

VC08F/T-485 Modbus Communication Protocol

Thank you for choosing our product! Please take note the followings before powering up the sensor.

Introduction:

The VC08F/T-RS485 is designed for measuring the ambient carbon dioxide concentration and provide measurement information for monitoring or control. The state-of-the-art NDIR sensing technology ensures accurate and stable measurements. It is perfect for building climate control, greenhouse, mushroom farming and other processes where CO2 measurement and control would be required. By controlling the ventilation of an air-conditioned space based on actual demand, it helps to balance between energy consumption and indoor air quality.

Wiring connection:

Terminal	Description
G+	Power Supply +24V ac or dc
G0	Power supply ground, GND
M	System Ground for RS485 cable shielding
B	RS485 data (-)
A	RS485 data (+)

Note : In order to avoid any sensor damage or hazard, do not power the sensor when wiring.

Sensor ID:

The default sensor ID or sensor address is **104**. When there would be more than one sensor on the same RS485 network, make sure that the sensor IDs are changed such that each sensor has its unique sensor ID or address.

Changing sensor ID:

The sequence should be as follows:

1. Write new address
Master send: <FE> <41> <00> <20> <01> <New Modbus address> <crc> <crc>
Sensor reply: <FE> <41> <crc> <crc>
2. Write "Copy to EEPROM"
Master send: <FE> <41> <00> <60> <01> <02> <crc> <crc>
Sensor reply: <FE> <41> <crc> <crc>
3. Reset sensor
Master send: <FE> <41> <00> <60> <01> <FF> <crc> <crc>
Sensor reply: <FE> <41> <crc> <crc>

Note that:

1. <FE> is a broadcast address command and only be used when RS485 network has only one VC08F-RS485. The broadcast address (<FE>) can also be replaced with the particular sensor ID to be changed.
2. The sensor ID can also be changed with SenseAir UIP software. Please refer to UIP5 for further details.

CO2 read sequence:

The sensor is addressed as "Any address" (0xFE). For specific address, <FE> should be changed to the sensor ID and the CRC should be changed accordingly.

Master send: <FE> <04> <00> <03> <00> <01> <D5> <C5>

Sensor reply: <FE> <04> <02> <CO2_H> <CO2_L> <crc> <crc>

Disable ABC function:

For installation space that does not stabilize at fresh-air background CO2 level, the ABC function should be disabled. We can do this by setting ABC_PERIOD to 0.

Master send: <FE> <06> <00> <1F> <00> <00> <AC> <03>

Sensor reply: <FE> <06> <00> <1F> <00> <00> <AC> <03>

Enable ABC function:

We can enable the ABC function by setting ABC_PERIOD to some value other than 0. In this example, we set it to 7.5 days.

Master send: <FE> <06> <00> <1F> <00> <B4> <AC> <74>

Sensor reply: <FE> <06> <00> <1F> <00> <B4> <AC> <74>

Background calibration sequence:

The sequence to perform a background calibration by issuing commands is as follows;

a) Clear acknowledgement in holding register

Master send: <FE> <06> <00> <00> <00> <00> <9D> <C5>

Sensor reply: <FE> <06> <00> <00> <00> <00> <9D> <C5>

b) Write command to start background calibration.

Master send: <FE> <06> <00> <01> <7C> <06> <6C> <C7>

Sensor reply: <FE> <06> <00> <01> <7C> <06> <6C> <C7>

c) Wait at least 2 seconds for standard sensor with 2 sec lamp cycle.

d) Read acknowledgement register.

Master send: <FE> <03> <00> <00> <00> <01> <90> <05>

Sensor reply: <FE> <03> <02> <00> <20> <AD> <88>