VMB4AN

Analog I/O 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:

- Module type and subtype
- Bus error counter status
- Real-time clock status
- Date status
- Daylight savings status
- Power up
- Memory data
- Memory data block (4 bytes)

The module can transmit the following commands:

- Real-time clock status request

The module can receive the following messages:

- Power up
- Module type request
- 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
- Read memory data
- Read memory data block (4 bytes)
- Memory dump request
- Write memory data
- Write memory data block (4 bytes)
-

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 module type:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 7 data bytes to send
DATABYTE1 = COMMAND_MODULE_TYPE (0xFF)
DATABYTE2 = VMB4AN type (0x32)
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 subtype:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 8 data bytes to send
DATABYTE1 = COMMAND_SUBTYPE (0xB0)
DATABYTE2 = VMB4AN type (0x32)
DATABYTE3 = High byte of serial number
DATABYTE4 = Low byte of serial number
DATABYTE5 = Subaddress1 (H'FF' sub-address disabled)
DATABYTE6 = Subaddress2 (H'FF' sub-address disabled)
DATABYTE7 = Subaddress3 (H'FF' sub-address disabled)
DATABYTE8 = Subaddress4 (H'FF' sub-address disabled)

Transmits bus error counter status

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

Transmits the memory data:

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

Remark:
address range: 0x0000 to 0x0B3F = memory map

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 0x0B3C = memory map
0x1000 to 0x13FC = eeprom data

Transmits the first 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_NAME_PART1 (0xF0)
DATABYTE2 = channel

Contents	*channel*
1	Alarm output1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = Character 1 of the name
DATABYTE4 = Character 2 of the name
DATABYTE5 = Character 3 of the name
DATABYTE6 = Character 4 of the name
DATABYTE7 = Character 5 of the name
DATABYTE8 = Character 6 of the name

Transmits the second part of the channel name:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Address of the module
RTR = 0
DLC3...DLC0 = 8 data bytes to send
DATABYTE1 = COMMAND_NAME_PART2 (0xF1)
DATABYTE2 = channel

Contents	*Channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = Character 7 of the name
DATABYTE4 = Character 8 of the name
DATABYTE5 = Character 9 of the name
DATABYTE6 = Character 10 of the name
DATABYTE7 = Character 11 of the name
DATABYTE8 = Character 12 of the name

Transmits the third part of the channel name:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Address of the module
RTR = 0
DLC3...DLC0 = 6 data bytes to send
DATABYTE1 = COMMAND_DIMMER_NAME_PART3 (0xF2)
DATABYTE2 = channel

Contents	*Channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = Character 13 of the name
DATABYTE4 = Character 14 of the name
DATABYTE5 = Character 15 of the name
DATABYTE6 = Character 16 of the name

Transmits clears LEDs on a linked push button:

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)

Transmits sets LEDs on a linked push button:

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)

Transmits blinks LEDs slowly on a linked push button:

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)

Transmits 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…85 / 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 (ex. Summer program)
x1xxxxxx	Program group 2 (ex. Winter program)
1xxxxxxx	Program group 3 (ex. 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	Unlock
1	Lock
2	Sensor preset 1 (safe) mode
3	Sensor preset 2 (night) mode
4	Sensor preset 3 (day) mode
5	Sensor preset 4 (comfort) mode

DATABYTE8 = Channel

Contents	Channel
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

Transmits the alarm output 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 = Alarm channel just pressed
DATABYTE3 = Alarm channel just released
DATABYTE4 = Alarm channel long pressed

Contents	*Alarm output number*
B'00000001'	Alarm output 1
B'00000010'	Alarm output 2
B'00000100'	Alarm output 3
B'00001000'	Alarm output 4
B'00010000'	Alarm output 5
B'00100000'	Alarm output 6
B'01000000'	Alarm output 7
B'10000000'	Alarm output 8

Transmits the alarm output status:

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

Contents	*Alarm output status*
B'xxxxxxx0'	Alarm output 1 off
B'xxxxxxx1'	Alarm output 1 on
B'xxxxxx0x'	Alarm output 2 off
B'xxxxxx1x'	Alarm output 2 on
B'xxxxx0xx'	Alarm output 3 off
B'xxxxx1xx'	Alarm output 3 on
B'xxxx0xxx'	Alarm output 4 off
B'xxxx1xxx'	Alarm output 4 on
B'xxx0xxxx'	Alarm output 5 off
B'xxx1xxxx'	Alarm output 5 on
B'xx0xxxxx'	Alarm output 6 off
B'xx1xxxxx'	Alarm output 6 on
B'x0xxxxxx'	Alarm output 7 off
B'x1xxxxxx'	Alarm output 7 on
B'0xxxxxxx'	Alarm output 8 off
B'1xxxxxxx'	Alarm output 8 on

DATABYTE3 = locked alarm output status (0 = unlocked / 1 = locked)

Contents	*Locked/unlocked alarm output status*
B'xxxxxxx0'	Alarm output 1 unlocked
B'xxxxxxx1'	Alarm output 1 locked
B'xxxxxx0x'	Alarm output 2 unlocked
B'xxxxxx1x'	Alarm output 2 locked
B'xxxxx0xx'	Alarm output 3 unlocked
B'xxxxx1xx'	Alarm output 3 locked
B'xxxx0xxx'	Alarm output 4 unlocked
B'xxxx1xxx'	Alarm output 4 locked
B'xxx0xxxx'	Alarm output 5 unlocked
B'xxx1xxxx'	Alarm output 5 locked
B'xx0xxxxx'	Alarm output 6 unlocked
B'xx1xxxxx'	Alarm output 6 locked
B'x0xxxxxx'	Alarm output 7 unlocked
B'x1xxxxxx'	Alarm output 7 locked
B'0xxxxxxx'	Alarm output 8 unlocked
B'1xxxxxxx'	Alarm output 8 locked

DATABYTE4 = disabled alarm output program (0 = program enabled / 1 = program disabled)

Contents	*Alarm output program enabled/disabled*
B'xxxxxxx0'	Alarm output 1 program enabled
B'xxxxxxx1'	Alarm output 1 program disabled
B'xxxxxx0x'	Alarm output 2 program enabled
B'xxxxxx1x'	Alarm output 2 program disabled
B'xxxxx0xx'	Alarm output 3 program enabled
B'xxxxx1xx'	Alarm output 3 program disabled
B'xxxx0xxx'	Alarm output 4 program enabled
B'xxxx1xxx'	Alarm output 4 program disabled
B'xxx0xxxx'	Alarm output 5 program enabled
B'xxx1xxxx'	Alarm output 5 program disabled
B'xx0xxxxx'	Alarm output 6 program enabled
B'xx1xxxxx'	Alarm output 6 program disabled
B'x0xxxxxx'	Alarm output 7 program enabled
B'x1xxxxxx'	Alarm output 7 program disabled
B'0xxxxxxx'	Alarm output 8 program enabled
B'1xxxxxxx'	Alarm output 8 program disabled

DATABYTE5 = clock alarm & program selection

Contents	*Clock alarm/Selected program*
B'xxxxxx00'	None
B'xxxxxx01'	Program group 1 selected
B'xxxxxx10'	Program group 2 selected
B'xxxxxx11'	Program group 3 selected
B'xxxxx0xx'	Clock alarm 1 off
B'xxxxx1xx'	Clock alarm 1 on
B'xxxx0xxx'	Local clock alarm 1
B'xxxx1xxx'	Global clock alarm 1
B'xxx0xxxx'	Clock alarm 2 off
B'xxx1xxxx'	Clock alarm 2 on
B'xx0xxxxx'	Local clock alarm 2
B'xx1xxxxx'	Global clock alarm 2
B'x0xxxxxx'	Sunrise disabled
B'x1xxxxxx'	Sunrise enabled
B'0xxxxxxx'	Sunset disabled
B'1xxxxxxx'	Sunset enabled

DATABYTE6 = test modus

Contents	*Test modus*
B'0xxxxxxx'	Test modus inactive
B'1xxxxxxx'	Test modus active

Transmit the sensor raw value:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 6 data bytes to send
DATABYTE1 = COMMAND_SENSOR_RAW_DATA (0xA9)
DATABYTE2 = channel

Contents	Channel
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Operating mode

Contents	Sensor mode
xxxxxx00	Voltage (0…10 V) sensor type
xxxxxx01	Current (4…20 mA) sensor type
xxxxxx10	Resistance (PT100/PT1000/Ni1000) sensor type
xxxxxx11	Period measurement sensor type

DATABYTE4 = Upper byte of sensor value
DATABYTE5 = High byte of sensor value
DATABYTE6 = Low byte of sensor value

Remark: Resolution of the 16-bit sensor value

Sensor mode	Resolution
Voltage (0…10 V) sensor type	0.25 mV
Current (4…20 mA) sensor type	5 µA
Resistance (PT100/PT1000/Ni1000) sensor type	0.25 Ohm
Period measurement sensor type	0.5 µs

If the Period = 0x000000 then the input is short circuited
If the Period = 0xFFFFFF then the input is left open

Transmit the sensor value as a text string:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = number of data bytes to send
DATABYTE1 = COMMAND_TEXT (0xAC)
DATABYTE2 = channel

Contents	Channel
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = text start position
DATABYTE4 = character 1
DATABYTE5 = character 2
DATABYTE6 = character 3
DATABYTE7 = character 4
DATABYTE8 = character 5

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

Transmits the sensor status:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 7 databytes to send
DATABYTE1 = COMMAND_SENSOR_STATUS (0xEA)
DATABYTE2 = channel

Contents	Channel
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Operating mode

Contents	Operating mode
xxxxxx00	Voltage (0…10 V) sensor type
xxxxxx01	Current (4…20 mA) sensor type
xxxxxx10	Resistance (PT100/PT1000/Ni1000) sensor type
xxxxxx11	Period measurement sensor type
xxxx00xx	Manual operating
xxxx01xx	Run sensor program
xxxx10xx	Temporarily operating
xxxx11xx	Reserved
xx00xxxx	Sensor preset 1 (safe) mode
xx01xxxx	Sensor preset 2 (night) mode
xx10xxxx	Sensor preset 3 (day) mode
xx11xxxx	Sensor preset 4 (comfort) mode
x0xxxxxx	Sensor mode unlocked
x1xxxxxx	Sensor mode locked
0xxxxxxx	Sensor program enabled
1xxxxxxx	Sensor program disabled

DATABYTE4 = Sleep time high byte
DATABYTE5 = Sleep time low byte
DATABYTE6 = auto send sensor value
(0 = no change auto send interval)
(1…4 = auto send disabled)
(5 = auto send when changed with minimum interval time)
(6 = auto send when 3.125% changed with minimum interval time)
(7 = auto send when 6.25% changed with minimum interval time)
(8 = auto send when 12.5% changed with minimum interval time)
(9 = auto send when 25% changed with minimum interval time)
(10…255s = fixed interval)
DATABYTE7 = minimum interval time when sensor value changed into seconds (0…255s)

Transmit the first part of the sensor settings:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 8 data bytes to send
DATABYTE1 = COMMAND_SENSOR_SETTINGS_PART1 (0xE8)
DATABYTE2 = channel

Contents	Channel
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Sensor current preset upper byte
DATABYTE4 = Sensor current preset high byte
DATABYTE5 = Sensor current preset low byte
DATABYTE6 = Sensor preset 1 upper byte
DATABYTE7 = Sensor preset 1 high byte
DATABYTE8 = Sensor preset 1 low byte

Transmit the second part of the sensor settings:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 8 data bytes to send
DATABYTE1 = COMMAND_SENSOR_SETTINGS_PART2 (0xE9)
DATABYTE2 = channel

Contents	Channel
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Sensor preset 2 upper byte
DATABYTE4 = Sensor preset 2 high byte
DATABYTE5 = Sensor preset 2 low byte
DATABYTE6 = Sensor preset 3 upper byte
DATABYTE7 = Sensor preset 3 high byte
DATABYTE8 = Sensor preset 3 low byte

Transmit the third part of the sensor settings:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 7 data bytes to send
DATABYTE1 = COMMAND_SENSOR_SETTINGS_PART3 (0xC6)
DATABYTE2 = channel

Contents	Channel
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Sensor preset 4 upper byte
DATABYTE4 = Sensor preset 4 high byte
DATABYTE5 = Sensor preset 4 low byte
DATABYTE6 = Sensor offset high byte
DATABYTE7 = Sensor offset low byte

Transmit the fourth part of the sensor settings:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes to send
DATABYTE1 = COMMAND_SENSOR_SETTINGS_PART4 (0xB9)
DATABYTE2 = channel

Contents	Channel
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Sensor default sleep time high byte
DATABYTE4 = Sensor default sleep time low byte

Transmits the analog output channel status:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 8 data bytes to send
DATABYTE1 = COMMAND_ANALOG_OUT_STATUS (0xB8)
DATABYTE2 = channel

Contents	Channel
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = inhibit/forced on/locked/program disabled setting

Contents	***Setting***
B'xxxxx000'	Channel normal
B'xxxxx001'	Channel inhibited
B'xxxxx01x'	Channel forced on
B'xxxxx1xx'	Channel locked
B'xxxx0xxx'	Channel program enabled
B'xxxx1xxx'	Channel program disabled

DATABYTE4 = Analog out value high byte
DATABYTE5 = Analog out value low byte
DATABYTE6 = upper byte of current timeout
DATABYTE7 = high byte of current timeout
DATABYTE8 = low byte of current timeout

Remark: [DATABYTE5][DATABYTE6][DATABYTE7] contain a 24-bit time in seconds

'Power up message' received:

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

'Real time clock request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
RTR = 1
DLC3...DLC0 = 1 data bytes received
DATABYTE1 = COMMAND_REALTIME_CLOCK_REQUEST (0xD7)

'Local Real time clock request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 1
DLC3...DLC0 = 1 data bytes received
DATABYTE1 = COMMAND_REALTIME_CLOCK_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
DATABYTE1 = COMMAND_SET_REALTIME_CLOCK (0xD8)
DATABYTE2 = Day of week

Contents day of week'	***Description***
H'00'	Monday
H'01'	Tuesday
H'02'	Wednesday
H'03'	Thursday
H'04'	Friday
H'05'	Saterday
H'06'	Sunday

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

'Set date' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
RTR = 0
DLC3...DLC0 = 5 data bytes to send
DATABYTE1 = COMMAND_SET_REALTIME_DATE (0xB7)
DATABYTE2 = Day (1…31)
DATABYTE3 = Month (1…12)
DATABYTE4 = High byte of Year
DATABYTE5 = Low byte of Year

'Set daylight savings' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
RTR = 0
DLC3...DLC0 = 2 data bytes to send
DATABYTE1 = COMMAND_SET_DAYLIGHT_SAVING (0xAF)
DATABYTE2 = 0 =disabled / 1 = enabled

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

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = 0x00
RTR = 0
DLC3...DLC0 = 3 data bytes to send
DATABYTE1 = COMMAND_ENA_DIS_SUNRISE_SUNSET (0xAE)
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 (0xAE)
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 = 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

'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_COUNTER_STATUS_REQUEST (0xD9)

'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 0x03BF

'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 0x03BC

'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)

'EEprom dump request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 3 data bytes received
DATABYTE1 = COMMAND_MEMORY_DUMP_REQUEST (0xCB)
DATABYTE2 = don't care
DATABYTE3 = don't care

'Write data to memory' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_WRITE_DATA_TO_MEMORY (0xFC)
DATABYTE2 = High memory address
DATABYTE3 = Low memory address
DATABYTE4 = Memory data to write

Remark:
Wait for 'data memory byte' feedback before sending a next command on the velbus.
Address range: 0x0000 to 0x03BF
Terminate always with a write command at the last memory location .

'Write memory block' command received:

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

Remark:
Wait for 'memory data block' feedback before sending a next command on the velbus.
Address range: 0x0000 to 0x03BC
Terminate always with a write command at the last memory location .

'Channel name request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_NAME_REQUEST (0xEF)
DATABYTE2 = Channel

Contents	*Channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4
255	All channels

'Status request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_STATUS_REQUEST (0xFA)
DATABYTE2 = Channel

Contents	*Channel*
0 (<9)	Alarm outputs 1…8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4
255	All channels

'Lock output ' 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

Contents	*Dimmer channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = upper byte of lock time
DATABYTE4 = high byte of lock time
DATABYTE5 = low byte of lock time

Remark:
[DATABYTE3][DATABYTE4][DATABYTE5] contain a 24-bit time in seconds
The command will be skipped when the time parameter contains zero.
When the time parameter contains 0xFFFFFF then the channel is permanently locked.

'Unlock output' 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

Contents	*Dimmer channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

'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

Contents	*Channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

'Disable channel output 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

Contents	*Channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = upper byte of program disable time
DATABYTE4 = high byte of program disable time
DATABYTE5 = low byte of program disable time

Remark:
[DATABYTE3][DATABYTE4][DATABYTE5] contain a 24-bit time in seconds
The command will be skipped when the time parameter contains zero.
When the time parameter contains 0xFFFFFF then the channel program will be permanently disabled.

'Select Program' command received:

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

Contents	*Selected program*
0	None
1	Group 1 (ex. Summer)
2	Group 2 (ex. Winter)
3	Group 3 (ex. Holiday)

'Read program step' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes to send
DATABYTE1 = COMMAND_READ_PROGRAM_STEP (0xC0)
DATABYTE2 = Start program step number (1…85)
DATABYTE3 = Program group number (1…3)
DATABYTE4 = Channel

Contents	*Channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

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 to send
DATABYTE1 = COMMAND_WRITE_PROGRAM_STEP (0xC2)
DATABYTE2 = Program step number (1…85)
DATABYTE3 = Program reference

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

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

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

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

DATABYTE5 = Program step hour & group number

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

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

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

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

DATABYTE7 = Program step action

Contents	**Action**
0	Unlock
1	Lock
2	Sensor preset 1 (safe) mode
3	Sensor preset 2 (night) mode
4	Sensor preset 3 (day) mode
5	Sensor preset 4 (comfort) mode

DATABYTE8 = Channel

Contents	Channel
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4
255	Delete program step

'Clear LED' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Address of the linked push button module
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_CLEAR_LED (0xF5)
DATABYTE2 = LEDs to clear (a one clears the corresponding LED)

'Set sensor input mode data' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_CONFIG_DATA (0xE4)
DATABYTE2 = Channel

Contents	***Channel***
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Index = 17
DATABYTE4 = sensor input mode

Contents	Sensor mode
0	Voltage (0…10 V) sensor type
1	Current (4…20 mA) sensor type
2	Resistance (PT100/PT1000/Ni1000) sensor type
3	Period measurement sensor type

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

'Set sensor preset data' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 6 data bytes received
DATABYTE1 = COMMAND_CONFIG_DATA (0xE4)
DATABYTE2 = Channel

Contents	***Channel***
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Index

Contents	
18	Current Preset value
19	Preset 1 (safe) value
20	Preset 2 (night) value
21	Preset 3 (day) value
22	Preset 4 (comfort) value

DATABYTE4 = data upper byte
DATABYTE5 = data high byte
DATABYTE6 = data low byte

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

'Set sensor offset data' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_CONFIG_DATA (0xE4)
DATABYTE2 = Channel

Contents	***Channel***
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = Index

Contents	
23	Raw offset (-32768…+32767)

DATABYTE4 = data high byte
DATABYTE5 = data low byte

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

'Sensor readout request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 3 data bytes to send
DATABYTE1 = COMMAND_SENSOR_VALUE_REQUEST (0xE5)
DATABYTE2 = Channel

Contents	***Channel***
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = auto send sensor value
(0 = no change auto send interval)
(1…4 = auto send disabled)
(5 = auto send when changed with minimum interval time)
(6 = auto send when 3.125% changed with minimum interval time)
(7 = auto send when 6.25% changed with minimum interval time)
(8 = auto send when 12.5% changed with minimum interval time)
(9 = auto send when 25% changed with minimum interval time)
(10…255s = fixed interval)

'Sensor settings request' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 2 data bytes to send
DATABYTE1 = COMMAND_TEMP_SENSOR_SETTINGS_REQUEST (0xE7)
DATABYTE2 = Channel

Contents	***Channel***
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

'Set sensor default sleep time' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_SET_DEFAULT_SLEEP_TIME (H'E3')
DATABYTE2 = Channel

Contents	*Channel*
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = High byte of the default sleep time
DATABYTE4 = Low byte of the default sleep time into minutes
(valid range 0x0001 to 0xFEFF or 1min to 65.279min)

Remark: Wait at least 20ms for sending a next command on the velbus

'Switch sensor to preset 1 (safe) mode' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_SWITCH_TO_SAFE_MODE (0xDE)
DATABYTE2 = Channel

Contents	*Channel*
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE2 = High byte of the sleep time
DATABYTE3 = Low byte of the sleep time into minutes

Remark:
A value of zero for the sleep time cancels the manual mode or sleep timer.
A sleep time of 0x0001 starts the default sleep time.
A sleep time between 0x0002 and 0xFEFF (2 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.
If the sleep time contains 0xFF00, the command is a program step.
A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore.

'Switch sensor to preset 2 (night) mode' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_SWITCH_TO_NIGHT_MODE (0xDD)
DATABYTE2 = Channel

Contents	*Channel*
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE2 = High byte of the sleep time
DATABYTE3 = Low byte of the sleep time into minutes

Remark:
A value of zero for the sleep time cancels the manual mode or sleep timer.
A sleep time of 0x0001 starts the default sleep time.
A sleep time between 0x0002 and 0xFEFF (2 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.
If the sleep time contains 0xFF00, the command is a program step.
A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore.

'Switch sensor to preset 3 (day) mode' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_SWITCH_TO_DAY_MODE (0xDC)
DATABYTE2 = Channel

Contents	*Channel*
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE2 = High byte of the sleep time
DATABYTE3 = Low byte of the sleep time into minutes

Remark:
A value of zero for the sleep time cancels the manual mode or sleep timer.
A sleep time of 0x0001 starts the default sleep time.
A sleep time between 0x0002 and 0xFEFF (2 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.
If the sleep time contains 0xFF00, the command is a program step.
A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore.

'Switch sensor to preset 4 (comfort) mode' command received:

SID10-SID9 = 11 (lowest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_SWITCH_TO_COMFORT_MODE (0xDB)
DATABYTE2 = Channel

Contents	*Channel*
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4

DATABYTE3 = High byte of the sleep time
DATABYTE4 = Low byte of the sleep time into minutes

Remark:
A value of zero for the sleep time cancels the manual mode or sleep timer.
A sleep time of 0x0001 starts the default sleep time.
A sleep time between 0x0002 and 0xFEFF (2 to 65.279min) starts the sleep timer for that time and program steps will not be executed during that time.
If the sleep time contains 0xFF00, the command is a program step.
A sleep time of 0xFFFF puts the sensor into manual mode. Program steps will not be executed anymore.

'Linked push button status' received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Address of the linked push button module
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_PUSH_BUTTON_STATUS (0x00)
DATABYTE2 = Linked push buttons just pressed (1 = just pressed)
DATABYTE3 = Linked push buttons just released (1 = just released)
DATABYTE4 = Linked push buttons long pressed (1 = longer than 0.85s pressed)

'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 (0xB5)
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.

'Slider status' received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Address of the slider module
RTR = 0
DLC3...DLC0 = 4 data bytes received
DATABYTE1 = COMMAND_SLIDER_STATUS (0x0F)
DATABYTE2 = Slider channel
DATABYTE3 = Slider status (0...100%)
DATABYTE4 = don't care

'Set analog output percentage' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_SET_VALUE (0x07)
DATABYTE2 = Channel

Contents	*Channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = Analog value in % (0 to 100%)
DATABYTE4 = high byte of dimspeed
DATABYTE5 = low byte of dimspeed

Remark: [DATABYTE4][DATABYTE5] contains a 16-bit time in seconds needed for dimming to the desired value.

'Set analog output value (12-bit)' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 6 data bytes received
DATABYTE1 = COMMAND_SET_VALUE (0x07)
DATABYTE2 = Channel

Contents	*Channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = Analog value high byte
DATABYTE4 = Analog value low byte
DATABYTE5 = high byte of dim speed
DATABYTE6 = low byte of dim speed

Remark: [DATABYTE4][DATABYTE5] contains a 16-bit time in seconds needed for dimming to the desired value.

'Set analog output value at last used value' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_RESTORE_LAST_DIMVALUE (0x11)
DATABYTE2 = Channel

Contents	*Channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = Don't care
DATABYTE4 = high byte of dim speed
DATABYTE5 = low byte of dim speed

Remark: [DATABYTE4][DATABYTE5] contains a 16-bit time in seconds needed for dimming to the desired value..

'Stop analog output dimming' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_STOP_DIMMING (0x10)
DATABYTE2 = Channel

Contents	*Channel*
12	Analog output 1
13	Analog output 2
14	Analog output 3
15	Analog output 4

'Start analog output timer' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_START_DIMMER_TIMER (0x08)
DATABYTE2 = Channel

Contents	*Channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = upper byte of timeout
DATABYTE4 = high byte of timeout
DATABYTE5 = low byte of timeout

Remark: [DATABYTE3][DATABYTE4][DATABYTE5] contains a 24-bit time-out time in seconds.
If the timeout parameter contains zero then no timer starts.
If the timeout parameter contains 0xFFFFFF then analog output is permanently (no timeout).

'Forced on analog output' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_FORCED_ON (0x14)
DATABYTE2 = Channel

Contents	*Dimmer channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = upper byte of 'forced on' time
DATABYTE4 = high byte of 'forced on' time
DATABYTE5 = low byte of 'forced on' time

Remark:
[DATABYTE3][DATABYTE4][DATABYTE5] contain a 24-bit time in seconds
The command will be skipped when the time parameter contains zero or the channels are already locked.
When the time parameter contains 0xFFFFFF then the analog output is permanently forced on.

'Cancel forced on analog output' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_CANCEL_FORCED_ON (0x15)
DATABYTE2 = Channel

Contents	*Dimmer channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

'Inhibit analog output' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 5 data bytes received
DATABYTE1 = COMMAND_INHIBIT (0x16)
DATABYTE2 = Channel

Contents	*Dimmer channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

DATABYTE3 = upper byte of inhibit time
DATABYTE4 = high byte of inhibit time
DATABYTE5 = low byte of inhibit time

Remark:
[DATABYTE3][DATABYTE4][DATABYTE5] contain a 24-bit time in seconds
The command will be skipped when the time parameter contains zero or the channels are already locked or forced on.
When the time parameter contains 0xFFFFFF then the output channel is permanently inhibited.

'Cancel inhibit analog output' command received:

SID10-SID9 = 00 (highest priority)
SID8...SID1 = Module address
RTR = 0
DLC3...DLC0 = 2 data bytes received
DATABYTE1 = COMMAND_CANCEL_INHIBIT (0x17)
DATABYTE2 = Channel

Contents	*Dimmer channel*
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

Memory map:

Address	*Contents*	*Address*	*Contents*
0x0000	Module name character 1	0x0001	Module name character 2
…	…	…	…
0x003E	Module name character 63	0x003F	Module name character 64
0x0040	Terminator	0x0041	Location id low byte
0x0042	Location id high byte	0x0043	Group id low byte
0x0044	Group id high byte	0x0045	Alarm clock configuration
0x0046	Wake up 1 hour (0…23)	0x0047	Wake up 1 minutes (0…59)
0x0048	Go to bed 1 hour (0…23)	0x0049	Go to bed 1 minutes (0…59)
0x004A	Wake up 2 hour (0…23)	0x004B	Wake up 2 minutes (0…59)
0x004C	Go to bed 2 hour (0…23)	0x004D	Go to bed 2 minutes (0…59)
0x004E	Sunrise hour at 21 December (0…23)	0x004F	Sunrise minutes at 21 December (0…59)
0x0050	Sunrise 21 January – sunrise 5 January (-128'..127')	0x0051	Sunrise 5 February – sunrise 21 January (-128'..127')
0x0052	Sunrise 21 February – sunrise 5 February (-128'..127')	0x0053	Sunrise 5 March – sunrise 21 February (-128'..127')
0x0054	Sunrise 21 March – sunrise 5 March (-128'..127')	0x0055	Sunrise 5 April – sunrise 21 March (-128'..127')
0x0056	Sunrise 21 April – sunrise 5 April (-128'..127')	0x0057	Sunrise 5 May – sunrise 21 April (-128'..127')
0x0058	Sunrise 21 May – sunrise 5 May (-128'..127')	0x0059	Sunrise 5 June – sunrise 21 May (-128'..127')
0x005A	Sunrise 21 June – sunrise 5 June (-128'..127')	0x005B	Sunrise 5 July – sunrise 21 June (-128'..127')
0x005C	Sunrise 21 July – sunrise 5 July (-128'..127')	0x005D	Sunrise 5 August – sunrise 21 July (-128'..127')
0x005E	Sunrise 21 August – sunrise 5 August (-128'..127')	0x005F	Sunrise 5 September – sunrise 21 August (-128'..127')
0x0060	Sunrise 21 September – sunrise 5 September (-128..127')	0x0061	Sunrise 5 October – sunrise 21 September (-128'..127')
0x0062	Sunrise 21 October – sunrise 5 October (-128'..127')	0x0063	Sunrise 5 November – sunrise 21 October (-128'..127')
0x0064	Sunrise 21 November – sunrise 5 November (-128'..127')	0x0065	Sunrise 5 December – sunrise 21 November (-128'..127')
0x0066	Sunrise 21 December – sunrise 5 December (-128'..127')	0x0067	Sunrise 5 January – sunrise 21 December (-128'..127')
0x0068	Sunset hour at 21 December (0…23)	0x0069	Sunset minutes at 21 December (0…59)
0x006A	Sunset 21 January – sunset 5 January (-128'..127')	0x006B	Sunset 5 February – sunset 21 January (-128'..127')
0x006C	Sunset 21 February – sunset 5 February (-128'..127')	0x006D	Sunset 5 March – sunset 21 February (-128'..127')
0x006E	Sunset 21 March – sunset 5 March (-128'..127')	0x006F	Sunset 5 April – sunset 21 March (-128'..127')
0x0070	Sunset 21 April – sunset 5 April (-128'..127')	0x0071	Sunset 5 May – sunset 21 April (-128'..127')
0x0072	Sunset 21 May – sunset 5 May (-128'..127')	0x0073	Sunset 5 June – sunset 21 May (-128'..127')
0x0074	Sunset 21 June – sunset 5 June (-128'..127')	0x0075	Sunset 5 July – sunset 21 June (-128'..127')
0x0076	Sunset 21 July – sunset 5 July (-128'..127')	0x0077	Sunset 5 August – sunset 21 July (-128'..127')
0x0078	Sunset 21 August – sunset 5 August (-128'..127')	0x0079	Sunset 5 September – sunset 21 August (-128'..127')
0x007A	Sunset 21 September – sunset 5 September (-128'..127')	0x007B	Sunset 5 October – sunset 21 September (-128'..127')
0x007C	Sunset 21 October – sunset 5 October (-128'..127')	0x007D	Sunset 5 November – sunset 21 October (-128'..127')
0x007E	Sunset 21 November – sunset 5 November (-128'..127')	0x007F	Sunset 5 December – sunset 21 November (-128'..127')
0x0082	Sunset 21 December – sunset 5 December (-128'..127')	0x0081	Sunset 5 January – sunset 21 December (-128'..127')
0x0082	Alarm output 1 name character 1	0x0083	Alarm output 1 name character 1
...	…	…	…
0x0090	Alarm output 1 name character 15	0x0091	Alarm output 1 name character 16
0x0092	Alarm output 2 name character 1	0x0093	Alarm output 2 name character 1
...	…	…	…
0x00A0	Alarm output 2 name character 15	0x00A1	Alarm output 2 name character 16
0x00A2	Alarm output 3 name character 1	0x00A3	Alarm output 3 name character 1
...	…	…	…
0x00B0	Alarm output 3 name character 15	0x00B1	Alarm output 3 name character 16
0x00B2	Alarm output 4 name character 1	0x00B3	Alarm output 4 name character 1
...	…	…	…
0x00C0	Alarm output 4 name character 15	0x00C1	Alarm output 4 name character 16
0x00C2	Alarm output 5 name character 1	0x00C3	Alarm output 5 name character 1
...	…	…	…
0x00D0	Alarm output 5 name character 15	0x00D1	Alarm output 5 name character 16
0x00D2	Alarm output 6 name character 1	0x00D3	Alarm output 6 name character 1
...	…	…	…
0x00E0	Alarm output 6 name character 15	0x00E1	Alarm output 6 name character 16
0x00E2	Alarm output 7 name character 1	0x00E3	Alarm output 7 name character 1
...	…	…	…
0x00F0	Alarm output 7 name character 15	0x00F1	Alarm output 7 name character 16
0x00F2	Alarm output 8 name character 1	0x00F3	Alarm output 8 name character 1
...	…	…	…
0x0100	Alarm output 8 name character 15	0x0101	Alarm output 8 name character 16

0x0102	Alarm condition 1 flags	0x0103	Alarm condition 1 absolute/relative
0x0104	Alarm condition 1 low byte ‘On’ limit/offset	0x0105	Alarm condition 1 high byte ‘On’ limit/offset
0x0106	Alarm condition 1 upper byte ‘On’ limit/offset	0x0107	Alarm condition 1 low byte ‘Off’ limit/offset
0x0108	Alarm condition 1 high byte ‘Off’ limit/offset	0x0109	Alarm condition 1 upper byte ‘Off’ limit/offset
0x010A	Alarm condition 1 ‘Off-to-On’ reaction time	0x010B	Alarm condition 1 ‘On-to-Off’ reaction time
	…		…
0x0274	Alarm condition 38 setting flags	0x0275	Alarm condition 38 absolute/relative
0x0276	Alarm condition 38 ‘On’ limit low byte	0x0277	Alarm condition 38 ‘On’ limit high byte
0x0278	Alarm condition 38 ‘On’ limit upper byte	0x0179	Alarm condition 38 ‘Off’ limit low byte
0x027A	Alarm condition 38 ‘Off’ limit high byte	0x027B	Alarm condition 38 ‘Off’ limit upper byte
0x027C	Alarm condition 38 ‘Off-to-On’ reaction time	0x027D	Alarm condition 38 ‘On-to-Off’ reaction time

Alarm condition flag

Contents	***Alarm settings flags***
B’xxxxxx00’	Sensor 1
B’xxxxxx01’	Sensor 2
B’xxxxxx10’	Sensor 3
B’xxxxxx11’	Sensor 4
B’xxxxx0xx’	‘Greater or equal than’ alarm type (normal)
B’xxxxx1xx’	‘Less than’ alarm type (inverted)
B’xxxx0xxx’	Logical OR alarm operator
B’xxxx1xxx’	Logical AND alarm operator
B’0000xxxx’	Assigned to alarm output 1
B’0001xxxx’	Assigned to alarm output 2
B’0010xxxx’	Assigned to alarm output 3
B’0011xxxx’	Assigned to alarm output 4
B’0100xxxx’	Assigned to alarm output 5
B’0101xxxx’	Assigned to alarm output 6
B’0110xxxx’	Assigned to alarm output 7
B’0111xxxx’	Assigned to alarm output 8
B’1xxxxxxx’	End of alarm

Alarm condition absolute/relative

Contents	***Alarm condition limit***
B’xxxx0000’	Absolute ‘on’ limit
B’xxxx0001’	Relative ‘on’ limit: preset 1 +/- offset
B’xxxx0010’	Relative ‘on’ limit: preset 2 +/- offset
B’xxxx0011’	Relative ‘on’ limit: preset 3 +/- offset
B’xxxx0100’	Relative ‘on’ limit: preset 4 +/- offset
B’xxxx1111’	Relative ‘on’ limit: sensor mode preset +/- offset
B’0000xxxx’	Absolute ‘off’ limit
B’0001xxxx’	Relative ‘off’ limit: preset 1 +/- offset
B’0010xxxx’	Relative ‘off’ limit: preset 2 +/- offset
B’0011xxxx’	Relative ‘off’ limit: preset 3 +/- offset
B’0100xxxx’	Relative ‘off’ limit: preset 4 +/- offset
B’1111xxxx’	Relative ‘off’ limit: sensor mode preset +/- offset

‘On’ and ‘Off’ limit setting = unsigned 24-bit value (0…8388607)
‘On’ and ‘Off’ offset setting = signed 24-bit value (-8388608…8388607)

Alarm condition 'Off-to-On' and 'On-to-Off' reaction times

contents	*Reaction time*
0	0s
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

Alarm clock configuration

Contents	*Channel locked/unlocked*
B'xxxxxxx0'	Alarm 1 disabled (default)
B'xxxxxxx1'	Alarm 1 enabled
B'0xxxxx0x'	Local alarm 1 (default)
B'1xxxxx1x'	Global alarm 1
B'xxxxx0xx'	Alarm 2 disabled (default)
B'xxxxx1xx'	Alarm 2 enabled
B'xxxx0xxx'	Local alarm 2 (default)
B'xxxx1xxx'	Global alarm 2
B'xxx0xxxx'	Sunrise disabled
B'xxx1xxxx'	Sunrise enabled (default)
B'xx0xxxxx'	Sunset disabled
B'xx1xxxxx'	Sunset enabled (default)
B'x0xxxxxx'	Day light savings disabled
B'x1xxxxxx'	Day light savings enabled (default)

Address	*Contents*	*Address*	*Contents*
0x027E	Sensor 1 name character 1	0x027F	Sensor 1 name character 2
...	…	…	…
0x028C	Sensor 1 name character 15	0x028D	Sensor 1 name character 16
0x028E	Sensor 1 mode I character 1	0x028F	Sensor 1 mode I character 2
...	…	…	…
0x029C	Sensor 1 mode I character 15	0x029D	Sensor 1 mode I character 16
0x029E	Sensor 1 mode II character 1	0x029F	Sensor 1 mode II character 2
...	…	…	…
0x02AC	Sensor 1 mode II character 15	0x02AD	Sensor 1 mode II character 16
0x02AE	Sensor 1 mode III character 1	0x02AF	Sensor 1 mode III character 2
...	…	…	…
0x02BC	Sensor 1 mode III character 15	0x02BD	Sensor 1 mode III character 16
0x02BE	Sensor 1 mode IV character 1	0x02BF	Sensor 1 mode IV character 2
...	…	…	…
0x02CC	Sensor 1 mode IV character 15	0x02CD	Sensor 1 mode IV character 16
0x02CE	Sensor 1 mode	0x02CF	Sensor 1 auto send minimum interval time
0x02D0	Sensor 1 default sleep time low byte	0x02D1	Sensor 1 default sleep time high byte
0x02D2	Sensor 1 preset 1 low byte	0x02D3	Sensor 1 preset 1 high byte
0x02D4	Sensor 1 preset 1 upper byte	0x02D5	Sensor 1 preset 2 low byte
0x02D6	Sensor 1 preset 2 high byte	0x02D7	Sensor 1 preset 2 upper byte
0x02D8	Sensor 1 preset 3 low byte	0x02D9	Sensor 1 preset 3 high byte
0x02DA	Sensor 1 preset 3 upper byte	0x02DB	Sensor 1 preset 4 low byte
0x02DC	Sensor 1 preset 4 high byte	0x02DD	Sensor 1 preset 4 upper byte
0x02DE	Sensor 1 calibration offset low byte	0x02DF	Sensor 1 calibration offset high byte
0x02E0	Sensor 1 units character 1	0x02E1	Sensor 1 units character 2
...	…	...	…
0x02E6	Sensor 1 units character 7	0x02E7	Sensor 1 number of digits after decimal point
0x02E8	Sensor 1 limit 1 low byte	0x02E9	Sensor 1 limit 1 high byte
0x02EA	Sensor 1 limit 1 upper byte	0x02EB	Sensor 1 start 1 low byte
0x02EC	Sensor 1 start 1 high byte	0x02ED	Sensor 1 start 1 upper byte
0x02EE	Sensor 1 start 1 most significant byte	0x02EF	Sensor 1 factor 1 low byte
0x02F0	Sensor 1 factor 1 high byte	0x02F1	Sensor 1 divisor 1
…	…	…	…
0x03A6	Sensor 1 limit 20 low byte	0x03A7	Sensor 1 limit 20 high byte
0x03A8	Sensor 1 limit 20 upper byte	0x03A9	Sensor 1 start 20 low byte
0x03AA	Sensor 1 start 20 high byte	0x03AB	Sensor 1 start 20 upper byte
0x03AC	Sensor 1 start 20 most significant byte	0x03AD	Sensor 1 factor 20 low byte
0x03AE	Sensor 1 factor 20 high byte	0x03AF	Sensor 1 divisor 20

Address	*Contents*	*Address*	*Contents*
0x03B0	Sensor 2 name character 1	0x03B1	Sensor 2 name character 2
...	…	…	…
0x03BE	Sensor 2 name character 15	0x03BF	Sensor 2 name character 16
0x03C0	Sensor 2 mode I character 1	0x03C1	Sensor 2 mode I character 2
...	…	…	…
0x03CE	Sensor 2 mode I character 15	0x03CF	Sensor 2 mode I character 16
0x03D0	Sensor 2 mode II character 1	0x03D1	Sensor 2 mode II character 2
...	…	…	…
0x03DC	Sensor 2 mode II character 15	0x03DF	Sensor 2 mode II character 16
0x03E0	Sensor 2 mode III character 1	0x03E1	Sensor 2 mode III character 2
...	…	…	…
0x03EC	Sensor 2 mode III character 15	0x03EF	Sensor 2 mode III character 16
0x03F0	Sensor 2 mode IV character 1	0x03F1	Sensor 2 mode IV character 2
...	…	…	…
0x03FC	Sensor 2 mode IV character 15	0x03FF	Sensor 2 mode IV character 16
0x0400	Sensor 2 mode	0x0401	Sensor 2 auto send minimum interval time
0x0402	Sensor 2 default sleep time low byte	0x0403	Sensor 2 default sleep time high byte
0x0404	Sensor 2 preset 1 low byte	0x0405	Sensor 2 preset 1 high byte
0x0406	Sensor 2 preset 1 upper byte	0x0407	Sensor 2 preset 2 low byte
0x0408	Sensor 2 preset 2 high byte	0x0409	Sensor 2 preset 2 upper byte
0x040A	Sensor 2 preset 3 low byte	0x040B	Sensor 2 preset 3 high byte
0x040C	Sensor 2 preset 3 upper byte	0x040D	Sensor 2 preset 4 low byte
0x040E	Sensor 2 preset 4 high byte	0x040F	Sensor 2 preset 4 upper byte
0x0410	Sensor 2 calibration offset low byte	0x0411	Sensor 2 calibration offset high byte
0x0412	Sensor 2 units character 1	0x0413	Sensor 2 units character 2
...	…	...	…
0x0418	Sensor 2 units character 7	0x0419	Sensor 2 number of digits after decimal point
0x041A	Sensor 2 limit 1 low byte	0x041B	Sensor 2 limit 1 high byte
0x041C	Sensor 2 limit 1 upper byte	0x041D	Sensor 2 start 1 low byte
0x041E	Sensor 2 start 1 high byte	0x041F	Sensor 2 start 1 upper byte
0x0420	Sensor 2 start 1 most significant byte	0x0421	Sensor 2 factor 1 low byte
0x0422	Sensor 2 factor 1 high byte	0x0423	Sensor 2 divisor 1
…	…	…	…
0x04D8	Sensor 2 limit 20 low byte	0x04D9	Sensor 2 limit 20 high byte
0x04DA	Sensor 2 limit 20 upper byte	0x04DB	Sensor 2 start 20 low byte
0x04DC	Sensor 2 start 20 high byte	0x04DD	Sensor 2 start 20 upper byte
0x04DE	Sensor 2 start 20 most significant byte	0x04DF	Sensor 2 factor 20 low byte
0x04E0	Sensor 2 factor 20 high byte	0x04E1	Sensor 2 divisor 20

Address	*Contents*	*Address*	*Contents*
0x04E2	Sensor 3 name character 1	0x04E3	Sensor 3 name character 2
...	…	…	…
0x04F0	Sensor 3 name character 15	0x04F1	Sensor 3 name character 16
0x04F2	Sensor 3 mode I character 1	0x04F3	Sensor 3 mode I character 2
...	…	…	…
0x0500	Sensor 3 mode I character 15	0x0501	Sensor 3 mode I character 16
0x0502	Sensor 3 mode II character 1	0x0503	Sensor 3 mode II character 2
...	…	…	…
0x0510	Sensor 3 mode II character 15	0x0511	Sensor 3 mode II character 16
0x0512	Sensor 3 mode III character 1	0x0513	Sensor 3 mode III character 2
...	…	…	…
0x0520	Sensor 3 mode III character 15	0x0521	Sensor 3 mode III character 16
0x0522	Sensor 3 mode IV character 1	0x0523	Sensor 3 mode IV character 2
...	…	…	…
0x0530	Sensor 3 mode IV character 15	0x0531	Sensor 3 mode IV character 16
0x0532	Sensor 3 mode	0x0533	Sensor 3 auto send minimum interval time
0x0534	Sensor 3 default sleep time low byte	0x0535	Sensor 3 default sleep time high byte
0x0536	Sensor 3 preset 1 low byte	0x0537	Sensor 3 preset 1 high byte
0x0538	Sensor 3 preset 1 upper byte	0x0539	Sensor 3 preset 2 low byte
0x053A	Sensor 3 preset 2 high byte	0x053B	Sensor 3 preset 2 upper byte
0x053C	Sensor 3 preset 3 low byte	0x053D	Sensor 3 preset 3 high byte
0x053E	Sensor 3 preset 3 upper byte	0x053F	Sensor 3 preset 4 low byte
0x0540	Sensor 3 preset 4 high byte	0x0541	Sensor 3 preset 4 upper byte
0x0542	Sensor 3 calibration offset low byte	0x0543	Sensor 3 calibration offset high byte
0x0544	Sensor 3 units character 1	0x0545	Sensor 3 units character 2
...	…	...	…
0x054A	Sensor 3 units character 7	0x054B	Sensor 3 number of digits after decimal point
0x054C	Sensor 3 limit 1 low byte	0x054D	Sensor 3 limit 1 high byte
0x054E	Sensor 3 limit 1 upper byte	0x054F	Sensor 3 start 1 low byte
0x0550	Sensor 3 start 1 high byte	0x0551	Sensor 3 start 1 upper byte
0x0552	Sensor 3 start 1 most significant byte	0x0553	Sensor 3 factor 1 low byte
0x0554	Sensor 3 factor 1 high byte	0x0555	Sensor 3 divisor 1
…	…	…	…
0x060A	Sensor 3 limit 20 low byte	0x060B	Sensor 3 limit 20 high byte
0x060C	Sensor 3 limit 20 upper byte	0x060D	Sensor 3 start 20 low byte
0x060E	Sensor 3 start 20 high byte	0x060F	Sensor 3 start 20 upper byte
0x0610	Sensor 3 start 20 most significant byte	0x0611	Sensor 3 factor 20 low byte
0x0612	Sensor 3 factor 20 high byte	0x0613	Sensor 3 divisor 20

Address	*Contents*	*Address*	*Contents*
0x0614	Sensor 4 name character 1	0x0615	Sensor 4 name character 2
...	…	…	…
0x0622	Sensor 4 name character 15	0x0623	Sensor 4 name character 16
0x0624	Sensor 4 mode I character 1	0x0625	Sensor 4 mode I character 2
...	…	…	…
0x0632	Sensor 4 mode I character 15	0x0633	Sensor 4 mode I character 16
0x0634	Sensor 4 mode II character 1	0x0635	Sensor 4 mode II character 2
...	…	…	…
0x0642	Sensor 4 mode II character 15	0x0643	Sensor 4 mode II character 16
0x0644	Sensor 4 mode III character 1	0x0645	Sensor 4 mode III character 2
...	…	…	…
0x0652	Sensor 4 mode III character 15	0x0653	Sensor 4 mode III character 16
0x0654	Sensor 4 mode IV character 1	0x0655	Sensor 4 mode IV character 2
...	…	…	…
0x0662	Sensor 4 mode IV character 15	0x0663	Sensor 4 mode IV character 16
0x0664	Sensor 4 mode	0x0665	Sensor 4 auto send minimum interval time
0x0666	Sensor 4 default sleep time low byte	0x0667	Sensor 4 default sleep time high byte
0x0668	Sensor 4 preset 1 low byte	0x0669	Sensor 4 preset 1 high byte
0x066A	Sensor 4 preset 1 upper byte	0x066A	Sensor 4 preset 2 low byte
0x066C	Sensor 4 preset 2 high byte	0x066C	Sensor 4 preset 2 upper byte
0x066E	Sensor 4 preset 3 low byte	0x066F	Sensor 4 preset 3 high byte
0x0670	Sensor 4 preset 3 upper byte	0x0671	Sensor 4 preset 4 low byte
0x0672	Sensor 4 preset 4 high byte	0x0673	Sensor 4 preset 4 upper byte
0x0674	Sensor 4 calibration offset low byte	0x0675	Sensor 4 calibration offset high byte
0x0676	Sensor 4 units character 1	0x0677	Sensor 4 units character 2
...	…	...	…
0x067C	Sensor 4 units character 7	0x067D	Sensor 4 number of digits after decimal point
0x067E	Sensor 4 limit 1 low byte	0x067F	Sensor 4 limit 1 high byte
0x0680	Sensor 4 limit 1 upper byte	0x0681	Sensor 4 start 1 low byte
0x0682	Sensor 4 start 1 high byte	0x0683	Sensor 4 start 1 upper byte
0x0684	Sensor 4 start 1 most significant byte	0x0685	Sensor 4 factor 1 low byte
0x0686	Sensor 4 factor 1 high byte	0x0687	Sensor 4 divisor 1
…	…		…
0x073C	Sensor 4 limit 20 low byte	0x073D	Sensor 4 limit 20 high byte
0x073E	Sensor 4 limit 20 upper byte	0x073F	Sensor 4 start 20 low byte
0x0740	Sensor 4 start 20 high byte	0x0741	Sensor 4 start 20 upper byte
0x0742	Sensor 4 start 20 most significant byte	0x0743	Sensor 4 factor 20 low byte
0x0744	Sensor 4 factor 20 high byte	0x0745	Sensor 4 divisor 20

Sensor mode

Contents	Sensor mode
xxxxxx00	Voltage (0…10 V) sensor type
xxxxxx01	Current (4…20 mA) sensor type
xxxxxx10	Resistance (PT100/PT1000/Ni1000) sensor type
xxxxxx11	Period measurement sensor type

Sensor auto send minimum interval time: 0…255 seconds

Sensor default sleep time: valid range 0x0001 to 0xFEFF or 1 minute to 65.279 minutes

Sensor preset value: 0…16777215 raw data

Sensor units: null terminated string

Sensor readout

$Limit_{n-1} < Raw < Limit_n$

$Readout = [(Start_n + factor_n * (Raw – CalOffset – Limit_{n-1} + 1)) / 2^{Divisor\_n}]/10^{Number\_of\_digits\_after\_decimal\_point}$

Sensor calibration offset: -32768…32767 raw data

Sensor limit: 0…16777215

Sensor start: - -2147483648…2147483647

Sensor factor: 0…65535

Sensor divisor: 0…31 (divide by 2^0…2^{31})

Number of digits after decimal point: 0…3

Reverse formule

$Readout_{n-1} < Readout < Readout_n$

If n=1 then $Limit_{n-1} = 0$

$Raw = Limit_{n-1} + 1 + CalOffset + (Readout*10^{Number\_of\_digits\_after\_decimal\_point} * 2^{Divisor\_n} - Start_n)/factor_n$

Address	*Contents*	*Address*	*Contents*
0x0746	Analog output 1 name character 1	0x0747	Analog output 1 name character 1
...	…	…	…
0x0754	Analog output 1 name character 15	0x0755	Analog output 1 name character 16
0x0756	Analog output 2 name character 1	0x0757	Analog output 2 name character 1
...	…	…	…
0x0764	Analog output 2 name character 15	0x0765	Analog output 2 name character 16
0x0766	Analog output 3 name character 1	0x0767	Analog output 3 name character 1
...	…	…	…
0x0774	Analog output 3 name character 15	0x0775	Analog output 3 name character 16
0x0776	Analog output 4 name character 1	0x0777	Analog output 4 name character 1
...	…	…	…
0x0784	Analog output 4 name character 15	0x0785	Analog output 4 name character 16

Address	*Contents*	*Address*	*Contents*
0x0786	Linked Push button 1 module address	0x0787	Linked Push button 1 bit number
0x0788	Linked Push button 1 action	0x0789	Linked Push button 1 time parameter
0x078A	Linked Push button 1 channel parameter	...	
...	...	...	...
0x0938	…	0x0939	Linked Push button 88 module address
0x093A	Linked Push button 88 bit number	0x093B	Linked Push button 88 action
0x093C	Linked Push button 88 time parameter	0x093D	Linked Push button 88 channel parameter
0x093E	Not used	0x093F	Not used

Remark: Unused locations contain 0xFF

Action

Action number	Action	Time parameter	Channel
0	Lock channel at closed switch	-	Channel (1...16)
1	Lock channel at opened switch	-	Channel (1...16)
2	Lock channel	Timeout	Channel (1...16)
3	Lock/unlock channel	Timeout	Channel (1...16)
4	Unlock channel	-	Channel (1...16)
5	Disable channel program at closed switch	-	Channel (1...16)
6	Disable channel program at opened switch	-	Channel (1...16)
7	Disable channel program	Timeout	Channel (1...16)
8	Disable/enable channel program	Timeout	Channel (1...16)
9	Enable channel program	-	Channel (1...16)
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 Clock Alarm 1 related program steps at closed switch	-	-
18	Enable Clock Alarm 1 related program steps at open switch	-	-
19	Disable Clock Alarm 1 related program steps at closed switch	-	-
20	Disable Clock Alarm 1 related program steps at open switch	-	-
21	Enable Clock Alarm 1 related program steps	-	-
22	Enable/Disable Clock Alarm 1 related program steps	-	-
23	Disable Clock Alarm 1 related program steps	-	-
24	Enable Clock Alarm 2 related program steps at closed switch	-	-
25	Enable Clock Alarm 2 related program steps at open switch	-	-
26	Disable Clock Alarm 2 related program steps at closed switch	-	-
27	Disable Clock Alarm 2 related program steps at open switch	-	-
28	Enable Clock Alarm 2 related program steps	-	-
29	Enable/Disable Clock Alarm 2 related program steps	-	-
30	Disable Clock Alarm 2 related program steps	-	-
31	Enable Sunrise related program steps at closed switch	-	-
32	Enable Sunrise related program steps at open switch	-	-
33	Disable Sunrise related program steps at closed switch	-	-
34	Disable Sunrise related program steps at open switch	-	-
35	Enable Sunrise related program steps	-	-
36	Enable/Disable Sunrise related program steps	-	-
37	Disable Sunrise related program steps	-	-
38	Enable Sunset related program steps at closed switch	-	-
39	Enable Sunset related program steps at open switch	-	-
40	Disable Sunset related program steps at closed switch	-	-
41	Disable Sunset related program steps at open switch	-	-
42	Enable Sunset related program steps	-	-
43	Enable/Disable Sunset related program steps	-	-
44	Disable Sunset related program steps	-	-
45	Sensor to Preset 1 (Safe) mode	Sleep time	Channel (9...12)
46	Sensor to Preset 2 (Night) mode	Sleep time	Channel (9...12)
47	Sensor to Preset 3 (Day) mode	Sleep time	Channel (9...12)
48	Sensor to Preset 4 (Comfort) mode	Sleep time	Channel (9...12)

Channel

Contents	*Channel*
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

Time parameter

Time parameter	**Timeout**
0	0s (no timer)
1	1s
2	2s
3	3s
...	
119	1min59s
120	2min
121	2min15s
...	
131	4min45s
132	5min
133	5min30s
...	
181	29min30s
182	30min
183	31min
...	
211	59min
212	1h
213	1h15min
...	
227	4h45min
228	5h
229	5h30min
...	...
237	9h30min
238	10h
239	11h
...	
251	23h
252	1d
253	2d
254	3d
255	Infinite

Sleep time parameter	**action**
0	No action
1	Select until next program step execution
2	Select for default sleep time (see sensor config.)
3	Select for 15 min (auto return to program)
4	Select for 30 min (auto return to program)
...	...
17	Select for 3h45 min (auto return to program)
18	Select for 4h min (auto return to program)
19	Select for 4h30 min (auto return to program)
...	...
33	Select for 11h30 min (auto return to program)
34	Select for 12h (auto return to program)
35	Select for 13h (auto return to program)
...	...
45	Select for 23h (auto return to program)
46	Select for 1 day (auto return to program)
47	Select for 1 day 12h (auto return to program)
...	...
57	Select for 6 days 12h (auto return to program)
58	Select for 7 days (auto return to program)
59	Select for 8 days (auto return to program)
...	...
96	Select for 45 days (auto return to program)
97	Select and ignore all program steps

Address	*Contents*	*Address*	*Contents*
0x0940	Program step 1 byte1	0x0941	Program step 1 byte2
0x0942	Program step 1 byte3	0x0943	Program step 1 byte4
0x0944	Program step 1 byte5	0x0945	Program step 1 byte6
…	…	…	…
0x0B38	Program step 85 byte1	0x0B39	Program step 85 byte2
0x0B3A	Program step 85 byte3	0x0B3B	Program step 85 byte4
0x0B3C	Program step 85 byte5	0x0B3D	Program step 85 byte6
0x0B3E	Not used	0x0B3F	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'	Program group 1
B'x1xxxxxx'	Program group 2
B'1xxxxxxx'	Program group3

Contents program byte4	*Description*
B’xx000000’	0min
B’xx000001’	1min
…	…
B’xx111011’	59min

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

Contents program byte5	**Action**
0	Unlock (channels 1...16)
1	Lock (channels 1...16)
2	Switch sensor to preset 1 (safe) mode (channels 9...12)
3	Switch sensor to preset 2 (night) mode (channels 9...12)
4	Switch sensor to preset 3 (day) mode (channels 9...12)
5	Switch sensor to preset 4 (comfort) mode (channels 9...12)

Contents program byte6	**Channel**
1	Alarm output 1
2	Alarm output 2
3	Alarm output 3
4	Alarm output 4
5	Alarm output 5
6	Alarm output 6
7	Alarm output 7
8	Alarm output 8
9	Sensor 1
10	Sensor 2
11	Sensor 3
12	Sensor 4
13	Analog output 1
14	Analog output 2
15	Analog output 3
16	Analog output 4

EEprom memory map:

Address	*Contents*	*Address*	*Contents*
0x1000’	Bank 0: Day of week	0x1001	Bank 1: Day of month
0x1002’	Bank 0: Month	0x1003’	Bank 1: Year low byte
0x1004’	Bank 0: Year high byte	0x1005’	Bank 1: Program group number
0x1006’	Bank 0:	0x1007	Bank 1:
0x1008’	Bank 0:	0x1009	Bank 1:
0x100A	Bank 0:	0x100B	Bank 1:
0x100C	Bank 0:	0x100D	Bank 1:
0x100E	Bank 0:	0x100F	Bank 1: current bank number
0x13F0	Bank 63: Day of week	0x13F 1	Bank 63: Day of month
0x13F2	Bank 63: Month	0x13F 3	Bank 63: Year low byte
0x13F4	Bank 63: Year high byte	0x13F 5	Bank 63:
0x13F6	Bank 63:	0x13F 7	Bank 63:
0x13F8	Bank 63:	0x13F9	Bank 63:
0x13FA	Bank 63:	0x13FB	Bank 63:
0x13FC	Bank 63:	0x13FD’	Bank 63:
0x13FE	Bank 63:	0x13FF	Bank 63: current bank number