

Sensor payload

All ELSYS LoRaWAN® sensor devices use the same payload structure.

1. Sensor data payload

One transmission can contain several sensor measurements.

Sensor data			
Data 1	Data 2	Data n

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 bytes
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 %Rh
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	CO ₂	2	0 – 10000 ppm (Fresh air: ~400 – 420 ppm)
7	0x07	Internal battery voltage	2	0 – 65535 mV
8	0x08	Analog1	2	0 – 65535 mV
9	0x09	GPS	6	3 Bytes Lat + 3 Bytes Long. Binary.
10	0x0A	Relative Pulse count	2	0 – 65535 (Between two send intervals)
11	0x0B	Absolute Pulse count	4	Absolute value: 0 – 4294967295
12	0x0C	External Temperature1	2	-3276.5 °C → 3276.5 °C
13	0x0D	External Digital/Button	1	0,1 (On/Off, Down/Up)
14	0x0E	External Distance	2	0 – 65535 mm
15	0x0F	Motion (Acceleration movements)	1	0 – 255 (Interrupts from accelerometer)
16	0x10	External IR Temperature	4	2 Bytes internal temp + 2 Bytes external. -3276.5 °C → 3276.5 °C (Value of: 260 → 26.0 °C)
17	0x11	Occupancy	1	0 – 2 (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. Value indicates conductivity. The higher the value, the more moisture.
19	0x13	Grideye (Room occupancy)	65	1 Byte ref. 64 Byte pixel temperature 8x8. Ref byte: 0 – 255 °C. Pixel data 0 – 25.5 °C. E.g. Ref = 25, First pixel = 13, Pixel temperature = Ref + Pixel/10 → 25 + 13/10 = 26.3
20	0x14	Pressure	4	Pressure data (hPa)
21	0x15	Sound	2	1 Byte peak + 1 Byte avg (dB)
22	0x16	Relative Pulse count 2	2	0 – 65535
23	0x17	Absolute Pulse count 2	4	Absolute value 0 – 4294967295
24	0x18	Analog 2	2	0 – 65535 mV
25	0x19	External Temperature 2	2	-3276.5 °C → 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 settings sent to server at startup (First package). Sent on Port+1. See sensor settings document for more information.
63		RFU		Reserved for future use

1.2.2 Data

Sensor value

1.2.3 Offset

Number of seconds 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: 39 Lux
05 06 → Type: Motion, Value: 6
06 0308 → Type: CO₂, Value: 776 ppm
07 0d62 → Type: Voltage, Value: 3426 → 3.426 V