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SAN TELEQUIP
Connecting. Converting. Leading !

Document Name: USER MANUAL for Smart Alert.
Model SA246M

INTRODUCTION

SMART ALERT (SA) is used for obtaining quick SMS alerts from field inputs. SA246M allows up to 4 Potential free inputs to be sensed. For every input, unique separate SMS is sent to multiple reporting numbers. Maximum upto 10 different persons could be notified with the alert. SA246M allows 6 potential free outputs to be controlled remotely via SMS. SA246M allows 2 analog inputs for 4~20 mA signals and also can poll Modbus slave devices through RS 485 interface and send an SMS containing Modbus data.

FEATURES

- 24 V/1A DC power supply.
- 4 number digital potential free alarm inputs with common ground pin
- 2 analog inputs for 4~20 mA signals.
- 6 number NO/NC outputs.
- Built in GSM modem.
- Storage of total 10 reporting telephone numbers. (Each with 14 digits max)
- Modbus protocol over RS485 interface supported.
- Buzzer for audible status.
- Configuration via preformatted SMS.
- Dimensions : 106 x 63 x 45 mm (Excluding connectors and antenna)

INSTALLING THE UNIT

Inserting/ Removing the SIM Card

To insert or remove the SIM Card, it is necessary to press the yellow SIM holder ejector button with sharp edged object like a pen or a needle. When this is done the SIM holder comes out a little, then pull it out and insert or remove the SIM Card. It is very important that the SIM is placed in the right direction for proper working.

Connecting External Antenna

Connect the external SMA antenna to the male antenna connector of the unit. The right Antenna should be used with the specified frequency otherwise it can affect the communication.

Power Supply – Screw type connector with +24V DC, 1A supply.

Digital Inputs –
For SA246M connect the potential free contact wires to DI1 ~ DI4 terminals of unit. The other end of contact can be connected to GND terminal provided.

Analog Inputs-

AI1 and AI2 are provided for analog inputs. The 4-20mA sensor output should be connected to AI1 or AI2 terminal and other end is to be connected to GND.

Digital Outputs-

SA246M supports6 digital outputs with two potential free NO-NC contacts for each output. The contact rating is 230V / 15A.

So appropriate capacity load can be switched using these outputs. Whenever unit is powered off, DO status falls back to NC status and is restored to last condition upon resumption of power.

OPERATION

At power on, unit beeps twice and power LED glows steady. The unit checks for range and range LED 1 blinks while the unit gets the range. When the range is found, LEDs become steady. In good range, all 3 LEDs glow. In medium range, only 2 LEDs will glow and in low range, only 1 LED will glow.

Unit then starts scanning inputs and report alarm as and when it detects change of input state. SA246M has 4 inputs DI1 ~ DI4 and four common GND terminals. The eight potential free contacts must be connected to these inputs. The inputs are configurable as NO (Normally Open) or NC (Normally closed) in normal condition. When any input changes its state, SMS for that input is sent to the configured reporting numbers. All numbers are reported one after another. Digital inputs and analog inputs can be reported to selected reporting numbers out of 10 reporting numbers. The unit can send different SMS messages for each input and the English text is also configurable. SMS text for channel reporting is 120 characters.

SA246M supports two analog inputs AI1 and AI2 with one common GND terminal. Analog inputs can be set to indicate alarm on crossing low or high levels. Two alarms can be set – Lo alarm and Hi alarm. When input to that analog channel goes below low level or goes above high level, alarm SMS corresponding to that analog input is sent to reporting numbers.

If restoral message command is given to unit then unit will send messages when DI or AI input comes in normal state. The text of these messages is also reconfigurable. User can set text upto 120 characters.

SA246M supports 6 digital outputs with two potential free NO-NC contacts for each output. Text for Digital output reporting is configurable and is 25 characters.

The status of each input channel is sent periodically to the reporting numbers .If any modbus slave Device is connected to SA246M then modbus data of the slave device is periodically sent to all the reporting Numbers . Also status message of input channels are sent indicating channel is in alarm or in normal state. The period of reporting is also configurable from 01 ~ 24 hours. If this value is set to zero, periodic status reporting is disabled. The instantaneous status of all channels can also be obtained on demand by user, by sending a SMS to the unit.

At factory shipping time, default authentication numbers are kept blank.

Configuration of unit can be done through any mobile number when authentication numbers are blank. Once finished configuration, user can enter authentication numbers. Once authentication numbers entered in the unit then any configuration change can be done using these two authenticated numbers only. These numbers can be changed at site.

When unit receives pre-formatted SMS messages, it acts per the message command. The configuration can be changed only through authenticated numbers; whereas general status read can be done through any number.

SA246M Device continuously poll modbus data and will send an SMS automatically when there is change of data and also at periodic time interval configured by user to receive periodic status. Total of 5 modbus queries can be configured.

SMS FORMATS FOR CONFIGURATION

- **To set SMS reporting numbers**

  #1231#XX#XX#XX#XX#XX#XX#XX#XX#XX#XX*

  Where, XX is dialing number. Maximum length can be 14 digits for each number.

  Unit will send acknowledgement SMS as following: (Assuming 2 numbers are configured)

  Command: ***#1231#+910123456789#+919876543210****
  Acknowledgement: ***SMS Nos:***
  +910123456789
  +919876543210

- **To set alarm messages texts for digital inputs**

  #123MX#Text*

  Where Text is the text message for each of 1 ~ 8 inputs respectively and X is channel number. Please note characters '#' and '*' should not be part of SMS alert text. Maximum text length can be 120 characters. Default text is 'Alarm on Channel X' for input X.

  Unit will send acknowledgement SMS for respective commands as follows.

  Set channel 1 Alarm text message:
  Command: ***#123M1#Alarm on channel 1****
  Acknowledgement: ***Reporting text1 for channel 1:***
  Alarm on channel 1

Set channel 2 Alarm text message:
Command: ***#123M2# Alarm on channel 2****
Acknowledgement: ***Reporting text1 for channel 2: Alarm on channel 2***

Set channel 3 Alarm text message:
Command: ***#123M3# Alarm on channel 3****
Acknowledgement: ***Reporting text1 for channel 3: Alarm on channel 3***

Set channel 4 Alarm text message:
Command: ***#123M4# Alarm on channel 4****
Acknowledgement: ***Reporting text1 for channel 4: Alarm on channel 4***

- **To set restoral message texts for digital inputs**

#123BX#Text*

Where Text is the text message for each of 1 ~ 4 inputs respectively and X is channel number. Please note characters '#' and '*' should not be part of SMS alert text. Maximum text length can be 120 characters. Default text is 'Alarm on Channel X' for input X.

Note: Restoral messages are sent only when 1 is set through #1233#1* command.

Unit will send acknowledgement SMS for respective commands as follows.

Set channel 1 Alarm text message:
Command: ***#123B1#Channel 1 is Normal****
Acknowledgement: ***Reporting text2 for channel 1: Channel 1 is Normal***

Set channel 2 Alarm text message:
Command: ***#123B2# Channel 2 is Normal ****
Acknowledgement: ***Reporting text2 for channel 2: Channel 2 is Normal***

Set channel 3 Alarm text message:
Command: ***#123B3# Channel 3 is Normal ****
Acknowledgement: ***Reporting text2 for channel 3: Channel 3 is Normal***

Set channel 4 Alarm text message:
Command: ***#123B4#Channel 4 is Normal ****

Acknowledgement: ***Reporting text2 for channel 4: Channel 4 is Normal***

- **To set alarm message text for analog channels**

#123PX#Text*

Where Text is the text message for analog inputs respectively and X is channel number. Please note characters '#' and '*' should not be part of SMS alert text. Maximum text length can be 120 characters. Default text is 'Alarm on Analog X' for input X.

Unit will send acknowledgement SMS for respective commands as follows.

Set analog channel 1 Alarm text message:
Command : **#123P1#Alarm on Analog 1***
Acknowledgment: ***Reporting text for Analog 1: Alarm on Analog 1***

Set analog channel 2 Alarm text message:
Command : **#123P2#Alarm on Analog 2***
Acknowledgment: ***Reporting text for Analog 2: Alarm on Analog 2***

- **To set restoral SMS text for analog channel**

#123NX#Text*

Where Text is the text message for each of 1 ~ 2 inputs respectively and X is channel number. Please note characters '#' and '*' should not be part of SMS alert text. Maximum text length can be 120 characters. Default text is 'Alarm on Analog X' for input X.

Unit will send acknowledgement SMS for respective commands as follows.

Set analog channel 1 Alarm text message:
Command : **#123N1#** ***Analog channel 1 is NORMAL** *
Acknowledgment: ***Reporting text for Analog 1: Analog channel 1 is NORMAL***

Set analog channel 2 Alarm text message:
Command : ***#123N2# Analog channel 2 is NORMAL****
Acknowledgment: ***Reporting text for Analog 2: Analog channel 2 is NORMAL***

- **To set configurable text to be added with periodic reporting SMS**

#123M9#Text*

Where Text is the text message which will be the part of periodic reporting SMS and will specify device information such as serial number, location etc configured by user. Please note that '#' and '*' should not be part of the text. Maximum text length can be of 20 characters. Default text for reporting text would be "Device Id: 0123456"

Unit will send acknowledgement SMS as following:

Command: ***#123M9#Device ID: 0123456****
Acknowledgement: ***Reporting text for Device:***
Device ID: 0123456

- **To set NO / NC status of inputs**

#1234#XXXX#AA#BB#CC#DD *

Where X = 0 means NO, 1 means NC and AA, BB, CC, DD are delays in seconds which can be set for input channels 1~4 respectively. Delays can take value from 00 to 99 seconds.

If unit is configured as NO, there will be alarm SMS if change of state is detected for specified delay period for particular channel.
For NO configuration, SMS format is:

Command: ***#1234#0000#90#90#90#90****
Acknowledgement: ***Configuration of input channels is:***
0000
Delays set to
90
90
90
90

In below message format input 1 & 2 is set to NC and input 3 & 4 is set to NO. If this message format is set, each input channel will report alarm state if corresponding channel has retained it's changed state for 90 seconds.

Command: ***#1234#1100#90#90#90#90****
Acknowledgement: ***Configuration of input channels is:***
1100
Delays set to
90
90
90

- **To enable/disable restoral messages for inputs**

  #1233#X*

  Where

  X = 0 means only alarm messages are sent for input channels.
  (Configured through #123MX#Text* commands).

  X=1 means restoral messages and alarm messages both are sent for input channels.
  (Configured through #123MX#Text* and #123BX#Text* commands).

  Command: ***#1233#1****
  Acknowledgement: **Inputs are BISTATE**

- **To set analog input Reporting Unit**

  #123UX#Text*

  Where Text is the Reporting units for channels 1 ~ 2 inputs respectively and X is channel number. Please note characters '#' and '*' should not be part of SMS alert text. Maximum text length can be 8 characters. Default reporting unit is '%' for both inputs.
  e.g.
  To set unit as DegC for channel 1, send SMS as

  Command: ***#123U1#DegC****
  Acknowledgement: **Reporting unit for analog 1: DegC**

  To set unit as Pascal for channel 2, send SMS as
  Command: ***#123U2#Pascal****
  Acknowledgement: **Reporting unit for analog 2: Pascal**

- **To set analog inputs full range values**

  #1239 #Low Value1#High Value1#Low Value2#High Value2*

  This command will set full range values corresponding to 4-20mA output of the sensor.

  Using actual values:

When actual values are known corresponding to 4-20mA, then set full scale actual values. e.g. Temperature sensor output is 0-70 deg corresponding to 4-20mA,then set command as

Command: ***#1239#0#70#0#70****
Acknowledgement : **Analog Input Format Is**
AI1L = 0
AI1H = 70
AI2L = 0
AI2H = 70

- **To set analog input levels**

#1236#Low_level1#High_level1#Low_ level2#High_ level2*

Analog channel 1 and channel 2 high and low Thresholds can be set using below SMS command. If analog channel value goes below/above set levels, then unit will send alert SMS.

Command: ***#1236#20.0#50.0#30.4#56.7 ****
Acknowledgement : ***Analog levels are set to :***
AI1LOW = 20.0
AI1HIGH = 50.0
AI2LOW = 30.4
AI2HIGH = 56.7

Note: Resolution of 1 bit after decimal point is necessary.Means Please do not set the value as 1235 only.Set it as 123.5 instead.

- **To select reporting numbers for Digital and analog inputs reporting**

#1232#XXXXXXXXXX#XXXXXXXXXX#XXXXXXXXXX#XXXXXXXXXX#
XXXXXXXXXX#XXXXXXXXXX*

Where X is the Reporting number's index which we set(using #1231#....* command), and it takes values from 0 to 9 and A(A means 10th reporting number.)
By default all numbers are reported for every input channel. If user wants to select the reporting numbers to which input alarm reporting to be done then this command is used.

E.g-#1232#145#36789#A#169A#123#1A* will send DI1 alarm messages to first ,forth and fifth reporting number,DI2 alarm messages get reported to Third,sixth,seventh,eighth,ninth reporting numbers,DI3 get reported to only tenth reporting number and DI4 get reported to first, sixth and Ninth and tenth reporting numbers,

AI1 gets reported to first second and third reporting numbers and AI2 gets reported to first and tenth reporting numbers.

Unit will send acknowledgement SMS as described below:

Command: ***#1232#145#*****36789#A#169A#123#1A*****
Acknowledgement: ***Nos. Selected :***
D1:145
D2:36789
D3:A
D4:169A
A1:123
A2:1A

- **To set periodic status reporting time**

#123HXX*

XX in the above format represents hours which can take values from 01 to 24.

The status of input channels is sent periodically to reporting numbers .

e.g. #123H01* will set periodic reporting time to 1 hour. So, when this time is set through SMS, unit will send status message after every one hour.Default Periodic hours are set to 01.

Unit will send acknowledgement SMS as described below:

Command: ***#123H01****
Acknowledgement: ***Periodic Reporting hours are set to:***
01

Note: #123H00* will disable the periodic status reporting.

- **To set output status**

#1235#XY*

Where X means output number and X means NO/NC status. (Used only for SA42 model)
X = 1 means output 1 and X = 2 means output 2 and so on upto output number 6.
Y = 0 means NO and Y = 1 means NC.

When common (C) terminal is connected to NO, LED corresponding to that output is ON, otherwise OFF. E.g. If C1 connected to NO1, then O1 LED will be ON.

Unit will send acknowledgement SMS as following:

Command*:*	***#1235#10****
Acknowledgement:	***Output 1 connected to NO1***
Command*:*	***#1235#21****
Acknowledgement:	***Output 2 connected to NC2***
Command*:*	***#1235#30****
Acknowledgement:	***Output 3 connected to NO3***
Command*:*	***#1235#41****
Acknowledgement:	***Output 4 connected to NC4***
Command*:*	***#1235#50****
Acknowledgement:	***Output 5 connected to NO5***
Command*:*	***#1235#61****
Acknowledgement:	***Output 6 connected to NC6***

- **To link Output with inputs**

In SA246M,outputs can be used by 2 methods. One using directly SMS specified in above #1235# format and second one is based on input channels alarm condition. If output is linked to the input channels, then that particular output is connected to NO when any one the input goes into alarm state. This output will restore to NC after set time (format explained in pulsed configuration below).

Command to link outputs to inputs.

#1238#XXXXXX* , where X = 1 or 0

E.g. #1238#101010* will link outputs 1,3,5 to the inputs and outputs 2,4,6 to be operated as independent output on SMS. Whenever any one of the 4 digital inputs goes into alarm, output 1,3,5 will be connected to NO and will restore automatically to NC, depending on next (Latch / Pulsed) configurations.

Unit will send acknowledgement SMS as following:

Command:	***#1238#101010****
Acknowledgement:	***Output linked to inputs:*** ***OP1 = Y*** ***OP2 = N*** ***OP3 = Y*** ***OP4 = N*** ***OP5 = Y*** ***OP6 = N***

- **To set SMS text for each DO channel for NO contact**

#123OX#Text*

Where Text is the text message for each of 1 ~ 6 Digital outputs respectively and X is channel number. Please note characters '#' and '*' should not be part of SMS alert text. Maximum text length can be 25 characters. Default text is 'Output 1 connected to NO1' for input X.

Unit will send acknowledgement SMS for respective commands as follows.

Set DO1 text for NO contact:
Command: ***#123O1#TAMPER1 is OPEN****
Acknowledgement: ***Reporting text for NO O/P 1: TAMPER1 is OPEN***

Set DO2 text for NO contact:
Command: ***#123O2# TAMPER2 is OPEN ****
Acknowledgement: ***Reporting text for NO O/P 2: TAMPER2 is OPEN***

Set DO3 text for NO contact:
Command: ***#123O3# TAMPER3 is OPEN ****
Acknowledgement: ***Reporting text for NO O/P 3: TAMPER3 is OPEN***

Set DO4 text for NO contact:
Command: ***#123O4# TAMPER4 is OPEN ****
Acknowledgement: ***Reporting text for NO O/P 4: TAMPER4 is OPEN***

Set DO5 text for NO contact:
Command: ***#123O5# TAMPER5 is OPEN ****
Acknowledgement: ***Reporting text for NO O/P 5: TAMPER5 is OPEN***

Set DO6 text for NO contact:
Command: ***#123O6# TAMPER6 is OPEN ****
Acknowledgement: ***Reporting text for NO O/P 6: TAMPER6 is OPEN***

- **To set SMS text for each DO channel for NC contact**

#123CX#Text*

Where Text is the text message for each of 1 ~ 6 Digital outputs respectively and X is channel number. Please note characters '#' and '*' should not be part of SMS alert text. Maximum text length can be 25 characters. Default text is 'Output 1 connected to NC1' for input X.

Unit will send acknowledgement SMS for respective commands as follows.

Set DO1 text for NC contact:
Command: ***#123C1#TAMPER1 is CLOSE****
Acknowledgement: ***Reporting text for NC O/P 1: TAMPER1 is CLOSE***

Set DO2 text for NC contact:
Command: ***#123C2# TAMPER2 is CLOSE ****
Acknowledgement: ***Reporting text for NC O/P 2: TAMPER2 is CLOSE***

Set DO3 text for NC contact:
Command: ***#123C3# TAMPER3 is CLOSE ****
Acknowledgement: ***Reporting text for NC O/P 3: TAMPER3 is CLOSE***

Set DO4 text for NC contact:
Command: ***#123C4# TAMPER4 is CLOSE ****
Acknowledgement: ***Reporting text for NC O/P 4: TAMPER4 is CLOSE***

Set DO5 text for NC contact:
Command: ***#123C5# TAMPER5 is CLOSE ****
Acknowledgement: ***Reporting text for NC O/P 5: TAMPER5 is CLOSE***

Set DO6 text for NC contact:
Command: ***#123C6# TAMPER6 is CLOSE ****
Acknowledgement: ***Reporting text for NC O/P 6: TAMPER6 is CLOSE***

- **To set time for auto-restoral of format**

Each output can be restored to NC after setting time period through following SMS format.

#1237#XAA#XAA#XAA#XAA#XAA#XAA*

Where, X = S (seconds) / M (Minutes) / H (hours).
A = Any digit between 0 – 9.

e.g. #1237#S60#M30#H05#S99#M99#H24* will configure output 1 to be connected to NO1 for 60 Seconds, output 2 to be connected to NO2 for 30 Minutes, Output 3 to be connected to NO3 for 5 Hours and so on.

If output is linked with input, output timing must be a non zero value. If configured zero, it will set to 5 seconds automatically.

If output is not linked with input, and timing is configured to 00, then it will not restore the output to NC.

Each reporting number will receive SMS after output is restored automatically.

Note: Output 2 is configured to be ON for 30 minutes. But user can restore the output to NC by sending SMS as #1235#X1* before 30 minutes are over. SMS override is allowed. Where X = 1,2,3,4,5,6 i.e. output number.

Unit will send acknowledgement SMS as following:

Command:	***#1237#S60#M30#H05#S99#M99#H24****
Acknowledgement:	***OP1 ON for 60 Sec***
	OP2 ON for 30 Min
	OP3 ON for 05 Hrs
	OP4 ON for 99 Sec
	OP5 ON for 99 Min
	OP6 ON for 24 Hrs

- **To set MODBUS query frame**

To set Query1 to Query5
#123Q1#XX,YY,ZZ,AA *

To set Query6 to Query10
#123Q2#XX,YY,ZZ,AA *

Where, XX = Device ID
YY= Function code,
ZZ = Start address
AA = Length of the query.

User have to set queries sequentially only.

E.g. #123Q1#01,01,1,10* will configure Query 1 where 01 is device ID, 01 is function code,1 is the start address and 10 will be the length for Query 1 .

Command:	***#123Q1#01,01,1,10****
Acknowledgement:	***Queries:***

01: 01,01,1,10

Note: If user want to store more than 5 queries then only use comand#123Q2#.....*

- **To set No of MODBUS Inputs**

  #123IP#05*

  This command will set number of MODBUS Inputs(Parameters) to 5

  Command: ***#123IP#05****
  Acknowledgement: ***No of Inputs on MODBUS:05***

- **To set MODBUS Polling Time**

  #123QT#S02*

  This command will set modbus scan time to 02 Seconds.
  By defaulty the modbus scan time will be 05 seconds User can change it using above command.

  Command: ***#123QT#S02****
  Acknowledgement: ***Polling Time 02 Seconds***

  Note:Polling time can be in Minutes / Hours.

- **To Delete all MODBUS Queries**

  #123DEL*

  This command will delete all the queries stored in the unit.User can add new queries then.

  Command: ***#123DEL****
  Acknowledgement: ***MODBUS Queries Cleared***

- **To set MODBUS Format for all MODBUS parameters.**

  #123W# XXXXXXXXXXXX *

  Where X will be 'I' or 'F or 'S'.
  I-Integer

F-Float
S-Swapped float
This command will set format for MODBUS parameters to be scanned. It is mandatory to set format for all the parameters that are to be scanned using MODBUS query.

Command: **#123W#IIIII***
Acknowledgement: ***MODBUS FORMAT IS:***
IIIII

Note:No of 'X' present in command = MODBUS parameters

- **To set Function codes for all Modbus parameters**

#123K#XX*

Where X is the fumction code which can be '1'/'2'/'3'/'4'.

Command: **#123K#11111***
Acknowledgement: ***Function codes:***
11111

Note:No of 'X' present in command = MODBUS parameters

- **To set MODBUS Threshold for MODBUS alert SMSs(For Function code 03 and 04)**

#123TH1#20.0,80.0#10.3,78.9#12.7,90.9#25.3,40.5#15.0,67.8*

The above command will set MODBUS thresholds for 5 analog inputs on MODBUS.

Command: **#123TH1#20.0,80.0#10.3,78.9#12.7,90.9#25.3,40.5#15.0,67.8***
Acknowledgement: **20.0, 80.0**
10.3, 78.9
12.7, 90.9
25.3, 40.5
15.0, 67.8

Note: 1 digit after decimal point is necessary.Do not enter the thresholds as 20,80 etc.

- **To set Text to report MODBUS alert mails**

#123ZXX#Text*

Where XX is the analog Input(Parameter) number on MODBUS

Command: **#123Z01#Temperature sensor***
Acknowledgement: **Reporting Text: Temperature sensor**

Text can be 20 characters long Max. Please note characters '#' and '*' should not be part of SMS alert text.
Max value of XX is 10.

- **To set Date and Time**

#123DT#DD/MM/YY#hh:mm:ss*

Wher,DD-Date,MM-Month and YY-Year.hh-Hours,mm-Minutes and ss-Seconds Unit supports 24 Hour clock format.

E.g #123DT#11/02/2016#15:51:45* will configure date as 11/02/2016 and Time as 15:51:45.

Unit will send acknowledgement SMS as following:

Command: **#123DT#11/02/2016#15:51:45***
Acknowledgement: ***Date – 11/02/2016***
Time – ***15:51:45***

- **To set Time at which Modbus SMS is required**

#123CT#hh:mm:ss#hh:mm:ss#hh:mm:ss*

Where,hh-Hours,mm-Minutes and ss-Seconds.Maximum 3 Times can be configured.When RTC time of unit Matches with these preconfigured times Unit will send modbus SMS.

E.g**-#**123CT#07:00:00#13:30:00#20:00:45* will configure 3 times as 07:00:00 in the morning, 13:30:00 in the afternoon and 20:00:45 in the evening.When RTC time matches with these times unit will send SMS of MODBUS data.

Unit will send acknowledgement SMS as following:

Command: **#123CT#07:00:00#13:30:00#20:00:45***
Acknowledgement: ***CONFIGURED TIMES***
07:00:00
13:30:00
20:00:45

- **To set Baud rate of RS485 port**

  #123BAUD#XX*

  Where,XX is the baud rate for RS485 port.XX takes values as 9600,19200,57600 and 115200.

  E.g-#123BAUD#19200* will configure baud rate of RS485 as 19200.
  While dispatching the unit the baud rate will be 9600

  Unit will send acknowledgement SMS as following:

Command:	***#123BAUD#19200****
Acknowledgement:	***BAUD RATE IS 19200***

  Note:New baud rate will take effect when Unit restarts.

- **To set Receiver number**

  #123Y#XX*

  Where, XX is receiver number. Maximum length can be 14 digits.

  E.g. #123A#+910123456789* will configure +910123456789 as receiver number.

  Unit will send acknowledgement SMS as following:

Command:	***#123Y#+910123456789****
Acknowledgement:	***Receiver No. is*** **+91012356789**

  When receiver number is configured in the unit then ,when DI of this unit activates it will send DO activation SMSs to receiver number and corresponding DI in receiver unit gets activated.Also if this unit works in bistate mode then when DI of this unit becomes normal it will send DO deactivation SMSs to the receiver and corresponding DO of receiver gets deactivated.

  e.g. if DI1 activated then unit will send #1235#10* command to receiver and DO of receiver also activates.

- **To disable DO acknowledgement messages if the unit is receiver**

  #123LDD#X*

  Where X is 1/0 to enable/disable respectively.

Command: **#123LDD#1***
Acknowledgement: **Unit is receiver**

E.g.#123LDD#1* command will eable this setting and DO acknowledgement messages in receiver will not be sent back to transmitter.

- **To set authentication numbers**

#123A#XX#XX*

Where, XX is authentication number. Maximum length can be 14 digits for each number.

E.g. #123A#+910123456789#+919876543210* will configure +919871045611 as first authentication number and +919871045501 as second authentication number.

Unit will send acknowledgement SMS as following:

Command: ***#123A#+910123456789#+919876543210****
Acknowledgement: ***Authentication numbers are:***
+910123456789
+919876543210

NOTE: Authentication numbers must be stored along with country code. Maximum of 2 authentication numbers can be stored.If authentication numbers are blank then Unit can be configured using any mobile number.

SMS FORMATS TO READ CONFIGURATION

For reading the configuration, SMS can be sent from any number. i.e. it is not necessary that it should be authentication number only. The SMS formats are mentioned below.

- **To read authentication numbers**

When unit receives this SMS, it will reply with an SMS as follows:

Command: ***#123RA****
Acknowledgement: ***Authentication numbers are:***
+910123456789

+919876543210

- **To read the currently configured SMS reporting numbers**
  When unit receives this SMS, it will reply with an SMS as follows: (Assuming only 02 reporting numbers are configured.)

  Command: ***#123R1****
  Acknowledgement: ***SMS Nos:***
  +910123456789
  +919876543210

- **To read configured SMS text for analog and digital channels and Read Device Text**

  Read Digital channel 1 Alarm text message:
  Command: ***#123RM1****
  Acknowledgement: ***Reporting text1 for channel 1:***
  Alarm on channel 1

  Read Digital channel 2 Alarm text message:
  Command: ***#123RM2****
  Acknowledgement: ***Reporting text1 for channel 2:***
  Alarm on channel 2

  Read Digital channel 3 Alarm text message:
  Command: ***#123RM3****
  Acknowledgement: ***Reporting text1 for channel 3:***
  Alarm on channel 3

  Read Digital channel 4 Alarm text message:
  Command: ***#123RM4****
  Acknowledgement: ***Reporting text1 for channel 4:***
  Alarm on channel 4

  Read Digital channel1 Restoral message text:
  Command: ***#123RB1****
  Acknowledgement: ***Reporting text2 for channel 1:***
  Channel 1 is Normal

  Read Digital channel2 Restoral message text:
  Command: ***#123RB2****
  Acknowledgement: ***Reporting text2 for channel 2:***
  Channel 2 is Normal

  Read Digital channel 3 Restoral message text:
  Command: ***#123RB3****

Acknowledgement: ***Reporting text2 for channel 3:***
Channel 3 is Normal

Read Digital channel 4 Restoral message text:
Command: ***#123RB4****
Acknowledgement: ***Reporting text2 for channel 4:***
Channel 4 is Normal

Read reporting text for analog channel 1:
Command : **#123RP1***
Acknowledgment: ***Reporting text for Analog 1:***
Alarm on Analog 1

Read reporting text for analog channel 2:
Command : **#123RP2***
Acknowledgment: ***Reporting text for Analog 2:***
Alarm on Analog 2

Read Analog channel 1 restoral message text
Command : **#123RN1***
Acknowledgment: ***Reporting text for Analog 1:***
Analog 1 is Normal

Read Analog channel 2 restoral message text
Command : **#123RN2***
Acknowledgment: ***Reporting text for Analog 2:***
Analog 2 is Normal

Read Device Information text message:
Command: ***#123RM9****
Acknowledgement: ***Reporting text for Device:***
Device ID: 0123456

- **To read current NO / NC status of inputs**

Command: ***#123R4****
Acknowledgement: ***Configuration of input channels is:***
0000
Delays set to
00
00
00
00

- **To read Bistate status of inputs**

Command: ***#123R3****
Acknowledgement: **Inputs are BISTATE**

- **To read Analog Input reporting unit**

Read Analog channel 1 reporting unit
Command : **#123RU1***
Acknowledgement: **Reporting unit for analog 1 : degc**

Read Analog channel 2 reporting unit
Command : **#123RU2***
Acknowledgement: **Reporting unit for analog 2 : Degc**

- **To read analog input format**

Command : **#123R9***
Acknowledgement : **Analog Input Format Is**
AI1L = 0000
AI1H = 0070
AI2L = 0000
AI2H = 0070

- **To read analog input levels**

Command: ***#123R6****
Acknowledgement: ***Analog threshold values are set to:***
AI1LOW = 0020.0
AI1HIGH =00 50.0
AI2LOW = 0030.4
AI2HIGH = 0056.7

- **To read Reporting numbers selected for Digital Inputs reporting**

Command: ***#123R2****
Acknowledgement: ***Nos. Selected :***
D1:145
D2:36789
D3:A
D4:169A
A1:123
A2:1A

- **To read current status of outputs**

Command: **#123R5***
Acknowledgement: ***Output 1 connected to NO1***
Output 2 connected to NC2
Output 3 connected to NO3
Output 4 connected to NC4
Output 5 connected to NO5
Output 6 connected to NC6

- **To read auto-restoral output timeout**

Command: **#123R7***
Acknowledgement: ***OP1 ON for 60 Sec***
OP2 ON for 30 Min
OP3 ON for 05 Hrs
OP4 ON for 99 Sec
OP5 ON for 99 Min
OP6 ON for 24 Hrs

- **To read output linked with input or not**

Command: **#123R8***
Acknowledgement: ***Output linked to inputs:***
OP1 = Y
OP2 = N
OP3 = Y
OP4 = N
OP5 = Y
OP6 = N

- **To read SMS text for DO connected to NO contact**

Command: **#123RO1***
Acknowledgement: ***TAMPER1 is OPEN***

Command: **#123RO2***
Acknowledgement: ***TAMPER2 is OPEN***

Command: **#123RO3***
Acknowledgement: ***TAMPER3 is OPEN***

Command: **#123RO4***
Acknowledgement: ***TAMPER4 is OPEN***

Command: **#123RO5***
Acknowledgement: ***TAMPER5 is OPEN***

Command: **#123RO6***
Acknowledgement: ***TAMPER6 is OPEN***

- **To read SMS text for DO connected to NC contact**

Command:	**#123RC1***
Acknowledgement:	***TAMPER1 is CLOSE***
Command:	**#123RC2***
Acknowledgement:	***TAMPER2 is CLOSE***
Command:	**#123RC3***
Acknowledgement:	***TAMPER3 is CLOSE***
Command:	**#123RC4***
Acknowledgement:	***TAMPER4 is CLOSE***
Command:	**#123RC5***
Acknowledgement:	***TAMPER5 is CLOSE***
Command:	**#123RC6***
Acknowledgement:	***TAMPER6 is CLOSE***

- **To read periodic status reporting hours**

Command:	***#123RH****
Acknowledgement:	***Periodic Reporting hours are set to: 01***

- **To read current status of inputs**

Command:	***#123RS****
Acknowledgement:	***C1 NO (ALT)***
	C2 NO (NRM)
	C3 NO (NRM)
	C4 NO (NRM)
	AI1 00.0degc (OPN)
	AI2 27.4degc (ALT)
	Device ID: 0123456

This message tells all input channls are configured as NO. Channel 2, 3 & 4 inputs are in their normal state and Digital input 1 ,5,6,7,8 and analog input 2 is in Alert state.Analog channel 1 is open. Also the message configured by user using #123M9* command will be added towards the end of periodic reporting to indicate device ID / location / Serial Number.

- **To read Baud Rate of RS485**

  Command: ***#123RBAUD****
  Acknowledgement: ***BAUD RATE IS 19200***

- **To read MODBUS Query set**

  If only 1 Query are set then,

  Command: ***#123RQ1****
  Acknowledgement: ***Queries:***
  01: 01,03,1,10

  Command: ***#123RQ2****
  Acknowledgement: ***Queries:***

- **To read No of MODBUS Inputs(Parameters)**

  Command: ***#*123RIP***
  Acknowledgement: ***No of Inputs on MODBUS:10***

- **To read MODBUS Polling Time**

  Command: ***#*123RQT***
  Acknowledgement: ***Polling Time 02 Seconds***

- **To read MODBUS Format**

  Command: ***#*123RW***
  Acknowledgement: ***MODBUS FORMAT IS:***
  IIIII

- **To read Function codes**

  Command: ***#*123RK***
  Acknowledgement: ***Function Codes are:***
  11111

- **To read MODBUS Thresholds(Function code 03/04)**

  Command: ***#*123RTH1***
  Acknowledgement: **20.0, 80.0**
  10.3, 78.9
  12.7, 90.9
  25.3, 40.5
  15.0, 67.8

- **To read MODBUS Alert mail Text**

Command: ***#123RZ01****
Acknowledgement: **Reporting Text: Temperature sensor**

- **To read Date and Time**

Command: ***#123RDT****
Acknowledgement: ***Date – 11/02/2016***
Time – ***17:53:23***

- **To read Time at which Modbus SMS is required**

Command: **#123RCT***
Acknowledgement: ***CONFIGURED TIMES***
08:30:00
16:30:00
22:00:45

- **To read Receiver number**

Command: ***#123RY****
Acknowledgement: ***Receiver No. is***
+91012356789

- **To read DO acknowledment message enable/disable settings in receiver**

Command: **#123RLDD***
Acknowledgement: **Unit is receiver**

LED INDICATIONS

LED NAME	Meaning
Power	ON - Unit is powered on.
Analog Input 1	ON - Input 1 is in alarm state. OFF - Input 1 is in normal state.
Analog Input 2	ON - Input 2 is in alarm state. OFF - Input 1 is in normal state.
Digital Input 1	ON - Input 1 is in alarm state. OFF - Input 1 is in normal state.
Digital Input 2	ON - Input 2 is in alarm state. OFF - Input 2 is in normal state.
Digital Input 3	ON - Input 3 is in alarm state. OFF - Input 3 is in normal state.

Digital Input 4	ON - Input 4 is in alarm state. OFF - Input 4 is in normal state.
Digital O/P 1	ON - Output1 is connected to NO1. OFF - Output1 is connected to NC1.
Digital O/P 2	ON - Output2 is connected to NO2. OFF - Output2 is connected to NC2.
Digital O/P 3	ON - Output3 is connected to NO3. OFF – Output3 is connected to NC3.
Digital O/P 4	ON - Output4 is connected to NO4. OFF – Output4 is connected to NC4.
Digital O/P 5	ON - Output5 is connected to NO5. OFF – Output5 is connected to NC5.
Digital O/P 6	ON - Output6 is connected to NO6. OFF – Output6 is connected to NC6.
RANGE	Indicates unit range.
	1 LED ON - Low rage.
	2 LEDs ON - Medium range.
	3 LEDs ON - Good range.

CONNECTOR DETAILS

- **3 Pin Howder connector for Power.**

CONNECTOR NAME	DETAILS
12VDC(+)	Positive Supply
12VDC(-)	GND
Earth	Earth

- **3 Pin Howder connector for Analog inputs**

CONNECTOR NAME	DETAILS
AI1	Analog Input channel 1
GND	Common GND terminal
AI2	Analog Input channel 2

- **Two 3 Pin Howder connector for Digital inputs**

CONNECTOR NAME	DETAILS
DI1	Digital Input channel 1
GND	Common GND terminal
DI2	Digital Input channel 2
DI3	Digital Input channel 3

GND	Common GND terminal
DI4	Digital Input channel 4

- **4 Pin Howder connector for output 1 & 2 connection**

CONNECTOR NAME	DETAILS
C1	Common 1
NO1	NO for output 1
C2	Common 2
NO2	NO for output 2

- **4 Pin Howder connector for output 3 & 4 connection**

CONNECTOR NAME	DETAILS
C3	Common 3
NO3	NO for output 3
C4	Common 4
NO4	NO for output 4

- **4 Pin Howder connector for output 5 & 6 connection**

CONNECTOR NAME	DETAILS
C5	Common 5
NO5	NO for output 5
C6	Common 6
NO6	NO for output 6

- **2 Pin Howder connector for Modbus communication**

CONNECTOR NAME	DETAILS
D+	RS485 D+ / Tx+
D-	RS485 D - / Tx-

TROUBLESHOOTING

- Unit doesn't power ON.

  1) Verify input voltage supply connections with their polarity.
  2) Check the supply 12 VDC with the help of Digital Multi Meter.

- Not receiving SMS from SA246M unit.

  1) Ensure device has range. Range LEDs are constant. If range LED's are blinking, then device has poor range. Check antenna connections

or check if SIM card is present and if present then, make sure it is inserted properly.

2) If device range indications LEDs are constant then make sure the SIM card has enough balance to send an SMS and/or is SMS service enabled. Before inserting new SIM card in the device, it is advised to check the new SIM card on a mobile device for SMS functionality and balance check.
3) If Range LEDs are constant, and device SIM is inserted properly and has sufficient balance then send any configuration read command such as #123R1* or #123RH* and check if device makes a long beep. This indicates device has received SMS. Now closely follow the device, device will again give 2 short beeps, this indicates device has acknowledged the received SMS command. *(NOTE: Kindly be patient, sometimes due to network congestion or peak network traffic, it takes more than 1 minute for SMS reception)*
4) If you still do not receive the SMS, then kindly return the device.

- I keep receiving “INVALID COMMAND!” SMS from unit.

1) Kindly send SMS #123RA*
2) Read the authentication numbers set.
3) Ensure you are sending SMS from one of the two authentication numbers set.
4) If authentication number is being used to send SMS then kindly ensure the command being sent is syntactically correct.