



ICP DAS GW-2493M ACnet/IP to Modbus Gateway User Manual

[Home](#) » [ICP DAS](#) » ICP DAS GW-2493M ACnet/IP to Modbus Gateway User Manual 

Contents

- [1 ICP DAS GW-2493M ACnet/IP to Modbus Gateway](#)
- [2 Product Information](#)
- [3 Product Usage Instructions](#)
- [4 General Information](#)
- [5 Features](#)
- [6 Specifications](#)
- [7 Documents / Resources](#)
 - [7.1 References](#)



ICP DAS GW-2493M ACnet/IP to Modbus Gateway



Product Information

- **Product Name:** GW-2493M (BACnet/IP Server to Modbus TCP Client Gateway)
- **Version:** 1.1.0 January 2023
- **Written by:** Johnny
- **Table of Contents:** GW-2493M (BACnet/IP Server to Modbus TCP Client Gateway) User Manual Ver 1.10

Important Information

Warranty:

All products manufactured by ICP DAS are under warranty regarding defective materials for one year, beginning from the date of delivery to the original purchaser.

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Contact us:

If you encounter any problems while operating this device, feel free to contact us via mail at: service@icpdas.com.

General Information

BACnet/IP:

BACnet/IP is based on Ethernet and uses UDP to transmit BACnet network packets (NPDU). Messages are transmitted such as Who-is and Who-has through the broadcast feature of UDP. The feature allows the user could search for device information without knowing the actual location of the device.

Modbus:

Modbus protocol mainly has two versions RTU and TCP. RTU can be realized through the COM interface and TCP can be realized through Ethernet. These two protocols are commonly used in the industrial control and automation industry. Modbus RTU is used to transmit and exchange data via RS-485. It's a serial communication between master and slave. Every slave has a unique address to identify. Users could implement communication by using different function codes. MODBUS TCP is a variant of MODBUS RTU. MODBUS messages are passed in an Intranet or Internet environment by using the TCP/IP protocol. The most common use of this protocol is to connect PLCs and gateways to other simple fieldbus or I/O networks via Ethernet.

About GW-2493M

The GW-2493M is a BACnet/IP Server to Modbus TCP Client Gateway.

Features

- Read/Write Modbus registers via BACnet objects
- Configurable BACnet/IP Server
- Configurable Modbus TCP Client
- Supports BACnet AI, AO, AV, BI, BO, BV, MSI, MSO, and MSV Object Types
- Supports Modbus discrete inputs, coils, input registers, and holding registers
- Supports up to 180* DI, 180* DO, 180* AI and 180* AO to transfer to BACnet Objects
- Simple data translation allows you to manipulate data as it passes between protocols

Specifications

GW-2493M (BACnet/IP Server to Modbus TCP Client Gateway)

Ethernet Controller:

10/100Base-TX Ethernet Controller (Auto-negotiating, Auto_MDIX)

Product Usage Instructions

1. Connect the GW-2493M gateway to your network using an Ethernet cable.
2. Configure the BACnet/IP Server and Modbus TCP Client settings according to your requirements. Refer to the user manual for detailed instructions.
3. To read or write Modbus registers, use the BACnet object provided by the gateway. The gateway supports BACnet AI, AO, AV, BI, BO, BV, MSI, MSO, and MSV Object Types.
4. The gateway also supports Modbus discrete inputs, coils, input registers, and holding registers. You can configure up to 180* DI, 180* DO, 180* AI and 180* AO to transfer to BACnet Objects.
5. If necessary, you can manipulate the data as it passes between protocols using the simple data translation feature.

General Information

BACnet/IP

BACnet is a communications protocol for building automation and control networks. It is an ASHRAE, ANSI, and ISO standard protocol. BACnet was designed to allow communication of building automation and control systems for applications such as heating, ventilating, and air-conditioning control, lighting control, access control, and fire detection systems and their associated equipment. The protocol provides mechanisms for computerized building automation devices to exchange information, regardless of the particular building service they perform. BACnet/IP is based on Ethernet and uses UDP to transmit BACnet network packets (NPDU). Messages are transmitted such as Who-is and Who-has through the broadcast feature of UDP. The feature allows the user could search for device information without knowing the actual location of the device.

Modbus

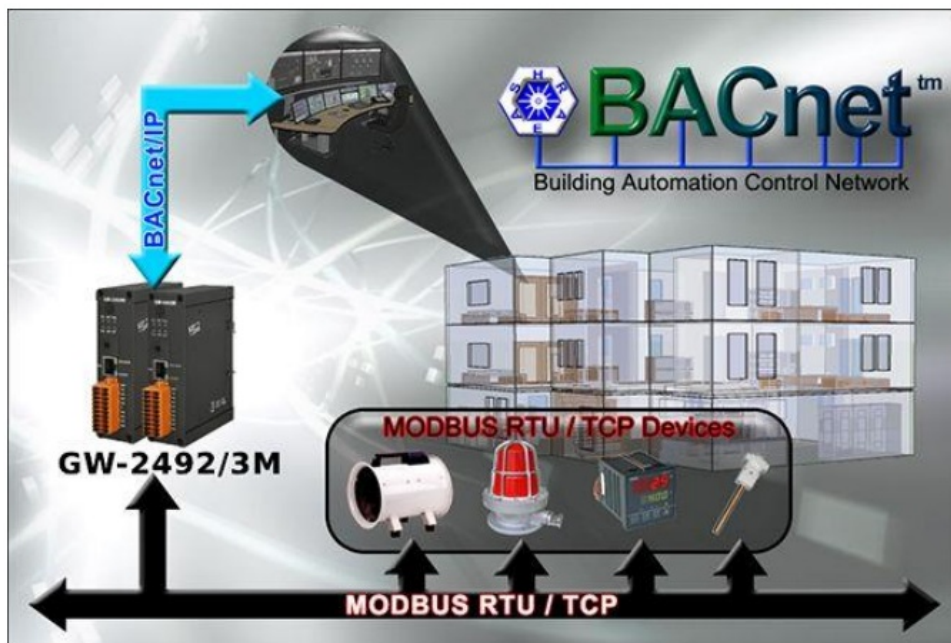
Modbus protocol mainly has two versions RTU and TCP. RTU can be realized through the COM interface and TCP can be realized through Ethernet. These two protocols are commonly used in the industrial control and automation industry. Modbus RTU is used to transmit and exchange data via RS-485. It's a serial communication between master and slave. Every slave has a unique address to identify. Users could implement communication by using different function codes. MODBUS TCP is a variant of MODBUS RTU. MODBUS messages are passed in an "Intranet" or "Internet" environment by using the TCP/IP protocol. The most common use of this protocol is to connect PLCs and gateways to other simple fieldbus or I/O networks via Ethernet.

About GW-2493M

GW-2493M is a BACnet/IP Server to Modbus TCP Client Gateway. It allows the BACnet client application to access Modbus TCP devices via the GW-2493M module. The BACnet/IP protocol is used to relay and exchange information between building devices. GW-2493M contains a large number of BACnet objects (AI, AO, AV, BI, BO, BV, MSI, MSO, MSV) gives you flexibility in mapping Modbus TCP registers to any combination of BACnet objects. Multiple BIBBs (DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM-B,...etc.) are supported. All the data transfer is configurable using a standard web browser.

Features

- Read/Write Modbus registers via BACnet objects
- Configurable BACnet/IP Server
- Configurable Modbus TCP Client
- Supports BACnet AI, AO, AV, BI, BO, BV, MSI, MSO, and MSV Object Types
- Supports Modbus discrete inputs, coils, input registers, and holding registers
- Supports up to 180* DI, 180* DO, 180* AI and 180* AO to transfer to BACnet Objects
- Simple data translation allows you to manipulate data as it passes between protocol



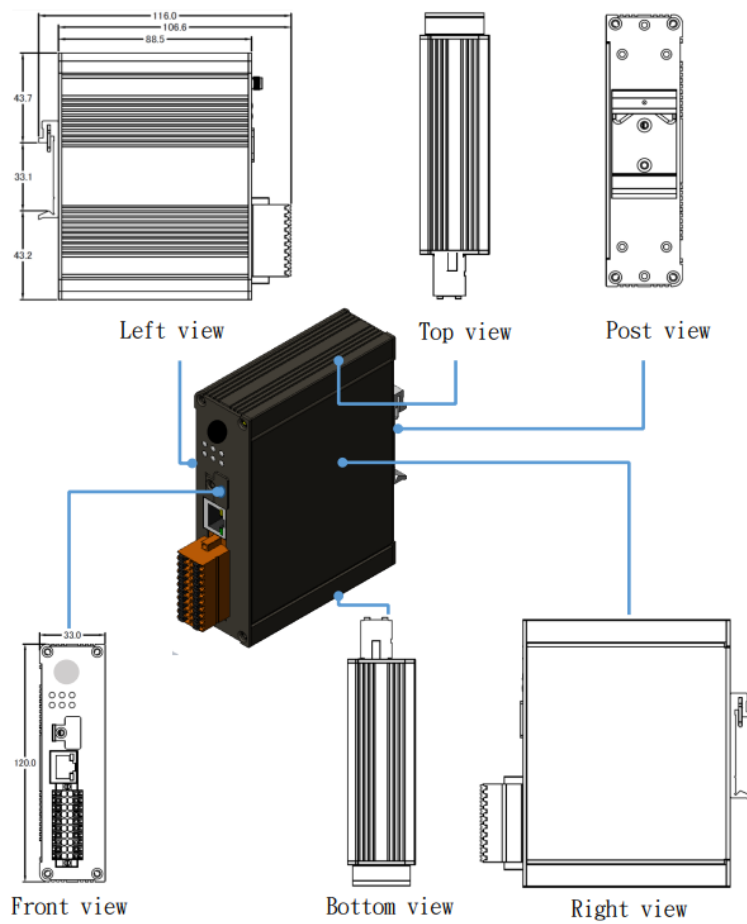
Specifications

GW 2493M BACnet/IP Server to Modbus TCP Client Gateway

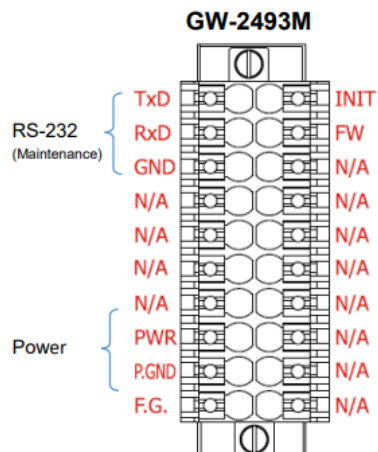
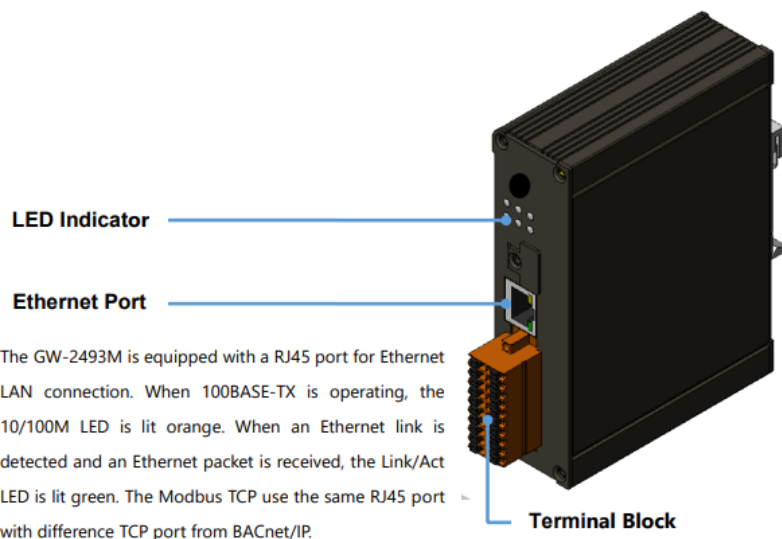
Ethernet	
Controller	10/100Base-TX Ethernet Controller (Auto-negotiating, Auto_MDIX)
Connector	RJ-45 with Ethernet indicator
Protocol	BACnet/IP Server
Max. Connections	8
BIBBS	DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM-B, DM-DDB-B, DM-DOB-B, DM-DCC-B, DM-RD-B
Modbus	Modbus TCP Clients (Max. 32)
Power	
Protection	Power reverse polarity protection
EMS Protection	ESD, Surge, EFT
Supply Voltage	+10 VDC ~ +30 VDC
Consumption	5 W @ 24 VDC
LED Indicator	
LED (Round)	Power (1), BACnet MS/TP Status (1), BACnet MS/TP Net(1), Modbus TCP TxD / RxD / Link (3)
Ethernet LED	Ethernet LED Ethernet Status (RJ-45) (2)
Mechanism	
Installation	DIN-Rail
Casing	Metal
Dimensions	33 x 120 x 116 mm (W x L x H)
Environment	
Operating Temp.	-25°C ~ +75°C
Storage Temp.	-30°C ~ +85°C
Humidity	10 ~ 90% RH, non-condensing

Hardware

- Size Unit: mm



Appearance



LED Indicator

There are six LEDs to indicate the various states of the GW-2493M. The following is the illustration of these six LEDs.

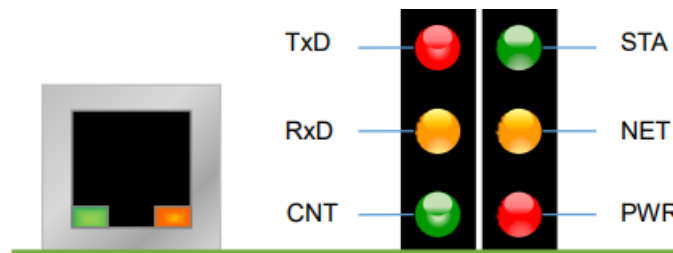


Figure 2.1 LED position of the GW-2493M

LED Name	GW-2493M Status	LED Status
ALL LEDs	FW Updating Mode	LED will be twinkled sequentially.
	FW Initial Mode	LED will be twinkled per 500ms.
PWR (Module)	Power On	On
	Power Failure	Off
NET (BACnet/IP)	Connected by at least one client	On
	No clients connect	Blink per 200 ms
STA (BACnet/IP)	Communication OK	On
	Communication Failure	Blink per 200 ms
CNT (Modbus)	Connect to at least one device	On
	No devices are connected	Blink per 200 ms
RxD (Modbus)	Data reception	On
	No Data reception	Off
TxD (Modbus)	Data transmission	On
	No Data reception	Off

Getting Started With GW-2493M

This chapter mainly describes the operation process of the GW-2493M.

Wiring Preparation

Before setting up the GW-2493M, please complete the necessary preparation for wiring. Please follow the Figure

2.1 wiring diagram, to wire the following items:

1. **Power Supply:** +10 VDC ~ +30 VDC
2. **Ethernet:** Connect the GW-2493M with the PC Or let the GW-2493M and PC connect with the same Ethernet Switch/Hub.
3. **INIT:** Special Don't care about it this time.
4. **FW:** Special purpose. Don't care about it this time

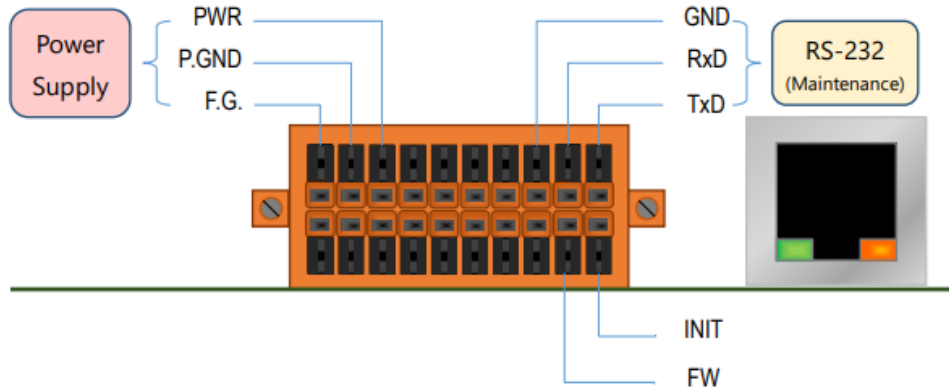


Figure 3.1 GW-2493M Wiring Diagram

GW-2493M Web Configuration

Please follow those steps to configure the GW-2493M via a web browser.

- **Step 0:**

Use the default account “admin” and the password “admin” to enter the main settings page.

- **Step 1**

The firmware version is shown on the web

- **Step 2**

The GW 249 3M is based on the information security law U ser need to change the account and password for the first time before using it.

ICP DAS GW-2493M BACnet/IP to Modbus Gateway

System Information

System

1 Firmware Version

Account Management

Account ADMIN

New Password *****

Retype New Password *****

2 Save

• Step 3

Please reflash the web page and log in again with a new account and password. Module Setting page will appear. Users could set the IP of the module

ICP DAS GW-2493M BACnet/IP to Modbus Gateway

System Information Module Setting

Port Setting

Ethernet

Protocol Setting

Modbus

BACnet/IP

Other

Import/Export

Factory Default

Ethernet Configurations

LAN1

IP 172.17.123.124

Mask 255.240.0.0

Gateway 172.18.0.254

PORT

Web Server Port 80

Modbus TCP Port 502

Modify

• Step 4.1

Press “Modify” to configure the parameters of Modbus in the Modbus page

ICP DAS GW-2493M BACnet/IP to Modbus Gateway

System Information Module Setting

Port Setting

Ethernet

1 Protocol Setting

Modbus

BACnet/IP

Other

Import/Export

Factory Default

Modbus Configurations

Modbus Information

Modbus Mode TCP Client

Modbus Timeout 500

Modbus Retry 0

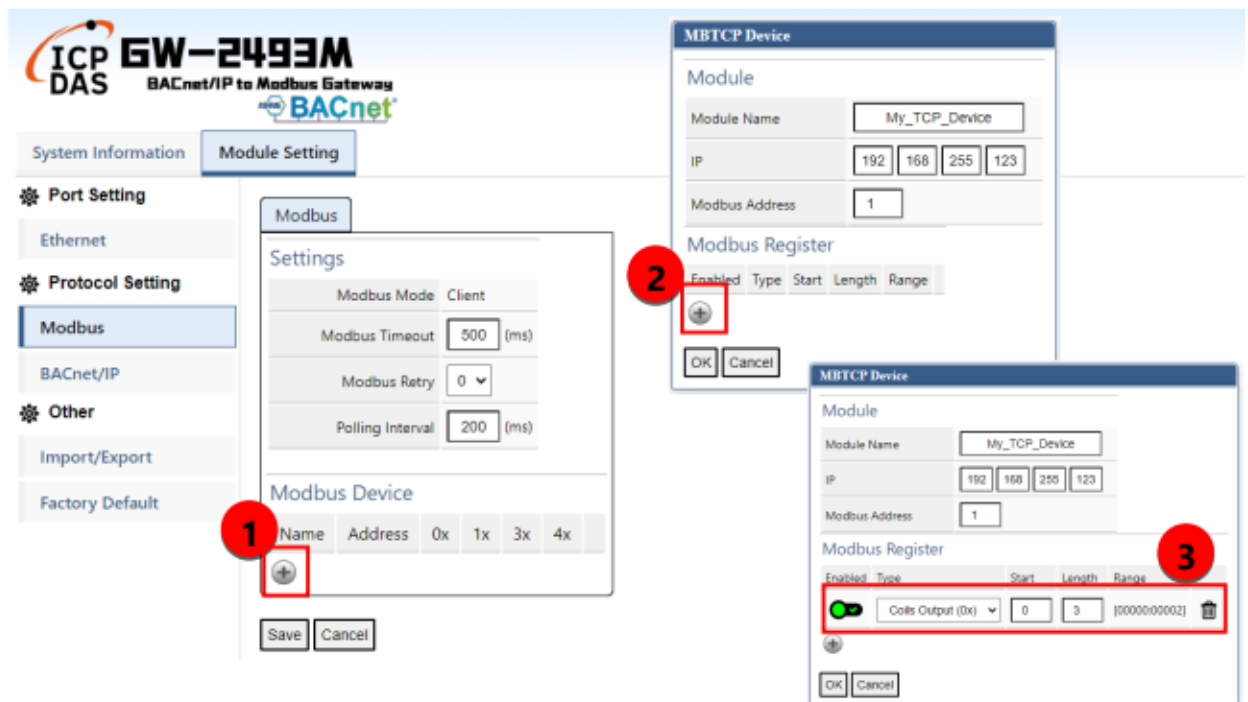
Polling Interval 200

2 Modify

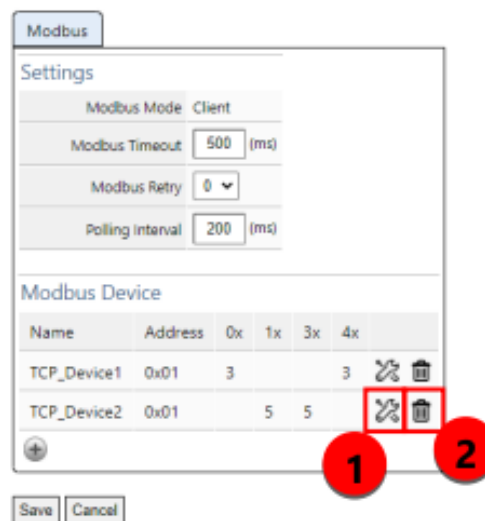
• Step 4.2

1. Press the “+” button to add a Modbus TCP node.

2. After editing “Modbus Name” and “ IP Address”, press the “+” button to add Modbus registers.
3. Press the “+” button to add Modbus function codes and register range.
4. Finally, the users need to press “save ” to save all Modbus configurations into the GW 249 3 M.
5. The users need to restart the GW 249 3 M to make the configuration work.

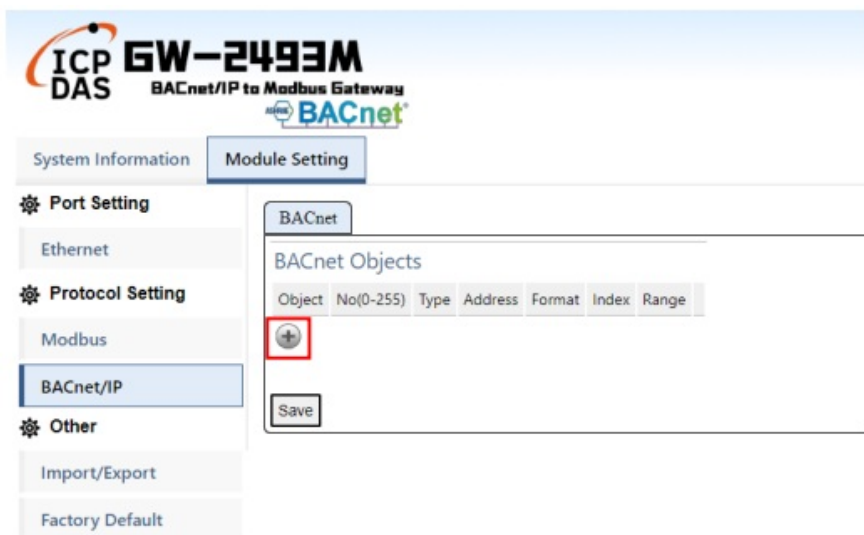


1. Press the icon to edit a Modbus register of that node
2. Press the icon to delete that Modbus node.

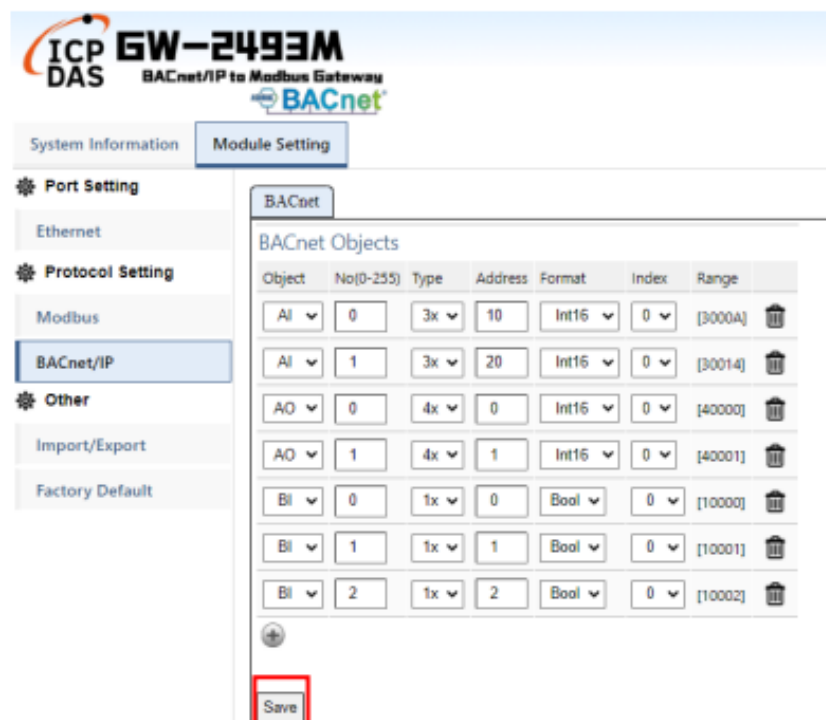


- Step 5

Press “+” button to add a BACnet object



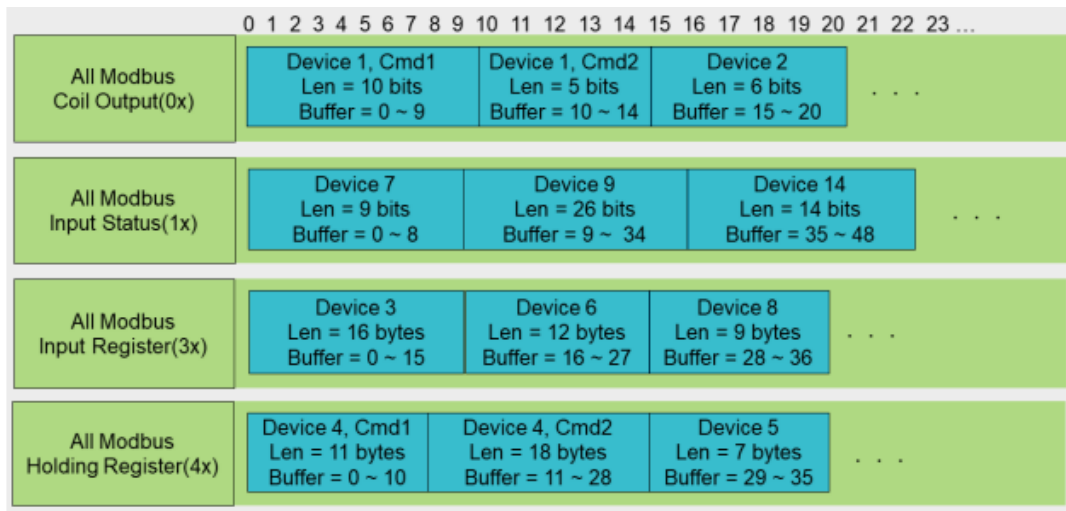
1. The “Object” field is a BACnet object that supports AI/AO/AV/BI/BO/BV/MI/MO/MV.
2. The “No” field is the serial number of the BACnet object. If you have AI*3 and AO*4, you need to assign the No as AI 0, AI 1, AI 2, AO 0, AO 1, AO 2, AO 3.
3. The “Type” field is the Modbus register type. The common configuration is shown below.
 - BACnet BO object maps to Modbus Coil Output(0x)
 - BACnet BI object maps to Modbus Input Status(1x)
 - BACnet AO object maps to Modbus Holding Register(4x)
 - BACnet AI object maps to Modbus Input Register(3x)
4. The “Address” field is the start address of the Integrated Modbus Register (Note 1).
5. The “Format” field is the data format that supports bool/int16/uint16/int32/uint32/float.
6. The “Index” field is reserved.
7. The “Range” field is the exact Modbus address of the register.



Note 1.

In the GW-2493M, all remote Modbus data that come from different remote Modbus TCP devices will be integrated by their register type. It means that all remote Coil Output data will be put into a Coil Output integrated buffer. All remote Input Status data will be put into an Input Status integrated buffer. There is also have Holding

Register integrated buffer and an Input Register integrated buffer in the GW-2493M. They were integrated as the illustration shown below



The BACnet object will read or write the data from those integrated buffers. Those Modbus data with the same type will be ordered by the Modbus Configuration Index in the integrated buffer. The first configuration Modbus command will be in the first address of the buffer. The order is shown below.

Modbus Retry: 0

Polling Interval: 200 (ms)

Modbus Device

Name	Address	0x	1x	3x	4x		
Device1	0x01	10/5				✕	🗑
Device7	0x01		9			✕	🗑
Device2	0x01	6				✕	🗑
Device3	0x01			16		✕	🗑
Device9	0x01		26			✕	🗑
Device6	0x01			12		✕	🗑
Device4	0x01				11/18	✕	🗑
Device8	0x01			9		✕	🗑
Device5	0x01				7	✕	🗑
Device14	0x01		14			✕	🗑

Save Cancel

For example in the illustration in Holding Register(4x), Device4 and command 1 are the smallest ID and the smallest command index. Device 4 and command 1 occupy the first address of the Holding Register buffer. The “Address” field of the BACnet object means the address in those integrated buffers. For example by the illustration, if the address of the BACnet “BO” object is 11, it means that the data of the “BO” object comes from the second bit of Device 1 and command 2 in the Coil Output buffer. If the address of the BACnet “AO” object(int16) is 7, it means that the output data of the “AO” object(int16) will be written to the 8-th words of Device 4 and command 1 in the Holding Register buffer.

Import/Export Configuration

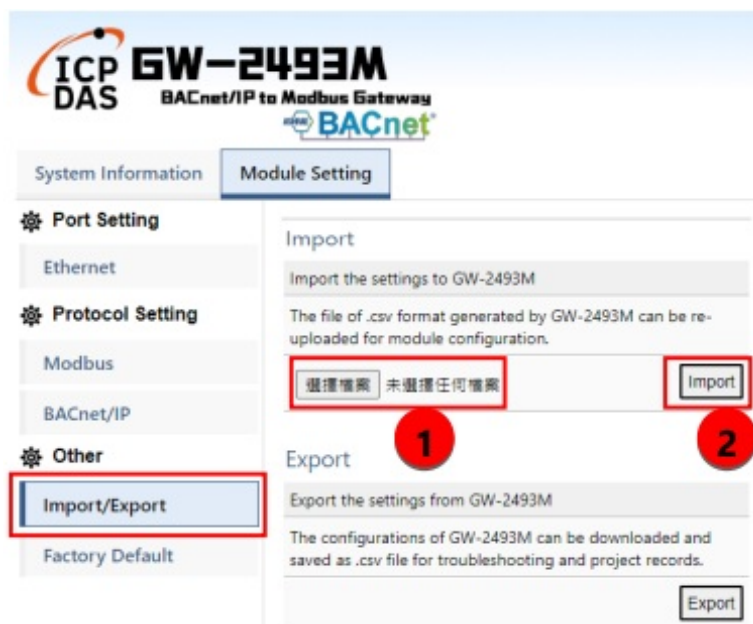
Export All Configurations to CSV file:

The GW-2493M supports an export function to write all configurations into a CSV file.



Import All Configurations from the CSV file :

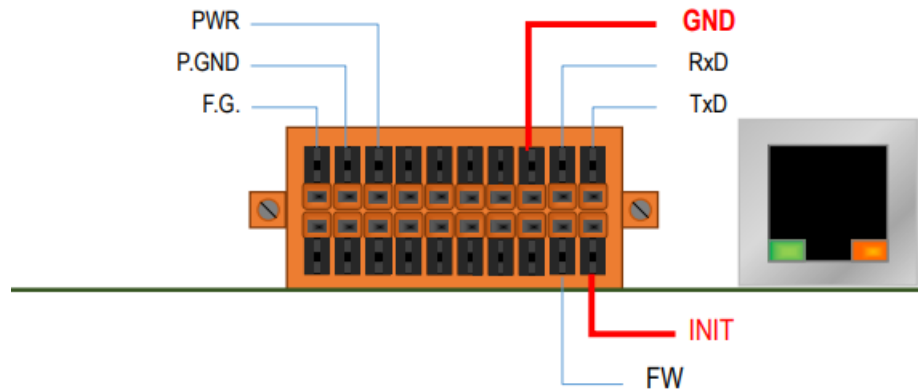
The users could import all configurations from a CSV file. It is convenient to move all configurations from one GW 2493M to another one. Firstly, the users select the CSV file. Then, they can press the Import button to import configurations into the GW 2493M modules.



How to restore the default Account/Password

If the users have forgotten the login information, they can follow the steps to restore the default login information.

1. Short the "INIT" and "GND" pins of GW-2493M and turn on the
2. The GW-2493M will restore the login
 - IP: 192.168.255.1
 - Mask: 255. 255. 0 .0
 - Gateway: 192.168.0.1
 - Login Account: admin
 - Login Password: admin



How to update the firmware

The GW-2493M can update the firmware via a software tool (Windows) by the following:

1. Download the latest version of the firmware program and update Tool (FW_Update_Tool) on the GW-2493M product page and store it in a computer that you want to connect to the GW-2493M.

Update Tool: Please refer to -> <https://www.icpdas.com/en/download/show.php?num=7824&model=GW-2493M>

2. Short the “FW” and “GND” pins of the GW-2493M and turn on the When the six LEDs of the GW-2493M turn blinking alternately, the GW-2493M successfully enters the firmware updating mode.

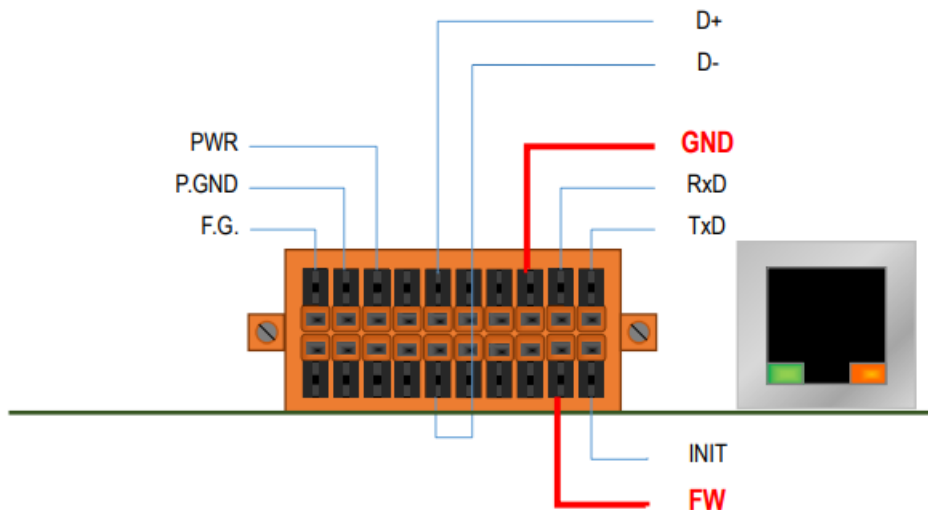
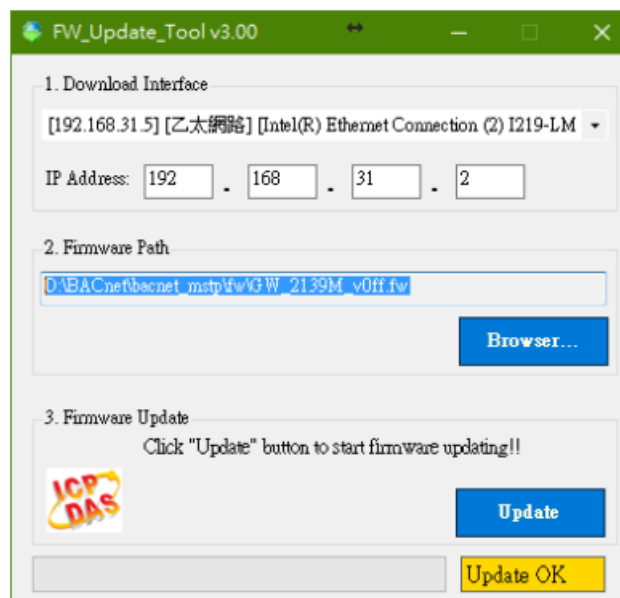


Figure 3.2 GW-2493M FW & GND Pin


3. Execute “FW_Update_Tool.exe” with the administrator privileges () and follow the steps in Figure 3.3:
In “Download Interface”, select a network port for connecting to the GW-2493M. In “Firmware Path”, select the latest firmware update file (GW_2493M_xxxx.fw). In “Firmware Update”, click “Update” to start the firmware updating.
4. When the update is completed, “Update OK” will be displayed in the “FW_Update_Tool” window to indicate that the firmware updating is successful. Next, remove the short connection between FW and GND, and reboot the power supply, then check the current firmware version on the Web interface.



GW-2493M (BACnet/IP Server to Modbus TCP Client Gateway)

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Documents / Resources

 <p>User Manual Version 1.00 January 2021</p> <p>GW-2493M BACnet/IP Server to Modbus TCP Client Gateway</p>	<p>ICP DAS GW-2493M ACnet/IP to Modbus Gateway [pdf] User Manual GW-2493M ACnet IP to Modbus Gateway, GW-2493M, ACnet IP to Modbus Gateway, Modbus Gateway</p>
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References

-  [ICP DAS](#)