# 5 NAVIGATING THE DEKO4078SD SIGNAL BOOSTER MANAGEMENT TOOL

This chapter describes how to navigate the Deko4078SD signal booster Management Tool application and the available functions.

## 5.1 ACCESS LEVELS

The enabled parameters displayed by the application depend on the access mode: **User** or **Guest**.

## 5.2 MAIN WINDOW

The Main window consists of the following tabs:

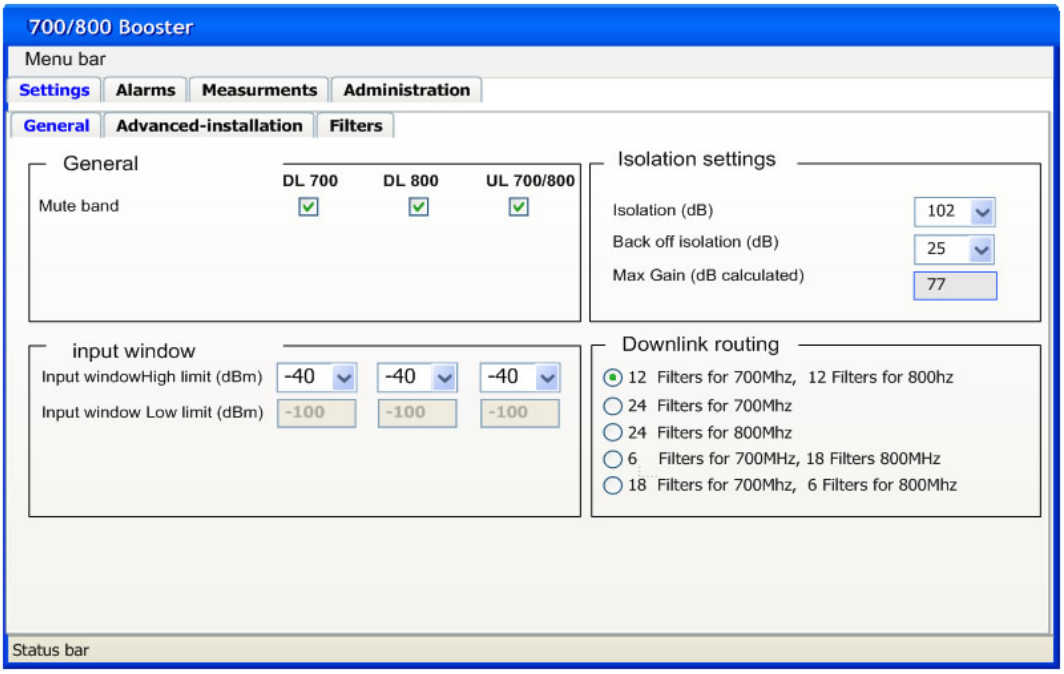
- **Settings** – enables configuring and defining the signal booster and filter parameters in the corresponding tabs.
- **Alarms** – Provides summary view of alarms and alarm log
- **Measurements** – provides a summary of the configured filter parameters and their alarms
- **Administration** – Includes the system information, SW upgrade option, communication parameters and user management option

## 5.3 SETTINGS

The **Settings** window consists of three main tabs: *General, Filter* and *Advanced-Installation*.

### 5.3.1 GENERAL

The following figure shows the **General** tab of the *Settings* window.

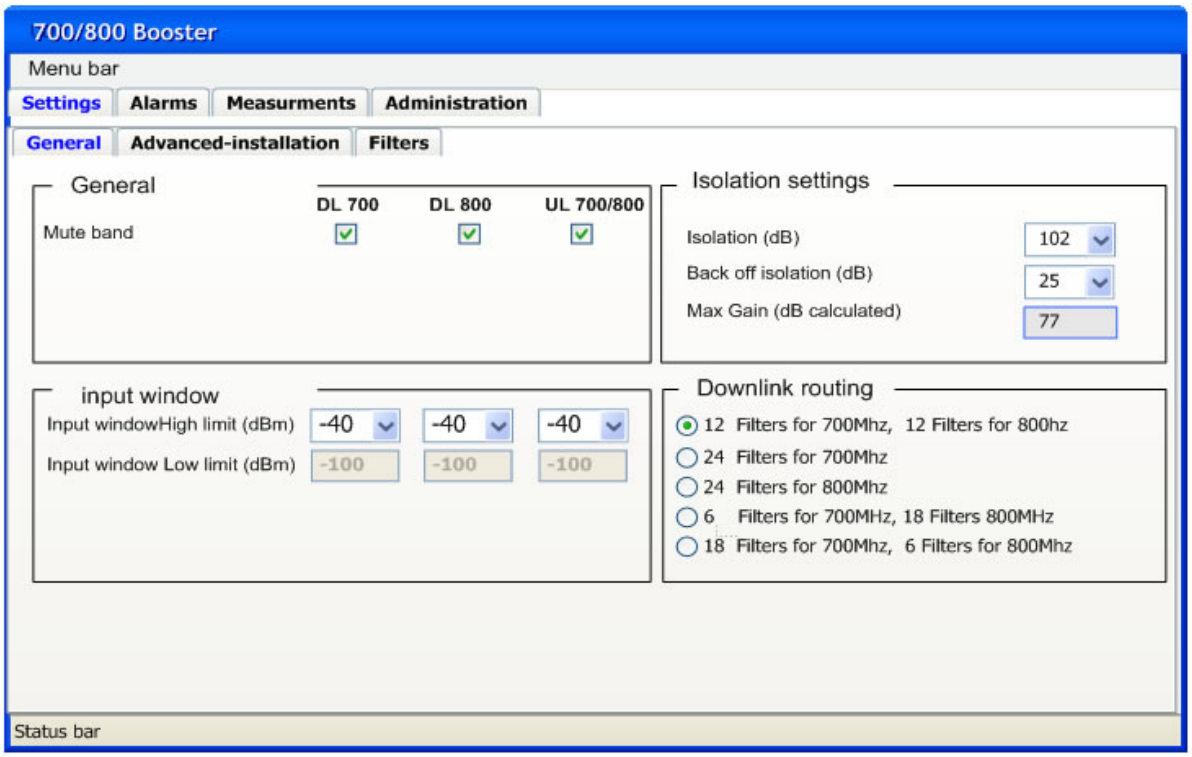


There are four main field areas:

- **General** – consists of the *Mute Band* option that enables manually muting the supported domains (700DL 800 DL and UL)
- **Isolation Settings** – provides the signal booster isolation parameters for configuration (*Isolation* and *Back Off Isolation*) which also determine the **Max Gain** for all the domains (automatically calculated).
- **Input Window** – displays the boosters high and low sensitivity limits for the sliding window. The high *Input window High limit* is configurable where as the low limit is adjusted automatically.

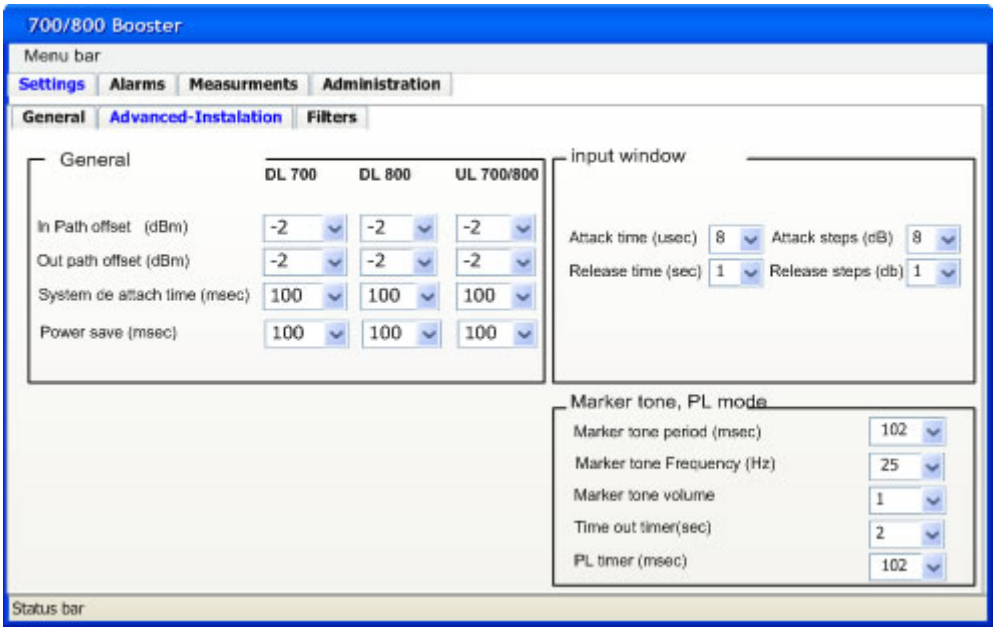
Note: The attack and release time for the sliding window is determined in the *Advanced-Installation* tab (see 5.3.2).

- **Downlink Routing** – Includes the Downlink Routing capability options that enable defining the number of filters to be used for each 700 and/or 800 MHz bands.



### 5.3.2 ADVANCED – INSTALLATION

The following figure shows the **Advance-Installation** tab of the *Settings* window.




The Advanced-Installation tab consists of three main field areas: General, Input Window and Marker Tone, PL Mode.

The following table provides a description of the parameters displayed in the *Advanced-Installation* field areas.

| Field Area | Parameter | Description |
|---|---|---|
| General | In Path Offset (dBm) | The attenuation measured (per domain – DL700/DL800/UL) between the Input antenna to the DMSB Signal Booster |
| | Out Path Offset (dBm) | The attenuation measured (per domain – DL700/DL800/UL) between the output of the DMSB Signal Booster to the antenna |
| | System de attach time (msec) | Determines the amount of time the channel remains open after the transmission has ended |
| | Power Save (msec) | Determines the amount of time (msec) after which the filter P.Amp is muted if it is not active.<br>Note: The mute is immediately released once the filter resumes being active. |
| Input Window | Attack Time (µsec) | Attack time for sliding window |
| | Attack Steps (dB) | Attack steps in dB increments for Attack time |
| | Release Time (sec) | Release time for sliding window |
| | Release Steps (dB) | Release steps in dB increments for Release time |
| Marker Tone, PL Mode | Marker Tone Period (msec) | Duration (msec) of the CW – signal generated by the signal booster for the ID Tone |
| | Marker Tone Frequency (Hz) | CW frequency (Hz) for ID Tone |
| | Marker Tone Volume | Volume of CW for ID Tone |
| | Time Out Timer (sec) | Limits channel occupancy to configured amount of time |
| | PL Timer (msec) | PL (Private line) timer for closing channel when wrong PL detected |

## 5.3.3 FILTERS

There are two filter screens: One provides a summarized description of the configured filters and the other provides the user with the filters' configurable parameters.

### *5.3.3.1 Filter Parameters*

The following figure shows the **Filters** (parameters) tab of the *Settings* window. This window is accessed by clicking on the **Add/Edit filter** button of the **Filter** (700/800) window (see Figure 19).

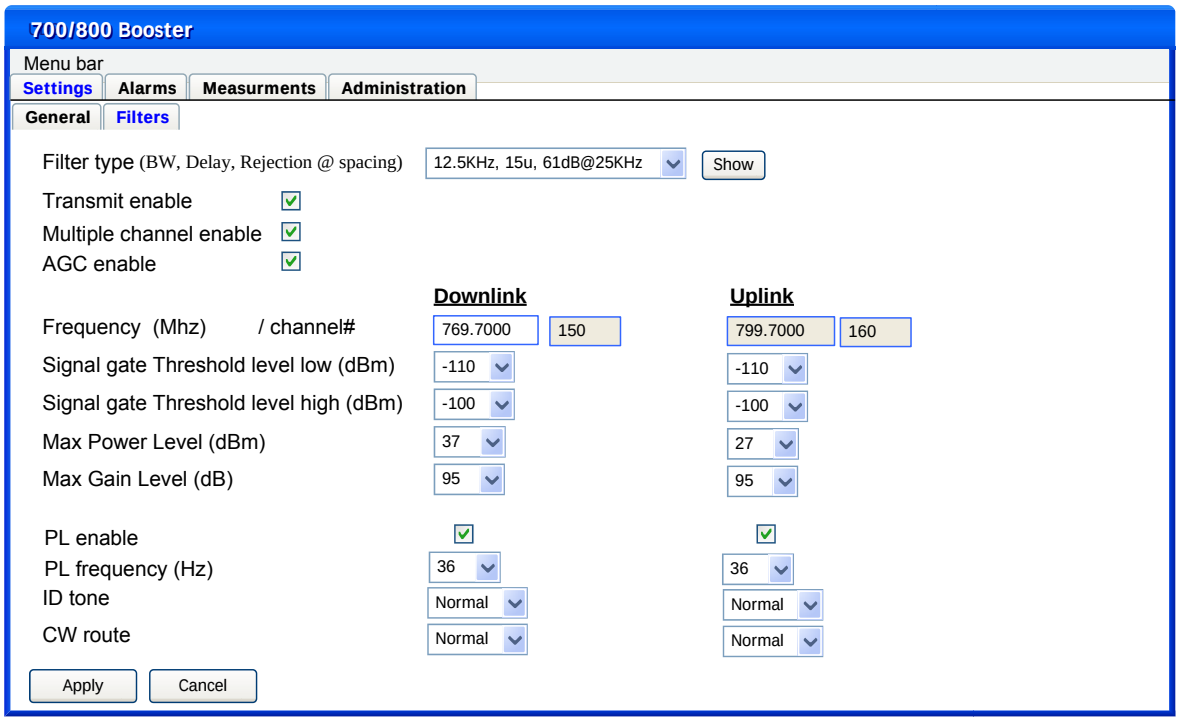



*Figure 18. Filter Parameters*

The majority of the parameters are displayed with default values, which can be user modified according to customer requirements. This window enables the user to select the required filter type and determine the DL center frequency.

Note: After configuring or modifying a parameter, click **Apply** to save the definition to the signal booster.

The following table provides a description of the parameter fields displayed in the window above.

| Field | Description |
|---|---|
| Filter Type | Combo box that provides a list of the available filter types |
| Transmit Enable | Enables filter operability. If this option is not enable (check marked) the filter will be defined but not operable. |
| Multiple Channel Enable | Option for enabling/disabling (default: enable) filter monitoring<br>For Setup – enables RSSI readings even when channel is not transmitting<br>For wideband filters – if a wideband filter is selected the monitoring option should be disabled in order to save power. |
| AGC Enable | Option for enabling and disabling Automatic Gain Control feature |
| Frequency (MHz) | Center Frequency |
| Signal Gate Threshold Level low (dBm) | UL and DL RSSI thresholds (low and high) in the **Signal Gate Threshold** fields determine the range in which the filter is active |
| Signal Gate Threshold Level high (dBm) | |
| Max Power Level (dBm) | This value limits the signal booster maximum output power. |
| Max Gain Level (dB) | This value limits the gain to a maximum of 90dB. |
| PL Enable | Option for enabling and disabling PL |
| PL Frequency (Hz) | Enables setting the PL frequency between 67 – 254 Hz |
| ID Tone | Provides several options for generating a specific tone in order to check the communication during setup (see 6.1) |
| CW Route | Determines the type of signal generated for the ID Tone by the signal booster<br>**Normal –** Signal is passed “as is”<br>**Zero –** No signal |

### 5.3.3.2 Filter Description

The following figure shows the **Filters** (description) tab of the *Settings* window. A separate window is displayed for each of the 700 and 800 bands.

This window includes the **Add/Edit Filter** option and provides a description of the type of filter(s) in use, their UL and DL center frequency, output power and gain. After the filters have been configured the user can navigate to this screen in order to view the filter characteristics (read only screen).

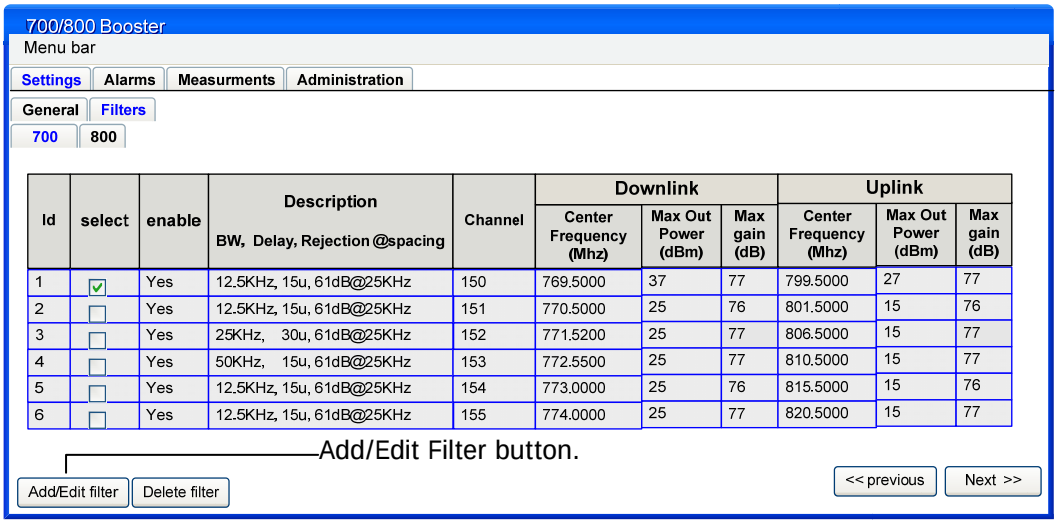



*Figure 19. Filter Description*

The following tables provide a description of the fields and buttons displayed in the figure above.

| Field | Description |
|---|---|
| ID | Filter ID Number |
| Select | Checkbox for selecting filter to be edited |
| Enable | Provides indication on whether the filter is enabled or not |
| Description | Description of selected filter type (see 4.2.3) |
| Channel | Filter channel number - translation from frequency to channel number |
| Center Frequency (MHz) | DL/UL center frequency |
| Max Out Power (dBm) | DL/UL Max composite output power settings |
| Max Gain (dB) | DL/UL Max gain settings |

| Button | Description | Comments |
|---|---|---|
| Add/Edit Filter | Used for adding a new filter or editing an existing one | |
| Delete Filter | Used for removing a selected filter from the list | |
| Previous | Used for navigating to previous screen (filter parameters screen) of selected filter when editing | It is recommended to avoid using the scroll bar and use the *Next* and *Previous* buttons |
| Next | Used for navigating to next screen | |

# 5.4 ALARMS

The alarms are displayed in two windows. One provides a summarized view of the system alarms and the other provides a log of the alarm history.

## 5.4.1 SUMMARY VIEW

The alarms **Summary View** tab displays the monitoring alarms for the system elements (Main, Power Amplifier and Power Supply) in addition to the Mute (per band) and External Alarms. See 6.5 for alarms description.


*Figure 20. Alarms Summary View*

### 5.4.2 LOGS

The **Alarms Log** tab of the *CMU* window displays a history of up to 200 logs of alarms generated by the system. The tab consists of a tabular screen with sorting capabilities that include the alarm time stamp and description.

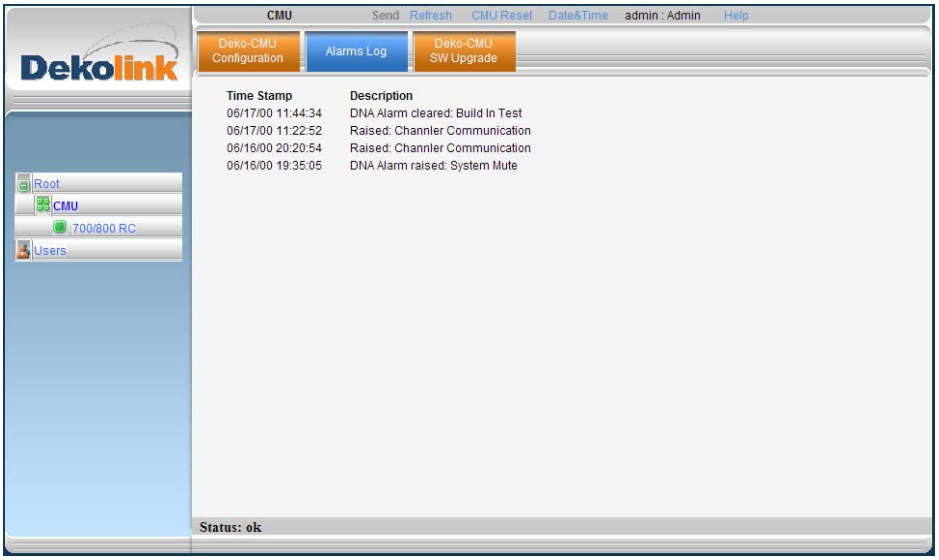
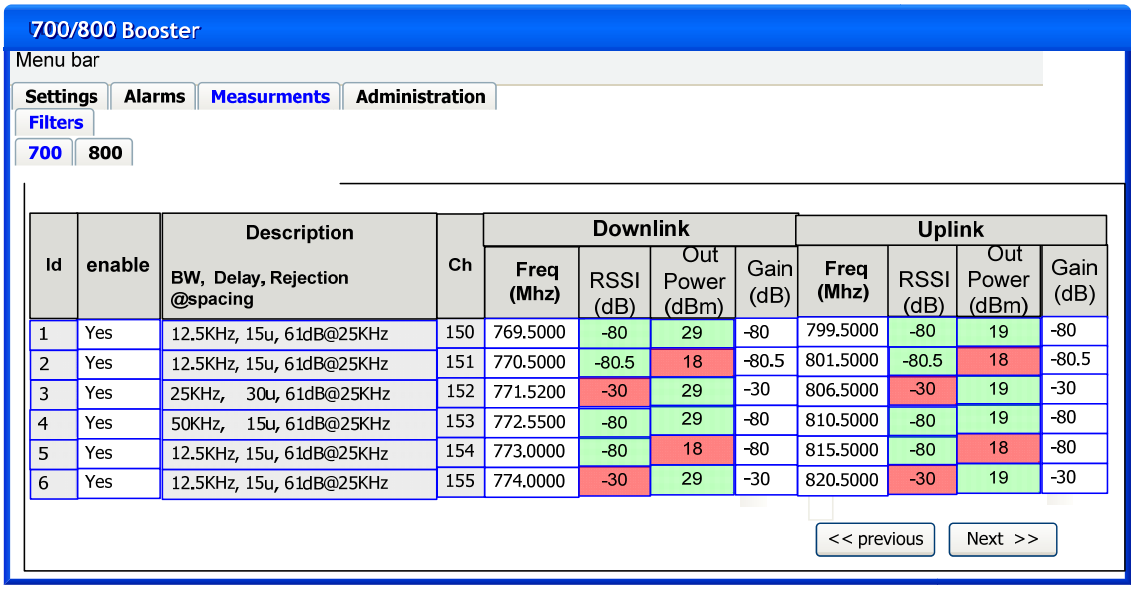



*Figure 21. Alarms Log*

## 5.5 MEASUREMENTS

The **Measurements** window is a read-only window which displays a summarized view of the configured filters for each band (the filters for the 700 and 800 bands are displayed in separate screens). This screen provides the user with a general description of the filters in addition to indicating whether the RSSI and Output Power threshold levels have been exceeded.




See 5.3.3.2 for description of fields.

# 5.6 ADMINISTRATION

The **Administration** window consists of the following tabs:

- **System Information** – Displays the system information such as the SW version and the system elements' part numbers. See 6.9
- **Backup** – Enables user to backup and restore user parameters such as the filter settings. See 7.2.3
- **SW Upgrade** – Enables user to upgrade the application SW with latest version. See 7.2.2
- **Filter Import** – Displays an inventory of all the filter types (grouped in banks) and provides a filter management option that enables the user to upload new filters to the filter bank. See 7.2.4.
- **Communication** – Displays configurable communication and modem parameters. See 4.2.4.
- **Users** – Provides user management options. See 7.1

# 6 DMSB MT OPERATIONS

## 6.1 FILTERS

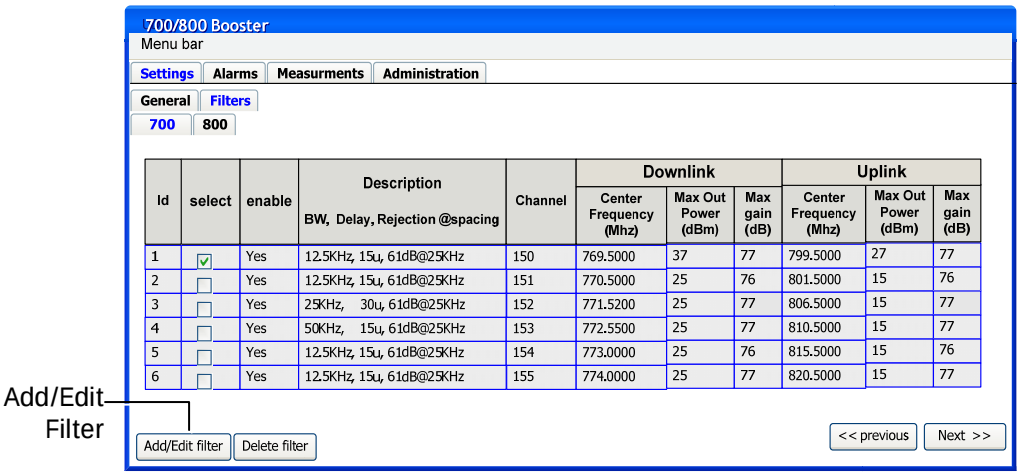
The application enables the user to add, edit and delete filters. See following sections for descriptions.

### 6.1.1 ADDING A FILTER

**To add a filter**

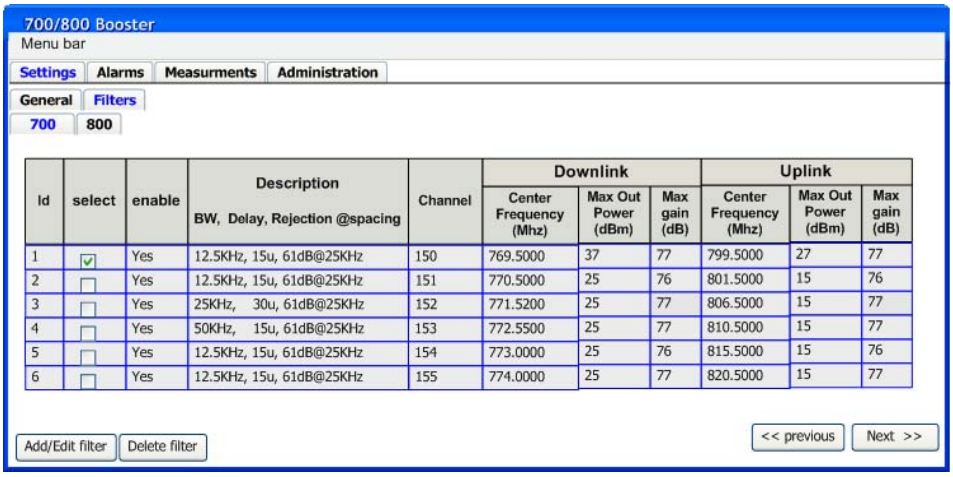
1. Click on the **Filters** tab of the *Settings* window. The following window appears:

Note: Upon initial setup there are no filters listed.




| Id | select | enable | Description BW, Delay, Rejection @spacing | Channel | Downlink Center Frequency (Mhz) | Downlink Max Out Power (dBm) | Downlink Max gain (dB) | Uplink Center Frequency (Mhz) | Uplink Max Out Power (dBm) | Uplink Max gain (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ☑ | Yes | 12.5KHz, 15u, 61dB@25KHz | 150 | 769.5000 | 37 | 77 | 799.5000 | 27 | 77 |
| 2 | ☐ | Yes | 12.5KHz, 15u, 61dB@25KHz | 151 | 770.5000 | 25 | 76 | 801.5000 | 15 | 76 |
| 3 | ☐ | Yes | 25KHz, 30u, 61dB@25KHz | 152 | 771.5200 | 25 | 77 | 806.5000 | 15 | 77 |
| 4 | ☐ | Yes | 50KHz, 15u, 61dB@25KHz | 153 | 772.5500 | 25 | 77 | 810.5000 | 15 | 77 |
| 5 | ☐ | Yes | 12.5KHz, 15u, 61dB@25KHz | 154 | 773.0000 | 25 | 76 | 815.5000 | 15 | 76 |
| 6 | ☐ | Yes | 12.5KHz, 15u, 61dB@25KHz | 155 | 774.0000 | 25 | 77 | 820.5000 | 15 | 77 |

2. Verify that no existing filters are selected and click on the **Add/Edit Filter** button. The following window appears.




| Id | select | enable | Description BW, Delay, Rejection @spacing | Channel | Downlink Center Frequency (Mhz) | Downlink Max Out Power (dBm) | Downlink Max gain (dB) | Uplink Center Frequency (Mhz) | Uplink Max Out Power (dBm) | Uplink Max gain (dB) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | ☑ | Yes | 12.5KHz, 15u, 61dB@25KHz | 150 | 769.5000 | 37 | 77 | 799.5000 | 27 | 77 |
| 2 | ☐ | Yes | 12.5KHz, 15u, 61dB@25KHz | 151 | 770.5000 | 25 | 76 | 801.5000 | 15 | 76 |
| 3 | ☐ | Yes | 25KHz, 30u, 61dB@25KHz | 152 | 771.5200 | 25 | 77 | 806.5000 | 15 | 77 |
| 4 | ☐ | Yes | 50KHz, 15u, 61dB@25KHz | 153 | 772.5500 | 25 | 77 | 810.5000 | 15 | 77 |
| 5 | ☐ | Yes | 12.5KHz, 15u, 61dB@25KHz | 154 | 773.0000 | 25 | 76 | 815.5000 | 15 | 76 |
| 6 | ☐ | Yes | 12.5KHz, 15u, 61dB@25KHz | 155 | 774.0000 | 25 | 77 | 820.5000 | 15 | 77 |

3. Select the required filter type in the **Filter Type** field.

Note: Filter types are taken from the list of available filter types.

4. Define the DL center frequency in the **Frequency** field.
5. Define the RSSI threshold range in the **Signal Gate Threshold Low/High** fields.

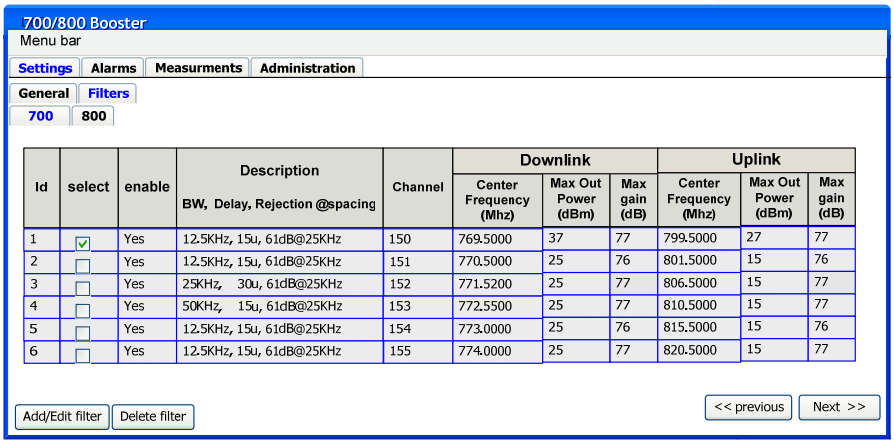
Note: The remaining filter parameters and attributes are displayed with default values that can be modified according to site requirements.

6. The default filter **Max Gain** value displayed is the Maximum Gain calculated according to the isolation settings (see section 4.2.1 step 2). This value can be modified, however the filter Maximum Gain cannot be higher than that calculated according to the booster isolation settings. If a higher maximum gain value is required the isolation settings must be modified accordingly.
7. Click **Apply**.

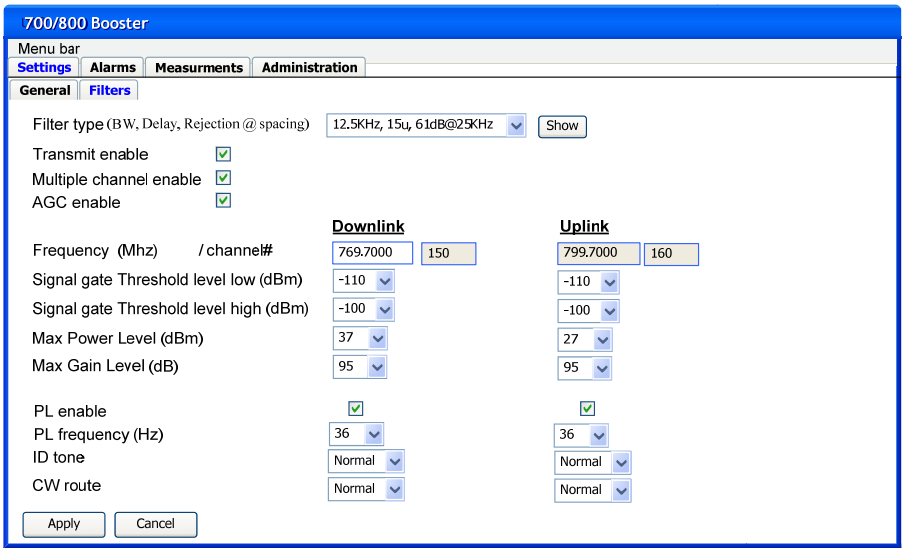
## 6.1.2 EDITING FILTERS

### To edit a filter

1. Click on the **Filters** tab of the *Settings* window. The following appears:




2. In the **Select** column, select the filter to be edited.
3. Click the **Add/Edit Filter** or **Next** button. The following window appears:

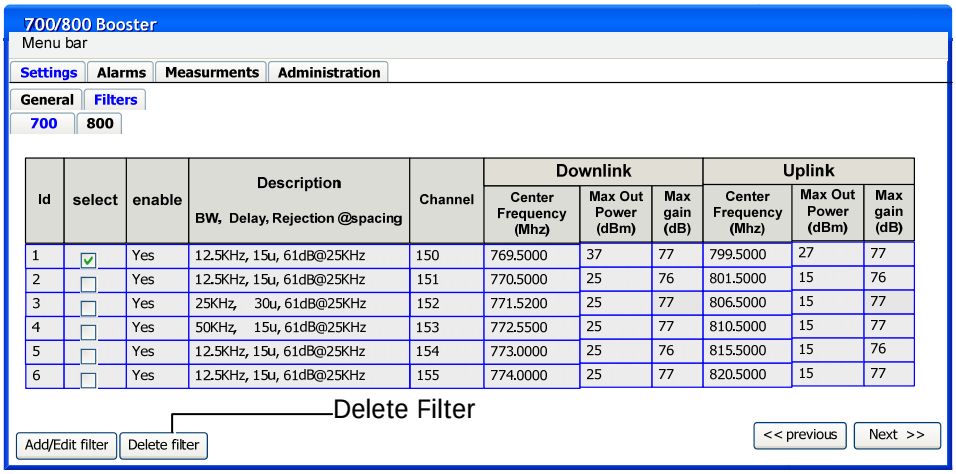



4. Modify the required parameters and click **Apply**. The previous filter screen appears.

### 6.1.3 DELETING FILTERS

**To delete a configured filter from the list**

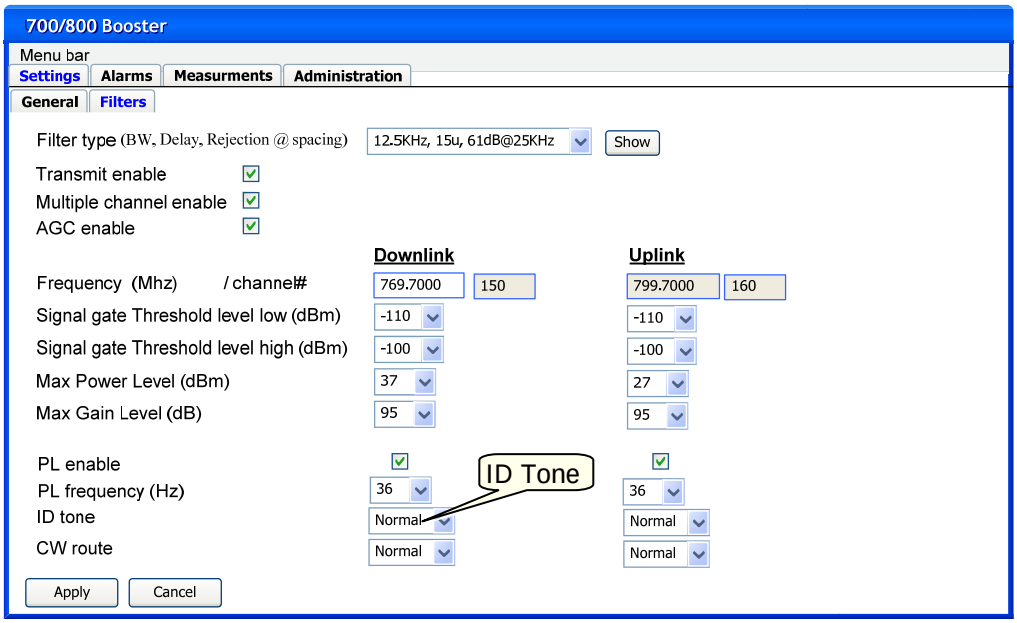
1. Click the **Filters** tab of the *Settings* window. The following appears:




2. In the **Select** column, select the filter to be deleted.
3. Click the **Delete Filter** button. The filter table will be updated and displayed with the new list of available filters.

## 6.2 GENERATING ID TONE ON CHANNELS

The ID tone is used for the “Walk Test” and enables the Deko4078SD signal booster to generate a specific tone in order to check the communication during setup. The ID Tone option is accessed through the *Routing* tab of the DDF window. See following figure.



### To determine the ID Tone

1. In the **ID Tone** field of the *Filters (parameters)* tab select one of the following ID Tone types from the drop down list:

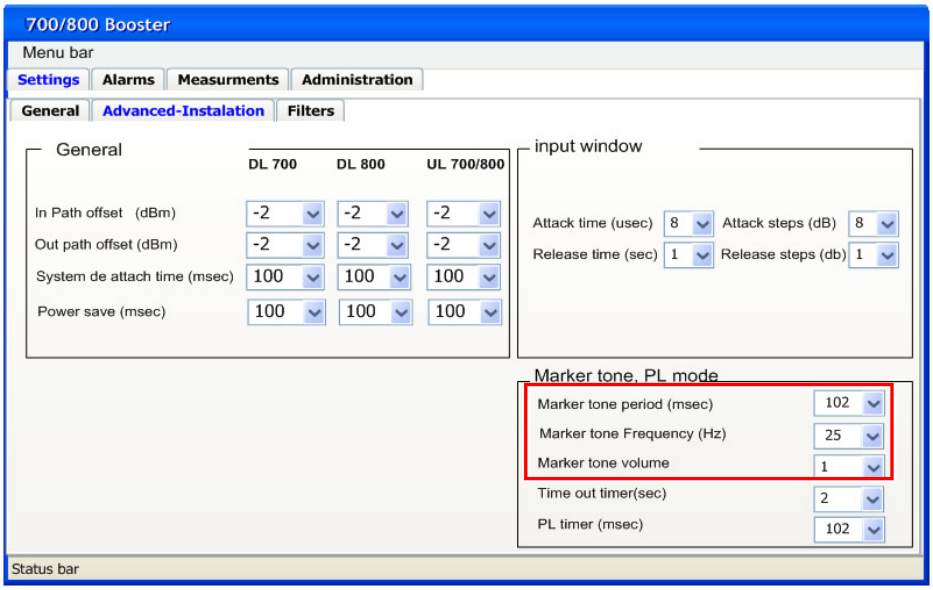
- **Normal –** Beep will be sounded at the beginning of the conversation
- **Repetition –** Beep will be sounded at predefined intervals
- **Continuous –** A continuous beep is sounded.

Note: Select *Disable* to disable the function.

2. In order to use the Booster as a signal generator, select the **Normal** option (default) from the **CW Route** drop-down list.

Note: Select **Zero** for no signal.

3. Click **Apply.**
4. Define the following ID Tone parameters in the *Marker Tone* field area of the **Advanced-Installation** tab (*Settings* window):
   - Marker (ID) Tone Period
   - Marker (ID) Tone Frequency (Hz)
   - Marker (ID) Tone Volume

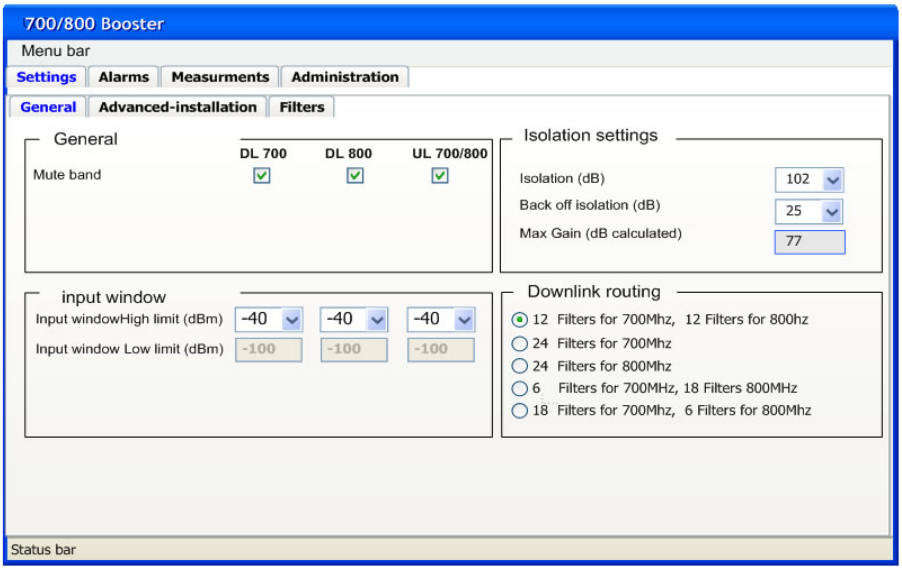



5. Click the **Send Parameters** button.

# 6.3 MODIFYING DEKO4078SD PARAMETERS

### To modify the signal booster parameters

1. Click the **General** sub-tab of the *Settings* tab. The following appears.




2. Perform the required changes in the displayed parameters (see field descriptions in section 5.3.1).

> Note: Upon selecting a different *downlink routing* option, the previous filter map is deleted and a new one must be configured (see 4.2.3 and/or 6.1.1).

3. Click **Send**.

# 6.4 VIEWING ONLINE BOOSTER PARAMETERS

### To view current signal booster Parameters

After a connection has been established between the computer and the signal booster click the **Refresh** button, located at the bottom of the *Settings* window shown below.

## 6.5 MONITORING ALARMS

The application provides three levels of alarms:

- **System alarms** – Provides the monitoring alarms for all three system units: Main, Power Amplifier and Power Supply. In addition, includes the Mute alarms.
- **External alarms** – Provides monitoring according to the external alarms defined by the user (see 6.7)
- **Specific alarms per channel** – Provides the user with alarms (per filter) indicating whether the filter exceeds the configured threshold range.

The following sections describe the alarms displayed in the application GUI.

### 6.5.1 SYSTEM ALARMS AND EXTERNAL ALARMS

The **Summary View** tab of the *Alarms* screen provides a summary view of the monitoring alarms for the system elements and the external alarms.

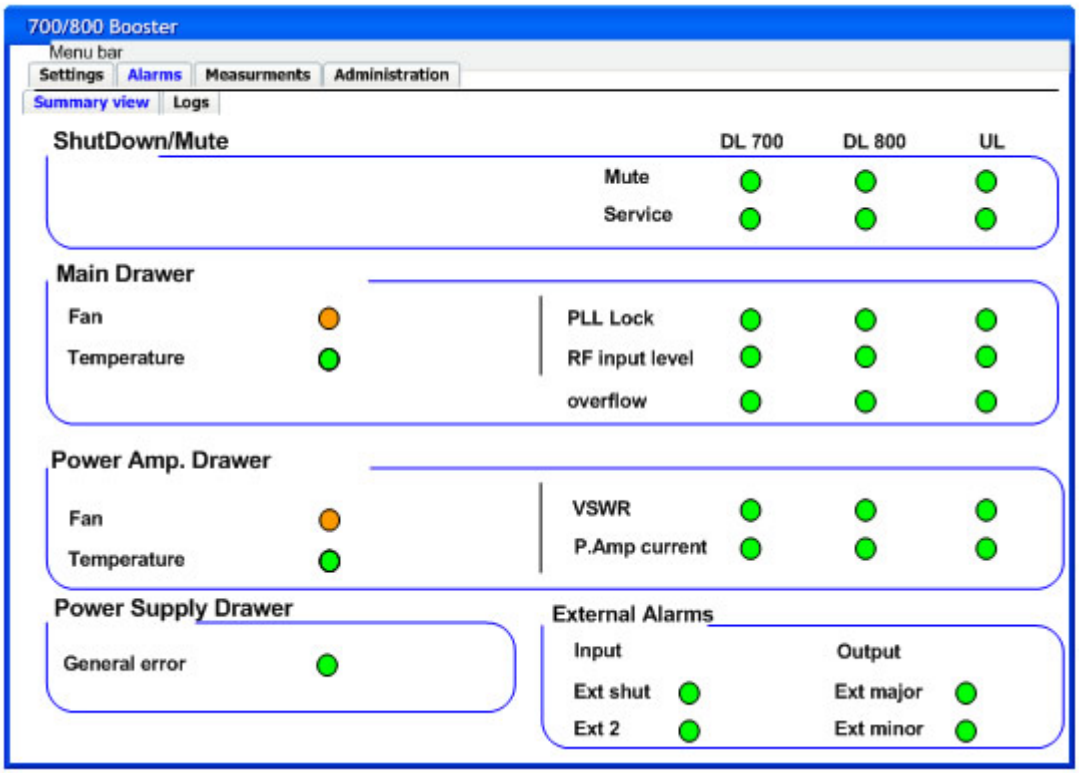



*Figure 22. Alarms- Summary View*

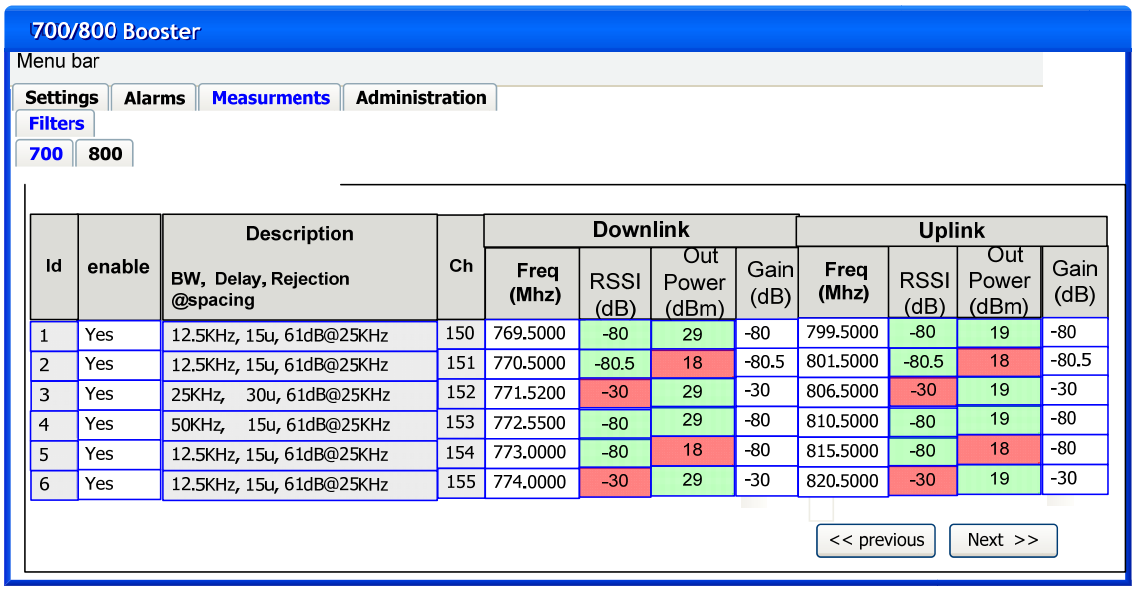
The following table provides a description of the alarms displayed in the figure above.

| Alarm Group | | Alarm | Description |
|---|---|---|---|
| Shutdown/Mute | | Mute | Mute per band - can be a result either of a manually performed mute, system mute or fatal error at the initialization phase. |
| | | Service | Band PA mutes due to failure to transmit power |
| Main Drawer | | Fan | Indicates operation status of fan |
| | | Temperature | Indicates an inner temperature over 60ºC. The power supply shutdowns the system when the temperature reaches 70ºC |
| | | PLL Lock | PLL lock per band at Main drawer - Faulty status of the Phased Locked Loop (PLL) |
| | | RF Input Level | Expected RF input level |
| | | Overflow | |
| Power Supply Drawer | | Fan | Red – Critical Alarm<br>Orange – Warning<br>Green - OK |
| | | Temperature | Indicates an inner temperature over 60ºC. The power supply shutdowns the system when the temperature reaches 70ºC |
| | | VSWR | VSWR per band at P.Amp drawer - High Voltage Standing Wave Ratio (VSWR) at the output port |
| | | P.Amp Current | P.Amp Current per band at P.amp drawer |
| External Alarms: | Input | Ext Shut | If the external signal arrives then the system will be muted and the corresponding alarm will be set |
| | | Ext 2 | Generic name that can be user defined - If the external signal arrives and the event is enabled the corresponding Alarm is set |
| | Output | Ext Major | If there is at least one major alarm in the system (as a result of system mute) the signal will be output and a corresponding Alarm will be set |
| | | Ext Minor | If there is at least one minor alarm in the system (system is not muted) the signal will be output and the corresponding alarm will be set |

## 6.5.2 SPECIFIC CHANNEL ALARMS

The alarms for the specific channels are viewed through the **Filters** tab of the *Measurements* screen.

An alarm indication is provided for each filter indicating whether they have exceeded their defined threshold limits. Alarm indications are provided for the following parameters: RSSI (dB), Out Power (dBm) and Gain (dB).




| Id | enable | Description BW, Delay, Rejection @spacing | Ch | Downlink Freq (Mhz) | Downlink RSSI (dB) | Downlink Out Power (dBm) | Downlink Gain (dB) | Uplink Freq (Mhz) | Uplink RSSI (dB) | Uplink Out Power (dBm) | Uplink Gain (dB) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Yes | 12.5KHz, 15u, 61dB@25KHz | 150 | 769.5000 | -80 | 29 | -80 | 799.5000 | -80 | 19 | -80 |
| 2 | Yes | 12.5KHz, 15u, 61dB@25KHz | 151 | 770.5000 | -80.5 | 18 | -80.5 | 801.5000 | -80.5 | 18 | -80.5 |
| 3 | Yes | 25KHz, 30u, 61dB@25KHz | 152 | 771.5200 | -30 | 29 | -30 | 806.5000 | -30 | 19 | -30 |
| 4 | Yes | 50KHz, 15u, 61dB@25KHz | 153 | 772.5500 | -80 | 29 | -80 | 810.5000 | -80 | 19 | -80 |
| 5 | Yes | 12.5KHz, 15u, 61dB@25KHz | 154 | 773.0000 | -80 | 18 | -80 | 815.5000 | -80 | 18 | -80 |
| 6 | Yes | 12.5KHz, 15u, 61dB@25KHz | 155 | 774.0000 | -30 | 29 | -30 | 820.5000 | -30 | 19 | -30 |

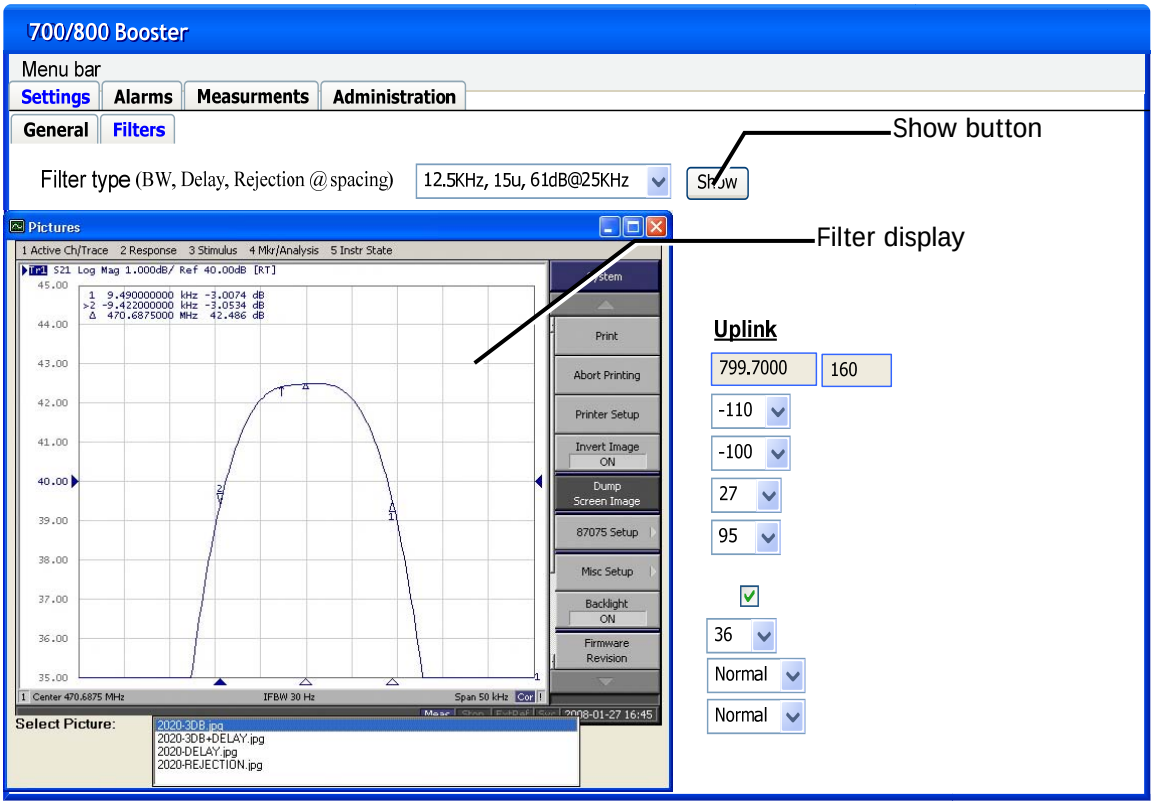
Red – threshold limits have been exceeded

Green – within threshold limits

## 6.6 VIEWING GRAPHIC DISPLAY OF FILTER

The Filter screens are shown by selecting a Filter Type in one of the window tabs and clicking the corresponding **Show** button.

The Filter screen includes several displays (**Select Picture** button, at bottom) that enable viewing the filter properties and characteristics to ensure a proper selection of the filter.




## 6.7 DEFINING THE EXTERNAL ALARMS

The external alarms can be defined and managed by the GUI application. This is performed by an administrator. The application enables the administrator to define two input and two output events, to enable/disable the alarms and to determine the activation mode (normally open or normally closed.

### To define the external alarms

1. Click the **External Alarms** tab of the *Administration* window (in Administration mode). The following tab appears:

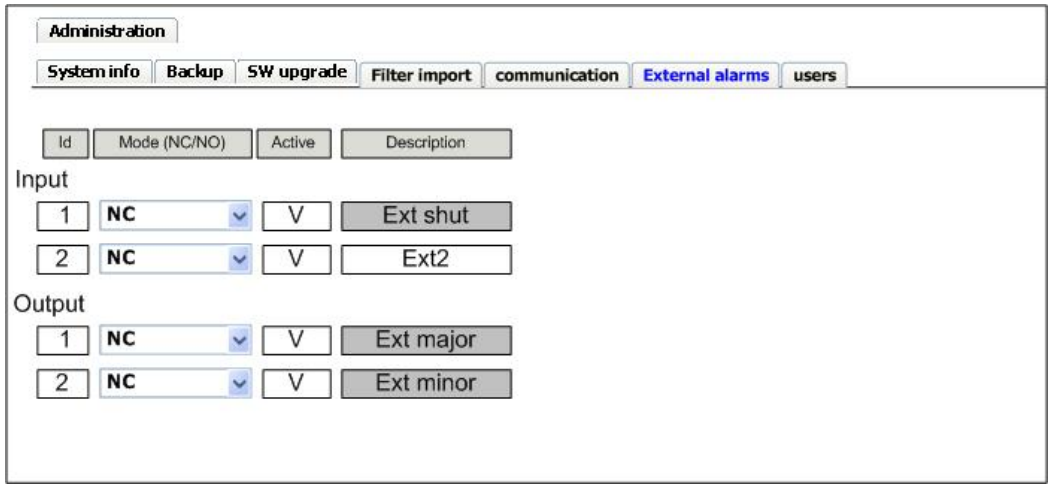



*Figure 23. External Alarms Tab*

2. Define the **Input** modes:
   - NC – Normally Closed
   - NO – Normally Open
3. Define a name for *Input 2* in the **Description** field (the default is a generic name).

Note 1: The *Input 1* description is hardcoded "Ext shut".
Note 2: When an external signal is received the system is muted and a corresponding alarm is generated.

4. Define the **Output** modes as performed for the Input, above.

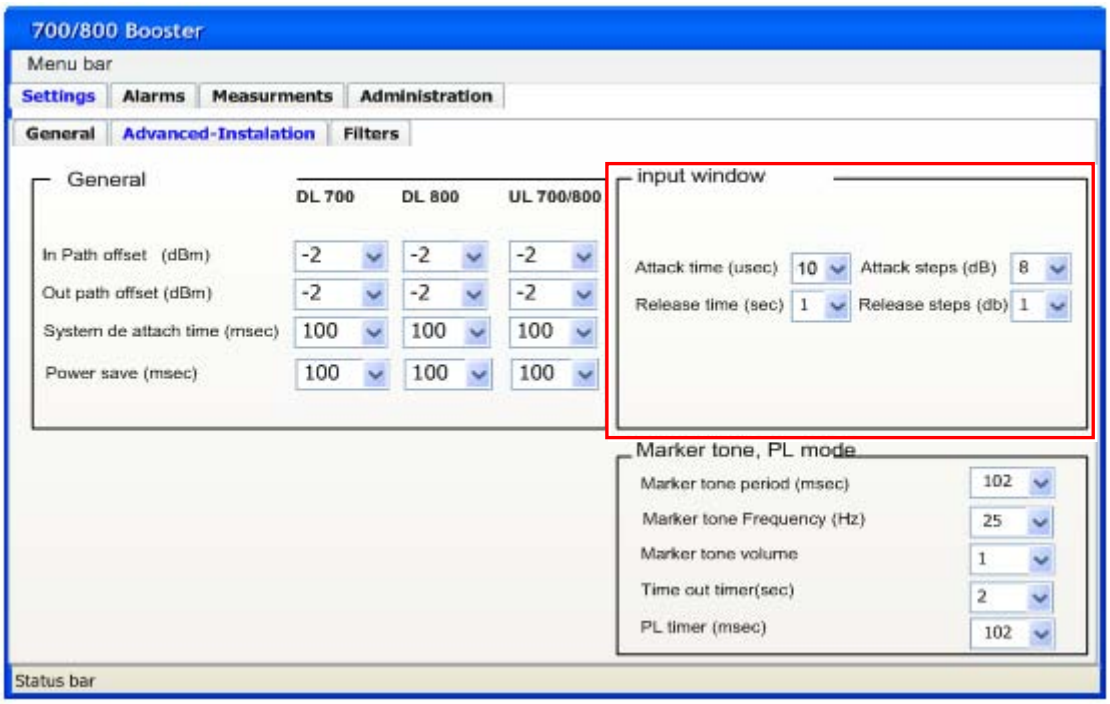
Note: The *Output* signals are hardcoded as **Ext major** and **Ext Minor**.

## 6.8 SLIDING WINDOW CONFIGURATION

Use the Input Window field area in the *Advanced-Installation* sub-tab to set the acknowledgment delay period (Sliding Window).

### To set the sliding window options

1. Click the **Settings** tab and then click the **Advanced-Installation** sub-tab. The following screen appears.



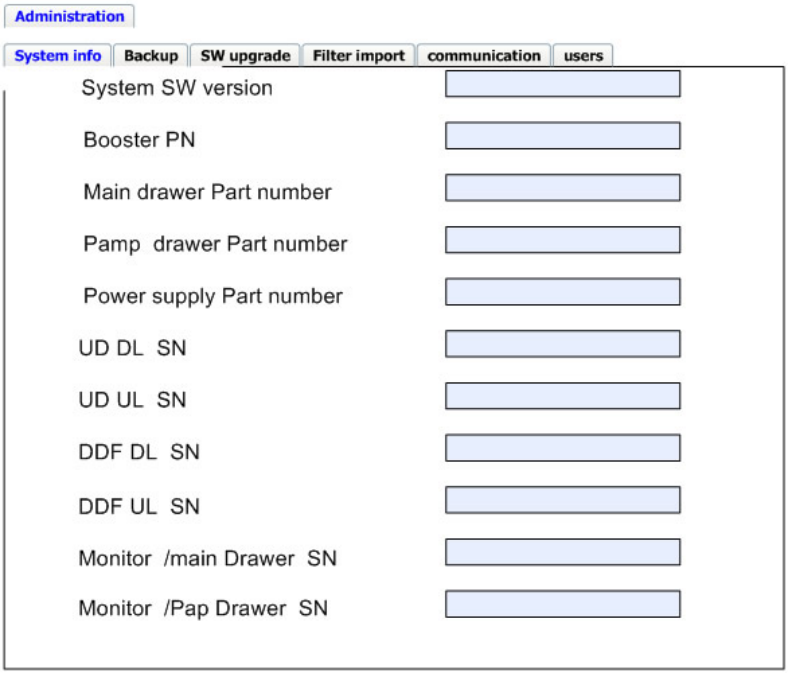

2. Define the following parameters:
   - **Attack Time (µsec)** - Time between the instant the signal exceeds the activation threshold and the units' reaction (default is 10µsec). The Attack Time range is between 10-50µsec. In addition, define the **Attack Steps** (0-31dB).
   - **Release Time (sec)** - Interval between the time the signal is disabled until it is continued (default is 1sec). The Release Time range is between1-60sec. In addition, define the **Release Steps** (0-31dB).
3. Click **Send**.

## 6.9 VIEWING SYSTEM INFORMATION

Refer to the **System Info** sub-tab of the *Administration* tab to view the signal booster general information. The following properties are displayed:

- System SW version
- Main drawer part number
- P.Amp drawer part number
- Power Supply part number
- UD DL SN – Up-Down Downlink Serial Number

- UD UL SN – Up-Down Uplink Serial Number
- DDF DL SN – Dekolink Digital Filter Downlink Serial Number
- DDF UL SN – Dekolink Digital Filter Uplink Serial Number
- Monitor/Main Drawer SN
- Monitor/P.Amp Drawer SN



# 7 ADMINISTRATION

## 7.1 MANAGING USERS

By default, *twelve* users belonging to one of three authentication levels are defined on the Booster. You may add new users, modify or delete existing users.

### 7.1.1 USER LEVELS

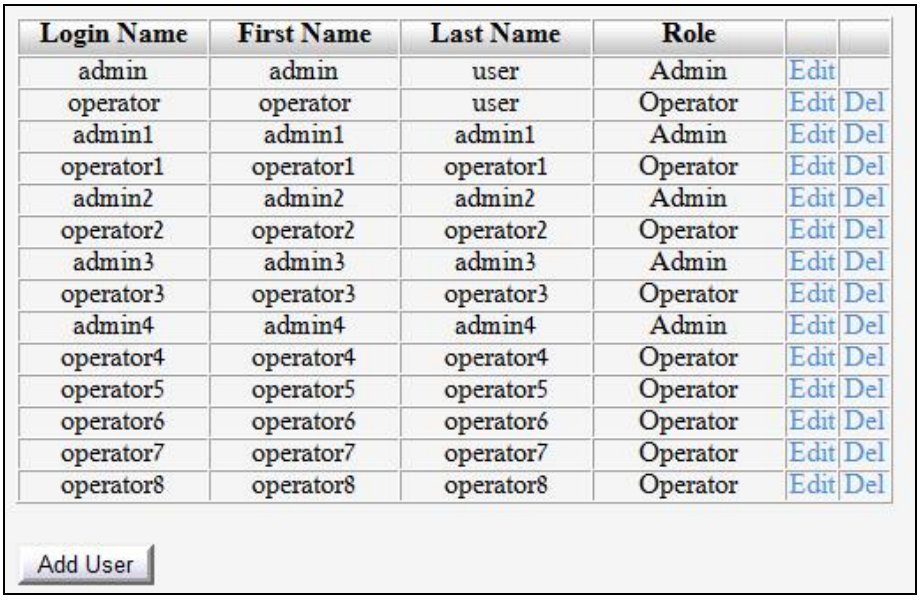
Three user levels are available:

- Admin – has access to all administration and configuration options, including user management. (Default Password **admin** and default User Name **admin**.)
- Operator – has access to all configuration options *except* for the Users list or the Loaders screen.
- Guest - Read-only access.

### 7.1.2 VIEWING THE LIST OF DEFINED USERS

**To display the User Administration pane**

From the **Tree Pane**, select **Users**. The list of users is displayed in the Configuration Pane according to the identifying information and authentication level (Role).



| Login Name | First Name | Last Name | Role | | |
|---|---|---|---|---|---|
| admin | admin | user | Admin | Edit | |
| operator | operator | user | Operator | Edit | Del |
| admin1 | admin1 | admin1 | Admin | Edit | Del |
| operator1 | operator1 | operator1 | Operator | Edit | Del |
| admin2 | admin2 | admin2 | Admin | Edit | Del |
| operator2 | operator2 | operator2 | Operator | Edit | Del |
| admin3 | admin3 | admin3 | Admin | Edit | Del |
| operator3 | operator3 | operator3 | Operator | Edit | Del |
| admin4 | admin4 | admin4 | Admin | Edit | Del |
| operator4 | operator4 | operator4 | Operator | Edit | Del |
| operator5 | operator5 | operator5 | Operator | Edit | Del |
| operator6 | operator6 | operator6 | Operator | Edit | Del |
| operator7 | operator7 | operator7 | Operator | Edit | Del |
| operator8 | operator8 | operator8 | Operator | Edit | Del |

Add User

The following table provides a description of the Users dialog buttons and options.

| Management Option | Description |
|---|---|
| **Add User** (button) | Adds a new user with to user defined access level and password. |
| Del(ete) | Deletes the corresponding user from the list. |
| Edit | Enables changing the definitions of an existing user. |

### 7.1.3 ADDING USERS

NOTE: User name and password entries are case sensitive.

**To add a user:**

1. From the Tree Pane, select **Users.** The list of users is displayed in the User's Pane.
2. From the User's Pane, click **Add User**. The Add User dialog box is displayed.


3. Enter the **Login Name** – name used by user to login.
4. Type the users **First Name** and **Last Name** – used to identify the user.
5. Select the **User Role** – access level. This defines the operations that the user will be able to perform.
6. Enter the **Password** and in **Verify Password** enter the password again for verification.
7. Click **OK.**

### 7.1.4 EDITING USERS

**To modify user definitions**

1. From the Tree Pane, select **Users**. The list of users is displayed in the User's Pane.
2. Select the User to be edited in the list.
3. Click **Edit**. The user definitions dialog appears.
4. Make the required changes and click **OK.**

### 7.1.5 DELETING A USER

**To delete a user:**

1. From the Tree Pane Select **Users**. The list of users is displayed in the User's Pane.
2. Select the User to be deleted in the list.

3. From the User's Pane, click **Del**. An authorization message dialog box is displayed.


4. Click **Yes**. The User's name is removed from the list.

## 7.2 CONFIGURATION, BACKUP AND RESTORE

The application enables performing the following backup and restore operations via the Backup/Restore dialog:

- Backing up the current configuration
- Restoring any previously saved configuration to the booster
- Restoring the booster's factory default setup
- Restoring a configuration file from a user defined location

NOTE: The configuration backup and restore files are stored in the Deko-CMU.

This section describes the Backup/Restore dialog and how to perform the backup, restore and upload operations.

### 7.2.1 THE CONFIGURATION BACKUP WINDOW

**To access the configuration backup window**:

1. From the Tree Pane, select the Booster and click the **Backup/Restore** button.
2. The Backup/Restore pane appears. The pane lists the currently backed up files and provides backup and restore options.

   The files are listed along with identifying information and the time of the backup. Files of user defined configurations are ***BLUE*****.**

*The default factory settings file is* ***BLACK*** and is named **DEKO4078_System*.csv.***

### 7.2.2 SW UPGRADE

The SW upgrade procedure must be performed for each individual Booster module: UD Uplink; UD Downlink; DDF Uplink; DDF Downlink.

NOTE: During the upgrade, the Booster is disconnected from the network.

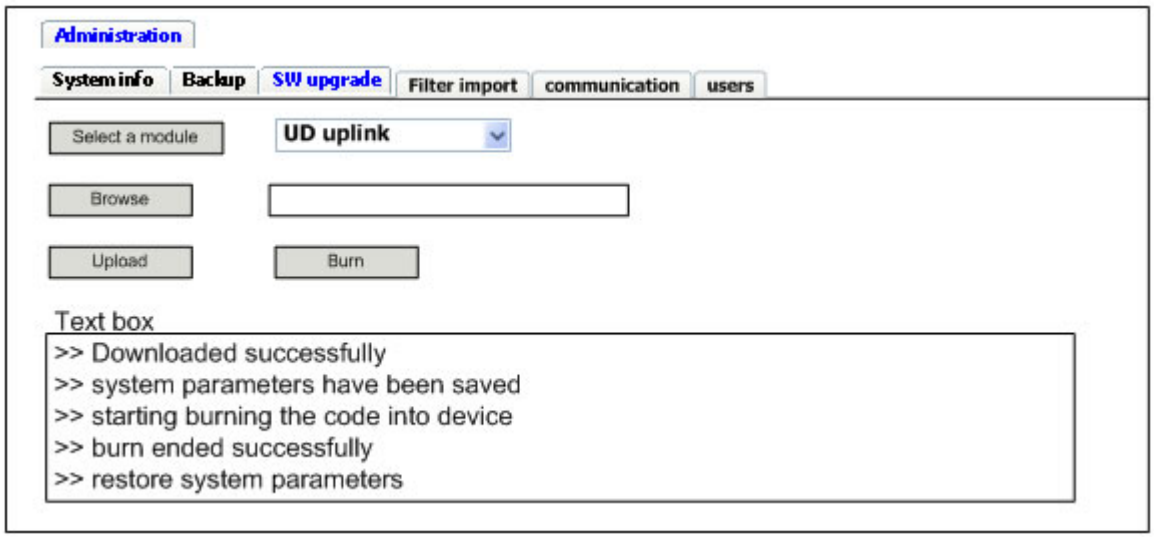
CAUTION

DO NOT TURN OFF THE BOOSTER DURING THE UPLOAD PROCESS!!!

View the current SW version in the **System-Info** sub-tab of the *Administration* tab (see 6.9).

**To perform the software upgrade procedure**

1. Select the *Administration* tab **SW Upgrade** sub-tab. The following window appears.




2. Select the module to be upgraded from the **Select a Module** drop-down list.
3. Click **Browse** to browse for the upgrade file and click **Open**.
4. Click **Upload**. The updating process begins. A message appears in "The activity log" box during the upload activity.
5. Once the updating process ends successfully, a message is issued in "The activity log" box. The next process – Getting the version number – is displayed.
6. Once the software version is ready to be installed (see message in "The activity log" box), click **Burn** to continue. The installation process starts, and is run automatically.
7. Wait until the update is complete (about 10 minutes). If the link is established through the modem, the speed of the connection determines how long the process takes.

   Once the installation process ends successfully, a message is issued in "The activity log" box.

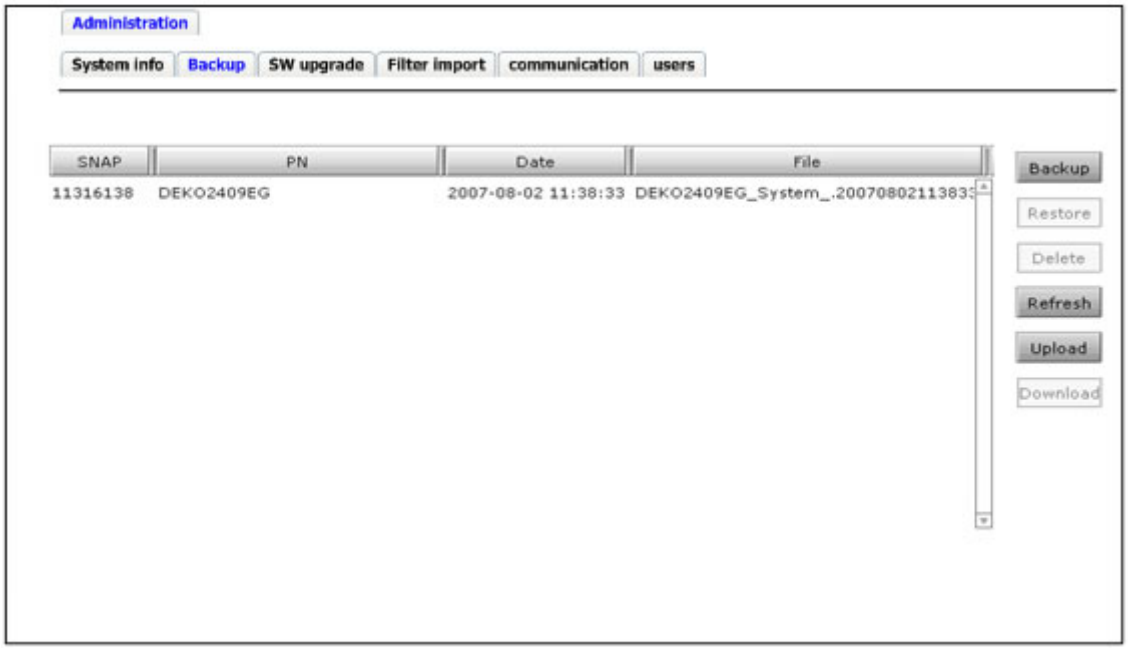
## 7.2.3 CONFIGURATION BACKUP AND RESTORE

The Backup option enables the user to backup and restore the user parameters. This is used mainly for backing up or restoring the filter settings (for all the domains).

### *7.2.3.1 Configuration Backup*

**To perform the configuration backup**

1. Click the *Administration* **Backup** sub-tab. The following Backup screen appears.




The pane lists the currently backed up files and provides backup and restore options.

2. Click **Backup**. A backup is created (a message is shown) and when completed, a new file is added to the list.

Note: The file name and attributes are set automatically.

### *7.2.3.2 Restoring Configuration*

**To restore a configuration**

1. Click the *Administration* **Backup** sub-tab. The following Backup screen appears.

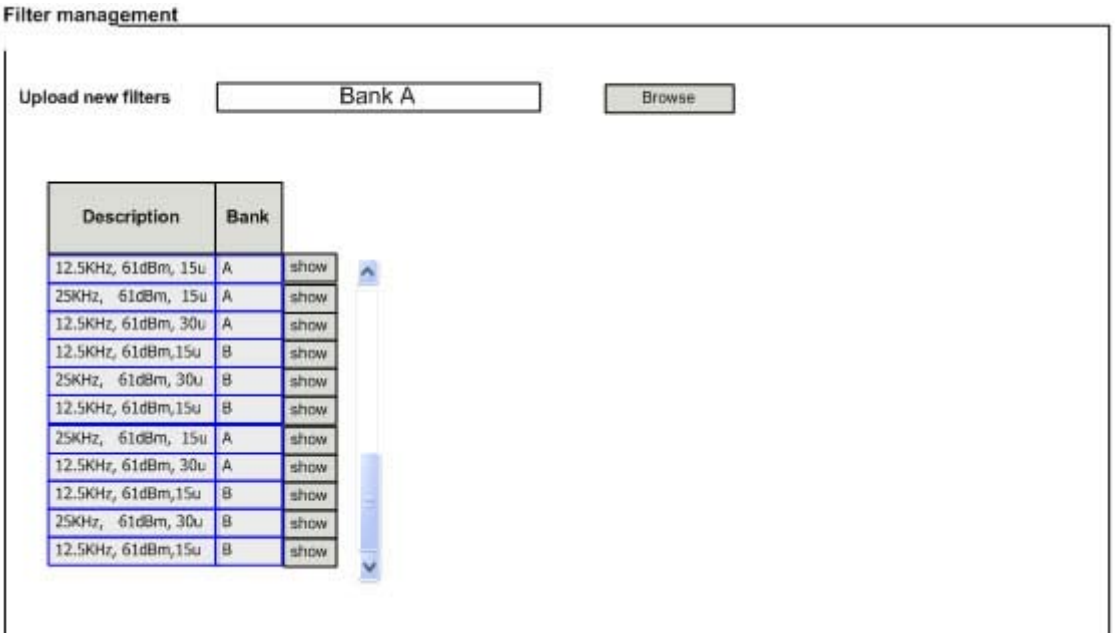

2. The Backup/Restore pane appears. The pane lists the currently backed up files and provides backup and restore options.
3. Select the file to be restored in the Booster.
4. Click **Restore**.
5. After restore is complete, click **Reset**.

### 7.2.4 UPLOADING NEW FILTERS

The application enables the user to import (and export) external files that define a filter assignment map.

**To upload new filters**

1. Click the *Administration* **Filter Import** sub-tab. The following screen appears.




2. Click **Browse** and select the file (filter bank) to be imported. The new filter bank overrides the previous existing one.
3. The previous filter settings are deleted so the user must re-configure the filters (see 4.2.3).

# APPENDIX A: RF CONNECTIONS

The following figure provides a description of the RF connections between the Main and Power Amplifier units.

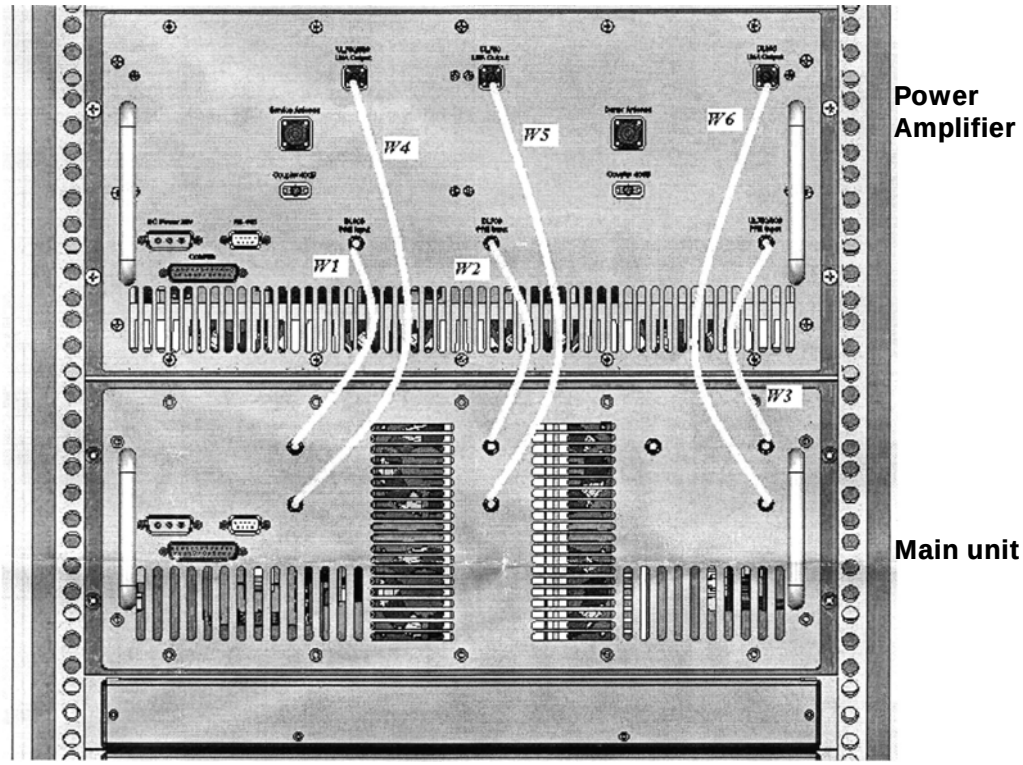



*Figure 24. RF Connections – Block Diagram*

The following table provides the list of RF cables used for the RF connections.

| Cable No. | From | | To | | Length | Cable Dekolink P/N |
|---|---|---|---|---|---|---|
| | Description | Connector Type (cable side) | Description | Connector Type (cable side) | | |
| W1 | DL800 Pre Output | SMA Male R.A | DL800 Pre Input | SMA Male R.A | 15cm | 1579907742 |
| W2 | DL700 Pre Output | SMA Male R.A | DL700 Pre Input | SMA Male R.A | 15cm | 1579907742 |
| W3 | UL700/800 Pre Output | SMA Male R.A | UL700/800 Pre Input | SMA Male R.A | 15cm | 1579907742 |
| W4 | UL700/800 LNA Output | SMA Male R.A | UL700/800 LNA Input | SMA Male R.A | 30cm | CC020C0C30 |
| W5 | DL700 LNA Output | SMA Male R.A | DL700 LNA Input | SMA Male R.A | 30cm | CC020C0C30 |
| W6 | DL800 LNA Output | SMA Male R.A | DL800 LNA Input | SMA Male R.A | 30cm | CC020C0C30 |

# APPENDIX B: SPECIFICATIONS (@+25°C)

This appendix provides the electrical, mechanical and environmental specifications of the Deko4078SD signal booster.

| **Electrical** | | | | |
|---|---|---|---|---|
| **Parameter** | | **DL** | | **UL** |
| | | **700MHz Band** | **800MHz Band** | **700/800MHz Band** |
| Frequency Range | | 769 – 775 MHz | 851 – 869 MHz | 799 – 805 MHz/806-824 MHz |
| Composite Output Power (Composite output power is controlled by AGC per channel) | | 40dbm | | 27dbm |
| Output Power Per Carrier | 1 Carrier | 37dbm | 37dbm | 27dbm |
| | 2 Carrier | 34dbm | 34dbm | 24dbm |
| | 3 Carrier | 32dbm | 32dbm | 23dbm |
| Passband Gain | | 95 dB | | 95 dB |
| Gain Range | | 60-95 dB @ 1 dB step | | 60-95 dB @ 1 dB step |
| Passband Ripple | | ± 1.5 dB max | | ± 1.5 dB max |
| AGC Dynamic Range | | 30 dB | | 30 dB |
| Filter Bandwidth | | 12.5 KHz – 4.5 MHz (Programmable) | | |
| Channel Delay | | 5-100 µsec depending on filter bandwidth, flatness and rejection | | |
| Detach time delay | | Adjustable 5msec – 1sec | | |
| Attack time delay | | Max. 5msec | | |
| Channel Setting Resolution | | 0.5 kHz | | |
| Noise Figure at maximum gain* | | 4.0 dB*; 15dB @ -10dBm input; 10dB @ -20dBm input; 5dB @ -30dBm input | | 3.0 dB*-for signals below -40dBm |
| System Sensitivity for 25KHz channel | | -90dBm for 12dB SINAD<br>-90dBm for $10^{-3}$ BER | | -110dBm for 12dB SINAD<br>-106dBm for $10^{-3}$ BER |
| Impedance at antenna port | | 50 Ohms | | |
| Isolation Input to Output | | 110 dB | | |
| VSWR | | 1.5: 1 max | | |
| Out of band interference | | -10dBm out of Duplexer Pass band without spec degradation | | |
| Maximum in-band signals | | -10dBm without spec degradation | | |
| Maximum in-band signals – no damage | | +4dBm | | |
| Power Supply N+1 redundancy | | 90 to 260 VAC | | |
| Optional DC supply | | +24VDC; ±48VDC | | |
| Optional Power supply charger + battery | | 4 or 8 Hours of back-up time | | |
| Power Consumption | | <600 watts | | |
| **Mechanical (for Indoor)** | | | | |
| Packaging | | 19" cabinet for 10RU equipment, 20" deep without doors | | |
| Unit Dimensions | | PS 1 RU, Digital filter 4RU, PA+duplexer 5RU | | |
| Connectors | | N-Female | | |
| **Environmental (for Indoor)** | | | | |
| Operating Temperature | | -10° C to + 50° C (14 to 122° F) | | |
| Humidity | | 10-95% Condensed | | |

# APPENDIX C: CONFIGURATION AND MANAGEMENT USING DDF APPLICATION

This appendix provides the initialization and setup procedures for the Deko4078SD signal booster. The procedures are performed through an Ethernet connection between the Deko4078SD signal booster and a computer running the Management Tool supplied with your Setup CD.

The commissioning procedure consists of opening a Deko4078SD Management Tool session and configuring the signal booster general parameters and required filters for the 700 MHz and 800 MHz bands.

## COMMISSIONING THE SIGNAL BOOSTER

### INSTALLING THE DMSB MANAGEMENT TOOL ON THE COMPUTER

**To install the Deko4078SD signal booster Management Tool on your Computer**

1. Run the Dekolink CD and double click the **RMS650_Setup_ddmmyy.exe** (where *ddmmyy* is day/month/year in double digits) file to install the Deko4078SD Management Tool SW. The following Install Command dialog appears.


*Figure 25. Install Command Dialog*

2. Click **Install**.
3. Double click the **RMS650ddf.exe** file from the Dekolink CD to run the program.
4. Once the program is installed, drag the **c-RMS650ddf** SW icon onto the desktop from the location: *c:\\program_files\dekolink\rms650\RMS650DDF*

   The SW installation is now complete.

## OPENING A SESSION

### To open a session to the Deko4078SD signal booster

1. Interconnect the **Main** unit and the computer on which the Management Application is installed using an RS232 connection.

Note: The connection is performed separately for the 700DL and 800DL and for the 700/800UL DDF modules.

2. Run the Deko4078SD *Management Tool* SW from the start menu of the computer on which it is installed. The following login dialog appears.

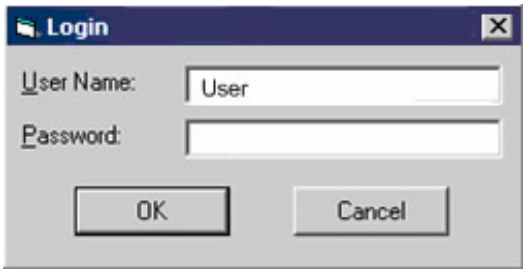
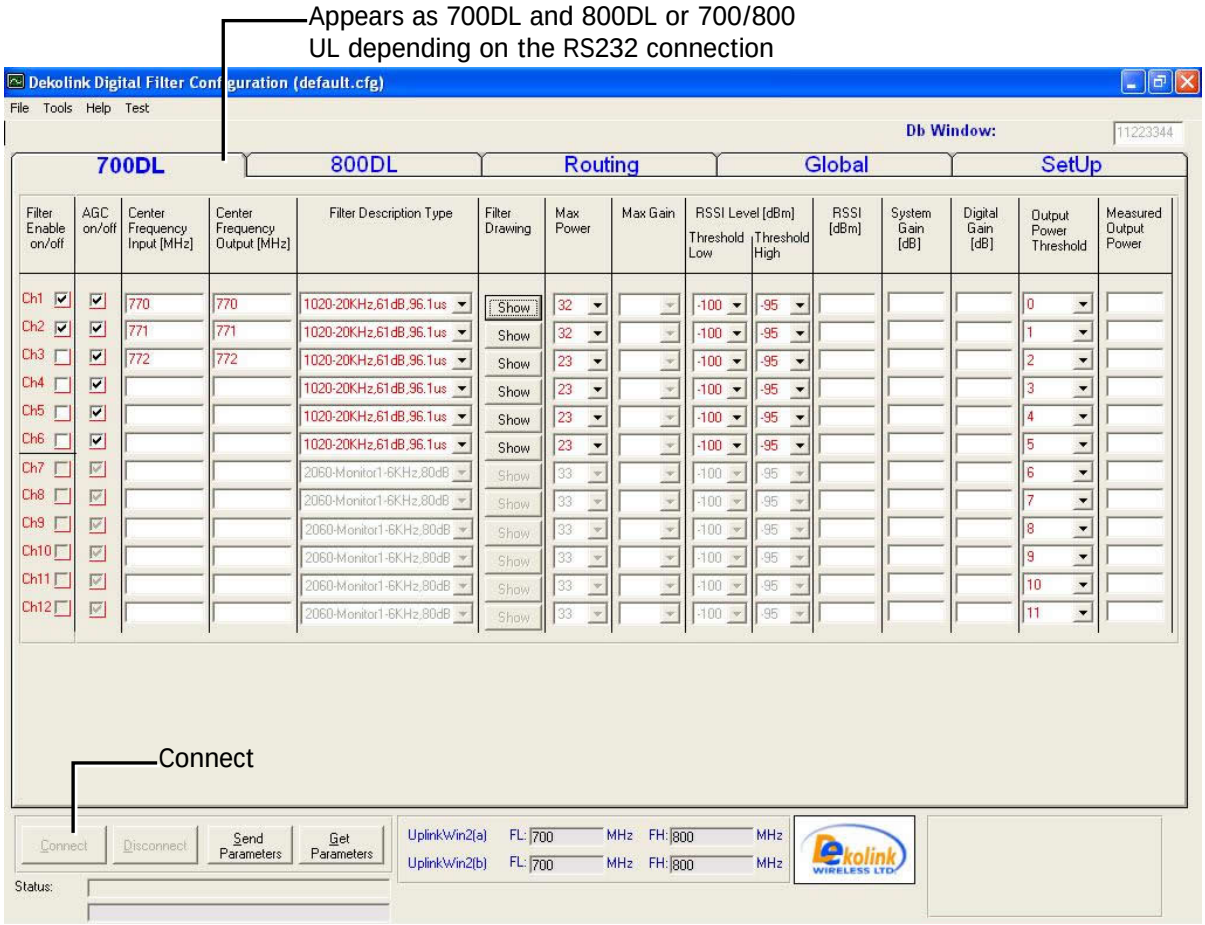



*Figure 26. Login Dialog*

3. Enter the **User Name 'User'.** *A password is not required.*
4. Click **OK**. The **DDF** (Dekolink Digital Filter) window appears.

Note: The DL and UL windows are similar.



5. Click the **Connect** button in order to establish a connection between the unit and the application.
6. Provision the system according to the following section.

## CONFIGURING THE BOOSTER PARAMETERS

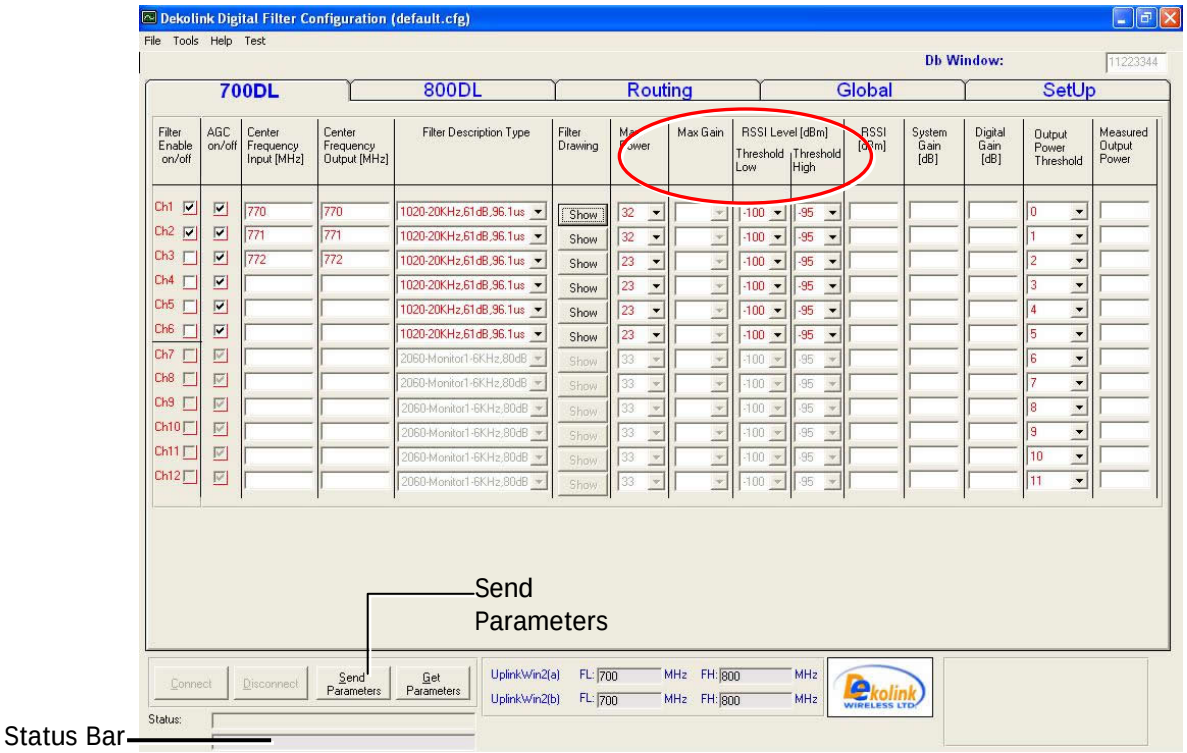
The booster parameters are displayed with default values, however these can be modified according to site requirements. The following configurable booster parameters are displayed in the 700 and 800 band windows:

- Max Power
- Max Gain
- Low and high RSSI threshold levels
- Output Power Threshold

### To configure the signal booster parameters

In the 700 and 800 band windows, define the configurable parameters (listed above) according to site requirements and click the **Send Parameters** button at the bottom of the window. The status of this operation is shown in the *Status* bar.

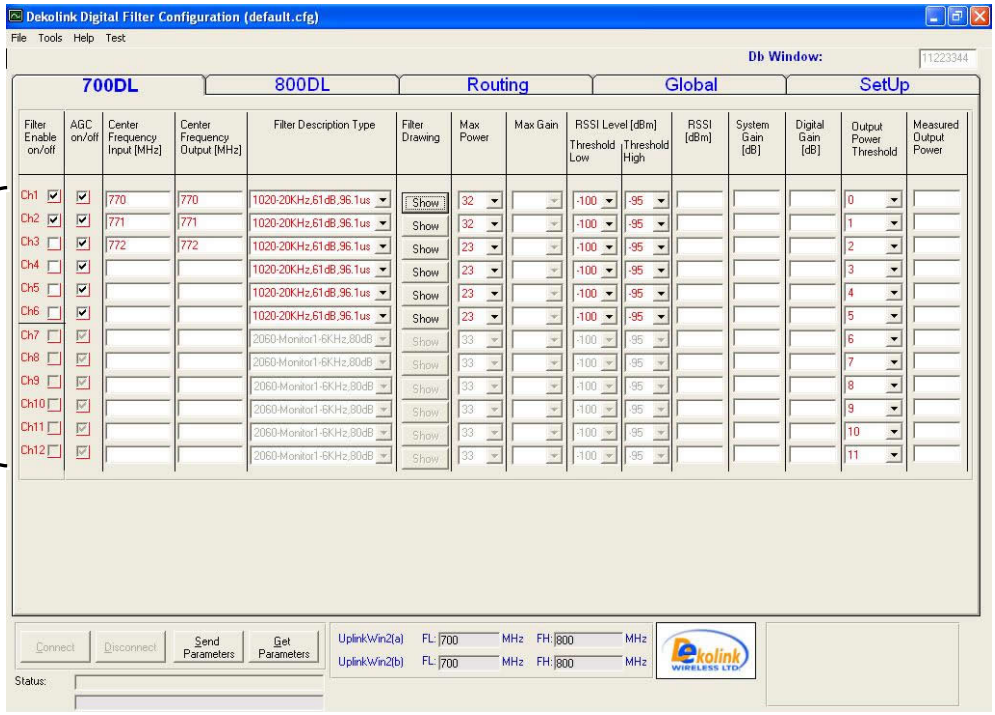
Note: The modified parameter values will appear in red until the *Send Parameters* button is clicked. After the parameters have been sent and written on to the DMSB unit, the values are shown in black.




The measured values of the unit are displayed in the RSSI, System Gain, Digital Gain and Measured Output Power columns. These are read-only parameters.

## CONFIGURING THE CHANNELS

This section describes how to configure the channels for the 700 and 800 bands. The application enables defining up to a total of 24 channels (displayed in groups of 6) for both the 700 and 800 bands. The channel configuration consists of selecting the required channels for each band and defining their filters (the same family of filters must be selected for each group of channels). The available channels and required filters are accessed from the 700 and 800 Window tabs.



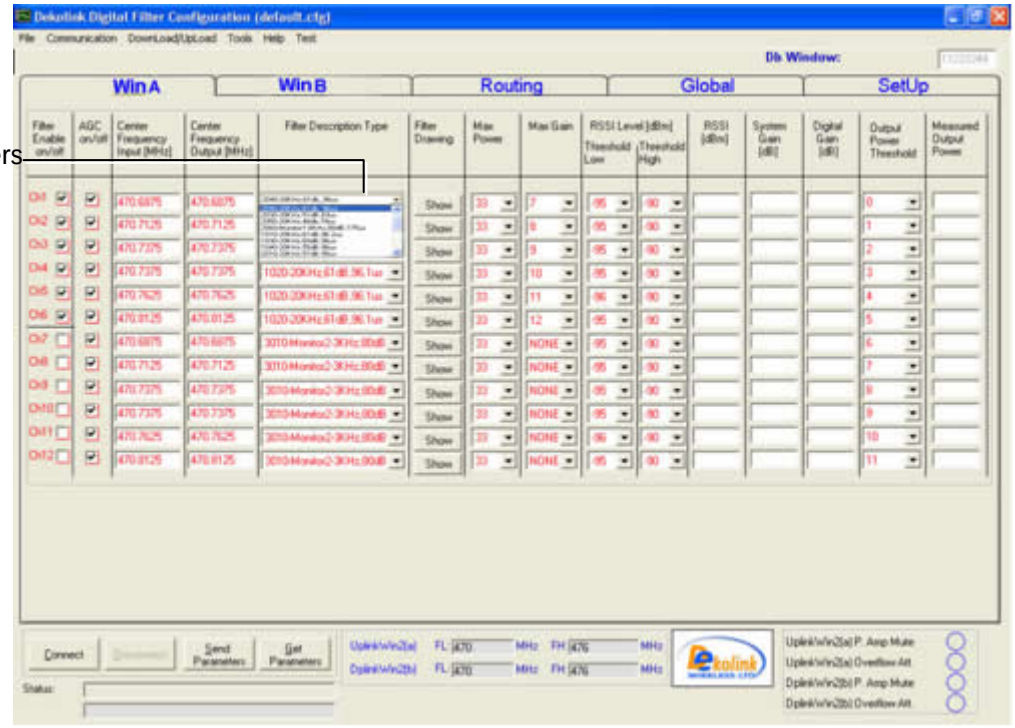

Array of up to 24 configurable channels

### To configure the required channels

1. Enable the required channels (up to 24 for both bands) in the **Filter Enable On/Off** column of each of the 700 and 800 band windows.

   Note: The channels are displayed in groups of six.

2. Determine the **Center Frequency Input**. The displayed *Center Frequency Output* will be similar to the displayed input.
3. Click **CTRL+ A** (to enter *Advanced* mode) and select the required filter type in the **Filter Description Type** column.




Note: Only one family of filters can be defined for the selected channels in each group. Note that when a family is defined, all the channels (6) in the group are assigned the same family automatically.

The filter type parameters include the following:

- Filter family
- Rejection
- Bandwidth
- Delay

4. Click the **Show** button to view a graphic display of the selected filter.
5. Verify the RSSI threshold levels. Modify if necessary according to site requirements.
6. Click **Send Parameters**.

# NAVIGATING THE SIGNAL BOOSTER MANAGEMENT TOOL

This chapter describes how to navigate the DMSB signal booster Management Tool application and the available functions.

## ACCESS LEVELS

The enabled parameters displayed by the application depend on the access mode: **User** or **Advanced**. The default access mode is *User.* While in the *User* level the functions reserved for *Advanced* users are disabled (fields are grayed) and are displayed for informational purposes only.

The *User* and *Advanced* access modes are defined as follows:

- **User** – Default or press **CTRL + U** (from Advanced mode)
- **Advanced** – Press **CTRL + A**
- **Technician** – Press **CTRL+ T**

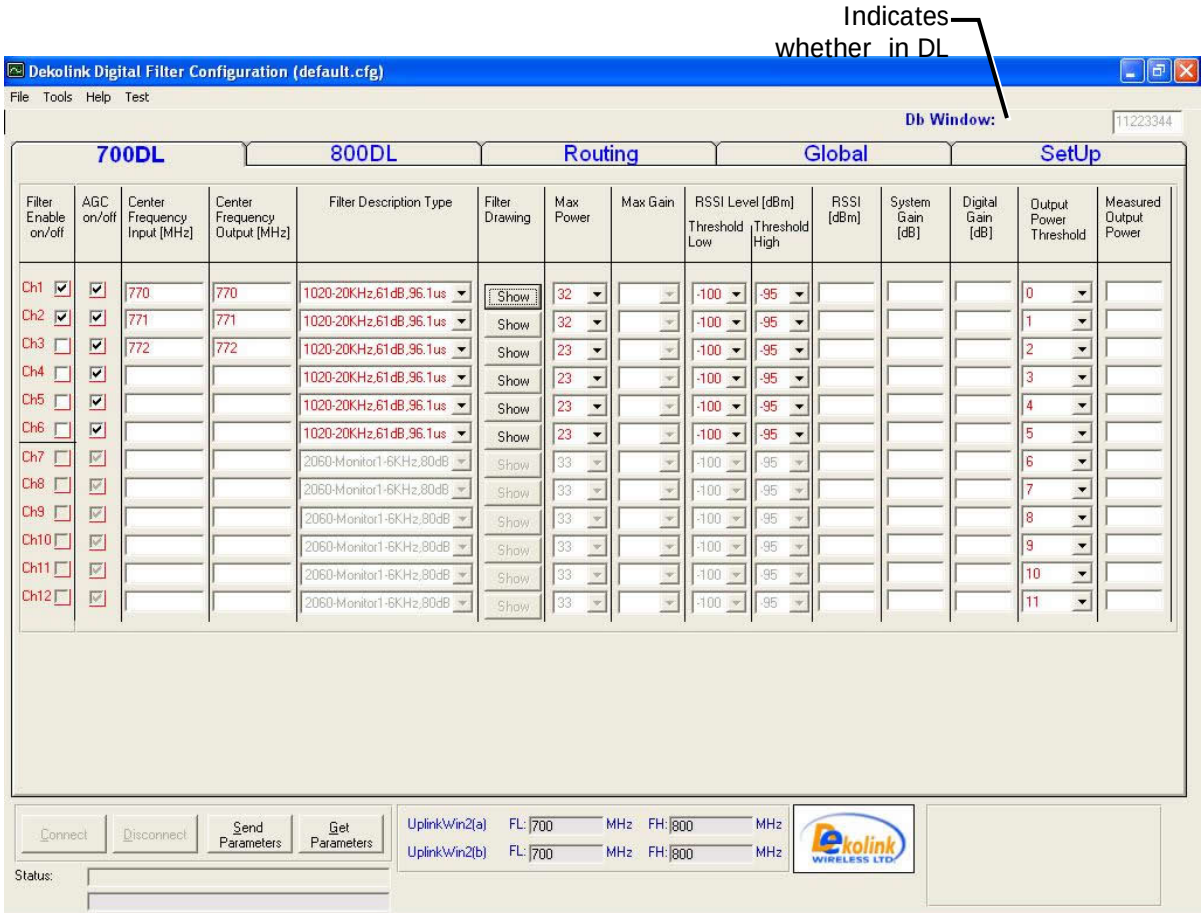
Note: It is specified when the application requires entering the *Advanced* mode to define a specific parameter.

## MAIN WINDOW

The main window is used for configuring the required channels (up to 24 for both bands). The signal booster identification information is displayed at the top part of the window.

The main window consists of the following tabs:

- **700DL/800DL** or **700/800 UL** – Displays the available 700 MHz and 800 MHz band channels for the user to select from in addition to the required filters. Also, displays center frequency (input equals output) and RSSI levels.
- **Global** – Displays the unit information (i.e serial number, SW version, etc.).
- **Routing** – Includes the FPGA Routing for transmitting CW in Test mode.
- **Setup** – N/A - for Dekolink Technicians only.

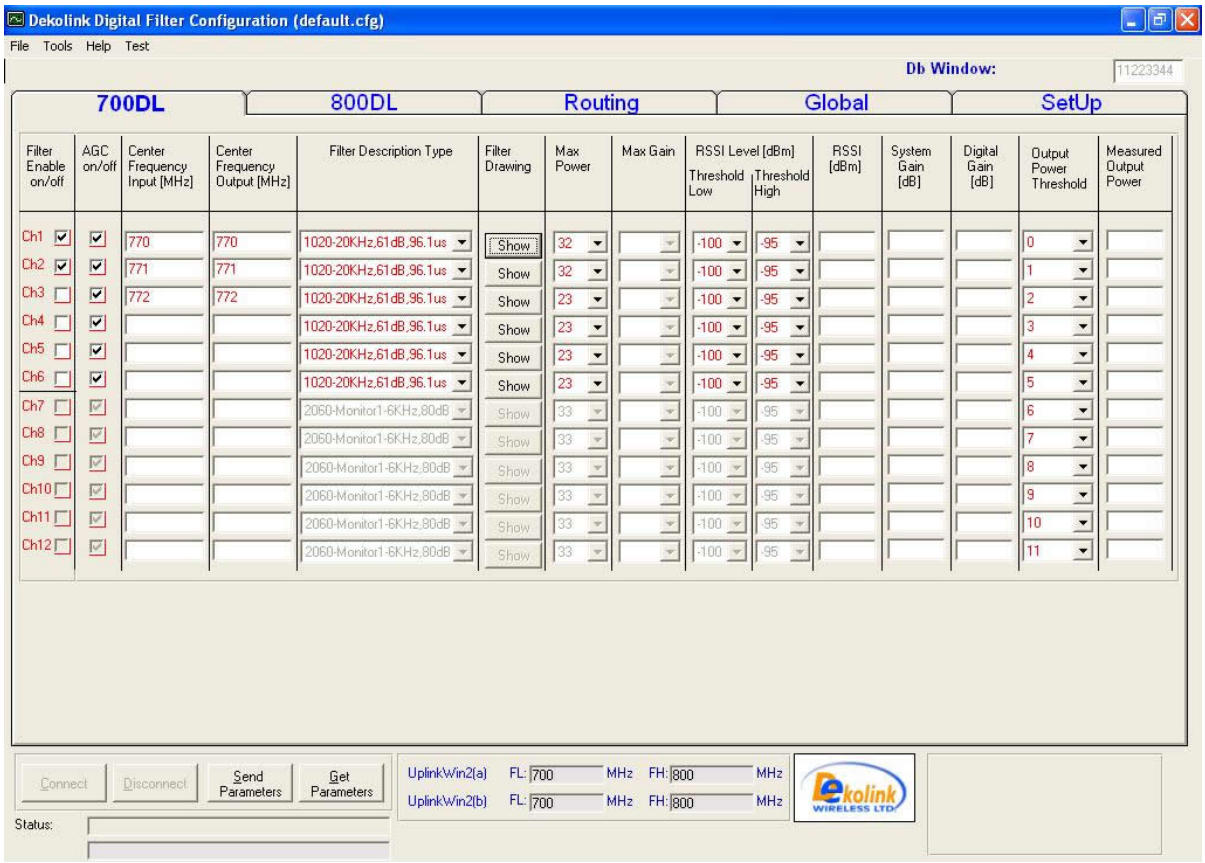



Note: Grayed fields are not active.

### *700DL/800DL and 700/800UL Channels*

Note: The UL and DL windows are similar, however they are accessed separately as described in the **Opening a Session** section of this appendix.

The 700 and 800 channel tabs display an array of up to 24 available channels (for both bands) for the user to select in addition to the required corresponding filters. The available channels to select from are displayed in groups of six (i.e Ch1- Ch6; Ch7-Ch12). The displayed input center frequency is equal to the displayed output center frequency. The following figure shows the *700DL* screen (the *800DL* tab is similar).




The following table provides a description of the configurable and non-configurable filter parameters displayed in this tab.

| | PARAMETER | DESCRIPTION |
|---|---|---|
| CONFIGURABLE | FILTER ENABLE ON/OFF | ENABLES/ DISABLES THE ACTIVE CHANNELS |
| | AGC | ENABLES/DISABLES AUTOMATIC GAIN CONTROL |
| | CENTER FREQUENCY INPUT | DISPLAYS THE CENTER FREQUENCY INPUT FOR THE CORRESPONDING CHANNEL OR FILTER. THE VALUE SHALL BE CONSISTENT WITH THE FREQUENCY BANDS OF THE DMSB AS LISTED IN **APPENDIX B: SPECIFICATIONS**. |
| | CENTER FREQUENCY | DISPLAYS THE CENTER FREQUENCY OUTPUT (EQUALS TO THE INPUT CENTER FREQUENCY – UNLESS IN |

| | | |
|---|---|---|
| | OUTPUT | FREQUENCY SHIFT MODE SEE SECTION 0) |
| | FILTER DESCRIPTION TYPE | DETERMINES THE FILTER TYPE FOR THIS CHANNEL, BY CLICKING IN THE COMBO BOX AND SELECTING A FILTER |
| | FILTER DRAWING | CONSISTS OF THE *SHOW* BUTTON THAT PROVIDES A GRAPHIC DISPLAY OF THE FILTER CHARACTERISTICS (SEE 0). |
| | OUTPUT POWER LEVEL | DETERMINES THE OUTPUT POWER FOR THE CHANNEL SIGNAL – THIS VALUE SHALL BE EQUAL FOR THE ACTIVE FILTER AND ITS MONITORING COUNTERPART |
| | RSSI LEVELS | DETERMINES THE RSSI THRESHOLD VALUES FOR THE SELECTED ACTIVE CHANNELS. THESE VALUES DEFINE THE OUTPUT POWER LIMITS OF THE CHANNEL PATH. |
| NON-CONFIGURABLE | MEASUREMENT OUTPUT POWER | DISPLAYS THE MEASURED COMPOSITE OUTPUT POWER |
| | SYSTEM GAIN | DISPLAYS THE CURRENT SYSTEM GAIN MEASUREMENT |
| | RSSI MEASUREMENT | DISPLAYS THE CURRENT RSSI MEASUREMENT |
| | DIGITAL GAIN MEASUREMENT | DISPLAYS THE DIGITAL GAIN FOR EACH CHANNEL |

## *Routing*

The Routing tab includes the **FPGA Route** parameter that enables transmitting the CW and ID Tone in Test mode (see 0).

The following figure shows the *Routing* tab.

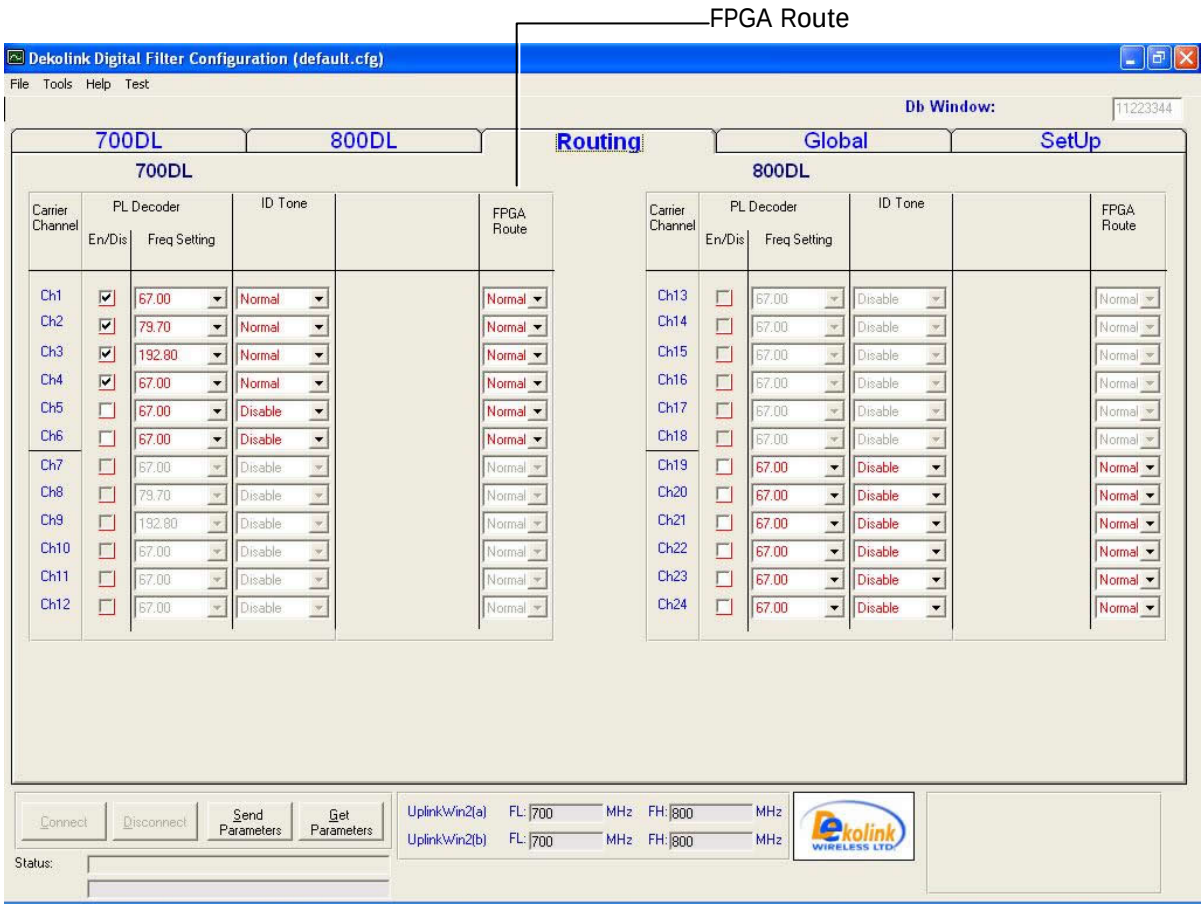



*Figure 27.Routing Tab*

## *Global*

The *Global* tab includes a display of the Deko4078SD signal booster information, the *Frequency Shift Mode* enable/disable checkbox (not relevant) and the system PL Mode parameters. The signal booster information displayed corresponds to the connected Deko4078SD signal booster and the *System PL Mode* parameters are displayed with the default values. The following figure shows the *Global* tab.

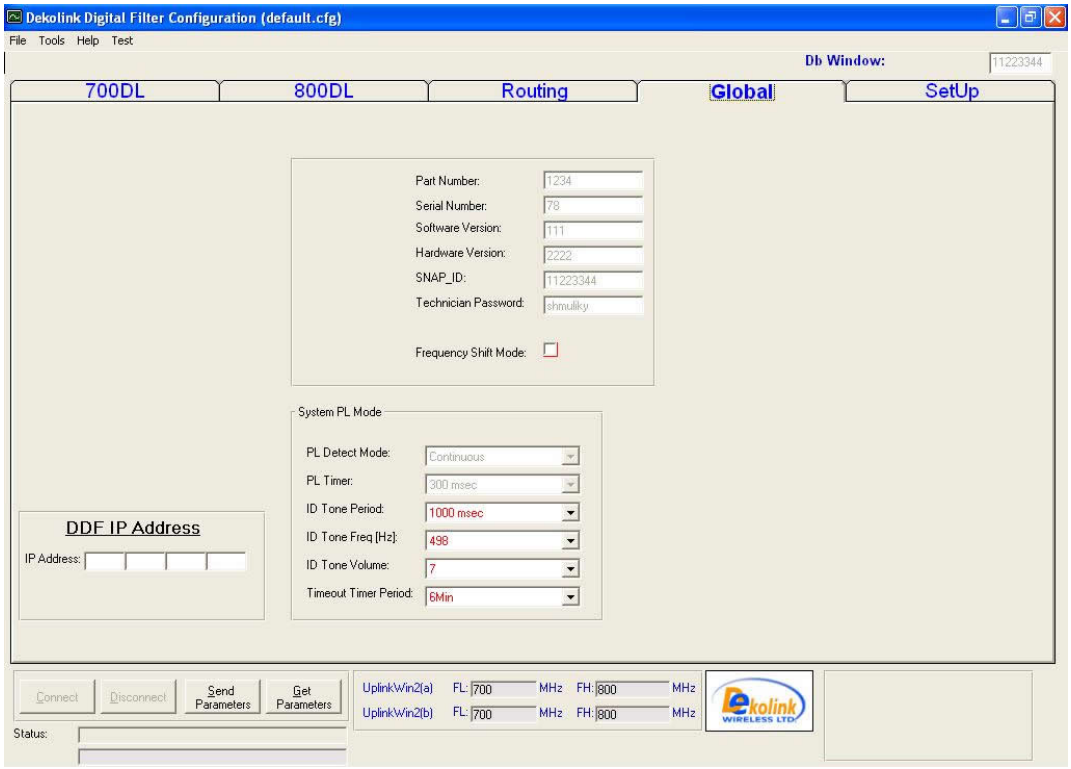



*Figure 28. Global Tab*

The *Global* screen displays the following:

**DMSB signal booster Information**

- Part Number
- Serial Number
- Software version
- Hardware version
- SNAP ID – SNAP protocol identification number
- Technician password – N/A

**DMSB signal booster Information**

- PL Detect Mode
- PL Timer (msec)
- ID Tone Period (msec) - Used for ID Tone definition not relevant)
- ID Tone Freq [Hz]
- ID Tone Volume
- Timeout Timer Period (min.) – Closes each Tx channel after it has been in use longer than the defined time limit.

# DMSB MT OPERATIONS

## FREQUENCY SHIFT

Frequency shift enables setting an output frequency that is different from the input frequency.

### To enable the frequency shift option

1. Access the **Global** tab of the DDF Window.
2. Click **CTRL+A** to enter *Advanced* mode.
3. Enable the **Frequency Shift** checkbox. See following figure.

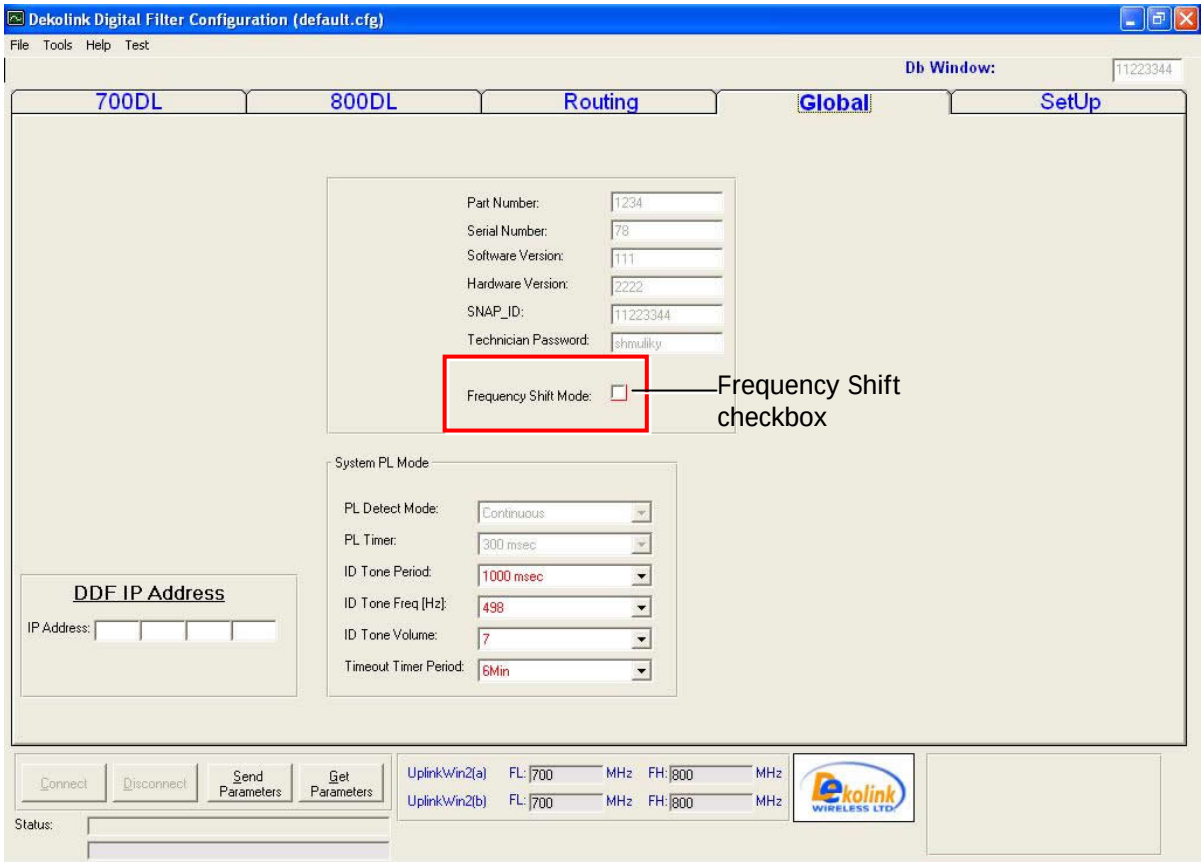


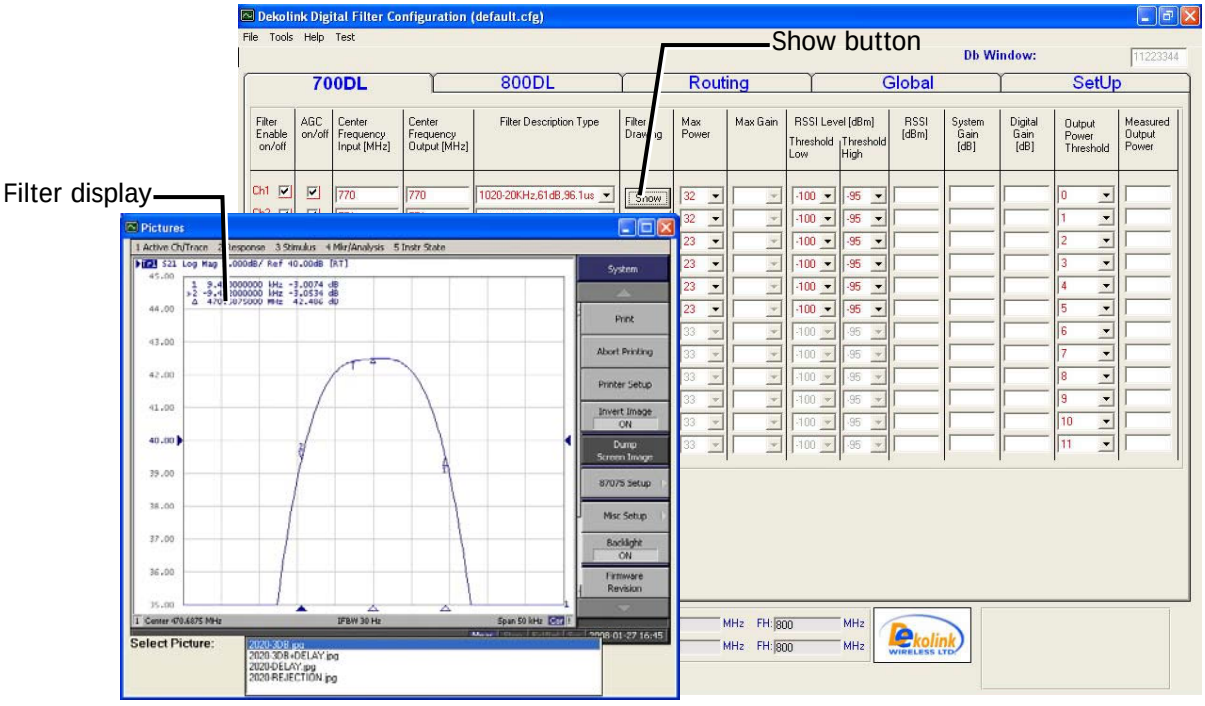

*Figure 29. Frequency Shift Mode*

4. Continue to the *Channel (700DL/800DL)* tab to determine the Center Frequency Input and Output.

## VIEWING GRAPHIC DISPLAY OF FILTER

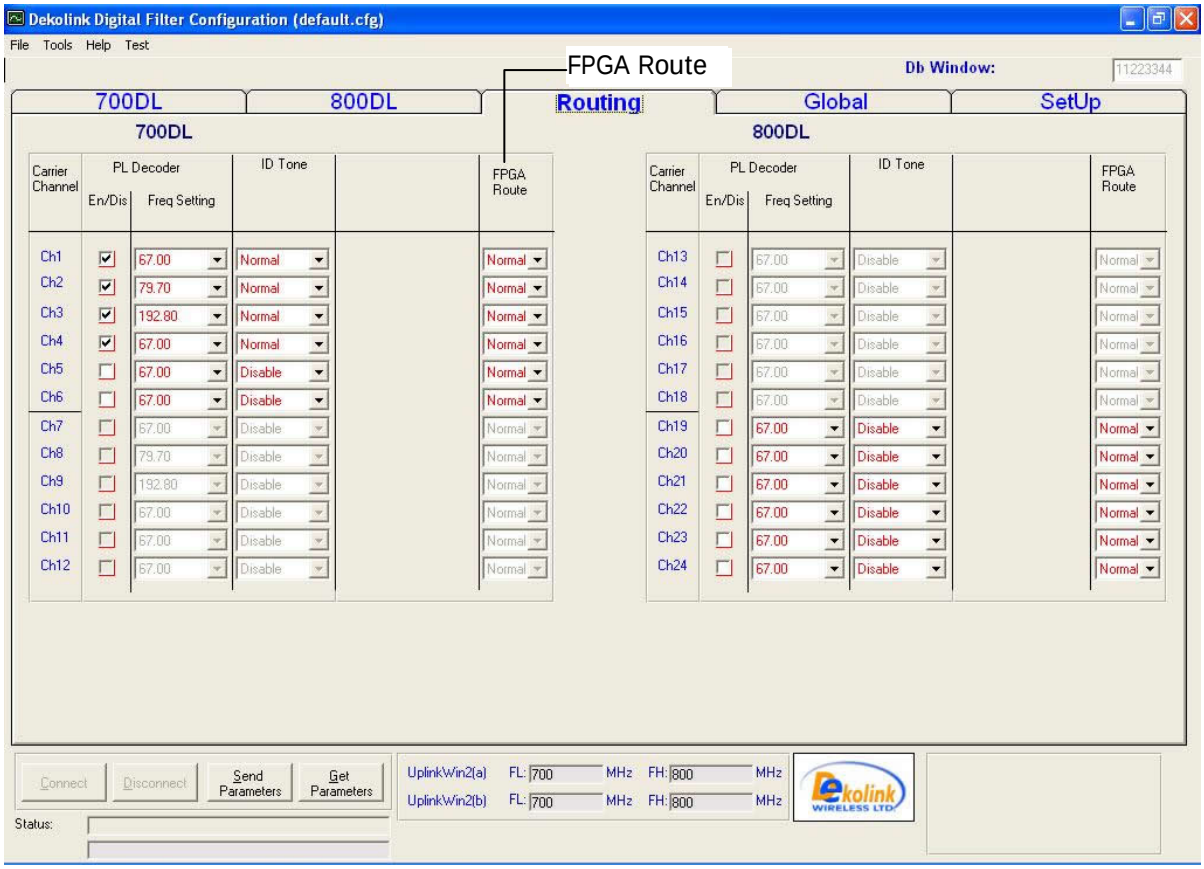
The Filter screens are shown by selecting a Filter Type in one of the window tabs and clicking the corresponding **Show** button.

The Filter screen includes several displays (**Select Picture** button, at bottom) that enable viewing the filter properties and characteristics to ensure a proper selection of the filter.



## FPGA ROUTE

The Deko4078SD MT application enables further narrowing down the signal passed for each channel. This option is performed via the **FPGA Route** parameter, which processes the signal via the DSPA.




### To define the FPGA Route Parameter

1. Access the *Routing* tab of the DDF window.
2. Click **CTRL+A** to access the *Advanced* mode.
3. Click the FPGA Route parameter to be defined corresponding to required channel and select one of the following options from the drop-down list:

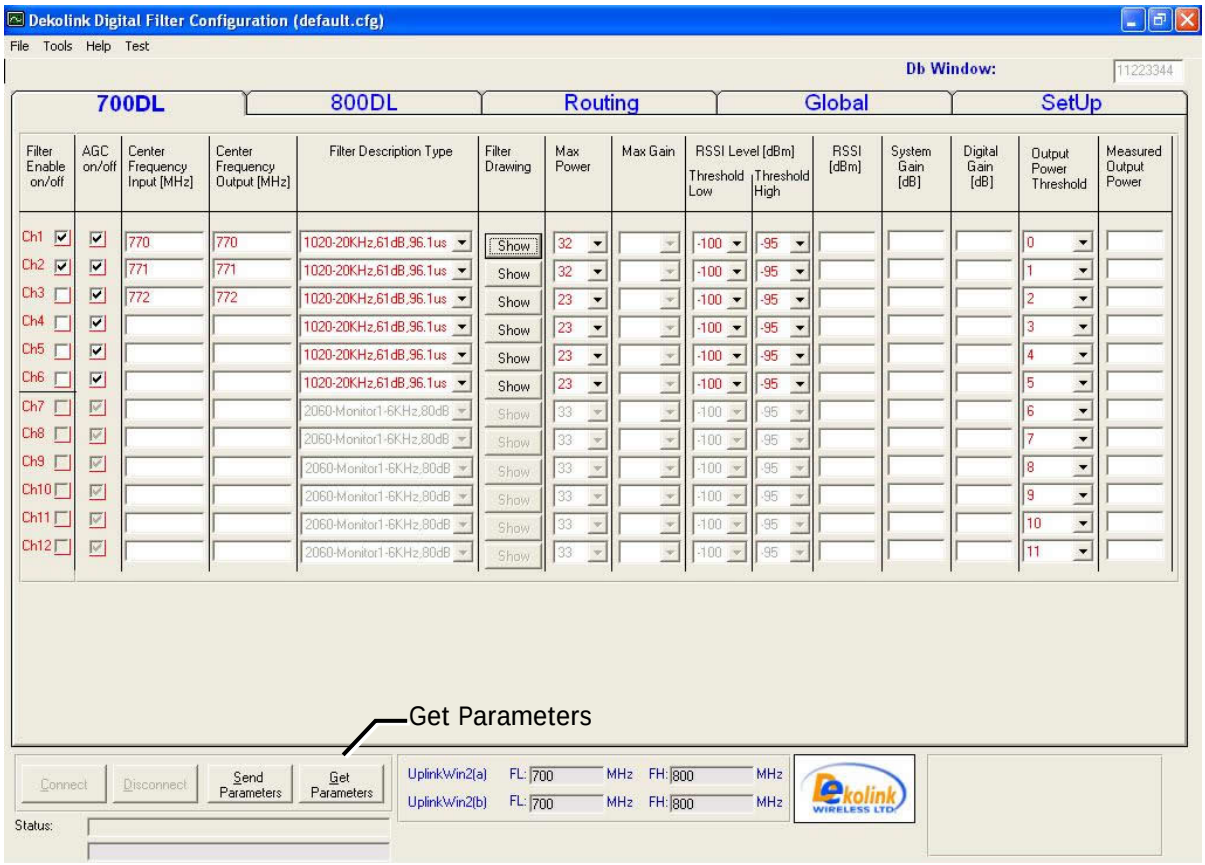
- Normal – Signal is passed "as is"
- CW – Booster can be used to generate the signal
- Zero – No signal

4. Click the **Send Parameters** button.

## VIEWING ONLINE DMSB SIGNAL BOOSTER PARAMETERS

### To view current Deko4078SD signal booster Parameters

After a connection has been established between the computer and the signal booster click the **Get** button, located at the bottom of the 700DL/800DL or UL700/800 shown below.




## SAVING / LOADING CONFIGURATIONS

The DMSB definition process includes the option to save the current configuration, and on the opposite to load a previous configuration.

The configuration files (.cfg) are stored in the DMSB in an internal directory.

### To save/load a configuration

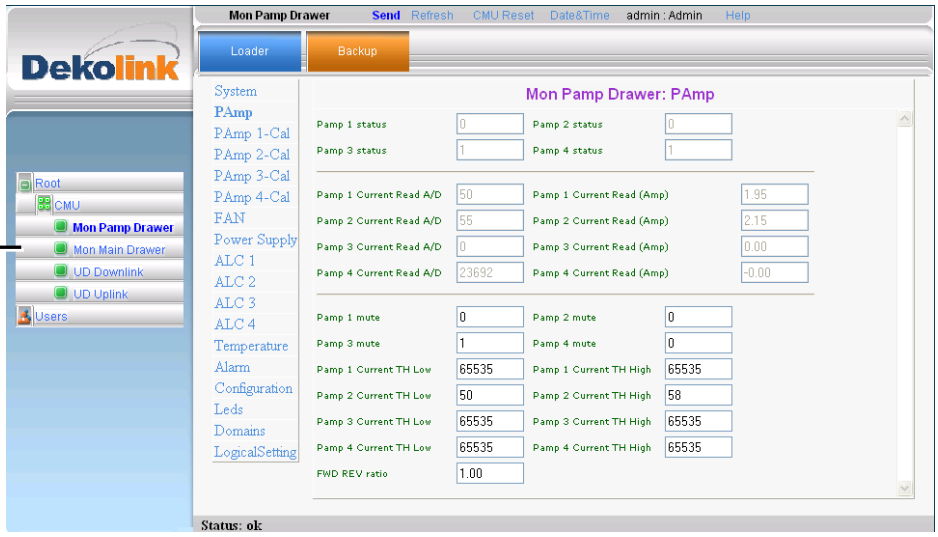
1. Press **CTRL+ T** to enter the Technical Mode.
2. Click on the *File* menu form the menu toolbar and select **Load Configuration** or **Save Configuration**, depending on the required action.
3. Select (for Load) or name (for Save) a file and proceed as for any Windows file.

# APPENDIX D: MUTING POWER AMPLIFIERS AND PERFORMING OUTPUT ATTENUATION PROCEUDRES

This section provides a description on how to manually mute a domain power amplifier (700DL, 800DL, or UL) and to attenuate the output power via the Dekolink-NMS Web GUI application.

## OPENING A SESSION

1. Interconnect the Deko4078SD Signal Booster Main unit and the computer using an RS232 connection.
2. Configure the computer network parameters (see 4.1.2).
3. Login (see 4.1.3). The following screen appears:

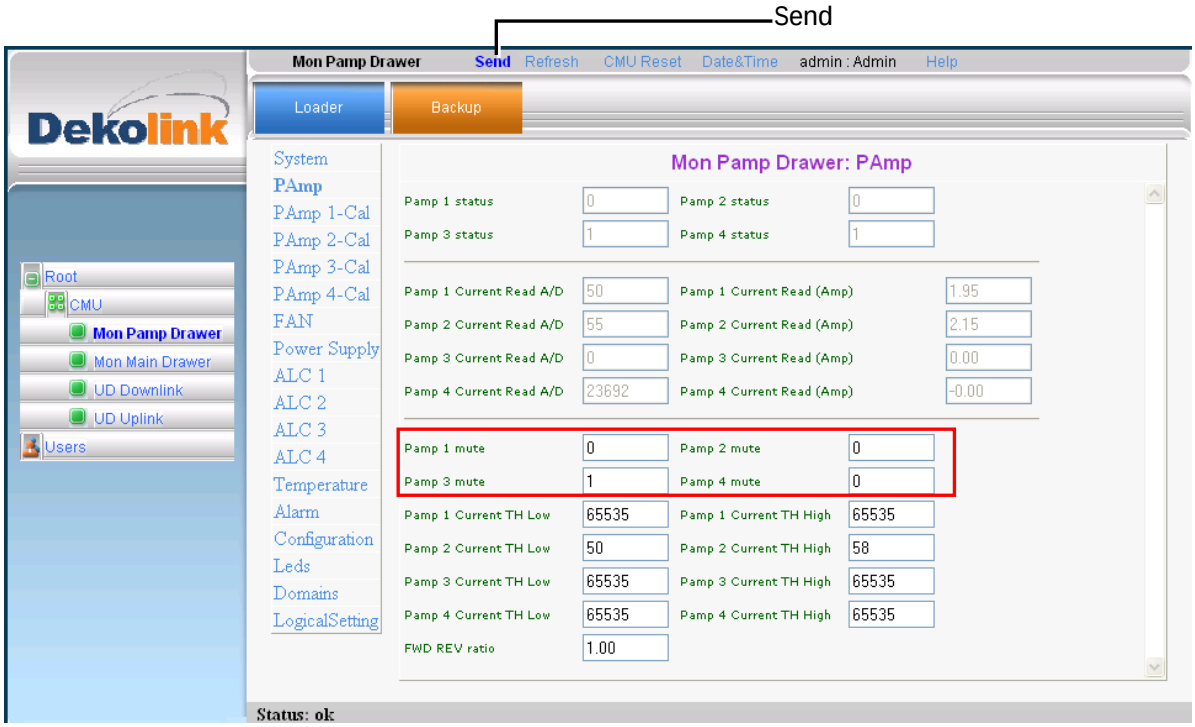



Tree pane listing the monitor and UD (Up-Down) cards

# MUTING A POWER AMPLIFIER

### To mute a power amplifier

1. Click the **Mon Pamp Drawer** in the left-hand tree pane.

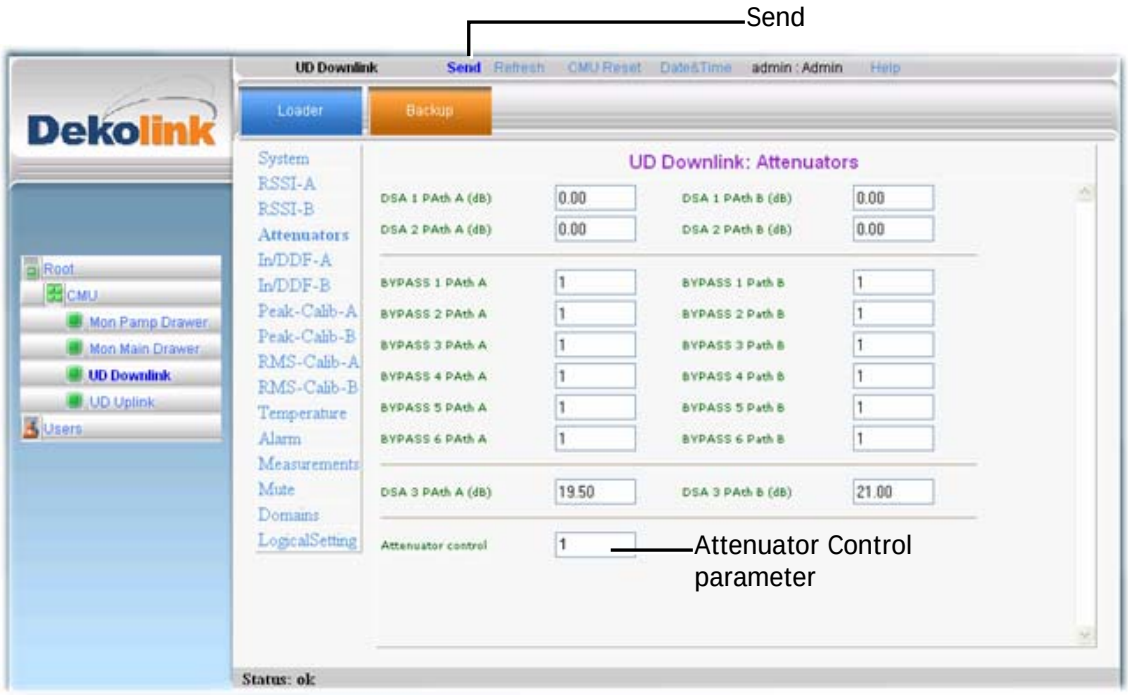



2. The Mute operation is performed through the **Pamp 1 mute**, **Pamp 2 mute**, **Pamp 3 mute** and **Pamp 4 mute** parameters, shown above.
3. Click **Send**.

# OUTPUT ATTENUATION

**To attenuate the DSA output**

1. Click a **UD** item (Uplink or Downlink) in the left-hand tree pane.




2. Set the **Attenuator Control** parameter to **1** and set the DSA parameters as required.
3. Click **Send**.

# APPENDIX E: DEKOLINK WIRELESS LIMITED WARRANTY

Dekolink Wireless LTD. (“Dekolink”), manufacturer of this product (the “Product”) warrants to the original purchaser (“Purchaser”) that the Product is free from defects in materials and workmanship for a term that ends on the earlier of twelve (12) months from the date of activation of the Product or fifteen (15) months from the date of shipment of the Product by Dekolink. The obligations of Dekolink under this warranty shall be limited solely to the repair or exchange or giving credit for, at the option of Dekolink, any Product that may prove defective in accordance with evidence satisfactory to Dekolink. Any repair or replacement of the Product by Dekolink shall not extend the original warranty period. This warranty is exclusive to the original Purchaser and is not assignable.

This warranty applies only upon the condition that the Product has been installed, maintained and operated under conditions of normal use. The provisions of this warranty shall not apply if, in Dekolink’s judgment, the Product has been subject to misuse or neglect, damaged in an accident or by act of vandalism, or repaired or altered in any way that adversely affects its performance or reliability.

To obtain warranty service, Purchaser may, upon the prior written authorization of Dekolink or its authorized service representative, return the defective Product to Dekolinks authorized service center. All shipping and insurance charges are the sole responsibility of Purchaser and are not included in this warranty.

Dekolink expressly excludes and disclaims all other warranties, including but not limited to any warranties of merchantability or fitness for a particular purpose.

Dekolink shall in no event be liable for any special, indirect, incidental, consequential or punitive damages or for loss, damage, or expense, including loss of use, profits, revenue, or goodwill, directly or indirectly arising from purchaser’s use or inability to use the merchandise, or for loss or destruction of other property or from any other cause, even if Dekolink has been advised of the possibility of such damage. Some states do not allow the exclusion or limitation of incidental or consequential damages so these limitations may not apply under certain circumstances. The liability of Dekolink shall in no event exceed an amount equivalent to the purchase price paid by the purchaser for the defective product. This warranty shall not be extended, altered or varied except by a written instrument duly signed by Dekolink.