# SENSECUBE

KCD-AN300
CO₂ Sensor module

Our CO₂ gas sensors get a small deviation unlike NDIR Single type. So they keep long term stability.

Excellent stability and accuracy
- through testing and calibration with sophisticated process and techniques

Easy application to
· Environment management system
· Indoor ventilation system
· Air conditioning system
· Securing devices of combustors

→ NDIR type uses optical property to measuring CO₂ gas. We make up for a controller not to be affected by a shock and a wave(vibration).
  But please consult with our engineers, if you use it under harsh environments (like construction sites).
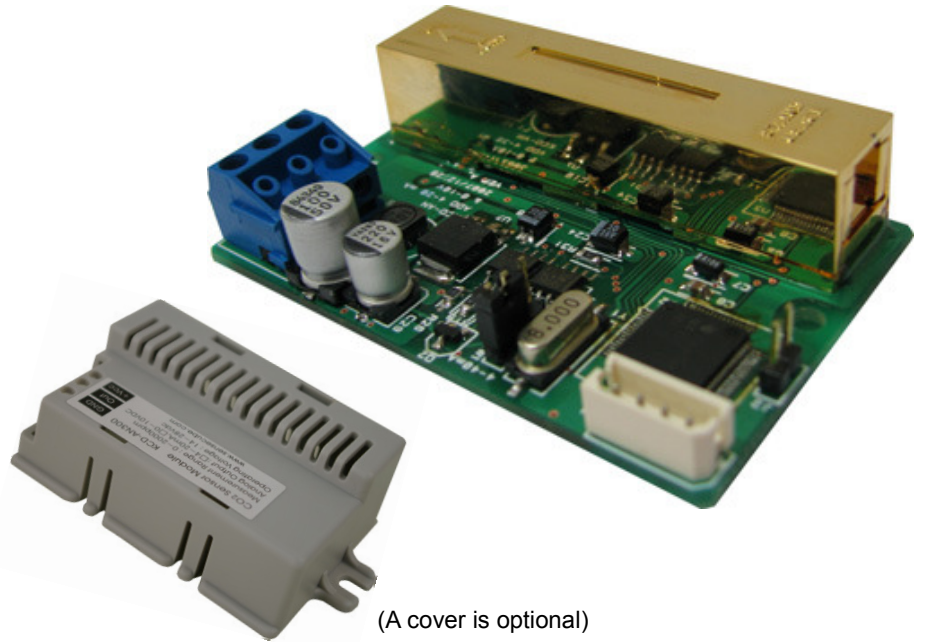
(A cover is optional)

◈ **Technical Data**

Measurement	Sensing Method	Dual Wavelength NDIR
	Measuring range options	0~2,000ppm, 0~5,000ppm, 0~10,000ppm
	Accuracy *	$\pm$ (4%FS+3%Reading)
	Response time (τ_{63})	< 40 sec
	Measurement time interval	1.5 sec

General	Warm up time	< 2 min
	Storage temperature	-40~70℃
	Weight	< 30g

Operating Conditions	Temperature	0~50℃
	Humidity	0~95%RH (Non-condensing)

Electrical	Power supply (rectifiered)	16~24VDC
	Power consumption	70mA average
	Analog outputs	4~20mA , 0~10VDC, 0~5VDC (optional)
	Communications	UART(38,400bps)

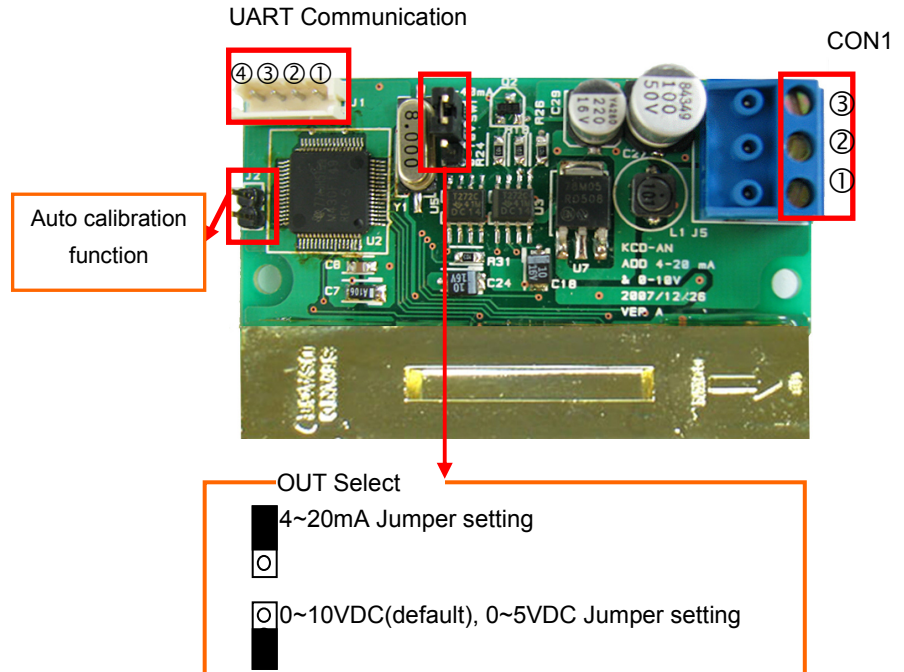| **Dimensions**	Module	Length × Width × Height	70mm × 44.5mm × 18 mm
		Hole Pitch	63mm±0.2mm (Φ3.5mm)
	Module (W/Cover)	Length × Width × Height	93mm × 53mm × 28 mm
		Hole Pitch	84mm±0.2mm

Contact us If you want to add technical functions or change specifications as you apply our CO₂ sensor to your product. Our engineers will support you.

* Under conditions of calibration facilities f production factory, @25℃ , intermediate value of detected ranges.
※ Specifications and images may change without prior notice.

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◈ **Connectors**

1. Components

UART Communication

CON1

Auto calibration function

OUT Select

4~20mA Jumper setting

0~10VDC(default), 0~5VDC Jumper setting

2. Specifications

1) CON1

No.	Name	Descriptions
1	V_{DD}	Power input, +16V ~ +24VDC
2	V_{OUT}	Signal output (0~5VDC, 0~10VDC, 4~20mA)
3	GND	GND

2) OUT Select

Jumper	Descriptions	
UP	Current output	4~20mA
DOWN	Voltage output	0~5VDC, 0~10VDC

❖ Voltage outputs : 0~10VDC(default), 0~5VDC(on demand)

3) Warm up

It takes about 30 seconds to output detect signal after initial power supply(16~24V).
But output signal during stability (first 2~3 minutes) may show incorrect values.

4) Data update period
   New data update every 1.5 sec - Infrared source lamp blinking interval

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3. UART Series Communication

1) Communication connectors

PIN No.	Name	Descriptions
1	DTR	FACTORY RESERVED
2	RST	FACTORY RESERVED
3	TXD	TRANSMIT DATA
4	RXD	RECEIVE DATA

2) Communication Mode : ASYNC
 (UART : Universal Asynchronous Receiver Transmitter)

3) Communication data type

Start Bit	D0	D1	D2	D3	D4	D5	D6	D7	Stop Bit
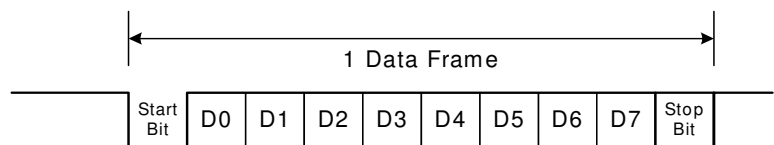
- BAUD RATE   38,400bps,
- Data Bits   8 bit
- Parity Bit   none
- Stop Bit   1 bit

4) Communication Protocol

COMMAND	1 byte	2byte	3byte	4byte
ASCII	#	H-DATA	L-DATA	CR
HEX	0x23	0x??	0x??	0x0D

- STX : shows the start of '#' protocol
- EOT : shows the end of CR protocol

❖ Read data of MODULE
    PC→MODULE : Do command to read data of a module
    MODULE→PC : Transmit stored data of a module to PC

Ex) When read a CO$_2$ Module's information   (KD-IAQ10 Ver1.xx)

COMMAND	1 byte	2byte	3byte	4byte
ASCII	#	0	2	CR
HEX	0x23	0x30	0x32	0x0D

RETURN	1 byte	2byte	-	n-1 byte	n bytes
ASCII	#	Data 0	-	Data n	CR
HEX	0x23	0x??	-	0x??	0x0D

❖ Read the current CO$_2$ ppm
    PC->MODULE : Do command to read CO$_2$ level
    MODULE->PC : Transmit the current level
    This module can measure CO$_2$ concentration up to 9,999ppm.

Ex) @980 ppm

COMMAND	1 byte	2byte	3byte	4byte
ASCII	#	1	0	CR
HEX	0x23	0x31	0x30	0x0D

RETURN	1 byte	2byte	3byte	4byte	5 byte	6 byte
ASCII	#	0	9	8	0	CR
HEX	0x23	0x30	0x39	0x38	0x30	0x0D

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◈ **Warranty and Instructions**

1. Warranty

This item passed our strict quality control.

Korea Digital Co., Ltd guarantees that we repair or replace without charge this item within 1 year after sale except for damage or break by customer's mistakes.

2. Instructions

1) <u>No impact</u> : The characters of NDIR optical system may be changed by impacts. Never drop this sensor module and give it heavy impacts.

2) Don't use it where water drops and condensation can occur, too Consult with us about technical details in advance.

3) Keep operating and storing conditions written above. If you do not, it may break down or have large errors.

4) Don't' use it without a case to block dust and other pollutants in case of using for a long time.

5) It is ideal to install the wave guide in right vertically from the directly in front of the sensor.

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