



**ST7200 Users Guide:
ST7200**

**ST7200
User Guide**

Revision 1.0

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Table of Contents

Objective	5
Equipment Needed	5
Configuration Recommendation	6
Procedures.....	7
SkyPatrol ST7200 Panel Descriptions	7
Battery Specifications	8
Installation	8
Installing Cables	8
Main Connector (7) Pin.....	9
SkyPatrol ST7200 Cables and Connections.....	10
Inserting the SIM.....	10
Insert the SIM per the Following Procedure:	10
Install the power cable as described in the following procedure:.....	11
Connecting the Power Source	11
LED Operation.....	12
Configure the Computer and Verify Correct Communications	12
Configure the SkyPatrol ST7200 to Communicate with the Server.....	18
Serial Loop-back Testing	18
Verify GPS Operation	22
Additional Software Features.....	23
Index	24

Objective

The objective of this document is to provide the user with basic information on how to configure the SkyPatrol ST7200 and verify communication with the server.

Equipment Needed

In this example the requirements are:

- SkyPatrol ST7200
- Power supply, 12 VDC, 2A
- Computer with one available USB port
- GSM/GPRS SIM with GPRS data enabled.
- APN (Access Point Name).
- Username and Password, if GPRS is operating on a non-transparent network.

Note: *If you don't know the name of the APN you need to use, please contact your cellular network carrier for that information.*

Configuration Recommendation

The SkyPatrol Mobile Tracker family of products is designed with features to support a robust connection with the network. However, there can be conditions when the connection to the network or the ability to transfer data across the network is beyond the control of the device alone.

For installations that require maximum connectivity, we strongly recommend implementing the following choices.

- i. Insure that the ignition wire is connected to a switched ignition source.

- ii. Use type 4 (ACKED) UDPC is the same as UDP (w/o Ack) except allows server commands sent via UDP (SMS cmd still supported)..

Procedures

SkyPatrol ST7200 Panel Descriptions

1. Front View



Figure 1 – SkyPatrol ST7200 Front View

2. Top View

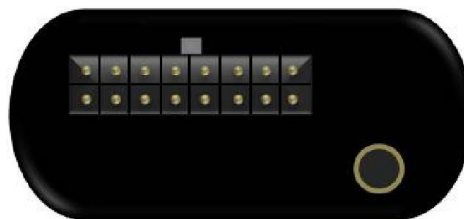


Figure 2 – SkyPatrol ST7200 Top View

Battery Specifications

The SkyPatrol ST7200 uses power either from the vehicle battery, or from an optional internal battery.

The battery specifications are as follows:

Nominal voltage:	3.7 VDC
Nominal Capacity:	650 mAH
Max charge voltage:	4.2 VDC

The features of the battery include the following:

- No memory effect
- Reliable service life
- Long-lasting performance
- No leakage and no explosion

Installation

When mounting the ST7200, locate an area out of view, such as under the dash or inside a front fairing. Be sure to place the device where it will not be obstructed by metal. Make sure that the label is facing the ground to ensure a better GPS fix. Power to the ST7200 can be taken directly from the battery, or from a wire that read the same voltage as the battery. A voltage on a wire that is slightly less than the battery voltage indicates that the wire is not directly from the battery and should not be used.



The SkyPatrol ST7200 is NOT a waterproof or sealed device. Care must be taken to ensure the device is kept away from water or any other liquids.

Installing Cables

During installation, the following precautions will help ensure proper operation of the SkyPatrol ST7200

- Remove power from the SkyPatrol ST7200.
- Do not create loops, sharp bends or crimps in the cables
- All cables should be attached to the vehicle and equipment in such a way to reduce stress or wear caused by vibration generated by moving vehicles.
- Use proper terminations on all power cables

Main Connector (7) Pin

Table 1 describes the pin functionality for the 7 pin I/O connector. Pins that are not planned for usage can be left open without anything connected to them.

Pin #	Pin Name	I/O	Functional Description	Logic State	Port Characteristics
1	IN1	I	Ignition Sense	High: Ignition ON Low: Ignition OFF	8 to 24 V < 5 V Note: Internally pulled low
2	IN2	I	Input Port 2	High: Low :	2.4 to 24 V < 0.2 V
3	GND		Ground		
4	OUT	O	Output Port	Open: Short:	> 1M Ω to ground < 10 Ω to ground, 250 mA max sink current
5	UART-RX	I	Serial Receive Port		3.3V Logic Interface Com Port Settings: Baud rate: 115200 bps; Flow control: None; 8N1
6	UART-TX	O	Serial transmit Port		3.3V Logic Interface Com Port Settings: Baud rate: 115200 bps; Flow control: None; 8N1
7	VBATT	I	Main Battery Voltage		6-24 V

Table 1 - 7 pin I/O Connector Interface

SkyPatrol ST7200 Cables and Connections

SkyPatrol ST7200 programming cable provides mini USB serial interface and power to the unit. The cable would be used for loading new software onto the SkyPatrol ST7200 and configuration of the device.

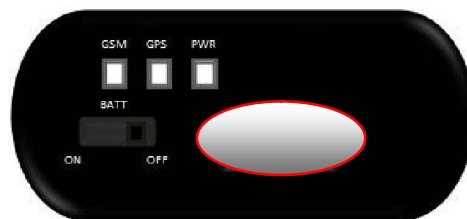


Figure 4 - USB Connection

Inserting the SIM

Insert the SIM per the Following Procedure:

Note: *The SIM card is not provided with the SkyPatrol ST7200 device. The SIM must be obtained from the GSM/GPRS service provider and must be provisioned by the operator for data and/or voice. Always take care to protect the SIM.*

The SIM Lock Switch is used to ensure the SIM remains in position.

1. Insert the SIM card into the SIM slot with the notch up and facing toward the left side of the SkyPatrol ST7200.

(INSERT PICTURES OF THE SIM HOLDER)

Install the power cable as described in the following procedure:

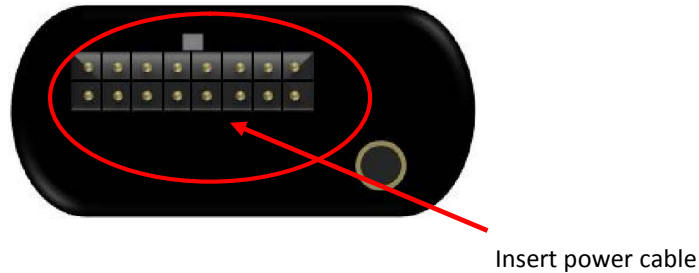


Figure 8 – Power Cable

1. Hook up the SkyPatrol TT8750+ to 8 - 32 VDC power source and apply power.
2. The **User 1 LED** (red) should start blinking.
3. Once the SkyPatrol TT8750+ attaches to the GSM network, the **GSM LED** (green) should go solid. If the **GSM LED** stays blinking, then there is a problem with the SIM or cellular reception.
4. Once the SkyPatrol TT8750+ acquires a GPS fix, the **GPS LED** (blue) will be solid red.

Connecting the Power Source

The GSM/GPRS SkyPatrol ST7200 has an input voltage range of 6 – 24 V DC. The power and ignition pins can support 6 – 24 V DC input voltage. The user has an option to connect these wires depending on the desired functionality. Described below are the desired functionality and their associated wire connecting procedure:



Use of the device outside of the specified voltage range may result in damage to the device and/or undesirable results.



The SkyPatrol ST7200 is designed to operate from 6 to 24 VDC. The user is responsible for ensuring the voltage supplied to the SkyPatrol ST7200 remains in this voltage range to include transient voltage spikes and load dump voltages. Failure to comply with this warning may result in damage to the SkyPatrol ST7200.

- Connect the Red power wire from the device to a constant 12V power source.
- Connect the Black ground wire from the device to chassis ground, or directly from the battery terminal.
- Do not cut the small Blue or Brown wire from the device.

LED Operation

Color	Function	Behavior
Blue	Network	Blink Fast (1/4 sec) = Searching Blink Slow (1 sec) = Cell Signal OK
Green	GPS Indicator	ON = No GPS Blinking = GPS OK

Configure the Computer and Verify Correct Communications

Note: The following examples use Windows 2007, and HyperTerminal. Please note that HyperTerminal is not included with the Windows Vista operating system. Any terminal program should work, using the parameters in Step 1.

1. Default Serial Parameters

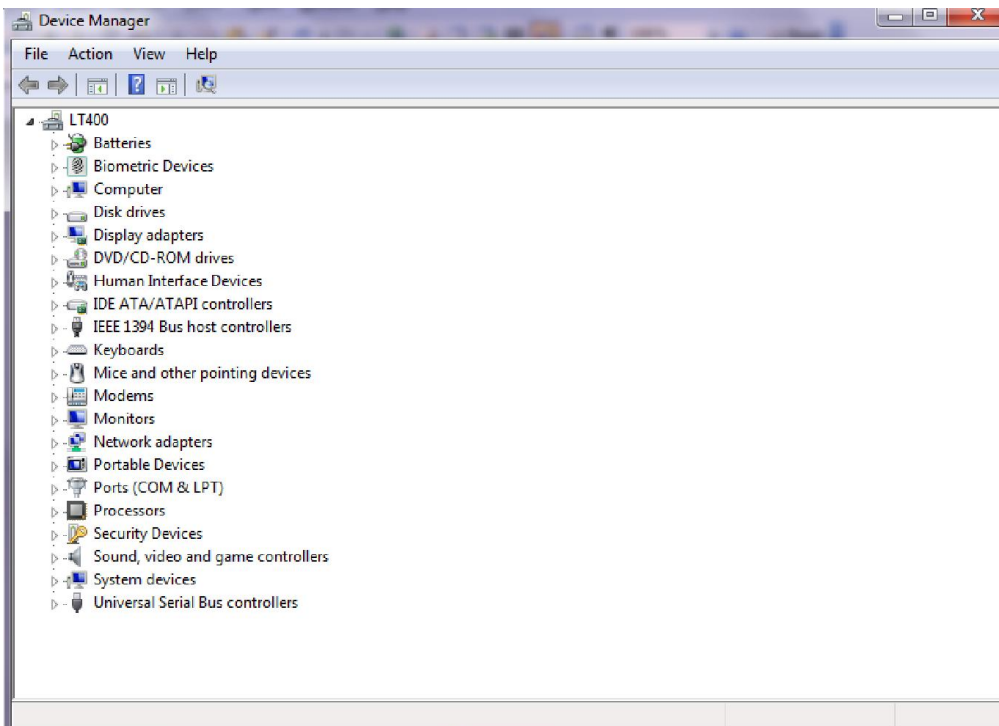
- a) 115200 baud rate
- b) 8 data bits
- c) 1 stop bit
- d) No Parity
- e) Flow Control = None

2. Determine which Com port to use

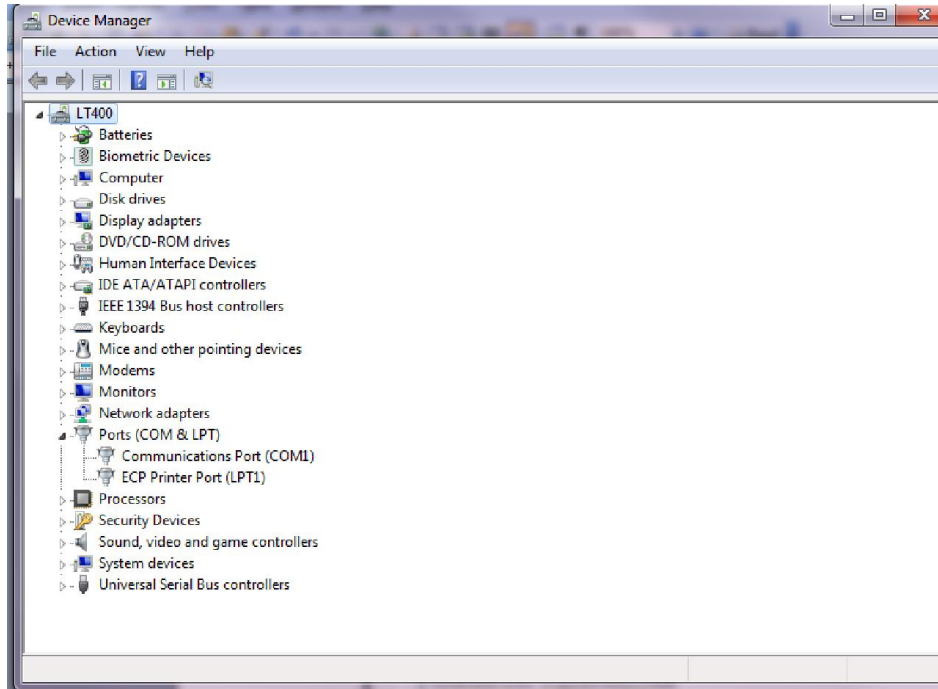
- a) With the USB port, you will need to determine which Com port it is installed on.

Note: *If the USB-to-serial converter has not been installed, install the necessary drivers. Then leave the device unplugged.*

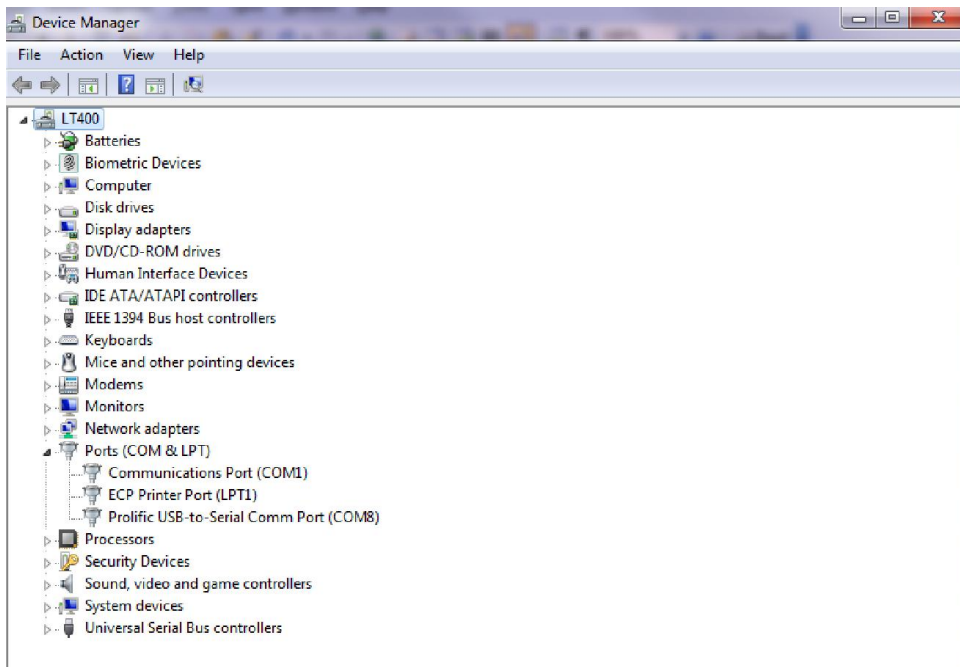
- b) Open up the Device Manager window. This is done through the Control Panel: System or right-click on Computer and select Properties. Select the Device Manager link. On Windows vista and newest Windows editions the screen looks like the following:



- c) Expand the Ports section by selecting the + sign beside Ports. Your window should look like the following:



- d) Plug in the USB-to-Serial converter. The window should change to show the USB-to-Serial converter installed.



- e) Most devices will show the Com port next to the device name. Record this number. In this case, it is COM8.

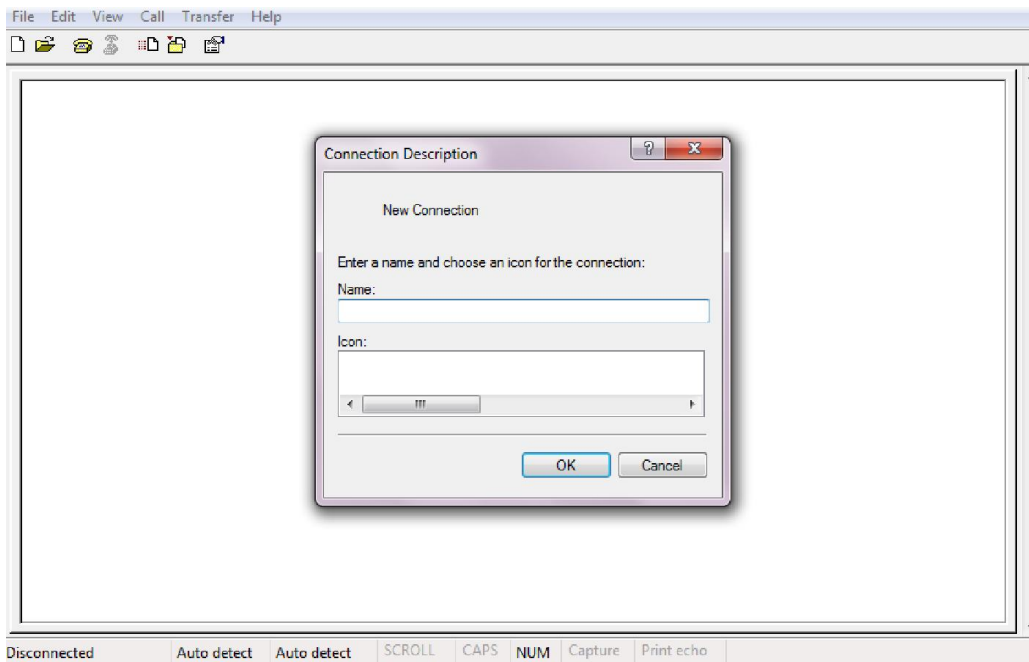
Note: Make sure there is no “!” or “X” next to the USB device. If you see an “!” or an “X,” the device is not properly installed and will not work.

3. Start HyperTerminal

You can copy Hyperterminal from a Windows 2000 and XP. You just need to copy the hypertrm.exe and the hypertrm.dll in the same Folder.

Run the program Hyperterminal.

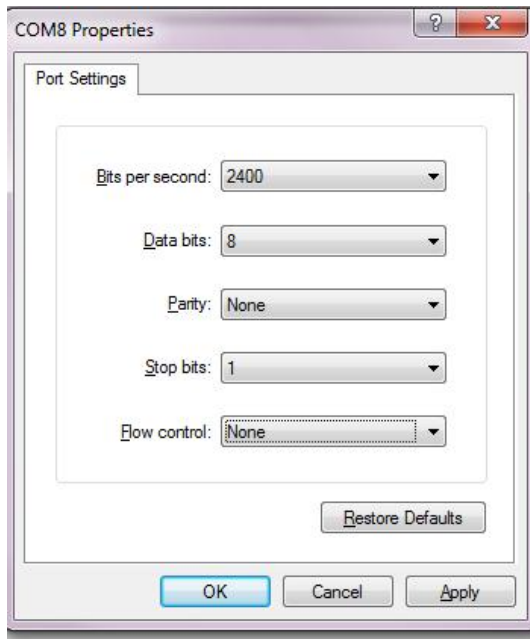
- a) You should see the following screen.



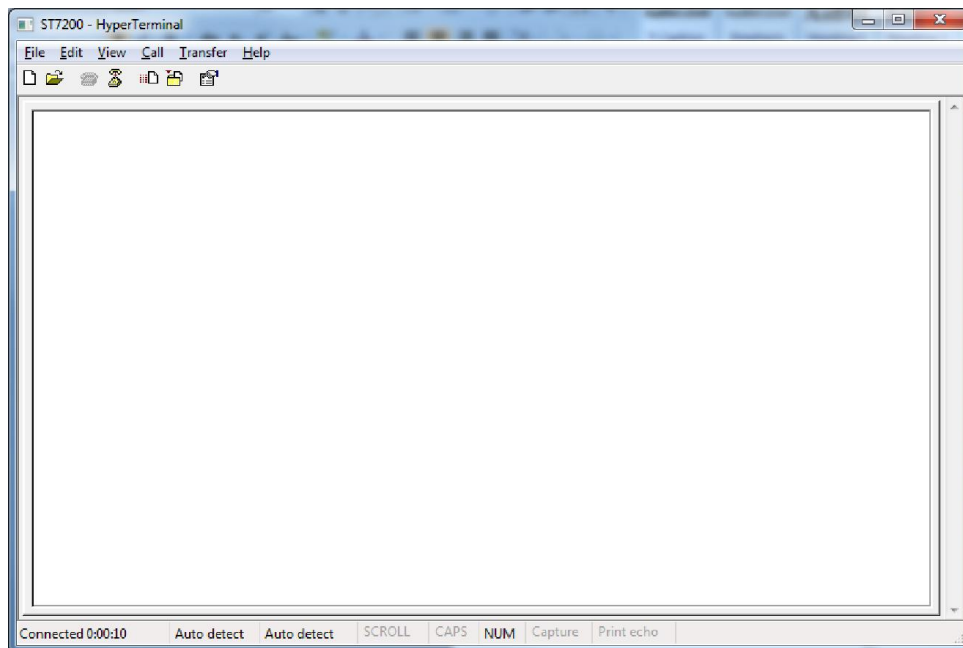
- b) Enter a name for the Connection. In this example, the Name is SkyPatrol ST7200.
- c) Click OK.
- d) The next window that will appear is the Connect To window.



- e) Change the Connect Using setting to the Com port that was determined in Step B.
- f) Click OK.
- g) The next window is the Port Settings window.



- h) Make sure the settings match the example.
- i) Click OK.
- j) Now the Main Program Window should appear.



Configure the SkyPatrol ST7200 to Communicate with the Server

1. Connect and verify Serial connectivity with the SkyPatrol ST7200.
 - a) Connect the PC serial connector to the SkyPatrol ST7200 programming cable.

Note: *In the following instructions, <CR> means using the **Enter Key** on the keyboard.*

- b) With HyperTerminal open, type AT <CR>. The SkyPatrol ST7200 should respond with **. If you do not see this response, double-check your connections. If the connections seem correct, disconnect the SkyPatrol ST7200 from the computer and perform the serial loop-back test (instructions follow):

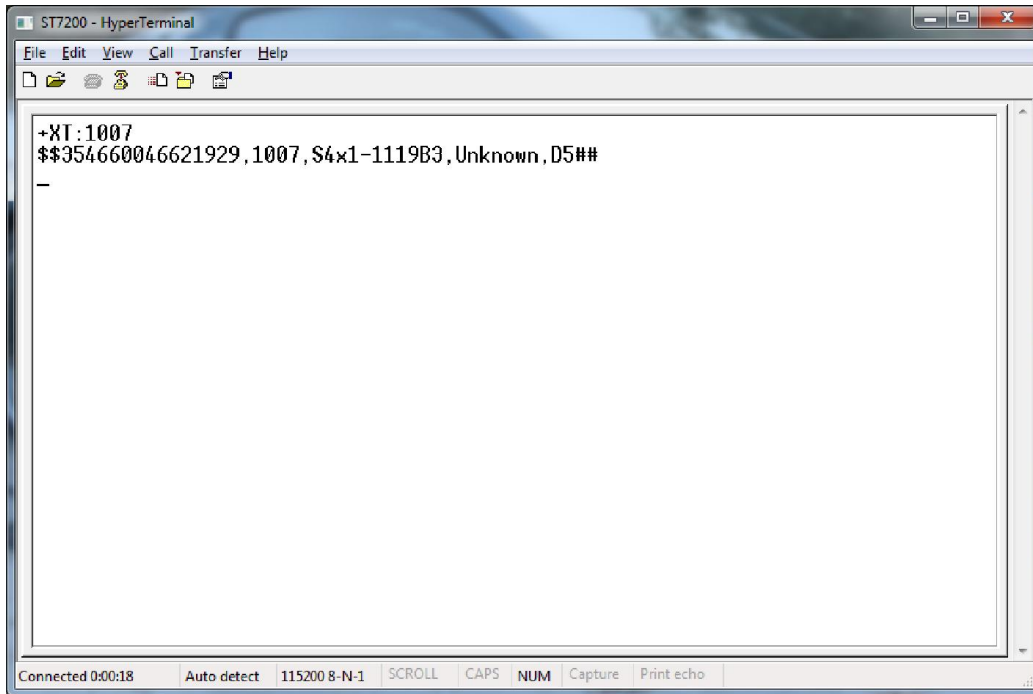
Serial Loop-back Testing

- Make sure the cursor is in the main window.
- Start typing characters.
- If all settings are correct, you should not see anything happening in the main window.
- Verify the programming cable is the correct one.
- Unplug and plug again the programming cable. Change the USB port connection if necessary and verify the COM port is the correct one.
- Start typing characters.
- You should now see what you are typing appearing in the main window.

If this happens, the COM port is configured correctly.

- c) Type AT<CR>. The SkyPatrol ST7200 should respond with **.
 - d) Type the password (*****) to enable the programming mode. The SkyPatrol ST7200 should respond with Accepted.

- e) Type +XT:1007<CR>. The SkyPatrol ST7200 should respond with
\$\$354660046621929,1007,\$4x1-1119B3,Unknown,D5##
Firmware revision
- f) If you get any different response, you are not connected to the SkyPatrol ST7200



2. Configure the SkyPatrol ST7200 to communicate with the Test Server.
 - a) The following information will need to be obtained from the SIM provider.
 - b) APN
 - c) Username and password (If necessary.)
 - d) Configure the SkyPatrol ST7200 to Access the GPRS network and server destination.
 1. To set the Port, IP, APN Username if applicable, password if applicable, and the APN name the rest is the SMS destination and protocol for the ST7200, send the following command:
+XT:1010,<PP>,<IP>,<USN>,<PWD>,<NAME>,<SM>,<TU>

2. Verify GSM status by sending the following command:

+XT:7050,<X>- Query diagnostics<CR>
Response (via SMS, UDPC):

\$\$<UID>,7050,<GSM>,<GPR>,<PDP>,<HD>,<HO>,<PU>,<R>,<%GPS>,<%GPSQ>,
<%GSM>,<%GPR>,<%PDP>,<LV>,<HV>,<CX>,<DBO>,<ABI>,<DBI>,<SO>,<SI>,<SS>##

<X>=1 is query without clear and <X>=2 is query and then clear all values

<GSM> is GSM registration state: 0=Not Reg, 1=Home, 2=Search, 3=Denied, 4=Unknown, 5=Roaming

<GPR> is GPRS registration state: 0=Not Reg, 1=Home, 2=Search, 3=Denied, 4=Unknown, 5=Roaming

<PDP> is GPRS PDP state, 0=Deactivated, 1=Activated

<HD> is Hours Disconnected counter, 1000 max

<HO> is Hours ON counter, 1000 max

<PU> is Power Up counter, 255 max

<R> is Reset counter, 255 max

<%GPS> is Percent lost GPS

<%GPSQ> is Percent lost GPS based on 5 Sat Quality Factor

<%GSM> is Percent lost GSM

<%GPR> is Percent lost GPRS

<%PDP> is Percent lost PDP context activation

<LV> is Low Voltage counter, # sec < 9 Volts, 60000 max

<HV> is High Voltage counter, # sec > 16 Volts 60000 max

<CX> is Context activation counter, 1000 max

<DBO> is Data Bytes Out, 10000000 max

<ABI> is ACK Bytes In, 10000000 max

<DBI> is DOTA Bytes In, 10000000 max

<SO> is SMS Msg Out counter, 1000 max

<SI> is SMS Msg In counter, 1000 max

<SS> is SMS Spam Msg In counter, 1000 max

Counter and Percent values are accumulated since last clear

3. Verify GPRS status by sending the following command:

+XT:7050,<X>- Query diagnostics<CR>
Response (via SMS, UDPC):

\$\$<UID>,7050,<GSM>,<GPR>,<PDP>,<HD>,<HO>,<PU>,<R>,<%GPS>,<%GPSQ>,<%GSM>,<%GPR>,<%PDP>,<LV>,<HV>,<CX>,<DBO>,<ABI>,<DBI>,<SO>,<SI>,<SS>##

<X>=1 is query without clear and <X>=2 is query and then clear all values

<GSM> is GSM registration state: 0=Not Reg, 1=Home, 2=Search, 3=Denied, 4=Unknown, 5=Roaming

<GPR> is GPRS registration state: 0=Not Reg, 1=Home, 2=Search, 3=Denied, 4=Unknown, 5=Roaming

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<PU> is Power Up counter, 255 max

<R> is Reset counter, 255 max

<%GPS> is Percent lost GPS

<%GPSQ> is Percent lost GPS based on 5 Sat Quality Factor

<%GSM> is Percent lost GSM

<%GPR> is Percent lost GPRS

<%PDP> is Percent lost PDP context activation

<LV> is Low Voltage counter, # sec < 9 Volts, 60000 max

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<CX> is Context activation counter, 1000 max

<DBO> is Data Bytes Out, 10000000 max

<ABI> is ACK Bytes In, 10000000 max

<DBI> is DOTA Bytes In, 10000000 max

<SO> is SMS Msg Out counter, 1000 max

<SI> is SMS Msg In counter, 1000 max

<SS> is SMS Spam Msg In counter, 1000 max

Counter and Percent values are accumulated since last clear

4. A locate message can be done to the unit to make sure the message is getting to the server.
 - Send the following command: +XT:7001,1<CR>

Verify GPS Operation

Follow these directions to verify GPS Operation.

1. From the terminal window, send the following command:
+XT:7050,1<CR>
2. The SkyPatrol ST7200 should respond with the following:

```
$$<UID>,7050,<GSM>,<GPR>,<PDP>,<HD>,<HO>,<PU>,<R>,<%GPS>,<%GPSQ>,<%GSM>,<%GPR>,<%PDP>,<LV>,<HV>,<CX>,<DBO>,<ABI>,<DBI>,<SO>,<SI>,<SS>##
```

<X>=1 is query without clear and <X>=2 is query and then clear all values

<GSM> is GSM registration state: 0=Not Reg, 1=Home, 2=Search, 3=Denied, 4=Unknown, 5=Roaming

<GPR> is GPRS registration state: 0=Not Reg, 1=Home, 2=Search, 3=Denied, 4=Unknown, 5=Roaming

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<%GPS> is Percent lost GPS

<%GPSQ> is Percent lost GPS based on 5 Sat Quality Factor

<%GSM> is Percent lost GSM

<%GPR> is Percent lost GPRS

<%PDP> is Percent lost PDP context activation

<LV> is Low Voltage counter, # sec < 9 Volts, 60000 max

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<ABI> is ACK Bytes In, 10000000 max

<DBI> is DOTA Bytes In, 10000000 max

<SO> is SMS Msg Out counter, 1000 max

<SI> is SMS Msg In counter, 1000 max

<SS> is SMS Spam Msg In counter, 1000 max

Counter and Percent values are accumulated since last clear

Additional Software Features

The following software features are included in the SkyPatrol ST7200

A user can send commands, via SMS, to the SkyPatrol ST7200.

It's just needed to send an SMS with the command to the SkyPatrol ST7200 SIM cellular phone

Index

	B		M
Battery Specifications, 8		Main Connector, 9	
	C		P
Communications, 12		Power Cable, 11	
Connections, 10		Power Source, 11	
	D		S
Description, 7		Serial, 18	
	I	Server, 18	
Installation, 8		Server Connectivity, 22	
Installing Cables, 8		SIM, 10	
Interface, 6			T
	L	To start, 5	
LED Operation, 12			