

# GSM SMS Alarm Messenger

## Premium Edition

<b>SMS Basic</b>	<b>SMS GSM alarm device [Basic]</b>
<b>SMS Pro</b>	<b>SMS GSM alarm device [Advanced]</b>
<b>SMS Pro-X</b>	<b>SMS GSM alarm &amp; data capturing device [Professional]</b>
<b>SMS Pro-S</b>	<b>SMS GSM alarm device</b> <b>[Temperature Sensor]</b>
<b>SMS Pro-SX</b>	<b>SMS GSM alarm device</b> <b>[External Temperature &amp; Humidity Sensor]</b>
<b>SMS Pro-QX</b>	<b>SMS GSM alarm &amp; data capturing device [Quad Band]</b>
<b>SMS Pro-QS</b>	<b>SMS GSM alarm &amp; data capturing device</b> <b>[Temperature Sensor + Quad Band]</b>
<b>SMS Pro-QSX</b>	<b>SMS GSM alarm &amp; data capturing device</b> <b>[External Temperature &amp; Humidity Sensor + Quad Band]</b>

Features	Basic	Pro	Pro-X	Pro-QX	Pro-S	Pro-SX
Alarm Input	8	8	8	8	8	8
Relay Output	1	3	3	3	3	3
Phone Number	6	6	6	6	6	6
Low Voltage Alert	✓	✓	✓	✓	✓	✓
Program by SMS	✓	✓	✓	✓	✓	✓
Program by PC Software	✓	✓	✓	✓	✓	✓
Voice	✓	✓	✓	✓	✓	✓
AD Channels	-	-	2	2	1	0
AD Hi/Lo Alert	-	-	✓	✓	✓	✓
Temperature Sensor	-	-	-	-	1	1
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

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## 1. Overview

### a. Introduction

SMS Pro is designed and integrated with a 16 bit MCU and reliable Siemens 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 10 latest SMS alarm message and resend when sending SMS failed
- ☑ 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 (Opto-isolated)
- ☑ N/C, N/O, State Change, O/C triggered levels
- ☑ 2 x AD channels
- ☑ Threshold High, Threshold Low, Closed
- ☑ 3 x Relay Outputs, NC/NO
- ☑ Alarm or SMS activated
- ☑ 4 x Mobile/Fixed Phone 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
- ☑ Sound monitoring upon microphone connected
- ☑ SMS alarm message text programmable
- ☑ Automatic 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**

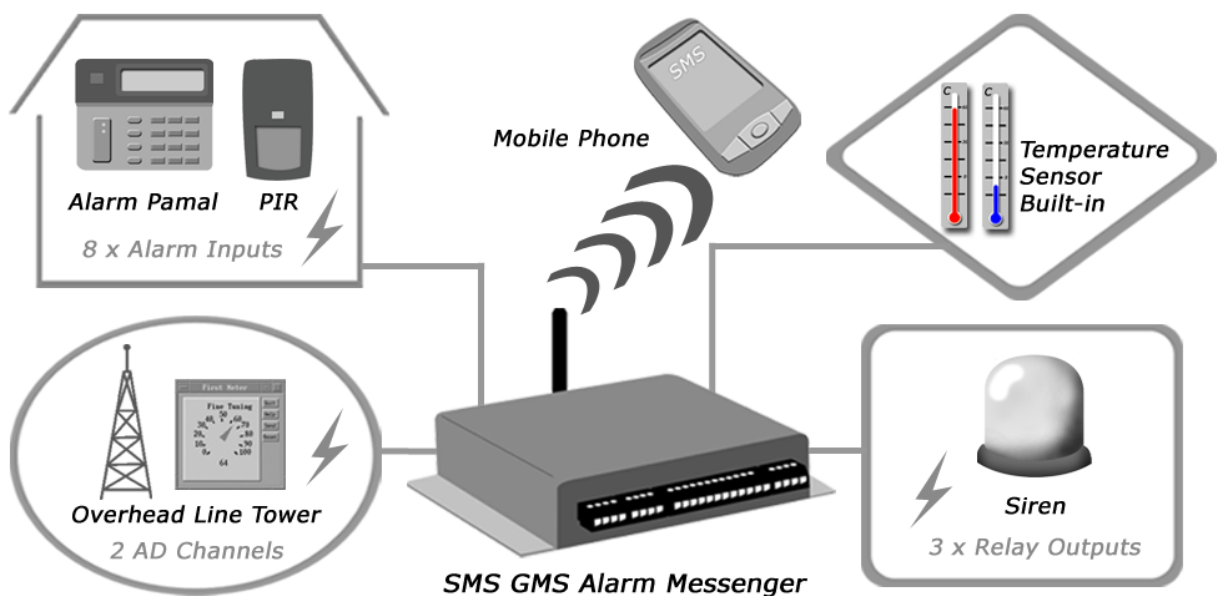
Operating Voltage	DC7~12V
Current	500mA (SMS Send/Receive) 50mA (standby)
Peak Pulse Current	< 1A
Dimension	135 x 105 x 25 mm
Operating Temperature	-25° C ~ 55° C
Weight	600g
RS232	9600bps, 8 Data Bits, None Parity, 1 Stop Bit

**f. Antenna Requirement**

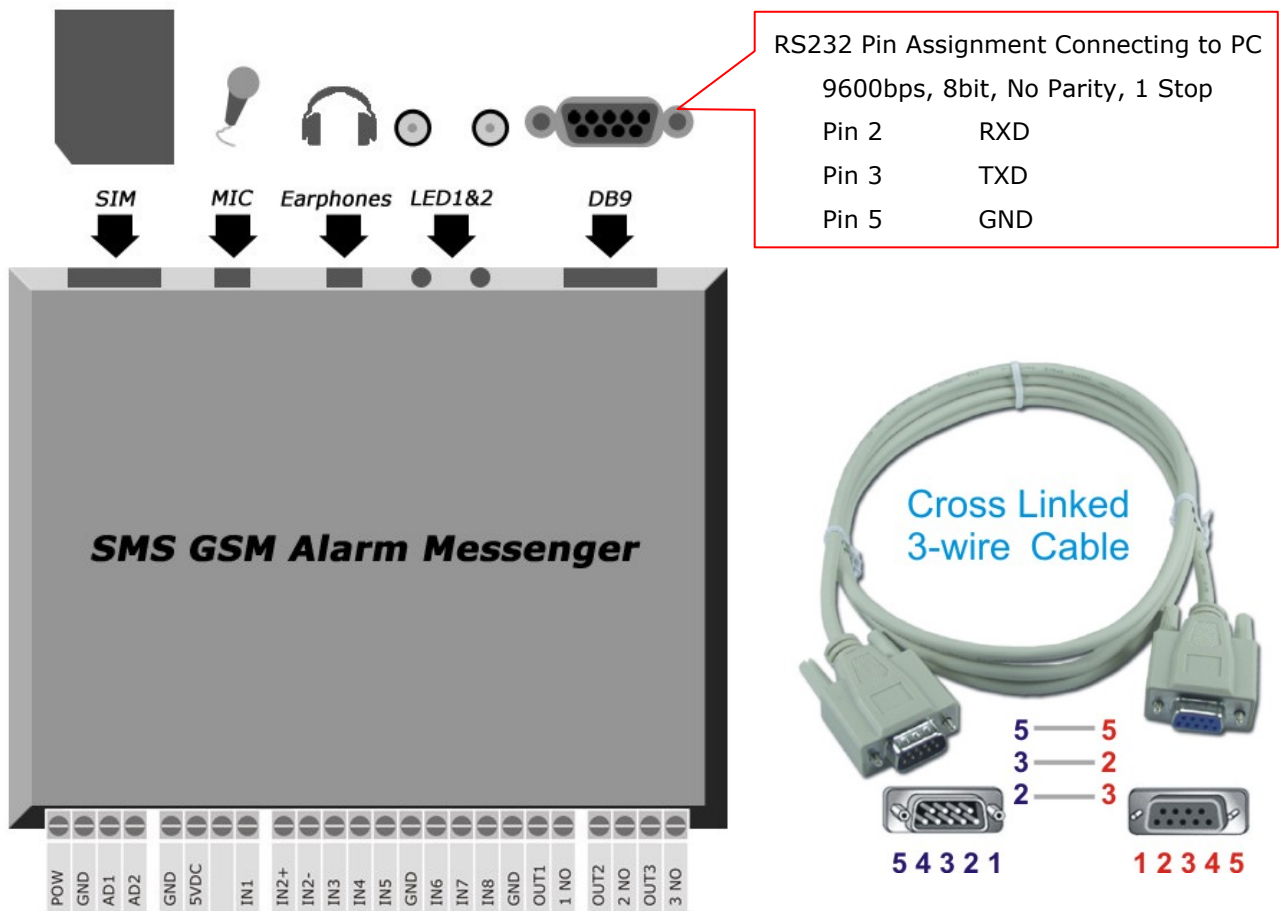
	GSM 900	GSM 1800
RF Frequency	925~960MHz	1805~1880MHz
TX Frequency	880~912MHz	1710~1785MHz
RF Rating	2W 12.5% Loop Loading	1W 12.5% Loop
Loading Resistance	50Ohm	
Radiation S/N	0dBi	

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

**g. Operation**



## 2. Connection



**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]

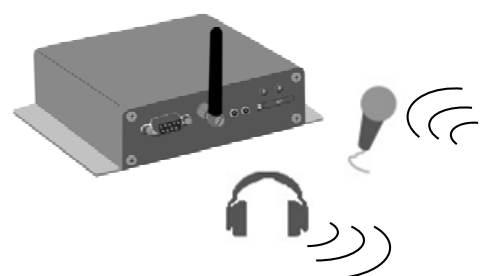
On  
 \* Normal

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

### Sound Monitoring

SMS Pro automatically picks up any phone call after 8 rings.

By connecting the microphone, mobile phone user can hear the sound from the SMS Messenger.



### 3. Inserting SIM card

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



1



2



3



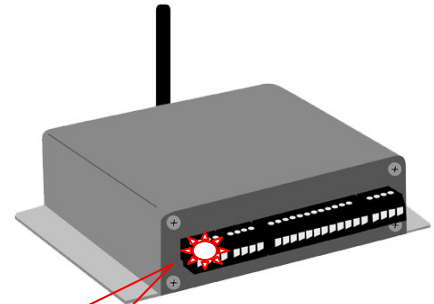
Make sure that the golden contact is facing down when inserting the SIM card caddy.

#### 4. Temperature Sensor [Pro-S]

##### A) Internal Version

An internal temperature sensor is integrated inside the SMS alarm metal case detecting the surrounding temperature.

Temperature Sensor: LM35DZ  
 Temperature Range: 0 ~ 100°C  
 Accuracy: 0.1°C  
 AD Channel: 2  
 High Temperature SMS Alert  
 Low Temperature SMS Alert

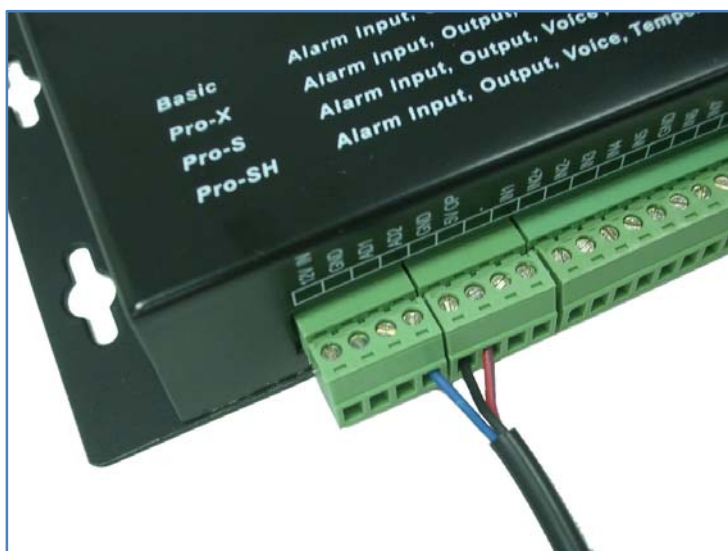


Internal temperature sensor

##### B) External Version

An external temperature sensor is integrated inside the SMS alarm metal case detecting the surrounding temperature.

Temperature Sensor: DS80B20  
 Temperature Range: -50 ~ 125°C  
 Accuracy: 0.1°C  
 AD Channel: 2  
 High Temperature SMS Alert  
 Low Temperature SMS Alert



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

External temperature & humidity sensor is supplied with 0.5m cable. Accuracy will be lower if cable is longer.

External Temperature Sensor

Temperature Range: -50 ~ 125°C

Accuracy: 0.1°C

AD Channel: 2

High Temperature SMS Alert

Low Temperature SMS Alert



External Temperature & Humidity sensor



External Humidity Sensor

Humidity Range: 0 ~ 100%RH

Accuracy: ± 5%RH

AD Channel: 1

High Humidity SMS Alert

Low Humidity SMS Alert

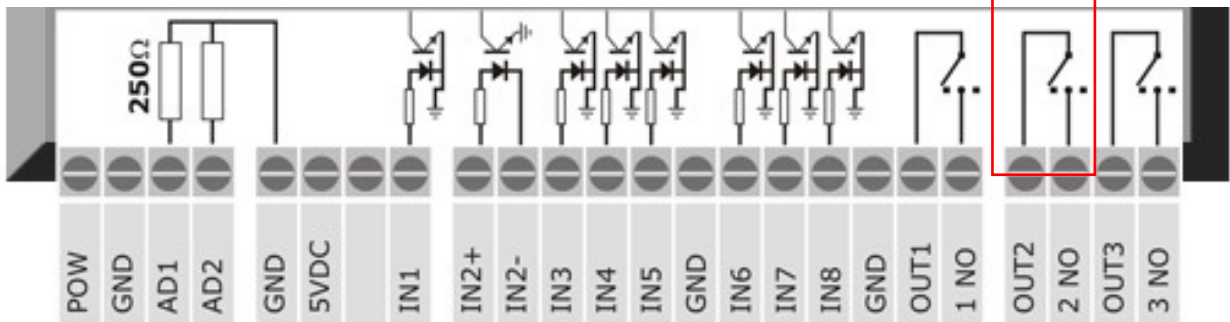
NOTE: Humidity Sensor must be installed upwards.



### 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 voltage type sensor]

Alarm Input

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

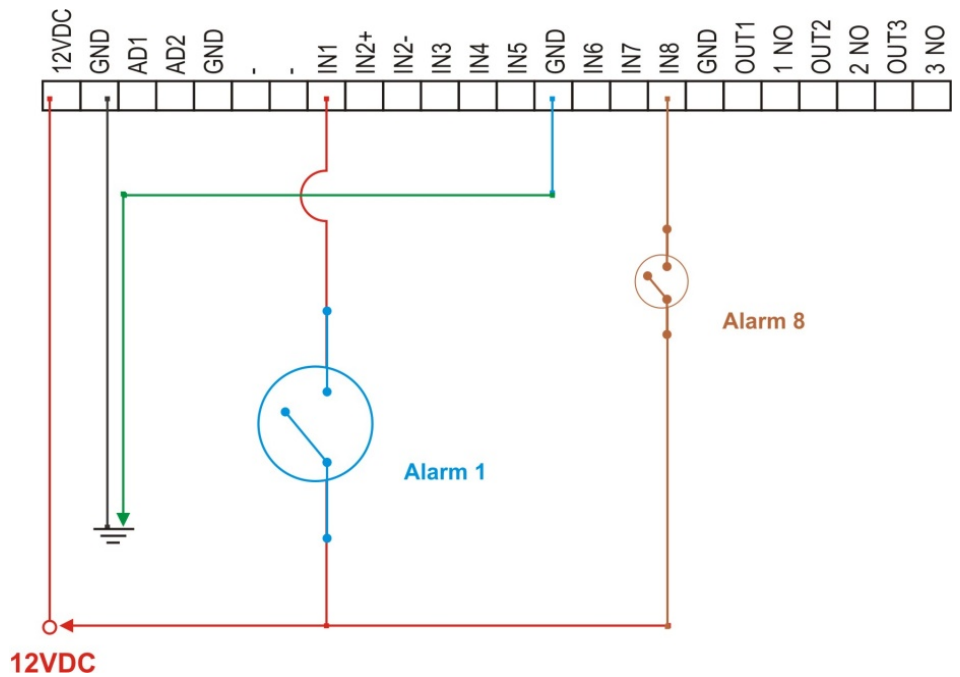
(a) IN1, IN3, IN4, IN5, IN6, IN7, IN8

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

(b) IN2+, IN2-

IN2+: DC7~12V

IN2-: Ground

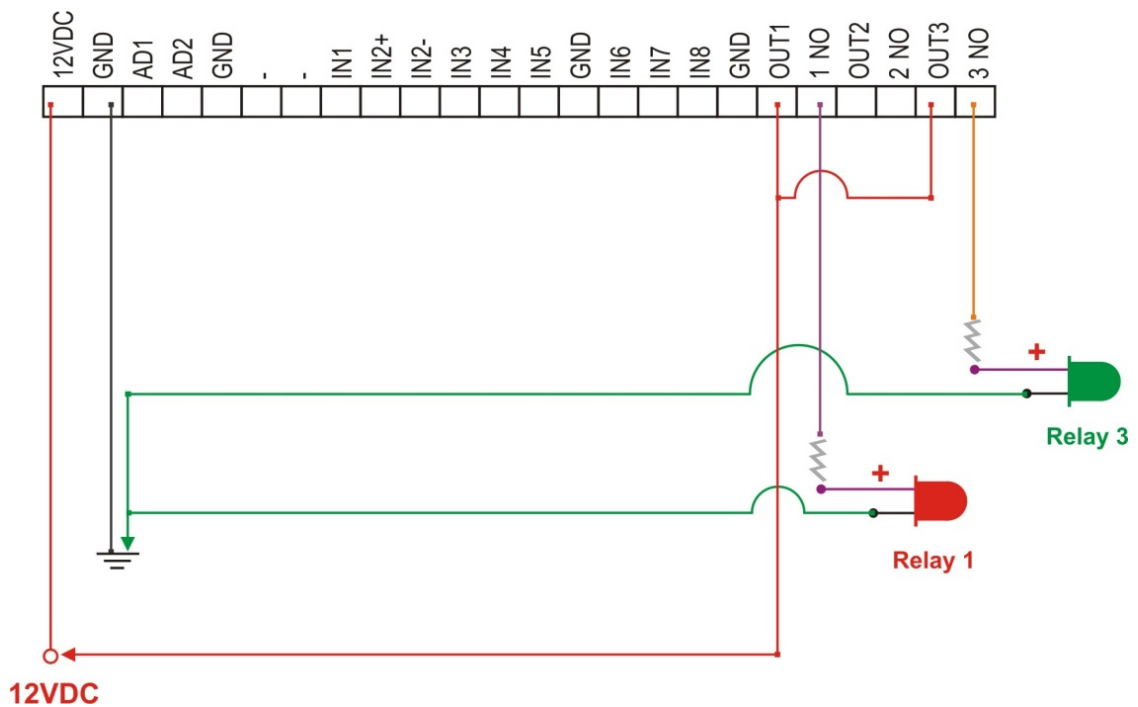


Relay Output

OUT1, OUT2, OUT3

Max. 1A, 24VDC, 1A, 120VAC

NC/NO (selected by jumper on board)



Analog to Digital Channel

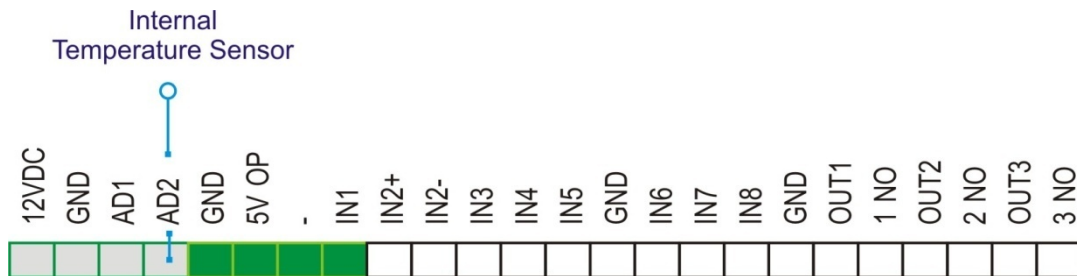
AD1 Analog Digital Channel 1, DC 7-15V Current 4~20mA

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

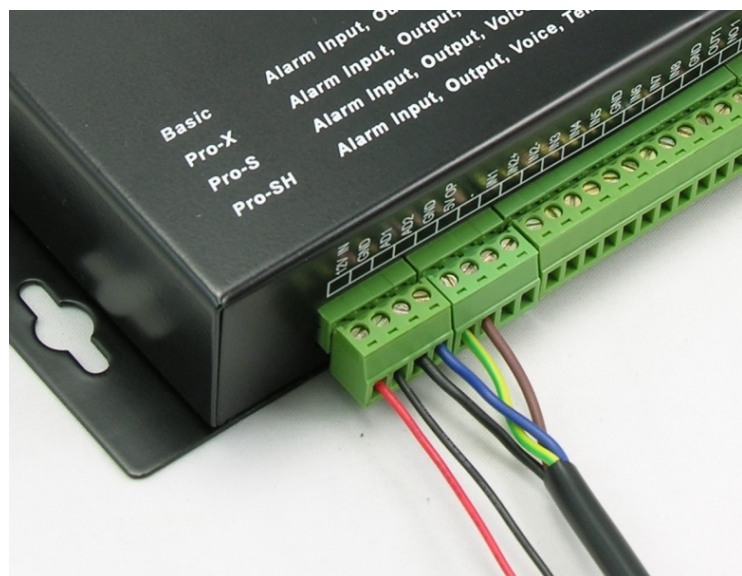
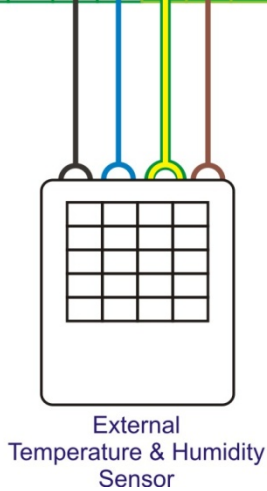
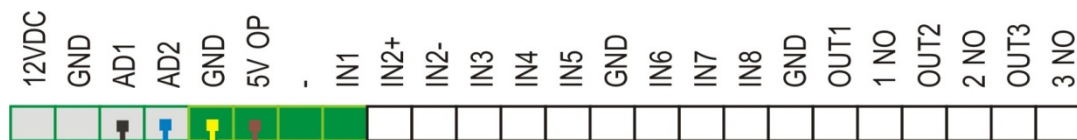
**Models**

1) Pro-X AD1 & 2 are available

2) Pro-S AD2 is used for temperature sensor  
AD1 is available

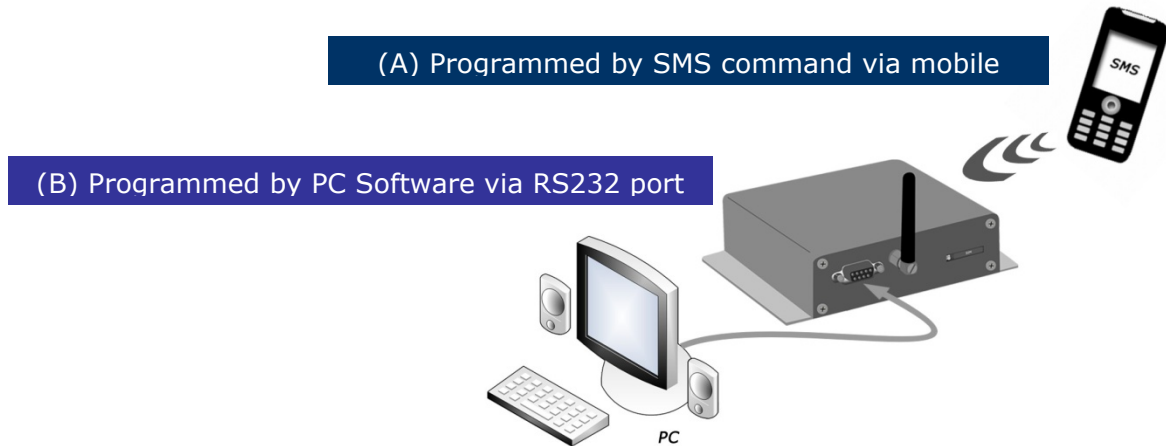


3) Pro-SH AD2 is used for temperature sensor  
AD1 is used for humidity sensor

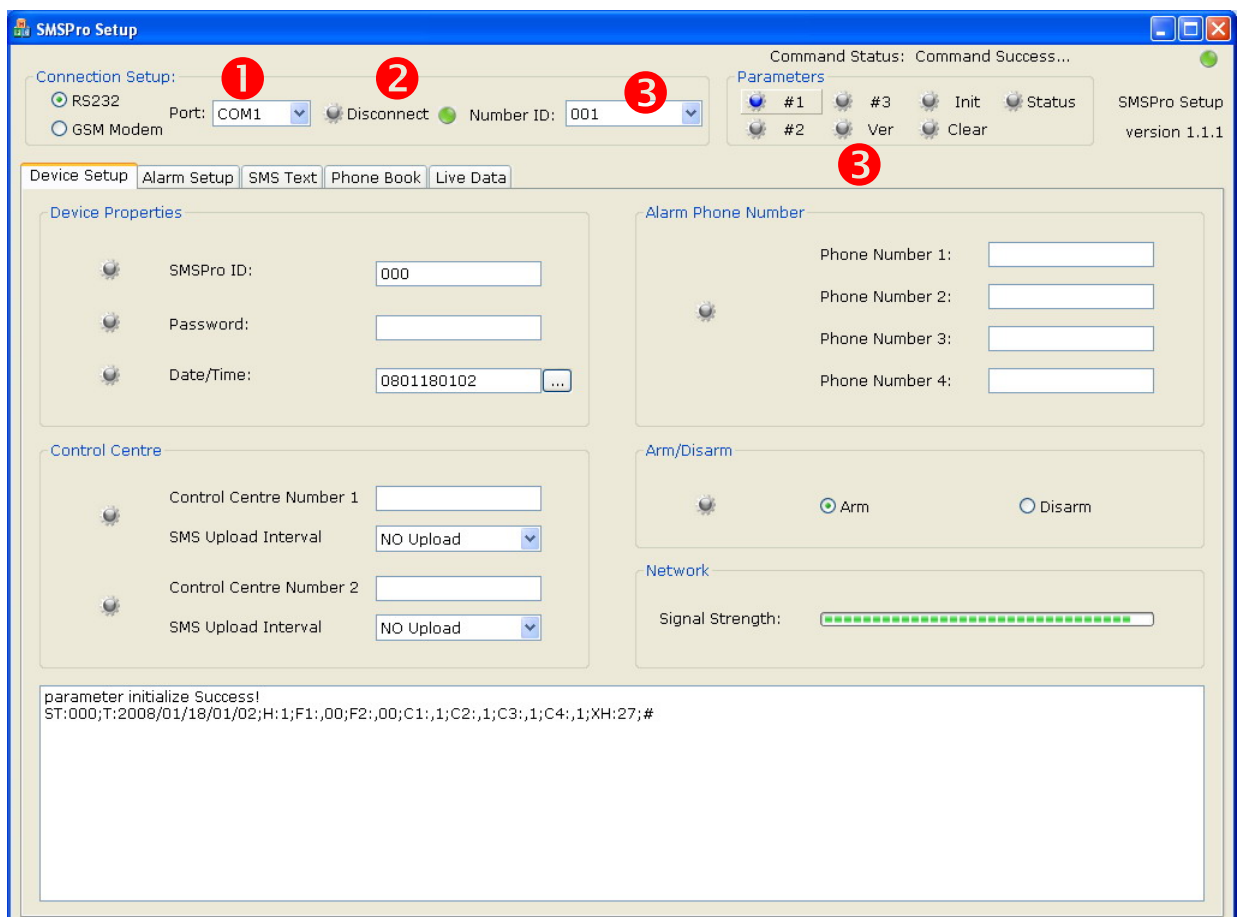


## 7. PC Setup Software

- The unit can be programmed by:
- (A) SMS command via mobile phone
  - (B) Software via its built-in RS232 port



Copy the program folder to C:\, and run "SMSPro\_Setup.exe" under Windows



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. Select Number 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 **LED2** is on (no flash) about 15~30 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**

## System Setup

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3.	SERIAL NUMBER SETUP	16
4.	CONTROL CENTRE NUMBER & HEALTH REPORTING SCHEDULE SETUP	16
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## Alarm Setup

8.	ALARM INPUT LEVEL & ALERT SETUP	19
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11.	USING SMS ALARM MESSENGER TO SEND SMS MESSAGE	23
12.	RELAY OUTPUT CONTROL	25
13.	RELAY OUTPUT DELAY TIME	25
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18.	DEFAULT SETTING	27
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## AD Channel Setup

23.	AD PARAMETERS SETUP	30
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## Temperature Sensor Setup

26.	MANUAL TEMPERATURE CHECK	34
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## Humidity Sensor Setup

29.	MANUAL HUMIDITY CHECK	36
30.	HUMIDITY ALARM SETUP	36

### 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	K2~8	Alarm Channel 2~8
	K1:0 means "Open"		
	K1:1 means "Closed"		
OUT1	Relay Output 1	OUT2~3	Relay Output 2~3
	OUT1:0 means "Open"		
	OUT1:1 means "Closed"		

**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

YYYYYYYYY 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	1 <sup>st</sup> , 7 <sup>th</sup> , 14 <sup>th</sup> , 21 <sup>st</sup> , 28 <sup>th</sup> Day (8:00am)
05	Every 2 hours	12	1 <sup>st</sup> , 15 <sup>th</sup> Day (8:00am)
06	Every 3 hours	13	1 <sup>st</sup> Day of Each Month (8:00am)

SMS Pro Duo 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	K2~8	Alarm Channel 2~8
		K1:0	means "Open"
		K1:1	means "Closed"
OUT1	Relay Output 1	OUT2~3	Relay Output 2~3
		OUT1:0	means "Open"
		OUT1:1	means "Closed"

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) Phone Number Setup**

4 sets Phone Number (Mobile Phone Number) can be preprogrammed to receive the alarm phone dialing or alarm SMS.

**Command:** PWD:XXXX,ALMNU1:ZZZZZZZZZZ,2:ZZZZZZZZZZ,3:ZZZZZZZZZZ,4: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,ZZZ,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
ZZZZ	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               4 <sup>th</sup> phone number     3 <sup>rd</sup> phone number   2 <sup>nd</sup> phone number 1 <sup>st</sup> phone number
NNN	Relay Output Control 0 means no relay output control 1 means relay output triggered by alarm  N N N           3 <sup>rd</sup> Relay Control   2 <sup>nd</sup> Relay Control 1 <sup>st</sup> Relay Control

Note on PC Setup Software:

**Alarm Default Level****SMS Command Value (X)**

0 means "Disabled"	NA
1 means "Close" triggered alarm	NP
2 means "Open" triggered alarm	NC
3 means both "Close" or "Open" triggered alarm	SC

**PC Setup Display**

NA  
NP  
NC  
SC

Example 1:

PWD:1234,ALMLEVEL2:1,01,1030,010%

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- no report

Relay Output 1 - no control

Relay Output 2 - triggered "CLOSE" by alarm

Relay Output 3 - no control

Example 2:

PWD:1234,ALMLEVEL1:1,11,1230,100%

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- no report

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,ALMLEVEL2:1,11,1111,001%

PWD:1234,ALMLEVEL5:1,11,1111,001%

## 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)

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

Example:

PWD:1234,ALM4TEXT:DoorContact1Open#%

Password: 1234

Alarm Channel 4 is triggered, SMS Message "Door Contact 1 Open" is sent to the pre-defined mobile phone numbers.

**AD Channel 1 ~ 2**

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

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,ACH2TEXT:High Temperature Alert#%

Threshold High: 4.250

AD value: 5.123

Password: 1234

Date: 2007-06-12

Time: 19:23

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

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

**11.10) Read the SMS Message Content**

Command 8 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)

Reply Message: ST001;T:2008/01/22/15/45; □□□□□□□□

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,RDACH0TEXT%

Reply Message: ST001;T:2008/01/22,15:45;V:12.3; □□□□□□□□

Command: PWD:XXXX,RDACH2TEXT%

Reply Message: □□□□□>ST001;T:2008/01/22/15/45;INPU AD1 ALARM!;A2:0.000

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:B%`

XXXX	Password
A	Phone Number (1~4)
B	SMS message selection
0:	schedule health check content
1-8:	Alarm Channel SMS message content
9:	manual input message content
A:	AD Channel 1
B:	AD Channel 2
C:	AD Channel 0 (low voltage alarm)

For example: `PWD:1234,SENDMS4:9,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 1~4

**Number Non Exist**      No phone number is preset in that location

Error message about setting B:

**Did not specify SMS contents**      B is not 0~9, A, B, or C


Reply confirmation message:

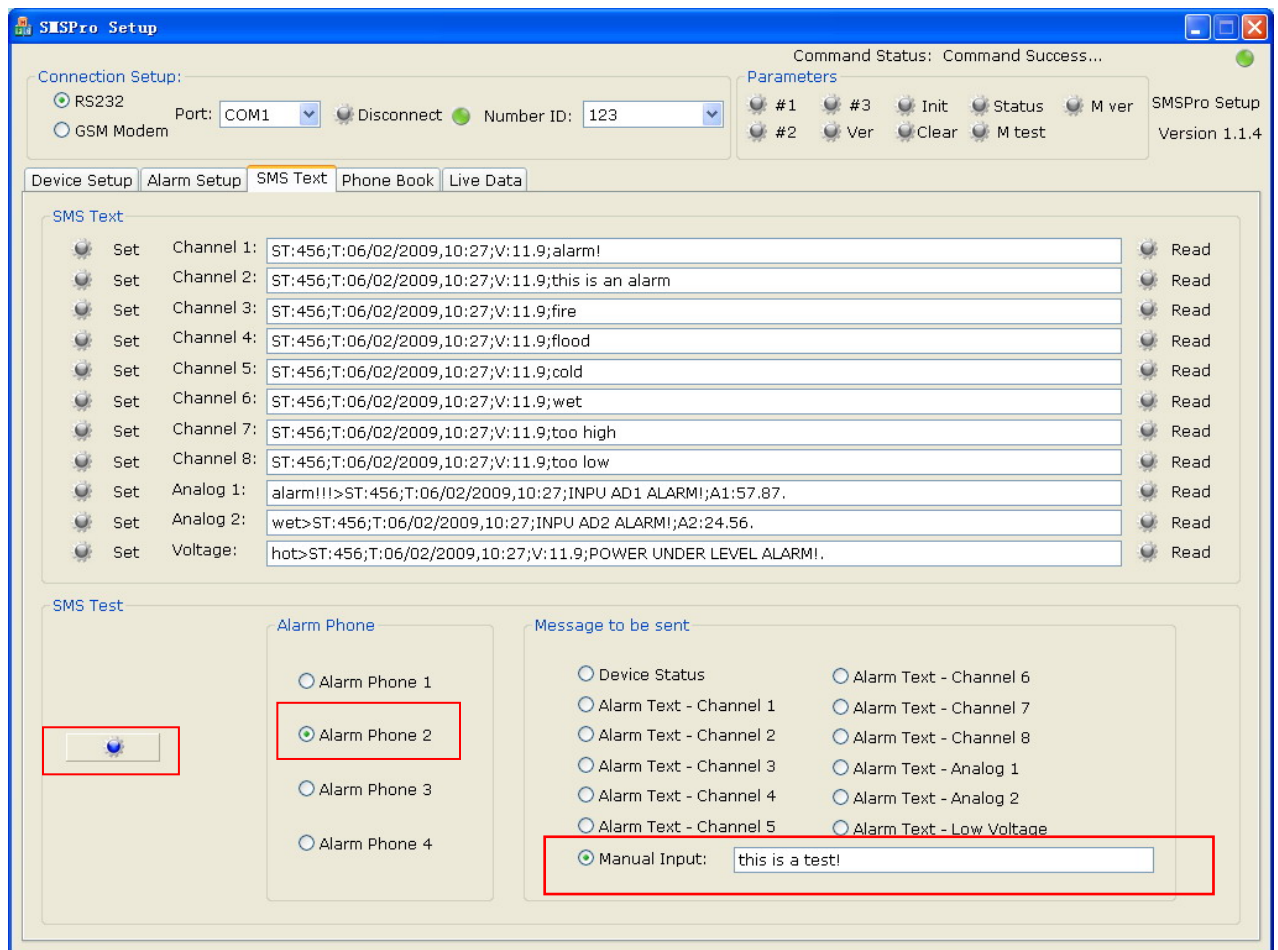
**Success!**      SMS Alarm unit succeeds in sending out the message

**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
- Type the message on "SENDTEXT" fill in Manual Input box
- Click  button



**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,ADCOUT:YY,ZZZ,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																				
ZZZZ	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 <table style="margin-left: 20px;"> <tr> <td style="border-left: 1px solid black; height: 40px; width: 10px;"></td> <td style="border-left: 1px solid black; height: 30px; width: 10px;"></td> <td style="border-left: 1px solid black; height: 20px; width: 10px;"></td> <td style="border-left: 1px solid black; height: 10px; width: 10px;"></td> <td>4<sup>th</sup> phone number</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>3<sup>rd</sup> phone number</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>2<sup>nd</sup> phone number</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>1<sup>st</sup> phone number</td> </tr> </table>					4 <sup>th</sup> phone number					3 <sup>rd</sup> phone number					2 <sup>nd</sup> phone number					1 <sup>st</sup> phone number
				4 <sup>th</sup> phone number																	
				3 <sup>rd</sup> phone number																	
				2 <sup>nd</sup> phone number																	
				1 <sup>st</sup> phone number																	
NNN	Relay Output Control 0 means no relay output control 1 means relay output triggered by alarm N N N <table style="margin-left: 20px;"> <tr> <td style="border-left: 1px solid black; height: 40px; width: 10px;"></td> <td style="border-left: 1px solid black; height: 30px; width: 10px;"></td> <td style="border-left: 1px solid black; height: 20px; width: 10px;"></td> <td>3<sup>rd</sup> Relay Control</td> </tr> <tr> <td></td> <td></td> <td></td> <td>2<sup>nd</sup> Relay Control</td> </tr> <tr> <td></td> <td></td> <td></td> <td>1<sup>st</sup> Relay Control</td> </tr> </table>				3 <sup>rd</sup> Relay Control				2 <sup>nd</sup> Relay Control				1 <sup>st</sup> Relay Control								
			3 <sup>rd</sup> Relay Control																		
			2 <sup>nd</sup> Relay Control																		
			1 <sup>st</sup> Relay Control																		

**11.16) Input Voltage Threshold 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) Default Setting**

PWD:1234,PARAMETER1%

ST:000;T:2006/10/01/01:01;H:1;F1:,00;F2:,00;C1:,1;C2:,1;C3:,1;C4:,1;XH:20#;

PWD:1234,PARAMETER2%

ST:000:VL:7.00,O:00,0000,000;A1M:5.000,1.000,0,5.000,0.500,O:00,0000,000;A2M:5.000,1.000,0,5.000,0.000,O:00,0000,000;K1:1,O:00,0000,000;#;

PWD:1234,PARAMETER3%

ST:000;K2:1,O:00,000,0;K3:1,O:00,000,0;K4:1,O:00,000,0;K5:1,O:00,000,0;K6:1,O:00,000,0;K7:1,O:00,000,0;K8:1,O:00,000,0;

**11.19) System Parameters RESET****PWD:XXXX,PARAMETER&%**

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

[SMS Message received]

Parameter initialize success!

**11.20) System Version Check****PWD:XXXX,CHEACKV**

[SMS Message received]

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**11.21) Return Message**

Command succeeds

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

Command fails

SMS Message: SMS format is error!

**11.22) System Parameters Report****PWD:XXXX,PARAMETER1%**

[SMS Message received]

ST:XXX;T:2006/10/08/08:00;H:X;F1:XXXXXXXXXX,YY;F2:XXXXXXXXXX,YY;C1:XXXX  
XXXXXXXX,Y;C2:XXXXXXXXXX,Y;C3:XXXXXXXXXX,Y;C4XXXXXXXXXX,Y;XH:XX#

ST:	Unit Serial Number
T:	Date/Time
H:X	Arm/Disarm
F1:	1 <sup>st</sup> Control Centre Number
XXXXXXXXXX	Control Centre Number
YY	Automatic Health Report Schedule
C1	1 <sup>st</sup> Alarm Report Phone Number
XXXXXXXXXX	Alarm Report Phone Number
Y	Alarm Report enabled/disabled
XH:XX	GSM Network Signal Strength (1 ~ 31)

**PWD:XXXX,PARAMETER2%**

(about Alarm Channel)

[SMS Message received]

ST:XXX;VL:XXXXX,O:AX,BBBB,CCC;A1M:XXXXX,XXXXX,R,WWWWW,WWWWW,O:AX,BB  
BB,CCC;A2M:XXXXX,XXXXX,R,WWWWW,WWWWW,O:AX,BBBB,CCC;K1:N,O:AX,BBBB,C  
CC;#

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
BBBB	report status for 4 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

**K1:N,O:AX,BBBB,CCC;**

Alarm 1 status

Refer to next page

**PWD:XXXX,PARAMETER3%**

**ST:XXX;K2:N,O:AX,BBBB,CCC;K3:N,O:AX,BBBB,CCC;K4:N,O:AX,BBBB,CCC;K5:N,O:AX,BBBB,CCC;K6:N,O:AX,BBBB,CCC;K7:N,O:AX,BBBB,CCC;K8:N,O:AX,BBBB,CCC;#**

### Alarm 2 ~ 8 Status Report

**K2:N,O:AX,BBBB,CCC;**

K2	Alarm Channel 2	
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
BBBB	report status for 4 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	

**COMMAND (Analog to Digital Channel)****11.23) AD Parameters Setup****PWD:XXXX,ADVALE1:XXXXX,NNNNN,Y,ZZZZZ,WWWWW%**

1	Channel 1
XXXXX	Measuring Range
NNNNN	Start Value
Y	1: Triggered Alarm enabled 0: Triggered Alarm disabled
ZZZZZ	Threshold High Value Setup
WWWWW	Threshold Low Value Setup

**Operation:**

- When the captured analog value is higher or lower than the threshold values, alarm is triggered within 0.5 second.
- SMS, Relay On/Off, Dial Phone etc corresponding actions described on next page will be taken.
- Alarm will only be re-triggered when the captured analog value returns to normal range and then reaches beyond the threshold values again.

**11.24) AD Channel Alarm Setup**

**PWD:XXXX,ADCOUTB: YY,ZZZZ,NNN%**

**B** 0 [Please refer to COMMAND 10 – Low Voltage Alert]

1: AD Channel 1

2: AD Channel 2

**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

**ZZZZ** 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

				4 <sup>th</sup> phone number
				3 <sup>rd</sup> phone number
				2 <sup>nd</sup> phone number
				1 <sup>st</sup> phone number

**NNN** Relay Output Control

0 means no relay output control

1 means relay output triggered by alarm

N N N

			3 <sup>rd</sup> Relay Control
			2 <sup>nd</sup> Relay Control
			1 <sup>st</sup> Relay Control



Example:

AI1M:0.600,1.000,1,0.500,0.100

0.600	AD value range 0.600
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 = 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

$$H = (0.018 \times 250 - 1) \times 0.6 / (0.02 \times 250 - 1) = 0.525$$

$$L = (0.008 \times 250 - 1) \times 0.6 / (0.02 \times 250 - 1) = 0.15$$

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,ADVALE1:0.600,1.000,1,0.525,0.150%

Command: PWD:1234,ADCOUT1:10,1000,100%

## Built-in Temperature Sensor Operation

### [Pro-S]

- Temperature Sensor [LM35DZ] is built-in with measuring range 0 ~ 100°C.
- AD Channel 2 is used for temperature measuring [Pro-S, Pro-SH]
- AD Channel 1 is available [Pro-S only]
- AD Channel 1 is used for humidity measuring [Pro-SH only]
- Since this is the internal built-in sensor, the response time will be relatively slow for application of gradual temperature change.

#### 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:XXXXX,NNNNN,Y,ZZZZZ,WWWWW%**

2	AD Channel 2		
XXXXX	Measuring Range	250.0	Default
NNNNN	Start Value	000.0	Default
Y	1: Triggered Alarm enabled 0: Triggered Alarm disabled		
ZZZZZ	Threshold High Temperature Setup		
WWWWW	Threshold 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
Threshold High Temperature Setup	070.0
Threshold Low Temperature Setup	015.0

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

PWD:1234,ADCOUT2:00,0010,100%

**11.28) Fine Tuning of Measuring Temperature**

Comparing the measuring value of an accurate thermometer, the built-in temperature sensor can be fine tuned with tolerance 0~4°C.

**Case 1 When sensor reports a value lower than the actual, start value adjustment will be 0 ~ 4.**

Actual Temperature: 25°  
 Sensor Report: 23.45°  
 Necessary Adjustment:  $25^{\circ} - 23.45^{\circ} = 01.55^{\circ}$   
 AD Channel 2  
 Measuring Range 250.0  
 Start Value 01.55  
 Triggered Alarm enabled 1  
 Threshold High Temperature Setup 070.0  
 Threshold Low Temperature Setup 015.0  
**PWD:1234,ADVALE2:250.0,01.55,1,070.0,015.0%**

**Case 2 When sensor reports a value higher than the actual, start value adjustment will be 10 ~ 14.**

Actual Temperature: 25°  
 Sensor Report: 27.45°  
 Necessary Adjustment:  $25^{\circ} - 27.45^{\circ} = -02.45^{\circ}$   
 AD Channel 2  
 Measuring Range 250.0  
 Start Value 12.45  
 Triggered Alarm enabled 1  
 Threshold High Temperature Setup 070.0  
 Threshold Low Temperature Setup 015.0  
**PWD:1234,ADVALE2:250.0,12.45,1,070.0,015.0%**

**Built-in Temperature Sensor:**

Model: LM35DZ  
 Power Input: 5VDC  
 Measuring Range: 0 ~ 100°C  
 Output Signal: 0~1 VDC  
 0VDC = 0°C  
 1VDC = 100°C

AD2 Channel Setup	Start Value:	000.0	Default
	Range:	250.0	Default

## External Temperature & Humidity Sensor Operation

### [Pro-SH, 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

#### 11.29) 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

#### 11.30) Humidity Alarm Setup

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

1	AD Channel 1		
XXXXX	Measuring Range	140.0	Default
NNNNN	Start Value	000.0	Default
Y	1: Triggered Alarm enabled		
	0: Triggered Alarm disabled		
ZZZZZ	Threshold High Humidity Setup		
WWWWW	Threshold 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
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,ADCOUT1:00,0100,001%

## External Temperature Sensor:


Model:	DS80B20		
Power Input:	5VDC		
Measuring Range:	-50 ~ 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)		
Output Signal:	0~3 DCV		
	0VDC = 0RH		
	3VDC = 100RH		
AD1 Channel Setup	Start Value:	000.0	Default
	Range:	140.0	Default

## Fine Tuning of Measuring Humidity

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.



**A**

SMS Alarm Messenger – Unit A

SIM Card Phone Number: 12345678



Either "One of alarm phone number" or "Control Centre Phone Number": 33333333



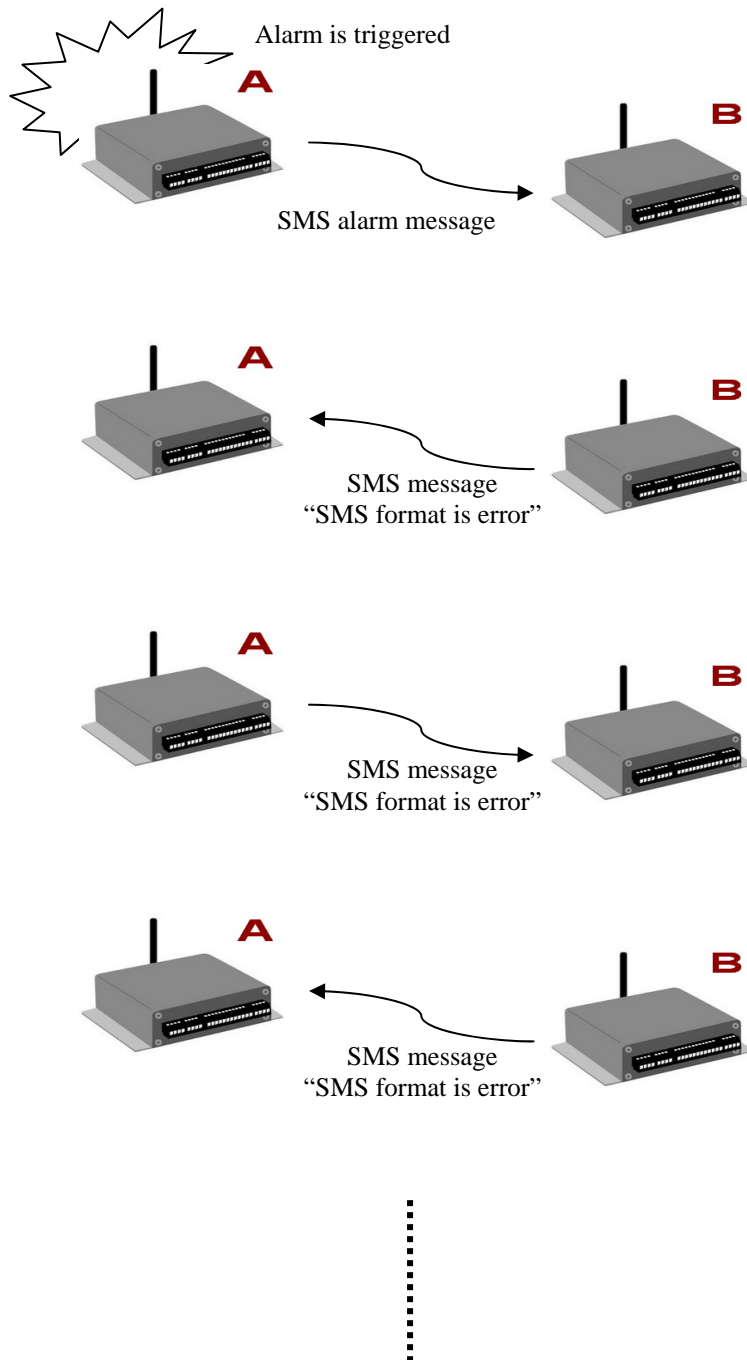
**B**

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.