



A large, light blue water droplet shape is centered in the background. Inside and around it are faint illustrations of a city skyline, industrial buildings with smokestacks, and a network of purple pipes. The entire scene is set against a light blue background with a subtle globe pattern.

Technical Document
Payload
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Volumeter description

- The volumeter can have up to 4 sensors, as shown in the figure below
- It sends regularly a payload that is described in the next slide



Keep-alive Frame

	#Bytes	offset	Size (bits)	Designation	Possible values
	Bytes 0	0	2	Command Code	0b01 : Volume after Keep-alive
		2	4	Sensor Number	0b0000 : Keep-alive 0b0001 : sensor 1* 0b0010 : sensor 2* 0b0100 : sensor 3* 0b1000 : sensor 4*
		6	2	Battery Level	0b00 : Out of Order Battery 0b01 : low level battery 0b10 : medium level battery 0b11 : full level battery
Sensor 1	Bytes 1 to 6	8	48	Number of Ticks	0x00..0xFFFFFFFFFFFF
Sensor 2	Bytes 7 to 12	56	48	Number of Ticks	0x00..0xFFFFFFFFFFFF
Sensor 3	Bytes 13 to 18	104	48	Number of Ticks	0x00..0xFFFFFFFFFFFF
Sensor 4	Bytes 19 to 24	152	48	Number of Ticks	0x00..0xFFFFFFFFFFFF

* - possible to put several sensors via bitmask



Keep-alive Frame

Example

- Frame received :

0x **69** **000000000000** **0000000005A3** **000000000000** **0000008600E3**

Header Sensor 1 Sensor 2 Sensor 3 Sensor 4

We can decode this frame as the following:

- Header: 0x69 equals to 01.1010.01, that translates to
 - 01 : Low battery
 - 1010 : Sensors 2 and 4
 - 01 : Indicates that this message transmits sensor data



Keep-alive Frame

Example

- Frame received :

0x **69** **0000000000000000** **00000000005A3** **0000000000000000** **0000008600E3**

Header Sensor 1 Sensor 2 Sensor 3 Sensor 4

- Sensors:
 - Sensor 1: 0x0000000000000000 = 0 ticks
 - Sensor 2: 0x0000000000005A3 = 1443 ticks
 - Sensor 3: 0x0000000000000000 = 0 ticks
 - Sensor 4: 0x00000008600E3 = 8782051 ticks



Conversion to liters

- Each sensor sends its data in ticks, the conversion to volume can be done as the following:

$$\text{Volume} = \text{ticks} / \text{ticks per liter}$$

- The number of ticks per liter depends on the type of sensor as the following table

Sensor type	Ticks per liter
DN20	1000
DN25	336.89



Conversion to liters

Example:

- Considering the DN20

Sensor 2: 1443 ticks = 1.443L

Sensor 4: 8782051 ticks = 8782.051 L

- Considering the DN25

Sensor 2: 1443 ticks = 4.283 L

Sensor 4: 8782051 ticks = 26068,007 L

