SMS Alarm Messenger

Pro Edition

SMS Basic	**SMS GSM alarm device [Basic]**
SMS Pro	**SMS GSM alarm device [Advanced]**
SMS Pro-X	**SMS GSM alarm & data capturing device [Professional]**
SMS Pro-Q	**SMS GSM alarm & data capturing device [Quad Band]**
SMS Pro-S	**SMS GSM alarm & data capturing device [Integrated Internal Temperature Sensor]**
SMS Pro-QS	**SMS GSM alarm & data capturing device [Integrated Internal Temperature Sensor + Quad Band]**

Features	Basic	Pro	Pro-X	Pro-Q	Pro-S
Alarm Input	3	8	8	8	8
Relay Output	1	3	3	3	3
Phone Number	4	4	4	4	4
Low Voltage Alert	-	✓	✓	✓	✓
Program by SMS	✓	✓	✓	✓	✓
Program by PC Software	-	✓	✓	✓	✓
Voice	-	✓	✓	✓	✓
AD Channels	-	-	2	2	2
AD Hi/Lo Alert	-	-	✓	✓	✓
Temperature Hi/Lo Alert	-	-	-	-	✓
GSM Band (MHz)	900/1800	900/1800	900/1800	900/1800 850/1900	900/1800

Version 4.2

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(A) Overview

1. Introduction

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

2. Application

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

3. 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

4. Safety

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

5. Electrical Specification

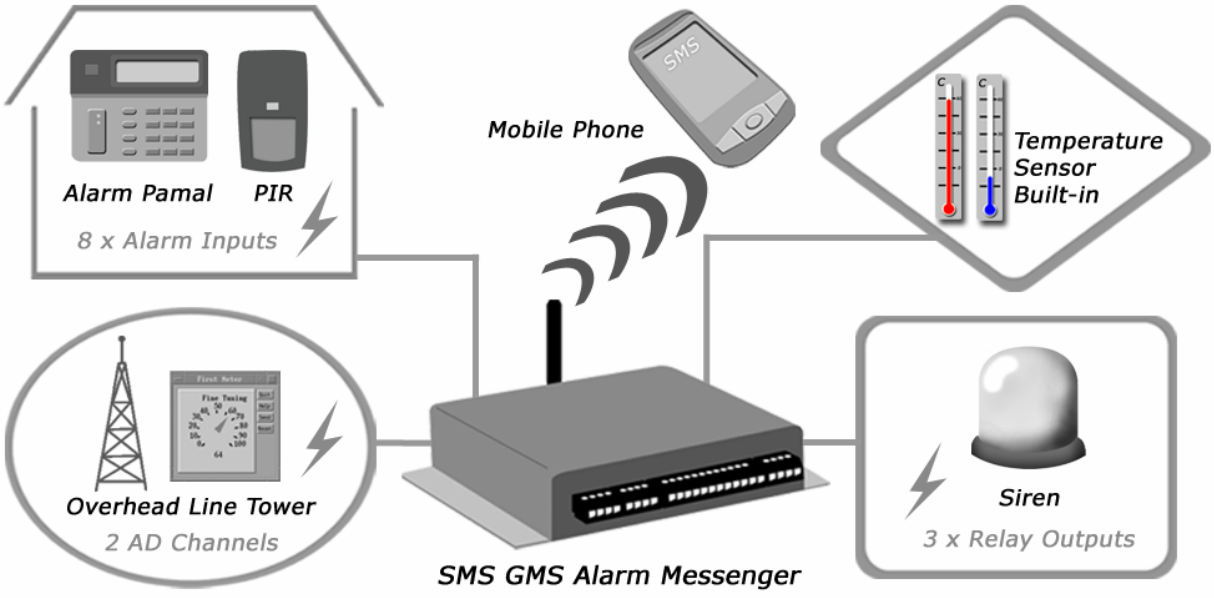
Operating Voltage	DC7~12V
Current	500mA (SMS Send/Receive)
	50mA (standby)
Peak Pulse Current	< 2A
Dimension	135 x 105 x 25 mm
Weight	600g
RS232	9000bps, 8 Stop Bit, 1 Parity

6. 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]

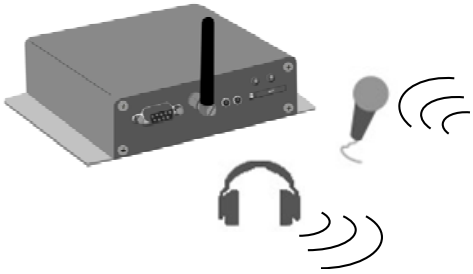
7. Operation



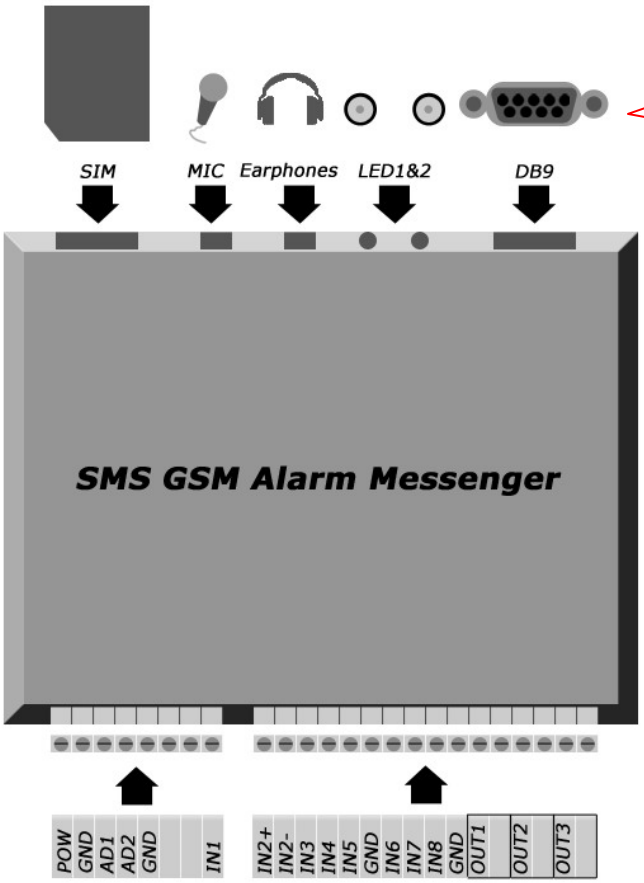
(B) Connection

Sound Monitoring

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



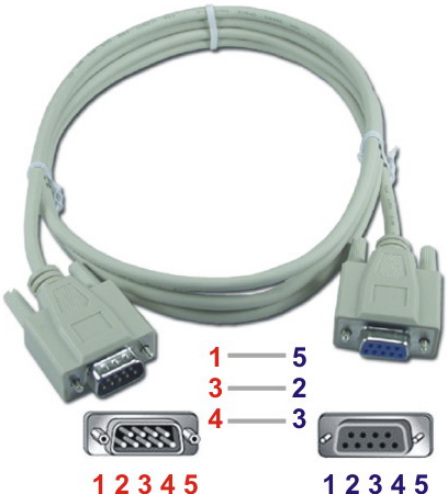
By connecting the microphone, mobile phone user can hear the sound from the SMS Messenger.



Connecting to PC

RS232 Pin Assignment

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

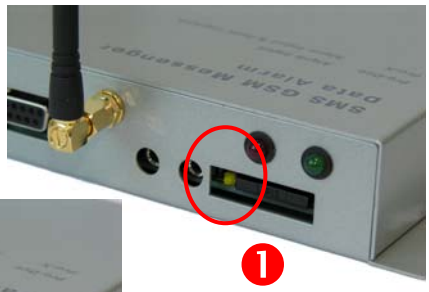
* Normal

Flash

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

(C) Inserting SIM card

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

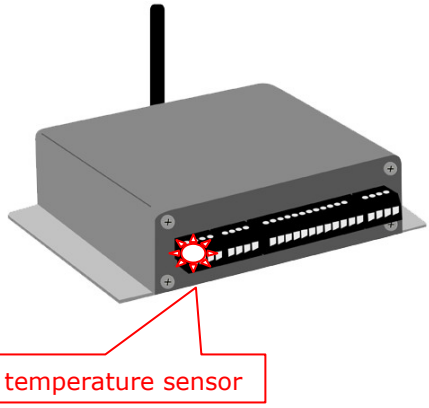


Make sure that the golden contact is facing down when inserting the SIM card caddy.

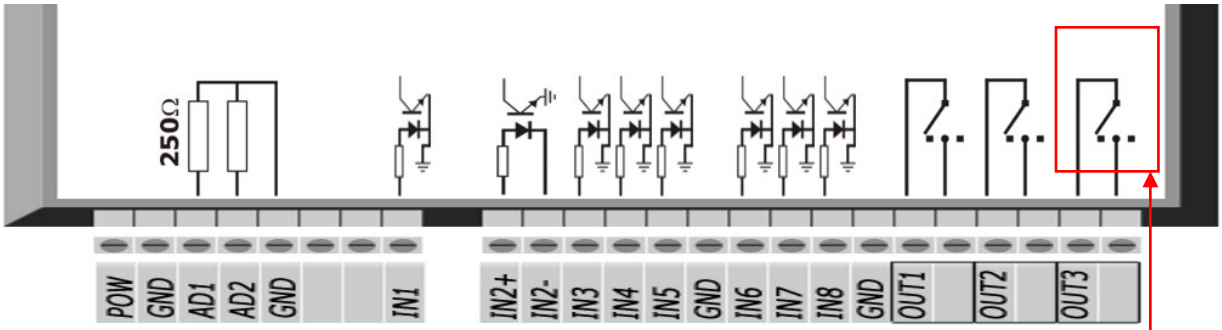
(D) Internal Temperature Sensor [Pro-S]

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

Temperature Range: 0 ~ 100°C
Accuracy: 0.1°C
High Temperature SMS Alert
Low Temperature SMS Alert



(E) Schematic Diagram



POW Power Input, DC7~12V

GND Power Ground

Relay Output jumper

1	2	3
■	■	■
1-2 Short		Normal Close
2-3 Short		Normal Open (default)

Alarm Input

Input: 12VDC, 7 ~ 15mA
Opto-isolated Inputs (1KΩ Input Resistance)

Input: 24VDC Resistor 1~2.2KΩ should be used in serial

(a) IN1, IN3, IN4, IN5, IN6, IN7, IN8 DC12V Alarm Input, 7~15mA
GND Common Ground Opto-coupled

(b) IN2+, IN2- Input DC7~12V

Relay Output

OUT1, OUT2, OUT3 Max. 1A, 24VDC, 1A, 120VAC
NC/NO (selected by jumper on board)

Analog to Digital Channel

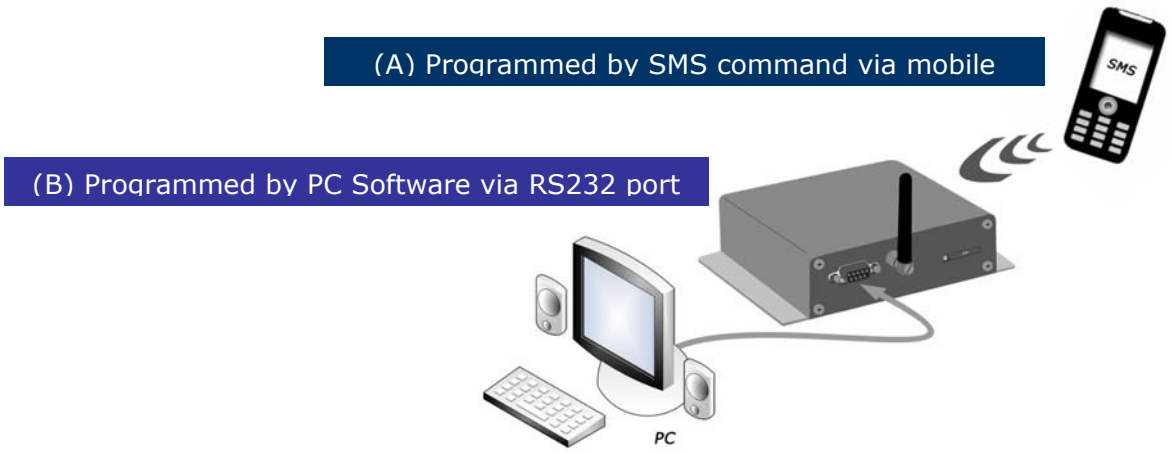
AD1 Analog Digital Channel 1, DC 7-15V Current 4~20mA, 250 Ω

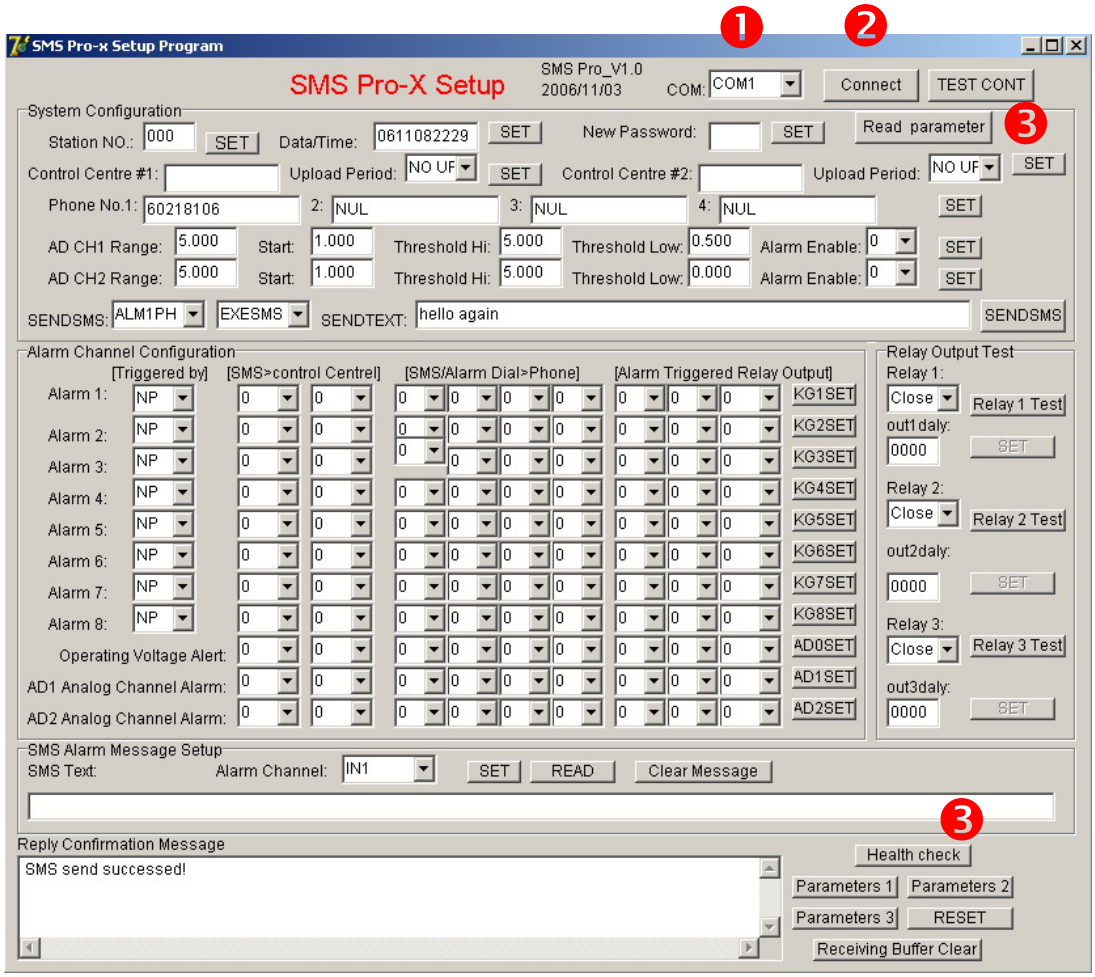
AD2 Analog Digital Channel 1, DC 7-15V Current 4~20mA, 250 Ω
AD2 is not available when temperature sensor is integrated.

(F) PC Setup Software [v4.0]

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 "SM41DPro.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. Click [**Health Check**] or [**Read Parameter**] to get the current configuration of the unit.

Please refer each setting to the corresponding command described on next pages.

(G) 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

(H) 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.

(I) 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.

(J) SMS Command List

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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.

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

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

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: 333)**

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:YYYYYYYYYYY,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 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 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

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!

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

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

8. Alarm Input Level & Alert Setup

Command: PWD:XXXX,ALMLEVELR:X,YY,ZZZZ,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 | | | | | | | 4th phone number | | 3rd phone number | 2nd phone number 1st 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

Note on PC Setup Software:

Alarm Default Level

SMS Command Value (X)	PC Setup Display
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

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,**1**00%

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,ALMLEVEL2:1,11,1111,00**1%**

PWD:1234,ALMLEVEL5:1,11,1111,00**1%**

Method 3

Programmed by PC Software "SMDPro" via RS232

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

9. SMS Alarm Message Setup

Alarm Channel 1 ~ 8

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

XXXX Password

Y Alarm Channel Number (1~8)

□□□□□□□ SMS Message (max. 100 characters – no space is allowed)

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 (1~2)

□□□□□□□ SMS Message (max. 100 characters – no space is allowed)

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:200706121923;A2:5.123#

10. Get the SMS Message Content

Command 8 is used to program the alarm message content into the SMS Alarm Unit. This command is used to get back the message content for verification.

Command: PWD:XXXX,READYTEXT%

XXXX Password

Y Alarm Channel Number (1~4)

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

11.Command the SMS unit 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%

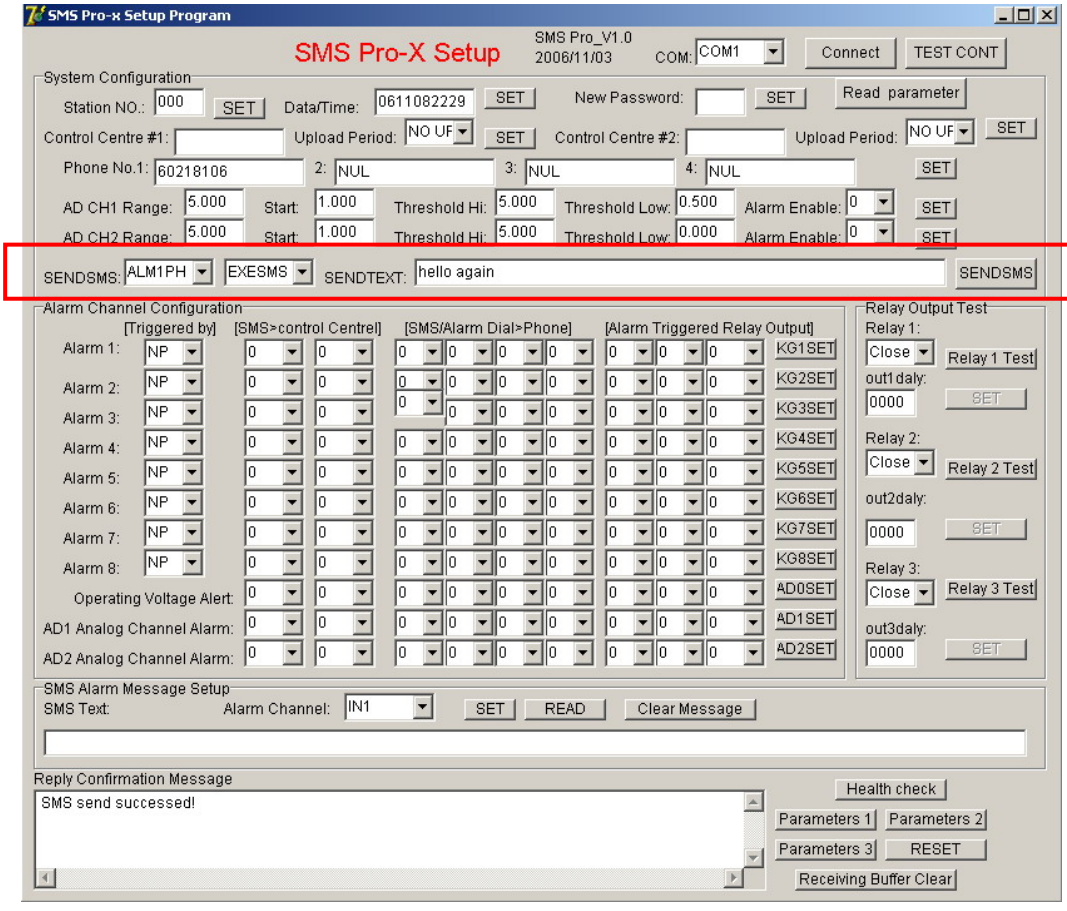
XXXX	Password
A	Phone Number (1~4)
B	SMS message selection
	0: schedule health check content
	1-8: Alarm Channel SMS message content
	9: manual input message content
For example:	PWD:1234,SENDMS4:9,Good Morning%
	SMS message "Good Morning" will be sent to the phone number 4.

Reply confirmation message:

Success!	SMS Alarm unit succeeds in sending out the message
Default! NONB	No preset phone number, operation failed
Default!	Operation failed but phone number exists

When using SMS PC Software, please select the following:

- Alarm phone number
- EXESMS
- Type the message on "SENDTEXT" fill in box
- Click "SENDSMS" button



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.

- 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.

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.

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#

15.Operating Voltage Low Level Alert

This command is to set the action to be done once the operating voltage drops below 7.0VDC. Value of current operating voltage can be retrieved by the command 2.

Command: PWD:XXXX,ADCOUT0:YY,ZZZZ,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 | | | | | | | 4th phone number | | 3rd phone number | 2nd phone number 1st 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

16.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

17.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;

18.System Parameters RESET

PWD:XXXX,PARAMETER&%

[SMS Message received]

Parameter initialize success!

19.Return Message

Command succeeds

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

Command fails

SMS Message: SMS format is error!

20.System Parameters Report

PWD:XXXX,PARAMETER1%

[SMS Message received]

ST:XXX;T:2006/10/08/08:00;H:X;F1:XXXXXXXXXXX,YY;F2;XXXXXXXXXXX,YY;C1:XXXXXXXXXXX,Y;C2:XXXXXXXXXXX,Y;C3:XXXXXXXXXXX,Y;C4XXXXXXXXXXX,Y;XH:XX#

ST:	Unit Serial Number
T:	Date/Time
H:X	Arm/Disarm
F1:	1st Control Centre Number
XXXXXXXXXX	Control Centre Number
YY	Automatic Health Report Schedule
C1	1st 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,BBBB,CCC;A2M:XXXXX,XXXXX,R,WWWWW,WWWWW,O:AX,BBBB,CCC;K1:N,O:AX,BBBB,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
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	Corresponding Output Relay Status	
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)

21.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

22.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
			4th phone number
		3rd phone number	
	2nd phone number		
1st 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		

23.System Parameters Report (about AD channels)

PWD:XXXX,PARAMETER2%

[SMS Message received]

ST:XXX;VL:XXXXX,O:AX,BBBB,CCC;A1M:XXXXX,XXXXX,R,WWWWW,WWWWW,O:AX,BBBB,CCC;A2M:XXXXX,XXXXX,R,WWWWW,WWWWW,O:AX,BBBB,CCC;K1:A,O:AX,BBBB,CCC;#

A1	AD Channel 1
M:XXXXX,XXXXX	Range Value, Start Value
R	AD Value Triggered Alarm enabled
WWWWW,WWWWW	Alarm Triggered Threshold High Value
	Alarm Triggered Threshold Low Value

e.g. A1M:0.600,1.000,1,0.500,0.100

0.600	Range from 0 to 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 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)

When AI1 value is over 0.500 or below 0.100, alarm will be triggered and SMS alert message will be sent out.

AI1 value is reported by COMMAND 2 [PWD:XXXX,STATUS%]

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

A2M…	AD Channel 2

Built-in Temperature Sensor Operation
[Pro-S]

- Temperature Sensor is built-in with measuring range 0 ~ 100°C.
- AD Channel 2 will be used for temperature measuring.
- Since this is the internal built-in sensor, the response time will be relatively slow for application of gradual temperature change.

24.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;#.

AI2 Current Temperature

25.AD Parameters Setup

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

2	AD Channel 2		
XXXXX	Measuring Range	250.0	Default
NNNNN	Start Value	00000	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	00000
Triggered Alarm enabled	1
Threshold High Temperature Setup	070.0
Threshold Low Temperature Setup	015.0

PWD:1234,ADVALE2:250.0,00000,1,070.0,015.0%

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

26.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° - 23.45° = 01.55°
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° - 27.45° = -02.45°
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%