

ATC-3000

Serial Server (MODBUS Gateway) User Manual



ATC-3000 is a high-performance industrial grade serial port server that provides seamless connection from serial devices (RS232/RS422/RS485) to Ethernet, and has built-in powerful MODBUS TCP/RTU/ASCII gateway functionality.

Core value: Solve the problem of serial device networking and achieve remote monitoring and management; Simplify the integration of MODBUS devices and achieve transparent conversion between different MODBUS protocols.

Typical application scenarios: industrial automation (PLC, HMI, sensors, instrument access SCADA/DCS/MES), building automation, energy management, environmental monitoring, etc.

ATC-3000 Serial Server (MODBUS Gateway) User Manual

Hardware installation

■ Connect an Ethernet cable to ATC-3000 unit if connecting to a switch or cross-over direct to the PC as figure1

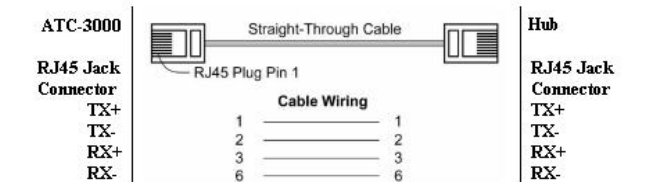


Figure 1

■ ATC-3000 10/100 Port t connect to Ethernet card use cross-Through Cable as figure2

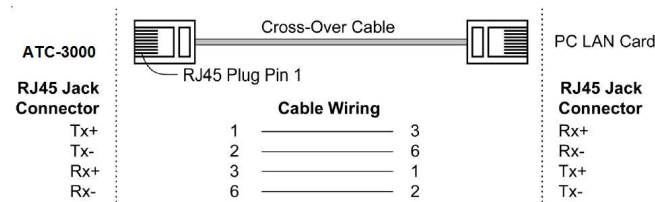


Figure 2

RS-232 Pinout: (DB9 Male)

(DB9Male)	Signal	I/O
PIN2	RXD	IN
PIN3	TXD	OUT
PIN5	GND	-
PIN7	RTS	OUT
PIN8	CTS	IN
(DB9Male)	Signal	I/O
PIN2	RXD	IN
PIN3	TXD	OUT
PIN5	GND	-
PIN7	RTS	OUT
PIN8	CTS	IN

RS-422/485 Pinout: (Six Terminal from left)

Terminal No.	1	2	3	4
RS-422	R+	R-	T+	T-
RS-485	485+	485-	-	-

■ Connect the power adapter to ATC-3000 and other apply power. Power from other device. (+9~+24V@0.5A).

LED indication

Name	Color	Status	Description
LINK	Green	Off	Ethernet Disconnected
SPEED	Green	Off	Ethernet is connected in 10M
		On	Ethernet is connected in 100M

ACT	Yellow	Off	System is not ready or halt
		Blinking	Data is transmitting between Ethernet and RS-232/422/485
PWR	Red	Off	Power Off
		On	Power On

Software Installation

■ Insert the software CD and search for such as vcom.rar, and then open this file to setup the vcom software.

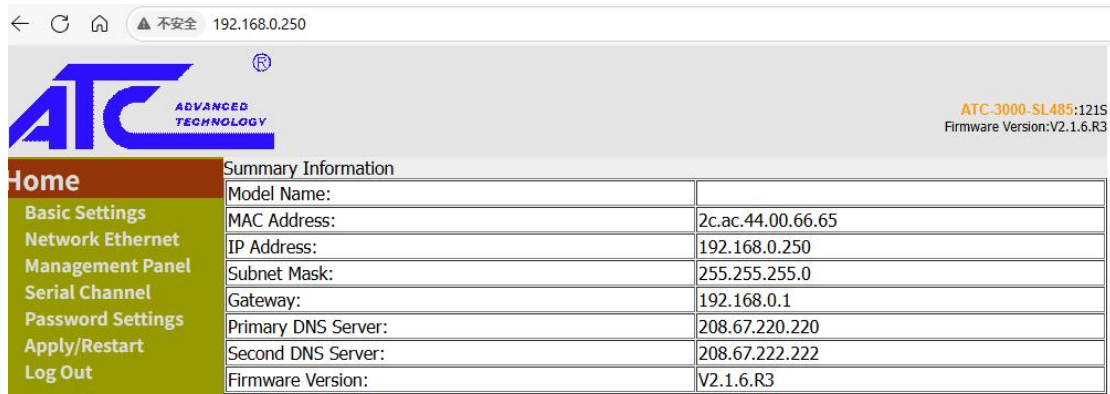
Note: Be sure you have administrative rights & disable fire-walls in windows XP.

Configure the ATC-3000

■ Use this section to set up your computer to assign it a static IP address in the **192.168.0.1** to **192.168.0.254** range with a subnet mask of 255.255.255.0. This is necessary to ensure that your computer can communicate with your ATC-3000. Your computer must have an Ethernet card and TCP/IP installed. TCP/IP should already be installed on computer using Windows 98/2000/XP and later operating systems.

■ Open your web browser and type <http://192.168.0.250> in the browser's address box. This address is the factory default IP Address of your ATC-3000. And then press "Enter".

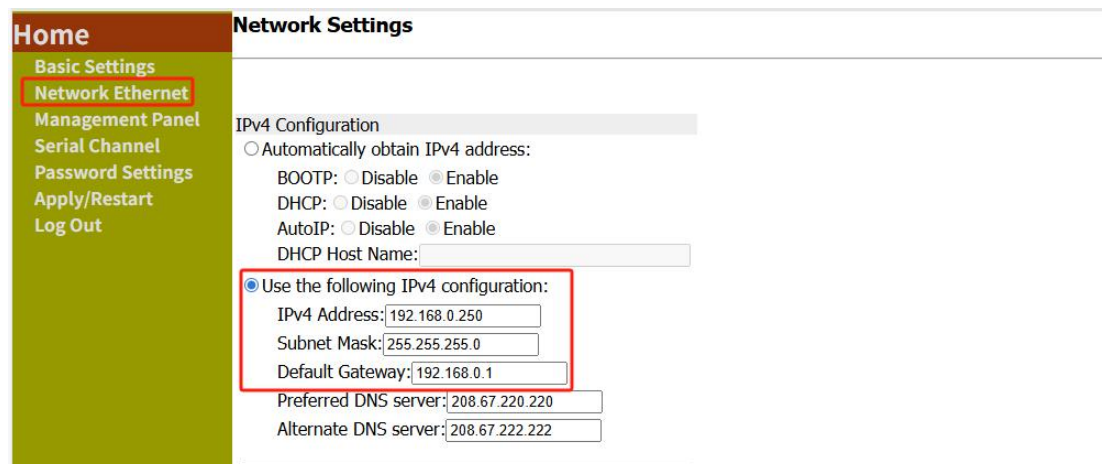
■ The "Username and Password required" message box will appear. Typing "admin" (default username) in the Username field and typing "admin" (default password) in the Password field. Click "OK" The setup screen will then appear.



Summary Information	
Model Name:	
MAC Address:	2c.ac.44.00.66.65
IP Address:	192.168.0.250
Subnet Mask:	255.255.255.0
Gateway:	192.168.0.1
Primary DNS Server:	208.67.220.220
Second DNS Server:	208.67.222.222
Firmware Version:	V2.1.6.R3

Modify IP address

Network Ethernet->Network Settings->Use the following IPv4 configuration:



Network Settings

IPv4 Configuration

☐ Automatically obtain IPv4 address:

BOOTP: ☐ Disable ☒ Enable

DHCP: ☐ Disable ☒ Enable

AutoIP: ☐ Disable ☒ Enable

DHCP Host Name:

☒ Use the following IPv4 configuration:

IPv4 Address:

Subnet Mask:

Default Gateway:

Preferred DNS server:

Alternate DNS server:

After setting up, click the Submit button below.

To make the parameters take effect, it is necessary to save the parameters and restart the device.

Home

- Basic Settings
- Network Ethernet
- Management Panel
- Serial Channel
- Password Settings
- Apply/Restart 1**
- Log Out

Apply Setting/Restart

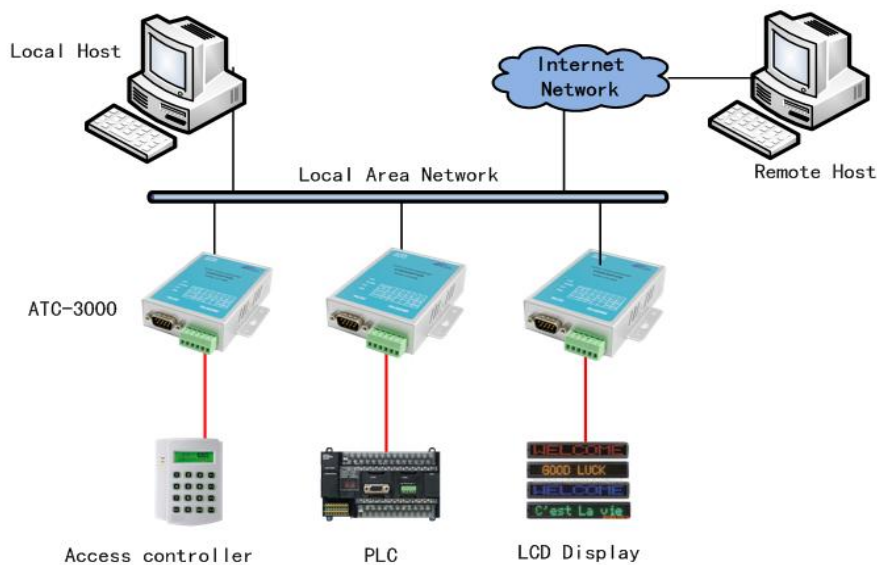
New configurations will NOT take effect until rebooted.

Warning! Both serial and ethernet connections will be dropped and data may be lost while rebooting.

☐ Load defaults
☐ Load defaults and reboot
☐ Reboot
☒ **Save and reboot 2**
 3

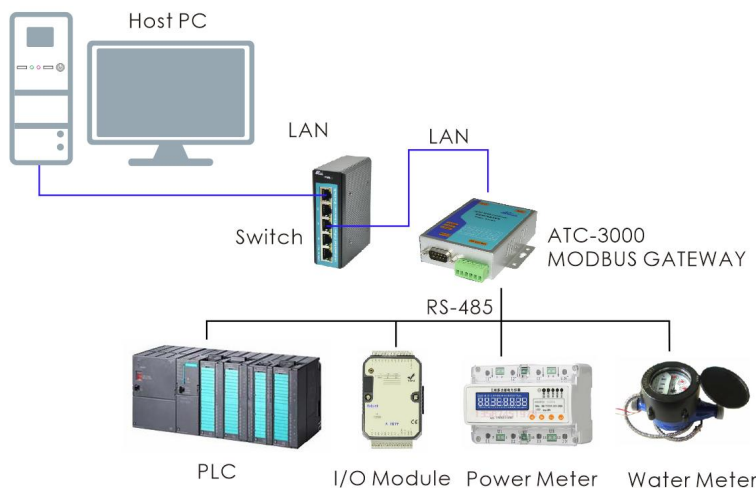
Transparent Protocol Transmission Mode

Transparent encapsulation of serial data into TCP/UDP packets for transmission over the network, and vice versa. The core advantage of using transparent protocol transmission for serial servers (i.e. not modifying the original serial data frames, only encapsulating and forwarding data) is strong compatibility and simple deployment, especially suitable for quickly endowing traditional serial devices with network communication capabilities.



Modbus Gateway Mode

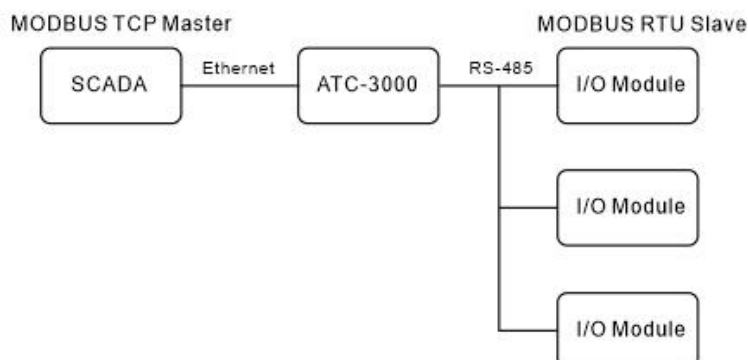
The core function of MODBUS gateway is to act as a "protocol translator" and "physical interface converter", enabling devices that could only use MODBUS RTU or ASCII protocol through serial communication (RS-232 / RS-485) to seamlessly connect to Ethernet (TCP/IP) based networks and communicate using MODBUS TCP protocol.



Modbus Mode: Serial Slave and Tcp Master

This mode corresponds to the serial port end and the MODBUS Slave device. The network corresponds to MODBUS TCP Master devices or SCADA software, etc.

The application diagram is shown below:



The webpage configuration is as follows:

1. Serial Channel --> Serial Setting

[Home](#)
[Basic Settings](#)
[Network Ethernet](#)
[Management Panel](#)
[Serial Channel](#)
[Password Settings](#)
[Apply/Restart](#)
[Log Out](#)

Serial Channel List

Name	Remark	Uart Baudrate	Ethernet Protocol	Channel Setting	Serial Setting	Connection Setting	Hostlist Setting
Channel1		9600	TCP	Channel	Serial	Connection	Hostlist

Refresh

[Home](#)
[Basic Settings](#)
[Network Ethernet](#)
[Management Panel](#)
[Serial Channel](#)
[Password Settings](#)
[Apply/Restart](#)
[Log Out](#)

Serial Settings

Channel 1

☒ Enable Serial Port

Port Settings

Protocol: RS485 Data Protocol: Transparent

Flow Control: None Baud Rate: 9600

Data Bits: 8 Parity: None

FIFO: 8 Stop Bits: 1

IO Mode: Flow Control and System

IO1 Status: 0 IO2 Status: 0

IO Control String:

Pack Control

Max packet length: 1024 byte Merge length: 1 byte

Uart Idle Time: 20 ms Net Idle Time: 5 ms

Latch Time: 500 ms Uart Out IFG: 5 ms

Enable Match Packing: ☐ Match 2 Bytes Sequence: ☐ Yes ☒ No

Send Frame Only: ☐ Yes ☒ No Match Byte: 0x31 0x32 (Hex)

Modbus Gateway

☒ Enable Modbus

Modbus Mode: Serial Slave and Tcp Master Modbus Timeout: 500 ms

Modbus Protocol: Serial Modbus RTU Broadcast Delay: 200 ms

Submit

Set parameters such as serial port type, baud rate, parity check, stop bit, etc.

Check the 'Enable Modbus' option.

Modbus Mode: Serial Slave and Tcp Master

Modbus Protocol: According to the Modbus device protocol, most devices use the Modbus RTU protocol.

2. Serial Channel --> Connection

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Serial Channel List

Name	Remark	Uart Baudrate	Ethernet Protocol	Channel Setting	Serial Setting	Connection Setting	Hostlist Setting
Channel1		9600	TCP	Channel	Serial	Connection	Hostlist

Refresh

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Connection Settings

Channel 1

Net Protocol: TCP Link Protocol: None

Connection Protocol: TCP Link Protocol: None

Connect Mode

Worked As: Server

Active Connect: Auto Start Start Character: 0X61

Endpoint Configuration:

Local Port: 27001 Remote Port:

Remote Host:

Use Hostlist: Disable DNS Query Period: 1800

Disconnect Mode

☒ Hard disconnect

Inactivity Timeout: 0 (Secs)

KeepAlive: 10 (Secs)

Submit

Net Protocol-Connection Protocol: TCP

Connect Mode-Worked As: Server

Endpoint Configuration-Local Port: 27001(default). It can be set according to the needs.

3. Serial Channel --> Hostlist

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart

Serial Channel List

Name	Remark	Uart Baudrate	Ethernet Protocol	Channel Setting	Serial Setting	Connection Setting	Hostlist Setting
Channel1		9600	TCP	Channel	Serial	Connection	Hostlist

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Hostlist Settings

Channel 1

TCP Hostlist Settings

Retry Counter: 3 Retry Timeout: 2

Backup Link: All Links Max TCP Links: 2

Host Information

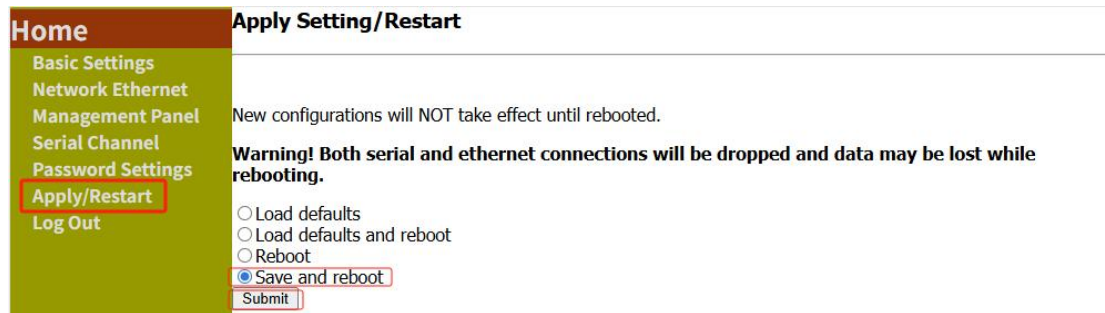
No.	Host Address	Port	No.	Host Address	Port
1		0	2		0
3		0	4		0
5		0	6		0
7		0	8		0
9		0	10		0
11		0	12		0

Max TCP Links: 2 (default), The value can be adjusted according to demand, with a maximum value of 20.

4. Apply/Restart

Check the 'Save and reboot' option

Click the 'Submit' button Then the set parameters will take effect.



Home **Apply Setting/Restart**

Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

New configurations will NOT take effect until rebooted.

Warning! Both serial and ethernet connections will be dropped and data may be lost while rebooting.

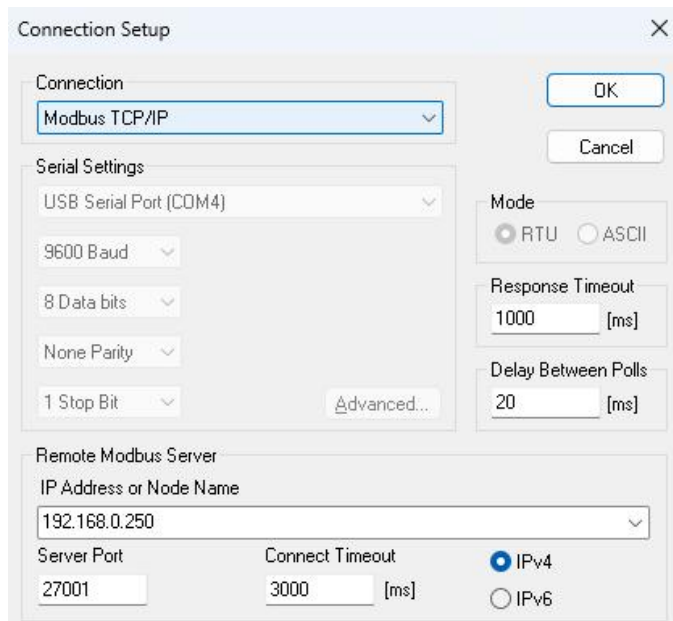
☐ Load defaults
☐ Load defaults and reboot
☐ Reboot
☒ **Save and reboot**

Submit

After completing the above operations, the ATC-3000 is now operating in MODBUS gateway mode (Serial Slave and Tcp Master).

MODBUS protocol communication test

At this point, we are connecting a MODBUS RTU slave device to the RS-485 interface of the ATC-3000. The Modbus Poll tool can be used on a computer for protocol testing.



Connection Setup

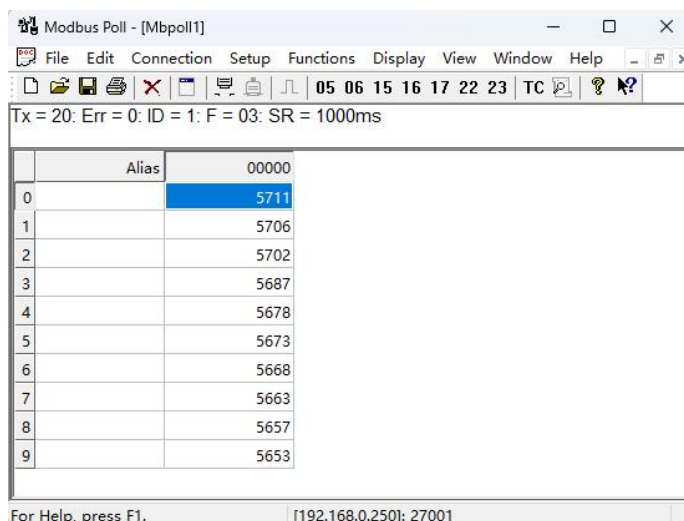
Connection: Modbus TCP/IP

Serial Settings:
USB Serial Port (COM4)
9600 Baud
8 Data bits
None Parity
1 Stop Bit

Mode:
☒ RTU ☐ ASCII

Response Timeout: 1000 [ms]
Delay Between Polls: 20 [ms]

Remote Modbus Server:
IP Address or Node Name: 192.168.0.250
Server Port: 27001
Connect Timeout: 3000 [ms]
☒ IPv4 ☐ IPv6



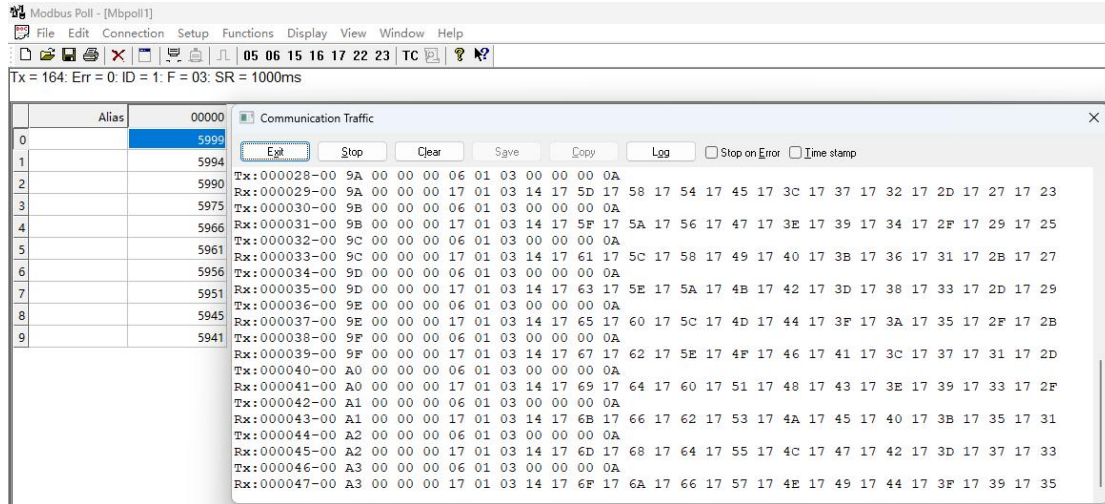
Modbus Poll - [Mbpoll1]

File Edit Connection Setup Functions Display View Window Help

Tx = 20: Err = 0: ID = 1: F = 03: SR = 1000ms

	Alias	Value
0		5711
1		5706
2		5702
3		5687
4		5678
5		5673
6		5668
7		5663
8		5657
9		5653

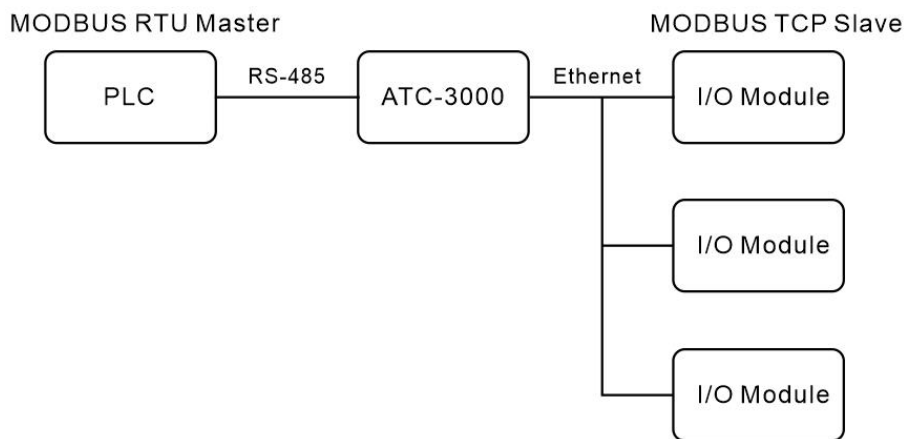
For Help, press F1. [192.168.0.250]: 27001



Modbus Mode: Serial Master and Tcp Slave

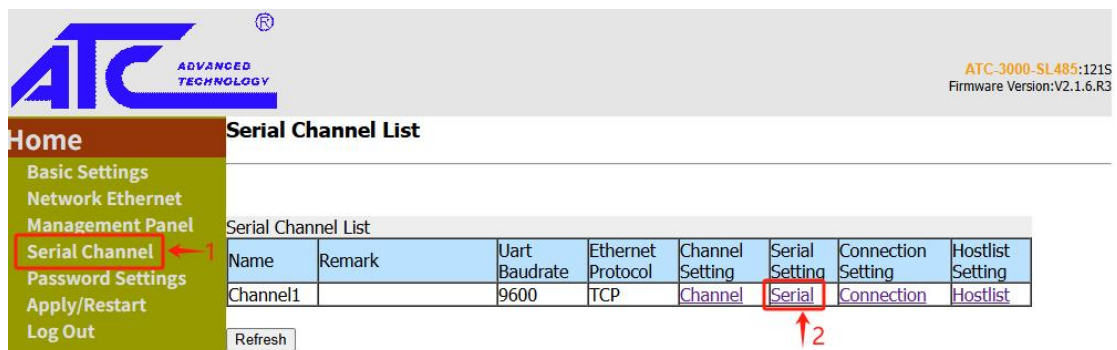
This mode corresponds to the serial port end and the MODBUS Master device. The network corresponds to MODBUS TCP Slave devices

The application diagram is shown below:



The webpage configuration is as follows:

1. Serial Channel --> Serial Setting



Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Serial Settings

Channel 1

☒ Enable Serial Port

Port Settings

Protocol:	RS485	Data Protocol:	Transparent
Flow Control:	None	Baud Rate:	9600
Data Bits:	8	Parity:	None
FIFO:	8	Stop Bits:	1
IO Mode:	Flow Control and System	IO1 Status:	0
IO1 Status:	0	IO2 Status:	0

IO Control String:

Pack Control

Max packet length:	1024	byte	Merge length:	1	byte
Uart Idle Time:	20	ms	Net Idle Time:	5	ms
Latch Time:	500	ms	Uart Out IFG:	5	ms
Enable Match Packing:	☐		Match 2 Bytes Sequence:	☐ Yes ☒ No	
Send Frame Only:	☐ Yes ☒ No		Match Byte:	0x31 0x32	(Hex)

Modbus Gateway

☒ Enable Modbus

Modbus Mode: Serial Master and Top Slave

Modbus Protocol: Serial Modbus RTU

Modbus Timeout: 500 ms

Broadcast Delay: 200 ms

Submit

Set parameters such as serial port type, baud rate, parity check, stop bit, etc.

Check the 'Enable Modbus' option.

Modbus Mode: Serial Master and Top Slave

Modbus Protocol: According to the Modbus device protocol, most devices use the Modbus RTU protocol.

5. Serial Channel --> Connection

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Serial Channel List

Name	Remark	Uart Baudrate	Ethernet Protocol	Channel Setting	Serial Setting	Connection Setting	Hostlist Setting
Channel1		9600	TCP	Channel	Serial	Connection	Hostlist

Refresh

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Connection Settings

Channel 1

Net Protocol

Connection Protocol: TCP

Link Protocol: None

Connect Mode

Worked As: Client

Active Connect: Auto Start

Start Character: 0X61

Endpoint Configuration:

Local Port: 27001

Remote Port: 502

Remote Host: 192.168.0.2

Use Hostlist: Only Client

DNS Query Period: 1800

Disconnect Mode

☒ Hard disconnect

Inactivity Timeout: 0 (Secs)

KeepAlive: 10 (Secs)

Submit

Net Protocol-Connection Protocol: TCP

Connect Mode-Worked As: Client

Endpoint Configuration

Remote Port: 502. This value needs to correspond to the actual device parameters.

Remote Host: 192.168.0.2. This IP address needs to correspond to the actual device parameters.

Use Hostlist: Only Client. If there are multiple Modbus TCP Slave devices, this option needs to be enabled.

6. Serial Channel --> Hostlist

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart

Serial Channel List

Serial Channel List

Name	Remark	Uart Baudrate	Ethernet Protocol	Channel Setting	Serial Setting	Connection Setting	Hostlist Setting
Channel1		9600	TCP	Channel	Serial	Connection	Hostlist

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Hostlist Settings

Success

Channel 1

TCP Hostlist Settings

Retry Counter: 3 Retry Timeout: 2

Backup Link: All Links Max TCP Links: 20

No.	Host Address	Port	No.	Host Address	Port
1	192.168.0.3	502	2		0
3		0	4		0
5		0	6		0
7		0	8		0
9		0	10		0
11		0	12		0

Submit

Max TCP Links: 2 (default), The value can be adjusted according to demand, with a maximum value of 20.

Host Information: Fill in the IP address and port number of the corresponding MODBUS TCP Slave device.

7. Apply/Restart

Check the 'Save and reboot' option

Click the 'Submit' button Then the set parameters will take effect.

Home
Basic Settings
Network Ethernet
Management Panel
Serial Channel
Password Settings
Apply/Restart
Log Out

Apply Setting/Restart

New configurations will NOT take effect until rebooted.

Warning! Both serial and ethernet connections will be dropped and data may be lost while rebooting.

☐ Load defaults
☐ Load defaults and reboot
☐ Reboot
☒ Save and reboot

Submit

After completing the above operations, the ATC-3000 is now operating in MODBUS gateway mode (Serial Master and Tcp Slave).

MODBUS protocol communication test

At this point, we are connecting a MODBUS TCP slave device to the Ethernet interface of the ATC-3000. The Modbus Poll tool can be used on a computer for protocol testing(use a USB to RS-485 cable connect PC and ATC-3000's RS-485 port).

Connection Setup

Connection: Serial Port

Serial Settings: USB Serial Port (COM4)

9600 Baud

8 Data bits

None Parity

1 Stop Bit

Advanced...

Mode: ☒ RTU ☐ ASCII

Response Timeout: 1000 [ms]

Delay Between Polls: 20 [ms]

Remote Modbus Server

IP Address or Node Name: 192.168.0.250

Server Port: 27001

Connect Timeout: 3000 [ms]

☒ IPv4 ☐ IPv6

Modbus Poll - [Mbpoll1]

File Edit Connection Setup Functions Display View Window Help

05 06 15 16 17 22 23 TC ? ?

Tx = 11: Err = 0: ID = 1: F = 03: SR = 1000ms

	Alias	00000
0		13060
1		13055
2		13051
3		13036
4		13027
5		13022
6		13017
7		13012
8		13006
9		13002

Modbus Poll - [Mbpoll1]

File Edit Connection Setup Functions Display View Window Help

05 06 15 16 17 22 23 TC ? ?

Tx = 32: Err = 0: ID = 1: F = 03: SR = 1000ms

	Alias	00000
0		13081
1		13076
2		13072
3		13057
4		13048
5		13043
6		13038
7		13033
8		13027
9		13023

Communication Traffic

Exit Stop Clear Save Copy Log ☐ Stop on Error ☐ Time stamp

```

Tx: 001980-01 03 00 00 00 0A C5 CD
Rx: 001981-01 03 14 33 13 33 0E 33 0A 32 FB 32 F2 32 ED 32 E8 32 E3 32 DD 32 D9 EE 47
Tx: 001982-01 03 00 00 00 0A C5 CD
Rx: 001983-01 03 14 33 14 33 0F 33 0B 32 FC 32 F3 32 EE 32 E9 32 E4 32 DE 32 DA C5 E9
Tx: 001984-01 03 00 00 00 0A C5 CD
Rx: 001985-01 03 14 33 15 33 10 33 0C 32 FD 32 F4 32 EF 32 EA 32 E5 32 DF 32 DB 0C 84
Tx: 001986-01 03 00 00 00 0A C5 CD
Rx: 001987-01 03 14 33 16 33 11 33 0D 32 FE 32 F5 32 F0 32 EB 32 E6 32 E0 32 DC 70 51
Tx: 001988-01 03 00 00 00 0A C5 CD
Rx: 001989-01 03 14 33 17 33 12 33 0E 32 FF 32 F6 32 F1 32 EC 32 E7 32 E1 32 DD 25 09
Tx: 001990-01 03 00 00 00 0A C5 CD
Rx: 001991-01 03 14 33 18 33 13 33 0F 33 00 32 F7 32 F2 32 ED 32 E8 32 E2 32 DE 52 7F
Tx: 001992-01 03 00 00 00 0A C5 CD
Rx: 001993-01 03 14 33 19 33 14 33 10 33 01 32 F8 32 F3 32 EE 32 E9 32 E3 32 DF 23 7F
  
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