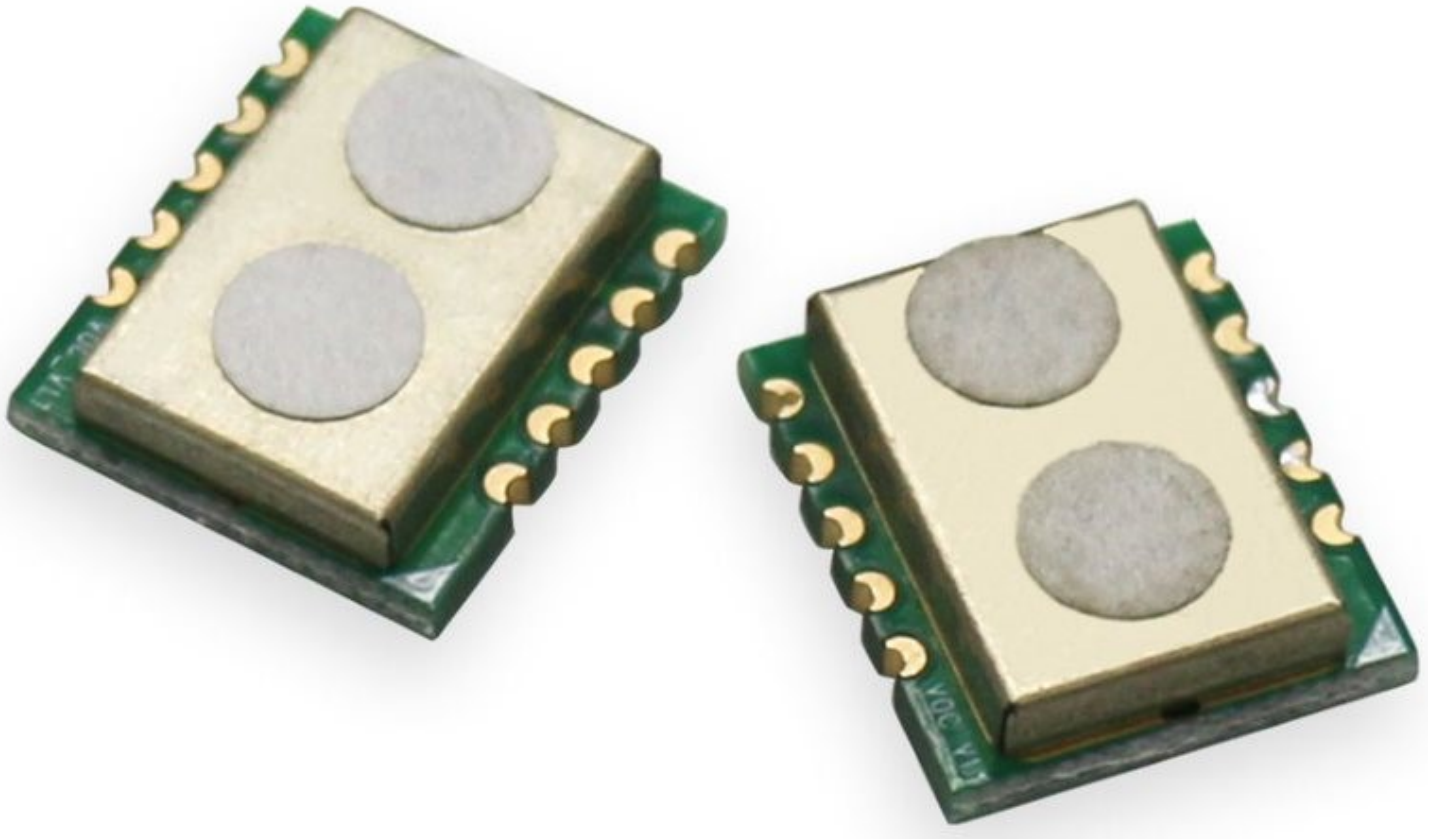


TVOC AIR QUALITY SENSOR MODULE (TTL)

User Guide for SRAQ-D725



Product Description >>

The SRAQ-D725 is a low power air quality sensor for detecting volatile organic compound (VOC), CO₂ and HCHO gas. A pre-programmed algorithm is used to estimate CO₂ and HCHO gases concentrations based on overall VOC concentration. It measures the concentration in real-time and outputs the data via UART protocol.

Features >>

- High sensitivity and good precision
- Small form factor
- Quick response
- Short preheat time
- Shock and vibration resistant

Applications >>

- Portable TVOC detector
- Air quality monitoring
- HAVC industry
- Smart buildings
- Other areas where TVOC is a concern

Thank you for choosing L-com product. To ensure safe, accurate performance and product longevity, please take a moment to familiarize yourself with this manual before powering the device. Please keep it handy for future reference. In case of any questions regarding the installation or use of product, please call us at 800.341.5266.

Reach out to us at customerservice@l-com.com and visit our website at www.l-com.com

Technical Parameters >>

Working voltage	3.3 VDC
Working current	< 40mA
Working environment	Temperature: -5 ~ 50, Humidity: 0 – 100% RH (Non-condensing)
Preheating time	≤ 5 Minute
Communication mode	UART @ TTL
Service life	3 year (Air)

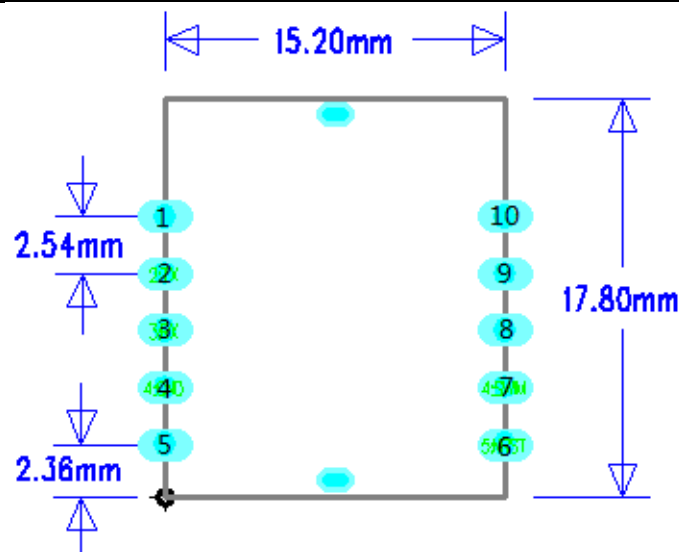
Product Technical Index >>

Detecting substance	Measurement range	Measurement accuracy	Resolution
eCO ₂	400 – 5000 ppm	±75 ppm	1 ppm
VOC	0 – 1000 ppb	±12 ppb	1 ppb
eCH ₂ O	0 – 400 ppb	±3 ppb	1 ppb

Remark: CO₂ and CH₂O concentrations are algorithm-based estimates, correlated to total measured VOC concentration.

Electrical Diagram >>

Number	Name	Definition
1	NC	---
2	TX	Sending end
3	RX	receiving end
4	GND	---
5	NC	---
6	RST	Reset
7	NC	---
8	NC	---
9	VCC	DC 3.3V
10	NC	---



Communication Protocol >>

UART@TTL communication protocol (9600 8 N)

Modules are configured as active communication mode when they leave the factory. Modules send out the current concentration value every 10S. If you need to change the communication mode, you can send 0x78 command, change the communication mode to 0x04 (Question-Answer), and the module will only send the current concentration value when it receives 0x86 command (read module concentration).

Command Operation

Instructions	Explain
0x78	Switching communication mode instruction
0x03	Active send mode instruction
0x04	Passive transmit mode instruction
0x86	Read sensor concentration command

Note: after the module is energized, it is active sending mode.

Communication mode switching: (module → user/MCU)

Receive	Frame Head	Command	Communication Mode	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
	0x42	0x78	Active: 0x03 Passive: 0x04	0x00	0x00	0x00	0x00	0x00	0x00
Send	Frame Head	Command	Communication Mode	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
	0x42	0x78	Success: 0x01 Fail: 0x00	0x00	0x00	0x00	0x00	0x00	0xFF

Get data (module → user MCU)

Active mode (0x03) The data upload time interval: 10S																	
Send	Header 1	Header 2	Retain			Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8	Data 9	Data 10	CRC_low	CRC-high
		0x42	0x4D	xx	xx	xx	xx	xx	xx	xx	eCO ₂ _H	eCO ₂ _L	VOC_H	VOC_L	CH ₂ O_H	CH ₂ O_L	CRC_16_L
Passive mode(0x04)																	
Receive	Header	Command	Mode	Retain	Retain	Retain	Retain	Retain	Check bit								
	0x42	0x86	0x04	0x00	0x00	0x00	0x00	0x00	0xFF								
Send	Header 1	Header 2	Retain			Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7	Data 8	Data 9	Data 10	CRC_low	CRC-high
		0x42	0x4D	xx	xx	xx	xx	xx	xx	eCO ₂ _H	eCO ₂ _L	VOC_H	VOC_L	CH ₂ O_H	CH ₂ O_L	CRC_16_L	CRC_16_H

CRC check : Select A001 or 8005 for reverse order.

Note: 0x42 and 0x4D do not participate in CRC check.

Data calculation method:

$$eCO_2_Value = CO_2_H * 256 + CO_2_L$$

$$VOC_Value = VOC_H * 256 + VOC_L$$

$$CH_2O_Value = CH_2O_H * 256 + CH_2O_L$$

Matters needing attention

1. The module avoids contact with organic solvents (including silica gel and other adhesives), coatings, reagents, oils and high concentration gases.
2. Modules must not withstand excessive impact or vibration.
3. Do not apply this module to a system involving personal safety.
4. Do not install modules in strong air convection.
5. Do not place the mould group in high concentration organic gas for a long time.

Attachment >>

```
unsigned int CRC_Compute ( unsigned char *arr_buff, unsigned char len)
{
    unsigned int crc=0xFFFF;
    unsigned char i, j;
    for ( j=0; j <len;j++)
    {
        crc=crc ^*arr_buff++;
        for ( i=0; i<8; i++)
        {
            if( ( crc&0x0001) >0)
            {
                crc=crc>>1;
                crc=crc^ 0xa001;
            }
            else
                crc=crc>>1;
        }
    }
    return ( crc);
}
```