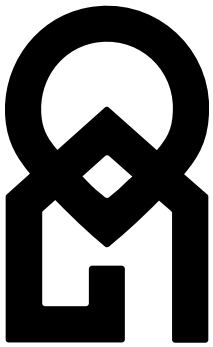

Tabs Sensors

Application Payload Specification

Version 1.1

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Revision History

Version	Date	Author	Remarks / Changes
1	19-Sep-2017	mku	Initial release
1.1	09-Oct-2017	mku	Corrected encoding of temperature

General

Multi-byte values are represented in little-endian encoding (least-significant byte first).

Signed values are represented using two's complement encoding.

Healthy Home Sensor

Port	103
Payload Length	8 bytes

Payload

Byte	0	1	2	3	4	5	6	7
Field	Status	Battery	Temp	RH	CO2		VOC	

Status	*Sensor status* Bits [7:0] RFU
Battery	*Battery level* Bits [3:0] unsigned value ν, range 1 – 14; battery voltage in V = (25 + ν) ÷ 10. Bits [7:4] unsigned value κ, range 0 – 15; remaining battery capacity in % = 100 × (κ ÷ 15).
Temp	*Temperature as measured by digital sensor* Bits [6:0] unsigned value τ, range 0 – 127; temperature in °C = τ - 32. Bit [7] RFU
RH	*Relative humidity as measured by digital sensor* Bits [6:0] unsigned value in %, range 0-100. The value 127 indicates measurement error. Bit [7] RFU
CO2	*Equivalent CO_2 level as measured by digital sensor* Bits [15:0] unsigned value in ppm, range 400 – 8192. The value 0 indicates no measurement available yet, a value of 0xffff indicates measurement error.
VOC	*Total Volatile Organic Compound Level as measured by digital sensor* Bits [15:0] unsigned value in ppb, range 0 – 1187. The value 0xffff indicates measurement error.

Door & Window Sensor

Port	100
Payload Length	8 bytes

Payload

Byte	0	1	2	3	4	5	6	7
Field	Status	Battery	Temp	Time		Count		

Status	*Sensor status* Bit [0] 1 – open, 0 – closed Bits [7:1] RFU
Battery	*Battery level* Bits [3:0] unsigned value ν, range 1 – 14; battery voltage in V = (25 + ν) ÷ 10. Bits [7:4] unsigned value κ, range 0 – 15; remaining battery capacity in % = 100 × (κ ÷ 15).
Temp	*Temperature as measured by on-board NTC* Bits [6:0] unsigned value τ, range 0 – 127; temperature in °C = τ - 32. Bit [7] RFU
Time	*Time elapsed since last event trigger* Bits [15:0] unsigned value in minutes, range 0 – 65,535.
Count	*Total count of event triggers* Bits [23:0] unsigned value, range 0 – 16,777,215. Note: This value is not stored persistently on the device, and may reset whenever the device is power-cycled or rebooted.

Motion Sensor

Port	102
Payload Length	8 bytes

Payload

Byte	0	1	2	3	4	5	6	7
Field	Status	Battery	Temp	Time		Count		

Status	*Sensor status* Bit [0] 1 – occupied, 0 – free Bits [7:1] RFU
Battery	*Battery level* Bits [3:0] unsigned value ν, range 1 – 14; battery voltage in V = (25 + ν) ÷ 10. Bits [7:4] unsigned value κ, range 0 – 15; remaining battery capacity in % = 100 × (κ ÷ 15).
Temp	*Temperature as measured by on-board NTC* Bits [6:0] unsigned value τ, range 0 – 127; temperature in °C = τ - 32. Bit [7] RFU
Time	*Time elapsed since last event trigger* Bits [15:0] unsigned value in minutes; range 0 – 65,535.
Count	*Total count of event triggers* Bits [23:0] unsigned value; range 0 – 16,777,215. Note: This value is not stored persistently on the device, and may reset whenever the device is power-cycled or rebooted.

Object Locator

Port	136
Payload Length	11 bytes

Payload

Byte	1	2	3	4	5	6	7	8	9	10	11
Field	Status	Battery	Temp	Lat				Lon			

Status	*Sensor status* Bits [2:0] RFU Bit [3] 1 – no GNSS fix, 0 – GNSS fix OK Bits [7:4] RFU
Battery	*Battery level* Bits [3:0] unsigned value ν, range 1 – 14; battery voltage in V = (25 + ν) ÷ 10. Bits [7:4] unsigned value κ, range 0 – 15; remaining battery capacity in % = 100 × (κ ÷ 15).
Temp	*Temperature as measured by on-board NTC* Bits [6:0] unsigned value τ, range 0 – 127; temperature in °C = τ - 32. Bit [7] RFU
Lat	*Latitude as last reported by GNSS receiver* Bits [27:0] signed value ϕ, range -90,000,000 – 90,000,000; WGS84 latitude in ° = ϕ ÷ 1,000,000. Bits [31:28] RFU
Lon	*Longitude and position accuracy estimate as last reported by GNSS receiver* Bits [28:0] signed value λ, range -179,999,999 – 180,000,000; WGS84 longitude in ° = λ ÷ 1,000,000. Bits [31:29] unsigned value α, range 0-7; position accuracy estimate in m = $2^{\alpha+2}$ (max). The value 7 represents an accuracy estimate of worse than 256m.

Note: If there is no GNSS fix (see sensor status), the Lat and Lon fields contain the last values reported by the GNSS receiver. If there has never been a GNSS fix acquired, the values may both be 0.