M5Stack Unit MQ I2C Protocol

REG MAP (Addr: 0x11)		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	note
Config status	0x00 R/W	MQ Status	LED Status															MQ Status: MQ Working Status 0: OFF mode 1: Continuous heating mode 2: Pin-level switch mode default: 0 LED Status: LED Working Status 0: LED OFF 1: LED ON default: 0
MQ heating pin high and low time config	0x10 R/W	High level Time	Low level Time															High Level Time: High-level duration (30–255 s) default: 30 s Low Level Time: Low-level duration (5–255 s) default: 5 s
MQ ADC 8bits	0x20 R	ADC Value																ADC Value: 0~255
MQ ADC 12bits	0x30 R	ADC Value-L	ADC Value-H															ADC Value: 0~4095 ADC Value = (ADC Value-H << 8) | ADC Value-L
MQ ADC valid tags	0x40 R	Valid Tags																Valid Tags: Whether the MQ ADC value is valid 0: Valid 1: Invalid
Internal NTC ADC 8bits	0x50 R	ADC Value																ADC Value: 0~255
Internal NTC ADC 12bits	0x60 R	ADC Value-L	ADC Value-H															ADC Value: 0~4095 ADC Value = (ADC Value-H << 8) | ADC Value-L
NTC resistance value	0x70 R	NTC Resistance Value_L	NTC Resistance Value_H															NTC Resistance: Reflects real-time temperature variations. NTC Resistance = (NTC Resistance Value_H << 8) | NTC Resistance Value_L (unit: Ω)
ADC channel voltage value	0x80 R	Internal Reference Voltage_L	Internal Reference Voltage_H	MQ Voltage_L	MQ Voltage_H	NTC Voltage_L	NTC Voltage_H											Internal Reference Voltage = (Internal Reference Voltage_H << 8) | (Internal Reference Voltage_L) (unit: mV) MQ Voltage = (MQ Voltage_H << 8) | (MQ Voltage_L) (unit: mV) NTC Voltage = (NTC Voltage_H << 8) | (NTC Voltage_L) (unit: mV)
Firmware Version	0xF0 R															Version		Version: Software Version Number
I2C Address	0xF0 R/W															Address		Address: I2C device address value: 0x08~0x77 default: 0x11

Config status : Working Status Configuration
  1. MQ work status
     OFF mode: The heating pin remains LOW; the MQ sensor is not heated and does not operate, and Valid tags is always 0. (Example Fig. 1)
     Continuous heating mode: The heating pin remains HIGH; the MQ sensor is continuously heated and stabilizes at about 55 °C (this refers to the temperature of the MQ sensor's metal shell, not the internal device temperature). During the first 20 s after heating starts, data readings are unstable, so Valid tags is 0 and the data is invalid. After 20 s, the data becomes valid. (Example Fig. 2)
     Pin-level switch mode: Requires configuring the HIGH-level time (0x10) and LOW-level time (0x11) (ensure the configuration is valid). In this mode the MQ sensor is intermittently heated by alternating the pin's HIGH and LOW levels. During the HIGH-level period, data is unstable for the first 20 s; valid data is available only after those 20 s, meaning Valid tags becomes 1 only after 20 s. (Example Fig. 3, Fig. 4)
  2. LED work status
     LED OFF: The LED is disabled.
     LED ON: The LED lights up when Valid tags indicates valid detection and turns off when invalid. While lit, the LED brightness is proportional to the detected ADC value—the higher the ADC value, the brighter the LED.

MQ heating pin high and low time config: This configuration applies only to the pin-level switch mode and must be set before enabling that mode; otherwise, it will not take effect.
  High level time: Must be ≥ 30 s; shorter settings are invalid.
  Low level time: Must be ≥ 5 s; shorter settings are invalid.

NTC resistance value: Returns the resistance of the NTC (unit: Ω).

ADC channel voltage value: Voltage of the ADC channels.
  Internal Reference Voltage: The STM32 chip's reference voltage is not always a stable 3.3 V. This value is the internally calibrated reference voltage; ADC conversions should be based on it to ensure measurement accuracy.
  MQ Voltage: Voltage value calibrated with the internal reference voltage, indicating the actual MQ sensor voltage.
  NTC Voltage: Voltage value calibrated with the internal reference voltage, indicating the actual NTC voltage.

I2C Address: After a successful change the new address takes effect immediately, is stored in internal flash, and is retained after power-off (this operation is time-consuming and erases flash; avoid frequent changes. Allow a 20 ms delay after use).