

BNET-2310M
User's Manual v1.00

Warranty

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

Warning

ICP DAS assumes no liability for damages resulting from the use of this product. ICP DAS reserves the right to change this manual at any time without notice. The information furnished by ICP DAS is believed to be accurate and reliable. However, no responsibility is assumed by ICP DAS for its use, or for any infringements of patents or other rights of third parties resulting from its use.

Copyright

All rights are reserved by ICP DAS Co., Ltd. 2024.

Trademark

The names used for identification only may be registered trademarks of their respective companies.

Contact us

If you have any problem, please feel free to contact us. You can count on us for quick response.

Email : service@icpdas.com

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Document Revision

Version	Author	Date	Description of Changes
1.00	Johney	2024/09/15	First Released Revision

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Table of Contents

1. General Information 5
1.1 BACnet Introduction 5
1.2 About BNET-2310M 5
1.3 Hardware Specification 5
1.4 Hardware Interface 8
1.5 BNET-2310M Pin Assignment and Wire Connection 8
1.6 LED Indication 10
1.6.1 PWR LED 10
1.6.2 LAN LED 10
1.6.3 BIP LED 10
2. Web Based Configuration Tool 12
2.1 Using Web-based Configuration Tool 12
2.2 Tab menu of Configuration Tool 14
2.2.1 System 14
2.2.2 Module Setting 14
2.3 System Information tab 15
2.3.1 Account Management 15
2.3.2 Reboot Module 16
2.4 [Module Setting] tab 17
2.5 [Network] configuration 17
2.5.1 Configuring Analog Range of BACnet Analog Objects 19
2.5.2 Import/Export Configuration 21
3. How to restore default Account/Password 23
4. How to update the firmware 24

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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-2310M

The BNET-2310M is multifunction BACnet/IP I/O module. The BNET-2310M provides 4 AI channels, 2 AO channels, 4 DI channels and 4 DO channels. The modules contain number of BACnet objects (Device, AI, AO, 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.

1.3 Hardware Specification

Model	BNET-2310M
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

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

BACnet Objects	1 Device, 4 AI, 2 AO, 4 BI, 4 BO
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
Analog Input	
Channel	4 Single-Ended
Range	±1 V , ±2.5 V, ±5 V, ±10 V,
Resolution	16-bit
Sampling Rate	10Hz
Accuracy	±0.1%
Over Voltage Protection	120 VDC
Individual Channel Configuration	Yes
Analog Output	
Channel	2
Type	Voltage
Range	0 V ~ +5 V, ±5 V, 0 V ~ +10 V, ±10 V
Resolution	12-bit
Accuracy	±0.1%
Voltage Output Capability	20 mA @DC10V
Current Load Resistance	500 Ω
Individual Channel Configuration	Yes
Digital Input	
Channel	4
Type	Dry Contact
Sink/Source	Source(PNP)
On Voltage Level	Close to GND
Off Voltage Level	Open
Overvoltage Protection	60 VDC
Individual Channel Configuration	Yes
Digital Output	
Channel	4
Type	Source(PNP)
Load Voltage	+10 VDC ~ 40 VDC
Max. Load Current	650 mA/channel
Overvoltage Protection	47 VDC
Overload Protection	Yes
Short-circuit Protection	Yes

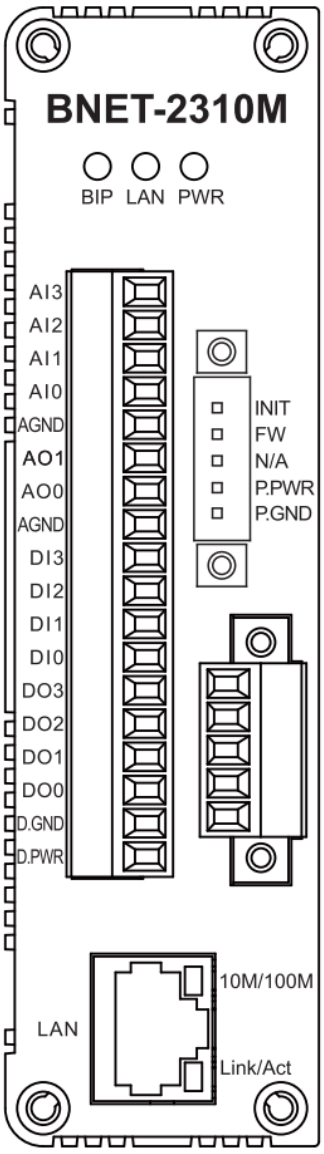
Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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	3.6W (0.15A @ 24VDC)

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.4 Hardware Interface

1.5 BNET-2310M Pin Assignment and Wire Connection

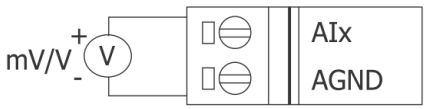
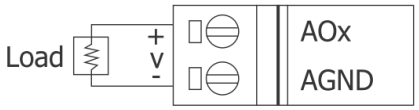


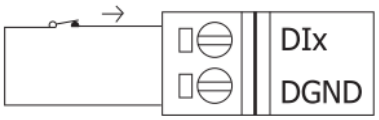
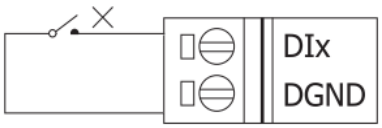
Power Input & Special functionality	
Pin	Description
INIT	For restoring default account, password, or IP address. Please refer to the chapter 3.
FW	For updating the firmware. Please refer to the chapter 4.
N/A	Don't care.
P.PWR	DC Power 10V ~ 30V input
P.GND	DC Power GND

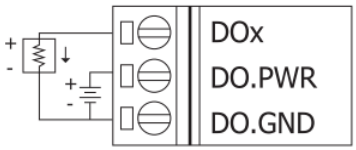
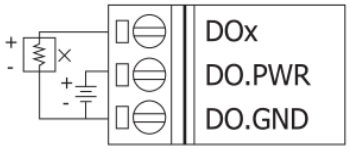
Digital and Analog IO pins	
Pin	Description
AI3	Analog Input 3 +
AI2	Analog Input 2 +
AI1	Analog Input 1 +
AI0	Analog Input 0 +
AGND	Analog Input GND
AO1	Analog Output 1 +
AO0	Analog Output 0 +
AGND	Analog Output GND
DI3	Digital Input 3
DI2	Digital Input 2
DI1	Digital Input 1
DI0	Digital Input 0
DO3	Digital Output 3
DO2	Digital Output 2
DO1	Digital Output 1
DO0	Digital Output 0
D.GND	Power GND for IO
D.PWR	DC 10V~30V for IO

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Wire Connection

Analog Type	Wire Connection
Analog Input	
Analog Output	

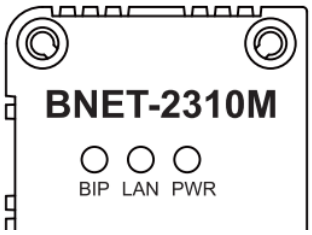
Digital Input	Wire Connection
ON State	
OFF State	

Digital Output	Wire Connection
ON State	
OFF State	

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1.6 LED Indication

The BNET-2310M provides three LEDs to indicate what situation is in the module. They are described as follows.



1.6.1 PWR LED

The PWR LED is red light and indicates the power status of the BNET-2310M. The PWR LED will be turned on after applying power. If the PWR LED flashes continuously, it means the hardware has some error.

1.6.2 LAN LED

The LAN LED is orange light and indicates the ethernet cable status of the BNET-2310M. If the ethernet cable of BNET-2310M be connected with the ethernet switch, the LAN LED will be truned on. Otherwise, the LAN LED will be turned off.

1.6.3 BIP LED

The BIP LED is green light and indicates the BACnet/IP communication status of the BNET-2310M. The following description shows the conditions of error status.

- BIP (Green light) LED flashes: The BNET-2310M is in idle status. There is no any BACnet/IP client communicating with. Or there is no any BACnet/IP message on the ethernet.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- BIP (Green light) LED ON: At least one BACnet/IP client is communicating with BNET-2310M. Or the BNET-2310M receive at least one BACnet/IP messages via ethernet.

LED	LED Status	BNET-2310M 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.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2. Web Based Configuration Tool

This chapter is to describe the web structure and software operating interfaces. The BNET-2310M provides Web-based configuration for the BACnet devices and objects settings. The functions include:

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

2.1 Using Web-based Configuration Tool

Connect the BNET-2310M 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**.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

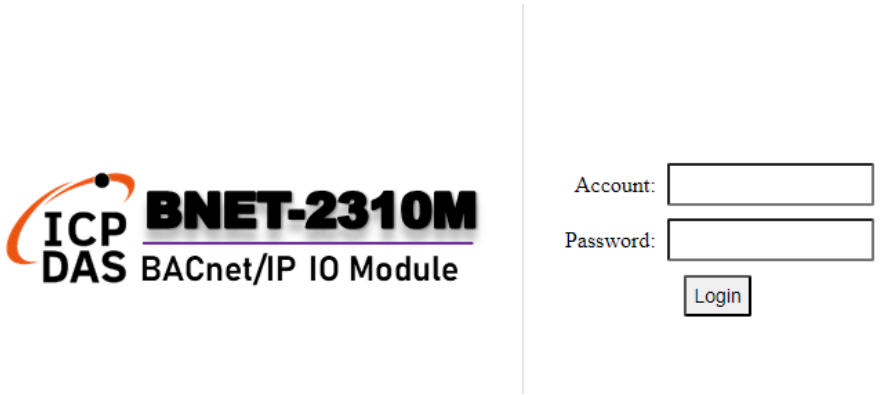


Figure 1. Logon screen

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

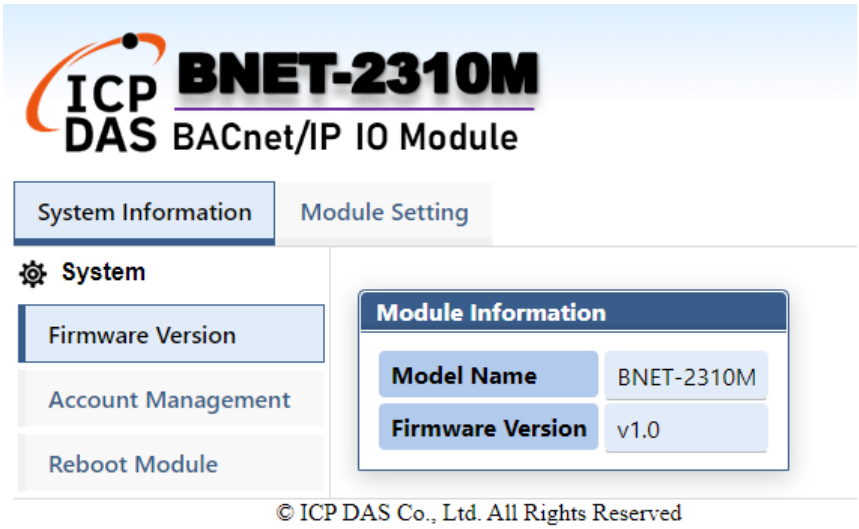


Figure 2. Web page overview

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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
- Analog channels configuration
- Import/Export configuration file

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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".

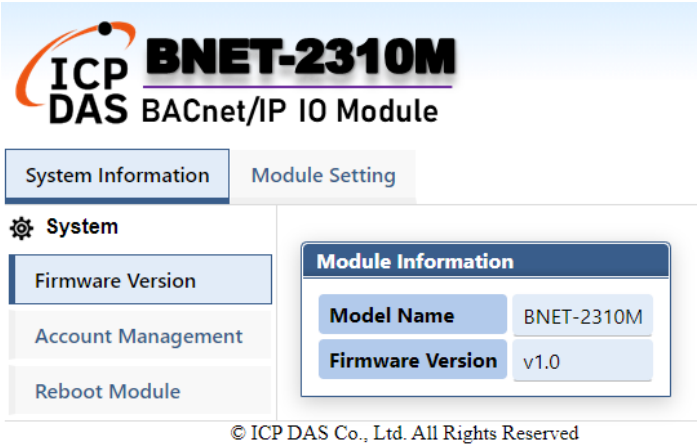


Figure 3. System tab

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.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

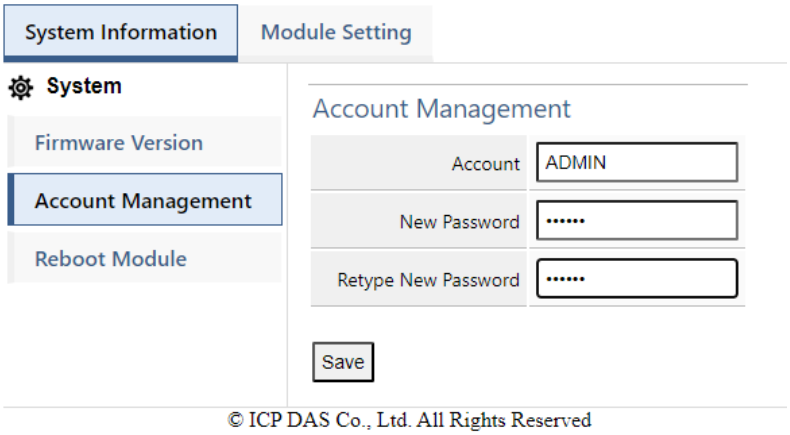


Figure 4. Account Management

2.3.2 Reboot Module

The section provides an interface which allows user to restart the BNET-2310M. User will need to reboot the system or restart it to apply the changes.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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.

2.5 [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.

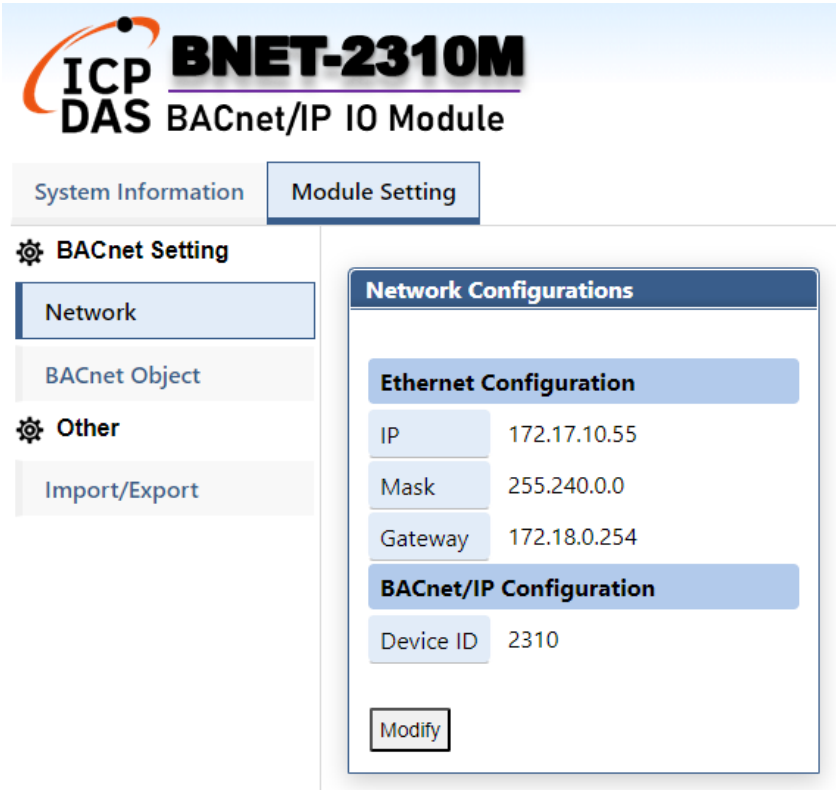


Figure 5. [Network] page

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

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

"Modify" button, those configuration can be edited and the screenshot is shown in the Figure 6.

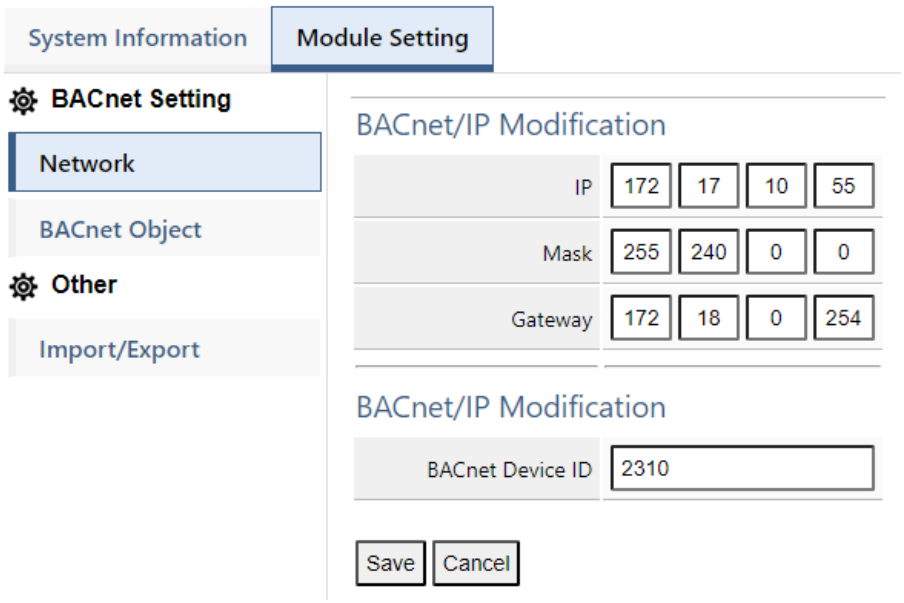


Figure 6. [Network] Modify page

- IP: The IP address (Ipv4) of the BNET-2310M.
- Mask: The subnet mask of the BNET-2310M.
- 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.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.5.1 Configuring Voltage Range of BACnet Analog Objects

The BNET-2310M supports several voltage range of BACnet analog objects including Analog Input and Analog Output. Figure 7 shows the configuration options of BACnet analog objects.

BACnet Object	Voltage Range
Analog Input BACnet Object	1. ±1V 2. ±2.5V 3. ±5V 4. ±10V
Analog Output BACnet Object	1. 0V ~ 5V 2. ±5V 3. 0V ~ 10V 4. ±10V

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

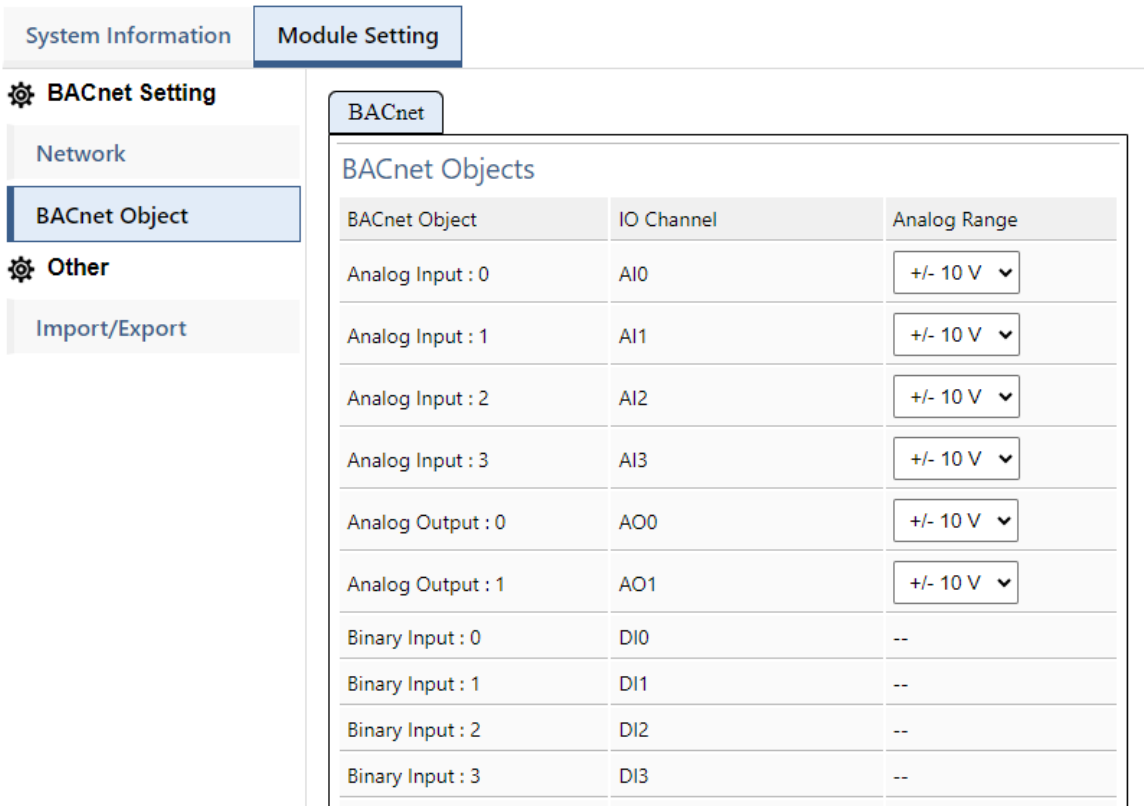


Figure 7. Voltage Range of BACnet Analog Objects

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.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.5.2 Import/Export Configuration

(1) Export All Configurations to CSV file

The BNET-2310M supports export function to write all configurations into a csv file. This help to save the configuration for future use. After clicking the "Export" button, the CSV file will be save into specificed location which provide by the users.

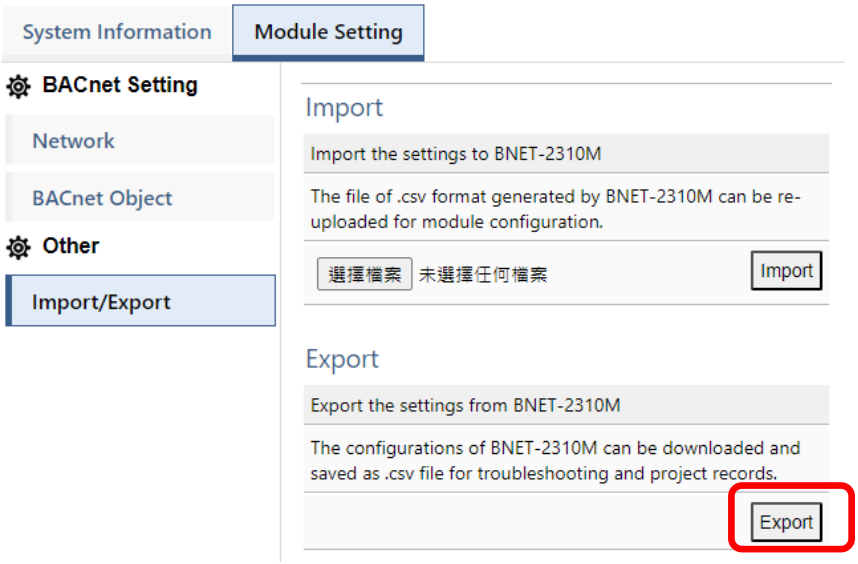


Figure 8. Export All Configuration to CSV file

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

(2) Import All Configurations from CSV file

The users could import all configurations from a CSV file. It is convinient to move all configurations from one BNET-2310M to another one. Firstly, the users select the CSV file. And then, they can press "Import" button to import configurations into the BNET-2310M modules.

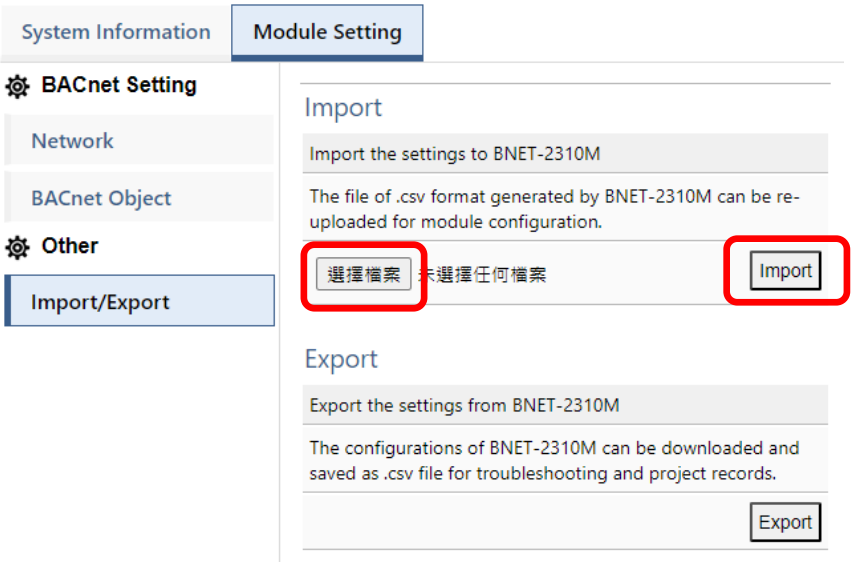


Figure 9. Import specificed CSV file into BNET-2310M

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

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-2310M and turn on the power.

(2) The BNET-2310M 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.

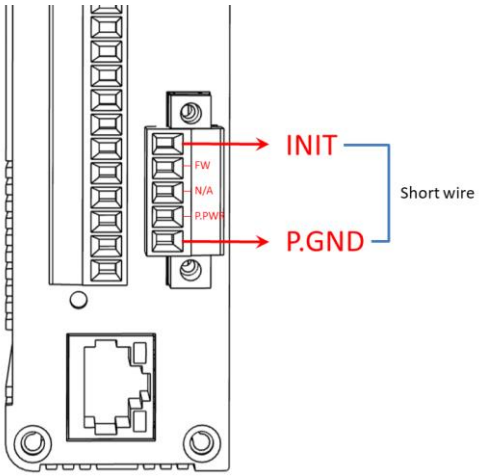


Figure 10. Short the "INIT" and "P.GND" pin

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4. How to update the firmware

The BNET-2310M 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-2310M and store it in a computer that you want to connect to BNET-2310M.

- **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-2310M and turn on the power. When the three LEDs of the BNET-2310M turn blinking alternately, the BNET-2310M is successfully entered the firmware updating mode.

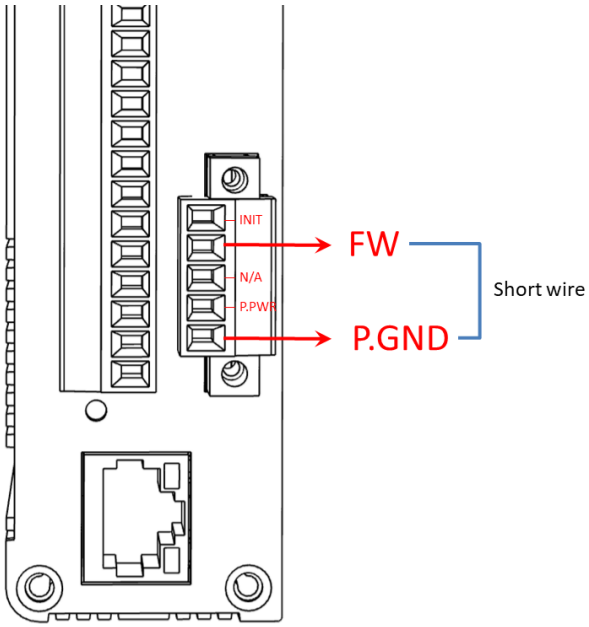


Figure 11 BNET-2310M FW & P.GND Pin

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

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

In "Download Interface", select a network port for connecting to BNET-2310M

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

In "Firmware Path", click the “Browser” button to select the latest firmware file (BNET_2310M_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-2310M 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.

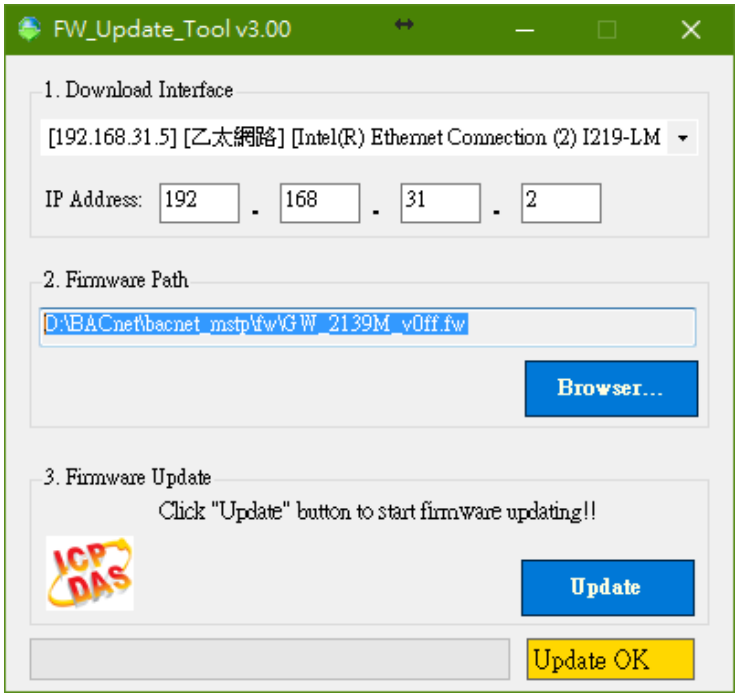


Figure 12 FW_Update_Tool firmware update steps

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000