

Sentry4G-900 pico Base Station

Operating Manual

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Sentry 4G-900 pico Base Station Operating Manual

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Warranty

One (1) year from date of purchase, return to factory. For warranty details, contact your customer service representative.

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1 Introduction

1.1 Overview

The Sentry 4G-900 pico Base Station Web Manager application is used to provision and control pico Base Stations and configure QoS for individual Subscriber Stations . The application provides Web Access to a single pico Base Station from any network connection via a standard Browser (i.e. Explorer or FireFox).

The pico Base Station Web Manager is used to initially define the basic communication parameters (i.e. IP address and bandwidth) *before* the unit is mounted on a pole. It can then be used to remotely access the Base Station, configure the required parameters, manage and monitor the unit.

1.2 Features

The Sentry 4G-900 pico Base Station Web Manager application includes the following capabilities and features:

- Intuitive user interface and parameter groupings
- Dashboard monitoring for vital parameters with access to the relevant panes
- Quick Start window customized for Base Stations in standalone or in ASN Gateway topologies
- QoS profile setting tools for STANDALONE configuration
- Enables remote software upgrade and restore to previous versions
- Advanced communication monitoring and troubleshooting tools for CPEs and subscribers

2 Getting Started

The Base Station should be provisioned with basic parameters BEFORE it is mounted (i.e. on the pole) where physical access will be more challenging. This is easily and quickly accomplished by opening a Web session to the Base Station and using the Web Manager Quick Start screen.

This chapter provides the following information:

- How to open a Web session to the Base Station
- How to provision the unit via the Quick Start tab in two operation modes: ASN-Gateway (default mode) and standalone mode
- Navigating the Web Manager application

2.1 Opening a Web Session to the Base Station

A Web session can be opened to the Base Station using two methods: local and remote.

Local Web sessions are usually used during setup to provision the unit with the IP address provided by the system administrator and to configure basic parameters. All the parameters required for initial setup are concentrated in the Quick Start menu.

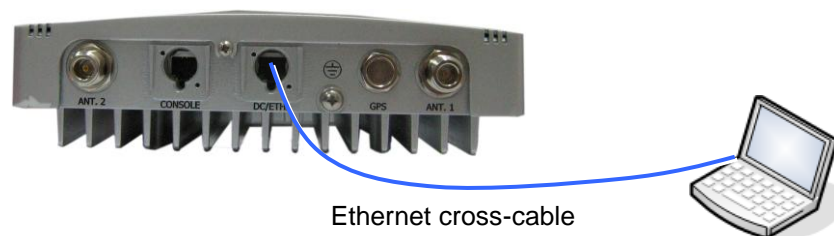
NOTE: Remote sessions are used during normal operation.

To open a local session

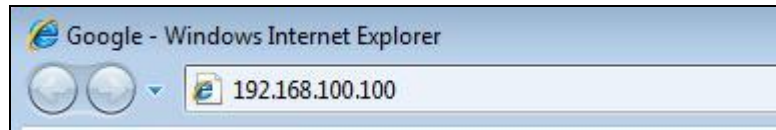
Note: The default IP address of the Base Station is 192.168.100.100

1. Verify that your computer is running Windows XP OS.
2. Use an Ethernet cross-cable to connect your computer (i.e. laptop) Ethernet port to the Base Station Ethernet management port.

NOTE: Some laptops may not require a cross-cable to locally connect to an Ethernet port since automatic identification of cross-cable connections are supported. For these type of computers, a standard Ethernet may be connected locally to the Base Station.



3. Launch your Web Browser (i.e. Explorer or FireFox) and enter the Base Station default IP address in the address bar.



4. Press the **Enter** key. The login window appears.
5. In the Login window, enter your provided **User Name** and **Password**.

The Web Manager window appears. The window consists of:

- Dashboard showing the main readings – click on a reading to access the corresponding screen.
- Main menu options – the relevant sub-menus are displayed in the left pane
- The display area showing the currently selected sub-pane options.

For a detailed explanation on navigating the Web Manager, refer to section 2.3.

The Admin menu, Current Status sub-menu item is displayed by default, providing status information on the Base Station.

Current Status	
Current Frequency [KHz]	3500000
Current Bandwidth [MHz]	10MHz
Current Preamble Index	0
Current BS IP Address	192.168.10.121
GPS Time	THU JAN 01 17:18:50 UTC 1970
Uptime [sec]	17:18:50
Tx Status	Operational

What next?

- To provision the unit (before physical mounting) - define the **Quick Start** parameters (see 2.2). *Once the Quick Start parameters have been defined, you will be able to access the Base Station remotely via an internet connection.*
- Learn how to navigate the Web Manager – refer to 2.3 [Navigating the Web Manager Screen](#).

2.2 Initial Setup the Base Station via Quick Start

NOTE: The Quick Start menu is usually accessed for the first time via a local connection BEFORE the Base Station is mounted onto the pole.

The Quick Start screen concentrates the IP address and other basic parameters required to set up the Base Station and to perform basic operations; these include Base Station service control and reboot.

The Web Manager supports two operation modes, each with a dedicated Quick Start screen:

- **ASN Gateway** – this is the default mode, corresponding to an installation topology that includes an ASN Gateway. In this type of installation the QoS is configured through the Gateway. No QoS set up is required at the Base Station.
- **Standalone** – in this mode, the Base Station installation topology does NOT include an ASN Gateway. It is required to configure the Web Browser to run in this mode.

The operation mode can be verified and modified through the Web Manager (Backbone menu).

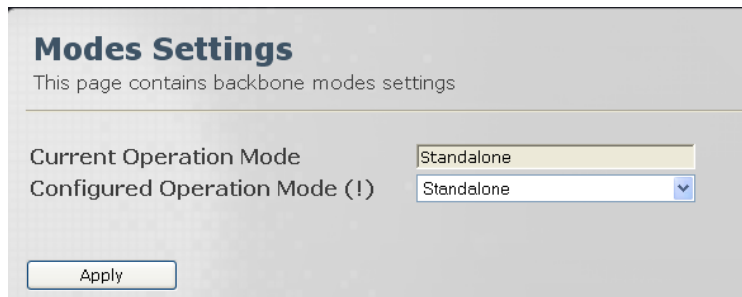
This section describes how to verify and modify the Web Manager mode according to the installation topology, and the Quick Start options for each mode.

2.2.1 Verifying and Setting Operation Mode – ASN Gateway or Standalone

The Web Manager is by default set to operate in ASN-GW mode. Configure the Web Manager operation mode to correspond the system topology: **Standalone** or **ASN-GW**. The selected mode affects some of the Web Manger features and displays.

To view and configure the operation mode

1. Click the **Backbone** menu option. Choose the **Backbone Admin** sub-menu and then the **Operation Modes**. The **Operation Modes** screen appears.



Modes Settings
This page contains backbone modes settings

Current Operation Mode

Configured Operation Mode (!)

2. In the **Configured Operation Mode** field set the value to Standalone or ASN-GW according to the system topology and click **Apply**.

2.2.2 ASN-Gateway Mode Quick Start

Follow this instructions in this section if the Base Station is in an ASN Gateway topology.

NOTE: All the parameters available in this pane, are also available in other panes corresponding to their parameter groups.

The Quick Start pane provides the basic parameters required for setting up the Base Station. These include the unit and ASN Gateway address, frequency, bandwidth, etc.

These parameters require re-starting the service (*) or rebooting the Base Station (!) as indicated. (See section 2.3.3). The necessary operation buttons are provided in the pane.

To set up the unit via the Quick Start pane

1. Click the **Quick Start** menu option. The **Quick Start** pane appears.

BS

Admin Subscribers Backbone Wireless **Quick Start**

STATUS: Operational
DOWNLINK: 0.00 Mbit/s
ALARMS: 0
REGISTERED: 1 MS
UPLINK: 0.00 Mbit/s

Quick Start Settings

This page contains Quick start settings.

Legend:
(!) - requires reboot
(*) - requires service restart

Configured BS IP Address (!)	192.168.10.121
Configured BS Subnet Mask (!)	255.255.255.0
Configured BS Default GW IP Address (!)	192.168.10.10
Configured ASNGW IP Address (!)	192.168.103.2
Configured Frequency [KHz] (*)	3500000
Configured Bandwidth [MHz] (*)	10MHz
Configured Authentication Mode (!)	PKMv2.0
Service State	Start

Apply

Reboot Reboot Device and load SW from Primary Bank.

Start Service Start transmission service and flush all service affecting configuration

Stop Service Stop transmission service

Basic communication parameters (Corresponding to mode: Standalone/ASN-GW)

Control options

The following operation buttons are available:

- **Apply** – implements changes performed by the user.
 - **Reboot** – reboot device and load SW from Preliminary bank
 - **Stop Service / Start Service** – two buttons used when service restart is required.
2. Update the required parameters in the Pane:
 - Base Station IP Address, Subnet Mask and Default GW (requires reboot).
 - ASN Gateway IP Address (requires reboot)
 - Base Station Center Frequency (requires service restart)
 - Base Station Bandwidth – Values: 3.5MHz, 5MHz, 7MHz, 10MHz. (requires service restart)
 - Authentication Mode:

- Null authentication – if this mode is selected, AAA Server parameters are not relevant.
 - PKMv2.0 – select this mode if AAA Server is used.
3. Click **Apply** to save the changes. *The parameters will not be uploaded to the Base Station until the appropriate Restart or Reboot operation was performed.*
 4. Depending on the parameters that were modified, perform the relevant operation in order to update the changes to the Base Station:
 - Restart the service (*) – click **Stop Service** and then **Start Service**
 - Reboot the Base Station (!) - click **Reboot**.

NOTE: (If necessary), to restore the factory defaults, click the **Factory Default** button.

The GPS link state shows the status of the GPS link:

- Auto – Default. Base Station waits for GPS synchronization before beginning transmission. This is usually the normal operation mode for multi-sector systems.
- Start – Base Station begins transmission without waiting for GPS synchronization. Used for single sector systems or for testing. The Stop option is used to discontinue transmission.
- Stop – Used to discontinue transmission initiated by Start.

NOTE: By default, GPS operation is enabled. To disable GPS (i.e. for operation in the lab or testing), refer to section 4.6.

2.2.3 Standalone Mode Quick Start

Follow this instructions in this section if the Base Station is in Standalone topology.

NOTE: All the parameters available in this pane, are also available in other panes corresponding to their parameter groups.

The Quick Start pane provides the basic parameters required for setting up the Base Station. These include the unit IP address parameters, frequency and bandwidth, and AAA Server settings.

These parameters require re-starting the service (*) or rebooting the Base Station (!) as indicated. (See section 2.3.3). The necessary operation buttons are provided in the pane.

To set up the unit via the Quick Start pane

1. Click the **Quick Start** menu option. The **Quick Start** pane appears.

The screenshot shows the 'Quick Start Settings' pane. At the top right, there are status indicators: 'BS' (Operational), 'DOWNLINK' (0.00 Mb/s), 'ALARMS' (0), 'REGISTERED' (1 MS), and 'UPLINK' (0.00 Mb/s). The 'Quick Start' menu option is circled in red. The main area contains configuration fields for various parameters, with a legend indicating that (!) requires a reboot and (*) requires a service restart. The fields are: Configured BS IP Address (!) (192.168.10.121), Configured BS Subnet Mask (!) (255.255.255.0), Configured BS Default GW IP Address (!) (192.168.10.10), Configured Frequency [KHz] (*) (3500000), Configured Bandwidth [MHz] (*) (10MHz), Configured Authentication Mode (!) (PKMv2.0), Configured AAA Server IP Address (!) (192.168.1.27), Configured AAA Server Port (!) (1812), Configured AAA Client ID (!) (BS), Configured AAA Client Secret (!) (Cisco), and Service State (Start). At the bottom, there are control buttons: Apply, Reboot (with subtext 'Reboot Device and load SW from Primary Bank.'), Start Service (with subtext 'Start transmission service and flush all service affecting configuration'), and Stop Service (with subtext 'Stop transmission service').

Basic communication parameters
(Corresponding to mode: Standalone/ASN-GW)

Control options

The following operation buttons are available:

- **Apply** – implements changes performed by the user.
 - **Reboot** – reboot device and load SW from Preliminary bank
 - **Stop Service / Start Service** – two buttons used when service restart is required.
2. Update the required parameters in the Pane:
 - Base Station IP Address, Subnet Mask and Default GW (requires reboot).
 - Base Station Center Frequency (requires service restart)
 - Base Station Bandwidth – Values: 3.5MHz, 5MHz, 7MHz, 10MHz (default)
 - Authentication Mode:
 - Null authentication – if this mode is selected, AAA Server parameters are not relevant.
 - PKMv2.0 – if this mode is selected, configure the AAA Server parameters
 - AAA Server IP Address, Server Port, Client ID and Client Secret (AAA User Defined password)
 3. Click **Apply** to save the changes. *The parameters will not be uploaded to the Base Station until the appropriate Restart or Reboot operation was performed.*
 4. Depending on the parameters that were modified, perform the relevant operation in order to update the changes to the Base Station:
 - Restart the service (*) – click **Stop Service** and then **Start Service**
 - Reboot the Base Station (!) - click **Reboot**.

NOTE: (If necessary), to restore the factory defaults, click the **Factory Default** button.

The GPS link state shows the status of the GPS link:

NOTE: By default, GPS operation is enabled. To disable GPS (i.e. for operation in the lab or testing), refer to section 4.6.

- Auto – Default. Base Station waits for GPS synchronization before beginning transmission. This is usually the normal operation mode for multi-sector systems.
- Start – Base Station begins transmission without waiting for GPS synchronization. Used for single sector systems or for testing. The Stop option is used to discontinue transmission.
- Stop – Used to discontinue transmission initiated by Start.

2.3 Navigating the Web Manager Screen

The Base Station management tool screens consist of four main areas:

- **Dash Board** – Provides Base Station main status indications: Alarms, Up/Down rate, registration elapsed time, Base Station status. Clicking on the status items opens the relevant pane in the Display area.
- **Main Menu Options** – a set of menus, where clicking each menu displays the corresponding set of sub-menus in the Sub-Menu Options Pane.
- **Sub-Menu Options Pane** – a set of commands and sub-menus related to the selected menu option. Selecting a sub-menu item, displays the relevant options in the Work Area.
- **Display Area** – display corresponds to the selected sub-menu item.

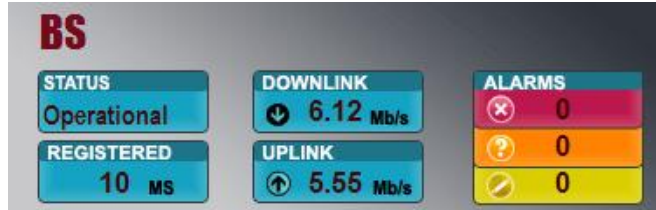
The screenshot shows the Base Station Web Manager interface. At the top, there are navigation tabs: Admin, Subscribers, Backbone, Wireless, and Quick Start. The Main Menu Options are located at the top left, and the Dash Board is at the top right, showing status indicators for Operational, Registered (10 ms), Downlink (0.59 Mb/s), Uplink (2.38 Mb/s), and Alarms (0). The Sub-Menu Options Pane is on the left, listing General, Security, Access Permissions, SNMP Managers, Alarms and Traps, SW Upgrade, GPS, SNMP, and Logout. The Display area shows the 'Device Access Permissions' page, which contains a table of permitted users and an 'Apply' button.

User Name	Access Level	Password	Retype Password
admin	admin		
supervisor	supervisor		
technician	technician		

2.3.1 Dash Board Options

The Dashboard is displayed on the Web Manager at all times, providing a glance view of vital parameters: Alarms, Up/Down rate, registration elapsed time, Base Station status.

Clicking on the status items opens the relevant pane in the Display area.



Item	Click to open the..
Status – Current Tx Status	Base Station Main Status screen
Registered – Number of registered SS.	Subscriber Management screen
Downlink / Uplink – average rate of Down/Up link traffic.	Aggregate Throughput Statistics screen
Alarms – Provides a summary of the current number of system's raised alarms according to their severity.	System Alarms screen

2.3.2 Main Menu Options

Each of the menu options provides access to sub-menus displayed in the left window pane.



<p>Admin - Access to general information on the base station (i.e. bandwidth, site details, access permissions etc.), SW upgrade and file management operations and activation settings, and Logout options</p>	<ul style="list-style-type: none"> General Security Alarms and Traps SW Upgrade GPS SNMP Logout
<p>Subscribers – Management of registered and provisioned SS and services (for Standalone operation mode).</p>	<ul style="list-style-type: none"> Subscribers Management Services
<p>Backbone – Determine and set operation mode (Standalone / ASN-GW), Base Station and GW IP addresses;</p> <p>For <i>standalone</i> mode define Switching parameters;</p> <p>For <i>ASN-GW</i> mode define ASN-GW parameters.</p>	<ul style="list-style-type: none"> Backbone Admin Switching

<p>Wireless – Access to all WiMAX parameters configuration and diagnostics options.</p>	<p>Wireless Admin Radio and Frame Wireless Security MAC Diagnostics</p>
<p>Quick Start – Access to all parameters required for initial set up of the system, depending on the operation mode (Standalone / ASN-GW).</p>	<p>Quick Start</p>

2.3.3 Modifying Parameters

Modified parameters are updated on the Base Station under three conditions, depending on the parameter:

- Some parameters do not require special operations - simply click **Apply** and they are updated on the Base Station.
- Some parameters affect the service – these are marked by an exclamation mark (!).

Configured BS IP Address (!)

To update these parameters, click **Stop Service** and then **Start Service** (in the **Quick Start** panel).

- Some parameters are updated after performing system reboot - these are marked by an asterisk (*).

Configured Frequency [KHz] (*)

For parameters that require reboot or service restart, two values are displayed:

- The **current** value used by the Base Station.
- The **configured** value - typed by the user but not yet updated onto the Base Station. (Will be updated in the Base Station after the required restart/reboot operation).

See example below.

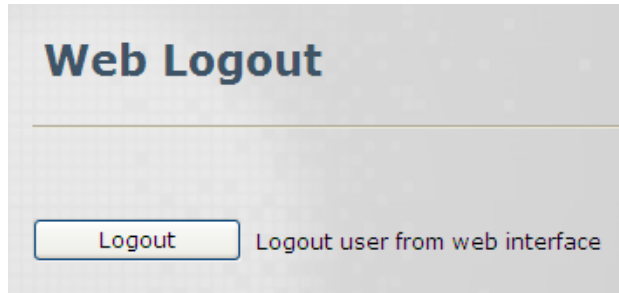
Current Base Station ID
Configured Base Station ID (!)

2.4 Logout

Logging out from the session is done through the logout pane.

To access the Logout pane

1. Click the **Admin** menu option and then the **Logout** sub-menu option.
2. In the displayed Logout pane click the Logout button.



3 Backbone Configuration

The Base Station backbone parameters provide infrastructure settings of the system mode and other parameters. After configuring the system operation mode (Standalone or ASN-GW), the corresponding backbone parameters can be configured.

The following backbone configurations are described in this chapter:

- General parameters (system operation mode, Base Station and GW addresses)
- Standalone mode: Switching parameters and learned MAC addresses
- ASN-GW mode: Definition of ASN-GW to Base Station connection parameters (IP, tunneling, keep-alive)

3.1 Setting the Operation Mode

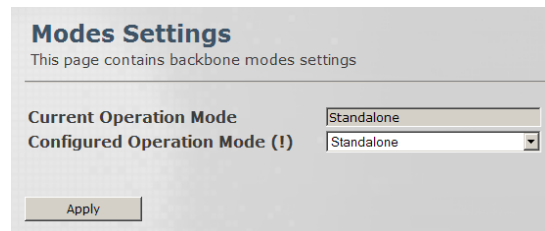
The system can operate in two configurations:

- *Standalone* mode
- *ASN-GW* mode (Default)

The operation mode defines whether system operation (such as QoS capabilities) are performed by the Base Station (Standalone mode) or by the ASN-GW (ASN-GW mode).

To access the Operation Mode pane

1. Click the **Backbone** menu option. The **Backbone Admin** sub-menu list is displayed in the Sub-Menu option pane.
2. From the **Backbone Admin** sub-menus choose **Operation Modes**. The Operation Modes pane is displayed.



3. To change the system operation mode:
 - In the **Configured Operation Mode** field choose the required mode.
 - Click **Apply**.
 - Restart the service to reset the operation mode to the configured value.

3.2 Base Station and ASN-Gateway IP Address

The Base Station and ASN-GW IP addresses and subnet mask are configured via the IP Addresses pane..

To access the IP Addresses pane

1. Click the **Backbone** menu option. The **Backbone Admin** sub-menu list is displayed in the Sub-Menu option pane.
2. From the **Backbone Admin** sub-menus choose **IP Addresses**. The IP Addresses pane is displayed.

IP Addresses	
This page contains BS IP addresses and DHCP client settings	
Current BS IP Address	192.168.10.121
Current BS Subnet Mask	255.255.255.0
Current BS Default GW IP Address	192.168.10.10
Configured BS IP Address (!)	192.168.10.121
Configured BS Subnet Mask (!)	255.255.255.0
Configured BS Default GW IP Address (!)	192.168.10.10

Apply

3. Define the required IP and subnet parameters and click **Apply**.
 - Base Station IP Address
 - Base Station Subnet Mask
 - Base Station Default GW IP Address
4. Restart the service to reset addresses according to the configured values.

3.3 Standalone: Switching parameters

The L2 switching related parameters define the L2 switching method, the MAC addresses table used by the switching mechanism, and the MAC addresses aging period (after which an unused MAC that appears in the table is ignored). These parameters are viewed and configured via the Backbone Switching sub panes.

3.3.1 Switching Settings

This pane provides configuration options for the L2 Switching mode and for the MAC address aging period.

To access the Switching Settings pane

1. Click the **Backbone** menu option and choose **Switching** and then **Switching Settings** from the sub-menus. The Switching settings pane is displayed.

2. Define the required parameters according to the following descriptions and click **Apply**.

Field	Description
Current/Configured Switching Mode	<p>This parameter defines the traffic forwarding method:</p> <p>L2 Switching mode: traffic flooding is enabled.</p> <p>To dynamically learn about station locations, the Base Station listens to incoming frames and keeps a table of address information by inspecting the source MAC addresses. If the source MAC address is not in the address table already, it is recorded in the table.</p> <p>As a part of the forwarding decision, if destination MAC address is found, the frame can be forwarded to that address. If the address is not found in the table, the frame is flooded to all the CPEs (if it's a downlink packet) and to the CPEs and network interface (if it's an uplink packet).</p> <p>Forward-to-router mode (<i>To be used for testing purposes only!!!</i>): all traffic is forwarded to the upstream router (no flooding). Do NOT use it.</p> <p>Values: [L2 Switching; Forward-to-router]</p>
MAC address Table Aging Time (300...1800) [sec]	<p>Mac Address Table Aging period (in seconds), after which unused MAC address entries will be dropped.</p> <p>Values: 300-1800</p>

3.3.2 MAC Addresses Table

This is a read-only pane, and displays the MAC addresses learned by the Base Station, that are used by the L2 switching mechanism.

To view the Switching MAC Addresses Table

1. Click the **Backbone** menu option and choose **Switching** and then **MAC Addresses Table** from the sub-menus. The MAC Addresses Table pane is displayed.

Index	MAC Address	TTL	Interface
1	FF:FF:FF:FF:FF:FF	0	RFIO;NSI;LOCAL
2	00:ED:04:A5:10:01	0	RFIO
3	00:18:4D:EA:81:35	180000	NSI
4	00:13:D5:00:12:E5	179999	LOCAL

2. The displayed information details are provided in the following table:

Field	Description
Index	Unique identifier
MAC Address	Base Station learned MAC addresses
TTL	Time to Live (for datagrams in the network)
Interface	Type of interface

3.4 ASN-GW Mode: ASN Settings

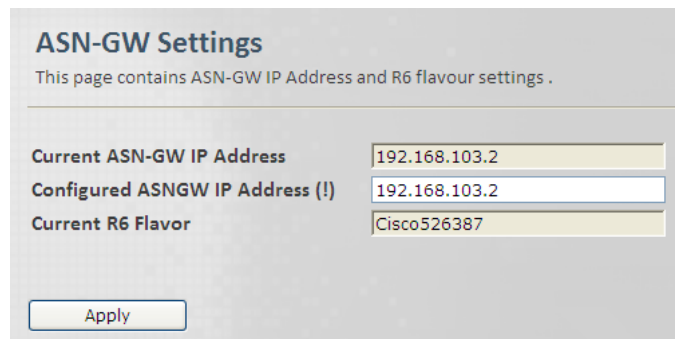
When the Base Station is in ASN-GW mode, it is required to define the backbone ASN-GW parameters. These include the ASN-GW IP address, tunneling method (between the Base Station and the ASN-GW), and the Base Station \leftrightarrow ASN keep-alive intervals.

3.4.1 ASN-GW Link Settings

This pane provides configuration options for the ASN-GW IP and R6 parameters.

To access the ASN-GW Settings pane

1. Click the **Backbone** menu option and choose **ASN Settings** and then **ASN-GW Settings** from the sub-menus. The ASN-GW settings pane is displayed.



ASN-GW Settings
This page contains ASN-GW IP Address and R6 flavour settings .

Current ASN-GW IP Address: 192.168.103.2
Configured ASNGW IP Address (!): 192.168.103.2
Current R6 Flavor: Cisco526387

Apply

2. Define the required parameters according to the following descriptions and click **Apply**.

Field	Description
ASNGW IP Address	IP address to be used after configuration flashing or reboot.
Current R6 Flavor	Type of R6 tunneling used between the Base Station and the ASN-GW (e.g. CiscoXXXXXX)

3. If the IP address has been configured, restart the service for the changes to be applied.

3.4.2 Keep Alive Settings

This pane provides configuration options for the keep-alive messages intervals and retries protocol.

To access the Keep Alive Settings pane

1. Click the **Backbone** menu option and choose **ASN Settings** and then **Keep Alive Settings** from the sub-menus. The Keep Alive settings pane is displayed.

2. Define the required parameters according to the following descriptions and click **Apply**.

Field	Description
Keep Alive timeout (10000..180000) [μ s]	This value indicates the time interval (in μ Sec) that a Base Station waits for the keep-alive response before keep-alive request re-transmission.
Keep Alive Retries (1..10)	Max number of keep-alive re-transmissions
Keep Alive Activation Mode	Enable / Disable Keep Alive activation. Values: [True, False]

3. If the **Keep Alive Activation Mode** has been configured, reboot the Base Station for the changes to be applied.

4 Administration

The following administration operations are described in this chapter:

- View system information
- Configure traps and SNMP options
- Configure access permissions
- Software version update operations

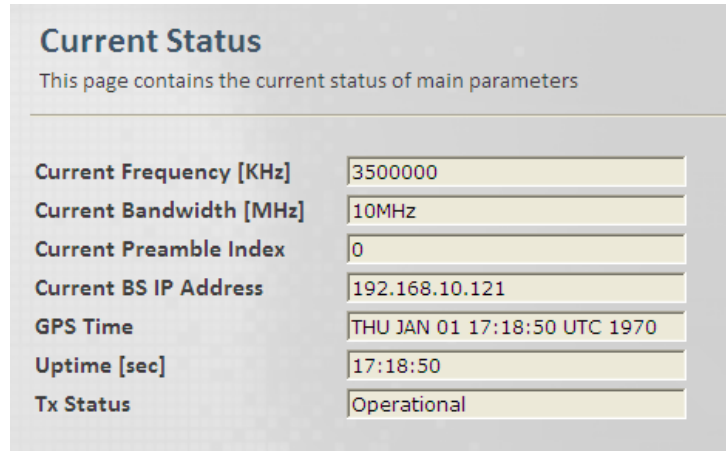
4.1 Viewing Device Status and Information

4.1.1 Main Status Pane

This pane provides status (read-only) information on the Base Station communication parameters.

To access the Main Status pane

1. Click the **Admin** menu option. From the **General** sub-menus choose **Current Status**. The Main Device Statuses pane is displayed.



Current Status
This page contains the current status of main parameters

Current Frequency [KHz]	3500000
Current Bandwidth [MHz]	10MHz
Current Preamble Index	0
Current BS IP Address	192.168.10.121
GPS Time	THU JAN 01 17:18:50 UTC 1970
Uptime [sec]	17:18:50
Tx Status	Operational

2. The displayed information details are provided in the following table:

Field	Description
Current Frequency [KHz]	Current Frequency in KHz
Current Bandwidth [MHz]	Current Operative BW in Mhz; Must be one of the supported BWs
Current Preamble Index	Current Operative Preamble Index
Current Base Station IP Address	Current Base Station IP Address
Current ASN-GW IP Address	Current ASNGW IP Address
GPS Time	Time & Date in UTC; Source is Base Station GPS
Uptime [sec]	Running Time [sec] (from last restart)
Tx Status	Shows status of system operation.

4.1.2 Device Info

This pane provides Base Station hardware identification information (read only) such as Device Serial Number, Manufacturer identifier, etc.

To access the Device Info pane

Click the **Admin** menu option and then the **General** sub-menu option. From the **General** sub-menus choose **Device Info**. The Device Info pane is displayed.

Device Info

This page contains device information

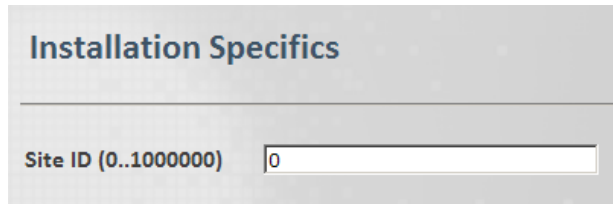
Product Type	<input type="text" value="7235"/>
MAC Address	<input type="text" value="00:13:D5:00:12:E5"/>
Device Serial Number	<input type="text" value="43540409007"/>
Boot Version	<input type="text" value="pBSP2.1.4510.28"/>
Calibration Version	<input type="text" value="2.0.0"/>
RF Version	<input type="text" value="2"/>
HW Version	<input type="text" value="28"/>

4.2 Base Station Identification Information

This information includes the site ID, Base Station location and antenna details.

To define Base Station identification information

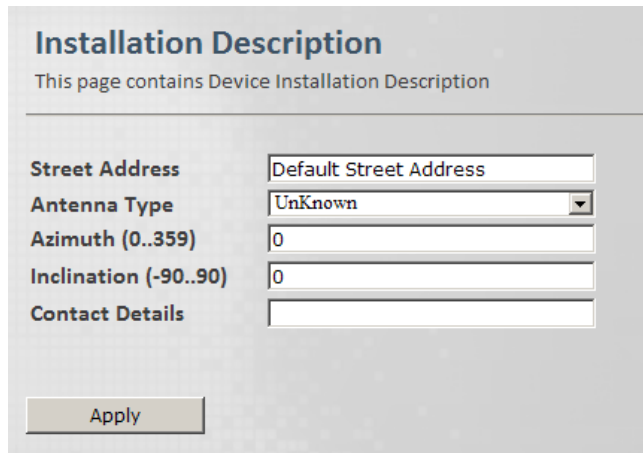
1. Click the **Admin** menu option, the **General** sub-menu option and then choose **Installation Specific**. The Installation Specifics



Installation Specifics

Site ID (0..1000000)

2. Define the **Site ID** as defined by the Network Operator and click **Apply**.
Several Base Station may have the same site ID. Values: [0,1000000]
3. Enter more descriptions on the location of the Base Station:
 - Choose **Installation Description** (from the Admin menu, General sub-menus). The Installation Description pane appears.



Installation Description

This page contains Device Installation Description

Street Address

Antenna Type

Azimuth (0..359)

Inclination (-90..90)

Contact Details

Apply

- Define the fields and click **Apply**:
 - Address of Base Station (up to 30 characters)
 - Antenna type: Omni, Directional or Unknown
 - Antenna Azimuth in degrees, as configured by the installer: 0 to 359
 - Inclination: Vertical inclination of antenna in degrees, as configured by the installer. Values: [-90,90]
 - Contact details: name, telephone ,etc. of service person that can be contacted.

4.3 Security

The Base Station is secured through access permissions and SNMP definitions. Up to three authentication levels are supported, where additional users can be defined according to the default authentication profiles.

4.3.1 Available Authentication Levels

Three authentication levels are available:

- Admin – highest level. Has access to all read and write options, including user definitions.
- Supervisor – has access to all Read and Write options except for User Definitions.
- Technician – has access to all Read options and limited access to configuration options.

4.3.2 Defining Users and their Access Permissions

This pane is used by the system administrator to define Base Station users granted with relevant permissions.

To view the Access Permissions pane

1. Click the **Admin** menu option and then the **Security** sub-menu option. From the **Security** sub-menus choose **Access Permissions**. The Access Permissions pane is displayed.

Device Access Permissions				
This page contains permission settings for all users				
Permitted Users				
	User Name	Access Level	Password	Retype Password
<input type="radio"/>	admin	admin		
<input type="radio"/>	supervisor	supervisor		
<input type="radio"/>	technician	technician		

Click to add users

Apply

2. To Add a user:

- Click the “+” sign at the bottom of the Users Table.
- Enter the new User Name.
- Select the relevant access level for that user.
- Enter and retype the Password.
- Click **Apply**.

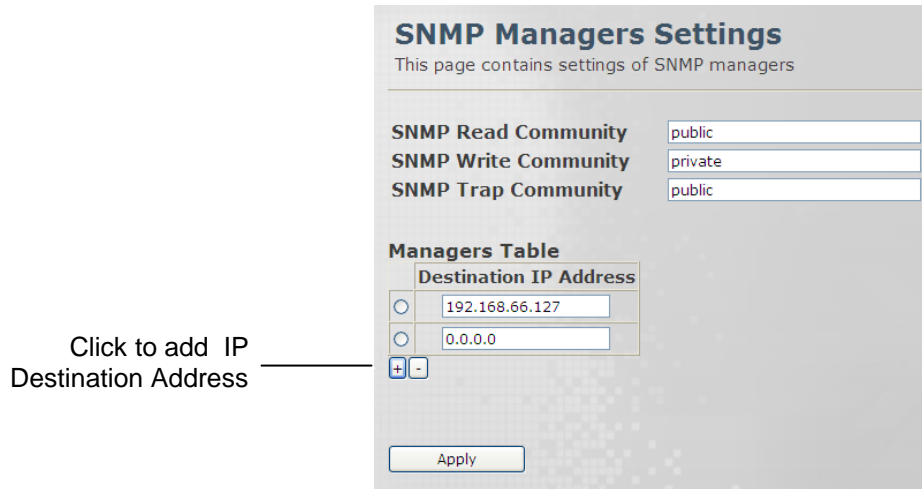
4.3.3 SNMP Settings and Trap Destination Addresses

This pane is used to define the IP destination addresses and the minimal severity of events sent to the corresponding IP Address destination.

Up to five IP Destination Addresses can be defined.

To access the SNMP Managers pane

1. Click the **Admin** menu option and then the **Security** sub-menu option. From the **Security** sub-menus choose **SNMP Managers**. The SNMP Managers pane is displayed.



2. Define the required parameters according to the following descriptions.
 - SNMP Read Community - can be used as a password to secure information retrieval.
Public – no password (default)
Private – password can be assigned
 - SNMP Write Community - can be used as a password to secure performing set commands.
Public – no password (default)
Private – password can be assigned
 - SNMP Trap Community - You can configure the SNMP service to send a trap when it receives a request for information that does not contain the correct community name and does not match an accepted host name.
Public – no password (default)
Private – password can be assigned
3. Add the IP Destination Addresses – these are the addresses to which traps will be sent:
 - Click the + sign to add a row to the table.

Note: To remove the last row, click the “-” sign. To remove a selected row, mark the required row and then click the “-” sign.

 - Define the IP Destination Address to which the traps will be sent and click **Apply**.

4.4 Alarms and Traps

Use the Web Manager to view a summary of the currently generated alarms. You can also disable irrelevant alarms.

4.4.1 Viewing a Summary of System Alarms

This read-only screen provides a summary of the current system alarms.

To access the Alarms pane

1. Click the **Admin** menu option and then the **Alarms and Traps** sub-menu option. From the **Alarms and Traps** sub-menus choose **Alarms**. The System Alarms pane is displayed.

System Alarms
This page contains system alarms, system settings and system status

Legend:
(1) - requires reboot
(*) - requires service restart

Number Of Critical Alarms: 0
Number Of Major Alarms: 0
Number Of Warning Alarms: 0

Alarms Table

ID	Name	Severity	Status	Category	Descr
7	HW	Clear	Off	HW	Hardware
8	ANTENNA	Clear	Off	Radio	Antennas
9	TIMING	Clear	Off	Communication	Timing
10	TEMPERATURE	Clear	Off	Other	Temperature
13	NEIGHBOR_BS_REACHABLE	Clear	Off	Communication	Neighbor BS reachat

4.4.2 Traps – SNMP Trap Settings

Use this pane to select the traps that will be supported by this Base Station.

To access the Traps pane

1. Click the **Admin** menu option and then the **Alarms and Traps** sub-menu option. From the **Alarms and Traps** sub-menus choose **Traps**. The SNMP Traps Settings pane is displayed.

Trap ID	Trap Name	Activation Mode	Severity	Category	Description	Value
<input type="radio"/>	RestartOK	True	Info	Other	BS has restarted successfully	
<input type="radio"/>	TimingOK	True	Clear	Communication	Timing is now locked	
<input type="radio"/>	TimingUnLock	True	Major	Communication	Timing is unlocked	
<input type="radio"/>	AntennaNormalReturnLoss	True	Clear	Radio	All Antennas are now connected	
<input type="radio"/>	AntennaHighReturnLoss	True	Critical	Radio	Antenna Disconnected. TX turned off	
<input type="radio"/>	TransmissionStart	True	Info	Radio	Radio is on	
<input type="radio"/>	TransmissionStop	True	Info	Radio	Radio is off	
<input checked="" type="radio"/>	HWFailure	True	Critical	HW	HW Failure	

Apply

Send Trap selected TRAP will be sent.

Legend:
(*) - requires reboot
(*) - requires service restart

2. Select the traps to be supported by this unit as follows:
 - Set the **Activation Mode** of the relevant trap to **True**.
 - Click **Apply**.

Note: Use the **Send Trap** button to send the trap to the defined Destination Addresses.

4.5 Software Versions Management

Two software versions are stored on the Base Station s:

- One in the Main Directory
- One in the Secondary Directory

The Base Station can run software from either the Main or the Secondary directory as determined by the user; however, software from the Main directory is always run upon Base Station reboot or reset.

Therefore, it is recommended to run the desired software from the Main directory.

The software components saved in one directory can be copied to the other directory, allowing the user to save backups of software versions and to restore or update versions as required.

This sections describes how to perform these operations, navigating between both directories and external URL locations.

4.5.1 Activating Software Versions

This pane shows which software versions are currently loaded and provides options for switching between the main and secondary software versions.

To access the SW Operations pane

1. Click the **Admin** menu option and then the **SW Upgrade** sub-menu option. From the **SW Upgrade** sub-menus choose **SW Properties**. The SW Properties pane is displayed.

SW Properties
This Page Contains Current SW Properties and Banks' Information

Current Active Bank	Primary
Primary SW Version	4.0.4603.58
Primary CDC	BS-Val-Cdc.xml
Primary UV	BS-Val-Unique.xml
Secondary SW Version	3.1.4603.54
Secondary CDC	BS-Val-Cdc.xml
Secondary UV	BS-Val-Unique.xml
Service State	Start

Reboot device and load SW from secondary bank.

Set current SW bank as Primary

Reboot Device and load SW from Primary Bank.

Restore Factory Defaults and Reboot Device

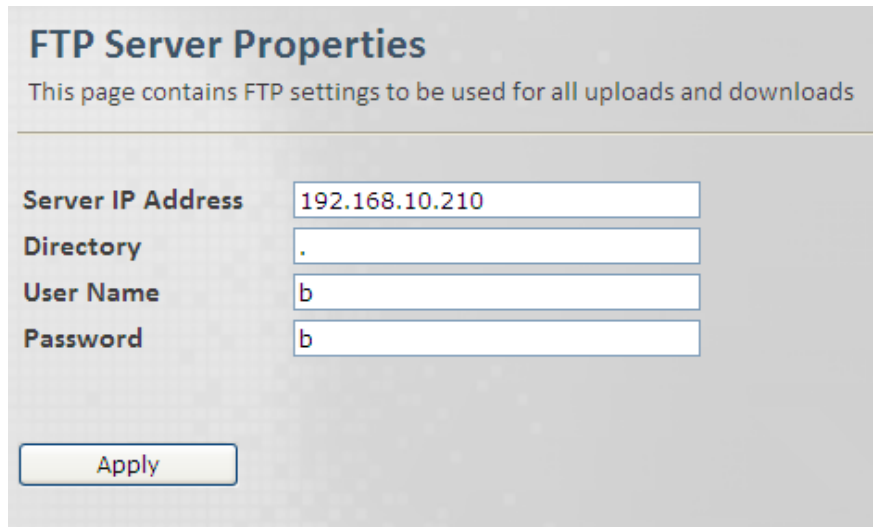
2. The following information is provided:
 - Current Active Bank - Primary or Secondary.
 - Primary SW version
 - Primary CDC
 - Primary UV
 - Secondary SW version
 - Secondary CDC
 - Secondary UV
 - Service State
3. The following operations can be performed:
 - **Run Secondary** - Reboot device and load from secondary
 - **Set as Primary** - Set current running SW as Primary
 - **Reboot** - Reboot device and load from main
 - **Factory Defaults** – Restore factory setup

4.5.2 FTP Server Configuration

Use this pane to define the location and access information of the FTP server in which software versions are stored.

To define the FTP Server parameters

1. Click the **Admin** menu option and then the **SW Upgrade** sub-menu option. From the **SW Upgrade** sub-menus choose **FTP Server**. The FTP Server Properties pane is displayed.



The screenshot shows a configuration window titled "FTP Server Properties". Below the title is a subtitle: "This page contains FTP settings to be used for all uploads and downloads". The main area contains four labeled input fields: "Server IP Address" with the value "192.168.10.210", "Directory" with the value ".", "User Name" with the value "b", and "Password" with the value "b". At the bottom left of the form is an "Apply" button.

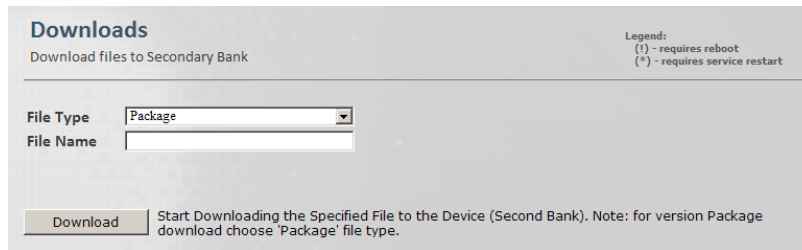
2. Define the FTP server parameters described below and click **Apply**:
 - Server IP Address
 - Directory – directory in which files are located
 - User Name and Password – your FTP User Name and Password.

4.5.3 Downloading Software Versions

This pane is used to download a new SW version from the FTP server to the Base Station Secondary SW directory.

To download SW to the Base Station Secondary SW directory

1. Click the **Admin** menu option and then the **SW Upgrades** sub-menu option. From the **SW Upgrades** sub-menus choose **Downloads**. The SW Downloads pane is displayed.



Downloads
Download files to Secondary Bank

Legend:
(1) - requires reboot
(*) - requires service restart

File Type: Package
File Name:

Start Downloading the Specified File to the Device (Second Bank). Note: for version Package download choose 'Package' file type.

2. Select the Type of File to be downloaded:

Package
Web Resource
CDC
UV

3. In the Download **File Name**, enter the name of the file to be downloaded.
4. Click **Download**. The specified file will be downloaded from the predefined FTP server to the BTS Secondary SW directory.

4.5.4 Managing Main Software Components

This pane provides options for copying selected Main software files to a user defined URL or to the Base Station Secondary software directory.

To access the Primary Bank (Main Version) pane

1. Click the **Admin** menu option and then the **SW Upgrade** sub-menu option. From the **SW Upgrade** sub-menus choose **Primary Bank**. The SW Primary Version Components pane is displayed.

Primary Components
This page contains information of the Primary Bank components

Legend:
(!) - requires reboot
(*) - requires service restart

Primary Components Table			
	Name	Type	Version
<input type="radio"/>	pico_appb40460358.Z.out	Application	4.0.4603.58
<input type="radio"/>	pico_vxWorks40460358.Z	VxWorks	4.0.4603.58
<input type="radio"/>	pico_bs40460358.sh	Script	4.0.4603.58
<input type="radio"/>	web.rc	Web Resource	4.0.4603.58
<input type="radio"/>	BS-Def.xml	Defaults	4.0.4603.58
<input type="radio"/>	BS-Val-Cdc.xml	CDC	3.1.4603.54
<input type="radio"/>	BS-Val-Unique.xml	UV	
<input type="radio"/>	BS-Gui.xml	GUI	4.0.4603.58

Send selected file(s) to the FTP Server URL.
 Copy selected file to secondary bank, note that matching secondary file must be erased first.
 Copy Primary bank files to secondary bank

2. Update the required parameters in the Pane table according to the following descriptions.

Field	Description
Name	SW Component Name (e.g. Base Station -GUI, etc.)
Type	Type of the SW component. Values: Package, Application, VxWorks, Blob, Script, Web Resource, Defaults, CDC, Regulation, UV, GUI
Version	SW Component Version

3. Click one of the buttons:
 - **Upload File** - Send selected files to the specified URL
 - **Copy File** - Copy selected file to secondary.
 - **Copy Dir** - Copy main zone files to secondary zone.

4.5.5 Managing Secondary Software Version Files

This pane provides options for uploading selected Secondary software version files to a specified URL and for removing selected files.

To access the Secondary Bank (Version) pane

1. Click the **Admin** menu option and then the **SW Upgrade** sub-menu option. From the **SW Upgrade** sub-menus choose **Secondary Bank**. The SW Secondary Bank Components pane is displayed.

Secondary Components
This page contains information of the Secondary Bank components

Legend:
(*) - requires reboot
(*) - requires service restart

Secondary Components Table

	Name	Type	Version
<input type="radio"/>	pico_appb31460354.Z.out	Application	3.1.4603.54
<input type="radio"/>	pico_vxWorks31460354.Z	VxWorks	3.1.4603.54
<input type="radio"/>	pico_bs31460354.sh	Script	3.1.4603.54
<input type="radio"/>	web.rc	Web Resource	3.1.4603.54
<input type="radio"/>	BS-Def.xml	Defaults	3.1.4603.54
<input type="radio"/>	BS-Val-Cdc.xml	CDC	3.1.4603.54
<input type="radio"/>	BS-Val-Unique.xml	UV	
<input type="radio"/>	BS-Gui.xml	GUI	3.1.4603.54

Send selected file(s) to the FTP Server URL.

Delete selected file(s) from secondary bank

Delete all secondary bank files.

2. Update the required parameters in the Pane table according to the following descriptions.

Field	Description
Name	SW Component Name (e.g. BSP, CPLD)
Type	Type of SW component. Values: Package, Application, VxWorks, Blob, Script, Web Resource, Defaults, CDC, Regulation, UV, GUI
Version	SW Component Version

3. Click one of the buttons:
 - **Upload File** - Send selected files to the specified URL
 - **Delete File** - Delete selected file from the secondary storage.
 - **Delete Directory** - Delete all secondary files.

4.5.6 Upgrade from Version 3.0.4602.yy

This procedure consists of the following steps:

1. Automatically loading a set of files as a package to the secondary directory
2. Running the version and verifying unit operation.
3. Setting the version to run from the Main directory.

4.5.6.1 Loading the New Version to the Secondary Directory

1. Configure FTP server from which the new software file will be downloaded:
 - From the **Admin** menu, select **SW Upgrade** and choose **FTP Server**.

The screenshot shows the 'FTP Server Properties' configuration page. The left sidebar has 'FTP Server' selected under 'SW Upgrade'. The main content area has the following fields:

Server IP Address	192.168.10.210
Directory	.
User Name	bs
Password	bs

An 'Apply' button is located at the bottom of the form.

- Type the IP of the FTP server.
 - Type the directory on which the software file is stored
 - Type your FTP Server User Name and Password.
 - Click **Apply**.
2. Download the files to the Secondary Directory by doing the following:
 - In the left pane, under **SW Upgrade**, click **Downloads**.

The screenshot shows the 'Downloads' configuration page. The left sidebar has 'Downloads' selected under 'SW Upgrade'. The main content area has the following fields:

File Type	Package
File Name	

A 'Download' button is located at the bottom of the form.

- Select the **File Type** as **Package**.
- Click **Download** to begin the process.

3. Verify that the downloaded version is saved into the Secondary Directory:

- Under **SW Upgrade**, choose **Secondary Bank**.

The screenshot shows the BS management interface. At the top right, there are status indicators: STATUS (Operational), DOWNLINK (0.00 Mb/s), ALARMS (0), REGISTERED (1 MS), and UPLINK (0.00 Mb/s). The left sidebar contains a navigation menu with 'Secondary Bank' highlighted in red. The main content area is titled 'Secondary Components' and contains a table of software components.

	Name	Type	Version
<input type="checkbox"/>	pico_appb31460354.Z.out	Application	3.1.4603.54
<input type="checkbox"/>	pico_vxWorks31460354.Z	VxWorks	3.1.4603.54
<input type="checkbox"/>	pico_bs31460354.sh	Script	3.1.4603.54
<input type="checkbox"/>	web.rc	Web Resource	3.1.4603.54
<input type="checkbox"/>	BS-Def.xml	Defaults	3.1.4603.54
<input type="checkbox"/>	BS-Val-Cdc.xml	CDC	3.1.4603.54
<input type="checkbox"/>	BS-Val-Unique.xml	UV	
<input type="checkbox"/>	BS-Gui.xml	GUI	3.1.4603.54

Below the table, there are three buttons: 'Upload File' (Send selected file(s) to the FTP Server URL), 'Delete File' (Delete selected file(s) from secondary bank), and 'Delete Directory' (Delete all secondary bank files).

- Under **Secondary Components Table**, verify that the software components are downloaded to the Secondary directory.

4.5.6.2 Running the New Software Version

Run the Secondary software version:

- Under **SW Upgrade**, choose **SW Properties**.

The screenshot shows the Base Station (BS) web interface. At the top right, there are status indicators: STATUS (Operational), DOWNLINK (0.00 Mb/s), ALARMS (0), REGISTERED (1 MS), and UPLINK (0.00 Mb/s). The left sidebar contains a navigation menu with 'SW Properties' highlighted in red. The main content area is titled 'SW Properties' and contains a table of software information:

Current Active Bank	Primary
Primary SW Version	4.0.4603.58
Primary CDC	BS-Val-Cdc.xml
Primary UV	BS-Val-Unique.xml
Secondary SW Version	3.1.4603.54
Secondary CDC	BS-Val-Cdc.xml
Secondary UV	BS-Val-Unique.xml
Service State	Start

Below the table, there are three buttons: 'Run Secondary' (circled in red), 'Set As Primary', and 'Reboot'. The 'Run Secondary' button has a tooltip that reads: 'Reboot device and load SW from secondary bank.' The 'Set As Primary' button has a tooltip: 'Set current SW bank as Primary'. The 'Reboot' button has a tooltip: 'Reboot Device and load SW from Primary Bank.' There is also a 'Factory Defaults' button with a tooltip: 'Restore Factory Defaults and Reboot Device'.

- Click **Run Secondary**. The Base Station will reset and the Secondary files will be loaded. This will take about 2 minutes.

4.5.6.3 Setting the Version to Run from the Primary Directory

Click **Set as Primary**. The software files will run from the Primary directory.

The screenshot shows the 'BS SW Properties' configuration page. At the top right, there are status indicators for 'STATUS' (Operational), 'DOWNLINK' (0.00 Mb/s), 'REGISTERED' (1 MS), 'UPLINK' (0.00 Mb/s), and 'ALARMS' (0). A legend indicates that '(R)' requires a reboot and '(*)' requires a service restart. The main content area displays a table of SW properties:

Property	Value
Current Active Bank	Primary
Primary SW Version	4.0.4603.58
Primary CDC	BS-Val-Cdc.xml
Primary UV	BS-Val-Unique.xml
Secondary SW Version	3.1.4603.54
Secondary CDC	BS-Val-Cdc.xml
Secondary UV	BS-Val-Unique.xml
Service State	Start

Below the table are four buttons with their respective descriptions:

- Run Secondary**: Reboot device and load SW from secondary bank.
- Set As Primary**: Set current SW bank as Primary. (This button is circled in red in the image.)
- Reboot**: Reboot Device and load SW from Primary Bank.
- Factory Defaults**: Restore Factory Defaults and Reboot Device.

The Software Upgrade procedure is now complete.

4.6 GPS Settings

The Base Station is set up by default, to operate with GPS. This section provides instructions on disabling the GPS for troubleshooting purposes or for lab operation conditions.

To access the GPS Info and Settings pane

1. Click the **Admin** menu option and then the **GPS** sub-menu option. From the **GPS** sub-menus choose **Info and Settings**. The GPS Info and Settings pane is displayed.

GPS Info and Settings
This page contains GPS Settings and Information

Current GPS HW support mode	ON
Configured GPS HW support mode (!)	ON
Current Link State	Auto
Configured Link State (*)	Start
GPS Stop Tx mode	False
GPS Time	THU JAN 01 17:28:13 UTC 1970
Synchronization state	Not Sync
Latitude [Degree]	0.000000
Longitude [Degree]	0.000000
Height [Meter]	0.000000

Satellite Table

Satellite ID	Receive Power [dBHz]
--------------	----------------------

Apply

2. To disable (or re-enable) the GPS, set the GPS HW Support mode and click **Apply**:
 - OFF - used in special cases. System does not attempt to synchronize with GPS. For example, for maintenance, or installations with a single Base Station. Or in cases where GPS is not relevant and we do not want device to continuously attempt to synchronize.
 - ON – normal operation.
3. To troubleshoot or for maintenance, use the Link State option – used for troubleshooting or for turning off Tx during maintenance. (Values: Stop, Start, Auto)
 - Auto – Default. Transmission is codependent on GPS and cannot be interrupted. Tx is stopped only if GPS is not synchronized (not controlled by user).
 - Start and Stop – used to start and stop Tx.
4. Set the GPS Stop Tx mode - Determine if the Base Station will continue transmitting after hold over.
 - False – off. Default.
 - True – on. Base Station continues transmitting after hold-over.

5. The remaining parameters are read-only and provide information on the GPS status and location.

5 QoS Management

NOTE: The QoS capabilities are only relevant for *Standalone* configuration. In ASN-GW mode, QoS management is performed through the ASN-GW.

By default, Subscriber Stations (SS) are assigned a Best Effort (BE) service profile for the UL and DL channels. Only the maximum bandwidth can be configured for the default service profile.

In addition, any SS can be assigned a number of user defined uplink and downlink Service Flows (SF) that together make up the service profile corresponding to the QoS requirements of that SS.

For example, a profile can consist of the following service flows: a flow matching VoIP needs, another matching video conferencing needs and a third matching web browsing needs.

The service flows are defined and allocated as SS profiles through the **Subscribers** set of screens.

5.1 QoS Definition Flow

The steps below summarize the procedure for defining SFs and assigning them to SSs (as a QoS profile):

1. Define a set of Service Flows (SFs) for the UL and for the DL.
2. For each SF define the relevant attributes: Classification-Rule-Priority, Scheduling, Min and Max rates, Latency, etc.
3. For each defined SF, you may define relevant classifiers. These are used to determine the traffic to which this rule (SF) will be applied.

The traffic can be defined according to the source of traffic or according to the type or any (logical OR) combination: DSCP range, port range, IP address source or destination, etc.
4. Define the MAC address of the SS to which the SFs will be assigned.
5. Define a QoS profile to the selected SS by assigning it the relevant Service Flows.

Note: For every SF change, it is required to perform service-restart to any CPE to which that SF has been allocated.

5.2 Defining Service Flow(s)

Any number of service flows can be defined for the uplink and for the downlink. The Service Flows are defined via the **Unicast Services Setting** screen.

5.2.1 The Unicast Service Pane

The Unicast Service Settings pane is used to define a pool of Service Flows, where each flow can be assigned a range of attributes. Selected SFs are then assigned to defined Subscriber Stations to create SS specific profiles.

To access the Unicast Services pane

Click the **Subscribers** menu option, from the Subscribers sub-menus choose **Services**. The **Unicast Services Settings** pane appears.

The pane lists the two default SFs and provides options adding more SFs.

The following operation buttons are available:

- **Apply** – implements changes on the selected row.
- **Classifiers** – invokes classifier-definition-screen (relevant to the selected row).
- **Provisioned SS** – shows the SS associated with the selected SF.

Unicast Services Settings
 This page contains unicast services settings. Any change here requires re-network entry in order to take affect
 Legend:
 (!) - requires reboot
 (*) - requires service restart

USF Table

	SF ID	Classifier Rule Priority	SF Name	Direction	Scheduling Service	Applicable Bas
<input type="radio"/>	1	0	Default ISF UL	UL	BE	All Users
<input type="radio"/>	2	0	Default ISF DL	DL	BE	All Users
<input type="radio"/>	3	1	SF-A UL	UL	nRT	Registration Base
<input type="radio"/>	4	4	SF-A DL	DL	BE	Registration Base
<input type="radio"/>	5	5	SF-B UL	UL	UGS	Registration Base
<input type="radio"/>	6	7	SF-B DL	DL	eRT	Registration Base

Default SFs (rows 1 and 2)

Example: SF-A defined (rows 3 and 4)

Click to add SF (button below table)

Scroll to view more attributes (vertical scrollbar on the right)

Buttons below table:
 Apply
 Classifiers Configure Classifiers Settings
 Provisioned SS Configure Preprovisioned SS List per SF

Working with the Unicast Service Settings pane

- The top two rows display the default (BE) UL and DL Service Flows and their attributes. Only the Max BW value can be modified for the default SFs.
- Up to 30 rows can be added (by clicking the '+' sign).
- Each SS can be assigned up to 4 SFs
- To add a Service Flow, click the (+) sign at the bottom of the table, define the parameters and click **Apply**.
- To delete a Service Flow – select the radio-button in the relevant row and click the (-) sign at the bottom of the table.
- After performing any change in SF definition, the CPE is required to re-access the network for changes implementation.

5.2.2 Defining Service Flows

The default SF do not provide QoS to the Subscriber Station. QoS is only provided by assigning the SS a profile based on the user defined Service Flows. This section describes how to define SFs and the available attributes.

To define a Service Flow

1. Click the **Subscribers** menu option, from the Subscribers sub-menus choose **Services**. The **Unicast Services Settings** pane appears.

Unicast Services Settings

This page contains unicast services settings. Any change here requires re-network entry in order to take affect

Legend:
 (1) - requires reboot
 (*) - requires service restart

USF Table

	SF ID	Classifier Rule Priority	SF Name	Direction	Scheduling Service	Applicable Bas
<input type="radio"/>	1	0	Default ISF UL	UL	BE	All Users
<input type="radio"/>	2	0	Default ISF DL	DL	BE	All Users
<input type="radio"/>	3	1	SF-A UL	UL	nRT	Registration Base
<input type="radio"/>	4	4	SF-A DL	DL	BE	Registration Base
<input type="radio"/>	5	5	SF-B UL	UL	UGS	Registration Base
<input checked="" type="radio"/>	6	7	SF-B DL	DL	eRT	Registration Base

Configure Classifiers Settings

Configure Preprovisioned SS List per SF

2. Add an SF (row) by clicking the (+) sign.
3. Configure the SF attributes according to the descriptions in the following table and then click **Apply**.

Note: If Classifiers are to be assigned, click the **Classifiers** button AFTER clicking **Apply**.

Field	Description																		
SF ID	Read only. Service Flow ID automatically provided by the system after applying the changes.																		
Classification Rule Priority	Classification rule priority: 0 to 255 The Priority Level determining how the SF data will be classified. The same priority can be assigned to an UL and to a DL SF. The Classification Rule Priority must be unique for each SF UL or SF DL. This parameter is related to the selected classifier.																		
SF Name	User assigned unique name identifying the Service Flow. The name should include the SF direction (UL or DL).																		
Direction	Direction to which SF is assigned - Downlink or Uplink																		
Scheduling Service	Service Scheduling Flows supported by WiMAX. <table border="1"> <thead> <tr> <th>Service Flow Designation</th> <th>Defining QoS Parameters</th> <th>Application Examples</th> </tr> </thead> <tbody> <tr> <td>UGS - Unsolicited Grant Services</td> <td>Maximum sustained rate Maximum latency tolerance Jitter tolerance</td> <td>Voice over IP (VoIP) without silence suppression</td> </tr> <tr> <td>RT – Real-Time Polling service</td> <td>Minimum reserved rate Maximum sustained rate Maximum latency tolerance Traffic priority</td> <td>Streaming audio and video, MPEG (Motion Picture Experts Group) encoded</td> </tr> <tr> <td>nRT – Non-Real-Time Polling service</td> <td>Minimum reserved rate Maximum sustained rate Traffic priority</td> <td>File Transfer Protocol (FTP)</td> </tr> <tr> <td>BE – Best-effort service</td> <td>Maximum sustained rate Traffic priority</td> <td>Web browsing, data transfer</td> </tr> <tr> <td>eRT – Extended-Real-Time Polling service</td> <td>Minimum reserved rate Maximum sustained rate Maximum latency tolerance Jitter tolerance Traffic priority</td> <td>VoIP with silence suppression</td> </tr> </tbody> </table>	Service Flow Designation	Defining QoS Parameters	Application Examples	UGS - Unsolicited Grant Services	Maximum sustained rate Maximum latency tolerance Jitter tolerance	Voice over IP (VoIP) without silence suppression	RT – Real-Time Polling service	Minimum reserved rate Maximum sustained rate Maximum latency tolerance Traffic priority	Streaming audio and video, MPEG (Motion Picture Experts Group) encoded	nRT – Non-Real-Time Polling service	Minimum reserved rate Maximum sustained rate Traffic priority	File Transfer Protocol (FTP)	BE – Best-effort service	Maximum sustained rate Traffic priority	Web browsing, data transfer	eRT – Extended-Real-Time Polling service	Minimum reserved rate Maximum sustained rate Maximum latency tolerance Jitter tolerance Traffic priority	VoIP with silence suppression
Service Flow Designation	Defining QoS Parameters	Application Examples																	
UGS - Unsolicited Grant Services	Maximum sustained rate Maximum latency tolerance Jitter tolerance	Voice over IP (VoIP) without silence suppression																	
RT – Real-Time Polling service	Minimum reserved rate Maximum sustained rate Maximum latency tolerance Traffic priority	Streaming audio and video, MPEG (Motion Picture Experts Group) encoded																	
nRT – Non-Real-Time Polling service	Minimum reserved rate Maximum sustained rate Traffic priority	File Transfer Protocol (FTP)																	
BE – Best-effort service	Maximum sustained rate Traffic priority	Web browsing, data transfer																	
eRT – Extended-Real-Time Polling service	Minimum reserved rate Maximum sustained rate Maximum latency tolerance Jitter tolerance Traffic priority	VoIP with silence suppression																	
Applicable Base	Determines the group of subscribers to which the SF will be assigned. Registration Base - assigns the SF to the explicitly configured (registered) SS. All Users - this SF will be applied to all subscribed SSs. Select this option to set this as the default profile.																		
Min Rate [Kbits/sec]	Minimum bandwidth rate for this SF.																		

Max Rate [Kbits/sec]	Maximum rate for this SF. A value of '0' provides unlimited rate.
Max Latency [μ sec] (UGS, RT, eRT)	Relevant only for UGS, RT and eRT. A value of '0' does not put a limit on latency. Maximum Latency (delay) for this SF. Set value according to the type of service (i.e. <100ms for Voice and Video applications).
Unsolicited Grant [μ sec] Interval (UGS, eRT)	Relevant if the UGS – UGI - TBD A value of '0' provides unlimited UGI.
Tolerated Jitter (UGS only) [μ sec]	the UGS tolerated jitter parameter.... A value of '0' does not put a limit on jitter.
Unsolicited Polling Interval (RT, nRT) [μ sec]	The maximal nominal interval between successive polling grants opportunities for this Service Flow, especially used for silence period of VoIP traffic with silence suppression.
Has Classifiers	Read only. Displays whether or not this SF is assigned Traffic Classifiers. Values: [True, False] To configure the SF Classifiers see 5.2.2.2.

4. If required, define the Traffic classifiers according to the following section.
5. Reset the SS-Base Station connectivity:

Resetting the connection of a single SS (in case the SF is applied on a *Registration Base*):

- Click the **Subscribers** menu option. Choose the **Subscriber Management** sub-menu and then the **Registered SS**.
- In the displayed **Registered SS Information** pane select the radio button of the requested SS and click the **Deregister** button.

Resetting the connection of all registered SSs (in case the SF is applied to *All Users*):

- Click the **Quick Start** menu option.
- In the displayed **Quick Start** pane click the **Stop Service** button, and then click the **Start Service** button.

5.2.2.1 Bandwidth Latency and Jitter Guidelines

Class	Application	Bandwidth Guideline		Latency Guideline	Jitter Guideline
4	Web Browsing & Instant Messaging	Moderate	10 kbps to 2 Mbps	N/A	N/A
5	Media Content Downloads	High	> 2 Mbps	N/A	N/A

Class	Application	Bandwidth Guideline		Latency Guideline		Jitter Guideline	
1	Multiplayer Interactive Gaming	Low	50 kbps	Low	< 25 msec	N/A	
2	VoIP & Video Conference	Low	32 to 64 kbps	Low	< 160 msec	Low	<50 msec
3	Streaming Media	Low to High	5 kbps to 2 Mbps	N/A		Low	<100 msec

5.2.2.2 Defining Traffic Classifiers for the SF

The Unicast Classifier pane is used to select the traffic to which the SF will be applied. The traffic can be selected according to various parameter types: traffic source and destination, DSCP and IP protocol.

Up to four classifiers can be defined for each SF where the data is analyzed according to each of the classifiers (logical 'OR') assigned to the SF. Each classifier consists of either one or two filtering values (e.g. traffic source from a specific IP address and a specific Port, DSCP range of traffic type, etc.), where the classifier is defined according to both (logical 'AND').

To define Unicast SF Classifiers

1. (If you are not already in the Unicast Services pane), access the **Unicast Services** pane (by clicking the **Subscribers** menu option and choosing **Services** from the sub-menu).
2. Select the relevant SF row and click the **Classifiers** button. The **Unicast SF Classifiers** screen appears.

Unicast SF classifiers

Classification rules determine which SF the traffic will use. Classification can be done at different protocol levels. Each row describes a rule (or optionally a pair of rules with logical AND between them). It's possible to define up to 4 rows. The logical relation between the rows is OR.

Legend:
(R) - requires reboot
(*) - requires service restart

SFID

USF Classifiers Table						
Index	Classifier Type 1	Classifier Value 1	And	Classifier Type 2	Classifier Value 2	
1	MAC src	11:22:33:44:55:66/48	And	Port src	1230-1250	
2	DSCP	13:57:0X3F	And	IP protocol	6	
+ -						

The following operation buttons are available:

- **Apply** – used to apply changes to selected classifier
 - **Back** – go back to the SF screen (to choose another SF).
3. Click the '+' sign to add a new row.
 4. Update the required parameters in the Pane table according to the following descriptions and click **apply** to implement the changes *for each row*.

NOTE: Once the classifier for the SF has been defined, the SF configuration is complete and the SF can be assigned to the desired SSs.

The following table provides a description of the Classifier types and values. The Type and Values are the same for Classifier 1 and for Classifier 2.

Field	Description																
Index	Read Only. Unique number, assigned by the system after applying the changes.																
Classifier Type 1/2	<p>Type of traffic classifier.</p> <p>Values:</p> <ul style="list-style-type: none"> None MAC src MAC dest IP src IP dest Port src Port dest DSCP IP protocol <p>DSCP Range Mask (DSCP field, providing differentiated services codepoint.) The DSCP is actually the first six-bits of the TOS (Type of Service) byte of the IP packet header)</p> <p>MAC address (Source/Destination);</p> <p>IP address (Source/Destination);</p> <p>Port Range (Source/Destination);</p> <p>IP Protocol (IP header field determining the protocol (TCP/ UDP/...))</p>																
Classifier Value 1/2	<p>The specific traffic-classification value, in accordance to the Classifier Type 1 field. Below are descriptions and examples of values according to the classifier type:</p> <table border="1"> <thead> <tr> <th><i>For.... (Classifier Type)</i></th> <th><i>Classifier Value Description</i></th> <th><i>Classifier Value Example</i></th> <th><i>Comment</i></th> </tr> </thead> <tbody> <tr> <td>MAC (src/dest)</td> <td>MAC/Mask</td> <td>11:22:33:44:55:66/48</td> <td>/Mask is optional</td> </tr> <tr> <td>IP address (src/dest)</td> <td>IP/Mask</td> <td>192.168.1.1/32</td> <td>/Mask is optional</td> </tr> <tr> <td>Port Range (src/dest)</td> <td>port range</td> <td>1230-1250</td> <td></td> </tr> </tbody> </table>	<i>For.... (Classifier Type)</i>	<i>Classifier Value Description</i>	<i>Classifier Value Example</i>	<i>Comment</i>	MAC (src/dest)	MAC/Mask	11:22:33:44:55:66/48	/Mask is optional	IP address (src/dest)	IP/Mask	192.168.1.1/32	/Mask is optional	Port Range (src/dest)	port range	1230-1250	
<i>For.... (Classifier Type)</i>	<i>Classifier Value Description</i>	<i>Classifier Value Example</i>	<i>Comment</i>														
MAC (src/dest)	MAC/Mask	11:22:33:44:55:66/48	/Mask is optional														
IP address (src/dest)	IP/Mask	192.168.1.1/32	/Mask is optional														
Port Range (src/dest)	port range	1230-1250															

Field	Description															
	DSCP Range Mask	toslow:toshigh:tosmask (range of TOS values followed by the TOS mask)	13:57:0x3F	<table border="1"> <tr> <td>0</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Precedence</td> <td>D</td> <td>T</td> <td>R</td> <td></td> <td></td> </tr> </table> <p>3 bits: IP precedence bits value: 0-7, Indicate datagram importance. Default - 0 (higher is better).</p> <p>Bits 3,4,5: Values: D,T,R requesting: low delay, high throughput, high reliability</p>	0	1	2	3	4	5	Precedence	D	T	R		
0	1	2	3	4	5											
Precedence	D	T	R													
	IP Protocol	IP Protocol	6	6 is TCP range:0-255												

5. Reset the SS- Base Station connectivity:

Resetting the connection of a single SS (in case the SF is applied on a *Registration Base*):

- Click the **Subscribers** menu option. Choose the **Subscriber Management** sub-menu and then the **Registered SS**.
- In the displayed **Registered SS Information** pane select the radio button of the requested SS and click the **Deregister** button.

Resetting the connection of all registered SSs (in case the SF is applied to *All Users*):

- Click the **Quick Start** menu option.
- In the displayed **Quick Start** pane click the **Stop Service** button, and then click the **Start Service** button.

5.3 QoS Assignment to Subscribers

After defining the pool of SFs (e.g. for UL A, DL A, UL B, DL B...), these SFs can be assigned to specific SSs according to QoS requirements.

To do so, define the MAC address of the SSs in the Pre-Provisioned SS screen, and then assign it the relevant SFs.

After assigning the SFs to a SS, Re-set the connection between the SS and the SF.

Note: Re-setting the connection between the SS and the Base Station is required when applying any change to an SF that is allocated to that SS.

This section details the required steps for assigning the defined SFs to specific SSs.

5.3.1 Assigning Service Profiles to Subscriber Stations

Subscriber Stations (SS) can be assigned a number of (pre-defined) Service Flows (SFs), where the combined SFs serve to create the Service Profile for the SS.

To access the Pre-Provisioned SS pane

1. Click the **Subscribers** menu option and from the **Subscriber Management** sub-menu option choose **Pre-Provisioned SS**. The Pre-Provisioned SS pane appears.

Pre-Provisioned SS

This page contains pre-provisioned SS Settings

Legend:
(r) - requires reboot
(*) - requires service restart

	MAC Address	Static MCS
<input type="checkbox"/>	11:00:00:00:00:00	Default
<input type="checkbox"/>	12:00:00:00:00:00	Default
<input type="checkbox"/>	13:00:00:00:00:00	Default
<input type="checkbox"/>	08:08:03:04:05:06	Default

Click to add an SS MAC address

Apply

USF Settings pressing that button opens unicast services settings window for that CPE

2. To add Subscriber Stations to the list:
 - Click the '+' sign. A row is added.
 - Enter the SS MAC Address. The Static MCS (CPE Specific Configuration) will be displayed.
 - Click **Apply**.
 - Repeat the procedure for any additional SS to be added to the list.

(To Remove the last row click the ‘-’ sign. To remove a selected row, mark that row and click the ‘-’ sign.

- To assign a service profile to an SS in the list:

Check the radio-button for the first SS to be assigned QoS and click the **USF Settings** operation button. The following screen appears.

Unicast SF Registration status
 This page contains USF registration status for specific SS.

Legend:
 (!) - requires reboot
 (*) - requires service restart

MSID: 22:33:44:55:66:77

Pre-Provisioned SS USF Table

SF ID	SF Name	Direction	Type of Service	Registration Status
<input type="radio"/> 1	Default ISF UL	UL	BE	All Users
<input type="radio"/> 2	Default ISF DL	DL	BE	All Users
<input checked="" type="radio"/> 3	SF-A UL	UL	UGS	Registered
<input type="radio"/> 4	SF-A DL	DL	nRT	Registered

Subscribe: Subscribe to Selected SF
 UnSubscribe: UnSubscribe from Selected SF
 Back

The screen provides the following interfaces:

- MAC address of the selected SS
- List of the available Service Flows
- Operation buttons for assigning and disassociating service flows from a SS

The following operation buttons are available:

- **Subscribe** – used to assign the selected SF to the SS
- **Unsubscribe** – used to disassociate the selected SF from the SS
- **Back** – go back to the Pre-Provisioned SS screen (to choose another SS).

- Select an SF row, and click the **Subscribe** button. The SF is assigned to the SS.
- Reset the SS- Base Station connectivity:

Resetting the connection of a single SS (in case the SF is applied on a *Registration Base*):

- Click the **Subscribers** menu option. Choose the **Subscriber Management** sub-menu and then the **Registered SS**.
- In the displayed **Registered SS Information** pane select the radio button of the requested SS and click the **Deregister** button.

Resetting the connection of all registered SSs (in case the SF is applied to *All Users*):

- Click the **Quick Start** menu option.
 - In the displayed **Quick Start** pane click the **Stop Service** button, and then click the **Start Service** button.
6. Repeat the above procedure to assign additional SFs to the SS as required.

5.4 Monitoring and Maintaining Registered SSs Connections

This pane displays a table summarizing the registered SS units basic operation information, and provides basic maintenance operation buttons.

To access the SS Lists pane

1. Click the **Subscribers** menu option and then the **Subscriber Management** sub-menu option. Choose **Registered SS** sub menu. The Registered SS Information pane is displayed.

Registered SS Information
This page contains information on registered SS

Number of Registered SS devices (0..1000)

SS Table

	MS ID	Connections	State	Basic CID
<input type="radio"/>	00:ED:04:A5:10:01	3	Operational	272

SS connection table will be opened.

SS capabilities table will be opened.

SS security context table will be opened.

SS UL Statistics page will be opened.

SS DL Statistics page will be opened.

SS RF Statistics page will be opened.

BS shall send Dereg request to the SS and delete SS from his lists.

2. The following information is available:

Field	Description										
Number of Registered SS devices	Range [0,1000]										
SS Table	The displayed table provides the following information for each SS:										
	<table border="1"> <thead> <tr> <th>Field</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>MS ID</td> <td>MAC Address of SS</td> </tr> <tr> <td>Connections</td> <td>Number of DL & UL connections, associated with that MSID</td> </tr> <tr> <td>State</td> <td>SS Operation state. Values: init, DL Synchronization, Handover DL acquisition, UL Acquisition, Ranging, Handover ranging, Capabilities negotiation, Authorization, Registration, DHCP, TOD, TFTP, Operational, Sleep, IDLE, Aborted</td> </tr> <tr> <td>Basic CID</td> <td></td> </tr> </tbody> </table>	Field	Description	MS ID	MAC Address of SS	Connections	Number of DL & UL connections, associated with that MSID	State	SS Operation state. Values: init, DL Synchronization, Handover DL acquisition, UL Acquisition, Ranging, Handover ranging, Capabilities negotiation, Authorization, Registration, DHCP, TOD, TFTP, Operational, Sleep, IDLE, Aborted	Basic CID	
	Field	Description									
	MS ID	MAC Address of SS									
	Connections	Number of DL & UL connections, associated with that MSID									
State	SS Operation state. Values: init, DL Synchronization, Handover DL acquisition, UL Acquisition, Ranging, Handover ranging, Capabilities negotiation, Authorization, Registration, DHCP, TOD, TFTP, Operational, Sleep, IDLE, Aborted										
Basic CID											

3. Use the available buttons to perform additional operations:

- **Connections** - SS connection hidden subtab table will be opened
- **Capabilities** – SS Capabilities hidden subtab will be opened
- **Security** – SS Security context hidden subtab will be opened
- **UL Statistics** – Provides UL Statistics
- **DL Statistics** - Provides DL Statistics
- **RF Statistics** - Provides RF Statistics
- **Deregister** – Reset the connection between the Base Station and the selected SS (Base Station shall send DEREG request to the SS and delete the SS from the lists).

6 Wireless (WiMAX) Parameters

The Wireless option includes the following sub menu options:

- Networking
- Radio and Frame
- Security
- MAC
- Diagnostics

The sub-menus' fields and operations are described below.

6.1 Network Identifiers

The Network Identifiers pane is used to define the Base Station name, unique ID and Network Access Provider ID.

To access the Network Identifiers pane

1. Click the **Wireless** menu option and then the **Wireless Admin** sub-menu option. The **Network Identifiers** pane is displayed.

Network Identifiers	
This page contains identifiers for the Wimax network	
Base Station Name	<input type="text" value="BS"/>
Current Base Station ID	<input type="text" value="00:13:D5:00:12:E5"/>
Configured Base Station ID (!)	<input type="text" value="00:00:00"/>
Current Operator ID	<input type="text" value="00:13:D5"/>
Configured Operator ID (!)	<input type="text" value="00:13:D5"/>
<input type="button" value="Apply"/>	

2. Enter the Configured Base Station Unique ID, keeping the following in mind:
 - Current Base Station Unique ID - Last 3 octets of Base Station -ID TLV as appear in NWG stage 3.
 - This ID should not be part of the MAC address, in order to allow mix of vendors.
3. Enter the Base Station Name and the Configured Operator (Network Access Provider) ID.
4. Click **Apply**.

6.2 Radio and Frame

Radio and Frame configurations and capabilities.

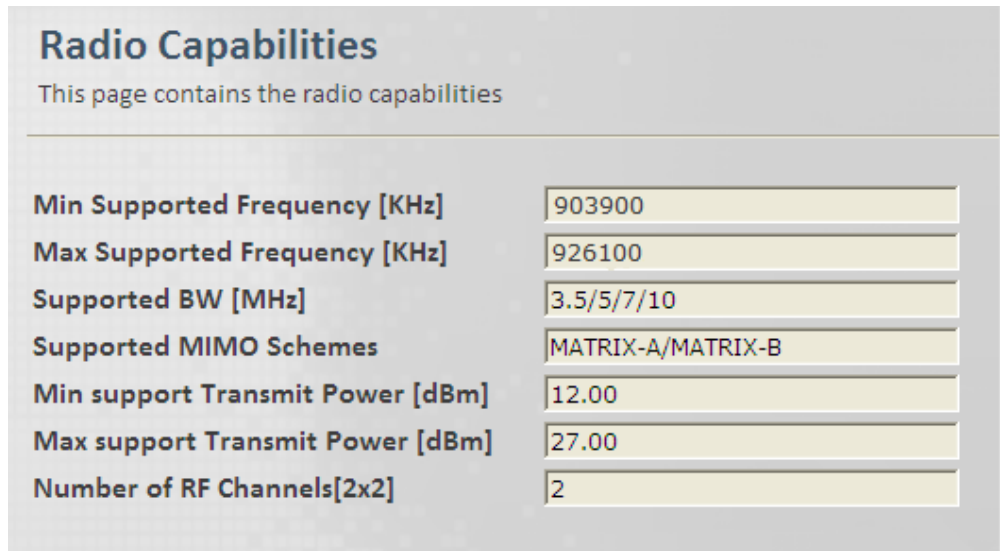
Radio configurable parameters should be set within the valid range of values. This range is determined by the specific country regulations, and in accordance to the device capabilities.

6.2.1 Radio Capabilities read Only

This pane displays the Device HW Radio configurations and capabilities.

To access the Radio Capabilities pane

1. Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **Radio Capabilities**. The Radio Capabilities pane is displayed.



Radio Capabilities	
This page contains the radio capabilities	
Min Supported Frequency [KHz]	903900
Max Supported Frequency [KHz]	926100
Supported BW [MHz]	3.5/5/7/10
Supported MIMO Schemes	MATRIX-A/MATRIX-B
Min support Transmit Power [dBm]	12.00
Max support Transmit Power [dBm]	27.00
Number of RF Channels[2x2]	2

2. The Pane displays information as follows:

Field	Description
Min / Max Supported Frequency [KHz]	Min / Max supported frequency range. Values: Min to Max, Separated by a comma. Example: 1350,1450
Supported BW [KHz]	Supported bandwidths in KHz. Values are separated by commas. Example: 5000,7000,10000
Supported MIMO Schemes	Supported MIMO schemes. Values: Matrixes separated with comma: A,B

Field	Description
Min / Max support Transmit Power [dBm]	Min / Max support Transmit Power [dbm]. Values: Min and Max separated by comma. Example: 10,36
Number of RF Channels[2x2]	Number of RF TX Channels

6.2.2 Radio Settings

This pane provides Radio parameters settings.

To access the Radio Settings pane

1. Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **Radio**. The Radio Settings pane is displayed.

Radio Settings

This page contains radio parameters settings.

Current Frequency [KHz]	<input type="text" value="915000"/>
Configured Frequency [KHz] (*)	<input type="text" value="915000"/>
Min Supported Frequency [KHz]	<input type="text" value="903900"/>
Max Supported Frequency [KHz]	<input type="text" value="926100"/>
Tx power [dBm]	<input type="text" value="12.00"/>
Min support Transmit Power [dBm]	<input type="text" value="12.00"/>
Max support Transmit Power [dBm]	<input type="text" value="27.00"/>
Initial Ranging Power (-90..111) [dBm]	<input type="text" value="-85.00"/>

RF Channels Table

RF Channel	Active	Tx Power [dBm]	Analog RSSI [mV]	Temperature	Antenna
0	True	12.09	1.76	48	Connected
1	True	12.28	1.76	48	Connected

2. Update the required parameters in the Pane according to the following descriptions and click **Apply**.

Field	Description
Frequency [KHz]	Current / Configured Frequency. This value will be in use after the next reboot or configuration flashing. Values: must be within the range of allowed frequencies (i.e. between the Min Supported Frequency and Max Supported Frequency fields – see below)
Min / Max Supported Frequency [KHz]	Min / Max frequency supported by the Base Station (read-only). Values: Min to Max separated by a comma. Example: 1350,1450
Tx power [dBm]	Tx Transmit Power Setting. Configured Tx power should be in the valid range, as determined by the regulations and the device capabilities (i.e. Min Supported Transmit Power and Max Supported Transmit Power fields, see below).
Min / Max support Transmit Power [dBm]	Min / Max supported transmission power by the Base Station (read-only). Values: Min and Max separated by a comma. Example: 10,36
Initial Ranging Power [dBm]	Maximum Initial Ranging Power. (Look for WiMAX def). If received power exceeds the maximum Initial ranging power, signal will not be accepted. Limits signal levels of third party equipment – used to minimize possible interference. Values: [-90,111]
RF Channel	RF Unit Name or ID. Values: [0,1]
Active	This Parameter sets/shows the Transmission Activation Status of the Base Station . Values: False - disabled True - enabled
Tx Power	RF unit Transmit Power (Tx) [dBm]. Values: [-50,100]
Analog RSSI	Analog RSSI level [dBm].
Temperature	RF2 Temperature [Celsius].
Antenna	Antenna Connectivity Status. Values: [Connected, Disconnected]

6.2.3 Frame

This pane provides Frame parameters settings.

To access the Frame pane

1. Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **Frame**. The Frame Settings pane is displayed.

Frame Settings
This page contains frame parameters settings.

Current Bandwidth [MHz]	10MHz
Configured Bandwidth [MHz] (*)	10MHz
Current Preamble Index	0
Configured Preamble Index (0..113) (*)	0
Current TDD split [%]	60
Configured TDD split (53..75) [%] (*)	60
Current DL Major Groups Bitmap	63
Configured DL Major Groups Bitmap (0..63) (*)	63
Current UL Subchannels bitmap	FF:FF:FF:FF:FF:FF:FF:FF
Configured UL Subchannels bitmap (!)	FF:FF:FF:FF:FF:FF:FF:FF
DCD Count	6
UCD Count	4

Apply

2. Update the required parameters in the Pane according to the following descriptions and click **Apply**.

Field	Description
Bandwidth [MHz]	<p>Configured Bandwidth.</p> <p>This value will be in use in the next service.</p> <p>Configured BW must be one of the supported BWs.</p> <p>Values:</p> <p>3.5MHz 5MHz 7MHz 10MHz</p> <p>Default: 10</p>
Preamble Index	<p>Configured Frame Preamble Index:</p> <p>Preamble Index allows the SS to perform frequency and time synchronization.</p> <p>The value should be different for neighboring Base Station.</p>

Field	Description
	Values: [0,113] Default: 0
TDD Split [%]	Current / Configured DL frame resources [%]: Ratio (in percentage) between DL and UL. Values: [53,75] Default: 66
DL Major Groups Bitmap (0..63)	Each bit 1-6 represents one Major or Minor group of DL resources (1-6 correspondingly). Note at least one major group shall be selected. Values: [0,63] Default: 63
UL Subchannels Bitmap	UL Sub-channels Bitmap
DCD Count	Downlink Channel Descriptor Count.
UCD Count	Uplink Channel Descriptor Count.

6.2.4 ARQ and HARQ

This pane provides HARQ and ARQ parameters settings for UL and DL.

To access the ARQ and HARQ pane

1. Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **ARQ and HARQ**. The ARQ and HARQ Settings pane is displayed.

Type of Service	ARQ Activation Status	HARQ Activation Status
BE	False	True
nRT	False	True
RT	False	True
eRT	False	True
UGS	False	True

Apply

2. Update the required parameters in the Pane according to the following descriptions and click **Apply**.

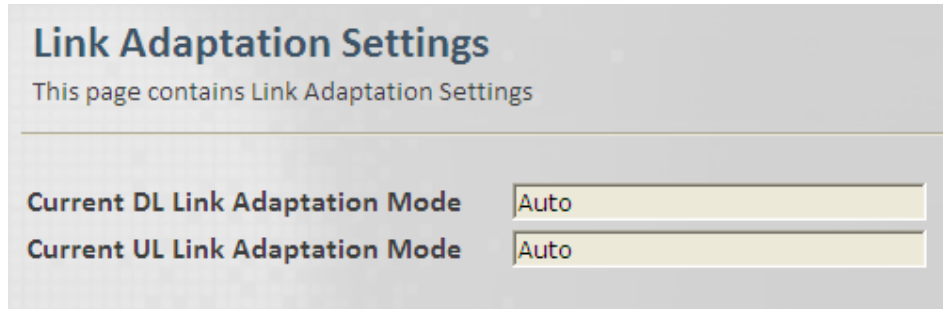
Field	Description
Type of Service	This parameter defines ARQ and HARQ per type of service when operating in local mode. Default: BE, nRT, RT, eRT, UGS
ARQ Activation Status	This parameter specifies the activation status of ARQ for local mode per type of service. Values: [False, True] Default: False, False, False, False, False
HARQ Activation Status	This parameter specifies the activation status of HARQ for local mode per type of service. Values: [False, True] Default: True, True, False, False, False

6.2.5 Link Adaptation

This is a read only pane that provides the status of the UL and DL adaptation mode.

To access the Link Adaptation pane

1. Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **Link Adaptation**. The Link Adaptation Settings pane is displayed, showing the UL and DL adaptation mode.



Link Adaptation Settings
This page contains Link Adaptation Settings

Current DL Link Adaptation Mode: Auto

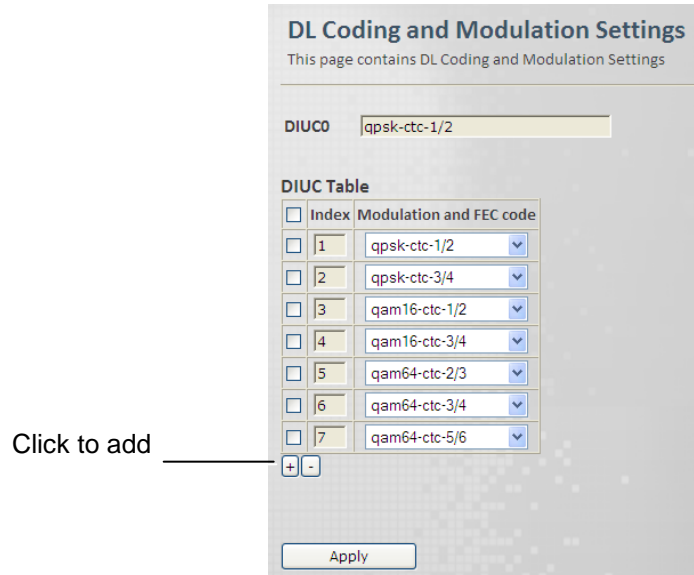
Current UL Link Adaptation Mode: Auto

6.2.6 DL Modulation

This pane provides a table with DL Coding and Modulation settings.

To access the DL Modulation pane

1. Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **DL Modulation**. The DL Coding and Modulation Settings pane is displayed.



DL Coding and Modulation Settings
This page contains DL Coding and Modulation Settings

DIUCO: qpsk-ctc-1/2

DIUC Table

<input type="checkbox"/>	Index	Modulation and FEC code
<input type="checkbox"/>	1	qpsk-ctc-1/2
<input type="checkbox"/>	2	qpsk-ctc-3/4
<input type="checkbox"/>	3	qam16-ctc-1/2
<input type="checkbox"/>	4	qam16-ctc-3/4
<input type="checkbox"/>	5	qam64-ctc-2/3
<input type="checkbox"/>	6	qam64-ctc-3/4
<input type="checkbox"/>	7	qam64-ctc-5/6

Click to add → + -

Apply

2. To Add a row (max 11 rows) to the table click the '+' sign. To Remove the last row click the '-' sign. To remove a selected row, mark the row and click the '-' sign.

- Update the required parameters in the Pane table according to the following descriptions and click **Apply**.

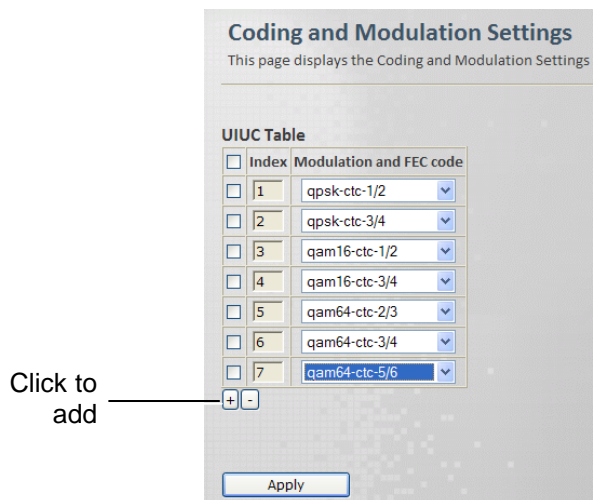
Field	Description
Index	DIUC Index Table Index is for: 0 - IUC 0 1 - IUC 1 2 - IUC 2 : 12- IUC 12 Values: [0,11] Default: 0
Modulation and FEC code	Values: qpsk-ctc-1/2 qpsk-ctc-3/4 qam16-ctc-1/2 qam16-ctc-3/4 qam64-ctc-2/3 qam64-ctc-3/4 qam64-ctc-5/6

6.2.7 UL Modulation

This pane provides a table with UL Coding and Modulation settings.

To access the UL Modulation pane

- Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **UL Modulation**. The UL Coding and Modulation Settings pane is displayed.



- To Add a row (max 11 rows) to the table click the '+' sign. To Remove the last row click the '-' sign. To remove a selected row, mark the row and click the '-' sign.

- Update the required parameters in the Pane table according to the following descriptions and click **Apply**.

Field	Description
Index	UIUC Index Table Index is: 0- IUC 0 (FFB) 1- IUC 1 2- IUC 2 : 10- IUC 10 Values: [0,11] Default: 0
Modulation and FEC code	Values: qpsk-ctc-1/2 qpsk-ctc-3/4 qam16-ctc-1/2 qam16-ctc-3/4 qam64-ctc-2/3 qam64-ctc-3/4 qam64-ctc-5/6

6.2.8 DL Zones

This pane provides DL Zone settings.

To access the DL Zones pane

- Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **DL Zones**. The DL Zone Settings pane is displayed.

DL Zone Settings

This page contain DL Zones settings

Legend:
(!) - requires reboot
(*) - requires service restart

Mandatory Zone Minimal Duration in [slots] (2..100) (*)

Mandatory Zone Maximal Duration in [slots] (4..100) (*)

Mandatory Zone Permutation Type (*)

Proceeding DL Zones Table (*)

Zone ID	Min slots	Max slots	Permutation	MIMO Config	PRBS ID	Perm Base	Use All SubChannels
<input type="radio"/> 1	<input type="text" value="1"/>	<input type="text" value="100"/>	<input type="text" value="PUSC"/>	<input type="text" value="MIMO A"/>	<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="False"/>

Click to add

- To Add a row to the table click the '+' sign. To Remove the last row click the '-' sign. To remove a selected row, mark the row and click the '-' sign.
- Update the required parameters in the Pane table according to the following descriptions and click **Apply**.

Field	Description
Mandatory Zone Minimal Duration in [slots]	Minimal Zone Duration in [slots]. Must not exceeds DL/UL ratio. Values: [4,100] Default: 4
Mandatory Zone Maximal Duration in [slots]	Maximal Zone Duration in [slots] Must be greater or equal to: Min-Number-Of-Slots-In-Time-Axis Values: [4,100] Default: 4
Mandatory Zone Permutation Type	Permutation Type: a label showing the permutation type of Zone 0. Values: PUSC FUSC Default: PUSC
Zone ID	Zone ID Values: [0,10] Default: 1
Min slots	Minimal duration in slots. Must not exceeds DL/UL ratio. Values: [0,100] Default: 0
Max slots	Maximal duration in slots. Must be greater or equal to of that zone: Min-Number-Of-Slots-In-Time-Axis. Values: [0,100] Default: 100
Permutation	Permutation Type (Base) Values: 0 - PUSC 1 - FUSC 2 – AMC Default: PUSC
MIMO Config	MIMO Configuration Values: SISO MIMO A MIMO B Default: MIMO A

Field	Description
PRBS ID	Pseudo random bit sequence (PRBS). Determines carrier and pilot position. Values: [0,2] Default: 0
Perm Base	The permutation base (PermBase) is used together with the WiMAX physical layer profile to compute the subcarrier-to-sub-channel map used by a given cell. Values: [0,31] Default: 0
Use all Sub Channels	Use All Sub Channels (Disable sub channels rotation). Values: True/False Default: False

6.2.9 Feedback Channel

This pane provides CQICH setting options.

To access the Feedback Channel (CQICH) pane

Click the **Wireless** menu option and then the **Radio and Frame** sub-menu option. From the **Radio and Frame** sub-menus choose **Feedback Channel**. The Feedback Channel Settings pane is displayed.



The pane displays the current feedback type.

6.3 Security - Authentication Settings

This pane provides security protocol, timers and counter settings. The pane displays relevant parameters according to the system operation mode:

- Standalone mode: requires definition of AAA server parameters
- ASN-GW node: only Operation and authentication mode parameters are relevant.

6.3.1 Standalone Authentication Settings

To access the Protocol and Timers pane

1. Click the **Wireless** menu option and then the **Wireless Security** sub-menu option. From the **Wireless Security** sub-menus choose **Authentication**. The Authentication configuration pane is displayed.

Field	Value
Current Operation Mode	Standalone
Current Authentication Mode	PKMv2.0
Configured Authentication Mode (!)	PKMv2.0
Current Radius Server IP Address	192.168.1.27
Configured AAA Server IP Address (!)	192.168.1.27
Current AAA Server Port	1812
Configured AAA Server Port (!)	1812
Current AAA Client ID	BS
Configured AAA Client ID (!)	BS
Current AAA Client Secret	Cisco
Configured AAA Client Secret (!)	Cisco

2. Update the required parameters in the Pane according to the following descriptions and click **Apply**.

Field	Description
Current Operation Mode	Specifies the operation mode, normal mode is ASNGW, Standalone mode is designed for demos. Values: Standalone, ASN-GW
Authentication Mode	A string specifying the authentication mode. Values: Null authentication PKMv2.0 Default: PKMv2.0 (Null when Current-Operation-Mode is standalone)
Current Radius Server IP Address	Current Radius Server IP Address

Configured AAA Server IP Address	AAA Server IP Address, Server Port, Client ID and Client Secret (AAA User Defined password)
AAA Server Port, Client ID, Client Secret	AAA Parameters
TEK Lifetime	Traffic Encryption Key Lifetime in [sec]. Values: [1800,604800] Default: 43200

6.3.2 ASN-GW Authentication Settings

To access the Protocol and Timers pane

1. Click the **Wireless** menu option and then the **Wireless Security** sub-menu option. From the **Wireless Security** sub-menus choose **Authentication**. The Authentication configuration pane is displayed.

2. Update the required parameters in the Pane according to the following descriptions and click **Apply**.

Field	Description
Current Operation Mode	Specifies the operation mode, normal mode is ASNGW, Standalone mode is designed for demos. Values: Standalone, ASN-GW
Authentication Mode	A string specifying the authentication mode. Values: Null authentication PKMv2.0 Default: PKMv2.0 (Null when Current-Operation-Mode is standalone)

6.4 MAC

The MAC configurations menus are displayed according to the Base Station operation mode:

- Standalone mode – A single pane is available, providing the UCD/DCD time interval and the UCD/DCD number of notifications.
- ASN-GW mode – three panes are available, describing the MAC settings, Neighbor Base Stations and DCD triggers.

The following sections describe the ASN-GW mode MAC screens.

6.4.1 General Info – MAC Settings

This pane provides general MAC settings such as MAC messages time intervals, formats, etc.

To access the General Info – MAC Settings pane

1. Click the **Wireless** menu option and then the **MAC** sub-menu option. From the **MAC** sub-menus choose **General Info**. The General Info MAC Settings pane is displayed.

MAC Settings
This page contains MAC messages period, formats and other settings.

UCD Period (40..20000) [ms]	1000
DCD Period (40..20000) [ms]	1000
UCD Repeat (1..5)	3
DCD Repeat (1..5)	3
NBR advertise Period (1000..100000) [ms]	1000
NBR Advertisement Activation Mode	True

Apply

2. Update the required parameters in the Pane according to the following descriptions and click **Apply**.

Field	Description
UCD Period	Defines the time interval (in [ms]), after which the UCD appears (e.g. every 100 ms). Values: [5,20000] Default: 1000
DCD Period	Defines the time interval(in [ms]) after which the DCD appears (e.g. every 100 ms). Values: [5,20000] Default: 1000

Field	Description
UCD Repeat	Number of UCD message notifications before new message appears. Values: [1,5] Default: 3
DCD Repeat	Number of DCD message notifications before new message appears. Values: [1,5] Default: 3
NBR advertise Period	Period in frames to advertise neighboring Base Station. Values: [1000,100000] Default: 1000
NBR Advertisement Activation Mode	Enable/Disable Base Station advertisement of NSP in NBR TLV message broadcasting. Values: False - disable, True – enable Default: True

6.4.2 Neighbor Base Station

This pane provides a table of the Neighbor Base Station's details – used for handover.

To access the Neighbor Base Station Settings pane

1. Click the **Wireless** menu option and then the **MAC** sub-menu option. From the **MAC** sub-menus choose **Neighbor Base Station**. The Neighbor Base Station Settings pane is displayed.

Neighbor Settings
This page contains NBR BS settings for HO purposes

Legend:
(!) - requires reboot
(*) - requires service restart

Number of NBR:

Neighbor BS Table

	BSID	IP Address	Operational Mode	Status	Preamble Index	Fi
<input type="radio"/>	11:22:33:44:55:66	1.2.1.1	Manual	Update Successful	0	0

Click to add

Apply

Sync Synchronise NBR in automode

- To Add a row to the table click the '+' sign. To Remove the last row click the '-' sign. To remove a selected row, mark the row and click the '-' sign.
- Update the required parameters in the Pane table and click **Apply**.

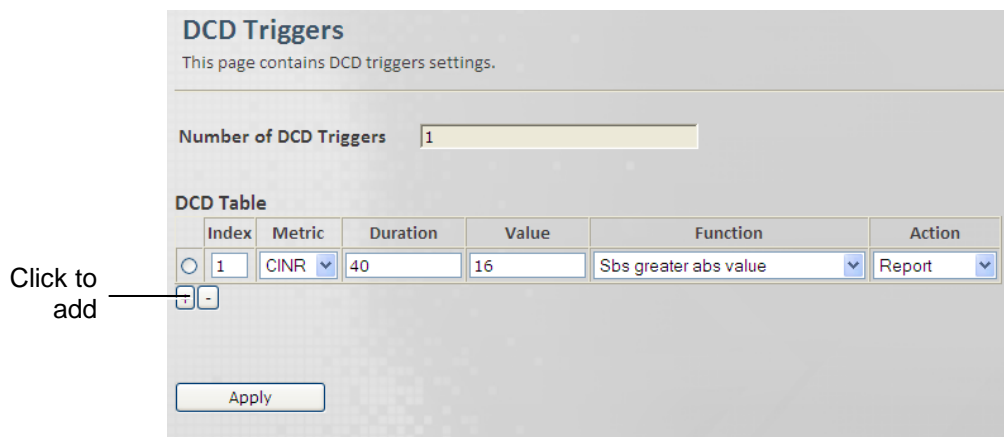
The table provides neighboring Base Stations attributes.

6.4.3 DCD Triggers

This pane provides a table of the DCD Trigger Settings. Timing for handover triggers. Look for neighbors in order to perform handover.....

To access the DCD Triggers Settings pane

- Click the **Wireless** menu option and then the **MAC** sub-menu option. From the **MAC** sub-menus choose **DCD Triggers**. The DCD Triggers Settings pane is displayed.



- To Add a row to the table click the "+" sign. To Remove the last row click the "-" sign. To remove a selected row, mark the row and click the "-" sign.
- Update the required parameters in the Pane table according to the following descriptions and click **Apply**.

Field	Description
Number of DCD Triggers	Number of configured DCD triggers
Index	DCD Trigger Index. Default: 0
Metric	This parameter specifies the DCD metric. Values: CINR RSSI RTD Default: CINR
Duration	This parameter specifies the average interval in frames duration. Values: [1,100]

Field	Description
	Default: 40
Value [1/4, 1/2 , 1/F dB]	<p>Trigger value is the value used in comparing measured metric.</p> <p>The value quota measurement depends on the trigger type (metric) as follows:</p> <ul style="list-style-type: none"> • For RSSI – [1/4dB] • For CINR – [1/2 dB] • For RTD – [1/Fs] (frequency sample) <p>Default: 16</p>
Function	<p>This parameter specifies the function used for the metric.</p> <p>Values:</p> <p>Nbs greater abs value</p> <p>Nbs less abs value</p> <p>Nbs greater rel value</p> <p>Nbs less rel value</p> <p>Sbs greater abs value</p> <p>Sbs less abs value</p> <p>Default: Sbs greater abs value</p>
Action	<p>Action performed upon reaching trigger condition.</p> <p>Values:</p> <p>Report</p> <p>Handover</p> <p>Scanning</p> <p>Default: Report</p>

6.5 Diagnostics

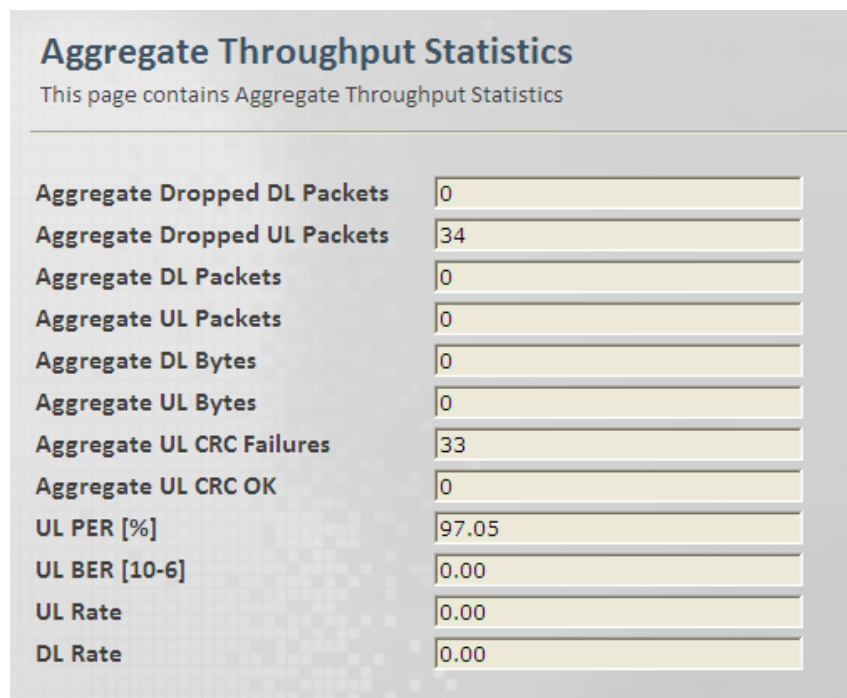
Information regarding the throughput values.

6.5.1 Aggregate Throughput

This pane provides read only aggregated Throughput Values (i.e. Dropped Packets, CRC failures, etc.).

To access the Aggregate Throughput pane

1. Click the **Wireless** menu option and then the **Diagnostics** sub-menu option. From the **Diagnostics** sub-menus choose **Aggregate Throughput**. The Aggregated Throughput Values pane is displayed.



The screenshot displays the 'Aggregate Throughput Statistics' pane. It features a title bar with the text 'Aggregate Throughput Statistics' and a subtitle 'This page contains Aggregate Throughput Statistics'. Below this, a list of metrics is shown, each with a corresponding value in a light yellow box. The metrics and their values are: Aggregate Dropped DL Packets (0), Aggregate Dropped UL Packets (34), Aggregate DL Packets (0), Aggregate UL Packets (0), Aggregate DL Bytes (0), Aggregate UL Bytes (0), Aggregate UL CRC Failures (33), Aggregate UL CRC OK (0), UL PER [%] (97.05), UL BER [10-6] (0.00), UL Rate (0.00), and DL Rate (0.00).

Metric	Value
Aggregate Dropped DL Packets	0
Aggregate Dropped UL Packets	34
Aggregate DL Packets	0
Aggregate UL Packets	0
Aggregate DL Bytes	0
Aggregate UL Bytes	0
Aggregate UL CRC Failures	33
Aggregate UL CRC OK	0
UL PER [%]	97.05
UL BER [10-6]	0.00
UL Rate	0.00
DL Rate	0.00

2. The parameters displayed in the Pane are according to the following descriptions:

Field	Description
Aggregated Dropped DL / UL Packets	Total number of aggregated Dropped DL / UL Packets since last reset.
Aggregated DL / UL Packets	Total number of Aggregated DL / UL Packets since last reset.
Aggregated DL / UL Bytes	Total number of Aggregated DL / UL Bytes since last reset.
Aggregated UL CRC Failures	Total number of Aggregated UL CRC Failures since last reset.
Aggregated UL CRC OK	Total number of Aggregated UL CRC OK since last reset.
UL PER [%]	UL Packet Error Rate
UL BER [10 ⁻⁶]	UL Bit Error Rate
UL / DL Rate	UL / DL Rate

7 List of Acronyms

Term	Description
AAA	Authentication Authorization Accounting
AES	Advanced Encryption Standard
AMC	Adaptive Modulation and Coding
API	Application Programming Interface
ASN	Access Service Network
ASP	Application Service Provider
ATPC	Automatic Transmit Power Control
BE	Best Effort
BPSK	Binary Phase Shift Keying
BS	Base Station
BWA	Broadband Wireless Access
cBS	Compact Base Station
CPE	Customer Premise Equipment
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
EAP	Extensible Authentication Protocol
ErtPS	Extended Real-Time Polling Service
FFT	Fast Fourier Transfer
FTP	File Transfer Protocol
FUSC	Fully Used Sub-Channelization
GW	Gateway
HA	Home Agent
HTTP	Hypertext Transport Protocol
ICMP	Internet Control Message Protocol
IDU	Indoor Units
IEEE	Institute of Electronic and Eclectic Engineers
IGMP	Internet Group Multicast Protocol
IMS	IP Multimedia System
IP	Internet Protocol
IPSec	IP Security
LAN	Local Area Network
LOS	Line-of-sight
MAC	Media Access Control

Term	Description
MAI	Multiple Access Interference
MAN	Metropolitan Area Network
MGCP	Media Gateway Control Protocol
MIMO	Multiple-Input, Multiple-Output
MIP	Mobile IP
MSG	Multi-Service Gateways
NAP	Network Access Provider
NMS	Network Management System
NLOS	Non-line-of-sight
nrtPS	Non-Real Time Polling Service
NSP	Network Service Provider
OAM	Operations and Maintenance
ODU	Outdoor Units
OFDM	Orthogonal Frequency Division Multiplexing
OFDMA	Orthogonal frequency division multiple access
pBS	Pico Base Station
PDA	Personal Digital Assistant
PMIP	Proxy Media IP
POP	Point of Presence
PPTP	Point-to-Point Tunneling Protocol
PUSC	Partially used sub-channelization
QAM	Quadrature Amplitude Modulation
QoS	Quality of Service
QPSK	Quadrature Phase Shift Keying
RF	Radio Frequency
rtPS	Real-Time Polling Service
SF	Service Flow
SIP	Session Initiation Protocol
SLA	Service Level Agreements
SNMP	Simple Network Management Protocol
SS	Subscriber Station
STC	Space-time coding
SU	Subscriber Unit
TCP	Transmission Control Protocol
TDD	Time Division Duplex
TFTP	Trivial File Transfer Protocol

Term	Description
UDP	User Datagram Protocol
UGS	Unsolicited Grant Service
VoIP	Voice over IP
VPN	Virtual Private Network
WAN	Wide Area Network
WiMAX	Worldwide Interoperability for Microwave Access