Thuraya IP Commander Terminal

Operating Instructions

Version 4.0

SR TECHNOLOGIES SRT WIRELESS SRT FINANCIAL SRT AVIATION

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Version	Date	Change Description
1.0	6/19/2014	Initial Release
2.0	9/28/2015	Updated Web Pages. Updated agency compliance pages.
3.0	10/13/2015	Updated password information. Added SRT Group information on front cover.
4.0	10/29/2015	Corrected temperature specs.

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Safety Information

For your safety and protection, read this entire user guide before you attempt to use the Thuraya IP Commander. In particular, read this safety section carefully. Keep this safety information where you can refer to if necessary.

Warning Symbols

This section introduces the various types of warnings used in this document to alert you to possible safety hazards.

WARNING: *Potential radio frequency (RF) hazard. Where you see this alert symbol and WARNING heading, strictly follow the warning instructions to avoid injury to eyes or other personal injury.*

WARNING: *Where you see this alert symbol and WARNING heading, strictly follow the warning instructions to avoid personal injury or damage equipment.*

DANGER: *Electric shock hazard: Where you see this alert symbol and DANGER heading, strictly follow the warning instructions to avoid electric shock injury or death.*

Warnings for the Thuraya IP Commander

WARNING: Do not stand at the side or top of the Antenna

This device emits radio frequency energy when in the transmit mode. To avoid injury, do not place head or other body parts at the side or top of the Thuraya antenna when system is operational. Maintain a distance of one meter away from those areas of the Thuraya antenna.

WARNING: In the vicinity of blasting work and in explosive environments

Never use the Thuraya IP Commander where blasting work is in progress. Observe all restrictions and follow any regulations or rules. Areas with a potentially explosive environment are often, but not always, clearly marked. Do not use the Thuraya IP Commander while at a fuel filling station. Do not use near fuel or chemicals.

WARNING: Antenna

The antenna cable carries DC power. Always power the IP Commander down prior to connecting or disconnecting the antenna cable from either the Thuraya antenna or the IP Commander.

Keep a clear line-of-sight to the satellite. Preferably, avoid all obstructions within three meters of the Thuraya antenna. Obstructions less than 150 mm (six inches) in diameter can be ignored beyond this distance.

Do not locate the antenna close to interfering signal sources or receivers. It is recommended that no other antennas be located within three meters of the Thuraya antenna. If there is other equipment installed near the Thuraya IP Commander, it is recommended to operate all equipment simultaneously and verify there is no co-interference.

WARNING: General

Handle your Thuraya IP Commander device with care. The Thuraya antenna is weather resistant per IEC 60529 IP56; however, do not submerge the unit. Avoid exposing the Thuraya IP Commander to extreme hot or cold temperatures outside the range -25 ºC to +55 ºC.

Avoid placing the IP Commander device close to open flames or any source of heat.

Changes or modifications to the IP Commander device not expressly approved by SRT Wireless, LLC could void your authority to operate this equipment.

Only use a soft damp cloth to clean the IP Commander device.

To avoid impaired performance, please ensure the unit's Thuraya antenna is not damaged or covered with foreign material like paint or labeling.

WARNING: Qualified Service

Do not attempt to disassemble the Thuraya antenna or IP Commander device. The unit does not contain consumer-serviceable components. Only qualified service personnel may install or repair equipment.

WARNING: Accessories

Use SRT Wireless LLC approved accessories only. Use of non-approved accessories may result in loss of performance, damage to the IP Commander, fire, electric shock or injury.

WARNING: Connecting Devices

Never connect incompatible devices to the Thuraya IP Commander. When connecting the Thuraya IP Commander to any other device, read this User Manual for detailed safety instructions.

DANGER: Pacemakers

The various brands and models of cardiac pacemakers available exhibit a wide range of immunity levels to radio signals. Therefore, people who wear a cardiac pacemaker and who want to use the Thuraya IP Commander should seek the advice of their cardiologist. If, as a pacemaker user, you are still concerned about interaction with the Thuraya IP Commander, we suggest you follow these guidelines:

- *Maintain a distance of 20 cm from the Wi-Fi antenna and your pacemaker;*
- *Maintain a distance of one meter from the Thuraya antenna front and sides and your pacemaker;*
- *Refer to your pacemaker product literature for information on your particular device.*

If you have any reason to suspect that interference is taking place, turn off your Thuraya IP Commander immediately.

DANGER: Hearing Aids

Most new models of hearing aids are immune to radio frequency interference from satellite terminals that are more than 2 meters away. Many types of older hearing aids may be susceptible to interference, making it very difficult to use them near a terminal. Should interference be experienced, maintain additional separation between you and the IP Commander.

DANGER: Electrical Storms

Operation of the Thuraya IP Commander during electrical storms may result in severe personal injury or death.

Glossary

A

APN

Access Point Name. This is an authentication setting that allows your device to connect to various services available on the Thuraya network.

C

Cat 5

Category 5 cable (Cat 5) is a twisted pair cable for carrying signals. This type of cable is used in structured cabling for computer networks such as Ethernet. The cable standard provides performance of up to 100 MHz and is suitable for 10BASE-T, 100BASE-TX (Fast Ethernet), and 1000BASE-T (Gigabit Ethernet). Cat 5 is also used to carry other signals such as telephony and video. The cable is commonly connected using punch-down blocks and modular connectors. Most Category 5 cables are unshielded, relying on the balanced line twisted pair design and differential signaling for noise rejection. Category 5 has been superseded by the Category 5e (enhanced) specification.

D

DHCP

The Dynamic Host Configuration Protocol (DHCP) is a standardized networking protocol used on Internet Protocol (IP) networks for dynamically distributing network configuration parameters, such as IP addresses for interfaces and services. With DHCP computers request IP addresses and networking parameters automatically from a DHCP server, reducing the need for a network administrator or a user from having to configure these settings manually.

DNS

The Domain Name System (DNS) is a hierarchical distributed naming system for computers, services, or any resource connected to the Internet or a private network. It associates various information with domain names assigned to each of the participating entities. Most prominently, it translates easily memorized domain names to the numerical IP addresses needed for the purpose of locating computer services and devices worldwide. The Domain Name System is an essential component of the functionality of the Internet.

E

Ethernet

Ethernet is a family of computer networking technologies for local area networks (LANs). Ethernet was commercially introduced in 1980 and standardized in 1983 as IEEE 802.3. The Ethernet standards comprise several wiring and

signaling variants of the OSI physical layer in use with Ethernet. The original 10BASE5 Ethernet used coaxial cable as a shared medium. Later the coaxial cables were replaced with twisted pair and fiber optic links in conjunction with hubs or switches. Data rates were periodically increased from the original 10 megabits per second to 100 gigabits per second.

G

GMPRS
Geo Mobile Packet Radio Service

GPS
The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites.[1] The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver.

H

Hotspot Access Point
A hotspot is a site that offers Internet access over a wireless local area network (WLAN) through the use of a router connected to a link to an Internet service provider. Hotspots typically use Wi-Fi technology. Hotspots may be found in coffee shops and various other public establishments in many developed urban areas throughout the world.

I

IEEE
The Institute of Electrical and Electronics Engineers is a professional association headquartered in New York City that is dedicated to advancing technological innovation and excellence. It has about 425,000 members in about 160 countries, slightly less than half of whom reside in the United States.

IP Commander
Sophisticated satellite terminal, permitting relatively high-speed data communications over a satellite.

K

kbps
A kilobit per second – kbit/s, kbps, or kb/s – is a unit of data transfer rate equal to: 1000 bits per second, or 125 bytes per second

L

LAN

A local area network (LAN) is a computer network that user interconnects computers in a limited area such as a home, school, computer laboratory, or office building using network media. The defining characteristics of LANs, in contrast to wide area networks (WANs), include their smaller geographic area, and non-inclusion of leased telecommunication lines.

R

RJ-45

The 8 position 8 contact (8P8C) connector is a modular connector commonly used to terminate twisted pair and multi-conductor flat cable. These connectors are commonly used for Ethernet over twisted pair, registered jacks and other telephone applications, RS-232 serial using the EIA/TIA 561 and Yost standards, and other applications involving unshielded twisted pair, shielded twisted pair, and multiconductor flat cable.

RSSI

RSSI is a generic radio receiver technology metric, which is usually invisible to the user of the device containing the receiver, but is directly known to users of wireless networking of IEEE 802.11 protocol family.

S

SIM

A subscriber identity module or subscriber identification module (SIM) is an integrated circuit that securely stores the international mobile subscriber identity (IMSI) and the related key used to identify and authenticate subscribers on mobile telephony devices (such as mobile phones and computers).

SMA

SMA (SubMiniature version A) connectors are semi-precision coaxial RF connectors developed in the 1960s as a minimal connector interface for coaxial cable with a screw type coupling mechanism. The connector has a 50 Ω impedance. It is designed for use from DC to 18 GHz.

SpaceCom

Manufacturer of terrestrial antennas used for satellite communication.

SSID

Each BSS (Basic Service Set) or ESS (Extended Service Set) is identified by a service set identifier (SSID) - a 1 to 32 byte string. This is normally a human-readable string and thus commonly called the "network name". In an IBSS (Independent BSS), the SSID is chosen by the client device that starts the

network, and broadcasting of the SSID is performed in a pseudo-random order by all devices that are members of the network.

Switches

A network switch (sometimes known as a switching hub) is a computer networking device that is used to connect devices together on a computer network. A switch is considered more advanced than a hub because a switch will only send a message to the device that needs or requests it, rather than broadcasting the same message out of each of its ports.

T

TCP/IP

The Internet protocol suite is the networking model and a set of communications protocols used for the Internet and similar networks. It is commonly known as TCP/IP, because its most important protocols, the Transmission Control Protocol (TCP) and the Internet Protocol (IP), were the first networking protocols defined in this standard. It is occasionally known as the DoD model, because the development of the networking model was funded by DARPA, an agency of the United States Department of Defense. TCP/IP provides end-to-end connectivity specifying how data should be formatted, addressed, transmitted, routed and received at the destination. This functionality has been organized into four abstraction layers which are used to sort all related protocols according to the scope of networking involved. From lowest to highest, the layers are the link layer, containing communication technologies for a single network segment (link), the internet layer, connecting independent networks, thus establishing internetworking, the transport layer handling process-to-process communication, and the application layer, which interfaces to the user and provides support services.

Thuraya

Thuraya is an international mobile satellite services provider based in the United Arab Emirates. The company operates in more than 160 countries across Europe, the Middle East, North, Central and East Africa, Asia and Australia. With more than 350 roaming partners worldwide, Thuraya is the only mobile satellite operator that offers GSM roaming services over mobile networks.

U

UTP

UTP cables are found in many Ethernet networks and telephone systems. For indoor telephone applications, UTP is often grouped into sets of 25 pairs according to a standard 25-pair color code originally developed by AT&T Corporation. A typical subset of these colors (white/blue, blue/white, white/orange, orange/white) shows up in most UTP cables. The cables are typically made with copper wires measured at 22 or 24 American Wire Gauge (AWG), with the colored insulation typically made from an insulator such as polyethylene or FEP and the total package covered in a polyethylene jacket.

W

WAN

A wide area network (WAN) is a network that covers a broad area (i.e., any telecommunications network that links across metropolitan, regional, or national boundaries) using private or public network transports. Business and government entities utilize WANs to relay data among employees, clients, buyers, and suppliers from various geographical locations. In essence, this mode of telecommunication allows a business to effectively carry out its daily function regardless of location. The Internet can be considered a WAN as well, and is used by businesses, governments, organizations, and individuals for almost any purpose imaginable.

WPA

Wi-Fi Protected Access (WPA) and Wi-Fi Protected Access II (WPA2) are two security protocols and security certification programs developed by the Wi-Fi Alliance to secure wireless computer networks. The Alliance defined these in response to serious weaknesses researchers had found in the previous system, WEP (Wired Equivalent Privacy). WPA (sometimes referred to as the draft IEEE 802.11i standard) became available in 2003. The Wi-Fi Alliance intended it as an intermediate measure in anticipation of the availability of the more secure and complex WPA2. WPA2 became available in 2004 and is a common shorthand for the full IEEE 802.11i (or IEEE 802.11i-2004) standard.

WPA2

WPA2 has replaced WPA. WPA2, which requires testing and certification by the Wi-Fi Alliance, implements the mandatory elements of IEEE 802.11i. In particular, it introduces CCMP, a new AES-based encryption mode with strong security. Certification began in September, 2004; from March 13, 2006, WPA2 certification is mandatory for all new devices to bear the Wi-Fi trademark.

Source: Wikipedia.org

1. Introduction

Thank you for purchasing the **Thuraya® IP Commander** terminal, a product of **SRT Wireless, LLC**, and hereinafter referred to as the **IP Commander.**

The **IP Commander** gives you instant access to the Internet anywhere you can "see" a **Thuraya** satellite in Europe, the Middle East, India, Africa, Asia, and Oceania. With the addition of a multi-port switch, you can use your **IP Commander** to set up a small network for wired devices, as well as wireless connections through its standard Wi-Fi® system. With its flexible power connections, you can operate your **IP Commander** far away from landlines, electrical power outlets, and wireless services. It's as simple as 1-2-3:

1. Provide AC or DC power from a vehicle, a high-capacity battery, generator, or commercial power.

2. Set up the **Thuraya SpaceCom** antenna so it has a clear view of the sky, and connect to the **IP Commander**.

3. Connect the **IP Commander** to any computer or local area network that supports standard TCP/IP connectivity, either via Ethernet wiring, or secure Wi-Fi[1].

A special jack has also been provided to connect a **Thuraya** handset to support voice operation directly from the **IP Commander** terminal.

[1]The **IP Commander** Wi-Fi system supports open (unencrypted) networks, as well as WPA-PSK (TKIP), WPA2-PSK (AES), and WPA-PSK (TKIP) + WPA2-PSK (AES) encryption types.

Product Specifications

Item	Specifications
Standards	IEEE 802.3, 802.3u, 802.11 b/g/n, Thuraya Satellite Terminal
Ports/Buttons	One 10/100 RJ-45 Ethernet Port, one Thuraya handset port, one DC power input port, one antenna connector, one Thuraya SpaceCom antenna port, power/reset button
Cabling type	UTP CAT 5 or better
Data Rate	Up to 384 kbps (Thuraya), up to 54 Mbps (Wi-Fi)
Transmit Power	16 dBW ± 1 dBW (Thuraya with Antenna), 15 dBm (Wi-Fi) (PRELIMINARY)
GL Services	Supported
Indicators	SUP, ON, ACT, SAT, GPS, ANT, LAN
Dimensions (L x W x H)	**IP Commander**: 12.35 in (314 mm) x 6.00 (152 mm) in x 2.50 in (64 mm)
Unit Weight	**IP Commander**: 6.5 lb (2.95 kg)
Power	100 VAC to 240 VAC, 50 Hz to 60 Hz, or 10 VDC to 34 VDC, 55 watts, maximum
Certifications	Per IEC IP66, KI10
Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)
Storage Temperature	-25 °C to 70 °C (-13 °F to 158 °F)
Operating, Storage Humidity	Per IEC IP66
Shock and Vibration	Per IEC K10 Per MIL-STD-810G Method 514.6, Procedure I, Category 24 Per MIL-STD-202G Method 214A, Test Condition B (7.6grms)

Table 1: Specifications

Minimum Requirements for PC (fixed or laptop)

- Web browser: Microsoft Internet Explorer, Firefox, or Safari
- Network: Ethernet or WLAN (802.11 b/g/n)
- 100 MB free disk space

Land Antenna Specifications

Based on proven concepts for automatic satellite search and continuous pointing using a stabilized platform with two degrees of freedom.

Item	Description
Overall Height, complete radome, no mounting	4.53 in (115 mm)
Maximum Diameter	10.83 in (275 mm)
Weight with radome, no mounting	4.63 lbs (2.1 kg)
Operational Temperature	-30 °C to +55 °C
Storage Temperature	-40 °C to +85 °C
Additional infrared flux density	Max 500W/m^2
Ingress protection category	IP56 when correctly mounted
Turning Rate	60 deg/sec
Turning Rate Acceleration	25 deg/sec^2
Maximum EIRP	13.5 dBW
Minimum G/T	> -16 dB/K
Junction Box TX input level nom.	31 dBm
RX Gain incl. cable and junction box	7.0 dB to 9.0 dB
Antenna Gain	10 dBi approx.
Antenna Polarization	LHCP
LNA Gain	12 dB ± 1 dB (excluding cable loss)
Transmit Gain	10 dBi ± 1 dB (including cable loss)
Supply Voltage to Power Supply	10 VDC to 32 VDC
Coaxial cable loss	3.5 dB fixed
Coaxial cable connector	TNC
Mounting	Magnetic mounting kit supplied, factory assembled to antenna
Random Vibration	1.05 g rms with the following spectral density: 5-20 Hz: 0.02 G2/Hz 120-150 Hz: -3 dB/octave
Single Frequency Vibration	5-10 Hz with amplitude 2.54 mm 10-15 Hz with amplitude 0.76 mm 15-25 Hz with amplitude 0.40 mm 25-33 Hz with amplitude 0.23 mm

Table 2: Land Antenna Specifications

2. Your New IP Commander System

Open the packing case. Review the packing list to confirm the contents. See Figure 1 below.

Figure 1: Thuraya® IP Commander System Shown in Available Pelican® Case

The system is shipped in a custom shipping box, which contains a **Thuraya IP Commander** radio, a SpaceCom® antenna with a 10-foot (3 meter) RF cable, a wired **Thuraya** handset, two Wi-Fi antennas, Ethernet (RJ-45) cable, a DC power cable, an AC power supply, and documentation/product licensing media.

A ruggedized Pelican® case (optional at extra cost, shown above) makes it easy for mobile users to safely transport their **IP Commander** system wherever it needs to go.

Front Panel Controls

Figure 2: Thuraya IP Commander Terminal

Item	Description
1 **Wi-Fi Antenna Port (SMA)**	Connect a **Wi-Fi** antenna to permit use as a wireless access point.
2 **SpaceCom Antenna Port**	Connects **SpaceCom** satellite antenna to the **Thuraya IP Commander**.
3 **Handset Connector**	Connects a specially-configured **Thuraya** telephone handset for making calls from the **IP Commander**.
4 **Power Input**	Connects to AC to DC Power Supply, or a vehicular power cable.
5 **RJ-45 (Ethernet) Connector**	Connects the **IP Commander** to a local area network.
6 **Status Indicator Panel**	Seven indicator lights show system status. **SUP**: Power supply is connected **ON**: IP Commander is powered on **ACT**: Activity on the satellite link **SAT**: Satellite antenna status **GPS**: GPS status **ANT**: Transmit antenna status **LAN**: Local Area Network status
7 **Power/Reset Button**	Quickly press and release to power up the **Thuraya IP Commander**. Press and hold for several seconds to reboot or completely power-down the unit. **NOTE**: Press and hold the **Power/Reset** button to revert all settings to factory default.

Table 3: Thuraya IP Commander Terminal Connections

Equipment Setup

1. Carefully attach the "rubber duck" whip antenna to the SMA connector (item ❶). The antenna is hinged, which permits you to orient it vertically.

> ***NOTE:*** *The SMA connector is very fragile. Tighten connector "finger tight." Do not use tools to tighten.*

2. Uncoil the 20-foot (6.1-meter) RF cable. Connect one side to the TNC connector on the **Thuraya IP Commander** (item ❷ above). Connect the other side to the TNC connector on the **Thuraya SpaceCom** antenna. Place the antenna outside with a full view of the sky.

3. Connect the handset (cable removed from photo for clarity) to the handset port on the **Thuraya IP Commander** (item ❸ above).

4. Connect the locking end of the RJ-45 Ethernet cable to the **Thuraya IP Commander** (item ❺ above), and the other to your network (switch, router, or a computer).

5. Connect the locking end of the power supply to the **Thuraya IP Commander** (item ❹ above). Connect the AC power cord (removed from photo for clarity) to the power supply and plug into a standard wall outlet (100-240 VAC, 50/60 Hz).[1]

6. Briefly press the power button (item ❼ above) to power up the unit.

Figure 3: Hook-up Diagram (numbering same as above)

[1] An automotive-style DC power cord is also provided with the **Thuraya IP Commander**. It has the same locking connector as the AC/DC power supply.

Thuraya Handset Operation

Figure 4: Thuraya Handset Configured for Use With IP Commander

A **Thuraya-compatible** handset is provided. It is designed to plug into the **Thuraya IP Commander** front panel (item ❸ in Figure 2). In order to make calls, the **Thuraya IP Commander** must be configured for voice operation. See "*3. Web Configuration Tool*" on page 12

Other than being plugged into the **Thuraya IP Commander**, this handset operates exactly the same as any other basic **Thuraya-compatible** handset.

Use the Handset to Control the Modem

You can also use the **Thuraya** handset to perform some basic operations on the **Thuraya IP Commander**. With the handset connected to the handset connector (item ❸ in Figure 2), press one of the keypad combinations as shown below, followed by the *Send* (OK) button. For example, to reboot the **Thuraya IP Commander**, press the # key three times, followed by the number *7*, or *###7*, and *Send* (OK).

Command	Function
General Function	
###V (###8 on keypad)	Switch from **IP Mode** to **Voice Mode**
###G (###4 on keypad)	Enter **GmPRS Mode** (not currently available)
###D (###3 on keypad)	Switch from **Voice Mode** to **Data, Standard Mode, Auto Connect** (IP Mode)
###R (###7 on keypad)	Reboot **Thuraya IP Commander**
Change Modes (Quick Boot)	
###3	Data Standard Mode
###31	Data Profile 1
###32	Data Profile 2
###33	Data Profile 3
###34	Data Profile 4
Start and Stop PDP context (billable data)	
###2	Toggle activate/deactivate
###20	Deactivate
###21	Activate

Table 4: Remote Control Thuraya IP Commander from Handset

Handset Status Display

Profile and Status (+ active/- inactive/* streaming)

E.g. *UAE-D1+* indicates profile 1 is active and it is not streaming

E.g. *UAE-D3** indicates profile 3 is active and it is streaming

E.g. *UAE-D4-* indicates profile 4 is selected but it is not active

Install SIM Card

Your **Thuraya IP Commander** has two SIM card slots, one designated as *Secondary* and the other as *Primary*. Both are installed into slots behind a metal plate on the left side of the **Thuraya IP Commander** enclosure, though only the *Primary* SIM card (right-hand slot) is used at this time. Below are the instructions for installing the SIM card.

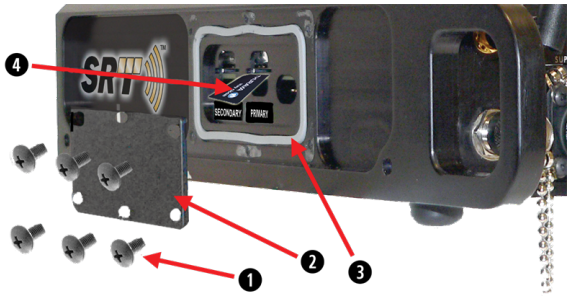

Figure 5: Steps to Install SIM Card

Item	Procedure
❶ **Remove six screws from access panel**	See Figure 5. Using a cross-point screwdriver, remove the six screws holding the side access panel in place.
❷ **Remove access panel**	Remove panel and put in a safe place.
❸ **Remove gasket if necessary**	If the gasket remains completely in place, don't remove it. If it does come loose, set aside.
❹ **Install Primary SIM card**	With the access panel removed, there are three openings on the side of the **Thuraya IP Commander** enclosure. The Primary SIM card goes into the far right-hand slot (closest to the front of the unit), labeled **Primary**. The SIM card receptacle is spring-loaded. Push until you feel it lock into place. To remove, press until you feel the card unlock, then remove.

Table 5: Open Access Panel and Install Voice and IP SIM Cards

Item	Procedure
❸ **Replace gasket**	See Figure 5. Carefully place gasket into the slot from which it was removed. Gasket must be completely inside the slot with no overhang.
❷ **Replace access panel**	Place the access panel over the area from which it was removed. Align the screw holes in the panel with the ones on the enclosure.
❶ **Insert and tighten screws**	Insert the screws into the appropriate holes. Tighten hand tight to ensure the plate is properly aligned. Tighten the rest of the way down with a cross-point screwdriver. Do not over-tighten!

Table 6: Close and Secure the Access Panel

Computer and Local Area Network Configuration

Your local area network (LAN) can be set up for wired, wireless, or both. Without going into great detail, local area network setup is exactly the same as you might do with a wired/wireless router. Along with full 802.11 b, g, and n Wi-Fi support, wired networks are supported with full DHCP (dynamic host control protocol) services. In other words, as long as your PC is set up to connect to a network using DHCP. This means you can connect hubs, switches, and any number of peripherals (printers, other PCs, etc.) to the network, beginning with the Ethernet port on the IP Commander.

Ethernet Switches and Hubs

By connecting the designated input port of a five-port Ethernet hub to the Ethernet (RJ-45) connector on the **IP Commander** front panel, four TCP/IP compatible network devices, such as printers and computers, can be added to the network. The devices should configure themselves using the **IP Commander** DHCP server functions.

> ***NOTE:*** *Bandwidth on the **IP Commander** satellite link is limited to a maximum of 384 kbps uplink and 444 kbps downlink. Please avoid streaming large files (movies, etc.) through the satellite, as the connection will quickly saturate, slowing down the network for you, and any other users that may be sharing your satellite connection via the local area network.*

Computers

In order to communicate with the **IP Commander**, and to become a member of the **IP Commander** network, computers must be set up to be able to receive network configuration information from the DHCP server on the **IP Commander** device. There are differences in configuration between Microsoft® Windows XP, Windows 7 (Windows Vista setup is very similar to that of Windows 7), and Apple® OS X®, which are described below.

> ***NOTE:*** *The only web browsers that have been tested are Microsoft Internet Explorer, versions 7 and newer.*

Microsoft Windows XP

1. Click the *Start* button and then the *Control Panel* icon. Click the *Network and Internet Connections* icon. Then click the *Network Connections* icon.

2. Select the *Local Area Connection* icon for the applicable Ethernet adapter (usually it is the first Local Area Connection listed). Double-click the *Local Area Connection*. Click the *Properties* button.

3. Make sure the box next to Internet Protocol (TCP/IP) is checked. Highlight *Internet Protocol (TCP/IP)*, and click the *Properties* button.

4. Select *Obtain an IP address automatically*. Once the new window appears, click the *OK* button. Click *the OK* button again to complete the PC configuration.

Microsoft Windows 7

1. Click the *Start* button and then the *Control Panel* icon. Click the *Network and Sharing Center* icon. Then click the *Local Area Connection* icon.

2. Click the *Properties* icon in the Local Area Connection Status window. This opens the Local Area Connection Properties window.

3. Make sure the box next to Internet Protocol Version 4 (TCP/IPv4) is checked. Highlight *Internet Protocol (TCP/IPv4)*, and click the *Properties* button.

4. Select *Obtain an IP address automatically*. Once the new window appears, click the *OK* button. Click *the OK* button again to complete the PC configuration.

Apple® OS X® (vers. 10.6.8 and newer) with the Apple Safari Browser

> ***NOTE:*** *While this configuration has not been tested by SRT Wireless, there is no obvious reason why this configuration should not work just as well as a Microsoft Windows installation.*

Unless your Apple computer was configured with a static IP address, the default network configuration is DHCP.

1. Connect an Ethernet cable between the computer and the Ethernet port on the **IP Commander** (or through an Ethernet switch, which in turn is connected to the **IP Commander**).

2. Launch your preferred web browser and select a known web URL. If it displays within a reasonable amount of time, the network connection has been successfully established.

3. Web Configuration Tool

The following section describes the **Thuraya IP Commander** internal web functionality, which permits you to view status, and perform minor system configuration. This also presumes that you have already connected a computer to the **Thuraya IP Commander** Ethernet port, and that both devices are powered-up.

Connect to the Thuraya IP Commander web server

Launch your preferred web browser. Enter the URL `http://192.168.1.254` (the default IP address of the **Thuraya IP Commander**). A login screen is displayed.

The default login is `admin`, and the default password is `admin`. Please change the administrator's password to something more secure as soon as possible. See "*Advanced → Change Password*" on page 38 for detailed instructions.

Figure 6: Login Screen

Control Panel

All **Thuraya IP Commander** control functions are accessed from the **Control Panel**, located at the far left side of the **Home** screen. Click the text to the right of the circled numbers. See Figure 7 below.

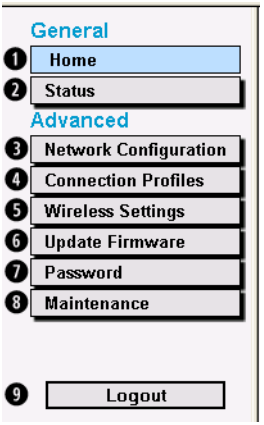

Figure 7: IP Commander Control Panel

Item	Description
1 **Home**	The default **Thuraya IP Commander** web page. Set device mode, download logs, power down the Terminal, connect to/disconnect from the Internet
2 **Status**	Set of five tabs that display operational status and operating parameters of various parts of the **Thuraya IP Commander** system. There are four tabbed views; Network Status, Antenna Status, GPS Status, and System Status
3 **Network Configuration**	Used to configure the wired network (Ethernet port).
4 **Connection Profiles**	Permits you to store up to four system profile settings which include Profile Name, APN, Multimedia, Streaming, Transmit, and Receive Rates.
5 **Wireless Settings**	Used to configure the wireless **Access Point** (IP and MAC addresses, SSID, Channel, and Encryption.
6 **Update Firmware**	When **Thuraya IP Commander** firmware updates become available, this function permits you to install them.
7 **Password**	For best security, the wireless password should be changed periodically. That operation is performed within this section.
8 **Maintenance**	Provides additional system options including downloading log files, restart the modem, enable extended logging (recording additional system parameters), and the version number of the site web server software.
9 **Logout**	Logs you out of the web session you used to configure the IP Commander terminal.

Table 7: IP Commander Control Panel Descriptions

General → Home Screen

After a successful login, you are taken to the **Home** screen. This screen is used to confirm the current device mode, provides a control to change device modes (voice or IP), initiates the download of the current log files, and can be used to remotely shut down the modem. See Figure 8.

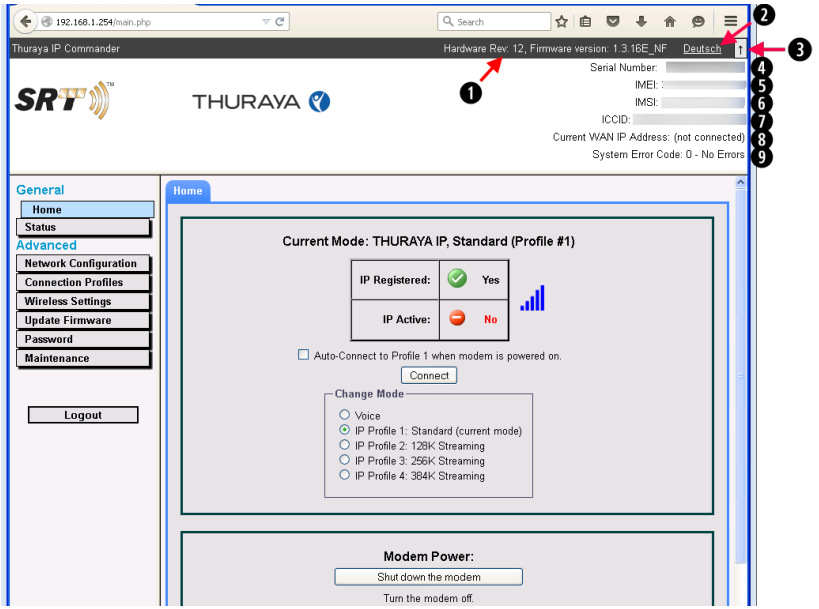

Figure 8: Home Screen

Item	Description
❶ **Versions**	Hardware and Software Version Numbers
❷ **Language Switcher**	Click to switch user interface between English and German
❸ **Show/Collapse Button**	Shows or hides SRT Wireless and Thuraya logos, along with serial numbers and telephone registration numbers. Reduces vertical size of page.
❹ **Serial Number**	IP Commander serial number
❺ **IMEI**	International Mobile Station Equipment Identity
❻ **IMSI**	International Mobile Subscriber Identity
❼ **ICCID**	SIM Card unique serial number
❽ **Current WAN IP Address**	IP Address of the Internet and Thuraya satellite side of the **IP Commander** device.
❾ **System Error Code**	Code(s) presented by the **IP Commander** device when faults occur

Table 8: System Functions

Status Indicators

The **Current Device Mode** indicator, found on the *Home* web page, shows what operational mode your **Thuraya IP Commander** is in (Voice or Thuraya IP).

Voice Mode

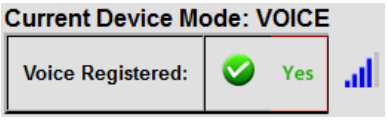

Figure 9: Status Indicator: Voice Mode

This panel shows the current status of the **Thuraya IP Commander** in **Voice Mode**. When it registers with the **Thuraya** satellite, the graphic indicator shows a **green** (✓) icon (and a **Yes** indicator) and a **blue** relative received signal strength bar graph, with five bars being the strongest signal. If not registered, the text in the second column changes to **No** in red, and shows a **red** (⊖) icon. Signal strength bars may or may not be present.

Thuraya IP Mode

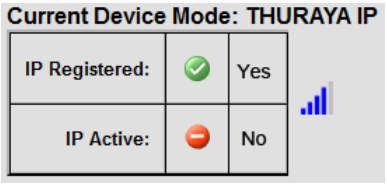

Figure 10: Status Indicator: Thuraya IP (Data) Mode

IP Registered: This panel shows the current status of the **Thuraya IP Commander** in **Thuraya IP Mode**. When it registers with the **Thuraya** satellite, the graphic indicator shows a **green** (✓) icon (and a **Yes** indicator), and a **blue** relative received signal strength bar graph, with five bars being the strongest signal. If not registered, the text in the second column displays a **No** in red, and shows a **red** (⊖) icon. Received signal strength bars may or may not be present.

IP Active: When the **Thuraya IP Commander** device registers with the **Thuraya** satellite, the graphic indicator shows a **green** (✓) icon (and a **Yes** indicator). It is now connected to the Internet, and connection fees commence. If not **Active**, the text in the second column displays a **No** in red, and shows a **red** (⊖) icon. Basically, this is a standby mode. Received signal strength bars may or may not be present.

Signal Quality Indicator (SQI): A graph with blue bars is displayed, showing the relative quality of signals received from the **Thuraya** satellite.

Disconnect from the Internet

If you are currently connected to the Internet, and wish to disconnect (disable the **Thuraya IP Active Mode**), return to the top level web page (the **Home** page, under the **General** heading). Click the *Disconnect* button, located at the bottom of the **Home** page. The **green (**) icon changes to a **red** ( ) icon on the **IP Active** line of the **Current Device Mode** section of the **Home** page, and the *Disconnect* button changes to *Connect*.

Change Device Mode and Setting Profiles

The **Thuraya IP Commander** is capable of making voice calls over the **Thuraya** satellite, or establishing an IP session to access the Internet or perform other digital communication. Changing modes is accomplished by clicking the *Switch to IP Data Mode* button (red arrow in Figure 11), which displays a small panel with five radio buttons (see Figure 12). The example in Figure 11 shows the modem in **Voice Mode**.

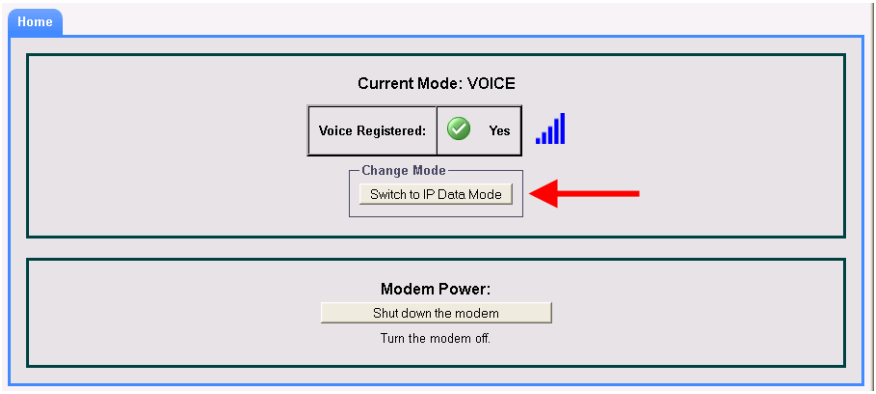

Figure 11: Change Device Mode Menu

NOTE: *The GMPRS mode is currently inoperative.*

When the mouse is released, the **Switch to IP Data Mode** button is replaced with a panel containing five radio buttons, and a *Connect* button. This menu is used to select one of the four profiles (see item ❷ in Figure 12 below), of which three are user-definable. For more information about the four IP modes and how to customize them, refer to *"Advanced → Connection Profiles"* on page 32.

If you want the modem to connect immediately upon power-up or reboot, check the *Auto Connect when modem is powered on* checkbox (see item ❶ in Figure 12 below).

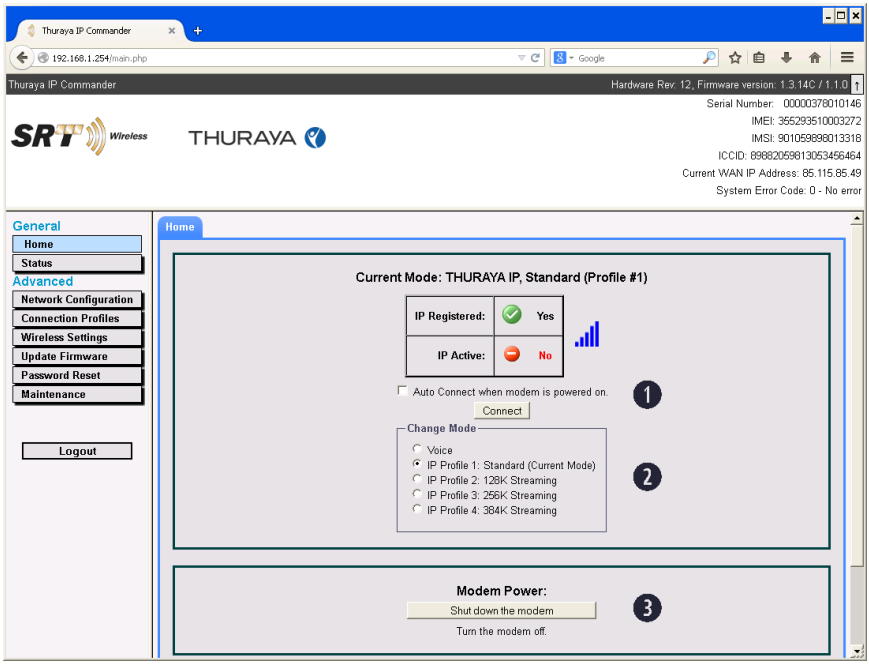

Figure 12: Select Mode (Standard IP Profile chosen in this example)

Choose the mode you wish to switch to, and click *Connect* to make the change.

NOTE: *Connect charges are incurred only when the **IP Active** indicator (see Figure 10) displays a **green** (✓) checkmark. If the indicator is **red** (⊖), you are not being charged for data access. Additionally, connect charges are only incurred when using the 384K streaming mode. If you want to change from **Voice Mode** to the **Thuraya IP device mode** but do not wish to immediately incur connect charges, do not check the **Auto Connect when modem is powered on** checkbox and do not click the **Connect** button until you are ready to access the Internet using the **Thuraya IP device mode**.*

General → Status

The Status screens offer additional information on the performance and general health of the **Thuraya IP Commander**. The following few pages describe the four tabs shown within the Status screen.

General → Status → Network Status

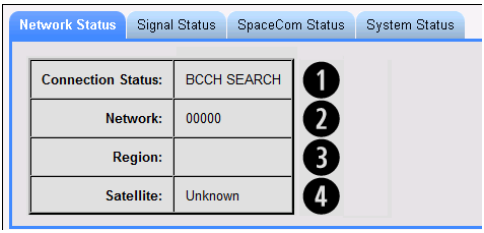

Figure 13: Status → Network Status Screen

Item	Description
1 Connection Status	Status of the current satellite network connection: BCCH SEARCH, IDLE CAMPED, RACH CIRCUIT, RACH PACKET, PACKET, VOICE / SMS
2 Network	The Alphanumeric identification of the satellite network, e.g. THURAYA
3 Region	The regional locale identifier of the modem's location or GPS position, e.g. UAE
4 Satellite	Thuraya; T2 or T3

Table 9: Network Status Screen Field Descriptions

General → Status → Signal Status

Signal Status shows several parameters that indicate overall signal quality.

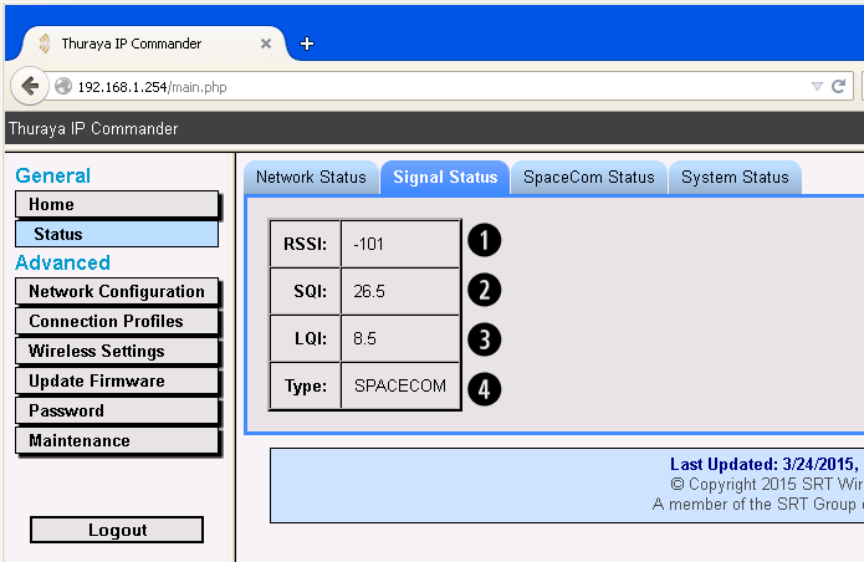

Figure 14: General → Status → Signal Status Page

Item	Description
1 RSSI	The Received Signal Strength Indication is a measurement of the power present in the received satellite radio signal expressed in dBm.
2 SQI	The Signal Quality Indicator is an estimate of the ratio of the desired signal power to the noise and interference power in the received radio signal.
3 LQI	The Link Quality Indicator is the amount of reserve link margin, with respect to the target signal quality.
4 Type	Antenna currently connected to the modem.

Table 10: General → Status → Signal Status Field Descriptions

General → Status → SpaceCom Status

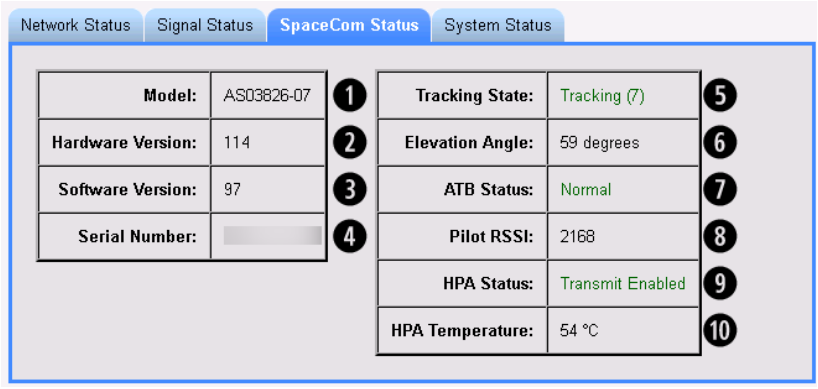

Figure 15: General → Status → SpaceCom Status

Item	Description
❶ Model	SpaceCom Antenna Model Number
❷ Hardware Version	SpaceCom Antenna Hardware Version Number
❸ Software Version	SpaceCom Antenna Software Version Number
❹ Serial Number	SpaceCom Antenna Serial Number
❺ Tracking State	Messages: Tracking, Not Tracking, Tracking, Trying to Track
❻ Elevation Angle	The angle between the antenna beam pointing direction, directly towards the satellite, and the local horizontal plane. It is the up-down angle.
❼ ATB Status	Status of the Antenna Tracking Board. States could be normal or error count.
❽ RSSI	A relative measurement of received signal strength
❾ HPA Status	Status of the High Power Amplifier
❿ HPA Temperature	Temperature of the High Power Amplifier

Table 11: SpaceCom Status Field Descriptions

General → Status → System Status

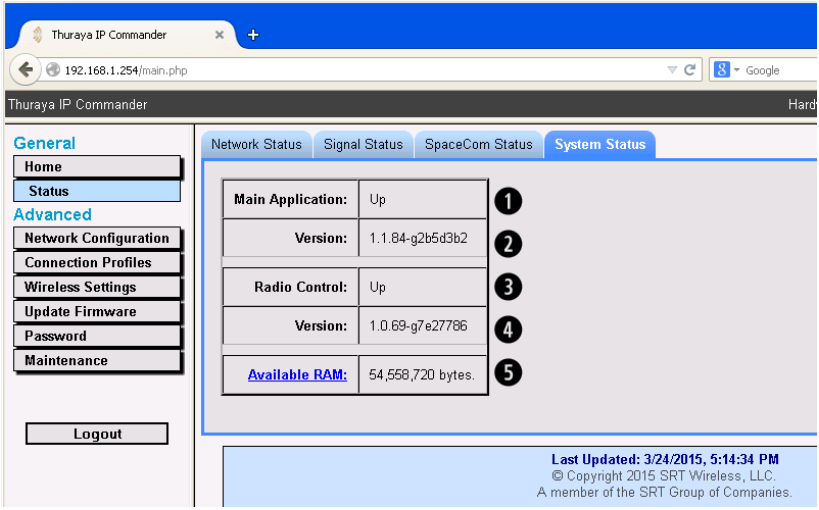

Figure 16: System Status Screen

Item	Description
❶ **Main Application:**	Indicates whether the **IP Commander** application is currently running.
❷ **Version:**	The version of the **IP Commander** application.
❸ **Radio Control:**	Indicates whether the radio control application is currently running.
❹ **Version:**	The version of the radio control application.
❺ **Available RAM:**	The currently available system RAM. Clicking the link displays a graph.

Table 12: System Status Field Descriptions

General → Status → System Status → Available RAM → Available RAM Graph

A hyperlink is provided for viewing how system memory is used over time. As shown in Figure 16, the **Available RAM** field is a hyperlink (note red arrow). Click the link to view a graph of memory usage. For an example of the **Available RAM Graph**, see Figure 17.

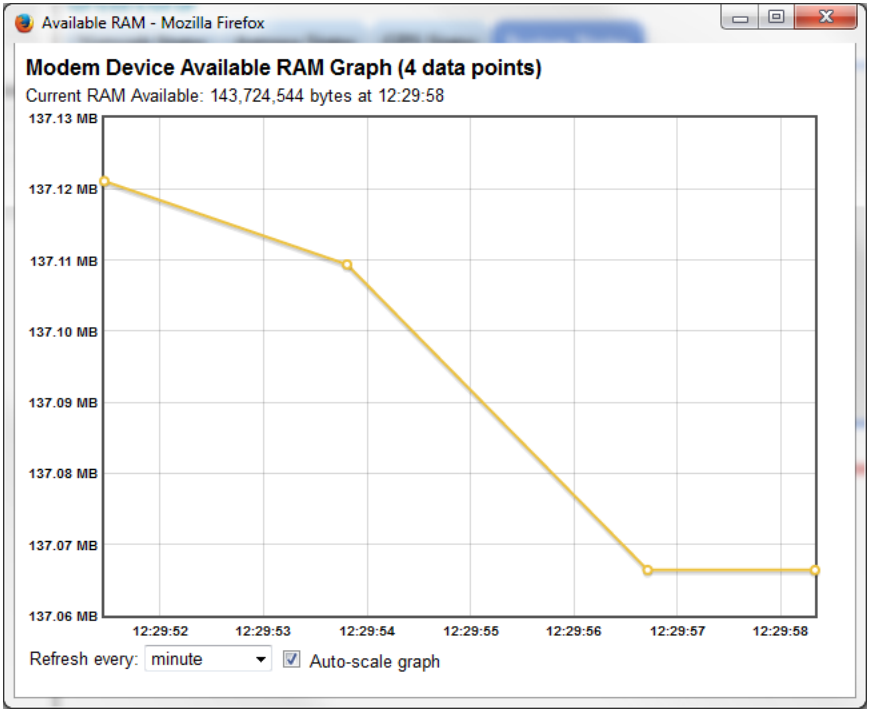

Figure 17: Available RAM Graph

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Advanced → Network Configuration

Your wired network can be configured when you click the *Network Configuration* tab. See Figure 18.

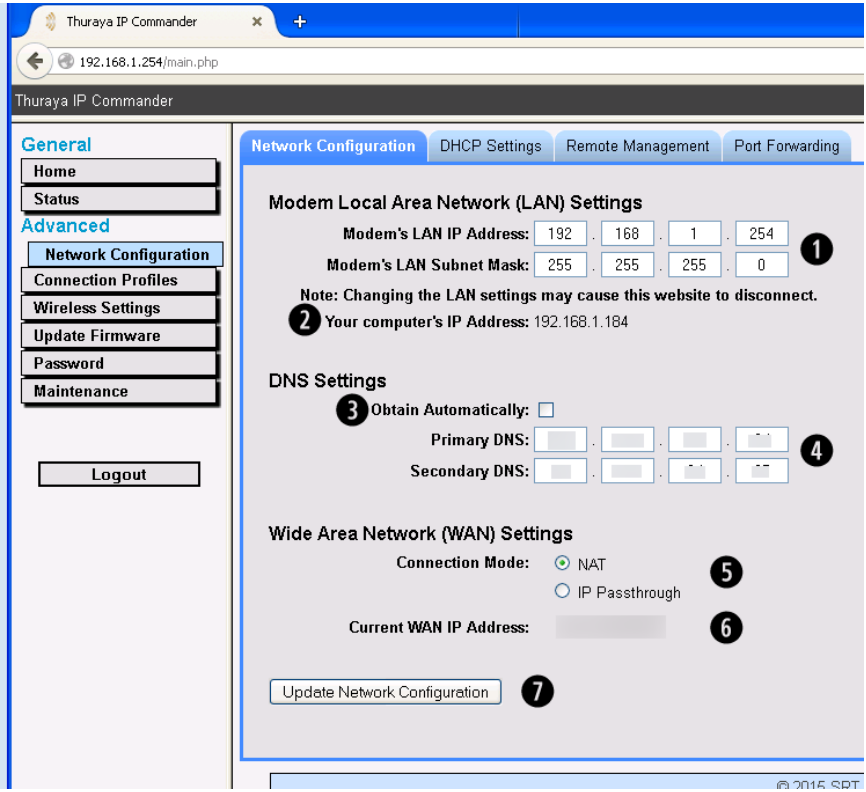


Figure 18: Network Configuration Screen

The screen is divided into four sections: LAN Settings, DNS Settings, and WAN Settings.

Item	Description
❶ **LAN Settings**	The IP address (192.168.1.254) and subnet mask (255.255.255.0) are default values set by **Thuraya**, and are the IP address and subnet mask of the modem itself. To access these web pages, you only need to enter http://192.168.1.254 from your web browser connected to the LAN side of the modem.
❷ **Your Computer's IP Address**	IP address of the computer controlling the IP Commander.
❸ **Obtain Automatically**	The checkbox, when checked, contacts Thuraya's domain name server to get IP addresses for the primary and secondary **Domain Name Server**, and populates those addresses in designated fields as shown in item ❹.
❹ **DNS Settings**	These addresses are usually provided by **Thuraya**, and can be automatically assigned if youcheck the checkbox shown in item ❸. The **DNS** server looks up and automatically translates easy for humans to understand alphanumeric addresses, like web URLs, into machine-friendly IP addresses (i.e., numbers).
❺ **WAN Settings: Connection Mode**	Select either the NAT radio button or the IP Passthrough radio button. Use the NAT (Network Address Translation) radio button for normal operation (using DHCP and Network Address Translation to move across the firewall). IP Passthrough disables the firewall and network address translation, effectively placing you on the WAN side of the modem. This should normally be avoided due to the potential security issues from bypassing the firewall. Your IT manager and the company that sold you the IP Commander device should be able to help you configure the WAN Settings Connection Mode in a manner most appropriate to your needs.
❻ **WAN Settings: Current WAN IP Address**	IP address on the **Thuraya** side of the connection. This address is automatically provided by **Thuraya** and is not modifiable. When offline, the IP address is displayed as 0.0.0.0.
❼ **Update Network Configuration Button**	To finalize the settings you have made on this page, click this button.

Table 13: Network Configuration Settings Field Descriptions

If you make any changes to your wired network, make sure you click the *Update Network Settings* button before going on to your next task.

Advanced → Network Configuration → DHCP Settings

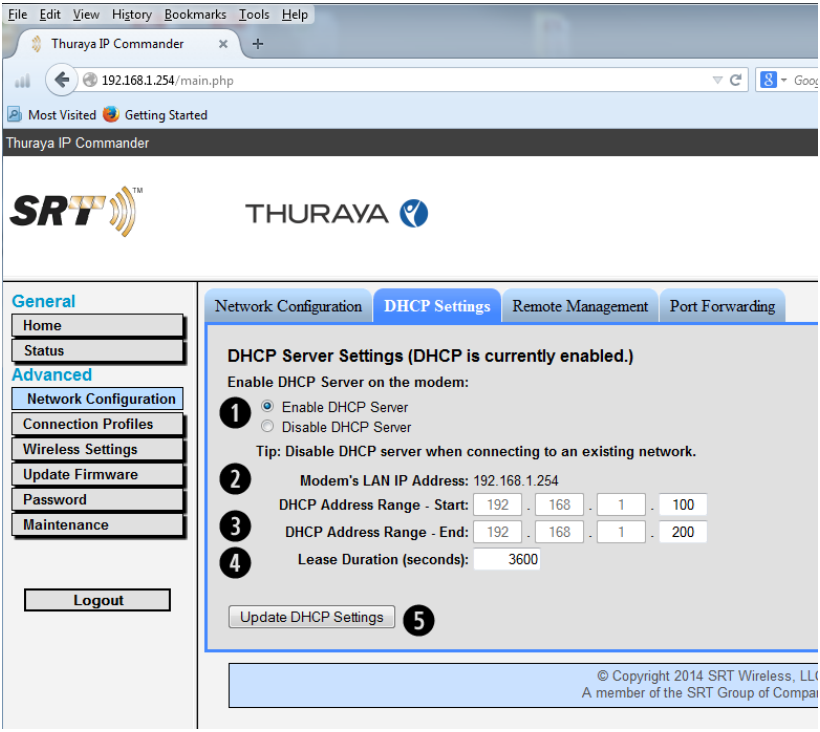


Figure 19: DHCP Settings Window

Item	Description
❶ **Enable DHCP Server on Modem Settings**	Your **Thuraya IP Commander** has a DHCP server, which assigns IP addresses to devices connected to its local area network. You have the option of turning it on and off. There are two reasons you might want to disconnect your DHCP server: 1. All of your network devices have been configured with static IP addresses. 2. You are connected to an existing local area network which also has DCHP services. Even if your devices have been assigned static IP addresses, if you wish to add more devices to this same network, the easiest way to bring them in is to enable the DCHP server. Review the **DHCP Address Range** start and end points. Ensure that the static IP addresses fall above and/or below the addresses shown in the Address Range fields (item ❸). In other words, If the DHCP address range goes from 192.168.1.100 to 192.168.1.200, you can assign static IP addresses beginning with 192.168.1.2 through 192.168.1.99. Additional static IP addresses can be assigned within the range of 192.168.1.201 through 192.168.1.253.
❷ **Modem's LAN IP Address**	This is the static IP address assigned by the modem's manufacturer. It can be changed on the Advanced→Network Configuration screen.
❸ **DHCP Address Range: Start/End**	By assigning a range of IP addresses to be used by the DHCP server, addresses outside this range can be manually assigned to devices when required.
❹ **Lease Duration**	The IP addresses assigned to devices on the LAN by the DHCP server are renewed/refreshed at predetermined periods of time. This default is 3600 seconds, or once per hour.
❺ **Update DHCP Settings Button**	Use this button to bypass the scheduled DHCP lease duration and immediately renew/refresh the DHCP assignments to all devices on the LAN using DHCP services, as well as set changes on the DHCP server.

Table 14: DHCP Settings

Advanced → Network Configuration → Remote Management

If your modem is inaccessible, or if you are unable to access the modem hardware directly,you can remotely manage the modem over the satellite connection, through the **Remote Management** tool.

With **Remote Management** enabled, it is possible to fully administer (manage the Status, Network Configuration, Wireless Settings, Firewall, etc., settings) your **IP Commander** modem via the Internet.

In order to do so, the *Enable Remote Management* checkbox must be checked, and the modem must be connected to the **Thuraya** satellite.

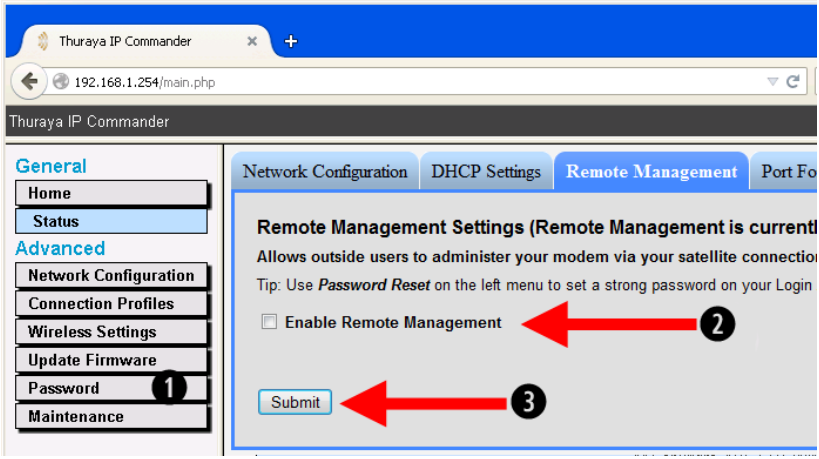


Figure 20: Enable Remote Management Screen

If you do not already have a strong password for your modem, this is a good time to set one up. To prevent access by undesirable individuals, your password should contain a combination of upper and lower case letters, numbers, and punctuation marks. It should be at least ten to fifteen characters long, because if a hacker guesses your password and takes control of your modem, you will not be able to remotely regain control of it, nor will you be able to reset it remotely. Additionally, you may be responsible for any charges for use of the modem. Click the *Password* (❶) tab and follow the instructions, found at *"Advanced → Change Password"* on page 38.

Once you have changed to a strong password, check the *Enable Remote Management* checkbox (❷), and click *Submit* (❸). The modem requires a restart before **Remote Management** is enabled (or disabled).

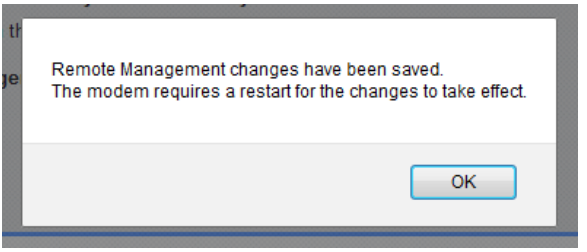


Figure 21: Notice that a Restart is Required

Once **Remote Management** is enabled, a message is displayed on the **Remote Management** web page, advising you of the modem's connection status, and that when connected, provides the URL (Uniform Resource Locator) of your **IP Commander** modem that would be used to access it from the Internet (http://*WAN-IP-Address*:41912).

CAUTION: *Your administrative password may need to be strengthened to prevent unauthorized access to the administrative settings on your* ***IP Commander*** *modem. Your password can be changed from the* ***Password*** *button under the* ***Advanced*** *settings buttons.*

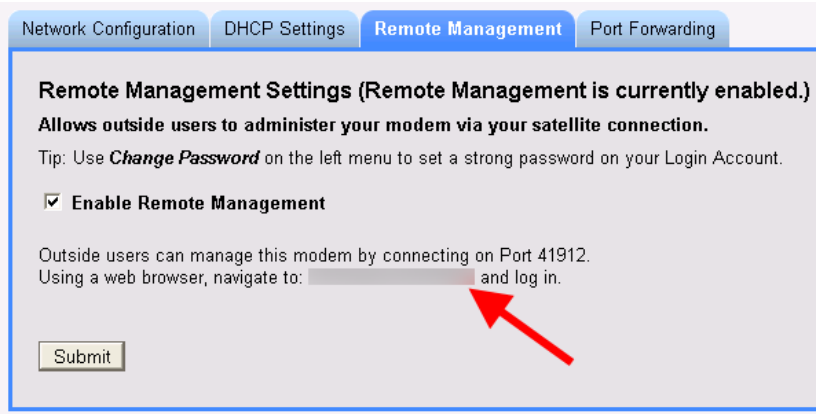


Figure 22: Typical Remote Management Screen (Enabled)

When **Remote Management** is enabled, the WAN IP address and port (http://*WAN-IP-Address*:41912) are displayed (see red arrow in Figure 22 above). When **Remote Management** is disabled, the IP address display reverts to 0.0.0.0.

Advanced → Network Configuration → Port Forwarding

Port Forwarding gives you the ability to allow data traffic to pass through specified ports. In other words, you can selectively open "ports" on your firewall to make specific services running on your LAN available to outside (Internet) access, while keeping the bulk of your LAN invisible to the Internet. For example, when your **IP Commander** modem has **Remote Access** enabled, port :41912 is opened to grant access, with proper authentication, to authorized individuals who are accessing the **IP Commander** from the Internet. This function is also used to permit individuals on the LAN side of the firewall to host Internet gaming services, as well as the ability to host a website accessible to Internet users. To further limit data traffic to specified ports, you can also assign port numbers to the local (LAN) side of the firewall. Configuring a port on the LAN side of the network (Local Port) permits specific traffic to be directed to a specific network device.

In this example, traffic coming in to the IP Commander's WAN connection (from the Thuraya satellite) through port 5004 is *only* forwarded to port 6000 on a LAN device with the IP address 192.168.120. Conversely, traffic from port 6000 on a network device with an IP address of 192.168.1.120 passes through the firewall to a network device on the internet using port 5004.

Ports can be opened individually, or in ranges.

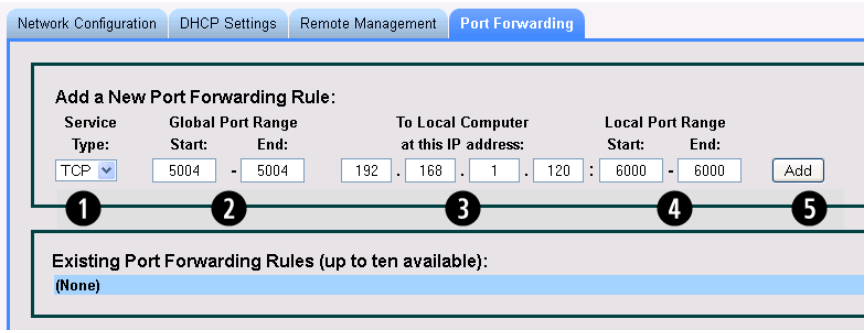


Figure 23: Initial Port Forwarding Setup Screen

Item	Description
❶ **Service Type**	TCP = TCP/IP UDP = UDP
❷ **Global Port Range (Start to End)**	The port numbers you are opening to the Internet. Can be used to assign a single port (Start: 80, End: 80), or a range (Start: 500, End: 600).
❸ **To Local Computer at this IP Address**	IP Address of a designated computer on your Local Area to which traffic from the Internet is being routed.

Item	Description
❹ **Local Port Range (Start to End)**	The port numbers you assign to a computer (or computers in more complicated setups), thereby limiting specific types of traffic from the Internet to devices on your LAN. For example, adding port :80 to the local computer's IP address limits incoming and outgoing traffic to http (web) traffic.
❺ **Add Button**	Click the *Add* button to add this Port Forwarding Rule to your list of forwarded ports (up to a maximum of ten).

Table 15: Port Forwarding Setup Screen Descriptions

Additional rules, up to a total of ten, can be assigned to devices connected to the LAN. When you have completed setting up the first rule, click the *Add* button (red arrow), and then that rule is moved to the *Existing Port Forwarding Rules* portion of the screen. At this point you can write another rule.

NOTE: *Computers being set up to use* ***Port Forwarding*** *must be configured with static IP addresses, as IP addresses being controlled by the DHCP server could change unexpectedly, disrupting communications.*

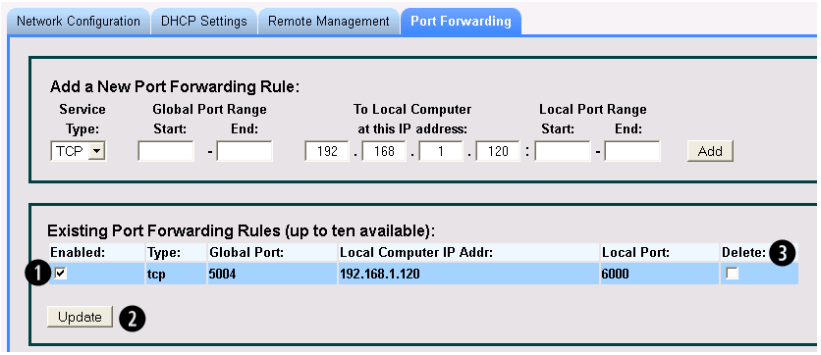


Figure 24: Port Forwarding Screen with One Rule Enabled and a Second Rule Being Edited

You can temporarily disable any saved rule by unchecking the *Enabled:* checkbox (❶) corresponding to the rule you want to disable, followed by clicking the *Update* button (❷). The listing remains, and can be re-enabled by re-checking the *Enabled:* checkbox (❶) and again clicking the *Update* button (❷). See Figure 24.

To delete a saved rule, click the *Delete* checkbox (❸) at the far right of the saved rule listing, and then click the *Update* button (❷) below the rule. See Figure 24.

The modem updates the rule list when the *Update* button (❷) is clicked. See Figure 24.

Advanced → Connection Profiles

Four **Connection Profiles** have been provided for running the **Thuraya IP Commander** in different operating modes. Using these profiles permit you to quickly go from, for example, a high-bandwidth multimedia streaming environment to reduced bandwidth that is suitable for basic telephone communications. Alternately, you can edit most of these profiles for your own requirements for more efficient use of your **Thuraya IP Commander** device. You can set different data rates depending upon your needs. Your service provider establishes billing methods and rate, as well as the **APN** (Access Point Name). Alternately, you can simply make use of the four profiles

In the illustration below, you can see an example of one of four profiles that you can quickly switch to. To change profiles, click the tab for the profile you want to use (*Profile 1, Profile 2*, etc.), and click the *Save this Profile* button. Only profiles 2, 3, and 4 are editable, should you want to customize one or more of the settings to meet your needs.

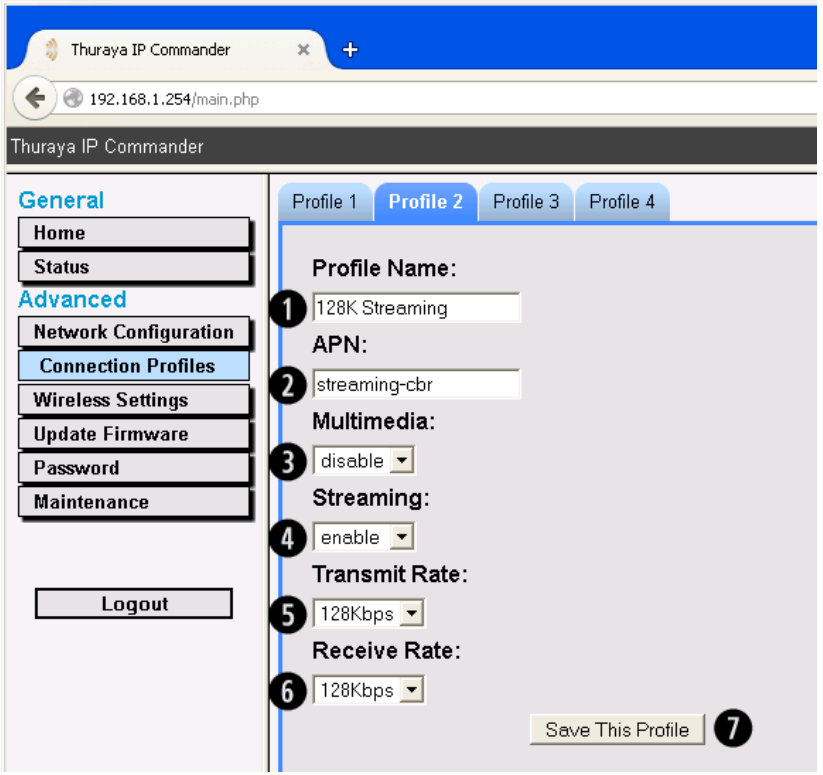


Figure 25: Connection Profile Settings (four default profiles shown)

Profile	Profile Name	APN	Multimedia	Streaming	Transmit Rate	Receive Rate
1[1]	Standard	standard-vbr	disable	disable	16Kbps	16Kbps
2	128K Streaming	streaming-cbr	disable	emable	128Kbps	128Kbps
3	256K Streaming	streaming-cbr	disable	enable	256Kbps	256Kbps
4	384K Streaming	streaming-cbr	disable	enable	384Kbps	384Kbps

Table 16: Default Profile Settings (Profiles 2, 3, 4 are User Modifiable)

Item	Description
❶ **Profile Name:**	The IP profile name is user defined; you can edit the name.
❷ **APN:**	The **A**ccess **P**oint **N**ame is assigned by **Thuraya** and is used to determine your network usage rate.
❸ **Multimedia:**	*Enable* or *Disable*
❹ **Streaming:**	*Enable* or *Disable*
❺ **Transmit Rate:**	*16, 32, 64, 128, 256,* or *384* Kbps
❻ **Receive Rate:**	*16, 32, 64, 128, 256,* or *384* Kbps

Table 17: Connection Profile Settings Descriptions

Profiles 2, 3, and 4 can be customized by using the drop down menus for *Multimedia, Streaming, Transmit Rate,* and *Receive Rate*. Transmission quality increases with each increase in **Transmit** and **Receive** data rate, at the cost of higher data transmission fees. For more information on data rates, please contact your **Thuraya** service provider. Multimedia and Streaming settings must be changed to *enable* before you can upload or download streaming media from the Internet.

[1]Reserved for Standard Mode. This Profile is not editable.

Advanced → Wireless Settings

Your wireless network is configurable as easily as any consumer Wi-Fi device. There are only four settings and a checkbox, enabling or disabling the Wi-Fi function. See Figure 26.

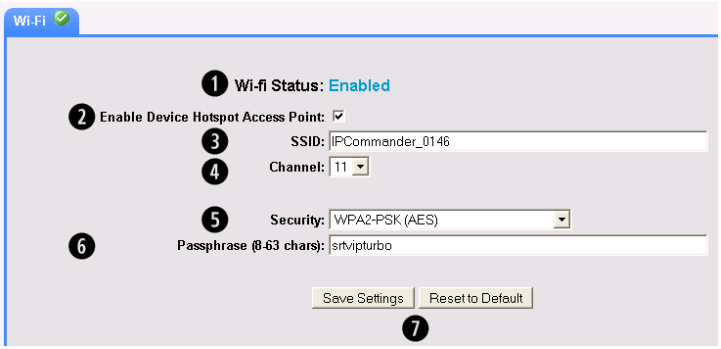


Figure 26: Wireless Settings Screen

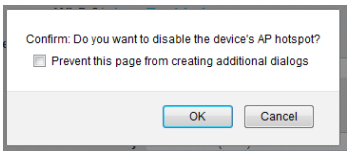
Item	Description
1 **Wi-Fi Status Indicator**	Displays Wi-Fi Status: *Enabled* or *Disabled*
2 **Enable Device Hotspot Access Point Checkbox**	Enables and disables the wireless functions of the **Thuraya IP Commander**. If you disable the Wi-Fi hotspot, a confirmation popup is displayed: 
3 **SSID**	User-assigned name of the Wi-Fi network.
4 **Channel**	Wi-Fi channel (selectable to a single channel in the 2.4 GHz radio band) on which the IP Commander operates.
5 **Security**	Activates one of three data encryption standards (or Open): • WPA-PSK (TKIP) • WPA2-PSK (AES) • WPA-PSK (TKIP) + WPA2-PSK (AES)
6 **Passphrase**	This passphrase is only needed for users accessing the **IP Commander** device wirelessly (the Passphrase field is only displayed when one of the three encryption types is selected). The passphrase should be at least eight characters long, containing upper and lowercase letters, numbers, and punctuation marks.
7 **Save Settings / Reset to Default**	Saves settings made on this page. Prompts user to reboot modem, or Resets to factory default settings.

Table 18: Wireless Settings Field Descriptions

To set up:

1. Enter a name for your network, up to 32 characters in length (case-sensitive), into the **SSID** field (❸).

2. Choose a channel on which to operate your Wi-Fi network (❹). The most popular 2.4 GHz network channels are 1, 6, and 11.

3. In the **Security** field drop-down menu (❺), assign an encryption type (WPA, WPA2, or both), unless you do not wish to use encryption, in which case, select *Open (Unencrypted)*.

> ***CAUTION:*** *Leaving your wireless **Hotspot Access Point** open (unencrypted) makes your wireless network (and those connected to it) vulnerable to attack by disreputable people. Additionally, unauthorized users could potentially run up access charges by using your satellite link. Use any one of the three encryption choices and use a long, strong passphrase.*

4. When an encryption type is assigned, another field, **Passphrase (8-63 chars)** is displayed (❻). Enter a passphrase into this field. This passphrase should include upper and lower case letters, numbers, punctuation, and symbols. The passphrase is case-sensitive. Write this passphrase down somewhere, and keep it in a secure place, as you will need to share it with anyone you authorize to connect to your Wi-Fi network.

5. Click the *Save Settings* button to apply any changes you may have just made. See Figure 27. A message pops up, which asks you to confirm if you want to save these AP settings. If you have made changes that are either in error or you would rather revert to the default settings, click the *Reset to Default* button located next to the *Save Settings* button. A message pops up, which asks you to confirm if you want to reset the **Access Point** to its default settings.

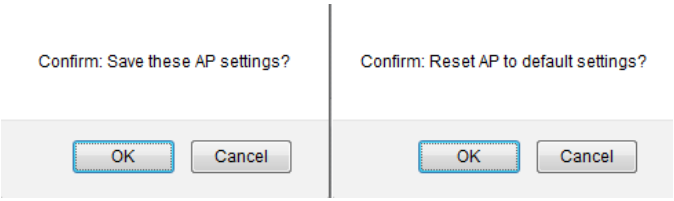


Figure 27: Confirm Buttons: Save AP Settings or Reset AP to Default

6. Click the *Enable Device Hotspot Access Point* checkbox (❷) to activate.

Advanced → Update Firmware

Your **Thuraya IP Commander** device may require updates to its internal operating system from time to time. An **Update Firmware** function has been provided to make this task easy to perform.

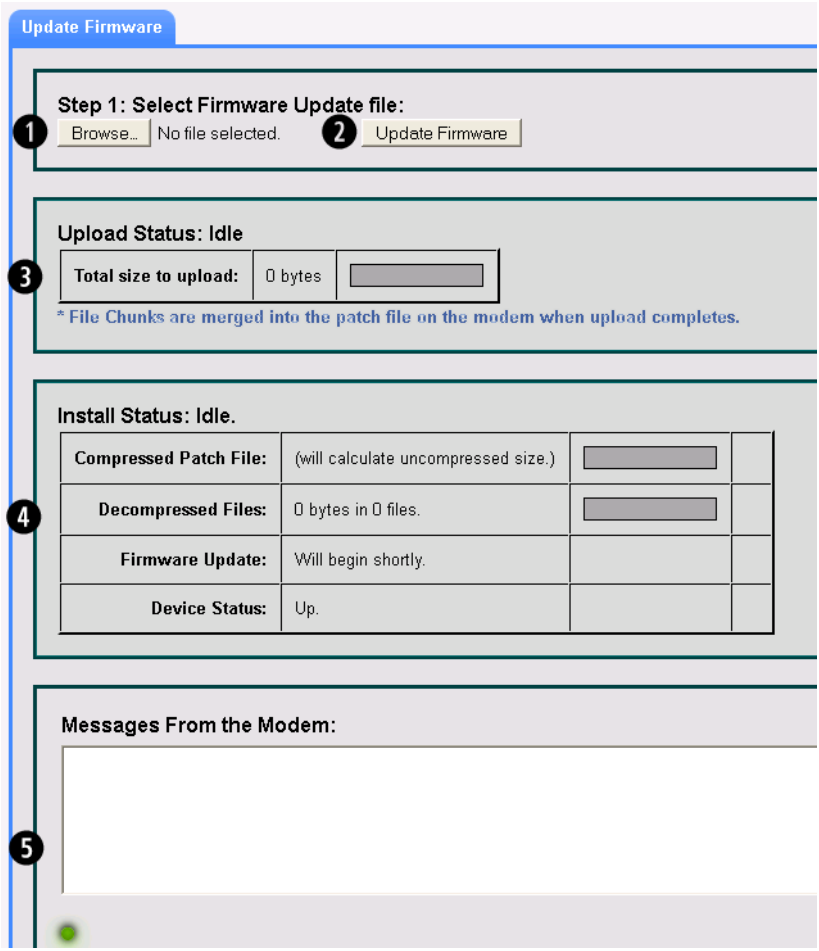


Figure 28: Update Firmware Screen

Item	Description
❶ **Browse Button**	Use the *Browse* button to locate the **Firmware Update** file on your computer.
❷ **Update Firmware Button**	Once you have located the firmware update file, select it and click the *Update Firmware* button to start the process.
❸ **Upload Status**	Shows upload progress.
❹ **Install Status**	Displays progress bars during installation.
❺ **Messages from the Modem**	Displays log messages (if generated) during the installation

Table 19: Update Firmware Field Descriptions

1. Obtain the update file from **Thuraya** or **SRT Wireless** in whatever method it is provided (web download, ftp, optical media, etc.).

2. Connect to the **Thuraya IP Commander** and log into the web browser (`http://192.168.1.254` with login and password of `admin`, unless you have changed the password to something more secure).

3. Click **Advanced→Update Firmware** to access the screen (see Figure 28).

4. Click the *Browse...* button (❶). This opens a standard file dialog box. Navigate to the location of the firmware update file on your computer and select. Click *OK*.

5. When the file has been successfully downloaded to the **IP Commander**, the *Update Firmware* button (❷) activates.

6. Click the *Update Firmware* button (❷). It takes several minutes to install.

Advanced → Change Password

One of the first things you should do when you set up your **Thuraya IP Commander** is to replace the default password (`admin`) with something much more secure. This is easily accomplished by bringing up the **Password Reset** function. The new password should be at least eight characters long, containing upper and lowercase letters, numbers, and punctuation marks.

> ***CAUTION:*** *When you change the default password (strongly recommended), make certain a copy of the new password is kept in a secure place. If the new password is lost or forgotten, your* ***Thuraya IP Commander*** *may need to be returned to the factory or an authorized representative for repair.*

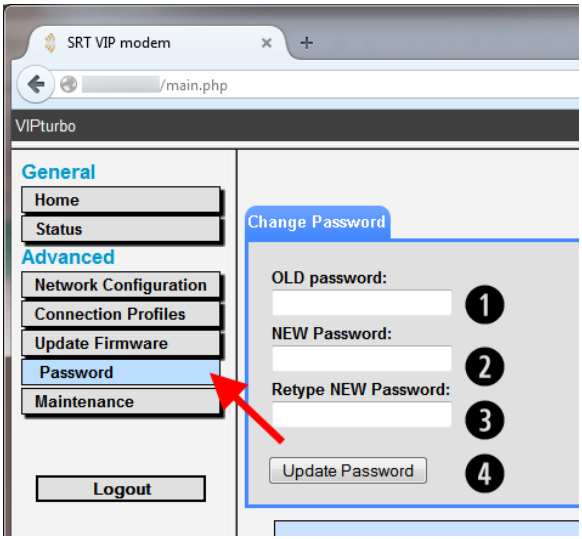


Figure 29: Change Password Screen

1. In the **Advanced** part of the **Control Panel**, click *Password*. See red arrow in Figure 29.
2. Type the current password (`admin` if it has never been changed) into the **OLD password** field (❶).
3. Type the new password into the **NEW Password** field (❷).
4. Type the new password once more, into the **Retype New Password** field (❸).
5. Click the *Update Password* button (❹).
6. The new password is now in effect.

Advanced → Maintenance

The **Maintenance** screen provides additional system information (download logs and web site version number) and a button to reboot the modem.

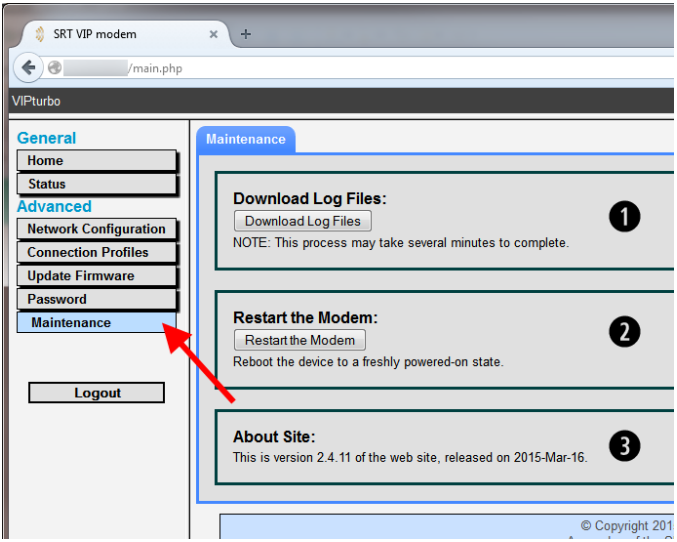


Figure 30: Maintenance Screen

Item	Description
❶ **Download Log Files**	To download the logs currently being stored by the **Thuraya IP Commander**, click the *Download Log Files* button. Follow the prompts to save the log files to your computer.
❷ **Restart the Modem**	Should you need to restart the **Thuraya IP Commander**, you can do so by clicking the *Restart the Modem* button.**See** *"Advanced → Maintenance → Restart the Modem"* on page 44 for instructions to restart the modem.
❸ **About Site**	Displays the version number of the installed radio control application.

Table 20: Maintenance Screen Descriptions

Advanced → Maintenance → Download Log Files

The **IP Commander** stores system logs, which can be a very useful troubleshooting aid in the event of a system fault. These files can be downloaded to your local PC.

To download the log files:

1. Go to the *Advanced → Maintenance* window.
2. Click the *Download Log Files* button. See Figure 31.

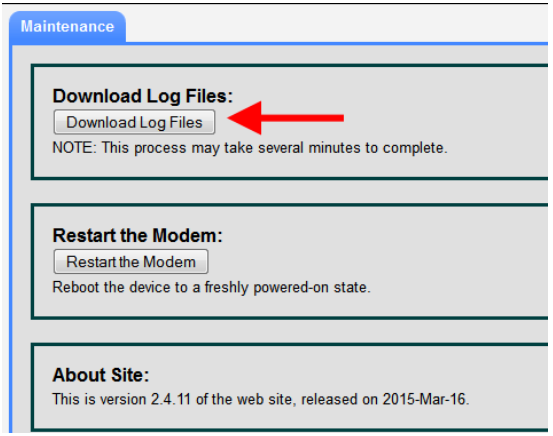


Figure 31: Click the Download Log Files Button

3. The **Log Files** screen is displayed. See Figure 32.

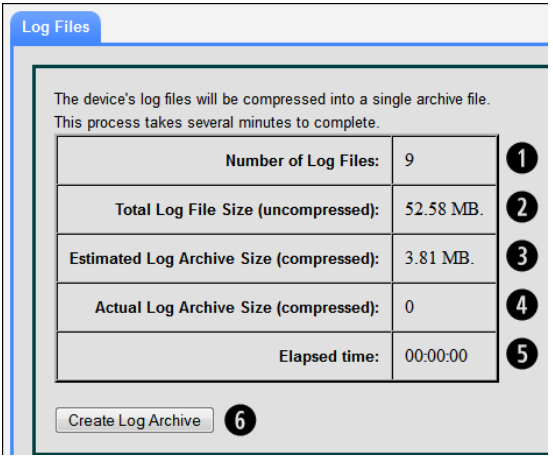


Figure 32: Log Files Screen

Item	Description
❶ Number of Log Files	Multiple log files are created. The total number of log files to be downloaded is displayed here.
❷ Total Log File Size	The total uncompressed size, in megabytes, of all the log files currently being stored in the IP Commander device.
❸ Estimated Log Archive Size	Estimated size of the log archive after being compressed.
❹ Actual Log Archive Size	Actual size of the log archive after being compressed
❺ Elapsed Time	Elapsed time to compress and download log files
❻ Create Log Archive Button	Button to start the process of compressing and transferring log files.

Table 21: Log File Compress/Download File Screen Field Descriptions

4. When the *Create Log Archive* button is clicked, an archive file is built, gathering all the logs, and compressing them into a single downloadable file. See Figure 33.

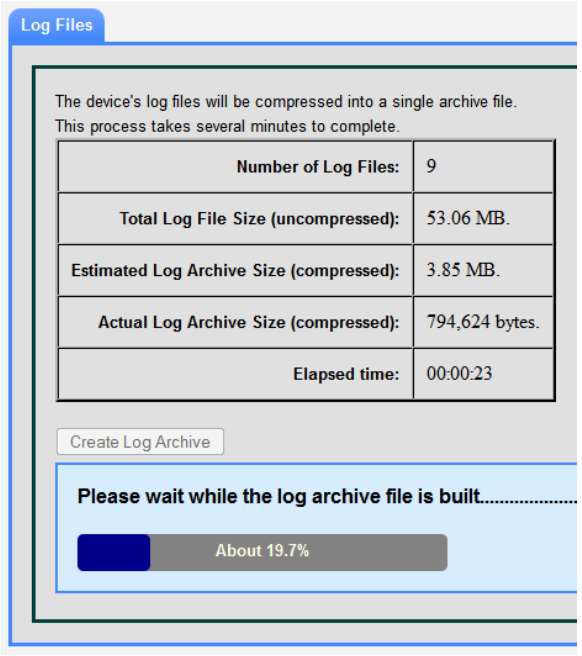


Figure 33: Building the Log Archive File

5. When the **Log Archive** file is built, the compressed file size is displayed, and instructions for downloading are provided. See red arrow in Figure 34.

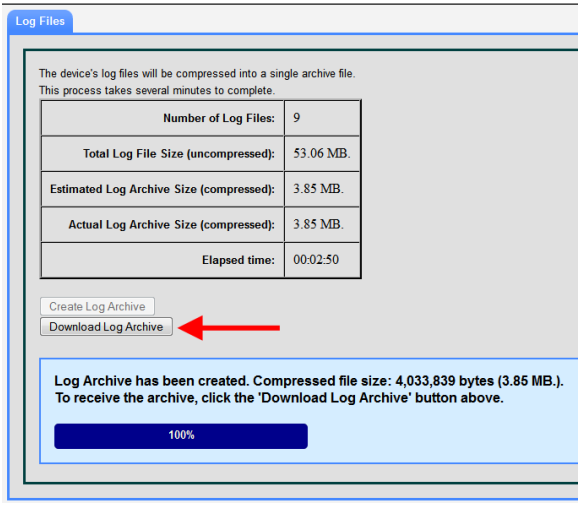


Figure 34: Click Download Log Archive Button

6. A file download window is displayed, overlaying the **Log Files** window. Either open the compressed file immediately, or download the **Log File Archive** to your PC for later examination. Click *OK*. See Figure 35.

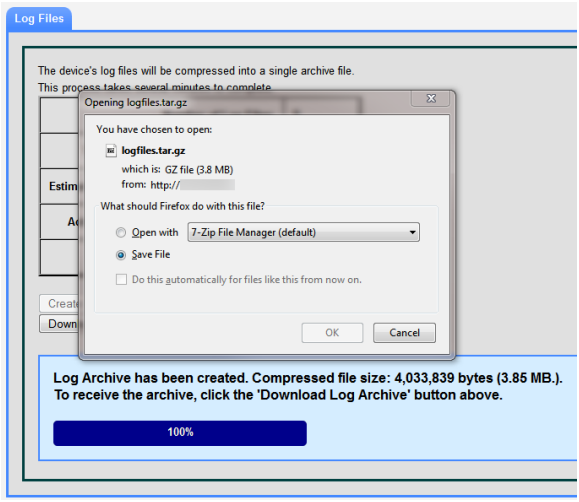


Figure 35: Download Log File Archive to Your PC

Advanced → Maintenance → Restart the Modem

The **IP Commander** modem needs to be restarted after some configuration actions. These include:

- Enabling (or disabling) the Hotspot

To restart the **IP Commander** modem:

1. Go to the *Advanced → Maintenance* window.
2. Click the *Restart the Modem* button. See Figure 36.

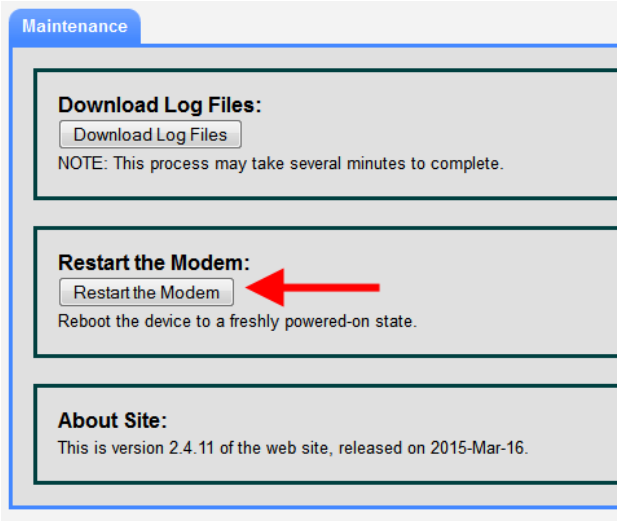


Figure 36: Click the *Restart the Modem* Button

3. The next screen displays a rotating gear symbol indicating the device is rebooting. Then a progress bar is displayed, indicating in relative terms how long the reboot process takes. Finally, a reboot complete screen is displayed. See Figure 37. Click *OK*.

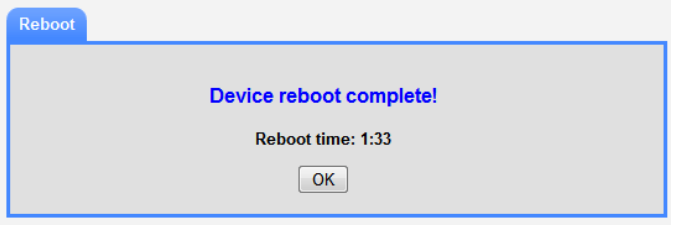


Figure 37: Reboot Complete Screen

4. When OK is clicked, a login screen is displayed. See Figure 38.

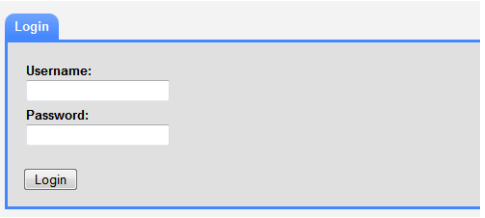


Figure 38: Login Screen Displayed after Reboot

5. Enter *Username* and *Password* to log back into the *IP Commander* device.

4. Agency Compliance Statements

This section provides information related to agency approvals and other special notices.

Declaration of Conformity

We,

SRT Wireless, LLC

of

4101 SW 47th Ave, Davie, FL 33314, USA

declare under our sole responsibility that the product

Thuraya IP Commander Modem

to which this declaration relates, is in conformity with the following standards and/or other normative documents.

For article 3.1(a), Health and Safety of the User:

IEC 60950-1

For article 3.1(b), Electromagnetic Compatibility:

EN 301 489-17, EN 301 489-20, EN 300 328, EN55022-B

For article 3.2, Effective Use of the Spectrum Allocated:

EN 300 328

We hereby declare that all essential radio test suites have been carried out and that the above named product is in conformity to all the essential requirements of Directive 1999/5/EC.

RoHS-2 Directive 2011/65/EU

The European Union (EU) Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU restricts the use of certain hazardous substances in electrical and electronic equipment.

Unless otherwise noted, all products, assemblies, and sub-assemblies manufactured by SRT Wireless and its sub-contractors are compliant with this directive.

Identification mark: CE

The equipment will also carry the Class 2 equipment identifier:

The technical documentation relevant to the above equipment will be held at:

SRT Wireless, LLC, 4101 SW 47th Ave, Davie, FL 33314, USA

John R. Russell
Vice President and Chief Operating Officer, SRT Wireless, LLC

23 September 2015

FCC Statements

FCC Part 15.19 Warning Statement- (Required for all Part 15 devices)

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 Part 15.21 Warning Statement

NOTE: THE **GRANTEE** IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

NOTE: 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.

FCC Part 1.1310 & 2.1091 Rf Exposure Statement

To Satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of **58 cm** or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended.

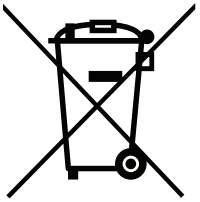
The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

EU WEEE (Waste Electrical and Electronic Equipment) Directives

The European Union (EU) directive on waste electrical and electronic equipment mandates recycling of electrical and electronic equipment throughout the EU by August 13, 2005.

Unless otherwise noted, all products, assemblies, and sub-assemblies manufactured by SRT Wireless and its sub-contractors will be compliant with this directive and any subsequent revisions or amendments. This product carries the WEEE label below to demonstrate compliance.

For addition information, contact SRT Wireless at: www.srtrl.com.



5. FAQs

You can always find the latest **FAQs** at the **SRT Wireless** website:

http://www.srtwireless.net/network-terminals/ip-commander-faqs/

Q *On the first initial boot up, in what mode does the **IP Commander** power up?*

A The first time you power your system on, it will boot up in *IP Standard Mode*.

Q *There are two SIM card slots, one designated as Primary and the other as Secondary. Do I use both slots?*

A Only the *Primary* slot is used.

Q *Where do I activate my SIM card?*

A It must be activated by an authorized **Thuraya** service provider. It allows both Voice and IP Data.

Q *Are there yearly maintenance fees associated with the system?*

A No.

Q *How am I billed?*

A In *IP Standard Mode*, you are billed by the megabyte. In *Streaming Mode*, you are billed by the minute.

Q *Do I have to wait until all status indicator lights turn green to use the **IP Commander**?*

A Not all lights have to be green but you should wait for the following combination before using the **IP Commander**:

- **Sup**-green (power supply is connected)
- **On**-green (**IP Commander** is powered on)
- **Act**-flashing red/off (activity on the satellite link)
- **Sat**-green (Satellite antenna status)
- **GPS**-green (GPS status)
- **Ant**-flash red/green or solid green is fine (show transmit antenna status)
- **LAN**-green if you're connected to a network; off if not connected (local area network status)

Q *What should my RSSI be in order to achieve optimal voice and data performance?*

A In order to achieve optimal voice and data performance you should have a RSSI range between -105 and -95.

Q *Does it matter where the antenna is placed on top of the vehicle?*

A Antenna placement on the vehicle should ensure that the antenna has clear line-of-sight to the satellite.

Q *Why do I need to change my connection profiles?*

A Profiles are changeable to reflect the data use plan that you purchased.

Q *When is it okay to power up and power down the **IP Commander**?*

A The antenna cable carries DC power. Always power the ***IP Commander*** down prior to connecting or disconnecting the antenna cable from either the antenna or the ***IP Commander***.

Training Videos

SRT Wireless has produced a number of training videos to help you set up and use your new **Thuraya IP Commander** device.

Please follow the links shown below on *YouTube.com*.

- *How to set up the IP Commander (https://youtu.be/PRI423fW77Q)*
- *How to Access the GUI (https://youtu.be/J7HfvJWF9UI)*
- *How to Switch Modes (https://youtu.be/raY_p0YOuDE)*
- *How to Power Off (https://youtu.be/jaxeIhYBF2w)*
- *How to Edit Connection Profiles (https://youtu.be/1-VRI4zjcJc)*
- *How to Change Wireless Settings (https://youtu.be/mU2N0a2Twq4)*
- *How to Change Password (https://youtu.be/3rIx7fgL3Cg)*
- *How to Restart Modem (https://youtu.be/DfUoM4-6E6Q)*
- *How to Connect to the Wireless Network (https://youtu.be/jrfx2C24nqY)*
- *How to Change Modes from the Handset (https://youtu.be/_0ZcIDUccX4)*

6. Troubleshooting

Problem	Possible Cause	Possible Solution
Terminal does not turn on.	• Power switch not on • Blown AC or DC line fuse • Insufficient current available from power source	• Ensure the power switch is on the ON position and the indicator LED is on. • Remove fuse and check. • Refer to this guide's installation and operation section. • Ensure the DC power source has sufficient current to supply the **Thuraya IP Commander**.
No connection to the Web page.	• No interface connection between the **Thuraya IP Commander** and the computer. • Your computer is configured with an IP address in the wrong subnet. Default gateway IP address is 192.168.1.1. • The cable is not properly connected.	• Ensure there is a WLAN or Ethernet connection between the terminal and computer, see User Guide • Check the IP configuration settings on your computer, or enable DHCP or use a static IP address in the same subnet as the UT local IP address. Default UT IP address is: 192.168.1.1 • Connect the cable.
Thuraya IP Commander does not obtain a GPS fix.	• **Thuraya** antenna's location limits visibility of 3 or more GPS satellites.	• Move the **Thuraya** antenna to a location where there are few obstructions such as trees or tall buildings, so that as much as possible of the sky is visible.
None of the above solutions resolve the problem.	• **Thuraya IP Commander** may have a hardware or software fault, and needs to be re-booted	• Remove power. Wait 30 seconds. Reconnect the DC power and turn on the **Thuraya IP Commander**.
No signal or weak signal from the Thuraya satellite.	• The view to the satellite is blocked • The antenna cable is not properly connected	• Make sure the antenna has a clear view in all directions. • Check that both ends of the cable are connected properly according to the guidelines in the Installation manual, or check that no connectors are damaged.

Problem	Possible Cause	Possible Solution
256 kbps or 384 kbps streaming does not work.	• The elevation angle to the satellite is too low • There is not enough free bandwidth for a 256 kbps or 384 kbps streaming connection	• 256 kbps and 384 kbps streaming is normally not available in areas with low elevation. • If there is too much traffic on the network, it may not be possible to assign a 256 kbps or 384 kbps streaming session. You may try a streaming profile with a lower bit rate or a best effort connection instead.
The web interface cannot be accessed.	• The browser is configured to use a proxy server • You have entered a wrong IP address • You are connected using a VPN	• For Microsoft Internet Explorer, select **Tools → Internet Options → Connections → LAN Settings** and uncheck *Use a proxy server for your LAN*. • Check the IP address and re-enter it. • Close down your VPN connection.
A phone connection cannot be established.	• The cable is not properly connected. • The cable type or connector type is not correct	• Connect the cable. • For information on the correct type of connector and cable, refer to the installation manual.
A LAN connection cannot be established.	• The cable is not properly connected	• Connect the cable.
Cannot register for voice.	• SIM card issues	• Check that the SIM card is in its proper slot and that it is currently active with your service provider
Cannot register for IP.	• SIM card issues	• Check that the SIM card is in its proper slot and that it is currently active with your service provider
Cannot connect for IP service.	• SIM card issues , Profile settings	• Check to ensure the SIM card is provisioned for IP service with your service provider, and check that the profile settings match with your billing agreement. A per-megabyte plan should set streaming to disabled.

Table 22: IP Commander Troubleshooting Chart

Error Codes

These error codes are displayed on the **Thuraya** handset, which connects to the front panel of the **IP Commander** device.

Number	Short Name	Remedial solutions by SRT
0	No error	No action required. The BDU is functioning properly.
1	Failed to read IMEI	The BDU failed to read the IMEI. Please restart the BDU If the problem persists, contact your service provider.
2	Illegal ME	This hardware is not accepted by the network.
3	IMEI not accepted	The network does not allow emergency calls from this IMEI.
101	Invalid antenna model	Check the correct antenna unit with its label “Only for Atlas IP BDU”.
102	HPA disabled	The antenna tranmit is powered off. Please restart the BDU.
103	HPA thermal alarm	The antenna transmitter has overheated. It may power off to prevent hardware damage. Please allow the system to cool down by powering off for a short time.
104	HPA fan fault	The fan inside the antenna has reported a problem. Please restart the BDU. If the problem persists, the antenna may need replacement.
105	HPA unknown fault	The antenna transmitter has reported an unknown error code. If the problem persists, the antenna may need replacement.
106	ATB failure	Check the antenna cable connections are secured at both ADU and BDU antenna ports.
107	Antenna com-munication problem	Check the antenna cable connections are secured at both ADU and BDU antenna ports. Restart the BDU.
108	Calibration failure	Check the antenna cable connections are secured at both ADU and BDU antenna ports. Restart the BDU

Number	Short Name	Remedial solutions by SRT
201	No SIM card in primary slot	Verify that the SIM card is present inside the BDU's SIM card slot. SIM card may be inserted wrongly. Remove SIM card and ensure it is inserted properly according to its oriented symbol on the BDU font panel. SIM Card contacts may be dirt. Clean the SIM card contact with a dry cloth. If the problem persists, replace the SIM card with a known good SIM card otherwise please return the BDU to your Service Provider for service.
202	No SIM card in secondary slot	
203	SIM communication problem	Power down the BDU and try again.
204	SIM Locked	The SIM card is locked. Enter the PUK to unlock the SIM card.
205	SIM Missing file	SIM card was incorrectly programmed with missing required field(s). Please contact your Service Provider.
301	Illegal MS	The subscriber information is rejected or the SIM card is not producing correct authentication information. Please contact the Service Provider.
302	PLMN not allowed	Network connection failure due to PLMN which is not allowed. Please contact your Service Provider.
303	Roaming not allowed	You are using an authorised SIM card from a carrier that does not have a roaming agreement with your Service Provider. Please contact the Service Provider.
304	IMSI unknown HLR	The subscriber information is not recognized by the network. Please contact your Service Provider
305	IMSI unknown VLR	The subscriber information is not on the network's roaming list.. Please contact your Service Provider
306	Service not supported	Network connection failure due to service option which is not supported. Please contact your Service Provider.
307	Service not subscribed	Verify the correct settings in the web console and contact your Service Provider to activate authorised service.

Number	Short Name	Remedial solutions by SRT
308	Network detached mobile	Verifying the settings on the web console. Restart the BDU and try again. If the problem persists, please contact your Service Provider.
309	GPRS not allowed	Verify the correct settings in the web console and contact your Service Provider to activate authorised service.
310	Service not allowed	Verify the correct settings in the web console and contact your Service Provider to activate authorised service.
311	Identity cannot be derived	Network registration failure. The BDU will retry automatically. If the problem persists, please contact your Service Provider.
312	Location area not allowed	Network connection failure due to the terminal which is not allowed in the location area. Please contact your Service Provider.
313	Temporary registration failure	Network registration failure. The BDU will retry automatically. If the problem persists, please contact your Service Provider.
314	General registration failure	Network registration failure. The BDU will retry automatically. If the problem persists, please contact your Service Provider.
315	Registration retries exhausted	Network re-connection failure. Restart the BDU if the problem persists.
401	Signal lost	Make sure no obstruction is blocking satellite signal and the ADU has a clear sky view in the direction of the satellite. If the problem persists, restart the BDU.
402	Pilot tracking	Make sure no obstruction is blocking satellite signal and the ADU has a clear sky view in the direction of the satellite
403	No GPS	Make sure no obstruction is blocking satellite signal and no object is placed over the ADU. Wait for 5 minutes for the GPS position to be updated. If the problem persists, restart the BDU.
404	Old GPS	A new GPS fix is obtained during the connection process, superseding the old fix. The terminal will reacquire the connection. If the problem continues and the new connection cannot be re-established, please contact your Service Provider.
501	LLC or SNDCP failure	Network connection failure caused by LLC or SNDCP failure. Restart the BDU. If the problem persists, please contact your Service Provider.

Number	Short Name	Remedial solutions by SRT
502	Unknown PDP type	Network connection failure. Restart the BDU. If the problem persists, please contact your Service Provider.
503	User authentication failure	Network registration failure. The BDU will retry automatically. If the problem persists, please contact your Service Provider.
504	PDP Option not supported	Network connection failure because the service option is not supported. Please contact your Service Provider to activate authorised service.
505	NSAPI already used	Network connection failure because the service is already in use for this subscriber. Restart the BDU. If the problem persists, please contact your Service Provider.
506	PDP deactivated by network	Network connection failure or the network may be down. Please contact your Service Provider.
507	PDP retries exhausted	Network connection failure or the network may be down. Please contact your Service Provider.
508	Missing or unknown APN	Network connection failure due to the missing or invalid of APN, Please contact your Service Provider to the correct network settings.
509	QOS rejected	Network connection failure due to rejected QOS by the network. If the problem persists, please contact your Service Provider.
510	PDP insufficient resources	Network connection failure due to insufficient resources. If the problem persists, please contact your Service Provider.
511	PDP reactivation required	Verify the correct settings in the web console and contact your Service Provider to activate authorised service.
512	PDP feature not supported	Network connection failure because the service option is not supported. Please contact your Service Provider to activate authorised service.
513	PDP transaction id in use	Network connection failure due to transaction ID. If the problem persists, please contact your Service Provider.
514	PDP not subscribed	Verify the correct settings in the web console and contact your Service Provider to activate authorised service.
515	PDP activation rejected	Network connection failure due to unknown cause. Verify the correct settings in the web console. If the problem persists, please contact your Service Provider.

Number	Short Name	Remedial solutions by SRT
516	PDP temporarily unavailable	Network access temporarily unavailable. Please wait for the terminal to reacquire a connection within 3 to 5 minutes. If the problem persists, contact your Service Provider.
517	General PDP failure	Network connection failure due to unknown cause. If the problem persists, please contact your Service Provider.
601	Invalid position	Network service is not available due to invalid GPS position. Verify the ADU has a clear sky view in the direction of the satellite. If the problem persists, contact your Service Provider.
602	Invalid position for beam	Registration is delayed or a handover is in progress. Please wait for the terminal to reregister within 1 to 3 minutes. If the problem persists, contact your Service Provider.
603	Lack of resources	Network connection failure due to insufficient resources. If the problem persists, please contact your Service Provider.
604	Wait for streaming channel	Network connection delayed due to resource requirement. Please wait 1 minute for resource allocation.
605	Non availability of service	Network service is not available. Please contact your Service Provider.
606	QOS not satisfied	Quality of service requested cannot be satisfied at this time. Please try again later, or configure a lower bit rate or best effort service.
607	Access barred	The service option is not available in the current spot beam. The BDU will attempt to find a more suitable signal automatically. If this message persists, contact your Service Provider.

Table 23: Error Codes