GSM SMS Alarm Messenger

Version 7

SMS Basic	**GSM SMS alarm messenger**
SMS Pro	**GSM SMS alarm messenger**
SMS Pro-X	**GSM SMS alarm, voice & data messenger**
SMS Pro-SX	**GSM SMS alarm messenger [Temperature & Humidity Sensor]**
SMS Pro-ST	**GSM SMS alarm & data messenger [2 x Temperature Sensor]**

Features	Basic	Pro	Pro-X	Pro-XQ	Pro-SX	Pro-ST
Alarm Input	8	8	8	8	8	8
Relay Output	1	3	3	3	3	3
Phone Number	10	10	10	10	10	10
Low Voltage Alert	✓	✓	✓	✓	✓	✓
Program by SMS	✓	✓	✓	✓	✓	✓
Program by PC Software	✓	✓	✓	✓	✓	✓
Voice	✓	✓	✓	✓	✓	✓
AD Channels	-	-	2	2	1	0
AD Hi/Lo Alert	-	-	✓	✓	✓	✓
Temperature Sensor	-	-	-	-	1	2
Humidity Sensor	-	-	-	-	1	-
Temp Hi/Lo Alert	-	-	-	-	✓	✓
Humidity Hi/Lo Alert	-	-	-	-	-	✓
GSM Band (MHz)	900/1800	900/1800	900/1800	900/1800 850/1900	900/1800	900/1800

Revision 150109 [v7.1D]

CONTENT

1. Overview

a. Introduction

SMS Pro is integrated with a 16 bit MCU and reliable Siemens MC39i GSM module.

b. Application

- Industrial equipment monitoring
- Data capturing
- Rural Security
- Car Security
- Intelligent Home Security
- Large scale area monitoring e.g. Power Plant

c. Features

- ☑ Operates in GSM covering zones, phone alarm dial & SMS alarm message
- ☑ Keep the last 10 SMS alarm messages when sending SMS failed
- ☑ Resend the last 10 failed SMS when GSM network resumes normal
- ☑ Health Status report by GSM mobile phone or PC (RS232)
- ☑ Configuration setup by GSM mobile phone or PC (RS232)
- ☑ Arm/Disarm by GSM mobile phone
- ☑ 8 x Alarm Inputs triggered by N/C, N/O or State Change
- ☑ 2 x AD channels with user programmable Alert High & Alert Low level
- ☑ 3 x Relay Outputs, NC/NO activated by alarm input or SMS manually
- ☑ 8 x Mobile/Fixed Phone Number + 2 x control centre number
- ☑ Alarm Alert Modes – SMS, Phone Dial or SMS & Phone Dial
- ☑ System status reporting in Automatic, Schedule or Alarm triggered modes
- ☑ Central Station monitoring number for Server connected with GSM Modem
- ☑ Sound monitoring upon microphone connected
- ☑ Each alarm input is associated with independent SMS alarm text
- ☑ SMS alarm message text user programmable
- ☑ Independent SMS message for close & open triggered alarms
- ☑ Schedule power supply voltage level checking
- ☑ Automatic reporting on low power voltage level
- ☑ Reply message verifying the receipt of each command

d. Safety

- Do not touch the antenna
- GSM 900MHz, 2W max.
- GSM 1800MHz, 1W max.
- Not designed for medical equipment or aerospace application

e. Electrical Specification

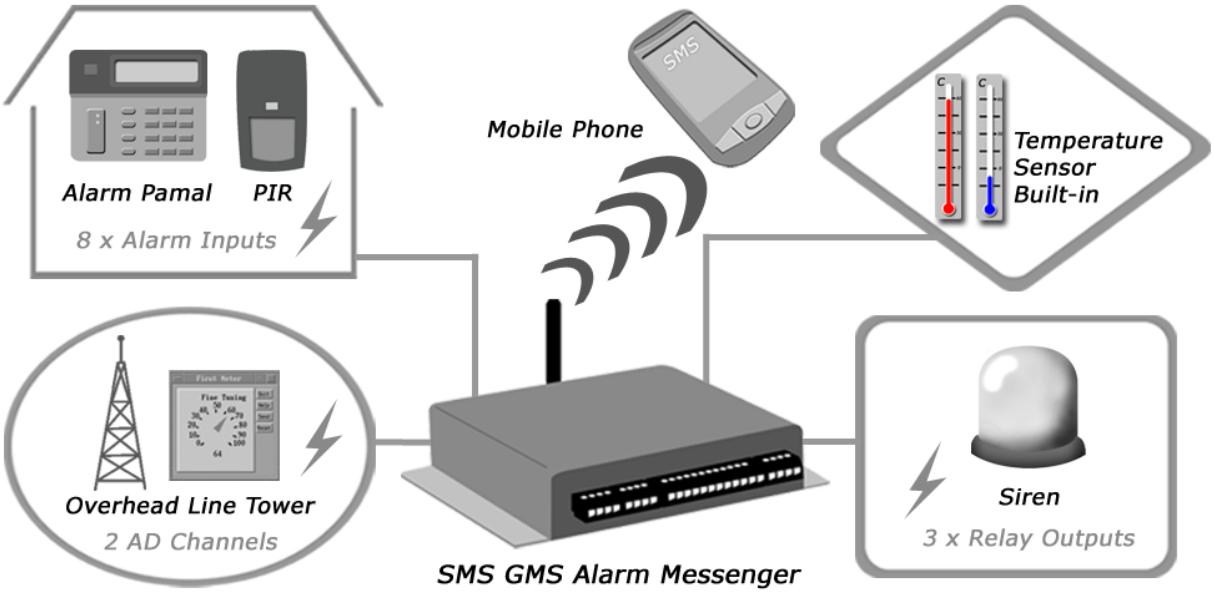
Operating Voltage	DC7~15V
Current	500mA (SMS Send/Receive)
	10mA (standby)
Peak Pulse Current	< 1A
Dimension	135 x 105 x 25 mm
Operating Temperature	-25° C ~ 55° C
Weight	600g
RS232	9600bps, 8 Data Bits, None Parity, 1 Stop Bit

f. Antenna Requirement

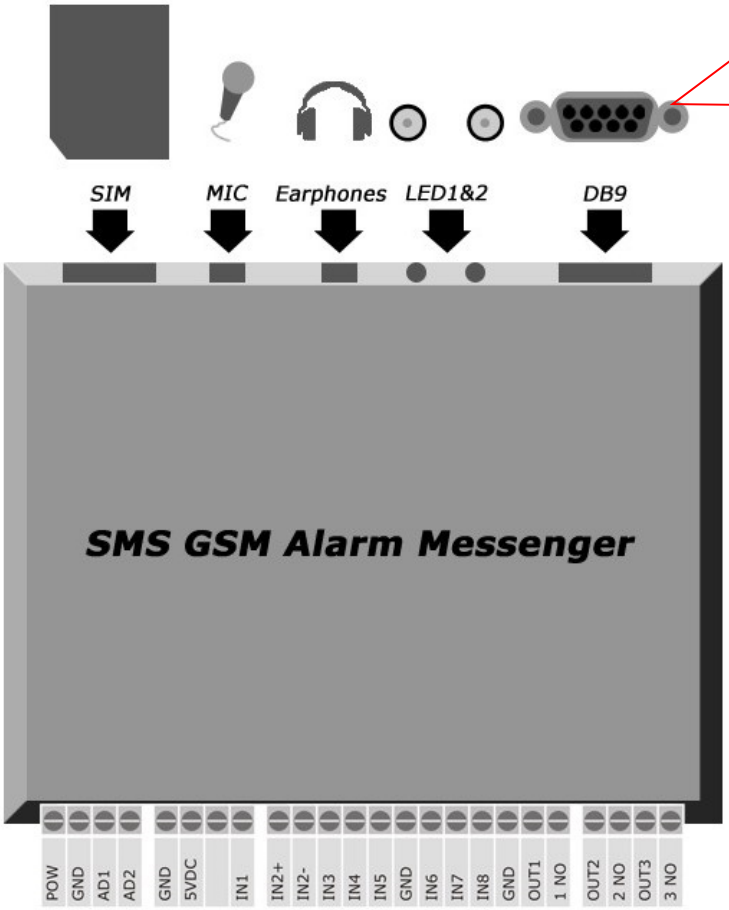
	GSM 900	GSM 1800
RF Frequency	925~960MHz	1805~1880MHz
TX Frequency	880~912MHz	1710~1785MHz
RF Rating	2W 12.5% Loop Loading	1W 12.5% Loop
Loading Resistance	50Ohm	
Radiation S/N	0dBi	

Note: GSM850/900/1800/1900MHZ is available in US or worldwide version [Pro-Q]

g. Operation



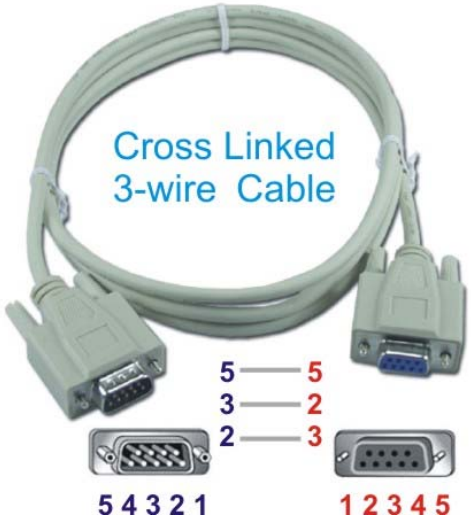
2. Connection



RS232 Pin Assignment Connecting to PC

9600bps, 8bit, No Parity, 1 Stop

Pin 2	RXD
Pin 3	TXD
Pin 5	GND



LED1 green [GSM Signal]

Flashing Off > On duration

* GSM Module Normal Operation

Flashing Same On/Off duration

* GSM Network Connection Problem

Reason:

Antenna not connected

No SIM Card

Defective SIM Card

GSM Module Defect

LED2 red [Operation Status]

On

* Normal

Flash

* Searching GSM Network
* Connecting GSM Network
* Receiving SMS messages
* Sending SMS messages
* Phone dialing

<u>Sound Monitoring</u>

SMS Pro automatically picks up any phone call after 8 rings. It rejects any call not from alarm phone number.

By connecting the microphone, mobile phone user can talk to the SMS Messenger.

3. Inserting SIM card

Press the yellow button to release the SIM card caddy as shown below.

Make sure that the golden contact is facing down when inserting the SIM card caddy.

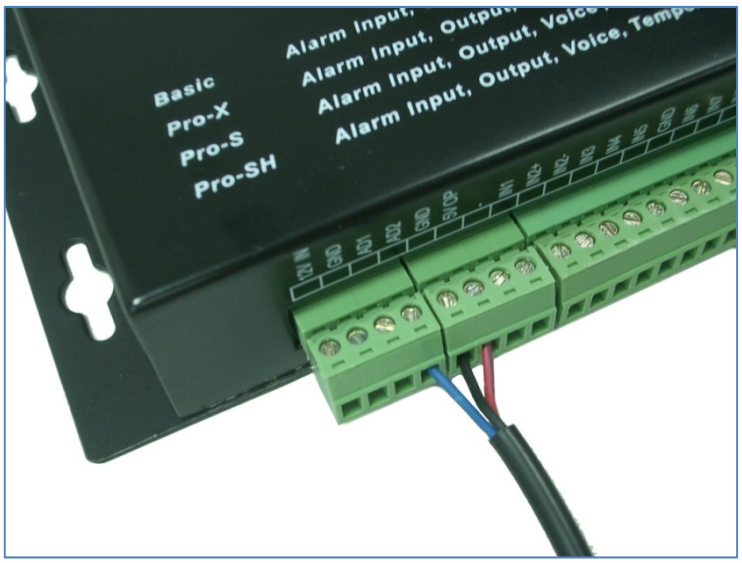
4. Temperature Sensor [Pro-ST]

2 x External temperature sensors are supplied with 1m cable. Cable can be extended up to max. 100 meter.

Temperature Sensor:	DS18B20
Temperature Range:	-50 ~ 125°C
Accuracy:	0.1°C
AD Channel:	2

High Temperature SMS Alert

Low Temperature SMS Alert



Cable Color Code

AD1 AD2 GND 5V

5. External Temperature & Humidity Sensor [Pro-SX]

External temperature & humidity sensor is supplied with 1m cable. Cable can be extended up to max. 100 meter.

<u>External Temperature Sensor</u>

Temperature Range: -50 ~ 125°C

Accuracy: 0.1°C

AD Channel: 2

High Temperature SMS Alert

Low Temperature SMS Alert

External Temperature & Humidity sensor

<u>External Humidity Sensor</u>

Humidity Range: 0 ~ 100%RH

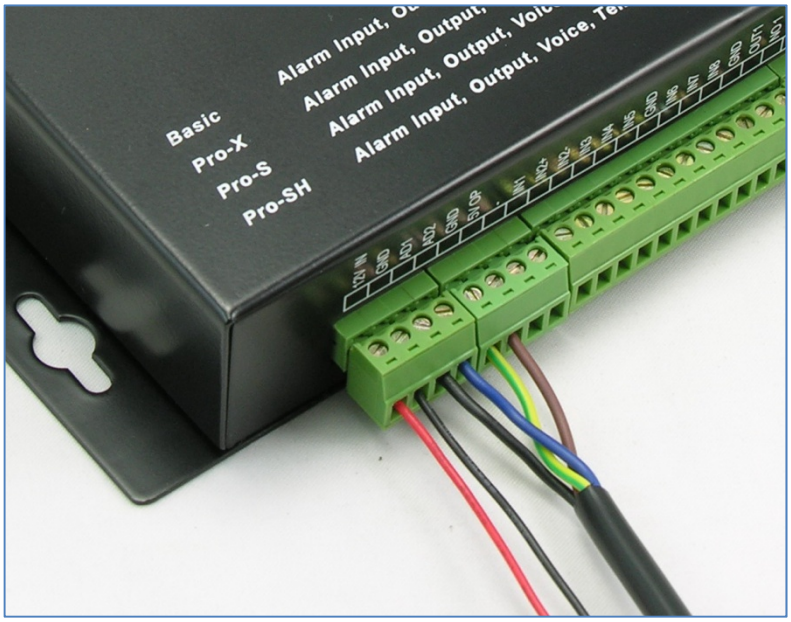
Accuracy: ± 5%RH

AD Channel: 1

High Humidity SMS Alert

Low Humidity SMS Alert

NOTE: Humidity Sensor must be installed upwards.



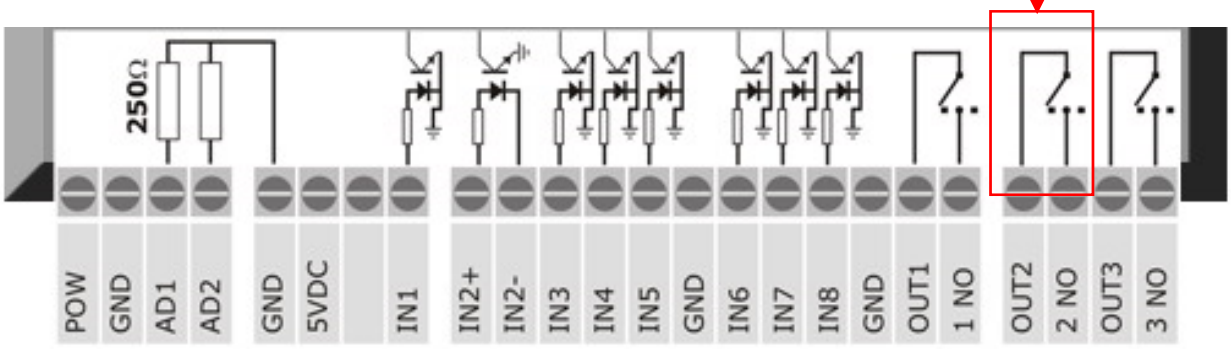
Cable Color Code

AD1 AD2 GND 5V

6. Schematic Diagram

The relay on/off start up status is determined by the jumper setting.
The relay will resume its start up status when power is off.

Relay Output jumper		
1	2	3
■	■	■
1-2 Short		Normal Close
2-3 Short		Normal Open (Default)



POW Power Input, DC7~12V

GND Power Ground

5VDC Power Output, DC5V [power supply for external sensor]

1) Alarm Input

Input: 12VDC, 7 ~ 15mA, Opto-isolated Inputs (1KΩ Input Resistance)
24VDC, resistor 1~2.2KΩ should be used in serial

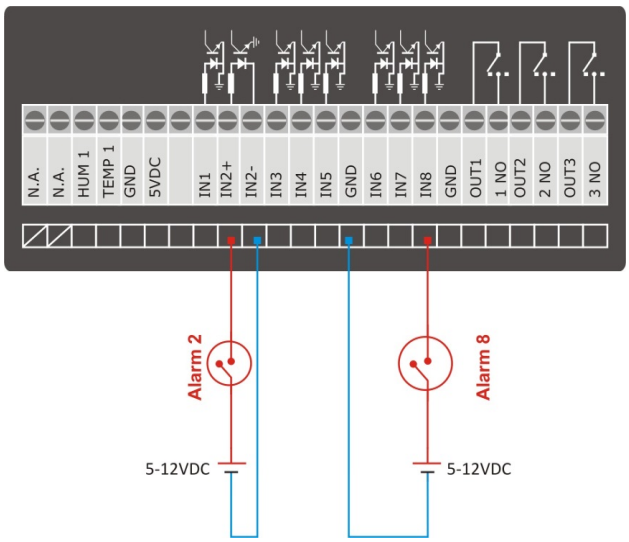
(a) IN1, IN3, IN4, IN5, IN6, IN7, IN8

Alarm Input: DC12V 7~15mA, GND: Common Ground

(b) IN2+, IN2-

IN2+: DC5~12V

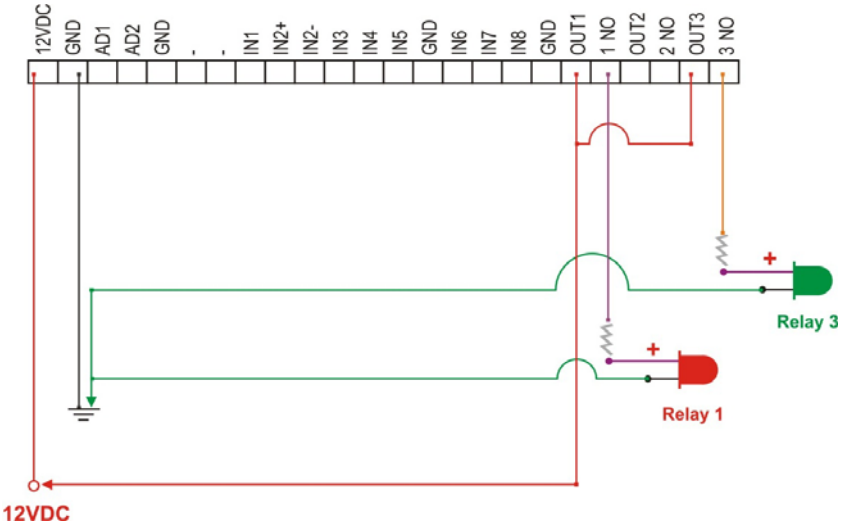
IN2-: Ground [It must NOT be common to the GND of the board]



2) Relay Output

OUT1, OUT2, OUT3 Max. 1A, 24VDC, 1A, 120VAC

NC/NO (selected by jumper on board)



3) Analog to Digital Channel

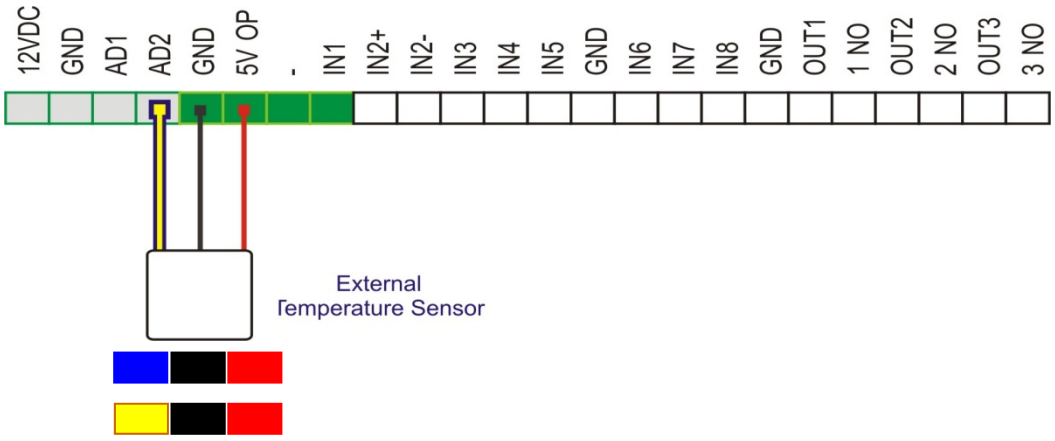
AD1 Analog Digital Channel 1, DC 7-15V Current 4~20mA

AD2 Analog Digital Channel 1, DC 7-15V Current 4~20mA

Models

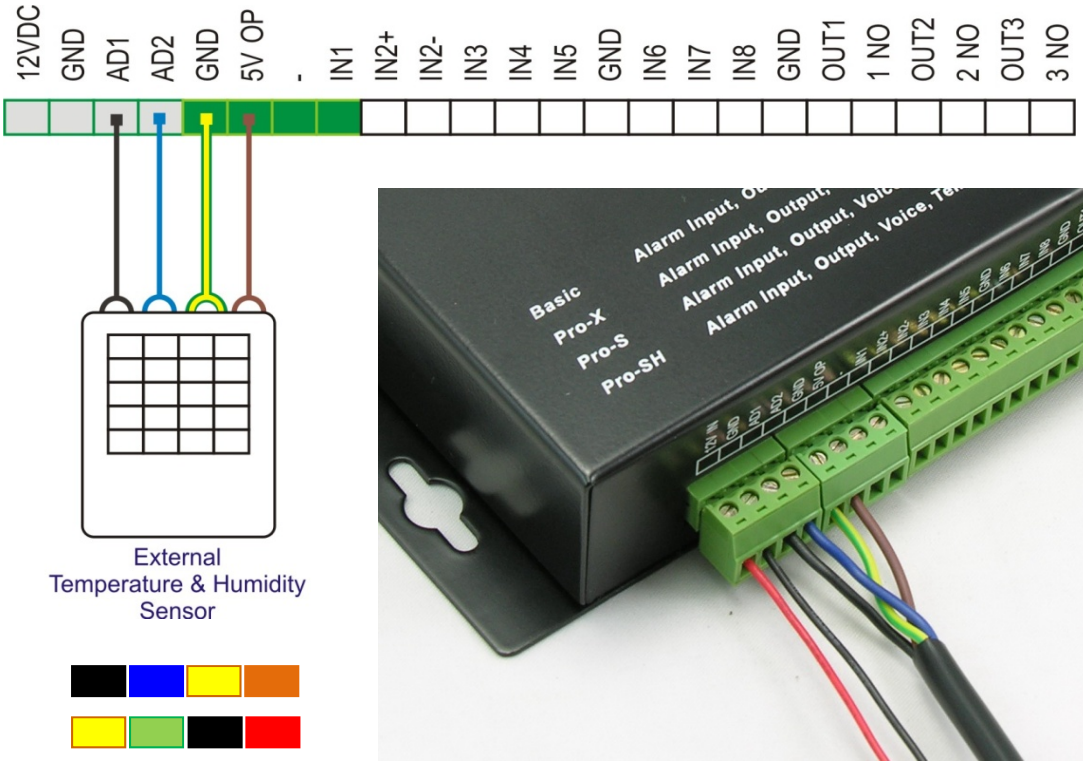
1) Pro-X AD1 & 2 are available

2) Pro-ST AD1 & 2 are used for temperature sensors



3) Pro-SX AD2 is used for temperature sensor

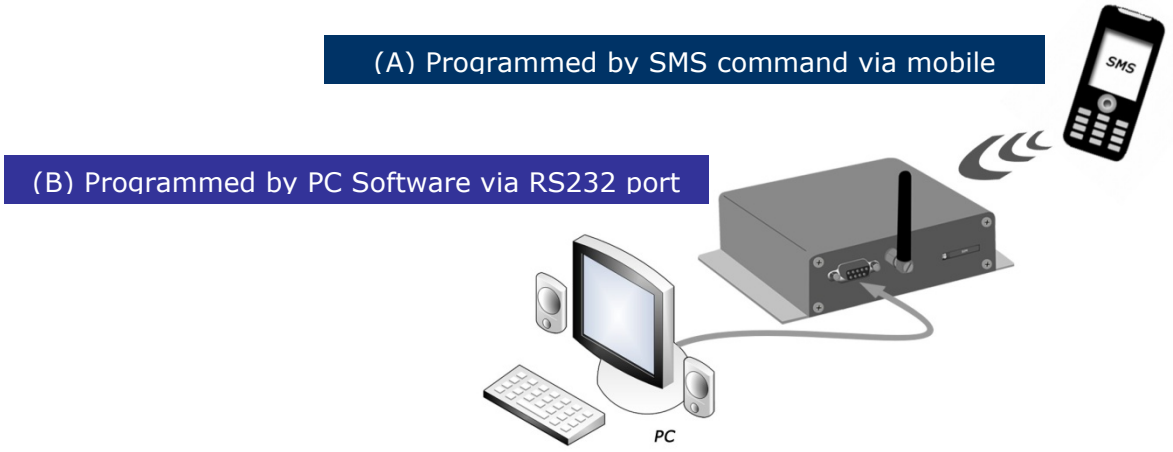
AD1 is used for humidity sensor



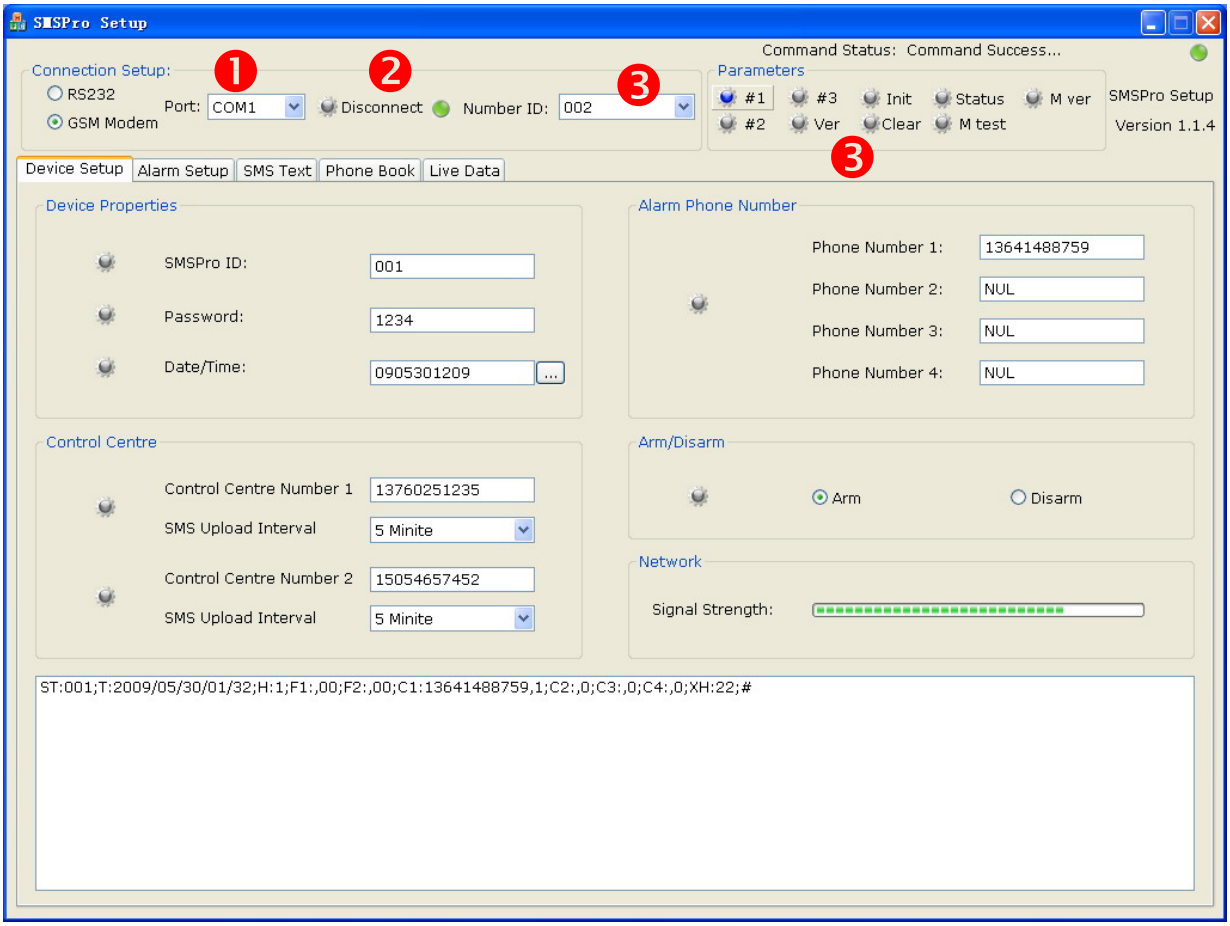
7. PC Setup Software

The unit can be programmed by: (A) SMS command via mobile phone

(B) Software via its built-in RS232 port



1. Select the **COM** port of PC connecting to the device.
2. Click [**Connect**] button to activate the connection between PC and SMS alarm unit.
3. Add a device ID in Phone Book.
4. Select Device ID, Click [**Init**] to reset or [**Ver**] to get the version of the device



Please refer to the manual of "SMSPro_Setup" software.

8. Quick Startup

1. Insert SIM Card into the alarm unit
2. Connect 12VDC power input
3. Wait until the RED LED is off after 15~30 seconds, and GREEN LED flashes every few seconds
4. Use another mobile phone, write a SMS message as below:

   PWD:1234,STATUS%
5. Send the message to the phone number of SIM card in the alarm unit
6. Within 30 seconds, your mobile phone will receive a reply SMS message from the alarm unit about its health status.
7. The unit is working normal now. Go to the next pages for other operations.

Note: Caller ID service must be activated

9. Alarm Trigger Response Time

After power on, the unit will take about 30 seconds for GSM module initialization and accessing the GSM network.

Upon alarm triggered, the unit will send the SMS alert message to Control Centre, and then other 4 programmable phone numbers. Control Centre can be disabled in order to make the users phone number receiving the alarm sooner.

10. GSM Network Connectivity

1. When GSM network is inaccessible or disconnected on sending SMS, the SMS will be lost.
2. When GSM network is inaccessible or disconnected before sending SMS, the unit will keep searching for the network and send the SMS until the GSM network resumes.
3. When sending the SMS alarm message fails, the SMS unit will keep the last 10 SMS alarm message and resend when the unit succeeds in accessing the GSM network again.

11. Command List

Command Description

Configure the SMS Alarm Messenger Unit by sending the command text through the GSM Mobile Phone.

Upon command received and processed, the unit will send a confirmation SMS message back to the mobile phone.

If command is incorrect, the unit will reply "SMS format is error!" to the mobile phone.

11.1) New Password Setup

Command: PWD:XXXX,NEWPWD:YYYY%

XXXX	Current Password	
YYYY	New Password (4 digits)	
Example:	PWD:1234,NEWPWD:2222%	
	Default Password:	1234
	New Password:	2222

11.2) Manual Health Reporting

Command: PWD:XXXX,STATUS%

[SMS Message received]

ST:XXX;T:2005/01/28/13:00;V:XXXX;AI1:0000;AI2:0000;K1:X;K2:X;K3:X:K4:X;K5:X;K6:X;K7:X:K8:X;OUT1:Y:OUT2:Y;OUT3:Y;#.

Example

ST:002;2005/01/28/13:00;V:8.15;AI1:0000;AI2:0000;K1:1;K2:0;K3:0:K4:1;K5:1;K6:0;K7:0:K8:1;OUT1:1:OUT2:1;OUT3:1;#.

ST	Unit Serial Number	XXX	ASCII code
T	Unit Internal Clock	XXXX	year/month/day/time
V	Operating Voltage	XXXX	
AI1	A/D Channel 1	X	hex digits
AI2	A/D Channel 2	X	hex digits
K1	Alarm Channel 1 K1:0 means "Open" K1:1 means "Closed"	K2~8	Alarm Channel 2~8
OUT1	Relay Output 1 OUT1:0 means "Open" OUT1:1 means "Closed"	OUT2~3	Relay Output 2~3

11.3) Serial Number Setup

Command: PWD:XXXX,SN:YYY%

XXXX	Password		
YYY	Serial Number (0-999)		
Example:	PWD:1234,SN:268%		
	Password:	1234	**(default)**
	Serial Number Set into the unit:	268	**(default: 000)**

11.4) Control Centre Number & Health Reporting Schedule Setup

Two values are configured by one single command.

(1) Control Centre Number is the phone number receiving the periodic report and regular report. Besides the periodic report on schedule (Command 5), report of any command will be sent to this number in addition to the mobile phone number sending the command. Max. 2 control centre can be defined.

Command: PWD:XXXX,CTRZ:YYYYYYYYYY,MM#%

XXXX	Password
Z	Control Centre Number (Max. 2 centres)
	1 means the first centre number
	2 means the second centre number
YYYYYYYY	Phone number in control centre
MM	Period Code of Automatic Scheduled Health Report

Example: PWD:1234, CTR1:123456789,05#%
Password: 1234
Report Health Status every 1 hour (refer Table #1)

(2) Periodic health status and any command from other mobile phone will be reported to the first control centre with number 123456789.

Table #1 Reference Table for the Automatic Periodic Health Status Report

00	No automatic report	07	Every 6 hours
01	Every 5 minutes	08	Every 12 hours
02	Every 15 minutes	09	Every 1 day (8:00am)
03	Every 30 minutes	10	Every odd day (8:00am)
04	Every 1 hour	11	1st, 7th, 14th, 21st, 28th Day (8:00am)
05	Every 2 hours	12	1st, 15th Day (8:00am)
06	Every 3 hours	13	1st Day of Each Month (8:00am)

SMS Pro automatically reports the unit health status on pre-defined schedule via SMS message.

[SMS Message received]

ST:XXX;T:2006/10/08/06:15;V:XXXX;AI1:0000:AI2:0000:K1:X;K2:X;K3:X;K4:X;K5:X;K6:X;K7:X;K8:X;OUT1:1:OUT2:1;OUT3:1;#.

ST	Unit Serial Number	XXX	ASCII code
T	Unit Internal Clock	XXXX	year/month/day/time
V	Operating Voltage	XXXX	
AI1	A/D Channel 1	X	hex digits
AI2	A/D Channel 2	X	hex digits
K1	Alarm Channel 1 K1:0 means "Open" K1:1 means "Closed"	K2~8	Alarm Channel 2~8
OUT1	Relay Output 1 OUT1:0 means "Open" OUT1:1 means "Closed"	OUT2~3	Relay Output 2~3

Example [SMS Message received]:

ST:001;2005/01/27/12:00;V:8.14;AI1:2312;AI2:2131;K1:1;K2:0;K3:0;K4:1;O:1

SMS Unit Current Status

ST	Unit Serial Number	001	
TIME	Unit Internal Clock	Date: 27 Jan 2005	Time: 12:00
V	Operating Voltage	8.14VDC	
AI1	A/D Channel 1	2132	
AI2	A/D Channel 2	X2131	
K1	Alarm Channel 1	1	Closed
K2	Alarm Channel 2	0	Open
K3	Alarm Channel 3	0	Open
K4	Alarm Channel 4	1	Closed
O	Output Relay 1	1	ON

11.5) Power Up Message

Whenever the unit is power up, the unit will automatically send the message "RESTART" to control centre configured in **command 4**.

RESTART!

11.6) System Clock Setup

Command: PWD:XXXX,TIME:AABBCCDDEE%

XXXX	Password
AABBCCDDEE	Year/Month/Day/Hour/Minute
Example:	PWD:1234,TIME:0602031327%
	Password: 1234
	Clock Set: 3 Feb 2006, 13:27

11.7) Alarm Phone Number Setup

8 Mobile Phone Numbers can be preprogrammed to receive the alarm phone dialing or alarm SMS.

Command: PWD:XXXX,ALMNU1:ZZZZZZZZZZ,2: ZZZZZZZZZZ,
3: ZZZZZZZZZZ,4:ZZZZZZZZZZ,5:ZZZZZZZZZZ,6:ZZZZZZZZZZ,
7: ZZZZZZZZZZ,8:ZZZZZZZZZZ#%

XXXX	Password
ZZZZZZZZZZ	Phone Number

Example 1:

PWD:1234,ALMNU1:12345678,2:36925814712,3:159357456,4:951753621#%

Password: 1234

Upon Alarm is triggered, call or SMS is made to following numbers.

Number 1	12345678
Number 2	36925814712
Number 3	159357456
Number 4	951753621

Example 2:

PWD:1234,ALMNU1:NUL,3:NUL#%

Password: 1234

Upon first example setup, call to following numbers is cancelled.

Number 1	12345678	Call not made
Number 2	36925814712	Call Retained
Number 3	159357456	Call not made
Number 4	951753621	Call Retained

NUL means no phone number will be set

11.8) Alarm Input Level & Alert Setup

Command: PWD:XXXX,ALMLEVELR:X,YY,ZZZZBBBB,NNN%

XXXX	Password
R	Alarm Channel Number
X	0 means "Disabled"
	1 means "Close" triggered alarm
	2 means "Open" triggered alarm
	3 means both "Close" or "Open" triggered alarm
YY	00 means alarm not report to Control Centre
	10 means alarm report to Control Centre 1
	01 means alarm report to Control Centre 2
	11 means alarm report to Control Centre 1 and 2
ZZZZBBBB	Selection of alarm phone dial and alarm SMS
	0 means no alarm report
	1 means "SMS" only
	2 means "phone dial" only
	3 means "SMS" first, and then "phone dial"

Z Z Z Z
- 4th phone number
- 3rd phone number
- 2nd phone number
- 1st phone number

B B B B
- 8th phone number
- 7th phone number
- 6th phone number
- 5th phone number

NNN	Relay Output Control
	0 means no relay output control
	1 means relay output triggered by alarm

N N N
- 3rd Relay Control
- 2nd Relay Control
- 1st Relay Control

Example 1:

PWD:1234,ALMLEVEL2:1,01,10300000,010%

Password: 1234

Alarm Channel 2: Once input is closed, alarm is triggered.

Control Centre 2 will be reported by SMS.

Phone Number 1	SMS alert
Phone Number 2	no report
Phone Number 3	SMS alert, then phone dial
Phone Number 4-8	no report
Relay Output 1	no control
Relay Output 2	triggered "CLOSE" by alarm
Relay Output 3	no control

Example 2:

PWD:1234,ALMLEVEL1:1,11,12300001,100%

Password: 1234

Alarm Channel 1: Once input is closed, alarm is triggered.

Control Centre 1 & 2 will be reported by SMS.

Phone Number 1	SMS alert
Phone Number 2	alarm phone dial
Phone Number 3	SMS alert , then phone dial
Phone Number 4-7	no report
Phone Number 8	SMS alert
Relay Output 1 -	triggered "CLOSE" by alarm
Relay Output 2 -	no control
Relay Output 3 -	no control

Example 3:

How to make the "Relay Output 3" triggered by alarm channels 2 & 5?

Once set, the relay output 3 will no longer be controlled by command 10 "COUT3:1'.

Method 1

Enable the control 3 triggered by alarm channels 2 & 5

PWD:1234,ALMLEVEL2:1,11,11110000,001%

PWD:1234,ALMLEVEL5:1,11,11110000,001%

Method 3

Programmed by PC Software "SMDPro" via RS232

Note: Microphone should be connected if "alarm phone dial" is selected.

11.9) SMS Alarm Message Setup

Alarm Channel 1 ~ 8

Command: PWD:XXXX,ALMYTEXT:□□□□□□□□□□□□□□#%

XXXX	Password	
Y	Alarm Channel Number (1~8)	
E	0	Close Triggered Alarm
	1	Open Triggered Alarm

□□□□□□□ SMS Message (max. 130 characters)

Example:

PWD:1234,ALM4T1XT:Main Door is Open#%

Alarm Channel 4 is triggered by "Open Contact", SMS Message "Main Door is Open" is sent to the pre-defined alarm mobile phone numbers.

PWD:1234,ALM4T0XT:Main Door is Closed#%

Alarm Channel 4 is triggered by "Close Contact", SMS Message "Main Door is Closed" is sent to the pre-defined alarm mobile phone numbers.

Alarm message will not be sent to control phone number.

Power Low Level, AD Channel 1 ~ 2

[Low Level Alert Message]

Command: PWD:XXXX,ACLYTEXT:□□□□□□□□□□□□# %

XXXX	Password
Y	AD Channel Number (0~2)
	0: Low Power Input Voltage Level Alarm
	1: AD Channel 1 Alarm
	2: AD Channel 2 Alarm
□□□□□□□	SMS Message (max. 100 characters)

Example:

PWD:1234,ACL2TEXT:Too Cold Alert#%

Alert Low: 5.250

AD value: 5.123

Password: 1234

Date: 2007-06-12

Time: 19:23

AD value captured is lower than threshold low, so alert SMS is sent with the following message content.

Too Cold Alert >ST:001;TM:28/01/2008,15:45;INPU AD2 ALARM!;A2:5.123.

[High Level Alert Message]

Command: PWD:XXXX,ACHYTEXT:□□□□□□□□□□□□# %

XXXX	Password
Y	AD Channel Number (1~2)
	1: AD Channel 1 Alarm
	2: AD Channel 2 Alarm
□□□□□□□	SMS Message (max. 100 characters)

11.10) Read the SMS Message Content

Previous command is used to program the alarm message content into the SMS Alarm Unit.

This command is used to read the message content for verification.

Alarm Channel 1 ~ 8

Command: PWD:XXXX,READYTEXT%

XXXX	Password
Y	Alarm Channel Number (1~8)
Alarm Message	NP: Message for "Close Triggered" alarm
	NC: Message for "Open Triggered" alarm
Reply Message:	ST001;T:2008/01/22/15/45;NP:□□□□□□□
	ST001;T:2008/01/22/15/45;NC:□□□□□□□

This command is used to read the message content for verification.

AD Channel 0 ~ 2

Command: PWD:XXXX,RDACHYTEXT%

XXXX	Password
Y	AD Channel Number (0~2)
	0: Low Power Input Voltage Level Alarm
	1: AD Channel 1 Alarm
	2: AD Channel 2 Alarm
Command:	PWD:XXXX,RDACH2TEXT%
Reply Message:	□□□□□>ST001;T:2008/01/22/15/45;INPU AD2 ALARM!;A2:4.200
	■■■■■ >ST001;T:2008/01/22/15/45;INPU AD2 ALARM!;A2:1.300
	□□□□□ = alert high alarm message
	■■■■■ = alert low alarm message

Example:

PWD:1234,ACL2TEXT:Alert Low#%

PWD:1234,ACH2TEXT:Alert High#%

Alert High>ST:000;T:08/01/2010,09:29;INPU AD2 ALARM!;A2:00000

Alert Low>ST:000;T:08/01/2010,09:29;INPU AD2 ALARM!;A2:00000

SMS Alarm Unit will reply to the mobile phone with the message content for that alarm channel.

11.11) Using SMS Alarm Messenger to send SMS Message

This command is used to make the SMS Alarm Unit to send the SMS for testing purpose.

Command: PWD:XXXX,SENDMSA:XB%

XXXX	Password
A	Phone Number (1~8)
XB	SMS message selection
	00: schedule health check status
	01: Closed Triggered Alarm Channel 1, SMS message
	02: Closed Triggered Alarm Channel 2, SMS message
	03: Closed Triggered Alarm Channel 3, SMS message
	04: Closed Triggered Alarm Channel 4, SMS message
	05: Closed Triggered Alarm Channel 5, SMS message
	06: Closed Triggered Alarm Channel 6, SMS message
	07: Closed Triggered Alarm Channel 7, SMS message
	08: Closed Triggered Alarm Channel 8, SMS message
	09: manual input message
	10: High Voltage Alarm Message [not available]
	11: AD Channel 1, Alert High SMS message
	12: AD Channel 2, Alert High SMS message
	13: Open Triggered Alarm Channel 1, SMS message
	14: Open Triggered Alarm Channel 2, SMS message
	15: Open Triggered Alarm Channel 3, SMS message
	16: Open Triggered Alarm Channel 4, SMS message
	17: Open Triggered Alarm Channel 5, SMS message
	18: Open Triggered Alarm Channel 6, SMS message
	19: Open Triggered Alarm Channel 7, SMS message
	20: Open Triggered Alarm Channel 8, SMS message
	21: Low Voltage Alarm Message
	22: AD Channel 1, Alert Low SMS message
	23: AD Channel 2, Alert Low SMS message

For example: PWD:1234,SENDMS4:09,Good Morning%

SMS message "Good Morning" will be sent to the phone number 4.

Error message about setting A:

Number Choice Miss	A is not within 1~8
Number Non Exist	No phone number is preset in that location

Error message about setting B:

Did not specify SMS contents	B is not within 00~20

Reply confirmation message:

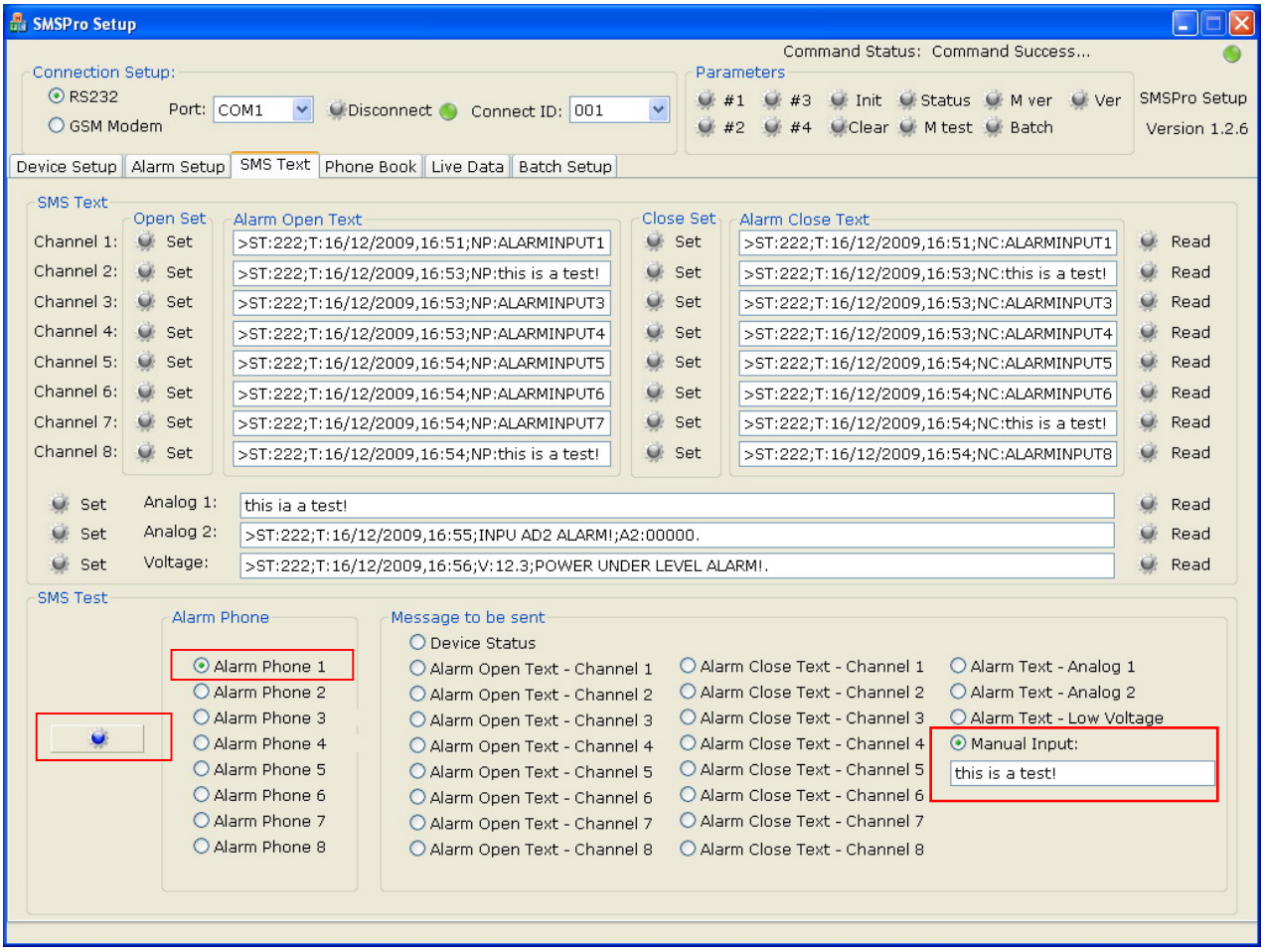
Success! SMS Alarm unit succeeds in sending out the message

Failed! Operation failed but phone number exists

When using SMSPro_Setup Software, SMS Alarm Messenger can be used as a GSM Modem sending SMS message to a user alarm mobile phone number.

Please select the following:

- Select alarm phone number 1, please make sure that this alarm phone number must be preset in device properties first
- Type the message e.g. "this is a test" in Manual Input box
- Click  button
- Message "sms alarm" will be sent to the alarm phone 1 as below



11.12) Relay Output Control

Command: PWD:XXXX,COUTN:Y%

XXXX	Password	
N	Relay Output Channel (1 ~ 3)	
Y	1	Turn On (Close) the output
	0	Turn Off (Open) the output

Relay Output is Normally Open by default. The default can be changed by the jumper on the board.

- Command "COUTN:1" is NOT valid when the relay output is triggered by alarm. Reply message will be "ST:XXX" in this case.
- In the above case, command "COUTN:0" is used to reset the relay output after the alarm is triggered.

11.13) Relay Output Delay Time

Command: PWD:XXXX,OUTNDLAY:YYYY%

XXXX	Password	
N	Relay Output Channel (1 ~ 3)	
YYYYY	0000 – 9999 seconds	
	0000	Turn On or Off the output (default)
	0005	Turn On the output for 5 seconds, and then Off again
		Turn Off the output for 5 seconds, and then On again

Relay output delay time is good for controlling the device e.g. electric door lock/unlock. Only a time lapse on/off is necessary.

11.14) Operating Voltage Low Level Alarm SMS

When the power supply voltage level is below the min. level at 5.34VDC, alert SMS is sent.

Date: 2007-06-15
Time: 13:25
ST:001;TM:200706151325;V:5.34#

11.15) Input Voltage Low Level Alarm

This command is to set the action to be done once the operating voltage drops below the preset value. Value of current operating voltage can be retrieved by the command 2.

Command: PWD:XXXX,ADCOUT0:YY,ZZZZBBBB,NNN%

XXXX Password

YY
00 means alarm not report to Control Centre
10 means alarm report to Control Centre 1
01 means alarm report to Control Centre 2
11 means alarm report to Control Centre 1 and 2

ZZZZBBBB Selection of alarm phone dial and alarm SMS
0 means no alarm report
1 means "SMS" only
2 means "phone dial" only
3 means "SMS" first, and then "phone dial"

Z Z Z Z
| | | |
| | | 4th phone number
| | 3rd phone number
| 2nd phone number
1st phone number

B B B B
| | | |
| | | 8th phone number
| | 7th phone number
| 6th phone number
5th phone number

NNN Relay Output Control
0 means no relay output control
1 means relay output triggered by alarm

N N N
| | |
| | 3rd Relay Control
| 2nd Relay Control
1st Relay Control

11.16) Input Voltage Alert Level Setup

Command: PWD:XXXX,POWVL:mmmm%

XXXX Password

Mmmm when power input is lower than this value, alarm is triggered

Example: PWD:1234,POWVL:8.25%

Password: 1234

When the battery voltage is lower than 8.25VDC, alarm is triggered.

The reactive will be setup by the command above.

11.17) Arm/Disarm Setup

Command: PWD:XXXX,ARM%

XXXX Password

Example: PWD:1234,ARM%

Password: 1234

Unit is armed, and in alert status

Command: PWD:XXXX,DISARM%

XXXX Password

Example: PWD:1234,DISARM%

Password: 1234

Unit is disarmed, and no alarm is reported

11.18) System Parameters RESET

PWD:XXXX,PARAMETER&%

This is to reset the parameters and password into default setting.

[SMS Message received]

Parameter initialize success!

11.19) System Version Check

PWD:XXXX,CHECKVR%

[SMS Message received]

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11.20) Return Message

Command succeeds

SMS Message: Function Code & Setting Parameters Set in the command

Command fails

SMS Message: SMS format is error!

11.21) Default Setting

PWD:1234,PARAMETER1%

ST:000;T:2006/10/01/01:01;H:1;F1:,00;F2;,00;XH:31#

PWD:1234,PARAMETER2%

ST:000:VL:7.00,O:00,0000,000;A1M:5.000,0.000,1.000,0,5.000,0.500,O:00,00000000,000;A2M:5.000,0.000,1.000,0,5.000,0.000,O:00,00000000,000#

PWD:1234,PARAMETER3%

ST:000;K1:1,O:00,00000000,000;K2:1,O:00,00000000,000;K3:1,O:00,00000000,000;K4:1,O:00,00000000,000;K5:1,O:00,00000000,000;K6:1,O:00,00000000,000;K7:1,O:00,00000000,000;K8:1,O:00,00000000,000;OTY:0000,0000,000;#

PWD:1234,PARAMETER4%

ST:000; C1:,1;C2:,1;C3:,1;C4:,1; C5:,1; C6:,1; C7:,1; C8:,1;#

11.22) System Parameters Report

[SMS Message received]
ST:XXX;T:2006/10/08/08:00;H:X;F1:XXXXXXXXXXX,YY;F2;XXXXXXXXXXX,YY;
XH:RR;ER:xyz#

ST:	XXX	Unit Serial Number	
T:	2006/10/08/08:00	Date/Time	
H:	X	1	Arm
		0	Disarm
F1:	1st Control Centre Number		
	XXXXXXXXXX	Control Centre Phone Number	
	YY	Automatic Health Report Schedule	
F1:	2nd Control Centre Number		
C1	1st Alarm Phone Number		
	XXXXXXXXXX	Alarm Phone Number	
	Y	1	Alarm Report enabled
		0	Alarm Report disabled
XH:RR	GSM Network Signal Strength (1 ~ 40)		
ER: xyz			Normal / Defect
	GSM Module	x:	0 / 1
	SIM Card/Service	y:	0 / 1
	GSM Network Coverage	z:	0 / 1

PWD:XXXX,PARAMETER4%
ST:XXX;C1:XXXXXXXXXXX,Y;C2:XXXXXXXXXXX,Y;C3:XXXXXXXXXXX,Y;C4:XXXXXXX
XXXX,Y;C5:XXXXXXXXXXX,Y;C6:XXXXXXXXXXX,Y;C7:XXXXXXXXXXX,Y;
C8:XXXXXXXXXXX,Y;#

C2 ~ C8	2nd ~ 8th Alarm Phone Number

PWD:XXXX,PARAMETER2%

[SMS Message received]

ST:XXX;VL:XXXX,O:AX,BBBBBBBB,CCC;A1M:XXXXX,UUUUU,YYYYY,R,HHHHH,PPPPP,O:AX,BBBBBBBB,CCC;A2M:XXXXX,UUUUU,YYYYY,R,HHHHH,PPPPP,O:AX,BBBBBBBB,CCC;#

VL	Min. Operating Voltage, below this level will trigger alarm 7VDC by default	
A	alarm report to Control Centre 1	0 means no report 1 means report
X	alarm report to Control Centre 2	0 means no report 1 means report
BBBBBBBB	report status for 8 phone numbers 0 means no report 1 means "SMS" but no "phone dialing" 2 means "phone dialing" but no "SMS" 3 means "SMS" and then "phone dialing"	
CCC	relay output control 0 means relay is not controlled by low voltage alarm 1 means relay is turned on by low voltage alarm	

PWD:XXXX,PARAMETER3%

ST:XXX;K1:N,O:AX,BBBBBBBB,CCC;K2:N,O:AX,BBBBBBBB,CCC;K3:N,O:AX,BBBBBBBB,CCC;K4:N,O:AX,BBBBBBBB,CCC;K5:N,O:AX,BBBBBBBB,CCC;K6:N,O:AX,BBBBBBBB,CCC;K7:N,O:AX,BBBBBBBB,CCC;K8:N,O:AX,BBBBBBBB,CCC;OTY:0000,0000,0000;#

Message is longer than 160 bytes.

By SMS, two separate messages will be sent via GSM.

By RS232 port, one message will be uploaded to PC.

Alarm 1 ~ 8 Status Report

K1	Alarm Channel 1	
N	0 means "Disabled"	
	1 means "Close" triggered alarm	
	2 means "Open" triggered alarm	
	3 means both "Close" or "Open" triggered alarm	
O	Control Centre Report Setting	
A	alarm report to Control Centre 1	0 means no report
		1 means report
X	alarm report to Control Centre 2	0 means no report
		1 means report
BBBBBBBB	report status for 8 phone numbers	
	0 means no report	
	1 means "SMS" but no "phone dialing"	
	2 means "phone dialing" but no "SMS"	
	3 means "SMS" and then "phone dialing"	
CCC	relay output control	
	0 means control not triggered by alarm	
	1 means alarm triggered control	
OTY	0000	1st relay time lapse
	0000	2nd relay time lapse
	0000	3rd relay time lapse

COMMAND (Analog to Digital Channel)

11.23) AD Parameters Setup

PWD:XXXX,ADVALEB:UUUUU,XXXXX,NNNNN,Y,ZZZZZ,WWWWW%

B	Channel 1 or 2	
UUUUU	Measuring Range Upper Limit	
XXXXX	Measuring Range Lower Limit	
NNNNN	Start Value	
Y	0: AD Alarm disabled	
	1: AD Alarm enabled,	Relay On Time Lapse
	2: AD alarm enabled,	Relay On when AD is higher than Alert High Relay Off when AD resumes normal
	3: AD alarm enabled,	Relay On when AD is lower than Alert Low Relay Off when AD resumes normal
	4: AD alarm enabled,	Relay On when AD is beyond Alert High & Low Relay Off when AD is within Alert High & Low
ZZZZZ	Alert High Value Setup	
WWWWW	Alert Low Value Setup	

Operation in case Y=1:

a) When the captured analog value is higher or lower than the alert values, alarm is triggered.
b) SMS or Dial Phone etc corresponding actions described on next page will be taken.
c) Relay is turn on, and off after preset time lapse.
d) Alarm will only be re-triggered when the captured analog value returns to normal range and then reaches beyond the alert values again.

Operation in case Y=4:

a) When the captured analog value is higher or lower than the alert values, alarm is triggered.
b) SMS or Dial Phone etc corresponding actions described on next page will be taken.
c) Relay is turn on, and only off when analog value is back within Alert Range.
d) Alarm will only be re-triggered when the captured analog value returns to normal range and then goes beyond the alert values again.

Application:

- When temperature is high, ventilation fan is turn on to cool down.
- When temperature is normal again, ventilation fan is turn off to save power.

11.24) AD Channel Alarm Setup

PWD:XXXX,ADCOUTB: YY,ZZZZBBBB,NNN%

XXXX — Password

B — 0: Low Voltage Alarm
1: AD Channel 1 Alarm
2: AD Channel 2 Alarm

YY — 00 means alarm not report to Control Centre
10 means alarm report to Control Centre 1
01 means alarm report to Control Centre 2
11 means alarm report to Control Centre 1 and 2

ZZZZBBBB — Selection of alarm phone dial and alarm SMS
0 means no alarm report
1 means "SMS" only
2 means "phone dial" only
3 means "SMS" first, and then "phone dial"

Z Z Z Z
- 4th phone number
- 3rd phone number
- 2nd phone number
- 1st phone number

B B B B
- 8th phone number
- 7th phone number
- 6th phone number
- 5th phone number

NNN — Relay Output Control
0 means no relay output control
1 means relay output triggered by alarm

N N N
- 3rd Relay Control
- 2nd Relay Control
- 1st Relay Control

11.25) System Parameters Report (about AD channels)

PWD:XXXX,PARAMETER2%

[SMS Message received]

ST:XXX;VL:XXXXX,O:AX,BBBB,CCC;A1M:XXXXX,UUUUU,YYYYY,R,HHHHH,PPPPP,O:AX,BBBBBBBB,CCC;A2M:XXXXX,UUUUU,YYYYY,R,HHHHH,PPPPP,O:AX,BBBBBBBB,CCC;#

A1	AD Channel 1	
M:	XXXXX	Range Upper Limit
	UUUUU	Range Lower Limit
	YYYYY	Start Value
R	1	AD Channel Alarm enabled
	0	AD Channel Alarm disabled
HHHHH	Alarm Triggered Alert High Value	
PPPPP	Alarm Triggered Alert Low Value	

O:	A	alarm report to Control Centre 1
		0 means no report
		1 means report
	X	alarm report to Control Centre 2
		0 means no report
		1 means report

BBBBBBBB	report status for 8 phone numbers
	0 means no report
	1 means “SMS” but no “phone dialing”
	2 means “phone dialing” but no “SMS”
	3 means “SMS” and then “phone dialing”
CCC	relay output control
	0 means relay is not controlled by alarm
	1 means relay is turned on by alarm

A2M…	AD Channel 2

Note: AI1 and AI2 values are reported by COMMAND [PWD:XXXX,STATUS%]

Example:

A1M:0.600,0.000,1.000,1,0.500,0.100

0.600	range upper limit	
0.000	range lower limit	
1.000	Start Value is "1.000"	(4mA * 250Ω=1)
1	Alarm Enabled	
0.500	Threshold High	
0.100	Threshold Low	

Standard range of data captured in AD Channel 1 is 4~20mA.

AI1 value depends on user setting of "Range", "Start Value" and the input current "c".

Start Value = 4mA x 250Ω = 1

AD Range = 0.600 - 0.000 usually specified by the current type transducer

$$AI1 = \frac{(c \times 250 - \text{Start Value})}{(0.02 \times 250 - \text{Start Value})} \times \text{Range}$$

AI1 reported value will be = Range x (0.012 x 250 – Start Value) / (5 – Start Value)

When current input is 12mA, AI1 = 0.6 x (0.012 x 250 – 1) / (5 – 1) = 0.3

When user requires:
High level alarm at 0.018mA
Low level alarm at 0.008mA

H = (0.018 x 250 – 1) x 0.6 / (0.02 x 250 – 1) = 0.525
L = (0.008 x 250 – 1) x 0.6 / (0.02 x 250 – 1) = 0.15

When AI1 value is over 0.525 or below 0.150, alarm will be triggered – SMS alert message will be sent out to phone number 1 and relay 1 is turned on.

Command: PWD:1234,ADVALE1:0.600,0.000,1.000,1,0.525,0.150%
Command: PWD:1234,ADCOUT1:10,10000000,100%

Temperature Sensor Operation

[Pro-ST]

- Temperature Sensor is bundled with measuring range -55 ~ 125°C.
- AD Channel 1, 2 are used for temperature measuring

11.26) Manual Temperature Check

Command: PWD:XXXX,STATUS%

[SMS Message received]

ST:XXX;T:2005/01/28/13:00;V:XXXX;AI1:0000;AI2:0000;K1:X;K2:X;K3:X:K4:X;K5:X;K6:X;K7:X:K8:X;OUT1:Y:OUT2:Y;OUT3:Y;#.

AI2	Current Temperature

11.27) Temperature Alarm Setup

PWD:XXXX,ADVALE2:UUUUU,XXXXX,NNNNN,Y,ZZZZZ,WWWWW%

2	AD Channel 2		
UUUUU	Range Upper Limit	0.000	Default
XXXXX	Range Lower Limit	250.0	Default
NNNNN	Start Value	000.0	Default
Y	1: Triggered Alarm enabled		
	0: Triggered Alarm disabled		
ZZZZZ	Alert High Temperature Setup		
WWWWW	Alert Low Temperature Setup		

Example:

When temperature is above 70° or below 15°, SMS alarm message will be sent to phone number 3 and relay output 1 will be triggered.

AD Channel	2
Measuring Range	250.0
Start Value	000.0
Triggered Alarm enabled	1
Alert High Temperature Setup	070.0
Alert Low Temperature Setup	015.0

PWD:1234,ADVALE2:250.0,0.000,000.0,1,070.0,015.0%

PWD:1234,ADCOUT2:00,00100000,100%

Temperature & Humidity Sensor Operation
[Pro-SX]

- Humidity Sensor is built-in with measuring range 0 ~ 100%RH
- AD Channel 2 is used for temperature measuring
- AD Channel 1 is used for humidity measuring

11.28) Manual Humidity Check

Command: PWD:XXXX,STATUS%

[SMS Message received]

ST:XXX;T:2005/01/28/13:00;V:XXXX;AI1:0000;AI2:0000;K1:X;K2:X;K3:X:K4:X;K5:X;K6:X;K7:X:K8:X;OUT1:Y:OUT2:Y;OUT3:Y;#.

AI1	Current Humidity
AI2	Current Temperature

11.29) Humidity Alarm Setup

PWD:XXXX,ADVALE1:UUUUU,XXXXX,NNNNN,Y,ZZZZZ,WWWWW%

1	AD Channel 1		
UUUUU	Range Upper Limit	140.0	
XXXXX	Range Lower Limit	0.000	
NNNNN	Start Value	000.0	Default
Y	1: Triggered Alarm enabled		
	0: Triggered Alarm disabled		
ZZZZZ	Alert High Humidity Setup		
WWWWW	Alert Low Humidity Setup		

Example:

When humidity is above 70%RH or below 15%RH, SMS alarm message will be sent to phone number 2 and relay output 3 will be triggered.

AD Channel	1
Measuring Range	140.0 – 0.000
Start Value	000.0
Triggered Alarm enabled	1
Threshold High Humidity Setup	070.0
Threshold Low Humidity Setup	015.0

PWD:1234,ADVALE2:140.0,000.0,1,070.0,015.0%

PWD:1234,ADCOUT1:00,01000000,001%

External Temperature Sensor Specification:

Model:	DS18B20		
Power Input:	5VDC		
Measuring Range:	-55 ~ 125°C		
Output Signal:	Digital Signal		
AD2 Channel Setup	Start Value:	000.0	Default
	Range:	250.0	Default

External Humidity Sensor Specification:

Model:	CHM-01A (Resistance Type Humidity Sensor)	
Power Input:	5V±5%	
Power Rating:	5mA max.(2mA avg.)	
Operating Range:	Temperature	0~60°C
	Humidity	10% -- 95%RH
Measuring Range:	0~100%RH	
Temperature Factor:	0.4%RH/°C	
	30~80%RH @5V Operating Voltage	
	Temperature Range=10~40°C (reference point: 25°C)	
Accuracy:	±5%RH (at 25, Input 5V)	

11.30) Fine Tuning of Measuring Temperature

Temperature sensor is digital type. No tuning or calibration is needed.

Humidity sensor needs calibration.

Output Signal:	0~3 DCV		
	0VDC = 0RH		
	3VDC = 100RH		
AD1 Channel Setup	Start Value:	000.0	Default
	Range:	140.0	Default

Adjust the Range of AD1 Channel Setup from 100 ~ 150 for calibration.

ⓘ "SMSPRo_Setup" Software provides a one-click button operation of calibration. Please refer to the manual of Setup Software.

12. Dead Loop Problem

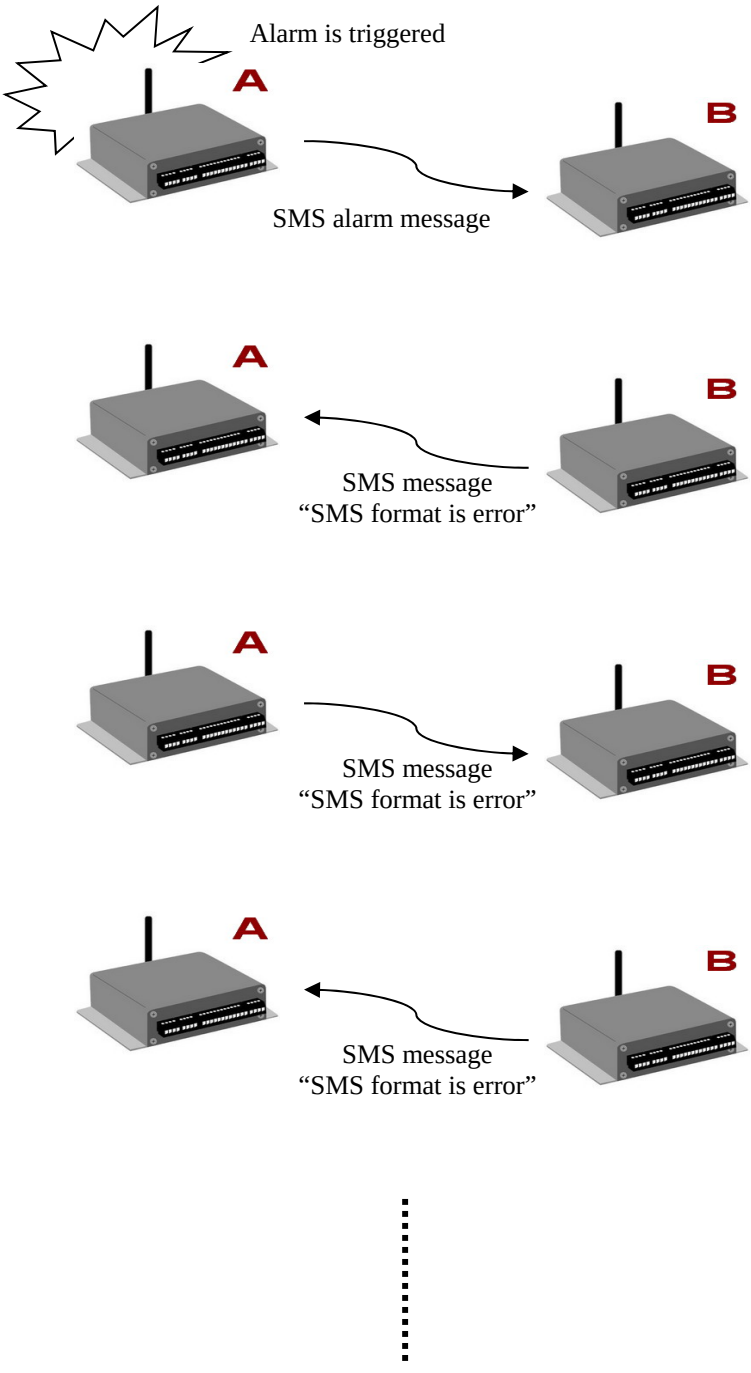
Please find below the possible cause of the "dead loop" problem which creates thousands of SMS delivery. User must pay attention to the setup of phone numbers.

SMS Alarm Messenger – Unit A
SIM Card Phone Number: 12345678
⊗ Either "One of alarm phone number" or "Control Centre Phone Number": 33333333

SMS Alarm Messenger – Unit B
SIM Card Phone Number: 33333333

1. When [Unit A] alarm is triggered, it will send alarm message to alarm phone number or control centre phone number.
2. When "alarm phone number" or "control centre phone number" is set to the phone number of another SMS Alarm Unit [Unit B], "Dead Loop" problem happens.
3. [Unit B] receives the alarm message from [Unit A]. Since it will consider this incoming text as a wrong command message, [Unit B] will reply to [Unit A] a message "SMS format is error!".
4. Then, [Unit A] receives the message "SMS format is error!" from [Unit B], it also considers this incoming text as a wrong command message. Therefore, [Unit A] will reply to [Unit B] a message "SMS format is error!".
5. Again, [Unit B] receives the same message from [Unit A]. Since it will also consider this incoming text as a wrong command message, [Unit B] will reply to [Unit A] a message "SMS format is error!".
6. Such case will cause a serious "Dead Loop" problem.

Schematics of "Dead Loop" Problem



13. Power Loss & Resume

1) PWD:1234,ARM%

   Above command is followed by another command e.g. PWD:XXXX,SN:YYY%

   ARM status will be kept when power is lost and resumed.

2) PWD:1234,ARM%

   No other command is followed

   DISARM status will be as default when power is lost and resumed.

14. Safety and Regulatory Notice

All applicable regulatory compliance statements, product certification markings, and safety and electromagnetic compatibility (EMC) standards and regulations the Data Logger is compliant with.

European Union Declaration of Conformity
Statement
We declare under our sole responsibility that the product GS828 GPRS Data Logger is in conformity with all applicable essential requirements necessary for CE marking, following the provisions of the European Council Directives 2004/108/EC (EMC Directive) and 2006/95/EC (Low Voltage Directive).

The product is properly CE marked demonstrating this conformity and is for distribution within all member states of the EU with no restrictions.
This product follows the provisions of the European Directives 2004/108/EC and 2006/95/EC.

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