AG-4-O2-MKE25

----- Pre-calibrated module Instruction Manual

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Product Description

The AG-4-O2-MKE25 is an embedded type module equipped with the Figaro's Oxygen Sensor KE25, for accurately detecting Oxygen (O_2) gas concentrations in various environments. The module has been pre-calibrated before leaving the factory and has good stability and selectivity. It uses digital communication (UART bus output) for gas concentration, which allows users to easily and quickly integrate the module into various systems, making it suitable for both indoor and outdoor air quality detection, as well as industrial gas detection.

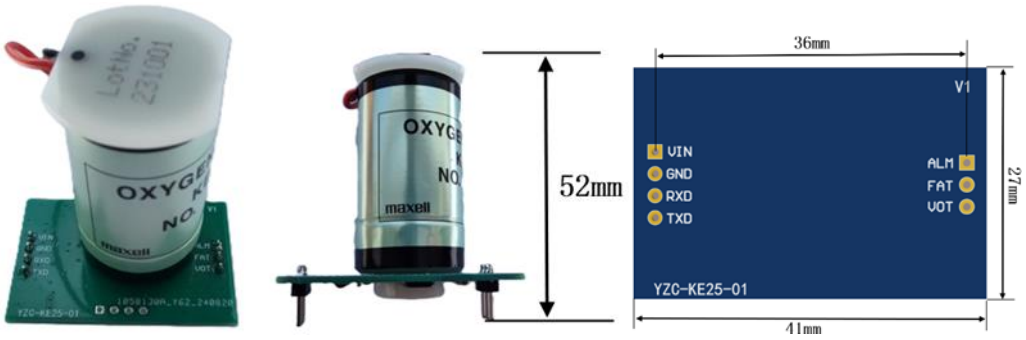
Technical Specification

Item	Specification
Model Number	AG-4-O2-MKE25
Target Gases	O_2
Sensing Principle	Electrochemical
Detection Range	0-100% vol
Resolution	0.1%
Measurement Error	< ±5% FS
Operating Voltage	3.2 - 5.5V DC
Operating Current	≤ 500uA@5V
Output Signal	UART (+3.0V TTL)
Temperature Range	10 - 40°C
Humidity Range	0% -90%RH
Pressure Range	900.0 to 1120 mbar
Storage Temperature	10 - 40°C
Size	L*W*H=41mm*27mm*52mm
Expected Life	≥ 5 years

Application

- Oxygen detectors
- Combustion gas monitoring
- Refrigeration (food industry)
- greenhouses

Product Appearance and Dimensions



Pin Configuration

The module reserves a 3P + 4P pin header with a pitch of 2.54 mm as the electrical interface. Pin descriptions are as follows:

Pin Number	Name	Functional Description
1	VIN	Power supply, 3.2 - 5V DC
2	GND	Signal ground
3	RXD	Serial port input, Connected to the host TXD
4	TXD	Serial port output, Connected to the host RXD
5	VOT	Module onboard 3.0V reference power output (maximum output capacity 50mA)
6	FAT	Fault signal output pin (reserved)
7	ALM	Alarm signal output pin (reserved)

Note:

1) After being powered-on, the module needs approximate 30s to warm up. Once the process is complete, the module enters into normal monitoring state.
2) After being powered-on, the module's serial port outputs a frame of data containing status and concentration values every 1 second.

Communication Protocol and Description

1. Serial communication adopts module active upload data mode, data upload interval 1 second.

2. UART serial port:
   Baud rate: 4800, data bits: 8bit, stop bits: 1bits, parity bit: no parity

3. The data frame is 5 bytes and has the following data format:

Frame Header	Status	Conc. high byte	Conc. low byte	Checksum
0xAA	State	D(H)	D(L)	Sum

Checksum Sum = 0xAA + State + D(H) + D(L)

The module state byte is defined as follows:

Operating properly	Module Circuit Fault	Power On to Warm Up
0x80	0x81	0x82

Note: Concentration values are all 0 during the module warm-up period;
Example:
Module upload: 0xAA 0x80 0x16 0x05 1F
Indicates that the module is in normal monitoring state and the current Oxygen concentration is 22.5% vol O_2.

4. The above communication protocols are only for module testing, and can also be customized according to customer requirements.

Application Notes

1. The module is not protected against reverse polarity or ESD (Electrostatic Discharge). Users should ensure correct power connection and implement appropriate ESD protection measures when using the module.
2. Exceeding the module power supply voltage range may cause damage to the module or the module may fail to operate properly.
3. Please follow precautions specific to the sensor when using the module.