VMBVP1

Doorbird interface module for VELBUS system

Binairy format:

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

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

The module can transmit the following messages:
- Channel status
- Module status
- Module type
- Bus error counter status
- 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

The module can receive the following commands:
- Linked push button status
- Module type request
- Module status request
- Light value request
- Set or clear test mode
- 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

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = H'00'
RTR = 0
DLC3...DLC0 = 1 data byte to send
DATABYTE1 = COMMAND_REALTIME_CLOCK_STATUS_REQUEST (H'D7')

Transmits the real time clock status:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 databytes to send
DATABYTE1 = COMMAND_REALTIME_CLOCK_STATUS (H'D8')
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 (H'B7')
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 (H'AF')
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 (H'00')
DATABYTE2 = Channel just pressed
DATABYTE3 = Channel just released
DATABYTE4 = Channel long pressed

Contents	*Channel number*
B'00000001'	Motion 1
B'00000010'	Motion 2
B'00000100'	Bell 1
B'00001000'	Bell 2
B'00010000'	Door 1
B'00100000'	Door 2
B'01000000'	Virtual button 1
B'10000000'	Virtual button 2

    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address
    RTR = 0
    DLC3...DLC0 = 7 data bytes to send
    DATABYTE1 = COMMAND_MODULE_TYPE (H'FF')
    DATABYTE2 = VMBVP1 type (H'33')
    DATABYTE3 = High byte of serial number
    DATABYTE4 = Low byte of serial number
    DATABYTE5 = Memory map version
    DATABYTE6 = Build year
    DATABYTE7 = Build week

Transmits the module status:

    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = Module address
    RTR = 0
    DLC3...DLC0 = 6 data bytes to send
    DATABYTE1 = COMMAND_MODULE_STATUS (H'ED')
    DATABYTE2 = channel status (1 = pressed / 0 = released)

Contents	Channel status
B'xxxxxxx0'	Motion 1 output off
B'xxxxxxx1'	Motion 1 output on
B'xxxxxx0x'	Motion 2 output off
B'xxxxxx1x'	Motion 2 output on
B'xxxxx0xx'	Bell 1 output off
B'xxxxx1xx'	Bell 1 output on
B'xxxx0xxx'	Bell 2 output off
B'xxxx1xxx'	Bell 2 output on
B'xxx0xxxx'	Door 1 output off
B'xxx1xxxx'	Door 1 output on
B'xx0xxxxx'	Door 2 output off
B'xx1xxxxx'	Door 2 output on
B'x0xxxxxx'	Virtual button 1 released
B'x1xxxxxx'	Virtual button 1 pressed
B'0xxxxxxx'	Virtual button 2 released
B'1xxxxxxx'	Virtual button 2 pressed

    DATABYTE3 = locked channel status (0 = unlocked / 1 = locked)

Contents	Test modus or locked status
B'xxxxxxx0'	Motion 1 output unlocked
B'xxxxxxx1'	Motion 1 output locked
B'xxxxxx0x'	Motion 2 output unlocked
B'xxxxxx1x'	Motion 2 output locked
B'xxxxx0xx'	Bell 1 output unlocked
B'xxxxx1xx'	Bell 1 output locked
B'xxxx0xxx'	Bell 2 output unlocked
B'xxxx1xxx'	Bell 2 output locked
B'xxx0xxxx'	Door 1 output unlocked
B'xxx1xxxx'	Door 1 output locked
B'xx0xxxxx'	Door 2 output unlocked
B'xx1xxxxx'	Door 2 output locked
B'x0xxxxxx'	Virtual button 1 unlocked
B'x1xxxxxx'	Virtual button 1 locked
B'0xxxxxxx'	Virtual button 2 unlocked
B'1xxxxxxx'	Virtual button 2 locked

DATABYTE4 = disabled channel program status (0 = program enabled / 1 = program disabled)

Contents	Program disabled status
B'xxxxxxx0'	Motion 1 output program enabled
B'xxxxxxx1'	Motion 1 output program disabled
B'xxxxxx0x'	Motion 2 output program enabled
B'xxxxxx1x'	Motion 2 output program disabled
B'xxxxx0xx'	Bell 1 output program enabled
B'xxxxx1xx'	Bell 1 output program disabled
B'xxxx0xxx'	Bell 2 output program enabled
B'xxxx1xxx'	Bell 2 output program disabled
B'xxx0xxxx'	Door 1 output program enabled
B'xxx1xxxx'	Door 1 output l program disabled
B'xx0xxxxx'	Door 2 output program enabled
B'xx1xxxxx'	Door 2 output program disabled
B'x0xxxxxx'	Virtual button 1 program enabled
B'x1xxxxxx'	Virtual button 1 program disabled
B'0xxxxxxx'	Virtual button 2 program enabled
B'1xxxxxxx'	Virtual button 2 program disabled

DATABYTE5 = alarm & program selection

Contents	Selected program
B'xxxxxx00'	No program group
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'0xxxxxxx'	Sunset disabled
B'1xxxxxxx'	Sunset enabled

DATABYTE6 = operating mode (0 = normal / 1 = test mode)

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes to send
DATABYTE1 = COMMAND_BUSERROR_COUNTER_STATUS (H'DA')
DATABYTE2 = Transmit error counter
DATABYTE3 = Receive error counter
DATABYTE4 = Bus off counter

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes to send
DATABYTE1 = COMMAND_MEMORY_DATA (H'FE')
DATABYTE2 = High memory address
DATABYTE3 = LOW memory address
DATABYTE4 = memory data

Remark: address range: H'0000' to H'01FF'

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 (H'CC')
    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: H'0000' to H'01FC'

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 (H'F5')
    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 (H'F6')
    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 (H'F7')
    DATABYTE2 = LED bit numbers (1 = slow blink LED)

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 (H'00')
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)

'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 (H'D7')

'Set real time clock' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = H'00'
RTR = 0
DLC3...DLC0 = 4 data bytes to send
DATABYTE1 = COMMAND_SET_REALTIME_CLOCK (H'D8')
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 = H'00'
RTR = 0
DLC3...DLC0 = 5 data bytes to send
DATABYTE1 = COMMAND_SET_REALTIME_DATE (H'B7')
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 = H'00'
RTR = 0
DLC3...DLC0 = 2 data bytes to send
DATABYTE1 = COMMAND_SET_DAYLIGHT_SAVING (H'AF')
DATABYTE2 = 0 =disabled / 1 = enabled

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

    SID10-SID9 = 11 (lowest priority)
    SID8...SID1 = H'00'
    RTR = 0
    DLC3...DLC0 = 3 data bytes to send
    DATABYTE1 = COMMAND_ENA_DIS_SUNRISE_SUNSET (H'AE')
    DATABYTE2 = Channel (FF)
    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 to send
    DATABYTE1 = COMMAND_ENA_DIS_SUNRISE_SUNSET (H'AE')
    DATABYTE2 = Channel (FF)
    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 = H'00'
    RTR = 0
    DLC3...DLC0 = 7 data bytes to send
    DATABYTE1 = COMMAND_SET_ALARM_CLOCK (H'C3')
    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 (H'C3')
    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 (H'FA')
>   DATABYTE2 = don't care

'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
B'00000000'	Normal
B'00000001'	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 = Module address
>   RTR = 0
>   DLC3...DLC0 = 2 data bytes received
>   DATABYTE1 = COMMAND_CLEAR_LED (H'F5')
>   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 (H'F6')
>   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 (H'F7')
>   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 (H'F8')
>   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 (H'F9')
>   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 (H'F4')
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 (H'FD')
DATABYTE2 = High memory address
DATABYTE3 = LOW memory address

Remark: address range: H'0000' to H'01FF'

'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 (H'CB')

'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 (H'C9')
DATABYTE2 = High memory address
DATABYTE3 = LOW memory address

Remark: address range: H'0000' to H'01FC'

'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 (H'FC')
DATABYTE2 = High memory address
DATABYTE3 = LOW memory address (H'00'...H'FF')
DATABYTE4 = memory data to write

Remark:
Wait at least 10ms for sending a next command on the velbus.
Address range: H'0000' to H'01FF'

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Address of the module
RTR = 0
DLC3...DLC0 = 7 data bytes received
DATABYTE1 = COMMAND_WRITE_MEMORY_BLOCK (H'CA')
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: H'0000' to H'01FC'

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 (H'D9')

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_CANCEL_FORCED_OFF (H'13')
DATABYTE2 = Channel bit

Contents	Channel
B'00000001'	Motion 1 output
B'00000010'	Motion 2 output
B'00000100'	Bell 1 output
B'00001000'	Bell 2 output
B'00010000'	Door 1 output
B'00100000'	Door 2 output
B'01000000'	Virtual button 1
B'10000000'	Virtual button 2

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_FORCED_OFF (H'12')
DATABYTE2 = Channel bit

Contents	Channel
B'00000001'	Motion 1 output
B'00000010'	Motion 2 output
B'00000100'	Bell 1 output
B'00001000'	Bell 2 output
B'00010000'	Door 1 output
B'00100000'	Door 2 output
B'01000000'	Virtual button 1
B'10000000'	Virtual button 2

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 H'FFFFFF' 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 databytes received
DATABYTE1 = COMMAND_ENABLE_PROGRAM (H'B2')
DATABYTE2 = Channel bit

Contents	Channel
B'00000001'	Motion 1 output
B'00000010'	Motion 2 output
B'00000100'	Bell 1 output
B'00001000'	Bell 2 output
B'00010000'	Door 1 output
B'00100000'	Door 2 output
B'01000000'	Virtual button 1
B'10000000'	Virtual button 2

'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 (H'B1')
DATABYTE2 = Channel bit

Contents	Channel
B'00000001'	Motion 1 output
B'00000010'	Motion 2 output
B'00000100'	Bell 1 output
B'00001000'	Bell 2 output
B'00010000'	Door 1 output
B'00100000'	Door 2 output
B'01000000'	Virtual button 1
B'10000000'	Virtual button 2

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 H'FFFFFF' 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 (H'B3')
DATABYTE2 = Program mode

Contents	Selected program
0	None
1	Program group 1
2	Program group 2
3	Program group 3

Memory map version 1:

Address	Contents	Address	Contents
0x0000	Virtual button 1 name character 1	0x0001	Virtual button 1 name character 2
…	..	..	..
0x000E	Virtual button 1 name character 15	0x000F	Virtual button 1 name character 16
0x0010	Virtual button 2 name character 1	0x0011	Virtual button 2 name character 2
…	..	..	..
0x001E	Virtual button 2 name character 15	0x001F	Virtual button 2 name character 16
0x0020	Reaction time virtual button 1	0x0021	Reaction time virtual button 2
0x0022	Motion 1 reaction time (default 0s)	0x0023	Motion 1 timer mode = restartable timer
0x0024	Motion 1 timeout (default 0s)	0x0025	Motion 1 flags cycling protect = off (default external overwrite off)
0x0026	Motion 2 reaction time (default 0s)	0x0027	Motion 2 timer mode = restartable timer
0x0028	Motion 2 timeout (default 0s)	0x0029	Motion 2 flags cycling protect = off (default external overwrite off)
0x002A	Reaction time bell & door input (default 0s)	0x002B	Alarm clock configuration
0x002C	Wake up 1 hour (0…23)	0x002D	Wake up 1 minutes (0…59)
0x002E	Go to bed 1 hour (0…23)	0x002F	Go to bed 1 minutes (0…59)
0x0030	Wake up 2 hour (0…23)	0x0031	Wake up 2 minutes (0…59)
0x0032	Go to bed 2 hour (0…23)	0x0033	Go to bed 2 minutes (0…59)
0x0034	Sunrise hour at 21 December (0…23)	0x0035	Sunrise minutes at 21 December (0…59)
0x0036	Sunrise 21 January – sunrise 5 January (-128'..127')	0x0037	Sunrise 5 February – sunrise 21 January (-128'..127')
0x0038	Sunrise 21 February – sunrise 5 February (-128'..127')	0x0039	Sunrise 5 March – sunrise 21 February (-128'..127')
0x003A	Sunrise 21 March – sunrise 5 March (-128'..127')	0x003B	Sunrise 5 April – sunrise 21 March (-128'..127')
0x003C	Sunrise 21 April – sunrise 5 April (-128'..127')	0x003D	Sunrise 5 May – sunrise 21 April (-128'..127')
0x003E	Sunrise 21 May – sunrise 5 May (-128'..127')	0x003F	Sunrise 5 June – sunrise 21 May (-128'..127')
0x0040	Sunrise 21 June – sunrise 5 June (-128'..127')	0x0041	Sunrise 5 July – sunrise 21 June (-128'..127')
0x0042	Sunrise 21 July – sunrise 5 July (-128'..127')	0x0043	Sunrise 5 August – sunrise 21 July (-128'..127')
0x0044	Sunrise 21 August – sunrise 5 August (-128'..127')	0x0045	Sunrise 5 September – sunrise 21 August (-128'..127')
0x0046	Sunrise 21 September – sunrise 5 September (-128'..127')	0x0047	Sunrise 5 October – sunrise 21 September (-128'..127')
0x0048	Sunrise 21 October – sunrise 5 October (-128'..127')	0x0049	Sunrise 5 November – sunrise 21 October (-128'..127')
0x004A	Sunrise 21 November – sunrise 5 November (-128'..127')	0x004B	Sunrise 5 December – sunrise 21 November (-128'..127')
0x004C	Sunrise 21 December – sunrise 5 December (-128'..127')	0x004D	Sunrise 5 January – sunrise 21 December (-128'..127')
0x004E	Sunset hour at 21 December (0…23)	0x004F	Sunset minutes at 21 December (0…59)
0x0050	Sunset 21 January – sunrise 5 January (-128'..127')	0x0051	Sunset 5 February – sunrise 21 January (-128'..127')
0x0052	Sunset 21 February – sunrise 5 February (-128'..127')	0x0053	Sunset 5 March – sunrise 21 February (-128'..127')
0x0054	Sunset 21 March – sunrise 5 March (-128'..127')	0x0055	Sunset 5 April – sunrise 21 March (-128'..127')
0x0056	Sunset 21 April – sunrise 5 April (-128'..127')	0x0057	Sunset 5 May – sunrise 21 April (-128'..127')
0x0058	Sunset 21 May – sunrise 5 May (-128'..127')	0x0059	Sunset 5 June – sunrise 21 May (-128'..127')
0x005A	Sunset 21 June – sunrise 5 June (-128'..127')	0x005B	Sunset 5 July – sunrise 21 June (-128'..127')
0x005C	Sunset 21 July – sunrise 5 July (-128'..127')	0x005D	Sunset 5 August – sunrise 21 July (-128'..127')
0x005E	Sunset 21 August – sunrise 5 August (-128'..127')	0x005F	Sunset 5 September – sunrise 21 August (-128'..127')
0x0060	Sunset 21 September – sunrise 5 September (-128'..127')	0x0061	Sunset 5 October – sunrise 21 September (-128'..127')
0x0062	Sunset 21 October – sunrise 5 October (-128'..127')	0x0063	Sunset 5 November – sunrise 21 October (-128'..127')
0x0064	Sunset 21 November – sunrise 5 November (-128'..127')	0x0065	Sunset 5 December – sunrise 21 November (-128'..127')
0x0066	Sunset 21 December – sunrise 5 December (-128'..127')	0x0067	Sunset 5 January – sunrise 21 December (-128'..127')
0x0068	Not used	0x0069	Not used
…	…	…	…
0x00AA	Not used	0x00AB	Module terminator
0x00AC	Location id low byte	0x00AD	Location id high byte
0x00AE	Group id low byte	0x00AF	Group id high byte
0x00B0	Module name character 1	0x00B1	Module name character 2
…	…	..	...
0x00EE	Module name character 63	0x00EF	Module name character 64
0x00F0	Not used	0x00F1	Not used
0x00F2	Not used	0x00F3	Not used
0x00F4	Not used	0x00F5	Program selection (none/summer/winter/holiday)
0x00F6	Program disable/enable flags	0x00F7	Locked/unlocked flags
0x00F8	Current day (1…31)	0x00F9	Current month (1…12)
0x00FA	Current year high byte	0x00FB	Current year low byte
0x00FC	Zone address	0x00FD	Module Address
0x00FE	Serial number high	0x00FF	Serial number low

Remark:

Unused locations contain 0xFF

Do not overwrite the following address location:

0x00F5	program selection
0x00F6	program enable/disable flags
0x00F7	locked/unlocked flags
0x00F8	current day of month
0x00F9	current month
0x00FA & 0x00FB	current year
0x00FC	zone address
0x00FD	module address
0x00FE & 0x00FF	module serial number

Reaction time virtual buttons

Contents	Reaction time
0x00	0s (factory default)
0xFF	Never

Reaction time bell and door

Contents	Reaction time
0x00	0s (fixed)

Reaction time motion

Contents	Reaction time
0	0s (factory default)
1	1s
2	2s
...	
59	59s
60	1min
61	1min1s
...	
…	
119	1min59s
120	2min
121	2min15s
...	
131	4min45s
132	5min
133	5min30s
...	
181	29min30s
182	30min
183	31min
...	
211	59min
212	1h

Timer mode

Contents	Timer mode
0x00	non restartable timer
0xFF	restartable timer (factory default)

Timeout

Contents	Timeout
0	0 = momentary (factory default)
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

Motion flags

Contents	Timer mode
B'xxxxxxx0'	Cycling protection disabled (default)
B'xxxxxxx1'	Cycling protection enabled
B'xxxxxx0x'	External overwrite disabled (default)
B'xxxxxx1x'	External overwrite enabled

Alarm clock configuration

Contents	Channel locked/unlocked
B'xxxxxxx0'	Alarm 1 disabled
B'xxxxxxx1'	Alarm 1 enabled
B'0xxxxx0x'	Local alarm 1
B'1xxxxx1x'	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'	Daylight savings disabled
B'x1xxxxxx'	Daylight savings enabled

Program selection

Contents	Selected program
0	None
1	Group 1 (eg. Summer programs)
2	Group 2 (eg. Winter programs)
3	Group 3 (eg. Holiday programs)

Channel program disabled

Contents	Channel program enabled/disabled
B'xxxxxxx0'	Motion 1 program enabled
B'xxxxxxx1'	Motion 1 program disabled
B'xxxxxx0x'	Motion 2 program enabled
B'xxxxxx1x'	Motion 2 program disabled
B'xxxxx0xx'	Bell 1 program enabled
B'xxxxx1xx'	Bell 1 program disabled
B'xxxx0xxx'	Bell 2 program enabled
B'xxxx1xxx'	Bell 2 program disabled
B'xxx0xxxx'	Door 1 program enabled
B'xxx1xxxx'	Door 1 program disabled
B'xx0xxxxx'	Door 2 program enabled
B'xx1xxxxx'	Door 2 program disabled
B'x0xxxxxx'	Virtual button 1 program enabled
B'x1xxxxxx'	Virtual button 1 program disabled
B'0xxxxxxx'	Virtual button 2 program enabled
B'1xxxxxxx'	Virtual button 2 program disabled

Channel locked

Contents	Channel locked/unlocked
B'xxxxxxx0'	Motion 1 output unlocked
B'xxxxxxx1'	Motion 1 output locked
B'xxxxxx0x'	Motion 2 output unlocked
B'xxxxxx1x'	Motion 2 output locked
B'xxxxx0xx'	Bell 1 output unlocked
B'xxxxx1xx'	Bell 1 output locked
B'xxxx0xxx'	Bell 2 output unlocked
B'xxxx1xxx'	Bell 2 output locked
B'xxx0xxxx'	Door 1 output unlocked
B'xxx1xxxx'	Door 1 output locked
B'xx0xxxxx'	Door 2 output unlocked
B'xx1xxxxx'	Door 2 output locked
B'x0xxxxxx'	Virtual button 1 unlocked
B'x1xxxxxx'	Virtual button 1 locked
B'0xxxxxxx'	Virtual button 2 unlocked
B'1xxxxxxx'	Virtual button 2 locked

Address	Contents	Address	Contents
0x0100	Linked Push button 1 module address	0x0101	Linked Push button 1 bit number
0x0102	Linked Push button 1 action	0x0103	Linked Push button 1 time parameter
0x0104	Linked Push button 1 channel parameter	...	…
...	...	...	...
0x0178	Linked Push button 25 module address	0x0179	Linked Push button 25 bit number
0x017A	Linked Push button 25 action	0x017B	Linked Push button 25 time parameter
0x017C	Linked Push button 25 channel parameter	0x017D	Not used
0x017E	Not used	0x017F	Not used

Action

Action number	Action	Time parameter	Bit number
0	Lock channel at closed switch	-	Channel bit
1	Lock channel at opened switch	-	Channel bit
2	Lock channel	Timeout	Channel bit
3	Lock/unlock channel	Timeout	Channel bit
4	Unlock channel	-	Channel bit
5	Disable channel program at closed switch	-	Channel bit
6	Disable channel program at opened switch	-	Channel bit
7	Disable channel program channel	Timeout	Channel bit
8	Disable/enable channel program	Timeout	Channel bit
9	Enable channel program	-	Channel bit
10	Select no programs	-	-
11	Select program group 1 (e.g. summer programs)	-	-
12	Select/deselect program group 1 (e.g. summer programs)	-	-
13	Select program group 2 (e.g. winter programs)	-	-
14	Select/deselect program group 2 (e.g. winter programs)	-	-
15	Select program group 3 (e.g. holiday programs)	-	-
16	Select/deselect program group 3 (e.g. holiday programs)	-	-
17	Enable Alarm 1 at closed switch	-	-
18	Enable Alarm 1 at open switch	-	-
19	Disable Alarm 1 at closed switch	-	-
20	Disable Alarm 1 at open switch	-	-
21	Enable Alarm 1	-	-
22	Enable/Disable Alarm 1	-	-
23	Disable Alarm 1	-	-
24	Enable Alarm 2 at closed switch	-	-
25	Enable Alarm 2 at open switch	-	-
26	Disable Alarm 2 at closed switch	-	-
27	Disable Alarm 2 at open switch	-	-
28	Enable Alarm 2	-	-
29	Enable/Disable Alarm 2	-	-
30	Disable Alarm 2	-	-
31	Enable Sunrise at closed switch	-	-
32	Enable Sunrise at open switch	-	-
33	Disable Sunrise at closed switch	-	-
34	Disable Sunrise at open switch	-	-
35	Enable Sunrise	-	-
36	Enable/Disable Sunrise	-	-
37	Disable Sunrise	-	-
38	Enable Sunset at closed switch	-	-
39	Enable Sunset at open switch	-	-
40	Disable Sunset at closed switch	-	-
41	Disable Sunset at open switch	-	-
42	Enable Sunset	-	-
43	Enable/Disable Sunset	-	-
44	Disable Sunset	-	-

Bit Number

Contents	Bit number
B'00000001'	Motion 1 output
B'00000010'	Motion 2 output
B'00000100'	Bell 1 output
B'00001000'	Bell 2 output
B'00010000'	Door 1 output
B'00100000'	Door 2 output
B'01000000'	Virtual button 1
B'10000000'	Virtual button 2

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
0x0180	Program step 1 byte1	0x0181	Program step 1 byte2
0x0182	Program step 1 byte3	0x0183	Program step 1 byte4
0x0184	Program step 1 byte5	0x0185	Program step 1 byte6
…	…	…	…
0x01F8	Program step 21 byte 1	0x01F9	Program step 21 byte2
0x01FA	Program step 21 byte3	0x01FB	Program step 21 byte4
0x01FC	Program step 21 byte5	0x01FD	Program step 21 byte6
0x01FE	Not used	0x01FF	Not used

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'	Summer program
B'x1xxxxxx'	Winter program
B'1xxxxxxx'	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 for motion, bell & door outputs
0	Unlock
1	Lock

Contents program byte5	Action for the virtual buttons
0	0s25 Pulse (only for virtual button 1 & 2)
1	1s Pulse (only for virtual button 1 & 2)
2	2s Pulse (only for virtual button 1 & 2)
...	...
119	1min59s Pulse (only for virtual button 1 & 2)
120	2min Pulse (only for virtual button 1 & 2)
121	2min15s Pulse (only for virtual button 1 & 2)
...	...
131	4min45s Pulse (only for virtual button 1 & 2)
132	5min Pulse (only for virtual button 1 & 2)
133	5min30s Pulse (only for virtual button 1 & 2)
...	...
181	29min30s Pulse (only for virtual button 1 & 2)
182	30min Pulse (only for virtual button 1 & 2)
183	31min Pulse (only for virtual button 1 & 2)
...	...
211	59min Pulse (only for virtual button 1 & 2)
212	1h Pulse (only for virtual button 1 & 2)
213	1h15min Pulse (only for virtual button 1 & 2)
...	...
227	4h45min Pulse (only for virtual button 1 & 2)
228	5h Pulse (only for virtual button 1 & 2)
229	5h30min Pulse (only for virtual button 1 & 2)
...	...
237	9h30min Pulse (only for virtual button 1 & 2)
238	10h Pulse (only for virtual button 1 & 2)
239	11h Pulse (only for virtual button 1 & 2)
...	…
246	18h Pulse (only for virtual button 1 & 2)
247	Press (only for virtual button 1 & 2)
248	Long Press (only for virtual button 1 & 2)
249	Release (only for virtual button 1 & 2)
250	Lock
251	Unlock
252	No action
…	…
255	No action

Contents program byte6	Channel
B'00000001'	Motion 1 output
B'00000010'	Motion 2 output
B'00000100'	Bell 1 output
B'00001000'	Bell 2 output
B'00010000'	Door 1 output
B'00100000'	Door 2 output
B'01000000'	Virtual button 1
B'10000000'	Virtual button 2