

BNET-2107M
User's Manual v1.00

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1. General Information

1.1 BACnet Introduction

BACnet stands for Building Automation Control network which is a data communication protocol developed by ASHRAE, BACnet is known as "ANSI/ASHRAE standard 135-2001" and now also known as the international standard "ISO 16484-5." The protocol has been designed specifically to meet the communication needs of building automation and control systems for applications such as heating, ventilating, air-conditioning control…etc. Its purpose is also to standardize communications between building automation devices from different manufacturers, allowing data to be shared and equipment to work together easily.

1.2 About BNET-2107M

The BNET-2107M is multifunction BACnet/IP I/O module. The BNET-2107M provides 8 DI channels and 8 DO channels. The modules contain number of BACnet objects (Device, BI, BO) with multiple BIBBS (DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM, DS-COV-B…etc.) supported. The modules also feature a built-in web server which allows remote configuration by using a regular web browser for an easy and safe access at anytime anywhere.

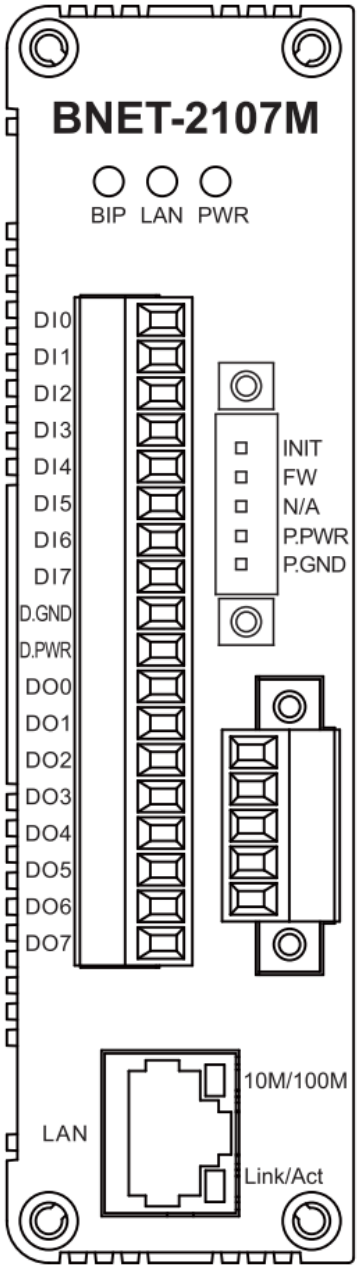
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1.3 Hardware Specification

Model	BNET-2107M
System	
Ethernet	10/100 Base-TX
Security	ID and Password
Built-in Watchdog	Yes
LED Indicator	Power, Ethernet and BIP status
Protocol	
BACnet	BACnet/IP Server
BACnet Objects	1 Device, 8 BI, 8 BO, 8 PIV
BIBB	DS-RP-B, DS-RPM-B, DS-WP-B, DS-WPM-B, DS-COV-B, DM-DDB-B, DM-DOB-B, DM-DCC-B, DM-TS-B, DM-UTC-B, DM-RD-B
Digital Input	
Channel	8
Type	Wet Contact
Sink/Source	Source(PNP)
On Voltage Level	+3.5 ~ +50VDC
Off Voltage Level	+1 VDC Max.
Overvoltage Protection	70 VDC
Max. Counts	32-bit (0 ~ 4,294,967,285)
Min. Pulse Width	10ms
Input Impedance	10 KΩ, 0.5 W
Digital Output	
Channel	8
Sink/Source	Sink(NPN)
Load Voltage	+3.5 VDC ~ 50 VDC
Max. Load Current	700 mA/channel
Overvoltage Protection	60 VDC
Overload Protection	Yes
Short-circuit Protection	Yes
Environmental	
Dimensions (W x L x D)	33mm x120mm x 106mm
Operating Temp.	-25 ~ +75 °C
Storage Temp.	-30 ~ +85 °C
Humidity	10 ~ 90% RH, Non-condensing
Power Input Range	+10 VDC ~ +30VDC
Power Consumption	2.4W (0.1A @ 24VDC)

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1.4 BNET-2107M Pin Assignment and Wire Connection

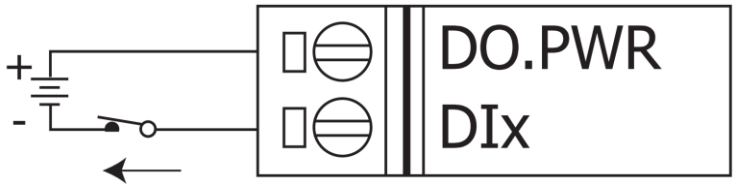
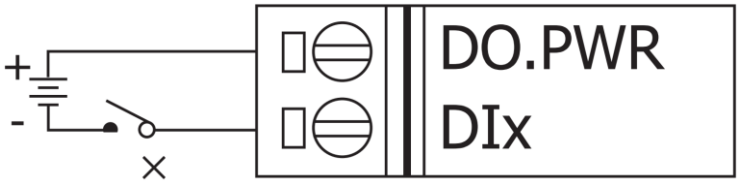


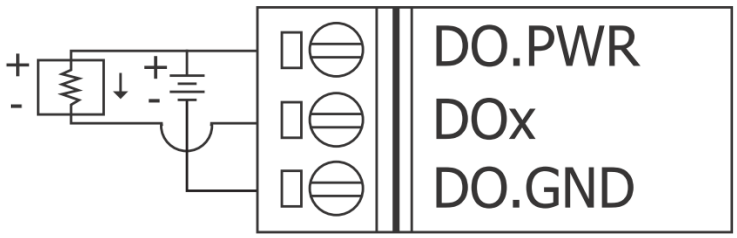
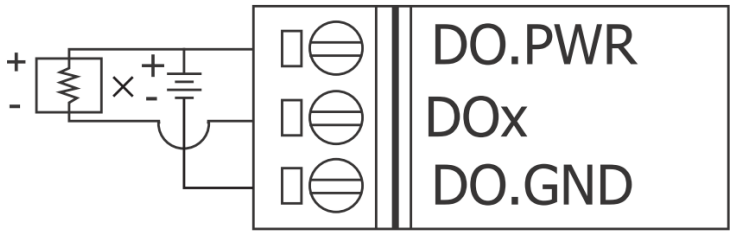
Power Input & Special functionality	
Pin	Description
INIT	For restoring default account, password, or IP address. Please refer to the chapter 3.
FW	For updating the firmware. Please refer to the chapter 4.
N/A	Don't care.
P.PWR	DC Power 10V ~ 30V input
P.GND	DC Power GND

Digital IO pins	
Pin	Description
DI0	Digital Input 0
DI1	Digital Input 1
DI2	Digital Input 2
DI3	Digital Input 3
DI4	Digital Input 4
DI5	Digital Input 5
DI6	Digital Input 6
DI7	Digital Input 7
D.GND	Power GND for IO
D.PWR	DC 10V~30V for IO
DO0	Digital Output 0
DO1	Digital Output 1
DO2	Digital Output 2
DO3	Digital Output 3
DO4	Digital Output 4
DO5	Digital Output 5
DO6	Digital Output 6
DO7	Digital Output 7

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Wire Connection

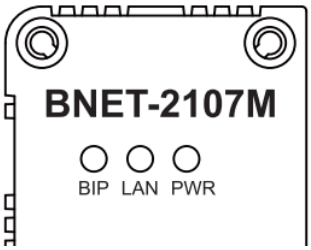
Digital Input	Wire Connection
ON State +3.5 ~ +50VDC	
OFF State +1V DC Max.	

Digital Output	Wire Connection
ON State	
OFF State	

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1.5 LED Indication

The BNET-2107M provides three LEDs to indicate what situation is in the module. They are described as follows.



1.5.1 PWR LED

The PWR LED is red light and indicates the power status of the BNET-2107M. The PWR LED will be turned on after applying power. If the PWR LED flashes continuously, it means the hardware has some error.

1.5.2 LAN LED

The LAN LED is orange light and indicates the ethernet cable status of the BNET-2107M. If the ethernet cable of BNET-2107M be connected with the ethernet switch, the LAN LED will be truned on. Otherwise, the LAN LED will be turned off.

1.5.3 BIP LED

The BIP LED is green light and indicates the BACnet/IP communication status of the BNET-2107M. The following description shows the conditions of error status.

- BIP (Green light) LED flashes: The BNET-2107M is in idle status. There is no any BACnet/IP client communicating with. Or there is no any BACnet/IP message on the ethernet.

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- BIP (Green light) LED ON: At least one BACnet/IP client is communicating with BNET-2107M. Or the BNET-2107M receive at least one BACnet/IP messages via ethernet.

LED	LED Status	BNET-2107M Status
All LED	Light up each one in turn	Firmware update mode.
	Blinks once in 500ms	Initial mode
PWR	ON	Power on.
	Blinks every 500ms	Hardware failure.
LAN	ON	The Ethernet cable is connected to the switch.
	OFF	The Ethernet cable is not connected to the switch.
BIP	ON	Receiving BACnet/IP messages or is communicating.
	Blinks every 500ms	Idle.
	OFF	The Ethernet cable is not connected to the switch.

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2. Web Based Configuration Tool

This chapter is to describe the web structure and software operating interfaces. The BNET-2107M provides Web-based configuration for the BACnet devices and objects settings. The functions include:

- System information.
- Network settings.
- BACnet objects information.

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2.1 Using Web-based Configuration Tool

Connect the BNET-2107M to network, and use standard web browser (Chrome, Firefox) to launch the user interface. The default link and network settings are as followed:

Web Address: http://192.168.255.1
IP Address: 192.168.255.1
Subnet Mask: 255.255.0.0
Gateway: 192.168.0.254

For security reason, user will have to login with user name and password before entering the configuration pages. The default user name and password are **admin** and **admin**.

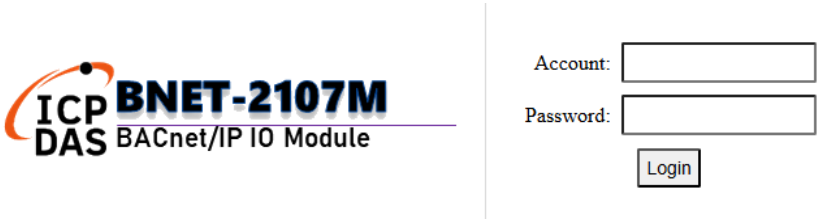


Figure 1. Logon screen

Screen opened as image shown in Figure 2. If the user login successfully, you can see the web page below.

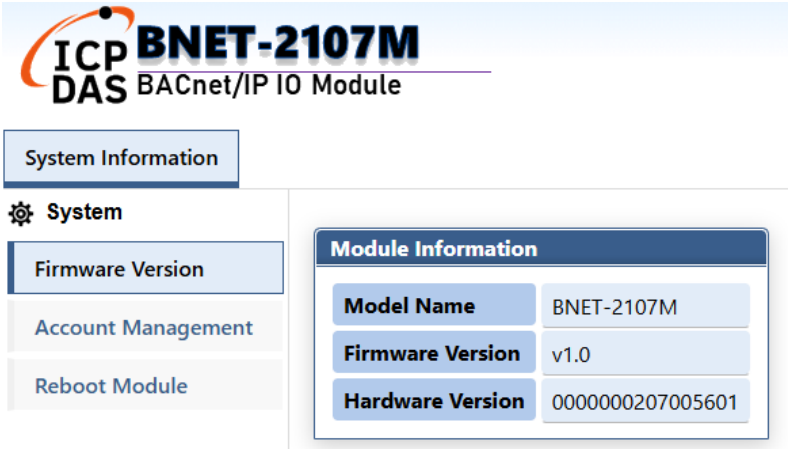


Figure 2. Web page overview

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2.2 Tab menu of Configuration Tool

The configuration tool had divided into two sections System Information, Module Setting. Please refer to the following clause for detail information.

2.2.1 System

System information consist of

- Module Firmware information
- Account Management. It provides the configuration for the user name and password.
- Reboot Module.

2.2.2 Module Setting

Module Setting Configuration consists of

- Ethernet IP/Mask/Gateway
- BACnet/IP Device ID Setting.
- BACnet Objects Information.

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2.3 [System Information] Tab

As shown in Figure 3, the system tab provides firmware version, Account Management, and Reboot Module operation. Here shows the page of "Firmware Version".

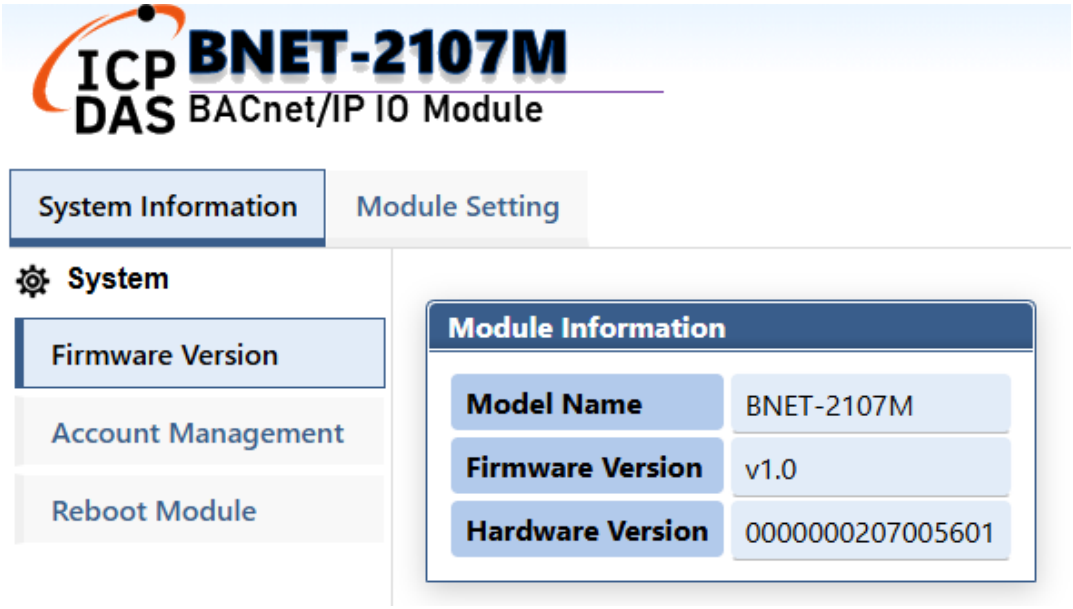


Figure 3. System tab

2.3.1 Account Management

Figure 4 shows the Account Management frame. The section provides an interface which allows user to modify the user name and password. User will need to reboot the system or restart it to apply the changes.

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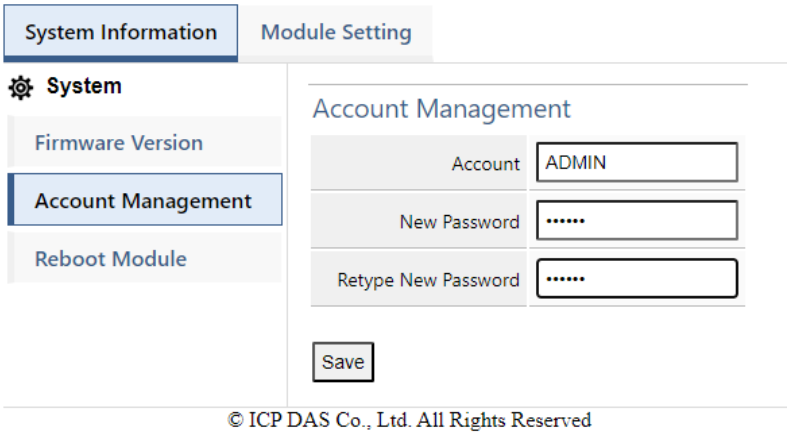


Figure 4. Account Management

2.3.2 Reboot Module

The section provides an interface which allows user to restart the BNET-2107M. User will need to reboot the system or restart it to apply the changes.

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2.4 [Module Setting] Tab

The Figure 5 shows the [Network] page of the [Module Setting] tab. The [Network] page consist an Ethernet configuration and Device ID of BACnet/IP configuration.

2.4.1 [Network] configuration

The Figure 5 shows the [Network] basic information, consisting of IP, Mask, Gateway and Device ID settings. The BACnet/IP port is fixed to 47808 (0xBAC0) and can not be changed.

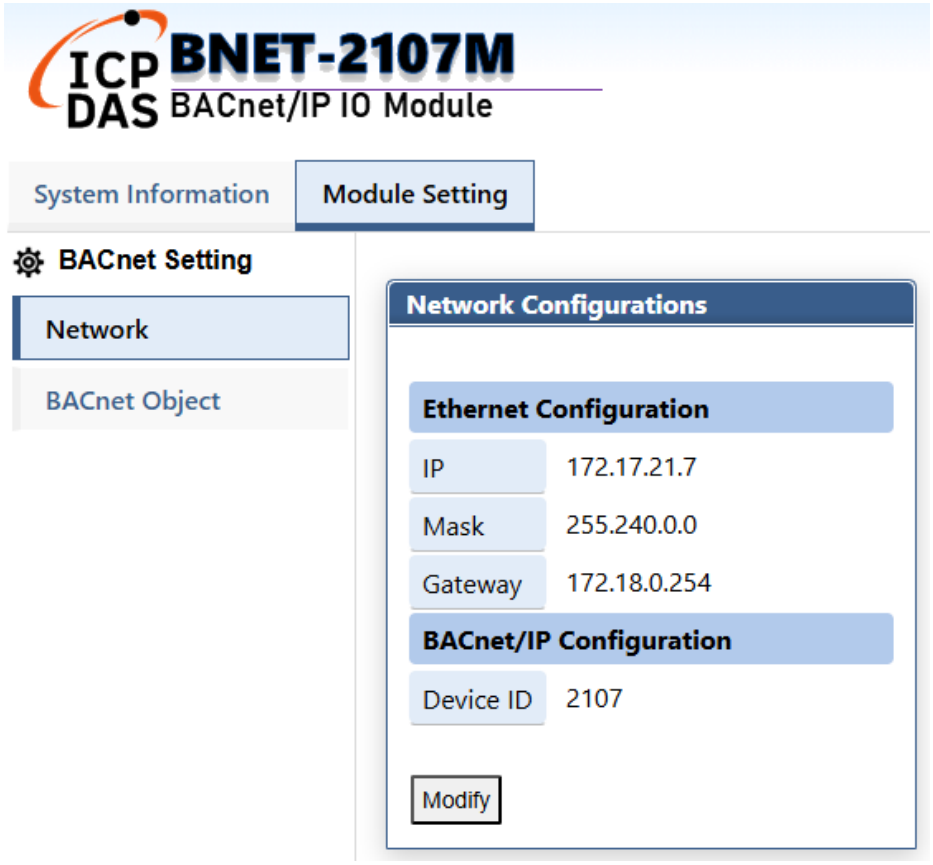


Figure 5. [Network] page

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The [Network] page consists an ethernet configuration which is for BACnet/IP protocol. The [Device ID] field is the Device_Identifier property of the BACnet/IP. After clicking "Modify" button, those configuration can be edited and the screenshot is shown in the Figure 6.

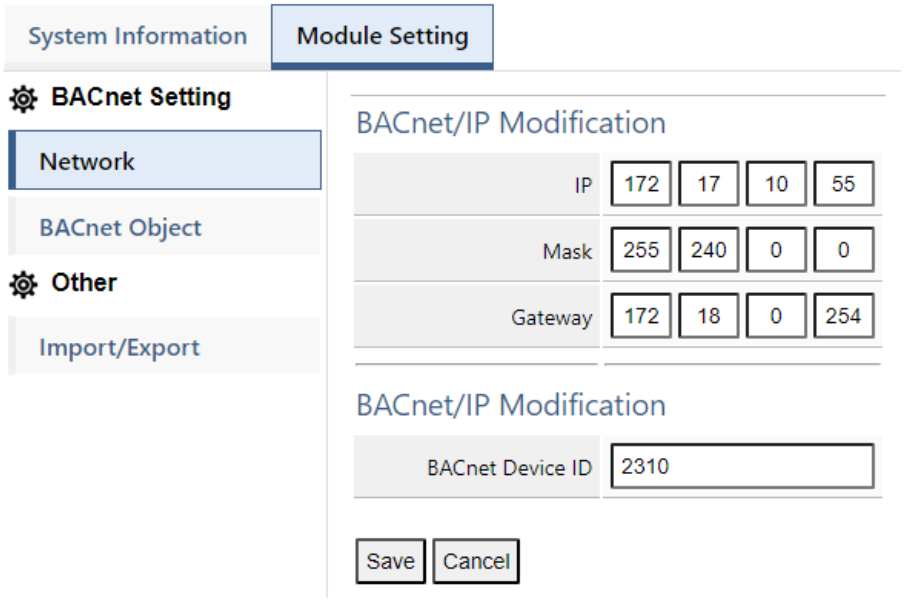


Figure 6. [Network] Modify page

- IP: The IP address (Ipv4) of the BNET-2107M.
- Mask: The subnet mask of the BNET-2107M.
- Gateway: The IP of the gateway which provide the entry point to the network.
- BACnet Device ID: The Device_Identifier property which range from 1 to 4194302.

All information isn't saved until clicking the Save Settings button.

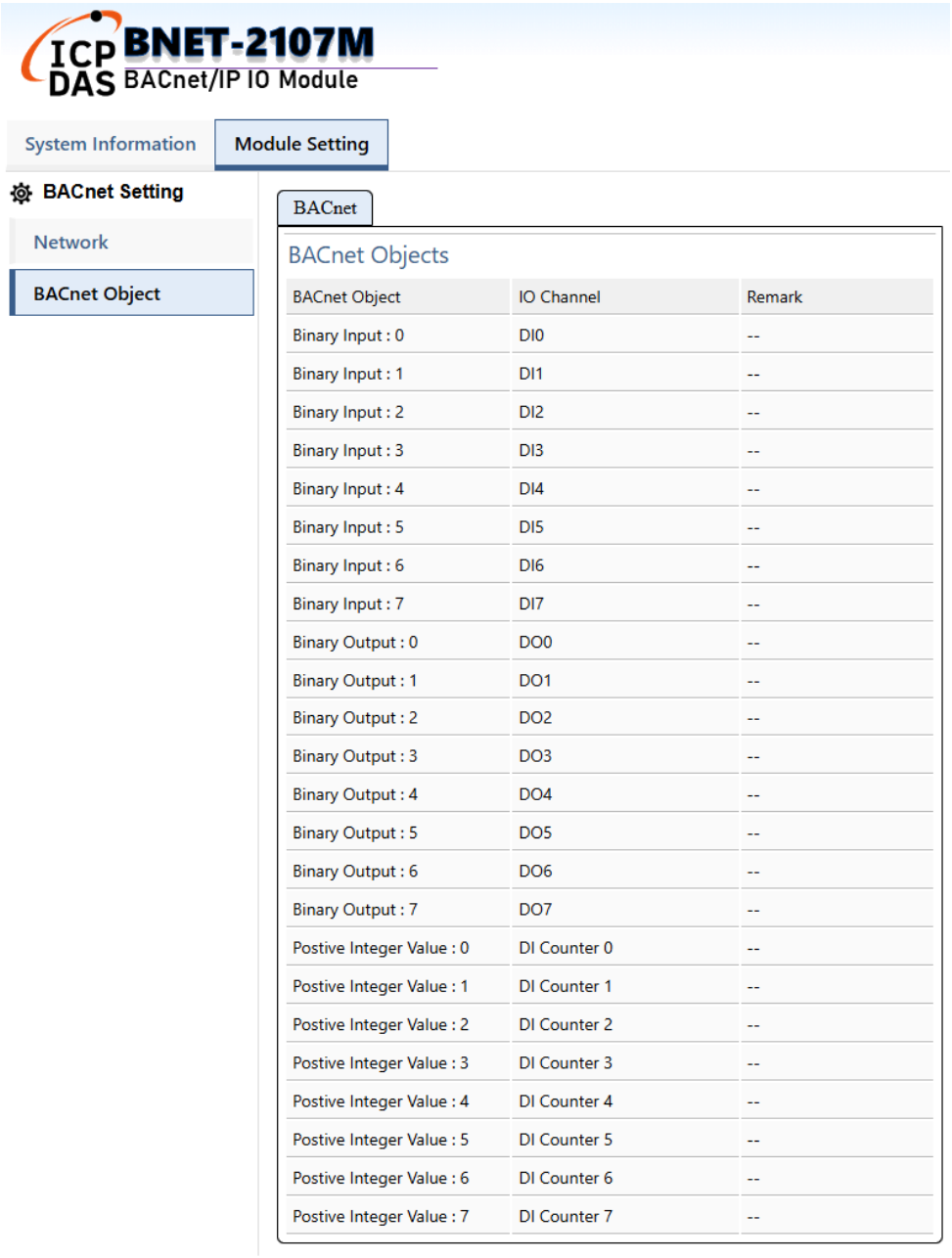
User will need to reboot the system or restart it to apply the changes.

After module rebooted, user will also need to re-open the web user interface.

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2.4.2 Browse BACnet Objects

The BNET-2107M supports several BACnet objects including Binary Input, Binary Output and Postive Integer Value as shown in Figure 7.



BACnet Object	IO Channel	Remark
Binary Input : 0	DI0	--
Binary Input : 1	DI1	--
Binary Input : 2	DI2	--
Binary Input : 3	DI3	--
Binary Input : 4	DI4	--
Binary Input : 5	DI5	--
Binary Input : 6	DI6	--
Binary Input : 7	DI7	--
Binary Output : 0	DO0	--
Binary Output : 1	DO1	--
Binary Output : 2	DO2	--
Binary Output : 3	DO3	--
Binary Output : 4	DO4	--
Binary Output : 5	DO5	--
Binary Output : 6	DO6	--
Binary Output : 7	DO7	--
Postive Integer Value : 0	DI Counter 0	--
Postive Integer Value : 1	DI Counter 1	--
Postive Integer Value : 2	DI Counter 2	--
Postive Integer Value : 3	DI Counter 3	--
Postive Integer Value : 4	DI Counter 4	--
Postive Integer Value : 5	DI Counter 5	--
Postive Integer Value : 6	DI Counter 6	--
Postive Integer Value : 7	DI Counter 7	--

Figure 7. BACnet Objects

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3. How to restore default Account/Password

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

(1) Short the "INIT" and "P.GND" pin of BNET-2107M and turn on the power.

(2) The BNET-2107M will restore the login information.

IP : 192.168.255.1

Mask : 255. 255. 0 .0

Gateway: 192.168.0.1

Login Account: admin

Login Password: admin.

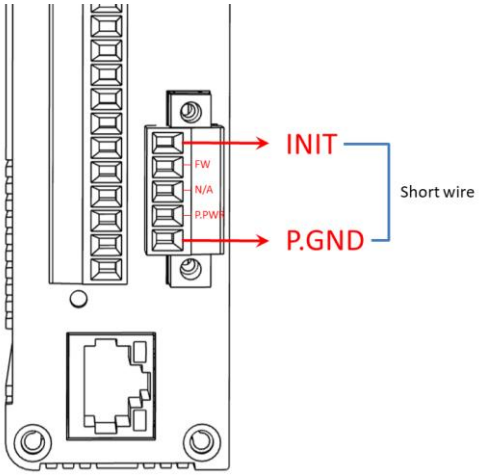


Figure 10. Short the "INIT" and "P.GND" pin

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4. How to update the firmware

The BNET-2107M can be updated the firmware via a software tool (Windows) by the following steps:

1) Download the latest version of the firmware program and update Tool (FW_Update_Tool) on the website of the BNET-2107M and store it in a computer that you want to connect to BNET-2107M.

- **Update Tool:** Please refers to -> https://www.icpdas.com/en/download/show.php?num=9351

2) Short the "FW" and "P.GND" pin of the BNET-2107M and turn on the power. When the three LEDs of the BNET-2107M turn blinking alternately, the BNET-2107M is successfully entered the firmware updating mode.

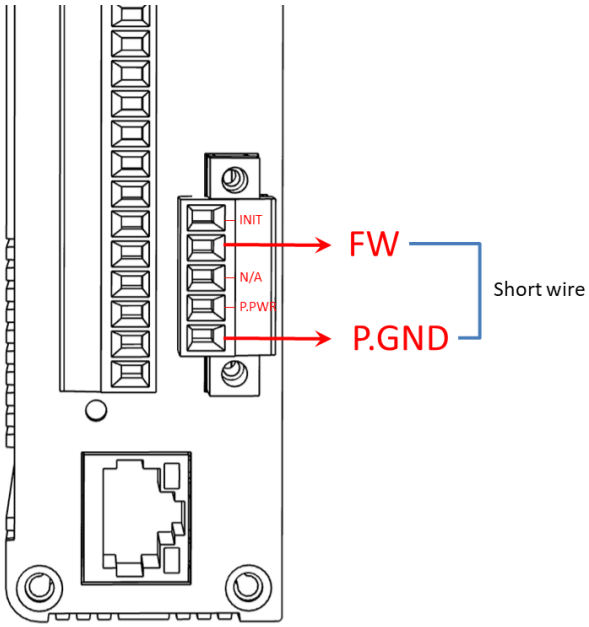


Figure 11 BNET-2107M FW & P.GND Pin

3) Execute "FW_Update_Tool.exe" with the administrator privileges ( ) and follow the steps as Figure 12:

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In "Download Interface", select a network port for connecting to BNET-2107M

In “IP Address”, the users can ignore it.

In "Firmware Path", click the “Browser” button to select the latest firmware file (BNET_2107M_vxxx.fw).

In "Firmware Update", click “Update” button to start the firmware updating. If you have meet updating fail, you can click the “Update” button again. Or you can reboot your BNET-2107M to enter the firmware updating mode again. And then, you can click the “Update” button again.

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 P.GND, and reboot the power supply, then check the current firmware version on the Web interface.

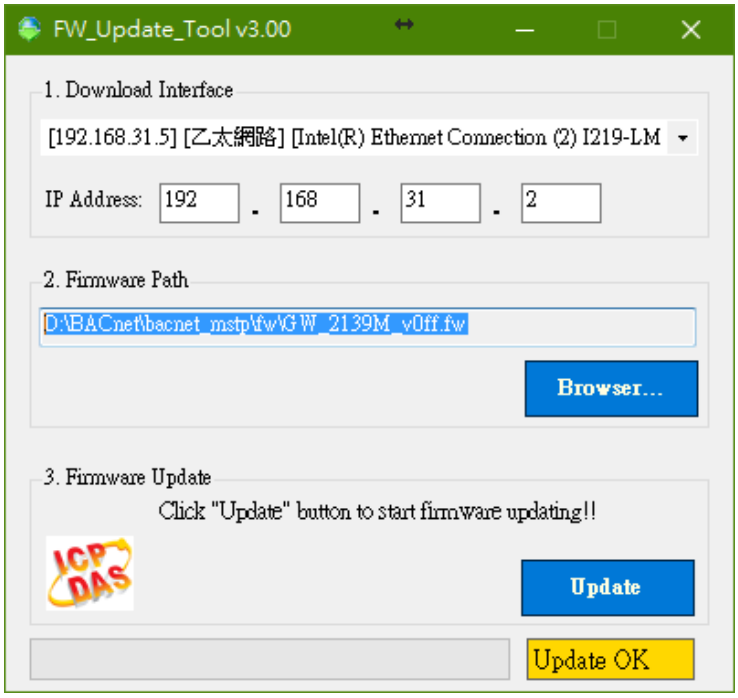


Figure 12 FW_Update_Tool firmware update steps

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