AlvariCRAFT™ for BreezeMAX TDD

User Manual

BreezeMAX Device Manager 4.5.0
for BreezeMAX Version 4.5
May 2008
P/N: 214980

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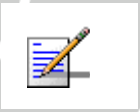
About This Manual

This manual describes AlvariCRAFT Device Manager Version 4.5.0, and how to use it for managing BreezeMAX TDD equipment running SW Versions 4.5.

Alvarion's AlvariCRAFT is an SNMP (Simple Network Management Protocol) application designed for online management of BreezeMAX system components. This utility simplifies the installation and maintenance of small size deployments by easily enabling the change of settings or firmware upgrade for one modular Base Station or Micro Base Station at a time, including the managed device's components and associated SUs.

This manual is intended for personnel responsible for managing the BreezeMAX Broadband Wireless Access system using the AlvariCRAFT utility. It is assumed that the reader is familiar with the operation and administration of BreezeMAX system components. For more information refer to the *BreezeMAX System Manuals*.



NOTE

This manual includes description of parameters and features associated with the capability of the Micro Base Stations to support Managed VoIP Services (SIP-Aware). However, note that this is a future capability that is not fully supported by the current BreezeMAX release.

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Chapter 1 - Using AlvariCRAFT

In This Chapter:

1.1 Installing AlvariCRAFT

The executable AlvariCRAFT file (Install_<version number>.exe) is available in the CD package.

Run the executable file and follow the instructions to install the AlvariCRAFT utility with the BreezeMAX Device Manager on your PC.

NOTE

Installing AlvariCRAFT will automatically uninstall a previously installed version of AlvariCRAFT.

When a previous version is uninstalled automatically, the list of managable devices that is kept as a part of AlvariCRAFT will be deleted.

The AlvariCRAFT application must be closed before starting installation of a new version.

1.2 Getting Started

To open the AlvariCRAFT Device Manager:

Double-click on the AlvariCRAFT icon or open it from the windows **Start** menu (**Programs>AlvariCRAFT**). The Main window opens, enabling view the current list of the devices that can be managed by the AlvariCRAFT utility, add new devices to the list, delete devices from the list and edit the relevant properties of the devices in the list. You can open the Device Manager or establish a Telnet cut-through to a selected device.

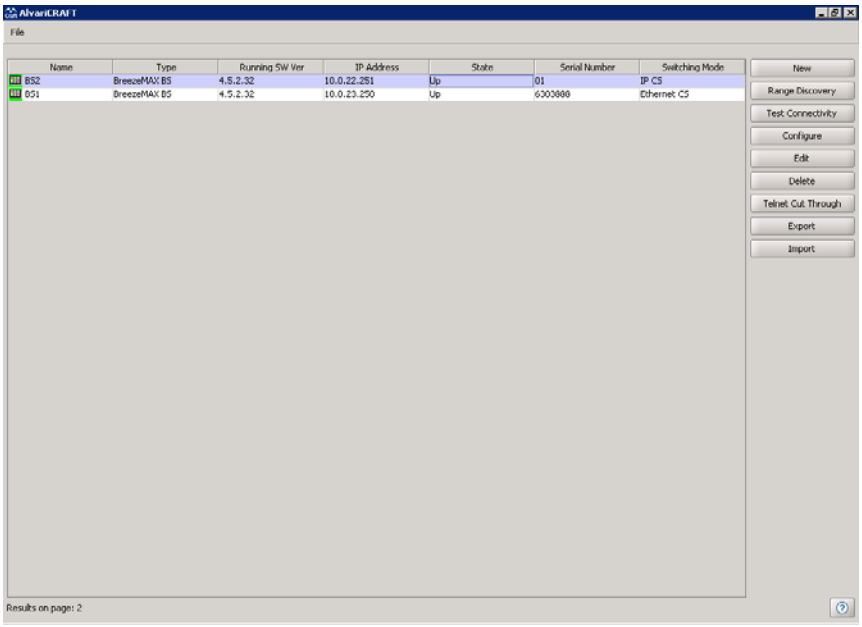


Figure 1-1: The Main Window

NOTE

When opened for the first time, the Managed Devices list is empty.

The following are the controls on the Main window:

Button	Description
New	Adds a new device to the list of devices that can be managed by the utility.

Button	Description
Range Discovery	Initiates a search for devices in a configurable range. Discovered devices will be added to the list of manageable devices.
Test Connectivity	Tests connectivity with selected device(s) and displays for each device whether the SNMP communities configured in AlvariCRAFT match those configured in the device.
Configure	Opens the Device Manager (see "Managing a Modular Base Station" on page 19 and "Managing a Micro Base Station" on page 169), allowing to manage the selected device and the SUs served by it. Not available if two or more devices are selected, or if the State is other than Up.
Edit	Opens the Equipment Editor (see below) for the selected device, allowing to edit the device's SNMP properties and its name in AlvariCRAFT. The IP Address of a defined device cannot be editted.
Delete	Deletes the selected device(s) from the database. Select the device(s) to remove and click **Delete**. The application prompts you for confirmation. You can always redefine deleted devices.
Telnet Cut Through	Opens a Telnet session to the selected device. Not available if more than one device is selected, or if the State is other than Up.
Export	Exports the list of managed devices with the relevant setting to a Comma Separated Values (csv) file.
Import	Imports a Comma Separated Values (csv) file with managed devices and their settings and add them to the list of managed devices. An existing device will be skipped.

To add a single device to the Managed Devices list:

1 Click on the **New** button to open the Equipment Type selection window.

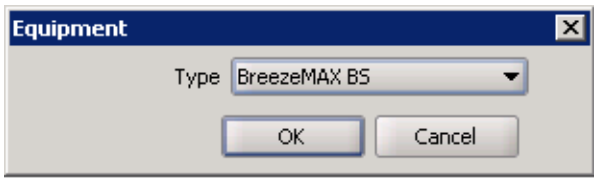


Figure 1-2: Equipment Type Selection

2 From the drop-down menu, select the Equipment Type: BreezeMAX BS (modular Base Station) or BreezeMAX MBS (Micro Base Station). Click **OK**. The Equipment Editor opens, allowing to define the Device Name and SNMP properties of the device to be managed.

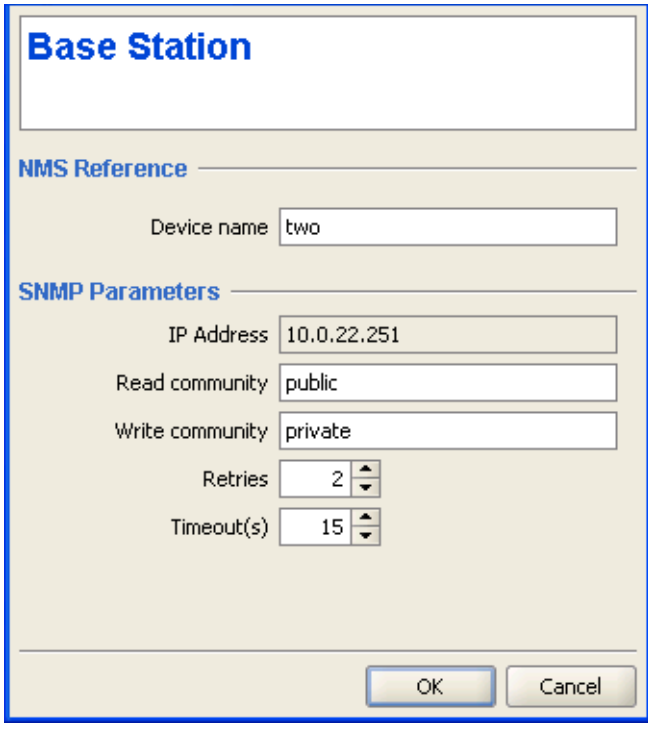


Figure 1-3: The Equipment Editor

The Equipment Editor includes the following fields:

Parameter	Description
NMS Reference	
Device Name	The device's name in the AlvariCRAFT utility.
SNMP Parameters	
IP Address	The device's IP Address. Read-only when editing the properties of a previously defined device.
Read community	The Read community string (password) for SNMP get operations. This string is used by the SNMP agent to allow/disallow SNMP read access. The default Read Community in BreezeMAX devices is *public*.
Write community	The Write community string (password) for SNMP set operations. This string is used by the SNMP agent to allow/disallow SNMP write access. The Write community can also be used for read (get) operations. The default Write Community in BreezeMAX devices is *private*.

Parameter	Description
Retries	The maximum number of retries for SNMP/TFTP communication with the Device. The range is from 0 to 255. The default is 2 retries.
Timeout(s)	The maximum time in seconds that the requesting process waits for a response from the Device before attempting a retransmission (or aborting if the maximum number of retries has been reached). The available range is 1 to 3600 seconds. The default is 15 seconds.

3 Enter the Device Name (optional), IP Address, Read community and Write community. Click **OK**.

4 The device's is added to the Managed Devices list.

For each defined device, the following information is displayed in the Managed Devices list:

Parameter	Description
Name	The name of the device as defined in the Equipment Editor (may differ from the Device Name defined in the device).
Type	The type of device: BreezeMAX BS or BreezeMAX MBS.
Running SW Ver	The running software version of the device (in a modular Base Station this is the SW version of the NPU). Displayed only after connecting with the device.
IP Address	The IP address of the device (the port used for accessing the device).
State	The connection state of the device: Up if AlvariCRAFT can communicate with it, Unreachable for a device that was reached in the past but cannot be reached currently, or Unknown for a device that was never reached by the AlvariCRAFT utility.
Serial Number	The serial number of the device (in a modulatr Base Station, this is the serial number of the NPU card). Displayed only after connecting with the device.
Switching Mode	The current Switching Mode of the device: Ethernet CS or IP CS (in the current release IP CS Switching Mode is applicable only for a modular Base Station).

NOTE

If the Authorized Managers list in the device is not empty, the AlvariCRAFT station must be defined as an Authorized Manager.

Configuring wrong communities during the initial definition of the device in the Equipment Editor will cause the device's State to be presented as Unknown or Unreacheable.

To discover manageable devices in a range:

1 Click on the **Range Discovery** button to open the Range Discovery window.

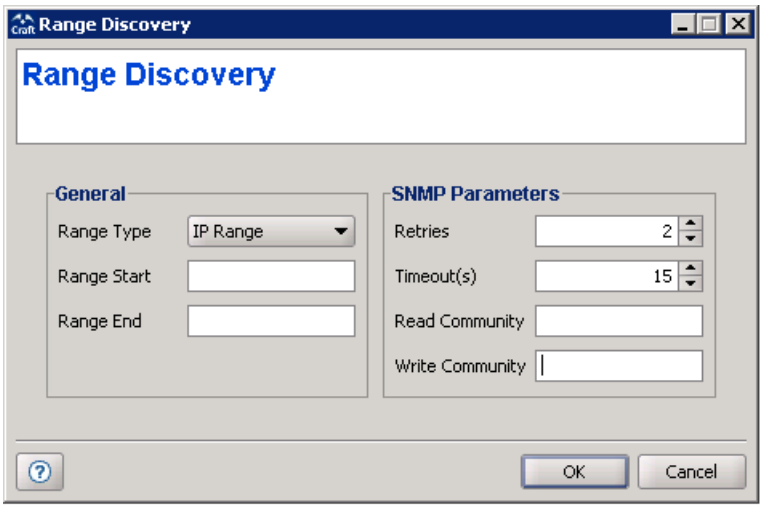


Figure 1-4: Range Discovery Window

The Range Discovery window includes the following fields:

Parameter	Description
General	
Range Type	A drop-down menu enabling selection of the method to be used for efining the search range: IP Range or Subnet.
Range Start	The start IP address of the range/subnet.
Range End/Subnet Mask	The end IP address (if Range Type is IP Range) or subnet mask (if Range Type is Subnet).
SNMP Parameters	

Parameter	Description
Retries	The maximum number of retries for SNMP/TFTP communication with each device in the defined range. The range is from 0 to 255. The default is 2 retries.
Timeout(s)	The maximum time in seconds that the requesting process waits for a response from a device before attempting a retransmission (or aborting if the maximum number of retries has been reached). The available range is 1 to 3600 seconds. The default is 15 seconds.
Read community	The Read community string (password) for SNMP get operations. This string is used by the SNMP agent to allow/disallow SNMP read access. The default Read Community in BreezeMAX devices is *public*.
Write community	The Write community string (password) for SNMP set operations. This string is used by the SNMP agent to allow/disallow SNMP write access. The Write community can also be used for read (get) operations. The default Write Community in BreezeMAX devices is *private*.

2 Select the Range Type and enter the IP parameters. Enter the SNMP communities and update the Retries and Timeout parameters if necessary. Click **OK**.

3 The Range Discovery Runtime Results window opens, displaying the search progress and the discovery results for each IP address in the defined range. You may abort the search before it is fully completed by clicking on the **Cancel** button. After viewing the results click on the **Close** button.

4 The discovered devices are added automatically to the Managed Devices list.

To manage a device:

Double-click on the selected entry in the Managed Devices list, or select it and click on the **Configure** button. The Device Manager for the selected entity opens, displaying the main page for the device.

1.3 Using the Device Manager

This section includes:

- "The Device Manager Components
- "Common Control Buttons
- "Hiding and Displaying the Navigation Pane
- "Working with Tables
- "Working with Configuration Tables

1.3.1 The Device Manager Components

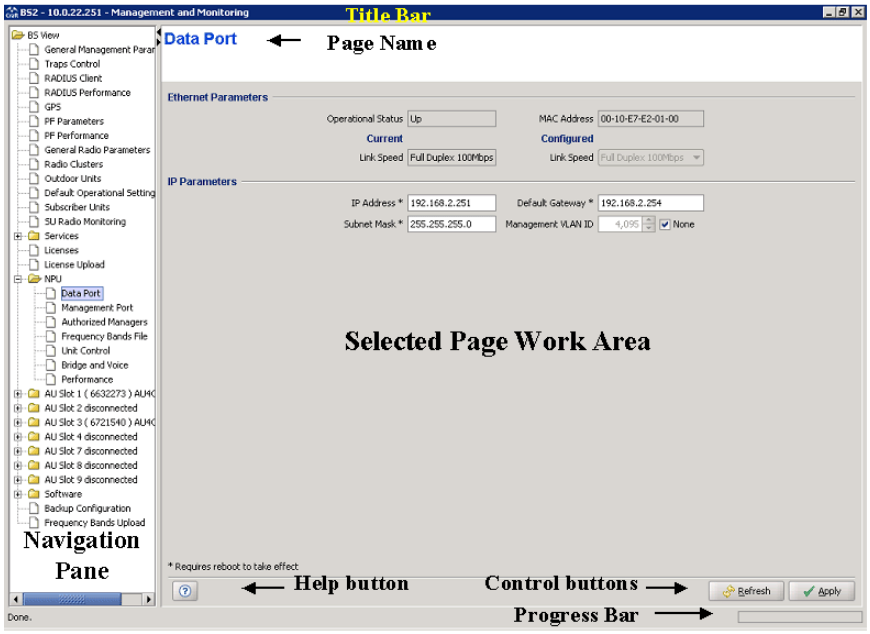


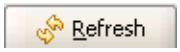
Figure 1-5: The Device Manager Window

The Device Manager window comprises the following components:

Component	Description
Title Bar	Identifies the managed device's name. It also includes standard icons for minimizing, maximizing or closing the Device Manager.
Navigation Pane	Displays all configuration/information pages and enables opening a selected page by clicking on it.
Selected Page	The selected page. Enables viewing/managing the applicable parameters.

1.3.2 Common Control Buttons

The following buttons are common to most configuration/information pages.

Button	Description
	Updates the information displayed in the page according to current values acquired from the device.
	Implements the modifications to the configuration of the device. Exiting the Device Manager or switching to another page without applying opens a confirmation dialog box, enabling to decide whether to discard the changes or continue editing. This button is not available in information pages that display read-only details and do not include any configurable parameters.
 *Help*	Click on the Help button to open the Help Navigator, displaying the Help topic for the current page.

1.3.3 Hiding and Displaying the Navigation Pane

By default, both the Navigation Pane and Work Area are displayed. When hovering the mouse over the separation bar between the Navigation Pane and Work Area, the mouse pointer becomes a double-headed arrow (↔). You can change the size of the Navigation Pane by dragging this arrow left/right until reaching the required display.

You can hide the Navigation Pane to increase the size of the Work Area or hide the Work area to increase the size of the Navigation Pane by clicking on the arrowheads () located on the separation bar.

With the Navigation Pane hidden or maximized, if clicking the arrowhead does not restore the display of both panes, manually drag the separation bar to restore the display.

1.3.4 Working with Tables

Most of AlvariCRAFT tables and lists allow sorting, resizing and rearranging the column display sequence.

To sort a table:

Tables can be sorted in an ascending order by clicking on any of the column headings. Click again on the column heading to sort in a descending order. Click a third time to return to no sorting (default mode).

To resize columns:

To resize a column, position the cursor on the border line between two columns headings. The cursor changes into a double-headed arrow. Drag the cursor to the left or to the right to increase or decrease the size of a column.

To rearrange columns:

To rearrange the columns sequence, click a column header and drag it to the new desired position.

1.3.5 Working with Configuration Tables

In some pages, tables are used for displaying information and configuring or managing multiple entities of the same type.

Grayed-out cells are read-only.

To modify the configuration of an existing entity:

Double-click on the applicable cell: In a text-cell, edit the content. In some cells a drop-down menu will open, enabling selection of the required option. Click on any other cell to apply the change to the selected cell. At this stage the change is

applied only to the display. The change is applied to the device only after clicking on the **Apply** button.

In rows with modified parameter(s) all the details are colored blue.

The following Row Control buttons are available in most pages with tables:

Button	Description
Delete	Select a row, click on the **Delete** button and then on the **Apply** button to remove the selected entity from the device. The details of a deleted entry are colored red.
Revert	Select one or more rows and click on the **Revert** button to cancel all changes made in these rows that were not applied yet. This applies also to entities that were selected for deletion.
Add	Click on the **Add** button to add a new entity (if applicable). The new entry will be colored green.

1.4 How to Get Help

Click the *Help* button  to open the Help Navigator window and the Help Topic window for a specific window.

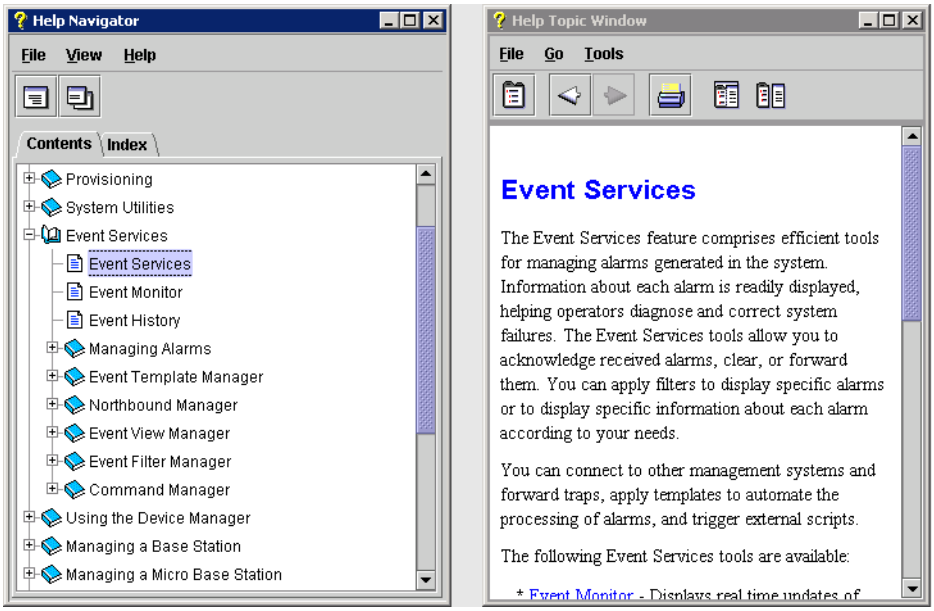


Figure 1-6: Help Navigator Window (Left) and Help Topic Window (Right)

NOTE

The Help Navigator Window and Help Topic Window displayed above are examples. The displayed content is not applicable for this version of AlvariCRAFT.

1.4.1 The Help Navigator

The Help Navigator window enables to view help contents, select a specific subject or search for information.

The Help Navigator window includes the following items:

Menus		
Menu	**Sub-Menu***	**Description**

File	Display <Ctrl-D>	Opens the selected topic in the Help Topic window. Selecting the topic and then selecting this menu is equivalent to double-clicking on the topic.
	Display in New Window <Ctrl-W>	Displays the selected topic in a new window, without closing a previously displayed topic.
	Print Tree <Ctrl-R>	Enables to print the topics tree as displayed on the Help Navigator. You can expand or collapse the tree nodes to change the display before printing.
	Print Topics <Ctrl-S>	Enables to print the selected topic that is displayed on the Help Topic window.
	Close <Ctrl-O>	Closes the Help Navigator window.
	Exit <Ctrl-X>	Closes all help windows and exits the Help Navigator.
View	Contents	Displays the Contents tab.
	Index	Displays the Index tab.
Help	About	Opens the About window, displaying the version details for the Help.
Toolbar		
Icon	**Tooltip**	**Description**
		Enables to select the major topics for online help display.
	Display	Opens the selected topic in the Help Topic window. Selecting the topic and then selecting this menu is equivalent to double-clicking on the topic.
	Display in New Window	Displays the selected topic in a new window, without closing a previously displayed topic.

* The keyboard shortcut is provided in angular brackets.

The Help Navigator window also includes the following tabs:

- “Table of Contents Tab
- “Index Tab

1.4.1.1 Table of Contents Tab

The Contents tab displays all the available topic nodes in tree structure. Click on the + symbol next to a topic node to expand it, or on -, to collapse it. Double-click on the topic to display it in the Help Topic window.

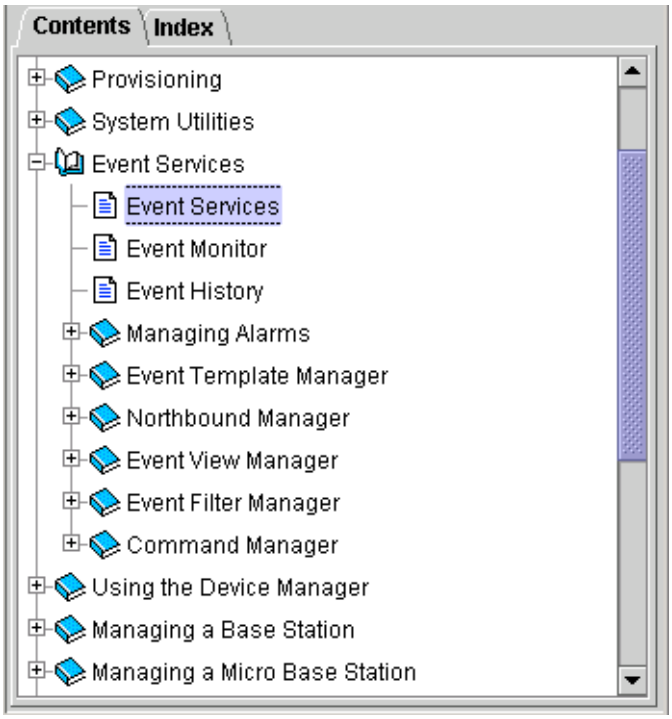


Figure 1-7: Contents Tab

NOTE

The Contents Tab displayed above is an examples. The displayed content is not applicable for this version of AlvariCRAFT.

1.4.1.2 Index Tab

The Index tab enables to search for specific content in all help topics.

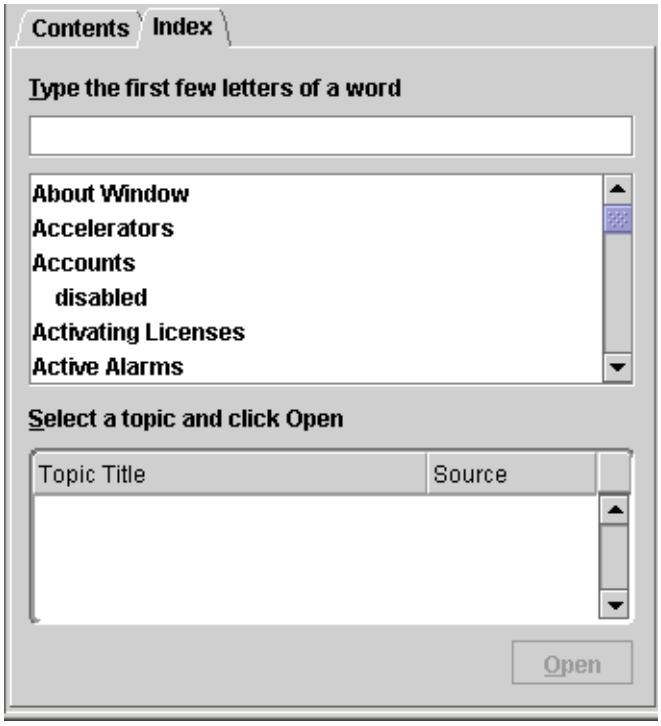


Figure 1-8: Index Tab

To search for information:

1. In the Index tab, type the keywords or the beginning of the keyword in the designated field. A list of matching topics is displayed.
2. Select the topic that matches your query. The list of available topics is displayed.
3. Select an item from the list and click Open to display the selected topic in the Help Topic window. You can also double-click on the list item to display its content.

1.4.2 The Help Topic Window

The Help Topic window displays the content of the selected help topic. At the bottom of each displayed topic are a back arrow and/or a forward arrow, enabling to navigate between displayed topics. In addition, the Help Topic window includes the following components:

Menus		
Menu	**Sub-Menu***	**Description**
File	Print Topic <Ctrl+P>	Enables to print the selected topic on the active Help Topic window.
	Close <Ctrl+O>	Closes the Help Topic window.
	Exit <Ctrl+X>	Closes all help windows and exits the Help Navigator.
Go	Back <Alt-Left>	Displays the previous topic. When the first topic is displayed, this menu item is greyed out (unavailable for selection). Click Alt and the left arrow on your keyboard to display previous topics.
	Forward <Alt-Right>	Displays the next topic. When the last topic is displayed, this menu item is greyed out (unavailable for selection). Click Alt and the right arrow on your keyboard to display the next topics.
Tools	Navigator	Activates/opens the navigator window.
	Find <Ctrl-F>	Enables to search for text on the active topic.
	Dock/Undock <Ctrl-K>/<Ctrl-U>	Merges/separates the Help Navigator and Help Topic windows. When docked, a single menu bar displays all available menus (File, View, Go, Tools, Help).
Toolbar		
Icon	**Tooltip**	**Description**
	Navigator	Activates/opens the navigator window.
	Back	Displays the previous topic. When the first topic is displayed, this menu item is greyed out (unavailable for selection). Click Alt and the left arrow on your keyboard to display previous topics.
	Forward	Displays the next topic. When the last topic is displayed, this menu item is greyed out (unavailable for selection). Click Alt and the right arrow on your keyboard to display the next topics.
	Print Topic	Enables to print the selected topic on the active Help Topic window.

	Dock	Merges the Help Navigator and Help Topic windows. When docked, a single menu bar displays all available menus (File, View, Go, Tools, Help).
	Undock	Separates the docked Help Navigator and Help Topic windows.

2

Chapter 2 - Managing a Modular Base Station

2.1 Introduction to Modular Base Station Management

The tree menu in the Navigation Pane on the left side of the Device Manager window enables selecting the following view and configuration pages:

- "BS View Page" on page 22
  - "General Management Parameters Page" on page 25
  - "Traps Control Page" on page 31
  - "RADIUS Client Page" on page 33
  - "RADIUS Performance Page" on page 37
  - "GPS Page" on page 40
  - "Modular Base Station PF Parameters Page" on page 47
  - "Modular Base Station PF Performance Page" on page 50
  - "General Radio Parameters Page" on page 52
  - "Radio Clusters Page" on page 55
  - "Outdoor Units Page" on page 57
  - "Default Operational Settings Page" on page 60
  - Filtering:
    - "Filters Page" on page 62
    - "MAC Deny List Page" on page 68
    - "Filtering Performance Page" on page 69
  - "Subscriber Units Page" on page 70
  - "SU Radio Monitoring Page" on page 73
  - Services:
    - "Services Page" on page 75
    - "Subscribers Page" on page 82
    - "Service Profiles Page" on page 85

2.2 BS View Page

The BS View page provides a graphical view of the current status of the modular Base Station's components.

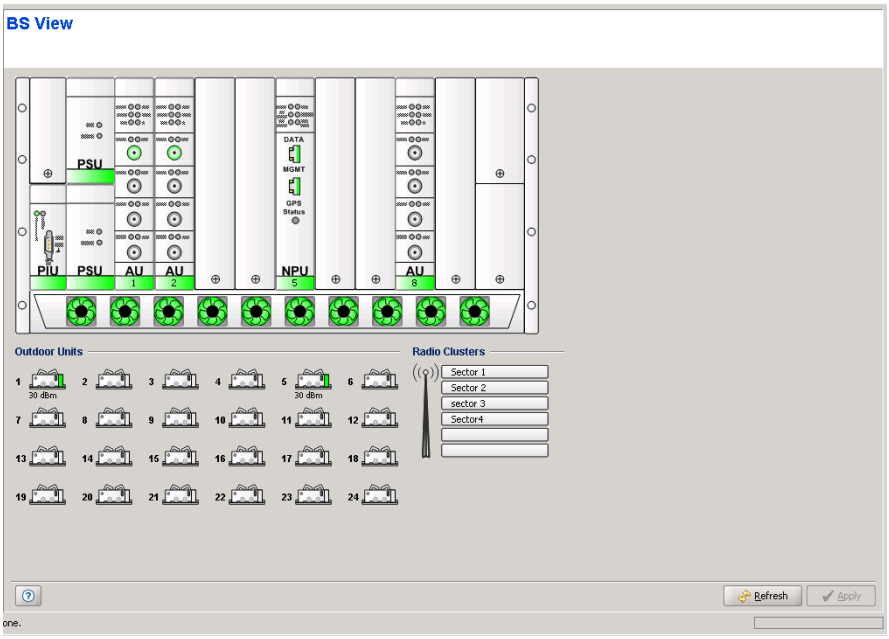


Figure 2-1: BS View Page

The BS View page includes the following components:

- "Chassis View"
- "Outdoor Units View"
- "Radio Clusters View"

2.2.1 Chassis View

The Chassis View is a graphical display of the BS chassis, showing the installed components and their status. The display is refreshed every 15 seconds. Each of the installed modules (NPU, AUs, PIUs, PSUs) and the 10 fans of the AVU module is marked in either green (indicating that the component operates properly) or red (indicating a fault status).

For a High-Power PIU, the letters “HP” are displayed at the bottom (in the area that should be marked green). In addition, you can place the cursor on the PIU to get a tooltip indicating its type (Normal Power/High Power). The left LED indicator on the top side of the PIU indicates its status: green for Master, grey for Redundant (applicable only if two PIUs are installed and connected to power).

For the NPU and installed AU(s), additional information and actions are available:

- The DATA and MGMT ports of the NPU are marked either green or red, indicating the Ethernet link status (up or down).
- The GPS Status indicator on the NPU is green when at least 4 satellites are received. Otherwise it is grey.
- Double-click on the NPU module to open the NPU general view page.
- Double-click on the DATA port to open the DATA Port configuration page.
- Double-click on the MGMT port to open the Management Port configuration page.
- In an AU, each of the ODU connectors (channels) are marked as follows:
  - No marking (gray): The Admin Status is Disabled.
  - Green: The Operational Status is Up, the Admin Status is Enabled.
  - Red: The Operational Status is Down (fault, the Admin Status is Enabled).

  Place the cursor on a connector to view the Downlink Frequency.
- Click once on an ODU connector (channel) to view relevant associations: A blue background will be added to the selected channel as well as to the Outdoor Unit and Radio Cluster associated with it (if applicable).
- Double-click on any of the ODU connectors (channels) to open the Channels configuration page for the applicable AU.
- Double-click on an AU module to open the AU general view page for the selected AU.

2.2.2 Outdoor Units View

The Outdoor Units view shows the ODU icons all the 24 Outdoor Units that can be defined. An undefined ODU is marked in gray. A defined ODU is marked in either green or red, indicating its operational status. Note that the operational status of an ODU can be OK (Up) only if it is properly connected to an active channel. For all defined ODUs the configured Tx Power is displayed below the unit's icon.

Click on an ODU's icon to view relevant associations: A blue background will be added to the selected ODU as well as to the ODU connector (AU channel) and Radio Cluster associated with it (if applicable).

Double-click on any of the ODUs to open the Outdoor Units configuration page.

Place the cursor on an ODU to view its configured Tx Power and Downlink Frequency (applicable only if the ODU is configured).

2.2.3 Radio Clusters View

The Radio Clusters view shows text boxes for the 6 Radio Clusters that can be defined. The name of a defined Radio Cluster is displayed in the relevant area. Note that the name can also be an empty string (null). It is recommended to define Radio Cluster Name for all defined Radio Cluster to provide clear distinction between defined and not-defined Radio Cluster.

Click on a Radio Cluster's text box to view relevant associations: A blue background will be added to the selected Radio Cluster as well as to the ODU(s) and AU channel(s) associated with it (if applicable).

Double-click on any of the Radio Clusters to open the Radio Clusters configuration page.

2.3 General Management Parameters Page

The General Management Parameters page enables viewing and configuring the general identification details of the device. In a modular Base Station it also enables viewing and changing the Switching Mode of the device and the PM/TM parameters.

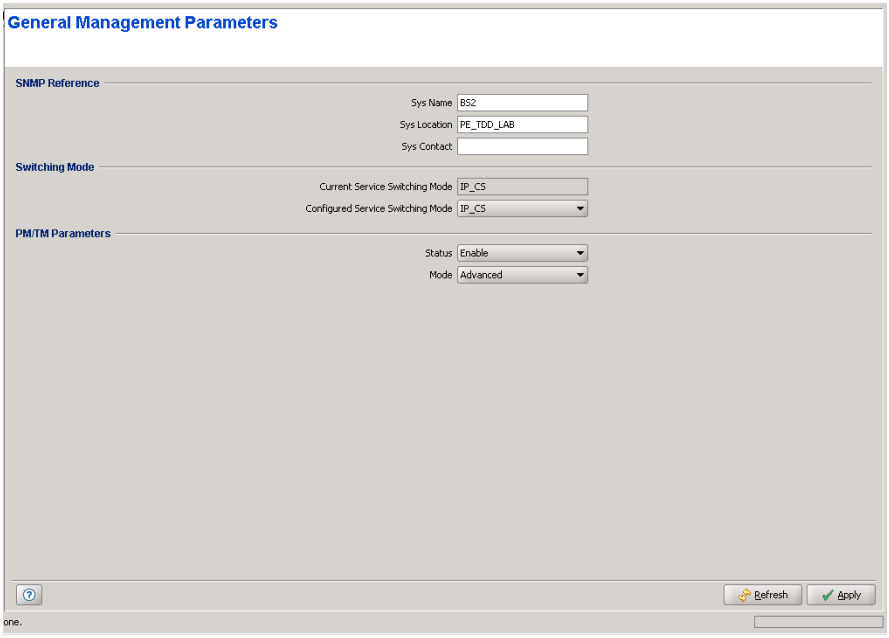


Figure 2-2: General Management Parameters Page (modular Base Station)

The General Management Parameters page includes the following components:

- "SNMP Reference"
- "Switching Mode"
- "PM/TM Parameters"

2.3.1 SNMP Reference

Parameter	Description
Sys Name	The system's name. A string of up to 255 printable characters.
Sys Location	The system's location. A string of up to 255 printable characters.
Sys Contact	The system's contact person name. A string of up to 255 printable characters.

2.3.2 Switching Mode

NOTE

In the current release the Switching Mode parameter is applicable only for modular Base Stations. It is not applicable to Micro Base Stations that operate always in Ethernet CS Switching Mode.

The Switching Mode parameter defines the convergence sublayer (CS) used in the network infrastructure. Ethernet CS is applicable to the current generation of layer 2 based services. IP CS Switching Mode is compatible with the infrastructure of next generation WiMAX systems or DSL systems. IP CS Switching Mode provides smooth upgrade to systems that fully support the IEEE 802.16e standard, with the same "Look and Feel" of service provisioning. The operator will only have to replace his access equipment while keeping most of his network equipment unchanged. It also enables operators working with BRAS that supports DHCP option 82 for already deployed DSL systems to add a wireless access solution in areas where DSL is not available using the same provisioning equipment.

A change in the Switching Mode is applied after resetting the NPU.

The following table lists the functional changes that are applied after switching to IP CS Switching Mode. For more details on using the IP CS Switching Mode refer to the System Manual.

Table 2-1: IP CS Switching Mode Functional Changes

Parameter	Change Description
Default Operational Setting	The Default Operational Settings parameters are not applicable for IP CS Switching Mode. The Service Working Mode is always Advanced Mode.
Services-Subscribers	The Subscribers parameters are not applicable for IP CS Switching Mode.

Table 2-1: IP CS Switching Mode Functional Changes

Parameter	Change Description
Services-Services	All previous Ethernet CS Switching Mode Services are deleted from the database. Services can only be accepted from AAA server and are read-only. A Service includes the following configurable parameters: Service Name, Service Type, Service Profile Name, SU MAC Address, Service VPL ID (new parameter that defines the VLAN ID to be used in the network side of the NPU) and Admin Status. The following parameters, used in Ethernet Switching Mode Services, are not applicable for IP Switching Mode Services: Subscriber Name, VLAN List, Hybrid VLAN Mode, VLAN Classification Mode, Access VLAN.
Services-Service Profiles	All previous Ethernet CS Switching Mode Service Profiles are deleted from the database. There are three new Service Types in IP CS Switching Mode: IP Mode Data, IP Mode VoIP and IP Mode Managed VoIP (the previous L2, PPPoE and VoIP Service Types used in Ethernet CS Switching Mode are not applicable for IP CS Switching Mode). Each Service Profile includes the following configurable parameters: Service Type (IP Mode Data, IP Mode VoIP, IP Mode Managed VoIP), Service Profile Name, Priority Classifier. Maximum Number of Voice Calls configurable parameters is available only for IP Mode Managed VoIP Service Profiles. In IP Mode Managed VoIP service Profiles there is a new configurable parameter, Voice Domain. In IP Mode Data Service Profiles there is a new configurable parameter, Service Group Name. IP Mode VoIP and IP Mode Managed VoIP Service Profiles use the @@IP Mode VoIP@@ Forwarding Rule (not available in the Service Profiles since the name cannot be modified). The following configurable parameters, used in Ethernet Switching Mode Service Profiles, are not applicable for IP Switching Mode Service Profiles: VLAN Transparency Mode, VPL ID, Priority Marking Mode, Priority Marking Value, Forwarding Rule.

Table 2-1: IP CS Switching Mode Functional Changes

Parameter	Change Description
Services-Forwarding Rules	All previous Ethernet CS Switching Mode Forwarding Rules are deleted from the database. A single Forwarding Rule named @@IP Mode VoIP@@ with Service Type IP Mode VoIP is provided for IP Mode VoIP and IP Mode Managed VoIP Services. Certain parameters of this Forwarding Rule (except the Name and Service Type) can be updated. This Forwarding Rule cannot be deleted. It is not possible to define additional Forwarding Rules. The default values of the @@IP Mode VoIP@@ Forwarding Rule configurable parameters are: ■ Unicast Relaying: Enabled ■ Broadcast Relaying: Enabled ■ Unknown forwarding Policy: Forward ■ Multicast QoS Profile Name: @@IP Mode VoIP@@
Services-Priority Classifiers	All previous Ethernet CS Switching Mode Priority Classifiers are deleted from the database. The Priority type is not configurable, and it is always DSCP (802.1p prioritization is not available in IP CS Switching Mode).
Services-QoS Profiles	All previous Ethernet CS Switching Mode QoS Profiles are deleted from the database. A single QoS Profile named @@IP Mode VoIP@@ is available as a default for the Multicast QoS Profile in the @@IP Mode VoIP@@ Forwarding Rule. All parameters of this QoS Profile can be updated, and it can also be deleted from the database. Additional QoS Profiles can be defined. The default values of the @@IP Mode VoIP@@ QoS Profile configurable parameters are: ■ Name: @@IP Mode VoIP@@ ■ QoS Type: BE ■ CT: Short (non-configurable) ■ MIR (Kbps): 128
Pre-configured Profiles	The pre-configured profiles are not available in IP CS Switching Mode.

Table 2-1: IP CS Switching Mode Functional Changes

Parameter	Change Description
Filtering (Filters, MAC Deny List and Performance pages)	All filtering related parameters are not applicable for IP CS Switching Mode.
RADIUS	All previous Ethernet CS Switching Mode Authentication and Accounting parameters are deleted from the database. In IP CS Switching Mode,only one Authentication Server and one Accounting Server can be defined. The configurable Server Status and read-only Activity Status parameters are not applicable.
DRAP related parameters	DRAP is not used in IP CS Switching Mode. Hence, the following configurable and read-only parameters/options are not applicable: In NPU menu: Voice (DRAP TTL Retries) In SU menu, Voice/Networking Gateways: Gateway Type
Operation Mode (AU and SU)	Not applicable for IP CS Switching Mode (Operation Mode is always Advanced Si)
SU Permanence Status	Not applicable for IP CS Switching Mode (SU Status is always Temporary).
Adding and Deleting SU,	Not applicable for IP CS Switching Mode.
Standard SW File	Standard AU/SU SW Files (Software Upgrade Settings page) are not applicable for IP CS Switching Mode.
SU MAC (Standard Mode) and Phy (Standard Mode) Parameters	Not applicable for IP CS Switching Mode (Operation Mode is always Advanced Si).
Backup Files	The Profiles and Services option and the Filtering option are not applicable for IP CS Switching Mode.
Service Groups	New feature-applicable for IP Mode Data Services
Voice Domains	New feature-applicable for IP Mode Managed VoIP Services
PF Servers	New feature-applicable for IP Mode Managed VoIP Services

2.3.3 PM/TM Parameters

NOTE

In the current release the PM/TM feature is applicable only for modular Base Stations. It is not applicable for Micro Base Stations.

The PM/TM feature enable managing the collection of Performance Monitoring and Traffic Monitoring data. When enabled, traffic (transferred data) information and performance (link quality indicators) statistics are collected by the device and stored in dedicated files that can be retrieved by the network management system or any other external application, using TFTP. Whenever a new file is generated, a suitable trap is sent. Analysis of the data can be used for various purposes such as calculating capacity utilization and oversubscription, radio planning and problem identification. Each file contains the accumulated traffic data and the per SU performance statistics for a 15 minutes interval. For certain radio planning purposes requiring higher resolution of performance statistics, it is possible to request that the 15 minutes file will include also per SU performance statistics for one minute intervals.

The PM/TM parameters are:

Parameter	Description
Status	Allows enabling or disabling the PM/TM feature.
Mode	Enables selection between Basic and Advanced modes of collecting traffic data and performance statistics. In Basic mode, each file contains all the relevant data for 15 minutes intervals, and up to the last four files may be stored in the NPU. In Advanced mode each file contains also performance statistics for 1 minute intervals, and the NPU may store the last two files.

2.4 Traps Control Page

The Traps Control page enables viewing the current parameters of all traps and modifying the parameters of selected traps. It also enables restoring the configuration of all modified traps to their default values.

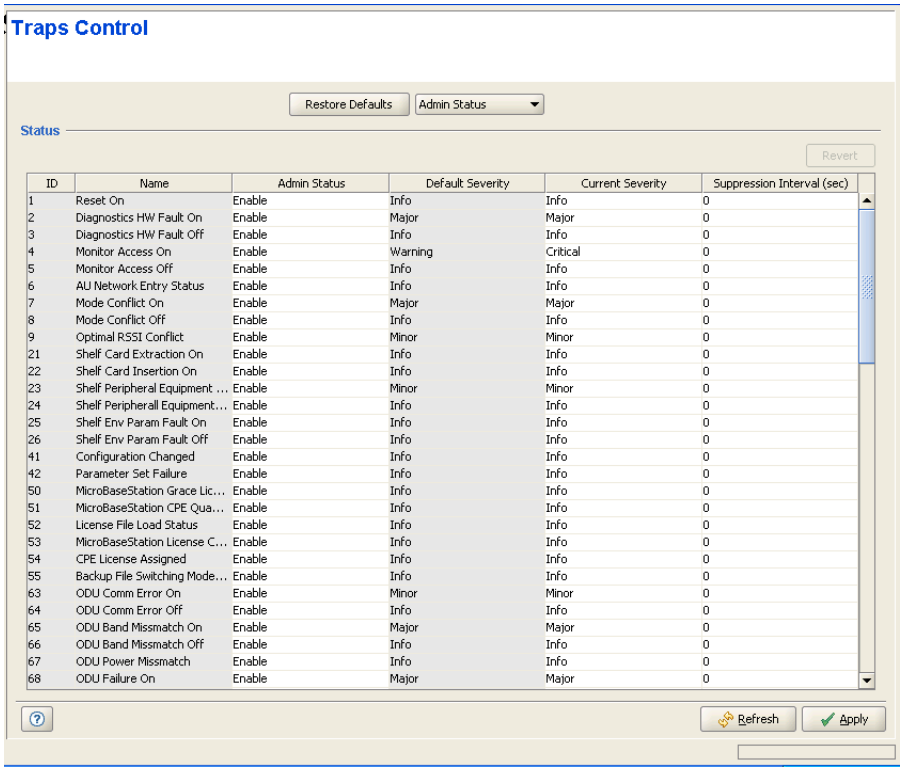


Figure 2-3: Traps Control Page

The Traps Control page includes a traps Status table that displays the following properties for each trap:

Parameter	Description
ID	A read-only display of the trap's Enterprise ID. Note that for standard MIB II traps, the private enterprise IDs 128 to 132 are used instead of the actual SNMP enterprise IDs 1 to 5.
Name	A read-only display of the trap's name.
Admin Status	The Administrative Status of the trap. If the Admin Status is set to Disable, this trap will not be sent by the managed device. The available options are Enable and Disable.

Parameter	Description
Default Severity	A read-only display of the trap's factory default severity level.
Current Severity	The current severity configured for the trap. The available options are Critical, Major, Minor, Warning and Info.
Suppression Interval	The Suppression Interval is the minimum time between consecutive transmissions of the same trap. This parameter can be used to prevent excessive retransmissions of the same trap. The available range is from 1 to 86,400 (seconds) or 0 for no suppression.

For more information on the traps see the Traps and Alarms document.

NOTE

The table includes all BreezeMAX traps. Note that some of the traps are applicable only for one device type: some traps are not applicable for a Micro Base Station, and some traps are not applicable for a modular Base Station.

The **Restore Defaults** button at the top of the page, together with the drop-down menu next to it, enables restoring all traps to their default configuration.

The available options in the drop-down menu and the respective effect on configuration of all traps upon clicking on the Restore Defaults button are:

Option	Restore Defaults Operation
Admin Status	The Admin Status of all traps will be set to the default Admin Status of Enable.
Severity	The Current Severity for each trap will revert to the default severity as displayed in the Default Severity entry for the trap.
Suppression Interval	The Suppression Interval of all traps will be set to the default Suppression Interval of 0 (no suppression).
All	All parameters of all traps will be set to their default values as defined above.

2.5 RADIUS Client Page

The RADIUS page enables viewing and modifying the RADIUS parameters of the device.

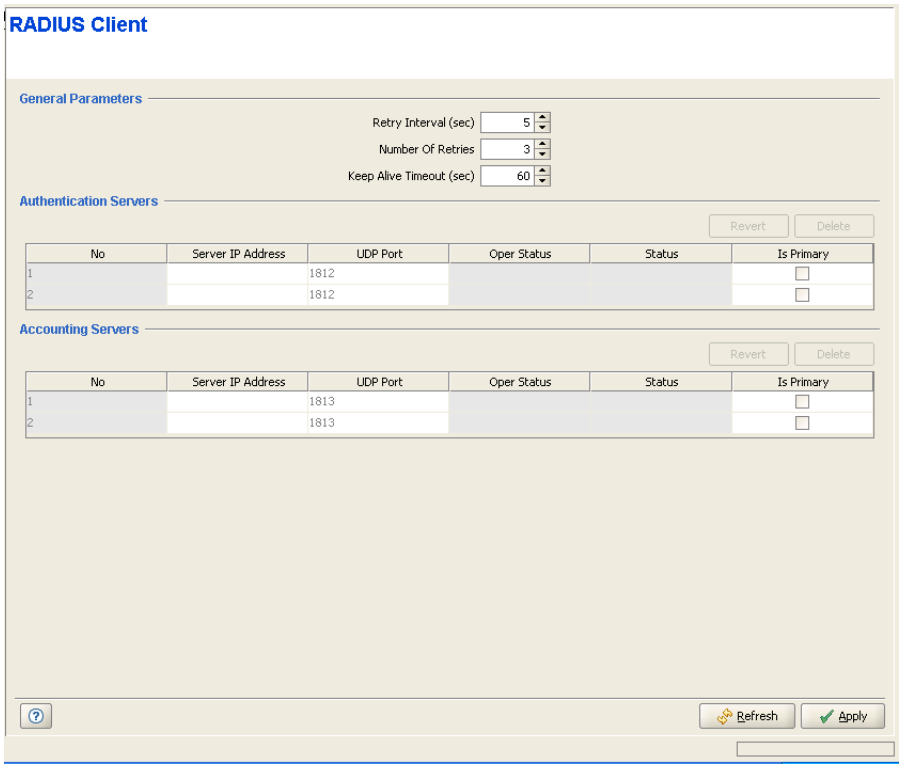


Figure 2-4: RADIUS Client Page, Ethernet CS Switching Mode

NOTE

Upon switching to IP CS Switching Mode, all previous Ethernet CS Switching Mode Authentication and Accounting parameters are deleted from the database. Other changes that affect RADIUS configuration in IP CS Switching Mode include:

a. Only one Authentication Server and one Accounting Server can be defined. The configurable Server Status and read-only Activity Status parameters are not applicable.

b. The IP interface parameters for communicating with each of the servers are configurable (alternatively, it is possible to automartically adopt the IP parameters of the Data port).

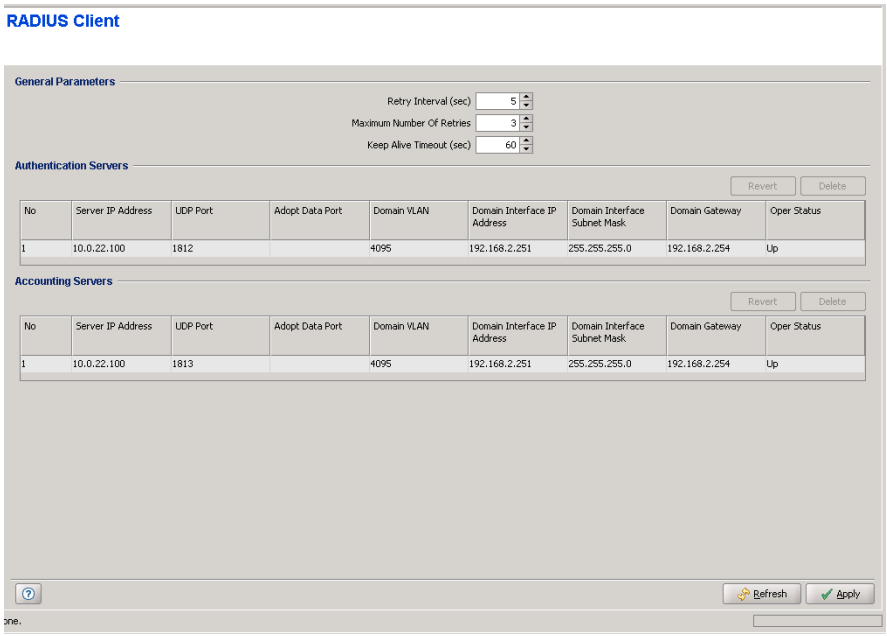


Figure 2-5: RADIUS Client Page, IP CS Switching Mode

The RADIUS Client Parameters page includes the following components:

- "General Parameters"
- "Authentication Servers/Accounting Servers"

2.5.1 General Parameters

The General Parameters section enables viewing and modifying parameters that affect the communication with all RADIUS servers. These parameters include:

Parameter	Description
Retry Interval (sec)	The Retry Interval parameter defines the time in seconds to wait before retransmitting a RADIUS message if no response is received. The range is 1-5 (seconds).
Number Of Retries	The Maximum Number of Retries parameter defines the maximum number of retransmission attempts, before a decision is taken to revert to another server, if configured, or give up. The range is 0-5 (retries).

Parameter	Description
Keep Alive Timeout (sec)	The device maintains a keep alive mechanism with all defined servers. The Keep Alive Timeout defines the time in seconds to wait before reaching a decision that a certain server is no longer available. The range is 60-180 (seconds).

2.5.2 Authentication Servers/Accounting Servers

The Authentication Servers and Accounting Servers sections enable viewing the status and parameters of defined Authentication/Accounting servers, adding a new server (up to a maximum of two of each type in Ethernet CS Switching Mode, and one of each type in IP CS Switching Mode), or deleting a server from the database of the device. The parameters of an existing server cannot be updated: to modify the parameters of a server, it must first be deleted and then defined again.

The Authentication/Accounting Servers tables include the following options for each entry:

Parameter	Description
Server IP Address	The IP address of the server.
UDP Port	The UDP port number used by the RADIUS server for authentication/accounting transactions. Valid values: 1 to 65535.
Adopt Data Port	Applicable only in IP CS Switching Mode where the IP interface defined for communication with the server may be on a different subnet then the one defined for the Data port for data and management purposes. Double click on the entry to open the drop-down menu. The options are Yes and No. If Yes is selected then relevant interface parameters are not configurable and will be adopted from Data port configuration: Domain VLAN = Data Port Management VLAN ID Domain Interface IP Address = Data Port IP Address Domain Interface Subnet Mask = Data Port Subnet Mask Domain Gateway = Data Port Gateway If No is selected, these parameters must be configured. In this case the IP parameters defined for the interface must be on a subnet that is unique in the device

Parameter	Description
Domain VLAN	Applicable only in IP CS Switching Mode. Configurable only if Adopt Data Port is set to No. The VLAN ID to be used for communication with the server. Available values for VLAN are 0 to 4094. Enter either null or 4095 for No VLAN ID. 4095 will be displayed for No VLAN ID
Domain Interface IP Address	Applicable only in IP CS Switching Mode. Configurable only if Adopt Data Port is set to No. The interface IP address to be used for communication with the server.
Domain Interface Subnet Mask	Applicable only in IP CS Switching Mode. Configurable only if Adopt Data Port is set to No. The subnet mask to be used with the interface IP address for communication with the server.
Domain Gateway	Applicable only in IP CS Switching Mode. Configurable only if Adopt Data Port is set to No. The default gateway IP address to be used for communication with the server.
Oper Status	The Operational Status of the server: Up or Down (according to the keep alive mechanism).
Status	Applicable only in Ethernet CS Switching Mode. The Activity Status of the server: Active or Standby (indicates whether this is the server currently in use for authentication/accounting purposes).
Is Primary	Applicable only in Ethernet CS Switching Mode. Defines whether this server is Primary or Secondary. Each Authentication/Accounting server can be defined as either Primary (checked) or Secondary (un-checked). Only one Authentication/Accounting server can be defined as Primary.

2.6 RADIUS Performance Page

The RADIUS Performance page enables on-line view of selected counters.

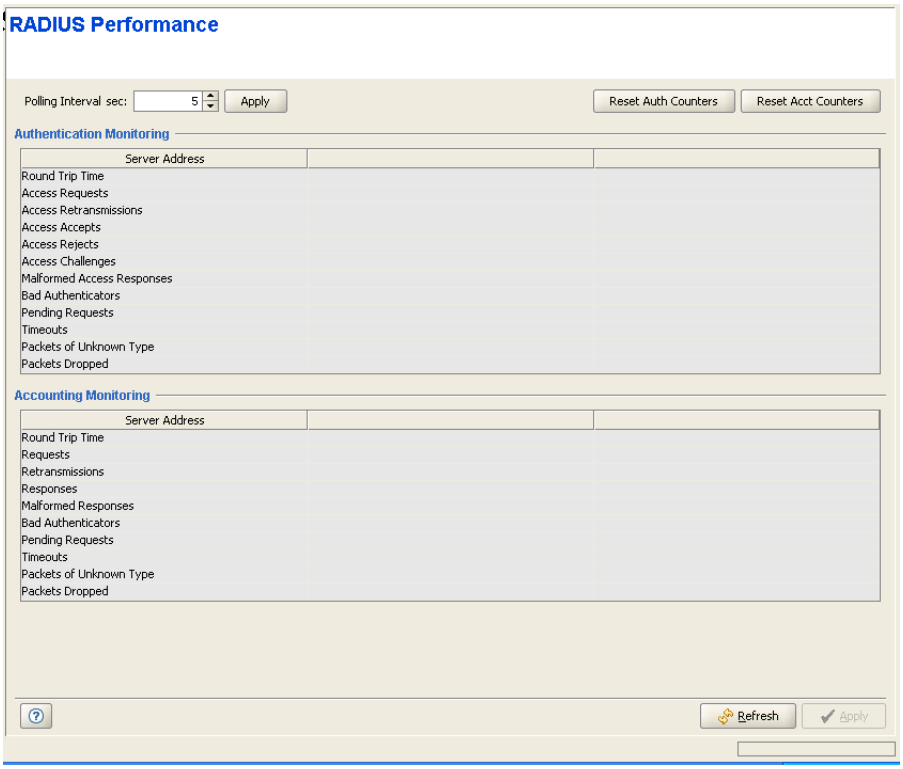


Figure 2-6: RADIUS Performance Page

To change the Polling (automatic refresh) Interval:

Enter the required Polling Interval and click on the Apply button next to it. The range for the polling interval is from 1 to 3,600 seconds.

The RADIUS page includes the following sections:

- "Authentication Monitoring"
- "Accounting Monitoring"

2.6.1 Authentication Monitoring

The Authentication Monitoring table displays for each of the Authentication Servers the following counters:

Counter	Description
Round Trip Time	The time interval (in hundredths of a second) between the most recent Access-Reply/Access-Challenge and the Access-Request that matched it from this server.
Access Requests	The number of RADIUS Access-Request packets sent to this server. This does not include retransmissions.
Access Retransmissions	The number of RADIUS Access-Request packets retransmitted to this server.
Access Accepts	The number of RADIUS Access-Accept packets (valid or invalid) received from this server.
Access Rejects	The number of RADIUS Access-Reject packets (valid or invalid) received from this server.
Access Challenges	The number of RADIUS Access-Challenge packets (valid or invalid) received from this server.
Malformed Access Responses	The number of malformed RADIUS Access-Response (Access-Accept, Access-Challenge or Access-Reject) packets received from this server. Malformed packets include packets with an invalid length. Bad authenticators or Signature attributes or unknown types are not included.
Bad Authenticators	The number of RADIUS Access-Response packets containing invalid authenticators or Signature attributes received from this server.
Pending Requests	The number of RADIUS Access-Request packets destined for this server that have not yet timed out or received a response. This counter is incremented when an Access-Request is sent and decremented due to receipt of an Access-Accept, Access-Reject or Access-Challenge, a timeout or retransmission.
Timeouts	The number of authentication timeouts to this server. After a timeout the client may retry to the same server, send to a different server, or give up. A retry to the same server is counted as a retransmit as well as a timeout. A send to a different server is counted as a Request as well as a timeout.
Packets Of Unknown Type	The number of RADIUS packets of unknown type which were received from this server on the authentication port.
Packets Dropped	The number of RADIUS packets of which were received from this server on the authentication port and dropped for any reason.

Click on the **Reset Auth Counters** to reset the Authentication Counters.

2.6.2 Accounting Monitoring

The Accounting Monitoring table displays for each of the Accounting Servers the following counters:

Counter	Description
Round Trip Time	The time interval (in hundredths of a second) between the most recent Accounting-Response and the Accounting-Request that matched it from this server.
Requests	The number of RADIUS Accounting-Request packets sent to this server. This does not include retransmissions.
Retransmissions	The number of RADIUS Accounting-Request packets retransmitted to this server. Retransmissions include retries where the Identifier and Acct-Delay have been updated, as well as those in which they remain the same.
Responses	The number of RADIUS packets received on the accounting port from this server.
Malformed Responses	The number of malformed RADIUS Accounting-Response packets received from this server. Malformed packets include packets with an invalid length. Bad authenticators or unknown types are not included.
Bad Authenticators	The number of RADIUS Accounting-Response packets containing invalid authenticators received from this server.
Pending Requests	The number of RADIUS Accounting-Request packets sent to this server that have not yet timed out or received a response. This counter is incremented when an Accounting-Request is sent and decremented due to receipt of an Accounting-Response, a timeout or retransmission.
Timeouts	The number of accounting timeouts to this server. After a timeout the client may retry the same server, send to a different server, or give up. A retry to the same server is counted as a retransmit as well as a timeout. A send to a different server is counted as an Accounting-Request as well as a timeout.
Packets of Unknown Type	The number of RADIUS packets of unknown type which were received from this server on the accounting port.
Packets Dropped	The number of RADIUS packets of which were received from this server on the accounting port and dropped for any reason.

Click on the **Reset Acct Counters** to reset the Accounting Counters.

2.7 GPS Page

The GPS page enables viewing and configuring the parameters that affect inter-cell and intra-cell synchronization.

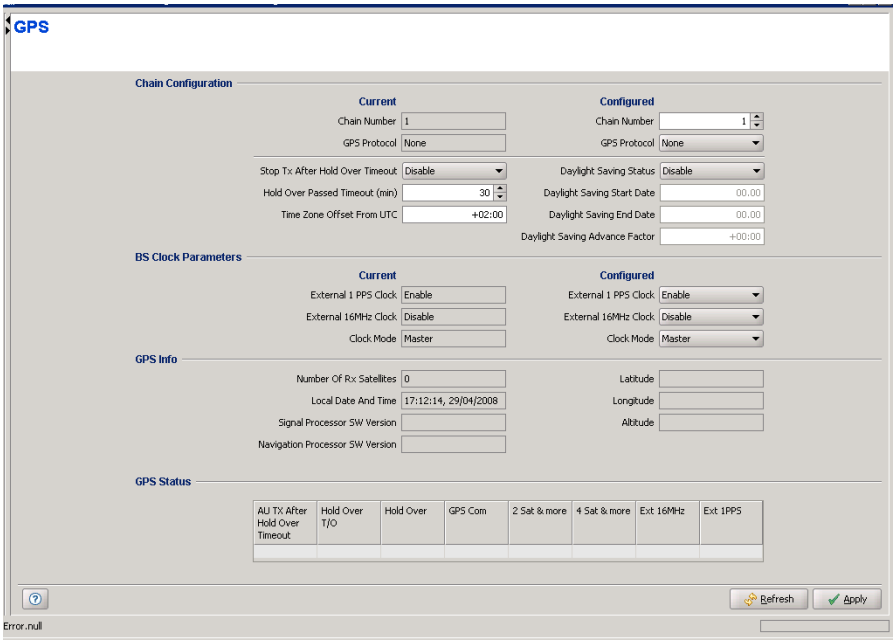


Figure 2-7: GPS Page (Micro Base Station)

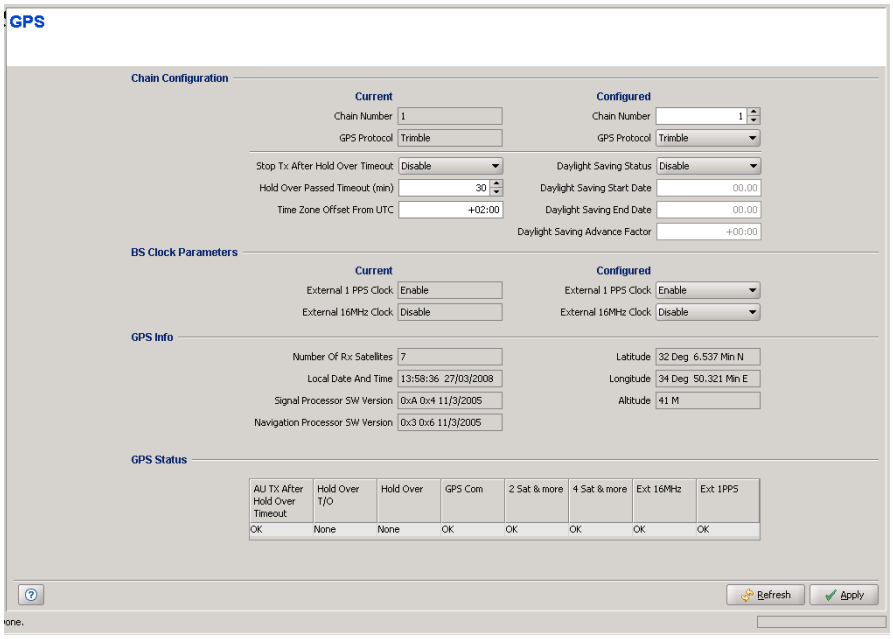


Figure 2-8: GPS Page (modular Base Station)

The GPS page comprises the following sections:

- "Chain Configuration"
- "BS Clock Parameters"
- "GPS Info"
- "GPS Status"

2.7.1 Chain Configuration

The Chain Configuration section includes the following parameters:

Parameter	Description
Chain Number (Current and Configured)	The Chain Number is used as a unique identifier of a chain. All modular Base Stations or Micro Base Stations belonging to the same chain should be configured with the same Chain Number. The Chain Number can be used by a central management system to guarantee that certain limitations are met. For example, in each chain one, and only one device should be defined as Master. In the current release, chaining is supported only in Micro Base Stations. The range is from 1 to 1500. The default is 0, indicating that a Chain Number is not configured yet. A valid Chain Number must be configured, and this number must be unique in the system to properly support central management of chaining.
GPS Protocol (Current and Configured)	The GPS Protocol defines the communication protocol with the GPS receiver. The available options are None, Trimble (for Outdoor GPS Receiver) and Symmetricom (for Indoor GPS Receiver).
Stop Tx After Hold Over Timeout	Upon losing the 1PPS clock from the GPS, or if the received clock is not considered accurate enough because the number of received satellites dropped below the minimum (two satellites), the local 1PPS clock will be generated using the available 16 MHz clock. After a certain time (defined by the Hold Over Passed Timeout parameters described below), it is assumed that due to clock drifts there might be interferences among sectors belonging to the Base Stations and sectors belonging to neighboring Base Stations. If the Stop Tx After Hold Over Timeout parameter is set to Enable, the Base Station will stop transmitting after this timeout (unless the unit has exitted Hold Over mode following proper reception of at least four satellites), to prevent interferences to the sectors belonging to other Base Stations. If it is set to Disable, transmissions will continue indefinitely, at the expense of potential interferences to sectors belonging to other Base Stations.
Hold Over Passed Timeout (min)	This parameter defines the Hold Over timeout, after which there might be interferences to other sectors. When the Stop Tx After Hold Over Timeout is enabled, transmissions will stop after this timeout. When the Stop Tx After Hold Over Timeout is disabled, this timeout indicates that there might be interferences to neighboring sectors. The range is from 0 to 2880 (minutes).

Parameter	Description
Time Zone Offset From UTC	This is the offset of the local time from UTC (Coordinated Universal Time). The range is from -12:00 up to +13:00 in 30 minutes resolution. The format must be either -XX:YY or +XX:YY where YY is either 00 or 30.
Daylight Saving Status	The Daylight Saving Status parameter is used to enable or disable the daylight saving feature using the following Daylight Saving Start Date, End Date and Advance Factor parameters.
Daylight Saving Start Date	When Daylight Saving is enabled, this parameter defines the date for starting the daylight saving feature. At the beginning of this date (midnight at the beginning of this date), the clock will be advanced by the amount of hours specified by the Daylight Saving Advance Factor (see below). Use the format dd:mm to define the date and month at which to start activating the Daylight Saving feature.
Daylight Saving End Date	When Daylight Saving is enabled, this parameter defines the date for ending the daylight saving feature (at “Daylight Saving Advance Factor” hours after midnight at the end of this date). Use the format dd:mm to define the date and month at which to end activating the Daylight Saving feature.
Daylight Saving Advance Factor	When Daylight Saving is enabled, this parameter enables configuring the amount of time by which the clock should be advanced during the daylight saving period. The range is from 00:00 to 04:45 (hours) in steps of 15 minutes.

2.7.2 BS Clock Parameters

The Clock parameters define the source for the main clocks in the system. These parameters are applied after reset. The BS Clock Parameters section enables viewing/updating the following parameters:

Parameter	Description
External 1 PPS Clock (Current and Configured)	The 1PPS (Pulse Per Second) clock is used to determine the air-frame start time. Assuming that all systems use the same air-frame size and DL/UL Ratio, then, when the 1PPS clock is received from a GPS system, this mechanism ensures inter-site and intra-site synchronization among all sectors, preventing cross interference and saturation problems. When using the internal 1PPS clock (derived from the selected 16 MHz clock source), only intra-site synchronization among sectors can be achieved. In a slave unit the External 1 PPS Clock is set to Enable and cannot be disabled (the clock is received from the previous unit in the chain). In a master unit the available options are Enable (use external 1PPS clock source) and Disable (use internal 1PPS clock source derived from the selected 16 MHz clock).
External 16 MHz Clock (Current and Configured)	The 16 MHz clock source is used for generation of all main clocking signals in the system, including the internal 1PPS clock. Using an external, accurate 16 MHz clock source will enable better hold-over of the 1PPS clock upon temporary loss (or reduced reliability when receiving less than 4 satellites) of the external 1PPS clock. This will allow a longer time of continued operation before appearance of interferences due to clock drifts among Base Stations. In a slave unit the External 1 PPS Clock is set to Enable and cannot be disabled (the clock is received from the previous unit in the chain). In a master unit the available options are Enable (use external 16 MHz clock source) and Disable (use internal 16 MHz clock source). In the current release, external 16 MHz clock from the GPS Adapter is not available. The External 16 MHz Clock must be disabled (the default).

Parameter	Description
Clock Mode (Micro Base Station only)	In the current release the Clock Mode parameter is not applicable for a modular Base Station, The Clock Mode parameter defines the location of the unit in the chain. The available options are: ■ Master ■ Redundant (not supported in current release) ■ Slave 1 (the first Slave unit in the chain, connected to the Master unit) ■ Slave 2 (the second Slave unit in the chain) ■ Slave 3 (the third Slave unit in the chain) ■ Slave 4 (the fourth Slave unit in the chain)

2.7.3 GPS Info

The GPS Info section is applicable only for a Trimble Outdoor GPS Receiver. The GPS Info section displays the following parameters:

Parameter	Description
Number Of Rx Satellites	The number of satellites received by the GPS receiver. For proper operation at least four satellites should be received.
Local Date And Time	The local date and time (using 24 hours clock) as calculated using the data (UTC time) from the GPS receiver and taking into account the Time Zone Offset from UTC. The format is: hh;mm;ss dd;mm;yyyy. For example: 13:04:23, 12/07/2006
Signal Processor SW Version	The number and date of the Signal Processor SW Version in the format 0xYY 0xZZ dd/mm/yyyy, where XX and YY are the Major and Minor SW Version Numbers in hexadecimal digits, respectively. For example: 0x18 0x2B 11/3/2005 means that the Major SW Version Number is 18 (hex), the Minor SW Version Number is 2B (hex), and the SW Version release date is 11 March 2005.
Navigation Processor SW Version	The number and date of the Navigation Processor SW Version in the format 0xYY 0xZZ dd/mm/yyyy, where XX and YY are the Major and Minor SW Version Numbers in hexadecimal digits, respectively. For example: 0x1A 0x1F 11/3/2005 means that the Major SW Version Number is 1A (hex), the Minor SW Version Number is 1F (hex), and the SW Version release date is 11 March 2005.

Parameter	Description
Latitude	The latitude as calculated by the GPS receiver. The format is xx Deg yy.yyy Min, B, where xx is the latitude in degrees, yy.yyy is in minutes (decimal format), and B is either E (East) or W (West). For example, 024 Deg 25.290 Min, E.
Longtitude	The longitude as calculated by the GPS receiver. The format is <xx Deg yy.yyy Min, A>, where xx is the longitude in degrees, yy.yyy is in minutes (decimal format), and A is either N (North) or S (South). For example, 42 Deg 06.512 Min, N.
Altitude	The altitude in meters as calculated by the GPS receiver.

2.7.4 GPS Status

The GPS Status section displays the following status details:

Parameter	Description
AU TX After Hold Over Timeout	Indicating whether the AUs are transmitting ot not (OK/Stopped)
Hold Over T/O	Indicating whether Hold Over Timeout has passed (None or Passed)
Hold Over	Indicating whether the device has entered into Hold Over state (None or Started)
GPS Com	Applicable only for Trimble GPS, indicating the status of communication with the GPS receiver (OK or Failed)
2 sat & more	Applicable only for Trimble GPS, indicating whether 2 (the minimum number required for maintaining synchronization) or more satellites are received by the GPS receiver (OK or Failed).
4 sat & more	Applicable only for Trimble GPS, indicating whether 4 (the minimum required for initial synchronization) or more satellites are received by the GPS receiver (OK or Failed)
Ext 16MHz	The status of External 16MHz clock (OK or Failed)
Ext 1PPS	The status of External 1PPS clock (OK or Failed)

2.8 Modular Base Station PF Parameters Page

The PF Parameters page in the modular Base Station is applicable only in IP CS Switching Mode for support of IP Mode Managed VoIP services.

The PF Parameters page enables viewing and editing the general parameters that affect the communication of the NPU with the Policy Function server(s) and with the SIP devices using IP Mode Managed VoIP Services. It also enables viewing the status and parameters of defined Policy Function servers, updating the parameters of a server, adding a new server, or deleting a server from the database.

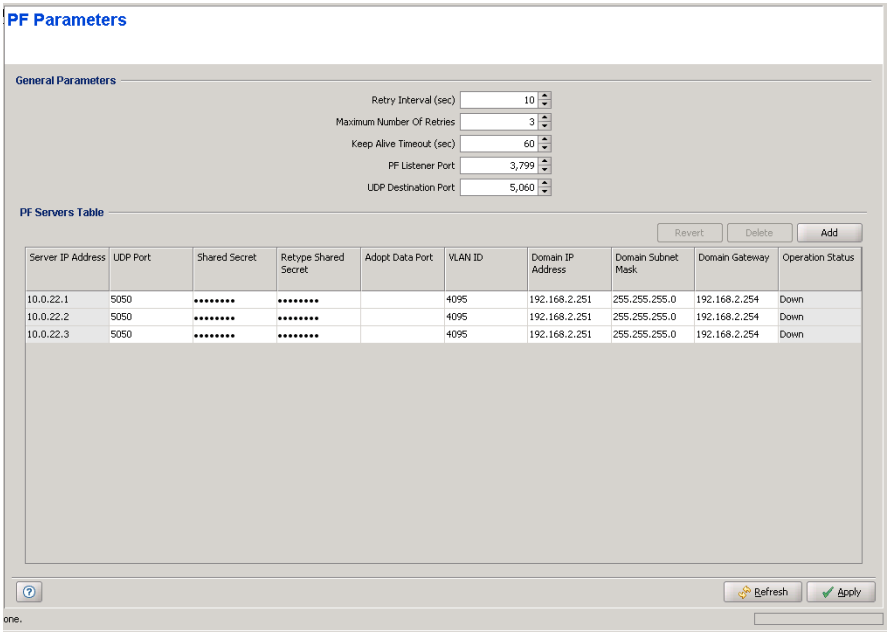


Figure 2-9: Modular Base Station PF Parameters Page

The PF Parameters page includes the following sections:

- "PF General Parameters"
- "PF Servers Table"

2.8.1 PF General Parameters

Parameter	Description
Retry Interval (sec)	The Retry Interval parameter defines the time in seconds to wait before retransmitting a message to the Policy Function server if no response is received. The range is 1-60 (seconds).
Maximum Number of Retries	The Number of Retries parameter defines the maximum number of retransmission attempts, before a decision is taken to revert to another server if configured (not applicable for current release), or give up. The range is 0-5 (retries).
Keep Alive Timeout (sec)	The NPU maintains a keep alive mechanism with all defined servers. The Keep Alive Timeout defines the time in seconds to wait before reaching a decision that a certain server is no longer available. The range is 60-300 (seconds).
PF Listener Port	The PF Listener Port is the number of the port used by the NPU for listening to R3 messages from Policy Function server(s). The range is 1-65535.
UDP Destination Port	The UDP Destination Port is the number of the port used by the NPU for receiving SIP messages from the voice gateway (provided that an IP Mode Managed VoIP Service is provisioned to the relevant SU). The same port number must be configured in all the relevant voice gateways. The range is 1-65535.

2.8.2 PF Servers Table

The PF Servers Table enables viewing the parameters of Policy Function servers, editing the parameters of an existing server, adding a new server or deleting a server from the database of the device. The database can contain up to 10 PF servers.

For each entry, the following parameters are available:

Parameter	Description
Server IP Address	The IP address of the Policy Function server. The IP address of an existing server cannot be modified.
UDP Port	The UDP port number used by the Policy Function server for receiving messages from the Micro Base Station. Valid values: 1 to 65535.

Parameter	Description
Shared Secret	Shared Secret is the key used for encrypting the user's credentials in the messages between the Micro Base Station and the Policy Function. For security reasons, the Shared Secret is displayed as a series of dots., and when defining it for the first time or updating it, the user is prompted to re-enter the new Shared Secret for confirmation. The Shared Secret comprises a string of 1 to 16 printable characters.
Retype Shared Secret	When either defining the Shared Secret for the first time or updating it, the user must re-enter the new Shared Secret for confirmation.
Adopt Data Port	The IP interface defined for communication with the server may be on a different subnet then the one defined for the Data port for data and management purposes. Double click on the entry to open the drop-down menu. The options are Yes and No. If Yes is selected then relevant interface parameters are not configurable and will be adopted from Data port configuration: VLAN ID = Data Port Management VLAN ID Domain IP Address = Data Port IP Address Domain Subnet Mask = Data Port Subnet Mask Domain Gateway = Data Port Gateway If No is selected, these parameters must be configured. In this case the IP parameters defined for the interface must be on a subnet that is unique in the device
VLAN ID	Configurable only if Adopt Data Port is set to No. The VLAN ID to be used for communication with the server. Available values for VLAN are 0 to 4094. Enter either null or 4095 for No VLAN ID. 4095 will be displayed fo No VLAN ID
Domain IP Address	Configurable only if Adopt Data Port is set to No. The interface IP address to be used for communication with the server.
Domain Subnet Mask	Configurable only if Adopt Data Port is set to No. The subnet mask to be used with the interface IP address for communication with the server.
Domain Gateway	Configurable only if Adopt Data Port is set to No. The default gateway IP address to be used for communication with the server.

2.9 Modular Base Station PF Performance Page

The PF Performance page in the modular Base Station enables viewing and resetting various counters showing statistics of communication between the NPU and defined Policy Function servers.

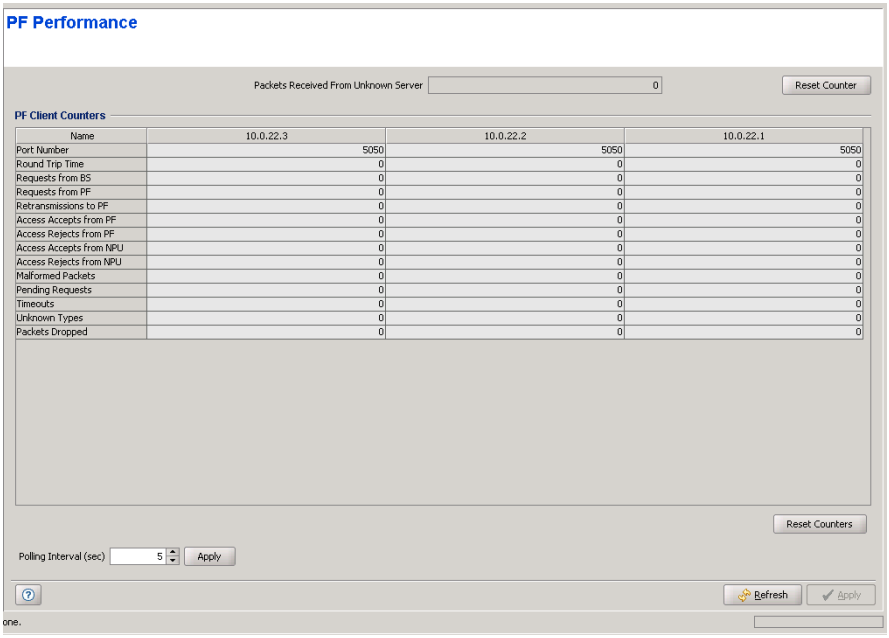


Figure 2-10: Modular Base Station PF Performance Page

The **Packets Received From Unknown Server** counter displays the total number of packets received from unknown servers(s) since the last reset.

The **PF Client Counters** table displays the following details for each of the Policy Function servers:

Parameter	Description
Name	The IP address of the Policy Function server.
Port Number	The UDP port number used by the Policy Function server for receiving messages from the NPU.
Round Trip Time	The time interval (in milliseconds) between the most recent Access-Reply and the Access-Request that matched it from this server.

Parameter	Description
Requests from BS	The number of PF Access-Request packets sent to this server. This does not include retransmissions.
Requests from PF	The number of PF Access-Request packets sent from this server.
Retransmissions to PF	The number of PF Access-Request packets retransmitted to this server.
Access Accepts from PF	The number of PF Access-Accept packets sent from this server.
Access Rejects from PF	The number of PF Access-Reject packets from to this server.
Access Accepts from NPU	The number of PF Access-Accept packets sent to this server.
Access Rejects from NPU	The number of PF Access-Reject packets sent to this server.
Malformed Packets	The number of malformed PF Access-Request packets received from this server. Malformed packets include packets with an invalid length.
Pending Requests	The number of PF Access-Request packets destined for this server that have not yet timed out or received a response. This counter is incremented when an Access-Request is sent and decremented due to receipt of an Access-Accept or Access-Reject, a timeout or retransmission.
Timeouts	The number of timeouts to this server that caused packets to be dropped.
Unknown Types	The number of packets of unknown type which were received from this server.
Packets Dropped	The number of PF packets which were received from this server and were dropped for any reason.

To change the polling interval:

The **Polling Interval** range is from 1 to 3600 seconds. Enter the required polling interval and click on the **Apply** button next to it.

To reset counters:

Click on the **Reset Counter** button next to the **Packets Received From Unknown Server(s)** to reset this counter.

Click on the **Reset Counters** button below the **PF Client Counters** table to reset the applicable counters.

2.10 General Radio Parameters Page

The General Radio Parameters page enables viewing and configuring the general radio parameters of the device.

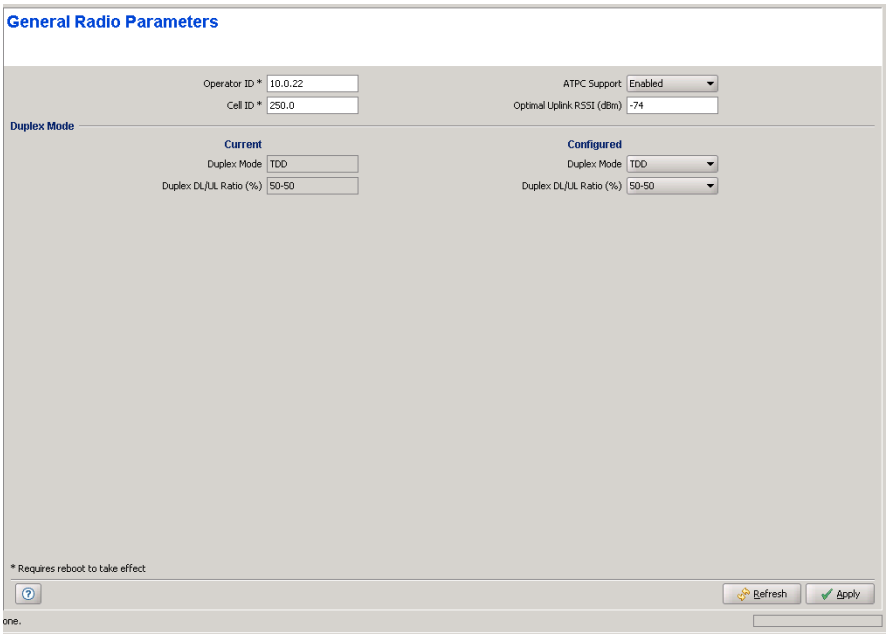


Figure 2-11: General Radio Parameters Page

The General Radio Parameters page includes the following parameters:

Parameter	Description
Operator ID	A unique identifier of the network. The same Operator ID must be defined for all Base Stations/Micro Base Stations in the network, and it should not be used by any device belonging to another network in the same area. The Operator ID consists of 3 groups of up to three digits each, where the range for each group is 0 to 255. In the modular Base Station, the Operator ID parameter is used by all AUs. Updated value of the Operator ID is applied for each AU after resetting the AU (or after resetting the NPU, which causes reset of all AUs). In the Micro Base Station, a change in the value configured for the Operator ID is applied only after reset.

Parameter	Description
Cell ID	A unique identifier of Base Station/Micro Base Station. The same Cell ID should not be used by any other device belonging to the network. The Cell ID consists of 2 groups of up to three digits each, where the range for each group is 0 to 255. In the modular Base Station, the Cell ID parameter is used by all AUs. Updated value of the Cell ID is applied for each AU after resetting the AU (or after resetting the NPU, which causes reset of all AUs). In the Micro Base Station, a change in the value configured for the Cell ID is applied only after reset.
ATPC Support	The ATPC Support parameter controls whether the ATPC algorithm should be used to determine current optimal transmit level for each SU served by the modular Base Station/Micro Base Station. The ATPC algorithm should always be enabled. The option to disable it is available to support certain tests. After each reset, the modular Base Station/Micro Base Station boots with the ATPC enabled, disregarding its status before the device was reset.
Optimal uplink RSSI (dBm)	The Optimal Uplink RSSI sets the target level at which all transmissions should be received by the AU-ODUs for optimal performance. The available range is from -80 to -74 (dBm). You can see the actual value of the Optimal Uplink RSSI in the Air Interface page of each AU/Micro Base Station.
Duplex Mode (Current and Configured)	The operation mode of the system: TDD or FDD. In the current release only TDD Mode is supported and the Duplex Mode should not be changed. A change in the configured Duplex Mode is applied only after reset.

Parameter	Description
Duplex DL/UL Ratio (%) (Current and Configured)	Defines the ratio of transmit (Down Link) time to receive (Up Link) time, in percents. (Applicable only for TDD Duplex Mode). The available values are: ■ 65-35 ■ 60-40 ■ 55-45 ■ 50-50 ■ 45-55 ■ 40-60 ■ 35-65 When Sub-channelization is enabled (Minimum Number of Sub-Channels is other than 16), some DL/UL Ratios are not supported for certain combinations of Bandwidth, Minimum Allocation (configurable only via Telnet) and Maximum Cell Radius: ■ For 3.5 MHz bandwidth and AU Minimum Allocation of 5 Symbols, DL-UL Ratios of 65-35 and 60-40 are not supported, regardless of Maximum Cell Radius. DL-UL Ratio of 55-45 is not supported for Maximum Cell Radius of 19 km and higher. ■ For 3.5 MHz bandwidth and AU Minimum Allocation of 3 Symbols, DL-UL Ratios of 65-35 and 60-40 are not supported, regardless of Maximum Cell Radius. DL-UL Ratio of 55-45 is not supported for Maximum Cell Radius of 42 km and higher. ■ For 5 MHz bandwidth and AU Minimum Allocation of 5 Symbols, DL-UL Ratio of 65-35 is not supported for Maximum Cell Radius of 30 km and higher. A change in the configured Duplex DL/UL Ratio is applied only after reset.

CAUTION

The Duplex DL/UL Ratio of all Base Stations in the same coverage area (neighboring cells) must be set to the same value to ensure optimal performance and avoid uplink saturation

2.11 Radio Clusters Page

The Radio Clusters page enables viewing and configuring the parameters of all available Radio Clusters.

Radio Cluster is a logical entity used to describe and support management of the Base Station's elements associated with specific geographical sectors. A Radio Cluster represents one or several ODUs that serve (through their directional antennas) the same geographical sector.

The Radio Cluster(s) must be defined prior to defining the relevant ODU(s), AU(s) and Channel(s).

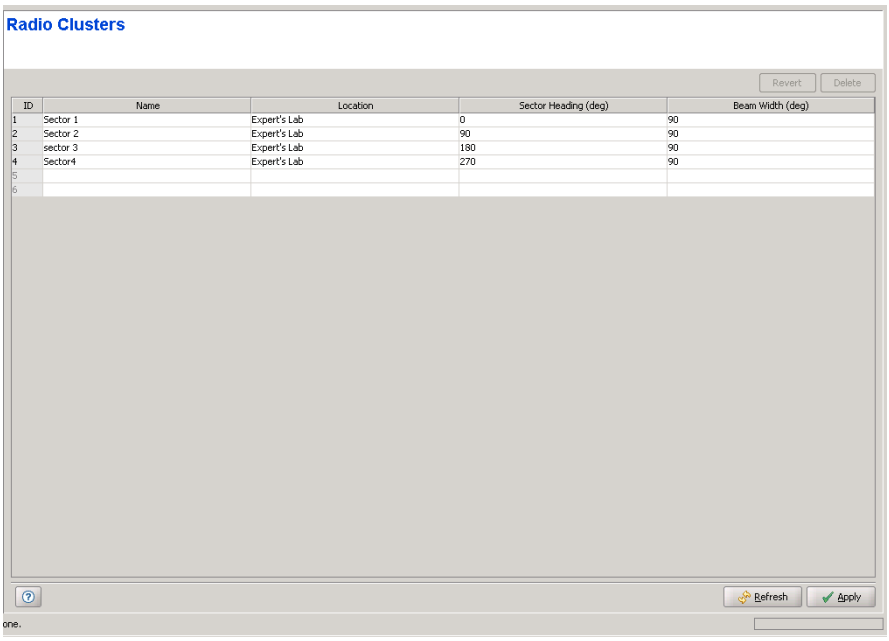


Figure 2-12: Radio Clusters Page (modular Base Station)

The Radio Clusters table includes the following parameters:

Parameter	Description
ID	A read-only display of the Radio Cluster's ID, which is a number used to identify the Radio Cluster. The range is from 1 to 6 in a modular modular Base Station, or 1 to 4 in a Micro Base Station.

Parameter	Description
Name	A string of up to 32 printable characters used as the descriptive name of the Radio Cluster. This is an optional descriptive parameter. It is recommended to define a unique name for each Radio Cluster to support identification of defined Radio Cluster in the BS/MBS View page.
Location	A string of up to 255 printable characters used to describe the location of the Radio Cluster. This is an optional descriptive parameter.
Sector Heading	The direction of the geographical sector, defined in degrees from the north. This is an optional descriptive parameter. The values range is from 0 to 359 (degrees from north).
Beam Width	The beam width, in degrees, of the antenna(s) used in the geographical sector. This is an optional descriptive parameter. The values range is from 0 to 359 (degrees).

2.12 Outdoor Units Page

The Outdoor Units page enables viewing and configuring the parameters of all available Outdoor Units (ODUs).

The ODU(s) must be defined prior to defining the relevant AU(s) and Channel(s).

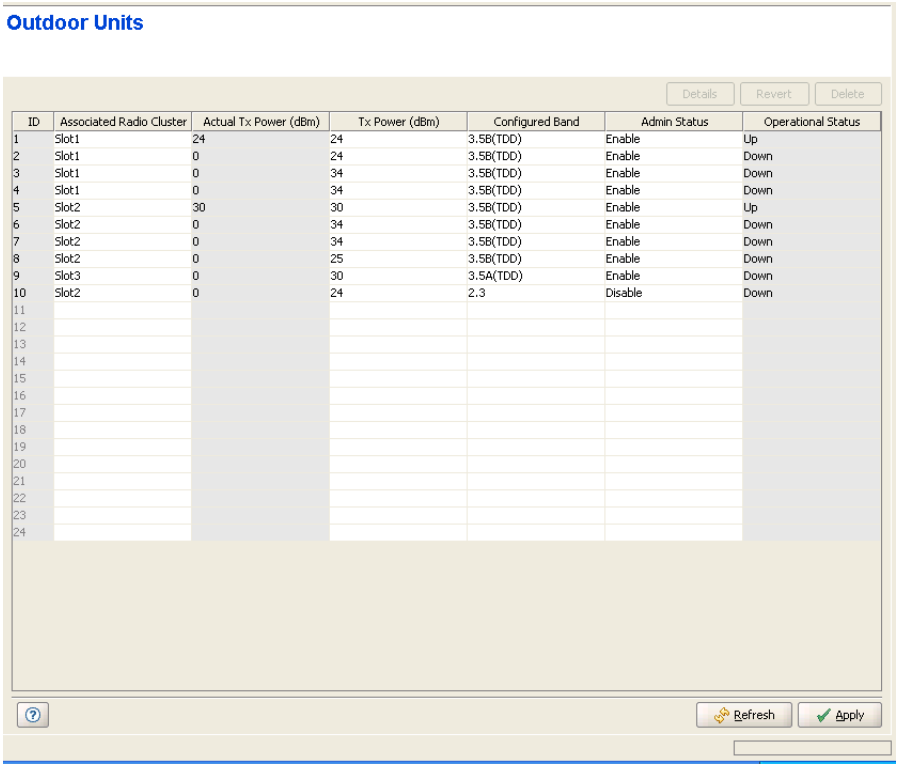


Figure 2-13: Outdoor Units Page (modular Base Station)

The Outdoor Units table includes the following parameters:

Parameter	Description
ID	A read-only display of the Outdoor Unit's ID, which is a number used to identify the ODU. The range is from 1 to 24 in a modular Base Station, or 1 to 4 in a Micro Base Station.
Associated Radio Cluster	The Name of the Associated Radio Cluster. The selection list includes all defined Radio Clusters.
Actual Tx Power	The actual Tx power of the ODU. See details in Tx Power below.

Parameter	Description
Tx Power	The power level of the transmitted signal at the antenna port of the ODU. The range is from 0 to 50 dBm, using a 1 dBm resolution. In case the entered value is not compatible with the installed ODU, a trap will be issued. If the entered value is below the minimum supported by the ODU the actual power will be set to the minimum supported by the unit. If the entered value is above the maximum supported by the ODU, the power will be changed to the maximum value supported by the ODU. Note that the displayed value is the configured value which may differ from the actual value. The Tx Power of a connected ODU can be changed only if the Admin Status of the associated channel is disabled. If the Diversity Mode of the AU/Micro Base Station to which the ODU is connected is set to any of the Fourth Order Diversity modes, the Tx Power of the ODUs associated with Channels 2-4 cannot be changed. After enabling the Admin Status of Channel 1, the Tx Power of the ODUs associated with Channels 2-4 will be forced to the value configured for the ODU associated with Channel 1. If the Diversity Mode of the AU/Micro Base Station to which the ODU is connected is set to Second Order Diversity, the Tx Power of the ODU associated with Channel 2 cannot be changed. After enabling the Admin Status of Channel 1, the Tx Power of the ODU associated with Channel 2 will be forced to the value configured for the ODU associated with Channel 1. Channels 3 and 4 are not used in Second Order Diversity Mode.
Configured Band	The Configured ODU Frequency Band can be modified through the use of Frequency Bands Configuration file. The available values are the bands from the displayed list of available Frequency Bands. The Configured ODU Frequency Band can be updated only if the ODU is not associated with any Channel, or if the Admin Status of the associated Channel is Disabled. Compatibility between the Configured ODU Frequency Band and its actual band is verified by the AU/Micro Base Station upon trying to associate the ODU with a Channel. If the Configured ODU Frequency Band differs from the actual band supported by the ODU, a mismatch trap will be sent by the AU/Micro Base Station upon trying to associate it with a Channel and the association will be rejected.
Admin Status	The transmit on/off status of the ODU. The available options are Enable and Disable.
Operational Status	A read-only display of the ODU's operational status.

Click on the **Details** button to open the **HW Details** window, displaying additional information on a selected ODU. The displayed details include:

- Card Serial Number
- Main Card HW Revision
- Main Card HW Configuration
- HC08 Version
- CPLD Version
- Temperature (Celsius)
- Max Tx Power (dBm): The maximum Tx Power supported by the ODU. This parameter sets the upper limit for the actual Tx Power parameter.
- ODU status Mask (Hex): A bit mask indicating the alarm status of the ODU. A mask of 00-00-00-00 indicates a no alarm condition. For details on possible alarm conditions and corrective actions refer to the System Manual.
- Rx Cable Loss (dB): The measured loss in dB of the IF cable connecting the ODU to the AU/Micro Base Station. The Rx Cable Loss should not exceed 10 dB.
- Connected AU Slot No (Applicable only for a modular Base Station).
- Channel

2.13 Default Operational Settings Page

The Default Operational Settings page enables viewing and modifying the Service Working Mode and Default Services.

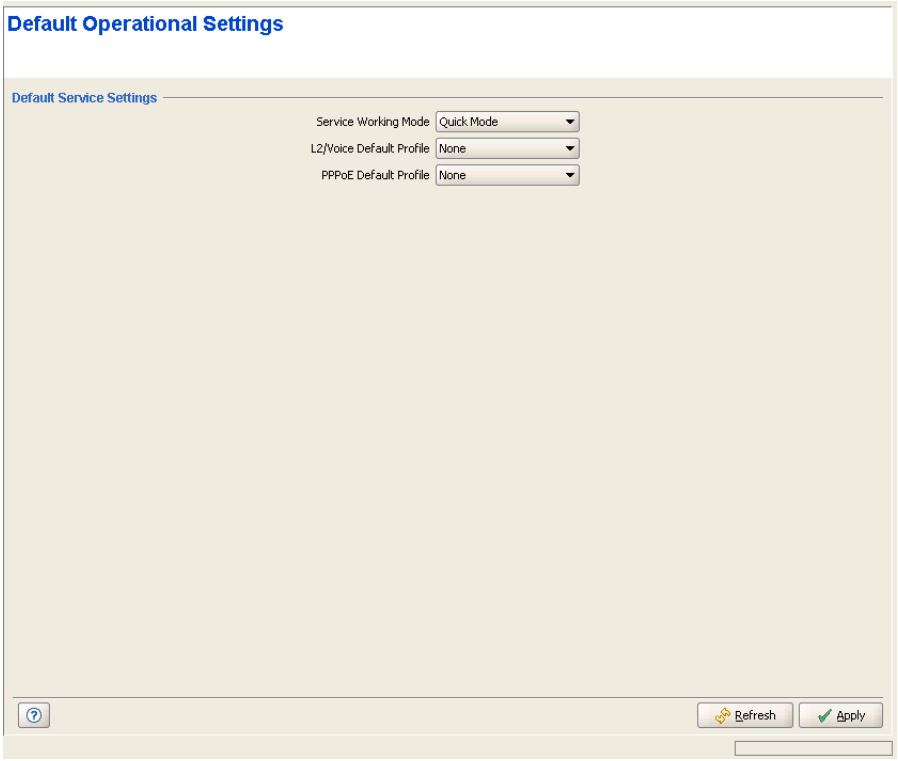


Figure 2-14: Default Operational Settings Page (modular Base Station, Ethernet CS Switching Mode)

The Default Operational Settings page includes the following parameters:

Parameter	Description
Service Working Mode	The Service Provisioning Mode: Advanced or Quick. Read-only (Advanced Mode) in IP CS Switching Mode.

Parameter	Description
L2/Voice Default Service (modular Base Station), or *L2/Voice/Managed VoIP Service (Micro Base Station)*	Not applicable in IP CS Switching Mode. The default L2 or Voice or Managed VoIP (in Micro Base Station only) Service Profile to be used by temporary SUs in Quick Mode if rejected by the RADIUS Authentication server (or if a RADIUS Authentication server is not available), provided it uses the “quick” User Password “quickynikinyoky”. Available profiles - any of the relevant Service Profiles existing in the device’s database, or None.
PPPoE Default Service	Not applicable in IP CS Switching Mode. The default PPPoE Service Profile to be used by temporary SUs in Quick Mode if rejected by the RADIUS Authentication server (or if a RADIUS Authentication server is not available), provided it uses the “quick” User Password “quickynikinyoky”. Available profiles - any of the PPPoE Service Profiles existing in the device’s database, or None.

2.14 Filters Page

The Filters page is not available in IP CS Switching Mode.

The Filters page enables to define Layer 2 and Layer 3/Layer 4 Filtering Rules. It also enables defining if and how to filter packets arriving from the backbone network or from the wireless link. The Filter page comprises three tabs:

- "Interface Tab": For defining the filtering mechanism on each of the interfaces (Network and Wireless) using Filtering Rules defined in the L2 and/or L3/L4 tabs.
- "L2 Tab": For defining L2 Filtering Rules and assigning them to the relevant interface(s).
- "L3/L4 Tab": For defining L3/L4 Filtering Rules and assigning them to the relevant interface(s).

2.14.1 Interface Tab

The Interface tab enables defining the filtering mechanism to be used on each of the interfaces, and applying the chain of rules on each interface type.

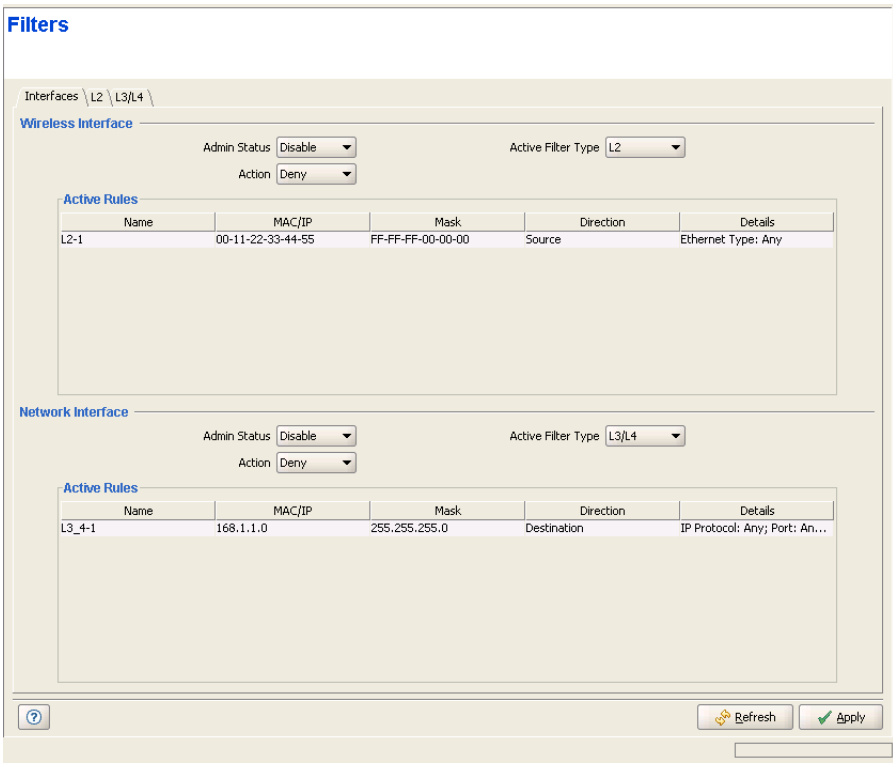


Figure 2-15: Filters Page - Interface Tab

For each interface (Network and Wireless), the following parameters are available:

Parameter	Description
Admin Status	Defines whether the filtering mechanism is enabled or disabled.
Action	Defines whether the Filtering Rules are inclusive (Allow) or exclusive (Deny). The applicable Filtering Rules are all Filtering Rules belonging to the selected Active Filter Type that are associated with the relevant Interface. If the Action is Allow, all frames matching any of the applicable Filtering Rules will be forwarded, and all other frames will be discarded. If the Action is Deny, all frames matching any of the applicable Filtering Rules will be discarded, and all other frames will be forwarded.
Active Filter Type	Defines which of the Filtering Rules List is used. The available options are L2 and L3/L4.

In addition, for each Interface the **Active Rules** table displays the list of applicable Filtering Rules that are associated with the Interface.

2.14.2 L2 Tab

The L2 tab enables defining up to 255 L2 Filtering Rules and optionally associating each Rule with the Wireless and/or Network Interface.

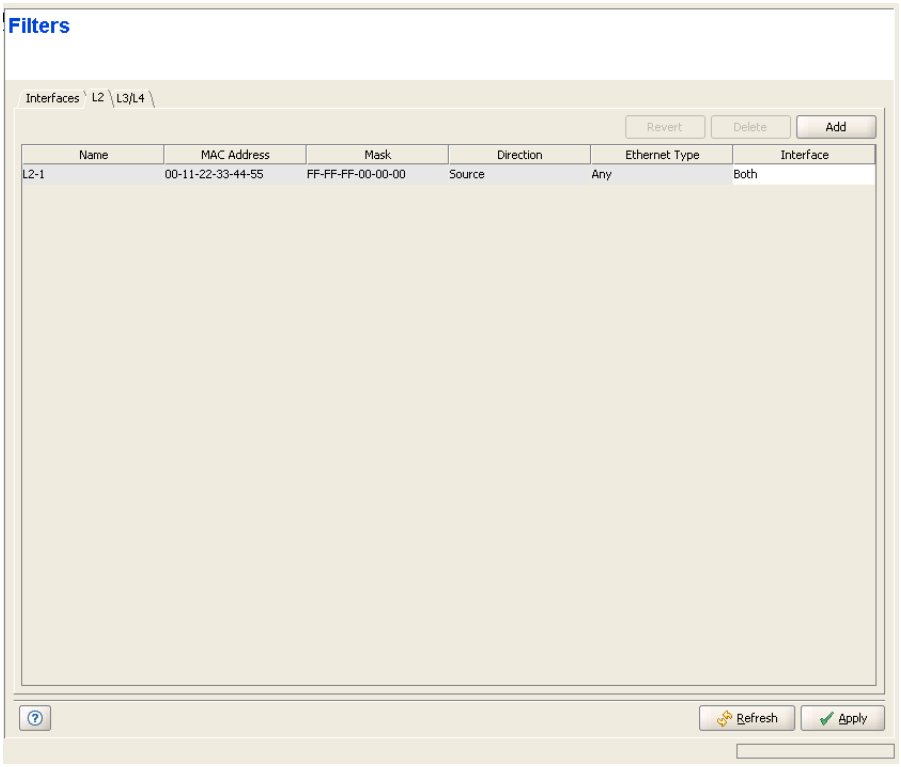


Figure 2-16: Filters Page - L2 Tab

The L2 tab includes a table with the following parameters for each entry:

Parameter	Description
Name	The name of the L2 Rule. The L2 Rule Name is a string of 1 to 32 printable characters.
MAC Address	The MAC Address. A string of 6 octets (where each octet is represented by two hexadecimal numbers) separated by dashes ("-"). An empty entry means "Any". An "Any" MAC Address means that the filter is defined only by the Ethertype field. The MAC Address (if not defined as “Any”) is the base MAC Address that is used together with the MAC Address Mask to define a range of MAC addresses.

Parameter	Description
Mask	The Mask is not applicable in a Micro Base Station. In a modular Base Station, this is the mask used together with the MAC Address to define a range of MAC addresses. A string of 6 octets (where each octet is represented by two hexadecimal numbers) separated by dashes ("-"). In a binary representation the string must comprise a series of contiguous binary '1's starting from the MSB, followed by a series of contiguous binary '0's (if the range includes more than a single address). The MAC Address Mask is not applicable for an "Any" MAC Address..
Direction	The direction (Source or Destination) of the MAC Address. Indicates whether the range defined by the MAC Address and MAC Address Mask is for the Source MAC Address field or the Destination MAC Address field in the Ethernet frame. The MAC Address Direction parameter is not applicable to "Any" MAC Address.
Ethernet Type	The Ethertype of the Ethernet frame. The Ethertype is defined by 4 hexadecimal digits. A selection of some popular Ethertypes is also available. "Any" is applicable only if a MAC Address range is defined (the combination of "Any" for both the MAC Address and Ethertype is not allowed). Enter tne required Ethertype (up to 4 hexadecimal digits) or select an Ethetype (or Any) from the drop-down menu.
Interface	The Interface(s) that will use this Filtering Rule if the selected Active Filter Type (see “Interface Tab” on page 62) is L2. The available options are None, Wireless, Network and Both.

NOTE

L2 Filtering Rules cannot be edited. To modify an existing Rule, delete it and then define it as a new Rule using the Add option.

2.14.3 L3/L4 Tab

The L3/L4 tab enables defining up to 255 L3/L4 Filtering Rules and optionally associating each Rule with the Wireless and/or Network Interface.

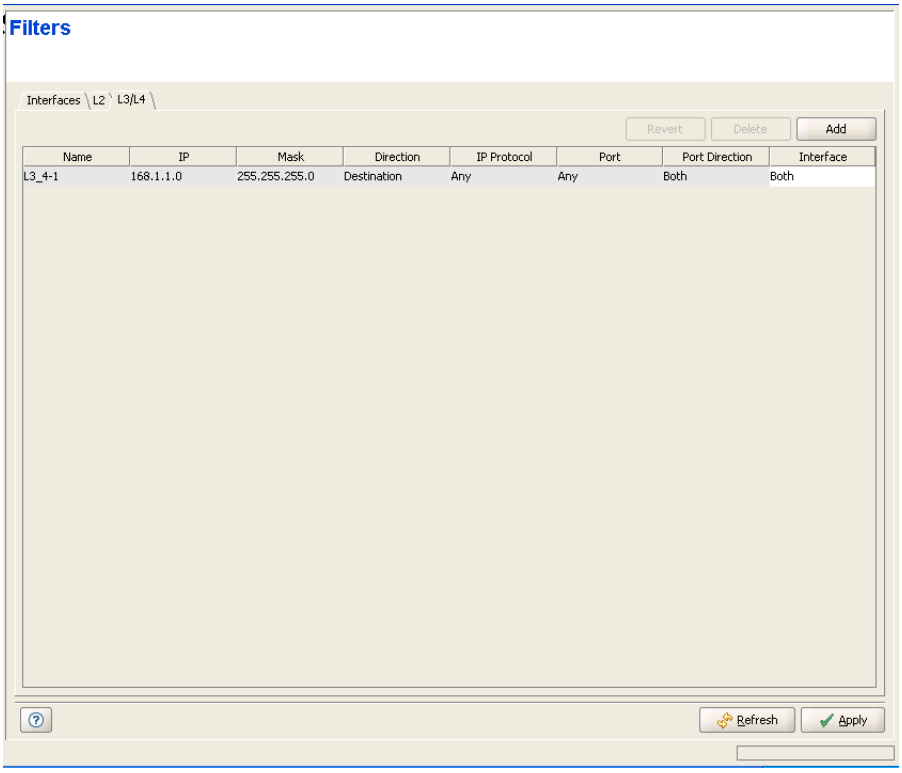


Figure 2-17: Filters Page - L3/L4 Tab

The L3/L4 tab includes a table with the following parameters for each entry:

Parameter	Description
Name	The name of the L3/L4 Rule. The L3/L4 Rule Name is a string of 1 to 32 printable characters.
IP Address	The IP Address. A string of 4 decimal numbers (where each number is in the range from 1 to 255) separated by dots ("."). An empty entry means "Any". An "Any" IP Address means that the filter is defined only by the Protocol field (and optionally by the Port and Port Direction for UDP or TCP protocols). In the modular Base Station, the IP Address (if not defined as “Any”) is the base IP Address that is used together with the IP Address Mask to define a range of IP addresses.

Parameter	Description
Mask	Not applicable in a Micro Base Station. In a modular Base Station, this is the mask used together with the IP Address to define a range of IP addresses. A string of 4 decimal numbers (where each number is in the range from 1 to 255) separated by dots ("."). In a binary representation the string must comprise a series of contiguous binary '1's starting from the MSB, followed by a series of contiguous binary '0's (if the range includes more than a single address). The IP Address Mask is not applicable for an "Any" IP Address.
Direction	Not applicable for a Micro Base Station where the Port Direction defines also the IP Address Direction. In a modular Base Station, this is the direction (Source or Destination) of the IP Address. Indicates whether the range defined by the IP Address and IP Address Mask is for the Source IP Address field or the Destination IP Address field in the IP frame. The IP Address Direction parameter is not applicable to "Any" IP Address.
IP Protocol	The protocol of the IP frame. The Protocol is defined by a decimal number from 0 to 254. A selection of some popular protocols is also available.In a Micro Base Station, the available protocols are TCP (6), UDP (17) or "Any". "Any" is applicable only if an IP Address range is defined (the combination of "Any" for both the IP Address and Protocol is not allowed). Enter the required Protocol number (0-254) or select a Protocol (or Any) from the drop-down menu.
Port	The TCP/UDP port number, which is applicable only if the IP Protocol is configured to a value of either 6 (TCP) or 17 (UDP). The Port is defined by a number in the range from 0 to 65534, or “Any”. A selection of some popular ports is also available. Enter tne required Port number (0-65534) or select a Port (or Any) from the drop-down menu.
Port Direction	The direction (Source or Destination) of the Port. Indicates whether the Port number is for the Source Port field or the Destination Port field in the IP frame. The Port Direction parameter is not applicable to "Any" Port. In a Micro Base Station, the Port Direction defines also the IP Address Direction.
Interface	The Interface(s) that will use this Filtering Rule if the selected Active Filter Type (see “Interface Tab” on page 62) is L3/L4. The available options are None, Wireless, Network and Both.

NOTE

L3/L4 Filtering Rules cannot be edited. To modify an existing Rule, delete it and then define it as a new Rule.

2.15 MAC Deny List Page

The MAC Deny List page is not available in IP CS Switching Mode.

The MAC Deny List page enables viewing and updating the MAC Deny List table. The MAC Deny List table is used to deny services to MAC Addresses behind SUs. Uplink frames whose source MAC address matches any of the entries in the list and downlink frames whose destination MAC address matches any of the entries in the list will be discarded.

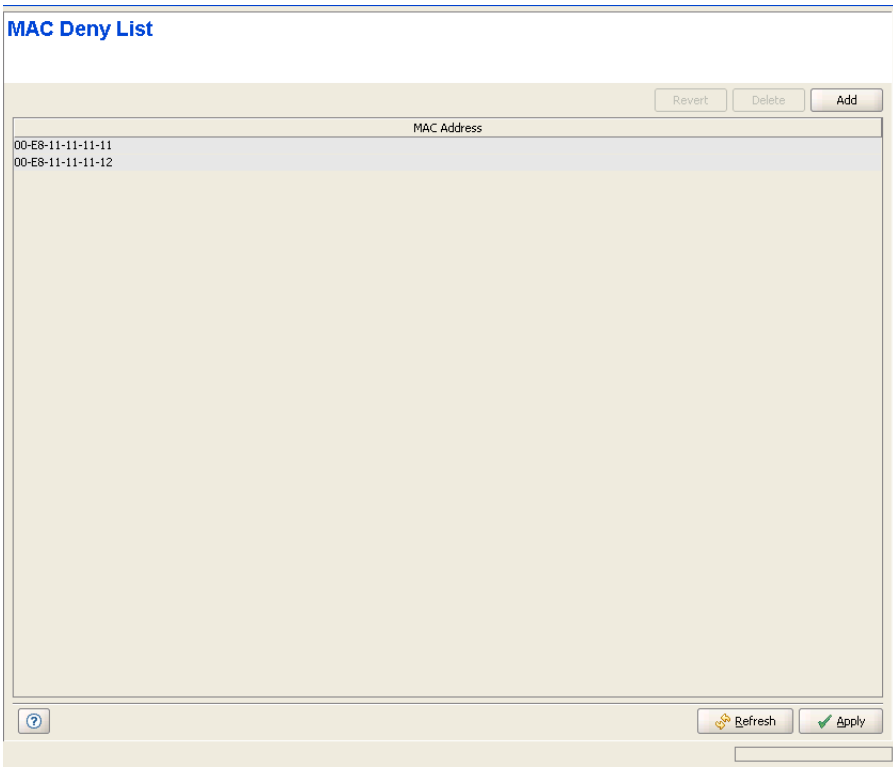


Figure 2-18: MAC Deny List Page

To add a MAC Address to the table, use the format xx-xx-xx-xx-xx-xx. The table can hold up to 255 entries.

2.16 Filtering Performance Page

The Filtering Performance page is not available in IP CS Switching Mode.

The Performance page enables on-line view of selected counters.

For details on the general functionality of the Performance Monitoring application, refer to “Using the Performance Page” on page 233.

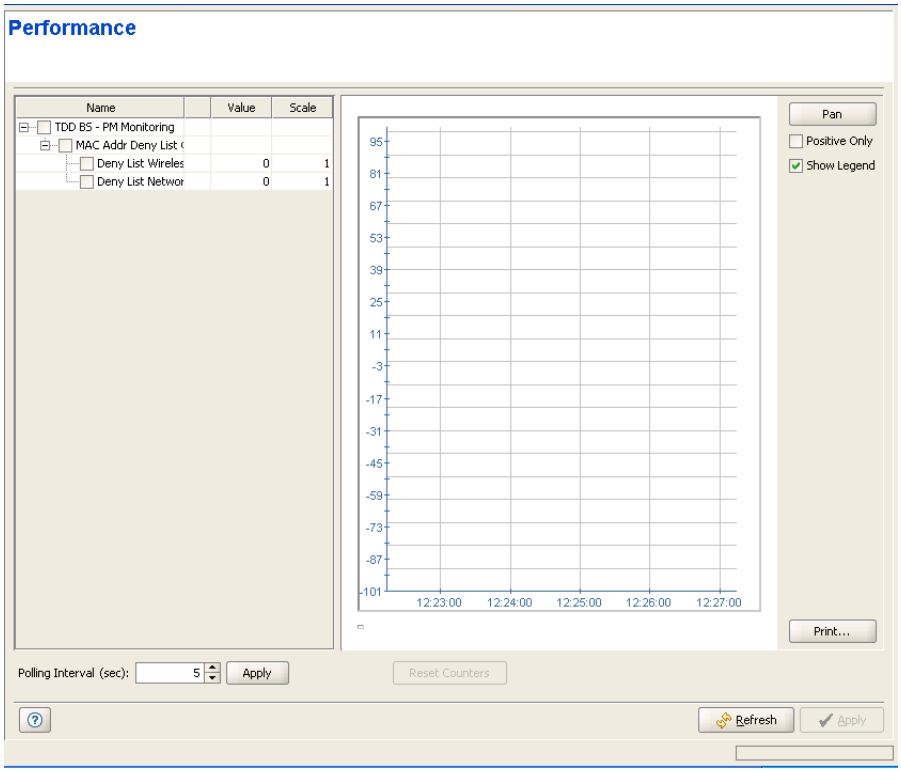


Figure 2-19: Filtering - Performance Page

The counters available for the Filter are:

Counter	Description
MAC Address Deny List Wireless Packet Counter	The total number of packets received on the wireless interface that were discarded because their source MAC address is included in the MAC Address Deny List.
MAC Address Deny List Network Packet Counter	The total number of packets received on the network (backbone) interface that were discarded because their destination MAC address is included in the MAC Address Deny List.

2.17 Subscriber Units Page

The Subscriber Units page displays general details on all Subscriber Units that are defined in the managed device. The list includes also registered temporary SUs.

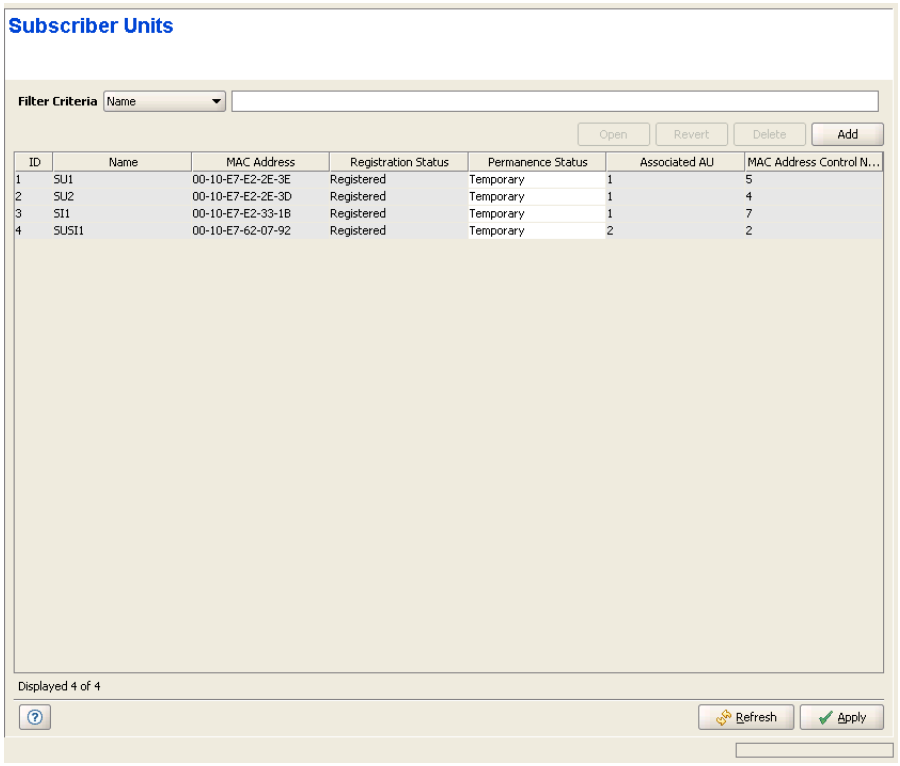


Figure 2-20: Subscriber Units Page (modular Base Station, Ethernet CS Switching Mode)

The device may serve a very large number of Subscriber Units. To enable simpler and more efficient management of Subscriber Units, you can filter the list of displayed units according to selected criteria:

To filter the list of Subscriber Unit:

1 Use the **Filter Criteria** drop-down menu to select the filtering criteria. The available options are Name, MAC Address, Registration Status, Permanence Status, Associated AU.

2 Use the text box/drop-down menu on the right side of the **Filter Criteria** selection menu as follows:

Filtering Criteria	Description
Name	Start filling in the first characters of the Name(s) you are looking for. After entering each characters, the displayed table will be updated to display only the entries for SUs whose Name meet the current filtering criteria (start with the entered string). If the definition text box is empty, all SUs will be displayed.
MAC Address	Start filling in the first characters of the MAC Address(es) you are looking for. After entering each characters, the displayed table will be updated to display only the entries for SUs whose MAC address meet the current filtering criteria (start with the entered string). If the definition text box is empty, all SUs will be displayed.
Registration Status	Select the required status (Authenticated, Registered, Not Registered) in the drop-down menu. Only SUs whose status is the selected one will be displayed.
Permanence Status	Applicable only in Ethernet CS Switching Mode. Select the required status (Permanent or Temporary) in the drop-down menu. Only SUs whose status is the selected one will be displayed.
Associated AU	Not applicable for a Micro Base Station. Type in the required AU Slot Number (1-4, 7-9) to display only SUs associated with the selected AU. Type in “N” to display only SUs that are not associated with any AU. Leave the text box empty to view all SUs.

The Subscriber Units table includes the following details for each SU:

Parameter	Description
Name	The SU’s Name.
MAC Address	The SU’s MAC Address.
Registration Status	The registration status of the SU: Registered (connected) or Not Registered.
Permanence Status	The Permanence Status of the SU: Permanent or Temporary. Applicable only in Ethernet CS Switching Mode (In IP CS Switching Mode the Permanence Status is always Temporary). In Ethernet CS Switching Mode the Permanence Status in the Subscriber Units table is configurable. A non-registered SU whose status has been changed to Temporary will be deleted from the table (and from the database of the device).

Parameter	Description
Associated AU	Not applicable for a Micro Base Station. The slot number of the AU with which the SU is associated, or None for an SU that is not-registered.
MAC Address Control Number	A number computed from the MAC Address that can be used for verification purposes.

To configure a selected SU:

Select a registered SU's entry and click on the **Open** button, or double-click on a selected entry to open the Device Manager for the selected SU.

To remove a selected SU from the database (applicable only in Ethernet CS Switching Mode):

Select an SU's entry and click on the **Delete** button (not available if the managed device operates in IP CS Switching Mode) to remove the SU from the database of the device. Only disconnected (Not Registered) SUs can be deleted.

To add a new SU (applicable only in Ethernet CS Switching Mode):

Click on the **Add** button (not available if the managed device operates in IP CS Switching Mode) to add a new SU to the database of the device. The SU will be added as Permanent.

2.18 SU Radio Monitoring Page

In the current release the SU Radio Monitoring page is applicable only for a modular Base station.

The SU Radio Monitoring page enable viewing wireless link performance indicators for a selected SU.

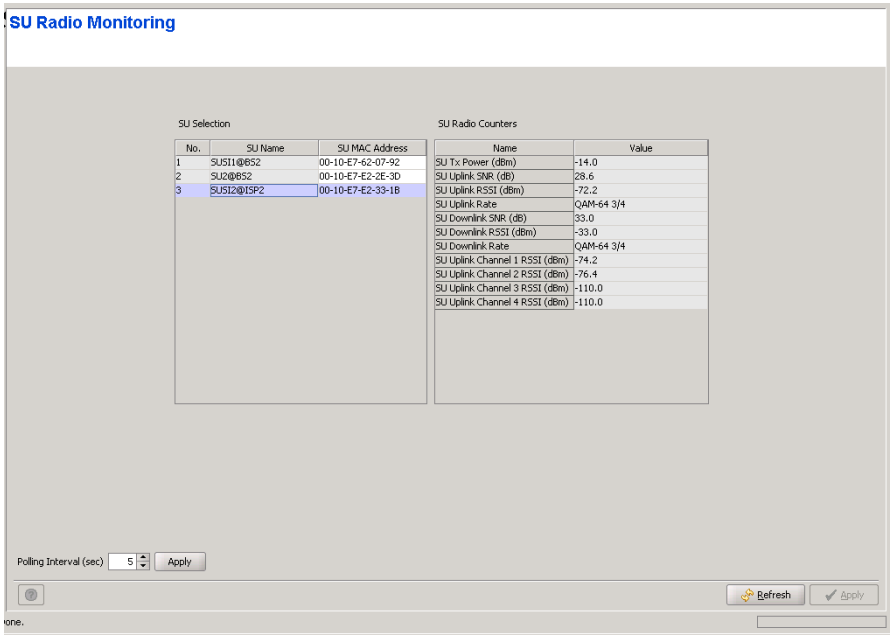


Figure 2-21: SU Radio Monitoring Page

The SU Selection table displays a list of all registered SUs. Select an entry to view its wireless link performance indicators.

The SU Radio Counters displays the following performance indicators for the selected SU:

Parameter	Description
SU Tx Power (dBm)	The current Tx Power (in dBm) of the SU
SU Uplink SNR (dB)	The combined SNR (in dB) of the signal received from the SU at all the ODUs connected to to the AU that serves the SU.
SU Uplink RSSI (dBm)	The combined RSSI (in dBm) of the signal received from the SU at all the ODUs connected to to the AU that serves the SU.

Parameter	Description
SU Uplink Rate	The current rate of uplink transmissions from the SU.
SU Downlink SNR (dB)	The SNR (in dB) at the SU.
SU Downlink RSSI (dBm)	The RSSI (in dBm) at the SU.
SU Downlink Rate	The current rate of uplink transmissions to the SU.
SU Uplink Channel 1 RSSI (dBm)	The RSSI (in dBm) of the signal received from the SU at the ODU connected to channel 1 of the serving AU. A value of -110.0 indicates no reception.
SU Uplink Channel 2 RSSI (dBm)	The RSSI (in dBm) of the signal received from the SU at the ODU connected to channel 2 of the serving AU. A value of -110.0 indicates no reception.
SU Uplink Channel 3 RSSI (dBm)	The RSSI (in dBm) of the signal received from the SU at the ODU connected to channel 3 of the serving AU. A value of -110.0 indicates no reception.
SU Uplink Channel 4 RSSI (dBm)	The RSSI (in dBm) of the signal received from the SU at the ODU connected to channel 4 of the serving AU. A value of -110.0 indicates no reception.

2.19 Services Page

The Services page displays a list of all Services in the database of the device. In Ethernet CS Switching Mode it also enables modifying existing Permanent Services, deleting Permanent Services from the database of the device, and defining new Permanent Services. The device can hold up to a total of 4095 Services.

NOTE

A Permanent Service is a Service defined in the device for a Permanent SU, and is applicable only in Ethernet CS Switching Mode. A Temporary Service can be granted to a Temporary SU by a RADIUS Authentication Server. In Ethernet CS Switching Mode a Temporary Service may also be granted by the Base Station (based on the Default Service Profiles) when a RADIUS server is not available, or when the SU is rejected by the RADIUS server, provided the device operates in Quick Service Mode and the SU uses the “quick” User Password “quickynikinyoky”. A Temporary Service is given a default name of <SU Name>#<Number>. A Temporary Service cannot be defined, deleted or edited.

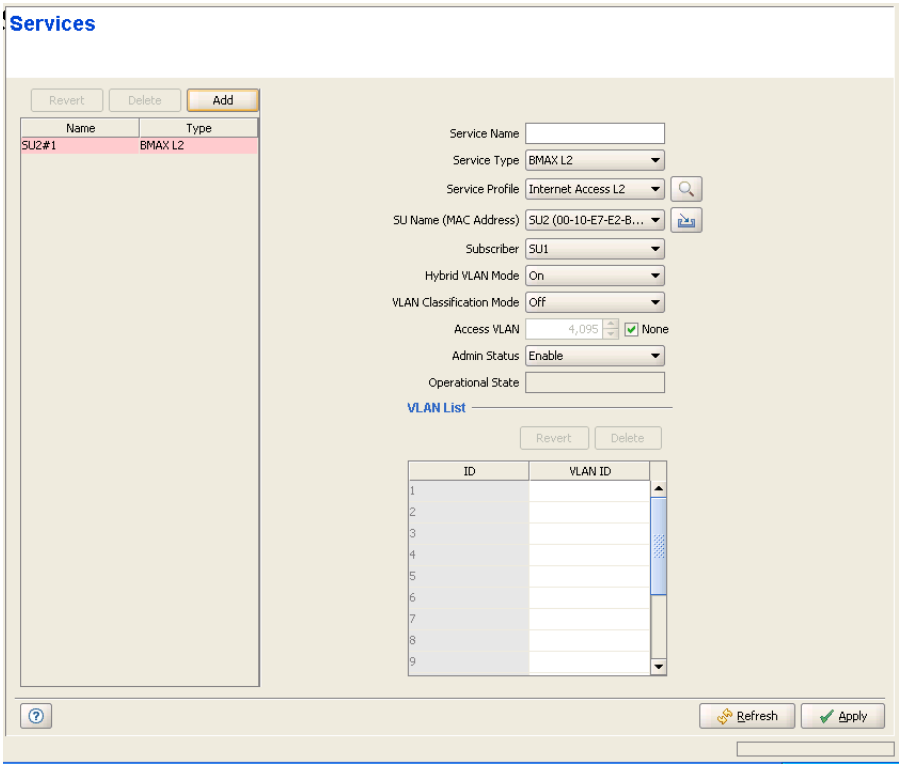


Figure 2-22: Services Page, Ethernet CS Switching Mode

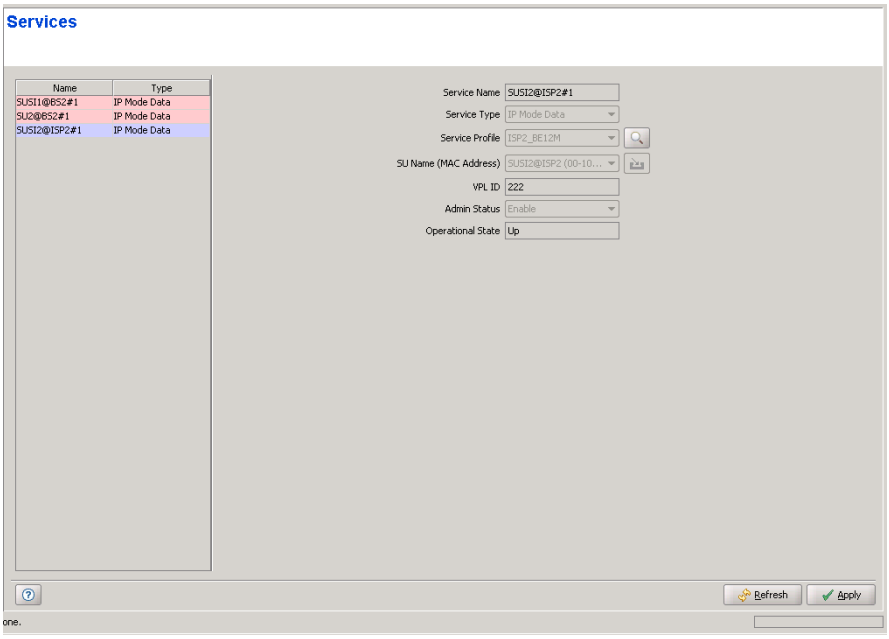


Figure 2-23: Services Page, IP CS Switching Mode

The Services page comprises two sections: The Services Table (on the left side) and the Service Editor section (on the right side). The Editor is available only when either selecting a Service in the Services Table or adding a new Permanent Service.

The Services table provides the following details for each of the existing Services:

Parameter	Description
Name	The Services Name.
Type	The Service Type: In Ethernet CS Switching Mode, the available types are L2, PPPoE or VoIP. In Micro Base Station, Managed VoIP Service Type is also available. In IP CS Switching Mode, the available types are IP Mode Data, IP Mode VoIP and IP Mode Managed VoIP.

Temporary Services are displayed with a pink background.

To view the details of a Service:

Select a Service's entry. The current Service configuration details will be displayed on the right side of the page.

To delete Permanent Service(s) from the device:

Select one or several Service entries, click on the **Delete** button and then click **Apply** to remove the selected Service(s) from the database of the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new Permanent Service:

Click on the **Add** button. The Service Editor will be displayed on the right side of the page. To add a new Service to the database of the device, fill in the necessary parameters and click **Apply**.

To modify an existing Permanent Service:

Select a Service's entry. The current Service configuration details will be displayed on the right side of the page, enabling modification of parameters. Click **Apply** to update the Service's configuration.

Service Configuration Parameters:

Parameter	Description
Name	The Services Name. A Service Name consists of up to 32 printable characters. It is configurable only for "permanent" Services and must be unique per device. A Temporary Service is given a default name of <SU Name)>#<Number>.

Parameter	Description
Service Type	The Service Type: In Ethernet CS Switching Mode, the available types are L2, PPPoE or VoIP. In Micro Base Station, Managed VoIP Service Type is also available. In IP CS Switching Mode, the available types are IP Mode Data, IP Mode VoIP and IP Mode Managed VoIP. The Service Type of an existing Service cannot be modified. For Temporary Services, the Service Type is not configurable and it is in accordance with the Service Type in the Service Profile associated to the Service.
Service Profile	The Name of the Service Profile. Read-only for Temporary Services. For Permanent Services, the drop-down menu includes all Service Profiles with a matching Service Type that are available in the database of the device. Click on the Preview button () to view the parameters of the selected Service Profile and its components. Click on the Service Profile title (it will be colored blue when placing the cursor on it) to switch to the Service Profiles page. Refer to “Service Profiles Page” on page 85 for more details on Service Profiles.
SU Name (MAC Address)	The Name and MAC Address of the SU associated with the Service. Read-only for Temporary” Services. For Permanent Services, the drop-down menu includes a list of the Names and MAC Addresses of all permanent SUs in the database of the device. You can also click on the **Select** button to view the main details of all available SUs. The selected SU can be modified only if the Admin Status of the Service is disabled. This is applicable only for Permanent Services. Click on the SU Name (MAC Address) title (it will be colored blue when placing the cursor on it) to switch to the Subscriber Units page.

Parameter	Description
Subscriber	Not applicable in IP CS Switching Mode. Applicable only to Permanent Services. The ID (Name) of the Subscriber to which the Service is allocated. The Subscribers drop-down menu includes all the Subscriber Names in the database of the device. The Subscriber of an existing Service cannot be modified. Click on the Subscriber title (it will be colored blue when placing the cursor on it) to switch to the Subscribers page. Refer to "Subscribers Page" on page 82 for more details on Subscribers.
VPL ID	Applicable only in IP CS Switching Mode. A read-only parameter specifying the VLAN ID to be used by the Service.
Hybrid VLAN Mode	Not applicable in IP CS Switching Mode. Read-only for Temporary Services in Ethernet CS Switching Mode. Hybrid VLAN Mode of operation enables classification of both tagged and untagged packets or untagged packets only, according to the following rules: ■ Hybrid VLAN Mode is Off and VLAN List is not empty: Only packets tagged with a VLAN ID that exists in the VLAN List will be forwarded. The VLAN List can include up to 16 entries. ■ Hybrid VLAN Mode is Off and the VLAN List is empty: All (both untagged and tagged with any VLAN ID) will be forwarded. ■ Hybrid VLAN Mode is On and VLAN List is not empty: Only untagged packets, and packets tagged with a VLAN ID that exists in the VLAN List, will be forwarded. The VLAN List can include up to 15 entries. ■ Hybrid VLAN Mode is On and the VLAN List is empty: Only untagged frames will be forwarded. Note that for each Service Type, a maximum of one Service that enables forwarding of untagged packets can be assigned to an SU. Forwarding of untagged packets is supported when either Hybrid VLAN Mode is On, or Hybrid VLAN Mode is Off and the VLAN List is empty. It is not possible to define for the same SU two Services of the same Service Type that enable forwarding of untagged packets. However, the same SU can be associated with two Services of different Service Types that enable forwarding of untagged packets, provided one of them is a PPPoE Service (the combinations L2 and VoIP, L2 and Managed VoIP, VoIP and Managed VoIP are forbidden).

Parameter	Description
VLAN Classification Mode	Not applicable in IP CS Switching Mode. Read-only for Temporary Services in Ethernet CS Switching Mode. The VLAN Classification feature enables using VLAN ID (in addition to destination MAC address) for classification of transparent service downlink traffic before transmission to the destination MAC address. The VLAN Classification feature supports applications where multiple VLANs are associated with a single MAC address, allowing to assign different services to different VLANs. VLAN Classification Mode can be set to On only if the following conditions are met: ■ The VLAN Transparency Mode of the applicable Service Profile is set to On. ■ A single VLAN ID is defined for the Service. This means that the allowed combinations are: a) Hybrid VLAN Mode is Off and the VLAN List includes a single VLAN ID, or b) Hybrid VLAN Mode is On and the VLAN List is empty. ■ All Services assigned to the same SU must be configured with the same VLAN Classification Mode (Either On or Off).
Access VLAN	Not applicable in IP CS Switching Mode. Read-only for Temporary Services in Ethernet CS Switching Mode. The Access VLAN parameter enables defining a VLAN ID to be used with untagged packets received on the Ethernet port of the SU. This parameter is applicable only for a transparent service (VLAN Transparency Mode is On) with Hybrid Mode set to On, or a transparent service with Hybrid Mode set to Off and an empty VLAN list. A tag with the defined Access VLAN will be added by the NPU/Micro Base Station to untagged packets in the uplink. The tag will be removed by the NPU/Micro Base Station from packets in the downlink. For a multicast connection, the NPU/Micro Base Station will send in addition to the VLAN list the single Access VLAN. The SU will be responsible to remove the Access VLAN if it is received on a multicast connection. The Access VLAN cannot be the same as the VPL ID in the applicable Service Profile(s). The range is from 0 to 4094 or None.
Admin Status	The administrative status of the Service. Configurable only for Permanent Services.
Operational State	A read-only display of the operational status. Up means that the Service is currently in use.

Parameter	Description
VLAN List	Not applicable in IP CS Switching Mode. Read-only for Temporary Services in Ethernet CS Switching Mode. A table of VLAN IDs listing the VLAN IDs behind the same SU associated with the applicable Subscriber. When Hybrid VLAN Mode is Off, the VLAN List can include up to 16 VLAN IDs. When Hybrid VLAN Mode is On, the VLAN List can include up to 15 VLAN IDs (the 16th entry is reserved for No VLAN). The maximum total number of VLAN IDs behind a single SU is 16. (15 when a Service with Hybrid VLAN Mode On is assigned to the SU). To avoid conflicts it is not allowed to define a VLAN ID that is identical to any VPL ID (applicable only for transparent Service Profiles). A specific VLAN ID behind a certain SU can be associated only with a single service of a certain service type. It is not possible to define two services of the same service type for the same SU and the same VLAN ID. The VLAN ID’s value can be from 0 to 4094.

2.20 Subscribers Page

The Subscribers page is not applicable in IP CS Switching Mode.

The Subscribers page displays a list of all Subscribers in the database of the device. It also enables modifying existing Subscribers, deleting Subscribers from the device, and defining new Subscribers. The Subscriber entity is applicable only to Permanent Services (services that are defined in the device's database and are provisioned to Permanent SUs). The device can hold up to 1024 Subscribers.

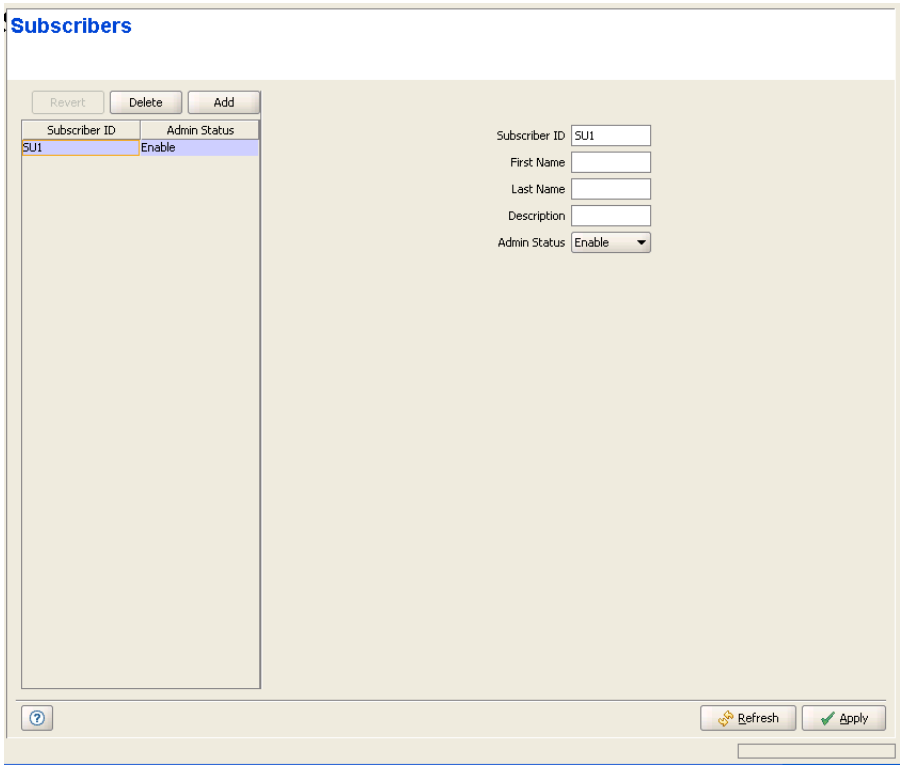


Figure 2-24: Subscribers Page

The Subscribers page comprises two sections: The Subscribers Table (on the left side) and the Subscriber Editor section (on the right side). The Editor is available only when either selecting a Subscriber in the Subscribers Table for viewing/modifying its parameters, or adding a new Subscriber.

The Subscribers table provides the following details for each of the existing Subscribers:

Parameter	Description
Subscriber ID	The Subscriber ID (Name).
Admin Status	The administrative status of the Subscriber.

To view the details of a Subscriber:

Select a Subscriber's entry. The current Subscriber configuration details will be displayed on the right side of the page.

To delete Subscriber(s) from the device:

Select one or several Subscriber entries, click on the **Delete** button and then click **Apply** to remove the selected Subscriber(s) from the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new Subscriber:

Click on the **Add** button. The Subscriber Editor will be displayed on the right side of the page. To add a new Subscriber to the database of the device, fill in the necessary parameters and click **Apply**.

To modify an existing Subscriber:

Select a Subscriber's entry. The current Subscriber configuration details will be displayed on the right side of the page, enabling modification of parameters. Click **Apply** to update the Subscriber's configuration.

Subscriber Configuration Parameters:

Parameter	Description
Subscriber ID	A Subscriber ID (Name) consists of up to 32 printable characters The Subscriber ID must be unique for the entire network.
First Name	An optional parameter for information purposes. A First Name consists of up to 50 printable characters.

Parameter	Description
Last Name	An optional parameter for information purposes. A Last Name consists of up to 50 printable characters.
Description	An optional parameter for information purposes. A Description consists of up to 50 printable characters
Admin Status	The administrative status of the Subscriber can be either Enable or Disable. Select Disable to disable all services to the Subscriber.

2.21 Service Profiles Page

The Service Profile page enables viewing all Service Profiles in the device's database, defining new Service Profiles, editing details of existing Service Profiles and removing Service Profiles from the database of the device.

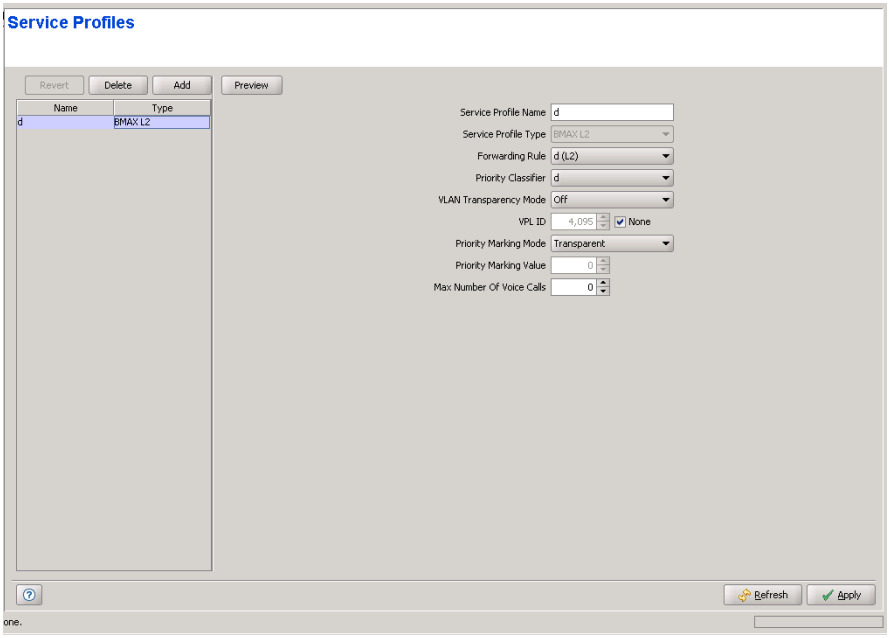


Figure 2-25: Service Profiles Page, Ethernet CS Switching Mode

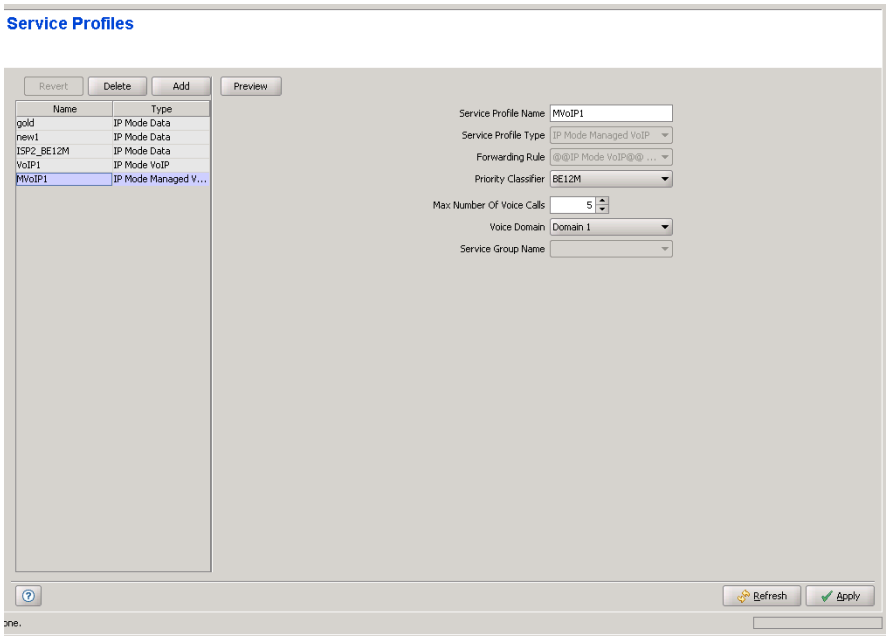


Figure 2-26: Service Profiles Page, IP CS Switching Mode

The Service Profiles page comprises two sections: The Service Profiles Table (on the left side) and the Service Profile Editor section (on the right side). The Editor is available only when either selecting a Service Profile in the Service Profiles Table for viewing/modifying its parameters, or adding a new Service Profile.

The Service Profiles table provides the following details for each of the existing Service Profiles:

Parameter	Description
Name	The Service Profile Name.
Type	The Service Profile Type: In Ethernet CS Switching Mode, the available types are L2, PPPoE or VoIP. In Micro Base Station, Managed VoIP Service Type is also available. In IP CS Switching Mode, the available types are IP Mode Data, IP Mode VoIP and IP Mode Managed VoIP.

To view the details of a Service Profile:

Select a Service Profile's entry. The current Service Profile configuration details will be displayed on the right side of the page. You can click on the **Preview**

button to view the parameters of all elements of the Service Profile (Forwarding Rule, Priority Classifier and the relevant QoS Profiles).

To delete Service Profile(s) from the device:

Select one or several Service Profile entries, click on the **Delete** button and then click **Apply** to remove the selected Service Profile(s) from the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new Service Profile:

Click on the **Add** button. The Service Profile Editor will be displayed on the right side of the page. To add a new Service Profile to the database of the device, fill in the necessary parameters and click **Apply**. You can click on the **Preview** button to view the parameters of all elements of the Service Profile (Forwarding Rule, Priority Classifier and the relevant QoS Profiles) before applying the change.

To modify an existing Service Profile:

Select a Service Profile's entry. The current Service Profile configuration details will be displayed on the right side of the page, enabling modification of parameters. Click **Apply** to update the Service Profile's configuration. You can click on the **Preview** button to view the parameters of all elements of the Service Profile (Forwarding Rule, Priority Classifier and the relevant QoS Profiles) before applying the change.

Service Profile Configuration Parameters:

Parameter	Description
Service Profile Name	A Service Profile Name consists of up to 32 printable characters.

Parameter	Description
Service Profile Type	The Service Type: In Ethernet CS Switching Mode, the available types are L2, PPPoE or VoIP. In Micro Base Station, Managed VoIP Service Type is also available. In IP CS Switching Mode, the available types are IP Mode Data, IP Mode VoIP and IP Mode Managed VoIP. The Service Type of an existing Service Profile cannot be modified.
Forwarding Rule	The Forwarding Rule used by the Service Profile. In Ethernet CS Switching Mode the Forwarding Rule parameter is not applicable to transparent Service Profiles (VLAN Transparency Mode On), as all transparent Service Profiles share the same pre-defined Forwarding Rule (@@Transparent@@). In IP CS Switching Mode, the Forwarding Rule parameter is not applicable to IP Mode Data Service Profiles. All IP Mode VoIP and IP Mode Managed VoIP Service Profiles use the @@IP Mode VoIP@@ Forwarding Rule (read-only). The drop-down menu includes all Forwarding Rules with a matching Service Type that are available in the database of the device. However, L2 Forwarding Rule can be used in a VoIP Service Profile, and vice versa. Click on the Forwarding Rule title (it will be colored blue when placing the cursor on it) to switch to the Forwarding Rules page. Refer to “Forwarding Rules Page” on page 92 for more details on Forwarding Rules.
Priority Classifier	The Priority Classifier used by the Service Profile. In Ethernet CS Switching Mode the Priority Classifier parameter is not applicable to VoIP Service Profiles. The drop-down menu includes all Priority Classifiers that are available in the database of the device. Click on the Priority Classifier title (it will be colored blue when placing the cursor on it) to switch to the Priority Classifiers page. Refer to “Priority Classifiers Page” on page 96 for more details on Priority Classifiers.

Parameter	Description
VLAN Transparency Mode	Not applicable in IP CS Switching Mode. The VLAN Transparency Mode defines the method of transferring packets to the operator's upstream network. When set to Off, the specified VPL ID will be added to data packets sent from the modular Base Station/Micro Base Station to the backbone. When set to On, data packets sent from the modular Base Station/Micro Base Station to the backbone will be transferred transparently. The VPL ID parameter is not applicable to Service Profiles with VLAN Transparency Mode On. Also The Forwarding Rule selection parameter is not applicable to transparent Service Profiles. For tagged packets, the VPL ID will be their VLAN tag. For untagged packets, the VPL ID will be None. To avoid conflicts, a transparent Service Profile cannot be assigned to a Service if the Service's VLAN ID list includes a VLAN ID that is equal to any of the already assigned VPL IDs. The combination of VLAN Transparency Service On, Hybrid VLAN Mode Off and an empty VLAN List means that all packets are forwarded. This combination should be used only if the Service Provider can ensure that there will not be conflicts between VLAN IDs used by devices behind the SU and existing VPL IDs. The combination VLAN Transparency Mode On, Hybrid VLAN Mode On and an empty VLAN List means that only untagged frames should be forwarded. Such a Service cannot be assigned if there is an assigned non-transparent Service with VPL ID = None.

Parameter	Description
VPL ID	Not applicable in IP CS Switching Mode. A Virtual Private Link ID to be used in the backbone behind the modular Base Station/Micro Base Station. The VPL ID parameter is applicable only to Service Profiles with VLAN Transparency Mode Off. To avoid conflicts, it is not allowed to define a VPL ID that is identical to any of the VLAN IDs in the already assigned transparent Services (Services using a Service Profile with VLAN Transparency Mode On). Several Service Profiles may share the same VPL ID. However, the following rules must be met: ■ Any number of L2 and/or VoIP Service Profiles may share the same VPL ID, provided they all use the same Forwarding Rule. ■ Any number of PPPoE Service Profiles may share the same VPL ID, provided they all use the same Forwarding Rule. ■ Any number of Managed VoIP Service Profiles (Micro Base Station) may share the same VPL ID, provided they all use the same Forwarding Rule. ■ Any number of L2, VoIP, Managed VoIP and PPPoE Service Profiles may share the same VPL ID, provided that different Forwarding Rules are used for the groups of PPPoE, Managed VoIP and L2/VoIP Service Profiles. Available values are in the range of 0 to 4094 or None (4095). The VPL ID of a Transparent Service Profile is set to 4096 (non configurable).
Priority Marking Mode	Not applicable in IP CS Switching Mode. The mode of marking data transmitted to the backbone network: Transparent, 802.1p or DSCP. DSCP is not applicable for PPPoE Service Profiles.
Priority Marking Value	Not applicable in IP CS Switching Mode. Not applicable if the selected Priority Marking Mode is Transparent. The marking value for data frames transmitted to the backbone, according to the configured Priority Marking Mode. The range is: ■ DSCP Marking Mode: 0 - 63 ■ 802.1p Marking Mode: 0 - 7

Parameter	Description
Max Number of Voice Calls	The upper limit on the number of simultaneous VoIP calls that can be supported by the Service using the Service Profile. In Ethernet CS Switching Mode this parameter is applicable only for L2 and VoIP Service Profiles for calls made by devices that support the DRAP protocol, and for Managed VoIP Service Profiles for calls to/from SIP gateways that are managed by suitable Policy Function and Application Function entities. In IP CS Switching Mode it is applicable only for IP Mode Managed VoIP Service Profiles. The available range is from 0 to 50 calls.
Voice Domain	The Voice Domain parameter is applicable only for Managed VoIP (Ethernet CS Switching Mode) and IP Mode Managed VoIP (IP CS Switching Mode) Service Profiles. It specifies the Voice Domain associated with the Managed VoIP/IP Mode Managed VoIP Service Profile, and must be one of the Voice Domains available in the database of the device. Click on the Voice Domain title (it will be colored blue when placing the cursor on it) to switch to the Voice Domains page. Refer to "Voice Domain Page" on page 102 for more details on Voice Domainss.
Service Group Name	Applicable only in IP CS Switching Mode for IP Mode Data Service Profiles. The Name of the Service Group associated with the Service Profile. Click on the Service Group Name title (it will be colored blue when placing the cursor on it) to switch to the Service Groups page. Refer to "Service Group Page" on page 105 for more details on Service Groups.

Click on the **Preview** button to view the parameters of all elements of the Service Profile.

2.22 Forwarding Rules Page

The Forwarding Rule includes the features that affect the wireless broadcast domain.

In Ethernet CS Switching Mode, any number of L2 and/or Voice Services may belong to the same broadcast domain if they share the same Forwarding Rule. Data in a PPPoE Service can pass only between the subscriber's equipment and an Access Concentrator behind the NPU.

In IP CS switching Mode the Forwarding Rule is not applicable for IP Mode Data Services. All IP Mode VoIP and Managed VoIP Services belong to the same broadcast domain, using the same @@IP Mode VoIP@@ Forwarding Rule. The name of the @@IP Mode VoIP@@ Forwarding Rule cannot be changed, and it cannot be deleted.

The Forwarding Rules page displays a list of all Forwarding Rules in the database of the device, enabling modification of existing Forwarding Rules. In Ethernet CS Switching Mode it enables also deleting Forwarding Rules from the device, and defining new Forwarding Rules.

The device can hold up to 255 Forwarding Rules.

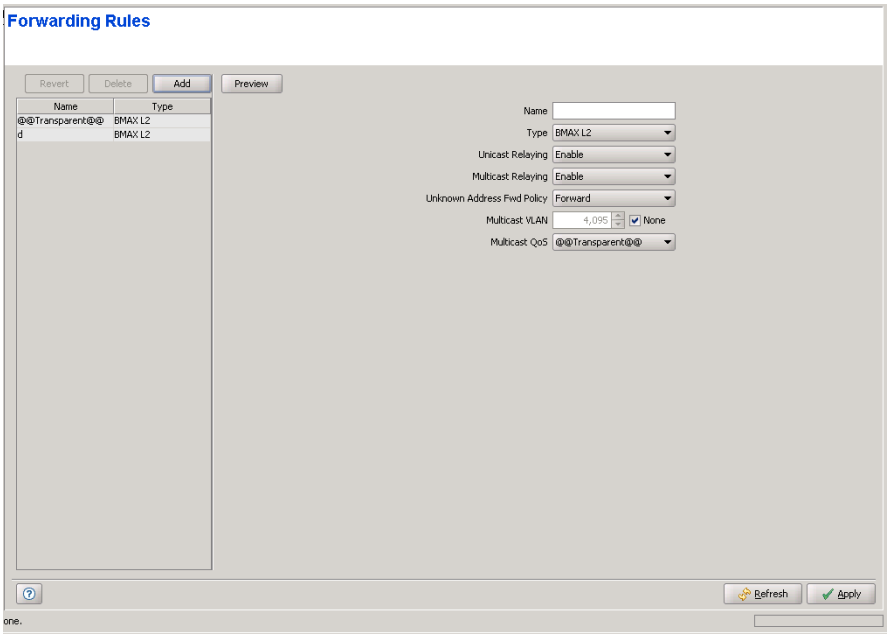


Figure 2-27: Forwarding Rules Page, Ethernet CS Switching Mode

The Forwarding Rules page comprises two sections: The Forwarding Rules Table (on the left side) and the Forwarding Rule Editor section (on the right side). The Editor is available only when either selecting a Forwarding Rule in the Forwarding Rules Table for viewing/modifying its parameters, or adding a new Forwarding Rule.

The Forwarding Rules table provides the following details for each of the existing Forwarding Rules:

Parameter	Description
Name	The Forwarding Rule Name.
Type	The Service Type: In Ethernet CS Switching Mode, the available types are L2, PPPoE or VoIP. In Micro Base Station, Managed VoIP Service Type is also available. In IP CS Switching Mode, the available type for the single available Forwarding Rule is IP Mode VoIP. This forwarding Rule is used by IP Mode VoIP and IP Mode Managed VoIP Service Profiles.

To view the details of a Forwarding Rule:

Select a Forwarding Rule's entry. The current Forwarding Rule configuration details will be displayed on the right side of the page. You can click on the **Preview** button to view the parameters of the Forwarding Rule, including the details of the relevant QoS Profile.

To delete Forwarding Rule(s) from the device:

Select one or several Forwarding Rule entries, click on the **Delete** button and then click **Apply** to remove the selected Forwarding Rule(s) from the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new Forwarding Rule:

Click on the **Add** button. The Forwarding Rule Editor will be displayed on the right side of the page. To add a new Forwarding Rule to the database of the device, fill in the necessary parameters and click **Apply**. You can click on the **Preview**

button to view the parameters of the Forwarding Rule, including the details of the relevant QoS Profile, before applying the change.

To modify an existing Forwarding Rule:

Select a Forwarding Rule's entry. The current Forwarding Rule configuration details will be displayed on the right side of the page, enabling modification of parameters. Click **Apply** to update the Forwarding Rule's configuration. You can click on the **Preview** button to view the parameters of the Forwarding Rule, including the details of the relevant QoS Profile, before applying the change.

Forwarding Rule Configuration Parameters:

Parameter	Description
Name	A Forwarding Rule Name consists of up to 32 printable characters. Note that in Ethernet CS Switching Mode the name of the Transparent Forwarding Rule (@@Transparent@@) cannot be modified. In IP CS Switching Mode, the name of @@IP Mode VoIP@@ Forwarding Rule cannot be modified.
Type	The Service Type: In Ethernet CS Switching Mode, the available types are L2, PPPoE or VoIP. In Micro Base Station, Managed VoIP Service Type is also available. In IP CS Switching Mode, the available type for the single available @@IP Mode VoIP@@ Forwarding Rule is IP Mode VoIP. The Service Type of an existing Forwarding Rule cannot be modified.
Unicast Relaying	In Ethernet CS Switching Mode Unicast Relaying is applicable only to L2 and Managed VoIP Forwarding Rules. In all PPPoE Forwarding Rules it is set to Disable. In all VoIP Forwarding Rules it is set to Enable. The Unicast Relaying parameter determines whether the AU/Micro Base Station performs unicast relaying. When the Unicast Relaying parameter is enabled, unicast packets originating from devices on the wireless link can be transmitted back to the wireless link devices. If disabled, these packets are not sent to the wireless link even if they are intended for devices on the wireless link.

Parameter	Description
Multicast Relaying	In Ethernet CS Switching Mode Multicast Relaying is applicable only to L2 and Managed VoIP Forwarding Rules. In all PPPoE Forwarding Rules it is set to Disable. In all VoIP Forwarding Rules it is set to Enable. The Multicast Relaying parameter is applicable only to L2 Services. The Multicast Relaying parameter determines whether the AU/Micro Base Station performs multicast relaying. When the Multicast Relaying parameter is enabled, multicast packets originating from devices on the wireless link are transmitted by the AU/Micro Base Station back to the wireless link devices, as well as to the backbone. If disabled, these packets are sent only to the backbone and are not sent back to the wireless link.
Unknown Address Fwd Policy	In Ethernet CS Switching Mode the Unknown Address Forwarding Policy parameter is applicable only to L2 and Managed VoIP Forwarding Rules. In all PPPoE Forwarding Rules it is set to Reject. In all VoIP Forwarding Rules it is set to Forward. The Unknown Address Forwarding Policy parameter determines the mode of controlling the flow of information from the backbone to the wireless media. Select from the following options: ■ Reject: The AU/Micro Base Station will transmit unicast packets only to those addresses that the AU/Micro Base Station knows to exist on the wireless link side. ■ Forward: Enables the transmission of all packets, except unicast packets sent to addresses that the AU/Micro Base Station recognizes as being on its wired backbone side.
Multicast VLAN	Available only in L2 and Managed VoIP Forwarding Rules in Ethernet CS Switching Mode. This parameter is not used and will be ignored by the device.
Multicast QoS	The QoS Profile to be used for multicast and broadcast messages. The drop-down menu includes all QoS Profiles that are available in the database of the device. Click on the Multicast QoS title (it will be colored blue when placing the cursor on it) to switch to the QoS Profile page.

Click on the **Preview** button to display a preview of the new/modified Forwarding Rule, including complete details of the selected Multicast QoS Profile.

2.23 Priority Classifiers Page

The Priority Classifier defines the QoS Profiles to be allocated to users/sessions differentiated by DSCP or 802.1p priority classifiers. Priority Classifiers are not applicable to VoIP Services in Ethernet CS Switching Mode. In IP CS Switching Mode only DSCP classification is supported.

The Priority Classifiers page displays a list of all Priority Classifiers in the database of the device. It also enables modifying existing Priority Classifiers, deleting Priority Classifiers from device, and defining new Priority Classifiers. The device can hold up to 255 Priority Classifiers.

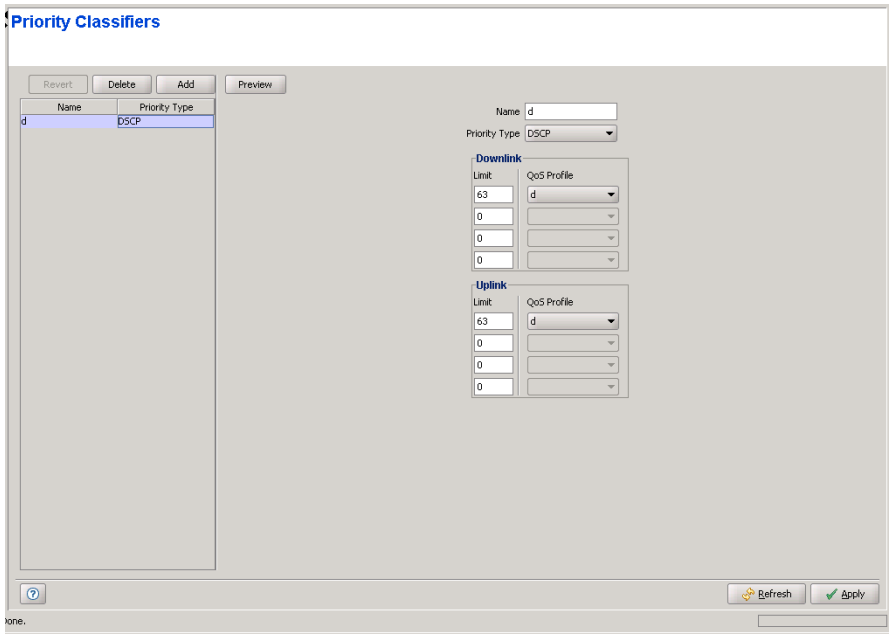


Figure 2-28: Priority Classifiers Page

The Priority Classifiers page comprises two sections: The Priority Classifiers Table (on the left side) and the Priority Classifier Editor section (on the right side). The Editor is available only when either selecting a Priority Classifier in the Priority Classifiers Table for viewing/modifying its parameters, or adding a new Priority Classifier.

The Priority Classifiers table provides the following details for each of the existing Priority Classifiers:

Parameter	Description
Name	The Priority Classifier Name.
Priority Type	The Priority Classifier Type: DSCP or 802.1p.

To view the details of a Priority Classifier:

Select a Priority Classifier's entry. The current Priority Classifier configuration details will be displayed on the right side of the page. You can click on the **Preview** button to view the parameters of the Priority Classifier, including the details of the relevant QoS Profile(s).

To delete Priority Classifier(s) from the device:

Select one or several Priority Classifier entries, click on the **Delete** button and then click **Apply** to remove the selected Priority Classifier(s) from the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new Priority Classifier:

Click on the **Add** button. The Priority Classifier Editor will be displayed on the right side of the page. To add a new Priority Classifier to the database of the device, fill in the necessary parameters and click **Apply**. You can click on the **Preview** button to view the parameters of the Priority Classifier, including the details of the relevant QoS Profile(s), before applying the change.

To modify an existing Priority Classifier:

Select a Priority Classifier's entry. The current Priority Classifier configuration details will be displayed on the right side of the page, enabling modification of parameters. Click **Apply** to update the Priority Classifier's configuration. You can click on the **Preview** button to view the parameters of the Priority Classifier, including the details of the relevant QoS Profile(s), before applying the change.

Priority Classifier Configuration Parameters:

Parameter	Description
Name	A Priority Classifier Name consists of up to 32 printable characters.
Priority Type	The Priority Classifier Type: DSCP or 802.1p. In IP CS Switching Mode only DSCP classifiers are available.
Uplink/Downlink Limits	The Uplink/Downlink Limit and QoS Profile parameters enables to define up to four ranges, where a different QoS Profile can be assigned to each range. The Limits (priority ranges) and assigned QoS Profiles are defined independently for the Uplink and Downlink, based on defining the upper Limit for each priority range. Up to 4 Limits (priority ranges), and the associated QoS Profiles, can be defined for each direction. A valid definition of Limits in each direction must comply with the following rules: ■ Each Limit must be higher than its predecessor. ■ The highest Limit must be the highest value available for the applicable priority type (7 for 802.1p, 63 for DSCP). ■ The same number of Limits (priority ranges) must be defined for the Uplink and Downlink. To define a Priority Classifier in case that no prioritization is used, select DSCP as the Priority Type, define 63 as the first Limit for both the Uplink and Downlink, and leave all other Limits empty. Alternatively, you can select 802.1p and define 7 as the Limit for both directions.
QoS Profiles	A QoS Profile must be associated with each defined Limit. The drop-down menus includes all QoS Profiles that are available in the database of the device.

Click on the **Preview** button to display a preview of the new/modified Priority Classifier, including complete details of the selected QoS Profiles.

2.24 QoS Profiles Page

The QoS Profiles page displays a list of all QoS Profiles in the database of the device. It also enables modifying existing QoS Profiles, deleting QoS Profiles from the device, and defining new QoS Profiles. The device can hold up to 255 QoS Profiles.

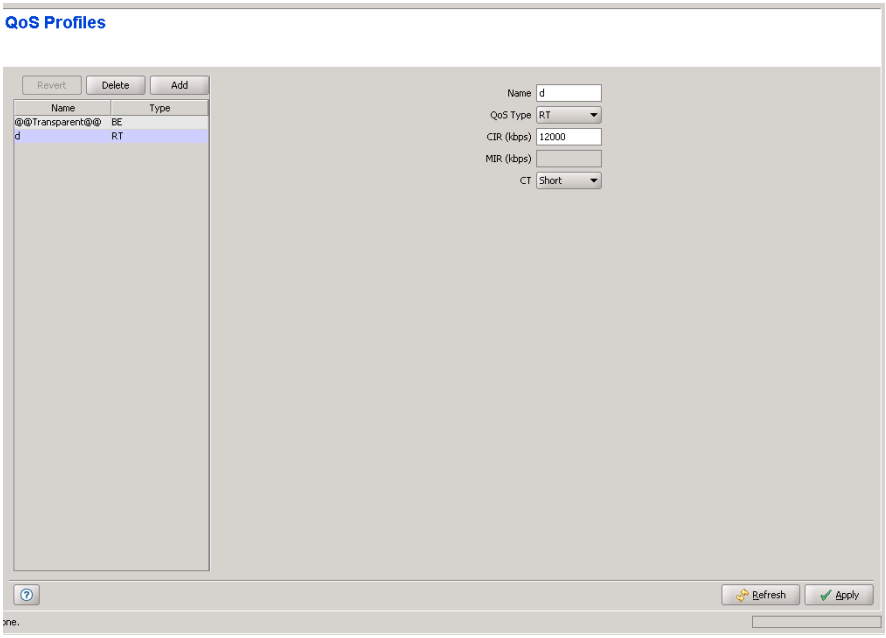


Figure 2-29: QoS Profiles Page

The QoS Profiles page comprises two sections: The QoS Profiles Table (on the left side) and the QoS Profile Editor section (on the right side). The Editor is available only when either selecting a QoS Profile in the QoS Profiles Table for viewing/modifying its parameters, or adding a new QoS Profile.

The QoS Profiles table provides the following details for each of the existing QoS Profiles:

Parameter	Description
Name	The QoS Profile Name.
Type	The QoS Type: BE, NRT, RT or CG.

To view the details of a QoS Profile:

Select a QoS Profile's entry. The current QoS Profile configuration details will be displayed on the right side of the page.

To delete QoS Profile(s) from the device:

Select one or several QoS Profile entries, click on the **Delete** button and then click **Apply** to remove the selected QoS Profile(s) from the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new QoS Profile:

Click on the **Add** button. The QoS Profile Editor will be displayed on the right side of the page. To add a new QoS Profile to the database of the device, fill in the necessary parameters and click **Apply**.

To modify an existing QoS Profile:

Select a QoS Profile's entry. The current QoS Profile configuration details will be displayed on the right side of the page, enabling modification of parameters. Click **Apply** to update the QoS Profile's configuration.

QoS Profile Configuration Parameters:

Parameter	Description
Name	A QoS Profile Name consists of up to 32 printable characters.
QoS Type	The QoS Type: BE, NRT, RT or CG.
CIR (kbps)	Applicable only to RT and NRT QoS Types. The information transfer rate that the system is committed to transfer under normal conditions. The rate is averaged over a minimum increment of time, which is defined by the CT parameter. The range is from 1 to 12,000 Kbps. MIR cannot be lower than CIR (applicable to NRT QoS type).

Parameter	Description
MIR (kbps)	Applicable only to NRT and BE QoS Types. The maximum information rate that the system will allow for the connection. The rate is averaged over a minimum increment of time, which is defined by the CT parameter. The range is from 1 to 12,000 Kbps.
CT	Applicable for RT and NRT QoS Types. The CT (Committed Time) parameter defines the time window over which the information rate is averaged to ensure compliance with the CIR or MIR parameter. It is used also to prioritize bandwidth allocation to connections, where for each QoS Type, connections with a shorter CT get higher priority. The available options are Short (50 mS), Medium (100 mS), and Long (200 mS). In BE QoS only Short is available. In certain pre-configured BE QoS profiles other values may be configured (legacy from previous versions), but the actual values is always Short.
PS (bytes)	Applicable only to CG QoS Type. The Packet Size parameter defines the amount of data in bytes that is expected for each grant. The range is from 64 to 1550 (bytes).
SI (ms)	Applicable only to CG QoS Type. The Sample Interval parameter defines the time in milliseconds between two successive grants (inter arrival time). The range is from 5 to 100 (milliseconds), using increments of 5 milliseconds.

2.25 Voice Domain Page

The Voice Domain page displays a list of all Voice Domains in the database of the device. It also enables modifying existing Voice Domains, deleting Voice Domains from the device, and defining new Voice Domains. The Voice Domain entity is applicable only to Managed VoIP Services in a Micro Base station (using Ethernet CS Switching Mode) or to IP Mode Managed VoIP Services in IP CS Switching Mode. The device can hold up to 5 Voice Domains.

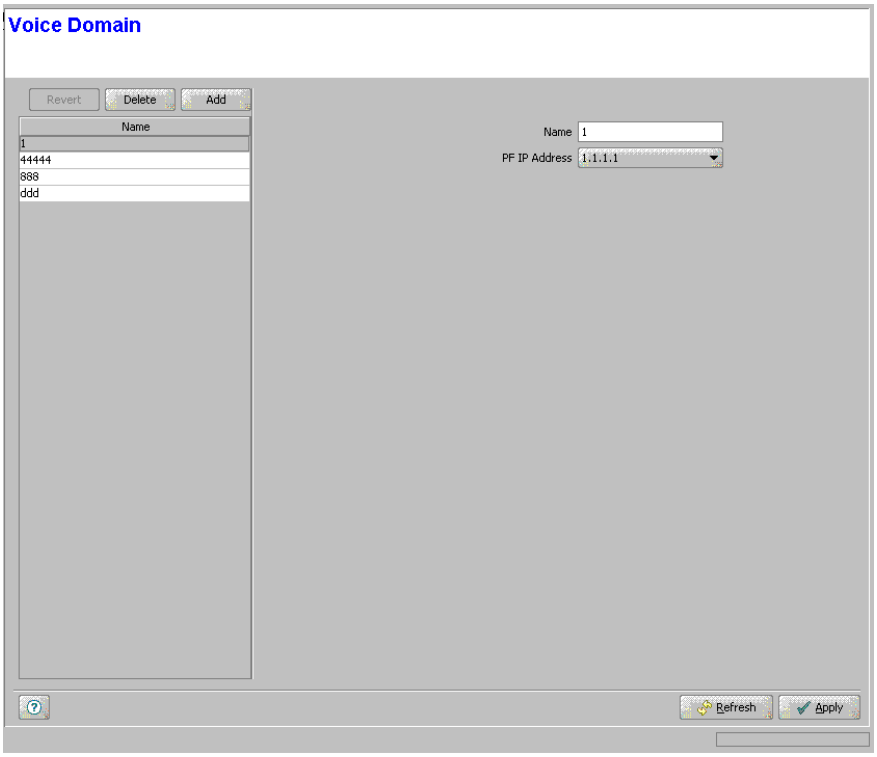


Figure 2-30: Voice Domain Page

The Voice Domains page comprises two sections: The Voice Domains Table (on the left side) and the Voice Domain Editor section (on the right side). The Editor is available only when either selecting a Voice Domain in the Voice Domains Table for viewing/modifying its parameters, or adding a new Voice Domain.

The Voice Domains table provides the Names associated with the existing Voice Domains.

To view the details of a Voice Domain:

Select a Voice Domain's entry. The current Voice Domain configuration details will be displayed on the right side of the page.

To delete Voice Domain(s) from the device:

Select one or several Voice Domain entries, click on the **Delete** button and then click **Apply** to remove the selected Voice Domain(s) from the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new Voice Domain:

Click on the **Add** button. The Voice Domain Editor will be displayed on the right side of the page. To add a new Voice Domain to the database of the device, fill in the necessary parameters and click **Apply**.

To modify an existing Voice Domain:

Select a Voice Domain's entry. The current Voice Domain configuration details will be displayed on the right side of the page, enabling modification of parameters. Click **Apply** to update the Voice Domain's configuration.

Voice Domain Configuration Parameters:

Parameter	Description
Name	The name of the Voice Domain. The Voice Domain Name comprises a string of 1 to 32 printable characters.

Parameter	Description
PF IP address	The IP Address of the Policy Function associated with the Voice Domain. The same PF IP Address may be associated with several Voice Domains. The PF IP Address must be the IP Address of one of the Policy Servers available in the database (see “Modular Base Station PF Parameters Page” on page 47 or “Micro Base Station PF Parameters Page” on page 177).

2.26 Service Group Page

The Service Group page is applicable only in IP CS Switching Mode.

The Service Group page displays a list of all Service Groups in the database of the device. It also enables deleting Service Groups from the device, and defining new Service Groups. The parameters of an existing Service Group cannot be modified. The Service Group entity is applicable only to IP Mode Data Services, defining the parameters required for getting the necessary service from the relevant ISP. The device can hold up to 10 Service Groups.

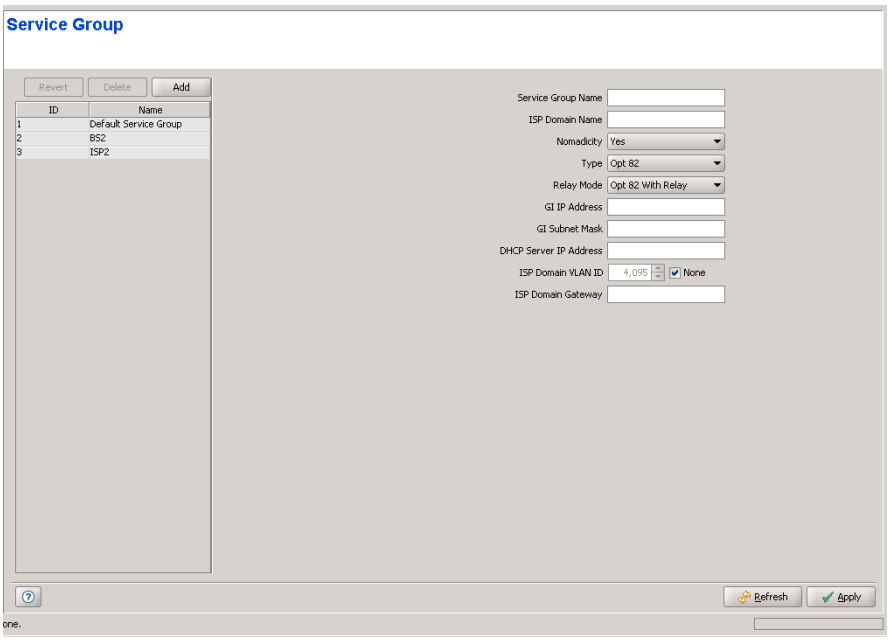


Figure 2-31: Service Group Page

The Service Groups page comprises two sections: The Service Groups Table (on the left side) and the Service Group Editor section (on the right side). The Editor is available only when either selecting a Service Group in the Service Groups Table for viewing/modifying its parameters, or adding a new Service Group.

The Service Groups table provides the Names associated with the existing Service Groups.

To view the details of a Service Group:

Select a Service Group's entry. The current Service Group configuration details will be displayed on the right side of the page.

To delete Service Group(s) from the device:

Select one or several Service Group entries, click on the **Delete** button and then click **Apply** to remove the selected Service Group(s) from the device. If you want to cancel the requested delete operation before clicking **Apply**, click on the **Revert** button.

To add a new Service Group:

Click on the **Add** button. The Service Group Editor will be displayed on the right side of the page. To add a new Service Group to the database of the device, fill in the necessary parameters and click **Apply**.

Service Group Configuration Parameters:

Parameter	Description
Service Group Name	The name of the Service Group. The Service Group Name comprises a string of 1 to 32 printable characters.
ISP Domain Name	The Domain Name of the ISP. Must be identical to the ISP Domain Name component in the User Name configured in the SU (<Name>@<ISP Domain Name>). An ISP Domain Name consists of up to 32 printable characters.
Nomadicity	The Nomadicity parameter allows locking the services provisioned to the SU to a specific Base Station. When Nomadicity is set to No both the Base Station (NPU) MAC address and the SU MAC address are used to identify the Calling Station ID in the communication with the RADIUS Authentication server, allowing to lock the services that can be provisioned to the SU to a specific Base Station. When Nomadicity is set to Yes only the SU MAC address is used in the Calling Station ID.

Parameter	Description
Type	The mode of communicating with a DHCP server for acquisition of IP configuration for the device connected to the SU: ■ Proxy (NPU acts as DHCP server) ■ Opt 82 (using DHCP option 82, with or without Relay) ■ Transparent (transparent communication with a DHCP server located belonging to an enterprise's network).
Relay Mode	Applicable only for Opt 82 mode. Affects the involvement in the NPU in the communication with the DHCP server. The available options are Opt 82 With Relay and Opt 82 Without Relay.
GI IP Address	The GI IP Address is applicable only for Option 82 With Relay mode. It defines the IP address of the Service Group interface to be used for communication with the DHCP server.
GI Subnet Mask	The GI Subnet Mask is applicable only for Option 82 With Relay mode. It defines the subnet mask to be used with the GI IP Address.
DHCP Server IP Address	he DHCP Server IP Address is applicable only for Option 82 With Relay mode. It defines the IP address of the DHCP server.
ISP Domain VLAN ID	The ISP Domain VLAN is applicable only for Option 82 With Relay Mode. It defines the VLAN used for ARPs and Pings to the GI IP Address and for ARP requests to the ISP Domain Gateway. Available values are in the range of 0 to 4094 or None (4095).
ISP Domain Gateway	The ISP Domain Gateway is applicable only for Option 82 With Relay Mode. It defines the IP address of the ISP Domain Gateway.

2.27 Licenses Page

The License feature enables managing the license(s) granted to CPEs with limited capabilities (“L model” CPEs) as well as the general Base Station licenses. In an “L model” CPE, the overall throughput (the aggregate downlink and uplink MIR in all services allocated to subscribers behind the CPE) is limited to 2 Mbps. The Network Service Provider may purchase a bank of CPE unlimited bandwidth licenses, and allocate licenses to selected L model CPEs on a need basis. Rather than granting licenses only to specific L model CPEs, the Network Service Provider may also purchase a Base Station unlimited bandwidth license to override the bandwidth limitations of all L model CPEs served by the modular Base Station/Micro Base Station. Note however, that such a license is local; once the CPE moves to another Base Station it does not retain to capability for unlimited bandwidth. On the other hand, once a CPE has been allocated with a specific license, this license is permanent and the CPE is no longer identified as an L model CPE.

In addition, the basic Micro Base Station is supplied with the capability to support a maximum of 20 CPEs. The Network Service Provider may purchase licenses that will enable supporting a higher number of CPEs: 50, 150 or 250. The Number of CPEs licenses of the Micro Base Station are accumulative: To support 250 CPEs, it is needed to install first a license for 50 CPEs, followed by a license for 150 CPEs and then a license for 250 CPEs.

The various licenses (CPEs Unlimited Bandwidth Licenses Bank, Base Station Unlimited Bandwidth License for all CPEs, Number of Supported CPEs License for a Micro Base Station) are supplied as files to be loaded to the modular Base Station/Micro Base Station using TFTP. A license file can be loaded only to the modular Base Station/Micro Base Station specified in the applicable purchase order.

The aggregate uplink and downlink MIR in all the services allocated to an L model CPE should not exceed 2 Mbps. If the aggregate MIR in the services assigned to such a CPE exceeds this limit, the Network Service Provider has a 30 days grace period. During the grace period the assigned services are provided to the CPE. At any time during the 30 days grace period the Network Service Operator can load to the CPE the required permanent license for unlimited bandwidth. If a license was not loaded during this grace period, the following will happen:

- During the first 3 days, defined as a temporary grace period, the Network Service Provider may change the services assigned to the CPE so that the

aggregate MIR is no longer above 2 Mbps. The CPE will be removed from the list of Temporary Grace Licenses and will return to its previous status.

- After expiry of the 3 days temporary grace period, the CPE is moved to the Grace Licenses list. After expiry of the full 30 days grace period, the CPE is moved to a list of "Grace Period Expired" CPEs (even if during the grace period the services assigned to them were changed so that the aggregate MIR is no longer above 2 Mbps). A CPE that was moved to the Grace Period Expired list will remain in this list for 3 months. A CPE that is included in this list cannot be granted another grace period. Any attempt to assign to it a service that will bring the aggregate MIR to a value above 2 Mbps will be rejected.

The License page enables viewing the current status of SUs and Base Station Licenses. The available options are:

"SUs License Bank Status Tab"

"Base Station Licenses Tab"

"Temporary Grace Licenses Tab"

"Grace Licenses Tab"

2.27.1 SUs License Bank Status Tab

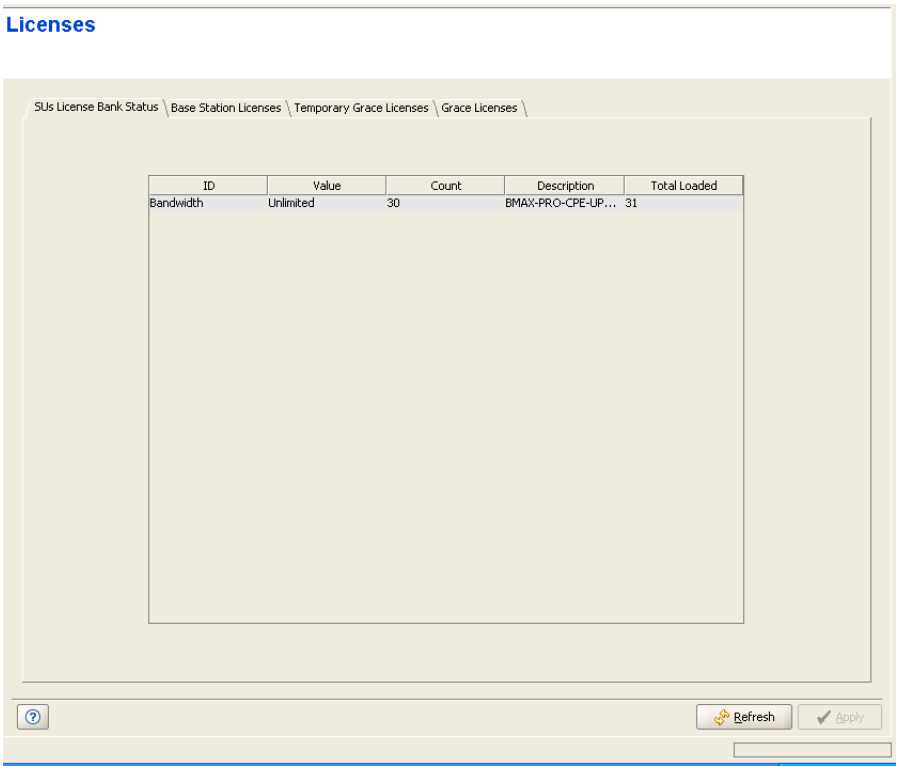


Figure 2-32: Licenses - SUs License Bank Status Tab

The SUs License Bank Status tab displays the current status of the SUs Licenses (if available). The displayed information for each license type includes:

Parameter	Description
ID	The relevant license type. In the current version only a BW (Band-Width) license type is available.
Value	The specific details of the relevant licenses. In the current version all BW licenses are Unlimited.
Count	The number of currently available licenses (balance). Each time a license is granted to a specific CPE, the License Count is decremented by one.
Description	A description of the license
Total Loaded	The total number of licenses of the relevant type that were loaded to the device.

2.27.2 Base Station Licenses Tab

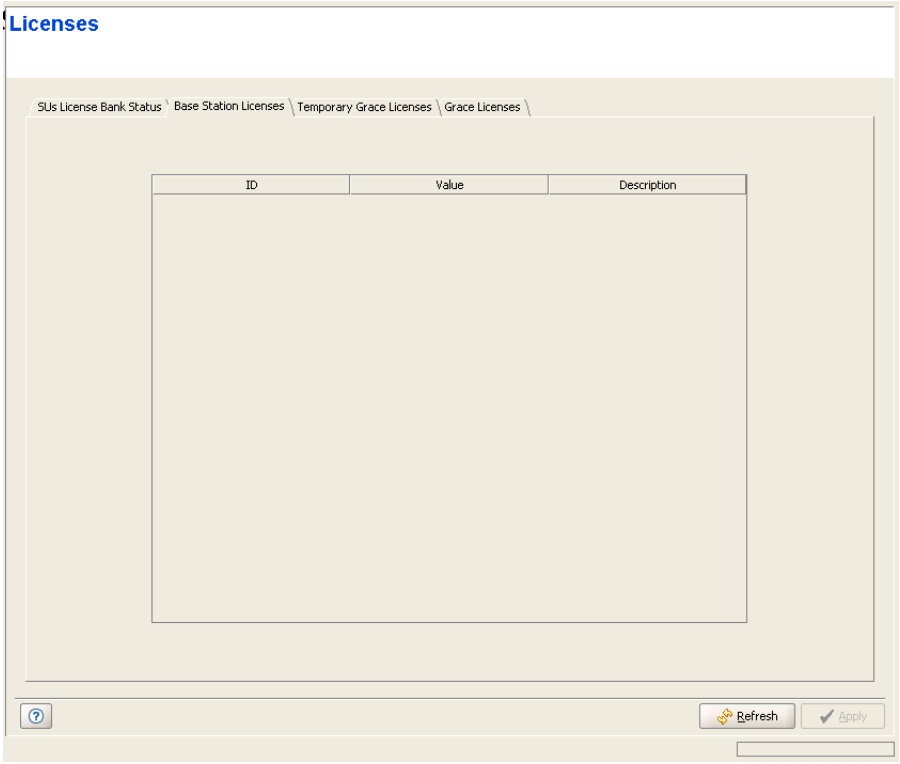


Figure 2-33: Licenses - Base Station Licenses Tab

The Base Station Licenses tab displays the current modular Base Station/Micro Base Station Licenses (if available). The displayed information for each license type includes:

Parameter	Description
ID	The relevant license type. In the current version the available license type IDs are: ■ BW (Band-Width) ■ CPE (Number of CPEs, applicable only for a Micro Base Station).
Value	TThe specific details of the relevant licenses. In the current version the following values are available: ■ Unlimited (for BW license ID) ■ 50, 150, 250 (for CPE license ID, applicable only for a Micro Base Station)

Parameter	Description
Description	A description of the license

2.27.3 Temporary Grace Licenses Tab

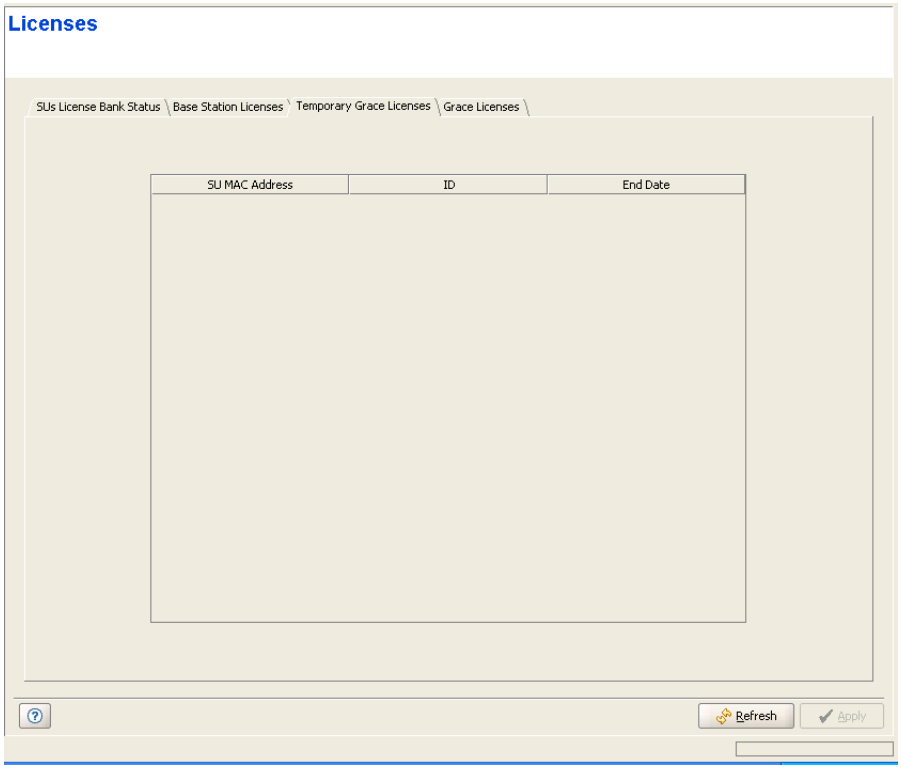


Figure 2-34: Licenses - Temporary Grace Licenses

The Temporary Grace Licenses tab displays the current temporary grace licenses granted to "L" model SUs (if applicable). The displayed information for each temporary grace license includes:

Parameter	Description
SU MAC Address	The MAC address of the relevant SU.
ID	The type of the temporary grace license granted to the SU. In the current version only a BW (Band-Width) license type is available.
End Date	The expiry date of the temporary grace license.

2.27.4 Grace Licenses Tab

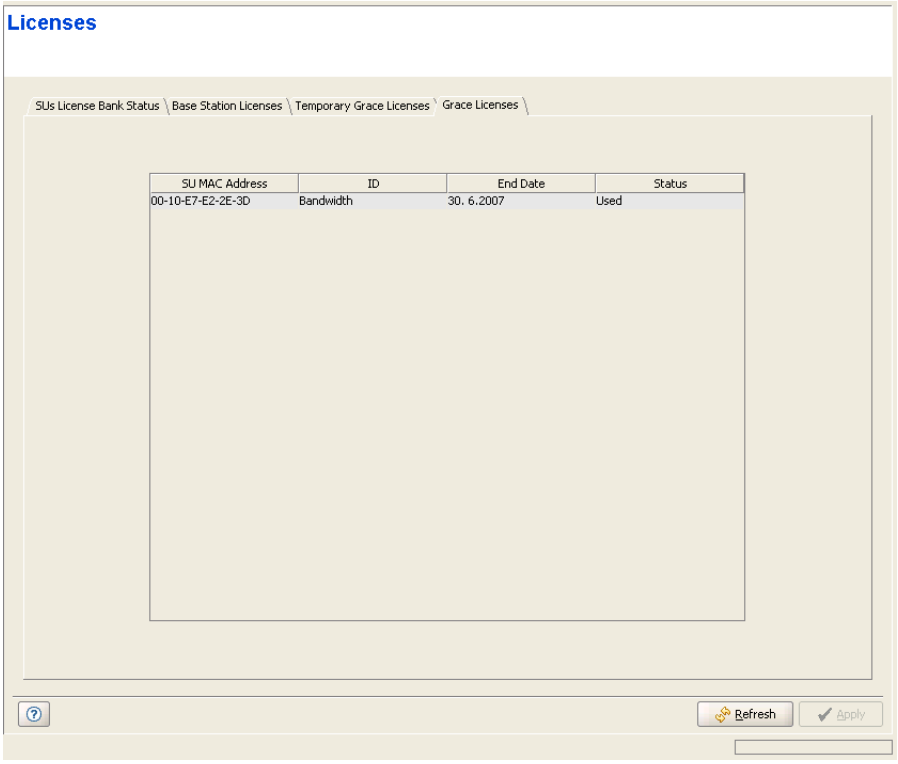


Figure 2-35: Licenses - Grace Licenses Tab

The Temporary Grace Licenses tab displays the current grace licenses granted to "L" model SUs (if applicable). The displayed information for each grace license includes:

Parameter	Description
SU MAC Address	The MAC address of the relevant SU.
ID	The type of the grace license granted to the SU. In the current version only a BW (Band-Width) license type is available.
Status	■ Grace Activated ■ Warning Issued (3 days before expiry date) ■ License Expired ■ Local permanent (SU received a Local license) ■ Permanent (SU received a Permanent license)
End Date	The expiry date of the grace license.

2.28 License Upload Page

The License Upload page enables loading new license(s) to the device.

See BreezeMAX - Getting and Loading Feature Licenses document for details on getting licenses and generating a license(s) file.

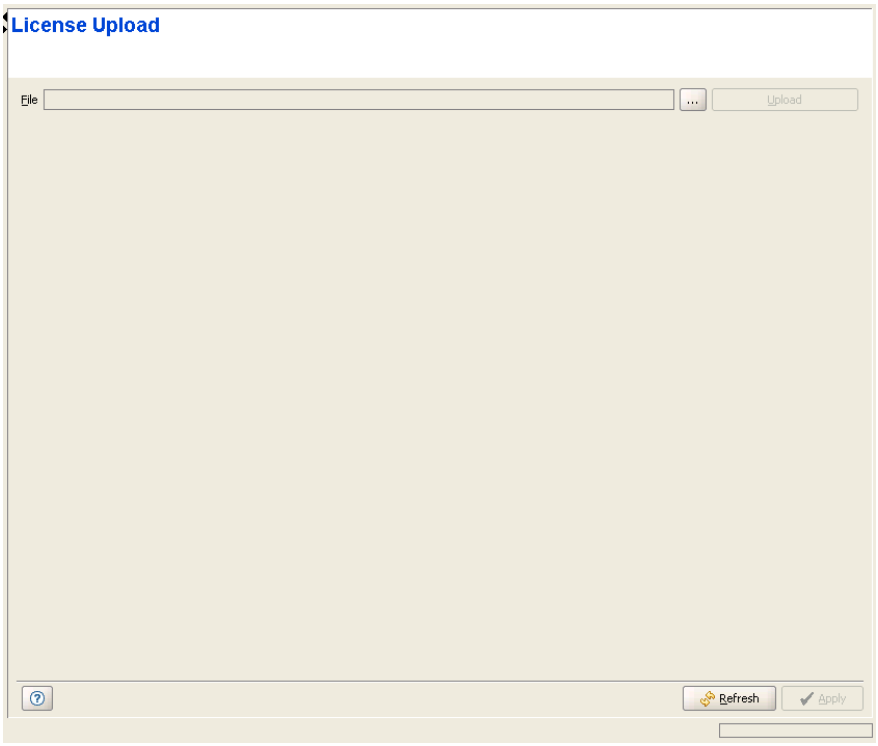


Figure 2-36: License Upload Page

To upload a License File to the device:

1. Click on the browser button to open the **Choose** window, enabling you to select the required License File that must be available on the PC running the AlvariCRAFT application.
2. After selecting the file, the read-only File text box will display the path to the selected file.
3. Click on the **Upload** button. The operation's results will be displayed.

2.29 NPU View Page

The NPU View page provides general details on the hardware and software of the NPU.

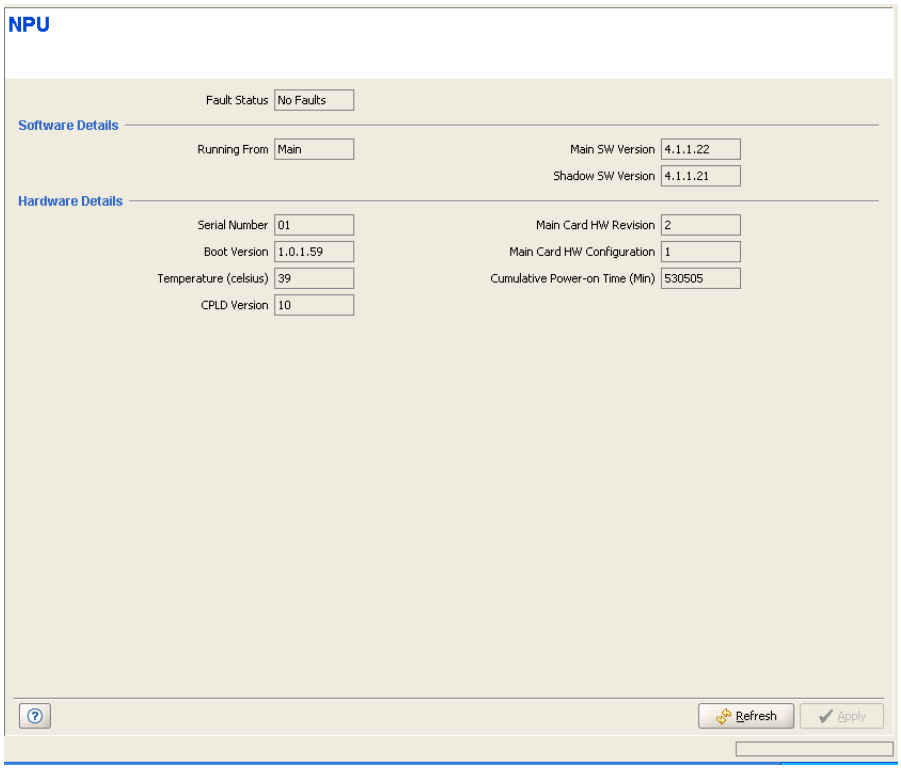


Figure 2-37: NPU View Page

The read-only details are:

- **Fault Status**
- **Main SW Version**
- **Shadow SW Version**
- **Running From**: Main or Shadow
- **Serial Number**
- **Boot Version**

- **Temperature (celsius)**
- **CPLD Version**
- **Main Card HW Revision**
- **Main Card HW Configuration**
- **Cumulative Power On Time (minutes)**

2.30 NPU Data Port Page

The NPU Data Port page enables viewing and configuring the Ethernet and IP parameters of the Data (DATA) port.

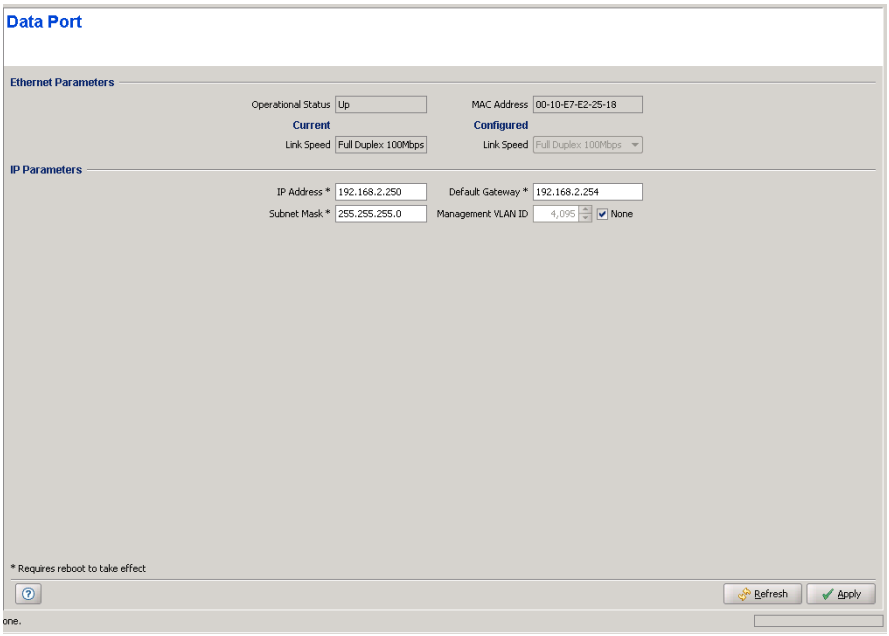


Figure 2-38: NPU Data Port Page

The Data Port page includes the following:

- "Ethernet Parameters"
- "IP Parameters"

2.30.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
MAC Address	The MAC address of the Data port.
Current Link Speed	The current link speed and duplex.

Parameter	Description
Configured Link Speed	The link speed that will be in effect after the next reset. The available options are ■ Full duplex 100Mbps ■ Full Duplex 1Gbps **NOTE**: In current release only Full Duplex 100Mbps is supported by the NPU.

2.30.2 IP Parameters

Parameter	Description
IP Address	The IP Address of the Data port.
Subnet Mask	The Subnet Mask of the Data port.
Default Gateway	The Default Gateway's IP Address of the Data port.
Management VLAN ID	The VLAN ID for management frames via the Data port. If a value from 0 to 4094 is configured for the Management VLAN ID, then the device will accept management frames only if their VLAN tag is the same as this value. Available values are 0-4094 or None (4095) for No VLAN ID.

CAUTION

Management VLAN ID is applied immediately (without reset). If you use the Data port for managing the device, you may loose management access to the device.

NOTE

The local subnet of the Data port (defined by the Data Port IP Address and Data Port Subnet Mask parameters), must differ from the local subnet of the Management port (defined by the Management Port IP Address and Management Port Subnet Mask parameters) and from the subnet that is used as the Static Route for remote management via the Management port (defined by the Management Port Destination Subnet and Management Port Destination Subnet Mask parameters).

2.31 NPU Management Port Page

The NPU Management Port page enables viewing and configuring the Ethernet and IP parameters of the Management (MGMT) port.

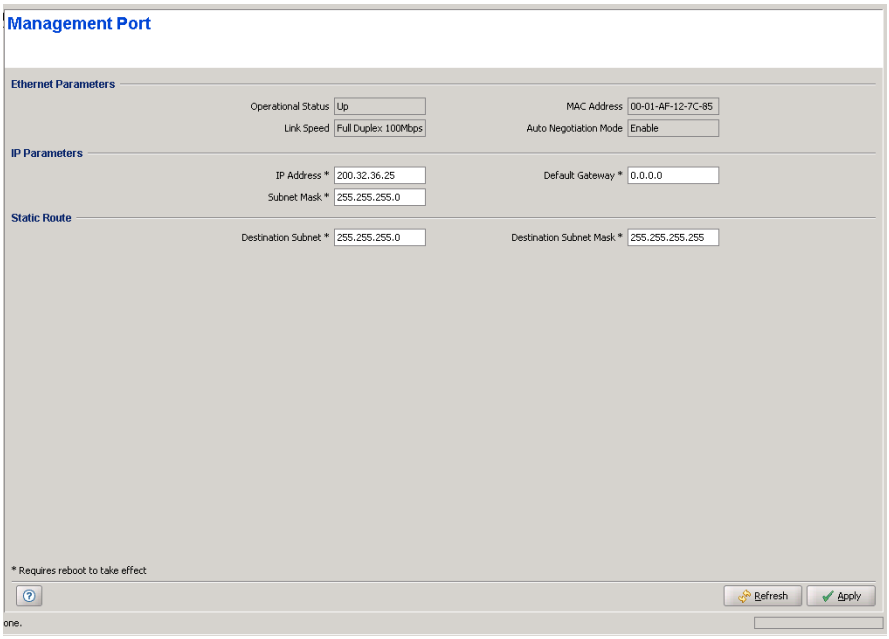


Figure 2-39: NPU Management Port Page

The Management Port page includes the following:

- "Ethernet Parameters"
- "IP Parameters"
- "Static Route"

2.31.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
MAC Address	The MAC address of the Management port.
Link Speed	The actual link speed and duplex.
Auto Negotiation Mode	The Management port of the NPU operates always in Auto Negotiation Mode Enabled.

NOTE

It is highly recommended to use the Management port for local management only. Typically the port should be down (disconnected).

2.31.2 IP Parameters

Parameter	Description
IP Address	The IP Address of the Management port.
Subnet Mask	The Subnet Mask of the Management port.
Default Gateway	The Default Gateway's IP Address of the Management port.

NOTES

The local subnet of the Management port (defined by the Management Port IP Address and Management Port Subnet Mask parameters), must differ from the local subnet of the Data port (defined by the Data Port IP Address and Data Port Subnet Mask parameters) and from the subnet that is used as the Static Route for remote management via the Management port (defined by the Management Port Destination Subnet and Management Port Destination Subnet Mask parameters).

If a Default Gateway is specified for the Management port (an address other than the 0.0.0.0 default, which means "no default gateway"), static route parameters must be defined as well. The static route subnet must be different from both the Data port and the Management port subnets.

CAUTION

Do not configure the IP Address of the Management port to 0.0.0.0, as this will cause loss of management connectivity via the Data port.

2.31.3 Static Route

The Destination Subnet parameters define a Static Route, which is an IP subnet of stations that can manage the device when connected via a router to the Management port.

Parameter	Description
Destination subnet	The Static Route's base IP address
Destination Subnet Mask	The Subnet Mask of the Static Route.

NOTE

The subnet that is used as the Static Route for remote management via the Management port (defined by the Management Port Destination Subnet and Management Port Destination Subnet Mask parameters) must differ from the local subnet of the Management port (defined by the Management Port IP Address and Management Port Subnet Mask parameters) and from the local subnet of the Data port (defined by the Data Port IP Address and Data Port Subnet Mask parameters)

2.32 Authorized Managers Page

The Authorized Managers page enables managing the list of Authorized Managers. An Authorized Manager is a station that is authorized to manage the modular Base Station/Micro Base Station and the relevant SUs. The table can contain up to 10 Authorized Managers. If the maximum number is reached, the Add button becomes inactive.

NOTE

If no Authorized Manager is defined in the device, it can be managed using SNMP by any station, with the default Read and Write Communities, but no traps will be sent from the device. If at least one Authorized Manager is defined, the device can be managed only by a station whose parameters match a defined Authorized Manager.

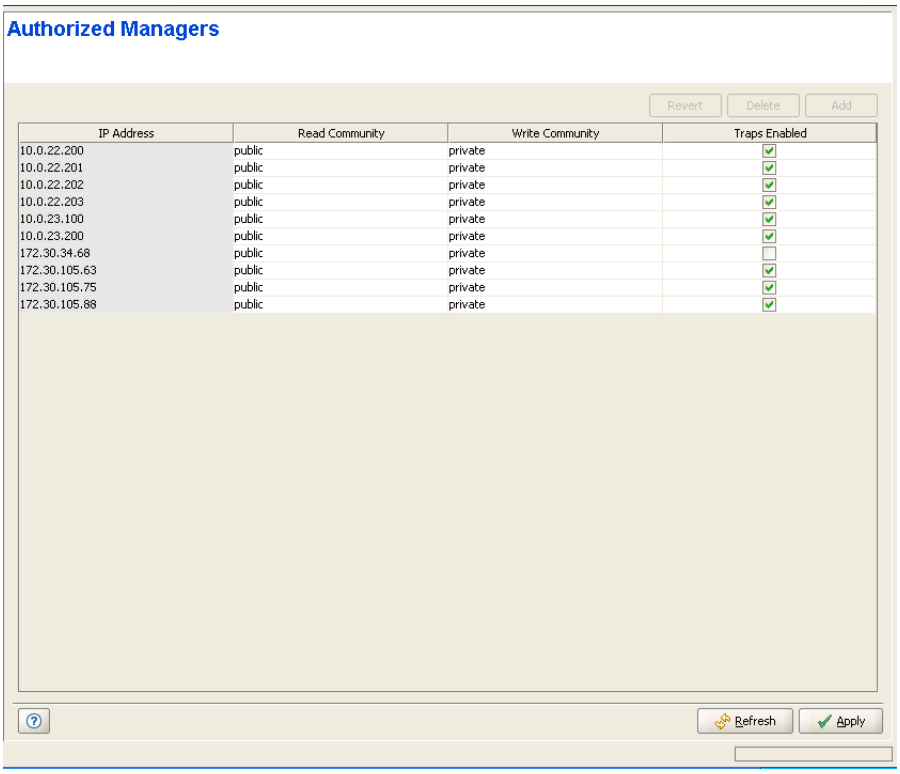


Figure 2-40: Authorized Managers Page

The Authorized Managers table includes the following fields for each Authorized Manager:

Parameter	Description
IP Address	The IP Address of the authorized management station.
Read Community	The SNMP Read Community string used by the management station for read-only operations. The Read Community comprises a string of up to 23 case sensitive characters. The Read Community serves also as the Trap Community when the station is configured to receive traps.
Write Community	The SNMP Write Community string used by the management station for write/read operations. The Write Community comprises a string of up to 23 case sensitive characters.
Traps Enabled	A toggle check-box indicating whether to enable or disable sending traps to the management station.

NOTE

The Read and Write Communities are mandatory and both must be defined (other than null)

2.33 Frequency Bands File Page

The Frequency Bands Configuration file defines the properties of each of the frequency bands supported by the system.

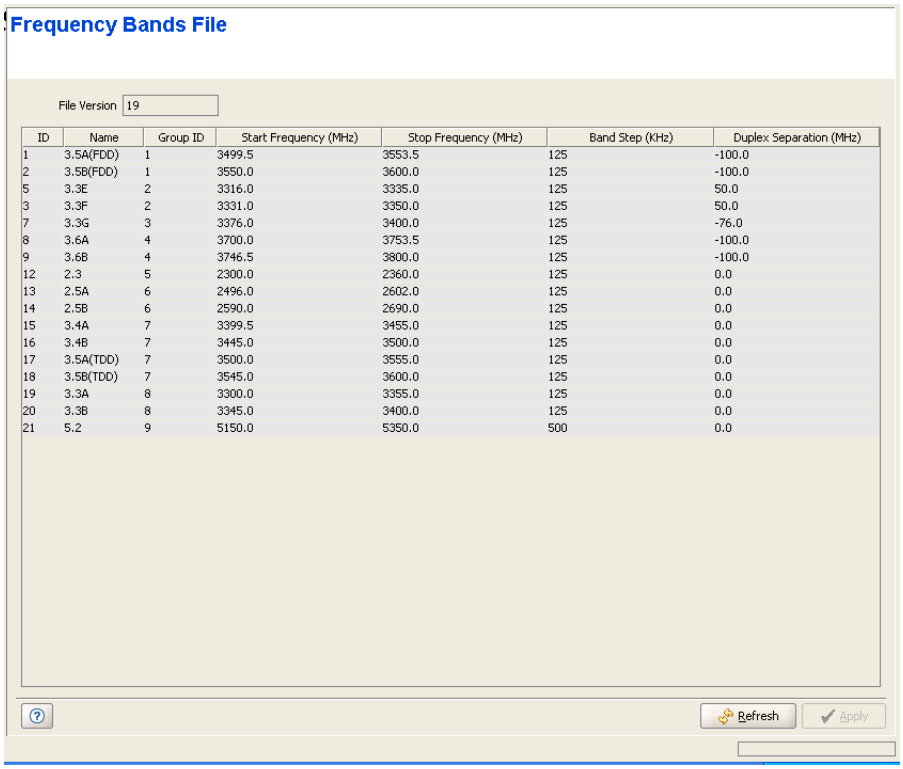


Figure 2-41: Frequency Bands File Page

These frequency bands' properties include:

Parameter	Description
ID	The Frequency Band ID.
Name	The Frequency Band name.
Group ID	In certain cases an AU/Micro Base Station can be connected to ODUs using different Frequency Bands. The Group ID defines the Frequency Bands Group, which includes the Frequency Bands that can be used by the AU/Micro Base Station connected to an ODU using the Frequency Band.
Start Frequency	The lowest downlink frequency in MHz.
Stop Frequency	The highest downlink frequency in MHz.

Parameter	Description
Band Step	The frequency resolution in KHz.
Duplex Separation	The difference between downlink (Tx) and uplink (Rx) frequencies, in MHz. For TDD bands the Duplex Separation is 0.

In addition, the **File Version** of the Frequency Bands File is also displayed.

NOTE

The Frequency Bands File includes also Frequency Bands for systems that support FDD Duplex Mode. These bands are not applicable to the current release. In addition, certain TDD bands included in the file may not be supported by currently availablr hardware.

2.34 NPU/Micro Base Station Unit Control Page

The Unit Control page enables managing the SW versions of the NPU/Micro Base Station, resetting the managed device to its default configuration and managing the AU (NPU only) and SU SW Files in the managed device.

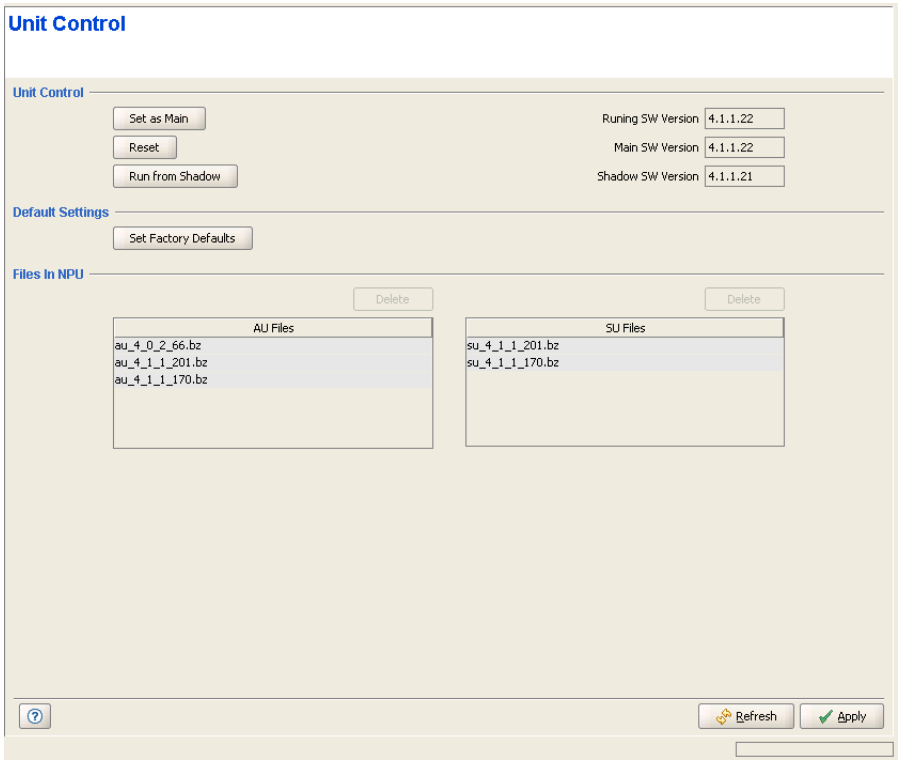


Figure 2-42: NPU Unit Control Page

The Unit Control page includes the following sections:

- "Unit Control"
- "Default Settings"
- "Files in NPU/MBS"

2.34.1 Unit Control

The NPU/Micro Base Station can contain two SW versions:

- **Main**: Each time the device resets it will reboot using the Main SW version.
- **Shadow**: Normally the Shadow version is the backup version. Each time a new SW File is downloaded to the device, it will be stored as the Shadow SW version, replacing the previous Shadow SW version.

The typical process of upgrading to a new SW version includes the following steps:

1. Download a new SW File to the device. It will be stored as the Shadow version.
2. Reset and run the device from its Shadow version. Note that at this stage, after reset the device will reboot from its previous (Main) SW version.
3. If you want to continue using the new SW version, swap the Shadow and Main versions. The new version is now defined as Main, and will be used each time the device reboots. The previous version is defined now as Shadow.

The Unit Control section includes the following parameters:

Parameter	Description
Running SW Version	A read-only display of the current SW version.
Main SW Version	The Main SW version.
Shadow SW Version	The Shadow SW version.

In addition, the following version control buttons are available:

Button	Description
Reset	Click on the Reset button to reset the NPU/Micro Base Station and run the Main SW version. Changes to some of the configurable parameters are applied only after reset. Refer to "Parameters Summary" on page 240 for information on which parameters are changeable in run time and which changes are applied only after reset.
Run from Shadow	Click on the Run from Shadow button to reset the unit and run the Shadow SW version. Note that after the next reset the unit will reboot from its Main SW version.
Set as Main	Click on the Set as Main button to swap between the Shadow and Main SW versions.

2.34.2 Default Settings

Click on the **Set Factory Defaults** button to reset the NPU/Micro Base Station parameters (excluding the Monitor/Telnet access Passwords) to their factory default values. For an NPU, the General Management Parameters, General Radio Parameters and Traps Control Parameters will also revert to their default values. Refer to "Parameters Summary" on page 240 for information on the factory default values of these parameters. The parameters will revert to their default values after the next reset.

2.34.3 Files in NPU/MBS

Up to four SU SW files can be stored in the NPU/Micro Base Station. In the NPU, up to four AU SW Files may also be stored. Any of the available files can be loaded by the NPU/Micro Base Station to a selected SU/AU. When four files of the same type are stored in the device, a new file of the same type cannot be added until at least one of the existing files of this type is deleted. The SU Files and (in NPU) AU Files tables enable viewing the current SU/AU SW files stored in the device and deleting selected file(s).

To delete a file, select it and click on the applicable **Delete** button.

2.35 NPU Bridge and Voice Page

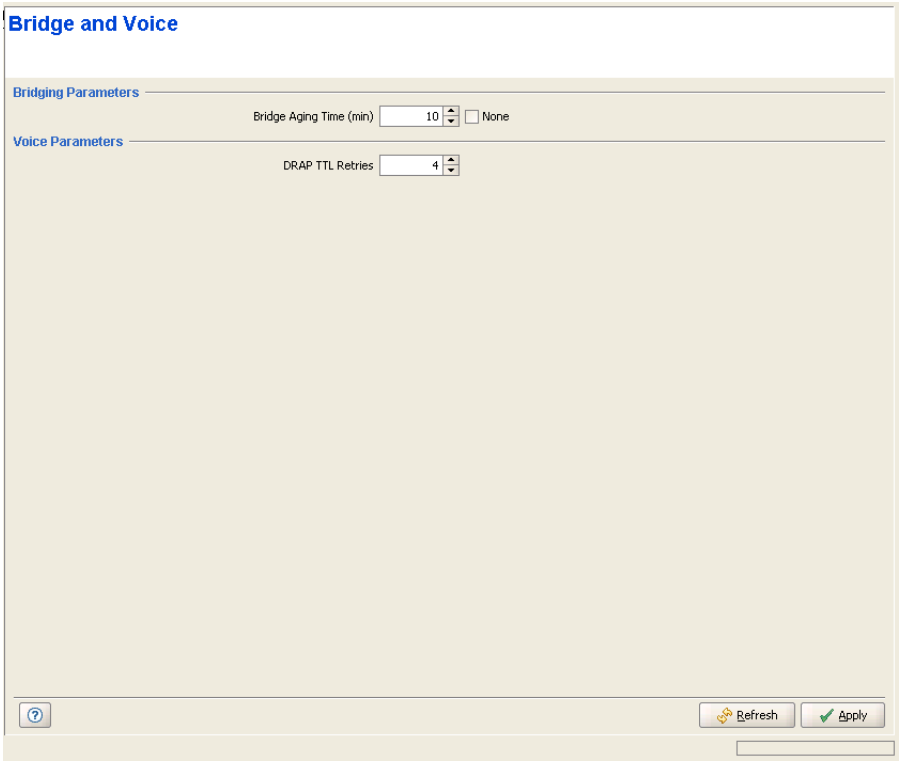


Figure 2-43: Bridge and Voice Page (NPU)

The Bridge and Voice page includes the following general parameters for bridging and for control of VoIP devices using the DRAP protocol:

Parameter	Description
Bridge Aging Time	The aging time for all addresses in the Forwarding Data Base. The available values are from 1 to 1440 minutes, or 0 (None) for no aging.
DRAP TTL Retries	The limit of TTL retries for gateways that support the DRAP protocol before concluding that the gateway is no longer active and removing it from the database. The TTL retry time (the maximum time between two consecutive Allocation Requests) is 255 seconds. The range is from 1 to 100 retries.

2.36 NPU Performance Page

The Performance page enables on-line view of selected counters.

For details on the general functionality of the Performance Monitoring application, refer to “Using the Performance Page” on page 233.

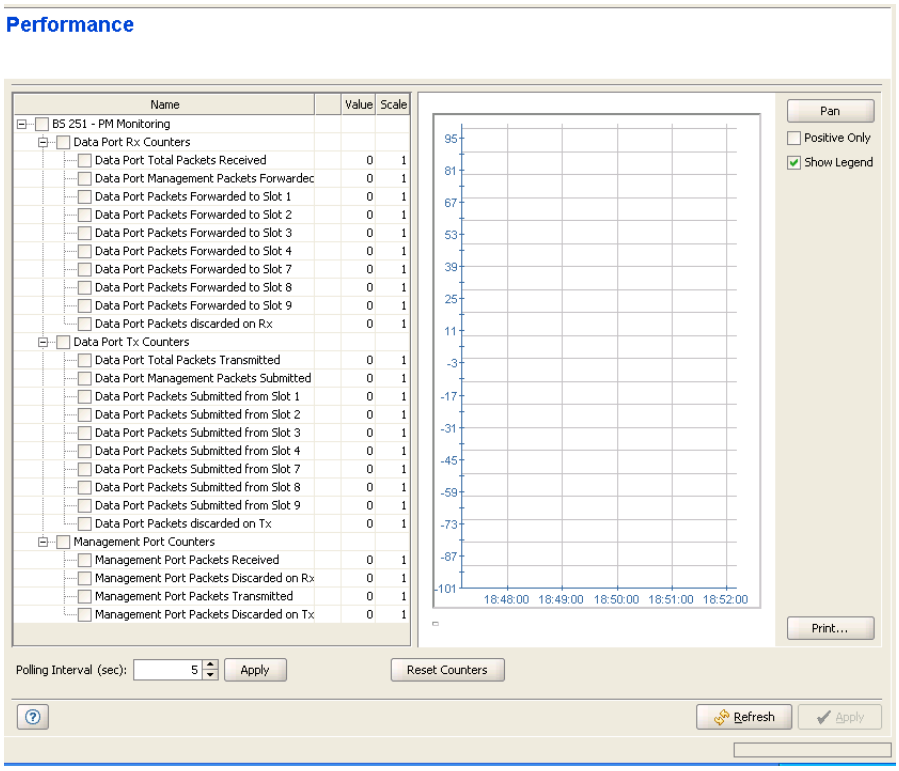


Figure 2-44: NPU Performance Page

The counters available for the NPU are:

- “Data Port Rx Counters”
- “Data Port Tx Counters”
- “Management Port Counters”
- “PF Server Counter”

2.36.1 Data Port Rx Counters

The Data Port Rx counters include:

Counter	Description
Data Port Total Packets Received	The total number of packets received on the interface. Packets with errors are not counted.
Data Port Management Packets Forwarded	The total number of management packets (packets whose destination is the NPU, and broadcasts) received on the Data port and forwarded to the NPU's internal management.
Data Port Packets Forwarded to Slot 1	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 1.
Data Port Packets Forwarded to Slot 2	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 2.
Data Port Packets Forwarded to Slot 3	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 3.
Data Port Packets Forwarded to Slot 4	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 4.
Data Port Packets Forwarded to Slot 7	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 7.
Data Port Packets Forwarded to Slot 8	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 8.
Data Port Packets Forwarded to Slot 9	The total number of packets received from the Data port and forwarded by the NPU to AU Slot 9.
Data Port Packets Discarded on Rx	The total number of packets discarded due to switching and classification failures.

2.36.2 Data Port Tx Counters

The Data Port Tx counters include:

Counter	Description
Data Port Total Packet Transmitted	The total number of packets transmitted to the interface. Packets with errors are not counted.
Data Port Management Packets Submitted	The total number of management packets submitted by the NPU.
Data Port Packets Submitted from Slot 1	The total number of packets received by the NPU from the AU in Slot 1 and submitted to the Data port.

Counter	Description
Data Port Packets Submitted from Slot 2	The total number of packets received by the NPU from the AU in Slot 2 and submitted to the Data port.
Data Port Packets Submitted from Slot 3	The total number of packets received by the NPU from the AU in Slot 3 and submitted to the Data port.
Data Port Packets Submitted from Slot 4	The total number of packets received by the NPU from the AU in Slot 4 and submitted to the Data port.
Data Port Packets Submitted from Slot 7	The total number of packets received by the NPU from the AU in Slot 7 and submitted to the Data port.
Data Port Packets Submitted from Slot 8	The total number of packets received by the NPU from the AU in Slot 8 and submitted to the Data port.
Data Port Packets Submitted from Slot 9	The total number of packets received by the NPU from the AU in Slot 9 and submitted to the Data port.
Data Port Packets Discarded on Tx	Always 0. Currently packets are not discarded on Tx.

2.36.3 Management Port Counters

The Management Port counters include:

Counter	Description
Management Port Packets Rx	The total number of packets received on the port. Packets with errors are not counted.
Packets Discarded on Rx	Packets received on the port that were discarded.
Management Port Packets Tx	The total number of packets transmitted to the port.
Packets Discarded on Tx	Always 0. Currently packets are not discarded on Tx.

2.36.4 PF Server Counter

The PF Server counter includes the PF Invalid Server Packets counter that displays the total number of packets received from unknown PF servers.

2.37 AU View Page

The AU View page provides general details on the hardware and software of the AU.

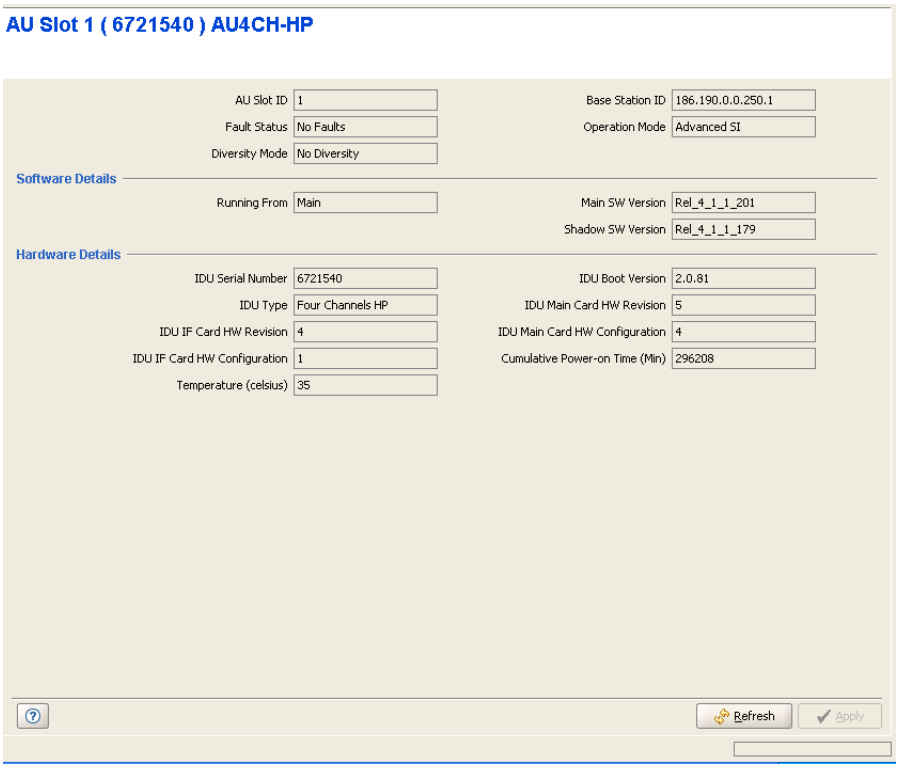


Figure 2-45: AU View Page

The read-only details are:

- **AU Slot ID**
- **Fault Status**
- **Diversity Mode**
- **Base Station ID**
- **Operation Mode** (in the current release only Advanced Si is applicable)
- **Main SW Version**

- **Shadow SW Version**
- **Running From** (Main or Shadow)
- **IDU Serial Number**
- **IDU Type** (Four Channels HP or Four Channels HP 4M)
- **IDU IF Card HW Revision**
- **IDU IF Card HW Configuration**
- **Temperature (celsius)**
- **IDU Boot Version**
- **IDU Main Card HW Revision**
- **IDU Main Card HW Configuration**
- **Cumulative Power On Time (Minutes)**

2.38 Voice Parameters Page

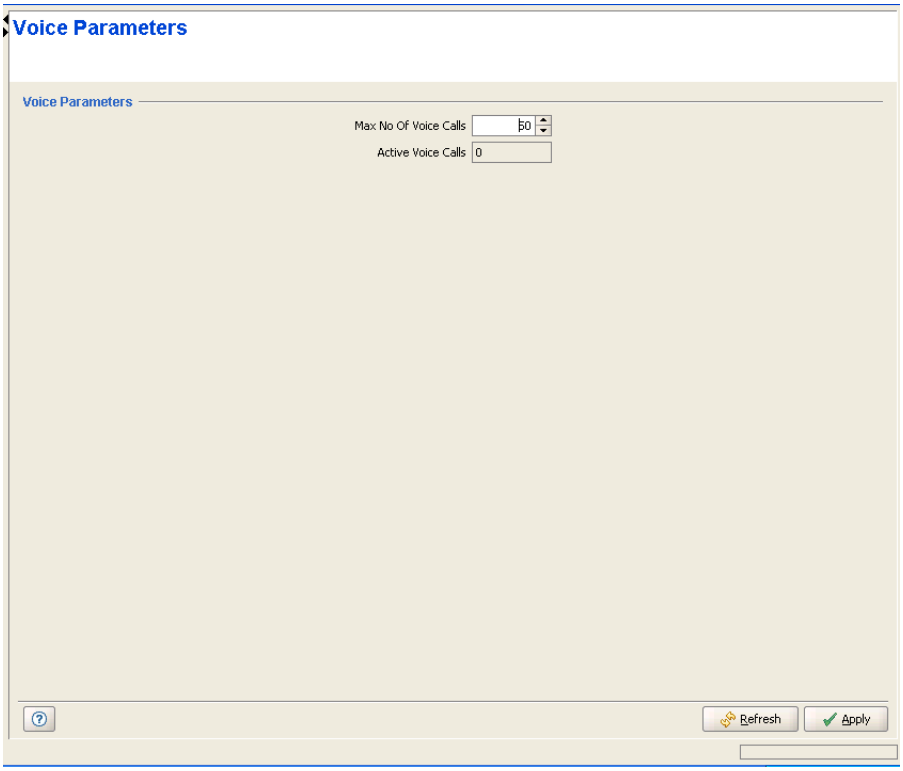


Figure 2-46: Voice Parameters Page

The Voice page includes the following parameters for control of VoIP sessions made by devices using the DRAP protocol in CS Switching Mode or by SIP devices using IP Mode Managed VoIP service in IP CS Switching Mode:

Parameter	Description
Max No. of Voice Calls	The upper limit of simultaneous voice calls that will be supported by the AU. The range is from 0 to 300 Voice Calls.
Active Voice Calls	A read-only display of the current number of voice calls in the sector.

2.39 Channels Page

The Channels page enables viewing and configuring the Diversity Mode of the AU/Micro Base Station and the parameters of the AU/Micro Base Station Channels.

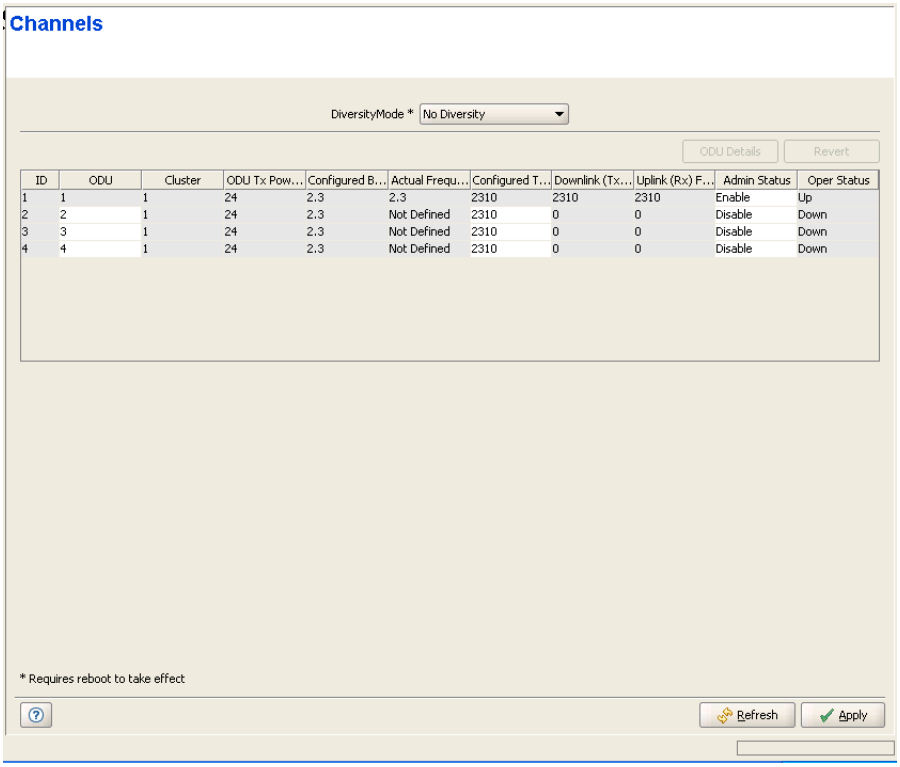


Figure 2-47: Channels Page

Diversity Mode: The Diversity Mode of the AU/Micro Base Station. The available options are:

- No Diversity
- Second Order Diversity
- Fourth Order Diversity for NLOS
- Fourth Order Diversity for LOS and NLOS

Each of the Fourth Order Diversity modes uses a different downlink diversity scheme optimally adapted to the different propagation conditions prevailing in the

relevant deployment scenario. Fourth Order Diversity for NLOS should typically be used when all or most of the SUs operate in Non-Line-Of-Sight (NLOS) conditions (typical to CPE Si units). Fourth Order Diversity for LOS and NLOS mode will provide better overall performance in deployments where there are SUs operating in both Line-Of-Sight (LOS) conditions (expected for most CPE-PRO S units) and Non-Line-Of-Sight (NLOS) conditions.

NOTE

A change in the Diversity Mode parameter takes effect immediately and automatically resets the AU/Micro Base Station. It also disables the Admin Status of all its channels when changing from No Diversity to Second Order/Fourthe Order Diversity and vice versa. When changing from Fourth Order Diversity to Second Order Diversity, it disables the Admin Status of Channels 3 and 4.

The Channels table has four entries for Channels 1 to 4. The Channels table include the following parameters for each Channel:

Parameter	Description
ODU	An ODU ID (1-24 for a modular Base station, 1-4 for a Micro Base Station) of an already defined ODU.
Cluster	A read-only display of the Associated Radio Cluster configured in the associated ODU.
ODU Tx Power	A read-only display of the Tx Power configured in the associated ODU
Configured Frequency Band	A read-only display of the Configured Frequency Band in the Associated ODU.
Actual Frequency Band	A read-only display of the actual Frquency Band of the ODU.

Parameter	Description
Configured Tx Frequency	The Tx frequency in MHz, which must be in accordance with the Bandwidth for the AU/Micro Base Station and the rules defined in the Frequency Bands File (see “Frequency Bands File Page” on page 124) for the frequency band selected as the Configured Band of the associated ODU. In addition, the following rules must be followed if the Diversity Mode is No Diversity: ■ After configuring the Tx Frequencies f1 for one of the Channels, the Tx Frequencies for other Channel of the same AU/Micro Base Station should be configured using increments of +/- 0.875 MHz from the defined frequency: f1 +/-(N*0.875). ■ The Tx Frequencies of all Channels of the same AU/Micro Base Station should belong to the same Frequency Bands Group (see “Frequency Bands File Page” on page 124). If the Diversity Mode is set to any of the Fourth Order Diversity modes, the Tx Frequencies of Channels 2-4 are not configurable: when the Admin Status of Channel 1 is enabled, The Configured Tx Frequency of Channels 2-4 is are set automatically to the same value configured for Channel 1. If the Diversity Mode is set to Second Order Diversity, the Tx Frequency of Channel 2 is not configurable: when the Admin Status of Channel 1 is enabled, The Configured Tx Frequency of Channel 2 s are set automatically to the same value configured for Channel 1. Channels 3 and 4 are not used in Second Order Diversity Mode.
Downlink (Tx) Frequency (MHz)	A read-only display of the actual Downlink Frequency in MHz.
Uplink (Rx) Frequency (MHz)	A read-only display of the Uplink Frequency in MHz, computed from the Tx Frequency according to the Duplex Separation of the applicable Frequency Band. For TDD the Uplink (Rx) Frequency is identical to the Downlink (Tx) Frequency.

Parameter	Description
Admin Status	The administrative status of the Channel. Note that the Admin Status must be disabled to enable changes in the Configured Frequency Band of an associated ODU. If the Configured Frequency Band differs from the actual band supported by the ODU, a mismatch trap will be sent by the AU/Micro Base Station upon trying to associate it with a Channel and the association will be rejected. The Admin Status of all Channels belonging to the same AU/Micro Base Station must be disabled to allow a configuration change in the Bandwidth parameter. If the Diversity Mode is set to any of the Fourth Order Diversity modes, the Admin Statuses of Channels 2-4 are not configurable: they are set automatically to the same value configured for Channel 1. If the Diversity Mode is set to Second Order Diversity, the Admin Status of Channel 2 is not configurable: it is set automatically to the same value configured for Channel 1. Channels 3 and 4 are not used in Second Order Diversity Mode.
Oper Status	A read-only display of the operational status of the Channel.

2.40 Air Interface Page

The Air Interface page enables viewing and configuring the MAC, Phy, ATPC, Multi Rate and Subchannelization parameters.

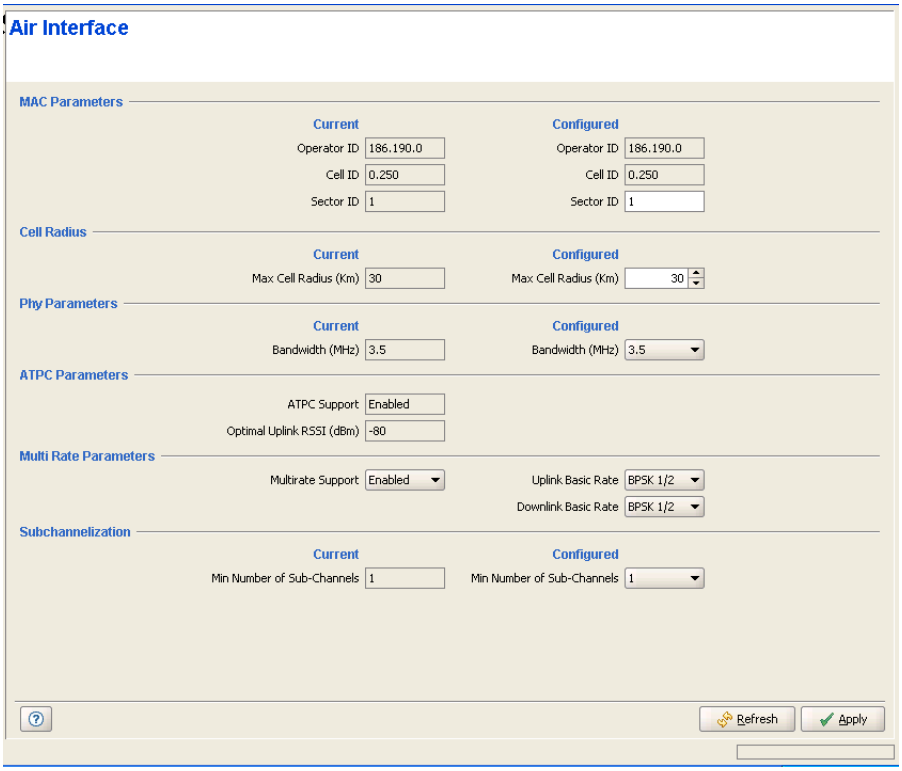


Figure 2-48: AU Air Interface Page

The Air Interface page includes the following sections:

- "MAC Parameters"
- "Cell Radius"
- "Phy Parameters"
- "ATPC Parameters"
- "Multi Rate Parameters"
- "Subchannelization"

2.40.1 MAC Parameters

Parameter	Description
Operator ID *(Current/Configured)*	Read-only displays of the Current and Configured Operator ID. The Operator ID is configured in the General Radio parameters page. In a modular Base Station, a configuration change in the AU is applied after reseting either the NPU (for all installed AUs) or the AU. In a Micro Base Station, a configuration change is applied after reseting the unit.
Cell ID *(Current/Configured)*	Read-only displays of the Current and Configured Cell ID. The Cell ID is configured in the General Radio parameters page. In a modular Base Station, a configuration change in the AU is applied after reseting either the NPU (for all installed AUs) or the AU. In a Micro Base Station, a configuration change is applied after reseting the unit.
Sector ID *(Current/Configured)*	The Current (read-only) and Configured Sector ID. A decimal number in the range from 0 to 255. A configuration change is applied after reset.

2.40.2 Cell Radius

Parameter	Description
Max Cell Radius (Km) *(Current/Configured)*	The Maximum Cell Radius is used to adapt various timing parameters of the MAC to the time it takes a message to reach its destination. This time delay is dependent upon the distance between the originating and receiving units. The timing parameters should be adapted to the largest expected delay, which is determined by the distance from the farthest SU served by the AU/Micro Base Station. In a TDD system, the values range for the Maximum Cell Distance is from 10 to 50 km for a bandwidth of 3.5 MHz, and 7 to 45 km for a bandwidth of 5 MHz (representing a maximum delay of 6 symbols). The actual value that the system will use is a multiple of the the one-way delay for a single basic time element: N*10 km for a bandwidth of 3.5 MHz or N*7.5 km for a bandwidth of 5 MHz, where N is a an integer from 1 to 6. The value configured for the Maximum Cell Radius will be up-rounded to the nearest applicable value.

2.40.3 Phy Parameters

Parameter	Description
Bandwidth (MHz) *(Current/Configured)*	The frequency bandwidth used by the radio. A change in the Bandwidth parameter will take effect only after resetting the AU/Micro Base Station. The Admin Status of all Channels must be disabled to enable a configuration change in the Bandwidth parameter. The available options are 1.75, 3.5, 5, 7, and 10 MHz. The current Bandwidth values applicable for systems operating in TDD Mode are 3.5 MHz and 5 MHz. A value that is not supported by the device will be rejected.

2.40.4 ATPC Parameters

The system employs an Automatic Transmit Power Control (ATPC) algorithm to dynamically adapt the transmit power of each SU so that it is received by the ODU at an optimal level. The algorithm is managed by the AU/Micro Base Station and optimal values are calculated separately for each SU based on the actual level at which it is received by the ODU. MAP messages transmitted to the SUs include information on the estimated up/down power level change required to achieve optimal transmit power level.

The ATPC parameters are configured in the General Radio Parameters page.

The ATPC Parameters include:

Parameter	Description
ATPC Support	Controls whether the ATPC algorithm should be used to determine current optimal transmit level for each SU served by the Base Station.
Optimal Uplink RSSI (dBm)	The Optimal Uplink RSSI sets the target level at which all transmissions should be received by the AU-ODUs for optimal performance. Note that it may differ from the value configured in the General Radio Parameters page, since the actual range supported by AUs in TDD mode is -80 to -74 dBm.

2.40.5 Multi Rate Parameters

The system employs a multirate algorithm to dynamically adapt the modulation scheme and Forward Error Correction (FEC) coding to actual link conditions. The algorithm is managed by the AU/Micro Base Station taking into account also information received from the served SUs. Optimal values are calculated

separately for the uplink and downlink for each SU, taking into account also the applicable QoS requirements. MAP messages transmitted to the SUs include information on the uplink rate that should be used by each SU for its next transmission.

The multirate algorithm optimizes the trade-off between capacity and error rate: In most deployments, most of the links use high order modulation most of the time, maximizing capacity. “Bad” links use lower order modulation, maximizing availability. The algorithm provides independent adaptation per SU, and it is performed independently for UL and DL, based on link quality information (Burst Error Rate, SNR). The algorithm provides dynamic adaptation - modulation can be changed on a per burst basis. UL transmission rate is determined by the AU/Micro Base Station, and DL transmission rate is determined by the SU.

The multirate algorithm in the uplink adapts dynamically both the modulation and the number of sub-channels to be allocated to each SU.

The Basic Rate is the minimum rate to be used by the Multirate algorithm. This is also the rate to be used for downlink broadcasts and multicasts. Broadcast and multicast messages are sent to multiple recipients with different link qualities. Therefore, it is preferable to use a relatively low rate for these transmissions, thus reducing the probability of errors and increasing the likelihood that all intended recipients will receive them properly.

In the uplink, this is the rate to be used by SUs for non-scheduled transmissions, such as during the contention period.

The Basic Rate is also the initial rate to be used by the algorithm for each new SU that joins the cell when the Multirate algorithm is enabled.

When the Multirate algorithm is disabled, communication with connected SUs will continue using the last uplink and downlink rates selected by the Multirate algorithm. The Basic Rates becomes available for configuration in each SU only when the Multirate algorithm is disabled in the AU/Micro Base Station.

The Multirate Parameters include:

Parameter	**Description**
Multirate Support	Controls whether the multirate algorithm should be used to determine current optimal rates in both the uplinks and the downlinks. The multirate algorithm should always be enabled. The option to disable it is available to enable using a fixed rate to support certain tests. After each reset, the AU/Micro Base Station boots with the multirate enabled, disregarding its status before the device was reset.

Parameter	**Description**
Uplink Basic Rate	The Basic Rate for all uplinks.
Downlink Basic Rate	The Basic Rate for all downlinks.

NOTE

Rate BPSK 3/4 is not applicable for TDD systems.

2.40.6 Subchannelization

The system supports Sub-Channelization (OFDMA) in the uplink, providing two advantages:

- Ability to connect SUs with relatively poor link conditions: reducing the amount of uplink sub-channels from 16 (full bandwidth) to 8, 4, 2 or 1 sub-channels enables increasing the maximum transmit power of the SU by 3, 6, 9 or 12 dBm, respectively.
- Better unitization of uplink capacity, by enabling several SUs to share the bandwidth at the same time.

The available options for the **Min Number of Sub-Channels** parameter are 1, 2, 4, 8, and 16 (full bandwidth) sub-channels. A value of 16 means that sub-channelization is disabled.

Changes in Minimum Number of Sub-Channels are applied only after reset.

2.41 Spectrum Analyzer Page

The Spectrum Analyzer page enables initiating a spectrum analysis test on selected frequencies, terminating an active test and viewing the results of the last test.

NOTE

During the test, the AU switches to receive mode and all SUs previously served by it are disconnected.

Using the parameters defined for the test, the AU scans the selected central frequencies. At each frequency it measures the RSSI for each of the applicable sub-carrier frequencies, and calculates the median RSSI (for all sub-carriers), the frequency of the sub-carrier with the highest RSSI (Max Hold Frequency) and the highest RSSI (Max Hold RSSI). To ensure that the measured values are not affected from transmissions of other AUs in the same network, the measurements are performed only in the time periods allocated for uplink transmissions.

CAUTION

After completion of the test the AU must be reset to resume normal operation.

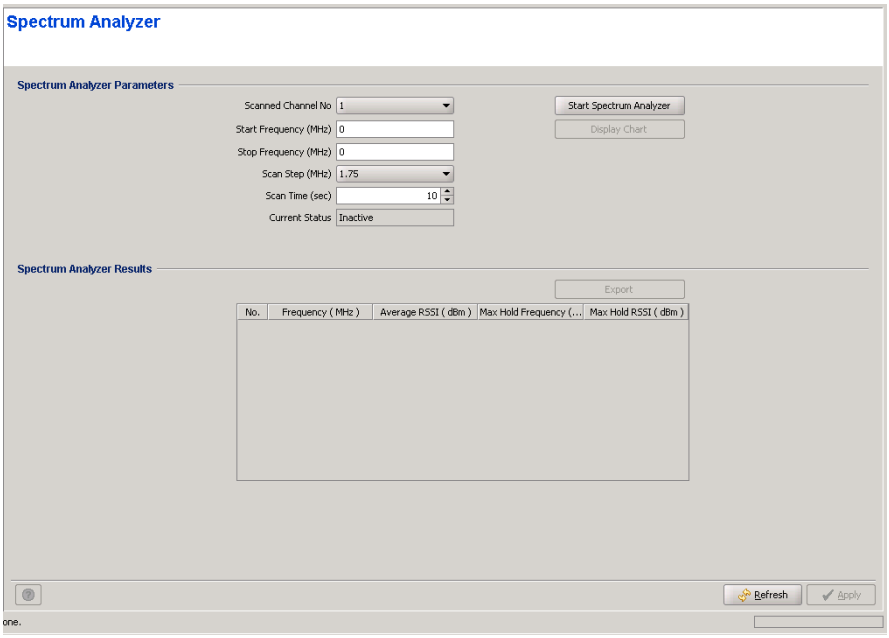


Figure 2-49: Spectrum Analyzer Page

The Spectrum analyzer Parameters are:

Parameter	Description
Scanned Channel No	The ID (1-4) of the channel to be tested. Must be an enabled channe.
Start Frequency (MHz)	The first frequency (in MHZ) participating in the test. Must be in the range supported by the ODU connected to the channel.
End Frequency (MHz)	The highest frequency (in MHz) that may participate in the test (the actuall highest frequency depends on the defined Start Frequency and Scan step). Must be in the range supported by the ODU connected to the channel.
Scan Step (MHz)	The scanning step. The available options are 1.75, 3.5, 2.5 and 5 (MHz). The scanned frequencies are defined by Start Frequency + N*Scan Step where N is 0, 1, 2...and the scanned frequency is lower than or or equal to the End Frequency.
Scan Time (sec)	The test duration in seconds at each of the scanned frequencies. The available range is from 1 to 65535 seconds.
Current Status	The current status of the test:Inactive, Active or Finished

To start a Spectrum Analyzer test:

1. Enter the desired test parameter.
2. Click on the **Start Spectrum Analyzer** button. If the defined test parameters are OK, the name of the button will be changed to **Abort Spectrum Analyzer** and the Current Status will change to **Active**.
3. You can abort the test before its completion by clicking on the **Abort Spectrum Analyzer** button.
4. The test results are displayed in the Spectrum Analyzer Results section.

To view a chart of the results:

Click on the **Display Chart** button. A Spectrum Analyzer Results Chart window will open, displaying the result on graphs. Place the cursor on (or next to) one of the points on a graph to view the exact details for this point.

To export the test parameters and results:

Click on the **Export** button. The Export window will open, allowing you to define the name and location for a CSV file containing the test details.

2.42 AU Unit Control Page

The Unit Control page enables managing the SW versions of the AU and resetting it to its default configuration.

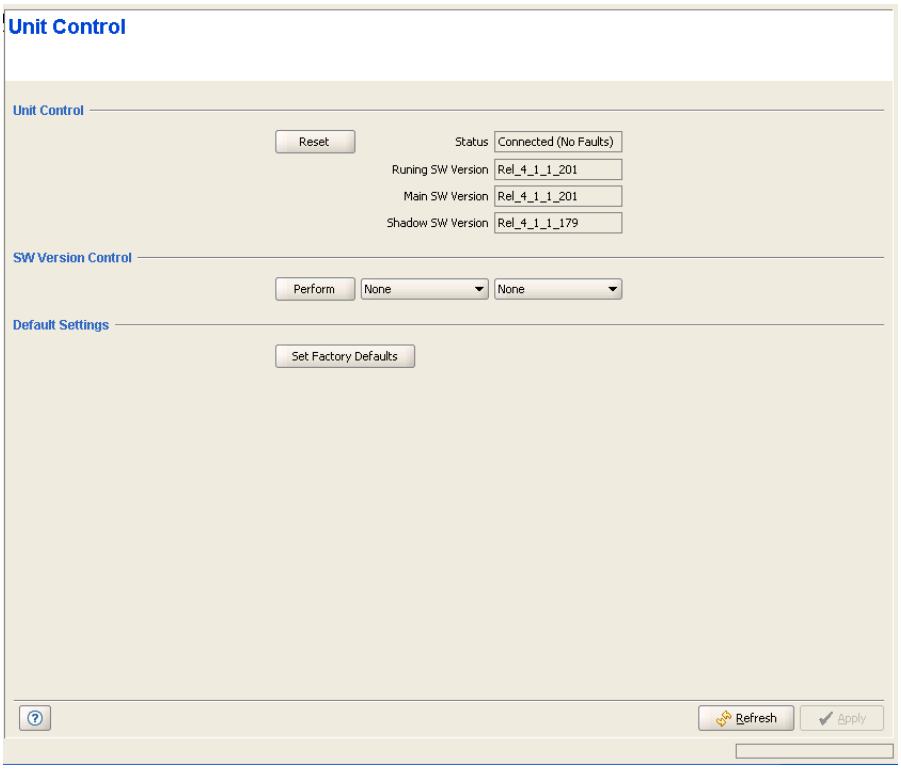


Figure 2-50: AU Unit Control Page

The Unit Control page includes the following sections:

- "Unit Control"
- "SW Version Control"
- "Default Settings"

2.42.1 Unit Control

The AU can contain two SW versions:

- **Main**: Each time the AU resets it will reboot using the Main SW version.
- **Shadow**: Normally the Shadow version is the backup version. Each time a new SW File is downloaded to the device, it will be stored as the Shadow SW version, replacing the previous Shadow SW version.

The Unit Control section includes the following parameters:

Parameter	Description
Status	A read-only display of the status: Connected or Disconnected.
Running SW Version	A read-only display of the current SW version.
Main SW Version	A read-only display of the Main SW version.
Shadow SW Version	A read-only display of the Shadow SW version.

Click on the Reset button to reset the AU and run the Main SW version. Changes to some of the configurable parameters are applied only after reset. Refer to "Parameters Summary" on page 240 for information on which parameters are changeable in run time and which changes are applied only after reset.

2.42.2 SW Version Control

The process of upgrading to a new SW version is controlled by the NPU, and is performed using one of the AU SW files existing in the NPU. If the specified AU SW file does not exist in the AU, it will be downloaded to the AU and the requested operation will be executed, as described below. If it already exists in the AU, then actual loading is not necessary.

The following components are available in the SW Version Control section:

Component	Description
Perform Button	Click on the Perform button to activate an upgrade process defined by the Action and SW Version drop-down menus.

Component	Description
Action Drop-Down Menu	Provide a selection between the following actions: ■ None ■ Load to Shadow: To download a specified SW file to the Shadow memory of the AU. If the file already exists in the AU, no action will take place. ■ Run from Shadow: To download a specified SW file from the NPU to the Shadow memory of the AU, reset the AU and reboot using the Shadow version. Note that because the process is controlled by the NPU, the AU will continue running from the Shadow version after reset. If the specified file already exists as the Shadow version (meaning that previously a Load to Shadow operation was executed for this file name), the only actual operation to take place will be to reset and run from Shadow. If the specified file already exists as the Main version, no action will take place. ■ Set as Main: To download a specified SW file from the NPU to the Shadow memory of the AU, reset the AU and reboot using the Shadow version, and then swap the Main and Shadow SW Version, so that the running version (which was previously the Shadow version) will become the Main version, to be used after next reset. If the specified file already exists as the running version and it is defined as the Shadow version (meaning that previously Load to Shadow and Run from Shadow operations were executed for this file name), the only actual operation to take place will be to swap the Main and Shadow versions. If it is already defined as the Main version, no action will take place.
SW Version Drop-Down Menu	The selection includes the SW versions of all AU files in the NPU.

2.42.3 Default Settings

Click on the **Set Factory Defaults** button to reset the AU parameters to their factory default values. Refer to "Parameters Summary" on page 240 for information on the factory default values of these parameters. The parameters will revert to their default values after the next reset.

2.43 AU Performance Page

The Performance page enables on-line view of selected counters.

For details on the general functionality of the Performance Monitoring application, refer to “Using the Performance Page” on page 234.

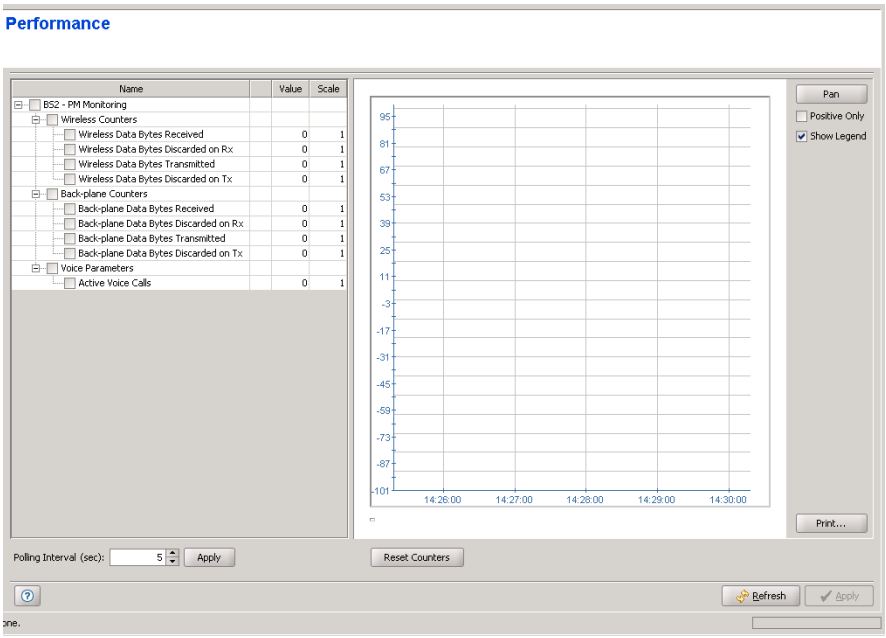


Figure 2-51: AU Performance Page

The counters available for the AU are:

- “AU Backplane Counters”
- “AU Wireless Counters”
- “Voice Parameters”

2.43.1 AU Backplane Counters

The AU Backplane counters include:

Counter	Description
AU Backplane Data Bytes Received	The total number of data bytes received from the Backplane (NPU). Management frames and frames with errors are not included.
AU Backplane Data Bytes Discarded on Rx	The number of bytes in packets discarded due to communication errors between the AU and the NPU.
AU Backplane Data Bytes Transmitted	The total number of data bytes transmitted to the Backplane (NPU). Management frames and frames with errors are not included.
AU Backplane Data Bytes Discarded on Tx	Data Bytes Discarded on Tx: This count is always 0 (No discards).

2.43.2 AU Wireless Counters

The AU Wireless counters include:

Counter	Description
Wireless Data Bytes Received	The total number of data bytes received from the Wireless link. MAC management frames and frames with errors are not included.
Wireless Data Bytes Discarded On Rx	The number of bytes in packets received from the Wireless link and discarded due to MAC protocol receive errors, such as duplicate sequence number, wrong sequence number etc. (not CRC errors).
Wireless Data Bytes Transmitted	The total number of data bytes transmitted to the Wireless link. MAC Management frames and frames with errors are not included.
Wireless Data Bytes Discarded On Tx	The number of bytes in packets discarded due to congestion in the wireless medium.

2.43.3 Voice Parameters

The Voice parameters invlude the Active Voice Calls counters (applicable for DRAP-based calls in Ethernet CS Switching Mode or calls nmade by SIP devices using IP Mode Managed VoIP in IP CS Switching Mode).

2.44 Modular Base Station Software Upgrade Page

The Software Upgrade Page enables loading the requested software files to the shadow memory of the devices using TFTP, and optionally activating the new software version.

Software Upgrade consists of several actions that need to be performed:

- Selecting the devices to be included in each software upgrade process
- Defining the software file(s) to be loaded
- Defining the actions that should take place once the new software file is loaded into the BS (NPU) and/or AU(s) and/or SU(s).

The files to be loaded should be available either in the NPU or in the PC running the AlvariCRAFT application.

The system will automatically identify the files and use the correct file for each device type. To ensure a smooth upgrade process while minimizing the risk of loosing connectivity to the Base Station, the order of upgrading devices is: first the SUs, then AUs then the NPU.

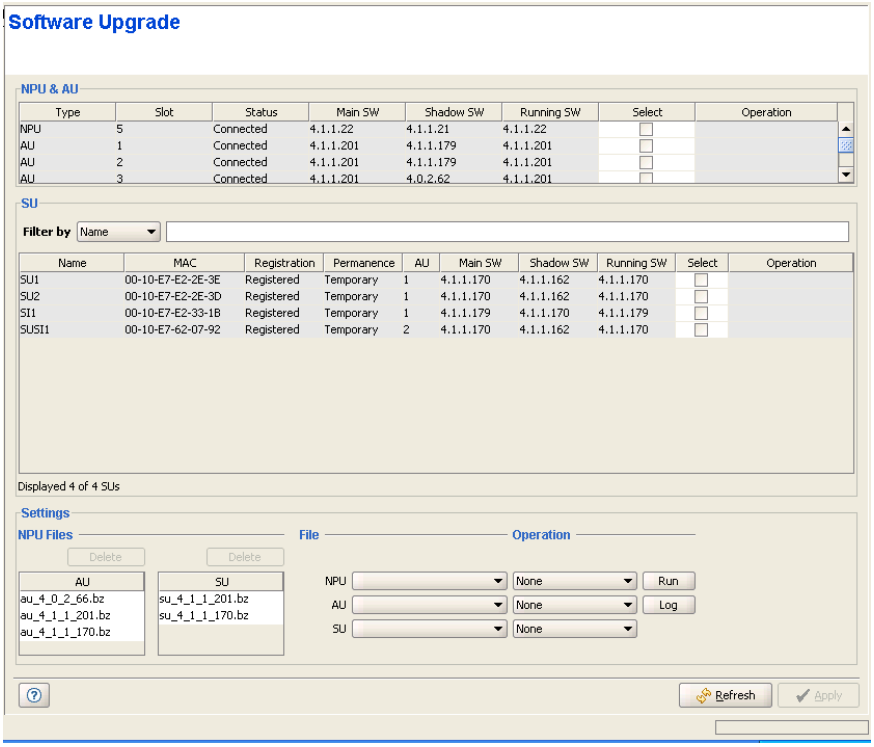


Figure 2-52: Software Upgrade Page (modular Base Station)

The Software Upgrade page includes the following sections:

- "NPU & AU Section"
- "SU Section"
- "Settings Section"

2.44.1 NPU & AU Section

The NPU & AU table comprises the following details for the relevant components:

Parameter	Description
Type	The card type: NPU
Slot	The card's slot ID: 5 for the NPU, 1-4, 7-9 for the AUs
Status	The card's status: Connected/Disconnected
Main SW	The Main SW version
Shadow SW	The Shadow SW version
Running SW	The currently running SW version

Parameter	Description
Select	Mark the checkbox to include the card/unit in the upgrade process according to the applicable definitions for the relevant device's type (File and Operation) in the Settings section.
Operation	Displays the current operation or the result of the last operation performed with the management application (Completed/Failed/Skipped/Aborted)

2.44.2 SU Section

The SU table comprises the following details for each of the SUs:

Parameter	Description
Name	The SU's Name
MAC	The SU's MAC address
Registration	The SU's registration status
Permanence	The SU's permanence status: Permanent or Temporary
AU	The connected AU's slot ID
Main SW	The Main SW version
Shadow SW	The Shadow SW version
Running SW	The currently running SW version
Select	Mark the checkbox to include the SU in the upgrade process according to the applicable definitions for SU (File and Operation) in the Settings section.
Operation	Displays the current operation or the result of the last operation performed with the management application (Completed/Failed/Skipped/Aborted).

You can use the Filter By option (or right click and select the required option) to view only SUs that meet the selected criteria.

2.44.3 Settings Section

The Settings section includes the following components:

Component	Description
NPU Files	Read-only tables that display the current AU and SU SW Files available in the NPU.

Component	Description
File	Select the upgrade file(s) from the list of available files for one or several of the relevant device types: ■ NPU ■ AU ■ SU You can select either one of the relevant files available in the NPU, or From Disk. If From Disk was selected, click on the Browse icon to open the Open dialog box, enabling you to select a file from your PC.
Operation	The operation to be performed for each device type. The available options are: ■ None ■ Reset ■ Load to NPU (not applicable for NPU) - Loads the AU/SU SW file to the NPU. Note that if the NPU already holds 4 files of the relevant type, one of them must be deleted (see "Files in NPU/MBS" on page 128). If the selected file already exists in the NPU, the operation will be skipped. ■ *Load to Shadow* - Loads the selected file to the Shadow memory of the applicable device(s). Applicable only if a file was selected for the relevant device type. If the file already exists in the device, no action will take place. For AU/SU, the file will be first loaded to the NPU (see above), and than loaded from the NPU to the AU/SU. ■ Run from Shadow - Perform the Load to Shadow operation (see above), reset it and reboot using the Shadow version. Note that for AU/SU, because the process is controlled by the NPU, the AU/SU will continue running from the Shadow version after reset. If the specified file already exists as the Shadow version (meaning that previously a Load to Shadow operation was executed for this SW File), the only operation to take place will be to reset and run from Shadow. If the specified file already exists as the Main version, no action will take place. ■ *Set as Main* - Perform the Load to Shadow and Run from Shadow operations (see above), then swap the files and sets the running file as the new Main file.

NOTE

If the definitions for a specific AU/SU in the Software Upgrade Settings page contradict the relevant definitions in the Software Upgrade page, the definitions in the Software Upgrade page will be ignored.

To execute a Software Upgrade process:

To execute a Software Upgrade process, select the devices to be upgraded (in the NPU & AU section and/or the SU section), define the software upgrade parameters as required (in the Settings section), and click **Run**. A Run dialog box will open, enabling you to save a log of the process, run the process without saving a log, or cancel the Run request. If you selected to save a log, a Save dialog box will open, enabling you to select the location and file name for the log. The default log file name includes the NPU's IP and the current Date and Time, with the extension ".log". After confirmation, the operation's Run log will be displayed. The **Abort** button enables you to cancel an operation before completion. Close the Run log window to resume normal operation of AlvariCRAFT.

To view a log of a previously executed process:

Click on the **Log** button to open the Log window for the last executed process. To view a previous log, click on the **Open** button in the Log window and select the required log. Close the Log window to resume normal operation of AlvariCRAFT.

2.45 Modular Base Station Software Upgrade Settings Page

The Software Upgrade Settings page enables managing the SW versions to be used upon network entry of all AUs and SUs in the modular Base Station, entire sectors (selected AUs and all the SUs associated with them), or selected AUs and/or SUs, using any of the AU/SU SW files stored in the NPU.

The Software Upgrade Page comprises three tabs:

- "BS Tab"
- "Sector Tab"
- "SU Tab"

2.45.1 BS Tab

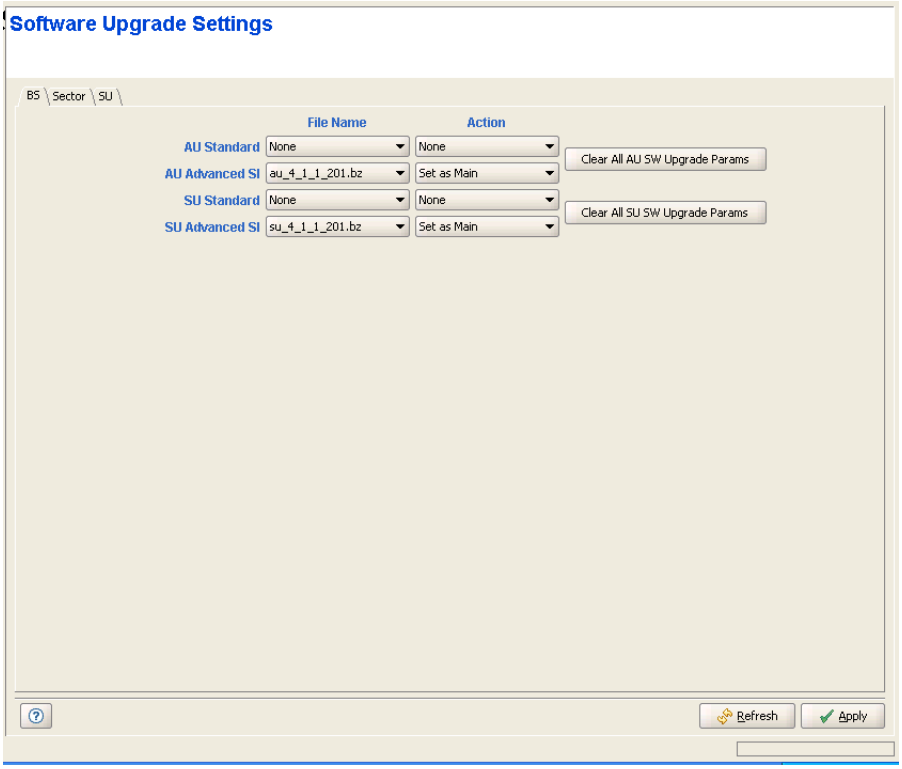


Figure 2-53: Software Upgrade Settings Page - BS Tab (modular Base Station)

The BS tab of the Software Upgrade page enables an efficient and simple-to-manage upgrade process, by defining the SW File and Action for all AUs and/or SUs in the Base Station.

Two different pairs of SW File Name and Action may be defined for each device type (AU/SU), to optionally support AUs/SUs using either Standard Operation Mode or Advanced Si (Advanced - Self Install) Operation Mode. In the current release only the Advanced Si Operation Mode is applicable.

For AUs, these are the SW File and associated Action that will be used for each AU after being installed, as well as after each reset. These SW File Names and Actions are applicable to all AUs in the Base Station using the specified Operation Mode. However, they are not applicable for any AU whose configured SW File Name in the Sector tab is other than None (null).

For SUs, these are the SW File and associated Action that will be used for an SU after network entry. These SW File Names and Actions are applicable to all SUs in the Base Station using the specified Operation Mode. However, they are not applicable for any SU for which the configured SW File in the Sector tab is other than None (null). They are also not applicable to any Permanent SU whose configured SW File Name in the SU tab is other than None (null).

The BS tab includes the following components:

Parameter/Button	Description
File Name *(AU Standard,* *AU Advanced Si* *SU Standard* *SU Advanced Si)*	The Name of the SW File to be used for upgrading an AU/SU using the specified Operation Mode (Standard/Advanced Si). Should be one of the AU/SU SW Files currently stored in the NPU, or None (null).

Parameter/Button	Description
Action *(AU Standard,* *AU Advanced Si* *SU Standard* *SU Advanced Si)*	For AUs using the relevant Operation Mode: The operation to be performed with the specified SW File for each AU after being installed, as well as after each reset. For SUs using the relevant Operation Mode: The operation to be performed with the specified SW File after network entry. The available options: None (do not load), Load to Shadow, Run from Shadow or Set as Main. Both File Name and Action must be configured (different than None) to properly define the upgrade process. Not applicable for any AU whose configured SW File Name in the Sector tab is other than None (null). Not applicable for any SU served by an AU for which the configured SW File in the Sector tab is other than None (null). They are also not applicable to any Permanent SU whose configured SW File Name in the SU tab is other than None (null).
Clear All AU SW Upgrade Params	Delete all AU SW Files and Actions (the AU File Names and Actions configured in the Sector tab) in all AUs.
Clear All SU SW Upgrade Params	Delete all SU SW Files and Actions (the SU File Names and Actions configured in the SU tab) in all Permanent SUs served by the Base Station.

2.45.2 Sector Tab

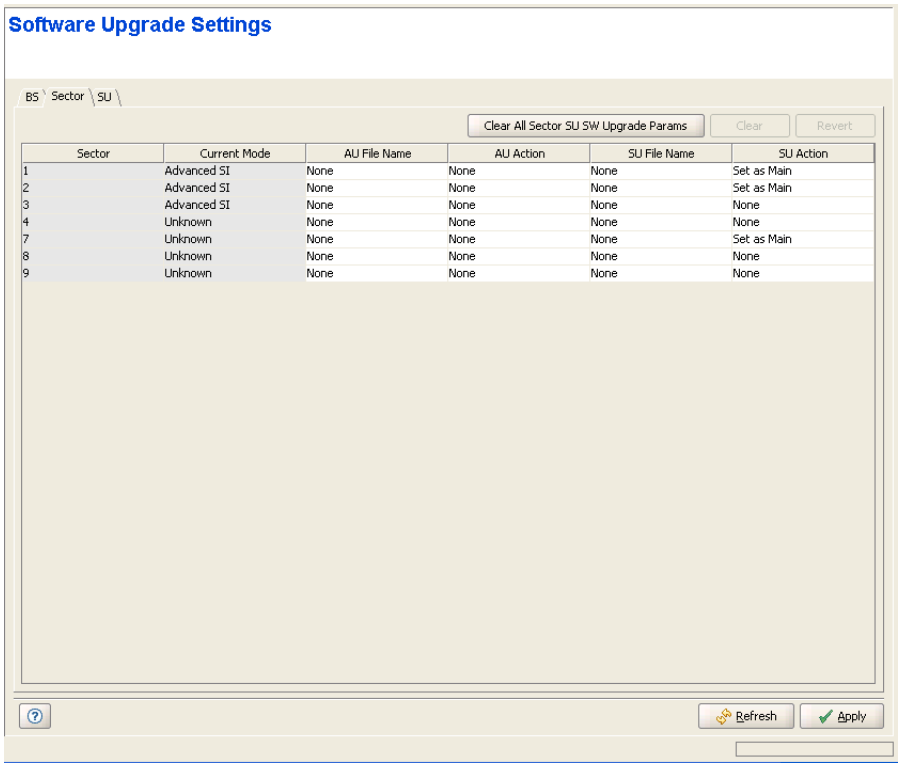


Figure 2-54: Software Upgrade Settings Page - Sectors Tab (modular Base Station)

The Sector tab of the Software Upgrade page enables an efficient and simple-to-manage upgrade process, by defining the SW File and Action for all SUs served by each AU (to take effect after network entry), and the SW File Name and Action for each AU (to take effect after clicking **Apply**).

The Sector tab includes a table with the following parameters for each AU:

Parameter	Description
Sector	Read-only. The Sector (AU) ID (Slot Number: 1-4, 7-9)
Current Mode	Read-only. The current Operation Mode of the AU: Advanced Si, Standard (not applicable to current release) or Unknown for a non-installed AU.

Parameter	Description
AU File Name	The Name of the SW File to be used for upgrading the AU. Can be one of the AU SW Files currently stored in the NPU, or None (null). Click on the AU File Name entry to open a drop-down menu, enabling selection of one of the AU SW Files available in the NPU, or None (null).
AU Action	The operation to be performed with the specified AU SW File for the AU after being installed, as well as after each reset. Double-click on the AU Action entry to open a drop-down menu with the available options: None (do not load), Load to Shadow, Run from Shadow or Set as Main. Both File Name and Action must be configured (different than None) to properly define the upgrade process.
SU File Name	The Name of the SW File to be used for upgrading all the SU upon network entry when associated with this AU. Can be one of the SU SW Files currently stored in the NPU, or None (null). Click on the SU File Name entry to open a drop-down menu, enabling selection of one of the SU SW Files available in the NPU, or None (null).
SU Action	The operation to be performed with the specified SW File for each SU after network entry. Double-click on the SU Action entry to open a drop-down menu with the available options: None (do not load), Load to Shadow, Run from Shadow or Set as Main. Both File Name and Action must be configured (different than None) to properly define the upgrade process. Not applicable for any Permanent SU whose configured SW File Name in the SU tab is other than None (null).

The Sector tab also includes the following buttons:

Button	Description
Clear All Sector SU SW Upgrade Params	Delete all SU SW Files and Actions (the SU File Names and Actions configured in the SU tab) in all Permanent SUs served by the selected AU(s).
Clear	Select one or more rows and click Clear to clear from the display all the File Names and Actions for the selected rows. Click Apply to configure the new values in the device.
Revert	Select one or more rows and click on the Revert button to cancel all changes made in these rows that were not applied yet.

2.45.3 SU Tab

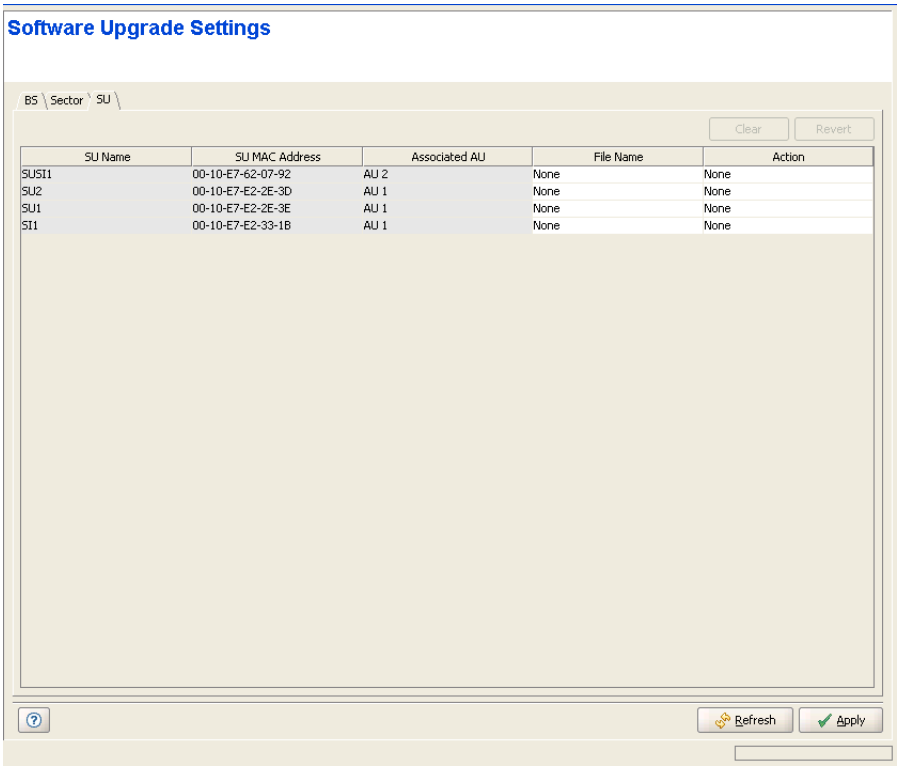


Figure 2-55: Software Upgrade Settings Page - SU Tab (modular Base Station)

The SU tab of the Software Upgrade page enables defining for each SU the SW File Name and Action to take effect immediately after clicking **Apply**.

The SU tab includes a table with the following parameters for each SU:

Parameter	Description
SU Name	Read-only. The SU's Name.
SU MAC Address	Read-only. The SU's MAC Address.
Associated AU	Read-only. The ID (Slot Number, 1-4, 7-9) of the AU to serving the SU, or null for an SU that is not currently connected.
File Name	The Name of the SW File to be used for upgrading all SUs upon network entry. Can be one of the SU SW Files currently stored in the NPU, or None (null). Click on the File Name entry to open a drop-down menu, enabling selection of one of the SU SW Files available in the NPU, or None (null).

Parameter	Description
Action	The operation to be performed with the specified SW File for the SU after network entry. Double-click on the Action entry to open a drop-down menu with the available options: None (do not load), Load to Shadow, Run from Shadow or Set as Main. Both File Name and Action must be configured (different than None) to properly define the upgrade process.

The SU tab also includes the following buttons:

Button	Description
Clear	Select one or more rows and click Clear to clear from the display all the File Names and Actions for the selected rows. Click Apply to configure the new values in the device.
Revert	Select one or more rows and click on the Revert button to cancel all changes made in these rows that were not applied yet.

2.46 Backup Configuration Page

The Backup Configuration page enables loading to the PC running the AlvariCRAFT application backup files of the modular Base Station/Micro Base Station configuration or loading backup files from the PC to the device.

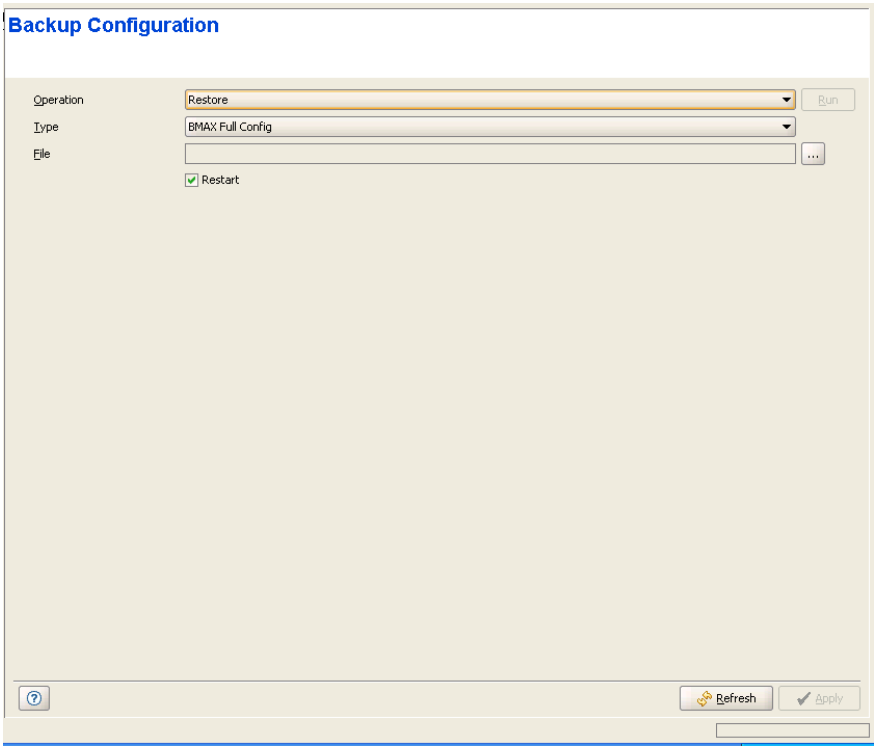


Figure 2-56: Backup Configuration Page

To load to the PC a Configuration Backup file of the device:

1 In the Operations drop-down menu, select Backup.

2 Select the required type in the Type drop-down menu.

The following backup file types can be created:

- **Full Config**: The entire modular Base Station/Micro Base Station configuration (excluding Passwords and basic IP parameters of the MGMT and DATA ports - IP Address, Subnet Mask and Default Gateway).

- **Services and Service Profiles**: All the profiles and configurations associated with service (General Service parameters, Subscribers, Services, Service Profiles, Forwarding Rules, Priority Classifiers, QoS Profiles). Not applicable in IP CS Switching Mode.
- **Service Profiles**: All the profiles associated with services.
- **Filters**: All the configurations of Filtering Rules, Interface Filtering and MAC Address Deny List. Not applicable in IP CS Switching Mode.
- **Traps**: The configuration parameters for all traps.
- **File Licensing**: All license related information, including total, available and used licenses, CPEs with allocated licenses (local or permanent), CPEs with grace or temporary grace licenses and CPEs for which grace license expired.

3 Click on the **Run** button. A **Save** window will be opened, enabling you to select name and path for the file to be saved. The default file name is <Device Name> <File Type> <date in the format yyyymmdd> <time in the format hhmm>.res.

4 Select location and name and click **Save**.

To load to the PC a Configuration Backup file of the device:

1 In the Operations drop-down menu, select Backup.

2 Select the required type in the Type drop-down menu.

3 Click on the browser button next to the File text box to open the **Choose** window, enabling you to select the required Configuration Backup file that must be available on the PC running the AlvariCRAFT application.

4 After selecting the file, the read-only File text box will display the path to the selected file.

5 If you wish to restart the device after loading the file, mark the **Restart** check-box. Otherwise make sure that it is not marked.

6 Click on the **Upload** button. The operation's results will be displayed.

2.47 Frequency Bands Upload

The Frequency Bands Upload page enables loading a new Frequency Bands file to the device.

Theis feature enables loading the required information for new bands that became available after release of the running SW version without the need to load a new SW file.

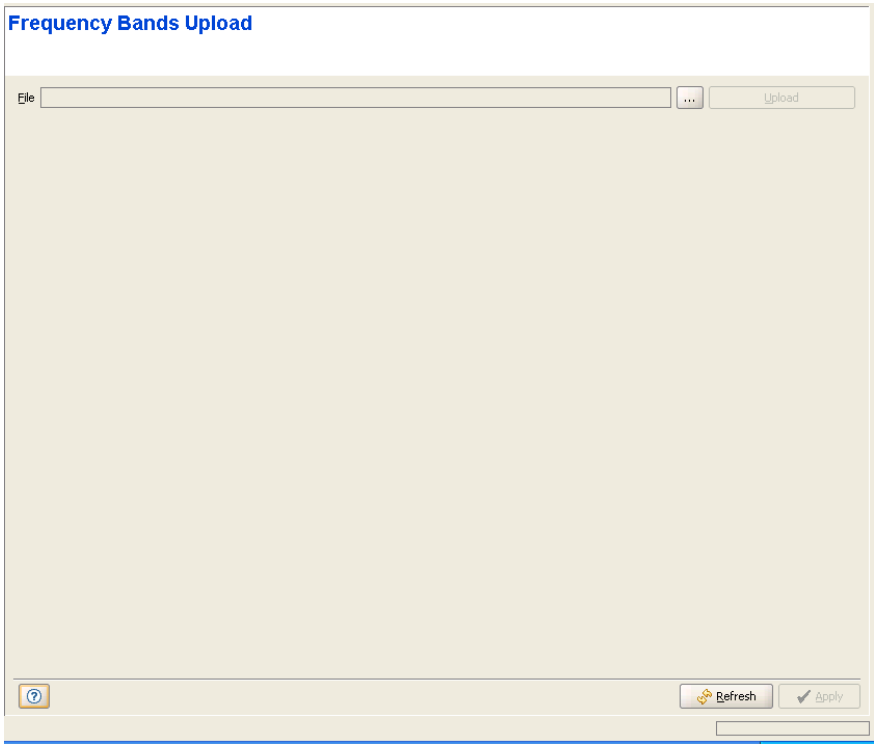


Figure 2-57: Frequency Bands Upload Page

To upload a Frequency Bands file to the device:

1. Click on the browser button to open the **Choose** window, enabling you to select the required Frequency Bands file that must be available on the PC running the AlvariCRAFT application.
2. After selecting the file, the read-only File text box will display the path to the selected file.
3. Click on the **Upload** button. The operation's results will be displayed.

3

Chapter 3 - Managing a Micro Base Station

3.1 Introduction to Micro Base Station Management

The tree menu on the right side of the Micro Base Station Device Manager window enables selecting the following view and configuration pages:

- "MBS (Micro Base Station) View Page" on page 172
  - "Micro Base Station General Details Page" on page 175
  - "General Management Parameters Page" on page 25
  - "Traps Control Page" on page 31
  - "RADIUS Client Page" on page 33
  - "RADIUS Performance Page" on page 37
  - "GPS Page" on page 40
  - "Micro Base Station PF Parameters Page" on page 177
  - "Micro Base Station PF Performance Page" on page 180
  - "General Radio Parameters Page" on page 52
  - "Radio Clusters Page" on page 55
  - "Outdoor Units Page" on page 57
  - "Default Operational Settings Page" on page 60
  - Filtering:
    - "Filters Page" on page 62
    - "MAC Deny List Page" on page 68
    - Performance Page, see "Filtering Performance Page" on page 69
  - "Subscriber Units Page" on page 70
  - Services:
    - "Services Page" on page 75
    - "Subscribers Page" on page 82
    - "Service Profiles Page" on page 85

- "Forwarding Rules Page" on page 92
- "Priority Classifiers Page" on page 96
- "QoS Profiles Page" on page 99
- "Voice Domain Page" on page 102

- Access Parameters:
  - "Air Interface Page" on page 140
  - "Channels Page" on page 136
- "Micro Base Station Data Port Page" on page 184
- "Micro Base Station Management Port Page" on page 186
- "Authorized Managers Page" on page 122
- "Frequency Bands File Page" on page 124
- Unit Control Page, See "NPU/Micro Base Station Unit Control Page" on page 126
- "Micro Base Station Bridge and Voice Page" on page 182
- "Micro Base Station Performance Page" on page 189
- "Licenses Page" on page 108
- "License Upload Page" on page 114
- "Backup Configuration Page" on page 165
- "Frequency Bands Upload" on page 167
- Software:
  - "Micro Base Station Software Upgrade Page" on page 192
  - "Micro Base Station Software Upgrade Settings Page" on page 197

3.2 MBS (Micro Base Station) View Page

The MBS View page provides a graphical view of the current status of the Micro Base Station's components.

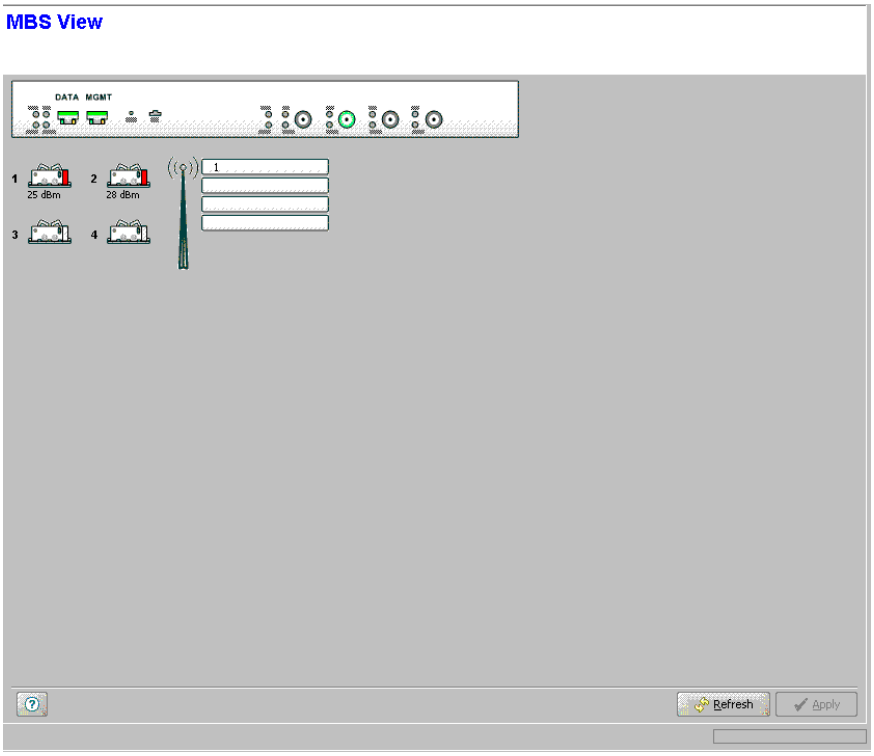


Figure 3-1: MBS (Micro Base Station) View Page

The MBS View page includes the following components:

- "Micro Base Station View
- "Outdoor Units View
- "Radio Clusters View

3.2.1 Micro Base Station View

The Micro Base Station View is a graphical display of the Micro Base Station, showing the status of the interfaces.

- The DATA and MGMT ports are marked either green or red, indicating the Ethernet link status (up or down).

- Double-click on the DATA port to open the DATA Port configuration page.
- Double-click on the MGMT port to open the Management Port configuration page.
- Each of the ODU connectors (channels) are marked as follows:
  - No marking: The Admin Status is Disabled.
  - Green: The Operational Status is Up, the Admin Status is Enabled.
  - Red: The Operational Status is Down (fault), the Admin Status is Enabled.

  Place the cursor on a connector to view the Downlink Frequency.
- Double-click on any of the ODU connectors (channels) to open the Channels configuration page.
- Click once on an ODU connector (channel) to view relevant associations: A blue background will be added to the selected channel as well as to the Outdoor Unit and Radio Cluster associated with it (if applicable).

3.2.2 Outdoor Units View

The Outdoor Units view shows the ODU icons of all the 4 Outdoor Units that can be defined. An undefined ODU is marked in gray. A defined ODU is marked in either green or red, indicating its operational status. Note that the operational status of an ODU can be OK (Up) only if it is properly connected to an active channel. For all defined ODUs the configured Tx Power is displayed below the unit's icon.

Click on an ODU's icon to view relevant associations: A blue background will be added to the selected ODU as well as to the ODU connector and Radio Cluster associated with it (if applicable).

Double-click on any of the ODUs to open the Outdoor Units configuration page.

Place the cursor on an ODU to view its configured Downlink Frequency and Tx Power (applicable only if the ODU is configured).

3.2.3 Radio Clusters View

The Radio Clusters view shows text boxes for the Radio Clusters that can be defined. The name of a defined Radio Cluster is displayed in the relevant area. An empty text box indicates that the relevant Radio cluster is not defined.

Click on a Radio Cluster's text box to view relevant associations: A blue background will be added to the selected Radio Cluster as well as to the ODU(s) and channel(s) associated with it (if applicable).

Double-click on any of the Radio Clusters to open the Radio Clusters configuration page.

3.3 Micro Base Station General Details Page

The General Details page provides general details on the hardware and software of the Micro Base Station.

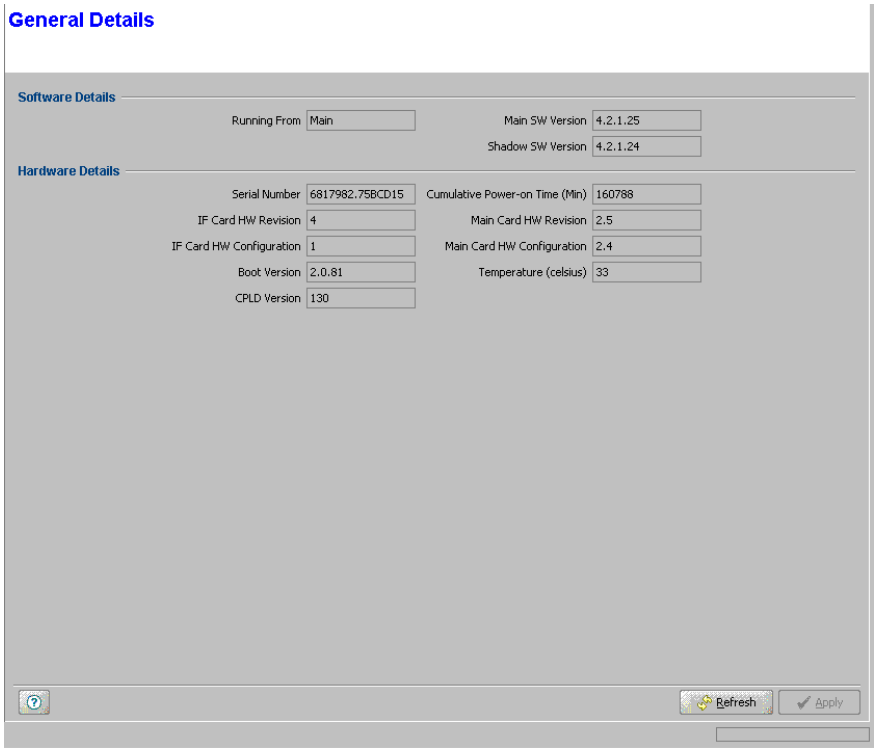


Figure 3-2: General Details Page, Micro Base Station

The read-only details are:

- **Running From**: Main or Shadow
- **Main SW Version**
- **Shadow SW Version**
- **Serial Number**
- **IF Card HW Revision**
- **IF Card HW Configuration**

- **Boot Version**
- **CPLD Version**
- **Cumulative Power On Time (minutes)**
- **Main Card HW Revision**
- **Main Card HW Configuration**
- **Temperature (celsius)**

3.4 Micro Base Station PF Parameters Page

The PF Parameters page enables viewing and and editing the general parameters that affect the communication of the Micro Base Station with the Policy Function server(s) and with the SIP devices using Managed VoIP Services. It also enables viewing the status and parameters of defined Policy Function servers, updating the parameters of a server, adding a new server, or deleting a server from the database.

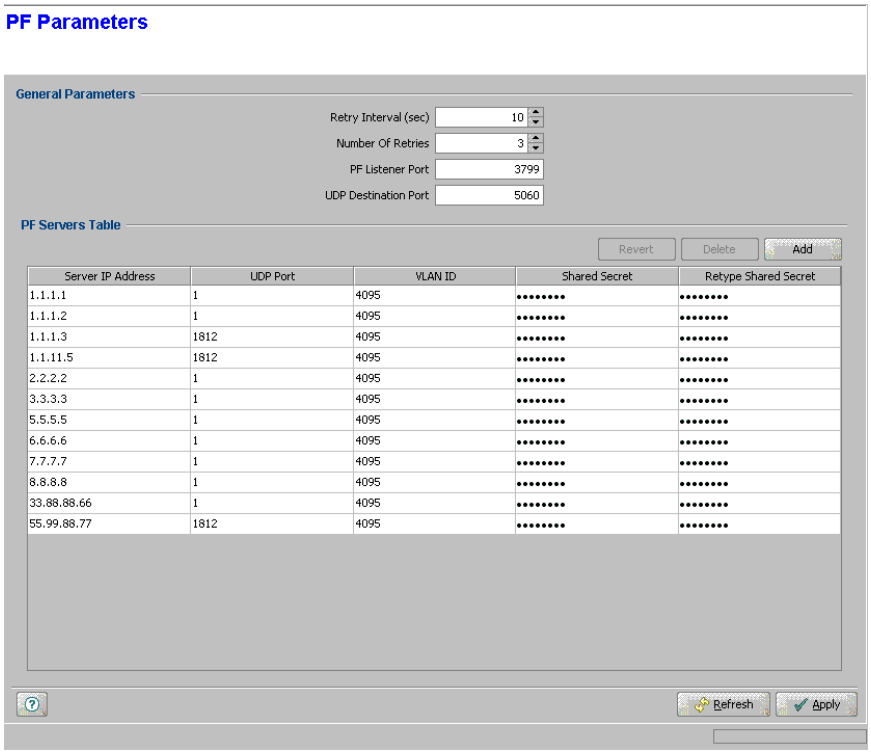


Figure 3-3: PF Parameters Page, Micro Base Station

The PF Parameters page includes the following sections:

- "PF General Parameters
- "PF Servers Table

3.4.1 PF General Parameters

Parameter	Description
Retry Interval (sec)	The Retry Interval parameter defines the time in seconds to wait before retransmitting a message to the Policy Function server if no response is received. The range is 1-60 (seconds).
Number of Retries	The Number of Retries parameter defines the maximum number of retransmission attempts, before a decision is taken to revert to another server if configured (not applicable for current release), or give up. The range is 0-5 (retries).
PF Listener Port	The PF Listener Port is the number of the port used by the Micro Base Station for listening to R3 messages from Policy Function server(s). The range is 1-65535.
UDP Destination Port	The UDP Destination Port is the number of the port used by the Micro Base Station for receiving SIP messages from the voice gateway (provided that a Managed VoIP Service is provisioned to the relevant SU). The same port number must be configured in all the relevant voice gateways. The range is 1-65535.

3.4.2 PF Servers Table

The PF Servers Table enables editing the parameters of an existing Policy Function server, adding a new serve or deleting a server from the database of the device. For each entry, the following parameters are available:

Parameter	Description
Server IP Address	The IP address of the Policy Function server. The IP address of an existing server cannot be modified.
UDP Port	The UDP port number used by the Policy Function server for receiving messages from the Micro Base Station. Valid values: 1 to 65535.
VLAN ID	The VLAN ID used for communication with the Policy Function server. Valid values are 0-4094. Enter either null or 4095 for No VLAN ID. 4095 will be displayed fo No VLAN ID.

Parameter	Description
Shared Secret	Shared Secret is the key used for encrypting the user's credentials in the messages between the Micro Base Station and the Policy Function. For security reasons, the Shared Secret is displayed as a series of dots., and when defining it for the first time or updating it, the user is prompted to re-enter the new Shared Secret for confirmation. The Shared Secret comprises a string of 1 to 16 printable characters.
Retype Shared Secret	When either defining the Shared Secret for the first time or updating it, the user must re-enter the new Shared Secret for confirmation.

3.5 Micro Base Station PF Performance Page

The PF Performance page enables viewing and resetting various counters showing statistics of communication between the device and defined Policy Function servers.

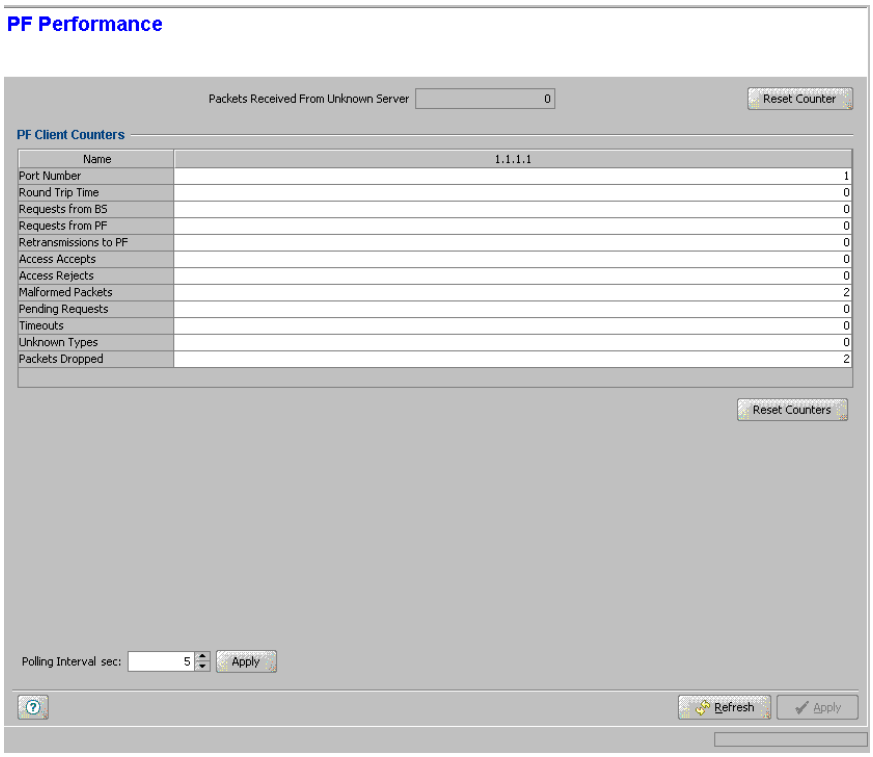


Figure 3-4: PF Performance Pag, Micro Base Statione

The **Packets Received From Unknown Server** counter displays the total number of packets received from unknown servers(s) since the last reset.

The **PF Client Counters** table displays the following details for each of the Policy Function servers:

Parameter	Description
Server IP Address	The IP address of the Policy Function server.
Port Number	The UDP port number used by the Policy Function server for receiving messages from the Micro Base Station.

Parameter	Description
Round Trip Time	The time interval (in milliseconds) between the most recent Access-Reply and the Access-Request that matched it from this server.
Requests from BS	The number of PF Access-Request packets sent to this server. This does not include retransmissions.
Requests from PF	The number of PF Access-Request packets sent from this server.
Retransmissions to PF	The number of PF Access-Request packets retransmitted to this server.
Access Accepts	The number of PF Access-Accept packets sent to this server.
Access Rejects	The number of PF Access-Reject packets sent to this server.
Malformed Packets	The number of malformed PF Access-Request packets received from this server. Malformed packets include packets with an invalid length.
Pending Requests	The number of PF Access-Request packets destined for this server that have not yet timed out or received a response. This counter is incremented when an Access-Request is sent and decremented due to receipt of an Access-Accept or Access-Reject, a timeout or retransmission.
Timeouts	The number of timeouts to this server that caused packets to be dropped.
Unknown Types	The number of packets of unknown type which were received from this server.
Packets Dropped	The number of PF packets which were received from this server and were dropped for any reason.

To change the polling interval:

The **Polling Interval** range is from 1 to 3600 seconds. Enter the required polling interval and click on the **Apply** button next to it.

To reset counters:

Click on the **Reset Counter** button next to the **Packets Received From Unknown Server(s)** to reset this counter.

Click on the **Reset Counters** button below the **PF Client Counters** table to reset the applicable counters.

3.6 Micro Base Station Bridge and Voice Page

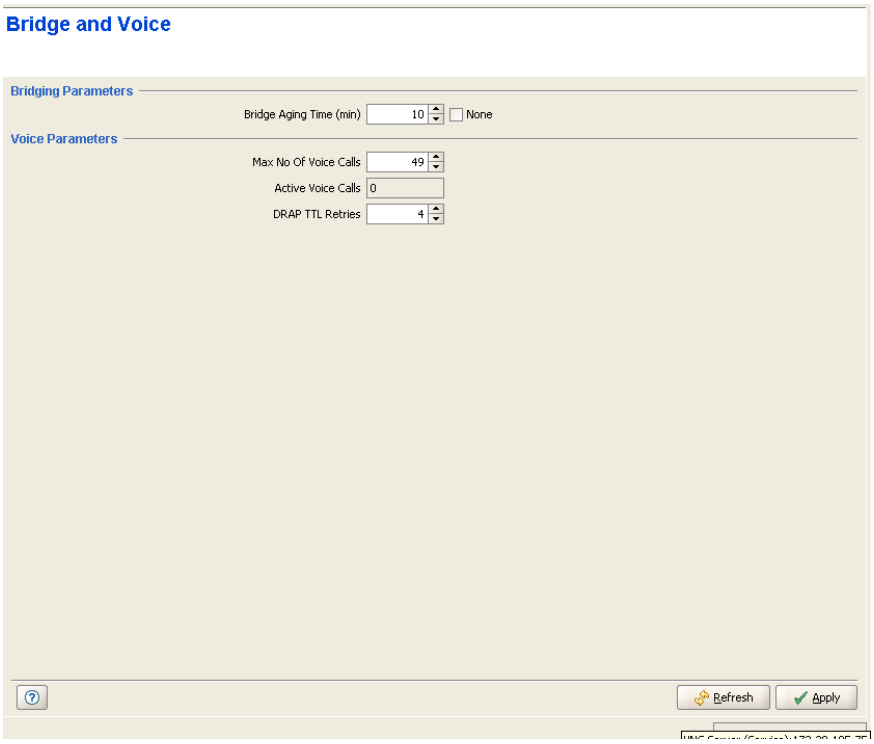


Figure 3-5: Bridge and Voice Page, Micro Base Station

The Bridge and Voice page includes the following general parameters for bridging and for control of VoIP sessions made by devices using the DRAP protocol, or SIP VoIP devices using Managed VoIP Services:

Parameter	Description
Bridge Aging Time	The aging time for all addresses in the Forwarding Data Base. The available values are from 1 to 1440 minutes, or 0 (None) for no aging.
Max No. of Voice Calls	The upper limit of simultaneous voice calls that will be supported by the Micro Base Station. The range is from 0 to 50 Voice Calls.
Active Voice Calls	A read-only display of the current number of voice calls in the cell.

Parameter	Description
DRAP TTL Retries	The limit of TTL retries for gateways that support the DRAP protocol before concluding that the gateway is no longer active and removing it from the database. The TTL retry time (the maximum time between two consecutive Allocation Requests) is 255 seconds. The range is from 1 to 100 retries.

3.7 Micro Base Station Data Port Page

The Micro Base Station Data Port page enables viewing and configuring the Ethernet and IP parameters of the Data (DATA) port.

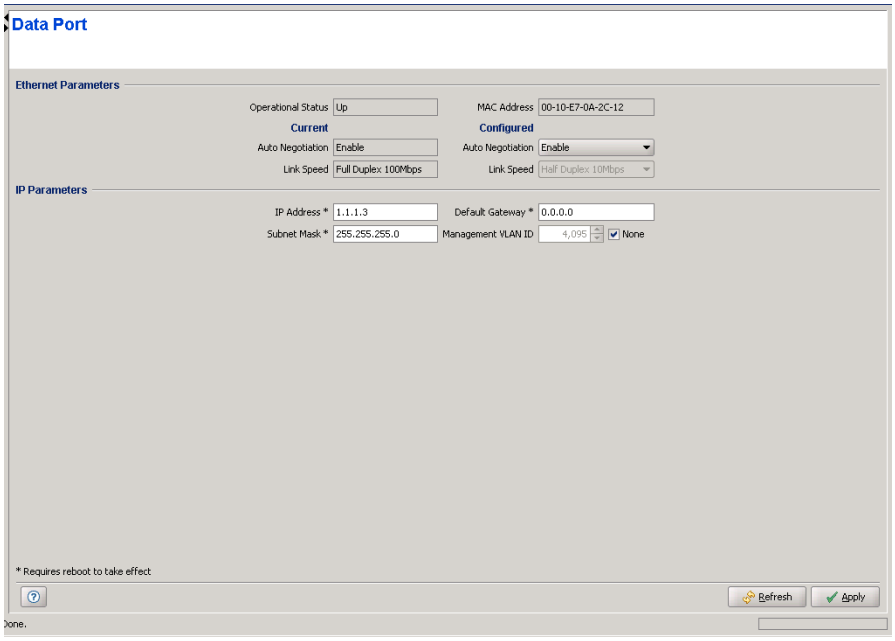


Figure 3-6: Data Port Page, Micro Base Station

The Data Port page includes the following:

- "Ethernet Parameters
- "IP Parameters

3.7.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
MAC Address	The MAC address of the Data port.
Current Auto Negotiation	The current auto negotiation mode.
Current Link Speed	The current actual link speed and duplex.

Parameter	Description
Configured Auto Negotiation	The auto negotiation mode that will be in effect after the next reset.
Configured Link Speed	Configurable only if the Configured Auto Negotiation is set to Disable.The link speed that will be in effect after the next reset. The available options are ■ Full duplex 100Mbps ■ Half duplex 100Mbps ■ Full duplex 10Mbps ■ Half duplex 10Mbps

3.7.2 IP Parameters

Parameter	Description
IP Address	The IP Address of the Data port.
Subnet Mask	The Subnet Mask of the Data port.
Default Gateway	The Default Gateway's IP Address of the Data port.
Management VLAN ID	The VLAN ID for management frames via the Data port. If a value from 0 to 4094 is configured for the Management VLAN ID, then the device will accept management frames only if their VLAN tag is the same as this value. Available values are 0-4094 or None (4095) for No VLAN ID.

CAUTION

A change in Management VLAN ID is applied immediately (without reset). If you use the Data port for managing the Micro Base Station, you may loose management access to the device.

NOTE

The local subnet of the Data port (defined by the Data Port IP Address and Data Port Subnet Mask parameters), must differ from the local subnet of the Management port (defined by the Management Port IP Address and Management Port Subnet Mask parameters) and from the subnet that is used as the Static Route for remote management via the Management port (defined by the Management Port Destination Subnet and Management Port Destination Subnet Mask parameters).

3.8 Micro Base Station Management Port Page

The Micro Base Station Management Port page enables viewing and configuring the Ethernet and IP parameters of the Management (MGMT) port.

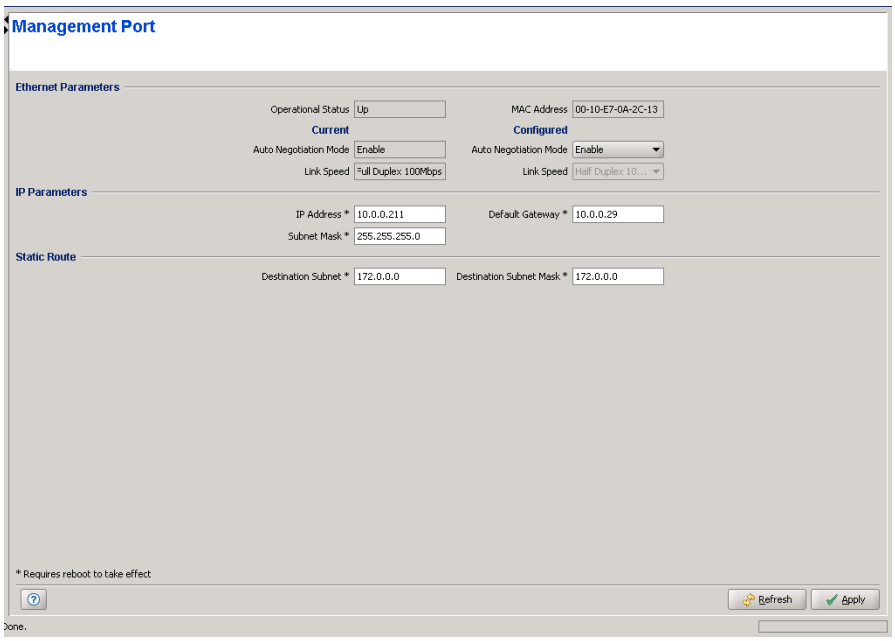


Figure 3-7: Management Port Page, Micro Base Station

The Management Port page includes the following:

- "Ethernet Parameters
- "IP Parameters
- "Static Route

3.8.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
MAC Address	The MAC address of the Management port.

Parameter	Description
Current Auto Negotiation	The current auto negotiation mode.
Current Link Speed	The current actual link speed and duplex.
Configured Auto Negotiation	The auto negotiation mode that will be in effect after the next reset.
Configured Link Speed	Configurable only if the Configured Auto Negotiation is set to Disable.The link speed that will be in effect after the next reset. The available options are ■ Full duplex 100Mbps ■ Half duplex 100Mbps ■ Full duplex 10Mbps ■ Half duplex 10Mbps

NOTE

It is highly recommended to use the Management port for local management only. Typically the port should be down (disconnected).

3.8.2 IP Parameters

Parameter	Description
IP Address	The IP Address of the Management port.
Subnet Mask	The Subnet Mask of the Management port.
Default Gateway	The Default Gateway's IP Address of the Management port.

NOTES

The local subnet of the Management port (defined by the Management Port IP Address and Management Port Subnet Mask parameters), must differ from the local subnet of the Data port (defined by the Data Port IP Address and Data Port Subnet Mask parameters) and from the subnet that is used as the Static Route for remote management via the Management port (defined by the Destination Subnet and Destination Subnet Mask parameters).

If a Default Gateway is specified for the Management port (an address other than the 0.0.0.0 default, which means "no default gateway"), Static Route parameters must be defined as well. The Static Route subnet must be different from both the Data port and the Management port subnets

CAUTION

Do not configure the IP Address of the Management port to 0.0.0.0, as this will cause loss of management connectivity via the Data port.

3.8.3 Static Route

The Destination Subnet parameters define a Static Route, which is an IP subnet of stations that can manage the device when connected via a router to the Management port.

Parameter	Description
Destination subnet	The Static Route's base IP address
Destination Subnet Mask	The Subnet Mask of the Static Route.

NOTE

The subnet that is used as the Static Route for remote management via the Management port (defined by the Destination Subnet and Destination Subnet Mask parameters) must differ from the local subnet of the Management port (defined by the Management Port IP Address and Management Port Subnet Mask parameters) and from the local subnet of the Data port (defined by the Data Port IP Address and Data Port Subnet Mask parameters)

3.9 Micro Base Station Performance Page

The Performance page enables on-line view of selected counters.

For details on the general functionality of the Performance Monitoring application, refer to “Using the Performance Page” on page 233.

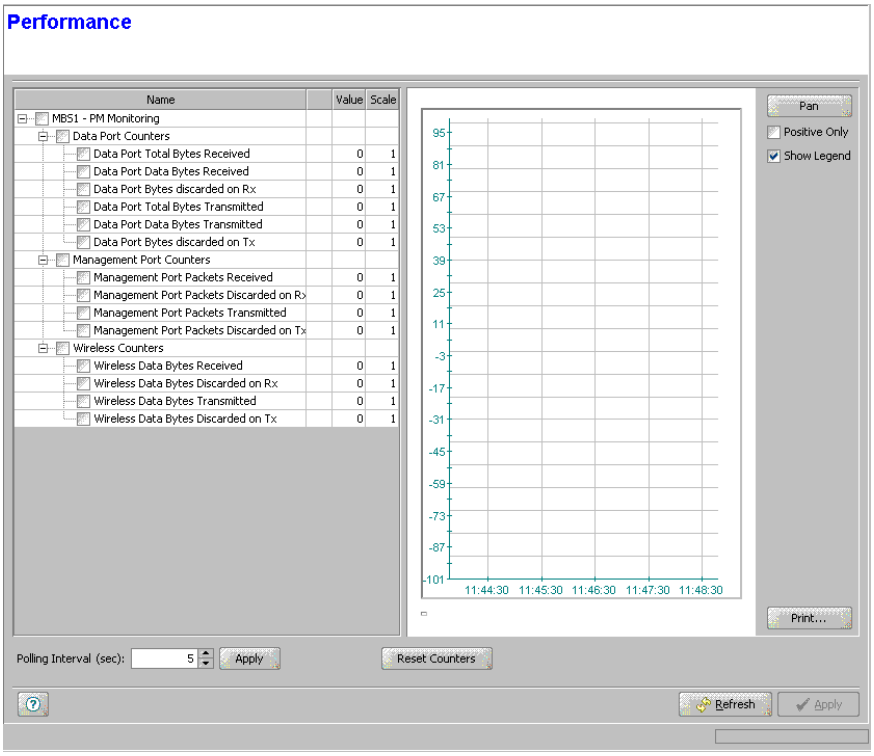


Figure 3-8: Performance Page, Micro Base Station

The counters available for the Micro Base Station are:

- “Data Port Counters
- “Management Port Counters
- “Wireless Counters

3.9.1 Data Port Counters

The Data Port counters include:

Counter	Description
Total Bytes Rx	The total number of bytes received from the Data port, including Management frames. Frames with errors are not included.
Data Bytes Rx	The total number of data bytes received from the Data port. Management frames and frames with errors are not included.
Data Bytes Discarded on Rx	The number of bytes in packets discarded due to internal communication errors.
Total Bytes Tx	The total number of bytes transmitted to the Data port, including Management frames. Bytes in frames with errors are not included.
Data Bytes Tx	The total number of data bytes transmitted to the Data port. Bytes in Management frames and frames with errors are not included.
Data Bytes Discarded on Tx	Data Bytes Discarded on Tx: This count is always 0 (No discards).

3.9.2 Management Port Counters

The Management Port counters include:

Counter	Description
Management Port Packets Rx	The total number of packets received on the port. Packets with errors are not counted.
Management Port Packets Discarded on Rx	Packets received on the port that were discarded.
Management Port Packets Tx	The total number of packets transmitted to the port.
Management Port Packets Discarded on Tx	Always 0. Currently packets are not discarded on Tx.

3.9.3 Wireless Counters

The Wireless counters include:

Counter	Description
Wireless Data Bytes Rx	The total number of data bytes received from the Wireless link. MAC management frames and frames with errors are not included.
Wireless Data Bytes Discarded On Rx	The number of bytes in packets received from the Wireless link and discarded due to MAC protocol receive errors, such as duplicate sequence number, wrong sequence number etc. (not CRC errors).

Counter	Description
Wireless Data Bytes Tx	The total number of data bytes transmitted to the Wireless link. MAC Management frames and frames with errors are not included.
Wireless Data Bytes Discarded On Tx	The number of bytes in packets discarded due to congestion in the wireless medium.

3.10 Micro Base Station Software Upgrade Page

The Software Upgrade Page enables loading the requested software files to the shadow memory of the devices using TFTP, and optionally activating the new software version.

Software Upgrade consists of several actions that need to be performed:

- Selecting the devices to be included in each software upgrade process
- Defining the software file(s) to be loaded
- Defining the actions that should take place once the new software file is loaded into the Micro Base Station and/or SU(s).

The files to be loaded should be available either in the Micro Base Station or in the PC running the AlvariCRAFT application.

The system will automatically identify the files and use the correct file for each device type. To ensure a smooth upgrade process while minimizing the risk of loosing connectivity to the device, the order of upgrading devices is: first the SUs, then the Micro Base Station.

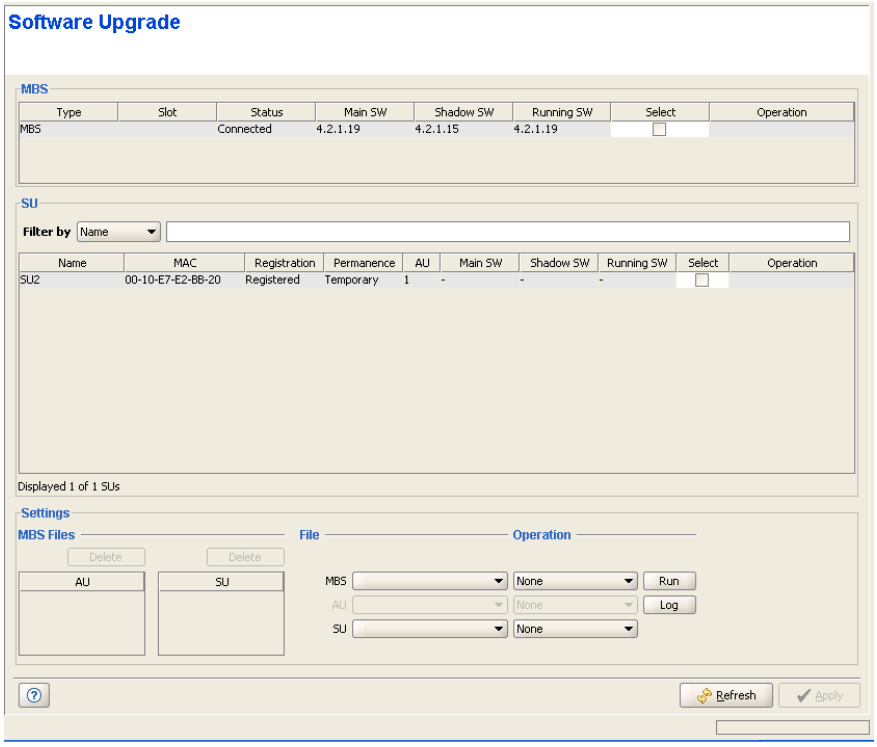


Figure 3-9: Micro Base Station Software Upgrade Page

The Software Upgrade page includes the following sections:

- "MBS Section
- "SU Section
- "Settings Section

3.10.1 MBS Section

The MBS table comprises the following details for the relevant components:

Parameter	Description
Type	MBS
Slot	Not applicable for a Micro Base Station.
Status	In a Micro Base Station the status is always connected.
Main SW	The Main SW version
Shadow SW	The Shadow SW version
Running SW	The currently running SW version

Parameter	Description
Select	Mark the checkbox to include the card/unit in the upgrade process according to the applicable definitions for the relevant device's type (File and Operation) in the Settings section.
Operation	Displays the current operation or the result of the last operation performed with the management application (Completed/Failed/Skipped/Aborted)

3.10.2 SU Section

The SU table comprises the following details for each of the SUs:

Parameter	Description
Name	The SU's Name
MAC	The SU's MAC address
Registration	The SU's registration status
Permanence	The SU's permanence status: Permanent or Temporary
AU	Always 1 for a Micro Base Station
Main SW	The Main SW version
Shadow SW	The Shadow SW version
Running SW	The currently running SW version
Select	Mark the checkbox to include the SU in the upgrade process according to the applicable definitions for SU (File and Operation) in the Settings section.
Operation	Displays the current operation or the result of the last operation performed with the management application (Completed/Failed/Skipped/Aborted).

You can use the Filter By option (or right click and select the required option) to view only SUs that meet the selected criteria.

3.10.3 Settings Section

The Settings section includes the following components:

Component	Description
MBS Files	Read-only tables that display the current SU SW Files available in the Micro Base Station (AU Files are not applicable for a Micro Base Station).

Component	Description
File	Select the upgrade file(s) from the list of available files for one or several of the relevant device types: ■ MBS ■ SU You can select either one of the relevant files available in the MBS, or From Disk. If From Disk was selected, click on the Browse icon to open the Open dialog box, enabling you to select a file from your PC.
Operation	The operation to be performed for each device type. The available options are: ■ None ■ Reset ■ Load to NPU (not applicable for MBS) - Loads the SU SW file to the Micro Base Station. Note that if the Micro Base Station already holds 4 files of the relevant type, one of them must be deleted (see "Files in NPU/MBS" on page 128). If the selected file already exists in the Micro Base Station, the operation will be skipped. ■ *Load to Shadow* - Loads the selected file to the Shadow memory of the applicable device(s). Applicable only if a file was selected for the relevant device type. If the file already exists in the device, no action will take place. For SU, the file will be first loaded to the Micro Base Station (see above), and than loaded from the Micro Base Station to the SU. ■ Run from Shadow - Perform the Load to Shadow operation (see above), reset it and reboot using the Shadow version. Note that for SU, because the process is controlled by the Micro Base Station, the SU will continue running from the Shadow version after reset. If the specified file already exists as the Shadow version (meaning that previously a Load to Shadow operation was executed for this SW File), the only operation to take place will be to reset and run from Shadow. If the specified file already exists as the Main version, no action will take place. ■ *Set as Main* - Perform the Load to Shadow and Run from Shadow operations (see above), then swap the files and sets the running file as the new Main file.

NOTE

If the definitions for a specific SU in the Software Upgrade Settings page contradict the relevant definitions in the Software Upgrade page, the definitions in the Software Upgrade page will be ignored.

To execute a Software Upgrade process:

To execute a Software Upgrade process, select the devices to be upgraded (in the MBS section and/or the SU section), define the software upgrade parameters as required (in the Settings section), and click **Run**. A Run dialog box will open, enabling you to save a log of the process, run the process without saving a log, or cancel the Run request. If you selected to save a log, a Save dialog box will open, enabling you to select the location and file name for the log. The default log file name includes the NPU's IP and the current Date and Time, with the extension ".log". After confirmation, the operation's Run log will be displayed. The **Abort** button enables you to cancel an operation before completion. Close the Run log window to resume normal operation of AlvariCRAFT.

To view a log of a previously executed process:

Click on the **Log** button to open the Log window for the last executed process. To view a previous log, click on the **Open** button in the Log window and select the required log. Close the Log window to resume normal operation of AlvariCRAFT.

3.11 Micro Base Station Software Upgrade Settings Page

The Software Upgrade Settings page enables managing the SW versions to be used upon network entry of all SUs served by the Micro Base Station, or selected SUs, using any of the SU SW files stored in the Micro Base Station.

The Software Upgrade Page comprises two tabs:

- "mBS Tab
- "SU Tab

3.11.1 mBS Tab

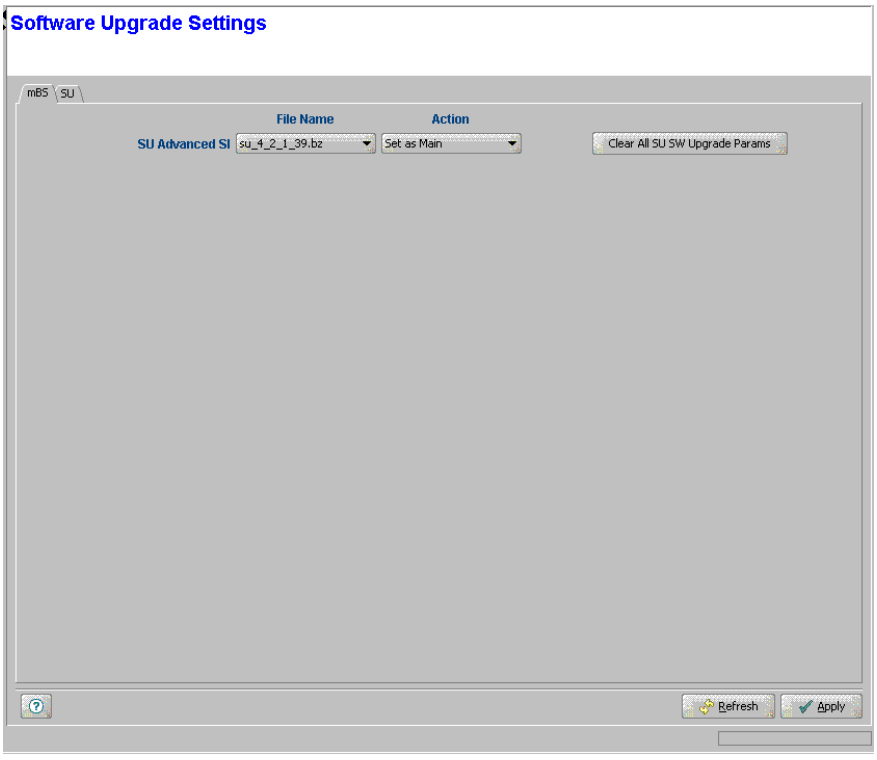


Figure 3-10: Micro Base Station Software Upgrade Settings Page - mBS Tab

The mBS tab of the Software Upgrade page enables an efficient and simple-to-manage upgrade process, by defining the SW File and Action for all SUs served by the Micro Base Station.

These are the SW File and associated Action that will be used for an SU after network entry. The SW File Name and Action are applicable to all SUs served by the Micro Base Station. They are not applicable to any Permanent SU whose configured SW File Name in the SU tab is other than None (null).

The mBS tab includes the following components:

Parameter/Button	Description
File Name	The Name of the SW File to be used for upgrading an SU. Should be one of the SU SW Files currently stored in the Micro Base Station, or None (null).
Action	The operation to be performed with the specified SW File after network entry. The available options: None (do not load), Load to Shadow, Run from Shadow or Set as Main. Both File Name and Action must be configured (different than None) to properly define the upgrade process. Not applicable for any Permanent SU whose configured SW File Name in the SU tab is other than None (null).
Clear All SU SW Upgrade Params	Delete all SU SW Files and Actions (the SU File Names and Actions configured in the SU tab) in all Permanent SUs served by the Micro Base Station.

3.11.2 SU Tab

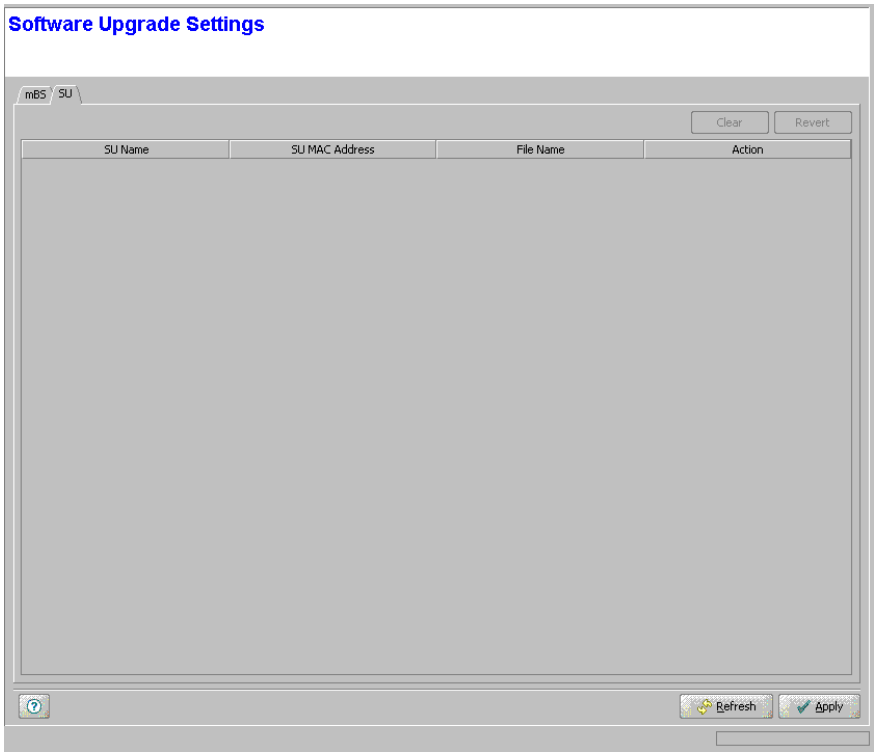


Figure 3-11: Micro Base Station Software Upgrade Settings Page - SU Tab

The SU tab of the Software Upgrade page enables defining for each SU the SW File Name and Action to take effect immediately after clicking **Apply**.

The SU tab includes a table with the following parameters for each SU:

Parameter	Description
SU Name	Read-only. The SU's Name.
SU MAC Address	Read-only. The SU's MAC Address.
File Name	The Name of the SW File to be used for upgrading all SUs upon network entry. Can be one of the SU SW Files currently stored in the Micro Base Station, or None (null). Click on the File Name entry to open a drop-down menu, enabling selection of one of the SU SW Files available in the Micro Base Station, or None (null).

Parameter	Description
Action	The operation to be performed with the specified SW File for the SU after network entry. Double-click on the Action entry to open a drop-down menu with the available options: None (do not load), Load to Shadow, Run from Shadow or Set as Main. Both File Name and Action must be configured (different than None) to properly define the upgrade process.

The SU tab also includes the following buttons:

Button	Description
Clear	Select one or more rows and click Clear to clear from the display all the File Names and Actions for the selected rows. Click Apply to configure the new values in the device.
Revert	Select one or more rows and click on the Revert button to cancel all changes made in these rows that were not applied yet.

4

Chapter 4 - Managing a Subscriber Unit

4.1 Introduction to Subscriber Unit Management

The tree menu on the right side of the Subscriber Unit Device Manager window enables selecting the following view and configuration pages:

4.2 SU Summary Page

The SU Summary page provides general details on the hardware and software of the Subscriber Unit as well as a summary of configuration parameters.

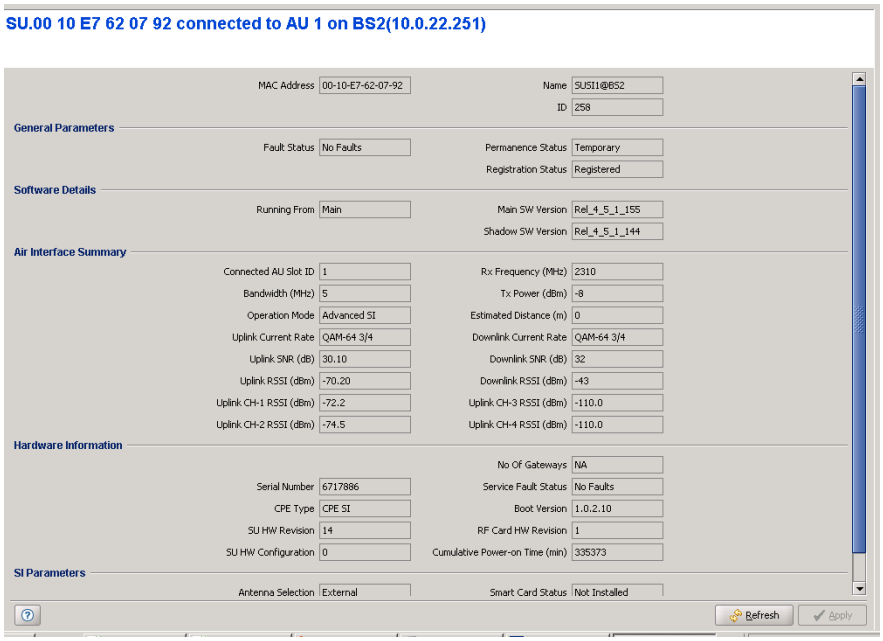


Figure 4-1: SU Summary Page

The read-only details are:

- **Identification Details**
  - **MAC address**
  - **Name**
  - **ID** (an ID allocated to each SU by the connected AU/Micro Base Station)
- **General Parameters:**
  - **Fault Status**
  - **Permanence Status**
  - **Registration Status**

- **Software Details**
  - **Running From**: Main or Shadow
  - **Main SW Version**
  - **Shadow SW Version**
- **Air Interface Summary**
  - **Connected AU Slot ID** (always 1 for a Micro Base Station)
  - **Bandwidth (MHz)**
  - **Operation Mode** (only Advanced Si is applicable in current version)
  - **Uplink Current Rate**
  - **Uplink SNR (dB)**: The combined SNR for all ODUs connected to the serving AU/Micro Base Station.
  - **Uplink RSSI (dBm)**: The combined SNR for all ODUs connected to the serving AU/Micro Base Station.
  - **Rx Frequency (MHz)**
  - **Tx Power (dBm)**
  - **Estimated Distance (m)**
  - **Downlink Current Rate**
  - **Downlink SNR (dB)**
  - **Downlink RSSI (dBm)**
  - **Uplink CH-1 RSSI (dBm)**: The RSSI in the ODU connected to channel 1 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm).
  - **Uplink CH-2 RSSI (dBm)**: The RSSI in the ODU connected to channel 2 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm).
  - **Uplink CH-3 RSSI (dBm)**: The RSSI in the ODU connected to channel 3 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm).

- **Uplink CH-4 RSSI (dBm)**: The RSSI in the ODU connected to channel 4 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm).

Hardware Information

- **Serial Number**
- **CPE Type**
- **SU IDU Type:** Basic (Universal IDU) or an IDU Gateway using DRAP (IDU-NG-4D1W, IDU-1D1V, IDU-1D2V, SRU-FT-1D1V, SRU-FT-1D1V). Not applicable for units operating in IP CS Switching Mode.
- **SU HW Revision**
- **SU HW Configuration**
- **No of Gateways:** In Ethernet CS Switching Mode this is the number of Alvarion Gateways using DRAP (including IDU gateways) or SIP devices using Managed VoIP service connected to the SU. In IP CS Switching Mode this is the number of VoIP SIP devices using Managed VoIP service connected to the SU.
- **Service Fault Status** (OK or reason for denying services to the SU: Loop or Duplicate SU Name).
- **Boot Version**
- **RF Card HW Revision**
- **Cumulative Power On Time (minutes)**

SI (Self Install SU) Parameters

- **Antenna Selection** (as configured in the SU)
- **Interface Type** (Ethernet or USB)
- **Smart Card Status**

4.3 Registration Parameters Page

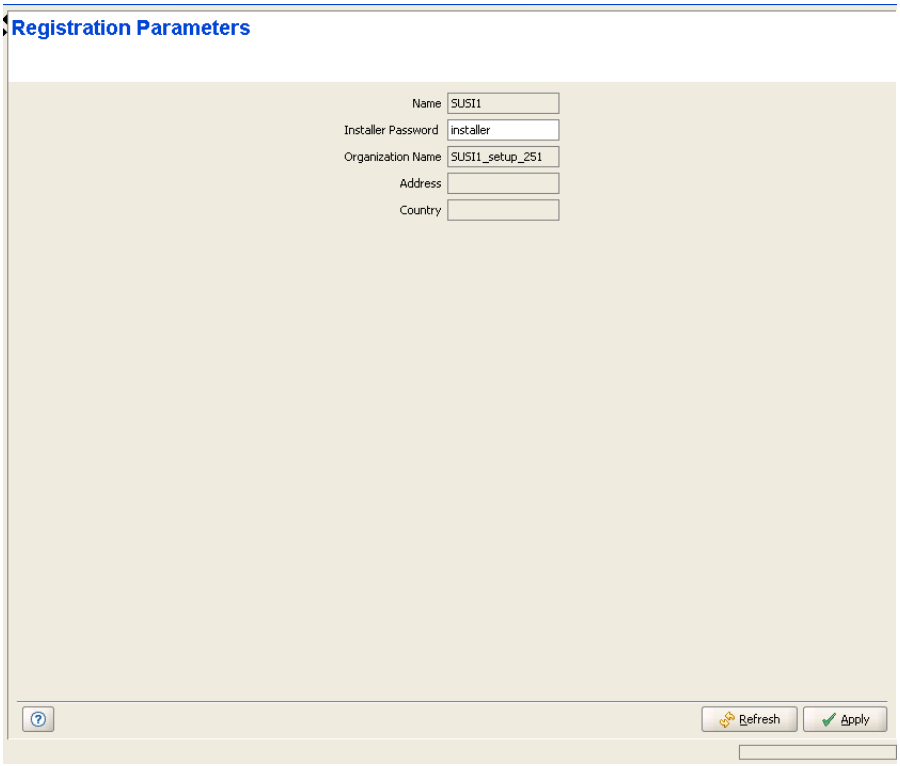


Figure 4-2: Registration Parameters Page

The Registration Parameters page includes the following:

Parameter	Description
SU Name	A read-only display of the SU's Name (User Name). The SU's User Name can only be configured locally in the SU. In Ethernet CS Switching Mode, the default SU Name given to a new SU during the definition process (adding a permanent SU) is SU@<SU's MAC Address>. When an SU is registered, it receives services based on its MAC address, and the default SU Name is replaced by the name configured in the SU (User Name). A Base Station cannot serve two SUs with the same User Name. Upon identifying an SU with an SU Name (User Name) that is identical to that of a previously registered SU, the new SU will be registered (to enable management), but will not receive any services. Its name in the database will be changed to SU@<SU's MAC Address>. The system administrator will be informed of the problem through the Service Fault Status parameter in the SU Summary Page. If the administrator decides that the SU is legitimate and should receive services, a new User Name must be configured in the SU.
Installer Password	The Installer Password is used for accessing the SU's Monitor (Installer) program locally, using Telnet via the SU's Ethernet port. The Installer Password consists of a string of up to 20 printable characters, case sensitive.
Organization Name	A read-only display of the Organization Name as configured locally in the SU.
Address	A read-only display of the Address as configured locally in the SU.
Country	A read-only display of the Country as configured locally in the SU.

4.4 Bridging Page

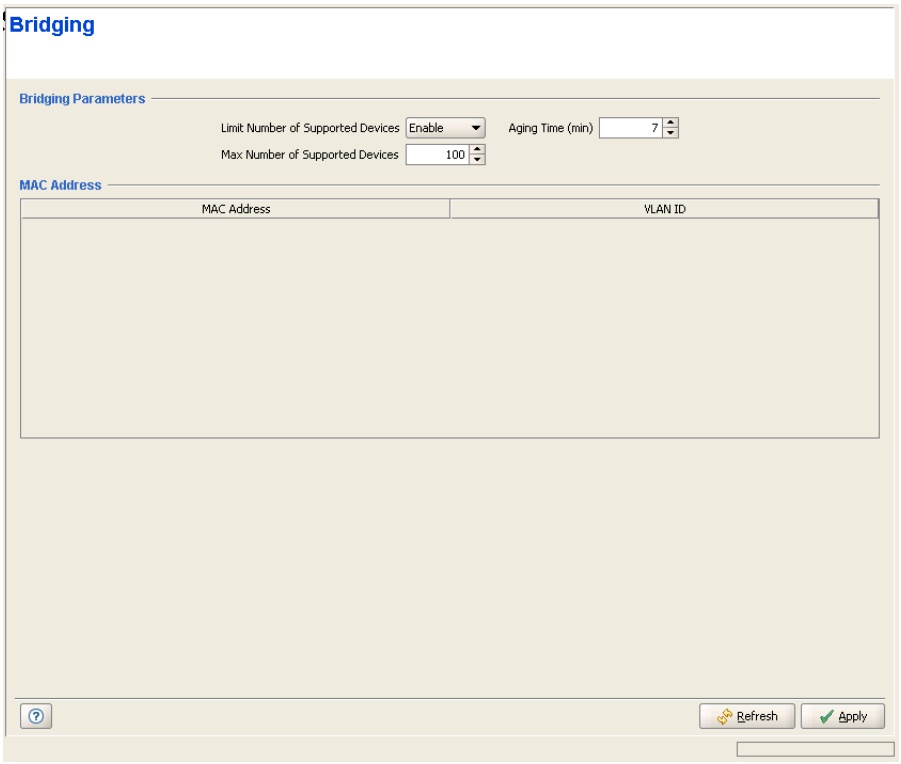


Figure 4-3: Bridging Page

The Bridging page includes the following:

Parameter	Description
Limit Number of Supported Devices	If the Limit Number of Supported Devices parameter is set to Disable, the maximum number of supported devices is 512. If it is set to Enable, the maximum number is defined by the Max Number of Supported Devices parameter.
Max Number of Supported Devices	The maximum number of devices that can be supported when the Limit Number of Supported Devices is set to Enable. The available values are from 1 to 512.
Aging Time	The aging time for all addresses in the SU's Forwarding Data Base. The available values are from 1 to 1440 minutes.

Parameter	Description
MAC Address Table	A read-only table displaying the MAC Addresses of devices behind the SU, and (if applicable) the VLAN ID associated with each device (if a device uses more than one VLAN ID, the first identified VLAN ID will be displayed).

4.5 Air Interface Page

The Air Interface page enables viewing and configuring the ATPC and Multi Rate parameters. For 3.5 GHz units, it also enables pre-configuration of MAC and Phy parameters for FDD Standard operation mode. These parameters do not affect the operation of the unit when using Advanced Si operation mode. These parameters are provided to support the Automatic Platform Detection mechanism of the dual-mode CPEs, allowing pre-configuration of the relevant parameters before switching the sector to operate in FDD mode using Standard operation mode. These parameters are applicable only to SUs in the 3.x GHz bands.

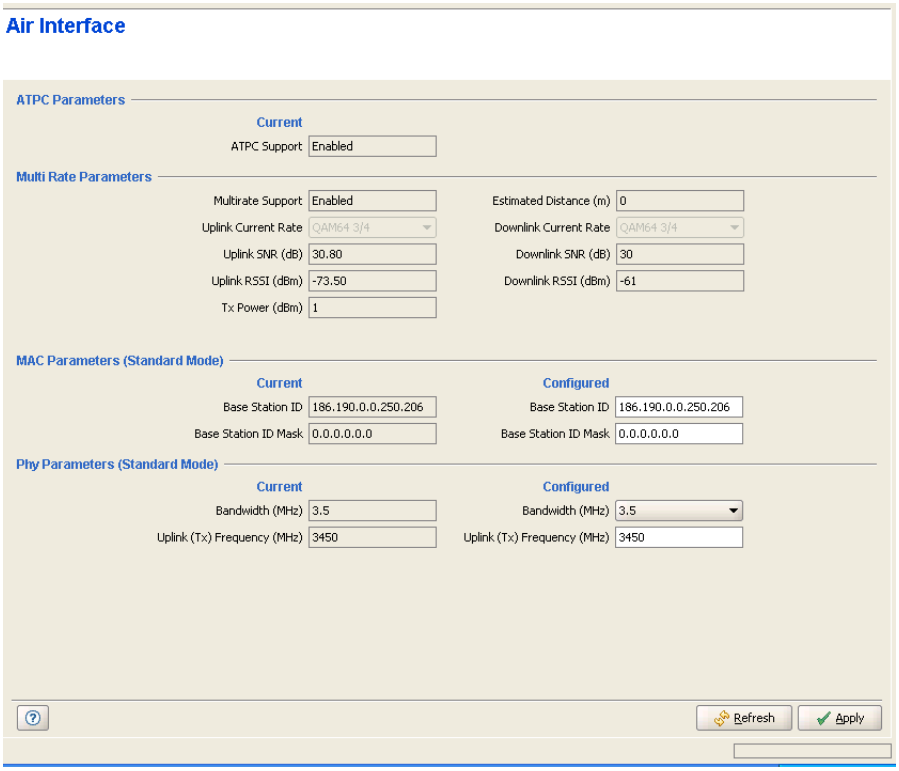


Figure 4-4: SU Air Interface Page (3.5 GHz Unit)

The SU Air Interface page includes the following:

- "ATPC Parameters"
- "Multi Rate Parameters"
- "MAC Parameters (Standard Mode)"

- "Phy Parameters (Standard Mode)"

4.5.1 ATPC Parameters

BreezeMAX employs an Automatic Transmit Power Control (ATPC) algorithm to dynamically adapt the transmit power of each SU so that it is received by the ODU at an optimal level. The algorithm is managed by the AU/Micro Base Station and optimal values are calculated separately for each SU based on the actual level at which it is received by the ODU. MAP messages transmitted to the SUs include information on the estimated up/down power level change required to achieve optimal transmit power level.

The ATPC Parameters include:

Parameter	Description
ATPC Support	A read-only display showing the option configured in the AU/Micro Base Station.

4.5.2 Multi Rate Parameters

BreezeMAX employs a multirate algorithm to dynamically adapt the modulation scheme and Forward Error Correction (FEC) coding to actual link conditions. The algorithm is managed by the AU/Micro Base Station taking into account also information received from the served SUs. Optimal values are calculated separately for the uplink and downlink for each SU, taking into account also the applicable QoS requirements. MAP messages transmitted to the SUs include information on the uplink rate that should be used by each SU for its next transmission.

The Basic Rate is the minimum rate to be used by the Multirate algorithm. This is also the rate to be used for downlink broadcasts and multicasts. Broadcast and multicast messages are sent to multiple recipients with different link qualities. Therefore, it is preferable to use a relatively low rate for these transmissions, thus reducing the probability of errors and increasing the likelihood that all intended recipients will receive them properly.

In the uplink, this is the rate to be used by SUs for non-scheduled transmissions, such as during the contention period.

The Basic Rate is also the initial rate to be used by the algorithm for each new SU that joins the cell when the Multirate algorithm is enabled.

When the Multirate algorithm is disabled, communication with connected SUs will continue using the last uplink and downlink rates selected by the Multirate

algorithm. The Basic Rates becomes available for configuration in each SU only when the Multirate algorithm is disabled in the AU/Micro Base Station.

The Multi Rate Parameters include:

Parameter	Description
Multirate Support	A read-only display of the Multirate Support option as configured in the AU/Micro Base Station.
Uplink Current Rate	The current uplink rate. Configurable in the SU only when the Multirate Support is disabled in the AU/Micro Base Station.
Uplink SNR (dB)	The current Signal to Noise Ratio of the SU's signal as received at the Base Station's ODU.
Uplink RSSI (dBm)	The current Signal Strength of the SU's signal as received at the Base Station's ODU.
Tx Power (dBm)	The current Tx Power of the SU (at the antenna's port)
Estimated Distance (m)	The estimated distance from the Base Station. The accuracy is from several hundreds of meters for line-of-sight links to 1500 meters for non-line-of-sight links.
Downlink Current Rate	The current downlink rate. Configurable in the SU only when the Multirate Support is disabled in the AU/Micro Base Station.
Downlink SNR (dB)	The current Signal to Noise Ratio of the signal received by the SU.
Downlink RSSI (dBm)	The current Signal Strength of the signal received by the SU.

4.5.3 MAC Parameters (Standard Mode)

The MAC Parameters are applicable only to 3.5 GHz units.

Parameter	Description
Base Station ID *(Current and Configured)*	The Base Station ID is the identifier of the AU/Micro Base Station to which the SU can connect. An SU can be authenticated by an AU/Micro Base Station only if the Base Station ID and Base Station ID Mask configured in the SU match the Base Station ID configured for the AU/Micro Base Station. The Base Station ID consists of six groups of up to three digits each, where the range for each group is 0 to 255. The first three groups define the Operator ID, the next two groups define the Cell ID and the sixth group defines the Sector (AU) ID. A change in the Base Station ID is applied only after reset.
Base Station ID Mask *(Current and Configured)*	The Base Station ID Mask, together with the Base station ID, define the AU(s)/ Micro Base Station(s) that can synchronize with the SU. The Base Station ID Mask consists of 6 groups of up to 3 digits each, where the range of each group is 0 to 255. The first 3 groups form the mask for the Operator ID. The next 2 groups form the mask for the Cell ID, and the last group forms the mask for the Sector ID. A change in the Base Station ID Mask is applied only after reset.

4.5.4 Phy Parameters (Standard Mode)

The Phy Parameters are applicable only to 3.5 GHz units.

Parameter	Description
Bandwidth *(Current and Configured)*	The frequency bandwidth used by the radio. A change in the Bandwidth parameter will take effect only after resetting the SU. The available options are: 1.75, 3.5, 5, 7 and 10 MHz.. Values that are not supported will be rejected.
Uplink (Tx) Frequency *(Current and Configured)*	The frequency used in the uplink (from SU to the Base Station). A change will take effect only after resetting the SU.The available values depend on the radio band and configured Bandwidth.

4.6 Frequency Scanning Page

The Frequency Scanning page enables viewing and defining the frequencies to be used by the scanning process.

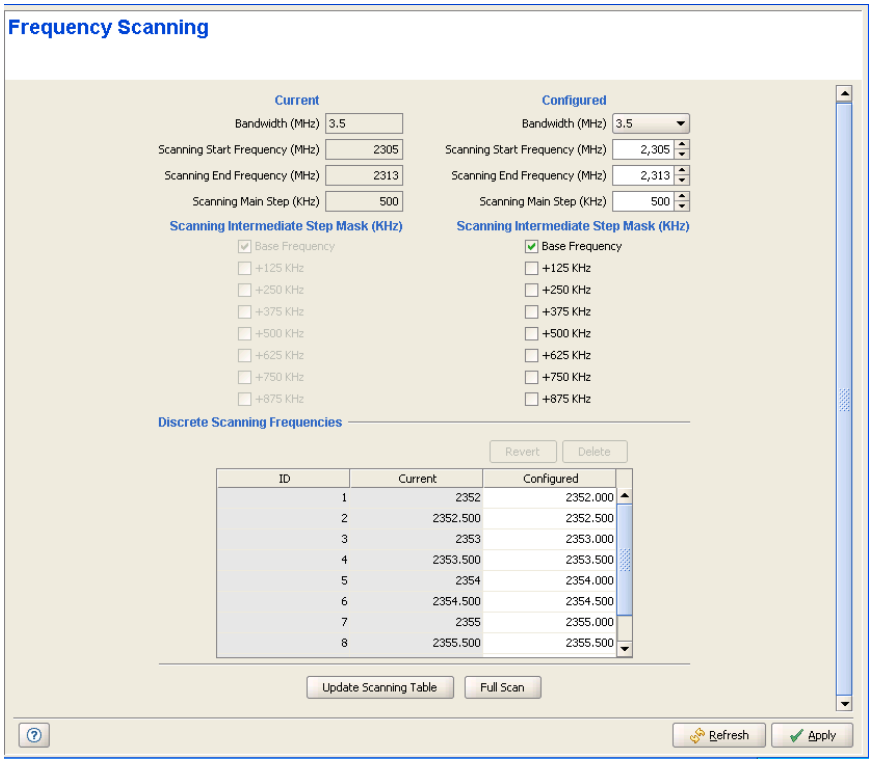


Figure 4-5: Frequency Scanning Page

The Frequency Scanning page includes the following parameters:

Parameter	Description
Bandwidth (MHz) (Current/Configured)	The frequency bandwidth used by the radio. The available options are: 1.75, 3.5, 5, 7 and 10 MHz. Values that are not supported will be rejected.
Scanning Start Frequency (MHz) (Current/Configured)	The lowest Rx frequency to be used in the scanning process.
Scanning End Frequency (MHz) (Current/Configured)	The highest Rx frequency to be used in the scanning process.

Parameter	Description
Scanning Main Step (KHz) (Current/Configured)	Define the Main Frequencies that may be used in the scanning process: Start Frequency + N*Main Step, N=1, 2...until End Frequency is reached. For 2.x/3.x GHz units and a bandwidth of 3.5 MHz, the range is from 125 KHz to 1750 KHz, in steps of 125 KHz. For 2.x/3.x GHz units and a bandwidth of 5 MHz, the range is from 125 KHz to 5000 KHz, in steps of 125 KHz. The Main Step must be higher than the highest step defined by the Intermediate Step Mask.
Scanning intermediate Step Mask (KHz) (Current/Configured)	Define the intermediate step frequencies to be included in the scanning process: ■ Base Frequency: If marked, add Start Frequency to the list of Main Frequencies. ■ 125 KHz: Include all Main Frequencies+125 KHz. ■ 250 KHz: Include all Main Frequencies+250 KHz. ■ 375 KHz: Include all Main Frequencies+375 KHz. ■ 500 KHz: Include all Main Frequencies+500 KHz. ■ 625 KHz: Include all Main Frequencies+625 KHz. ■ 750 KHz: Include all Main Frequencies+750 KHz. ■ 875/1250 KHz: Include all Main Frequencies+875/1250 KHz (875 is applicable for 3.5 MHz bandwidth. 1250 is applicable for 5 MHz bandwidth).
Discrete Scanning Frequencies (Current/Configured)	Up to 10 discrete frequencies that are included in the scanning list.

In addition, the following controls are available:

- **Update Scanning Table**: Click on the button to update the frequency scanning table in run time (without resetting the unit).
- **Full Scan**: Click on the button to initiate a full scanning process.

4.7 Best BST/AU Selection Page

The Best BST/AU feature enables an SU to connect to the best AU/Micro Base Station in its neighborhood.

The SU scans all AUs/Micro Base Stations in a predefined range, in all frequencies (according to the frequencies defined in the "Frequency Scanning Page" on page 214) and in all available antennas (according to the local definition in the SU, as indicated by the Antenna Selection parameter in the "SU Summary Page" on page 203). Each of the AUs/Micro Base Stations with which the SU can communicate (perform initial phase of network entry) is given a quality mark based on the quality of the signal at which it is received by the SU. At the end of the scanning period, the SU reaches a Best AU decision according to the information gathered. The AU/Micro Base Station with the highest quality mark is selected as the Best BST/AU, and the SU will immediately try to associate with it at the relevant frequency.

The range used for scanning is defined by the BST/AU ID and BST/AU ID Mask parameters. The initial range can be limited by defining a preferred range of AUs/Micro Base Stations, and selecting the best AU/Micro Base Station in the preferred range. If no AU/Micro Base Station is found in the preferred range, the SU will scan the entire range.

After power-up or reset the SU waits for 60 seconds on the last used frequency to enable continued association with the same AU/Micro Base Station. If the previous AU is not found within 60 seconds the SU tries connecting with the next AU/Micro Base Station in the best AU table and so on. If no AU belonging to the best AU table is found the SU starts a full scan in accordance with the configured scanning parameters.

A Mobility Mode parameter enables supporting optimal performance after loosing connectivity to the AU/Micro Base Station according to the expected mobility of the SU: A Mobile SU is expected to move among different AU/Micro Base Station, while a Nomadic SU is typically stationary although it may also be moved to the coverage area of a different AU/Micro Base Station.

After loosing connectivity to the AU/Micro Base Station, a Nomadic SU waits for 5 minutes on the last used frequency to enable continued association with the same AU/Micro Base Station. If the previous AU/Micro Base Station is not found within 5 minutes the SU tries connecting with the next AU/Micro Base Station in the best AU table and so on. If no AU/Micro Base Station belonging to the best AU table is found the SU starts a full scan in accordance with the configured scanning parameters.

A Moblie SU behaves the same way after loosing connectivity to the AU/Micro Base Station, except that it waits only for 100 milliseconds on the last used frequency. This enables faster association with a new AU/Micro Base Station if necessary.

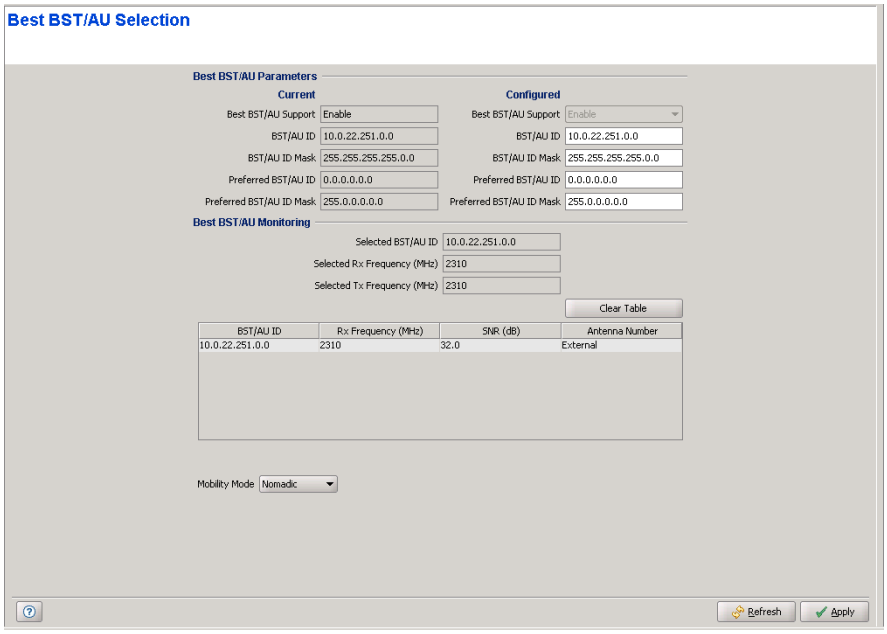


Figure 4-6: Best BST/AU Selection Page

The Best BST/AU page includes the following components:

- "Best BST/AU Parameters"
- "Best BST/AU Monitoring"

4.7.1 Best BST/AU Parameters

The Best BST/AU Parameters section includes the following parameters:

Parameter	Description
Best BST/AU Support *(Current/Configured)*	Starting on SW version 4.5, the Best BST/AU Support parameter is always set to Enable and cannot be modified.
BST/AU ID and *Preferred BST/AU ID Mask* *(Current/Configured)*	These two parameters define the overall range for scanning in order to find the best AU/Micro Base Station. If no AU/Micro Base Station is found within the range defined by the Preferred BST/AU ID and Preferred BST/AU ID Mask, the SU will continue searching in the entire range defined by the BST/AU ID and BST/AU ID Mask parameters. The BST/AU ID and Preferred BST/AU ID Mask consist of 6 groups of up to 3 digits each, where the range of each group is 0 to 255. The first 3 groups form the base address/mask for the Operator ID. The next 2 groups form the base address/mask for the Cell ID, and the last group forms the base address/mask for the Sector ID.
Preferred BST/AU ID and *Preferred BST/AU ID Mask* *(Current/Configured)*	These two parameters define the initial range for scanning in order to find the best AU/Micro Base Station. The SU will select the best AU/Micro Base Station within this range. If no AU/Micro Base Station is found within this range, the SU will continue searching in the entire range defined by the BST/AU ID and BST/AU ID Mask parameters. The Preferred BST/AU ID and Preferred BST/AU ID Mask consist of 6 groups of up to 3 digits each, where the range of each group is 0 to 255. The first 3 groups form the base address/mask for the Operator ID. The next 2 groups form the base address/mask for the Cell ID, and the last group forms the base address/mask for the Sector ID.
Mobility Mode	The Mobility Mode parameters affects the behaviour of the SU after loosing connectivity with the AU/Micro Base Station. The available options are Nomadic and Mobile.

4.7.2 Best BST/AU Monitoring

The Best BST/AU Monitoring section includes the following components, displaying the results of the scanning and Best BST/AU selection process:

Parameter	Description
Selected BST/AU ID	The Base Station ID of the selected AU/Micro Base Station to which the SU is connected.

Parameter	Description
Selected Rx Frequency (MHz)	The selected Rx frequency used for communication with the selected AU/Micro Base Station
Selected Tx Frequency (MHz)	The selected Tx frequency (in TDD systems Tx frequency is the same as Rx frequency)
Best BST/AU Table	A table displaying the results of the scanning and Best BST/AU selection process for all AUs with whom the SU can communicate. For each relevant AU/Micro Base Station, the following details are displayed: ■ BST/AU ID ■ Rx Frequency (MHz) ■ SNR (dB) ■ Antenna Number

In addition, the **Clear Table** button enables clearing the current Best BST/AU Table. Typically this should be done prior to initiating a full scanning process (otherwise the SU will try first the AUs/Micro Base Stations that are included in the current table).

4.8 Gateways Page

The Gateways page enables viewing details on the Voice/Networking Gateways connected to the SU, and open an http cut-through to a selected Gateway for managing it using the built-in web server. This is applicable only for Alvarion's gateways supporting the DRAP protocol in Ethernet CS Switching Mode, or for SIP gateways using either Managed VoIP service (Micro Base Station in Ethernet CS Switching Mode) or IP Mode Managed VoIP Service (modular Base Station in IP CS Switching Mode).

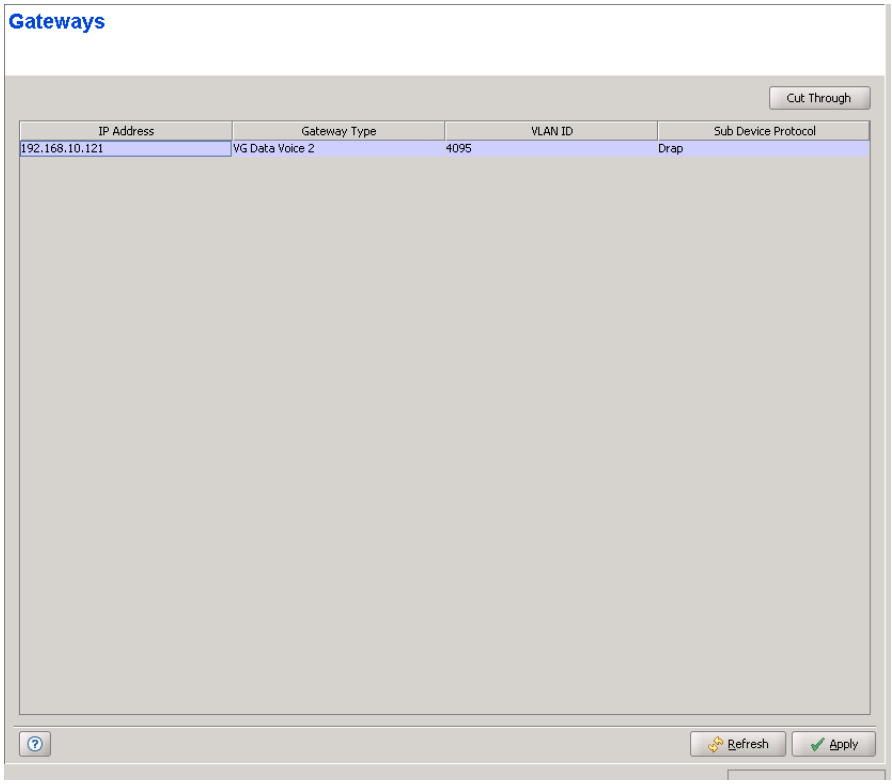


Figure 4-7: Gateways Page

For each Gateway, the following details are provided:

Parameter	Description
IP Address	The IP address of the Gateway.
Gateway Type	Not applicable in IP CS Switching Mode. Applicable only for gateways using DRAP. The Gateway Type.

Parameter	Description
VLAN ID	Applicable only for Voice Gateways. The VLAN ID used for management of the Gateway.
Sub Device Protocol	DRAP or Dynamic, where Dynamic indicates a SIP device using either Managed VoIP service (Micro Base Station in Ethernet CS Switching Mode) or IP Mode Managed VoIP Service (modular Base Station in IP CS Switching Mode)

To manage a Gateway using its built-in web server:

Select an entry and click on the **Cut Through** button to open a web browser cut-through to the device, enabling to manage it using the web server incorporated in the Alvarion's Gateways.

4.9 Unit Control Page

The Unit Control page enables managing the SW versions of the SU and resetting it to its default configuration.

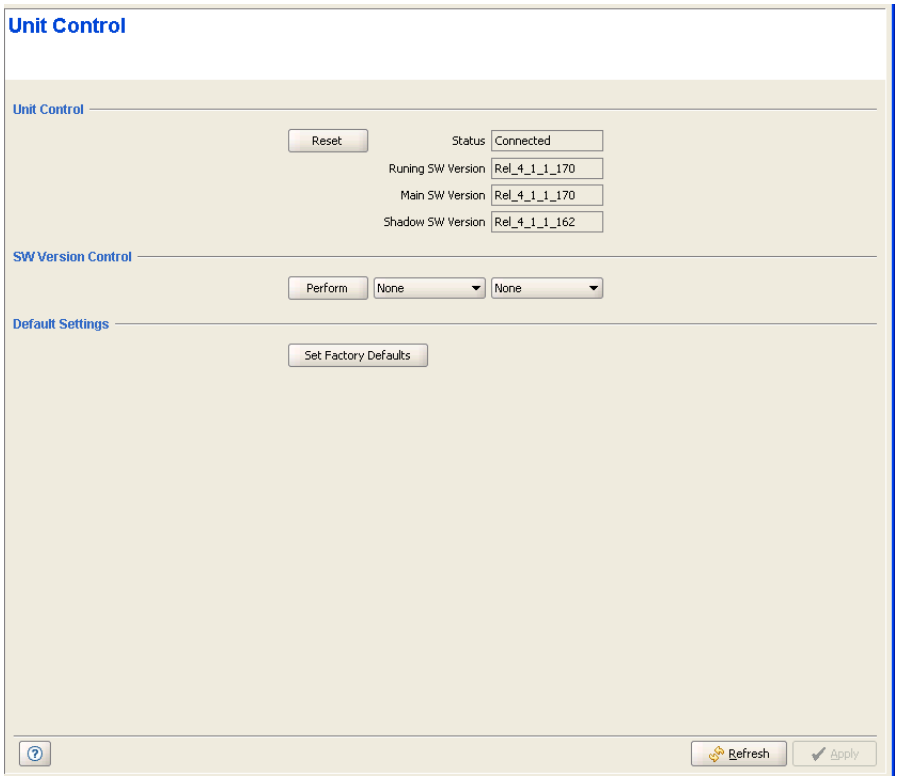


Figure 4-8: SU Unit Control Page

The Unit Control page includes the following sections:

- "Unit Control"
- "SW Version Control"
- "Default Settings"
- "License" (L model CPE)

4.9.1 Unit Control

The SU can contain two SW versions:

- **Main**: Each time the SU resets it will reboot using the Main SW version.
- **Shadow**: Normally the Shadow version is the backup version. Each time a new SW File is downloaded to the device, it will be stored as the Shadow SW version, replacing the previous Shadow SW version.

The Unit Control section includes the following parameters:

Parameter	Description
Status	A read-only display of the registration status: Connected or Disconnected.
Running SW Version	A read-only display of the current SW version.
Main SW Version	The Main SW version.
Shadow SW Version	The Shadow SW version.

Click on the Reset button to reset the SU and run the Main SW version. Changes to some of the configurable parameters are applied only after reset. Refer to "Parameters Summary" on page 240 for information on which parameters are changeable in run time and which changes are applied only after reset.

4.9.2 SW Version Control

The process of upgrading to a new SW version is controlled by the NPU/Micro Base Station, and is performed using one of the existing SU SW files in the NPU/Micro Base Station. If the specified SU SW file does not exist in the SU, it will be downloaded to the SU and the requested operation will be executed, as described below. If it already exists in the SU, then loading process is not necessary.

The following components are available in the SW Version Control section:

Component	Description
Perform Button	Click on the Perform button to activate an upgrade process defined by the Action and SW Version drop-down menus.

Component	Description
Action Drop-Down Menu	Provide a selection between the following actions: ■ None ■ Load to Shadow: To download a specified SW file to the Shadow memory of the SU. If the file already exists in the SU, no action will take place. ■ Run from Shadow: To download a specified SW file from the NPU/Micro Base Station to the Shadow memory of the SU, reset the SU and reboot it using the Shadow version. Note that because the process is controlled by the NPU/Micro Base Station, the SU will continue running from the Shadow version after reset. If the specified file already exists as the Shadow version (meaning that previously a Load to Shadow operation was executed for this file name), the only operation will be to reset and run from Shadow. If the specified file already exists as the Main version, no action will take place. ■ Set as Main: To download a specified SW file from the NPU/Micro Base Station to the Shadow memory of the SU, reset the SU and reboot it using the Shadow version, and then swap the Main and Shadow SW Version, so that the running version (which was previously the Shadow version) will become the Main version, to be used after next reset. If the specified file already exists as the running version and it is defined as the Shadow version (meaning that previously Load to Shadow and Run from Shadow operations were executed for this file), the only operation will be to swap the Main and Shadow versions. If the version is already defined as Main, no action will take place.
SW Version Drop-Down Menu	The selection includes the SW versions of all existing SU SW files in the NPU.

4.9.3 Default Settings

Click on the **Set Factory Defaults** button to reset the SU parameters to their factory default values. Refer to "Parameters Summary" on page 240 for information on the factory default values of these parameters. The parameters will revert to their default values after the next reset.

4.9.4 License

The License section is applicable only for L model CPEs, and it displays the number of available licenses in the CPE Licenses Bank (if any). It also enables loading to the CPE an Unlimited Bandwidth license by clicking on the **Make Bandwidth Unlimited** button. The button becomes available only if there are licenses available in the CPE Licenses Bank. Note that once an Unlimited

Bandwidth license has been granted to the SU, its' type changes and it is no longer identified as an L model CPE.

4.10 Ethernet Port Page

The Ethernet Port page enables viewing and configuring the Ethernet parameters of the Ethernet port.

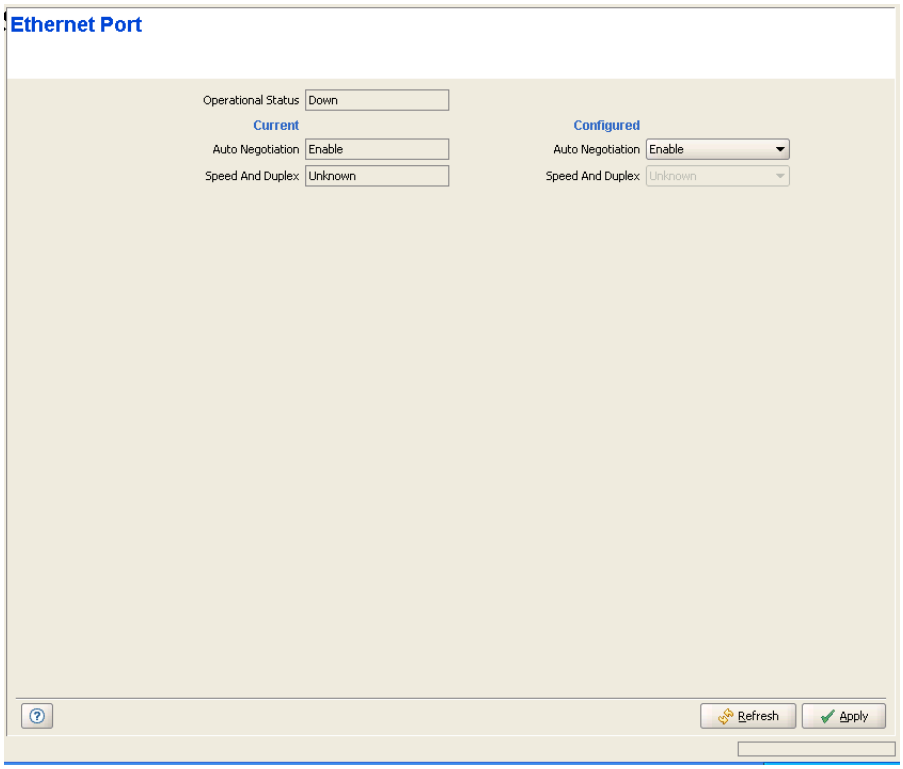


Figure 4-9: Ethernet Port Page

The Ethernet Port page includes the following:

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
Current Auto Negotiation	The current auto negotiation mode.
Current Speed and Duplex	The current actual link speed and duplex.
Configured Auto Negotiation	The auto negotiation mode that will be in effect after the next reset.

Parameter	Description
Configured Speed and Duplex	Configurable only if the Configured Auto Negotiation is set to Disable.The link speed that will be in effect after the next reset. The available options are ■ Full duplex 100Mbps ■ Half duplex 100Mbps ■ Full duplex 10Mbps ■ Half duplex 10Mbps

4.11 Burst Counters Page

The Burst Counters page enables viewing details on the link quality using Burst error Rate counters.

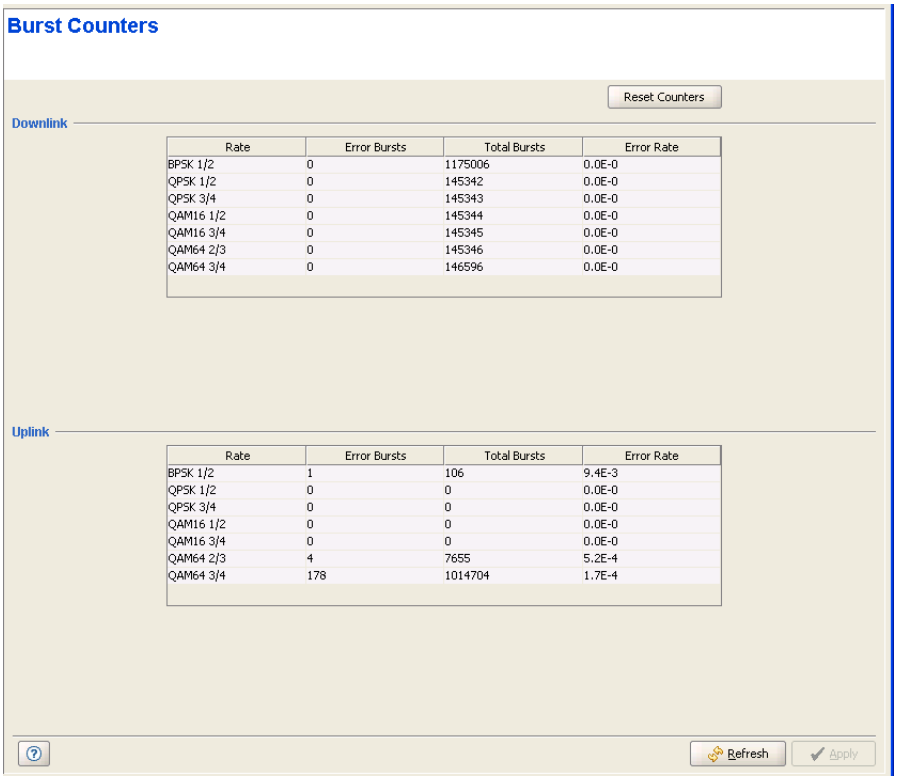


Figure 4-10: Burst Counters Page

The information displayed for each rate in uplink and downlink is the accumulated number since the last time the counters were reset. For each direction (uplink/downlink) the displayed information includes the following statistics for each rate:

- Error Bursts
- Total Bursts
- Error Rate

Click on the **Reset** button to reset the Burst Counters.

4.12 Performance Page

The Performance page enables on-line view of selected counters.

For details on the general functionality of the Performance Monitoring application, refer to “Using the Performance Page” on page 234.

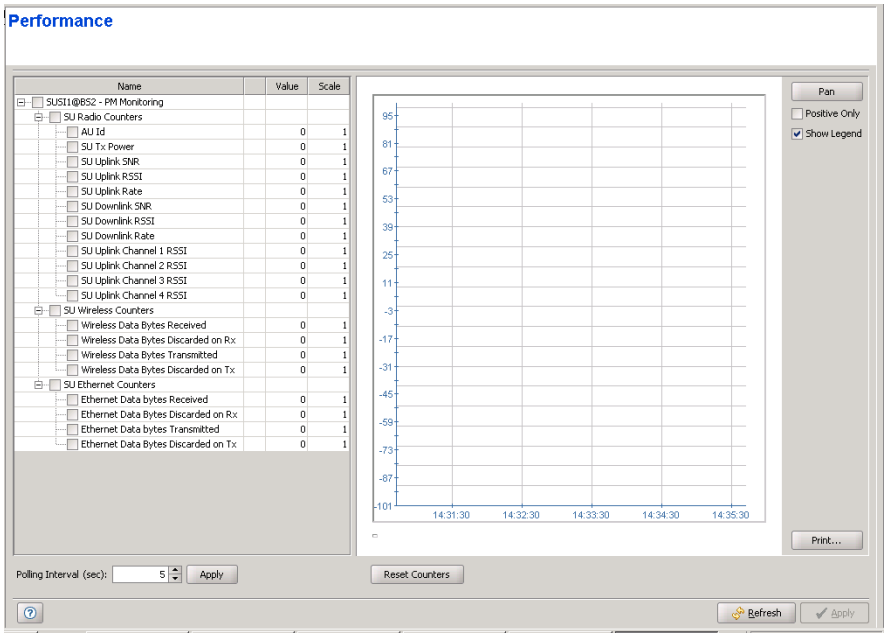


Figure 4-11: SU Performance Page

The counters available for the SU are:

- “SU Radio Counters”
- “SU Wireless Counters”
- “SU Ethernet Counters”

4.12.1 SU Radio Counters

The SU Radio counters include:

Counter	Description
AU ID	The AU ID (slot number) of the AU serving the SU
SU Tx Power	The current Tx power of the SU, in dBm.
SU Uplink SNR	The combined SNR (in dBm) for all ODUs connected to the serving AU/Micro Base Station.
SU Uplink RSSI	The combined RSSI (in dBm) for all ODUs connected to the serving AU/Micro Base Station..
SU Uplink Rate	The current uplink rate of the SU.
SU Downlink SNR	The SNR in dB of the signal received by the SU.
SU Downlink RSSI	The RSSI in dBm of the signal received by the SU.
SU Uplink Rate	The current downlink rate of the SU.
SU Uplink Channel 1 RSSI	The RSSI (in dBm) in the ODU connected to channel 1 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm)
SU Uplink Channel 2 RSSI	The RSSI (in dBm) in the ODU connected to channel 2 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm)
SU Uplink Channel 3 RSSI	The RSSI (in dBm) in the ODU connected to channel 3 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm)
SU Uplink Channel 4 RSSI	The RSSI (in dBm) in the ODU connected to channel 4 of the serving AU/Micro Base Station. A value of -110.0 indicates no reception (RSSI below -102 dBm)

4.12.2 SU Wireless Counters

The SU Wireless counters include:

Counter	Description
Wireless Data Bytes Received	The total number of data bytes received from the Wireless link. Management frames and frames with errors are not included.
Wireless Data Bytes Discarded On Rx	The number of bytes in packets received from the Wireless link and discarded due to MAC protocol receive errors, such as duplicate sequence number, wrong sequence number etc. (not CRC errors).

Counter	Description
Wireless Data Bytes Transmitted	The total number of data bytes transmitted to the Wireless link. MAC Management frames and frames with errors are not included.
Wireless Data Bytes Discarded On Tx	The number of bytes in packets discarded due to congestion in the wireless medium.

4.12.3 SU Ethernet Counters

The SU Ethernet counters include:

Counter	Description
Ethernet Data Bytes Received	The total number of data bytes received from the Ethernet port. Management frames and frames with errors are not included.
Ethernet Data Bytes Discarded on Rx	The number of bytes discarded when a packet received from the Ethernet port is not forwarded to the Wireless port due to bridging or classification considerations.
Ethernet Data Bytes Transmitted	The total number of data bytes transmitted to the Ethernet port. Bytes in Management frames and frames with errors are not included.
Ethernet Data Bytes Discarded on Tx	The number of bytes discarded when a packet received from the Wireless port is not forwarded to the Ethernet port due to bridging or VLAN considerations.

5

Chapter 5 - Using the Performance Page

5.1 Using the Performance Page

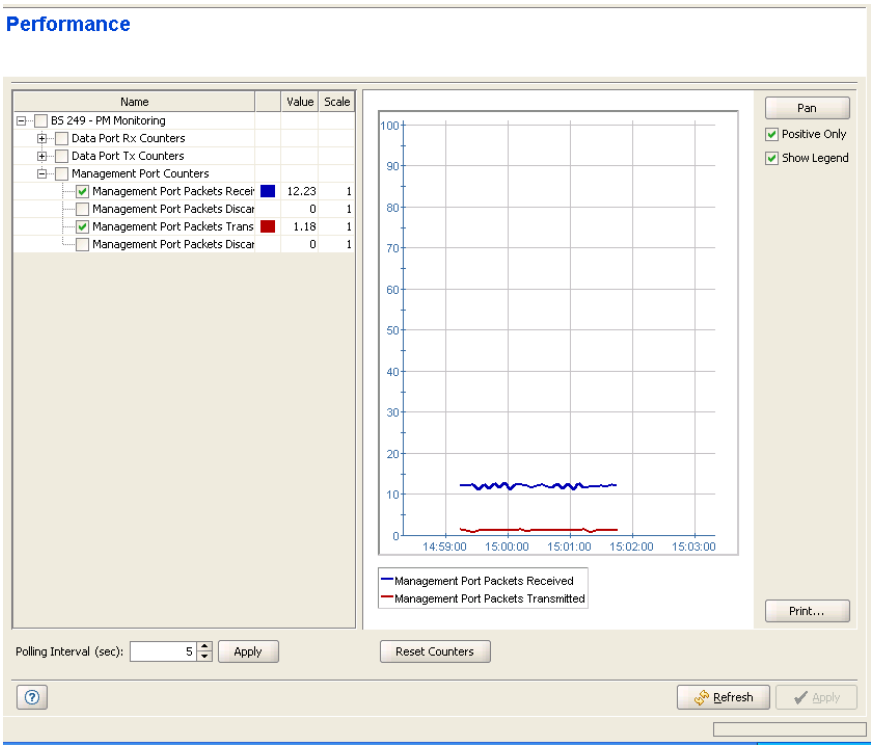


Figure 5-1: Performance Page

The Performance page enables on-line monitoring of graph(s) for selected counters. The graph for each counter that accumulate data displays the counter rate, defined as: (Current Value-Previous Value)/Polling Interval (seconds). For status counters (such as the SU Radio Counters), the absolute value is displayed.

NOTE

The rate calculation will always use the actual time between the two polling activities, including the network/device overheads.

The Performance pages include two sections: the counters selection section and the graph and control buttons section. For convenient viewing of the required information, you can change the relative sizes of the two sections, by dragging the line separating them.

- "The Counters Selection Section" on page 235
- "The Graph and Controls Section" on page 236

5.1.1 The Counters Selection Section

The counters selection section enables to select specific counters, to define the graph's values scale for each of the selected counters, to define the polling interval for the on-line display and to reset the counters.

The counters selection section, on the left side of the window, displays all the counters groups applicable to the relevant device.

You can perform the following operations in the Counters Selection section:

To expand/collapse the list of counters:

1. Use the Expand/Collapse (+/-) check-box on the left side of the device's name to view/hide all counters groups available for the device.
2. Use the Expand/Collapse (+/-) check-box on the left side of the counters group name, to view/hide all counters available in the group.

To the right of each counter, the following details are available:

- The color of the graph for this counter (available only for a selected counter)
- The current graph's value of the counter
- The scale value for the graph (see details below)

To view the graph of a counter:

Select the check box to the left of a counter to add it to the graph and view its details. The color to be used in the graph for the selected counters is displayed to the right of the counter.

To change the color of a counter's graph:

Click on the color display (on the right side of the selected counter). The **Pick a Color** window opens, allowing you to change the color's properties.

Deselect the check box to terminate the on-line display of the counter. Select again to continue the display.

To optimize the value (vertical) axis of a counter:

The values scale (vertical axis) is fixed, between -100 to +100 (or between 0 to 100 for a Positive Only graph). Some counters may have values that either exceed this range or are too small. The value scale of each counter is displayed to the right of the counter's name (the default is 1.0). To change the value scale of a counter, select it and choose the desired scale from the scale drop-down list that will be displayed on the right side of the counter. You can use the current graph's value (displayed in the Value column next to the Counter's name) to identify the required value scale. The values displayed for this counter on the graph are the actual counter values multiplied by the scale factor.

To change the polling interval:

The **Polling Interval** range is from 1 to 3600 seconds. Enter the required polling interval and click on the **Apply** button next to it.

To reset the counters:

Click on the **Reset Counters** button to reset all applicable counters. All counters listed in the Counters Selection list will be reset, regardless of whether they are selected or not.

5.1.2 The Graph and Controls Section

The graph and controls section contains the graph area, used for displaying the selected counters over time.

The names and details of the counters that were selected are displayed below or to the left of the graph area.

The following graph controls are available:

- **Pan/Zoom** Button**:** Toggles between the **Pan** and **Zoom** modes.
- **Positive Only** Check Box**:** Select to set the boundaries of the values (vertical) axis between 0 and +100. Deselect (the default) to set the boundaries between -100 to +100.

- **Show Legend** Check Box: Select (the default) to display the selected counters' legend. Deselect to hide the legend.
- **Print...:** Enables to setup the page, print the graph or display a print preview.

You can use the **Pan/Zoom** toggle button to either shift the time axis or change its resolution:

To shift the time axis:

1. Make sure that *Pan* mode is selected. If *Zoom* mode is selected, click the button to toggle to *Pan* mode.
2. Drag the graph surface left or right to shift the displayed section of the Time axis.

To change the resolution of the time axis:

1. Make sure that *Zoom* mode is selected. If *Pan* mode is selected, click on the button to toggle to *Zoom* mode.
2. Drag the graph surface left or right to change the resolution of the Time axis.

To print or preview a graph:

Click on **Print...**. A pop-up menu opens with three options:

- **Print...:** To open the Print dialog box for selecting a printer, setting up the printing properties and printing the graph.
- **Print Preview...:** Displays a preview of the graph before printing.
- **Page Setup...:** To open the Page Setup dialog box.

6

Chapter 6 - Parameters Summary

6.1 Parameters Summary

Parameter	Range	Default	Run-Time Updated
General Management Parameters Page			
Sys Name	Up to 255 printable characters	Null	Yes
Sys Location	Up to 255 printable characters	Null	Yes
Sys Contact	Up to 255 printable characters	Null	Yes
Switching Mode (modular Base Station only)	■ Ethernet CS ■ IP CS	Ethernet CS	No
PMTM Status	■ Disable ■ Enable	Disable	Yes
PMTM Mode	■ Basic ■ Advanced	Basic	Yes
Traps Control Page			
Admin Status	■ Disable ■ Enable	Enable	Yes
Severity	■ Critical ■ Major ■ Minor ■ Warning ■ Info	Depends on trap	Yes
Suppression Interval	0 - 86,400 (seconds). 0 means no suppression	0 (no suppression)	Yes
RADIUS Client Page			
Retry Interval (sec)	1-5	5	Yes
Number Of Retries	0-5	5	Yes
Keep Alive Timeout (sec)	60-180	60	Yes
Authentication Server IP Address	IP address	null	Yes

Parameter	Range	Default	Run-Time Updated
Authentication Server UDP Port	1-65535	1812	Yes
Authentication Server Is Primary	Applicable only in Ethernet CS Switching Mode: Yes (checked) or No (unchecked) (Only one server can be Primary)		Yes
Authentication Server Adopt Data Port (Applicable only for IP CS)	1 - Yes 2 - No		Yes
Authentication Server Domain VLAN (Applicable only for IP CS and Adopt Data Port =No))	0-4094 or null for No VLAN		Yes
Authentication Server Domain Interface IP Addresss (Applicable only for IP CS and Adopt Data Port =No))	IP address		Yes
Authentication Server Domain Interface Subnet Mask (Applicable only for IP CS and Adopt Data Port =No))	IP address		Yes
Authentication Server Domain Gateway (Applicable only for IP CS and Adopt Data Port =No))	IP address		Yes
Accounting Server IP Address	IP address	null	Yes
Accounting Server UDP Port	1-65535	1813	Yes
Accounting Server Is Primary	Applicable only in Ethernet CS Switching Mode: Yes (checked) or No (unchecked) (Only one server can be Primary)		Yes
Accounting Server Adopt Data Port (Applicable only for IP CS)	1 - Yes 2 - No		Yes
Accounting Server Domain VLAN (Applicable only for IP CS and Adopt Data Port =No))	0-4094 or null for No VLAN		Yes
Accounting Server Domain Interface IP Addresss (Applicable only for IP CS and Adopt Data Port =No))	IP address		Yes

Parameter	Range	Default	Run-Time Updated
Accounting Server Domain Interface Subnet Mask (Applicable only for IP CS and Adopt Data Port =No))	IP address		Yes
Accounting Server Domain Gateway (Applicable only for IP CS and Adopt Data Port =No))	IP address		Yes
GPS Page			
Chain Number	1 - 1500	0 (not defined yet-must be defined)	No
GPS Protocol	0 - None 1 - Trimble 2 - Symmetricom	Timble	No
Stop Tx After Hold Over Timeout	■ Disable ■ Enable	Disable	Yes
Hold Over Passed Timeout (min)	0 - 2880 (minutes)	30 (minutes)	Yes
Time Zone Offset From UTC	-12:00 to +13:00, in .30 increments	+02:00	Yes
Daylight Saving Status	■ Disable ■ Enable	Enable	Yes
Daylight Saving Start Date	dd.mm	12.04	Yes
Daylight Saving End Date	dd.mm	15.09	Yes
Daylight Saving Advance Factor	0 to 4:45 hours in 15 minutes steps	1:00	Yes
External 1 PPS Clock	■ Disable ■ Enable	Enable	No
External 16MHz Clock	■ Disable ■ Enable	Disable	No

Parameter	Range	Default	Run-Time Updated
Clock Mode (Micro Base Station only)	■ Master ■ Slave1 ■ Slave2 ■ Slave3 ■ Slave4	Master	No
PF Parameters Page, modular Base Station			
Retry Interval	1-60 (seconds)	10	Yes
Number of Retries	0-5	3	Yes
Keep Alive Timeout (sec)	60-300 (seconds)	60	Yes
PF Listener Port	1-65535	3799	Yes
UDP Destination Port	1-65535	5060	Yes
Server IP Address (per server)	IP address		Yes
UDP Port (per server)	1-65535		Yes
Shared Secret (per server)	1-16 printable characters		Yes
Adopt Data Port	■ Yes ■ No		Yes
VLAN ID (Applicable only if Adopt Data Port =No))	0-4094 or null for No VLAN		Yes
Domain IP Address (Applicable only if Adopt Data Port =No))	IP address		Yes
Domain Subnet Mask (Applicable only if Adopt Data Port =No))	IP address		Yes
Domain Gateway (Applicable only if Adopt Data Port =No))	IP address		Yes
PF Parameters Page, Micro Base Station			
Retry Interval	1-60 (seconds)	10	Yes
Number of Retries	0-5	3	Yes
PF Listener Port	1-65535	3799	Yes

Parameter	Range	Default	Run-Time Updated
UDP Destination Port	1-65535	5060	Yes
IP Address (per server)	IP address		Yes
UDP Port (per server)	1-65535		Yes
VLAN ID (per server)	0-4094. Null or 4095 for none		Yes
Shared Secret (per server)	1-16 printable characters		Yes
General Radio Parameters Page			
Operator ID	X.X.X X: 0-255	186.190.0	No
Cell ID	X.X X: 0-255	0.250	No
ATPC Support	■ Disable ■ Enable Disable is temporary until next reset	Enable	Yes
Optimal Uplink RSSI (dBm)	-80 to -74	-74	Yes
Duplex Mode	FDD, TDD (only TDD applicable for current release)	TDD	No
Duplex DL/UL Ratio (%)	■ 65-35 (%) ■ 60-40 (%) ■ 55-45 (%) ■ 50-50 (%) ■ 45-55 (%) ■ 40-60 (%) ■ 35-65 (%) (See “General Radio Parameters Page” on page 52 for limitations)	50-50 (%)	Yes
Radio Clusters Page			
Name	Up to 32 printable characters	Null	Yes
Location	Up to 255 printable characters		Yes
Sector Heading	0 - 359 (degrees)	0	Yes

Parameter	Range	Default	Run-Time Updated
Beam Width	0 - 359 (degrees)	90	Yes
Outdoor Units Page			
Associated Radio Cluster	The defined Radio clusters		Yes
Configured Frequency Band	According to loaded Frequency Bands file	Not Defined	Yes
Tx Power (dBm)	Depends on ODU Type and Radio Band.	28	Yes
Admin Status	■ Disable ■ Enable	Disable	Yes
Default Operational Settings Page (Ethernet CS)			
Service Working Mode	■ Advanced ■ Quick	Quick	Yes
Default L2/Voice Default Profile (modular Base Station)	Any of the L2 or VoIP Service Profiles from the device's database, or None	Internet Access L2	Yes
Default L2/Voice/Managed VoIP Default Profile (Micro Base Station)	Any of the L2, VoIP or Managed VoIP Service Profiles from the device's database, or None	Internet Access L2	Yes
Default PPPoE Default Profile	Any of the PPPoE Service Profiles from the device's database, or None	None	Yes
Filter Page - Interface Tab (Ethernet CS)			
Admin Status	■ Disable ■ Enable	Disable	Yes
Action	■ Deny ■ Allow	Disable	Yes
Active Filter Type	■ L2 ■ L3/L4	L2	Yes
Filter Page - L2 Tab (Ethernet CS)			
Name	Up to 32 printable characters		Yes
MAC Address	xx-xx-xx-xx-xx-xx or null for "Any"		Yes
Mask	Not applicable in a Micro Base Station. Not applicable for "Any" MAC Address. xx-xx-xx-xx-xx-xx		Yes

Parameter	Range	Default	Run-Time Updated
Direction	Not applicable for “Any” IP Address. ■ Source ■ Destination		Yes
Ethernet Type	Ethertpe from the list or 4 hexadecimal digits or null for Any.		Yes
Interface	■ None ■ Wireless ■ Network ■ Both		Yes
Filter Page - L3/L4 Tab (Ethernet CS)			
Name	Up to 32 printable characters		Yes
IP Address	IP address or null for “Any”		Yes
Mask	Not applicable in a Micro Base Station. Not applicable for “Any” IP Address. IP address format.		Yes
Direction	Not applicable in a Micro Base Station. Not applicable for “Any” IP Address. ■ Source ■ Destination		Yes
IP Protocol	A protocol from the list or “Any” or a number from 0 to 254. In a Micro Base Station, the available protocols are TCP (6), UDP (17) or "Any".		Yes
Port	A port from the list or “Any” or a number from 0 to 65534 . Applicable only if the IP Protocol is either 6 (TCP) or 17 (UDP).		Yes
Port Direction	Not applicable to "Any" Port. ■ Source ■ Destination		Yes

Parameter	Range	Default	Run-Time Updated
Interface	■ None ■ Wireless ■ Network ■ Both		Yes
MAC Deny List Page			
MAC Address	xx-xx-xx-xx-xx-xx		Yes
Subscriber Units Page			
Permanence Status	■ Permanent ■ Temporary		Yes
Services Page (configurable only for permanent services in Ethernet CS)			
Name	Up to 32 printable characters		Yes
Service Type	Ethernet CS: ■ L2 ■ PPPoE ■ VoIP ■ Managed VoIP (Micro Base Station) Not configurable in IP CS		Yes
Service Profile	A Service Profile from the device's database		Yes
SU MAC Address	An SU's MAC Address from the device's database		Yes
Subscriber	A Subscriber from the device's database		Yes
Hybrid VLAN Mode	■ On ■ Off		Yes
VLAN Classification Mode	■ On ■ Off		Yes
Access VLAN	0 - 4094 or None		Yes

Parameter	Range	Default	Run-Time Updated
Admin Status	■ Disable ■ Enable		Yes
VLAN List	Each VLAN ID: 0 - 4094		Yes
Subscribers Page (Ethernet CS)			
Subscriber Name	Up to 32 printable characters. Must be unique for the entire network.		Yes
First Name	Optional. Up to 50 printable characters.		Yes
Last Name	Optional. Up to 50 printable characters.		Yes
Description	Optional. Up to 50 printable characters.		Yes
Admin Status	■ Disable ■ Enable		Yes
Service Profiles Page			
Service Profile Name	Up to 32 printable characters		Yes
Service Type	Ethernet CS: ■ L2 ■ PPPoE ■ VoIP ■ Managed VoIP (Micro Base Station) IP CS: ■ IP Mode Data ■ IP Mode VoIP ■ IP Mode Managed VoIP		Yes
Forwarding Rule	A Forwarding Rule from the device's database (if applicable for the specific Service Type)		Yes
Priority Classifier	A Priority Classifier from the device's database (if applicable for the specific Service Type)		Yes
VLAN Transparency Mode (Ethernet CS)	■ On ■ Off		Yes

Parameter	Range	Default	Run-Time Updated
VPL ID (Ethernet CS)	0 to 4094 or None (4095) or Not Applicable (4096) for VLAN Transparency mode = On.		Yes
Priority Marking Mode (Ethernet CS)	■ Transparent ■ 802.1p ■ DSCP		Yes
Priority Marking Value (Ethernet CS)	■ Transparent Marking Mode: Not applicable ■ DSCP Marking Mode: 0 - 63 ■ 802.1p Marking Mode: 0 - 7		Yes
Max Number of Voice Calls	0 to 50 calls.		Yes
Voice Domain	Applicable only for Managed VoIP Service Profiles (Micro Base Station) or IP Mode Managed VoIP Service Profile (modular Base station). A Voice Domain from the device's database		Yes
Service Group Name	Applicable only n IP CS Switching Mode for IP Mode Data Service Profiles. A Service Group Name from the device's database.		Yes
Forwarding Rules Page			
Name	Up to 32 printable characters		Yes
Type	Ethernet CS: ■ L2 ■ PPPoE ■ VoIP ■ Managed VoIP (Micro Base Station) IP CS: Not configurable		Yes
Unicast Relaying	■ Disable ■ Enable		Yes

Parameter	Range	Default	Run-Time Updated
Multicast Relaying	■ Disable ■ Enable		Yes
Unknown address Fwd Policy	■ Reject ■ Forward		Yes
Multicast QoS	A QoS Profile from the device's database		Yes
Priority Classifiers Page			
Name	Up to 32 printable characters		Yes
Priority Type	■ DSCP ■ 802.1p. (not available in IP CS)		Yes
Uplink/Downlink Limits	Each Limit must be higher than its predecessor and the last number must be the highest available for the applicable priority type (7 for 802.1p, 63 for DSCP).		Yes
QoS Profiles	QoS Profiles from the device's database		Yes
QoS Profiles Page			
Name	Up to 32 printable characters		Yes
QoS Type	BE NRT RT CG		Yes
CIR	Applicable only to RT and NRT QoS Types. From 1 to 12,000 Kbps.		Yes
MIR	Applicable only to NRT and BE QoS Types. From 1 to 12,000 Kbps.		Yes
CT	Applicable for RT and NRT QoS Types. ■ Short ■ Medium ■ Long		Yes
PS	Packet Size is applicable only to CG QoS Type. From 64 to 1550 (bytes).		Yes

Parameter	Range	Default	Run-Time Updated
SI	Sample Interval is aplicable only to CG QoS Type. From 5 to 100 (milliseconds), using increments of 5 milliseconds.		Yes
Voice Domain Page			
Name	1-32 printable character		Yes
PF IP Address	IP address of a Policy Server that exists in the database		Yes
Service Group Page (IP CS)			
Service Group Name	1 to 32 printable character		Yes
ISP Domain Name	Up to 32 printable characters		Yes
Nomadicity	■ Yes ■ No	Yes	Yes
Type	■ Proxy ■ Opt 82 ■ Transparent	Proxy	Yes
Relay Mode	■ Opt 82 With Relay ■ Opt 82 Without Relay	Opt 82 With Relay	Yes
GI IP Address	IP address		Yes
GI Subnet Mask	IP address	255.255.255.248	Yes
DHCP Server IP Address	IP address		Yes
ISP Domain VLAN ID	0-4094 or null for No VLAN		Yes
ISP Domain Gateway	IP address		Yes
Data Port Page			
Configured Auto Negotiation (Micro Base Station)	■ Disable ■ Enable	Enable	Yes

Parameter	Range	Default	Run-Time Updated
Configured Link Speed	NPU: ■ Full duplex 100Mbps ■ Full duplex 1Gbps NOTE: In current release only Full Duplex 100Mbps is supported by the NPU. Micro Base Station (if Configured Auto Negotiation is set to Disable): ■ Full duplex 100Mbps ■ Half duplex 100Mbps ■ Full duplex 10Mbps ■ Half duplex 10Mbps	NPU: Full Duplex 100Mbps. Micro Base Station: Not Applicable.	No
IP Address	IP address	1.1.1.3	No
Subnet Mask	IP address	255.255.255.0	No
Default Gateway	IP address	0.0.0.0	No
Management VLAN ID	0-4094 or None (4095)	Null	Yes
Management Port Page			
Configured Auto Negotiation (Micro Base Station)	■ Disable ■ Enable	Enable	Yes
Configured Link Speed (Micro Base Station)	Applicable only if Configured Auto Negotiation is set to Disable: ■ Full duplex 100Mbps ■ Half duplex 100Mbps ■ Full duplex 10Mbps ■ Half duplex 10Mbps	Not Applicable	Yes
IP Address	IP address	10.0.0.1	No
Subnet Mask	IP address	255.255.255.0	No
Default Gateway	IP address	0.0.0.0	No
Destination subnet	IP address	0.0.0.0	No
Destination Subnet Mask	IP address	0.0.0.0	No

Parameter	Range	Default	Run-Time Updated
Authorized Managers Page			
IP Address	IP address		Yes
Read Community	Up to 23 printable characters, case sensitive		Yes
Write Community	Up to 23 printable characters, case sensitive		Yes
Trap Enabled	Enable/Disable (check box)		Yes
Bridge and Voice Page			
Bridge Aging Time	1 - 1440 minutes or 0 for no aging	10 minutes	Yes
DRAP TTL Retries	1 - 100	4	Yes
Voice Parameters Page (AU)			
Max No. of Voice Calls	0 - 300	50	Yes
Channels Page			
Diversity Mode	■ No Diversity ■ Second Order Diversity ■ Fourth Order Diversity for NLOS ■ Fourth Order Diversity for LOS and NLOS	No Diversity	Yes (Automatic Reset)
Associated ODU	A defined ODU ID		No
Configured Tx Frequency	According to the Configured Frequency Band in the Associated ODU, and the Bandwidth		No
Admin Status	■ Disable ■ Enable	Disable	No
Air Interface Page (AU/Micro Base Station)			
Sector ID	0-255	206	No
Max. Cell Radius (km)	Bandwidth 3.5 MHz: 10 -50 km Bandwidth 5 MHz: 7 - 45 km	20 km	No

Parameter	Range	Default	Run-Time Updated
Bandwidth (MHz)	■ 1.75 ■ 3.5 ■ 5 ■ 7 ■ 10 A Bandwidth that is not supported by the AU/Micro Base Station will be rejected	3.5	No
Multirate Support	■ Disable ■ Enable Disable is temporary until next reset	Enable	Yes
Uplink Basic Rate	■ BPSK 1/2 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4	BPSK 1/2	Yes
Downlink Basic Rate	■ BPSK 1/2 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4	BPSK 1/2	Yes

Parameter	Range	Default	Run-Time Updated
Min Number of Sub-Channels	■ 1 ■ 2 ■ 4 ■ 8 ■ 16	1	No
Registration Parameters Page (SU)			
Installer Password	Up to 20 printable characters, case sensitive	installer	Yes
Bridging Page			
Limit Number of Supported Devices	■ Disable ■ Enable	Disable	Yes
Max Number of Supported Devices	1 - 512	512	Yes
Aging Time	1 - 1440 minutes	3 minutes	Yes
Air Interface Page (SU)			
Uplink Basic Rate	Configurable only when Multirate Support in the AU/Micro Base Station is disabled. ■ BPSK 1/2 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4		

Parameter	Range	Default	Run-Time Updated
Downlink Basic Rate	Configurable only when Multirate Support in the AU/Micro Base Station is disabled. ■ BPSK 1/2 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4		
Base Station ID	X.X.X.X.X.X. X: 0 - 255		No
Base Station ID Mask	X.X.X.X.X.X. X: 0 - 255		No
Bandwidth (MHz)	■ 1.75 ■ 3.5 ■ 5 ■ 7 ■ 10 A Bandwidth that is not supported by the unit will be rejected.		No
Uplink (Tx) Frequency (MHz)	Depends on Frequency Bands Group available for the AU/Micro Base Station, and the Bandwidth. Not applicable to current release.		No
Frequency Scanning Page			

Parameter	Range	Default	Run-Time Updated
Bandwidth (MHz)	■ 1.75 ■ 3.5 ■ 5 ■ 7 ■ 10 A Bandwidth that is not supported by the unit will be rejected.		
Scanning Start Frequency (MHz)	Depends on Frequency Bands Group available for the AU/Micro Base Station, and the Bandwidth.		No
Scanning End Frequency (MHz)	Depends on Frequency Bands Group available for the AU/Micro Base Station, and the Bandwidth.		No
Scanning Main Step (KHz)	Bandwidth 3.5 MHz: 125 to 1750 in steps of 125 Bandwidth 5 MHz: 125 to 5000 in steps of 125		No
Scanning Intermediate Step Mask (KHz)	Enable/Disable (checked/unchecked) for each of the 8 steps		No
Best BST/AU Page			
Best BST/AU Support	■ Disable ■ Enable Starting on SW Version 4.5 hard-coded to Enable		No
BST/AU ID	X.X.X.X.X.X X: 0 - 255		No
BST/AU ID Mask	X.X.X.X.X.X X: 0 - 255		No
Preferred BST/AU ID	X.X.X.X.X.X X: 0 - 255		No

Parameter	Range	Default	Run-Time Updated
Preferred BST/AU ID Mask	X.X.X.X.X.X X: 0 - 255		No
Mobility Mode	■ Mobile ■ Nomadic	Nomadic	Yes
Ethernet Port Page (SU)			
Configured Auto Negotiation	■ Disable ■ Enable	Enable	No
Configured Link Speed	Applicable only if Configured Auto Negotiation is set to Disable: ■ Full duplex 100Mbps ■ Half duplex 100Mbps ■ Full duplex 10Mbps ■ Half duplex 10Mbps	Not Applicable	No