

## The way to communicate with a module (RS485)

RS485 support model : SEN CO2 HC K 100 und SEN CO2 HC E 100

### ■ ASCII method

#### ⊙ Hyper Terminal Setting

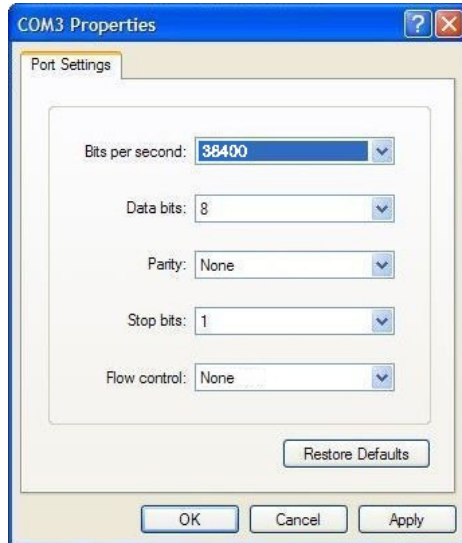
1. Check driver installation status of RS485 converter.  
(ex.CP210x USB to UART Bridge Controller )
2. Check Port number. (ex.COM3)  
Start>Control Panel>System>Hardware>Device manager>Ports(Com&Lpt)
3. Open up HyperTerminal and set as below.
  - 1) Start> Programs> Accessories > Communications > HyperTerminal
  - 2) Type in a desired name and push OK. The icon does not matter.



- 3) Select a COM port and push OK.



4) In the COM properties, select the options as below.



**Bits per second : 115,200**  
Data bits : 8  
**Parity : EVEN**  
Stop bits : 1  
Flow control : None

⊙ **Check communication status**

Press **#+ENTER**. If it shows 'DISPLAY STOP', it operates normally.

⊙ **Command Table**

COMMAND (CR=Carrige Return(0x0D))	FUNCTION
#2 +CR	Module Information
#10 +CR	Display CO2
#20,CO2(ppm) +CR	Calibration
#33 +CR	Setting manual
#32 +CR	Show setting value
#31,1,Range_code,2,ABC +CR	Setting
#30,** +CR	Range 5%:5, 10%:10, 20%:20

'**+CR**' is to press 'Enter' key on a keyboard.

(Remark) The contents of table can differ depending on models.

You can see contents by inputting **#33 +CR**.

⊙ **To get information of a module**

**#2 +CR** → co2 sensor module  
Ver B (Build 0001)

⊙ **To get current measured value**

**#10 +CR** → #\*\*\*\*

If the measuring range of a module is 10%,  
the displayed figures (\*\*\*) are 1/10 of real current measured value.

If the measuring range of a module is 20%,  
the displayed figures (\*\*\*) are 1/100 of real current measured value.

⊙ **To change current value into other value(\*\*\*)**

#20,\*\*\* +CR (no space between #20 and \*\*\*)

(Remark) \*\*\* value is CO2 concentration you want at ppm unit regardless of measuring ranges.

Do Not change arbitrarily without put in standard gas to a module.

⊙ **To show a manual related setting of a module's functions (It can differ depending on models.)**

#33 +CR

Sensor Type Select -> 0. PerkinElmer 1. Heimann

Output Type Select ->

0. 0V ~ 5V Voltage Output

1. 1V ~ 5V Voltage Output

2. 0V ~ 4V Voltage Output

Lamp Period Select ->

0. 6sec(1sec On,5sec Off)

1. 3sec(0.75sec On,2.25sec Off)

2. 1.5sec(0.5sec On,1sec Off)

3. 0.75sec(0.25sec On,0.5sec Off)

CO2 output mode Select ->

0. 1% mode

1. 10% mode [/10]

\*\*OUTPUT RANGE(command #30) -> 1~20 [11~20:/10]

(Remark) It can be needed re-calibration when you change it arbitrarily. It can differ depending on models.

⊙ **To show current setting of a module**

#32 +CR

Sens Outp Lamp

#0001,0000,0003,0001,(0010)

①, ②, ③, ④, ⑤

① sensor type : 1(default)

② Output Type Select : 0, 3 - exception

③ Lamp Period Select : 2

④ Output Mode Select (Wave Guide Range)

⑤ Output Range (command #30)

(Remark) If the measuring range of a module is 10%,

the displayed figures (\*\*\*) are 1/10 of real current measured value.

If the measuring range of a module is over 10%,

the displayed figures (\*\*\*) are 1/100 of real current measured value.

⊙ **To change setting value of a module**

#31,1,1,2,0 +CR

Refer to explanation of '#33 and #32' . To change it arbitrarily causes defect.

⊙ To change 'measuring range' of a module into 20% range

#30,20 +CR

The result will be displayed '0020'.

■ **BINARY method**

⊙ **Communication between devices by Hexadecimal(HEX)**

1) To request data transfer from MASTER to SLAVE

Ex) To request data transfer of ID 31

03 1F 06 0A 32 04

2) Commands for setting or changing ID status from MASTER to SLAVE

Ex) To change ID from 31 to 1

03 1F 08 3A 01 00 65 04

Ex) To change ID from 1 to 31

03 01 08 3A 1F 00 65 04

3) Commands for setting or changing Output mode from MASTER to SLAVE

Ex) To change ID 31 to Voltage output mode

03 1F 08 3B 00 00 66 04

Ex) To change ID 31 to Current output mode

03 1F 08 3B 01 00 66 04

⊙ **Communication types from MASTER to SLAVE**

1) Commands for transferring data from MASTER to SLAVE

Type 1	STX	ID	LENGTH	COMMAND	CHECKSUM	ETX
BYTE	1	1	1	1	1	1
Remark	COMMAND 0X0A(exclusive use)					

2) Commands for setting or changing ID or output modes from MASTER to SLAVE

Type 2	STX	ID	LENGTH	COMMAND	DATA	CHECKSUM	ETX
BYTE	1	1	1	2	2	1	1
Remark	All change commands except for COMMAND 0X0A						

Rounding off numbers over 0XFF after sum CHECKSUM

Ex) 01FF → FF, FFFF → FF

■ **Cautions**

1) Check communication ports for RS485 : RS485A, RS485B

2) Check Baudrate parity.

3) Check default ID (Binary communication)

4) Check voltage and current spec. It can differ depending on models.

5) To change internal impedance can be needed depending on RS485 converters on the market.