# Modbus Router User Manual



MB1002-ARM



MB2004-A9

### Table of Contents

1 Introduction1	
1.1 Statement1	
1.2 Technical Support1	
2 Overview1	
3 Procedure	1
3.1 Web Login2	,
3.2 Download Instructions and OPC Server	,
3.3 User Admin4	
3.4 Network4	
3.5 Router Settings	į
3.6 Time Settings5	,
3.7 Firmware Information6	;
3.8 Memory Information6	;
3.9 Log Message7	'
4 Modbus Client Test	;
5 OPC Modbus Server Access Router	;
6 Modbus Router Hardware Parameters9	)

# **1** Introduction

### 1.1 Statement

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## **1.2 Technical Support**

- Technical Support E-mail: support@opcmaster.com
- Technical support hotline: +86-021-58776098
- URL:<u>http://www.opcmaster.com</u>or<u>http://www.bacnetchina.com</u>

# 2 Overview

- This description is applicable to two models of MB1002-ARM and MB2004-A9. The former can carry two Modbus RTU buses while the latter can carry four Modbus RTU buses.
- How it works: Modbus RTU of serial port can be converted into Modbus TCP or Modbus UDP of Ethernet port by the way of "penetrate" without setting up point in Modbus router. Buses of Modbus Router work in parallel without affecting each other. Different Routers can be distinguished by Modbus TCP/UDP client software through IP address, different buses can be distinguished through port numbers, different devices can be distinguished through station Numbers.

- Web Configuration: Login to the webpage built into the Modbus router and set communication parameters, port number and other parameters.
- OPC Server Software: If the user needs to transfer the Modbus TCP of the Modbus Router to the OPC server for the third-party configuration software, we also provide free OPC server software. Users can download the software directly in the gateway's web page. Software X2OPC has passed the CTT test of OPC foundation, and the software is reliable and stable.

# **3 Procedure**

Modbus Router is configured through Web Page, the default IP address is 192.168.1.88, Users need to connect the PC and the gateway with a cable, modify the IP address of the PC to the same network segment of gateway, such as 192.168.1.55. Then enter the IP address 192.168.1.88 in the browser, login to the Router's built-in web page.

# 3.1 Web Login

Input IP address of the gateway 192.168.1.88 in the browser, as shown 3-1-1



Figure 3-1-1 Web login

Input the user name and password in the pop-up window , as shown 3-1-2.

() • () http://192.168.1.88//ogin.html	ρ + c Ø Ø User Login	×			- □ - × A ★ \$
		Λ	迅绕 sunfull		
		专注自控:	物物互联		
	User Login			Language v	
	Username	admin	~		
	Password	Login Re	eset		

Figure 3-1-2 User login

Note that the default user name is "admin", password is "admin123456".

# 3.2 Download Instructions and OPC Server

**Download**: Download instructions of Modbus Router or software X2OPC, as shown 3-2-1.

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	=			Language ~ 🗭
<sup>返</sup> 税 sunfull 支注自控 物物互联	Download			
	Download List	Size	Date Modify	
	Modbus Router	1.3 MB	2019-03-31 16:00:00	
La Download	Modbus2OPC	5.6 MB	2019-03-31 16:00:00	
😧 User Admin				
🌣 Network				
🍄 Router				
🗘 Time				
<b>Y</b> Firmware				
Memory				
🚯 Log				
			Co	pyright © 2011-2016 www.bacnetchina.com

Figure 3-2-1 Download file

### 3.3 User Admin

Users can manage their login account such as add, modify, delete and other ways, as shown 3-3-1.

Modbus Router ×	+	e i Baare	Barris Co.		1	
$\leftrightarrow$ $\rightarrow$ C (i) Not secure   1	192.168.1.88/index.html					☆ 🖰 :
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sunfull 专注自控 物物互联	User Admin					
		Username				
		Password				
🛓 Download		Access User			v	
🔅 User Admin		Add Re	set			
🌣 Network	Username	Password	Access	Modify	Save	Delete
🏟 Router	admin	admin123456	Admin	Modify	Save	Delete
🌣 Time						
▼ Firmware						
(i) Memory						
🕸 Log					Copyright © 2	011-2016 www.bacnetchina.com

Figure 3-3-1 User Management

# 3.4 Network

Set network interface IP address of Router, as shown 3-4-1.

🗅 Modbus Router 🛛 🗙	+	e i tana e	8-44.4K		a second of	
$\leftrightarrow$ $\rightarrow$ C (1) Not secure   19	92.168.1.88/index.html					☆ 😬 :
	=					Language 🗸 🚺
迟统 sunfull 专注自控 物物互联	Network					
		Network1			Network2 (Default)	
	IP Address	172.24.13.88		IP Address	192.168.1.88	
📥 Download	Subnet Mask	255.255.255.0		Subnet Mask	255.255.255.0	
🔅 User Admin	Default Gateway	172.24.13.1		Default Gateway	192.168.1.1	
Network			ок	Reload		
🍄 Router			_			
🍄 Time						
<b>T</b> Firmware						
(i) Memory						
🚜 Log					Copyright © 2011-2	016 www.bacnetchina.com



Note that the MB2004-A9 model has two ports that can be accessed by two

Modbus TCP clients of different network segments, while the MB1002-ARM model only has one port.

## 3.5 Router Settings

Setting parameter of Modbus Router, as shown 3-5-1.

Modbus Router	× +		-	A CONTRACTOR		
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	=					Language 🗸 🗭
运统 sunfull	-					
专注自控 物物互联	Router					
	Port1					
	Mode	TCP	Ŧ	Port	502	
📥 Download	Max Conn	1	Ŧ	Delay Between Polls(ms)	10	
🔅 User Admin	Baud Rate	9600	Ŧ	Data Bits	8	T
🏟 Network	Stop Bits	1	T	Parity	None	•
🔅 Router	Flow Control	None	•	TimeOut(ms)	1500	
🌣 Time						
T Firmware	Port2				-	
	Mode	TCP	•	Port	503	
(1) Memory	Max Conn	1	•	Delay Between Polls(ms)	10	
🚯 Log	Baud Rate	9600	T	Data Bits	8	•

Figure 3-5-1 Router settings

#### Note:

1, Each serial port of Router corresponds to a port number, so the port number can not be repeated.

2, Different serial ports can set different baud rate. Baud rates available 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 56000, 57600, 115200.

#### 3.6 Time Settings

Set system time of Router, as shown 3-6-1.

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sunfull	Time	
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L Download	2019-05-07 16:57:07 Wite	
🔅 User Admin		
Network		
🔅 Router		
🏶 Time		
▼ Firmware		
Memory		
Log	Copyright © 2	2011-2016 www.bacnetchina.com

Figure 3-6-1 Time Settings

### **3.7 Firmware Information**

Firmware information refers to the firmware version, machine code and registration code of Router, as Figure 3-7-1.

Modbus Router ×	÷	
$\leftrightarrow$ $\rightarrow$ C (i) Not secure   192	.168.1.88/index.html	☆ 🛛 :
送税	≣	Language ~ ()
sunfull 专注自控 物物互联	Firmware	
	Name	ModbusRouter Build: Apr 2 2019(Linux2004Pro)
<b>.</b>	Machine Code	0E:7B:26:2F:3F:BC
Southead Download	Licence Key	6B080000-3EEBB718-2C07E301160BB885C6
🔅 User Admin	Re	load
🏟 Network		
🏟 Router		
🍄 Time		
▼ Firmware		
(i) Memory		
€B Log		Copyright © 2011-2016 www.bacnetchina.com

Figure 3-7-1 Firmware information

# **3.8 Memory Information**

You can view the memory usage of the gateway and restart the gateway, as

shown 3-8-1.

Modbus Router	× +			
← → C ③ Not secure	192.168.1.88/index.html			☆ <b>⊖</b> :
	≡			Language v 🕞
ま注自控 物物互联	Memory			
		Memory Load	4%	
		Total Memory	509716K	
📥 Download		Used Memory	23088K	
🍄 User Admin			Restart Gateway	
🍄 Network				
🔅 Router				
🏟 Time				
T Firmware				
Memory				
🚯 Log				Copyright © 2011-2016 www.bacnetchina.com

Figure 3-8-1 System information

# 3.9 Log Message

View the log messages prompted by the system, as shown 3-9-1.





# **4 Modbus Client Test**

Modbus Poll reads the data of Modbus RTU devices under Modbus Router through Modbus TCP client as shown below 4-1

A Modbus Poll - Mbpoll3	<b>* *</b> ×
File Connection Setup Functions Display View Window Help	
Image: Constraint of the second se	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	
For Help, press F1. For Edit, double click on a value. Pe	ort 5: 9600-8-N-1

Figure 4-1 Modbus Poll Reads Data

# **5 OPC Modbus Server Access Router**

If the data of Modbus TCP is eventually collected to Kingview, WinCC and other configuration software, users can also use X2OPC server software to facilitate the establishment of tags. X2OPC reads Modbus RTU devices data under Modbus Router through Modbus TCP protocol as shown below:

X2OPC - Simulat	tor											x
File Edit View	Tools Web Serv	er Help	0									
D 📽 🖬 🗊 d	• 🖪 💣 🞒 😭	1 × Pa	🖻 🗙 🖍 🕨 📕									
🖃 🗊 ТСР		^ ID	Item ID	Register Type	Register Ad	DataType	Value	Quality	Timestamp	Update Co	Description	
🖨 🚛 TCP502		1	Address	4X(Holding Register)	1	Word	43	Good	2019-05-07 18:0	1		
		<b>1</b> 2	BO_1	0X(Coil Status)	1	Boolean	1	Good	2019-05-07 18:0	1		
D10		<b>1</b> 3	BO_2	0X(Coil Status)	2	Boolean	0	Good	2019-05-07 18:0	1		
D11		<b>6</b> 4	BO_3	0X(Coil Status)	3	Boolean	0	Good	2019-05-07 18:0	1		
D12		<b>1</b> 5	BO_4	0X(Coil Status)	4	Boolean	0	Good	2019-05-07 18:0	1		
	1	6 👩	BO_5	0X(Coil Status)	5	Boolean	0	Good	2019-05-07 18:0	1		
		07	BO_6	0X(Coil Status)	6	Boolean	0	Good	2019-05-07 18:0	1		
D5												
- D7												
	L.											
🕀 🚛 ТСР503		-										
Date	Time	Eve	nt									-
2019/5/7	18:00:08	TCP		00 00 04 01 01 01 01								
€ 2019/5/7	18:00:08	TCP	TCP502.D1.(TX) 00 01 00 (	00 00 06 01 03 00 00 00 01								
2019/5/7	18:00:08	тср	.TCP502.D1.(RX) 00 01 00	00 00 05 01 03 02 00 2B								
€ 2019/5/7	18:00:08	тср	.TCP502.D2.(TX) 00 02 00 (	00 00 06 02 01 00 00 00 06								
2019/5/7	18:00:08	TCP	.TCP502.D2.(RX) 00 02 00	00 00 04 02 01 01 00								
	18:00:08	тср	.TCP502.D2.(TX) 00 03 00 (	00 00 06 02 03 00 00 00 01								
2019/5/7	18:00:08	тср	.TCP502.D2.(RX) 00 03 00	00 00 05 02 03 02 00 D3								
	18:00:08	тср	.TCP502.D3.(TX) 00 04 00 (	00 00 06 03 01 00 00 00 06								
2019/5/7	18:00:08	TCP	.TCP502.D2.(RX) 00 03 00	00 00 05 02 03 02 00 D3								=
	18:00:08	тср	TCP.TCP502.D3.(TX) 00 04 00 00 00 06 03 01 00 00 00 06									
2019/5/7	18:00:08	TCP.TCP502.D3.(RX) 00 04 00 00 04 03 01 01 00										
2019/5/7	18:00:08	TCP.TCP502.D3.(TX) 00 05 00 00 06 03 03 00 00 00 1										
2019/5/7	18:00:08	TCP	.TCP502.D3.(RX) 00 05 00	00 00 05 03 03 02 00 00								
2019/5/7	18:00:08	ТСР	.TCP502.D4.(TX) 00 06 00 0	00 00 06 04 01 00 00 00 06								1
												(5

Figure 5-1 X2OPC Reads Data

# 6 Modbus Router Hardware Parameters

# 6.1 Hardware Performance Table

Hardware performance as shown in Table 6-1.

Parameter	MB2004-A9	MB1002-ARM				
CPU	4-core, 1.4GHz	1-core, 300MHz				
RAM	512M DDR2	64M DDR2				
Memory	8GB Flash	128M				
OS	Liı	nux				
Ethernet Interface	2 independent 10M / 100M Ethernet interface	1 10M / 100M Ethernet interface				
USB interface	1					
TF card slot		1				
Mounting	DIN-Rail	Mounting				
Power supply	AC/D	C 24V				
RTC clock	Internal integrated real-time clock, an on-board battery CR2032 (can last three years)					
Serial communication port	4 fully isolated RS485 interface (TX/RX LED)	2 fully isolated RS485 / 232 interface (TX/RX LED)				

Table 6-1 Hardware Performance Table

# 6.2 Electrical Specifications and Work Environment Table

Electrical specifications and working environments as shown below.

Parameter	MB2004-A9	MB1002-ARM	
Rated power	8W	6W	
Rated voltage	AC/DC 24V , works: 12V ~ 24V.		
Power protection	Adopt isolated power module, equipped with lightning stroke and surge protection.		
Allowed to lose electric	<5 ms		
CE & ROHS	Compliance withEN55032:2015, EN55035:2017 standard, in line with ROHS Lightning surge ± 4KV, group pulse ± 4KV; contacting electrostatic 4K, 8K Air discharge		
Operating temperature	-20 ~ 70 ℃		
Storage temperature	<b>-40 ~ 80</b> ℃		
Working humidity	20% to 90% non-condensing		
Storage humidity	15% to 95% non-condensing		
Aseismicity	10 ~ 25 Hz (X, Y, Z direction 2G / 30 min)		
Cooling mode	Natural air cooling		
Protection class	The front panel meet IP65 (flat mating enclosure installed), the shell meet IP20, whole machine passed the 48-hour salt spray test		

Mechanical structure	Aluminum alloy	Zinc plated carbon steel	
Overall size	142mm x 91mm x 35mm	109mm x 86mm x 34mm	
Total Weight	250g	350g	

Table 6-2 Electrical Specifications, and Working Environment Parameters

# 6.3 Power Interface

Mainboard power input adopts standard 3PIN 5.08mm spacing connector, and the definition of input pin is shown in table 6-3. Power input supports  $12V \sim 24V$  AC/DC input, over current and lightning protection, and reverse connection protection.

Port Definition	Instructions	Note
V +	Positive of DC, live wire	
	of AC	
V-	Negative of DC ,	
	earth line of AC	
Earth	Rack earth	Connect the earth

Table 6-3 Power Interface Parameters

# 6.4 RS485 interface parameters

RS485 interface adopts the standard 12PIN 5.08mm spacing connector, and the pin definition is shown in table 6-4.

No.	Gateway port	MB2004-A9	MB1002-ARM	Note
1	A1 (+)		RS485 / RS232	Full electrically
2	B1 (-)	RS485 interface 1 (COM1)	multiplexing interface 1 (COM1)	interface, maximum isolation voltage is 2000V
3	GND			
4	A2 (+)		RS485 / RS232	Full electrically
5	B2 (-)	RS485 interface2 (COM2)	RS485 interface2 multiplexing (COM2) (COM2) (COM2)	isolated RS485 interface, maximum isolation voltage is 2000V
6	GND			
7	A3 (+)			Full electrically
8	B3 (-)	RS485 interface 3 (COM3)		interface,
9	GND			maximum isolation voltage is 2000V
10	A4 (+)			Full electrically
11	B4 (-)	RS485 interface 4		interface,
12	GND	(COM4)		maximum isolation voltage is 2000V

Table 6-4 RS485 interface parameters