TF-LP01 Laser Particle Sensor

Features:

* High accuracy
* Fast response
* Compact in size

Applications:

* Air purifier, portable air quality detector, smart home, etc.

TF-LP01 type laser particle sensor is a small module for detection of particles in the air with scattering principle. It features compact size, high accuracy, repeatablity and consistency, and strong resistance against interference. It adopts ultra-silent fan, and is able to response in real-time and collect data continuously. The sensors are 100% tested and calibrated in factory.

Technical index:

Distinguishable particle：PM1.0 、PM2.5 、PM10

Interface type：USART（3.3V TTL level）PWM（customized）

Measurement range：0~999 ug/m^3

Measurement accuracy: ±10 ug/m^3@0~99 ug/m^3 ±10%@100~999 ug/m^3

Mass concentration resolution：1 ug/m^3

Response time：＜10S

Operating voltage：DC5.0V（±0.1V）

Operating current：＜100mA

Operating temperature：-10℃~50℃

Operating humidity：≤95%RH（non-condensation）

Storage temperature：-30℃~70℃

Overall dimensions：51 x 33 x 22mm

Port :

PIN1	Vcc 5.0±0.1V DC
PIN2	GND
PIN3	NC
PIN4	RXD TTL3.3V
PIN5	TXD TTL3.3V
PIN6	RESET （RST）
PIN7	NC
PIN8	NC

Concentration grading comparison table:

Font color code	Grade	Mass concentration（ug/m^3）
	excellent	0- 50
	Good	50- 100
	Mild contamination	100 - 150
	middle level pollution	150 - 200
	Heavy pollution	200 - 300
	Severe pollution	＞ 300

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Communication protocol:

1. Serial port configuration

PIN1	Vcc 5.0±0.1V DC
PIN2	GND
PIN3	NC
PIN4	RXD TTL3.3V
PIN5	TXD TTL3.3V
PIN6	RESET （RST）
PIN7	NC
PIN8	NC

2. Initiative upload data

Byte number	Data	Notes
1	2	
2	9	
3	14	Data field length
4 - 5		PM1.0 current value（ug/m^3）
6 - 7		PM2.5 current value（ug/m^3）
8 - 9		PM10 current value（ug/m^3）
10 - 11		Calibration value after filtering of PM1.0（ug/m^3）
12 - 13		Calibration value after filtering of PM2.5 （ug/m^3）
14 - 15		Calibration value after filtering of PM10（ug/m^3）
16		CRC high
17		CRC low

3. CRC algorithm

```
uint16_t crc16_modbus(uint8_t *modbusdata , uint16_t Length) {
    uint16_t i, j;
    uint16_t crc16 = 0xFFFF;

    for (i = 0; i < Length; i++)
    {
        crc16 ^= modbusdata[i];

        for (j = 0; j < 8; j++)
        {
            if ((crc16 & 0x01) == 1)
                crc16 = (crc16 >> 1) ^ 0xA001; else
                crc16 >>= 1;
        }
    }

    return crc16;
}
```

Important note: Operating conditions in which Figaro sensors are used will vary with each customer's specific applications. Figaro strongly recommends consulting our technical staff before deploying Figaro sensors in your applications and , in particular, when customer's target gases are not listed herein. Figaro cannot assume any responsibility for any use of its sensors in a product or application for which sensor has not been specifically tested by Figaro.

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