

M-Bus specification

Heat Meter

Supercal 5

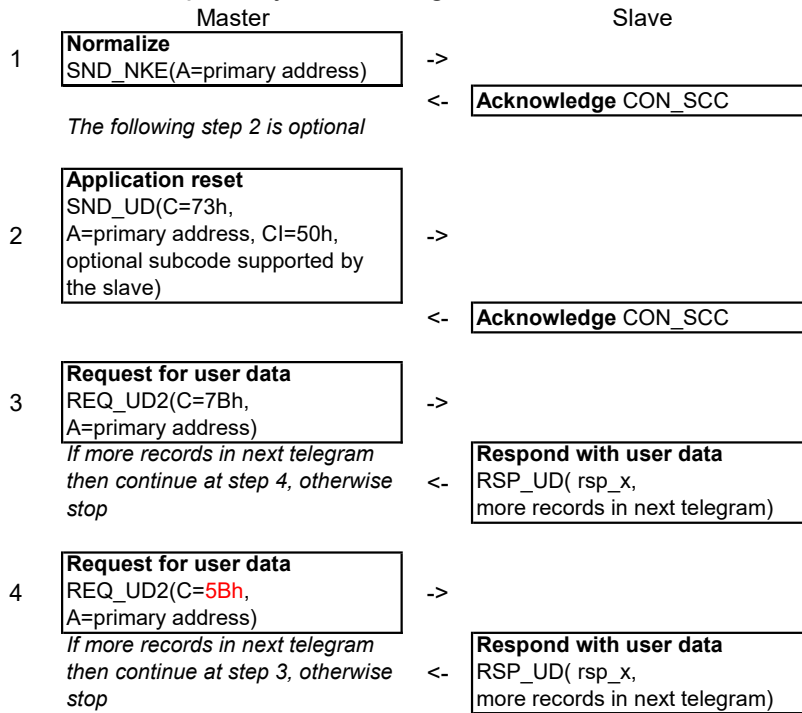
Document: M-Bus_Frames_SC5_2023-08-21
Firmware: SC5 V1.0.5 + V1.0.x

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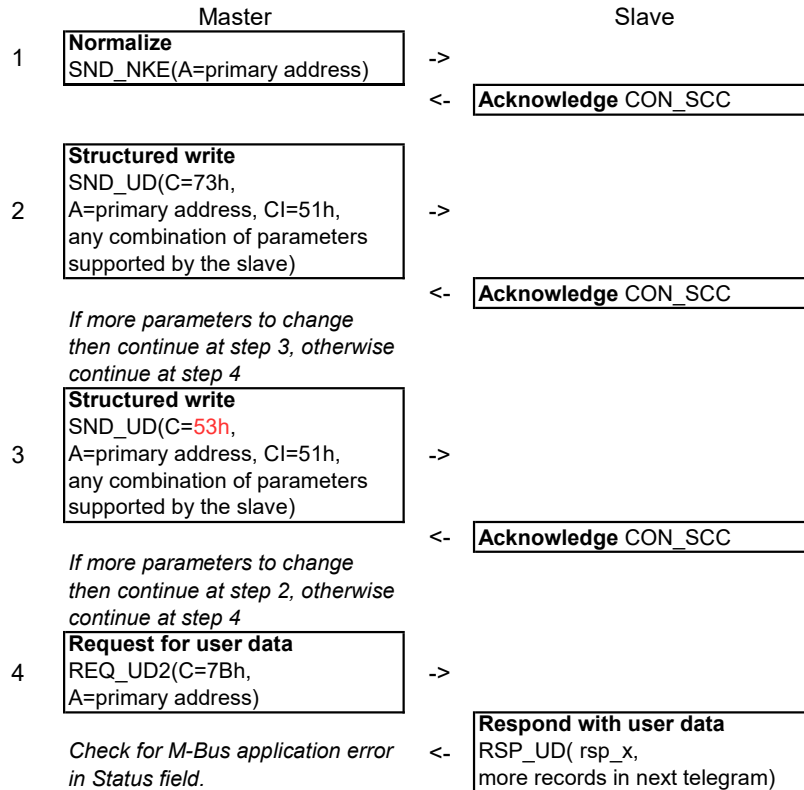
Revision:

| Date | Author | Description |
|------------|--------|---|
| 24.06.2019 | JMM | |
| 10.09.2020 | JMM | Modified frames: r5, r6, r7, r8, c1, c10_ |
| 17.09.2020 | JMM | Modified sheets: Stx, c1, c7, c8, c12, s |
| 01.10.2020 | JMM | Modified sheets: s |
| 17.11.2020 | JMM | Modified sheets: r5 |
| 08.02.2021 | JMM | Modified sheets: Keys, Frames, he, c3, c4 |
| 17.02.2022 | JMM | Modified sheets: Keys, Frames, r5, r6, r7, r8, v1, c1, c2, c4_, c5, c14, c16 |
| 11.03.2022 | JMM | Modified frames: Frames, c4, c14 |
| 17.03.2022 | JMM | M-Bus version 71 (47h) |
| 07.06.2022 | FS | Added r4 Lora default frames |
| 06.07.2022 | JMM | M-Bus version 72 (49h); Modified sheets: Keys, Frames; Add new M-Bus field "Application reset" |
| 16.11.2022 | JMM | Correction of sheet C4_; Modified sheet c5 |
| 30.03.2023 | NU | Add notes in "c8" with range to implement in Superprog |

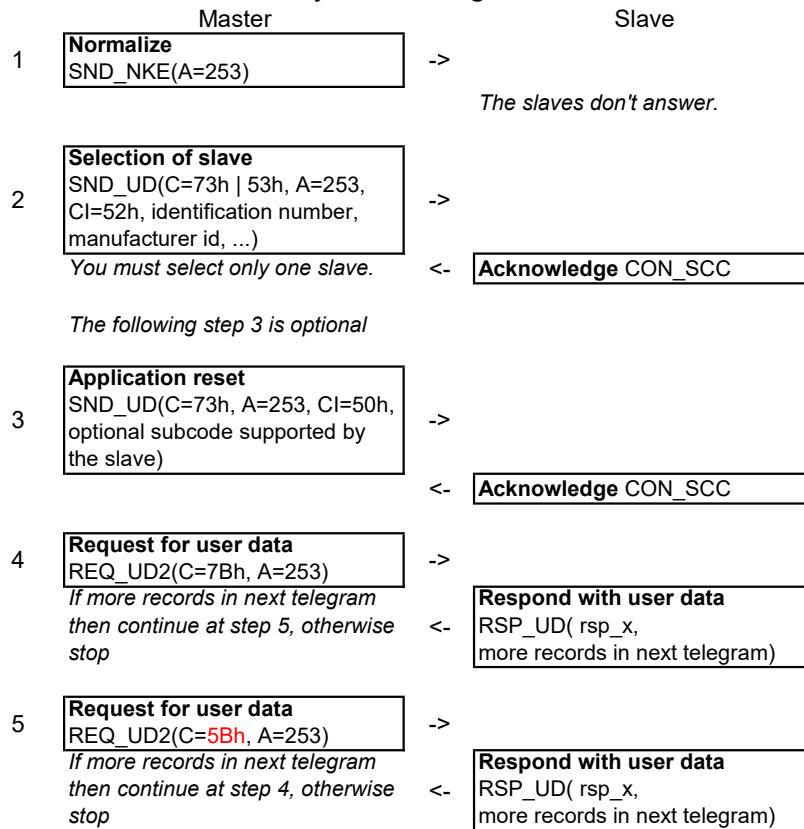
Read data with primary addressing



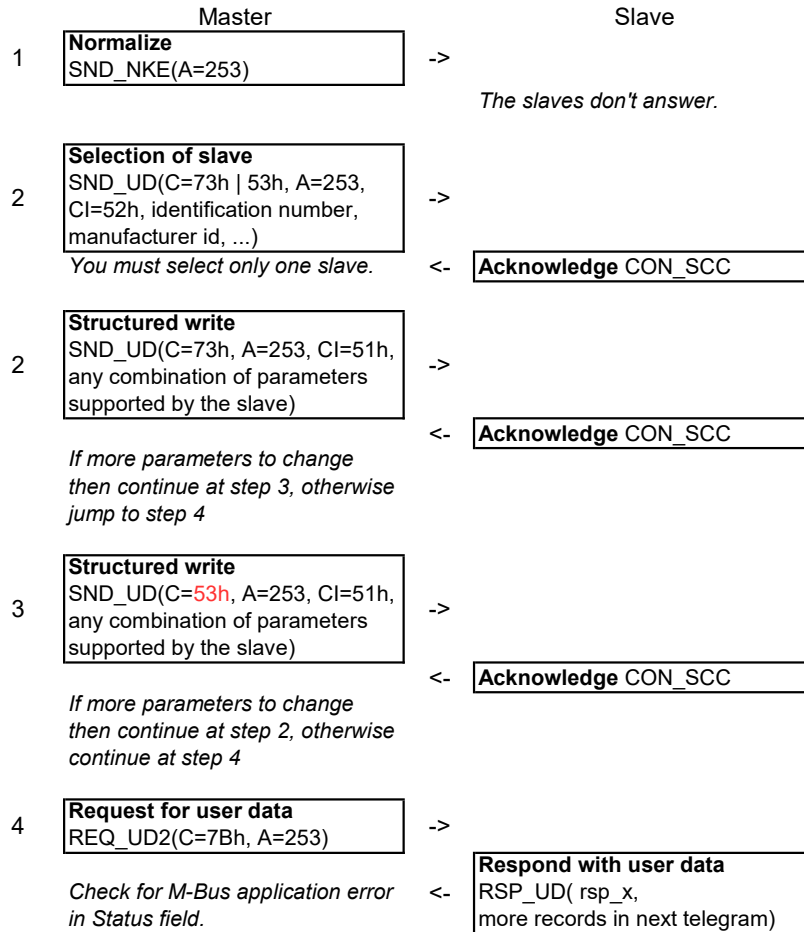
Change parameters with primary addressing



Read data with secondary addressing



Change parameters with secondary addressing



Keys

| | | | |
|-------|---|------------|--|
| | Optional record | | |
| xx | Value LSByte first | | |
| yy | Value MSByte first | | |
| ar ar | Application Reset | bit2..0 | Interface to apply the application reset |
| | | 000b | <i>reserved</i> |
| | | 001b | Wire |
| | | 010b | Optical |
| | | 011b | Module 1 |
| | | 100b | NFC |
| | | 101b | Module 2 |
| | | 110b | Radio MFD |
| | | 111b | Radio wM-Bus |
| | | bit6..3 | <i>reserved</i> |
| | | bit7 | 0: without subcode1: subcode in bit15..8 |
| | | bit15..8 | Subcode |
| br | Baudrate | 0 | 2380 bit/s |
| | | 1 | 300 bit/s |
| | | 2 | 600 bit/s |
| | | 3 | 1200 bit/s |
| | | 4 | 2400 bit/s |
| | | 5 | 4800 bit/s |
| ch | ASCII character | | |
| | The LCD supports only the character codes 20h..7Eh | | |
| cs | The value of Check Sum is calculated from arithmetical sum modulo 256 of each byte of | | |
| di | INx pulse factor display unit | | Allowed only if |
| | 00 | m3/pulse | |
| | 01 | pulse/m3 | |
| | 02 | L/pulse | unter INx unitiu iu = vu v |
| | 03 | pulse/L | |
| | 04 | gal/pulse | |
| | 05 | pulse/gal | |
| | 06 | kWh/pulse | |
| | 07 | pulse/kWh | |
| | 08 | MJ/pulse | |
| | 09 | pulse/MJ | unter INx unitiu iu = eu e |
| | 0A | kBtu/pulse | |
| | 0B | pulse/kBtu | |
| | 0C | Mcal/pulse | |
| | 0D | pulse/Mcal | |
| | 0E | unit/pulse | ter INx unitiu iu = 00, 00 |
| | 0F | pulse/unit | |

| dt | Device type | | Flowmeter position | |
|----|-------------|---------------------------|--------------------|-----------|
| | 04 | Heat | outlet, return | cold pipe |
| | 0A | Cooling | outlet, return | hot pipe |
| | 0B | Cooling | inlet, flow | cold pipe |
| | 0C | Heat | inlet, flow | hot pipe |
| | 0D | Heat / Cooling load meter | | |

| en en en | Physical unit coding of energy (depends on Energy unit "eu eu") | | | en en En |
|----------|---|---------------------|----------|----------|
| | 03 | 0.001 kWh | | 03 |
| | 04 | 0.01 kWh | | 04 |
| | 05 | 0.1 kWh | | 05 |
| | 06 | 1 kWh 0.001 MWh | kWhMWh | 06 |
| | 07 | 0.01 MWh | | 07 |
| | 85 7D | 0.1 MWh | | 85 7D |
| | FB 01 | 1 MWh | | FB 01 |
| | 0B | 0.001 MJ | | 0B |
| | 0C | 0.01 MJ | | 0C |
| | 0D | 0.1 MJ | | 0D |
| | 0E | 1 MJ 0.001 GJ | MJGJ | 0E |
| | 0F | 0.01 GJ | | 0F |
| | FB 08 | 0.1 GJ | | FB 08 |
| | FB 09 | 1 GJ | | FB 09 |
| | 80 3D | 0.001 kBtu | | 80 3D |
| | 81 3D | 0.01 kBtu | | 81 3D |
| | 82 3D | 0.1 kBtu | | 82 3D |
| | 83 3D | 1 kBtu 0.001 MBtu | kBtuMBtu | 83 3D |
| | 84 3D | 0.01 MBtu | | 84 3D |
| | 85 3D | 0.1 MBtu | | 85 3D |
| | 86 3D | 1 MBtu | | 86 3D |
| | FB 8C 74 | 0.001 Mcal | | FB 8C 74 |
| | FB 8C 75 | 0.01 Mcal | | FB 8C 75 |
| | FB 0C | 0.1 Mcal | | FB 0C |
| | FB 0D | 1 Mcal 0.001 Gcal | McalGcal | FB 0D |
| | FB 0E | 0.01 Gcal | | FB 0E |
| | FB 0F | 0.1 Gcal | | FB 0F |
| | FB 8D 7D | 1 Gcal | | FB 8D 7D |

er er er

Detailed errors

| Supercal 5 | |
|-------------------|---------------------------------------|
| bit0 | AD ref1 error |
| bit1 | AD ref2 error |
| bit2 | AD Pt sensor 1 |
| bit3 | AD Pt sensor 2 |
| bit4 | Temperature 1 below min |
| bit5 | Temperature 1 above max |
| bit6 | Temperature 2 below min |
| bit7 | Temperature 2 above max |
| bit8 | Sum of all temperatures and AD errors |
| bit9 | Flow in saturation |
| bit10 | Case is open |
| bit11 | Main power cut |
| bit12 | Module 1 error |
| bit13 | Module 2 error |
| bit14 | Firmware checksum error |
| bit15 | Radio error |
| bit16 | Unknown C field |
| bit17 | Unknown CI field |
| bit18 | Unknown record |
| bit19 | Access right violation. |
| bit20 | Bad record size |
| bit21 | Bad record value |
| bit22 | Incorrect password |
| bit23 | † |

† Not used

eu eu

Energy unit

en en en

| | | | |
|-------|------------|----------|----------|
| 01 03 | 0.001 kWh | | 03 |
| 01 02 | 0.01 kWh | | 04 |
| 01 01 | 0.1 kWh | | 05 |
| 01 00 | 1 kWh | kWhMWh | 06 |
| 02 03 | 0.001 MWh | | 06 |
| 02 02 | 0.01 MWh | | 07 |
| 02 01 | 0.1 MWh | | 85 7D |
| 02 00 | 1 MWh | | FB 01 |
| 03 03 | 0.001 MJ | | 0B |
| 03 02 | 0.01 MJ | | 0C |
| 03 01 | 0.1 MJ | | 0D |
| 03 00 | 1 MJ | MJGJ | 0E |
| 04 03 | 0.001 GJ | | 0E |
| 04 02 | 0.01 GJ | | 0F |
| 04 01 | 0.1 GJ | | FB 08 |
| 04 00 | 1 GJ | | FB 09 |
| 05 03 | 0.001 kBtu | | 80 3D |
| 05 02 | 0.01 kBtu | | 81 3D |
| 05 01 | 0.1 kBtu | | 82 3D |
| 05 00 | 1 kBtu | kBtuMBtu | 83 3D |
| 06 03 | 0.001 MBtu | | 83 3D |
| 06 02 | 0.01 MBtu | | 84 3D |
| 06 01 | 0.1 MBtu | | 85 3D |
| 06 00 | 1 MBtu | | 86 3D |
| 07 03 | 0.001 Mcal | | FB 8C 74 |
| 07 02 | 0.01 Mcal | | FB 8C 75 |
| 07 01 | 0.1 Mcal | | FB 0C |
| 07 00 | 1 Mcal | McalGcal | FB 0D |
| 08 03 | 0.001 Gcal | | FB 0D |
| 08 02 | 0.01 Gcal | | FB 0E |
| 08 01 | 0.1 Gcal | | FB 0F |
| 08 00 | 1 Gcal | | FB 8D 7D |

in in in

Physical unit coding of counter INx (depends on Counter INx unit "iu iu")

| | | |
|----------|------------------------------------|------|
| FD BA 73 | 0.001 unit | |
| FD BA 74 | 0.01 unit | unit |
| FD BA 75 | 0.1 unit | |
| FD 3A | 1 unit | |
| vo vo | see Physical unit coding of volume | |
| en en en | see Physical unit coding of energy | |

ip ip ip

Physical unit coding of INx pulse factor (depends on Counter INx unit "iu iu")

| | |
|----------|-------------------|
| FD BA 28 | Unit [unit/pulse] |
| 96 28 | Volume [m3/pulse] |
| 88 28 | Energy [J/pulse] |

iu iu

Counter INx unit

| | | in in in | ip ip ip |
|-------|-----------------|----------|----------|
| 00 03 | 0.001 unit | FD BA 73 | FD BA 28 |
| 00 02 | 0.01 unit | FD BA 74 | FD BA 28 |
| 00 01 | 0.1 unit | FD BA 75 | FD BA 28 |
| 00 00 | 1 unit | FD 3A | FD BA 28 |
| vu vu | see Volume unit | vo vo | 96 28 |
| eu eu | see Energy unit | en en en | 88 28 |

Le

Length of the M-Bus frame. The fields Start, Length, Check Sum and Stop (6 bytes) are not

Ln

Length of the ASCII character string

The allowed range is indicated in the "Coding" column.

Warning: according to the M-Bus standard, the first byte following the length byte is the rightmost character of the string, and the last byte is the leftmost character.

Lw

Length of the wM-Bus frame. The field Length itself and the CRCs are not included in the

me me

Module error

Common to all modules

| | |
|------|----------------------------------|
| bit0 | Module missing |
| bit1 | Insufficient support |
| bit2 | Incompatible power supply |
| bit3 | RESERVED for "USE_LAST_BAUDRATE" |
| bit4 | Reserved |
| bit5 | Reserved |
| bit6 | Reserved |
| bit7 | Reserved |

Specific to module D/A

| | |
|-------|-------------------|
| bit8 | Frame error |
| bit9 | Application error |
| bit10 | Parameter error |
| bit11 | Power fail |
| bit12 | Reserved |
| bit13 | Reserved |
| bit14 | Reserved |
| bit15 | Reserved |

Specific to LoRaWAN module

| |
|------------------|
| Frame error |
| Unsupported slot |

Specific to SC5U module

| |
|-------------------|
| Frame error |
| Reverse flow |
| No water |
| Overflow |
| Amplitude low |
| Temperature alarm |

mo

More records in next telegram :

| | |
|-----|-----|
| 0Fh | no |
| 1Fh | yes |

sf sf sf
sf

Selected frames

| | | M-Bus wire | Optical | NFC | Radio M | wM-Bus |
|-----------|---|------------|---------|-----|---------|--------|
| bit0 | r1: Customisable M-Bus frame 1 | yes | | | | no |
| bit1 | r2: Customisable M-Bus frame 2 | yes | | | | no |
| bit2 | r3: Customisable M-Bus frame 3 | yes | | | | no |
| bit3 | r4: Customisable M-Bus frame 4 | yes | | | | no |
| bit4 | r5: Current totalizers: energy, volume, IN1, IN2 | yes | | | | no |
| bit5 | r6: Totalizers at set day 1 and set day 2(energy) | yes | | | | no |
| bit6 | r7: IN3, IN4 | yes | | | | no |
| bit7 | r8: IN5, IN6 | yes | | | | no |
| bit8 | wM: Wireless M-Bus, OMS | no | | | | yes |
| bit9 | h1: History 1 of totalizers | yes | | | | no |
| bit10 | h2: History 2 of totalizers | yes | | | | no |
| bit11 | h3: History 3 of totalizers | yes | | | | no |
| bit12 | h4: History 4 of totalizers | yes | | | | no |
| bit13 | h5: History of average values | yes | | | | no |
| bit14 | h6: History of peak values | yes | | | | no |
| bit15 | he: Events log | yes | | | | no |
| bit16..31 | Reserved | no | | | | no |

| st | Status | Supercal 5 | M-Bus standard |
|---------|--------|-----------------------|-----------------------|
| bit1..0 | | Application | Application |
| 00b | | No error | No error |
| 01b | | † | Application busy |
| 10b | | Any application error | Any application error |
| 11b | | † | Reserved |
| bit2 | | Main power cut | Power low |
| bit3 | | † | Permanent error |
| bit4 | | Temporary error | Temporary error |
| bit5 | | Flow in saturation | Manufacturer specific |
| bit6 | | Temperature | Manufacturer specific |
| bit7 | | Case is open | Manufacturer specific |

| vo vo | Physical unit coding of volume (depends on volume unit "vu vu") | |
|-------|---|---------|
| 10 | 0.001 L | |
| 11 | 0.01 L | |
| 12 | 0.1 L | |
| 13 | 1 L 0.001 m3 | Lm3 |
| 14 | 0.01 m3 | |
| 15 | 0.1 m3 | |
| 16 | 1 m3 | |
| 90 3D | 0.001 gal | |
| 91 3D | 0.01 gal | |
| 92 3D | 0.1 gal | |
| 93 3D | 1 gal 0.001 kgal | galkgal |
| 94 3D | 0.01 kgal | |
| 95 3D | 0.1 kgal | |
| 96 3D | 1 kgal | |

| vu vu | Volume unit | | vo vo |
|-------|-------------|---------|-------|
| 09 03 | 0.001 L | | 10 |
| 09 02 | 0.01 L | | 11 |
| 09 01 | 0.1 L | | 12 |
| 09 00 | 1 L | Lm3 | 13 |
| 0A 03 | 0.001 m3 | | 13 |
| 0A 02 | 0.01 m3 | | 14 |
| 0A 01 | 0.1 m3 | | 15 |
| 0A 00 | 1 m3 | | 16 |
| 0B 03 | 0.001 gal | | 90 3D |
| 0B 02 | 0.01 gal | | 91 3D |
| 0B 01 | 0.1 gal | | 92 3D |
| 0B 00 | 1 gal | galkgal | 93 3D |
| 0C 03 | 0.001 kgal | | 93 3D |
| 0C 02 | 0.01 kgal | | 94 3D |
| 0C 01 | 0.1 kgal | | 95 3D |
| 0C 00 | 1 kgal | | 96 3D |

† Not used.

Normalize SND_NKE (master to slave)

| | Field | Frame bytes in hex | Byte | Coding | Comment |
|-------|-----------|--------------------|------|--------|--------------------|
| Start | Start | 10 | 1 | | |
| | Control | 40 | 1 | | Normalize, SND_NKE |
| | Address | xx | 1 | | |
| End | Check Sum | cs | 1 | | |
| | Stop | 16 | 1 | | |

Frame size: 5 bytes

Acknowledge CON_SCC (slave to master)

| | Field | Frame bytes in hex | Byte | Coding | Comment |
|--|-------|--------------------|------|--------|-------------|
| | | E5 | 1 | | Acknowledge |

Frame size: 1 bytes

Application reset SND_UD (master to slave)

| | | | | | | <MbusRecord> XML attributes | | | | | |
|-------|---------------------|-----------------------------|------|-----------|---------------------------------|-----------------------------|---------|--------|---------|----------|--------|
| | | | | | | Name | SubUnit | Tariff | Storage | Function | Origin |
| | Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | | |
| Start | Start, Length | 68, Le Le, 68 | 4 | | | | | | | | |
| | Control | 73 53 | 1 | | Send user data to slave, SND_UD | | | | | | |
| | Address | xx | 1 | | | | | | | | |
| Use | Control Information | 50 | 1 | | Application reset | | | | | | |
| | Subcode | xx | 1 | C, 8 bits | For subcode see table below. | | | | | | |
| End | Check Sum | cs | 1 | | | | | | | | |
| | Stop | 16 | 1 | | | | | | | | |

Frame size: 10 bytes

| Subcode | Frames selected | M-Bus standard |
|------------------------|--------------------------------------|---|
| 00h | r5..r8, h1..h4, h5, h6, he | All |
| 10h | <i>Selection defined by the user</i> | User data (consumption) |
| 20h | r5, r6, r7, r8 | Simple billing (current and fixed date value) |
| 30h | h1, h2, h3, h4 | Enhanced billing (historic values) |
| 31h | h1 | |
| 32h | h2 | |
| 33h | h3 | |
| 34h | h4 | |
| 40h | | Multi tariff billing |
| 50h | | Instantaneous values (for regulation) |
| 60h | h5, h6, he | Load profile values for management |
| 61h | h5 | |
| 62h | h6 | |
| 63h | he | |
| 70h | | Reserved |
| 80h | c1..c16 | Installation and startup (bus address, fixed) |
| 90h | v1 | Testing (high resolution values) |
| 91h | v1 | Start NOWA |
| 92h | v1 | Stop NOWA |
| 93h | v1 | Force measure |
| A0h | | Calibration |
| B0h | s | Manufacturing |
| C0h | | Development |
| D0h | | Self test |
| E0h | | Reserved |
| F0h | | Reserved |
| <i>Without subcode</i> | <i>Selection defined by the user</i> | |

Frames selected after a reset

Notes

- For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

Request for user data REQ_UD2 (master to slave)

| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment |
|-----------|-----------------------------|------|--------|-----------------------------------|
| Start | 10 | 1 | | |
| Control | 7B 5B | 1 | | Request for class 2 data, REQ_UD2 |
| Address | xx | 1 | | |
| Check Sum | cs | 1 | | |
| Stop | 16 | 1 | | |

Frame size: 5 bytes

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

Selection of slaves SND_UD (master to slave)

| | | | | | <MbusRecord> XML attributes | | | | | |
|-----------------------|-----------------------------|------|------------|---------------------------------|-----------------------------|-------|--------|---------|----------|--------|
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | Name | SubUn | Tariff | Storage | Function | Origin |
| Start, Length | 68, 1.e 1.e, 68 | 4 | | | | | | | | |
| Control | 73 53 | 1 | | Send user data to slave, SND_UD | | | | | | |
| Address | FD | 1 | | A: 253 | | | | | | |
| Control Information | 52 | 1 | | Selection of slaves | | | | | | |
| Identification number | xx xx xx xx | 4 | A, 32 bits | | IdentificationNumber | | | | | |
| Manufacturer ID | xx xx | 2 | C, 16 bits | | Manufacturer | | | | | |
| Version of meter | xx | 1 | C, 8 bits | | Version | | | | | |
| Device type | xx | 1 | D, 8 bits | | DeviceType | | | | | |
| Check Sum | cs | 1 | | | | | | | | |
| Stop | 16 | 1 | | | | | | | | |

Frame size: 17 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

Structured write SND_UD (master to slave)

| | | <MbusRecord> XML attributes | | | | | |
|-------------------------------------|--|-------------------------------|------------|-------------|--|-----------------------|----------|
| | | Name | SubUn | Tariff | Storage | Function | Origin |
| Field | Frame bytes in hex (Note 1) | Byt | Coding | Comment | | | |
| Start | Start Length | 68,1e 1e,68 | 4 | | | | |
| | Control | 73 53 | 1 | | Send user data to slave_SND_UD | | |
| User Data | Address | xx | 1 | | | | |
| | Control Information | 51 | 1 | | Structured write telegram | | |
| | | | 0 | | | | |
| | Enter the installer password | 0C,FD 13,xx xx xx xx | 7 | A, 32 bits | Ⓒ Ⓜ Note 2 | AccessCodeOperator | 0 0 0 0 |
| | Change the installer password | 4C,FD 13,xx xx xx xx | 7 | A, 32 bits | Ⓘ Note 2, Note 3 | AccessCodeOperator | 0 0 1 0 |
| | | | 0 | | | | |
| | Primary address | 01,7A,xx | 3 | C, 8 bits | Ⓘ Primary addr. of the channel itself | PrimaryAddress | 0 0 0 0 |
| | Identification number | 0C,79,xx xx xx xx | 6 | A, 32 bits | Ⓘ Id number of the channel itself | IdentificationNumber | 0 0 0 0 |
| | | | 0 | | | | |
| | Current date & time | 04,6D,xx xx xx xx | 6 | F, 32 bits | Ⓒ Only adjust ±30 min, 1 time/day Ⓘ No limitation, Note 4 | DateAndTime | 0 0 0 0 |
| | | | 0 | | | | |
| | M-Bus storage number of history 1 | 82 B0 B0 20,FF FE 28,xx xx | 9 | C, 16 bits | Ⓘ Ⓜ | DeviceSpecificValue40 | 0 47 0 0 |
| | M-Bus storage number of history 2 | 82 80 80 30,FF FE 28,xx xx | 9 | C, 16 bits | Ⓘ Ⓜ | DeviceSpecificValue40 | 0 48 0 0 |
| | M-Bus storage number of history 3 | 82 90 80 30,FF FE 28,xx xx | 9 | C, 16 bits | Ⓘ Ⓜ | DeviceSpecificValue40 | 0 49 0 0 |
| | M-Bus storage number of history 4 | 82 A0 80 30,FF FE 28,xx xx | 9 | C, 16 bits | Ⓘ Ⓜ | DeviceSpecificValue40 | 0 50 0 0 |
| | M-Bus storage number of history of average | 82 B0 80 30,FF FE 28,xx xx | 9 | C, 16 bits | Ⓘ Ⓜ | DeviceSpecificValue40 | 0 51 0 0 |
| | M-Bus storage number of history of peak | 82 80 90 30,FF FE 28,xx xx | 9 | C, 16 bits | Ⓘ Ⓜ | DeviceSpecificValue40 | 0 52 0 0 |
| | M-Bus storage number of event log | 82 90 90 30,FF FE 28,xx xx | 9 | C, 16 bits | Ⓘ Ⓜ | DeviceSpecificValue40 | 0 53 0 0 |
| | | | 0 | | | | |
| | Energy totalizer tariff 2 remainder | 85 A0 10,en en en,xx xx xx xx | 10 | H, 32 bits | Ⓧ Ⓜ; Note 5 | Energy | 0 6 0 0 |
| Volume totalizer tariff 2 remainder | 85 A0 10,vo vo, xx xx xx xx | 9 | H, 32 bits | Ⓧ Ⓜ; Note 6 | Volume | 0 6 0 0 | |
| | | 0 | | | | | |
| Counter IN1 remainder | 85 C0 10,in in in,xx xx xx xx | 10 | H, 32 bits | Ⓘ Ⓜ; Note 7 | Dimensionless Volume Energy | 1 4 0 0 | |
| Counter IN2 remainder | 85 80 50,in in in,xx xx xx xx | 10 | H, 32 bits | Ⓘ Ⓜ; Note 7 | Dimensionless Volume Energy | 2 4 0 0 | |
| Counter IN3 remainder | 85 C0 50,in in in,xx xx xx xx | 10 | H, 32 bits | Ⓘ Ⓜ; Note 7 | Dimensionless Volume Energy | 3 4 0 0 | |
| Counter IN4 remainder | 85 80 90 40,in in in,xx xx xx xx | 11 | H, 32 bits | Ⓘ Ⓜ; Note 7 | Dimensionless Volume Energy | 4 4 0 0 | |
| Counter IN5 remainder | 85 C0 90 40,in in in,xx xx xx xx | 11 | H, 32 bits | Ⓘ Ⓜ; Note 7 | Dimensionless Volume Energy | 5 4 0 0 | |
| Counter IN6 remainder | 85 80 D0 40,in in in,xx xx xx xx | 11 | H, 32 bits | Ⓘ Ⓜ; Note 7 | Dimensionless Volume Energy | 6 4 0 0 | |
| | | 0 | | | | | |
| Application reset | 02,FF FE 32,ar ar | 6 | C, 16 bits | Ⓧ | DeviceSpecificValue50 | 0 0 0 0 | |
| | | 0 | | | | | |
| End | Check Sum | cs | 1 | | | | |
| | Stop | 16 | 1 | | | | |

Max frame size: 189 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.
2. To intentionally loss all access rights without a "incorrect password" error, enter the value FFFFFFFFh.
- 3.
4. Use the standard time all the year regardless of the daylight-saving time (as the radio devices).
5. The value of "en en" depends on Energy unit, see key "eu eu"
6. The value of "vo vo" depends on Volume unit, see key "vu vu"
7. The value of "in in" depends on Counter INx unit, see key "iu iu"

- Ⓒ No special access right is needed to change this value.
- Ⓘ The installer access right (or higher) is needed to change this value.
- Ⓧ The verifier access right (or higher) is needed to change this value.
- Ⓜ The manufacturer access right (or higher) is needed to change this value.
- Ⓘ This value is read only.
- Ⓧ This value is write only.

Change baud rate SND_UD (master to slave)

| | Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment |
|-----------|---------------------|-----------------------------|------|--------|--|
| Start | Start, Length | 68, 1e 1e, 68 | 4 | | |
| | Control | 73 53 | 1 | | Send user data to slave, SND_UD |
| | Address | xx | 1 | | |
| User Data | Control Information | B8 B9 BA BB BC | 1 | | Set baud rate: B8h: 300; B9h: 600; BAh: 1200; BBh: 2400; BCh: 4800 |
| | Check Sum | cs | 1 | | |
| End | Stop | 16 | 1 | | |

Frame size: 9 bytes

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

Effective change of baud rate

| Communication channel | Change baud rate, Cf: B8..BCh |
|-----------------------|-------------------------------|
| M-Bus wire | Immediate |
| Optical | Ignored, detected by wakeup |
| Module 1 | Immediate |
| NFC | Ignored |
| Module 2 | Immediate |
| Radio MFD, wM-Bus | Ignored |

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | | |
|---|---|-------------------------|--------|-------------------------------------|-----------------------------|-------|--------|---------|----------|--------|--|
| | | | | | Name | SubUn | Tariff | Storage | Function | Origin | |
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | | | |
| Start | Start Length | 68, 1e 1e, 68 | 4 | | | | | | | | |
| | Control | 08 | 1 | Respond with user data, RSP_UD | | | | | | | |
| | Address | xx | 1 | | | | | | | | |
| User Data | Control Information | 72 | 1 | Variable structure respond | | | | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | IdentificationNumber | | | | | | |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits "SON" | Manufacturer | | | | | | |
| | Version of meter | 48 | 1 | C, 8 bits 72 | Version | | | | | | |
| | Device type | dt | 1 | D, 8 bits | DeviceType | | | | | | |
| | Access number | xx | 1 | C, 8 bits | AccessNumber | | | | | | |
| | Status | st | 1 | Ds, 8 bits | Status | | | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | Signature | | | | | | |
| | | | 0 | | | | | | | | |
| | Encryption verification | 2F 2F | 2 | | IdleFiller | | | | | | |
| | | | 0 | | | | | | | | |
| | Customisable M-Bus frame (encrypted part) | | | | | | | | | | |
| | | | | ## | | | | | | | |
| | Encryption block filling | 2F 2F 2F 2F 2F 2F 2F 2F | 8 | | IdleFiller | | | | | | |
| | | | 0 | | | | | | | | |
| Customisable M-Bus frame (unencrypted part) | | | | | | | | | | | |
| | | | 10 | | | | | | | | |
| More records in next telegram | RD | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | | |
| Check Sum | cs | 1 | | | | | | | | | |
| Stop | 16 | 1 | | | | | | | | | |

Max frame size: 192 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | |
|-------------------------------|-----------------------------|---------------------------------|------------|---|-----------------------------|---------------------------------|--------|---------|------------|--------|
| | | | | | Name | Sub Unit | Tariff | Storage | Function ‡ | Origin |
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | | |
| Start | Start, Length | 68, 1e 1e, 68 | 4 | | | | | | | |
| | Control | 08 | 1 | Respond with user data, RSP_UD | | | | | | |
| | Address | xx | 1 | | | | | | | |
| User Data | Control Information | 72 | 1 | Variable structure respond | | | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | IdentificationNumber | | | | | Header |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | Manufacturer | | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | Version | | | | | |
| | Device type | dt | 1 | D, 8 bits | DeviceType | | | | | |
| | Access number | xx | 1 | C, 8 bits | AccessNumber | | | | | |
| | Status | st | 1 | Ds, 8 bits | Status | | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | Signature | | | | | |
| | | | 0 | | | | | | | |
| | Encryption verification | 2F 2F | 2 | | IdleFiller | | | | | |
| | | | 0 | | | | | | | |
| | Current date & time | 04, 6D, xx xx xx xx | 6 | F, 32 bits | DateAndTime | 0 | 0 | 0 | 0 | |
| | | | 0 | | | | | | | |
| | Energy totalizer tariff 0 | 04, en en en, xx xx xx xx | 8 | B, 32 bits | Ⓢ Ⓟ; Note 2 | Energy | 0 | 0 | 0 | |
| | Volume totalizer tariff 0 | 04, vo vo, xx xx xx xx | 7 | B, 32 bits | Ⓢ Ⓟ; Note 3 | Volume | 0 | 0 | 0 | |
| | Energy totalizer tariff 1 | 84 10, en en en, xx xx xx xx | 9 | B, 32 bits | Ⓢ Ⓟ; Note 2 | Energy | 0 | 1 | 0 | |
| | Volume totalizer tariff 1 | 84 10, vo vo, xx xx xx xx | 8 | B, 32 bits | Ⓢ Ⓟ; Note 3 | Volume | 0 | 1 | 0 | |
| | Energy totalizer tariff 2 | 84 20, en en en, xx xx xx xx | 9 | B, 32 bits | Ⓢ Ⓟ; Note 2 | Energy | 0 | 2 | 0 | |
| | Volume totalizer tariff 2 | 84 20, vo vo, xx xx xx xx | 8 | B, 32 bits | Ⓢ Ⓟ; Note 3 | Volume | 0 | 2 | 0 | |
| | | | 0 | | | | | | | |
| | Counter IN1 device type | 81 40, FD 09, xx | 5 | D, 8 bits | Ⓢ Ⓟ | DeviceType | 1 | 0 | 0 | |
| | Counter IN1 identification | 8C 40, 79, xx xx xx xx | 7 | A, 32 bits | Ⓢ Ⓟ | IdentificationNumber | 1 | 0 | 0 | |
| | Counter IN1 totalizer | 84 40, in in in, xx xx xx xx | 9 | B, 32 bits | Ⓢ Ⓟ; Note 4 | Dimensionless Volume Energy | 1 | 0 | 0 | |
| | Counter IN2 device type | 81 80 40, FD 09, xx | 6 | D, 8 bits | Ⓢ Ⓟ | DeviceType | 2 | 0 | 0 | |
| | Counter IN2 identification | 8C 80 40, 79, xx xx xx xx | 8 | A, 32 bits | Ⓢ Ⓟ | IdentificationNumber | 2 | 0 | 0 | |
| | Counter IN2 totalizer | 84 80 40, in in in, xx xx xx xx | 10 | B, 32 bits | Ⓢ Ⓟ; Note 4 | Dimensionless Volume Energy | 2 | 0 | 0 | |
| | | | 0 | | | | | | | |
| | High temperature | 02, 59, xx xx | 4 | B, 16 bits | Ⓢ Ⓟ [0.01 °C] | FlowTemperature | 0 | 0 | 0 | |
| | Low temperature | 02, 5D, xx xx | 4 | B, 16 bits | Ⓢ Ⓟ [0.01 °C] | ReturnTemperature | 0 | 0 | 0 | |
| | Flow | 04, 39, xx xx xx xx | 6 | B, 32 bits | Ⓢ Ⓟ [0.01 l/h] | VolumeFlow | 0 | 0 | 0 | |
| | Power | 04, 2B, xx xx xx xx | 6 | B, 32 bits | Ⓢ Ⓟ [1 W] | Power | 0 | 0 | 0 | |
| | | | 0 | | | | | | | |
| | Encryption block filling | 2F 2F 2F 2F 2F 2F | 6 | | IdleFiller | | | | | |
| | | 0 | | | | | | | | |
| Device access right | 01, FF 2B, xx | 4 | D, 8 bits | Ⓢ Ⓟ 0: Consumer; 1: Installer; 2: Verifier; 3: Manufacturer | DeviceAccessRightLevel | 0 | 0 | 0 | | |
| Detailed errors | 03, FF 2C, er er er | 6 | D, 24 bits | Ⓢ Ⓟ | ManufacturerErrorFlags | 0 | 0 | 0 | | |
| Fabrication Number | 0C, 78, xx xx xx xx | 6 | A, 32 bits | Ⓢ Ⓟ | FabricationNumber | 0 | 0 | 0 | | |
| Internal version | 0C, FD 0F, xx xx xx 1c | 7 | A, 32 bits | Ⓢ Ⓟ lc = language code: 0: en-GB; 1: de-DE; 2: fr-FR; 3: it-IT; 4: es-ES; | OtherSoftwareVersion | 0 | 0 | 0 | | |
| Running hours | 03, 22, xx xx xx | 5 | B, 24 bits | Ⓢ Ⓟ [h] | OnTime | 0 | 0 | 0 | | |
| | | 0 | | | | | | | | |
| More records in next telegram | mo | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | |
| End | Check Sum | cs | 1 | | | | | | | |
| | Stop | 16 | 1 | | | | | | | |

Max frame size: 178 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.
2. The value of "en en" depends on Energy unit, see key "eu eu"
3. The value of "vo vo" depends on Volume unit, see key "vu vu"
4. The value of "in in" depends on Counter INx unit, see key "iu iu"

- Ⓢ No special access right is needed to change this value.
- Ⓢ ⓘ The installer access right (or higher) is needed to change this value.
- Ⓢ Ⓟ The verifier access right (or higher) is needed to change this value.
- Ⓢ Ⓢ The manufacturer access right (or higher) is needed to change this value.
- Ⓢ ⓘ This value is read only.

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | |
|--|--|-------------------------------|------------|-------------------------------------|---------------------------------|---------------------------------|--------|---------|-----------|--------|
| | | | | | Name | SubUnit | Tariff | Storage | Function† | Origin |
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | | |
| Start | Start_Length | 68,1e 1e,68 | 4 | | | | | | | |
| | Control | 08 | 1 | Respond with user data, RSP_UD | | | | | | |
| | Address | xx | 1 | | | | | | | |
| User Data | Control Information | 72 | 1 | Variable structure respond | | | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | IdentificationNumber | | | | | Header |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | Manufacturer | | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | Version | | | | | |
| | Device type | dt | 1 | D, 8 bits | DeviceType | | | | | |
| | Access number | xx | 1 | C, 8 bits | AccessNumber | | | | | |
| | Status | st | 1 | Ds, 8 bits | Status | | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | Signature | | | | | |
| | | | 0 | | | | | | | |
| | Encryption verification | 2F 2F | 2 | | IdleFiller | | | | | |
| | | | 0 | | | | | | | |
| | Set day | 42,6C,xx xx | 4 | G, 16 bits | Ⓜ ⓘ Note 2 | Date | 0 | 0 | 1 | 0 |
| | | | 0 | | | | | | | |
| | Energy totalizer tariff 0 at set day | 44,en en en,xx xx xx xx | 8 | B, 32 bits | Ⓜ ⓘ Note 3 | Energy | 0 | 0 | 1 | 0 |
| | Volume totalizer tariff 0 at set day | 44,vo vo,xx xx xx xx | 7 | B, 32 bits | Ⓜ ⓘ Note 4 | Volume | 0 | 0 | 1 | 0 |
| | Energy totalizer tariff 1 at set day | C4 10,en en en,xx xx xx xx | 9 | B, 32 bits | Ⓜ ⓘ Note 3 | Energy | 0 | 1 | 1 | 0 |
| | Volume totalizer tariff 1 at set day | C4 10,vo vo,xx xx xx xx | 8 | B, 32 bits | Ⓜ ⓘ Note 4 | Volume | 0 | 1 | 1 | 0 |
| | Energy totalizer tariff 2 at set day | C4 20,en en en,xx xx xx xx | 9 | B, 32 bits | Ⓜ ⓘ Note 3 | Energy | 0 | 2 | 1 | 0 |
| | Volume totalizer tariff 2 at set day | C4 20,vo vo,xx xx xx xx | 8 | B, 32 bits | Ⓜ ⓘ Note 4 | Volume | 0 | 2 | 1 | 0 |
| | | | 0 | | | | | | | |
| | Counter IN1 totalizer at set day | C4 40,in in in,xx xx xx xx | 9 | B, 32 bits | Ⓜ ⓘ Note 5 | Dimensionless Volume Energy | 1 | 0 | 1 | 0 |
| | Counter IN2 totalizer at set day | C4 80 40,in in in,xx xx xx xx | 10 | B, 32 bits | Ⓜ ⓘ Note 5 | Dimensionless Volume Energy | 2 | 0 | 1 | 0 |
| | | | 0 | | | | | | | |
| | Set day 2 | 82 01,6C,xx xx | 5 | G, 16 bits | Ⓜ ⓘ Note 2 | Date | 0 | 0 | 2 | 0 |
| | | | 0 | | | | | | | |
| | Energy totalizer tariff 0 at set day 2 | 84 01,en en en,xx xx xx xx | 9 | B, 32 bits | Ⓜ ⓘ Note 3 | Energy | 0 | 0 | 2 | 0 |
| | Volume totalizer tariff 0 at set day 2 | 84 01,vo vo,xx xx xx xx | 8 | B, 32 bits | Ⓜ ⓘ Note 4 | Volume | 0 | 0 | 2 | 0 |
| | Energy totalizer tariff 1 at set day 2 | 84 11,en en en,xx xx xx xx | 9 | B, 32 bits | Ⓜ ⓘ Note 3 | Energy | 0 | 1 | 2 | 0 |
| | Volume totalizer tariff 1 at set day 2 | 84 11,vo vo,xx xx xx xx | 8 | B, 32 bits | Ⓜ ⓘ Note 4 | Volume | 0 | 1 | 2 | 0 |
| | Energy totalizer tariff 2 at set day 2 | 84 21,en en en,xx xx xx xx | 9 | B, 32 bits | Ⓜ ⓘ Note 3 | Energy | 0 | 2 | 2 | 0 |
| Volume totalizer tariff 2 at set day 2 | 84 21,vo vo,xx xx xx xx | 8 | B, 32 bits | Ⓜ ⓘ Note 4 | Volume | 0 | 2 | 2 | 0 | |
| | | 0 | | | | | | | | |
| Counter IN1 totalizer at set day 2 | 84 41,in in in,xx xx xx xx | 9 | B, 32 bits | Ⓜ ⓘ Note 5 | Dimensionless Volume Energy | 1 | 0 | 2 | 0 | |
| Counter IN2 totalizer at set day 2 | 84 81 40,in in in,xx xx xx xx | 10 | B, 32 bits | Ⓜ ⓘ Note 5 | Dimensionless Volume Energy | 2 | 0 | 2 | 0 | |
| | | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| Encryption block filling | 2F 2F 2F 2F 2F 2F 2F 2F | 11 | | IdleFiller | | | | | | |
| | | 0 | | | | | | | | |
| More records in next telegram | mo | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | |
| End | Check Sum | cs | 1 | | | | | | | |
| | Stop | 16 | 1 | | Max frame size: 182 bytes | | | | | |

Symbols

- † Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.
2. The year equal to 2000 indicates that the values at set day are not yet stored.
The year different than 2000 indicates that the date is the date of the last storage.
3. The value of "en en en" depends on Energy unit, see key "eu eu"
4. The value of "vo vo" depends on Volume unit, see key "vu vu"
5. The value of "in in in" depends on Counter INx unit, see key "iu iu"

- Ⓜ No special access right is needed to change this value.
- ⓘ The installer access right (or higher) is needed to change this value.
- Ⓜ The verifier access right (or higher) is needed to change this value.
- Ⓜ The manufacturer access right (or higher) is needed to change this value.
- Ⓜ This value is read only.

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | |
|-------------------------------|------------------------------------|---------------------------------------|------|------------|-------------------------------------|---------------------------------|--------|---------|------------|--------|
| | | | | | Name | Sub Unit | Tariff | Storage | Function ‡ | Origin |
| | Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | |
| Start | Start, Length | 68, 1e 1e, 68 | 4 | | | | | | | |
| | Control | 08 | 1 | | Respond with user data, RSP_UD | | | | | |
| | Address | xx | 1 | | | | | | | |
| User Data | Control Information | 72 | 1 | | Variable structure respond | | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | | IdentificationNumber | | | | Header |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | "SON" | Manufacturer | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | | | |
| | Device type | dt | 1 | D, 8 bits | | DeviceType | | | | |
| | Access number | xx | 1 | C, 8 bits | | AccessNumber | | | | |
| | Status | st | 1 | Ds, 8 bits | | Status | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | | Signature | | | | |
| | | | 0 | | | | | | | |
| | Encryption verification | 2F 2F | 2 | | ⚡ | IdleFiller | | | | |
| | | | 0 | | | | | | | |
| | Counter IN3 device type | 81 C0 40, FD 09, xx | 6 | D, 8 bits | ⚡ ⓘ | DeviceType | 3 | 0 | 0 | 0 |
| | Counter IN3 identification | 8C C0 40, 79, xx xx xx xx | 8 | A, 32 bits | ⚡ ⓘ | IdentificationNumber | 3 | 0 | 0 | 0 |
| | Counter IN3 totalizer | 84 C0 40, in in in in, xx xx xx xx | 10 | B, 32 bits | ⚡ ⓘ Note 2 | Dimensionless Volume Energy | 3 | 0 | 0 | 0 |
| | Counter IN3 totalizer at set day | C4 C0 40, in in in in, xx xx xx xx | 10 | B, 32 bits | ⚡ ⓘ Note 2 | Dimensionless Volume Energy | 3 | 0 | 1 | 0 |
| | Counter IN3 totalizer at set day 2 | 84 C1 40, in in in in, xx xx xx xx | 10 | B, 32 bits | ⚡ ⓘ Note 2 | Dimensionless Volume Energy | 3 | 0 | 2 | 0 |
| | | | 0 | | | | | | | |
| | Counter IN4 device type | 81 80 80 40, FD 09, xx | 7 | D, 8 bits | ⚡ ⓘ | DeviceType | 4 | 0 | 0 | 0 |
| | Counter IN4 identification | 8C 80 80 40, 79, xx xx xx xx | 9 | A, 32 bits | ⚡ ⓘ | IdentificationNumber | 4 | 0 | 0 | 0 |
| | Counter IN4 totalizer | 84 80 80 40, in in in in, xx xx xx xx | 11 | B, 32 bits | ⚡ ⓘ Note 2 | Dimensionless Volume Energy | 4 | 0 | 0 | 0 |
| | Counter IN4 totalizer at set day | C4 80 80 40, in in in in, xx xx xx xx | 11 | B, 32 bits | ⚡ ⓘ Note 2 | Dimensionless Volume Energy | 4 | 0 | 1 | 0 |
| | Counter IN4 totalizer at set day 2 | 84 81 80 40, in in in in, xx xx xx xx | 11 | B, 32 bits | ⚡ ⓘ Note 2 | Dimensionless Volume Energy | 4 | 0 | 2 | 0 |
| | | | 0 | | | | | | | |
| Encryption block filling | 2F | 1 | | ⚡ | IdleFiller | | | | | |
| | | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| More records in next telegram | mo | 1 | | | Start of manufacturer specific data | ManufacturerDataBlock | | | | |
| Check Sum | cs | 1 | | | | | | | | |
| End | Stop | 16 | 1 | | | | | | | |

Max frame size: 118 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.
2. The value of "in in in" depends on Counter INx unit, see key "iu iu"

- Ⓞ No special access right is needed to change this value.
- ⓘ The installer access right (or higher) is needed to change this value.
- Ⓥ The verifier access right (or higher) is needed to change this value.
- Ⓜ The manufacturer access right (or higher) is needed to change this value.
- Ⓡ This value is read only.

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | |
|-------------------------------|------------------------------------|------------------------------------|--------|-------------------------------------|-----------------------------|---------------------------------|--------|---------|-----------|--------|
| | | | | | Name | SubUnit | Tariff | Storage | Function† | Origin |
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | | |
| Start | Start, Length | 68, Le Le, 68 | 4 | | | | | | | |
| | Control | 08 | 1 | Respond with user data, RSP_UD | | | | | | |
| | Address | xx | 1 | | | | | | | |
| User Data | Control Information | 72 | 1 | Variable structure respond | | | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | IdentificationNumber | | | | | |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | "SON" | Manufacturer | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | | | |
| | Device type | dt | 1 | D, 8 bits | | DeviceType | | | | |
| | Access number | xx | 1 | C, 8 bits | | AccessNumber | | | | |
| | Status | st | 1 | Ds, 8 bits | | Status | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | | Signature | | | | |
| | | | 0 | | | | | | | |
| | Encryption verification | 2F 2F | 2 | | 🔒 | IdleFiller | | | | |
| | | | 0 | | | | | | | |
| | Counter IN5 device type | 81 C0 80 40, FD 09, xx | 7 | D, 8 bits | 🔒 ⓘ | DeviceType | 5 | 0 | 0 | 0 |
| | Counter IN5 identification | 8C C0 80 40, 79, xx xx xx xx | 9 | A, 32 bits | 🔒 ⓘ | IdentificationNumber | 5 | 0 | 0 | 0 |
| | Counter IN5 totalizer | 84 C0 80 40, in in in, xx xx xx xx | 11 | B, 32 bits | 🔒 ⓘ Note 2 | Dimensionless Volume Energy | 5 | 0 | 0 | 0 |
| | Counter IN5 totalizer at set day | C4 C0 80 40, in in in, xx xx xx xx | 11 | B, 32 bits | 🔒 ⓘ Note 2 | Dimensionless Volume Energy | 5 | 0 | 1 | 0 |
| | Counter IN5 totalizer at set day 2 | 84 C1 80 40, in in in, xx xx xx xx | 11 | B, 32 bits | 🔒 ⓘ Note 2 | Dimensionless Volume Energy | 5 | 0 | 2 | 0 |
| | | | 0 | | | | | | | |
| | Counter IN6 device type | 81 80 C0 40, FD 09, xx | 7 | D, 8 bits | 🔒 ⓘ | DeviceType | 6 | 0 | 0 | 0 |
| | Counter IN6 identification | 8C 80 C0 40, 79, xx xx xx xx | 9 | A, 32 bits | 🔒 ⓘ | IdentificationNumber | 6 | 0 | 0 | 0 |
| | Counter IN6 totalizer | 84 80 C0 40, in in in, xx xx xx xx | 11 | B, 32 bits | 🔒 ⓘ Note 2 | Dimensionless Volume Energy | 6 | 0 | 0 | 0 |
| | Counter IN6 totalizer at set day | C4 80 C0 40, in in in, xx xx xx xx | 11 | B, 32 bits | 🔒 ⓘ Note 2 | Dimensionless Volume Energy | 6 | 0 | 1 | 0 |
| | Counter IN6 totalizer at set day 2 | 84 81 C0 40, in in in, xx xx xx xx | 11 | B, 32 bits | 🔒 ⓘ Note 2 | Dimensionless Volume Energy | 6 | 0 | 2 | 0 |
| | | | 0 | | | | | | | |
| | Encryption block filling | 2F 2F 2F 2F 2F 2F 2F 2F 2F 2F 2F | 12 | | 🔒 | IdleFiller | | | | |
| | | | 0 | | | | | | | |
| | | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| More records in next telegram | m0 | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | |
| End | Check Sum | cs | 1 | | | | | | | |
| | Stop | 16 | 1 | | | | | | | |

Max frame size: 134 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.
2. The value of "in in in" depends on Counter INx unit, see key "iu iu"

- Ⓞ No special access right is needed to change this value.
- ⓘ The installer access right (or higher) is needed to change this value.
- Ⓥ The verifier access right (or higher) is needed to change this value.
- Ⓜ The manufacturer access right (or higher) is needed to change this value.
- Ⓡ This value is read only.

Send no reply SND_NR, wM-Bus OMS (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | | |
|-----------------|--------------------------------------|---------------------------------|------------|---|-----------------------------|---------------------------------|--------|---------|----------|--------|--|
| | | | | | Name | SubUn | Tariff | Storage | Function | Origin | |
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | | | |
| DLL | Length | Lw | 1 | | | | | | | | |
| | Control | 44 46 | 1 | 44h: SND_NR (Send No Reply) 46h: SND_IR (Installation Request) | | | | | | | |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits "SON" | Manufacturer | | | | | | |
| | Radio serial number | xx xx xx xx | 4 | A, 32 bits Unchangeable | IdentificationNumber | | | | | | |
| | Version of meter | 48 | 1 | C, 8 bits 72 | Version | | | | | | |
| TPL | Device type | dt | 1 | D, 8 bits | DeviceType | | | | | | |
| | Control Information | 7A | 1 | Variable structure respond | | | | | | | |
| | Access number | xx | 1 | C, 8 bits | AccessNumber | | | | | | |
| | Status | st | 1 | Ds, 8 bits | Status | | | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | Signature | | | | | | |
| ABL | Encryption verification | 2F 2F | 2 | Ⓜ | IdleFiller | | | | | | |
| | | | 0 | | | | | | | | |
| | Current date & time | 04, 6D, xx xx xx xx | 6 | F, 32 bits | DateAndTime | 0 | 0 | 0 | 0 | | |
| | Energy totalizer tariff 0 | 04, en en en, xx xx xx xx | 8 | B, 32 bits | Ⓜ | Energy | 0 | 0 | 0 | 0 | |
| | Volume totalizer tariff 0 | 04, vo vo, xx xx xx xx | 7 | B, 32 bits | Ⓜ | Volume | 0 | 0 | 0 | 0 | |
| | Energy totalizer tariff 1 | 84 10, en en en, xx xx xx xx | 9 | B, 32 bits | Ⓜ | Energy | 0 | 1 | 0 | 0 | |
| | Volume totalizer tariff 1 | 84 10, vo vo, xx xx xx xx | 8 | B, 32 bits | Ⓜ | Volume | 0 | 1 | 0 | 0 | |
| | Counter IN1 totalizer | 84 40, in in in, xx xx xx xx | 9 | B, 32 bits | Ⓜ | Dimensionless Volume Energy | 1 | 0 | 0 | 0 | |
| | Counter IN2 totalizer | 84 80 40, in in in, xx xx xx xx | 10 | B, 32 bits | Ⓜ | Dimensionless Volume Energy | 2 | 0 | 0 | 0 | |
| | | | 0 | | | | | | | | |
| | Set day | 42, 6C, xx xx | 4 | G, 16 bits | Ⓜ | Date | 0 | 0 | 1 | 0 | |
| | Energy totalizer tariff 0 at set day | 44, en en en, xx xx xx xx | 8 | B, 32 bits | Ⓜ | Energy | 0 | 0 | 1 | 0 | |
| | Volume totalizer tariff 0 at set day | 44, vo vo, xx xx xx xx | 7 | B, 32 bits | Ⓜ | Volume | 0 | 0 | 1 | 0 | |
| | Energy totalizer tariff 1 at set day | C4 10, en en en, xx xx xx xx | 9 | B, 32 bits | Ⓜ | Energy | 0 | 1 | 1 | 0 | |
| | Volume totalizer tariff 1 at set day | C4 10, vo vo, xx xx xx xx | 8 | B, 32 bits | Ⓜ | Volume | 0 | 1 | 1 | 0 | |
| | Counter IN1 totalizer at set day | C4 40, in in in, xx xx xx xx | 9 | B, 32 bits | Ⓜ | Dimensionless Volume Energy | 1 | 0 | 1 | 0 | |
| | Counter IN2 totalizer at set day | C4 80 40, in in in, xx xx xx xx | 10 | B, 32 bits | Ⓜ | Dimensionless Volume Energy | 2 | 0 | 1 | 0 | |
| | | | 0 | | | | | | | | |
| | High temperature | 02, 59, xx xx | 4 | B, 16 bits | Ⓜ (P) [0.01 °C] | FlowTemperature | 0 | 0 | 0 | 0 | |
| | Low temperature | 02, 5D, xx xx | 4 | B, 16 bits | Ⓜ (P) [0.01 °C] | ReturnTemperature | 0 | 0 | 0 | 0 | |
| | Flow | 04, 39, xx xx xx xx | 6 | B, 32 bits | Ⓜ (P) [0.01 l/h] | VolumeFlow | 0 | 0 | 0 | 0 | |
| | Power | 04, 2B, xx xx xx xx | 6 | B, 32 bits | Ⓜ (P) [1 W] | Power | 0 | 0 | 0 | 0 | |
| | | | 0 | | | | | | | | |
| | Encryption block filling | 2F 2F 2F 2F 2F 2F 2F 2F | 10 | | Ⓜ | IdleFiller | | | | | |
| | | | 0 | | | | | | | | |
| Detailed errors | 03, FF 2C, er er er | 6 | D, 24 bits | (P) § | ManufacturerErrorFlags | 0 | 0 | 0 | 0 | | |
| | | 0 | | | | | | | | | |

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
§ manufacturer specific VIFE

Max frame size: 165 bytes

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

Send no reply SND_NR, wM-Bus OMS (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | | |
|--------------------------|--------------------------------------|---------------------------------|------------|------------------|---|---------------------------------|--------|---------|----------|--------|--|
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | Name | SubUn | Tariff | Storage | Function | Origin | |
| DLL | Length | Lw | 1 | | | | | | | | |
| | Control | 44 46 | 1 | | 44h: SND_NR (Send No Reply) 46h: SND_IR (Installation Request) | | | | | | |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | "SON" | Manufacturer | | | | | |
| | Radio serial number | xx xx xx xx | 4 | A, 32 bits | Unchangeable | IdentificationNumber | | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | | | | |
| Device type | dt | 1 | D, 8 bits | | DeviceType | | | | | | |
| ELL | Control Information | 8C | 1 | | Short Extended Link Layer | | | | | | |
| | CC | 20 | 1 | | Communication Control | | | | | | |
| | ACC | xx | 1 | | Access Counter | | | | | | |
| AFL | Control Information | 90 | 1 | | Authentication and Fragmentation Layer | | | | | | |
| | AFFL | 0F | 1 | | AFL Length | | | | | | |
| | FLC | 00 2C | 2 | | Fragmentation Control Field | | | | | | |
| | MCL | 25 | 1 | | Message Control Field | | | | | | |
| | MCR | xx xx xx xx | 4 | | Message Counter | | | | | | |
| | MAC | xx xx xx xx xx xx xx xx | 8 | | CMAC-AES-128 | | | | | | |
| TRL | Control Information | 7A | 1 | | Variable structure respond | | | | | | |
| | Access number | xx | 1 | C, 8 bits | | AccessNumber | | | | | |
| | Status | st | 1 | Ds, 8 bits | | Status | | | | | |
| | Configuration | x0 07 | 2 | C, 16 bits | | Signature | | | | | |
| CFE | 10 | 1 | | | | | | | | | |
| APL | Encryption verification | 2F 2F | 2 | | 🔒 | IdleFiller | | | | | |
| | | | 0 | | | | | | | | |
| | Current date & time | 04, 6D, xx xx xx xx | 6 | F, 32 bits | 🔒 | DateAndTime | 0 | 0 | 0 | 0 | |
| | Energy totalizer tariff 0 | 04, en en en, xx xx xx xx | 8 | B, 32 bits | 🔒 | Energy | 0 | 0 | 0 | 0 | |
| | Volume totalizer tariff 0 | 04, vo vo, xx xx xx xx | 7 | B, 32 bits | 🔒 | Volume | 0 | 0 | 0 | 0 | |
| | Energy totalizer tariff 1 | 84 10, en en en, xx xx xx xx | 9 | B, 32 bits | 🔒 | Energy | 0 | 1 | 0 | 0 | |
| | Volume totalizer tariff 1 | 84 10, vo vo, xx xx xx xx | 8 | B, 32 bits | 🔒 | Volume | 0 | 1 | 0 | 0 | |
| | Counter IN1 totalizer | 84 40, in in in, xx xx xx xx | 9 | B, 32 bits | 🔒 | Dimensionless Volume Energy | 1 | 0 | 0 | 0 | |
| | Counter IN2 totalizer | 84 80 40, in in in, xx xx xx xx | 10 | B, 32 bits | 🔒 | Dimensionless Volume Energy | 2 | 0 | 0 | 0 | |
| | | | 0 | | | | | | | | |
| | Set day | 42, 6C, xx xx | 4 | G, 16 bits | 🔒 | Date | 0 | 0 | 1 | 0 | |
| | Energy totalizer tariff 0 at set day | 44, en en en, xx xx xx xx | 8 | B, 32 bits | 🔒 | Energy | 0 | 0 | 1 | 0 | |
| | Volume totalizer tariff 0 at set day | 44, vo vo, xx xx xx xx | 7 | B, 32 bits | 🔒 | Volume | 0 | 0 | 1 | 0 | |
| | Energy totalizer tariff 1 at set day | C4 10, en en en, xx xx xx xx | 9 | B, 32 bits | 🔒 | Energy | 0 | 1 | 1 | 0 | |
| | Volume totalizer tariff 1 at set day | C4 10, vo vo, xx xx xx xx | 8 | B, 32 bits | 🔒 | Volume | 0 | 1 | 1 | 0 | |
| | Counter IN1 totalizer at set day | C4 40, in in in, xx xx xx xx | 9 | B, 32 bits | 🔒 | Dimensionless Volume Energy | 1 | 0 | 1 | 0 | |
| | Counter IN2 totalizer at set day | C4 80 40, in in in, xx xx xx xx | 10 | B, 32 bits | 🔒 | Dimensionless Volume Energy | 2 | 0 | 1 | 0 | |
| | | | 0 | | | | | | | | |
| | High temperature | 02, 59, xx xx | 4 | B, 16 bits | 🔒 (P) [0.01 °C] | FlowTemperature | 0 | 0 | 0 | 0 | |
| | Low temperature | 02, 5D, xx xx | 4 | B, 16 bits | 🔒 (P) [0.01 °C] | ReturnTemperature | 0 | 0 | 0 | 0 | |
| Flow | 04, 39, xx xx xx xx | 6 | B, 32 bits | 🔒 (P) [0.01 l/h] | VolumeFlow | 0 | 0 | 0 | 0 | | |
| Power | 04, 2B, xx xx xx xx | 6 | B, 32 bits | 🔒 (P) [1 W] | Power | 0 | 0 | 0 | 0 | | |
| | | 0 | | | | | | | | | |
| Encryption block filling | 2F 2F 2F 2F 2F 2F 2F 2F | 10 | | 🔒 | IdleFiller | | | | | | |
| | | 0 | | | | | | | | | |
| Detailed errors | 03, FF 2C, er er er | 6 | D, 24 bits | 🔒 § | ManufacturerErrorFlags | 0 | 0 | 0 | 0 | | |
| | | 0 | | | | | | | | | |

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
§ manufacturer specific VIFE

Max frame size: 186 bytes

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

Respond with user data RSP_UD, Variable structure response (slave to master)

| Field | Frame bytes in hex (Note 1) | Byt | Coding | Comment | <MbusRecord> XML attributes | | | | | | |
|-------------------------------|-------------------------------------|-----|------------|-------------------------------------|------------------------------------|--------|--------|---------|----------|--------|--------|
| | | | | | Name | Sub/In | Tariff | Storage | Function | Origin | |
| Start Length | 68, Le Le, 68 | 4 | | | | | | | | | |
| Control | 08 | 1 | | Respond with user data, RSP_UD | | | | | | | |
| Address | xx | 1 | | | | | | | | | |
| Control Information | 72 | 1 | | Variable structure respond | | | | | | | |
| Identification number | xx xx xx xx | 4 | A, 32 bits | | IdentificationNumber | | | | | | Header |
| Manufacturer ID | EE 4D | 2 | C, 16 bits | "SON" | Manufacturer | | | | | | |
| Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | | | | | |
| Device type | dt | 1 | D, 8 bits | | DeviceType | | | | | | |
| Access number | xx | 1 | C, 8 bits | | AccessNumber | | | | | | |
| Status | st | 1 | Ds, 8 bits | | Status | | | | | | |
| Configuration | 00 00 | 2 | C, 16 bits | | Signature | | | | | | |
| | | 0 | | | | | | | | | |
| Encryption verification | 2F 2F | 2 | | Ⓜ | IdleFiller | | | | | | |
| | | 0 | | | | | | | | | |
| Date history | 84 80 8A 0F, 6D, xx xx xx xx | 9 | F, 32 bits | Ⓜ Ⓞ | DateAndTime | 0 | 0 | 8000 | 0 | | |
| Energy tariff 0 history | 84 80 8A 0F, en en en, xx xx xx xx | 11 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8000 | 0 | | |
| Energy tariff 0 history | 8D 80 8A 0F, en en en 1E, 7E, §4 §§ | 11 | LVAR | Ⓜ Ⓞ Note 2 | Energy_CompactProfileWithRegisters | 0 | 0 | 8000 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8001 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8002 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8003 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8004 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8005 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8006 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8007 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8008 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8009 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8010 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8011 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8012 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8013 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8014 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8015 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8016 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8017 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8018 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8019 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8020 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8021 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8022 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8023 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8024 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8025 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8026 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8027 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8028 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8029 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8030 | 0 | | |
| | xx xx xx xx | 4 | B, 32 bits | Ⓜ Ⓞ | Energy | 0 | 0 | 8031 | 0 | | |
| | | 0 | | | | | | | | | |
| Encryption block filling | 2F 2F 2F | 3 | | Ⓜ | IdleFiller | | | | | | |
| | | 0 | | | | | | | | | |
| More records in next telegram | mo | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | | |
| End Check Sum | cS | 1 | | | | | | | | | |
| Stop | 16 | 1 | | | | | | | | | |

Max frame size: 182 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.
2. The bit7 of the last "en en" byte is setted.

- Ⓒ No special access right is needed to change this value.
- Ⓘ The installer access right (or higher) is needed to change this value.
- Ⓥ The verifier access right (or higher) is needed to change this value.
- Ⓜ The manufacturer access right (or higher) is needed to change this value.
- Ⓞ This value is read only.

Respond with user data RSP_UD, Variable structure response (slave to master)

| | Field | Frame bytes in hex (Note 1) | Byt | Coding | Comment | <MbusRecord> XML attributes | | | | | | | | |
|-----------|-------------------------------|---------------------------------|------------|------------|-------------------------------------|-----------------------------------|-------|-------|---------|----------|--------|--|--|--|
| | | | | | | Name | SubUn | Tarif | Storage | Function | Origin | | | |
| Start | Start_Length | 68, Le Le, 68 | 4 | | | | | | | | | | | |
| | Control | 08 | 1 | | Respond with user data, RSP_UD | | | | | | | | | |
| User Data | Address | xx | 1 | | | | | | | | | | | |
| | Control Information | 72 | 1 | | Variable structure respond | | | | | | | | | |
| Records | Identification number | xx xx xx xx | 4 | A, 32 bits | | IdentificationNumber | | | | | | | | |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | "SON" | Manufacturer | | | | | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | | | | | | | |
| | Device type | dt | 1 | D, 8 bits | | DeviceType | | | | | | | | |
| | Access number | xx | 1 | C, 8 bits | | AccessNumber | | | | | | | | |
| | Status | st | 1 | Ds, 8 bits | | Status | | | | | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | | Signature | | | | | | | | |
| | | | 0 | | | | | | | | | | | |
| | Encryption verification | 2F 2F | 2 | | Ⓜ | IdleFiller | | | | | | | | |
| | | | 0 | | | | | | | | | | | |
| | Date history | 84 84 8C 09, 6D, xx xx xx xx | 9 | F, 32 bits | Ⓜ Ⓞ | DateAndTime | 0 | 0 | 5000 | 0 | | | | |
| | Average power history | 85 84 8C 09, 2B, xx xx xx xx | 9 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5000 | 0 | | | | |
| | Average power history | 8D 84 8C 09, AB 1E, 7E, 5\$ 5\$ | 9 | LVAR | Ⓜ Ⓞ | Power_CompactProfileWithRegisters | 0 | 0 | 5000 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5001 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5002 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5003 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5004 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5005 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5006 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5007 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5008 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5009 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5010 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5011 | 0 | | | | |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5012 | 0 | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5013 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5014 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5015 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5016 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5017 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5018 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5019 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5020 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5021 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5022 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5023 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5024 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5025 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5026 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5027 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5028 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5029 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5030 | 0 | | | | | |
| | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓞ [W] | Power | 0 | 0 | 5031 | 0 | | | | | |
| | | 0 | | | | | | | | | | | | |
| | Encryption block filling | 2F 2F 2F 2F 2F 2F 2F | 7 | | Ⓜ | IdleFiller | | | | | | | | |
| | | 0 | | | | | | | | | | | | |
| | More records in next telegram | m0 | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | | | | |
| End | Check Sum | c8 | 1 | | | | | | | | | | | |
| | Stop | 16 | 1 | | | | | | | | | | | |

Max frame size: 182 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

- Ⓞ No special access right is needed to change this value.
- Ⓜ The installer access right (or higher) is needed to change this value.
- Ⓞ The verifier access right (or higher) is needed to change this value.
- Ⓜ The manufacturer access right (or higher) is needed to change this value.
- Ⓞ This value is read only.

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | <MbusRecord> XML attributes | | | | | | |
|-----------|-------------------------------|-------------------------------|------------|-------------------------------------|-----------------------|---|--------|--------|
| | | Name | SubUn | Tariff | Storage | Function | Origin | |
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | |
| Start | Start, Length | 68, 1E, 1E, 68 | 4 | | | | | |
| | Control | 08 | 1 | Respond with user data, RSP_UD | | | | |
| User Data | Address | xx | 1 | | | | | |
| | Control Information | 72 | 1 | Variable structure respond | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | IdentificationNumber | | | |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | "SON" | Manufacturer | | |
| | Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | |
| | Device type | dt | 1 | D, 8 bits | | DeviceType | | |
| | Access number | xx | 1 | C, 8 bits | | AccessNumber | | |
| | Status | st | 1 | Ds, 8 bits | | Status | | |
| | Configuration | 00 00 | 2 | C, 16 bits | | Signature | | |
| | Encryption verification | 2F 2F | 2 | | IdleFiller | | | |
| | Peak power history | 9D 8C 8A 0D, AB 1E, 46, 05 00 | 9 | LVAR | Ⓜ Ⓡ | Power_CompactProfileWithRegisters | 0 0 | 7000 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7000 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7001 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7002 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7003 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7004 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7005 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7006 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7007 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7008 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7009 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7010 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7011 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7012 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7013 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7014 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7015 1 |
| | | xx xx xx xx | 4 | H, 32 bits | Ⓜ Ⓡ [W] | Power | 0 0 | 7016 1 |
| | | 0 | | | | | | |
| | Dates of the peak power | 9D 8C 8A 0D, ED 1E, 46, 04 00 | 9 | LVAR | Ⓜ Ⓡ | DateAndTime_CompactProfileWithRegisters | 0 0 | 7000 1 |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7000 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7001 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7002 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7003 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7004 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7005 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7006 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7007 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7008 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7009 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7010 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7011 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7012 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7013 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7014 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7015 1 | |
| | xx xx xx xx | 4 | F, 32 bits | Ⓜ Ⓡ | DateAndTime | 0 0 | 7016 1 | |
| | | 0 | | | | | | |
| | Encryption block filling | 2F 2F 2F 2F | 4 | | IdleFiller | | | |
| | | 0 | | | | | | |
| | More records in next telegram | mo | 1 | Start of manufacturer specific data | ManufacturerDataBlock | | | |
| End | Check Sum | cs | 1 | | | | | |
| | Stop | 16 | 1 | | | | | |

Max frame size: 182 bytes

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

- Ⓒ No special access right is needed to change this value.
- Ⓘ The installer access right (or higher) is needed to change this value.
- Ⓥ The verifier access right (or higher) is needed to change this value.
- Ⓜ The manufacturer access right (or higher) is needed to change this value.
- Ⓡ This value is read only.

Respond with user data RSP_UD, Variable structure response (slave to master)

| Field | Start | Frame bytes in hex (Note 1) | Byt | Coding | Comment | <MbusRecord> XML attributes | | | | | | | | | |
|-------------------------------|----------------------------------|-----------------------------|-----|------------|-------------------------------------|--|-------|-------|---------|----------|--------|--|--|--|--|
| | | | | | | Name | SubUn | Tarif | Storage | Function | Origin | | | | |
| Start Length | 68 | 1E 1E, 68 | 4 | | | | | | | | | | | | |
| Control | 08 | | 1 | | Respond with user data, RSP_UD | | | | | | | | | | |
| Address | xx | | 1 | | | | | | | | | | | | |
| Control Information | 72 | | 1 | | Variable structure respond | | | | | | | | | | |
| Identification number | xx xx xx xx | | 4 | A, 32 bits | | IdentificationNumber | | | | | | | | | |
| Manufacturer ID | EE 4D | | 2 | C, 16 bits | "SON" | Manufacturer | | | | | | | | | |
| Version of meter | 48 | | 1 | C, 8 bits | 72 | Version | | | | | | | | | |
| Device type | dt | | 1 | D, 8 bits | | DeviceType | | | | | | | | | |
| Access number | xx | | 1 | C, 8 bits | | AccessNumber | | | | | | | | | |
| Status | st | | 1 | Ds, 8 bits | | Status | | | | | | | | | |
| Configuration | 00 00 | | 2 | C, 16 bits | | Signature | | | | | | | | | |
| Encryption verification | 00 | | 0 | | | | | | | | | | | | |
| Event | 8D 8C 8A 0D, FF C3 1E, 1D, 01 0D | | 10 | LVAR | Ⓜ (r) | DeviceSpecificValue3_CompactProfileWithRegisters | 0 | 0 | 7000 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) See Coding below | DeviceSpecificValue3 | 0 | 0 | 7000 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7001 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7002 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7003 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7004 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7005 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7006 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7007 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7008 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7009 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7010 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7011 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7012 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7013 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7014 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7015 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7016 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7017 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7018 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7019 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7020 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7021 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7022 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7023 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7024 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7025 | 0 | | | | | |
| xx | | | 1 | C, 8 bits | Ⓜ (r) | DeviceSpecificValue3 | 0 | 0 | 7026 | 0 | | | | | |
| Date of the event | 8D 8C 8A 0D, ED 1E, 6E, 04 00 | | 9 | LVAR | Ⓜ (r) | DateAndTime_CompactProfileWithRegisters | 0 | 0 | 7000 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7000 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7001 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7002 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7003 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7004 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7005 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7006 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7007 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7008 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7009 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7010 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7011 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7012 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7013 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7014 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7015 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7016 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7017 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7018 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7019 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7020 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7021 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7022 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7023 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7024 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7025 | 0 | | | | | |
| xx xx xx xx | | | 4 | F, 32 bits | Ⓜ (r) | DateAndTime | 0 | 0 | 7026 | 0 | | | | | |
| Encryption block filling | 2F 2F 2F 2F | | 4 | | Ⓜ | IdleFiller | | | | | | | | | |
| More records in next telegram | 8D | | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | | | | | |
| Check Sum | c8 | | 1 | | | | | | | | | | | | |
| Stop | 16 | | 1 | | | | | | | | | | | | |

Symbols

- ‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
- § manufacturer specific WIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

- Ⓒ No special access right is needed to change this value.
- Ⓓ The installer access right (or higher) is needed to change this value.
- Ⓔ The verifier access right (or higher) is needed to change this value.
- Ⓕ The manufacturer access right (or higher) is needed to change this value.
- Ⓖ This value is read only.

Max frame size: 182 bytes

Coding

| Event | | |
|----------------------------------|----------------------------------|----|
| LOG_UNEXPECTED, | | 0 |
| LOG_ERR_AD_REF_1_START, | | 1 |
| LOG_ERR_AD_REF_1_END, | | 2 |
| LOG_ERR_AD_REF_2_START, | | 3 |
| LOG_ERR_AD_REF_2_END, | | 4 |
| LOG_ERR_AD_PT_SENSOR_1_START, | | 5 |
| LOG_ERR_AD_PT_SENSOR_1_END, | | 6 |
| LOG_ERR_AD_PT_SENSOR_2_START, | | 7 |
| LOG_ERR_AD_PT_SENSOR_2_END, | | 8 |
| LOG_ERR_TEMPERATURE_1_MIN_START, | | 9 |
| LOG_ERR_TEMPERATURE_1_MIN_END, | | 10 |
| LOG_ERR_TEMPERATURE_1_MAX_START, | | 11 |
| LOG_ERR_TEMPERATURE_1_MAX_END, | | 12 |
| LOG_ERR_TEMPERATURE_2_MIN_START, | | 13 |
| LOG_ERR_TEMPERATURE_2_MIN_END, | | 14 |
| LOG_ERR_TEMPERATURE_2_MAX_START, | | 15 |
| LOG_ERR_TEMPERATURE_2_MAX_END, | | 16 |
| LOG_ERR_TEMPERATURE_START, | Sum of all temperatures and AD e | 17 |
| LOG_ERR_TEMPERATURE_END, | | 18 |
| LOG_ERR_FLOW_SATURATION_START, | | 19 |
| LOG_ERR_FLOW_SATURATION_END, | | 20 |
| LOG_ERR_CASE_OPENED, | | 21 |
| LOG_ERR_CASE_CLOSED, | | 22 |
| LOG_ERR_MAIN_POWER_CUT_START, | | 23 |
| LOG_ERR_MAIN_POWER_CUT_END, | | 24 |
| LOG_MODULE1_ERROR_START, | | 25 |
| LOG_MODULE1_ERROR_END, | | 26 |
| LOG_MODULE2_ERROR_START, | | 27 |
| LOG_MODULE2_ERROR_END, | | 28 |
| LOG_FIRMWARE_CHECKSUM_START, | | 29 |
| LOG_FIRMWARE_CHECKSUM_END, | | 30 |
| LOG_RADIO_ERROR_START, | | 31 |
| LOG_RADIO_ERROR_END, | | 32 |
| LOG_AWAKE_FROM_RESET, | | 33 |
| LOG_DEVICE_SEALED, | | 34 |
| LOG_DEVICE_UNSEALED, | | 35 |

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | |
|-------------------------------------|------------------------------------|----------------------------|------------|-------------------------------------|-----------------------------|-----------------------|--------|---------|----------|--------|
| | | | | | Name | SubUn | Tariff | Storage | Function | Origin |
| Field | Frame bytes in hex (Note 1) | Bytes | Coding | Comment | | | | | | |
| Start | Start, Length | 68,1e,1e,68 | 4 | | | | | | | |
| | Control | 08 | 1 | Respond with user data, RSP_UD | | | | | | |
| | Address | xx | 1 | | | | | | | |
| User Data | Control Information | 72 | 1 | Variable structure respond | | | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | IdentificationNumber | | | | | Header |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | "SON" | Manufacturer | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | | | |
| | Device type | dt | 1 | D, 8 bits | | DeviceType | | | | |
| | Access number | xx | 1 | C, 8 bits | | AccessNumber | | | | |
| | Status | st | 1 | Ds, 8 bits | | Status | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | | Signature | | | | |
| | | | 0 | | | | | | | |
| | Fabrication Number | 0C,78,xx xx xx xx | 6 | A, 32 bits | m | FabricationNumber | 0 | 0 | 0 | 0 |
| | | | 0 | | | | | | | |
| | High temperature | 05,5B,xx xx xx xx | 6 | H, 32 bits | Ⓢ °C | FlowTemperature | 0 | 0 | 0 | 0 |
| | Low temperature | 05,5F,xx xx xx xx | 6 | H, 32 bits | Ⓢ °C | ReturnTemperature | 0 | 0 | 0 | 0 |
| | Temperature difference | 05,63,xx xx xx xx | 6 | H, 32 bits | Ⓢ [K] | TemperatureDifference | 0 | 0 | 0 | 0 |
| | Flow | 05,3E,xx xx xx xx | 6 | H, 32 bits | Ⓢ [m3/h] | VolumeFlow | 0 | 0 | 0 | 0 |
| | Power | 05,2B,xx xx xx xx | 6 | H, 32 bits | Ⓢ [W] | Power | 0 | 0 | 0 | 0 |
| | | | 0 | | | | | | | |
| | Volume totalizer tariff 0 for test | 84 80 20,vo vo,xx xx xx xx | 9 | B, 32 bits | Ⓢ; Note 3 | Volume | 0 | 8 | 0 | 0 |
| | Volume remainder tariff 0 for test | 85 80 30,vo vo,xx xx xx xx | 9 | H, 32 bits | Ⓢ; Note 3 | Volume | 0 | 12 | 0 | 0 |
| | | | 0 | | | | | | | |
| Energy totalizer tariff 0 | 04,en en en,xx xx xx xx | 8 | B, 32 bits | Ⓢ; Note 2 | Energy | 0 | 0 | 0 | 0 | |
| Energy totalizer tariff 0 remainder | 85 80 10,en en en, xx xx xx xx | 10 | H, 32 bits | Ⓢ; Note 2 | Energy | 0 | 4 | 0 | 0 | |
| | | 0 | | | | | | | | |
| Volume totalizer tariff 0 | 04,vo vo,xx xx xx xx | 7 | B, 32 bits | Ⓢ; Note 3 | Volume | 0 | 0 | 0 | 0 | |
| Volume totalizer tariff 0 remainder | 85 80 10,vo vo,xx xx xx xx | 9 | H, 32 bits | Ⓢ; Note 3 | Volume | 0 | 4 | 0 | 0 | |
| Energy totalizer tariff 1 | 84 10,en en en,xx xx xx xx | 9 | B, 32 bits | Ⓢ; Note 2 | Energy | 0 | 1 | 0 | 0 | |
| Energy totalizer tariff 1 remainder | 85 90 10,en en en,xx xx xx xx | 10 | H, 32 bits | Ⓢ; Note 2 | Energy | 0 | 5 | 0 | 0 | |
| | | 0 | | | | | | | | |
| Volume totalizer tariff 1 | 84 10,vo vo,xx xx xx xx | 8 | B, 32 bits | Ⓢ; Note 3 | Volume | 0 | 1 | 0 | 0 | |
| Volume totalizer tariff 1 remainder | 85 90 10,vo vo, xx xx xx xx | 9 | H, 32 bits | Ⓢ; Note 3 | Volume | 0 | 5 | 0 | 0 | |
| | | 0 | | | | | | | | |
| More records in next telegram | mo | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | |
| Check Sum | cs | 1 | | | | | | | | |
| End | Stop | 16 | 1 | | Max frame size: 146 bytes | | | | | |

Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
§ manufacturer specific VIFE

Notes

- For non hexadecimal or lower case digits see the detailed description in the Keys sheet.
- The value of "en en en" depends on Energy unit, see key "eu eu"
- The value of "vo vo" depends on Volume unit, see key "vu vu"

- Ⓢ No special access right is needed to change this value.
- Ⓢ The installer access right (or higher) is needed to change this value.
- Ⓢ The verifier access right (or higher) is needed to change this value.
- Ⓢ The manufacturer access right (or higher) is needed to change this value.
- Ⓢ This value is read only.

Respond with user data RSP_UD, Variable structure response (slave to master)

| | | | | | <MbusRecord> XML attributes | | | | | |
|---|---|-------------------------------|------------|-------------------------------------|---------------------------------|---|--------|---------|----------|--------|
| | | | | | Name | SubUn | Tariff | Storage | Function | Origin |
| Field | Frame bytes in hex (Note 1) | Byte | Coding | Comment | | | | | | |
| Start | Start_Length | 68,Le Le,68 | 4 | | | | | | | |
| | Control | 08 | 1 | Respond with user data, RSP_UD | | | | | | |
| | Address | xx | 1 | | | | | | | |
| User Data | Control Information | 72 | 1 | Variable structure respond | | | | | | |
| | Identification number | xx xx xx xx | 4 | A, 32 bits | IdentificationNumber | | | | | Header |
| | Manufacturer ID | EE 4D | 2 | C, 16 bits | Manufacturer | | | | | |
| | Version of meter | 48 | 1 | C, 8 bits | 72 | Version | | | | |
| | Device type | dt | 1 | D, 8 bits | | DeviceType | | | | |
| | Access number | xx | 1 | C, 8 bits | | AccessNumber | | | | |
| | Status | st | 1 | Ds, 8 bits | | Status | | | | |
| | Configuration | 00 00 | 2 | C, 16 bits | | Signature | | | | |
| | | | 0 | | | | | | | |
| | Production NFI | 8C 40,78,xx xx xx xx | 7 | A, 32 bits | (m) | FabricationNumber | 1 | 0 | 0 | 0 |
| | | | 0 | | | | | | | |
| | RTC calibration | 02,FF FE 31,xx xx | 6 | C, 16 bits | (m) | DeviceSpecificValue49 | 0 | 0 | 0 | 0 |
| | | | 0 | | | | | | | |
| | Carrier sense threshold | 82 80 C0 40,FF 39,xx xx | 8 | B, 16 bits | (i) [dBm] -130..-2 | DeviceSpecificSignedValue1 | 6 | 0 | 0 | 0 |
| | Rf power amplifier (common) | 81 80 C0 40,FF 4F,pA | 7 | C, 8 bits | (m) | DeviceSpecificValue15 | 6 | 0 | 0 | 0 |
| | Frequency offset Tx (common) | 84 80 C0 40,FF 3B,xx xx xx xx | 10 | B, 32 bits | (m) | DeviceSpecificSignedValue3 | 6 | 0 | 0 | 0 |
| | | | 0 | | | | | | | |
| | Ohmmeter calibration reference 1 | 05,FF FE 11,xx xx xx xx | 8 | H, 32 bits | (m) [Q] | DeviceSpecificResistance0 | 0 | 0 | 0 | 0 |
| | Ohmmeter calibration reference 2 | 85 10,FF FE 11,xx xx xx xx | 9 | H, 32 bits | (m) [Q] | DeviceSpecificResistance0 | 0 | 1 | 0 | 0 |
| | Ohmmeter polynomial degree | 81 80 A0 30,FF 45,xx | 7 | C, 8 bits | (m) 0..2 | DeviceSpecificValue5 | 0 | 56 | 0 | 0 |
| | Ohmmeter polynomial | 8D 80 A0 30,FF AD 1E,0E,05 00 | 10 | LVAR | (m) | Coefficient_CompactProfileWithRegisters | 0 | 56 | 0 | 0 |
| | a0 | xx xx xx xx | 4 | H, 32 bits | (m) | Coefficient | 0 | 56 | 0 | 0 |
| | a1 | xx xx xx xx | 4 | H, 32 bits | (m) | Coefficient | 0 | 56 | 1 | 0 |
| | a2 | xx xx xx xx | 4 | H, 32 bits | (m) | Coefficient | 0 | 56 | 2 | 0 |
| | | | 0 | | | | | | | |
| | MFD radio scan counter wM-Bus radio sent counter | 84 A0 B0 20,FD 61,xx xx xx xx | 10 | C, 32 bits | (m) | CumulationCounter | 0 | 46 | 0 | 0 |
| | MFD radio carrier counter wM-Bus radio sent encrypted counter | C4 A0 B0 20,FD 61,xx xx xx xx | 10 | C, 32 bits | (m) | CumulationCounter | 0 | 46 | 1 | 0 |
| MFD radio wakeup counter wM-Bus not used | 84 A1 B0 20,FD 61,xx xx xx xx | 10 | C, 32 bits | (m) | CumulationCounter | 0 | 46 | 2 | 0 | |
| MFD radio received frames counter wM-Bus not used | C4 A1 B0 20,FD 61,xx xx xx xx | 10 | C, 32 bits | (m) | CumulationCounter | 0 | 46 | 3 | 0 | |
| MFD radio sent frames counter wM-Bus not used | 84 A2 B0 20,FD 61,xx xx xx xx | 10 | C, 32 bits | (m) | CumulationCounter | 0 | 46 | 4 | 0 | |
| | | 0 | | | | | | | | |
| | | 0 | | | | | | | | |
| Device reset counter | 02,FD 75,xx xx | 5 | C, 16 bits | (m) | NumberOfTimesTheMeterWasStopped | 0 | 0 | 0 | 0 | |
| | | 0 | | | | | | | | |
| Fabrication Number of cloning source | 4C,78,xx xx xx xx | 6 | A, 32 bits | (v) | FabricationNumber | 0 | 0 | 1 | 0 | |
| Detailed errors | 03,FF 2C,er er er | 6 | D, 24 bits | (r) § | ManufacturerErrorFlags | 0 | 0 | 0 | 0 | |
| Special flags | 01,FF FE 30,xx | 5 | C, 8 bits | (v) | DeviceSpecificValue48 | 0 | 0 | 0 | 0 | |
| | | 0 | | | | | | | | |
| More records in next telegram | mo | 1 | | Start of manufacturer specific data | ManufacturerDataBlock | | | | | |
| Check Sum | cs | 1 | | | | | | | | |
| End | Stop | 16 | 1 | | | | | | | |

Max frame size: 178 bytes

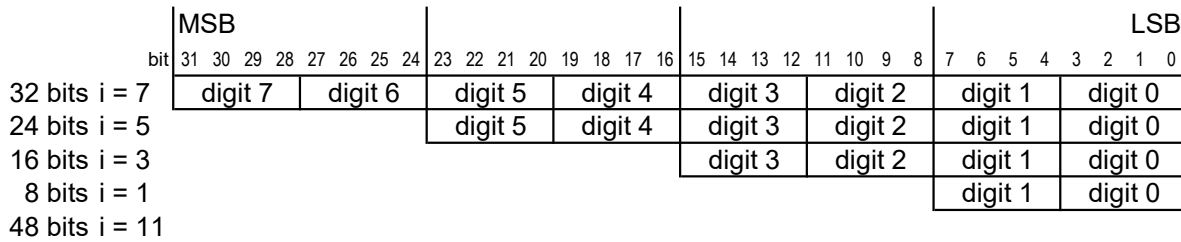
Symbols

‡ Function: 0=instantaneous, 1=maximum, 2=minimum, 3=during error state
§ manufacturer specific VIFE

Notes

1. For non hexadecimal or lower case digits see the detailed description in the Keys sheet.

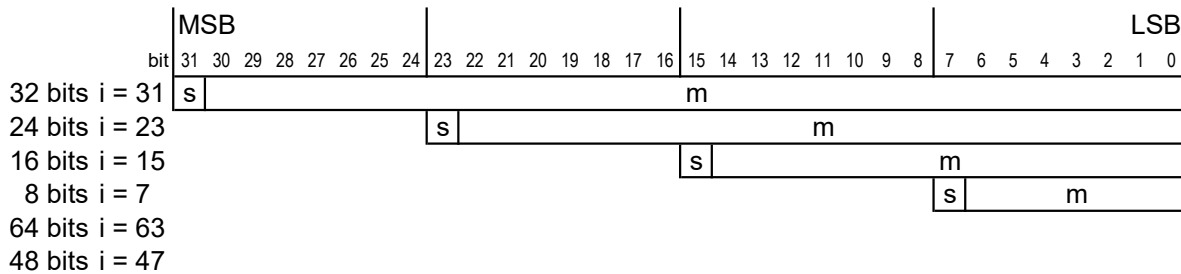
- (c) No special access right is needed to change this value.
- (i) The installer access right (or higher) is needed to change this value.
- (v) The verifier access right (or higher) is needed to change this value.
- (m) The manufacturer access right (or higher) is needed to change this value.
- (r) This value is read only.

Type A Unsigned integer BCD

bit[x] : 0, 1

digit[x] : 0 .. 9

$$\text{digit}[x] = \text{bit}[x*4+3]*2^3 + \text{bit}[x*4+2]*2^2 + \text{bit}[x*4+1]*2^1 + \text{bit}[x*4+0]*2^0$$

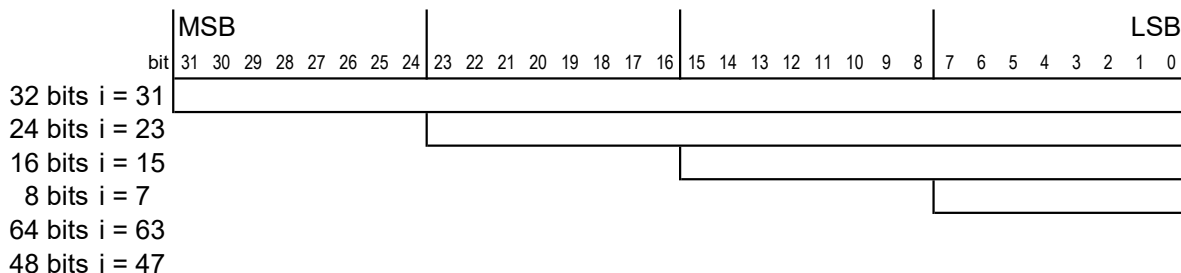
$$\text{number} = \text{digit}[i]*10^i + \text{digit}[i-1]*10^{(i-1)} + \text{digit}[i-2]*10^{(i-2)} + \dots + \text{digit}[0]*10^0$$
range : 0 .. 10⁽ⁱ⁺¹⁾-1**Type B** Binary integer

bit[x] : 0, 1

$$m = \text{bit}[i-1]*2^{(i-1)} + \text{bit}[i-2]*2^{(i-2)} + \dots + \text{bit}[0]*2^0$$

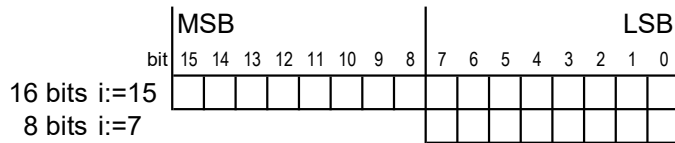
Sign : 0=positive, 1=negative

If Sign(bit[i]) = positive Then number = m

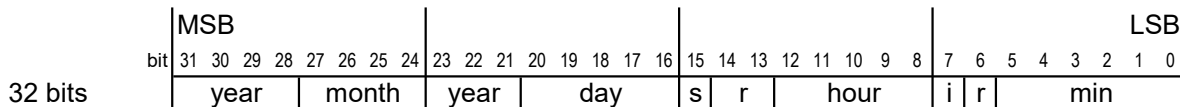
If Sign(bit[i]) = negative Then number = m - 2ⁱrange : -2ⁱ .. +(2ⁱ)-1**Type C** Unsigned integer

bit[x] : 0, 1

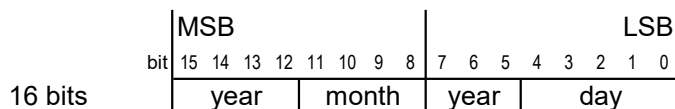
$$\text{number} = \text{bit}[i]*2^i + \text{bit}[i-1]*2^{(i-1)} + \text{bit}[i-2]*2^{(i-2)} + \dots + \text{bit}[0]*2^0$$
range : 0 .. +2⁽ⁱ⁺¹⁾-1

Type D Array of Boolean

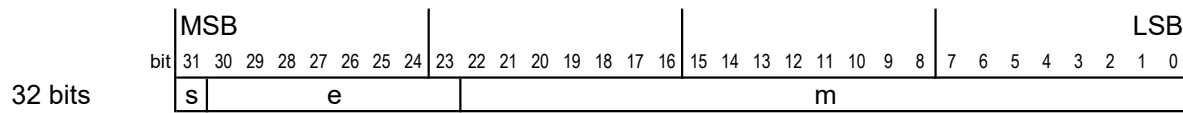
bit[x] : 0, 1
 Boolean : 0=false, 1=true
 Flag[i] = Boolean(bit[i])
 Flag[i-1] = Boolean(bit[i-1])
 ...
 Flag[0] = Boolean(bit[0])

Type F Date and Time

bit[x] : 0, 1
 min : 0 .. 59 min = bit[5]*2⁵ + ... + bit[0]*2⁰
 hour : 0 .. 23 hour = bit[12]*2⁴ + ... + bit[8]*2⁰
 day : 1 .. 31 day = bit[20]*2⁴ + ... + bit[16]*2⁰
 month : 1 .. 12 month = bit[27]*2³ + ... + bit[24]*2⁰
 year : 0 .. 99 year = bit[31]*2⁶ + ... + bit[28]*2³ + bit[23]*2² + ... + bit[21]*2⁰
 s : standard time (bit[15]=0), summer time (bit[15]=1)
 i : valid (bit[7]=0), invalid (bit[7]=1)
 r : reserved (bit[6],bit[13],bit[14] are always 0)

Type G Date

bit[x] : 0, 1
 day : 1 .. 31 day = bit[4]*2⁴ + ... + bit[0]*2⁰
 month : 1 .. 12 month = bit[11]*2³ + ... + bit[8]*2⁰
 year : 0 .. 99 year = bit[15]*2⁶ + ... + bit[12]*2³ + bit[7]*2² + ... + bit[5]*2⁰

Type H Floating point (IEEE STD 754)

bit[x] : 0, 1

$m = \text{bit}[22] \cdot 2^{-1} + \text{bit}[21] \cdot 2^{-2} + \dots + \text{bit}[0] \cdot 2^{-23}$

$e = \text{bit}[30] \cdot 2^7 + \text{bit}[29] \cdot 2^6 + \dots + \text{bit}[23] \cdot 2^0$

$s = -1^{\text{bit}[31]}$

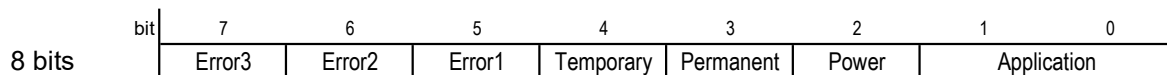
If (e>0) AND (e<255) Then number = $s \cdot 2^{(e-127)} \cdot (1 + m)$

If (e=0) AND (m<>0) Then number = $s \cdot 2^{(e-126)} \cdot m$

If (e=0) AND (m=0) Then number = $s \cdot 0$

If (e=255) AND (m=0) Then number = $s \cdot \text{infinite}$

If (e=255) AND (m<>0) Then number = not a number

Type Ds Status, array of boolean

bit[x] : 0, 1

Application = $\text{bit}[1] \cdot 2^1 + \text{bit}[0] \cdot 2^0$

Application: 0=no error, 1=busy, 2=error, 3=reserved

Power: 1=power low

Permanent: 1=permanent error

Temporary: 1=temporary error

Error1: manufacturer specific

Error2: manufacturer specific

Error3: manufacturer specific