



User Manual

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GW-2139M

(BACnet MS/TP to Modbus TCP Gateway)



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Table of Contents

1. General Information	4
1.1 BACnet MS/TP Introduction	4
1.2 Modbus TCP Introduction	4
1.3 About GW-2139M	5
1.4 Features.....	6
1.5 Specifications.....	7
2. Hardware.....	8
2.1 Size (Unit : mm)	8
2.2 Appearance.....	9
2.3 LED Indicator	10
3. Getting Started With GW-2139M.....	11
3.1 Wiring Preparation	11
3.2 GW-2139M Utility	12
3.3 How to update the firmware	16

Important Information

Warranty

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

Warning

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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 . We guarantee to respond within 2 working days.

1. General Information

1.1 BACnet MS/TP Introduction

BACnet is a data communications protocol for Building Automation and Control Networks. BACnet Master Slave Token Passing (MS/TP) protocol is used to relay and exchange information between building devices. BACnet MS/TP is based on BACnet standard protocol SSPC-135, Clause 9. BACnet MS/TP is a peer-to-peer, multiple master protocol based on token passing. A token is information packets in the form of a pulse signal that is passed between devices on a network. BACnet MS/TP is exclusive to BACnet and can be implemented using the EIA-485 signaling standard. This is a shielded twisted-pair (STP) LAN operating at speeds from 9600 bit/s to 76800 Kbit/s. This LAN type is particularly suitable for single controller and low cost communications.

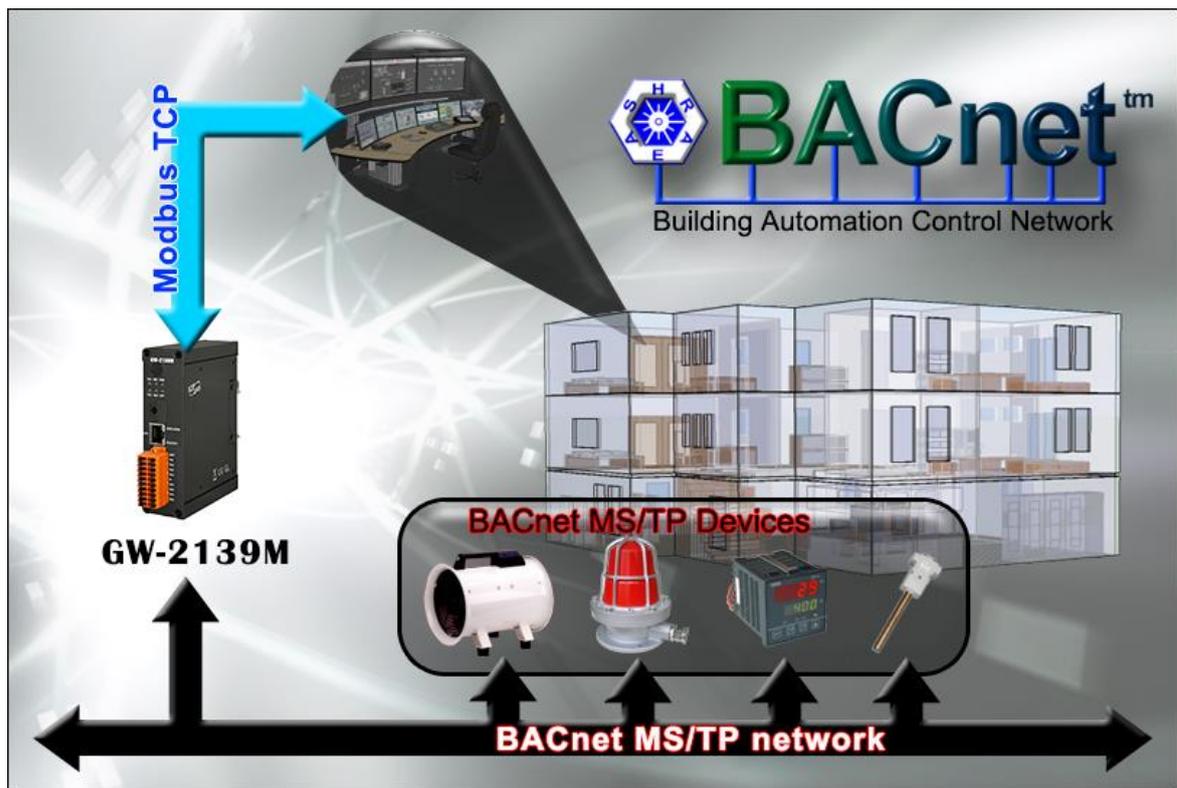
1.2 Modbus TCP Introduction

MODBUS/TCP is a variant of the MODBUS family of simple, vendor-neutral communication protocols intended for supervision and control of automation equipment. Specifically, it covers the use of MODBUS messaging in an “Intranet” or “Internet” environment using the TCP/IP protocols. The most common use of the protocols at this time are for Ethernet attachment of PLC’s, I/O modules, and gateways to other simple field buses or I/O networks.



1.3 About GW-2139M

GW-2139M is a network gateway allowing Modbus TCP client devices to be accessed BACnet MS/TP network as a BACnet MS/TP master. The BACnet Master Slave Token Passing (MS/TP) protocol is used to relay and exchange information between building devices. GW-2139M 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. BACnet interoperability building blocks (DS-RP-A, DS-RPM-A, DS-WP-A, DS-WPM-A, DM-DDB-A, DM-DOB-A, DM-DCC-A, DM-RD-A) are Supported. All the data transfer is configurable using ICPDAS Utility.



1.4 Features

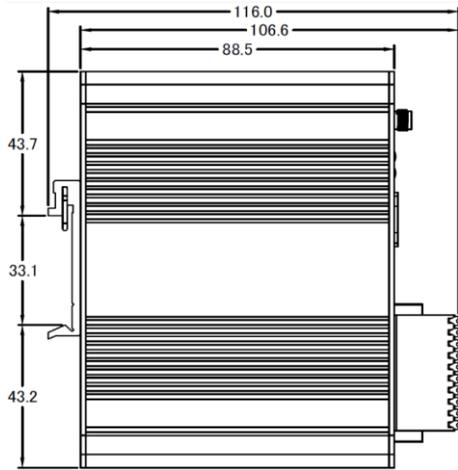
- Read/Write standard BACnet objects via Modbus
- Configurable BACnet MS/TP master
- Configurable Modbus TCP server
- Simple data translation allows you to manipulate data
- Supports BACnet AI, AO, AV, BI, BO, BV, MSI, MSO, MSV Object Types
- Supports Modbus DI, DO, AO, AI Types
- BACnet object properties mapping configured via Modbus register
- Isolated COM : RS-485
- Provide LED indicators
- Built-in Watchdog
- 4KV ESD Protection

1.5 Specifications

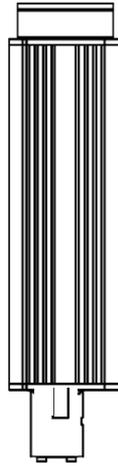
Ethernet	
Controller	10/100Base-TX Ethernet Controller (Auto-negotiating, Auto_MDIX)
Connector	RJ-45 with Ethernet indicator
Protocol	Modbus TCP Server
Max. Connections	8
RS-485 Interface	
Connector	terminal block (D+, D-)
Baud Rate (bps)	9600, 19200, 38400, 57600, 76800
Comm. format	N, 8, 1
Terminator Resistor	Built-in 120 ohm terminator resistor, enabled/disabled via Jump
Isolation	3 kV VDC for DC to DC, 2500 Vrms for photo couple
Protocol	BACnet MS/TP Master
Maximum Connections	32
BACnet Objects	AI, AO, AV, BI, BO, BV, MSI, MSO, MSV
BIBBs	DS-RP-A, DS-RPM-A, DS-WP-A, DS-WPM-A, DM-DDB-A, DM-DOB-A, DM-DC-A, DM-RD-A
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

2. Hardware

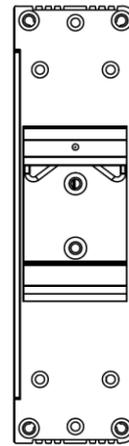
2.1 Size (Unit : mm)



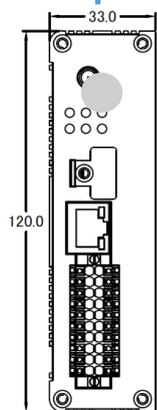
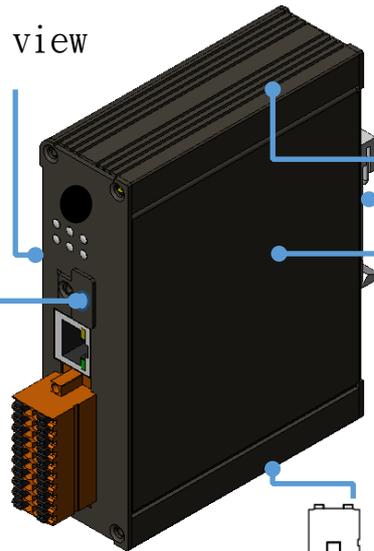
Left view



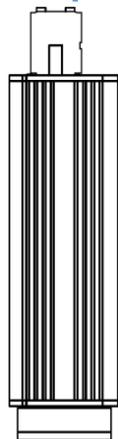
Top view



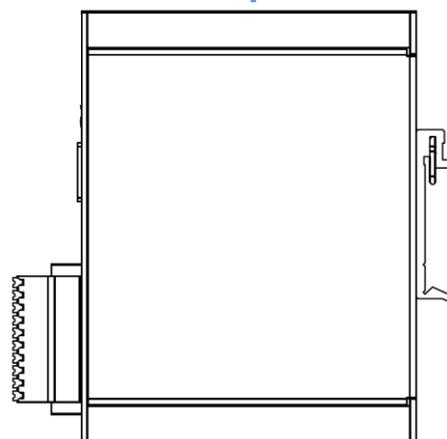
Post view



Front view



Bottom view



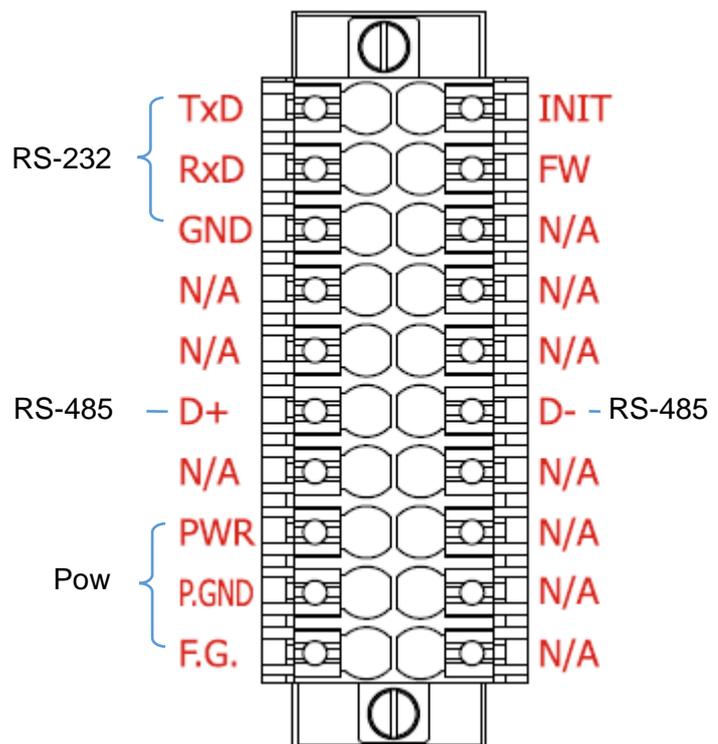
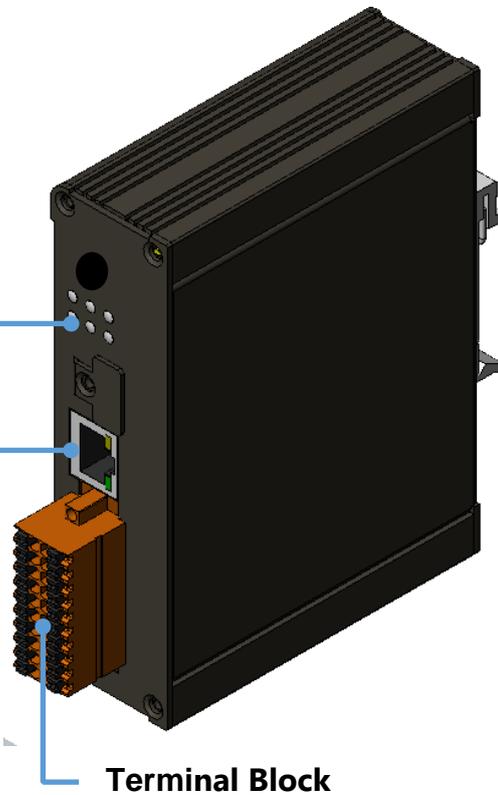
Right view

2.2 Appearance

LED Indicator

Ethernet Port

The GW-2139M is equipped with a RJ45 port for Ethernet LAN connection. When 100BASE-TX is operating, the 10/100M LED is lit orange. When 10BASE-T is operating or the machine is not connected to the network, it is turned off. When an Ethernet link is detected and an Ethernet packet is received, the Link/Act LED is lit green.



2.3 LED Indicator

There are six LEDs to indicate the various states of the GW-2139M. The following is the illustration of these six LEDs.

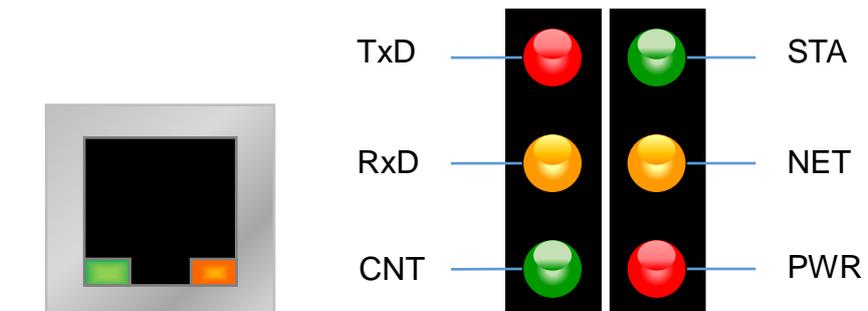


Figure 2.1 LED position of the GW-2139M

LED Name	GW-2139M Status	LED Status
ALL LEDs	FW Updating Mode	LED will be twinkled sequentially.
PWR (Module)	Power On	On
	Power Failure	Off
NET (MSTP)	Connect at least one device	On
	No devices are connected	Blink per 200 ms
STA (MSTP)	Connect all device	On
	Some devices are not connected	Blink per 200 ms
CNT (Modbus)	Connected by least one client.	On
	No clients connect	Blink per 200 ms
RxD (Modbus)	Data reception	On
	No Data reception	Off
TxD (Modbus)	Data transmission	On
	No Data reception	Off

Table 2.1 LED indication of the GW-2139M

3. Getting Started With GW-2139M

This chapter mainly describes the operation process of the GW-2139M.

3.1 Wiring Preparation

Before setting up the GW-2139M, please complete the necessary preparation about wiring.

Please follow Figure 2.1 wiring diagram, to wire the following items:

1. Power Supply : +10 VDC ~ +30 VDC
2. RS-485 : D+ & D- (MSTP wiring)
3. RS-232 : TxD / RxD / GND (Debug Port ; N, 8, 1 ; 115200 baud rate)
4. Ethernet : Connect the GW-2139M and computer into the same LAN through cable or Ethernet Switch/Hub.
5. INIT : Connect to GND to initial mode. (Address IP:192.168.255.1)
6. FW : Connect to GND and insert RJ45 to download mode. (LED will be twinkled.)

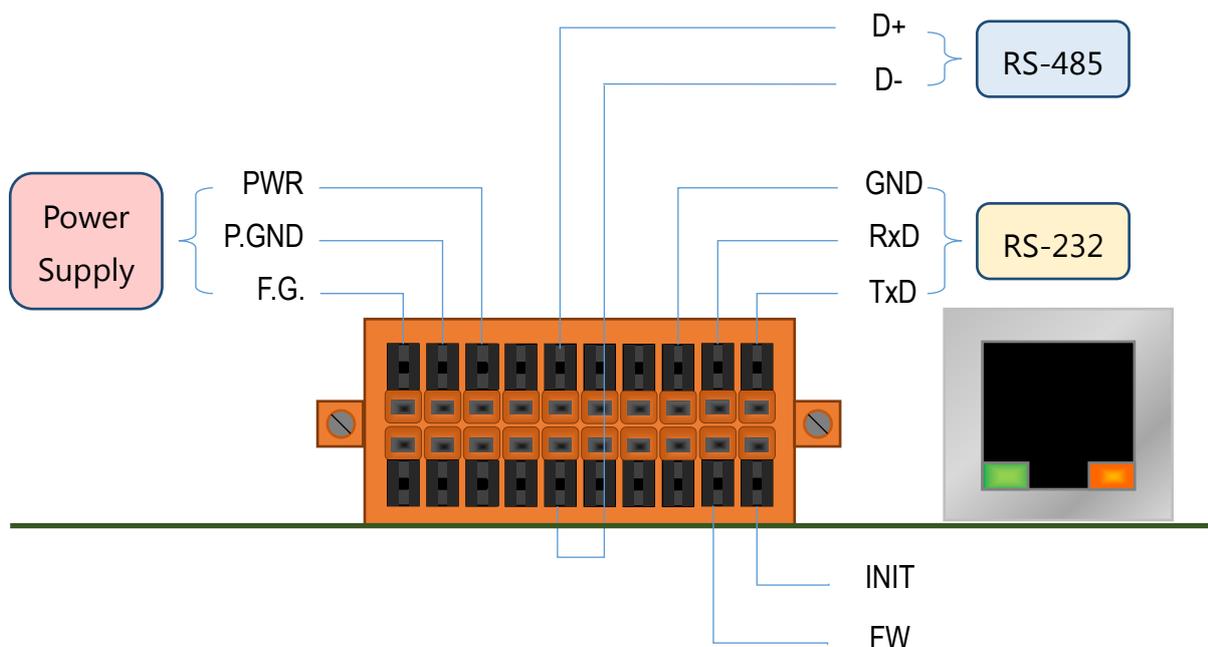


Figure 3.1 GW-2139M Wiring Diagram

3.2 GW-2139M Utility

Please change the GW-2139M to initial mode and follow the following steps to set up the communication between the utility and the GW-2139M.

Step0 :

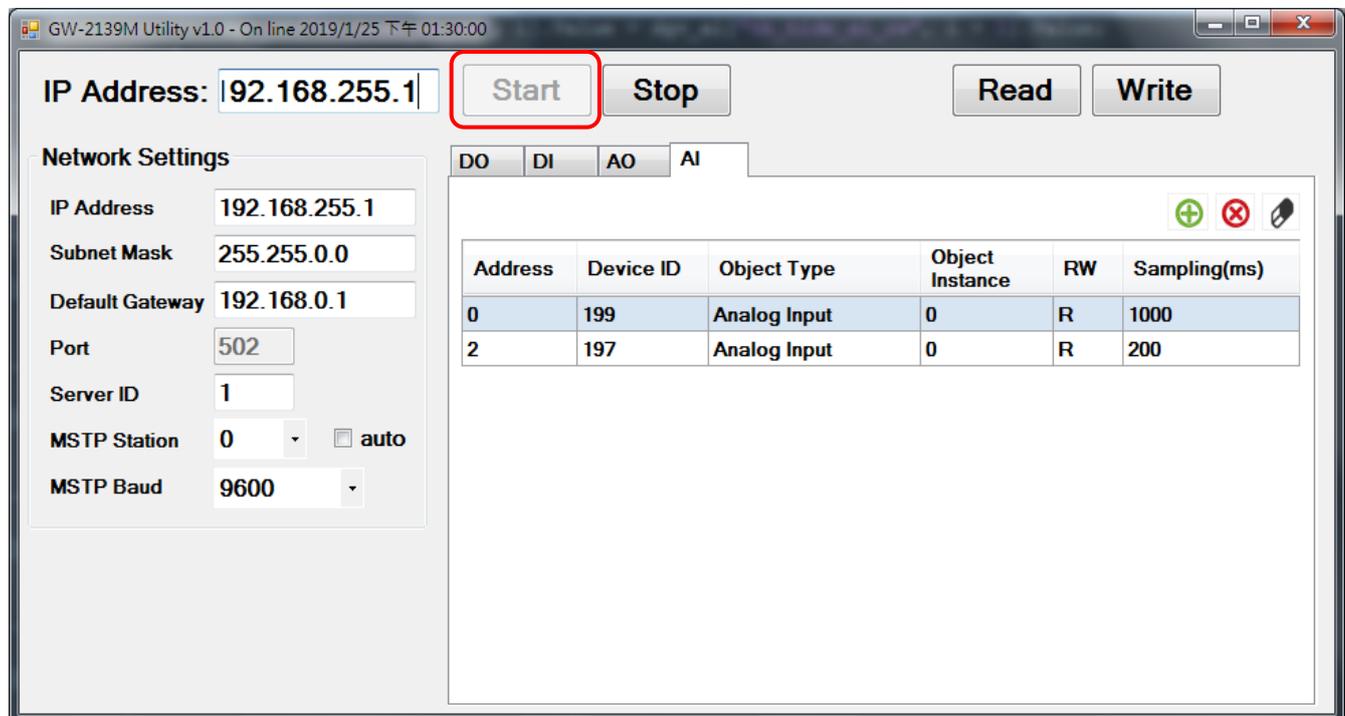
Power off the GW-2139M.

Step1 :

Pin INIT Connect to GND and Power on to initial mode.

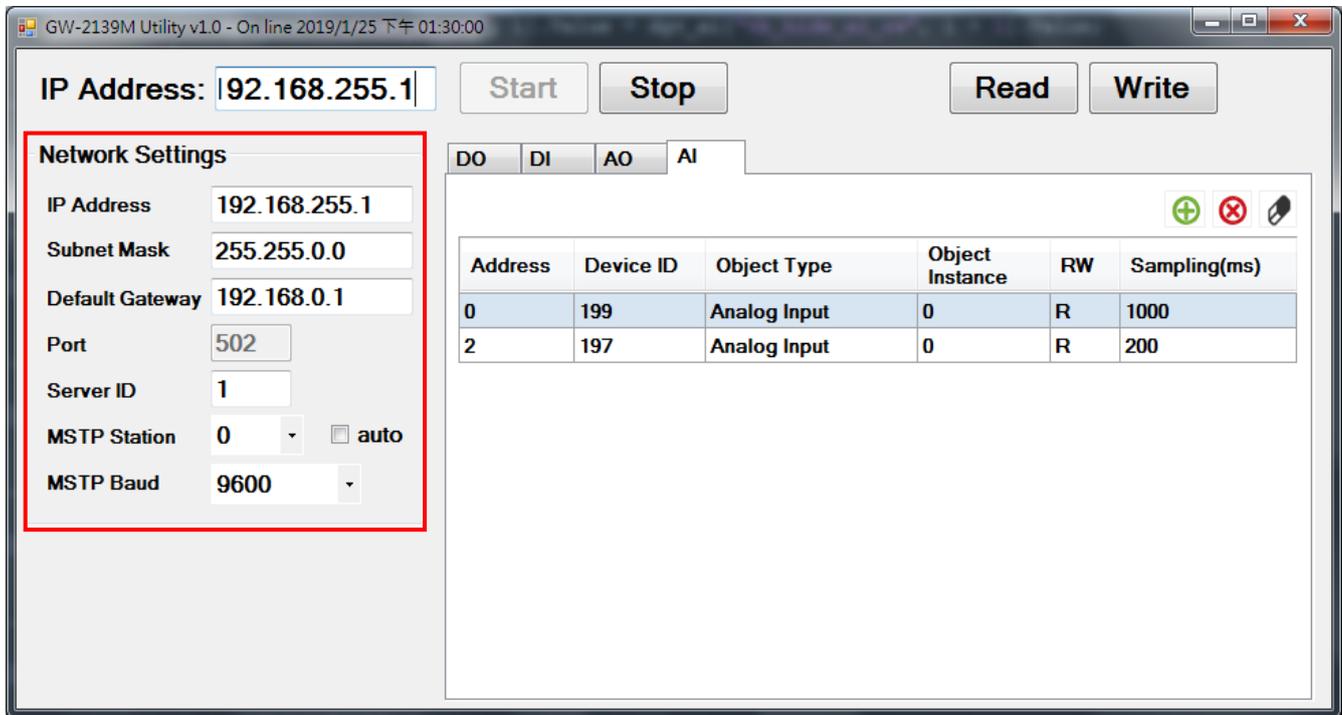
Step2 :

Open Utility and click Start.



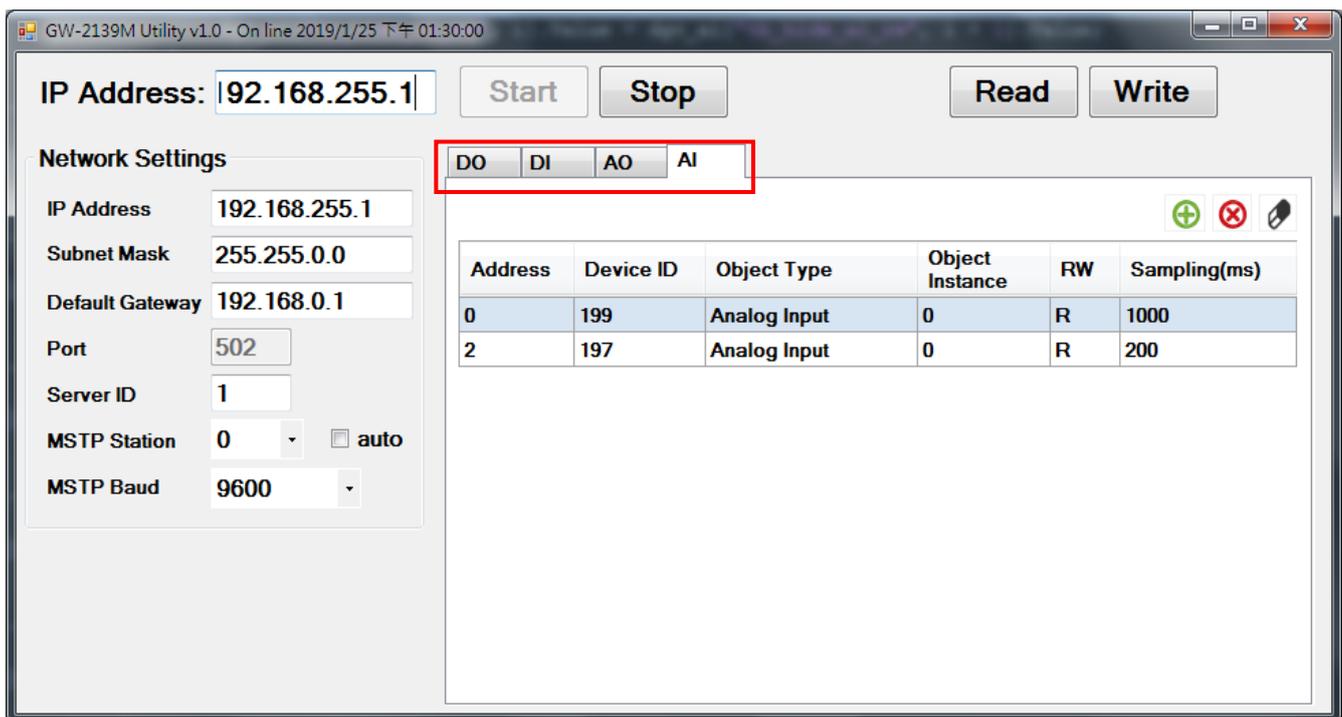
Step3 :

Set the module network parameter.



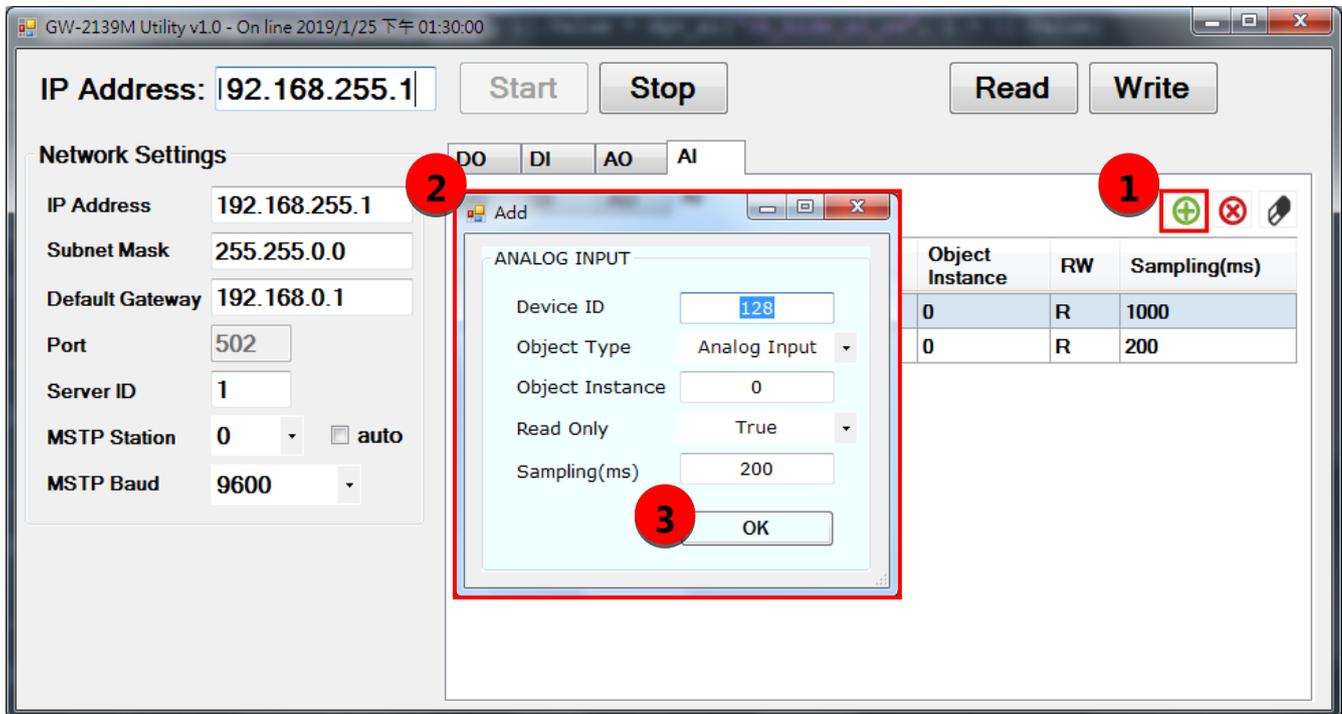
Step4 :

Select the DO, DI, AO or AI page and edit the mapping table.



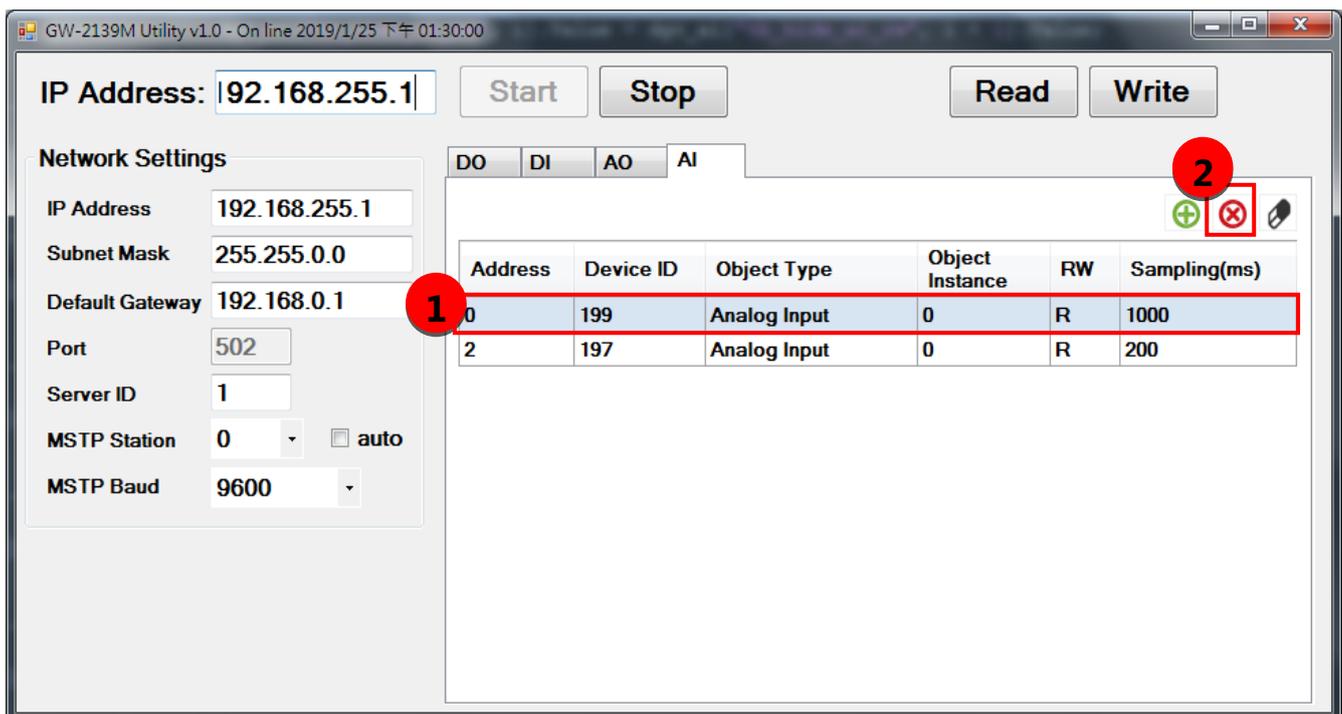
Step5 :

Add the one item to mapping table of the page.



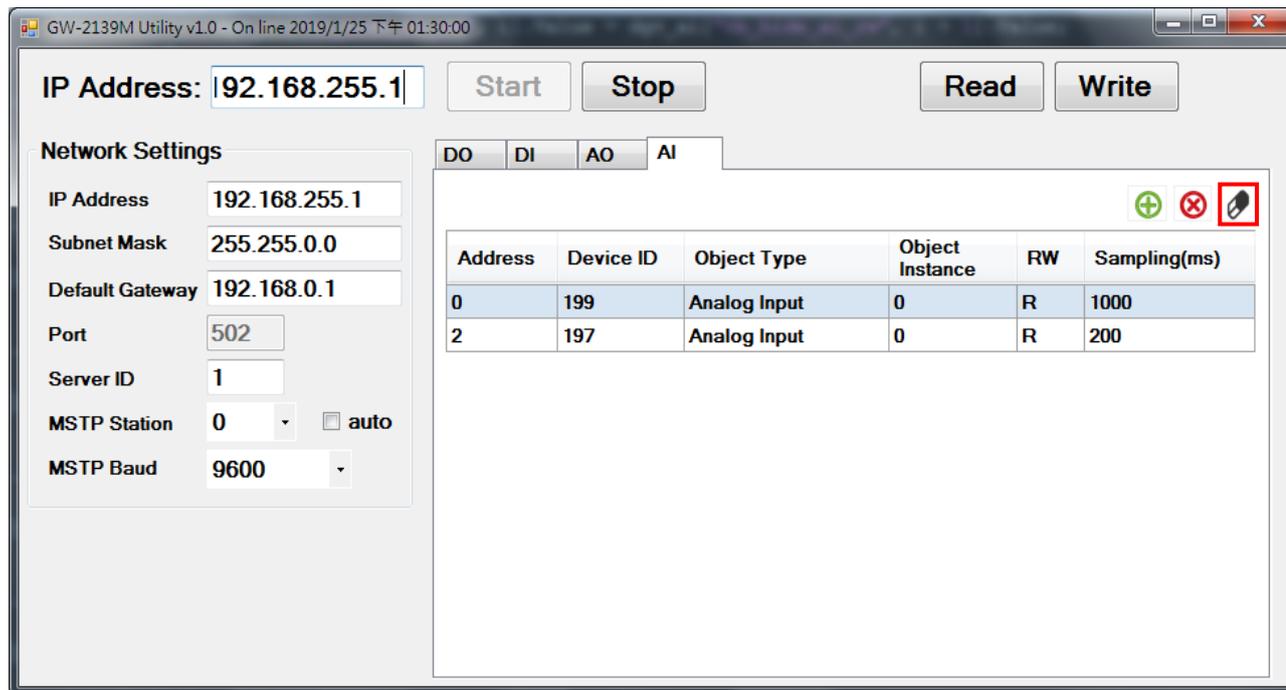
Step6 :

Delete the one item from mapping table of the page.



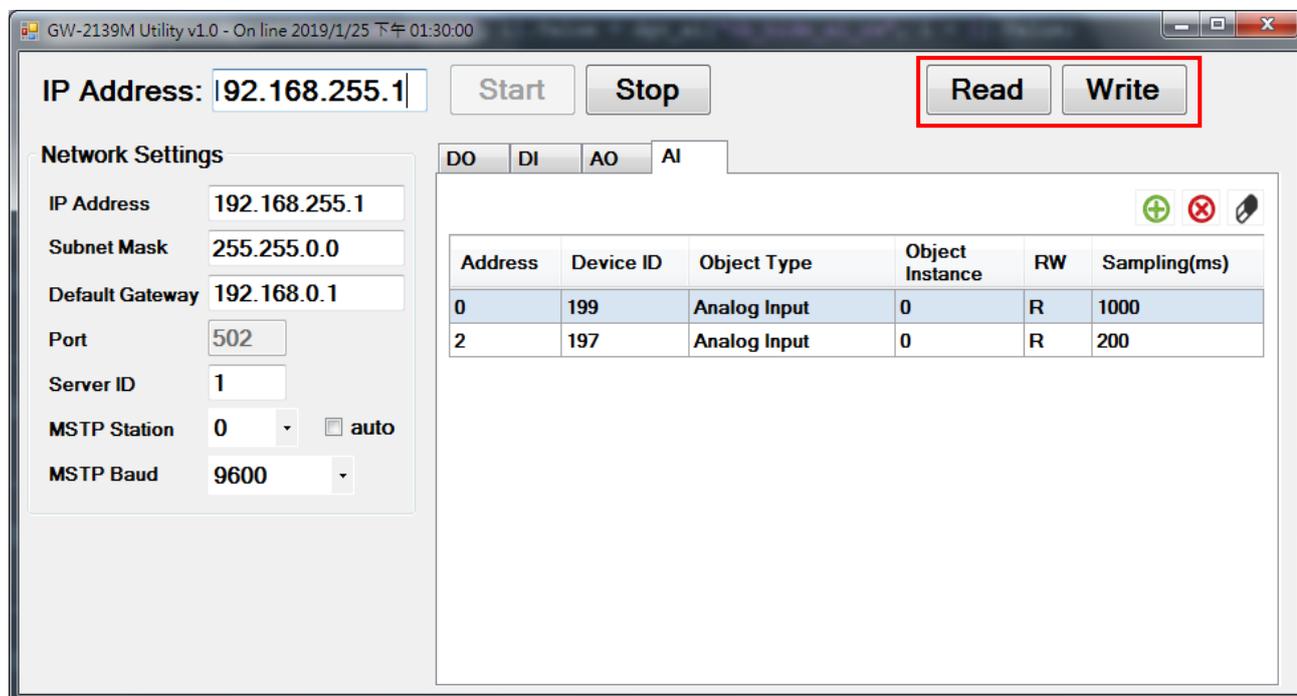
Step7 :

Delete all items from mapping table of the page.



Step8 :

Write/Read the all configuration to the module.



Step9 :

Please power off and remove GND from INIT Pin. Then power on to normal mode.

3.3 How to update the firmware

GW-2139M 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-2139M product page and store it in a computer that you want to connect to GW-2139M.

-**Update Tool:** Please refers to ->

<http://www.icpdas.com/en/download/index.php?model=GW-2139M>

2) Short the FW with GND of GW-2139M and turn on the power. When the six LEDs of GW-2139M turn blinking alternately, the GW-2139M is successfully entered the firmware updating mode.

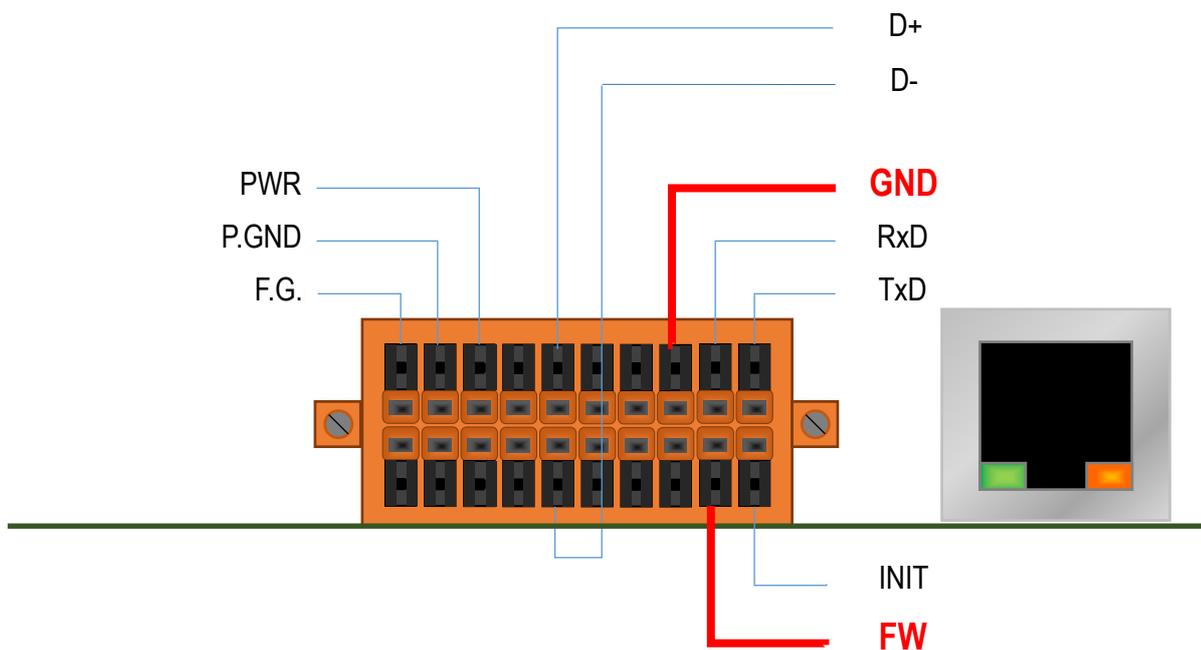


Figure 3.2 GW-2139M FW & GND Pin

3) Execute “FW_Update_Tool.exe” with the administrator privileges (👤) and follow the steps as

Figure 3.3:

In "Download Interface", select a network port for connecting to GW-2139M

In "Firmware Path", select the latest firmware update file (GW2139M_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.

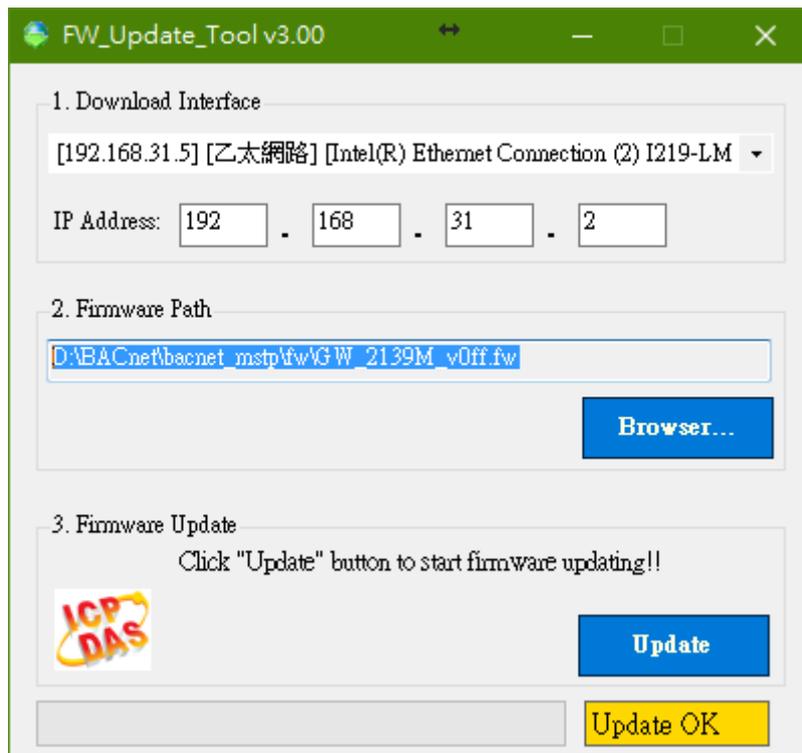


Figure 3.3 FW_Update_Tool firmware update steps