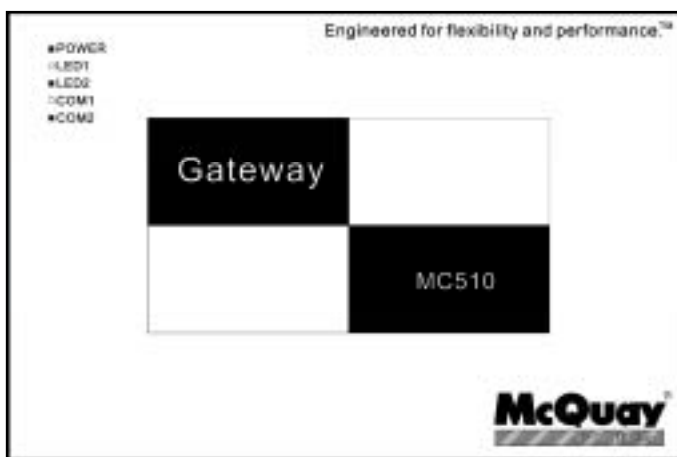


OPERATION MANUAL 使用说明书

MC510 Gateway

MC510 网关



使用此网关之前请仔细阅读此说明书，并妥善保管

Please read the User Manual before operating the gateway and keep it for any further study

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MC510-0704-A1

M08019000026

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1 简介

MC510网关能够协调McQuay MDS机组控制系统和基于ModBus通讯协议的通讯系统间的通讯。网关能够自动把McQuay的机组内部通讯协议转换成ModBus通讯协议，确保MDS机组和基于ModBus通讯协议的BAS系统相连接，我们这里所指的ModBus通讯协议是一个公开出版的官方文本：

Modicon ModBus Protocol

Reference Guide

March 1992, PI-MBUS-300Rev.D

我们所用的协议是基于RTU格式。

2 LED 的说明

- “ POWER ” 指示灯，当有电源时指示灯亮。
- “ LED1 ” 指示灯（保留）
- “ LED2 ” 指示灯（保留）
- “ COM1 ” 指示灯，当 MC510 与 BAS 系统通讯时，“ COM1 ” 指示灯闪烁。
- “ COM2 ” 指示灯，当 MC510 与外机通讯时，“ COM2 ” 指示灯闪烁。

3 安装注意事项

3.1 网关带电时，不能对其操作。

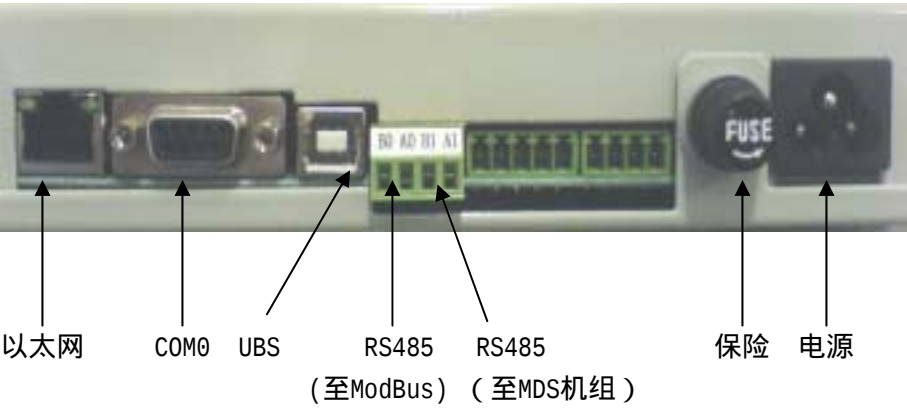
3.2 不能把网关安装在变压器电缆、电磁波源附近、强电附近。 操作内部跳线时,手不能接触电子元件，避免因放电而引起元件的无法恢复的损坏。

4 电源

网关的主板允许使用的电源范围是：100Vac——240Vac ， 50/60Hz。

保险丝额定电流为250mA。

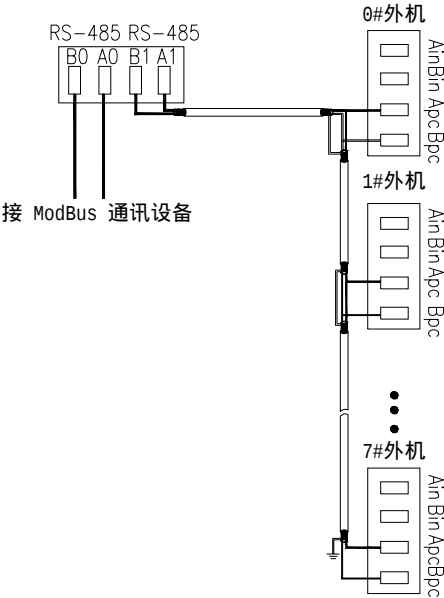
5 MC510 网关的端口配置



6 MC510 网关的接线

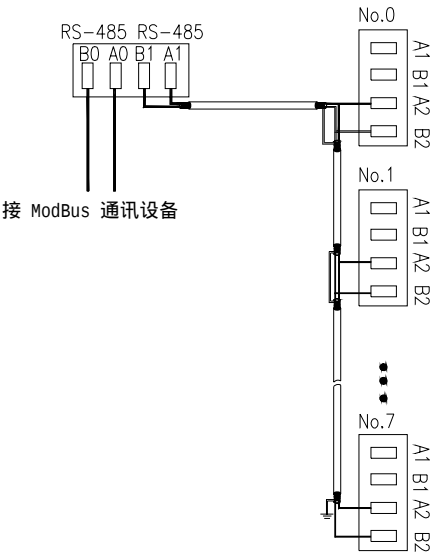
一个 MC510 网关最多允许接 8 台 MDS 机组或 MC501_B 转换器。

6.1 网关与 MDS 外机接线示意图如下：



网关与 MDS 外机的联接

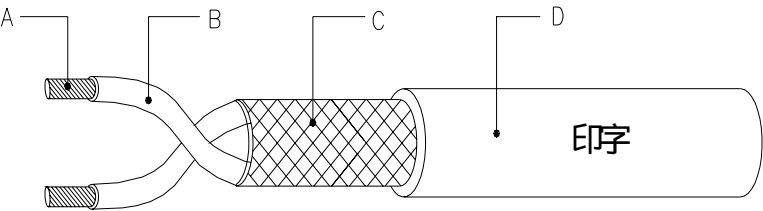
6.2 510 网关与 MC501_B 转换器接线示意图如下：



网关与 MC501_B 控制器的联接

7 屏蔽双绞线的要求

屏蔽双绞线图例



7.1 网络连接线如上图所示：

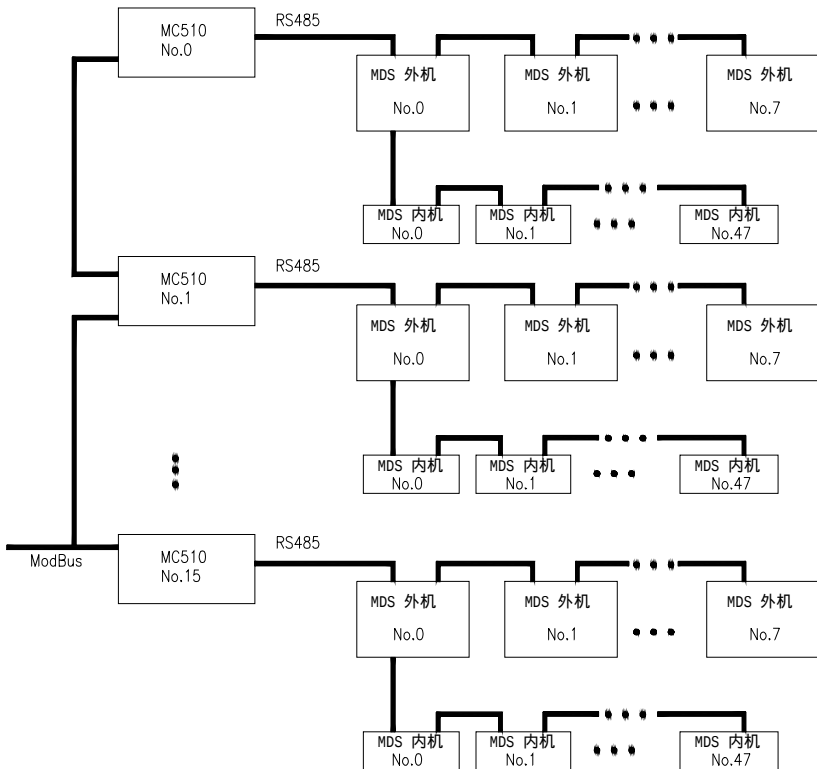
- A：导体（镀锡铜线绞制，横截面积至少 0.5mm^2 或 20AWG）
- B：绝缘体
- C：屏蔽层（镀锡铜线缠绕或编织，屏蔽率至少 95%以上）
- D：外护套（PVC）

7.2 说明：

- A. 尽可能选择屏蔽层紧密，导线绞距小的网络连接线。
- B. 可参考使用 UL2547 或 UL2791 电线标准。
- C. 每段电缆加起来的总长度 ≤ 1000 米。

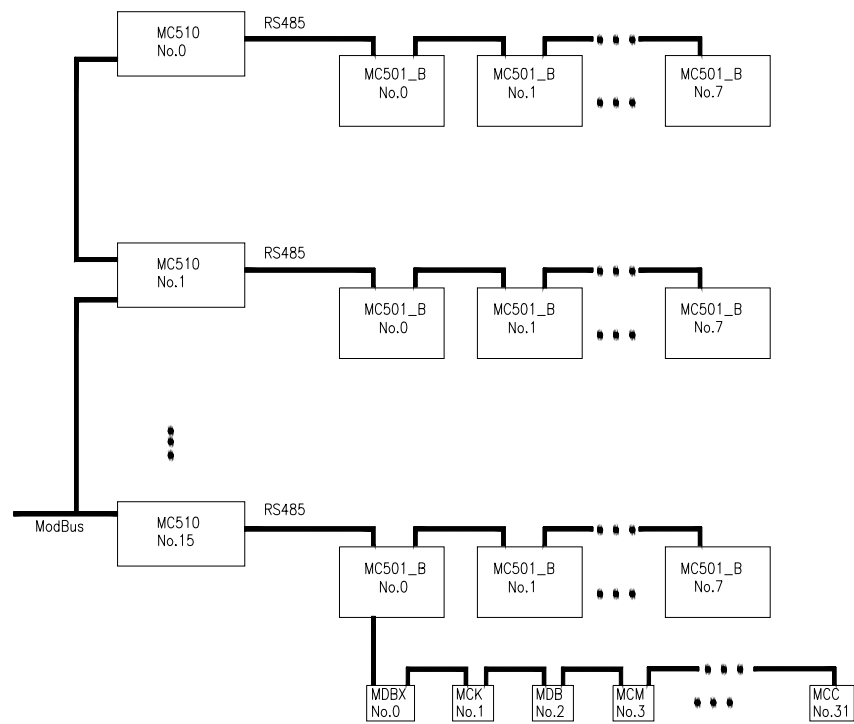
8 MC510 与 McQuay 空调应用示例

8.1 MC510 网关与 MDS 机组



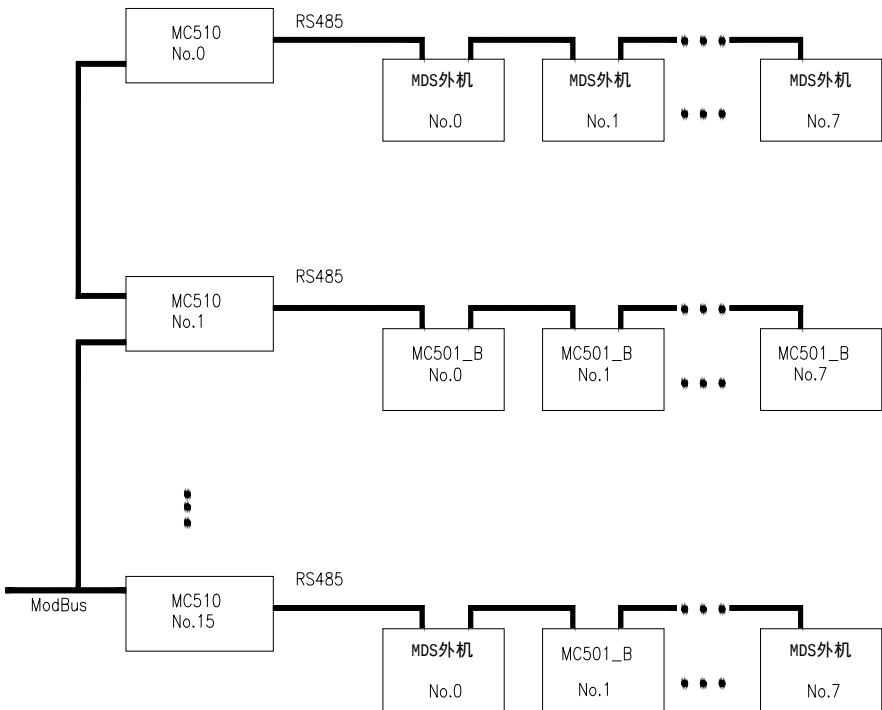
应用示例 1: MC510 与 MDS 机组

8.2 MC510 网关与 MC501_B 转换器



应用示例 2：MC510 与 MC501_B 转换器

8.3 MDS 外机与 MC501_B 转换器的混接



应用示例 3:MDS 机组与 MC501_B 的混接

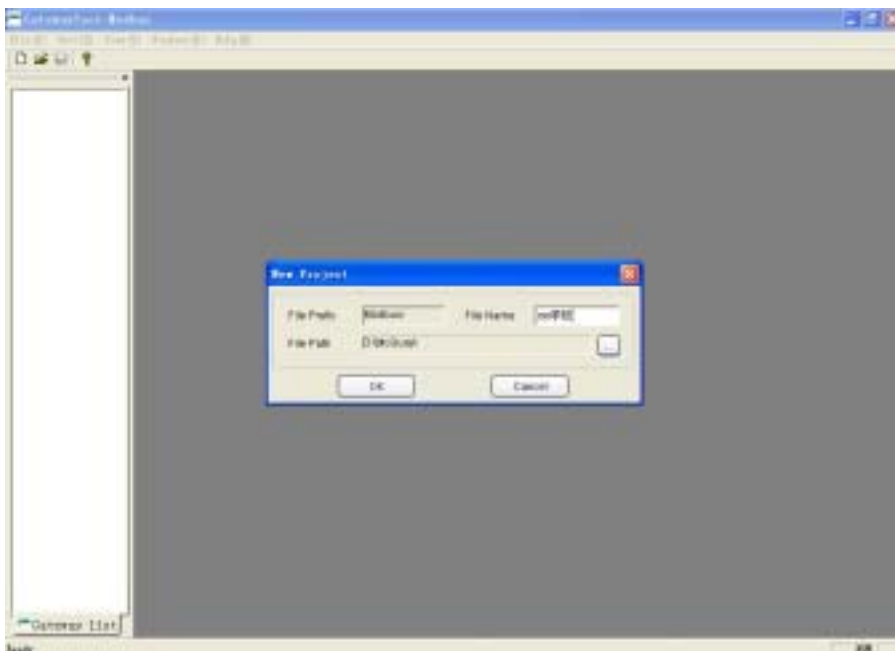
目前 MC510 网关最大支持 8 台 MDS 外机或 MC501_B 转换器，而一个 ModBus 总线系统能与最多 16 台 MC510 网关相接，若数量超出范围，另架设一 ModBus 通道即可。

9 MC510 网关设置

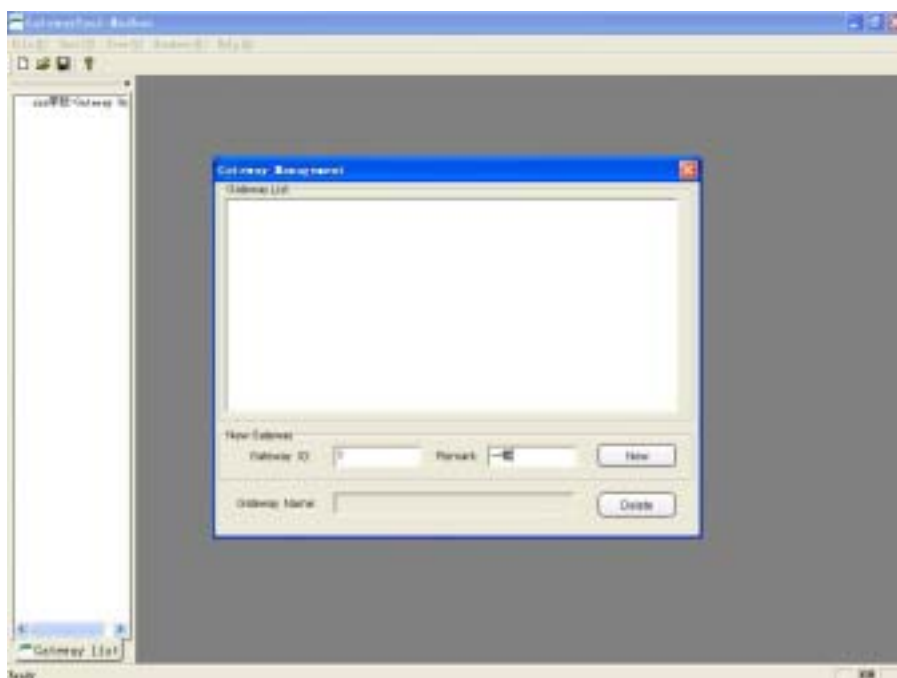
网关设置步骤：

9.1 用一根网线将 PC 机网卡和网关的以太网端口相连接，接上电源并上电。

9.2 解压 GateWay 配置软件包，无需安装。运行“GateWayTool”程序，选择菜单 File → New 创建一新的项目，输入项目文件名并选择合适目录。界面如下图所示：

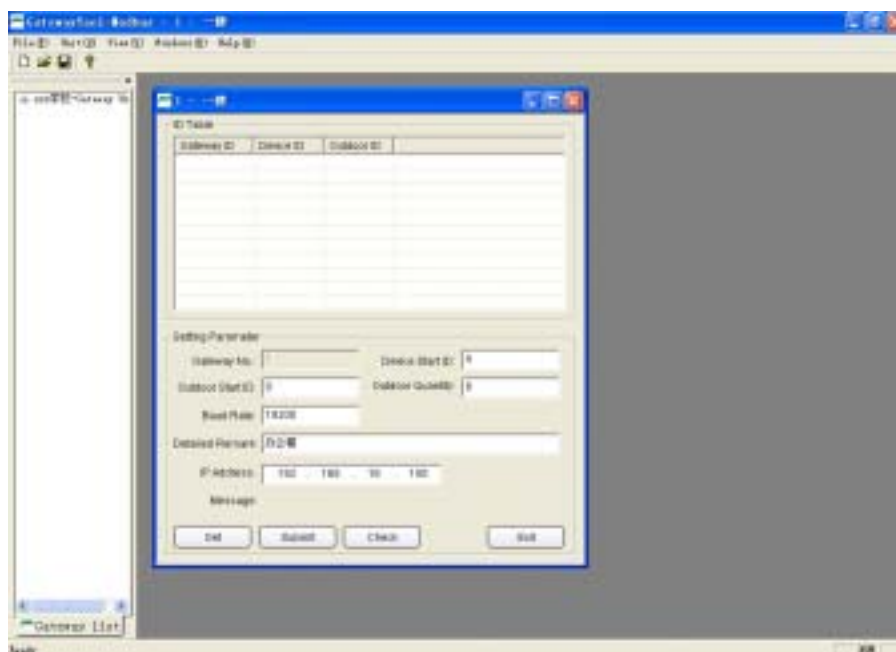


9.3 选择菜单 Unit→Unit Manage 进入单元管理界面，如图所示：

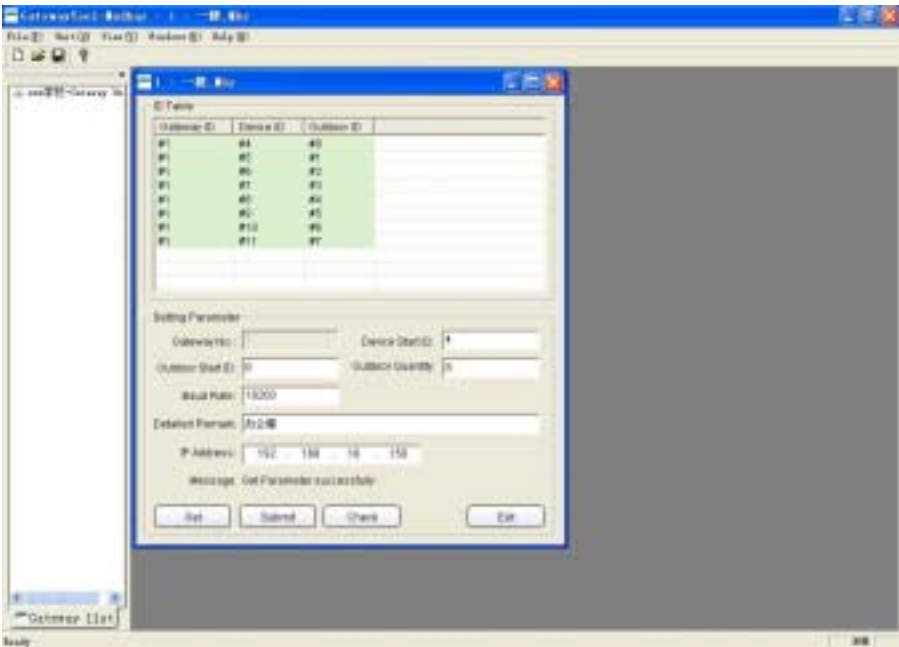


其中默认网关 ID 从 1 开始 ,可在“ Remark ”栏内加入注释。选择“ New ”按钮即可开始创建 1 号网关参数 ;“ Delete ”为删除列表内已选择的网关。

9.4 进入网关设置界面 ,如下图所示 :



设置参数前需先将用户 PC 机的 IP 与网关默认 IP(192.168.16.150) 设置为同一网段，即用户 PC 机的 IP 需设置为 192.168.16.x ，设置好 IP 后先选择“ Get ”按钮，即可获得网关内的默认参数设置，如下图示：



其中“Gateway ID”为当前设置的网关编号，“Device ID”为 ModBus 总线的设备地址号，“Outdoor ID”为外机地址。

9.5 修改具体参数，

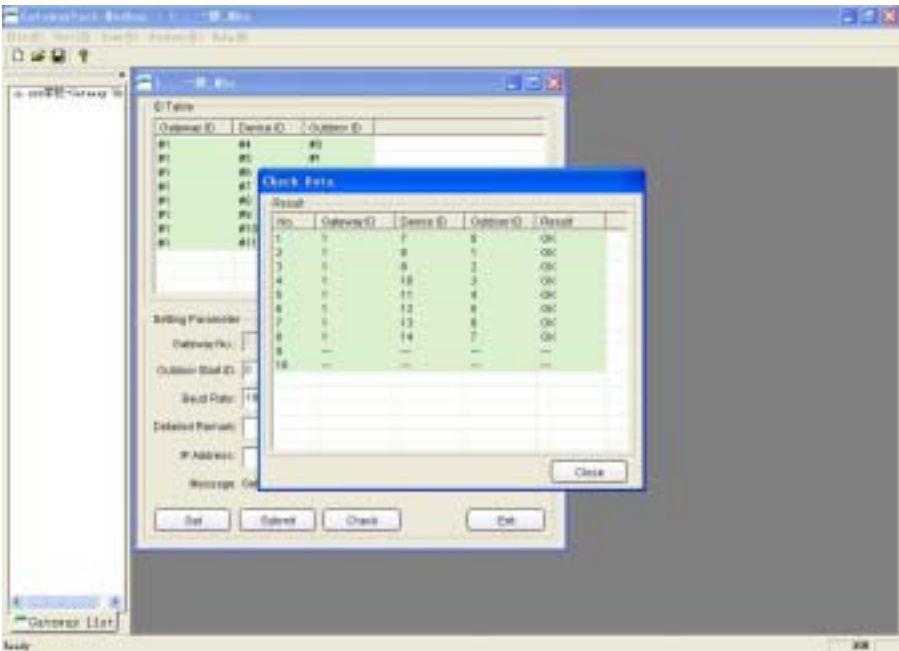
“Device Start ID” ModBus 总线设备起始地址

“Outdoor Start ID” 外机（或 MC501_B）起始地址（默认为 0）

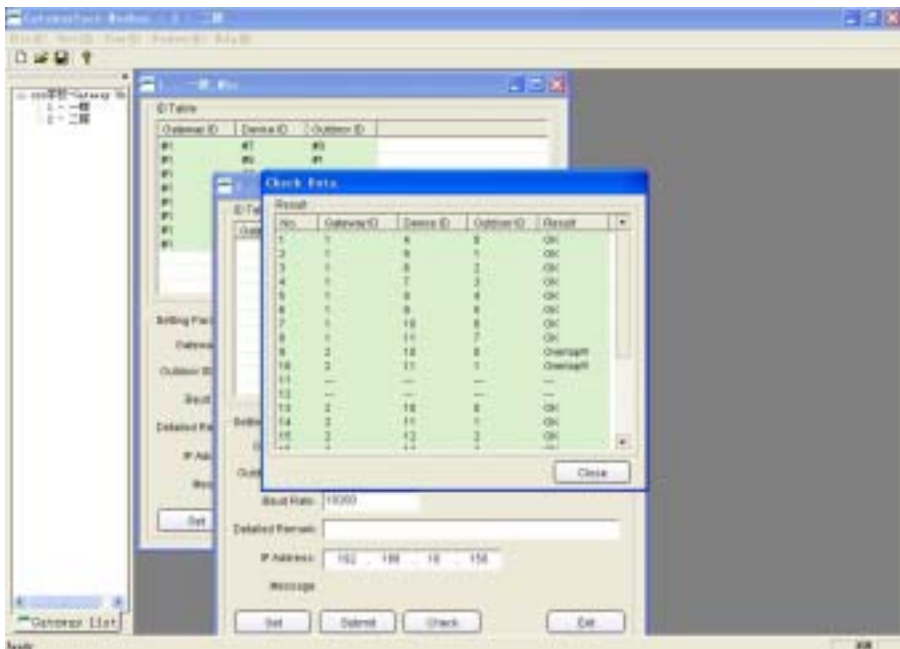
“Outdoor Quantity” 外机（或 MC501_B）数量（最大为 8 台）

“Baud Rate” ModBus 总线波特率

按实际参数依次填入，然后按“Submit”（注意：第一次配置参数时，必须先点击“Get”按钮，获得默认参数），接着出现如下界面：



“ Result ” 栏若为 “ OK ”，则表示前后网关的 “ Device ID ” (BAS 分配的设备地址)未发生冲突，按下 “ Close ” 后 “ Message ” 将显示：Modify Parameter Successfully ；若前后网关发生设备地址冲突，例如:网关 1 设置 “ Device Start ID ” 为 4，外机数量为 8，那么这八台外机所占用的设备地址为 4, 5, ...11。如果网关 2 设置 “ Device Start ID ” 为 10，即网关 2 设备地址从 10 开始，那么就与网关 1 的地址 10 和地址 11 发生冲突，此时按下 “ Submit ” 后 “ Result ” 栏中对应出现 “ overlap!!! ”，如下图所示。表明当前的设置出现设备地址冲突，需要返回重新设置“ Device Start ID ” 为 12 即可。



9.6 一旦“Submit”成功，按“Exit”即可退出当前网关设置窗口，同时将网线接至下一网关并上电启动，等待启动约十秒钟后，即可重复步骤3进行设置。

9.7 所有网关设置完毕，选择 Unit—>Check All，对所有网关设置作冲突检查。选择 Unit—>Report，生成配置报表以供参考。

说明：

A 若始终不能获得正确的“Get”网关参数，请检查网线是否连接，IP的设置以及网关是否已成功启动。

B 支持波特率为 9600bps，19200bps，38400bps

C “Check”按钮可用于随时对网关 ModBus 设备地址进行冲突检测。

D 请严格按照设置步骤一步一步设置。全部网关设置成功后网关编号即已固定与某台网关绑定。

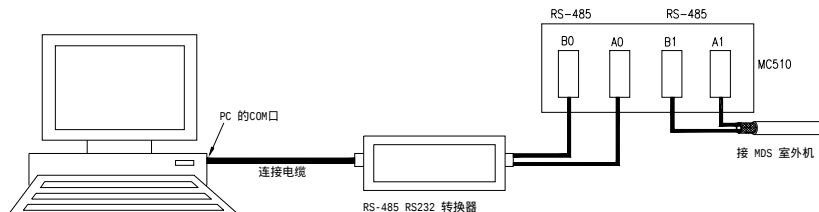
E 目前最多可以设置为 16 台网关，若数量超出需另外搭建一个通道

F 设置完毕，将 MC510 的 ModBus 端口“ A0 , B0 ”与 BAS 的 ModBus 总线的 A 和 B 相接，“ A1 , B1 ”与 MDS 外机或 MC501_B 转换器的 A 和 B 相接。务必注意：A 和 B 不能接反！网关正常运行过程中需把网线拔掉！

G 请保留网关配置文件及生成的配置报表以供日后参考。

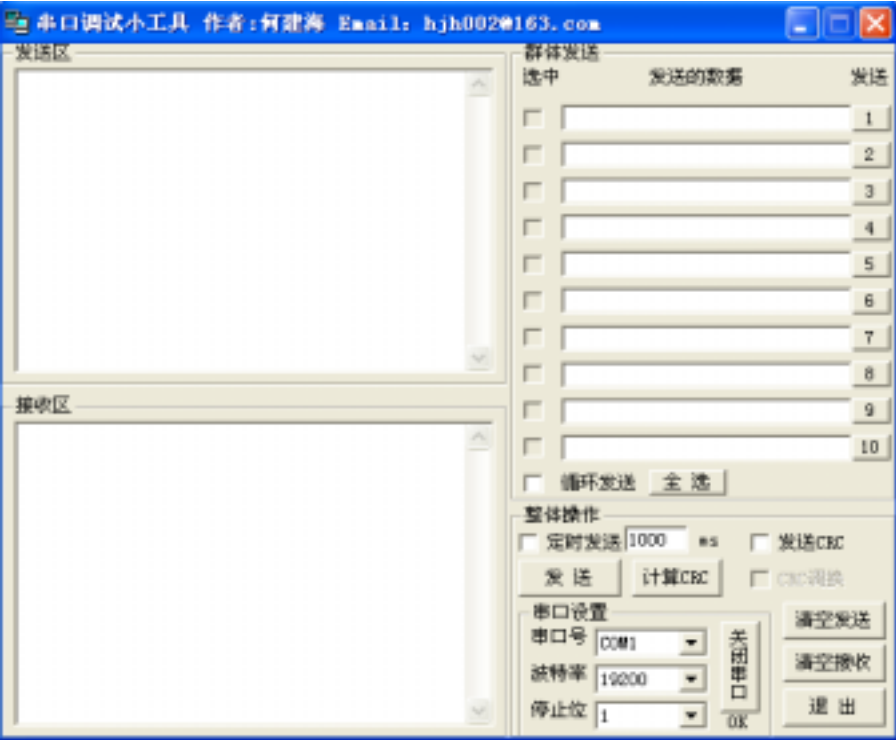
10.PC 机模拟测试

10.1 与 PC 机的连接



10.2 测试软件

使用 Mcquay 开发的串口调试软件，可测试 MC510 是否通讯正常。



10.3 测试举例

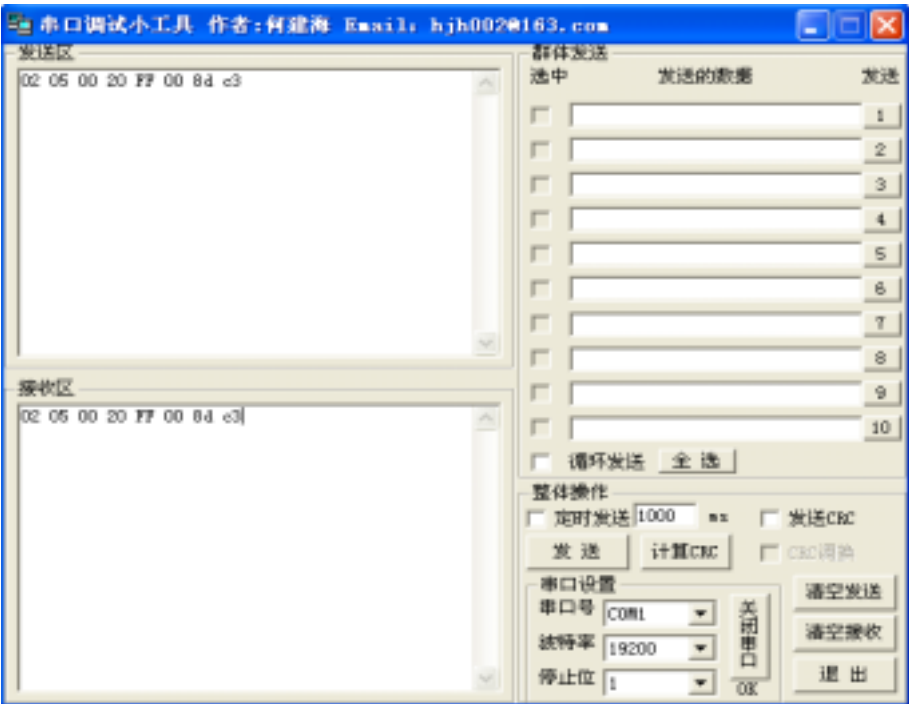
开“Device ID”为2的外机的2号内机，经计算，其Index为2*16=32，转换为十六进制为20。

发送数据的格式为：

描述	数据（Hex）
Slave Address	02
Function	05
Coil Address Hi	00
Coil Address Lo	20

Force Data Hi	FF
Force Data Lo	00
Error Check CRC Hi	8d
Error Check CRC Lo	c3
发送数据后，MC510应答为：	
Slave Address	02
Function	05
Coil Address Hi	00
Coil Address Lo	20
Force Data Hi	FF
Force Data Lo	00
Error Check CRC Hi	8d
Error Check CRC Lo	c3

如果接收区能显示正确的应答数据，则表明MC510能与BAS系统正常通讯，如下图显示。如果相应的内机能开机，则表明MC510与机组通讯正常。



11 MC510网关ModBus命令意义说明

ModBus命令	意 义	说 明
1	读1个或多个Coil状态	用来读取当前开关量的值
3	读1个或多个Holding寄存器	用来读取当前Holding寄存器的值
4	读1个或多个Input寄存器	用来读取当前Input寄存器的值
5	写单个Coil开关量	用来改变单个Coil变量的值
6	写单个Holding寄存器	用来改变单个Holding寄存器的值

MC510网关只支持上表的ModBus命令，具体协议数据表见附录。

附 录
(MC510网关ModBus协议数据表)

1 . Coil开关量数据表

0号内机

Addr	Chinese Variable	read / write	data size	valid range	unit	data type
1	开/关 机	r/w	1bit	0=off 1=on	N/A	coil
2	新风机	r/w	1bit	0=off 1=on	N/A	coil
3	负离子发生器	r/w	1bit	0=off 1=on	N/A	coil
4	睡眠	r/w	1bit	0=off 1=on	N/A	coil
5	键盘锁定	r/w	1bit	0=off 1=on	N/A	coil
6	摆风	r/w	1bit	0=off 1=on	N/A	coil
7	加热器1	r/w	1bit	0=off 1=on	N/A	coil
8	加热器2	r/w	1bit	0=off 1=on	N/A	coil
9	保留	r/w	1bit		N/A	coil
10	保留	r/w	1bit		N/A	coil
11	保留	r/w	1bit		N/A	coil
12	保留	r/w	1bit		N/A	coil
13	保留	r/w	1bit		N/A	coil
14	保留	r/w	1bit		N/A	coil
15	保留	r/w	1bit		N/A	coil
16	保留	r/w	1bit		N/A	coil

1号内机

Addr	Chinese Variable	read / write	data size	valid range	unit	data type
17	开/关 机	r/w	1bit	0=off 1=on	N/A	coil
18	新风机	r/w	1bit	0=off 1=on	N/A	coil
19	负离子发生器	r/w	1bit	0=off 1=on	N/A	coil
20	睡眠	r/w	1bit	0=off 1=on	N/A	coil
21	键盘锁定	r/w	1bit	0=off 1=on	N/A	coil
22	摆风	r/w	1bit	0=off 1=on	N/A	coil
23	加热器1	r/w	1bit	0=off 1=on	N/A	coil
24	加热器2	r/w	1bit	0=off 1=on	N/A	coil
25	保留	r/w	1bit		N/A	coil
26	保留	r/w	1bit		N/A	coil
27	保留	r/w	1bit		N/A	coil
28	保留	r/w	1bit		N/A	coil
29	保留	r/w	1bit		N/A	coil
30	保留	r/w	1bit		N/A	coil
31	保留	r/w	1bit		N/A	coil
32	保留	r/w	1bit		N/A	coil

说明：后面的内机均可依据公式： $\text{Addr}=16*\text{No.}+\text{Fref}$ 计算。（No.为内机号，Fref为功能偏移量）例如第4号内机的开/关机，则其操作的Coil地址 $\text{Addr}=16*4+1=65$ 。

2 . Holding 变量数据表

0 号内机

Addr	Chinese Variable	read / write	data size	valid range	unit	data type
3002	工作模式	r/w	2byte	0x0001=制冷 0x0002=风扇 0x0003=除湿 0x0004=制热 0x0008=自动 0x0009=测试模式1 0x000A=测试模式2	N/A	holding
3003	设置风速	r/w	2byte	0x0001=低风 0x0002=中风 0x0004=高风 0x0008=自动	N/A	holding
3004	设置温度	r/w	2byte	有符号数，放大10倍	0.1	holding
3005	设置湿度	r/w	2byte		1%	holding
3006	保留	r/w	2byte		N/A	holding
3007	保留	r/w	2byte		N/A	holding
3008	保留	r/w	2byte		N/A	holding
3009	保留	r/w	2byte		N/A	holding

1 号内机

Addr	Chinese Variable	read / write	data size	valid range	unit	data type
3010	工作模式	r/w	2byte	0x0001=制冷 0x0002=风扇 0x0003=除湿 0x0004=制热 0x0008=自动 0x0009=测试模式1 0x000A=测试模式2	N/A	holding
3011	设置风速	r/w	2byte	0x0001=低风 0x0002=中风 0x0004=高风 0x0008=自动	N/A	holding
3012	设置温度	r/w	2byte	有符号数，放大10倍	0.1	holding
3013	设置湿度	r/w	2byte		1%	holding
3014	保留	r/w	2byte		N/A	holding
3015	保留	r/w	2byte		N/A	holding
3016	保留	r/w	2byte		N/A	holding
3017	保留	r/w	2byte		N/A	holding

说明 :后面的内机均可依据公式 :Addr=3001+8*No.+Fref 计算。(No. 为内机号 , Fref 为功能偏移量) 例如第 3 号内机的设置风速 , 则其操作的 Holding 地址 :

Addr=3001+8*3+2=3027 。

3 . Input 变量数据表

网关及外机参数区

Addr	Chinese Variable	read / write	data size	valid range	unit	data type
6001	网关编号	r	2byte		N/A	input
6002	设备起始地址	r	2byte		N/A	input
6003	外机起始地址	r	2byte		N/A	input
6004	外机数量	r	2byte	$1 \leq \text{num} \leq 8$	N/A	input
6005	ModBus 波特率	r	2byte		N/A	input
6006 ~ 6020	保留	r	2byte		N/A	input
6021	外机软件版本	r	2byte		N/A	input
6022	环境温度	r	2Byte			input

6023	主机故障报警	r	2byte	bit0=数码过载 bit1=定速压缩机 1 过载 bit2= 定速压缩机 2 过载 bit3=定速压缩机 3 过载 bit4=高压故障 bit5=低压故障 bit6=存贮器故障 bit7=系统故障 bit8=排气温度过高 bit9=内外机通讯故障 bit10=四通阀故障 bit11=环境温度过高/过低 禁止运行 bit12=启动紧急运行功能 bit13=过热度小于 2 度保护 bit14=冷媒泄漏 bit15=主从机通讯故障		input
6024	从机故障报警	r	2byte	bit0=定速压缩机 1 过载 bit1=定速压缩机 2 过载 bit2=定速压缩机 3 过载 bit3=定速压缩机 4 过载 bit4=高压开关 bit5=低压开关 bit6=存贮器故障 bit7=系统故障 bit8=排气温度过高 bit9=内外机通讯故障 bit10=四通阀故障 bit11=环境温度过高/过低 禁止运行 bit12=启动紧急运行功能 bit13=过热度小于 2 度保护 bit14=冷媒泄漏 bit15=主从机通讯故障		input

6025 ~ 6072	保留	r	2byte		N/A	input
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0 号内机

Addr	Chinese Variable	read / write	data size	valid range	unit	data type
6073	内机软件版本	r	2byte		N/A	input
6074	回风温度	r	2byte		0.1	input
6075	回风湿度	r	2byte		1%	input
6076	出风温度	r	2byte		0.1	input
6077	当前风速	r	2byte	0x0000=停止 0x0001=低风 0x0002=中风 0x0004=高风 0X0010=Turbo	N/A	input

6078	故障报警	r	2byte	bit0=TH1 传感器 bit1=TH2 传感器 bit2=TH3 传感器 bit3=TH4 传感器 bit4=水泵故障 bit5=保留 bit6=保留 bit7=保留 bit8=保留 bit9=保留 bit10=保留 bit11=保留 bit12=保留 bit13=保留 bit14=保留 bit15=保留	N/A	input
6079	运行状态	r	2byte	0x0000=停止 0x0001=制冷 0x0002=风扇 0x0003=除湿 0x0004=制热 0x0009=测试模式 1 0x000A=测试模式 2	N/A	input
6080	保留	r	2byte		N/A	input
6081	保留	r	2byte		N/A	input
6082	保留	r	2byte		N/A	input
6083	保留	r	2byte		N/A	input
6084	保留	r	2byte		N/A	input
6085	保留	r	2byte		N/A	input

1 号内机

Index	Chinese Variable	read / write	data size	valid range	unit	data type
6086	内机软件版本	r	2byte		N/A	input
6087	回风温度	r	2byte		0.1	input
6088	回风湿度	r	2byte		1%	input
6089	出风温度	r	2byte		0.1	input
6090	当前风速	r	2byte	0x0000=停止 0x0001=低风 0x0002=中风 0x0004=高风 0X0010=Turbo	N/A	input

6091	故障报警	r	2byte	bit0=TH1 传感器 bit1=TH2 传感器 bit2=TH3 传感器 bit3=TH4 传感器 bit4=水泵故障 bit5=保留 bit6=保留 bit7=保留 bit8=保留 bit9=保留 bit10=保留 bit11=保留 bit12=保留 bit13=保留 bit14=保留 bit15=保留	N/A	input
6092	运行状态	r	2byte	0x0000=停止 0x0001=制冷 0x0002=风扇 0x0003=除湿 0x0004=制热 0x0009=测试模式 1 0x000A=测试模式 2	N/A	input
6093	保留	r	2byte		N/A	input
6094	保留	r	2byte		N/A	input
6095	保留	r	2byte		N/A	input
6096	保留	r	2byte		N/A	input
6097	保留	r	2byte		N/A	input
6098	保留	r	2byte		N/A	input

说明 :后面的内机均可依据公式 :Addr=6072+13*No.+Fref 计算。(No 为内机号 , Fref 为功能偏移量) 例如第 6 号内机的出风温度 , 则其操作的 input 地址 :

Addr=6072+13*6+4=6154 。

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1. General

MC510 (Gateway) establish a communication between MDS outdoor unit and ModBus BAS system. Here ModBus protocol is an official open document:

Modicon ModBus Protocol

Reference Guide

March 1992, PI-MBUS-300Rev.D

McQuay protocol is base on RTU.

2. Led Indicator

- “POWER” It is on when power on
- “LED1” no indication (spare)
- “LED2” no indication (spare)
- “COM1” It twinkle when MC501 communicate with BAS
- “COM2” It twinkle when MC501 communicate with outdoor unit air condition.

3. Installation Attention

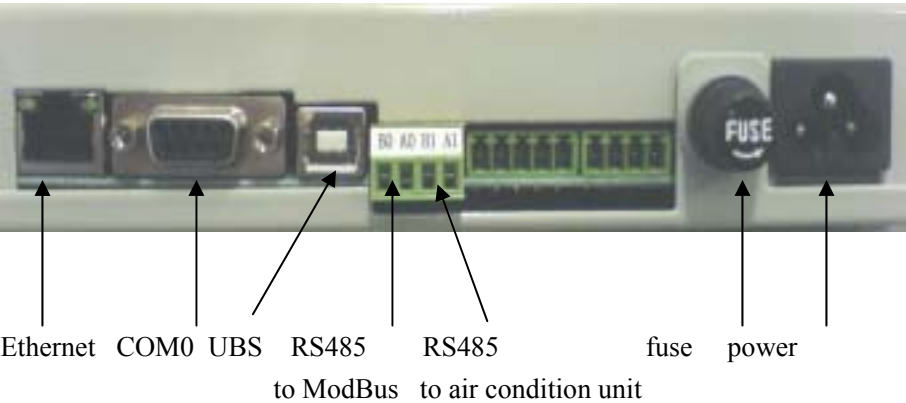
- Before operation MC510 power must be off
- MC510 is Only installed where no transformer cable, high power ,high magnetic field

4. Power Source

Only supply AC voltage (100-240V, 50/60Hz) as a power source to the device.

Fuse rated current is 250mA

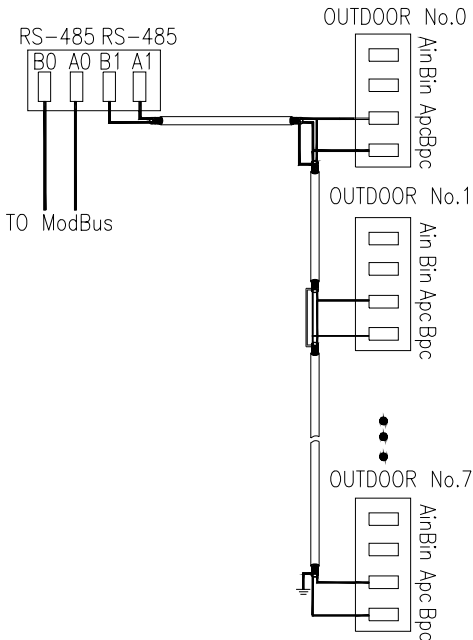
5. MC510 Interface



6. MC510 Bus

MC510 can support maximum up to 8 MDS outdoor unit or MC501-B converter.

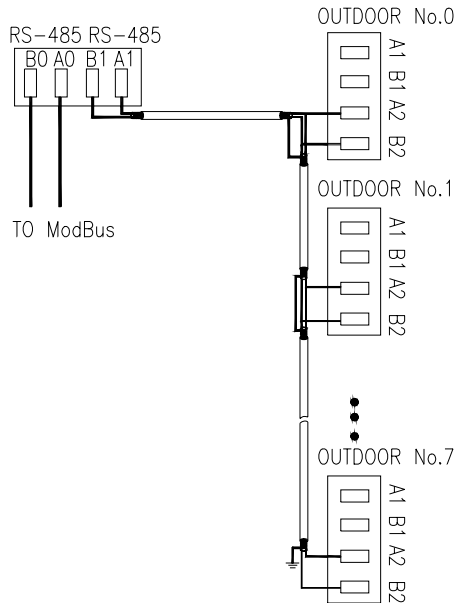
6.1 MC510 and MDS outdoor unit net



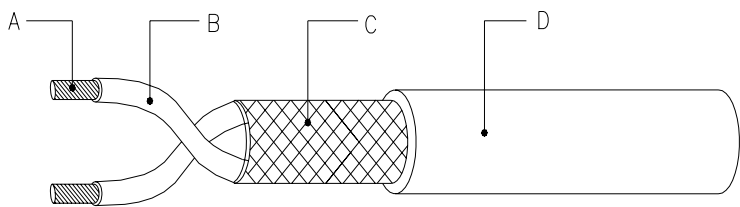
6.2 MC510

and MC501-B

Bus



7. Screen Wire Specification



7.1 A: conductor, tinned copper wire, section is not less than 0.5 square mm or

AWG20

B: insulation layer

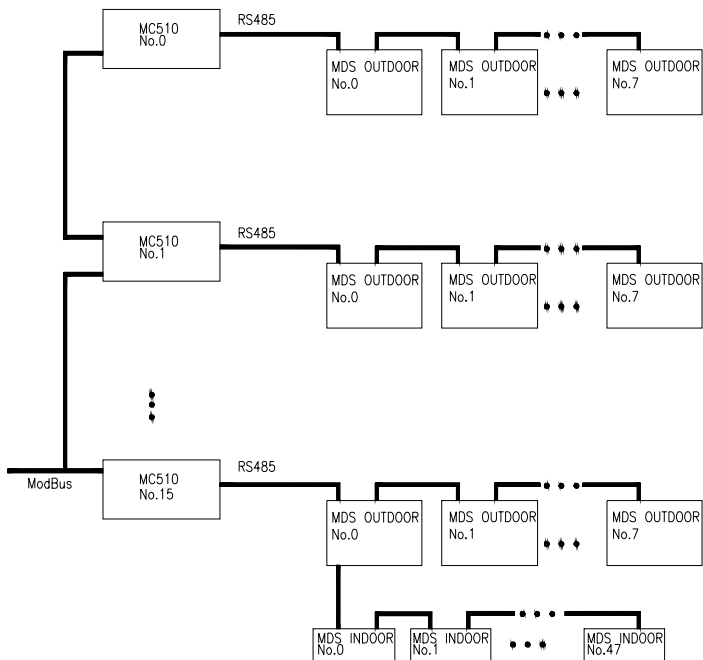
C: screen layer, tinned copper wire twist, at least 90% screen ratio.

D: protect layer

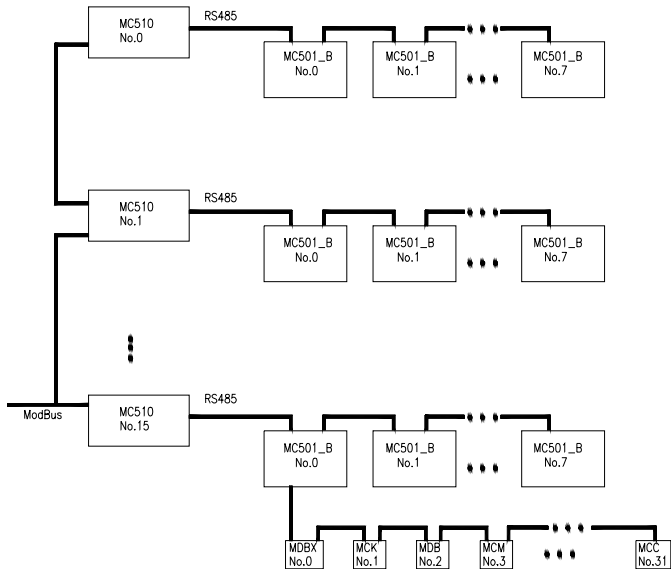
7.2 Please consult UL2791, A segment cable is not long than 1000 m

8. MC510 and McQuay Air Condition Bus Example

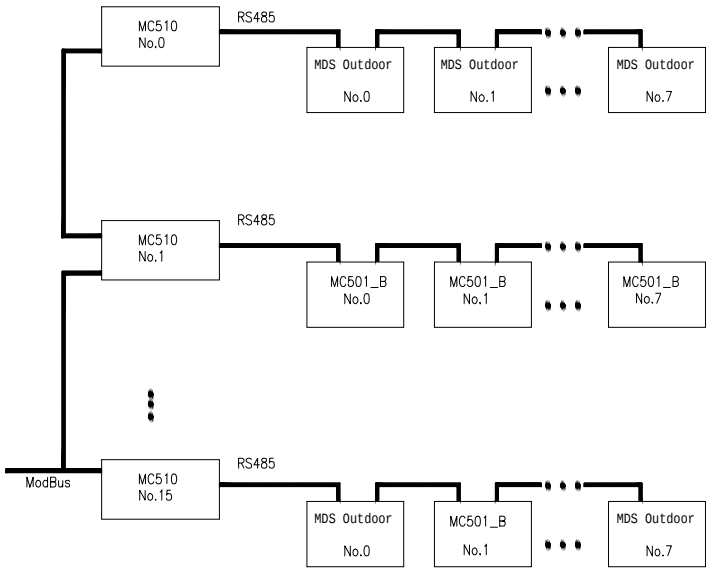
8.1 MC510 AND Digital Variable Multi Unit Bus



8.2 MC510 and MC501-B Bus



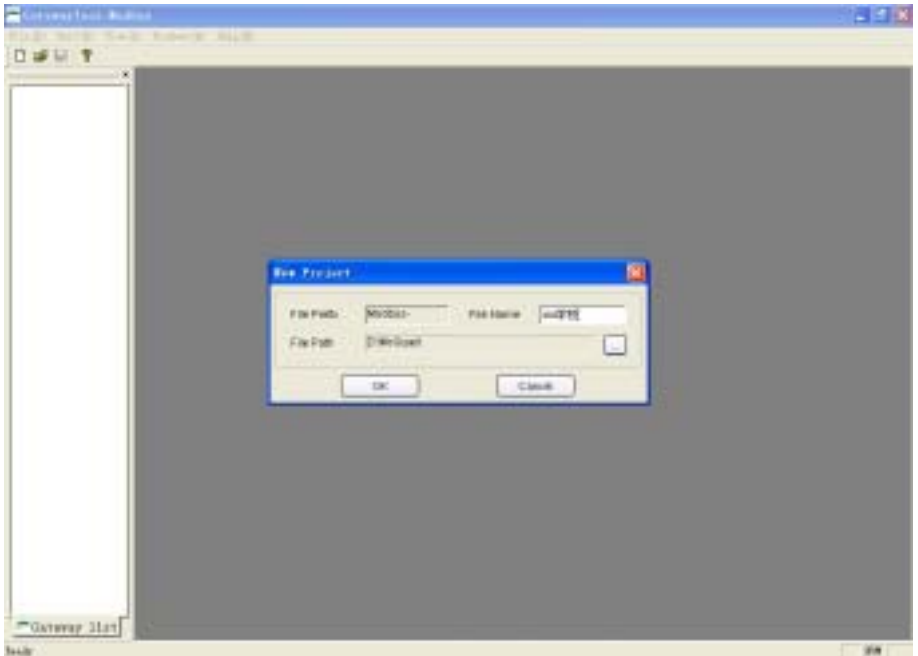
8.3 Digital Variable Multi Unit and MC501-B Bus



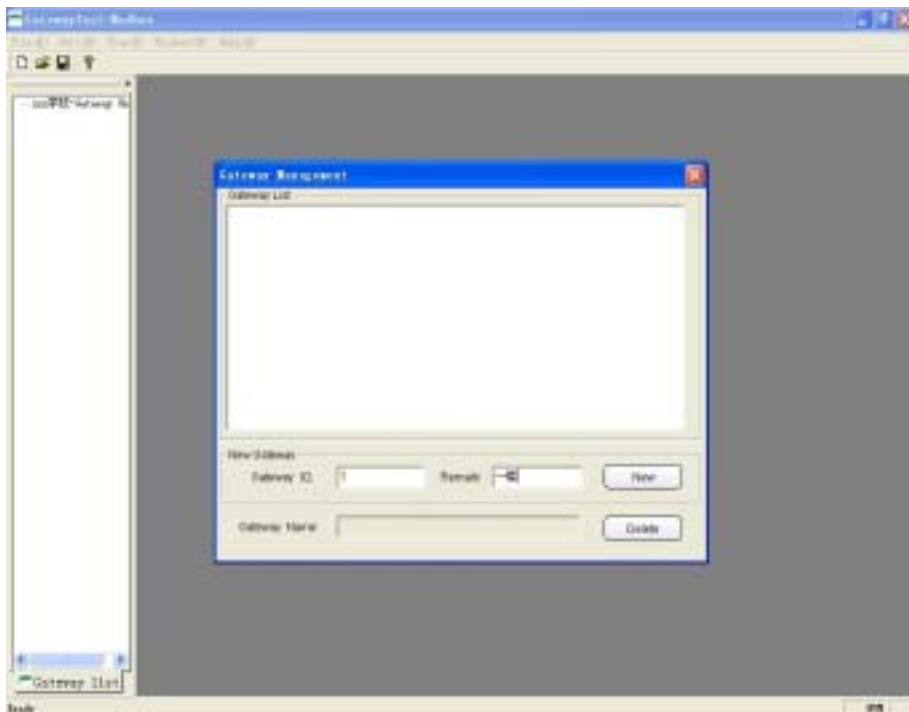
9. MC510 Setting

9.1 Link PC network card and Ethernet port of MC510 by a cable, and power on

9.2 Decompress soft wire fold and run “GateWayTool”, select menu file→New to establish an item, Select the specified path, Enter the software name and save it, (As shown in the following figure)

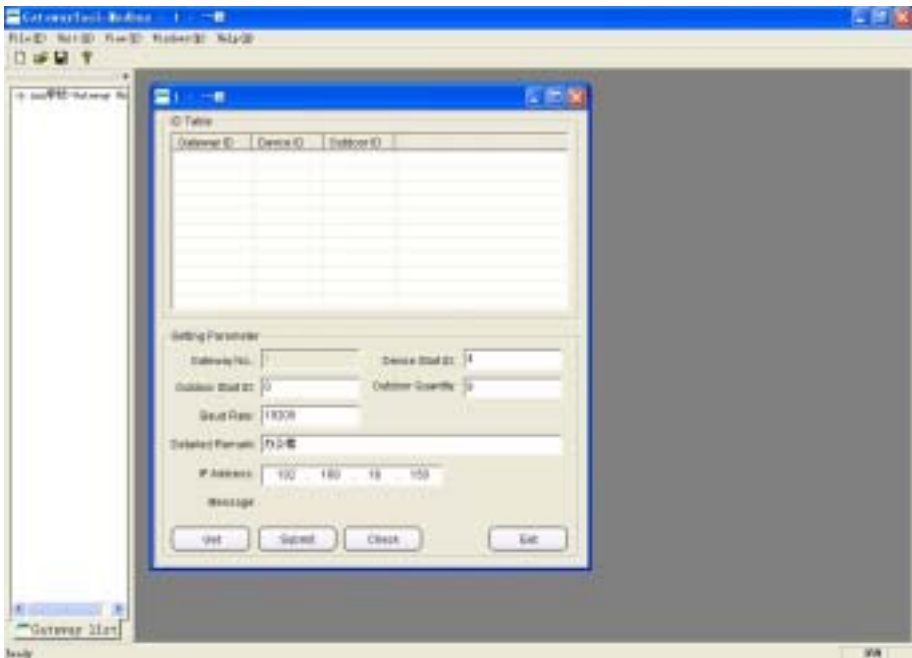


9.3 Select menu Unit→Unit Manage; enter Unit Manage page (As shown in the following figure)

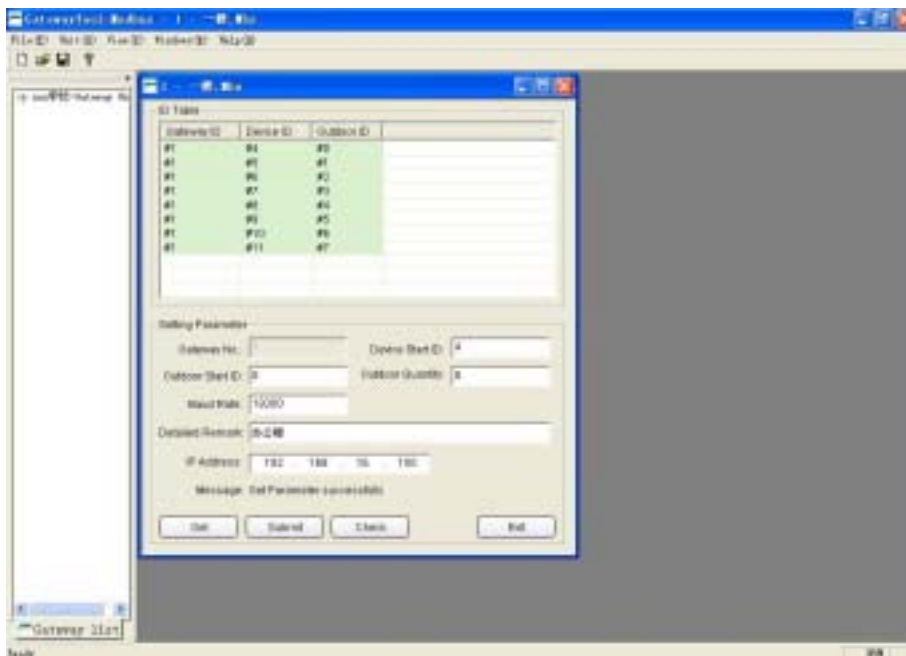


Select “New” button to create No.1 Gateway ,default Gateway ID is 1, user can enter remark in “remark”. Select “Delete” button to delete the gateway selected in right list

9.4 enter gateway parameter setting page (As shown in the following figure)



User must set IP paragraph of PC same as default gateway IP paragraph, when gateway default IP is 192.168.16.150, The IP of PC should be setted 192.168.16.X.. Press “Get” button, Default parameter of Gateway display (As shown in the following figure)



“Gateway ID” is the setting gateway No., “Device ID” is the device address No. in ModBus net. “Outdoor ID” is MDS outdoor unit address No.

9.5 Modification default parameter

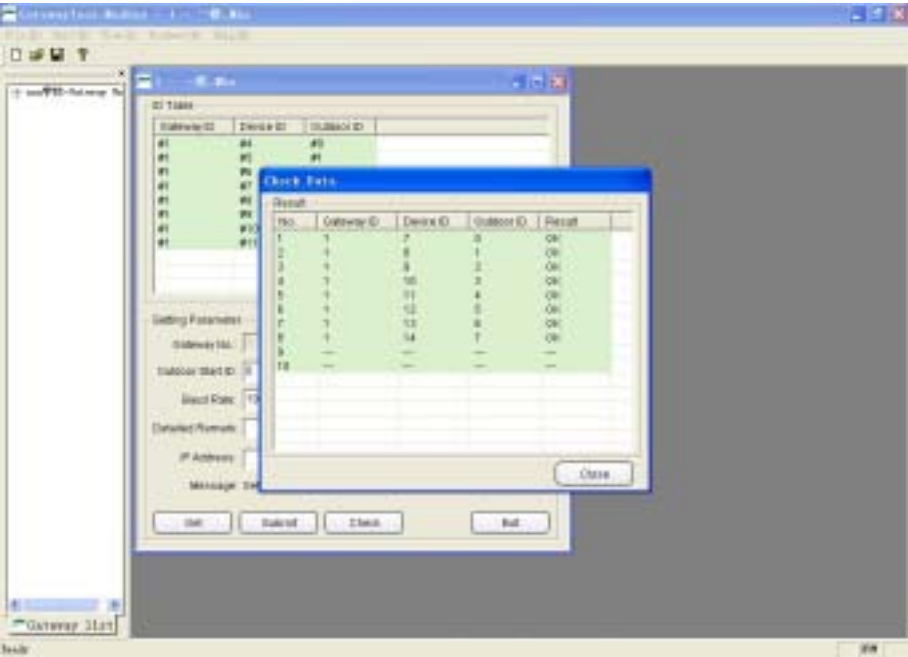
“Device Start ID” is the start address of ModBus device

“Outdoor Start ID” is the start address of Outdoor unit or MC501-B

“Outdoor Quantity” is quantity of Outdoor unit or MC501-B

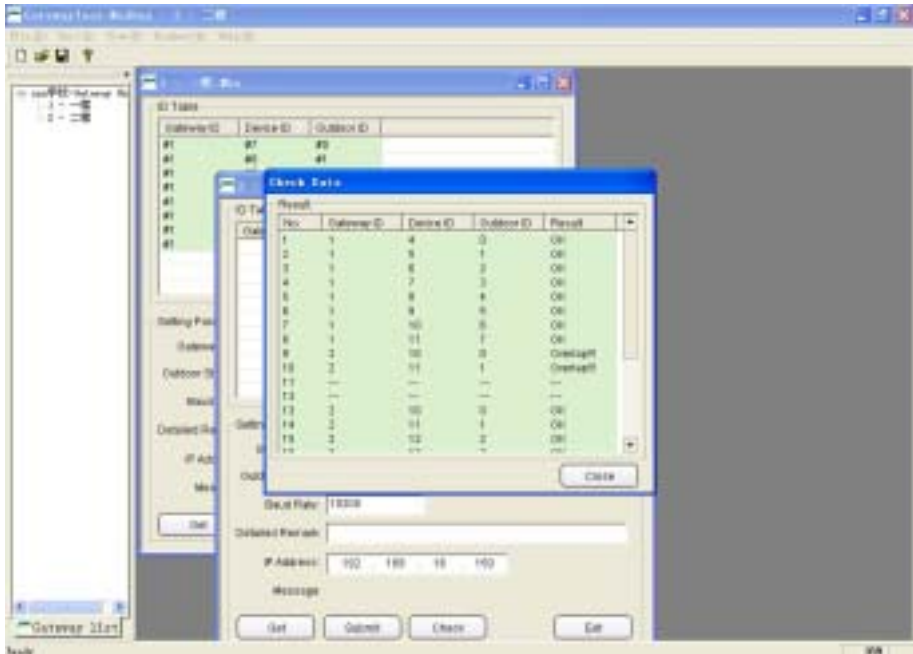
“Baud Rate” is ModBus Baud rate

Fill actual parameter and press “Submit” (note: User must press “Get” button read default parameter first setting parameter) following figure display



If “Result” list display “ok”, It means the address is correct, Press “Close”, it display “ modify parameter successfully”; If “Result” list display “overlap”, It means address setting overlap, User must set “Device start ID” again. Give an example:

The “Device Start ID” of Gateway 1 is 4, and outdoor quantity is 8, so the 8 Outdoors’ ID is 4,5,...11, If the ID of Gateway 2 is setted 10, The “Device Start ID” of Gateway 2 is 10,11...,17, 10 and 11 overlap, When user press “Submit”, result list display “overlap!!!” (As shown in the following figure), User should set “device Start ID” 12



- 9.6 When press “submit” successfully , press “Exit” exit the setting page, user repeat step hereinbefore to set next Gateway
- 9.7 When all Gateway setting finish, select menu Unit→Check All to check overlap. User can get a configure list.

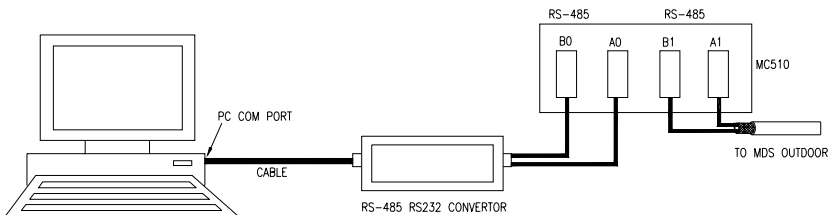
Note:

- A. If User can’t get Gateway parameters, please check net cable ensure correct link, IP setting is correct
- B. Baud Rate support 9600bps, 19200bps, 38400bps
- C. User can check Gateway ModBus device ID by pressing “Check” button
- D. All Gateway setting finish, The Gateway gets the specified No.
- E. Max supported up to 16 gateways, If gateway more than 16, user need to establish another channels

- F. After Gateway setting finish, User needed to establish a communication between gateway ModBus (port A0 and B0) and BAS ModBus(port A and B), gateway ModBus (port A1 and B1) and MDS Outdoor or MC501-B(port A and B)When Gateway work, please open net cable
- G. please save correlation document

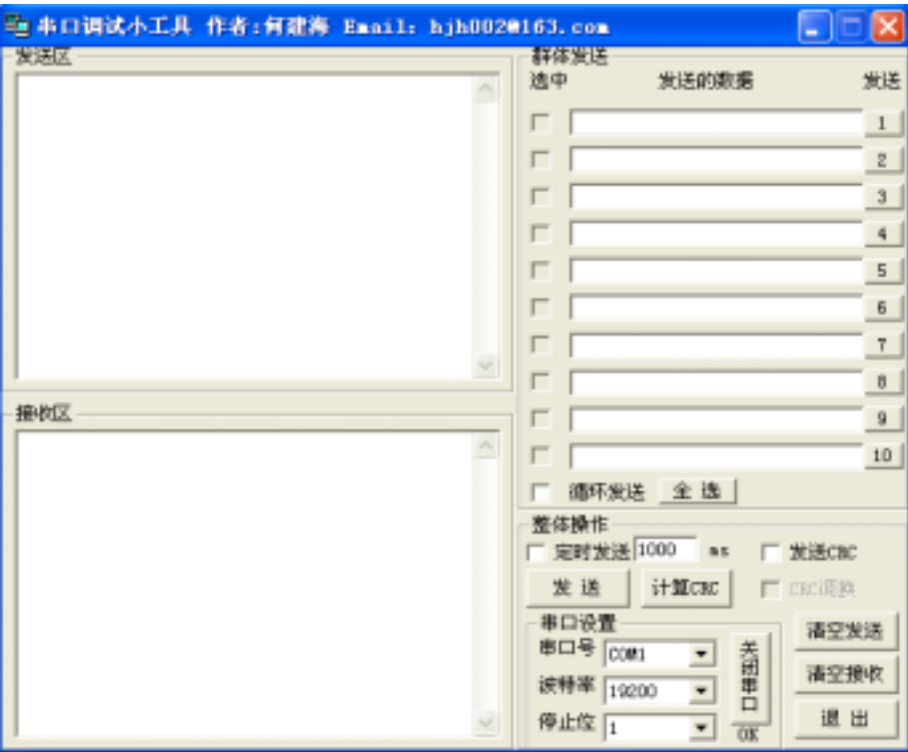
10. Gateway and PC Simulation Test

10.1 Wire Link



10.2 Test Software

User can test MC510 communication by McQuay COM test software



10.3 For Example

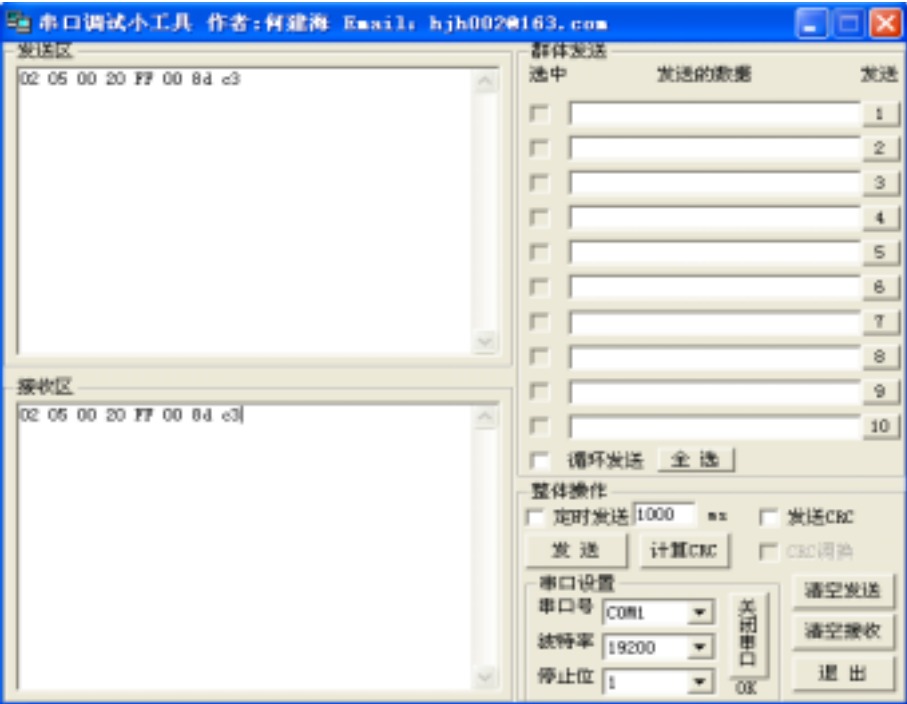
The indoor No.3 linked “Device ID 2” Outdoor will be on, The Index is $(3-1)*16=32$ (HEX20)

Send date format:

Description	date(Hex)
Slave Address	02
Function	05
Coil Address Hi	00
Coil Address Lo	20
Force Data Hi	FF

Force Data Lo	00
Error Checker CRC Hi	8d
Error Checker CRC Lo	c3
MC510 Responsion :	
Slave Address	02
Function	05
Coil Address Hi	00
Coil Address Lo	20
Force Data Hi	FF
Force Data Lo	00
Error Check CRC Hi	8d
Error Check CRC Lo	c3

If user can receive correct date, It means the communication between MC510 and BAS is normal (As shown in the following figure); if the indoor is on, It means the communication between MC510 and MDS is normal



11 MC510 and ModBus order description

ModBus order	explain	description
1	Read 1 or many Coil status	Read current on/off variable
3	Read 1 or many Holding register	Read current Holding value
4	Read 1 or many Input register	Read current Input value
5	Write 1 Coil on/off variable	Change Coil variable value
6	Write 1Holding register	Change 1 Holding value

Appendix

(MC510 ModBus protocol date list)

1 . Coil on/off variable list

No.0 indoor

Addr	Variable	read / write	data size	valid range	unit	data type
1	ON/OFF Air condition	r/w	1bit	0=off 1=on	N/A	coil
2	fresh air unit	r/w	1bit	0=off 1=on	N/A	coil
3	ionizer	r/w	1bit	0=off 1=on	N/A	coil
4	sleep	r/w	1bit	0=off 1=on	N/A	coil
5	keyboard lock control	r/w	1bit	0=off 1=on	N/A	coil
6	swing	r/w	1bit	0=off 1=on	N/A	coil
7	Heater control 1	r/w	1bit	0=off 1=on	N/A	coil
8	Heater control 2	r/w	1bit	0=off 1=on	N/A	coil
9	remain	r/w	1bit		N/A	coil
10	remain	r/w	1bit		N/A	coil
11	remain	r/w	1bit		N/A	coil
12	remain	r/w	1bit		N/A	coil
13	remain	r/w	1bit		N/A	coil
14	remain	r/w	1bit		N/A	coil
15	remain	r/w	1bit		N/A	coil
16	remain	r/w	1bit		N/A	coil

No.1 indoor

Addr	English Variable	read / write	data size	valid range	unit	data type
17	ON/OFF Air condition	r/w	1bit	0=off 1=on	N/A	coil
18	fresh air unit	r/w	1bit	0=off 1=on	N/A	coil
19	ionizer	r/w	1bit	0=off 1=on	N/A	coil
20	sleep	r/w	1bit	0=off 1=on	N/A	coil
21	keyboard lock control	r/w	1bit	0=off 1=on	N/A	coil
22	swing	r/w	1bit	0=off 1=on	N/A	coil
23	Heater control 1	r/w	1bit	0=off 1=on	N/A	coil
24	Heater control 2	r/w	1bit	0=off 1=on	N/A	coil
25	remain	r/w	1bit		N/A	coil
26	remain	r/w	1bit		N/A	coil
27	remain	r/w	1bit		N/A	coil
28	remain	r/w	1bit		N/A	coil
29	remain	r/w	1bit		N/A	coil
30	remain	r/w	1bit		N/A	coil
31	remain	r/w	1bit		N/A	coil
32	remain	r/w	1bit		N/A	coil

Note : other indoor calculate formula :Addr=16*No.+Fref 。 (No.: indoor No. , Fref: offset) for example,No.4 indoor on/off , its Coil address is Addr=16*4+1=65 。

2. Holding variable list

No.0 indoor

Addr	English Variable	read / write	data size	valid range	unit	data type
3002	Model operation	r/w	2byte	0x0001=COOL 0x0002=FAN 0x0003=DRY 0x0004=HEAT 0x0008=AUTO 0x0009= Test mode 1 0x000A= Test mode 2	N/A	holding
3003	Set fan speed	r/w	2byte	0x0001=LOW 0x0002=Medium 0x0004=High 0x0008= AUTO	N/A	holding
3004	set temp.	r/w	2byte	Symbol date , zoom decuple	0.1	holding
3005	set humi.	r/w	2byte		1%	holding
3006	remain	r/w	2byte		N/A	holding
3007	remain	r/w	2byte		N/A	holding
3008	remain	r/w	2byte		N/A	holding
3009	remain	r/w	2byte		N/A	holding

No.1 indoor

Addr	English Variable	read / write	data size	valid range	unit	data type
3010	model operation	r/w	2byte	0x0001=COOL 0x0002=FAN 0x0003=DRY 0x0004=HEAT 0x0008=AUTO 0x0009= Test mode 1 0x000A= Test mode 2	N/A	holding
3011	set fan speed	r/w	2byte	0x0001=LOW 0x0002=Medium 0x0004=High 0x0008= AUTO	N/A	holding
3012	set temp.	r/w	2byte	symbol date , zoom decuple	0.1	holding
3013	set humi.	r/w	2byte		1%	holding
3014	remain	r/w	2byte		N/A	holding
3015	remain	r/w	2byte		N/A	holding
3016	remain	r/w	2byte		N/A	holding
3017	remain	r/w	2byte		N/A	holding

Note : other indoor calculate formula : $\text{Addr} = 3001 + 8 * \text{No.} + \text{Fref}$. (No.: indoor No. ,Fref: offset)for example No.3 fan speed setting ,Holding Address : $\text{Addr} = 3001 + 8 * 3 + 2 = 3027$.

3 . Input variable list

Gateway and outdoor parameter

Addr	English Variable	read / write	data size	valid range	unit	data type
6001	gateway ID	r	2byte		N/A	input
6002	device Start ID	r	2byte		N/A	input
6003	outdoor Start ID	r	2byte		N/A	input
6004	outdoor Num	r	2byte	$1 \leq \text{num} \leq 8$	N/A	input
6005	ModBus Baud rate	r	2byte		N/A	input
6006 ~ 6020	remain	r	2byte		N/A	input
6021	outdoor unit software version	r	2byte		N/A	input
6022	env. temp.	r	2Byte			input

6023	alarm	r	2byte	bit0=Digital comp overload bit1=Fix comp1 overload bit2=Fix comp2 overload bit3= Fix comp3 overload bit4=Discharge pressure too high bit5=Suction pressure too low bit6=Outdoor storage malfunction bit7= System malfunction bit8= Discharge temp. too high bit9= Discharge temp. too high bit10=4WV malfunction bit11= Ambient temp. exceed the limit bit12= Emergency run bit13= Super heat too low bit14= Refrigerant leakage bit15=Slave communication malfunction		input
6024	alarm	r	2byte	bit0=Fix comp1 overload bit1= Fix comp2 overload bit2= Fix comp3 overload bit3= Fix comp4 overload bit4= Discharge pressure too high bit5= Suction pressure too low bit6= Outdoor storage malfunction bit7= System malfunction bit8= Discharge temp. too high bit9= Discharge temp. too high bit10=4WV malfunction bit11= Ambient temp. exceed the limit bit12= Emergency run bit13= Super heat too low bit14= Refrigerant leakage bit15=Slave communication malfunction		input

6025 ~ 6072	remain	r	2byte		N/A	input
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No.0 indoor

Addr	English Variable	read / write	data size	valid range	unit	data type
6073	indoor unitsoftware version	r	2byte		N/A	input
6074	room temp.	r	2byte		0.1	input
6075	humidity	r	2byte		1%	input
6076	out fan temp.	r	2byte		0.1	input
6077	fan speed	r	2byte	0x0000=stop 0x0001=low fan 0x0002= Medium fan 0x0004= High fan 0X0010=Turbo	N/A	input
6078	alarm	r	2byte	bit0=TH1 temp. sensor bit1=TH2 temp. sensor bit2=TH3 temp. sensor bit3=TH4 temp. sensor bit4=pump malfunction bit5=spare bit6= spare bit7= spare bit8= spare bit9= spare bit10= spare bit11= spare bit12= spare bit13= spare bit14= spare bit15= spare	N/A	input

6079	running status 1	r	2byte	0x0000=Stop 0x0001=Cool 0x0002=Fan 0x0003=Dry 0x0004=Heat 0x0009=Test mode 1 0x000A=Test mode 2	N/A	input
6080	remain	r	2byte		N/A	input
6081	remain	r	2byte		N/A	input
6082	remain	r	2byte		N/A	input
6083	remain	r	2byte		N/A	input
6084	remain	r	2byte		N/A	input
6085	remain	r	2byte		N/A	input

No.1 indoor

Index	English Variable	read / write	data size	valid range	unit	data type
6086	indoor unitsoftware version	r	2byte		N/A	input
6087	room temp.	r	2byte		0.1	input
6088	humidity	r	2byte		1%	input
6089	out fan temp.	r	2byte		0.1	input
6090	fan speed	r	2byte	0x0000=stop 0x0001=low fan 0x0002= Medium fan 0x0004= High fan 0X0010=Turbo	N/A	input

6091	alarm	r	2byte	bit0=TH1 temp. sensor bit1=TH2 temp. sensor bit2=TH3 temp. sensor bit3=TH4 temp. sensor bit4=pump malfunction bit5=spare bit6= spare bit7= spare bit8= spare bit9= spare bit10= spare bit11= spare bit12= spare bit13= spare bit14= spare bit15= spare	N/A	input
6092	running status 1	r	2byte	0x0000=Stop 0x0001=Cool 0x0002=Fan 0x0003=Dry 0x0004=Heat 0x0009=Test mode 1 0x000A=Test mode 2	N/A	input
6093	remain	r	2byte		N/A	input
6094	remain	r	2byte		N/A	input
6095	remain	r	2byte		N/A	input
6096	remain	r	2byte		N/A	input
6097	remain	r	2byte		N/A	input
6098	remain	r	2byte		N/A	input

Note : other indoor calculate formula : $\text{Addr}=6072+13*\text{No.}+\text{Fref.}$ (No.: indoor No. , Fref: offset) for example,The No.6 indoor leaving air temperature 内机的 , input address :
 $\text{Addr}=6072+13*6+4=6154$ 。