



User Manual

Version 1.0.0 Mar 2024

SMSMB for G-4510/4514 series



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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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Email: service@icpdas.com

1. Introduction

1.1 Overview

- G-4510/4514 series

The G-4510/4514 series devices are M2M low-power PAC products equipped with built-in solar/lead-acid battery chargers. They are ideal for use in hydrological monitoring, debris flow monitoring fields, or applications where power sources are inconvenient to access and solar power is needed. If combined with their GPS functionality (optional), they can also be applied in vehicle-mounted and riverboat monitoring fields

The G-4510/4514 series features a solar charger, optional GPS module, Ethernet, 3 DI, 3 DO, 8 AI, 1 Relay, 1 RS-232, and 1 RS-485. With the optional 4G module, it can be used in various fields requiring 4G, 3G, GPRS, SMS, Ethernet, or serial ports. Its built-in MiniOS7 provides the same development environment as the I-7188/I-7186 series. For users of the I-7188/I-7186 series, the G-4510/4514 series offers a familiar development environment, making it easier to use

- G-451x SMSMB Firmware

The G-451x SMSMB Firmware eliminates the need for users to go through the development process. Its main function is to send alert messages triggered by Modbus RTU commands, capable of sending fixed or dynamic messages, etc. Users only need to provide their own SIM card and equip the EC2x series communication module. They can then set trigger conditions and SMS message content through the Utility, with a maximum of 128 phone numbers and 128 sets of trigger events

- G-451x SMSMB Utility

Using the SMSMB Firmware in conjunction with the Utility provided by our company, users

can easily configure the working logic of the controller by simply clicking actions with the mouse. Additionally, Modbus command testing is available, allowing users to quickly test trigger events and send messages to confirm whether trigger events are set correctly. This simple and fast process can significantly reduce the resources users spend on system development.

1.2 Features

- Supports Modbus communication for triggering SMS alarms.
- Up to 128 sets of alarms can be customized, with each set capable of defining two types of SMS message content based on On/Off settings.
- Up to 16 phone books can be customized, with each set able to accommodate 16 phone numbers.
- Each alarm set can specify one or more phone books.
- SMS content can contain a maximum of 70 Unicode characters.
- SMS content and phone numbers can be dynamically assigned via Modbus RTU commands.



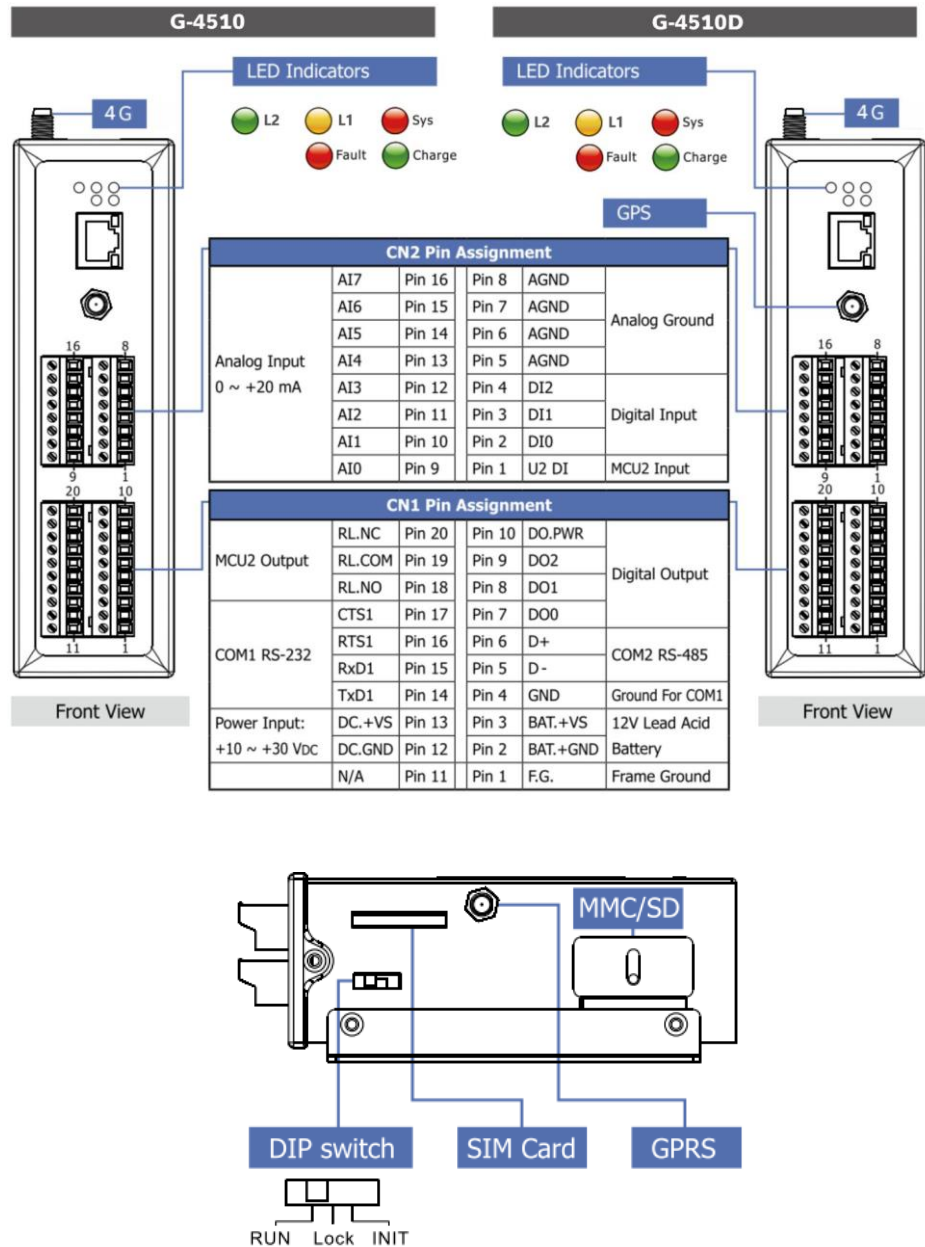
Tips & Warnings



Note: This SMSMB Firmware only supports the EC2x and LE910C4 series communication modules; others are not compatible

2. Hardware

2.1 Pin Assignments

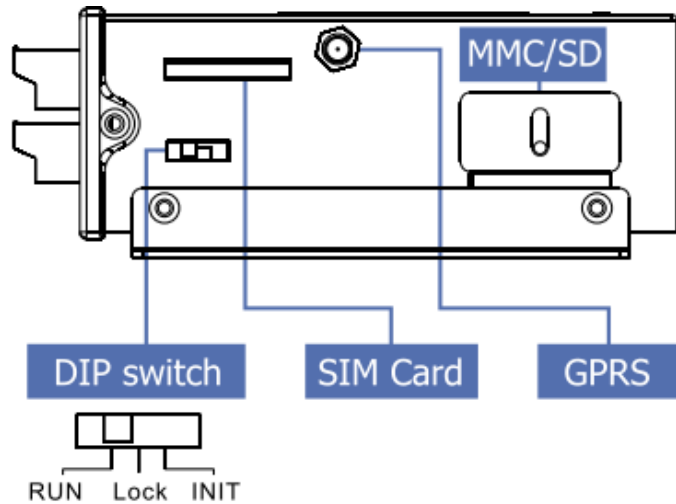


Tips & Warnings



Note: The hardware configuration of G-4510 and G-4514 is the same.

2.2 Operation Mode Switch

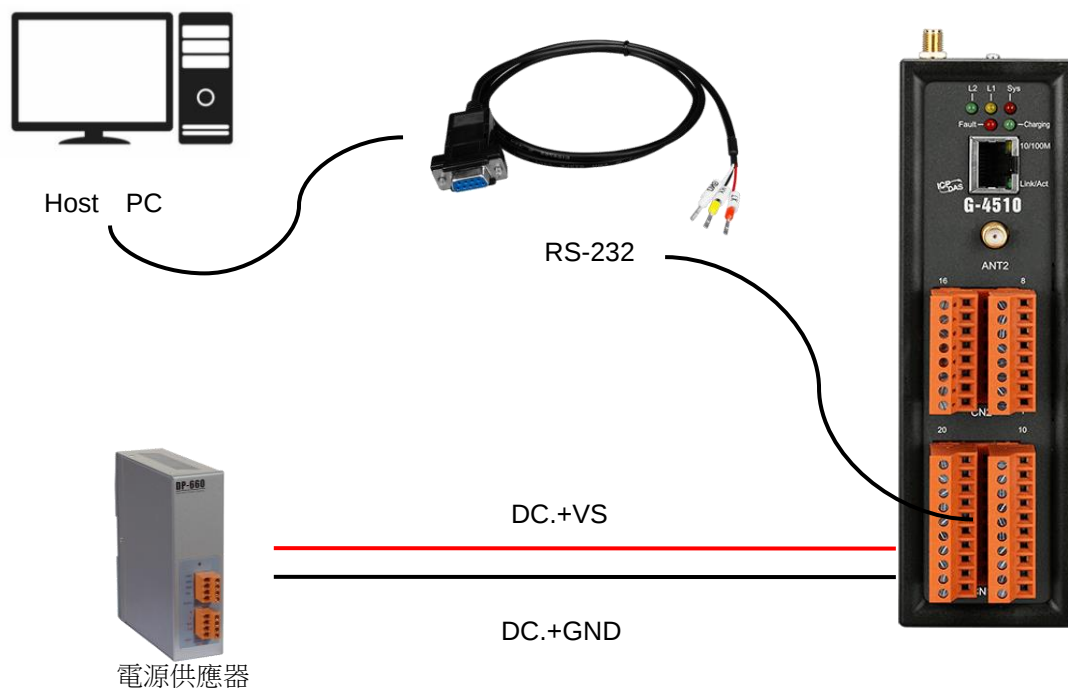


作業模式切換	
RUN	OS can execute autoexec.bat
	Flash can be read/write
Lock	OS can execute autoexec.bat
	Flash is read only (lock)
INIT	OS 不可執行 autoexec.bat
	Flash can be read/write

3. Upload SMSMB Firmware to G-4510/4514 Series

3.1 Hardware Connection

When users want to use SMS IO , they need to upload G 451 x SMS IO firmware to G 4510 /4514 series hardware. There are 2 kinds of interface s which are RS 232 and Ethernet ports to download the firmware. Use the COM Port of Host PC connects to G 4510 /4514 series . Please refer to the below picture



3.2 Upload Firmware

- Please download the firmware and burn in software MiniOS7 Utility from the official website first.

- Download the MiniOS7 Utility software

<https://www.icpdas.com/tw/download/show.php?num=4067&root=&model=&kw=MiniOS7%20Utility>

■ Download the MiniOS7 Utility user's manual

<https://www.icpdas.com/tw/download/show.php?num=4058&root=&model=&kw=MiniOS7%20Utility>

■ Download the SMSMB Firmware

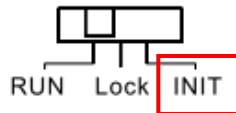
➤ G-4510 Series

<https://www.icpdas.com/tw/download/show.php?num=8005&model=G-4510>

➤ G-4514 Series

<https://www.icpdas.com/tw/download/show.php?num=6843&nation=TW&kind1=&model=&kw=4514>

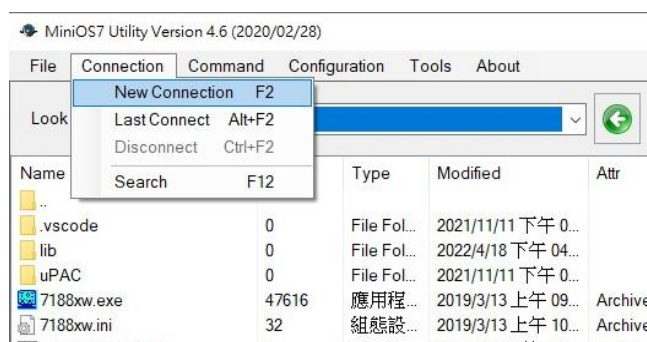
● First switch the device switch to INIT mode and restart the G 4510 /4514 device



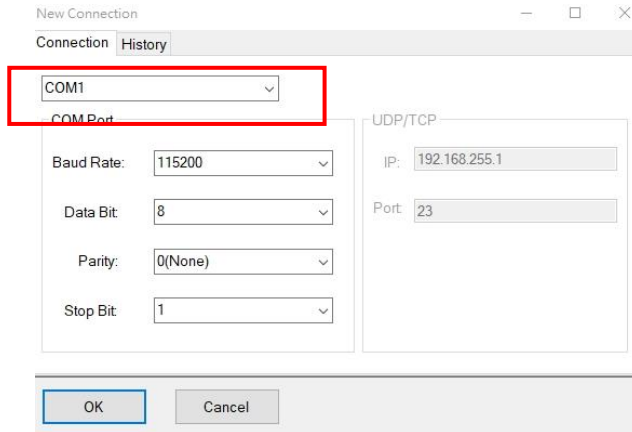
● Open MiniOS7 tool, currently there are two ways to upload firmware, RS 232 and Ethernet, please refer to the following steps for details

● Upload Firmware to G 4510/4514 Series via COM Port

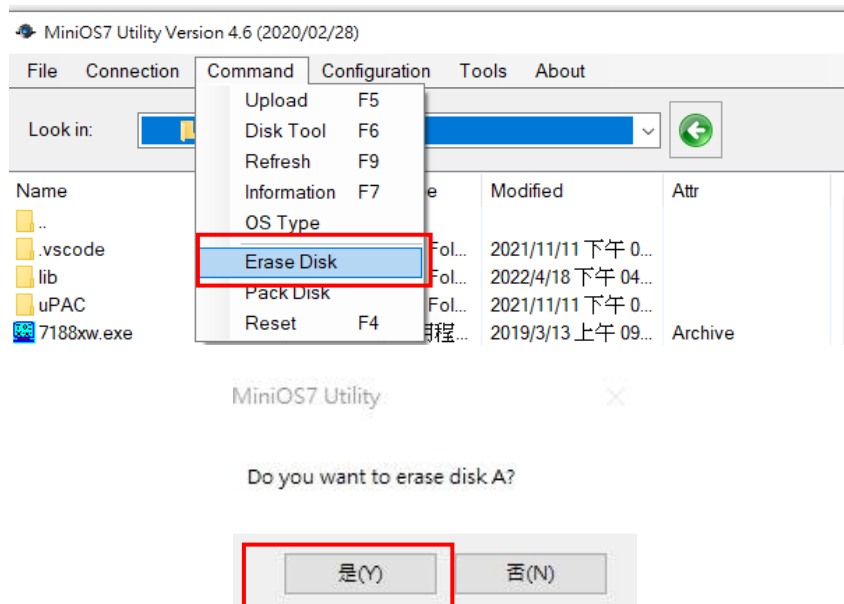
(1) Choose Menu Bar > Connection , and click “**new connection**” or click “**F2**”



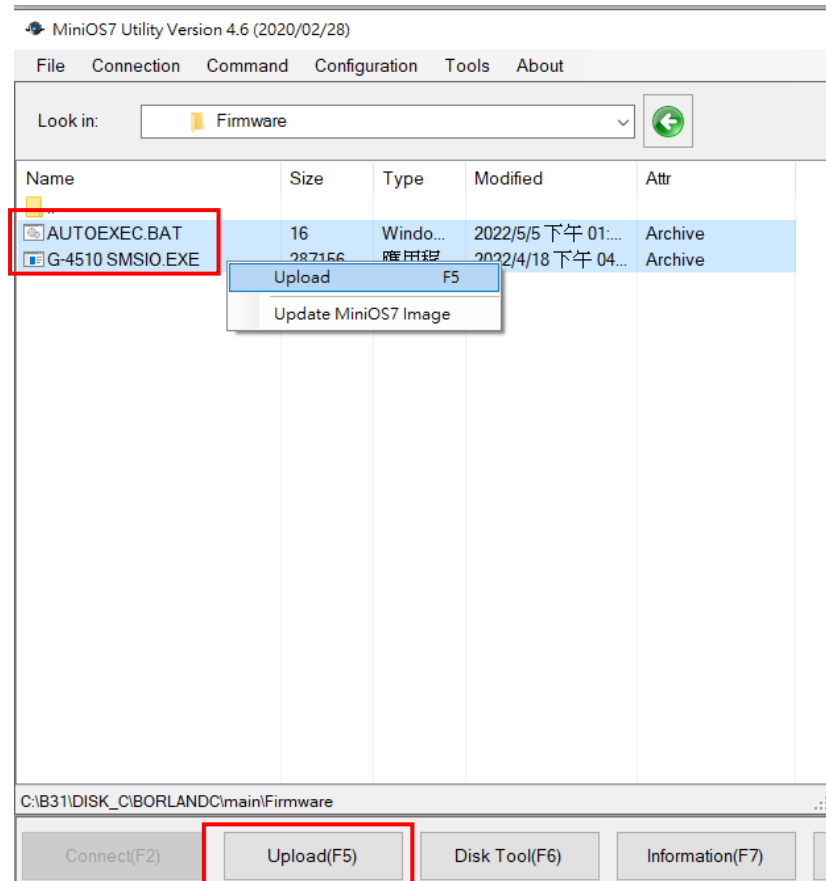
(2) Select the COM Port of RS 232



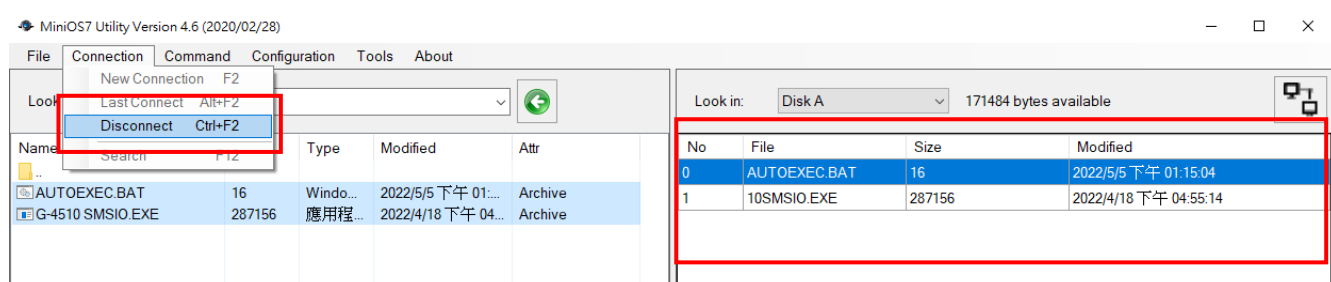
(3) Choose Menu Bar > Command, and click “Erase Disk”



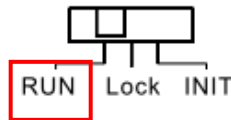
- (4) Select the files **G451x SMSMB.exe** and **autoexec.bat** to be uploaded in the left screen and click **“Upload”** or **F5** and wait for the upload to complete.



- (5) After the upload is complete, the file will appear in the right interface. After making sure it is correct, you can go to Menu Bar > Select Connection and click on **“Disconnect”** or **“Ctrl + F2”** to close the connection.

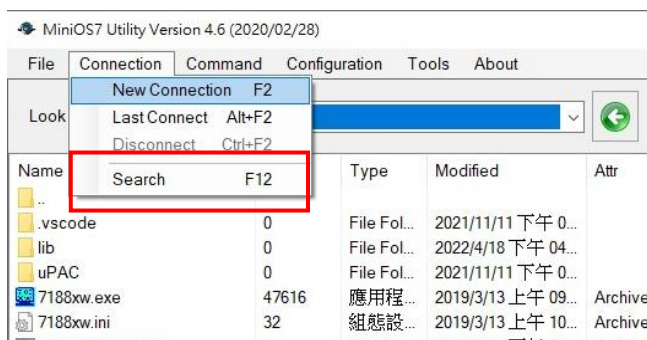


- (6) Turn off the G 4510/4514 device, switch the device to RUN mode, and restart the device, then you can login to Utility or enter the working mode directly.

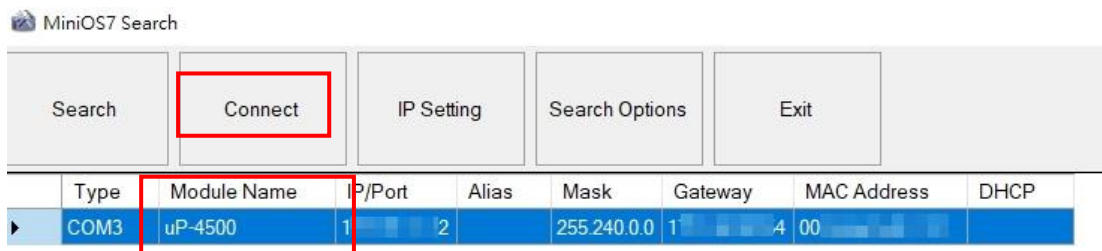


● Upload Firmware to G4510/4514 Series via Ethernet

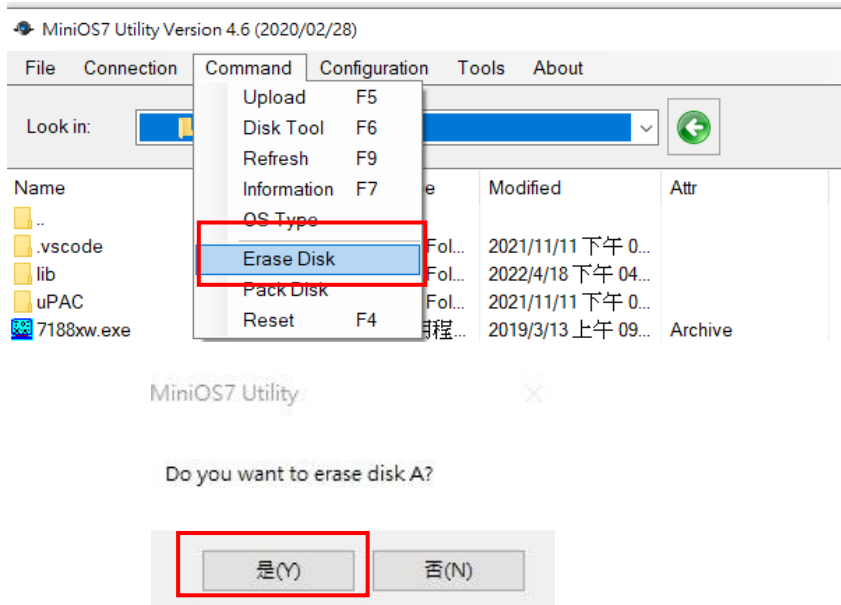
- (1) Choose Menu Bar > Connection , and click “**Search**” or “**F12**”



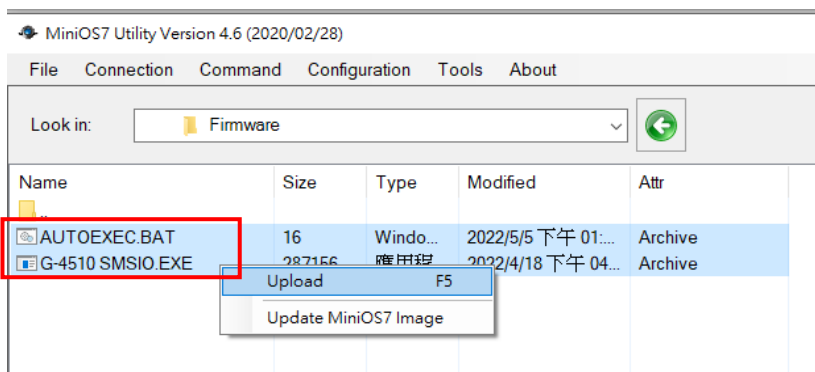
- (2) When the search is complete, find your device and double click or click “**Connect**” to connect



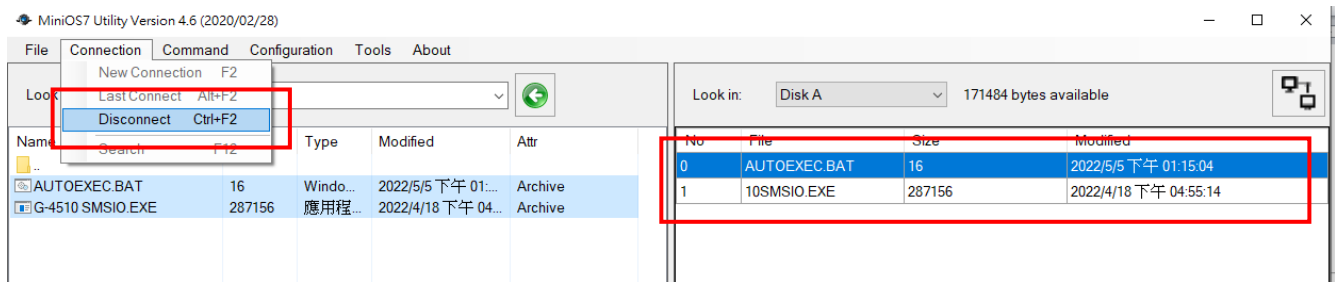
(3) Choose Menu Bar > Command, and click “**Erase Disk**”



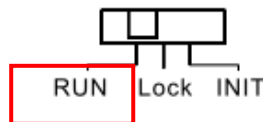
(4) Select the files **G451x SMSMB.exe** and **autoexec.bat** to be uploaded in the left screen and click “**Upload**” or “**F5**” and wait for the upload to complete.



- (5) After the upload is complete, the file will appear in the right interface. After making sure it is correct, you can go to Menu Bar > Select Connection and click on **“Disconnect”** or **“Ctrl + F2”** to close the connection.



- (6) Turn off the G 4510 /4514 device, switch the device to RUN mode, and restart the G4510/4514 device, then you can login to Utility or enter the working mode directly.



4. Installing SMSMB Utility

● Installing .NET Compact Framework

You can use Utility to set parameters or view debug messages. It requires a .NET Framework 2.0 or higher runtime environment to execute. NET Framework 2.0 or later can be installed by downloading from the following URL or by directly searching for.

◆ Microsoft .NET Framework download

<https://dotnet.microsoft.com/en-us/download/dotnet-framework>

● Utility installation steps

Download and install the G451x SMSMB Utility_setup.exe from the official website, and the installation interface is as follows.

◆ G-4510/4514 SMSMB Utility download

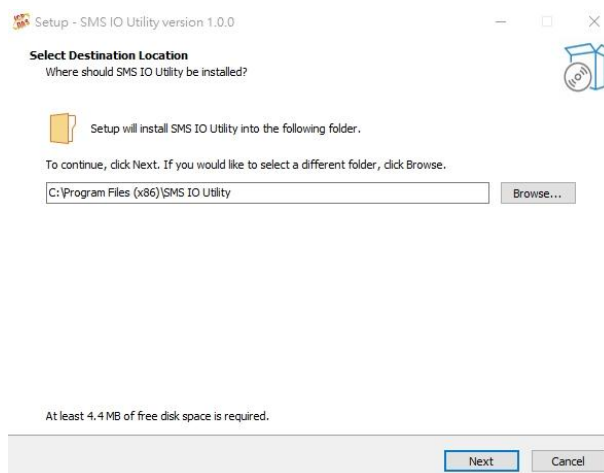
■ G-4510 series

<https://www.icpdas.com/tw/download/index.php?model=G-4510>

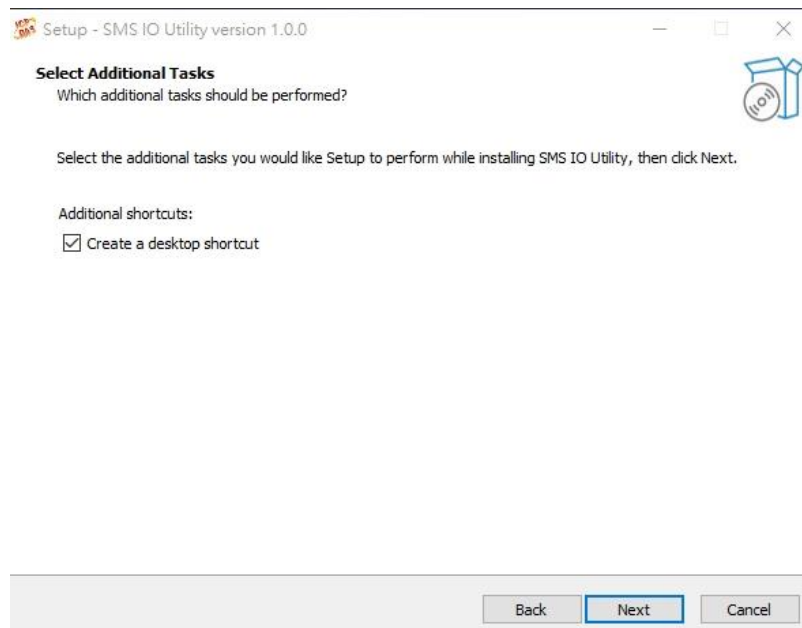
■ G-4514 series

<https://www.icpdas.com/tw/download/show.php?num=6843&nation=TW&kind1=&model=&kw=4514>

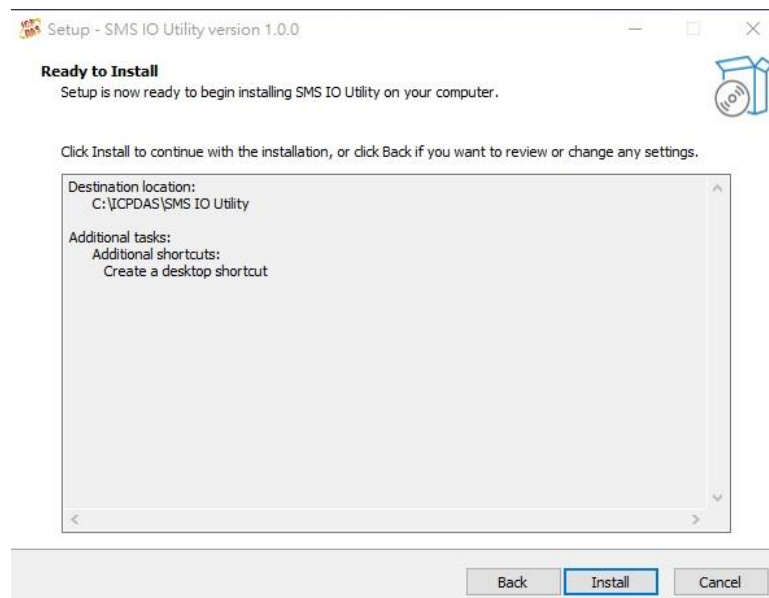
(1) Select the installation path. The default path is “**C:\Program Files(x86) SMSMB Utility**”, and click “**Next**” to continue.



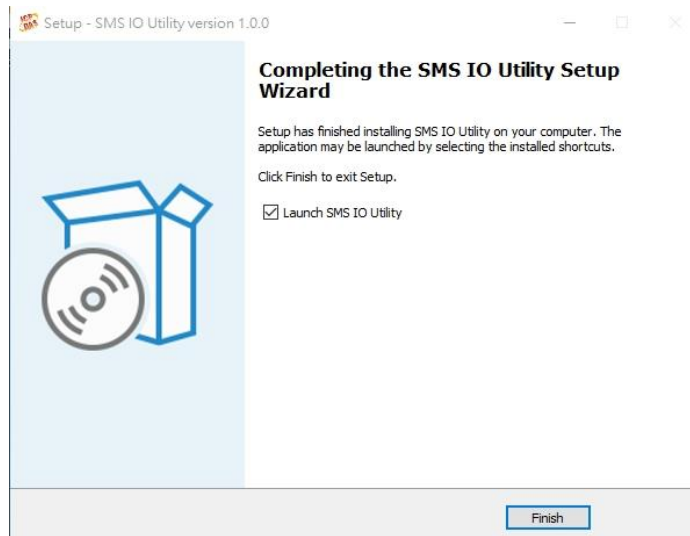
(2) Select whether to create a shortcut on the desktop, and then click “**Next**” to continue.



(3) Click “**Install**” to start the installation



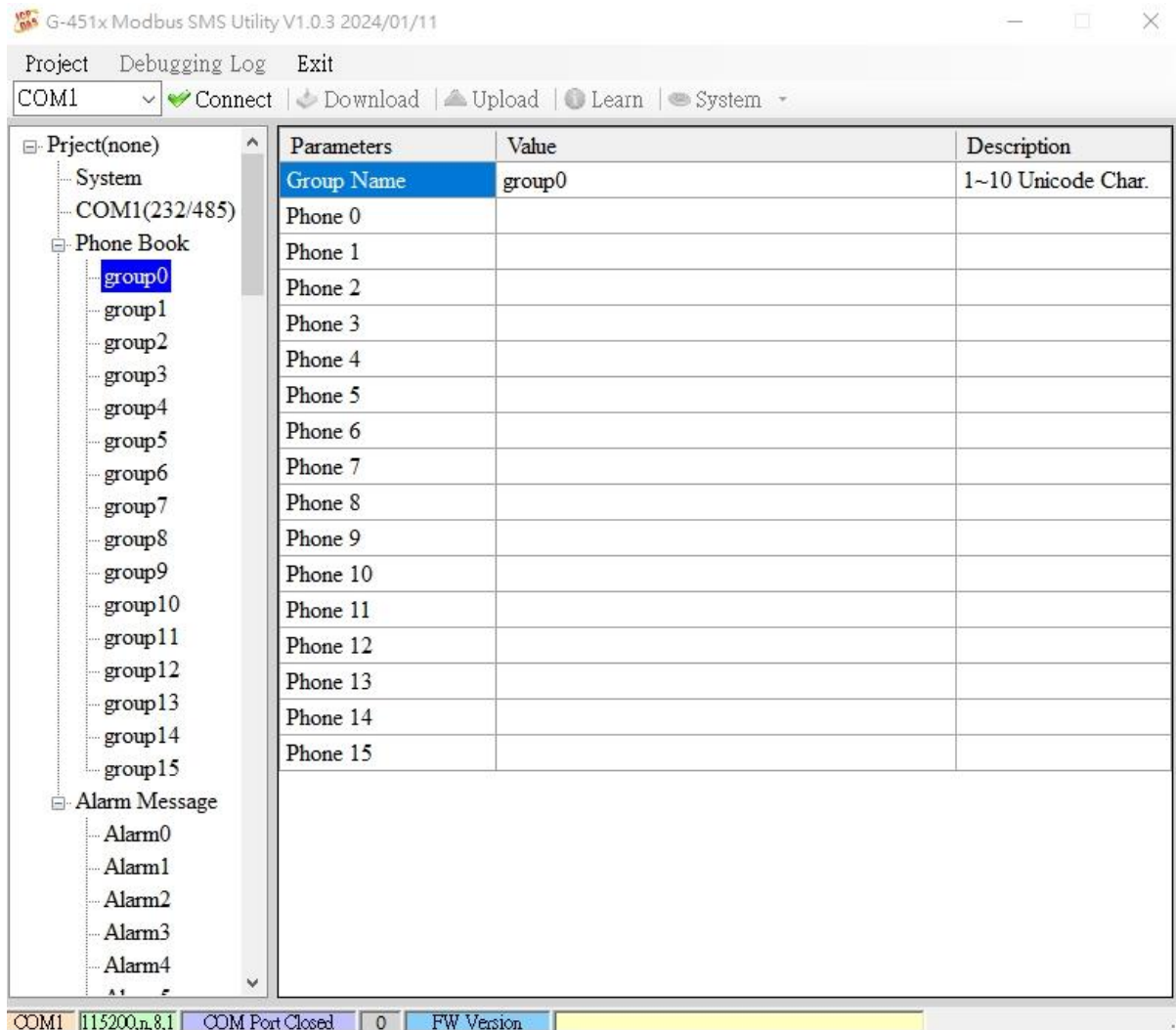
(4) The installation will be completed, as shown in the following figure.



(5) If you choose to create a desktop shortcut, as shown in the following figure.

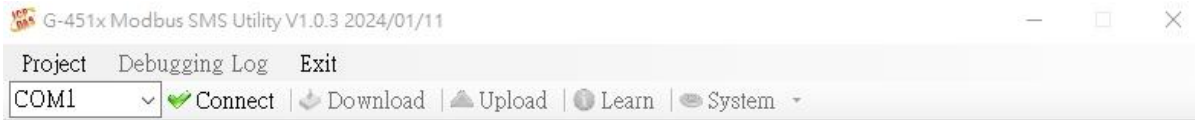


5. SMSMB Utility Introduction



The SMSMB Firmware requires this software for configuration, with the main functions as follows:

5.1 Toolbar



5.1.1 COM

Select the PC-side COM PORT connected to the device's RS232/RS485 interface.

Tips & Warnings



Note: The login Utility Comport is fixed at **115200/8/N/1**.

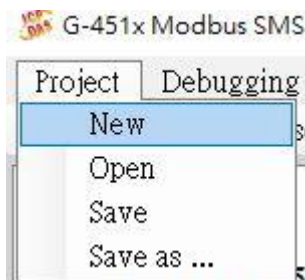
Therefore, if the RS-485 settings are modified, it may prevent access to the Utility. To access the Utility, you can switch to RS-232 login or manually issue the command “**@RS485;0**” to restore the default settings. This command will restore the default values of **115200/8/N/1** and restart the device.

5.1.2 Connect/Disconnect

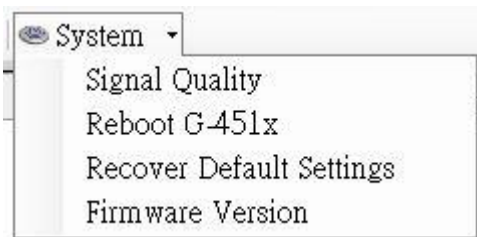
Before performing any operations on the G-4510/4514, you must first log in to the Utility. Each function will only be accessible after logging in. If the SMS machine experiences a restart or external power-off event, you will need to log in again.

5.1.3 Project

The parameters can be stored on the computer, and this operation includes: New, Open, Save, Save as..., etc."

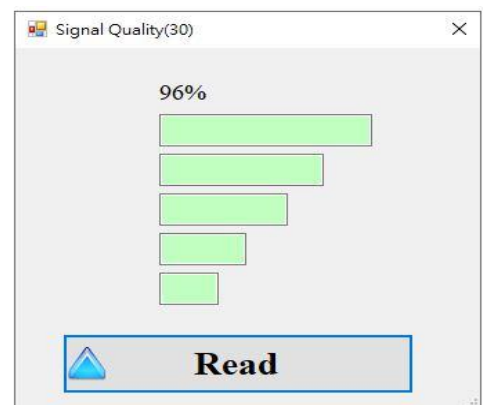


5.2 System



5.2.1 Signal Quality

Read the current SIM card signal strength from the device, which is represented in five segments, and display the current signal strength percentage.



Tips & Warnings



If the signal value is 0% or displays 'Not Registered,' please confirm whether the SIM card is inserted or reinserted and restart the device. If the signal value is below 30%, please move the device to an area with better signal reception for configuration.

5.2.2 Reboot Device

After clicking this function, the device will restart directly and automatically log out of the Utility.

5.2.3 Recover Default Settings

After clicking this function, the default factory values will be written to the device, and the Utility will automatically log out.

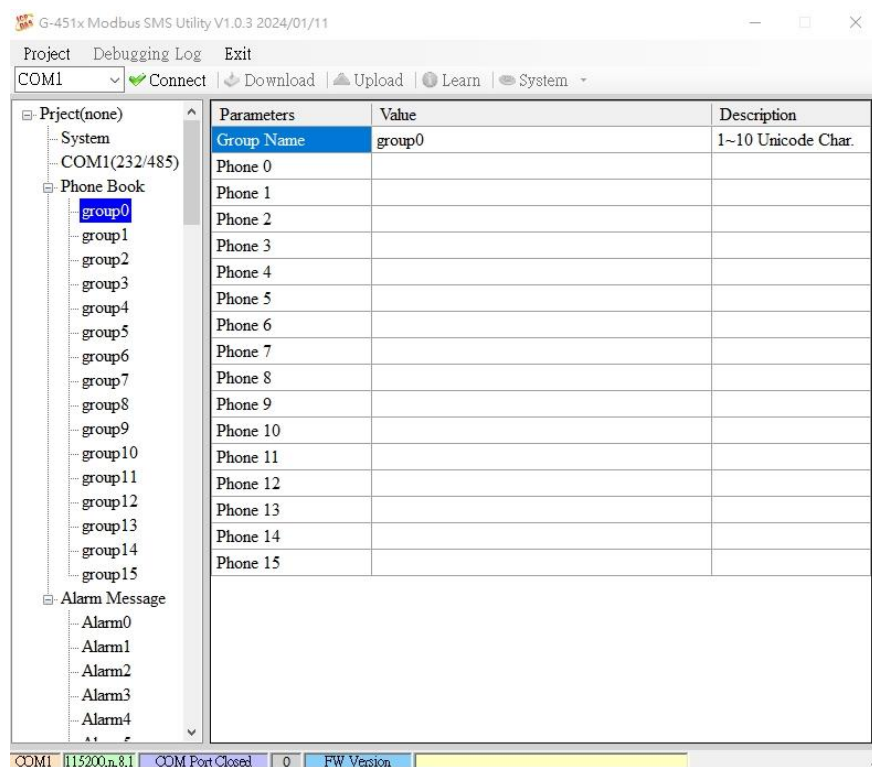
5.2.4 Version

Inquire about the version information of G-451x SMSMB Firmware and Utility.



5.3 Parameter Setting

This is the page for setting parameters. Clicking on the parameter options on the left will display the parameter contents on the right. Detailed parameter settings are explained as follows:



5.3.1 Project System Settings

Project(none) System COM1(232/485) Phone Book Alarm Message	Parameters	Value	Description
	Protocol	Modbus RTU	Read Only
	Modbus Address	1	1~247
	Variable SMS	Disable	Enable or Disable
	Alarm Mode	Level Trigger	Level or Edge Trigger
	PIN Code	0000	4 numbers
	Recieve SMS Filter	Enable	Enable or Disable

■ Protocol:

The device currently only supports Modbus RTU communication.

■ Module Address:

Allows setting the Modbus Address of the device, with a range from 1 to 247.

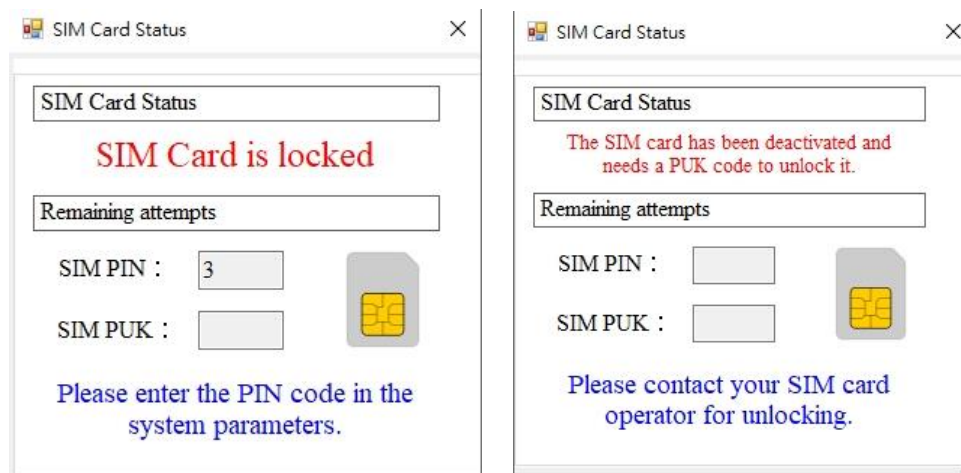
■ Variable SMS:

Variable SMS function, allowing selection of whether this function is enabled.

■ Alarm Mode:

Alarm Mode: Selectable alarm triggering mode as either Level Trigger or Edge Trigger.

■ PIN Code: Setting the password required to unlock the SIM card.



Tips & Warnings



The PIN Code is the password for the SIM card. If entered incorrectly three times in a row, it will result in the SIM card being locked. Therefore, please ensure that your PIN Code is entered correctly. If your SIM card is locked, please contact your service provider to unlock it.

■ **Receive SMS Filter:** To enable the SMS reception filtering function, when this feature is activated, the device will only receive messages sent from the phone numbers stored in the Phone Book and will ignore all others.

5.3.2 Project COM1 RS-485 Port Setting

Project(none) System COM1(232/485) Phone Book Alarm Message	Parameters	Value	Description
	Port	RS-485	Read Only
	Data Bit	8	5~8
	Stop Bit	1	1 or 2
	Parity Bit	none	none, odd, even
	Baud Rate	115200	bps

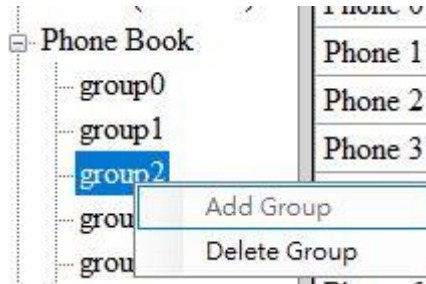
- **Port:** Indicates the ability to modify the COM Port parameters for RS-485.
- **Data Bit:** Data bits, support 5~8 bit.
- **Stop Bit:** Stop bit, support 1~2 bit.
- **Parity Bit:** Parity bit, supports none, odd, even.
- **Baud Rate:** supports 2400、4800、9600、19200、38400、57600、115200 bps.

5.3.3 Project Phone Book Settings

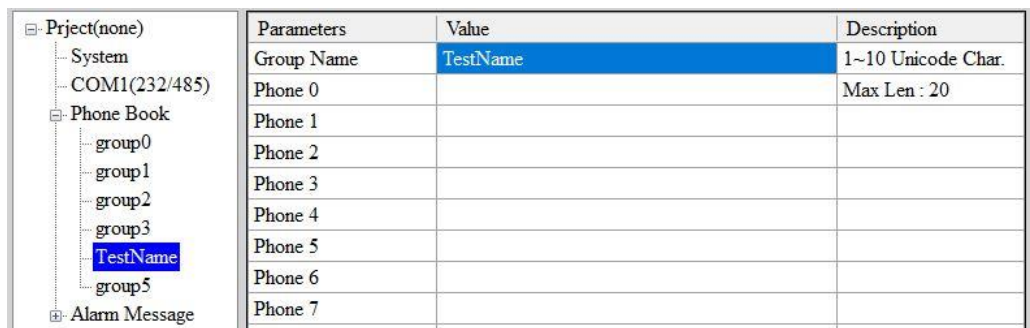
G-451x Modbus SMS Utility V1.0.3 2024/01/11			
Project COM1 Debugging Log Exit			
COM1 Connect Download Upload Learn System			
Project(none) System COM1(232/485) Phone Book group0 group1 group2 group3 group4 group5 group6 group7 group8 group9 group10 group11 group12 group13 group14 group15	Parameters	Value	Description
	Group Name	group5	1~10 Unicode Char.
	Phone 0		Max Len : 20
	Phone 1		
	Phone 2		
	Phone 3		
	Phone 4		
	Phone 5		
	Phone 6		
	Phone 7		
	Phone 8		
	Phone 9		
	Phone 10		
	Phone 11		
	Phone 12		
	Phone 13		
	Phone 14		
	Phone 15		

The Phone Book defines phone groups and the telephone numbers within categorized groups. Detailed operational instructions for its functions are as follows:

■ **Add Group/Delete Group:** Right-click on Phone Book, then click Add Group to create a new phone group. Up to 16 groups can be supported. Click Delete Group on the group to be removed to delete it, as shown in the image below:



■ **Modify Group Name:** Click on the group you want to modify and enter the name in the 'Group Name' field on the right side of the screen. It supports up to 10 characters, as shown in the image below:



■ **Add or Delete Phone Number:** Enter the phone number in the field on the right side of the group. Each group can input a maximum of 16 phone numbers, with a maximum length of 20 digits, as shown in the image below:

Parameters	Value	Description
Group Name	TestName	1~10 Unicode Char.
Phone 0	0912354567	Max Len : 20
Phone 1	0987654321	
Phone 2		
Phone 3		

5.3.4 Project Alarm Message Settings

Project(none) System COM1(232/485) Phone Book Alarm Message Alarm0 Alarm1 Alarm2 Alarm3 Alarm4 Alarm5 Alarm6 Alarm7 Alarm8 Alarm9	Parameters	Value	Description
	Alarm Channel	0	Read Only
	On Message	Channel0 ON	54 Unicode Char.
	Off Message	Channel0 OFF	54 Unicode Char.
	SMS Alarm	Enable	Enable or Disable
	Voice Alarm	Disable	Enable or Disable
	Trigger Time	0	0~9999 Secs
	All Group	☐	
	group0	☐	
	group1	☐	
	group2	☐	
	group3	☐	
	TestName	☐	
	group5	☐	

Alarm Message allows the definition of the SMS content to be sent for each alarm, as well as the target phone group. Detailed explanation is as follows:

■ **Alarm Channel:** The alarm number, Channel ranges from 0 to 127, and the name cannot be modified.

1. **Alarm Channel 0~13 group:** This is a group that can be used without inserting an SD card; other groups cannot be configured.

2. **Alarm Channel 14~127 group:** To expand the group, users can insert an SD card into the device and restart it, then they can open the group and configure it.

■ **On Message:** When the alarm status is set to On, the SMS content sent can be up to 54 characters maximum.

■ **Off Message:** When the alarm status is set to Off, the maximum length of the SMS content sent is 54 characters.

■ **SMS Alarm:** SMS will only be sent when the On/Off status is triggered after the function is enabled.

■ **Voice Alarm:** Voice alarm function is not supported on the current G-451x series, therefore this feature is not available for configuration

■ **Trigger Time:** The duration to wait before sending an SMS, only supported in Alarm Mode

Edge Trigger mode, with a range of 0 to 9999 seconds.

■ **All Group:** Select or deselect all phone groups.

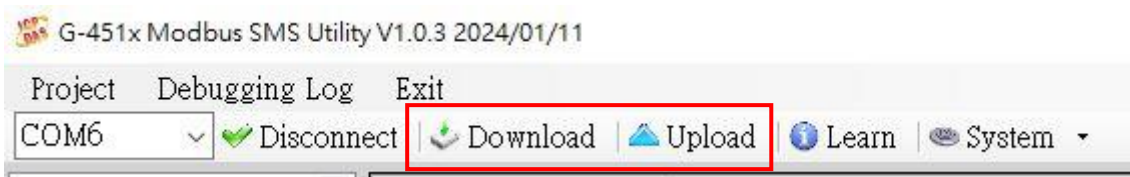
group0 ~ group15: Select the phone groups to send alarms when triggered. (Multiple selections are allowed.)

Tips & Warnings



1. Parameters for Alarm Channels 14 to 127 will be saved to the SD card. Please do not delete the config.ini file on the SD card to prevent data loss.
2. The triggering status of On/Off is determined by Modbus commands. Please refer to section [5.5 SMS alarm trigger commands](#).
3. Voice Alarm function is not supported on the G-451x series devices. For voice functionality, please refer to the [GTP-541M device](#).
4. Groups 0 to 15 will be displayed based on the Phone book settings. If no groups are added to the Phone book, no options will be generated under Alarm.
5. After setting the parameters, be sure to click "Download" to upload the parameters to the device.
6. When using Modbus command communication, be sure to log out of the Utility.

5.4 Download and Upload Parameters



■ **Download:** Transfers Utility parameters to the device. After completing parameter settings, you can use this button to download the parameters to the device.

■ **Upload:** Upload device parameters to the Utility. You can use this button to upload device parameters.

Tips & Warnings



Please avoid powering off during downloading and uploading to prevent errors.

5.5 SMS Alarm Trigger Commands

The control unit connects to the G-451x series devices via RS-485 and uses Modbus RTU commands to configure, trigger, and send SMS alarms. Please see below for details on SMS types and trigger commands.

Function Overview	
Fixed SMS Trigger	Sending fixed SMS
Variable SMS Trigger	Setting variable SMS
	Sending variable SMS
Dynamic SMS Trigger	Setting dynamic phone numbers
	Setting dynamic SMS content
	Sending dynamic SMS
Receive SMS	Checking for incoming SMS
	Reading sender's phone number
	Reading receive date
	Reading SMS content

5.5.1 Fixed SMS Trigger

Level Trigger Mode: Upon receiving a command, the device will immediately send the corresponding SMS content according to the Alarm Channel settings.

- Alarm Mode should be set to Level Trigger.
- Level Trigger activation does not involve any waiting time.

Edge Trigger Mode: Upon receiving a command, the device will send the corresponding SMS content according to the Alarm Channel settings and will wait for the specified Trigger Time before sending.

- Alarm Mode must be set to Edge Trigger.
- Edge Trigger activation will wait for the specified Trigger Time before sending, with a range of 0 to 9999 seconds.

Request (hex)

Slave Address	Function	Coil Address		Write Data		CRC-16	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	05	00	7F	FF	00	BD	E2

Send Fixed SMS	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x05 Write Single Coil
Coil Address	Alarm Channel
Write Data	0xFF00: Triggered by On, sends the content in the On Message field. 0x0000: Triggered by Off, sends the content in the Off Message field.
Example 1: Sending an On Message to Alarm 127	
Send	01 05 00 7F FF 00 BD E2
Response	01 05 00 7F FF 00 BD E2
Example 2: Send Alarm0's Off Message content SMS	
Send	01 05 00 00 00 00 CD CA
Response	01 05 00 00 00 00 CD CA

5.5.2 Variable SMS Trigger

Variable SMS allows additional content to be added after the original SMS content before sending the SMS command. This can be useful for distinguishing commands sent to different devices via SMS. For example, after configuring variable SMS content, sending a command to

trigger the Alarm Channel SMS will result in the SMS content being defined by the On/Off Message plus the configured variable SMS content.

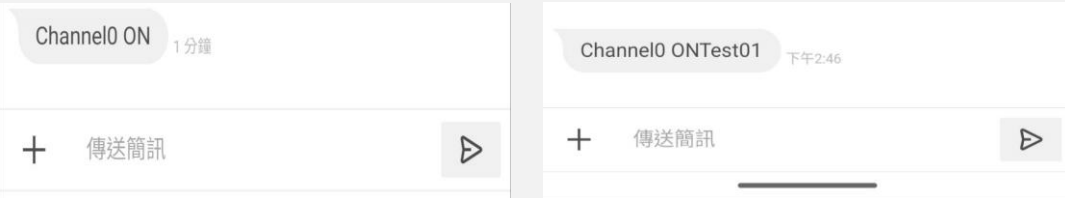
- To use this feature, Variable SMS must be set to Enable.
- It requires sending commands to configure variable content and send SMS messages.

Request(hex)

Slave Address	Function	Starting Address		Quantity of Registers		Byte Count
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	10	01	7F	00	10	20

Data (bytes * n words)						CRC-16	
1 Unicode word occupies 2 bytes						1 byte	1 byte
54	00	...	00	00	...	FD	77

Setting Variable SMS	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x10 Write Multiple Registers
Starting Address	The starting address defined for variable SMS content is a fixed value of 0x017F .
Quantity of Registers	The number of characters for variable SMS is a fixed value of 0x0010 , supporting up to 16 Unicode characters.
Byte Count	The number of bytes occupied by the SMS content is a fixed value of 0x0020 .
Data	● Users can customize SMS content, with a maximum of 16 characters, which must be in Unicode encoding ● It is necessary to use 0x0000 as the termination character. If the SMS character count is exactly 16 characters, the termination character is not required.

Example:	
Enable Variable SMS function	
Set the variable content to "Test01"	
Send an SMS with the content of the On Message for Alarm0.	
Enable Variable function	
Send	01 10 00 CB 00 01 02 00 01 77 EB
Response	01 10 00 CB 00 01 70 37
Set the variable SMS content to "Test01".	
Send	01 10 01 7F 00 10 20 54 00 65 00 73 00 74 00 30 00 31 00 C2 C3
Response	01 10 01 7F 00 10 F1 E1
Sending a variable SMS for Alarm0's On Message, you can see in the image below that the received SMS is "Channel0" + "Test01".	
Send	01 05 00 00 FF 00 8C 3A
Response	01 05 00 00 FF 00 8C 3A
 Fixed SMS Variable SMS	

5.5.3 Dynamic SMS Trigger

Dynamic SMS allows customization of target phone numbers and SMS content via Modbus RTU commands. This feature does not affect the settings of Alarm Channels. If the target phone numbers and content to be sent are not set within the Alarm Channels, users can define the content by issuing commands to set dynamic phone numbers and SMS content. SMS messages support a maximum of 70 characters.

Request(hex)

Slave Address	Function	Starting Address		Quantity of Registers		Byte Count
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	10	01	D5	00	0A	14

Data (bytes * n words)						CRC-16	
1 ASCII word occupies 1 bytes						1 byte	1 byte
30	09	...	00	00	...	46	90

Set the dynamic SMS phone number	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x10 Write Multiple Registers
Starting Address	The starting address defined for dynamic phone numbers is a fixed value of 0x01D5 .
Quantity of Registers	The number of registers occupied by dynamic phone numbers.
Byte Count	This is " Registers x 2 ," which represents the length of the phone number.
Data	● Users can customize phone numbers, with a maximum of 20 characters, which must be in ASCII encoding. ● It is necessary to use 0x00 as the termination character. If the length is exactly 20 characters, the termination character is not required.

Request(hex)

Slave Address	Function	Starting Address		Quantity of Registers		Byte Count
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	10	01	8F	00	46	8C

Data (bytes * n words)						CRC-16	
1 Unicode word occupies 2 bytes						1 byte	1 byte
54	00	...	00	00	...	9D	FF

Set the dynamic SMS content.

Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x10 Write Multiple Registers
Starting Address	The starting address defined for dynamic SMS content is a fixed value of 0x018F .
Quantity of Registers	The number of characters occupied by dynamic SMS content, with a maximum support of 70 characters.
Byte Count	This is " Registers x 2 ", which represents the number of bytes occupied by the SMS content.
Data	● Users can customize SMS content, with a maximum of 70 characters, which must be in Unicode encoding. ● It is necessary to use 0x0000 as the termination character. If the length is exactly 70 characters, the termination character is not required.

Request(hex)

Slave Address	Function	Coil Address		Write Data		CRC-16	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	05	00	80	FF	00	8D	D2

Send dynamic SMS

Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x05 Write Single Coil
Coil Address	The address for sending dynamic SMS is a fixed value of 0x0080 .
Write Data	Sending dynamic SMS has a fixed value of 0xFF00 .

Example: Set the target phone number to 0906xxxx34.

Send	01 10 01 D5 00 0A 14 30 39 30 36 38 34 35 33 33 34 00 00 00 00 00 00 00 00 00 00 46 90
Response	01 10 01 D5 00 0A 50 0A

Example: Set the SMS content to 'Test02'.

Send	01 10 01 8F 00 46 07 54 00 65 00 73 00 74 00 30 00 32 00 00 00 9D FF
Response	01 10 01 8F 00 46 71 EC

Example: Send dynamic SMS.

Send	01 05 00 80 FF 00 8D D2
Response	01 05 00 80 FF 00 8D D2



Received dynamic SMS successfully.

5.5.4 Receive SMS

Users can issue Modbus RTU commands to the device in a polling manner to inquire whether the device has received an SMS. If the device has received an SMS, it will automatically issue a command to inquire about the sender's phone number and SMS content.

Users only need to parse the content of the response. Additionally, if the user has enabled the Receive SMS Filter function, SMS sent from numbers not set in the phone book will be filtered out.

Request(hex)

Slave Address	Function	Starting Address		Quantity of inputs		CRC-16	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	02	00	01	00	01	E8	0A

Response(hex)

Slave Address	Function	Byte Count	Data (n bytes)		CRC-16	
1 byte	1 byte	1 byte	1 byte		1 byte	1 byte
01	02	01	00	...	36	38

Inquire if SMS has been received	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x02 Read Discrete Inputs
Starting Address	The fixed value for the starting position of the data query is 0x0001 .
Quantity of inputs	Bit count, fixed value of 0x0001 .
Response	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x02 Read Discrete Inputs
Byte Count	fixed value of 0x0001 .

Data	Response 0x00 → No SMS received
	Response 0x01 → SMS received

Request(hex)

Slave Address	Function	Starting Address		Quantity of inputs		CRC-16	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	04	00	2F	00	51	00	3F

Response(hex)

Slave Address	Function	Byte Count	Data (bytes * n words)		CRC-16	
1 byte	1 byte	1 byte	2 byte	1 Unicode word	1 byte	1 byte
			Word type	occupies 2 bytes		
01	04	A2	00	01	...	36 38

Read SMS content	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x04 Read Input Registers
Starting Address	The starting address for storing SMS content.
Quantity of inputs	Read the data of several registers, with a fixed value of 0x51.
Response	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x04 Read Input Registers
Byte Count	How many Bytes the data occupies
Word type	As the encoding type of the word 0x0000 , SMS content is ASCII code 0x0001 , SMS content is Unicode code
Data	SMS content

Request(hex)

Slave Address	Function	Starting Address		Quantity of inputs		CRC-16	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	04	00	1E	00	0A	10	0B

Response(hex)

Slave Address	Function	Byte Count	Data (bytes * n words)			CRC-16	
1 byte	1 byte	1 byte	1 ASCII word occupies 1 bytes			1 byte	1 byte
01	04	14	30	39	...	4E	33

Read sender's phone number	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x04 Read Input Registers
Starting Address	The starting address for storing the sender's phone number.
Quantity of inputs	Read the data of several registers, with a fixed value of 0x0A
Response	
Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x04 Read Input Registers
Byte Count	How many Bytes the data occupies
Data	The sender's phone number is in ASCII code and must end with 0x00.

Request(hex)

Slave Address	Function	Starting Address		Quantity of inputs		CRC-16	
1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte	1 byte
01	04	00	1E	00	0A	10	0B

Response(hex)

Slave Address	Function	Byte Count	Data (bytes * n words)			CRC-16	
1 byte	1 byte	1 byte	1 ASCII word occupies 1 bytes			1 byte	1 byte
01	04	14	30	39	...	4E	33

Read the received date and time

Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x04 Read Input Registers
Starting Address	The starting address for storing the date and time.
Quantity of inputs	Read the data of several registers, with a fixed value of 0x07.

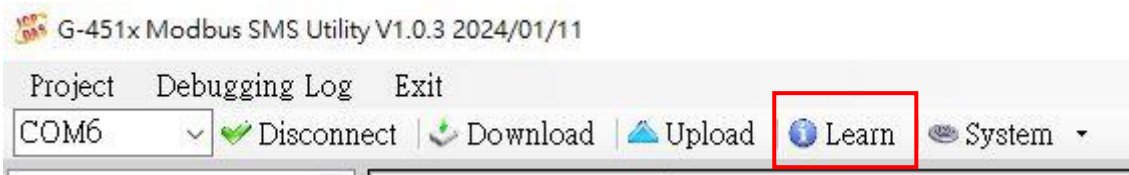
Response

Item	Description
Slave Address	Modbus Address for G-451x device, the range is 1~247.
Function	0x04 Read Input Registers
Byte Count	How many Bytes the data occupies
Data	The received date and time are formatted as yyyyMMddHHmmss and encoded in ASCII .

Example: Inquire if SMS has been received														
Send	01 02 00 01 00 01 E8 0A													
Response	01 02 01 01 60 48 Received SMS 01 02 01 00 A1 88 No SMS received													
Example: Read SMS content.														
Send	01 04 00 2F 00 51 00 3F													
Response	01 04 A2 00 01 49 00 43 00 50 00 44 00 41 00 53 00 20 00 53 00 4D 00 53 00 36 38													
Example: Read sender's phone number.														
Send	01 04 00 1E 00 0A 10 0B													
Response	01 04 14 30 39 30 37 35 32 31 35 33 31 00 00 00 00 00 00 00 00 00 00 4E 33													
Example: Read date														
Send	01 04 00 28 00 07 31 C0													
Response	01 04 0E 32 30 32 34 30 32 30 32 31 31 31 34 32 36 72 7A													
<table><tr><td>NO.</td><td>Date</td><td>Phone</td><td>Short Message</td><td>Clear</td></tr><tr><td>1</td><td>2024/02/02 16:53:...</td><td>0907521531</td><td>ICPDAS SMS</td><td></td></tr></table> Read result					NO.	Date	Phone	Short Message	Clear	1	2024/02/02 16:53:...	0907521531	ICPDAS SMS	
NO.	Date	Phone	Short Message	Clear										
1	2024/02/02 16:53:...	0907521531	ICPDAS SMS											

5.6 Learn SMS Transmission and Command Instructions

Clicking the "Learn" button will take you to the testing interface. Users can use this interface to test and learn about fixed SMS triggering, variable SMS, dynamic SMS, and SMS receiving functionalities. Additionally, users can view Modbus RTU commands through the information below.

The image shows the 'Modbus Command Learning' dialog box. It has a title bar with a close button. The dialog is divided into two tabs: 'Send SMS' and 'Receive SMS'. The 'Send SMS' tab is selected. Under 'Send SMS', there are two main sections. The first is 'Send Fixed SMS', which includes a 'Channel' dropdown menu (currently showing '0__') and a status dropdown menu (currently showing 'ON'), followed by a 'Send' button. The second is 'Send SMS dynamically', which includes a 'Phone Number' text field and a 'Send' button. Below these sections is a section titled 'Modify variable SMS and send SMS(Fixed and Variable)'. It contains a 'Variable SMS' label, two buttons 'Enable' and 'Disable', and a 'Send' button. At the bottom of the dialog, there are two tables. The left table has columns 'F. Code' and 'Request'. The right table has columns 'F. Code' and 'Reply'. There is a 'Clear' button next to the 'Reply' column header. The tables are currently empty.

● Fixed SMS

1. First, configure parameters in the Alarm Channel and set phone numbers in the Phone Book, then write the parameters to the device
2. Enter the Channel number you want to test.
3. Choose whether to send an ON or OFF SMS, and press send.

● Variable SMS

1. Set up the Channel, trigger conditions, and phone numbers for fixed SMS.
2. Enable the Variable feature.
3. Enter the content you want to include, and press send.
4. The result will be 'Channel 0' add the content you entered.

● Dynamic SMS

1. Enter the target phone number.
2. Enter the SMS content and click send.

● Receive SMS

1. Enter the scan time in seconds, and click start to begin polling.

NO.	Date	Phone	Short Message
1	2024/02/05 10...	0907521531	簡訊測試: Hello SMS

2. If an SMS is detected, the content will be automatically analyzed and displayed in the upper right corner
3. If no SMS is received, please check the Receive SMS Filter in the System settings to ensure it is turned off.

5.7 Debugging Log

Enabling this feature will record SMS sending failures and data storage failures to the SD Card, and provide users with debugging suggestions.



1. Select File :

This displays the files under the Error Log folder on the SD Card. Users can select the date file they want to view to check the error message records for that day.

2. Setting :

Check "Enable" and press "Save" to save the settings to the device and enable the error message recording function.

3. Error :

Displays error messages, such as "SMS Error: Send SMS Failed".

4. Register :

Displays the SIM card registration status at the time the error occurred.

5. Signal Quality :

Displays the signal status at the time the error occurred.

6. Suggestion :

This provides suggestions based on common issues to help users troubleshoot and debug.

7. Delete :

Allows deletion of individual date files or multiple date files.

8. Export :

Exports the selected date files (Excel file).

Tips & Warnings



1. Note: Individual or multiple date files can be deleted, but entire year or month folders cannot be deleted.
 2. After clicking Enable, you need to return to the main screen and click Download to write the settings to the device.
-

Appendix A. Revision History

This chapter provides revision history information to this document.

The table below shows the revision history.

版本	日期	作者	Description
1.0.0	2024-03-26	Patty	The First Release Revision