SMS-531

Intelligent 3G Modbus SMS/Voice Alarm Controller

User's Manual V1.1

High Quality, Industrial Data Acquisition, and Control Products

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Version	Date	Author	Description
1.0	2013/01/24	William	Release version
1.1	2013/12/30	William	(1) Add function code 15 (2) Modify Example 5: Receiving the SMS

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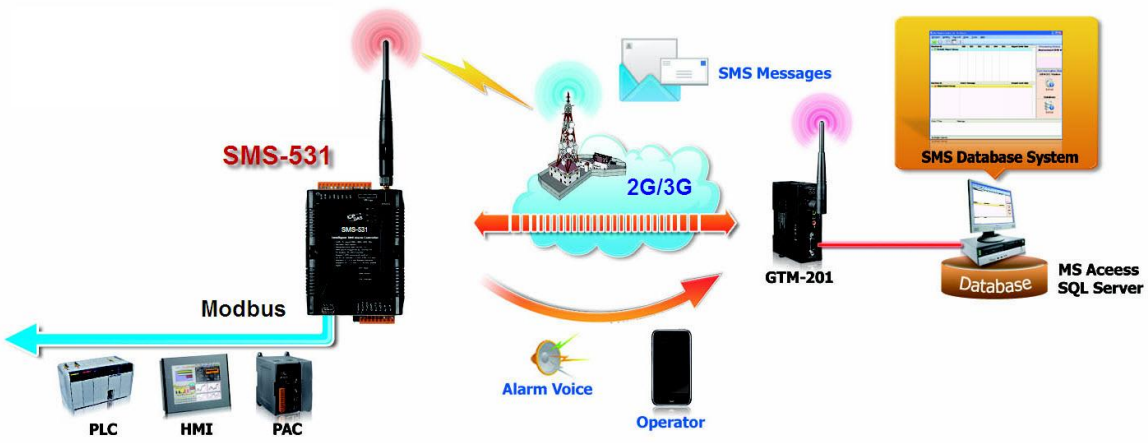
1. Introduction

SMS-531 is an intelligent 3G Modbus/SMS gateway for industry M2M applications. It is convenient for users to apply to M2M applications with the host like PC, PLC, HMI and PAC via Modbus RTU communication. It supports UNICODE format for users to send SMS messages to the specific mobile phones by Modbus RTU protocol with various language. That can make the current system to M2M applications. Moreover, the SMS-531 also supports the sound alarm application with the pre-defined voice files. It can be used to inform operator the urgent event immediately. For managing more SMS-5xx series remotely, ICP DAS provides SMS DBS software for users to apply in the system.

Therefore, the SMS-531 can be a powerful tool allowing you to use your mobile phone to monitor and control your business from any location.



1.1 Features

- Support GSM 850/900/1800/1900 MHz Quad-band frequency
- Support WCDMA 850/900/1900/2100 MHz Quad-band frequency
- Support Modbus RTU slave protocol
- Support max. 256 short messages and voice alarms
- Support max. 70 Unicode Characters
- Easy to setup and configure
- Escalation and reminder function
- Up to 256 mobile phones can be alerted for each alarm point
- These phone numbers can be divided into groups
- Configurable SMS messages
- The content of sending SMS message can be changed by Modbus protocol
- Built-in Watchdog Function
- Industrial Design with Surge Protection
- Support SMS DB of ICP DAS software
- 1 RS-485, 2 RS-232 port
- Support micro SD/SDHC card. (max. 32G bytes)
- Support DC +10 VDC ~ +30 VDC Power Input
- DIN Rail design

1.2 Applications

- Remote equipment maintenance and automation
- Vending or Gaming monitor system
- Home/Factory security
- Escalators & Elevators
- Energy Management
- Temperature Monitoring

Application 1：Signal Alarm and SMS Communication

Application 2：Home Security

Application 3：Remote Maintenance

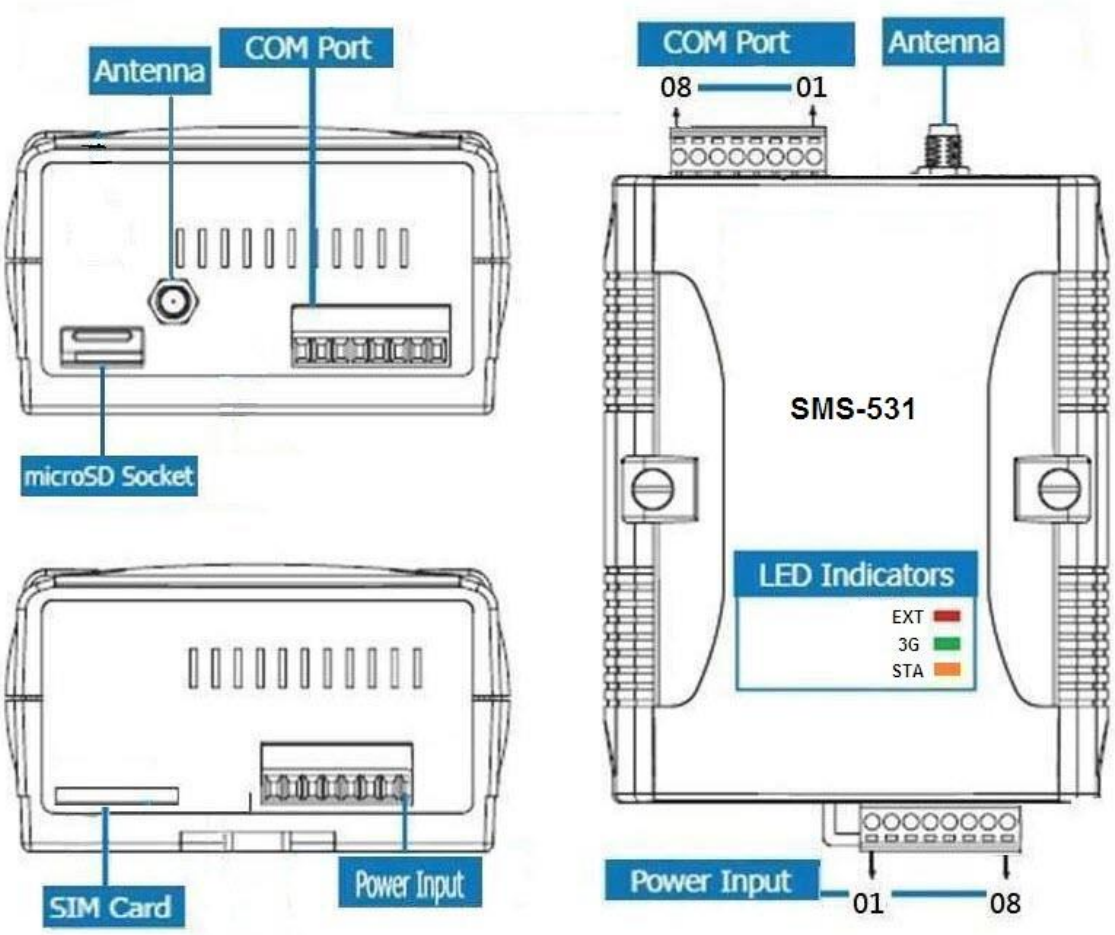
2. Hardware

2.1 Specifications

System	
CPU	32 bit CPU
SRAM	64K Bytes
Flash Memory	512K Bytes
WDT(watchdog)	Yes
Serial Ports	
COM1	RS-232 : TXD,RXD,GND：Configuration and Debug
COM2	RS-232 : TXD,RXD,GND：Communicating with the Host
COM3	RS-485 : D+,D-：Communicating with the Host
3G Interface	
Frequency	WCDMA Quad-Band 850/900/1900/2100 MHz
GSM Interface	
Frequency	Quad-Band 850/900/1800/1900 MHz
Coding schemes	CS 1, CS 2, CS 3, CS 4
SMS Format	sending : UCS2 receiving : UCS2/7bits
Power	
Protection	Reverse polarity protection
Frame Ground Protection	ESD, Surge, EFT, Hi-Pot
Required Supply Voltage	+10 VDC ~ +30 VDC
Mechanical	
Casing	Plastic
Dimensions(W x L x H)	91 mm x 132 mm x 52 mm
Installation	DIN-Rail
Environment	
Operating Temperature	-25 ℃ ~ +75 ℃
Storage Temperature	-40 ℃ ~ +80 ℃
Humidity	5 ~ 95% RH, non-condensing

2.2 Appearance and Pin Assignments

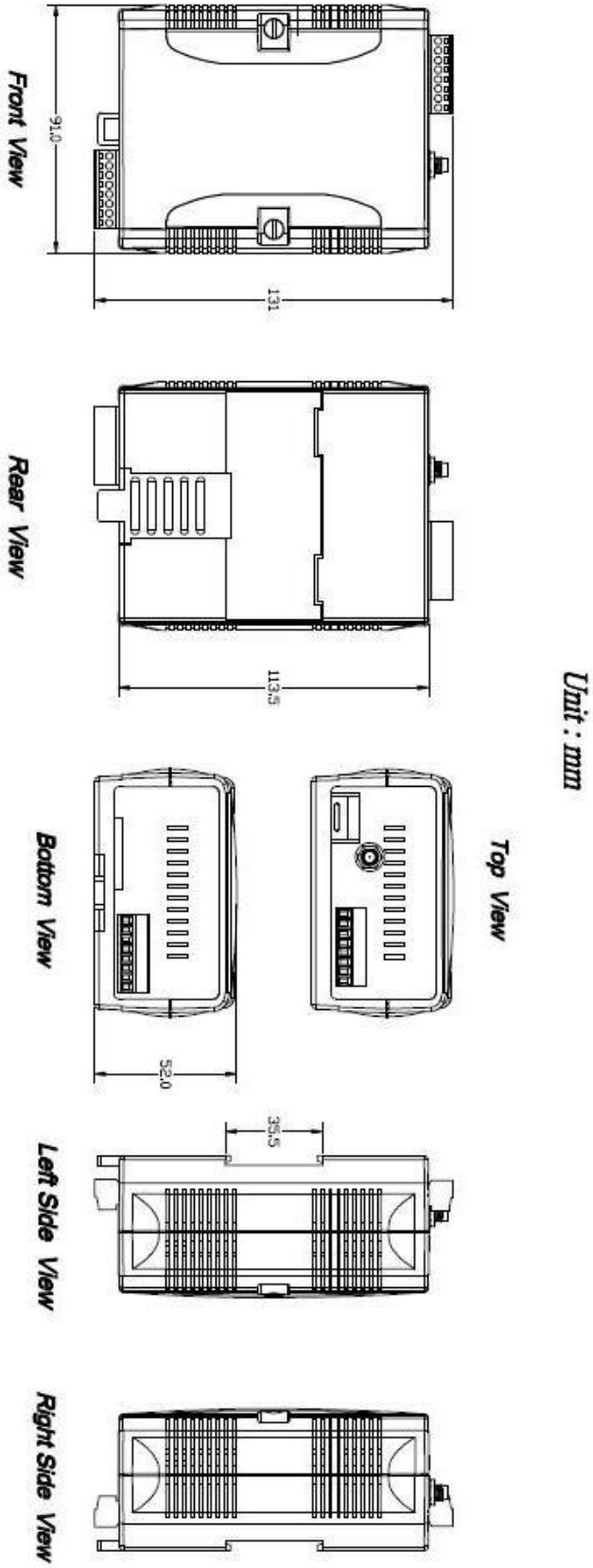
Pin assignments of SMS-531



Power Input		
Terminal No.		Pin Assignment
N/A	01	N/A
	02	N/A
	03	N/A
GND	04	GND
Initial	05	Init
Power Input: 10 ~ 30 VDC	06	DC.+VS
	07	DC.GND
Frame Ground	08	F.G

COM Port		
Terminal No.		Pin Assignment
COM3 RS-485	01	D-
	02	D+
COM2 RS-232	03	TxD2
	04	RxD2
	05	GND
N/A	06	N/A
COM1 RS-232	07	TxD1
	08	RxD1

2.3 Dimensions



2.4 LED Indicators

There are three LED indicators to help users to judge the various conditions in the SMS-531. The description is as follows:

A. EXT (Red): The External Power LED is to indicate whether the power is supplied or not.

The power is active	The power is not active
On	Off

B. 3G (Green): The modem LED can indicate the status of 3G module. (After modem registered)

(1) Use 3G SIM card.

3G module normal	3G module fail
Blanking*2 (2 sec)	Off or Blanking (not 2 sec)

(2) Use 2G SIM card.

3G module normal	3G module fail
Blanking*1 (2 sec)	Off or Blanking (not 2 sec)

Note: When the SMS-531 sends voice alarm, the 3G LED is continuous on.

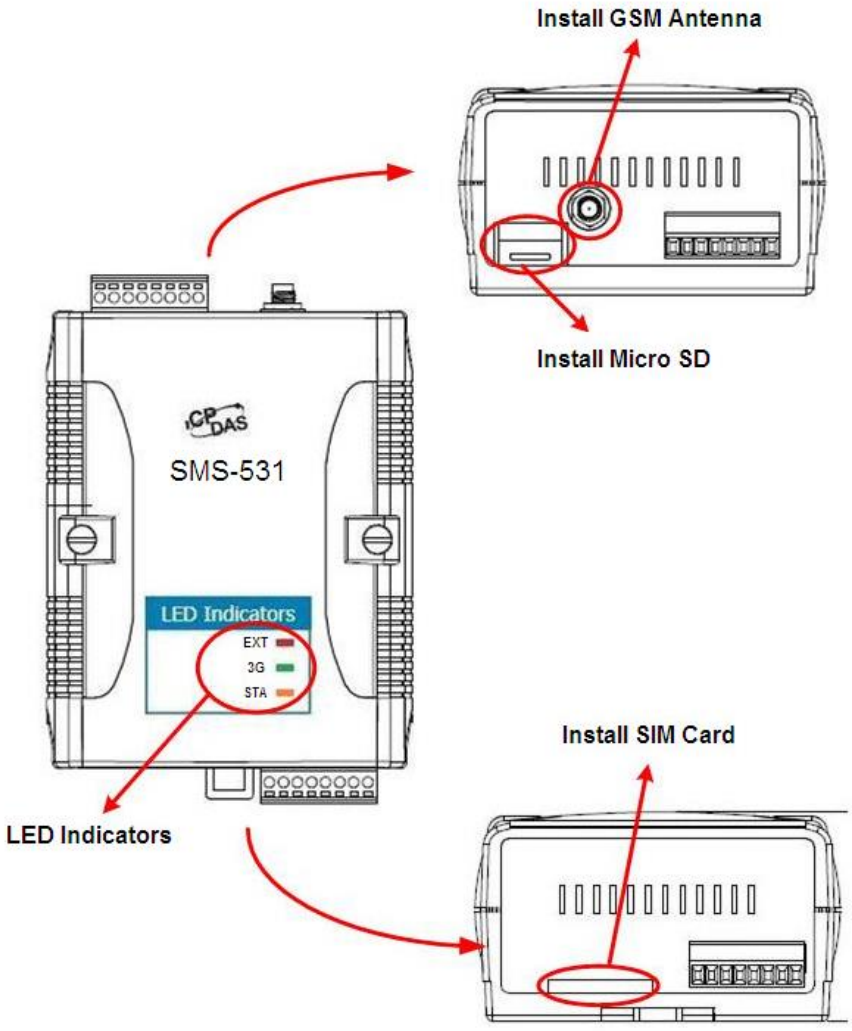
C. STA (Orange): The System LED is to indicate if the SMS-531 is normal or fail.

Normal(idle)	Running	3G error	Wrong PIN/PUK code
Blanking (1 sec)	Blanking (0.5 sec)	Always on or off	Blinking per 50 ms

2.5 Installing the SMS-531

If users want to start SMS-531 normally, it needs to follow these steps to install the SMS-531 below:

A. Install the antenna
B. Plug in the normal SIM card (Before apply the SIM card, confirm it is OK by mobile phone.)
C. Install SD Card(Option, for voice alarm files)
D. Pin06 and Pin07 of the power input connect to the DC.+VS and DC.GND of the power supply.
E. It is needed to wait for 30 ~ 50 seconds to search the 3G base and register to the ISP. After finishing the process, SMS-531 would be in normal operation mode and the STA LED would blank per 1 sec. The start time of SMS-531 depends on the strength of 3G signal.



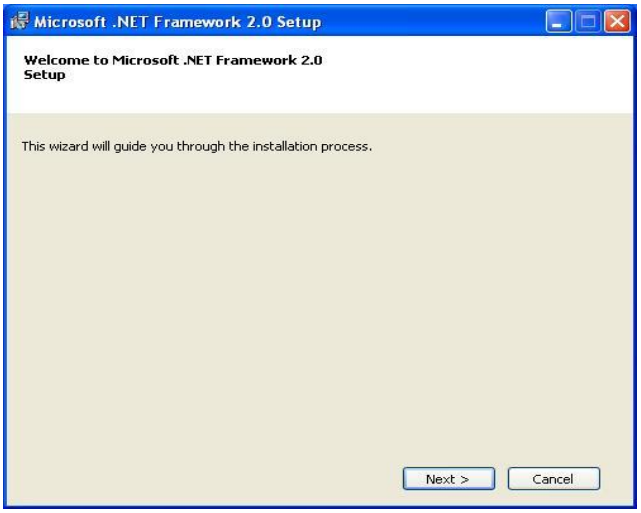
3. Installing the GT-531 Series Utility

It needs the runtime environment with .NET Framework 2.0 or above to execute the GT-531 Series Utility in the PC. If there has .NET Framework 2.0 or above in the PC, the section 3.1 can be omitted.

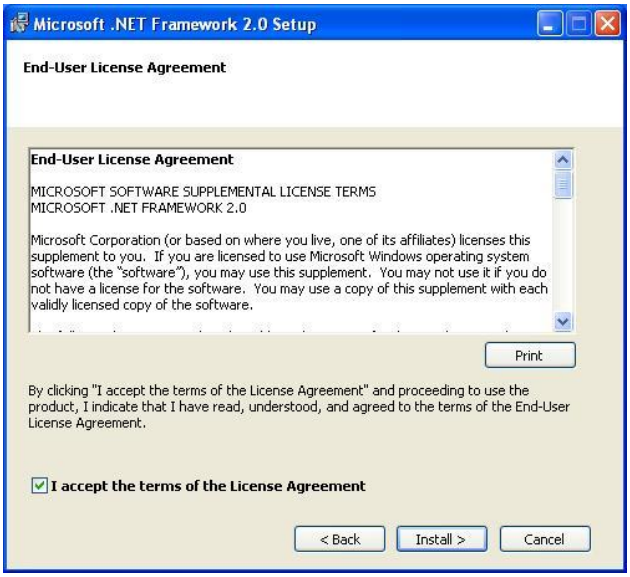
3.1 Installing .NET Compact Framework

The user can download the .NET Compact Framework 2.0 or above from Microsoft web site. The install figure is as follows:

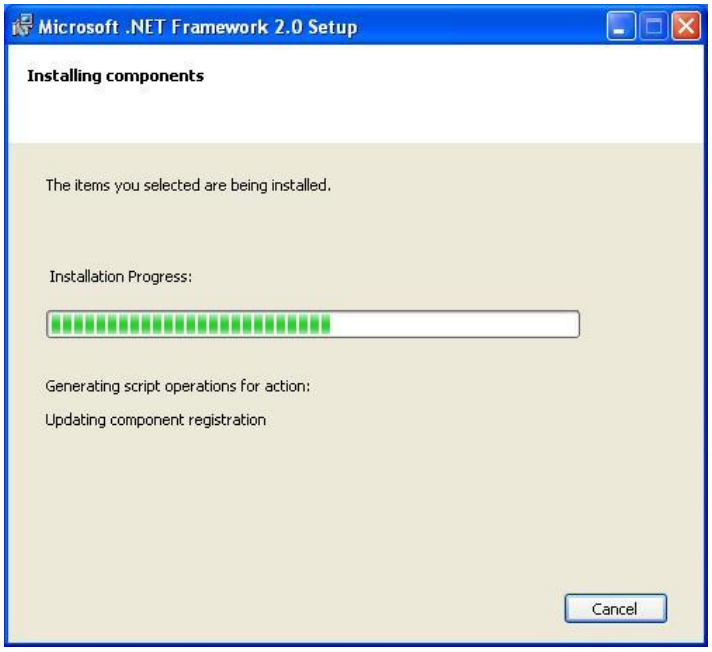
(1) Press "Next" to the next step.



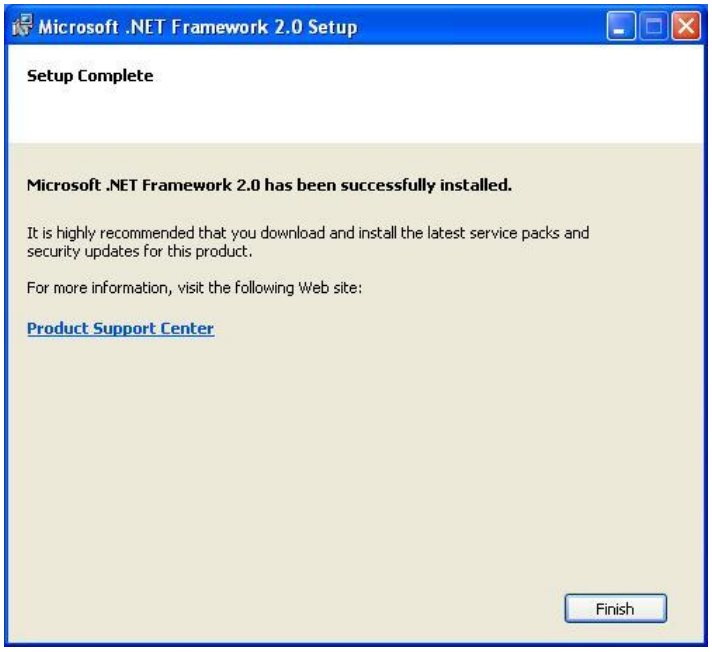
(2) Select the "I accept the terms of the License Agreement" and "Install" to the next step.



(3) The installation process would be going.



(4) After finishing the installation, press "Finish" to exit the program.



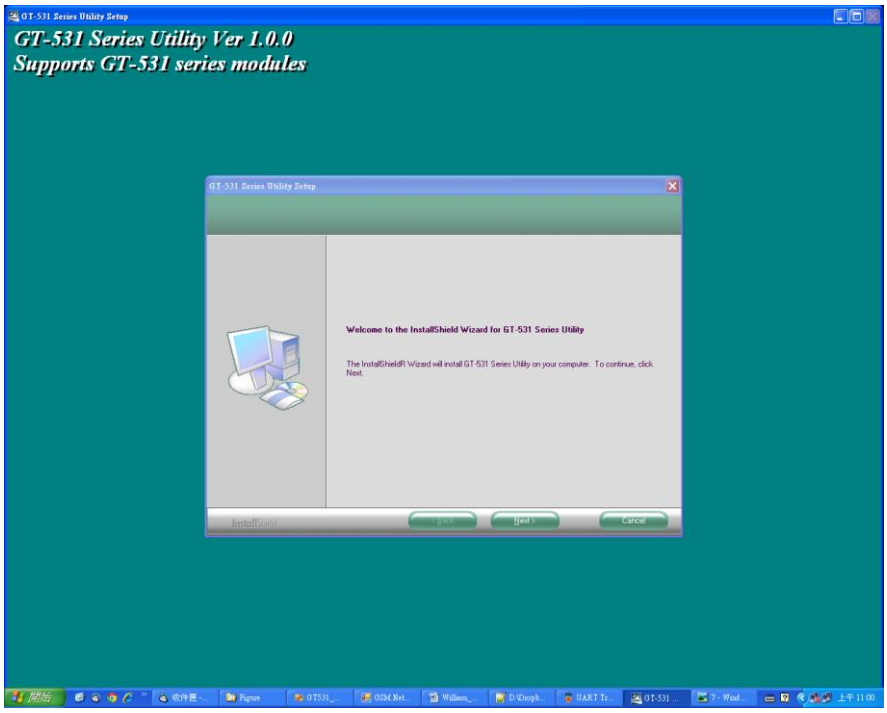
3.2 Installing GT-531 Series Utility

A. Plug in the shipment CD into the PC

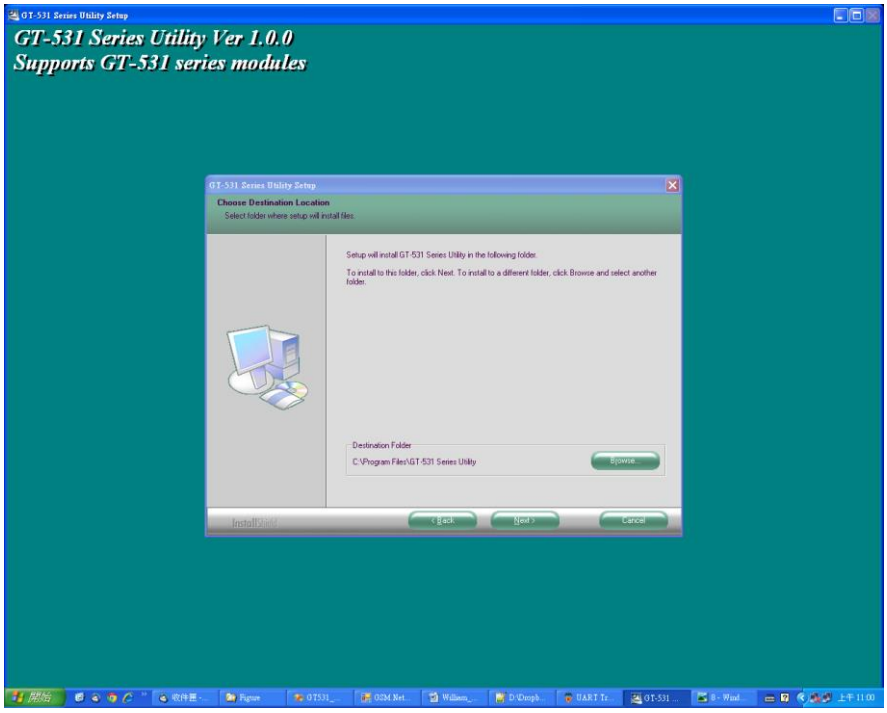
B. Execute \software\pc_utility\Install_GT531_Series_Utility_Vxxx.exe

The installation figure is as follows:

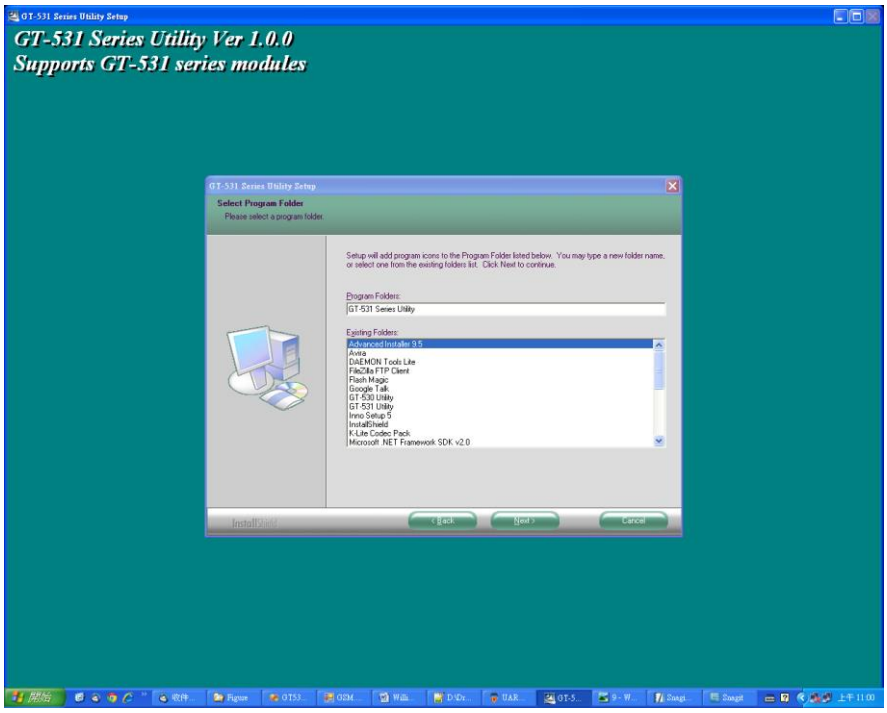
(1) Press "Next" to start the installation procedure.



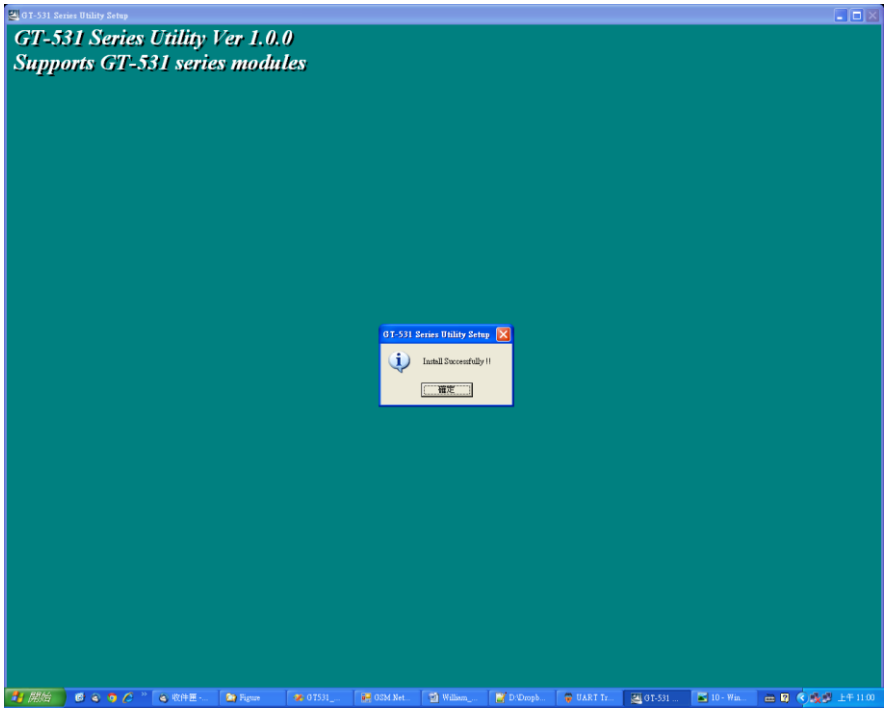
(2) Select the installation path. The default path is "C:\Progrm Files\GT-531 Series Utility". Press "Next" to the next step.



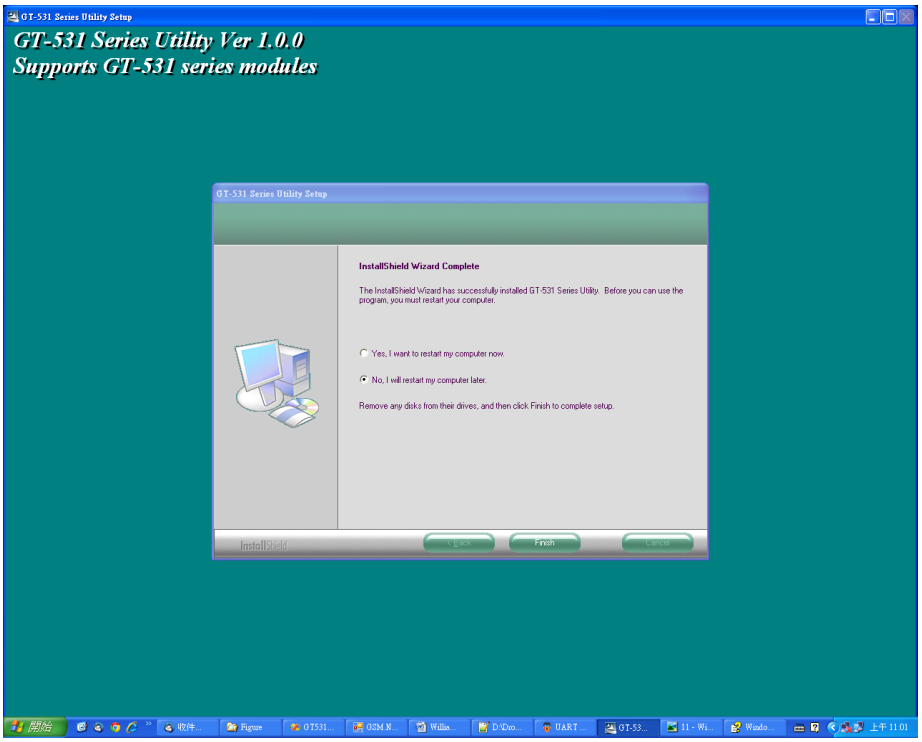
(3) Input the name shown in "All Programs". Press "Next" to the next step.



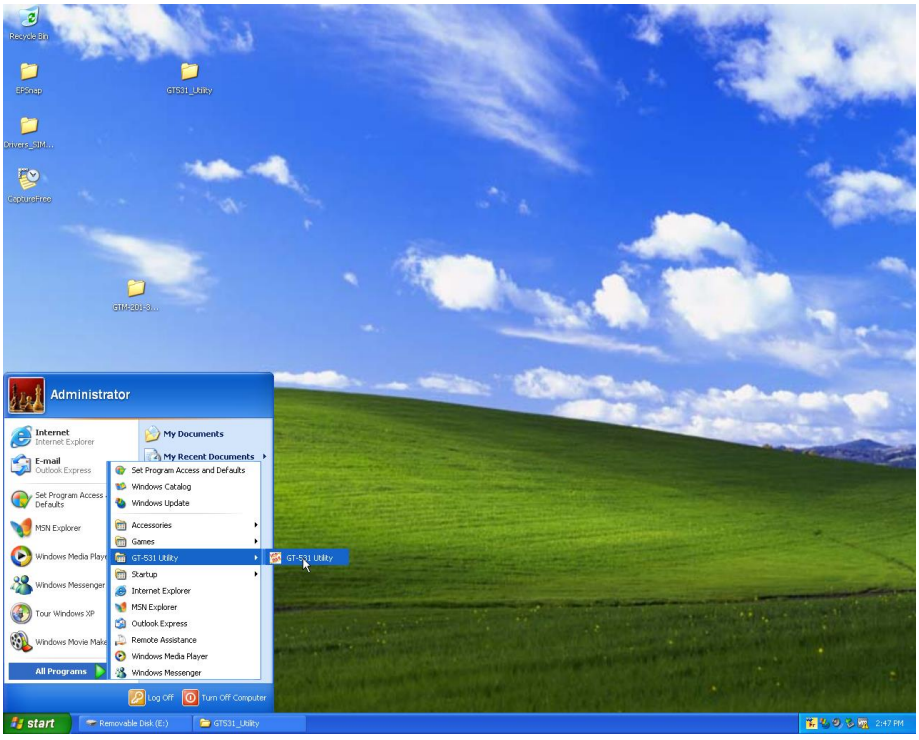
(4) After finishing the installation procedure, press "OK" to the next step.



(5) Press "Finish" to finish the installation procedure.



(6) Launch GT-531 Series Utility from the start menu: "Start → All Programs → GT-531 Series Utility → GT-531 Series Utility".



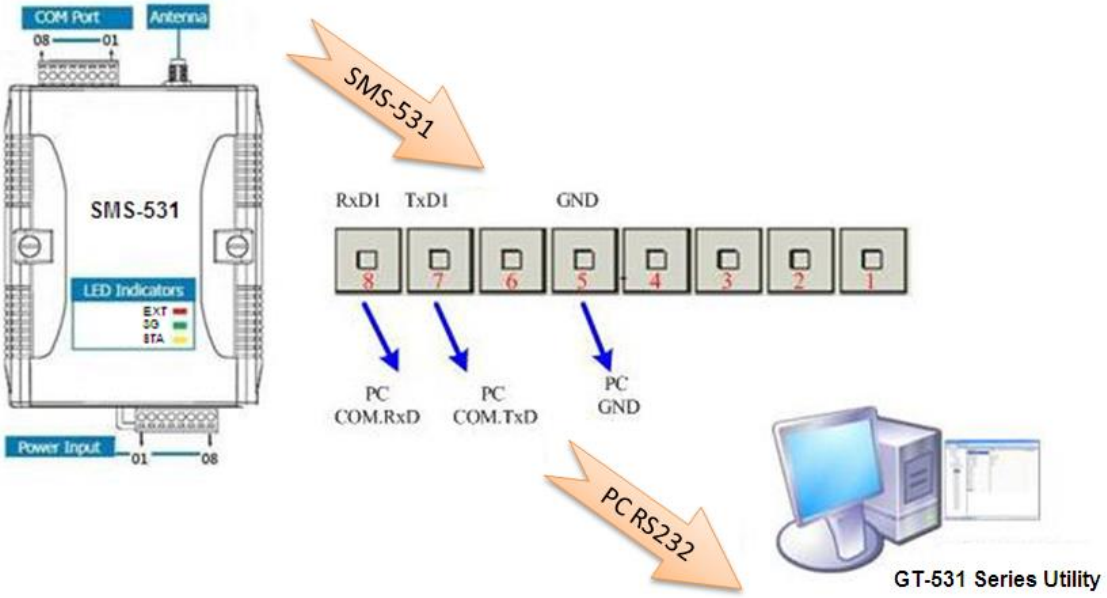
4. The GT-531 Series Utility Operation Description

Before GT-531 Series Utility is connected to the SMS-531, please confirm these following steps:

1. The STA LED is blanking. There are 2 kinds of blanking in the SMS-531.

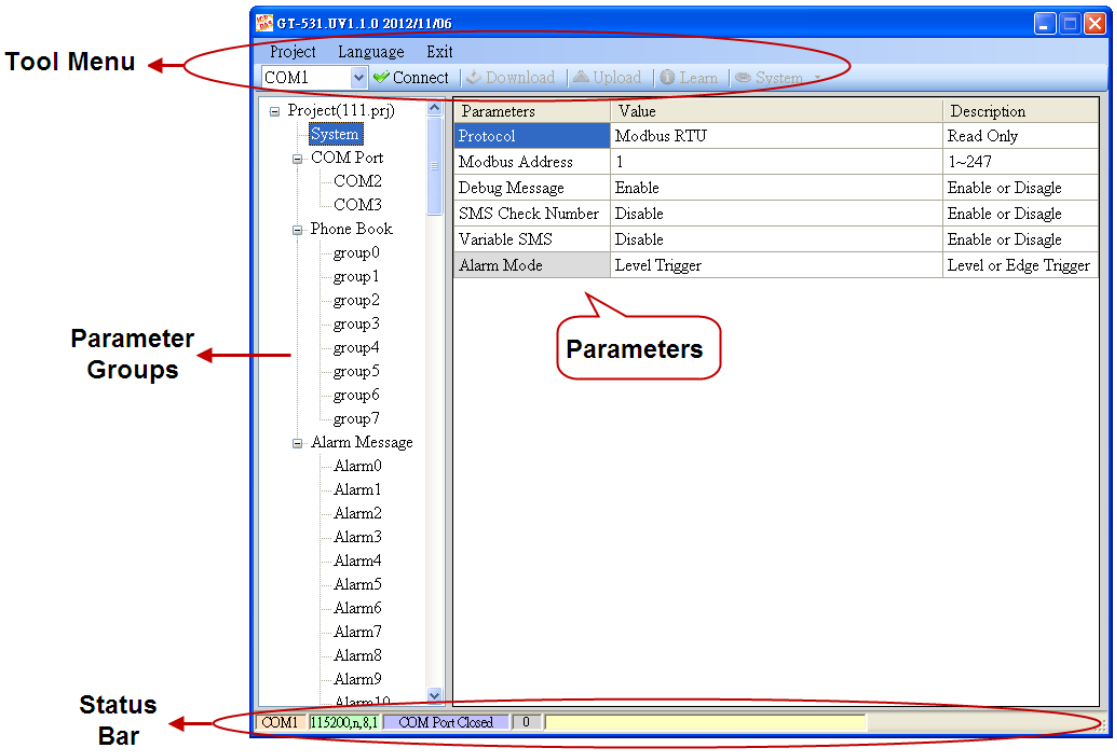
STA LED	Description
Blanking per 1 sec	Normal mode
Blanking per 50 ms	The PIN/PUK code is wrong. As this condition happened, users need to set PIN/PUK code in the GT-531 Series Utility.

2. Confirm the RS232 wire connection between the SMS-531 and PC is correct. Users can refer to the following figure.



4.1 Main Menu

The main menu of GT-531 Series Utility includes the following sections:



A. Tool Menu

These tools include all the function operation of the GT-531 Series Utility. The description is as follows.

1. Project:
   The parameters of the SMS-531 can be saved as the project file. The operation functions include "New", "Open", "Save", "Save as…", and etc...
2. Language:
   The GT-531 Series Utility only support English interface now.
3. Exit:
   Exit the GT-531 Series Utility.
4. COM Port:
   The COM Port number of the host PC connecting to the SMS-531.
5. Connect:
   Connecting to the SMS-531.
6. Download:
   Downloading the settings to the SMS-531.
7. Upload:
   Uploading the settings from the SMS-531 to GT-531 Series Utility.

8. Learn:
   Providing the simple way for users to learn the Modbus RTU commands to operate SMS-531.
9. System:
   Providing some system operations include "Signal Quality", "Reboot SMS-531", "Recover Default Settings", "Firmware Version", "Input PIN/PUK" and "Voice File Management".

B. Parameter groups

There are four parameter groups in the GT-531 Series Utility including "System", "COM Port", "Phone Book" and "Alarm Message".

C. Parameters

Showing or setting the parameters.

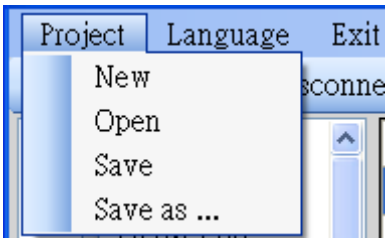
D. Status Bar

This bar can show the operation procedure of the GT-531 Series Utility. From left to right, they are:

1. The used com port number
2. Communication configuration of the COM Port
3. The current status of the COM port
4. The Modbus address of the SMS-531
5. The result for operating the functions

4.2 File Menu

This tool provides users to operate the project file. It can save the SMS-531 configuration as the file or upload the settings from the file. It is convenient to manage a lot of SMS-531s. The explanation is as follows.



A. New: Opening a new file
B. Open: Opening a exited file
C. Save: Saving the file

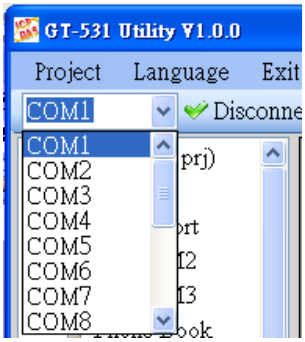
   If the parameters are changed or save the uploading parameters from the SMS-531, you can use this function to save these configurations.

D. Save as: Saving the file as another name

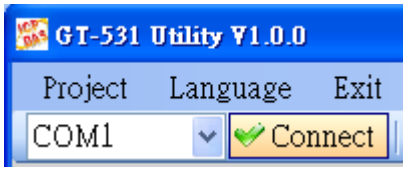
4.3 Connecting to the SMS-531

For connecting to the SMS-531, you can follow the steps below.

A. Select the COM port of the host PC and connect to the COM1 of SMS-531.

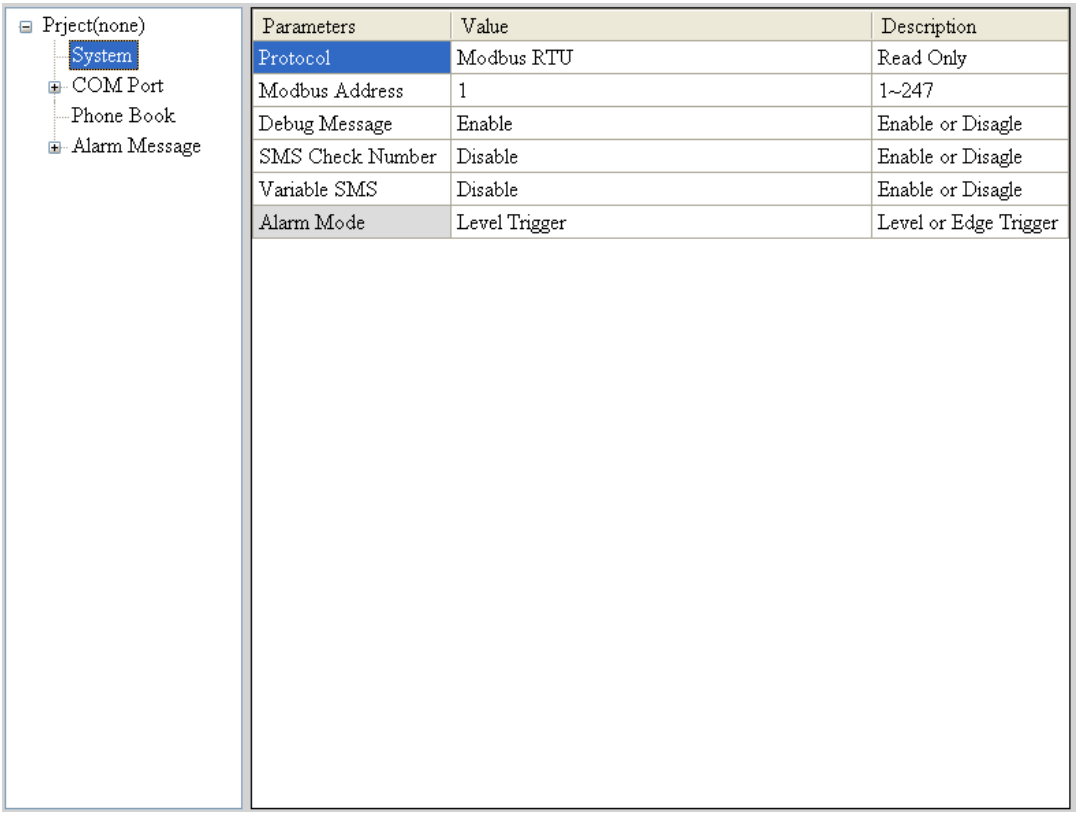


B. Press "Connect" to connect to the SMS-531. If the connection is failed, check the COM port settings and wiring.



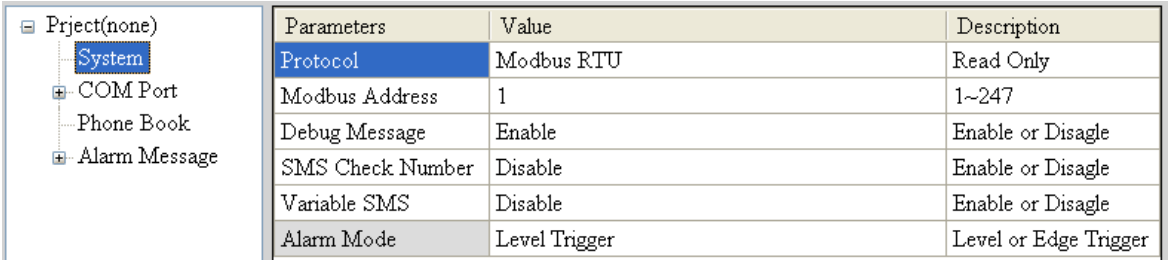
4.4 Parameters

The parameters would be shown in the right of the windows if click the tree field in the left side of the GT-531 Series Utility. Press the parameters' "Value" filed can change these parameters as the following figure.



4.4.1 System

There are 6 items in the system field below.



A. Protocol:
   The communication protocol of the SMS-531.The current protocol is Modbus RTU. It can not be changed.

B. Module Address:
   To show or set the Modbus ID of the SMS-531.

C. Debug Message:
   Disabling or enabling the debug messages from COM1.

D. SMS Check Number:

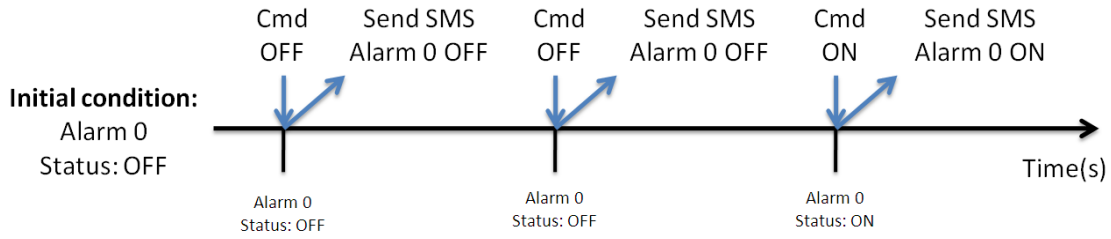
Disabling or enabling the check code for SMS. If the SMS-531 is applied with the SMS DB system of ICP DAS, the check code function must be enabled and user must add "ALARM;" to the start of the short message.

E. Variable SMS:

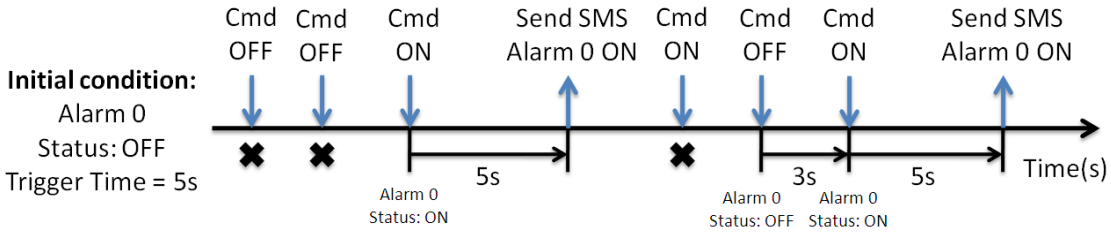
Disabling or enabling the function for changing the content of the transmitting SMS. If enabling this function, the SMS content is the defined message in the "Alarm message" and the changeable content from communication. The defined message is max 54 characters. The changeable message is max 16 characters. The total message is max 70 characters.

F. Alarm Mode:

(1) Level Trigger：The SMS will be sent when SMS-531 receive command.

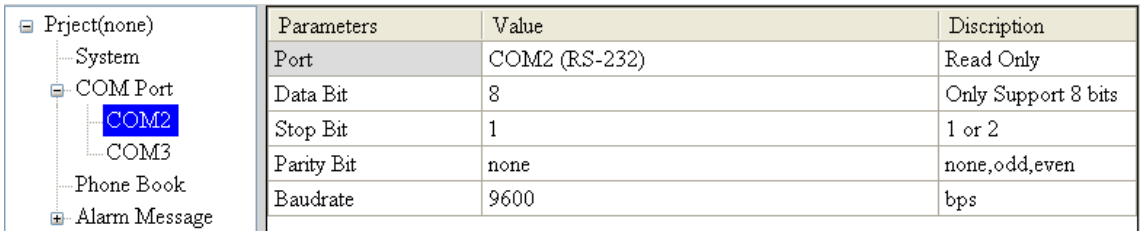


(2) Edge Trigger：When the alarm status change, the SMS will be sent. (It' s support Alarm Trigger Time.)



4.4.2 COM Port

The parameters of COM Port (COM2, COM3)



Parameters	Description
Port	COM Port name (read only)
Data Bit	Only 8 bits
Stop Bit	1 or 2 bits
Parity Bit	None, Even, Odd
Baudrate	2400、4800、9600、19200、38400、57600、115200 bps

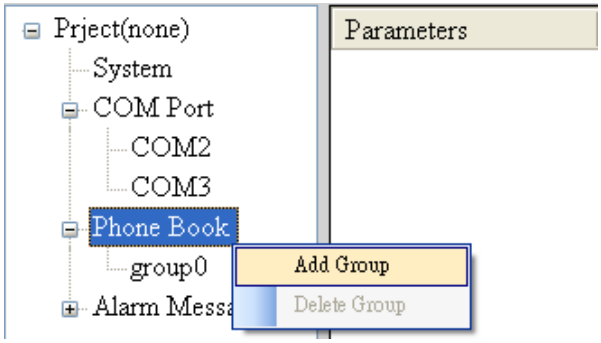
4.4.3 Phone Book

The parameters of "Phone Book" define the phone groups and the phone numbers.

A. Add Group

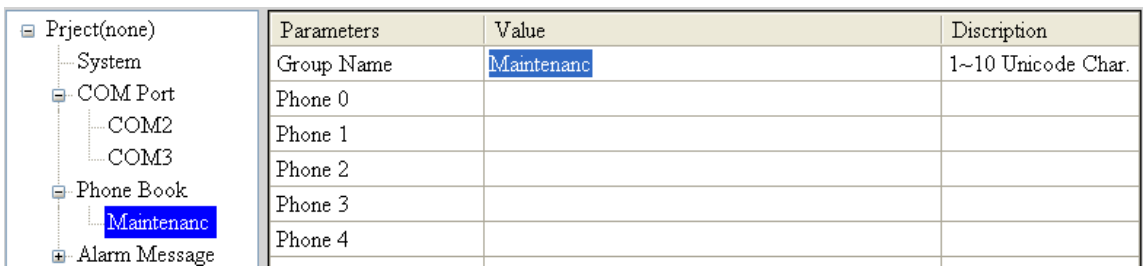
Right click "Phone Book" and select "Add Group" to new a phone group.

The max group number is 16.



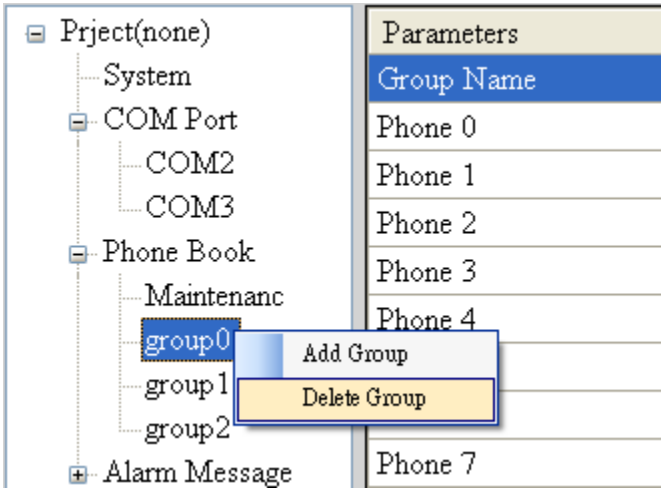
B. Changing the Group name

You can modify the name of groups from the right window as the following figure.



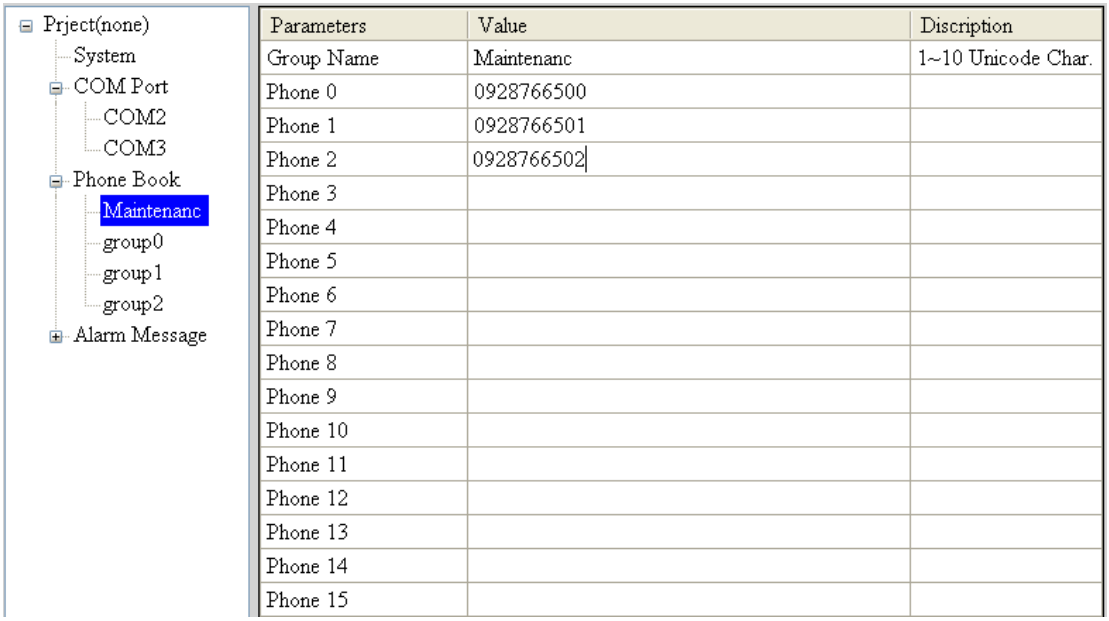
C. Delete Group

You can delete a group by right clicking the group from the left windows as the following figure.



D. Adding, changing or deleting the phone numbers in the groups

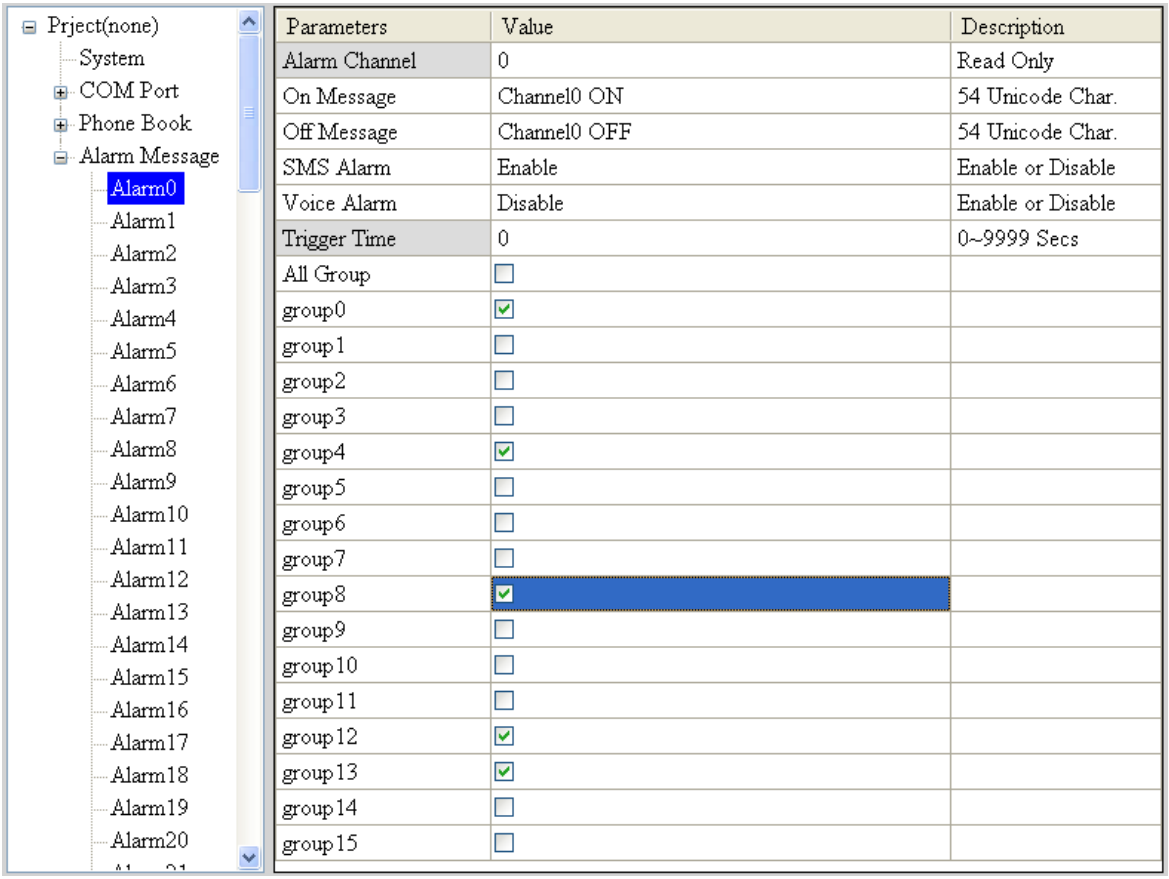
By clicking the group from the left windows, you can add, change or delete the phone number from the right windows. The max quantity of phone number in a group is 16.



Parameters	Value	Discription
Group Name	Maintenanc	1~10 Unicode Char.
Phone 0	0928766500	
Phone 1	0928766501	
Phone 2	0928766502	
Phone 3		
Phone 4		
Phone 5		
Phone 6		
Phone 7		
Phone 8		
Phone 9		
Phone 10		
Phone 11		
Phone 12		
Phone 13		
Phone 14		
Phone 15		

4.4.4 Alarm Message

The parameters in "Alarm Message" can define the SMS content and phone groups according with alarm channels.



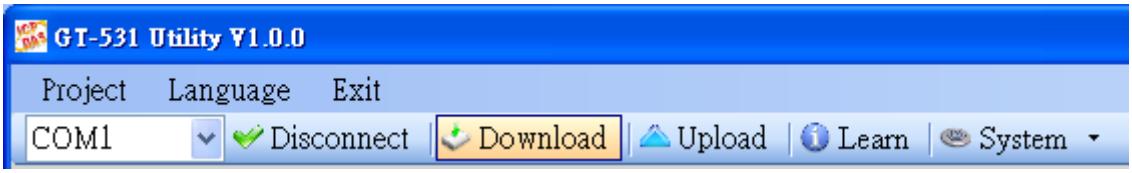
Parameters	Description
Alarm Channel	The Alarm number of the SMS-531
On Message	The transmitting SMS content when alarm is on
Off Message	The transmitting SMS content when alarm is off
SMS Alarm	Enabling or disabling the SMS alarm
Voice Alarm	Enabling or disabling the voice alarm
Trigger Time	How long to wait before sending SMS
All Group	Selecting or canceling all groups
group0 ~ group15	Enabling or Disabling the group

Note: Trigger Time only support Edge Trigger mode.

4.5 Downloading/Uploading the SMS-531's Parameters

A. Downloading parameters

As the configuration is finishing, the function can download the parameters to the SMS-531 by clicking "Download" as the following figure.



B. Uploading parameters

"Upload" button can upload the parameters from the SMS-531 as the following figure.

4.6 Learning Modbus RTU Commands and Testing

The "Learn" function provides a quick way to learn and test the Modbus commands for the SMS-531 as the following figure.

There are 2 functions in the windows. The description is as follows:

A. Send SMS

That can help users to learn the Modbus commands to send SMS from the SMS-531, including:

1. Sending the fixed content SMS

   It can accord to the defined content of the SMS messages and phone groups to send the SMS.

   Note: The "System->Variable SMS" must be disabled.

2. Setting the variable content of SMS and sending SMS

   This function needs to use 2 Modbus commands.

   (1) Modify the variable content of the SMS (Unicode)

   (2) Sending the SMS

   The content of SMS includes the fixed and variable content.

   Note: The "System->Variable SMS" must be enabled.

3. Sending the SMS dynamically

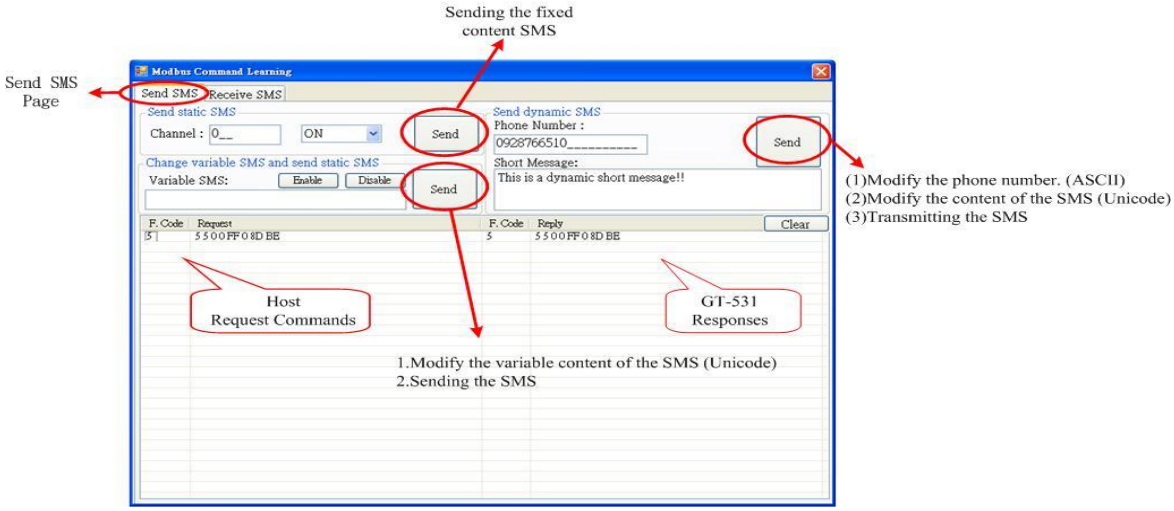
   The function needs 3 Modbus commands about this function.

   (1) Modify the phone number. (ASCII)

   (2) Modify the content of the SMS (Unicode)

   (3) Transmitting the SMS

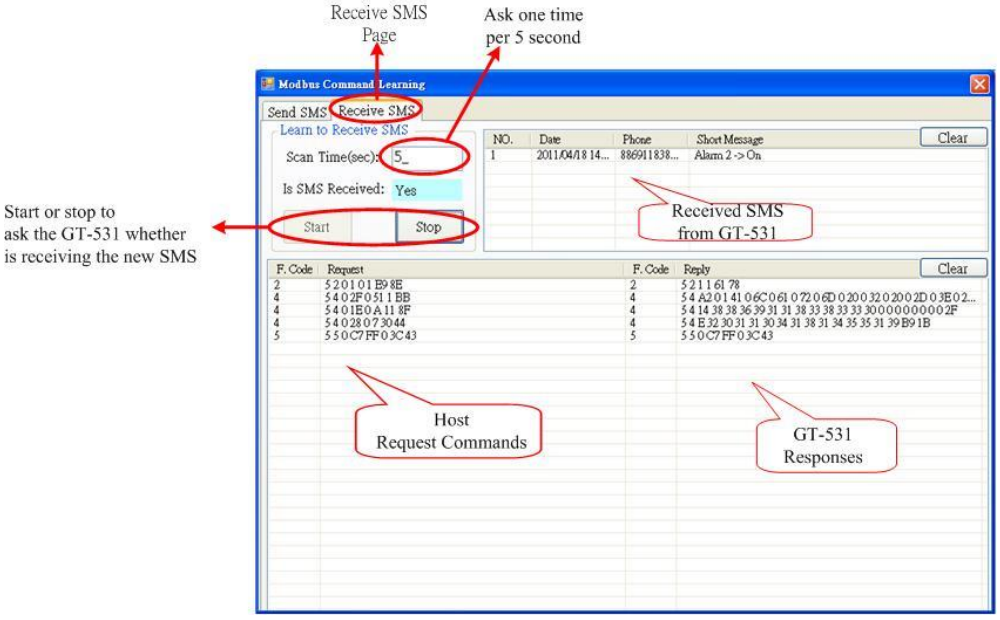
   When using this function, you must wait the transmitting SMS has been sent out then send the next.



B. Receive SMS

The function provides how to get the received SMS from the SMS-531. The SMS-531 can filter the SMS if the SMS is not transmitted from the phone of the groups. Getting the SMS steps are described as follows.

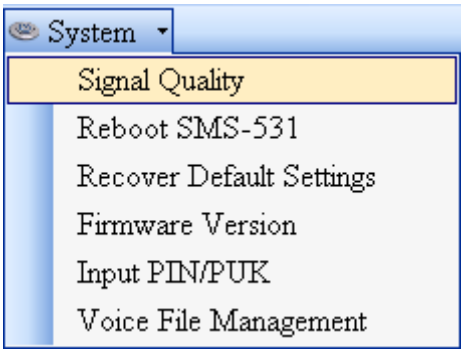
1. Click "Start" button, and the GT-531 Series Utility would send the Modbus command to ask the SMS-531 whether is receiving the new SMS every second.
2. If the response is indicated the SMS-531 has received the SMS, the GT-531 Series Utility would send 3 Modbus commands to read the SMS from the SMS-531.
   (1) Modbus command for the date of SMS
   (2) Modbus command for the phone number of the SMS
   (3) Modbus command for the content of the SMS
3. In the last, send a clear SMS command to clear the SMS from the SMS-531 and it can receive the next SMS.

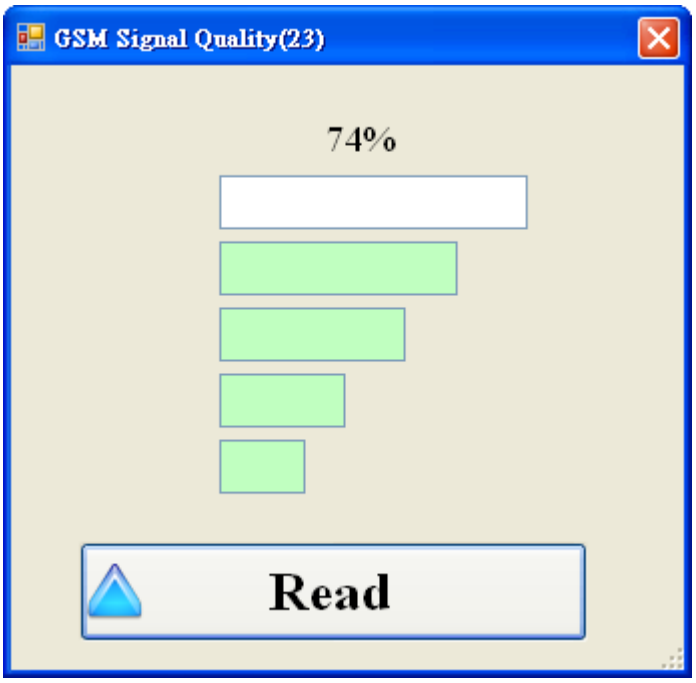


4.7 System

4.7.1 Signal Quality

Click "System->Signal Quality" can show the signal quality windows to know the 3G signal strength.





A. Field Description:

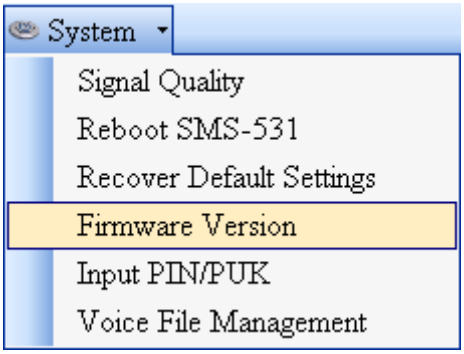
The strength is divided into 5 sections shown in percentage.

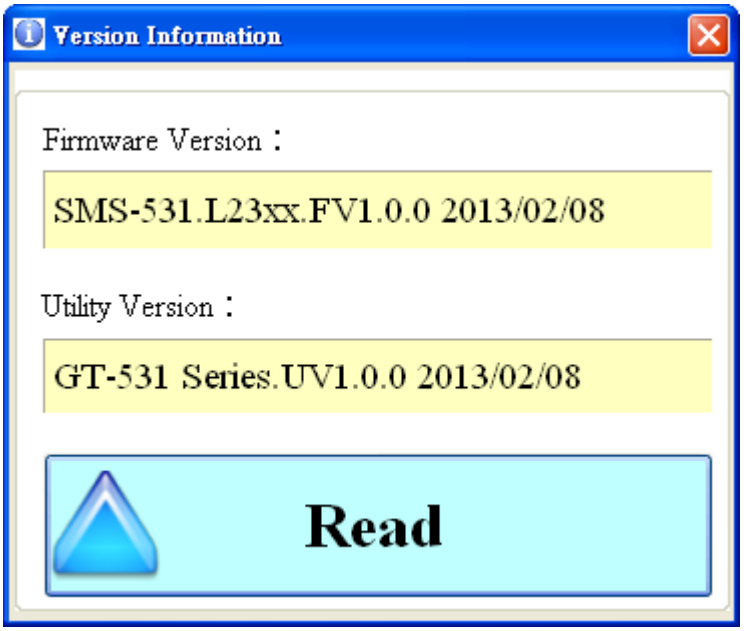
B. Operation:

Read：Read the 3G signal strength from the SMS-531.

4.7.2 Inquiring Firmware Version

Press "System->Firmware Version" in tool menu, and the window would show the versions of the GT-531 Series Utility and firmware.



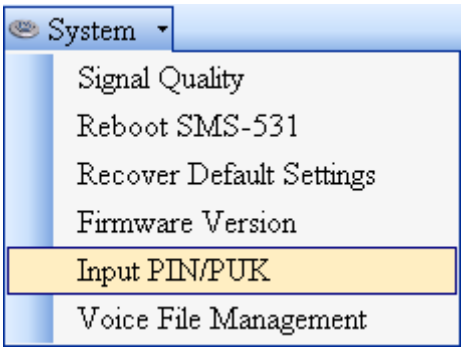


A. Field Description:
   (1) Firmware version: show the version information the of SMS-531's firmware
   (2) Utility version: show the version information of the SMS-531's utility

B. Operation:
   Read: Read these information from the SMS-531.

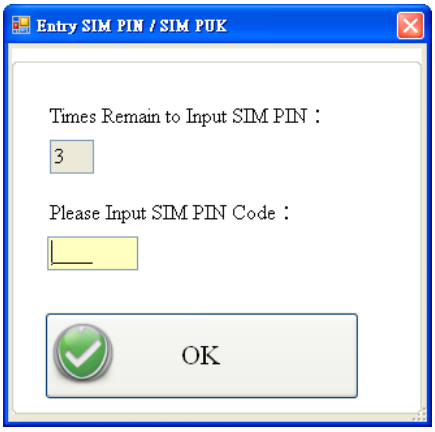
4.7.3 Inputting the PIN/PUK Code

When the SMS-531 starts and the STA LED is blanking per 50 ms, it is needed to input the PIN or PUK code in the SMS-531. In this condition, click "System->Input PIN/PUK" button to set the PIN/PUK code.



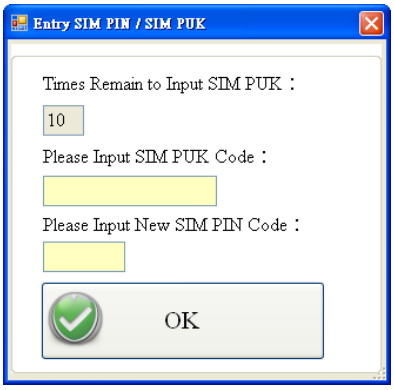
(1) Asking for inputting PIN code

If the PIN code is effective, the "Enter SIM PIN/SIM PUK" window would pop-up as follows. If the number of times for inputting the wrong PIN code is more than the allowed number, the PIN code would be ineffective. And the "PUK code" window would pop up.



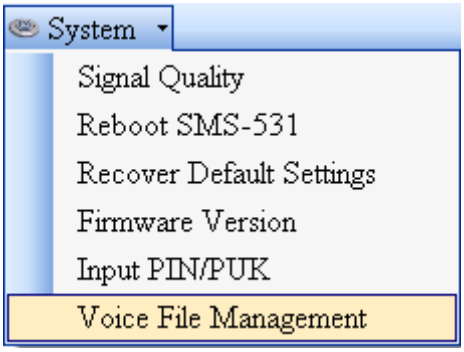
(2) Asking for inputting PUK code

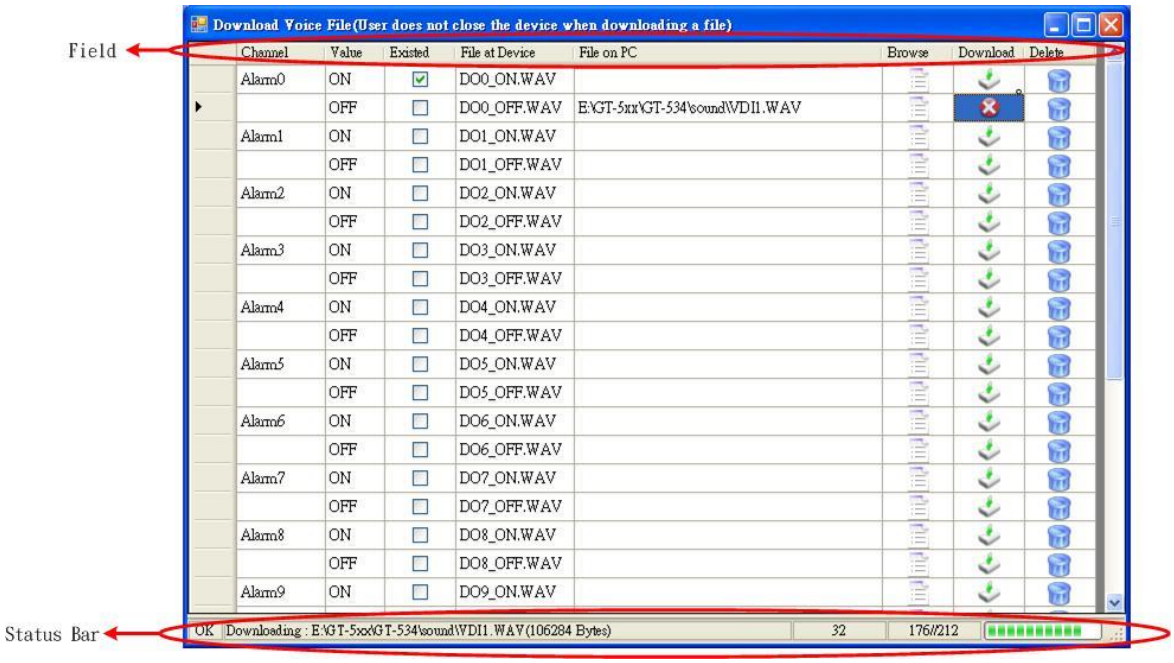
If the PIN code is ineffective, the "PUK code" window would pop-up as follows. As the number of times for inputting the wrong PUK code is more than allowed number, the SIM card would be ineffective forever. Therefore, it is important to input the correct PUK code.



4.7.4 Voice File Management

The "System->Voice File Management" can help users to manage the voice files. The description is as follows.





(1) Field Description

Channel: Alarm number

Value: Alarm status

Existed: Showing the voice file whether is in the root path of the SMS-531

File at Device: The voice file name in the SMS-531 is fixed and unchangeable and is to the corresponding alarm number.

File on PC: The voice file name and path on the PC for downloading to the SMS-531.

Browse: Select the file for downloading to the SMS-531. The name and path would be shown in "File on PC".

Download: This button can download the file to the SMS-531 and would rename the name according to the related alarm number.

Delete: Delete the file from the SD card of the SMS-531.

(2) Status Bar

The status bar shows the SD status and the downloading information. The information is as follows from left to right.

1. The SD status: OK: Normal, NO: SD card error.
2. The voice file path, name and size
3. The current downloading time
4. The block number of the file and the transmitted block
5. The percent of downloading

Note: Due to the downloading file of the Utility is using COM port, the downloading speed is not fast. If the file size is over 1 Mbytes, we recommend users to copy and rename the file by SD card reader.

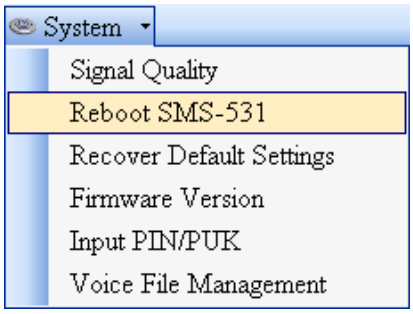
(3) Sound Format

SMS-531 only support WAV file and the following file format needed:

File type	*.Wav
Audio type	PCM
Data bit	16 bits
Channel	Single track
Sample rate	8 kHz,11 kHz

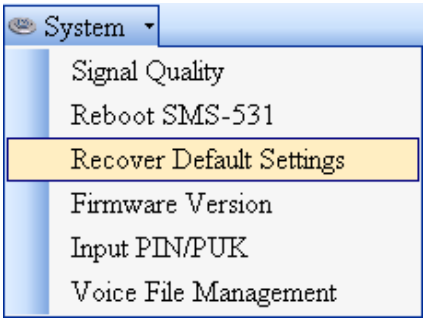
4.7.5 Reset the SMS-531

Clicking "System->Reboot SMS-531" button can reset the SMS-531 as follows.



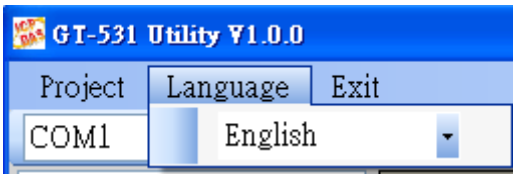
4.7.6 Recover to the Factory Settings

It can recover the SMS-531 to the default settings by clicking "System->Recover Default Settings".



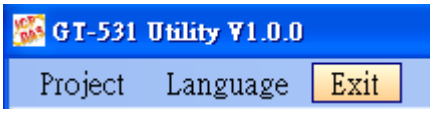
4.8 Language

"Language" can define the interface language of the GT-531 Series Utility. It only support English interface now.



4.9 Exit

This function would exit the GT-531 Series Utility.



5. Example

We provide 6 examples for users to learn how to operate the SMS-531.

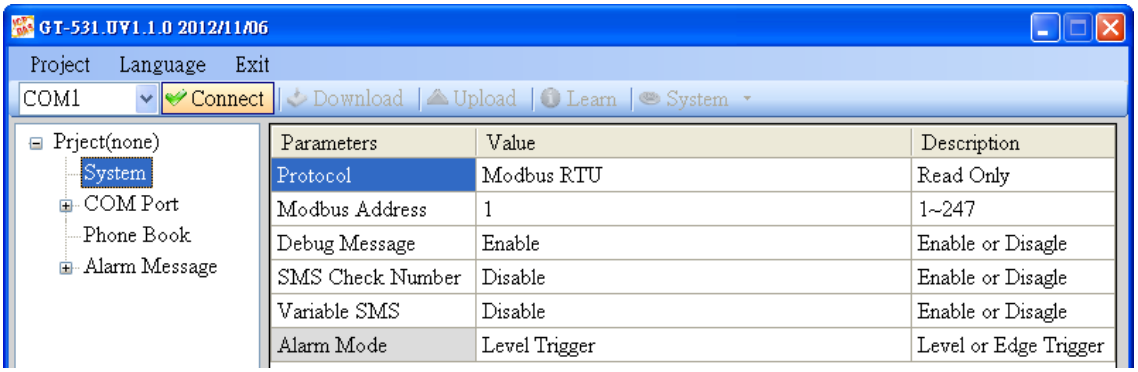
Example	Description
Example 1: Sending the general alarm SMS (Level Trigger)	This example shows how to send the fixed content alarm SMS by Modbus commands in Level Trigger mode.
Example 2: Sending the variable alarm SMS	This example shows how to send the variable content alarm SMS by Modbus commands.
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 the alarm voice	This example shows how to send the voice alarm by Modbus commands.
Example 5: Receiving the SMS	This example shows how to receive SMS from the SMS-531 by Modbus commands.
Example 6: Sending the general alarm SMS (Edge Trigger)	This example shows how to send the fixed content alarm SMS by Modbus commands in Edge Trigger mode.

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

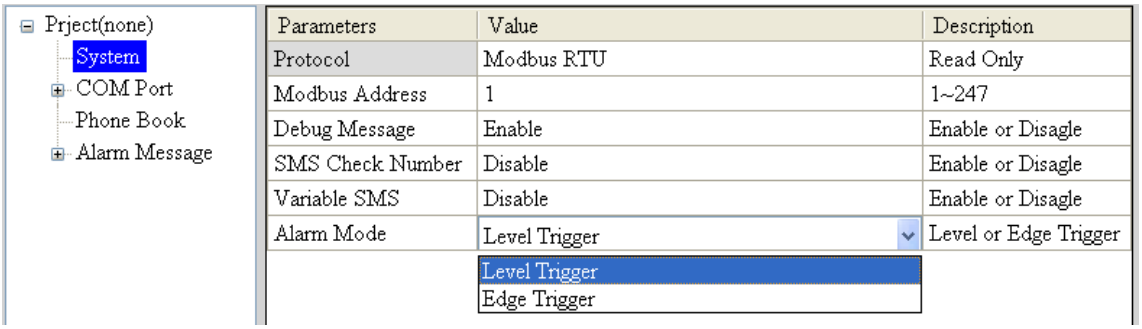
This example shows the steps to send the defined SMS to the defined phones in Level Trigger mode.

1. Setting the parameters by the GT-531 Series Utility

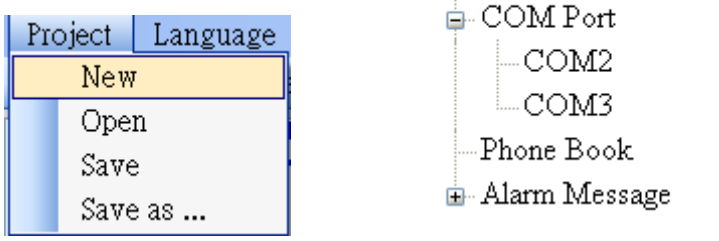
(1) Connect to the SMS-531. The Alarm Mode field will be enabled.



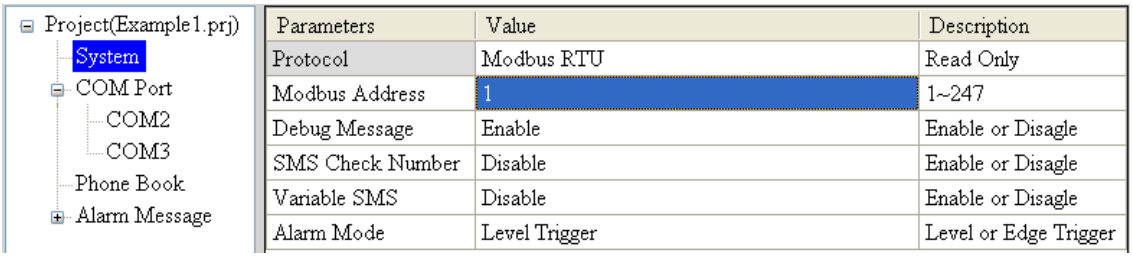
(2) Choose the level trigger mode.



(3) New and name an "Example1.prj" project in the Utility.

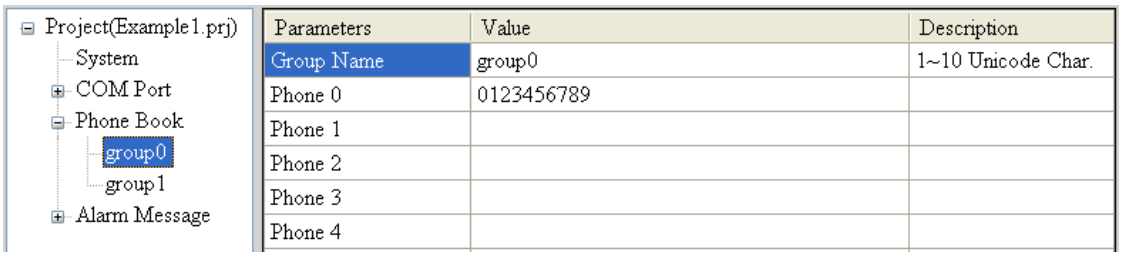


(4) Set the modbus address as 1. (The factory default address is 1)

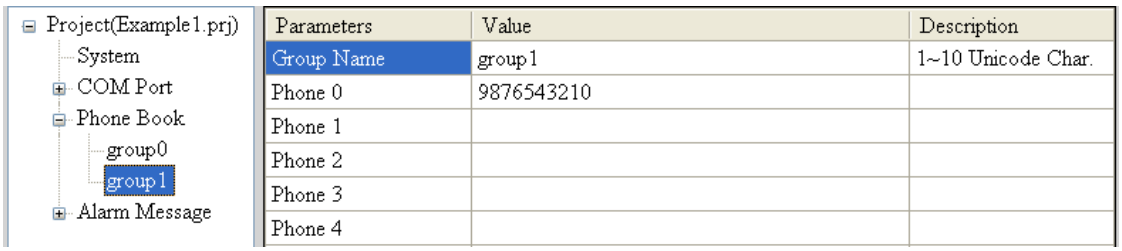


Parameters	Value	Description
Protocol	Modbus RTU	Read Only
Modbus Address	1	1~247
Debug Message	Enable	Enable or Disagle
SMS Check Number	Disable	Enable or Disagle
Variable SMS	Disable	Enable or Disagle
Alarm Mode	Level Trigger	Level or Edge Trigger

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



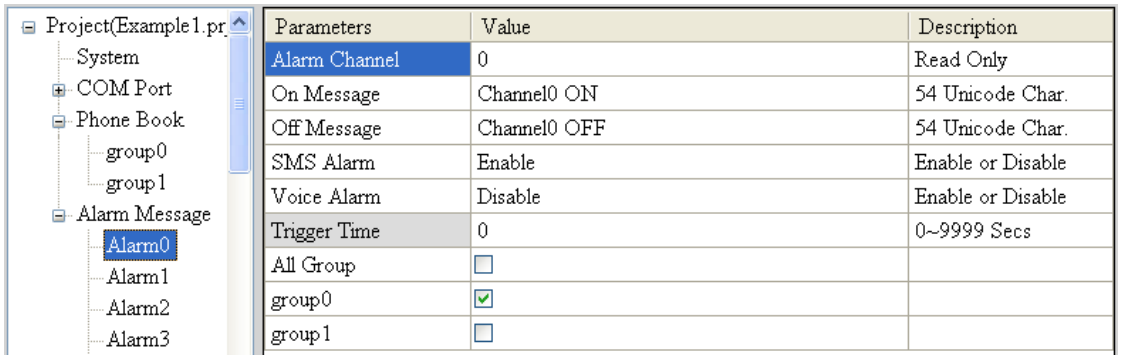
Parameters	Value	Description
Group Name	group0	1~10 Unicode Char.
Phone 0	0123456789	
Phone 1		
Phone 2		
Phone 3		
Phone 4		



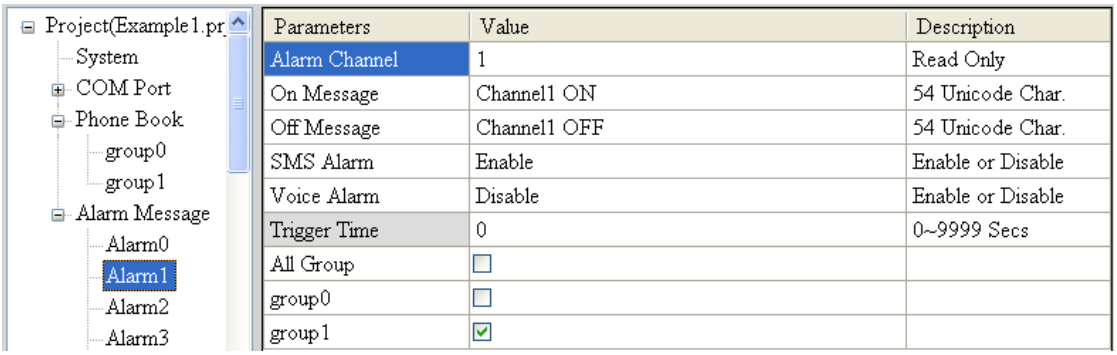
Parameters	Value	Description
Group Name	group1	1~10 Unicode Char.
Phone 0	9876543210	
Phone 1		
Phone 2		
Phone 3		
Phone 4		

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

Note: Trigger time field can't be used in Level Trigger mode.



Parameters	Value	Description
Alarm Channel	0	Read Only
On Message	Channel0 ON	54 Unicode Char.
Off Message	Channel0 OFF	54 Unicode Char.
SMS Alarm	Enable	Enable or Disable
Voice Alarm	Disable	Enable or Disable
Trigger Time	0	0~9999 Secs
All Group	☐	
group0	☑	
group1	☐	



(7) Connect to the SMS-531 and download these parameters to it.

2. Modbus RTU commands

(1) Connect COM2 (RS-232) or COM3 (RS-485) of the SMS-531 to the Host.

(2) Sending the Modbus commands from the Host to the SMS-531 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 SMS-531 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. The content of the SMS is "Channel0 ON"		

Command Format:

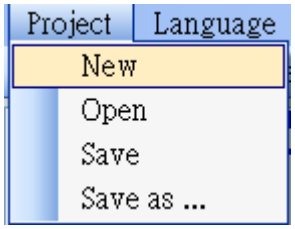
Send the alarm SMS		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00, Sending the field content of "On Message". =0x0000, Sending the field content of "Off Message".
	Byte 6 ~ 7	CRC-16
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x85
	Byte 2	Error Code 06: Buffer overflow
	Byte 3 ~ 4	CRC-16

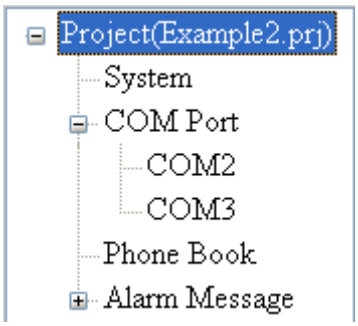
5.2 Example 2: Sending the variable alarm SMS

This example explains the procedure of the sending variable alarm SMS to the defined phones. The alarm SMS includes the content defined in "Alarm Messages" (max 54 chars) and the content (max 16 chars) by Modbus command.

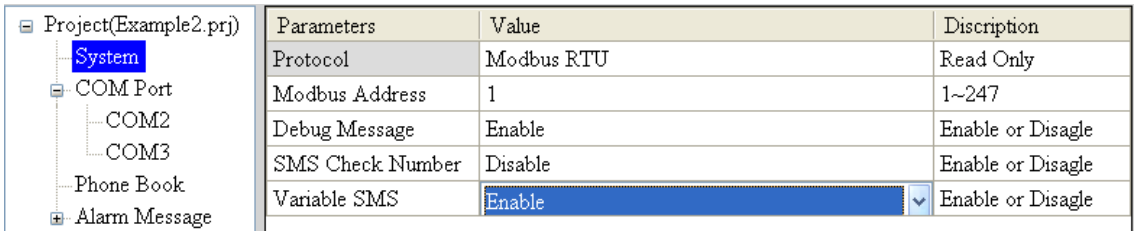
1. Setting the parameters by the GT-531 Series Utility

(1) New and name an "Example2.prj" project in the Utility.

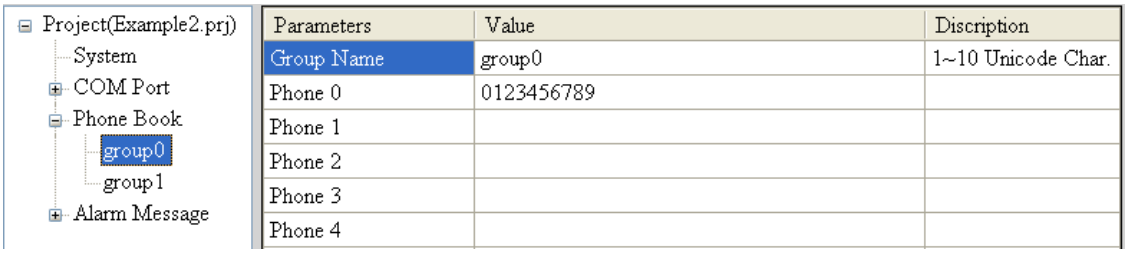


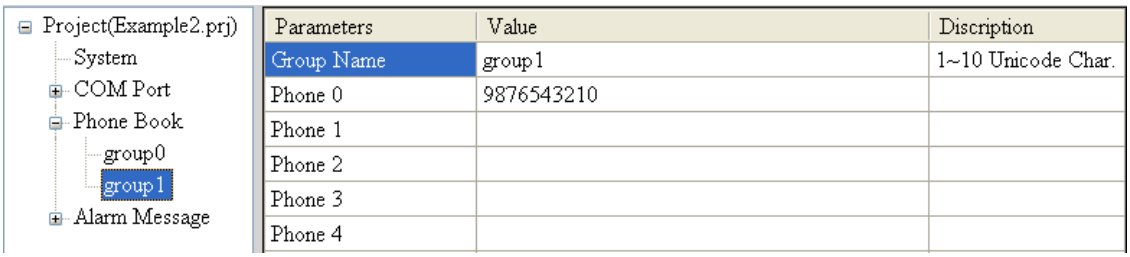


(2) Set the Modbus address as 1 (the factory default address is 1) and "Variable SMS" as enable.

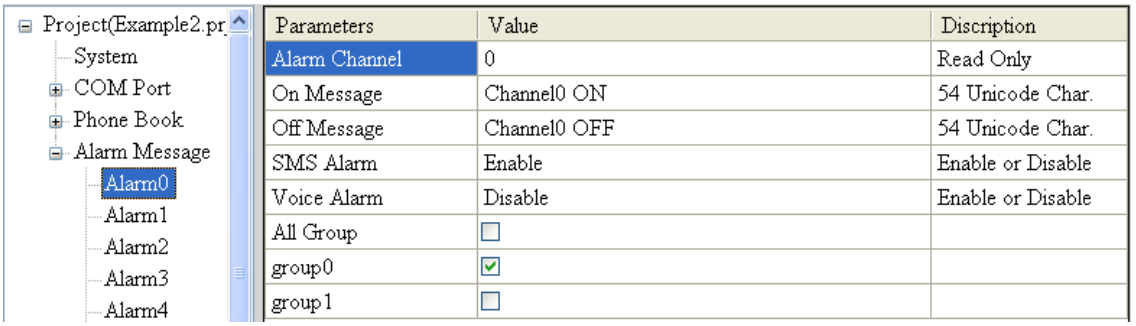


(3) Add 2 new phone groups and input phone numbers as follows:

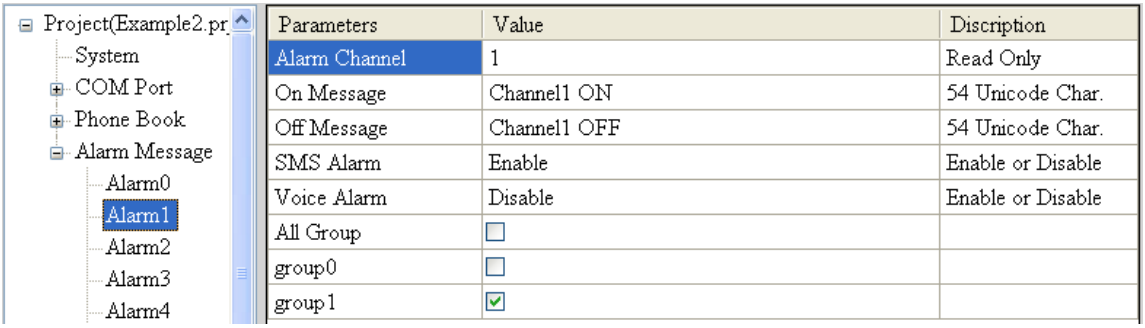




(4) Set the Alarm Channel0 and Channel1 separately as follows:



Parameters	Value	Discription
Alarm Channel	0	Read Only
On Message	Channel0 ON	54 Unicode Char.
Off Message	Channel0 OFF	54 Unicode Char.
SMS Alarm	Enable	Enable or Disable
Voice Alarm	Disable	Enable or Disable
All Group	☐	
group0	☑	
group1	☐	



Parameters	Value	Discription
Alarm Channel	1	Read Only
On Message	Channel1 ON	54 Unicode Char.
Off Message	Channel1 OFF	54 Unicode Char.
SMS Alarm	Enable	Enable or Disable
Voice Alarm	Disable	Enable or Disable
All Group	☐	
group0	☐	
group1	☑	

(5) Connect to the SMS-531 and download these parameters to the SMS-531.

2. Modbus RTU Command

(1) Connect COM2 (RS-232) or COM3 (RS-485) of the SMS-531 to the Host.

(2) The host needs to send the SMS content command to define the variable part of the alarm SMS first. Then, send the transmitting SMS command.

Commands and Description:

Command	Setting the variable SMS content	Command	01 10 01 7F 00 06 0C 2B 00 56 00 53 00 4D 00 53 00 00 00 E7 DD
		Response	01 10 01 7F 00 06 702F
	Transmitting the SMS	Command	01 05 00 01 FF 00 DD FA
		Response	01 05 00 01 FF 00 DD FA
Description	1. Set the variable SMS content as "+VSMS". 2. Send the SMS. 3. The content of the SMS is the "On Message" field of Alarm Channel1 and the variable content. 4. Transmitting the SMS to the phones of group1		
Result	The phone numbers in group1 would receive the SMS. The content of the SMS is "Channel1 ON+VSMS".		

Format Description:

Setting the variable SMS content		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 16
	Byte 2 ~ 3	The start address of the variable content of the SMS
	Byte 4 ~ 5	Register Count: The quantity of the SMS content (The max is 16 chars)
	Byte 6	Byte Count (Register Count x 2)
	Byte7 ~ 18	Variable SMS Content (Unicode) : In this example, it is "+VSMS" messages and the end char is 0x0000. If the quantity is 16, it needs not the end char.
	Byte19 ~ 20	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	The start address of the variable content of the SMS
	Byte 4 ~ 5	Register Count: The quantity of the SMS content (The max is 16 chars)
	Byte 6 ~ 7	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x90

	Byte 2	Error Code 02: Format error
	Byte 3 ~ 4	CRC-16 check code

Sending the SMS		
Command	Byte 0	The Modbus Address of the SMS-531
	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 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS -531
	Byte 1	= 0x85
	Byte 2	Error Code 06: Buffer overflow
	Byte 3 ~ 4	CRC-16 check code

5.3 Example 3: Sending the alarm SMS dynamically

This example is shown how to send the variable SMS to the variable phones by Modbus commands. The max chars of the variable SMS is 70 Unicode.

For sending the variable SMS, it is not needed to be set by the GT-531 Series Utility. This function can be finished by Modbus commands as follows.

(1) Connect to COM2(RS-232) or COM3(RS-485) of the SMS-531 to the Host PC.

(2) The host sends the Modbus commands to the SMS-531 to set the content of the SMS and phone number first. Then, send the command to transmit the SMS.

Commands and Description:

Command	Setting the 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
		Response	01 10 01 D5 00 06 50 0F
	Setting the SMS content (Hex)	Command	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
		Response	01 10 01 8F 00 0C F0 1B
	Sending the SMS(FC 5) (Hex)	Command	01 05 00 80 FF 00 8D D2
		Response	01 05 00 80 FF 00 8D D2
	Sending the SMS(FC 15) (Hex)	Command	01 0F 00 80 00 01 01 01 EE 89
		Response	01 0F 00 80 00 01 01 01 EE 89
Description	1. The phone number：0123456789 2. The content of the SMS：Dynamic SMS 3. Transmitting the SMS		
Result	The phone number "0123456789" would receive the "Dynamic SMS" SMS.		

Format Description:

Setting the variable phone number		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	The start address of the phone number
	Byte 4 ~ 5	Register Count: The register size of the phone number
	Byte 6	Byte Count(Register Counter x 2)
	Byte7 ~ 18	The phone number (ASCII code). The end char is 0x00. If the number size is 20, it is needed not the end char.
	Byte 19 ~ 20	CRC-16 check code
Correct response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	The start address of the phone number
	Byte 4 ~ 5	Register Count: The register size of the phone number
	Byte 6 ~ 7	CRC-16 check code
Error response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x90
	Byte 2	Error Code 02: The SMS-531 is sending the SMS. The phone number is unchangeable.
	Byte 3 ~ 4	CRC-16 check code

Setting the content of the SMS		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	The start address of the sent SMS
	Byte 4 ~ 5	Register Count: The size of the SMS. The max is 70 Unicode.
	Byte 6	Byte Count(Register Counter x 2)
	Byte7 ~ 30	The content of the SMS (Unicode code). The end char is 0x0000. If the size of the SMS is 70, it is not needed the end char.
	Byte 31 ~ 32	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 16 (0x10)
	Byte 2 ~ 3	The start address of the sent SMS
	Byte 4 ~ 5	Register Count: The size of the SMS. The max is 70 Unicode.

	Byte 6 ~ 7	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x90
	Byte 2	Error Code 02: The SMS-531 is sending the SMS. The content of the SMS is unchangeable.
	Byte 3 ~ 4	CRC-16 check code

Sending the SMS (Function Code 5)		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x0080
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x0080
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x85
	Byte 2	Error Code: 06: Sending buffer overflow or the SMS is sending
	Byte 3 ~ 4	CRC-16 check code

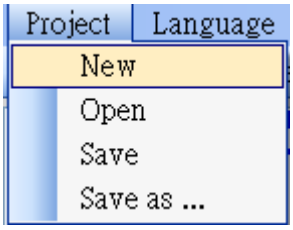
Sending the SMS (Function Code 15)		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x0F
	Byte 2 ~ 3	= 0x0080
	Byte 4 ~ 5	= 0x0001
	Byte 6	= 0x01
	Byte 7	= 0x01
	Byte 8 ~ 9	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x0F
	Byte 2 ~ 3	= 0x0080
	Byte 4 ~ 5	= 0x0001
	Byte 6	= 0x01
	Byte 7	= 0x01
	Byte 8 ~ 9	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x8F
	Byte 2	Error Code: 06: Sending buffer overflow or the SMS is sending
	Byte 3 ~ 4	CRC-16 check code

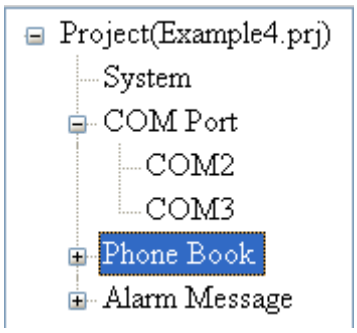
5.4 Example 4: Sending the alarm voice

This example is shown how to send the defined voice alarm via the SMS-531.

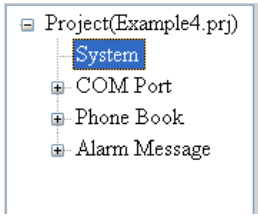
1. Setting the parameters by the GT-531 Series Utility

(1) New and name an "Example4.prj" project in the Utility.



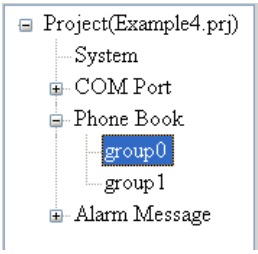


(2) Set the Modbus address as 1 (the factory default address is 1).

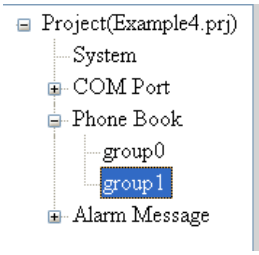


Parameters	Value	Discription
Protocol	Modbus RTU	Read Only
Modbus Address	1	1~247
Debug Message	Disable	Enable or Disagle
SMS Check Number	Disable	Enable or Disagle
Variable SMS	Disable	Enable or Disagle

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

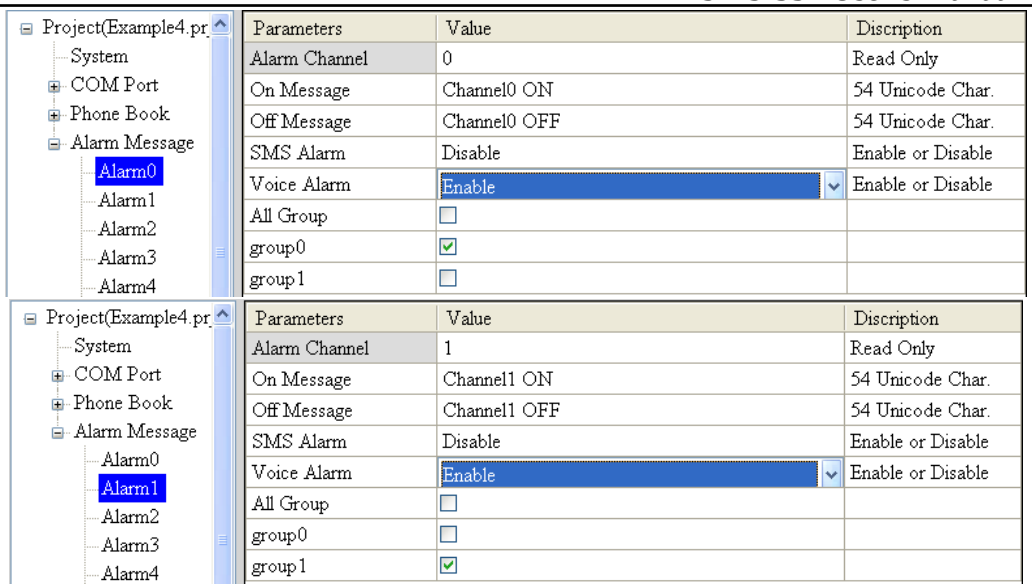


Parameters	Value	Discription
Group Name	group0	1~10 Unicode Char.
Phone 0	0123456789	
Phone 1		
Phone 2		
Phone 3		
Phone 4		



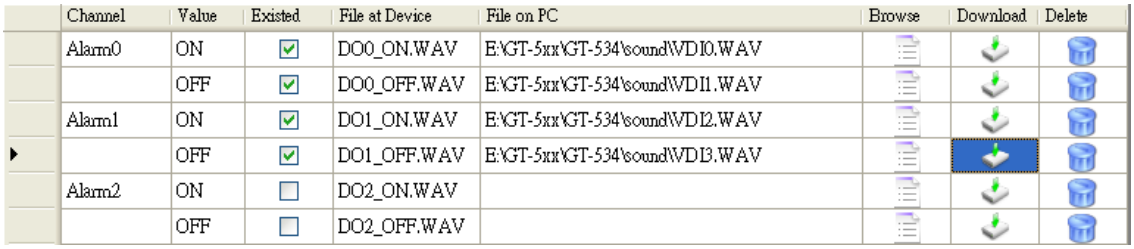
Parameters	Value	Discription
Group Name	group1	1~10 Unicode Char.
Phone 0	9876543210	
Phone 1		
Phone 2		
Phone 3		
Phone 4		

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



(5) Connect to the SMS-531 and download these parameters to the SMS-531.

(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.



2. Modbus RTU command

(1) Connect to COM2(RS-232) or COM3(RS-485) of the SMS-531 by RS-232 or RS-485 of the Host.

(2) The host sends the Modbus command to transmit the voice alarm from the SMS-531.

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 SMS-531 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 SMS-531. As take the call, you would heart the alarm voice in DO0_ON.WAV.		

Format Description:

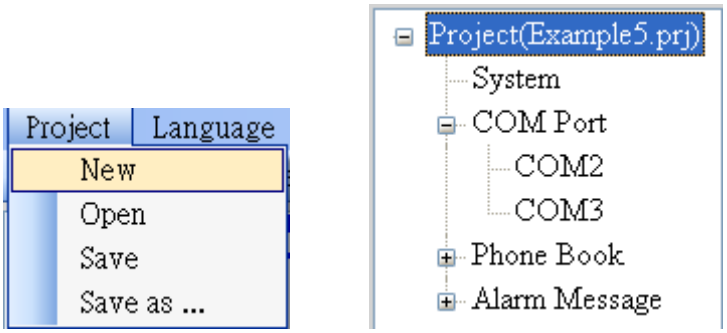
Sending the voice alarm		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00, To play DOx_ON.WAV file. The x is the number of Alarm channel. =0x0000, To play DOx_OFF.WAV file. The x is the number of Alarm channel.
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x85
	Byte 2	Error Code 06: Transmitting Buffer overflow
	Byte 3 ~ 4	CRC-16 check code

5.5 Example 5: Receiving the SMS

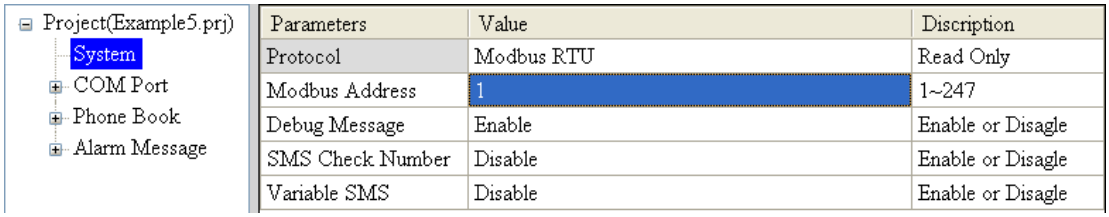
This example is shown how to read the SMS form the SMS-531.

1. Setting the parameters by the GT-531 Series Utility

(1) New and name an "Example5.prj" project in the Utility.

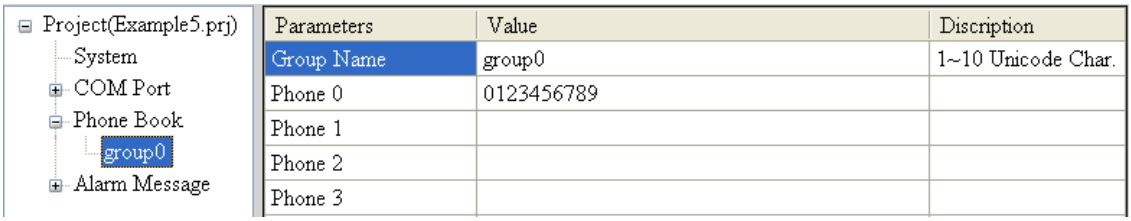


(2) Set the Modbus address as 1 (the factory default address is 1).



Parameters	Value	Discription
Protocol	Modbus RTU	Read Only
Modbus Address	1	1~247
Debug Message	Enable	Enable or Disagle
SMS Check Number	Disable	Enable or Disagle
Variable SMS	Disable	Enable or Disagle

(3) Add a new phone group and input phone numbers above. The SMS-531 is built-in the phone filter. The SMS would be received according to the defined phone numbers.



Parameters	Value	Discription
Group Name	group0	1~10 Unicode Char.
Phone 0	0123456789	
Phone 1		
Phone 2		
Phone 3		

(4) Connect to the SMS-531 and download these parameters to the SMS-531.

2. Modbus RTU commands

(1) Connect to COM2(RS-232) or COM3(RS-485) of the SMS-531 to the Host.

(2) The host can send the Modbus command periodically to inquire the SMS-531 whether has received the SMS. If the SMS-531 has received the SMS, you can send the command to read it.

Command and Description:

Command	Checking the received SMS (Hex)	command	01 02 00 01 00 01 E8 0A
		Response	01 02 01 00 A1 88 (No SMS) 01 02 01 01 60 48 (Receiving the SMS)
	Reading the phone number of the received SMS (Hex)	command	01 04 00 1E 00 0A 10 0B
		Response	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
	Reading the date of the received SMS (Hex)	command	01 04 00 28 00 07 31 C0
		Response	01 04 0E 32 30 31 31 30 34 32 32 30 39 35 35 33 31 3D 79
	Reading the content of the received SMS (Hex)	command	01 04 00 2F 00 51 00 3F
		Response	01 04 A2 00 00 48 65 6C 6C 6F 2C 47 54 2D 35 33 31 21 00 00 00 ……(Size is 162 Bytes)
	Clear the SMS from the GT-531 (Hex)	command	01 05 00 C7 FF 00 3D C7
		Response	01 05 00 C7 FF 00 3D C7
Description	1. The phone of Groups transmits the SMS to the SMS-531. The SMS is "Hello,GT-531!". 2. To inquire the SMS-531 whether has received the SMS periodically. 3. If the SMS-531 has received the SMS, send the command to read the phone number, date and the SMS. 4. Because these addresses of these information are continuous, you can send one command to read that.		

	5. Send a clear SMS command to clear the SMS from the GT-531 and it can receive the next SMS.
Result	The phone of transmitting SMS：886928766507 Date：20110422095531(2011/04/22/ 09:55:31) The SMS：Hello,GT-531!

Format Description:

Inquiring the SMS-531 whether has received the SMS		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 2
	Byte 2 ~ 3	The address to indicate whether the SMS-531 has received the SMS
	Byte 4 ~ 5	Bit Count，1 bit
	Byte 6 ~ 7	CRC-16 check code
Correct response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 2
	Byte 2	Byte Count，(The size of Data)
	Byte 3	= 0, No SMS = 1, Having received the SMS
	Byte 4 ~ 5	CRC-16 check code
Error response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x82
	Byte 2	Error Code 02: Error format
	Byte 3 ~ 4	CRC-16 check code

Reading the phone number of the received SMS		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 4
	Byte 2 ~ 3	The data address of the sending phone number
	Byte 4 ~ 5	Register Count (The inquired count of register. It is fixed as 10(0x0A)
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 4
	Byte 2	Byte Count
	Byte 3 ~ 22	The sending phone number (ASCII coed, 0x00 is the end char)
	Byte 23 ~ 24	CRC-16 check code

Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x84
	Byte 2	Error Code 02: Error format
	Byte 3 ~ 4	CRC-16 check code

Reading the date of the SMS		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 4
	Byte 2 ~ 3	The data address of the received SMS date
	Byte 4 ~ 5	Register Count (The inquired count of register. It is fixed as 7(0x07)
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 4
	Byte 2	Byte Count
	Byte 3 ~ 16	Date and Time (ASCII code，yyyyMMddHHmmss)
	Byte 17 ~ 18	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x84
	Byte 2	Error Code: 06: Error format
	Byte 3 ~ 4	CRC-16 check code

Reading the SMS		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 4
	Byte 2 ~ 3	The address of the received SMS content
	Byte 4 ~ 5	Register Count (The inquired count of register. It is fixed as 81(0x51)
	Byte 6 ~ 7	CRC-16 check code
Correct Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 4
	Byte 2	Byte Count
	Byte 3 ~ 4	=0x0000, The data is ASCII code. =0x0001, The data is Unicode code.
	Byte 5 ~ 164	The SMS content. The end char is 0x00 if the data is ASCII code. If the end char is 0x0000, it is Unicode.

	Byte 165 ~ 166	CRC-16 check code
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x84
	Byte 2	Error Code: 02: Error format
	Byte 3 ~ 4	CRC-16 check code

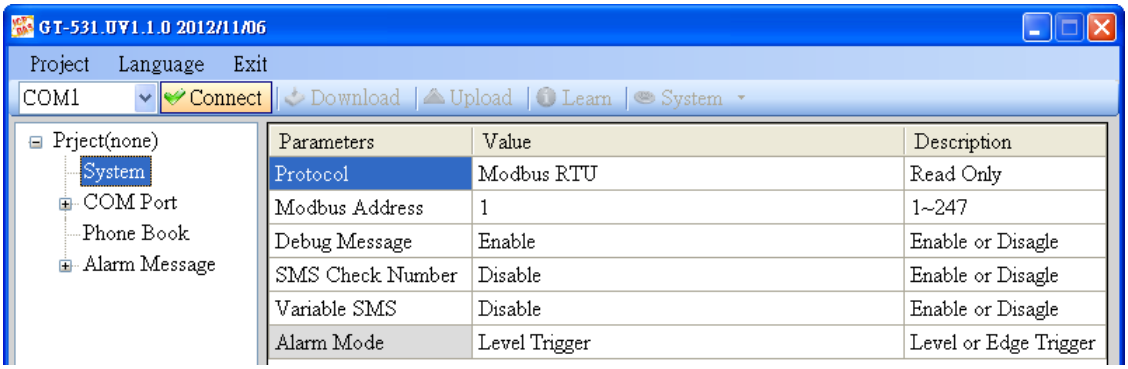
Clear the SMS from the SMS-531		
Command	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x00C7
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16
Correct response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	= 0x00C7
	Byte 4 ~ 5	= 0xFF00
	Byte 6 ~ 7	CRC-16
Error response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x85
	Byte 2	Error Code 02: Error format
	Byte 3 ~ 4	CRC-16 check code

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

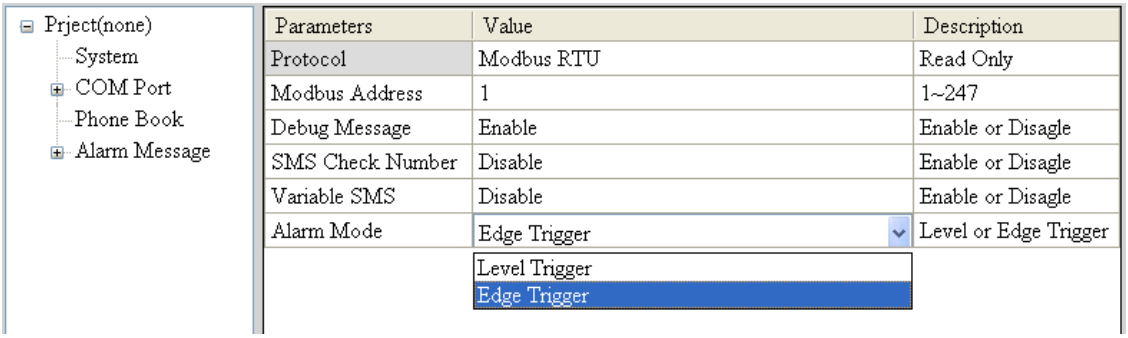
This example shows the steps to send the defined SMS to the defined phones in Edge Trigger mode.

1. Setting the parameters by the GT-531 Series Utility

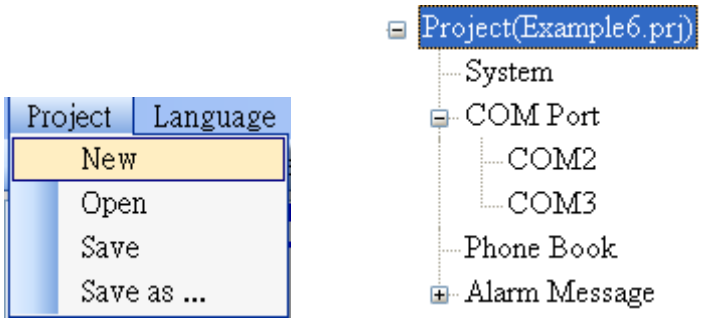
(1) Connect to the SMS-531. The Alarm Mode field will be enabled.



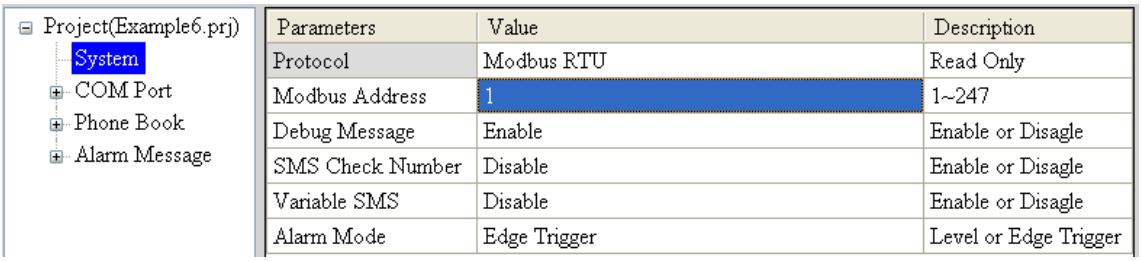
(2) Choose the edge trigger mode.



(3) New and name an "Example6.prj" project in the Utility.

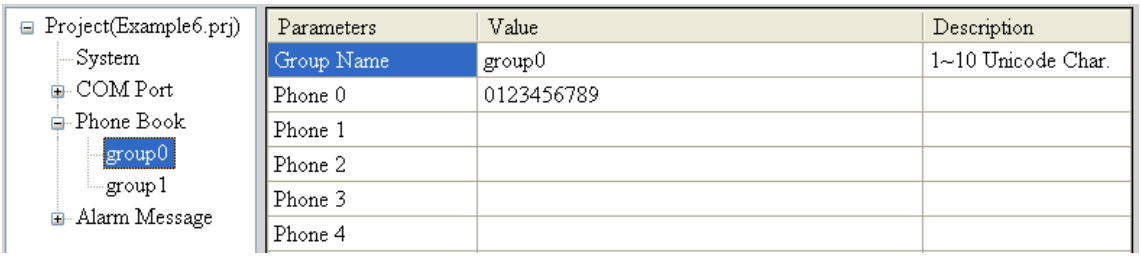


(4) Set the modbus address as 1. (The factory default address is 1)

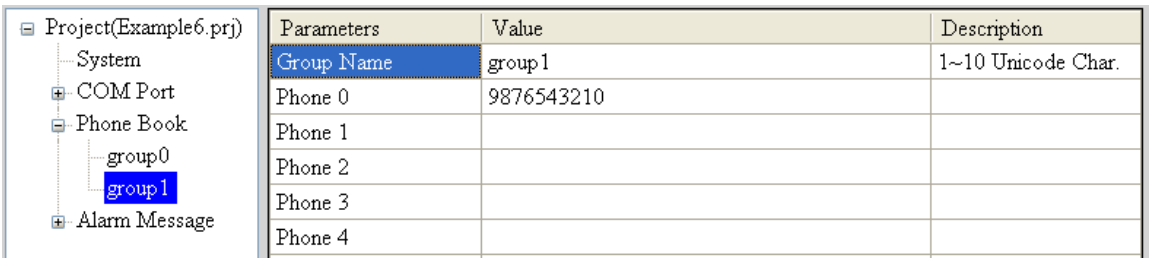


Parameters	Value	Description
Protocol	Modbus RTU	Read Only
Modbus Address	1	1~247
Debug Message	Enable	Enable or Disagle
SMS Check Number	Disable	Enable or Disagle
Variable SMS	Disable	Enable or Disagle
Alarm Mode	Edge Trigger	Level or Edge Trigger

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

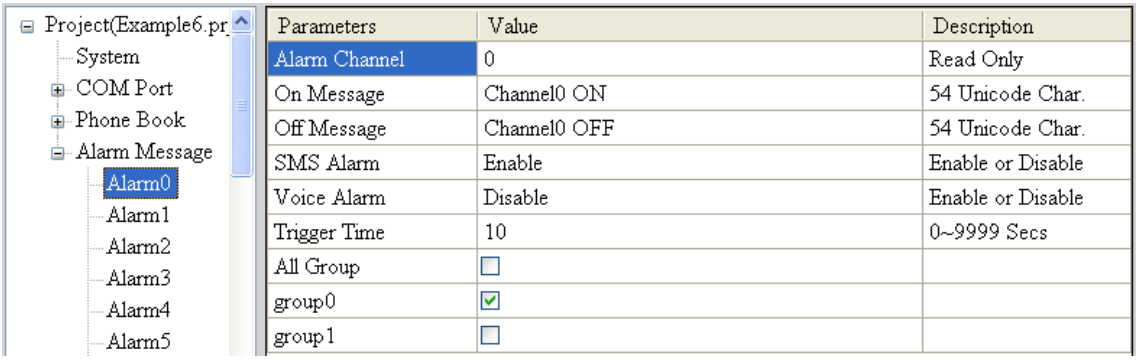


Parameters	Value	Description
Group Name	group0	1~10 Unicode Char.
Phone 0	0123456789	
Phone 1		
Phone 2		
Phone 3		
Phone 4		

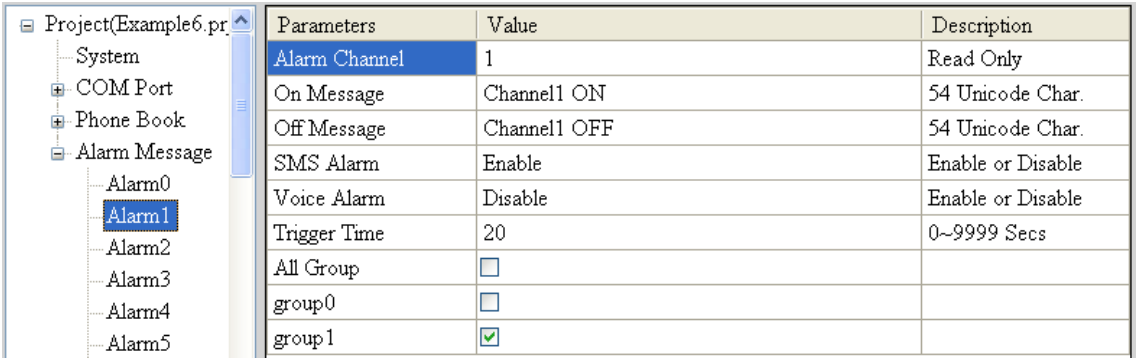


Parameters	Value	Description
Group Name	group1	1~10 Unicode Char.
Phone 0	9876543210	
Phone 1		
Phone 2		
Phone 3		
Phone 4		

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

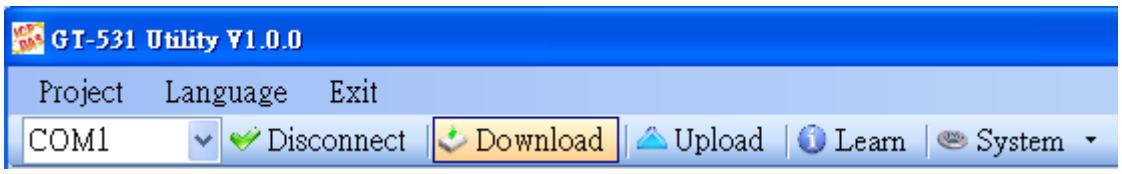


Parameters	Value	Description
Alarm Channel	0	Read Only
On Message	Channel0 ON	54 Unicode Char.
Off Message	Channel0 OFF	54 Unicode Char.
SMS Alarm	Enable	Enable or Disable
Voice Alarm	Disable	Enable or Disable
Trigger Time	10	0~9999 Secs
All Group	☐	
group0	☑	
group1	☐	



Parameters	Value	Description
Alarm Channel	1	Read Only
On Message	Channel1 ON	54 Unicode Char.
Off Message	Channel1 OFF	54 Unicode Char.
SMS Alarm	Enable	Enable or Disable
Voice Alarm	Disable	Enable or Disable
Trigger Time	20	0~9999 Secs
All Group	☐	
group0	☐	
group1	☑	

(7) Connect to the SMS-531 and download these parameters to it.



2. Modbus RTU commands

(1) Connect COM2 (RS-232) or COM3 (RS-485) of the SMS-531 to the Host.

(2) Sending the Modbus commands from the Host to the SMS-531 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 SMS-531 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 SMS-531
	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 SMS-531
	Byte 1	Function Code = 0x05
	Byte 2 ~ 3	Alarm Channel
	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16
Error Response	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x85
	Byte 2	Error Code 06: Buffer overflow 13: Alarm status are the same (EX: Original status is ON, want to change the status to ON)
	Byte 3 ~ 4	CRC-16

6. SMS-531 Modbus Address Table

The Modbus function codes supported in the SMS-531 are 1, 2, 3, 4, 5, 6, 15 and 16. The Modbus address distribution is as the following table.

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

Address	Data Address	Description	Attribute
00001 ~ 00128	0x0 ~ 0x7F	Transmitting the alarm SMS and voice according 0~127 alarm	R/W
00129	0x80	Transmitting the SMS dynamically	R/W
00200	0xC7	=1, Clearing the received SMS buffer	R/W
00201	0xC8	=1, Clearing the transmitting SMS buffer	R/W
00210	0xD1	=1, Saving the data of the holding registers to Flash (Address: 40001~40256)	R/W

Note: Using function code 15 to transmit the alarm SMS and voice according 0~127 alarm, maximum quantity of DO is up to 16.

(2) Discrete Input (Function Code: 2)

Address	Data Address	Description	Attribute
10001	0x0	The status of transmitting SMS buffer 0：No 1：Overflow	R
10002	0x1	The indication of the received SMS 0：No received SMS 1：Having received SMS	R
10003	0x2	The status of SD card 0：No SD card or Error 1：Normal	R

(3) Input Register (Function Code: 4)

Address	Data Address	Description	Attribute
30001 ~ 30016	0x0 ~ 0xF	The status of transmitting SMS buffer 0~15 (1) High Byte：Buffer status 0-> Idle 1-> Waiting for transmitting 2-> Transmitting 3-> Transmitting OK 4-> Transmitting fault (2) Low Byte ：Error code	R
30017	0x10	The last transmitting SMS buffer number	R
30018	0x11	The status of transmitting dynamic SMS (1) High Byte：Status 0-> Idle 1-> System busy or waiting for transmitting 2-> Transmitting 3-> Transmitting OK 4-> Transmitting fault (2) Low Byte：Error code	R
30019	0x12	The 3G signal strength 0~31s or 99(Error)	R
30031 ~ 30040	0x1E ~ 0x27	The SMS transmitter's phone number. ASCII code by end char 0x00.	R
30041 ~ 30047	0x28 ~ 0x2E	The date and time of receiving SMS	R
30048	0x2F	The format of the received SMS 0x0000=ASCII 0x0001=Unicode	R
30049 ~ 30128	0x30 ~ 0x7F	The content of the received SMS ASCII： By end char 0x00 Unicode：By end char 0x0000	R

Note: Query the status of transmitting SMS can't be used in Edge Trigger mode.

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

<table>
<tr><th>Address</th><th>Data Address</th><th>Description</th><th>Attribute</th></tr>
<tr><td>40200</td><td>0xC7</td><td>Module Address(Modbus Net ID)，1~247</td><td>R/W</td></tr>
<tr><td>40201</td><td>0xC8</td><td>COM2
(1)High Byte
<table><tr><td>Code</td><td>0x04</td><td>0x05</td><td>0x06</td><td>0x07</td></tr><tr><td>Baud</td><td>2400</td><td>4800</td><td>9600</td><td>19200</td></tr><tr><td>Code</td><td>0x08</td><td>0x09</td><td>0x0A</td><td></td></tr><tr><td>Baud</td><td>38400</td><td>57600</td><td>115200</td><td></td></tr></table>(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</td><td>R/W</td></tr>
<tr><td>40202</td><td>0xC9</td><td>COM3 setting. The data format is as COM2</td><td>R/W</td></tr>
<tr><td>40207</td><td>0xCE</td><td>Enabling or Disabling the debug message
0x0000=Disable
0x0001=Enable</td><td>R/W</td></tr>
<tr><td>40208</td><td>0xCF</td><td>Enabling or Disabling the SMS with the check code
0x0000=Disable
0x0001=Enable</td><td>R/W</td></tr>
<tr><td>40384 ~ 40399</td><td>0x17F ~ 0x18E</td><td>The variable content of the SMS (Unicode by the end char 0x0000)</td><td>R/W</td></tr>
<tr><td>40400 ~ 40469</td><td>0x18F ~ 0x1D4</td><td>The dynamic transmitting SMS content (Unicode by the end char 0x0000)</td><td>R/W</td></tr>
<tr><td>40470 ~ 40479</td><td>0x1D5 ~ 0x1DE</td><td>The phone number for the dynamic transmitting SMS (ASCII by the end char 0x00)</td><td>R/W</td></tr>
</table>

7. Troubleshooting

Item	Trouble state	Solution
1	STA is always on	1. Check SIM card. 2. Check Antenna. 3. Check the 3G signal strength.
2	STA led is blanking per 50 ms.	It shows the SIM card needs to input PIN or PUK code. The SMS-531 is not set these code or the wrong codes. You can set these code in "System->Input PIN/PUK".
3	The GT-531 Series Utility can not connect to the SMS-531	1. Check STA LED blinking every 1 sec. 2. Check the COM port wire connection.
4	Can not receive the SMS	Please confirm the transmitter's phone number is in the groups.
5	The defined phone received an abnormal SMS	The SMS-531 support only Unicode SMS. Confirm the defined SMS content is Unicode.
6	The SMS-531 is not replied by Modbus command	1. Confirm the wire connection. 2. Confirm the Modbus ID of the SMS-531. 3. Confirm the COM port configuration.
7	Can not hear the voice alarm from the SMS-531	Confirm the SD card is normal and the voice file is in it.
8	SMS DBS could not received the SMS from SMS-531	User must add "ALARM;" to the start of the short message.