

Modbus Gateway Operation Manual

Applicable models: CCM-18A/N-U

Thank you very much for purchasing our product.
Before using your unit, please read this manual carefully and keep it for future reference.

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1. Safety precautions

The following contents are stated on the product and the operation manual, including usage, precautions against personal harm and property loss, and the methods of using the product correctly and safely. After fully understanding the following contents (identifiers and icons), read the text body and observe the following rules.


■ Identifier description


Identifier	Meaning
 Warning	Means improper handling may lead to personal death or severe injury.
 Caution	Means improper handling may lead to personal injury or property loss.
[Note]: 1. "Harm" means injury, burn and electric shock which need long-term treatment but need no hospitalization 2. "Property loss" means loss of properties and materials.	

■ Icon description

Icon	Meaning
	It indicates forbidding. The forbidden subject-matter is indicated in the icon or by images or characters aside.
	It indicates compulsory implementation. The compulsory subject-matter is indicated in the icon or by images or characters aside.

Warning

 Warning	Delegate installation	Please entrust the distributor or professionals to install the unit. The installers must have the relevant know-how. Improper installation performed by the user without permission may cause fire, electric shock, personal injury or water leakage.
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 Usage Warning	Forbid	Do not spray flammable aerosol to it directly. Otherwise, fire may occur.
	Forbid	Do not operate with wet hands or let water enter it. Otherwise, electric shock may occur.

2 Overview

2.1 Instruction

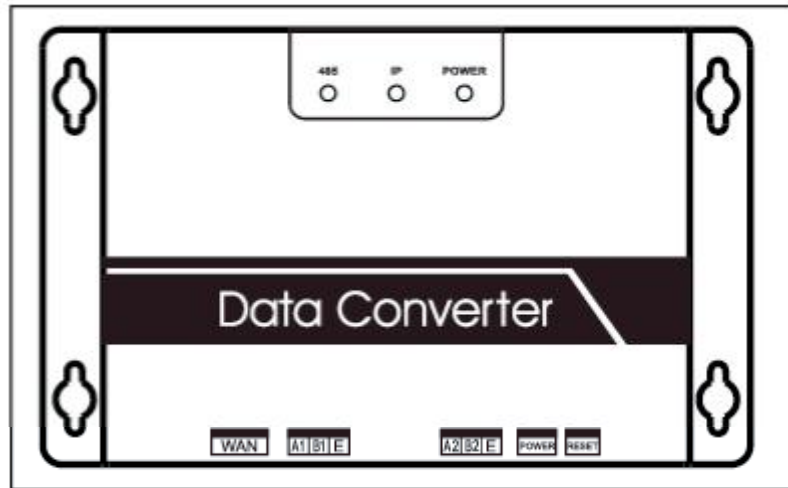


Fig.2.1

WAN terminal: Connect to the switch by 5 kinds of network cables to ensure that PC can access to the web page of it.

A1B1E terminal: Connect to the indoor unit

A2B2E terminal: Connect to the terminal serial port.

2.2 System Architecture Description

The system can access 16 indoor machine (address is 0 # to 15 #), the upper computer system with Modbus protocol access to terminal A2B2E by RTU or by TCP to connect to modbus gateway. See the connection figure between modbus gateway and air-conditioner system below:

Connection through Modbus TCP:

Note: XYE ports access by means of series hand in hand to the gateway A1B1E port

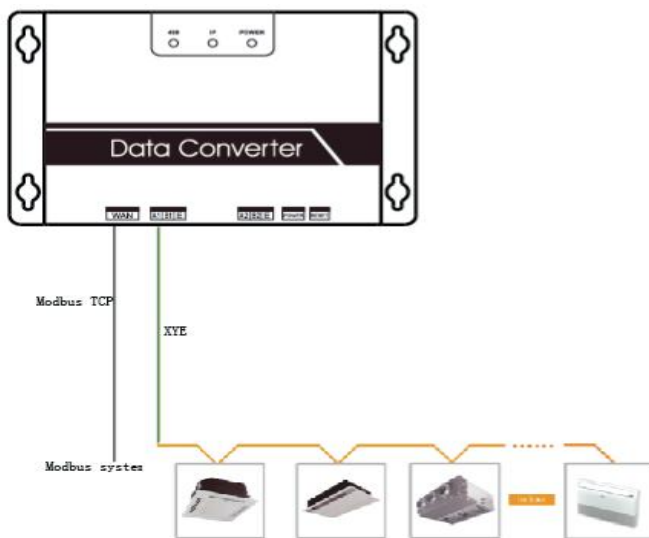


Fig.2.2

Connection through Modbus RTU:

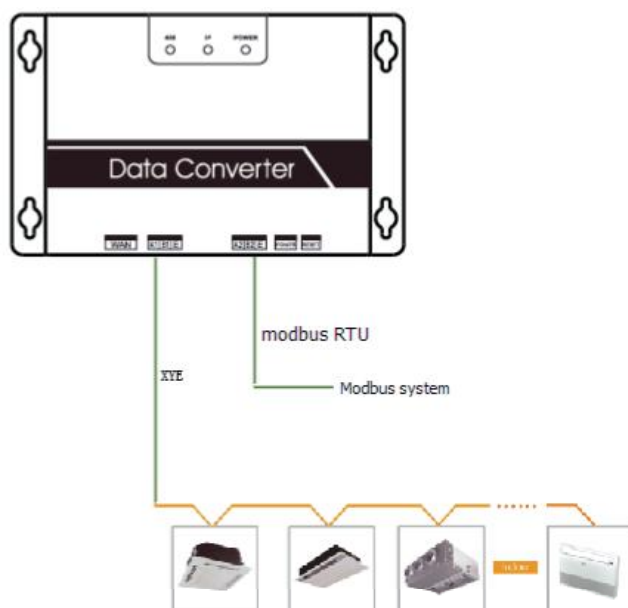


Fig.2.3

2.3 Function Code

Function code	Function name	Function
0x01	Read Coils	Read
0x04	Read Input Register	Read
0x10	Write Holding Register	Write

2.4 Abnormal Reply

The master unit sends requests and waits for reply from the slave. When there's no error occurs, the slave will reply normally, but when there's data checking error, the slave won't answer. When the master unit sends wrong data (except for checking error), the slave will answer abnormally.

Code	Name	Meaning
0x01	Illegal function code	Function code received by the slave can't be executed.
0x02	Illegal data address	The received data address is not allowed.
0x03	Illegal data	Value in query data field is not allowed by the slave
0x06	Slave busy	The slave is busy with a long-time program command. Ask the master to send messages when the slave is free.

3 Usage Introduction

3.1 IP Configuration

The default IP address is 192.168.1.200 when modbus gateway leaves the factory.

The PC used for visiting websites must be in the same subnet segment with modbus gateway, which means it should be 192.168.1.xx (xx is from 2 to 254).

There are 2 ways to configure IP: static configuration and multi-IP addition

3.1.1 Single IP Configuration

Open protocol dialog, configure the IP address and subnet mask, for example: IP: 192.168.1.211, subnet mask 255.255.255.0

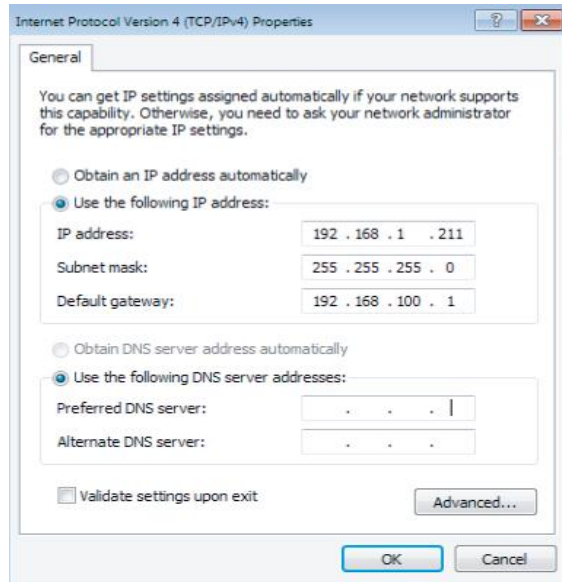


Fig.3.1

After setting, click "OK" button.

3.1.2 Multi-IP Addition

Configure a static IP address before adding multiple IP.

Open protocol dialog and choose Advanced tab. TCP/IP setting dialog will display like below:

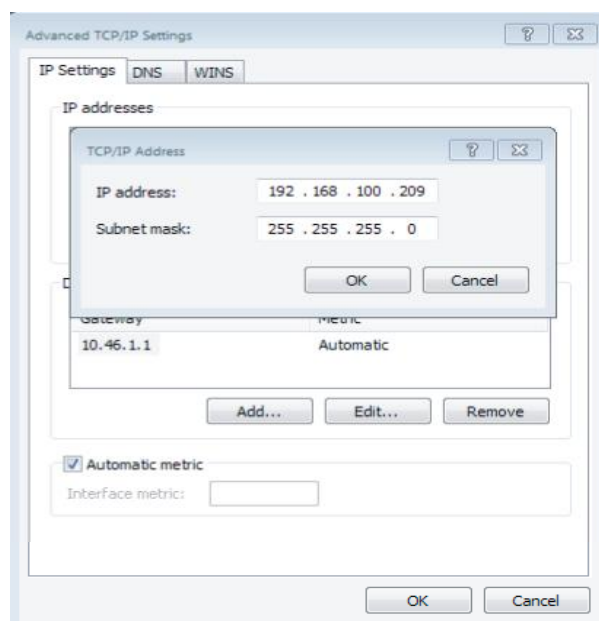


Fig.3.2

Click “Add” in IP address bar to add an IP address which is in the same segment as “192.168.1.200”, e.g., IP: 192.168.1.209, subnet mask 255.255.255.0, and click “OK”

3.2 Configuration

Input http://192.168.1.200 in the address bar in IE (suggest to use IE). Choose “Configuration” when web page of modbus gateway displays, as shown below:

Modbus Address 1

Modbus Commu. Setting 9600 None-无校验 1 StopBi

IP Address 192.168.1.200

Netmask 255.255.255.0

Gateway 192.168.1.1

Setting successful!

Get Setting Apply Setting

Fig.3.3

Parameters Setting:

Parameter	Description
Modbus address	Modbus ID, to distinguish modbus gateway with multiple Modbus protocols in the same subnet. Don't repeat the address.
Modbus commu- nication setting	Baud rate: suggest 9600; Check bit: no checking by default Stop bit: 1StopBit by default
IP address	IP address of modbus gateway, multiple IPs can't be the same.
Subnet Mask	Default: 255.255.255.0
Gateway	Local gateway address

Click “Apply Setting” after changing the corresponding parameters. Click “Get Settings” when apply the new settings. Modbus gateway will restart automatically after changing settings, the network will break and reconnect.

3.3 Air Conditioner Information Query

Choose “Coil Outputs” or “Input Registers” in the web page to read information of the air conditioner unit.
When choose “Coil Outputs” it will be like the picture below.

Welcome to MDV Modbus Gateway System											
Coil Outputs				Input Registers				Airconditions			
0	1	2	3	4	5	6	7	8	9	10	11
								28	Change air	<input type="radio"/>	
1	Fan-mode	<input type="radio"/>						29	Cleaner	<input type="radio"/>	
2	Dry-mode	<input type="radio"/>						30	Humidify	<input type="radio"/>	
3	Heat-mode	<input checked="" type="radio"/>						31	Add Oxygen	<input type="radio"/>	
4	Cool-mode	<input type="radio"/>						32	Dryer	<input type="radio"/>	
5	Auto-mode	<input type="radio"/>						33	Horizontal sway	<input type="radio"/>	
6	Mode-lock	<input type="radio"/>						34	Add water	<input type="radio"/>	
7	--	<input type="radio"/>						35	Pump	<input type="radio"/>	
8	On/Off	<input checked="" type="radio"/>						36	--	<input type="radio"/>	
9	High-fan	<input type="radio"/>						37	Lock cool	<input type="radio"/>	
10	Medium-fan	<input type="radio"/>						38	Lock heat	<input type="radio"/>	
11	Low-fan	<input type="radio"/>						39	Lock-center-ctrl	<input type="radio"/>	
12	Breeze-fan	<input type="radio"/>						40	Lock-remote-ctrl	<input type="radio"/>	
13	--	<input type="radio"/>						41	E0 Phase error	<input type="radio"/>	
14	--	<input type="radio"/>						42	E1 Commu.error	<input type="radio"/>	
15	--	<input type="radio"/>						43	E2 T1 sensor error	<input type="radio"/>	

Fig.3.4

When click the address number of the indoor unit, it will show corresponding operation information of the air conditioner.
When click “input registers”, the interface will be like this:

Airconditioner Control: 0#

RUN MODE	COOL	HEAT	AUTO
FAN SPEED	HIGH	MEDIUM	LOW
SET TEMP.	17℃	18℃	19℃
	21℃	22℃	23℃
	25℃	26℃	27℃
	29℃	30℃	

System Control

MODE	COOL, 17℃, LOW FAN	COOL, 24℃, MEDIUM FAN
MODE	HEAT, 30℃, HIGH FAN	HEAT, 26℃, MEDIUM FAN

Fig.3.6

Single air conditioner control area: control the single air conditioner. Choose a single air conditioner and set mode, wind speed and temperature.

Single control area: to choose a single air conditioner, set mode, wind speed, temperature and click "Apply" to carry out a single controlling function.

Group control area: to choose the corresponding group control button and carry out group controlling. All the indoor units under the control of modbus gateway carry out this operation.

3.4 Upper Computer Access

3.4.1 Upper Computer Access Mode

Upper computer system with Modbus protocol port can communicate with modbus gateway through Modbus TCP or Modbus RTU. For detailed information, please refer to Fig .2.2 and Fig. 2.3.

3.4.2 Access to Debug

Via Modbus Poll software to access debugging. Here is the debug procedure:

3.4.2.1 Install Modbus Poll software

When finish installing Modbus Poll software, the home page will display like this:

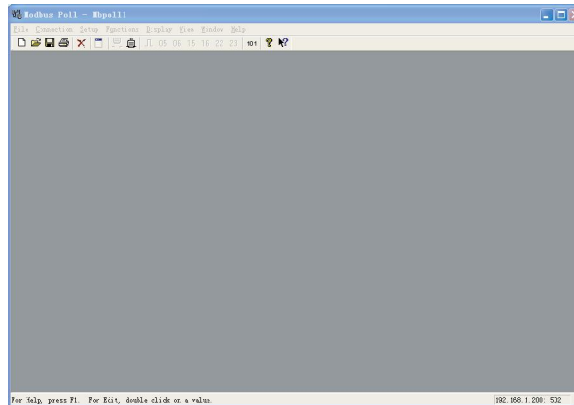


Fig.3.7

3.4.2.2 Connect Modbus Gateway

There're 2 connection ways: Modbus TCP and Modbus RTU

1) Choose "Connection" -> "Connection" in figure 3.7, and then chose TCP/IP in the pop-up window:

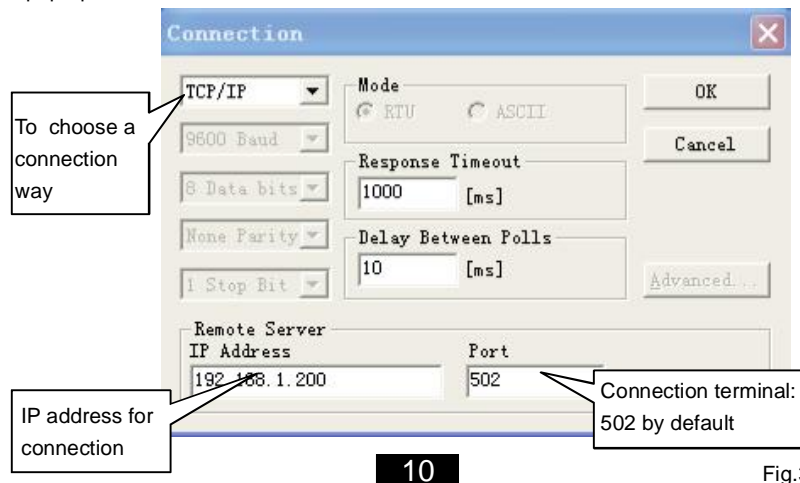


Fig.3.8

Click "OK" when finish setting.

2) Connection through Modbus/RTU

Choose RTU to connect, as shown below:

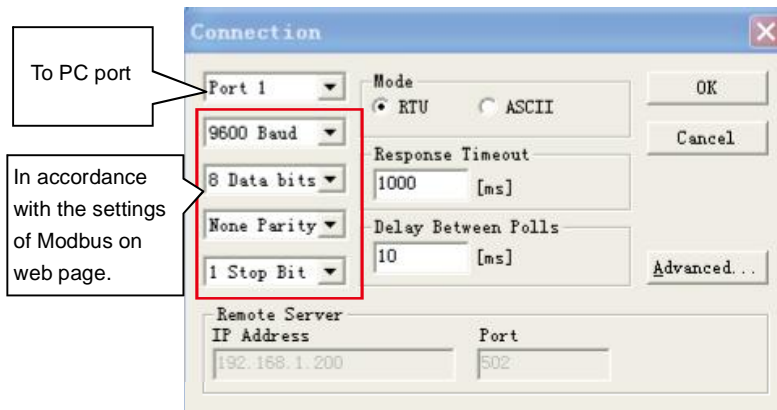


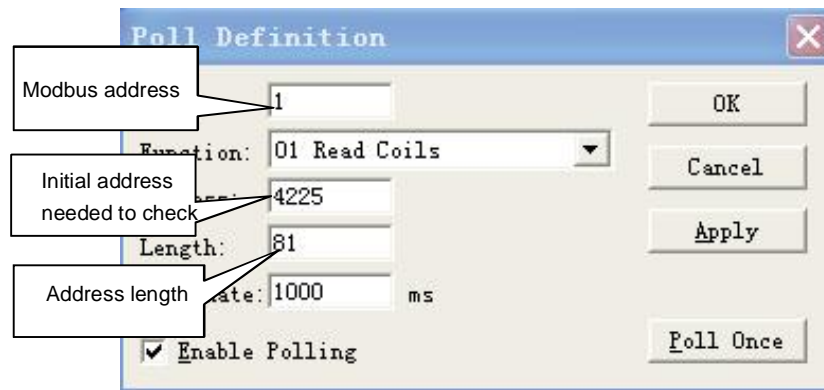
Fig.3.9

3.4.2.3 Test

Modbus Poll software can read/write the content of corresponding address in mapping table.

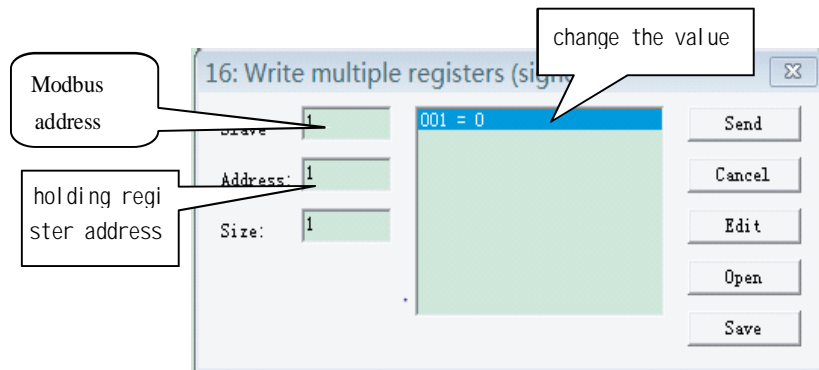
Take reading coil content for an example:

Choose "Poll Definition" under "Setup"



Click the "OK" button and it will display the content. If the content is the same as the value of the web page which has the same address, it means that the software debugging success.

Take writing holding register for example:
 Choose button 16 in Fig.3.7,as shown below:



After changed the value,click "send" button to finish the writing operation.

4 Software Reset

Press "RESET" button on the gateway for 3 seconds and power on again, the software configuration will be back to the original setting.

5 Appendix 《Mapping Table》