

Elsys sensors payload

All Elsys LoRa sensor devices use the same payload structure.

1 Elsys payload

1.1 Sensor data payload

One transmission can contain several sensor measurements.

| | | | |
|-------------|-------------|------|-------------|
| Sensor data | Sensor data | | Sensor data |
|-------------|-------------|------|-------------|

1.2 Sensor data

| | | | |
|--------------|------|------|--------|
| Size: | 1 | 1-n | 0-4 |
| Sensor data: | Type | Data | [OFFS] |

1.2.1 Sensor Type

Type of sensor and number of offset bytes

| | | |
|------------|---------|---------|
| Bit: | 2 [7-6] | 6 [5-0] |
| Type bits: | NOB | STYPE |
| | | |

1.2.1.1 NOB (Number of offset bytes)

| Bit 7 | Bit 6 | Name |
|-------|-------|----------------|
| 0 | 0 | 0 Offset bytes |
| 0 | 1 | 1 Offset byte |
| 1 | 0 | 2 Offset bytes |
| 1 | 1 | 4 Offset bytes |

1.2.1.2 Stype

| Bits 5...0 | (hex) | Type | Data size | Comment |
|------------|-------|---------------------------------|-----------|--|
| 0 | 0x00 | Reserved | | |
| 1 | 0x01 | Temperature | 2 | -3276.5°C-->3276.5°C (Value of: 100→10.0 °C) |
| 2 | 0x02 | Humidity | 1 | 0-100% |
| 3 | 0x03 | Acceleration/level | 3 | X,Y,Z -127-127 (Value of:63=1G) |
| 4 | 0x04 | Light | 2 | 0-65535 Lux |
| 5 | 0x05 | Motion (PIR) | 1 | 0-255 (Number of motion count) |
| 6 | 0x06 | Co2 | 2 | 0-10000ppm |
| 7 | 0x07 | Battery | 2 | 0-65535mV |
| 8 | 0x08 | Analog1 | 2 | 0-65535mV |
| 9 | 0x09 | GPS | 6 | 3 bytes lat, 3 bytes long,binary |
| 10 | 0x0A | Pulse count | 2 | 0-65535 (between two send intervals) |
| 11 | 0x0B | Pulse count ABS | 4 | Absolute value 0-4294967295 |
| 12 | 0x0C | External temp1 | 2 | -3276.5C-->3276.5C |
| 13 | 0x0D | External Digital/Button | 1 | 0,1 (on/off, down/up) |
| 14 | 0x0E | External distance | 2 | 0-65535mm |
| 15 | 0x0F | Motion (acceleration movements) | 1 | 0-255 (interrupts from accelerometer) |
| 16 | 0x10 | External IR temperature | 4 | 2bytes internal temp 2 bytes external, -3276.5C-->3276.5C |
| 17 | 0x11 | Occupancy | 1 | 0-255 (0 --> no body,1-->body,2--> Body) ERS Desk: 0 --> no body,1-->Pending(entering, leaving),2--> Occupied ERS Eye: 0 --> no body, 1-->PIR triggered. 2--> Heat triggered |
| 18 | 0x12 | External water leak | 1 | 0-255 |
| 19 | 0x13 | Grideye (room occupancy) | 65 | 1byte ref,64byte pixel temp 8x8 (reserved for future use) |
| 20 | 0x14 | Pressure | 4 | Pressure data (hPa) |
| 21 | 0x15 | Sound | 2 | Sound data,1 byte peak/ 1byte avg (dB) |
| 22 | 0x16 | Pulse count 2 | 2 | 0-65535 |
| 23 | 0x17 | Pulse count 2 ABS | 4 | Absolute value 0-4294967295 |
| 24 | 0x18 | Analog 2 | 2 | 0-65535mV |
| 25 | 0x19 | External temp 2 | 2 | -3276.5C-->3276.5 °C (Value of: 100→10.0 °C) |
| 26 | 0x1A | External digital 2 | 1 | 0,1 (on/off, down/up) |
| 27 | 0x1B | External Analog uV | 4 | 4 bytes signed int (uV). Analog from ADC-Module |
| 61 | 0x3D | Debug information | 4 | Data depends on debug information |
| 62 | 0x3E | Sensor settings | n | Sensor setting sent to server at startup (first package). Sent on Port+1. See sensor settings for more information. |

| | | |
|----|-----|-------------------------|
| 63 | RFU | Reserved for future use |
|----|-----|-------------------------|

1.2.2 Data

Sensor value

1.2.3 Offset

Number of second's since data was sampled

1.3 Example

1.3.1 Temperature

1.3.1.1 Temperature 20.5°C

"0x01,0x00CD" Payload 3 bytes

TYPE, DATA

1.3.1.2 Temperature 20.5°C 10 sec ago

"0x41,0x00CD,0x0A" Payload 4 bytes

TYPE, DATA , OFFSET

1.3.1.3 Temperature 20.5°C 24 hours ago

"0xC1,0x00CD,0x00015180" Payload 7 bytes

1.3.1.4 Temperature 20.5°C and 26.8°C 10 sec ago

"0x01,0x00CD,0x41,0x010C,0x0A" Payload 7 bytes

TYPE, DATA , TYPE, DATA , OFFSET

1.3.2 Combined sensors

1.3.2.1 Raw data

"0100e202290400270506060308070d62"

1.3.2.2 Decoded into groups

TYPE, DATA

01 00e2 → Type: Temperature, Value: 226→22.6°C

02 29 → Type: Humidity, Value: 41%Rh

04 0027 → Type: Light, Value: 39Lux

05 06 → Type: Motion, Value: 6

06 0308 → Type: Co2, Value: 776ppm

07 0d62 → Type: Voltage, Value: 3426→3.426V

2 RAW payload (obsolete)

All sensor data are sent without header and offset and only the latest value are sent.

2.1 Sensor data payload

One transmission can contain several sensor measurements.

| | | | |
|-------------|-------------|------|-------------|
| Sensor data | Sensor data | | Sensor data |
|-------------|-------------|------|-------------|

2.2 Sensor data

| | |
|--------------|------|
| Size: | 1-n |
| Sensor data: | Data |

2.2.1 Sensor data size

2.2.2 Sensor data order

Sensor data are always sent in the same order. If the sensor type is inactivated the data is removed and remaining data is shifted to the left.

| sensor 1 | sensor 2 | sensor 3 | sensor 4 |
|-------------|----------|--------------|----------|
| Temperature | Humidity | Acceleration | Battery |

2.3 Example

2.3.1 Temperature

2.3.1.1 Temperature 20.5C

"0x00CD" Payload 2 bytes

2.3.1.2 Temperature 20.5C, Humidity 30%

"0x00CD,0x1E" Payload 3 bytes

2.3.1.3 Humidity 30%

"0x1E" Payload 1 byte

2.3.1.4 Humidity 30%, Battery 3.61V

"0x1E,0x0E1A" Payload 3 bytes