



# StarMAX™

6000 SERIES MOBILE BASE STATIONS USER MANUAL

260-668107-001



# **StarMAX™ 6000 Series Mobile Base Stations User Manual**

**Rel. 4.1.1 (GA Preliminary Draft)**



## ***StarMAX™ 6000 Series Mobile Base Stations User Manual***

260-668107-001 October 2009

This manual incorporates features and functions provided with the StarMAX™ 6000 Series, Release 4.1.1. (GA Preliminary Draft).

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## ***FCC Notices***

1. The StarMAX Base Station must be professionally installed and maintained.
2. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential environment is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
3. Notes specific to the 2.496 – 2.69GHz band:
  - The StarMAX Base Station (radio model 8200-26, range 2.583-2.690) is compliant with FCC CFR47, Part 27.
  - To ensure compliance with the FCC RF exposure requirements, a minimum distance of 3.72 meters must be maintained between the base station antenna and any persons whilst the unit is operational. This calculation is based on the maximum conducted power and maximum antenna gain.
  - The 2.6GHz Base Station has been tested and certified for use with an XPOL antenna with a maximum gain of 18dBi and Omni antennas with a maximum gain of 13dBi.
4. Notes specific to the 3.65 – 3.675GHz band:
  - The StarMAX 3.6GHz Base Station complies with FCC CFR47, Part 90, Subpart Z
  - For FCC CFR47, Part 90, Subpart Z, StarMAX operation is restricted to the 25MHz band 3.65GHz – 3.675GHz.
  - To ensure compliance with the FCC RF exposure requirements, a minimum distance of 25cm must be maintained between the base station antenna and any persons whilst the unit is operational at 5MHz and 34cm for 10MHz operation. This calculation is based on the EIRP limits within Part 90, Subpart Z.
  - The 3.6GHz Base Station has been tested and certified for use with an XPOL antenna with a maximum gain of 16.5dBi or Omni antennas with a maximum gain of 13dBi.
  - For FCC CFR47, Part 90, Subpart Z operation between 3.65 – 3.675GHz, the EIRP must be limited to 5W for 5MHz operation and 10W for 10MHz. The conducted power must be limited during installation according to the gain of the antenna used. As the conducted power tolerance is +/- 1dB for StarMAX the power should be reduced by 1dB from the absolute EIRP limits of 5W and 10W. For example, if operating in a 10MHz channel and using a 16.5dBi antenna, the conducted power would be limited to a maximum of 22.5dBm.

## ***RF Exposure guidelines***

The following MPE (maximum permissible exposure) calculations have been produced in accordance with the guidelines of EN 50383/EN 50385. These calculations represent examples only and do not include every possible combination of output power and antenna gain.

Occupational is defined as: “The occupationally exposed population consists of adults who are generally exposed under known conditions and are trained to be aware of the potential risk and to take appropriate precautions”.

2.3 – 2.7GHz			
Transmit Power (dBm)	Antenna Gain (dBi)	Compliance Boundary General Public (m)	Compliance Boundary Occupational (m)
40.0	20.7	3.72	1.67
40.0	9.0	0.97	0.43
36.0	20.7	2.35	1.05
36.0	9.0	0.61	0.27
3.3 – 3.8GHz			
Transmit Power (dBm)	Antenna Gain (dBi)	Compliance Boundary General Public (m)	Compliance Boundary Occupational (m)
36.0	23.0	3.1	1.37
36.0	9.0	0.61	0.27

### **WARNING**

Making adjustments and/or modifications to this equipment that are not in accordance with the provisions of this instruction manual or other supplementary documentation may result in personal injury or damage to the equipment, and may void the equipment warranty.

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# Chapter 1. Introduction & Overview

This manual provides you with a basic overview of the StarMAX™ 6000 Series Mobile Base Stations and helps you in commissioning and basic system operation of the base station.

This manual is intended for use by Base Station users, mostly service provider staff and Harris Stratex Networks support staff. Basic understanding of the WiMAX 802.16e 2005 standards and a basic IP-based networking knowledge are the prerequisites for the user manual. This manual provides a detailed explanation of system configuration and maintenance, as well as requisite system operation details.

For more information, refer to the StarMAX™ 6000 Series Mobile Base Stations Installation Guide.

## Abbreviations & Definitions

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Abbreviations	Description
ACB	ATCA carrier board
ASN	Access Service Network
BE	Best Effort
BS	Base Station
CIR	Committed Information Rate
CINR	Carrier-to-Interface plus Noise Ratio
CLI	Command Line Interface
CPE	Customer Premises Equipment
CPRI	Common Public Radio Interface
CSN	Core Service Network
DC	Direct Current
EIRP	Equivalent Isotropic Radiated Power
EMS	Element Management System
FEC	Forward Error Correction
GND	Ground
GPS	Global Positioning System

Abbreviations	Description
GSSU	GPS Synchronization Supply Unit
IDU	Indoor Unit
IF	Intermediate Frequency
IPMI	Intelligent Platform Management Interface
LED	Light Emitting Diode
LVDS	Low Voltage Data Signal
MAC	Medium Access Control
MIMO	Multiple-Input and Multiple-Output
MPU	Main Processor Unit
MS	Mobile Station
NMS	Network Management System
Nrt-PS	Non Real Time Polling Services
ODU	Outdoor Unit
PLL	Phase Locked Loop
PMP	Point To Multipoint
PMPF	PMP Card with Fiber Optics Interface
POST	Power On Self Test
PPS	Pulses Per Second
PS	Power Supply
RO	Read Only
RF	Radio Frequency
R/W	Read/Write
RSSI	Receive Signal Strength Indicator
SELV	Safety Extra Low Voltage
SFP	Small Form-factor Pluggable
SNMP	Simple Network Management Protocol
SoC	System on Chip
SS	Subscriber Station
STC/MRC	Space Time Coding / Max. Ratio Combining
TDM	Time Division Multiplexing
TTL	Transistor-Transistor Logic
VEE	Virtual End-to-End

Abbreviations	Description
WEEE	Waste Electronic Electric Equipment

# Conventions

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The following conventions are used in the document to help you to identify special terms.

Convention	Usage	Example
<b>Bold</b>	The following screen elements: Button List Drop-down menu	Click <b>OK</b> .
Courier New	Computer output text	<pre>HSX_bs#configure access-list 2 permit 11:22:33:44:55:66  00:00:00:00:00:00 22:33:44:55:66:77 00:00:00:00:00:00</pre>
<b>Courier Bold</b>	User input text	<b>&gt;HSX_bs#exit</b>
<i>Courier Italic</i>	Variable in command that you may replace with other values, as required	To make a new directory, enter: <pre>prompt&gt; mkdir <i>new_directory_name</i></pre>
<i>Italic</i>	Description of figures and tables, Book title and emphasis, Cross References	<i>ProductCodes</i> Refer to <i>User Manual</i> for more information.
< >	Mandatory parameters	HSX_bs# show card <unit number>
[ ]	Optional parameters	HSX_bs# configure ip address <ip-address> [subnet mask]
	Mutually exclusive choices in a command or a code	HSX_bs#reboot 1 2 3



The Note format is used for clarification or to point out specific text or instructions in the procedure or description.



***The Caution format is used for a Warning or a Caution. The information that follows alerts personnel to possible damage to equipment or interruption of service, or a violation of a legal requirement.***



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The Stop format indicates a pause in the procedure to perform some other task. The procedure continues once you have completed the other task.

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## Overview of a StarMAX™ Base Station

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### Introducing StarMAX™

The StarMAX™ 6000 is a series of Base Station solutions, which offers a possibility to install 16d and 16e WiMAX blades into a 1U or 4U chassis. Together with the StarMAX™ 8200 series of the 16e ODUs, it is used to build a flexible network of multi-sectored WiMAX 16e Base Stations (BS).

The Solution is designed in a modular split indoor/outdoor (IDU/ODU) form. A High bandwidth CPRI interface (fiber optic) is used between an IDU and an ODU. The power supply for the ODU is delivered over a separate cable.

Harris Stratex Networks' Mobile WiMAX solution supports mobile voice and data services, and can be used in a carrier grade nationwide network or on an enterprise grade campus network. A StarMAX™ System complies with the 802.16e-2005 specifications and ensures interoperability with the systems built in accordance with the same specifications. This enables the opportunity to use Subscriber Stations and Mobile Stations of different vendors. The StarMAX™ solution is wave 2 compliant and certified by the WiMAX Forum. While the system is designed to offer mobile services, the same can also offer fixed, nomadic or portable services without any loss of efficiency.

A StarMAX™ 6000 Series Base Station indoor unit is a compact 1U or 4U rack mount Base Station. The solution is scalable for dense urban to rural deployments with provision for multi-sectored deployments with a dense frequency reuse. It gives the flexibility of deploying a lower number of sectors initially and addition of new sectors later on if necessary. The solution is available in various frequency bands in order to meet the requirements of different markets.

All connections are made on the front panel to ease the installation and maintenance and enable back-to-back or wall positioning of the equipment. The chassis is designed for carrier grade deployments with redundant power supply and a field replaceable FAN unit.

The StarMAX™ 8200 Series Outdoor unit delivers a high output power with an advanced antenna technology like MIMO 2x2 Matrix A/B for better coverage and service quality in demanding mobile environments. Together with the StarMAX™ range of Subscriber Stations, StarMAX™ NMS and StarMAX™ ASN the Base Station offers a complete mobile solution for the operator.

## StarMAX™ 6000 Series Mobile Base Station Building Blocks

The StarMAX™ 6000 Series of Mobile Base Stations use a number of different blades to support different Base Station configurations, network structures and implementation scenarios. The building block can be divided in different groups of products, according to the functions they are delivering:

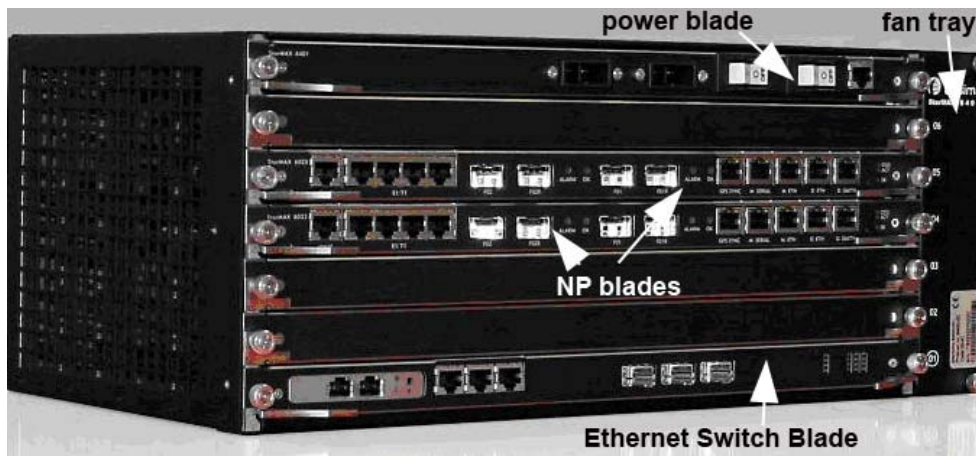
- a. StarMAX 6000 chassis or MSAN chassis
- b. StarMAX 6000 16 e WiMAX Network Processing Blades
- c. StarMAX™ 4940 external GSSU unit
- d. StarMAX™ 4930 GPS unit and a cable splitter for synchronization purpose
- e. StarMAX™ 6080 Synch blade
- f. cables (RF jumper cable, IF cable, antenna cable)
- g. Outdoor Unit (ODU)

Beside those stated above, the StarMAX™ 8200 ODU part is necessary to form a complete Base Station, which is covered elsewhere in this document.

### The StarMAX™ Chassis

An operator has a choice of using a single blade 6100 chassis or a multi-blade 6400 chassis. Since there is a requirement for a Synchronization blade, it is recommended that the operator use the 6400 chassis, because it ensures a stable network in case of future growth.

Figure 1-1. StarMAX™ Mobile Base Station



### The MSAN Chassis

The MSAN chassis is much like the 6400 chassis with one major difference: there is no master slot. The NMS displays the MSAN chassis as a 3rd party chassis.



## Brief Description of a StarMAX™ Base Station

A Base Station installed at the Operator premises provides data connectivity to all provisioned and registered Subscriber stations.

The StarMAX™ 6000 Series Base Station has a rugged industrial design with dual redundant power supply inlets and removable cooling fan tray to ensure reliability and high performance in adverse conditions. Redundant WiMAX configurations can be built by adding more base systems to the stack or designating an available WiMAX point-to-multipoint module within a base system as a hot standby.

The StarMAX™ 6000 Series base station has implemented several enhanced modes of WiMAX for performance differentiation, to receive diversity through MRC and transmit diversity through STC and for payload header suppression for increasing IP payload throughput.

Based on Harris Stratex Networks' core intellectual property a wide range of RF options are supported, including 2.3/2.5/3.3/3.5 GHz bands in Time Division Duplexing (TDD) modes of operation.

The Harris Stratex Networks base station also supports portability and mobility in the WiMAX network by enabling TRUFLE™ technology which supports features such as a state handover of a subscriber station from one base station to another without losing IP connectivity and TCP sessions.

## Network Management System for the StarMAX™ Base Station

The Harris Statex Networks network management system, StarMAX™ NMS implements full Fault, Configuration, Accounting, Performance, and Security (FCAPS) functionalities and is implemented on a client-server architecture based on the SNMP v2. This provides an easy integration of the NMS into the operator's management and billing systems environment.

The Provisioning Manager keeps the access lists and implements service level agreements. It can configure min/max bandwidth, QoS, priority and rate limiting per subscriber station or service flow. Supported classes of service are Best Effort (BE), UGS, nrt-PS, eRtps and Rt-PS.

## Specifications

This section details the specifications of the StarMAX™ system.

Table 1-1. General Radio Specifications

	8200-2.3G	8200-2.5G	8200-3.3G	8200-3.5G
<b>Frequency Range</b>	2300-2400 MHz	2496-2690 MHz	3300-3400 MHz	3400-3600 MHz
<b>Frequency Setting Step Size</b>	250 kHz			
<b>Frequency Stability (Int. Synch. Mode)</b>	±4ppm			
<b>Duplexing Method</b>	TDD			
<b>Multiple Access Method</b>	TDMA			
<b>Modulation</b>	OFDMA, 1024/512 FFT with adaptive subcarrier modulation: QPSK-1/2, QPSK-3/4, QAM16-1/2, QAM16-3/4, QAM64-1/2, QAM64-2/3, QAM64-3/4, QAM64-5/6			
<b>Air Interface Standard Compliance</b>	IEEE 802.16e-2005 OFDMA 1024/512 FFT			
<b>Bandwidth<sup>a</sup></b>	5MHz; 7MHz; 10MHz			
<b>Frame Length<sup>b</sup></b>	5ms			
<b>EqC-PET =</b>	O			
<b>EqC-SET =</b>	DM			
<b>EqC-EMO =</b>	variable 2, 4, 6			
<b>EqC-ChS =</b>	5MHz to 10MHz			
<b>EqC-FR =</b>	2.3-2.4; 2.5-2.69 GHz; 3.3-3.4GHz; 3.41GHz-3.6GHz			
<b>EqC-STN =</b>	CS			
<b>Emission Designation</b>	5M00X7W, 7M00X7W, 10M0X7W			

a. Any bandwidth between 1,5MHz and 14MHz with a granularity of 250kHz can be supported.

b. Frame lengths of 2,5ms and 4ms can be supported.

**Table 1-2.** Transmit Radio Specifications

<b>Maximum Output Power at Antenna Port<sup>a</sup></b>	2x+36dBm, 2x+39dBm, 2x+40dBm
<b>Output power adjusting range</b>	25dB
<b>Output Power Setting Step Size</b>	1dB
<b>Output Power Tolerance</b>	+1dB / -2dB
<b>TX Signal EVM at Maximum Output Power</b>	< -31dB
<b>TX Noise Spectral Density at Max. Power</b>	< -119dBm/Hz
<b>Adjacent Channel Power Ratio<sup>b</sup></b>	< -40dBc
<b>Alternate Channel Power Ratio<sup>b</sup></b>	< -65dBc
<b>Unwanted Emissions at Antenna Port</b>	< -50dBm

a. RMS power of data symbols regardless of the modulation used.

b. At maximum output power

**Table 1-3.** Receive Radio Specifications

<b>Noise Figure</b>	4dB
<b>Max. RX Level at Antenna Port, BER&lt;1E-6</b>	-45dBm
<b>Max. Tolerable RX Level at Antenna Port</b>	-10dBm
<b>Receive Sensitivity (BER&lt;1E<sup>-6</sup>, BW=10 MHz, QPSK1/2)</b>	-98dBm
<b>Adjacent Channel Rejection (16QAM-3/4)</b>	Better than 11 dB
<b>Non-Adjacent Channel Rejection (16QAM-3/4)</b>	Better than 30 dB
<b>Image Rejection</b>	70dB
<b>Unwanted Emissions at Antenna Port</b>	< -60dBm

**Table 1-4.** Interface Specifications

	<b>6012-01 &amp; 6012-00 (WiMAX blade)</b>	<b>8200 (ODU)</b>
<b>CPRI Connector</b>	Duplex LC (SFP Module)	ODC -2
<b>Antenna Connector</b>	-	N(f) – 50Ω
<b>Data Port</b>	1 x 10/100BT (RJ-45) 1 x 1000BT (RJ-45) backplane	-
<b>GPS Synchronization</b>	Front - (RJ-45) backplane	-
<b>Power Supply</b>	2 x 3 Contact connector	CPC Series 5

**Table 1-5.** TMN Specifications

<b>Out of Band Management</b>	NMS using SNMP, CLI using Telnet, SSH
<b>In Band Management</b>	NMS using SNMP, CLI using Telnet, SSH
<b>SNMP Agents</b>	Built-in SNMP agent v2c, standard and Harris Stratex Networks proprietary MIBs
<b>Software Upgrade</b>	Using FTP/TFTP, centralized upgrade from NMS
<b>Configuration Upload</b>	Using FTP/TFTP

**Table 1-6.** Mechanical and Electrical Specifications

	StarMAX 6022 + 6100 (1 slot IDU chassis)	StarMAX 6022 + 6400 ( 6 slot IDU chassis)	StarMAX 8200 (RRH)
<b>Dimensions (HxWxD) [mm]</b>	44x444x250	176x430x280	410x294x154
<b>Interfaces</b>	WAN - 1GBE & 10 MNG - 10 Clock - 1PPS or GPS on BNC PWR - -48VDC IDU/ODU - optical (LC)	100BaseT on RJ-45 100BaseT & Serial on RJ-45	-
<b>Weight (max) [kg]</b>	5.2	10	13
<b>Power Supply Voltage</b>	-48V ÷ -60V		-48V
<b>Power Consumption, max.</b>	37W	6022 (2 sector blade, 4 blades max.) -28W  6400 (chassis + fan unit) - 48W  6080 (opt. sync. blade) - 25W  6090 (opt. IP switch blade) - 25W	36/39dBm  205/225W max  155/175W for 70:30 TDD split
<b>Rack Pole Requirements</b>	IDU: 19" and 23"		ODU up to 120 mm pole diameter

**Table 1-7.** Environmental Specifications

	StarMAX 6xxx (IDU chassis)	StarMAX 8200 (ODU)
<b>Operating Temperature Range</b>	--5°C ÷ +45°C	-40°C ÷ +50°C
<b>Operating Humidity Range EN 300 019 reference</b>	5% ÷ 95% class 3.2	10% ÷ 100% extended class 4.1E
<b>Storage Temperature Range</b>	-45°C ÷ +85°C	
<b>Storage Humidity Range EN 300 019 reference</b>	8% ÷ 100% class 1.3E	
<b>Transportation</b>	EN 300 019 class 2.3	

**Table 1-8.** Standard Compliance

<b>EMC</b>	EN 301 489-1, EN 301 489-4
<b>Safety</b>	EN 60 950

**Table 1-9.** GPS Sync Blade Holdover duration for 6080-02-00-01 StarMAX  
6080 GPS Receiver Blade, 8hr Hold Over

Maximum phase error PPS	Constant temp.	+ or – 3°C	+ or – 10°C
7 μsec	10 h	2 h	30mn
10 μsec	14 h	3h	1h
25 μsec	20 h	7h	2h 15mn

**Table 1-10.** GPS Sync Blade Holdover duration for 6080-00-00-01 StarMAX  
6080 GPS Receiver Blade, 24hr Hold Over

Maximum phase error PPS	Constant temp.	+ or – 3°C	+ or – 10°C
7 μsec	> 24h	5 h	2h
10 μsec	> 24h	7 h	3h
25 μsec	> 24h	13h	7h

# Chapter 2. Getting Started

## Commissioning the Base Station

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### Configuring the Basic Parameters

This section explains the process of configuring the basic system parameters after system is installed. Refer to the StarMAX™ 6000 Series Mobile Base Stations Installation Manual for the installation details.

Configure the system management IP address, IP sub-net mask and gateway IP address through the serial port. Refer to [Configuring Basic IP Parameters on page 3-1](#).

Configure the list of the authorized users for the system operation and maintenance through the Java based NMS or CLI. Refer to [Configuring and Managing User Access on page 3-11](#).

After you have configured the basic parameters, you can configure the additional parameters and services through the Java based NMS or CLI through serial port or a telnet session.

### Operational Verification of the Base Station

**Table 2-1.** Base Station LED verification

LED	Description
OOS (red)	<ul style="list-style-type: none"><li>• Unlighted: The PMPF image is not running.</li><li>• Blinking: The PMPF is running a self test.</li><li>• Solid: The PMPF is functional.</li></ul>
ACT (green)	Illuminates, when base station is functional (activity).
SR (blue)	Illuminates, when 48V is applied to the system and power is not provided to the system side.
LED F01, F02 OK (green)	<ul style="list-style-type: none"><li>• Unlighted: The PMPF image is not running.</li><li>• Blinking: The PMPF is running a self test.</li><li>• Solid: The PMPF is functional.</li></ul>
LED F01, F02 ALARM (red)	<ul style="list-style-type: none"><li>• Unlighted: The PMPF is functional.</li><li>• Blinking: The PMPF has a wrong configuration/not configured.</li><li>• Solid: The PMPF has a permanent fault (broken).</li></ul>
LED GPS SYNC OK (green)	<ul style="list-style-type: none"><li>• Unlighted: PLL not locked to the PPS.</li><li>• Lighted: PLL locked to the PPS.</li></ul>

LED	Description
YNC ALARM (red)	<ul style="list-style-type: none"> <li>• Unlighted: PPS signal present</li> <li>• Lighted: no PPS signal present</li> </ul>

Table 2-2. SYNC LED

LED	Description
<b>System LEDs</b>	
RED LED (ALARM: SYNC MODULE OSCILOQUARTZ)	<ul style="list-style-type: none"> <li>• Error status: Antenna not connected, GPS not locked, PPS not present</li> </ul>
GREEN LED(OK: SYNC MODULE (OSCILOQUARTZ)	<ul style="list-style-type: none"> <li>• OK status: GPS locked, PPS provided).</li> </ul>
RED LED (OOS: SYNC blade)	“Out Of Service Status”: Blade is not operational.
GREEN LED (ACT: SYNC blade)	<ul style="list-style-type: none"> <li>• “Active” : Blade is working as specified.</li> </ul>
BLUE LED (SR: SYNC blade)	<ul style="list-style-type: none"> <li>• SYNC blade not powered ON : Secondary power not present on Sync blade.</li> </ul>
LED GPS SYNC OK (green)	<ul style="list-style-type: none"> <li>• Unlighted: PLL not locked to the PPS.</li> <li>• Lighted: PLL locked to the PPS.</li> </ul>
<b>LED</b>	<b>Description</b>
<b>RJ45</b>	
GREEN LED (SYNC IN)	<ul style="list-style-type: none"> <li>• PPS signal</li> </ul>
YELLOW LED (SYNC IN)	<ul style="list-style-type: none"> <li>• 12V present</li> </ul>
GREEN LED (E.MNG and E.SYNC)	<ul style="list-style-type: none"> <li>• ACTIVITY</li> </ul>
YELLOW LED (E.MNG and E.SYNC)	<ul style="list-style-type: none"> <li>• SPEED STATUS ON: 100Mbps OFF: 10Mbps</li> </ul>

## Verifying Data Connectivity

To verify data connectivity from the end-user's Personal Computer (PC) connected to any synchronized subscriber station, try to connect to the Internet.

## Required Information

Table 2-3 lists parameters required to bring the base station to a minimal operational state.



**Table 2-3.** Required Information before Starting the Operation

Item	Parameters	How/What to Update
Management Port (mandatory)	IP Address	192.168.1.100
	Subnet Mask	255.255.255.0
	Gateway	192.168.1.1
FTP Server (optional)	FTP User name	<Selected FTP server Login User name>
	FTP password	<Selected FTP server Login Password>
Admin User Login Info (mandatory)	Username (Preconfigured)	admin admin
	Password (Preconfigured)	
	Privilege User Login Info (mandatory)	Privilege Username (Preconfigured) Privilege User Password (Preconfigured)
Frequency and Bandwidth provisioning	Frequency in kHz	2500000 for 2.5 GHz
	Bandwidth in kHz	10000 for 10 MHz

# Logging-in In to the Base Station for the First Time

---

You must use the serial port on the front panel of the StarMAX™ 6000 (IDU) to manage the base station when you log in for the first time. This ensures that the basic parameters (for example the IP address) can be configured to enable Telnet access to the CLI or Java base NMS (i.e. NMS).

Ensure that you have the following items before you log in:

- A VT-100 compatible terminal, or a PC with terminal emulation software
- A DB-9 to RJ-45 serial cable

To log in:

1. Connect a serial cable from the COM port on your computer to the serial port (RJ-45 connector) on the IDU.
2. Configure the terminal or emulation program as follows:
  - Port: COM1 (the one you connected serial cable to),
  - Data rate: 115200,
  - Data: 8 bits,
  - Parity: none,
  - Stop: 1 bit,
  - Flow control: none.
  - Activate connection.
3. Connect the IDU to the power supply and wait until the IDU responds with a login: prompt.
4. To log into the admin user mode type the following:

```
>Login:<name>  
>Password:<password>
```

The default admin username and password are set to the same value: **admin**.

To log into the privilege user mode type the following:

```
>Login:<rootusername>  
>Password:<rootpassword>
```

The default privilege username is **root**. The default privilege password is **telsimawl**.



---

The Default Password of the privileged user root can be changed.

---

After successful login, the IDU responds with a BS\_bs# prompt. That means you are ready to enter CLI commands to control the base station. The following sections show you how to use CLI commands to configure and monitor the base station.

If a user is already logged into admin user mode and wants to upgrade access rights to that of privilege user mode, enter the following command:

```
>BS_bs#enable
>Enter root password:<rootpassword>
>enabled#
```

To log out enter the following command:

```
>enable#exit
>C:\
```

## Accessing CLI by using Telnet

---

To access a CLI prompt via Telnet perform the following steps:

1. Open command prompt.
2. Type the following command:

```
C:\>telnet <IP address>
```

Here <IP address> is the base station management port IP address. A login: prompt will appear.

3. Log in as described in [Logging-in In to the Base Station for the First Time on page 2-4](#).

After successful login, IDU responds with a BS\_bs# prompt. That means you are ready to enter CLI commands to control the base station. Following sections show how to use CLI commands to configure and monitor the base station.

To log out use the following command:

```
>enable#exit
>C:\
```




---

Exiting from telnet CLI prompt as described above ends the active telnet session.

---

CLI is used to access the Base Station software from a configuration and monitoring perspective. CLI is divided into different modes; the commands available to you at any given time depend on the mode you are currently in. Entering a question mark (?) at the CLI prompt allows you to obtain a list of further command nodes available based on the sequence of command nodes or parameters entered.

## Understanding Command Modes

When you log in to the CLI as an administrative user, you are in administrative command mode, while when you log in as privilege user, you are in privilege command mode respectively. Administrative user mode contains only a limited subset of commands. If you are already logged in as an administrative user and want to have access to all commands, you must enter the privileged command mode by using enable command which authenticates the privileged user password. From the privileged command mode you can issue any command - administrative or privileged mode - or you can enter global configuration mode. Commands are not saved when the base station system reboots.

The table below describes the different user levels and the associated description on the node accessibility (access privileges are in the increasing order).

**Table 2-4.** BS System Users Privilege Categories

Privilege Category	Category Description
ACCT-RO	Display of accounting related information (configuration parameters and statistics information).
IP-RO	Display of IP related information (configuration parameters and statistics information).
RF-RO	Display of Radio Frequency related information (configuration parameters and statistics information).
ACCT-ROD	Display of accounting related debug information.
IP-ROD	Display of IP related debug information.
RF-ROD	Display of RF related debug information.
ACCT-RW	Accounting parameter configuration/write access as well as display of configuration parameters, statistics and debug information.
IP-RW	IP parameter configuration/write access as well as display of configuration parameters, statistics and debug information.
RF-RW	Parameter configuration/write access as well as display of configuration parameters, statistics and debug information.

Configuration modes enable you to create/re-create the running configuration file. The generated running configuration file can be saved to the startup configuration file, these commands in the startup configuration files are executed when the system is rebooted to configure the system to pre-reboot state. Please refer to [Managing Configuration Files and Software on page 4-5](#) for more details.

To enter specific configuration modes, you must start at global configuration mode. From global configuration mode, you can enter a different configuration mode, for example, interface configuration mode by entering node name “interface” and an interface specific node name, for example, “fastethernet”, “wimax” etc. Refer to [Appendix B](#) for further details.

The table below describes how to access and exit various common command modes of the CLI. It also shows examples of the prompts displayed for each mode.

**Table 2-5.** Accessing and Exiting Commands Modes

Command Mode	Access method	Prompt	Exit Method
Administrative or user	Log in	BS_bs#	exit command
Privilege	Log in as privilege user or use the enable command from administrative command mode	enabled# or BS_bs#	exit command
Global Configuration	From privilege mode, use the configure privileged command. From administrative mode, use enable command to authenticate followed by configure privileged command.	BS_bs (config)#	Use quit command or press <b>Ctrl-Z</b> .
Interface Configuration	From global configuration mode, specify an interface using an interface command.	BS_bs (config-if)#	To return to global configuration mode, use the quit command.

## Getting Help

CLI offers the context-sensitive help feature by the user entering a question mark (?) at the CLI shell with or without CLI nodes. This displays a list of further commands (nodes) options available in terms of nodes/parameters at any given context based on the user nodes/parameters entry.

To get specific help for a command mode, a command, a keyword, or an argument, use one of the commands listed in the table below.

**Table 2-6.** Help Commands

Command	Purpose
CLI command node string?	Provides a list of commands that begin with a particular character string. (No space between 'CLI command node string' and question mark and note that CLI command node string can be partial.)
CLI command node string<Tab>	Completes the CLI command node string if the command name specified in the string is partial.
?	Provides a list of commands that are available subsequent to a particular CLI command mode.
command ?	Provides a list of keywords or arguments that you must enter next on the command line. (Space between command and question mark.)

## Using the No and Default Forms of Commands

---

Many configuration commands have a **no** form. In general, use the **no** form to disable a function. Use the command without the **no** keyword to re-enable a disabled function or to enable a function that is disabled by default.

# Chapter 3. Configuring the Base Station

This chapter explains the process of configuring various parameters of the base station.

## Configuring Basic IP Parameters

---

To configure basic management port IP parameters enter the following commands:

```
BS_bs#config
>BS_bs(config)#ip address <ipaddr> <subnetmask> <gateip address>
>BS_bs(config)#quit
>BS_bs#
ip address <ip> <netmask> <gateway>
```

where:

- <ipaddr> is the IP address assigned to the base station management port in IP address format, for example, 192.168.182.253
- <subnetmask> is the subnet mask assigned to the base station management port in IP address format, for example 255.255.255.0
- <gateip address> is the gateway IP address assigned to the base station management port in IP address format, for example 192.168.182.1

To view base station basic IP parameters enter the following command:

```
>BS_bs#show ip
```

## Configuring ASN

---

To configure ASN use the following commands:

```
configure asn / show asn
forwarding-options - Specify the ASN data plane type
gateway           - Specifies ASN-GW(ASN gateway) parameters
quit              - Exit ASN configuration mode
r6-timer          - Specify timeout values for R6 Message Timers
tunnel            - Specify ASN data plane tunnel parameters
wimax-sector     - Specify WiMAX sector specific parameters
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

# Configuring DNS Client

---

To enable DNS client service on the base station it is mandatory to be logged into the privilege user mode. Use the following steps.

In the first step set primary DNS server that will be used by DNS client. Optionally, alternate DNS server can be set. Use the following commands:

```
>BS_bs#config
>BS_bs(config)#ip dns server <dnsserver> primary
```

where:

- **<dnsserver>** is DNS server IP address provided by your network administrator, for example 192.168.180.8
- **Primary flag** is used to set the primary DNS server IP address provided by your network administrator, for example 192.168.180.8

Next, enable DNS client using this command:

```
>BS_bs(config)#ip dns enable
```

At this point DNS client is functional. Additionally, domain name can be stored:

```
>BS_bs(config)#ip dns domain <domain>
```

where **<domain>** is the domain name used by DNS client, for example hstx.com

To view DNS client settings enter this command:

```
>BS_bs#show ip dns
```

# Configuring FTP Client

---

To set the default username and password for the FTP client on the base station you will use when accessing the FTP server, it is mandatory to be logged into the privilege user mode. Use the following commands:

```
>BS_bs#config
>BS_bs(config)#ip ftp username <name>
>BS_bs(config)#ip ftp password
Enter ftp password: <password>
```

where:

- **<name>** is a FTP server authentication username, used as the default username for ftp put or ftp get CLI commands



- <password> is a FTP server authentication password corresponding to username, used as the default password for authentication for ftp put or ftp get CLI commands.

## Configuring ntp

---

To enable, to configure ntp server and to configure time zone use the following commands:

```
configure ntp / show ntp
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring Interface Fastethernet

---

To configure internet fastethernet use the following commands:

```
configure interface fastethernet / show interface fastethernet
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring Interface Gigabitethernet

---

To configure internet gigabitethernet use the following commands:

```
configure interface gigabitethernet /show interface gigabitethernet
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring Broadcast

---

To enable broadcast control use the following commands:

```
configure broadcast-control-enable  
configure broadcast-echo
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

# Configuring Multicast

---

To enable multicast control use the following commands:

```
configure multicast-control-enable
configure multicast-echo
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

# Configuring NI power

---

To set the default NI power per subcarrier use the following command:

```
configure interface wimax 1/1 uplink default-ni-power
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

# Configuring NSP

---

To configure nsp use the following command:

```
configure interface wimax 1/1 nsp
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

# Configuring NAP

---

To configure nap use the following command:

```
configure interface wimax 1/1 nap
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring MIMO

---

To enable mimo and to set mimo profile use the following command:

```
configure interface wimax 1/1 mimo enable
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring VLAN ID

---

To set Home VLAN ID for all the CPEs connected to this Base Station and to set Home VLAN ID for all the Subscriber Stations connected to this base station use the following command:

```
configure vlan-policy home-vid
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring preamble-index

---

To configure preamble-index use the following command:

```
configure interface wimax 1/1 preamble-index
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring frequency-fractional-reuse

---

To configure frequency-fractional-reuse use the following command:

```
configure interface wimax 1/1 frequency-fractional-reuse
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring handover-advertisement

---

To configure handover-advertisement use the following command:

```
configure interface wimax 1/1 handover advertisement-enable
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring handover dcdTriggers

---

To configure handover dcdTriggers use the following command:

```
configure interface wimax 1/1 handover dcdTriggers
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring handover neighbor-bs-entry

---

To configure handover neighbor-bs-entry use the following command:

```
configure interface wimax 1/1 handover neighbor-bs-entry
```

For detailed description and examples please refer to the *StarMAX™ 6000 Series Mobile Base Stations Command Line Interface*.

## Configuring Synchronization

---

The following options are available to synchronize the IDU into the system.

- IDU is the synchronization master and the source. This option is only for test purposes and should not be used during normal operation. To perform this configuration enter the following commands:

```
>BS_bs#config
>BS_bs(config)# synchronization
>BS_bs(sync)#mode master
>BS_bs(sync)#source generated <freq>
>BS_bs(sync)#quit
>BS_bs(config)#quit
>BS_bs#
```

where <freq> determines the synchronization source frequency. Options are:

- -1- 1 Hz
- IDU is the synchronization master and the source is generated externally by GPS receiver and connected to GPS SYNC port on the IDU front panel. To perform this configuration enter the following commands:

```
>BS_bs#config
>BS_bs(config)# synchronization
>BS_bs(sync)#mode master
>BS_bs(sync)# source external frontpanel
>BS_bs(sync)#quit
>BS_bs(config)#quit
>BS_bs#
```




---

If this option is used in StarMax6400 chassis only one blade must be set to Master mode all others must be configured as slave.

---

- Two or more IDU blades in StarMAX 6400 chassis are connected to GPS receiver thru GSSU unit. To perform this configuration enter the following commands:

```
>BS_bs#config
>BS_bs(config)# synchronization
>BS_bs(sync)#mode slave
>BS_bs(sync)# source external frontpanel
>BS_bs(sync)#quit
>BS_bs(config)#quit
```

To view IDU synchronization settings enter the following command:

```
>BS_bs#show synchronization
```

## Rebooting the IDU Modules

---

To reboot one of the IDU modules enter the following command:

```
>BS_bs#reboot <slotnumber>
Enter the reason [Max characters not to exceed 1024]: testing the
system
Confirm:[Y/N]
Y
>BS_bs#
```

where <slotnumber> defines reboot target module. Options are:

- 1 - ACB (IDU main board)
- 2 - PMP card in slot #1
- 3 - PMP card in slot #2

## Provisioning the RF Interface

---

### Enabling WiMAX Interface

To enable the wimax interface with basic configuration at IDU such as enable MAC frames and basic ODU configuration, use the following commands:

```
BS_bs#config or >enabled#config
BS_bs(config)#interface wimax <slotinterfacenumber> enable
BS_bs(config)#quit
BS_bs#
```

where:

- <slotinterfacenumber> is the wimax interface ID. Options are:
  - -1/1 - wimax interface connected to interface 1 on IDU front panel
  - -1/2 - wimax interface connected to interface 2 on the IDU front panel

### Configuring Channel Bandwidth and Frequency

To configure RF interface (sector) channel bandwidth and frequency it is mandatory to be logged into the privilege user mode. Use the following commands:

```
>BS_bs#config or >enabled#config
>BS_bs(config)#interface wimax <slotinterfacenumber>
>BS_bs(config-i/f-W)#frequency <frequency>
>BS_bs(config-i/f-W)#bandwidth <bandwidth>
>BS_bs(config-i/f-W)#quit
>BS_bs#
```

where:

- `<slotinterfacenumber>` is the wimax interface ID. Options are:
  - -1/1 - ODU connected to PMP Interface 1 port on the IDU front panel
  - -1/2 - ODU connected to PMP Interface 2 port on the IDU front panel
- `<frequency>` is the channel frequency in KHz, for example 3342500 to set 3.3425 GHz
- `<bandwidth>` is the channel bandwidth in MHz, for example 3500 to set 3.5 MHz

To view channel bandwidth, frequency, operational status, or administrative status at the WiMAX interface enter the following command:

```
> BS_bs#show interface wimax config
```

## Configuring Output Power

To configure output power for one of the RF interfaces (sectors) it is mandatory to be logged into the privilege user mode. Use the following commands:

```
>BS_bs#config or >enabled#config
>BS_bs(config)#interface wimax <slotinterfacenumber>
>BS_bs(config-i/f-W)#downlink tx-power 20
>BS_bs(config-i/f-W)#quit
>BS_bs#
```

where:

- `<slotinterfacenumber>` is the wimax interface ID. Options are:
  - -1/1 - ODU connected to PMP 1 interface port on the IDU front panel
  - -1/2 - ODU connected to PMP 2 interface port on the IDU front panel
- `<txpower>` is the output power of RF transmitter in ODU in dBm(txpower range 30-40, for example 30 to set 30 dBm)

To view output power enter the following command:

```
>BS_bs#show interface wimax downlink-config <slotId>
```

where:

- `<slotId>` - Slot number in multiple blade chassis and default to "1" for this release.

## Configuring MAC

---

### Configuring Link Adaptation

This set of commands offers you to enable or disable automatic uplink or downlink adaptation, according to the radio conditions and specified thresholds, hysteresis and protection.

```
BS_bs#configure interface wimax 1/1 uplink link-adaptation
```

```
BS_bs#configure interface wimax 1/1 downlink link-adaptation
link-adaptation enable or disable link adaptation
```

where:

- `<slotinterfacenumber>` is the WiMAX interface ID. The options are:
  - -1/1 - ODU connected to PMP 1 interface port on the IDU front panel
  - -1/2 - ODU connected to PMP 2 interface port on the IDU front panel
- `<linkadapthys>` is the CINR hysteresis in dB when upgrading the FEC. Allowed value is floating in the range 0 to 100.
- `<linkadaptionprot>` is the CINR protection in dB against implemented CINR. The allowed value is floating in the range from 0 to 100.

## Setting MAC Frame

To set the G-ratio of the cyclic prefix start and the duration of the MAC frame for one of the RF interfaces (sectors) enter the following commands.

```
>BS_bs#config or >enabled#config
>BS_bs(config)#interface wimax <slotinterfacenumber>
>BS_bs(config-if-W)#cyclic-prefix <cyclic-prefix>
>BS_bs(config-if-W)#frame-duration <frame-duration>
>BS_bs(config-if)#quit
>BS_bs#
```

where:

- `<slotinterfacenumber>` is the wimax interface ID. Options are:
  - -1/1 - ODU connected to PMP 1 interface port on the IDU front panel
  - -1/2 - ODU connected to PMP 2 interface port on the IDU front panel
- `<cyclic-prefix>` the G-ratio of the cyclic prefix start. Options are:
  - -1/8
- `<frame-duration>` is the MAC frame duration. Options are:
  - -5ms



---

For StarMAX 8200 1/8 and 5ms are supported.

---

## Configuring TDD Scheduler

TDD scheduler allows you to set dynamic configuration of the adaptive state of the split of the TDD frame between the uplink and the downlink. When adaptive split is enabled, the sub-frame sizes are dynamically adapted to the load of each link, and the split parameter specifies the equilibrium point when both links are under congestion. When disabled, the sizes of the downlink and uplink sub-frames are constant and are defined by the split parameter. A static split is useful for BWA, when reusing a single frequency. A dynamic split results in better bandwidth use.



To enable adaptive TDD split for one of the RF interfaces (sectors) enter the following commands.

```
>BS_bs#config or >enabled#config
>BS_bs(config)#interface wimax <slotinterfacenumber>
```

>To set the size of the downlink sub-frame as a percentage of the frame being split enter:

```
>BS_bs(config-i/f-W)#tdd-split <tddsplit>
>BS_bs(config-i/f-W)#quit
>BS_bs#
```

where:

- <slotinterfacenumber> is the wimax interface ID. Options are:
  - -1/1 - ODU connected to PMP 1 interface port on the IDU front panel
  - -1/2 - ODU connected to PMP 2 interface port on the IDU front panel
- <tddsplit> the size of the downlink sub-frame as a percentage of the frame being split, integer in the range from 0 to 100.

## Configuring and Managing User Access

---

### Adding Users

To add the CLI system user it is mandatory to be logged into the privilege user mode or privilege equal to or above ACCOUNTING-RW. Use the following commands:

```
>BS_bs#config
>BS_bs(config)#user add <name> <access>
>BS_bs(config)#user password <name>
Load-Setup#configure user add test_user rf-rw
User account created successfully.
Default Password: test_user
Load-Setup#
```

where:

- <name> is the username added to CLI system user list
- <access> is an enumerated defining user access level. Options are:
  - One of the nine access privilege category (For details refer to [Understanding Command Modes on page 2-6](#)).
- <password> is the password belonging to added username

To view the CLI system users list, it is mandatory to be logged into the system with root privilege:

```
>BS_bs#show user
```

### Deleting Users

To delete a CLI system user it is mandatory to be logged into the privilege user mode. Only a root user can delete another configured user. Use the following commands:

```
>BS_bs#config
>BS_bs(config)#user delete <name>
>BS_bs(config)#quit
>BS_bs#
```

where <name> is the username to be deleted from the CLI system user list.

To view CLI system users list enter the following commands:

```
>BS_bs#show user
```

### Changing Password

To change a password for one of the CLI system users it is mandatory to be logged into the privilege user mode. Use the following commands:

```
>BS_bs#config
>BS_bs(config)#user password <name>
Enter Old password:<oldpassword> (Not prompted for "root" login)
Enter new password:<password>
Confirm new password:<password>
>BS_bs(config)#quit
>BS_bs#
```

where:

- <name> is the username for which the password is to be changed
- <password> is the new password

### Changing Access Level

To change the access level for one of the CLI system users you must log into the privilege user mode or privilege access level equal to or above ACCOUNTING-RW. Enter the following commands:

```
>BS_bs#config
>BS_bs(config)#user access <name> <access>
>BS_bs(config)#quit
>BS_bs#
```

where:

- <name> is the username for which access level is to be changed
- <access> is an enumerated defining new user access level. Options are:
  - one of the nine access privilege categories (for details refer to [Appendix B](#)).

To view the CLI system users list, it is mandatory to be logged into the system with root privilege:

```
>BS_bs#show user
```

# Chapter 4. Monitoring and Managing the Base Station

This chapter helps you to perform various administrative tasks related to Base Station operation.

## Monitoring Environment Status

---

The environmental module allows you to monitor base station temperature and voltage sensor status. Use the following command.

```
>BS_bs#show environment <envtype>  
>BS_bs#
```

The environment parameters are shown in the following sample table:

```
BS_bs#show environment all
```

ID	Description	Value	Sensor Status	Alarm Status
20	ACB Temp 0	35 C	ok	
21	ACB Temp 1	36 C	ok	
22	ACB Temp 2	34 C	ok	
23	ACB Temp 3	36 C	ok	
24	ACB 3.3V	3.3 V	ok	
25	ACB 2.5V	2.5 V	ok	
26	ACB 1.8V	1.8 V	ok	
27	ACB 1.25V	1.21 V	ok	
28	ACB 5V	5.0 V	ok	
83	Fan	0 running	ok	
84	Fan	1 running	ok	
85	Fan	2 running	ok	
89	Fan Temp 0	29 C	ok	
99	PMP1 Temp 0		unavailable	
100	PMP1 Temp 1		unavailable	
108	PMP2 Temp 0		unavailable	
109	PMP1 Temp1		unavailable	

BS\_bs#

## Managing Subscriber Stations

---

To configure the MAC based access control list, you must login in privilege user mode. Enter the following commands:

```
>BS_bs#configure access-list 2 permit <srcaddr> <srcaddrmask>
<destaddr> <destaddrmask>
```

where:

- <srcaddr> Source MAC address of the Ingress or Egress packets used to drop or allow traffic, for example 11:22:33:44:55:66
- <srcaddrmask> Source MAC address mask
- <destaddr> Destination MAC address of the Ingress or Egress packets used to drop or allow traffic, for example 22:33:44:77:88:99
- <destaddrmask> Destination MAC address mask

**Examples:**

Sample MAC filter configuration is shown below:

```
BS_bs#configure access-list 2 permit
11:22:33:44:55:6600:00:00:00:00 22:33:44:55:66:77
00:00:00:00:00:00
```

Configured MAC/IP access control entries can be displayed as illustrated below:

```
>BS_bs#show access-lists
Extended access list 1
deny 11:22:33:44:55:66 00:00:00:00:00:00 11:22:33:44:55:77
00:00:00:00:00:00
>BS_bs#
```

As per the internal implementation the digits in the net mask are inversed and then added to retrieve the network IP address.

## Management VLANs

---

To configure management VLAN, you must login in privilege user mode. Enter the following commands:

```
>BS_bs#configure mgmt-vlan <vlanID>
```

where:

```
<vlanID> - VLAN Identifier [Range 2-4089]
```

**Examples:**

Sample management VLAN and corresponding show management VLAN are illustrated below:

```
>BS_bs#configure mgmt-vlan 21
Added Management VLAN!!
>BS_bs#show mgmt-vlan
Configured Management VLAN IDs:
21
>BS_bs#
```

To delete management VLAN, you must login in a privilege user mode. Enter the following commands:

```
>BS bs#configure no mgmt-vlan <vlanID>
```

where:

```
<vlanID> - VLAN Identifier [Range 2-4089]
```

**Example:**

```
BS_bs#configure no mgmt-vlan 21
Management VLAN Deleted!!
BS_bs#
```

## Configuring mgmt-vlan-mode

This command is used to configure management VLAN mode.

```
configure mgmt-vlan-mode {vMode}
```

### *Parameters:*

{vmode} VlanMode (outofBand, inBand)

### *Examples:*

```
BS_bs#show mgmt-vlan-mode
Management VLAN Mode: OUT OF BAND Management
BS_bs#configure mgmt-vlan-mode inBand
BS_bs#show mgmt-vlan-mode
Management VLAN Mode: IN_BAND Management
BS_bs#configure mgmt-vlan-mode outofBand
BS_bs#show mgmt-vlan-mode
Management VLAN Mode: OUT OF BAND Management
```

# Managing Configuration Files and Software

---

This section contains instructions on how to upgrade or downgrade your base station software.

## Software Upgrade

To upgrade software images you must log into the privilege user mode. Enter the following commands:

```
>BS_bs#upgrade <type> <image> [slot] [element] <hostname> <username>
<passwd>
>BS_bs#reboot 1
>BS_bs#
```

where:

- <type> Type of component to upgrade. Valid values of enumerated type:
  - system - system upgrade
  - kernel - kernel upgrade
  - appln - application upgrade
  - bootrom - bootrom upgrade
  - ipmi - impmi upgrade
  - ems - ems upgrade
  - odu - ODU upgrade
- <image> is a image file name with file path, for example /ata/loads/sw23.tgz
- [slot] defines upgrade target. Options are:
  - acb
  - pmp1
  - pmp2
  - null
  - odu1
  - odu2
- <element>
- <hostname> is a FTP host name or FTP host IP address, for example 192.168.250.75
- <username> is a FTP server username for FTP authentication
- <passwd> is a FTP server password for FTP username authentication

To verify the current software version enter the following command:

```
>BS_bs#show software version
```

### Examples:

If used image <type> is system then the file used must be .tgz and <slot> must be null.

```
>BS_bs#upgrade system tbwa-2.2.3.2.2.2.tgz 192.168.250.202 root password
```

If kernel then the file used must be elf and <slot> can be acb, pmp1 or pmp2.

```
>BS_bs#upgrade kernel acb_kernel acb 192.168.250.202 root password
```

If appln then the file used must be .out and <slot> can be acb, pmp1 or pmp2.

```
>BS_bs#upgrade appln acb_app.out acb 192.168.250.202 root password
```

If bootrom then the file used must be .bin and <slot> can be acb, pmp1 or pmp2.

```
>BS_bs#upgrade bootrom pmp_bootrom.bin pmp2 192.168.250.202 root password
```

## Software Downgrade

To downgrade any software image to a previously upgraded image it is mandatory to be logged into the privilege user mode. Enter the following commands:

```
>BS_bs#downgrade system
```

```
Available Versions:
```

```
2.2.M.1.A.9
```

```
2.2.M.1.A.8
```

```
Press 0 to exit
```

```
Enter the version:
```

where:

- <type> defines downgrade target. Options are:
  - system

To verify current software version enter the following command:

```
>BS_bs#show software version
```

## Configuration File Manipulation

To store running configuration data it is mandatory to be logged into the privilege user mode.

To store it into startup configuration file, enter the following commands:

```
>BS_bs#config or >enabled#config
```

```
>BS_bs(config)#runningconfig
```

```
>BS_bs(config)#quit
```

```
>BS_bs#copy running-config startup-config
```

```
>BS_bs#
```



To store running configuration data into any intermediate file, enter the following commands:

```
>BS_bs#config or >enabled#config
>BS_bs(config)#runningconfig
>BS_bs(config)#quit
>BS_bs#copy runningconfig <filename>
>BS_bs#
```

where <filename> is the name of the file containing running configuration data

To view running configuration data enter the following command:

```
>BS_bs#show running-config
```

To view startup configuration data enter the following command:

```
>BS_bs#show startup-config
```




---

The file is overwritten without any indication during copying to a destination file, if the file already existed.

---

## Configuring Syslog and SNMP Traps to Monitor System Performance

---

### Configuring Syslog Service

To configure syslog service it is mandatory to be logged into the privilege user mode. Use the following commands to enable syslog messages report to the syslog server:

```
>BS_bs#config or >enabled#config
>BS_bs(config)#syslog add <ipaddr>
>BS_bs(config)#syslog enable <ipaddr>
>BS_bs(config)#syslog severity <ipaddr> <severity>
```

where:

- <ipaddr> is syslog server IP address, for example 192.168.250.75
- <severity> defines syslog message severity threshold above which the messages are reported to the syslog server. Options are:
  - 0 - Emergency
  - 1 - Alert
  - 2 - Critical
  - 3 - Error
  - 4 - Warning

- 5 - Notification
- 6 - Information
- 7 - Debug
- 8 - Default

Setting syslog message severity threshold is necessary to enable messages reporting. For example, if severity threshold is set to 4, only critical, alert and emergency messages are reported.

The following commands can be used to set further syslog server parameters and to disable or remove the server.

```
>BS_bs(config)#syslog modulename <ipaddr> <modulename>  
>BS_bs(config)#syslog throttlesize <ipaddr> <throttlesize>
```

where:

- <ipaddr> is syslog server IP address, for example 192.168.250.75
- <modulename> defines the system module from which the syslog server receives messages from. Messages generated by this module are received regardless of message severity while messages from other modules are received only if their severity is higher than set by severity command. Options are:
  - ipmi
  - cli
  - eventlog
  - chassismgr
  - dnsmgr
  - snmpmgr
  - interfacemgr
  - ipmgr
  - snmpmgr
  - trapmgr
  - radiomgr
  - zarlink-driver
  - filter
  - syncmgr
  - wimax-log
  - tw\_cli\_rpc
  - dhcp
  - monitor
  - vlanpolicy
  - ssmanager
  - ssadmission
  - trpoller

- `conntable`
- `<throttlesize>` is the maximum number of messages per second to be sent to syslog server. Allowed interval is 1 to 499.

## Configuring SNMP Trap Service

To add and enable SNMP trap receiver to the base station enter the following commands:

```
BS_bs#
BS_bs#show snmp-trap-receivers
Configured SNMP TRAP receivers:
-----
IP: 192.168.255.14  port: 162 status = enabled community: public
Configured SNMP PS TRAP receivers:
-----
IP: 192.168.255.14  port: 163 status = enabled community: public
BS_bs#
configure snmp-server-trap-receiver 192.168.255.14
configure snmp-server-trap-enable 192.168.255.14
configure snmp-ps-trap-receiver 192.168.255.14 163
configure snmp-ps-trap-enable 192.168.255.14 163
```

where:

- `<ip>` is SNMP trap receiver IP address, for example 192.168.250.75
- `<community-name>` is the SNMP TRAP community name
- `<udp-port>` is the UDP port number

To disable SNMP trap receiver enter the following command:

```
>BS_bs(config)#no snmp-server-trap-enable <ipaddr> <community-name>
<udp-port>
```

To remove SNMP trap receiver from the base station enter the following command:

```
>BS_bs(config)#no snmp-server-trap-receiver <ipaddr>
<community-name> <udp-port>
```

To view the list of SNMP receivers including their status enter the following command:

```
>BS_bs#show snmp-trap-receivers
```



# Appendix A. Connection Request Signaling

## General

---

The Connection request signaling feature refers to the overall Base Station capability to switch each subscriber's connection to the appropriate controller entity - a Harris Stratex Networks Provisioning Server (PS) or a 3rd party ASN-GW.

## Operating Modes

---

Supporting this capability requires the Base Station to operate in one of the following modes:

BS Connection Mode	How to activate this mode	Subscriber connection status
Statis-PS	Configure and enable a PS trap receiver.	All subscribers entering either PMPf/Sector are provisioned via the HSX Provisioning server.
Static-ASN	Configure and enable an ASN-GW.	All subscribers entering either PMPf/Sector are provisioned via the 3rd party NWG standards compliant ASN gateway.
Dynamic	Configure and enable both the PS trap receiver and the ASN-GW.	Base Station software determines connection status for each subscriber by examining incoming subscriber MAC messages and switching the connection to an appropriate control plane.
None	No PS trap receiver or ASN-GW is enabled.	Subscriber connection requests are denied when SBC MAC message arrives over the air. This mode is provided as a safety mechanism with the introduction of this feature.

The dynamic mode and the ability to activate the right mode based on configuration are now available.

In **Dynamic Mode**, the connection request signaling software maintains per subscriber state to determine the subscriber connection mode throughout the lifetime for the subscriber. The table below outlines the **per-subscriber connection mode** when the **BS Connection Mode is "Dynamic"**:

## Appendix A. Connection Request Signaling

Subscriber Connection Mode	How this mode is detected
Dynamic-ASN	<p>Presence of the following features in the subscriber MAC messages:</p> <ul style="list-style-type: none"> <li>• EAP authentication capability in SBC-REQ</li> <li>• Handover ranging indicated in RNG-REQ</li> <li>• Idle mode capability (e.g. Location Update) indicated in RNG-REQ</li> </ul>
Dynamic-PS	<p>Absence of the above features. Note:</p> <ul style="list-style-type: none"> <li>• This automatically qualifies all HSX 16e Fixed modems' connection mode to be switched to the Provisioning Server because they don't exhibit the above capabilities.</li> <li>• A mobile modem like a Quanta PC card or USB dongle can also be used with the Provisioning Server provided the above features are disabled via the modem management console or GUI.</li> </ul>

Changing the Base Station connection mode at run-time impacts the feature and the following user actions are needed to be taken when you are switching between modes.

BS Connection Mode (current)	Sample User Configuration action	BS Connection Mode (new)	User action needed
None	Configure and enable a PS trap receiver.	Static-PS	No action needed.
None	Configure and enable an ASN-GW.	Static-ASN	No action needed.
Static-PS	Disable PS trap receiver. Enable ASN-GW.	Static-ASN	Reboot both sectors (PMPF cards).
Static-ASN	Disable ASN-GW. Enable PS trap receiver.	Static-PS	Reboot both sectors (PMPF cards).
Dynamic	Disable PS trap receiver.	Static-ASN	Reboot both sectors (PMPF cards).
Dynamic	Disable ASN-GW.	Static-PS	Reboot both sectors (PMPF cards).



If future software releases the requirement to reboot the sectors on a Base Station connection mode change would be relaxed.





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