

Modbus RTU To CAN Converter

MES-S1101-CAN-J1939-I

User Manual



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Preface

■ Version Change Log

Date	Change Description	Version
2023-9-15	Document Established	1.0
2023-12-8	Added Software Features	2.0
2024-2-20	Added Some Images	2.1
2024-06-30	Revised Some Descriptions	2.2
2024-7-15	Revised Register Range Descriptions	2.3

■ Safety Precautions

Please pay attention to the content marked with this  icon. Failure to follow standard procedures may result in module damage.

1. Quick Start Guide

1.1 Power Supply

The ModbusRTU To CAN Converter operates with a power supply voltage of 9-30V. Connect the positive power supply to Power+ and the negative power supply to Power-.

 The device is designed with reverse polarity protection. Reversing the +/- connections will not damage the device, but do not connect a power supply exceeding 30V, as it may cause damage to the device.

1.2 Bus Connections

1.2.1 Ethernet Bus Connection

You can use a standard Ethernet cable to directly connect the BY- MRTC-IG with other Ethernet devices.

1.2.2 CAN Bus Connection

For CAN bus connections, connect CAN_H to CAN_H, and CAN_L to CAN_L. Optionally, add a 120Ω termination resistor (R1) if necessary.

1.2.3 RS485 Bus Connection

For RS485 bus connections, connect A to A, and B to B. Optionally, add a 120Ω termination resistor (R2) if necessary.

1.3 Configuration

The CAN to Modbus RTU converter is configured via Ethernet. The default IP address is 192.168.1.130. Whether or not you have changed the IP address, ensure that the IP address of your computer and the module are in the same subnet before configuring.

During configuration, you need to set up the CAN bus communication parameters, Modbus bus communication parameters, and the corresponding relationships for data forwarding between Modbus and CAN buses. (See section 4.2 for details.)

1.4 Testing

Users can test the functionality of the CAN to Modbus RTU converter using a computer. You can use

Modbus Poll software to simulate communication between a Modbus master and the module. On the CAN side, connect a CAN analyzer to send and receive CAN data through computer software. (See section 4.3 for details.)

2. Product Information

2.1 Function Introduction

The Modbus To CAN Series Converter come in two models: CAN to Modbus RTU converter (ModbusRTU to CAN) and BY-MTTC-IG (ModbusTCP to CAN). These modules function as standard Modbus slaves. PLCs, HMIs, PCs, and other host devices can communicate with the module via Ethernet or RS485 bus using the Modbus protocol to read or send CAN bus data.

Before using the Modbus To CAN Series Converter, you need to configure various operational parameters (see section 4.1). Once configured correctly, the module will store received CAN data into the corresponding Modbus holding registers. The Modbus master can read the data from these registers using function code 03. When the master wants to send data, it simply writes data to the specified Modbus holding registers, and the module will add the CAN ID and transmit the data onto the CAN bus.

In summary, the Modbus To CAN Series Converter provide bidirectional conversion between Modbus and CAN data, allowing the host devices to extend their CAN bus communication capabilities using this module.

2.2 Electrical Specifications

Electrical Specifications	
Operating Voltage and Current	9-30V (24V, 100mA)
Dimensions and Mounting	114.5 × 99.5 × 22.5 mm, DIN rail mounting (35 mm)
Operating Temperature/Humidity	-40 ° C to +85 ° C, ≤95% RH
Ethernet Specifications	<ul style="list-style-type: none">● RJ45 interface● Baud Rate: 10M/100M auto-sensing
CAN Port Specifications	<ul style="list-style-type: none">● Supports CAN 1.0 and CAN 2.0 Protocols● Terminal block, CAN terminal (H, L)

	<ul style="list-style-type: none"> ● Baud Rate: 5K to 1000K ● 120Ω Termination Resistor: Integrated, selectable via DIP switch R1 & R2
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3. Interface/Indicator Light Definitions

3.1 Panel Functions and Interface Definitions

3.1.1 Power Interface

POWER Interface		
Label	Meaning	Connection to
+	Positive Power Supply	Positive terminal of 12V or 24V DC power supply
-	Negative Power Supply	Negative terminal of 12V or 24V DC power supply
PE	Shield Ground	Cabinet shell, metal enclosure, ground
NC	No Connection	-

3.1.2 Ethernet Interface

Ethernet Interface		
Label	Meaning	Connection to
Ethernet	Ethernet Interface	Ethernet interface of computer, PLC, HMI, etc.

3.1.3 CAN Bus Interface

CAN Interface		
Label	Meaning	Connection to
H	CAN Bus H Signal Line	Existing CAN Bus H signal line
L	CAN Bus L Signal Line	Existing CAN Bus L signal line

3.1.4 RS485 Bus Interface

RS485		
Mark	Meaning	Connecting to
A+	RS485 Bus A or +	Existing RS485 Bus A or +
B-	RS485 Bus B or -	Existing RS485 Bus B or -

3.1.4 RST DIP Switch

RST Switch		
Label	Meaning	Note
ON	Enter Upgrade Mode	Keep RST switch in OFF position during normal operation. Use ON position for kernel upgrades under guidance.
OFF	Enter Working Mode	

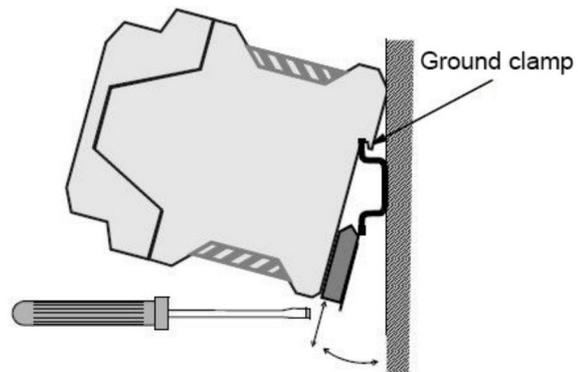
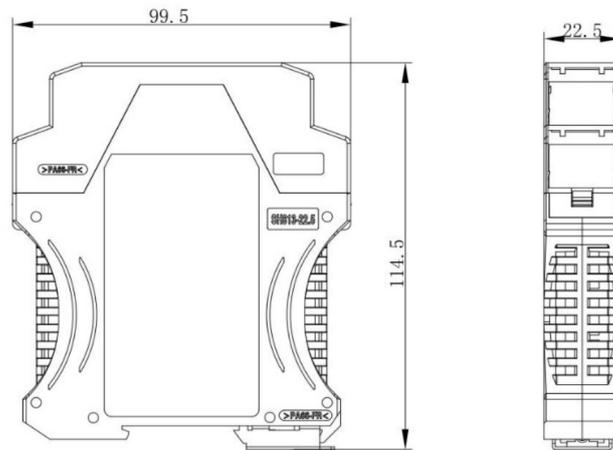
3.1.5 Termination Resistor DIP Switch

Termination Resistor Switch		
Label	Meaning	Note
R1	CAN Bus Termination Resistor	Evaluate the need for termination resistor based on site conditions; switch to ON to enable 120Ω termination resistor.
R2	RS485 Bus Termination Resistor	

3.2 Indicator Light Functions

Indicator Name	Status	Meaning
SYS	Flashing	System initialization normal
Modbus	Flashing	Modbus data transmission
CANT	Flashing	sending CAN data
CANR	Flashing	receiving CAN data

3.3 Module Dimensions



4. Device Usage

4.1 Restore Factory Settings

With the RST DIP switch in the OFF position, power on the module to enter normal operation mode. Once in normal mode, set the RST DIP switch to ON. The module's four indicator lights will flash simultaneously. After 10 seconds, the indicator lights will turn off, indicating that the module has been restored to factory settings. To cancel the factory reset operation during the flashing process, set the RST DIP switch back to the OFF position.

4.2 Software Configuration

4.2.1 Preparation Before Configuration

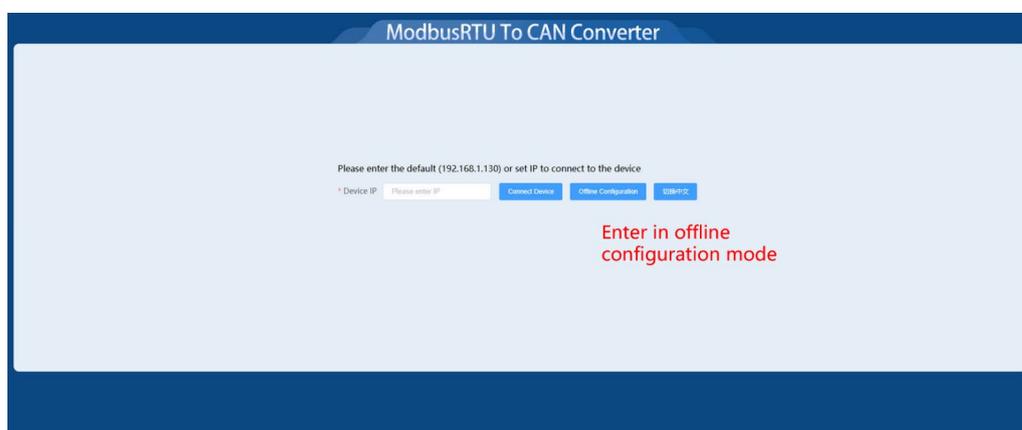
Before configuring the module, ensure that the module is powered on, the RST DIP switch is in the OFF position, and it is connected to a computer via Ethernet.

Change the IP address of the computer's network adapter to be in the same subnet as the module's IP address (default IP address: 192.168.1.130).

4.2.2 Open Configuration Interface

Double-click "MRTCTool.html" to open the configuration parameter web interface. Click English to switch to English mode. Enter the module's IP address on the webpage and click "Connect Device" to enter the detailed configuration interface.

When unable to connect to the device, you can enter the configuration tool by clicking on "Offline Configuration". In this mode, you can modify configurations according to your needs and export the configuration file. Once the device is accessible, you can directly import the configuration file into the device.



Once in the configuration interface, basic operations for the module can be performed from the top of the page. First, click "Upload" to upload the module's parameters to the configuration interface. After making configuration changes, click "Download" to download the parameters from the configuration interface to the module.

To bulk download parameters, click "Export" to export the parameters to your computer. The exported parameter file can be loaded using "Import" which saves time for bulk configuration.

4.2.3 Configure Ethernet Communication Parameters

The upper left corner of the page allows you to configure the basic ethernet communication parameters, including IP address, gateway, and subnet mask.

The screenshot shows a configuration panel titled "Basic Info" with a toggle switch. It contains four input fields: "IP Address" (192.168.1.110), "Gateway" (192.168.1.1), "Mask" (255.255.255.0), and "NIC Mode" (10M Full-Duple).

4.2.4 Configure CAN Communication Parameters

The upper right corner of the page allows you to configure the Slave ID, CAN bus baudrate, RS485 bus parameter.

The screenshot shows a configuration panel titled "Communication" with a toggle switch. It contains six input fields: "SlaveID" (1), "CAN Baudrate" (200), "485 Baudrate" (115200), "485 Parity" (None), "485 Data Length" (8 Bits), and "485 Stop Bits" (1 Bit).

4.2.5 Configure Modbus → CAN Conversion Parameters

The screenshot shows a configuration panel titled "Write Register" with a toggle switch and an "Add" button. It contains a table with columns: "CAN Format", "CAN ID", "Address", "Length", "Mode", "Periodic Time", and "Operate". The table has one row with values: "STD", "0x1", "0x100", "8", "Periodic", "100", and "Delete".

The left side of the area is used to configure the parameters for Modbus to CAN data direction (Modbus write register, function code 16), including:

- **CAN Format:** Select between Standard Frame and Extended Frame.
- **CAN ID and Address:** Configure the data written to the corresponding Modbus register address, which will be sent to the CAN bus with the

specified CAN ID.

- **Length:** The length of the CAN data for this ID.
- **Mode:** Select between Periodic (repeatedly sending this ID's CAN data to the bus) and Triggered (only sending this ID's CAN data when the corresponding Modbus register value changes).
- **Periodic Time:** The interval time between data transmissions in Periodic mode, in milliseconds.

The default factory setting includes a configuration that sends the values of Modbus register addresses 100, 101, 102, and 103 to the CAN bus in Standard Frame format, with Frame ID 001, length 8 bytes, and a cycle time of 100ms.

4.2.6 Configure CAN → Modbus Conversion Parameters

	CAN Format	CAN ID	Address	Length	Auto Reset	Reset Value	Operate
1	STD	0x0	0x0	8	No <input checked="" type="checkbox"/> Yes	0x1122	Delete

The right side of the area is used to configure the parameters for CAN to Modbus data direction (Modbus read register, function code 03), including:

- **CAN Format:** Select between Standard Frame and Extended Frame.
- **CAN ID and Address:** Configure which Modbus registers will store the data received from the CAN bus with the corresponding CAN ID.
- **Length:** The length of the CAN data for this ID.
- **Auto Reset:** The value of the register automatically resets after the Modbus master successfully reads it.
- **Reset Value:** The default reset value of the register after resetting when Auto Reset is enabled.

The default factory setting includes a configuration where data with Standard Frame format and CAN ID 000 has DATA0 and DATA1 stored in Modbus register 00, DATA2 and DATA3 in Modbus register 01, DATA4 and DATA5 in Modbus register 02, and DATA6 and DATA7 in Modbus register 03.

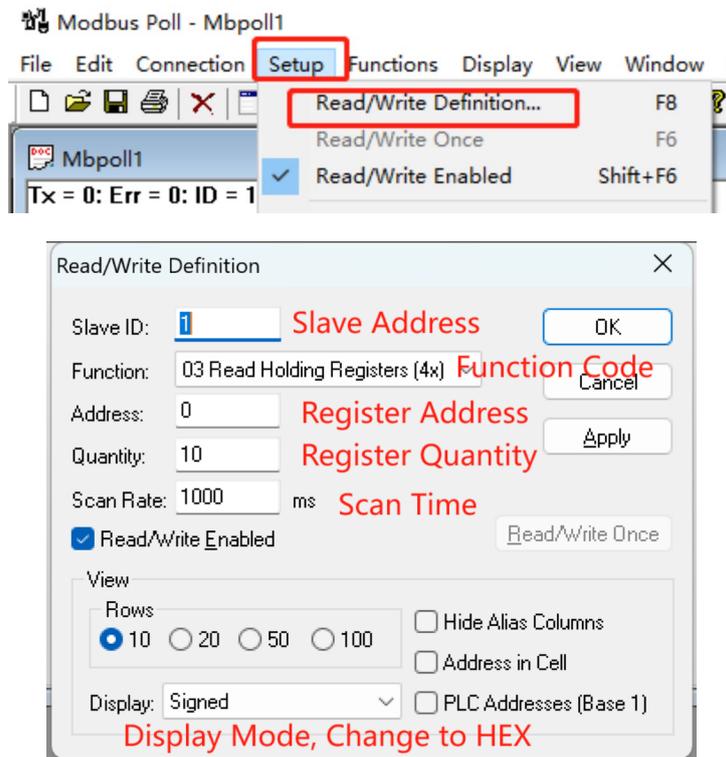
4.3 Function Testing

It is recommended to use the ModbusPoll software on a computer and a CAN bus analyzer to test the device's functionality.

4.3.1 Receiving CAN Data via ModbusPoll Software

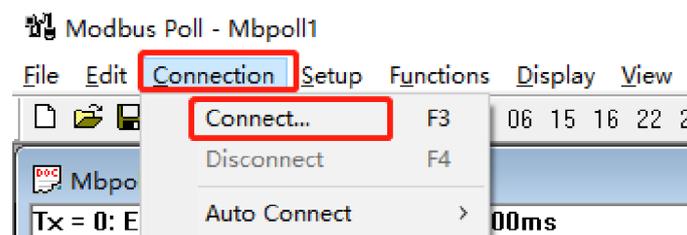
Using the factory default settings as an example (default configuration as per section 4.2.6):

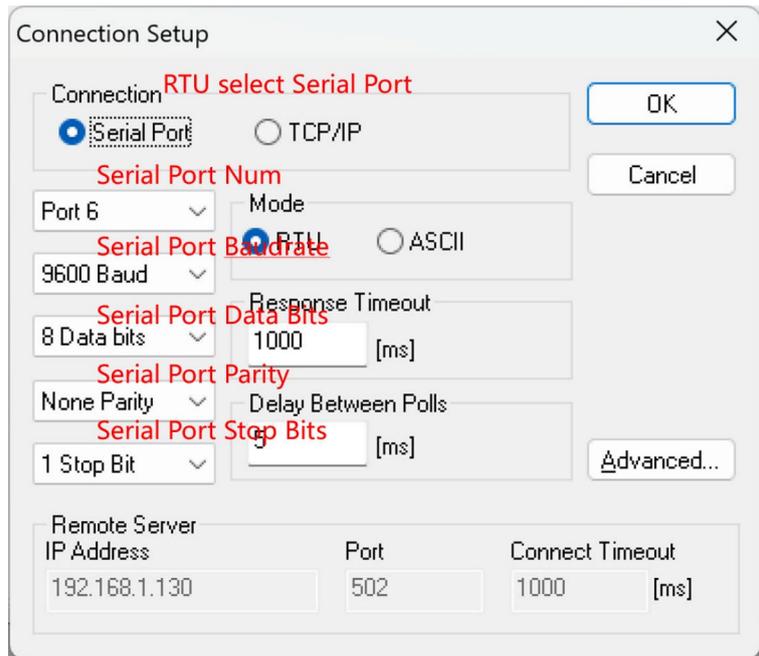
Click "Setup" and select "Read/Write Definition."



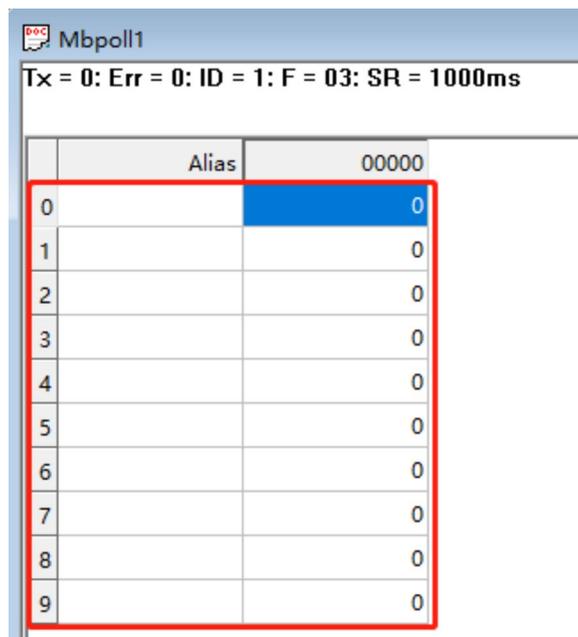
In this interface, modify the Slave ID, Modbus function code, Modbus register address, number of Modbus registers, scan time, and display mode.

After setting up, click "Connection" and select "Connect."





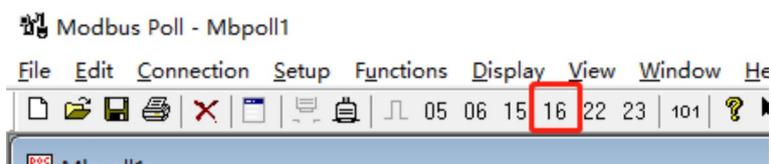
Choose TCP, enter the module's IP address, and click OK to connect.

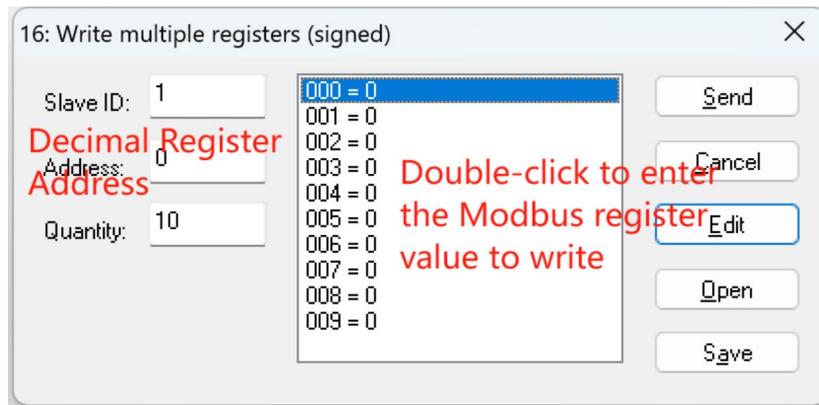


Once correctly connected, the main interface will display the data read from the registers.

4.3.2 Sending CAN Data via ModbusPoll Software

Click "16" at the top of the software.





Modify the Slave Address, Modbus Register Address, and Number of Registers. On the right side, double-click to enter the data to be filled.

Click "Send" to transmit the Modbus data. If the module's CAN bus is correctly connected to the CAN analyzer, the analyzer will receive the data sent by the module.

5. Service and Warranty Policy

5.1 Service Policy

Rusavtomatika provides remote technical support services. If users encounter any issues while using the module, they can contact us at any time via the engineer's phone number provided below.

5.2 Warranty Policy

Rusavtomatika guarantees that, within 12 months from the date of receipt, any module failures caused by product quality issues will be repaired free of charge. For any device failures resulting from improper use at anytime, reasonable repair fees will be charged.