# **SMS-531**

# **Intelligent 3G Modbus SMS/Voice**

# **Alarm Controller**

User's Manual V1.1





### Warranty

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

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

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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

# Image: Mining and the second state of the second state

### 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
<b>3G Interface</b>	
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	ESD Surge FET Hi Dot
Protection	LSD, Surge, EP1, III-P0t
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 °C ~ +75 °C
Storage Temperature	-40 °C ~ +80 °C
Humidity	5 ~ 95% RH, non-condensing

# 2.2 Appearance and Pin Assignments

Pin assignments of SMS-531



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

CC	OM Port	t
Torminal No		Pin
Terminar No	).	Assignment
COM3	01	D-
RS-485	02	D+
COM2	03	TxD2
COM2	04	RxD2
K3-232	05	GND
N/A	06	N/A
COM1	07	TxD1
<b>RS-232</b>	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.

Microsoft .NET Framework 2.0 Setup		
Welcome to Microsoft .NET Framework 2.0 Setup		
his wizard will guide you through the installation process.		
		_
	Next > Cancel	

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

End-User Licens	se Agreement
MICROSOFT SOFT MICROSOFT .NET	TWARE SUPPLEMENTAL LICENSE TERMS
Microsoft Corpora supplement to you software (the "sol not have a license validly licensed co	tion (or based on where you live, one of its affiliates) licenses this J. If you are licensed to use Microsoft Windows operating system ftware"), you may use this supplement. You may not use it if you do to the software. You may use a copy of this supplement with each py of the software.
	Print
By clicking "I accep	ot the terms of the License Agreement" and proceeding to use the that I have read, understood, and agreed to the terms of the End-User
product, I indicate License Agreemen	t.

(3) The installation process would be going.

🕼 Microsoft .NET Framework 2.0 Setup	
Installing components	
The Brown increases and any balance in the land	
The items you selected are being installed.	
Installation Programs	
Generating script operations for action:	
Updating component registration	
	Count
	Cancel

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

🛱 Microsoft .NET Framework 2.0 Setup	
Setup Complete	
Microsoft .NET Framework 2.0 has been successfully installed.	
It is highly recommended that you download and install the latest service packs and security updates for this product.	
For more information, visit the following Web site:	
Product Support Center	
	Finish

# 3.2 Installing GT-531 Series Utility

- A. Plug in the shipment CD into the PC

The installation figure is as follows:

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

CT-531 Sense Unity Sense GT-531 Series Utility Supports GT-531 ser	y Ver 1.0.0 ries modules							ļ	
	GT-531 Series Utility Setu	Y				×			
		Welcose to the I	InstallShield Wizard Vizard wil install GT-531	for GT-531 Series Series UNity on your o	Utility computer: To cont	rue, dick			
	InstallShind	-	- 1 aci	Novt>	C	Carcel			
11周治 きょう/2 *******		7531 <b>100</b> 00M Net	Villion	D Doopb	😰 UART Tr.	<b>2</b> 01-531	2 7 - Wind	- 8 (34)	

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

GT-531 Series Utility Setup								
GT-531 Series Utility	Ver 1.0.0							
Supports GT-531 seri	ies modules							
	(17-52) Series Hillity Sales							
	Choose Destination Location							
	Select folder where setup will ins	tall files.						
		Setup will install GT-	531 Series Utility in th	e following folder.				
		To install to this folder.	e, click Next. To insta	il to a different loider,	click Browse and se	lect another		
	LAS							
		Destination Folder	T EM Codes UNDer		6			
		C. Vrogram Piles sc	11-531 Selles Dolly		_			
	InstallSink	6	< Back	Next >		Cancel		
HE CANE.	- 🏹 Fugue 🔹 🕐 07531	0SM Net	William	D Droph	UARI Ir	01-531	😹 8 - Wind	E 12 ( ) 14 1

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

🥶 01-531 Series Utility Setup	
GT-531 Series Utility Ver 100	
Supports G1-531 series modules	
GT-511 Series Billity Setup	
Select Program Folder	
Please select a program folder	
Sate or index program Fadore instructions to the Popular Fadore instructions on the top Popular Fadore instructions on the Popular Fadore instructins on the Popular Fadore instructions on the Pop	
Installizinité (Radu Nod) Carcel	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10 LE 1100

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



- <image>
- (5) Press "Finish" to finish the installation procedure.

(6) Launch GT-531 Series Utility from the start menu: "Start  $\rightarrow$  All Programs  $\rightarrow$  GT-531 Series Utility  $\rightarrow$  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

	ST-531.UV1.1.0 2012/11/06			
Tool Menu 🛶 🧹	Project Language Exit	La Download   A H		
Tool Menu ← Parameter Groups	Project Language Exit COM1 Connect Project(111.pr) COM Port COM2 COM3 Phone Book group0 group1 group2 group4 group5 group7 Alarm Message Alarm0	Parameters Protocol Modbus Address Debug Message SMS Check Number Variable SMS Alarm Mode	Value Modbus RTU 1 Enable Disable Level Trigger	Description Read Only 1~247 Enable or Disagle Enable or Disagle Enable or Disagle Level or Edge Trigger
Status	Alarm1 Alarm2 Alarm3 Alarm4 Alarm5 Alarm6 Alarm7 Alarm7 Alarm8 Alarm9 Alarm9 Alarm10	Cloced 0		

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.

- Download: Downloading the settings to the SMS-531.
- 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.

<u> 6</u> GT-531	Otility ¥1.0.0	J
Project	Language	Exit
COM1	🗸 🛩 Dia	sconne
COM1 COM2 COM3 COM4	prj)	<
COM5 COM6 COM7 COM8	12 13	

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

🌃 GT-531 Utility ¥1.0.0					
Project	Language	Exit			
COM1	👻 🛩 Coi	nnect			

# 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.

😑 Prject(none)	Parameters	Value	Description
	Protocol	Modbus RTU	Read Only
🖬 COM Port	Modbus Address	1	1~247
Phone Book	Debug Message	Enable	Enable or Disagle
ia- Alarm Message	SMS Check Number	Disable	Enable or Disagle
	Variable SMS	Disable	Enable or Disagle
	Alarm Mode	Level Trigger	Level or Edge Trigger

### 4.4.1 System

There are 6 items in the system field below.

Prject(none)	Parameters	Value	Description
- System	Protocol	Modbus RTU	Read Only
🗊 COM Port	Modbus Address	1	1~247
Phone Book	Debug Message	Enable	Enable or Disagle
🗈 Alarm Message	SMS Check Number	Disable	Enable or Disagle
	Variable SMS	Disable	Enable or Disagle
	Alarm Mode	Level Trigger	Level or Edge Trigger

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

Prject(none)	Parameters	Value	Discription
System	Port	COM2 (RS-232)	Read Only
😑 COM Port	Data Bit	8	Only Support 8 bits
<mark>COM2</mark>	Stop Bit	1	1 or 2
COM3	Parity Bit	none	none,odd,even
Alarm Message	Baudrate	9600	bps

### 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.

Prject(none)	Parameters	Value	Discription
System	Group Name	Maintenanc	1~10 Unicode Char.
🖻 COM Port	Phone 0		
-COM2	Phone 1		
COM3	Phone 2		
Phone Book	Phone 3		
⊡ Maintenanc ⊪ Alarm Message	Phone 4		

### 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 groupsBy 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.

🗉 Prject(none)	Parameters	Value	Discription
System	Group Name	Maintenanc	1~10 Unicode Char.
🖨 COM Port	Phone 0	0928766500	
COM2	Phone 1	0928766501	
COM3	Phone 2	0928766502	
Phone Book	Phone 3		
	Phone 4		
group0	Phone 5		
group?	Phone 6		
⊕ Alarm Message	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.

😑 Prject(none) 🧧		Parameters	Value	Description
System		Alarm Channel	0	Read Only
🗉 COM Port		On Message	Channel0 ON	54 Unicode Char.
🖶 Phone Book		Off Message	Channel0 OFF	54 Unicode Char.
🖨 Alarm Message		SMS Alarm	Enable	Enable or Disable
Alarm0		Voice Alarm	Disable	Enable or Disable
Alarm		Trigger Time	0	0~9999 Secs
Alarm2		All Group		
Alarm4		group0		
Alarm5		group1		
Alarm6		group2		
Alarm7		group3		
-Alarm8		group4		
Alarm9		group5		
-Alarm10		group6		
Alarm11		group7		
Alarm12		group8	✓	
Alarm13		group9		
Alarm15		group10		
Alarm16		group11		
Alarm17		group12		
Alarm18		group13		
Alarm19		group14		
Alarm20	,	group15		

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.

S GT-531 Utility ¥1.0.0					
Project	Language Exit				
COM1	👻 🛩 Disconnect	<mark>I 🕹 Download</mark> 🖾 Upload 🛛 🕥 Learn 🖉 🥯 System 🔹			

B. Uploading parameters

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

퉬 GT-531	Utility ¥1.0.0
Project	Language Exit
COM1	👻 🛩 Disconnect   🕹 Download   🖾 Upload   🚯 Learn   🥗 System 🝷

### 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.

<u> 6</u> GT-531	Utility ¥1.0.0					
Project	Language	Exit				
COM1	🐱 🎺 Dise	connect	🤣 Download	🛆 Upload	🚺 Learn	🥯 System 🔹

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.

	Sending the fixed content SMS	
Send SMS Page	Modbus Command Leaving         Send SMS Receive SMS         Send static SMS         Channel : 0 ON          ON          Send         Phone Number :         0928766510         Send SMS:         Bable         Detable         Send         Phone Number :         0928766510         Send         Send         Send         Send         Send         Phone Number :         0928766510         Send         Send         Send         Send         Send         Send         Send         This is a dynamic short message!!         This is a dynamic short message!!         F. Code       Payer         S 5500FF0 8D BE       Send         Host       GT-531         Request Commands       1.Modify the variable content of the SMS (Unicode)         2.Sending the SMS	(1)Modify the phone number. (ASCII) (2)Modify the content of the SMS (Unicode) (3)Transmitting the SMS

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.

	Receive SMS Page	Ask one time per 5 second	
Start or stop to ask the GT-531 whether	Send SMS Receive SMS Learn to Receive SMS Scan Time(sec): 5_ Is SMS Received: Yes Start Stop	NO. Date Phone 1 2011.04/18 14 8869118	Short Message Clear 8 Alam 2->On Received SMS from GT-531
is receiving the new SMS	F.Code Request 2 5201011098 4 5402F05118B 4 5402F05118B 4 54028073044 5 550C7FF03C43 H Request C	P.Co 2 4 4 5 Commands	e Reply Clear 52116178 54 A2014106C06107206D02003202002D03E022 54 44 3338 45931313034338333330000000002F 54 E230313130343183134353139B91B 550C7FF03C43 GT-531 Responses

# 4.7 System

### 4.7.1 Signal Quality

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

•	System 🔹
	Signal Quality
	Reboot SMS-531
	Recover Default Settings
	Firmware Version
	Input PIN/PUK
	Voice File Management

💀 GSM Signal Quality(23)	K
74%	
🔺 Read	

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.



<b>Version Information</b>	×
Firmware Version : SMS-531.L23xx.FV1.0.0 2013/02/08	
Utility Version : GT-531 Series.UV1.0.0 2013/02/08	
Read	

- 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.

۲	System 🔹		
	Signal Quality		
Reboot SMS-531			
	Recover Default Settings		
	Firmware Version		
	Input PIN/PUK		
	Voice File Management		

(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.

😸 Entry SIM PIN / SIM PUK	
Times Remain to Input SIM PIN: 3	
Please Input SIM PIN Code:	
ОК	

(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.

💀 Entry SIM PIN / SIM PUK	X
Times Remain to Input SIM PUK : 10 Please Input SIM PUK Code :	
Please Input New SIM PIN Code :	
ОК	

### **4.7.4 Voice File Management**

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



	Channel	Value	Existed	File at Device	File on PC	Browse	Download	Dele
	AlarmO	ON	~	DO0_ON.WAV			٤.	1
•		OFF		DO0_OFF.WAV	E:VGT-5xxVGT-534\sound\VDI1.WAV		- 🔕	1
	Alarm1	ON		DO1_ON.WAV			2	1
		OFF		DO1_OFF.WAV			2	1
	Alarm2	ON		DO2_ON.WAV			٢	1
		OFF		DO2_OFF.WAV			2	1
	Alarm3	ON		DO3_ON.WAV			٢	1
		OFF		DO3_OFF.WAV			2	1
	Alarm4	ON		DO4_ON.WAV			٢	1
		OFF		DO4_OFF.WAV			2	1
	Alarm5	ON		DO5_ON.WAV			٢	8
		OFF		DO5_OFF.WAV			2	1
	Alam6	ON		DO6_ON.WAV			٢	1
		OFF		DO6_OFF.WAV			2	8
	Alarm7	ON		DO7_ON.WAV			٢	8
		OFF		DO7_OFF.WAV			2	8
	Alarm8	ON	. 🖭	DO8_ON.WAV			٢	1
		OFF		DO8_OFF.WAV			2	8
	Alarm9	ON		DO9_ON.WAV		100	٢	1

(1) Field Description

Stat

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	РСМ
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.

•	System 🝷
	Signal Quality
	Reboot SMS-531
	Recover Default Settings
	Firmware Version
	Input PIN/PUK
	Voice File Management

### 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.

🎬 GT-531 Utility ¥1.0.0					
Project	Language	Exit			
COM1	English				

# **4.9 Exit**

This function would exit the GT-531 Series Utility.

🎉 GT-531 Utility ¥1.0.0					
Project	Language	Exit			

# 5. Example

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

Example	Description
Example 1:	This example shows how to send the fixed
Sending the general alarm SMS	content alarm SMS by Modbus commands in
(Level Trigger)	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:	This example shows how to send the fixed
Sending the general alarm SMS	content alarm SMS by Modbus commands in
(Edge Trigger)	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.

S GT-531.UY1.1.0 2012/11/06								
Project Language Exit								
COM1 🛛 👻 <del>ビ Connect</del>	COM1 🔷 🛩 Connect 🖾 Download 🕼 Upload 🕼 Learn 🏾 🥯 System 🔹							
Prject(none)	Parameters	Value	Description					
- System	Protocol	Modbus RTU	Read Only					
🗈 COM Port	Modbus Address	1	1~247					
Phone Book	Debug Message	Enable	Enable or Disagle					
🖮 Alarm Message	SMS Check Number	Disable	Enable or Disagle					
	Variable SMS	Disable	Enable or Disagle					
	Alarm Mode	Level Trigger	Level or Edge Trigger					

### (2) Choose the level trigger mode.

Prject(none)	Parameters	Value	Description
- <mark>System</mark>	Protocol	Modbus RTU	Read Only
🗊 COM Port	Modbus Address	1	1~247
- Phone Book ⊕ Alarm Message	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
		Level Trigger	
		Edge Trigger	

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

	😑 Project(Example 1.prj)
	System
Project Language	🖨 COM Port
New	COM2
Open	COM3
Save	Phone Book
Save as	🖬 Alarm Message

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

😑 Project(Example1.prj)	Parameters	Value	Description
System	Protocol	Modbus RTU	Read Only
🖨 COM Port	Modbus Address	1	1~247
COM2	Debug Message	Enable	Enable or Disagle
COM3	SMS Check Number	Disable	Enable or Disagle
Phone Book	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:

😑 Project(Example1.prj)	Parameters	Value	Description
System	Group Name	group0	1~10 Unicode Char.
🗉 COM Port	Phone 0	0123456789	
📮 Phone Book	Phone 1		
group0	Phone 2		
group l	Phone 3		
⊞- Alarm Message	Phone 4		

😑 Project(Example1.prj)	Parameters	Value	Description
System	Group Name	group1	1~10 Unicode Char.
🗊 COM Port	Phone 0	9876543210	
🖃 Phone Book	Phone 1		
group0	Phone 2		
group I	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.

😑 Project(Example1.pr	Parameters	Value	Description
System	Alarm Channel	0	Read Only
🗉 COM Port	On Message	Channel0 ON	54 Unicode Char.
🖨 Phone Book	Off Message	Channel0 OFF	54 Unicode Char.
group0	SMS Alarm	Enable	Enable or Disable
group I	Voice Alarm	Disable	Enable or Disable
	Trigger Time	0	0~9999 Secs
Alarm1	All Group		
Alarm2	group0		
Alarm3	group 1		

😑 Project(Example 1. pr 🛆	Parameters	Value	Description
System	Alarm Channel	1	Read Only
🗉 COM Port	On Message	Channell ON	54 Unicode Char.
🖃 Phone Book	Off Message	Channel1 OFF	54 Unicode Char.
group0	SMS Alarm	Enable	Enable or Disable
groupl	Voice Alarm	Disable	Enable or Disable
Alarm Message	Trigger Time	0	0~9999 Secs
Alarm1	All Group		
Alarm2	group0		
Alarm3	group 1		

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

S GI-531 Utility ¥1.0.0							
Project	Language	Exit					
COM1	🔽 🛩 Dis	connect	🕹 Download	🛆 Upload	🚺 Leam	🥯 System	•

### 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:

Commondo	Sending Alarm SMS	Command	01 05 00 00 FF 00 8C 3A			
Commands	(Hex)	Response	01 05 00 00 FF 00 8C 3A			
	1. The SMS-531 recei	1. The SMS-531 receives the Modbus command then sends the alarm				
	message.					
Description	2. The content of the alarm SMS is "On Message" of Alarm Channel0					
	message.					
	3. The alarm SMS wo	uld send to	the defined phone groups.			
Docult	The phones defined in the group0 would receive the SMS. The content of					
Result	the SMS is "Channel0 ON"					

Commands and Description:

### Command Format:

Send the ala	Send the alarm SMS					
	Byte 0	The Modbus Address of the SMS-531				
	Byte 1	Function Code = $0x05$				
Command	Byte 2 ~ 3	Alarm Channel				
Command	Derto 1 5	=0xFF00, Sending the field content of "On Message".				
	$byte 4 \sim 3$	=0x0000, Sending the field content of "Off Message".				
	Byte 6 ~ 7	CRC-16				
	Byte 0	The Modbus Address of the SMS-531				
Correct	Byte 1	Function Code = $0x05$				
Dorrect	Byte 2 ~ 3	Alarm Channel				
Response	Byte 4 ~ 5	=0xFF00 or =0x0000				
	Byte 6 ~ 7	CRC-16				
	Byte 0	The Modbus Address of the SMS-531				
Emer	Byte 1	= 0x85				
EIIOI	Derto 2	Error Code				
Response	Byte 2	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.

😑 Project(Example2.prj) 🛛 Pa	arameters	Value	Discription
<mark>System</mark> Pr	rotocol	Modbus RTU	Read Only
🖻 COM Port 🛛 🕅 M	lodbus Address	1	1~247
-COM2 De	ebug Message	Enable	Enable or Disagle
COM3 SN	MS Check Number	Disable	Enable or Disagle
Phone Book	ariable SMS	Enable 🗸 🗸	Enable or Disagle

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

🖃 Project(Example2.prj)	Parameters	Value	Discription
System	Group Name	group0	1~10 Unicode Char.
🗊 COM Port	Phone 0	0123456789	
🖃 Phone Book	Phone 1		
-group0	Phone 2		
group I	Phone 3		
	Phone 4		

😑 Project(Example2.prj)	Parameters	Value	Discription
System	Group Name	group 1	1~10 Unicode Char.
🗊 COM Port	Phone 0	9876543210	
Phone Book	Phone 1		
group0	Phone 2		
group I	Phone 3		
	Phone 4		

(4)	Set the Alarm	Channel0	and Channel1	separately as follows:	
( ')	bet the main	Chambro		bepututery us 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 Alarm Channel On Message Off Message SMS Alarm Voice Alarm All Group group0 group1	ParametersValueAlarm Channel0On MessageChannel0 ONOff MessageChannel0 OFFSMS AlarmEnableVoice AlarmDisableAll GroupIgroup0Igroup1I

😑 Project(Example2.pr 🛆	Parameters	Value	Discription
System	Alarm Channel	1	Read Only
🖬 COM Port	On Message	Channell ON	54 Unicode Char.
🗊 Phone Book	Off Message	Channel1 OFF	54 Unicode Char.
🖻 Alarm Message	SMS Alarm	Enable	Enable or Disable
Alarm0	Voice Alarm	Disable	Enable or Disable
Alarm 1	All Group		
Alarm3	group0		
Alarm4	group1		

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

S GT-531 Utility ¥1.0.0					
Project	Language Exit				
COM1	👻 🛩 Disconnect	🕹 Download	🔺 Upload	🛈 Leam	🥯 System 🔹

### 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.

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

### Commands and Description:

### Format Description:

Setting the variable SMS content				
	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		
	Dyte 4 % 5	max is 16 chars)		
Command	Byte 6	Byte Count (Register Count x 2)		
		Variable SMS Content (Unicode) : In this example, it is		
	Byte7 ~ 18	"+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		
	Byte 0	The Modbus Address of the SMS-531		
	Byte 1	Function Code = $16 (0x10)$		
Correct	Byte 2 ~ 3	The start address of the variable content of the SMS		
Response		Register Count: The quantity of the SMS content (The		
Response	Byte 4 ~ 5	max is 16 chars)		
	Byte 6 ~ 7	CRC-16 check code		
Error	Byte 0	The Modbus Address of the SMS-531		
Response	Byte 1	= 0x90		

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

Sending the SMS			
	Byte 0	The Modbus Address of the SMS-531	
	Byte 1	Function Code = $0x05$	
Commond	Byte 2 ~ 3	Alarm Channel	
Command	D . 4 5	=0xFF00, Sending the field content of "On Message"	
	Byte 4 ~ 5	=0x0000, Sending the field content of "Off Message"	
	Byte 6 ~ 7	CRC-16 check code	
	Byte 0	The Modbus Address of the SMS-531	
Correct	Byte 1	Function Code = $0x05$	
Posponso	Byte 2 ~ 3	Alarm Channel	
Response	Byte 4 ~ 5	=0xFF00 or =0x0000	
	Byte 6 ~ 7	CRC-16 check code	
	Byte 0	The Modbus Address of the SMS -531	
Eman	Byte 1	= 0x85	
EIIOI	Dute 2	Error Code	
Response	Byte 2	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:

	Setting the phone number	Command	01 10 01 D5 00 06 0C 30 31 32 33 34 35 36 37 38 39 00 00 D5 2B		
	(Hex)	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		
Command		Response	01 10 01 8F 00 0C F0 1B		
	Sending the SMS(FC 5)	Command	01 05 00 80 FF 00 8D D2		
	(Hex)	Response	01 05 00 80 FF 00 8D D2		
	Sending the SMS(FC 15)	Command	01 0F 00 80 00 01 01 01 EE 89		
	(Hex)	Response	01 0F 00 80 00 01 01 01 EE 89		
	1. The phone number : 0123456789				
Description	2. The content of the SMS : Dynamic SMS				
	3. Transmitting the SMS				
Result	Result The phone number "0123456789" would receive the "Dynamic SMS.				

Format Description:

Setting the variable phone number				
	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		
Command	Byte 6	Byte Count(Register Counter x 2)		
		The phone number (ASCII code). The end char is		
	Byte7 ~ 18	0x00. If the number size is 20, it is needed not the end		
		char.		
	Byte 19 ~ 20	CRC-16 check code		
	Byte 0	The Modbus Address of the SMS-531		
Compat	Byte 1	Function Code = $16 (0x10)$		
response	Byte 2 ~ 3	The start address of the phone number		
response	Byte 4 ~ 5	Register Count: The register size of the phone number		
	Byte 6 ~ 7	CRC-16 check code		
	Byte 0	The Modbus Address of the SMS-531		
	Byte 1	= 0x90		
Error rosponso		Error Code		
Entor response	Byte 2	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				
	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 $4 \sim 5$	Register Count: The size of the SMS. The max is 70		
	Byte 4 % 5	Unicode.		
Command	Byte 6	Byte Count(Register Counter x 2)		
	Byte 0 Byte7 ~ 30	The content of the SMS (Unicode code). The end char		
	Byte7 ~ 30	is 0x0000. If the size of the SMS is 70, it is not needed		
		the end char.		
	Byte 31 ~ 32	CRC-16 check code		
	Byte 0	The Modbus Address of the SMS-531		
Composi	Byte 1	Function Code = $16 (0x10)$		
Correct	Byte 2 ~ 3	The start address of the sent SMS		
Response	Duto 4 5	Register Count: The size of the SMS. The max is 70		
	Byte 4 ~ 5	Unicode.		

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

Sending the S	SMS (Function C	Code 5)
	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = $0x05$
Command	Byte 2 ~ 3	= 0 x 0 0 8 0
	Byte 4 ~ 5	$= 0 \mathrm{xFF00}$
	Byte 6 ~ 7	CRC-16 check code
	Byte 0	The Modbus Address of the SMS-531
Course	Byte 1	Function Code = $0x05$
Correct	Byte 2 ~ 3	= 0x0080
Response	Byte 4 ~ 5	$= 0 \mathrm{xFF00}$
	Byte 6 ~ 7	CRC-16 check code
	Byte 0	The Modbus Address of the SMS-531
<b>E</b>	Byte 1	= 0x85
Error Response	Derte 2	Error Code:
	Byte 2	06: Sending buffer overflow or the SMS is sending
	Byte 3 ~ 4	CRC-16 check code

Sending the SMS (Function Code 15)					
	Byte 0	The Modbus Address of the SMS-531			
	Byte 1	Function Code = $0x0F$			
	Byte 2 ~ 3	= 0 x 0 0 8 0			
Command	Byte 4 ~ 5	= 0 x 0 0 0 1			
	Byte 6	$= 0 \mathrm{x} \mathrm{O} \mathrm{1}$			
	Byte 7	$= 0 \mathrm{x} \mathrm{O} \mathrm{1}$			
	Byte 8 ~ 9	CRC-16 check code			
	Byte 0	The Modbus Address of the SMS-531			
	Byte 1	Function Code = $0x0F$			
Compost	Byte 2 ~ 3	= 0 x 0080			
Dorponso	Byte 4 ~ 5	= 0 x 0 0 0 1			
Response	Byte 6	$= 0 \mathrm{x} \mathrm{O} \mathrm{1}$			
	Byte 7	= 0x01			
	Byte 8 ~ 9	CRC-16 check code			
	Byte 0	The Modbus Address of the SMS-531			
Emor	Byte 1	= 0x8F			
Dosponso	Duto 2	Error Code:			
Response	Dyte 2	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).

<ul> <li>Project(Example4.prj)</li> <li>System</li> <li>COM Port</li> <li>Phone Book</li> <li>Alarm Message</li> </ul>	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:

😑 Project(Example4.prj)	Parameters	Value	Discription
System	Group Name	group0	1~10 Unicode Char.
🗊 COM Port	Phone 0	0123456789	
📮 Phone Book	Phone 1		
-group0	Phone 2		
group I	Phone 3		
uessage ⊥	Phone 4		

🖃 Project(Example4.prj)	Parameters	Value	Discription
System	Group Name	group1	1~10 Unicode Char.
🗉 COM Port	Phone 0	9876543210	
😑 Phone Book	Phone 1		
group0	Phone 2		
group I	Phone 3		
⊪- Alann Message	Phone 4		

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

😑 Project(Example4.pr	Parameters	Value	Discription
System	Alarm Channel	0	Read Only
🗉 COM Port	On Message	Channel0 ON	54 Unicode Char.
🕀 Phone Book	Off Message	Channel0 OFF	54 Unicode Char.
🖻 Alarm Message	SMS Alarm	Disable	Enable or Disable
Alarm0	Voice Alarm	Enable 🗸	Enable or Disable
Alarm I	All Group		
Alarm3	group0		
Alarm4	group1		
😑 Project(Example4.pr	Parameters	Value	Discription
Project(Example4.pr System	Parameters Alarm Channel	Value 1	Discription Read Only
<ul> <li>Project(Example4.pr</li> <li>System</li> <li>COM Port</li> </ul>	Parameters Alarm Channel On Message	Value 1 Channel1 ON	Discription Read Only 54 Unicode Char.
<ul> <li>Project(Example4.pr</li> <li>System</li> <li>COM Port</li> <li>Phone Book</li> </ul>	Parameters Alarm Channel On Message Off Message	Value 1 Channel1 ON Channel1 OFF	Discription Read Only 54 Unicode Char. 54 Unicode Char.
<ul> <li>Project(Example4.pr</li> <li>System</li> <li>COM Port</li> <li>Phone Book</li> <li>Alarm Message</li> </ul>	Parameters Alarm Channel On Message Off Message SMS Alarm	Value 1 Channel1 ON Channel1 OFF Disable	Discription Read Only 54 Unicode Char. 54 Unicode Char. Enable or Disable
<ul> <li>Project(Example4.pr</li> <li>System</li> <li>COM Port</li> <li>Phone Book</li> <li>Alarm Message</li> </ul>	Parameters           Alarm Channel           On Message           Off Message           SMS Alarm           Voice Alarm	Value 1 Channel1 ON Channel1 OFF Disable Enable V	Discription Read Only 54 Unicode Char. 54 Unicode Char. Enable or Disable Enable or Disable
<ul> <li>Project(Example4.pr</li> <li>System</li> <li>COM Port</li> <li>Phone Book</li> <li>Alarm Message</li> <li>Alarm0</li> <li>Alarm1</li> <li>Alarm2</li> </ul>	Parameters       Alarm Channel       On Message       Off Message       SMS Alarm       Voice Alarm       All Group	Value 1 Channel1 ON Channel1 OFF Disable Enable	Discription Read Only 54 Unicode Char. 54 Unicode Char. Enable or Disable Enable or Disable
<ul> <li>Project(Example4.pr</li> <li>System</li> <li>COM Port</li> <li>Phone Book</li> <li>Alarm Message</li> <li>Alarm0</li> <li>Alarm1</li> <li>Alarm2</li> <li>Alarm3</li> </ul>	Parameters       Alarm Channel       On Message       Off Message       SMS Alarm       Voice Alarm       All Group       group0	Value 1 Channel1 ON Channel1 OFF Disable Enable	Discription Read Only 54 Unicode Char. 54 Unicode Char. Enable or Disable Enable or Disable

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

S GT-531 Utility ¥1.0.0					
Project	Language Exit				
COM1	👻 🛩 Disconnect 🛛 🕹 Download 🖉 🗠 Upload 🖉 🕥 Learn 🖉 🥯 System 🝷				

(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 on PC	Browse	Download	Delete
	Alarm0	ON	<b>~</b>	DO0_ON.WAV	E:\GT-5xx\GT-534\sound\VDI0.WAV	Ē	- 🕹 -	
		OFF	<b></b>	DO0_OFF.WAV	E:VGT-5xxVGT-534\sound\VDI1.WAV	Ē	- 🕹 -	
	Alarm1	ON	<b>~</b>	DO1_ON.WAV	E:\GT-5xx\GT-534\sound\VD12.WAV		- 🕹 -	
•		OFF		DO1_OFF.WAV	ENGT-5xx/GT-534/sound/WDB.WAV	Ē	<i>.</i>	
	Alarm2	ON		DO2_ON.WAV			- 🕹 -	
		OFF		DO2_OFF.WAV		Ē	- 🕹 -	

### 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	Command	01 05 00 00 FF 00 8C 3A		
	(16 Hex)	Response	01 05 00 00 FF 00 8C 3A		
	1. As the SMS-531 recei	ves the cor	nmand, it would sent the voice alarm.		
Description	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 l	heart the al	arm voice in DO0_ON.WAV.		

### Format Description:

Sending the voice alarm				
	Byte 0	The Modbus Address of the SMS-531		
	Byte 1	Function Code = $0x05$		
	Byte 2 ~ 3	Alarm Channel		
Command		=0xFF00, To play DOx_ON.WAV file. The x is the		
Command	Puto 1 5	number of Alarm channel.		
	$Dyte 4 \sim 3$	=0x0000, To play DOx_OFF.WAV file. The x is the		
		number of Alarm channel.		
	Byte 6 ~ 7	CRC-16 check code		
	Byte 0	The Modbus Address of the SMS-531		
Compat	Byte 1	Function Code = $0x05$		
Despense	Byte 2 ~ 3	Alarm Channel		
Response	Byte 4 ~ 5	=0xFF00 or =0x0000		
	Byte 6 ~ 7	CRC-16 check code		
	Byte 0	The Modbus Address of the SMS-531		
Error	Byte 1	= 0x85		
Pasponso	Duto 1	Error Code		
Response	Byte 2	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).

🖃 Project(Example5.prj)	Parameters	Value	Discription
<mark>- System</mark> ⊕ COM Port ⊕ Phone Book ⊕ Alarm Message	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.

🖃 Project(Example5.prj)	Parameters	Value	Discription
System	Group Name	group0	1~10 Unicode Char.
🗊 COM Port	Phone 0	0123456789	
🖨 Phone Book	Phone 1		
group0	Phone 2		
🖅 Alarm Message	Phone 3		

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

S GT-531 Utility ¥1.0.0						
Project	Language	Exit				
COM1	🐱 🛩 Disc	connect	🕹 Download	🔺 Upload	🕕 Learn	🥯 System 🔹

### 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:

	Checking the	command	01 02 00 01 00 01 E8 0A		
	received SMS	Deenence	01 02 01 00 A1 88 (No SMS)		
	(Hex)	Response	01 02 01 01 60 48 (Receiving the SMS)		
	Reading the phone	command	01 04 00 1E 00 0A 10 0B		
	number of the received SMS (Hex)	Response	01 04 14 38 38 36 39 32 38 37 36 36 35 30 37 00 00 00 00 00 00 00 00 00 B6 6E		
	Reading the date of	command	01 04 00 28 00 07 31 C0		
Command	the received SMS (Hex)	Response	01 04 0E 32 30 31 31 30 34 32 32 30 39 35 35 33 31 3D 79		
	Reading the	command	01 04 00 2F 00 51 00 3F		
	content of the		01 04 A2 00 00 48 65 6C 6C 6F 2C 47 54		
	received SMS (Hex)	Response	2D 35 33 31 21 00 00 00(Size is 162 Bytes)		
	Clear the SMS	command	01 05 00 C7 FF 00 3D C7		
	(Hex)	Response	01 05 00 C7 FF 00 3D C7		
	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.				
Description	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 comman	nd to read th	hat.		

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

# Format Description:

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

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

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

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

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

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

Clear the SMS from the SMS-531			
	Byte 0	The Modbus Address of the SMS-531	
	Byte 1	Function Code = $0x05$	
Command	Byte 2 ~ 3	= 0 x 0 0 C7	
	Byte 4 ~ 5	$= 0 \mathrm{x} \mathrm{FF} \mathrm{0} \mathrm{0}$	
	Byte 6 ~ 7	CRC-16	
	Byte 0	The Modbus Address of the SMS-531	
Compat	Byte 1	Function Code = $0x05$	
response	Byte 2 ~ 3	$= 0 \times 00C7$	
response	Byte 4 ~ 5	$= 0 \mathrm{xFF00}$	
	Byte 6 ~ 7	CRC-16	
	Byte 0	The Modbus Address of the SMS-531	
	Byte 1	= 0x85	
Error response	Puto 2	Error Code	
	Byte 2	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.

🖉 GT-531.UT41.1.0 2012/11/06						
Project Language Exi	Project Language Exit					
COM1 🛛 👻 🛩 Connect	🛛 🤣 Download 🛛 📥 Up	pload   🕕 Learn   🥯 System 🔹				
🗉 Prject(none)	Parameters	Value	Description			
System	Protocol	Modbus RTU	Read Only			
🗈 COM Port	Modbus Address	1	1~247			
Phone Book	Debug Message	Enable	Enable or Disagle			
🗈 Alarm Message	SMS Check Number	Disable	Enable or Disagle			
	Variable SMS	Disable	Enable or Disagle			
	Alarm Mode	Level Trigger	Level or Edge Trigger			

### (2) Choose the edge trigger mode.

Prject(none)	Parameters	Value	Description
System	Protocol	Modbus RTU	Read Only
🗊 COM Port	Modbus Address	1	1~247
Phone Book	Debug Message	Enable	Enable or Disagle
🗈 Alarm Message	SMS Check Number	Disable	Enable or Disagle
	Variable SMS	Disable	Enable or Disagle
	Alarm Mode	Edge Trigger 🗸 🗸	Level or Edge Trigger
		Level Trigger	
		Edge Trigger	

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

	😑 Project(Example6.prj)		
	System		
Project Language	🖨 COM Port		
New	COM2		
Open	COM3		
Save	-Phone Book		
Save as	🕳 Alarm Message		

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

😑 Project(Example6.prj)	Parameters	Value	Description
- <mark>System</mark>	Protocol	Modbus RTU	Read Only
🕀 COM Port	Modbus Address	1	1~247
Phone Book	Debug Message	Enable	Enable or Disagle
⊞- Alarm Message	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:

😑 Project(Example6.prj)	Parameters	Value	Description
System	Group Name	group0	1~10 Unicode Char.
🗊 COM Port	Phone 0	0123456789	
🖨 Phone Book	Phone 1		
-group0	Phone 2		
group I	Phone 3		
⊞ Alam Message	Phone 4		

😑 Project(Example6.prj)	Parameters	Value	Description
System	Group Name	group 1	1~10 Unicode Char.
🗊 COM Port	Phone 0	9876543210	
Phone Book	Phone 1		
group0	Phone 2		
group I	Phone 3		
⊪ Alam Message	Phone 4		

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

😑 Project(Example6.pr	Parameters	Value	Description
System	Alarm Channel	0	Read Only
🖬 COM Port	On Message	Channel0 ON	54 Unicode Char.
🖶 Phone Book	Off Message	Channel0 OFF	54 Unicode Char.
🖻 Alarm Message	SMS Alarm	Enable	Enable or Disable
- Alarm0	Voice Alarm	Disable	Enable or Disable
Alarm I	Trigger Time	10	0~9999 Secs
Alarm3	All Group		
Alarm4	group0		
- Alarm5	group1		

😑 Project(Example6.pr	Parameters	Value	Description
System	Alarm Channel	1	Read Only
🕀 COM Port	On Message	Channell ON	54 Unicode Char.
🗊 Phone Book	Off Message	Channel1 OFF	54 Unicode Char.
🖻 Alarm Message	SMS Alarm	Enable	Enable or Disable
-Alarm0	Voice Alarm	Disable	Enable or Disable
Alarm 1	Trigger Time	20	0~9999 Secs
Alarm3	All Group		
Alarm4	group0		
Alarm5	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:

	-				
Commanda	Sending Alarm SMS	Command	01 05 00 00 FF 00 8C 3A		
Commands	(Hex)	Response	01 05 00 00 FF 00 8C 3A		
	1. The SMS-531 receives the Modbus command then sends the alarm				
	message.				
Description	2. The content of the alarm SMS is "On Message" of Alarm Channel0				
	message.				
	3. The alarm SMS wo	uld send to	the defined phone groups.		
Degult	The phones defined in	the group0	would receive the SMS after 10 seconds.		
Result	The content of the SM	S is "Chan	nel0 ON"		

Command F	Format:	
Send the ala	ırm SMS	
	Byte 0	The Modbus Address of the SMS-531
	Byte 1	Function Code = $0x05$
Command	Byte 2 ~ 3	Alarm Channel
Command	Duto 1 5	=0xFF00, Sending the field content of "On Message".
	Буle 4 ~ 3	=0x0000, Sending the field content of "Off Message".
	Byte 6 ~ 7	CRC-16
	Byte 0	The Modbus Address of the SMS-531
Compost	Byte 1	Function Code = $0x05$
Dornento	Byte 2 ~ 3	Alarm Channel
Response	Byte 4 ~ 5	=0xFF00 or =0x0000
	Byte 6 ~ 7	CRC-16
	Byte 0	The Modbus Address of the SMS-531
	Byte 1	= 0x85
Frror		Error Code
Response	Byte 2	06: Buffer overflow
Response	Byte 2	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.

Address	Data Address	Description		
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	

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

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

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

(2) Discrete Input (Function Code: 2)

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	R
		<ul><li>4-&gt; Transmitting fault</li><li>(2) Low Byte : Error code</li></ul>	
30017 30018	0x10 0x11	The last transmitting SMS buffer number 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
300480x2FThe format of the receive 0x0000=ASCII 0x0001=Unicode		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

### (3) Input Register (Function Code: 4)

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

Address	Data Address	Description			Attribute			
40200	0xC7	Module Address(Modbus Net ID) , 1~247						
40201	0xC8	COM2 (1)High Byte Code $0x04$ Baud $2400$ Code $0x08$ Baud $38400$ (2)Low Byte Bit 2:0 (Data Bit) 011 : 8 Data Bit Bite 4:3(stop bit) 00 : 1 stop bit 01 : 2 stop bit Bite 6:5(parity) 00 : no parity 01 : odd parity 10 : over pority	20M2         1)High Byte $\boxed{Code}$ $0x04$ $0x05$ $0x06$ $0x07$ Baud       2400       4800       9600       19200 $\boxed{Code}$ $0x08$ $0x09$ $0x0A$ Baud       38400       57600       115200         2)Low Byte         Bit 2:0 (Data Bit)       011 : 8 Data Bits         3ite 4:3(stop bit)       00 : 1 stop bit         01 : 2 stop bit         3ite 6:5(parity)       00 : no parity         01 : odd parity					
40202	0xC9	COM3 setting. The data format is as COM2						
40207	0xCE	Enabling or Disabling the debug message 0x0000=Disable 0x0001=Enable						
40208	0xCF	Enabling or Disabling the SMS with the check code 0x0000=Disable 0x0001=Enable				R/W		
40384 ~	0x17F ~	The variable conten	t of the S	MS (Unic	ode by the end	R/W		
40399	0x18E	char 0x0000)	· 01 6	7				
40400 ~	0x18F ~ 0x1D4	The dynamic transmitting SMS content (Unicode by the				R/W		
40470 ~ 40479	0x1D4 0x1D5 ~ 0x1DE	The phone number (ASCII by the end cl	for the dy har 0x00)	ynamic tra	nsmitting SMS	R/W		

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

# 7. Troubleshooting

Item	Trouble state	Solution
1	STA is always on	<ol> <li>Check SIM card.</li> <li>Check Antenna.</li> <li>Check the 3G signal strength.</li> </ol>
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	<ol> <li>Check STA LED blinking every 1 sec.</li> <li>Check the COM port wire connection.</li> </ol>
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	<ol> <li>Confirm the wire connection.</li> <li>Confirm the Modbus ID of the SMS-531.</li> <li>Confirm the COM port configuration.</li> </ol>
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.