VZ89 I2C SPEC

1. Theory of operation:

When the device is connected to the I2C bus line, the device is working as a slave device. The master can write/read the VZ89 device using the I2C interface command.
The VZ89 device address contains seven fixed bits.
The VZ89 device is set in “standard mode”: bit rates up to 100 kbit/s.

2. Device addressing:

The address byte is the first byte received following the START condition from the master device. The first part of the address byte consists of a 4-bit device code which is set to 1110 for the VZ89. The device code is followed by three address bits (A2, A1, A0) which are programmed at 0:

VZ89 address (7 bits) = 0b1110000

3. Command byte:

The master sends a command byte (8 bits) in order to set parameters to the VZ89 or to request its status, as follow:

3.1. 0b00001000: *Set ppmC02:*

This command is used to send a ppmCO2 value from an analyser to the VZ89 in order to recalibrate its outputs.

3.2. 0b00001001: *Get VZ89 status:*

This command is used to read the VZ89 status coded with 6 bytes:
D1 (8bits) represent the CO2-equivalent signal value [13..242].
D2 (8bits) represent the VOC-short signal value [13..242].
D3 (8bits) represent the VOC-long signal value [13..242].
D4 (8bits) represent the 1st byte of raw sensor resistor value (LSB).
D5 (8bits) represent the 2nd byte of raw sensor resistor value.
D6 (8bits) represent the 3rd byte of raw sensor resistor value (MSB).

Note: the raw sensor resistor value [Ω] = **10*(D4 + (256*D5) + (65536*D6))**

4. Writing data to VZ87

Send by master

Send by slave

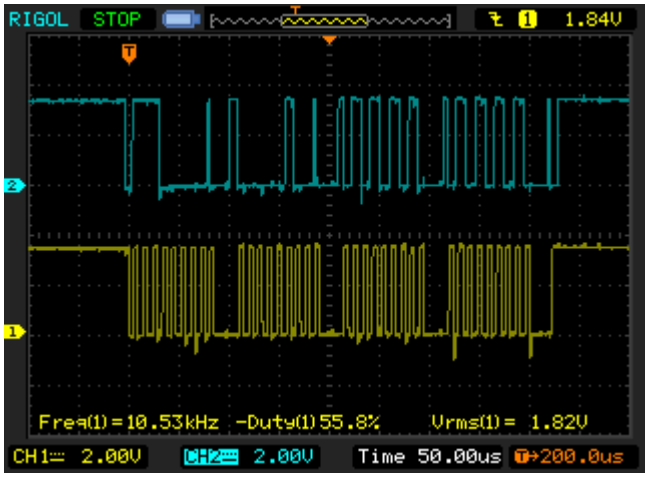
Address byte

	A6	A5	A4	A3	A2	A1	A0	R/W	
Start	1	1	1	0	0	0	0	0	ACK

C7	C6	C5	C4	C3	C2	C1	C0	
Commande byte								ACK

D7	D6	D5	D4	D3	D2	D1	D0	
Data MSB								ACK

D7	D6	D5	D4	D3	D2	D1	D0		
Data LSB								ACK	Stop



SDA

SCL

Note: in this exemple:

D1: Address [7bits] = 1110000 and R/W [1bit] = 0

D2: Command = 00000100 (no longer used)

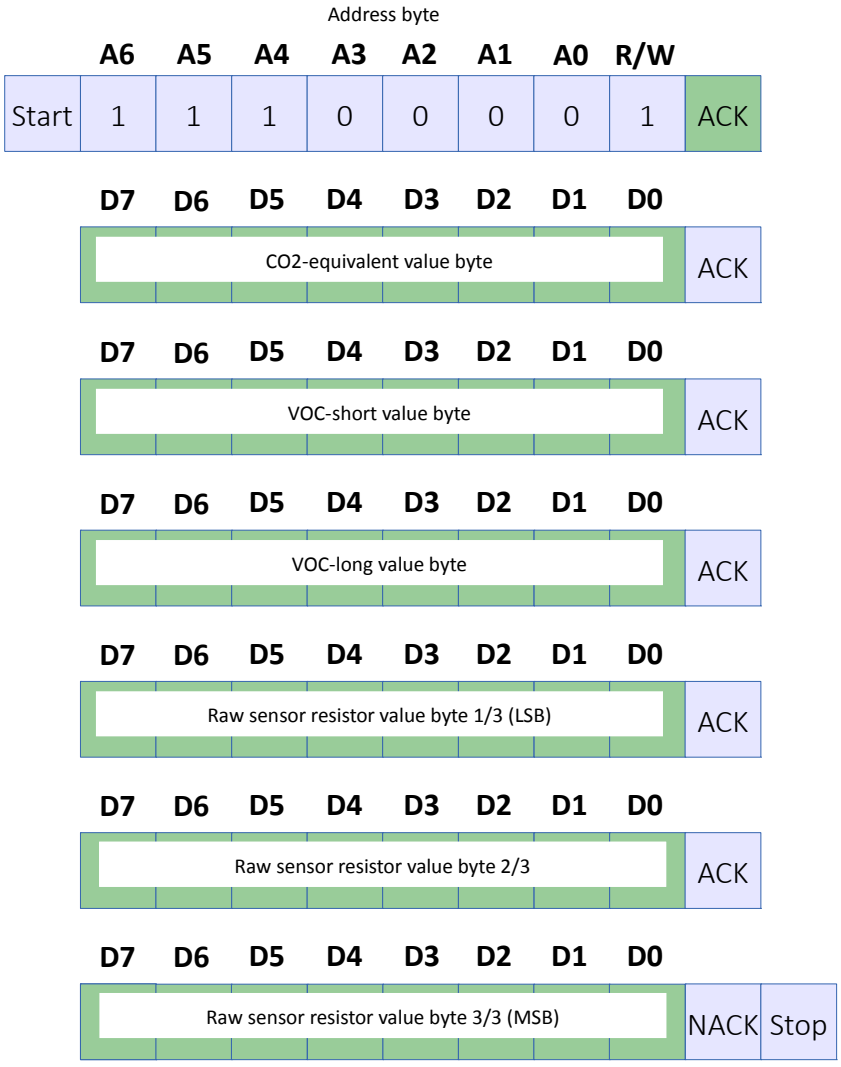
D3: Data MSB = 01010101

D4: Data MSB = 01010101

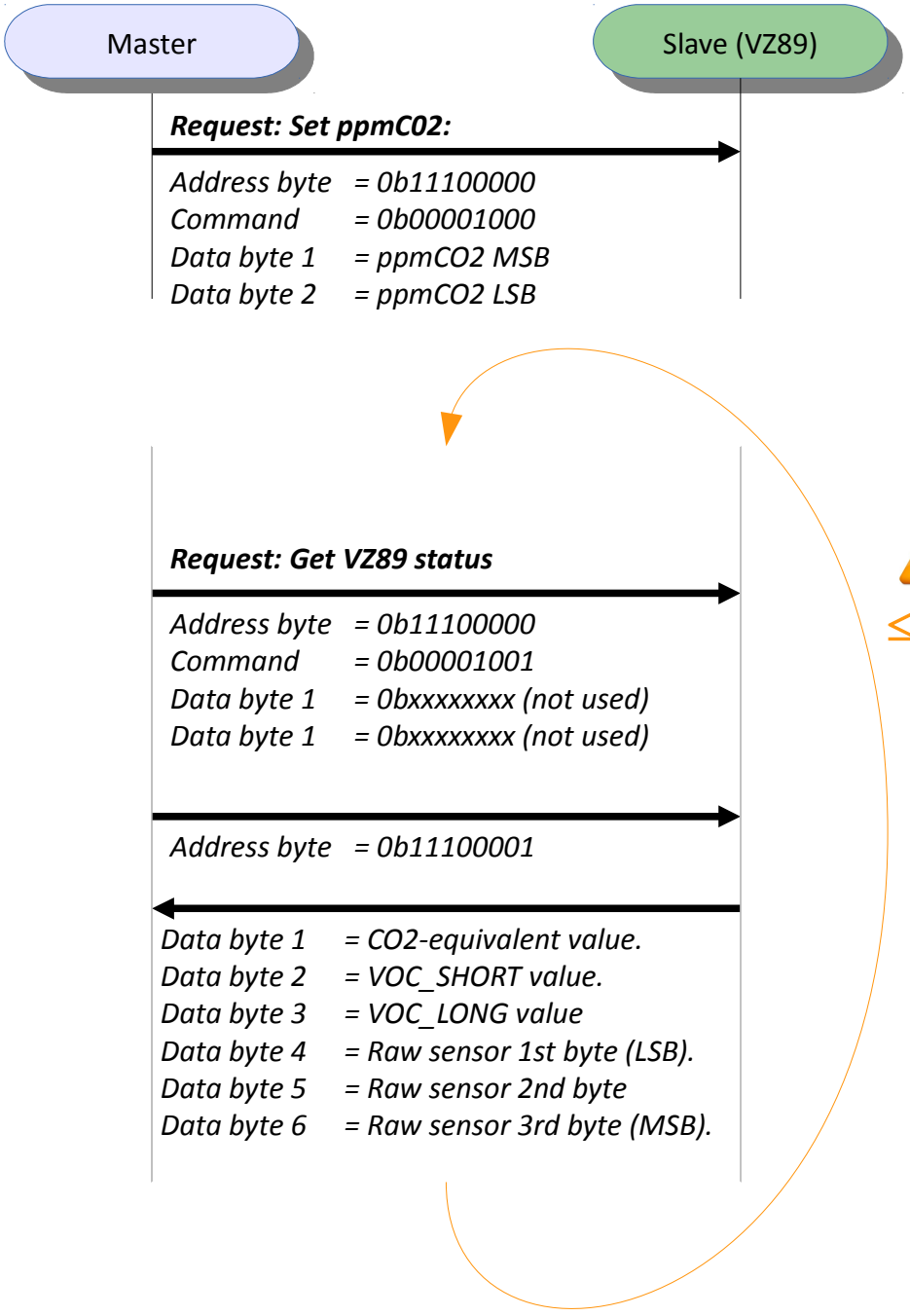
5. Reading VZ89 status

Send by master

Send by slave



6. I2C Communication diagram:



≤1Hz Like the VZ89 refresh its output once every seconds, please don't request VZ89 at a frequency > 1Hz.

Annex

a. Document history

Date	Author	Description	Status	Rev
Jul-17,2014	Francois Carnal	• Doc creation		A