

Edition 1, SW Release 3.1.7 and higher, July 2006

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Manual I: see Installation Guide

Step-by-step guide to install and configure Quadro.

Manual II: Administrator's Guide

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About this Administrator's Guide

The Quadro Manual is divided into three parts:

- **Manual I: Installation Guide** gives step-by-step instructions to provision the QuadroFXO and configure the phone extensions with the Epygi SIP Server. After successfully configuring the QuadroFXO, users will be able to make SIP phone calls to remote Quadro devices, make local calls to the PSTN and access the Internet from devices connected to the LAN.
- **Manual II: Administrator's Guide** explains all Quadro management menus available for extension users. A list of all call codes can be found there, too.

This guide contains many example screen illustrations. Since Quadro IP PBXs offer a wide variety of features and functionality, the example screens shown may not appear exactly the same for your particular Quadro IP PBX as they appear in this manual. The example screens are for illustrative and explanatory purposes, and should not be construed to represent your own unique environment.

[Quadro's Graphical Interface](#) describes the Quadro's graphical user interface and explains all recurrent buttons.

[Administrator's Menus](#) explains the Administrator's management pages according to the menu structure shown on the main page of the Quadro management.

[Error! Reference source not found.](#) explains some input-options for administrators only that may be selected from the extension user's main page.

[Appendix: System Default Values](#) lists all factory defaults.

[Appendix: Software License Agreement](#) includes the contract for using Quadro's hardware and software.

Quadro's Graphical Interface

Administrator's Main Page

When the administrator logs in, the **Quadro Management** page is displayed with a table of active calls (including information about call peers, call duration and start time) at the startup. Here the administrator may access the following settings and perform the actions:

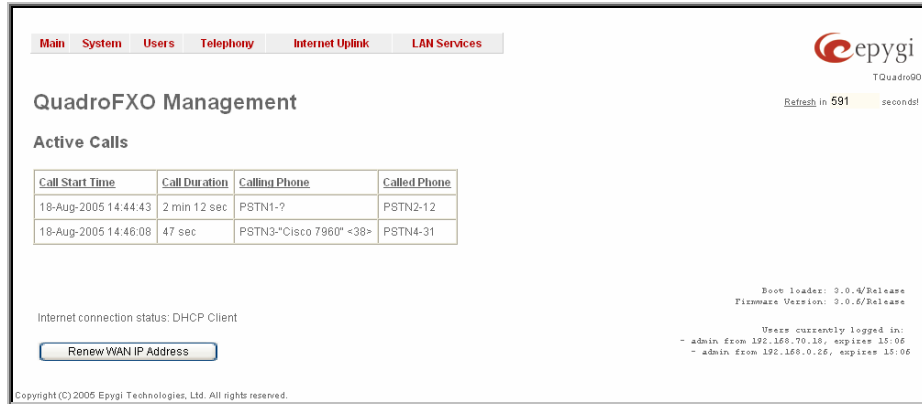


Fig. II-1: QuadroFXO Management

System Menu

- [System Configuration Wizard](#)
- [Internet Configuration Wizard](#)
- [Status](#)
- [IP Routing Configuration](#)
- [Events](#)
- [Time/Date Settings](#)
- [Mail Settings](#)
- [Firmware Update](#)
- [Networking Tools](#)
- [Diagnostics](#)
- [Automatic Provisioning](#)
- [Upload Language Pack](#)
- [User Rights Management](#)

Telephony Menu

- [Call Statistics](#)
- [SIP Settings](#)
- [RTP Settings](#)
- [NAT Traversal Settings](#)
- [FXO Settings](#)
- [Gain Control](#)
- [Call Routing](#)
- [VoIP Carrier Wizard](#)
- [RADIUS Client Settings](#)
- [Dial Plan Settings](#)

Internet Uplink Menu

- [PPP/ PPTP Settings](#)
- [Firewall and NAT](#)
- [Filtering Rules](#)

LAN Services Menu

- [DNS Settings](#)
- [DHCP Settings for the LAN Interface](#)

Users Menu

- [Extensions Management](#)

[Registration Form](#)
(in menu tree only)

[Logout](#)

The functional button **Renew Wan IP Address** appears on the administrator's main **Quadro Management** page if the Quadro device acts as a DHCP client. The **Renew WAN IP Address** button is used to obtain a new WAN IP address in case, e.g., the Quadro moves to another network.

The functional button **Establish Your Internet Connection Now** respectively **Terminate Your Internet Connection Now** occurs on the Quadro Management page if PPPoE is used as WAN interface protocol.



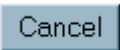
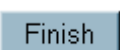
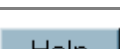

The link **Please Check Your Pending Events** will be displayed on the administrator **Main Menu** page if new system events exist. The link leads to the **Events** page that can be also accessed from the System menu.





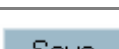

The list of **Users currently logged into the system** is seen in the lower right corner of the Administrator's Main Menu. Information about IP address user accessed Quadro GUI from, the username user is logged in and the time until the next automatically logout is provided herein. The current version of the Quadro's firmware and of its boot loader is also available here. The idle session timeout is set to 20 minutes. If no action is performed during that time, user will be automatically moved to the Login page and will be requested to login again.

The link **Refresh in** occurs in the upper right corner beside the field displaying the number of seconds until the next refresh and is used to perform a manual reload of the page. If a page with a Refresh counter is left opened, the session time-out counter will be updated periodically and the logout timeout will never expire.

Recurrent Buttons

Throughout this guide, you will see a variety of recurrent buttons. Below is a description of these buttons.

Button	Description
	This button leads back to the previous page of a fixed sequence of pages (used mainly in wizards).
	This button leads forward to the next page of a fixed sequence of pages (used mainly in wizards).
	This button discards the latest not yet confirmed entries.
	This is the last button of a fixed sequence of pages that completes and saves the entries of an entire sequence.
	This button opens the help page belonging to the currently active Quadro management page.
	This button opens a window where the last inserted IP addresses are listed. It allows the user to make a quick selection of an IP address that has been previously used. This will avoid the user needing type it again. The clipboard can hold up to 10 IP addresses and a new IP address will replace the oldest one from the list.

Button	Description
	This button returns you to the page you were previously on.
	This button confirms an operation you started before.
	This button confirms an operation you chose before.
	This button discards an operation you chose before.
	This button saves the settings modified on the currently active management page.
	This button opens a window where the last inserted SIP addresses are listed. It allows the user to make a quick selection of an IP address that has been previously used. This will avoid the user needing type it again. The clipboard can hold up to 10 SIP addresses and a new SIP address will replace the oldest one from the list.

Recurrent Functional Buttons

In connection with the tables, the following are the few buttons you will see:

Functional Button	Description
<u>Add</u>	Allows adding a new record to the displayed table. A new page will be displayed to enter any new settings.
<u>Edit</u>	Allows modifying the settings of the record selected by a checkbox. Normally only one (1) record may be selected. A new page will be displayed to enter the modified settings.
<u>Delete</u>	Deletes the selected entry(s) of a table. A warning message will ask for confirmation before deleting an existing entry.
<u>Select All</u>	Selects all table entry(s) for example for further deletion.
<u>Inverse Selection</u>	Inverses (opposites) an existing selection of table entry(s). If no entries are selected, clicking the button will select all records.
<u>Refresh in...</u>	May be shown in the upper right corner of a page. It displays the number of seconds remaining until the next refresh of the page will occur. It may be used to reload the page manually.

Most of the tables offer the option to sort the entries in ascending or descending order by clicking the headings of the columns. A small arrow next to the column heading indicates the direction of sorting - upward or downward. The entries of the table can be selected by using the corresponding checkboxes in order to edit or delete them.

Entering a SIP Addresses correctly

Calls over IP are implemented based on Session Initiating Protocol (SIP) on the Quadro. When making a call to a destination that is somewhere on the Internet, a SIP address must be provided.

SIP addresses needs to be specified in one of the following formats:

```

"display name" <username@ipaddress:port>
"display name" <username@ipaddress>
username@ipaddress:port
username@ipaddress
username
    
```

For your convenience, the following combinations can be used:

- *@ipaddress - any user from the specified SIP server
- username@* - a specified user from any SIP server
- *@* - any user from any SIP server

The display name and the port number are optional parameters in the SIP address. If a port is not specified, 5060 will be set up as the default one. The range of valid ports is between 1024 and 65536.

A flexible structure of wildcards is allowed. In comparison with a wildcard, the "?" character stands for only one unknown digit and the "*" character stands for any number of any digits.

Please Note: Wildcards are available for caller addresses only. No wildcard characters are allowed for called party addresses. Exceptions are addresses in **Supplementary Addresses** table that are used by **Outgoing Call Blocking** service. To use "*" and "?" themselves (as non wildcard characters), use "*" and "\?" correspondingly.

Administrator's Menus

System Menu



Fig. II-1: System Menu in Dynamo theme



Fig. II-2: System Menu in Plain theme

System Configuration Wizard

The **System Configuration Wizard** allows the administrator to define the Quadro's Local Area Network settings and to specify regional configuration settings to make Quadro operational in its LAN. The **System Configuration Wizard MUST be run upon Quadro's first startup** to make sure that it works properly in its network environment. The Wizard allows navigating through the following basic configuration parameters and settings:

- System Configuration (see below)
- [DHCP Settings for the LAN Interface](#)
- Regional Settings and Preferences (see below)

DHCP Settings for the LAN are described in the chapters below. The LAN configuration and regional settings will be described later in this chapter.

Please Note: It is strongly recommended to leave the factory default settings if their meanings are not fully clear to the administrator.

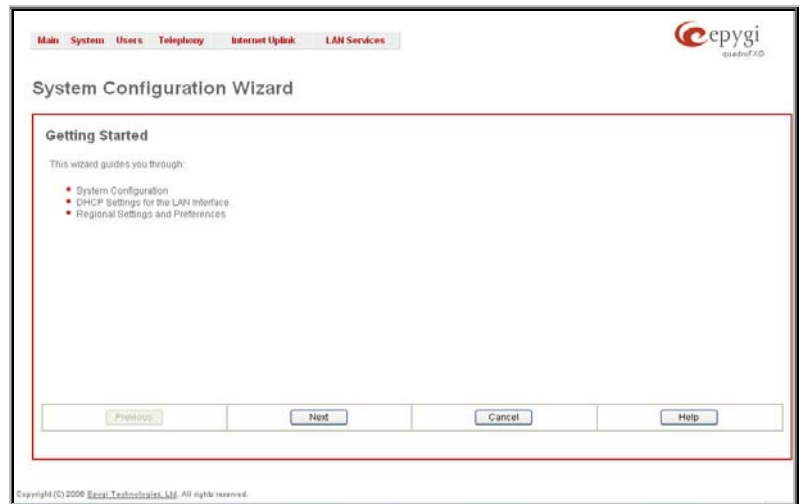


Fig. II-3: System Configuration Wizard - Start page

The **System Configuration** page contains the host name, IP address and Subnet Mask information about the Quadro LAN interface. These settings make Quadro available to the internal network.

The **System Configuration** page offers the following input options:

- Host Name** requires a host name for the Quadro device.
- IP Address** requires the Quadro host address for the LAN interface.
- Subnet Mask** requires the Quadro hosts' Subnet Mask.

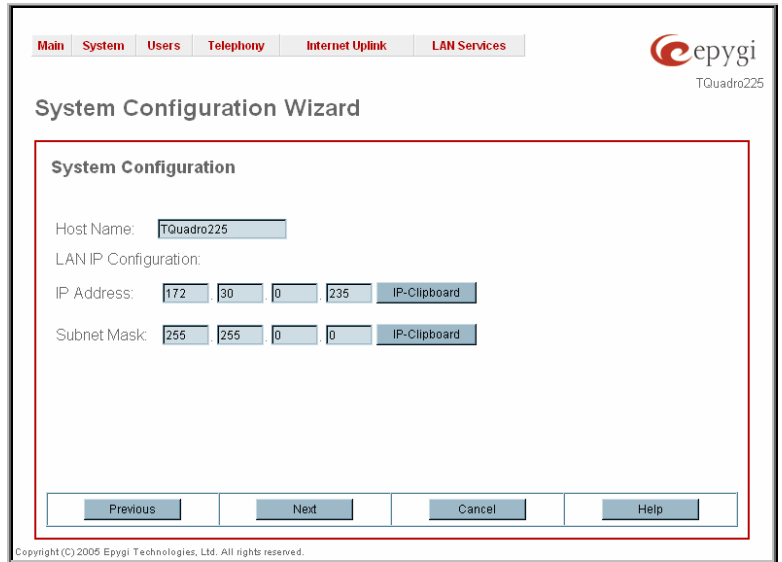


Fig. II-4: System Configuration Wizard - System Configuration page

The **Regional Settings and Preferences** are used to select settings specific to the location of the Quadro. This is important for the functionality of the voice subsystem.

The **Regional Settings and Preferences** page has two drop down lists to select the **Location** (country) and a corresponding **Timezone**. This page also has a manipulation radio button group to choose:

- **System Language** – selection is available only when the custom Language Pack has been uploaded and it is used to enable custom language for system voice messages or returning back to the default language English.
- **GUI Theme** - selection used to select the GUI theme style of the web based configuration pages.

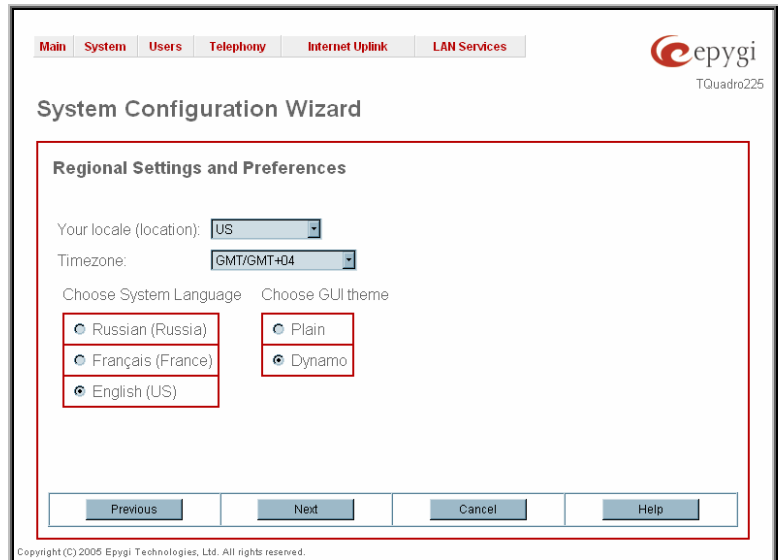


Fig. II-5: System Configuration Wizard - Regional Settings page

Internet Configuration Wizard

The **Internet Configuration Wizard** allows the administrator to configure the WAN interface settings and to adjust Quadro's connectivity with an external network. The **Internet Configuration Wizard MUST be run for Quadro to be connected to the Internet.**

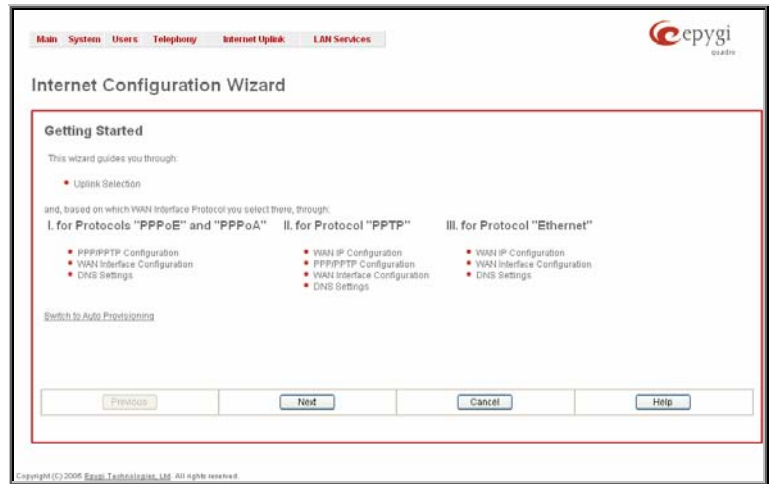


Fig. II-6: Internet Configuration Wizard - Start page

All the settings of the **Internet Configuration Wizard** are described in the chapters below except those for the IP settings, which will be described in this chapter.

Please Note: It is strongly recommended not to change the factory default settings if their meanings are not fully clear to an administrator.

The Wizard allows navigating through the following basic configuration parameters and settings:

- Uplink configuration (see below)

For WAN Interface protocol **PPPoE**, **PPPoA**, **1483B** and **1483R**:

- [PPP/ PPTP Settings](#)
- WAN Interface Configuration (see below)
- [DNS Settings](#)

For WAN Interface protocol **PPTP**:

- WAN IP Configuration (see below)
- [PPP/ PPTP Settings](#)
- WAN Interface Configuration (see below)
- [DNS Settings](#)

For WAN Interface protocol **Ethernet**:

- WAN IP Configuration
- WAN Interface Configuration (see below)
- [DNS Settings](#)

The **Switch to Auto Provisioning** link moves you to the [Automatic Provisioning](#) page where Quadro can be configured automatically.

The **Uplink Configuration** page allows you to select the Quadro's WAN interface connection type and its bandwidth settings. These settings will make Quadro available to the external network.

Depending on the Uplink Interface Protocol selection, the page following the **Uplink Configuration** page is different. Thus if **PPPoE** is selected, the next page will be **PPP Configuration**, while selecting **Ethernet** will bring up the **WAN IP Configuration** page.

The **Uplink Configuration** page offers the following components:

The **WAN Interface Protocol** radio buttons are used to choose the protocol depending on the requirements of the ISP (Internet Service Provider):

- PPPoE** - turns on the PPP over an Ethernet connection.
- PPTP** – turns on the Point to Point Tunneling Protocol (**PPTP**) interface used for the connection between Quadro and ADSL modem. A fixed IP address configuration is needed in this case.
- Ethernet** - turns on the Ethernet connection.

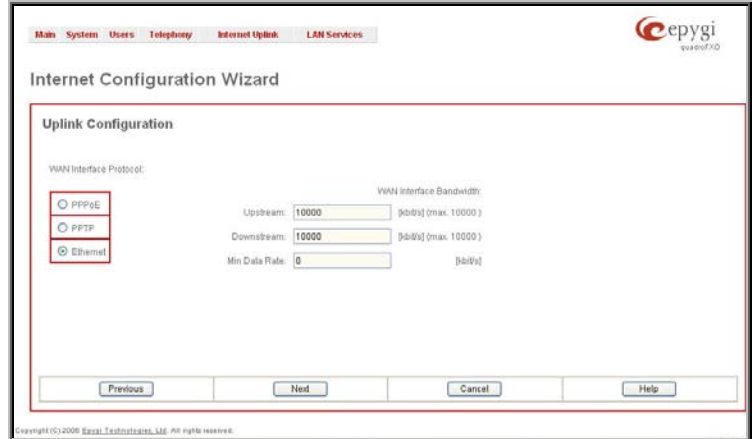


Fig. II-7: Internet Configuration Wizard - Uplink Configuration page

The **WAN Interface Bandwidth** settings allow the specification of the upstream and downstream speeds in kbit/s, helping to assure the quality of IP calls. An IP call loses the voice quality if there is no available bandwidth. When approaching the limits of bandwidth capacity, another IP call will be declined.

The bandwidth provided by the ISP has to be specified in the text fields **Upstream Speed** and **Downstream Speed**. The default entry in both fields is 10000, the maximum bandwidth of a 10 MB Ethernet. In most cases, providers offer a smaller bandwidth than 10000 kbit/s.

The bandwidth required by an IP call depends on the codecs used and these specifications are listed in the table below:

Required Bandwidth for Standard Packets:

Packet Size in msec.	Needed bandwidth in kbit/s using the Codecs:							
	G.711u/G.711a	G.726-16	G.726-24	G.726-32	G.726-40	G.729a	G.723	iLBC-13.33
10	105	58	66	74	82	50	-	-
20	84	37	45	53	61	29	-	-
30	76	30	38	45	53	22	21	27
40	74	27	34	42	50	19	-	-
50	71	25	32	40	48	17	-	-
60	67	22	30	37	45	15	13	20

The **Min Data Rate** text field requires the amount of upstream bandwidth that ought to remain for data applications even if voice applications use the entire available upstream bandwidth. The value selected here needs to be smaller than the upstream bandwidth and is measured in kbit/s.

The **WAN IP Configuration** page is only displayed if **Ethernet** or **PPTP** has been selected to be the uplink protocol. It offers the following components:

The **Assign automatically via DHCP** radio-button selection switches to automatic retrieval of the WAN IP address from a DHCP server at the ISP/uplink.

Please Note: DHCP referred to here is the one that runs on the provider's side and not the Quadro's personal DHCP server.

The **Assign Manually** radio-button switches to the manual adjustment of IP settings. This selection requests the following parameters:

IP Address requires the IP address for the Quadro WAN interface.

Subnet Mask requires the subnet mask for the Quadro device WAN interface.

Default Gateway requires the IP address of the router where all packets are to be sent to, for example, to the router of the provider.

The **WAN Interface Configuration** page may be used to modify the MAC address of the Quadro. This might be necessary if the ISP (Internet Service Provider) requires a specified MAC address, for example, for authentication. This page offers the following components:

MAC Address Assignment manipulation radio-buttons:

- **This Device** turns to the default MAC address of the Quadro.
- **User Defined** requires user defined MAC Address.

The **MTU** drop down list allows you to select the maximum packet size on the Ethernet (in bytes). MTU is used to fragment the packets before transmitting them to the network. The MTU preferred value is dependent on the Ethernet connection. The default MTU size is 1500 Bytes for Ethernet and 1400 Bytes for PPPoE.

Status

The system status window displays non-editable tables providing extensive system status information about Quadro: [General Information](#), [Network Status](#), [Lines Status](#), [Memory Status](#), [Hardware Status](#) and [SIP Registration Status](#). The links on this page lead to device Transfer Statistics, user mailboxes and supplementary services configuration pages.

The **System Status** page has several tables providing system information.

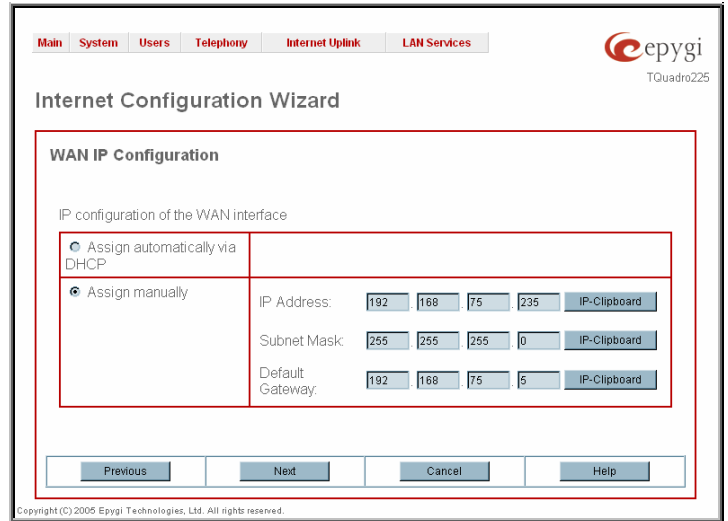


Fig. II-8: Internet Configuration Wizard - WAN IP Configuration page

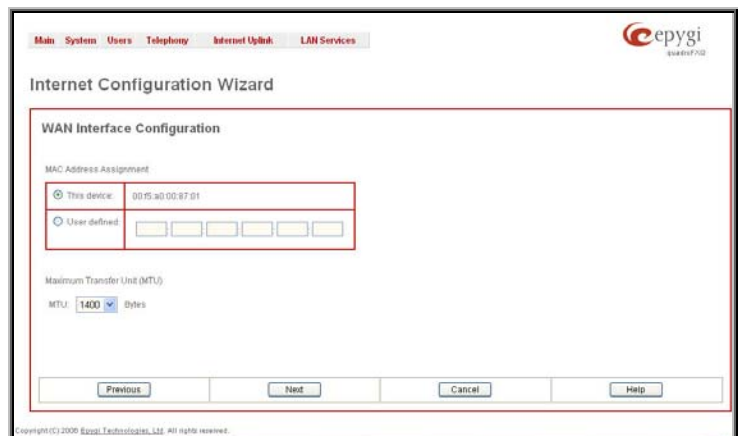


Fig. II-9: Internet Configuration Wizard - WAN MAC Address Configuration page

General Information

The **General Information** page includes the following information:

- **Uptime duration** - Period Quadro is on since last reboot.
- **Device hostname** - Quadro device host name.
- **Quadro Operating System** - Quadro operating system version.
- **Application Software** - Software and file system versions of the Quadro.
- **Boot Loader** - Quadro boot loader version.
- **DSP Software** - Quadro DSP software version and the date of build.
- **Preinstalled Languages** – this field is present only when multiple languages are preinstalled on the device and it indicates the system default languages.
- **Language Pack** – this field is present only when the custom language pack is uploaded and it indicates the version.



Fig. II-10: Quadro Status - General Information page

Network Status

The **Network Status** page includes the following information about **Interfaces**:

Interface Name lists the Network interfaces available on the Quadro (LAN and WAN).

IP Address lists the IP addresses corresponding to each network interface.

Subnet Mask lists the subnet masks corresponding to each network interface.

Properties will list the MAC address corresponding to each network interface on the Quadro.

Monitor includes links to survey LAN and WAN traffic correspondingly. The selection of these links will open a new window with a table of network traffic statistics on the following selected interfaces:

- Received Bytes
- Received Packets
- Received Errors
- Received Drop Errors
- Received Overrun Errors
- Received MultiCast Packets
- Transmitted Bytes
- Transmitted Packets
- Transmitted Errors
- Transmitted Drop Errors
- Transmitted Carrier Errors
- Transmitted Collisions

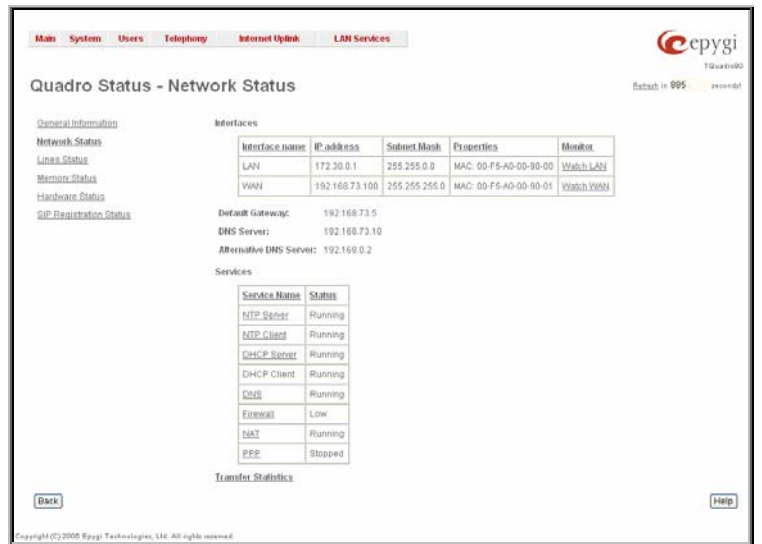


Fig. II-11: Quadro Status Network Status page

When opening the corresponding interface statistics window, no traffic values are displayed at first. After opening the window, the tables will serve as a counter and traffic statistics will be updated every minute.

DNS Server, Alternative DNS Server and Default Gateway - these display the Quadro settings corresponding to what has been configured with the [System Configuration Wizard](#).

Services (NTP Server and Client, DHCP Server and Client, DNS, Firewall, NAT, PPP) statuses: shows if they have **stopped** or if they are still **running**.

Transfer Statistics - link to the Transfer Statistics page.

The **Transfer Statistics** page shows a user-defined statistics table with the transmit/receive value (criteria), interface type and time period. It contains the following components:

Time range of statistic table - the drop down list includes the period (in days) statistics data that is to be collected and the corresponding diagram charts that are to be built.

Interface - the drop-down list offer the values:

- **WAN** - Wide Area Network (WAN) events only
- **LAN** - Local Area Network (LAN) events only

The area **Receive Values** provides the following:

- **Receive Bytes** - number of received bytes.
- **Receive Packets** - number of received Ethernet packets.
- **Receive Errors** - number of received packets containing errors.
- **Receive Drop Errors** - number of received packets that have been discarded.
- **Receive Overrun Errors** - number of received overrun errors that occur when the receive buffer is not large enough to hold all incoming packets. This error usually appears due to a slow receiving system.
- **Receive MultiCast Packets** - number of received broadcast packets.

The area **Transmit Values** provides the following:

- **Transmit Bytes** - number of transmitted bytes
- **Transmit Packets** - number of transmitted Ethernet packets.
- **Transmit Errors** - number of transmitted packets containing errors.
- **Transmit Drop Errors** - number of transmitted packets that have been discarded.
- **Transmit Carrier Errors** - number of transmit carrier errors that occur due to a defective or lost connection on the Ethernet link.
- **Transmit Collisions** - number of transfer errors that occurred during a simultaneous packet transmission from both sides.

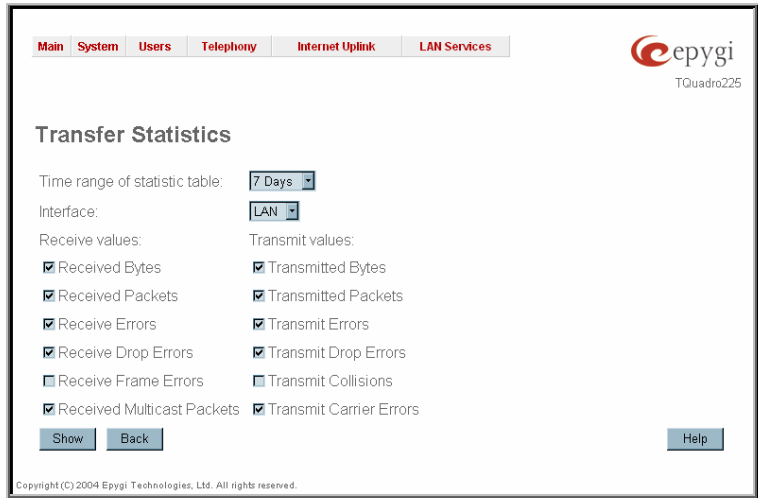


Fig. II-12: Transfer Statistics page

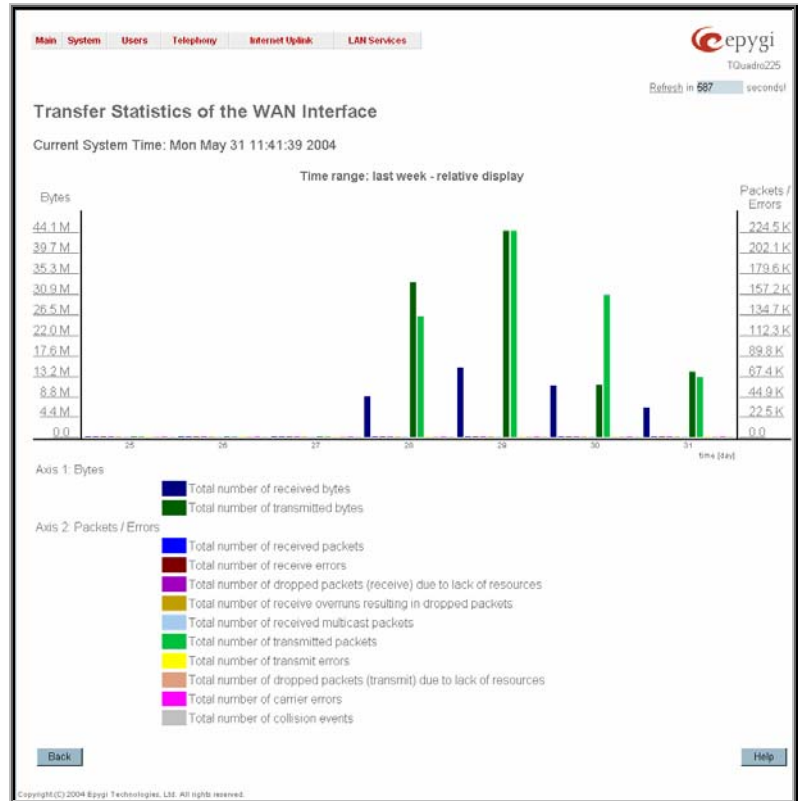


Fig. II-13: Transfer Statistics Diagram Chart

To see the **Transfer Statistics Diagram Charts**, select the desired criteria and click **Save** to generate the corresponding chart and the table showing the transfer statistics values (if enabled). The letters **M** (millions) and **K** (thousands) used in the legend of the displayed diagrams show the total number of specified criteria. The **Reset Statistics** button is used to reset the chart and the table (if enabled).

Lines Status

The **Quadro Status - Lines Status** page shows the current status of each FXO line with all details of the active calls. Since only one line of information can be displayed at a time, the **FXO#** functional buttons are used to navigate through information regarding other lines.

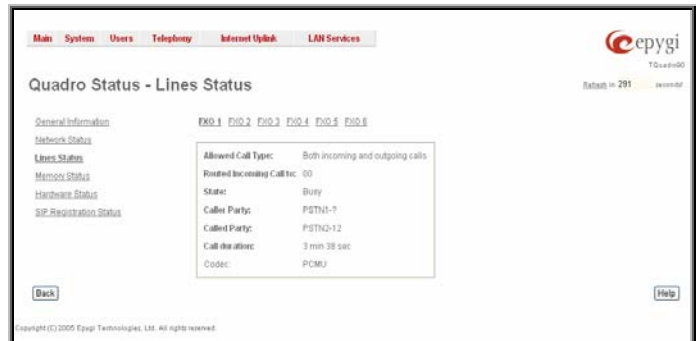


Fig. II-14: Line Status - FXO Status page

The **Lines Status** table of each **FXO Line** provides information about the **Allowed Call Types**, the extension number (attendant or routing client), to whom the **Incoming Call** is **Routed To** and the **State** of the line (**Free** or **Busy**).

Memory Status

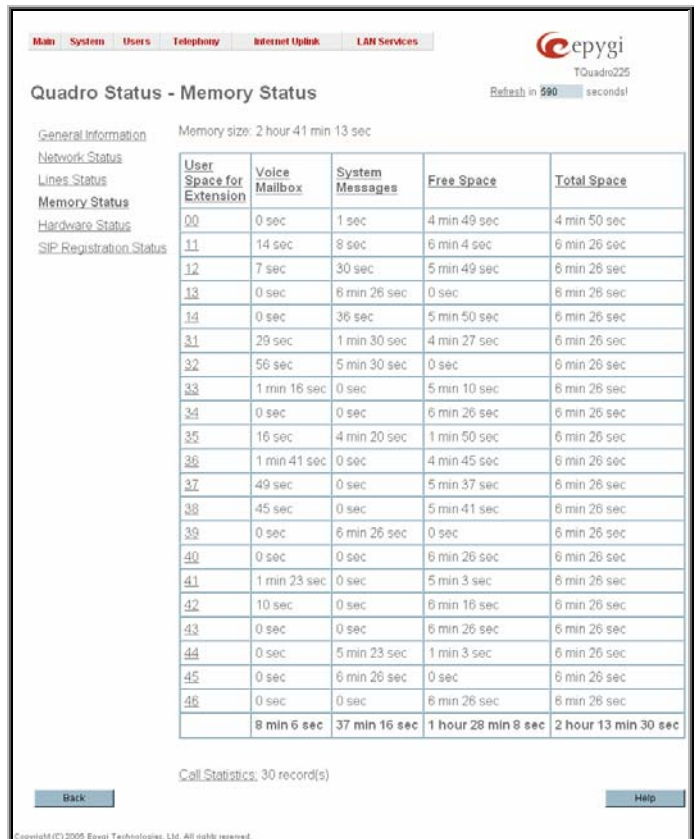


Fig. II-15: Memory Status page

The **Memory Status** page includes tables with the available **User Space** information for each extension. These tables display the space used by the voice mailbox and uploaded/recorded system greetings. It shows the free and total space (counted in minutes/seconds) for every extension. This page includes the following information:

Memory Size shows total memory space (counted in minutes/seconds) available on the Quadro and assigned to all extensions.

The table's links lead the administrator to the extension settings page where **User Space** may be altered.

Call Statistics shows the current number of calls with recorded statistic entries.

Hardware Status

The **Hardware Status** table displays a list of the hardware devices present and currently available on the Quadro board. The hardware device version number and additional comments about its state are indicated here.

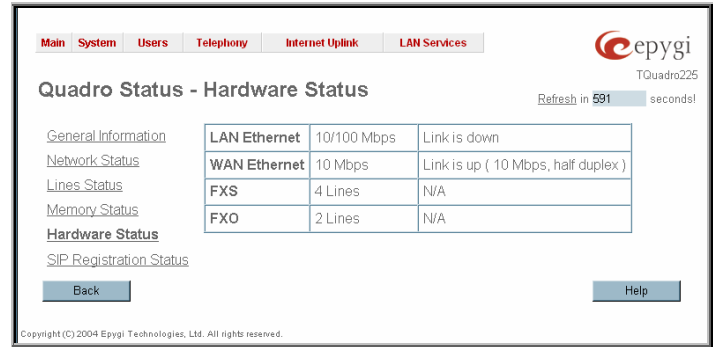


Fig. II-16: Hardware Status page

SIP Registration Status

The **SIP Registration Status** is a table displaying the SIP registration information of the Quadro extensions.

The table contains a list of all the registered extensions of Quadro, SIP registration name for each extension, addresses of SIP servers where they are registered (if applicable), whether or not it is registered for each extension, and the registration date and time. By clicking on the row heading, the table will be sorted by the selected column. When sorting (ascending or descending), arrows will be displayed next to the column heading.

The links inside the table will link you to the [Extensions Management](#) – Edit Entry page where the SIP registration settings may be altered.

The **Detected Connection Type** field displays the connection type Quadro currently is acting in (direct connection or behind NAT). If Quadro is acting behind NAT, the NAT machine IP address is also displayed.

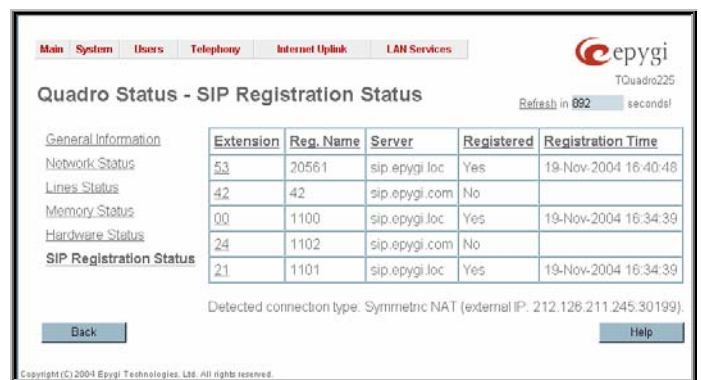


Fig. II-17: SIP Registration Status page

IP Routing Configuration

Routing is used to relay information across the Internet from a source to a destination. Along the way, at least one intermediate node is typically encountered. Routing is different than bridging. The main difference between bridging and routing is that bridging operates at the OSI Data Link Layer (Level Two Media Access Control Layer) and routing operates at OSI Network Layer (Level Three).

Quadro's **IP Routing** service allows you to route IP packets from one destination to another (or to a specified router) through Quadro.

The **IP Routing Configuration** page is used to make IP Static and IP Policy routes for IP packets routing. This page consists of two tables. Entries in the tables are color coded according to the state of the route. For example, yellow indicates disabled routes, green indicates successful routes and red indicates routes with an error.

IP Static Routes are used to forward IP packets from the Network, where the Quadro is connected, to the specified destination.

The **IP Static Routes** table displays all established IP static routes with their parameters: **Target State** for the state of the route (enabled or disabled), **Actual State** for the state of the route connection (up, down or erroneous), **Route To** for the subnet where the incoming packets should be routed to and **Via IP Address** for the router IP address where incoming packets should be routed through.

Add opens the **Add IP Static Route** page where a new static route can be established.

Enable/Disable is used to activate and deactivate a selected route(s). At least one route should be selected in order to use these functions, otherwise the following error message will appear: "No record(s) selected."



Fig. II-18: IP Static Routing table

The **Add IP Static Route** page offers the following components:

Route To requires the IP address and subnet mask for the destination the IP packet should be forwarded to.

Via IP Address requires the IP address of the subsequent router for IP packet forwarding to the specified destination.

Attention: The rule with the longest subnet (smallest IP range) will take effect when having two or more IP Static routing rules with the coinciding subnets.

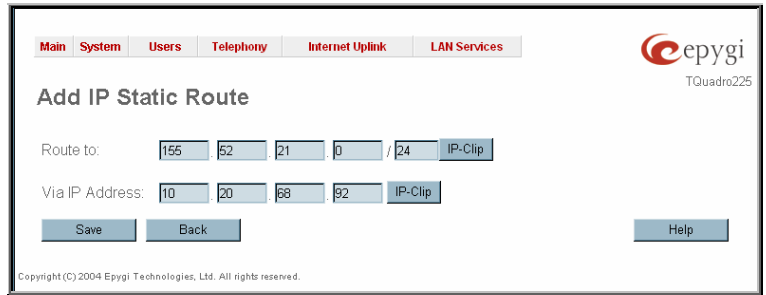


Fig. II-19: Add IP Static Routing page

IP Policy Routes allow IP packets forwarding to the specified router depending on the source IP address as well as defining the priority for the current routing rule.

The **IP Policy Routes** table displays all specified IP policy routes with their parameters: **Target State** for the state of the route (enabled or disabled), **Actual State** for the state of the route connection (up, down or erroneous), **Priority** for the route priority, **Route From** is where the subnet, routed packets come from and **Via IP Address** is where the router IP address incoming packets should be routed through.

Add opens the **Add IP Policy Route** page to establish a new policy route.

Enable and **Disable** are used to activate or to deactivate the selected route(s).

Raise Priority and **Lower Priority** are used to increase or decrease the priority of the selected policy route(s) by one. At least one route should be selected to use these functions, otherwise the error message "No record(s) selected" will appear.



Fig. II-20: IP Policy Routing table

The **Add IP Policy Route** page offers the following input options:

Priority requires a numeric value (from 1 to 252) to define the priority of the routing rule. The lower the number, the sooner the routing rule will take effect (higher priority).

From requires the packet source IP address and subnet mask of the specified destination to match with the rule.

Via IP address requires the IP address of the subsequent router for IP packet forwarding.

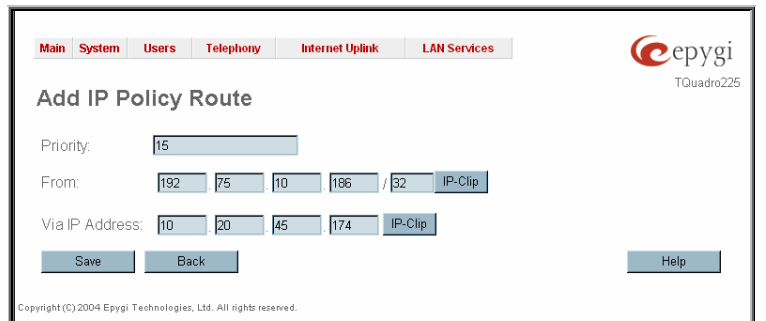


Fig. II-21: Add IP Policy Route page

The **Enable** and **Disable** functional buttons are used to activate or to deactivate the selected route(s). At least one route should be selected to use these functions, otherwise the error message "No record(s) selected" will appear.

To Add an IP Static Route

1. Select the **IP Static Routes** link on the **Routing Configuration** page.
2. Press the **Add** button on the **IP Static Routes** page. The **Add Entry** page will appear in the browser window.
3. Enter the destination IP address and subnet mask in the **Route To** text fields. Use the **IP-Clip** button to select a previously entered IP address.
4. Enter the router IP address into the **Via IP Address** text fields.
5. Press the **Save** button to make the static route with these settings.

To Add an IP Policy Route

1. Select the **IP Policy Routes** link on the **Routing Configuration** page.
2. Press the **Add** button on the **IP Policy Routes** page. The **Add Entry** page will appear in the browser window.
3. Specify the policy routing rule priority in the **Priority** text field.
4. Enter the packet source IP address and subnet mask in the **From** text fields. Use the **IP-Clip** button to select a previously entered IP address.
5. Enter the router IP address into the **Via IP Address To** text fields.
6. Press the **Save** button to make the policy route with these settings.

Configuration Management

The **Configuration Management** page assists the administrator with managing the system configuration settings and voice data. For example, the administrator is able to backup and download the settings to a PC and then upload and restore them back to the Quadro. Additionally, this page provides the possibility of restoring the factory default configuration settings.

The **Backup & Automatically Download all config & voice data** link leads to the **Automatically Backup Configuration Settings** page where the automatic backup of the system configuration and the voice data can be configured. The service allows you to setup Quadro so it will automatically backup the system configuration and the voice data and store it in the specified location.

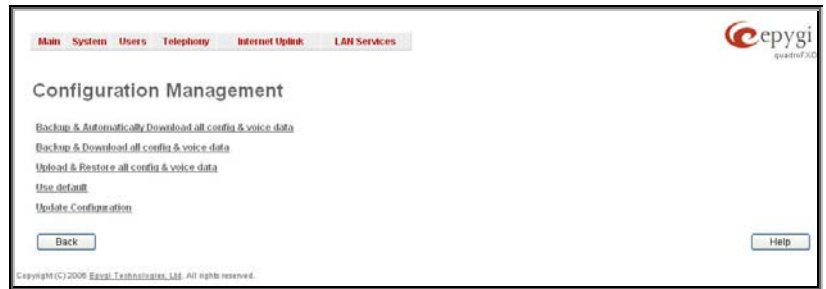


Fig. II-22: Configuration Management page

The **Automatically Backup Configuration Settings** page allows you to enable the automatic backup of the system configuration and the voice data on the Quadro. With this service, Quadro will automatically backup the system configuration and the voice data and store it in the specified location.

This page contains the following components:

The **Enable Automatically Backup** checkbox enables automatic backup mechanism on the Quadro.

The following group of manipulation radio buttons allows you to select whether the backup files will be delivered by email or stored in some location:

- The **Send via Email** radio button is used to send the automatically backed up files via email. The selection enables Email Address text field that requires the email address of the administrating person to receive the automatically backup files.
- The **Send to Server** radio button is used to store the automatically backup files on a remote server. This selection enables the following fields to be inserted:

The **Server Name** requires the IP address or the host name of the remote server.

The **Server Port** requires the port number of the remote server.

The **Path on Server** requires the path on the server to store the backup files in.

The **Send Method** manipulation radio buttons allow you to select the remote server type: TFTP or FTP. In case of FTP selection, the authentication username and the password need to be inserted. In case if these fields are left empty, anonymous authentication will be used.

The **Backup Interval Selection** checkboxes are used to select the time interval automatically backup the Quadro's configuration and the voice data. The **Time** based checkbox is used to select the hour when the configuration and the voice data will be automatically backed up on the daily basis. The **Weekday** checkbox is used to select the weekday when the configuration and the voice data will be automatically backed up on the weekly basis. At least one of these checkboxes needs to be selected.

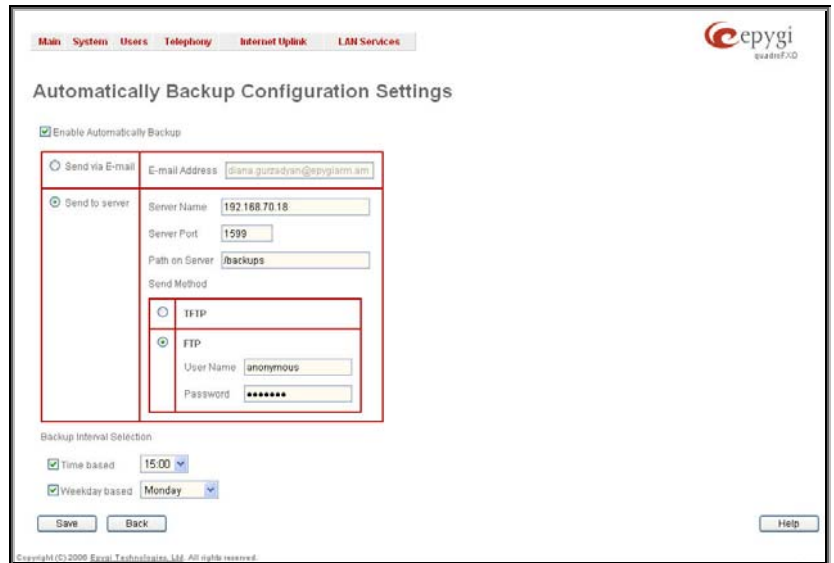


Fig. II-23: Configuration Management page

The **Backup & Download all config & voice data** link generates a backup file with all configuration settings and user uploaded greeting messages. It opens a file chooser window for immediate download to the users PC.

Attention: Configuration and voice data cannot be backed up if the size of voice data is too large. In this case, to be able to backup configuration and voice data on the Quadro, please remove some user defined system messages (by restoring the default ones, see Feature Codes), or remove some extensions from the [Extensions Management](#) table.

The **Upload & Restore all config & voice data** link opens a page that has a **Browse** button, (which opens a file chooser to select a backed-up file) and a **Configuration to Upload** field requiring the file path to upload and to restore it immediately. Pressing **Save** will restore the selected backup file, and delete all current user defined greetings and replace configuration settings.

The **Use Default** functional button resets all configuration settings and restores the board's factory default configuration. By restoring the default configuration you will replace your current configuration, lose all voice mails and reboot the device. You will not be automatically redirected to the GUI start page. After the successful reboot you will need to enter into the management page and login again to access the Quadro's configuration. A warning message will ask you to confirm your selection before restoring the default configuration.

Please Note: Unlike the factory default settings restore procedure initialized from the Reset button on the Quadro board, this link will keep the following data:

- Call Statistics
- Transfer Statistics
- System Events
- Feature Keys
- Device Registration state

The [Update Configuration](#) link leads you to the page where Quadro's configuration can be automatically or manually updated, downloaded and edited.

Update Configuration

The **Update Configuration** allows to automatically or manually updating Quadro's configuration, as well as downloading a legible and editable configuration file, making necessary changes and uploading it back to the system. This allows you to use parts of the configuration of one Quadro on another Quadro with some changes done prior to uploading the new configuration. The Quadro reseller, distributor, ISP or carrier usually uses this service.

Attention: It is strongly recommended to consult with the technical support center before making changes on this page. Incorrect settings here may corrupt current configurations.

This page consists of the following components:

Server and **Server Port** text fields require an IP address or Host name and the port number of the server configuration where they will be downloaded from.

The **Update Method** drop down list indicates the connection type used to download the configuration (ftp, tftp, http or https).

The **Enable Version Check** checkbox selection enables version verification before the configuration is being downloaded.

Attention: Disabling the **Enable Version Check** checkbox may cause incompatibility problems on the device.

The **Update Interval Selection** manipulation radio-button group is used to select the frequency of configuration checks/updates performed on the Quadro:

- **Check/Update at boot time** – with this option, new available configuration will be checked/updated each time Quadro boots.
- **Check/Update manually** – with this option, configuration check/upload will be performed only by manual selection.
- **Check/Update time/date scheduled** – with this option new available configurations will be checked/updated periodically depending on the selected time and/or weekday. This selection enables **Time Based** and **Weekday Based** checkboxes. Selecting one or both of them allows you to define the time and the weekday when configuration checks/updates will be automatically performed.

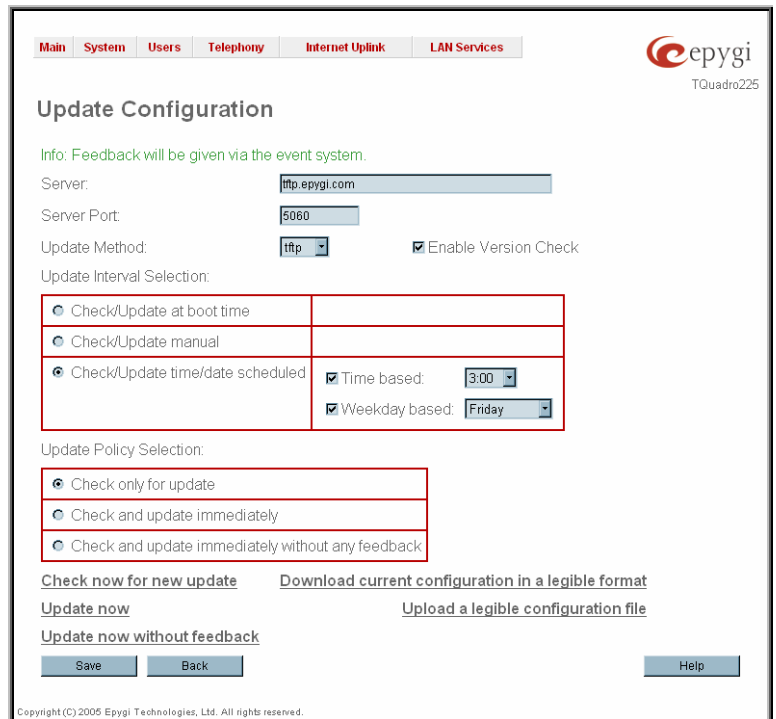


Fig. II-24: Upload Configuration page

The **Update Policy Selection** manipulation radio-button group is used to select the operation performed on the following selections:

- **Check only for update** – with this option, the system will only perform checking of the availability of new suitable configuration and will log corresponding event in the [Events](#) table (depending on configuration in Events Settings).
- **Check and update immediately** - with this option, the system will check the availability and correspondingly update the new configuration and will log corresponding event in the Events table (depending on the configuration in Events Settings).
- **Check and update immediately without any feedback** - with this option, the system will check the availability and correspondingly update the new configuration but will not log any events on this.

The **Check now for new update** functional button performs manual checking of the availability of new configurations and logs corresponding event in the Events table (depending on the configuration in Events Settings).

The **Update now** functional button performs manual checking and update of the availability new configuration and logs corresponding event in the Events table (depending on the configuration in Events Settings).

The **Update now without feedback** functional button performs manual checking and update of the availability new configurations but will not log any events.

The **Download current configuration in a legible format** link refers to the **Configuration Summary** page where a partial or complete configuration can be defined and downloaded or viewed.

The **Configuration Summary** page is used to define a partial configuration and to download it to a PC or to view it directly in the browser.

In the text field on this page, the partial configuration to be downloaded should be specified. Pressing **Start generate a legible configuration file** will start parsing the configuration structure of the device. Progress will be seen in the area below.

The **Cancel generation process** button appears when the configuration generation procedure starts and it is used to stop it.

The **Download generated configuration** button becomes available when the legible configuration generation is finished. It is used to download the generated file to the PC in a plain text format. Necessary changes can be made in the downloaded configuration file and then uploaded back to the system.



Fig. II-25: Configuration Summary page

Attention: Make sure the changes you have done in the downloaded legible configuration file are valid and will not corrupt the system when being uploaded back to device.

View generated configuration button becomes available when the legible configuration generation is finished. It is used to view the generated file directly in the browser. The **Upload a legible configuration file** link refers to the page where the configuration file can be uploaded in a text format. The **Browse** button in the opened page is used to browse certain legible configuration file to be uploaded and updated to the system. Configuration files to be uploaded should be in the *.txt format, otherwise a system error occurs. The configuration file upload progress will be displayed in the area below.

Events

The **Events** page has two tables. All system events that have occurred will be displayed in one table and event settings will be displayed in the other.

The **System Events** page may be accessed through the **Events** link from the main menu. It lists information about system events that have occurred on Quadro. When a new event takes place, a record is added to the System Event table. For failure events (priority 2 and 3, see below), the warning "Please check your pending events!" will appear at the bottom of all management pages.

The system events and the warning message are visible only for the administrator. The warning link, (which leads directly to the **System Events** page) will disappear from the management pages if the administrator has marked all new events as "read".

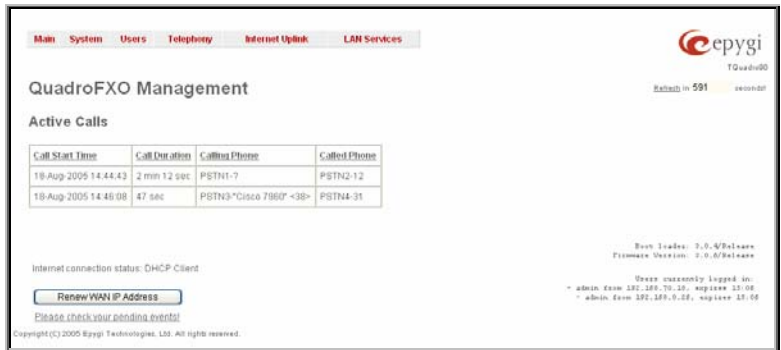


Fig. II-26: Event Warning on the Main Menu page

System Events

Current System Time: Mon Sep 26 15:51:59 2005

Status	Timestamp	Priority	Application	Name	Description	Reference
<input type="checkbox"/>	Mon Sep 26 09:10:29 2005	3	SIP	registration failure	Could not Register user 77 on server sip.epygi.com:5050. Reason: Timeout occurred	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:10:24 2005	3	SIP	registration failure	Could not Register user 111 on server 111.111.111.111:2123. Reason: Timeout occurred	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:09:00 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Authentication failure	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:08:55 2005	1	SIP	registration succeeded	Successfully registered user 66101 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:08:55 2005	1	SIP	registration succeeded	Successfully registered user 1100 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:08:55 2005	1	SIP	registration succeeded	Successfully registered user 1102 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:08:55 2005	1	SIP	registration succeeded	Successfully registered user 1101 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:11:01 2005	3	SIP	registration failure	Could not Register user 66101 on server sip.epygi.loc:5060. Reason: Incorrect remote address	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:11:01 2005	3	SIP	registration failure	Could not Register user 1100 on server sip.epygi.loc:5060. Reason: Incorrect remote address	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:11:01 2005	3	SIP	registration failure	Could not Register user 1102 on server sip.epygi.loc:5060. Reason: Incorrect remote address	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:11:01 2005	3	SIP	registration failure	Could not Register user 1101 on server sip.epygi.loc:5060. Reason: Incorrect remote address	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:08:34 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Destination unreachable	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:07:34 2005	3	SIP	registration failure	Could not Register user 66101 on server sip.epygi.loc:5060. Reason: Destination unreachable	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:07:34 2005	3	SIP	registration failure	Could not Register user 1100 on server sip.epygi.loc:5060. Reason: Destination unreachable	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:07:34 2005	3	SIP	registration failure	Could not Register user 1102 on server sip.epygi.loc:5060. Reason: Destination unreachable	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:07:34 2005	3	SIP	registration failure	Could not Register user 1101 on server sip.epygi.loc:5060. Reason: Destination unreachable	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:07:04 2005	3	SIP	registration failure	Could not Register user 77 on server sip.epygi.com:5050. Reason: Destination unreachable	SIP Registration Status
<input type="checkbox"/>	Mon Sep 26 09:05:51 2005	3	SIP	registration failure	Could not Register user 111 on server 111.111.111.111:2123. Reason: Destination unreachable	SIP Registration Status
<input type="checkbox"/>	Sun Sep 25 02:51:48 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Authentication failure	SIP Registration Status
<input type="checkbox"/>	Sun Sep 25 03:19:43 2005	2	SNTP	connect failure	System time could not be set. Reason: None of the servers answered	Time / Date
<input type="checkbox"/>	Sun Sep 25 03:10:49 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Timeout occurred	SIP Registration Status
<input type="checkbox"/>	Sun Sep 25 02:41:45 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Authentication failure	SIP Registration Status
<input type="checkbox"/>	Sun Sep 25 02:37:28 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Timeout occurred	SIP Registration Status
<input type="checkbox"/>	Sun Sep 25 02:28:22 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Authentication failure	SIP Registration Status
<input type="checkbox"/>	Sun Sep 25 02:06:43 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Timeout occurred	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:29:42 2005	1	SIP	registration succeeded	Successfully registered user 66101 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:59 2005	3	SIP	registration failure	Could not Register user 77 on server sip.epygi.com:5050. Reason: Timeout occurred	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:53 2005	3	SIP	registration failure	Could not Register user 111 on server 111.111.111.111:2123. Reason: Timeout occurred	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:34 2005	3	SYSTEM	reboot	The device has been successfully started after reboot.	
<input type="checkbox"/>	Fri Sep 23 15:20:20 2005	3	SIP	registration failure	Could not Register user 5810 on server sipcenter.com:5060. Reason: Authentication failure	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:20 2005	3	SIP	registration failure	Could not Register user 3330 on server sip.quadrop.net:5060. Reason: Incorrect remote address	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:24 2005	3	SIP	registration failure	Could not Register user 51210 on server sip.fwd.com:5060. Reason: Incorrect remote address	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:22 2005	1	SIP	registration succeeded	Successfully registered user 1100 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:22 2005	1	SIP	registration succeeded	Successfully registered user 1102 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:20:21 2005	1	SIP	registration succeeded	Successfully registered user 1101 on server sip.epygi.loc:5060	SIP Registration Status
<input type="checkbox"/>	Fri Sep 23 15:19:35 2005	1	SNTP	time set	Time changed by 1.447249 secs to Fri Sep 23 15:19:33 2005 (09p1.epygi.com)	Time / Date

Back Help

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Fig. II-27: System Events list

The **System Events** table is the list of new and read system events. System events have corresponding coloring depending on the nature of the event: success (priority 1, color green), low importance failure (priority 2, color yellow), critical failure (priority 3, color red).

The table shows the **Status** of the event (new or read) as well as the name of the application the event refers to, event description, and the date when the event was received. For example, if the event was caused due to incorrect mail sending or SIP registration, corresponding links will be seen in the Reference column of the table. The administrator can view the detailed log for each event that has occurred.

The **System Events** page offers the following components:

Current System Time displays the local date and time on Quadro.

Mark all as read marks newly occurred events as "read".

Disable LED switches off the flashing LED (if applicable) on the board. An LED notification may appear (depending on the notification type given) in the page [Events](#) page when a new event occurs.

Numerous circumstances may cause a certain application on Quadro to flag an event.

The **Event Settings** page lists all possible events on the Quadro and allows controlling notification (action) when an event takes place.

Each entry in the events' table has a checkbox assigned to each row. By selecting the corresponding checkboxes, operations such as **Edit** may be done for one or more events.

Edit opens the **Edit Event Settings** page to modify the event action.

Display Notification - A notification link will be displayed on the bottom of all pages and a record is added into the **Events** table. The notification is executed as a link "Please Check you pending events!". The link leads to the **System Events** page. This action also will take place if Flash LED or Send Mail has been selected, even if not specifically selected.

Flash LED - The second LED (yellow) will blink every second and a notification will be displayed on the bottom of all pages. For some events the LED will start flashing after a delay.

Send Mail - A notification e-mail about the new event description in the email will be sent to the e-mail address specified in the [Mail Settings](#) page.



Fig. II-28: Event Configuration Settings page

Actions that are not allowed for the selected event (like mail notification if the PPP link is down or the mail server has been configured improperly) are hidden. For multiple events editing, actions that are not appropriate for least one of the selected events will also be hidden.

If Quadro cannot receive an IP address from the DHCP or PPP servers, or cannot register an extension on the SIP or Routing servers, or cannot reach the NTP server, it raises only one event for the entire period the action has failed, but will continue to try. When the required action is successful Quadro raises an appropriate message.

The **Edit Event Settings** page offers the following input options:

Application displays the application the event refers to. **Multiple** is shown here if more than one event has been selected for the action assignment.

Name displays the name of the event. **Multiple** is shown here if more than one event has been selected for the action assignment.

Description displays additional information about the event. **Multiple** is shown here if more than one event has been selected for the action assignment.

Action offers radio buttons to choose one of the actions to notify the Quadro administrator when an event(s) takes place.



Fig. II-29: Edit Event Settings page

To Assign an Action to the Event

1. Select the checkbox of one or more events to assign an action to them.
2. Press the **Edit** button. The **Edit Event Settings** page appears.
3. Select an action type from the **Action** radio buttons to notify the administrator about the event.
4. Press the **Save** button to submit the changes or use **Back** to abort the selected action.

Time/Date Settings

The **Time and Date Settings** page provides information about the current system time and date. The settings may be updated through the international time and date servers.

Time is used to set the local time (hour, minute).

Date is used to set the date (month, day, year).

Timezone provides a selection of world time zones and is used to select the local country time zone. Timezones are specified by GMT (Greenwich Mean Time) and by specific timezones for the United States and Canada.

Enable Simple Network Time Protocol Server enables the SNTP (Simple Network Time Protocol) server on Quadro, thus Quadro becomes the timeserver for its LAN.

Enable Simple Network Time Protocol Client enables the SNTP client on the Quadro, thus Quadro becomes a client to an external timeserver. A checkbox disables Date and Time drop down lists and enables the following parameters:

The **SNTP Servers** table lists all defined NTP Servers.

The **Add** functional button opens an **Add NTP Server** page where a new NTP server can be defined. This page offers the **NTP Server** radio buttons that are used to choose between a manual and a predefined NTP server.

Manual requires the NTP server's FQDN (Full Qualified Domain Name) or its IP address.

Predefined is used to select the NTP server's host address from the drop down list, where the most common NTP servers are listed.

The **Move Up** and **Move Down** functional buttons are used to sort NTP servers in the order they need to be accessed. If the NTP server in the first position of the **SNTP Servers** table does not answer, NTP server in the next position will try to be reached.

Please Note: You can add another NTP server to the list if the defined NTP servers are not functional (for example, Quadro's date/time is not being updated automatically).

Polling Interval indicates the time interval for the periodical synchronization between the timeserver and Quadro. It counts in hours.

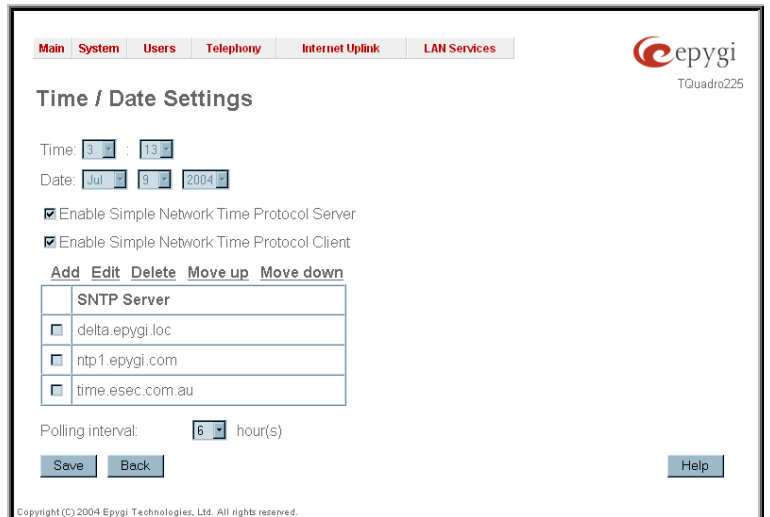


Fig. II-30: Time and Date Settings page



Fig. II-31: Add NTP Server page

Attention: Time and Date Settings will be reset if Quadro has lost power.

Mail Settings

The **System Mail Settings** page allows you to send warnings automatically about the board status or problems to the administrator. System events that require email notification are selected on the [Events](#) page. System mail must be enabled and the SMTP server needs to be configured for voice message transmission to the extension user's mailing account.

Enable enables system mail sending and voice messages transmission to the extension user's mailbox.

SMTP Host requires the SMTP host IP address or domain name. The SMTP host needs to be configured to enable voice message transmission.

SMTP Port requires the SMTP host port number.

Mail Sender Address text field requires the source address for the Quadro notification emails. The email address defined here should be an existing valid e-mail address registered on the selected SMTP server or it should have permission to use that particular SMTP server for e-mail transmission.

Mail Recipient Address text field requires an active e-mail address where system emails will be delivered. The e-mail recipient here can be a Quadro administrator or someone responsible for network and system problems.

Mail Recipient Address (CC) text field requires an active email address where a carbon copy (CC) of the system emails will be delivered.

Enable SMTP Authentication must be selected if the specified SMTP server requires authentication. In this case, authentication **User Name** and **Password** configured on the SMTP server should be defined in the corresponding text fields.

Send Test Mail is used to initiate a test e-mail transmission. This button will be enabled if correct values have been submitted and saved on this page.

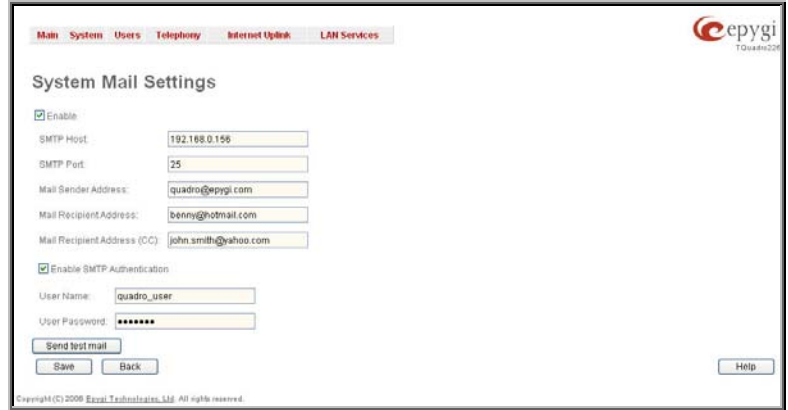


Fig. II-32: System Mail Settings page

To configure the System Mail

1. Enable the system mail sending by the **Enable** checkbox selection.
2. Update or set the SMTP host in the **SMTP Host** text field.
3. Update or set the e-mail sender address in the **Mail Sender Address** text field.
4. Update or set the e-mail address in the **Mail Recipient Address** text field.
5. Enable **SMTP Authentication** if it is required on the server.
6. Insert into the corresponding text fields an authentication **User Name** and **User Password** defined by your SMTP server.
7. Press the **Save** button to submit these settings.
8. Use the **Send Test Mail** button to send a test e-mail with the configured settings.

Firmware Update

This window allows updating the software of Quadro by installing new firmware (image). Users registered at Epygi will receive a notice when new firmware is available and will be able to download it from the Epygi Technical Support WEB page.

Updating new firmware requires a working power supply. Quadro is provided with a battery (accumulator). If the battery is low or simply absent the "There is no battery or voltage is low" warning is displayed.

Please Note: Installing new firmware will take about 15 minutes. During this time, QuadroFXO, telephony and Internet access will be disabled.

The firmware update will cause the loss of the following data:

- All internally stored voice mails and custom voice messages
- DHCP leases
- Transfer statistics
- Call statistics
- All pending events
- User specific GUI states

The following main processes will be stopped during the firmware update and will be restarted after the installation is completed:

- Voice Software
- Network Time Protocol Daemon
- Network Interface Statistic Daemon
- Dynamic DNS Daemon

Please Note: If you consider the [Call Statistics](#) entries in the displayed tables to be important, it is recommended to download them from the corresponding page prior to starting the Firmware Update.

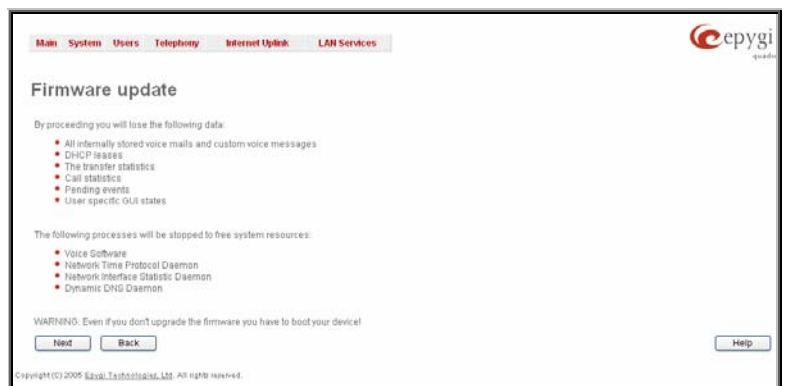


Fig. II-33: Firmware Update page 1

Next will move you to the second page of Firmware Update where the image file should be selected.

The second page of **Firmware update** has a **Browse** button used to browse the image file, and the **Specify Image** text field that will display the selected image filename.

Pressing **Save** will start uploading the image file to the board and the next page will display results and verification of the image being burned.

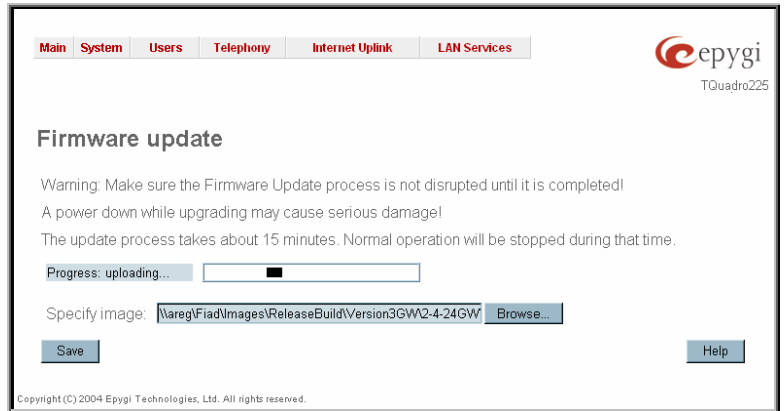


Fig. II-34: Firmware Update page 2

This page displays non-editable information about the image validity. The **Image Check** field will display "invalid" if the image does not correspond to the hardware version.

The **Current Software Version** field shows the old software version. The **New Software Version** field shows the new version of the software image.

This page needs to be confirmed in order to continue image updating. If you are sure that the image version is appropriate for your device press **Save**.

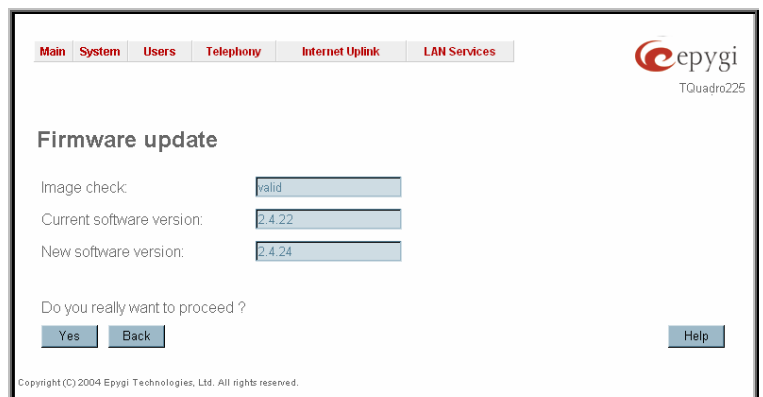


Fig. II-35: Firmware Check page

Networking Tools

The **Networking Tools** page provides the possibility to check the Internet connection.

Ping sends four ICMP (Internet Control Message Protocol) requests with a default size of 64 bytes to the destination (IP address or host name) specified in the text field **Ping Target**. The response times are logged, and the round trip time (the time required from being sent until being received again) is measured. The minimum and maximum round trip time and its average as well as the percentage of lost and of received frames results are displayed in the lower area of the page.

Traceroute checks the Internet connection by triggering the routers (hops) that are passed to reach the destination specified in the **Traceroute Target** text field. Trace routing gives feedback on the routers passed by packets on the way toward the destination and the round trip delay of packets to these routers.

Attention: No **Traceroute** is possible if a high priority Firewall has been enabled (see chapter [Firewall and NAT](#)).

For the purpose of tracerouting, several IP packets are sent out. UDP (User Datagram Protocol) is used to send packets and ICMP (Internet Control Message Protocol) is used to receive information about the routers. In their headers, the TTL (Time To Live) value increases from 1 to 30. When the first IP frame is received by the first router, its IP address will be returned in its acknowledgement

The second frame delivers the IP address of the second router and so on and so forth. The results of **Traceroute** are displayed on the lower area of the page.

Ping Target requires the destination (IP address or host name) for the ICMP request.

The **Ping** button starts pinging the specified ping target.

Traceroute Target is used to enter the IP address or host name of the destination to be trace routed.

The **Traceroute** button is used to process the router triggering to check the Internet connection.

In the field below these, the output of the Ping or Traceroute procedure is shown.

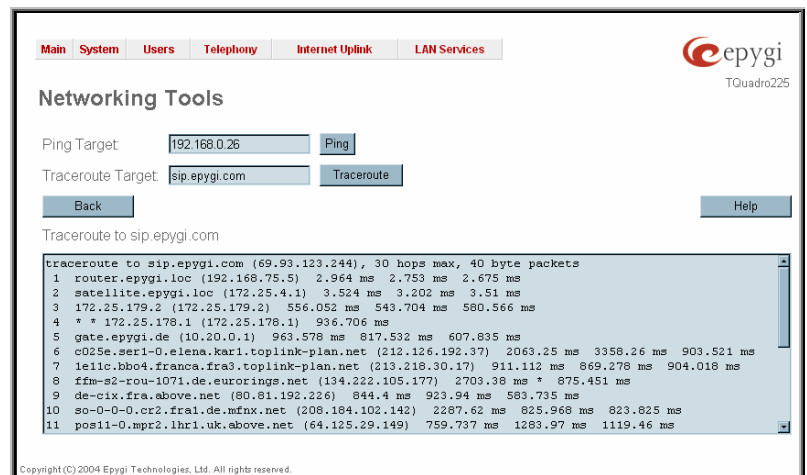


Fig. II-36: Networking Tools page

To Check the Internet connection

1. Specify the destination address for the ICMP request in the **Ping Target** text field.
2. Press the **Ping** button to process the ICMP request.
3. Specify the destination address to trace the route.
4. Press the **Traceroute** button to process the router triggering.

Diagnostics

The **System Diagnostic** page gives a possibility of running Network and WAN protocol diagnostics to verify Quadro's connectivity and to download all system logs for possible problems recovery.

The **Start Detecting WAN Protocol** button is used to initiate WAN diagnostics that will detect the WAN IP configurations: static or through DHCP and PPP servers. For static WAN IP configuration, gateway availability is checked. When acting as a client, DHCP and PPP servers' accessibilities are being verified.

The **Start Network Diagnostics** button is used to initiate network diagnostics, i.e., to check the WAN link and IP configuration, to verify gateway, DNS primary and secondary (if configured) servers' accessibilities.

The field below will display the diagnostics results and the connectivity conditions. The system should be reconfigured if problems occur during the diagnostics.

The **Download system logs** button is used to download all logs to the local PC as a *.tar archive file. These logs can then be used by the Epygi Technical Support Office to determine the problem that has occurred on your Quadro.

The **Reboot this Device** button is used to reboot the Quadro. Please note that the session with the Quadro will be closed, i.e., the Quadro GUI should be newly opened and a new login will be required afterwards.

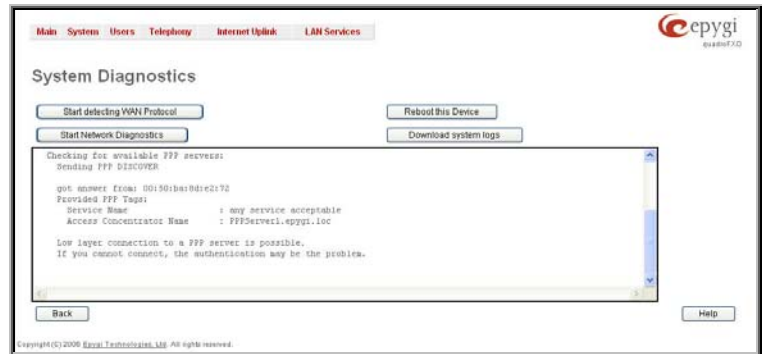


Fig. II-37: System Diagnostic page

Automatic Provisioning

Automatic Provisioning provides the possibility to automatically configure the WAN network settings of Quadro. This is very useful when the administrator is not actually aware about the Quadro's network settings. **Automatic Provisioning** automatically detects the matching network configuration settings, applies them on the Quadro, thus connecting the device to the internet through the available ISP connection.

Please Note: **Automatic Provisioning** can only be run from the LAN side of the Quadro, i.e. from the PC connected to the Quadro's LAN.

Automatic Provisioning automatically detects and configures the following settings on the Quadro:

- WAN interface type (PPPoE or Ethernet)
- WAN IP settings
- PPP settings
- ISP settings
- DHCP settings
- DNS settings
- NAT Traversal settings

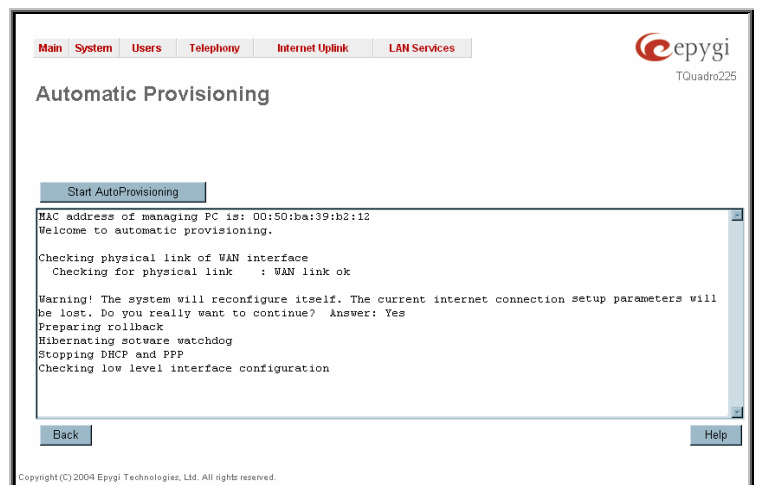


Fig. II-38: Auto Provisioning page

Upload Language Pack

Upload Language Pack page allows to upload a custom language for GUI and Voice Messages of the Quadro. The language of voice messages can be switched to the custom Language Pack language from GUI setting page at the [System Configuration Wizard](#). The language of GUI session can be changed to the custom Language Pack language from the radio buttons on the login page.

Uploading a Language Pack will cause the loss of the following data:

- All internally stored voice mail
- DHCP leases
- Call statistics
- Pending events
- Transfer statistics

Please Note: Only one custom Language Pack can be uploaded at the time. Uploading a Language Pack will remove the existing one (if existing) and will reboot the Quadro.

Current Language Pack field displays a read-only information about the custom language pack uploaded. When no custom language pack is uploaded, field indicates "unknown".

Below, there is a **Language Pack File to Upload** text field which displays the selected image filename. **Browse** button is used to browse the custom language pack to be uploaded.

Remove Current Language Pack link is seen only when custom language pack is uploaded and is used to remove it from the system.

Pressing **Save** will start uploading the custom language pack to the board. The next page will be displayed, showing the result of a verification of the language pack being uploaded and asks for confirmation to overwrite the existing custom language pack (if any).

After final confirmation, system will upload the selected custom Language Pack and will reboot.

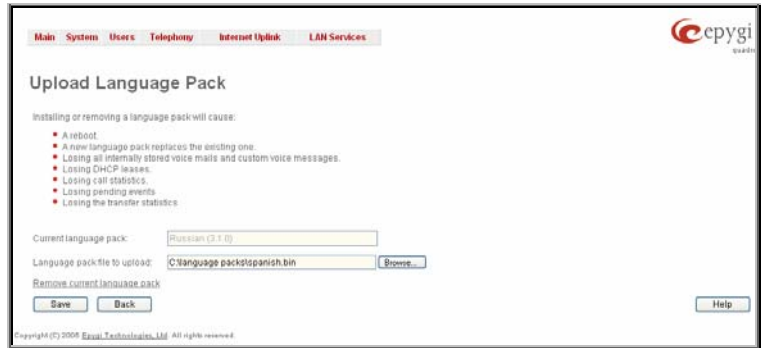


Fig. II-39: Upload Language Pack page

User Rights Management

The **User Rights Management** service sets restrictions on the GUI access for various users, permits or denies the access to certain Web GUI configuration pages and creates multilevel user management of the Quadro. The feature is useful to the ISPs in order to set the restrictions for certain customers to manage the Quadro's configuration.

Two levels of Quadro GUI administration are available:

- **Administrator** – this is the main administrator's account. The administrator can configure to have the factory reset safe the default password or choose not to. The administrator has access to all Web GUI pages and no one else has configuration permission to adjust this account. The administrator is responsible for granting access to all other user groups.
- **Local Administrator** – this is a common (sub-) administrator's account. The password is not factory reset safe. Local Administrator can have permission to adjust each GUI page.
- **Extension** – this account refers to all extensions created on the Quadro. The password for default extensions is not factory reset safe but is contained in the backed up configuration. Permissions for an extension to access each GUI page can be adjusted here.

The **User Rights Management** page consists of two pages. The **Users** page is used to manage the available users on the Quadro. The **Roles** page is used to assign the corresponding permissions to the users.

The **Users** page contains a table where the Administrator and Local Administrator users are listed. This page allows them to modify the passwords of available users in the table and to manage the Local Administrator's account. The following functional buttons are available on this page:

The **Change Password** functional button is used to change the password of the Administrator and Local Administrator user's account. Select one of the available users in the table by toggling the corresponding checkbox and press **Change Password** to open the corresponding page.

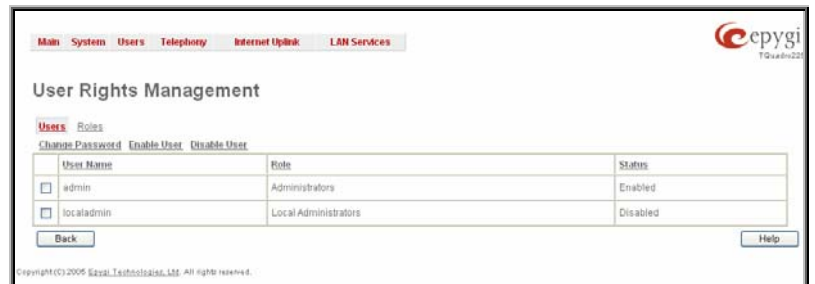


Fig. II-40: Users page at User Rights Management

The **Change Password** page is used to change the user's password. It offers the following components:

The **Old Password** text field is only present when modifying the Administrator account password and requires the current password of the Administrator. An error message prevents entering the wrong password.

The **New Password** text field requires a new password for the Administrator or Local Administrator. Reentering the new password in the **Confirm New Password** text field will confirm the new password.

The password can consist of numerical values only. Up to 20 digits are allowed. A corresponding warning appears if any other symbols are inserted.

The **Store password in persistent area (Factory reset save)** checkbox is only present when modifying the Administrator's account password and is used to save the Administrator's password in the factory reset safe place.

Attention: Be EXTREMELY careful when enabling this checkbox. When it is done, the Administrator's password cannot be retrieved even after a factory reset. In this case, if the Administrator's password has been forgotten, the Quadro will be considered broken. Please contact Epygi Technical Support Center for replacing the device.



Fig. II-41: Change Password page

The **Enable User** and **Disabled User** functional buttons are used to enable or disable the Local Administrator's account.

Please Note: The Administrator's account cannot be disabled.



Fig. II-42: Roles page at User Rights Management

The **Roles** page contains a table where the Local Administrator and Extensions users are listed. This page allows you to set the permissions to the GUI pages for each user in the table.

The **Edit** functional button leads to the **Change Access Rights** page where a list of user specific GUI pages is displayed. Select the user in the table and press **Edit** to manage the permission for the corresponding user..

On the **Change Access Rights** page, **Grant Access/Deny Access** functional buttons are used to grant or deny access to certain GUI page(s) for the selected user.

When access to a certain GUI page is denied for a user, the "You are not authorized to access this page!" warning message will be displayed.

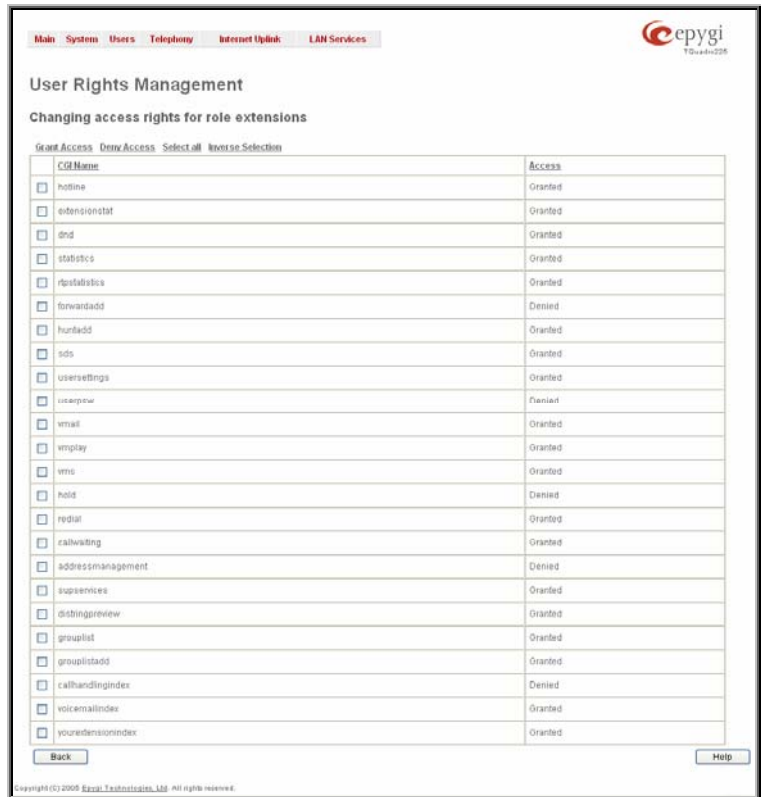


Fig. II-43: Edit Roles page at User Rights Management

Users Menu

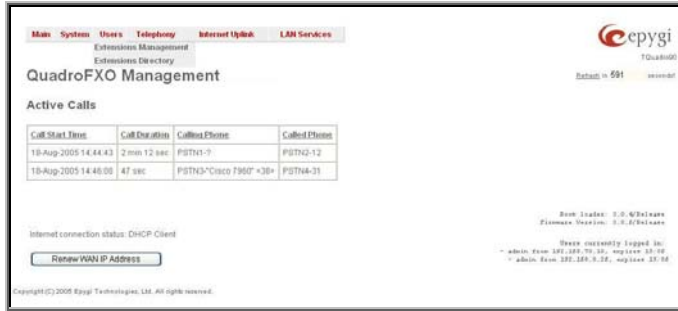


Fig. II-44: Telephone Users Menu in Dynamo Theme



F Fig. II-45: Telephone Users Menu in Plain Theme

Extensions Management

The **Extensions Management** is used to create user extensions and auto attendants on the Quadro. From this page, by clicking on the user extension, administrator can get the extension settings pages.

Two types of user extensions, **active** and **inactive**, can be created on the Quadro. Active extensions are those that are attached to a line, can place and receive calls and use available telephony services. Inactive extensions are those that are not attached to the line. They can use some available telephony services but they cannot place and receive calls. Instead, inactive extensions have a voice mailbox available to store the messages from callers.

Attendant extensions are dedicated to the IVR system on the Quadro. These extensions are used by callers to reach Quadro's users and use the remote access and call relay services. It is possible to create Auto Attendants with the custom scenarios. By default, Quadro has one Auto Attendant extension (00) which is undeletable.

The **Extensions** table is a list of all extensions and their parameters.

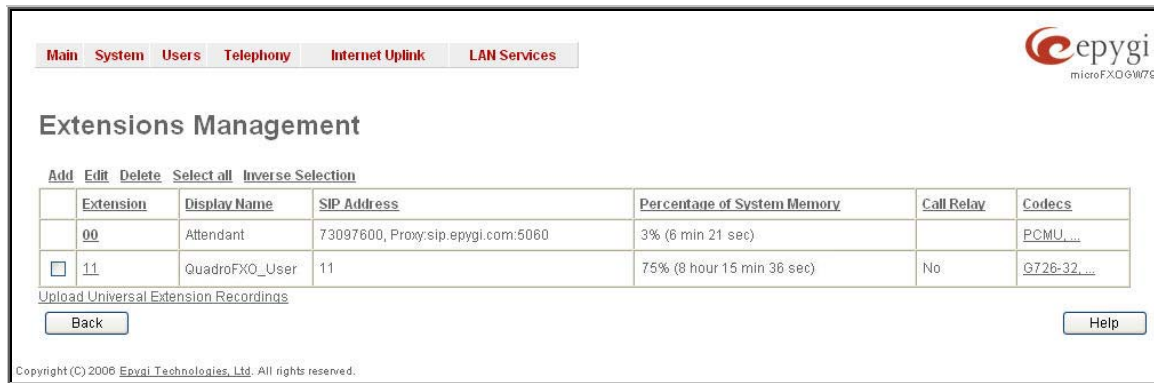


Fig. II-46: Extensions Management page

The following columns are present in the table:

- **Extension** - lists the 2-digit user or attendant extensions on the Quadro. This number is used for internal PBX calls.
- **Display Name** - indicates an optional display name to identify the caller.
- **SIP Address** - displays the SIP address of the corresponding extension. The column displays the full SIP address, (i.e., username@sipserver:port) when the **Registration on SIP Server** checkbox is selected. If registration is disabled, the SIP address will be displayed in the following format: "username, Proxy: sipserver:port". If no SIP registration server or SIP server port is defined, corresponding information will not be included in this column. If no username is defined, the extension number will be displayed instead.
- **Percentage of System Memory** - indicates the user space (in percentages) configured for each extension. For user extensions, the actual available duration (in minutes) for the blocking messages is displayed here. For attendant extensions, the actual available duration (in minutes) for the auto attendant messages is displayed here.
- **Call Relay** - indicates whether or not the Call Relay option is enabled on the extension.
- **Codecs** - column lists the short information (full information is seen in the tool tip) about extension specific voice Codecs. Extension codec's can be accessed and modified by clicking on the link of the corresponding extension's Codecs. The link leads to the [Extension Codecs](#) page.

Clicking on each user extension in the Extensions table will open the extension specific **Extension Settings** menu. When Call Park service is enabled on the extension, it is displayed without a link in the Extensions Management table and extension pages. Additionally, the supplementary services configuration pages will not be accessible.

Add opens the **Add Entry** page where the type and number of the new extension should be defined. This page consists of the following components:

The **Extension** text field is used to enter a new extension number. The extension number is a two-digit number. If non-digit symbols have been entered, the error "Incorrect Extension: no symbol characters allowed" will appear. If the extension length is shorter than 2 digits, the error "Incorrect Extensions length" will prevent the creation of the extension. If an extension with the same number already exists in the Extensions Management table, the error "Extension already exists" will appear.

Please Note: Each extension number cannot start with digits 0, 8 or 9.

The **Type** drop down list is used to select the type of the extension (user or attendant) to be created (for details see below).

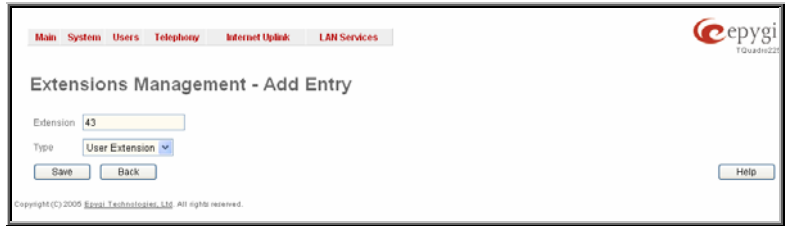


Fig. II-47: Extensions Management - Add Entry page

Edit opens the **Edit Entry** page where a newly created user or attendant extension settings might be adjusted. To operate with **Edit**, one or more record(s) have to be selected, otherwise the "No records selected" error message will appear.

The **Edit Entry** page consists of two frames. In the left frame settings groups are listed. Clicking on the corresponding settings group displays their configuration options in the right frame.

Please Note: Save changes before moving among settings groups.

User Extension Settings

1. General Settings

This group requires extension's personal information and has the following components:

Display Name is an optional parameter used to recognize the caller. Usually the display name appears on the called party's phone display when a call is made or a voice mail is sent.

Password requires a password for the new extension.

The extension password may only contain digits. If non-numeric symbols are entered, the "Incorrect Password: no symbol characters allowed" error will prevent making the extension.

Confirm Password requires a password confirmation. If the input is not corresponding to the one in the **Extension Password** field, the "Incorrect Password confirm" error will appear.

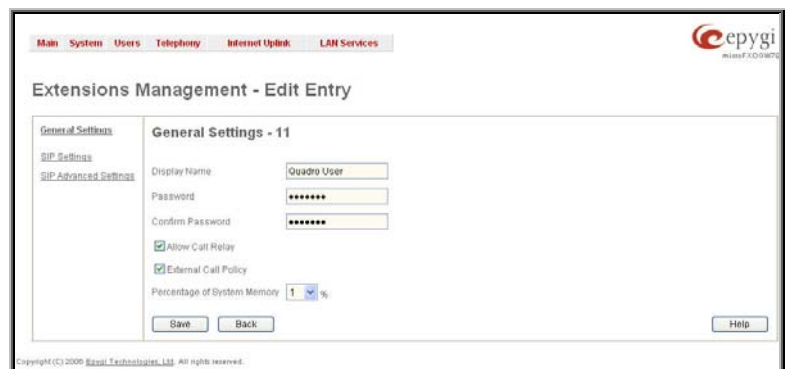


Fig. II-48: Extensions Management - Edit Entry – General Settings page

Allow Call Relay enables the current extension to be used to access the Call Relay service in the Quadro's Auto Attendant. It is recommended to define a proper and non-empty password when enabling this feature in order to protect the Call Relay service from an unauthenticated access.

When **External Call Policy** checkbox is enabled, all incoming IP calls to the corresponding extension will be handled by the external Policy Server.

The **Percentage of System Memory** drop down list allows you to select the space for the extension's voice mails and uploaded/recorded greetings and blocking messages. The maximum value in the drop down list is equal to the maximum available space for voice messages on Quadro. When editing an existing extension and decreasing the voice mailbox size, the system will check the present amount of voice mails in the mailbox of the extension. If the memory required for these voice mails exceeds the size entered, the system will suggest either to remove all voice messages from the extension's voice mailbox or to select a larger size so that the existing voice messages can be stored in the mailbox.

2. SIP Settings

This group is used to configure extension's SIP registration settings and consists of the following components:

User Name requires a user name for the extension registration on the SIP server. The registration user name needs to be unique on the SIP server and it is displayed on the called phone when performing an IP call.

Password indicates the password for the extension registration on a SIP server.

Registration Password is used to confirm the password. If the entered password does not correspond to the one entered in the **Password** field, the error message "The passwords do not match. Please try again" will appear.

SIP Server indicates the host address of the SIP server. The field is not limited regarding symbol usage or length. It can be either an IP address such as 192.168.0.26 or a host address such as sip.epygi.com.

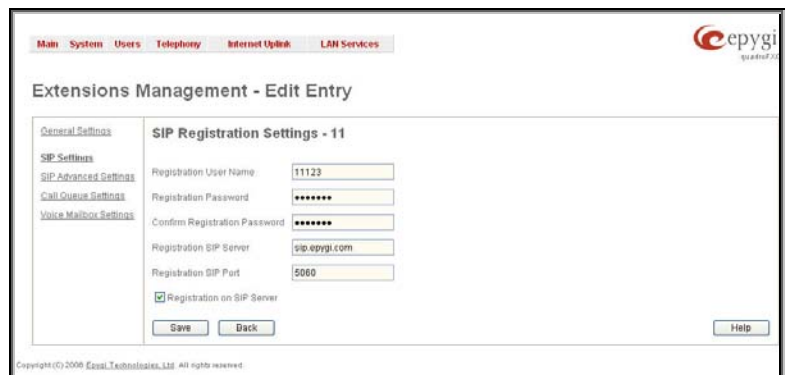


Fig. II-49: Extensions Management - Edit Entry – SIP Settings page

Registration SIP Port indicates the host port number to connect to the SIP server. The SIP server port may only contain digit values, otherwise the error message "SIP Server Port is incorrect" will be displayed when applying the extension settings. If the SIP server port is not specified, Quadro will access the SIP server through the default port 5060.

Registration on SIP Server enables the SIP server registration option. If the extension has already been registered on an SIP server, its IP address will be displayed in brackets.

3. Advanced SIP Settings

This group is used to configure advanced SIP settings (Outbound Proxy, Secondary SIP Server and Outbound Proxy for the Secondary SIP Server settings and to define other SIP server specific settings).

The SIP Outbound proxy is an SIP server where all the SIP requests and other SIP messages are transferred. Some SIP servers use an outbound proxy server to escape restrictions of NAT. For example, Free World Dialup service uses an Outbound Proxy server. If an Outbound proxy is specified for an extension, all SIP calls originating from that extension are made through that outbound proxy, i.e., all requests are sent to that outbound proxy, even those made by Speed Calling.

The Secondary SIP Server acts as an alternative SIP registration server when the primary SIP Registration Server is inaccessible. If the connection with the primary SIP server fails, Quadro will automatically start sending SIP messages to the Secondary SIP Server. It will switch back to the primary SIP server as soon as the connection is reestablished.

Authentication User Name requires an identification parameter to reach the SIP server. It should be provided by the SIP service provider and can be requested for some SIP servers only. For others, the field should be left empty.

Send Keep-alive Messages to Proxy enables the SIP registration server accessibility to the verification mechanism. **Timeout** indicates the timeout between two attempts for the SIP registration server accessibility verification. If no reply is received from the primary SIP server within this timeout, the Secondary SIP server will be contacted. When the primary SIP server recovers, SIP packets will resume being sent to it.

The **RTP Priority Level** drop down list is used to select the priority (low, medium or high) of the RTP packets sent from a corresponding extension. RTP packets with higher priority will be sent first in case of heavy traffic.

A group of **Host address** and **Port** text fields respectively require the host address (IP address or the host name) and the port numbers of the **Outbound Proxy**, **Secondary SIP Server** and the **Outbound Proxy for the Secondary SIP Server**. These settings are provided by the SIP servers' providers and are used by Quadro to reach the selected SIP servers.

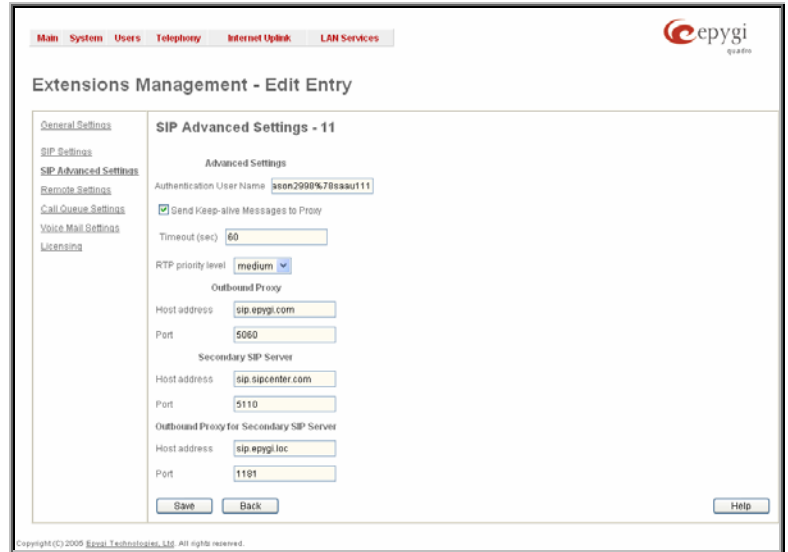


Fig. II-50: Extensions Management - Edit Entry – Advanced SIP Settings page

Attendant Extension Settings

For **Attendant** extensions, the **Extensions Management - Edit Entry** page consists of **General Settings**, **Attendant Scenario**, **SIP Settings** and **SIP Advanced Settings** pages. The **SIP Settings** and **SIP Advanced Settings** pages are the same as for the regular extensions described above. The **General Settings** and **Attendant Scenario** pages are described below:

1. General Settings (for attendant extension)

This group requires personal extension information and has the following components:

Display Name is an optional parameter used to define the Auto Attendant's description. Usually the display name appears on the called party's phone display when a call is made or a voice mail is sent.

The **Percentage of System Memory** drop down list is used to define the space for the Auto Attendant's system messages. The maximum value in the drop down list is equal to the maximum available space for voice messages on Quadro.

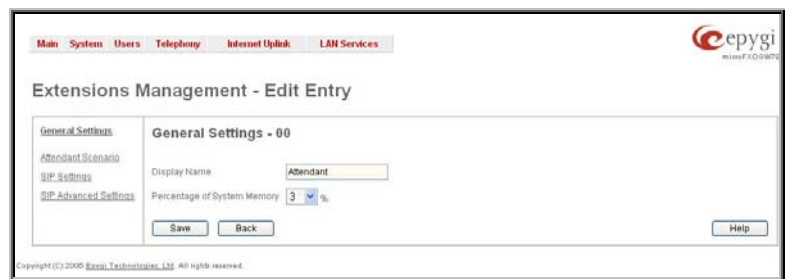


Fig. II-51: Extensions Management - Edit Entry – General Settings for Auto Attendant page

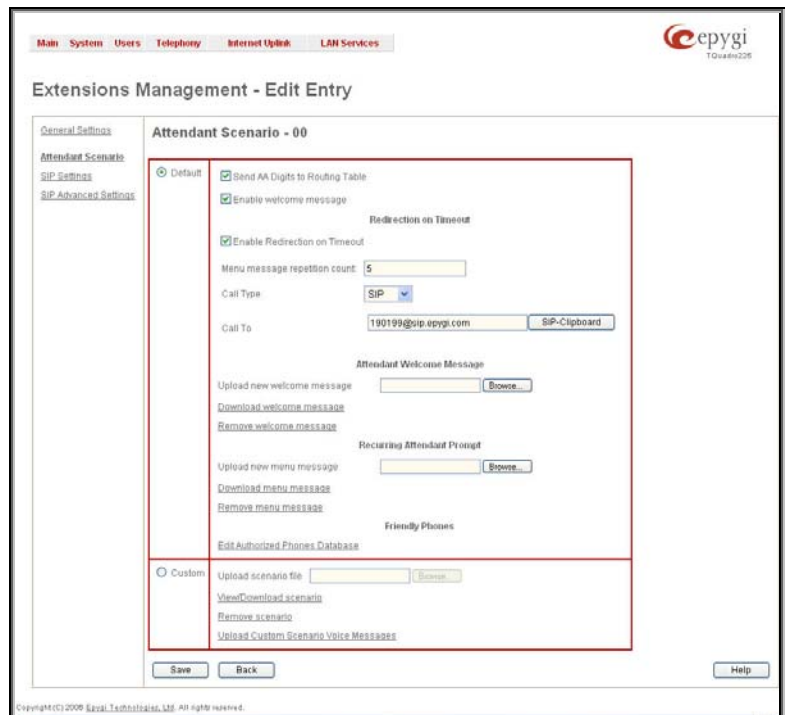


Fig. II-52: Extensions Management - Edit Entry – Attendant Scenario page

2. Attendant Scenario

This group is used to select between default and custom attendant functionality scenarios. When the **Default** scenario is selected, a group of settings should be adjusted. The user defined Auto Attendant welcome messages can be uploaded and the list of **Friendly Phones** can be configured. For **Custom** scenario, a scenario script file (in EpygiXML coding, the coding standard can be found at [Epygi Technical Support](#)) should be defined and the custom voice messages can be uploaded.

The **Default** manipulation radio button selection enables following components:

- The **Send AA Digits to Routing Table** checkbox selection switches the Auto Attendant to the routing mode. Any inserted digits in the Connection menu will be parsed through the Routing Table on the Quadro.

Please Note: This checkbox affects **ONLY** the Connections Menu (see Auto Attendant LAN Services). In the Call Relay Menu, the routing prefix needs to be dialed (see Feature Codes) to parse the dialed number through the Routing Table.
- Enable Welcome Message** checkbox is used to enable/disable the Auto Attendant welcome message (the default one or the custom one uploaded from this page or recorded from the handset (see Feature Codes) being played when callers enter Quadro's Auto Attendant.
- Redirection on Timeout** - this group allows automatic call redirection in case if no actions has been performed by the caller.

Menu Message Repetition Count text field indicates the number of Auto Attendant menu messages to be consecutively played to the caller with no action from his/her side. Once the menu message will be played the number of times indicated in this text field, the call will be automatically redirected to the defined destination.

Call Type drop down list includes possible incoming call types (PBX, PSTN, SIP or Auto). PBX selection means that the call will be redirected to the local extension. **SIP** selection means that the call will be redirected to the SIP destination correspondingly. **PSTN** selection means that the call will be redirected to the PSTN destination. **Auto** selection is used for undefined call types: destination (independent on whether it is a PBX number, SIP address or PSTN number) will be reached through Routing.

Call To text field requires the destination number dialed in the format depending on the selected Call Type. The wildcard is supported in this field.
- Attendant Welcome Message** - this group allows updating the active Auto Attendant welcome message (played only once when entering Auto Attendant), downloading it to the PC, or restoring the default one. The group offers the following components:

The **Restore Default Welcome Message** checkbox allows restoring the Auto Attendant default welcome message file if another one has been previously selected. If the checkbox is selected, the file upload will be disabled.

Upload new welcome message indicates the file name used to upload a new welcome message. The uploaded file needs to be in PCMU wave format, otherwise the system will prevent uploading it and the "Invalid audio file, or format is not supported" warning message will appear. The system also prevents uploading if there is not enough memory available for the corresponding extension and the "You do not have enough space" warning message will appear.

Browse opens the file chooser window to browse for a new welcome message file.

The **Download Welcome Message File** link appears only if a file has been previously uploaded. The link is used to download the audio file to the PC and opens the file chooser window where the saving location can be specified.
- Recurring Attendant Prompt** - this group allows updating the active recurring Auto Attendant message (played after the Attendant Welcome Message and then periodically repeated while being in the Auto Attendant), downloading it to the PC, or restoring the default one. The group offers the following components:

The **Restore Default Recurring Attendant Prompt** checkbox allows restoring the Recurring Attendant Prompt file if another one has been previously selected. If the checkbox is selected, the file upload will be disabled.

Upload new Recurring Attendant Prompt indicates the file name used to upload a new recurring auto attendant prompt. The uploaded file needs to be in PCMU wave format, otherwise the system will prevent uploading and the "Invalid audio file, or format is not supported"

warning message will appear. The system also prevents uploading if there is not enough memory available for the corresponding extension. This will cause the "You do not have enough space" warning message to appear.

Browse opens the file chooser window to browse for a new menu message file.

The **Download Recurring Attendant Prompt File** link appears only if a recurring Auto Attendant prompt has been previously uploaded. The link is used to download the audio file to the PC and opens the file chooser window where the saving location can be specified.

- **Friendly Phones** - the **Edit Authorized Phones Database** link refers to the [Authorized Phones Database](#) page where a list of trusted external phones can be created.

The **Custom** manipulation radio button selection allows you to upload Attendant's custom scenario file and voice messages. The selections are:

- The **Upload Scenario File** indicates the file name used to upload a new scenario file. The uploaded file needs to be in EpygiXML format (the coding standard can be found at [Epygi Technical Support](#)) and is restricted to a 20KB file size. **Browse** opens the file chooser window to browse for a custom scenario file.
- The **View/Download Scenario** link appears only when a custom scenario file has been previously uploaded and is used to view or download the scenario file. The **Remove Scenario** link is used to remove a custom scenario file and return to the default Auto Attendant scenario.
- The **Upload Custom Scenario Voice Messages** link refers to the page where voice messages used in the uploaded custom scenario should be managed.

This page provides the possibility of uploading voice messages to be played in the custom Auto Attendant scenario. It also removes and downloads the uploaded files to a PC.

The **Upload Custom Scenario Voice Messages** page contains a table where uploaded custom voice messages are listed. Use the **Download** functional button to download and use **Remove** to delete the corresponding custom voice message. **Browse** opens a file chooser window to browse for a custom voice message.



Fig. II-53: Upload Custom Voice Messages page

The **Edit** functional button provides a possibility of editing multiple extensions at the same time. In this case, fields that cannot be edited for multiple records have **Multiple** values in the **Edit Entry** page. When editing user and attendant extensions together, the **Edit Entry** page displays only those fields that are for both user extension and attendant settings. Additionally, for the fields that need to be modified, a **Select to modify fields** checkbox alongside the corresponding field needs to be selected to submit changes, otherwise the fields will not be updated.

Delete removes the selected extensions. If no records are selected an error message occurs.

The [Upload Universal Extension Recordings](#) link leads to the page where universal default voice messages for all extensions are defined.

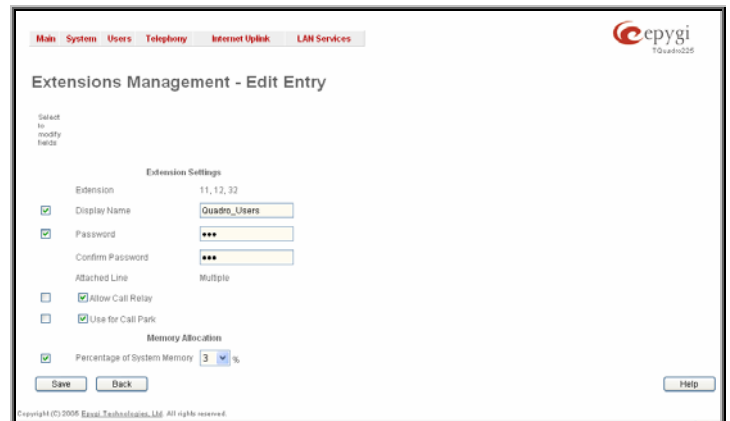


Fig. II-54: Extensions Management - Edit Entry page for multiple edit operation

To Configure an Extension

1. Press the **Add** button on the **Extensions Management** page. The **Add Entry** page will appear in the browser window.
2. Enter the desired extension number in the **Extension** text field and select the extension type from the **Type** drop down list.
3. Press **Save** to create an extension with the defined number.
4. Select the checkbox of the newly created extension in the **Extensions Management** table and press the **Edit** button. The **Edit Entry** page will appear in the browser window.
5. Move through the extension's configuration pages and fill the fields with the appropriate information.
6. To apply extension settings, press **Save**.

To Delete an Extension

1. To remove an extension with all its settings select one or more checkboxes of the corresponding extensions that should be deleted from the **Extensions Management** table. Press **Select all** if all extensions should be deleted.
2. Click on the **Delete** button on the **Extensions Management** page.
3. Confirm the deletion by clicking on **Yes**. The extension(s) will be deleted. To abort the deletion and keep the extension in the list, click **No**.

Extension Codecs

To establish IP voice communication, both partners have to use the same codec. When establishing the communication line, this codec is negotiated. If the caller does not find an appropriate codec, the communication cannot take place. If you want to be reachable by all IP calls, it is helpful to support as many codecs as possible. In this case, all the codecs that Quadro offers should be added to the **Active Codecs** table. Some codecs require a high transfer rate of up to 64 kbit/s. If you are certain you do not want to use these codecs, make sure they are not listed in the table **Active Codecs**.

The **Extension Codecs** page displays a list of **Active Codecs** with the state of the **Out of Band DTMF** and **FAX Support** features for Quadro extensions and the Auto Attendant.

Please Note: Use caution when configuring Auto Attendant Codecs as they are used by virtual extensions for redirecting the incoming calls.

The table **Active Codecs** lists active voice codecs for the selected line that are supported by Quadro. The order of records in the **Active Codecs** table is important for transmitting and receiving. A codec placed at the top of the table will be used as the preferred codec. If the remote party does not support the preferred codec, the following codecs will be tried in a top to down order in the **Active Codecs** table.

Each record in the table has an assigned checkbox. They are used to select the record to be deleted or moved up or down.

An error occurs if no records are selected and the user activates the delete button, the "No records selected" error message appears. At least one codec must be attached to the line. When attempting to delete the last codec, the "At least one codec should stay in the codec list" error message will appear.

Add opens the **Add Entry** page where the user may add codecs supported by Quadro. The voice codec defines the voice compression algorithm for the incoming and outgoing DSP packages.

Codecs lists all codecs supported by Quadro. If no more codecs are available (all available codecs have already been transferred to the **Active Codecs** table), the **Add Entry** page will display the message "No Available Codecs" instead of the drop down menu.

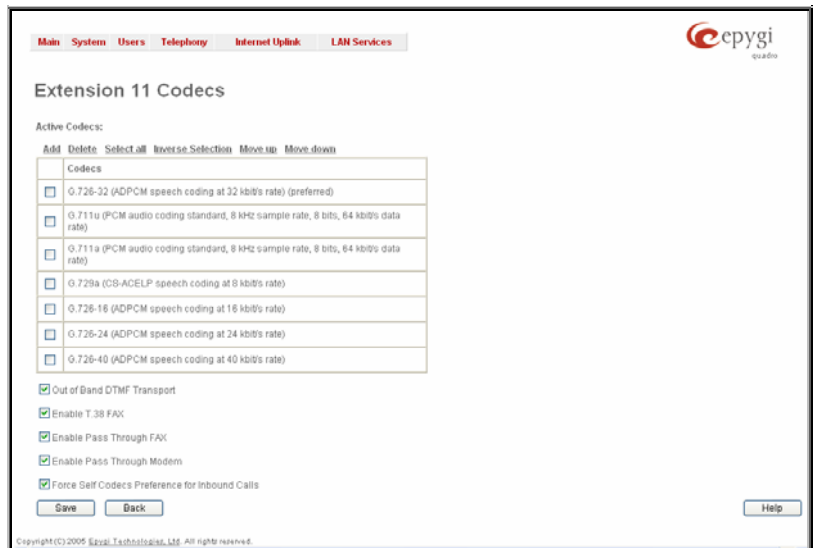


Fig. II-55: Extension Codecs list

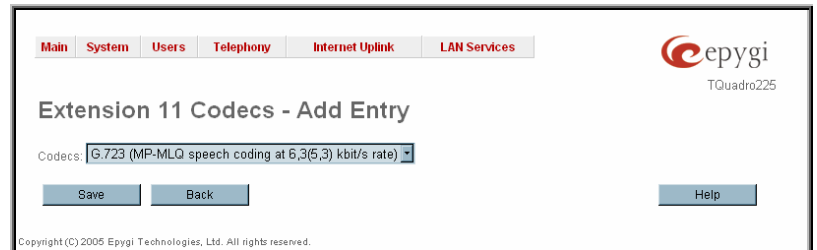


Fig. II-56: Extension Codecs - Add Codec page

The **Move Up/Move Down** buttons are used to move the selected codec one level up/down in the table.

The **Out of Band DTMF Transport** checkbox enables DTMF code transmission in parallel with the voice stream. The destination receiving the DTMF code will play it locally if it supports the feature. This is helpful to avoid DTMF's loss upon bad traffic. This feature is valuable for all codecs but it is especially recommended to enable it in case low bit rate codecs (G729, G723, G726/16, etc.) are selected.

Enable T.38 FAX checkbox enables the FAX tone detection and the T.38 codec support for the FAX transmission from/to the Fax Machine/Fax modem attached to the line. **Enable Pass Through FAX** checkbox enables the FAX tone detection and the G711 codec support for the FAX transmission from/to the Fax Machine/Fax modem attached to the line.

If both of these checkboxes are enabled, T.38 codec will be used as preferred codec for FAX transmit/receive and if not acceptable by the peer, G711 codec will be used instead.

Please Note: If both of these checkboxes are disabled, no FAX transmission to the peer's voice mailbox will be possible. Checkboxes are applicable for FAX transmission/receipt over an IP network only.

Enable Pass Through Modem checkbox enables the modem tone detection and the G711 codec support for the data transmission from/to the modem attached to the line. During data transmission, Silence Suppression (see [RTP Settings](#)) and Echo Cancellation are being disabled on the line.

The **Force Self Codecs Preference for Inbound Calls** checkbox enables the usage of your own preferred codecs (if available on both peers) for the IP connection establishment on the extension.

Authorized Phones Database

The **Authorized Phones Database** page is used to create a list of trusted external phones. If they are part of the Quadro Authorized Phones database, external SIP or PSTN, then users are free to access the Quadro Auto Attendant services without requiring authentication. When adding a trusted phone to the list, an existing extension has to be chosen. The parameters (extension number and password, as well as SIP and Speed Calling Settings) will be used automatically for the trusted caller access of the Quadro Auto Attendant. A direct connection to the **Call Relay** menu can be optionally provided.

The **Authorized Phones Database** page displays the **Authorized Phones Database** table where the trusted phones are listed. Only SIP and PSTN users can be added to the **Authorized Phones Database**.

The **Authorized Phones Database** table displays all trusted callers with their settings. For example, the call type, caller address, extension they automatically login with, information if they have automatic access to Call Relay Menu of the Auto Attendant, etc.

Call Type	Caller Address	Login Extension	Automatically Enter Call Relay Menu	Callback	Description
<input type="checkbox"/> PSTN	126597869598	11	Yes	Disabled	From Morn
<input type="checkbox"/> PSTN	987657778768565	32	No	Enabled: Auto/12234	Customer Support
<input type="checkbox"/> SIP	124435@sip.epygi.com	14	Yes	Disabled	Epygi Tech support
<input type="checkbox"/> SIP	52425@sip.epygi.com	34	No	Disabled	Salesperson
<input type="checkbox"/> SIP	11221@sip.epygi.com	13	Yes	Enabled: PSTN0039411210	From Home

Fig. II-57: Authorized Phones Database

Each record in the table has an assigned checkbox. The checkbox is used to edit or delete the corresponding record. The "No records selected" error message occurs if the user activates the edit or delete button with no records being selected. The error message "One record should be selected" appears if the user tries to edit more than one record. The heading of each column in the table has a link. By clicking on the column heading, the table will be sorted by the selected column. When sorting (ascending or descending), arrows will be displayed next to the column heading.

The **Add** functional button refers to the **Authorized Phones Database- Add Entry** page where new trusted users may be entered.

The **Authorized Phones Database- Add Entry** page offers two group of input options:

Caller Settings

The **Call Type** drop down list includes possible incoming call types (PSTN, SIP or Auto). In **SIP**, the caller connects Quadro through a SIP server and **PSTN** means the caller is a PSTN user. **Auto** is used for undefined call types and the destination (independent on whether it is a PBX number, SIP address or PSTN number) will be reached through Routing.

The **Caller Address** text field requires the caller's SIP address (see chapter [Entering a SIP Addresses correctly](#)) or PSTN number to be added to the trusted phones list. The PSTN number length depends on the area code and phone number. The wildcard is supported in this field. If the caller address already exists in the **Authorized Phones Database**, the error message "The record already exists" appears when selecting the **Save** button.

Fig. II-58: Authorized Phones Database - Add Entry page

The **Login Extension** drop down list provides all existing extensions on the Quadro. When calling the Quadro Auto Attendant, a trusted user will automatically be logged in as the selected extension, i.e., the extension number and its password will be automatically submitted by the Quadro system. The trusted user will directly access the Quadro Auto Attendant services. The SIP settings of the login extension will be used when making IP calls.

The **Automatically Enter Call Relay Menu** checkbox enables direct access for the trusted user to the Quadro Auto Attendant Call Relay menu. If the checkbox is not selected, a trusted caller will be directed to the Auto Attendant's main menu, but will still be able to reach Remote Access (Voice Mailbox of the specified extension) and Call Relay services (see Feature Codes) with no authentication.

The **Description** text field allows entering an optional comment.

Callback Settings

The **Enable Callback** checkbox selection gives the possibility for specified trusted caller to use the Instant Call Back service (see chapter [Call Back Services](#)).

The **Callback Call Type** drop down list includes possible callback call types (PBX, PSTN, SIP and Auto).

The **Callback Destination** text field requires the destination number where Quadro should instantly call back to. The value inserted in this field is dependent on the selected callback call type: for **PBX**, 2-digit extension is required, for **SIP**, the SIP address is required and for **PSTN**, a PSTN number is required. **Auto** is used for undefined call types: destination (independent on whether it is a PBX number, SIP address or PSTN number) will be reached through [Call Routing](#) table. If this field is left empty, the callers address will be implied as a callback destination.

Please Note: The Call Back service is functional and can be enabled only for PSTN callers.

To Add an Authorized phone to the database

1. Enter the desired **Auto Attendant Settings** page.
2. Select **Edit Authorized Phones Database** to enter the **Authorized Phones Database** page.
3. Press the **Add** button on the **Authorized Phones Database** page. The **Add Entry** page will appear in the browser window.
4. Choose the call type and enter a caller address in the corresponding text field.
5. Select a **Login Extension** and the **Automatically Enter Call Relay Menu** checkbox (if required).
6. Enable **Call Back** service if required and define a **Call Back Destination** in the same named field.
7. Fill in an optional **Description** in the appropriate field, if required.
8. Press **Save** to submit the settings.

To Delete an Authorized phone from the database

1. Enter the desired **Auto Attendant Settings** page.
2. Select **Edit Authorized Phones Database** to enter the **Authorized Phones Database** page.
3. To remove an authorized phone(s), select one or more checkboxes of the corresponding records that should be deleted from the **Authorized Phones Database** table. Press **Select all** if all records should be deleted.
4. Press the **Delete** button on the **Authorized Phones Database** page.
5. Confirm the deletion by clicking on **Yes** or cancel the action by clicking on **No**.

Call Back Services

With **Call Back** service, PSTN callers can save a call charge when calling to and through Quadro. Quadro provides the possibility of creating a list of those trusted PSTN callers that are allowed to make free of charge calls to Quadro's Auto Attendant or through its Call Relay menu to the third party IP or PSTN destination. Two types of Call Back services are available on the Quadro: **Pre-configured Call Back** and **Remote Call Back Configuration**.

Pre-Configured Call Back

For **Pre-configured Call Back**, a list of trusted PSTN callers must be configured in the Quadro's Authorized Phones Database using Web Management. The Call Back service should be enabled and a valid callback destination should be specified for each PSTN caller.

To use **Pre-configured Call Back**, the PSTN caller registered in the Authorized Phones Database simply calls to the PSTN number attached to the Quadro FXO line (the FXO line should be previously routed to the Auto Attendant from the [FXO Settings](#) page) from the global PSTN network. Let the call to ring twice and then hang up. Call Back will be instantly activated, and Quadro will call back to the defined Call Back destination. By answering the incoming call the PSTN party will be connected to the Auto Attendant menu.

Remote Call Back

The **Remote Call Back Configuration** service is used by authorized PSTN caller to configure or reconfigure by an authorized PSTN caller using a phone and calling to the Quadro's Auto Attendant. Remote Call Back Configuration is divided into two modes accessible from the Quadro's Auto Attendant: **Permanent Call Back** and **Non-Permanent Call Back**.

Please Note: Remote Call Back Configuration services are only available when the **Automatically Enter Call Relay Menu** checkbox is disabled in Authorized Phones Database for the trusted user.

Permanent Call Back service allows the callers registered in the Authorized Phones Database to create a new trusted PSTN Caller with Call Back enabled. They can also modify the Call Back destination of an existing PSTN Caller in the Authorized Phones Database. By calling Quadro's PSTN number (that is previously routed to the Auto Attendant) and entering the Auto Attendant menu, the caller can use the ***6** code (see Feature Codes) to create a new trusted PSTN Caller as well as to modify the Call Back destination for the already registered Caller in the Authorized Phones Database.

Entering the **Permanent Call Back** reconfiguration menu, the system will ask the caller to login by dialing the number and an appropriate password for the Quadro's extension that is used as login extension in Call Back settings. After entering the login successfully the PSTN callers should follow the voice instructions for configuring a new entry or reconfiguring the existing entry in Authorized Phone database.

When the system accepts the settings, the corresponding entry will be logged to the Authorized Phones Database. The detected PSTN caller address must correspond to the one applied by the caller, the FXO line must be available on the Quadro, there must be network connectivity and the destination must be reachable. The PSTN caller will then be disconnected from the Quadro's Auto Attendant and the defined Call Back destination will receive a call from the Quadro within the next 45 seconds. Answering the incoming call, the PSTN caller will be reconnected to the Quadro's Auto Attendant.

Non-Permanent Call Back configuration service allows the trusted caller to organize one-time Call Back to the defined PSTN destination. In this situation, no entry will be logged to the Authorized Phones Database.

By calling Quadro's PSTN number (that is previously routed to the Auto Attendant) and entering the Auto Attendant menu, the caller is able to use the ***5** menu (see Feature Codes) to modify the Call Back destination for the already registered Caller in the Authorized Phones Database.

The system will ask the caller to login by dialing the number and an appropriate password for the Quadro's extension that is used as login extension in the Call Back settings. After successful login, the PSTN caller should follow the voice instructions for reconfiguring the existing entry in Authorized Phone database.

The detected PSTN caller address must correspond to the one applied by the caller, the FXO line must be available on the Quadro, there must be network connectivity and the destination must be reachable. The PSTN caller will then be disconnected from the Quadro's Auto Attendant and the defined Call Back destination will receive a call from the Quadro within the next 45 seconds. Answering the incoming call, the PSTN caller will be reconnected to the Quadro's Auto Attendant.

Upload Universal Extension Recordings

The **Upload Universal Extension Recordings** are to be defined by the Quadro administrator and will be present instead of the default voice messages for all extensions on the Quadro. They will be used when no custom messages have been uploaded or recorded.

The following system messages can be uploaded from this page:

- **Incoming call blocking** - played when a blocked user calls the extension
- **Outgoing call blocking** – played when extension dials a blocked destination

The **Upload Universal Extension Recordings** page consists of a table where the universal voice messages are listed.

An **Upload** functional link is present for each voice message recording that is not uploaded in the table and it is used to upload the custom system message. When a message is uploaded, the **Upload** functional link is replaced by **Download** and **Remove** functional links respectively. These are used to download to the PC and to remove the uploaded system message.

The **Memory Allocation** group includes a drop down list used to specify the **Percentage of System Memory** for the universal extension recordings. The maximum value in the drop down list is equal to the maximum available space for voice messages on Quadro.



Fig. II-59: Upload Universal Extension Recordings page

Please Note: Changing the **Percentage of System Memory** on this page will stop any recordings of universal extension voice messages from the handset.

Telephony Menu

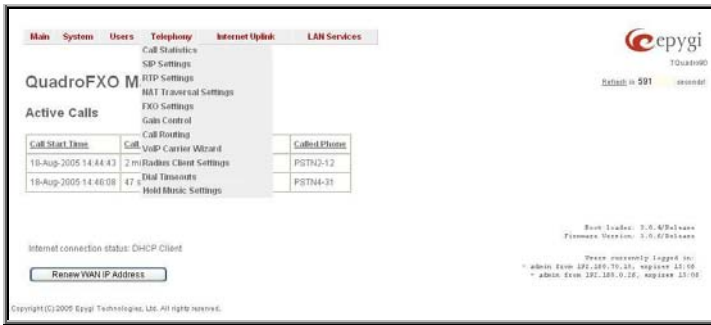


Fig. II-60: Telephony Menu in Dynamo Theme



Fig. II-61: Telephony Menu in Plain Theme

Call Statistics

The **Call Statistics** page displays four tables. They provide information on successful, unsuccessful and missed incoming and outgoing calls on the first three tables, and statistics settings on the fourth page. Call statistics allows the collecting of call events on the Quadro with their parameters and to search them by various criteria.

The **Statistics Settings** page offers the following input options:

The **Enable Call Reporting** checkbox enables Call Statistics reporting. The selected number of statistics entries will be displayed in the Call Statistics tables.

The **Maximal Number of Displayed Call Records** drop down lists are used to select the number of **Successful**, **Missed** and **Nonsuccessful** statistics entries to be displayed in the corresponding **Call Statistics** tables. If the record numbers exceed the numbers specified in these drop down lists, the oldest record will be removed.

The **Download Call Statistics** link is used to download all displayed statistics in a file that can be viewed with a simple text editor.

The **Clear all Records** button is used to clear all statistics records.

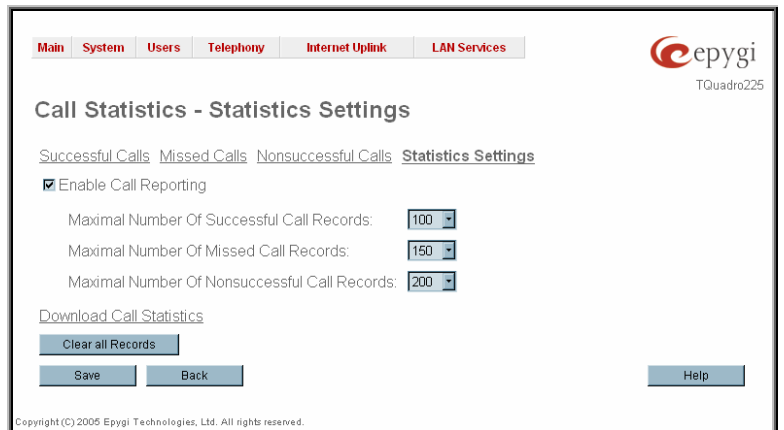


Fig. II-62: Call Statistics Settings page

The **Number of Records** displays the current number of statistics entries in the table. For successful calls, **Total Duration**, **Maximum Duration**, **Average Duration** and **Minimum Duration** statistics are displayed on top of the table.

The **Call Statistics: Successful Calls**, **Missed Calls** and **Nonsuccessful Calls** pages consist of the general information on successful, missed and unsuccessful calls, search fields and the calls table. The search components are as follows:

From and **To** text fields are used to search by date and time. The data must be entered in either of the following formats: dd-mm-yyyy hh:mm:ss or dd-Mon-yyyy hh:mm:ss. The time criteria are optional. **From** requires an earlier date and time than the **To** field. If the entered data does not meet this condition, the error message "Minimal date should be less than maximal date" prevents statistics filtering.

From and **To** drop down lists are used to search by duration. The duration has to be selected from the list of values. **From** field must indicate a shorter duration than the **To** field. If the inserted data does not meet this condition, the error message "Minimal duration should be less than maximal duration" prevents statistics filtering.

Calling Phone and **Called Phone** respectively require the caller and called party's SIP address (see chapter [Entering a SIP Addresses correctly](#)), extension or PSTN number as search criteria. Wildcard symbols are allowed here.

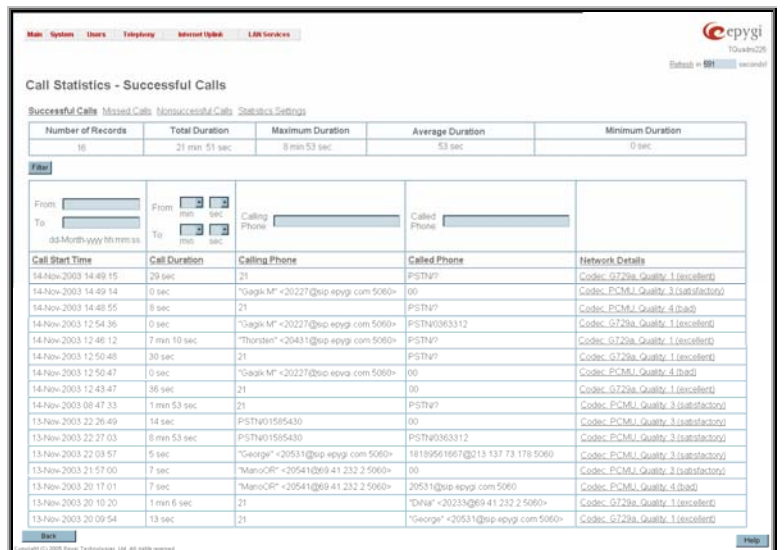


Fig. II-63: Call Statistics page

The **Call Statistics: Successful Calls, Missed Calls and NonSuccessful Calls** tables are lists of successful, missed and unsuccessful incoming and outgoing calls and their parameters (Call Start Time, Call Duration, Call destinations). Each column heading in the tables is a link. By clicking on the column heading, the table will be sorted by the selected column. Upon sorting (ascending or descending), arrows will be displayed close to the column heading.

The **Network Details** column is only present in the **Successful Calls** table and provides brief information about the call quality and codecs used to receive and transmit packets. Clicking on the successful call details will open the **RTP Statistics** page where detailed information about the established call is provided. The **Call Detail** column is present only in the **Non Successful Calls** table and indicates the reason why the call was unsuccessful.

Filter performs a search procedure by the selected criteria. The search may be done with several criteria at the same time.

To Enable/Disable the Statistics

1. Enter the **Call Statistics Settings** page.
2. Select or deselect the **Enable Call Reporting** checkbox to enable or disable statistics recording.
3. If enabling the statistics, the maximum number of records to be stored in the statistics table should be selected from the corresponding drop down lists.
4. Press **Save** to apply the new configuration.

To Filter the Statistics

1. Enter the desired criteria fields.
 2. Press the **Filter** button to search the call reports within the **Call Statistics** table.
- Please Note:** To return to the complete **Statistics Table**, clear all search criteria and press **Filter**.

To Reset the Statistics

1. Press the **Clear All Records** button in the **Call Statistics Settings** page.
2. Confirm the deletion by clicking on **Yes**. The call statistics will then be deleted. To abort the deletion and keep the statistics information, click on **No**.

RTP Statistics

The **RTP Statistics** page provides detailed information about the established call is provided.

Quality - estimated call quality, which depends on RTP statistic. Below is the legend for Call Quality definitions on the displayed RTP Statistics:

- excellent** - RX Lost Packets < 1% & RX Jitter < 20
- good** - RX Lost Packets < 5% & RX Jitter < 80
- satisfactory** - RX Lost Packets < 10% & RX Jitter < 150
- bad** - RX Lost Packets < 20% & RX Jitter < 200
- very bad** - RX Lost Packets > 20% or RX Jitter > 200

- Rx/Tx Codec** - codec for received and transmitted RTP stream respectively.
- Rx/Tx Packets** - number of RTP packets received and transmitted respectively.
- Rx/Tx Packet Size** - size of RTP packet (payload) received and transmitted respectively.
- Rx Lost Packets** - number of lost RTP packets for received stream.

Rx Jitter - inter-arrival jitter is an estimate of the statistical variance of the RTP data packet inter-arrival time, measured in timestamp units. The inter-arrival jitter is defined to be the mean deviation (smoothed absolute value) of the difference D in packet spacing at the receiver compared to the sender for a pair of packets. If Si is the RTP timestamp from packet i, and Ri is the time of arrival in RTP timestamp units for packet i, then for two packets i and j, D may be expressed as:

$$D(i,j) = (Rj - Ri) - (Sj - Si) = (Rj - Sj) - (Ri - Si)$$

$$J(i) = J(i-1) + (|D(i-1,i)| - J(i-1))/16, \text{ where } J(i) \text{ is Rx Jitter for packet } i.$$

For more details about Jitter calculations, please refer to the RFC1889.

Rx Maximum Delay - maximum variance (absolute value) of actual arrival time of the RTP data packet compared to estimated arrival time, measured in milliseconds.

If Si is the RTP timestamp from packet i, and Ri is the time of arrival in RTP timestamp units for packet i, then variance for packet i may be expressed as following: $V(i) = |(Ri - R1) - (Si - S1)| = |(Ri - Si) - (R1 - S1)|$

Rx Maximum Delay = max V(i) / 8



Fig. II-64: RTP Statistics page

RX Delay Increase Count – indicates the number of times the delay in jitter buffer is increased during the call.

RX Delay Decrease Count - indicates the number of times the delay in jitter buffer is decreased during the call.

Please Note: RTP Statistics is logged only when at least one of the call endpoints is located on the Quadro. For example, it will not be logged when:

- calls incoming from or addressed to the IP lines or remote extension,
- calls from an external user are routed to another external user through Quadro's routing rules.

In the first case, RTP statistics will be logged if remote extension or IP line user is calling locally to the Quadro's extension or auto attendant.

SIP Settings

The **SIP Settings** provide information on the SIP receive UDP and TCP ports and allows you to select DNS server configurations for SIP and the SIP timers scheme.

The **UDP Port** indicates the SIP UDP (User Datagram Protocol) receive port number. By default 5060 is selected and used. The SIP UDP port cannot be in the selected RTP/RTCP port range for FXS and IP lines (see [RTP Settings](#)), otherwise the "Mapped port for SIP shouldn't be in RTP port range" error message appears.

The **TCP Port** indicates the SIP TCP (Transmission Control Protocol) receive port number. By default, 5060 is selected and used.

Please Note: Quadro will not use TCP protocol as a transport for SIP messages if the **TCP Port** field is left empty.

Enable Session Timer enables advanced mechanisms for connection activity checking. This option allows both user agents and proxies to determine if the SIP session is still active.

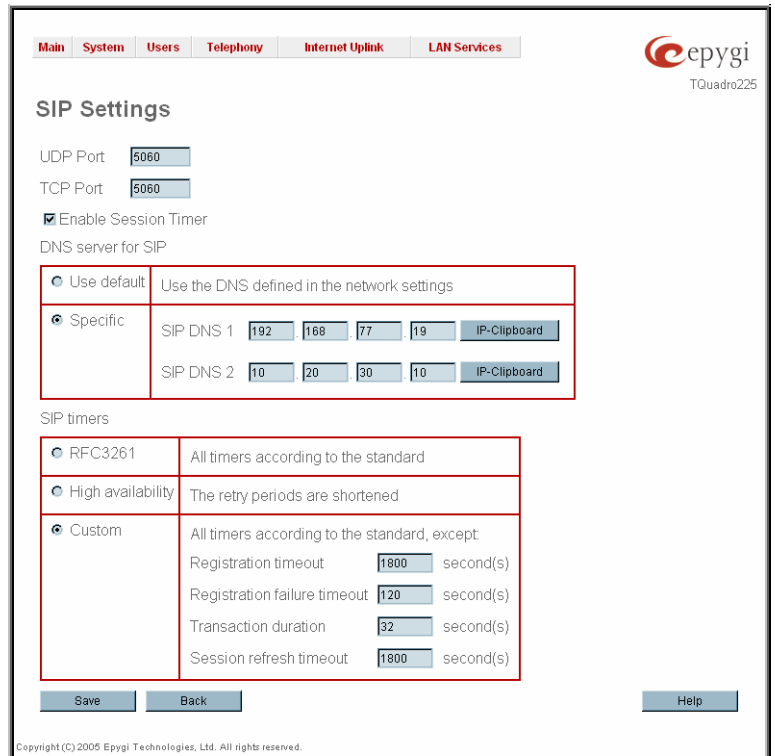


Fig. II-65: SIP Settings page

The **DNS server for SIP** radio button group allows you to choose between regular DNS servers configured in the [DNS Settings](#) page and specific DNS servers for SIP traffic.

- **Use default** is used to apply regular DNS servers for SIP traffic.
- **Specific** is used to enable SIP specific DNS servers. For this selection, both primary and secondary SIP DNS servers should be defined in the **SIP DNS 1** and **SIP DNS 2** text fields. At the least, a primary DNS server should be inserted.

The **SIP Timers** radio button group is used to define the timeouts of the SIP messages retransmission.

- **RFC 3261** will apply standard SIP timers described in the corresponding specification.
- **High availability** will apply SIP timers to shorten the call establishment, registration confirmation and registration failure procedures. This selection provides more firmness to the SIP connection but increases the network traffic on the Quadro.
- **Custom** allows manually defining the **Registration Timeout**, **Registration Failure Timeout**, **Transaction Duration** and **Session refresh timeout** SIP timers (in seconds).

RTP Settings

The **RTP Settings** page allows the administrator to configure the codec's packet size and silence suppression for each voice codec, to select the G.726 codec standard, to define RTP/RTCP port ranges, etc. All parameters listed on this page may be modified and submitted.

The **Codec Properties** table lists all codecs with the corresponding packetization interval and information about silence suppression.

Edit opens the **Edit RTP Settings** page where the codec settings can be modified. To use **Edit**, only one codec may be selected at a time, otherwise the "One record should be selected" error message appears.

The **Packetization Interval** is the time interval between two RTP packets of the same stream. If the interval is increased, the overhead is decreased but the voice quality may deteriorate as a result. If the interval is decreased, the network load is increased and the delay is reduced.

Silence Suppression disables RTP packet transmission in case of no voice activity. This feature helps to avoid extra traffic if the RTP stream contains no voice activity. It is activated after two seconds of silence and restarted immediately if any audio appears.

The **G.726 Standard** radio buttons are used to select between packaging the G.726 codewords into octets. If you experience problems with the G.726 voice quality when one of these packaging is selected, try a different one.

- If **Use ITU-T specification** is selected, the ITU I.366.2 ("AAL2 type 2 service specific convergence sublayer for narrow-band services") type packaging of codewords is used, where packing code words into octets is starting from the most significant rather than the least significant digit in the octet.
- If **Use IETF RFC** is selected, the IETF RFC ("RTP Profile for Audio and Video Conferences with Minimal Control") type packaging of codewords is used, where packing code words is starting from the least significant position in the octet.

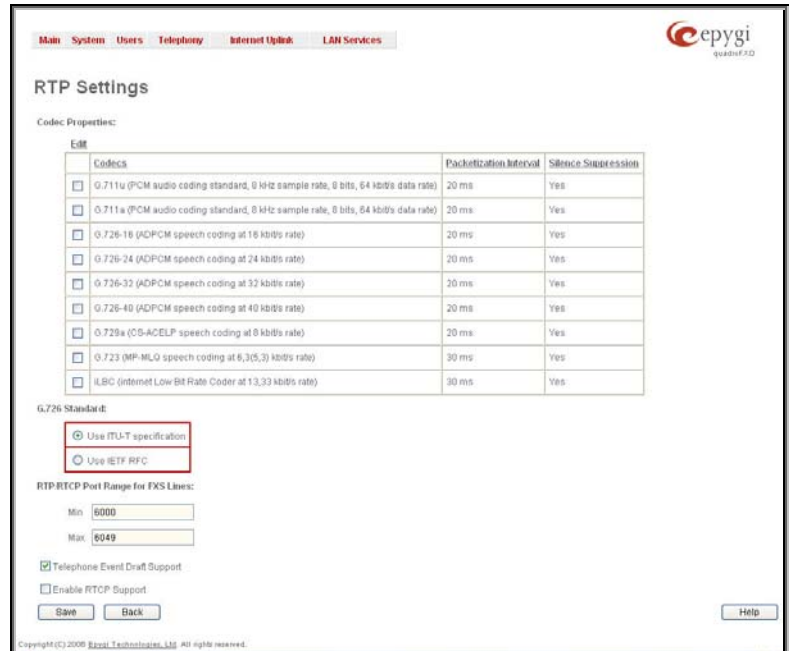


Fig. II-66: RTP Settings page

RTP/RTCP Port Range for FXS Lines:

- **Min** - minimal port has to be higher than 1024 and lower than the maximal port range. Only even numbers are allowed.
- **Max** - maximal port has to be lower than 65536 and higher than the minimal port range. Only odd numbers are allowed.

Since the specified maximum port has to be higher than the minimum port, the error message "Min port number should be less than max port number" will appear if this condition is not met. The port range must consist of digits only, otherwise the error "Incorrect Port Range: only Integer values allowed" will appear. The difference between Max and Min RTP ports should be 50 ports or less (according to the system's capabilities) otherwise the corresponding warning appears. RTP/RTCP Port ranges cannot include the defined SIP UDP ports (see [SIP Settings](#)) otherwise an error message will appear.

Telephone Event Draft Support enables telephony events transmission according to the draft-ietf-avt-rfc2833bis-04. The checkbox needs to be toggled if the SIP destination party phone or IVR has problems recognizing DTMFs generated by the Quadro.

Enable RTCP Support enables Real Time Control Protocol support and allows for the RTCP packets transmission. RTCP protocol is used for monitoring the RTP streams and changing RTP characteristics depending on Network conditions.

The **RTP Settings – Edit Entry** page offers a drop down list and a checkbox.

Packetization Interval contains possible values (in milliseconds) to be configured for the selected codec.

The **Enable Silence Suppression** checkbox selection enables voice activity detection for the selected codec.

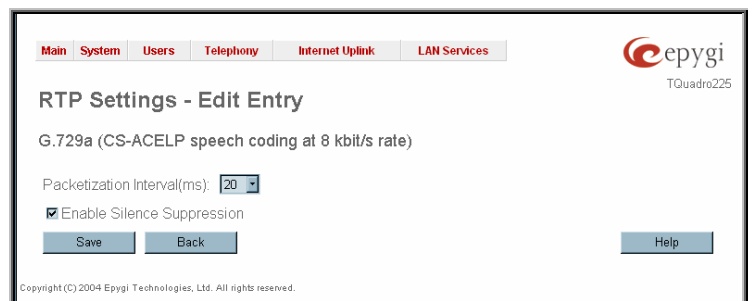


Fig. II-67: RTP Settings - Edit Entry

To Edit Codec Parameters

1. Select the codec from the **Codecs Table** that is to be edited.
2. Press the **Edit** button on the **RTP Settings** page. The **Edit Entry** page will appear in the browser window.
3. Change values in **Packetization Interval** and/or enable/disable **Silence Suppression**.
4. To save the codec settings press **Save**, or to keep the initial data click **Back**.

NAT Traversal Settings

The **NAT Traversal Settings** page is divided into separate pages used to configure General NAT settings, SIP NAT parameters, RTP and STUN parameters for NAT and a page where the NAT Exclusion table may be filled.

The **General Settings** page consists of a manipulation radio buttons group to select the mode of the NAT Traversal usage for the SIP traffic (any incoming and outgoing SIP messages from and to the Quadro will be routed through the NAT PC).

- **Automatic** – with this selection, system will analyze the Quadro's WAN IP address and if it is in the IP range specified for local networks (according to RFC), the SIP traffic will be routed through NAT. Otherwise, if Quadro's WAN IP address is outside the specified IP range, no SIP traffic will be routed through NAT server.
- **Force** – with this selection, all SIP traffic will be routed through NAT server.
- **Disable** – with this selection, no SIP traffic will be routed through NAT server.

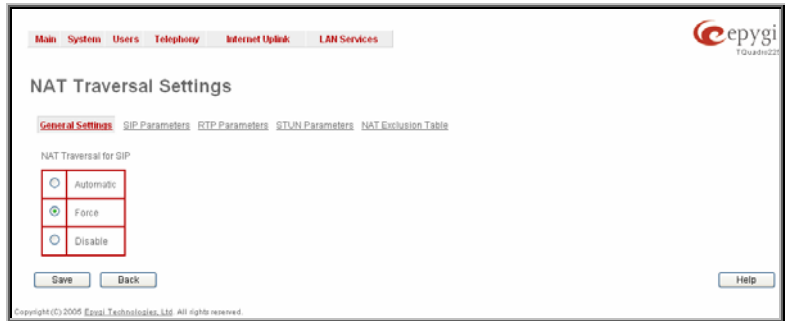


Fig. II-68: General NAT traversal page

The **SIP Parameters** page is used to configure NAT specific settings for SIP and offers two independent groups of settings:

UDP Parameters:

Manipulation radio buttons allow you to select the type of connection over NAT:

Selecting **Use STUN** will switch to automatic discovery of Mapped settings for the SIP UDP traffic over NAT. STUN settings are configured on the STUN parameters page (see below).

Selecting **Use Manual NAT Traversal** allows you to manually define the mapped settings for the SIP UDP traffic over NAT:

Mapped Host requires the IP address of the mapped host for SIP UDP traffic over NAT.

Mapped Port requires the port number on the mapped host for the SIP UDP traffic over NAT.

TCP Parameters:

Mapped Host requires the IP address of the mapped host for SIP TCP traffic over NAT.

Mapped Port requires the port number on the mapped host for the SIP TCP traffic over NAT.

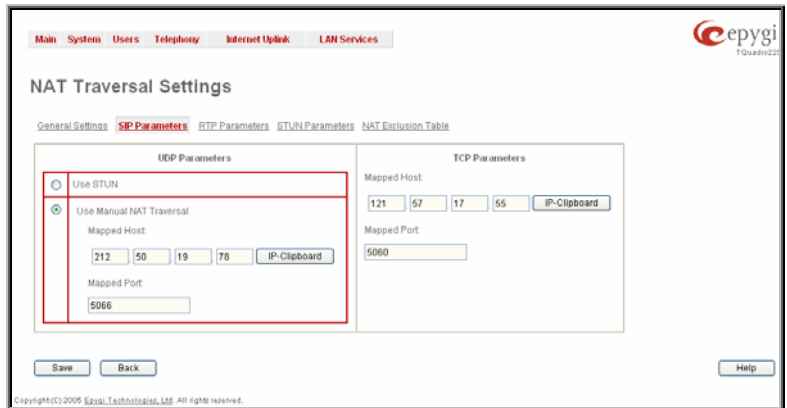


Fig. II-69: SIP Parameters page

The **RTP Parameters** page is used to choose between the STUN and Manual NAT traversal connection for the RTP traffic and to define the RTP/RTCP ports for the connection over NAT.

Manipulation radio buttons allow you to select the type of connection over NAT:

Selecting **Use STUN** will switch to automatic discovery of Mapped settings for the RTP UDP traffic over NAT. STUN settings are configured on the STUN Parameters page (see below).

Selecting **Use Manual NAT Traversal** allows you to manually define the RTP/RTCP port ranges for the RTP traffic over NAT:

- The **Mapped Host** text fields require the Mapped Host for RTP traffic over NAT.
- **Mapped RTP/RTCP Port Range for FXS Lines:**
 - **Min** - minimal port has to be higher than 1024 and lower than the maximal port range. Only even numbers are allowed.
 - **Max** - maximal port has to be lower than 65536 and higher than the minimal port range. Only odd numbers are allowed.

Please Note: RTP/RTCP Mapped Port ranges should be greater than or equal to the RTP/RTCP port ranges defined on the [RTP Settings](#) page.

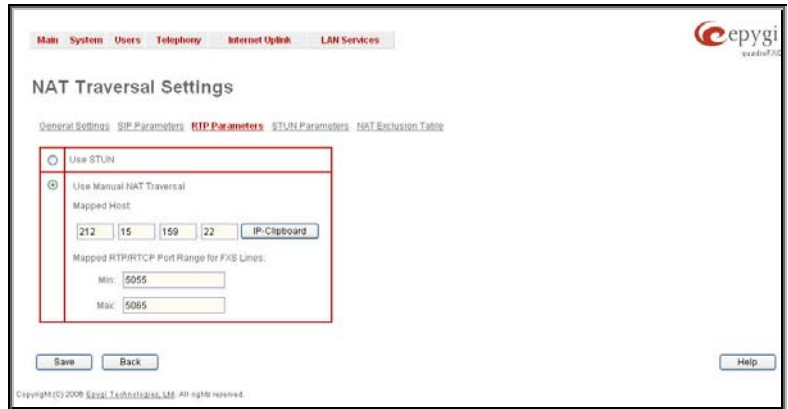


Fig. II-70: RTP Parameters page

The **STUN Parameters** page enables automatic NAT configuration through the STUN server and is used to configure the STUN (Simple Traversal of UDP over NAT) client on the Quadro. This page requires the following data to be inserted:

The **STUN Server** text field requires the STUN server's hostname or IP address. The **STUN Port** text field requires the STUN server port number.

The **Secondary STUN Server** and **Secondary STUN Port** text fields respectively require the parameters of the secondary STUN server.

The **Polling Interval** drop down list contains the possible time intervals between referrals to the STUN server.

The **Keep-alive interval** text field provides the options to select the time interval (in seconds) for keeping NAT mapping alive.

The **NAT IP checking interval** text field indicates the interval (in seconds) between the NAT IP checking attempts (used to distinguish the possible NAT IP address changes and to perform registration on the new host). The value should be in the range of 10 to 3600.

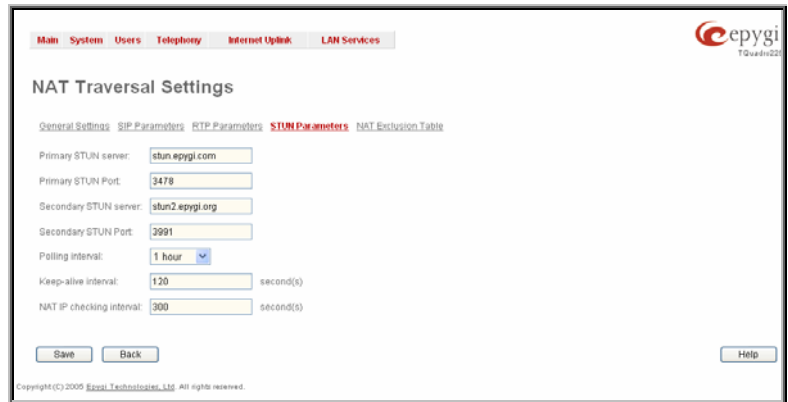


Fig. II-71: STUN Parameters page

The **NAT Exclusion Table** page includes a table where all possible IP ranges are listed that allows you to exclude some network addresses from being NATed. For example, if a Quadro user needs to make SIP calls within the local network as well as outside of that network, all local IP addresses are required to be excluded from NAT traversal settings by being listed in this table. Otherwise, a malfunction may occur in SIP operations.

The **NAT Exclusion Table** page offers the following input options:

Each record in the table has a corresponding checkbox assigned to its row. The checkbox is used to delete or to edit the corresponding record. Only one record may be edited at a time. An error message will appear if no selection is made or more than one is selected.

Each column heading in the table is a link. By clicking on the column heading, the table will be sorted by the selected column. When sorting (ascending or descending), arrows will be displayed next to the column heading.

The **Add Entry** page includes the following text fields:

Add opens the **Add Entry** page where a new IP range can be added.

Edit opens the **Edit Entry** page where the IP range can be modified. This page includes the same components as the **Add Entry** page.

The **NAT Exclusion Table** lists all possible IP ranges that are not included in the NAT process, but may be accessed directly. IP addresses that are not listed in the **NAT Exclusion Table** are accessed over NAT.



Fig. II-72: NAT Exclusion Table page

IP address requires the IP address that is placed behind NAT within the local network.

Subnet Mask requires the subnet mask corresponding to the specified IP address.

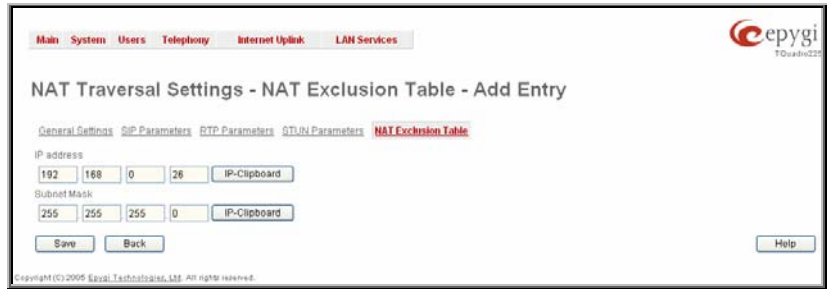


Fig. II-73: NAT Exclusion Table - Add Entry page

To Configure the NAT Exclusion Table

1. Press the **Add** button on the **NAT Exclusion Table** page. The **Add Entry** page will appear in the browser window.
2. Specify an **IP Address** and its **Subnet Mask** in the corresponding text fields.
3. Press **Save** on the **Add Entry** page to add the selected IP range to the **NAT Exclusion Table** list.

To Delete an IP Range from the NAT Exclusion Table

1. Select the checkboxes of the corresponding IP range(s) that should to be deleted from the **NAT Exclusion Table**. Press **Select all** if all IP ranges should to be deleted.
2. Press the **Delete** button on the **NAT Exclusion Table** page.
3. Confirm the deletion by pressing **Yes**. The IP range will then be deleted. To abort the deletion and keep the IP range in the list, press **No**.

FXO Settings

The **FXO Settings** are used to configure the FXO support that allows Quadro to connect to other PBXs or analog telephone lines. The **FXO Settings** also gives you the option to limit incoming or outgoing calls for the selected FXO line if required. Depending on the Quadro model, several FXO ports will be available on the board, thus giving you the option connect several PSTN lines to the Quadro and to use them simultaneously.

The administrator may assign a default recipient for each FXO line where calls from the Central Office (PSTN) will be routed. The assigned recipients become the Quadro "default users". If the Quadro Auto Attendant has been selected as a "default user", a caller from the PSTN needs to go through the attendant menu to reach the desired extension.

The **FXO Settings** page lists the available local FXO lines, shared FXO lines on the remote devices (if any) and their settings. If the FXO service has been disabled, the **Allowed Call Type**, **Route Incoming Call to** and **PSTN number** columns are set to N/A.

Clicking on the FXO line number will open the **FXO Settings - FXO#** page where the FXO line settings may be modified.

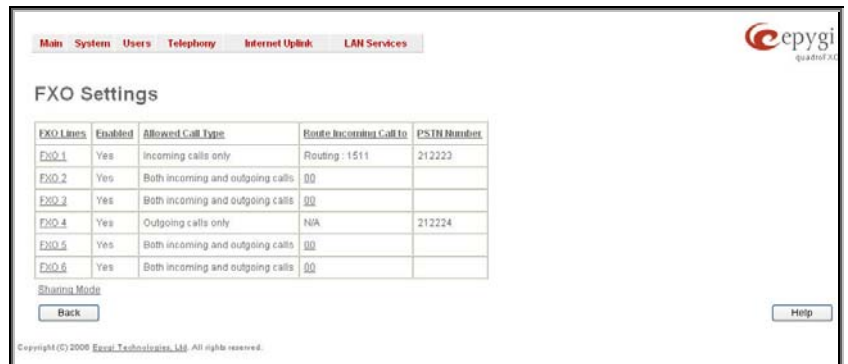


Fig. II-74: FXO Settings page

If **Sharing Mode** is enabled and QuadroFXO acts as an FXO line expansion device, i.e. provides its FXO lines to the remote Quadro IP PBX, the FXO Settings page becomes read-only. Any modifications in the shared FXO line's settings on the master Quadro will be immediately reflected in the FXO Settings table on the slave Quadro.

Routing:smth will be seen in the **Route Incoming Calls To** column once the Sharing Mode is enabled, where **smth** is the destination the call is routed to on the Quadro IP PBX. Exceptions are cases when **Outgoing Calls Only** is selected for **Allowed Call Type**, in this case **N/A** will be displayed in the **Route Incoming Calls To** column.

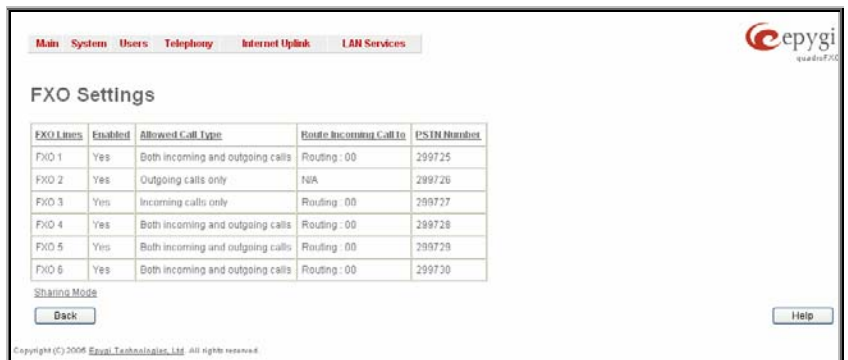


Fig. II-75: FXO Settings page when QuadroFXO shares its FXO lines to the master IP PBX

The **Enable FXO** checkbox selection activates FXO support for the selected FXO line.

The **Allowed Call Type** is used to choose the allowed call directions for the corresponding FXO line. The administrator may choose between:

- **Enabling incoming calls** (prohibiting outgoing calls) for the selected FXO line.
- **Enabling outgoing calls** (prohibiting incoming calls) for the selected FXO line.
- **Enabling both incoming and outgoing calls** for the selected FXO line.

The **Route incoming FXO Call** to manipulation radio buttons group allows you to define the destination where incoming calls addressed to the corresponding FXO line will be forwarded to.

- **Extension** – this selection allows you to choose the local PBX user or auto attendant extension to forward calls. If an inactive extension is chosen from this list, the voice mail system will answer the call addressed to the corresponding FXO line. If the Auto Attendant extension is chosen, it will become the “default user” for the corresponding FXO line on the Quadro.
- **Routing** – this selection allows you to forward the incoming calls to the destination defined through [Call Routing](#). This selection requires you to enter a routing pattern to the corresponding field. Based on the registered PSTN users, the caller will be able to reach the destination according to configurations in Call Routing Table.

By choosing a destination, the Quadro administrator virtually assigns a default number that will start ringing when a call is initiated to the Quadro's PSTN number.

The **PSTN Number** text field allows you to enter the PSTN number that the current FXO line is attached to. The field value is optional and used as an identification parameter for FXO lines. The field value can be left empty.

Alternative AC Termination Mode appears if the local country (Germany, Israel, France, etc.) selected for Quadro has two COs that use different types of AC termination. Contact your CO to learn about your AC termination mode. Selecting the checkbox may help if the voice quality over FXO is poor or an echo is noticed.

The [Sharing Mode](#) link refers to page where local FXO lines can be shared to the remote Quadros.

To modify the FXO Settings

1. Select the FXO line number from the **FXO Settings** table. The **FXO Settings -FXO#** will appear where the line settings may be modified.
2. Enable the FXO line to receive calls from PSTN. To reject calls from/to the PSTN deselect the **Enable FXO** checkbox.
3. If FXO has been enabled, select the **Call Type** from the **Allowed Call Type** drop down list and the extension from the **Route FXO Call to** drop down list to route the FXO calls correspondingly.
4. Insert a **PSTN number** in the same named text field to identify the FXO line.
5. Enable **Alternative AC Termination Mode** if your CO so requires.
6. Press **Save** to submit the FXO line settings.

Sharing Mode

Sharing Mode allows QuadroFXO to act as an FXO expansion device for the remote Quadro IP PBX, i.e. to share its FXO lines to the master Quadro IP PBX. This provides Quadro IP PBX a possibility to call not only through local FXO lines but also through available shared FXO lines on the QuadroFXO.

When sharing mode is enabled, the FXO Settings page becomes read-only on QuadroFXO and corresponding routing patterns are automatically created in the [Call Routing](#) table.

- Information defined in **PSTN Number** text field, as well as the configured **Allowed Call Types** for each of the FXO lines on the QuadroFXO will be transparent to Quadro IP PBX upon enabling the sharing mode.
- Independent of the configuration on the QuadroFXO, the incoming calls on all shared FXO lines will be automatically routed to the default Auto Attendant (00) once FXO sharing is activated. Occasionally, routed destinations can be then changed on Quadro IP PBX.
- Any changes applied to the configuration of shared FXO lines on Quadro IP PBX will be automatically reflected in the **FXO Settings** page and **Call Routing** table on the QuadroFXO device.

Fig. II-76: FXO Line Settings page

Sharing Mode page consists of the following components:

The **Provide FXO lines for master device** checkbox is used to share the existing FXO lines to the remote Quadro.

Username and **Password** text fields are used to enter the identification parameters for the authentication on the remote Quadro. In its turn, these authentication settings should be added in the **Authorization Parameters** table on the master Quadro.

Master device IP text field requires the IP address of the master Quadro current FXO lines will be shared for.

Master device port text field requires the port number of the master Quadro current FXO lines will be shared for.

Registration State and **Registration Date/Time** fields indicate read-only information about the last successful registration on the master Quadro (i.e. when authentication was successful), its state and the registration date/time.

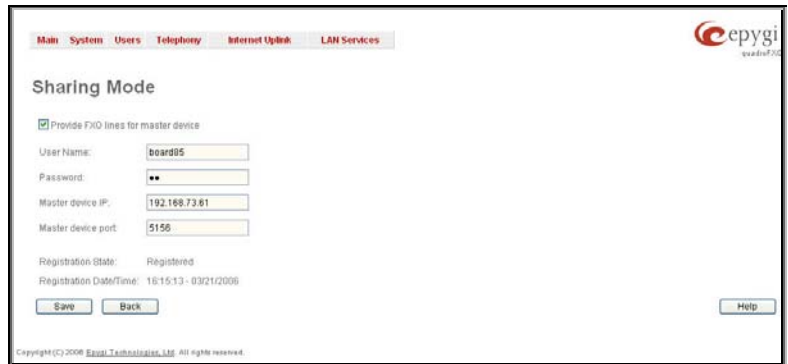


Fig. II-77: Sharing Mode page

Gain Control

The **Gain Control** settings are used to define transmit and receive gains. For FXO lines, **Transmit Gain** defines the level of voice transmitted from Quadro to the PSTN network and **Receive Gain** defines the volume of voice received by Quadro from the PSTN network.

The **Gain Control** page offers **Transmit Gain** and **Receive Gain** drop down lists for each line that contains allowed gain values, which can be set up by the administrator for every line.

Please Note: If the gain control has been configured incorrectly, DTMF digits may not be properly recognized. Gain control settings are strictly dependent on the location (country) of Quadro and the phone type. If a private PBX is attached to the FXO port on the Quadro, the voice level in the handset of the phone connected to the Quadro FXS port may be too loud (depending on the PBX type and configuration). This can be adjusted by decreasing the FXO **Receive Gain** to three or to zero.

The **Restore Default Gains** button restores the default values.

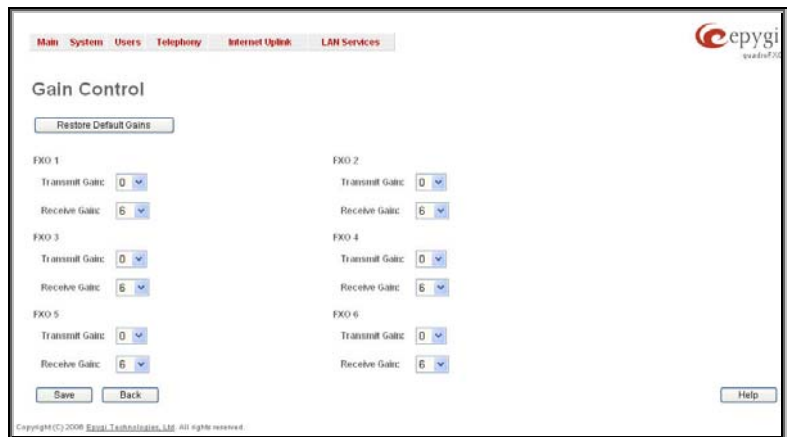


Fig. II-78: Gain Control page

Call Routing

The **Call Routing** service simplifies the calling procedure for Quadro users, i.e., different types of calls (internal, SIP, PSTN or IP-PSTN) can be placed in the same way. SIP registration is not needed for extensions to make routing calls.

The **Call Routing** page offers the following components:

- The **Route all incoming SIP calls to Call Routing** checkbox is used to route ALL incoming SIP calls (whether or not the pattern matches the extension's SIP registration username) to the Call Routing table. Digits will not be stripped in this case.
- The **Call Routing Table** link leads to the **Call Routing** table where routing patterns may be manually defined.
- The **Local AAA Table** link leads to the page where local AAA (Authentication, Authorization, and Accounting) database can be managed.

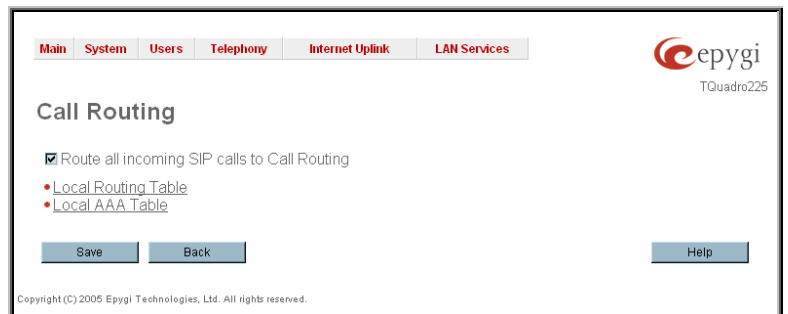


Fig. II-79: Call Routing page

ID	State	Pattern	NDS	Prefix	Call Type	UES	Destination Address	ML	URP	AAA Required	Port ID	Fail Reason	Inb Caller Pattern	Inb NDS	Inb Prefix	Inb Call Type	Inb Served	Inb Port ID	DT Period(s)	Metric	Description
1	Enabled	8*	1		SIP		sip.epygi.com	No	No	No		None								10	Make SIP call
2	Enabled	[0-9]?			PBX					No		None								10	Call to Extensions
3	Enabled	7*	1		SIP		sip.epygi.loc:5060	No	No	No		None								10	
4	Enabled	9*			SIP		192.168.75.215:5116	No	No	No		Any								10	
5	Enabled	51320	2	01	SIP	13	sip.epygi.com:5155	Yes		Auth Users List		Wrong Number	541110	5	00	FXO		FX01	[Jan-Dec][1-31][00:00-23:59]	3	To Epygi Tech Support
6	Enabled	12		01	FXO					Auth&Acc Users List	FX02	Cannot Establish Connection	156			PBX			[Sun-Sat][00:00-23:59]	7	A quick call to my handdresser
7	Disabled	99*	2		FXO				No	No	FX01	None								10	
8	Enabled	654	3	11	SIP		192.168.73.58:5060	No	No	No		None								10	
9	Enabled	777	3	11	SIP		172.38.1.3:5060	No	No	No		None								10	
10	Enabled	991	3	9091314026	IP-PSTN		192.168.75.215:5116	Yes	No	No		None							[Mon,Tue,Thu,Fri][09:00-18:00]	10	

NDS - Number of Discarded Symbols
 UES - Use Extension Settings
 ML - Multiple Logons
 URP - Use RTP Proxy
 Inb - Inbound
 DT - Date/Time

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Fig. II-80: Call Routing table

Defining patterns in the **Call Routing Table** avoids registering Quadro at the routing management server and gives you an option to establish a direct connection to the destination or to use a SIP server for call routing.

The **Call Routing Table** lists manually defined routing patterns along with their parameters (pattern number, state, routing and inbound caller settings, RTP Proxy and Date/Time period settings, metric and description), as well as automatically created and undeletable patterns created when the **Sharing Mode** is enabled.

If the route has an **Authentication** or an **Authentication&Accounting** selected from the **AAA Required** checkbox group, it will have a link to the **Users List** in the **Call Routing table**. The **Users List** page contains a list of authorized users defined from the **Local AAA Table** and gives the option to enable/disable authentication of each user for a particular route.

Since the **Call Routing Table** may have multiple entries that could match to same pattern, the table will be internally rearranged according to the rules with the following consequences:

- The pattern matching best to the **Best Matching Algorithm** will have the higher position in the rearranged list
- If multiple patterns equally match to the **Best Matching Algorithm**, the pattern with the lower metric will get the higher position in the rearranged list
- If the multiple patterns with the same metric have been matched to the **Best Matching Algorithm**, the pattern in the higher position in the table will get the higher position in the rearranged list.

The pattern in the highest position of the rearranged list will be considered as the preferred one. The second and subsequent matching patterns will be used, if the destination refused the call due to the configured Fail Reason.

The **Enable/Disable** functional buttons are used to enable/disable the selected route(s). Disabled routes will have no effect. Enabled routes will be parsed when initiating routing calls. The **State** column in the **Call Routing Table** displays the current state of the routes (enabled/disabled).

Add starts the **Call Routing Wizard** where a new routing pattern may be defined. The **Call Routing Wizard** is divided into several pages. Page 1 displays the following components:

Pattern requires entering the routing pattern's identification. To make a specified call, the appropriate routing pattern should be dialed. Wildcards are allowed here (see chapter **Entering a SIP Addresses correctly**). '[', ']', ',', '-', '{', '}' are used to define a range or a quantity of numbers, '!' symbol is used for exclusion ("!5a" inserted in Pattern field means all patterns except those equal to 5a). For example, 2{13-17, ww, a-c} means that the dialed number may be 213, 214, 215, 216, or 217, 2ww, 2a, 2b and 2c to match the specified pattern; in the case of 2[3,7], the dialed number may be 23 or 27 to match the specified pattern.

Number of Discarded Symbols (NDS) requires the number of symbols that should be discarded from the beginning of the routing pattern. The field should be empty if digits do not need to be discarded. Only numeric values are allowed for this field, otherwise the error message "Error: Number of Discarded Symbols is incorrect - digits allowed only" will appear.

Prefix requires entering the symbols (letters, digits and any characters supported in the SIP username) that will be placed in front of the routing pattern instead of the discarded digits.

Suffix requires entering the symbols (letters, digits and any characters supported in the SIP username) that will be placed in the end of the routing pattern. For example, if the routing **Pattern** is 12345, the **Number of Discarded Symbols** is two, and the **Prefix** is 909 and **Suffix** is 0a, the final phone number will be 9093450a.

Call Type gives you the option to select the call type (PBX, PBX-Voicemail, FXO, SIP, IP-PSTN or ISDN). The **PBX** call type is dedicated for call routing to the local PBX extension, and the **PBX-Voicemail** call type is dedicated to route the calls directly to the voice mailbox of the local PBX extension.

Metric allows entering a rating for the selected route in a range from 0 to 20. If a value is not inserted into this field, 10 will be used as the default. If two route entries match a user's dial string, the route with the lower metric will be chosen.

The **Description** text field requires an optional description of the routing pattern.

The **Filter on Caller / Call Type / Modify Caller ID** checkbox selection allows limiting the functionality of the current route to be used by the defined caller(s) only. If this checkbox is enabled, inbound caller information (**Inbound Caller Pattern**, **Inbound Call Type**, **Inbound Port ID**, etc.) will be required later in the **Call Routing Wizard**.

The **Set Date / Time Period(s)** checkbox selection allows you to define a validity period(s) for current routing patterns to take place and to define pattern date/time rules. When this checkbox is enabled, the **Call Routing Wizard - Page 5** will be displayed.

Require Authorization for Enabling/Disabling checkbox is used to enable administrator's password authentication when enabler/disabler keys are configured for the routing rule. The service can be used locally from the handset (see Feature Codes) or remotely from Auto Attendant (see Auto Attendant Services). When this checkbox is selected, administrator's password will be requested to enable/disable the certain routing rule(s). If the administrator's password has been inserted incorrectly for 3 times, no status changes will be applied to any of the routing record(s), even to those which have no authorization enabled.

Enabler Key and **Disabler Key** text fields request digit combination which should be dialed from the handset or Auto Attendant to enable or disable the certain routing rules in the Call Routing Table. You can set the same Enabler/Disabler Key for multiple routing rules (the same key may be used as enabler for one routing rule, and as disabler for another one) - this will allow managing several routing rules with the single key.

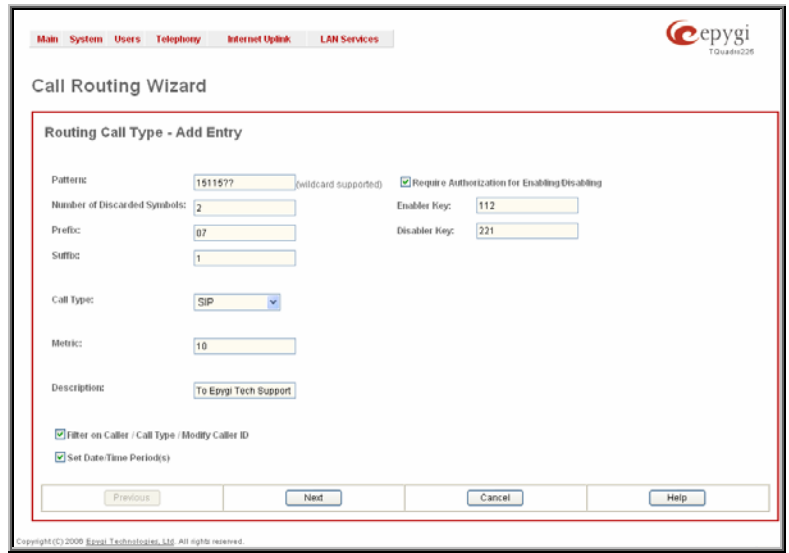


Fig. II-81: Call Routing Wizard - page 1

The second page of the **Call Routing Wizard** offers different components depending on the **Call Type** selected on the previous page.

Use Extension Settings drop down list is applicable to SIP and IP-PSTN call types and allows you to select the extension (also Auto Attendant) on behalf of the call that will be placed. The SIP settings of the selected extension will be used as the caller information. If an entry is not selected from this list, the original caller information will be kept. When **Keep original DID** checkbox is selected, the called destination will receive the original caller's information and not the information of the extension selected from the **Use Extension Settings** list.

Destination Host requires the IP address or the host name of the destination (for a direct call) or the SIP server (for calls through the SIP server).

Destination Port requires the port number of the destination or of the SIP server.

User Name and **Password** require the identification settings for the public SIP server or servers requiring authentication.

Fig. II-82: Call Routing Wizard - page 2

The **Multiple Logons (ML)** checkbox is only available for the IP-PSTN call type and allows/denies multiple logon to the public SIP server with the same username at the same time.

The **Use RTP Proxy** checkbox is available for SIP and IP-PSTN call types and is applicable when a route is used for calls through Quadro between peers that are both located outside the Quadro. When this checkbox is selected, RTP streams between external users will be routed through Quadro. When the checkbox is not selected, RTP packets will move directly between peers.

The **AAA Required** checkboxes are used to choose one or more of the following Authentication, Authorization, and Accounting (AAA) settings:

- **Local Authentication** – with this checkbox selected, callers will need to pass authentication through the Local AAA table (see below) when dialing the current pattern.
- **RADIUS Authentication and Authorization** – this checkbox is present when a RADIUS client is enabled. With this checkbox selected, callers will need to pass the authentication through RADIUS server (see above) when dialing the current pattern.
- **RADIUS Accounting** – this checkbox is present when a RADIUS client is enabled. With this checkbox selected, authentication will not take place, but a caller identifying a CDR (call detail report) will be sent to the RADIUS server. This checkbox selection enables accounting on the RADIUS for a certain call. This selection enables the **Client Code Identification** checkbox which is used to activate/deactivate the code identification on the RADIUS server. When the **Client Code Identification** checkbox is selected, caller may optionally dial an identity code at the end of the corresponding route. To make an identified call, caller should dial **Routing Number + * + Identity Code**. Here, **Identity Code** is an arbitrary digit combination used to identify the corresponding routing rule. Identity Code can be used to identify certain called destinations. This will allow to search the calls by the certain identity code criteria on the RADIUS server (for example, for further billing calculation purposes).

If the authentication is configured based on the caller's address, callers will pass the authentication automatically; otherwise they will be required to identify themselves by a username and a password.

The **Fail Reason** drop down list shows the available failure reasons, depending on the call type selection on the previous page. The following Fail Reasons may be available in this list:

- **Cannot Establish Connection** – this failure reason is only available for FXO and ISDN calls and indicates cases when a connection cannot be established.
- **Wrong Number** – available for PBX, SIP and IP-PSTN call types and indicates cases when the dialed number is wrong.
- **Busy** - available for PBX, SIP and IP-PSTN call types and indicates cases when the dialed destination is busy.
- **Network Failure** - available for SIP and IP-PSTN call types and indicates cases of system overload, network failure or a timeout expiration occurred.
- **Other** - available for SIP and IP-PSTN call types and indicates cases of authorization, negotiation, not supported, request rejected or other unknown errors occur.
- **System Failure** - available for SIP and IP-PSTN call types and indicates cases of Network Failure and Other fail reasons.
- **None** – available for all call types and indicates no failure reason.
- **Any** - available for all call types and indicates any of the above mentioned fail reasons.

If the call cannot be established due to some of the selected Failure Reasons, the call routing table will be parsed for the next matching pattern and, if found, the call will be routed to the specified destination.

The **Transport Protocol for SIP messages** manipulation radio buttons group is available for **SIP** or **IP-PSTN** call types only and allows you to select the transport (UDP or TCP) to transmit the SIP messages through.

The **SIP Privacy** manipulation radio buttons group is only available for the **SIP** call type and allows you to select the security of the SIP route by means of hiding (or replacing, depending on the configuration of the SIP server) the key headers of the SIP messages used to establish the call.

- **Default Privacy** – with this selection, Quadro specific SIP privacy will not be applied and all privacy will rely on the configuration of the SIP Server.
- **Disable Privacy** – with this selection, SIP call security will not be disabled and all headers of the SIP message will be transparently visible to the destination.
- **Enable Privacy** - with this selection, SIP privacy will be specified for the corresponding route. This selection enables a group of checkboxes in order to choose the key headers that are to be fully or partly hidden or replaced. The **Require Privacy** checkbox selection is used to restrict the delivery of the SIP message if any of the selected headers cannot be hidden (or replaced, depending on the configuration of the SIP server) before being sent to the destination.

The **Port ID** drop down list is present for FXO and ISDN call types and contains FXO line numbers and ISDN trunks. **Any Local** and **Any@Any** selections are only available for the FXO call type and provides the option to route calls via the first available local FXO line or any FXO lines (including shared on other Quadro boards) respectively.

The **Call Routing Wizard** - Page 3 appears if the **Fill Call Source Information** checkbox had been enabled on Page 1 of the **Call Routing Wizard**. It will require information about the Inbound caller.

The **Inbound Caller Pattern** field requires the caller's address where the current route will be applied. Alphanumerics and any characters supported in the SIP username are allowed for this field. Wildcards are allowed here (see chapter [Entering a SIP Addresses correctly](#)). '[', ']', ',', '.', '{', '}' are used to define a range or a quantity of numbers. For example, 2{13-17, ww, a-c} means that the dialed number may be 213, 214, 215, 216, or 217, 2ww, 2a, 2b and 2c to match the specified pattern; in the case of 2{3,7}, the dialed number may be 23 or 27 to match the specified pattern.

The **Inbound Number of Discarded Symbols** and **Inbound Prefix** text fields are hidden only when an **FXO** call type has been selected from Page 1 of the **Call Routing Wizard**. The **Number of Discarded Symbols (NDS)** text field requires the number of digits that should be discarded from the beginning of the **Inbound Caller Pattern**. The field should be empty if digits do not need to be discarded. Only numerics are allowed for this field, otherwise the error message "Error: Number of Discarded Symbols is incorrect - digits allowed only" will appear.

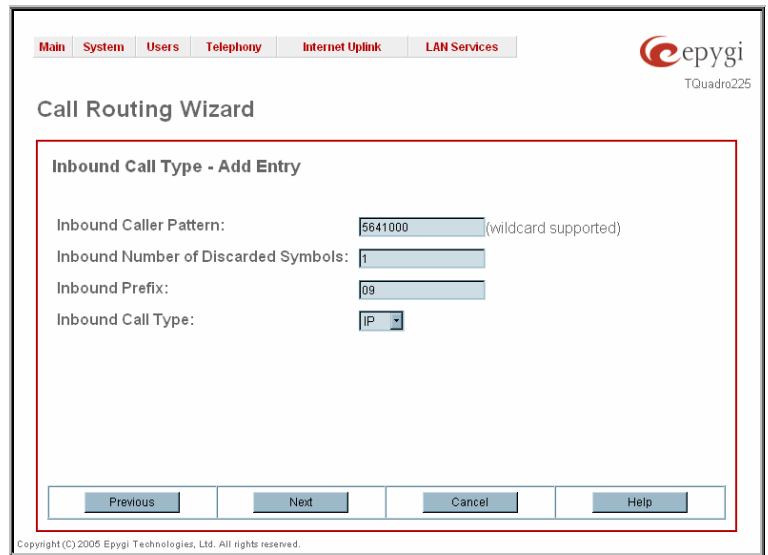


Fig. II-83: Call Routing Wizard - page 3

The **Inbound Prefix** text field requires entering the symbols (alphanumerics and any characters supported in the SIP username) that will be placed in front of the **Inbound Caller Pattern** instead of the discarded digits. (For example, if the routing pattern is 12345, the Number of Discarded Symbols is two, and the prefix digits are 909, the final phone number will be 909345.) Wildcards are allowed here (see chapter [Entering a SIP Addresses correctly](#)).

The **Inbound Call Type** drop down list gives you the option to select the call type (PBX, SIP, FXO) used by the inbound caller to reach the Quadro.

The **Next** button will open the **Call Routing Wizard** - Page 4 where different information about Inbound Caller will be required depending on the selected **Inbound Call Type**. For the **SIP** Inbound Call Type, the **Inbound Host** text field will require one or more IP addresses or host names of the SIP server where the caller is registered, or the caller's device they are direct calls, separated by a space. If the **FXO** Inbound Call Types are selected, the **Inbound Port ID** drop down list will require selecting the FXO line number correspondingly, and in the next step, a list of timeslot(s) used to receive calls from the defined caller.

The **Call Routing Wizard** - Page 5 appears if the **Set Date / Time Period(s)** checkbox previously had been enabled on Page 1 of the **Local Call Routing Wizard**. It will require information about the pattern validity period(s).

This page provides selection between **Typical** and **Custom** date/time rule definitions.

The **Typical** selection contains the following group of radio buttons that are used to select the frequency of the corresponding routing pattern that is to take place:

- **Daily**
- **Weekly** – the preferred weekday(s) should be selected for this option.
- **Monthly** – the calendar day should be selected for this option.
- **Annually** – the calendar day and month should be selected for this option.

In the **Available Time Period** drop down lists, the time range of the pattern validation should be defined. Any time selected in this field will be considered corresponding to the Quadro's [Time/Date Settings](#).

The **Custom** selection provides the option to manually define the validity period(s). Use the following format to insert pattern date/time rule(s):

[Month,Month-Month,...][Day-Day,Day,...][hh:mm-hh:mm,...]; ...



Fig. II-84: Call Routing Wizard - page 5

The **Duplicate** functional button is used to create a routing pattern with the settings of an exiting one. This is to avoid configuring a new routing entry completely by duplicating an existing entry with different settings. To use the **Duplicate** button only one record may be selected, otherwise the error message "One row should be selected" will appear. The **Duplicate** button opens the **Call Routing Wizard** where all fields except the **Pattern** field are already filled in. A **Pattern** for the new route will be required anyway.

The **Move Up/Move Down** buttons are used to move call routing patterns one level up or down within the **Call Routing** table. The sequence of the routing patterns is important when making routing calls because the **Call Routing** table is parsed from the top down and routing will take place according to the first pattern that matches the dialed number. The **Move To** button is used to move the selected entry to a different position in the Call Routing Table. This will increase or decrease the selected pattern's priority. Pressing the button will open the page where a row number should be specified together with the position the selected entry is to be placed (before or after the defined row).

The **Local AAA Table** page allows you to manage local authentication and the authorization database. Callers dialing the routes which have an AAA (Authentication, Authorization, and Accounting) option enabled, will pass the authorization on the **Local AAA Table** by using a phone number or username/password, depending on the corresponding entry configuration on this page.

The caller passes authorization automatically if the detected phone number of the caller dialing a route has the AAA option enabled and is registered in the **Local AAA Table**. If the caller ID service is disabled or the caller's phone number is not registered, the caller is asked to enter a registration user name and password.

The **Add** functional button opens the **Call Routing - Local AAA Table - Add Entry** page where a new local AAA record can be created.

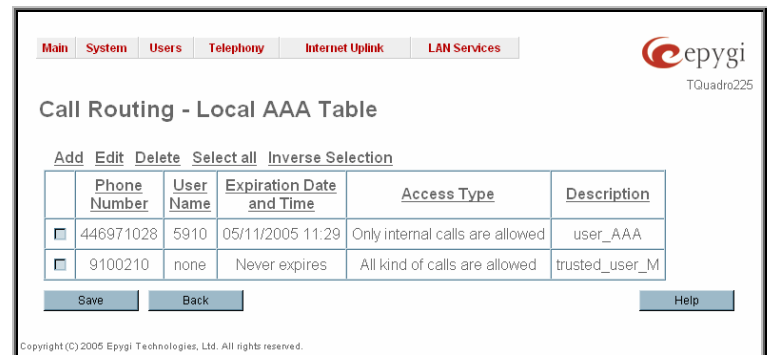


Fig. II-85: PSTN User Registration page

The **Call Routing – Local AAA Table - Add Entry** page offers a group of manipulation radio buttons to select the type of authorization and the following other parameters:

- **Authentication by Caller ID** – this selection is used to set the authentication based on the caller's phone number (which is considered to be automatically detected). The **Phone Number** text field requires the caller's phone number. Only numeric and wildcard characters (see chapter [Entering a SIP Addresses correctly](#)) are allowed for this field. '[', ']', ',', '-', '{', '}', are used to define a range or a quantity of numbers. For example, 2{13-17, ww, a-c} means that the dialed number may be 213, 214, 215, 216, or 217, 2ww, 2a, 2b and 2c to match the specified phone number; in the case of 2{3,7}, the dialed number may be 23 or 27 to match the specified phone number.
- **Authorization by Username and Password** – this selection is used to set the authentication based on the username and password inserted by the user upon login. The **Username** text field requires the authentication username. Only numeric values are allowed for this field, otherwise the error message "Incorrect Username - digits allowed only" will appear. The **Password** text field requires the authentication password. Only numeric values are allowed for this field, otherwise the error message "Incorrect Password - digits allowed only" will appear.

The **Expiration Date and Time** drop-down lists are used to set the date and time when the registration will expire.

The **Expires in** checkbox is used to enable the **Expiration Date and Time** feature.

The **Description** text field requires an optional description about the calling party.

Fig. II-86: PSTN User Registration - Add Entry page

To make a Call Routing pattern

1. Click on the **Call Routing Table** link on the **Call Routing** page.
2. Press the **Add** button on the **Call Routing** page.
3. Specify the **Pattern** in the corresponding field.
4. Select the **Number of Discarded Symbols** and **Prefix** if required.
5. Select the **Call Type** from the drop down list.
6. Define the **Metric** or leave the default.
7. Enter a **Description** if needed.
8. Enable the **Filter on Caller / Call Type / Modify Caller ID** checkbox, if the route functionality should be limited depending on inbound caller information.
9. Enable **Set Date/Time Period(s)** checkbox, if route should be functional within certain time/date interval.
10. Press **Next**.
11. Select user or attendant extension from **Use Extension Settings** drop down on behalf of which the call will be placed.
12. Specify the **Destination Host** and **Port Number**, **Username** and **Password** if **IP** or **IP-PSTN** call type has been selected. For **IP-PSTN** call type, enable **Multiple Logons** if necessary. Enable **Use RTP Proxy** checkbox, if needed.
13. Choose the Authentication and Accounting method from **AAA Required** drop down list.
14. Choose a **Fail Reason** from the corresponding drop down list.
15. Press the **Next** button.
16. If **Filter on Caller / Call Type / Modify Caller ID** checkbox has been previously enabled and the call type is different from the FXO, fill **Inbound Caller Pattern** in the corresponding text field, choose the needed value from **Inbound Call Type** drop down list, as well as **Inbound Number of Discarded Symbols** and **Inbound Prefix** values.
17. Press the **Next** button.
18. If **IP** has been selected on the previous step in the **Inbound Call Type** drop down list, then **Inbound Host** should be inserted in the current page. If **FXO** or **ISDN** has been selected in the **Inbound Call Type** drop down list, then the ISDN trunk or the FXO line number should be selected here.
19. If **Set Date/Time Period(s)** checkbox has been selected on the first page, pressing **Next** will open **Date/Time Rules** page where route validity should be defined.
20. Press the **Finish** button to establish a local route with the inserted settings.

To create a local AAA entry

1. Click on the **Local AAA Table** link on the **Call Routing** page.
2. Press the **Add** button on the **Local AAA Table** page.
3. Choose the Authentication type.
4. Enter the **Phone Number** or the **Username** and **Password** depending on the selected Authentication type.
5. Use the **Expiration Date and Time** checkbox to enable the expiration timeout.
6. Select the **Expiration Date and Time** from the corresponding drop down lists.
7. Press **Save** to apply these settings.

Best Matching Algorithm

The **Best Matching Algorithm** is used by the Routing Agent (RA) to sort the list of patterns that match a dialed number. Sorting is done by the following principle: **the more the pattern matches the dialed number, the higher its priority.**

To decide which of the selected patterns matches the dialed number more in comparison with the other patterns, the following list of criteria is used (List 1). The criteria are ordered by their priorities: that is Criterion 2 is calculated only if more than one pattern takes the same value for Criterion 1, Criterion 3 is calculated only if more than one pattern takes the same value for Criterion 2, etc. **Each consecutive criterion is calculated only if more than one pattern takes the same value for the preceding criteria.**

List 1

Criterion 1	The presence of asterisks ("**") in a pattern The patterns without "**" have higher priority.
Criterion 2	The number of matching digits/symbols The more matching digits a pattern has, the higher its priority.
Criterion 3	The number of square brackets ("[]") The more ranges a pattern has, the higher its priority.
Criterion 4	The number of question marks ("?") The more question marks a pattern has, the higher its priority.
Criterion 5	The number of braces ("{}") The more ranges a pattern has, the higher its priority.
Criterion 6	The number of asterisks ("**") The fewer asterisks a pattern has, the higher its priority.
Criterion 7	The value of the metric The lower the metric of a pattern is, the higher its priority.
Criterion 8	The position in the routing table The higher the position of a pattern in the routing table is, the higher its priority.

The algorithm is discussed in the example below.

Example The user has dialed 1231 and the Routing Agent has found the following list of matching patterns.

The list of matching patterns found by RA
1
123*
{11-15}3*
??1
123?
[1-3]*
[1-3]???
{100-150,asd,\^?}1
12*31
1[1-3]3[0-8]
1231
*2*1
*

The step-by-step discussion of the **Best Matching Algorithm** is as follows.

Step 1: The list is split into two groups separating the patterns with "**" from the ones without (Criterion 1). The patterns with "**" form a group with lower priority and are pushed back to the end of the list (Table 1).

Table 1 The list split into two subgroups
??1 123? [1-3]??? {100-150, asd, \^?}1 1[1-3]3[0-8] 1231
1 123* {11-15}3* [1-3]* 12*31 *2*1 *

Step 2: The two groups of patterns are sorted separately from each other by the number of matching digits in descending order (Criterion 2, Table 2). The patterns that have the same number of matching digits are grouped into sub-lists (Table 3). If a sub-list consists of one pattern, it stays in its position and does not participate in further discussions.

Table 2

The list of patterns	Criterion 2
1231	4
123?	3
??1	2
1[1-3]3[0-8]	2
{100-150, asd, \^?}1	1
[1-3]???	0
12*31	4
123*	3
*2*1	2
1	1
{11-15}3*	1
[1-3]*	0
*	0

Table 3

The list of patterns	Criterion 2
1231	4
123?	3
??1	2
1[1-3]3[0-8]	2
{100-150, asd, \^?}1	1
[1-3]???	0
12*31	4
123*	3
*2*1	2
1	1
{11-15}3*	1
[1-3]*	0
*	0

The principle by which the patterns have been sorted in Step 1 is applied in all further steps with a different criterion.

Step 3: Each sub-list is sorted separately from the others by the number of brackets (“[]”) in the pattern in descending order (Criterion 3, Table 4). The patterns that have the same number of ranges are grouped into sub-lists (Table 5). If a sub-list consists of one pattern, it stays in its position and does not participate in further discussions.

Table 4

The list of patterns	Criterion 3
1231	-
123?	-
1[1-3]3[0-8]	2
??1	0
{100-150, asd, \^?}1	-
[1-3]???	-
12*31	-
123*	-
*2*1	-
1	0
{11-15}3*	0
[1-3]*	1
*	0

Table 5

The list of patterns	Criterion 3
1231	-
123?	-
1[1-3]3[0-8]	2
??1	0
{100-150, asd, \^?}1	-
[1-3]???	-
12*31	-
123*	-
*2*1	-
1	0
{11-15}3*	0
[1-3]*	1
*	0

Step 4: Each sub list is sorted separately from the others by the number of question marks in the pattern in descending order (Criterion 4, Table 6). The patterns that have the same number of question marks are grouped into sub-lists. If a sub-list consists of one pattern, it stays in its position and does not participate in further discussions.

Table 6

The list of patterns	Criterion 3
1231	-
123?	-
1[1-3]3[0-8]	-
?2?1	-
{100-150, asd, \^?}1	-
[1-3]???	-
12*31	-
123*	-
*2*1	-
1	0
{11-15}3*	0
[1-3]*	-
*	-

Step 5: Each sub-list is sorted separately from the others by the number braces (“{ }”) in the pattern in descending order (Criterion 5, Table 7). The patterns that have the same number of ranges are grouped into sub-lists (Table 8). If a sub-list consists of one pattern, it stays in its position and does not participate in further discussions.

Table 7

The list of patterns	Criterion 4
1231	-
123?	-
1[1-3]3[0-8]	-
?2?1	-
{100-150, asd, \^?}1	-
[1-3]???	-
12*31	-
123*	-
*2*1	-
{11-15}3*	1
1	0
[1-3]*	-
*	-

Table 8

The list of patterns	Criterion 4
1231	-
123?	-
1[1-3]3[0-8]	-
?2?1	-
{100-150, asd, \^?}1	-
[1-3]???	-
12*31	-
123*	-
*2*1	-
{11-15}3*	1
1	0
[1-3]*	-
*	-

Step 6: This step is applicable to the subgroup containing patterns with “*”, the group with lower priority. Each sub-list is sorted separately from the others by the number of asterisks (“*”) in ascending order (Criterion 6). The patterns that have the same number of asterisks are grouped into sub-lists. If a sub-list consists of one pattern, it stays in its position and does not participate in further discussions.

Step 7: Each sub-list is sorted separately from the others by the value of metric in ascending order (Criterion 7). The patterns that have the same value of metric are grouped into sub-lists. If a sub-list consists of one pattern, it stays in its position and does not participate in further discussions.
The values of metrics are taken from the routing table.

Step 8: The patterns in each sub-list are arranged by their positions in the routing table (Criterion 8).

The subgroup containing patterns with “*” is attached to the end of the subgroup without “*” forming a single list of sorted patterns. The obtained list is the sorted list of the patterns by the Best Matching Algorithm (Table 9).

Table 9 The sorted list of patterns
1231
123?
1[1-3]3[0-8]
?2?1
{100-150, asd, *\?}1
[1-3]???
12*31
123*
*2*1
{11-15}3*
1
[1-3]*
*

VoIP Carrier Wizard

The **VoIP Carrier Wizard** is used to define access codes for available VoIP Carrier accounts which will particularly allow you to reach users over IP-PSTN providers or to call to the peers registered on the certain SIP servers by dialing simple digit combinations.

For each configured VoIP carrier, the wizard creates a specific IP-PSTN routing rule in the [Call Routing](#) table. Additionally, a virtual extension automatically generated in [Extensions Management](#) will be registered on the defined VoIP Carrier's SIP server. The settings of that extension will be used to make calls from Quadro's users towards the created VoIP Carrier will be placed.

VoIP Carrier Wizard – Page 1 provides a following option of describing the VoIP carrier:

When predefined carrier is selected in the **VoIP Carrier** drop down list, the SIP Server and Port will be already predefined in the next page. **Manual** selection allows you to manually set up the VoIP Carrier settings.

The **Description** field allows you to insert an optional description of the VoIP Carrier.

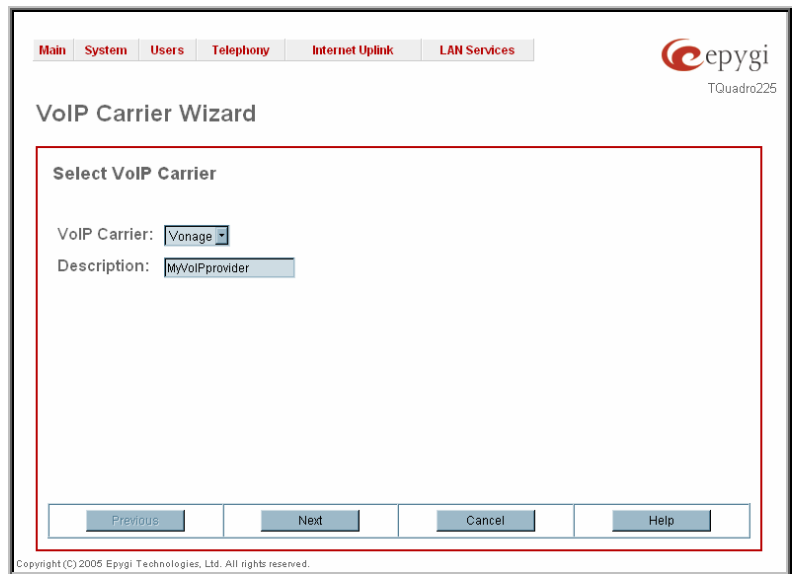


Fig. II-87: VoIP Carrier Wizard page

VoIP Carrier Wizard – Page 2 is used to define VoIP Carrier Settings. The page contains following components:

1. VoIP Carrier Common Settings

The **Account Name** text field requires a username for authentication on the defined SIP server.

The **Password** text field requires a password for authentication on the defined SIP server.

The **Confirm Password** text field requires a password confirmation. If the input is not corresponding to the one in the **Extension Password** field, the error message “Incorrect Password confirm” will appear.

The **SIP Server** text field requires an IP address or the hostname of the SIP server destination party it is registered on.

The **SIP Server Port** text field requires the port number of the SIP server destination party it is registered on.

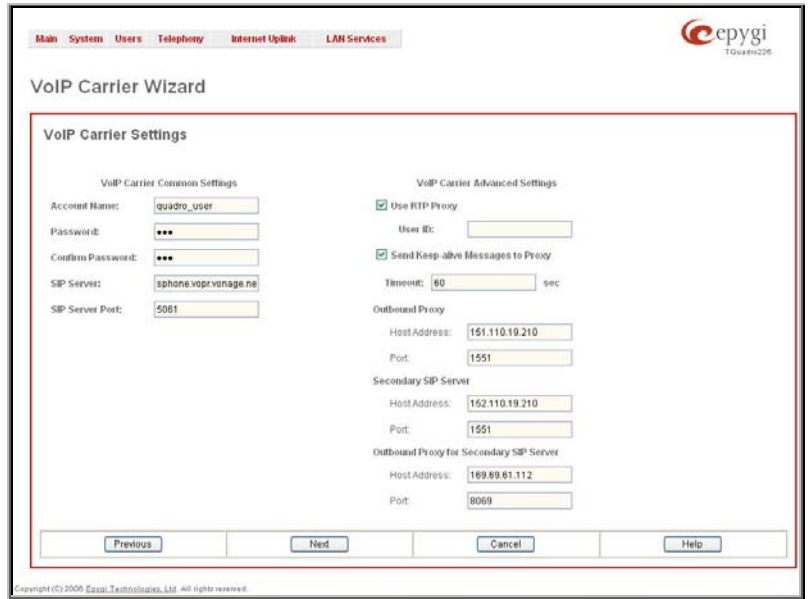
2. VoIP Carrier Advanced Settings

The **Use RTP Proxy** checkbox is applicable only when a route is used for calls towards a configured VoIP Carrier from a peer located outside the Quadro. When this checkbox is selected, the RTP streams between external users will be routed through Quadro. When the checkbox is not selected, RTP packets will move directly between peers.

UserID requires an identification parameter to reach the SIP server. It should have been provided by the SIP service provider and can be requested only for certain SIP servers. For others, the field should be left empty.

Send Keep-alive Messages to Proxy enables the SIP registration server accessibility to the verification mechanism. **Timeout** indicates the timeout between two attempts of SIP registration server accessibility verification. If a reply is not received from the primary SIP server within this timeout, the secondary SIP server will be contacted. When the primary SIP server recovers, SIP packets will continue to be sent to the server.

A group of **Host address** and **Port** text fields respectively require the host address (IP address or the host name), the port number of the **Outbound Proxy**, **Secondary SIP Server** and the **Outbound Proxy for the Secondary SIP Server**. These settings are provided by the SIP servers' providers and are used by Quadro to reach the selected SIP servers.



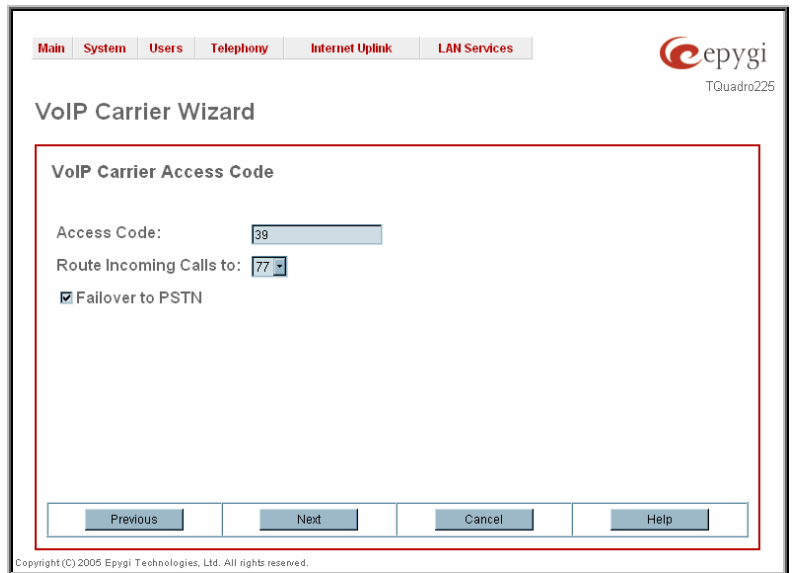
VoIP Carrier Wizard – Page 3 contains the following VoIP Carrier access code selection components:

The **Access Code** text field requires a digit combination by dialing, which the corresponding VoIP Carrier will be reached.

The **Route Incoming Calls To** drop down list allows you to select an extension (or Auto Attendant) on the Quadro where incoming calls from the configured VoIP Carrier should be routed to.

The **Failover to PSTN** checkbox selection will route the call to the PSTN through local FXO line in case if the VoIP Carrier is not available. When this checkbox is selected, an additional entry will be added to the [Call Routing](#) table. This maintains digit transmission to the local PSTN when an IP call towards the configured VoIP Carrier cannot be established.

Please Note: A warning message will appear when the defined **Access Code** already exists in the Call Routing table or causes a conflict with entries already in the Call Routing table. In this case, when continuing through the **VoIP Carrier Wizard**, the existing entry in the Call Routing table will automatically be overwritten by the new settings.



RADIUS Client Settings

RADIUS (Remote Authentication Dial In User Service) specifies the RADIUS protocol used for authentication, authorization and accounting, to differentiate, to secure and to account for the users. The RADIUS Server provides the option for a caller from/through Quadro to pass authentication and to be able to dial a specific number.

When a RADIUS client is enabled on the Quadro, and according to the configuration of **AAA Required** option (see [Call Routing](#) table), the RADIUS server will be used to authenticate user and/or to account for the call. This can be accomplished by automatic detection of the caller's number or a customized login prompt where the caller is expected to enter a username and password.

Transactions between the client and the RADIUS server are authenticated through the use of a shared Secret Key, which is never sent over the network. In addition, user passwords are encrypted when sent between the client and RADIUS server to eliminate the possibility of a party viewing an unsecured network where they could determine a user's password. If no response from the RADIUS Server is returned after the Receive Timeout expires, the request is resent numerous times as defined in the Retry Count list. The client can also forward requests to an alternate server(s) if the primary server is down or unreachable. An alternate server can be used after a number of failed tries to the primary server.

Once the RADIUS server receives the request, it determines if the sending client is valid. A request from a client that the RADIUS server does not recognize must be silently discarded. If the client is valid, the RADIUS server consults a database of users to find the user whose name matches the request. The user entry in the database contains a list of requirements (username, password, etc.) that must be met to give access to the user. If all conditions are met, the user gets access to the Quadro Network.

The **RADIUS Client Settings** page contains the **Enable RADIUS Client** checkbox that enables RADIUS client on the Quadro.

Please Note: The RADIUS Client cannot be disabled if there is at least one route with **RADIUS Authentication and Authorization** or **RADIUS Accounting** values configured in the **AAA Required** drop down list at the [Call Routing](#) table. In order to be able to disable the RADIUS Client on the Quadro, appropriate routes should be removed first.

The other RADIUS Client settings are divided into three groups:

1. Registration Settings

The **Primary Server** requires the IP address of the primary Radius Server.

The **Secondary Server** requires the IP address of the secondary Radius Server.

NAT Station IP text fields require the NAT PC WAN IP address. If no NAT Station is specified here, Quadro's IP address will be sent to the RADIUS server.

Secret Key is used to insert the secret key between the Radius client and the server. Contact the Radius server administrator to get the secret key for your Quadro.

The **Confirm Secret Key** field is used to verify the secret key. If the entered **Secret Key** does not correspond to the one in the **Confirm Secret Key** field, the error message "The Secret Key does not match. Please try again" will appear.

Retry Count allows you to select the number of attempts authorized before canceling the registration.

Receive Timeout allows you to select the timeout (in seconds) between two attempts to register.

Encoding Type allows you to select the encoding type (PAP or CHAP) that should be unique on both the client and the server sides for the establishment of a successful connection. Encoding type should also be requested from the Radius Server administrator.

The **Authorization Port** text field requires the port number on the RADIUS server where Quadro is to send the authentication requests.

The **Accounting Port** text field requires the port number on the RADIUS server where Quadro is to send the accounting messages.

2. Authentication Settings

The **Enable common login for all users in time of by Phone authentication** checkbox enables custom settings for the callers who passed an authorization by phone on the Quadro. This checkbox enables **Username** and **Password** text fields to insert the custom settings that will stand instead of the source caller's settings when being delivered to the RADIUS server.

The **Authentication on Destination RADIUS Server** parameters group is used to insert a **Username** and a **Password** (followed by the password confirmation) to pass authentication on the RADIUS Server of the destination Quadro. If these fields are left empty, the original authentication settings that users enter for authentication will be used.

3. Accounting Settings

The **Username** field is dedicated for accounting services only. It is used to insert an identification username for accounting purposes. When no username is specified in this field, the source username will be used for accounting.

The **Send Accounting messages** manipulation radio buttons group is used to select sending both **Start** and **Stop** accounting messages or only **Stop** accounting message.

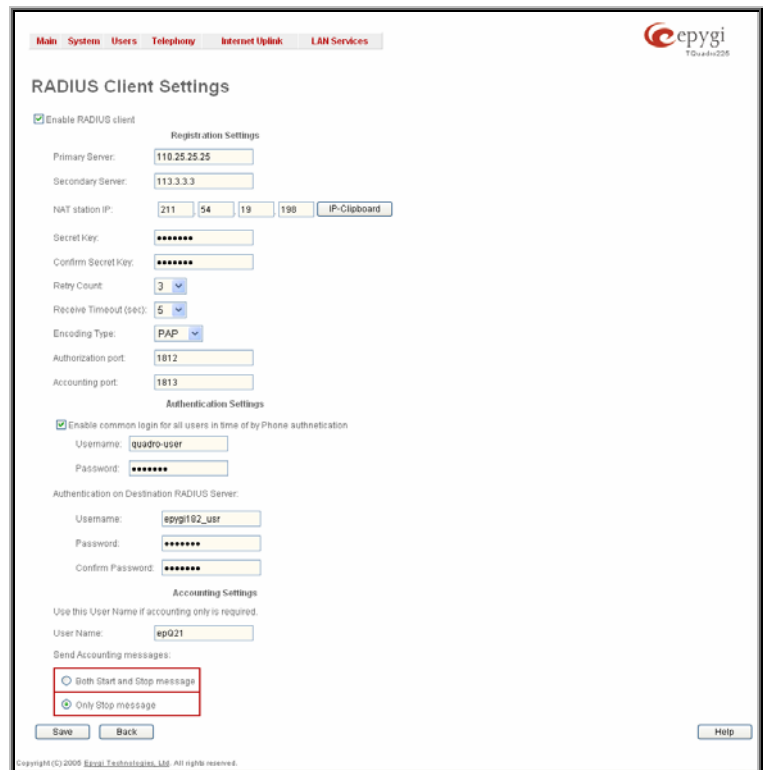


Fig. II-88: Radius Client Settings page

Dial Plan Settings

The **Dial Plan Settings** page is used to adjust the dialing timeouts for the routing calls over Quadro.

This page consists of the only drop down list used to configure the dialing timeout for the Routing calls. Values selected in the lists indicate the interval between the dialed number and it being applied to the network.



Fig. II-89: Dial Plan Settings page

System Hold Music Settings

The **System Hold Music Settings** allows you to define the hold music played to the PSTN party when it is held by the IP user. This page also allows you to define the percentage of system memory dedicated to the uploaded hold music file. This page contains following components:

The **Play Hold Music** drop down list specifies the music played to the PSTN party when it is held by remote IP user. It offers the following options:

- **Off** - no music will be played.
- **Local Music** – the hold music configured on the Quadro will be sent to the remote PSTN party while it is on hold.
- **Remote Music** – music sent by the IP party will be transparently passed to the PSTN user while it is held by the IP party.

Restore Default Hold Music File enables the default hold music. If the checkbox is selected, the text field **Upload New Hold Music File** will be disabled.

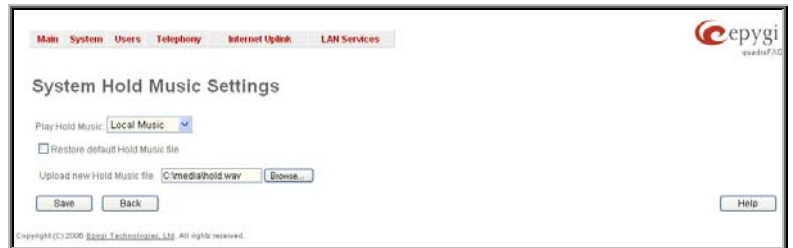


Fig. III-90 Basic Services - Hold Music Settings page

The **Upload New Hold Music File** text field can be used to enter the path where the custom hold music file is located. If the hold music file is browsed with the help of file-chooser, this field displays the path of the browsed file. The **Browse** button is used to browse for the hold music file.

The music file needs to be in PCMU wave format, otherwise the system will prevent uploading the file and will display the warning message "Invalid audio file or format is not supported". Additionally, the system will refuse uploading if insufficient memory is available for the Quadro and will then announce "You do not have enough space".

The **Download Hold Music File** link appears only if a file has been uploaded recently. It downloads the audio file to the PC and opens a window where the saving location can be specified.

Internet Uplink Menu



Fig. II-91: Internet Uplink menu in Dynamo theme



Fig. II-92: Internet Uplink menu in Plain theme

PPP/ PPTP Settings

The **PPP/PPTP Settings** page is used to establish a connection over the DSL link, or any other type of uplink, to the ISP. A connection is needed to set up and make or receive calls through PPP over Ethernet. The connection may be configured for manual setup or always up. Once a connection has been established between the Quadro and the provider, Quadro users will be able to make and receive calls at any time.

The **PPP/PPTP Settings** page offers the following components:

The [Advanced PPP Settings](#) link refers to the same named page where certain parts of the negotiation process during connection establishment can be adjusted. This link is not available when accessing this page through the [Internet Configuration Wizard](#).

The **PPTP Server** text fields are only enabled when Quadro is running with the PPTP interface and require the IP address of the PPTP server.

The **Encryption** drop down list is only enabled when Quadro is running with the PPTP interface and it is used to select the encryption for the traffic over the PPTP interface.

Authentication Settings require the Username and Password used for the authentication on the ISP server.

Dial Behavior radio buttons enables the following selections:

- **Dial Manually** - if this radio button is activated, a button will be displayed in the main management window that serves to switch the Internet connection on/off. When accessing the Internet, every station of the connected LAN has to connect to Quadro first.
- **Always connected** - Quadro stays in the always connected mode. This will allow always being online in the network.

IP Address Assignment radio buttons are used to define the IP address assignment for the PPP interface with the following options:

- **Dynamic IP Address** – the IP address to the PPP interface will be assigned dynamically by the DHCP server.
- **Fixed IP Address** – the fixed user defined IP address will be assigned to the PPP interface.

The **Keep Connection alive** checkbox enables keeping the connection alive by sending control packets dedicated for the link state verification.

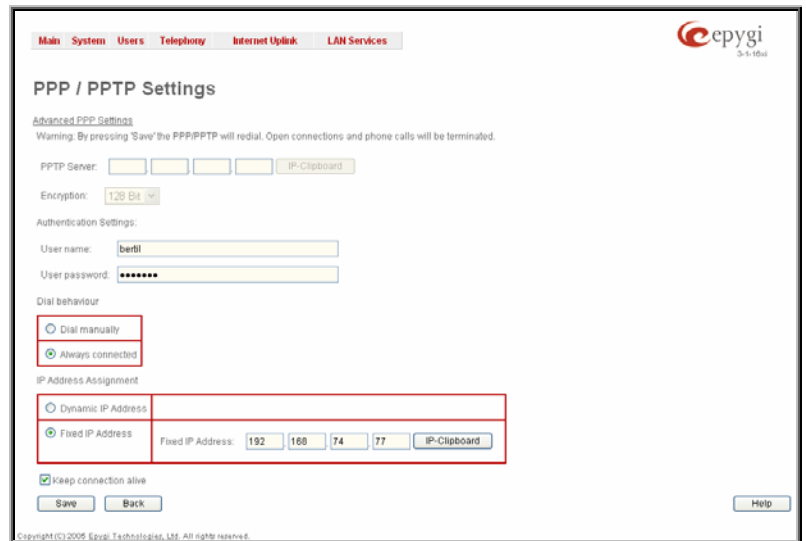


Fig. II-93: PPP Dial Settings page

Advanced PPP Settings

The **Advanced PPP Settings** are used to enable/disable certain parts of the negotiation process during connection establishment. These settings are available only if Quadro has a PPPoE WAN interface.

Attention: Disabling any of the services below may cause problems when establishing a connection including the complete connection failure. The default settings should be changed only if the ISP (Internet Service Provider) specifically requires it or if the peer system has problems with one of the services listed below. More information about these services can be found at: <http://www.protocols.com/pbook/ppp.htm>.

The **Advanced PPP Settings** page offers the following group of checkboxes:

Enable automatic PPP restart at checkbox is used to select the time when the PPP connection will automatically be restarted. The checkbox selection enables **LCP echo failures** text field that indicates the number of the LCP echo failure packets received before the PPP connection will be considered as dead and will be restarted.

Disable CCP (Compression Control Protocol) negotiation - this option should only be selected if the peer system is not working properly. For example, if it is not accepting the requests from the PPPD (Point-to-Point Daemon) for CCP negotiation.

Disable magic number negotiation - with this option, PPPD cannot detect a looped-back line. This option should only be selected if the peer is not working properly.

Disable protocol field compression negotiation in both the receive and the transmit direction – with this option, no protocol field compression will take place.

Disable Van Jacobson style TCP/IP header compression in both the transmit and the receive direction – with this option, no negotiation of TCP/IP header compression will take place and the header will always be sent uncompressed.

Disable the connection-ID compression option in Van Jacobson style TCP/IP header compression - with this option, PPPD will not compress the connection-ID byte from Van Jacobson and will not ask the peer to do so.

Disable the IPXCP and IPX protocols - this option should only be selected if the peer is not working properly and cannot handle requests from PPPD for IPXCP negotiation.

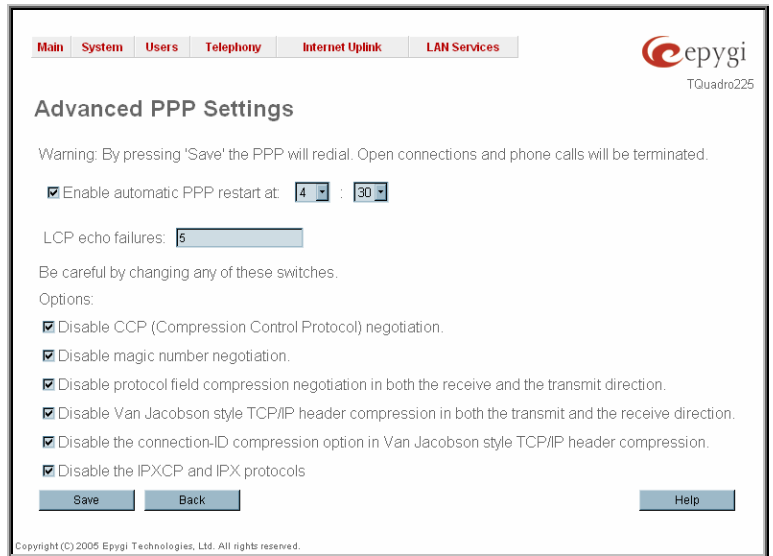


Fig. II-94: Advanced PPP Settings page

Firewall and NAT

The **Firewall Configuration** page allows setting up a firewall, configuring the security level and enabling the NAT and IDS services of Quadro.

A **Firewall** is a security service configured by the Quadro administrator based on various criteria. The firewall allows or blocks traffic based on policies, services and/or IP addresses. The firewall has several levels of security policies (low, medium or high). The administrator may add additional service-based rules. Filtering rules will take effect only if the Firewall has been enabled and are independent from the selected firewall security level.

NAT (Network Address Translation) is used to allow Quadro LAN members to connect to the Internet using Quadro's WAN IP address. The Quadro/NAT also handles forwarding incoming packets from the WAN to the PCs or devices on Quadro's LAN.

The **Firewall Configuration** page offers the following components:

The **Enable NAT** checkbox selection enables Network Address Translation.

The **Enable Firewall** checkbox selection enables the firewall security service. The firewall security level has to be selected, otherwise the firewall cannot be enabled.

The **Firewall Security** radio buttons are the following:

- **Low Security** - Everything that is not explicitly forbidden will be allowed. This security level doesn't block anything by default. It is recommended if the device is already located behind another firewall or if every filter has been configured correctly.
- **Medium Security** - Traffic originating from the LAN side may pass and traffic from the WAN side will be blocked by default. This is the recommended security level.
- **High Security** - Everything that is not explicitly allowed will be blocked, including traffic from the LAN side.

The [Advanced Firewall Settings](#) link refers to the page where Quadro's privacy can be configured.

The [View Filter Rules](#) link opens the [Filtering Rules](#) page.

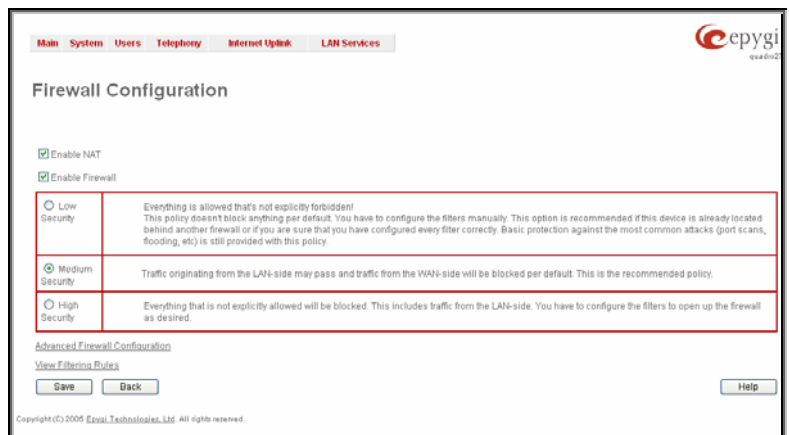


Fig. II-95: Firewall and NAT Settings page

Advanced Firewall Settings

Advanced Firewall Settings are used to deny Ping and operation addressed towards the device. With this feature enabled, Quadro will answer with inscrutable messages to the Ping operation.

Please Note: Operations are available only when the firewall is enabled from the [Firewall and NAT](#) page.

This page offers the following components:

The **Ping Stealth** checkbox selection prohibits a Ping operation toward Quadro from its WAN.



Fig. II-96: Advanced Firewall Settings page

Filtering Rules

The **Filtering Rules** page allows you to configure the filters for incoming and outgoing traffic.

To prevent inaccurate configuration, only one rule per service is allowed. The user may use IP groups to include several IP addresses for this rule. Since the filtering rules specify the operation mode of the firewall, they only take effect if the firewall has been enabled (additionally NAT should be enabled to use the **Port Forwarding** function in the **Incoming Traffic / Port Forwarding** filtering rules). The filtering rules are independent from the security level, so they will work if enabled, no matter what security level has been selected.

Please Note: Applying firewall rules will prevent the establishment of new connections that violate the rules. Applying rules does not kill existing connections that violate the rule.

View All displays all configured filters specified by their **State** (enabled or disabled), the selected **Service**, the set **Action** (allowed or blocked), the IP addresses the filters apply to (if **Restricted**) and the destination of port forwarding (**Redirect to**, in case of **Incoming Traffic/Port Forwarding**). Since it is read-only, no modifications are allowed and no functional buttons are available.

The **Incoming Traffic/Port Forwarding** filter is for incoming traffic. The rules here allow or deny systems on the Internet to reach the services of Quadro's LAN. The NAT service should be enabled on the Quadro to provide the possibility of **Port Forwarding** in the **Incoming Traffic/Port Forwarding** filtering rules. The **Port Forwarding** function will be unavailable if NAT is disabled on the Quadro.

The **Outgoing Traffic** filter is for outgoing traffic. The rules here allow or deny Quadro's LAN users to reach external services.

Management Access is used to enable management access to the Quadro from the Internet. A host on the Internet can be allowed to reach the Quadro.

SIP Access is to allow or deny the SIP access to or from the particular SIP servers, SIP hosts or a group of them. The **SIP Access** filtering rule may prevent or allow incoming or outgoing SIP calls to or from specified SIP server(s) or host(s).

When **Blocked IP List** is used, traffic from specific hosts may be blocked, no matter what services are opened in the other filters. NO traffic will be allowed to the specified hosts. The **Blocked IP List** service has a higher priority if the same host is also listed in the **Allowed IP List** table.

Allowed IP List allows trusted hosts to reach your network and vice versa. It is an exception to other rules and only all services may be allowed for a single host.

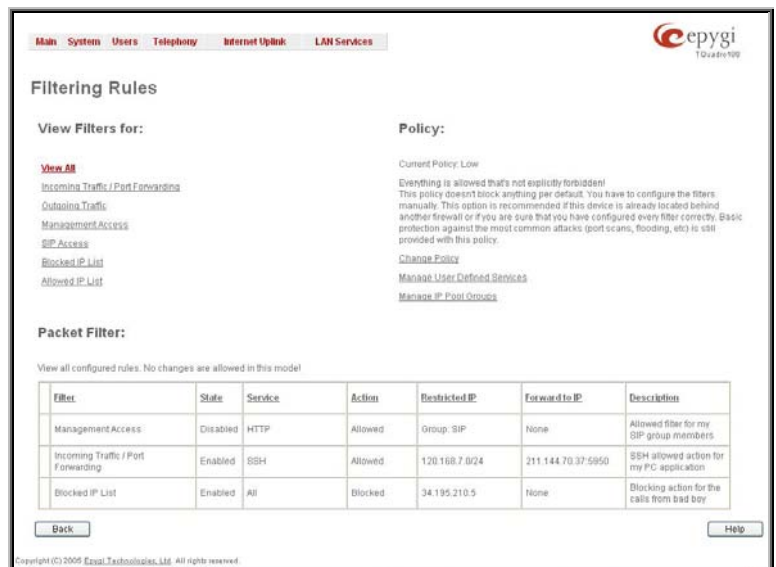


Fig. II-97: Filtering Rules page

The **Filtering Rules** page provides several links. Each link opens its specific parameters on the same page. Only **Change Policy** (see chapter [Firewall and NAT](#)), **Manage user Defined Services** (see chapter [Service Pool](#)) and **Manage IP Pool Groups** (see chapter [IP Pool](#)) lead to separate pages. The **Filtering Rules** page also includes the currently selected firewall security (**Policy**) level and its description.

The table displayed on the bottom of this page shows the filters selected above, specified by their **State** (enabled or disabled), the selected **Service**, the set **Action** (allowed or blocked), the IP addresses the filters apply to (if **Restricted**) and the destination of port forwarding (**Redirect to**, in case of **Incoming Traffic/Port Forwarding**). With the exception of View All, the table offers the following functional buttons:

- **Enable** is used to enable the rule. If no records are selected the error message "No record(s) selected" will appear.
- **Disable** is used to disable the rule. If no records are selected the error message "No record(s) selected" will appear.
- **Add** opens a filter specific page where new rules may be defined by a **Service**, an **Action**, a **Restriction** to certain IP address(es) or IP groups, and if adding a rule for **Incoming Traffic/Port Forwarding**, the destination IP address for **Forwarding**.

The page to add a rule for **Incoming Traffic/Port Forwarding** offers the following input options:

Service includes a list of possible services to be configured. All user-defined services also will be displayed in this list.

Action includes possible actions to setup the rule.

Forward to IP requires the destination IP address where traffic should be transferred to if it comes from the restricted host. The IP address defined in this field will be ignored for blocked action of the **Incoming Traffic/Port Forwarding** rule.

Note: It is not allowed to forward incoming packets when the NAT service is disabled on the Quadro.

Port Translation text field is available for "Allowed" action only and optionally requires the port number that will stand instead of the original port number when incoming packet is being forwarded. If this field is left empty, the original port number will be used when forwarding the packet.

Restriction radio buttons:

- Selecting **Any** blocks or allows all host IP addresses. This selection is not present for the **Management Access, Blocked and Allowed IP List** rules.
- Selecting **Single IP** will require the IP address of the allowed or blocked host.
- Selecting **IP/Mask** will require the subnet to be allowed or blocked, specified by an IP address and the Maskbits. The following are **Maskbit** examples:
 - 255.0.0.0= /8,
 - 255.255.0.0 = /16,
 - 255.255.255.0 = /24,
 - 255.255.255.255= /32
- **Group** indicates the user-defined groups that include IP addresses that should be allowed or blocked.

The **Description** field is used to insert an optional description of the filtering rule.

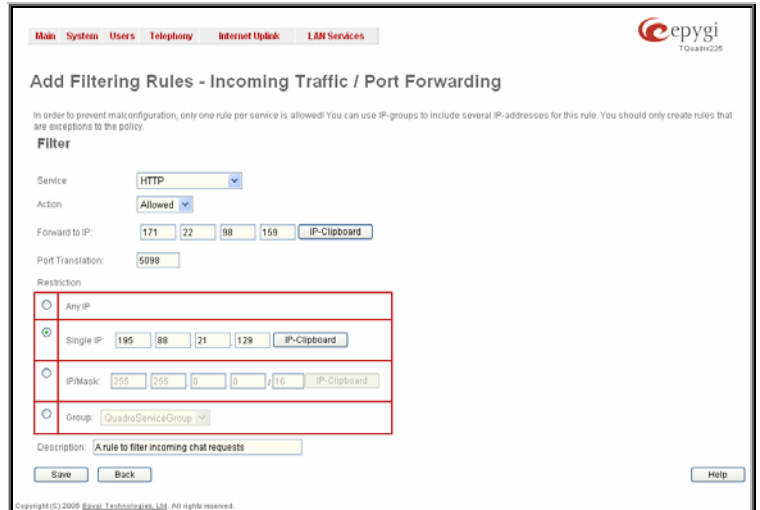


Fig. II-98: Filtering Rules - Page to add a rule for Incoming Traffic

To Add a Filtering Rule

1. Select the **Filter** link (Incoming Traffic/Port Forwarding, Outgoing Traffic, Management Access, SIP Access, Blocked IP List, Allowed IP List) to add a rule for it. The corresponding **Filter** table will appear in the same window.
2. Click **Add** on the **Filtering Rules** page. A page where a new rule may be added will appear in the browser window. The page will be named corresponding to the selected filter.
3. Select a service name from the **Service** list to configure a rule for it. If the list has a default value, do not change the default values.
4. Select an action from the **Action** list that is used in the rule. If the list has a default value, do not change the default values.
5. Enter the IP address in the **Forward to IP** field if an **Incoming Traffic Rule** is to be added.
6. Choose the restriction type by selecting **Any, SingleIP or IP/Mask** and enter the required information in the text fields or select a group.
7. Insert a **Description**, if needed.
8. To add a rule with these parameters, press **Save**.

To Delete Filtering Rules

1. Select the **Filter** link to delete a rule from its table. The appropriate **Filter** table will appear in the same window.
2. Check one or more checkboxes of the corresponding rules that should be deleted from the rules table. Press **Select all** if all rules should be deleted.
3. Press the **Delete** button on the **Filtering Rules** page.
4. Confirm the deletion by clicking on **Yes**, or cancel by clicking on **No**.

Service Pool

The **Service Pool** table is a list of all created services and their parameters. It is used to add new services with the appropriate settings (protocol type and port range). New services can be used to add a restriction or permission by defining a new filtering rule with the following:

Add opens the **Add New Service** page where new services may be added.

Edit opens the **Edit Service** page where the service parameters (except for the service name) can be modified. This page includes the same components as the **Add New Service** page. To operate with **Edit** only one record may be selected, otherwise the error message "One row must be selected" will appear.

The **Add** page is used to add new services and includes the following text fields and buttons:

Service Name requires a name for the service that should be added.

Protocol includes a list of possible protocols to be selected.

Port Range requires a port range for the defined service.

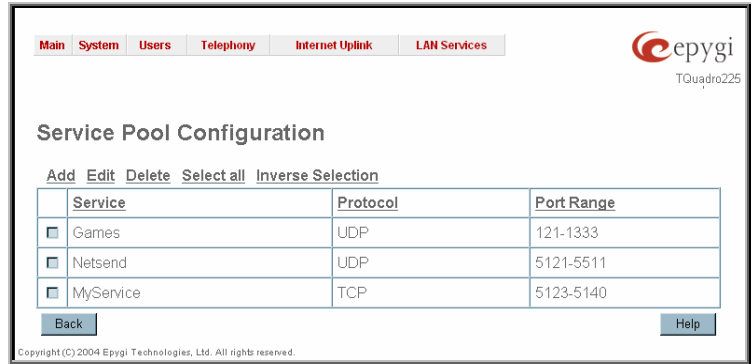


Fig. II-99: Service Pool page

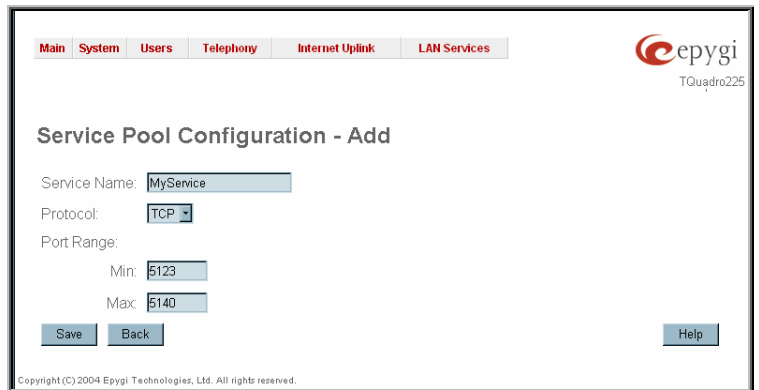


Fig. II-100: Service Pool - Page to add a new Service

To Add a new Service

1. Select the **Manage User Defined Services** link on the **Filtering Rules** page.
2. Click on the **Add** button on the **Service Pool Configuration** page. A page where a new service may be added will appear in the browser window.
3. Define a service name in the **Service Name** text field.
4. Select the protocol type for the service from the **Protocol** drop down list.
5. Enter the port range in the **Port Range** text fields or leave one of them empty to define a particular port for the service.
6. To add a service with these parameters, click on **Save**.

To Delete a Service

1. Select the **Manage User Defined Services** link. The **Service Pool Configuration** page appears with the table of services (if any).
2. Check one or more checkboxes of the corresponding services that should be deleted from the **Service Pool** table. Press **Select all** if all services should be deleted.
3. Click on the **Delete** button on the **Service Pool Configuration** page.
4. Confirm the deletion by clicking on **Yes**, or cancel by clicking on **No**.

IP Pool

The **Manage IP Pool Groups** link opens the **IP Pool Configuration** page.

The **IP Pool** table is the list of all added groups and the members assigned to these groups. If a group is empty, **EMPTY** will be indicated in the **Members** column. If hidden, group members will still remain active but **HIDDEN** will be displayed in the **Members** column.

The **IP Pool Configuration** is used to add groups of IP addresses that have the same restriction criteria. When adding a new filtering rule, groups may be used instead of several IP addresses. **IP Pool Configuration** offers the following components:

View makes hidden groups visible.

Hide makes group members hidden and adds the **HIDDEN**



Fig. II-101: IP Pool Configuration page

comment in the member column.

Add opens the **Add Group** page where a new group may be added. This page consists of the **Group Name** text field (requiring the group name) and the **Group Description** text field (requiring the optional group description), as well as standard **Save** and **Back** buttons to apply or abort changes.

Edit opens the **Edit Group** page where the service parameters can be modified. It provides the same components as the **Add Group** page. To operate with **Edit**, only one record may be selected, otherwise the error message "One row must be selected" will appear.

Please Note: Changing a group name will also change the references to this group, including groups where this group is a member of, and all affected filter rules (enabled and disabled ones, in all chains).

Clicking on the **Group** name will display an **IP Pool Group Configuration** page with the **Members** list for the current group.

The **IP Pool Group Configuration** page displays a list of all the added member IP addresses for the selected group. It offers the following components:

Current Group provides read-only information about the current group name the members are listed for.

Add opens the **Add Member** page where a new member may be added.

Edit opens the **Edit Members** page where the service parameters can be modified. This page includes the same components as the **Add Member** page. To operate with **Edit**, only one record may be selected, otherwise the error message "One row must be selected" will appear.



Fig. II-102: IP Pool configuration – Add Group page



Fig. II-103: IP Pool Group Configuration page

The **Add Members** page provides the following radio buttons:

IP Address requires the member IP address that is to be added to the group.

IP Subnet requires the subnet specified by the IP address and the Maskbits. See above for more information about Maskbits.

The **User-defined Group** includes previously added groups that may also be added as a member to another group.

Member description text fields can be used to enter an optional description of the member.

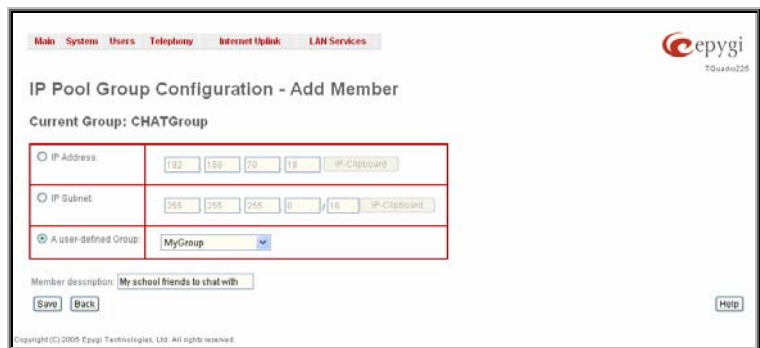


Fig. II-104: IP Pool Group Configuration – Add Member

To Add a new Group with Members

1. Select the **Manage IP Pool Groups** link on the **Filtering Rules** page.
2. Click on the **Add** button on the **IP Pool Configuration** page. A page where a new group may be added will appear in the browser window.
3. Define a group name in the **Group Name** text field and fill in the **Group Description**, if needed.
4. To add a group with the given parameters, press **Save**.
5. Open the **IP Pool Group Configuration** page by clicking on the group name.
6. Select the **Add** button on the **IP Pool Group Configuration** page. A page opens where new members may be added to the group.
7. Enter an IP address for the member in the **IP Address** text fields, select a IP subnet or IP group from the **User defined Group** drop down list to assign it to the currently selected group.
8. Enter a **Member Description** in the corresponding text field, if needed.
9. To add a member with these parameters to the selected group press **Save**.

To Delete a Member

1. Select the **Manage IP Pool Groups** link. The **IP Pool Configuration** page appears with the table of groups (if any).
2. Click on the desired members that should be deleted. The **IP Pool Group Configuration** list will appear.
3. Check one or more checkboxes of the corresponding members that should be deleted from the **Members** table. Press **Select all** if all members should be deleted.
4. Press the **Delete** button on the **IP Pool Group Configuration** page.
5. Confirm the deletion by pressing on **Yes** or cancel the deletion by pressing on **No**.

To Delete a Group

1. Select the **Manage IP Pool Groups** link. The **IP Pool Configuration** page appears with the table of groups (if any).
2. Check the one or more checkboxes of the corresponding groups that should be deleted from the groups table. Press **Select all** if all groups should be deleted.
3. Press the **Delete** button on the **IP Pool Configuration** page.
4. Confirm the deletion by pressing on **Yes** or cancel the deletion by pressing on **No**.

LAN Services Menu



Fig. II-105: LAN Services menu in Dynamo theme



Fig. II-106: LAN Services menu in Plain theme

DNS Settings

The **DNS Settings** page provides the option of setting up a name server for the Quadro. It offers the following components:

The **Nameserver Assignment** radio buttons are as follows:

- The **Dynamically by provider** selection automatically configures the assignment of the name server address from the provider party.
- **Fixed Nameserver address** is a manually selected name server. The **Nameserver** text field requires the IP address of an external name server. The **Alternative Nameserver** text field requires the IP address of the secondary name server. The **Alternative Nameserver** is used if the main name server cannot be accessed.

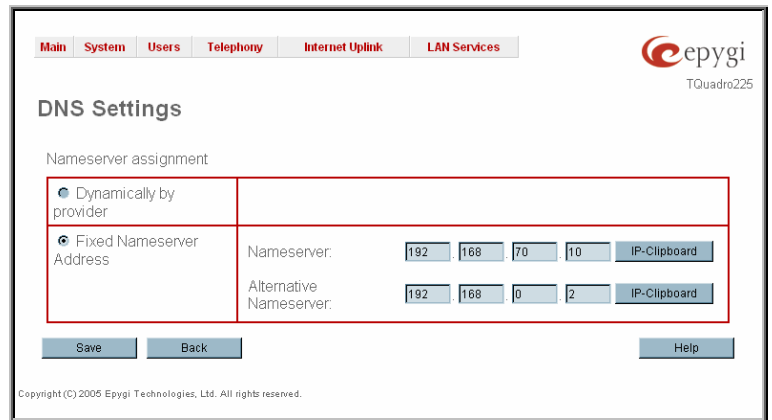


Fig. II-107: DNS Settings page

DHCP Settings for the LAN Interface

The **DHCP Settings** page provides the option of enabling a DHCP server and controlling the Quadro user's LAN settings. Therefore, Quadro LAN users will automatically be provided with the following settings using the configured parameters:

- IP addresses
- NTP (corresponds to the Quadro's IP address)
- WINS server
- Nameserver (corresponds to the Quadro's IP address)
- Domain name

The **DHCP Settings** page offers the following input options:

Enable DHCP Server activates the DHCP server on Quadro.

IP Address Range defines a range of IP addresses that will be assigned to the Quadro LAN users. The IP range must be at least 6, otherwise the error message "Address Range too small" will prevent it from being saved. The error message "Address Range too large" will appear if the IP range is greater than 254.

WINS Server defines a WINS server IP address for the Quadro LAN users.

View DHCP Leases leads to the page where the DHCP leased LAN IP addresses are listed.

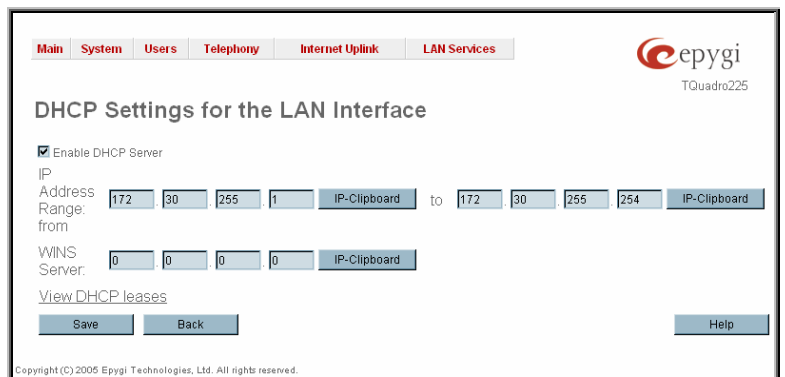


Fig. II-108: DHCP Settings page for LAN interface

The **DHCP Leased IP Addresses** page includes a list of the leased host addresses that are part of the Quadro's LAN. For these hosts, Quadro acts as a server supplying them with a unique IP address. It displays a read-only table describing all the leased IP hosts and their parameters. The table contains the following columns:

- IP address** - host IP address, assigned by Quadro.
- MAC address** - host MAC address, provided by the host itself.
- Lease Start** - date and time when the leased IP address has been activated.
- Lease End** - date and time when the leased IP address has been or will be deactivated.
- Hostname** - hostname, provided by the host itself.

IP Address	MAC address	Lease start	Lease end	Hostname
192.168.198.101	00:04:1c:00:07:3f	Mon May 09 02:28:35 2005	Mon May 16 02:28:35 2005	
192.168.198.100	00:50:da:cd:d6:a9	Mon May 09 14:11:29 2005	Mon May 16 14:11:29 2005	TEST12

Fig. II-109: DHCP Leases page for LAN interface

Registration Form

The **Registration Form** page appears when administrating an unregistered Quadro, and it has been created for customer support purposes. The page requires customer registration at the Epygi Technical Support Center. It provides several links offering the following registration options:

- Register now** leads to the Epygi Technical Support System Registration page and requires customer's information to submit the Quadro registration form.
- Remind me later** hides the registration notification in the Quadro through [System Configuration Wizard](#) or [Internet Configuration Wizard](#) until the next administrating activities..
- Don't remind me more** hides the registration notification forever.

Fig. II-110: Device Registration page

Logout

This option is used to close the session between the user PC and Quadro and to leave the QuadroFXO Web Management or to enter the management with another login. By selecting the **Logout** button, the startup page will be displayed and the user needs to login again.

Extension User's Menus

When logging in as an extension user the page **Extension Settings** is displayed with the **Error! Reference source not found.** table as a startup. This page displays a list of available codecs for the corresponding extension, the list of other extensions on the Quadro, their Display names, the SIP registration username and line number (if attached), as well as the FXO lines state and the destination to route incoming calls. For FXO lines, allowed call types are displayed here.

- [Your Extension](#)
- [Call Statistics](#)
- [Speed Calling](#)
- [Account Settings](#)
- [Supplementary Services](#)
 - [Caller ID Based Services](#)
 - [Incoming Call Blocking](#)
 - [Outgoing Call Blocking](#)
 - [Call Hunting](#)
 - [Unconditional Call Forwarding](#)

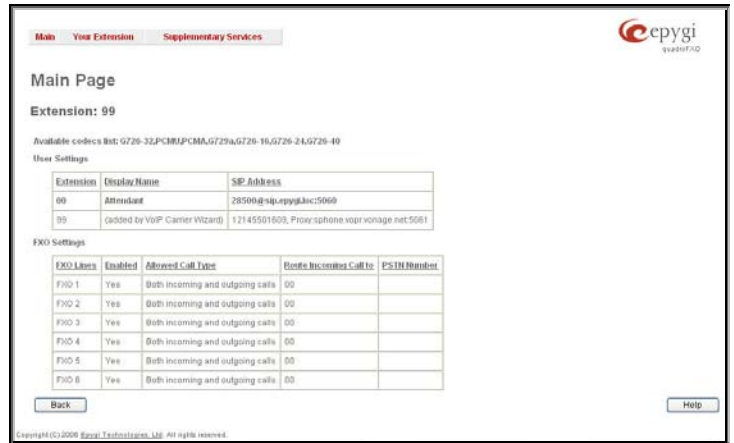


Fig. III-1: Quadro Extension User's page

Your Extension



Fig.0-2 Your Extension menu in Dynamo theme

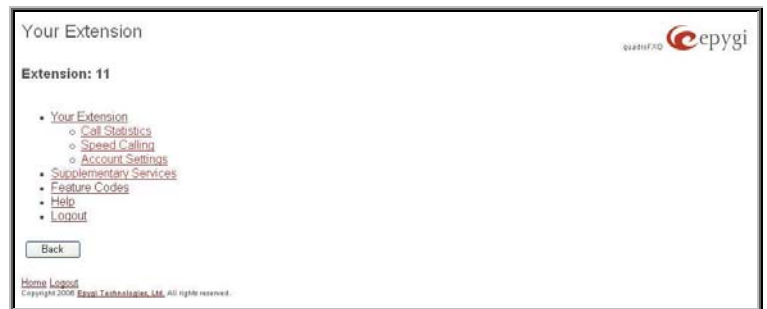


Fig. III-3 Your Extension menu in Plain Theme

Call Statistics

The page **Call Statistics** allow collecting the call events and their parameters over the Quadro, i.e. incoming and outgoing calls reporting. It contains three tables and provides reports on successful, not successful and missed incoming and outgoing calls for the current extension only. The page also gives a possibility to filter the collected **Call Statistics** based on various criteria. The search components are as follows.

The **From** and **To** text fields are used to search by date and time. The data must be inserted in the following format: dd-mm-yyyy hh:mm:ss or dd-Mon-yyyy hh:mm:ss. The **From** field has to indicate an earlier date and time than the **To** field. If the entered data does not correspond with this condition, the "Minimal date should be less than maximal date" error message prevents statistics filtering.

The **From** and **To** drop down lists are used to search by duration. The duration needs to be specified from the listed values. The **From** field has to indicate a shorter duration than the **To** field. If the entered data does not correspond with this condition, the "Minimal duration should be less than maximal duration" error message prevents statistics filtering.

Called Phone requires the called party's SIP address, extension or PSTN number as a search criteria.

Calling Phone requires the caller party's SIP address, extension or PSTN number as a search criteria. For **Called** and **Calling Phone** wildcards are available (see chapter [Entering a SIP Addresses correctly](#)). If the defined caller or called addresses are inserted incorrectly the "Calling (Called) address is incorrect" error will prevent filtering.

Number of Records	Total Duration	Maximum Duration	Average Duration	Minimum Duration
16	21 min 51 sec	8 min 53 sec	53 sec	0 sec

Call Start Time	Call Duration	Calling Phone	Called Phone	Network Details
14-Nov-2003 14:49:15	29 sec	21	PSTN?	Codec: G729a, Quality: 1 (successful)
14-Nov-2003 14:49:14	0 sec	"Gagik M" <20227@ep-epgy.com>5060	00	Codec: PCMU, Quality: 3 (unsuccessful)
14-Nov-2003 14:48:55	8 sec	21	PSTN?	Codec: PCMU, Quality: 4 (bad)
14-Nov-2003 12:54:36	0 sec	"Gagik M" <20227@ep-epgy.com>5060	PSTN0363312	Codec: G729a, Quality: 1 (successful)
14-Nov-2003 12:46:12	7 min 10 sec	"Thorsten" <20431@ep-epgy.com>5060	PSTN?	Codec: G729a, Quality: 1 (successful)
14-Nov-2003 12:50:40	30 sec	21	PSTN?	Codec: G729a, Quality: 1 (successful)
14-Nov-2003 12:50:40	0 sec	"Gagik M" <20227@ep-epgy.com>5060	00	Codec: PCMU, Quality: 4 (bad)
14-Nov-2003 12:43:47	0 sec	21	PSTN?	Codec: G729a, Quality: 1 (successful)
14-Nov-2003 08:47:33	8 min 53 sec	21	PSTN?	Codec: PCMU, Quality: 3 (unsuccessful)
13-Nov-2003 22:26:49	14 sec	PSTN01585430	00	Codec: PCMU, Quality: 3 (unsuccessful)
13-Nov-2003 22:27:03	8 min 53 sec	PSTN01585430	PSTN0363312	Codec: PCMU, Quality: 3 (unsuccessful)
13-Nov-2003 22:03:57	5 sec	"George" <20531@ep-epgy.com>5060	18189561667@13 137 73 178 5060	Codec: PCMU, Quality: 3 (unsuccessful)
13-Nov-2003 21:57:01	7 sec	"ManoCR" <20541@9 41 232 2 5060>	00	Codec: PCMU, Quality: 3 (unsuccessful)
13-Nov-2003 20:19:20	7 sec	"ManoCR" <20541@9 41 232 2 5060>	20531@ep-epgy.com 5060	Codec: PCMU, Quality: 4 (bad)
13-Nov-2003 20:19:20	1 min 6 sec	21	"Gina" <20231@9 41 232 2 5060>	Codec: G729a, Quality: 1 (successful)
13-Nov-2003 20:09:54	13 sec	21	"George" <20531@ep-epgy.com>5060	Codec: G729a, Quality: 1 (successful)

Fig. III-4 Extension's Call Statistics page

The **Call Statistics- Successful Calls, Missed Calls and NonSuccessful Calls** tables list the successful, missed and not successful incoming and outgoing calls and their parameters (Call Start Time, Call durations, Calling and Called phones) for the current extension. Each column heading in the tables are created as links. By clicking on the column heading, the table will be sorted by the selected column. After sorting (ascending or descending) arrows will be displayed close to the column heading.

Number or records displays the current number of statistics entries in the table. For Successful calls **Total Duration, Maximum Duration, Average Duration** and **Minimum Duration** are displayed at the top of the table.

The **Network Details** column is present in the **Successful Calls** table only and provides brief information about the call quality and the codecs used to transmit and receive packets. Clicking on the successful call details will open **RTP Statistics** page where detailed information (Call Quality, Receive and Transmit Codecs, Number of Packets and Packet Sizes, Number of Received Lost Packets, Receive Jitter and Receive Maximum Delay) about the established call is provided. **Call Detail** column is present in the **Non Successful Calls** table only and indicates the reason of the call being unsuccessful.

Filter performs a search procedure by the selected criteria. The search may be conducted with several criteria at once.

To Filter the Statistics

1. Enter the desired search criteria.
 2. Click on the **Filter** button to search call reports within the **Call Statistics** table.
- Info:** To return to the complete statistics table clear all search criteria and press **Filter**.

Speed Calling

The **Speed Calling** service of Quadro simplifies dialing to the called destination. It provides short digit combinations for frequently dialed phone numbers.

The **Speed Calling Settings** page lists all defined **Calling codes** with their parameters:

Add opens the **Speed Calling Settings-Add Entry** page where the user may add a suitable key combination for Speed Calling.

Edit opens the **Speed Calling Settings-Edit Entry** page where the Speed Calling codes may be edited. The page includes the same components as the **Add Speed Calling Code** page.

If no records are selected and the user attempts to Edit or Delete them, an error will occur: "No records selected".

Calling code	Description	Call to	Call type
<input type="checkbox"/> #11	My Sweet Home	00157456810	Auto
<input type="checkbox"/> #61	My Room-Mate	2015511@ep.epgy.com	SIP
<input type="checkbox"/> #77	My Boss	31	PBX
<input type="checkbox"/> #33	Mother	091406699	PSTN

Fig. III-5 Speed Calling Settings page

The **Speed Calling Settings-Add Entry** page includes the following fields and buttons:

Call Type lists the available call types:

- PBX - local calls between Quadro extensions and Auto Attendant
- SIP – calls through a SIP server
- PSTN – calls to PSTN
- Auto – used for undefined call types. Destination (independent on whether it is a PBX number, SIP address or PSTN number) will be reached through Routing.

Calling Code (#) requires a key combination to dial the destination phone number. Only numeric characters are allowed for this field. If nonnumeric symbols are entered and the **Save** button is selected an error will appear: "Incorrect calling code: no symbol characters allowed". This field is limited to two digits. If the calling code already exists in the **Speed Calling Codes** table, when selecting **Save** an error will appear: "Speed Calling Code already exists".

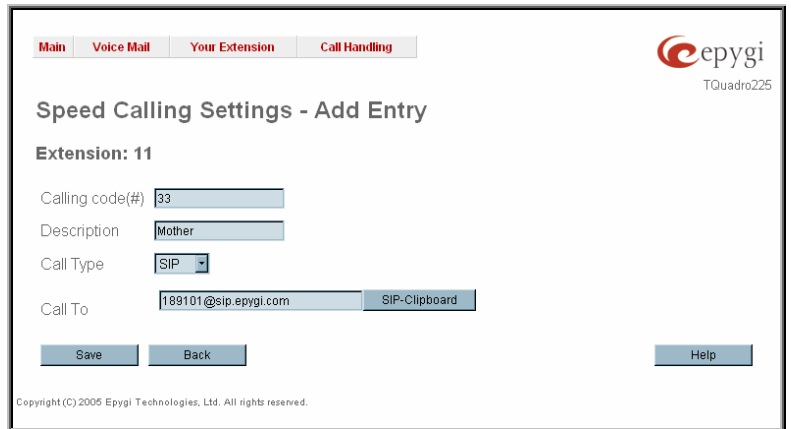


Fig. III-6 Speed Calling Settings – Add Entry page

Description allows entering a short description about the called destination or simply the username of the remote party.

Depending on the selected call type the **Call To** text field indicates the SIP address, extension or PSTN number that has to be dialed whenever the calling code is used. (How to enter a SIP address correctly)

Two digits should be inserted in the **Call To** field for the PBX call type. The PSTN number length depends on the area code and phone number. Only the SIP registration username can be inserted here to call to the SIP user registered on the same SIP server that the current extension is registered on, i.e. leaving an empty SIP server hostname, system will automatically set the current extension's registration server hostname instead.

To Add a Speed Calling Code

1. Press the **Add** button on the **Speed Calling Settings** page. The **Speed Calling Settings-Add Entry** page will appear in the browser window.
2. Select the call type from the **Call Type** drop down list.
3. Choose a **Calling Code** and enter the **Description** for the called party.
4. Enter the destination SIP address, extension or PSTN number (dependant on the chosen call type) in the **Call To** text field according to the entering rules.
5. To create the **Speed Calling Code** click on **Save**.

To Edit a Speed Calling Code

1. Select the checkbox of the corresponding record that has to be edited in the **Speed Calling Codes** table
2. Press the **Edit** button on the **Speed Calling Settings** page. The **Speed Calling Settings-Edit Entry** page will appear in the browser window.
3. Change the desired fields.
4. To save the modifications click on **Save**, to keep the initial data, select **Cancel**.

To Delete a Speed Calling Code

1. Select the checkbox of the corresponding record that ought to be deleted from the **Speed Calling Code** table. Press **Select all** if all records ought to be deleted.
2. Press the **Delete** button on the **Speed Calling** page.
3. Confirm the deletion by clicking the **Yes** button. The speed calling code with its parameters will be deleted. To abort the deletion and to keep the record in the list, select **No**.

Account Settings

The **Account Settings** page provides information on the extension display name, allows changing the user password, enabling user password protection for incoming/outgoing calls and downloading/uploading of a file with the user-defined voice greetings. All parameters listed on this page may be modified and submitted. The page consists of the following components:

Extension shows a non-editable parameter providing information about the current user extension number.

Display Name defines an optional parameter used to identify the calling party. Usually the display name appears on the phone display if a call is placed or a voice mail is sent. The field is not limited regarding symbol usage but its length is limited to 20 characters.

User Permissions selection indicates password protection for:

- **Incoming Calls** enables password protection for incoming calls. If the service is enabled a user password is required to be able to accept the incoming calls.
- **Outgoing Calls** enables password protection for outgoing calls. If the service is enabled a user password is required to be able to make calls.



Fig. III-7 Extension Account Settings page

The **File to upload** text field can be used to type in the path where backed up file with voice messages is located. If voice greetings are browsed with the help of a file-chooser, this field displays the path of the browsed file. The **Browse** button is used to browse for the previously downloaded file with custom voice messages.

Attention: Uploading the selected file will replace your custom voice messages. Uploading custom messages downloaded from the other Quadro will overwrite messages that have not been configured by the user with the current device defaults. This means that if some default messages were used on one Quadro, they may be completely different on the other one upon the uploading of the voice data.

The link **Download custom voice messages** appears only when there are some user-defined custom greetings recorded and is used to download a compressed file with all user specified voice messages. The link opens the file-chooser window to specify the saving location.

The link **Change Password** refers to the page where the user password can be changed.

The **Change Password** page requests the following information:

Old Password requires the existing password for the extension access (this field is not displayed when the administrator updates the user's password from the User specific configuration page).

New Password is used to change the existing one. The password should only consist of digits with a length between 0-20 digits.

Confirm New Password is used to confirm the new password. If the entered **New Password** does not match to the one entered in the **Confirm Password** field the error "The passwords do not match. Please try again" will appear.

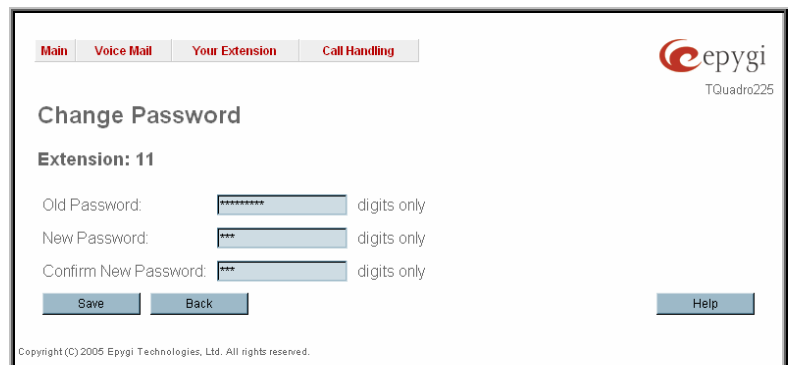


Fig. 3-8 Change Password page for extension access

Please Note: If the extension is allowed to be used for the Call Relay service from the Quadro's Auto Attendant, it is highly recommended to define a proper and non-empty password on this page.

Supplementary Services

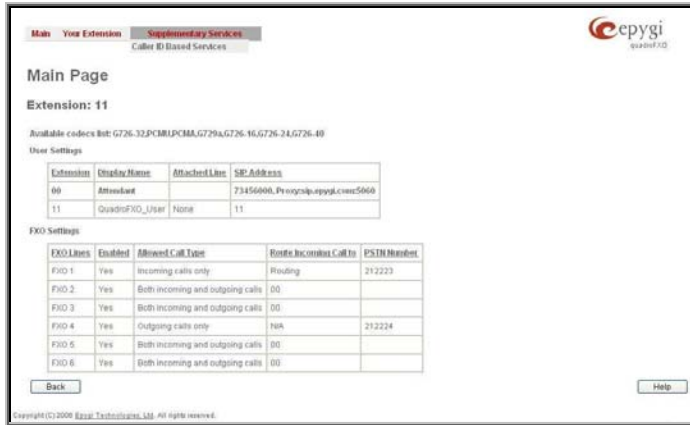


Fig. III-9 Supplementary Services menu in Dynamo Theme



Fig. III-10 Supplementary Services menu in Plain Theme

Caller ID Based Services

The **Caller ID Based Services** page provides a possibility to configure a set of telephony settings from the same page. Incoming and Outgoing Call Blocking Settings, Unconditional Call Forwarding and Call Hunting services are configurable from this page.

The **Caller ID Based Services** page contains a table where all caller or called destinations and the states (ON or OFF) of caller ID based services for each of them are listed. Caller or called destinations are used to configure caller ID based services based on them. The column headings of the table are designed as links. By clicking on the column heading the table will be sorted by the selected column. Upon sorting (ascending or descending) arrows will be displayed close to the column heading.

The table also has **Any Address** entry that is undeletable. It is used to configure caller ID based services for all addressed. When adding a new caller address **Any Address** is changed to **Other Addresses**. Now there could be different configurations for the specified addresses and for all others.

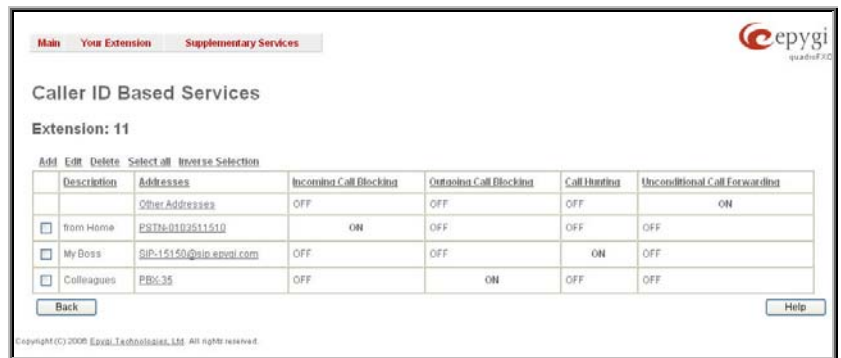


Fig. 3-11 Caller ID Based Services page

Add opens the **Caller ID Based Services - Add Entry** page where a new address can be defined. Page consists of the following components:

The **Description** text field requires optional information about the address owner.

Call Type lists the available call types:

- PBX - local Quadro extensions and Auto Attendant
- SIP – caller or called destinations reached through a SIP server
- PSTN – caller or called destination dialed from or to PSTN
- Auto – used for undefined call types. In this case, for incoming calls from specific address, configuration of caller ID based services will apply either to PBX, SIP or PSTN callers. For outgoing calls, the called destination will be reached through Routing.

Addresses text field requires a SIP address (see chapter [Entering a SIP Addresses correctly](#)), an extension or a PSTN number, for whom supplementary services should be applied. If the address already exists in the table, selecting **Save** will give the error “Caller address already exists”. Wildcard is allowed in this field (see chapter [Entering a SIP Addresses correctly](#)). Entering “*” as PBX or PSTN addresses will apply configuration of supplementary services to all extensions or PSTN users.

Two digits should be inserted in the **Addresses** text field for the PBX call type. The PSTN number length depends on the area code and phone number.

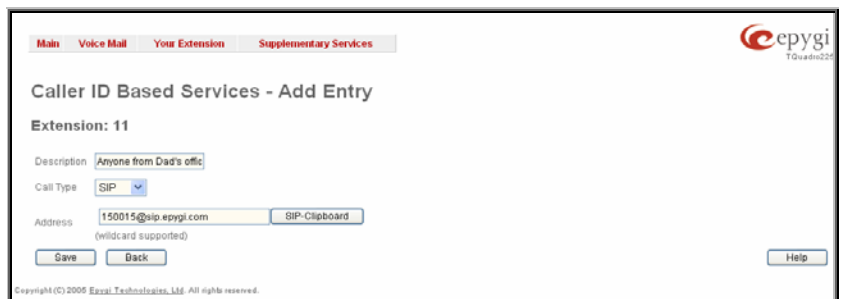


Fig. 3-12 Caller ID Based Services – Add Entry page

When clicking on the **Address** in the **Caller ID Based Services** table, the caller ID based services configuration pages for the corresponding extension will be displayed.

The **Caller ID Based Services for Address** page consists of two frames. In the left frame all caller ID based services are listed. Clicking on the corresponding caller ID based service, its settings will be displayed in the right frame.

Please Note: Pay attention to save changes before moving among caller ID based services configuration pages.

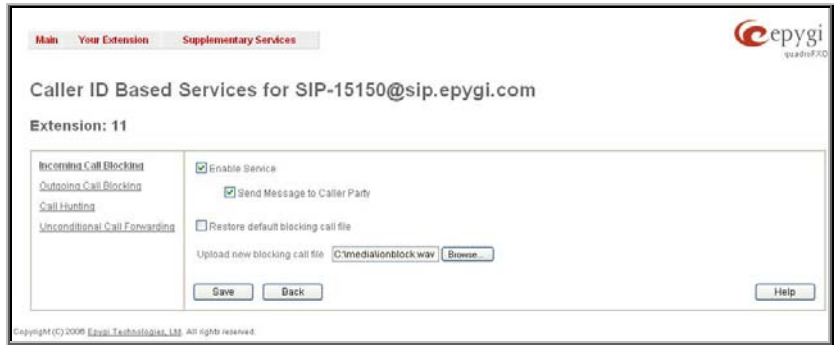


Fig. 3-13 Caller ID Based Services for Address page

Below is the guidance on configuration of each caller ID based service available to the user.

To Configure Caller ID Based Services

1. Press the **Add** button on the **Caller ID Based Services** page. The **Caller ID Based Services - Add Entry** page where new address can be defined will appear in the browser window.
2. Define an optional **Description** of the address.
3. Select the call type from the **Call Type** drop down list.
4. Enter the SIP address, extension or PSTN number (dependant on the chosen call type) in the **Address** text field according to the entering rules.
5. To add an address to the **Caller ID Based Services** table, click **Save**.
6. Click on the newly created **Address** in the **Caller ID Based Services** table to open the **Caller ID Based Services for Address** page.
7. From the left frame, choose a Caller ID Based Services and enable, configure and adjust corresponding service(s) settings in the right frame. Pay attention to **Save** configuration each time moving among Caller ID Based Services configuration pages.

To Edit Caller ID Based Services

1. Select the checkbox of the corresponding address that has to be edited in the **Caller ID Based Services** table. The **Caller ID Based Services - Edit Entry** page will appear in the browser window.
2. Change the **Description** of the address, if needed.
3. Change the **Call Type** and the **Address** defined in the corresponding fields.
4. **Save** changes.
5. If the reconfiguration of **Caller ID Based Services** is needed, click on the corresponding **Address** in the **Caller ID Based Services** table to open the **Caller ID Based Services for Address** page.
6. From the left frame, choose a Caller ID Based Services and change service(s) settings in the right frame, if required. Pay attention to **Save** configuration each time moving among **Caller ID Based Services** configuration pages.

Incoming Call Blocking

Incoming Call Blocking allows blocking unwanted incoming calls for a Quadro extension. This page provides the necessary settings for incoming call blocking. It indicates if the service is enabled for the particular caller and whether or not the custom message will be used to inform the caller about the call being blocked. If the service for the particular caller has been enabled by the administrator and has been stated as protected, it cannot be disabled by the user.

Please Note: Since the administrator can protect the service from being disabled by you, contact the administrator if callers complain that they cannot reach you.

The **Enable Service** checkbox selection blocks all calls to the current extension from corresponding **Address** listed in Caller ID Based Services table Incoming Call Blocking service is configured for.

The **Send Message to Caller Party** checkbox is available when the service is enabled and initiates a message to inform the caller that their line has been blocked. Otherwise the caller party will be disconnected without notification.

The **Restore Default Blocking Call File** restores the default incoming call blocking message if another user-defined file has been selected previously. When the checkbox is selected, the file upload possibility will be disabled.

The **Upload New Blocking Call File** requires the name of the desired voice message file. The file needs to be in PCMU wave format, otherwise the system will prevent uploading it with the "Invalid audio file, or format is not supported" warning message. The system also prevents uploading if there is not enough space available for the corresponding extension; this will cause the "You do not have enough space" warning.



Fig. 3-14 Incoming Call Blocking page

Browse is used to browse custom voice message used for incoming call blocking.

The **Download Voice Message File** link appears only if a file has previously been uploaded. The link is used to download the audio file to the PC and opens a window where the saving location can be specified.

Outgoing Call Blocking

Outgoing Call Blocking allows blocking unwanted outgoing calls for a Quadro extension towards the destination **Address** service is configured for. This page provides the necessary settings for the outgoing call blocking service. It indicates whether service is enabled for the particular caller and whether or not a custom message will be used to inform caller about the call being blocked. If the service for particular caller has been enabled by administrator and has been stated as protected, it cannot be disabled by the user.

Please Note: Since the administrator can protect the service from being disabled by you, contact the administrator if you have problems establishing certain calls.

The **Enable Service** checkbox selection blocks all calls to the corresponding **Address** listed in Caller ID Based Services table from current extension.

The **Send Message to Caller Party** checkbox is available when service is enabled and initiates a message to inform the caller that their line has been blocked. Otherwise the caller party will be disconnected without a warning.

The **Restore Default Blocking Call File** restores the default outgoing call blocking message if another user-defined file has been selected previously. When the checkbox is selected, the file upload possibility will be disabled.

The **Upload New Blocking Call File** requires the name of the desired voice message file. The file needs to be in PCMU wave format, otherwise the system will prevent uploading it with the "Invalid audio file, or format is not supported" warning message. The system also prevents uploading if there is not enough space available for the corresponding extension, this will cause the "You do not have enough space" warning.

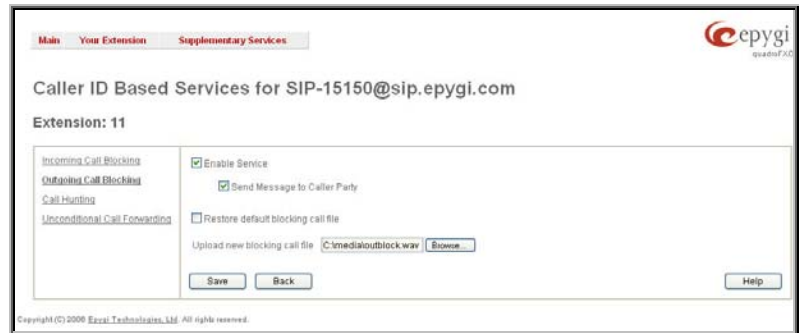


Fig. 3-15 Outgoing Call Blocking page

Browse is used to browse custom voice message used for outgoing call blocking.

The **Download Voice Message File** link appears only if a file has previously been uploaded. The link is used to download the audio file to the PC and opens a window where the saving location can be specified.

Call Hunting

The **Call Hunting** service provides the possibility of incoming call consecutive ringing on several extensions depending on the calling party. The **Call Hunting** page contains a table where all the participants in the call hunting group for the corresponding extension should be defined.

Attention: By configuring the **Call Hunting** service, **Forwarding** and **Many Extensions Ringing** automatically will be disabled on the current extension.

Selecting **Enable Service** activates the Call Hunting service on the current extension.

The table displayed here lists the extensions to where the call must be consecutively duplicated in case of a call from the corresponding caller. The **Line Status** column shows whether or not the extension is **Attached**, **Not Attached** or **Attendant**. An extension can't ring if it is **Not Attached**, it must be attached to the line by the administrator from the **Extensions Management** page.

As the order of the entries in the **Call To** table define the consecutive ringing order, **Move Up/ Move Down** is available to move the checked **Call To** extension either one level up or down.



Fig. 3-16 Call Hunting page

Add opens the **Add Entry** page to add called extensions (an attendant or a user extension). It has manipulation radio buttons to select the type of extension to be added to Call Hunting, and contains the following components:

- The **Call To** drop down list contains Quadro's attendant or user extensions, depending on the radio button selected. It is possible to add the same extension more than once to the **Call To** table. The extension will ring - depending on the order - as often as configured.
- The **Duration** drop down list is available for user extensions only and is used to select the period (in seconds) during which the corresponding user's extension should ring.

When saving the call hunting configuration, a message will notify the user that the Many Extensions Ringing and the Call Forwarding services have been disabled.

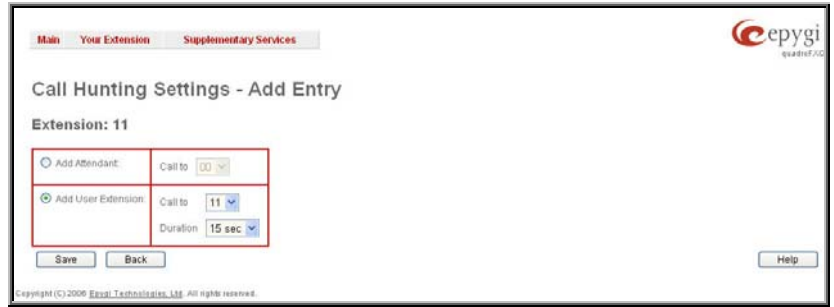


Fig. 3-17 Call Hunting – Add Entry page

Circular Mode checkbox enables the startover of the call hunting when the last extension in the Call Hunting table has been called and still with no answer. When this checkbox is not selected, call hunting will terminate once the last extension in the Call Hunting table does not answer the call, the incoming call will be then disconnected.

Unconditional Call Forwarding

Unconditional Call Forwarding is a service of Quadro that allows the automatic unconditional transfer of incoming calls to varying other destinations.

Please Note: By setting up the unconditional forwarding service, **Many Extension Ringing** and **Call Hunting** services will be disabled automatically.

The **Enable Service** checkbox selection activates the unconditional call forwarding service on the current extension.

Please Note: Unconditional Call Forwarding service has higher priority versus to other forwarding types, i.e. when Unconditional Call Forwarding is enabled, Busy Forwarding and No Answer Forwarding services won't take effect (even if enabled).

The table displayed here lists the destinations where the incoming call from a particular caller should be unconditionally forwarded to.

Add opens the **Add Entry** page to add forwarding destinations. It consists of the following components:

Call Type lists the available call types:

- PBX - forwarding destination is a local Quadro extensions or Auto Attendant
- SIP – forwarding destination is reached through a SIP server
- PSTN – forwarding destination is a PSTN user
- Auto – used for undefined call types. In this case, the routing pattern will be considered and parsed through the Local Routing Table.



Fig. 3-18 Unconditional Call Forwarding page

The **Forward To** text field requires the SIP address (see chapter [Entering a SIP Addresses correctly](#)), extension or PSTN number, where incoming call from a certain caller should be unconditionally forwarded. If the address already exists in the table, selecting **Save** will give the error "Caller address already exists". Wildcard is allowed in this field (see chapter [Entering a SIP Addresses correctly](#)). Entering "*" as PBX or PSTN addresses will apply the configuration of Caller ID Based services to all extensions or PSTN users.

Two digits should be inserted in the **Forward To** text field for the PBX call type. The PSTN number length depends on the area code and phone number.

When saving the unconditional call forwarding configuration, a message will notify the user that Many Extension Ringing and Call Hunting services have been disabled.

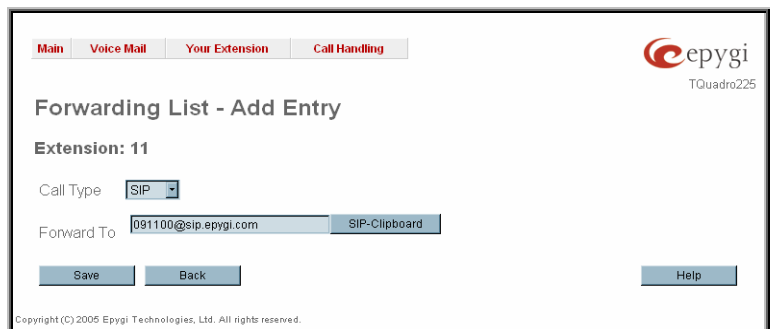


Fig. 3-19 Call Forwarding – Add Entry page

Logout

This option is used to close the session between the user PC and Quadro and to leave the Quadro Web Management or enter into the management with another login. By selecting the **Web Management** link, the startup page will be displayed and the user will need to login again.

Quadro's Feature Codes

This chapter describes how Quadro's feature codes allow the user to navigate through Quadro's services with the help of a phone handset. These services are **Establishing a Call**.

Establishing a call

To make a call, dial the **Routing Number**.

Routing Numbers and available routs to, from and through Quadro are listed in the **Call Routing Table**, which is configured and managed by Quadro's Administrator. To get information about dialing rules, please turn to administrator.

Please Note: You may accelerate establishing a connection by a pound (#) sign dialed at the end of the number.

Appendix: System Default Values

Administrator Settings

Parameter	System Default Value
Admin Settings	Login name -admin Password - 19
Quadro Hostname	quadro
LAN IP Address	172.28.0.1 Subnet Mask - 255.255.0.0
DHCP Server	Enabled, IP Range - 172.28.0.100-172.28.0.254, WINS - 0.0.0.0.
Regional Settings and Preferences	Locale – US, TimerZone - US/Central, Theme – Dynamo.
WAN Interface Protocol	Ethernet
WAN Interface Bandwidth	Upstream – 10000, Downstream – 10000, Min Data Rate – 0.
WAN IP	Automatically through DHCP
Mac Address	Assigned by device, MTU - 1500 Bytes.
DNS Server	Dynamically
IP Routing Configuration	No Routes
Event Settings	"Display notification" for all except PPP Link Up, Link Down and Authentication Failure events, which has "Do nothing" action assigned.
Time/Date Settings	NTP Server and Client – enabled, Predefined NTP Server - ntp1.epygi.com, Polling interval – 6.
Mail Settings	Disabled
Language Pack	Default - English Custom Language Pack - none
User Rights Management	Users - admin (enabled), localadmin (disabled). Roles - Extension (all accessible pages for extension), Local Administrators (all accessible pages for localadmin).
Extensions Management	00 extension exists
Attendant 00 Settings – General	Display name – Attendant, Percentage of System Memory – 3%.
Attendant 00 Settings – Attendant Scenario	Scenario – default, Send AA digits to Routing Table – enabled, Enable welcome message – enabled, Redirection on Timeout – disabled, Welcome message and Recurring Attendant Prompt – default, Authorized Phones Database – undefined.
Attendant 00 Settings – SIP	Registration username and password - automatically generated, SIP server - sip.epygi.com, SIP Server port – 5060, SIP Server Registration – disabled.
Attendant 00 Settings – SIP Advanced	Authentication User Name – undefined, Send Keep-alive Messages to Proxy – disabled, RTP Priority Level – medium, Outbound Proxy, Secondary SIP Server and Outbound Proxy for Secondary SIP Server – undefined.
Attendant 00 Settings - Codecs	Codecs - G711u (preferred), G711a, G726/16, G726/24, G726/32, G726/40, G729a, G723, iLBC

Parameter	System Default Value
	Out of Band DTMF Transport – enabled, T.38 FAX – enabled, Pass Through FAX – enabled, Pass Through Modem – disabled, Force Self Codecs Preference for Inbound Calls - disabled.
Universal Extension Recordings	Default
Call Statistics	Enabled 100 entries for all type of calls
SIP Settings	UDP and TCP Port – 5060, Session Timer – disabled, DNS Server for SIP – default, SIP timers – RFC 3261.
RTP Settings	Properties for all Codecs except G723 and iLBC : Packetization -20ms Silence Suppression -yes G723 and iLBC properties: Packetization - 30ms Silence Suppression – yes RTP/RTCP port range for FXS lines - 6000-6049 G276 Standard - ITU-T specification Telephone Event Draft Support - enabled RTCP Support - disabled
NAT Traversal Settings	NAT Traversal for SIP – force SIP and RTP Parameters - Use STUN SIP TCP Port – 5060 STUN Parameters: Primary STUN Server - stun.epygi.com Primary STUN Port – 3478 Secondary STUN Server – undefined Secondary STUN Port - undefined Polling Interval: 1 hour Keep-alive interval: 120 seconds NAT IP checking interval: 300 seconds No entries in NAT Exclusion table
FXO Settings	6 FXO lines – all enabled, incoming and outgoing calls allowed and routed to 00 Attendant on all, Provide FXO lines for master device – disabled.
Gain Control Settings	FXO lines: Transmit Gain: 0 Receive Gain: 6
Call Routing	Route all incoming SIP calls to Call Routing – enabled. Local Routing table – no entries. Local AAA Table - no entries.
RADIUS Client Settings	Disabled
Dial Timeouts	4 seconds
System Hold Music Settings	Play Hold Music – Local Music, Hold Music file – default.
Firewall	Firewall – disabled, Ping Stealth – enabled.
NAT	Enabled
Filtering Rules	Outgoing Traffic - MS File Sharing (Blocked for all), SIP Access (Allowed for all), No user defined services and IP pool groups

Extension Settings

Parameter	System Default Value
Speed Calling	No entries
Account Settings	Display Name – undefined, User Password Protection – disabled both for incoming and outgoing calls, Custom Voice Messages – default.
Caller ID Based Services	No entries in the table. For Any Callers – all services except Unconditional Forwarding are disabled, Unconditional Forward is enabled, with 00@172.30.0.1 forward destination. Blocking Voice Messages - default

Appendix: Software License Agreement

EPYGI TECHNOLOGIES, LTD. Software License Agreement

THIS IS A CONTRACT. CAREFULLY READ ALL THE TERMS AND CONDITIONS CONTAINED IN THIS AGREEMENT. USE OF THE QUADRO HARDWARE AND OPERATIONAL SOFTWARE PROGRAM INDICATES YOUR ACCEPTANCE OF THESE TERMS AND CONDITIONS. IF YOU DO NOT AGREE TO THESE TERMS AND CONDITIONS, SIMPLY DO NOT USE THE HARDWARE OR SOFTWARE.

- **License.** Epygi Technologies, Ltd. (the "Licensor"), hereby grants to you a non-exclusive right to use the Quadro Operational Software program, the documentation for the software and such revisions for the software and documentation as the Licensor may make available to you from time to time (collectively, the "Licensed Materials"). You may only use the Licensed Materials in connection with your operation of the Quadro or any Quadro SIP Gateway product. You may not use, copy, modify or transfer the Licensed Materials, in whole or in part, except as expressly provided for by this Agreement.
- **Ownership.** By paying the purchase price for the Licensed Materials, you are entitled to use the Licensed Materials according to the terms of this Agreement. The Licensor, however, retains sole and exclusive title to, and ownership of, the Licensed Materials, regardless of the form or media in or on which the original Licensed Materials and other copies may exist. You acknowledge that the Licensed Materials are not your property and understand that any and all use and/or transfer of the Licensed Materials is subject to the terms of this Agreement.
- **Term.** This license is effective until terminated. This license will terminate if you fail to comply with any terms or conditions of this Agreement or you transfer possession of the Licensed Materials to a third party in violation of this Agreement. You agree that upon such termination, you will return the Licensed Materials to the Licensor, at its request.
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- **Entire Agreement.** It is understood that this Agreement, along with the Quadro Installation Guide and User's Manual, constitute the complete and exclusive agreement between you and the Licensor and supersede any proposal or prior agreement or license, oral or written, and any other communications related to the subject matter hereof. If one or more of the provisions of this Agreement is found to be illegal or unenforceable, this Agreement shall not be rendered inoperative but the remaining provisions shall continue in full force and effect.
- **No Waiver.** Failure by either you or the Licensor to enforce any of the provisions of this Agreement or any rights with respect hereto shall in no way be considered to be a waiver of such provisions or rights, or to in any way affect the validity of this Agreement. If one or more of the provisions contained in this Agreement are found to be invalid or unenforceable in any respect, the validity and enforceability of the remaining provisions shall not be affected.
- **Governing Law.** This Agreement shall be governed by and construed in accordance with the laws of the state of Texas, without regard to choice of law provisions that would cause the application of the law of another jurisdiction.
- **Attorneys' Fees.** In the event of any litigation or other dispute arising as a result of or by reason of this Agreement, the prevailing party in any such litigation or other dispute shall be entitled to, in addition to any other damages assessed, its reasonable attorneys' fees, and all other costs and expenses incurred in connection with settling or resolving such dispute.

If you have any questions about this Agreement, please write to Epygi at 6900 North Dallas Parkway, Suite 850, Plano, Texas 75024 or call Epygi at 972.692.1166.