Carbon Dioxide (CO₂)Transmitter

Data Sheet

CD-100M(LG)

CD-100M

CD-100ML (with LCD)

General

CD-100M(LG) series are one board RS-485 MODBUS type transmitters of CO2 Sensor. Temperature and relative humidity can be selectable.

CD-100M(LG) transmitters can communicate with other controller as a slave sensor. Only a Modbus master can initiate a transaction. The sensor is a slave and will never initiate communication.

Features

• NDIR (Non-Dispersive Infrared) technology

• **LCD Display** model is available (CD-100ML).

• **RS-485 MODBUS output**
 Modicon Mod-Bus RTU MODE, which follow Modicon Mod-Bus procotol
 (http://www.modbus.org)
 – settable Address ID by switch

• **4 wired output**

• **Re-calibration function**
 10 minutes manual recalibration(MCDL) or weekly auto-calibration(ACDL) are supported and settable by switch.

• **CO2 ppm measurement range** -settable by switch

• **Power Consumption** 0.4W at normal voltage of 24V DC, AC.

• **Size** : 123mm x 70mm x 43mm(115g)

CD-100M(LG) Specification

Dimensions (unit : mm)

General Performance

Operating Temperature range
-10 ~ 60℃
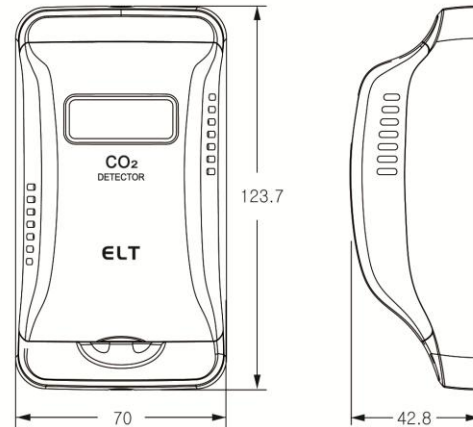※ "BZ" Option : -40 ~ 40℃

Operating Humidity range
0 ~ 95% RH (Non-condensing)
※ 'G' option : 0 ~ 99% RH (Non-condensing)

Storage Temperature
-30℃ ~ 70℃

CO₂ Measurement

Sensing Method
NDIR (Non-dispersive Infrared)
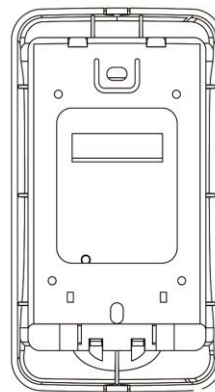
Measurement Range
0 to 2,000/ 3,000 / 5,000 / 10,000ppm
(Optional)

Accuracy   ±30ppm ±5%
(ACDL operation : ±30ppm ±3% of reading)

Response Time (90%)   150 seconds

Sampling Interval   3 sec.
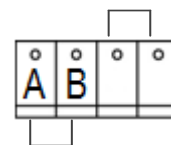
Electrical Data

Input Power
24VAC/24VDC ± 20%, 50/60Hz (4-wired)

Current Consumption
Peak 100mA, Normal 10mA
※ Two times of peak current capacity
allocation is recommended.

Wiring Method

[4-wired] 24VAC or 24VDC
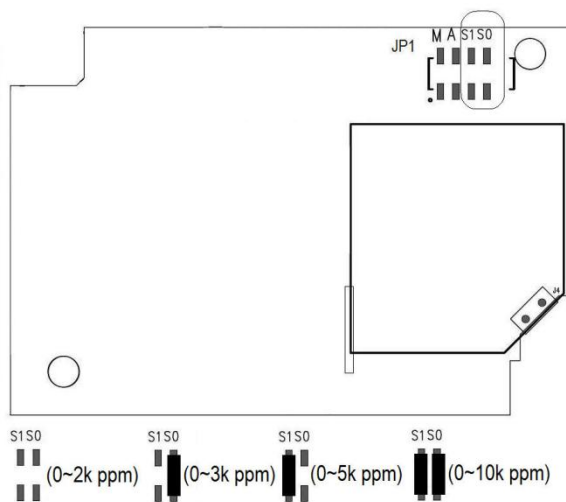
24VAC/24VDC

RS-485 A/B

PPM Measurement Range

■ **JP1 : CO2 Measurement range selection**

2K ppm : 0 ~ 2,000ppm CO2
3K ppm : 0 ~ 3,000ppm CO2
5K ppm : 0 ~ 5,000ppm CO2
10K ppm : 0 ~ 10,000ppm CO2

Operation Mode Selection with MCDL and ACDL

■ **JP1: Calibration selection**

● **M : MCDL**

Users can do 10 minutes manual calibration (MCDL) when sensor showed much different ppm in severe condition like as agricultural applications.
-**Procedures :** Move the switch [No.1] to 'ON' position and wait over 11 minutes in fresh air. After the setting of ambient air-flowing status

● **A : ACDL**

When users are using the CD-100M in indoor ventilation applications like as HVAC, building, houses etc., the ACDL function operation is strongly suggested.
- **Procedures :** Move the switch [No.2] to 'ON' position
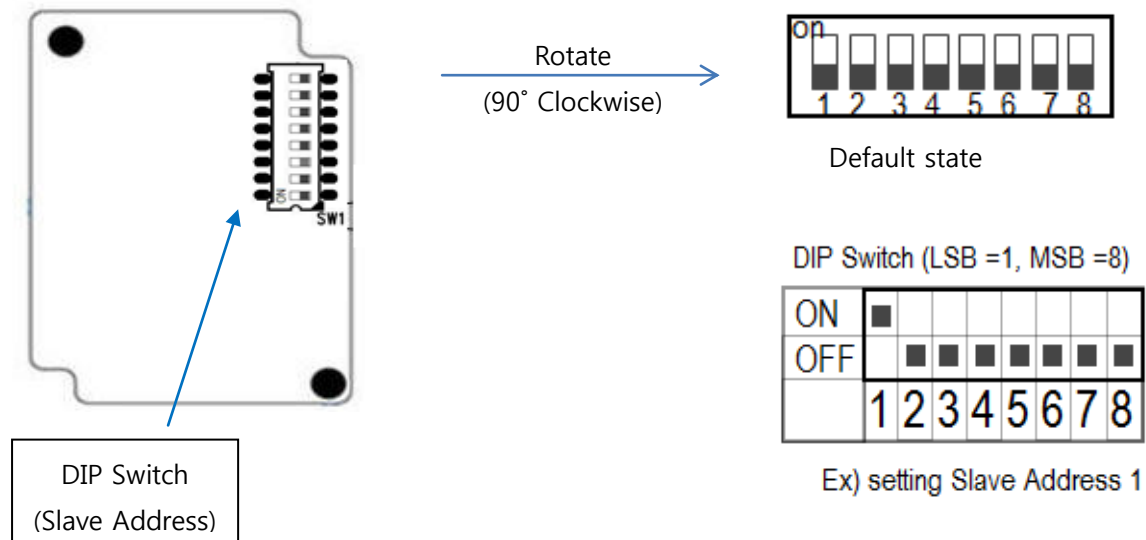Auto calibration acts first 2days, and every 7 days after power on.
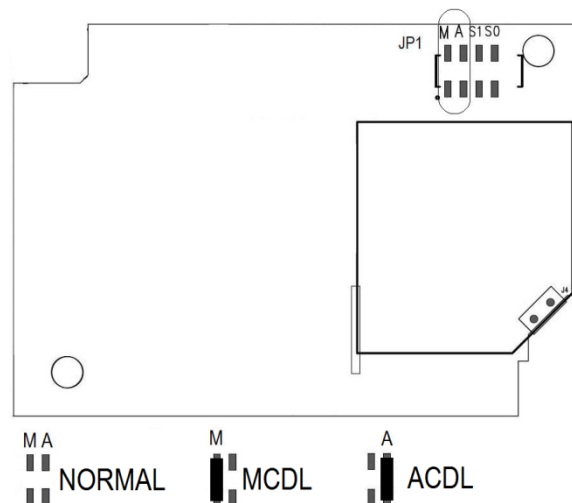
※ Caution : Move back the switch to 'NORMAL' position again after finishing manual calibration.

RS485 Mod-Bus Slave Address setting

■ **SW1 :** Mod-Bus slave address can be set by DIP Switch.

Rotate
(90˚ Clockwise)

Default state

DIP Switch (LSB =1, MSB =8)

DIP Switch
(Slave Address)

Ex) setting Slave Address 1

※ Please refer to Appendix for DIP Switch Settings.

RS485 Mod-Bus Protocol

1) Modicon Mod-Bus RTU Mode: Follow Modicon Mod-Bus protocol (http://www.modbus.org)

2) Communication Specifications

RS-485 (2-wire, half-duplex)

Parameter	Description
Baud rate	9,600 BPS (Option : 38,400 BPS)
Data Bit	8 Bits
Parity Bit	None
Stop Bit	1
Flow Control	None

3) Hold Register Specifications
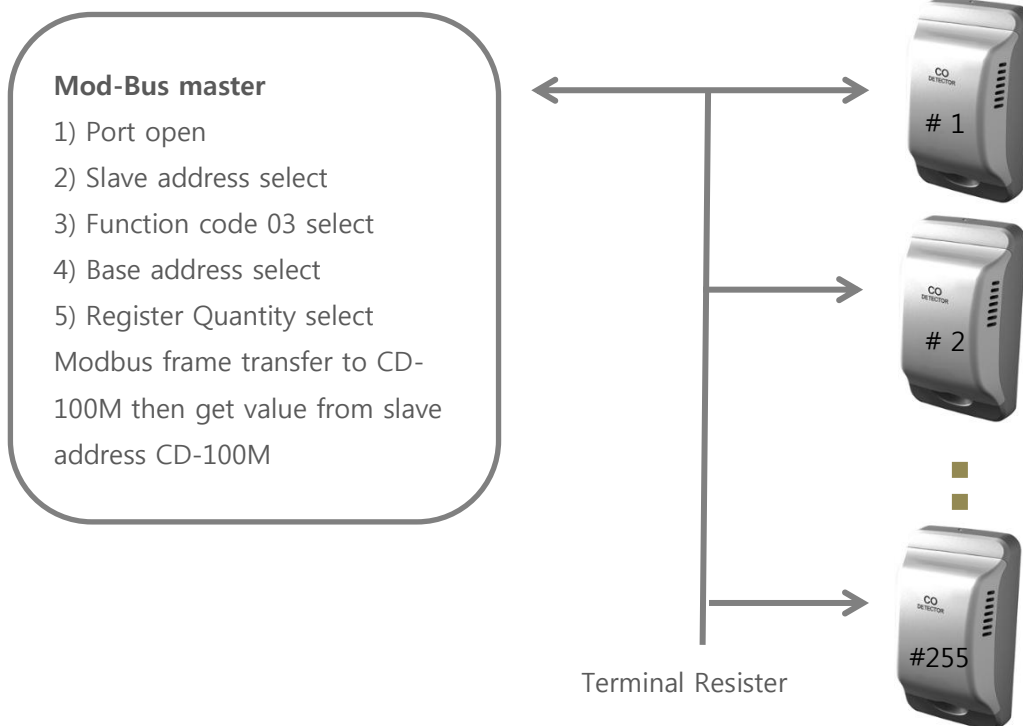· Mapping Base Address : 0x0050.
· Hold Register. Max. Read Size : 4

Register Address	Value	Data Type	Unit	Description
0x0050	CO2	2 Byte WORD	PPM	Co2 Ex) 800 -> 800 PPM
0x0051	Reserved	2 Byte WORD	℃	
0x0052	Reserved	2 Byte WORD	%	
0x0053	Reserved	2 Byte WORD		

4) Supported Function Code

- Currently supported only code 03 and exception responses.
- Error code 0x83 or other (CODE + 0x80)

Exception code	Description
01	Exception of Function code
02	Exception of Starting Address
03	Exception of Quantity of Registers

5) Example How to get value from CD-100M(LG) by Mod-Bus protocol

Mod-Bus master
1) Port open
2) Slave address select
3) Function code 03 select
4) Base address select
5) Register Quantity select
Modbus frame transfer to CD-100M then get value from slave address CD-100M

1

2

#255

Terminal Resister

Ordering Code with Option selection.

Ordering Code	LCD	Temp.& Humid	99% Humidity	Remark
CD-100M	X	X	X	Modbus
CD-100ML	O	X	X	Modbus, LCD(O)
CD-100MG	X	X	O	Modbus, 99% Humidity
CD-100MLG	O	X	O	Modbus, LCD(O), 99% Humidity
CD-100M-HT	X	O	X	Modbus, Temp.&Humidity
CD-100ML-HT	O	O	X	Modbus, LCD(O), Temp.&Humidity

◆ APPENDIX

DIP No.	OFF	ON(address)
1	☐	1
2	☐	2
3	☐	4
4	☐	8
5	☐	16
6	☐	32
7	☐	64
8	☐	128

1. DIP SWITCH Address Settings

Address #1

	OFF	ON
1		■
2	☐	
3	☐	
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	

Address #2

	OFF	ON
1	☐	
2		■
3	☐	
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	

Address #4

	OFF	ON
1	☐	
2	☐	
3		■
4	☐	
5	☐	
6	☐	
7	☐	
8	☐	

Address #8

	OFF	ON
1	☐	
2	☐	
3	☐	
4		■
5	☐	
6	☐	
7	☐	
8	☐	

Address #16

	OFF	ON
1	☐	
2	☐	
3	☐	
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #32

	OFF	ON
1	☐	
2	☐	
3	☐	
4	☐	
5	☐	
6		■
7	☐	
8	☐	

Address #64

	OFF	ON
1	□	
2	□	
3	□	
4	□	
5	□	
6	□	
7		■
8	□	

Address #128

	OFF	ON
1	□	
2	□	
3	□	
4	□	
5	□	
6	□	
7	□	
8		■

2. DIP SWITCH Examples (Address #1~#24)

Address #1

	OFF	ON
1		■
2	□	
3	□	
4	□	
5	□	
6	□	
7	□	
8	□	

Address #2

	OFF	ON
1	□	
2		■
3	□	
4	□	
5	□	
6	□	
7	□	
8	□	

Address #3

	OFF	ON
1		■
2		■
3	□	
4	□	
5	□	
6	□	
7	□	
8	□	

Address #4

	OFF	ON
1	□	
2	□	
3		■
4	□	
5	□	
6	□	
7	□	
8	□	

Address #5

	OFF	ON
1		■
2	□	
3		■
4	□	
5	□	
6	□	
7	□	
8	□	

Address #6

	OFF	ON
1	□	
2		■
3		■
4	□	
5	□	
6	□	
7	□	
8	□	

Address #7

	OFF	ON
1		■
2		■
3		■
4	□	
5	□	
6	□	
7	□	
8	□	

Address #8

	OFF	ON
1	□	
2	□	
3	□	
4		■
5	□	
6	□	
7	□	
8	□	

Address #9

	OFF	ON
1		■
2	□	
3	□	
4		■
5	□	
6	□	
7	□	
8	□	

Address #10

	OFF	ON
1	□	
2		■
3	□	
4		■
5	□	
6	□	
7	□	
8	□	

Address #11

	OFF	ON
1		■
2		■
3	□	
4		■
5	□	
6	□	
7	□	
8	□	

Address #12

	OFF	ON
1	□	
2	□	
3		■
4		■
5	□	
6	□	
7	□	
8	□	

Address #13

	OFF	ON
1		■
2	□	
3		■
4		■
5	□	
6	□	
7	□	
8	□	

Address #14

	OFF	ON
1	□	
2		■
3		■
4		■
5	□	
6	□	
7	□	
8	□	

Address #15

	OFF	ON
1		■
2		■
3		■
4		■
5	□	
6	□	
7	□	
8	□	

Address #16

	OFF	ON
1	☐	
2	☐	
3	☐	
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #17

	OFF	ON
1		■
2	☐	
3	☐	
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #18

	OFF	ON
1	☐	
2		■
3	☐	
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #19

	OFF	ON
1		■
2		■
3	☐	
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #20

	OFF	ON
1	☐	
2	☐	
3		■
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #21

	OFF	ON
1		■
2	☐	
3		■
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #22

	OFF	ON
1	☐	
2		■
3		■
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #23

	OFF	ON
1		■
2		■
3		■
4	☐	
5		■
6	☐	
7	☐	
8	☐	

Address #24

	OFF	ON
1	☐	
2	☐	
3	☐	
4		■
5		■
6	☐	
7	☐	
8	☐	