

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 protocol
(<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°C

※ "BZ" Option : -40 ~ 40°C

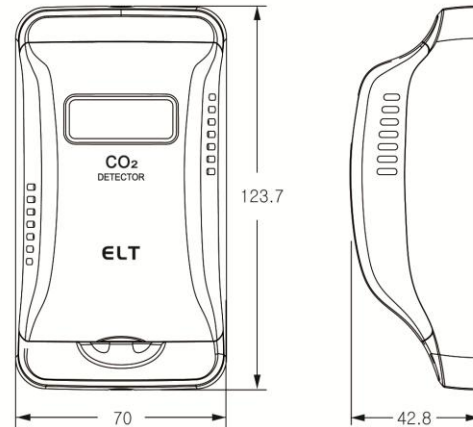
Operating Humidity range

0 ~ 95% RH (Non-condensing)

※ 'G' option : 0 ~ 99% RH (Non-condensing)

Storage Temperature

-30°C ~ 70°C



CO₂ Measurement

Sensing Method

NDIR (Non-dispersive Infrared)

Measurement Range

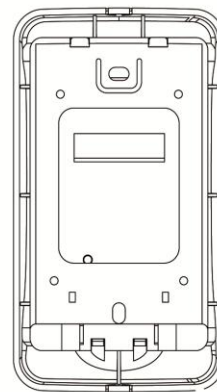
0 to 2,000 / 3,000 / 5,000 / 10,000ppm
(Optional)

Accuracy ±30ppm ±5%

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

Response Time (90%) 150 seconds

Sampling Interval 3 sec.



Wiring Method

[4-wired] 24VAC or 24VDC

Electrical Data

Input Power

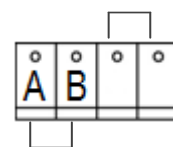
24VAC/24VDC ± 20%, 50/60Hz (4-wired)

Current Consumption

Peak 100mA, Normal 10mA

※ Two times of peak current capacity allocation is recommended.

24VAC/24VDC



RS-485 A/B

PPM Measurement Range

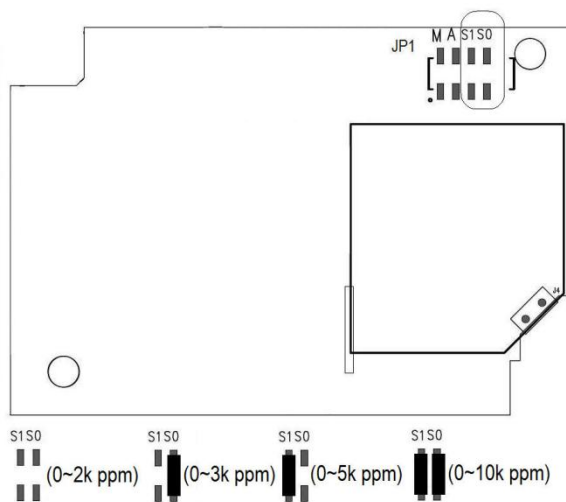
■ JP1 : CO2 Measurement range selection

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.

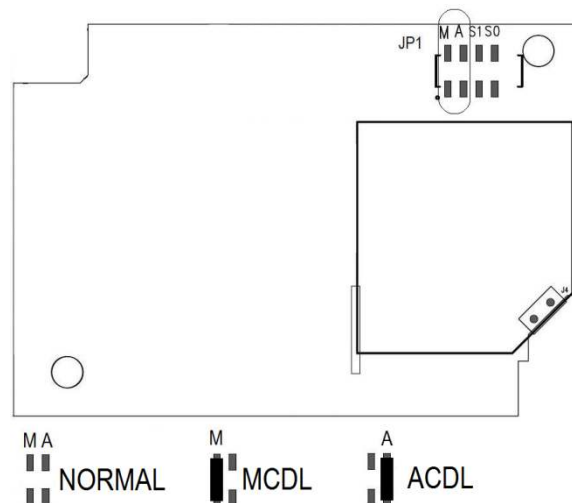
- **Procedures** : Move the switch [No.1] to 'ON' position and wait over 11 minutes in fresh air. After the setting of ambient air-flowing status

● 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

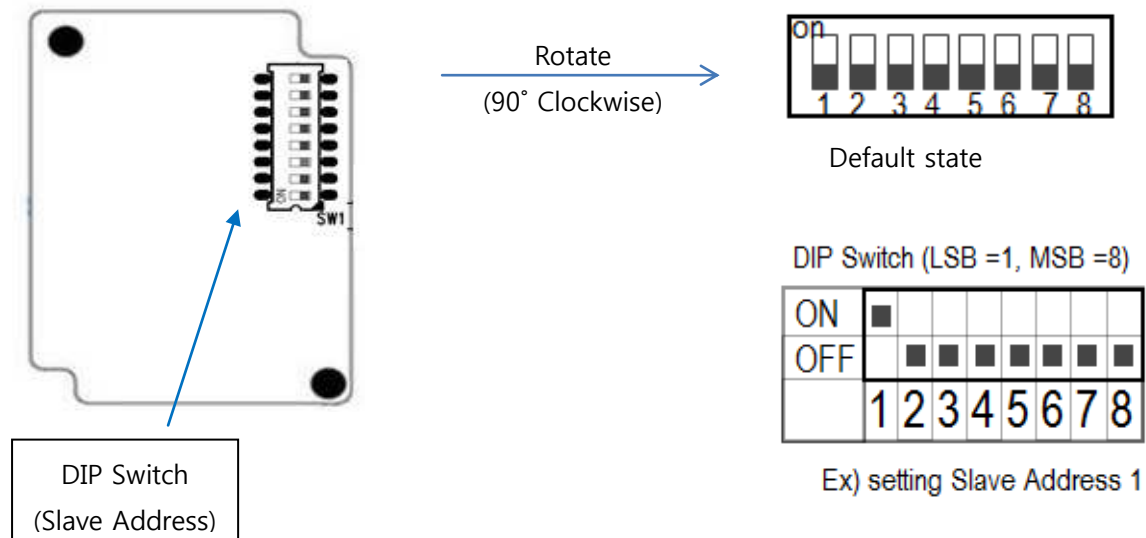
Auto calibration acts first 2days, and every 7 days after power on.



※ 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.



※ 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

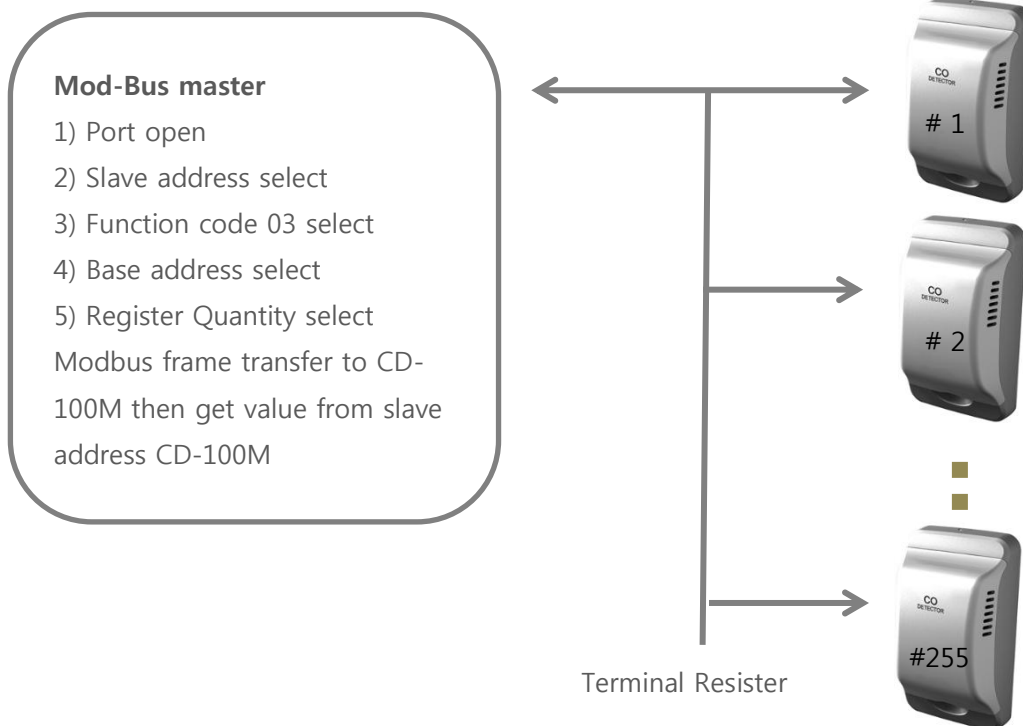
Register Address	Value	Data Type	Unit	Description
0x0050	CO2	2 Byte WORD	PPM	Co2 Ex) 800 -> 800 PPM
0x0051	Reserved	2 Byte WORD	°C	
0x0052	Reserved	2 Byte WORD	%	
0x0053	Reserved	2 Byte WORD		

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



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	<input type="checkbox"/>	1
2	<input type="checkbox"/>	2
3	<input type="checkbox"/>	4
4	<input type="checkbox"/>	8
5	<input type="checkbox"/>	16
6	<input type="checkbox"/>	32
7	<input type="checkbox"/>	64
8	<input type="checkbox"/>	128

1. DIP SWITCH Address Settings

Address #1

	OFF	ON
1		■
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #2

	OFF	ON
1	<input type="checkbox"/>	
2		■
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #4

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3		■
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #8

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #16

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5		■
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #32

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6		■
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #64

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7		<input checked="" type="checkbox"/>
8	<input type="checkbox"/>	

Address #128

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8		<input checked="" type="checkbox"/>

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

Address #1

	OFF	ON
1		<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #2

	OFF	ON
1	<input type="checkbox"/>	
2		<input checked="" type="checkbox"/>
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #3

	OFF	ON
1		<input checked="" type="checkbox"/>
2		<input checked="" type="checkbox"/>
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #4

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3		<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #5

	OFF	ON
1		<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	
3		<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #6

	OFF	ON
1	<input type="checkbox"/>	
2		<input checked="" type="checkbox"/>
3		<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #7

	OFF	ON
1		■
2		■
3		■
4	<input type="checkbox"/>	
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #8

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #9

	OFF	ON
1		■
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #10

	OFF	ON
1	<input type="checkbox"/>	
2		■
3	<input type="checkbox"/>	
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #11

	OFF	ON
1		■
2		■
3	<input type="checkbox"/>	
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #12

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3		■
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #13

	OFF	ON
1		■
2	<input type="checkbox"/>	
3		■
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #14

	OFF	ON
1	<input type="checkbox"/>	
2		■
3		■
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #15

	OFF	ON
1		■
2		■
3		■
4		■
5	<input type="checkbox"/>	
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #16

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #17

	OFF	ON
1		<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #18

	OFF	ON
1	<input type="checkbox"/>	
2		<input checked="" type="checkbox"/>
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #19

	OFF	ON
1		<input checked="" type="checkbox"/>
2		<input checked="" type="checkbox"/>
3	<input type="checkbox"/>	
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #20

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3		<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #21

	OFF	ON
1		<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	
3		<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #22

	OFF	ON
1	<input type="checkbox"/>	
2		<input checked="" type="checkbox"/>
3		<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #23

	OFF	ON
1		<input checked="" type="checkbox"/>
2		<input checked="" type="checkbox"/>
3		<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	

Address #24

	OFF	ON
1	<input type="checkbox"/>	
2	<input type="checkbox"/>	
3	<input type="checkbox"/>	
4		<input checked="" type="checkbox"/>
5		<input checked="" type="checkbox"/>
6	<input type="checkbox"/>	
7	<input type="checkbox"/>	
8	<input type="checkbox"/>	