User Manual

Version 1.1.0 Feb 2026

GTP-541M

(4G Intelligent Multi-Function Controller)

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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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Contact us

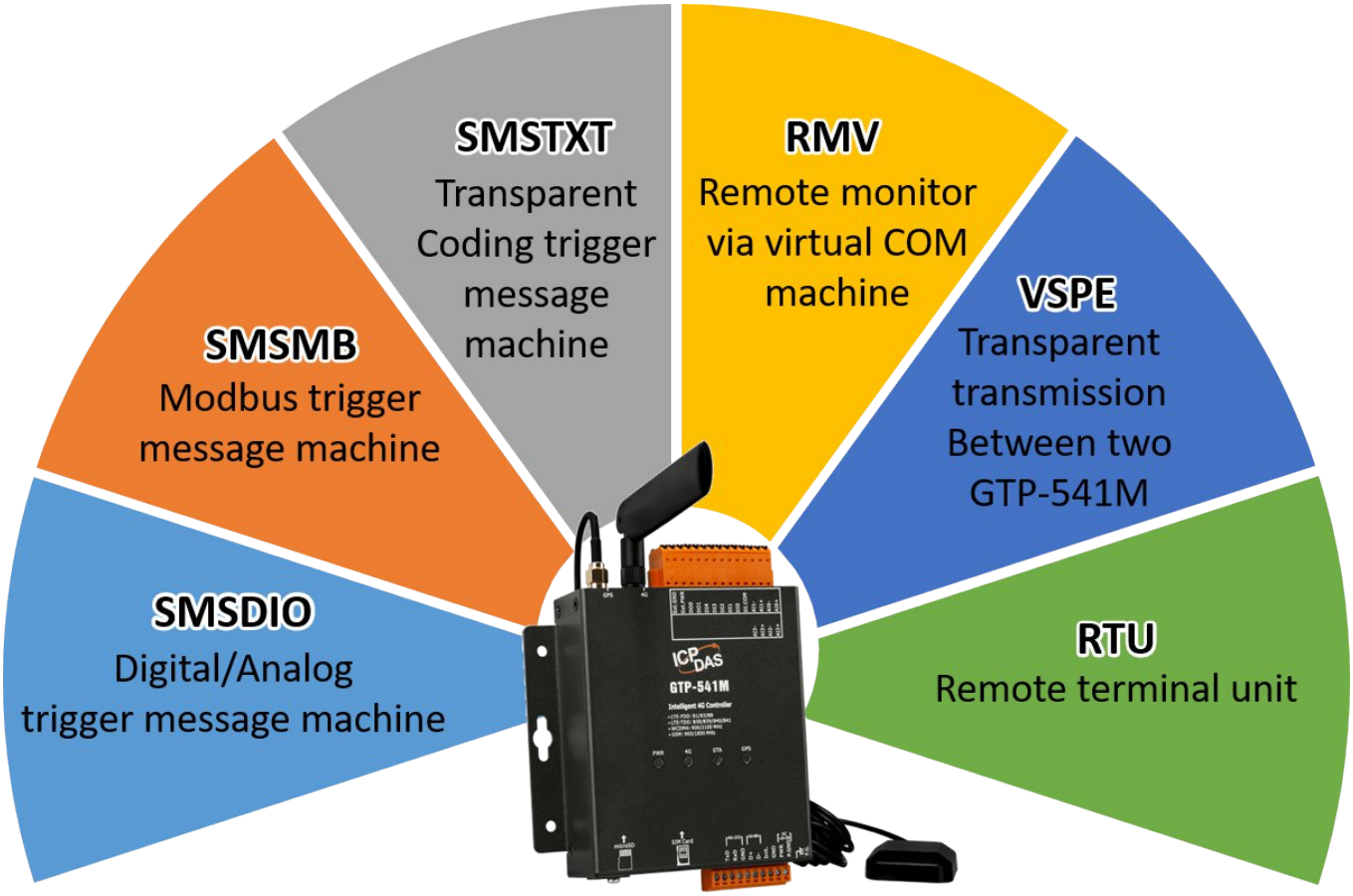
If you encounter any problems while operating this device, feel free to contact us via mail at: service@icpdas.com .

1.Introduction

The GTP-541M is an industrial smart 4G remote terminal device that is backward compatible with the 2G/3G frequency band and can be used with different software interfaces to meet user needs.

4G remote terminal equipment transmits I/O signals to the remote management platform through LTE/WCDMA/GPRS. ICP also provides related software support to facilitate customers to quickly establish monitoring programs. These softwares include VxServer. Virtual COM software such as VxComm.

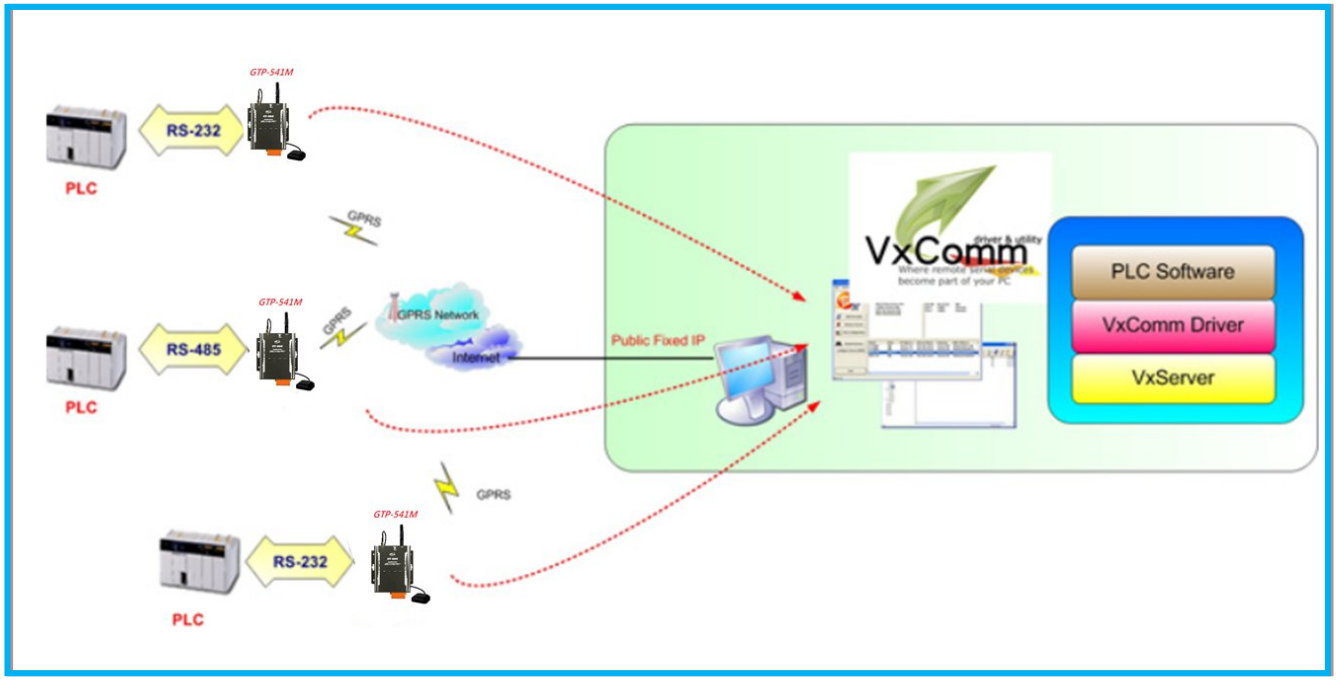
In addition, users can switch GTP-541M different functions such as ModBusSMS, DIOSMS and RMV through SD card replacement firmware to meet different application requirements. The powerful features of the GTP-541M reduce user development costs and time, making it ideal for IoT applications.



Virtual software - VxServer
VxServer is virtual com mediation software. VxServer with VxComm Driver can establish virtual COM port(s) and can be mapped to the physical sequence on GTP-541M /M2M-710D/M2M-711D via Ethernet, GPRS, 4G, Wi-Fi and other networks.
Detailed description and software download: http://m2m.icpdas.com/VxServer_TC.html

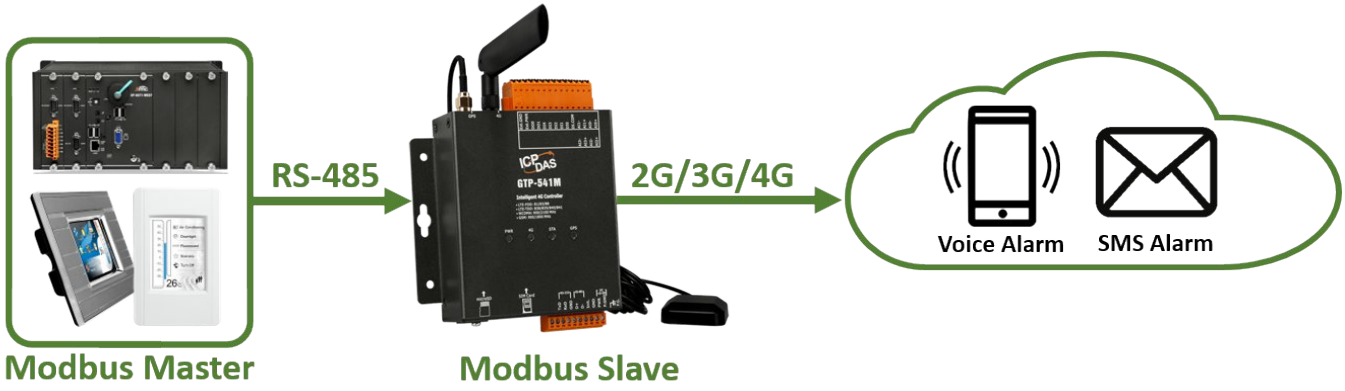
Virtual software - VxComm
The VxComm Driver creates a virtual COM port(s) and maps to the entity sequence on the

7188E/8000E/PDS via Ethernet. The user's RS-232 client program only needs to be connected to the virtual COM port to access the serial device on the Internet or Ethernet via PDS/DS/TDS/7188E/8000E.
Detailed description and software download: http://www.icpdas.com/vxcomm_tc.html



1.1 Features

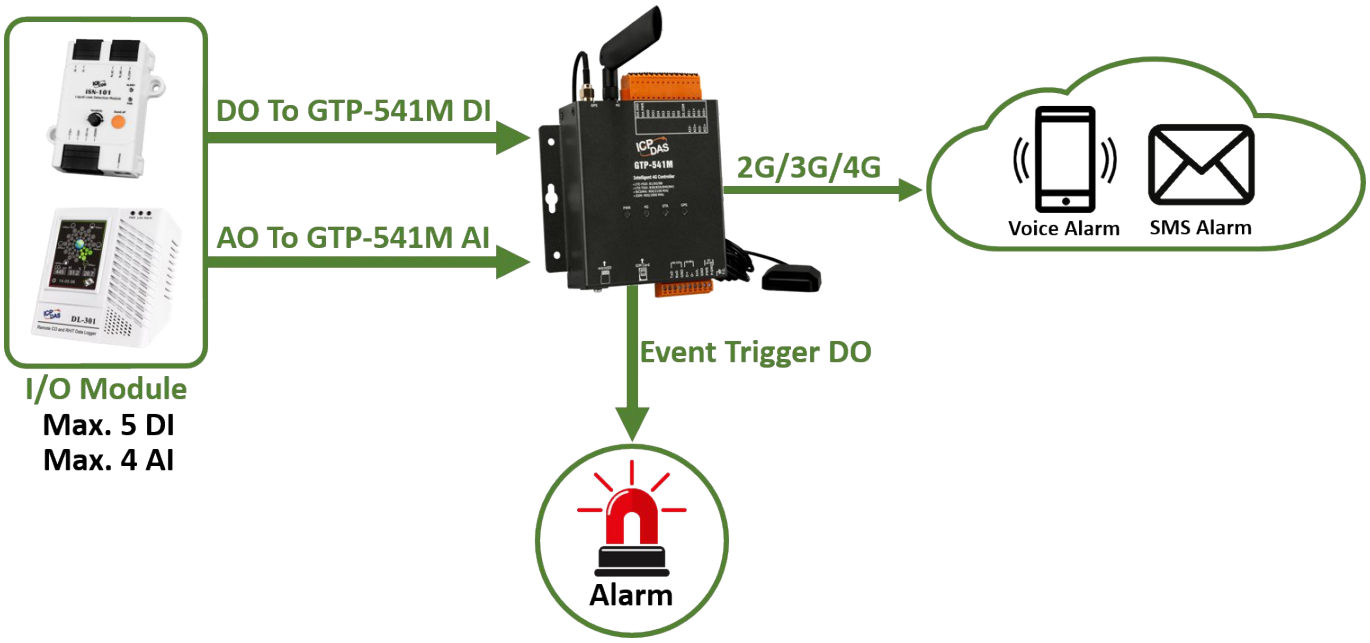
■ Modbus SMS Function (SMSMB Firmware)



- Support Modbus slave communication to trigger SMS, voice alarm or built-in DO.
- 127 groups of alarm can be customized, each group can be set according to ON/OFF

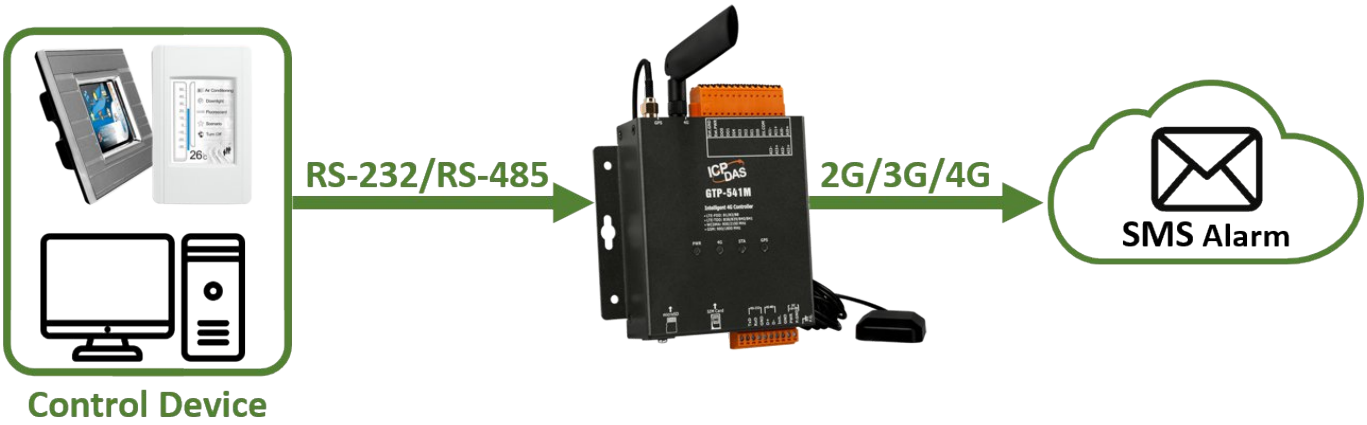
  2 kinds of SMS content and voice.
- 16 groups of phone books can be customized, each group can set 16 phone numbers.
- Each group of alarm can specify more than one phone book.
- The SMS content is up to 70 Unicode characters.
- The SMS content and the phone number can be dynamically specified through Modbus RTU commands.

■ IO SMS Function (SMSDIO Firmware)



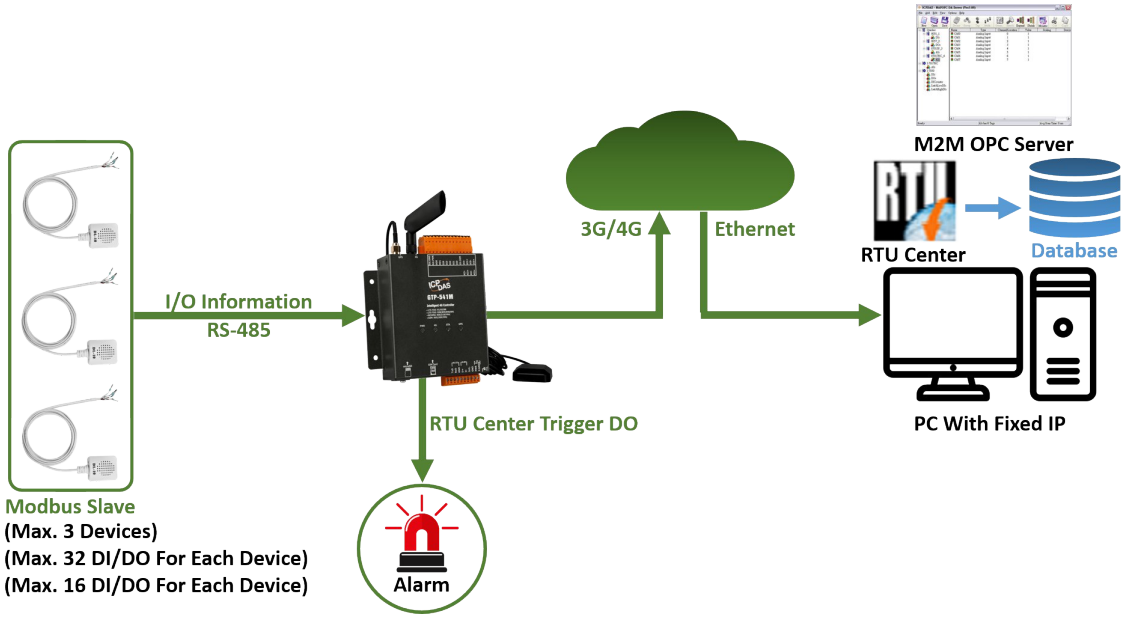
- 9 trigger conditions through the build-in AI/DI to trigger SMS or voice alarm.
- Each trigger condition can set 10 phone numbers.
- Trigger conditions through the build-in AI can be set for range detection.
- Trigger conditions through the build-in DI can be set to Normal Close, Normal Open or Counter.
- Report DI, AI and Counter values regularly.
- The SMS content is up to 70 Unicode characters of 160 ASCII characters.
- Send SMS through mobile phone to inquire about I/O status or set DO

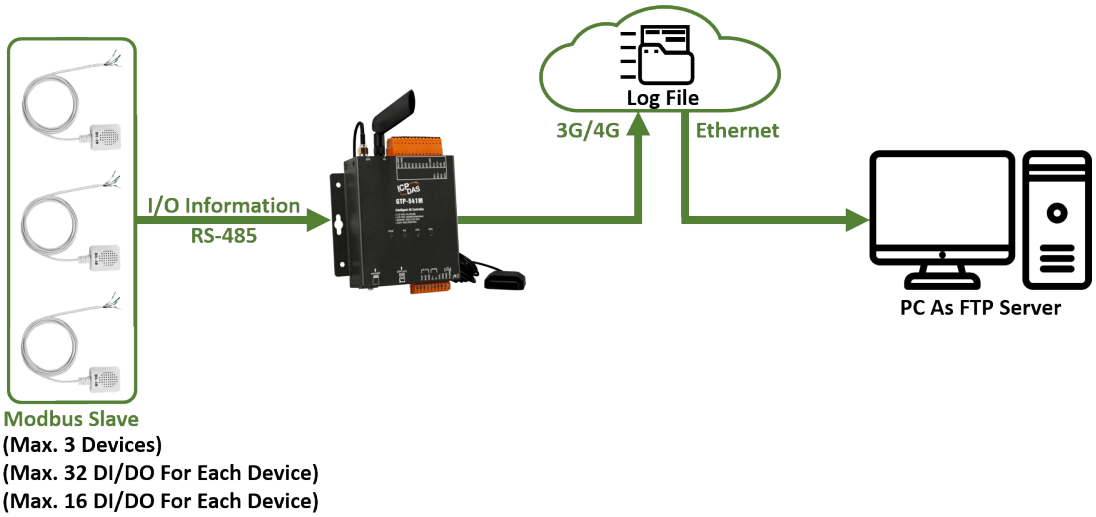
■ Text SMS Function (SMSTXT Firmware)

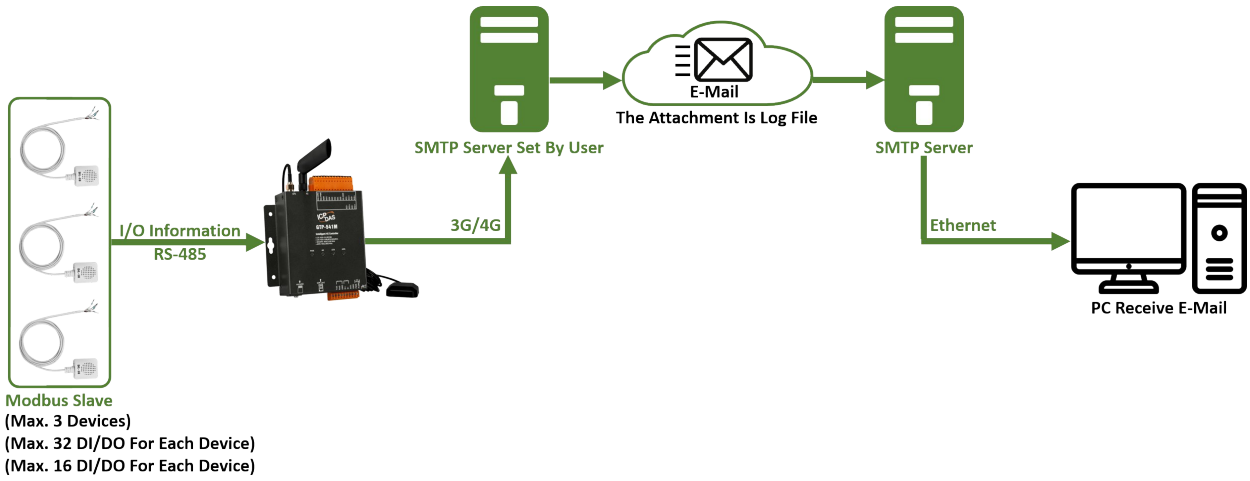


- Support ASCII command communication to trigger SMS or voice alarm.
- 127 groups of alarm can be customized, each group can be set 2 kinds of SMS content and voice.
- 16 groups of phone books can be customized, each group can be set 16 phone numbers.
- Each alarm can specify more than one phone book.
- The SMS content is up to 70 Unicode characters of 140 ASCII characters.
- The SMS content and the phone number can be dynamically specified through ASCII commands

■ Remote Terminal Unit Function (RTU Firmware)







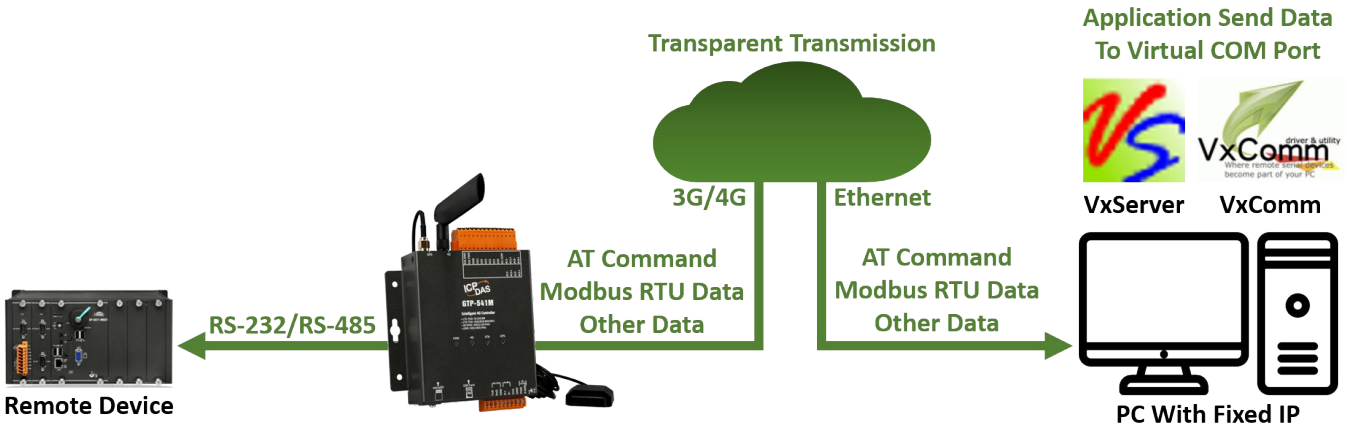
◆ Support Modbus slave communication, up to 3 Modbus devices can be

connected.

- Up to 32x DI, 32x DO, 16x AI and 16x AO status can be inquired for each Modbus device.
- Provide RTU, E-Mail and FTP mode (choose one to use)
  - RTU Mode
    - Report I/O status of Modbus device, I/O status of GTP-541M and GPS data to M2M RTU Center software on PC regularly.
    - Data received by M2M RTU Center can be saved to MS SQL, MySQL or MariaDB database.
    - Application on PC can set build-in DO through M2M RTU Center.
  - E-Mail & FTP Mode
    - Periodically log Modbus device I/O status, built-in I/O status, and GPS data
    - Log files are uploaded via E-Mail attachment or FTP

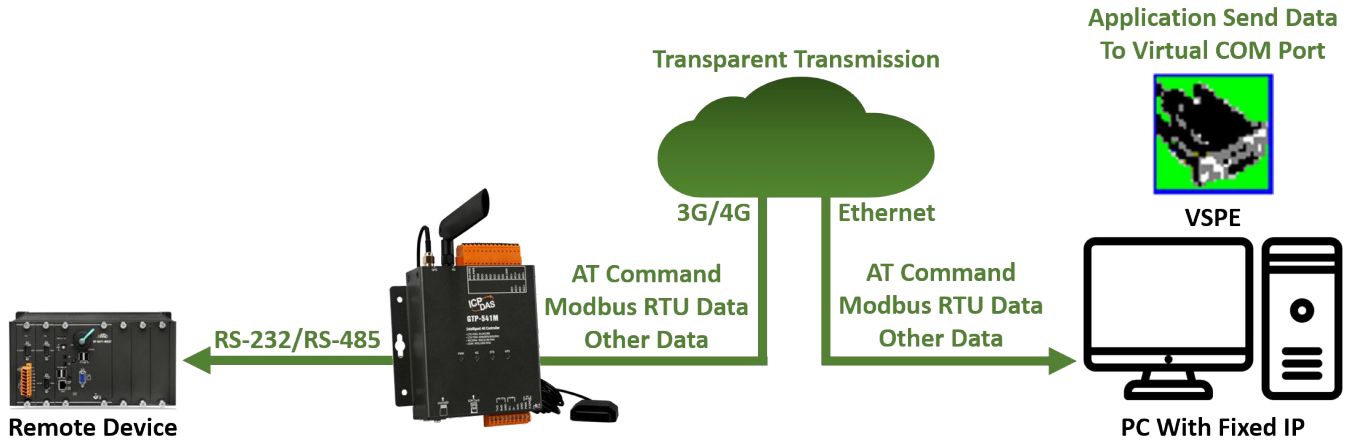
■ Remote Maintain Function

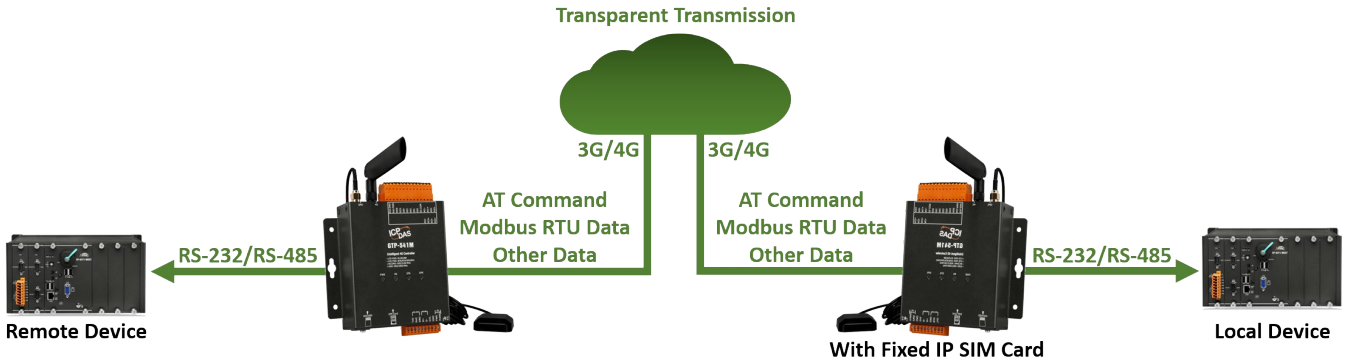
◆ RMV Firmware



- Mapping RS-232/485 of GTP-541M to virtual COM port on PC
- Transparent transmission between physical COM port (GTP-541M) and virtual COM port (PC).
- PC need to provide a fixed IP address.
- PC need to install VxServer and VxComm software.
- VxServer and VxComm software support Windows XP/7/10, 32-bit, 64-bit operating system.

◆ VSPE Firmware





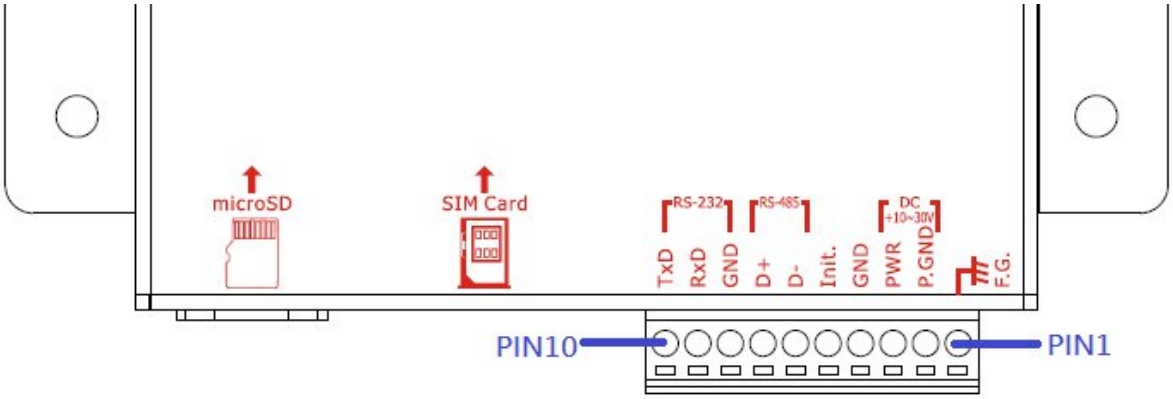
- Mapping RS-232/485 of GTP-541M to virtual COM port on PC
- Transparent transmission between physical COM port (GTP-541M) and virtual COM port (PC).
- PC need to provide a fixed IP address.
- PC need to install VSPE (Virtual Serial Port Emulator) software.
- VxServer and VxComm software support Windows and Linux operating system.
- Support pair connection of 2 GTP-541M.

Specification

Module	GTP-541M
System	
CPU	ARM Cortex™ A5 processor
4G System	
LTE-FDD Band	B1/B3/B8
LTE-TDD Band	B38/B39/B40/B41
3G System	
Frequency Band	900/2100 MHz
Power Class	Class 3(250mW @ WCDMA/HSPA)
2G System	
Frequency Band	900/1800 MHz
Power Class	Class 4 (2 W @ 900 MHz)
	Class 1 (1 W @ 1800 MHz)
Serial Ports	
Utility Port(COM 1)	RS-232:TxD, RxD, GND
COM 1	RS-485: D+, D-
Baud Rate	9600、19200、38400、57600 and 115200 bps
Power	
Protection	Power reverse polarity protection
Frame Ground Protection	ESD, Surge, EFT, Hi-Pot
Required Supply Voltage	+10 VDC ~ +30 VDC
Mechanical	
Casing	Metal
Dimensions(W x L x H)	125 mm x 113 mm x 33 mm
Environment	
Operating Temperature	-25 ℃ ~ +75 ℃
Storage Temperature	-30 ℃ ~ +80 ℃
Relative Humidity	5 ~ 95% RH, non-condensing

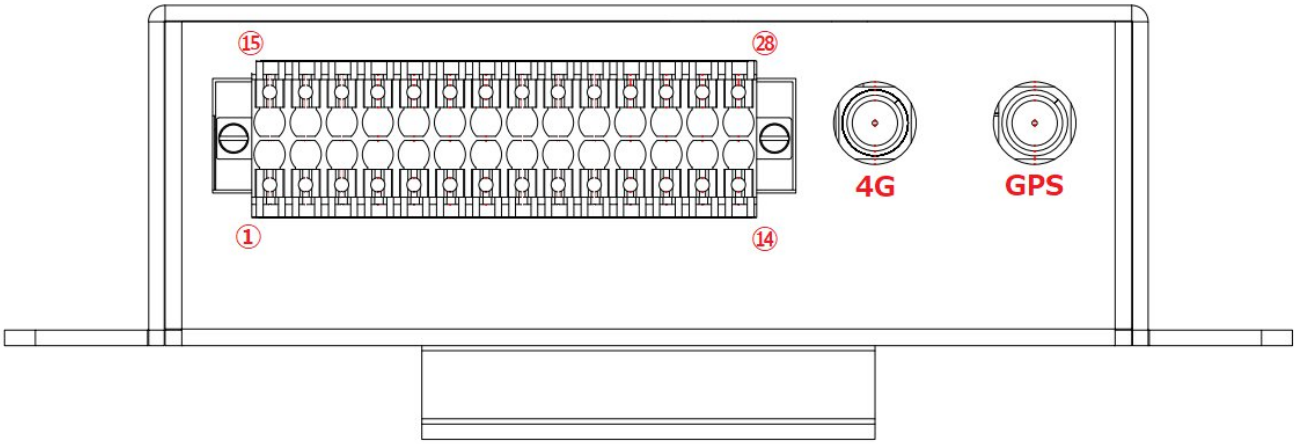
2.Hardware appearance

■ **Appearance and foot configuration (lower side)**



COM Port and Power Input		
Pin		**Description**
Frame Ground	**1**	F.G
Power Input： +10VDC ~ +30VDC	**2**	P.GND
	3	PWR
Init.	**4**	GND
	5	Init.
COM 1 RS-485	**6**	D-
	7	D+
COM 1 Utility Port RS-232	**8**	GND
	9	RxD
	10	TxD

■ Appearance and foot configuration (upper side)



DI/DO Port					
Pin		**Description**	**Pin**		**Description**
AI	**1**	AI0 +	**AI**	**15**	AI2 +
	2	AI0 GND		**16**	AI2 GND
	3	AI1 +		**17**	AI3 +
	4	AI1 GND		**18**	AI3 GND
DI	**5**	DI.COM	**Extended Option**	**19**	
	6	DI0		**20**	
	7	DI1		**21**	
	8	DI2		**22**	
	9	DI3		**23**	
	10	DI4		**24**	
DO	**11**	DO1		**25**	
	12	DO0		**26**	
DI/DO Power	**13**	Ext.PWR		**27**	
	14	Ext.GND		**28**	

2.1 LED indicator

The GTP-541M provides four LED indicators. The table below will indicate the status indication of the LED light.

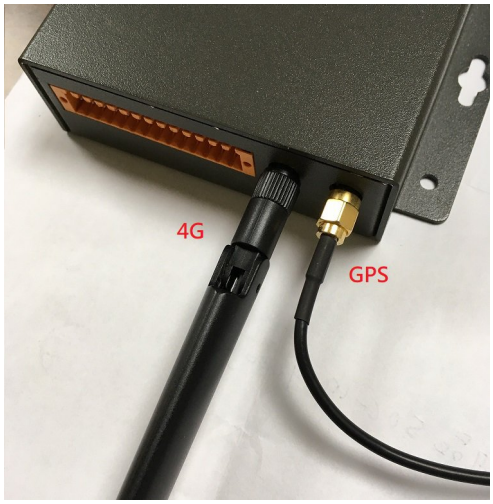
LED Name	LED Status		LED Description
PWR (Red)	ON		The power of the module is ON
	OFF		The power of the module is OFF
4G (Green)	2G / 3G	4G	Network Status
	Always ON	200ms ON, 200ms OFF	Network Searching
	800ms ON, 800ms OFF	Always OFF	Network Registered
	200ms ON, 200ms OFF	Always OFF	Data Transmitting
STA (Orange)	Flashes every 0.9 seconds		Completed registration with the base station
	Flashes every 0.5 seconds		Network function registration is completed
	Flashes every 0.2 seconds		Communicating with the remote device
	Flashes every 3 seconds		System alive
GPS(Green)	Flash once per second		GPS successfully positioned
	Hengliang		GPS is not yet positioned

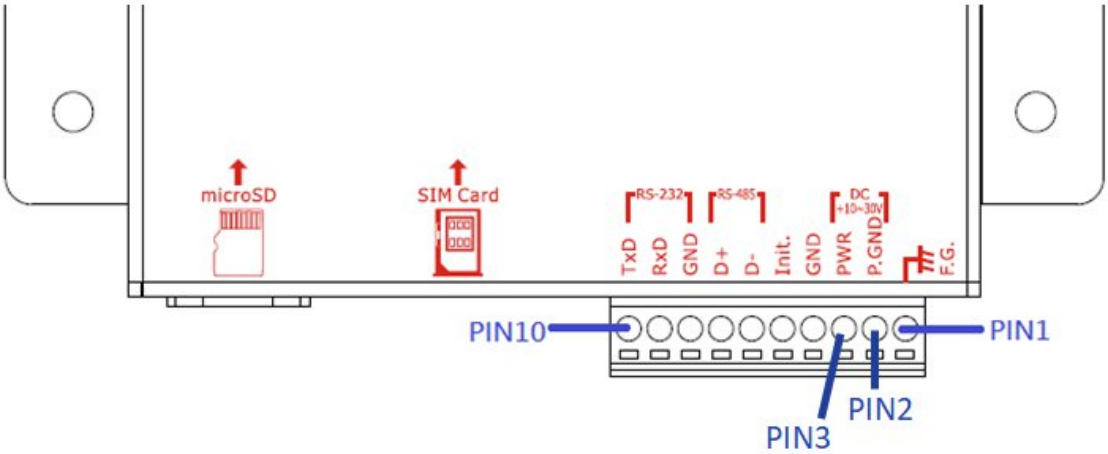
2.2 Installing the antenna and SIM card

(1) Install 4G antenna and GPS antenna

(2) Insert a confirmed SIM card (test with your phone first)

(3) Connect DC.+VS (PIN3) and DC.GND (PIN2) to the power supply



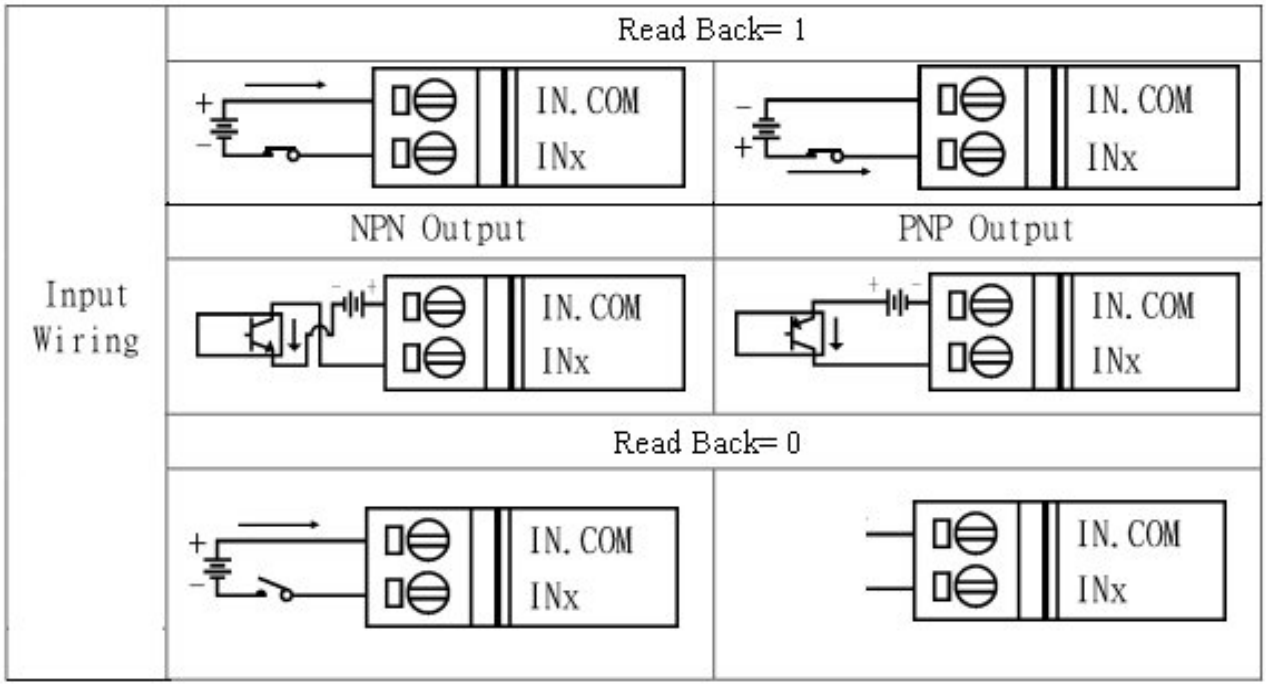


Tips & Warnings

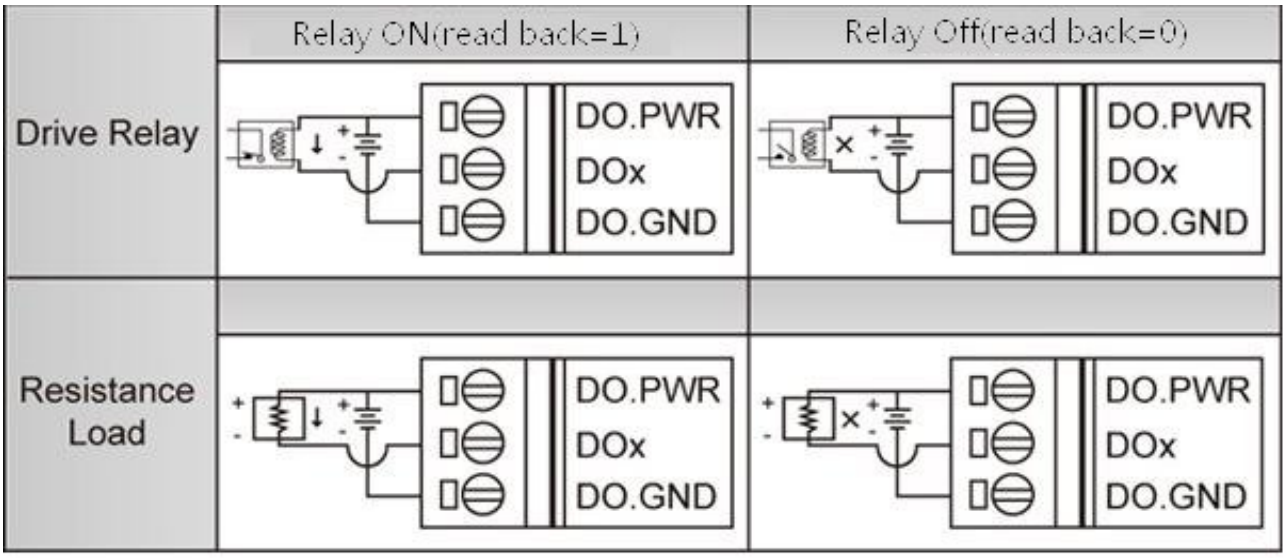
The product case may be hot and do not touch until the case has cooled, otherwise it may be burnt.

2.3 DI/DO wiring method

2.3.1 DI Wiring Instructions



2.3.2 DO wiring instructions



3.Environment settings before installing GTP-541M Utility

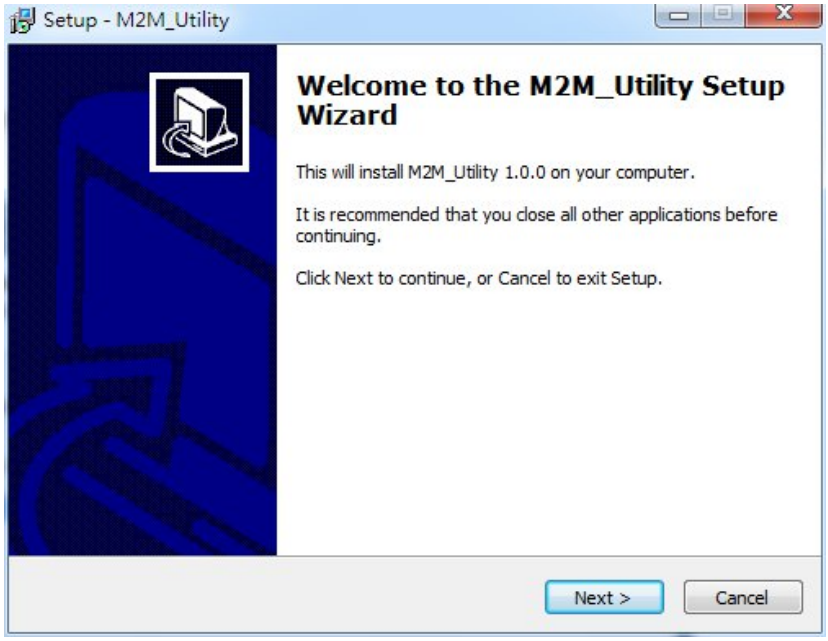
Users can use the GTP-541M Utility to set parameters or view debug messages. This program requires a .NET Framework 2.0 or higher runtime environment to be executed on the PC. You can download .NET Framework 2.0 and .NET Framework 3.5 from the following URL.

- Microsoft .NET Framework 2.0
  https：//www.microsoft.com/en-us/download/details.aspx?id=1639
- Microsoft .NET Framework 3.5
  https：//www.microsoft.com/en-us/download/details.aspx?id=21

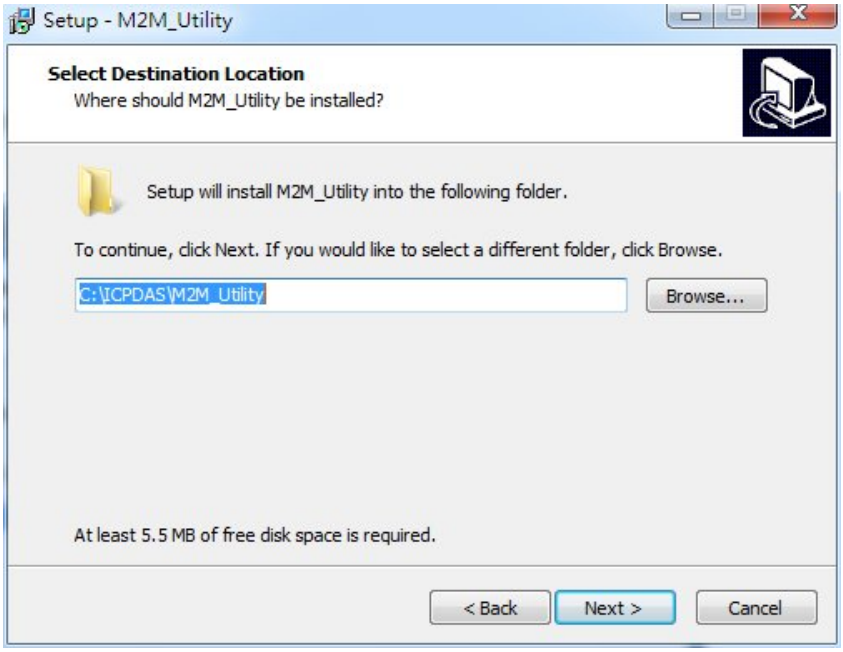
3.1 Installing M2M_Utility

Insert the installation CD and execute \GTP-541M\Software\M2M_Setup_V110.exe. The installation screen is as follows:

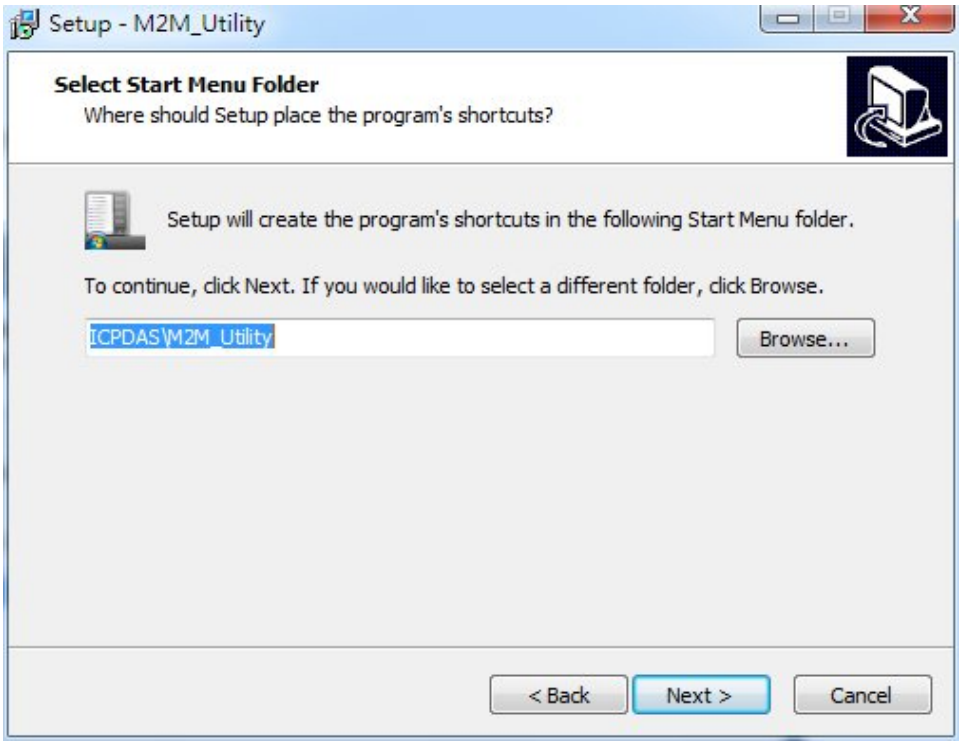
(1) Press "Next" to start the installation



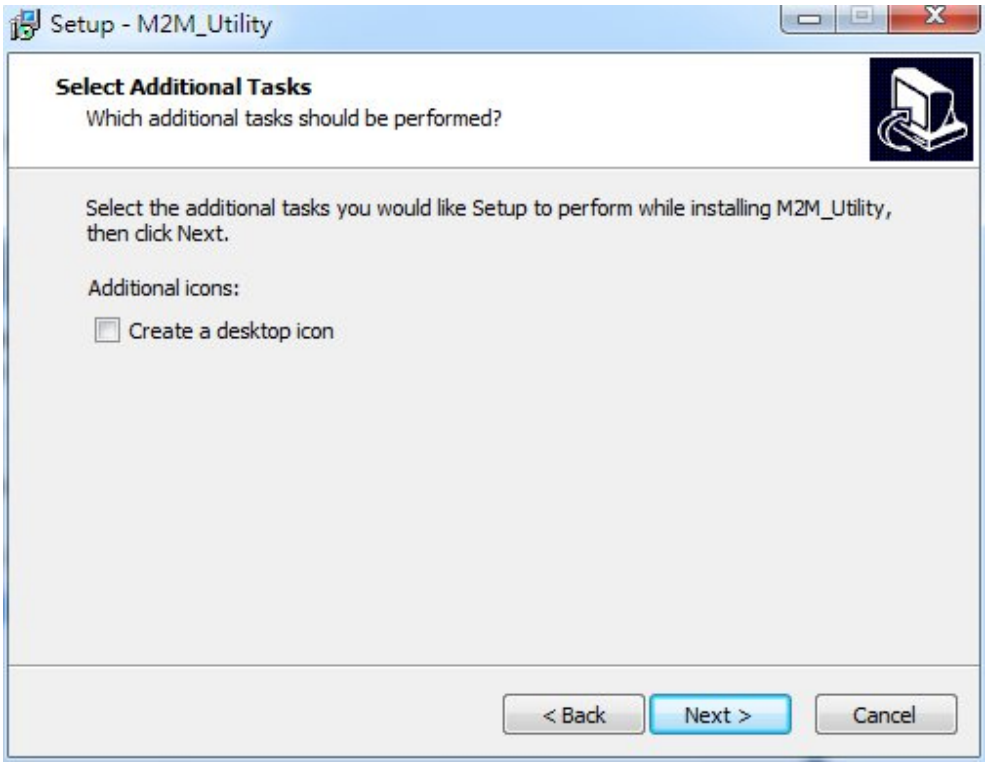
(2) Select the installation directory, the default path is “C:\ICPDAS\M2M _Utility”, after confirming, press “Next” to continue



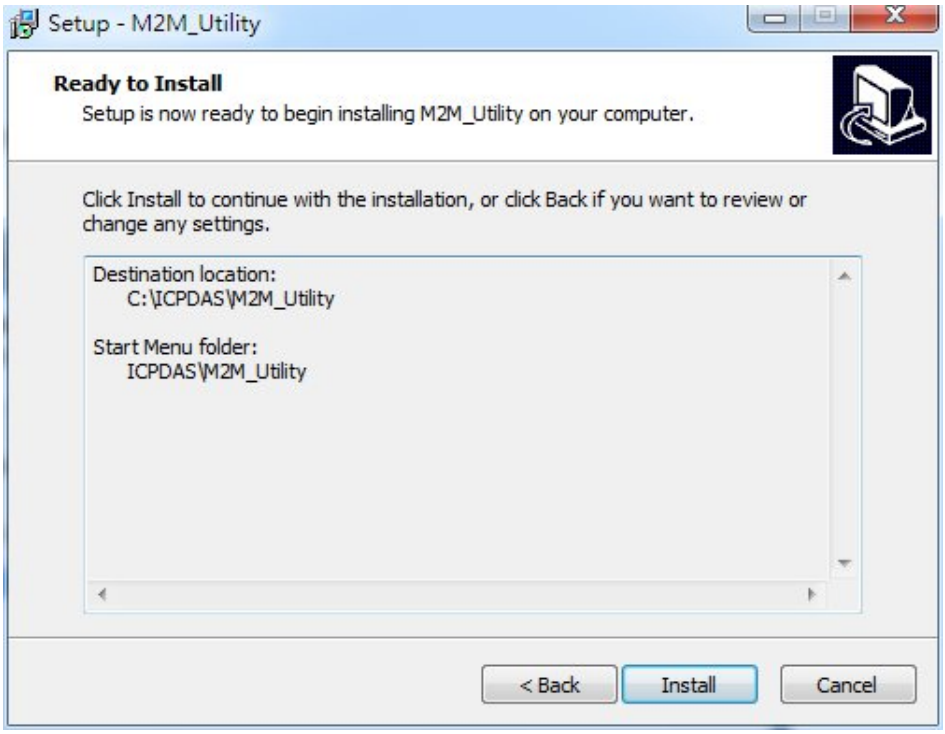
(3) Select the path in "All Programs", after confirming, press "Next" to continue



(4) Select whether to establish a shortcut on the desktop. After confirming, press "Next" to continue.



(5) Select "Install" to start the installation.



(6) Installation is complete

4.Turn on the Utility operation instructions

The UTP for each version of the GTP-541M is enabled by M2M_Utility. The Auto Run-up can be used to detect the internal firmware version of the GTP-541M to enable the utility or manually open the specified Utiliy from the Manual Run-up.

Note: See page 13 to install and execute the M2M Utility.

1. **Confirmation before opening Utility**
   1. Check if the 4th pin of the GTP-541M is connected to the 5th pin as shown in Figure 4.1.
   2. Turn on the GTP-541M power supply and confirm that the STA light flashes normally before you can start operating M2M Utility.exe.

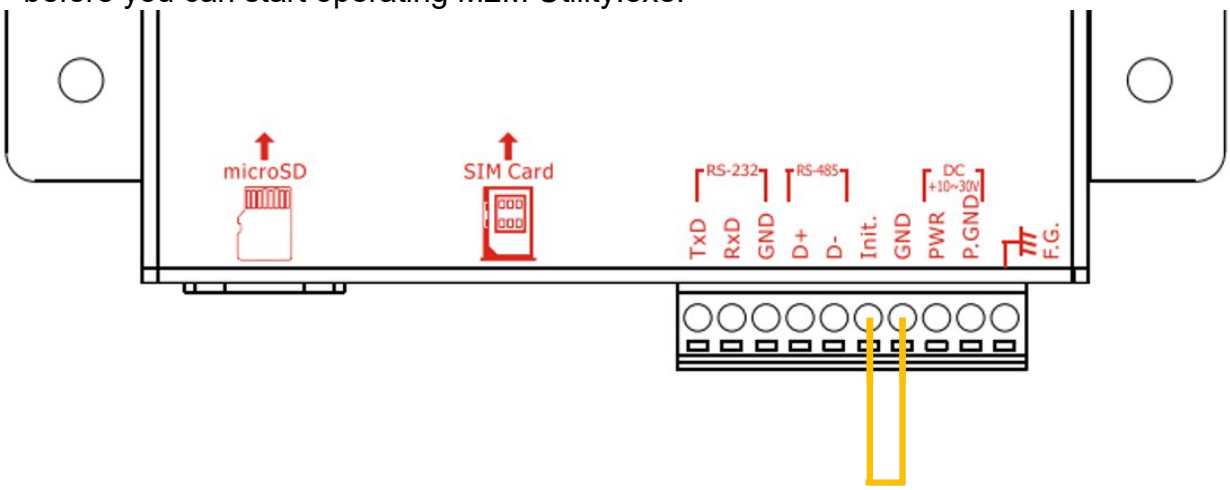
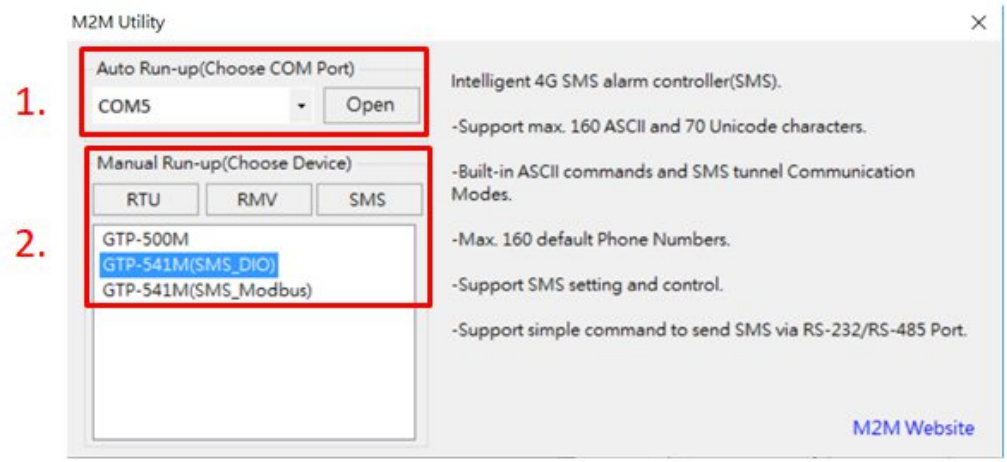


Figure 4.1

2. **The introduction of the layout**



1. Auto Run-up:
   Selecting the ComPort number connected to the GTP-541M and pressing Open will automatically determine the Utility corresponding to the current GTP-541M Firmware and enable it.

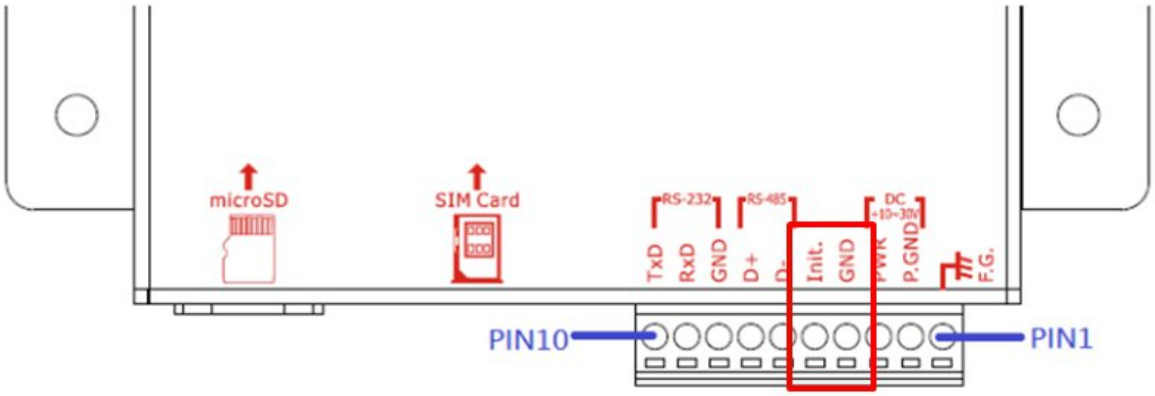
2. Manual Run-up:
   Manually select the Utility version you want to open. Relevant information will be displayed

in the right pane when you click the list option. When you double-click the list option, the corresponding Utility will be enabled.

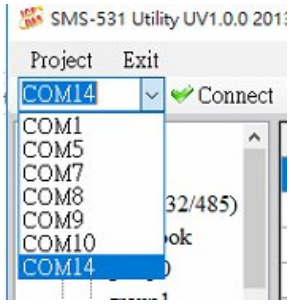
4.1 GTP-541M enters the Utility Mode Operating Instructions

Connect the Utility to the GTP-541M by following the steps below:

A. After connecting the 4th Pin-Gnd of COM Port and Power Input to the 5th Pin-Init, power on the GTP-541M to enter the Utility mode.



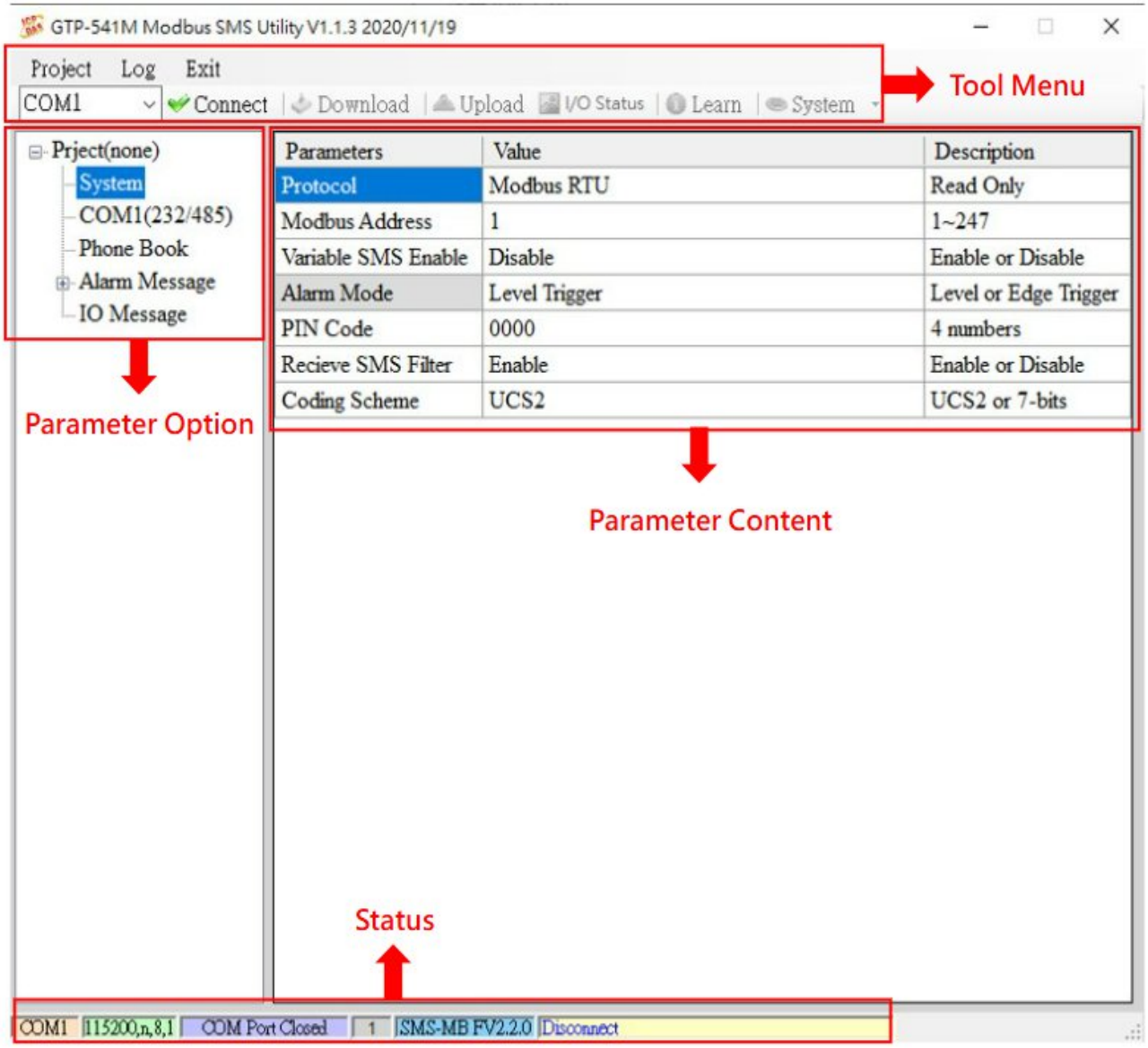
B. Select the COM Port number corresponding to the RS-232/RS-485 connected to the GTP-541M on the PC side.



C. Press the “Connect” button to connect with the GTP-541M. After successful, the “Connect” button will become the “Disconnect” button. If the connection is not successful, check the RS-232/ between the GTP-541M and the PC. Whether the RS-485 line is normal, whether the ComPort is occupied, or whether the 4th Pin-Init is successfully connected to the 5th Pin-Gnd.

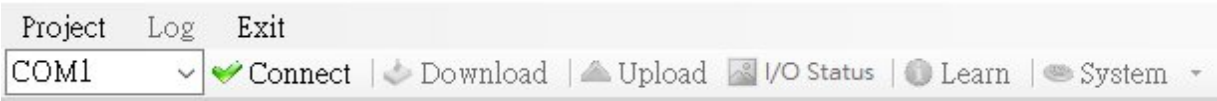
D. After finishing the parameter setting, please remember to unplug the 4th pin init and the 5th pin GND to return to the working mode

5.ModBusSMS Utility main screen description



5.1 Layout Introduction

一、The toolbar



- PProject:
  The parameters are stored in the form of a Project file. This operation includes: "New", "Open", "Save", "Save as..." and so on.
- Exit:
  Leave the Series Utility.
- COM Port:
  The COM port number of the PC connected to the GTP-541M.
- Connect:
  Utility and GTP-541M are connected.
- Download:
  Download the parameters to the GTP-541M.
- Upload:
  Upload the parameters of the GTP-541M to the Series Utility.
- I/O Status:
  Read peripheral IO values, and control DO status.
- Learn:
  Through this function, users can learn Modbus RTU commands for sending SMS messages and receiving SMS messages, and can test and send SMS messages.
- System:
  Perform some systemic functional operations, including: "Signal Quality", "Reboot GTP-541M", "Recover Default Settings", "Firmware Version".

一、The parameter options

- GTP-541M's parameter options are divided into 4 categories, including: “System”, “COM Port”, “Phone Book”, “Alarm Message”, "IO Message".

二、The parameter content

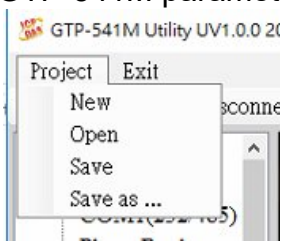
- Display details of the change parameters

三、The status column

- Display information about the GTP-541M Series Utility during operation, from left to right, in order:
  1. PC side COM Port number used by Utility
  2. COM Port transmission settings
  3. Current state of COM Port
  4. Current device's Modbus Address
  5. Tips for the results of each operation

5.2 Parameter File Management

The Project option can be used to save parameters into files or open parameter files. It is convenient to manage multiple GTP-541M parameters. The options are as follows:



A. New：
Create and open a new parameter file.

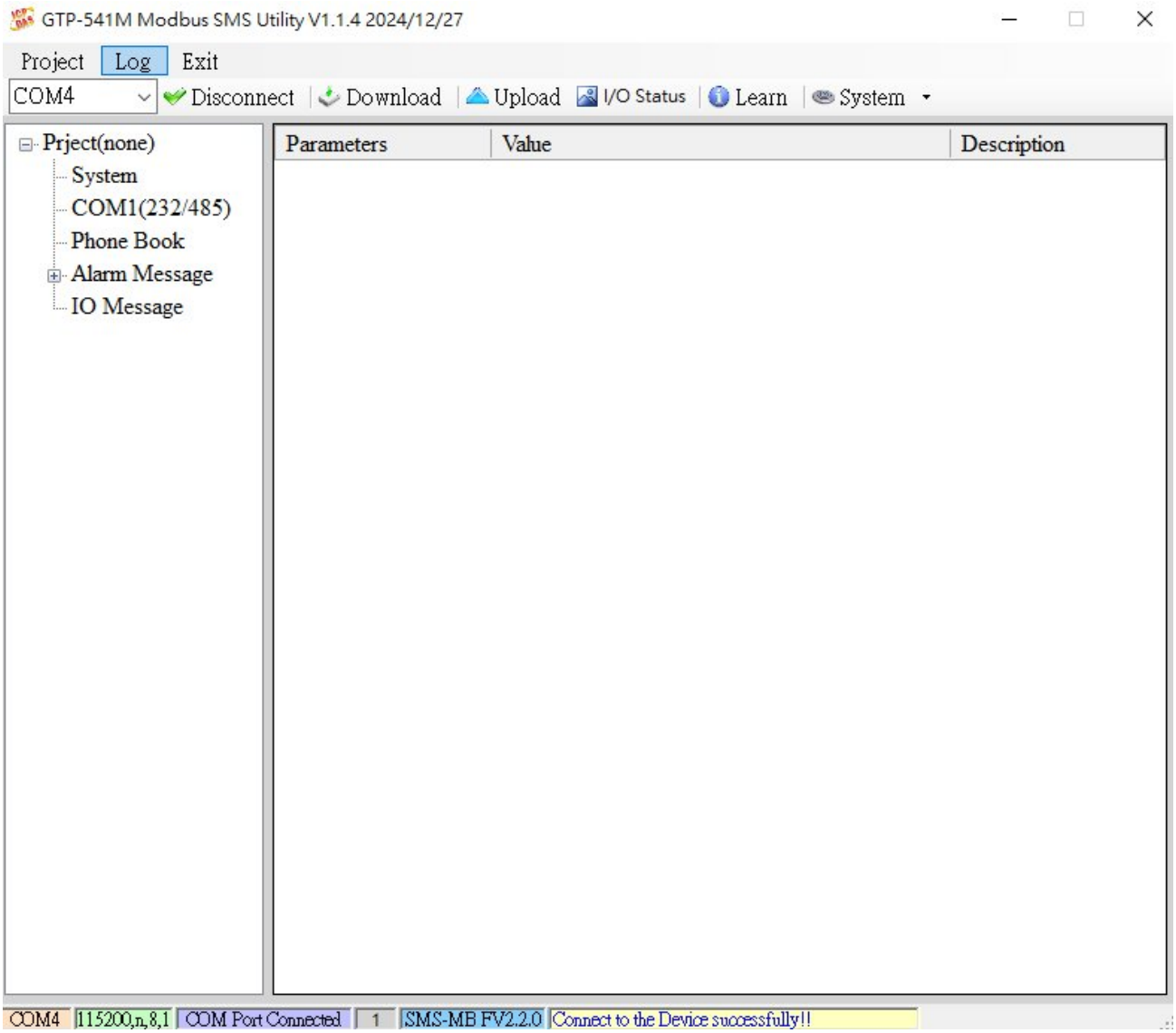
B. Open：
Open an existing parameter file.

C. Save ：
This function can be used to store parameter files, if the parameters are changed or if the uploaded GTP-541M parameters are to be saved.

D. **Save as**：
Save the parameters as another file name.

5.3 Description of parameter options

Click on the left window, the tree parameter option, the right side will display the parameter content in the parameter option, select the content you want to change, then press the right mouse button to modify it, as shown below:



5.3.1 Description of System Parameters

The "System" parameters, including 6 items, are:

Parameters	Value	Description
Protocol	Modbus RTU	Read Only
Modbus Address	1	1~247
Variable SMS Enable	Disable	Enable or Disable
Alarm Mode	Level Trigger	Level or Edge Trigger
PIN Code	0000	4 numbers
Recieve SMS Filter	Enable	Enable or Disable
Coding Scheme	UCS2	UCS2 or 7-bits

A. **Protocol:**
The communication protocol supported by the GTP-541M currently supports only Modbus RTU (read only, not changeable).

B. **Module Address:**
Used to set or display the Modbus Address of the GTP-541M.

C. **Variable SMS Enable:**
Whether to enable the function of the variable SMS. When this feature is turned on, the content of the transmitted SMS is a combination of the SMS content defined in the Alarm Message and the variable SMS content. Among them, Alarm Message has a maximum of 54 characters, and variable SMS has a maximum of 16 characters, which is a total of 70 characters.

D. **Alarm Mode :**
Set SMS Trigger Method **:**
Level Trigger : After giving the command, trigger SMS sending.
Edge Trigger : To trigger SMS sending, the state of the command must be different from the previous state.

E. **PIN Code:**
The PIN code required to unlock the SIM card.

F. **Receive SMS Filter:**
The phone whitelist feature is not available yet

G. **Coding Scheme:**
Set the SMS coding scheme: UCS2 supports 70-character Chinese messages, while 7-bits supports 140-character English messages.

5.3.2 COM Port Parameter Description

"COM Port" parameters, Uart connection ComPort related settings, RS-232 and RS-485 can only be used together can not coexist, the parameters are as follows:

Parameters	Value	Description
Port	COM1 (RS-232/485)	Read Only
Data Bit	8	Only Support 8 bits
Stop Bit	1	1 or 2
Parity Bit	none	none,odd,even
Baudrate	115200	bps

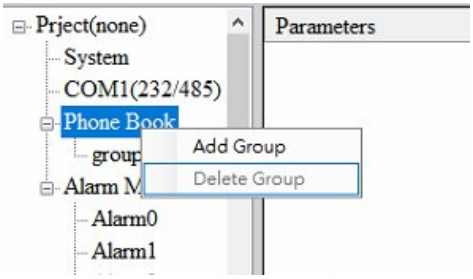
parameter name	Description
Port	**COM Port name. Read only, cannot be changed**
Data Bit	**Data bit, only supports 8 bits**
Stop Bit	**Stop bit, support 1 and 2 bits**
Parity Bit	**Peer check, support for none, even and odd**
Baudrate	**Transmit bits per second, supporting 2400, 4800, 9600, 19200, 38400, 57600 and 115200bps**

5.3.3 Phone Book Parameter Description

The "Phone Book" parameter is used to define the phone group number and the phone number in the category group. The description is as follows:

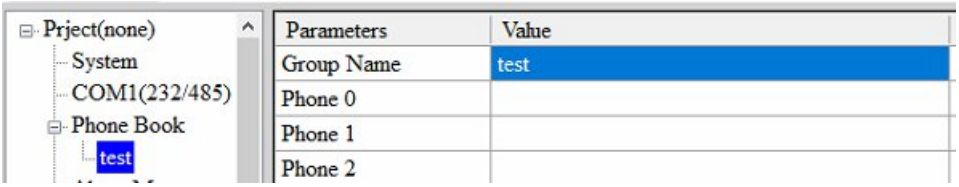
A. **Add a group and edit the group name :**
Right click on the “Phone Book” and select “Add Group” to add a new phone group. Up to

16 groups (group0~15) can be supported, as shown below：



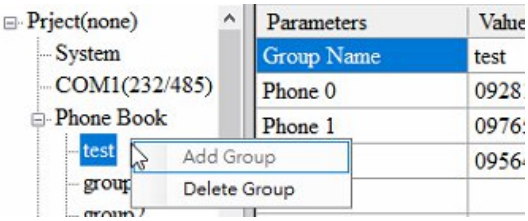
B. **Modify the group name**：

After adding a phone group, to change the group name, first click on the group name in the left window, then go to the right window (Group Name) to change, as shown below：



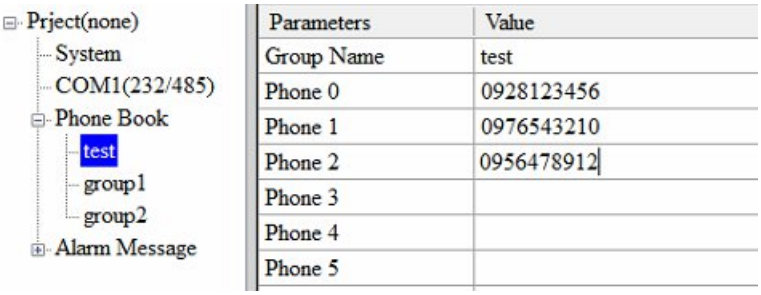
C. **Delete group**：

Click on the phone group you want to delete, right click on it and click on “Delete Group”, the phone group will be deleted, as shown below：



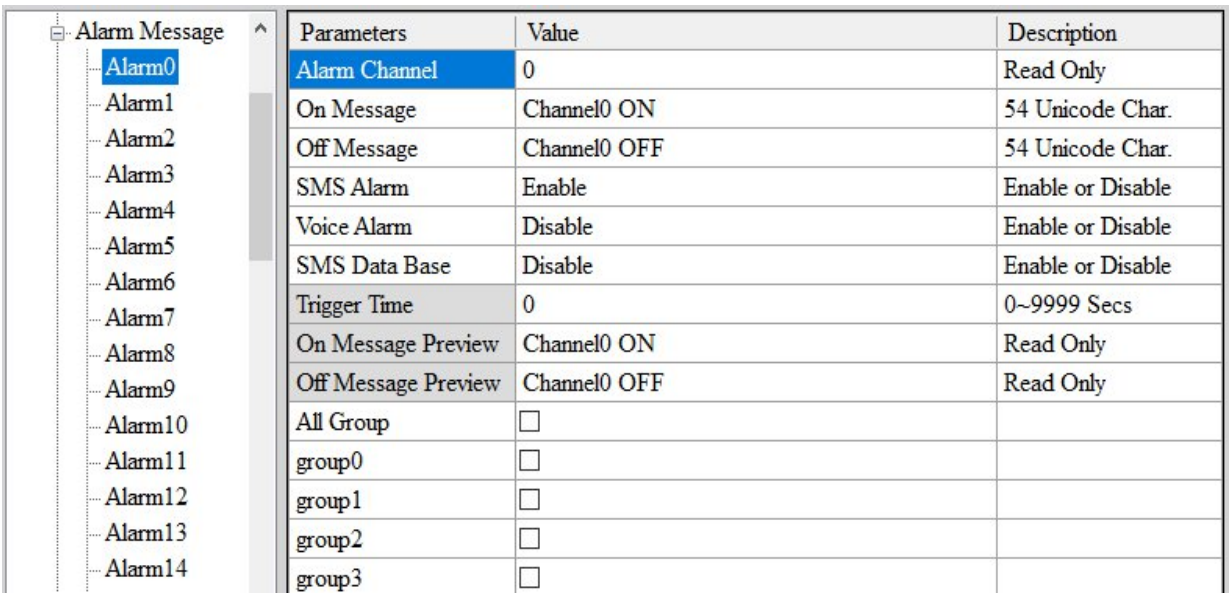
D. **Add, edit, or delete phone numbers in the group**:

Click on the group name in the left window, then add, modify or delete the phone number in the right window. Each group can set up to 16 phone numbers.



5.3.4 Alarm Message Parameter Description

"Alarm Message" parameters, used to define the content of the SMS and send the target phone group, etc：



參數名稱	說明
Alarm Channel	Alarm number
On Message	SMS content sent when the modbus status is set to On.
Off Message	SMS content sent when the modbus status is set to Off.
SMS Alarm	SMS alarm function switch
Vocie Alarm	Voice alarm function switch
SMS Data Base	SMS Data Base function switch
Trigger Time	Set the duration of the status, and the SMS will be sent only when the duration meets the required time.
On Message Preview	Message Preview
Off Message Preview	Message Preview
All Group	Enable or disable all phone groups
group0 ~ group15	When an alarm is triggered, a message will be sent to the selected phonebook.

Notice: Trigger Time is only available in Edge Trigger mode.

5.4 Download and upload parameters

A. **Download:**

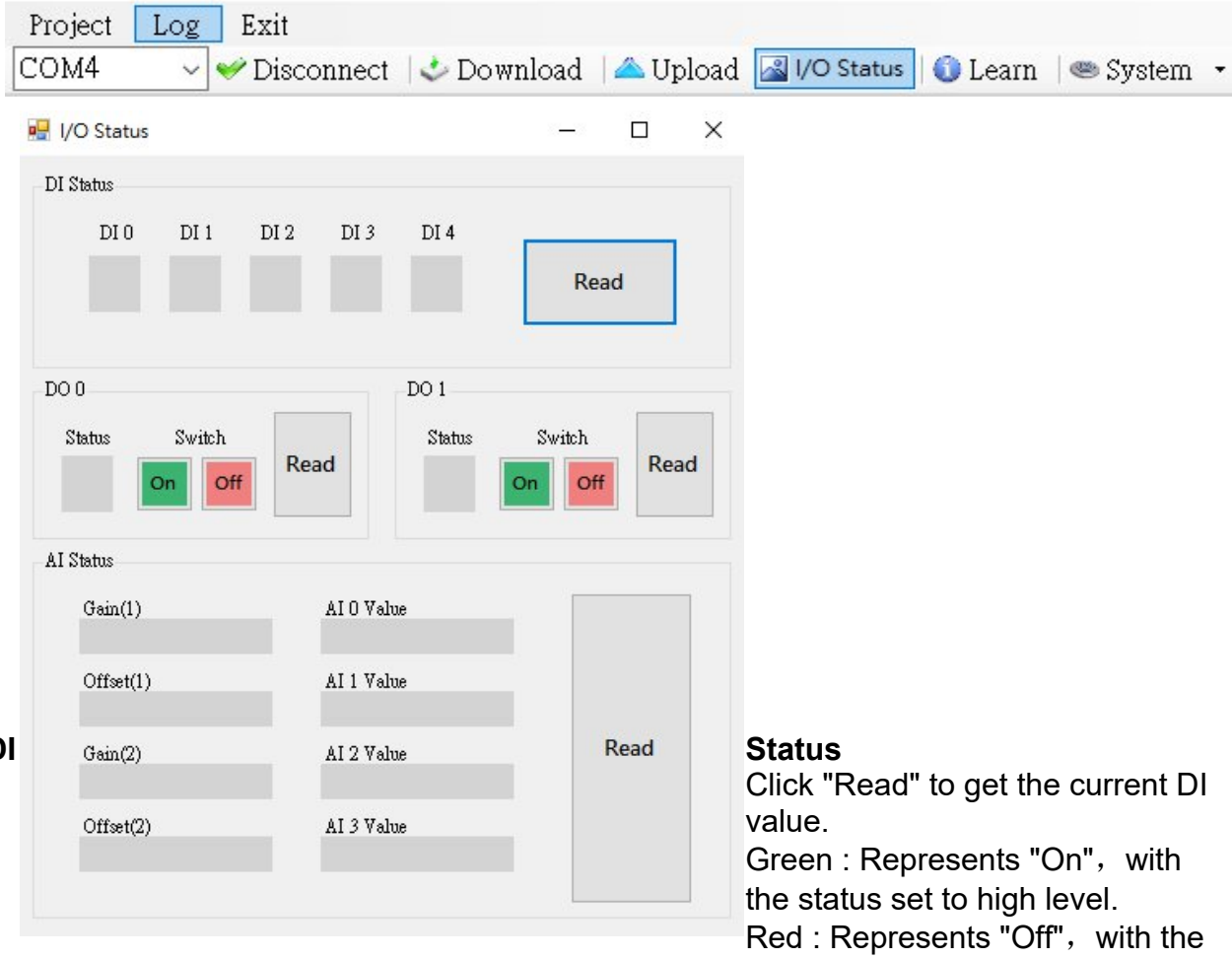
After the parameter setting is completed, you can use this button to download the parameters to the GTP-541M Device, as shown below, click the “Download” button.

B. **Upload:**

When you need to read out the parameters in GTP-541M, you can use this button to read related data from GTP-541M Device, as shown below, click the “Upload” button.

5.5 Read/Write I/O Value

Users can read the current I/O status of the device and manually control the DO status. The field descriptions are as follows :



A. **DI Status**

Click "Read" to get the current DI value.

Green : Represents "On"，with the status set to high level.

Red : Represents "Off"，with the status set to low level.

Gray : "Read" button has not been clicked, or there is a serial communication error.

B. **DO Status**

Click "Read" to get the current DO value; it will be shown under the "Status" label.

Green : Represents "On"，with the status set to high level.

Red : Represents "Off"，with the status set to low level.

Gray : "Read" button has not been clicked, or there is a serial communication error.

Click "On / Off" under the "Switch" label to control DO value.

On : Set DO value to high level.

Off : Set DO value to low level.

C. **AI Status**

Click "Read" to get the current AI value.

Gain/Offset are used to calibrate the voltage value; if Gain is 1 or Offset is 0, please contact us.

Besides using the utility to obtain I/O values, you can also use modbus commands to query

I/O values. Please refer to Chapter 12, GTP-541M Modbus Position Configuration Table for the corresponding Modbus addresses. The AI values are stored in 16-bit hexadecimal format. Please use the following formula to convert the hex value to a decimal.

- Hex <= 0x7FFF
  Represent positive values, multiply by 0.0003125 to convert the hexadecimal value to the corresponding decimal voltage value.
  Decimal = Hex * 0.0003125 (V)
- Hex > 0x7FFF
  Represent negative values, take the two's complement, then multiply by -0.0003125 to convert the hexadecimal value to the corresponding decimal voltage value.
  Decimal = ~(Hex - 1) * -0.0003125 (V)

5.6 Learning Modbus RTU Commands and Testing

After clicking the “Learn” button, you can enter the Modbus RTU command learning and SMS test and test page. Its main function is to provide users with a quick interface to learn how to send and receive SMS and test through Modbus RTU commands, as shown in the figure below：

This learning page can be divided into two functions: sending a newsletter and receiving a newsletter：

A. **Sending a newsletter**：

Modbus RTU commands that can be used to learn to send text messages, including：

1. **Send fixed newsletter content:**

   Send the SMS according to the content of the SMS and the phone group set in “Alarm Message”. Note: The option in “System->Variable SMS” must be set to Disable.

2. **Set variable SMS content and send SMS**：

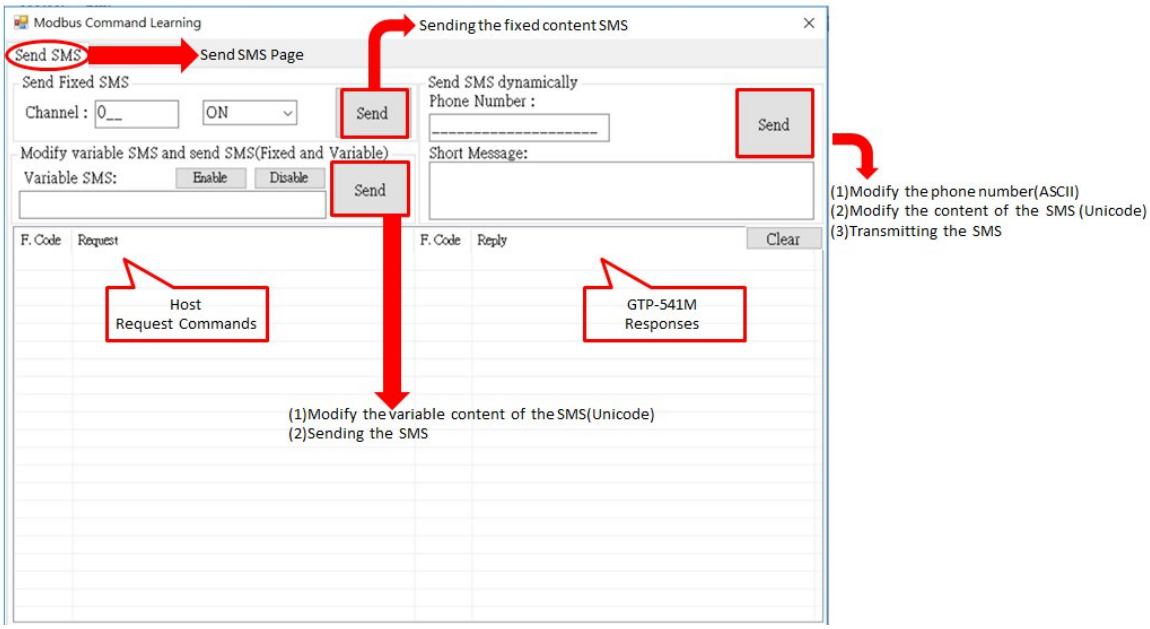
   This action will send 2 Modbus RTU commands
   (1) Change variable SMS content (Unicode)
   (2) Sending a newsletter
   The content of the newsletter is a combination of the content of the newsletter and the content of the variable newsletter set in the "Alarm Message", and the message transmission method is the same as "transmitting the fixed message content".

   Note: The option in "System->Variable SMS" must be set to Enable

3. **Send a dynamic newsletter:**

   This action will transfer 3 Modbus RTU commands：
   (1) Change the dynamic phone number (ASCII code)
   (2) Change dynamic SMS content (Unicode code)
   (3) Send a dynamic newsletter

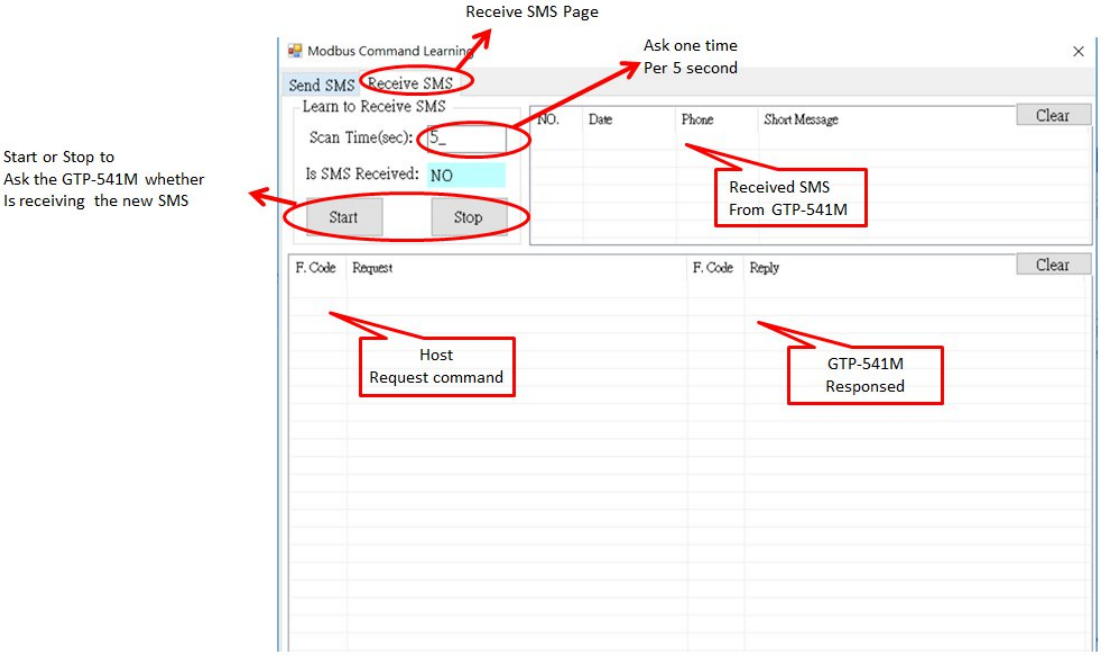
   Note: To send a dynamic message, you must wait for the previous message to be sent before you can transfer the next message.



B. **Receiving newsletters**：

This page is mainly for users to learn how to receive SMS from GTP-541M. The receiving SMS function of GTP-541M has a filtering design that can be set to be turn on or off. Only the SMS sent by the phone in the phone group will be received and stored by GTP-541M. The steps for receiving the newsletter are as follows：

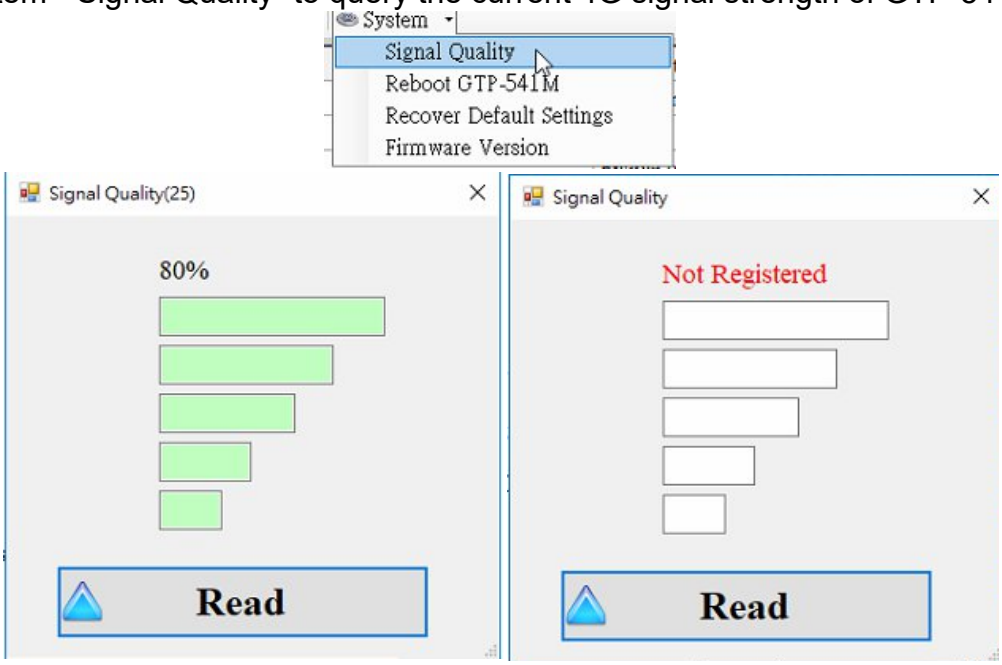
1. After pressing the “Start” button, the GTP-541M Series Utility will send a Modbus RTU command every 20 seconds to ask if the GTP-541M has received the SMS.
2. If yes, send 3 Modbus RTU commands to read the received SMS content：
   (1) Date of receipt of the newsletter
   (2) Send a text message for the newsletter
   (3) Newsletter content
3. Finally, send a Modbus RTU command to clear the SMS message, so that you can continue to receive the next SMS.


Receive SMS Page
Ask one time
Per 5 second
Start or Stop to
Ask the GTP-541M whether
Is receiving the new SMS
Modbus Command Learning
Send SMS
Receive SMS
Learn to Receive SMS
Scan Time(sec): 5
Is SMS Received: NO
Start
Stop
NO.
Date
Phone
Short Message
Clear
Received SMS
From GTP-541M
F. Code
Request
F. Code
Reply
Clear
Host
Request command
GTP-541M
Responsed

5.7 System function

5.7.1 Querying the signal strength of the module

Click “System->Signal Quality” to query the current 4G signal strength of GTP-541M.



A. **Field Description：**

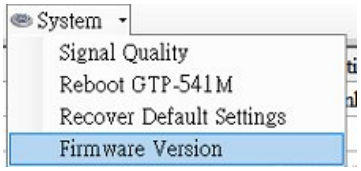
The signal strength is expressed in 5 segments and shows the current percentage of the signal strength. It will be displayed when there is no signal"Not Registered” .

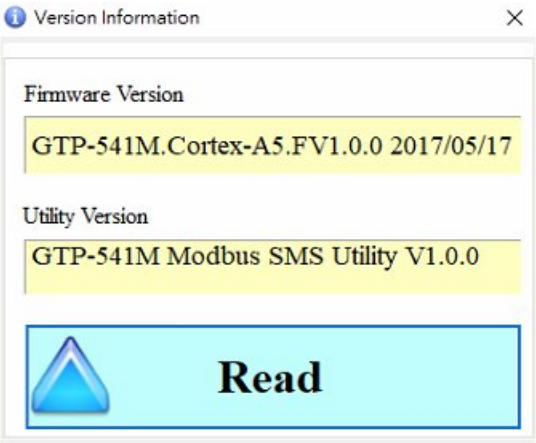
B. **Description of operation options：**

Read: Read the current 4G signal strength from GTP-541M.

5.7.2 Querying the Firmware Version

Click “System->Firmware Version” to display the version of the Utility and the version information of the firmware. The description is as follows：





A. **Field Description：**

(1) Firmware Version: Display firmware version information

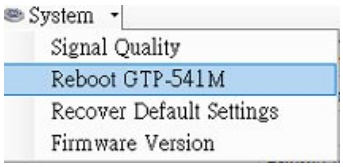
(2) Utility Version: Display version information of GTP-541M Series Utility

B. **Description of operation options：**

(1) Read: Read the firmware version information from GTP-541M and display it in the window.

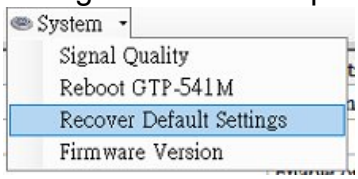
5.7.3 Restarting GTP-541M

Click "System->Reboot GTP-541M" to restart GTP-541M



5.7.4 Reply to factory defaults

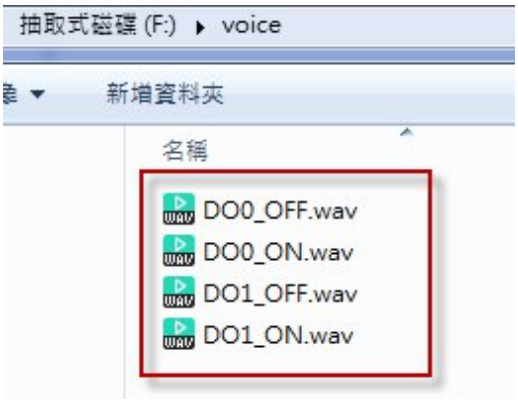
Click “System->Recover Default Settings” to return the parameters to the factory defaults.



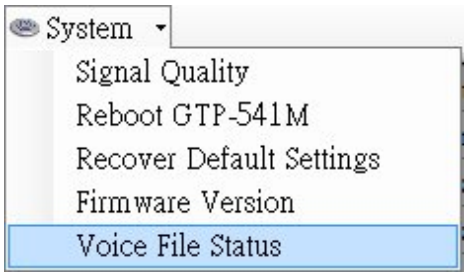
5.7.5 Voice file format and status

(1) Please add a voice folder to the SD card first, and then put the voice file into the voice folder.

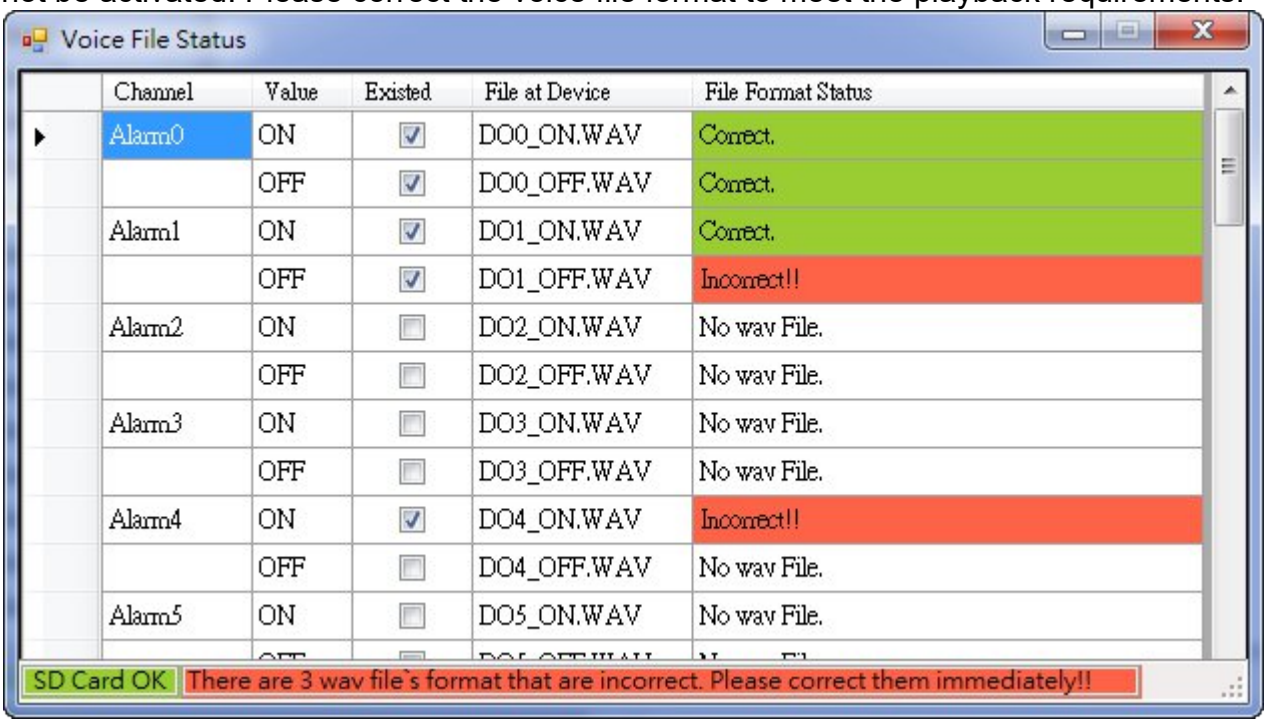
→



(2) Click “System->Voice File Status” on the Utility to check whether the current voice file status and format in the SD card match.



The Voice File Status page can view the voice files of the ON and OFF states corresponding to each Alarm. If the file exists, the Existed item will display a tick, and the Fiel Format Status item displays whether the current voice file format meets the voice dialing requirements. Correct will display a green background, if not, it will display Incorrect!! with a red background. Once the system detects that the voice file format does not meet the playback requirements, even if the Alarm is triggered, the voice alarm will not be activated. Please correct the voice file format to meet the playback requirements.



Channel	Value	Existed	File at Device	File Format Status
Alarm0	ON	☑	DO0_ON.WAV	Correct.
	OFF	☑	DO0_OFF.WAV	Correct.
Alarm1	ON	☑	DO1_ON.WAV	Correct.
	OFF	☑	DO1_OFF.WAV	Incorrect!!
Alarm2	ON	☐	DO2_ON.WAV	No wav File.
	OFF	☐	DO2_OFF.WAV	No wav File.
Alarm3	ON	☐	DO3_ON.WAV	No wav File.
	OFF	☐	DO3_OFF.WAV	No wav File.
Alarm4	ON	☑	DO4_ON.WAV	Incorrect!!
	OFF	☐	DO4_OFF.WAV	No wav File.
Alarm5	ON	☐	DO5_ON.WAV	No wav File.

(3) Voice File Format

The GTP-541M only supports the playback of WAV files. The following formats are required. For example, if the voice file is not in the following format, please use the software to convert:

File type	wav
Audio format	PCM
Audio sample size	16 bits
Channel	mono
Audio sampling frequency	8 kHz
Audio bit rate	128kbps

5.8 Using the sample description

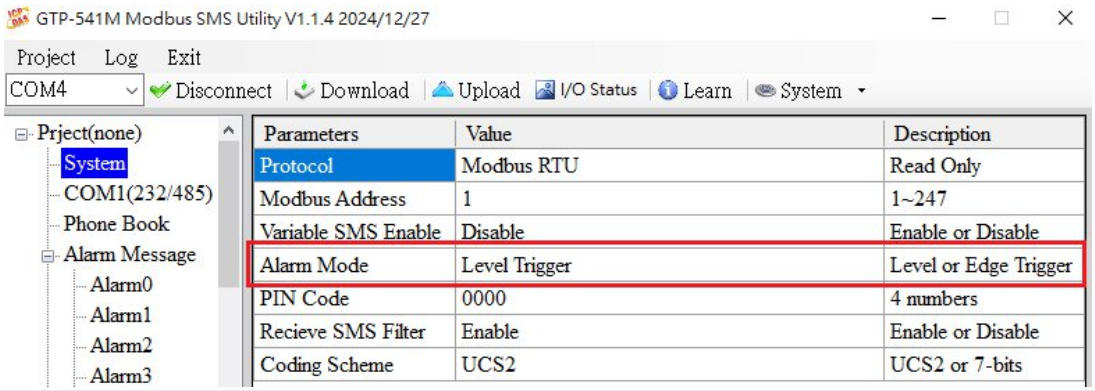
The following are examples of usage examples, as follows：

Example	Description
Example 1: Sending the general alarm SMS(Level Trigger)	This example shows how to send the fixed content alarm SMS by Modbus commands in Level Trigger mode.
Example 2: Sending the variable alarm SMS	This example shows how to send the variable content alarm SMS by Modbus commands.
Example 3: Sending the alarm SMS dynamically	This example shows how to send the alarm SMS to the specific phone dynamically by Modbus commands.
Example 4: Sending I/O value SMS	This example shows how to send I/O value SMS by Modbus commands.
Example 5: Receiving the SMS	This example shows how to receive SMS from the GTP-541M by Modbus commands.
Example 6: Sending the general alarm SMS (Edge Trigger)	This example shows how to send the voice alarm by Modbus commands.
Example 7: Sending the alarm voice	This example shows how to send the voice alarm by Modbus commands.
Example 8: Check alarm sending status	This example shows how to check the SMS / Voice alarm sending status.
Example 9: Sending the manager SMS	This example shows how to send manager SMS by Modbus commands.

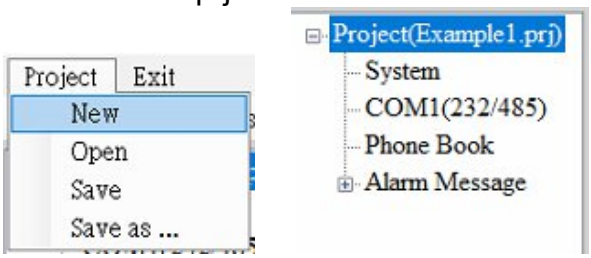
5.8.1 Example 1: Sending the general alarm SMS (Level Trigger)

This example illustrates the action that should be taken to transfer a fixed message content to a defined phone number.

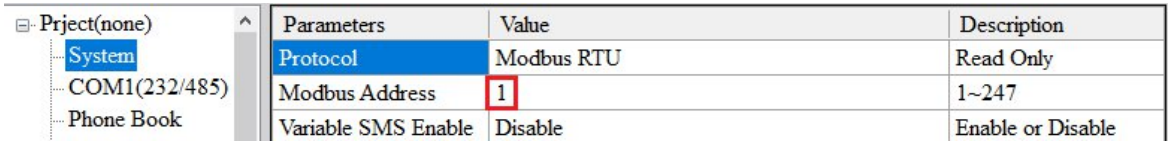
1. **Set parameters through the GTP-541M Series Utility**
   (1) Connect to GTP-541M, the Alarm Mode field will enable



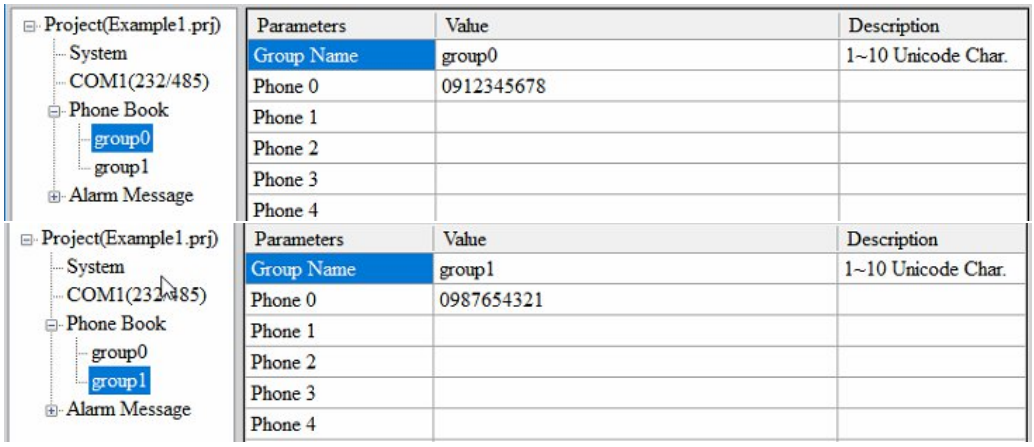
(2) Add a new project named File1.prj



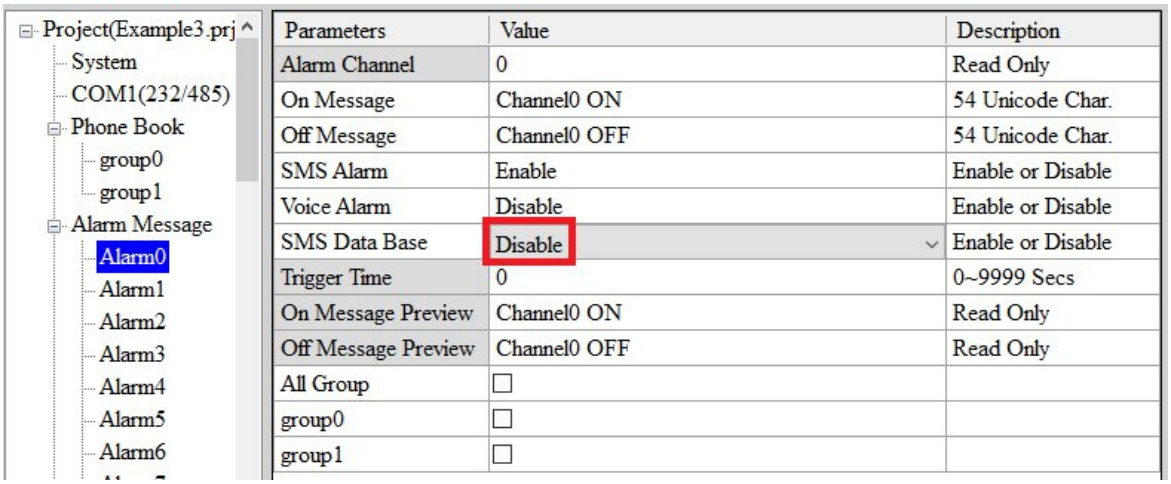
(3) Set the Modbus Address of GTP-541M, the factory default is 1



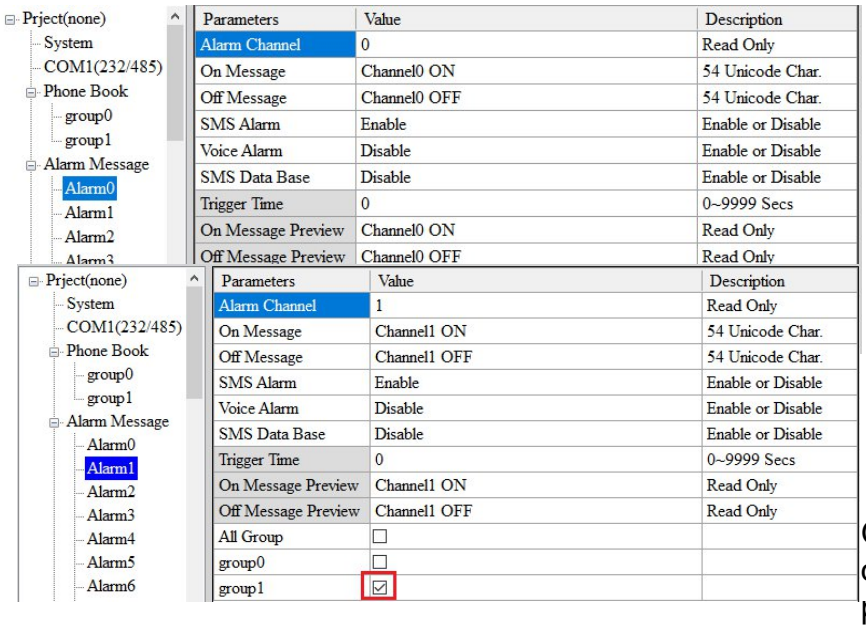
(4) Add 2 phone groups and add a phone number as shown below：



(5) Enabling the SMS Database function according to the requirements.
(This field is optional. When enabled, additional information will be automatically added to the SMS to support the SMS management software developed by ICPDAS)



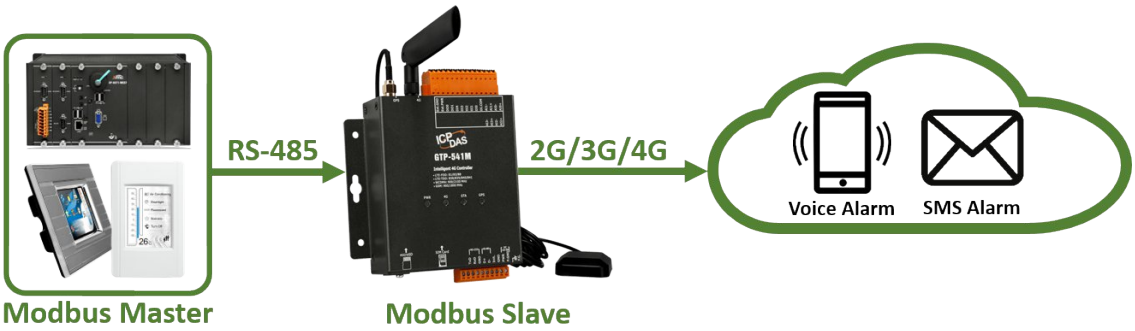
(6) Set Alarm Channel 0 and Alarm Channel1 respectively, as follows：

(7) 

Connect GTP-541M and download the parameters to GTP-541M

2. Modbus RTU command

(1) The control host connects to the GTP-541M COM1 (RS-232/RS-485) via RS-232 or RS-485.



(2) The control host sends a Modbus RTU command to the GTP-541M to send a text message.

Command and action description:

command	Send an alert (16-bit)	command	01 05 00 00 FF 00 8C 3A
		Respond	01 05 00 00 FF 00 8C 3A
Action description	After the GTP-541M receives the command, the content of the SMS message is: in Alarm Channel0, the content defined in the "On Message" field is transmitted to whom: the phone number defined in group0		
result	The phone number defined in the phone group group0 should receive the newsletter with the message content "Channel0 ON"		

Command format description：

Send an alert		
command	Byte 0	Modbus Address set by GTP-541M

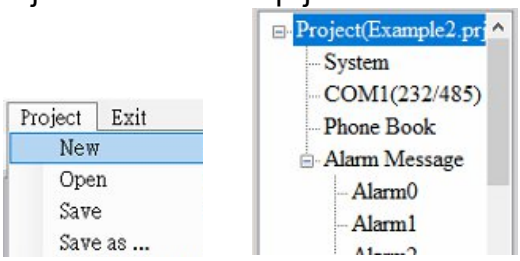
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 →Send the newsletter content in the "On Message" field =0x0000 → Send the newsletter content in the "Off Message" field
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16 check code

5.8.2 Example 2:Variable SMS Alerts

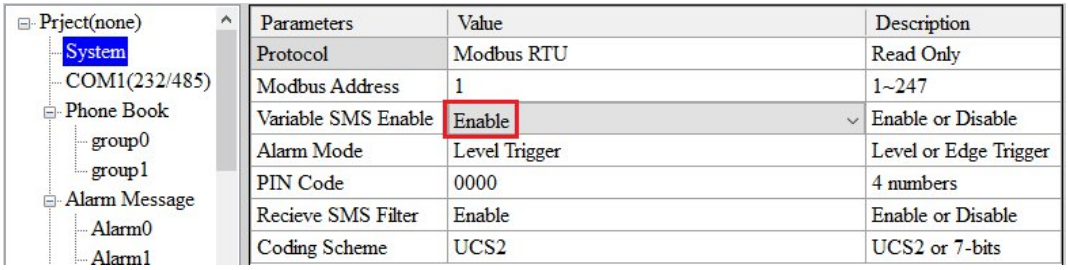
This example is mainly to illustrate the actions that should be taken to transmit variable SMS content to a defined phone number. Among them, the variable SMS content is the combination of the content defined in the Alarm Message (maximum 54 Unicode words or 108 ASCII words), plus the combination of variable SMS content (maximum 16 Unicode words or 32 ASCII words).

1. **Set parameters through the GTP-541M Series Utility**

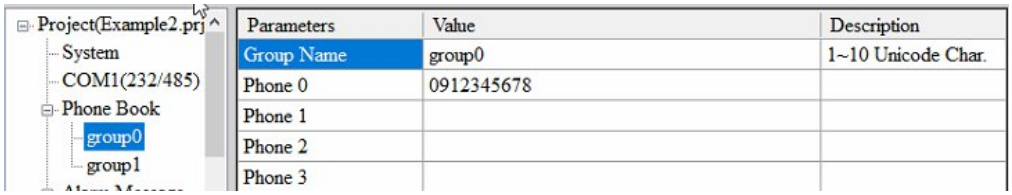
(1) Add a new project named File2.prj



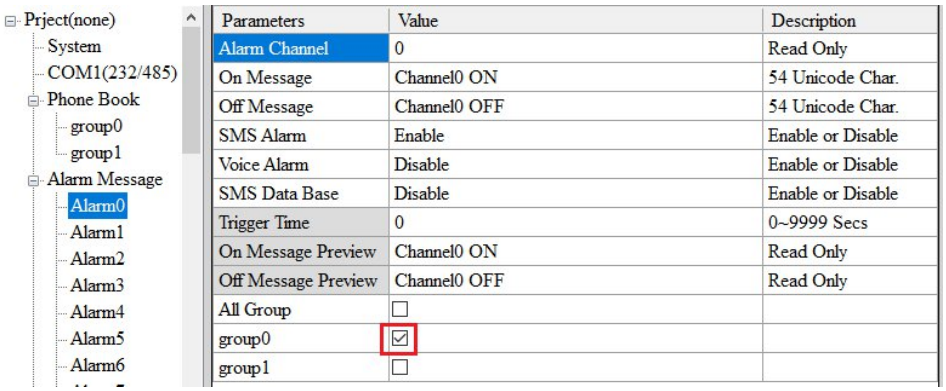
(2) Set the Modbus Address of GTP-541M, the factory default is 1, and set the “Variable SMS” field to Enable.



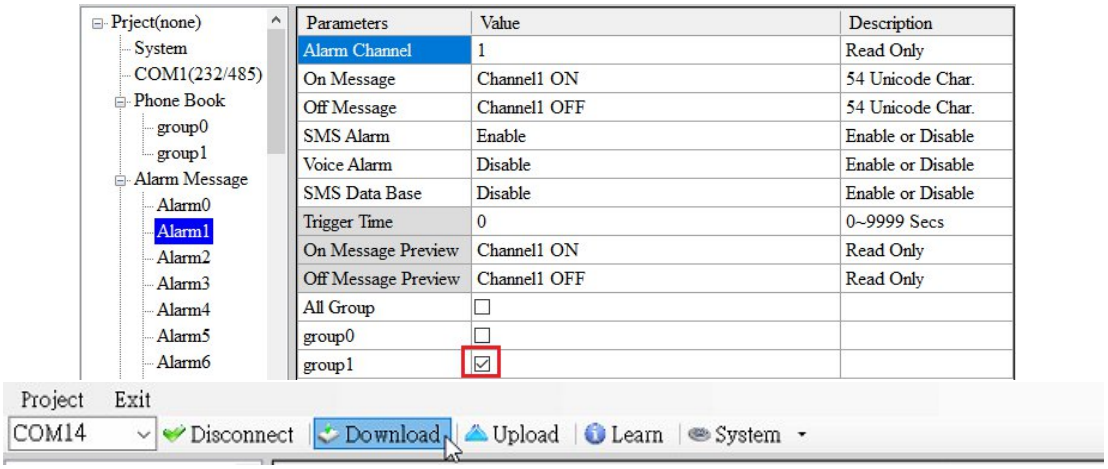
(3) Add 2 phone groups and add a phone number as shown below：



(4) Set Alarm Channel 0 and Alarm Channel1 respectively, as follows：

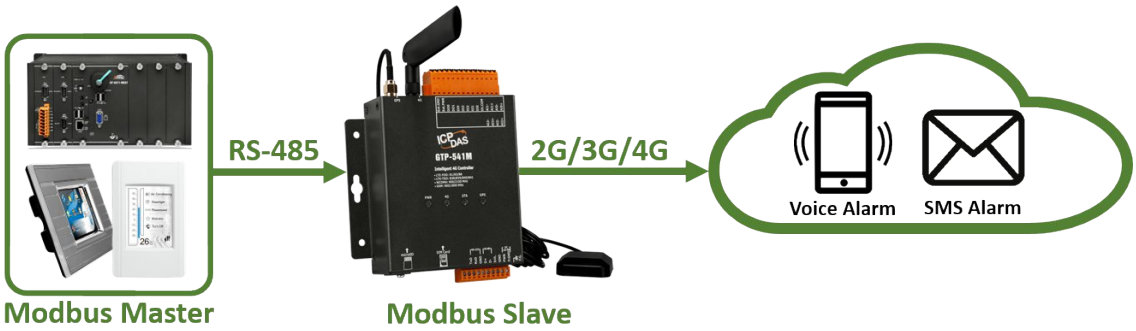


(5) Connect GTP-541M and download the parameters to GTP-541M



2. Modbus RTU command

(1) The control host connects to the GTP-541M COM1 (RS-232/RS-485) via RS-232 or RS-485.



(2) The control host sends a Modbus RTU command to the GTP-541M, first sets the variable SMS content, and then transmits the SMS.

Command and action description：

command	Set variable	command	01 10 01 7F 00 06 0C **2B 00 56**

	newsletter content	(UCS2)	**00 53 00 4D 00 53 00 00 00** E7 DD
		Respond (UCS2)	01 10 01 7F 00 06 70 2F
		command (7-bits)	01 10 01 7F 00 03 06 **2B 56 53 4D 53 00** 23 D3
		Respond (7-bits)	01 10 01 7F 00 03 B0 2C
	Send an alert	command	01 05 00 01 FF 00 DD FA
		Respond	01 05 00 01 FF 00 DD FA
Action description	1. Set the variable SMS content first. Take this as an example: +VSMS. Modbus RTU data requires an ending character, and there are differences depending on the coding scheme : For the coding scheme : **UCS2** Modbus RTU data : 2 bytes per char, in little-endian order. For the coding scheme : **7-bits** Modbus RTU data : 1 bytes per char. 2. Send a message again 3. The content of the newsletter is: in the Alarm Channel1, the content defined by the "On Message" field, plus the variable newsletter content. 4. To whom: the phone number defined in group1		
result	The phone number defined in the phone group group1 receives the newsletter and its message content is "Channel1 ON+VSMS".		

Command format description：

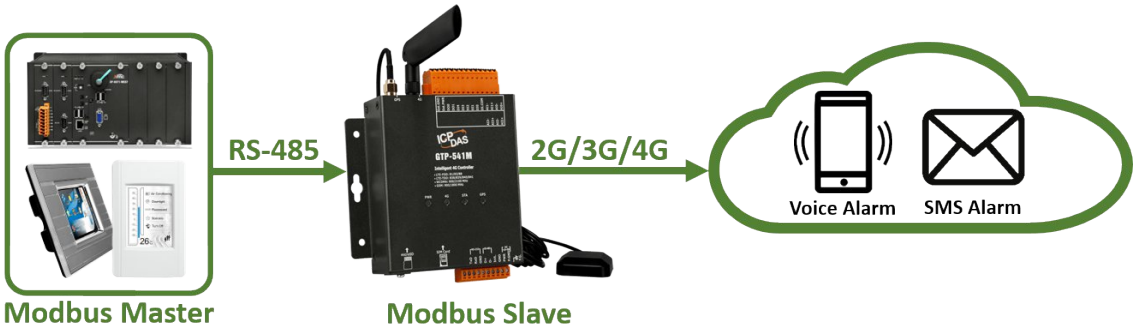
Set variable newsletter content		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 16
	Byte 2 ~ 3	Data Address, the starting address of the variable SMS content definition
	Byte 4 ~ 5	Register Count, the number of words in the newsletter, up to 16 Unicode characters
	Byte 6	Byte Count (Register Counter x 2), the content of the newsletter accounts for a few Bytes
	Byte7 ~ 18	Byte Count (Register Counter x 2), the content of the newsletter accounts for a few Bytes...
	Byte19 ~ 20	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	Data Address, the starting address of the variable SMS content definition
	Byte 4 ~ 5	Register Count, the number of words in the newsletter
	Byte 6 ~ 7	CRC-16 check code

Send a newsletter		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 →Send the newsletter content in the "On Message" field =0x0000 → Send the newsletter content in the "Off Message" field
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16 check code

5.8.3 Example 3: Dynamic SMS alert

This example is mainly to illustrate the action that should be taken if a dynamic SMS is to be sent to a dynamic phone number. Among them, dynamic newsletter content, support up to 70 Unicode characters or 140 ASCII characters to transmit dynamic newsletters, no need to set any parameters through GTP-541M Series Utility, can be directly through the Modbus RTU commands, the examples are as follows：

(1) The control host connects to the GTP-541M COM1 (RS-232/RS-485) via RS-232 or RS-485.



(2) The control host pairs the GTP-541M to issue the Modbus RTU command, set the dynamic message content and phone number, and then transmit

Command and action description：

command	Set dynamic phone number (hex)	command	01 10 01 D5 00 06 0C 30 31 32 33 34 35 36 37 38 39 00 00 D5 2B
		Respond	01 10 01 D5 00 06 50 0F
	Set dynamic newsletter content (hexadecimal)	command (UCS2)	01 10 01 8F 00 0C 18 **44 00 79 00 6E 00 61 00 6D 00 69 00 63 00 20 00 53 00 4D 00 53 00 00 00** AC 3B
		Respond (UCS2)	01 10 01 8F 00 0C F0 1B
		command (7-bits)	01 10 01 8F 00 06 0C **44 79 6E 61 6D 69 63 20 53 4D 53 00** C7 27
		Respond (7-bits)	01 10 01 8F 00 06 70 1C
	Send a newsletter (hexadecimal)	command	01 05 00 80 FF 00 8D D2
		Respond	01 05 00 80 FF 00 8D D2
Action description	1. Set the phone number to: 0123456789 2. Set the content of the newsletter as: Dynamic SMS Modbus RTU data requires an ending character, and there are		

	differences depending on the coding scheme : For the coding scheme : **UCS2** Modbus RTU data : 2 bytes per char, in little-endian order. For the coding scheme : **7-bits** Modbus RTU data : 1 bytes per char. 3. Send a newsletter
result	Phone 0123456789, you will receive a newsletter with the following message: Dynamic SMS

Format description：

Set a dynamic phone number		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	Data Address, the starting address of the dynamic phone number
	Byte 4 ~ 5	Register Count, the number of Registers in the phone number
	Byte 6	Byte Count (Register Counter x 2), the length of the phone number
	Byte7 ~ 18	Phone number, ASCII code, at least one 00 is the end character. If the phone number is 20, the end character is not required.
	Byte19 ~ 20	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	Data Address, the starting address of the dynamic phone number
	Byte 4 ~ 5	Register Count, the number of Registers in the phone number
	Byte 6 ~ 7	CRC-16 check code

Set dynamic newsletter content		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	Data Address, the starting address defined by the dynamic message
	Byte 4 ~ 5	Register Count, the number of words in the dynamic newsletter, up to 70 Unicode characters
	Byte 6	Byte Count(Register Counter x 2)
	Byte7 ~ 30	Dynamic newsletter, Unicode code, ending with 0x0000 characters, if the length is 70 characters, no end character is required
	Byte 31 ~ 32	CRC-16 check code
Correct	Byte 0	Modbus Address set by GTP-541M

response	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	Data Address, the starting address defined by the dynamic message
	Byte 4 ~ 5	Register Count, the number of words in the dynamic newsletter
	Byte 6 ~ 7	CRC-16 check code

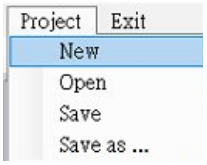
Send a newsletter		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x0080
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x0080
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16 check code

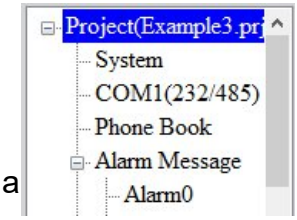
5.8.4 Example 4: Sending I/O value SMS

This example mainly explains how to send an I/O value SMS to the set phone book. It can be done directly through the Modbus RTU command. The text stored in the SMS is fixed, as shown in the example below:

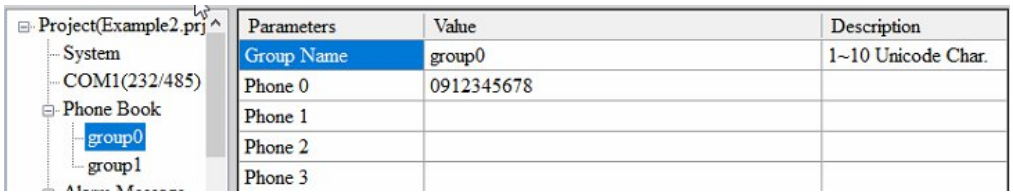
1. **Set parameters through the GTP-541M Series Utility**

   (1) Add a new project named File3.prj

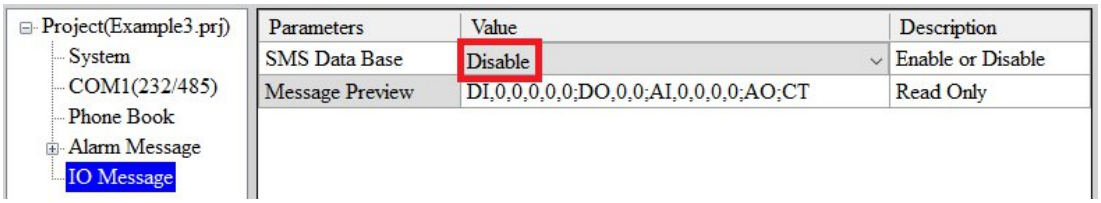




   (2) Add phone group and add a phone number as shown below：

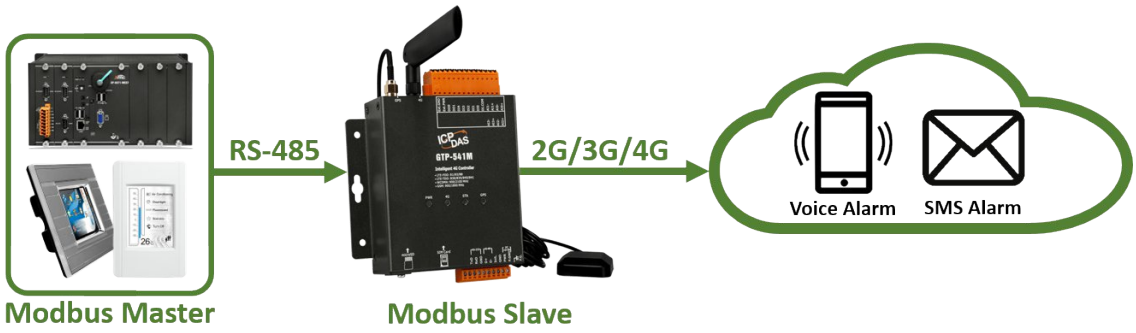


   (3) Enabling the SMS Database function according to the requirements.
   (This field is optional. When enabled, additional information will be automatically added to the SMS to support the SMS management software developed by ICPDAS)



2. **Modbus RTU command**

   (1) The control host connects to the GTP-541M COM1 (RS-232/RS-485) via RS-232 or RS-485.



   (2) The control host sends a Modbus RTU command to the GTP-541M to send a text message.
   Command and action description：

command	Send an alert (16-bit)	command	01 05 00 83 FF 00 7D D2
		Respond	01 05 00 83 FF 00 7D D2

Action description	After receiving the command, the GTP-541M will send an SMS containing all of the I/O values to the set phone book group0.
result	The phone number defined in phone group0 should receive the newsletter. The value in the SMS is: DI,**DI0,DI1,DI2,DI3,DI4,**DO,**DO0,DO1,**AI,**AI0,AI1,AI2,AI3**

Command format description：

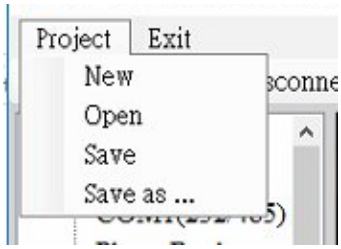
Send an alert		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x0083
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x0083
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16 check code

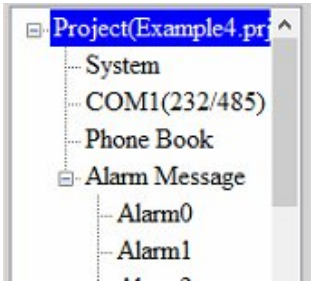
5.8.5 Example 5: Receiving a newsletter

This example is mainly to explain how to read the newsletter content received by GTP-541M.

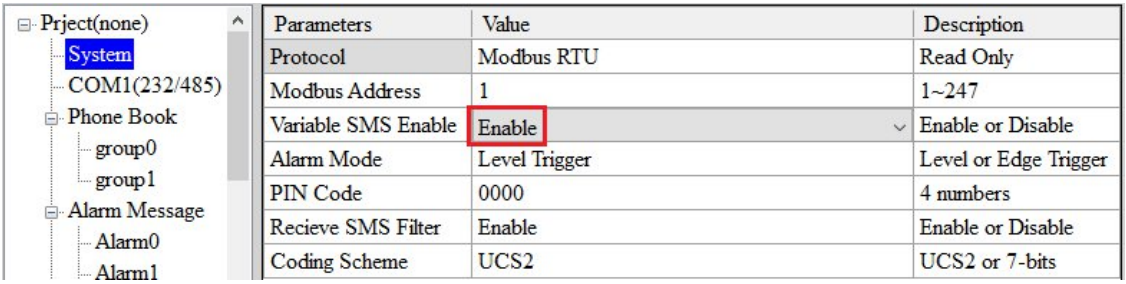
1. Set parameters through the GTP-541M Series Utility

(1) Add a new project named File4.prj

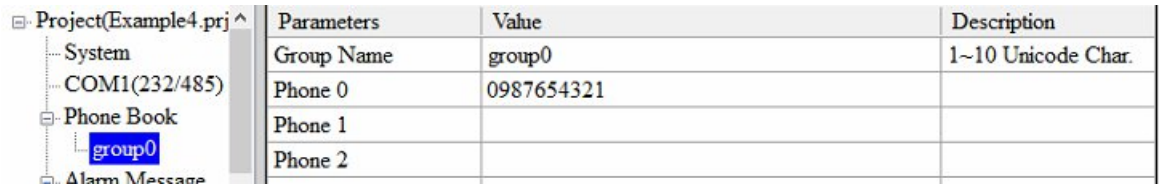




(2) Set the Modbus Address of the GTP-541M,the factory default is 1. Receive Simplified function If you need to limit the phone number, Receive SMS Filter selects Edable



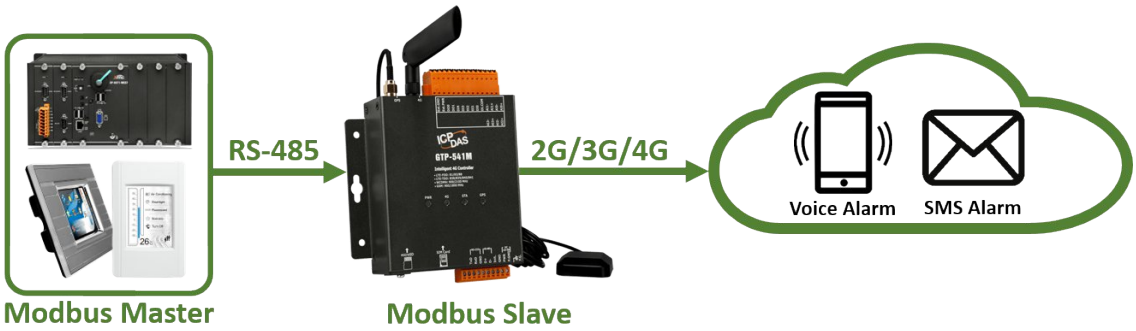
(3) Add 1 phone group and add a phone number as shown below.GTP-541M if you turn on phone filtering,only the phone number in the phone group will be sent.



(4) Connect GTP-541M and download the parameters to GTP-541M

2. Modbus RTU command

(1) The control host connects to the GTP-541M COM1 (RS-232/RS-485) via RS-232 or RS-485.



(2) The control host sends a Modbus RTU command to the GTP-541M to poll the GTP-541M for receiving the SMS. If so, read the SMS content.

Command and action description：

command	Check if there is a newsletter (hexadecimal)	command	01 02 00 01 00 01 E8 0A
		Respond	01 02 01 00 A1 88 (no newsletter received) 01 02 01 01 60 48 (received newsletter)
	Read transmitter phone (hexadecimal)	command	01 04 00 1E 00 0A 10 0B
		Respond	01 04 14 38 38 36 39 32 38 37 36 36 35 30 37 00 00 00 00 00 00 00 00 B6 6E
	Read receipt date (hexadecimal)	command	01 04 00 28 00 07 31 C0
		Respond	01 04 0E 32 30 31 38 30 38 30 32 30 39 35 35 33 31 3D 79
	Read newsletter content (hexadecimal)	command	01 04 00 2F 00 51 00 3F
		Respond	1 4 A2 00 00 48 65 6C 6C 6F 2C 47 54 50 2D 35 34 31 21 00 00 00 ……(data total 162 Bytes)
Action description	Send the newsletter to the GTP-541M with the phone number in the phone group. The content is “Hello, GTP-541!”. Polling, continuously check whether the GTP-541M receives the newsletter and if it receives the newsletter. The commands for reading the sender's phone, the date of receipt, and the content of the message are sent continuously because the sender's phone, the date of receipt, and the address of the message are contiguous. Therefore, all the information can be read back using only one read command.		
result	The result of reading is: Transmitter's phone: 886928766507 Received date: 20180802095531 (2018/08/02/ 09:55:31) Newsletter content: Hello, GTP-541M!		

Format description:

Check if there is a newsletter		
command	Byte 0	Modbus Address set by GTP-541M

	Byte 1	Function Code = 2
	Byte 2 ~ 3	Data Address, whether the indication address of the SMS has been received
	Byte 4 ~ 5	Bit Count，1 bit
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 2
	Byte 2	Byte Count, data accounted for a few Bytes
	Byte 3	= 0, no newsletter received = 1, I received a newsletter
	Byte 4 ~ 5	CRC-16 check code

Read transmitter phone		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 4
	Byte 2 ~ 3	Data Address, the starting address of the sender's phone
	Byte 4 ~ 5	Data Address, the starting address of the sender's phone...
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 4
	Byte 2	Byte Count, data accounted for a few Bytes
	Byte 3 ~ 22	Transmitter phone number, ASCII code, ending with 0x00
	Byte 23 ~ 24	CRC-16 check code

Read receipt date		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 4
	Byte 2 ~ 3	Modbus Address set by GTP-541M...
	Byte 4 ~ 5	Register Count, read several Register data, fixed at 7 (0x07)
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 4
	Byte 2	Byte Count, data accounted for a few Bytes
	Byte 3 ~ 22	Byte Count, data accounted for a few Bytes...
	Byte 23 ~ 24	CRC-16 check code

Read newsletter content		
command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 4
	Byte 2 ~ 3	Data Address, the starting address of the content of the stored newsletter
	Byte 4 ~ 5	Register Count, read several Register data, fixed at 81 (0x51)
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 4
	Byte 2	Byte Count, data accounted for a few Bytes
	Byte 3 ~ 22	=0x0000, the content of the newsletter is ASCII code =0x0001, the content of the newsletter is Unicode code
	Byte 23 ~ 24	CRC-16 check code

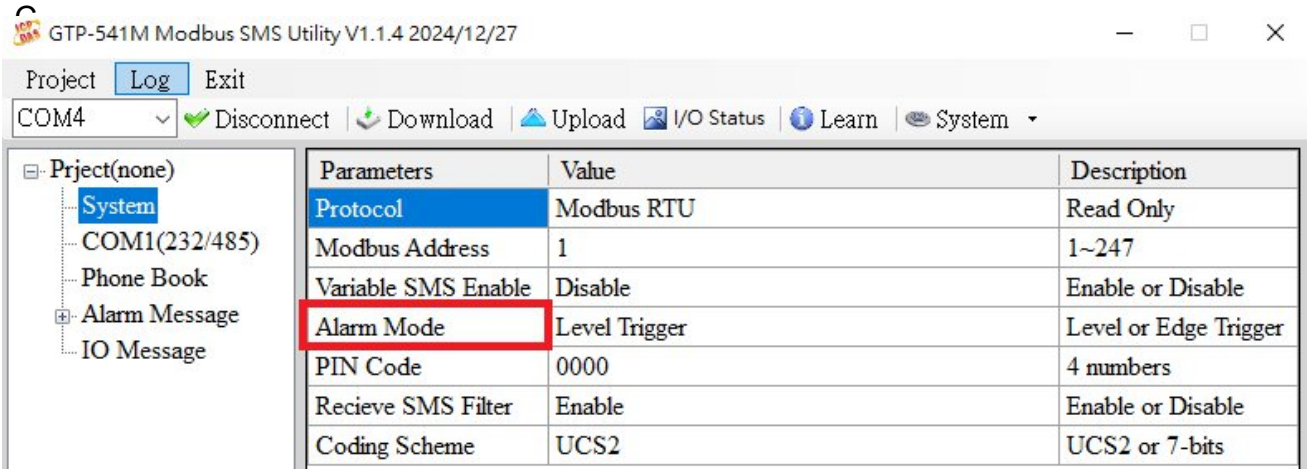
5.8.6 Example 6: Sending the general alarm SMS (Edge Trigger)

This example shows the steps to send the defined SMS to the defined phones in Edge Trigger mode.

1. **Setting the parameters by the GTP-541M Series Utility**

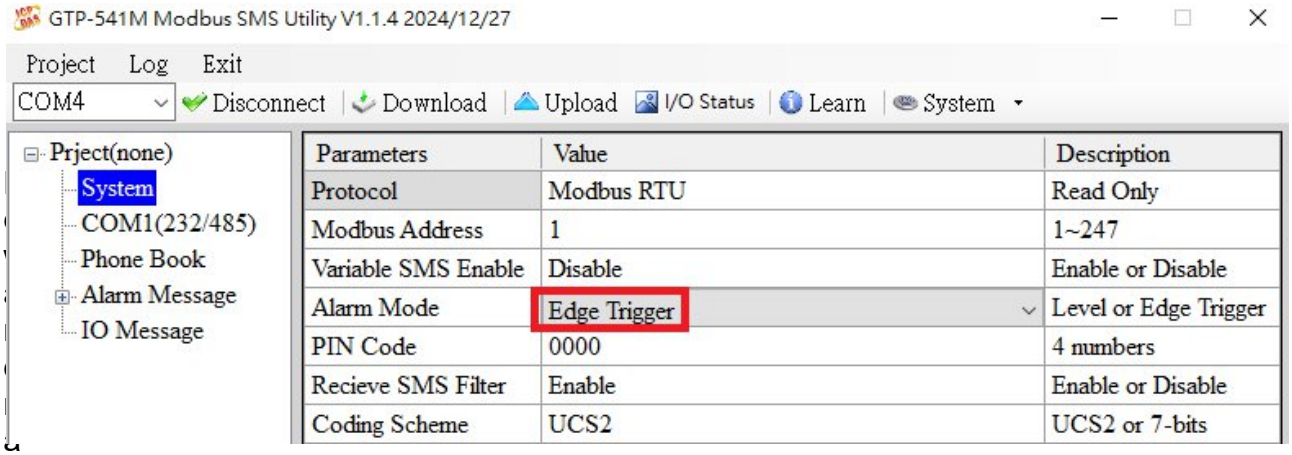
(1) Connect to the GTP-541M. The Alarm Mode field will be enabled.

(2) C

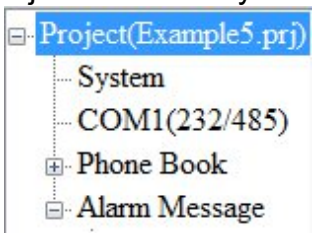


hoose the edge trigger mode.

(3)

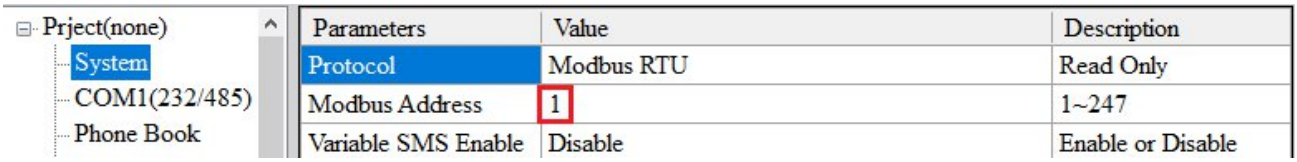


me an “Example5.prj” project in the Utility.

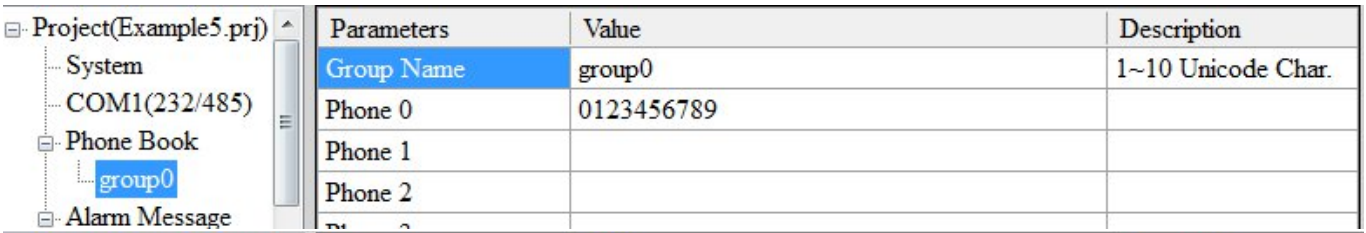


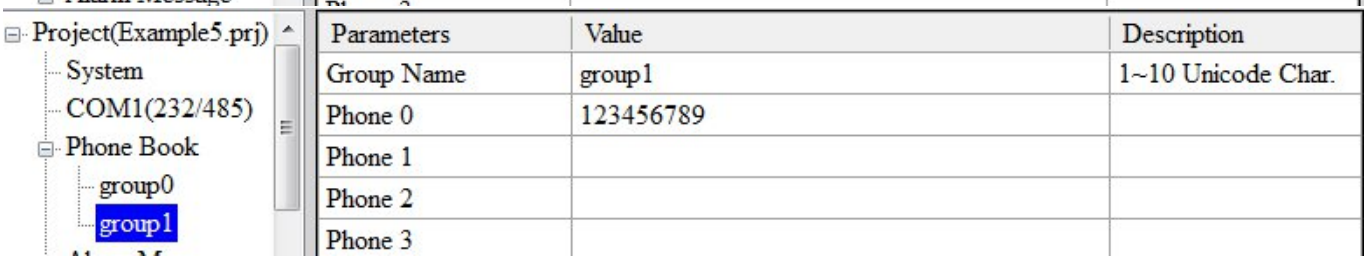
(4) Set the modbus address as 1. (The factory default address is 1)

(5)

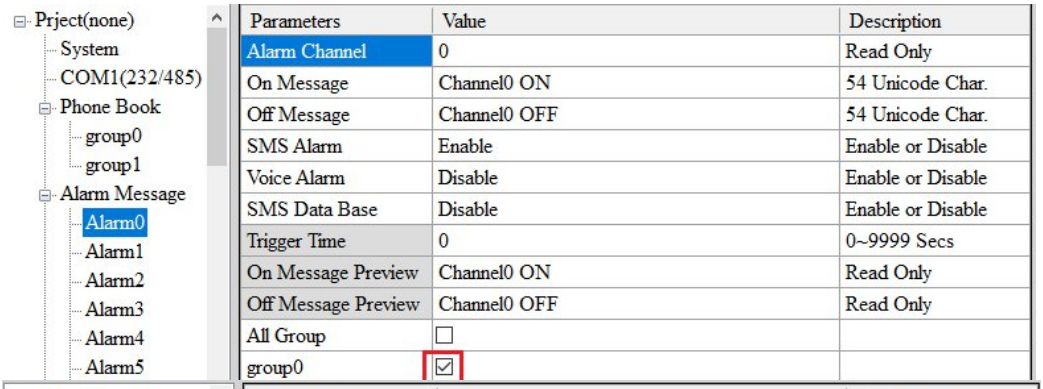


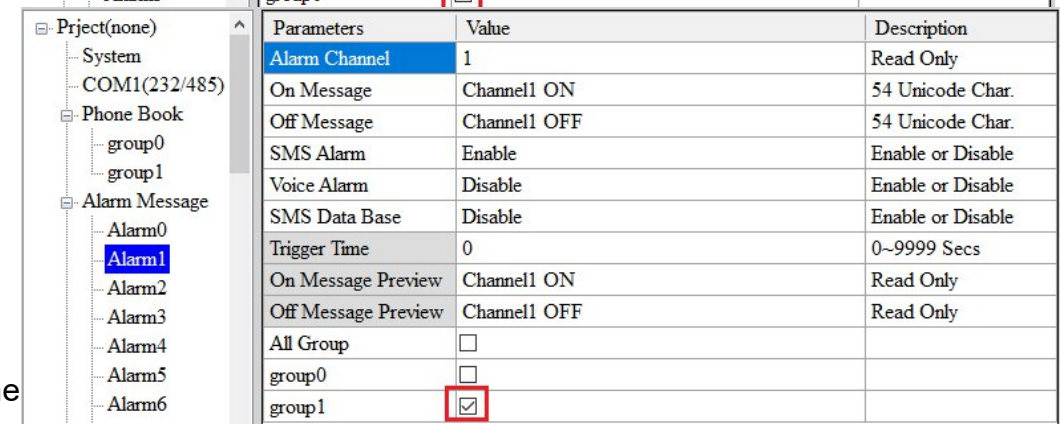
dd 2 new phone groups and input phone numbers as follows:



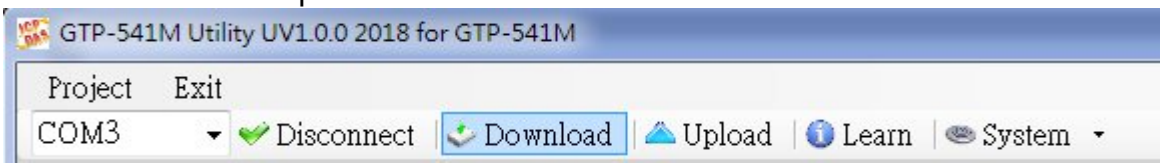


(6) Set the Alarm Channel0 and Channel1 separately as follows:



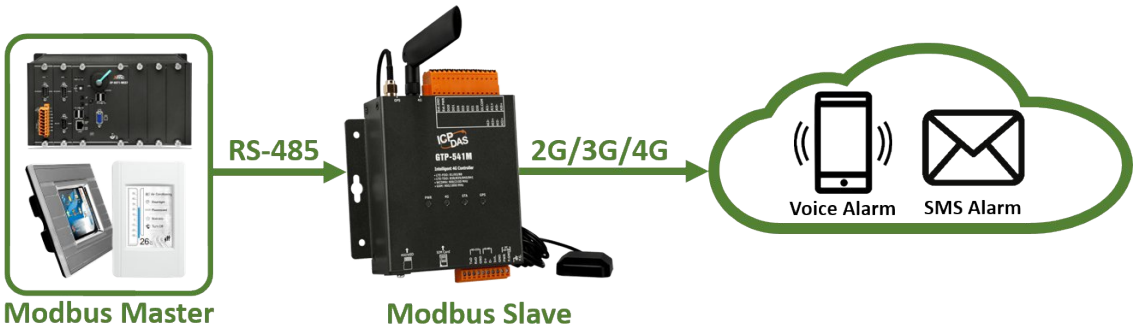


(7) Connect to the GTP-541M and download these parameters to it.



2. **Modbus RTU commands**

(1) Connect COM1 (RS-232/RS-485) of the GTP-541M to the Host.



(2) Sending the Modbus commands from the Host to the GTP-541M to transmit the alarm SMS as follows:

Commands and Description:

Commands	Sending Alarm SMS (Hex)	Command	01 05 00 00 FF 00 8C 3A
		Response	01 05 00 00 FF 00 8C 3A
Description	1. The GTP-541M receives the Modbus command then sends the alarm message. 2. The content of the alarm SMS is “On Message” of Alarm Channel0 message. 3. The alarm SMS would send to the defined phone groups.		
Result	The phones defined in the group0 would receive the SMS after 10 seconds. The content of the SMS is “Channel0 ON”		

Command Format:

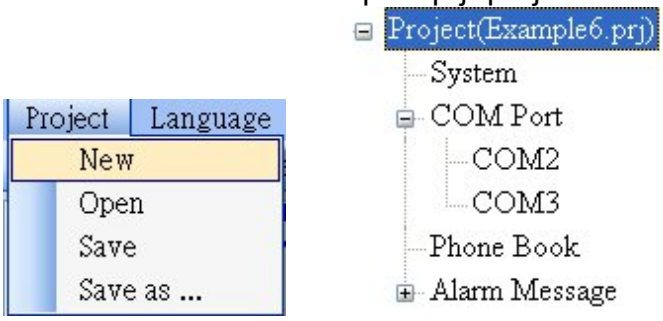
Send the alarm SMS		
Command	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00, Sending the field content of “On Message”. =0x0000, Sending the field content of “Off Message”.
	Byte 6 ~ 7	CRC-16
Correct Response	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16

5.8.7 Example 7: Sending the alarm voice

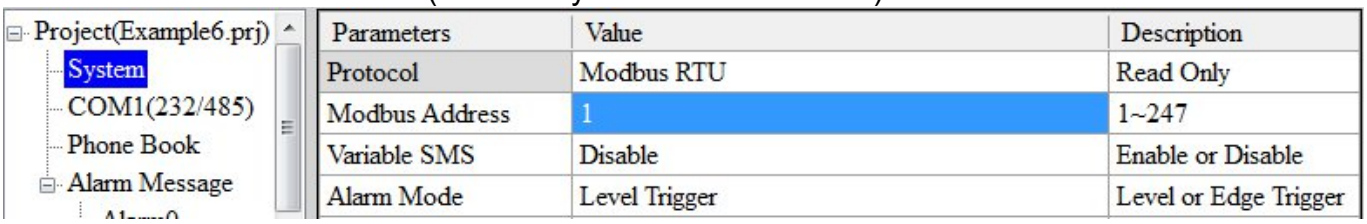
This example is shown how to send the defined voice alarm via the GTP-541M.

1. **Setting the parameters by the GTP-541M Series Utility**

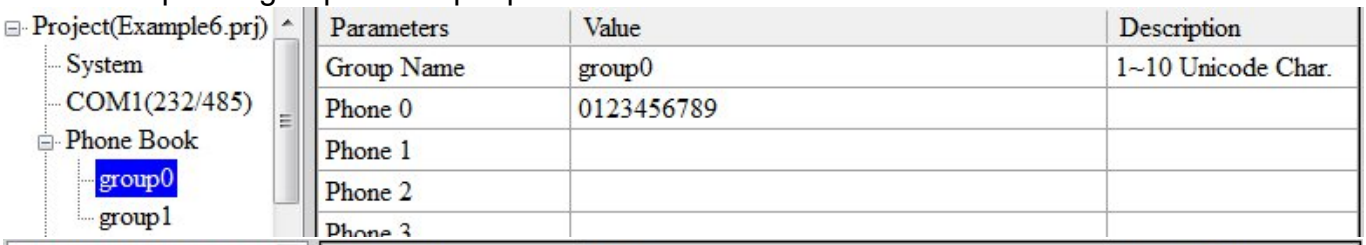
(1) New and name an “Example6.prj” project in the Utility.

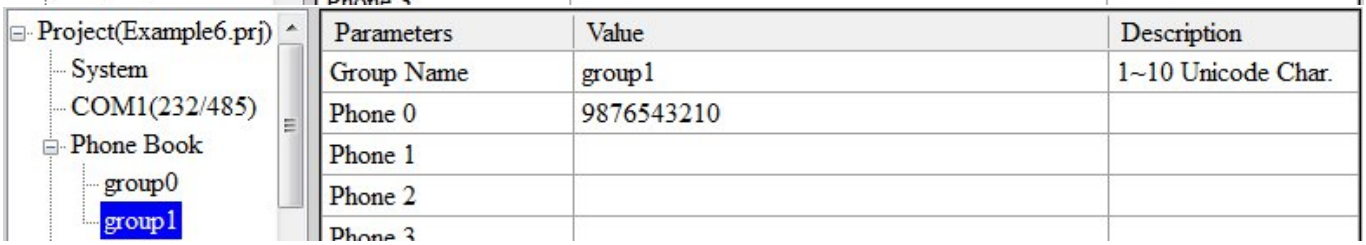


(2) Set the Modbus address as 1 (the factory default address is 1).

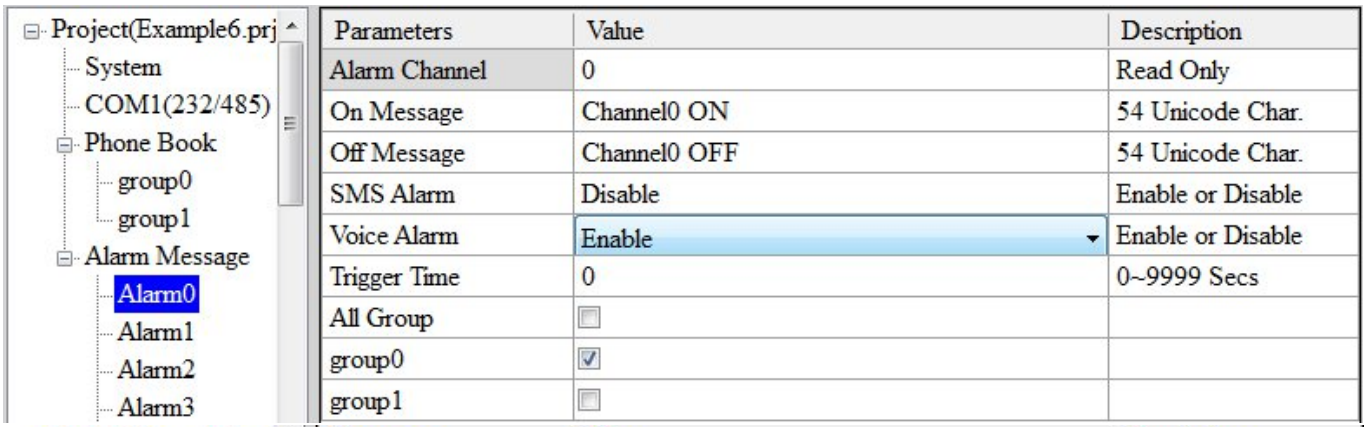


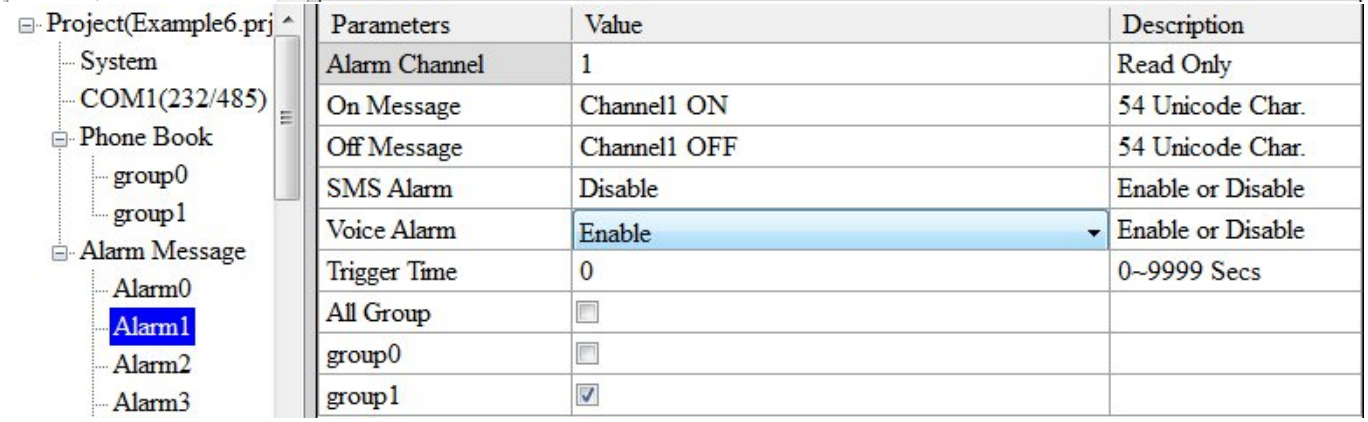
(3) Add 2 new phone groups and input phone numbers as follows:



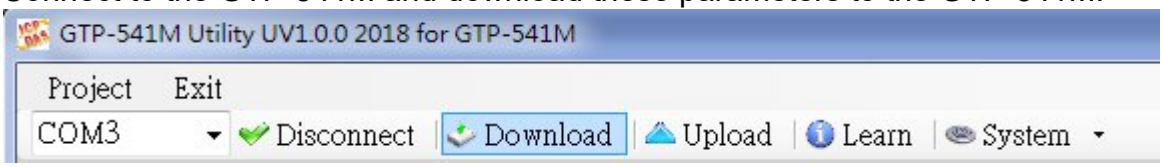


(4) Set the “Voice Alarm” fields as enable in Alarm Channel0 and Alarm Channel1 as follows.

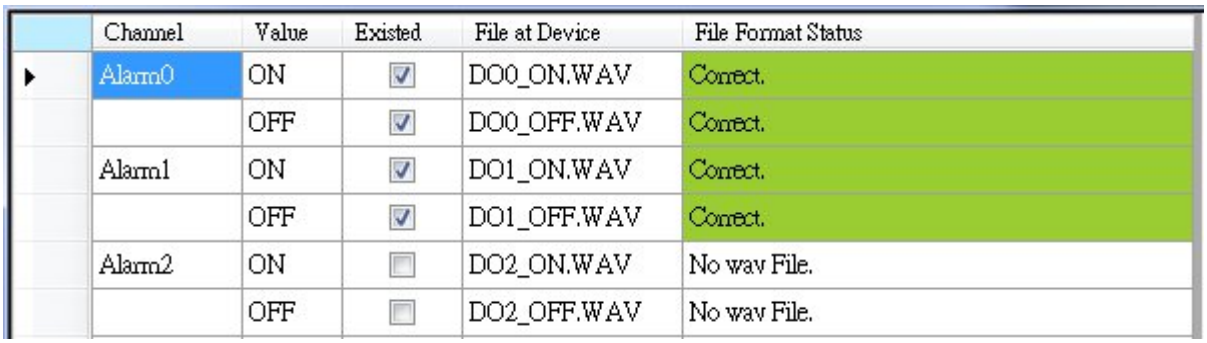




(5) Connect to the GTP-541M and download these parameters to the GTP-541M.



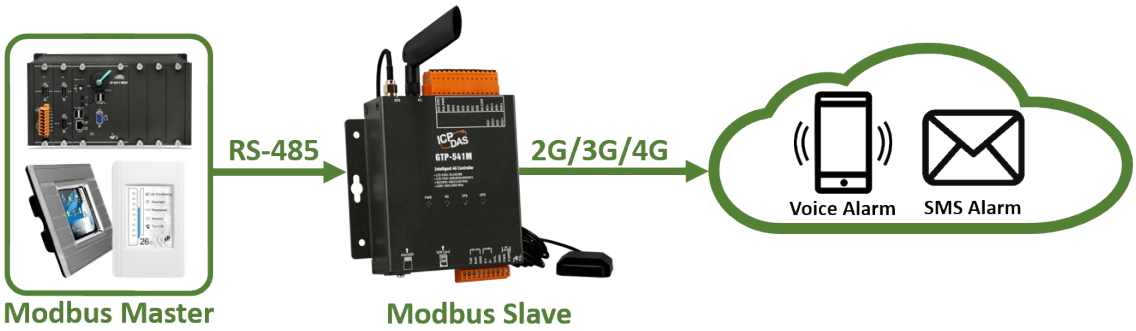
(6) Select the “System->Voice File Management” to download or confirm the voice files of the Alarm0 ON/OFF and Alarm1 ON/OFF are in the SD card.



Channel	Value	Existed	File at Device	File Format Status
Alarm0	ON	☑	DO0_ON.WAV	Correct.
	OFF	☑	DO0_OFF.WAV	Correct.
Alarm1	ON	☑	DO1_ON.WAV	Correct.
	OFF	☑	DO1_OFF.WAV	Correct.
Alarm2	ON	☐	DO2_ON.WAV	No wav File.
	OFF	☐	DO2_OFF.WAV	No wav File.

2. **Modbus RTU command**

(1) Connect COM1 (RS-232/RS-485) of the GTP-541M to the Host.



(2) The host sends the Modbus command to transmit the voice alarm from the GTP-541M.

Command and Description:

Command	Sending the voice alarm (16 Hex)	Command	01 05 00 00 FF 00 8C 3A
		Response	01 05 00 00 FF 00 8C 3A
Description	1. As the GTP-541M receives the command, it would sent the voice alarm. If the “SMS Alarm” is set as enable, the SMS would be sent. 2. The voice file is DO0_ON.WAV. 3. The voice is sent to the phones in the group0.		
Result	The phones in Group0 would receive the voice call from the GTP-541M. As take the call, you would heart the alarm voice in DO0_ON.WAV.		

Format Description:

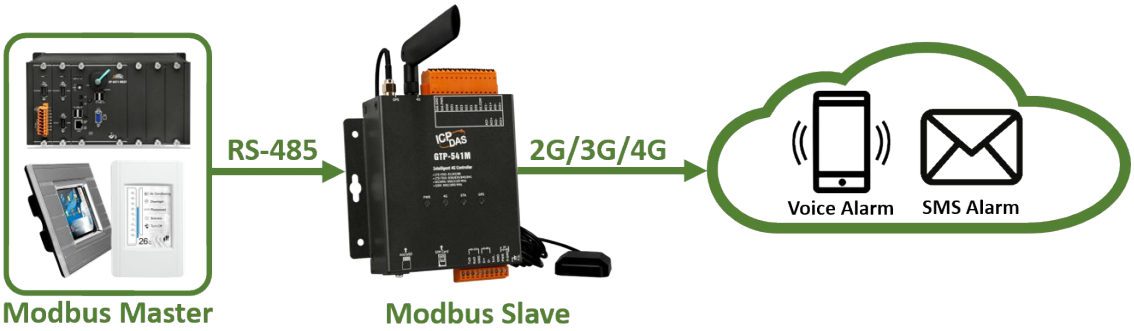
Sending the voice alarm		
Command	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00, To play DOx_ON.WAV file. The x is the number of Alarm channel. =0x0000, To play DOx_OFF.WAV file. The x is the number of Alarm channel.
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16 check code

5.8.8 Example 8: Check alarm sending status

This example shows how to check the sending/dialing status of SMS and voice alarms.

1. Modbus RTU command

(1) Connect COM1 (RS-232/RS-485) of the GTP-541M to the Host.



(2) The host sends a Modbus command to the GTP-541M to check whether the alarm sending process has completed. SMS alarms and voice alarms use different Modbus addresses.

(For SMS alarm) Command and Description:

Command	check whether the alarm sending is complete. (16 Hex)	Command	01 02 00 09 00 01 69 C8
		Response	01 02 01 00 A1 88
Description	1. This command example shows how to check whether SMS sending process is complete for the alarm group 0. 2. Please refer to the format description below for the Modbus addresses and their corresponding alarm groups.		
Result	When the GTP-541M receives the command, it will reply: 0 : if the process has not completed yet. 1 : if the process is complete. You can also check multiple alarm groups at the same time according to your needs.		

(For SMS alarm) Format Description:

Command	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x02
	Byte 2 ~ 3	Modbus address for checking whether the alarm group sending process has completed. Alarm groups from **0 to 127**. **Alarm group 0** corresponds to Modbus addresses **0x09** **Alarm group 1** corresponds to Modbus addresses **0x0A,**and so on.
	Byte 4 ~ 5	How many discrete input you want to read. Values are displayed in hexadecimal format. Byte 4 : High byte of the value. Byte 5 : Low byte of the value.

	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x02
	Byte 2	Bytes count of Data
	Byte 3	Data : represent SMS sending process (If you read multiple discrete inputs, the number of bytes in this part will vary according to your Modbus command.)
	Byte 4 ~ 5	CRC-16 check code

(For Voice alarm) Command and Description:

Command	check whether the alarm sending is complete. (16 Hex)	Command	01 02 00 89 00 01 68 20
		Response	01 02 01 00 A1 88
Description	1. This command example shows how to check whether Voice dialing process is complete for the alarm group 0. 2. Please refer to the format description below for the Modbus addresses and their corresponding alarm groups.		
Result	When the GTP-541M receives the command, it will reply: 0 : if the process has not completed yet. 1 : if the process is complete. You can also check multiple alarm groups at the same time according to your needs.		

(For Voice alarm) Format Description:

Command	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x02
	Byte 2 ~ 3	Modbus address for checking whether the alarm group dialing process has completed. Alarm groups from **0 to 127**. **Alarm group 0** corresponds to Modbus addresses **0x89** **Alarm group 1** corresponds to Modbus addresses **0x8A,**and so on.
	Byte 4 ~ 5	How many discrete input you want to read. Values are displayed in hexadecimal format. Byte 4 : High byte of the value. Byte 5 : Low byte of the value.
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x02
	Byte 2	Bytes count of Data
	Byte 3	Data : represent voice dialing process (If you read multiple discrete inputs, the number of bytes in this part will vary according to your Modbus command.)
	Byte 4 ~ 5	CRC-16 check code

(3) The host sends a Modbus command to the GTP-541M to check the sending / dialing status of each phone. SMS alarms and voice alarms use the same Modbus addresses.

We recommend that you check whether the sending/dialing process is complete before checking the sending/dialing status of each phone. Otherwise, part of the phone list may still be waiting to be sent or dialed. You will need to check again after the process is complete.

Command and Description:

Command	check the sending / dialing status (16 Hex)	Command	01 04 00 A9 00 01 E1 EA
		Response	01 04 02 04 00 BB F0
Description	1. This command example shows how to check the sending status of the first phone in the phone group 0 of alarm group 0. 2. Each alarm group occupies 256 registers, with each register representing one phone. For example : **Alarm group 0** corresponds to Modbus addresses **from 0xA9 to 0x1A8**. Within this range, the Modbus addresses: **0xA9~0xB8** represent **Phone group 0 , Phone 0 ~ Phone 15** **0xB9~0xC8** represent **Phone group 1, Phone 0 ~ Phone 15** and so on. You can refer to the format description shown below.		
Result	As the GTP-541M receives the command, it will reply with the alarm sending status according to the given Modbus address. You can also check multiple statuses at the same time according to your needs.		

Format Description:

Command	Byte 0	The Modbus Address of the GTP-541M				
	Byte 1	Function Code = 0x04				
	Byte 2 ~ 3	Modbus address for sending status. Each alarm group occupies 256 registers. (Partial examples are listed below. You can calculate the index to get the status of other alarm groups.)				
		Alarm group	Phone Group		Phone number	
		0	0	0xA9~0xB8	0	0xA9
					1	0xAA
					2	0xAB
					3	0xAC
					4	0xAD
					5	0xAE
					6	0xAF
					7	0xB0
					8	0xB1
					9	0xB2

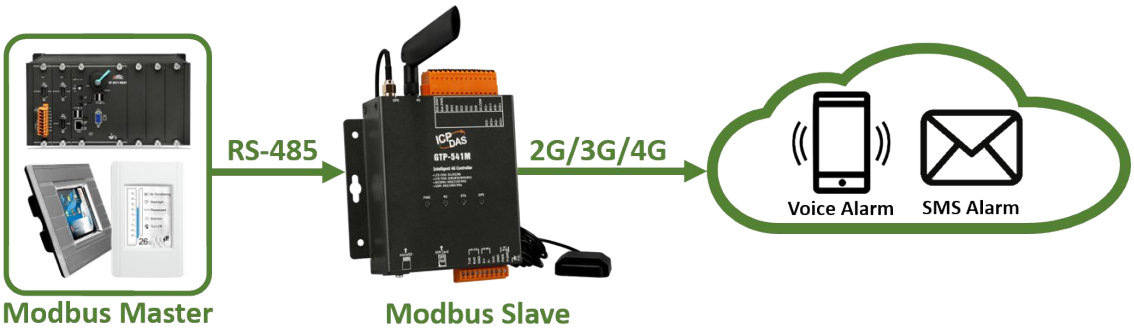
					10	0xB3
					11	0xB4
					12	0xB5
					13	0xB6
					14	0xB7
					15	0xB8
			1	0xB9~0xC8	0	0xB9
					1	0xBA
					2	0xBB
					3	0xBC
					4	0xBD
					5	0xBE
					6	0xBF
					7	0xC0
					8	0xC1
					9	0xC2
					10	0xC3
					11	0xC4
					12	0xC5
					13	0xC6
					14	0xC7
					15	0xC8
	Byte 4 ~ 5	How many registers you want to read. Values are displayed in hexadecimal format. Byte 4 : High byte of the value. Byte 5 : Low byte of the value.				
	Byte 6 ~ 7	CRC-16 check code				
Correct Response	Byte 0	The Modbus Address of the GTP-541M				
	Byte 1	Function Code = 0x04				
	Byte 2	Bytes count of Data				
	Byte 4 ~ 5	Data High bytes : represent SMS sending status Data Low bytes : represent Voice dialing status If you read multiple registers, the number of bytes in this part will vary according to your Modbus command.)				
	Byte 6 ~ 7	CRC-16 check code				

5.8.9 Example 9: Sending the manager SMS

This example shows how to send the manager SMS.
The manager SMS is composed of the list of phone numbers for which the voice alarm was not dialed successfully. If you do not want to query the list of phone numbers that failed to be dialed one by one using Modbus commands, you can send a manager SMS to a designated phone to view the list directly on the phone.

1. Modbus RTU command

(1) Connect COM1 (RS-232/RS-485) of the GTP-541M to the Host.



(2) The host sends a Modbus command to the GTP-541M to check whether the machine is ready to send a manager SMS.

In the worst-case scenario, the list of failed call attempts may be very long, resulting in a lengthy SMS message, so the message will be divided into multiple SMS messages. We recommend checking whether the device is ready to send before sending the manager SMS to avoid incomplete transmission of the list.

Command and Description :

Command	check if machine is ready to send SMS (16 hex)	Command	01 02 01 09 00 01 68 34
		Response	01 02 01 01 60 48
Description	This command shows how to check whether the machine is ready to send a manager SMS.		
Result	When the GTP-541M receives the command, it will reply with a status: 0 (not ready) or 1 (ready).		

Format Description:

Command	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x02
	Byte 2 ~ 3	Fixed Modbus address : 0x109
	Byte 4 ~ 5	Fixed bits number : 0x1
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x02
	Byte 2	Bytes count of Data
	Byte 3	Data: represents whether the machine is ready to

		send a manager SMS.
	Byte 4 ~ 5	CRC-16 check code

(3) The host sends a Modbus command to the GTP-541M to set the manager phone number (designated phone number) and trigger manager SMS.

Command and Description :

Command	set the manager phone number (16 Hex)	Command	01 10 01 DF 00 06 0C 30 31 32 33 34 35 36 37 38 39 00 00 53 8C
		Response	01 10 01 DF 00 06 70 0D
	Trigger manager SMS (16 Hex)	Command	01 05 00 84 FF 00 CC 13
		Response	01 05 00 84 FF 00 CC 13
Description	1. Set the phone number to 0123456789 (max. 20 digits). 2. Trigger manager SMS.		
Result	Phone : 0123456789, if you trigger the manager SMS, the message would be sent to this phone.		

Format Description:

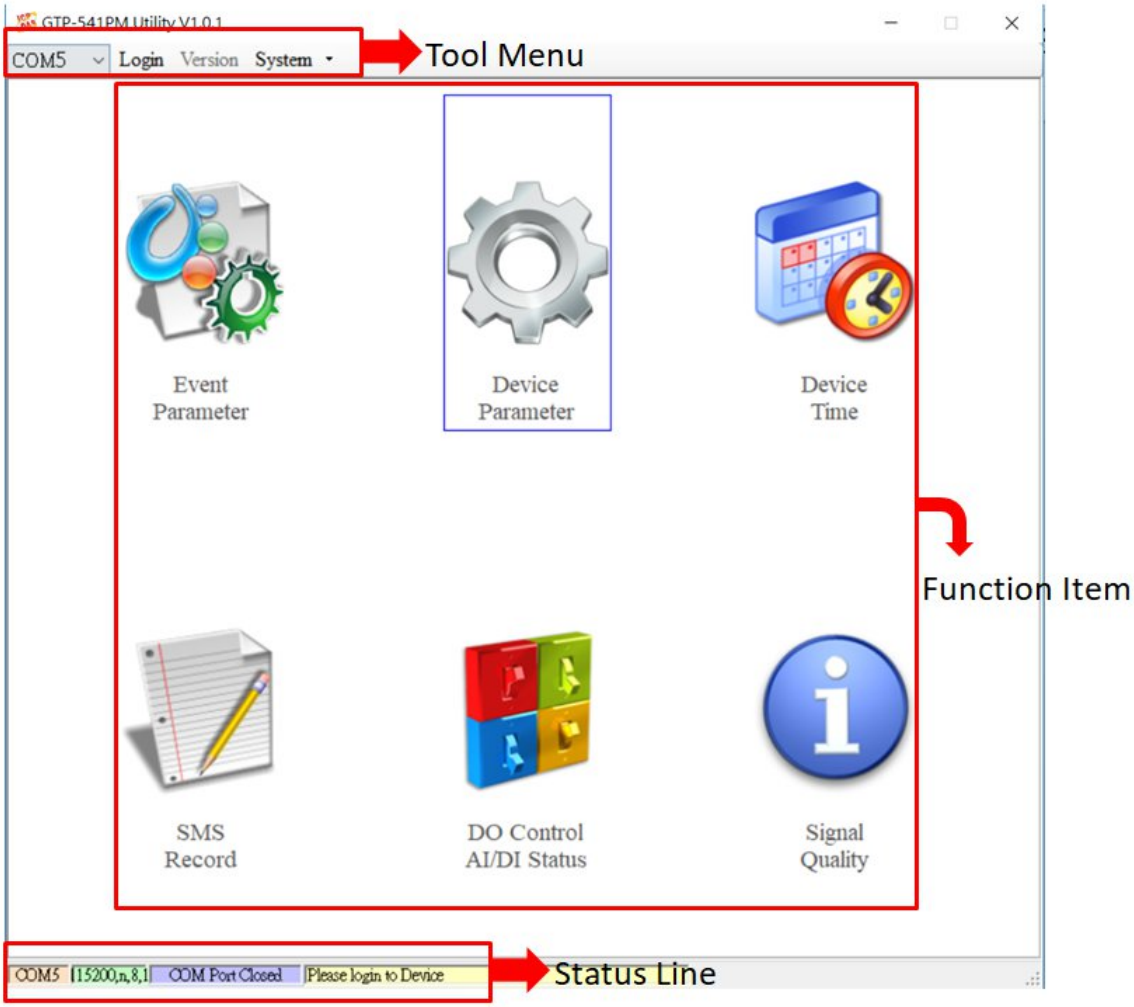
set the manager phone number		
Command	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x10
	Byte 2 ~ 3	Fixed Modbus address : Start from 0x1DF
	Byte 4 ~ 5	How many register you want to write. Values are displayed in hexadecimal format. Byte 4 : High byte of the value. Byte 5 : Low byte of the value.
	Byte 6	How many bytes you want to write.
	Byte 7~18	Phone number, ASCII code, at least one 00 is the end character. If the phone number is 20, the end character is not required.
	Byte 9~20	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x10
	Byte 2~3	Fixed Modbus address : Start from 0x1DF
	Byte 4~5	How many register you write. Values are displayed in hexadecimal format. Byte 4 : High byte of the value. Byte 5 : Low byte of the value.
	Byte 6~7	CRC-16 check code

Trigger manager SMS		
Command	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Fixed Modbus address : Start from 0x84

	Byte 4 ~ 5	Fixed value = 0xFF00
	Byte 6~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2~3	Fixed Modbus address : Start from 0x84
	Byte 4~5	Fixed value = 0xFF00
	Byte 6~7	CRC-16 check code

6.DIOSMS Utility main screen description

The GTP-541M SMS Utility layout mainly includes the following parts, which are described below.：



Toolbar

- COM：

  Select PC-side COM PORT connected to GTP-541M

- Login/Logout：

  Before you can do anything with the GTP-541M, you must log in. After the login is successful, the option will be logged out, and the options in the Utility will allow the operation. If the SMS machine has been reopened or turned off, you must log in again.

- Version：

  GTP-541M Firmware and Utility version information

- System：

There are two functions of Recover to Factory Settings and Restart GTP-541M (Reset Device)

Function option

- Event Parameter：
  Event related setting of GTP-541M.
- Device Parameter:

  Set parameters for Comport related functions.
- SMS Record：

  It can query the records of Auto Report events and SMS events, and display up to 1000 pens. The number of stored SMS messages increases or decreases depending on the content.
- Device Time：

  Query and set device time.
- DO Control/DI/AI Status：

  Query I/O status and DO control.
- Signal Quality：

  Query the signal strength of the current device.

Status column

Display information about the GTP-541M SMS Utility operation, from left to right, in order

(1) PC-side COM Port number used by the Utility.

(2) Transmission parameter setting of COM Port.

(3) Current COM Port connection status.

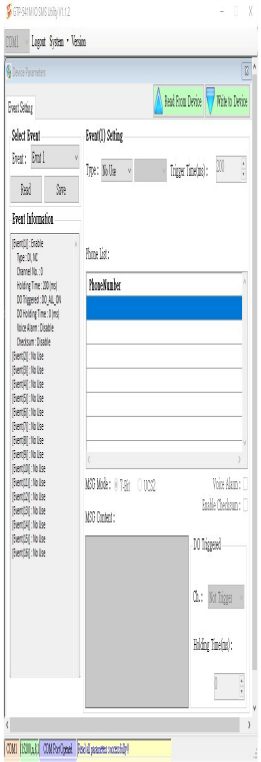
(4) The result of each operation, such as the “storage” action success or failure.

6.1 Main parameters

Set the block of 16 Event types, trigger conditions, trigger time, phone number and SMS content, etc:

6.1.1 Description of the Event Parameter

This is the page in the main parameter window. The parameters are as follows:



◆ Select Event

Select to set the first few events, press Read when the selection is completed, it will switch to the setting options of the Event, a total of 16 events.

◆ Event Information

After the Event Setting is set, press the Select button of the Select Event, and the settings of each Event will be updated in the form, as shown in Figure 6.1.1

Figure 6.1.1

◆ Event(x) Setting

The number in the Event(x)Setting bracket indicates the Event number, and the Type indicates the type of the Event (DI/AI/Counter/AutoReport). The interface to be set for different Types is also different:

1. DI Type:
   When Type selects DI, it will change the relevant setting interface to Figure 6.1.2:

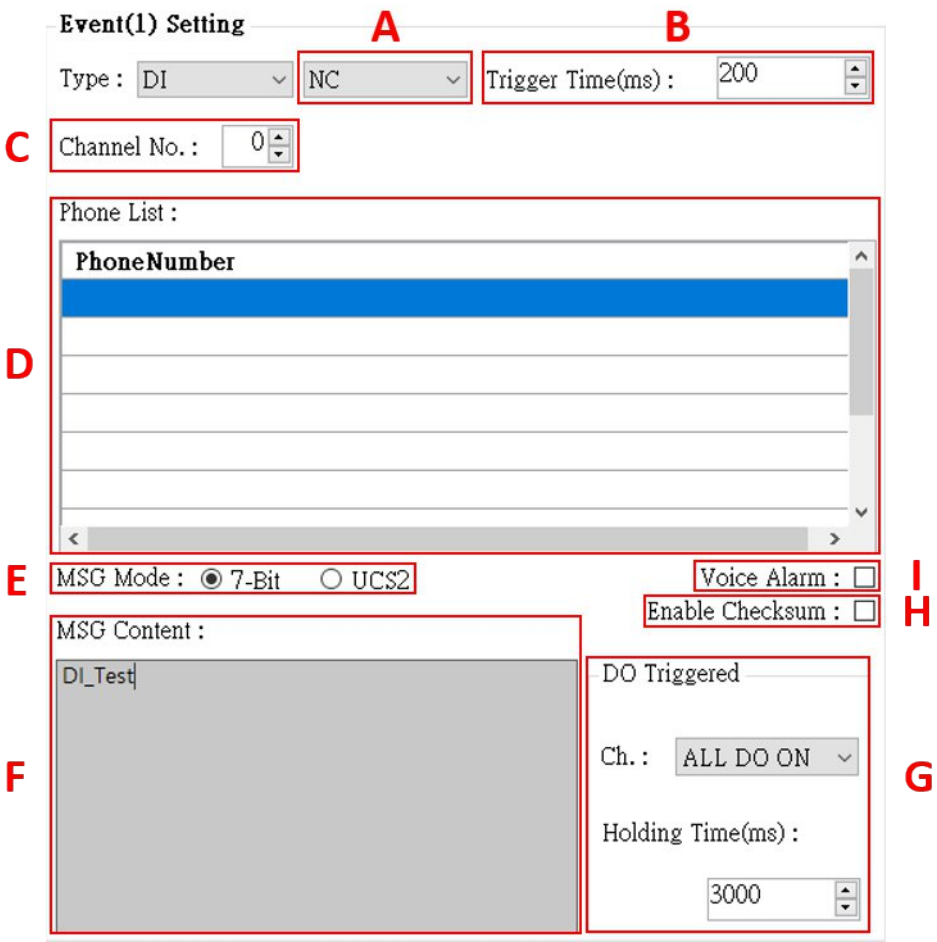


Figure 6.1.2

The parameters are as follows:

A. When the NC (long-closed) is selected, the event is triggered after the circuit is disconnected. When NO (long open) is selected, the event is triggered after the circuit is closed. For the DI circuit, please refer to page 11.

B. Setting the DI trigger signal needs to remain unchanged until the set time (in ms)。

C. Set one of the DIs (0~4) as the monitoring point. When this point meets the set condition, an alarm will be triggered.
Note 1: DI points set by Counter type cannot be selected repeatedly。

D. The target mobile phone number sent by the triggered alert message, up to 10 groups.

E. The encoding of the content of the newsletter, only the English number can be input in 7-bit, and the multi-language can be input in UCS2.

F. Content of the newsletter, up to 160 words in 7-bit, up to 70 words in UCS2, restricted characters: '!', '@', '>';'!', '@' at the beginning of the newsletter or using '>', a parsing error will occur, please do not use.

G. Select the DO that is turned on when the alarm is triggered:

Ch.:

There are four options "Not Trigger", "DO0 ON", "DO1 ON" and "ALL DO ON". The four DO states can be selected, in order, "Do not turn on", "Open DO0", "Open DO1" "and" DO is fully open".

Holding Time (ms):

DO triggers the state to maintain the time, 0 means that it is always maintained, and other numbers are the calculation time. When the value reaches this value, the DO triggered by the alarm will be turned off. The time unit is ms.

H. Choose whether to turn on voice

I. Enable SMS DBS checksum

- Normal format: <Message>
- SMSDBS format: ALARM;<Machine_ID>;<Date>;<Time>;<Message>(<CRC>)

2. AI Type:

When Type selects AI, it will change the relevant setting interface to Figure 6.1.3:

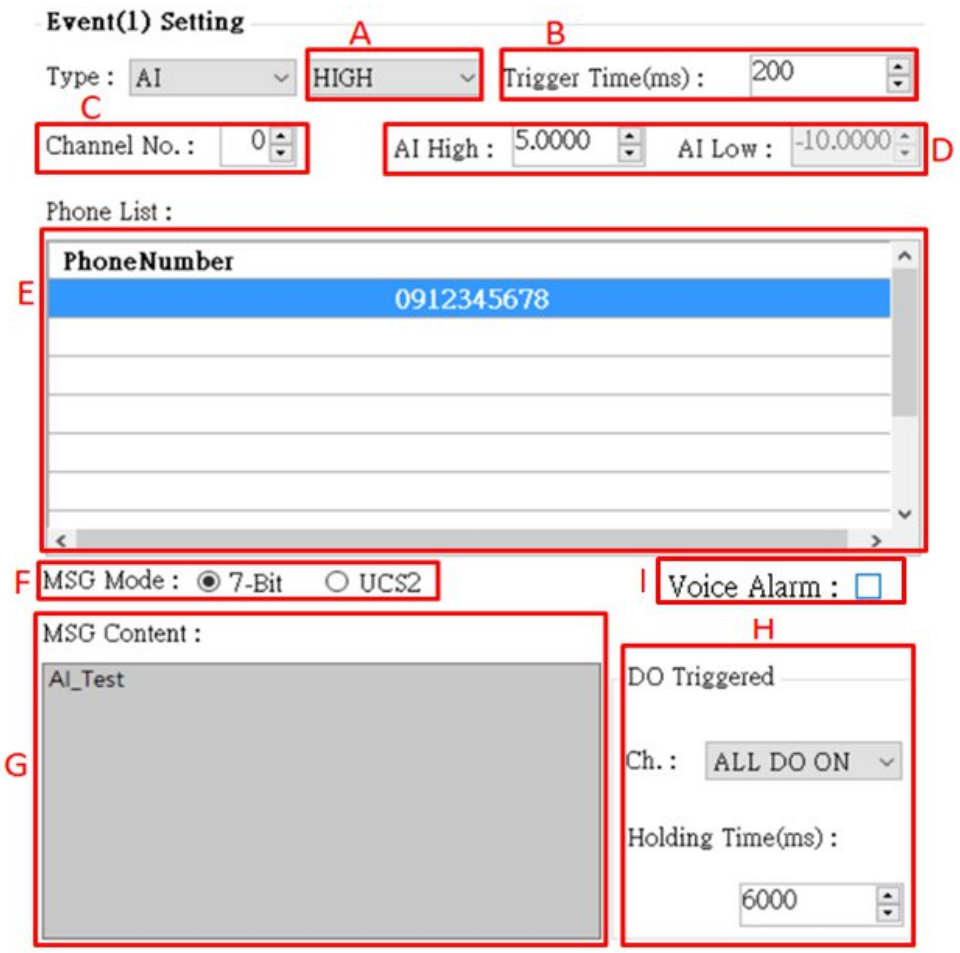


Figure 6.1.3

The parameters are as follows:

A. When “HIGH” is selected, the Ai input value is greater than the AI High value and the alarm will be triggered. When “LOW” is selected, the Ai input value is less than the AI Low value and the alarm will be triggered. When “HL” is selected, the Ai input value is greater than the AI High value or An alarm is triggered when the value is less than AI Low.

B. The alarm will be triggered when the AI trigger value needs to be continuously higher or lower than the set value until the set time (in ms) is exceeded.

C. Set one of the AI (0~3) as the monitoring point, which will trigger the alarm when it meets the set condition.

D. Alarm trigger boundary for AI values.

E. The target mobile phone number sent by the triggered alert message, up to 10 groups。

F. The encoding of the content of the newsletter, only the English number can be input in 7-bit, and the multi-language can be input in UCS2.

G. Content of the newsletter, up to 160 words in 7-bit, up to 70 words in UCS2, restricted characters: '!', ‘@’, ‘>’;'!', ‘@’ at the beginning of the newsletter or using ’>’, a parsing error will occur, please do not use.

H. Select the DO that is turned on when the alarm is triggered:

Ch.:

There are four options “Not Trigger”, “DO0 ON”, “DO1 ON” and “ALL DO ON”. The four DO states can be selected, in order, “Do not turn on”, “Open DO0”, “Open DO1” "And" DO is fully open.

Holding Time (ms):

DO triggers the state to maintain the time, 0 means that it is always maintained, and other numbers are the calculation time. When the time reaches this value, the DO triggered by the alarm is turned off, and the time unit is ms.

I. Choose whether to turn on voice

3. Counter Type:

When Type selects Counter, it will change the relevant setting interface to Figure 5.1.4:

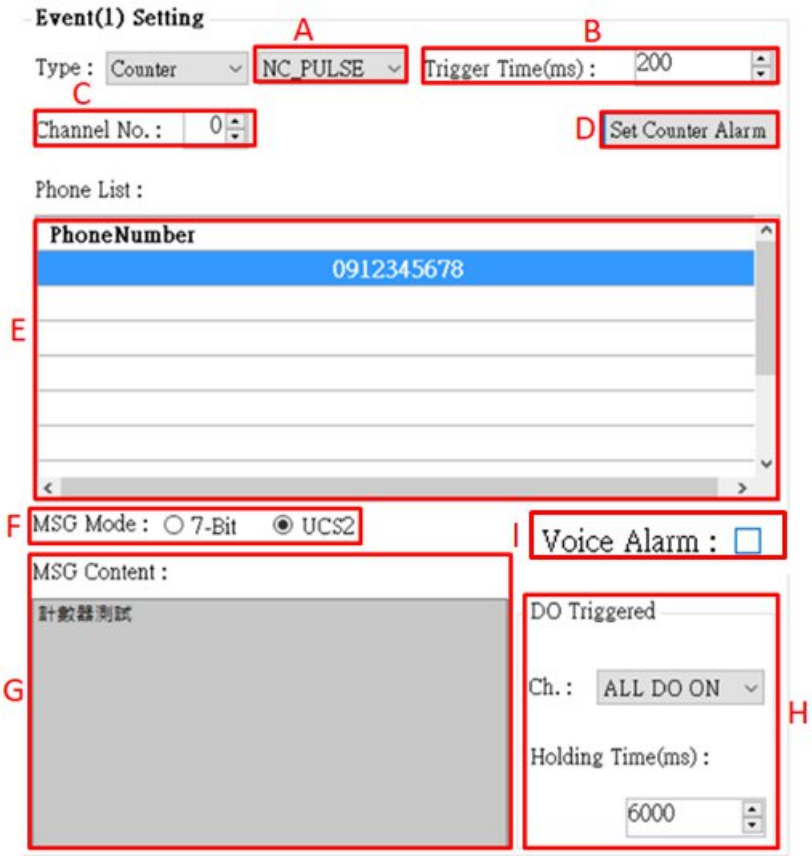


Figure 6.1.4

The parameters are as follows:

A. When NC_PULSE is selected, the count value is increased by one after the circuit is disconnected. When NO_PULSE is selected (long open), the count value is increased by one after the circuit is closed.

B. Setting the DI trigger signal needs to remain unchanged until the set time (in ms).

C. Set one of the DIs (0~4) as the monitoring point. When this point meets the set condition, the count value will increase.
Note: The DI point set by DI type cannot be selected repeatedly.

D. Set the counter parameters, as shown in Figure 6.1.5
   (1) Counter name, Counter0~Counter4 corresponds to DI0~DO4.
   (2) Counter current count value.
   (3) Set the current value of the counter.
   (4) Counter usage status.
   (5) The value of the counter trigger alarm, which must be greater than the value of Set Value by more than 10.
   (6) Read the current status of Device Counters.
   (7) Write Counters to Device.

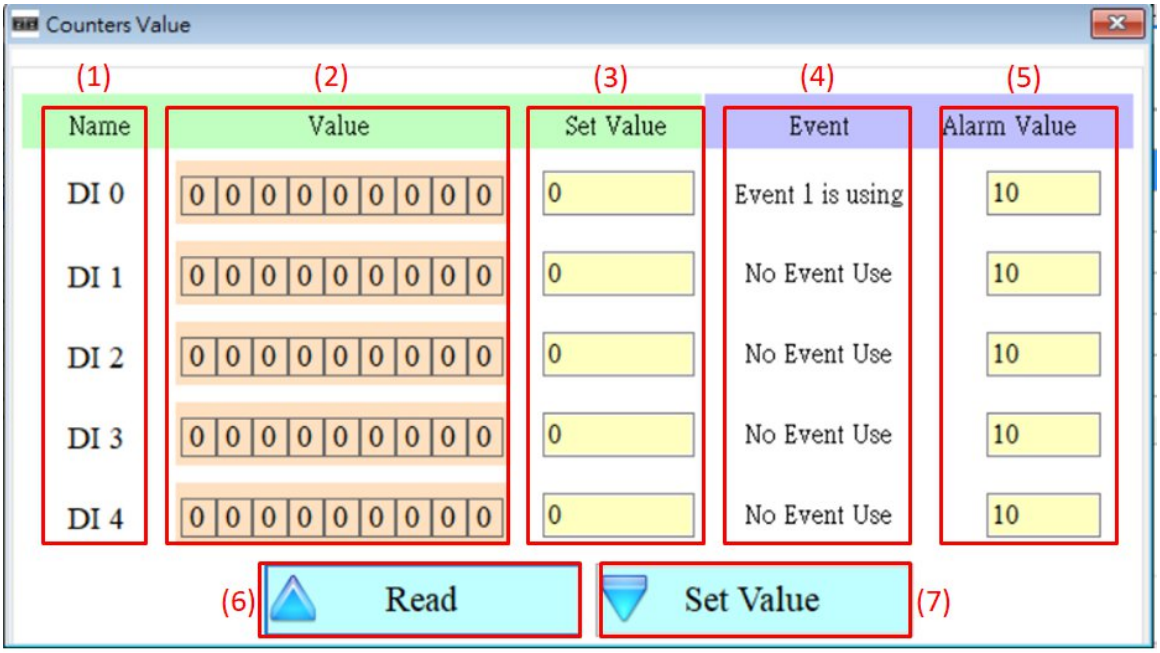


Figure 6.1.5

E. The target mobile phone number sent by the triggered alert message, up to 10 groups.

F. The encoding of the content of the newsletter, only the English number can be input in 7-bit, and the multi-language can be input in UCS2.

G. Content of the newsletter, up to 160 words in 7-bit, up to 70 words in UCS2, restricted characters: '!', '@', '>';'!', '@' at the beginning of the newsletter or using '>', a parsing error will occur, please do not use.

H. Select the DO that is turned on when the alarm is triggered:

Ch.:

There are four options "Not Trigger", "DO0 ON", "DO1 ON" and "ALL DO ON". The four DO states can be selected, in order, "Do not turn on", "Open DO0", "Open DO1" "and" DO is fully open".

Holding Time (ms):

DO triggers the state to maintain the time, 0 means that it is always maintained, and other numbers are the calculation time. When the value reaches this value, the DO triggered by the alarm will be turned off. The time unit is ms.

I. Choose whether to turn on voice

4. Auto-Report Type:

When Type selects Auto-Report, it will change the relevant setting interface to Figure 6.1.6:

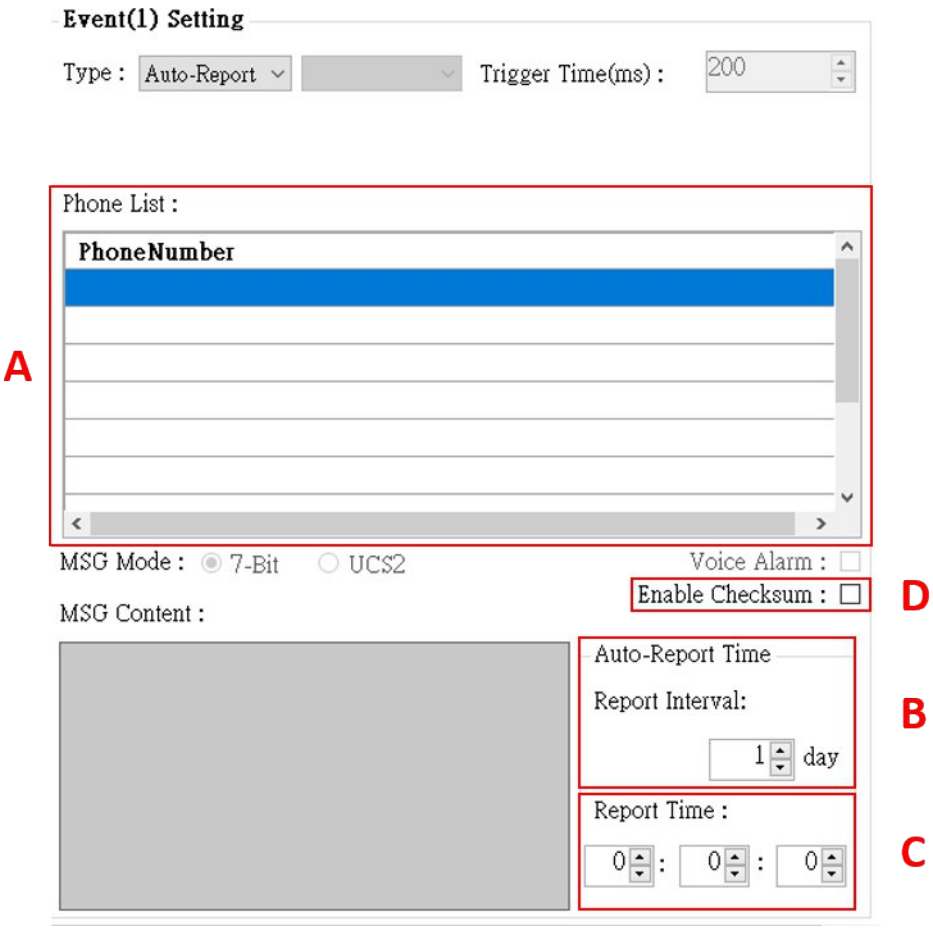


Figure 6.1.6

The parameters are as follows:

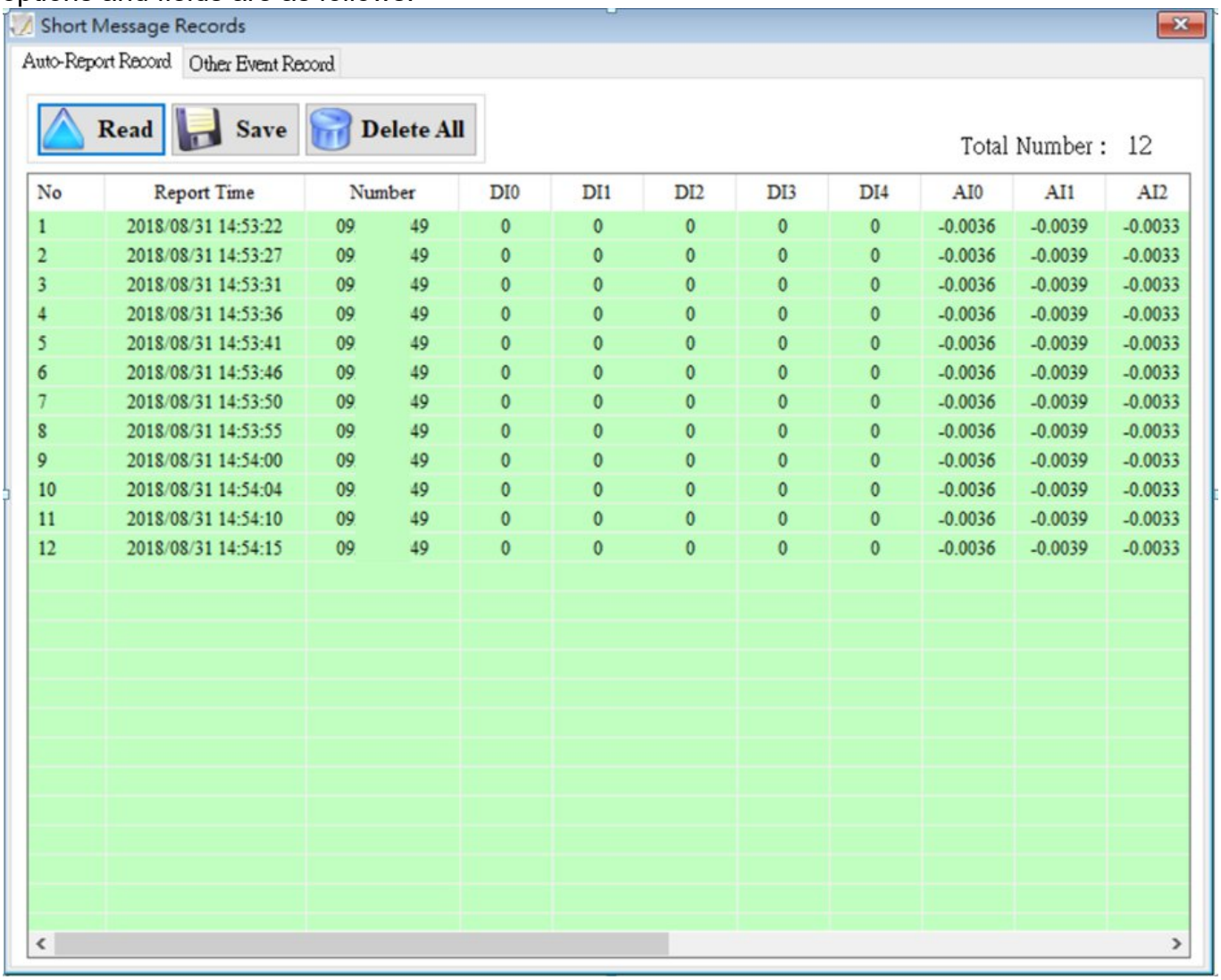
A. The target mobile phone number sent by the triggered alert message, up to 10 groups.
B. Set a few days to return once (1~30 days).
C. Set the time for return, from left to right, respectively, hour, minute, second.
D. Enable SMS DBS checksum
   - Normal format: <Message>
   - SMSDBS format: CRPT;<Machine_ID>;<tDate>;<Time>;<Counter0>;...;<Counter5>(<CRC>)

6.2 SMS Record Description

This window can query, store and delete the return record of Auto-Report and the return report of the newsletter event.

6.2.1 Auto-Report report

This page can be used to query the recorded Auto-Report report records in GTP-541M. The options and fields are as follows:



No	Report Time	Number		DI0	DI1	DI2	DI3	DI4	AI0	AI1	AI2
1	2018/08/31 14:53:22	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
2	2018/08/31 14:53:27	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
3	2018/08/31 14:53:31	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
4	2018/08/31 14:53:36	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
5	2018/08/31 14:53:41	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
6	2018/08/31 14:53:46	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
7	2018/08/31 14:53:50	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
8	2018/08/31 14:53:55	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
9	2018/08/31 14:54:00	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
10	2018/08/31 14:54:04	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
11	2018/08/31 14:54:10	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033
12	2018/08/31 14:54:15	09	49	0	0	0	0	0	-0.0036	-0.0039	-0.0033

Operating option description

- Read：

  Read the transmission record and data of Auto-Report from GTP-541M, and display up to 1000 pens.

- Save：

  Save the record as a .csv file.

- Delete All：

  Remove all return records from GTP-541M.

- Total Number

  Total number of fields.

Field description

- No：

  Record number.

- Report Time：

  Time on the GTP-541M when the newsletter is sent.

- Number：

  Phone number sent to the target.

- DI(0~4)：

  DI status.

- AI(0~3):

  AI value.

- CI(0~4):

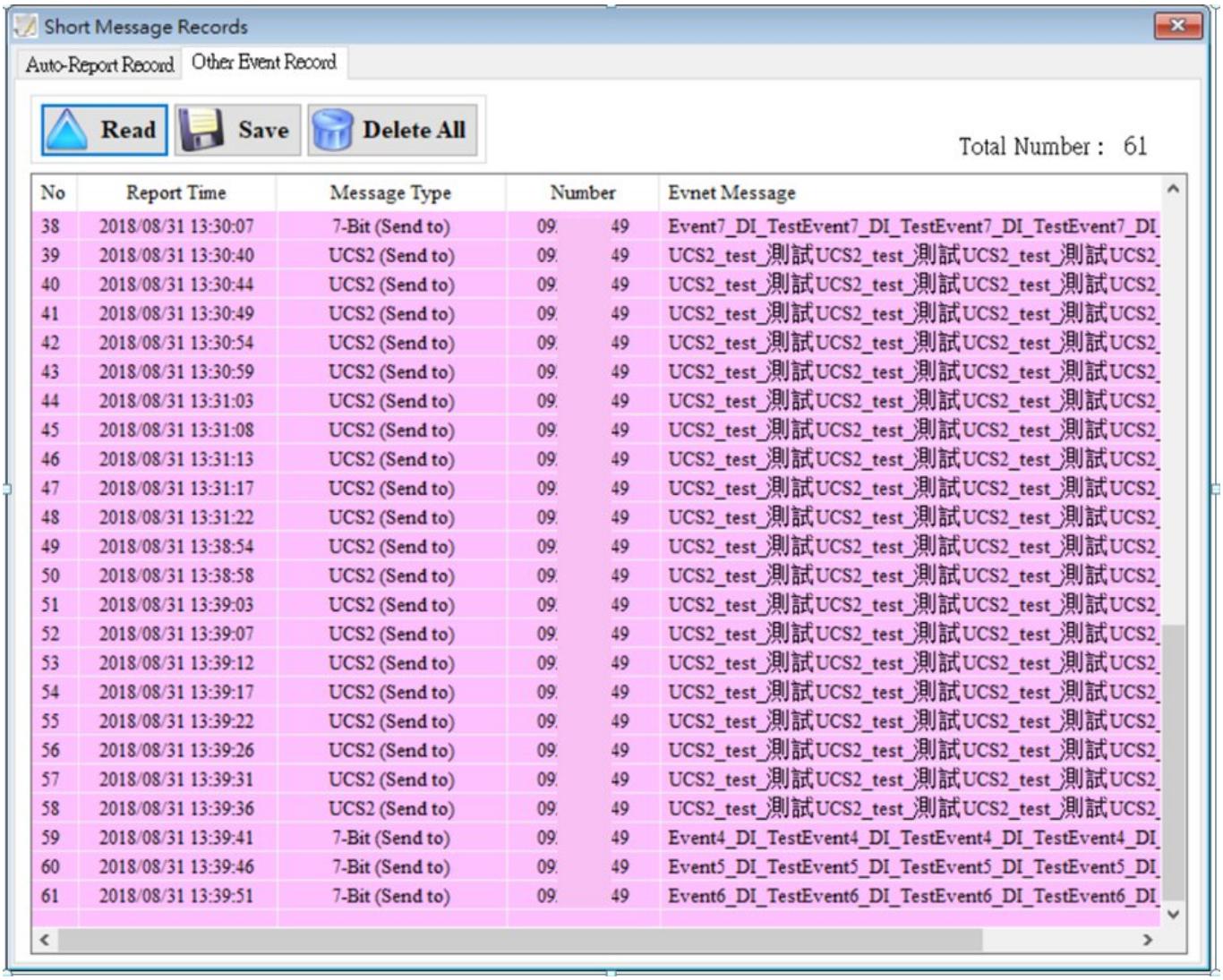
  Counter value.

- DO(0~1):

  DO status.

6.2.2 Event record query

This page can be used to query the records of all incoming events in GTP-541M. The options and fields are as follows：



No	Report Time	Message Type	Number	Evnet Message
38	2018/08/31 13:30:07	7-Bit (Send to)	09 49	Event7_DI_TestEvent7_DI_TestEvent7_DI_TestEvent7_DI_
39	2018/08/31 13:30:40	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
40	2018/08/31 13:30:44	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
41	2018/08/31 13:30:49	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
42	2018/08/31 13:30:54	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
43	2018/08/31 13:30:59	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
44	2018/08/31 13:31:03	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
45	2018/08/31 13:31:08	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
46	2018/08/31 13:31:13	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
47	2018/08/31 13:31:17	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
48	2018/08/31 13:31:22	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
49	2018/08/31 13:38:54	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
50	2018/08/31 13:38:58	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
51	2018/08/31 13:39:03	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
52	2018/08/31 13:39:07	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
53	2018/08/31 13:39:12	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
54	2018/08/31 13:39:17	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
55	2018/08/31 13:39:22	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
56	2018/08/31 13:39:26	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
57	2018/08/31 13:39:31	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
58	2018/08/31 13:39:36	UCS2 (Send to)	09 49	UCS2_test_測試UCS2_test_測試UCS2_test_測試UCS2_
59	2018/08/31 13:39:41	7-Bit (Send to)	09 49	Event4_DI_TestEvent4_DI_TestEvent4_DI_TestEvent4_DI_
60	2018/08/31 13:39:46	7-Bit (Send to)	09 49	Event5_DI_TestEvent5_DI_TestEvent5_DI_TestEvent5_DI_
61	2018/08/31 13:39:51	7-Bit (Send to)	09 49	Event6_DI_TestEvent6_DI_TestEvent6_DI_TestEvent6_DI_

Record field description

- Read：

  Read all event records from GTP-541M, display up to 1000 pens, and increase the number of stored SMS messages according to the amount of content.

- Save：

  Store event log file.

- Delete All：

  Remove all event records from GTP-541M containing Auto-Report events.

- Total Number

  Total number of fields.

Field description

- No：

  Event record number.

- Report Time：

  Time on GTP-541M when sending newsletters.

- Message Type：

  Newsletter type.

- Number：

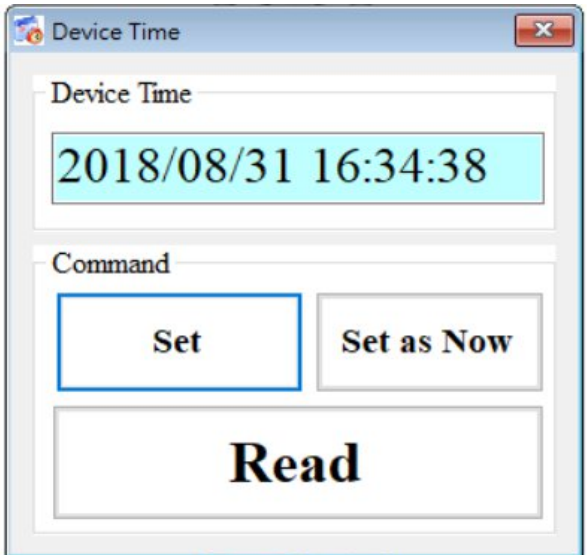
  Send a text message and receive the destination phone number of the newsletter.

- Event Message：

  Newsletter content of the event.

6.3 Device Time Parameter Description

Through this window, you can change and query the time of GTP-541M. The following are the operation options and descriptions of the fields：



Field description

- Device Time：

  Display device current time.

- Command：

  Set time and read time.

Operating option description

- Set：

  The user can enter the date and time into the Device Time field, and Set will set the time in the Device Time field to the device.

- Set as Now：

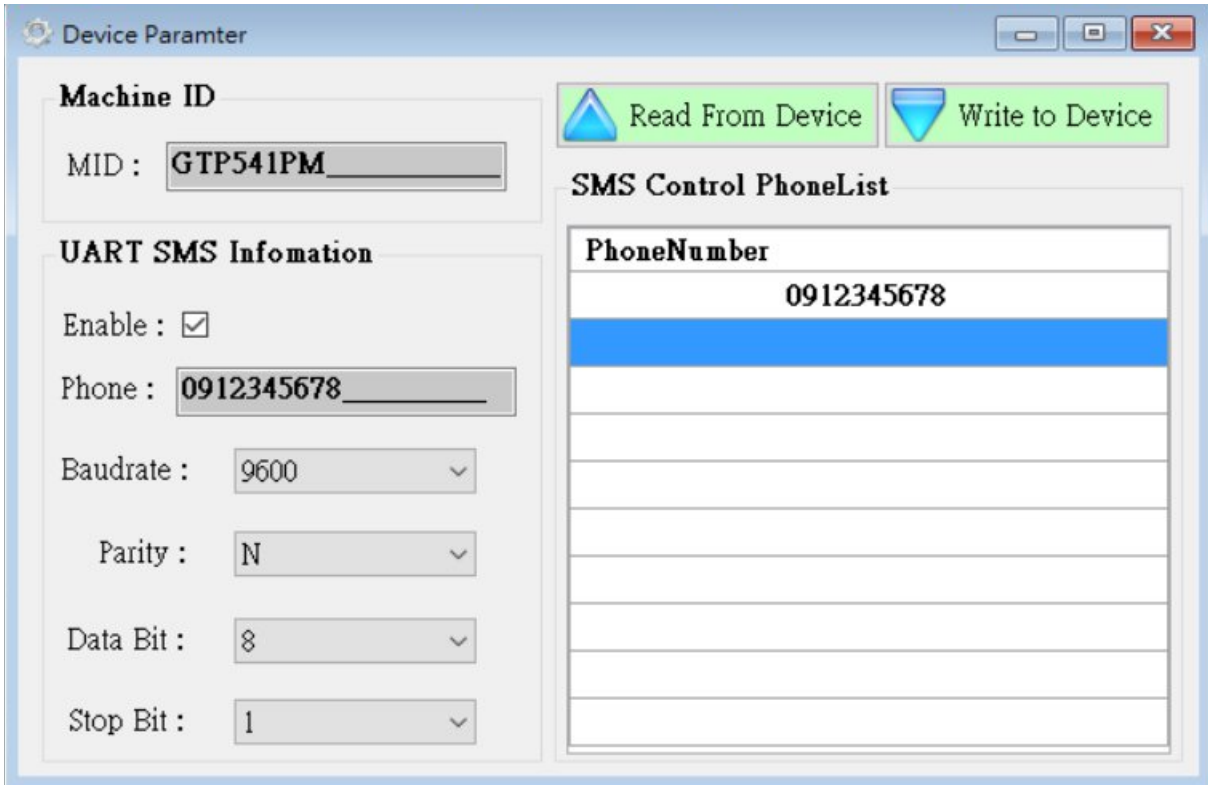
  Read the current date and time of the PC and set it to the device.

- Read：

  Display device current time.

6.4 Device Parameter Parameter Description

This window provides functions for setting the device name and communication, communication parameters, etc. The operation options and fields are as follows:



Field description

- Machine ID：

  Users can customize the device name from this.

- Uart SMS Infomation：

  The user can set the UART parameters by this function. The function is to send the beginning of the "+++" through the Uart and the "message content" to trigger the GTP-541M to send the SMS. The content of the message is "+++".

  For example: Uart sends +++Uart_Test, GTP-541M will send a message with Uart_Test to the phone number 0912345678.

- SMS Control PhoneList：

  The telephone number of the authority control device can be set accordingly. For related instructions, please refer to page 69.

Operating option description

- MID：

  The name of the GTP-541M.

- Enable：

  Whether to enable the Uart SMS Command function.

- Phone：

  Receive the phone number of the newsletter.

- Baudrate:

  Comport Baudrate for RS-232/RS-485。

- Parity:

  Comport Parity of RS-232/RS-485.

- Data Bit:

  Comport Data Bit for RS-232/RS-485.

- Stop Bit:

  Comport Stop Bit for RS-232/RS-485.

- Phone Number:

  Phone number with permission to query and set the device.

- Read From Device:

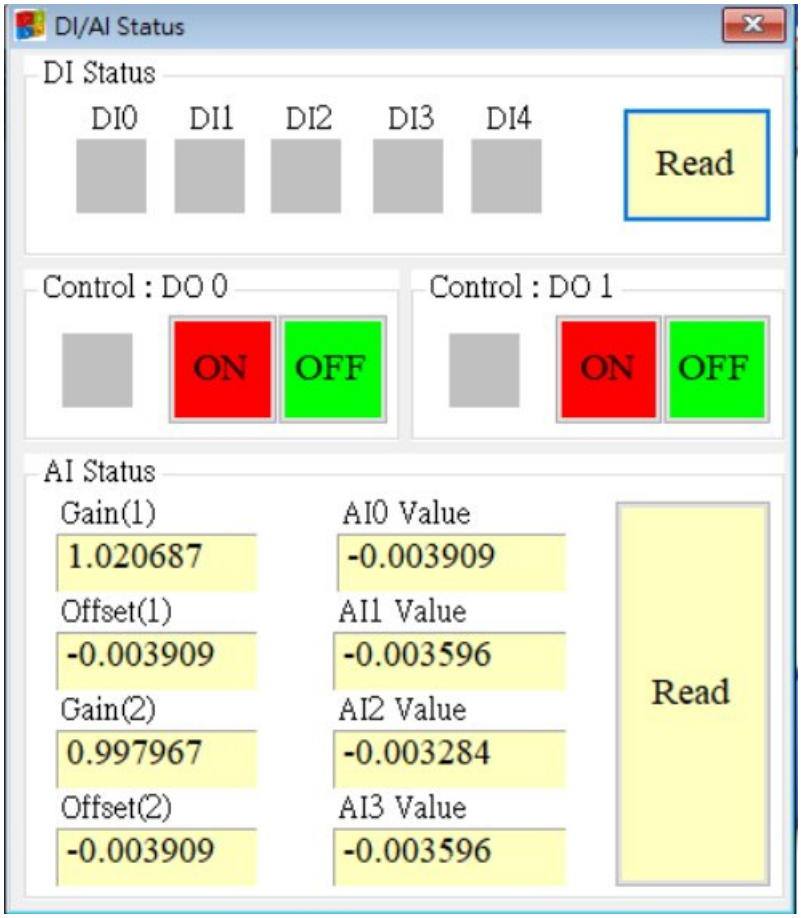
  Read related settings from Device.

- Write to Device:

  Write Device related settings.

6.5 DO Control AI/DI Status Description

The user can read the current state of the I/O on the device and manually control the DO state, and the operation options and fields are as follows:



DI Status

- Red：

  When DI is ON, the status is low.

- Gray：

  When DI is OFF, the status is high.

- Read

  Read DI/DO status.

Control : DO0、DO1

- Red：

  When DI is ON, the status is low.

- Gray：

  When DI is OFF, the status is high.

- ON:

  Turn on DO0, DO1.

- OFF:

  Close DO0, DO1.

AI Status

- AI0(~3) Value：

  The AI value currently read, in volts (V).

- Gain(1~2)：

  AI correction value, read only. If Gain is 1, Offset is 0, please contact us.

- Offset(1~2)：

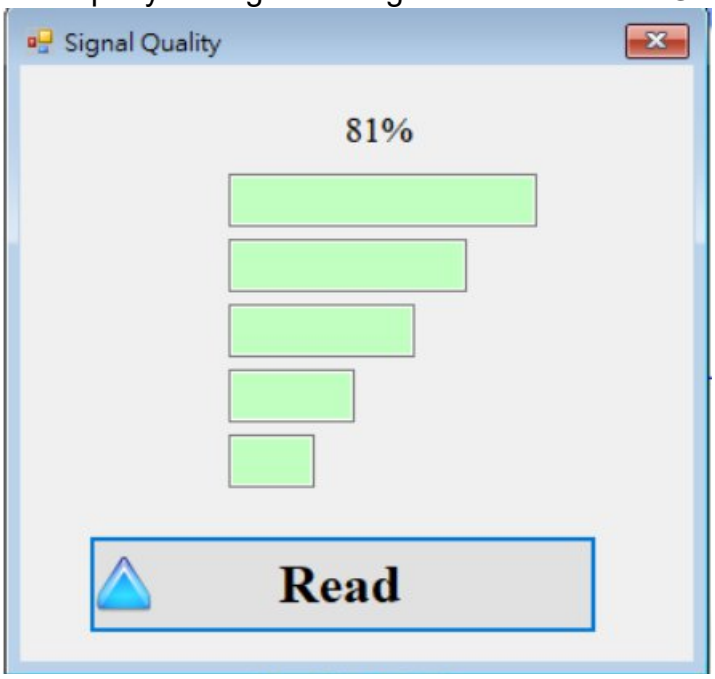
  AI correction value, read only. If Gain is 1, Offset is 0, please contact us.

- Read:

  Read AI voltage value.

6.6 Signal Quality Description

This window can be used to query the signal strength received on the GTP-541M.



Signal Quality field description

The signal strength is expressed in 5 segments and shows the current percentage of signal strength.

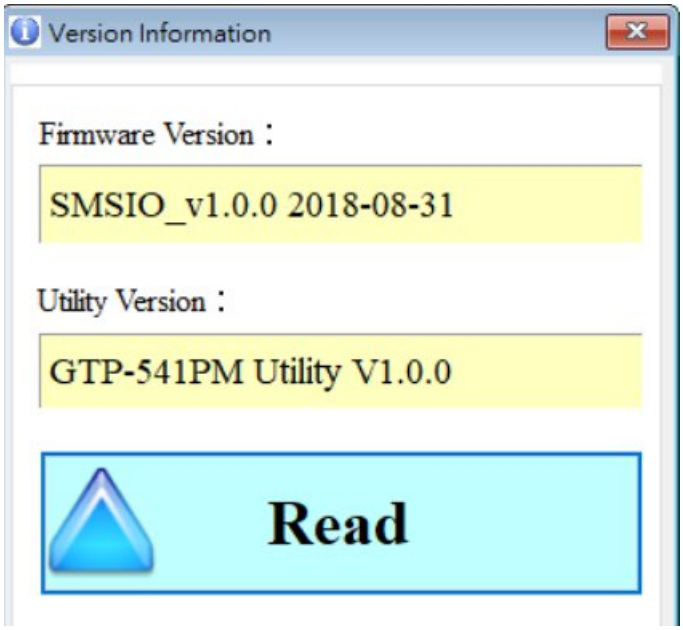
Operating option description

◆ Read：

Read the current signal strength from GTP-541M.

6.7 Version Information Description

Click "Version" in the toolbar to display the version of SMS Utility and the version information of the firmware that can be queried：



Field description

◆ Firmware Version：

Display firmware version information.

◆ Utility Version：

Display version information of SMS Uitlity.

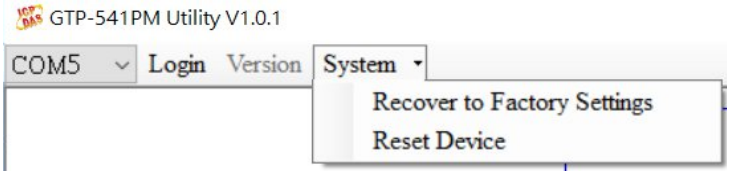
Operating option description

◆ Read：

Read the firmware version information from GTP-541M and display it in the window.

6.8 System Description

In the drop-down menu "System", there are two functions "ReCover to Factory Settings" and "Reset Device". The function description and operation mode of the two are as follows:



6.8.1 ReCover to Factory Settings Instructions

This option restores the parameters to the factory settings, including the password, as follows:

(1) Click “System” → “ReCover to Factory Settings” .

6.8.2 Reset Device Description

This option restarts the GTP-541M in software mode as follows:

(1) Click “System” → ”Reset Device” .

6.8.3 PIN Code Description

This option can be used to set the password required for the SIM card to be opened. After the setting is completed, restart the GTP-541M and apply it. If the SIM card does not require a password, it will not be entered even if it is set.

6.8.4 Voice File Status Description

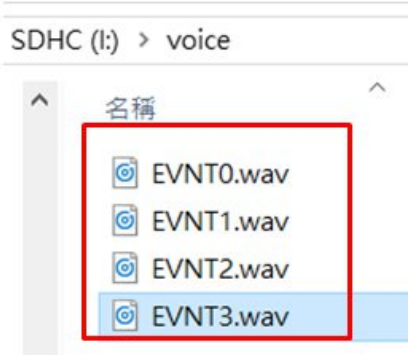
This option is to confirm whether the name and format of the voice file in the SD card are correct. If the format and name are correct, the Correct and Existing status will be checked.

6.9 Voice file format, status and on

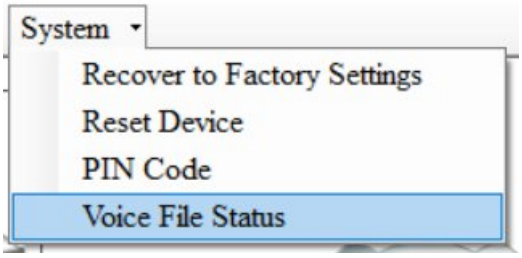
Note: The voice file function can only be used in firmware version 1.20 or higher and Utility version 1.1.0 or higher.

一、Please add a voice folder to the SD first, and then put the specified voice file into the voice folder.

→



二、Click "System->Voice File Status" in the Utility interface to check whether the current voice file status and format in the SD match.



The Voice File Status page can view the voice file corresponding to each EVENT. If the file exists, the Existed item will display a tick, and the Fiel Format Status item displays whether the current voice file format meets the voice dialing requirements. If it matches, the green background will be displayed"Correct", if it does not match, it displays "Incorrect" with a red background. Once the system detects that the voice file format does not meet the playback requirements, even if this event is triggered, the voice alarm will not be activated. Please correct the voice file format to meet the playback requirements.

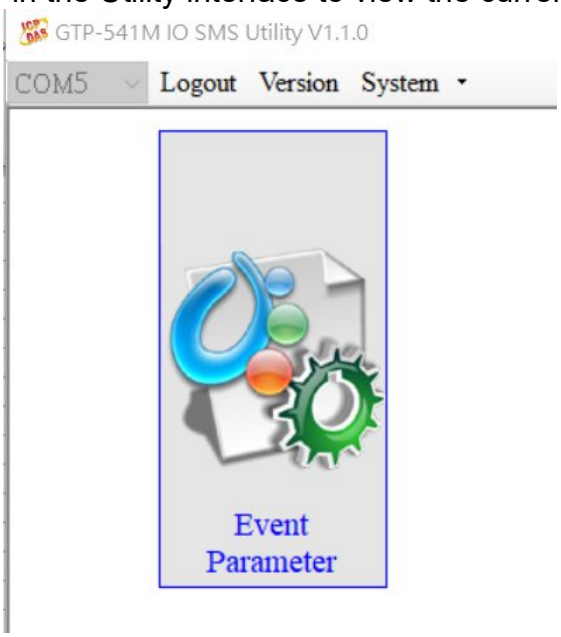
Voice File Status

Event	Existed	File at Device	File Format Status
Event 1	☑	EVNT0.WAV	Correct.
Event 2	☑	EVNT1.WAV	Correct.
Event 3	☑	EVNT2.WAV	Correct.
Event 4	☑	EVNT3.WAV	Incorrect!!
Event 5	☐	EVNT4.WAV	No wav File.
Event 6	☐	EVNT5.WAV	No wav File.
Event 7	☐	EVNT6.WAV	No wav File.
Event 8	☐	EVNT7.WAV	No wav File.
Event 9	☐	EVNT8.WAV	No wav File.
Event 10	☐	EVNT9.WAV	No wav File.
Event 11	☐	EVNT10.WAV	No wav File.
Event 12	☐	EVNT11.WAV	No wav File.
Event 13	☐	EVNT12.WAV	No wav File.
Event 14	☐	EVNT13.WAV	No wav File.
Event 15	☐	EVNT14.WAV	No wav File.
Event 16	☐	EVNT15.WAV	No wav File.

SD Card OK Get the parameters successfully.

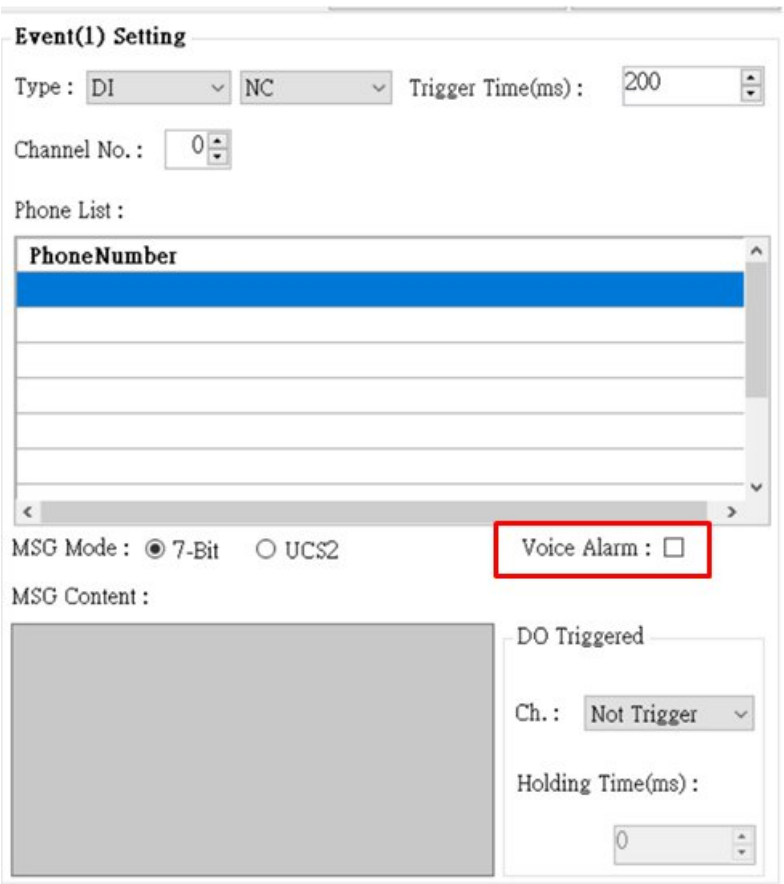
三、Enable sending voice files

(1) Click “Event Parameter” in the Utility interface to view the current Event settings.

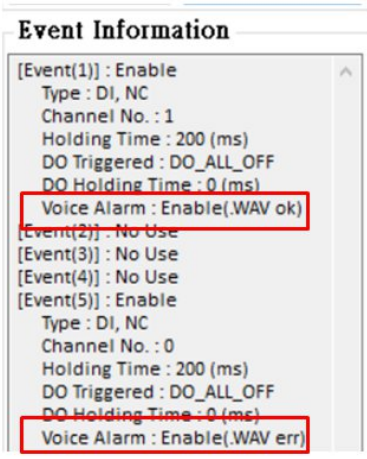


(2) In the selected Event settings, you can see the "Voice Alarm" option, tick to open this Event voice file function.

Note: Voice mode is only available for DI, AI and Counter.



(3) After the setting is completed, it will confirm whether there is a corresponding voice file for this event. If the confirmation is correct, it will display OK. If the error is displayed, err will be displayed. The error may be due to the file not being present or the format is wrong.



四、Voice File Format

GTP-541M only supports the playback of WAV files. The following formats are required. For example, voice files are not in the following format. Please use the software to convert:

File type	wav
Audio format	PCM
Audio sample size	16 bits

Channel	mono
Audio sampling frequency	8 kHz
Audio bit rate	128kbps

6.10 SMS instruction description

Through the SMS command, you can use the phone to send commands to the GTP-541M to complete pre-defined actions, such as controlling the DO output to be ON. To achieve this function, the phone number of the next command must be set in the SMS PhoneList of Devic Parameter.

SMS instruction summary

SMS command	Description
@TIME	Time setting / query
@DOCn	DO control
@ACTV	Count value query
@DIV	DI/DO status query
@AIV	AI status query

6.10.1 @TIME(Time setting / query)

(1) **Description**

Set or query the current time of GTP-541M.

(2) **Request**

set up

@TIME; YYYYMMDD; HHmmSS

Inquire

@TIME

Field description

YYYYMMDD：The date to be set, 8 characters long, respectively, the year, month, and day of the year.

HHmmSS：The time to be set, the length of 6 characters, respectively (24-hour clock), minutes, seconds.

Example：

Set the time of the SMS machine to 2018/08/30 12:05:30

@TIME;20180830;120530

Query the current time of the SMS：

@TIME

(3) **Response**

Format

!MID;TIME;Result;YYYYMMDD;HHmmSS

Field description

MID：Device code.

TIME：This command name.

Result：Command execution result.

OK → Set or query success.

ER→ The format entered is incorrect or does not have this permission.

Others：The format entered is incorrect or does not have this permission....

Example：

!GTP-541M;TIME;OK;20090410;100300

6.10.2 @DOCn(DO control)

(1) **Description**

Control DO output.

(2) **Request**

Set up

@DOCn;CMD;millisecond

@DOCn;CMD

Field description

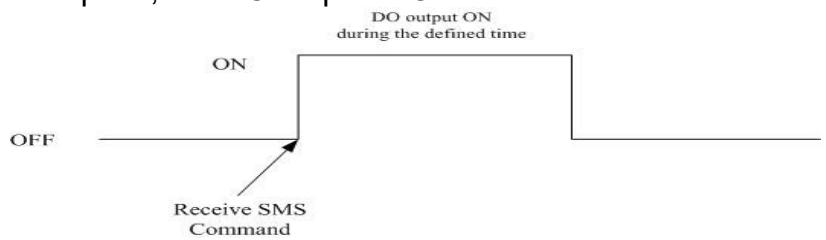
n： 0 ~ 4

CMD：

ON → DO output is ON.

OFF → DO output is OFF.

PULSE → Keep the DO output ON for the set number of seconds. After the time has elapsed, the DO output is OFF..



Second：When the control command is PLUS, the number of seconds that the DO output is ON (maximum: 8640000ms, 24HR per day).

Example：

Control DO1 output to ON：

@DOC1;ON

Controls the time when the DO1 output is ON for 5000 milliseconds (ms)：

@DOC1;PLUS;5000

(3) **Response**

Format

!MID;DOCn; Result; CMD;millisecond

Field description

MID：Device code.

DOC：This command name.

Result：Command execution result.

OK → Control success.

ER→ The format entered is incorrect or does not have this permission.

CMD, millisecond：Same as in the command format.

Example：

!GTP-541M;DOC1;OK;ON

!GTP-541M;DOC1;OK;PLUS;5000

6.10.3 @ACTV(Count value query)

(1) **Description**

Query counter current count value.

(2) **Request**

Inquire

@ACTV

Example：

@ACTV

(3) **Response**

Format

!MID;ACTV;Result;CT0;CT1;CT2;CT3;CT4

Field description

MID：Device code.

ACTV：This command name.

Result：Command execution result.

OK → search successful.

ER→ The format entered is incorrect or does not have this permission.

DI0 ~ 4：DI0 ~ 4 The current count value, if you want to reset it, it will be changed by Utility.

Example：

!GTP-541M;ACTV;OK;3;3;3;3;3

6.10.4 @DIV(DI/DO status query)

(1) **Description**

Query the current actual status value (0 or 1) of the DI point and the DO point。

(2) **Request**

Inquire

@DIV

Example：

@DIV

(3) **Response**

Format

!MID;DIV; Result;DI0;DI1;DI2;DI3;DI4;DO0;DO1

Field description

MID：Device code.

DIV：This command name.

Result：Command execution result.

OK → search successful.

ER→ The format entered is incorrect or does not have this permission.

DI0 ~ DIn：DI current actual status value.

0 → Low Voltage.

1 → High Voltage.

DO0 ~ DO1：DO current actual status value.

0 → Low Voltage.

1 → High Voltage.

Example：

!GTP-541PM;DIV;OK;0;0;0;0;0;1;0

6.10.5 @AIV (AI status query)

(1) **Description**

Query the current status value of the AI point.

(2) **Request**

Inquire

@AIV

Example：

@AIV

(3) **Response**

Format

!MID;AIV; Result; AI0 value; AI1 value; AI2 value; AI3 value

Field description

MID：Device code.

AIV：This command name.

Result：Command execution result.

OK → search successful.

ER→ The format entered is incorrect or does not have this permission.

AIn value：Corrected AI value.

Example：

!GTP-541M;AIV;OK; 4.999; 4.999;0.005;0.003

6.11 DIOSMS usage examples

一、Event DI setting and testing

A. Determine that the 4th pin and the 5th pin on the GTP-541M are successfully connected, as shown in Figure 6.10.1

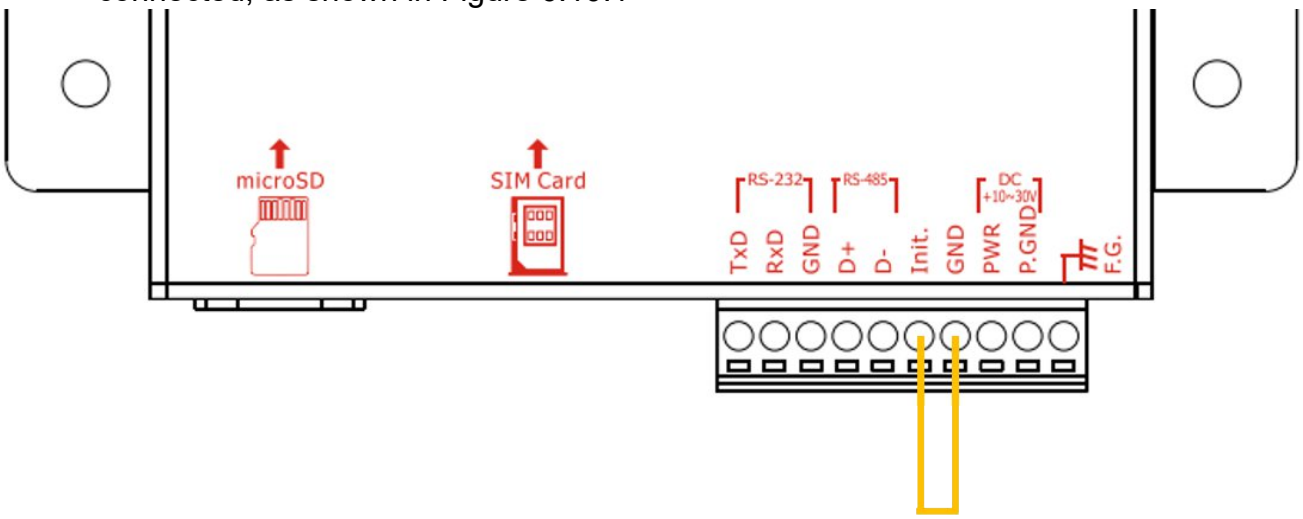


Figure 6.10.1

B. Click “Login” on the Utility screen. As shown in Figure 6.10.2, if the connection is successful, the “Login” button will change to “Logout”, as shown in Figure 6.10.3

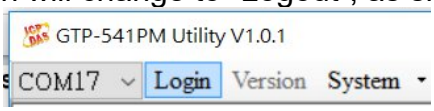


Figure 6.10.2

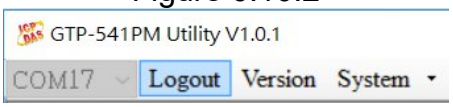


Figure 6.10.3

C. Select “Event Parameter” in the function option as shown in Figure 6.10.4

”

Figure 6.10.4

D. First select Event and press “Read” as shown in Figure 6.10.5

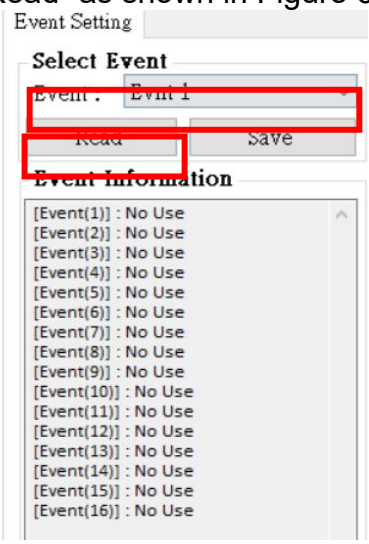


Figure 6.10.5

E. Select “DI” in Type as shown in Figure 6.10.6. After selecting, it will pop up the attention window and select “Yes” as shown in Figure 6.10.7

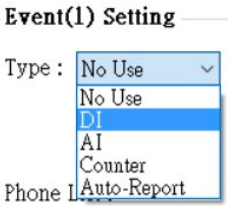


Figure 6.10.6

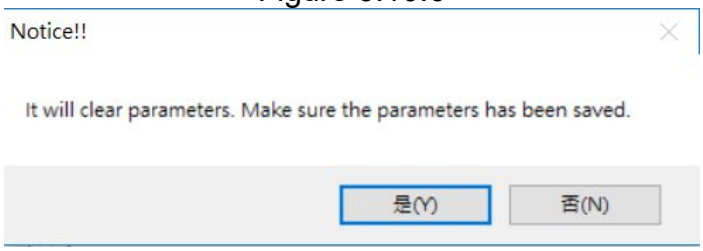


Figure 6.10.7

F. Select trigger condition as “NC”, Trigger Time “200ms” and Channel No. “0” as shown in Figure 6.10.8

Figure 6.10.8

G. Refill the target phone number, as shown in Figure 6.10.9

Figure 6.10.9

H. Select the alert message content encoding method and fill in the alert message content as shown in Figure 6.10.10

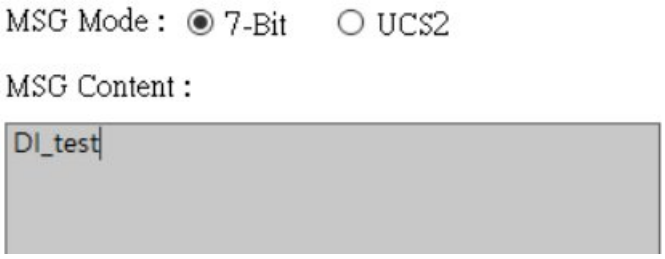


Figure 6.10.10

I. Select the setting for DO when triggering the alarm, Ch select “ALL DO ON” to turn on DO0 and DO1, and Hold Time (ms) to select “6000” ms to let DO turn on after 6 seconds, as shown in Figure 6.10.11

Figure 6.10.11

J. After setting, select “SAVE” to save as shown in Figure 6.10.12. Complete the list below to display the settings just made.

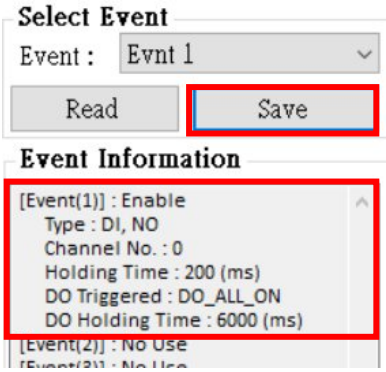


Figure 6.10.12

K. After confirming the completion, click “Write to Device”. As shown in Figure 5.10.13, write the settings to GTP-541M. At this time, the confirmation window will pop up and click OK. As shown in Figure 5.10.14, the parameters will be written. Information, after completion, will jump out of the success window as shown in Figure 5.10.15

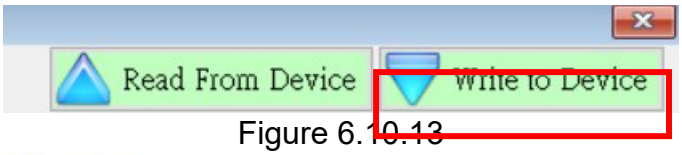


Figure 6.10.13

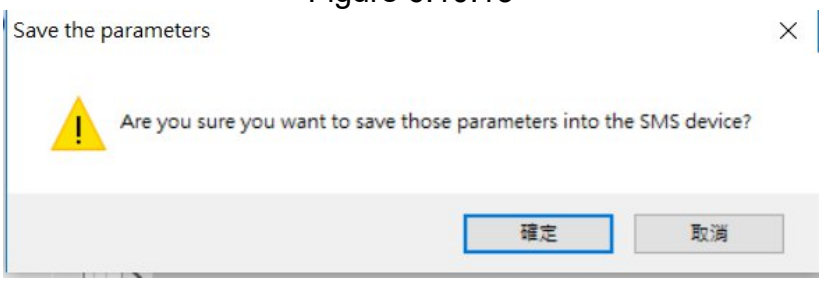


Figure 6.10.14

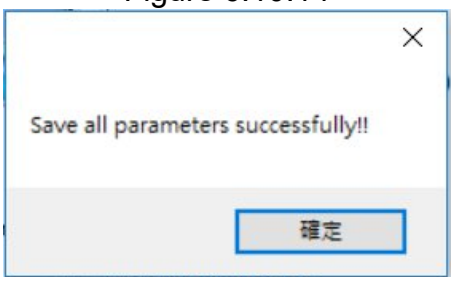


Figure 6.10.15

L. L. Then unplug the 4th pin and the 5th pin on the GTP-541M as shown in Figure 5.10.16, and restart the GTP-541M.

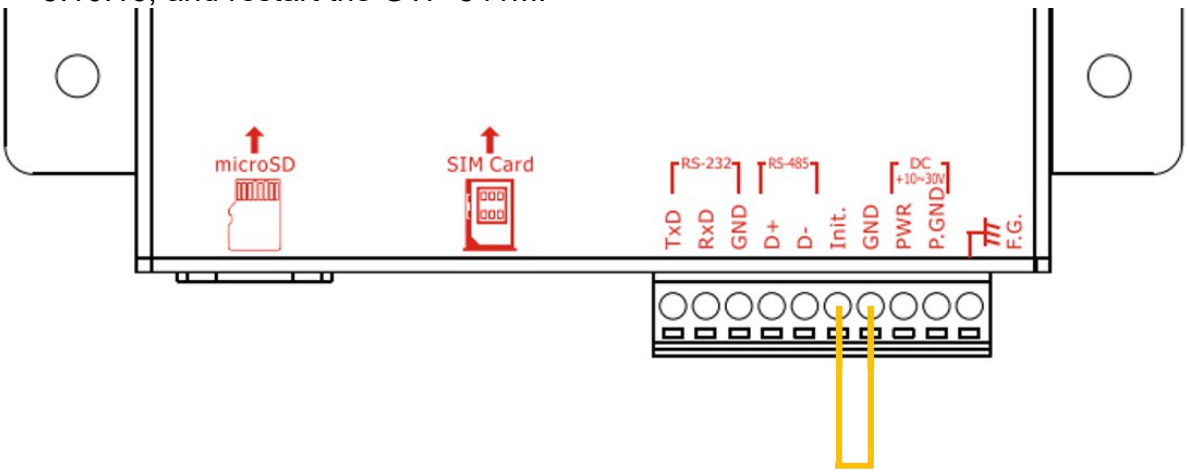


Figure 6.10.16

M. After confirming that the STA light starts to flash normally, input the trigger signal to DI0, and the input mobile phone will receive the alarm message.

二、Event Counter setting and testing

A. Determine that the 4th pin and the 5th pin on the GTP-541M are successfully connected, as shown in Figure 6.10.17

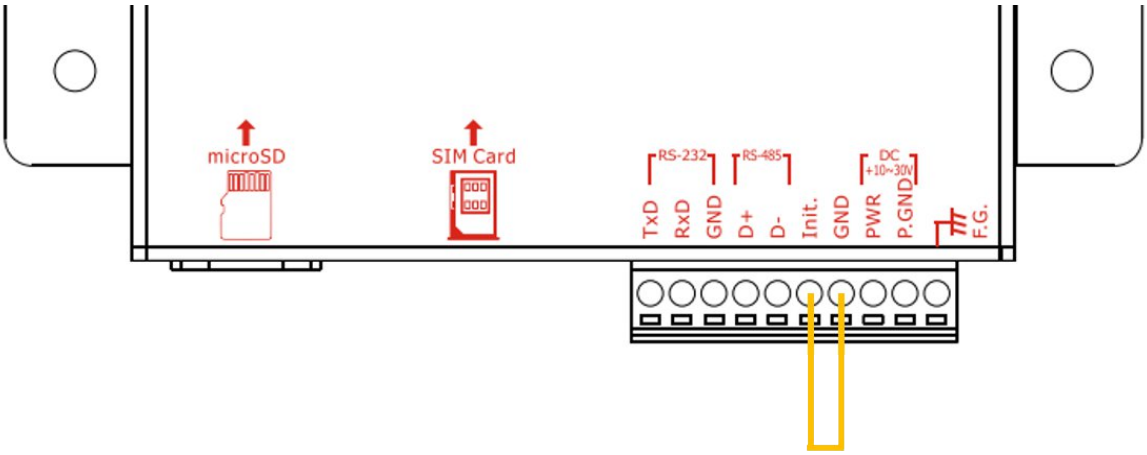


Figure 6.10.17

B. Click “Login” on the Utility screen. As shown in Figure 6.10.18, if the connection is successful, the “Login” button will change to “Logout”, as shown in Figure 6.10.19

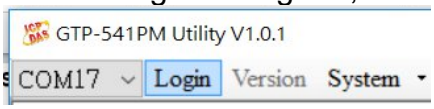


Figure 6.10.18

Figure 6.10.19

C. Select “Event Parameter” in the function option as shown in Figure 6.10.20

Figure 6.10.20

D. First select Event and press "Read" as shown in Figure 6.10.21

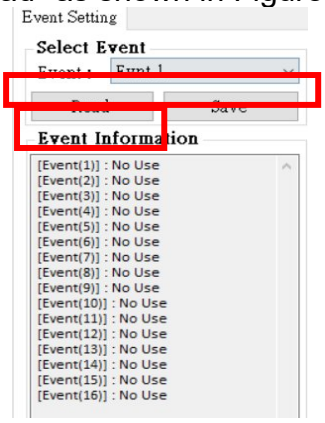


Figure 6.10.21

E. Select “Counter” in Type as shown in Figure 6.10.22. After selecting, it will pop up the attention window and select “Yes” as shown in Figure 6.10.23

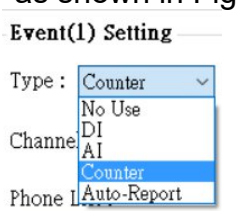


Figure 6.10.22

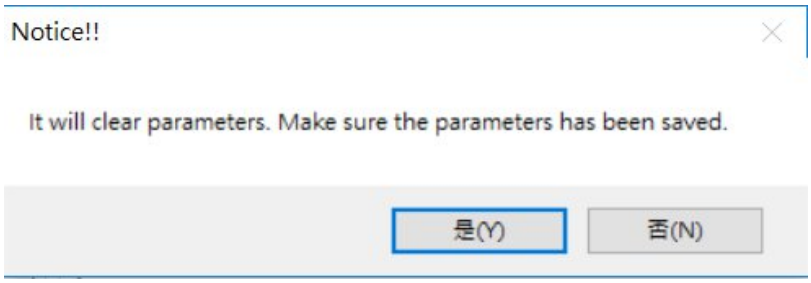


Figure 6.10.23

F. Select the trigger condition as "NO_PULSE", Trigger Time "200ms" and Channel No. "0", as shown in Figure 6.10.24

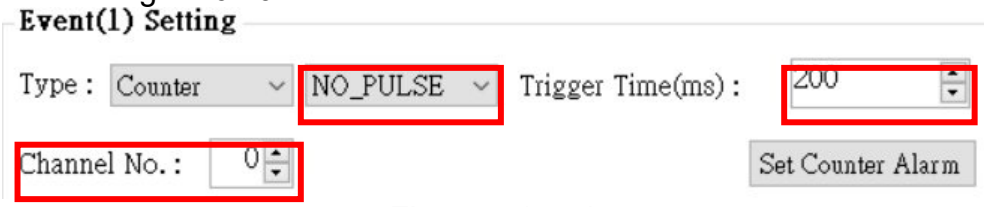


Figure 6.10.24

G. Click the Set Counter Alarm button as shown in Figure 6.10.25. Enter the Set Counter Alarm parameter. “Set Value” is “0” and “Alarm Value” is “10”. As shown in Figure 5.20, press the “Set Value” button.

Figure 6.10.25

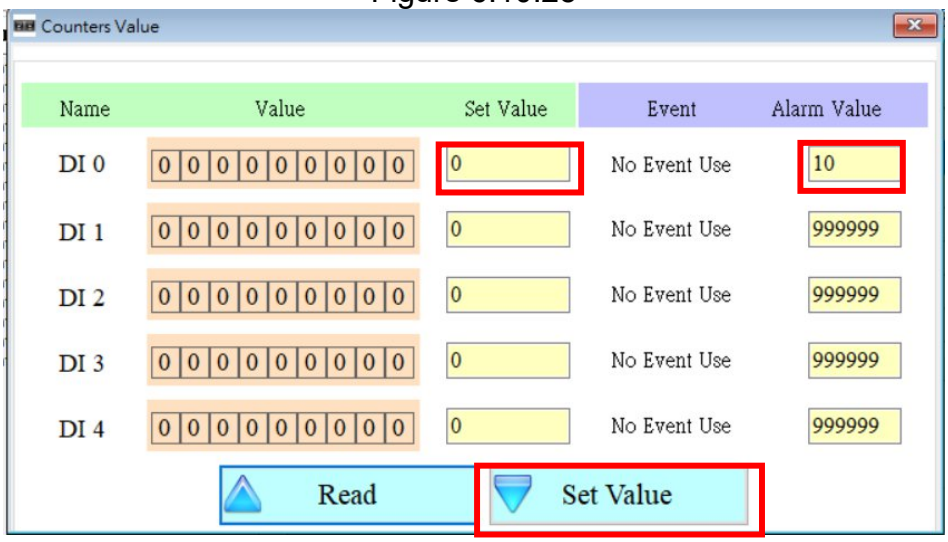


Figure 6.10.26

H. Fill in the target phone number, as shown in Figure 6.10.27

Figure 6.10.27

I. Select the alert message content encoding method and fill in the alert message content as shown in Figure 6.20.28

Figure 6.10.28

J. Select the setting for DO when triggering the alarm, Ch select “ALL DO ON” to turn on DO0 and DO1, and Hold Time (ms) to select “6000” ms to let DO turn on after 6 seconds, as shown in Figure 6.10.29

Figure 6.10.29

K. After setting, select “SAVE” to save as shown in Figure 6.10.30. Complete the list below and the setting will be displayed

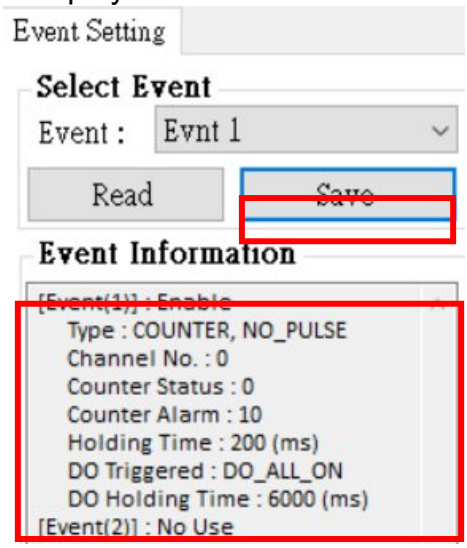


Figure 6.10.30

L. After finishing the selection, click “Write to Device”. As shown in Figure 6.10.31, write the settings to GTP-541M. At this time, the confirmation window will pop up and click OK. As shown in Figure 6.10.32, the parameters will be written. After the data is completed, the success window will pop up as shown in Figure 6.10.33

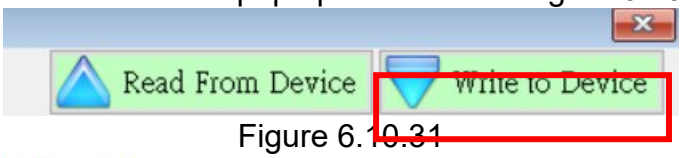


Figure 6.10.31

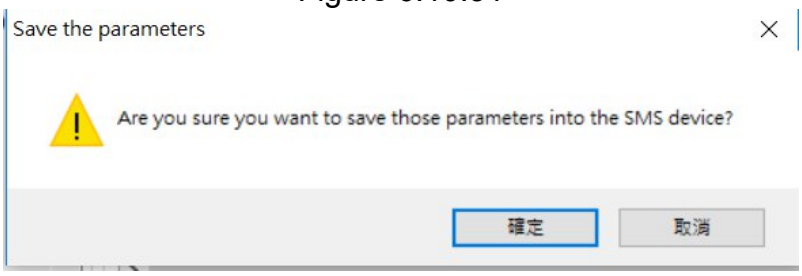


Figure 6.10.32

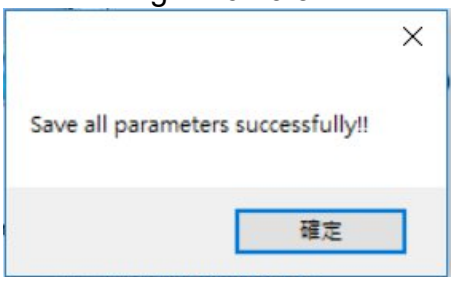


Figure 6.10.33

N. Pull the 4th pin and the 5th pin on the GTP-541M to connect as shown in Figure 6.10.34, and restart GTP-541M.

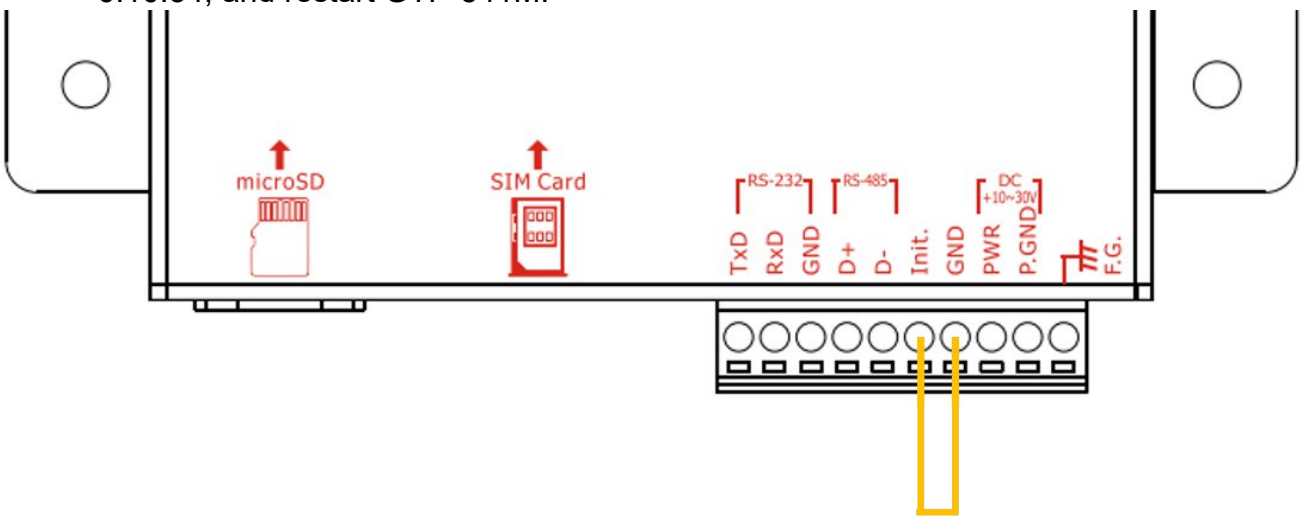
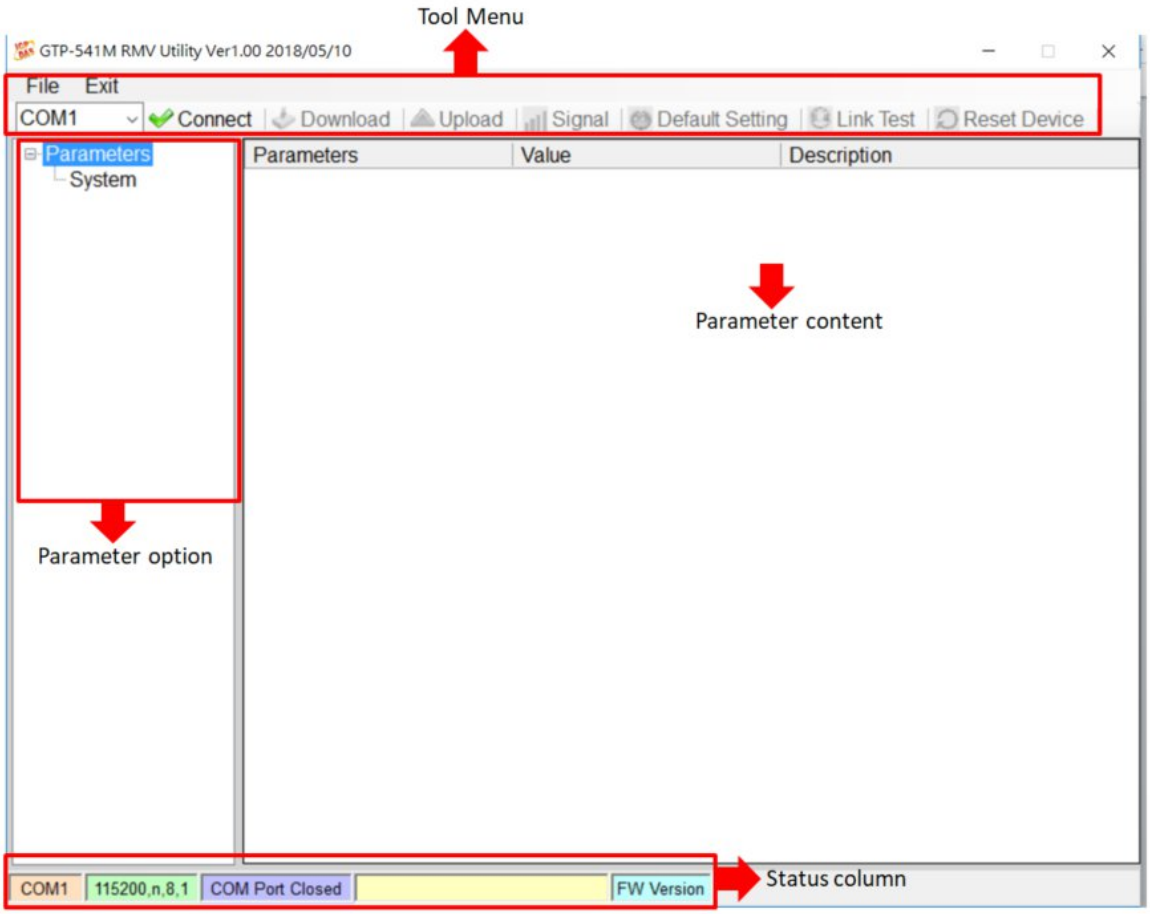


Figure 6.10.34

M. After confirming that the STA light starts to flash normally, input the trigger signal to DI0 for 10 times, then the incoming mobile phone will receive the alarm message.

7.RMV Utility main screen description

The GTP-541M Utility interface mainly includes the following parts, as explained below:



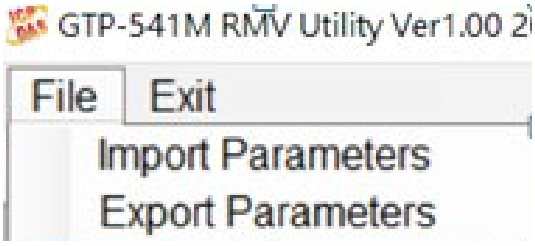
1. Toolbar
   Toolbar options, including all the main function operations of the GTP-541M Utility, as described below：
   (1) File: The parameters of SMSRMV are stored in the form of a Project file. This operation includes:
   "Import Parameters", "Export Parameters" .
   (2) Exit: Leaving GTP-541M Utility .
   (3) COM Port: No.: PC end COM Port number connected to GTP-541M .
   (4) Connect: Connect with GTP-541M .
   (5) Download: Download parameters to GTP-541M .
   (6) Upload: Upload the parameters of GTP-541M to GTP-541M Utility.
   (7) Signal: Query signal strength and network status.
   (8) Default Setting: Reply to factory settings
   (9) Link Test: Connection test
2. Parameter option:
   Parameter options for GTP-541M, including: "System" and "COM Port".
3. Parameter content:
   Display and change the contents of the parameters.
4. Status column:

Display current GTP-541M Utility related information, from left to right, in order:

(1) PC end COM Port number used by Utility .
(2) COM Port transmission settings .
(3) Current status of COM Port .
(4) Current operating status of the device .
(5) Firmware version.

7.1 Parameter File Management

Through the Project option, parameters can be saved into files or open parameter files, etc., and multiple GTP-541M parameters can be conveniently managed. The options are as follows:



(1) Import Parameters: Open an existing parameter file to connect to GTP-541M.

(2) Export Parameters: Save the parameter as another file name.

7.2 Connection GTP-541M

GTP-541M can be connected by the following operations

1. Select the COM Port number of RS-232 / RS-485, as shown in Figure 7.2.1.

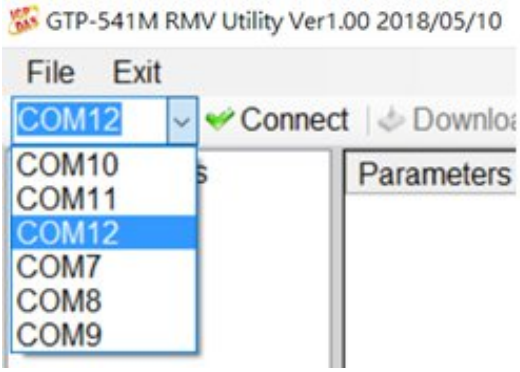


Figure 7.2.1

2. Press the “Connect” button to connect with the GTP-541M, as shown in Figure 7.2.2. If the cable fails, check if the RS-232/RS-485 Comport of the GTP-541M and the PC cable are selected correctly. Is the RS-232 / RS-485 line normal or whether the Init 4th and 5th pins are connected, as shown in Figure 7.2.3.

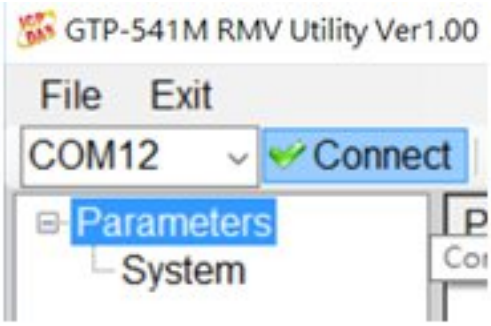


Figure 7.2.2

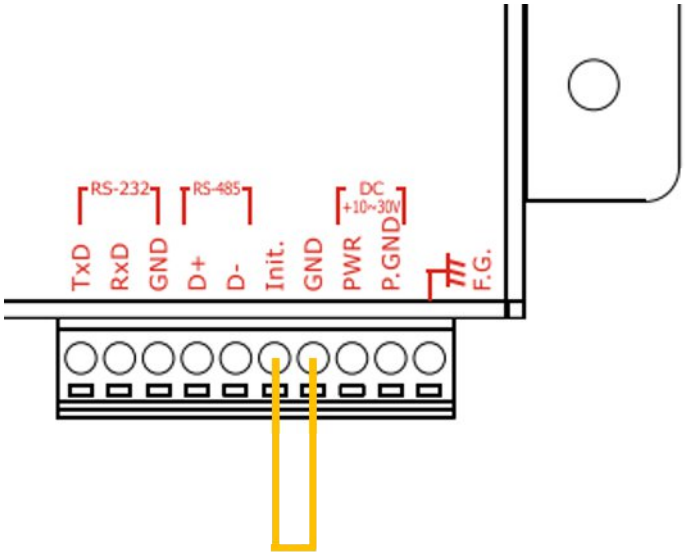


Figure 7.2.3

7.3 Parameter Description

Click on the left window, the tree parameter option, the right side will display the parameter content in the parameter option, select the content you want to change, you can modify it, as shown in Figure 7.3.1 below.

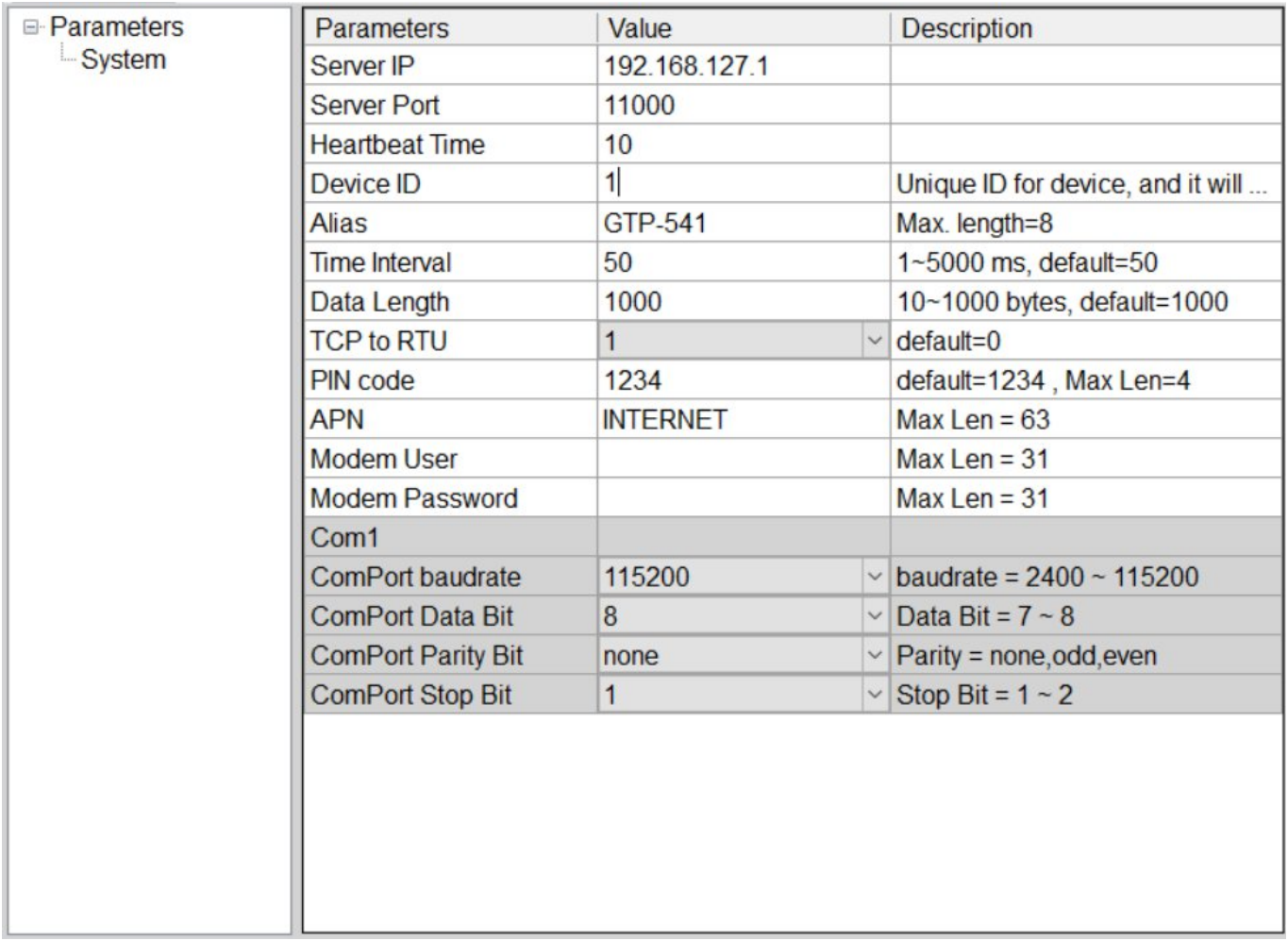


Figure 7.3.1

7.3.1 Description of System Parameters

The "System" parameters, including 12 items：

parameter name	Description
Server IP	Remote Server IP
Server Port	Remote Server Port
Heartbeat Time	Heartbeat packet (range 10 seconds ~ 65535 seconds)
Device ID	Address ID of GTP-541M
Alias	Module alias (maximum length 8 words)
Time Interval	Interval (ms)
Data Length	Data length
TCP to RTU	Whether to enable TCP to RTU

PIN Code	SIM card unlock PIN code
APN	Internet APN
Modem User	Internet account
Modem Password	Internet password
ComPort Baudrate	Transmit bits per second, supporting 2400, 4800, 9600, 19200, 38400, 57600, and 115200bps
ComPort Data Bit	Data bit, support 7 or 8 bits
ComPort Parity Bit	Peer check, support for none, even and odd
ComPort Stop Bit	Stop bit, support 1 bit and 2 bits

7.4 Download and upload parameters

1. Download parameters
   After the parameter setting is completed, you can download the parameters to the GTP-541M through this operation, as shown in Figure 7.4.1, click the “Download” button

Figure 7.4.1

2. Upload parameters
   This operation can be used when the parameters in the GTP-541M need to be extracted, as shown in Figure 7.4.2, click the “Upload” button.

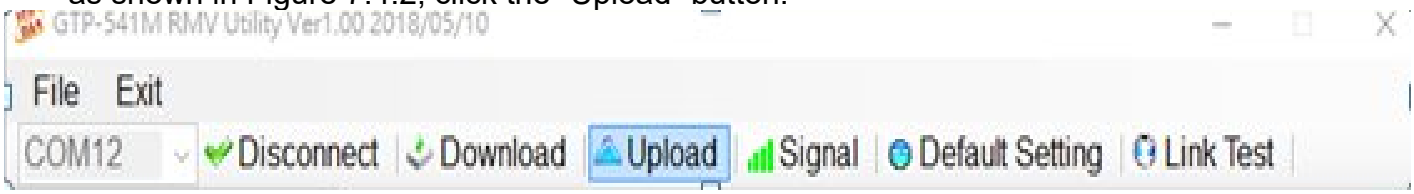


Figure 7.4.2

7.5 Query signal strength

Click “Signal” to query the signal strength of the target GTP-541M. The sequence of steps is shown in Figure 7.5.1~7.5.2.

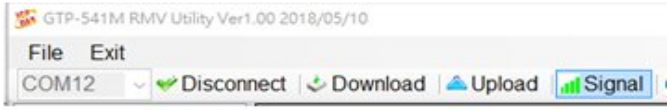


Figure 7.5.1

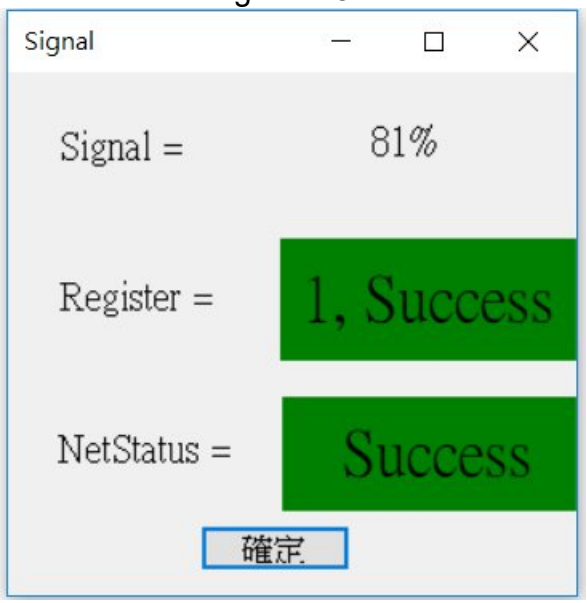


Figure 7.5.2

Field description：

A. Register: The signal strength is expressed as a percentage ,, and the current intensity state is displayed in red and green.

B. NetStatus: Shows the current connection status as red and green, and shows success and failure in color.

7.6 Back to factory defaults

After clicking “Default Setting”, click “Yes” to return the parameter to the factory default value. Click “No” to cancel the original factory default. The sequence is shown in Figure 7.6.1~7.6.2

Figure 7.6.1

Figure 7.6.2

7.7 connection test

After clicking "Link Test", wait for 6 seconds to get the result of connecting to the test server. The sequence of steps is as follows Figure 7.7.1~7.7.3

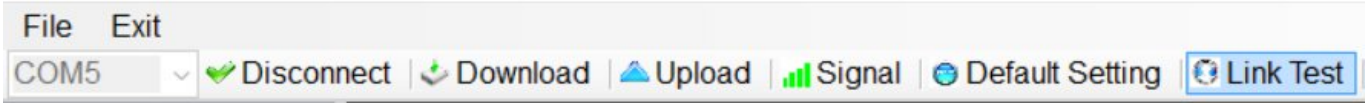


Figure 7.7.1

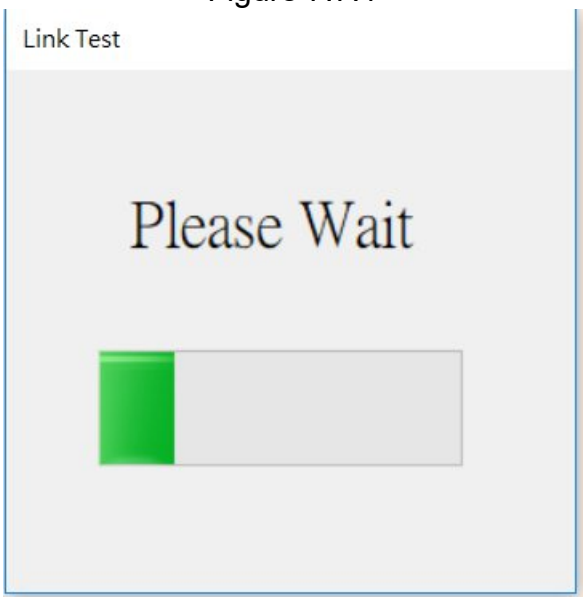


Figure 7.7.2

Figure 7.7.3

7.8 Restart

Click the “Reset Device” button. After 5 seconds, the GTP-541M will restart. The sequence of actions is shown in Figure 7.8.1~7.8.3

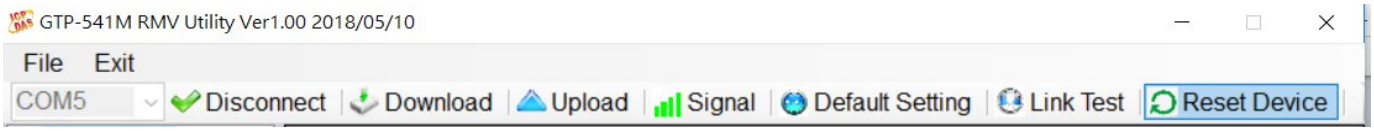


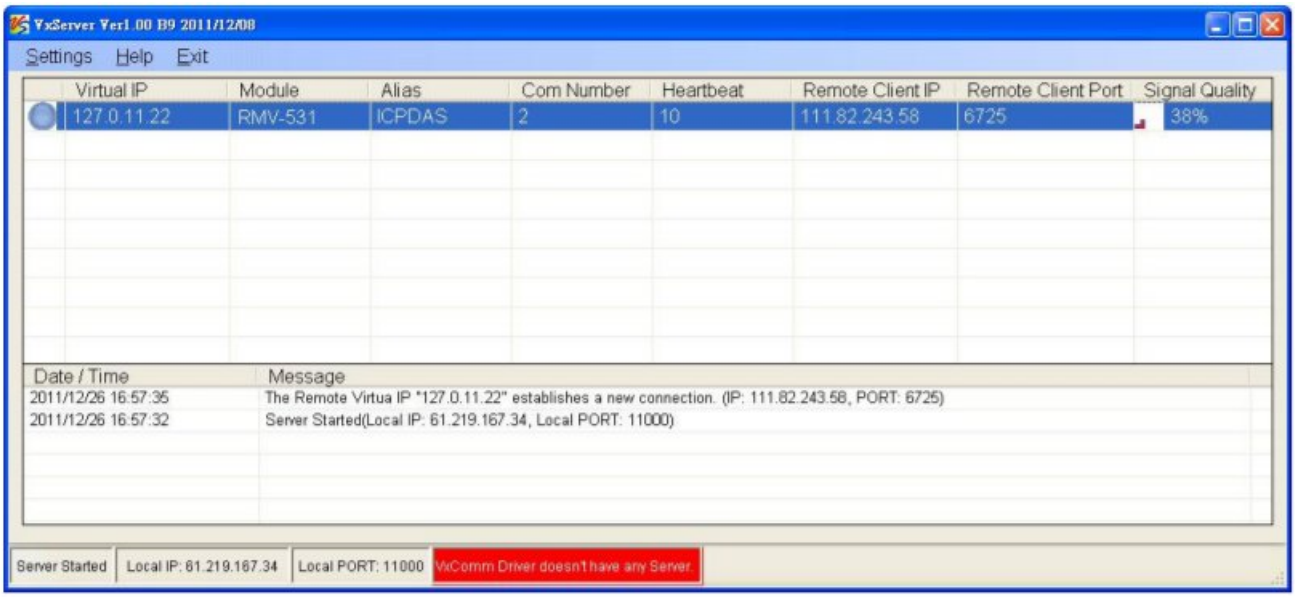
Figure 7.8.1

Figure 7.8.2

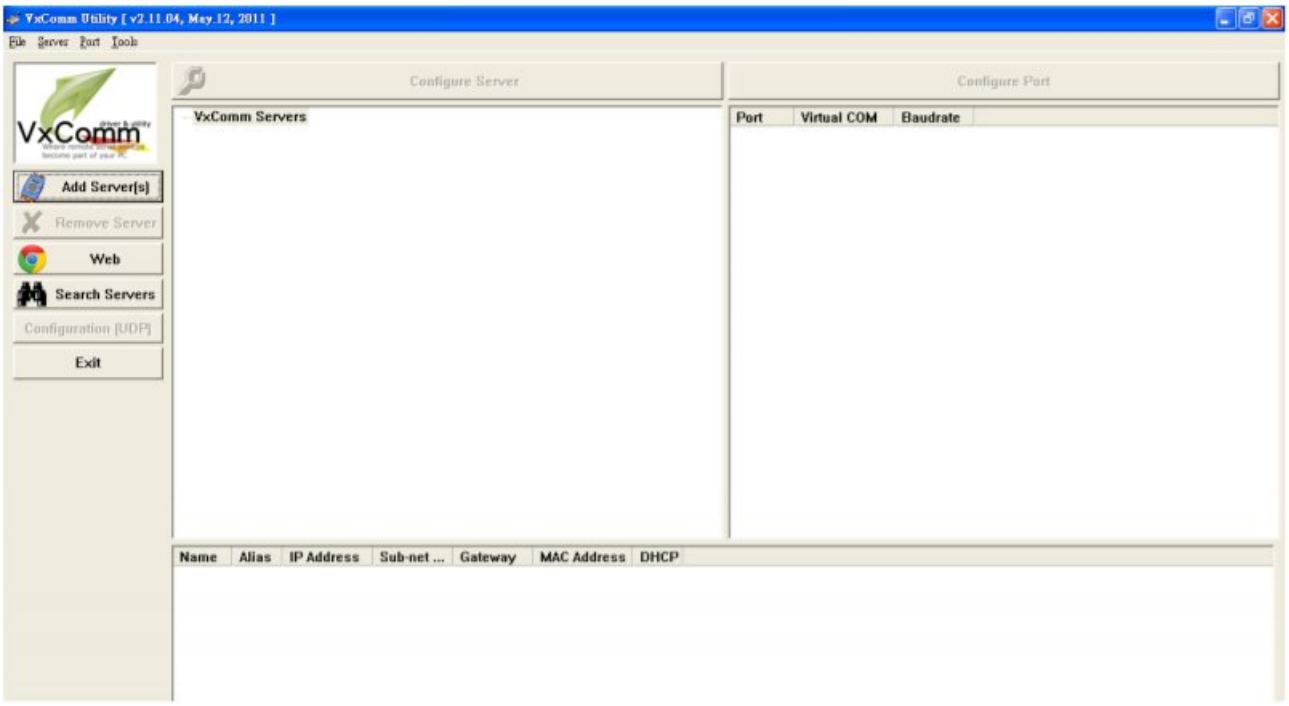
Figure 7.8.3

7.9 Setting VxServer and VxComm Driver

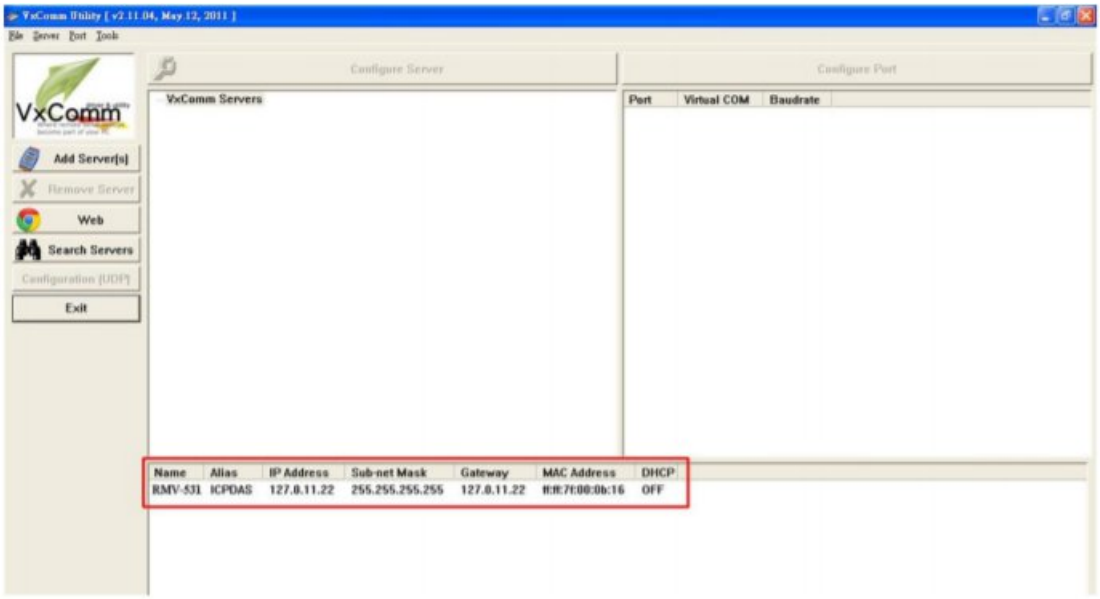
1. Confirm that the device is connected to the server.



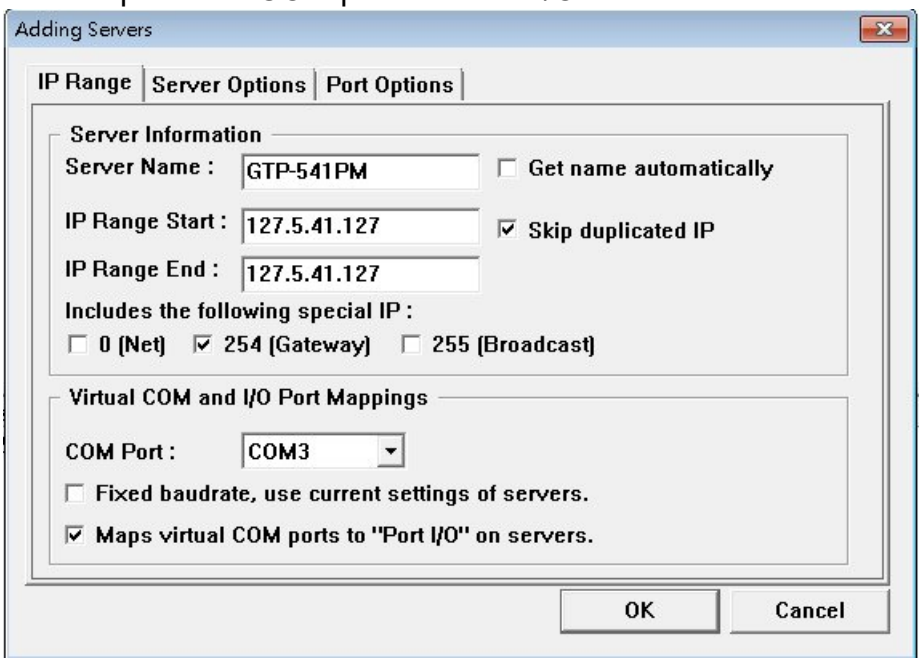
2. Execute the VxComm Utility and click on "Search Servers".



3. Select the device you want to join and click on “Add Server(s)”.

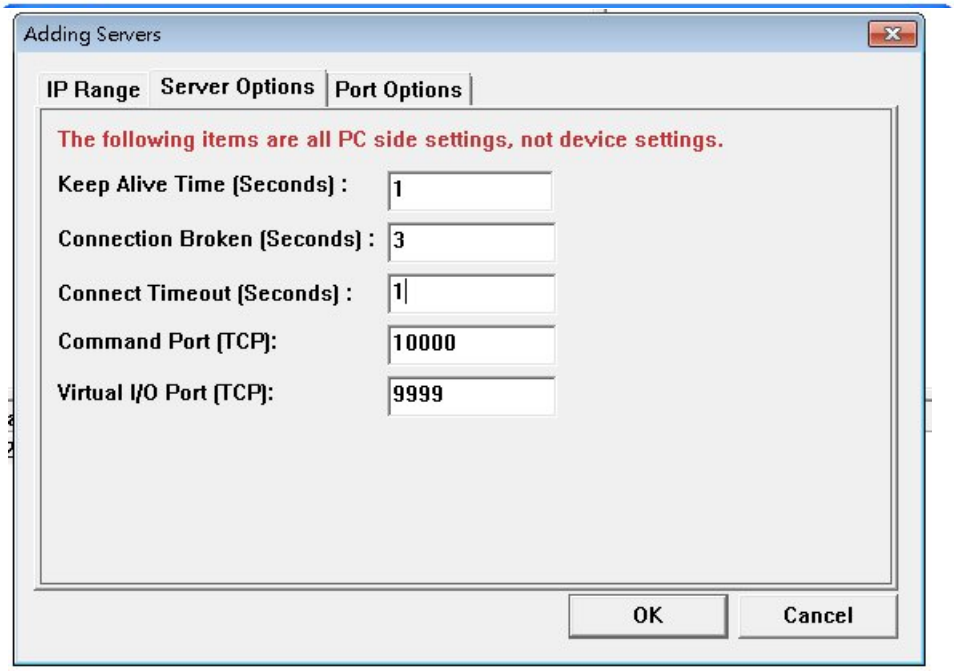


4. IP Range check "Maps virtual COM ports to "Port I/O" on servers".

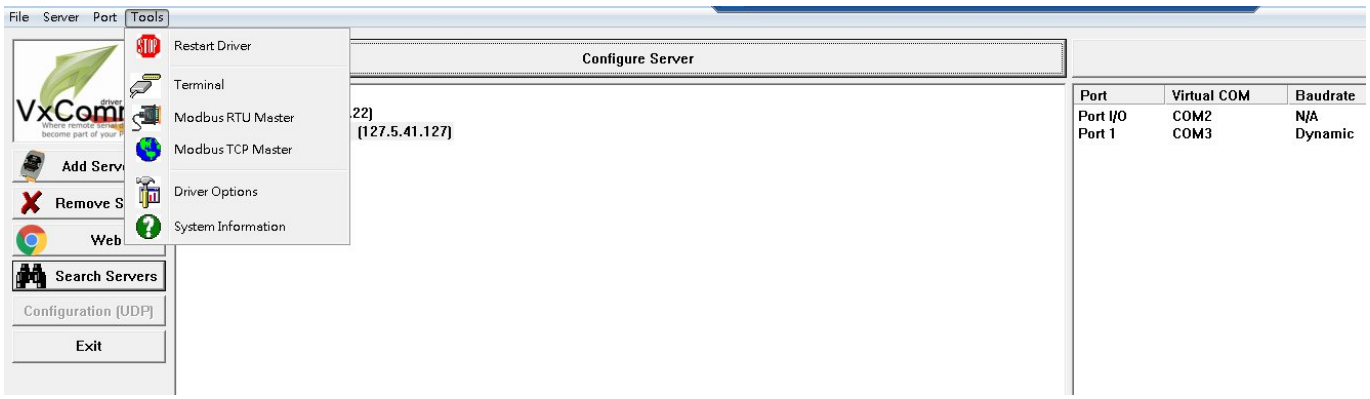


5. Server Options, please follow the parameter settings below.

參數	固定數值
Keep Alive Time	1
Connection Broken	3
Connect Timeout	1
Command Port	10000
Virtual I/O Port	9999

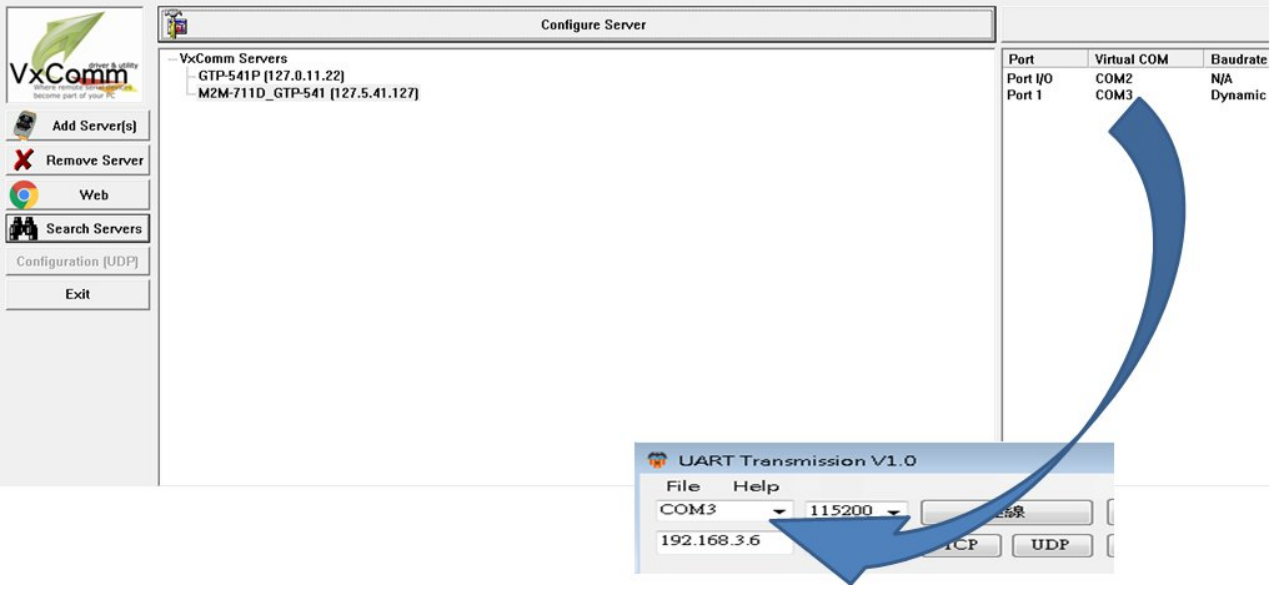


6. Tools Restart Driver.



7. Click “Restart Driver” .

8. Select Com port according to Port I/O, click "Uart Utility" "Connect".



7.10 Virtual COM Connection Example

一、GTP-541M is connected to Utility.

A. Confirm whether the 4th Pin and the 5th Pin of GTP-541M are connected, as shown in Figure 7.10.1

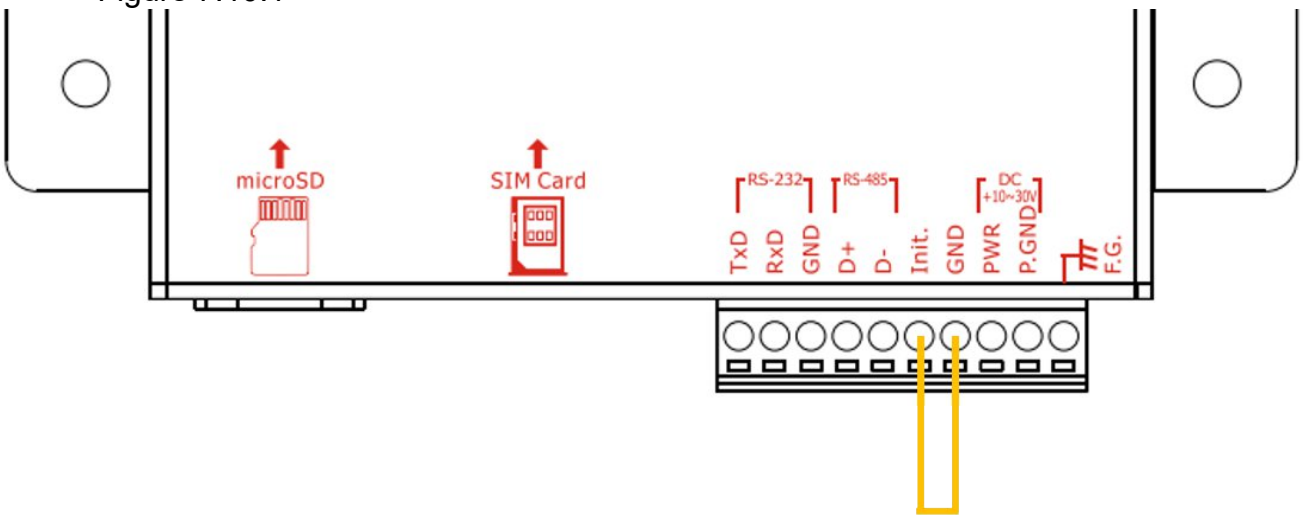


Figure 7.10.1

B. Click “Connect” on the Utility screen. As shown in Figure 7.10.2, if the connection is successful, “Connect success” will pop up and the “Connect” button will become “Disconnect”, as shown in Figure 7.10.3 and Figure 7.10.4.

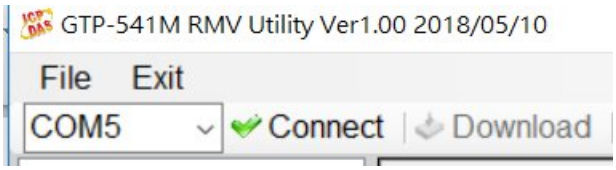


Figure 7.10.2

Figure 7.10.3

Figure 7.10.4

C. System parameter setting screen is shown in Figure 7.10.5. After setting the relevant parameters, press “Download” to write the parameter setting to GTP-541M as shown in Figure 7.10.6. After the writing is completed, the “Download to the device success”

window will pop up. Figure 7.10.7

Note 1: If the SIM card is not set to Pin code, this column can be kept at the default value.

Note 2: For related parameter functions, please refer to pages 78、79.

Parameters
System

Parameters	Value	Description
Server IP	125.227.224.161	
Server Port	11000	
Heartbeat Time	10	
Device ID	127	Unique ID for device, and it will ...
Alias	GTP-541M	Max. length=8
Time Interval	50	1~5000 ms, default=50
Data Length	1000	10~1000 bytes, default=1000
TCP to RTU	0	default=0
PIN code	1234	default=1234 , Max Len=4
APN	INTERNET	Max Len = 63
Modem User		Max Len = 31
Modem Password		Max Len = 31
Com1		
ComPort baudrate	115200	baudrate = 2400 ~ 115200
ComPort Data Bit	8	Data Bit = 7 ~ 8
ComPort Parity Bit	none	Parity = none,odd,even
ComPort Stop Bit	1	Stop Bit = 1 ~ 2

Figure 7.10.5

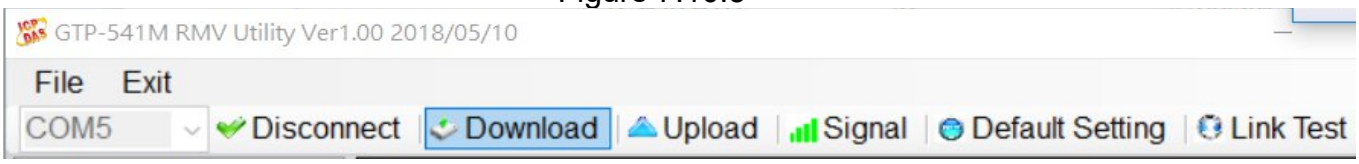


Figure 7.10.6

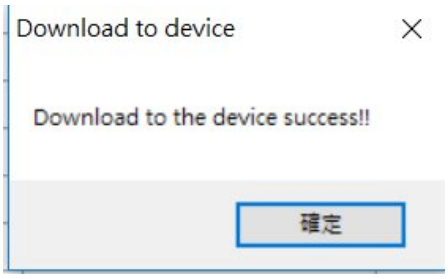


Figure 7.10.7

D. After the Utility setting is completed and written to the GTP-541M, confirm whether the 4th Pin and the 5th Pin of the GTP-541M have been removed as shown in Figure 7.10.8, and restart the GTP-541M.

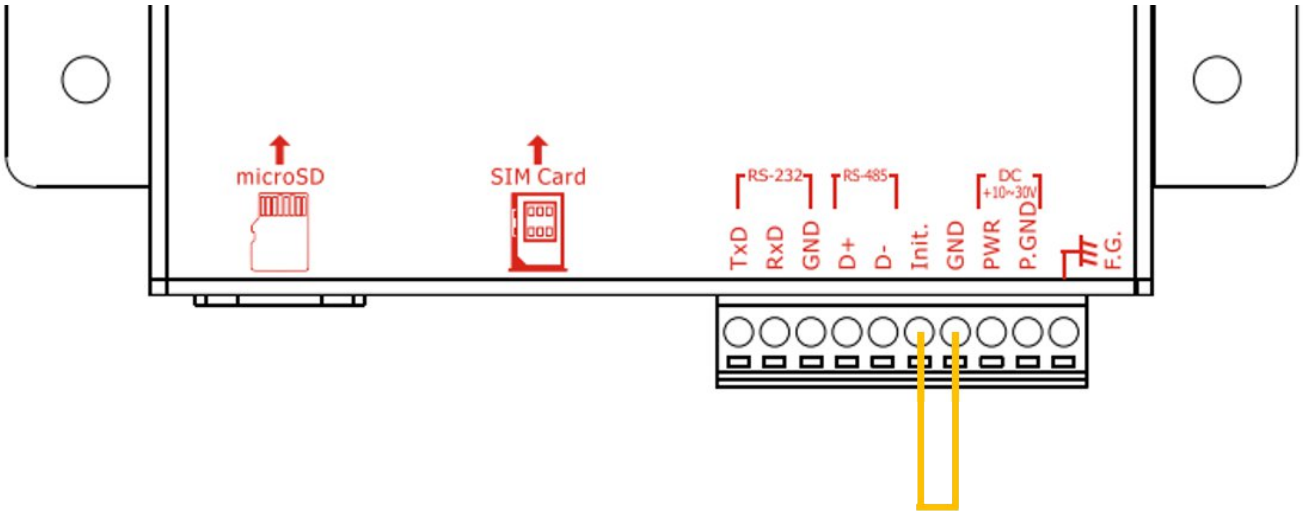


Figure 7.10.8

E. Server side open VxServer.exe as shown in Figure 7.10.9. After opening, it will show the items that GTP-541M has been connected to (if it does not appear immediately, please wait a moment), as shown in Figure 7.10.10, if GTP-541M has not appeared in List, please confirm whether Local IP and Local Port are the set Server IP and Server Port.

Note 1: Server IP must be a fixed IP。

Figure 7.10.9

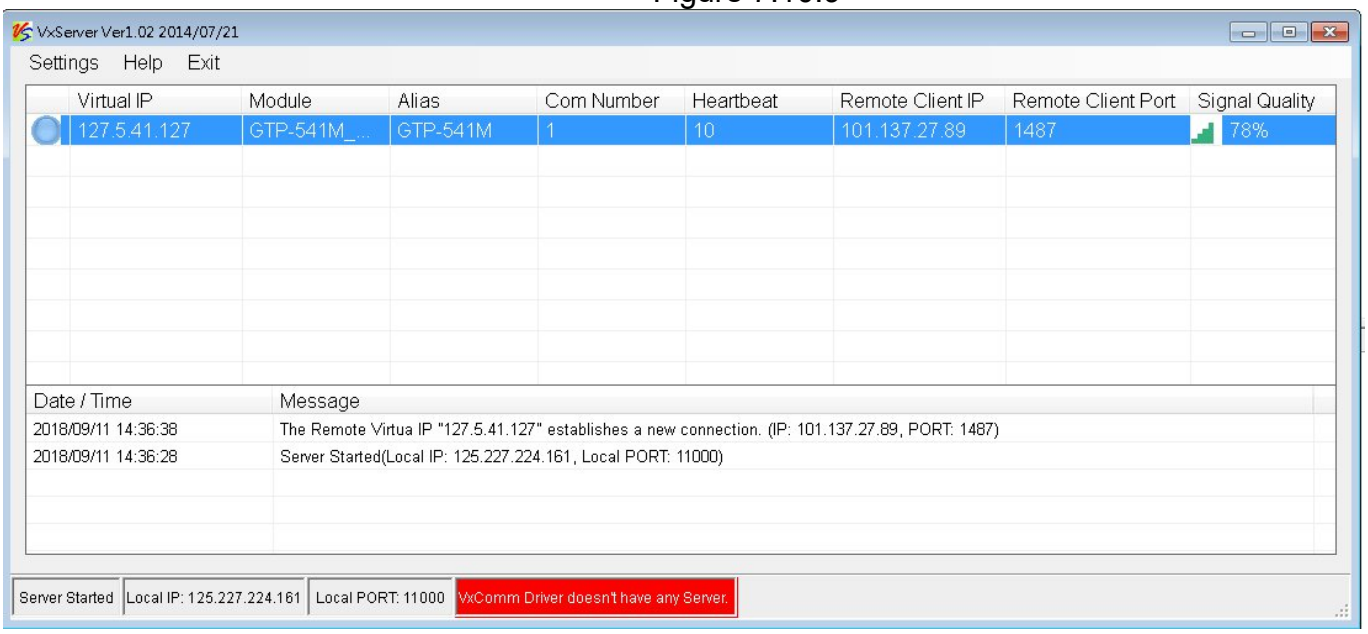


Figure 7.10.10

F. Open VxComm Utility.exe as shown in Figure 7.10.11. After opening, click “Search Servers” on the left side of the VxComm screen as shown in Figure 7.10.12, and confirm whether the GTP-541M appears in the list below the VxComm screen as shown in Figure 7.10.13.

Figure 7.10.11

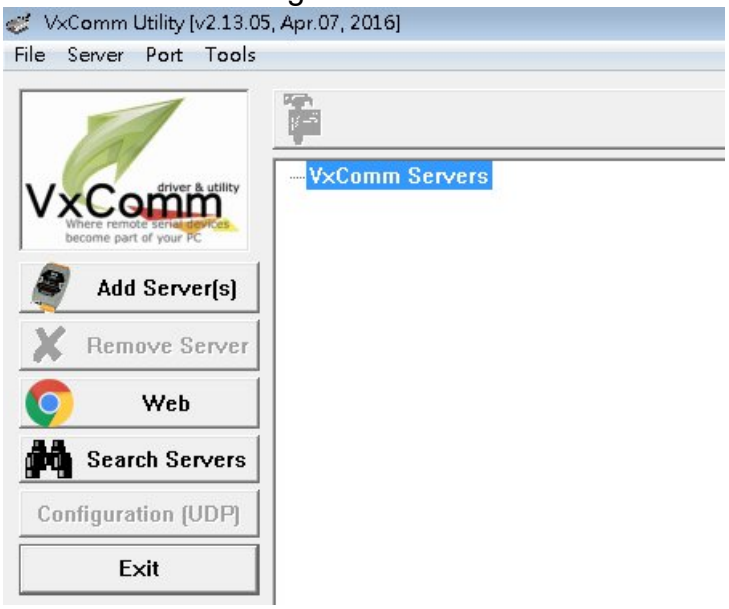


Figure 7.10.12

Name	Alias	IP Address	Sub-net Mask	Gateway	MAC Address	DHCP
GTP-541M_RMV	GTP-541M	127.5.41.127	255.255.255.255	127.5.41.127	ff:ff:7f:05:29:7f	OFF

Figure 7.10.13

G. Right click on GTP-541M and select “Add Server” as shown in Figure 7.10.14. After clicking, the Adding Servers window will appear as shown in Figure 7.10.15. In this window, select “COM Port” in the Virtual COM and I/O Port Mappings block. And "check below" Maps virtual COM ports to "Port I/O" on servers.

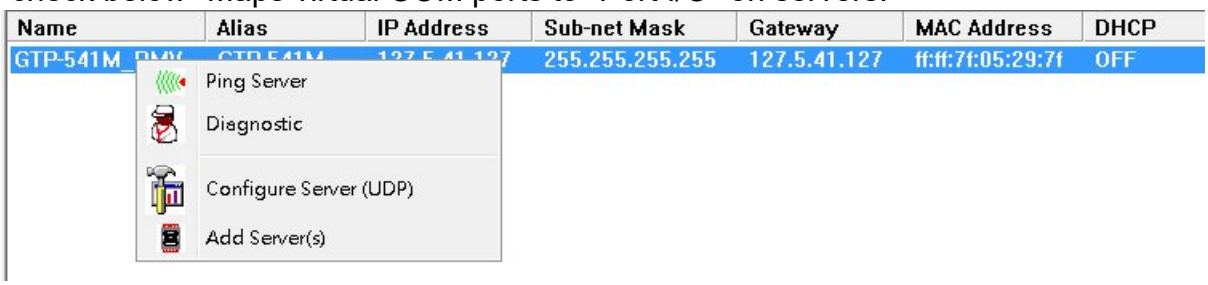


Figure 7.10.14

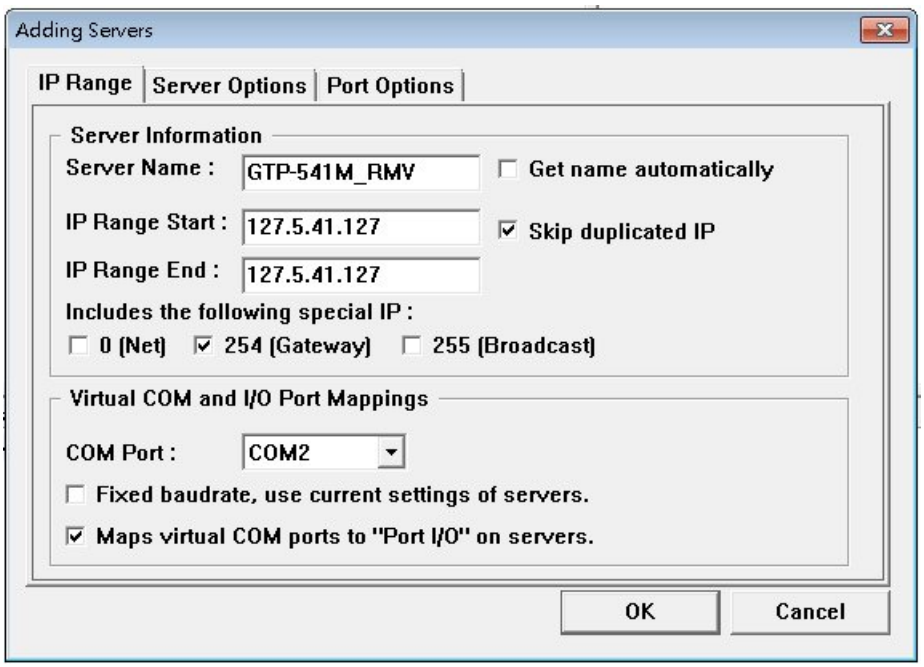


Figure 7.10.15

H. Then click on the Server Options at the top of the window and follow the screen setting parameters as shown in Figure 7.10.16. After setting, select "OK". ◦

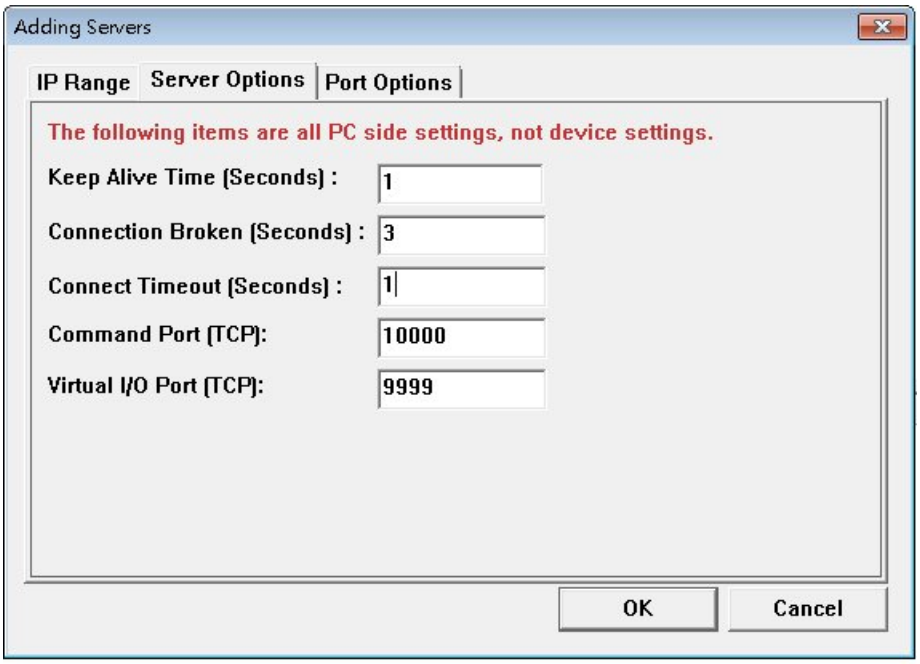


Figure 7.10.16

I. Upon completion, VxComm Servers will have the name of GTP-541M, and the right block will also appear ComPort is shown in Figure 7.10.17 ◦

Figure 7.10.17

J. After the setting is completed, click the “Restart Driver” update status in the upper left toolbar “Tools” as shown in Figure 7.10.18. At this time, “VxComm Driver is running” will be displayed at the bottom of the VxServer screen as shown in Figure 7.10.19。

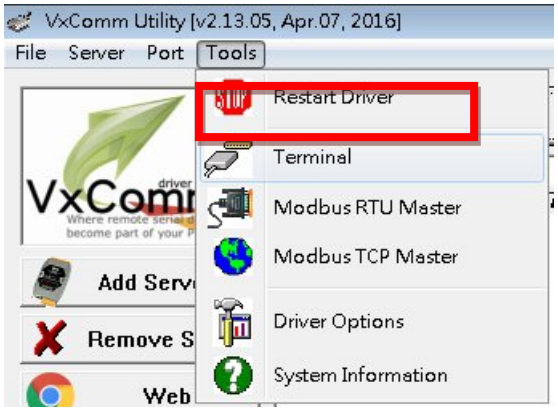


Figure 7.10.18

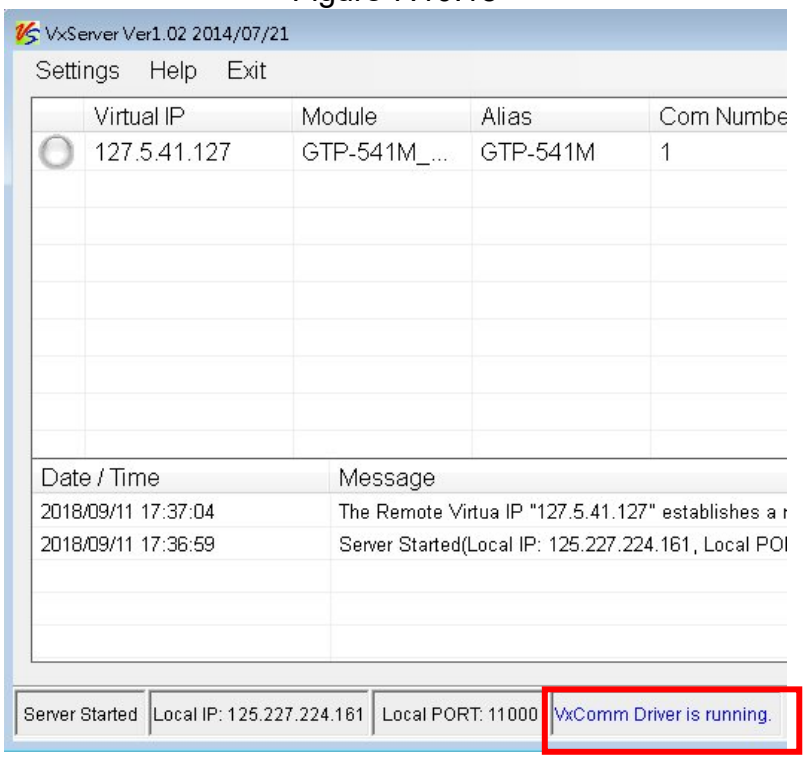


Figure 7.10.19

K. Open the Uart Utility program and select the Virtual COM number of Port1 as shown in Figure 7.10.20 and Figure 7.10.12

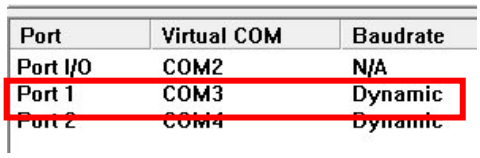


Figure 7.10.20

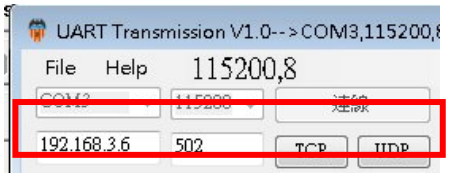
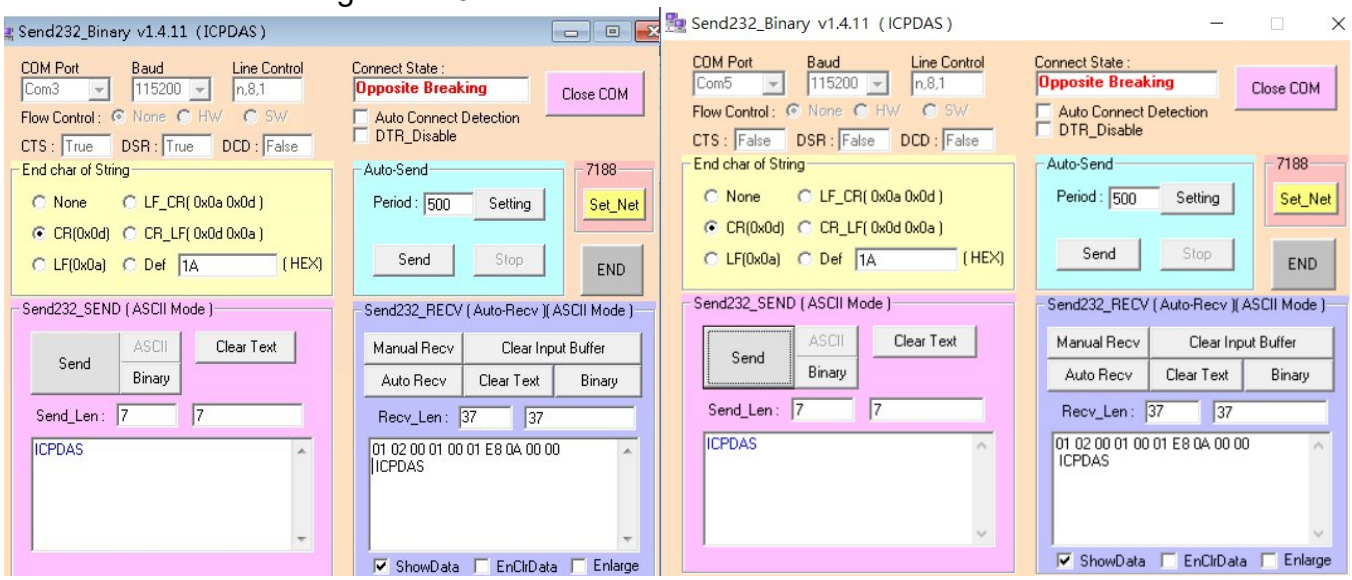


Figure 7.10.21

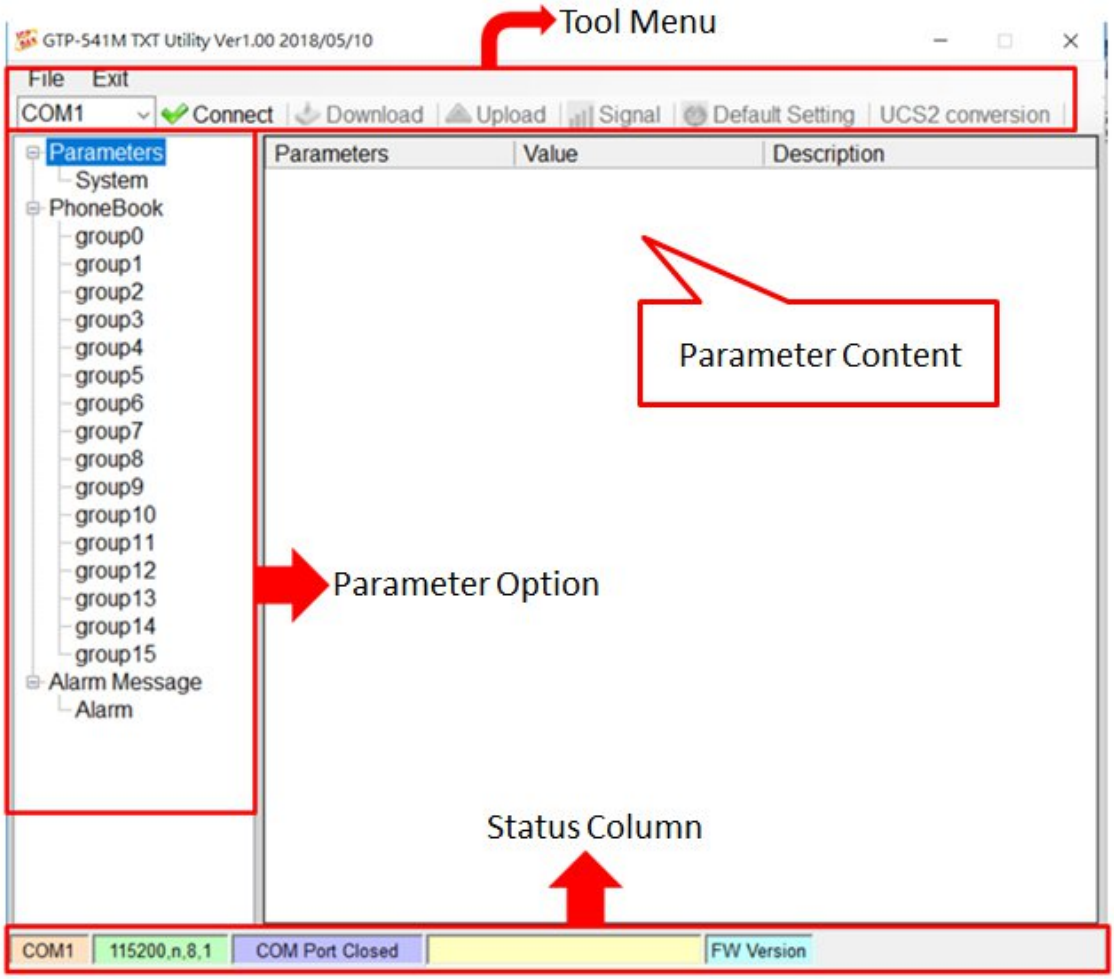
L. After opening Uart Utility on the PC side and selecting Virtual COM, connect the PC to RS-232/RS-485 on the GTP-541M side and open the Uart Utility to select the ComPort number of RS-232/RS-485. Data and confirm that the other side can receive normally, as shown in Figure 7.10.22



Server端PC Client端PC

Figure 7.10.22

8.TXTSMS Utility main screen description



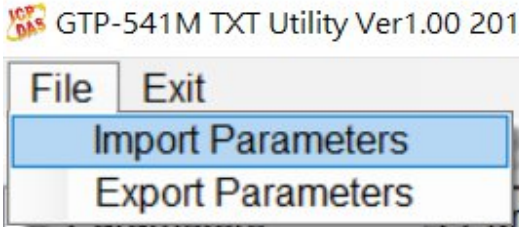
1. Tool Menu:
   - File:
     Store and read the Prj parameter file.
   - Exit:
     Leave the Utility.
   - COM Port:
     PC-side ComPort number connected to GTP-541M.
   - Connect:
     The Utility is connected to the GTP-541M.
   - Download:
     Download the parameters to the GTP-541M.
   - Upload:
     Read the parameter data of GTP-541M to Utility.
   - Signal:
     Read the current signal strength.
   - Default Setting:
     Restore the data to the factory-set parameters.
   - UCS2 Conversion:

A tool that converts input strings to Unicode.

2. Parameter Option
   - GTP-541M's parameter options are divided into 3 categories, including "System", "PhoneBook" and "Alarm Message".
3. Parameter Content
   - A table showing the parameters that can be changed.
4. Status Column
   - Display details of the GTP-541M Utility operation, from left to right, in order:
     A. The COM port number of the PC used by the Utility.
     B. ComPort transmission settings.
     C. The current state of ComPort.
     D. Utility action results.
     E. Firmware version of GTP-541M.

8.1 Parameter File Management

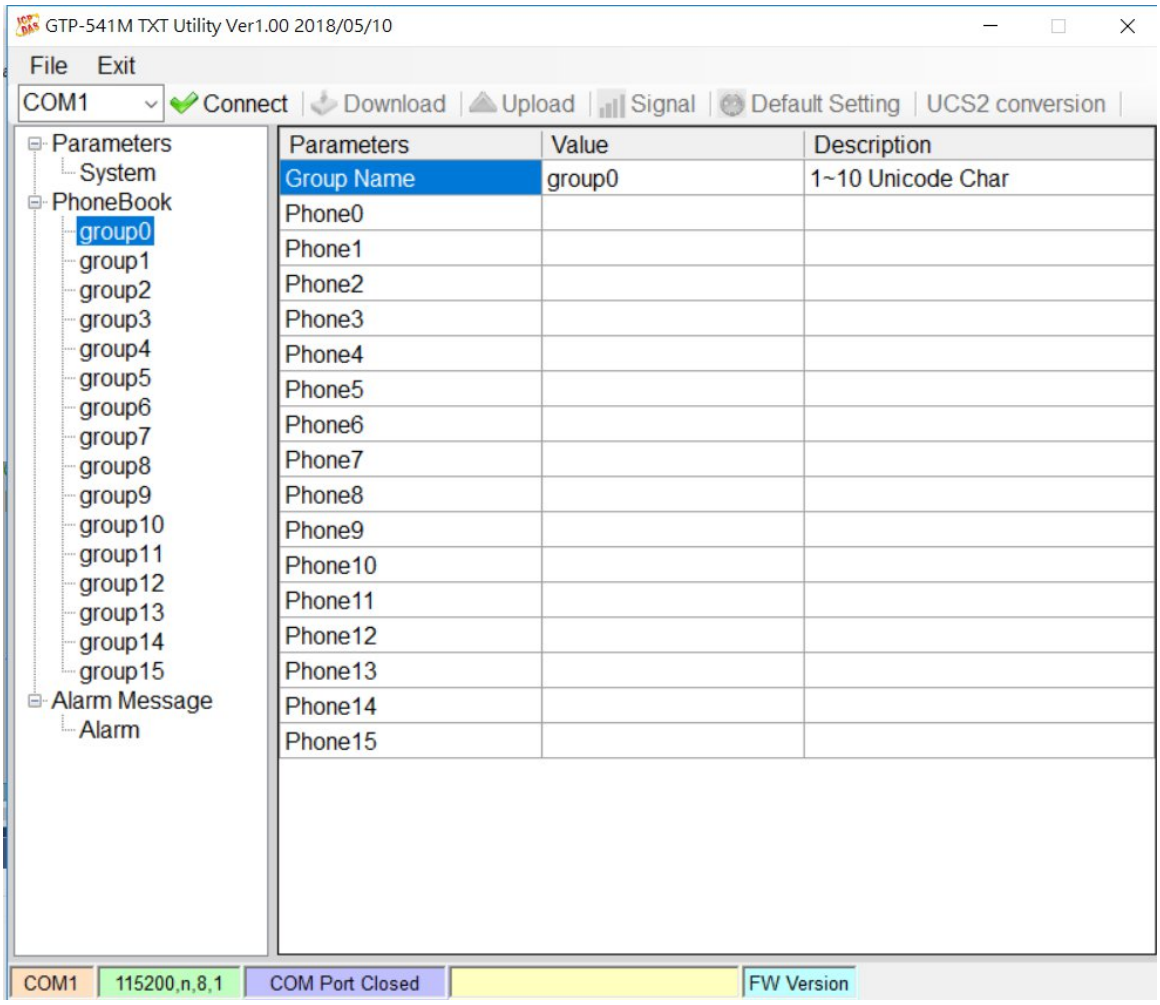
The File option can be used to save parameters into files or open parameter files. It is convenient to manage multiple GTP-541M parameters. The options are as follows:



A. Import Parameters:
   Read the Prj file and fill in the relevant parameters into the Utility.
B. Export Parameters:
   Export the parameter file Prj file

8.2 Description of parameter options

Click on the left window, the tree parameter option, the right side will display the parameter content in the parameter option, select the content you want to change, you can modify it, as shown below:



8.2.1 Description of System Parameters

The "System" parameters, including 5 items, are:

Parameters	Value	Description
PIN code	1234	default=1234 , Max Len=4
Com1		
ComPort baudrate	115200	baudrate = 2400 ~ 115200
ComPort Data Bit	8	Data Bit = 7 ~ 8
ComPort Parity Bit	none	Parity = none,odd,even
ComPort Stop Bit	1	Stop Bit = 1 ~ 2

A. PIN Code:
If you have a password when registering your SIM card, you can use this code to unlock it. If you do not need to unlock it, you will not use this item.

B. ComPort baudrate:
Set Com1's transmission bits per second to support 2400, 4800, 9600, 38400, and 115200bps.

C. ComPort Data Bit:
Set the data bit of Com1 to support 7~8 bits.

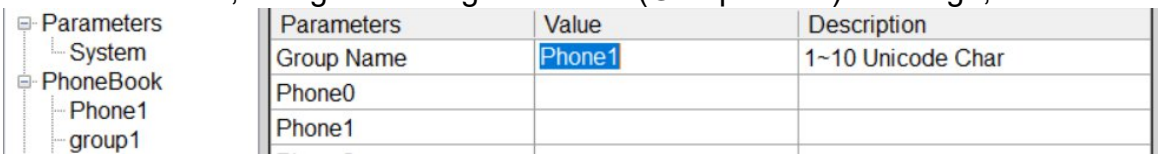
D. ComPort Parity Bit:
Set the E1 check of Com1 to support none, even (even) and odd (odd).

E. ComPort Stop Bit:
Set the stop bit of Com1 to support 1 and 2 bits.

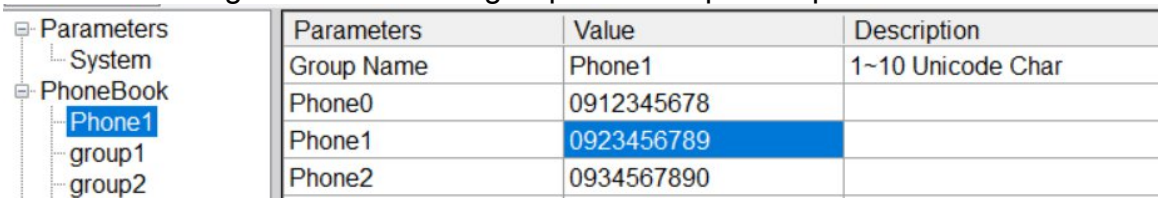
8.2.2 Phone Book Parameter Description

The "Phone Book" parameter is used to define the phone group number and the phone number in the category group. The description is as follows:

A. Modify the group name:
After adding a phone group,to change the group name,first chick on the group name in the left windows,then go to the right windows(Group Name)to change,as shown below:

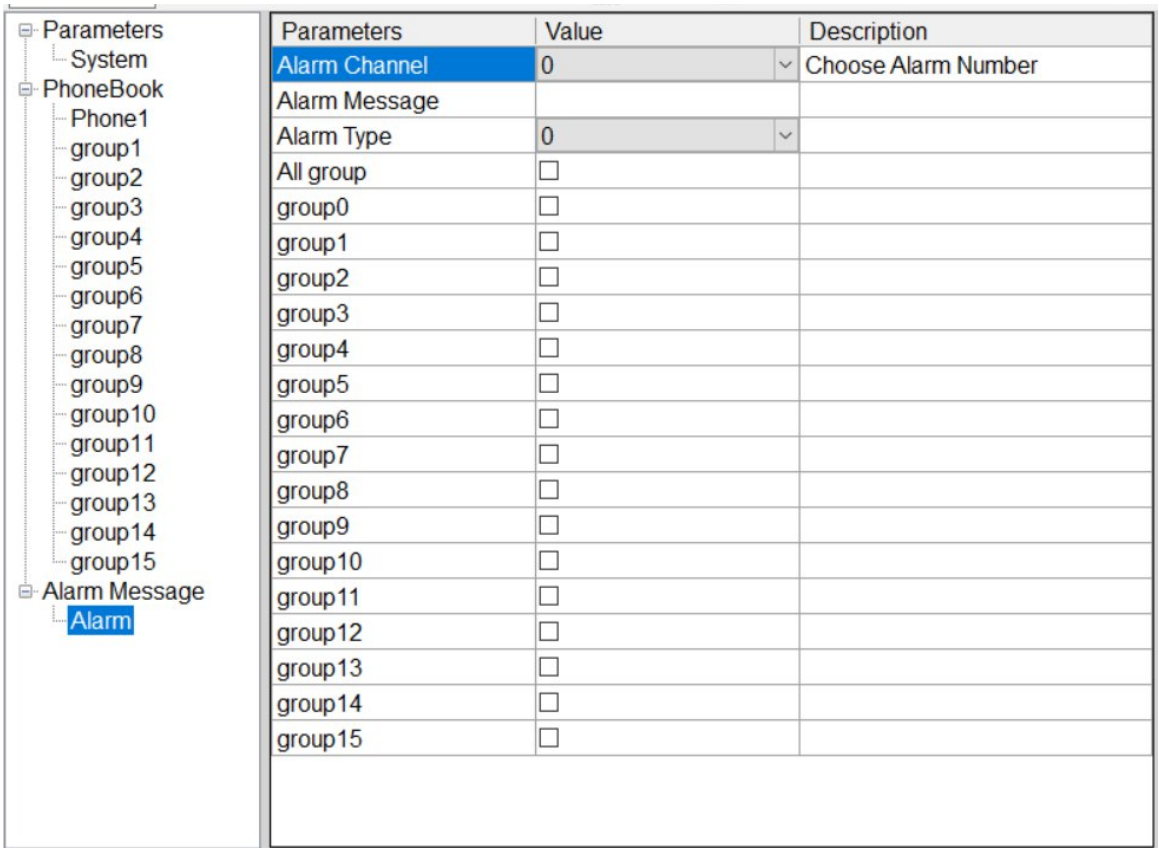


B. Add, modify, or delete phone numbers in the group:
Click on the group name in the left window, then add, modify or delete the phone number in the right window. Each group can set up to 16 phone numbers.



8.2.3 Alarm Message Parameter Description

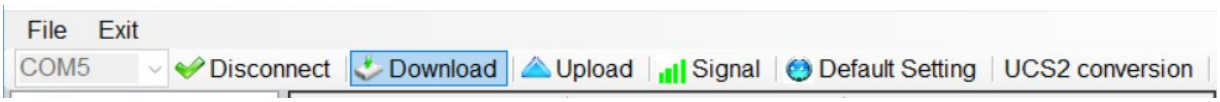
The parameters of "Alarm Message" are used to define the content of the SMS and send the target phone group. The description is as follows:



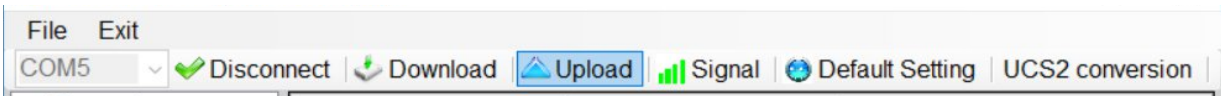
Parameter Name	Description
Alarm Channel	Alarm number, drop-down form, select 0~255
Alarm Message	When the input command triggers an alarm, the content of the sent message, the number of input words is divided according to the choice of Alarm Type: 1: UCS2 code 70 words. 0 : ASCII code 140 words.
Alarm Type	The format of the SMS encoding is divided into UCS2 and ASCII.
All Group	Check or cancel all phone groups.
group0~group15	After checked, when an alarm is triggered, an alert message is sent to the group of the choosed group.

8.3 Download and Upload Parmeters

A. Download:
After the parameter setting is completed, you can use this button to download the parameters to the GTP-541M Device, as shown below, click the “Download” button.



B. Upload:
When you need to read the parameters in GTP-541M, you can use this button to read related data from GTP-541M Device, as shown below, click the “Upload” button.



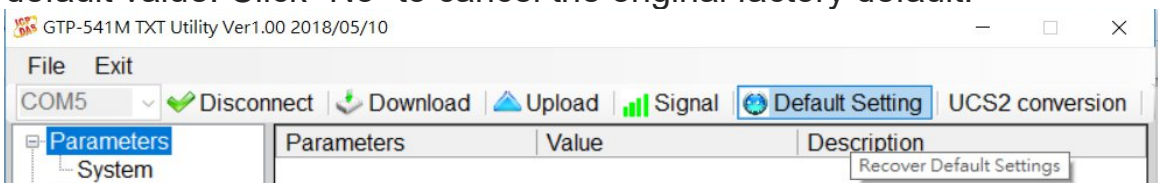
8.4 Query signal strength

Click the “Signal” button to query the current 4G signal strength of the GTP-541M.

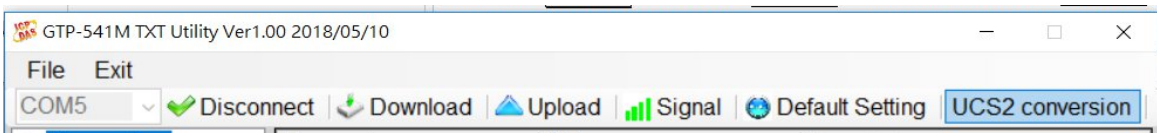
A. Description of the field:
Signal: The percentage of signal strength.
Register: The SIM card registration status is successfully displayed in green, and the failure is displayed in red.

8.5 Back to factory defaults

After clicking “Default Setting”, click “Yes” to return the parameter to the factory default value. Click “No” to cancel the original factory default.

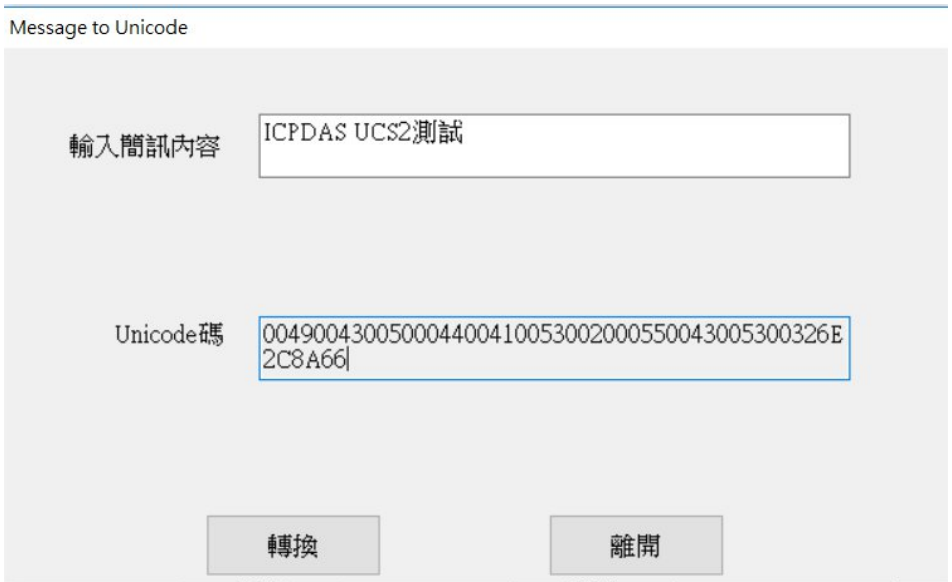


8.6 UCS2 Conversion Tool



1. 1. Click “UCS2 Conversion” to open the UCS2 conversion tool, as shown below.

2. Enter the content of the message in the upper field, and the converted Unicode code will be displayed in the lower field.



3. This code is for UCS2 newsletter content that is filled in when sending SMS messages dynamically.

8.7 SMS Command Description

Through the SMS command, you can send a dynamic message and a fixed message to the GTP-541M through the Comport command.

SMS instruction summary

SMS command	Description
@ALARM	Send fixed message
@SMSSEND	Send dynamic ASCII message
@SMSSENDUCS2	Send dynamic UCS2 message

8.7.1 @ALARM(Send fixed message)

(1) Description
The command is send fixed message.

(2) Reqiest
Set Up:
@ALARMn
Field description:
n: ALARM number to send.
Example:
Send a fixed message ALARM1.
@ALARM0

(3) Response
Format:
!ALARMn;OK
Field description:
n: Specified Alarm number.
Example:
!ALARM0;OK

8.7.2 @SMSSEND(Send Dynamic ASCII Message)

(1) Description
The command is send ASCII dynamic SMS.

(2) Request
Set Up:
@SMSSEND=Phone;Message
Field Description:
Phone: Destination phone number to send.
Message: The content format of the message is 26 basic Latin letters, Arabic numerals and English punctuation marks, and the maximum number of words is 140.
Example:
Send ASCII dynamic message
@SMSSEND=0912345678;ICPDAS_ASCII_TEST

(3) Request:
Receive ASCII SMS content:
ICPDAS_ASCII_TEST
Uart receive format:
!SMSSEND;OK
Example:
!SMSSEND;OK

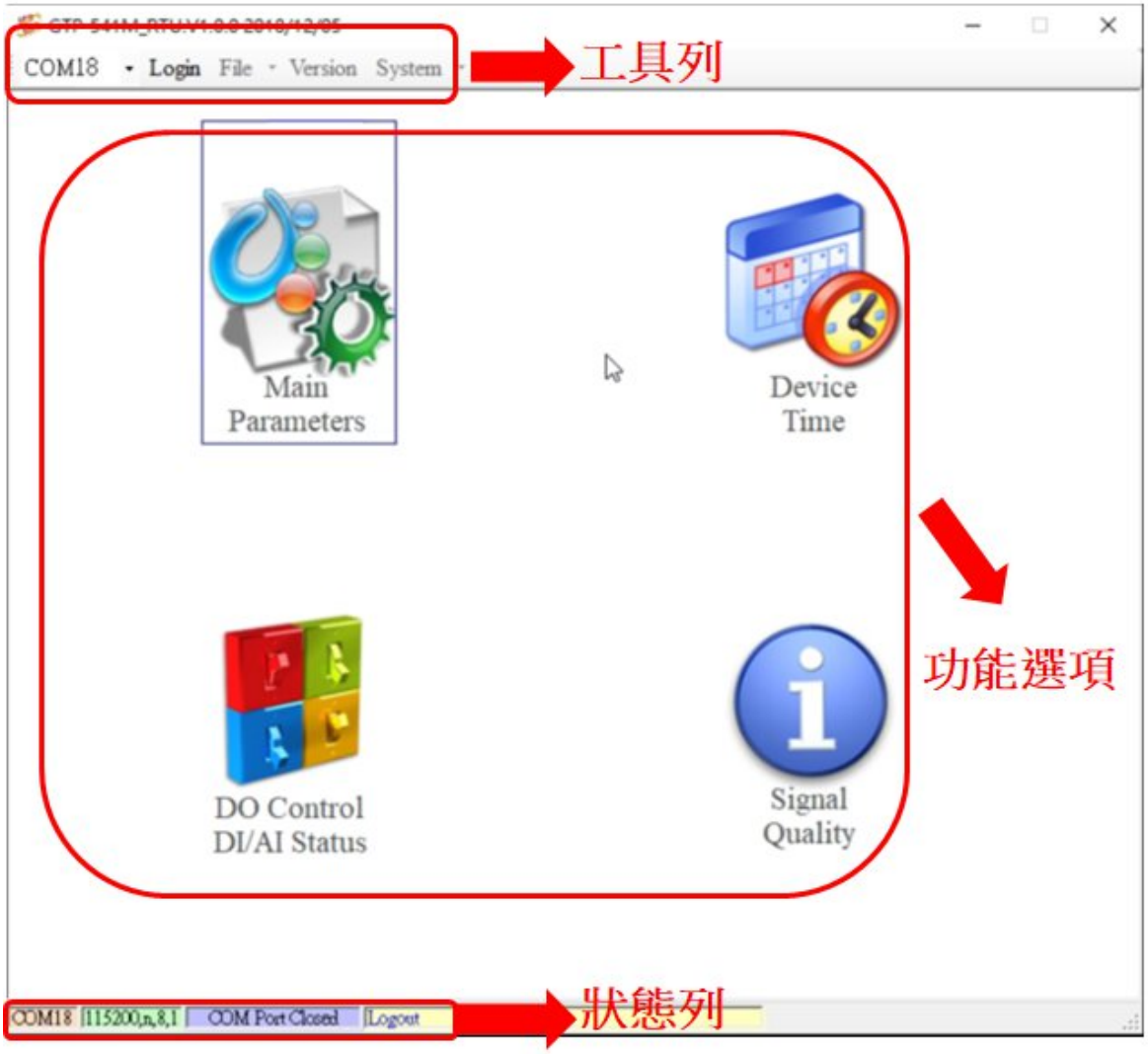
8.7.3 @SMSSENDUCS2(Send dynamic UCS2 Message)

(1) Description:
The command is send UCS2 dynamic SMS.
(2) Request:
Set Up:
@SMSSENDUCS2=Phone;Message
Field description:
Phone: Destination phone number to send.
Message: SMS content format Unicode encoding, up to 70 words.

Example:
Send UCS2 dynamic SMS
@SMSSENDUCS2=0912345678;0049004300500044004100530020005500430053003 2
(3) Response
Receive UCS2 SMS content:
ICPDAS UCS2
Uart receive format:
!SMSSENDUCS2;OK
Example:
!SMSSENDUCS2;OK

9.RTU Utility main screen description

The GTP-541M RTU Utility layout mainly includes the following parts, which are explained as follows:



Tool train

◆ COM：

Select PC COM PORT Connected to GTP-541M

◆ Login/Logout：

To do anything with GTP-541M, you must log in first. After successful login, the options will become logout, and the options in Utility will allow the operation. If the newsletter reopens or shuts down the external power supply, it must be re-logged in.

◆ Version：

GTP-541M Firmware and Utility Version Information.

- System：

  There are two functions: Recover to Factory Settings and Restart GTP-541M (Reset Device).

Functional options

- Main Parameter：
  GTP-541M Parameter settings.
- Device Time:

  Query and set device time.
- DO Control/DI/AI Status：

  Query I/O status and DO control.
- Signal Quality：

  Query the current signal strength of the device.

Status Bar

Display information about the operation of the GTP-541 Utility, from left to right, in order

(5) PC-side COM Port number used by the Utility.

(6) Transmission parameter setting of COM Port.

(7) The current connection status of the COM Port.

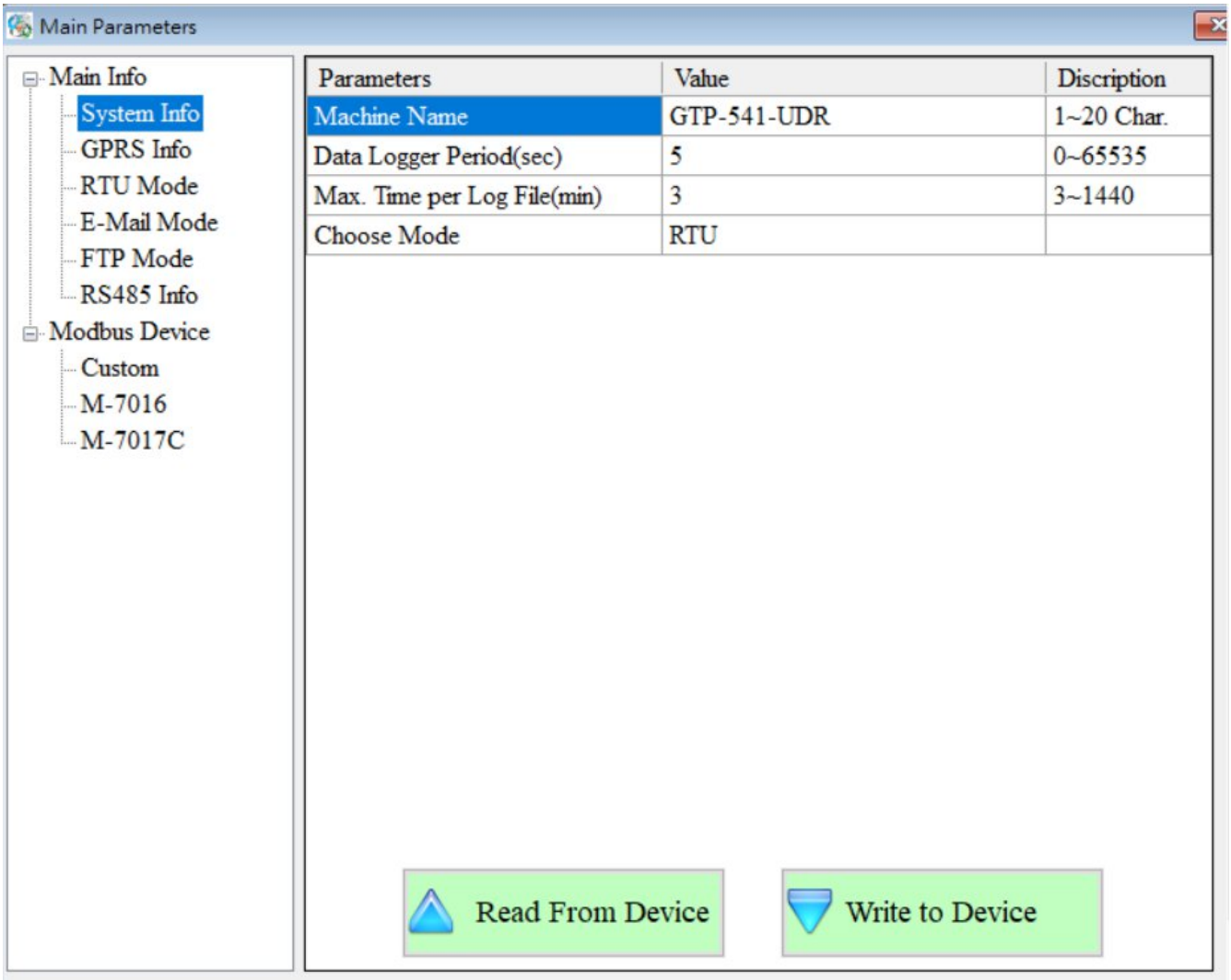
(8) The result of each operation, such as the success of the “storage” action.

9.1 Main Parameter

Set the parameters and functions of the block, described in detail as follows:

9.1.1 Main Info Parameter Description

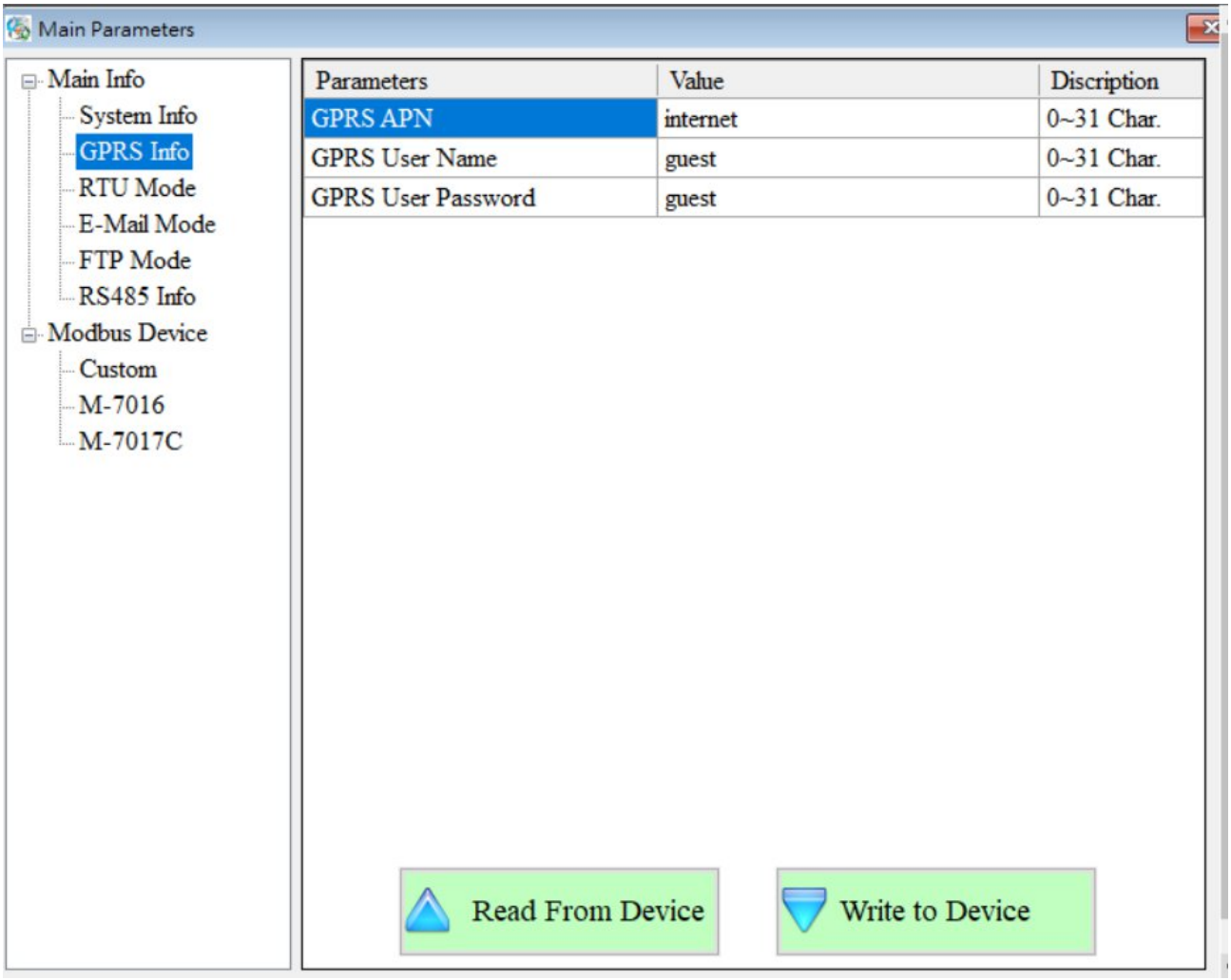
◆ System Info



Parameter name	Description
Machinie Name	Device name. In E-Mail mode, the E-Main content contains this information. (1 - 20 characters)
Data Logger Period(Sec)	In data records, the time interval of each record is in seconds. If it is 0, the function of I/O data record is turned off. (0 - 65535 seconds)

Max Time per Log File(Min)	The time of each record is divided into units. (3-1440 points)
Choose Mode	Select the function options to open, RTU, E-Mail and FTP3 functions to open alternatively。

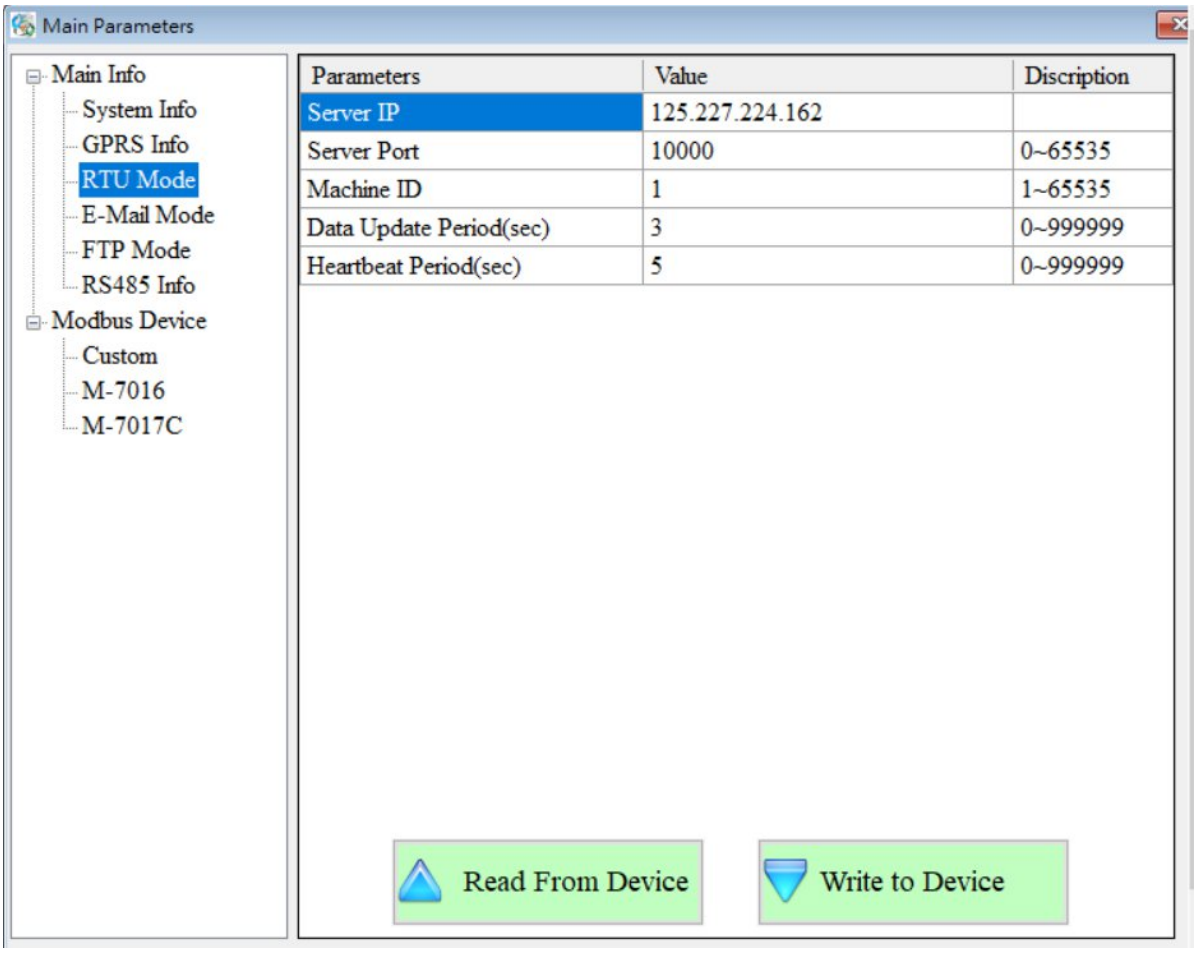
◆ GPRS Info



Parameter name	Description
GPRS APN	The Access point name required to log in to the GPRS system is provided by the carrier who applied for the SIM card. (0 ~ 31 char)
GPRS User Name	The account number required to log in to the GPRS system is provided by the carrier who applied for the SIM card.

	(0 ~ 31 char)
GPRS User Password	The password required to log in to the GPRS system is provided by the carrier who applied for the SIM card.(0 ~ 31 char)

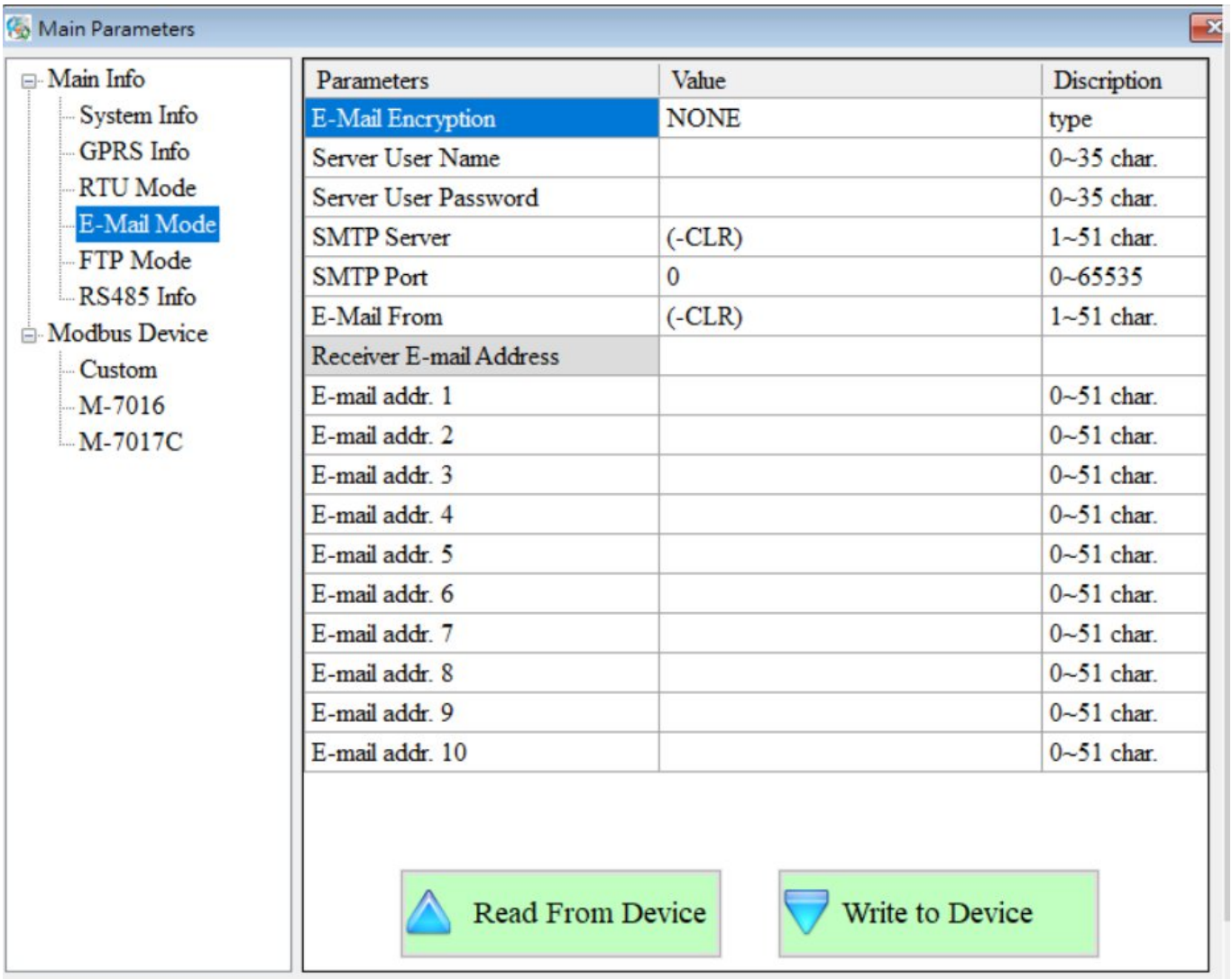
◆ RTU Mode



Parameter name	Description
Server IP	IP position of server. In RTU mode, it refers to the remote PC that executes M2M RTU Center, and in E-Mail mode, it refers to the mail server. (0 - 31 characters)
Server Port	The network port number used by the server. In RTU mode, you need to specify 10000, in E-Mail mode, and 25 for general mail servers. (0 ~ 65535)

Machine ID	In RTU mode, the ID of the GTP-541M device. In the receiving software "M2M RTU Center" of the remote PC, the ID of the device must be added before the data uploaded by the device can be received. (1 ~ 65535)
Data Update Period(sec)	The time interval for uploading data is in seconds. If it is 0, this function is turned off. (0-999999 seconds)
Heartbeat Period(sec)	The time interval for transmitting a heartbeat packet is to tell the remote PC that the device is still alive. (0-999999 seconds)

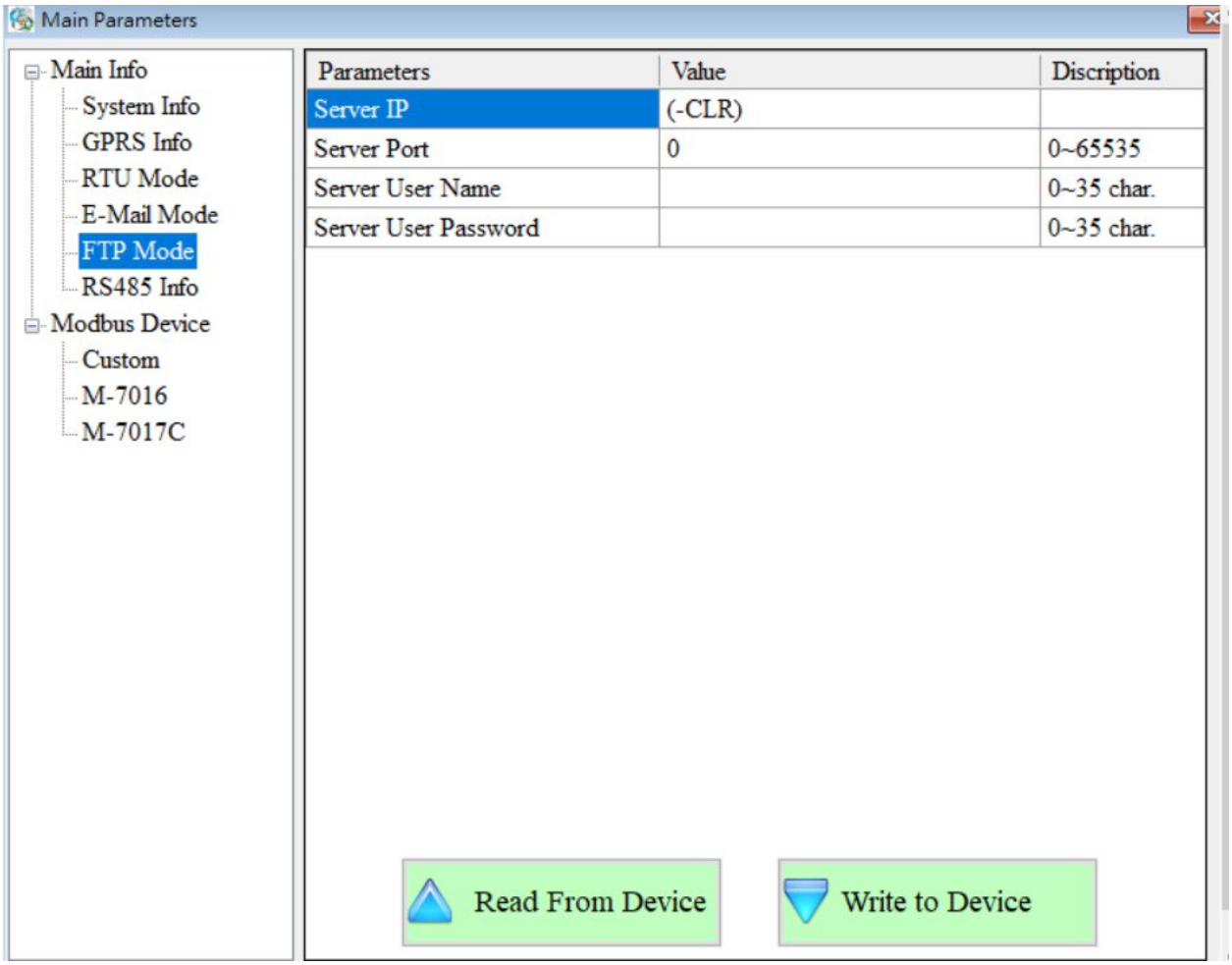
◆ E-Mail Mode



Parameter name	Description
E-Mail Encryption	GTP-541M only supports the following three ways: 1. NONE: No authentication is required. 2. SSL: Log in to the mail server with the authentication of SSL. 3. TLS: Log in to the mail server with TLS authentication.
Server User Name	Log in to the mail server account. (0-35 characters)
Server Password	The password to log in to the mail server. (0-35 characters)
SMTP Server	IP location of SMTP. (0 - 51 characters)

SMTP Port	The network port number used by SMTP.
E-Mail From	Specify the sender of the e-mail. In E-Mail mode, this field cannot be empty. (1 - 51 characters)
E-Mail Addr.1~ E-Mail Addr. 10	In E-Mail mode, these 10 fields can be used to specify the addresses of e-mail, currently supporting up to 10 locations. (0-51 characters)

◆ FTP Mode



Parameter name	Description
Server IP	IP address of FTP.
Server Port	FTP's network port number.
Server User Name	FTP login account.
Server User Password	FTP login password.

◆ E-Mail/FTP Mode Log File

The log files are uploaded at 12 o'clock in the evening every day. Upload all the log files in the SD card in order (using attachments in Mail mode) and delete them. The content will be separated by commas. The first data of each file is the name of the field. The second data starts

as data value. The data format is the date of the record, GTP-541M I/O data, Modbus RTU I/O data and GPS data. The following is an example of the most complete log file. Modbus RTU device data and GPS data will be set according to the actual settings.

Date	DI0	DI1	DI2	DI3	DI4	DO0	DO1	AI0	AI1
20201214 165112	1	0	0	0	0	1	0	16225	22281

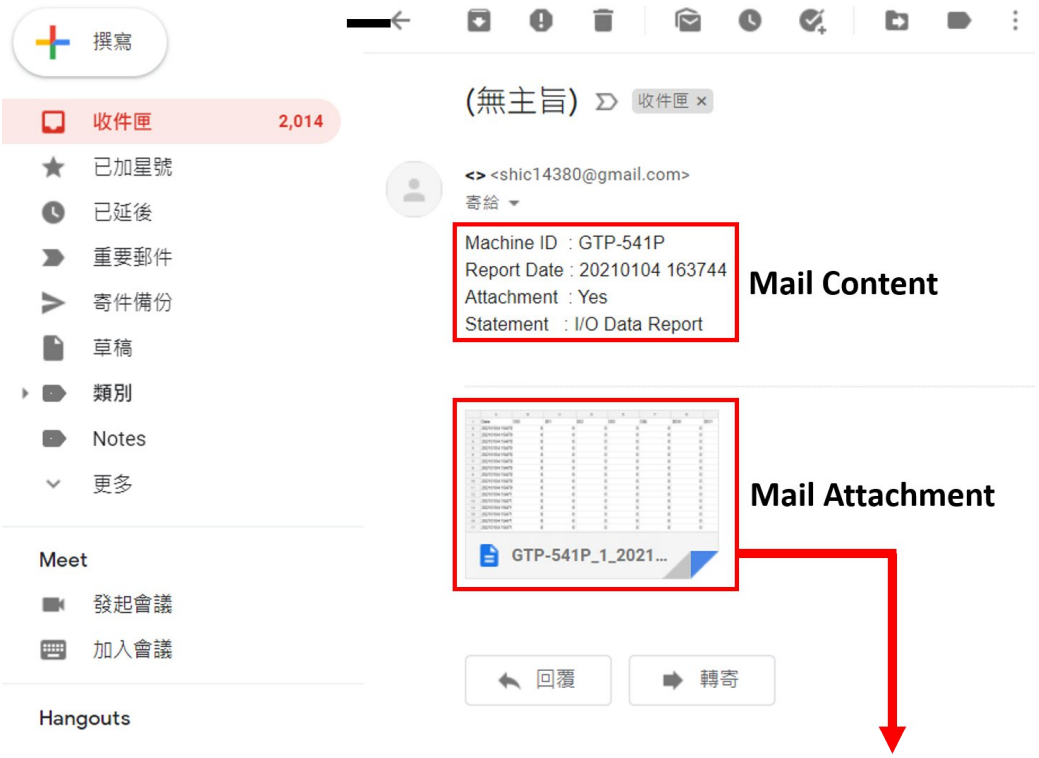
AI2	AI3	Module [M-7016] Addr.	DI0	DO0	DO1	DO2	DO3	AI0
10485	6553	3	1	0	0	0	0	0.033

AI1	AO0	Module [M-7060] Addr.	DI0	DI1	DI2	DI3	DO0	DO1
0.671	1.500	5	1	0	0	0	1	0

DO2	DO3	Module [M-7080B] Addr.	DO0	DO1	CI0	CI1
0	0	1	0	0	655	596

GPS Data(GPRMC)
$GPRMC,032015.000,A,2237.2113,N,12018.1153,E,0.00,98.25,240420,,,A,V*2E

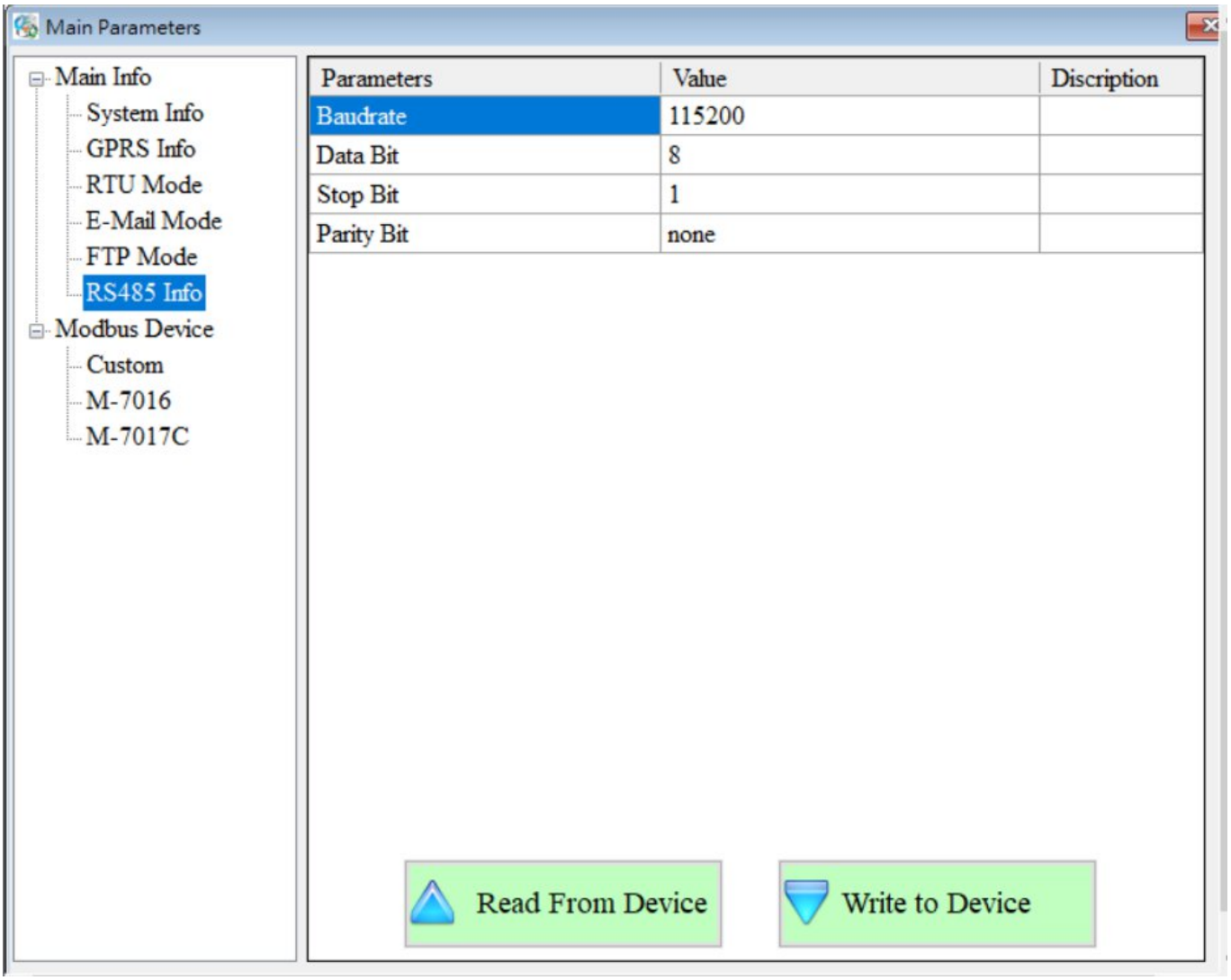
The picture below shows the presentation of Mail, which is divided into two parts: Mail content and Mail attachments. The content includes: the name of the device, the time when the mail was sent, whether the attachment is included, and the status of the data. The attachment is a log file, and the log file in FTP mode is the same as this file.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Date	DI0	DI1	DI2	DI3	DI4	DO0	DO1	AI0	AI1	AI2	AI3	GPS Data(GPRMC)	
2	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
3	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
4	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
5	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
6	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
7	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
8	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
9	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
10	20210104	0	0	0	0	0	0	0	65534	65534	65535	65534	$GPRMC,,V,,,,,,,,,,N*53	
11	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
12	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
13	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
14	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
15	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
16	20210104	0	0	0	0	0	0	0	65534	65535	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	
17	20210104	0	0	0	0	0	0	0	65534	65534	65534	65534	$GPRMC,,V,,,,,,,,,,N*53	

File Name: Machine Name + Machine ID + Date Of Record

◆ RS-485 Info



Parameter name	Description
Baudrate	Transport Rate of ComPort
Data Bit	Data bits of ComPort
Stop Bit	Stop Bits of ComPort
Parity Bit	Specifies the method of peer checking. None: No check, odd: odd bit check, even: even bit check.

Modbus Devices

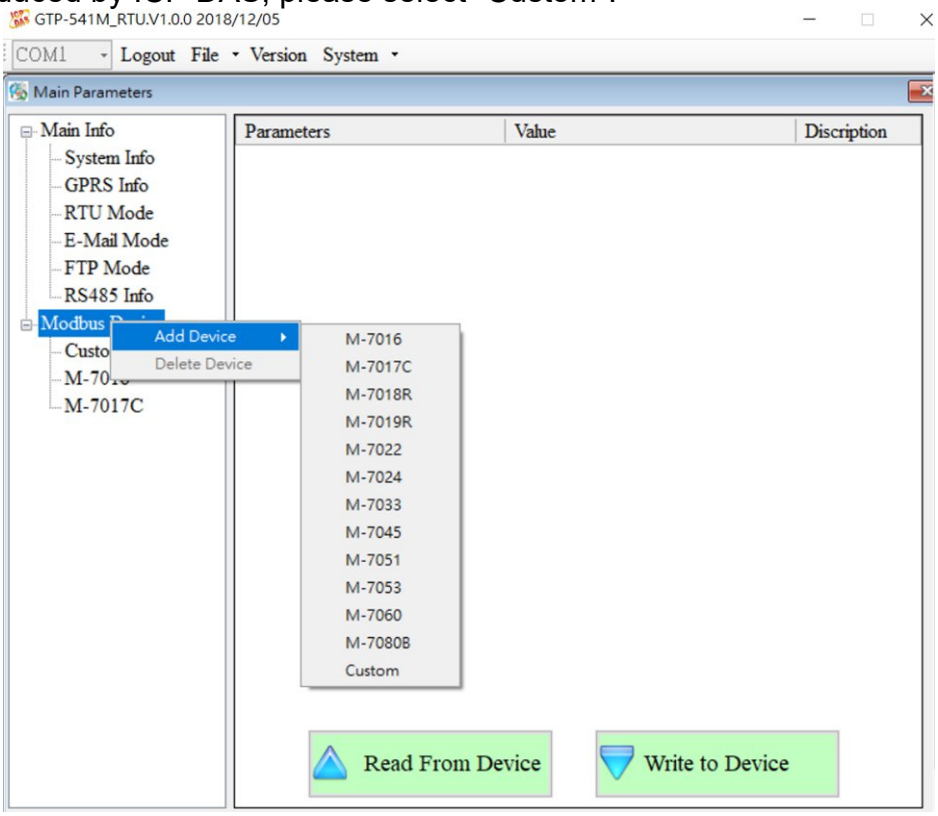
GTP-541M can connect up to three Modbus RTU devices, Macro's M-8000 series products and other Modbus RTU devices. The number of I/O channels supported by each Modbus RTU device is as follows:

DI : 32 Channels
DO : 32 Channels
AI :16 Channels
AO :16 Channels

1. **Add a new Modbus RTU device**

To join a Modbus RTU device to the GTP-541, you can do the following:

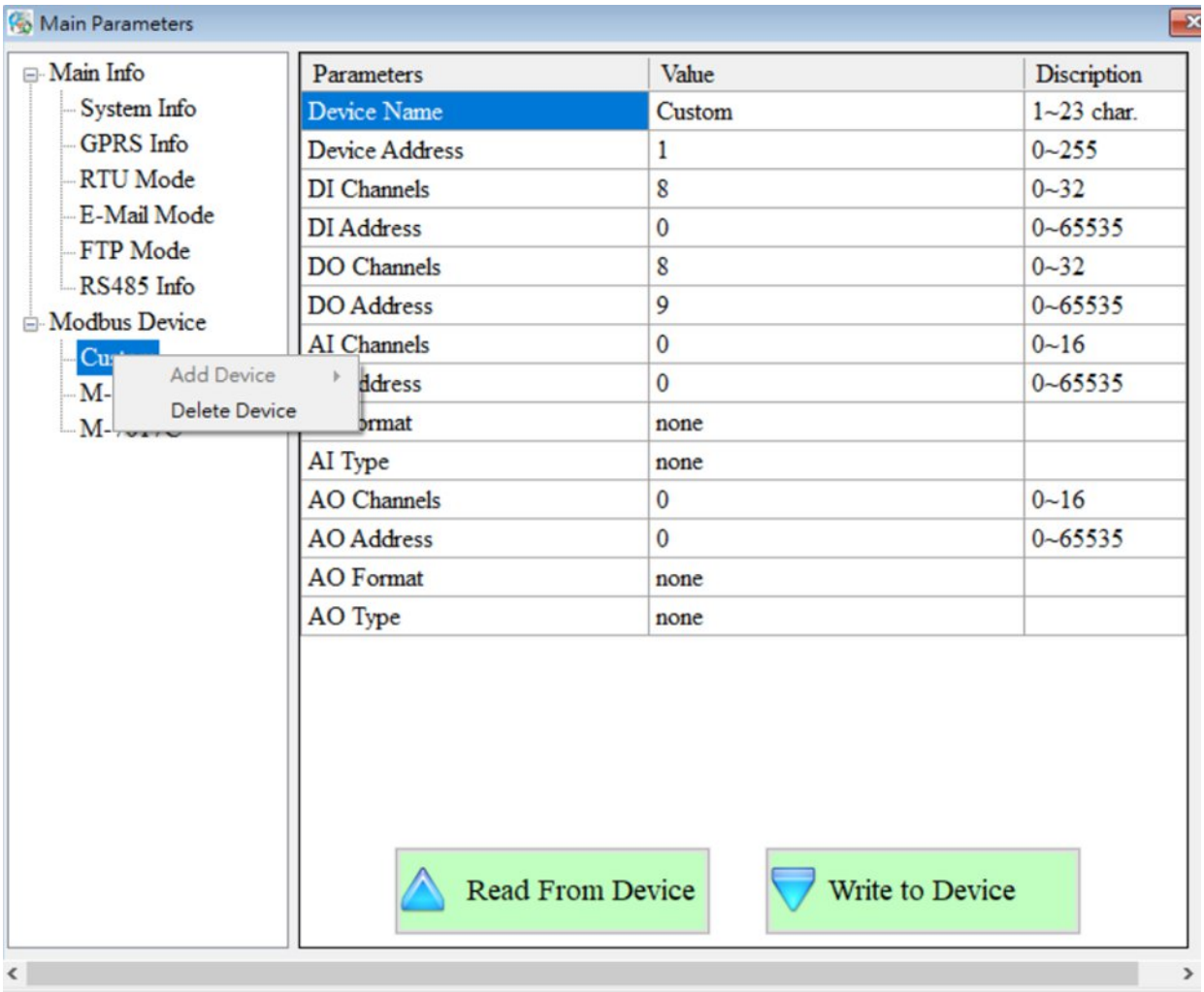
(1) Click on "Modbus Device" in the tree view and press the right mouse button.
(2) Click on "Add Device"
(3) Select the name of the Modbus RTU device. If it is not the M-8000 series produced by ICP DAS, please select "Custom".



1. **Remove a Modbus RTU device**

To remove a Modbus RTU device from the GTP-541, you can do the following:

(1) Click on the name of the Modbus RTU device you want to remove in the tree view and press the right mouse button.
(2) Click on "Delete Device" to complete the removal.

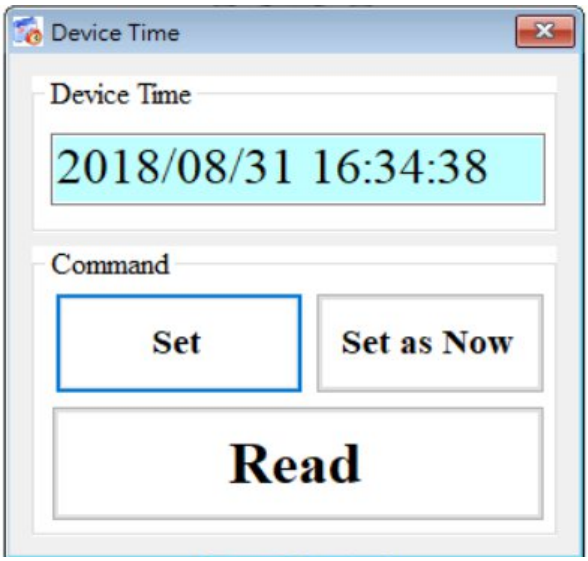


2. **Parameter Description**

Parameter name	Description
Device name	The name of the Modbus RTU device
Device Address	Address of Modbus RTU device
DI Channels	DI channel number
DI Address	Read the start address of the DI data
DO Channels	DO channel number
DO Address	Read the start address of the DO data
AI Channels	AI channel number
AI Address	Read the start address of the AI data
AI Format	AI data format, custom Modbus RTU device only supports 16-bit data length
AI Type	Type of AI
AO Channels	AI channel number
AO Address	Read the start address of the AO data
AO Format	AO data format, custom Modbus RTU device only supports 16-bit data length
AO Type	Type of AO

9.2 Device Time parameter description

Through this window, you can change and query the time of GTP-541M. The following are its operation options and field instructions:



Field description

- Device Time：

  Display device current time.

- Command：

  Set time and read time.

Operational options description

- Set：

  The user can enter the date and time into the Device Time field by himself. Set sets the time in the Device Time field to the device.

- Set as Now：

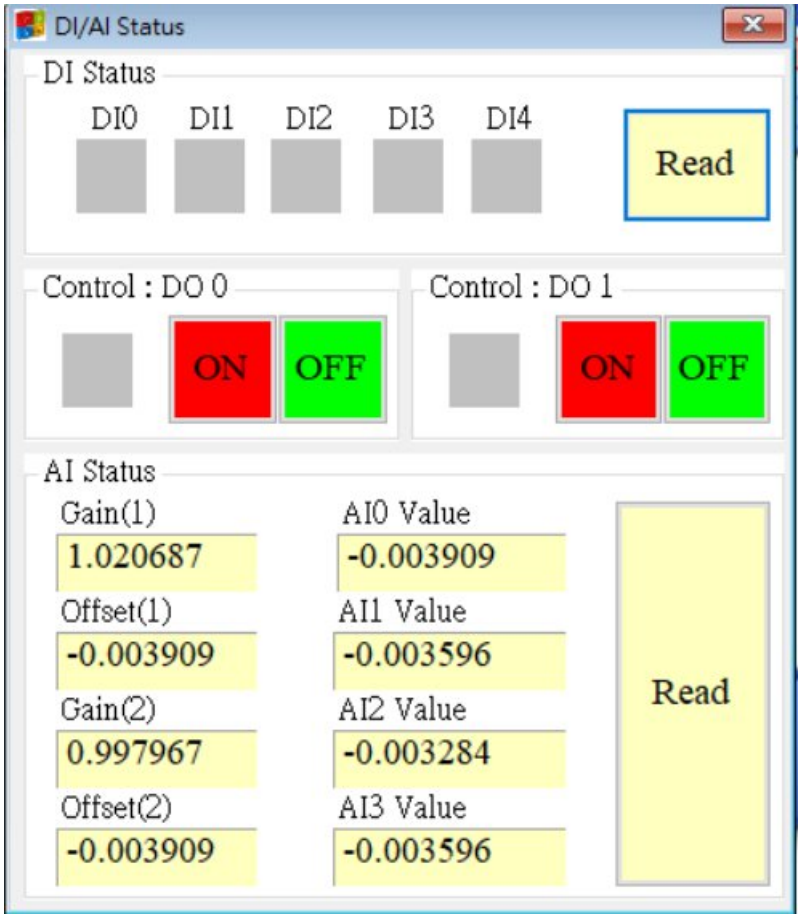
  Read the current date and time of PC and set it to the device.

- Read：

  Display device current time.

9.3 DO Control AI/DI Status Description

Users can read the I/O status of the current device and manually control the DO status. The operation options and fields are described below.



DI Status

- Red：

  When DI is ON, the state is low quasi-bit.

- Gray：

  When DI is OFF, the state is high bit.

- Read

  Read the DI/DO status.

Control : DO0、DO1

- Red：

  When DO is ON, the state is low quasi-bit.

- Gray：

  When DO is OFF, the state is high bit.

- ON:

  Open DO0, DO1.

- OFF:

  Close DO0, DO1.

AI Status

- AI0(~3) Value：

  The current AI reading is in volts (V).

- Gain(1~2)：

  AI correction value, read-only. If Gain is 1 and Offset is 0, please contact us.

- Offset(1~2)：

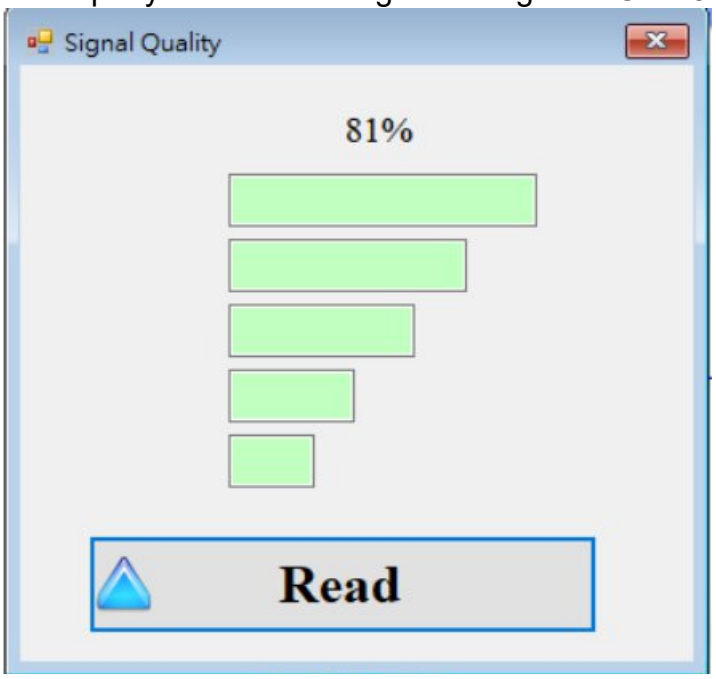
  AI correction value, read-only. If Gain is 1 and Offset is 0, please contact us.

- Read:

  Read AI voltage value.

9.4 Signal Quality Description

This window can be used to query the received signal strength on GTP-541M



Signal Quality field description

The signal strength is expressed in 5 segments and the current percentage of the signal strength is shown.

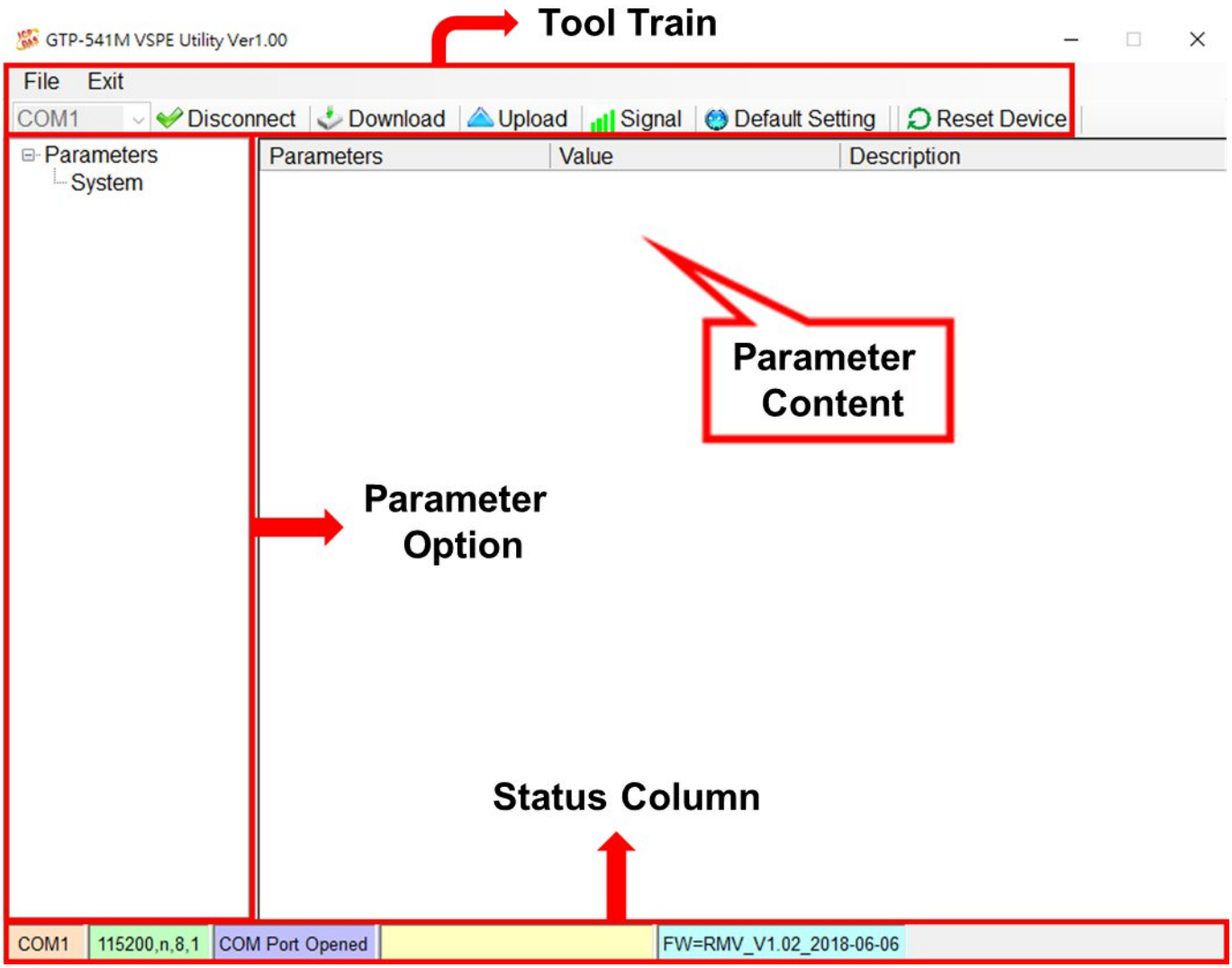
Operational options description

- Read：

  Read the current signal strength from GTP-541M.

10.VSPE Utility main screen description

The GTP-541M VSPE Utility layout mainly includes the following parts, which are described as follows:



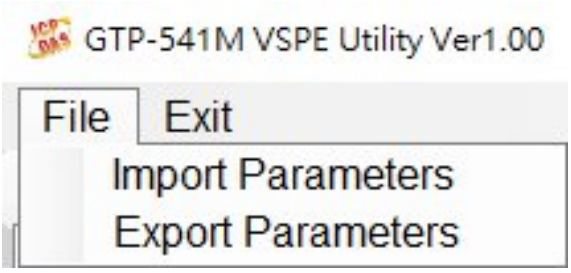
1. Tool Train
   Tool Train Options, including all the main function operations of GTP-541M VSPE Utility, the description is as follows:
   (1) File: The VSPE parameter is saved as a Project file. This operation includes Import Parameters and Export Parameters
   (2) Exit: Exit GTP-541M VSPE Utility
   (3) COM Port: COM Port number of PC connected with GTP-541M
   (4) Connect / Disconnect: Connect / Disconnect with GTP-541M
   (5) Download: Download parameters to GTP-541M
   (6) Upload: Upload GTP-541M parameters to GTP-541M VSPE Utility
   (7) Signal: Query signal strength and network status
   (8) Default Setting: Restore factory settings
   (9) Reset Device: Restart device
2. Parameter Option:

GTP-541M parameter options, including **System** and **COM Port**.

3. Parameter Content:
   Display and change the contents of parameters.
4. Status Column
   Display a series of information during the operation of GTP-541M VSPE Utility, from left to right, in order:
   (1) PC side COM Port used by VSPE Utility
   (2) COM Port transmission settings
   (3) Current status of COM Port
   (4) Current operation status of the device
   (5) Firmware version

10.1 Parameter file management

Through the File option, the parameters can be saved as a file or opened, which is convenient for managing multiple GTP-541M parameters. The options are described as follows:



Import Parameters: Open an existed parameters
Export Parameters: Save parameters as a file

10.2 Connect GTP-541M

GTP-541M can be connected by following operations:

1. Select COM Port, as shown in Figure 10.2.1.

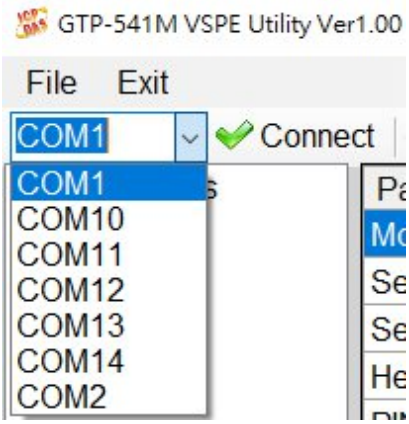


Figure 10.2.1

2. Click **Connect** to connect GTP-541M, as shown in Figure 10.2.2.

※ If the connection fails, please check the following conditions:

- COM Port selection is correct
- RS-232 / RS-485 wiring is normal
- The Init. pin is connected to GND pin, as shown in Figure 10.2.3

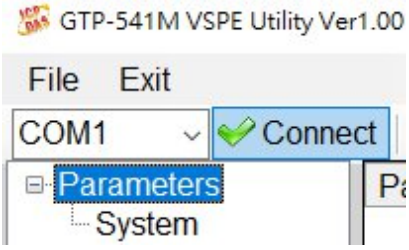


Figure 10.2.2

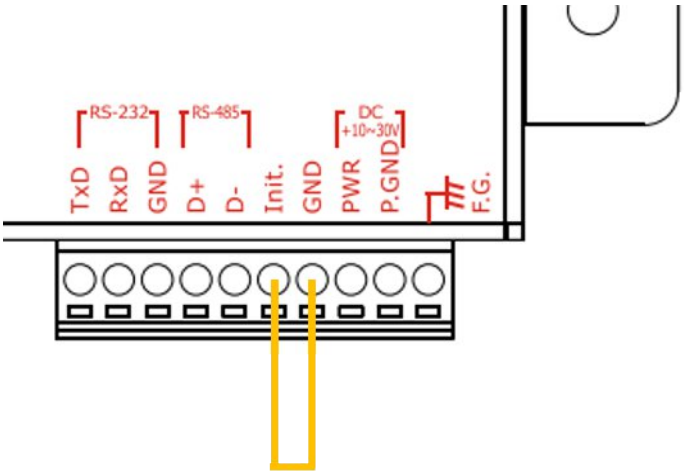


Figure 10.2.3

10.3 Parameter Description

Click the tree parameter option in the left window of the main screen, and the right window will display the parameter content of the parameter option, which can be modified, as shown in Figure 10.3.1.

Parameters	Value	Description
Mode	Pair Server	
Server IP	125.227.224.158	
Server Port	11000	
Heartbeat Time	10	
PIN code	1234	default=1234 , Max Len=4
APN	INTERNET	Max Len = 63
Modem User		Max Len = 31
Modem Password		Max Len = 31
Com1		
ComPort baudrate	19200	baudrate = 2400 ~ 115200
ComPort Data Bit	7	Data Bit = 7 ~ 8
ComPort Parity Bit	odd	Parity = none,odd,even
ComPort Stop Bit	2	Stop Bit = 1 ~ 2

Figure 10.3.1

10.3.1 System parameter description

The parameters of **System** include 12 items, which are:

Parameter Name	Description
Mode	Connection object VSPE Client: Connect to VSPE Server on PC Pair Client: Connect to GTP-541M Pair Server: Wait for connection of GTP-541M
Server IP	Remote Server IP
Server Port	Remote Server Port
Heartbeat Time	Heartbeat packet (range 10 seconds ~ 3600 seconds)
PIN code	SIM card unlock PIN code
APN	Internet APN
Modem User	Internet account
Modem Password	Internet password
ComPort baudrate	Transmit bits per second, supporting 2400, 4800, 9600, 19200, 38400, 57600, and 115200bps
ComPort Data Bit	Data bit, support 7 or 8 bits
ComPort Parity Bit	Peer check, support for none, even and odd
ComPort Stop Bit	Stop bit, support 1 bit and 2 bits

10.4 Download and upload parameters

1. Download parameters

After the parameter setting is completed, the parameters can be downloaded to GTP-541M by clicking **Download**, as shown in Figure 10.4.1.

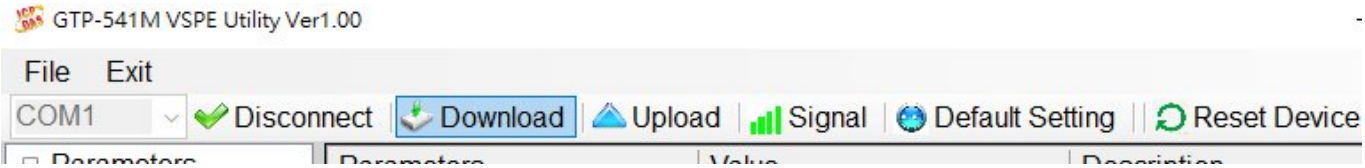


Figure 10.4.1

2. Upload parameters

When you need to read out the parameters saved in GTP-541M, you can click **Upload** button, as shown in Figure 10.4.2.

Figure 10.4.2

10.5 Query signal strength

You can click **Signal** to check the current signal strength of GTP-541M. The sequence of steps is as shown in Figure 10.5.1 to Figure 10.5.2.

Figure 10.5.1

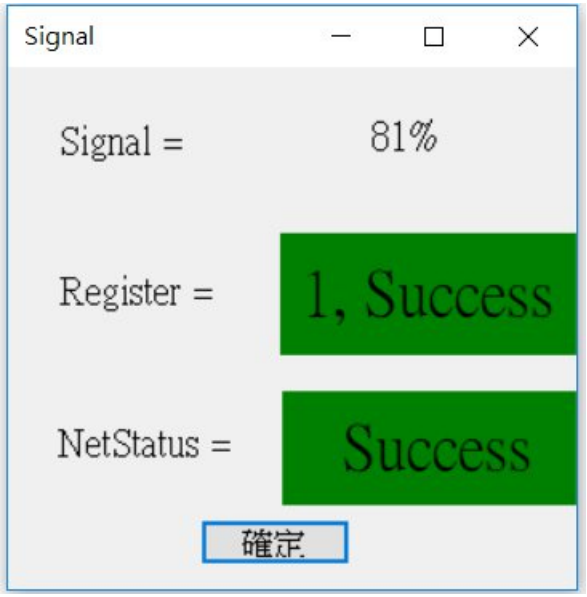


Figure 10.5.2

Field Description:

- Signal: Current signal strength expressed as a percentage
- Register: Current registration status with the cell site
  - Green: Registered
  - Red: Not Registered
- NetStatus: Current connection status
  - Green: Connected
  - Red: Not connect

10.6 Restore factory settings

You can click **Default Setting** to restore the parameters to factory defaults. When clicking **Default Setting**, a window will pop up, click **Yes** to restore the parameters to the default value, or click **No** to cancel. The sequence of steps is as shown in Figure 10.6.1 to 10.6.2.

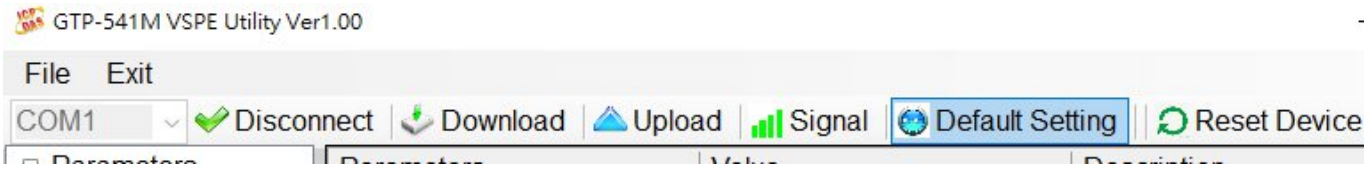


Figure 10.6.1

Figure 10.6.2

10.7 Reset device

Click **Reset Device**, GTP-541M will restart after 5 seconds. The sequence of steps is as shown in Figure 10.7.1 to 10.7.3.

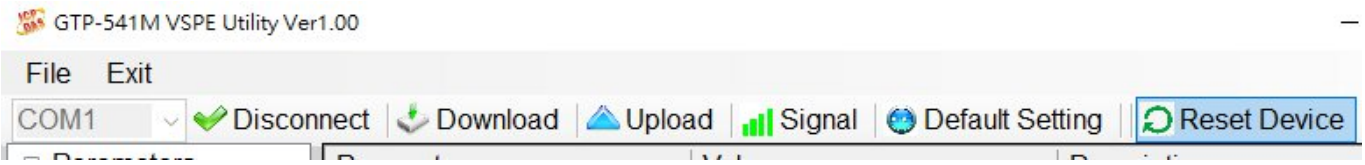


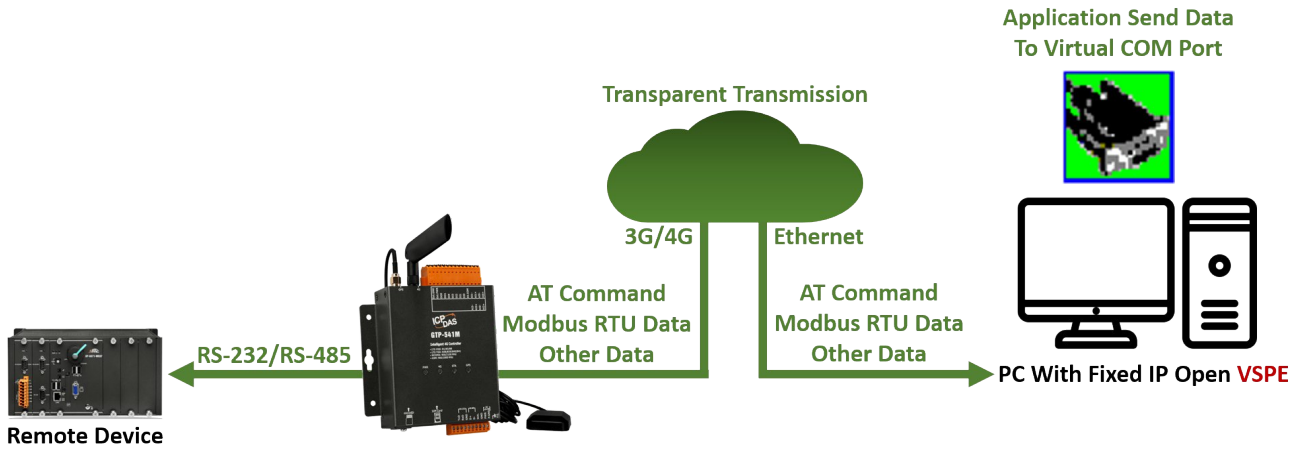
Figure 10.7.1

Figure 10.7.2

Figure 10.7.3

10.8 Connection Example

10.8.1 VSPE Client mode



1. Please download and install VSPE from the following link:
http://www.eterlogic.com/Products.VSPE.html

2. Open VSPE, click **Create new device** to create virtual COM Port, as shown in Figure 10.8.1.1

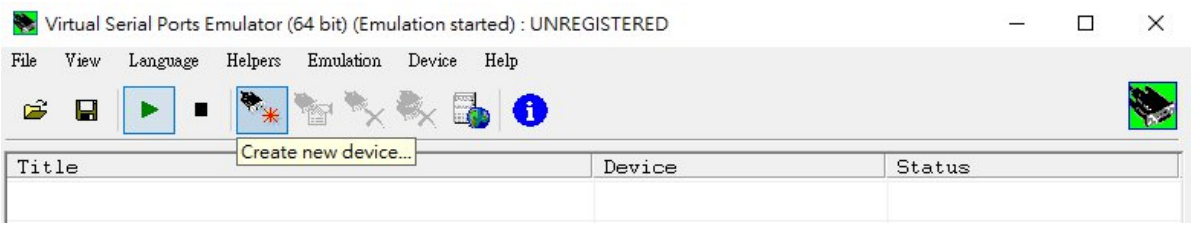


Figure 10.8.1.1

3. Select the device type as **Connector** and click **Next**, as shown in Figure 10.8.1.2

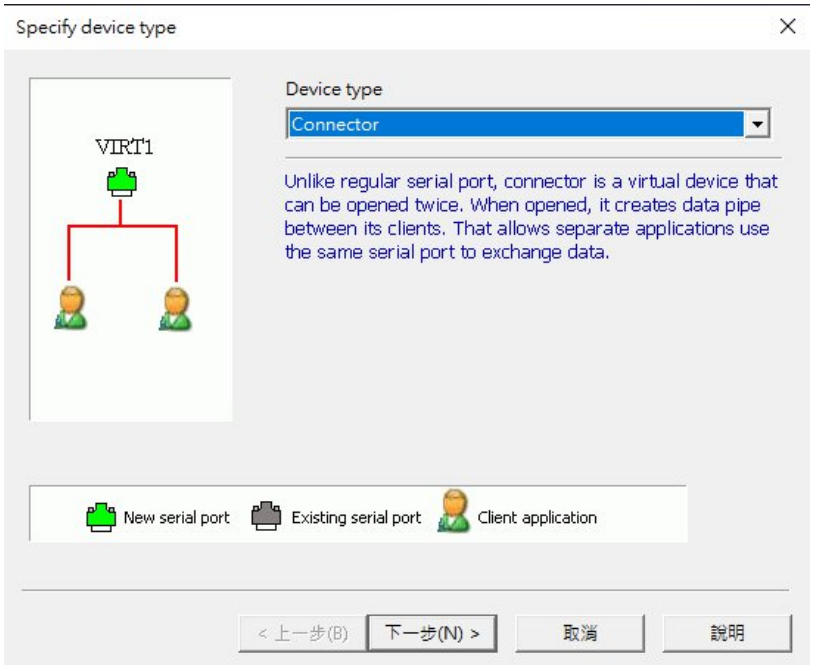


Figure 10.8.1.2

4. Select the virtual COM Port and click **Finish**, as shown in Figure 10.8.1.3

Figure 10.8.1.3

5. Right-click the newly added virtual COM Port on the main screen and select **Create**, as shown in Figure 10.8.1.4

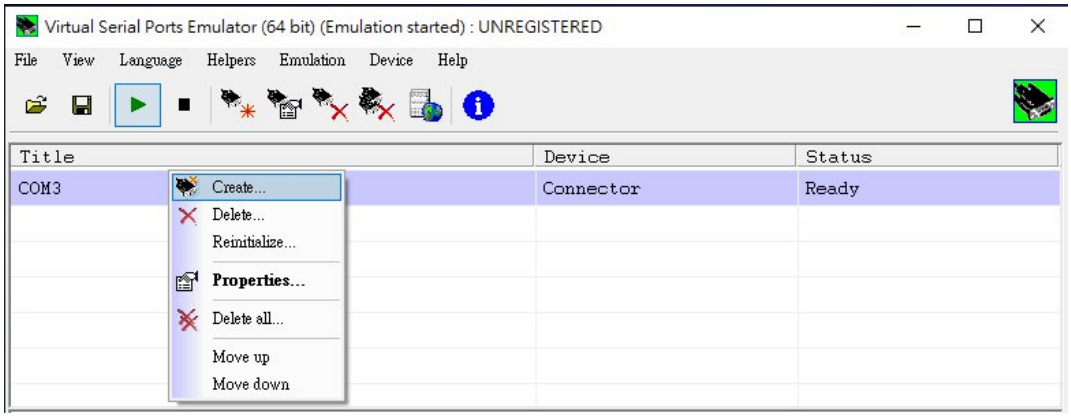


Figure 10.8.1.4

6. Select the device type as **TcpServer** and click **Next**, as shown in Figure 10.8.1.5

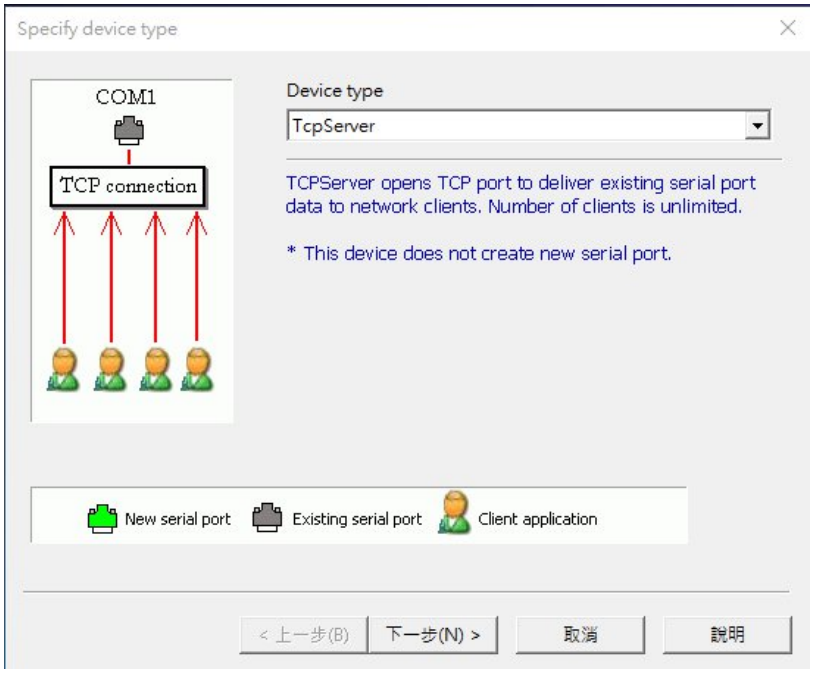


Figure 10.8.1.5

7. After setting **Local TCP port** and **Serial port setting**, click **Finish**, as shown in Figure 10.8.1.6

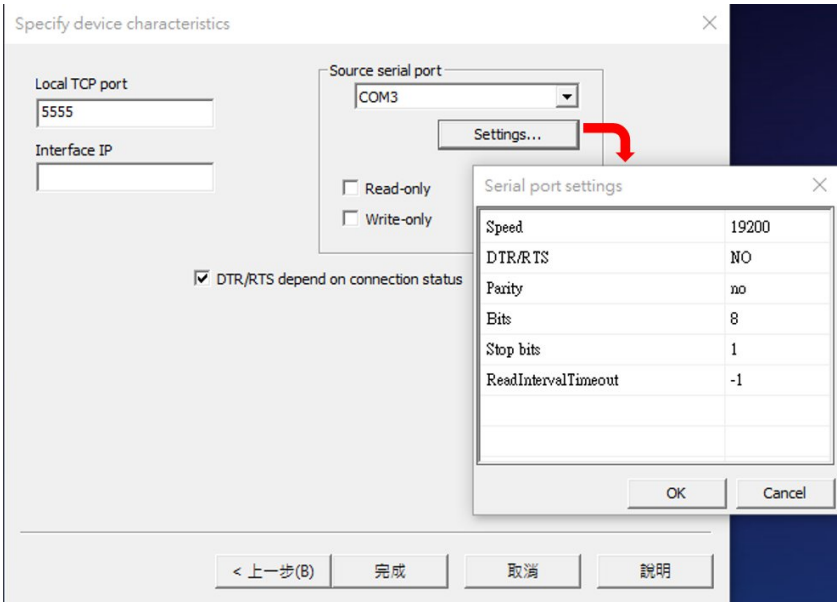


Figure 10.8.1.6

8. After setting, a **TcpServer** device will be added to the main screen. If GTP-541M is not connected yet, the status will show as **Ready**, as shown in Figure 10.8.1.7

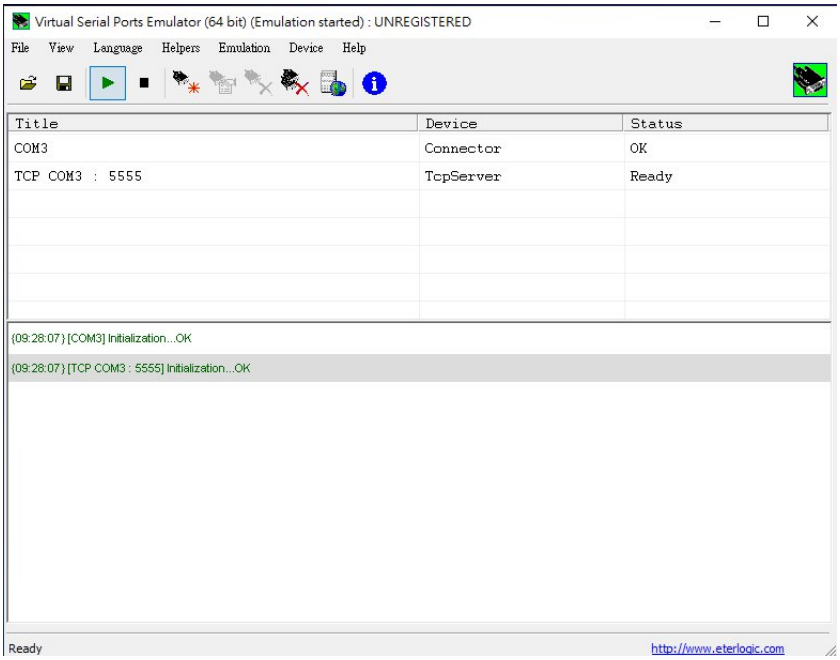


Figure 10.8.1.7

9. Connect the Init. pin to GND pin, as shown in Figure 10.8.1.8

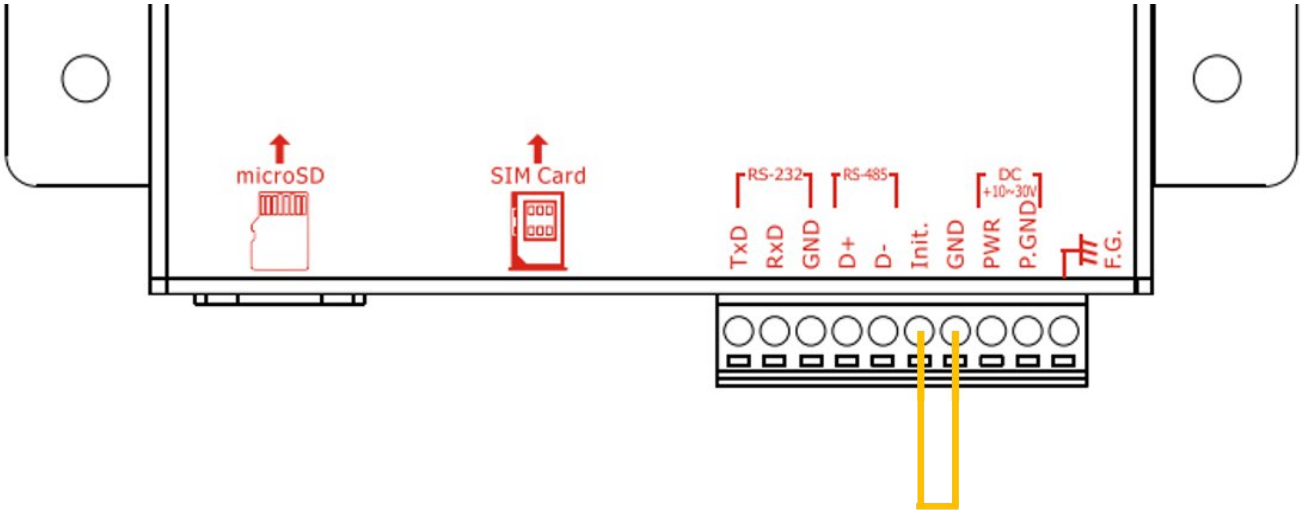


Figure 10.8.1.8

10. Open GTP-541M VSPE Utility, select COM Port and click **Connect**, as shown in Figure 10.8.1.9. If the connection is successful, the button will change to **Disconnect**, as shown in Figure 10.8.1.10

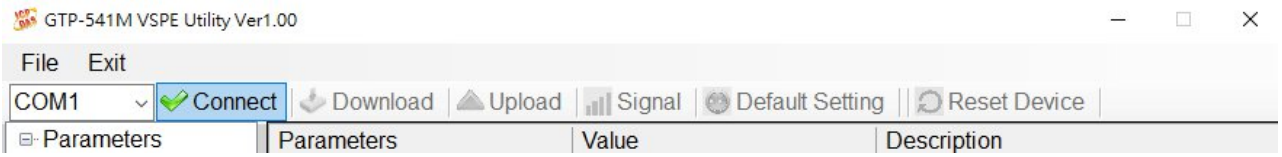


Figure 10.8.1.9

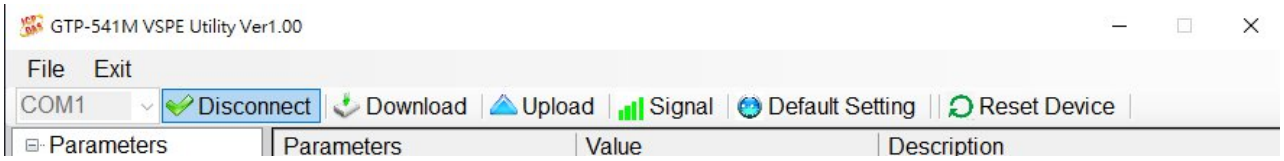


Figure 10.8.1.10

11. Click **System** to set the following parameters, as shown in Figure 10.8.1.11
    - Mode: VSPE Client
    - Server IP: IP of VSPE on PC
    - Server Port: Port of VSPE on PC

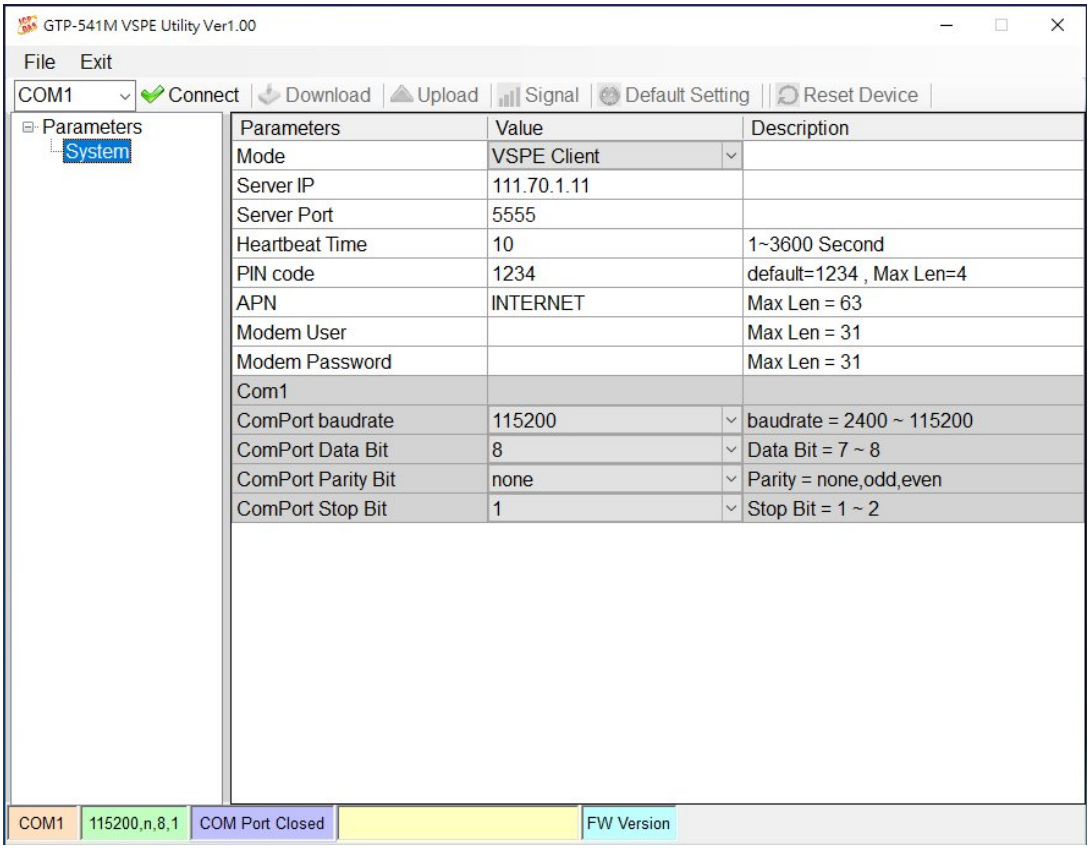


Figure 10.8.1.11

12. Click **Download** to write parameters to GTP-541M, as shown in Figure 10.8.1.12

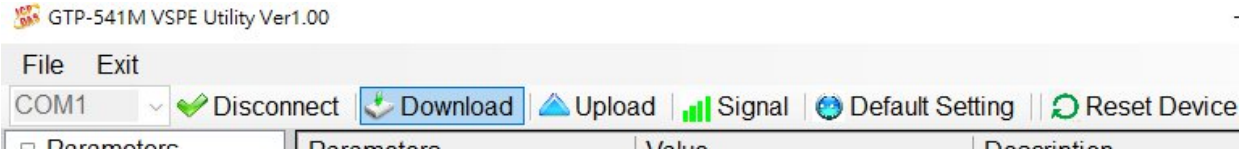


Figure 10.8.1.12

13. Disconnect the Init. pin and GND pin, restart GTP-541M, as shown in Figure 10.8.1.13

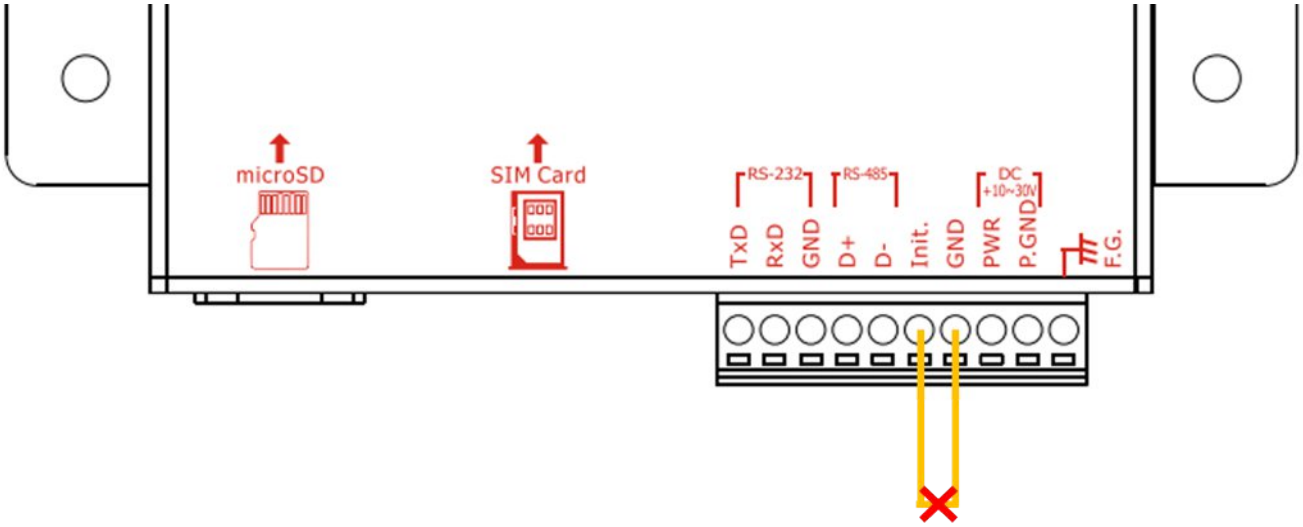
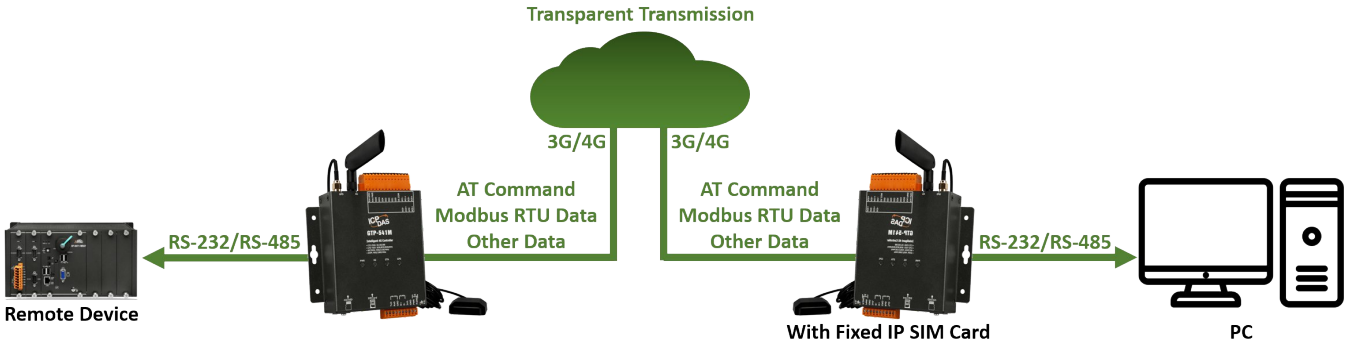


Figure 10.8.1.13

14. When the STA light is blinking, send data to GTP-541M via RS-232 / RS-485 and check whether the COM Port on the VSPE side has received data

10.8.2 Pair Connection mode



1. Connect the Init. pin to GND pin, as shown in Figure 10.8.2.1

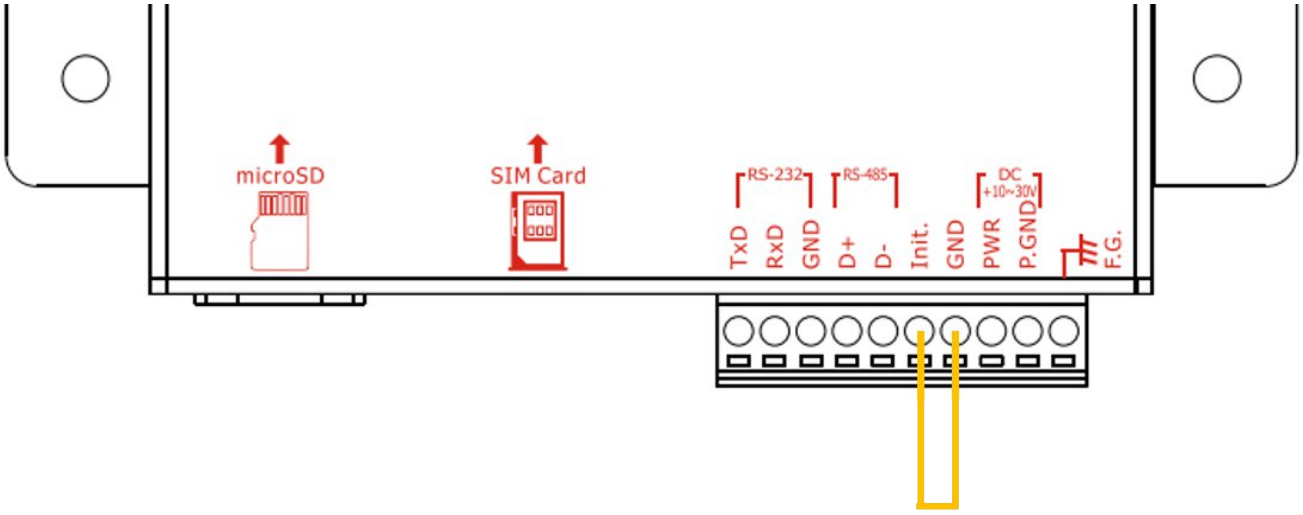


Figure 10.8.2.1

2. Open GTP-541M VSPE Utility, select COM Port and click **Connect**, as shown in Figure 10.8.2.2. If the connection is successful, the button will change to **Disconnect**, as shown in Figure 10.8.2.3

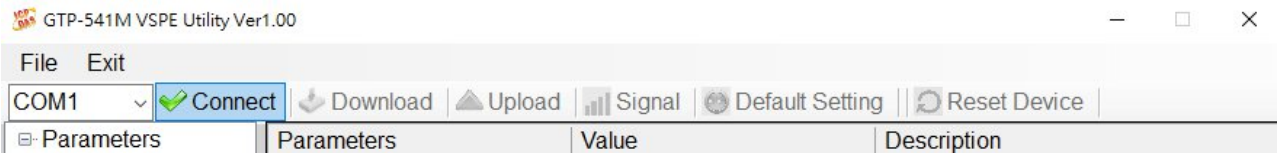


Figure 10.8.2.2

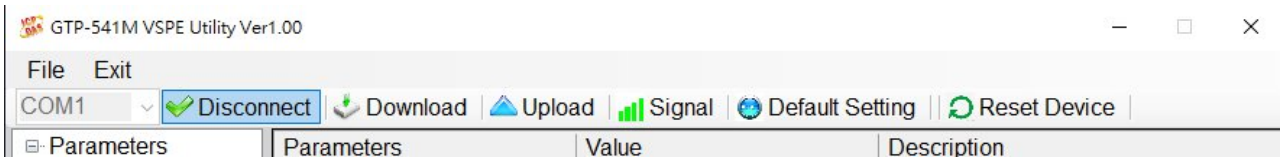


Figure 10.8.2.3

3. Click **System** to set the following parameters, as shown in Figure 10.8.2.4
   - Mode: Pair Server
   - Server IP: IP of SIM card
   - Server Port: Custom value

   ※ The device as "Pair Server" must use a SIM card with a fixed IP and enter the correct APN

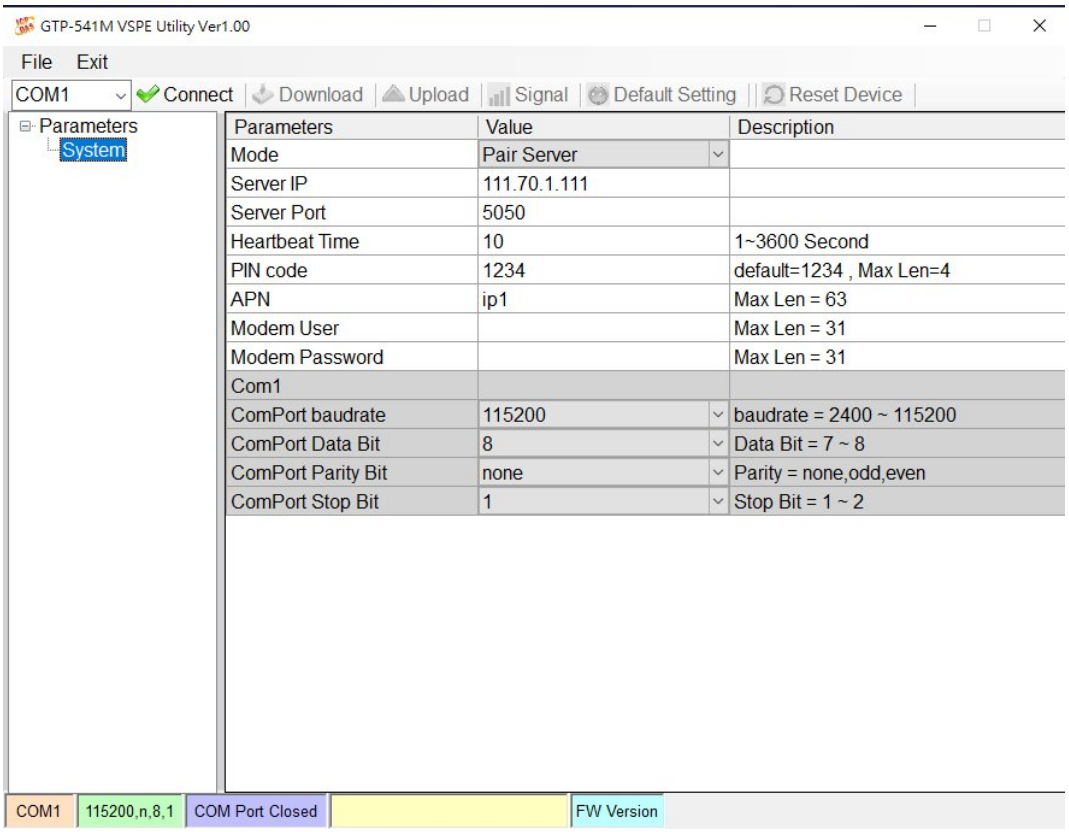


Figure 10.8.2.4

4. Click **Download** to write parameters to GTP-541M, as shown in Figure 10.8.2.5

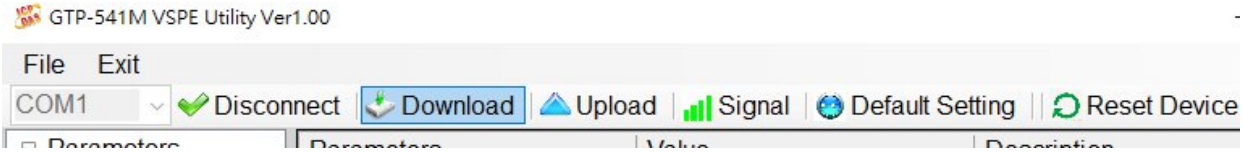


Figure 10.8.2.5

5. Disconnect the Init. pin and GND pin, restart GTP-541M, as shown in Figure 10.8.2.6

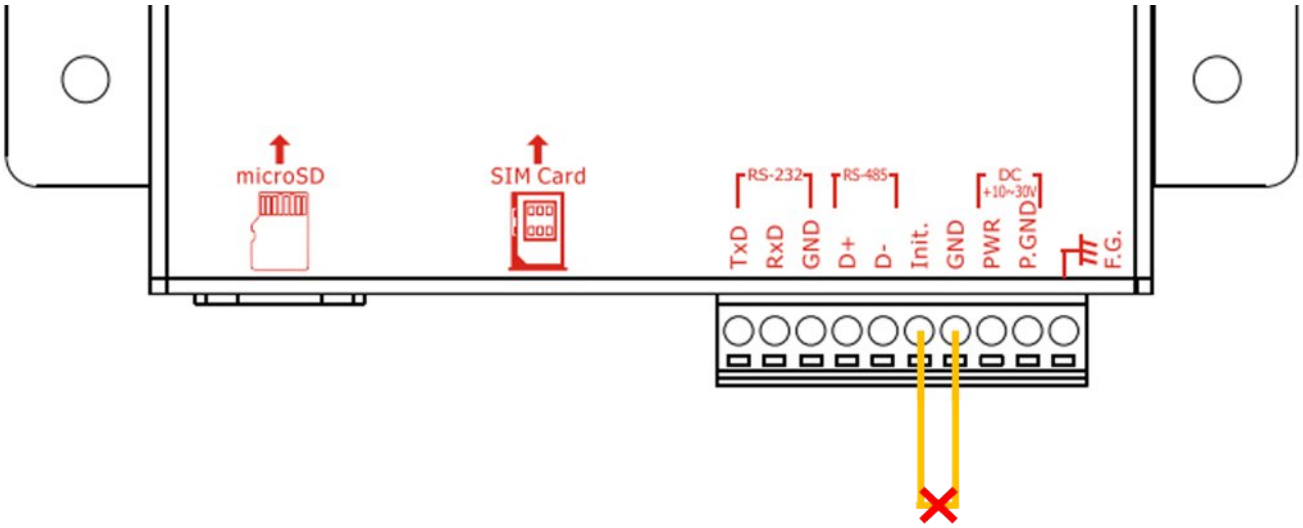


Figure 10.8.2.6

6. Connect the Init. pin and GND pin for another device, as shown in Figure 10.8.2.7

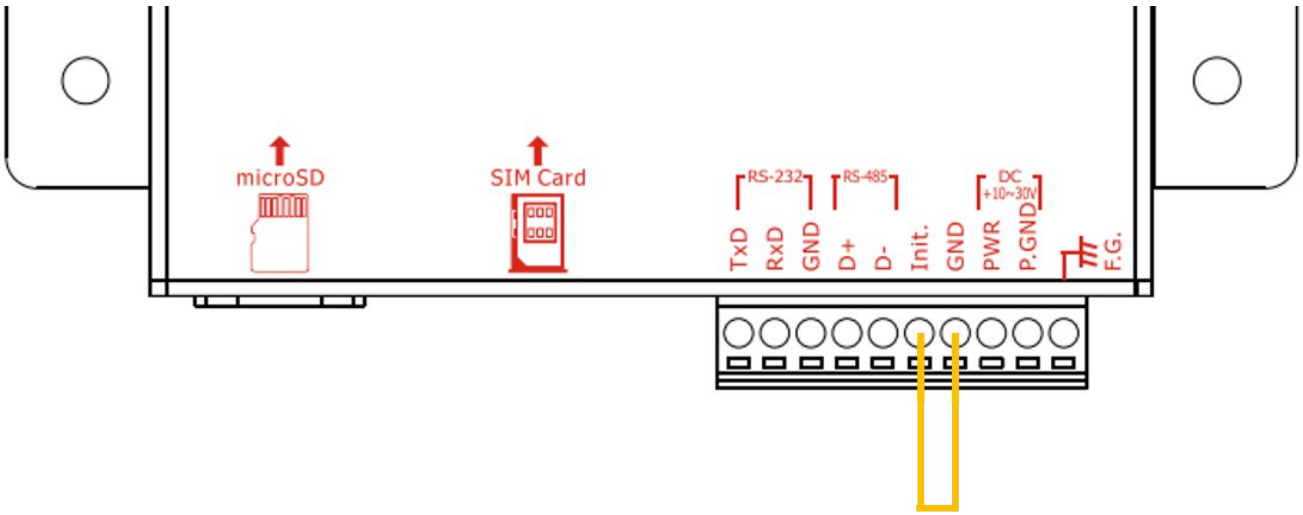


Figure 10.8.2.7

7. Select COM Port on the Utility screen and click **Connect**, as shown in Figure 10.8.2.8. If the connection is successful, the button will change to **Disconnect**, as shown in Figure 10.8.2.9

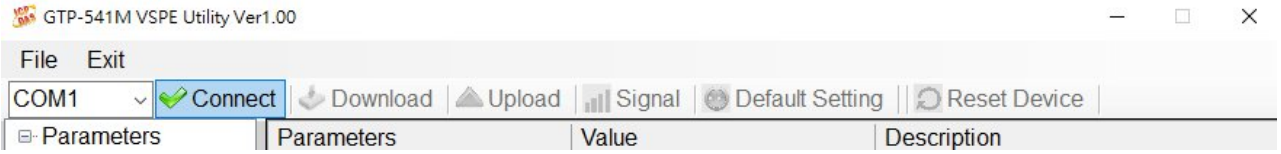


Figure 10.8.2.8

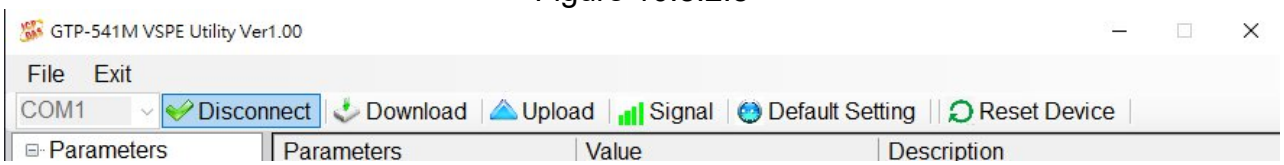


Figure 10.8.2.9

8. Click **System** to set the following parameters, as shown in Figure 10.8.2.10
   - Mode: Pair Client
   - Server IP: IP set by the first device
   - Server Port: Port set by the first device

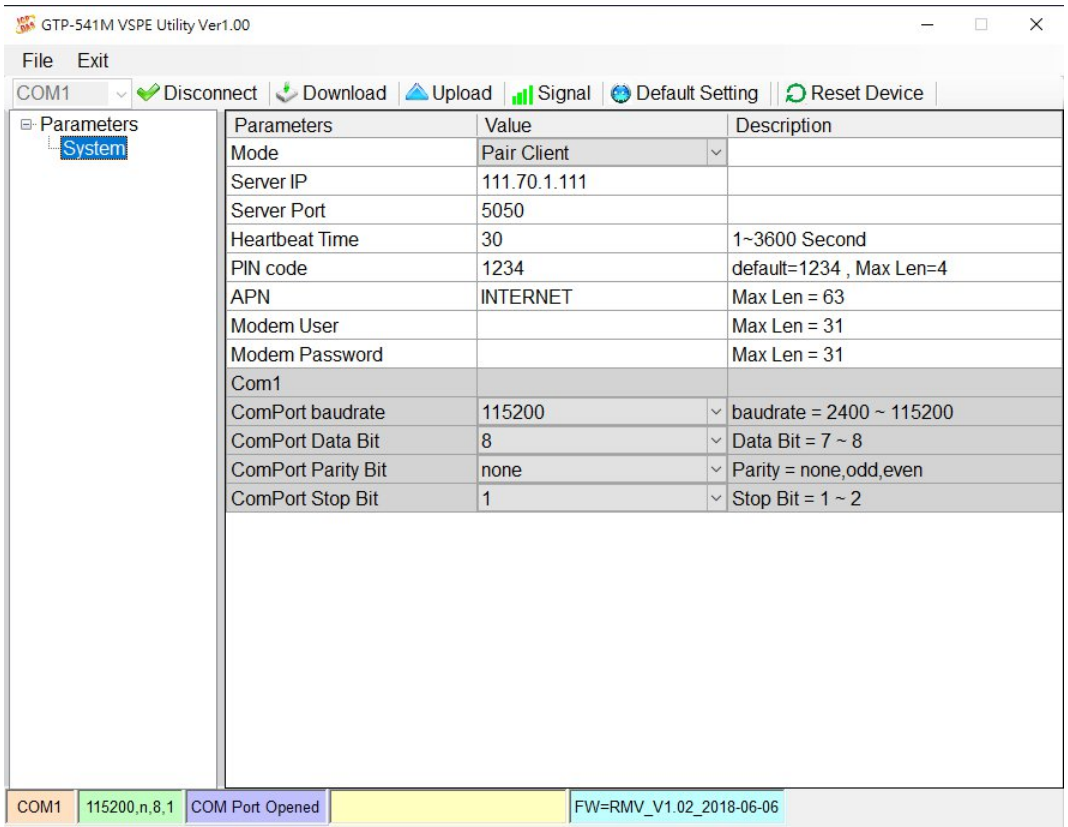


Figure 10.8.2.10

9. Click **Download** to write parameters to GTP-541M, as shown in Figure 10.8.2.11

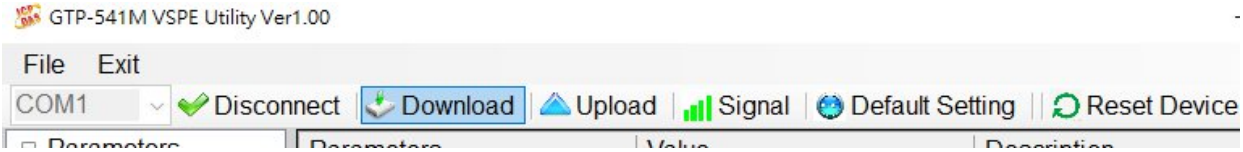


Figure 10.8.2.11

10. Disconnect the Init. pin and GND pin, restart GTP-541M, as shown in Figure 10.8.2.12

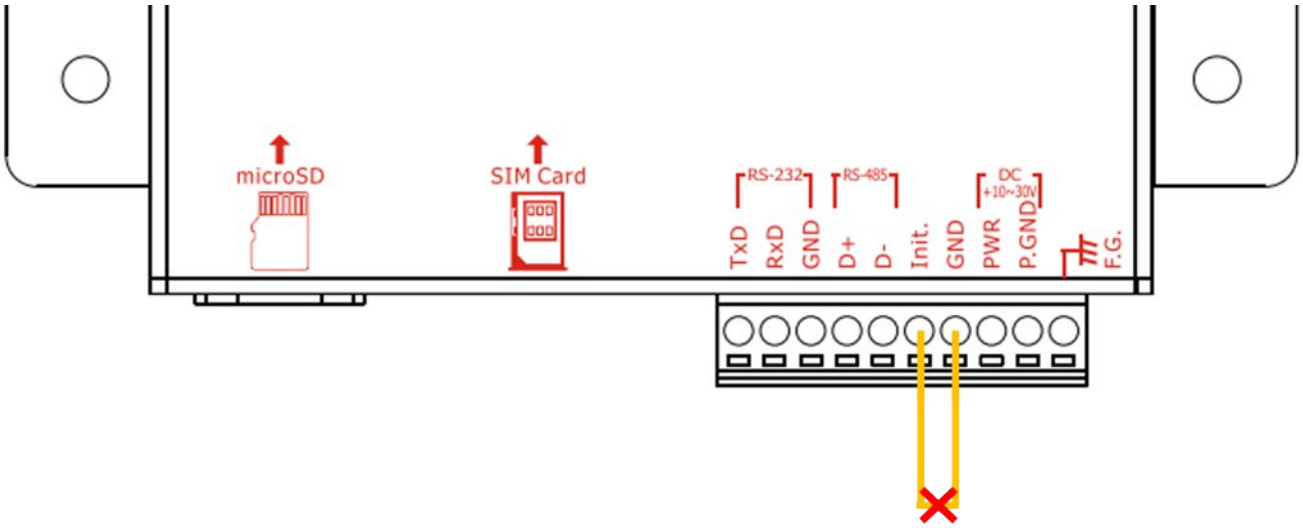
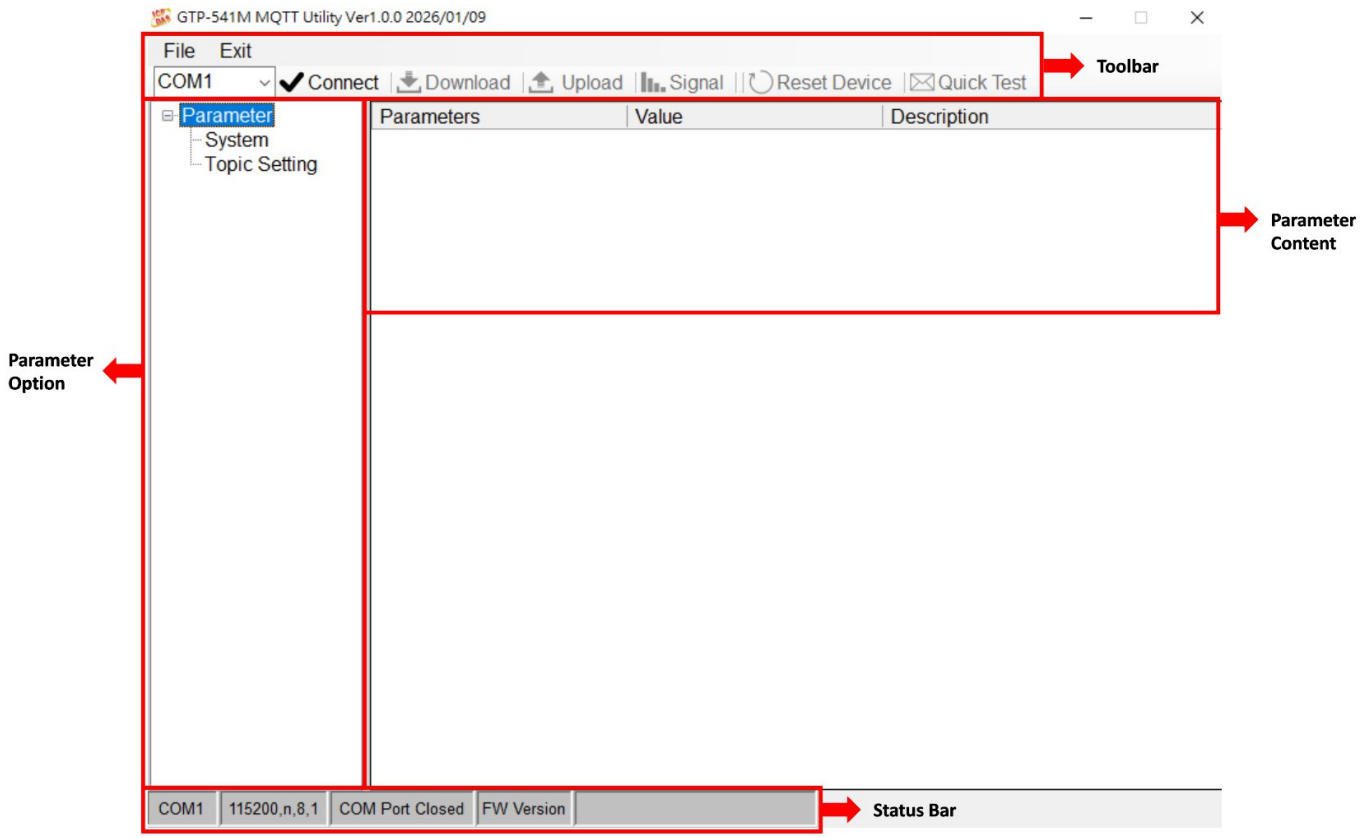


Figure 10.8.2.12

11. Send data between two devices via RS-232 / RS-485, check whether the data sent by each other is received

11.MQTT Utility main screen description

The GTP-541M MQTT Utility layout consists of the following sections:

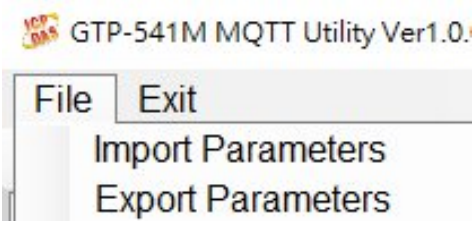


1. Toolbar
   (1) File：Save or load settings as a Project file. This includes operations such as Import Parameters and Export Parameters.
   (2) Exit: Exit the GTP-541M Utility.
   (3) COM Port Number: Displays the PC-side COM Port number used to connect to the GTP-541M.
   (4) Connect: Establish a connection with the GTP-541M.
   (5) Download: Download parameters from the Utility to the GTP-541M.
   (6) Upload: Upload parameters from the GTP-541M to the Utility.
   (7) Signal: Check signal strength and network status.
   (8) Reset Device: Restart the device.
   (9) Quick Test: Quickly verify MQTT Publish/Subscribe functions.
2. Parameter Option
   Displays the available parameter options for the GTP-541M.
3. Parameter Content
   Configurable Parameters.
4. Displays the current GTP-541M Utility information. From left to right :
   (1) PC COM Port number used by the Utility
   (2) COM Port communication settings (Fixed at 115200, n, 8, 1 in Utility configuration mode)
   (3) Current COM Port status

(4) Firmware version
(5) Current device operating status

11.1 Parameter file management

Through the File option, the parameters can be saved as a file or opened, which is convenient for managing multiple GTP-541M parameters. The options are described as follows:



Import Parameters: Open an existed parameters
Export Parameters: Save parameters as a file

11.2 Connection to GTP-541M

Connecting to GTP-541M in Utility Mode

1. Select the appropriate COM Port number for your RS-232 or RS-485 interface (refer to Figure 11.2.1).

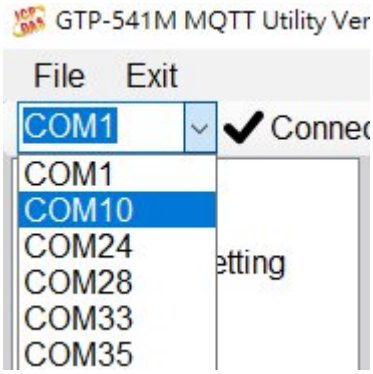


Figure 11.2.1

2. Click "Connect" to establish a connection with the GTP-541M, as shown in Figure 11.2.2. If the connection fails, please verify that the correct RS-232 / RS-485 COM Port is selected, ensure the wiring is intact, and confirm that Init Pin 4 and Pin 5 are properly connected as illustrated in Figure 11.2.3.

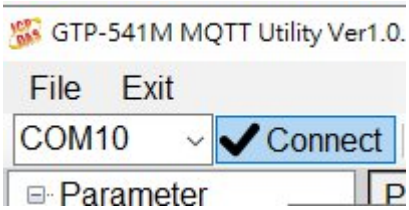


Figure 11.2.2

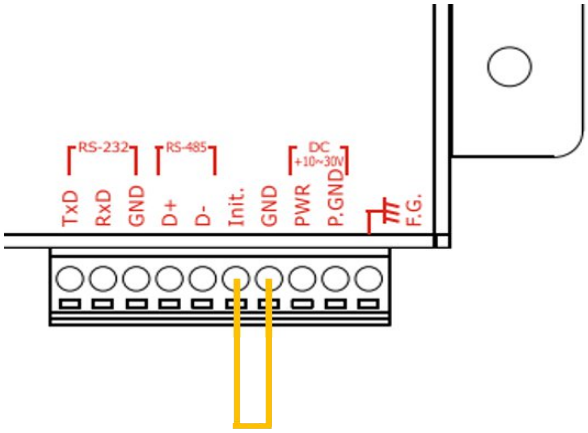


Figure 11.2.3

11.3 Parameter Description

There are two main sections: "System" and "Topic Setting." All MQTT topic-related configurations are categorized under "Topic Setting," while other settings such as connection and COM port configurations are located under "System."

11.3.1 System Parameter

Click Parameter → System to begin configuring the parameters, as shown in Figure 11.3.1. This section includes three parts: Modbus RTU setting, Network setting, and MQTT setting.

Parameters	Value	Description
Modbus RTU setting		
Modbus Address	1	1~247
Baudrate	115200	
Data Bit	8	
Parity	none	
Stop Bit	1	
Network setting		
PIN Code	0000	Max Length = 4
APN	internet	Max Length = 64
Modem Username	guest	Max Length = 64
Modem Password	guest	Max Length = 64
MQTT setting		
MQTT Host	test.mosquitto.org	Max Length = 253
MQTT Port	1883	Max Length = 5
MQTT Scheme	tcp	
Client ID	icpdas	Max Length = 50
Quality of Service	1	
Keep Session	No	
Will Function	No	
Will Topic		Max Length = 128
Will Message		Max Length = 256
User Name		Max Length = 128

Figure 11.3.1

1. Modbus RTU setting:

Parameter	Description
Modbus Address	Modbus slave address
Baudrate	Baud Rate (bps): Supports 2400, 4800, 9600, 19200, 38400, 57600, and 115200 bps.
Data Bit	Data Bits: Supports 7 or 8 bits.
Parity Bit	Parity: Supports None, Even, and Odd.
Stop Bit	Stop Bits: Supports 1 or 2 bits.

2. Network:

Parameter	Description
PIN Code	SIM Card PIN Code
APN	APN
Modem User	APN Username
Modem Password	APN Password

3. MQTT Setting:

Parameter	Description
MQTT Host	MQTT Broker Address / IP
MQTT Port	MQTT Broker Port
MQTT Scheme	Protocol Type
Client ID	Unique MQTT Client ID
Quality of Service	Quality of Service
Keep Session	Determines whether the Broker retains subscriptions and message states after the MQTT Client disconnects
Will Function	Determines whether to enable the Last Will feature
Will Topic	The topic used to publish the "Will message" when the device disconnects
Will Message	The content of the message to be published by the Broker when the device disconnects.
User Name	MQTT user name
Password	MQTT password

11.3.2 System Parameter

Click Parameter → Topic Setting to begin configuring the parameters, as shown in Figure 11.3.2.

Parameters	Value	Description
Topic		
Publish Topic 1		Max Length = 128
Publish Topic 2		Max Length = 128
Publish Topic 3		Max Length = 128
Publish Topic 4		Max Length = 128
Publish Topic 5		Max Length = 128
Subscribe Topic 1		Max Length = 128
Subscribe Topic 2		Max Length = 128
Subscribe Topic 3		Max Length = 128
Subscribe Topic 4		Max Length = 128
Subscribe Topic 5		Max Length = 128

Figure 11.3.2

1. Topic:

Parameter	Description
Publish Topic	Set the topics for publishing messages. Up to 5 sets of topics.
Subscribe Topic	Set the topics for subscribing to messages. Up to 5 sets of topic.

11.4 Upload & Download Parameter

1. Download Parameters

After completing the parameter settings, click the "Download" button to transfer the parameters from the Utility to the GTP-541M, as shown in Figure 11.4.1.

Figure 11.4.1

2. Upload Parameters

Click the "Upload" button to read the parameters from the GTP-541M into the Utility, as shown in Figure 11.4.2.

Figure 11.4.2

11.5 Check Signal Strength

Click "Signal" to check the current signal strength of the GTP-541M, as shown in Figures 11.5.1 and 11.5.2.

Figure 11.5.1

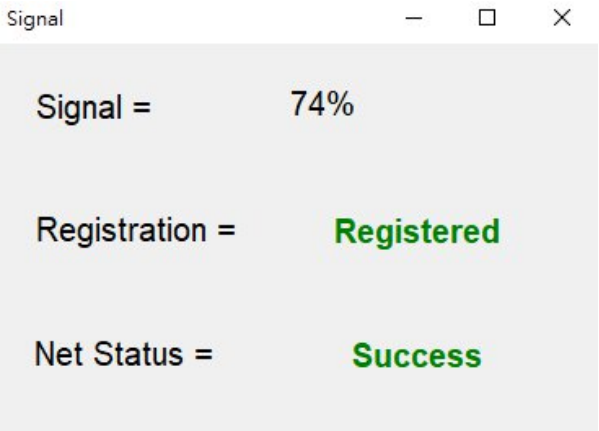


Figure 11.5.2

Field Descriptions

1. Signal: The current signal strength, expressed as a percentage. A higher value indicates a better signal.
2. Registration: The registration status of the SIM card with the base station. If any abnormality occurs, it will be displayed in red text.
3. Net Status: Indicates whether the network connection is established. If disconnected, it will be displayed in red text.

11.6 Reset Device

Click the "Reset Device" button to reboot the GTP-541M. Wait for the startup process to complete, as shown in Figures 11.6.1 to 11.6.3.

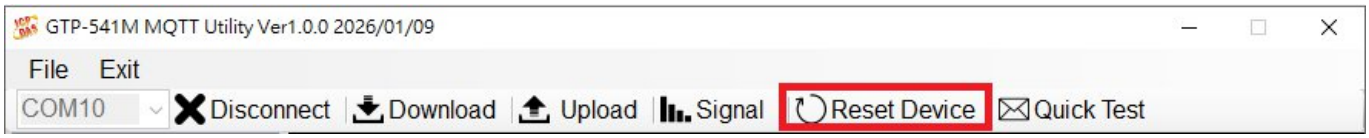


Figure 11.6.1

Figure 11.6.2

Figure 11.6.3

11.7 Quick Test

Click the "Quick Test" button to enter the test page, as shown in Figures 11.6.1 and 11.6.2.

Figure 11.6.1

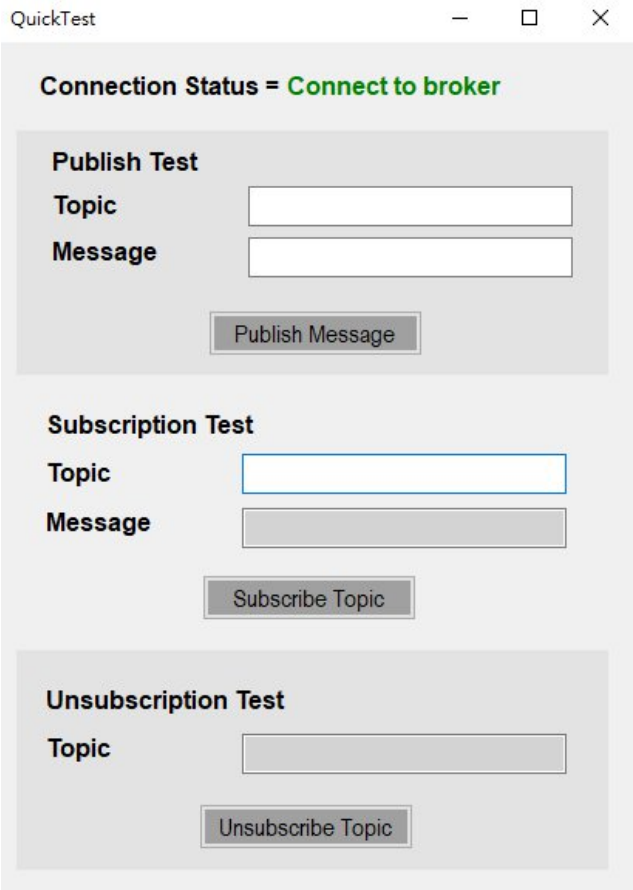


Figure 11.6.2

Field Descriptions

1. Connection Status: Displays the connection status to the Broker. If “Not connected to broker” is displayed, please double-check the settings in Parameter → System → MQTT setting. After adjusting, click "Reset Device" or manually power cycle the device to apply the new MQTT settings.
2. Publish Test: Enter the Topic and Message, then click "Publish Message". The message will be automatically published to the Broker.
3. Subscription Test: Enter the Topic and click "Subscribe Topic". If any subscribed content is received, it will be automatically updated in the Message field.
4. Unsubscription: Click "Unsubscribe Topic" to cancel the subscription of the current Topic.

11.8 Connection Example

The following example uses the free public broker provided by Eclipse Mosquitto for demonstration.

11.8.1 Non-encrypted Connection (Anonymous Login)

1. Refer to Chapter 11.2 to connect the Utility to the GTP-541M. Configure the parameters and download them to the device. The MQTT configuration is shown in Figure 11.7.1 below.

MQTT setting		
MQTT Host	test.mosquitto.org	Max Length = 253
MQTT Port	1883	Max Length = 5
MQTT Scheme	tcp	
Client ID	client	Max Length = 50
Quality of Service	0	
Keep Session	No	
Will Function	No	
Will Topic		Max Length = 128
Will Message		Max Length = 256
User Name		Max Length = 128
Password		Max Length = 128

Figure 11.7.1

   Select “tcp” as the MQTT Scheme, which indicates an unencrypted connection.
2. After configuring the parameters, power cycle the device or click "Reset Device." The device will automatically connect to the broker based on the settings.
3. On the Quick Test page, double-check if the MQTT settings are correct and that the device has connected to the broker.

11.8.2 Non-encrypted Connection (using Account/Password)

1. Refer to Chapter 11.2 to connect the Utility to the GTP-541M. Configure the parameters and download them to the device. The MQTT configuration is shown in Figure 11.7.2 below.

MQTT setting		
MQTT Host	test.mosquitto.org	Max Length = 253
MQTT Port	1884	Max Length = 5
MQTT Scheme	tcp	
Client ID	client	Max Length = 50
Quality of Service	0	
Keep Session	No	
Will Function	No	
Will Topic		Max Length = 128
Will Message		Max Length = 256
User Name	rw	Max Length = 128
Password	readwrite	Max Length = 128

Figure 11.7.2

Select “tcp” as the MQTT Scheme for an unencrypted connection, and configure the Username and Password.

2. After configuring the parameters, power cycle the device or click "Reset Device." The device will automatically connect to the broker based on the settings.
3. On the Quick Test page, double-check if the MQTT settings are correct and that the device has connected to the broker.

11.8.3 TLS Encrypted Connection (Using CA Certificate)

1. Refer to Chapter 11.2 to connect the Utility to the GTP-541M. Configure the parameters and download them to the device. The MQTT configuration is shown in Figure 11.7.3 below.

MQTT setting		
MQTT Host	test.mosquitto.org	Max Length = 253
MQTT Port	8883	Max Length = 5
MQTT Scheme	ssl	
Client ID	client	Max Length = 50
Quality of Service	0	
Keep Session	No	
Will Function	No	
Will Topic		Max Length = 128
Will Message		Max Length = 256
User Name		Max Length = 128
Password		Max Length = 128

Figure 11.7.3

2. After configuring the parameters, power off the device and remove the SD card to store the certificate. Create a new folder named "certs" in the root directory of the SD card, and rename the CA certificate to "ca.crt," as shown in Figures 11.7.4 and 11.7.5.

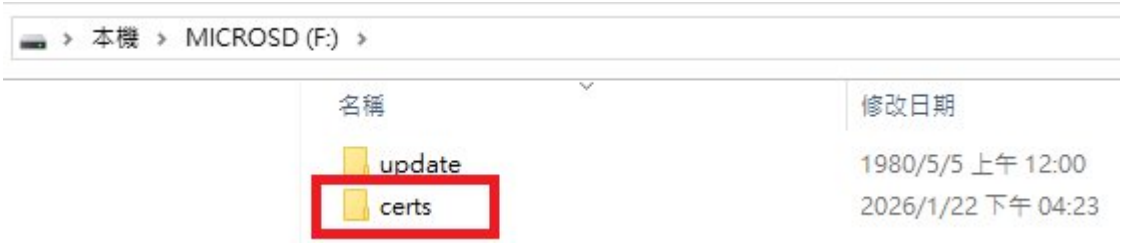


Figure 11.7.4

Figure 11.7.5

3. Reinsert the SD card into the GTP-541M and power on the device. The device will

automatically connect to the broker according to the settings.

4. On the Quick Test page, double-check if the MQTT settings are correct and that the device has connected to the broker.

11.8.4 TLS Encrypted Connection (Using CA Certificate, Client Certificate, and Client Private Key)

1. Refer to Chapter 11.2 to connect the Utility to the GTP-541M. Configure the parameters and download them to the device. The MQTT configuration is shown in Figure 11.7.6 below.

MQTT setting		
MQTT Host	test.mosquitto.org	Max Length = 253
MQTT Port	8884	Max Length = 5
MQTT Scheme	ssl	
Client ID	client	Max Length = 50
Quality of Service	0	
Keep Session	No	
Will Function	No	
Will Topic		Max Length = 128
Will Message		Max Length = 256
User Name		Max Length = 128
Password		Max Length = 128

Figure 11.7.6

2. After configuring the parameters, power off the device and remove the SD card to store the certificates and private key. Create a new folder named "certs" in the root directory of the SD card. Rename the files as follows: CA certificate to "ca.crt," client certificate to "client.crt," and client private key to "client.key," as shown in Figure 11.7.8.

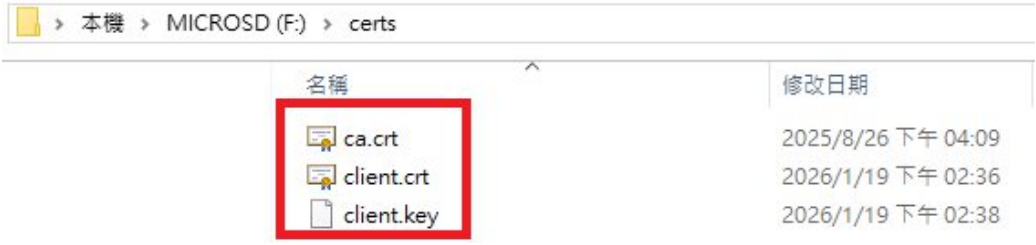


Figure 11.7.8

3. Reinsert the SD card into the GTP-541M and power on the device. The device will automatically connect to the broker according to the settings.
4. On the Quick Test page, double-check if the MQTT settings are correct and that the device has connected to the broker.

11.9 Publish and Subscribe Example

Once the Quick Test confirms a successful connection to the Broker, remove the jumper between the "Init" and "GND" pins (Figure 11.9.1). Power cycle the device to switch to "Run Mode." You can then perform data Publishing and Topic Subscription via the Modbus RTU protocol.

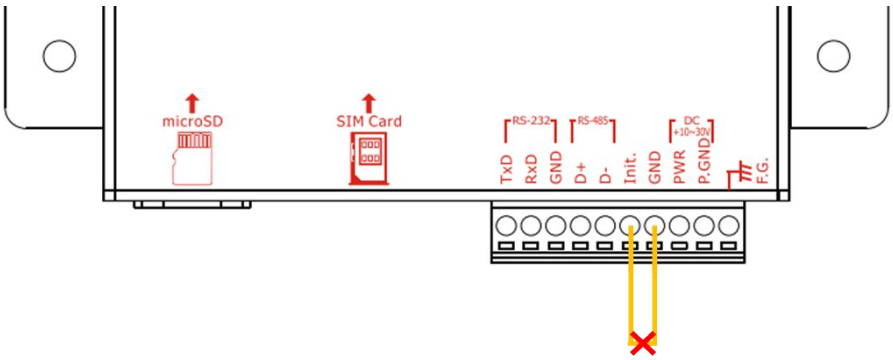
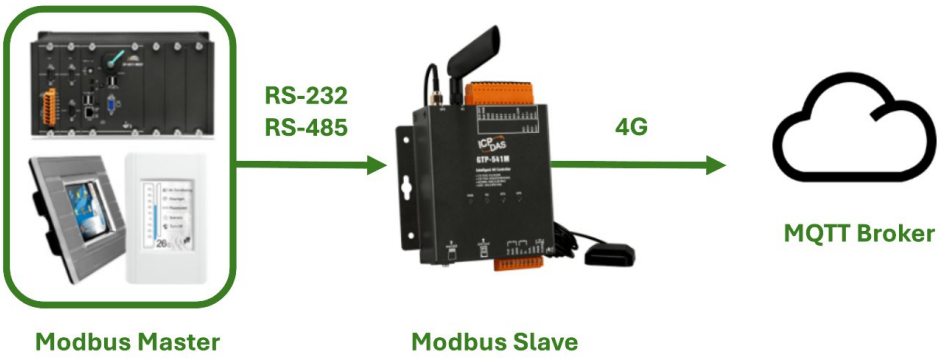


Figure 11.9.1

11.9.1 Publish

1. The host controller connects to the GTP-541M via RS-232 or RS-485. Through the COM Port (RS-232/RS-485), the host can publish messages stored in the GTP-541M registers to the Broker.



2. The host controller sends Modbus commands to the GTP-541M. The workflow is as follows:

2-1. Configure Publish Messages

Configure Publish Message (Format)		
Command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function code = 0x10
	Byte 2 ~ 3	Fixed address，0x0000
	Byte 4 ~ 5	Quantity of Registers to Write Byte 4 : High byte Byte 5 : Low byte
	Byte 6	Number of bytes to be written.
	Byte 7 ~ N	Message content. Store the string using Unicode encoding.
	Byte N+1 ~ N+2	CRC-16 Checksum
Response	Byte 0	Modbus Address set by GTP-541M

Configure Publish Message (Format)		
	Byte 1	Function Code = 0x10
	Byte 2 ~ 3	Fixed address，0x0000
	Byte 4 ~ 5	Quantity of Registers to Write Byte 4 : High byte Byte 5 : Low byte
	Byte 6 ~ 7	CRC-16 Checksum

Configure Publish Message (Example)	
Command (Hex)	01 10 00 00 00 05 0A **00 48 00 65 00 6C 00 6C 00 6F** 72 C5
Response (Hex)	01 10 00 00 00 05 00 0A
Description	The message content is stored in the Modbus registers using Unicode encoding. Each register carries one character in Big-Endian format (High Byte followed by Low Byte).As shown in the example above, this corresponds to the string "**Hello**".

2-2. Perform Publish

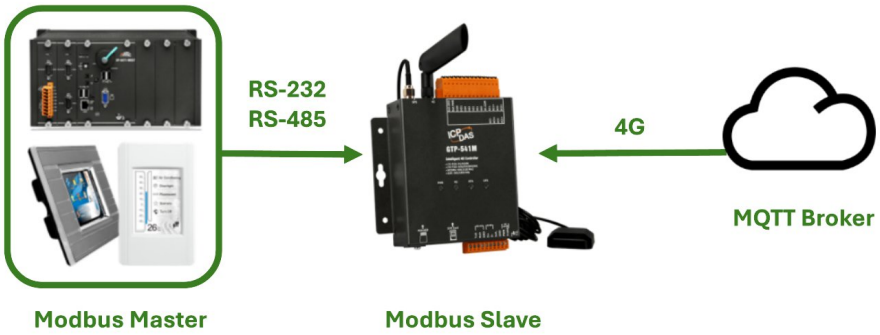
Perform Publish (Format)		
Command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	based on Topic: If publishing to Publish Topic 1, address = 0x0000 If publishing to Publish Topic 2, address = 0x0001 And so on. Please refer to the "MQTT Modbus Address Table" for details.
	Byte 4 ~ 5	Fixed value, 0xFF00
	Byte 6 ~ 7	CRC-16 Checksum
Response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	based on Topic: If publishing to Publish Topic 1, address = 0x0000 If publishing to Publish Topic 2, address = 0x0001 And so on. Please refer to the "MQTT Modbus Address Table" for details.
	Byte 4 ~ 5	Fixed value, 0xFF00
	Byte 6 ~ 7	CRC-16 Checksum

Perform Publish (Example)	
Command (Hex)	01 05 **00 00** FF 00 8C 3A
Response (Hex)	01 05 00 00 FF 00 8C 3A
Description	Publish the content stored in the Modbus registers to **Publish Topic 1**.

11.9.2 Query Subscription Content

1. The host controller connects to the GTP-541M via RS-232 or RS-485. Through the COM Port (RS-232/RS-485), the host can publish messages stored in the GTP-541M registers

to the Broker.



2. The host controller sends Modbus commands to the GTP-541M. The workflow is as follows:

Query Subscription Content

Query Subscription Content (Fornat)		
Command	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x03
	Byte 2 ~ 3	based on Topic: If query Subscribe Topic 1, address = 0x0080 If query Subscribe Topic 2, address = 0x0100 And so on. Please refer to the "MQTT Modbus Address Table" for details.
	Byte 4 ~ 5	Number of registers to be queried. Byte 4 : High byte Byte 5 : Low byte
	Byte 6 ~ 7	CRC-16 Checksum
Response	Byte 0	Modbus Address set by GTP-541M
	Byte 1	Function Code = 0x03
	Byte 2	Number of registers
	Byte 3 ~ N	Subscription Content
	Byte N+1 ~ N+2	CRC-16 Checksum

Query Subscription Content (Example)	
Command (Hex)	01 03 00 80 00 04 45 1E
Response (Hex)	01 03 08 00 54 00 45 00 53 00 54 BC 33
Description	Query the subscription content of "**Subscribe Topic 1**".The message content is stored in the Modbus registers using Unicode encoding. Each register carries one character in Big-Endian format (High Byte followed by Low Byte). As shown in the example above, this corresponds to the string "**TEST**".

12.Firmware Update Instructions

12.1 Update firmware from SD card

12.1.1 Firmware update before V2.0.0

12. After downloading the update file, unzip it to get the firmware, as shown in Figure 11.1.1.

Figure 11.1.1

13. Add the **update** folder in SD card, and put the firmware, as shown in Figure 11.1.2.

Figure 11.1.2

14. Change the firmware file name to **fw**, as shown in Figure 11.1.3.

Figure 11.1.3

15. Restart the device after insert SD card, the program will be automatically updated. Observe the STA and GPS light to confirm the update result.
    - Success: Blink once every 0.1 seconds for 10 seconds
    - Failure: Blink once every 0.9 seconds for 10 seconds

Figure 11.1.4

16. When updating, the firmware and configuration files in the device will be backed up into SD card with the extension **.bck**, as shown in Figure 11.1.5.

Figure 11.1.5

12.1.2 Firmware update after V2.0.0

1. After downloading the update file, unzip it to get the firmware and patches, as shown in Figure 11.1.6.

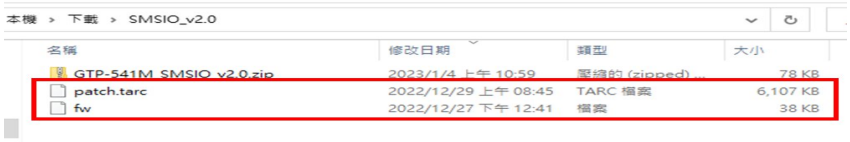


Figure 11.1.6

2. Add the **update** folder in SD card, and put the firmware and patches, as shown in Figure 11.1.7.

Figure 11.1.7

3. Restart the device after insert SD card, the program will be automatically updated. Observe the STA and GPS light to confirm the update result.
   - ■ Success: Blink once every 0.1 seconds for 10 seconds
   - ■ Failure: Blink once every 0.9 seconds for 10 seconds

   ※ If the version before V2.0.0 is updated to the version after V2.0.0 for the first time, the device will restart twice

Figure 11.1.8

4. When updating, the firmware and configuration files in the device will be backed up into SD card with the extension **.bck**, as shown in Figure 11.1.9.

Figure 11.1.9

12.2 Update Firmware from Utility

※ Only supports update after V2.0.0

1. After downloading the update file, unzip it to get the firmware and patches, as shown in Figure 11.2.1.

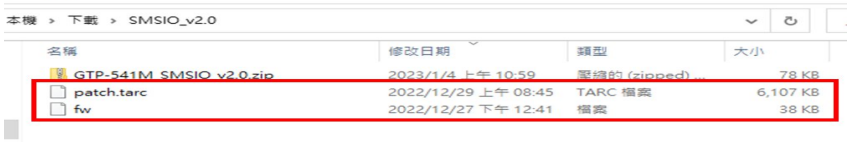


Figure 11.2.1

2. Connect the Init. pin to the GND pin, connect RS-232, and power on GTP-541M, as shown in Figure 11.2.2.

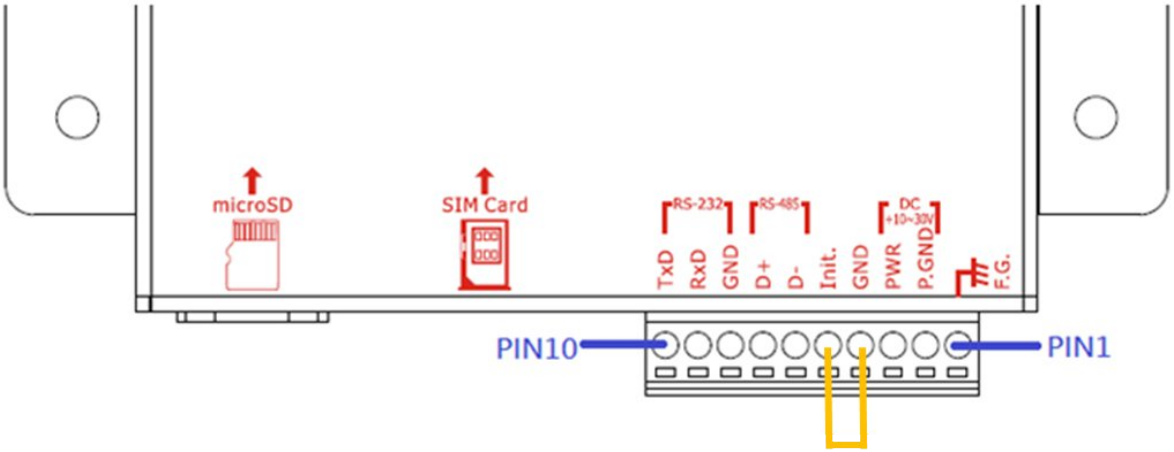


Figure 11.2.2

3. Open GTP-541M Utility and click **Update**, as shown in Figure 11.2.3.

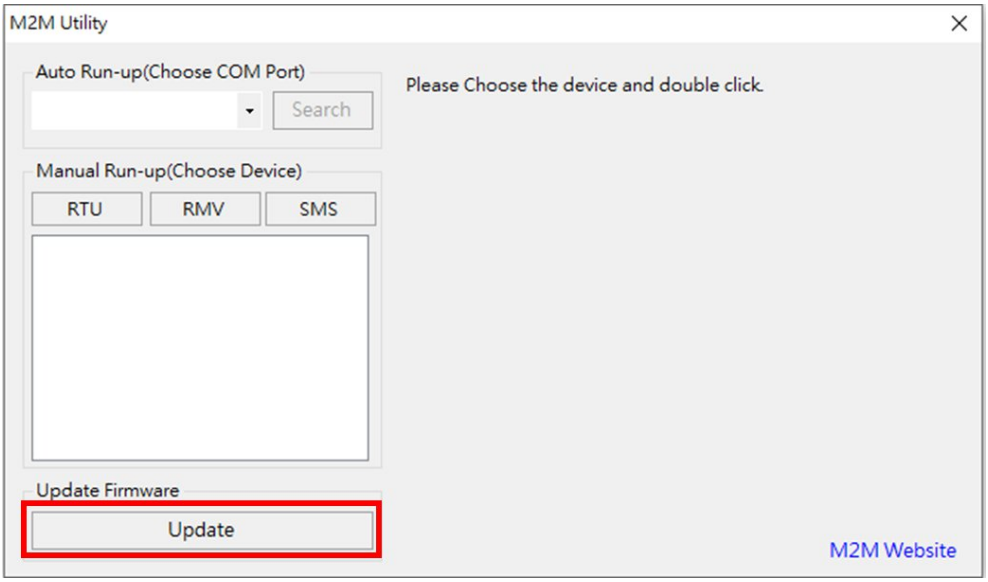


Figure 11.2.3

4. Select the COM Port, as shown in Figure 11.2.4.

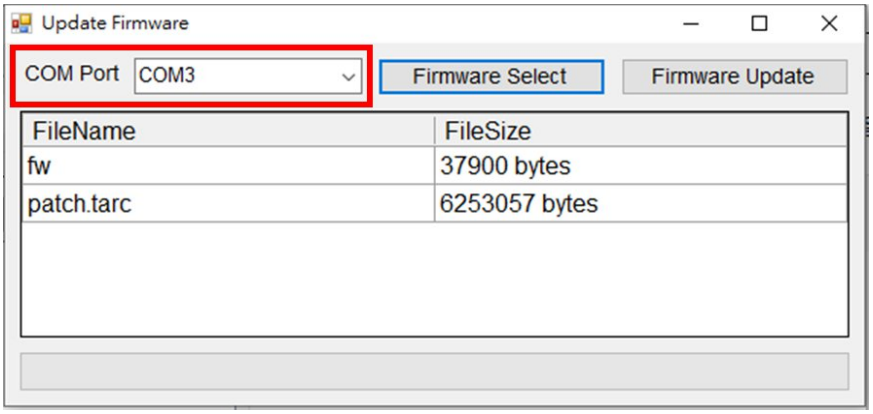


Figure 11.2.4

※ The COM Port needs to support the baudrate of 460800 bps, as shown in Figure 11.2.5

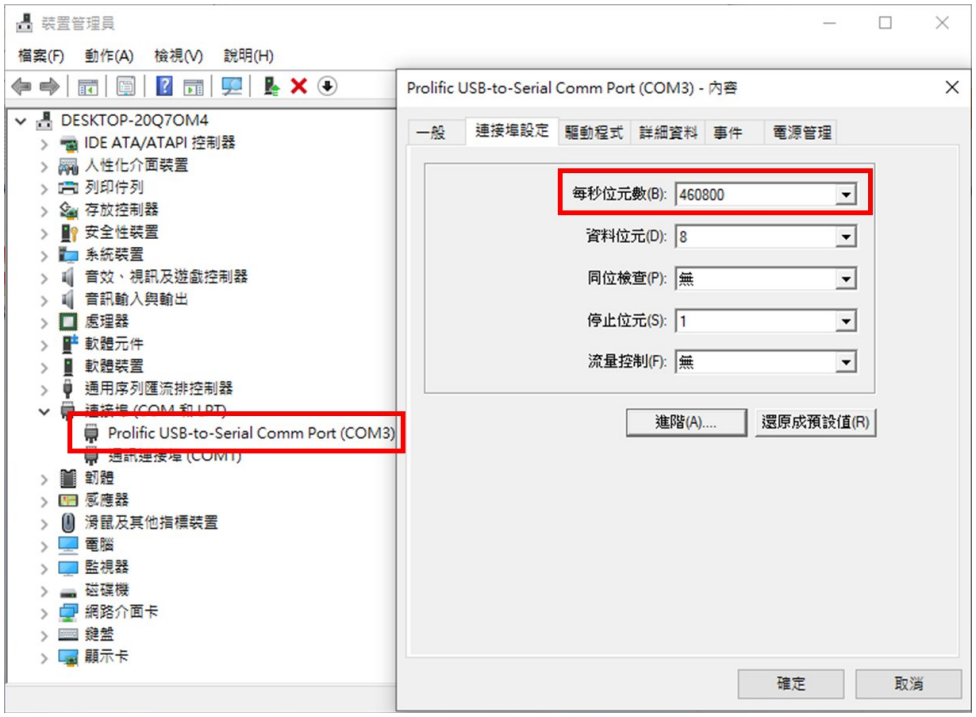


Figure 11.2.5

5. Select the update directly, as shown in Figure 11.2.6.

※ The update directly needs to contain the firmware and patches

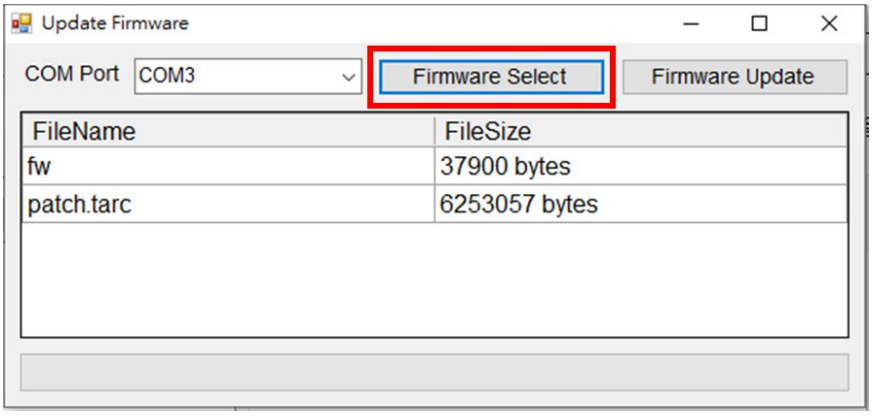


Figure 11.2.6

6. Click **Firmware Update**, as shown in Figure 11.2.7.

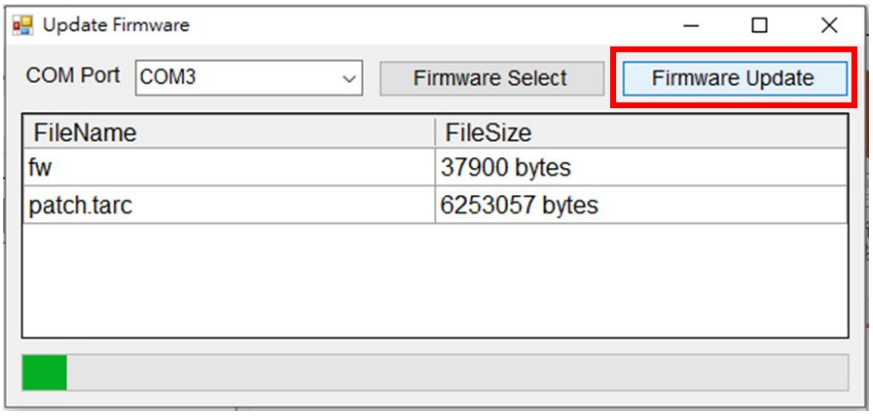


Figure 11.2.7

7. After the update is completed, a window as shown in Figure 11.2.8 will pop up. Observe the STA and GPS light to confirm the update result.
   - Success: Blink once every 0.1 seconds for 10 seconds
   - Failure: Blink once every 0.9 seconds for 10 seconds

   ※ If the version before V2.0.0 is updated to the version after V2.0.0 for the first time, the device will restart twice

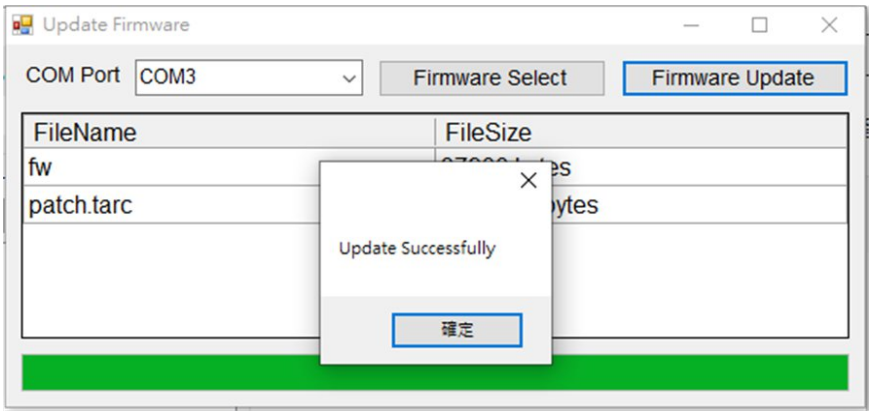


Figure 11.2.8

Figure 11.2.9

13.Modbus Position Configuration Table (SMSMB)

The Modbus Function Codes supported by the GTP-541M are: 1, 2, 3, 4, 5, 6, 15 and 16. The following is the address configuration table：

(1) Coil Status (Function Code:1, 5, 15)

Address	Data Address	Description	Attribute
00001~ 00128	0x0~ 0x7F	Send alarm number 0~127 corresponding SMS and voice alarm	R/W
00129	0x80	Send a dynamic SMS	R/W
00130~ 00131	0x81~ 0x82	Read or write DO~DO1 value	R/W
00132	0x83	Send a I/O Status SMS	R/W
00133	0x84	Send a manager SMS	R/W
00200	0xC7	=1, clear the Buffer receiving the SMS	R/W
00201	0xC8	=1, clear Buffer for sending SMS	R/W
00210	0xD1	=1, save the ModBus data to Flash	R/W

(2) Discrete Input (Function Code: 2)

Address	Data Address	Description	Attribute
10001	0x0	Is the Buffer that sent the SMS message full? 0: Not full 1: full	R
10002	0x1	Have you received a SMS? 0: No 1: Yes	R
10003	0x2	Current status of the SD card 0: No SD card or SD card is abnormal 1: normal	R
10004	0x3	Whether it is in Utility mode 0: No 1: yes	R
10005~ 10009	0x4~ 0x8	Read DI0~DI4 value	R
10010~ 10137	0x9~ 0x88	Check if alarm group's SMS sending is complete. Data address : 0x9 for alarm group 0 0xA for alarm group 1, and so on up to 0x88 for alarm group 127 Value : 0 : Currently sending to the phone list. 1 : Sending dialing finished.	R
10138~ 10265	0x89~ 0x108	Check if alarm group's voice dialing is complete. Data address : 0x89 for alarm group 0 0x8A for alarm group 1, and so on up to	R

		0x108 for alarm group 127 Value : 0 : Currently dialing the phone list. 1 : Dialing finished.	
10266	0x109	Check if the machine is ready to send “manager SMS”. 0 : Not ready 1 : Ready	R

(3) Input Register (Function Code: 4)

Address	Data Address	Description	Attribute
30018	0x11	Dynamic messaging status (1) High Byte: Status 0 : Idle 1 : The system is busy or waiting for transmission 2 : Transfer 3 : Transfer success 4 : Transfer failed (2) Low Byte: Error code for transmission failure	R
30019	0x12	GSM signal strength 0~31 or 99(Error)	R
30027	0x1A	Status of IO SMS transmission (1) High Byte: Status 0 : Idle 1 : The system is busy or waiting for transmission 2 : Transfer 3 : Transfer success 4 : Transfer failed (2) Low Byte: Error code for transmission failure	R
30028	0x1B	SIM card registration status 0 : Not registered 1 : Registered 2 : Unregistered, looking for 3 : Registration rejection 4 : Unknown network status 5 : Registered, roaming	R
30029	0x1C	Mobile network registration type 0 : no service 1 : 2G 4 : 3G 8 : 4G	R
30031 ~ 30040	0x1E~ 0x27	Send the sender's phone number, ASCII code, end the character with 0x00 as the data	R
30041 ~ 30047	0x28~ 0x2E	Time when the newsletter was received, in the format yyyyMMddHHmmss	R

30048	0x2F	Received SMS encoding 0x0000=ASCII 0x0001=Unicode	R
30049~ 30128	0x30~ 0x7F	Received newsletter content ASCII code: end character with 0x00 as data Unicode: end character with 0x0000 as data	R
30162~ 30165	0xA1~ 0xA4	Read AI0~AI3	R
30170~ 332937	0xA9~ 0x80A8	Read SMS / Voice alarm sending status (1) High bytes : SMS status 0 : Idle 1 : Waiting to be sent 3 : Sent successfully 4 : Send failed (2) Low bytes : Voice status 0 : Idle 1 : Waiting to be called 3 : Called successfully 4 : Call failed Modbus address interval : Alarm 0 : 0xA9 ~ 0x1A8 Alarm 1 : 0x1A9 ~ 0x2A8 Alarm 2 : 0x2A9 ~ 0x3A8 and so on, each alarm group uses 256 registers.	R

Note: The ability to query the delivery status of SMS cannot be used in Edge Trigger mode.

(4) Holding Register(Output Register) (Function Code: 3, 6, 16)

Address	Data Address	Description	Attribute
40200	0xC7	Module Address(Modbus Net ID)，1~247	R/W
40201	0xC8	COM1 related settings (1) High Byte Code 0x04 0x05 0x06 0x07 Baud 2400 4800 9600 19200 Code 0x08 0x09 0x0A Baud 38400 57600 115200 (2) Low Byte Bit 2:0 (Data Bit) 011：8 Data Bits Bite 4:3(stop bit) 00：1 stop bit 01：2 stop bit Bite 6:5(parity) 00：no parity 01：odd parity 10：even parity	R/W
400384 ~	0x17F~ 0x18E	Variable SMS content, Unicode code, ending with 0x0000	R/W

400399			
400400 ~ 400469	0x18F~ 0x1D4	Dynamic newsletter content, Unicode code, ending with 0x0000	R/W
400470 ~ 400479	0x1D5 ~ 0x1DE	Dynamic phone number, ASCII code, ending with 0x00	R/W
400480 ~ 400489	0x1DF~ 0x1E8	Manager phone number, ASCII code, ending with 0x00	R/W

14.Modbus Position Configuration Table (MQTT)

The Modbus Function Codes supported by the GTP-541M are: 1、2、3、4、5、6、15、16. The following is the address configuration table

(1) Coil Status (Function Code：1, 5, 15)

Address	Data Address	Description	Attribute
00001~ 00002	0x0~ 0x1	Read/Write DO0~DO1	R/W
00003~ 00007	0x2~ 0x6	Publish messages to the specified topic 0x0 : Publish message to Publish Topic 1 0x1 : Publish message to Publish Topic 2 0x2 : Publish message to Publish Topic 3 0x3 : Publish message to Publish Topic 4 0x4 : Publish message to Publish Topic 5	R/W

(2) Discrete Input (Function Code：2)

Address	Data Address	Description	Attribute
10001~ 10005	0x0~ 0x4	Read DI0~DI4	R

(3) Input Register (Function Code：4)

Address	Data Address	Description	Attribute
30001~ 30004	0x0~ 0x3	Read AI0~DI3	R

(4) Holding Register(Output Register) (Function Code：3, 6, 16)

Address	Data Address	Description	Attribute
40001~ 40128	0x0~ 0x7F	Save the message content to be published	R/W
40129~ 40256	0x80~0xFF	Subscription content of Subscribe Topic 1	
40257~ 40384	0x100~0x17F	Subscription content of Subscribe Topic 2	
40385~ 40512	0x180~0x1FF	Subscription content of Subscribe Topic 3	
40513~ 40640	0x200~0x27F	Subscription content of Subscribe Topic 4	
40641~ 40768	0x280~0x2FF	Subscription content of Subscribe Topic 5	

Appendix A. Manual Revision History

This chapter provides a revised record of this user manual.

The following table provides the date and description of each revision of this file.

version	publish time	Author	Description
1.0.0	2018/08/31	Jeromy	First release
1.0.1	2018/10/19	Jeromy	Update image
1.0.2	2018/11/13	Jeromy	Modify the error content
1.0.3	2018/11/22	Eddie	Increase ModBusSMS voice alarm function
1.0.4	2018/12/06	Jeromy	Add TXT_SMS Function
1.0.5	2019/04/24	Jeromy	Added DIOSMS voice alert feature
1.0.7	2019/12/17	Jeromy	How to return to working mode after adding end parmeters.
1.0.8	2021/02/03	Selby	Increase VSPE function and application diagrams
1.0.9	2023/01/05	Selby	Add Firmware Update Description
1.0.12	2024/12/27	Jay	Modifications for ModbusSMS Utility: 1. Support reading I/O values and controlling DO. 2. Support UCS2 and 7-bit SMS encoding. 3. Support SMS database functionality. 4. Support IO status SMS. 5. Support SMS preview.
1.0.13	2025/07/11	Jay	Add ModbusSMS feature : 1. Check the SMS / Vocie sending status. 2. Add manager SMS.