

## Carbon Dioxide(CO<sub>2</sub>) sensor module: Model: SH-DS



### ■ Application

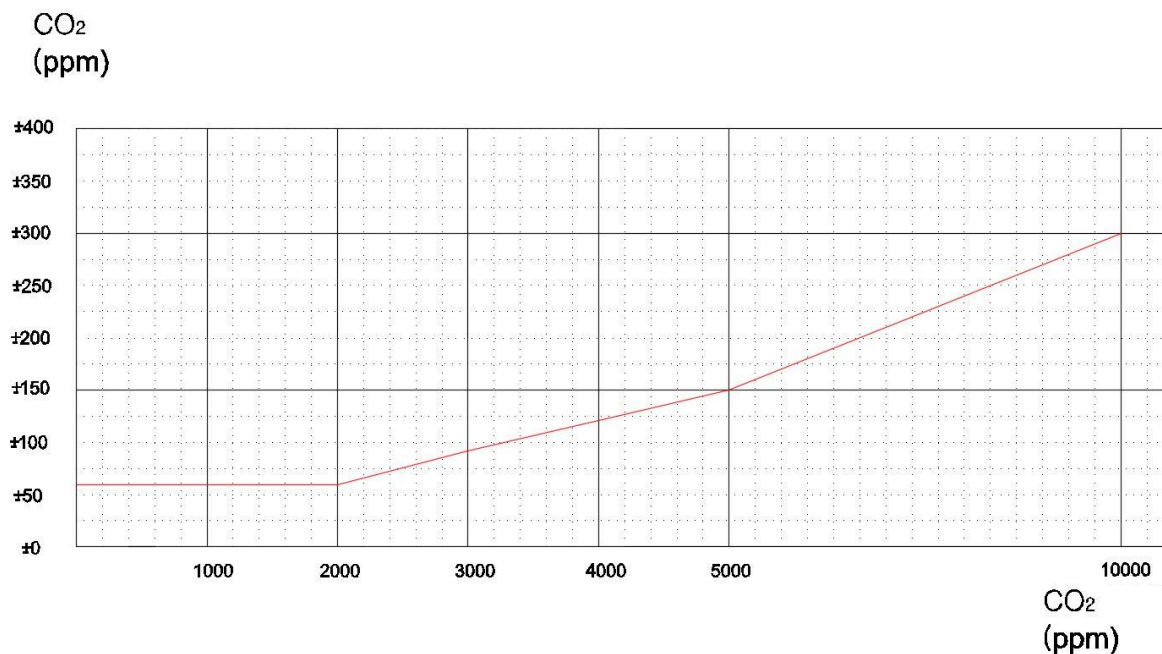
- CO<sub>2</sub> Control for Indoor Air Quality
- CO<sub>2</sub> Measuring for Ventilation Control
- CO<sub>2</sub> Control for Building, Hospital, School
- CO<sub>2</sub> Control for Air cleaner, Air conditioner.
- Mushroom Control, Boiler Control

### ■ Technical Specification

<b>Measuring Type</b>	Dual Light Wavelength Non-Dispersive Infrared (NDIR)
<b>Measuring Range</b>	0 ~ 3,000 / 5,000 / 50,000 / 100,000 ppm
<b>Accuracy</b>	±2% FS, ±3% measured value @ 0 ~ 50°C
<b>Signal Update Time</b>	Every 2.0 Seconds
<b>Warm-up Time @25°C</b>	< 90Sec
<b>Operating Condition</b>	-10 ~ 50°C, 0 ~ 99.5% RH (Non Condensing)
<b>Output</b>	Analog : 0~3VDC (0~3000, 5000, 10,000 ppm)
<b>Output</b>	UART: 9600bps /TTL Level 3.3V
<b>Power Input</b>	DC5V ~ 9V Input (5 ~ 7V recommendation)
<b>Consumption Current</b>	Normal 35mA, Peak 80mA
<b>Interface</b>	4PIN Header[CN1]
<b>Interface size</b>	Molex 5267 With 2.54mm spacing.
	Refer to dimension
	(W)40mm x (H)36mm x (D)11.9 mm, Weight : 12g

♣ This product can be changed for quality improvement without any notification

## ■ Tolerance



## ■ Features

1. Dual light Wavelength **NDIR (Non-dispersive Infrared)** Method

that detects CO<sub>2</sub> in the air.

2. Analog and Digital output by request of control system

A. Analog Output: 0~3V (0~3000/5000/50,000/100,000 ppm)

B. Digital Output: UART (3.3V Level) Output

✧ *Enable to make changes in specifications and protocol on customer's demands.*

## ■ Output option

### 1. Digital Output: UART (TTL Level 3.3V)

#### A. SH-DS(3000ppm) Format (ASCII Data)

- Baud rate : 9600bps
- Signal update term : every 2 seconds

1	2	3	4	5	6
CO <sub>2</sub> Value				CR	LF

Output example) When CO<sub>2</sub> concentration is 1000ppm, 1000[13][10F]

Hex value ( ASCII ) : 0x31, 0x30, 0x30, 0x30, 0x0D, 0x0A

### 2. Analog Output (CO<sub>2</sub> only)

- CO<sub>2</sub>: 0 ~ 3V (0 ~ 3000 / 5000 / 10000ppm)

**\*\* Output Current: Max 30mA**

#### A. Analog Output table

	3000ppm	5000ppm	10000ppm
0V	0ppm	0ppm	0ppm
1V	1000ppm	1666.7ppm	3333.3ppm
2V	2000ppm	3333.3ppm	6666.7ppm
3V	3000ppm	5000ppm	10000ppm

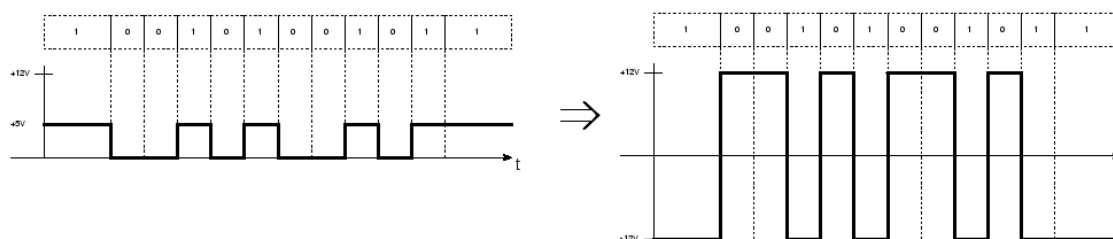
## ■ PC communication

### 1. UART interface

A. Use RS-232 interface converter.

Communicate with PC using TTL signal is unsuitable,

Thus, communication by change voltage level



### 2. Communication Program

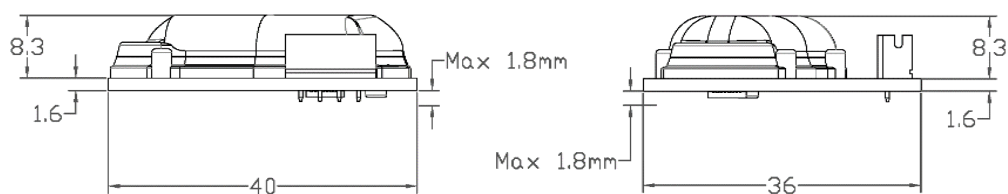
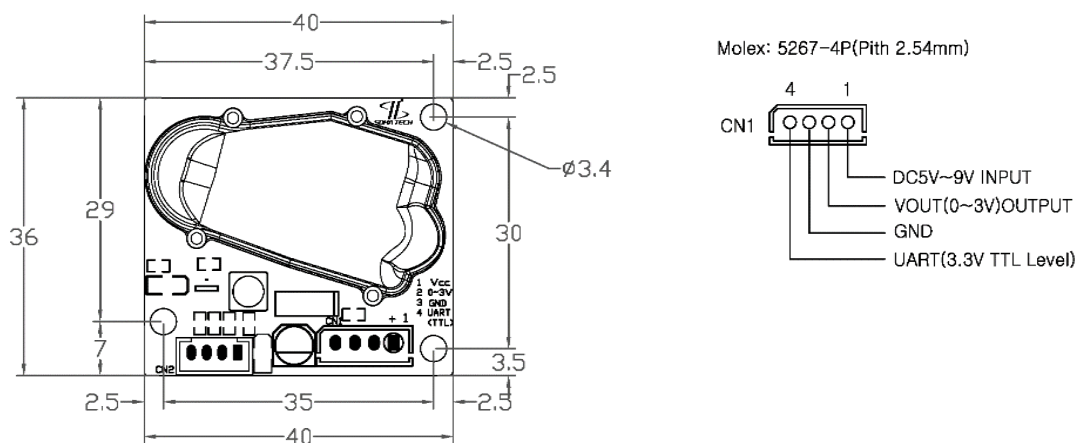
A. Use Hyper-terminal or other Communication Program

## ■ Cautions

1. Beware of impact on the product could cause degrading the accuracy and malfunctioning.
2. Do not advice to equip the product in which not in compliance with operation conditions recommended.
3. Advise inquiry to manufacturer when the product equip on site where are able to be expected extremely dew condensation (coating option).
4. Advise calibration and correction after 1 year. Notice that depend on the environmental change which could cause the long-term change as a sensor's attributes could cause deterioration on product (need cost)
5. Strongly recommend change the product as possible when product has de-grade performance for using long time in the abnormal environmental conditions.

■ Dimension

- SIZE : 40(W) \* 36(H) \* 11.7(D)



CO<sub>2</sub> SENSOR Segmentation

MODEL	RANGE	
SH-DS	003	0~3,000ppm
	005	0~5,000ppm
	010	0~10,000ppm

Example for CO<sub>2</sub> naming system  
SH-DS-005(5,000ppm)