

# VMB4RF

**Wireless remote control receiver  
module for VELBUS system**

Binary format:

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

<i>bits</i>	<i>Description</i>
SOF	Start Of Frame (always 0)
SID10 & SID9	Priority (00: highest ... 11: lowest priority)
SID8...SID1	Address
SID0	Always 0
RTR	Remote Transmit Request
IDE	Identifier Extension (always 0)
r0	reserved (always 0)
DLC3...DLC0	Data Length Code (0...8)
Databyte1	Command
Databyte2	Parameter
Databyte3	Parameter
Databyte4	Parameter
Databyte5	Parameter
Databyte6	Parameter
Databyte7	Parameter
Databyte8	Parameter
CRC15...CRC1	Cyclic Redundancy Checksum
CRCDEL	CRC Delimiter (always 1)
ACK	Acknowledge slot (transmit 1 readback 0 if received correctly)
ACKDEL	Acknowledge Delimiter (always 1)
EOF7...EOF1	End Of Frame (always 111111)
IFS3...IFS1	InterFrame Space (always 111)

*The module can transmit the following messages:*

- 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)
- Received code
- Real-time clock status
- Date 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
- Channel name request
- Clear channel led
- Set channel led
- Slow blink channel led
- Fast blink channel led
- Very fast blink 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 local alarm clock
- Set global alarm clock
- Lock channel
- Unlock channel
- Disable channel program
- Enable channel program
- Select program
- Set or clear learning remote mode

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

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = H'00'

RTR = 0

DLC3...DLC0 = 1 databyte 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 databytes 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 channel switch status:***

SID10-SID9 = 00 (highest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 4 databytes to send

DATABYTE1 = COMMAND\_PUSH\_BUTTON\_STATUS (H'00')

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 = 7 databytes to send

DATABYTE1 = COMMAND\_MODULE\_TYPE (H'FF')

DATABYTE2 = VMB4RF type (H'1A')

DATABYTE3 = High byte of serial number

DATABYTE4 = Low byte of serial number

DATABYTE5 = Memorymap version

DATABYTE6 = Build year

DATABYTE7 = Build week

**Transmits the module status:**

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 5 databytes to send

DATABYTE1 = COMMAND\_MODULE\_STATUS (H'B4')

DATABYTE2 = channel 1 to 4 status (1 = pressed / 0 = released)

DATABYTE3 = enabled/disable channel status (1 = enabled / 0 = disabled)

DATABYTE4 = learn transmitter mode (1 = learn / 0 = normal)

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

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

DATABYTE7 = alarm &amp; program selection

<i>Contents</i>	<i>Selected programl</i>
B'xxxxxx00'	None
B'xxxxxx01'	Summer
B'xxxxxx10'	Winter
B'xxxxxx11'	Holiday
B'xxxx0xx'	Alarm 1 off
B'xxxx1xx'	Alarm 1 on
B'xxx0xxx'	Local alarm 1
B'xxx1xxx'	Global alarm 1
B'xx0xxxx'	Alarm 2 off
B'xx1xxxx'	Alarm 2 on
B'x0xxxxx'	Local alarm 2
B'x1xxxxx'	Global alarm 2
B'x0xxxxxx'	Sunrise disabled
B'x1xxxxxx'	Sunrise enabled
B'0xxxxxxx'	Sunset disabled
B'1xxxxxxx'	Sunset enabled

**Transmit: Bus error counter status**

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 4 databytes to send

DATABYTE1 = COMMAND\_BUSERROR\_COUNTER\_STATUS (H'DA')

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 databytes 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'02FF'

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 7 databytes 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'02FC'

***Transmits the first part of channel 1 to 8 name:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 8 databytes to send  
DATABYTE1 = COMMAND\_CHANNEL\_NAME\_PART1 (H'F0')  
DATABYTE2 = Channel

<i>Contents</i>	<i>Channel number</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

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 1 to 8 name:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 8 databytes to send  
DATABYTE1 = COMMAND\_CHANNEL\_NAME\_PART2 (H'F1')  
DATABYTE2 = Channel

<i>Contents</i>	<i>Channel number</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

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 1 to 8 name:**

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 6 databytes to send

DATABYTE1 = COMMAND\_CHANNEL\_NAME\_PART3 (H'F2')

DATABYTE2 = Channel

<i>Contents</i>	<i>Channel number</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

DATABYTE3 = Character 13 of the channel name

DATABYTE4 = Character 14 of the channel name

DATABYTE5 = Character 15 of the channel name

DATABYTE6 = Character 16 of the channel name

Remarks:

Unused characters contain H'FF'.

**Transmits received code:**

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 6 databytes to send

DATABYTE1 = COMMAND\_RF\_CODE\_STATUS (H'B6')

DATABYTE2 = Code info

<i>Contents</i>	<i>Code info</i>
B'00000111'	32-bit code transmitter
B'00011111'	48-bit code transmitter

DATABYTE3 = Code byte1

DATABYTE4 = Code byte2

DATABYTE5 = Code byte3

DATABYTE6 = Code byte4

Remark: Do not validate the following codes:

<i>Code info</i>	<i>Code byte1</i>	<i>Code byte2</i>	<i>Code byte3</i>	<i>Code byte4</i>
H'07'	H'56'	H'65'	H'72'	H'2F'
H'1F'	H'4E'	H'41'	H'54'	H'48'

**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 databytes 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 databytes 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 databytes to send

DATABYTE1 = COMMAND\_SLOW\_BLINKING\_LED (H'F7')

DATABYTE2 = LED bit numbers (1 = slow blink LED)

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

SID10-SID9 = 00 (highest priority)  
 SID8...SID1 = Address of the linked push button module  
 RTR = 0  
 DLC3...DLC0 = 4 databytes 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 databyte 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 databytes to send  
 DATABYTE1 = COMMAND\_SET\_REALTIME\_CLOCK (H'D8')  
 DATABYTE2 = Day of week

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

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

***‘Set date’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = H'00'  
 RTR = 0  
 DLC3...DLC0 = 5 databytes 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 global clock alarm’ command received:***

SID10-SID9 = 11 (lowest priority)  
 SID8...SID1 = H'00'  
 RTR = 0  
 DLC3...DLC0 = 7 databytes 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 databytes 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 databytes received

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

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

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 databytes received  
DATABYTE1 = COMMAND\_CHANNEL\_NAME\_REQUEST (H'EF')  
DATABYTE2 = Channel

<i>Contents</i>	<i>Channel number</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 databytes received  
DATABYTE1 = COMMAND\_CLEAR\_LED (H'F5')  
DATABYTE2 = LEDs to clear (a one clears the corresponding LED of channel 1 to 4)

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 databytes received  
DATABYTE1 = COMMAND\_SET\_LED (H'F6')  
DATABYTE2 = LEDs to set (a one sets the corresponding LED of channel 1 to 4)

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 databytes received  
DATABYTE1 = COMMAND\_SLOW\_BLINK\_LED (H'F7')  
DATABYTE2 = LEDs to blink slow (a one blinks slow the corresponding LED of channel 1 to 4)

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 databytes received  
DATABYTE1 = COMMAND\_FAST\_BLINK\_LED (H’F8’)  
DATABYTE2 = LEDs to blink fast (a one blinks fast the corresponding LED of channel 1 to 4)

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 2 databytes 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 4)

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 4 databytes received  
DATABYTE1 = COMMAND\_UPDATE\_LED\_STATUS (H’F4’)  
DATABYTE2 = LEDs to set (a one sets the corresponding LED of channel 1 to 4)  
DATABYTE3 = LEDs to blink slow (a one blinks slow the corresponding LED of channel 1 to 4)  
DATABYTE4 = LEDs to blink fast (a one blinks very fast the corresponding LED of channel 1 to 4)

Remark: 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 databytes received  
DATABYTE1 = COMMAND\_READ\_DATA\_FROM\_MEMORY (H’FD’)  
DATABYTE2 = High memory address  
DATABYTE3 = LOW memory address

Remark: address range: H’0000’ to H’02FF’

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 1 databytes 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 databytes received  
DATABYTE1 = COMMAND\_READ\_MEMORY\_BLOCK (H’C9’)  
DATABYTE2 = High memory address  
DATABYTE3 = LOW memory address

Remark: address range: H’0000’ to H’02FC’

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

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

Remark:

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

Address range: H'0000' to H'02FF'

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

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Address of the module  
RTR = 0  
DLC3...DLC0 = 7 databytes 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'02FC'

***‘Bus error counter status request’ command received:***

SID10-SID9 = 11 (lowest priority)  
SID8...SID1 = Module address  
RTR = 0  
DLC3...DLC0 = 1 databytes to send  
DATABYTE1 = COMMAND\_BUS\_ERROR\_COUNTER\_STATUS\_REQUEST (H'D9')

***‘Set or Clear learn remote mode’ command received:***

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

<i>Contents</i>	<i>Operating mode</i>
B'00000000'	Normal
B'00000001'	Learn remote code

Remark:

After changing the operating mode, the module sends his status.

There is a timeout of 107 seconds for the learn mode.

Receiving a valid remote code will set the code on the bus and terminate the learn mode.

***‘Unlock channel’ command received:***

SID10-SID9 = 00 (highest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 2 databytes received

DATABYTE1 = COMMAND\_CANCEL\_FORCED\_OFF (H'13')

DATABYTE2 = Channel bit

<i>Contents</i>	<i>Channel</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

***‘Lock channel’ command received:***

SID10-SID9 = 00 (highest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 5 databytes received

DATABYTE1 = COMMAND\_FORCED\_OFF (H'12')

DATABYTE2 = Channel bit

<i>Contents</i>	<i>Dimmer channel</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

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

<i>Contents</i>	<i>Channel</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

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

SID10-SID9 = 11 (lowest priority)

SID8...SID1 = Module address

RTR = 0

DLC3...DLC0 = 5 databytes received

DATABYTE1 = COMMAND\_DISABLE\_PROGRAM (H'B1')

DATABYTE2 = channel

<i>Contents</i>	<i>Channel</i>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4

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 databytes received

DATABYTE1 = COMMAND\_SELECT\_PROGRAM (H'B3')

DATABYTE2 = Program mode

<i>Contents</i>	<i>Selected programl</i>
0	None
1	Summer
2	Winter
3	Holiday

## Memory map:

<i>Address</i>	<i>Contents</i>	<i>Address</i>	<i>Contents</i>
H'0000'	Channel 1 name character 1	H'0001'	Channel 1 name character 2
...	...	...	...
H'000E'	Channel 1name character 15	H'000F'	Channel 1 name character 16
H'0010'	Channel 2 name character 1	H'0011'	Channel 2 name character 2
...	...	...	...
H'001E'	Channel 2name character 15	H'001F'	Channel 2 name character 16
H'0020'	Channel 3 name character 1	H'0021'	Channel 3 name character 2
...	...	...	...
H'002E'	Channel 3name character 15	H'002F'	Channel 3 name character 16
H'0030'	Channel 4 name character 1	H'0031'	Channel 4 name character 2
...	...	...	...
H'003E'	Channel 4name character 15	H'003F'	Channel 4 name character 16
H'0040'	Channel 1 reaction time	H'0041'	Channel 2 reaction time
H'0042'	Channel 3 reaction timer	H'0043'	Channel 4 reaction time
H'0044'	Program selection (none/summer/winter/holiday)	H'0045'	Channel 8...1 prog disable/enable flags
H'0046'	Channel 8...1 locked/unlocked flags	H'0047'	Alarm clock configuration
H'0048'	Wake up 1 hour (0...23)	H'0049'	Wake up 1 minutes (0...59)
H'004A'	Go to bed 1 hour (0...23)	H'004B'	Go to bed 1 minutes (0...59)
H'004C'	Wake up 2 hour (0...23)	H'004D'	Wake up 2 minutes (0...59)
H'004E'	Go to bed 2 hour (0...23)	H'004F'	Go to bed 2 minutes (0...59)
H'0050'	Code 1 info	H'0051'	Code 1 byte1
H'0052'	Code 1 byte 2	H'0053'	Code 1 byte3
H'0054'	Code 1 byte 4	H'0055'	Code 1 name character 1
...	...	...	...
H'005E'	Code 1 character10	H'005F'	Code 1 name character 11
H'0060'	Code 2 info	H'0061'	Code 2 byte1
H'0062'	Code 2 byte 2	H'0063'	Code 2 byte3
H'0064'	Code 2 byte 4	H'0065'	Code 2 name character 1
...	...	...	...
H'006E'	Code 2 character10	H'006F'	Code 2 name character 11
...	...	...	...
H'00E0'	Code 10 info	H'00E1'	Code 10 byte1
H'00E2'	Code 10 byte 2	H'00E3'	Code 10 byte3
H'00E4'	Code 10 byte 4	H'00E5'	Code 10 name character 1
...	...	...	...
H'00EE'	Code 10 character10	H'00EF'	Code 10 name character 11
H'00F0'	Not used	H'00F1'	Not used
...	...	...	...
H'00F6'	Not used	H'00F7'	Not used
H'00F8'	Led feedback on/off	H'00F9'	Enable/disable slow blinking led feedback
H'00FA'	Enable/disable fast blinking led feedback	H'00FB'	Enable/disable very fast blinking led feedback
H'00FC'	Receive pulse extend time	H'00FD'	Module address
H'00FE'	Serial number high byte	H'00FF'	Serial number low byte

**Remark:** Unused locations contain H'FF'  
Do not overwrite the module address and serial number

### Valid reaction times

<i>Contents</i>	<i>Reaction time</i>
H'05'	0.1s
H'4C'	1s
H'99'	2s
H'E0'	3s
H'FF'	Channnel disabled

### Program selection

<i>Contents</i>	<i>Selected program</i>
0	None
1	Summer
2	Winter
3	Holiday

**Channel program disabled**

<b>Contents</b>	<b>Channel program enabled/disabled</b>
B'xxxxxxx0'	Channel 1 programs enabled
B'xxxxxxx1'	Channel 1 programs disabled
...	...
B'xxxx0xxx'	Channel 4 programs enabled
B'xxxx1xxx'	Channel 4 programs disabled

**Channel locked**

<b>Contents</b>	<b>Channel locked/unlocked</b>
B'xxxxxxx0'	Channel 1 unlocked
B'xxxxxxx1'	Channel 1 locked
...	...
B'xxxx0xxx'	Channel 4 unlocked
B'xxxx1xxx'	Channel 4 locked

**Alarm clock configuration**

<b>Contents</b>	<b>Alarm clock configuration</b>
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'	Summer time disabled
B'x1xxxxxx'	Summer time enabled

**Led feedback on/off**

<b>Contents</b>	<b>Led feedback</b>
B'xxxxxxx0'	Channel 1 off
B'xxxxxxx1'	Channel 1 on
...	...
B'xxxx0xxx'	Channel 4 off
B'xxxx1xxx'	Channel 4 on

**Slow blinking Led feedback on/off**

<b>Contents</b>	<b>Slow blinking Led feedback</b>
B'xxxxxxx0'	Channel 1 off
B'xxxxxxx1'	Channel 1 on
...	...
B'xxxx0xxx'	Channel 4 off
B'xxxx1xxx'	Channel 4 on

**Fast blinking Led feedback on/off**

<b>Contents</b>	<b>Fast blinking Led feedback</b>
B'xxxxxxx0'	Channel 1 off
B'xxxxxxx1'	Channel 1 on
...	...
B'xxxx0xxx'	Channel 4 off
B'xxxx1xxx'	Channel 4 on

***Very Fast blinking Led feedback on/off***

<b><i>Contents</i></b>	<b><i>Very Fast blinking Led feedback</i></b>
B'xxxxxxx0'	Channel 1 off
B'xxxxxxx1'	Channel 1 on
...	...
B'xxxx0xxx'	Channel 4 off
B'xxxx1xxx'	Channel 4 on

***Code x info***

<b><i>Contents</i></b>	<b><i>RF code info</i></b>
B'00x00xx0'	32 bit remote control with channel 1 disabled
B'00x00xx1'	32 bit remote control with channel 1 enabled
B'00x00x0x'	32 bit remote control with channel 2 disabled
B'00x00x1x'	32 bit remote control with channel 2 enabled
B'00x000xx'	32 bit remote control with channel 3 disabled
B'00x001xx'	32 bit remote control with channel 3 enabled
B'00x1xxx0'	48 bit remote control with channel 1 disabled
B'00x1xxx1'	48 bit remote control with channel 1 enabled
B'00x1xx0x'	48 bit remote control with channel 2 disabled
B'00x1xx1x'	48 bit remote control with channel 2 enabled
B'00x1x0xx'	48 bit remote control with channel 3 disabled
B'00x1x1xx'	48 bit remote control with channel 3 enabled
B'00x10xxx'	48 bit remote control with channel 4 disabled
B'00x11xxx'	48 bit remote control with channel 4 enabled
B'000xxxxx'	No swapping of channels
B'001xxxxx'	Channels 1&2 swapped with channels 3&4

***Receive pulse extend time***

Multiples of 0.0131072s



<b>Address</b>	<b>Contents</b>	<b>Address</b>	<b>Contents</b>
H'0100'	Sunrise hour at 21 December (0...23)	H'0101'	Sunrise minutes at 21 December (0...59)
H'0102'	Sunrise 21 January – sunrise 5 January (-128'..127')	H'0103'	Sunrise 5 February – sunrise 21 January (-128'..127')
H'0104'	Sunrise 21 February – sunrise 5 February (-128'..127')	H'0105'	Sunrise 5 March – sunrise 21 February (-128'..127')
H'0106'	Sunrise 21 March – sunrise 5 March (-128'..127')	H'0107'	Sunrise 5 April – sunrise 21 March (-128'..127')
H'0108'	Sunrise 21 April – sunrise 5 April (-128'..127')	H'0109'	Sunrise 5 May – sunrise 21 April (-128'..127')
H'010A'	Sunrise 21 May – sunrise 5 May (-128'..127')	H'010B'	Sunrise 5 June – sunrise 21 May (-128'..127')
H'010C'	Sunrise 21 June – sunrise 5 June (-128'..127')	H'010D'	Sunrise 5 July – sunrise 21 June (-128'..127')
H'010E'	Sunrise 21 July – sunrise 5 July (-128'..127')	H'010F'	Sunrise 5 August – sunrise 21 July (-128'..127')
H'0110'	Sunrise 21 August – sunrise 5 August (-128'..127')	H'0111'	Sunrise 5 September – sunrise 21 August (-128'..127')
H'0112'	Sunrise 21 September – sunrise 5 September (-128'..127')	H'0113'	Sunrise 5 October – sunrise 21 September (-128'..127')
H'0114'	Sunrise 21 October – sunrise 5 October (-128'..127')	H'0115'	Sunrise 5 November – sunrise 21 October (-128'..127')
H'0116'	Sunrise 21 November – sunrise 5 November (-128'..127')	H'0117'	Sunrise 5 December – sunrise 21 November (-128'..127')
H'0118'	Sunrise 21 December – sunrise 5 December (-128'..127')	H'0119'	Sunrise 5 January – sunrise 21 December (-128'..127')
H'011A'	Sunset hour at 21 December (0...23)	H'011B'	Sunset minutes at 21 December (0...59)
H'011C'	Sunset 21 January – sunrise 5 January (-128'..127')	H'011D'	Sunset 5 February – sunrise 21 January (-128'..127')
H'011E'	Sunset 21 February – sunrise 5 February (-128'..127')	H'011F'	Sunset 5 March – sunrise 21 February (-128'..127')
H'0120'	Sunset 21 March – sunrise 5 March (-128'..127')	H'0121'	Sunset 5 April – sunrise 21 March (-128'..127')
H'0122'	Sunset 21 April – sunrise 5 April (-128'..127')	H'0123'	Sunset 5 May – sunrise 21 April (-128'..127')
H'0124'	Sunset 21 May – sunrise 5 May (-128'..127')	H'0125'	Sunset 5 June – sunrise 21 May (-128'..127')
H'0126'	Sunset 21 June – sunrise 5 June (-128'..127')	H'0127'	Sunset 5 July – sunrise 21 June (-128'..127')
H'0128'	Sunset 21 July – sunrise 5 July (-128'..127')	H'0129'	Sunset 5 August – sunrise 21 July (-128'..127')
H'012A'	Sunset 21 August – sunrise 5 August (-128'..127')	H'012A'	Sunset 5 September – sunrise 21 August (-128'..127')
H'012C'	Sunset 21 September – sunrise 5 September (-128'..127')	H'012C'	Sunset 5 October – sunrise 21 September (-128'..127')
H'012E'	Sunset 21 October – sunrise 5 October (-128'..127')	H'012F'	Sunset 5 November – sunrise 21 October (-128'..127')
H'0130'	Sunset 21 November – sunrise 5 November (-128'..127')	H'0131'	Sunset 5 December – sunrise 21 November (-128'..127')
H'0132'	Sunset 21 December – sunrise 5 December (-128'..127')	H'0133'	Sunset 5 January – sunrise 21 December (-128'..127')
H'0134'	Linked Push button 1 module address	H'0135'	Linked Push button 1 bit number
H'0136'	Linked Push button 1 action	H'0137'	Linked Push button 1 time parameter
H'0138'	Linked Push button 1 channel parameter	H'0139'	Linked Push button 2 module address
H'013A'	Linked Push button 2 bit number	H'013B'	Linked Push button 2 action
H'013C'	Linked Push button 2 time parameter	H'013D'	Linked Push button 2 channel parameter
H'013E'	...	H'013F'	...
...	...	...	...
H'01F0'	...	H'01F1'	...
H'01F2'	Linked Push button 39 module address	H'01F3'	Linked Push button 39 bit number
H'01F4'	Linked Push button 39 action	H'01F5'	Linked Push button 39 time parameter
H'01F6'	Linked Push button 39 channel parameter	H'01F7'	Linked Push button 40 module address
H'01F8'	Linked Push button 40 bit number	H'01F9'	Linked Push button 40 action
H'01FA'	Linked Push button 40 time parameter	H'01FB'	Linked Push button 40 channel parameter
H'01FC'	Not used	H'01FD'	Not used
H'01FE'	Not used	H'01FF'	Not used

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

#### Action

<b>Action number</b>	<b>Action</b>	<b>Time parameter</b>	<b>Bit number</b>
0	Switch status led indication	-	Channel bit
1	Lock channel at closed switch	-	Channel bit
2	Lock channel at opened switch	-	Channel bit
3	Lock channel	Timeout	Channel bit
4	Lock/unlock channel	Timeout	Channel bit
5	Unlock channel	-	Channel bit
6	Disable channel program at closed switch	-	Channel bit
7	Disable channel program at opened switch	-	Channel bit
8	Disable channel program channel	Timeout	Channel bit
9	Disable/enable channel program	Timeout	Channel bit
10	Enable channel program	-	Channel bit
11	Select no programs	-	-
12	Select summer programs	-	-
13	Select winter programs	-	-
14	Select holiday programs	-	-
15	Enable Alarm/Sunrise/Sunset at closed switch	-	Alarm/sunrise/sunset bit
16	Enable Alarm/Sunrise/Sunset at open switch	-	Alarm/sunrise/sunset bit
17	Disable Alarm/Sunrise/Sunset at closed switch	-	Alarm/sunrise/sunset bit

18	Disable Alarm/Sunrise/Sunset at open switch	-	Alarm/sunrise/sunset bit
19	Enable Alarm/Sunrise/Sunset	-	Alarm/sunrise/sunset bit
20	Enable/Disable Alarm/Sunrise/Sunset	-	Alarm/sunrise/sunset bit
21	Disable Alarm/Sunrise/Sunset	-	Alarm/sunrise/sunset bit

#### Bit Number

<i>Contents</i>	<i>Bit number</i>
B'00000001'	Channel 1 or Alarm1
B'00000010'	Channel 2
B'00000100'	Channel 3 or Alarm2
B'00001000'	Channel 4
B'00010000'	Channel 5 or Sunrise
B'00100000'	Channel 6 or Sunset
B'01000000'	Channel 7
B'10000000'	Channel 8

#### Time parameter

<b>Time parameter</b>	<b>Timeout</b>
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

<i>Address</i>	<i>Contents</i>	<i>Address</i>	<i>Contents</i>
H'0200'	Program step 1 byte1	H'0201'	Program step 1 byte2
H'0202'	Program step 1 byte3	H'0203'	Program step 1 byte4
H'0204'	Program step 1 byte5	H'0205'	Program step 1 byte6
...	..	..	..
H'02F6'	Program step 42 byte1	H'02F7'	Program step 42 byte2
H'02F8'	Program step 42 byte3	H'02F9'	Program step 42 byte4
H'02FA'	Program step 42 byte5	H'02FB'	Program step 42 byte6
H'02FC'	Not used	H'02FD'	Not used
H'02FE'	Not used	H'02FF'	Not used

<i>Contents program byte1</i>	<i>Description</i>
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

<i>Contents program byte2</i>	<i>Description</i>
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

<i>Contents program byte3</i>	<i>Description</i>
B'xxx00000'	0h
B'xxx00001'	1h
...	...
B'xxx10111'	23h
B'xx1xxxxx'	Summer program
B'x1xxxxxx'	Winter program
B'1xxxxxxx'	Holiday program

<i>Contents program byte4</i>	<i>Description</i>
B'xx000000'	0min
B'xx000001'	1min
...	...

B'xx111011'	59min
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<i>Contents program byte4</i>	<i>Contents program byte2</i>	<i>Description</i>
B'00xxxxxx'	B'0000xxxx'	Never
B'00xxxxxx'	B'0001xxxx'	Day 1 of the month
B'00xxxxxx'	B'0010xxxx'	Day 2 of the month
...	...	...
B'01xxxxxx'	B'1111xxxx'	Day 31 of 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>	<b>Channel</b>
B'00000001'	Channel 1
B'00000010'	Channel 2
B'00000100'	Channel 3
B'00001000'	Channel 4