Spectralink DECT Server 8000 and Spectralink DECT Server 2500

Configuration Guide

14184634 version 6.0, K016
June, 2015

Copyright Notice

Notice

Spectralink Corporation has prepared this document for use by Spectralink personnel and customers. The drawings and specifications contained herein are the property of Spectralink and shall be neither reproduced in whole or in part without the prior written approval of Spectralink, nor be implied to grant any license to make, use, or sell equipment manufactured in accordance herewith.

Spectralink reserves the right to make changes in specifications and other information contained in this document without prior notice, and the reader should in all cases consult Spectralink to determine whether any such changes have been made.

NO REPRESENTATION OR OTHER AFFIRMATION OF FACT CONTAINED IN THIS DOCUMENT INCLUDING BUT NOT LIMITED TO STATEMENTS REGARDING CAPACITY, RESPONSE-TIME PERFORMANCE, SUITABILITY FOR USE, OR PERFORMANCE OF PRODUCTS DESCRIBED HEREIN SHALL BE DEEMED TO BE A WARRANTY BY SPECTRALINK FOR ANY PURPOSE, OR GIVE RISE TO ANY LIABILITY OF SPECTRALINK WHATSOEVER.

Spectralink Corporation,
2550 55th Street,
Boulder CO 80301,
USA

Spectralink Europe ApS,
Langmarksvej 34,
8700 Horsens,
Denmark

Chapter 1: Preface

This guide explains how to use the Spectralink DECT Server 8000 and the Spectralink DECT Server 2500 Web interface.

Before You Begin

This guide assumes the following:

- That a site survey and deployment have been conducted and the installer has access to these plans.
- That the host pbx is installed and initialized and is working correctly.

Related Documents

For information about the physical installation of the Spectralink DECT Server 8000 and Spectralink DECT Server 2500, refer to the Spectralink DECT Server 8000 Installation Guide and Spectralink DECT Server 2500 Installation Guide, which can be found on www.spectralink.com.

List of Acronyms

AC	Authentication code (Subscription PIN code)
API	Application Programming Interface
dB	deciBel
CPT	Call Progress Tone
CTS	Clear to Send
DCD	Data Carrier Detect
DECT	Digital Enhanced Cordless Telecommunications
DTMF	Dual Tone Multi-Frequency
DSR	Data Set Ready
DTR	Data Terminal Ready
FSK	Frequency Shift-Keying
HW PCS	Hardware Product Change Status
IPEI	International Portable Equipment Identity - the unique ID of a handset
LID	Line identifier
MSF	Message Service Function
OAM	Operation, Administration, and Maintenance
PB	Print circuit board
PBA	Print circuit board assembly
PBX	Private Branch eXchange
PCS	Product Change Status
PIE	Production Initial Edition
PPID	Portable Part Identification
PP	Portable Part (Handset)
RFP	Radio Fixed Part (Base Station)
RPN	Radio Part Number
RTS	Request to Send
SN	Serial Number (IPEI number)
SW PCS	Software Product Change Status
WRFP	Wireless Radio Fixed Part (Repeater)

Reporting Issues to Spectralink

If you experience issues with the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 and want to report it to Spectralink, please provide the following information.

- Configuration data as described in “SERVICE REPORT”
- Number of repeaters in the installation.
- Floor plans showing location of base stations and repeaters and their Radio Part Number (RPN).
- Issue description: What happened? What did you expect would happen? Can you reproduce the issue? How often does the issue occur?
- Capture the scenario by setting the trace level to 3, and then e-mail the trace report to Spectralink.

Deploying an Installation Using Repeaters or Base Stations Only

If possible make the installation using base stations and no repeaters.

You should only use repeaters, if you need either the very fast handover or the range of the external antenna!

Base stations: Their presence is visible to the Spectralink DECT Server and the server can track the what happens to calls on base stations.

Repeaters: They are invisible to the Spectralink DECT Server and so are handovers between repeaters and between repeaters and base stations.

The invisibility of the repeater is a consequence of the principle behind the repeater concept in a DECT system.

Performance

- Sites without repeaters: The statistics will document the performance of the deployment and show which base stations to focus on.
- Sites with repeaters: You have to depend on your customers feedback or put your walking shoes on and spend time on the site and try out all possible handover situations, and generate your own statistic by hand.

Investigating deployment issue on a installation without repeaters, or very few repeaters (like 100 base stations and only 3 repeaters):

1. Remote investigation:
   a. Get the System Configuration and trace files

   b Get a (building) blue print with base station placement (if repeaters then they also have to be on the blue print)

   c Analyze the statistics and find out where you have the deployment issues, if any.

   d Most issues can be addressed remotely.

2 On-site investigation:

   a If you can't solve the issues remotely then you have to go on site, and you will typical have a good idea about which kind of issues the site has and where the issues are located.

Investigating deployment issues on a installation with repeaters (like 40 base stations and 16 repeaters).

1 Remote investigation:

   a Typically useless.

   b System Configuration and trace files will typically not help you much; the repeaters are invisible to the Spectralink DECT Server 8000 and Spectralink DECT Server 2500.

2 On-site investigation:

   a First find out if there is an issue and where it is located.

Conclusion

Going for repeaters in an installation increases time spent on the deployment issues, travel expenses and walking time and reduces the possibility for documenting the system performance.

Note

If you have a site that can be covered by 60 base stations (and no repeaters) and then you as an alternative would like to install 24 base stations and 72 repeaters, it can be a big challenge to make that change.

Note

We recommend that you as a minimum use Cat. 5 - twisted pair cabling for any KIRK Base Station installation made as a part of Spectralink DECT Server 2500 or Spectralink DECT Server 8000 solution.

Chapter 2: System Overview

This section provides information about the system components of the Spectralink DECT Server 8000 and Spectralink DECT Server 2500.

Components

The Spectralink DECT Server 8000 requires one CPU card and up to 8 interface cards for each shelf. The Spectralink DECT Server 2500 also requires one CPU card and up to 3 interface cards. If a larger system is required, you can link up to 8 Spectralink DECT 8000 Servers together with a maximum of 64 interface cards for a Spectralink DECT Server 8000.
If the requirements outgrow a Spectralink DECT Server 2500, then buy an empty Spectralink DECT Server 8000 shelf and re-use the CPU card and interface cards from Spectralink DECT Server 2500 in the Spectralink DECT Server 8000 cabinet.

Figure 1 *Spectralink DECT Server 8000 Chassis with CPU (without Link option) and Interface cards*

Figure 2 *Spectralink DECT Server 8000 Chassis with CPU (with Link option) and Interface cards*

Figure 3 *Spectralink DECT Server 2500 Chassis with CPU (without Link option) and Interface cards*

Figure 4 *Spectralink DECT Server 2500 Chassis with CPU (with Link option) and Interface cards*

The following table contains Spectralink DECT Server 8000 and Spectralink DECT Server 2500 CPU cards and their part numbers:

Table 1 *Spectralink DECT Server 8000 and Spectralink DECT Server 2500 CPU cards*

Picture	Description	Part Numbers
	CPU card without link option	02339900
	CPU card with link option	02339800

CPU card without link option has build-in Media Resource for 8 Channels.

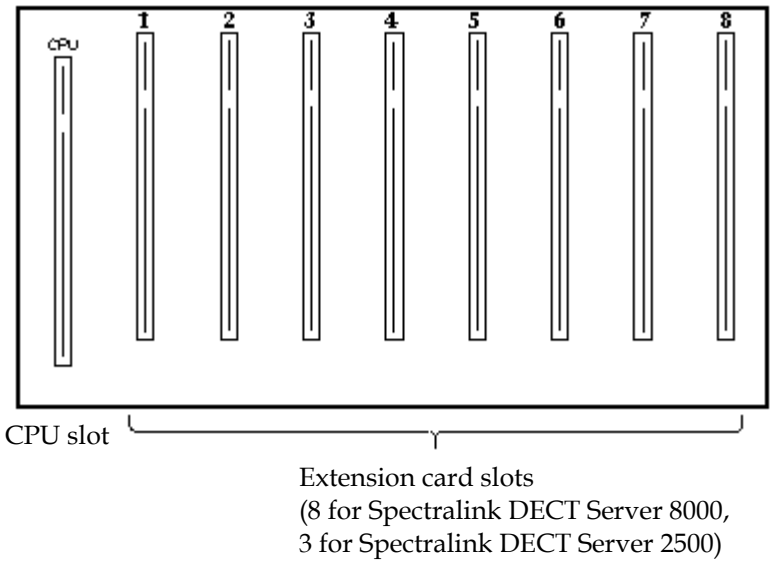
Note

CPU card without link with part number 02339600 requires seperate Media Resource card.

Backplane Overview

The main part of the gateway is a backplane board with a minimum amount of circuits and a CPU card. The backplane is located at the bottom of the chassis. The CPU card is plugged in to the left.

Figure 5 *Spectralink DECT Server 8000 Backplane Overview*



Overview of Front LEDs

The following tables describe the status LEDs for each card.

LED Name	Location	Color	Description
POWER	On top of all modules	Green	Steady green light when the power is on and the card is running.
POWER	On top of all modules	Red	Flashing red light at power up. Steady red light in case of error.

Note
On CPU card without link, the POWER LED is signalling the IP address of Spectralink DECT Server 8000 (or Spectralink DECT Server 2500) by means of a sequence of LED flashing different colors.
Below is an example of behavior for IP address 127.0.1.101

- LED steady green (“beginning of message”); LED off (break); LED flash blue (ignore this)
- The power LED morses the IP address. The morse cycle for the power LED is as follows: Steady green 30 seconds, Blinking blue 3 seconds (get ready sequence starts) Green blink represents digits (zero is a long blink). Red means dot between digits.
- break, LED flash green once (=”1”), break, LED flash green twice (=”2”), break, LED flash green 7 times (=”7”), break, LED flash red (=”.”)
- break, LED flash green once, longer (=”0”), break, LED flash red (=”.”)
- break, LED flash green once (=”1”), break, LED flash red (=”.”)
- break, LED flash green once (=”1”), break, LED flash green once, longer (=”0”), break, LED flash green once (=”1”), break
- LED steady green (“end of message”)

Table 2 *CPU Card Ethernet Connector LEDs*

LED Name	Location	Color	Description
Link	At the bottom of all modules	Yellow	Steady yellow when the Ethernet connection is in sync.
Activity	At the bottom of all modules	Green	Flashing green light when the Ethernet connection is active.

Table 3 *Analogue Interface Card LEDs*

LED Name	Location	Color	Description
Ringing	Connectors on analogue interface cards	Yellow	Steady yellow when there's incoming ringing voltage for at least one line.
Activity	Connectors on analogue interface cards	Green	Steady green when the card is up and running. Also indicates that there are no active calls. Slow green flash when there's at least one active call on the connector.

Table 4 *Base Station Interface Card*

LED Name	Location	Color	Description
RFP 0-7	Upper half - one LED for each RFP	Red	Steady red when there is power on the connector but not active RFP connect. Flashing red during power up sequence of RFP.
RFP 0-7	Upper half - one LED for each RFP	Green	Steady green when RFP is in sync. Flashing green when at least one handset has a connection on the RFP.

Table 5 *Media Resource card*

LED Name	Location	Color	Description
Card Status	Upper half	• Red • Green	Steady red light in case of error. Steady green light when the power is on and the card is running.
Call Activity	Upper half	Green	Steady green when there are no active calls. Slow green flash when there's at least one active call using the Media Resource Card.
Idle Channels	Upper half	Green	Steady green when there are Idle channels available.

Base Station Interface Card Placement

In a Spectralink DECT Server 8000 multi shelf system, if you have one to eight BIF08 cards, then place all cards in shelf no. 1, and if you have between nine and sixteen then place all BIF08 cards in shelves no. 1 and no. 2.

Chapter 3: Accessing the Web Interface

How to Access the Web Interface

Note

It is recommended that you use the latest version of Firefox or Chrome.

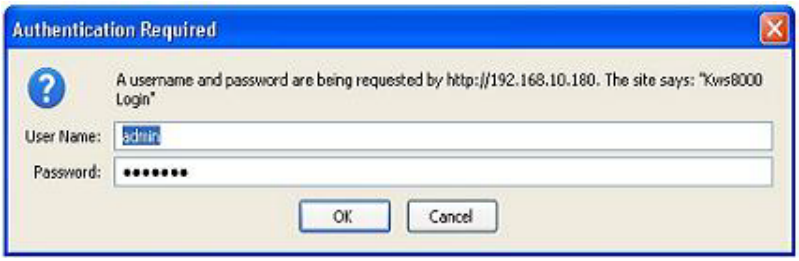
The Web Interface is accessed through a standard web browser.

1 Open a web browser.

2 In the browser address bar, type http://192.168.0.1 (default) and then press **Enter**.

The Authentication page is displayed.

Figure 1 *Authentication page*



3 In the **User Name** field, enter **admin**.

4 In the **Password** field, enter **admin**.

Note

The default user name of the system is **admin** and the default password of the system is **admin**. It is strongly recommended that you change the password.

5 Click **OK**. The Service Report page is displayed.

Chapter 4: General System Settings

This section describes how you manage the following settings from the **System** menu:

- 'Service Report'
- 'Information Page'
- 'System Configuration'
- 'Network Settings'
- 'Corporate Phonebook Configuration'
- 'Update Firmware'
- 'System Restart'
- 'Backup and Restore'

Service Report

You can save both configuration and statistical information as a **.tar.gz** archive. This can be required if you want to send this information to Spectralink in case you need assistance.

To Get the Service Report Archive

1 On the **System** menu, click **Service Report.**

2 Click the **Get Service Report** button. You will start receiving the files. When the process is completed, the word '**Done!**' is displayed.

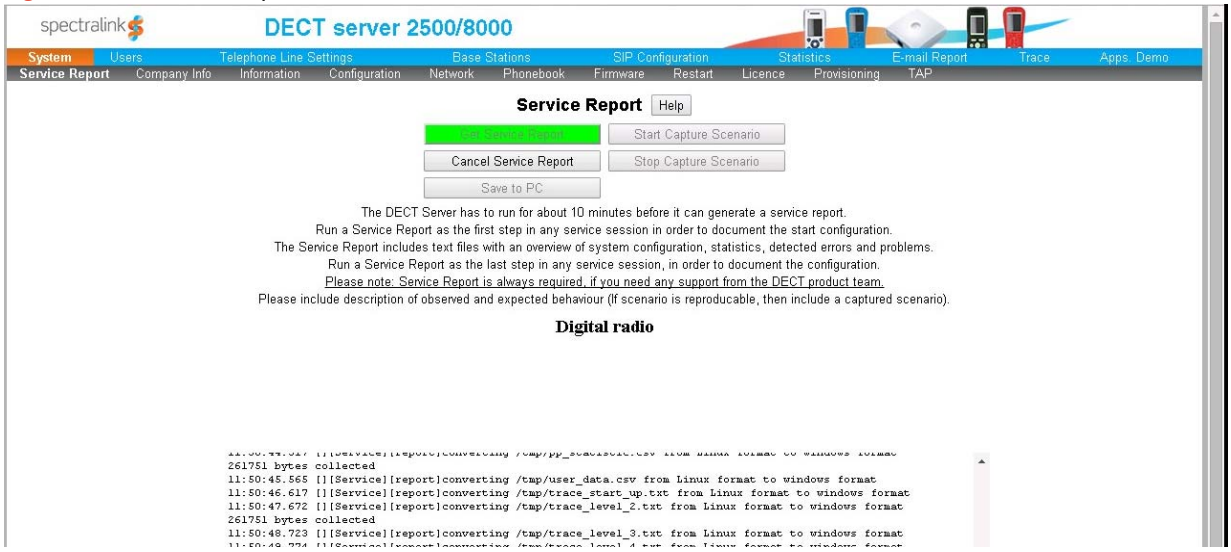
Note

To view the warning.txt file after the files have been generated, click the **View warnings** link at the end of the generated files list.

-OR-

3 Click **Cancel Service Report** to cancel the process.

Figure 1 *Service Report archive*



4 Click the **Save to PC** button to save the archive. The **Opening servicereportfiles.tar.gz** page is displayed.

5 Click **Save File** to download the file to your PC.

Spectralink DECT Server 8000 and the Spectralink DECT Server 2500 generate the following files:.

- configuration.txt
- eng1.tar.gz
- gain_data.txt
- level_2_trace.txt
- level_3_trace.txt
- pp_statistic.csv
- restart_data.txt
- rfp_statistic.csv
- settings.txt
- statistics.txt
- trace_start_up.txt
- user_data.txt
- Warnings.txt

If more shelves are present in the system, the system will generate additional “eng<**n**>.tar.gz”files for each shelf (**n** represents the shelf number).

The first action on a site inspection should be to get those System Configuration and Trace files.

The last thing to do before leaving a site should also be to take the System Configuration and Trace files.

If you have an issue to report about a site, then those files are required with the report.

To Start or Stop Scenario Capture

1 Repeate steps 1 and 2 from To Get the Service Report Archive section.

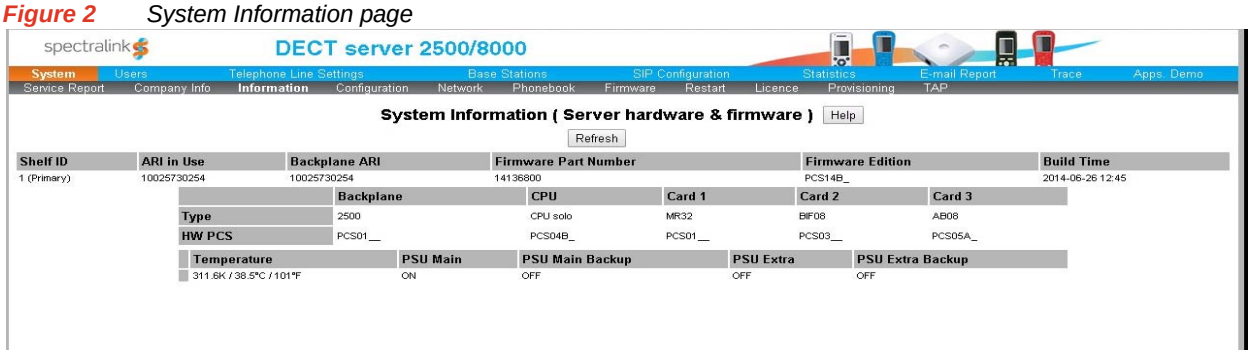
2 Click the **Start capture of scenario** button. The Grab Events is ended and the trace level is set to 5.

3 Click the **Stop capture** button. The Grab Events begins and the trace level is set back to previous value.

Information Page

1 On the **System** menu, click **Information**. The **System Information** page is displayed.

Figure 2 *System Information page*



2 Click **Refresh** to load the information.

The System Information page displays hardware and interface information for each shelf and for each slot in each shelf.

You can view the following information about hardware product change status (HW PCS) for each slot in each shelf, and information about which Interface card is used for each slot in each shelf. Furthermore, you can view information about which software version is currently used. The following figure provides an example of the information that is displayed on the System information tab.

System Configuration

Note

Click the **Refresh** button to read the settings from the system.

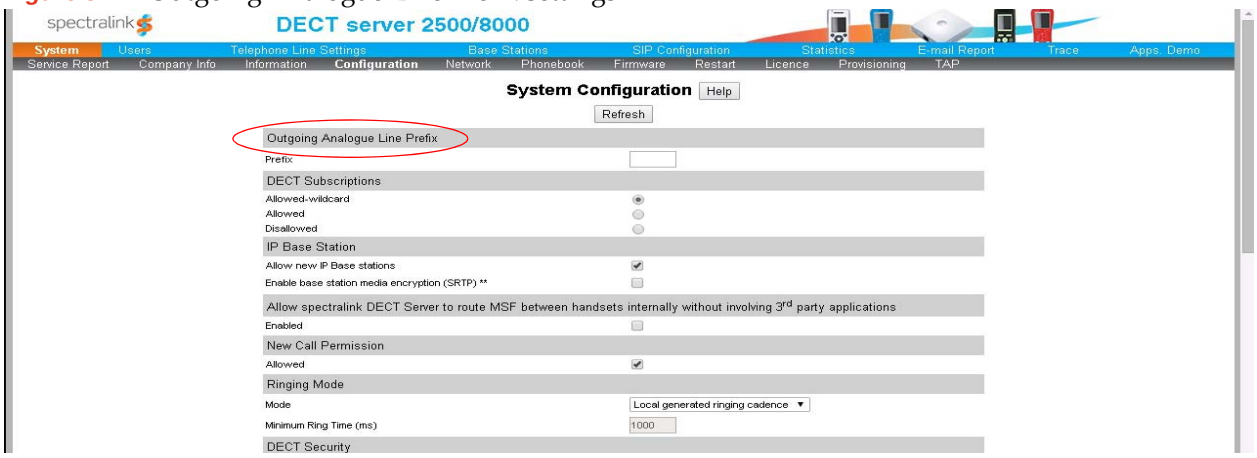
Setting the Outgoing Analogue Line Prefix

The Outgoing Analogue Line Prefix specifies which start digit(s) the Spectralink DECT Server will look for, in an outgoing call. If the Spectralink DECT Server sees the digit(s), then it will insert a delay between the prefix digit(s) and the rest of the dialled number.

To set the Outgoing Analogue Line Prefix

1 On the **System** menu, click **Configuration.** The **System Configuration** page is displayed.

Figure 3 Outgoing Analogue Line Prefix settings



2 Type a prefix in the **Prefix** field, and then click **Save** to write it to the system.

Note

The system dials the outgoing line prefix cipher, and then waits for the dial tone before sending the remaining digits of the number.

Allowing Subscription

To subscribe handsets to the system the system must be set to allow subscriptions. For detailed information about how to subscribe handsets, see the user guide for specific handsets. You can find the handset user guides on www.spectralink.com

To Allow or Disable Subscriptions

1 From the **System** menu, go to **Configuration** and on the **System Configuration** page choose one of the following options:

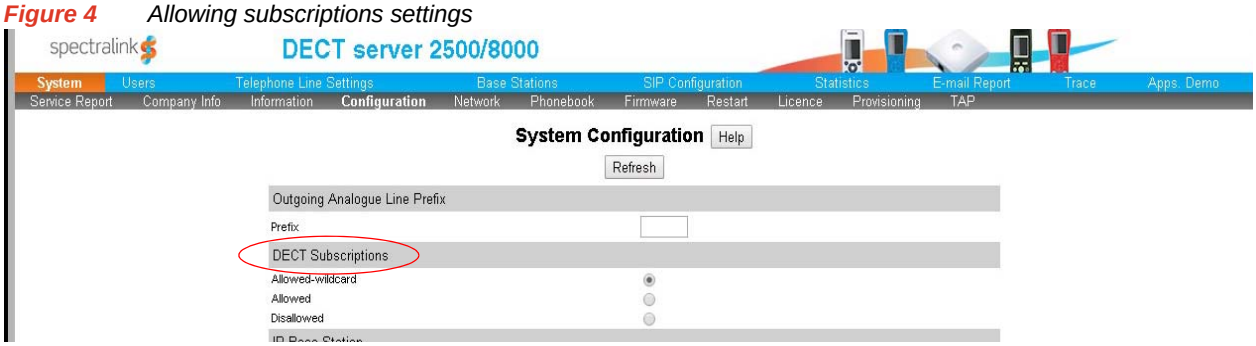
   a **Allowed-wildcard** (default option)**:** Spectralink DECT Server 8000 will autocreate a new user with the corresponding IPEI number for the handset. By default the created user will be disabled. To configure the user fill in the corresponding values in **Create or Change User** (see” “section) window and make sure you select **Allow** from the **Service Status** drop-down list.

   b **Allowed**- users can be subscribed to the system.

c **Disallowed**- users cannot be subscribed to the system.

2 Click **Save** to write the change to the system.

Figure 4 *Allowing subscriptions settings*



Allowing Routing of MSF between Handsets Internally without Involving 3rd Party Application

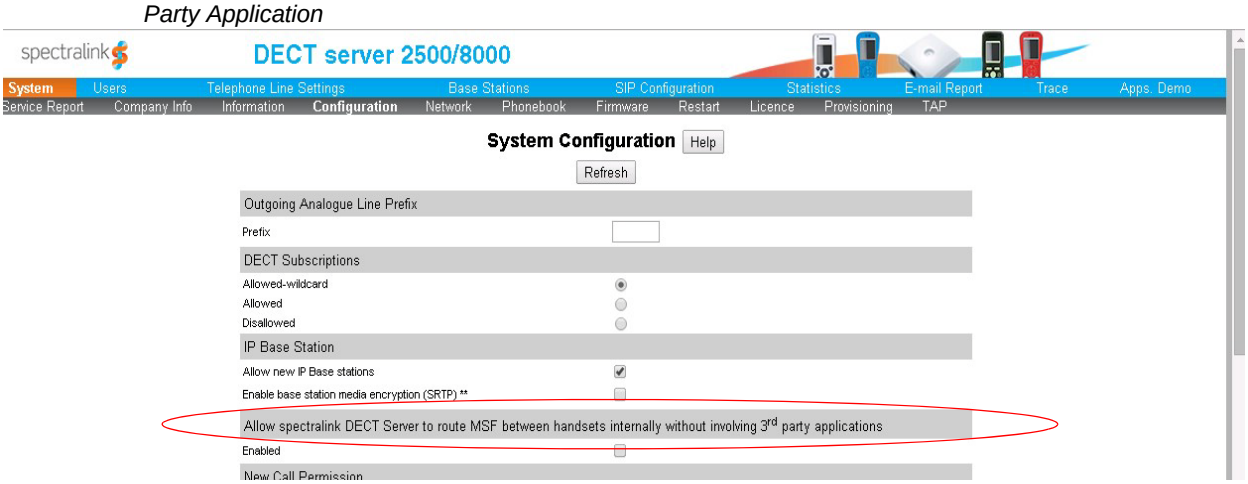
This option enables Spectralink DECT Server 8000 to route messages internally between handsets without involving a 3rd Party application.

To Allow Spectralink DECT Server to Route MSF Between Handsets Internally Without Involving 3rd Party Application

1 From the **System** menu, go to **Configuration** and on the **System Configuration** page under **Allow Spectralink DECT Server to route MSF between handsets internally without involving 3rd party applications** section, click **Enabled** or **Disabled**.

2 Click **Save** write the changes to the system.

Figure 5 *Allowing Spectralink DECT Server to Route MSF between Handsets Internally without Involving a 3rd Party Application*



Allowing or Blocking New Calls

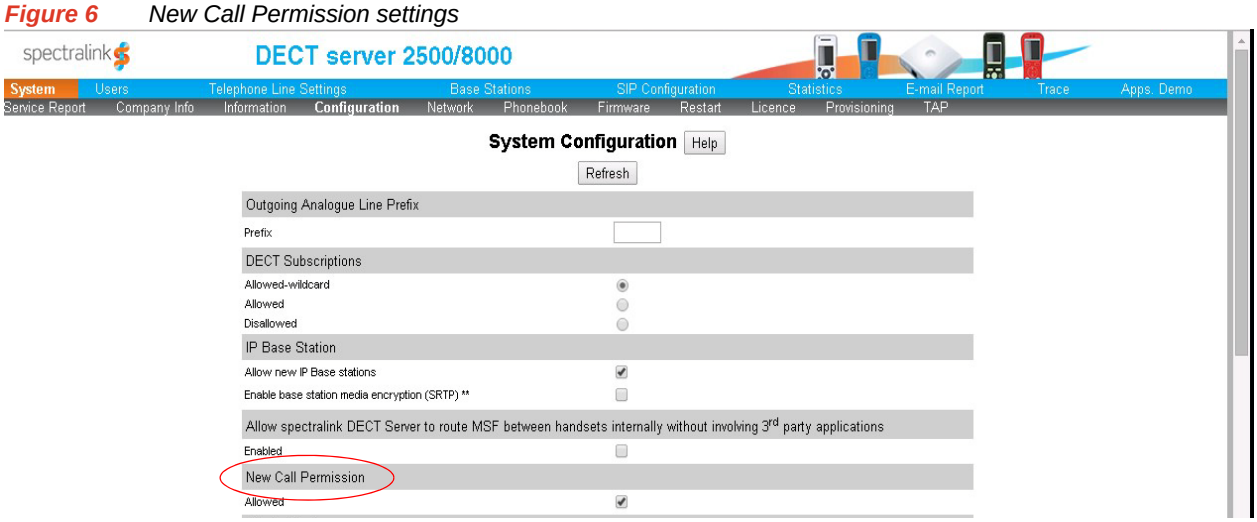
The system allows blocking new calls. The active calls are unaffected by this setting.

To Allow or Block New Calls

1 From the **System** menu, go to **Configuration** and on the **System Configuration** page under the **New Call Permission** section, click **Allowed** or **Blocked**.

2 Click **Save** to write the changes to the system.

Figure 6 *New Call Permission settings*



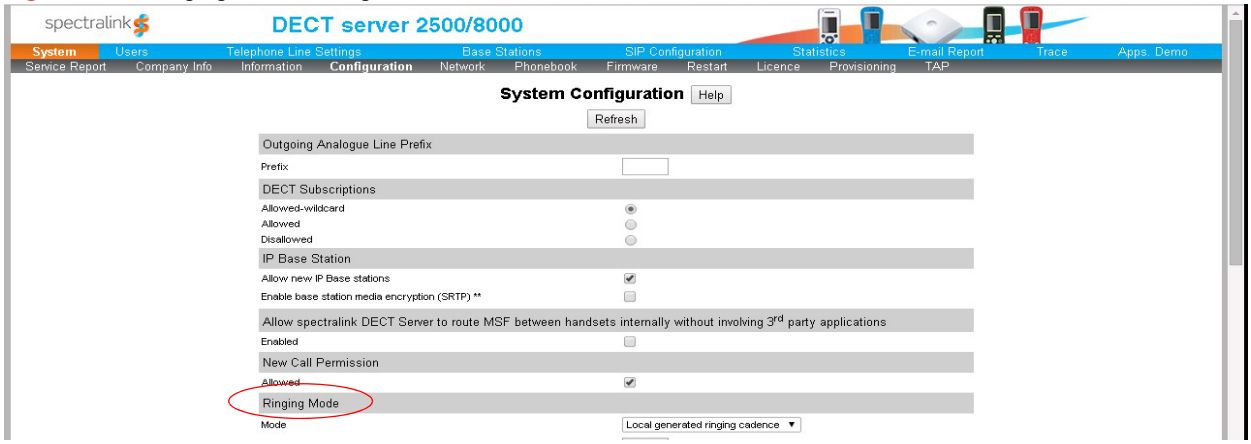
Setting the Ringing Mode

The system allows setting the ringing mode and maximum ring time (ms) for incoming analogue calls.

To Set the Ringing Mode

1 On the **System** menu, click **Configuration**. The **System Configuration** page is displayed.

Figure 7 *Ringing Mode settings*



2 On the **Ringing Mode** section, from the **Mode** drop-down list select one of the following options: **Ringing cadence follows (I)PBX** or **Local generated ringing cadence**.

3 Select the **Minimum Ring Time (ms)** value: minimum length of each alerting period, as seen by Spectralink DECT Server 8000 (default is 500).

Note

If a new ring start is seen within MinRingTime then it will be ignored (Valid values are between 40 and 120 units of 10 milliseconds.)

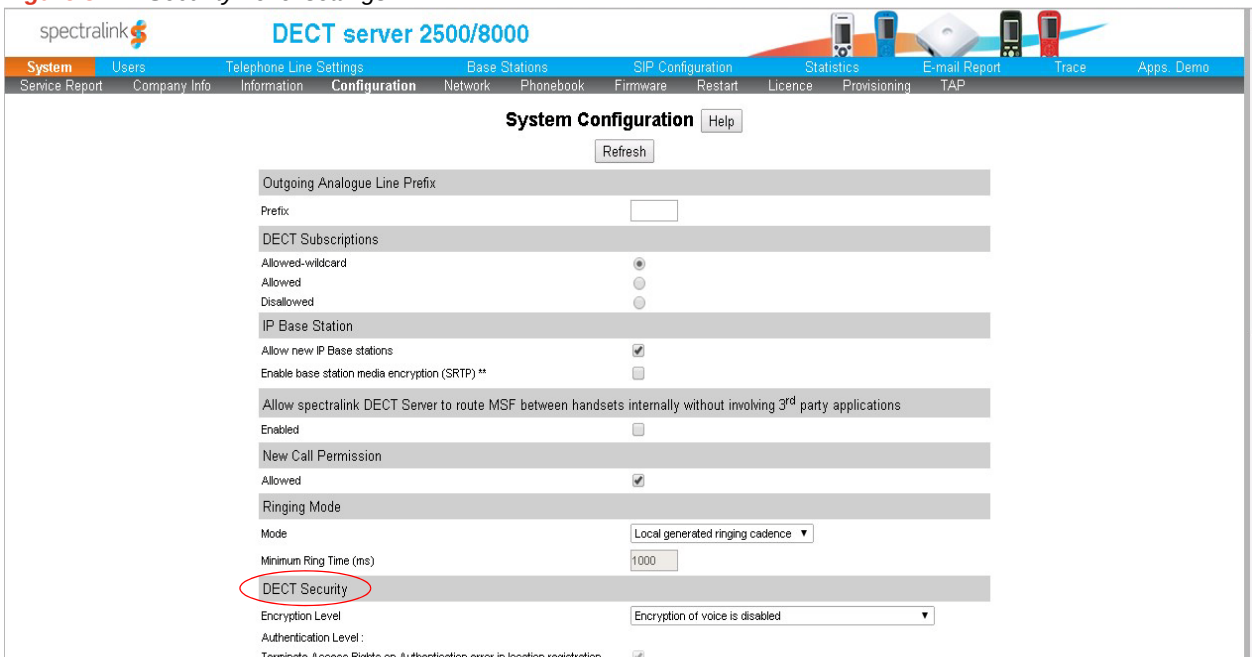
4 Click **Save** to write the changes to the system.

Setting the Security Level

You can specify the voice encryption level and the authentication level for the system.

1 On the **System** menu, click **Configuration.** The **System Configuration** page is displayed.

Figure 8 *Security Level settings*



2 Under **DECT Security,** select the **Encription Level** and the **Authentication Level.**

3 Select or deselect **Check Authentication on incoming voice calls** and **Check Authentication on outgoing voice calls** check-boxes.

4 Enter the **System access code** in the corresponding field and then click **Save** to write the configuration to the system.

Note

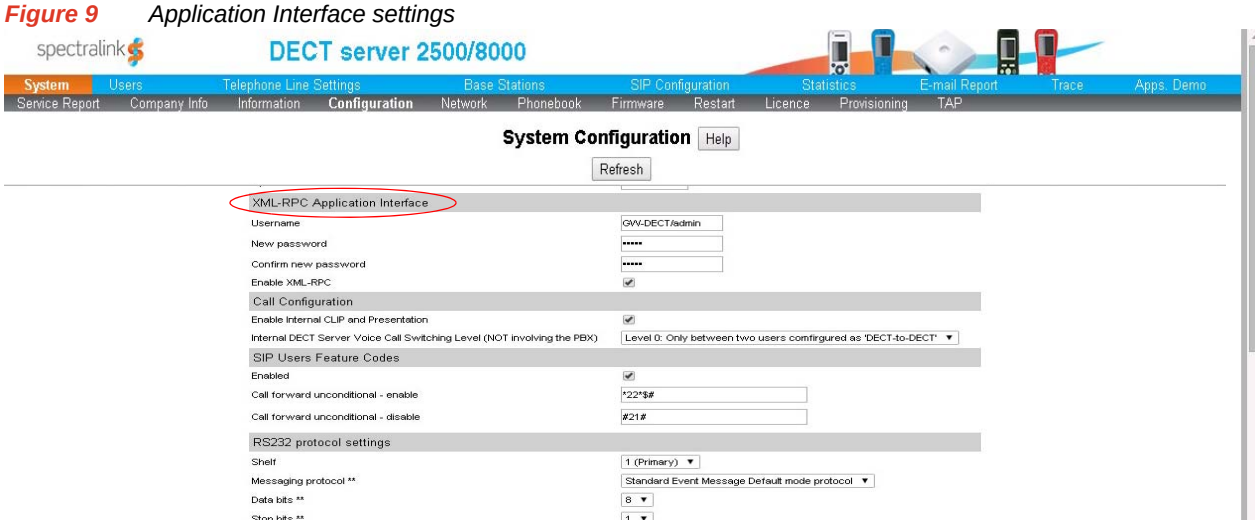
Repeaters (WRFPs) do NOT support voice encryption. If voice encryption is enabled all the RFPs (base stations) need to be of the RFP5: or RFP6 generation.

Application Interface Settings

To Access the XML-RPC Application

1 On the **System** menu, click **Configuration.** The **System Configuration** page is displayed.

Figure 9 *Application Interface settings*



2 Under **Application Interface**, on the **Username** field, type the name of the user (default ‘GW-DECT/admin’).

3 On the **New password** field, type your password (default ‘admin’).

4 Re-type your password in the **New password again** field.

5 Check the **Enable XML-RPC** check box.

6 Click **Save** to write your changes to the system.

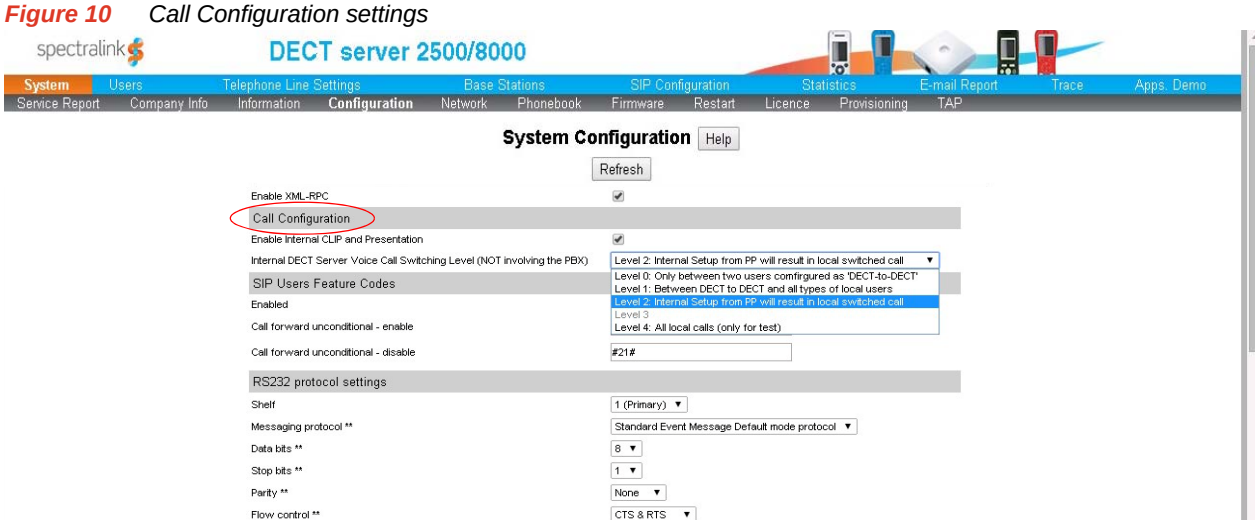
Call Configuration Settings

With Call Configuration you can enable clip and presentation on analog interface and specify the local switching level.

To Configure a Call

1 On the **System** menu, click **Configuration.** The **System Configuration** page is displayed.

Figure 10 *Call Configuration settings*



2 On the **Call Configuration** section select the **Enable Internal CLIP and Presentation** check-box if you want to receive clip and presentation on internal calls (call from one handset to another on the same Spectralink DECT Server). When a user is created/changed you can write a text in the presentation field.

3 Select one of the following **Internal Voice Call Switching Level**s to switch local calls (users on the same Spectralink DECT Server) without involving the PBX:

- Only Between DECT to DECT users
- **Between DECT to DECT and all types of local users** - enables users subscribed as DECT_TO_DECT to call/receive calls from users subscribed as SIP users and analogue users.
- **Internal Setup from PP will result in local switched call** - enables users subscribed as SIP users and analogue users to make internal calls if they use the **INT** key to dial the number (40xx PP) and **R** key (on 50xx, 60xx and 70xx) + **Between DECT to DECT and all types of local users** level (If you choose “Internal Setup from PP will result in local switched call” level then “Between DECT to DECT and all types of local users” level is automatically chosen as well).
- **Level 3** - not implemented yet.
- **All local calls** - all calls will be routed internally regardless of interface type + “Between DECT to DECT and all types of local users” level + “Internal Setup from PP will result in local switched call” level + Level 3 (If you choose “All local calls” level then “Between DECT to DECT and all types of local users” level then “Internal Setup from PP will result in local switched call” level and Level 3 are also chosen automatically).

Note

When calls are routed internally it is not possible to use the **R**-key (hold and transfer calls).

4 Click **Save** to write the configuration to the system.

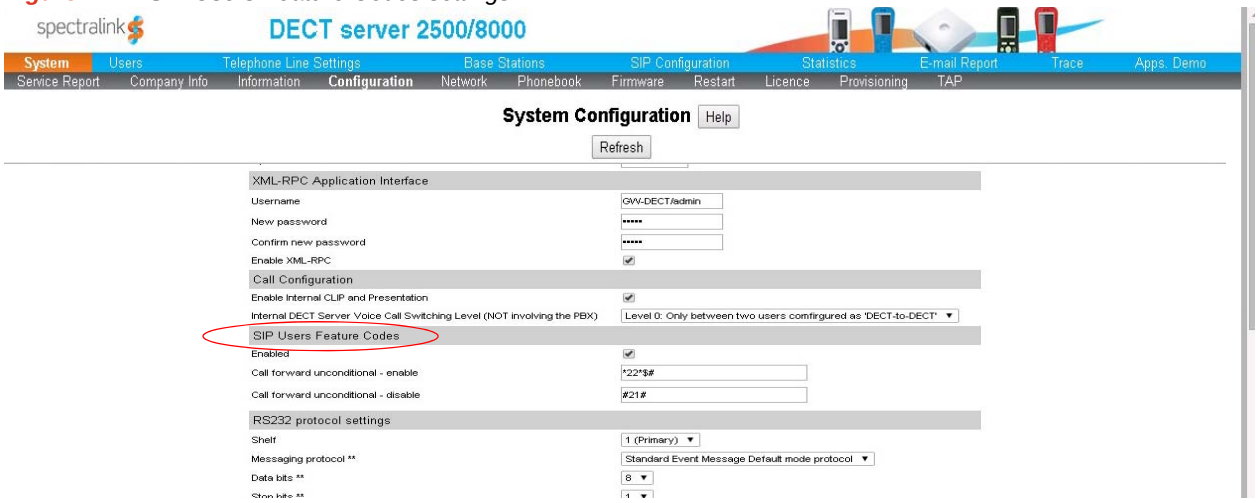
SIP Users Feature Codes Settings

If a handset has a call forward enabled the standby text will be pre-ended with (CFU) to give the user an indication that the handset is forwarded.

To Enable or Disable CFU

1 On the **System** menu, click **Configuration.** The **System Configuration** page is displayed.

Figure 11 *SIP Users Feature Codes settings*



2 Enable or disable the **SIP Users Feature Codes**.

3 Specify the codes for enabling and disabling CFU.

- Code for enabling CFU- default code is ***21*$#** where **$** denotes the number to forward the calls to.
- Code for disabling CFU - default code is **#21#**.

4 Click **Save** to write the configuration to the system.

Network Settings

Note

Click the **Refresh** button to read the settings from the system.

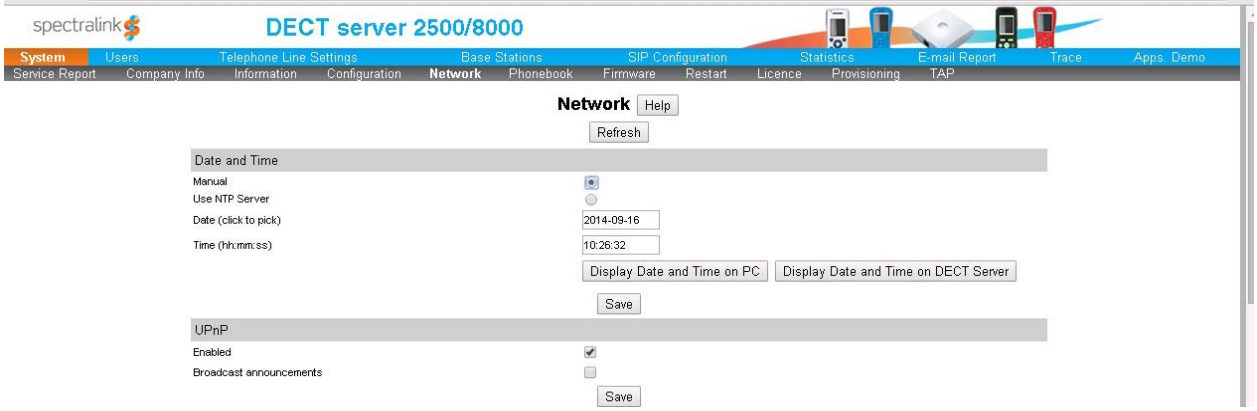
Setting Date and Time

You can choose whether to read date and time from the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 or whether to use the date and time from your PC, and write it to the system. You also have the option to take the time information from a NTP server.

To Set Date and Time Manually

1 On the **System** menu, click the **Network** tab.

Figure 12 *Setting Date and Time Manually*



2 Select the **Manual** radio box.

3 Click the **Date** box and choose the date from the calendar displayed.

4 Specify the **Time**.

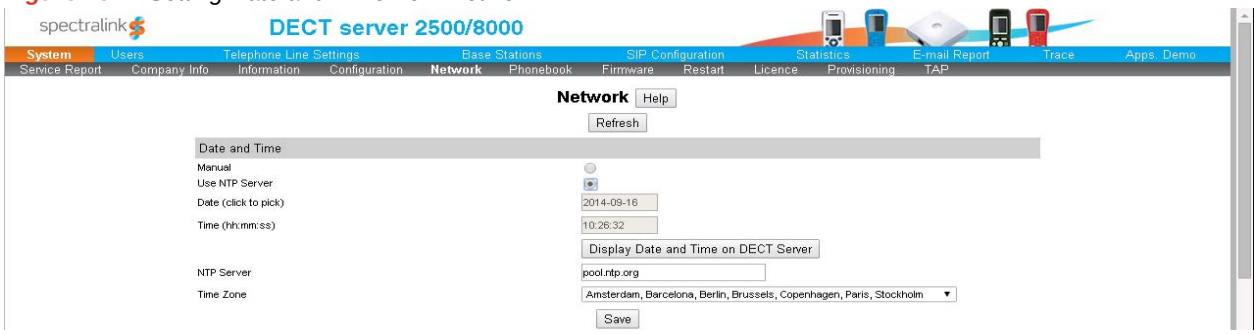
5 Click **Read from PC** to read the date and time from the PC or click **Read from KWS** to read the date and time from the Spectralink DECT Server.

6 Click **Save** to write the date and time to the system.

To Set Date and Time from the Network

7 On the **System** menu, click the **Network** tab.

Figure 13 *Setting Date and Time from Network*



8 Select the **Network** radio box.

9 Type the **NTP Server** network address.

10 Select the desired **Time Zone** from the drop down list.

11 You can further configure the **Posix Timezone String** or else leave the default value.

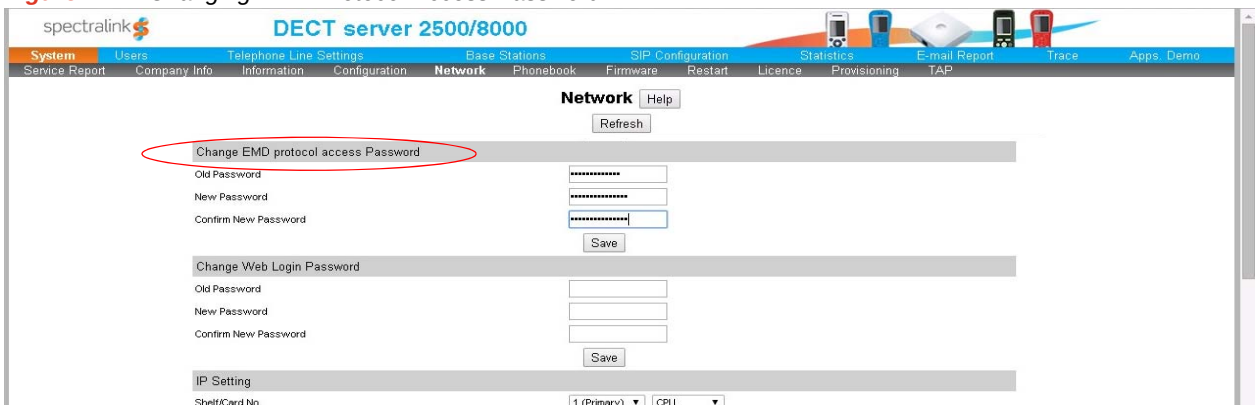
12 Click **Save** to write the NTP date and time to the system.

Changing EMD Protocol Access Password

To Change the EMD Protocol Access Password (“SIO Password")

1 On the **System** menu, click **Network**.

Figure 14 *Changing EMD Protocol Access Password*



2 Under **EMD protocol access Password**, type the current password in the **Old Password** field.

3 Type the new password in the **New Password** field, and then re-type it in the **Confirm New Password** field.

4 Click **Save** to modify the password, and then click **Close**.

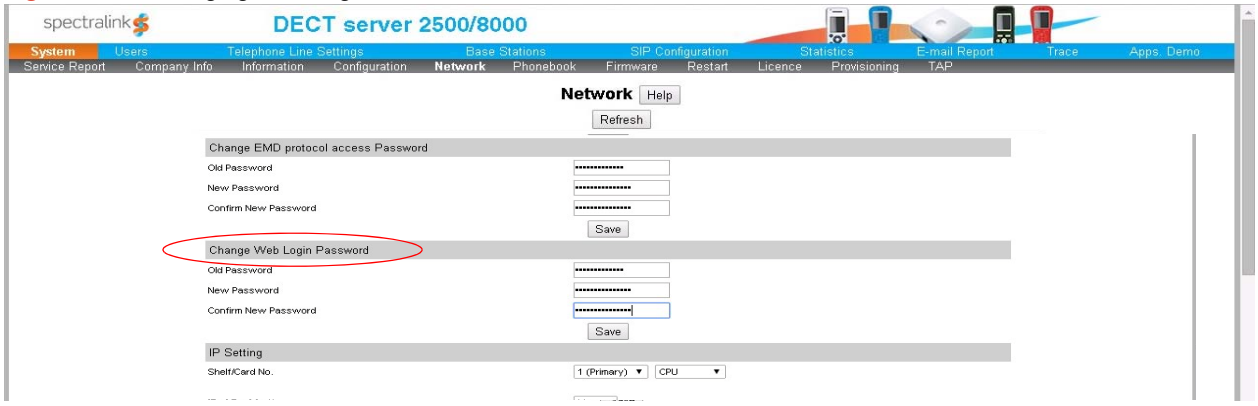
Changing Web Login Password

By default, the password to access the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 is ‘**admin**’. If you change the password, save it somewhere safe. If you forget your password, please contact Spectralink.

To Change Web Login Password

1 On the **System** menu, click **Network**.

Figure 15 *Changing Web Login Password*



2 Under **Web Login Password**, type the current password in the **Old Password** field.

3 Type the new password in the **New Password** field, and then re-type it in the **Confirm New Password** field.

4 Click **Save** to modify the password, and then click **Close**.

Setting the IP Address

Note

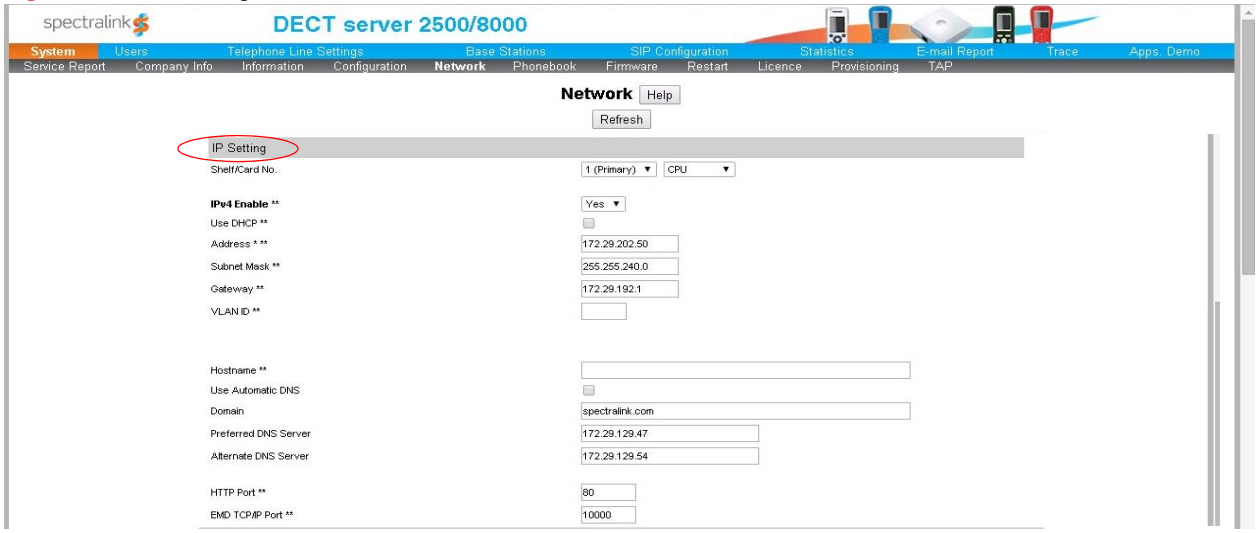
You may have to wait up to 12 seconds before you can read successfully a changed IP address back.

You can set the IP address of a shelf or a special extension card which needs this kind of settings.

To Set the Shelf or Card IP Address

1 On the **System** menu, click **Network**.

Figure 16 *IP Settings & Status*



2 On the **IP Settings & Status** section, select the **Shelf No.** and **Card No.** to read the IP address.

Valid shelf numbers are Primary and 2(Secondary). Valid card numbers are CPU and MR card 7 for Primary and CPU for Secondary.

Click **Refresh**, to read the IP configuration from the system. On the **IP Address** and **Sunbet Mask** fields, you can check the ethernet connection status and current configuration.

3 Select or deselect **Use DHCP** check-box.

If the option is deselected you need to type the **Gateway** information.

4 Select or deselect **Use Automatic DNS** check-box.

If the option is deselected you need to type the **Domain**, the **Preferred DNS Server** and the **Alternate DNS Server**.

5 Click **Save** to write the IP configuration to the system.

Note

If any MR32 cards exist in Spectralink DECT Server 8000 (or Spectralink DECT Server 2500) then all MR32 cards and the CPU card on Master (top) shelf must be connected to the LAN, otherwise you cannot configure the MR32 cards, nor make SIP calls.

Corporate Phonebook Configuration

On the **Phonebook** tab you can disable phonebook, import CSV file containing user phonebook or you can set up a corporate phonebook through LDAP server.

Note

Click the **Refresh** button to read the settings from the system.

Disabling Phonebook

To Disable or Enable Phonebook

1 On the **System** menu, click **Phonebook**.

2 Select or deselect the **Disabled** radio box.

3 Click **Save** to write the setting to the system.

-or-

4 Click **Refresh** to read the setting from the system.

Importing Phonebook Data from CSV File

You can import the data for the phonebook from a CSV file if you do not have access to a LDAP server. The format is as follows:

```
"Label1","Label2","Label3","Label4","Label5"
"Field1",”Field2”,"Field3","Field4","Field5"
"Field1",”Field2”,"Field3","Field4","Field5"
```

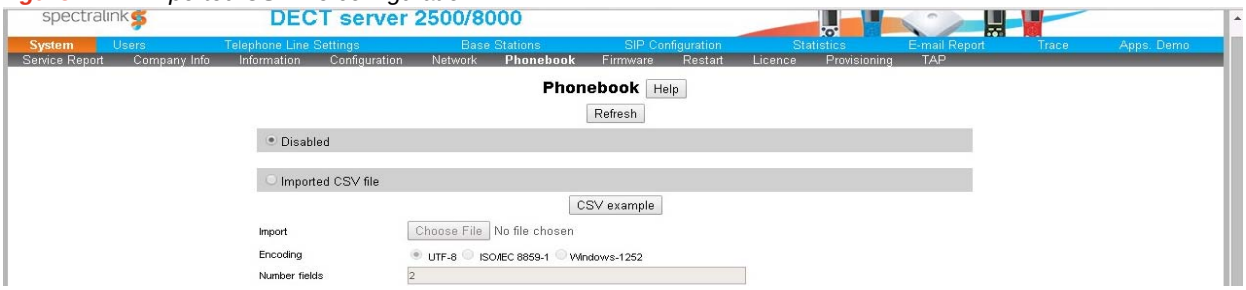
The labels are column names displayed in the handset and fields are the actual data for the records. See the example below:

```
"Name","Phone","Mobile","Department","Title"
"Peter Petersen",1000,20123456,"Sales","Manager"
"Niels Nielsen",1001,20123457,"R&D","Developer"
```

To Import the CSV File Phonebook

1 On the **System** menu, click **Phonebook**.

Figure 17 *Imported CSV file configuration*



2 Tick the **Imported CSV file** radio box.

3 Click the **Browse** button to load the CSV file to import.

4 Select the correct **Encoding** for the CSV file. The encoding depends on the software that was used to generate the CSV file.

e.g. For Microsoft Windows, you will probably select Windows-1252.

5 In the **Number fields**, enter the indexes of the columns containing dialable numbers. The first column is 1, e.g. 2, 3.

6 Click **Save** to import the CSV files to the system.

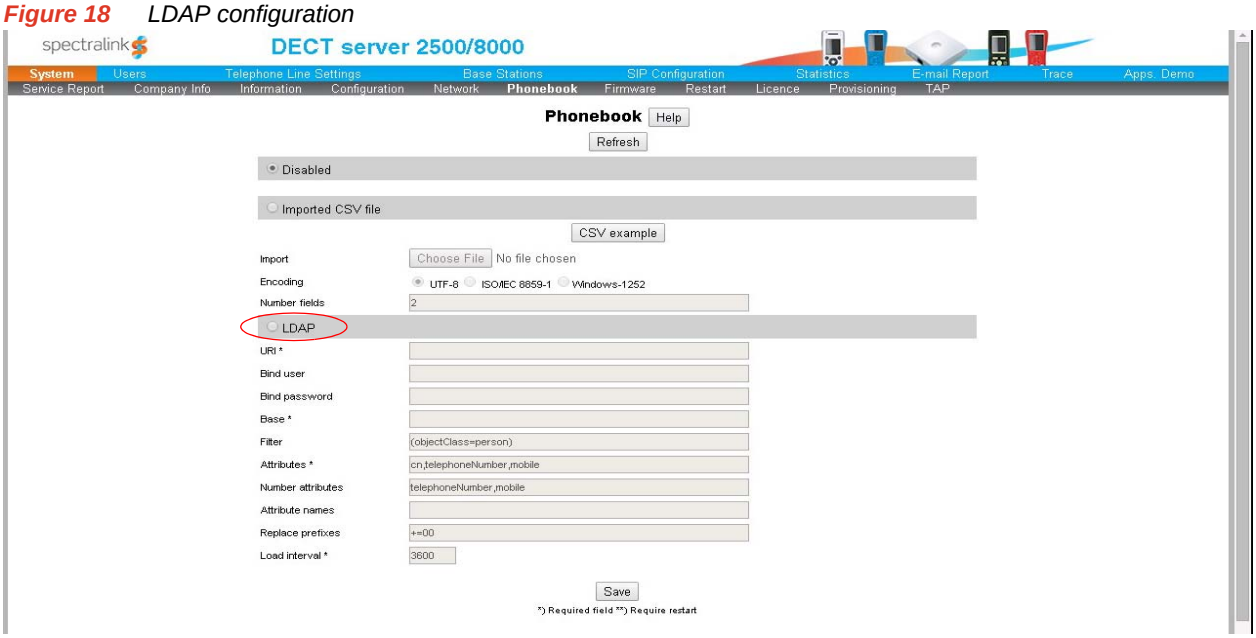
Retrieving Phonebook Data via LDAP

To Configure LDAP:

Fields marked with * are mandatory.

1 On the **System** menu, click **Phonebook**.

Figure 18 *LDAP configuration*



2 Tick the **LDAP** radio box.

3 In the **URI*** field, type the URI of the LDAP server, e.g. ldap://example.com

4 In the **Bind user** field, type the username used for authentication against LDAP.

Note

It might be necessary to specify the path for username (DOMAIN\username), e.g. CN=Manager,DC=example,DC=com.

1 In the **Bind password** field, type the bind user password

2 In the **Base*** field, type the base path where the users are located in the LDAP structure, e.g. DC=example,DC=com

3 In the **Filter**, type the filter used for the LDAP query. The (objectClass=person) filter can be used successfully in most cases.

4 In the **Attributes*** field, type the LDAP attributes you want to query the LDAP for, separated by a comma, e.g.displayName,telephoneNumber, mobile.

5 In the **Number attributes** field type LDAP attributes that will be used to dial, e.g. telephoneNumber,mobile

6 In the **Attribute names** field, type the attribute names you want to assign to the attributes specified above, separated by a comma, e.g. Name,Phone,Mobile

7 In the **Replace prefixes** field, type the phone number prefixes to replace or strip, separated by a comma.

Note

If the phone number is +45678912345, and the user has the extension 12345, specify “+456789” in the Replace prefixes field.

If the phone number is “+456789123456” and “06789123456” must be dialled, then specify “+45=0”.

8 In the **Load interval*** field, type the interval in seconds in order to query the LDAP server for updates.

9 Click **Save** to write your configuration data to the system.

Note

The phonebook will be inaccessible while retrieving phonebook data from a remote LDAP-serv. The refresh interval (the interval at which the central phonebook data is being copied from the LDAP to the Spectralink DECT Server) should be chosen with care. The combination of a slow LDAP-server/slow LDAP-server connection and a high number of entries in the corporate phonebook (> 10,000) should be configured with a long refresh interval, e.g. once-a-day.

Note

To set up a local ADAM (Active Directory Application Mode) LDAP in order for a Spectralink DECT Server 8000 to connect and retrieve LDAP data from it, click the link below and follow the guide to download ADAM and create a new directory instance:

http://www.codeproject.com/KB/aspnet/ADAM_and_LDAP_ClientNet.aspx

To set up the Spectralink DECT Server 8000 to connect to the LDAP instance (after creating the Superuser or the ServiceAccount), do the following:

1. Browse to your Spectralink DECT Server 8000 web interface.
2. On the Authentication page, enter the **User Name** (**admin**) and the **Password** (**admin**).
3. On the **System** menu, click and then **Phonebook**.
4. Tick the **LDAP** radio button and enter the IP address in the **URI** field of your PC where you have ADAM installed and running.

The following details are used:

Bind user: CN=superuser,CN=People,CN=Sandbox,DC=ITOrg

Bind password: As described in the ADAM Installation Guide, you reset the Superuser password by choosing a different password.

Base: CN=Sandbox,DC=ITOrg

Filter: (objectclass=person)

Attributes: sn,telephoneNumber

Number attributes: telephoneNumber

Attribute names: Name, Phone

Replace prefixes: National prefixes and or local prefixes can be stripped (e.g. +4576,76,+45)

Limitations:

- 40.000 entries maximum

5 attributes maximum

Setting up the Corporate Phonebook in the Handsets

Before you can utilize the search via the Spectralink DECT Server 8000 phonebook, activate the long key press function to support the MSF function.

1. Press the **Menu** button.
2. Press the **Mute** key to select **Set Up**.
3. Scroll to **Advanced** via the left and right soft keys and press the **Mute** button.

4 Scroll to **Long Key** via left and right soft keys and press the **Mute** button.

5 Press the **Mute** button to select Send MSF.

Spectralink 7000 Series

To access the corporate phonebook via a handset from the Spectralink 7000 Series, please enable the long key MSF Function:

1 Press the Menu button

2 Select **Settings**

3 Select **Advanced**

4 Select **Long Key**

5 Select **MSF**

Once the long key press function is active, you can use the corporate phonebook in one of the following ways

Spectralink 7000 Series

- Press long **0** and toggle between the search attributes that have been added in the corporate phonebook settings.
- Search by using the keypad buttons from 0 to 9 to enter text. Press each key once for every character.
- Press # to delete a character.
- Use the left and right soft keys to navigate and press the **Mute** button to select your choic.e
- Press long 1 to 5 keys to skip the initial menu and go directly to search.
- Press the hook key to dial a number.

Update Firmware

When a new release or updates to the firmware are available, go to the **Update Firmware** page to download the new firmware.

Updating IP-DECT and Digital Base Station Firmware

There are two ways to update the firmware: flash updating by means of embedded SW and uploading an external file.

To Update Base Station Firmware

1 On the **System** menu, click **Update Firmware**.

Figure 19 *Update Base Station Firmware*

2 Select the **Update Base Station Firmware** radio box.

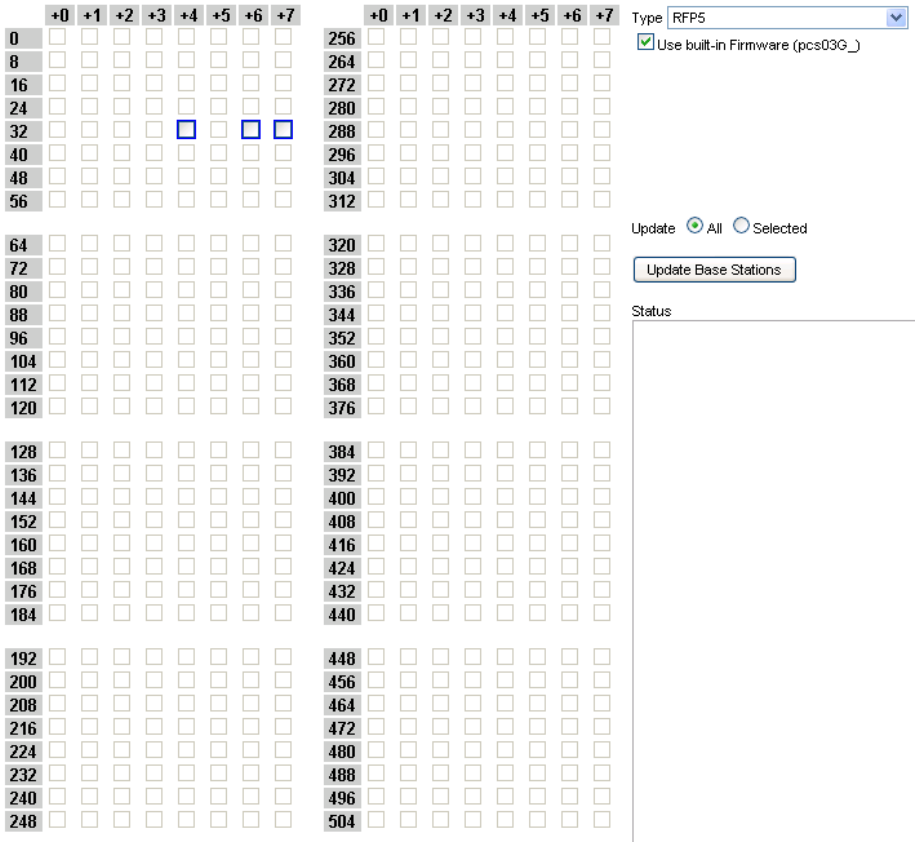
3 Click the **Load Base Station Firmware** button. A new window is displayed, showing a matrix containing all possible RFPs' locations.

4 Select from the **Type** combo the type of RFP (RFP5 or RFP4 (Infineon) from SW PCS09_). The checkbox(es) in the matrix corresponding to the RFP available will be enabled.

RFP Firmware Update Using Built-in Firmware

1 Make sure the **Use built-in Firmware** checkbox is selected. In this case, RFPs will use an embedded code from the Spectralink DECT Server software.

Figure 20 *RFP Firmware update matrix (by means of embedded SW)*



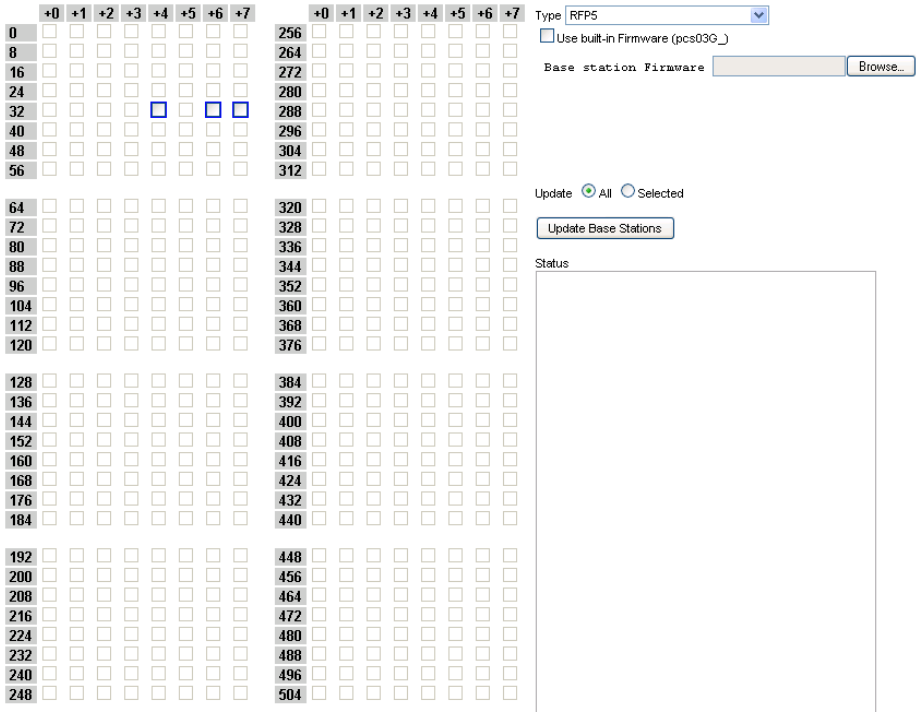
2 From the **Update** radio boxes select either **All** (if you want to update all RFPs at once) or **Selected** (in this case you need to select in the RFP matrix the RFPs which need to be updated).

3 Click the **Update Base Stations** button and the update process will begin. You can check the operation progress in application bottom bar. An alert window will inform whether the updating was successfully performed or an error occurred. The status of the operation will be written in the **Status** textbox.

RFP Flash Update Using an External File

1 Uncheck the **Use built-in Firmware** (e.g. pcs03G_) checkbox. Click the **Browse...** button to select the **Base station Firmware** file.

Figure 21 *RFP Flash update (by means of external file)*



2 From the **Update** radio boxes, select either **All** (if you want to update all RFPs at once) or **Selected** (in this case you need to select in the RFP matrix the RFPs which need to be updated).

3 Click the **Update Base Stations** button and the update process will begin. You can check the operation progress in application bottom bar. An alert window will inform whether the updating was successfully performed or an error occured. The status of the operation will be written in the **Status** textbox.

Updating Server Firmware

When a new release or updates of the Server firmware are available, you can download the new firmware.

To Update Server Firmware

1 On the **System** menu, click **Update Firmware**.

2 Select the **Update Server Firmware** radio box.

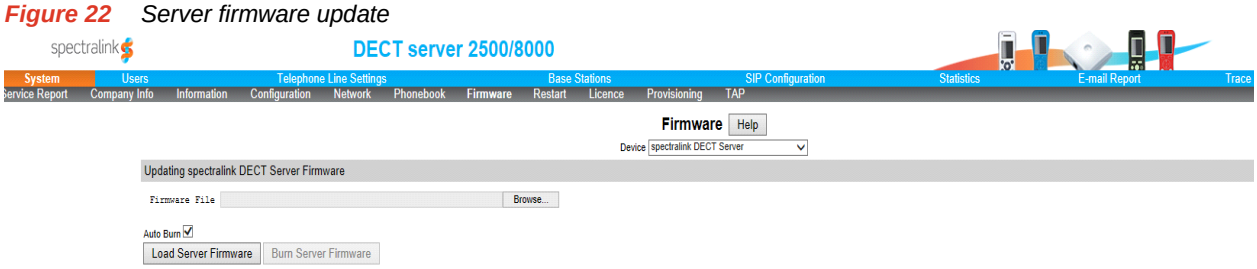
3 **a.** Click **Browse...**to load the firmware file, select **Auto Burn** check-box and click **Load Server Firmware**; the flash file starts loading and when it iscompletely loaded it will turn into Spectralink DECT Server, automatically.

-OR-

b. 1. Click **Browse...**to load the firmware file; if **Auto Burn** check-box is not selected, then click the **Load Server Firmware** button**;** the firmware file starts loading.

2. When loading has completed, click the **Burn Server Firmware** button in order to flash the firmware.

Figure 22 *Server firmware update*



System Restart

Some configuration changes require a restart in order to take effect. A reset restarts the Spectralink DECT Server 8000 software.
You must restart the system after the following procedures:

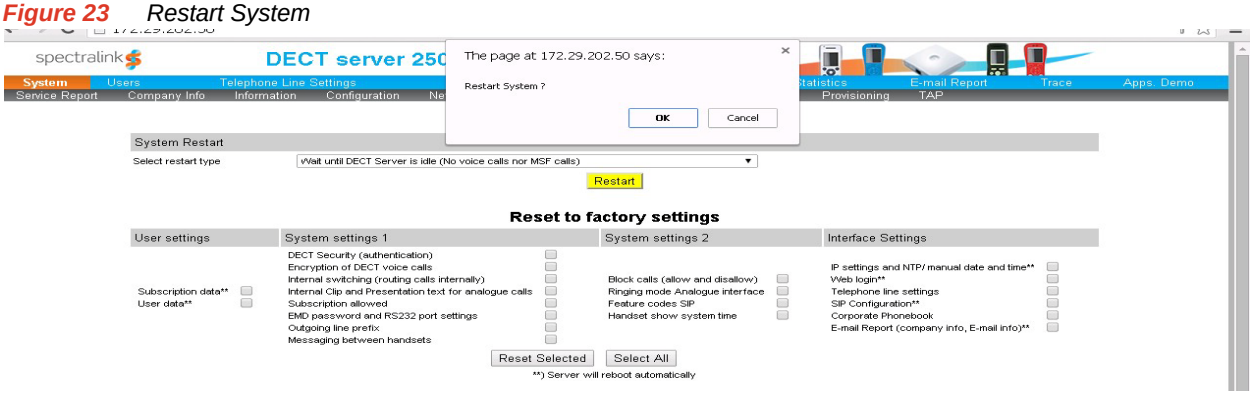
- configuring
- uploading configuration data
- uploading firmware

To Restart the System

1 On the **System** menu, click **Restart**.

2 From the **Select restart type** drop-down list, select the desired option and then click **Restart**. A new window asking if you want to restart the system is displayed.

Figure 23 *Restart System*



3 Click **OK** to restart the system.

-or-

4 Click **Cancel** if you don't want to restart the system.

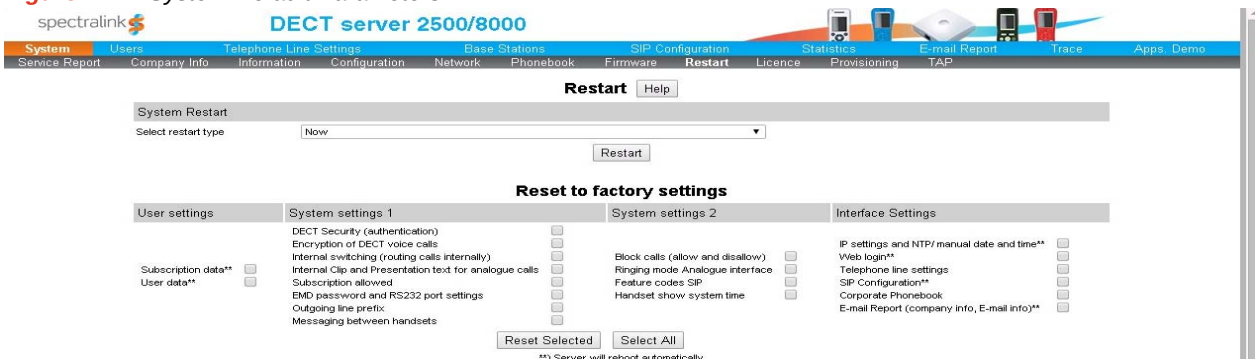
System Default

You can erase different settings in the system and set them to default values.

To Set the Parameters to Their Default Value

1 On the **System** menu, click **Restart**.

Figure 24 *System Default Parameters*



2 In the **Reset to factory settings** pane, select the check boxes corresponding to the parameters you want to set to their default values and then click **Reset Selected** to write the changes to the system. If you want to set all the parameters to their default value, first click the **Select All** button and then click **Reset Selected**. Your operation status is displayed.

The list with all the parameters and their default value is the following:

Table 1 *System default values*

System Default	Parameter	Default Value
User Settings	Subscription data	Remove subscription
	User data	Remove users
System Settings	DECT Security (authentication)	0X07
	Encryption of DECT voice calls	Disabled
	Internal switching (routing calls internally)	Disabled
	Internal Clip and Presentation text for analogue calls	Enabled
	Subscription allowed	Wildcard
	EMD password	No password
	Outgoing line prefix	No prefix
	Messaging between handsets	Disabled
	Block calls (allow and disallow)	Call allowed
	Ringing mode Analogue interface	Follow exchange (500 ms)
	Feature codes SIP	Standard
	Handset show system time	Enabled
Interface Settings	IP settings and NTP/manual date and time**	192.168.0.1, static **
	Web login	User name: Admin Password: admin
	Analogue settings	Default
	SIP Configuration**	No default domain **
	Corporate Phonebook	Disabled
	E-mail Report (company info, E-mail info)**	Disabled **

Backup and Restore

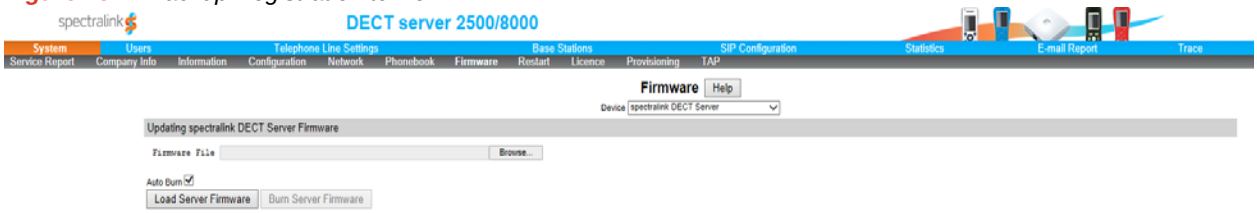
Note

Do not make backup with one PCS edition of Spectralink DECT Server and restore with an older edition of PCS.

To Backup Registrations to File

1 On the **Users** menu, click **Backup/Restore**.

Figure 25 *Backup Registration to file*



2 Click the **Backup** button. The **Opening kws8000users.udb** dialog box is displayed.

3 Click the **Save file** radio box and then click **OK**. Now your registered users are backed to a file.

To Restore Registration from File

1 On the **Users** menu, click **Backup/Restore**.

2 Click **Browse...** to select a User backup file.

3 Click **Restore.** The following message is displayed: ‘System will automatically restart after restoring registrations. do you want to continue?’

4 Click **OK** to start the restoring.

-or-

5 Click **Cancel** if you don’t want to restore registrations.

Chapter 5: Handset Registration and Subscription

This section provides you with information about handset registration and subscription. You must register and subscribe a handset before you can use it.

When registering handsets, you enter information about the handset settings (such as: the handset serial number, name, directory number etc.) in the system database. When subscribing handsets you subscribe a registered handset to the system for usage. If the handset is not registered in the system database, subscription of the handset is not possible.

Registering Handsets through the Web Interface

When a connection has been established between the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 and the system, the Spectralink DECT Server 8000 and Spectralink DECT Server 2500 WEB interface displays all the information for registering handsets. Subscription data is read and shown on the **Users** tab.

Figure 1 *Users tab*

User Registration

To View User Information

a On the **Users** menu, under **List Users** tab, click the **Refresh** button. You can now view information about all the registered users.

Table 1 *Registration Information*

Property	Description
PPID	Portable Part Identification number (Internal ID in the DECT system)
IPEI	Lists the serial number of a handset
Local Number (DN, extension)	Lists the local number of a handset
Name	Name of the handset as it appears in the database.
Standby Text	Text that is displayed when the handset is on hook.
Presentation Text	Optional text that is send to caller.
CFU Number	Call Forward Unconditional
SIP Username	Local Number (DN)
Domain	Only for SIP Users - SIP domain other than the SIP domain in the SIP Configuration.
SIP Auth Username	Authentication Username
SIP Auth Password	Authentication
Service Status	Status of Enable Calls, Disable Calls or Block Outgoing Calls settings. Available in the next generation of the Spectralink DECT Server 8000 and Spectralink DECT Server 2500 software.
PBX Connection	Shows whether a user is registered or not to a PBX Connection
SIP Status	SIP registration status
Access Code	Lists the subscription password (if any)
Line Type	Specifies whether the line is analogue, DECT-to-DECT (for Spectralink messaging portables) or SIP.
Connector	Specifies the connector from A-D.
Pair	Specifies the wire pair from 1-4.
Card Number	Identifies the number of the card to which the handset is registered. (1-8)
Shelf Number	Identifies the shelf to which the handset is connected.(1-8)

Table 1 *Registration Information*

Property	Description
Part Number	Part number that identifies the handset software.
HW PCS	Product change status of the handset software.
Tx Gain (dB)	The transmitter gain in dB.
Rx Gain (dB)	The receiver gain in dB.

Note

On the **List Users** tab, at the top of the page, on the left side you can view the **ARI** number.

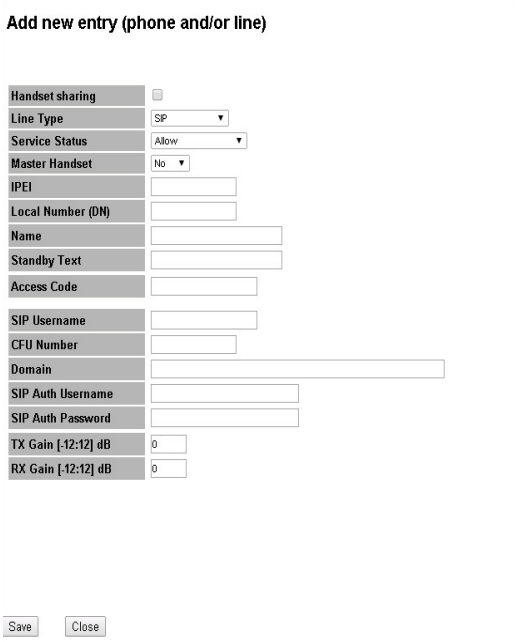
To Register New Analogue Line Type Users

Note

When there are no users in the database it is not possible to create a new user.

1 On the **Users** tab, click the analogue tab to **Create new registration** button. The **Create new user** dialog appears.

Figure 2 *Add new Analogue User*



2 In the **IPEI** field, type the IPEI number (serial number) of the handset. The serial number consist of a five-digit handset type (manufacturer code) and a seven-digit handset number.

   a On Spectralink 7420, Spectralink 7440, and Spectralink 7480 , press *99984*, and then press the Mute key to read the IPEI number. The IPEI number is the one displayed on the second line. Alternatively, look at the label for the serial number.

   b On Spectralink 7520, Spectralink 7540, Spectralink 7620, Spectralink 7640, Spectralink 7710, Spectralink 7720, Spectralink 7740 press Menu, select Status and then select Firmware version to display the IPEI number.

   c Alternatively, you can go to the Debug menu and set the trace level to 1, and then try to subscribe the handset. The subscription will fail, but the handset IPEI will be displayed in the Trace window.

3 In the **Local Number** (**DN**) field, type the direct number of the handset. The number must match the number of the attached PBX line. Typing a direct number makes it possible to send an MSF to the handset.

4 In the **Name** field, type the name of the handset as it appears in the database. This field is optional.

5 In the **Standby Tex**t field, type the text that is displayed when the handset is on hook.

6 In the **Presentation Text** field type the text to be sent to the caller, in case internal generated CLIP is enabled and the PBX does NOT send CLIP on analogue lines. It is also sent to a DECT-to-DECT phone, but not to a SIP user.

7 From the **Service Status** list select **Allow** in order to activate the user services. In case you want to disable the service status, select **Disable**.

8 In the **Access Code** field, type the authentication code (AC). This field is optional.

9 From the **Line Type** list, select **Analogue**.

10 From the **Connector** drop-down list, select the connector (A-D) to which the handset is connected.

11 In the **Pair** list, enter the wire pair (1-4) to which the handset is connected.

12 In the **Card Number** list, enter the card number to which the handset is connected.

13 In the **Shelf Number** list enter the shelf number to which the handset is connected.

14 In the **TX Gain [-12:12] dB** field, type a value between -12:12.

15 In the **RX Gain [-12:12] dB** field, type a value between -12:12.

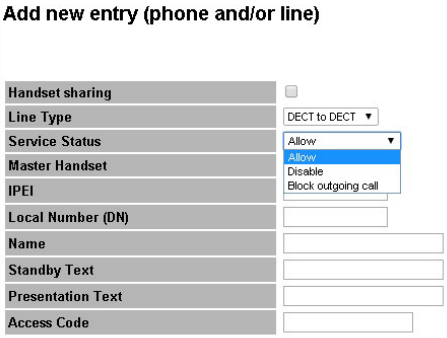
16 Click **Save** to save the registration.

17 You can continue with new registrations, or click **Close** to close the window.

To Register New DECT to DECT Line Type Users

18 Repeat steps 1 to 8 from “"""To Register New Analogue Line Type Users"" section.

Figure 3 *Add new DECT to DECT user*



19 From the **Line Type** drop-down list, select **DECT to DECT**.

20 Repeat steps 14 to 17 from “”””” section.

Note

Only handsets that are developed and manufactured by Spectralink Europe ApS, support Spectralink messaging and can be used as DECT to DECT handsets. Other handsets can not be used as DECT to DECT handsets because they do not support the Messaging protocol.

To Register New SIP Line Type Users

1 Repeat steps 1 to 6 from “”””To Register New Analogue Line Type Users”” section.

2 In the **SIP Username** field, type the local number.

3 In the **CFU Number** field, type the number of the handset you want your calls to be redirected to.

4 In the **SIP Auth Username** field, type the authentication username, if required.

5 In the **SIP Auth Password** filed, type the authentication password, if required.

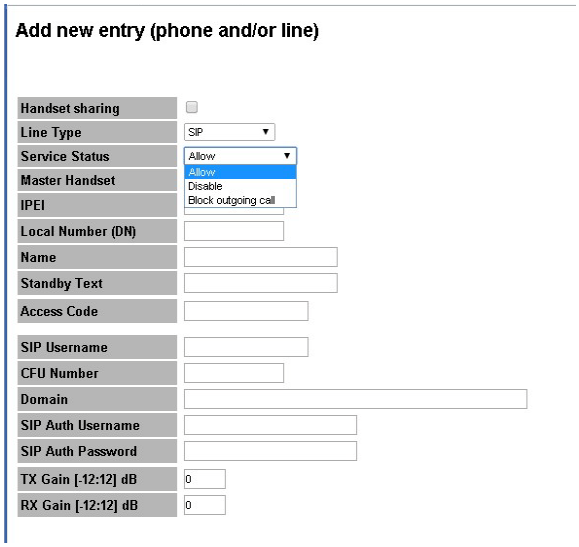
6 From the **Service Status** list select **Allow** in order to activate the user services. In case you want to disable the service status, select **Disable**.

7 In the **Access Code** field, type the authentication code (AC). This field is optional.

8 From the **Line Type** list, select **SIP**.

9 Repeat steps **14** to **17** from “”””””To Register New Analogue Line Type Users””section.

Figure 4 *Add new SIP user*



To Delete a User

1 Click the user you want to delete. The user page information is displayed.

2 Click **Delete** to remove the user.

Changing a Registration

To change a user registration, you follow the same procedure as described in "To Register New SIP Line Type Users" section. However, when you change a registration, the GainTx and GainRx fields are also available. We recommend that you only make changes to GainRx.

Chapter 6: System Management

This section describes how to work with the Spectralink DECT Server 8000 and Spectralink DECT Server 2500 WEB page.

The Spectralink DECT Server 8000 and Spectralink DECT Server 2500 WEB page enables you to manage text messages, status information, user registration, and base station information. Furthermore, you use the WEB page to maintain the system and keep track of system statistics. This information is detailed in the following sections:

- 'Analogue Settings'
- 'Base Station Settings'
- 'SIP Configuration'
- 'MSF Messages (Message Service Function)'

Analogue Settings

On the **Telephone Line** menu, you can find information about the system configuration of the Spectralink DECT Server 8000 or Spectralink DECT Server 2500.

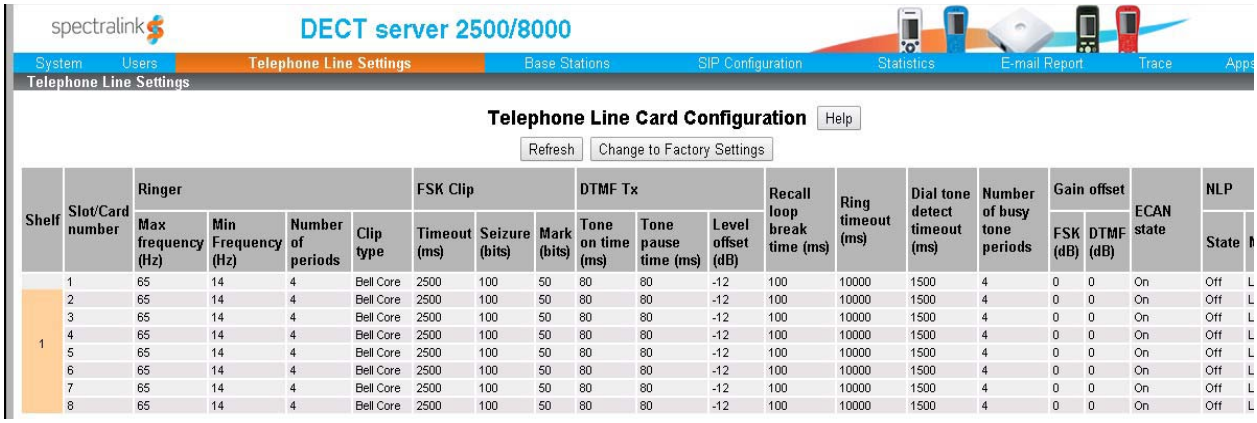
System Configuration

Note

Click the **Refresh** button to read the settings from the system.

The following figure provides an example of the information that is displayed on the System Configuration section.

Figure 1 *System Configuration (for a Spectralink DECT Server 8000 system)*



Shelf	Slot/Card number	Ringer				FSK Clip			DTMF Tx			Recall loop break time (ms)	Ring timeout (ms)	Dial tone detect timeout (ms)	Number of busy tone periods	Gain offset		ECAN state	NLP	
		Max frequency (Hz)	Min Frequency (Hz)	Number of periods	Clip type	Timeout (ms)	Seizure (bits)	Mark (bits)	Tone on time (ms)	Tone pause time (ms)	Level offset (dB)					FSK (dB)	DTMF (dB)		State	
1	1	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L
	2	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L
	3	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L
	4	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L
	5	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L
	6	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L
	7	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L
	8	65	14	4	Bell Core	2500	100	50	80	80	-12	100	10000	1500	4	0	0	On	Off	L

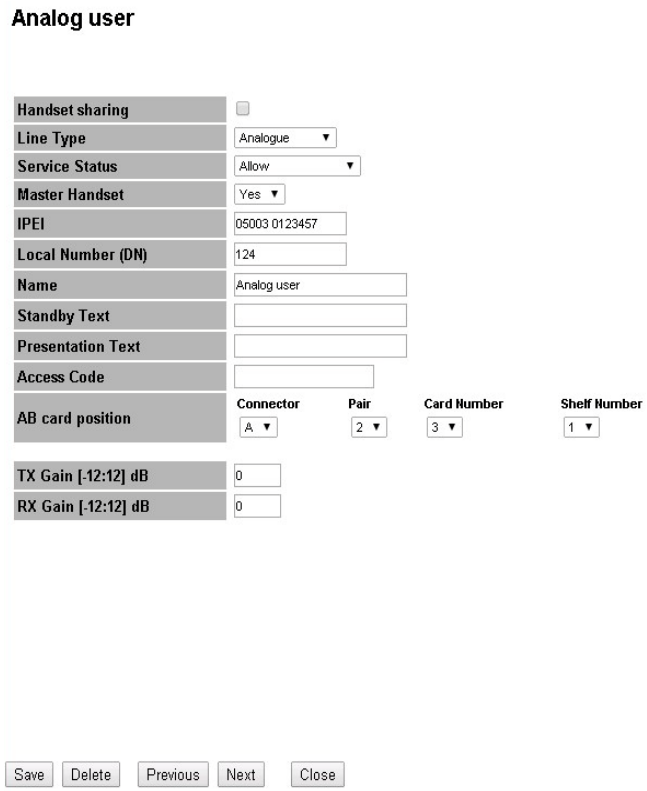
You can also change the parameter settings for each slot on each shelf.

To Change System Configurations

1 On the **Users** menu, click **Analogue** tab.

2 On the **Analogue** tab, left-click any cell in a row that contains information about the slot settings you want to change. The **Analogue Settings** window appears. In the title bar, you can see which shelf number and slot number you have selected.

Figure 2 *List Analogue Settings dialog*



3 Make the desired changes and click **Save**. The following message is displayed: ‘Analogue card settings updated successfully’. Click **OK** to close.

4 Click **Use all settings on all cards** if you want to apply the settings for all the cards.

For each slot in a shelf the following information is displayed.

Table 7-1 Analogue Settings

Parameter	Details	Description
Ringer	Maximum frequency	Lists the maximum ringer frequency
	Minimum frequency	Lists the minimum ringer frequency
	Number of periods	Specifies the number periods
	Clip type	Displays the caller ID standard that is used.
FSK Clip	Timeout	Specifies how long the caller ID is displayed on the handset.
	Seizure (bits)	Specifies the number of alternating bits used for channel signaling.
	Mark (bits)	Specifies the number of alternating bits used for synchronization.
DTMF Tx	Tone on time (ms)	Specifies the length of the dual tone (DTMF) for dialled digit.
	Tone pause time (ms)	Specifies the pause between two digits.
	Level offset (dB)	Increase/decrease the default level of the DTMF tones.
Recall Loop Break Time		The register recall time in milliseconds. (R)
Ring	Timeout	If an incoming call is terminated before it is answered, then the Spectralink DECT Server needs to see that the call is terminated by the far end. This value specifies for how long after the last ring voltage, the Spectralink DECT Server will register that the incoming call does no longer exist.

Table 7-1 Analogue Settings

Parameter	Details	Description
Dial Tone Detect	Timeout	Specifies the number of seconds to wait for a dial tone before sending digits regardless of whether there's a dial tone.
Number of Busy Tone Periods	Periods	The number of busy tone periods.
Gain	FSK(dB)	FSK signal gain
	DTMF(dB)	DTMF signal
ECAN State	(On/Off)	Specifies whether echo cancellation is enabled or disabled.
NLP	State (On/Off)	Specifies whether the non-linear processor is enabled or disabled.
	Mode: • Limits the signal when it is active • Reserved • Sends sign noise when it is active • Sends white noise when it is active	Determines type of comfort noise that is used.
CPT (Call Progress Tone)	Busy low frequency	The minimum frequency of the range within which CPT is detected.
	Busy high frequency	The maximum frequency of the range within which CPT is detected.
	Busy tone on time (ms)	Specifies the length of time the tone is heard.
	Busy tone pause time (ms)	Specifies the length of time between audible tones.
	Dial low frequency (Hz)	The minimum frequency of the dial tone range.
	Dial high frequency (Hz)	The maximum frequency of the dial tone range.

Table 7-1 Analogue Settings

Parameter	Details	Description
	Dial tone on time (ms)	Specifies the length of time the tone is heard.
	Dial tone pause time (ms)	Specifies the length of time between audible tones
	Detect tolerance (ms)	Specifies detect tolerance for both busy tone pause and dial tone pause.
IWU Gain	Tx(dB)	The transmitter gain in dB.
	Rx (dB)	The receiver gain in dB.

Base Station Settings

On the **Base Stations** menu you find information about the settings of each base station in the system.

Figure 3 List Base Stations tab

To Read Base Station Settings

- To populate the table with system information, click the **List Base Station** tab.

The following information is displayed.

Table 7-2 Base Station Settings

Parameter	Description
RFP	Radio Fixed Part number 0-511
PCS	The base station software version
Part Number	Part number that identifies the base station software.
Region	The region that determines the base station settings.

Table 7-2 Base Station Settings

Parameter	Description
Time slot in air	There are 12 air time slots in each direction (numbered 0-11). If set to “Even”, the base station uses an even time slot (0,2,4,6,8,10). If set to “Odd” then the base station will use an odd time slot (1,3,5,7,9,11). If set to “Follow RPN”, the base station will use even time slots if it has an even RPN; if it has an odd RPN then the base station will use odd time slots.
RPN in Air	Radio Part Number in Air. The number the base station sends. (0-255)
Cable Delay	The time it takes the signal to reach the base station.
Shelf	The number of the shelf to which the base station is connected. (1-8)
Card No.	Specifies the card number. (1-8)

To Change Base Station Region

1 On the **List Base Station** tab, go to the RFP whose region you want to change, and then select from the **Region** drop-down list the preferred region.

   a Europe

   b USA

Note

You should only change to a region with a frequency range that is legal for use in your area.

2 Click the **Update RFP** button ,to write the changes to the system.

To Change Base Station Slot

3 On the **List Base Station** tab, go to the RFP whose slot you want to change, and then select from the **Time Slot in Air** drop-down list, one of the following options:

   a Even

   b Odd

   c Follow RFP

4 Click the **Update RFP** button , to write the changes to the system.

To Change Region/Slot on All Base Stations (RFPs)

5 On the **List Base Station** tab, go to the row that contains the base station (RFP) whose slot or region you have changed and click **Change all to this RFP's time slot and regio**n button  .

To Reset a Base Station

6 On the **List Base Station** tab, go to the row that contains the base station (RFP) that you want to reset and click the **Reset RFP** button  .

Spectralink IP-DECT Base Station Description

Spectralink IP-DECT Base Station Provides DECT Coverage to Spectralink Handsets

The base station is a compact device that contains RF circuitry and transmit/receive antennas. The main function of the base station is to provide audio and data communication between the handsets and the Spectralink IP-DECT Server 2500/8000. The IP-DECT base station supports 11 RF channels for speech channels.

Note

The IP-DECT base station is also termed by some manufacturers as the RFP (Radio Fixed Part)

DECT coverage is provided according to the band standard at the site:

- Base station - DECT provides 11 RF channels of 1.8 GHz, DECT standard, used in Europe, Australia and South America.
- Base station - USA DECT provides 11 RF channels of the 1.9 GHz, USA DECT standard, used in North America.

Spectralink IP-DECT Base Station Types and Part Numbers

The IP-DECT base station contain RF circuitry that comply with the local band standards: UPCS, DECT, or ETSI DECT. The following table includes a list of available base stations and their part numbers.

Table 7-3 Spectralink Base Station Part Numbers

Variants of Spectralink Base Stations	Part Number
Spectralink IP-DECT Base Station, 1G8 version (conforms with standard DECT markets)	02337400
Spectralink IP-DECT Base Station,1G9 version (for North America)	02337401

Spectralink IP-DECT Base Station Appearance and Components

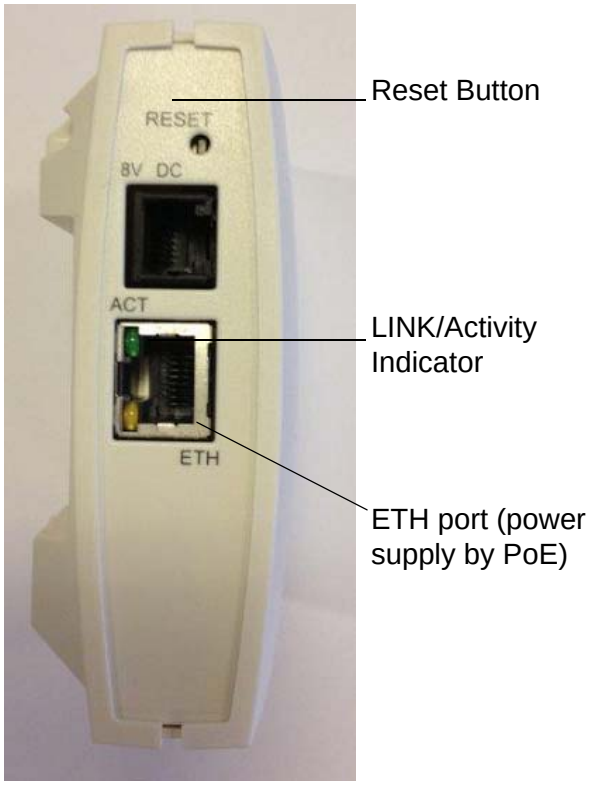
The IP-DECT base station front cover includes the following:

- LED that indicates the operating status of the unit

Figure 4 *IP-DECT Base Station - Front view*

The base station front includes the following (see figure below).

Figure 5 *IP-DECT Base Station - Front*



Spectralink IP-DECT Base Station LED Indicators

Front Cover

The base station front cover has one indicator describing the base station faults and failures. The indicator is off when the base station is not powered. The LED flashes when the base station initializes. The indicator is on when the base station is operating.

Table 7-4 LED Indicator Description - Front Cover

LED Indicator	Meaning
Steady green	OK and idle
Slow green flashing	OK and active voice call
Fast green flashing	No sync over air possible, or sync master is not available.
Slow red flashing	Missing media resource or base station (if it is a media resource: missing connection to Spectralink IP-DECT Server 6500)
Fast red flashing	Error
Steady red	Reset/shutdown in progress
Steady red for 5 seconds followed by fast red flashing	Reset to factory settings

LAN Port on Face Plate

Table 7-5 LED Indicator Description - LAN port

LED Indicator	Meaning
LINK Indicator - yellow	Link layer software has established connection
LINK Indicator - green flashing	Activity

Spectralink IP-DECT Base Station - Reset Button

It is possible to restart or reset the base station by pressing the Reset button on the bottom of face plate of the base station.

Resetting the Spectralink IP-DECT Base Station Hardware

The following table contains a description of the different actions that take place when pressing the Reset button.

Table 7-6 Reset Button Description

Press button	Action
Short press (2 to 5 sec.)	System restarts when button is released.
Long press (5 to 9 sec.) until front LED flashes red, then release button	Resets the system to factory default settings (original IP settings (DHCP) and empty user data base) and restarts the system. Firmware version is not affected.

Installing the Spectralink Base Station

The base station is suitable for mounting indoors on a wall.

How do I install an 8 Channel Base Station?

The eight channel digital base station uses four wires instead of two to obtain full call capacity. If only two wires are connected, it will serve as a four channel digital base station. The eight channel digital base station will occupy two slots out of eight available slots on the base station interface card (BIF8)

For wiring of eight channel Base Stations see help text on Base Station page in DECT Server 8000/2500 WEB GUI.

Note

The new eight channel digital base station can with advantage be used in areas where there is a lot of traffic and a 4 Channel Base Station doesn´t fulfill the capacity needed.

Note

Before you begin the installation, determine the position of the base station for best coverage. The coverage depends on the construction of the building, architecture, and the choice of building materials.

The base station can be mounted up-side down on walls.

Note

Please refer to Installations guide for DECT Server 8000 for wiring instructions. These can be found in Appendix B: Cable Connections.

The base stations are designed to only be mounted on the wall at least 2,40 m (8ft) off the ground but no higher than 6 m (20ft). The connectors can be pointed either up or down. The base stations should not be flush mounted to the ceiling as it would affect signal propagation. If ceiling mounting is a requirement, the base stations could be drop mounted from the ceiling in the same orientation (i.e., vertical) and height (no higher than 6 m (20ft) from ground as described for wall mounting. If mounting base stations higher than 6 m (20ft) off the ground, coverage directly underneath the base station will be impacted.

Caution

Do not mount the base station on soft surfaced walls such as those covered with canvas, metal or sponge-like materials.

1 Mount the base station on the wall using the anchors and screws accompanying the product.

Note

When you place the base station on the screws, ensure that the screws do not touch the printed circuit board..

Figure 6 *Base Station Wall Mounting*

1 Connect the RJ45 plug to the ethernet connector at the bottom of the base station.

Figure 7 *Base Station - Ethernet Connector*

Recording the Installation Information

After completing the installation of the base stations, record the location of each base station and add a descriptive text in the Administration Page of the Spectralink IP-DECT Server 2500/8000 under **Administration/Base stations**.

Radio Part Numbers

Base stations and repeaters both transmit a radio part number - an 8 bit number between 0 and 255.

The handset compares the RPN of the base/repeater to which it is currently connected to that of the RPN of the base station/repeater it wants to handover to.

The type of handover to use depends on the units involved in the handover.

Handovers

- Handovers between two base stations must take place as connection handovers.
- Handovers between a repeater and the base station with which the repeater is synchronized should preferably take place as bearer handovers, because this is the fastest process.
- Handovers between a repeater and a base station with which the repeater is not synchronized must take place as connection handovers.

Handover Capabilities

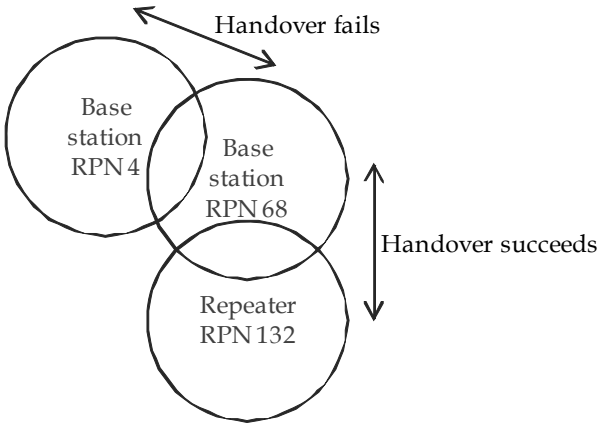
A handset cannot tell the difference between a base station and a repeater. Therefore, the RPN transmission pattern by default determines how the handover takes place. Assigning the recommended repeater RPN is therefore very important.

Spectralink DECT Base Stations transmit a pattern that determines whether to use a connection or a bearer handover.

By default the base stations are configured to perform a bearer handover if there is a difference of 64, 128, or 192 between the two RPNs.

In systems with more than 64 base stations you must be careful when you reuse RPNs. That is, base stations that are mounted in close proximity of each other can not have a difference in RPN of 64, 128, or 192. The handset will not be able to make a connection handover as shown in the below figure:

Figure 8 *RPN and Handovers*



Also, a handset must never be able to detect two radio units (base stations or repeaters) with the same RPN at the same time. The handset will not be able to make a handover. If an RPN is reused, the units must be placed at a fair distance from each other.

Go to ‘Appendix B: Base Station and Repeater Numbering’ section to see a complete list of the recommended repeater and base station numbering in systems with up to 512 base stations.

SIP Configuration

On the **SIP Configuration** menu you define general SIP settings, information about proxies, authentication, signalling, message waiting indication and media.

To Read SIP Configuration

1 On the main menu, click **SIP Configuration**. The **List SIP Configuration** information is listed.

Figure 9 *List SIP Configuration tab*

The following information is displayed:

Table 7-7 SIP Configuration

Parameter	Details	Description
General	Local Port **	Enter the local port number. The default local port number is 5060. **Note:** The local port is the port on which the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 listens for incoming SIP-signalling
	Transport * **	UDP only: To be selected if SIP signalling is sent through UDP, and only simple DNS is used for resolving IP addresses. DNS SRV: To be selected if SIP signalling is sent through UDP, and DNS SRV is used for resolving IP addresses.
	Default Domain **	Enter the name of the domain. If only one SIP server then you should write the IP address or name of the SIP server in this field. If you have more than one SIP server either with load balancing or as backup, then you should write the domain name in this field. **Note:** If no user specific domain is configured, the handsets registered on the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 will use the default domain as the domain part of the SIP URI; e.g. **John Doe <sip:1234@somecompany.com>**
	Register each endpoint on separate port **	If enabled, it specifies that each user should use an individual UDP port for its signaling; if disabled, all users should use the local port defined in the SIP configuration.

Parameter	Details	Description
	Send all messages to current registrar	Specifies how requests outside a dialog are sent if a list of SIP servers is received via DNS SRV. If enabled, it sends each request to the server currently holding the registration; if disabled, it performs a DNS SRV lookup for each request and determines the destination from this.
	Registration Expire (sec) *	Enter the number of seconds before a SIP registration will be renewed. The default value is 3600
	Max Forwards *	It refers to the maximum number of proxys or gateway jumps, maximum number of times the SIP messages can be forwarded. The default value is 70.
	SIP type of service * **	Defines IP type of service used for SIP messages. The default setting is 96.

Parameter	Details	Description
Proxies	**Proxy 1..4 ****	You can define up to 4 SIP proxies. When defining a proxy, please specify the priority, weight and URI of the proxy. If you have more than one SIP server, then the addresses must be written in the Proxy 1..4 fields. If more than one has the same Priority, then the weight is used for load sharing. The sum of weights for SIP server on one Priority level should be 100. SIP server(s) with priority 1 is the main call handler, if that goes out of server then Spectralink DECT Server will register the SIP users on SIP server(s) with priority level of 2. Please note if a server goes down and the Spectralink DECT Server doesn't have outgoing calls, it will not know and incoming calls from the next level of SIP server will not be answered. As soon as the first outgoing call fails, then the Spectralink DECT Server will react to incoming call from the new SIP server on the next priority level. **Note:** The proxy is the SIP URI of the SIP-proxy. The Spectralink DECT Server 8000 and Spectralink DECT Server 2500 will route all outgoing SIP signalling to the proxy, e.g. SIP registrations and outgoing calls.
Authentication	**Default User**	Default user name used for SIP authentication.
	Default Password	Enter password. **Note:** If no handset specific authentication user name/password is configured, handsets registered on the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 will use the default user name/password for authentication.

Parameter	Details	Description
DTMF Signalling	**Send as RTP**	Enable the check box (Real-Time Transport Protocol), if you want the keypad signalling sent as RTP packets with DTMF code. **Note.** Some SIP servers understand both methods, so if you enable both methods for sending DTMF, then ciphers will be sent twice.
	Offered rfc2833 payload type	Payload type for rfc2833 in SDP offers. The default value is 96.
	Send as SIP Info	Enable the check box, if you want the keypad signalling sent as SIP INFO.
	Tone Duration (msec)	Enter the time length of the tone in milliseconds. The default value is 270.
Message waiting indication	**Enable Indication**	Enable the check box, if you want to display MWI in the handset..
	Enable Subscription **	Enable the check box, if you want to subscribe to MWI indications from the SIP proxy.
	Subscription Expire (sec) *	Enter the number of seconds before MWI subscription will be renewed. The default value is 3600.
Media	**Packet Duration (msec) ***	It defines the duration of the RTP media stream packets. Select between **10**, **20** and **40** msec.
	Media Type of Service * **	IP type of service for voice. The default setting is 184.
	Port Range Start * **	Port range start used for RTP. The default value is 58000.

Parameter	Details	Description
	Codec priority *	Define the priorities of codecs. **G726-32/8000**: The standard 32 kbit/second ADPCM used by the DECT standard between PP and RFP. We also use it on the lines between RFP and Spectralink DECT Server and on the back plane between the different interface cards (BIF08, AB08, AB16 & MR32). **PMCA/8000** is G.711 A-law. **PCMU/8000** is G.711 µ-law. **Note**: For international (POTS) calls between a nation using µ-law and a nation using A-law, the international line shall use A-law.
	Require symmetric RTP **	Require that the other party sends RTP from the same UDP port as it will receive RTP.
Call status	**Play on-hold tone**	Enable check box to receive on-hold tone when placed on hold.
	Display status messages	Enable check box to receive status messages in the handset display.
	'#' key ends overlap dialing	Pressing pound key dials number in overlap dialing. **Note:** SIP is an American designed telephony standard, so it needs a complete telephone number before it can start call routing. There are two ways for the SIP interface to assume the number is completed. 1. If no new digit within 4 seconds after the last, then the number is considered completed. This method is hard coded and always enabled. 2. You can also enabled "#" as a completion sign.
	Call waiting	Enable call waiting.

2 Make the desired changes and click **Save** to save your SIP configuration data.

Note

*) - Required field, **) - Restart required for the setting to be applied.

MSF Messages (Message Service Function)

From the **Apps. Demo** tab you can send MSF messages and events to any MSF compatible handset connected to the Spectralink DECT Server 8000 or Spectralink DECT Server 2500. Also, any MSF-compatible handset connected to the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 can send MSF messages and events to the Spectralink DECT Server 8000 or Spectralink DECT Server 2500.

Note

The MSF Demo tabs are only a demo of messaging services that demonstrates the capacity of the messaging API. The API is intended to be used by a third-party application, such as an alarm server.

You can send several types of MSF messages and events:

- **Normal MSF** - A normal MSF message is sent to each individual handset at a time, and a confirmation is sent when the handset has received the message.
- **MSF Format III** - An MSF Format III message can be sent to a handset, a group of handsets or to all handsets at a time, and a confirmation is received.

Note

MSF Format III is only supported on Spectralink 7620, Spectralink 7640, Spectralink 7710, Spectralink.

- **MSF Broadcast -** A broadcast message can be sent to a large number of users at the same time, but there is no confirmation from the individual handsets.
- **PP Hardware Extension -** It is used to configure the sensors of the handset and receive alarms.

Note

PP Hardware Extension is only supported on 7640 and 7740 Handsets.

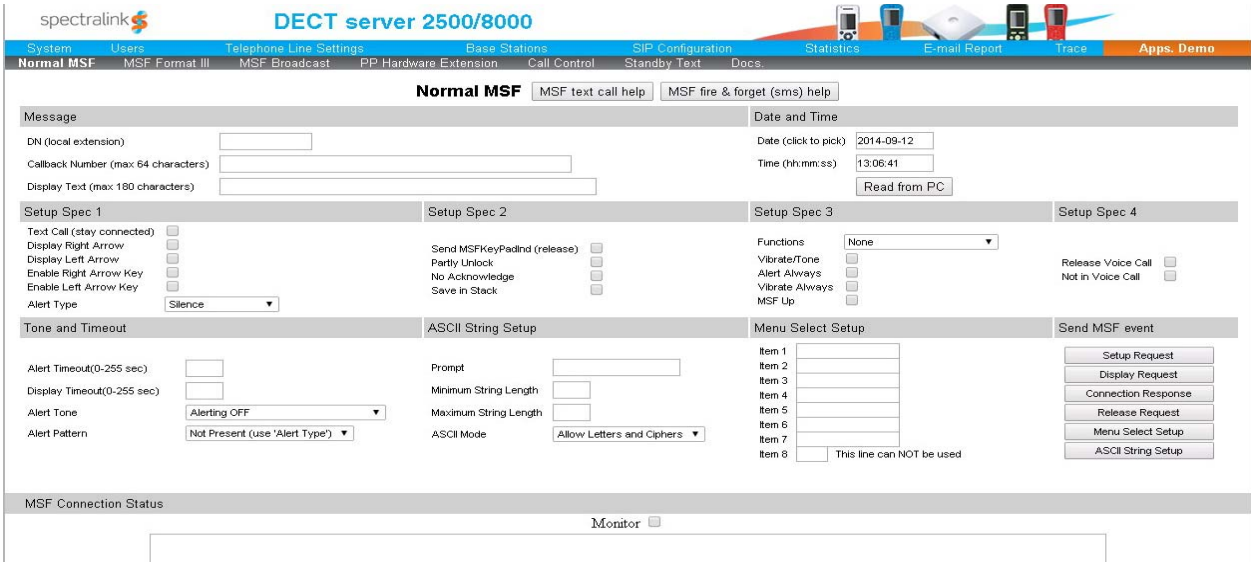
- **Call Control -** It is used for call configurations.
- **Temp Standby Text -** It is used to change the standby text on the handset display.

Normal MSF

To Send Normal MSF Messages to a Handset

1 On the menu window of the WEB page, click the **Apps. Demo** tab and then click **Normal MSF**.

Figure 10 *Normal MSF tab*



2 In the **Message** pane, type the directory number of the receiver handset in the **Direct Number** field, and then type the message you want to send in the **Display Text** field.

3 If you want the receiver to call you back, type a number in the **Callback Number** field.

4 Use the **Setup Spec** panes to define different settings for the receiver handset.

- **Setup Spec 1**: Use these fields to define how the display on the receiver handset behaves when receiving a text message.
- **Setup Spec 2**: Use these fields to define how the receiver handset handles the text message.
- **Setup Spec 3**: Use these fields to define how the receiver handset acts when receiving a text message.
- **Setup Spec 4:** Use these fields to define how the receiver handset handles voice calls when receiving a text message.

5 In the **Tone and Time-out** pane specify the type of tone the receiver handset sends when receiving a text message.

6 In the **Date and Time** pane click the **Date** field to select the date, and in the **Time** field type the time to include the information in the text message.

-OR-

7 Click the **Read from PC** button to read the date and time from your PC.

8 The **Menu Select Setup** box demonstrates the facilities of the API.

9 The **ASCII String Setup** pane, demonstrates the facilities of the API.

Note

To obtain the API specifications, please contact Spectralink Europe.

10 Click the **Setup Request** button to send the text message.

The **MSF Connection Status** box displays an MSF connection confirmation from the receiver handset when the text messages is received (to confirm the connection the user of the handset you must press ✓/**OK**.)

If an error occurs during the connection, or if the handset releases the call, a release text is displayed in the **MSF Connection Status** box. The most common release text are the following:

Table 7-8 Connection Status

Message	Cause
Normal release	The handset has received the message.
Timer expiry	A time-out occurred when trying to send MSF to the handset.
Handset is out of range	There is no contact to the handset
Handset is busy	The handset is busy with another MSF connection.
Unknown handset	The handset is unknown to the system. Check the directory number.

11 If you have received a connection confirmation, and if you selected the **Text Call** (stay connected) check box in the **Setup Spec 1** area, the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 is still connected to the handset and you can continue sending messages.

Type the new text message in the **Display Text** field, and then click **Display Request**.

12 To release the connection to the handset, click **Release Request** if the **Text Call** (stay connected) box is selected. Otherwise the connection is automatically released after transfering the message.

13 Click **Clear** to clear the **Connection Status** area.

Responding to Text Messages

On the Normal MSF tab, the Connection Status area shows if a text message has been sent from a handset to the Spectralink DECT Server 8000 or Spectralink DECT Server 2500.

1 To respond to the message and set up a connection, type the handset number in the **Direct Number** field. The number is displayed in the Connection Status area. Click **Connection Response**.

2 To release the connection to the handset, type the direct number in the **Direct Number** field, and then click **Release Request**.

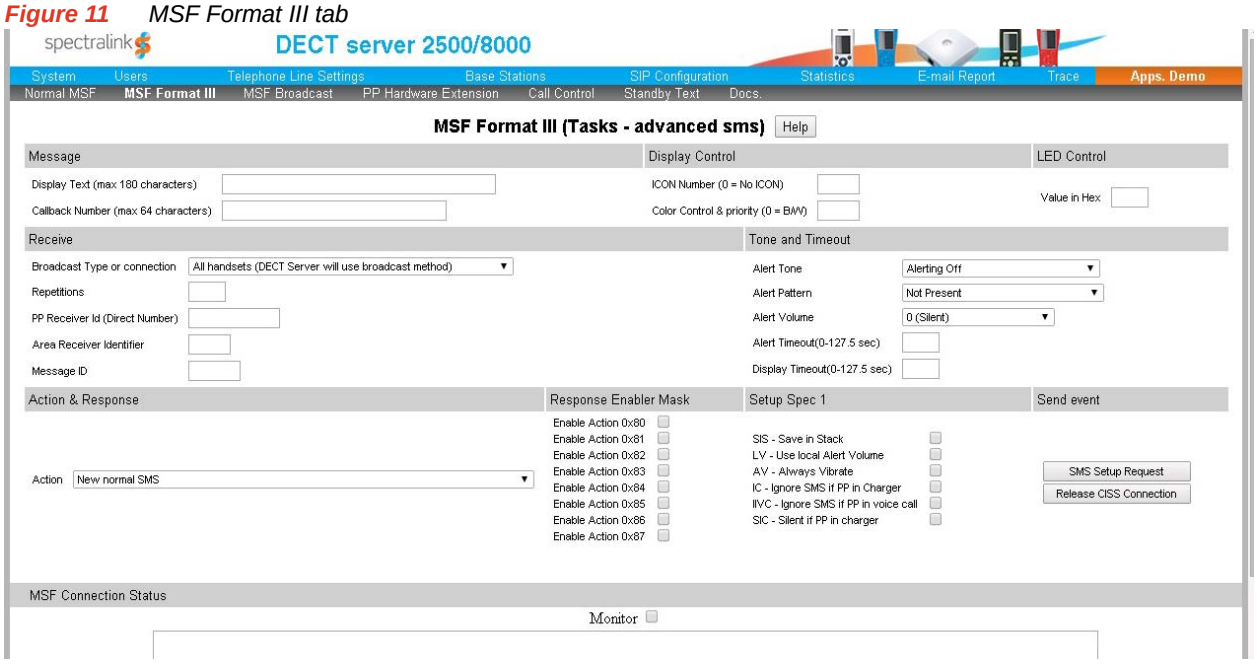
3 Click **Clear** to clear the **MSF Connection Status** area.

MSF Format III

To Send Normal MSF Messages to a Handset

1 On the menu window of the WEB page, click the **Apps. Demo** tab and then click **MSF Format III**.

Figure 11 *MSF Format III tab*



2 In the **Message** pane, type the message you want to send in the **Display Text** field and then if you want the receiver to call you back, type a number in the **Callback Number** field.

3 Under **Display** pane, in the **ICON Number (0=No ICON)**, type the number corresponding to the predefined icon and in the **Color Control** field type the message priority value.

4 Under **LED Control**, in the **Value in Hex** field type the desired value to control the color of the LED and the output (flashing, switching-color).

5 In the **Receive** pane, select from the **Broadcast Type** drop-down list one of the following options: **All handsets** (Spectralink DECT Server will use broadcast method), **One handset** (Spectralink DECT Server will use CISS method) or **A group of handsets** (Spectralink DECT Server will use broadcast method).

6 In the **Repetition** field, specify the number of times you wish the broadcast to be resent.

7 (Only if the selected broadcast type is One handset) In the **PP Receiver Id (Direct number),** specify the number where you wish to send the message.

8 (Only if the selected broadcast type is All handsets) In the **Area Receiver Identifier** field, specify to which group of RFP the message should be broadcasted.

9 In the **Message ID** field type a number for the identification of the message.

10 In the **Tone and Time-out** pane specify the type of tone the receiver handset sends when receiving a text message.

11 In the **Action & Response** pane, specify the method through which you wish to send the message. For more details see Api specifications.

Note

To obtain the API specifications, please contact Spectralink Europe.

12 In the **Response Enabler Mask** pane, specify the type of response to the action.

13 Use the **Setup Spec 1** pane to select the method through which you wish to receive the message.

14 Under **MSF Format III**, click **SMS Setup Request** to send the message. If SMS Setup Request is busy click **Connection CISS Release** to release the connection.

15 Select the **Monitor** check box to receive a status on both the sent and received messages or deselect the Monitor check box if you wish to receive status only on the sent messages.

16 Click **Clear** to clean the Monitor window (optional).

MSF Broadcast

To Send MSF Broadcast Messages to a Handset

1 On the menu window of the WEB page, click the **Apps. Demo** tab and then click **MSF Broadcast**.

Figure 12 *MSF Broadcast tab*

2 From the **Broadcast Type** drop-down list select if you wish to send the message to **All, Single PP** or to a **Group**.

3 In the **Repetitions** field, specify the number of times you wish the broadcast to be resent.

4 (Only if the selected broadcast type is Single PP) In the **PP Receiver Id (Direct number),** specify the number where you wish to send the message.

5 From the **Discriminator** drop-down list select the pattern for displaying the message.

6 In the **Text (max 19 characters)** field, type the message you wish to send.

7 Click **Broadcast Request** to send the message.

8 Select the **Monitor** check box to receive a status on both the sent and received messages or deselect the Monitor check box if you wish to receive status only on the sent messages.

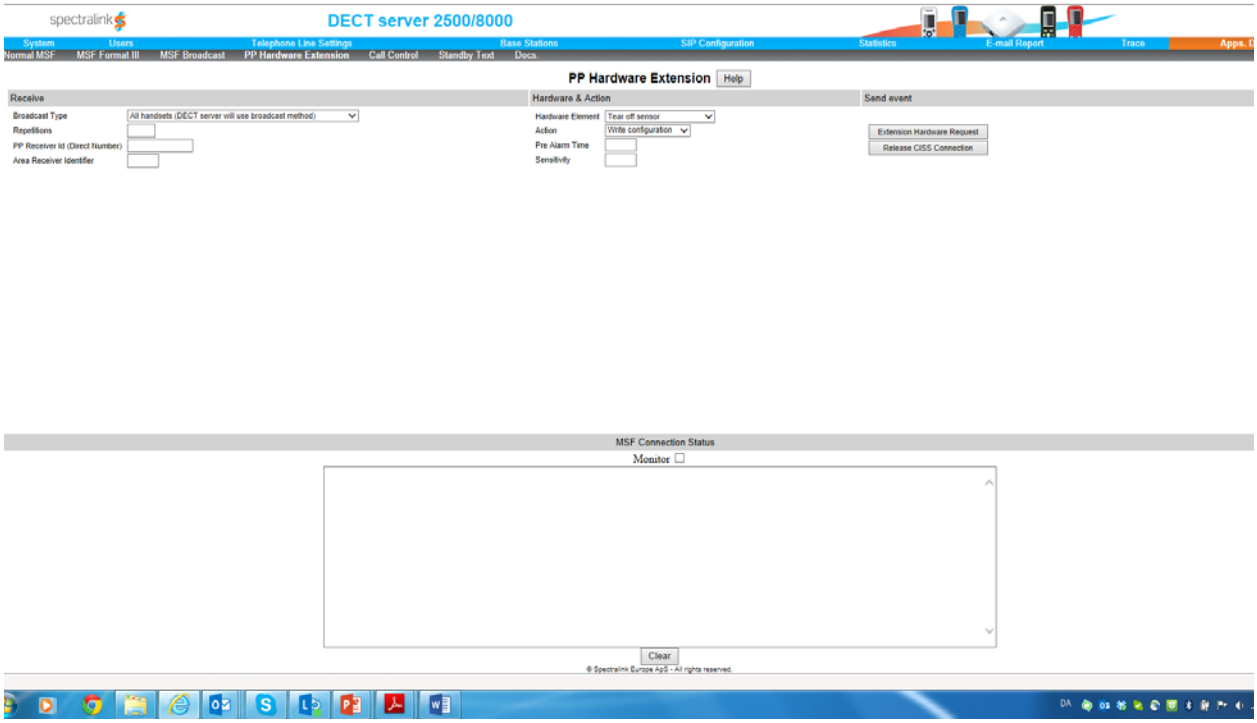
9 Click **Clear** to clean the Monitor window (optional).

PP Hardware Extension

To Configure the Sensors of the Handset and Receive Alarms

1 On the menu window of the WEB page, click the **Apps. Demo** tab and then click **PP Hardware Extension** tab.

Figure 13 *PP Hardware Extension tab*



2 In the **Receive** pane, select from the **Broadcast Type** drop-down list one of the following options: **All handsets** (Spectralink DECT Server will use broadcast method), **One handset** (Spectralink DECT Server will use CISS method) or **A group of handsets** (Spectralink DECT Server will use broadcast method).

3 In the **Repetitions** field, specify the number of times you wish the broadcast to be resent.

4 (Only if the selected broadcast type is One handset) In the **PP Receiver Id (Direct number),** specify the number where you wish to send the message.

5 (Only if the selected broadcast type is All handsets) In the **Area Receiver Identifier** field, specify to which group of RFP the message should be broadcasted.

6 In the **Hardware & Action** pane, select the sensor type from the **Hardware Element** drop-down list.

7 From the **Action** drop-down list, select the desired action.

8 In the **Pre Alarm Time** and **Sensitivity** fields, specify the sensor configuration values.

9 Click **Extension Hardware Request** button to send the current settings. If Extension Hardware Request is busy, click **Release CISS Connection** to release the connection.

10 Select the **Monitor** check box to receive a status on both the sent and received messages or deselect the Monitor check box if you wish to receive status only on the sent messages.

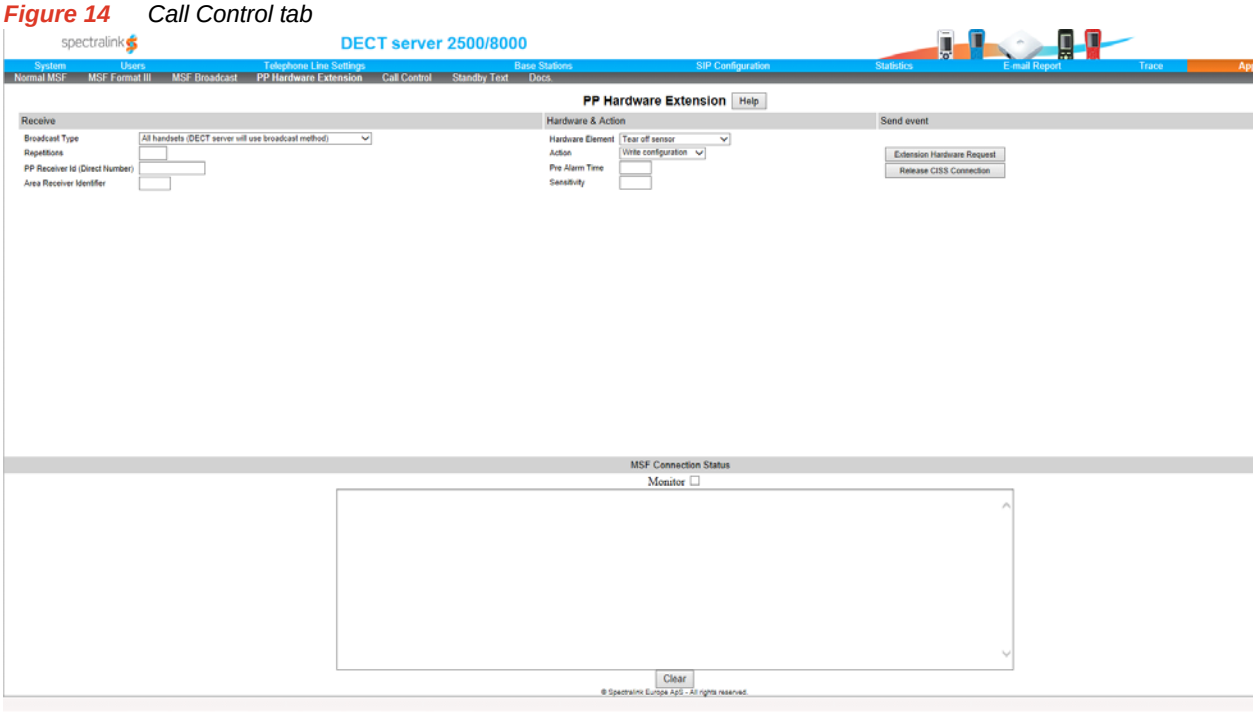
11 Click **Clear** to clean the Monitor window (optional).

Call Control

To Configure a Call

1 On the menu window of the WEB page, click the **Apps. Demo** tab and then click **Call Control** tab.

Figure 14 *Call Control tab*



2 In the **Message** pane, type the **Local Number (DN)** where you want to send the message.

3 In the **Digits to Dial** field enter the digits to dial out (‘0’...’9’, ‘*’, ‘#’, ‘P’, ‘p’, ‘S’, ‘s’, ‘,’).

4 In the **Display Text** field, enter the text you want to send (max 33 characters).

5 Use the **Clip Number** field to enter text with ciphers.

6 Select one of the **Feedback (Call Status = CS)** check boxes according to the desired settings.

7 Select one or more **PP Configuration** check boxes according to your handset configuration.

8 In the **Call Preferences** pane, select the **Call type** from the corresponding drop-down list.

9 From the **Alerting** drop-down list, choose the desired type of ringing.

10 From the **PP Volume** drop-down list, select the desired volume level.

11 (Only if the selected Call Control is **Send Digits Request**) Select the **Mute** check box to mute tx path towards PP during the period of sending the digits.

12 Select from the **Alerting/Tone** drop-down list the desired alerting and tone type.

13 In the **Call Control** pane click one of the following buttons:

- **Click To Dial Request** - in case you want to generate a voice call on behalf of a PP.
- **PP Reconfig Request -** to change PP configuration for Call Control.
- **Call Release Request -** to force the realease of a voice call in both directions.
- **Send Digits Request -** to generate digits towards the PSTN line.
- **Call Alerting & Tone Request -** to force the start and stop of ringing (alerting) and to force the use of local tones in PP.
- **Call Display Request -** to update the display and CLIP info in PP.

14 Select the **Monitor** check box to receive a status on both the sent and received messages or deselect the Monitor check box if you wish to receive status only on the sent messages.

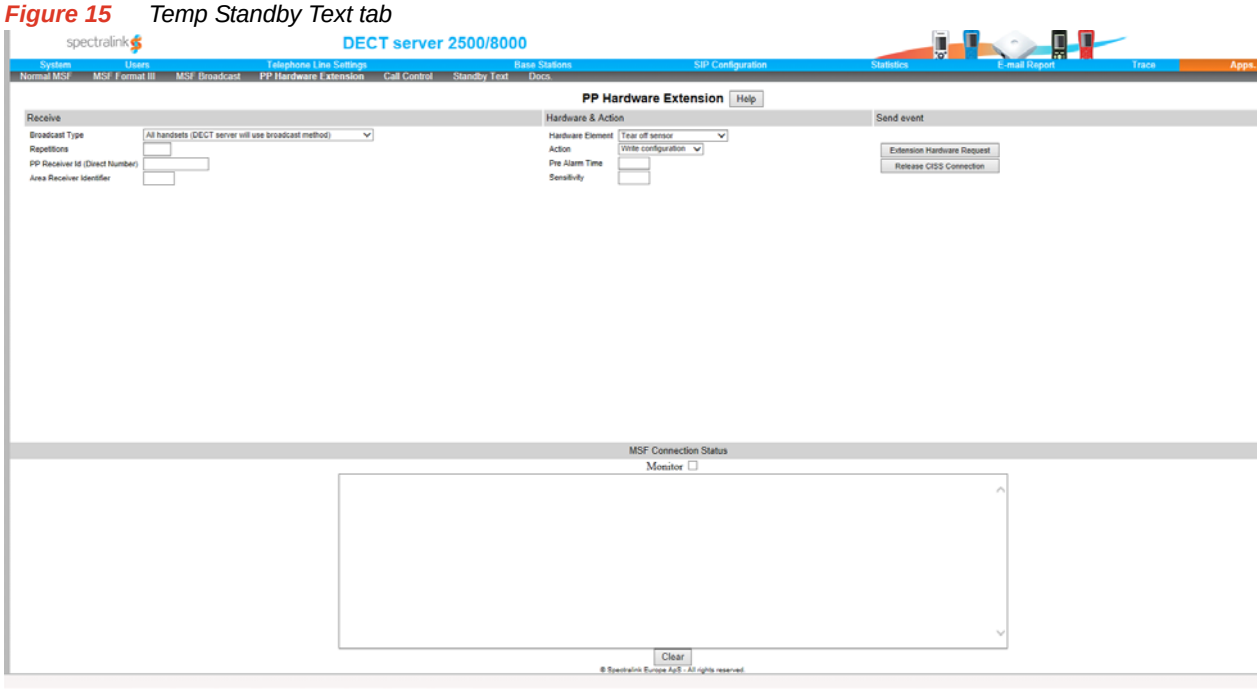
15 Click **Clear** to clean the Monitor window (optional).

Temp Standby Text

To Change the Standby Text on the Handset Display

1 On the menu window of the WEB page, click the **Apps. Demo** tab and then click **Temp Standby Text** tab.

Figure 15 *Temp Standby Text tab*



2 In the **Message** page, fill in the **Local Number** field with the number where you want to send the standby text.

3 In the **Temp StandBy Text** field, type the standby text.

4 Click the **Temp StandBy Text Request** button to send the standby text.

5 Select the **Monitor** check box to receive a status on both the sent and received messages or deselect the Monitor check box if you wish to receive status only on the sent messages.

6 Click **Clear** to clean the Monitor window (optional).

Chapter 7: System Statistics

On the Statistics tab, you can view statistical information about the entire system.The information can, among other things, be used to measure performance and for fault finding.

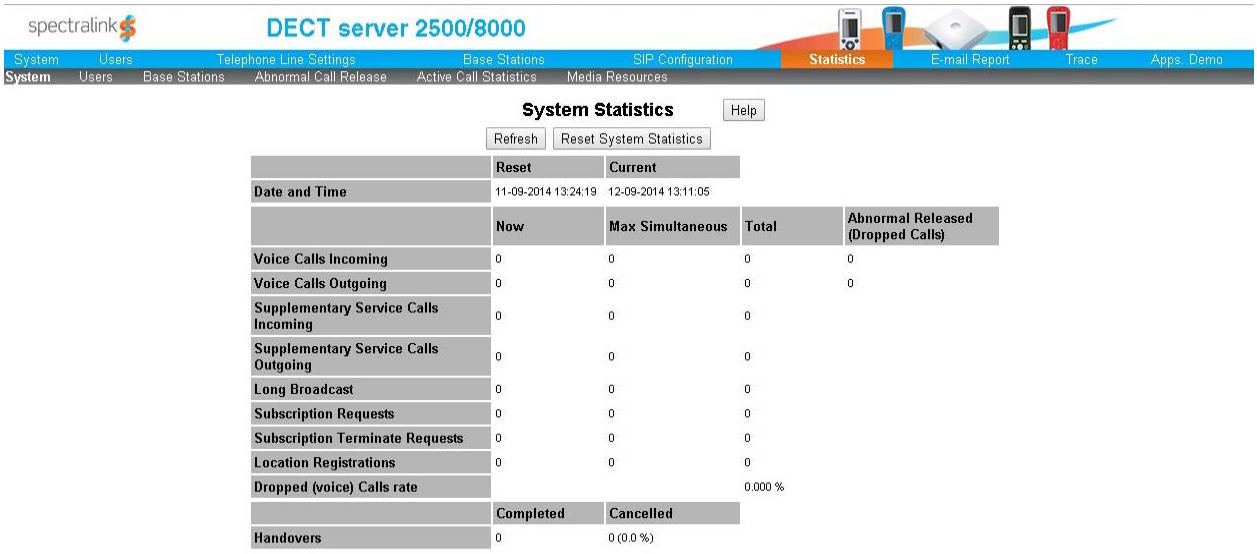
There are 6 tabs that each contain detailed statistical information about specific parts of the system:

- System
- Users
- Base Stations
- Abnormal Call Release
- Active Call Statistics
- Media Resources
- System Statistics

To Read System Statistics

- On the **Statistics** menu, click the **System** tab, and then click the **Refresh** button to load statistical information about the system.

Figure 1 *System Statistics page*



The following information is displayed.

Table 1 *System Statistics*

Parameter	Description
Date and Time	The current date and time, and the date and time of the last statistics reset.
Voice calls Incoming	The number of current incoming calls, maximum number of simultaneous calls, total number of incoming calls, and abnormal released calls (calls not terminated by one of the interacting parts.)
Voice Calls Outgoing	The number of current outgoing calls, maximum number of simultaneous calls, total number of outgoing calls, and abnormal released calls (calls not terminated by one of the interacting parts.)
Supplementary Service Calls Incoming	Messaging status, maximum number of simultaneous service calls, total number of incoming service calls, and abnormal released calls (calls not terminated by one of the interacting parts.)
Supplementary Service Calls Outgoing	The number of current outgoing service calls maximum number of simultaneous service calls, total number of outgoing service calls, and abnormal released calls (calls not terminated by one of the interacting parts.)
Long Broadcast	The number of text messages sent to all or a group of handsets.
Subscription Requests	The number of successful attempts to subscribe a handset.
Subscription Terminate Requests	The number of successful attempts to unsubscribe a handset.
Location Registrations	
Dropped Calls	The rate of calls that are unexpectedly interrupted.
Cancelled Handovers	The number of failed handovers.
Completed Handovers	The number of successful handovers.

To Reset Statistics

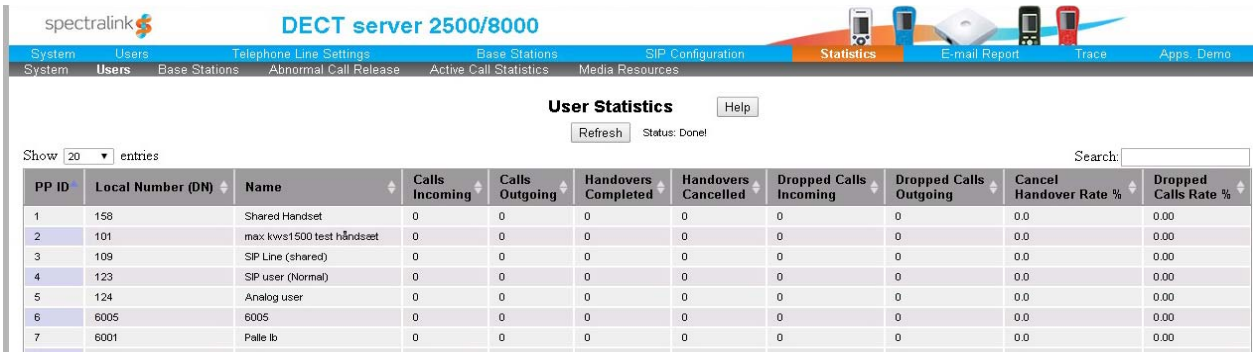
- On the **Statistics** menu, click the **System** tab, and then click the **Reset System Statistics** button to load statistical information about the system.

To Read User Statistics

- On the **Statistics** tab, click the **Users** tab, and then click the **Refresh** button.

  Use the **First PPID** and **Last PPID** field to determine the range of handset (PPs) from which you want to obtain statistical information.

Figure 2 *User Statistics page*



To sort the table ascending or descending click the header fields.

The following information is displayed:

Table 2 *PP Statistics*

Parameter	Description
PPID	The Portable Part Identification number
Local Number	The local number of the handset. (DN, extension)
Name	Name of the handset as it appears in the database.
Calls	Total number of incoming and outgoing calls on the handset.
Handover	Total number of handset successful handovers and the number of failed handovers attempts.
Dropped Calls	The total number of calls that were unintentionally disconnected.
Handover Cancel Rate	The rate of handovers that did not succeed.
Dropped Calls Rate	The rate of calls that are terminated unexpectedly.

To Read Base Station Statistics

1 On the **Statistics** menu, click the **Base Stations** tab.

2 Click the **Refresh** button to view information about the base stations.

Use the **First RFP** and **Last RFP** field to specify the range of RFPs from which you want to obtain statistical information. The default setting is 0 to 63.

Figure 3 *Base Station Statistics*

3 If you only want to display the base stations that are connected, select **Show only connected RFP's** check-box and click the **Refresh** button.

The following information is displayed.

Table 3 *Radio Fixed Parts Statistics*

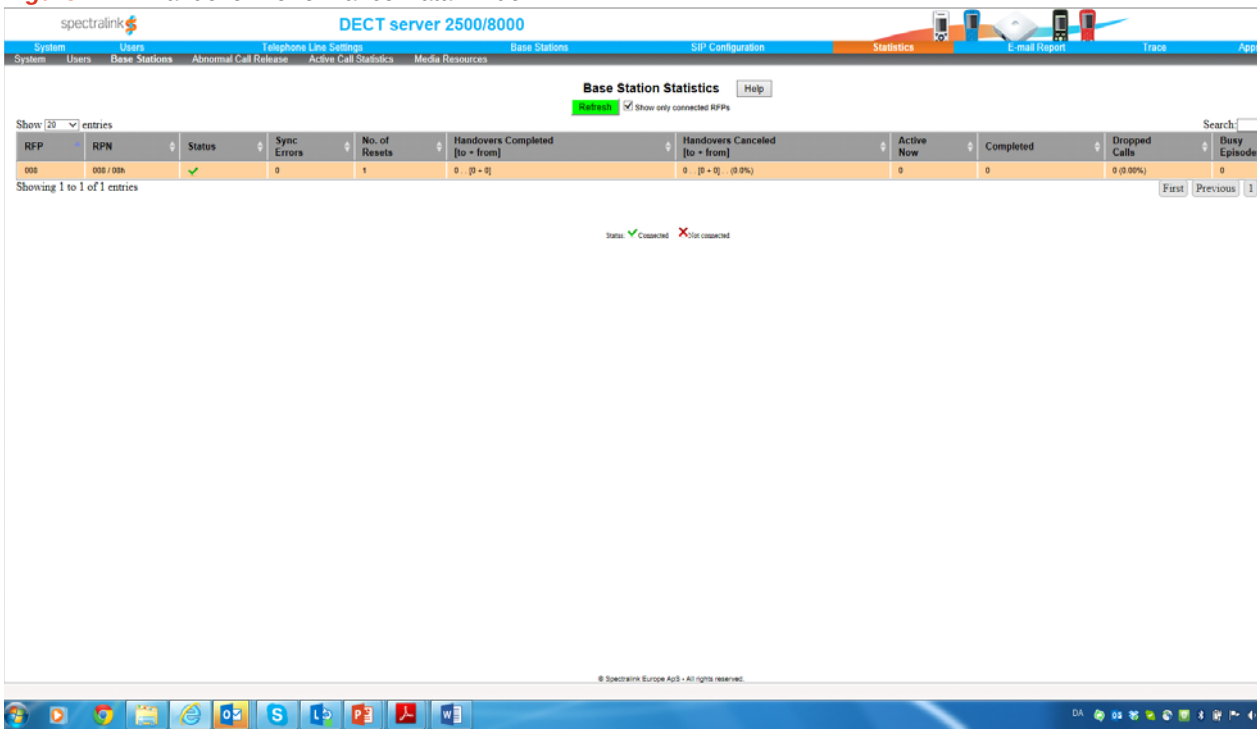
Parameter	Description
RFP	Radio Fixed Part number (from 0 to 511)
RPN in Air	Radio Part Number (from 0-255)
Status	Displays whether the base station is connected or disconnected.
Sync. Errors	The number of synchronization errors on the cable that connects the base station with the Spectralink DECT Server 8000 or Spectralink DECT Server 2500.
No. of Resets	Number of times the base station has been restarted.
Handovers Completed (from)	Number of handovers from the RFP that were completed.
Handovers Canceled (from)	Number of handovers from the RFP that were cancelled.
Handovers Completed (to)	Number of handovers to the RFP that were completed.
Handovers Canceled (to)	Number of handovers to the RFP that were canceled.
Cancel Handover Rate	The rate of canceled handovers for the RFP.
Active Calls Now	Number of current active calls
Total Number of Calls	The total number of calls on the base station.
Number of Dropped Calls	Total number of dropped calls on the base station.

Table 3 *Radio Fixed Parts Statistics*

Parameter	Description
Dropped Call Rate	The rate of dropped calls on the base station.
Busy Episodes	The number of episodes all 4 base station channels were busy at the same time.
Number of Busy Periods	Number of busy periods on the base station divide into intervals of seconds. 0-3, 4-8, 9-15, 16-45, 46-120, 121-300, 300+

4 Click any of the handover data in the rows containing base station information. A new window with handover performance data is displayed.

Figure 4 *Handover Performance Data window*



To Read Abnormal Call Statistics

1 On the **Statistics** menu, click the **Abnormal Call Release** tab.

2 Click **Refresh** to view information about abnormal calls.

Figure 5 *Abnormal Call Release page*

The following information is displayed:

.

Table 4 *Abnormal Calls Statistics*

Parameter	Description
Time of Incident	Time of the disconnection.
Local Number	Local number of the handset.(DN, extension)
Name	Name of the handset as it appears in the database.
PPID	Portable Part Identification
RFP Number	Radio Fixed Part Number

To Read the Active Calls Statistics

1 On the **Statistics** menu, click the **Active Call Statistics** tab.

2 Click the **Refresh** button to view information about current calls.

Figure 6 *Active Calls Statistics tab*

Table 5 *Current Calls Statistics*

Parameter	Description
Established Time	The time the call started
Duration	The length of the call in seconds
Direction	Specifies whether the call is incoming or outgoing.

Table 5 *Current Calls Statistics*

Parameter	Description
Interface	Specifies the type of interface. Currently only analogue and DECT to DECT.
Local Number	The local number of the handset (DN, extension)
Name	Name of the handset as it appears in the database.

To Read Media Resources Statistics

1 On the **Statistics** menu, click the **Media Resources** tab.

2 Click the **Refresh** button to view information about the media resources.

Figure 7 *Media Resources Statistics*

Table 6 *Media Resources Statistics*

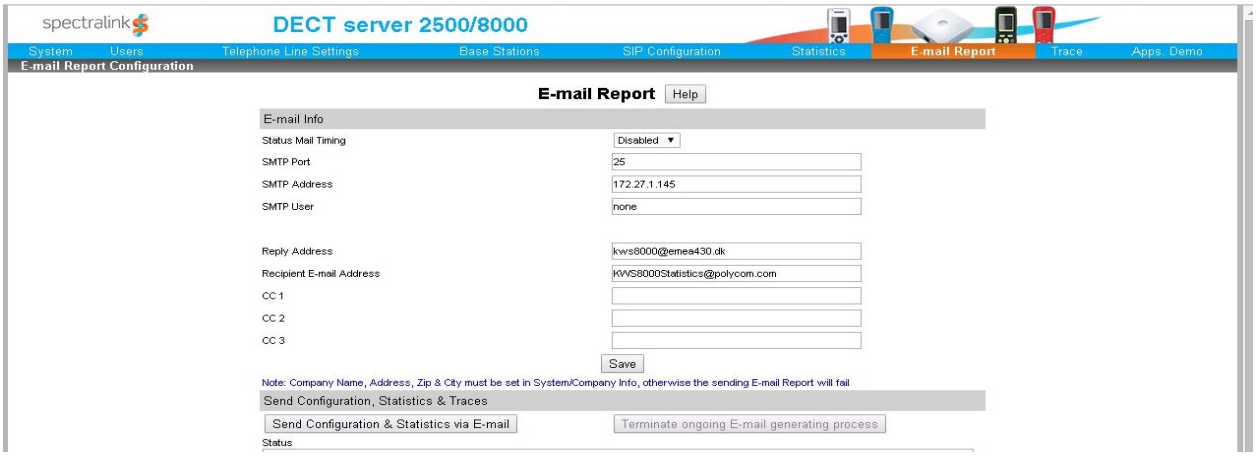
Parameter	Description
Shelf	The shelf containing the Media Resource Card.
Slot	The slot on which the Media Resource Card is connected.
Active Calls	The number of active calls.
Max Active Calls	The maximum number of active calls.
Total Calls	The number of total calls.

E-mail Report

Sending Configuration Statistics via E-mail

You can send the Configuration statistics to Spectralink via e-mail but first you have to fill in the information required on the **List E-mail Report Configuration** tab.

Figure 8 *E-mail Report page*



To specify E-mail Report Information

1 On the **List E-mail Report Configuration** tab, in the **Company info** pane enter the following information about your company: **Company Name *, Address *, Zip*, City *, State, Country, Contact Person, Direct Phone Number, Direct E-mail, Phone Number, Fax Number.**

Note

Company Name *, Address *, Zip *, City * fields are mandatory fields.

2 In the **E-mail info** pane specify from which e-mail account you want to send the statistical information.

3 From the **Status Mail Timing** list, select how often you want to send the status mail. The default setting is **Disabled**.

4 In the **SMTP Port** field, enter the port used for incoming mail.

5 In the **SMTP Address** field enter the IP address of the SMTP server.

6 In the **SMTP User** field enter the user name if required by the SMTP server.

7 In the **Reply Address** field enter the e-mail address to which the report recipient can reply.

8 In the **Recipient E-mail Address** field type Spectralink DECT Server 8000statistics@spectralinkSpectralink.com.

9 In the **Carbon Copy** fields enter the e-mail addresses of any other recipients to which you want to send a copy of the report.

10 Under **Send Configuration, Statistics & Traces**, click the **Send Configuration Statistics via E-mail** button to send the report.

Note

If E-mail report is not used, make sure that **Status Mail Timing** is disabled. Please fill in the required content in **Company Info** panel.

The Spectralink DECT Server 8000 generates the following files:

- configuration.txt
- eng1.tar.gz
- gain_data.txt
- level_2_trace.txt
- level_3_trace.txt
- pp_statistic.csv
- restart_data.txt
- rfp_statistic.csv
- settings.txt
- statistics.txt
- trace_start_up.txt
- user_data.txt
- Warnings.txt

More files might be added.

If more shelves are present in the system, the system generates additional “eng<**n**>.tar.gz”files for each shelf (**n** represents the shelf number).

Chapter 3: Regulatory Notices

This section contains important safety regulations for the SPECTRALINK DECT Server 8000.

International Regulatory and Product Information

United States Federal Communication Commission (FCC)

Part 15: Class A Statement. This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. Test limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manuals, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

United States Safety Construction Details:

- All connections are indoor only.
- No direct connections to public networks.
- Unit is intended for RESTRICTED ACCESS LOCATION.
- Unit is to be installed in accordance with the National Electrical Code.
- The branch circuit overcurrent protection shall be rated 20 A for the AC system.
- This equipment has a maximum operating ambient of 40°C. The ambient temperature in the rack shall not exceed this temperature

CE Mark R&TTE Directive

SPECTRALINK declares that the SPECTRALINK DECT Server 8000 is in conformity with the following relevant harmonized standards:

EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011

EN55022:2010/AC2011

EN55024:2010

EN61000-3-2:2006 + A1:2009 + A2:2009

EN61000-3-3: 2008

Following the provisions of the Council Directive 1999/CE on radio and telecommunication terminal equipment and the recognition of its conformity.

This SPECTRALINK product has been marked with the CE mark. This mark indicates compliance with EEC Directives 89/336/EEC, 73/23/EEC 1999/5/EC. A full copy of the Declaration of Conformity can be obtained from SPECTRALINK Europe ApS, Langmarksvej 34, 8700 Horsens, Denmark.

The WEEE Marking on this equipment indicates that the product must not be disposed of with unsorted waste, but must be collected separately.

Canadian Department of Communications

This Class [A] digital apparatus complies with Canadian ICES-003.

Notice: The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunication network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions maynot prevent degradation of service in some situations. Repairs to certified equipment malfunctions, may give the telecommunications company causes to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

Important Safety Instructions and Product Information

Before using your telephone equipment, you should always follow basic safety instruction to reduce the risk of fire, electrical shock and injury to persons, and damage to property.

1. Read and understand all instructions
2. Follow all warnings and instructions including those marked on the product
3. Unplug this product before cleaning. Do not use liquid cleaners or aerosol cleaners. Use damp cloth for cleaning
4. Do not install the telephone equipment in the bathroom or near a wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool
5. The product should be operated only from the type of power source indicated on the instructions. If you are not sure of the type of power supply, consult your dealer or local power company.
6. Do not overload wall outlets and extension cords as this can result in fire or electrical shock.

7 Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in fire, electrical shock, or injury. Never spill liquid of any kind into this product.

8 To reduce the risk of electrical shock or burns, do not disassemble this product. Opening or removing covers may expose you to dangerous voltages, dangerous electrical current, or other risks. Incorrect reassemble can cause electrical shock when the appliance is subsequently used. If the product need repair, consult your dealer.

9 This product does not support connections to outside plant.

10 Refer servicing to qualified service personnel under the following conditions:

- If liquid has been spilled into the product
- If the product has been exposed to rain or water
- If the product does not operate normally when following the operating instructions in the manual. Adjust only those controls that are covered by the operation instructions. Improper adjustment of other controls may result in damage and will often require extensive work by qualified service personnel to restore the product to normal operation.
- If the product has been dropped or cabinet has been damaged
- If the product exhibits a distinct change in performance

Warning

1 Avoid using telephone during an electrical storm. There may be a risk of electrical shock from lightning

2 Do not use the telephone to report a gas leak in the vicinity of the leak

3 Do not place the unit near microwave ovens, radio equipment, or non-ground connected televisions. These appliances may cause electrical interference to the base or handset

4 Installation must be performed in accordance with all relevant national wiring rules

5 Plug acts as Disconnect Device - The socket outlet to which this apparatus is connected must be installed near the equipment and must always be readily accessible

6 The system will not operate in the event of a blackout. Please keep a backup phone for emergencies

Intrinsic safety

Do not install the unit in conditions where there is a danger of electrically ignited explosions.

Exposure to Sunlight, Heat and Moisture

Do not expose the unit to direct sunlight for long periods. Keep away from excessive heat and moisture.

Spare Parts and Accessories

Use only approved spare parts and accessories. The operation of non-approved parts cannot be guaranteed and may even cause damage.

RF Compliance Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICES

FCC Note: This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IC Note: Operation is subject to the following two conditions: (1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. The term "IC:" before the certification /registration number only signifies that the Industry Canada technical specifications were met.

Privacy of communications may not be ensured when using this telephone.

Information to user: The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Spectralink® Product Warranty Statement

The software included in this Product (including, without limitation, firmware and all updated thereto, including any software that may be downloaded electronically via the internet or otherwise (the "Software") is licensed, not sold. Customer shall not reverse compile, disassemble or otherwise reverse engineer, embed within any other software product, or modify in any manner with respect thereto, the Software in whole or in part.

THE TERMS AND CONDITIONS APPLICABLE TO Spectralink'S LIMITED WARRANTY ARE AS SET FORTH BELOW (AND ARE ALSO INCLUDED IN THE DOCUMENTATION PACKAGED WITH NEW Spectralink PRODUCTS):

LIMITED WARRANTY. SPECTRALINK warrants to the end user ("Customer") that the product will be free from defects in workmanship and materials, under normal use and service, for one year, or such longer period as SPECTRALINK may announce publicly from time to time for particular products, from the date of purchase from SPECTRALINK or its authorized reseller. SPECTRALINK's sole obligation under this express warranty shall be, at SPECTRALINK's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, SPECTRALINK may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of SPECTRALINK. Replacement products or parts may be new or reconditioned. SPECTRALINK warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the

initial warranty period, whichever is longer. Products returned to SPECTRALINK must be sent prepaid and packaged appropriately for safe shipment, and it is recommended that they be insured or sent by a method that provides for tracking of the package. Responsibility for loss or damage does not transfer to SPECTRALINK until the returned item is received by SPECTRALINK. The repaired or replaced item will be shipped to Customer, at SPECTRALINK's expense, not later than thirty (30) days after SPECTRALINK receives the defective product, and SPECTRALINK will retain risk of loss or damage until the item is delivered to Customer.

EXCLUSIONS. SPECTRALINK will not be liable under this limited warranty if its testing and examination disclose that the alleged defect or malfunction in the product does not exist or results from:

• Failure to follow SPECTRALINK's installation, operation, or maintenance instructions.

• Unauthorized product modification or alteration.

• Unauthorized use of common carrier communication services accessed through the product.

• Abuse, misuse, negligent acts or omissions of Customer and persons under Customer's control; or

• Acts of third parties, acts of God, accident, fire, lighting, power surges or outages, or other hazards.

WARRANTY EXCLUSIVE. IF A SPECTRALINK PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT SPECTRALINK'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS,

EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. SPECTRALINK NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF ITS PRODUCTS.

SUPPORT & SERVICE AGREEMENTS. If you purchased your product from a SPECTRALINK Authorized Reseller, contact the Authorized Reseller for information about support and service agreements applicable to your product. For information on SPECTRALINK service, go to the SPECTRALINK web site www.spectralink.com, products and services menu, or call 1-800-765-9266, outside the US call 1-

408-526-9000, or your local SPECTRALINK Office, as listed on the SPECTRALINK Web site.

LIMITATION OF LIABILITY. TO THE FULL EXTENT ALLOWED BY LAW, SPECTRALINK EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING

OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF SPECTRALINK OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT SPECTRALINK'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

DISCLAIMER. Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, or the limitation of liability for personal injury, so the above limitations and exclusions may be limited in their application to you. When the implied warranties are not allowed to be excluded in their entirety, they will be limited to the duration of the applicable written warranty. This warranty gives you specific legal rights which may vary depending on local law.

GOVERNING LAW. This Limited Warranty and Limitation of Liability shall be governed by the laws of the State of California, U.S.A., and by the laws of the United States, excluding their conflicts of laws principles. The United Nations Convention on Contracts for the International Sale of Goods is hereby excluded in its entirety from application to this Limited Warranty and Limitation of Liability.

END-USER LICENSE AGREEMENT FOR SPECTRALINK SOFTWARE

IMPORTANT - READ CAREFULLY BEFORE USING THE SOFTWAREPRODUCT:

This End-User License Agreement ("Agreement") is a legal agreement between you (either an individual or a single entity) and SPECTRALINK, B.V for the SPECTRALINK® SOFTWARE PRODUCT licensed by SPECTRALINK, B.V in Europe, the Middle East, Africa, and Asia Pacific, or the SPECTRALINK SOFTWARE PRODUCT licensed by SPECTRALINK, Inc. in the rest of the world (collectively referred to herein as “SPECTRALINK”). The SOFTWARE PRODUCT includes computer software as attached hereto and may include associated media, printed materials, and "online" or electronic documentation ("SOFTWARE PRODUCT"). By clicking “I agree” or by installing, copying, or otherwise using the SOFTWARE PRODUCT, you agree to be bound by the terms of this Agreement. If you do not agree to the terms of this Agreement, do not install or use the SOFTWARE PRODUCT, and return it to your place of purchase for a full refund. The SOFTWARE PRODUCT is protected by copyright laws and international copyright treaties, as well as other intellectual property laws and treaties. The SOFTWARE PRODUCT is licensed (not sold) to you, and its use is subject to the terms of this Agreement.

1. GRANT OF LICENSE.

Subject to the terms of this Agreement, SPECTRALINK grants to you a non-exclusive license to install and use the SOFTWARE PRODUCT on the SPECTRALINK product with which this SOFTWARE PRODUCT is supplied (the “PRODUCT”). You may use the SOFTWARE PRODUCT only in connection with the use of the PRODUCT. You are not permitted to lease, rent, distribute or sublicense the SOFTWARE PRODUCT or to use the SOFTWARE PRODUCT in a time-sharing arrangement or in any other unauthorized manner. Further, no license is granted to you in the human readable code of the SOFTWARE PRODUCT (source code). Except as provided below, this License Agreement does not grant you any rights to patents, copyrights, trade secrets, trademarks, or any other rights in respect to the SOFTWARE PRODUCT.

2. DESCRIPTION OF OTHER RIGHTS AND LIMITATIONS.

2.1 Limitations on Reverse Engineering, Decompilation, and Disassembly. You may not reverse engineer, decompile, or disassemble the SOFTWARE PRODUCT, except and only to the extent that such activity is expressly permitted by applicable law notwithstanding this limitation. The SOFTWARE PRODUCT is licensed as a single product. Its component parts may not be separated for use on more than one PRODUCT.

2.2 Back-up. Except as expressly provided for under this Agreement you may not copy the SOFTWARE PRODUCT; except, however, you may keep one copy of the SOFTWARE PRODUCT and, if applicable, one copy of any previous version, for back-up purposes, only to be used in the event of failure of the original. All copies of the SOFTWARE PRODUCT must be marked with the proprietary notices provided on the original SOFTWARE PRODUCT. You may not reproduce the supporting documentation accompanying the SOFTWARE PRODUCT.

2.3 Modifications. You may not modify, translate or create derivative works of the SOFTWARE PRODUCT.

2.4 Proprietary Notices. You may not remove or obscure any proprietary notices on or in the SOFTWARE PRODUCT or the supporting documentation.

2.5 Software Transfer. You may permanently transfer all of your rights under this Agreement, provided you retain no copies, you transfer all of the SOFTWARE PRODUCT (including all component parts, the media and printed materials, any upgrades, this Agreement, and, if applicable, the Certificate of Authenticity), and the recipient agrees to the terms of this Agreement. If the SOFTWARE PRODUCT is an upgrade, any transfer must include all prior versions of the SOFTWARE PRODUCT. However, if the SOFTWARE PRODUCT is marked “Not for Resale” or “NFR”, you may not resell it or otherwise transfer it for value.

2.6 Copyright. All title and copyrights in and to the SOFTWARE PRODUCT (including but not limited to any images, photographs, animations, video, audio, music, text, and "applets" incorporated into the SOFTWARE PRODUCT), the accompanying printed materials, and any copies of the SOFTWARE PRODUCT are owned by SPECTRALINK or its suppliers. The SOFTWARE PRODUCT is protected by copyright laws and international treaty provisions. Title, ownership rights, and intellectual property rights in the SOFTWARE PRODUCT shall remain in SPECTRALINK or its suppliers. Title and related rights in the content accessed through the SOFTWARE PRODUCT is the property of such content owner and may be protected by applicable law. This Agreement gives you no rights in such content.

2.7 Confidentiality. The SOFTWARE PRODUCT contains valuable proprietary information and trade secrets of SPECTRALINK and its suppliers and you shall protect the confidentiality of, and avoid disclosure and unauthorized use of, the SOFTWARE PRODUCT.

2.8 Dual-Media Software. You may receive the SOFTWARE PRODUCT in more than one medium. Regardless of the type or size of medium you receive, you may use only one medium that is appropriate for your single PRODUCT. You may not use or install the other medium on another PRODUCT.

2.9 Reservation. SPECTRALINK reserves all rights in the SOFTWARE PRODUCT not expressly granted to you in this Agreement.

3. SUPPORT SERVICES.

SPECTRALINK may provide you with support services related to the SOFTWARE PRODUCT("SUPPORT SERVICES "). Use of SUPPORT SERVICES is governed by the SPECTRALINK policies and programs described in the SPECTRALINK - provided materials. Any supplemental software code provided to you as part of the SUPPORT SERVICES is considered part of the SOFTWARE PRODUCT and is subject to the terms and conditions of this Agreement. With respect to technical information you provide to SPECTRALINK as part of the SUPPORT SERVICES, SPECTRALINK may use such information for its business purposes, including for product support and development. SPECTRALINK will not utilize such technical information in a form that personally identifies you.

4. TERMINATION.

Without prejudice to any other rights, SPECTRALINK may terminate this Agreement if you fail to comply with any of the terms and conditions of this Agreement. In such event, you must destroy all copies of the SOFTWARE PRODUCT and all of its component parts. You may terminate this Agreement at any time by destroying the SOFTWARE PRODUCT and all of its component parts.

5. UPGRADES.

If the SOFTWARE PRODUCT is labeled as an upgrade, you must be properly licensed to use the software identified by SPECTRALINK as being eligible for the upgrade in order to use the SOFTWARE PRODUCT. A SOFTWARE PRODUCT labeled as an upgrade replaces and/or supplements the software that formed the basis for your eligibility for the upgrade. You may use the resulting upgraded SOFTWARE PRODUCT only in accordance with the terms of this Agreement. If the SOFTWARE PRODUCT is an upgrade of a component of a package of software programs that you licensed as a single product, the SOFTWARE PRODUCT may be used and transferred only as part of that single SOFTWARE PRODUCT package and may not be separated for use on more than one PRODUCT.

6. WARRANTY AND WARRANTY EXCLUSIONS.

6.1 Limited Warranty. SPECTRALINK warrants that (a) the SOFTWARE PRODUCT will perform substantially in accordance with the accompanying documentation for a period of ninety (90) days from the date of receipt by you, and (b) any SUPPORT SERVICES provided by SPECTRALINK shall be substantially as described in applicable written materials provided to you by SPECTRALINK, and SPECTRALINK support engineers will make commercially reasonable efforts to solve any problem issues. SPECTRALINK does not warrant that your use of the SOFTWARE PRODUCT will be uninterrupted or error free, or that all defects in the SOFTWARE PRODUCT will be corrected. SPECTRALINK's sole obligation under this express warranty shall be, at SPECTRALINK's option and expense, to refund the purchase price paid by you for any defective software product which is returned to SPECTRALINK with a copy or your receipt, or to replace any defective media with software which substantially conforms to applicable SPECTRALINK published specifications. Any replacement SOFTWARE PRODUCT will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer.

6.2 Warranties Exclusive. IF THIS SOFTWARE PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, YOUR SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT SPECTRALINK'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS,

OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINgeMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. SPECTRALINK NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF THIS SOFTWARE PRODUCT. SPECTRALINK SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT OR MALFUNCTION IN THE SOFTWARE PRODUCT DOES NOT EXIST OR WAS CAUSED BY YOUR OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO MODIFY THE PRODUCT, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, POWER CUTS OR OUTAGES, OTHER HAZARDS, OR ACTS OF GOD.

7. LIMITATION OF LIABILITY.

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, IN NO EVENT SHALL SPECTRALINK OR ITS SUPPLIERS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, LOSS OF BUSINESS INFORMATION, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF OR INABILITY TO USE THE SOFTWARE PRODUCT OR THE PROVISION OF OR FAILURE TO PROVIDE SUPPORT SERVICES, EVEN IF SPECTRALINK HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN ANY CASE, SPECTRALINK'S ENTIRE LIABILITY SHALL BE LIMITED TO THE GREATER OF THE AMOUNT ACTUALLY PAID BY YOU FOR THE SOFTWARE PRODUCT OR U.S. $5.00. PROVIDED, HOWEVER, IF YOU HAVE ENTERED INTO A SPECTRALINK SUPPORT SERVICES AGREEMENT, SPECTRALINK'S ENTIRE LIABILITY REGARDING SUPPORT SERVICES SHALL BE GOVERNED BY THE TERMS OF THAT AGREEMENT.

8. DISCLAIMER.

Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, or the limitation of liability for personal injury, so the above limitations and exclusions may be limited in their application to you. When the implied warranties are not allowed to be excluded in their entirety, they will be limited to the duration of the applicable written warranty. This warranty gives you specific legal rights which may vary depending on local law.

9. EXPORT CONTROLS.

The SOFTWARE PRODUCT may not be downloaded or otherwise exported or re-exported (i) into (or to a national or resident of) Cuba, Iraq, Libya, North Korea, Yugoslavia, Iran, Syria, Republic of Serbia, or any other country to which the U.S. has embargoed goods; or (ii) to anyone on the U.S. Treasury Department’s list of Specially Designated Nationals or the U.S. Commerce Department's Table of Denial Orders. By downloading or using the SOFTWARE PRODUCT, you are agreeing to the foregoing and you are representing and warranting that you are not located in, under the control of, or a national or resident of any such country or on any such list. If you obtained this SOFTWARE PRODUCT outside of the United States, you are also agreeing that you will not export or re-export it in violation of the laws of the country in which it was obtained.

10. MISCELLANEOUS.

10.1 Governing Law. This Agreement shall be governed by the laws of the State of California as such laws are applied to agreements entered into and to be performed entirely within California between California residents, and by the laws of the United States. The United Nations Convention on Contracts for the International Sale of Goods (1980) is hereby excluded in its entirety from application to this Agreement.

10.2 General. This Agreement represents the complete agreement concerning this license and may amended only by a writing executed by both parties. If any provision of this Agreement is held to be unenforceable, such provision shall be reformed only to the extent necessary to make it enforceable.

10.3 Contact. If you have any questions concerning this Agreement, or if you desire to contact SPECTRALINK for any reason, please contact the SPECTRALINK office serving your country.

10.4 U.S. Government Restricted Rights. The SOFTWARE PRODUCT and documentation are provided with RESTRICTED RIGHTS. The SOFTWARE PRODUCT programs and documentation are deemed to be "commercial computer software" and "commercial computer software documentation", respectively, pursuant to DFAR Section 227.7202 and FAR 12.212(b), as applicable. Any use, modification, reproduction, release, performance, display or disclosure of the SOFTWARE PRODUCT programs and/or documentation by the U.S. Government or any of its agencies shall be governed solely by the terms of this Agreement and shall be prohibited except to the extent expressly permitted by the terms of this Agreement. Any technical data provided that is not covered by the above provisions is deemed to be "technical data-commercial items” pursuant to DFAR Section 227.7015(a). Any use, modification, reproduction, release, performance, display or disclosure of such technical data shall be governed by the terms of DFAR Section 227.7015(b).

Appendix B: Base Station and Repeater Numbering

The following table lists base station and repeater numbering.

Table 1 *Base Station and Repeater Numbering*

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
1	1	A	1	0	0	64	128	192
1	1	A	2	1	1	65	129	193
1	1	A	3	2	2	66	130	194
1	1	A	4	3	3	67	131	195
1	1	B	1	4	4	68	132	196
1	1	B	2	5	5	69	133	197
1	1	B	3	6	6	70	134	198
1	1	B	4	7	7	71	135	199
1	2	A	1	8	8	72	136	200
1	2	A	2	9	9	73	137	201
1	2	A	3	10	10	74	138	202
1	2	A	4	11	11	75	139	203
1	2	B	1	12	12	76	140	204
1	2	B	2	13	13	77	141	205
1	2	B	3	14	14	78	142	206
1	2	B	4	15	15	79	143	207
1	3	A	1	16	16	80	144	208
1	3	A	2	17	17	81	145	209
1	3	A	3	18	18	82	146	210
1	3	A	4	19	19	83	147	211
1	3	B	1	20	20	84	148	212
1	3	B	2	21	21	85	149	213
1	3	B	3	22	22	86	150	214
1	3	B	4	23	23	87	151	215
1	4	A	1	24	24	88	152	216
1	4	A	2	25	25	89	153	217

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
1	4	A	3	26	26	90	154	218
1	4	A	4	27	27	91	155	219
1	4	B	1	28	28	92	156	220
1	4	B	2	29	29	93	157	221
1	4	B	3	30	30	94	158	222
1	4	B	4	31	31	95	159	223
1	5	A	1	32	32	96	160	224
1	5	A	2	33	33	97	161	225
1	5	A	3	34	34	98	162	226
1	5	A	4	35	35	99	163	227
1	5	B	1	36	36	100	164	228
1	5	B	2	37	37	101	165	229
1	5	B	3	38	38	102	166	230
1	5	B	4	39	39	103	167	231
1	6	A	1	40	40	104	168	232
1	6	A	2	41	41	105	169	233
1	6	A	3	42	42	106	170	234
1	6	A	4	43	43	107	171	235
1	6	B	1	44	44	108	172	236
1	6	B	2	45	45	109	173	237
1	6	B	3	46	46	110	174	238
1	6	B	4	47	47	111	175	239
1	7	A	1	48	48	112	176	240
1	7	A	2	49	49	113	177	241
1	7	A	3	50	50	114	178	242
1	7	A	4	51	51	115	179	243
1	7	B	1	52	52	116	180	244
1	7	B	2	53	53	117	181	245
1	7	B	3	54	54	118	182	246
1	7	B	4	55	55	119	183	247
1	8	A	1	56	56	120	184	248
1	8	A	2	57	57	121	185	249

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
1	8	A	3	58	58	122	186	250
1	8	A	4	59	59	123	187	251
1	8	B	1	60	60	124	188	252
1	8	B	2	61	61	125	189	253
1	8	B	3	62	62	126	190	254
1	8	B	4	63	63	127	191	255
2	1	A	1	64	64	128	192	0
2	1	A	2	65	65	129	193	1
2	1	A	3	66	66	130	194	2
2	1	A	4	67	67	131	195	3
2	1	B	1	68	68	132	196	4
2	1	B	2	69	69	133	197	5
2	1	B	3	70	70	134	198	6
2	1	B	4	71	71	135	199	7
2	2	A	1	72	72	136	200	8
2	2	A	2	73	73	137	201	9
2	2	A	3	74	74	138	202	10
2	2	A	4	75	75	139	203	11
2	2	B	1	76	76	140	204	12
2	2	B	2	77	77	141	205	13
2	2	B	3	78	78	142	206	14
2	2	B	4	79	79	143	207	15
2	3	A	1	80	80	144	208	16
2	3	A	2	81	81	145	209	17
2	3	A	3	82	82	146	210	18
2	3	A	4	83	83	147	211	19
2	3	B	1	84	84	148	212	20
2	3	B	2	85	85	149	213	21
2	3	B	3	86	86	150	214	22
2	3	B	4	87	87	151	215	23
2	4	A	1	88	88	152	216	24
2	4	A	2	89	89	153	217	25

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
2	4	A	3	90	90	154	218	26
2	4	A	4	91	91	155	219	27
2	4	B	1	92	92	156	220	28
2	4	B	2	93	93	157	221	29
2	4	B	3	94	94	158	222	30
2	4	B	4	95	95	159	223	31
2	5	A	1	96	96	160	224	32
2	5	A	2	97	97	161	225	33
2	5	A	3	98	98	162	226	34
2	5	A	4	99	99	163	227	35
2	5	B	1	100	100	164	228	36
2	5	B	2	101	101	165	229	37
2	5	B	3	102	102	166	230	38
2	5	B	4	103	103	167	231	39
2	6	A	1	104	104	168	232	40
2	6	A	2	105	105	169	233	41
2	6	A	3	106	106	170	234	42
2	6	A	4	107	107	171	235	43
2	6	B	1	108	108	172	236	44
2	6	B	2	109	109	173	237	45
2	6	B	3	110	110	174	238	46
2	6	B	4	111	111	175	239	47
2	7	A	1	112	112	176	240	48
2	7	A	2	113	113	177	241	49
2	7	A	3	114	114	178	242	50
2	7	A	4	115	115	179	243	51
2	7	B	1	116	116	180	244	52
2	7	B	2	117	117	181	245	53
2	7	B	3	118	118	182	246	54
2	7	B	4	119	119	183	247	55
2	8	A	1	120	120	184	248	56
2	8	A	2	121	121	185	249	57

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
2	8	A	3	122	122	186	250	58
2	8	A	4	123	123	187	251	59
2	8	B	1	124	124	188	252	60
2	8	B	2	125	125	189	253	61
2	8	B	3	126	126	190	254	62
2	8	B	4	127	127	191	255	63
3	1	A	1	128	128	192	0	64
3	1	A	2	129	129	193	1	65
3	1	A	3	130	130	194	2	66
3	1	A	4	131	131	195	3	67
3	1	B	1	132	132	196	4	68
3	1	B	2	133	133	197	5	69
3	1	B	3	134	134	198	6	70
3	1	B	4	135	135	199	7	71
3	2	A	1	136	136	200	8	72
3	2	A	2	137	137	201	9	73
3	2	A	3	138	138	202	10	74
3	2	A	4	139	139	203	11	75
3	2	B	1	140	140	204	12	76
3	2	B	2	141	141	205	13	77
3	2	B	3	142	142	206	14	78
3	2	B	4	143	143	207	15	79
3	3	A	1	144	144	208	16	80
3	3	A	2	145	145	209	17	81
3	3	A	3	146	146	210	18	82
3	3	A	4	147	147	211	19	83
3	3	B	1	148	148	212	20	84
3	3	B	2	149	149	213	21	85
3	3	B	3	150	150	214	22	86
3	3	B	4	151	151	215	23	87
3	4	A	1	152	152	216	24	88
3	4	A	2	153	153	217	25	89

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
3	4	A	3	154	154	218	26	90
3	4	A	4	155	155	219	27	91
3	4	B	1	156	156	220	28	92
3	4	B	2	157	157	221	29	93
3	4	B	3	158	158	222	30	94
3	4	B	4	159	159	223	31	95
3	5	A	1	160	160	224	32	96
3	5	A	2	161	161	225	33	97
3	5	A	3	162	162	226	34	98
3	5	A	4	163	163	227	35	99
3	5	B	1	164	164	228	36	100
3	5	B	2	165	165	229	37	101
3	5	B	3	166	166	230	38	102
3	5	B	4	167	167	231	39	103
3	6	A	1	168	168	232	40	104
3	6	A	2	169	169	233	41	105
3	6	A	3	170	170	234	42	106
3	6	A	4	171	171	235	43	107
3	6	B	1	172	172	236	44	108
3	6	B	2	173	173	237	45	109
3	6	B	3	174	174	238	46	110
3	6	B	4	175	175	239	47	111
3	7	A	1	176	176	240	48	112
3	7	A	2	177	177	241	49	113
3	7	A	3	178	178	242	50	114
3	7	A	4	179	179	243	51	115
3	7	B	1	180	180	244	52	116
3	7	B	2	181	181	245	53	117
3	7	B	3	182	182	246	54	118
3	7	B	4	183	183	247	55	119
3	8	A	1	184	184	248	56	120
3	8	A	2	185	185	249	57	121

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
3	8	A	3	186	186	250	58	122
3	8	A	4	187	187	251	59	123
3	8	B	1	188	188	252	60	124
3	8	B	2	189	189	253	61	125
3	8	B	3	190	190	254	62	126
3	8	B	4	191	191	255	63	127
4	1	A	1	192	192	0	64	128
4	1	A	2	193	193	1	65	129
4	1	A	3	194	194	2	66	130
4	1	A	4	195	195	3	67	131
4	1	B	1	196	196	4	68	132
4	1	B	2	197	197	5	69	133
4	1	B	3	198	198	6	70	134
4	1	B	4	199	199	7	71	135
4	2	A	1	200	200	8	72	136
4	2	A	2	201	201	9	73	137
4	2	A	3	202	202	10	74	138
4	2	A	4	203	203	11	75	139
4	2	B	1	204	204	12	76	140
4	2	B	2	205	205	13	77	141
4	2	B	3	206	206	14	78	142
4	2	B	4	207	207	15	79	143
4	3	A	1	208	208	16	80	144
4	3	A	2	209	209	17	81	145
4	3	A	3	210	210	18	82	146
4	3	A	4	211	211	19	83	147
4	3	B	1	212	212	20	84	148
4	3	B	2	213	213	21	85	149
4	3	B	3	214	214	22	86	150
4	3	B	4	215	215	23	87	151
4	4	A	1	216	216	24	88	152
4	4	A	2	217	217	25	89	153

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
4	4	A	3	218	218	26	90	154
4	4	A	4	219	219	27	91	155
4	4	B	1	220	220	28	92	156
4	4	B	2	221	221	29	93	157
4	4	B	3	222	222	30	94	158
4	4	B	4	223	223	31	95	159
4	5	A	1	224	224	32	96	160
4	5	A	2	225	225	33	97	161
4	5	A	3	226	226	34	98	162
4	5	A	4	227	227	35	99	163
4	5	B	1	228	228	36	100	164
4	5	B	2	229	229	37	101	165
4	5	B	3	230	230	38	102	166
4	5	B	4	231	231	39	103	167
4	6	A	1	232	232	40	104	168
4	6	A	2	233	233	41	105	169
4	6	A	3	234	234	42	106	170
4	6	A	4	235	235	43	107	171
4	6	B	1	236	236	44	108	172
4	6	B	2	237	237	45	109	173
4	6	B	3	238	238	46	110	174
4	6	B	4	239	239	47	111	175
4	7	A	1	240	240	48	112	176
4	7	A	2	241	241	49	113	177
4	7	A	3	242	242	50	114	178
4	7	A	4	243	243	51	115	179
4	7	B	1	244	244	52	116	180
4	7	B	2	245	245	53	117	181
4	7	B	3	246	246	54	118	182
4	7	B	4	247	247	55	119	183
4	8	A	1	248	248	56	120	184
4	8	A	2	249	249	57	121	185

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
4	8	A	3	250	250	58	122	186
4	8	A	4	251	251	59	123	187
4	8	B	1	252	252	60	124	188
4	8	B	2	253	253	61	125	189
4	8	B	3	254	254	62	126	190
4	8	B	4	255	255	63	127	191
5	1	A	1	256	0	64	128	192
5	1	A	2	257	1	65	129	193
5	1	A	3	258	2	66	130	194
5	1	A	4	259	3	67	131	195
5	1	B	1	260	4	68	132	196
5	1	B	2	261	5	69	133	197
5	1	B	3	262	6	70	134	198
5	1	B	4	263	7	71	135	199
5	2	A	1	264	8	72	136	200
5	2	A	2	265	9	73	137	201
5	2	A	3	266	10	74	138	202
5	2	A	4	267	11	75	139	203
5	2	B	1	268	12	76	140	204
5	2	B	2	269	13	77	141	205
5	2	B	3	270	14	78	142	206
5	2	B	4	271	15	79	143	207
5	3	A	1	272	16	80	144	208
5	3	A	2	273	17	81	145	209
5	3	A	3	274	18	82	146	210
5	3	A	4	275	19	83	147	211
5	3	B	1	276	20	84	148	212
5	3	B	2	277	21	85	149	213
5	3	B	3	278	22	86	150	214
5	3	B	4	279	23	87	151	215
5	4	A	1	280	24	88	152	216
5	4	A	2	281	25	89	153	217

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
5	4	A	3	282	26	90	154	218
5	4	A	4	283	27	91	155	219
5	4	B	1	284	28	92	156	220
5	4	B	2	285	29	93	157	221
5	4	B	3	286	30	94	158	222
5	4	B	4	287	31	95	159	223
5	5	A	1	288	32	96	160	224
5	5	A	2	289	33	97	161	225
5	5	A	3	290	34	98	162	226
5	5	A	4	291	35	99	163	227
5	5	B	1	292	36	100	164	228
5	5	B	2	293	37	101	165	229
5	5	B	3	294	38	102	166	230
5	5	B	4	295	39	103	167	231
5	6	A	1	296	40	104	168	232
5	6	A	2	297	41	105	169	233
5	6	A	3	298	42	106	170	234
5	6	A	4	299	43	107	171	235
5	6	B	1	300	44	108	172	236
5	6	B	2	301	45	109	173	237
5	6	B	3	302	46	110	174	238
5	6	B	4	303	47	111	175	239
5	7	A	1	304	48	112	176	240
5	7	A	2	305	49	113	177	241
5	7	A	3	306	50	114	178	242
5	7	A	4	307	51	115	179	243
5	7	B	1	308	52	116	180	244
5	7	B	2	309	53	117	181	245
5	7	B	3	310	54	118	182	246
5	7	B	4	311	55	119	183	247
5	8	A	1	312	56	120	184	248
5	8	A	2	313	57	121	185	249

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
5	8	A	3	314	58	122	186	250
5	8	A	4	315	59	123	187	251
5	8	B	1	316	60	124	188	252
5	8	B	2	317	61	125	189	253
5	8	B	3	318	62	126	190	254
5	8	B	4	319	63	127	191	255
6	1	A	1	320	64	128	192	0
6	1	A	2	321	65	129	193	1
6	1	A	3	322	66	130	194	2
6	1	A	4	323	67	131	195	3
6	1	B	1	324	68	132	196	4
6	1	B	2	325	69	133	197	5
6	1	B	3	326	70	134	198	6
6	1	B	4	327	71	135	199	7
6	2	A	1	328	72	136	200	8
6	2	A	2	329	73	137	201	9
6	2	A	3	330	74	138	202	10
6	2	A	4	331	75	139	203	11
6	2	B	1	332	76	140	204	12
6	2	B	2	333	77	141	205	13
6	2	B	3	334	78	142	206	14
6	2	B	4	335	79	143	207	15
6	3	A	1	336	80	144	208	16
6	3	A	2	337	81	145	209	17
6	3	A	3	338	82	146	210	18
6	3	A	4	339	83	147	211	19
6	3	B	1	340	84	148	212	20
6	3	B	2	341	85	149	213	21
6	3	B	3	342	86	150	214	22
6	3	B	4	343	87	151	215	23
6	4	A	1	344	88	152	216	24
6	4	A	2	345	89	153	217	25

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
6	4	A	3	346	90	154	218	26
6	4	A	4	347	91	155	219	27
6	4	B	1	348	92	156	220	28
6	4	B	2	349	93	157	221	29
6	4	B	3	350	94	158	222	30
6	4	B	4	351	95	159	223	31
6	5	A	1	352	96	160	224	32
6	5	A	2	353	97	161	225	33
6	5	A	3	354	98	162	226	34
6	5	A	4	355	99	163	227	35
6	5	B	1	356	100	164	228	36
6	5	B	2	357	101	165	229	37
6	5	B	3	358	102	166	230	38
6	5	B	4	359	103	167	231	39
6	6	A	1	360	104	168	232	40
6	6	A	2	361	105	169	233	41
6	6	A	3	362	106	170	234	42
6	6	A	4	363	107	171	235	43
6	6	B	1	364	108	172	236	44
6	6	B	2	365	109	173	237	45
6	6	B	3	366	110	174	238	46
6	6	B	4	367	111	175	239	47
6	7	A	1	368	112	176	240	48
6	7	A	2	369	113	177	241	49
6	7	A	3	370	114	178	242	50
6	7	A	4	371	115	179	243	51
6	7	B	1	372	116	180	244	52
6	7	B	2	373	117	181	245	53
6	7	B	3	374	118	182	246	54
6	7	B	4	375	119	183	247	55
6	8	A	1	376	120	184	248	56
6	8	A	2	377	121	185	249	57

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
6	8	A	3	378	122	186	250	58
6	8	A	4	379	123	187	251	59
6	8	B	1	380	124	188	252	60
6	8	B	2	381	125	189	253	61
6	8	B	3	382	126	190	254	62
6	8	B	4	383	127	191	255	63
7	1	A	1	384	128	192	0	64
7	1	A	2	385	129	193	1	65
7	1	A	3	386	130	194	2	66
7	1	A	4	387	131	195	3	67
7	1	B	1	388	132	196	4	68
7	1	B	2	389	133	197	5	69
7	1	B	3	390	134	198	6	70
7	1	B	4	391	135	199	7	71
7	2	A	1	392	136	200	8	72
7	2	A	2	393	137	201	9	73
7	2	A	3	394	138	202	10	74
7	2	A	4	395	139	203	11	75
7	2	B	1	396	140	204	12	76
7	2	B	2	397	141	205	13	77
7	2	B	3	398	142	206	14	78
7	2	B	4	399	143	207	15	79
7	3	A	1	400	144	208	16	80
7	3	A	2	401	145	209	17	81
7	3	A	3	402	146	210	18	82
7	3	A	4	403	147	211	19	83
7	3	B	1	404	148	212	20	84
7	3	B	2	405	149	213	21	85
7	3	B	3	406	150	214	22	86
7	3	B	4	407	151	215	23	87
7	4	A	1	408	152	216	24	88
7	4	A	2	409	153	217	25	89

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
7	4	A	3	410	154	218	26	90
7	4	A	4	411	155	219	27	91
7	4	B	1	412	156	220	28	92
7	4	B	2	413	157	221	29	93
7	4	B	3	414	158	222	30	94
7	4	B	4	415	159	223	31	95
7	5	A	1	416	160	224	32	96
7	5	A	2	417	161	225	33	97
7	5	A	3	418	162	226	34	98
7	5	A	4	419	163	227	35	99
7	5	B	1	420	164	228	36	100
7	5	B	2	421	165	229	37	101
7	5	B	3	422	166	230	38	102
7	5	B	4	423	167	231	39	103
7	6	A	1	424	168	232	40	104
7	6	A	2	425	169	233	41	105
7	6	A	3	426	170	234	42	106
7	6	A	4	427	171	235	43	107
7	6	B	1	428	172	236	44	108
7	6	B	2	429	173	237	45	109
7	6	B	3	430	174	238	46	110
7	6	B	4	431	175	239	47	111
7	7	A	1	432	176	240	48	112
7	7	A	2	433	177	241	49	113
7	7	A	3	434	178	242	50	114
7	7	A	4	435	179	243	51	115
7	7	B	1	436	180	244	52	116
7	7	B	2	437	181	245	53	117
7	7	B	3	438	182	246	54	118
7	7	B	4	439	183	247	55	119
7	8	A	1	440	184	248	56	120
7	8	A	2	441	185	249	57	121

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
7	8	A	3	442	186	250	58	122
7	8	A	4	443	187	251	59	123
7	8	B	1	444	188	252	60	124
7	8	B	2	445	189	253	61	125
7	8	B	3	446	190	254	62	126
7	8	B	4	447	191	255	63	127
8	1	A	1	448	192	0	64	128
8	1	A	2	449	193	1	65	129
8	1	A	3	450	194	2	66	130
8	1	A	4	451	195	3	67	131
8	1	B	1	452	196	4	68	132
8	1	B	2	453	197	5	69	133
8	1	B	3	454	198	6	70	134
8	1	B	4	455	199	7	71	135
8	2	A	1	456	200	8	72	136
8	2	A	2	457	201	9	73	137
8	2	A	3	458	202	10	74	138
8	2	A	4	459	203	11	75	139
8	2	B	1	460	204	12	76	140
8	2	B	2	461	205	13	77	141
8	2	B	3	462	206	14	78	142
8	2	B	4	463	207	15	79	143
8	3	A	1	464	208	16	80	144
8	3	A	2	465	209	17	81	145
8	3	A	3	466	210	18	82	146
8	3	A	4	467	211	19	83	147
8	3	B	1	468	212	20	84	148
8	3	B	2	469	213	21	85	149
8	3	B	3	470	214	22	86	150
8	3	B	4	471	215	23	87	151
8	4	A	1	472	216	24	88	152
8	4	A	2	473	217	25	89	153

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
8	4	A	3	474	218	26	90	154
8	4	A	4	475	219	27	91	155
8	4	B	1	476	220	28	92	156
8	4	B	2	477	221	29	93	157
8	4	B	3	478	222	30	94	158
8	4	B	4	479	223	31	95	159
8	5	A	1	480	224	32	96	160
8	5	A	2	481	225	33	97	161
8	5	A	3	482	226	34	98	162
8	5	A	4	483	227	35	99	163
8	5	B	1	484	228	36	100	164
8	5	B	2	485	229	37	101	165
8	5	B	3	486	230	38	102	166
8	5	B	4	487	231	39	103	167
8	6	A	1	488	232	40	104	168
8	6	A	2	489	233	41	105	169
8	6	A	3	490	234	42	106	170
8	6	A	4	491	235	43	107	171
8	6	B	1	492	236	44	108	172
8	6	B	2	493	237	45	109	173
8	6	B	3	494	238	46	110	174
8	6	B	4	495	239	47	111	175
8	7	A	1	496	240	48	112	176
8	7	A	2	497	241	49	113	177
8	7	A	3	498	242	50	114	178
8	7	A	4	499	243	51	115	179
8	7	B	1	500	244	52	116	180
8	7	B	2	501	245	53	117	181
8	7	B	3	502	246	54	118	182
8	7	B	4	503	247	55	119	183
8	8	A	1	504	248	56	120	184
8	8	A	2	505	249	57	121	185

Shelf No	Card No	Connector	Pair	RFP	RPN	repeater 1	repeater 2	repeater 3
8	8	A	3	506	250	58	122	186
8	8	A	4	507	251	59	123	187
8	8	B	1	508	252	60	124	188
8	8	B	2	509	253	61	125	189
8	8	B	3	510	254	62	126	190
8	8	B	4	511	255	63	127	191

Chapter 8: Tracing Communication

The trace features of the Spectralink DECT Server 8000 and Spectralink DECT Server 2500 are particularly useful when testing a new installation, for finding errors and for documenting scenarios.

Tracing

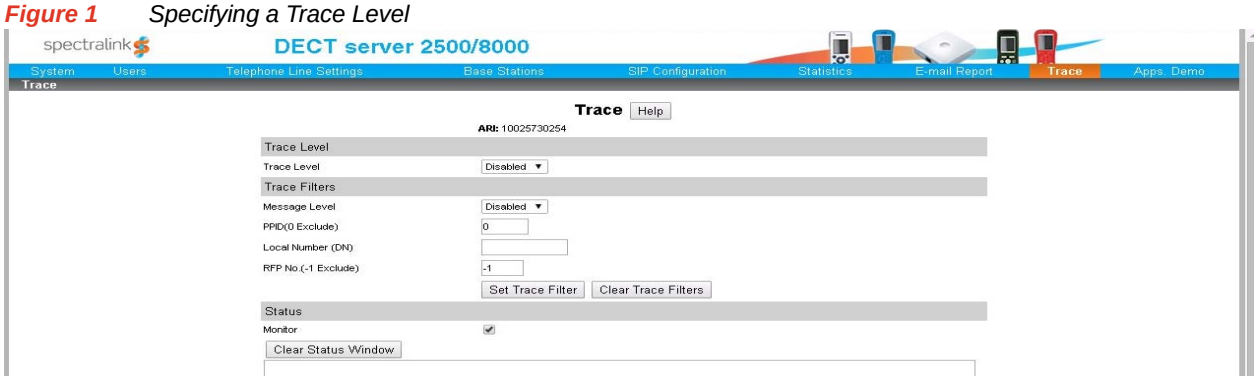
The trace tab displays tracing information according to the settings you have specified on the Trace menu.

To limit the amount of information that is displayed, you can specify a trace level.

To Specify a Trace Level

a On the **Trace** menu, go to **Trace Level**, and the select the preferred level.

Figure 1 *Specifying a Trace Level*



The following options are displayed:

Table 1 *Trace Levels*

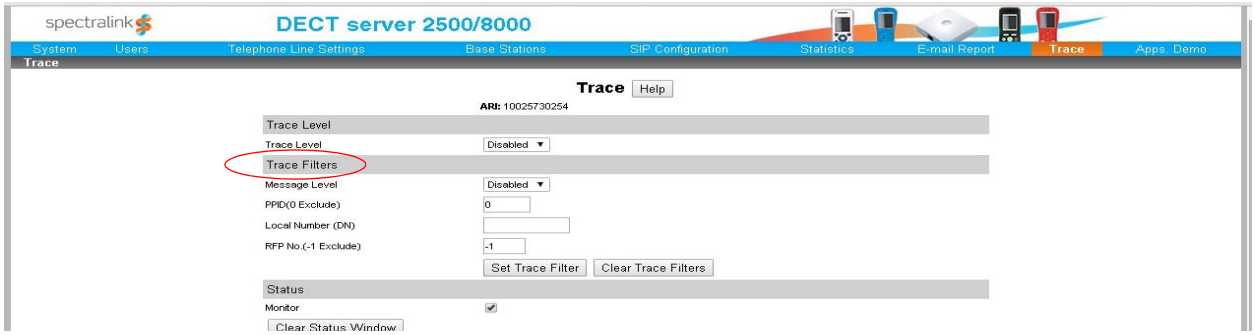
Trace level	Description
Disabled	Displays no trace messages.
Level 1	Displays subscription and location registration information.
Level 2	Displays subscription, location registration, abnormal calls, and messaging information.
Level 3	Displays subscription, location registration, abnormal calls, messaging, and normal voice information.
Level 4	Displays information related to SIP communication (for SIP users only).

To further limit the amount of information that is displayed, you can set a trace filter.

To Specify a Trace Filter

1 On the **Trace** menu, go to **Trace Filters** and in the **Message Level** list, select the trace level on which you want to add a trace.

Figure 2 *Specifying Trace Filters*



2 To include a specific PPID in the filter, select the number from the **PPID** list, otherwise select **0 Exclude**.

3 To include a specific local number in the filter, type the number in the **Local Number** field.

4 To include a specific RFP number in the filter, select the preferred number from the **RFP Number** list, otherwise select **-1 Exclude**.

5 When you have defined all your filter preferences, click the **Set Trace Filter** button.

The results that are displayed on the Trace tab are now based both on the trace level and the trace filter you have specified.

You can apply more than one filter at a time. When you want to apply another filter, simply go through steps 1-5 again.

To Clear All Filters

a From the **Trace** menu, click the **Clear Trace Filters** button.

Trace Monitor

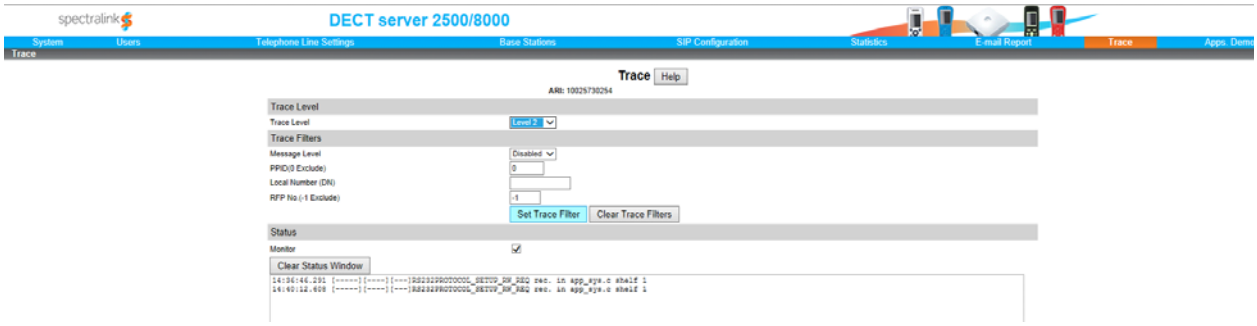
The trace monitor displays information about the host and Spectralink DECT Server 8000 or Spectralink DECT Server 2500 connection.

To View Trace Monitor Information

1 On the **Trace** menu, select a **Trace Level.**

2 Select the status **Monitor** check-box. The information is displayed in the status window.

Figure 3 *Viewing Serial Monitor Information*



3 Select **Clear Status Window** to remove the information.

To View or Configure Trace Mode Command Interpreter

4 On the **Trace** menu, type in the **Command** field the syntax corresponding to the command you want to view or configure (e.g. Trace (log) =T, Debug=D, Messaging=M, etc.).

5 Click **Send** to view the selected information. The information is displayed in the status window.

6 Click **Clear Status Window** to remove the information.

Appendix B: Updating Software Manually

The following procedure describes how you update the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 software manually if the default update procedure fails.

Prerequisites.

- Spectralink serial cable.
- PC with HyperTerminal installed.

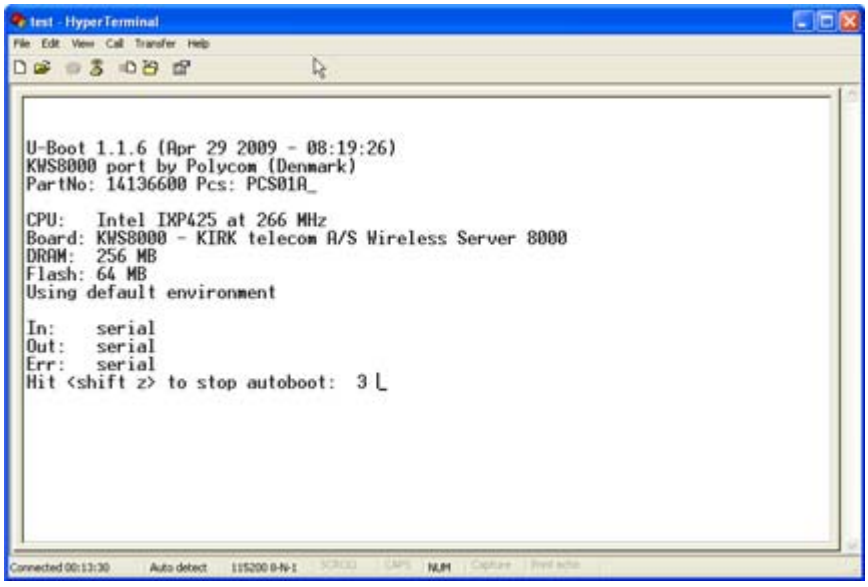
To Update Software Manually

1 Set the HyperTerminal to 115200, 8 data, no parity, 1 stop bit and no flow control.

2 Select a free com port, and then connect the Spectralink serial cable between the com port on the pc and the serial port on the Spectralink DECT Server 8000 or Spectralink DECT Server 2500.

3 Power on the Spectralink DECT Server 8000 or Spectralink DECT Server 2500 system. The following the terminal window is displayed.

Figure A *HyperTerminal Window*



4 Hold down the **Shift** key and then press the **Z** key. A command prompt is displayed.
In the prompt type **loadb** and then press **Enter**. The following text is displayed in the command prompt.
Ready for binary (kermit) download to 0x00010000 at 115200 bps...

5 From the **Transfer** menu, select **Send File**.

6 Select the uimage file you want to download, in the protocol item select **Kermit**, and then click the **Send** button.The following text is displayed on completion. Note that

```
## Total Size      = 0x00231708 = 2299656 Bytes
## Start Addr      = 0x00010000
Note the Total Size may vary from uimage to uimage.
```

Note The Total Size may vary from uimage to uimage. 0x00231708 is an example. You must always use the correct image size.

7 Type **protect off 1:1-63** and then press **Enter**. The following text is displayed on completion.

```
Un-Protect Flash Sectors 1-63 in Bank # 1
```

8 Type **erase 1:1-63**, and then press enter. The following text is displayed completion.

```
Erase Flash Sectors 1-63 in Bank # 1
..................................................................... done
```

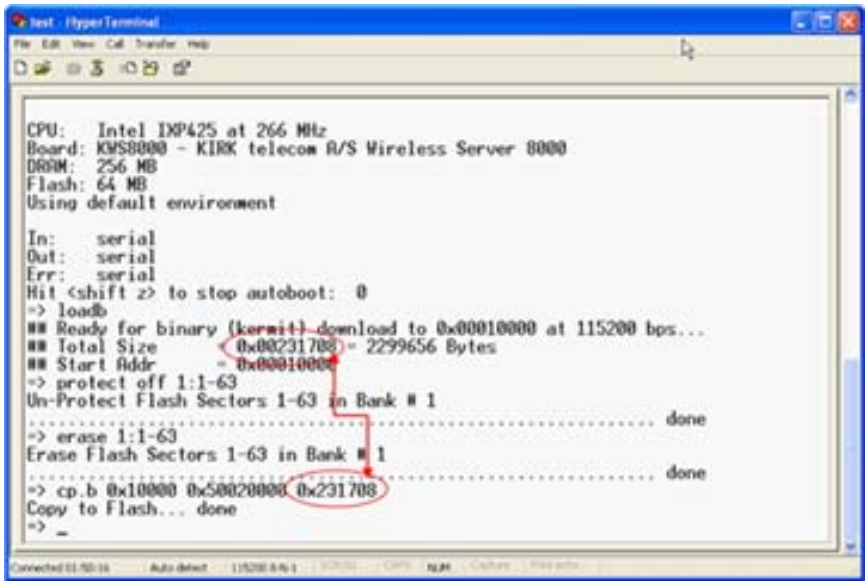
9 Type **cp.b 0x10000 (Start Addr) 0x50020000 <Total Size>** where the last number must be the TotalSize of the uimage (in this example `0x231708`). All numbers are in hexadecimal.

10 Press **Enter**. The following text is displayed on completion.

```
Copy to Flash... done
```

11 Type **boot** and then press Enter. The system restarts.

Figure B *Hyper Terminal Example*



Tables

Figures