

CHOOSE WELL...
CHOOSE WISELY...
CHOOSE MAXON...

Smartmax M2M HSPA Smart Modem Solution

GPS User Manual



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CONTACT INFORMATION

In keeping with Maxon's dedicated customer support policy, we encourage you to contact us.

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RF EXPOSURE AND ELECTRICAL SAFETY COMPLIANCE

The use of this device in any other type of host configuration may not comply with the RF exposure requirements and should be avoided. During operation, a 20 cm separation distance should be maintained between the antenna, whether extended or retracted, and the user's/bystander's body (excluding hands, wrists, feet, and ankles) to ensure RF exposure compliance. The modem is not designed for, nor intended to be, used in applications within 20 cm (8 inches) of the body of the user. Continued compliance of the equipment relies upon it being used with an AS/NZS 60950.1 approved SELV power supply.

Caution

Change or modification without the express consent of Maxon Electronics Australia Pty. Ltd. voids the user's authority to use the equipment. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. The modem is a transmitting device with similar output power to a mobile phone. This equipment generates, uses, and can radiate radio frequency energy and, if not used in accordance with instructions, can cause harmful radiation to radio communication. Use only the supplied or an approved antenna. Unauthorized antennas, modifications, or attachments could impair call quality, damage the device, or result in violation of RF exposure regulations.

However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference in radio and television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving radio or TV antenna
- Increase the separation distance between the equipment and the receiver
- Contact Maxon Australia Technical Support for assistance.

General Safety

RF Interference Issues: Avoid possible radio frequency (RF) interference by carefully following safety guidelines below:

- Switch OFF the Modem when in an aircraft. The use of cellular telephones in aircraft is illegal. It may endanger the operation of the aircraft and/or disrupt the cellular network. Failure to observe this instruction may lead to suspension or denial of cellular services to the offender, legal action, or both.
- Switch OFF the Modem in the vicinity of gasoline or diesel fuel pumps or before filling a vehicle with fuel.
- Switch OFF the Modem in hospitals and any other place where medical equipment may be in use.
- Respect restrictions on the use of radio equipment in fuel depots, chemical plants, or in areas of blasting operations.
- There may be a hazard associated with the operation of your Modem in the vicinity of inadequately protected personal medical devices such as hearing aids and pacemakers. Please consult the manufacturers of the medical device to determine if it is adequately protected.
- Operation of the Modem in the vicinity of other electronic equipment may cause interference if the equipment is inadequately protected. Observe any warning signs and manufacturers' recommendations.
- The modem contains sensitive electronic circuitry. Do not expose the modem to any liquids, high temperatures or shock. The modem is not waterproof. Please keep it dry and store it in a cool, dry place.
- Only use original accessories or accessories that are authorized by the manufacturer. Using unauthorized accessories may affect your modem's performance, damage your modem and violate related national regulations.
- Always handle the modem with care. There are no user serviceable parts inside the modem. Unauthorised dismantling or repair of the modem will void the warranty.

Vehicle Safety

- Do not use the Modem while driving.
- Respect national regulations on the use of cellular telephones in vehicles. Road safety always comes first.

- If incorrectly installed in a vehicle, the operation of the Modem could interfere with the correct functioning of vehicle electronics. To avoid such problems, be sure that the installation has been performed by qualified personnel.
- Verification of the protection of vehicle electronics should be part of the installation.

Note: The user is cautioned that changes or modifications not expressly approved by Maxon Australia could void the warranty.

Potentially Unsafe Areas

Posted Facilities: Turn off this device in any facility or area when posted notices require you to do so.

Blasting Areas: Turn off your device where blasting is in progress. Observe restrictions and follow any regulations or rules.

Potentially Explosive Atmospheres: Turn off your device when you are in any area with a potentially explosive atmosphere. Obey all signs and instructions. Sparks in such areas could cause an explosion or fire, resulting in bodily injury or death.

Areas with a potentially explosive atmosphere are often but not always clearly marked. They include:

- fuelling areas such as gas or petrol stations
- below deck on boats
- transfer or storage facilities for fuel or chemicals
- vehicles using liquefied petroleum gas, such as propane or butane
- areas when the air contains chemicals or particles such as grain, dust or metal powders
- avoid using the modem in areas that emit electromagnetic waves or enclosed metallic structures e.g. lifts.
- any other area where you would normally be advised to turn off your engine

REVISION HISTORY

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Introduction

Smartmax GPS Integration is a function of communication between Smartmax and a GPS Tracking Server. To use this feature you will need to buy Smartmax GPS Kit which includes the GPS receiver and and Activation key.

Connect the GPS Module to Smartmax's USB port, and communicate Smatmax to Goolocate server via using several protocols which used in between AVL201 GPS modem and Goolocate server.

Note we will remove Goolocate from the manuals and deal with a generic server, probably by the end of the document we can mention the Goolocate software to be discussed in the next meeting

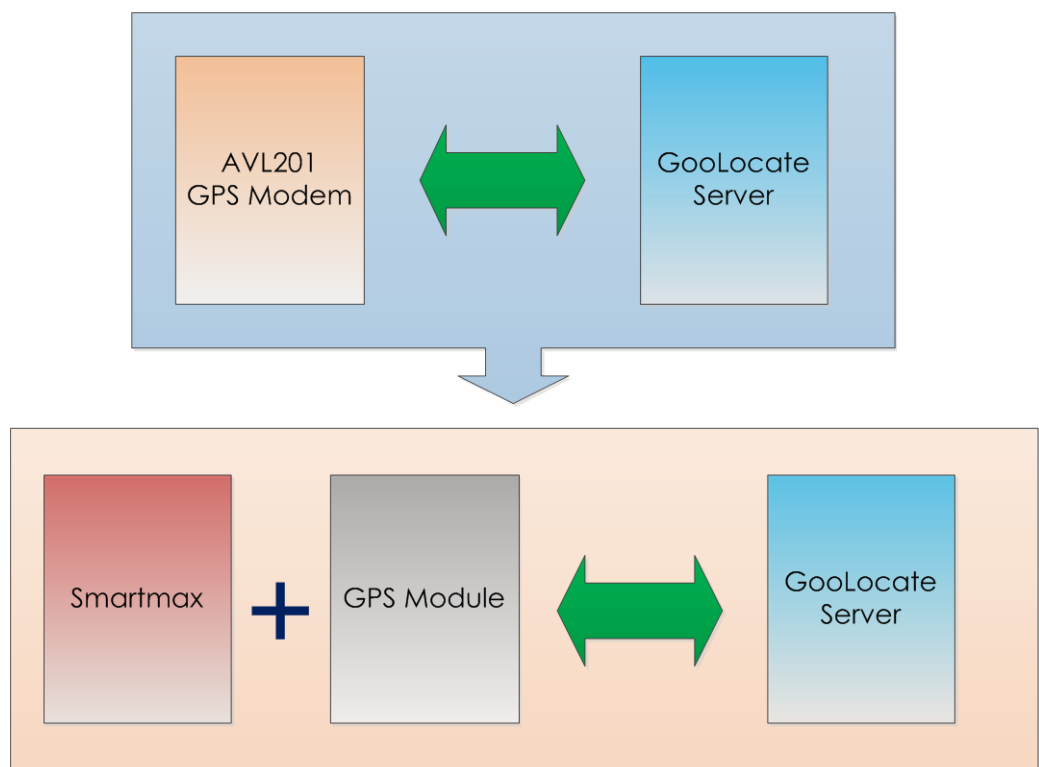


Figure 1. Smartmax GPS Integration

GPS Features

- GPS Data can be sent via the wireless network, serial connection or both
- GPS formats: GPRMC, GPVTG, GPGGA, GPGSA, GPGSV or GPGLL
- Geo-fencing with alerts for up to 3 mobile phones.
- Advanced notifications, alarms & customisable thresholds
- Integrated with Smartmax Digital Inputs
- Ability to send IO Controller status and values update along with GPS
- updates including WAN IP Address, IO Status, Wireless Network Status,
- Battery Voltage & Temperature.

GPS Installation

1. Plug the GPS Receiver supplied by Maxon in the GPS kit in the Smartmax usb LAN port.
- 2.



Figure1. Connect GPS module to LAN port

- **Web page settings**

Ethernet Type changing

To use GPS Module, set Ethernet type to USB Converter in LAN Page

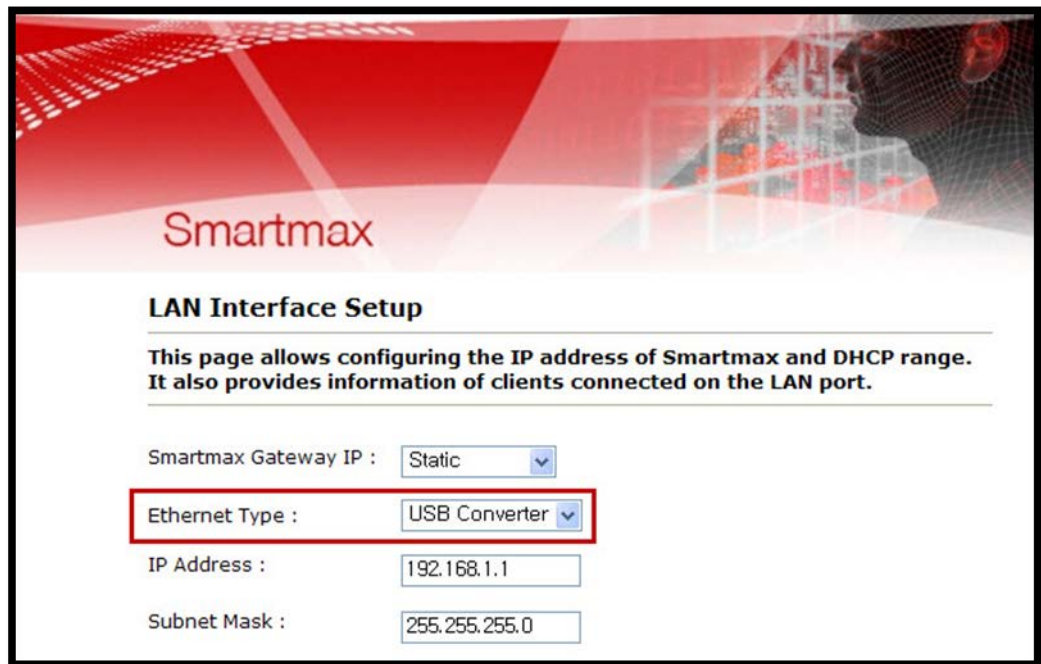


Figure 2 LAN page – Set Ethernet Type to USB Converter

GPS Setting page

When you open GPS Setting Page, following screen appears.

GPS Setting

Enable GPS :

☒ Enable
 ☐ Disable

GPS Output Interface :

☒ Network
 ☐ Serial Port

Network Protocol Type :

UDP

GPS Center First Address :

203.206.174.94

GPS Center Second Address :

203.206.174.99

GPS Center Listening Port :

3001

Device ID :

12345

GPS Information Contents :

☒ Append the device ID to the tail of GPS information
☒ GPRMC
 ☐ GPVTG
 ☐ GPGGA
 ☐ GPGSA
☐ GPGSV
 ☐ GPGLL

Ignition Input

Ignition Input Enable :

Enable

Select Ignition Input :

Input 2

Send Message interval for On State:

5

Send Message interval for Off State:

5

Geo-fence

Geo-fence Enable :

Enable

Geo-fence Mode :

Radius

GPS Coordinate of Center :

N

85.123

E

132.5340

Get current position

Distance Limit (Meters) :

10 ~ 5000

GPS Information Update Interval(Seconds) :
(For Breach of the Geo-fence)

20

Geo-fence Messages and Number :

Message

Enter Phone Number

Message

Enter Phone Number

Message

Enter Phone Number

I/O Reporting

I/O Reporting with GPS location update :

Enable

Additional Specific

Initial Recognition Message Enable :

Enable

Initial Recognition Message :

No#710

String send with GPS location update :

Enable

String :

Serial Port Settings

Baudrate :

115200

Databit :

8

Parity :

None

Stopbit :

1

Flow Control :

None

Figure 3. GPS setting page

Enable GPS

GPS function activating menu.



Enable GPS : ☒ Enable ☐ Disable

Figure 4. Enable GPS

GPS Output Interface

GPS Output Interface menu. You can select Network, Serial Port or both of two.



GPS Output Interface : ☒ Network ☐ Serial Port

Figure 5. GPS Interface selection

To use Serial Port, select “Modem Router” mode in WAN page.



Smartmax

WAN Interface Setup

This page allows configuring network authentication information, connection retrial and scheduler timers.

Mode :

Profile :

APN Name :

Dialup :

Figure 6. Wan Interface Setup page

Set Serial Port at “Serial Port Settings” menu in the bottom of GPS setting page.

Serial Port Settings	
Baudrate :	115200
Databit :	8
Parity :	None
Stopbit :	1
Flow Control :	None

Figure 7. Serial Port setting

Network Protocol Type

Set Network Protocol Type which is using for connect to GPS server. User can select TCP or UDP, UDP is default setting.

Network Protocol Type :	UDP
-------------------------	-----

Figure 8. Network Protocol Type

GPS Center Address and Port

Input Goolocation server Address and Port number to access. URL or IP address is available to input. If access failed with the First address, program tries to access with the Second address automatically.

GPS Center First Address :	203.206.174.94
GPS Center Second Address :	203.206.174.99
GPS Center Listening Port :	3001

Figure 9. GPS Center Address and Port Setting

GPS Information Update Interval

GPS Information Update Interval setting menu. The unit of time is second, you can set Update Interval between 2~600seconds.

A screenshot of a software interface showing the 'GPS Information Update Interval(Seconds)' setting. The text is in a grey font. To the right of the text is a text input field containing the number '5'. The entire interface is enclosed in a black rectangular border.

Figure 10. GPS Information Update Interval

Device ID

Device ID setting menu. Set ID with 15 integer numbers. Smartmax engine's IMEI number is a default value.

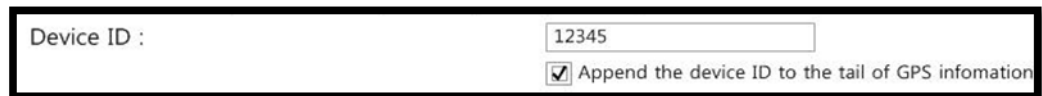
A screenshot of the 'Device ID' setting menu. It features the label 'Device ID :' in grey. To its right is a text input field containing '12345'. Below the input field is a checkbox that is checked, followed by the text 'Append the device ID to the tail of GPS information'. The interface is enclosed in a black rectangular border.

Figure 11. Device ID

Ignition Input

- Ignition Input Enable setting.

Select Enable or Disable Ignition Input alert.

A screenshot of the 'Ignition Input Enable' setting. The text 'Ignition Input Enable :' is in grey. To its right is a dropdown menu currently showing 'Enable'. The interface is enclosed in a black rectangular border.

Figure 12. Ignition Input Enable

- Select Ignition Input

Select Input port to detect Ignition input. Input 2~Input 5 port are available.

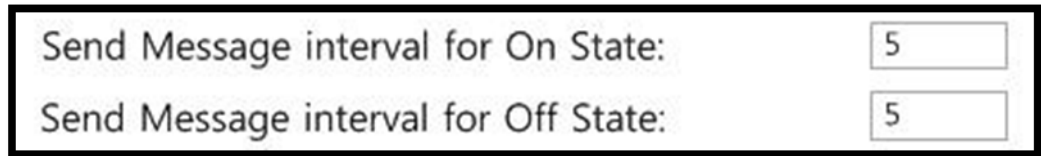
A screenshot of the 'Select Ignition Input' setting. The text 'Select Ignition Input :' is in grey. To its right is a dropdown menu currently showing 'Input 2'. The interface is enclosed in a black rectangular border.

Figure 13. Select Ignition Input

- Send Message interval

Set message interval depending on the state. The message type is same

as I/O Reporting message type.



Send Message interval for On State:	5
Send Message interval for Off State:	5

Figure 14. Send Message Intervals

Geo-fence

This function supports when Smartmax is moved outside of range which is set in Geo-fence, Smartmax sends SMS to registered number.

- **Geo-fence Enable**

Select Enable or Disable Geo-fence function.



Geo-fence Enable :	Enable
--------------------	--------

Figure 15. Geo-fence Enable

- **Geo-fence Mode**

Geo-fence has two modes – Radius and Rectangle. Radius mode alerts to user when Modem is moved outside of certain radius range from center GPS coordinates, and Rectangle mode alerts to user when Modem is moved outside of set virtual rectangle. Each mode needs different option settings. Radius mode needs center coordinate and distance value from center coordinate, and Rectangle mode needs maximum/minimum latitude and longitude to draw virtual rectangle.

- **Geo-fence Mode : Radius**

If you select the Radius mode, user ought to set the center coordinates and distance from center. User can input center coordinate directly, or to get the current coordinate, click “Get Current Position” button. Also you can set center coordinate by SMS(refer to the appendix A) or setting

input pin(when input pin turned high, set that moment location as a center coordinate).



Figure 16. When you click “Get Current Position” button, the current position is setting as a center coordinate

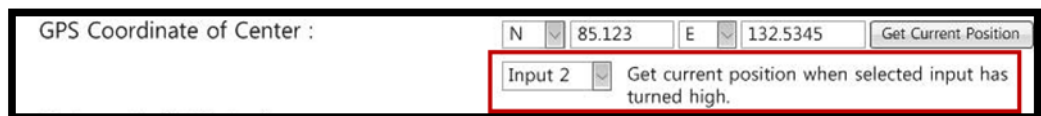


Figure 17. Select Input pin. When selected pin turned high, get position and set the position as a center coordinate

- **Geo-fence Mode : Rectangle**

When user select Rectangle mode, user should enter maximum/minimum latitude and longitude to draw virtual rectangle. Set virtual rectangle by input latitude and longitude. Smartmax alerts to user by SMS when it's moved outside of range.



Figure 18. User needs to input maximum/minimum latitude and longitude to use Rectangle mode

- **GPS Information Update Interval(for breach of the Geo-fence)**

Set GPS location data sending interval when Modem is moved outside of set Geo-fence range.

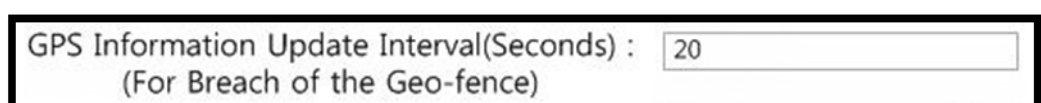


Figure 19. Set GPS data sending interval for breach of the Geo-fence

- **Geo-fence Messages and Numbers**

Menu for input alert message and phone number for receiving SMS alerts messages when Modem is moved outside of setting range. Also user can input current coordinates by SMS using this number in Radius Geo-fence mode.

Geo-fence Messages and Number :	Message	Enter Phone Number
	Message	Enter Phone Number
	Message	Enter Phone Number

Figure 20. Send user setting message to input number

I/O Reporting

In I/O Reporting menu, user can set up whether send I/O data together or not when Smartmax sends GPS location data. If I/O Reporting Enable, send I/O data together when Smartmax sends GPS location data.

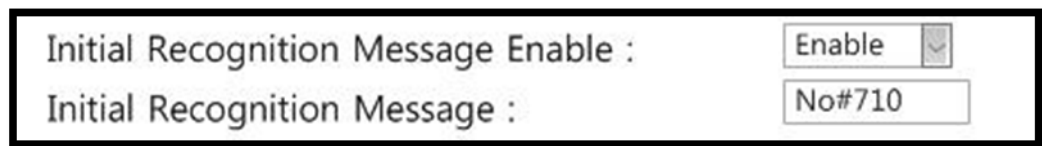
I/O Reporting with GPS location update :	Enable
--	-------------------------------------

Figure 21. I/O Reporting Enable

Additional Specific

- **Initial Recognition Message**

Menu for set initial recognition Message when Smartmax is connected to server , and select Enable or Disable.

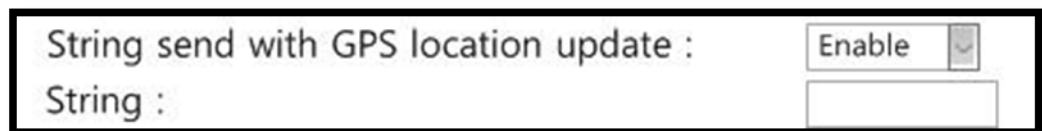


Initial Recognition Message Enable :	Enable
Initial Recognition Message :	No#710

Figure 22. Input initial register message

- **String send with GPS location update**

Menu for input appendix string when send GPS location data. This input string will be sent with GPS location data.



String send with GPS location update :	Enable
String :	

Figure 23. Set Enable or Disable, and string message

● Get and Set Messages

Get Smartmax's data and set I/O of Smartmax by input command.

- **Get IMEI**

Get IMEI number by command "222#8888#".

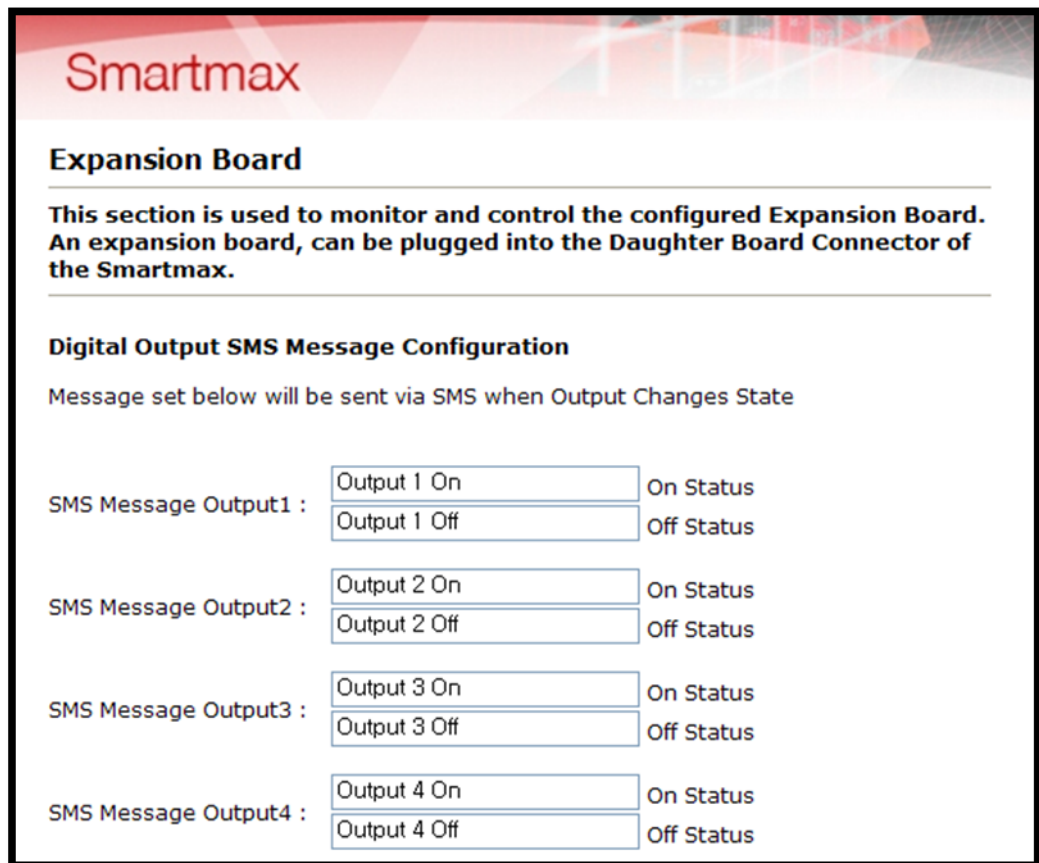
- **Get IO Data**

Get Smartmax's I/O data by command "M001".

- **Switch Outputs On/Off**

ON or OFF Smartmax's particular I/O. The protocol is as follows.

001#<Admin Password>#\$IOSET: <SMS OUTPUT COMMAND>



The screenshot shows the 'Smartmax' logo at the top. Below it is the 'Expansion Board' section, which includes a descriptive paragraph: 'This section is used to monitor and control the configured Expansion Board. An expansion board, can be plugged into the Daughter Board Connector of the Smartmax.' Below this is the 'Digital Output SMS Message Configuration' section. It states: 'Message set below will be sent via SMS when Output Changes State'. There are four rows of configuration options, each for an output (1, 2, 3, and 4). Each row has a label 'SMS Message OutputX :', followed by two input fields: 'Output X On' and 'Output X Off', and then two status indicators: 'On Status' and 'Off Status'.

Expansion Board			
Expansion Board			
This section is used to monitor and control the configured Expansion Board. An expansion board, can be plugged into the Daughter Board Connector of the Smartmax.			
Digital Output SMS Message Configuration			
Message set below will be sent via SMS when Output Changes State			
SMS Message Output1 :	Output 1 On	On Status	
	Output 1 Off	Off Status	
SMS Message Output2 :	Output 2 On	On Status	
	Output 2 Off	Off Status	
SMS Message Output3 :	Output 3 On	On Status	
	Output 3 Off	Off Status	
SMS Message Output4 :	Output 4 On	On Status	
	Output 4 Off	Off Status	

**Figure 24. Control I/O by using message set in SMS Output page under
Expansion I/O Board**

Appendix. A Protocol Example

- **GPS Location data**

NO#200
3582440117623068
\$GPRMC,072545.00,A,3345.31099,S,15042.49116,E,31.244,324.35,310811,,,D
*44

- **I/O Reporting**

\$IO:MSGSEQUENCE,DATETIMESTAMP,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,25.00,0.00,2,2,26.68,0.00,WANIP,UPTIME,FIRMWARE VERSION,RSSI

- **Get IMEI (Server, Smartmax)**

222#8888#No#222
IMEI Code: 358244017623077

- **Get IO Data (Server, Smartmax)**

M001
\$IO:MSGSEQUENCE,DATETIMESTAMP,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,OFF,25.00,0.00,2,2,26.68,0.00,WANIP,UP TIME,FIRMWARE VERSION,RSSI

- **Switch Outputs On/Off**

001#maxon#\$ioset: output 1 on

- **Set Geo-fence Coordinate of Center by SMS Command**

\$GEO-FENCE:CENTER=CURRENT POSITION