GPS/GPRS Nano Tracker
MU-201 User Manual

Revision: 1.0.1
Revision Date: 2011/1/5

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Content

1. Notification

1.1   Introduction:

SANAV MU-201 is a more compact version of GPS tracker focusing on the covert, pets or asset tracking market. Its location can be real time tracked through internet or specified terminals. The user can communicate with the service server through GPRS/GSM network, transfer alarms of Emergency, Geo-fencing., Remote Control, and Lower power, and record the tracking history stored in internal memory through USB or website.

This User Manual details the specification, hardware design, SMS commands, and Respond messages of MU-201. If you have any problem with the content in this manual, please contact SANAV Customer Service by e-mail to **sanav@sanav.com**.

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1.4 Document Amendments

Revision	Date	MU-201 Firmware Version	Comments
1.0.1	2011/1/5	Beta V2.02	Major Functions implemented

2. Specifications:

GSM	
Frequency:	Quad-Band: 850/900/1800/1900MHz Compliant to GSM phase 2/2+ -Class 4 (2W @ 850/900MHz) -Class 1 (1W @ 1800/1900MHz)
GPRS:	GPRS multi-slot class 10 GPRS mobile station class B
RMS Phase Error:	≤5deg
Max Out RF power:	31.0dBm±3dBm
Dynamic Input Range:	-15 ~ -102 dBm
Receiving Sensitivity:	Class II RBER≤2％（-102dBm）
Stability Of Frequency:	Greater than 2.5ppm
Max Frequency Error:	±0.1ppm
GPS	
GPS Chipset:	u-blox
Sensitivity:	Autonomous Acquisition -144 dBm Hot start -155 dBm Tracking -160 dBm
Channels :	20 channel all-in-view tracking
TTFF (Open Sky):	Cold start 40 s average Warm start <30s Hot start <2 s
User Interfaces	
Mini USB Connector:	Include charger
Power Button:	Power on and power off.
General	
Dimension:	60mm* 35 mm * 17mm
Weight:	65 g
Backup Battery:	Li-Polymer 650 mAh , 3.7V
Standby Time:	10 minutes reporting: 50 Hours (estimation) 60 minutes reporting: 100 Hours (estimation)
Charge Voltage	5 V DC
Air Interface Protocol	
Transmit Protocol:	TCP,UDP,SMS
Geo-Fence:	10 Geo-Fence regions can be defined.
Low Power Alarm:	Alarm when battery is low
Power On Report:	Report on power up
Environment	
Operating Temperature	0°C to +55°C
Storage Temperature	-20°C to +85°C
Adapter Temperature	0°C to +40°C

＊This specification is subject to change without prior notice

2.1 Package Contents

MU-201*1pcs	Charging Cable*1pc
Wall Charger*1 100～240V AC / 1.2A）*1pc	
Utility CD * 1pc	

2.1.1 Optional Accessories:

- AP Data Cable

- ## 3. Hardware Description

3.1 Front Face

SOS/Park Button

- **SOS -** Press and hold for 3s to trigger SOS Mode.
- **Park -** One Short Press to Enter Park Mode; and one short press again to exit Park Mode.

- **GSM LED**
- **GPS LED**

3.1.1 LED light status of MU-201

MU-201 LED Display Scenario Table				
Device Status	**GSM**		**GPS**	
	Red	**Green**	**Red**	**Blue**
Power on Long Press Power key for 3 seconds	Steady ON (Than following booting)			
Power off Long Press Power key for 3 seconds		Steady ON Than power off		Steady ON Than power off
GPS Status — Searching GPS Signal	-	-	1 flash per 5s	-
GPS Status — GPS Signal Fixed	-	-	-	1 flash per 5s
GPS Status — GPS sleeping mode	-	-	-	-
GSM Status — Searching GSM Signal & no servers	-	-	-	-
GSM Status — GSM Signal Fixed	-	1 flash per 5s	-	-
SOS Mode — In SOS Mode	Steady ON	-	Steady ON	-
Park Mode — Park on	-	-	Flash 5 times	
Park Mode — In Park Mode	Flash once per 5s	-	-	-
Park Mode — Park off		-	-	Flash 5 times
Receive SMS Command	-	Flash 5 times	-	-
Low Power	Flash 500ms/sec.	-		-
Battery Charging	-	-	-	Flash 500ms/sec
Battery Full Charged	Flash 500ms/sec.	-	-	-

NOTE* Due to the device is still in Beta Version, the above LED Status is subject to change. Please contact SANAV if you have any question regarding the device LED indication.

3.2 TOP Face

Power button

Turn ON：Long Press for 3 seconds when the device is OFF.

Turn OFF：Long Press for 3 seconds when the device is ON.

(Note* When press the Power button for 3 seconds, you will see both GPS and

GSM LED lit on, then you can let go and the device will shut down afterwards.)

3.3 Bottom Face
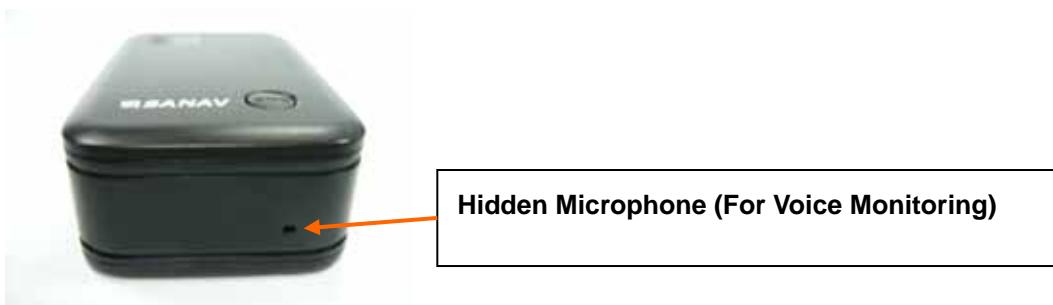
Hidden Microphone (For Voice Monitoring)

3.4 Side Face

SIM Card Holder

3.4.1 Correct Way to insert SIM Card *(Please note the SIM Card orientation!)*

![SANAV logo]
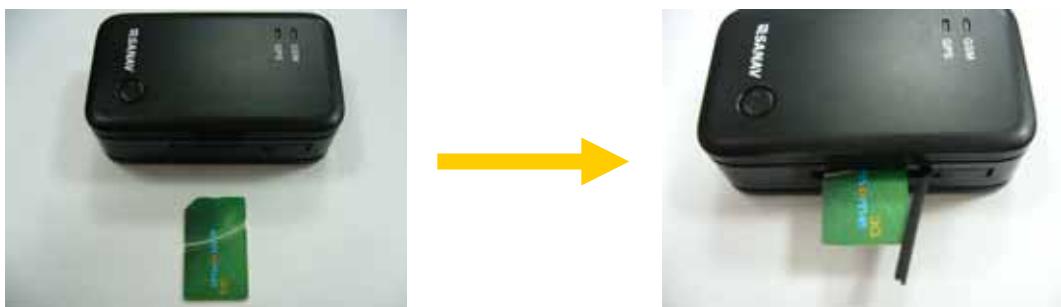
3.6 Charging MU-201

MINI USB 8 PIN

Plug power cable to Mini USB connector for charging the device. (5V DC Input)

When you charge the device for the 1st time, please use the power cable that's contained in the package, and charge the device for 2~3 hours.

3.7 Dimension

60 mm

35 mm

19mm

4 SMS Command Setup for MU-201

MU-201 currently provides SMS commands for remote setup. You can setup the MU-201 by following the instructions shown in following chapters via SMS from a cellular phone or GSM modem. Key the specific SMS message in your cellular phone and send it to the SIM number of MU-201. The setup messages are showed in the following sections.

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4.1 Change Username

You can change the ID of MU-201 by following the format below. No space is allowed between the characters. For example, if you send the SMS message shown in the example below to the MU-201, you will change the ID from "username" to "car"

Setup format： #「username」,「Password」,「Function Code」,「New username」*

Example：#username,0000,1,car*

The table 4.1.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	Default ID of MU-201
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
1	Mode 1 defines the ID setup
Car	✧ New ID defined by the owner. ✧ At the maximum of 16 characters, including a~z,A~Z,0~9, @ - _ / .!%&
*	End sign.

Table 4.1.1

The table 1.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device username is updated.,4.032V
Setup Fail	Username setup Fail!-01- Username is empty or length is too long!,3.926V
MU-201 is in Emergency Mode	in emergency, changing username is not allowed.,3.972V

Table 4.1.2

4.2 Change Password

Use this SMS message example seen below to change the password of MU-201. For example, by following the example below, you will change the default password, "0000" to a new password, "1111".

Setup format：# 「username」, 「Password」, 「Function Code」, 「new Password」, 「new Password」 *

Example：#username,0000,2,1111,1111*

The table 2.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
username	✧ Default ID of MU-201. ✧ If you have changed the username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
2	Mode 2 defines to change the password
1111	New password (Please note at the maximum of 4 number)
1111	Reconfirm the password
*	End sign.

Table 4.2.1

The table 4.2.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device Password is updated.,4.020V
Setup Fail	Password setup Fail!,3.914V
MU-201 is in Emergency Mode	in emergency, changing password is not allowed.,3.945V

Table 4.2.2

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4.3 Set up APN for Device Report

Use this SMS message to predefine the APN by following the format below.

Setup format: #「username」,「Password」,「Function Code」,「APN name」,「APN username」,「APN password」, 「APN DNS」*

Example：#username,0000,3,Twm,1234,1234, 172.20.2.10*

Note that the total length of APN name, APN username, APN Password, and APN DNS should be lesser than 70 characteristics.

The table 4.3.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
3	Mode 3 defines the changes of the built-in APN setting.
Twm	APN Name
1234	APN Usename
1234	APN Password
172.20.2.10	APN DNS
*	End sign.

Table 4.3.1

The table 4.3.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device GPRS APN is updated.-03- Set up the GPRS APN,3.947V
MU-201 is in Emergency Mode	in emergency, GPRS APN setup is not allowed.,3.942V

4.4 Set up URL for Device Report

Use this SMS message to predefine the URL by following the format below.

Setup format: #「username」,「Password」,「Function Code」,「URL」*

Example：#username,0000,4,http://www.sanav.com/eric-gga/gprs.aspx*

Note that the URL should be lesser than 80 characteristics.

The table 4.4.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
4	Mode 4 defines to transmit data to a specific website
http://www.sanav.com/eric-gga/gprs.aspx	URL
*	End sign.

Table 4.4.1

The table 4.4.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device IP/Domain is updated.-04- Set up a Host Name (URL) to Transmit Data is OK,3.947V
MU-201 is in Emergency Mode	in emergency, IP/Domain setup is not allowed.,3.942V

4.5 Set up Phone Number List

Use this SMS message to predefine the cellular numbers in "Phone Book" (Max. of 3 numbers) by following the format below.

Setup format: # 「username」,「Password」,「Function Code」,「PH-01」,「PH-02」,「PH-03」*

Example：#username,0000,5,+886123456789,+492234567890,+866323456789*

Note that both adding and not adding the "+ "sign in front of the cellular phone number(s) are both acceptable, while the"+" sign should precede the national code.

The table 4.5.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
username	✧　　Default ID of MU-201. ✧　　If you have changed the Username, please use the updated one.
0000	✧　　Default password. ✧　　If you have changed the password, please use the updated one.
5	Mode 5 defines the changes of the built-in phone number list.
+886123456789	1st cellular numbers, **PH-01**
+492234567890	2nd cellular numbers, **PH-02**
+866323456789	3rd cellular numbers, **PH-03**
*	End sign.

Table 4.5.1

The table 4.5.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device phone book is updated.-05- Setup Phone is OK ,phone1=+886970016355,phone2=+886970016355,phone3=+866970016355,4.013V
MU-201 is in Emergency Mode	in emergency, phone book setup is not allowed.,3.939V

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4.6 Set up SOS Number

Use this SMS message to predefine the SOS cellular numbers by following the format below. MU-201 will first send a SOS Alert to the SOS phone and then make a phone call to the SOS phone number immediately.

Setup format: # 「username」, 「Password」, 「Function Code」, 「SOS Phone」*

Example：#username,0000,sosphone,+886123456789*

Note that both adding and not adding the "+ "sign in front of the cellular phone number(s) are both acceptable, while the"+" sign should precede the national code.

The table 4.6.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
sosphone	Mode "sosphone" defines the changes of the built-in phone number list.
+886123456789	SOS Phone number
*	End sign.

Table 4.6.1

The table 4.6.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device sos phone book is updated.SOS phone=0955123456,4.016VV
MU-201 is in Emergency Mode	in emergency, sos phone book setup is not allowed.,3.920V

SOS Algorithm

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Press SOS Button

Check Phonebook — Yes → **Send SMS to all numbers**

No ↓

Check SOS Phonebook — Yes → **Call SOS Number**

No ↓

Call hangs up

Send data according to preset router
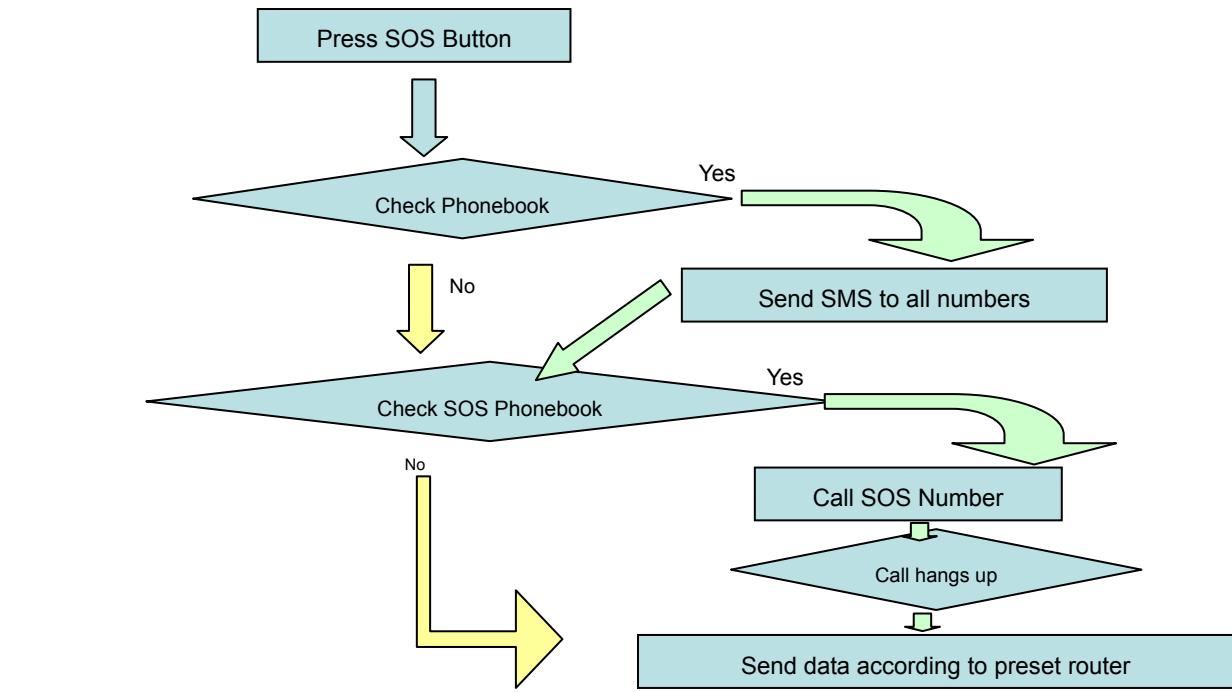
4.6.2 Set up SOS Report Interval

Use this SMS message to predefine the SOS report interval by following the format below.

Setup format: # 「username」, 「Password」, 「Function Code」, 「SOS report interval」, 「SOS report times」*

Example：#username,0000,15,30,3*

Note that SOS report interval ranges from 1~65000 seconds; SOS report times ranges from 1~9999 times.

The table 4.6.2.2 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
15	Function Code
30	It defines the report interval (in this case, one report per 30s) when SOS is triggered.
3	It defines how many times the SOS report will be sent to the defined SOS phone number. (in this case, 3 times)
*	End sign.

Table 4.6.2.2

The table 4.6.2.3 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	setup OK. Device Panic report setting is updated.-15-Panic Report Setting,3.950V
MU-201 is in Emergency Mode	in emergency, Panic Report setting is not allowed.-15-Panic Report Setting ,4.000V

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4.6.3 Stop SOS Report (Exit from SOS Mode)

While the device is still in SOS Mode (meaning it's sending the SOS Alert Report), one can use this SMS message to stop the SOS report and Exit from SOS mode.

Setup format: # 「username」,「Password」,「offpanic」*

Example: #username,0000,offpanic*

Note: Users can enter or exit SOS Mode by pressing the SOS button on the device, too. See Chapter 2, Hardware Description.

The table 4.6.3.1 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device OffPanic is Done and switching to normal mode.,3.806V

4.7 Set up Auto Report

Use this command to set up the frequency of Auto Report. MU-201 can report according to <u>time interval</u> only or according to <u>time and distance travelled</u>.　If you sent the SMS command as the **Example1** below, MU-201 will check the distance travelled every 300 seconds to see if it has traveled exceeds 100 meters from the last known location. If it does, it will report. If doesn't, MU-201 will not report. When the MU-201 stays at the same location for 30 minutes (300 seconds x 6 times), it will also report and marked the location as last known location.

Note: You may limit the amount of the Auto reply messages by inputting the digits from 1 to 9998 in the 「total number of report」 field. When you input 9999, the Auto Report Message will not stop unless you define a new Auto Report Setting.

Setup format:#「username」,「Password」,「Function Code」,「intervals (sec)」,「total number of report」,「distance interval(m)」,「stationary detection(times)」,[Time Unit(s/m/h)]*

Example1：#username,0000,6,300,99,100,6,s*

The table 4.7.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
username	✧　Default ID of MU-201. ✧　If you have changed the Username, please use the updated one.
0000	✧　Default password. ✧　If you have changed the password, please use the updated one.
6	Mode 6 defines to change the intervals and times of sending-back data
300	A constant interval of sending data
99	The amount of 99 messages sent automatically
100	**Distance Interval**: when the auto report function is activated, the tracker will take the current position as the center point, if this value is defined, the tracker will take this distance as the radius to make a circle. When the tracker exceeds this circle, the alarm report will be sent to the assigned router. The unit of this function is **meter**. <u>Minimum 100m</u>.
6	**Stationary Detection**: If this value is defined by 5, the tracker will detect if the tracker exceeds the circle for 5 times. If the tracker doesn't exceed this circle, the tracker will send a notice message. The unit is **times**.
s	**Time Unit as "s" for seconds, "m" for minutes, and "h" for hours.** **In this example, we put "300" in constant interval of sending data, so the actual report will be 300 seconds.**
*	End sign.

Table 4.7.1

The table 4.7.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	setup OK. Device Auto Report setting is updated.,AUTO,3.808V setup OK. Device Auto Report setting is updated.,AGF,3.809V
MU-201 is in Emergency Mode	in emergency, Auto Report setting is not allowed.,3.866V

4.8 Acquire the Report of Current Position (SMS Polling)

You can send the SMS according to the example shown below. It will transmit current data to the web server (URL) or assigned router at once.

Setup format：#「username」,「Password」,「Function Code」*

Example：#username,0000,10*

The table 4.8.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	Start sign.
Username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
10	Mode 10 defines to transmit current data to the web server at once.
*	End sign.

Table 4.8.1

4.9 Setup Report Interval When Park Is Triggered

When the park function is activated, user can use this command to setup report interval. For the detail, please take a look at following instruction.

Setup format：#「username」,「Password」,「Function Code」,「intervals (sec)」,「Total number of report」*

Example: #username,0000,16,60,60*

The table 4.9.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	**Start sign.**
username	✧　　Default ID of MU-201. ✧　　If you have changed the Username, please use the updated one.
0000	✧　　Default password. ✧　　If you have changed the password, please use the updated one.
16	Mode 16 is to set interval when Park is triggered
Interval(sec)	Maximum 65000 seconds
Total number of report	1-9998 times; 9999 is infinite
*	End sign.

Table 4.9.1 The explanation of each segment of command

The table 4.9.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	setup OK. Device Move report setting is updated.-16-Park Report Setting,3.947V
MU-201 is in Emergency Mode	in emergency, Move report setting is not allowed.-16-Park Report Setting,4.021V

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4.10 Setup Over Speed Detection

Use this command to set up the Over Speed Detection Setting; please notice that this is for "Setup" only, you have to send another command to activate the function. Once the Over Speed detection is activated, MU-201 will start to report according to interval set below.

Setup format：

「username」,「Password」,「Function Code」,「Speed Limit」,「Unit」,「Interval(s)」,「Total Report」*

Example: #username,0000,11,100,km,60,2*

The table 4.10.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	**Start sign.**
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
11	Mode 11 is to set speed limit
100	Speed Limit
km	Speed in km/hr; you can also input "mi" (miles) or "nm" (nautical miles) for different unit.
60	Report time interval, 60 seconds
2	Send out 2 reports according to time interval when over speed occurred.
*	End sign

Table 4.10.1 The explanation of each segment of command

The table 4.10.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	setup ok. Device Speed limit is updated.-11-Speed Limit,3.965V
MU-201 is in Emergency Mode	in emergency, Speed limit setting is not allowed.-11-Speed Limit,3.936V

4.11 Activate Over Speed Detection

Once you have done the Over Speed Setup above in Chapter 8, use this command to turn ON/OFF the detection.

Setup format：#「username」,「Password」,「Speed」, 「ON or OFF」*

Example: #username,0000,speed,on*

The table 4.11.1 describes the meaning of each segment in the message above.

Text Keyed In SMS	Description
#	**Start sign.**
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
Speed	Function Code
on	on: Activate Speed Detection; off: deactivate Speed Detection
*	End sign

Table 4.11.1 The explanation of each segment of command

The table 4.11.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Setup OK!START Speed Limit Timer is OK.,3.965V Setup OK!STOP Speed Limit Timer is OK.,3.965V

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4.12 Setup Geofence Coordinate

Users can setup the Geofence by using this command. The Geofence is defined as a round area. Therefore, the coordinates is the center and the radius is defined in meter.

Setup format : #「username」,「Password」,「gf1~10」,「Latitude」,「N or S」,「Longitude」,「E or S」,「meters」,「IN/Out mode」*

Command: #username,0000,gf1,2458.9741,N,12125.6460,E,500,1~3*

The table 4.12.1 describes the meaning of each segment in the message above

Text Keyed In SMS	Description	
#	**Start sign.**	
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.	
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.	
Gf1	Geofence setup mode. You can input gf1, gf2, gf3, gf4...gf10 to define each Geofence range. There are 10 sets of Geofence can be pre-defined.	
2458.97411	Latitude (unit:ddmm.mmmmm)	
N	N = North, S = South	
12125.64601	Longitude (unit:dddmm.mmmmm)	
E	E= East , W= West	
500	500 meters in radius	
1~3	1	It will trigger the alarm when the tracker is outside of the geofence.
	2	It will trigger the alarm when the tracker is inside of the geofence.
	3	It will trigger the alarm when the tracker is either outside or inside of the geofence.
*	End sign.	

Table 4.12.1 The explanation of each segment of command

If you would like to enable/disable the Geofence Function, it can be done by sending the following SMS command:

Command: #username,0000,gf,on*

#username,0000,gf,off*

Once the device receive the above SMS command, the Geofence Detection will be disabled.

The table 4.12.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	setup OK. Device is in Geofence mode.,3.937V setup OK. Geofence mode has been deactivated.,3.946V
MU-201 is in Emergency Mode	in emergency, Geofence mode cannot be activated.,3.920V

4.13 Setup Geofence Alarm Report Interval

Users can use this command to define the Geofence Report Interval and times.

Setup format：#「username」,「Password」,「Function mode」, 「Seconds」,「times」*

Example:

Command: #username,0000,17,0~30000,0~9999*

The table 4.13.1 describes the meaning of each segment in the message above

Text Keyed In SMS	Description
#	**Start sign.**
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
17	Mode 17 defines to set the geofence report interval
0~65000	Time interval in second
0~9999	Total report. Note that 9999 means infinite reporting.
*	End sign.

Table 4.13.1 The explanation of each segment of command

The table 4.13.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	GTS setting is updated.,3.836V
MU-201 is in Emergency Mode	in emergency, Geofence Report setting is not allowed.-17-Geo Setting,4.000V

4.14 Setup Voice Mode

Users can use this command to define the Voice Mode of MU-201.

Voice Mode is to define how MU-201 will action when receiving an incoming call.

Please note that have if you have enabled "Security Phone Book" function, then MU-201 will verify whether the caller's

number is in the Security Phone Book. If it's not, then MU-201 will not react to the incoming call.

Setup format：#「username」,「Password」,「Function mode」,「0~3」*

Example:

Command: #username,0000,8,0~3*

The table 4.14.1 describes the meaning of each segment in the message above

Text Keyed In SMS	Description
#	**Start sign.**
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
8	Mode 8 defines to set the Voice Mode.
0~3	0 and 1: MU-201 will Auto-answer the call and go into Voice Monitoring Mode. 2: MU-201 will hang up the call and respond its current location to the caller's cell number. 3: MU-201 will hang up the call and respond its current location to the defined Router.
*	End sign.

Table 4.14.1 The explanation of each segment of command

The table 4.14.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device is switching to MIC mode.-08- Monitor Modevoice mode 0, auto answer the call,3.944V Device is switching to MIC mode.-08- Monitor Modevoice mode 2, reply the polling SMS to caller,3.930V Device is switching to MIC mode.-08- Monitor Modevoice mode 3, reply the polling SMS to phone1,3.914V
MU-201 is in Emergency Mode	in emergency, Voice setting mode is not allowed.-08- Monitor Mode,3.958V

4.15 Setup TCP/UDP Server Address

Users can use this command to define the TCP/UDP Server Address of MU-201.

Setup format：#「username」,「Password」,「Function mode」,「TCP/UDP server address」*

Example:

Command: #username,0000,18,0.0.0.0:0000*

The table 4.15.1 describes the meaning of each segment in the message above

Text Keyed In SMS	Description
#	**Start sign.**
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
18	Mode 18 defines to set up the TCP/UDP Server Address
0.0.0.0:0000	TCP/UDP Server Address and Port
*	End sign.

Table 4.15.1 The explanation of each segment of command

The table 4.15.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device TCP/UDP is updated.-18-TCP/UDP address Setting,4.092
MU-201 is in Emergency Mode	in emergency, TCP/UDP setup is not allowed.,3.830V

4.16 Setup Backup/Log Interval Mode (Pre-defined Backup Times)

Users can use this command to define the log interval of MU-201.

So the device will log the GPS reports inside the flash memory until it reaches the pre-defined backup times, and then send the reports altogether.

Setup format：#「username」,「Password」,「Function mode」, 「backup mode」*

Example:

Command: #username,0000,21,0~2*

The table 4.16.1 describes the meaning of each segment in the message above

Text Keyed In SMS	Description
#	**Start sign.**
username	✧　　Default ID of MU-201. ✧　　If you have changed the Username, please use the updated one.
0000	✧　　Default password. ✧　　If you have changed the password, please use the updated one.
21	Function code
0~2	0: Disable Backup or Log function completely. 1: Enable Backup function, the device will log the data when there is no GSM/GPRS reception. 2: Enable Log Interval function, the device will log the data based on defined report interval. And then send it altogether.
*	End sign.

Table 4.16.1 The explanation of each segment of command

The table 4.16.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Device log mode is disable.,3.816V
MU-201 is in Emergency Mode	in emergency, log mode setup is not allowed.,3.830V

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4.17 Setup SMS Google Map Report

Users can use this command to define the SMS report format when **Voice Mode** is set at "2" or "3". (See Chapter 4.14)

There are 2 options: 1) GPRMC Format and 2) OpenGEO SMS Format.

With OpenGeo SMS Format, the device will send the device location in Google Map hyperlink. It can then be shown on the Mobile Browser which supports Google Map.

Setup format：#「username」,「Password」,「map」,「0~1」*

Example:

Command: #username,0000,map,1*

The table 4.17.1 describes the meaning of each segment in the message above

Text Keyed In SMS	Description
#	**Start sign.**
username	✧ Default ID of MU-201. ✧ If you have changed the Username, please use the updated one.
0000	✧ Default password. ✧ If you have changed the password, please use the updated one.
Map	The Function code to setup SMS report format.
0~1	0: Report SMS in GPRMC Format 1: Report SMS in OpenGeo Format (Google Map Link)
*	End sign.

Table 4.17.1 The explanation of each segment of command

The table 4.17.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Google MAP hyper-link state in SMS is OFF!,3.816V Google MAP hyper-link state in SMS is ON!,3.816V
MU-201 is in Emergency Mode	in emergency, Google Map hyper-link setting is not allowed.,3.816V

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4.18 Setup Security Phone Book

Users can use this command to define the Security Phone book; the maximum numbers is 10 sets.

Please note that SOS Phone + Default Phone Book (3 sets) = 4 sets numbers are also considered Security Phone numbers; so you basically have 14 sets Security Phone Numbers available for setup.

Setup format : #「username」,「Password」,「secphone」, 「1~10」, 「Phone number」*

Example:

Command: #username,0000,secphone,1,+886123456789*

Note that both adding and not adding the "+ "sign in front of the cellular phone number(s) are both acceptable, while the"+" sign should precede the national code.

The table 4.18.1 describes the meaning of each segment in the message above

Text Keyed In SMS	Description
#	**Start sign.**
username	✧　　Default ID of MU-201. ✧　　If you have changed the Username, please use the updated one.
0000	✧　　Default password. ✧　　If you have changed the password, please use the updated one.
Secphone	The Function code to setup Security Phone Book Numbers.
1	The ID of each phone number. You can put 1~10 here
+886123456789	The Security Phone number you would like to assign to the ID.
*	End sign.

Table 4.18.1 The explanation of each segment of command

The table 4.18.2 shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Security Phone setting is OK!Security_phone(1)=0910061229,3.807V
MU-201 is in Emergency Mode	in emergency, Security phone settging is not allowed.,3.807V

4.18.2 Enable/Disable Security Phone Book Detection

You can use this command to enable/disable Security Number Functions.

Setup Format: #username,0000,SECURITY,ON/OFF*

Text Keyed In SMS	Description
#	**Start sign.**
username	✧ ID of MU-201
0000	✧ Password of MU-201.
SECURITY	Function Code
ON/OFF	ON: Only accept calls/commands from security numbers; OFF: Accept all calls/commands.
*	End sign.

The table 4.18.2.2shows each confirmation message reply after setup

Situation	Message Reply
Setup Succeeds	Setup Success, Security State is ON!,3.806V
	Setup Success, Security State is OFF!,3.806V
MU-201 is in Emergency Mode	in emergency, Security state setting is not allowed.,3.809V

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5 Respond messages

This chapter shows you how to read and understand the different response messages sent from MU-201. Basically, there're 12 different situations that trigger the MU-201 to response its position and are shown in the following pages.

Status Table:

Event	Descriptions
AUTO / BAUTO	When the monitor sends a valid Auto Report command to MU-201, it will send a report including an "**Auto**" behind each GPRMC sentence. **BAUTO** represents data stored at the flash.
MOVE / BMOVE	When MU-201 exceeds the speed limit in Park mode, it will trigger the "**Move**" event and start sending report according to the setting. **BMOVE** represents data stored at the flash.
POLL / BPOLL	When using the SMS to poll the report, the event will be "**POLL**". **BPOLL** represents data stored at the flash.
GFIN / BGFIN	When MU-201 enters the geofence area, it triggers the "**GFIN**" event. **BGFIN** represents data stored at the flash.
GOUT / BGOUT	When MU-201 moves out from the geofence area, it triggers the "**GOUT**" event. **BGOUT** represents data stored at the flash.
Overspeed / BOverspeed	**Over Speed Event** **BOverspeed** means the Overspeed data you received was stored in the flash and then sent back.
LP / BLP	When MU-201's is in low power (under 3.7V), the report sent from MU-201 **BLP** represents data stored at the flash.

5.1 Output Format When The Router Is Set to HTTP, TCP or UDP

1.Uploading Auto data when GPS is fixed

When execute the Auto Report according to the settings with a GPS fixed, MU-201 will upload the data to HTTP or TCP or UDP. The data format will be like the following.

Format:

imei=imei&rmc=$GPRMC,status,Battery Level

Example:

imei=135790246811220&rmc= $GPRMC,105924.000,A,2457.8098,N,12125.5395,E,0.00,0.00,270111,,*0E,AUTO,3.987V

2.Uploading Auto data when GPS is not fixed

Example:

imei=357853030016621&rmc=$GPRMC,105521.855,V,2457.7591,N,12125.5684,E,0.00,0.00,011110,,*1A,AUTO

Field	Descriptions
imei	IMEI code of the MU-201. GSM unique identity number.
$GPRMC	It is a full sentence of GPRMC including the current Lat/Long, UTC and others.
Status	This is the event that triggers the response. Please refer to status table.
Battery Level	

!! Note: 2. The **"A"** is the GPRMC sentence indicates the GPS status, which is GPS fixed. If the GPS is not fixed, letter **"V"** will substitute the letter "A".

5.2 Output Format when The Router Is Set to SMS

1.Uploading Auto data when GPS is fixed

When execute the Auto Report according to the settings with a GPS fixed, MU-201 will upload the data to SMS. The data format will be like the following.

Format:

username,$GPRMC,status

Example:

username, $GPRMC,105924.000,A,2457.8098,N,12125.5395,E,0.00,0.00,270111,,*0E,AUTO

2.Uploading Auto data when GPS is not fixed

Example:

Username, $GPRMC,105924.000,A,2457.8098,N,12125.5395,E,0.00,0.00,270111,,*0E,AUTO

Field	Descriptions
username	The username of MU-201.
$GPRMC	It is a full sentence of GPRMC including the current Lat/Long, UTC and others.
Status	This is the event that triggers the response. Please refer to status table.

!! Note: 2. The **"A"** is the GPRMC sentence indicates the GPS status, which is GPS fixed. If the GPS is not fixed, letter **"V"** will substitute the letter "A".

5.3 NMEA 0183 GPRMC Sentence

RMC - Recommended Minimum data

The Recommended Minimum sentence defined by NMEA for GPS/Transit system data.

$GPRMC, hhmmss, status, latitude, N, longitude, E, spd, cog, ddmmyy, mv, mvE, mode*cs<CR><LF>

Name	ASCII String		Units	Description	
	Format	Example			
$GPRMC	string	$GPRMC		Message ID	RMC protocol header
hhmmss	hhmmss.sss	110214.00		UTC Time	Time of position fix
status	character	A		Status	Status
					V = Navigation receiver warning
					A = Data valid
latitude	ddmm.mmmm	2457.81039		Latitude	User datum latitude degrees, minutes, decimal minutes format
N		N		N/S Indicator	N=north or S=south
longitude	dddmm.mmmm	12125.54004		Longitude	User datum latitude degrees, minutes, decimal minutes format
E	character	E		E/W indicator	E=east or W=west
Spd	numeric	0.634	knots	Speed	Speed Over Ground
cog	numeric	287.73	degrees	COG	Course Over Ground
ddmmyy	ddmmyy	270111		Date	Current Date in Day, Month Year format
mv	numeric		degrees	Magnetic variation value	Not being output by receiver
mvE	character			Magnetic variation E/W indicator	Not being output by receiver
mode		A		Mode Indicator	A=Data VALID, V=Data Invalid
cs	hexadecimal	*62		Checksum	
<CR> <LF>					End of message

Example: $GPRMC,110214.00,A,2457.81039,N,12125.54004,E,0.634,287.73,270111,,,A*62

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Warranty

Warranty Time Period and Repair Coverage

SAN JOSE TECHNOLOGY, INC. warrants MU-201 to be free from all defects and malfunctions in materials and workmanship for a period of 12 months from the original purchase date from SAN JOSE Technology or authorized dealers. If the equipment functions improperly during the warranty period, SAN JOSE Technology will either repair or replace the unit without charge. Such repair service will include necessary adjustments, remanufacture, and replacements. The product should be returned freight-prepaid by the purchaser within valid warranty period. **Notice that you must contact SAN JOSE Technology for a RMA (Return Material Authorization) number before returning the goods for repair**.

Telephone assistance will also be provided during the warranty period.

Limitations

This warranty is limited only to the repair or replacement of defective parts confirmed by SAN JOSE Technology to be a result of faulty materials or workmanship. Instruments mechanically or physically damaged due to the following conditions are beyond our warranty:

Neglect, misuse or abuse, such as a incorrect testing, installation, or operation.

Place subject in extreme environments beyond the limits of the specifications.

Subjected to disassembling, soldering, alteration, unauthorized repair, and electrical shock by nature.

Any incidental or consequential losses or damages result from the purchase.

Disaster, accident, using any unauthentic substitutive equipment or loss of any accessory that's not provided by SAN JOSE Technology.

For damages caused under the above conditions, we'll contact you to discuss replacement options.

for FCC 15b devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: -Reorient or relocate the receiving antenna. -Increase the separation between the equipment and receiver. -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. -Consult the dealer or an experienced radio/TV technician for help.

b. FCC Part 15.21 information for user

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

b-1. FCC Part 15.19 (若 EUT 太小時無法放入 label 上時，則須加入使用手冊內)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation

FCC RF Radiation Exposure Statement:

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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