

Zigbee to RS485 Repeater, 3 Input Module

Description

Zigbee to RS485 repeater is a kind of lowcost, low consumption, and wireless mesh network targeted at wide development of long life devices in wireless control and monitoring applications. It applies wireless controlling and wireless data transmission. One zigbee to RS485 repeater can work with another or others as one network. As one solution to replace wire connection, it can connect with computer.

The unit can implement the wireless transmission based on RS485,while 3 Input Module connected with equipments such as temperature sensor,power meter,etc.One word,they work together to provide a simple way to integrate mesh technology into application.



Zigbee to RS485 Repeater

Specifications

| | |
|------------------------------|--|
| Supple Voltage | 2.1 to 3.6V |
| Communica-tion | RS485, Zigbee |
| Antenna | RPSMA Connector,50Ω |
| Transmission Range | Penetrate a wall inside room; 200m wide open outside space |
| Max Current | <20mA @24VAC |
| Transmit Power | 100mW(+20dBm) |
| Receiver | -101 dBm |
| Data Rate | RF 250 Kbps,Serial up to 1Mbps |
| Frequency Band | ISM 2.4 GHz |
| Operating Temperature | -40° C to +85° C |
| Memory | Standard: N/A Programmable: 256KB Flash/4 KB RAM |
| IDS | PAN ID and addresses, cluster IDs and endpoints |
| Channels | 16 channels |
| Transmit Current | Standard: 120 mA @ 3.3 VDC Programmable: 120 mA @ 3.3 VDC |
| Receive Current | Standard: 31 mA @ 3.3 VDC Programmable: 45 mA @ 3.3 VDC |
| Power-down Current | <3 μA at 25° C |



3 Input Module

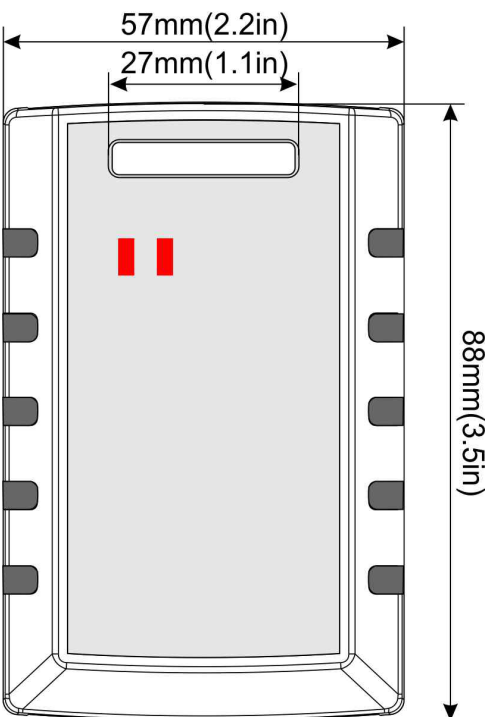
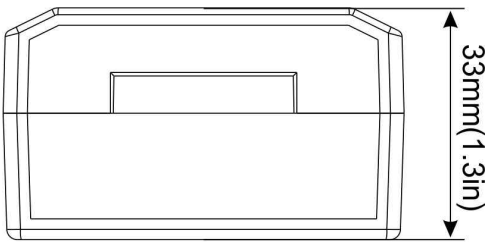
Zigbee to RS485 Repeater, 3 Input Module

Highlight

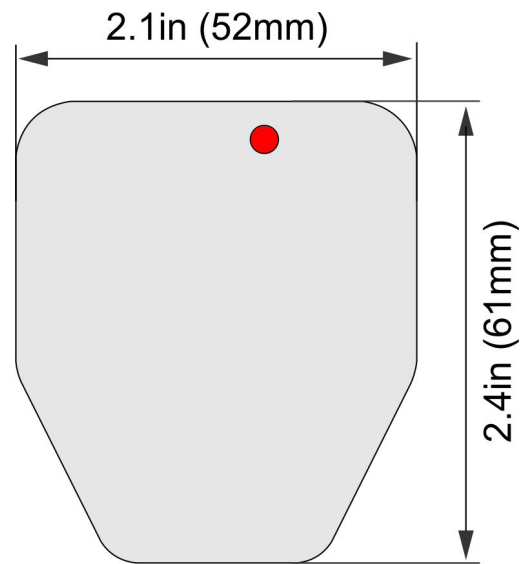


Dimension

Zigbee to RS485 Repeater



3 Input Module

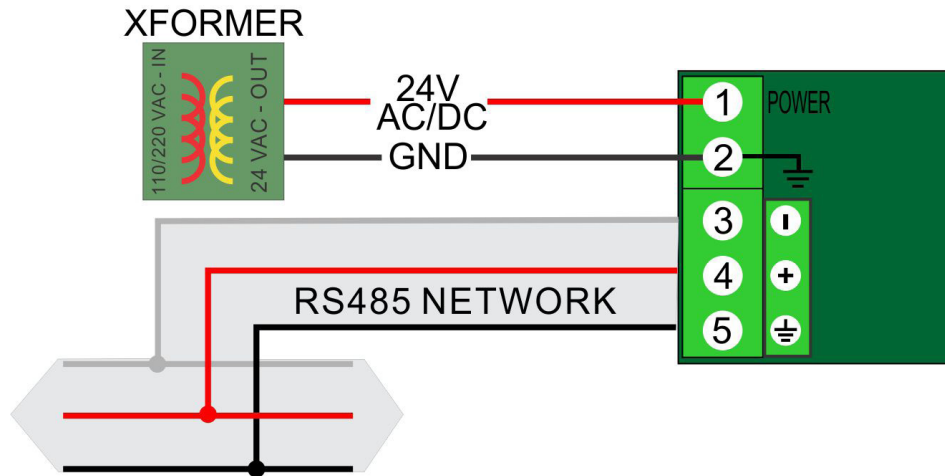


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Wiring Diagram

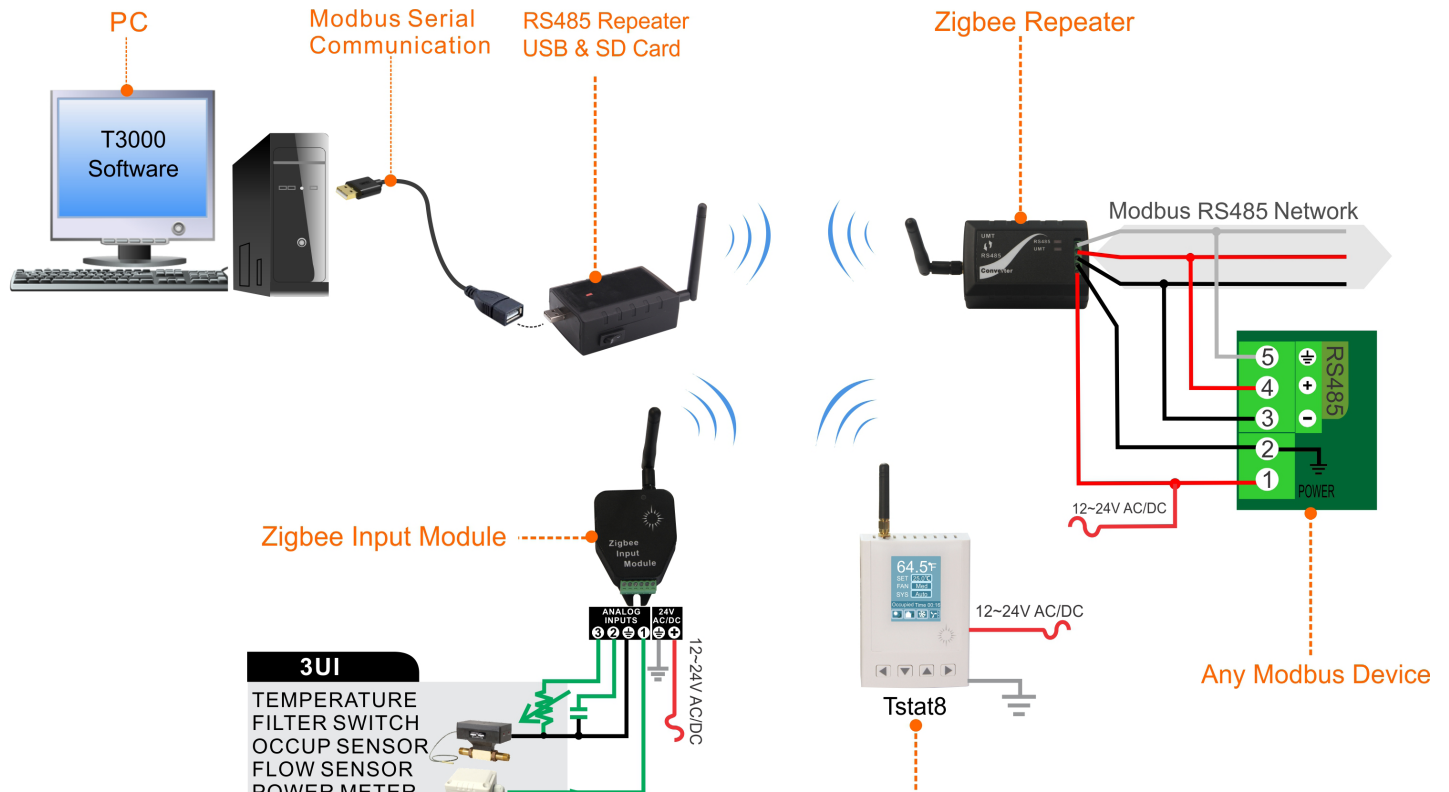
The diagram below will show you how to properly set up a zigbee repeater.

ZIGBEE WIRING DIAGRAM



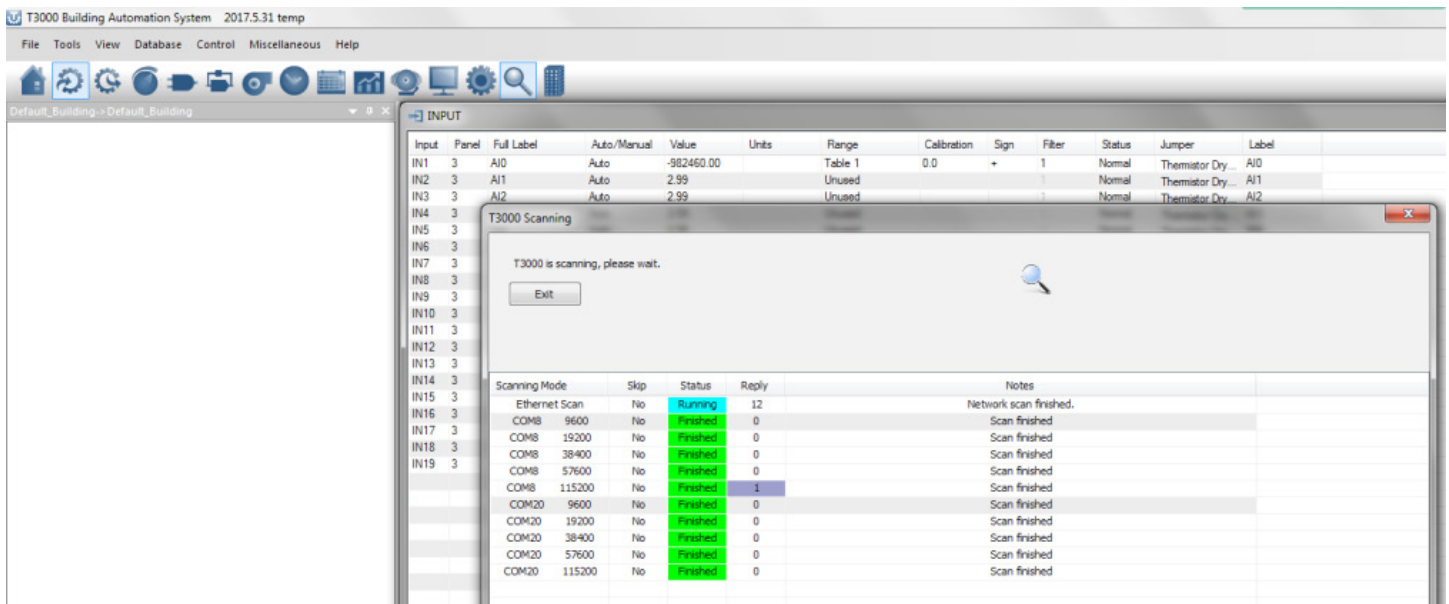
T3000 Operation

This example will show you how the unit will properly work with T3000 software when connecting any Modbus module to a zigbee repeater.

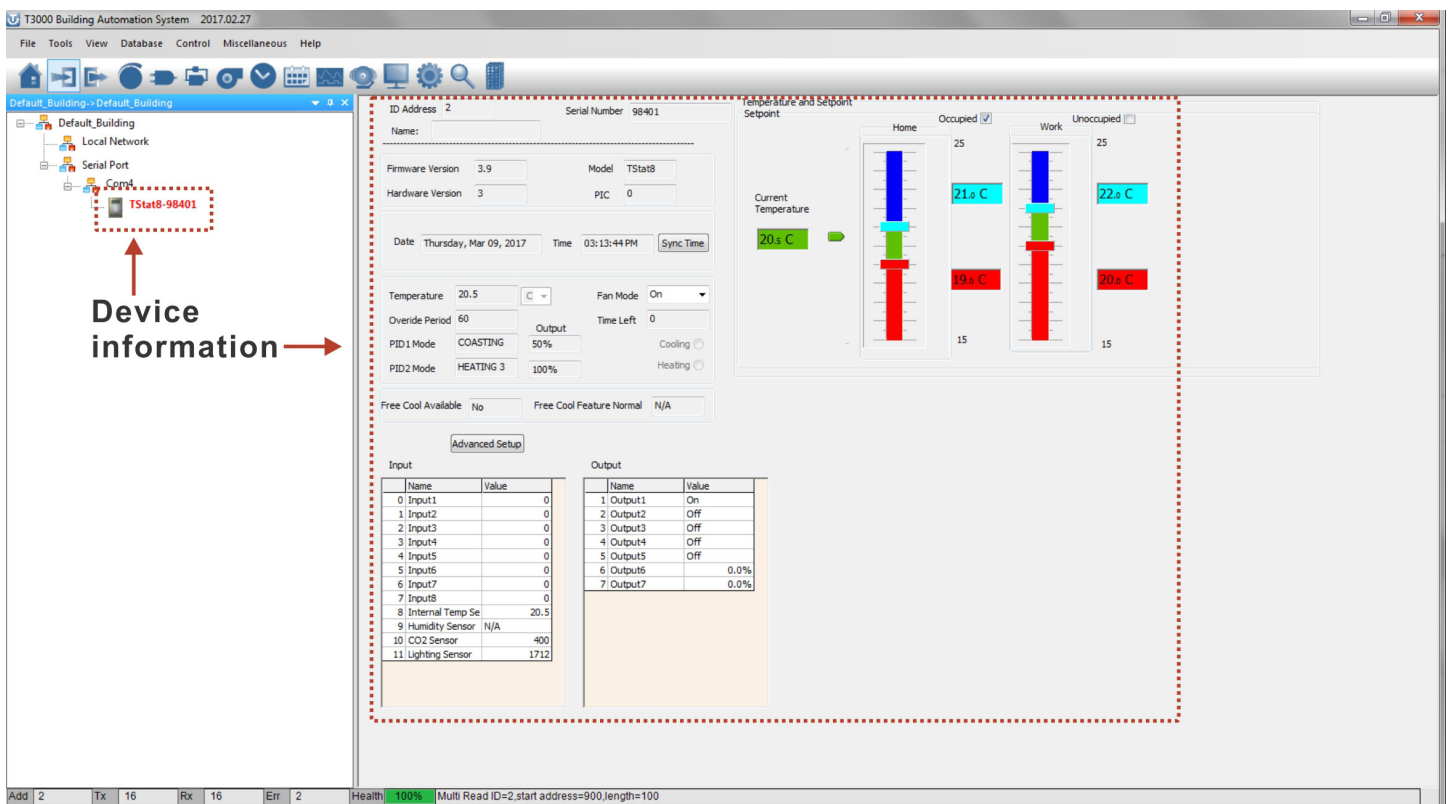


Zigbee to RS485 Repeater, 3 Input Module

- Step1. Connect the Zigbee repeater and Zigbee input module 24VAC power.
- Step2. Connect any modbus device and zigbee repeater by RS485 port.
- Step3. Connect the Zigbee server to a PC USB port.
- Step4. Visit <https://temcocontrols.com/ftp/software/T3000.zip>,download T3000 software.



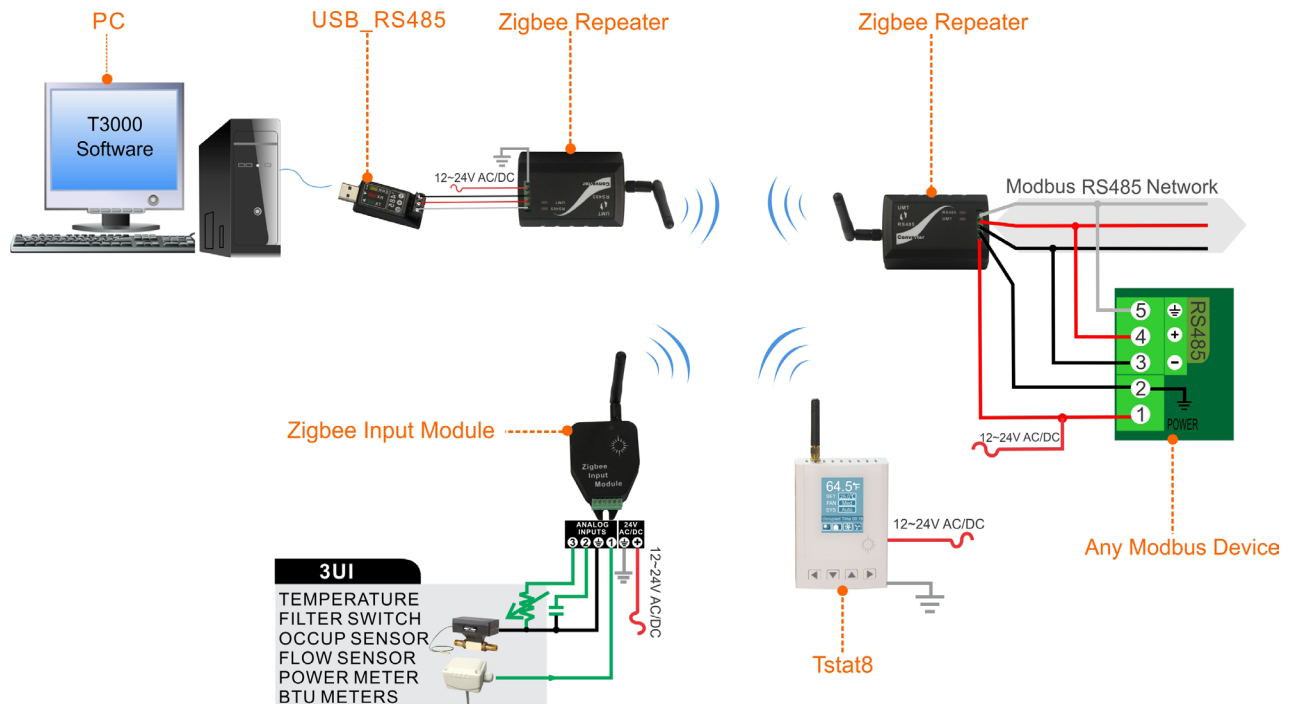
Step5. Start T3000 program, Click  to scan, then you can find the Modbus device connected.



Zigbee to RS485 Repeater, 3 Input Module

Wireless Modbus RS485 'wire replacement' configuration

The zigbee modules can operate as a transparent wire replacement.



Operation:

Step1. Connect the Zigbee Repeater host-side to PC via RS485.

Step2. Start ModbusPoll, Click "Connection Setup", the default baudrate is 9600.

The screenshot shows the Modbus Poll software interface. The main window displays a table with data points and a status bar indicating "No Connection". A "Connection Setup" dialog box is open, showing the following settings:

| Address | Value | Address | Value |
|---------|-------|---------|--------|
| 0 | 1 | 00020 | 0 |
| 1 | 1 | | 4 |
| 2 | 1 | | -13606 |
| 3 | 2000 | | 0 |
| 4 | 0 | | 0 |
| 5 | 0 | | 8192 |
| 6 | 0 | | 0 |
| 7 | 0 | | 174 |
| 8 | 0 | | 123 |
| 9 | 0 | | 213 |

Connection Setup

Connection: Serial Port

Serial Settings:

- USB Serial Port (COM9)
- 9600 Baud
- 8 Data bits
- None Parity
- 1 Stop Bit

Mode: RTU ASCII

Response Timeout: 1000 [ms]

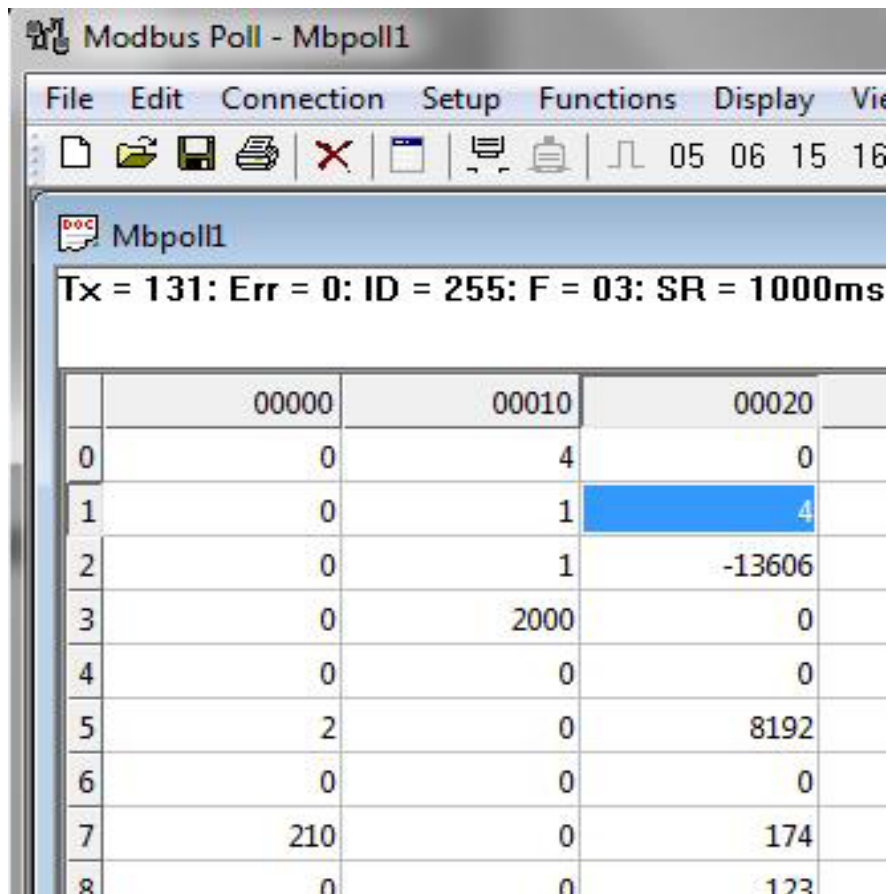
Delay Between Polls: 1000 [ms]

Remote Server:

- IP Address: 127.0.0.1
- Port: 502
- Connect Timeout: 3000 [ms]

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Step3. Configure the device to Coordinator, set the value of register23 to 0 (If you need to change the Baudrate, set the value of register21, 0 stands for 9600, 1 stands for 119200, and 4 stands for 115200). Then the Zigbee Repeater host-side configuration is finished.



Modbus Poll - Mbpoll1

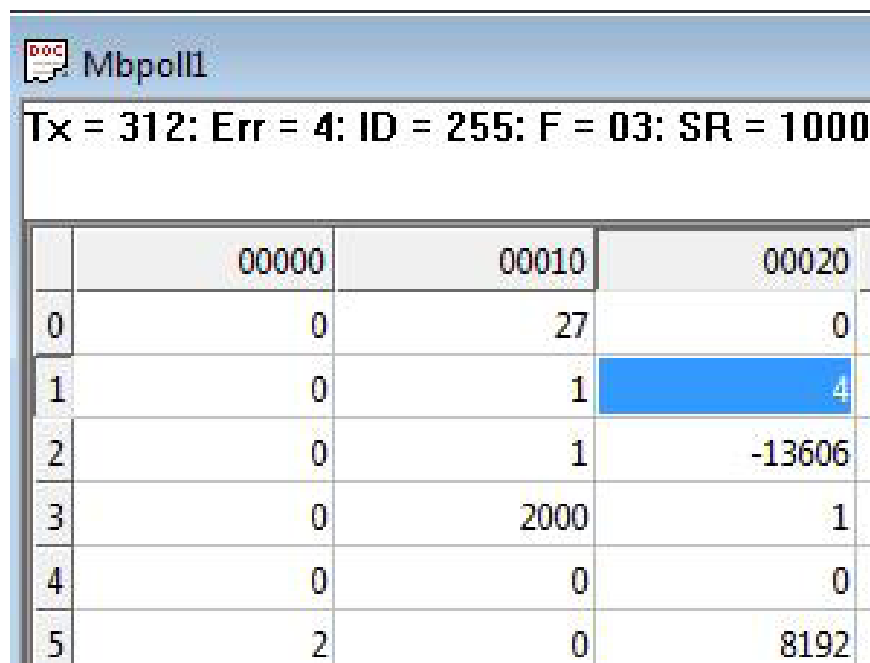
File Edit Connection Setup Functions Display View

Mbpoll1

Tx = 131: Err = 0: ID = 255: F = 03: SR = 1000ms

| | 00000 | 00010 | 00020 |
|---|-------|-------|--------|
| 0 | 0 | 4 | 0 |
| 1 | 0 | 1 | 4 |
| 2 | 0 | 1 | -13606 |
| 3 | 0 | 2000 | 0 |
| 4 | 0 | 0 | 0 |
| 5 | 2 | 0 | 8192 |
| 6 | 0 | 0 | 0 |
| 7 | 210 | 0 | 174 |
| 8 | 0 | 0 | 174 |

Step4. Configure the Zigbee Repeater device-side. Connect it to PC via RS485, start ModbusPoll, Click "Connection Setup", the default baudrate is 9600; configure the device to router, set the value of register23 to 1; set the baudrate value of the register 21 to the Modbus device to be connected. Then the Zigbee Repeater device-side configuration is finished.



Mbpoll1

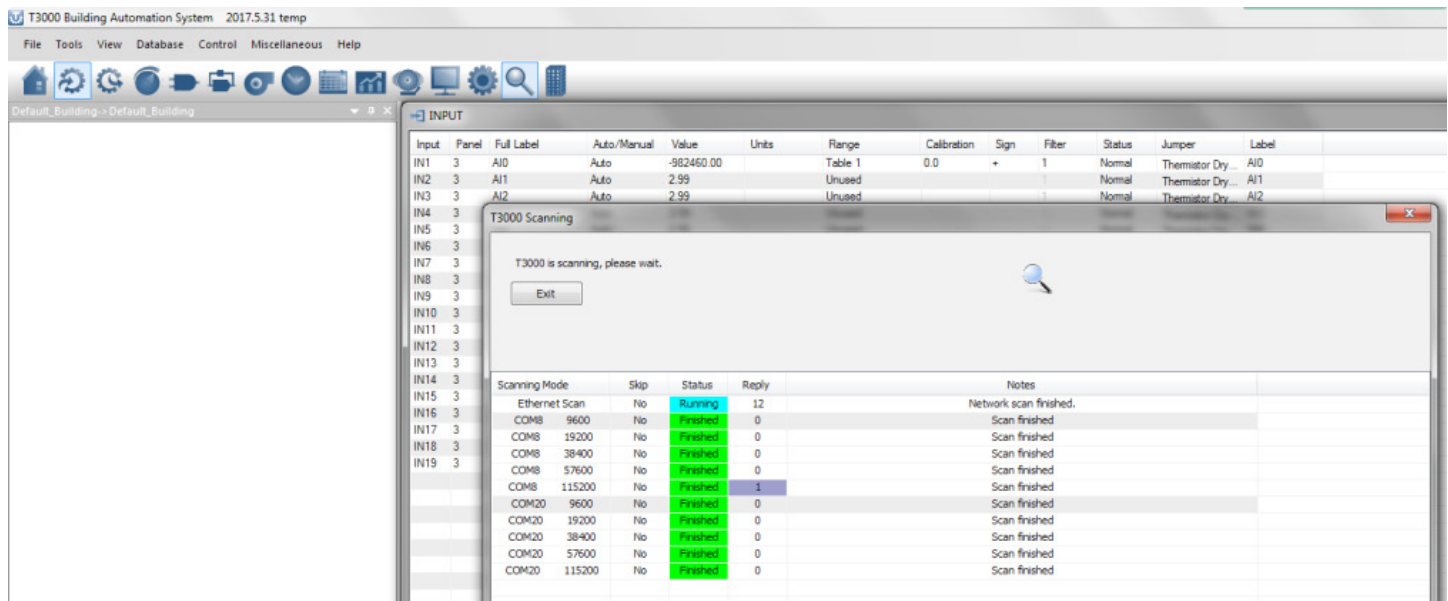
Tx = 312: Err = 4: ID = 255: F = 03: SR = 1000

| | 00000 | 00010 | 00020 |
|---|-------|-------|--------|
| 0 | 0 | 27 | 0 |
| 1 | 0 | 1 | 4 |
| 2 | 0 | 1 | -13606 |
| 3 | 0 | 2000 | 1 |
| 4 | 0 | 0 | 0 |
| 5 | 2 | 0 | 8192 |

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Step5. Connect the Zigbee Repeater device-side to the Modbus device to be connected.

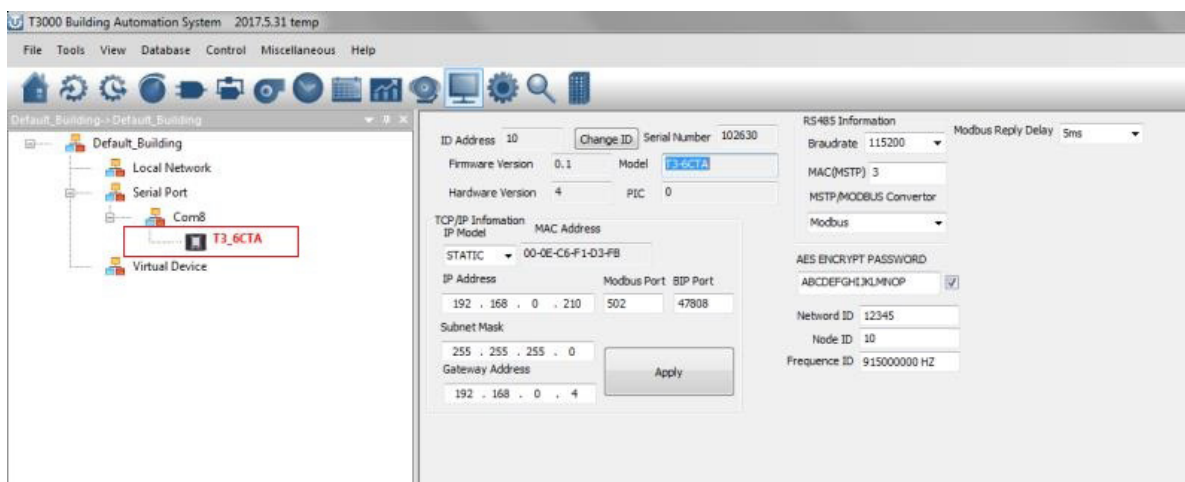
Step6. Start T3000, Click  to scan.



The screenshot shows the T3000 Building Automation System interface. A 'T3000 Scanning' dialog box is open, displaying a table of scanning results. The table has columns for Scanning Mode, Skip, Status, Reply, and Notes. The status 'Running' is highlighted in blue, and 'Finished' is highlighted in green.

| Scanning Mode | Skip | Status | Reply | Notes |
|---------------|------|----------|-------|------------------------|
| Ethernet Scan | No | Running | 12 | Network scan finished. |
| COM8 9600 | No | Finished | 0 | Scan finished |
| COM8 19200 | No | Finished | 0 | Scan finished |
| COM8 38400 | No | Finished | 0 | Scan finished |
| COM8 57600 | No | Finished | 0 | Scan finished |
| COM8 115200 | No | Finished | 1 | Scan finished |
| COM20 9600 | No | Finished | 0 | Scan finished |
| COM20 19200 | No | Finished | 0 | Scan finished |
| COM20 38400 | No | Finished | 0 | Scan finished |
| COM20 57600 | No | Finished | 0 | Scan finished |
| COM20 115200 | No | Finished | 0 | Scan finished |

Step7. Then you can find the Modbus device connected.



The screenshot shows the T3000 Building Automation System interface. The 'Com8' port is selected, and the 'T3_6CTA' device is highlighted. The configuration panel shows various settings for the device.

RS485 Information

- Baudrate: 115200
- Modbus Reply Delay: Sms
- MAC(MSTP): 3
- MSTP(MODBUS Converter): Modbus
- AES ENCRYPT PASSWORD: ABCDEFGHIJKLMNOP
- Network ID: 12345
- Node ID: 10
- Frequency ID: 915000000 HZ

TCP/IP Information

- IP Model: STATIC
- MAC Address: 00-DE-C6-F1-D3-F8
- IP Address: 192 . 168 . 0 . 210
- Subnet Mask: 255 . 255 . 255 . 0
- Gateway Address: 192 . 168 . 0 . 4
- Modbus Port: 502
- BIP Port: 47808

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Modbus Register List

| Address | Bytes | INTs | Multiplier | Length info | Operation info | Register and Description |
|----------------|-------|-------|------------|-------------|----------------|--|
| 0 to 3 | 4 | int8 | 1 | Low byte | R | Serial Number - 4 byte value. Read-only |
| 4 to 5 | 2 | int8 | 0.1 | Low byte | R | Software Version – 2 byte value. Read-only |
| 6 | 1 | int8 | 1 | Low byte | W/R | ADDRESS. Modbus device address, default:MainBoard-1 |
| 7 | 1 | int8 | 1 | Low byte | R | Product Model. This is a read-only register that is used by the microcontroller to determine the product |
| 8 | 1 | int8 | 1 | Low byte | R | UTC time, hour |
| 9 | 1 | int8 | 1 | Low byte | R | UTC time, minute |
| 10 | 1 | int8 | 1 | Low byte | R | UTC time, second |
| 11 | 1 | int8 | 1 | Low byte | R | UTC time, month |
| 12 | 1 | int8 | 1 | Low byte | R | UTC time, day |
| 13 | 1 | int8 | 1 | Low byte | R | UTC time, year |
| 18 to 20 | | | | | | Blank, for future use |
| 21 | 1 | int8 | 1 | Low byte | R | BaudRate, default 0-9600,1-19200,2-38400,3-57600,4-115200 |
| 22 | 2 | int16 | 1 | Full | R | PANID for zigbee devices |
| 23 | 1 | int8 | 1 | Full | W/R | Device type of zigbee. 0 means coordinator , 1 means router |
| 24 to 25 | 4 | int16 | 1 | Full | W/R | Channel of Zigbee, default channel is channel 13, 0x00002000 |
| 26 | 1 | int8 | 1 | Low byte | R | Zigbee module software revision |
| 27-34 | 8 | int8 | 1 | Low byte | R | Zigbee extended address(MAC address) |
| 35 | 1 | int8 | 1 | Low byte | W/R | Set 1 to reboot zigbee module |
| 36-51 | 16 | int8 | 1 | Low byte | W/R | Security key |
| 52 | 1 | int8 | 1 | Low byte | R | Amount of nodes connected (NUM) |
| 53 to (52+NUM) | 1 | int8 | 1 | Low byte | R | Boat monitor's modbus ID |
| 53+NUM*2 | 1 | int16 | 1 | Full | R | voltage value (176 means 17.6V) |
| 53+NUM*3 | 1 | int8 | 1 | Low byte | R | Switch status |
| 53+NUM*4 | 1 | int16 | 1 | Full | R | Temperature value (227 means 22.7C) |
| 53+NUM*5 | 1 | int16 | 1 | Full | R | Temperature value (227 means 22.7C) |
| 53+NUM*6 | 1 | int8 | 1 | Low byte | R | Boat monitor's signal strength(RSSI) |
| | | | | | | |