memory block' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Address of the module
RTR = 0
DLC3...DLC0 = 7 data bytes received
DATABYTE1 = COMMAND_WRITE_MEMORY_BLOCK (0xCA)
DATABYTE2 = High memory address
DATABYTE3 = LOW memory address
DATABYTE4 = memory databyte1 to write
DATABYTE5 = memory databyte2 to write
DATABYTE6 = memory databyte3 to write
DATABYTE7 = memory databyte4 to write

Remark:

Wait for 'memory data block' feedback before sending a next command on the velbus.
Address range: 0x0000 to 0x03FC

'Bus error counter status request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 1 data bytes to send
DATABYTE1 = COMMAND_BUS_ERROR_CONTER_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...8 (255 for all channels)

'Lock channel' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_FORCED_OFF (0x12)
DATABYTE2 = Channel number 1...8 (255 for all channels)
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 0xFFFFFFF then the channel will be permanently locked.

'Enable Channel Program' command received:

SID10-SID9 = 11 (lowest priority)
 SID8...SID1 = Module address
 RTR = 0
 DLC3...DLC0 = 2 data bytes received
 DATABYTE1 = COMMAND_ENABLE_PROGRAM (0xB2)
 DATABYTE2 = Channel number 1...8 (255 for all channels)

'Disable Channel Program' command received:

SID10-SID9 = 11 (lowest priority)
 SID8...SID1 = Module address
 RTR = 0
 DLC3...DLC0 = 5 data bytes received
 DATABYTE1 = COMMAND_DISABLE_PROGRAM (0xB1)
 DATABYTE2 = Channel number 1...8 (255 for all channels)
 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 0xFFFFFFF then the channel program will be permanently disabled.

'Select Program' command received:

SID10-SID9 = 11 (lowest priority)
 SID8...SID1 = Module address
 RTR = 0
 DLC3...DLC0 = 2 data bytes received
 DATABYTE1 = COMMAND_SELECT_PROGRAM (0xB3)
 DATABYTE2 = Program mode

| <i>Contents</i> | <i>Selected program</i> |
|-----------------|-------------------------|
| 0 | None |
| 1 | Program group 1 |
| 2 | Program group 2 |
| 3 | Program group 3 |

'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...70)
 DATABYTE3 = Program group number (1...3)
 DATABYTE4 = channel number 1...8
 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...70)
 DATABYTE3 = Program reference

| <i>Contents</i> | <i>Description</i> |
|-----------------|----------------------------------|
| 000xxxxx | Disable program step |
| 001xxxxx | Absolute time |
| 010xxxxx | Wake up time 1 + relative time |
| 011xxxxx | Go to bed time 1 + relative time |
| 100xxxxx | Wake up time 2 + relative time |
| 101xxxxx | Go to bed time 2 + relative time |
| 110xxxxx | Sunrise + relative time |

| | |
|----------|------------------------|
| 111xxxxx | Sunset + relative time |
| xxx01111 | Rel. time = 3h45min |
| ... | |
| xxx00001 | Rel. time = 15min |
| xxx00000 | Rel. time = 0 |
| xxx11111 | Rel. time = -15min |
| ... | |
| xxx10000 | Rel. time = -4h |

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

| 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) |
| x1xxxxx | Program group 2 (Winter program) |
| 1xxxxxx | 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 |
|-----------------------|-----------------------|-----------------------------|
| 0xxxxxx | 0000xxxx | Never |
| 00xxxxxx | 0001xxxx | Day 1of the month |
| 00xxxxxx | 0010xxxx | Day 2of the month |
| ... | ... | ... |
| 01xxxxxx | 1111xxxx | Day 31of the month |
| 10xxxxxx | 0000xxxx | Never |
| 10xxxxxx | 0001xxxx | Every Monday |
| 10xxxxxx | 0010xxxx | Every Tuesday |
| ... | ... | ... |
| 10xxxxxx | 0111xxxx | Every Sunday |
| 10xxxxxx | 1000xxxx | Every weekend (sa & su) |
| 10xxxxxx | 1001xxxx | Every working day (mo...fr) |
| 10xxxxxx | 1010xxxx | Every day except Sunday |
| 10xxxxxx | 1011xxxx | Every day |
| 10xxxxxx | 1100xxxx | Never |
| ... | ... | ... |
| 11xxxxxx | 1111xxxx | Never |

DATABYTE7 = Program step action

| Contents | Action |
|-----------------|----------------|
| 0 | 0s25 Pulse |
| 1 | 1s Pulse |
| 2 | 2s Pulse |
| ... | ... |
| 119 | 1min59s Pulse |
| 120 | 2min Pulse |
| 121 | 2min15s Pulse |
| ... | ... |
| 131 | 4min45s Pulse |
| 132 | 5min Pulse |
| 133 | 5min30s Pulse |
| ... | ... |
| 181 | 29min30s Pulse |
| 182 | 30min Pulse |
| 183 | 31min Pulse |
| ... | ... |
| 211 | 59min Pulse |
| 212 | 1h Pulse |
| 213 | 1h15min Pulse |
| ... | ... |
| 227 | 4h45min Pulse |
| 228 | 5h Pulse |
| 229 | 5h30min Pulse |
| ... | ... |
| 237 | 9h30min Pulse |
| 238 | 10h Pulse |
| 239 | 11h Pulse |
| ... | ... |
| 246 | 18h Pulse |
| 247 | Press |
| 248 | Long Press |
| 249 | Release |
| 250 | Lock |
| 251 | Unlock |
| 252 | No action |
| ... | ... |
| 255 | No action |

DATABYTE8 = Channel

| Contents | Channel |
|----------|-----------|
| 1 | Channel 1 |
| 2 | Channel 2 |
| ... | ... |
| 7 | Channel 7 |
| 8 | Channel 8 |

Remark:

Erase program step if channel parameter is equal with zero.

Memory map:

| Addr | Contents | Addr | Contents |
|-------------|---|-------------|---|
| 0x0000 | Channel 1 name character 1 | 0x0001 | Channel 1 name character 2 |
| ... | ... | ... | ... |
| 0x000E | Channel 1 name character 15 | 0x000F | Channel 1 name character 16 |
| 0x0010 | Channel 1 reaction time | 0x0011 | Channel 1 start function |
| 0x0012 | Channel 1 end function | 0x0013 | Channel 1 mode |
| 0x0014 | Channel 2 name character 1 | 0x0015 | Channel 2 name character 2 |
| ... | ... | ... | ... |
| 0x0022 | Channel 2 name character 15 | 0x0023 | Channel 2 name character 16 |
| 0x0024 | Channel 2 reaction time | 0x0025 | Channel 2 start function |
| 0x0026 | Channel 2 end function | 0x0027 | Channel 2 mode |
| ... | ... | ... | ... |
| 0x008C | Channel 8 name character 1 | 0x008D | Channel 8 name character 2 |
| ... | ... | ... | ... |
| 0x009A | Channel 8 name character 15 | 0x009B | Channel 8 name character 16 |
| 0x009C | Channel 8 reaction time | 0x009D | Channel 8 start function |
| 0x009E | Channel 8 end function | 0x009F | Channel 8 mode |
| 0x00A0 | Long pressed delay | 0x00A1 | Dual function long pressed time |
| 0x00A2 | Led backlight intensity | 0x00A3 | Led intensity |
| 0x00A4 | Not used | 0x00A5 | Not used |
| 0x00A6 | Not used | 0x00A7 | Alarm clock configuration |
| 0x00A8 | Wake up 1 hour (0...23) | 0x00A9 | Wake up 1 minutes (0...59) |
| 0x00AA | Go to bed 1 hour (0...23) | 0x00AB | Go to bed 1 minutes (0...59) |
| 0x00AC | Wake up 2 hour (0...23) | 0x00AD | Wake up 2 minutes (0...59) |
| 0x00AE | Go to bed 2 hour (0...23) | 0x00AF | Go to bed 2 minutes (0...59) |
| 0x00B0 | Sunrise hour at 21 December (0...23) | 0x00B1 | Sunrise minutes at 21 December (0...59) |
| 0x00B2 | Sunrise 21 January – sunrise 5 January (-128'...127') | 0x00B3 | Sunrise 5 February – sunrise 21 January (-128'...127') |
| 0x00B4 | Sunrise 21 February – sunrise 5 February (-128'...127') | 0x00B5 | Sunrise 5 March – sunrise 21 February (-128'...127') |
| 0x00B6 | Sunrise 21 March – sunrise 5 March (-128'...127') | 0x00B7 | Sunrise 5 April – sunrise 21 March (-128'...127') |
| 0x00B8 | Sunrise 21 April – sunrise 5 April (-128'...127') | 0x00B9 | Sunrise 5 May – sunrise 21 April (-128'...127') |
| 0x00BA | Sunrise 21 May – sunrise 5 May (-128'...127') | 0x00BB | Sunrise 5 June – sunrise 21 May (-128'...127') |
| 0x00BC | Sunrise 21 June – sunrise 5 June (-128'...127') | 0x00BD | Sunrise 5 July – sunrise 21 June (-128'...127') |
| 0x00BE | Sunrise 21 July – sunrise 5 July (-128'...127') | 0x00BF | Sunrise 5 August – sunrise 21 July (-128'...127') |
| 0x00C0 | Sunrise 21 August – sunrise 5 August (-128'...127') | 0x00C1 | Sunrise 5 September – sunrise 21 August (-128'...127') |
| 0x00C2 | Sunrise 21 September – sunrise 5 September (-128'...127') | 0x00C3 | Sunrise 5 October – sunrise 21 September (-128'...127') |
| 0x00C4 | Sunrise 21 October – sunrise 5 October (-128'...127') | 0x00C5 | Sunrise 5 November – sunrise 21 October (-128'...127') |
| 0x00C6 | Sunrise 21 November – sunrise 5 November (-128'...127') | 0x00C7 | Sunrise 5 December – sunrise 21 November (-128'...127') |
| 0x00C8 | Sunrise 21 December – sunrise 5 December (-128'...127') | 0x00C9 | Sunrise 5 January – sunrise 21 December (-128'...127') |

| Addr | Contents | Addr | Contents |
|-------------|--|-------------|--|
| 0x00CA | Not used | 0x00CB | Not used |
| 0x00CC | Sunset hour at 21 December (0...23) | 0x00CD | Sunset minutes at 21 December (0...59) |
| 0x00CE | Sunset 21 January – sunrise 5 January (-128'...127') | 0x00CF | Sunset 5 February – sunrise 21 January (-128'...127') |
| 0x00D0 | Sunset 21 February – sunrise 5 February (-128'...127') | 0x00D1 | Sunset 5 March – sunrise 21 February (-128'...127') |
| 0x00D2 | Sunset 21 March – sunrise 5 March (-128'...127') | 0x00D3 | Sunset 5 April – sunrise 21 March (-128'...127') |
| 0x00D4 | Sunset 21 April – sunrise 5 April (-128'...127') | 0x00D5 | Sunset 5 May – sunrise 21 April (-128'...127') |
| 0x00D6 | Sunset 21 May – sunrise 5 May (-128'...127') | 0x00D7 | Sunset 5 June – sunrise 21 May (-128'...127') |
| 0x00D8 | Sunset 21 June – sunrise 5 June (-128'...127') | 0x00D9 | Sunset 5 July – sunrise 21 June (-128'...127') |
| 0x00DA | Sunset 21 July – sunrise 5 July (-128'...127') | 0x00DB | Sunset 5 August – sunrise 21 July (-128'...127') |
| 0x00DC | Sunset 21 August – sunrise 5 August (-128'...127') | 0x00DD | Sunset 5 September – sunrise 21 August (-128'...127') |
| 0x00DE | Sunset 21 September – sunrise 5 September (-128'...127') | 0x00DF | Sunset 5 October – sunrise 21 September (-128'...127') |
| 0x00E0 | Sunset 21 October – sunrise 5 October (-128'...127') | 0x00E1 | Sunset 5 November – sunrise 21 October (-128'...127') |
| 0x00E2 | Sunset 21 November – sunrise 5 November (-128'...127') | 0x00E3 | Sunset 5 December – sunrise 21 November (-128'...127') |
| 0x00E4 | Sunset 21 December – sunrise 5 December (-128'...127') | 0x00E5 | Sunset 5 January – sunrise 21 December (-128'...127') |
| 0x00E6 | Not used | 0x00E7 | Not used |

Remark:

Unused locations contain 0xFF

Valid reaction times

| Contents | Reaction time |
|----------|--------------------------------|
| 0x01 | Immediately (0.065s) (default) |
| 0x0E | 0.5s |
| 0x1C | 1s |
| 0x38 | 2s |
| 0x54 | 3s |
| 0xFF | Channel disabled |

Channel x start/end function

| Contents | Function |
|----------|-----------|
| 1 | Channel 1 |
| 2 | Channel 2 |
| ... | ... |
| 7 | Channel 7 |
| 8 | Channel 8 |

Remark:

For a normal one function button, the start and end function channel are the same.

For a multi-function button, the start function channel must be less than the end function. At every press the next channel will be send. When the end function channel is reached, the start channel will be send again at the next press.

For a dual function button, the start function channel will be send at a short press or the end function will be send at a long press.

Channels mode

| Contents | Description |
|--------------|---|
| B'xxxxxxxx0' | Dual function disabled (default) |
| B'xxxxxxxx1' | Dual function enabled |
| B'xxxxxx0x' | Multi-function auto reset disabled (default) |
| B'xxxxxx1x' | Multi-function auto reset enabled |
| B'xxxxx0xx' | Led backlight off |
| B'xxxxx1xx' | Led backlight on |
| B'xxxx0xxx' | Led monitor mode |
| B'xxxx1xxx' | Led feedback mode (default) |
| B'xxx0xxxx' | Slow blinking led feedback disabled |
| B'xxx1xxxx' | Slow blinking led feedback enabled (default) |
| B'xx0xxxxx' | Fast blinking led feedback disabled |
| B'xx1xxxxx' | Fast blinking led feedback enabled (default) |
| B'x0xxxxxx' | Very fast blinking led feedback disabled |
| B'x1xxxxxx' | Very fast blinking led feedback enabled (default) |
| B'0xxxxxxxx' | Channel inverted |
| B'1xxxxxxxx' | Channel normal |

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 |
| 0x2E | 1.6s |

Valid dual function long pressed times

| Contents | Long pressed time |
|----------|-------------------|
| 0x1C | 1s |
| 0x38 | 2s |
| 0x54 | 3s |

Led intensity

| <i>Contents</i> | <i>Led intensity</i> |
|-----------------|----------------------|
| 0x00 | Minimum |
| ... | ... |
| 0xFF | Maximum |

Alarm clock configuration

| <i>Contents</i> | <i>Channel locked/unlocked</i> |
|-----------------|--------------------------------|
| B'xxxxxxxx0' | Alarm 1 disabled |
| B'xxxxxxxx1' | Alarm 1 enabled |
| B'0xxxxxx0x' | Local alarm 1 |
| B'1xxxxxx1x' | Global alarm 1 |
| B'xxxxx0xx' | Alarm 2 disabled |
| B'xxxxx1xx' | Alarm 2 enabled |
| B'xxxx0xxx' | Local alarm 2 |
| B'xxxx1xxx' | Global alarm 2 |
| B'xxx0xxxx' | Sunrise disabled |
| B'xxx1xxxx' | Sunrise enabled |
| B'xx0xxxxx' | Sunset disabled |
| B'xx1xxxxx' | Sunset enabled |
| B'x0xxxxxx' | Summer time disabled |
| B'x1xxxxxx' | Summer time enabled |

| Address | Contents | Address | Contents |
|----------------|-------------------------------------|----------------|--------------------------------------|
| 0x00E8 | Linked Push button 1 module address | 0x0101 | Linked Push button 1 bit number |
| 0x0102 | Linked Push button 1 action | 0x0103 | Linked Push button 1 parameter 1 |
| 0x0104 | Linked Push button 1 parameter 2 | ... | ... |
| ... | ... | ... | ... |
| ... | ... | 0x020F | Linked Push button 60 module address |
| 0x0210 | Linked Push button 60 bit number | 0x0211 | Linked Push button 60 action |
| 0x0212 | Linked Push button 60 parameter 1 | 0x0213 | Linked Push button 60 parameter 2 |

Remark: Unused locations contain 0xFF

Action

| Action number | Action | Parameter 1 | Parameter 2 |
|----------------------|--|--------------------|--------------------|
| 0 | Not used (Switch status led indication) | - | Channel 1...8 |
| 1 | Lock channel at closed switch | - | Channel 1...8 |
| 2 | Lock channel at opened switch | - | Channel 1...8 |
| 3 | Lock channel | Timeout | Channel 1...8 |
| 4 | Lock/unlock channel | Timeout | Channel 1...8 |
| 5 | Unlock channel | - | Channel 1...8 |
| 6 | Disable channel program at closed switch | - | Channel 1...8 |
| 7 | Disable channel program at opened switch | - | Channel 1...8 |
| 8 | Disable channel program channel | Timeout | Channel 1...8 |
| 9 | Disable/enable channel program | Timeout | Channel 1...8 |
| 10 | Enable channel program | - | Channel 1...8 |
| 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 | - | - |

Time parameter

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

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

| Address | Contents | Address | Contents |
|----------------|-----------------------|----------------|-----------------------|
| 0x0214 | Program step 1 byte1 | 0x0215 | Program step 1 byte2 |
| 0x0216 | Program step 1 byte3 | 0x0217 | Program step 1 byte4 |
| 0x0218 | Program step 1 byte5 | 0x0219 | Program step 1 byte6 |
| ... | .. | .. | .. |
| 0x03B2 | Program step 70 byte1 | 0x03B3 | Program step 70 byte2 |
| 0x03B4 | Program step 70 byte3 | 0x03B5 | Program step 70 byte4 |
| 0x03B6 | Program step 70 byte5 | 0x03B7 | Program step 70 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 |
| B'x1xxxxxx' | Program group 2 |
| B'1xxxxxxx' | Program group 3 |

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

| <i>Contents program byte4</i> | <i>Contents program byte2</i> | <i>Description</i> |
|-------------------------------|-------------------------------|-----------------------------|
| 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 |

| <i>Contents program byte5</i> | <i>Action</i> |
|-------------------------------|----------------|
| 0 | 0s25 Pulse |
| 1 | 1s Pulse |
| 2 | 2s Pulse |
| ... | ... |
| 119 | 1min59s Pulse |
| 120 | 2min Pulse |
| 121 | 2min15s Pulse |
| ... | ... |
| 131 | 4min45s Pulse |
| 132 | 5min Pulse |
| 133 | 5min30s Pulse |
| ... | ... |
| 181 | 29min30s Pulse |
| 182 | 30min Pulse |
| 183 | 31min Pulse |
| ... | ... |
| 211 | 59min Pulse |
| 212 | 1h Pulse |
| 213 | 1h15min Pulse |
| ... | ... |
| 227 | 4h45min Pulse |
| 228 | 5h Pulse |
| 229 | 5h30min Pulse |
| ... | ... |
| 237 | 9h30min Pulse |
| 238 | 10h Pulse |
| 239 | 11h Pulse |
| ... | ... |
| 246 | 18h Pulse |
| 247 | Press |
| 248 | Long Press |
| 249 | Release |
| 250 | Lock |
| 251 | Unlock |
| 252 | No action |
| ... | ... |
| 255 | No action |

| <i>Contents program byte6</i> | Channel |
|--------------------------------------|----------------|
| 1 | Channel 1 |
| 2 | Channel 2 |
| 3 | Channel 3 |
| 4 | Channel 4 |
| 5 | Channel 5 |
| 6 | Channel 6 |
| 7 | Channel 7 |
| 8 | Channel 8 |

| <i>Address</i> | <i>Contents</i> | <i>Address</i> | <i>Contents</i> |
|----------------|--------------------------|----------------|--------------------------|
| 0x03B8 | Location id low byte | 0x03B9 | Location id high byte |
| 0x03BA | Group id low byte | 0x03BB | Group id high byte |
| 0x03BC | Module name character 1 | 0x03BD | Module name character 2 |
| ... | .. | .. | .. |
| 0x03FA | Module name character 63 | 0x03FB | Module name character 64 |
| 0x03FC | Not used | 0x03FD | Not used |
| 0x03FE | Not used | 0x03FF | Used for flash writing |