AlvariCRAFT™ for BreezeMAX FDD

User Manual

BreezeMAX Device Manager 3.1.0
for BreezeMAX SW Version 3.0
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About This Manual

This manual describes AlvariCRAFT Device Manager Version 3.1.0, and how to use it for managing BreezeMAX FDD equipment using SW Version 3.0.

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 FDD 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 FDD System Manual*.

Contents

Figures

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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 Base Station(s) that can be managed by the AlvariCRAFT utility, add new Base Stations to the list, delete Base Stations from the list and edit the relevant properties of the Base Stations in the list. You can open the Device Manager or establish a Telnet cut-through to a selected device.

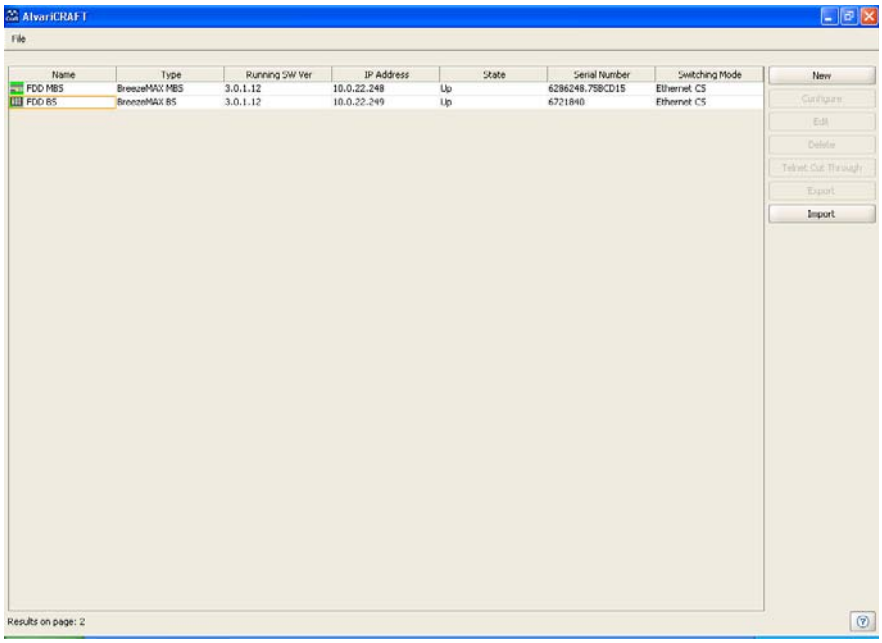


Figure 1-1: The Main Window

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.
Configure	Opens the Device Manager (see "Managing a Base Station" on page 19), allowing to manage the selected device. 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 Base Station to the Managed Devices list:

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

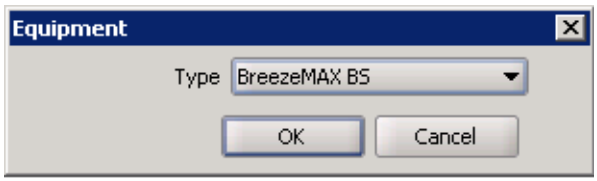


Figure 1-2: Equipment Type Selection

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.

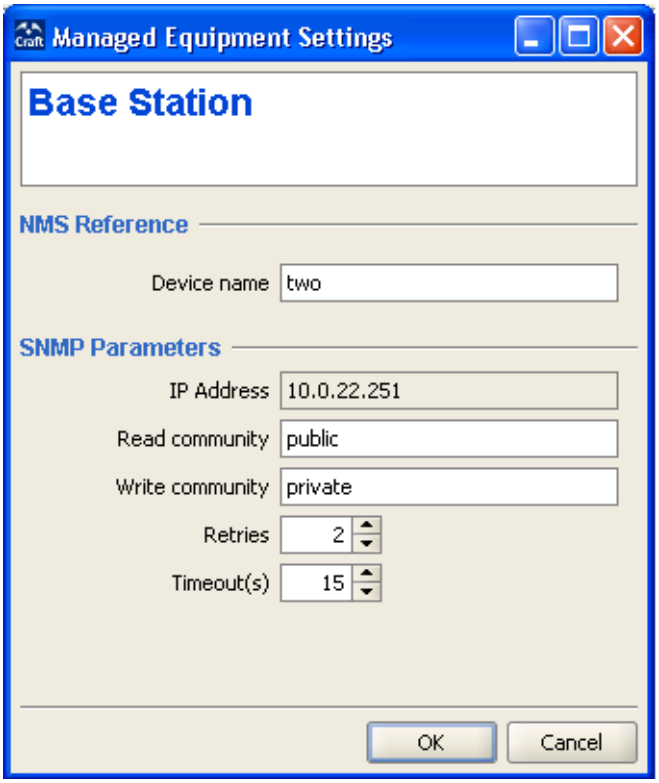


Figure 1-3: The Equipment Editor

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 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 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 (NPU/MBS). 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(NPU card/MBS). Displayed only after connecting with the device.
Switching Mode	This parameter is not applicable for FDD systems (always Ethernet CS)

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 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

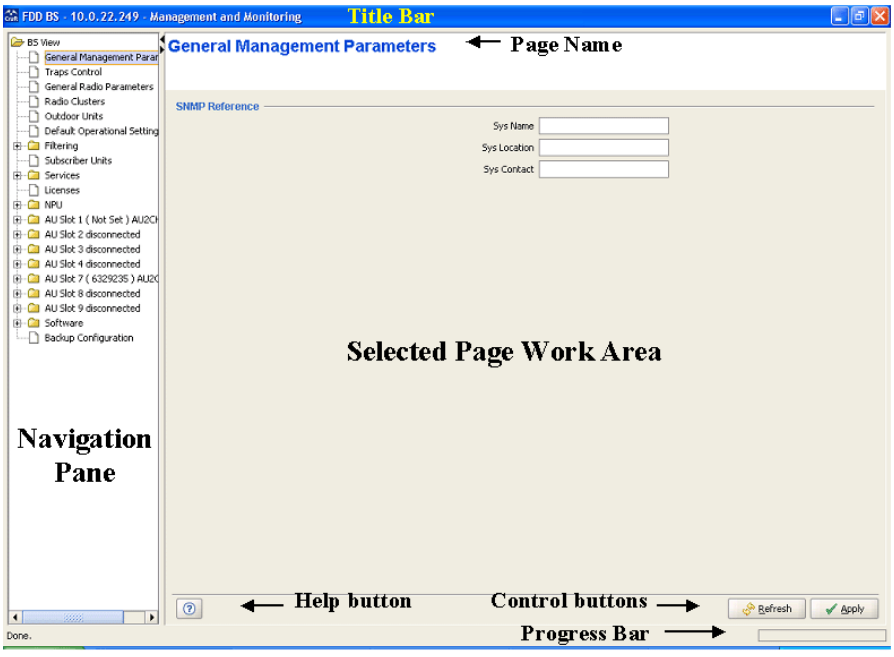


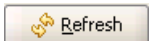
Figure 1-4: The Device Manager Window

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
	Click on the Refresh button to update the information displayed in the page according to current values acquired from the device.
	Click on the pply button to implement 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

All 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.

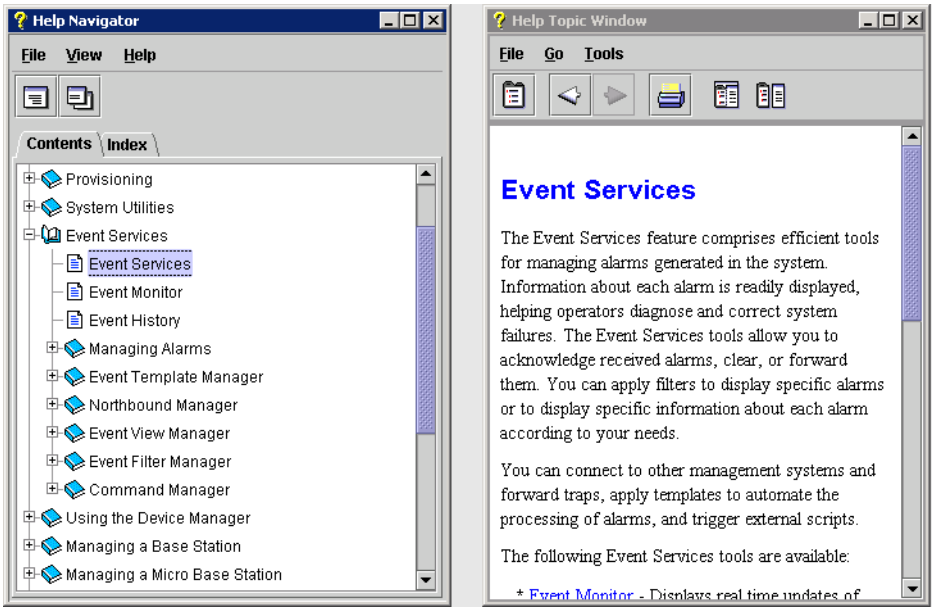


Figure 1-5: Help Navigator Window (Left) and Help Topic Window (Right)

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.

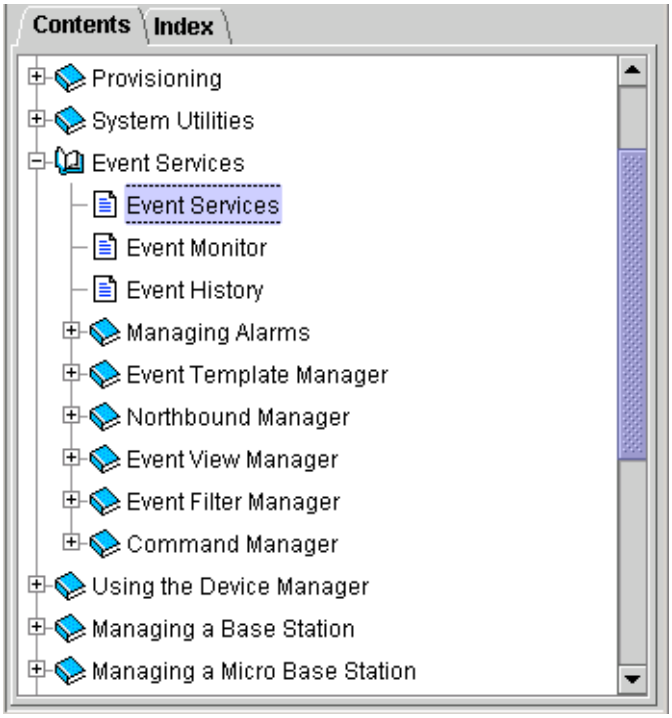


Figure 1-6: Contents Tab

1.4.1.2 Index Tab

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

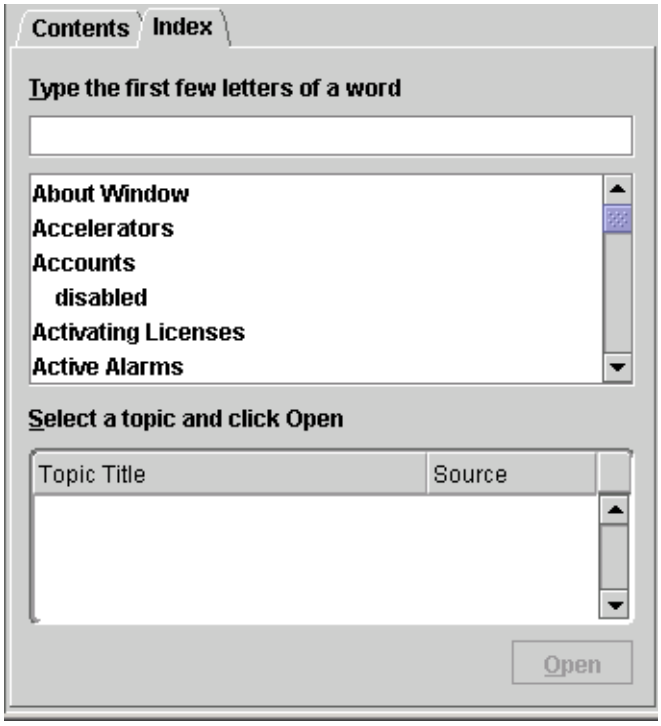


Figure 1-7: Index Tab

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 Base Station

2.1 Introduction to 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 (Base Station) View Page" on page 22
  - "General Management Parameters Page" on page 25
  - "Traps Control Page" on page 26
  - "General Radio Parameters Page" on page 28
  - "Radio Clusters Page" on page 30
  - "Outdoor Units Page" on page 32
  - "Default Operational Settings Page" on page 35
  - Filtering:
    - "Filters Page" on page 38
    - "MAC Deny List Page" on page 44
    - "Filtering Performance Page" on page 45
  - "Subscriber Units Page" on page 46
  - Services:
    - "Services Page" on page 49
    - "Subscribers Page" on page 54
    - "Service Profiles Page" on page 57
    - "Forwarding Rules Page" on page 62
    - "Priority Classifiers Page" on page 66
    - "QoS Profiles Page" on page 69
    - "Q in Q Page" on page 72
  - "Licenses Page" on page 74
  - NPU: "NPU View Page" on page 80

2.2 BS (Base Station) View Page

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

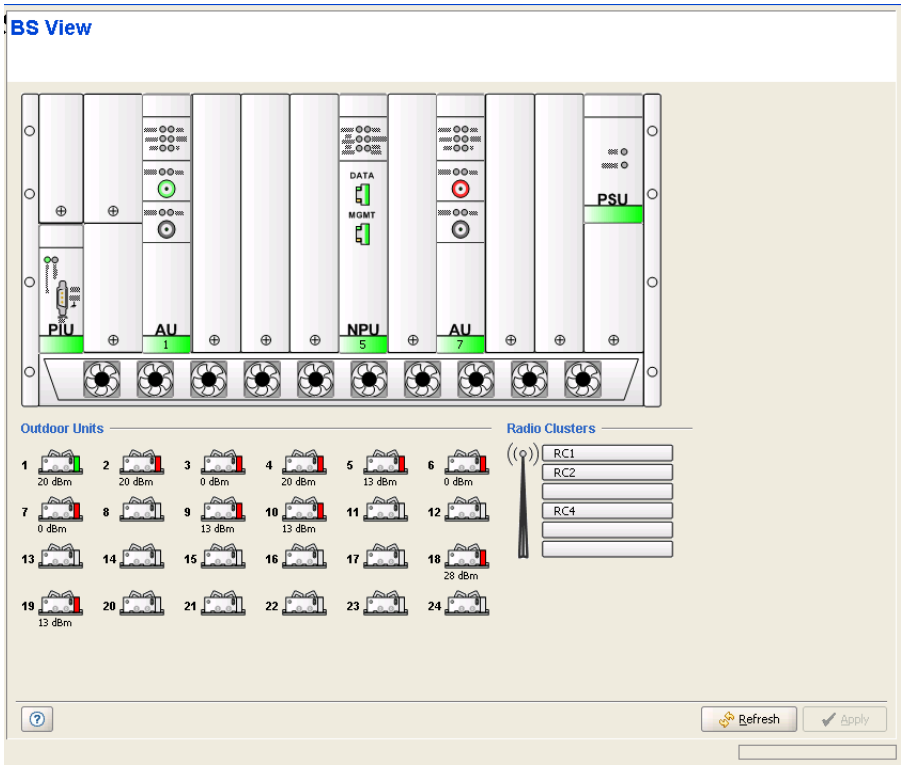


Figure 2-1: BS View Page

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 Base Station, 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 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).
- 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 cluster to provide clear distinction between defined and not-defined clusters.

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 Base Station/Micro Base Station.

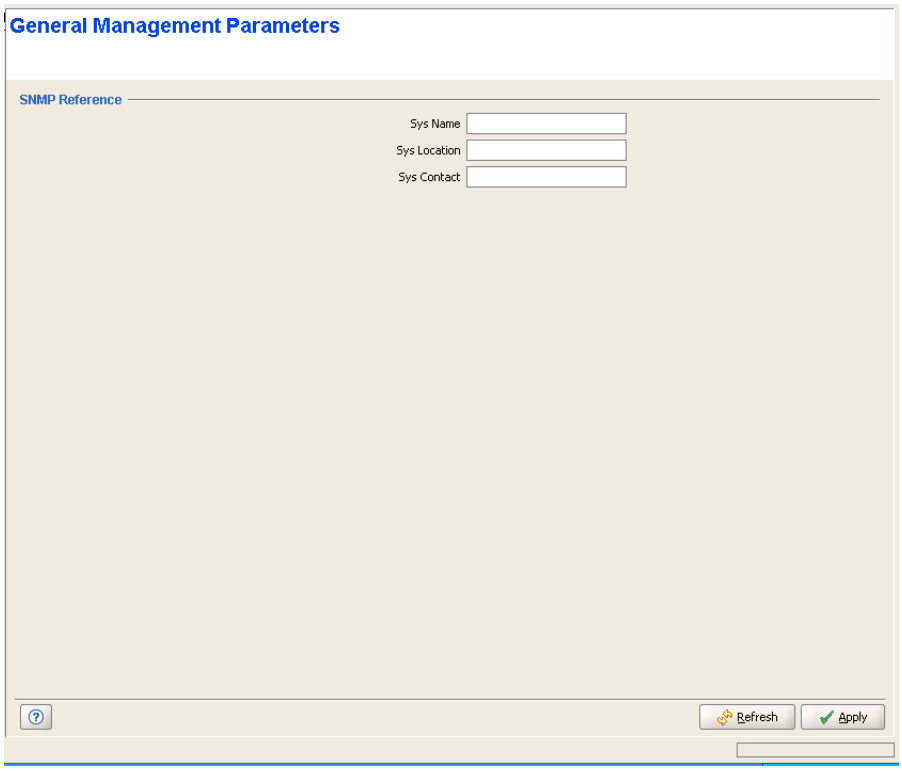


Figure 2-2: General Management Parameters Page

The General Management Parameters page includes the following SNMP Reference parameters:

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.

2.4 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.

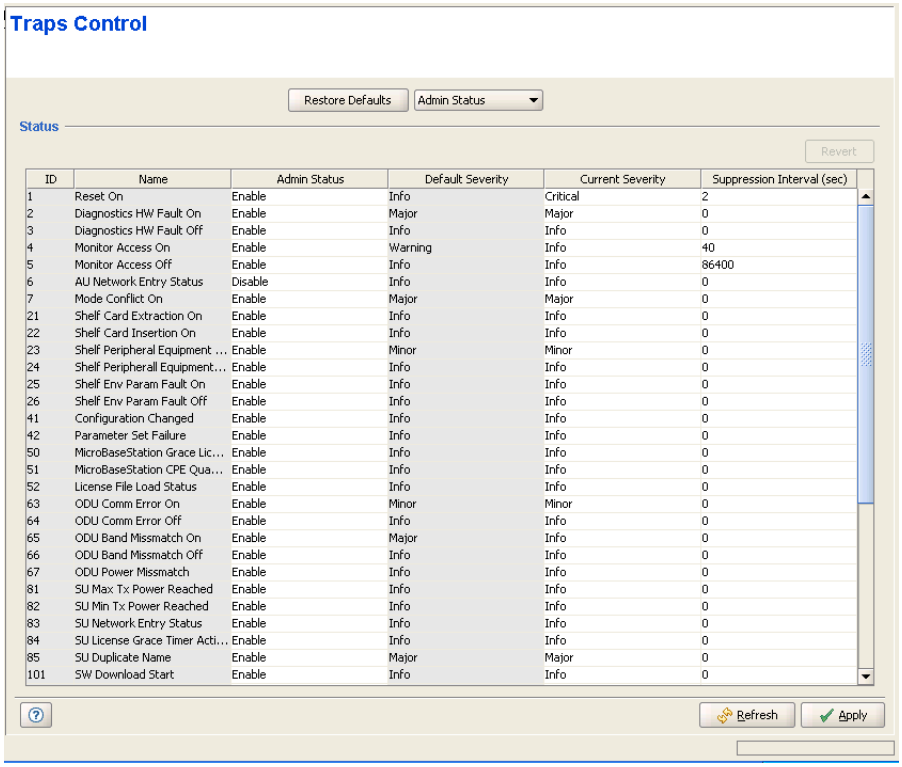


Figure 2-3: Traps Control Page

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 base station 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 General Radio Parameters Page

The General Radio Parameters page enables viewing and configuring the general radio parameters of the Base Station/Micro Base Station.

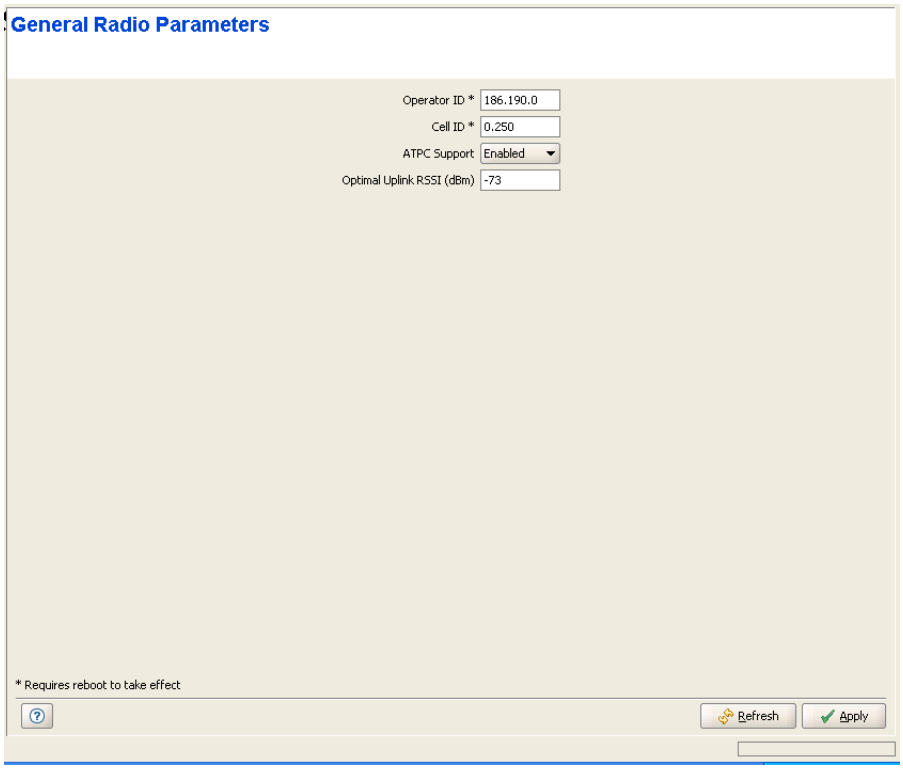


Figure 2-4: General Radio Parameters Page

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 Base Station/Micro Base Station 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.
Cell ID	A unique identifier of Base Station/Micro Base Station. The same Cell ID should not be used by any other Base Station/Micro Base Station 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 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 Base Station/Micro Base Station boots with the ATPC enabled, disregarding its status before the device was reset.
Optimal Rx 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 -103 to -60 (dBm).

2.6 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).

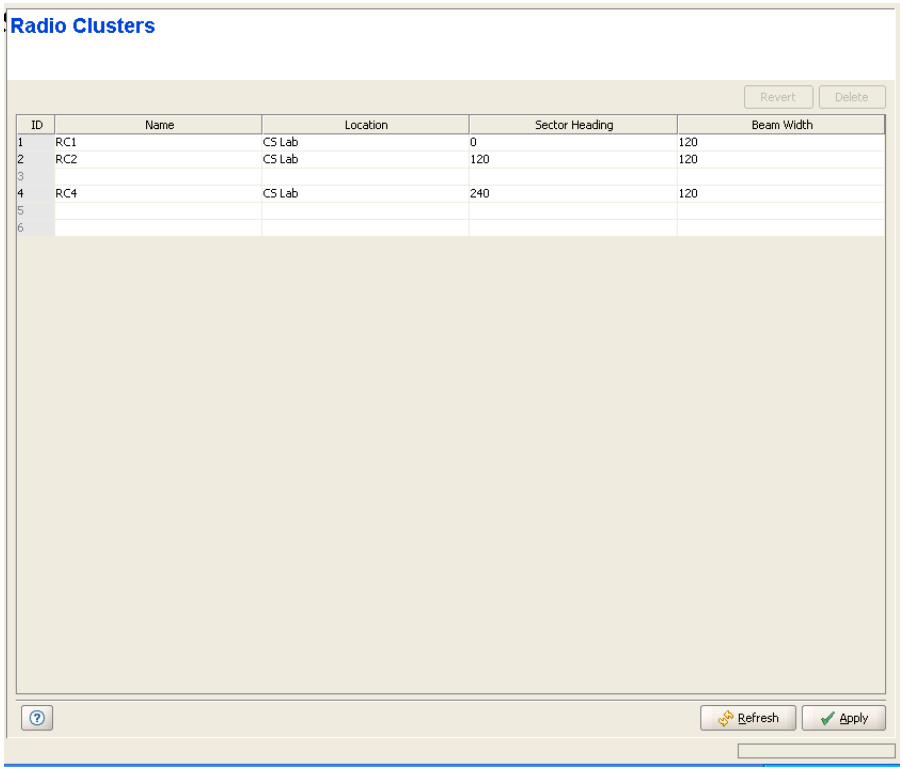


Figure 2-5: Radio Clusters Page (Base Station)

The Radio Clusters table includes the following parameters:

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

2.7 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).

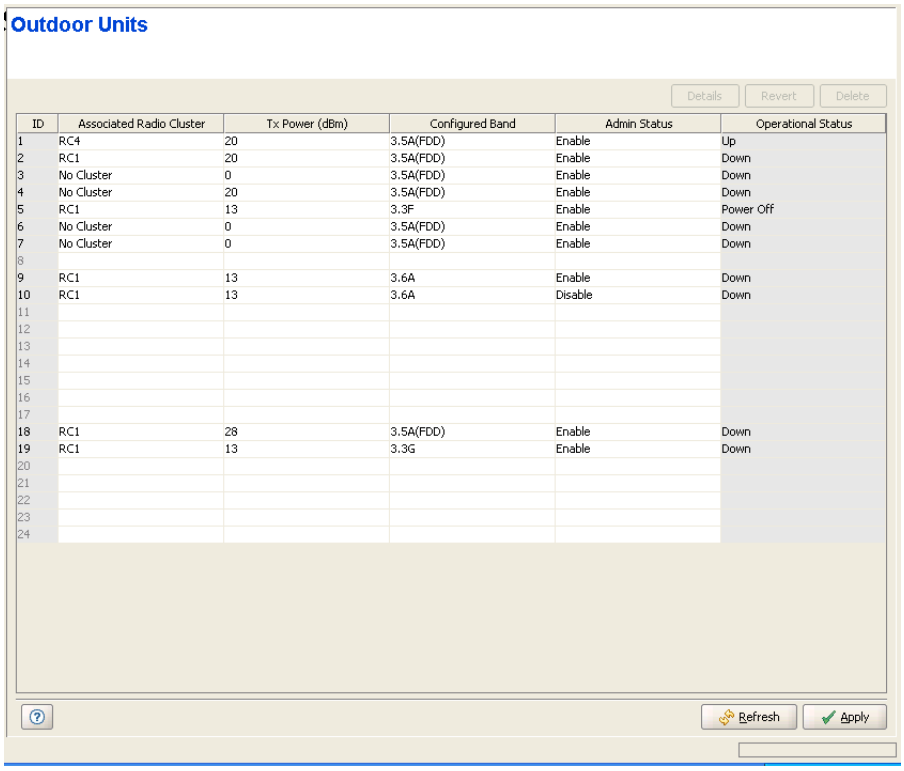


Figure 2-6: Outdoor Units Page (Base Station)

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 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 Cluster.

Parameter	Description
Tx Power	The power level of the transmitted signal at the antenna port of the ODU. The range is from 13 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 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.
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.
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
- HW Revision

- 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 Tx Power parameter.
- Connected AU Slot No (not applicable for a Micro Base Station)
- Channel

2.8 Default Operational Settings Page

The Default Operational Settings page enables viewing and modifying general default parameters related to service provisioning and new SUs that join the network.

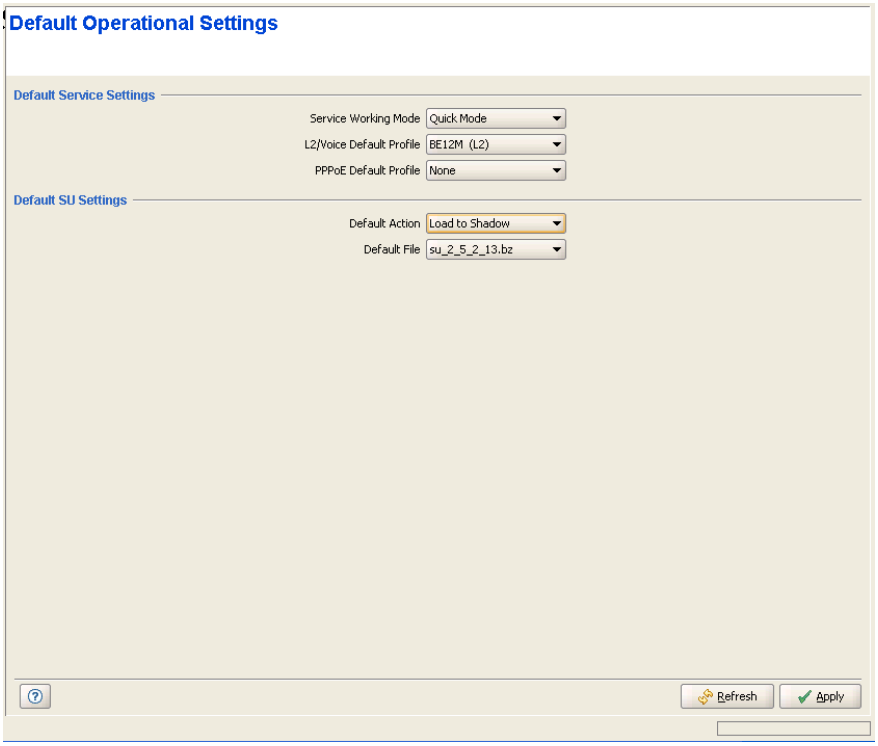


Figure 2-7: Default Operational Settings Page

The Default Operational Settings page includes the following parameters:

- "Default Service Settings"
- "Default SU Settings"

2.8.1 Default Service Settings

A Base Station/Micro Base Station can operate in either Advanced or Quick mode of services provisioning.

Advanced Mode enables operators to completely deny services to SUs that are not defined in the system. This increases the security of the system but complicates

slightly the installation process, because an SU must be defined in the system before it can be registered and receive any service.

Quick Mode is intended primarily for scenarios where the operator is not concerned with potentially "stolen" SUs, and wishes to provide basic services also to SUs that are not yet defined in the system. It may also be used as a temporary operation mode during SUs installation phase.

In both modes, defined services are provisioned to defined SUs. The difference between the two modes is in provisioning of services to SUs that are not defined in the system.

In Advanced mode, an undefined SU that is authenticated by the system will be added to the database of the NPU (NMS) as Temporary. The database will include also its MAC address and the configured registration parameters. No services are provided as long as the SU is defined as Temporary. To receive services, the SU should be defined in the system. Then it becomes a Permanent SU and the required services should be assigned to it.

In Quick mode, an undefined SU that is authenticated by the system will be added to the database of the NPU (NMS) as Temporary. The subscriber will be able to use only services based on the Default Service Profile(s). Once the SU is defined as Permanent and services are assigned to it, it will be able to use the defined services.

The Default Service Settings parameters are:

Parameter	Description
Service Working Mode	The Service Provisioning Mode: Advanced or Quick.
L2/Voice Default Service	The default L2 or Voice Service Profile to be used by temporary SUs in Quick Mode. Available profiles - any of the L2 or Voice Service Profiles existing in the device's database, or None.
PPPoE Default Service	The default PPPoE Service Profile to be used by temporary SUs in Quick Mode. Available profiles - any of the PPPoE Service Profiles existing in the device's database, or None

2.8.2 Default SU Settings

Parameter	Description
Default Action	The Default Action is the action to be taken with the Default File when a new temporary SU joins the cell when operating in Quick Mode. The available options are: ■ None: Do not perform any action. ■ Download to Shadow: Select this option to download a specified SW file from the NPU/Micro Base Station to the Shadow memory of the SU. If the specified file already exists in the SU, no action will take place. ■ Run from Shadow: Select this option to download a specified SW file from the NPU/Micro Base Station to the Shadow memory of the SU, reset the SU and reboot 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 Download 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 is the current Main version, no action will take place. ■ Set as Main: Select this option to download a specified SW file from the NPU/Micro Base Station to the Shadow memory of the SU, reset the SU 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 a Download and Run from Shadow operation was 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.
Default File	The Default File is the name of the SU SW file to be used for new temporary SUs when operating in Quick Mode. The selection options includes all SU SW Files available in the NPU/Micro Base Station.

2.9 Filters Page

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).

2.9.1 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.

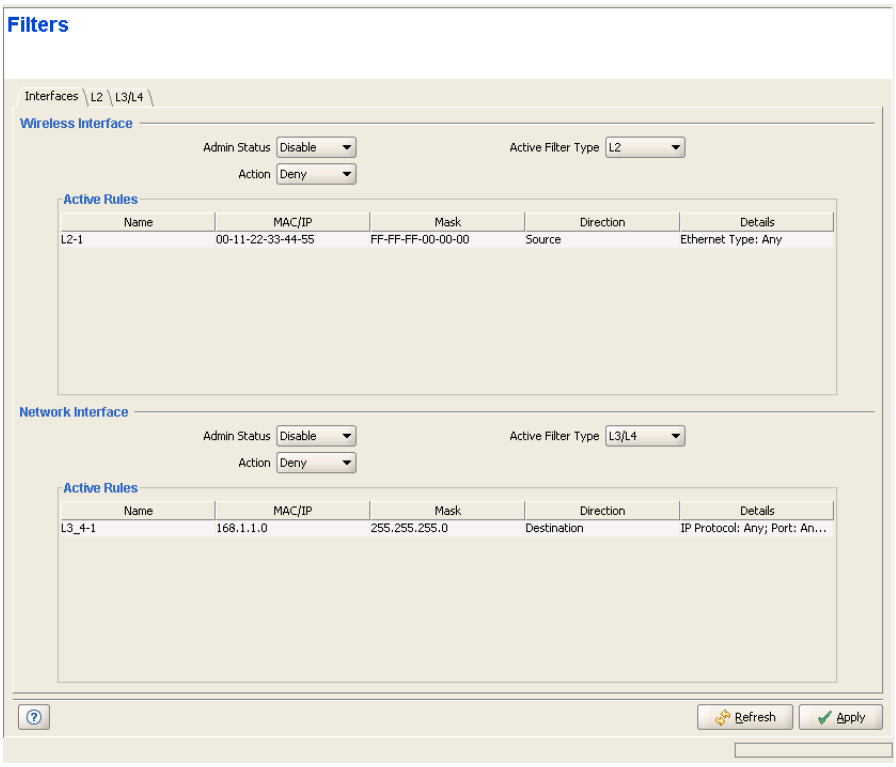


Figure 2-8: Filters Page - Interface Tab (BS)

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.

2.9.2 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.

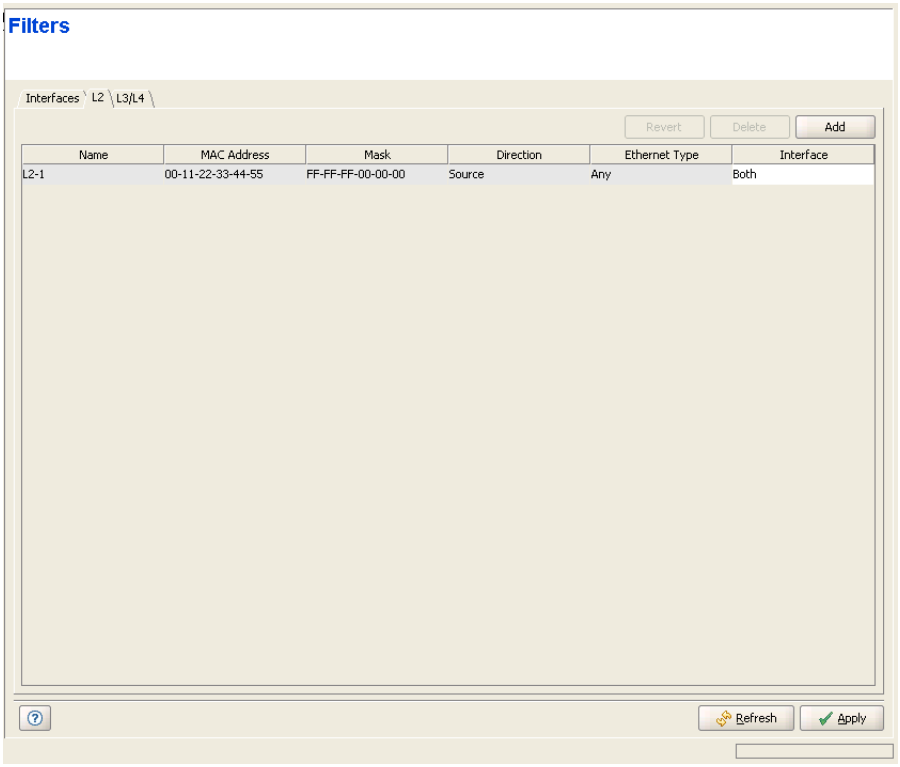


Figure 2-9: Filters Page - L2 Tab

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 38) 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.

2.9.3 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.

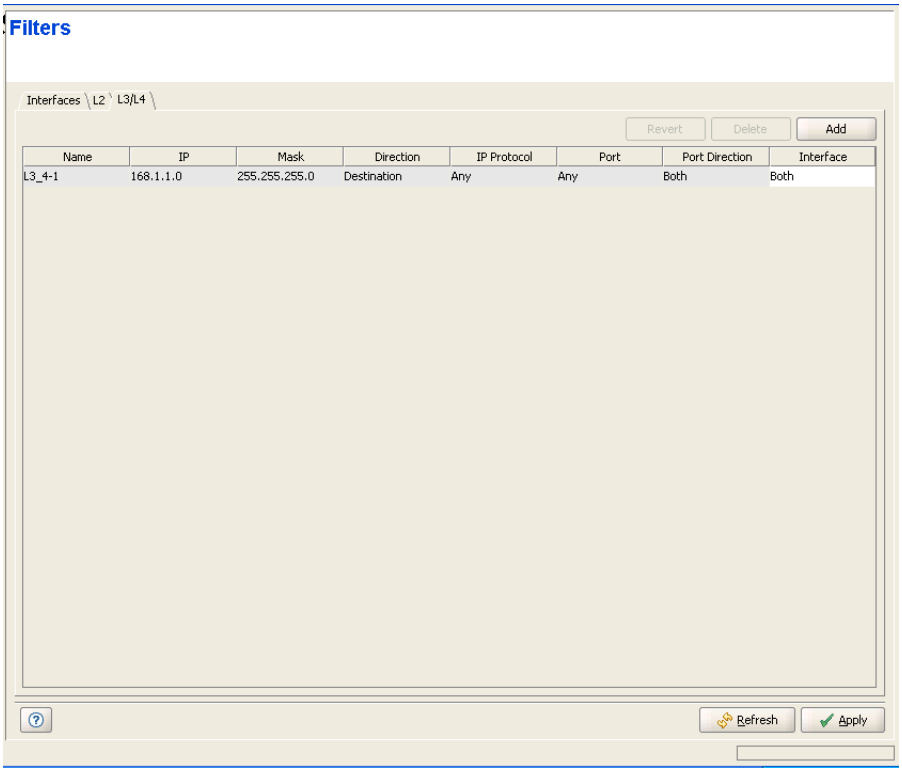


Figure 2-10: Filters Page - L3/L4 Tab

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 applicable 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 38) 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.

2.10 MAC Deny List Page

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.

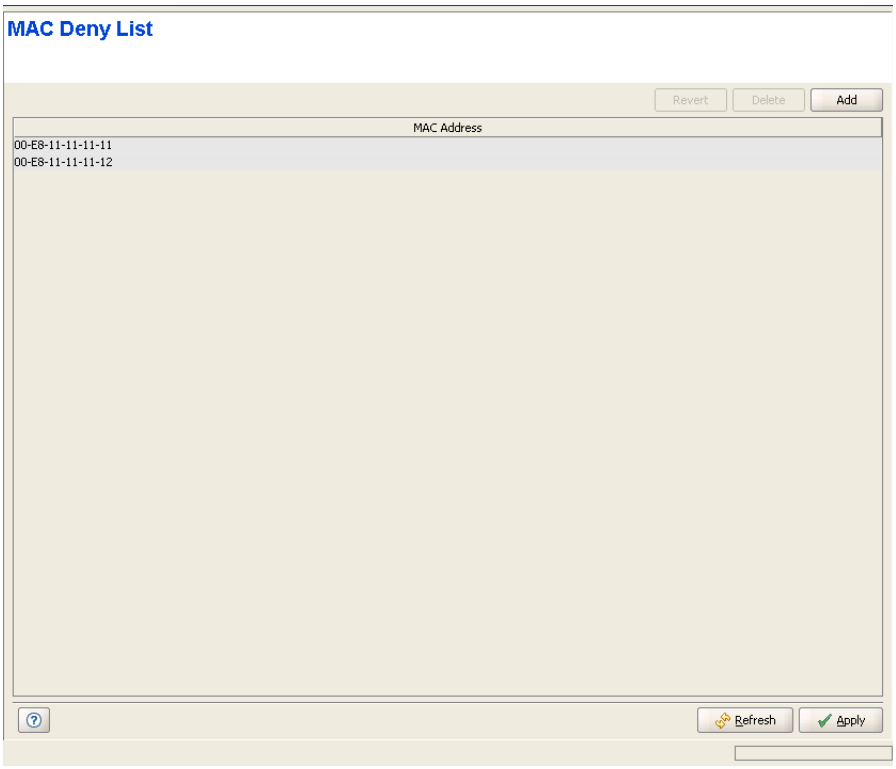


Figure 2-11: MAC Deny List Page

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.

2.11 Filtering 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 167.

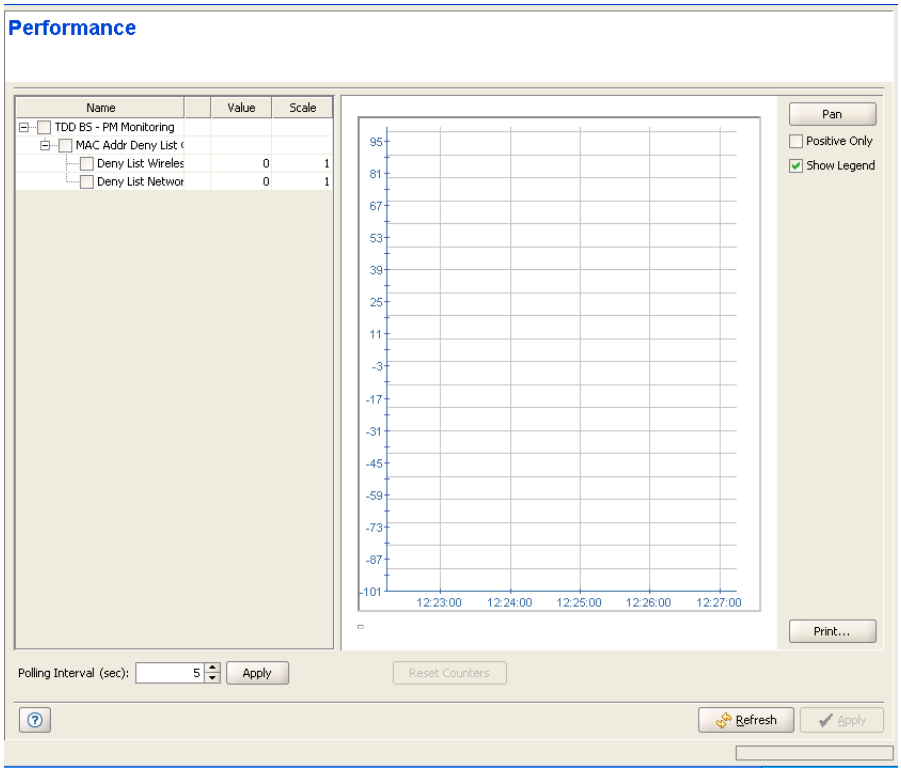


Figure 2-12: Filtering - Performance Page

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.

2.12 Subscriber Units Page

The Subscriber Units page displays general details on all Subscriber Units that are defined in the Base Station/Micro Base Station. The list includes also registered temporary SUs.

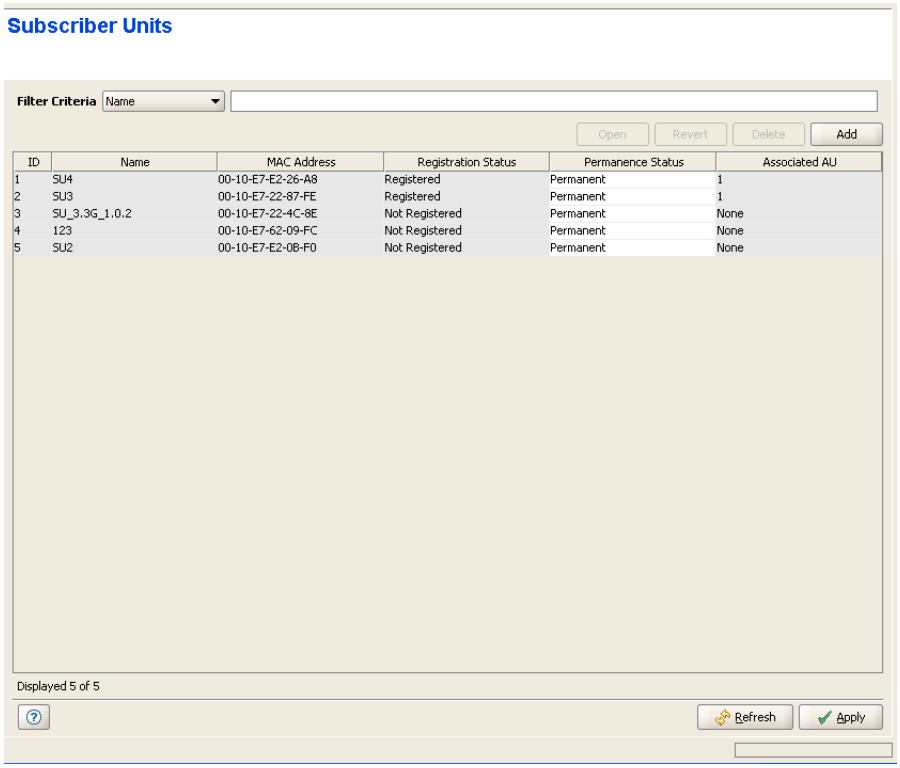


Figure 2-13: Subscriber Units Page

The Base Station 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 Units:

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 (in Modular Base Station).
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	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. 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 Base Station/Micro Base Station).
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.

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 (see "Managing a Subscriber Unit" on page 139).

To remove a selected SU from the database:

Select an SU's entry and click on the **Delete** button to remove the SU from the database of the Base Station/Micro Base Station. Only disconnected (Not Registered) SUs can be deleted.

To add a new SU:

Click on the **Add** button to add a new SU to the database of the Base Station/Micro Base Station. The SU will be added as Permanent.

2.13 Services Page

The Services page displays a list of all Services in the database of the Base Station/Micro Base Station. 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. A Temporary Service can be granted to a Temporary SU by a RADIUS Authentication Server. 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 editted.

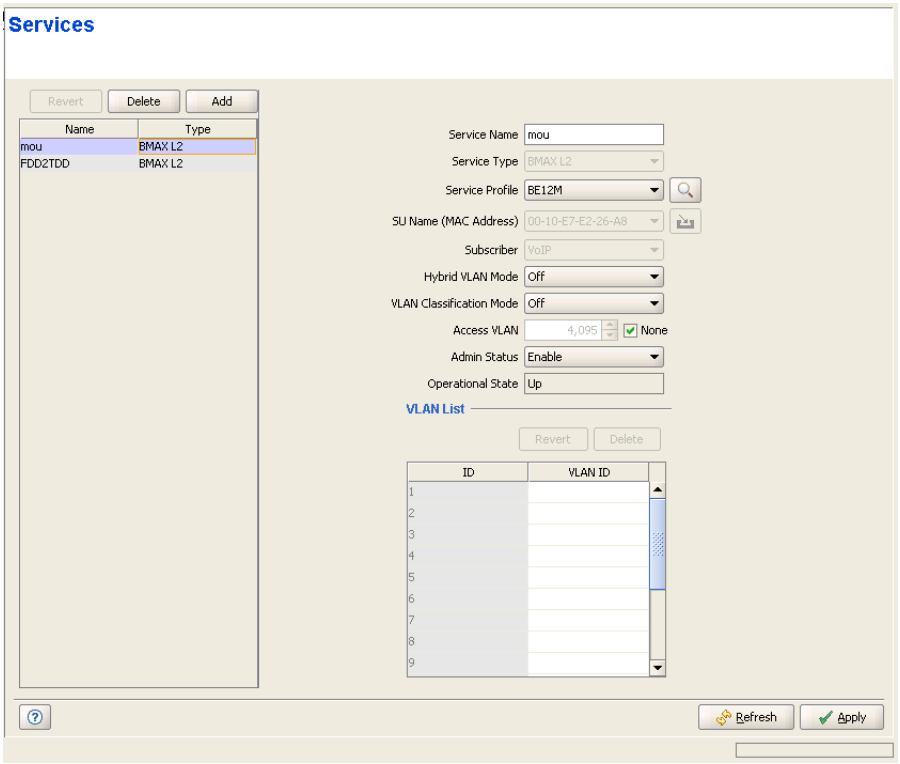


Figure 2-14: Services Page

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: L2, PPPoE or 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 Base Station/Micro Base Station. 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 Base Station/Micro Base Station, 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. The Service Name must be unique per device.
Service Type	The Service Type: L2, PPPoE or VoIP. The Service Type of an existing Service cannot be modified.
Service Profile	The Name of the Service Profile. The drop-down menu includes all Service Profiles with a matching Service Type that are available in the database of the Base Station/Micro Base Station. Click on the Preview button () to view the parameters of the selected Service Profile and its components (Forwarding Rule, Priority Classifier and relevant QoS Profiles). Refer to "Service Profiles Page" on page 57 for more details on Service Profiles.
SU MAC Address	The MAC Address of the SU associated with the Service. The SU MAC Address drop-down menu includes the MAC Addresses of all SUs in the database of the Base Station/Micro Base Station. You can also click on the **Select** button to view the main details of all available SUs. The MAC Address can be modified only if the Admin Status of the Service is disabled.
Subscriber	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 Base Station/Micro Base Station. The Subscriber of an existing Service cannot be modified. The Subscriber Name is not applicable to a Temporay Service. Refer to "Subscribers Page" on page 54 for more details on Subscribers.

Parameter	Description
Hybrid VLAN 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, excluding the combination of L2 Service and VoIP Service.
VLAN Classification 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).

Parameter	Description
Access VLAN	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.
Operational State	A read-only display of the operational status. Up means that the Service is currently in use.
VLAN List	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.

2.14 Subscribers Page

The Subscribers page displays a list of all Subscribers in the database of the Base Station/Micro Base Station. 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.

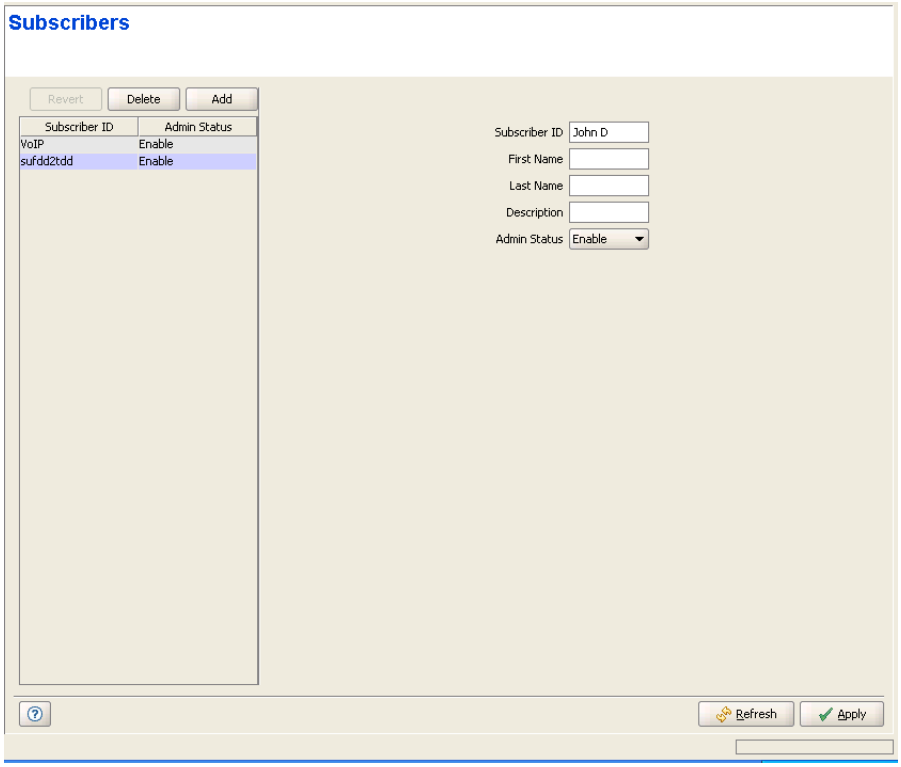


Figure 2-15: Subscribers Page

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 Base Station/Micro Base Station. 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 Base Station/Micro Base Station, 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.

2.15 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.

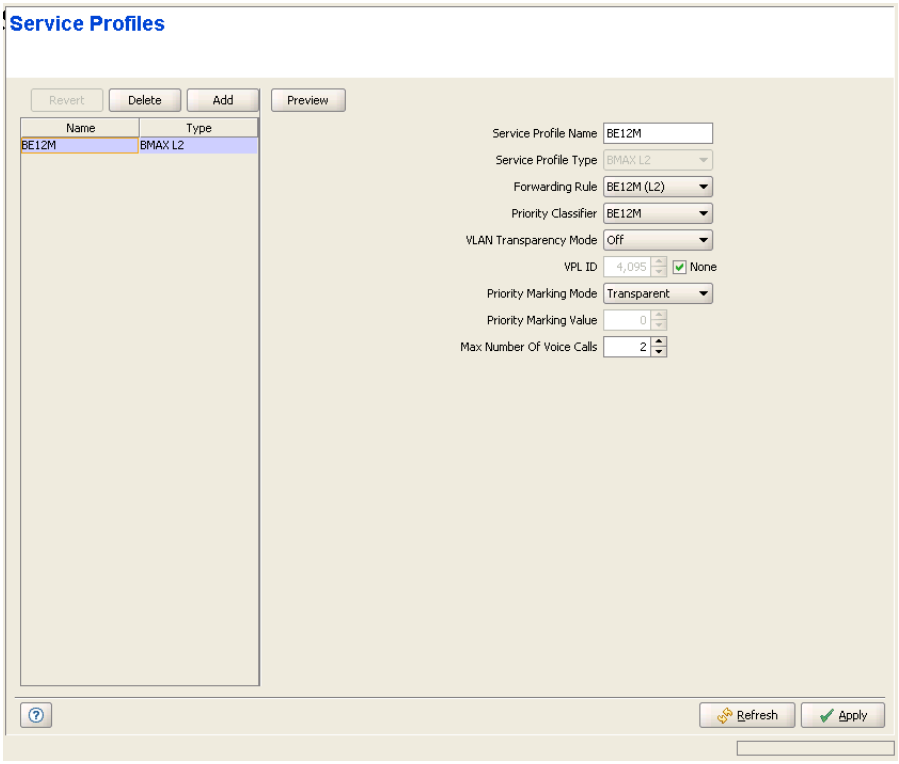


Figure 2-16: Service Profiles Page

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: L2, PPPoE or 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 Base Station/Micro Base Station. 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 Base Station/Micro Base Station, 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.
Service Profile Type	The Service Type: L2, PPPoE or VoIP. The Service Type of an existing Service Profile cannot be modified.
Forwarding Rule	The Forwarding Rule used by the Service Profile. 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@@). The drop-down menu includes all Forwarding Rules with a matching Service Type that are available in the database of the Base Station/Micro Base Station: For L2 and VoIP Service Profiles all available L2/VoIP Forwarding Rules will be included, and for PPPoE Service Profiles all available PPPoE Forwarding Rules will be included. Refer to "Forwarding Rules Page" on page 62 for more details on Forwarding Rules.
Priority Classifier	The Priority Classifier used by the Service Profile. 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 Base Station/Micro Base Station. Refer to "Priority Classifiers Page" on page 66 for more details on Priority Classifiers.

Parameter	Description
VLAN Transparency 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 Base Station/Micro Base Station to the backbone. When set to On, data packets sent from the 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	A Virtual Private Link ID to be used in the backbone behind the 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 L2, VoIP and PPPoE Service Profiles may share the same VPL ID, provided that all L2/Voice Service Profiles use the same Forwarding Rule A, and all PPPoE Service Profiles use the same Forwarding Rule B, where A and B are different. 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	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 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
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. This parameter is applicable only for L2 and VoIP Service Profiles, for calls made by devices that support the DRAP protocol. The available range is from 0 to 50 calls.
Class	Currently the Class of all Service Profiles is Local. This parameter may serve in the future for other classes of Service Profiles.

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).

2.16 Forwarding Rules Page

The Forwarding Rule defines the features that affect forwarding and relaying of data. Data in L2 and VoIP services may be switched only between the Services that share the same Forwarding Rule. Data in PPPoE service can pass only between the subscriber and an Access Concentrator behind the Base Station/Micro Base Station.

The Forwarding Rules page displays a list of all Forwarding Rules in the database of the Base Station/Micro Base Station. It also enables modifying existing Forwarding Rules, deleting Forwarding Rules from the device, and defining new Forwarding Rules. The device can hold up to 255 Forwarding Rules.

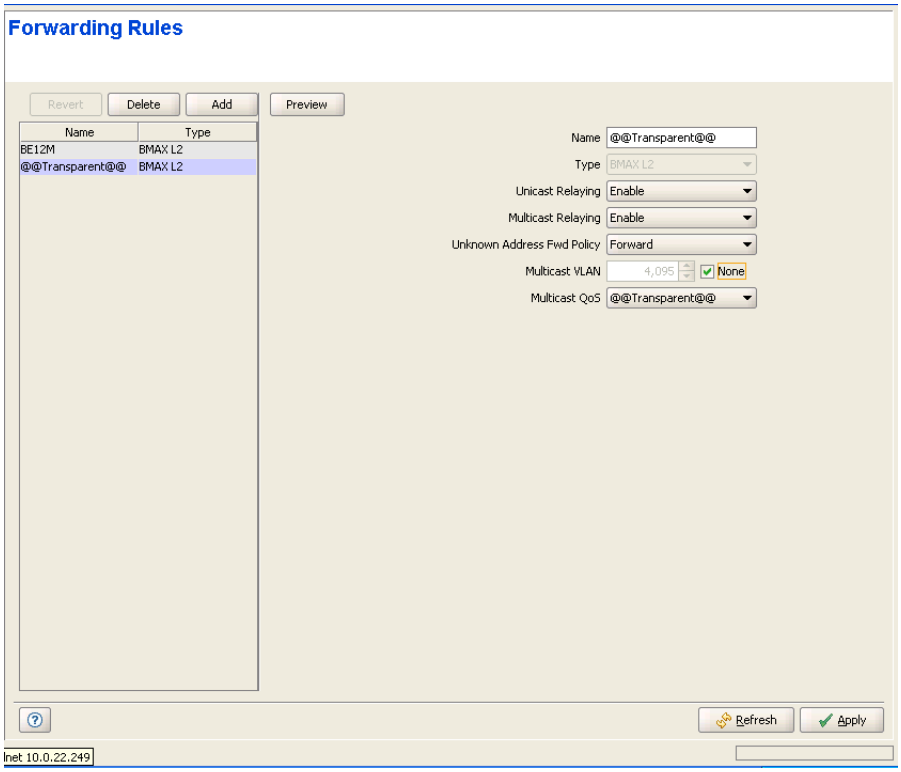


Figure 2-17: Forwarding Rules Page

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 Forwarding Rule Service Type: L2, PPPoE or VoIP.

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 Base Station/Micro Base Station. 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 Base Station/Micro Base Station, 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 the name of the Transparent Forwarding Rule (@@Transparent@@) cannot be modified.
Type	The Service Type: L2, PPPoE or VoIP. The Service Type of an existing Forwarding Rule cannot be modified.
Unicast Relaying	The Unicast Relaying parameter is applicable only to L2 Services. 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.
Multicast Relaying	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	The Unknown Address Forwarding Policy parameter is applicable only to L2 Services.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.

Parameter	Description
Multicast VLAN	The Multicast VLAN ID parameter is applicable only to Services assigned to SUs with SW version below 2.0. The Multicast VLAN ID is the VLAN ID to be attached to multicast messages in order to enable full support of the VLAN feature by SUs with SW version below 2.0. In SUs with SW version below 2.0, it was necessary to use behind the SU a VLAN switch with binding capability to support multiple VLAN IDs. The VLAN switch was responsible for duplicating all the packets to the correct ports according to the multicast connection, this required switch pre-configuration. If a VLAN switch with binding capability was not used, only a single VLAN ID behind the SU could be supported, and this VLAN ID has to be identical to the multicast VLAN ID. In the current version, all packets received from the wireless port over a multicast connection are transmitted by the SU several times to the Ethernet port, each time with a different VLAN ID, taken from the VLAN ID list supplied by the NPU/Micro Base Station. Available values are in the range of 0 to 4094, None (4095) or 4096 (non configurable) for the Transparent Forwarding Rule (@@Transparent@@).
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 Base Station/Micro Base Station.
Class	Currently the Class of all Forwarding Rules is Local. This parameter may serve in the future for other classes of Forwarding Rules.

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

2.17 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.

The Priority Classifiers page displays a list of all Priority Classifiers in the database of the Base Station/Micro Base Station. 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.

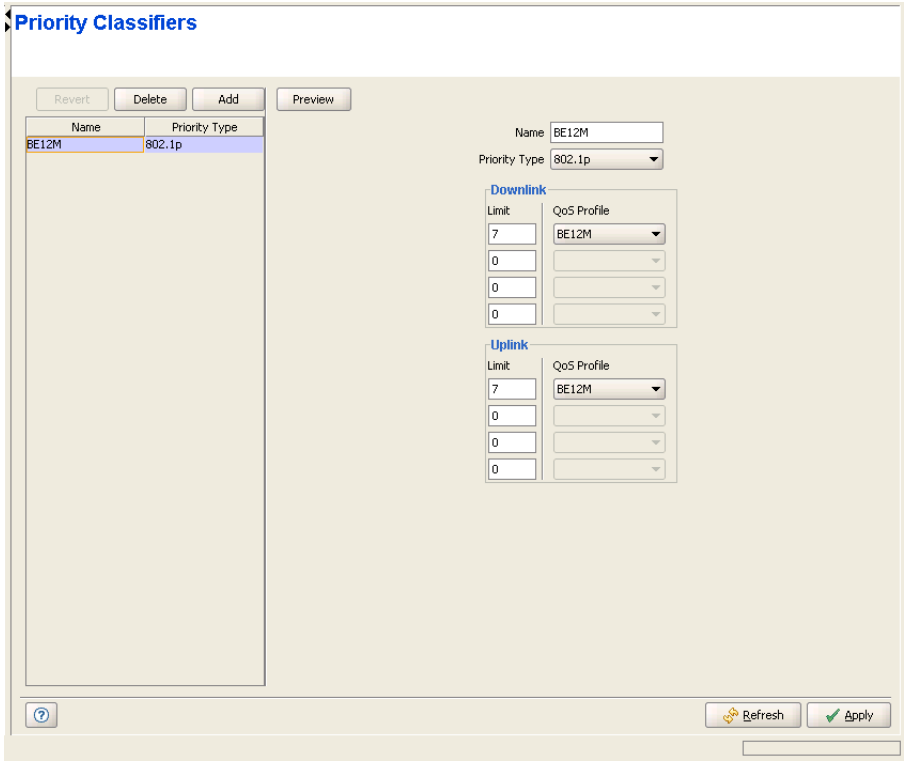


Figure 2-18: Priority Classifiers Page

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 Base Station/Micro Base Station. 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 Base Station/Micro Base Station, 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.
Class	Currently the Class of all Priority Classifiers is Local. This parameter may serve in the future for other classes of Priority Classifiers.
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 Base Station/Micro Base Station.

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

2.18 QoS Profiles Page

The QoS Profiles page displays a list of all QoS Profiles in the database of the Base Station/Micro Base Station. 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.

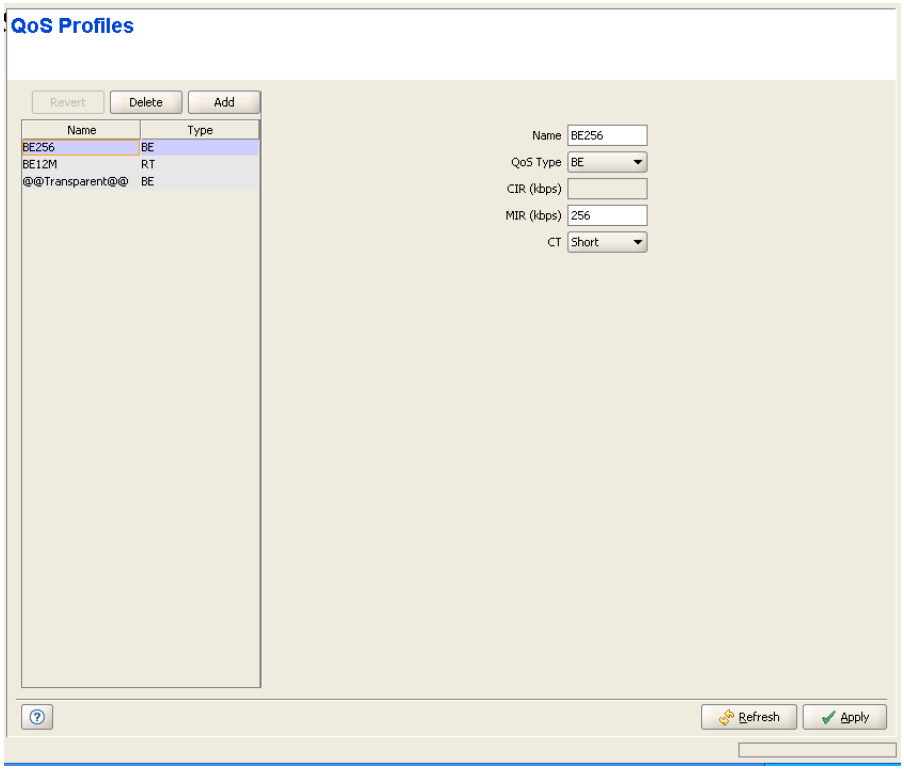


Figure 2-19: QoS Profiles Page

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.

Parameter	Description
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 Base Station/Micro Base Station. 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 Base Station/Micro Base Station, 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.

Parameter	Description
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).
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, NRT and BE 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, Medium, and Long. The actual value in milliseconds for each of the three options varies according to the QoS type.
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.
Class	Currently the Class of all QoS Profiles is Local. This parameter may serve in the future for other classes of QoS Profiles.

2.19 Q in Q Page

The system supports the 802.1 QinQ standard, which defines the way to have 2 VLAN tags (double-tagged frames). This procedure allows an additional VLAN tag, called Metro VLAN tag, to be inserted into an existing IEEE 802.1Q tagged frame. This is a solution to transport multiple customers' VLANs across the service provider's network without interfering with each other. The expanded VLAN space allows the service provider to provide certain services, such as Internet access, on specific VLANs for specific customers, and yet provide other types of services for other customers on other VLANs.

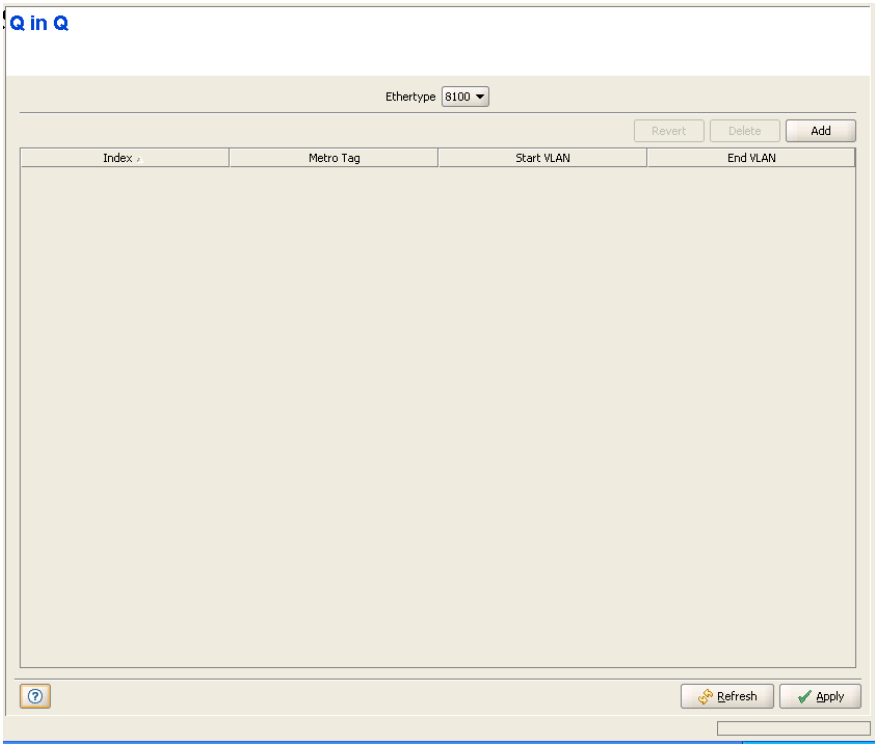


Figure 2-20: Q in Q Page

The Q in Q page comprises the following components:

- **Ethertype**: The EtherType to be used with the Metro tags. The available options are 8100, 9100 and 9200.

- **Metro Tags Table**: Enables adding, deleting and editing the properties of up to four Metro Tags. The table includes the following properties for each entry:

Parameter	Description
ID	An auto- sequential number from 1 to 4.
Metro Tag	TheMetro Tag to be added to packets with a VLAN ID within the range specified by Start VLAN and End VLAN parameters of the entry. The range is from 0 to 4094.
Start VLAN	The lower limit of the range defining the VLAN IDs associated the applicable Metro Tag. The range is from 0 to 4094.
End VLAN	The upper limit of the range defining the VLAN IDs associated the applicable Metro Tag.The range is from 0 to 4094. End VLAN cannot be lower than Start VLAN.

NOTE

VLAN ranges defined for different Metro Tags cannot overlap.

2.20 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 Base Station. In addition, the basic Micro Base Station with SW version 2.5 or higher 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 Base Station using TFTP. A license file can be loaded only to the 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"

2.20.1 SUs License Bank Status Tab

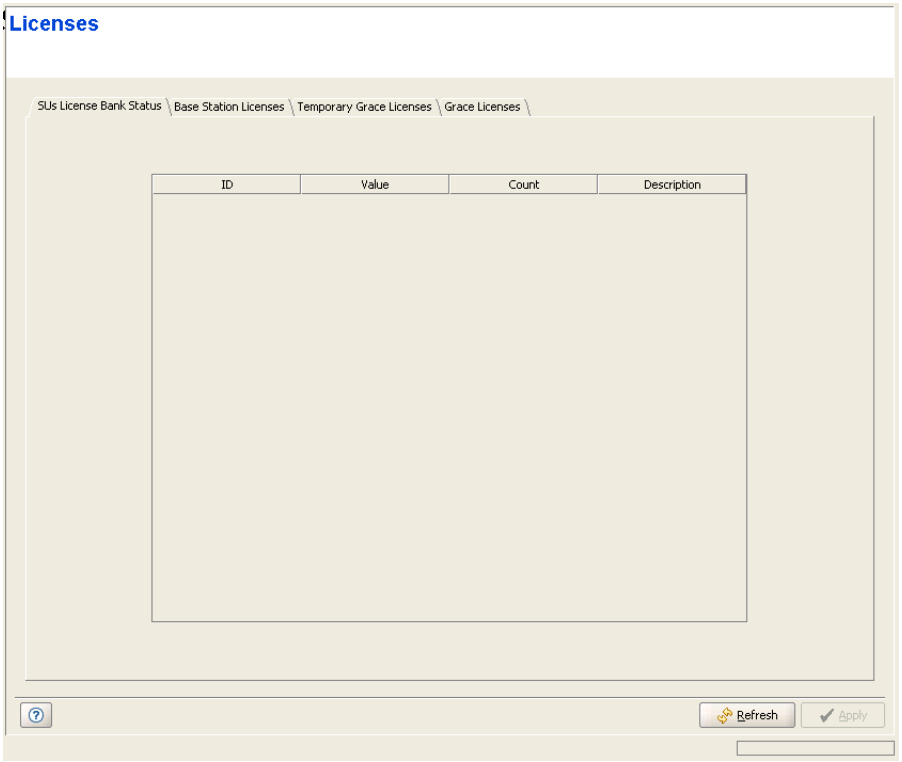


Figure 2-21: Licenses - SUs License Bank Status tab

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.

Parameter	Description
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

2.20.2 Base Station Licenses Tab

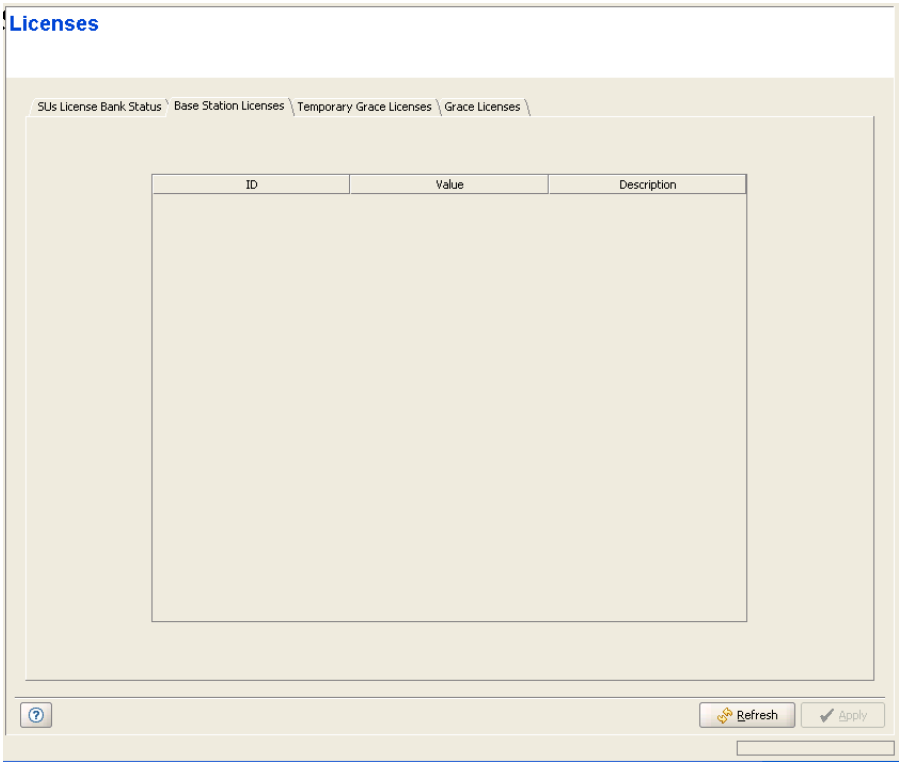


Figure 2-22: Licenses - Base Station Licenses Tab

The Base Station Licenses tab displays the current 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	The 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)
Description	A description of the license

2.20.3 Temporary Grace Licenses Tab

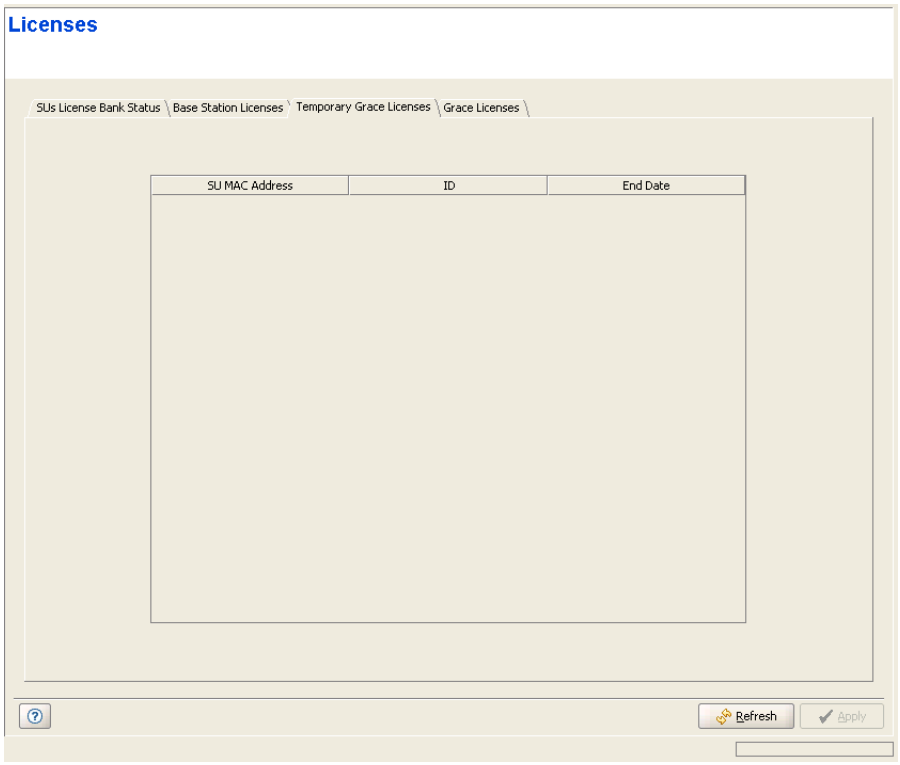


Figure 2-23: Licenses - Temporary Grace Licenses

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.

2.20.4 Grace Licenses Tab

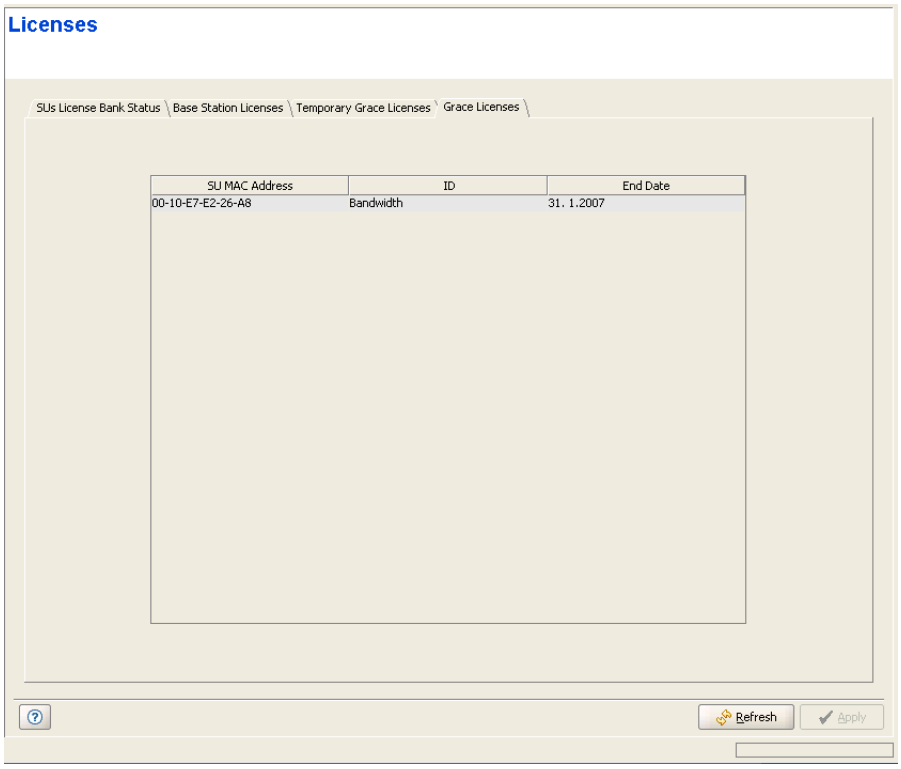


Figure 2-24: Licenses - Grace Licenses Tab

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.
End Date	The expiry date of the grace license.

2.21 NPU View Page

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

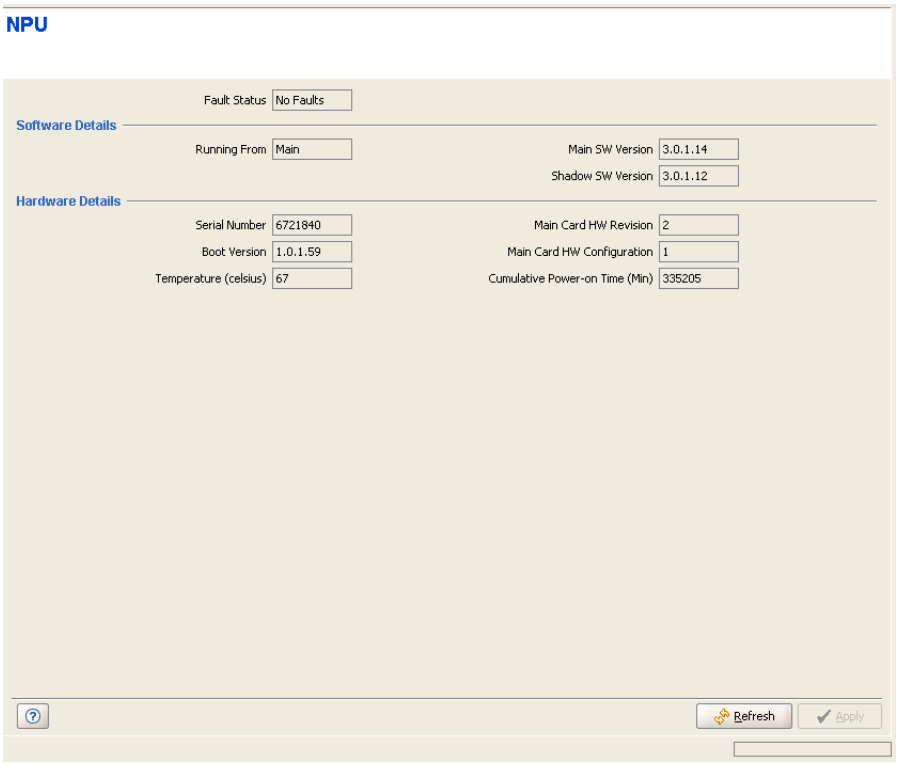


Figure 2-25: NPU View Page

The read-only details are:

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

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

2.22 Data Port Page

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

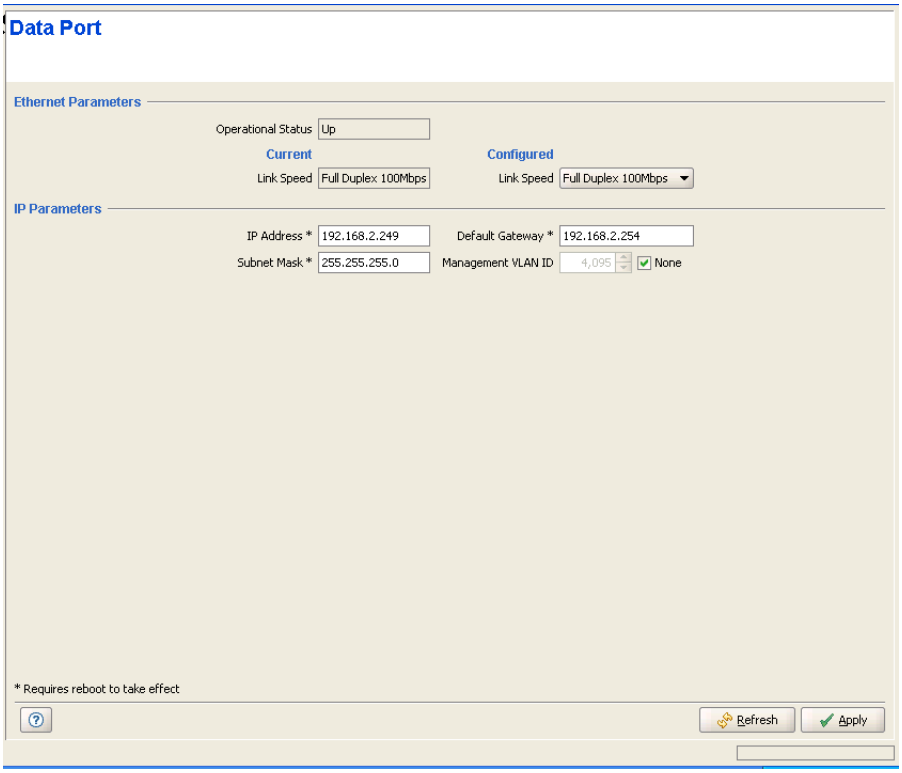


Figure 2-26: NPU Data Port Page

The Data Port page includes the following:

- "Ethernet Parameters"
- "IP Parameters"

2.22.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
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

2.22.2 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).

CAUTION

Management VLAN ID is applied immediately (without reset). If you use the Data port for managing the 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).

2.23 Management Port Page

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

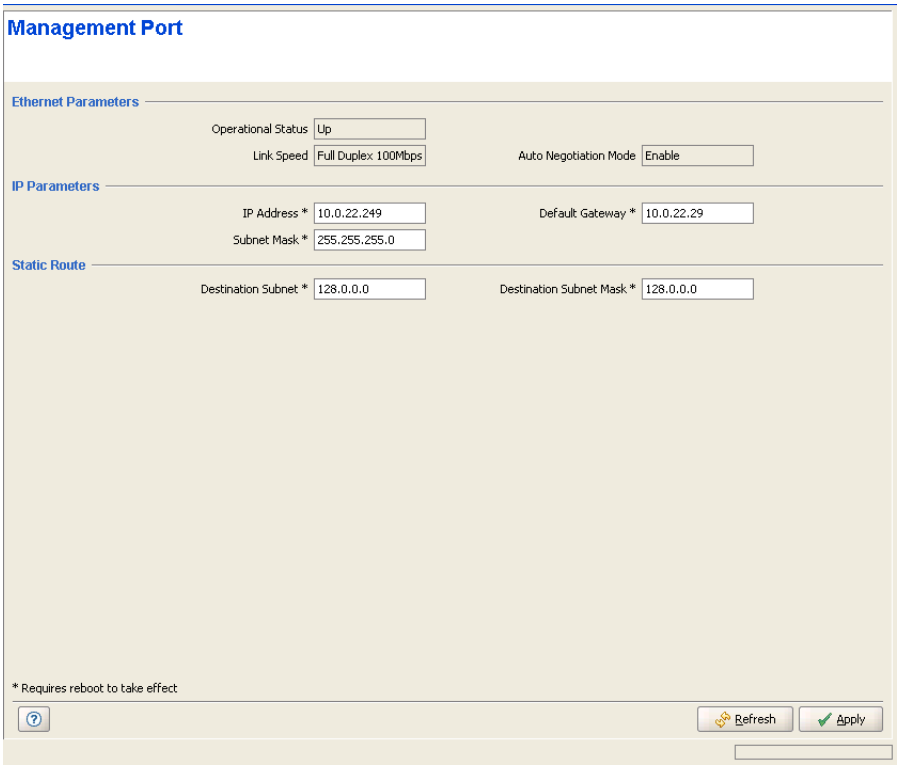


Figure 2-27: NPU Management Port Page

The Management Port page includes the following:

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

2.23.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
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).

2.23.2 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.

2.23.3 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)

2.24 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 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.

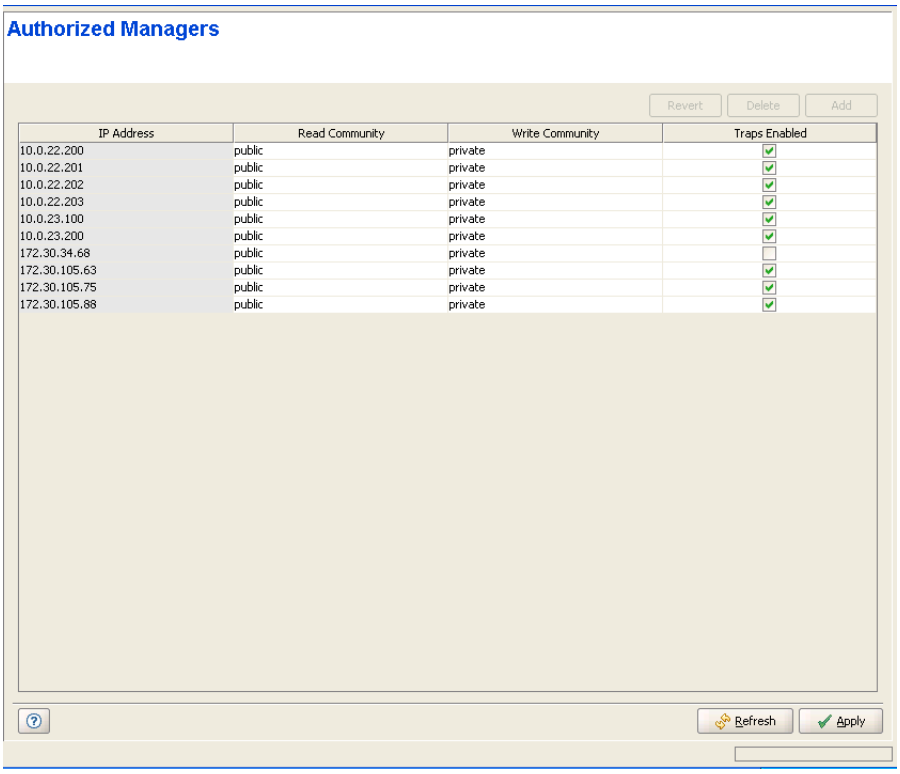


Figure 2-28: Authorized Managers Page

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)

2.25 Frequency Bands File Page

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

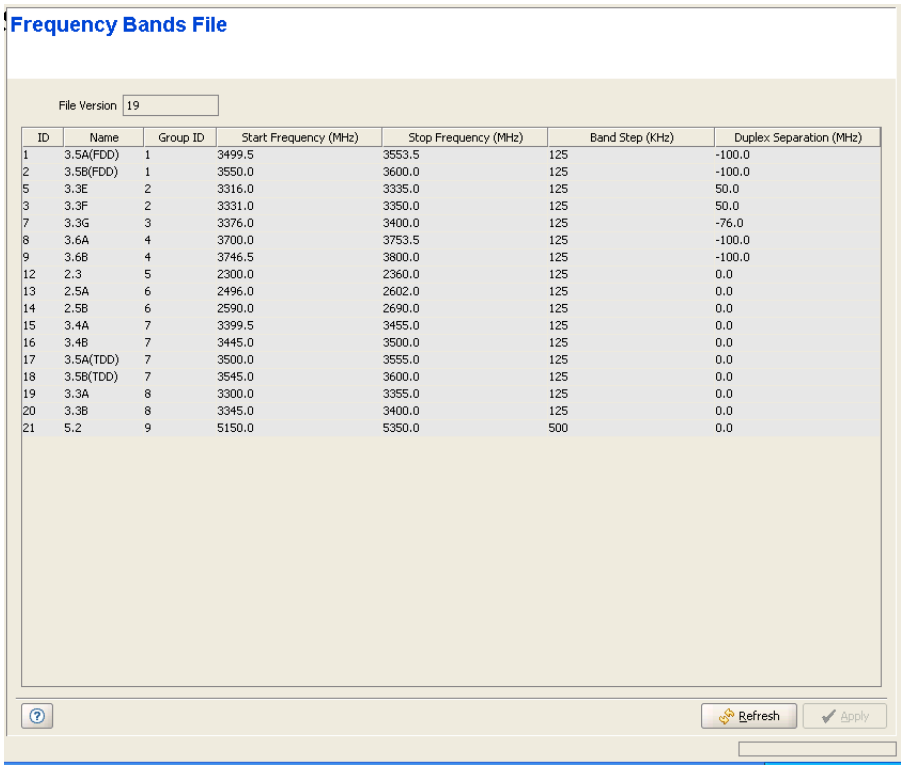


Figure 2-29: Frequency Bands File Page

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 TDD Duplex Mode. These bands are not applicable to the current release.

2.26 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.

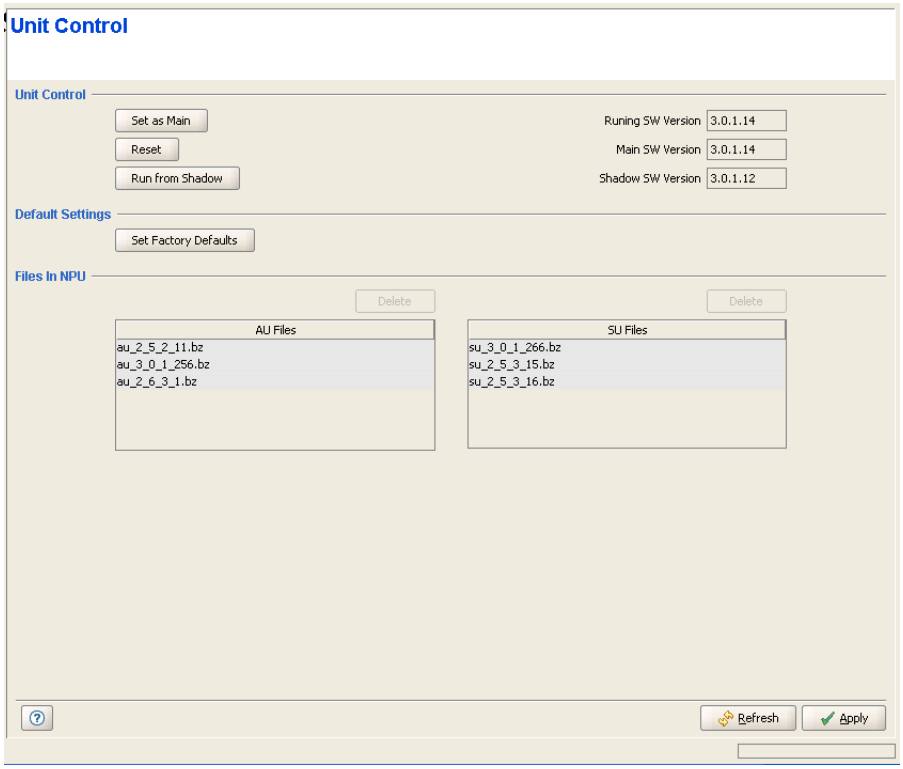


Figure 2-30: NPU Unit Control Page

The Unit Control page includes the following sections:

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

2.26.1 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 unit and run the Main SW version. Changes to some of the configurable parameters are applied only after reset. Refer to "Parameters Summary" on page 174 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.

2.26.2 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 173 for information on the factory default values of these parameters. The parameters will revert to their default values after the next reset.

2.26.3 Files in NPU/MBS

Up to three SU SW files can be stored in the NPU/Micro Base Station. In the NPU, up to three 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 three 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.

2.27 Bridge and Voice Page

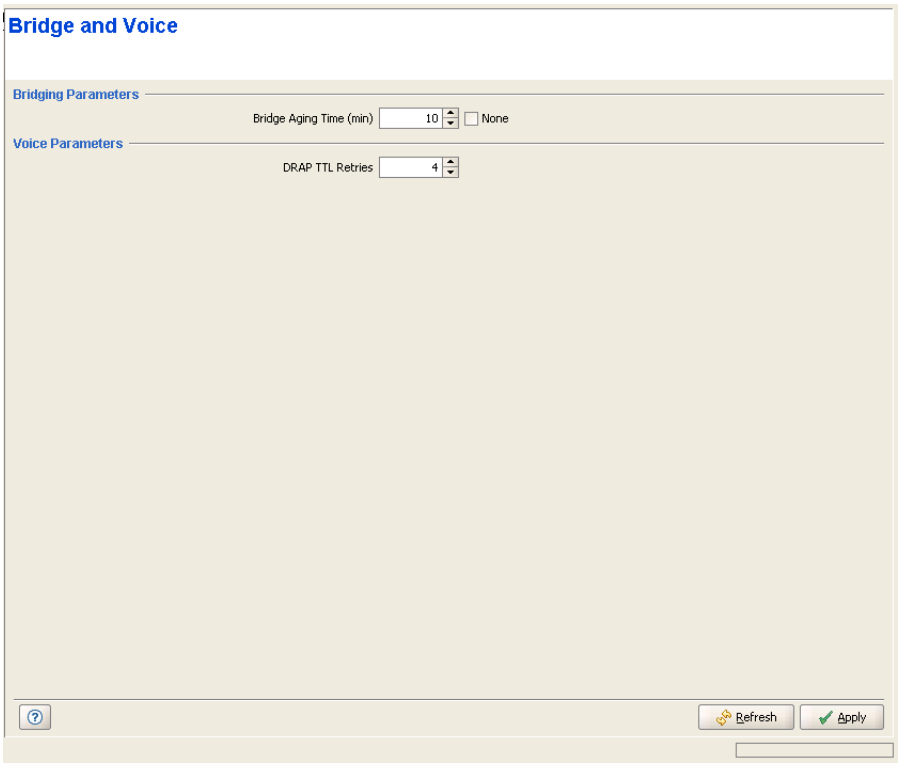


Figure 2-31: Bridge and Voice Page (NPU)

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.

2.28 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 167.

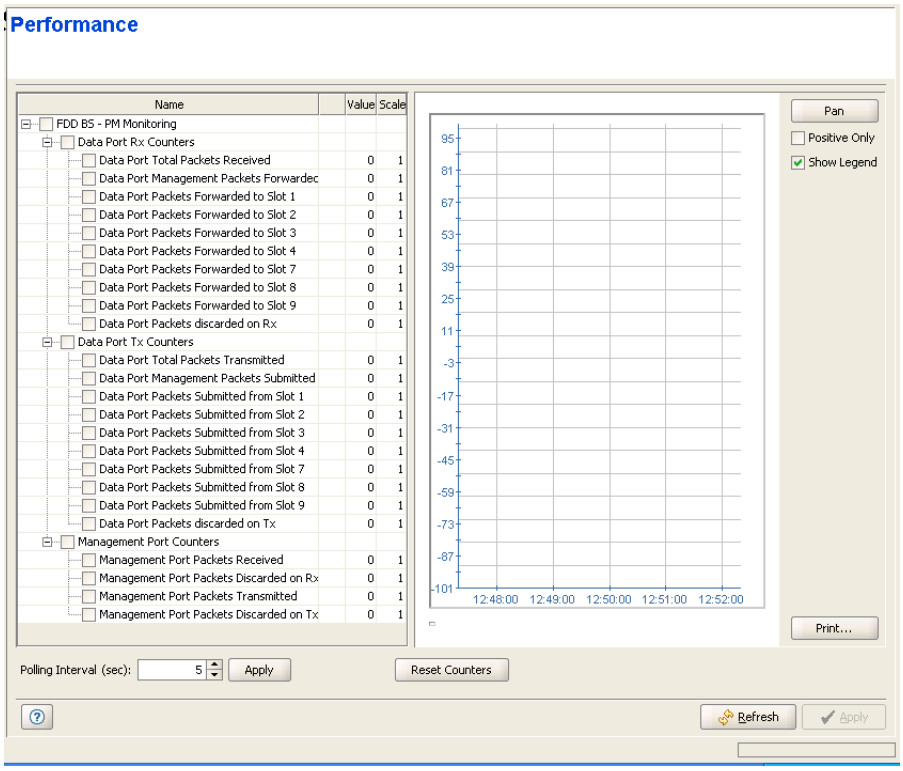


Figure 2-32: NPU Performance Page

The counters available for the NPU are:

- “Data Port Rx Counters”
- “Data Port Tx Counters”
- “Management Port Counters”

2.28.1 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.

2.28.2 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.
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.

Counter	Description
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.

2.28.3 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.

2.29 AU View Page

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

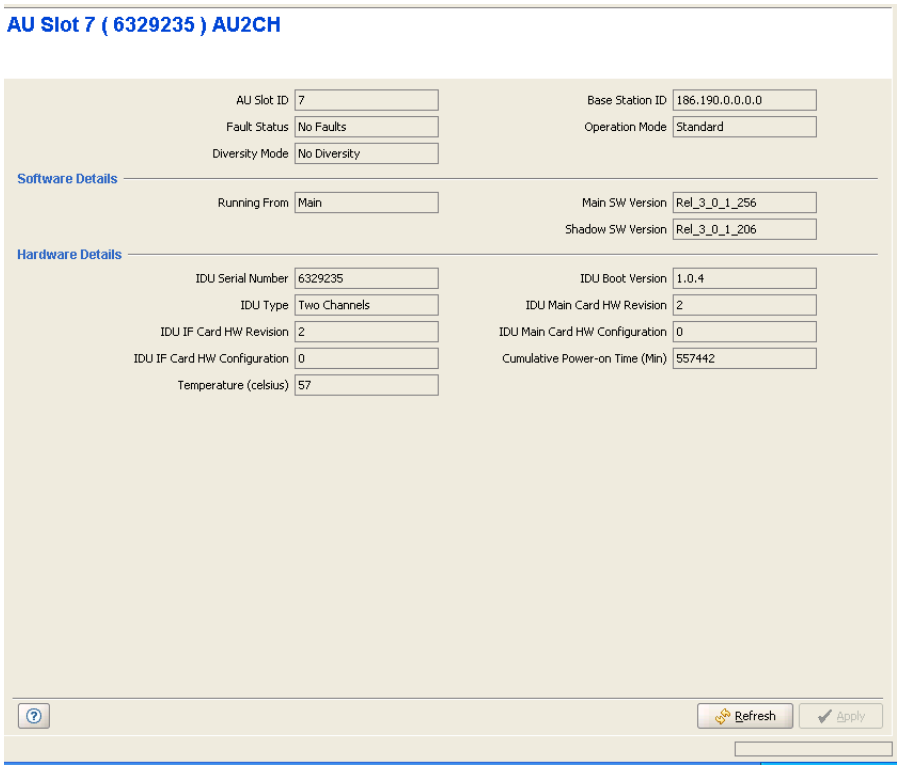


Figure 2-33: AU View Page

The read-only details are:

- **AU Slot ID**
- **Fault Status**
- **Diversity Mode**
- **Base Station ID**
- **Operation Mode** (in the current release only Standard is applicable)
- **Running From** (Main or Shadow)

- **Main SW Version**
- **Shadow SW Version**
- **IDU Serial Number**
- **IDU Type** (in the current release only Two Channels type is available)
- **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)**

2.30 Voice Parameters Page

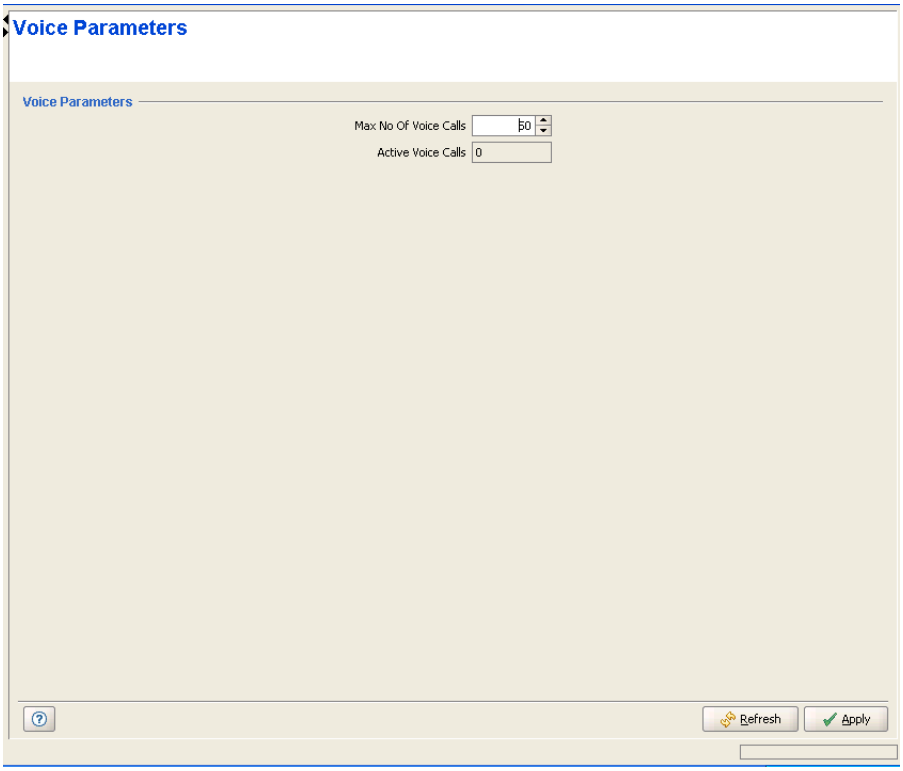


Figure 2-34: Voice Parameters Page

The Voice page includes the following parameters control of VoIP sessions made by devices using the DRAP protocol:

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.

2.31 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.

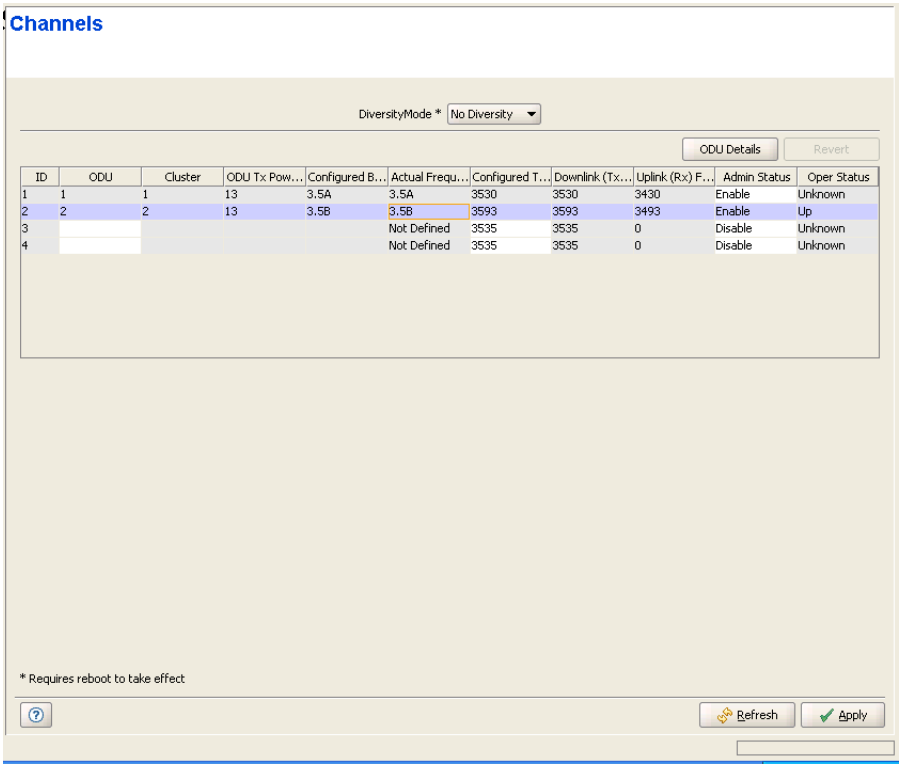


Figure 2-35: Channels Page

Diversity Mode: The Diversity Mode of the AU. The available options are:

- No Diversity
- Second Order Diversity
- Rx Diversity

In No Diversity mode each channel serves a different sector, using a different frequency. Second Order Diversity, intended primarily for Non Line Of Sight (NLOS) deployments, use time and space diversity scheme in the downlink and ODU selection based on SNR in the uplink. Rx Diversity may provide better performance in certain deployments with both NLOS and LOS, and it uses only

SNR-based selection in the uplink. In Rx Diversity the ODU connected to Channel 2 operates in receive only mode (the transmitter is switched off).

NOTE

A change in the Diversity Mode parameter takes effect immediately and automatically resets the AU/Micro Base Station and disables its channels.

The Channels table has four entries for Channels 1 to 4. In the current version only Channels 1 and 2 are applicable. 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.
Configured Tx Frequency	The Tx frequency in MHz, which must be in accordance with the Bandwidth configured for the AU/Micro Base Station and the rules defined in the Frequency Bands File (see "Frequency Bands File Page" on page 89) 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 89). f the Diversity Mode is set to Second Order Diversity or Rx 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 is set automatically to the same value configured for Channel 1.

Parameter	Description
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.
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 Second Order Diversity or Rx Diversity, the Admin Status of Channel 2 is not configurable: it is set automatically to the same value configured for Channel 1.
Oper Status	A read-only display of the operational status of the Channel.

2.32 Air Interface Page

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

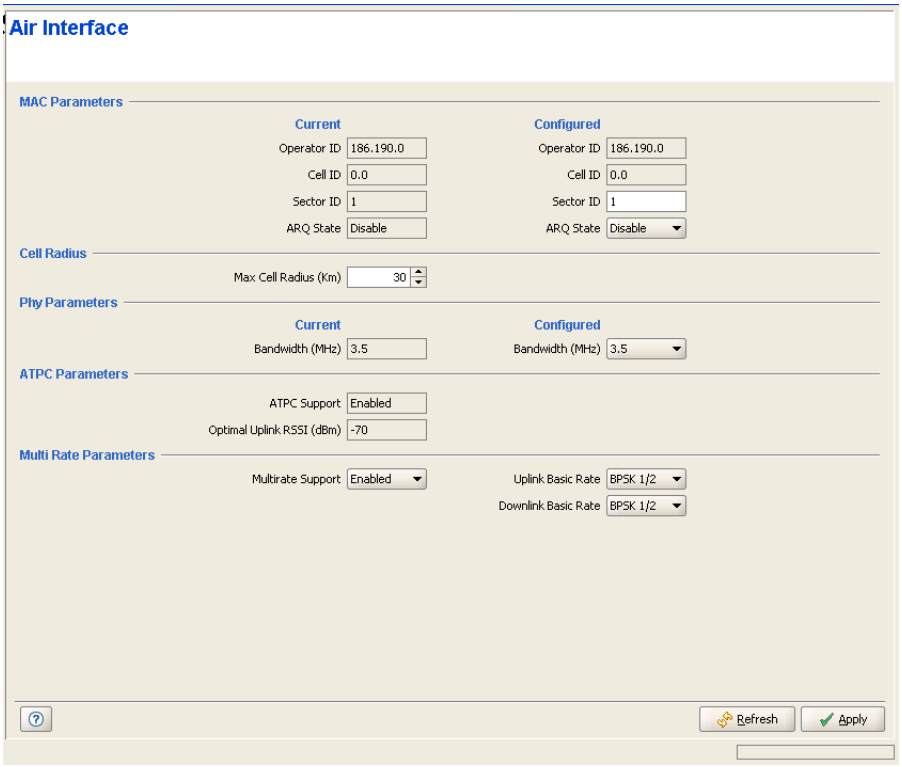


Figure 2-36: AU Air Interface Page (AU)

The Air Interface page includes the following sections:

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

2.32.1 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.
ARQ State *(Current/Configured)*	The Current (read-only) and Configured ARQ State. Controls whether to use an ARQ algorithm for detecting errors and requesting retransmissions of applicable unicast messages (applicable only for Best Effort and Non Real Time services). A configuration change is applied after reset.

2.32.2 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. The values range is from 10 to 110 km, using 10 km increments

2.32.3 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 and 3.5 MHz.

2.32.4 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 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.

2.32.5 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 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. Broadcasts and multicasts messages are not acknowledged, so that the ARQ mechanism cannot be used and there is no way to guarantee that all intended recipients will receive them properly. In addition, multicasts and broadcasts 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 boots with the multirate enabled, disregarding its status before the device was reset.
Uplink Basic Rate	The Basic Rate for all uplinks.
Downlink Basic Rate	The Basic Rate for all downlinks.

2.33 AU Unit Control Page

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

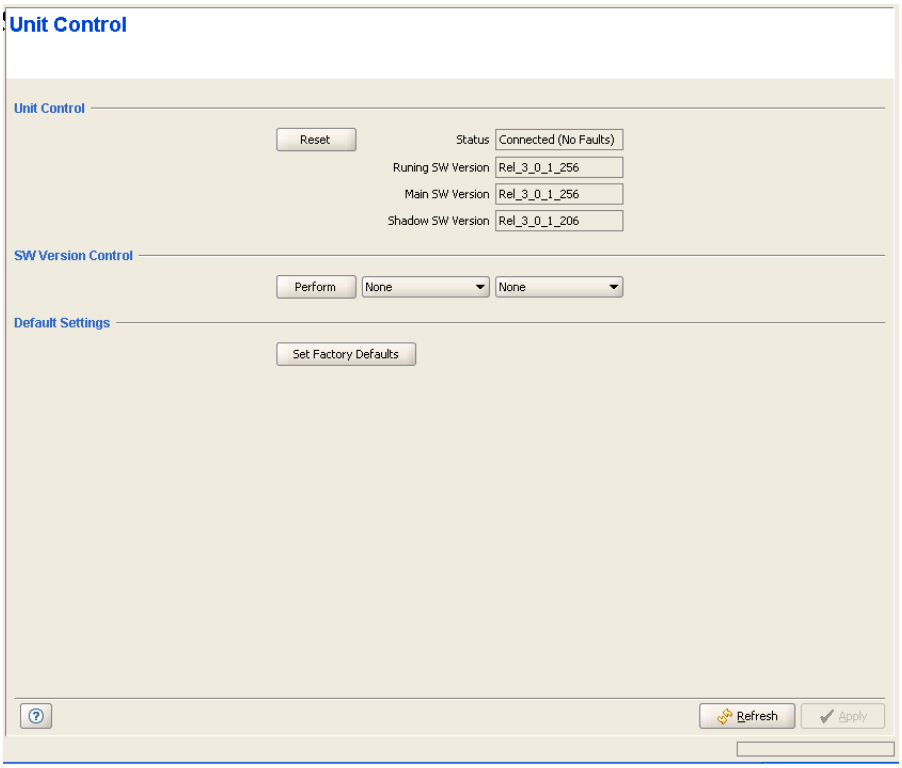


Figure 2-37: AU Unit Control Page

The Unit Control page includes the following sections:

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

2.33.1 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 174 for information on which parameters are changeable in run time and which changes are applied only after reset.

2.33.2 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.

2.33.3 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 174 for information on the factory default values of these parameters. The parameters will revert to their default values after the next reset.

2.34 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 168.

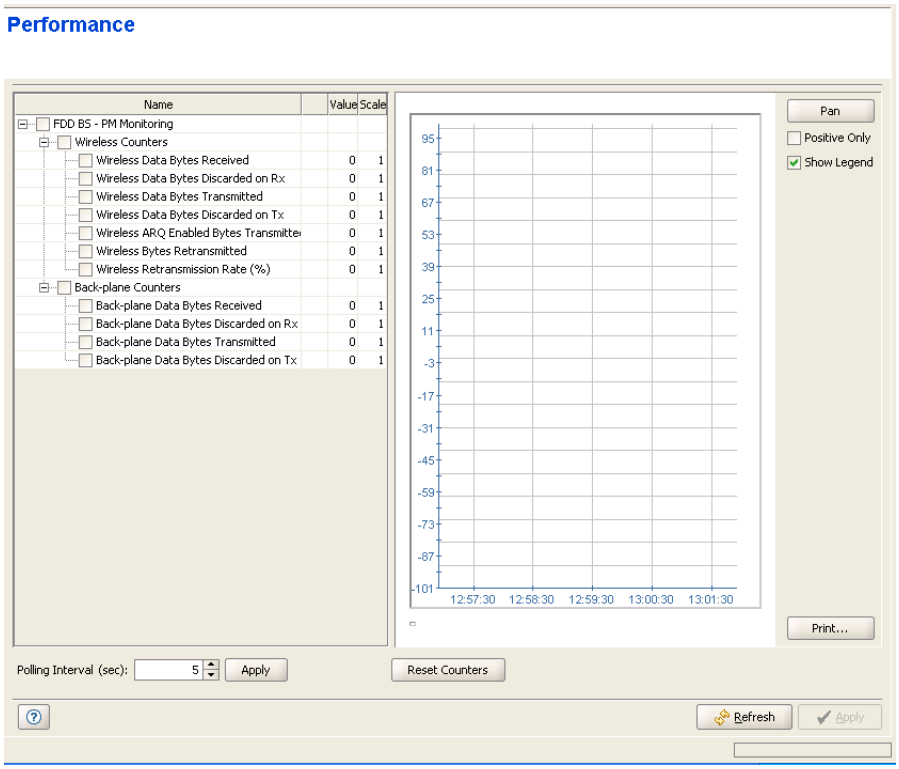


Figure 2-38: AU Performance Page

The counters available for the AU are:

- “AU Backplane Counters”
- “AU Wireless Counters”

2.34.1 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).

2.34.2 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.
Wireless ARQ Enabled Bytes Transmitted	The number of bytes transmitted over BE and NRT connections. Applicable only if the ARQ mechanism is enabled.
Wireless Bytes Retransmitted	The number of unacknowledged bytes that were retransmitted. Retransmissions are applicable only to BE and NRT connections provided the ARQ mechanism is enabled.
Wireless Retransmission Rate	Retransmission Rate in percents is defined as: 100*(ReTx Bytes) / (ARQ Enabled Bytes Tx).

2.35 The 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 various units.

The files to be loaded should be available either in the NPU/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 Base Station, the order of upgrading devices is: first the SUs, then AUs (in a modular Base Station), then the NPU/Micro Base Station.

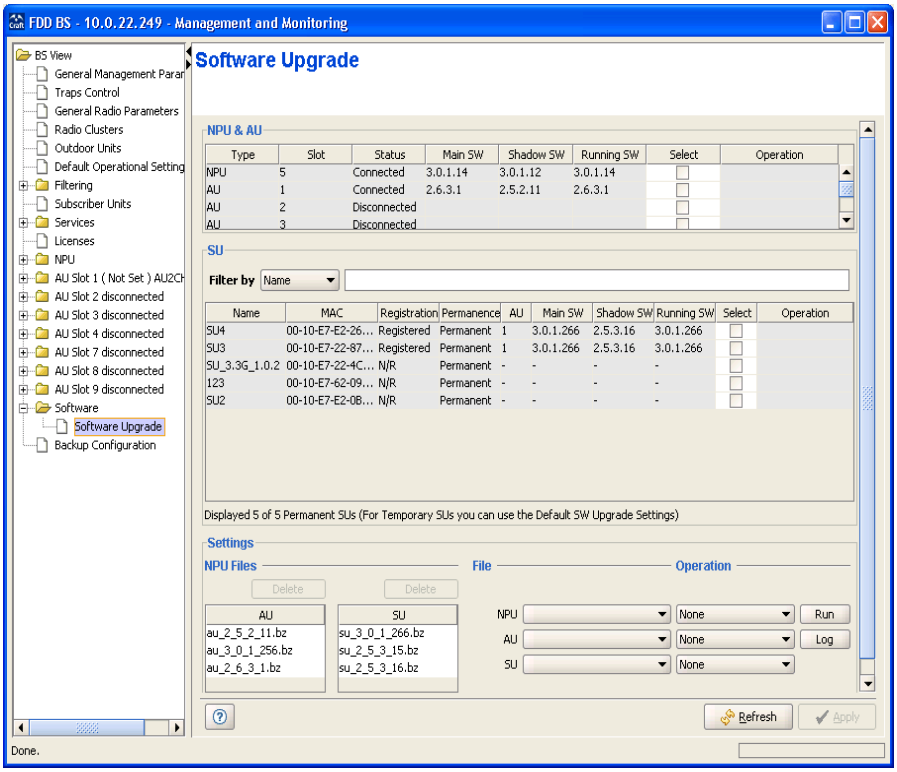


Figure 2-39: Software Upgrade Page (NPU)

The Software Upgrade page includes the following sections:

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

2.35.1 NPU & AU/MBS Section

The NPU & AU table in the modular Base Station, or the MBS table in the Micro Base Station, comprises the following details for the relevant components:

Parameter	Description
Type	The card type: NPU or AU in a modular Base Station, MBS in a Micro Base Station
Slot	Not applicable for a Micro Base Station. The card's slot ID: 5 for the NPU, 1-4, 7-9 for the AUs
Status	The card's status: Connected/Disconnected (in a Micro Base Station the status is always connected).

Parameter	Description
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 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)

2.35.2 SU Section

The SU table comprises the following details for the NPU and 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 processaccording 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.

2.35.3 Settings Section

The Settings section includes the following components:

Component	Description
NPU/MBS Files	Read-only tables that display the current AU (not applicable for a Micro Base Station) and SU SW Files available in the NPU/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: ■ NPU/MBS ■ AU (not applicable for a Micro Base Station) ■ SU You can select either one of the relevant files available in the NPU/Micro Base Station, 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/Micro Base Station. Note that if the NPU/Micro Base Station already holds 3 files of the relevant type, one of them must be deleted (see "Files in NPU/MBS" on page 93). If the selected file already exists in the NPU/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 AU/SU, the file will be first loaded to the NPU/Micro Base Station (see above), and than loaded from the NPU/Micro Base Station 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/Micro Base Station, 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.

To execute a Software Upgrade process:

To execute a Software Upgrade process, select the devices to be upgraded (in the NPU & AU/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.

2.36 Backup Configuration Page

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

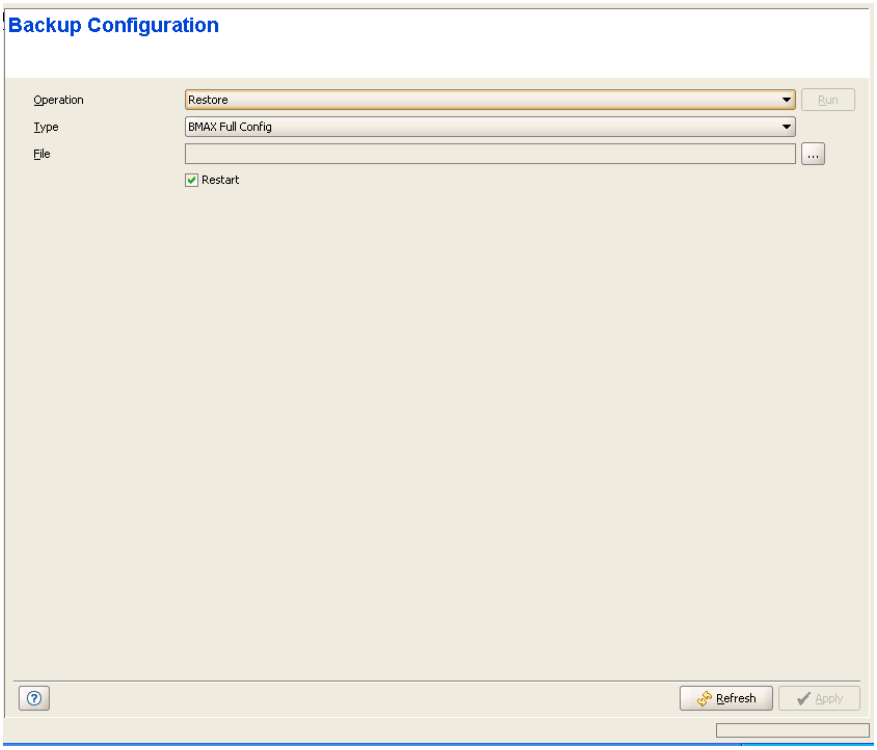


Figure 2-40: Backup Configuration Page

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 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).
- **Service Profiles**: All the profiles associated with services (Service Profiles, Forwarding Rules, Priority Classifiers, QoS Profiles).
- **Filters**: All the configurations of Filtering Rules, Interface Filtering and MAC Address Deny List.
- **Traps**: The configuration parameters for all traps.

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.

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 124
  - "General Details Page" on page 127
  - "General Management Parameters Page" on page 25
  - "Traps Control Page" on page 26
  - "General Radio Parameters Page" on page 28
  - "Radio Clusters Page" on page 30
  - "Outdoor Units Page" on page 32
  - "Default Operational Settings Page" on page 35
  - Filtering:
    - "Filters Page" on page 38
    - "MAC Deny List Page" on page 44
    - Performance Page, see "Filtering Performance Page" on page 45
  - "Subscriber Units Page" on page 46
  - Services:
    - "Services Page" on page 49
    - "Subscribers Page" on page 54
    - "Service Profiles Page" on page 57
    - "Forwarding Rules Page" on page 62
    - "Priority Classifiers Page" on page 66
    - "QoS Profiles Page" on page 69
    - "Q in Q Page" on page 72
  - Access Parameters:

- "Air Interface Page" on page 104
- "Channels Page" on page 101

- "Data Port Page" on page 131
- "Management Port Page" on page 133
- "Authorized Managers Page" on page 87
- "Frequency Bands File Page" on page 89
- Unit Control Page, See "NPU/Micro Base Station Unit Control Page" on page 91
- "Bridge and Voice Page" on page 129
- "Performance Page" on page 136
- "Licenses Page" on page 74
- Software:
  - "The Software Upgrade Page" on page 113
- "Backup Configuration Page" on page 118

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.

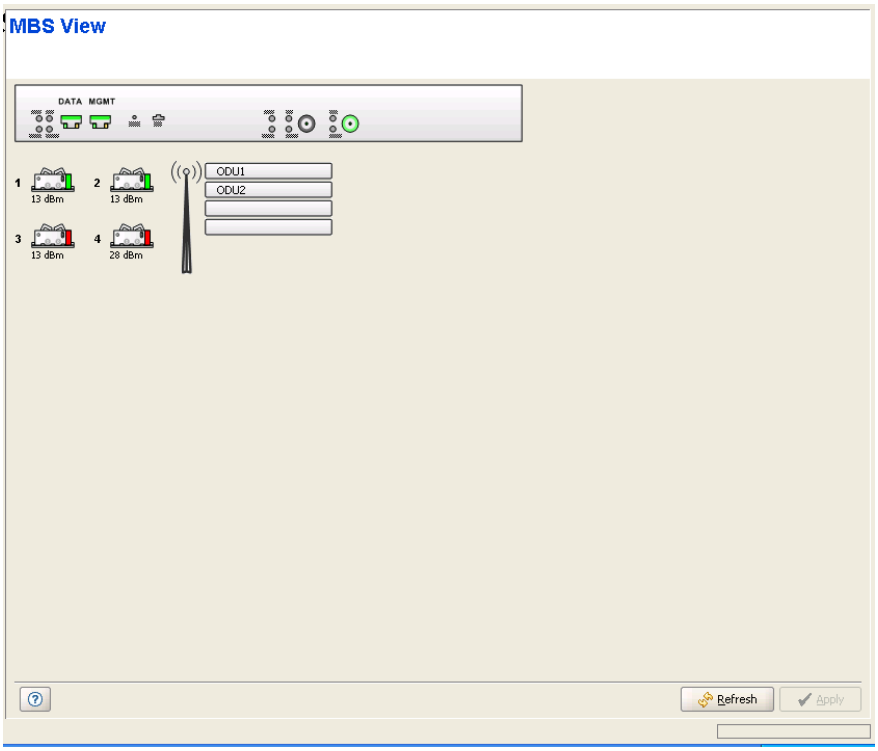


Figure 3-1: MBS View Page

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 Tx Power and Downlink Frequency (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 General Details Page

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

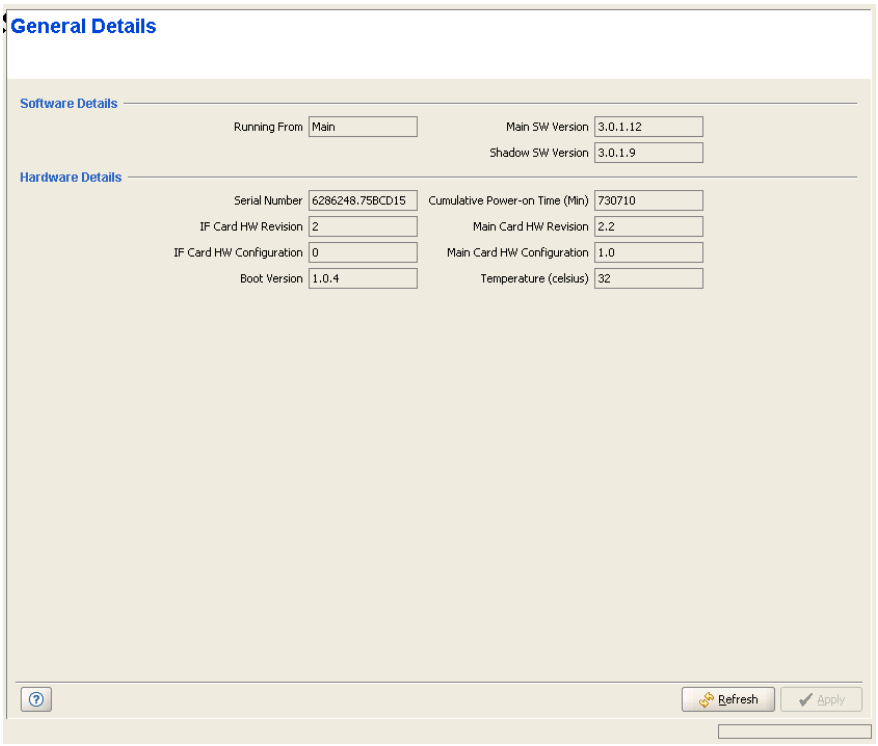


Figure 3-2: General Details Page

The read-only details are:

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

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

3.4 Bridge and Voice Page

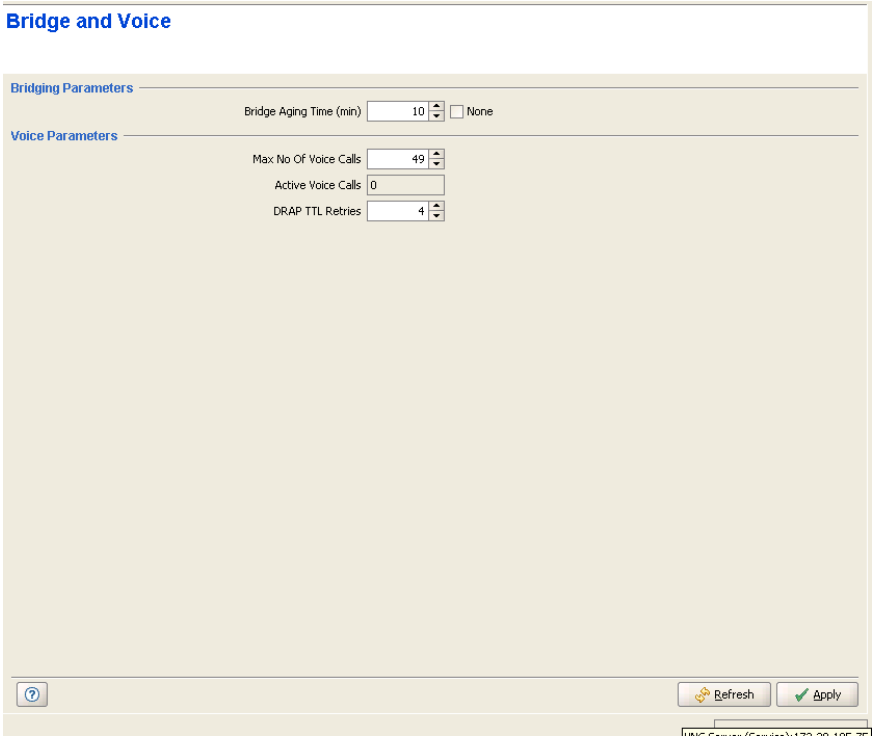


Figure 3-3: Bridge and Voice Page (MBS)

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.
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.

3.5 Data Port Page

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

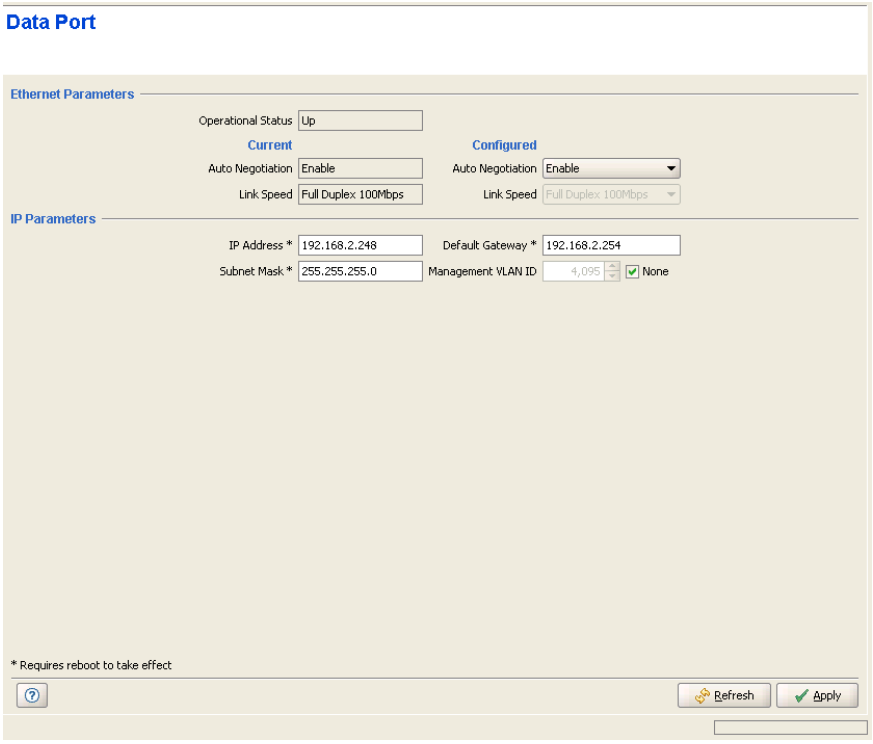


Figure 3-4: MBS Data Port Page

The Data Port page includes the following:

- "Ethernet Parameters
- "IP Parameters

3.5.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
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

3.5.2 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).

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).

3.6 Management Port Page

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

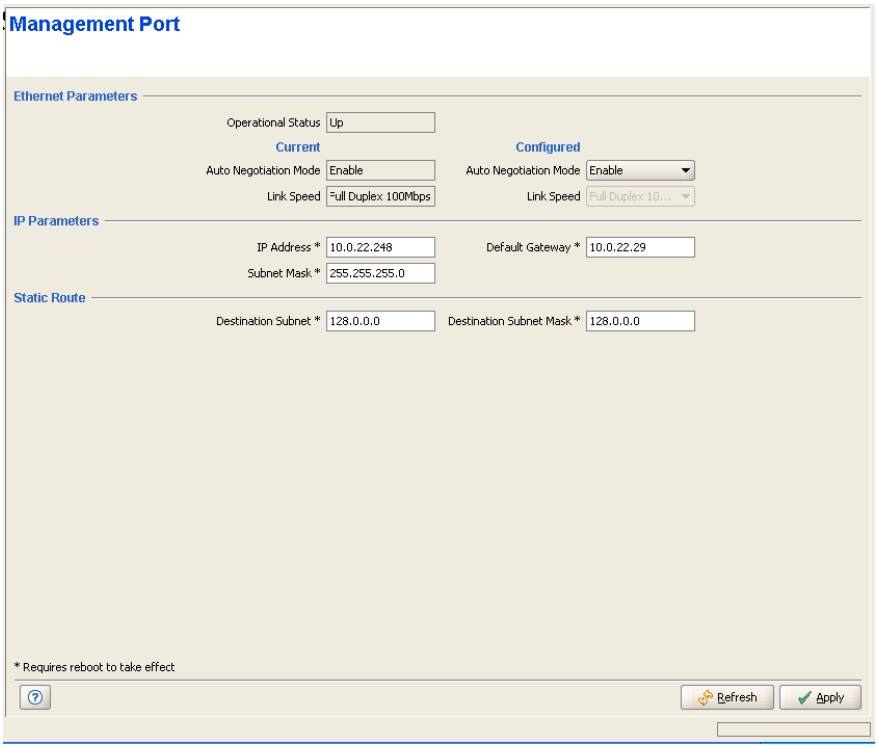


Figure 3-5: MBS Management Port Page

The Management Port page includes the following:

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

3.6.1 Ethernet Parameters

Parameter	Description
Operational Status	The status of the Ethernet link: Up or Down.
Current Auto Negotiation	The current auto negotiation mode.

Parameter	Description
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).

3.6.2 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.

3.6.3 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)

3.7 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 167.

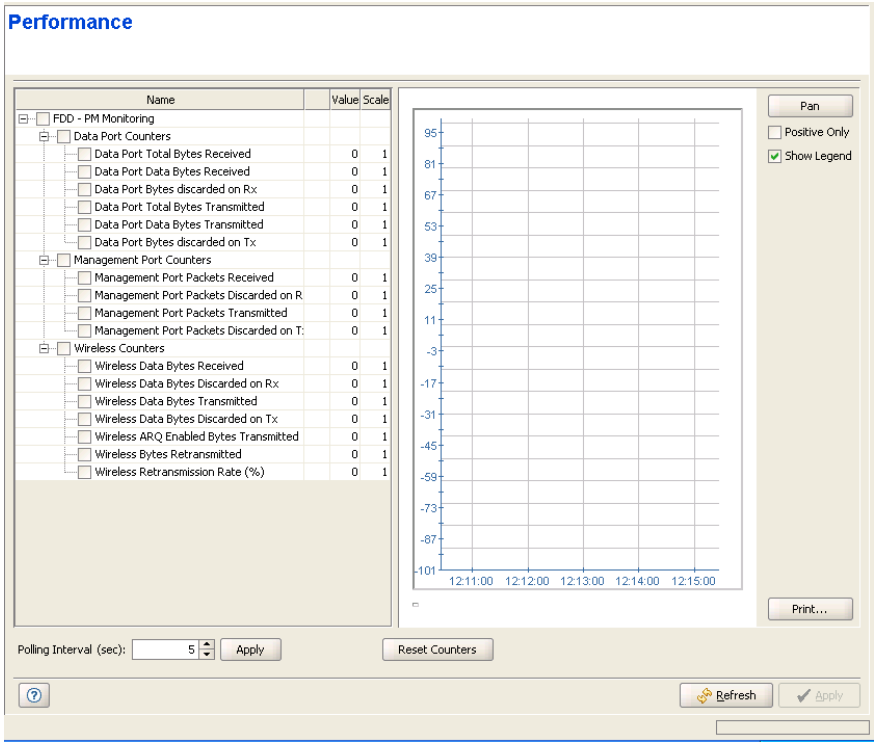


Figure 3-6: MBS Performance Page

The counters available for the Micro Base Station are:

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

3.7.1 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).

3.7.2 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.

3.7.3 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).
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.
Wireless ARQ Enabled Bytes Tx	The number of bytes transmitted over BE and NRT connections. Applicable only if the ARQ mechanism is enabled.
Wireless ReTx Bytes	The number of unacknowledged bytes that were retransmitted. Retransmissions are applicable only to BE and NRT connections provided the ARQ mechanism is enabled.
Wireless ReTx Rate	Retransmission Rate in percents is defined as: 100*(ReTx Bytes) / (ARQ Enabled Bytes Tx).

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.

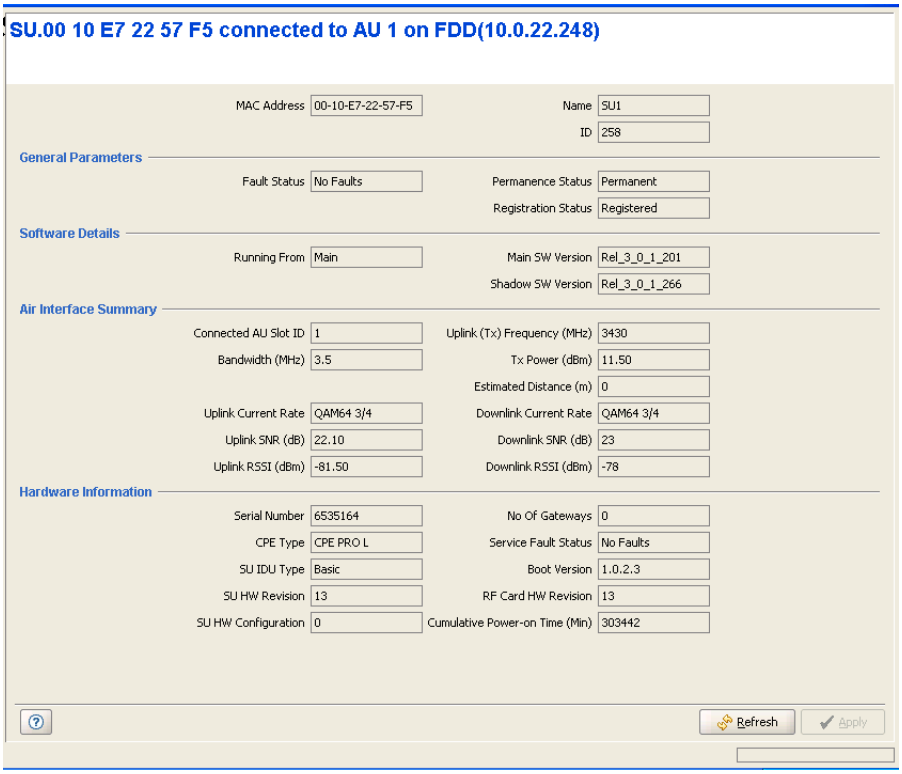


Figure 4-1: SU Summary Page

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**: SW version
  - **Main SW Version**
  - **Shadow SW Version**
- **Air Interface Summary**
  - **Connected AU Slot ID** (always 1 for a Micro Base Station)
  - **Bandwidth (MHz)**
  - **Uplink Current Rate**
  - **Uplink SNR (dB)**
  - **Uplink RSSI (dBm)**
  - **Uplink (Tx) Frequency (MHz)**
  - **Tx Power (dBm)**
  - **Estimated Distance (m)**
  - **Downlink Current Rate**
  - **Downlink SNR (dB)**
  - **Downlink RSSI (dBm)**
- **Hardware Information**
  - **Serial Number**
  - **CPE Type**
  - **SU IDU Type** (Basic or IDU-NG-4D1W**)**
  - **SU HW Revision**

- **SU HW Configuration**
- **No of Gateways** (The number of Alvarion Gateways connected to the SU (including IDU-NG-4D1W, if exists).
- **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)**

4.3 Registration Parameters Page

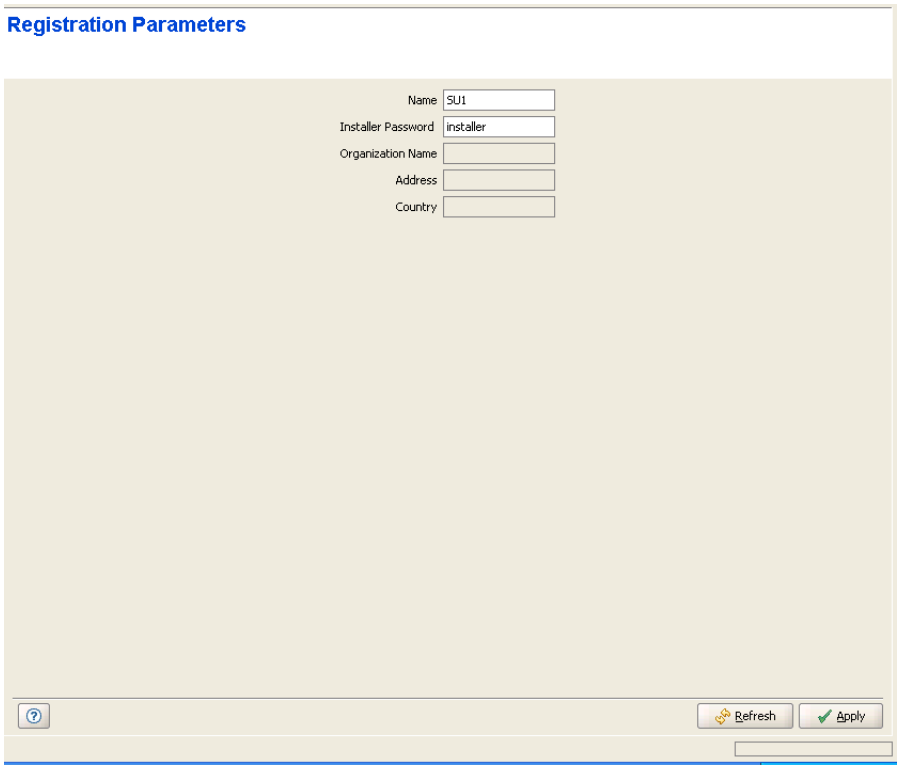


Figure 4-2: Registration Parameters Page

The Registration Parameters page includes the following:

Parameter	Description
SU Name	The SU Name is typically configured locally in the SU (Common Name). The default SU Name given to a new SU during the definition process 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 (Common Name). Under normal conditions, the SU Name should be changed only upon identifying an SU with an SU Name that is identical to that of a previously registered SU. In this case, the new SU will be registered (to enable management), but will not receive any services. Its name in the NPU/Micro Base Station 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 and through a trap message (rbSuDuplicateName trap). If the administrator decides that the SU is legitimate and should receive services, a new SU Name must be configured. The SU Name comprises a string of up to 32 printable characters. A change in the SU Name parameter takes effect only after reset.
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

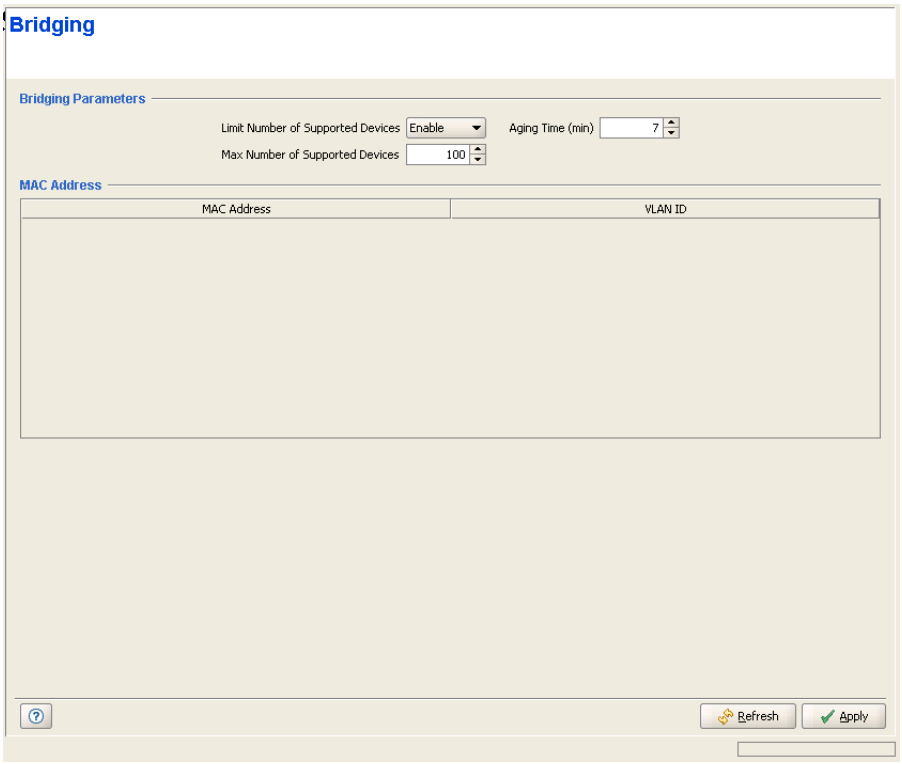


Figure 4-3: Bridging Page

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 MAC, Phy, ATPC and Multi Rate parameters.

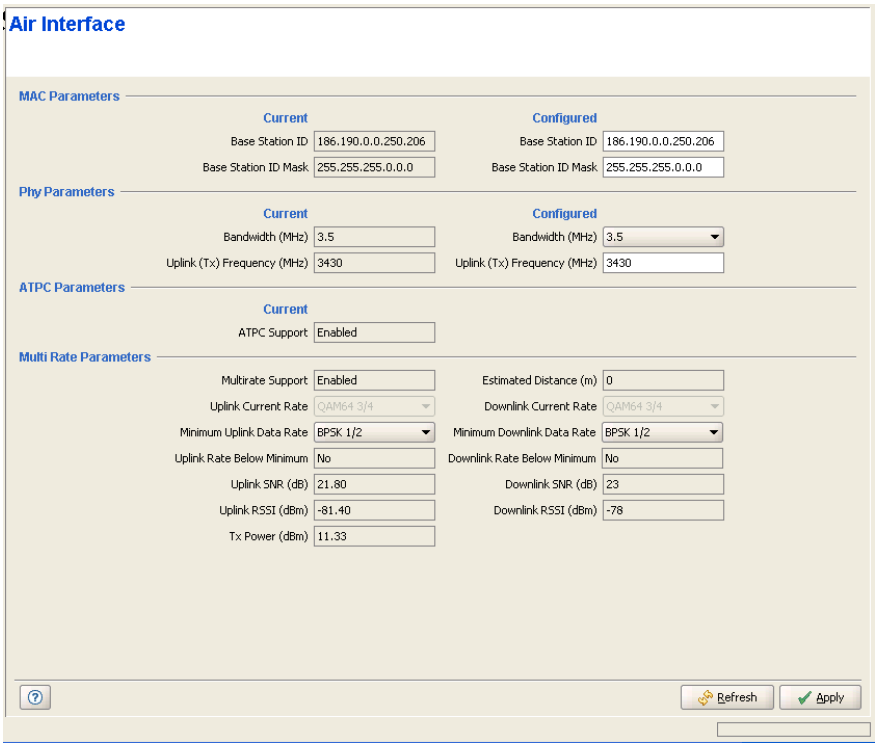


Figure 4-4: SU Air Interface Page

The SU Air Interface page includes the following:

- "MAC Parameters"
- "Phy Parameters"
- "ATPC Parameters"
- "Multi Rate Parameters"

4.5.1 MAC Parameters

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.

4.5.2 Phy Parameters

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 MHz and 3.5 MHz.
Uplink (Tx) Frequency *(Current and Configured)*	The frequency used in the uplink (from SU to AU/Micro Base Station). Available values depend on the hardware of the SU (Frequency Band) and on the Bandwidth. A change in the Uplink Frequency parameter will take effect only after resetting the SU.

4.5.3 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.

4.5.4 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. 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. Broadcasts and multicasts messages are not acknowledged, so that the ARQ mechanism cannot be used and there is no way to guarantee that all intended recipients will receive them properly. In addition, multicasts and broadcasts 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 lower the rate used by any SU, the higher is the number of symbols that should be allocated to it for transmitting/receiving a certain amount of data, resulting in reduced overall capacity of the sector. To minimize such a degrading effect on the performance of the entire sector, a Minimum Data Rate per SU can

be configured. If the SU operates at a rate lower than the defined minimum, the QoS parameters of the services allocated to it will be decreased to reduce the effect on overall sector capacity. The Minimum Data Rate can be configured separately for the Downlink and Uplink, and the effect on QoS parameters ia as follows:

For a Continuous Grant (CG) connection: The service will be denied as long as the SU operates in a rate that is lower than the Minimum Data Rate.

For BE, NRT and RT connections, the MIR and or CIR values will be reduced according to the formula: Corrected Value=Configured Value * (Current Rate Bytes per Symbol)/(Minimum Data Rate Bytes per Symbol), where the Bytes per Symbol for each rate are defined in the following table:

Rate	Modulation and Coding	Bytes per Symbol	
		BW=1.75 MHz	BW=3 .5 MHz
1	BPSK 1/2	6	12
2	BPSK 3/4	9	18
3	QPSK 1/2	12	24
4	QPSK 3/4	18	36
5	QAM16 1/2	24	48
6	QAM16 3/4	36	72
7	QAM64 2/3	48	96
8	QAM64 3/4	54	108

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.
Minimum Uplink Data Rate	The minimum uplink rate for data transmissions.
Uplink Rate Below Minimum	Indicates whether the current uplink rate is below the Minimum Uplink Data Rate or not. When it is below the minimum, quality of service parameters will be reduced as described above.
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)
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.
Minimum Downlink Data Rate	The minimum downlink rate for data transmissions.

Parameter	Description
Downlink Rate Below Minimum	Indicates whether the current downlink rate is below the Minimum Downlink Data Rate or not. When it is below the minimum, quality of service parameters will be reduced as described above.
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.

4.6 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.

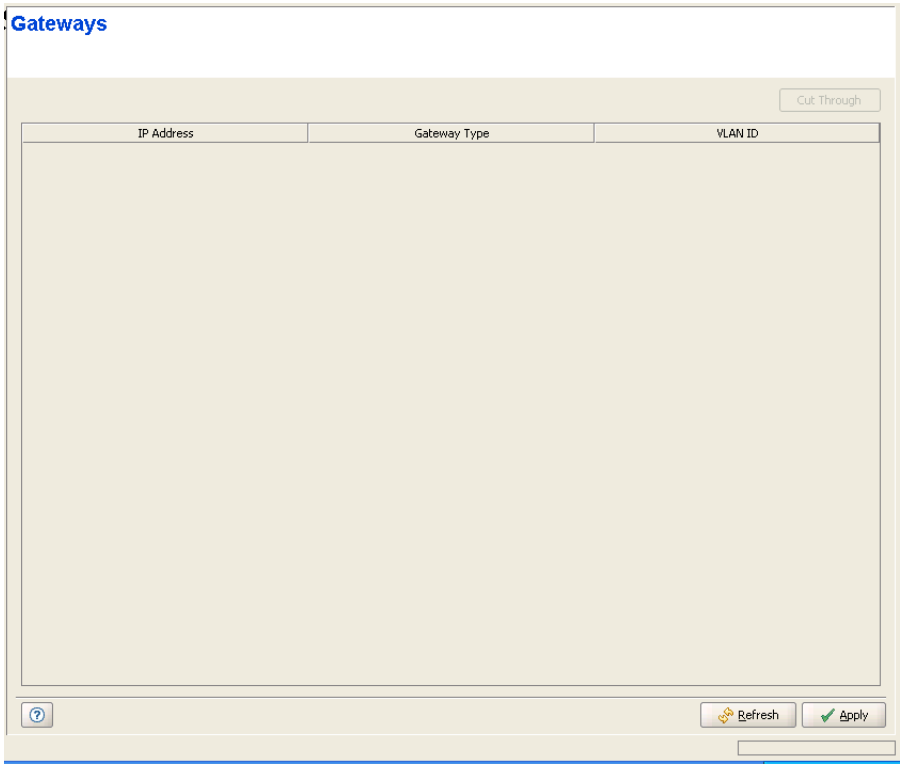


Figure 4-5: Gateways Page

For each Gateway, the following details are provided:

Parameter	Description
IP Address	The IP address of the Gateway.

Parameter	Description
Gateway Type	The Gateway Type. Currently the following Gateways are supported: ■ IDU-NG-4D1W: A Networking Gateway that serves also as an SU IDU, supporting 4 data ports and 1 Wireless LAN port. ■ VG-1D1V: A stand-alone (external) Voice Gateway, supporting 1 data port and 1 POTS port. ■ VG-1D2V: A stand-alone (external) Voice Gateway, supporting 1 data port and 2 POTS ports.
VLAN ID	Applicable only for Voice Gateways. The VLAN ID used for management of the Gateway.

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 Gateways.

4.7 Unit Control Page

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

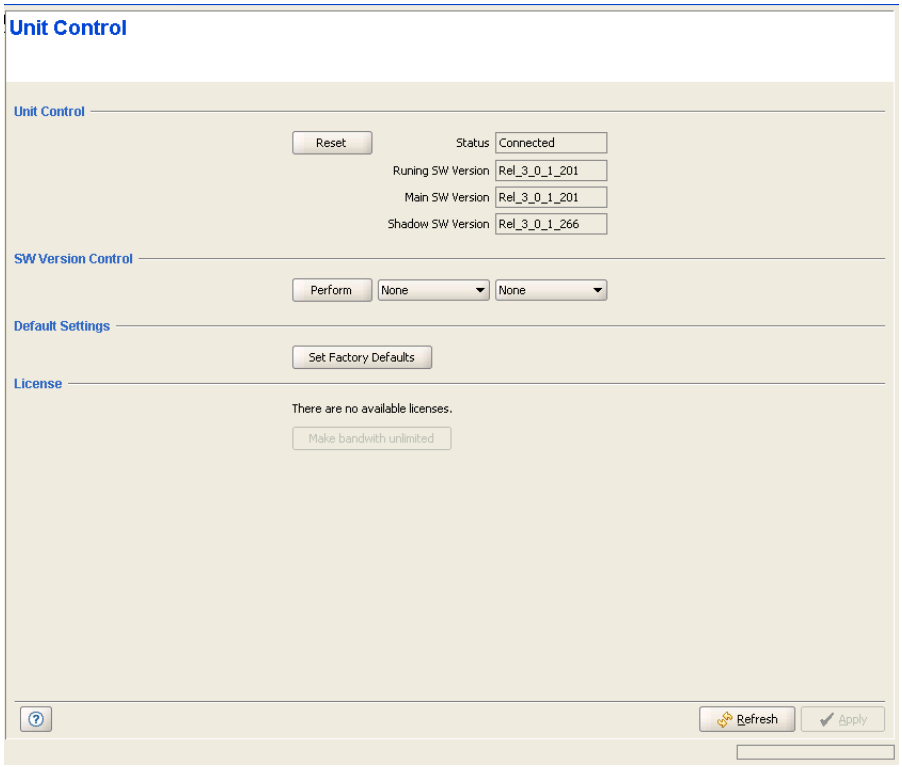


Figure 4-6: SU Unit Control Page

The Unit Control page includes the following sections:

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

4.7.1 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 174 for information on which parameters are changeable in run time and which changes are applied only after reset.

4.7.2 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.

4.7.3 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 174 for information on the factory default values of these parameters. The parameters will revert to their default values after the next reset.

4.7.4 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 the following two conditions are met:

- There are licenses available in the CPE Licenses Bank
- No license has been previously allocated to the CPE.

4.8 Ethernet Port Page

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

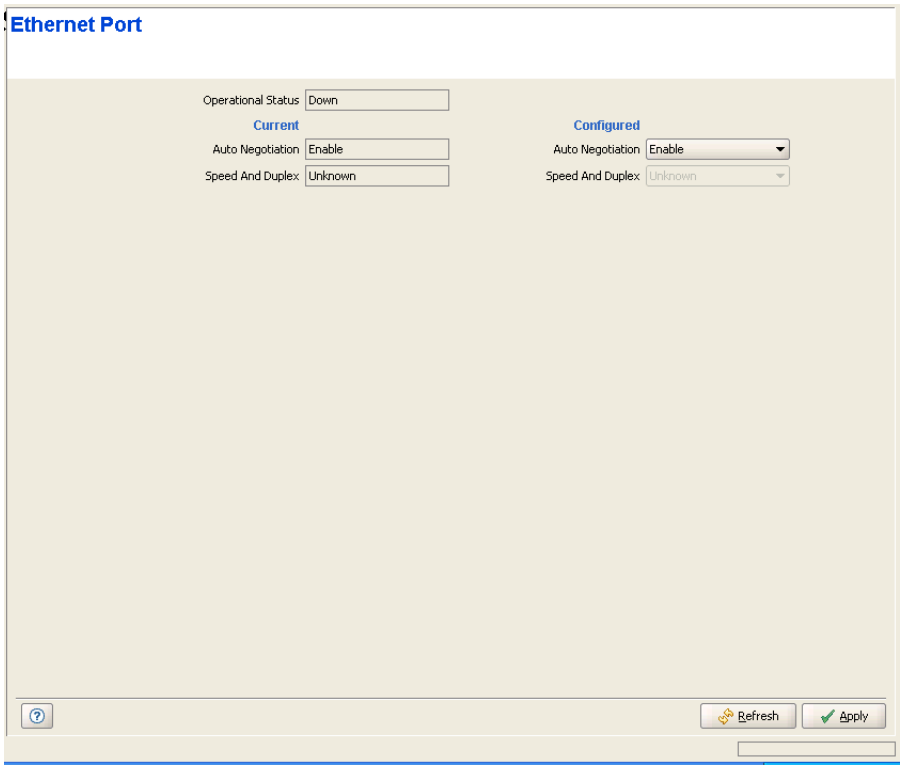


Figure 4-7: Ethernet Port Page

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

4.9 Burst Counters Page

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

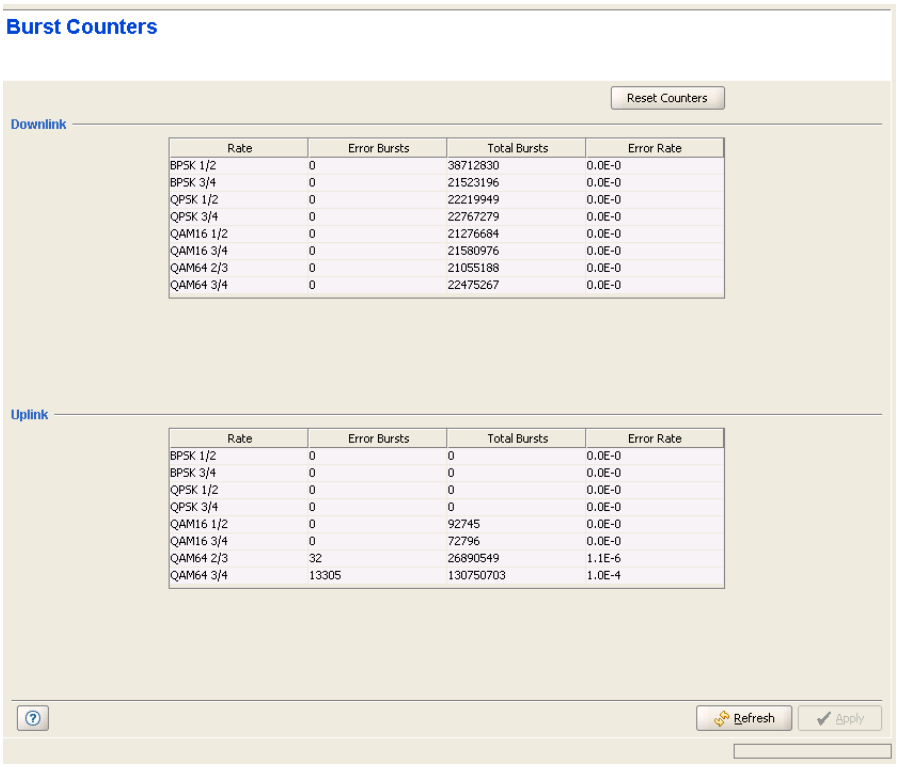


Figure 4-8: Burst Counters Page

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.

4.10 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 168.

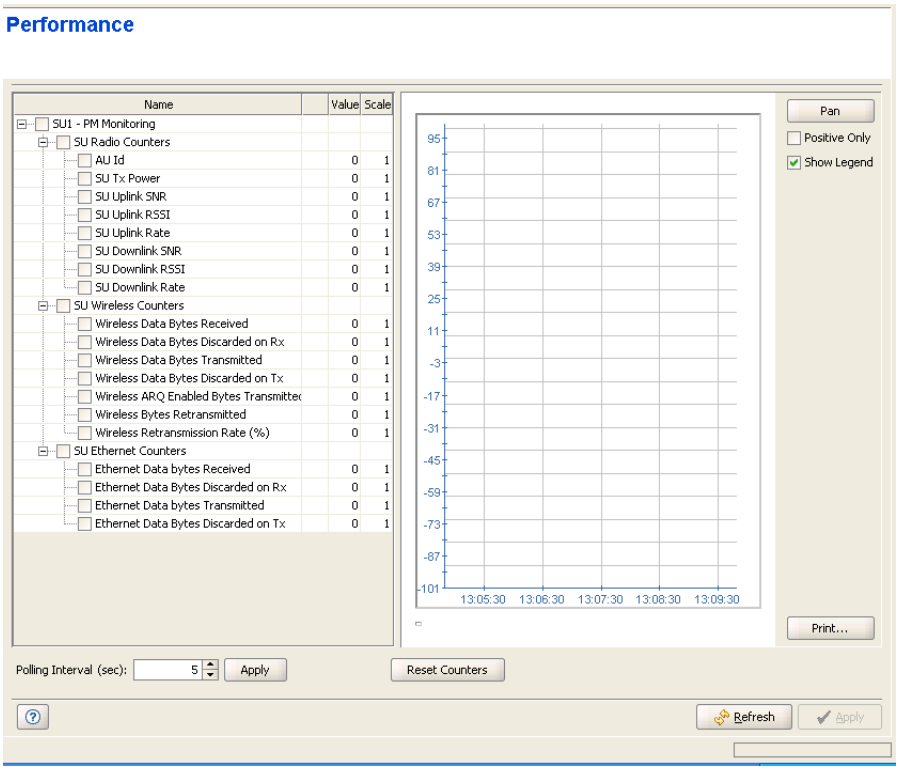


Figure 4-9: SU Performance Page

The counters available for the SU are:

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

4.10.1 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 SNR in dB of the SU's signal as received at the Base Station.
SU Uplink RSSI	The RSSI in dBm of the SU's signal as received at the 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.

4.10.2 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).
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.
Wireless ARQ Enabled Bytes Transmitted	The number of bytes transmitted over BE and NRT connections. Applicable only if the ARQ mechanism is enabled.
Wireless Bytes Retransmitted	The number of unacknowledged bytes that were retransmitted. Retransmissions are applicable only to BE and NRT connections provided the ARQ mechanism is enabled.
Wireless Retransmiaaion Rate	Retransmission Rate in percents is defined as: 100*(ReTx Bytes) / (ARQ Enabled Bytes Tx).

4.10.3 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.

4.11 Licenses Page ("L" model only)

The Licenses page, available only for "L" (Limited) model units, displays the current licenses (if any) installed on the SU.

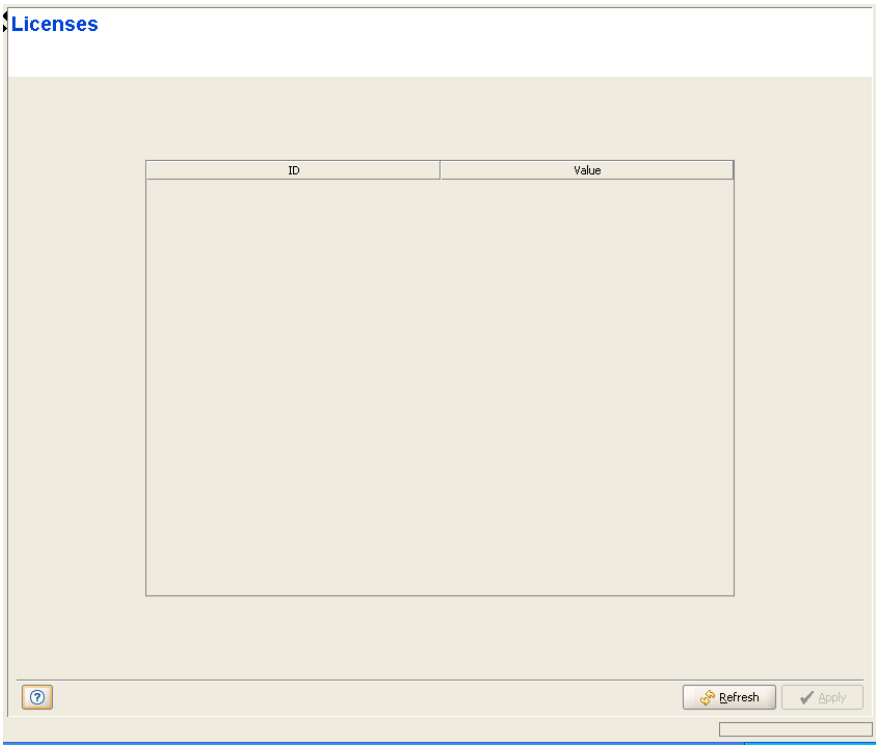


Figure 4-10: SU Licenses Page

The displayed information for each license type includes:

Parameter	Description
ID	The relevant license type. In the current version only a BandWidth license type is available.
Value	The specific details of the relevant licenses. In the current version all Bandwidth licenses are Unlimited.

For more details on licenses, refer to "Licenses Page" on page 74.

5

Chapter 5 - Using the Performance Page

5.1 Using the Performance Page

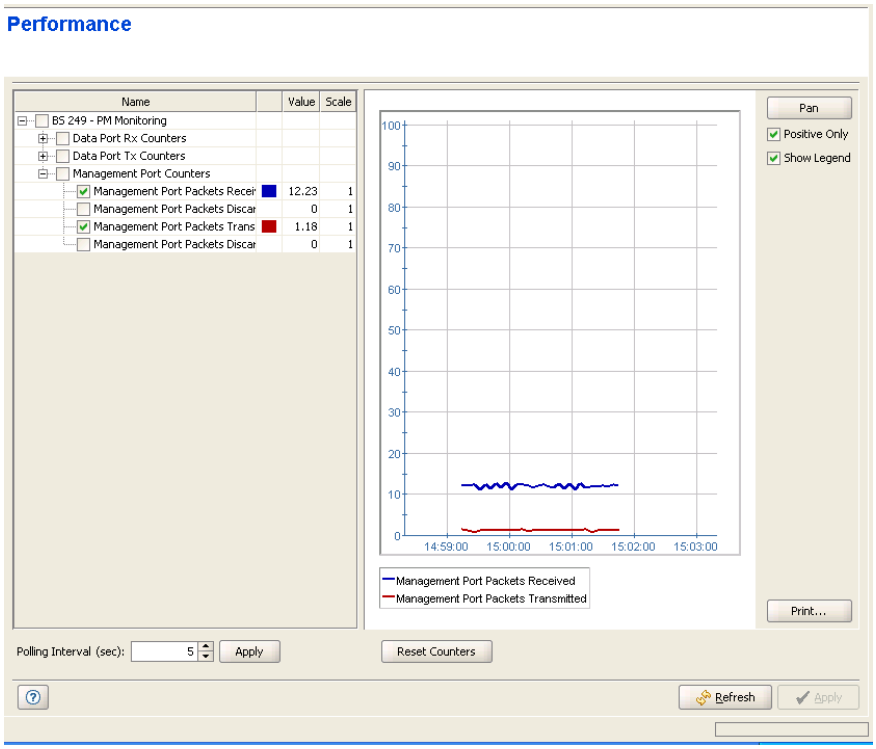


Figure 5-1: Performance Page

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 169
- "The Graph and Controls Section" on page 170

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
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
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)	-103 to -60	-73	Yes
Radio Clusters Page			
Name	Up to 32 printable characters	Null	Yes
Location	Up to 255 printable characters		Yes

Parameter	Range	Default	Run-Time Updated
Sector Heading	0 - 359 (degrees)	0	Yes
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			
Service Working Mode	■ Advanced ■ Quick	Quick	Yes
Default L2/Voice Default Profile	Any of the L2 or 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			
Admin Status	■ Disable ■ Enable	Disable	Yes
Action	■ Deny ■ Allow	Disable	Yes
Active Filter Type	■ L2 ■ L3/L4	L2	Yes
Filter Page - L2 Tab			
Name	Up to 32 printable characters		Yes
MAC Address	xx-xx-xx-xx-xx-xx or null for "Any"		Yes
Mask	Not applicable for "Any" MAC Address. xx-xx-xx-xx-xx-xx		Yes
Direction	Not applicable for "Any" IP Address. ■ Source ■ Destination		Yes

Parameter	Range	Default	Run-Time Updated
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			
Name	Up to 32 printable characters		Yes
IP Address	IP address or null for “Any”		Yes
Mask	Not applicable for “Any” IP Address. IP address format.		Yes
Direction	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.		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
Interface	■ None ■ Wireless ■ Network ■ Both		Yes
MAC Deny List Page			
MAC Address	xx-xx-xx-xx-xx-xx		Yes
Subscriber Units Page			

Parameter	Range	Default	Run-Time Updated
Permanence Status	■ Permanent ■ Temporary		Yes
Services Page			
Name	Up to 32 printable characters		Yes
Service Type	■ L2 ■ PPPoE ■ VoIP		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
Admin Status	■ Disable ■ Enable		Yes
VLAN List	Each VLAN ID: 0 - 4094		Yes
Subscribers Page			
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

Parameter	Range	Default	Run-Time Updated
Service Type	■ L2 ■ PPPoE ■ VoIP		Yes
Forwarding Rule	Not applicable if VLAN Transparency Mode is On. A Forwarding Rule from the device's database		Yes
Priority Classifier	Not applicable to VoIP Service Profiles. A Priority Classifier from the device's database		Yes
VLAN Transparency Mode	■ On ■ Off		Yes
VPL ID	0 to 4094 or None (4095) or Not Applicable (4096) for VLAN Transparency mode = On.		Yes
Priority Marking Mode	■ Transparent ■ 802.1p ■ DSCP		Yes
Priority Marking Value	■ 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
Forwarding Rules Page			
Name	Up to 32 printable characters		Yes
Type	■ L2 ■ PPPoE ■ VoIP		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 VLAN	Applicable on for SUs with SW version below 2.0. 0 - 4094.		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.		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, NRT and BE QoS Types. ■ Short ■ Medium ■ Long		Yes

Parameter	Range	Default	Run-Time Updated
PS	Packet Size is applicable only to CG QoS Type. From 64 to 1550 (bytes).		Yes
SI	Sample Interval is aplicable only to CG QoS Type. From 5 to 100 (milliseconds), using increments of 5 milliseconds.		Yes
Q in Q Page			
Ethertype	■ 8100 ■ 9100 ■ 9200	8100	Yes
Metro Tag	0-4094		Yes
Start VLAN	0-4094		Yes
End VLAN	0-4094		Yes
Data Port Page			
Configured Auto Negotiation (Micro Base Station)	■ Disable ■ Enable	Enable	Yes
Configured Link Speed	NPU: ■ Full duplex 100Mbps ■ Full duplex 1Gbps 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.	Yes
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			

Parameter	Range	Default	Run-Time Updated
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
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 ■ Rx Diversity	No Diversity	Automatic Reset
Associated ODU	A defined ODU ID		No

Parameter	Range	Default	Run-Time Updated
Configured Tx Frequency	According to the Configured Frequency Band in the Associated ODU, and the AU Bandwidth		No
Admin Status	■ Disable ■ Enable	Disable	No
Air Interface Page (AU)			
Sector ID	1-255	206	No
ARQ State	■ Disable ■ Enable	Disable	No
Max. Cell Radius (km)	10 -110 km	20 km	No
Bandwidth (MHz)	■ 1.75 ■ 3.5	3.5	No
Multirate Support	■ Disable ■ Enable Disable is temporary until next reset	Enable	Yes
Uplink Basic Rate	■ BPSK 1/2 ■ BPSK 3/4 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4s	BPSK 1/2	Yes

Parameter	Range	Default	Run-Time Updated
Downlink Basic Rate	■ BPSK 1/2 ■ BPSK 3/4 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4	BPSK 1/2	Yes
Bridge and Voice Page (MBS)			
Bridge Aging Time	1 - 1440 minutes or 0 for no aging	10 minutes	Yes
Max No. of Voice Calls	0-50	50	Yes
DRAP TTL Retries	1 - 100	4	Yes
Registration Parameters Page (SU)			
SU Name	Up to 32 printable characters		No
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)			
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		No
Uplink (Tx) Frequency (MHz)	Depends on Frequency Bands Group available for the AU/Micro Base Station, and the Bandwidth.		No

Parameter	Range	Default	Run-Time Updated
Uplink Current Rate	Configurable only when Multirate Support in the AU/Micro Base Station is disabled. ■ BPSK 1/2 ■ BPSK 3/4 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4		
Downlink Current Rate	Configurable only when Multirate Support in the AU/Micro Base Station is disabled. ■ BPSK 1/2 ■ BPSK 3/4 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4		

Parameter	Range	Default	Run-Time Updated
Minimum Uplink Data Rate	■ BPSK 1/2 ■ BPSK 3/4 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4	BPSK 1/2	
Minimum Downlink Data Rate	■ BPSK 1/2 ■ BPSK 3/4 ■ QPSK 1/2 ■ QPSK 3/4 ■ QAM16 1/2 ■ QAM16 3/4 ■ QAM64 2/3 ■ QAM64 3/4	BPSK 1/2	
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