

# Hypermedia Gateways HG-4000 3U and 6U Product Manual



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## Table of Contents

<b>Hardware and Installation.....</b>	<b>1</b>
Overview .....	2
Contents of Package .....	2
Safety Information.....	3
System Components.....	4
Installation.....	7
Pre-Installation Preparation .....	7
Installing the D-Link DIR100 Router.....	8
Installing the RO 1.1 Embedded Router Card.....	10
Installing the Media Gateway (MG) Card.....	11
Installing the Cellular Card.....	12
Powering Up and LEDs.....	14
LEDs.....	15
<b>HMC Quick Start .....</b>	<b>17</b>
Installation.....	18
Start-up and Initial Connection .....	20
User Interface Overview .....	23
HMC Navigation.....	24
Save/Load Configuration .....	26
Call Parameters .....	27

<b>Configuring a Cellular Card .....</b>	<b>29</b>
Cellular Card and System Terminology .....	30
Volume Settings .....	31
Media Connections.....	32
Associating/Linking Cellular Channels .....	32
Unlinking Cellular Allocations.....	33
Callbacks .....	34
Resources .....	34
Call Triggers .....	35
SMS Triggers.....	35
Callthroughs .....	37
Dial Filters.....	39
PIN Codes .....	40
MSN Values .....	41
Reset.....	42
Information Screens .....	43
Module Info .....	43
Serial Numbers .....	43
Locks .....	44
SIM Select.....	45
SIM Counters .....	46
SIM Auto Manage.....	47
Call Counter Steps.....	48
CLI Blocking.....	49
Call Limits.....	50
Cell Selection .....	51
USSD SIM Balance.....	53
Settings.....	54
Monitoring Cellular Cards .....	55
All Cells.....	55

Reception.....	56
Status.....	57
<b>Configuring LCR.....</b>	<b>59</b>
Overview.....	60
Linking to LCR.....	61
Linking from a Media Branch.....	61
Linking from the LCR Branch.....	63
Editing a Target Link.....	65
Breaking a Link (Unlink).....	65
Groups.....	66
Creating a Group.....	66
Using the Default Group Settings.....	67
Resource Map.....	68
Sample Assignment.....	68
Assigning LCR Resources.....	69
Rules.....	72
Creating a Rule.....	72
Creating a Default Set of Rules.....	74
Deleting a Rule.....	74
Filters.....	75
Time Frames.....	76
Creating a Time Frame.....	76
Disabling Time Frames.....	77
Advanced Call Routing (ACR).....	78
Modifying the Existing ACR Number List.....	78
Creating a New ACR Number List File.....	79
ACR Rules.....	80
Callthrough.....	83
Number Filters.....	85
Creating a Number Filter.....	85

Applying a Callthrough Filter.....	87
Callback Triggers .....	88
CDR.....	90
Enabling Collection of CDR.....	90
Downloading a CDR File .....	91
Deciphering the CDR File .....	91
Activating LCR in PC Cards.....	94
LCR CDRs .....	96
Deciphering the CDR File .....	96
<b>Configuring the VoIP Card .....</b>	<b>99</b>
VoIP Media Connections .....	100
Associating/Linking VoIP Channels .....	100
Unlinking VoIP Allocations .....	102
Callthrough.....	103
VoIP Settings.....	105
VoIP Management Features .....	107
IP Filters.....	107
DDI Filters (Direct Dial-in).....	108
Dial Filters .....	110
Call Routing.....	111
Phone2Net Dial Plan.....	111
DDI Blocking.....	112
Cause Codes.....	113
Monitoring VoIP Cards .....	115
Review VoIP Card Information.....	115
Controlling VoIP Line Activity .....	116
VoIP CDRs .....	117
Deciphering the VoIP CDR File.....	117



<b>Managing via the HMC .....</b>	<b>121</b>
User Management .....	122
Add User .....	122
User List.....	123
VPN Groups .....	124
Number Filters.....	125
Scheduler .....	127
Switch SIM per Slot.....	127
Switch SIM per System .....	129
Reset SIM Counter .....	130
Set Multi SIM .....	132
VoIP Channels .....	133
Manual Command .....	135
Callback.....	137
Remote Delegation .....	137
Ext. Authentication .....	138
<b>Callback and Callthrough.....</b>	<b>139</b>
Callback Overview .....	140
Callback Best Practice.....	141
Determine a Trigger Strategy .....	141
Allocate the Trigger Resource .....	142
Allocate the Callback Resource.....	144
Optionally, Require PIN Code Authorization .....	146
Authorize the User .....	147
Inform Users .....	148
Callthrough Overview .....	149
Callthrough Best Practice.....	150
Allocate the Callthrough Resource.....	150
Determine and Configure a User Authentication Strategy .....	153

Inform Users .....	153
CB/CT CDRs.....	154
<b>Console Suite and other Tools .....</b>	<b>155</b>
Console Suite.....	156
CDR Console .....	156
Log Console.....	157
Decoding Logs.....	158
Service Console .....	167
HGS Setup Parameters Tool .....	168
PRI Cause Conversion .....	170
Hypermedia Gateway Server List .....	172
Adding a New Server.....	172
Accessing Other Tools via the Server List .....	173
Troubleshooting .....	174
<b>Index .....</b>	<b>177</b>

## Chapter 1

# HARDWARE and INSTALLATION

*Hardware and installation vary depending upon the features included with the Hypermedia Gateway system.* Skip the sections that do not apply to your system.

This section includes:

- “Contents of Package” on page 2
- “Safety Information” on page 3
- “System Components” on page 4
- “Pre-Installation Preparation” on page 7
- “Installing the D-Link DIR100 Router” on page 8
- “Installing the Media Gateway (MG) Card” on page 11
- “Installing the Cellular Card” on page 12
- “Powering Up and LEDs” on page 14
- “LEDs” on page 15

## Overview

The HyperGateway family of scalable platforms empowers cost-effective corporate telephony over fixed, cellular and IP networks. HyperGateway systems provide integrated voice communications for both on-site and remote users of small-to-large enterprises. Acting as legacy PBX VoIP enablers, the flexible systems are easily expanded to meet evolving corporate telephony needs over time.

The Hypermedia Gateway unit is a 19" x 6U or 19" x 3U rack-mountable box that connects to the local PBX or network via a PRI card or VoIP card. It also connects to the cellular network via up to 8 cellular cards, each card with 4 modules of cellular channels. The system enables any combination of connectivity between its various interfaces.

Running on the HyperGateway family of platforms, HyperSaving Package is a corporate communications software add-on that minimizes expenses of local, national and international calls. The scalable system provides secure and flexible control of on-site and remote calls over fixed, cellular and IP networks. Leveraging organizational communications resources, Web-based management capabilities, and operators' various service tariffs, HyperSaving Package empowers significant savings in corporate telephony expenses. HyperSaving Package includes any combination of Corporate Call-Back, Corporate Call-Order and Corporate Call-Through services that improve the organization's bottom line.

## Contents of Package

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Depending upon configuration, the package should contain some or all of the following:

- The Hypermedia Gateway unit
- PRI cables
- Ethernet cables
- 1 or 2 power cords, depending upon the configuration
- 1 to 8 indoor antennas, depending upon the configuration
- 1 control cord
- Optionally, a D-Link DIR-100 router
- The warranty certificate
- Hypermedia Software CD-ROM

## Safety Information

Hypermedia Gateway works with a nominal mains supply voltage of 110–240V AC. Hazardous voltages are present inside of this equipment. Some of the parts can also have high operating temperatures.

To avoid injury and prevent equipment damage, observe the following safety precautions:

- Installation, service, and maintenance of the Hypermedia Gateway should be done by qualified technicians only.
- Do not connect the Hypermedia Gateway to any power source other than the indicated nominal source.
- The power supply cord must be connected to a socket with a valid ground. This equipment should only be used in buildings with proper safety ground.
- When connecting the equipment, first, ensure that the ground connection is connected to the rack ground or building ground.
- When disconnecting the equipment, disconnect the ground connection last.
- Opening the housing may be dangerous and invalidates the warranty. Only a qualified technician should open the housing. Before opening, disconnect the power cable from the equipment.
- The Hypermedia Gateway complies with all necessary safety standards. Equipment connected to the Hypermedia Gateway must also comply with the applicable safety standards.
- The packaging is designed to protect against mechanical damage and should be stored. Do not ship equipment unless it is properly packed in its original wrapping and shipping containers.
- Make sure that the equipment top and bottom are not blocked to air movement. Leave 1U under and on top of the equipment for proper ventilation.
- Do not operate the Hypermedia Gateway in close proximity to potentially hazardous areas. These includes areas such as, but not exclusively, fuel stations, fuel depots, chemical works or during blasting.
- Operate the device in its normal operating position only.
- The operation of radio transmitters, which includes cellular engines, can impair the function of medical devices that have not been properly shielded. Please ask the advice of your doctor or the manufacturer of the medical device.
- To avoid moisture condensation, allow time for the unit to adapt to the ambient temperature before switching it on.

## System Components

The Hypermedia Gateway system consists of the components described below:

- The Hypermedia Gateway **unit** is a 19" x 6U or 19" x 3U rack-mountable box that connects to the local PBX or network. The system enables any combination of connectivity between its PRI, BRI, VoIP, and cellular interfaces.
- The unit contains a **back-plan and slots** for the boards described in Table 1, “Hypermedia Gateway Boards,” on page 5. Placement of the boards varies according to product.
- The unit contains a single **power supply** module. A dual power supply module is also available.

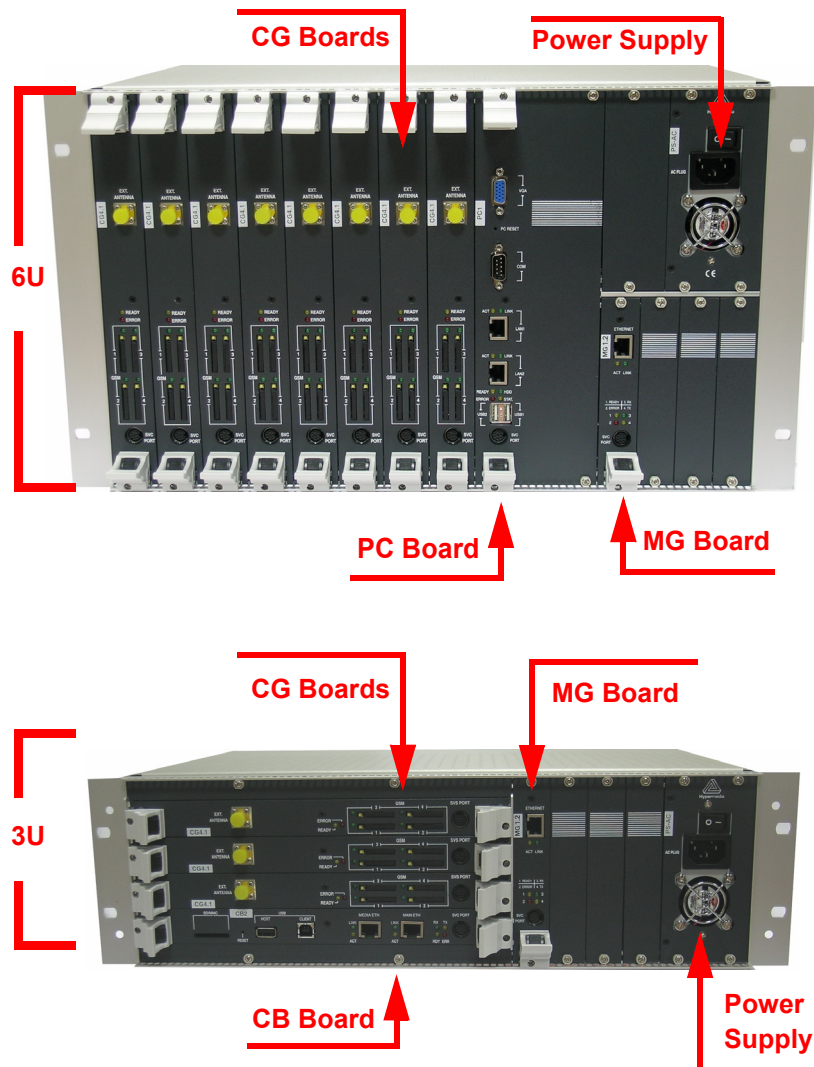


Figure 1: Examples of Boards within a Hypermedia Gateway

- The **D-LINK DIR-100** is an Ethernet Broadband Router equipped with NAT network address translation technology. It enables the Hypermedia Gateway to connect to a public IP and to operate behind firewalls equipped with Network Address Translation (NAT); this provides maximum network security.
- The **HyperGateway Server** is an application that is embedded in the Control Board, the PRI 2.1 board, and on the PC1/2 board. The HyperGateway Server is controlled and managed by the browser-based Hypermedia Management Console.
- The **Hypermedia Management Console (HMC)** is used by the system administrator for remote configuration and monitoring of the Hypermedia Gateway system. It runs over TCP/IP and is accessed via a standard WEB browser.

**Table 1: Hypermedia Gateway Boards**

<b>Board Name</b>	<b>Description</b>
<b>CB1/2</b> Control Board	<p>The CB1/2 module is designed for remote TCP/IP access, advanced application and enhanced new features. It comes in two configurations:</p> <ul style="list-style-type: none"> <li>• Stand-alone embedded HyperGateway Server for some dual-PRI configurations (single PRI with the HyperGateway Server runs on the PRI 2.1 board mentioned below)</li> <li>• VoIP Gateway add-on supporting the VoIP interface and providing a SIP/H323 interface</li> </ul>
<b>PC1/2</b> Control Board	<p>The PC1/2 is a double-slot computer designed for use by alternative carriers. It enables TCP/IP access and supports the VoIP Gateway. The PC1/2 runs the HyperGateway Server for direct remote access, and provides a SIP/H323 interface when VoIP is implemented.</p>
<b>CG41/CC41</b> Cellular Gateway	<p>CG41 for GSM and CC41 for CDMA is a single-slot card that enables inbound and outbound cellular voice calls for GSM and CDMA networks.</p>
<b>QBRI</b> Quad BRI Board	<p>The QBRI boards are single-slot cards that enable signaling over a BRI channel on public or private ISDN. The HyperGateway Server runs on the single QBRI board.</p>

**Table 1: Hypermedia Gateway Boards**

Board Name	Description
<p><b>MG-1.1/1.2</b> Media Matrix and Media Gateway</p>	<p>The MG-1.1/1.2- Media Matrix is a single-slot card that enables flexible, pre-defined, and dynamic allocation of GSM channels, E1 PRI B-channels, and VoIP channels. It comes in two configurations:</p> <ul style="list-style-type: none"> <li>• The basic Matrix slot board</li> <li>• VoIP Gateway add-on supporting the VoIP interface and capable of carrying 32–72 concurrent VoIP calls. It is designed for use by alternative carriers.</li> </ul>
<p><b>PRI-1.1 (EOL)</b> and <b>PRI-2.1/2.2</b> PRI ISDN</p>	<p>The PRI boards are single-slot cards that enables signaling over a Primary Rate Interface (PRI) channel on public or private Integrated Services Digital Networks (ISDN) at E1 and T1 reference points.</p> <p>The PRI-1.1 module supports a single PRI channel. The PRI-2.x comes in two configurations:</p> <ul style="list-style-type: none"> <li>• 2.1 single PRI with the HyperGateway Server</li> <li>• 2.2 dual PRI with Bypass</li> </ul>
<p><b>RO 1.1</b> Router Card</p>	<p>The RO 1.1 module is a single-slot card that provides Ethernet Broadband Router functionality. It is equipped with NAT network address translation technology and enables the Hypermedia Gateway to connect to a public IP and to operate behind firewalls equipped with Network Address Translation (NAT)</p>
<p><b>HYD2 and HBS2</b> Hybrid Card</p>	<p>These cards combine the functionality of the MG and PRI cards. Optionally, these cards can also support VoIP functionality. The HYD2 supports dual PRI channels and the HBS2 supports a single PRI channel.</p>



## Installation

*Installation varies depending upon the boards included with the Hypermedia Gateway system.* Skip the sections that do not apply to your system.

This section is subdivided into:

- “Pre-Installation Preparation” on page 7
- “Installing the D-Link DIR100 Router” on page 8
- “Installing the Media Gateway (MG) Card” on page 11
- “Installing the Cellular Card” on page 12
- “Powering Up and LEDs” on page 14

### Pre-Installation Preparation

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1. Install the Hypermedia Gateway in a 19” rack. Depending upon the physical configuration, the unit requires a height of either 3U or 6U. In addition, we recommend:
  - Avoid installing the device near computer rooms, computer monitors, electrical cabinets, metal objects, and windows with fold aluminum sheet.
  - Perform a cellular signal check before mounting the system. This can be done by checking the Signal Strength and the Bit Error Rate ratio on another mobile phone's display from the same operator and system.
  - Ensure that the device is protected against direct sunlight and heat. This increases both the reliability of the operation as well as its service life.
  - The antennas are for indoor use only.
  - The cables to the devices should be installed so that they do not cause any physical risk. Power cables should be installed separate from the signal cables.
2. Depending upon the configuration of your system, verify that you have some or all of the following:
  - an Ethernet or WAN socket with a fixed IP address
  - a spare PRI card in your PBX
  - SIM cards from your GSM operator. One SIM card is required for each GSM channel
  - in case of CDMA network, a MIN or NAM from your local operator
3. To configure the Router, get the following information from your Internet Service Provider:
  - WAN IP Address
  - Subnet Mask, and WAN Gateway

## Installing the D-Link DIR100 Router

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1. Connect the D-Link DIR 100 Router to the Hypermedia Gateway. There are two ways to connect the router depending upon whether or not the system has a CB card. Choose the method that matches the configuration of the Hypermedia Gateway.



Figure 2: D-Link DIR 100 Router

### System with a CB Card

If the system has a CB card, both D-Link Router cables attach to it.

- a. Attach Port 1 of the D-Link Router to the Control Board (CB) port marked MEDIA ETH.
- b. Attach Port 2 of the D-Link Router to the Control Board (CB) port marked MAIN ETH.

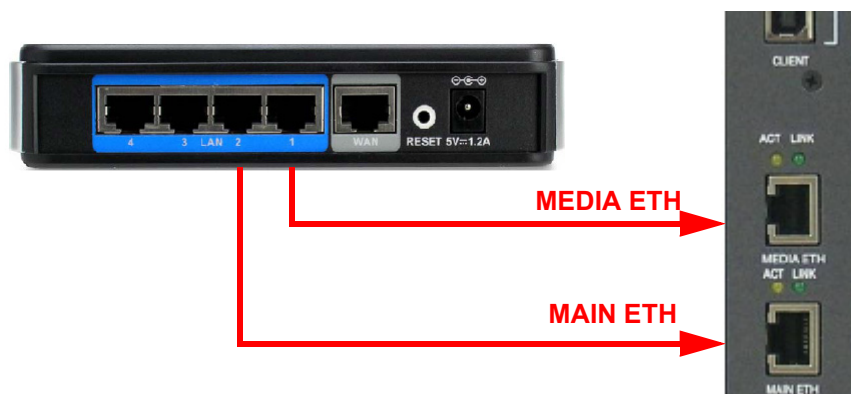


Figure 3: D-Link Connection for System with CB Card

- c. Connect the D-Link's WAN port to an appropriate network port.

### System without a CB Card

If the system does not have a CB card, connect the D-Link Router cables as follows:

- a. Attach Port 1 of the D-Link Router to the MG card's port marked ETHERNET.
- b. Attach Port 2 of the D-Link Router to the PC card's port marked LAN.

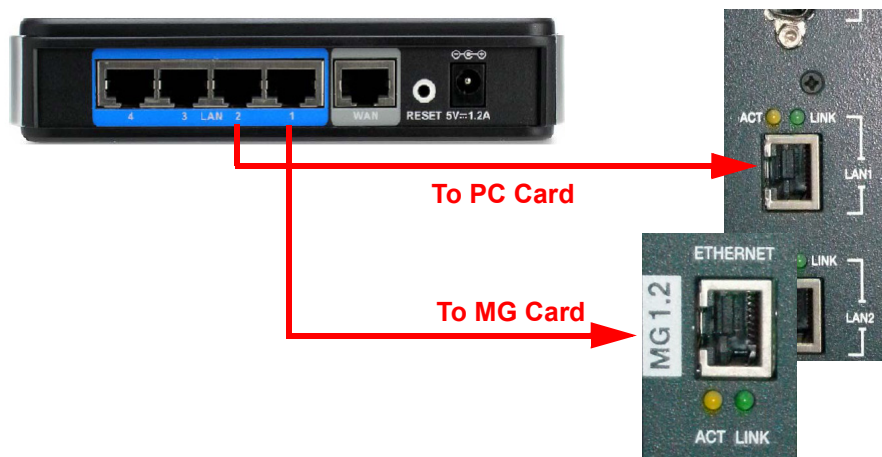


Figure 4: D-Link Connection for System with CB Card

- c. Connect the D-Link's WAN port to an appropriate network port.
2. Plug in the router and wait until its Status LED starts blinking green. This indicates that the unit is functioning properly. A prolonged steady green light indicates a problem.
3. Configure the router.
  - a. Get the following information from your Internet Service Provider:
    - WAN IP Address
    - WAN Subnet Mask
    - WAN Gateway,
  - b. Using a computer connected to the same LAN as the Hypermedia Gateway, open a browser.
  - c. Configure the computer to automatically accept its IP address. This is done via the Windows Network Connections tool. (Refer to Windows on-line Help and search for DHCP.)
  - d. Enter the IP address of the DIR-100 into a browser's Address field and press "Enter." The default IP address on a system using a CB is 192.168.9.254. The default IP address on a system using a PC is 192.168.0.1. The Log In screen is displayed.
  - e. Enter the username **admin** and the password **hypergateway**.
  - f. Click **Log In**. The Setup Wizard is displayed.
  - g. Click **Manual Internet Connection Setup**.

h. Click **WAN**. The Internet Connections screen is displayed.

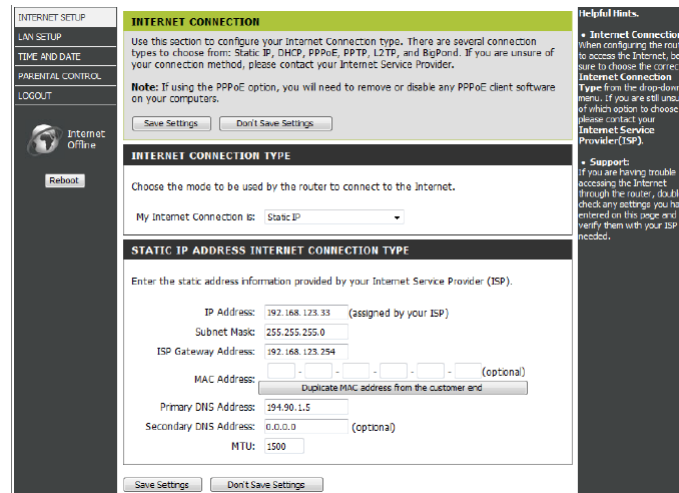


Figure 5: D-Link Internet Connections Screen

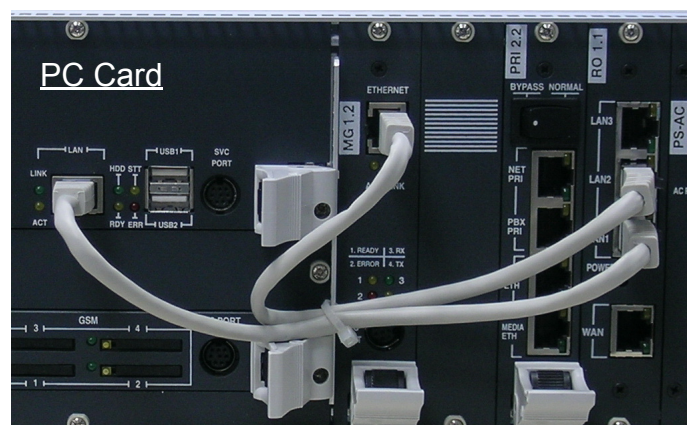
- i. Enter the WAN (Public) IP address information provided to you by your ISP.
- j. Click **Save Settings**.

**Note:** For additional documentation, see the *D-Link Manual* found on the CD-ROM.

## Installing the RO 1.1 Embedded Router Card

The RO 1.1 module is a single-slot card that provides Ethernet Broadband Router functionality. It is equipped with NAT network address translation technology and enables the Hypermedia Gateway to connect to a public IP and to operate behind firewalls equipped with Network Address Translation (NAT).

1. Connect a cable from the PC card's LAN port to the RO card's LAN1 port.
2. Connect a cable from the MG card's ETHERNET port to the RO card's LAN2 port.
3. Configure the router. Begin configuration with step 3 on page 9.



## Installing the Media Gateway (MG) Card

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The MG-1.1/1.2- Media Matrix is a single-slot card that enables flexible, pre-defined, and dynamic allocation of GSM channels, E1 PRI B-channels, and VoIP channels. It comes in two configurations:

- the basic Matrix slot board (pictured)
- VoIP Gateway add-on supporting the VoIP interface

Every Hypermedia Gateway system has an MG card. The MG card has an array of manual Dual In-line Package (DIP) switches. Set them to match the system configuration.

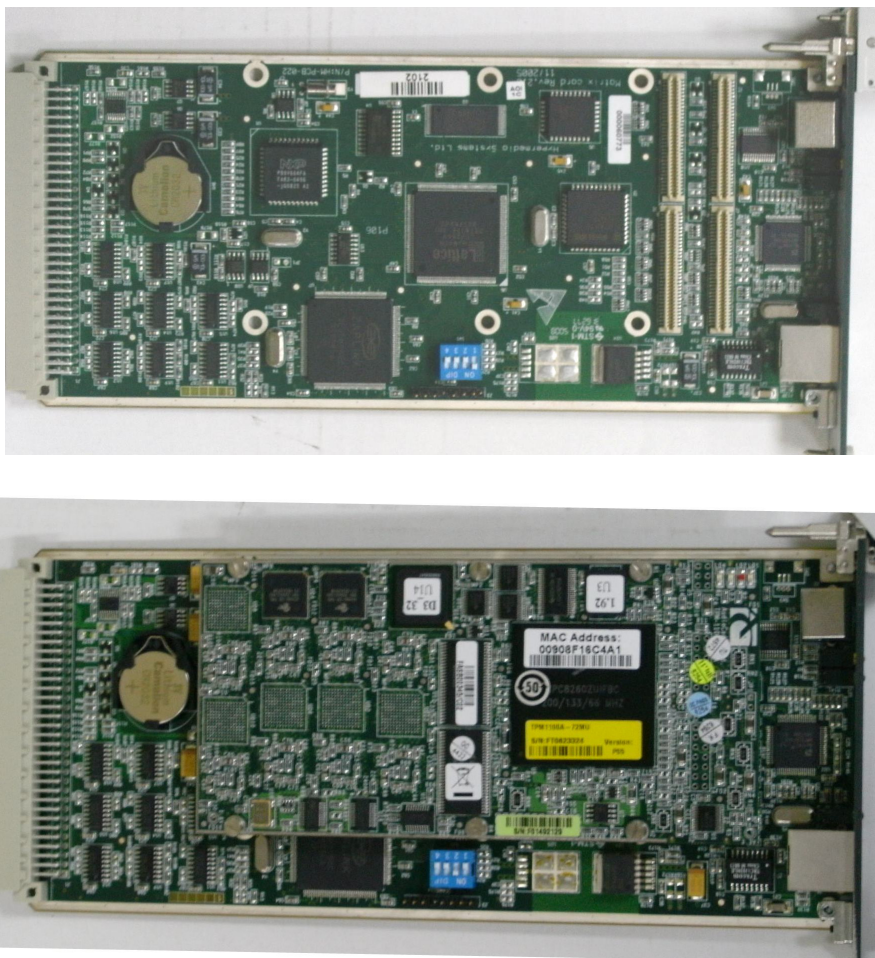
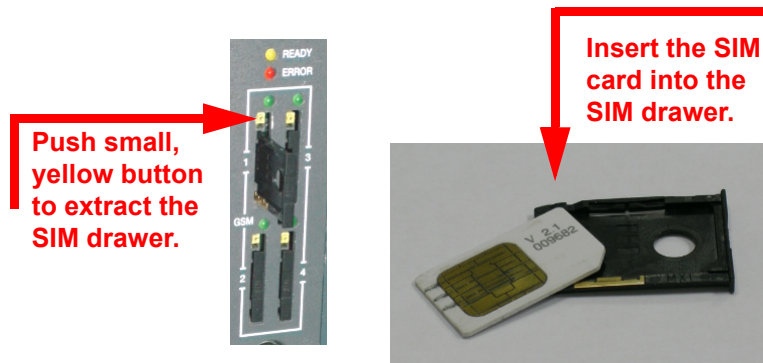


Figure 6: MG Card 1.2 Without VoIP (above) and 1.1 (below) With VoIP



## Installing the Cellular Card

1. Insert the GSM SIM Cards. One SIM card should be used per each cellular channel.



- a. Push the small yellow button. This pushes SIM drawer out of the slot.
- b. Remove the SIM drawer.
- c. Place the SIM card in the SIM drawer.
- d. Replace the SIM drawer.
- e. Optionally, to use the CG board's multi-SIM extender:
  - i. Pull out the CG board.

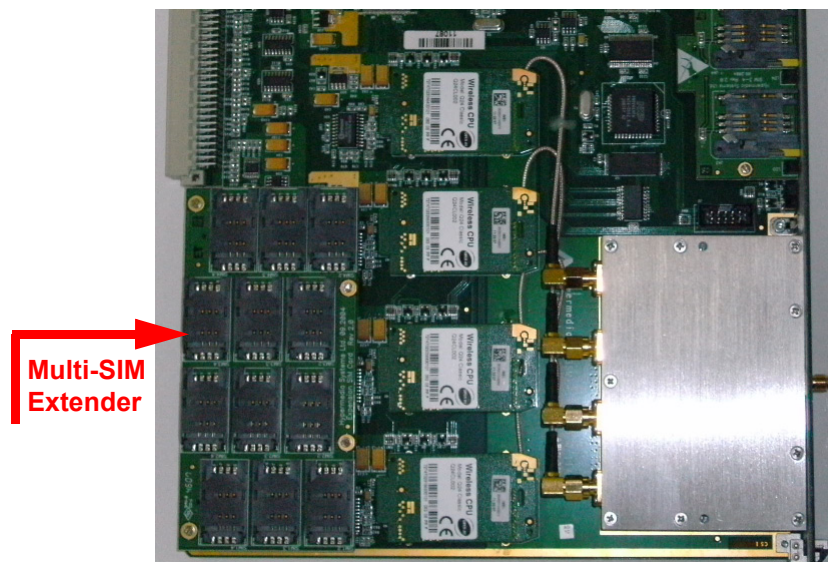



Figure 7: CG Card Multi-SIM Extender

- ii. Slide back and pull up the SIM socket.

**WARNING!** Do not use force on the SIM sockets.

- iii. Slide in the SIM cards.
  - iv. Lock the SIM sockets.
2. Install the antennas. Each cellular card requires one antenna.
- a. Locate the antenna socket (). The socket is above the SIM drawers.
  - b. Fasten the antenna using the SMA connector. Do not use excess force.
  - c. Tether all cables securely. Tethering helps prevent breakage of connectors and damage to cellular cards.

**WARNING!** *The antennas are for indoor use only. The antennas will be irreversibly damaged if placed outdoors.*

- d. Place the antenna indoors, where the reception level is high.
- e. Optionally, to improve reception, place the magnetic back of the antenna on a metal plate larger than 20 x 20 cm.

## Powering Up and LEDs

1. Turn on the unit. The power panel is located at the top right corner of the system.



Figure 8: Power Panel

**Note:** Redundant power supplies are optional. When installed, if one fails, or if you power up the system with just one power supply, an alarm will sound. To stop the alarm, press the **Alarm Reset** button at the top left of the panel.

2. Check the LEDs. LED behavior is explained in the following tables:

**Table 2: Table of LED Tables**


MG Card's Ethernet LEDs	Table 3 on page 15
VoIP LEDs	Table 4 on page 15
Cellular Card Green SIM LEDs	Table 5 on page 16




## LEDs

Following are explanations of LED behavior for each of the Hypermedia Gateway's cards.

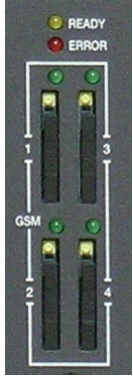
**Table 3: MG Card's Ethernet LEDs**

	Off	On	Blinking
ACT		Active traffic	
LINK		LAN Connection established	

**Table 4: VoIP LEDs**

	Off	On	Blinking
Ready / Yellow	Power is off	Connected on 95%	Maintenance mode
Error / Red			Error
Rx / Green		Internal communication	
Tx / Yellow		Internal communication	
* The VoIP LEDs appear on the MG Card and the CB card.			

**Table 5: Cellular Card Green SIM LEDs**

	<b>State</b>	<b>Explanation</b>
	Flashing	No SIM card. The channel does not contain an installed SIM card.
	LED is off	No reception. The channel is not connected to a cellular network.
	Short blink	Stand by. The channel is connected but there is no call in progress.
	Long blink	Dialing out or receiving a call. User is either dialing out or receiving a call in this channel.
	Constantly on	In use. A call is in progress.

## Chapter 2

# HMC QUICK START

Use the Hypermedia Management Console (HMC) to configure and monitor a Hypermedia Gateway from a remote location. Access to the Gateway is over TCP/IP using a standard version of Internet Explorer.

***Note:** The Hypermedia Management Console is customized to match the specific order. Some branches of the HMC may or may not appear based upon the customization.*

This section includes:

- “Installation” on page 18
- “Start-up and Initial Connection” on page 20
- “User Interface Overview” on page 23
- “HMC Navigation” on page 24
- “Save/Load Configuration” on page 26
- “Call Parameters” on page 27

## Installation

To install the Hypermedia Management Console program:

1. Ensure that the computer matches the following minimum system requirements:
  - Windows 2000, XP, or Vista
  - Internet Explorer 6 or 7
2. Ensure that you have access to the installation file. It is included with the Hypermedia Gateway CD-ROM.

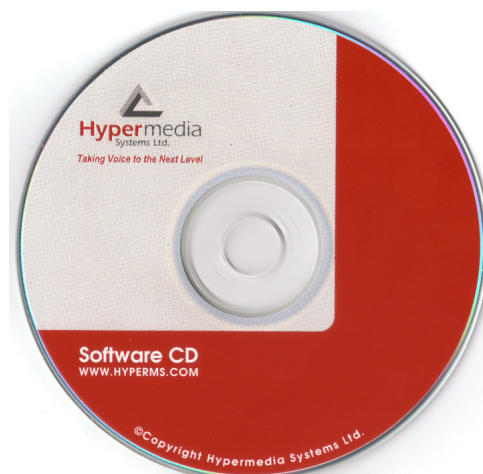


Figure 9: Hypermedia Gateway CD-ROM

The installation file name begins with the letter **HMC** and ends with the extension **.exe**. The specific name depends upon the type of installation.

3. Double-click the file **HMCxxx-xxx.exe** file. The Setup program starts.

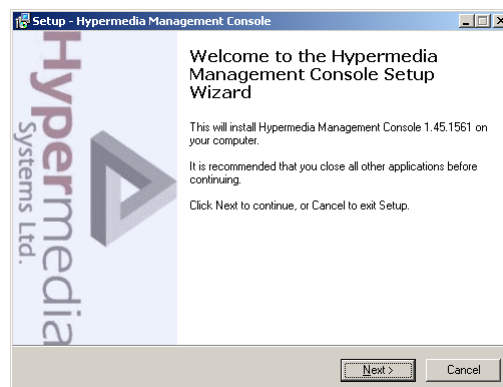


Figure 10: Setup Welcome Screen

4. Click **Next**. The License Agreement is displayed.

5. To continue, you must accept the terms of the agreement. Click **I accept the agreement** and click **Next**. The Select Destination Location window is displayed.
6. Define the location where the program files will be installed. The default location is "C:\ProgramFiles\Hypermedia". Click **Next**. The Select Start Menu Folder is displayed.
7. Define the name of the program group that will be added to the Start Menu. The default name is Hypermedia. Click **Next**. The Additional Tasks window is displayed.
8. Optionally, select the checkbox to create a Desktop shortcut. Click **Next**. The Ready to Install window is displayed.

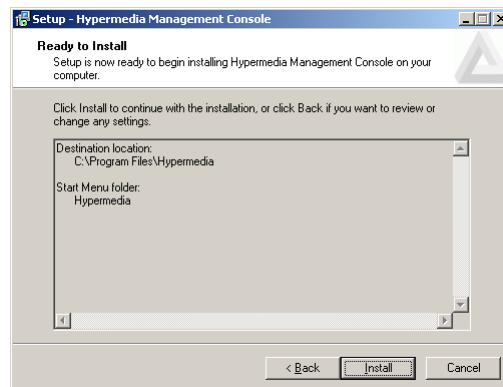


Figure 11: Setup Ready to Install Screen

9. Click **Install**. The installation process begins. A progress bar reports on the progress of the installation.
10. After the installation is complete, click **Finish**. The installation program creates a program group in the Start menu and, optionally, a Desktop shortcuts.

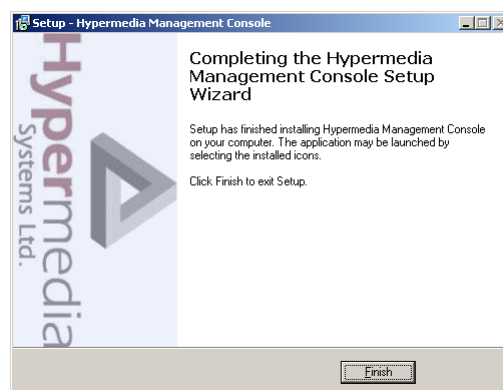


Figure 12: Setup Finish Screen

## Start-up and Initial Connection

To run the Hypermedia Management Console:

1. Click the Windows **Start** button > **Programs** > **Hypermedia**. The Hypermedia program group expands.
2. Click **Hypermedia Management Console**. The program opens in the default browser.

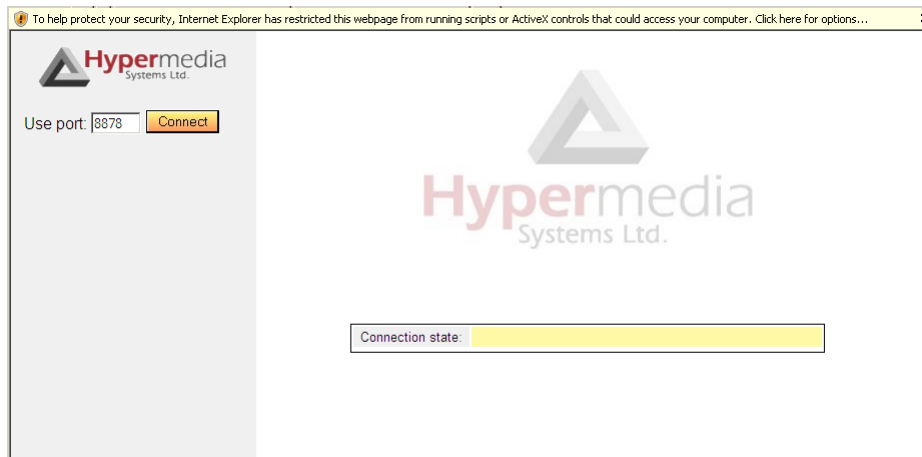


Figure 13: HMC Connection Screen

3. Click the warning bar at the top of the screen and, from the dropdown menu, click **Allow Blocked Content**. Confirm your choice by clicking **Yes** at the confirmation message.

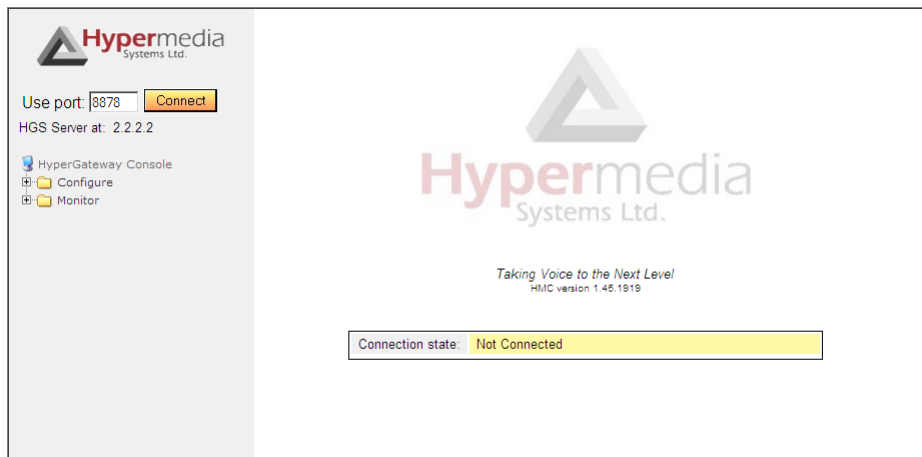


Figure 14: HMC Connection Screen

**Note:** To avoid recurring displays of the warning bar, from the menu bar click **Tools** > **Internet Options** > **Advanced** > **Allow active content to run in files on My Computer**.

4. Enter the IP address:
  - a. Expand the **Configure** branch.
  - b. Expand the **Server Settings** branch.
  - c. Select **IP address**. The Server Address screen is displayed.

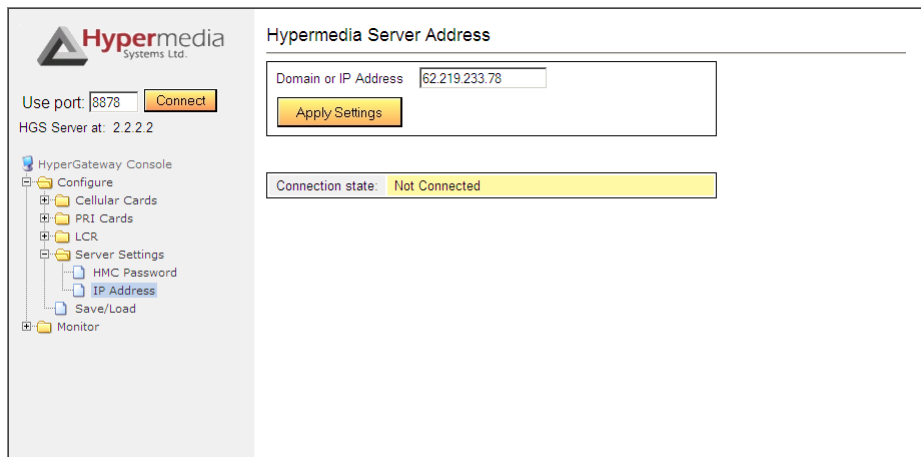


Figure 15: HMC Server Address Screen

**Note:** For a local connection, use the default IP address. The default address is 127.0.0.1. For a remote connection, enter the remote IP address and use port 80.

- d. Enter the IP address and click **Apply Settings**.

**Note:** If the Gateway is located behind a firewall, enable traffic on TCP port 8878. Contact the network administrator for details.

5. Either press **F5** or click the browser's **Refresh** button. The authorization screen is displayed.

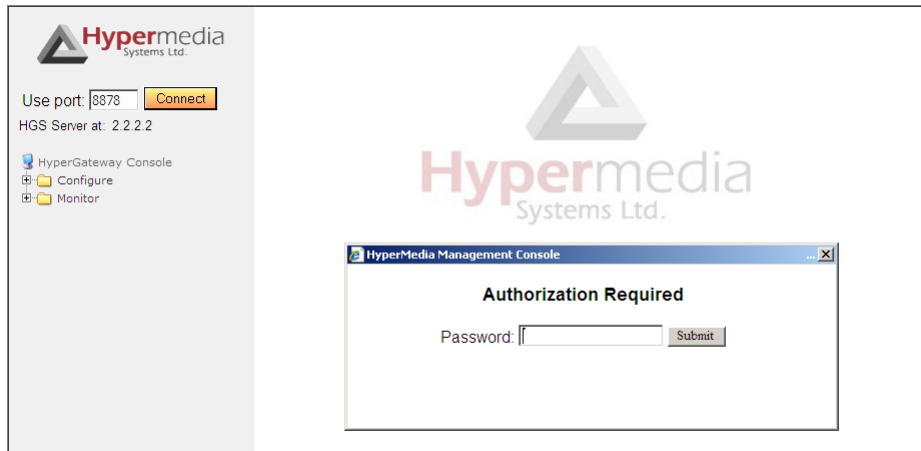


Figure 16: HMC Login Authorization Request

**Note:** The default password is **admin**.

6. Enter the password and click **Submit**. A confirmation message is displayed. The confirmation message indicates that you have successfully connected to the Hypermedia Gateway.

Connection state:	HMC version	1.75.2733
	HGS version	1.78.3094-SL
	SGW version	1.78.3094-SL
	SMS version	1.06.dev-3197

Figure 17: HMC Connection State Display



## User Interface Overview

The Hypermedia Management Console opens in a browser. The interface is divided into a Navigation Pane and a Configuration and Monitor Pane.

In addition, the interface includes identifying information.

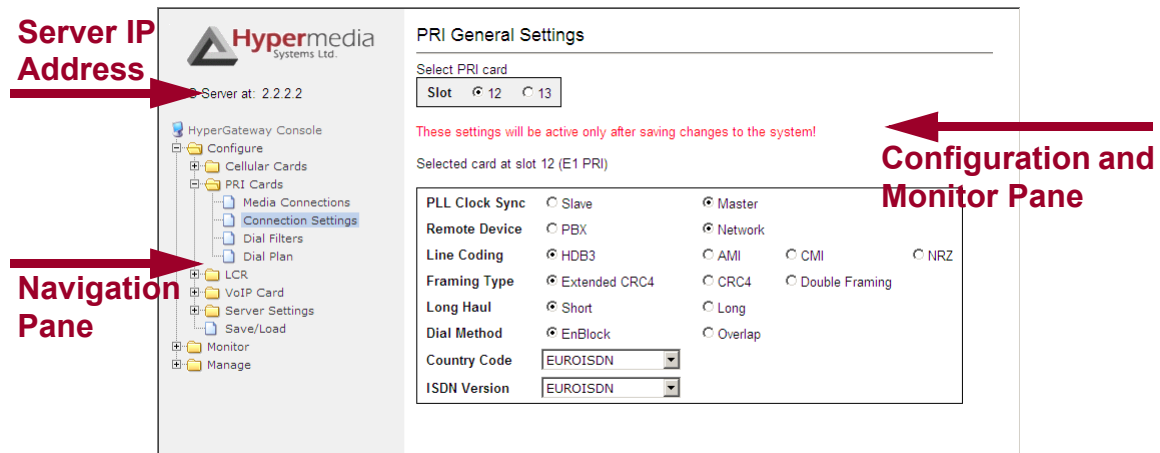


Figure 18: The Hypermedia Management Console Interface

Popup and dropdown menus, are available from the Configuration and Monitor pane. Color is used to indicate editing mode and changes of status.

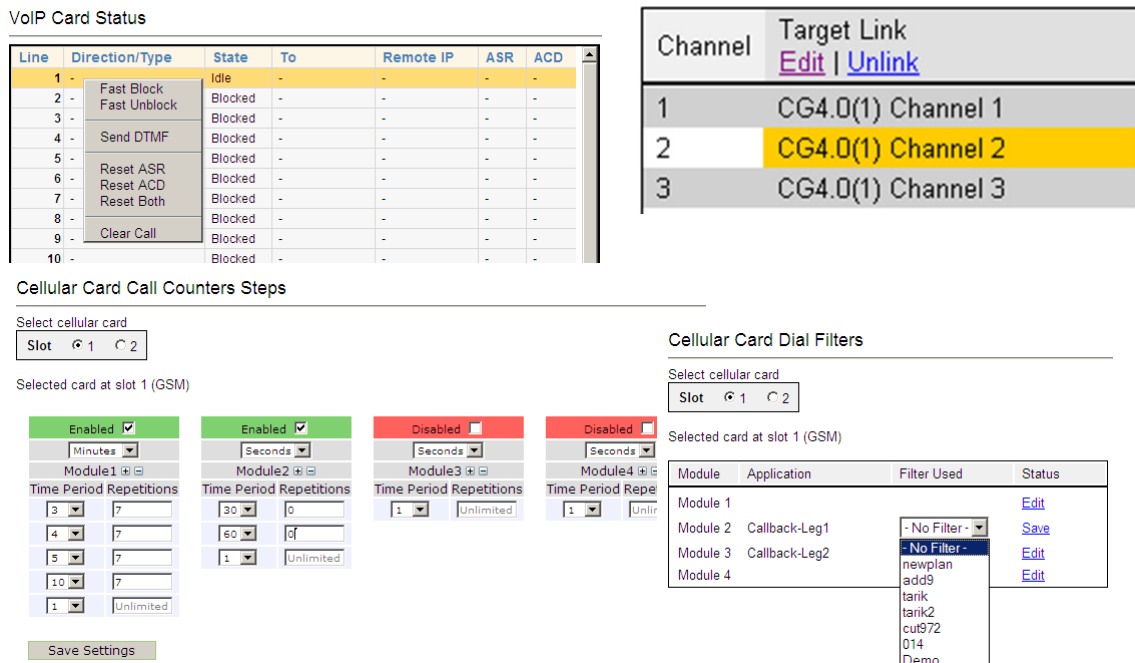


Figure 19: Samples of the HMC Configuration and Monitor Pane

## HMC Navigation

The Navigation Pane includes the branches and sub-branches from which access is gained to the configuration, monitoring, management, and Save/Load panes.

**Table 6: Summary of the Navigation Pane Branches and Sub-branches**

Branch and Sub-branch	Uses
Configure > SMS Server	Open the SMS Server branch to configure SMS settings, channels, and Advanced Call Routing (ACR).
Configure > Cellular Cards	Open the Cellular Cards branch to configure parameters controlling the cellular service. These parameters include, for example, volume control and PIN codes.
Configure > LCR Cards	Open the LCR branch to configure Least Cost Routing (LCR). Gateways with LCR route calls based on rules created by the administrator. This results in per-call routing. In contrast, when using gateways without LCR, all call routes are fixed.
Configure > PRI Cards	Open the PRI Cards branch to configure parameters controlling the connections between the digital PBX and the Hypermedia Gateway and to configure the associations between PRI channels and cellular cards.
Configure > BRI Cards	Open the BRI Cards branch to configure parameters controlling the connections between the digital PBX and the Hypermedia Gateway and to configure other parameters and settings affecting the BRI connection.
Configure > VoIP Cards	Open the VoIP Cards branch to configure connections from a VoIP card to other cards and channels in the system and to configure VoIP parameters.
Configure > Server Settings	Open the Configure > Server Settings branch to configure the Hypermedia PRI Server's IP address and the Hypermedia Management Console's password.
Configure > Save/Load	Open the Save/Load branch to store settings, save an existing configuration, restore a saved configuration, and delete a configuration.
Monitor > Cellular Cards	Open the Monitor > Cellular Cards branch to view the quality of the cellular card reception and their status.

**Table 6: Summary of the Navigation Pane Branches and Sub-branches**

Branch and Sub-branch	Uses
Monitor > PRI Cards	Open the Monitor > PRI Cards branch to view the status of each of the PRI channels.
Monitor > BRI Cards	Open the Monitor > BRI Cards branch to view the status of each of the BRI ports and the Bypass status.
Monitor > VoIP Cards	Open the Monitor > VoIP Cards branch to view the status of VoIP lines, and to download a file containing VoIP CDRs.
Monitor > LCR CDRs	Open the Monitor > LCR CDRs branch to download a file containing VoIP CDRs.
Manage > Number Filters	Open the Number Filters branch to perform advanced manipulations on numbers that are sent to, or received by, the Gateway.
Manage > Scheduler	Open the Task Scheduler to configure the Gateway to repeat commands at scheduled intervals.
Manage > VoIP	Open the VoIP Management branch to enhance the overall performance of the VoIP network. VoIP Management Features enable you to restrict incoming calls, refine routing, and review VoIP messages.

## Save/Load Configuration

Use Save/Load Configuration branch to download and upload system settings via a configuration file.

Save / Load Configurations

<b>Store settings on cards</b> Permanently save all the configuration settings in the HyperGateway. This process might take up to 60 seconds.	<input type="button" value="Save All Settings"/>
<b>Save existing configuration</b> Make a backup of the existing configuration. This includes media link settings and application resource assignments.	<input type="text"/> <input type="button" value="Save Configuration"/>
<b>Restore saved configuration</b> Restore a previously saved configuration of media links and application resource assignments	<input type="text"/> <input type="button" value="Load Configuration"/>
<b>Delete saved configuration</b> Delete a saved configuration from the existing configurations list.	<input type="text"/> <input type="button" value="Delete Configuration"/>

Status

Figure 20: HMC Save and Load Options

There are four possibilities:

### **Store settings on cards**

Use this option to write the entire configuration onto the Flash Memory of the slot's module, that is, to permanently save all the configuration settings in the Hypermedia Gateway. This process might take up to 60 seconds.

### **Save existing configuration**

Use this option to make a backup of the existing configuration. This option backs-up media link settings and application resource assignments.

### **Restore saved configuration**

Use this option to restore a previously saved configuration of media links and application resource assignments.

### **Delete saved configuration**

Use this option to delete a saved configuration from the existing configurations list.

## Call Parameters

Use the Call Parameter branch to configure parameters affecting Callback and Callthrough and general parameters effecting the Media Card.

To define Call Parameters:

1. From the Configure branch of the HMC navigation pane, click the **Call Parameters** sub-branch. The Call Configuration screen is displayed.

Call Configuration

<b>Allow Duplicate CLI's</b> Allow two or more simultaneous calls with the same caller ID.	Yes
<b>Remote Hangup Closes Session</b> If set to 'Yes' then a hangup initiated by the remote side will disconnect caller and close the session. If set to 'No' then a remote hangup will generate a dialtone enabling making another call.	Yes
<b>Media Card Fallback</b> If set to 'No' then Callback and Callthrough applications will not be created if no media card exists in the system. If set to 'Yes' Callback and Callthrough applications will attempt to use PBX features to complete call.	Yes
<b>Callthrough Authentication Policy</b> The following table summarizes the different call authentication policies and their effect on callthrough sessions:	
OnlyCLI	Call is disconnected if the caller ID is unknown.
OnlyCode	Call is accepted and code always
	Either

Submit

Figure 21: HMC Call Configuration Screen

2. Configure the following parameters:

### **Allow Duplicate CLIs**

If Yes is selected, the Gateway allows two or more simultaneous calls with the same caller ID.

### **Remote Hang up Closes Session**

If Yes is selected, a hang-up initiated by the remote side will disconnect the caller and close the session. If No is selected, a remote hang-up will generate a dial tone enabling the user to make another call.

### **Media Card Fallback**

If No is selected, Callback and Callthrough applications will not be created if the system does not include a Media Card. If Yes is selected, Callback and Callthrough applications will attempt to use the PBX's features to complete the call.

### **Callthrough Authentication Policy**

From the dropdown menu, select an option described in the table of authentication policies.

### **Callback Authentication Policy**

If Yes is selected, users are required to enter a personal access code when receiving callbacks.

**Callback Dial Timeout**

Enter a period of time, measured in milliseconds, during which the Gateway will attempt to call the party that requested a Callback.

**Remote Party Answer Timeout**

Enter a period of time, measured in milliseconds, during which the Gateway will attempt to call the remote party.

**Number Send Delay**

Entered a period of time, measured in milliseconds, after which a dialed number will be automatically sent. This parameter applies only when the Media Card is present.

**Dial tone Length**

Enter a period of time, measured in milliseconds, during which the dial tone is played for Callthrough or Callback sessions. This parameter applies only when the Media Card is present.

**Callback Automatic DTMF Send Delay**

Enter a period of time, measured in milliseconds, after which the automatic DTMF sequence is sent when the Callback returns call (if one is defined for the callback number). This parameter applies only when the Media Card is present.

**Callback Automatic DTMF Digit Duration**

Entered a period of time, measured in milliseconds, which determines the length of a DTMF digit sent for automatic Callback DTMF digits.

**Callback Automatic Inter-Digit Duration**

Enter a period of time, measured in milliseconds, that defines the period of silence between DTMF digits sent for automatic Callback DTMF digits.

**Delay after DTMF Code is Sent**

Enter a period of time, measured in milliseconds, that determines the delay before the Gateway dials the second leg of the callback (if a DTMF code is sent to the first leg of the call).

**Callback Activation/Delegation Delay**

Enter period of time, measured in milliseconds, which determines how long the Gateway waits before returning a Callback to a requesting phone or delegating a Callback request to a remote HGS. This is used so that the remote Callback will not be triggered too early, which can possibly result in receiving a busy signal from the endpoint that requested it.

**Enable Using Callthrough Resources for Callbacks**

If No is selected, only Callback resources are used to dial callback. If Yes is selected, the Gateway attempts to use Callthrough resources if a Callback is requested but no Callback resources are available.

3. Click **Submit** and wait for the “Successfully updated ... Server refresh returned: OK” messages.

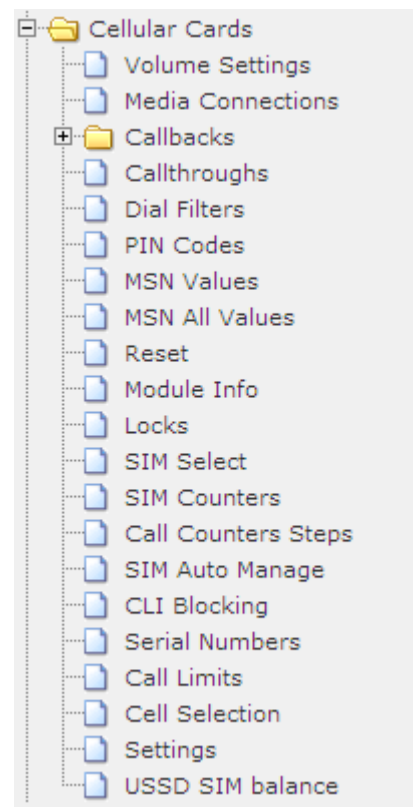
## Chapter 3

# CONFIGURING a CELLULAR CARD

This section contains:

- “Cellular Card and System Terminology” on page 30
- “Volume Settings” on page 31
- “Media Connections” on page 32
- “Callbacks” on page 34
- “Callthroughs” on page 37
- “Dial Filters” on page 39
- “PIN Codes” on page 40
- “MSN Values” on page 41
- “Reset” on page 42
- “Information Screens” on page 43
- “Locks” on page 44
- “SIM Select” on page 45
- “SIM Counters” on page 46
- “SIM Auto Manage” on page 47
- “Call Counter Steps” on page 48
- “CLI Blocking” on page 49
- “Call Limits” on page 50
- “Cell Selection” on page 51
- “Settings” on page 54
- “USSD SIM Balance” on page 53
- “Monitoring Cellular Cards” on page 55

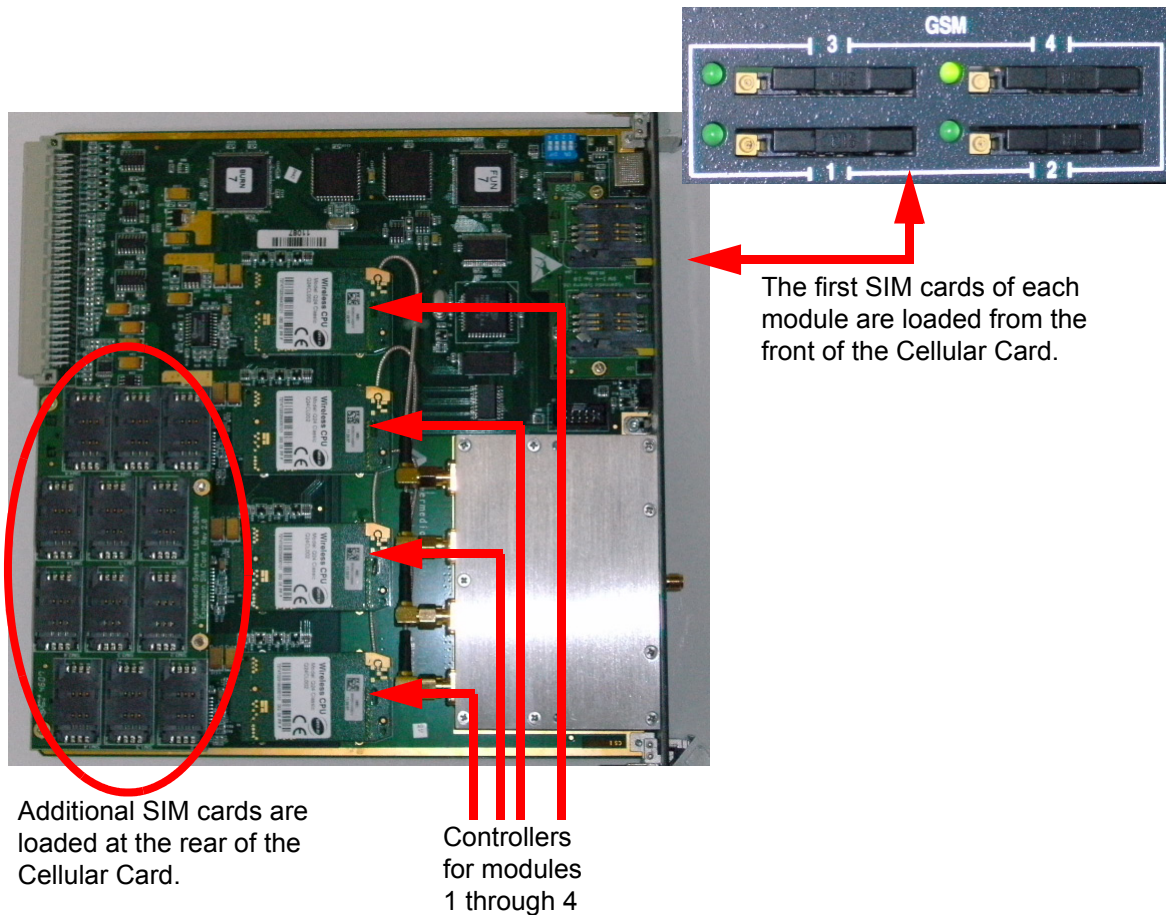
**Note:** The HMC is customized to match the specific order. Some branches of the HMC may or may not appear based upon the customization.





## Cellular Card and System Terminology

A cellular card has 4 modules, each of which can have 1 to 4 SIM holders. Therefore, each card can hold up to 16 SIM cards. In addition, a Hypermedia Gateway can include several SIM cards.



Some parameters can be applied either to specific SIM cards, or to specific modules, or to the entire cellular card, or to all the cards in the system.



## Volume Settings

Use Volume Settings to adjust a cellular module’s audio level. This can be done for each of the cellular modules on a Hypermedia Gateway.

To adjust the audio level:

1. From the Cellular Cards branch of the HMC navigation pane, click the **Volume Settings** sub-branch. The Volume Settings screen is displayed.

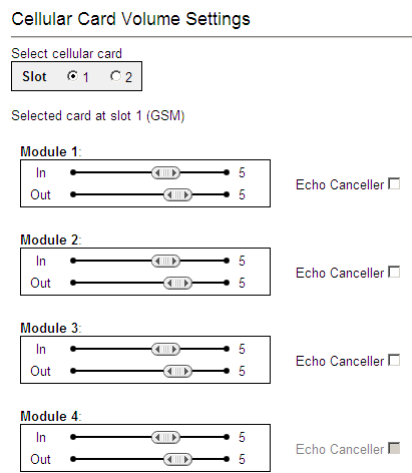


Figure 22: HMC Volume Settings Screen

2. If more than one slot is displayed, select a specific Cellular Card. The Volume Settings screen of that cellular card is displayed.
3. To increase the volume, move the slider to the right. Each module includes two sliders:
  - In**  
“In” adjusts the volume heard by the party on the PBX (or local network) side of the conversation.
  - Out**  
“Out” adjusts the volume heard by the remote party.

**Note:** Changes to volume are saved automatically. The message “New volumes set successfully” is displayed.

4. Select or clear the Echo Canceller checkbox. There are several different causes of the echo effect. Selecting Echo Canceller minimizes or cancels the echo effect.
5. After enabling Echo Canceller, from the HMC navigation pane, click the **Save/Load** branch and then click **Save All Settings**.

## Media Connections

Use the Media Connection screen to configure the connections from the channels of a Cellular card to other cards and channels in the system, including the PRI cards (E.1) and the VoIP cards (MG). Connections can be either static or dynamic, as in the case of LCR.

For example, you can assign each cellular channel to a specific E1 channel. In this case, every time there is an incoming call from a specific E1 channel, it will be routed to the configured channel on the cellular card and vice versa.

***Note:** The matrix can be configured in any combination. Routing can be assigned between any cellular channel and any other channel in the system, including other cellular channels.*

### Associating/Linking Cellular Channels

To associate a cellular channel with another media channel:

1. From the Cellular Cards branch of the HMC navigation pane, click the **Media Connections** sub-branch. The Media Matrix is displayed.

Cellular Cards Media Matrix

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Channel	Target Link (Select to change)
1	CG4.0(1) Channel 1
2	CG4.0(1) Channel 3
3	CG4.0(1) Channel 2
4	-

Figure 23: Cellular Media Matrix screen

2. If more than one slot is displayed, select a specific cellular card. The Media Matrix of that cellular card is displayed.
3. Click within a channel row. The row turns yellow.
4. Click **Edit**. The row becomes configurable.

Channel	Target Link
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-

Channel	Target Link
1	LCR Resource 65
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-

Figure 24: Media Matrix Row when Configurable

- From the first dropdown list, allocate this channel to a card by selecting the card.

**Note:** If all of the card's channels are already allocated, the message "Fully allocated" appears.

- From the second dropdown list, assign this channel to a specific channel on the target card.

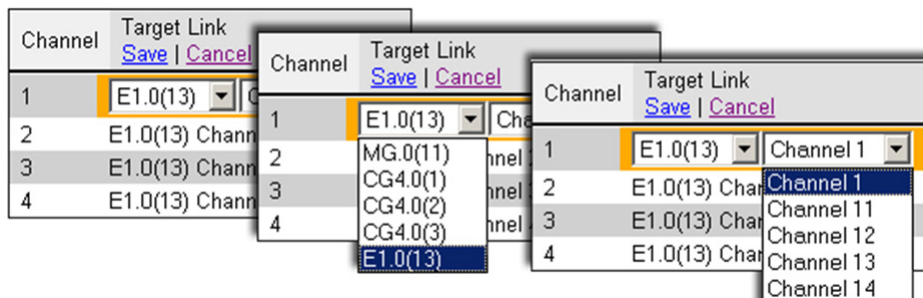


Figure 25: Assigning a Target Link

- Click **Save**. The configuration dropdown boxes are hidden.
- Optionally, repeat the process for additional channels and other media types.
- Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Unlinking Cellular Allocations

To break an allocation:

- From the Cellular Card branch of the HMC navigation pane, click the **Media Connections** sub-branch. The Media Matrix is displayed.
- Click within a channel row. The row turns yellow.

Channel	Target Link
1	CG4.0(1) Channel 1
2	CG4.0(1) Channel 2
3	CG4.0(1) Channel 3

Figure 26: Breaking a Target Link

- Click **Unlink**.
- Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Callbacks

Use Callback to cause the Gateway to authorize an incoming call, disconnect the incoming call, and then call-back the User. A Callback is initiated by a trigger. The trigger can be either a phone call, an SMS message, or a message sent via the Hypermedia Web-based Callback dialer.

**Note:** *Callback belongs to the Hypersavings Package and requires a separate license.*

## Resources

For a Resource to be available for Callback, it **must be linked to itself**. Then, Resources must be allocated to the Callback feature. To allocate resources to Callback:

1. Ensure that at least one Cellular Card > Media Connection channel is linked to a Cellular Gateway (CG) and is unallocated (see “Media Connections” on page 32).
2. From the HMC navigation pane’s **Cellular** branch, expand the **Callbacks** sub-branch.
3. Click **Resources**. The Resources screen is displayed.

Cellular Card Callback Resources

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Module	Set 1st Leg	Status	Group	2nd Leg
Module 1	<input type="checkbox"/>	Free	General	CG4_0(1) Chan. 1
Module 2	---	Unmapped.	---	---
Module 3	---	Unmapped.	---	---
Module 4	---	Unmapped.	---	---

Figure 27: HMC Cellular Resources Screen

4. Select a Resource’s **Set 1st Leg** checkbox. When selected, this Resource can accept Callback requests. Also, when selected, this Resource is not used for standard calls.

**Note:** *To clear a checkbox, from the Cellular Card Media Connection branch, select the channel and click Unlink.*

5. From the **Group** dropdown list, select the Group that will be allowed to use this Callback Resource. These are the Groups that are defined in the VPN Groups sub-branch of the Manage branch.

**Note:** *The 2nd Leg column displays the channel used for the 2nd leg of the Callback.*

6. Repeat the procedure for other Resources that will be allocated to Callback calls.
7. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Call Triggers

---

Use Call Triggers to configure the gateway to respond to a call to a specific channel as a Callback request.

1. Ensure that at least one Cellular Card > Media Connection channel is linked to a Cellular Gateway (CG) and is unallocated (see “Media Connections” on page 32).
2. From the HMC navigation pane’s Cellular branch, expand the **Callbacks** sub-branch.
3. Click **Call Triggers**. The Callback Triggers screen is displayed.

Callback Triggers using Cellular Modules

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Channel	Status	Set As Trigger
Channel 1	Free.	<input type="checkbox"/>
Channel 2	Used as Callback-Leg1	---
Channel 3	Used as Callback-Leg2	---
Channel 4	Unmapped.	---

Figure 28: HMC Cellular Call Triggers Screen

4. Select the checkbox. When selected, the channel is allocated to Callback.

**Note:** To clear a checkbox, from the Cellular Card Media Connection branch, select the channel and click **Unlink**.

5. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## SMS Triggers

---

Use the SMS Triggers screen to enable use of SMS messages to command the Gateway to call back the party who sent the SMS message.

**Note:** The SMS message must contain the telephone number that the Gateway is to call.

To enable use of SMS triggers:

1. From the HMC navigation pane’s Cellular branch, expand the **Callbacks** sub-branch.
2. Click the **SMS Triggers** sub-branch. The SMS Triggers screen is displayed.

Cellular Card SMS Callback Triggers

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Use number filter:

Module 1	<input checked="" type="checkbox"/>	Accept SMS Triggers
Module 2	<input checked="" type="checkbox"/>	Accept SMS Triggers
Module 3	<input type="checkbox"/>	Accept SMS Triggers
Module 4	<input type="checkbox"/>	Accept SMS Triggers

Figure 29: HMC SMS Triggers Screen

3. If more than one slot is displayed, select a specific Cellular Card. The SMS Trigger screen of that cellular card is displayed.
4. Optionally, select a Number Filter (see “Number Filters” on page 125).
5. Select or clear the checkbox for each module. When selected, an SMS from the user to a SIM card on that module will initiate a Callback.
6. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Callthroughs

Use Callthrough to place calls, via the Hypermedia Gateway, to external numbers.

**Note:** Callthrough belongs to the Hypersavings Package and requires a separate license.

Users receive a dial-tone from the Hypermedia Gateway and can then place calls either:

- via the PBX to a corporate extension
- to a VoIP phone number
- to a Cellular phone number
- to a PSTN phone number

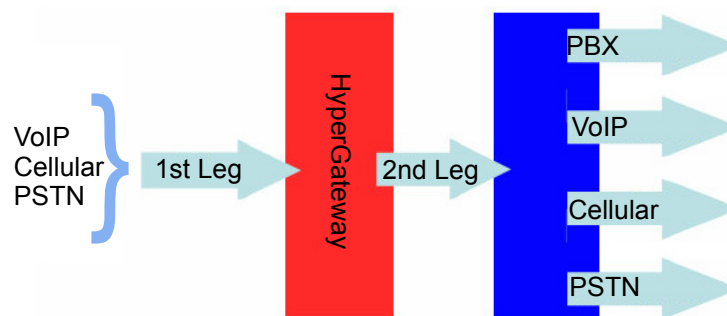


Figure 30: The Callthrough Sequence

To configure Callthrough:

1. Ensure that at least one Cellular Card > Media Connection channel is linked to the target Callthrough equipment and is unallocated (see “Media Connections” on page 32).
2. From the Cellular Cards branch of the HMC navigation pane, click the **Callthrough** sub-branch. The Callthrough screen is displayed.

Cellular Card Callthrough Resources

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Channel	Set 1st Leg	Status	Group	Other Leg
Module 1	<input type="checkbox"/>	Free. (PRI/Cell GW)	General	CG4.0(1) Chan. 1
Module 2	---	Used for Callback-Leg1	---	---
Module 3	---	Used for Callback-Leg2	---	---
Module 4	---	Unmapped.	---	---

Figure 31: The Callthrough Screen

3. Select a Module's **Set 1st Leg** checkbox. When selected, this Module can accept Callthrough calls from the user. Also, when selected, this Module is not used for standard calls.

***Note:** To clear a checkbox, from the Cellular Card Media Connection branch, select the channel and click Unlink.*

4. From the **Group** dropdown list, select the Group that will be allowed to use this Callthrough Resource. These are the Groups that are defined in the VPN Groups sub-branch (see "VPN Groups" on page 124).

***Note:** The Other Leg column displays the equipment used for the 2nd leg of the Callthrough.*

5. Repeat the procedure for other Resources that will be allocated to Callthrough calls.
6. Click **Apply Settings**.



## Dial Filters

Filters enable consistent, automatic management of phone numbers before they are routed.

**Note:** *The Dial Filters feature is relevant only to Hypermedia HG4000 Gateways. Filters are created on the Manage > Number Filters screen (see “Number Filters” on page 125).*

*Cellular card’s Dial Filters can be used only if linked to a VoIP channel or used with Callback/Callthrough features.*

To apply a dialing filter to a module:

1. From the Cellular Cards branch of the HMC navigation pane, click the **Dial Filters** sub-branch. The Cellular Card Dial Filters screen is displayed.

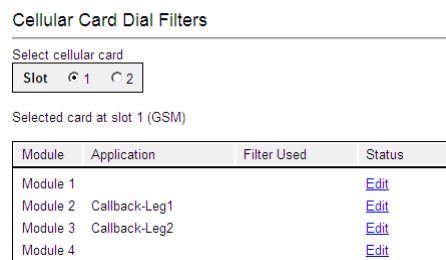


Figure 32: Cellular Card Dial Filters Screen

2. If more than one slot is displayed, select a specific Cellular card. The Dial Filters of that Cellular card are displayed.
3. Click **Edit**. A dropdown list of existing filters is displayed.
4. Expand the list and select a filter.

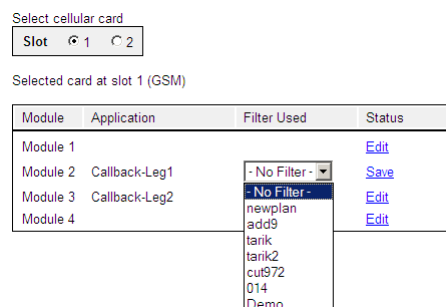


Figure 33: Filters Dropdown List

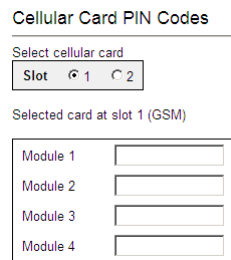
5. Click **Save**.
6. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## PIN Codes

Use the PIN Codes screen to configure the PIN code that the gateway uses when a SIM card with an active PIN is inserted. Consult your cellular provider for more information regarding the PIN code.

To enter a SIM card's PIN code:

1. From the Cellular Cards branch of the HMC navigation pane, click the **PIN Codes** sub-branch. The PIN Codes screen is displayed.



Cellular Card PIN Codes

Select cellular card

Slot 1 2

Selected card at slot 1 (GSM)

Module 1

Module 2

Module 3

Module 4

Figure 34: HMC Cellular PIN Codes Screen

2. If more than one slot is displayed, select a specific Cellular Card. The PIN Codes screen of that cellular card is displayed.
3. Enter the PIN code into the associated Module's field.
4. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

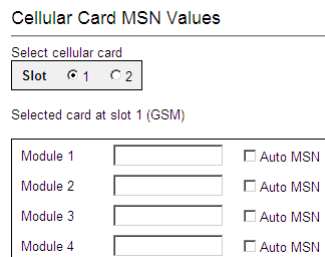
## MSN Values

Use Multiple Subscriber Number (MSN) values to route incoming calls to a specific extension on the PBX. You can assign a different extension for each channel or route all channels to the same extension.

***Note:** Hypermedia's use of MSN differs from the traditional ISDN use. MSN is an incoming call routing method in which a group of phone numbers is assigned to a particular PRI ISDN line by the telephone company.*

To route incoming calls to a specific extension on the PBX:

1. From the Cellular Cards branch of the HMC navigation pane, click the **MSN Values** sub-branch. The MSN Values screen is displayed.



Cellular Card MSN Values

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Module 1	<input type="text"/>	<input type="checkbox"/> Auto MSN
Module 2	<input type="text"/>	<input type="checkbox"/> Auto MSN
Module 3	<input type="text"/>	<input type="checkbox"/> Auto MSN
Module 4	<input type="text"/>	<input type="checkbox"/> Auto MSN

Figure 35: Cellular MSN Values

2. If more than one slot is displayed, select a specific Cellular Card. The MSN Values screen of that cellular card is displayed.
3. Enter a PBX extension number.
4. Select or clear the **Auto MSN** checkbox. When selected, if a local user “A” called a remote user “B” through a cellular module and later “B” calls the cellular module’s number, the system will automatically route the incoming call to “A”. The system remembers that “A” was the last local user to call “B” through that cellular module.
5. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Reset

Use the Cellular Card Reset screen to reset either the entire cellular card or a specific cellular module.

To reset a cellular card or module:

1. From the Cellular Cards branch of the HMC navigation pane, click the **Reset** sub-branch. The Reset screen is displayed.

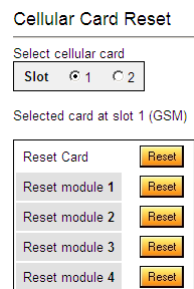


Figure 36: Cellular Card Reset screen

2. If more than one slot is displayed, select a specific Cellular Card. The Reset screen of that cellular card is displayed.

**WARNING!** *There is no confirmation message. The Reset command is sent as soon as the reset button is clicked.*

3. Click **Reset**. The screen confirms that the Reset command has been sent.

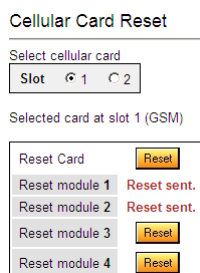


Figure 37: Reset Screen After Sending the Reset Command

## Information Screens

Several of the HMC screens display information.

### Module Info

---

Use the Module Info screen to review information about the modules of a cellular card.

1. From the Cellular Cards branch of the HMC navigation pane, click the **Module Info** sub-branch. The Module Info screen is displayed.

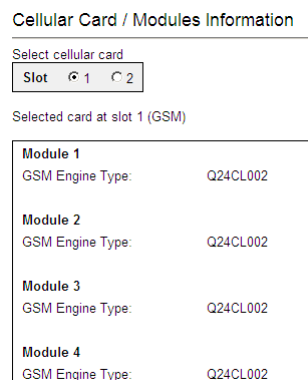


Figure 38: HMC Module Info Screen

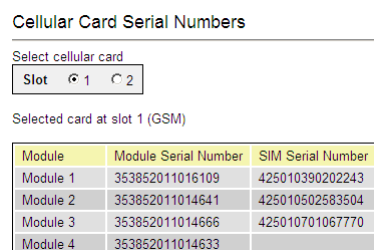
2. If more than one slot is displayed, select a specific Cellular Card. The Module Info screen of that cellular card is displayed.

### Serial Numbers

---

Use the Serial Numbers screen to view the GSM Modules IMEI (International Mobile Equipment Identity) and the SIMs IMSI (International Mobile Subscriber Identity).

1. From the Cellular Cards branch of the HMC navigation pane, click the **Serial Numbers** sub-branch. The Serial Numbers screen is displayed.



Cellular Card Serial Numbers		
Select cellular card		
Slot	1	2
Selected card at slot 1 (GSM)		
Module	Module Serial Number	SIM Serial Number
Module 1	353852011016109	425010390202243
Module 2	353852011014641	425010502583504
Module 3	353852011014666	425010701067770
Module 4	353852011014633	

Figure 39: HMC Serial Numbers Screen

2. If more than one slot is displayed, select a specific Cellular Card.

## Locks

Use Locks to restrict access to specific GSM operators and/or a specific SIM card. When a lock is defined, the Gateway will only accept calls from an operator or a SIM card that matches the Lock number.

In addition, use Locks to prevent roaming handover in cases where the Gateway is located close to county or country borders.

To define a Lock number:

1. Ensure that:
  - you have obtained the codes from the cellular operator
  - the cellular modules support SIM locks
2. From the Cellular Cards branch of the HMC navigation pane, click the **Locks** sub-branch. The Locks screen is displayed.

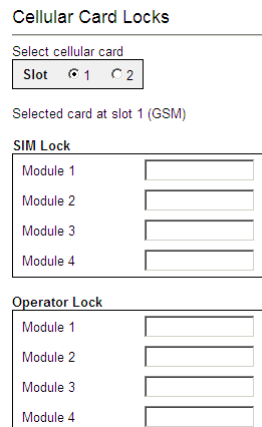


Figure 40: HMC Cellular Locks Screen

3. If more than one slot is displayed, select a specific Cellular Card. The Locks screen of that cellular card is displayed.

4. Enter:

### **SIM Lock**

Use SIM Locks to avoid using SIM cards other than those whose Mobile Network Code (MNC) and Mobile Country Code (MCC) values have been entered.

### **Operator Lock**

Use Operator Locks to avoid registration to any network other than the one whose MNC and MCC values have been entered.

5. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## SIM Select

Use the SIM Select screen to manually select and activate a SIM card for current use. SIM Select should not be used when SIM Auto-Manage is active (see “SIM Auto Manage” on page 47). The definition can be applied just to the module, to all 4 modules on the card, or to all the cellular cards in the system (see “Cellular Card and System Terminology” on page 30).

To define which of a module’s SIM cards are associated with the SIM Auto Manage feature:

1. From the Cellular Cards branch of the HMC navigation pane, click the **SIM Select** sub-branch. The SIM Select screen is displayed.

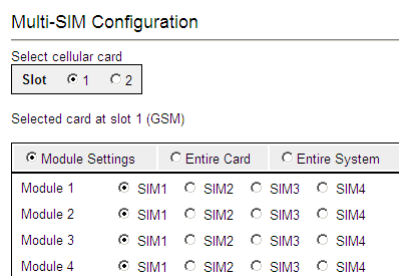


Figure 41: HMC SIM Select Screen

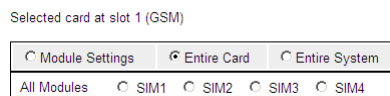
2. If more than one slot is displayed, select a specific Cellular Card. The SIM Select screen of that cellular card is displayed.
3. Select an application option.

### Module Settings

Applies the SIM configuration to the specific module.

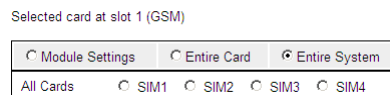
### Entire Card

Applies the SIM configuration to all the modules on the card.



### Entire System

Applies the SIM configuration to all the cards in the system.



4. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## SIM Counters

Use the SIM Counter screen to review the actual usage time of each SIM card and to set counter steps per module.

1. From the Cellular Cards branch of the HMC navigation pane, click the **SIM Counters** sub-branch. The SIM Counters screen is displayed.

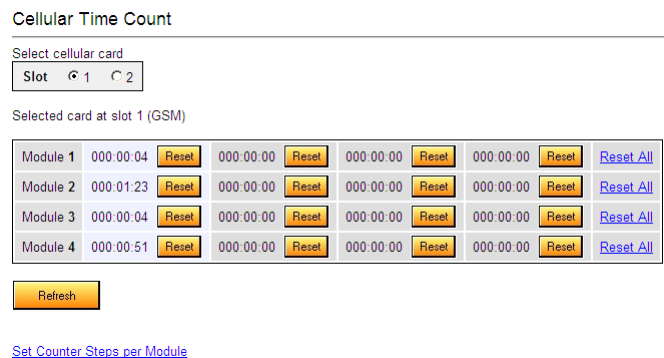


Figure 42: HMC SIM Counters Screen

2. If more than one slot is displayed, select a specific Cellular Card. The SIM Counters screen of that cellular card is displayed.
3. Optionally, select from the following controls:
  - Reset**  
Resets the counter for the specific step.
  - Reset All**  
Resets all the counters in that module.
  - Refresh**  
Updates the information.
4. Optionally, click **Set Counter Steps per Module** to set the exact period of time per counting step. The Cellular Card Call Counters Steps screen is displayed (see “Call Counter Steps” on page 48).

**Note:** Setting Counter Steps is important when using the SIM Auto Manage with pre-paid SIM cards.



## SIM Auto Manage

Use the SIM Auto Manage screen to configure the Gateway to automatically alternate—and/or discontinue—use of SIM cards. This enables load-balancing between a GSM module’s SIM cards based on preconfigured switched time cycle.

To enable automatic management of SIM cards:

1. From the Cellular Cards branch of the HMC navigation pane, click the **SIM Auto Manage** sub-branch. The SIM Auto Manage screen is displayed.

Automatic SIM Management

---

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Enable Auto Switch	SIM1	SIM2	SIM3	SIM4	Minutes until SIM is switched	Minutes until SIM is blocked
<input checked="" type="checkbox"/> Module 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1000	4000
<input checked="" type="checkbox"/> Module 2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1000	4000
<input checked="" type="checkbox"/> Module 3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1000	4000
<input checked="" type="checkbox"/> Module 4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	1000	4000

Figure 43: HMC SIM Auto Manage Screen

2. If more than one slot is displayed, select a specific Cellular Card. The SIM Auto Manage screen of that cellular card is displayed.
3. Select the checkbox beside a module number in the Enable Auto Switch column. The SIM column checkboxes and Minutes column fields are displayed.
4. To assign a SIM card to a module, select the checkboxes in the SIM column.

**Note:** In Figure # 43, each module has two SIM cards assigned to it. The Gateway will allow a SIM card to function for 1000 minutes and then switch to the second SIM card. Once a SIM card has functioned for 4000 minutes—that is, 4 cycles—it is blocked. It can only be unblocked manually.

5. In the **Minutes until SIM is switched** field, enter an amount of time measured in minutes. This is the how long each SIM card will be used until the Gateway automatically switches to the next SIM card assigned to that module.
6. In the **Minutes until SIM is blocked** field, enter an amount of time measured in minutes. This is the totally amount of time a SIM card is used before the Gateway discontinues use of it.
7. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Call Counter Steps

Steps, Time Periods, and Repetitions work as follows: If the Time Period = 60 seconds and Repetition = 3, and the caller speaks for 10 seconds, he will be charged for Time Period = 60 seconds. If the caller speaks for 110 seconds, he will be charged for Time Period = 120 seconds. This charging policy—that is, step—expires after 180 seconds that being the Time Period (= 60 seconds) times the Repetition (= 3). Then, the next step is applied. The final step will always be 1 x Unlimited.

Cellular Card Call Counters Steps

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Enabled <input checked="" type="checkbox"/>	Enabled <input checked="" type="checkbox"/>	Disabled <input type="checkbox"/>	Disabled <input type="checkbox"/>
Minutes	Seconds	Seconds	Seconds
Module1	Module2	Module3	Module4
Time Period Repetitions	Time Period Repetitions	Time Period Repetitions	Time Period Repetitions
3 7	30 0	1 Unlimited	1 Unlimited
4 7	60 0		
5 7	1 Unlimited		
10 7			
1 Unlimited			

Save Settings

Figure 44: HMC Cellular Call Counter Steps Screen

To configure Counters Steps:

1. If more than one slot is displayed, select a specific Cellular Card. The SIM Counters screen of that cellular card is displayed.
2. Select a checkbox to enable the step. When enabled, the area is displayed in the color green.
3. From the upper dropdown menu, select either Seconds or Minutes. This determines the duration of time indicated by the numbers in the Time Period column.
4. Increase the number of steps by clicking the plus sign beside the module number.
5. For each step, define the Time Period—that is, how long—the step is applied.
6. For each step, define the number of repetitions.
7. Repeat the procedure for additional modules.
8. Click **Save Settings** and wait for **Configuration Saved** to be displayed.

## CLI Blocking

Use the Calling Line Identification (CLI) Blocking screen to hide the caller's phone number from the person receiving the call.

***Note:** Some operators do not allow CLI Blocking. In some cases, if the CLI is blocked, the call does not go through. Check the operator's policy.*

To block CLI:

1. From the Cellular Cards branch of the HMC navigation pane, click the **CLI Blocking** sub-branch. The CLI Blocking screen is displayed.

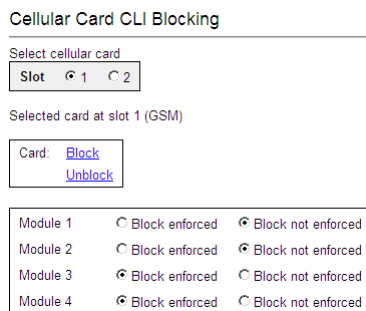


Figure 45: HMC Cellular CLI Blocking Screen

2. If more than one slot is displayed, select a specific Cellular Card. The CLI Blocking screen of that cellular card is displayed.
3. Use one of the two options:

### Card

- **Block**  
Click **Block** to block CLI for all 4 of a card's SIM modules.
- **Unblock**  
Click **Unblock** to allow CLI for all 4 of a card's SIM modules.

### Module

- **Block enforced**  
Select **Block enforced** to block CLI for a specific SIM card.
- **Block not enforced**  
Select **Block not enforced** to allow CLI for a specific SIM card.

4. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Call Limits

Use the Call Limits screen to set the amount of time the Gateway will wait for an outgoing call to be answered and to set the maximum length of outgoing call.

To set Call Limits:

1. From the Cellular Cards branch of the HMC navigation pane, click the **Call Limits** sub-branch. The Call Limits the screen is displayed.

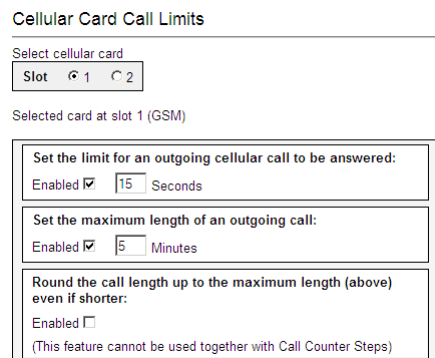


Figure 46: HMC Cellular Call Limits Screen

2. If more than one slot is displayed, select a specific Cellular Card. The Call Limits screen of that cellular card is displayed.
3. Select or clear the following limits:

**Set the limit for an outgoing cellular call to be answered**

When enabled, enter a duration of time measured in seconds that the gateway will wait for the call to be answered.

**Set the maximum length of an outgoing call**

When enabled, enter a duration of time measured in minutes that is the maximum permitted length of a phone call. Calls are disconnected at the beginning of the last minute, rather than its end.

**Round the call length up to the maximum length**

When enabled, callers are charged for the maximum length (defined above) even when the conversation is shorter than the maximum length.

**Note:** Round the call up to the maximum length cannot be used with SIM Counters steps (see “Call Counter Steps” on page 48).

4. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Cell Selection

Use the Cell Selection screen to manually camp on a cellular site. Most often, a user selects the strongest cell site. However, if the Base Transceiver Station (BTS) or tower is locked, this service cannot be applied.

**Notes:** *What is **Camp On**? After completing the cell selection process a MS (Mobile Station) or UE (User Equipment) will camp onto the cell that offers what seems to be the best radio connection within the network.*

*What is **BCCH**? BCCH stands for Broadcast Control Channel. This downlink channel contains specific parameters needed by a mobile in order that it can identify the network and gain access to it. Typical information includes the LAC (Location Area Code) and RAC (Routing Area Code), the MNC (Mobile Network Code) and BA (BCCH Allocation) list.*

***dBm** is an abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW). It is used in radio and fiber optic networks as a measure of absolute power because of its capability to express values in a short form. This feature functions only with Wavecom GSM modules.*

To camp on a site:

1. From the Cellular Cards branch of the HMC navigation pane, click the **Cell Selection** sub-branch. The Cell Selection screen is displayed.

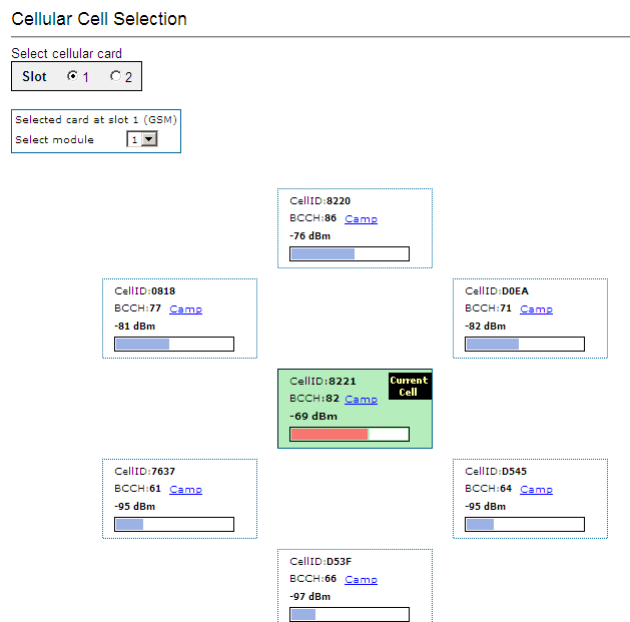
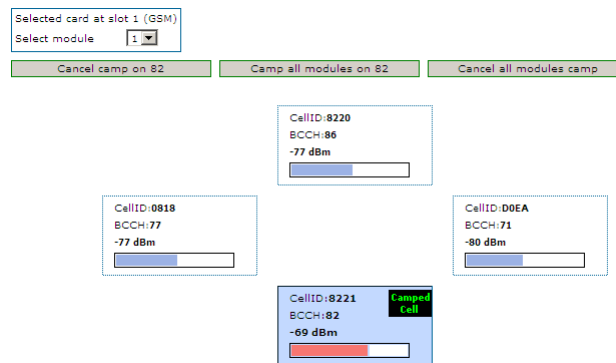


Figure 47: HMC Cellular Cell Selection Screen

2. If more than one slot is displayed, select a specific Cellular Card. The Cell Selection screen of that cellular card is displayed.
3. From the **Select module** dropdown box, select a module. This is the module that the Camp selection will be applied to.
4. In one of the CellID boxes, click **Camp**. The screen indicates Camp Cell and new controls are displayed at the top of the screen.



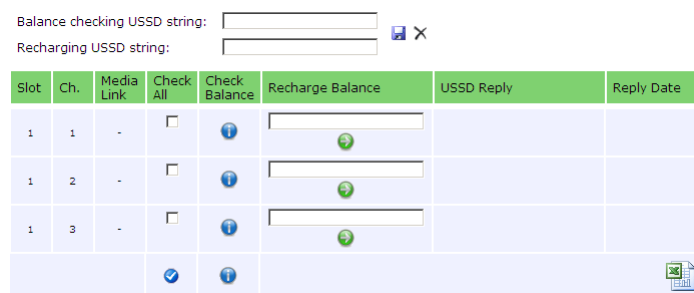
5. Optionally, to camp all the card's modules on the same cell, click **Camp all modules on**.



## USSD SIM Balance

Use the USSD SIM Balance screen to check the balance remaining on a SIM card and to add value to (charge) a SIM card.

**Note:** *Unstructured Supplementary Service Data is a standard for transmitting information over GSM signalling channels. It is mostly used as a method to query the available balance and other similar information in pre-paid GSM services. The function that is triggered when sending USSD is network-dependent and depends on the specific services the operator is offering. (Wikipedia)*

1. Ensure that your Service Provider has given you a USSD string for checking balance and a second string for adding value (charging) the SIM card.
2. From the Cellular Cards branch of the HMC navigation pane, click the **USSD SIM Balance** sub-branch. The USSD SIM Balance screen is displayed.



Balance checking USSD string:   

Recharging USSD string:









Slot	Ch.	Media Link	Check All	Check Balance	Recharge Balance	USSD Reply	Reply Date
1	1	-	<input type="checkbox"/>		<input type="text"/>		
1	2	-	<input type="checkbox"/>		<input type="text"/>		
1	3	-	<input type="checkbox"/>		<input type="text"/>		
			<input checked="" type="checkbox"/>				

Figure 48: HMC Cellular USSD SIM Balance Screen

3. Enter the **Balance checking USSD string**.
4. Enter the **Recharging USSD string**.
5. Select or clear the **Check All** checkbox. When selected, the Hypermedia Management Console will check the balance of all the SIM cards.
6. Click  (Check Balance). The balance is displayed in the USSD Reply column.
7. Optionally, recharge the SIM card:
  - a. Ensure that you have a recharge string. Often, the string is displayed on recharge cards after a removing a layer of ink that hides the string.
  - b. Enter the string into the Recharge Balance field.
  - c. Click the  (Recharge Balance) button.
8. Optionally, click the  (Microsoft Excel) icon to save the results as an Excel file.

## Settings

Use the Settings screen to enable and disable advanced parameters. For assistance with these, contact Technical Support.

1. From the Cellular Cards branch of the HMC navigation pane, click the **Settings** sub-branch. The Cellular Card Settings screen is displayed.

Cellular Card Settings

---

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Send an immediate dummy ALERTING message upon establishment of an outgoing call through cellular: Enabled <input type="checkbox"/>
Wait before sending a dummy ALERTING message on an outgoing call through cellular (unless such a real message is indicated by the network before that time): Enabled <input type="checkbox"/> <input type="text" value="0"/> Seconds (Irrelevant if immediate dummy ALERTING above is enabled)
Send a fixed cause code upon termination of all outgoing calls through cellular (assuming these have at least led to alerting, if not answering, on the remote side): Enabled <input type="checkbox"/> <input type="text" value="0"/> (decimal)
Cause code sent by the cellular card on failed outgoing calls (with an unknown reason): <input type="text" value="31"/> (decimal)
Use GSM 03.38 Hexadecimal encoding on SMS sending and receiving: Enabled <input type="checkbox"/>

Figure 49: HMC Cellular Card Settings Screen

2. If more than one slot is displayed, select a specific Cellular Card. The Cellular Card Settings screen of that cellular card is displayed.
3. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.



## Monitoring Cellular Cards

To monitor the cellular cards, open the Monitor > Cellular branch of the Hypermedia Management Console. There are three views.

### All Cells

To view information about all the SIM slots on all the cellular modules, expand the Monitor > Cellular Cards sub-branch and select **All Cells**. The Cellular Cards Reception screen is displayed.

**Note:** The status of a SIM slot is displayed here and on the Status screen, but not on the Reception screen.

Cellular Card Receptions

Module	Type	Operator	RX Level	RX BER	Status
1 / 1	GSM	orange (8221)	-67 dBm	<0.2%	Idle
1 / 2	GSM	orange (8221)	-65 dBm	<0.2%	Idle
1 / 3	GSM	orange (8221)	-67 dBm	<0.2%	Idle
1 / 4	GSM		Unknown	Unavailable	Missing SIM card
2 / 1	GSM		Unknown	Unavailable	No Signal
2 / 2	GSM		Unknown	Unavailable	Missing SIM card
2 / 3	GSM		Unknown	Unavailable	Faulty/missing
2 / 4	GSM		Unknown	Unavailable	Faulty/missing

Figure 50: Cellular Cards Reception Screen

The screen displays the following information:

#### Module

This indicates the card and the SIM slot number.

#### Type

The module can support either GSM or CDMA.

#### Operator

This is the cellular network associated with the SIM card and the Cell ID.

#### RX Level

This indicates the received power level in dBm. This number can be between -51 dBm and -110 dBm (see “RX Level” on page 56).

#### RX BER

Bit Error Rate (BER) is a calculated figure for the quality of the signal received from the base (see “RX BER” on page 56).

#### Status

This displays the status of the specific SIM slot.

## Reception

To view information about the SIM slots on a specific cellular modules, especially the reception level and the BER level:

1. Expand the Monitor > Cellular Cards sub-branch and select **Reception**.
2. Select a specific slot. The Cellular Cards Reception screen for that card is displayed.

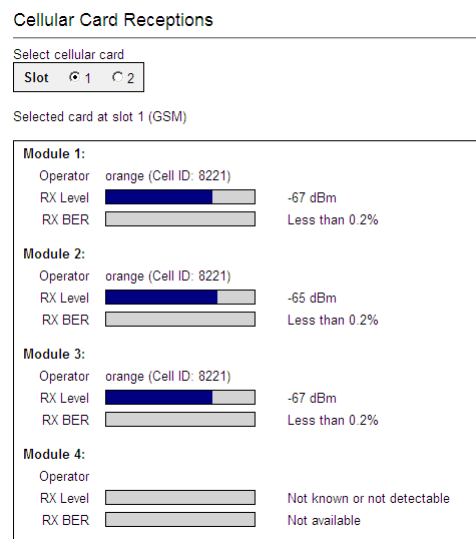


Figure 51: Specific Card's Cellular Reception Screen

The screen displays the following information:

### Type

This information is displayed between the Slot selection box and the reception information. A module can support either GSM or CDMA.

### Module 1 / 2 / 3 / 4

This indicates the card's SIM slot number.

### Operator

This is the cellular network associated with the SIM card and the Cell ID.

### RX Level

This indicates the received power level in dBm. This number can be between -51 dBm and -110 dBm.

### RX BER

Bit Error Rate (BER) is a calculated figure for the quality of the signal received from the base. It is an indication of the number of errors detected in the signal received by the cellular channel, graded into quality ratings according to the percentage of errors in the data. Typical values for BER are between "Not Available" (which represents less than 0.2%) and 6.4%.

BER of more than 6.4 will result in calls being disconnected as well as “noisy” calls. If this occurs, find a better location for the antenna or check the connections to the antenna.

## Status

---

To view information about the status of SIM slots on a specific cellular module:

1. Expand the Monitor > Cellular Cards sub-branch and select **Status**.
2. Select a specific slot. The Cellular Cards Status screen for that card is displayed.

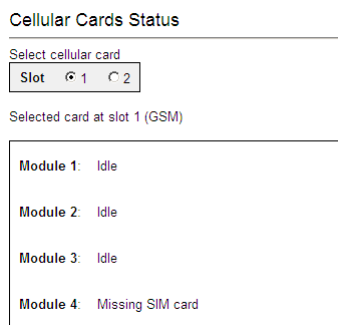


Figure 52: Cellular Cards Status Screen

3. Review the status. Common possibilities include:
  - Module doesn't exist or is faulty
  - Idle
  - Incoming call from cellular network
  - Remote side ringing
  - Call connected
  - Call cleared
  - Dialing out through cellular network
  - No Signal
  - Missing SIM card

*This page is intentionally blank.*

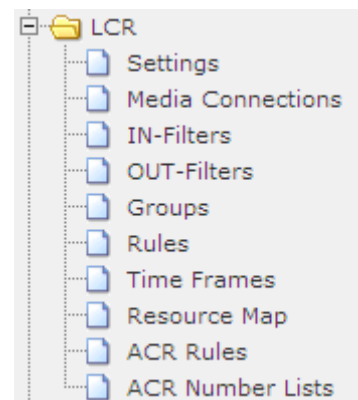
## Chapter 4

# CONFIGURING LCR

**Note:** *The Hypermedia Management Console is customized to match the specific order. Some branches of the HMC may or may not appear based upon the customization.*

This section includes:

- “Overview” on page 60
- “Linking to LCR” on page 61
- “Groups” on page 66
- “Resource Map” on page 68
- “Rules” on page 72
- “Filters” on page 75
- “Time Frames” on page 76
- “Advanced Call Routing (ACR)” on page 78
- “Callthrough” on page 83
- “Number Filters” on page 85
- “Callback Triggers” on page 88
- “CDR” on page 90
- “Activating LCR in PC Cards” on page 94
- “LCR CDRs” on page 96



## Overview

Gateways with Least Cost Routing (LCR) route calls based on rules created by the administrator. This results in per-call routing. In contrast, when using gateways without LCR, all call routes are fixed.

LCR enables greater customizing and, potentially, saves money.

The best-practice order of building the LCR plan is:

***Note:** A best-practice is a technique or methodology that, through experience and research, has been proven to efficiently and reliably lead to the desired result.*

1. Link media to the LCR module
2. Create Groups
3. Assign the LCR Resources to Groups
4. Create Rules

The following are optional:

- Create IN or OUT filters
- Create Time Frames and apply them to the Rules

This section follows the best-practice order.

## Linking to LCR

Each media type must be configured to refer calls to the LCR module. This can be done either from the specific media branch or from the LCR branch.

***Note:** Each of the three media type branches—Cellular, PRI, and VoIP—includes a sub-branch named Media Connections.*

### Linking from a Media Branch

To link a media to LCR:

1. From the HMC navigation pane, click a **Media Connections** sub-branch. The Media Matrix is displayed.

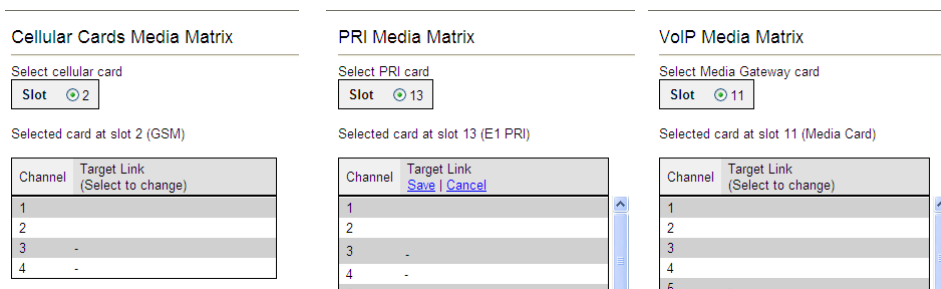


Figure 53: Media Matrix before LCR

2. Click within a channel row. The row turns yellow.
3. Click **Edit**. The row becomes configurable.

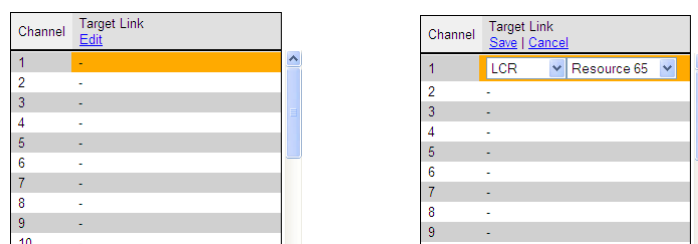
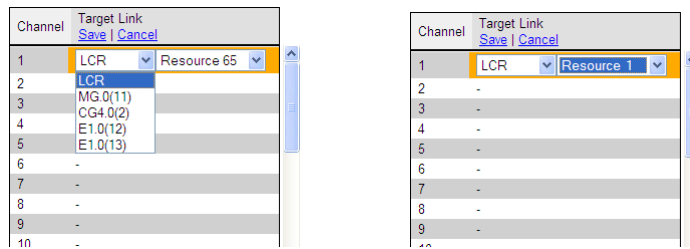


Figure 54: Channel Row when Configurable

4. From the dropdown lists, select **LCR** and the Resource number.



Channel	Target Link
1	LCR Resource 65
2	LCR
3	MG0(11)
4	CG4.0(2)
5	E1.0(12)
6	E1.0(13)
7	-
8	-
9	-
10	-

Channel	Target Link
1	LCR Resource 1
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-

Figure 55: Channel Row Dropdown Lists

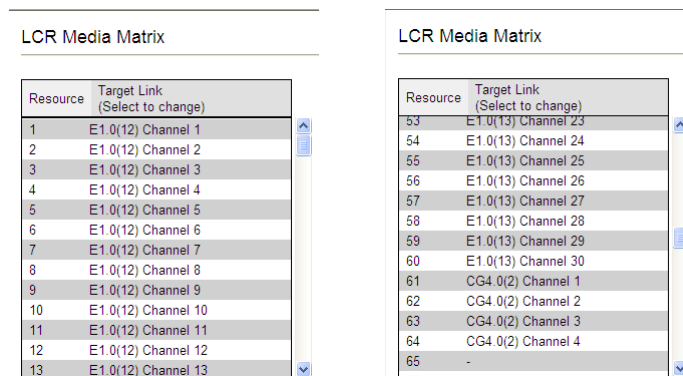
5. Click **Save**. The configuration dropdown boxes are hidden.



Channel	Target Link
1	LCR Resource 8
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-

Figure 56: Channel Row Configured

6. Optionally, repeat the process for additional channels and other media types.
7. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.
8. When finished, from the LCR branch, select **Media Connections**. The LCR Media Matrix displays the links.



Resource	Target Link (Select to change)
1	E1.0(12) Channel 1
2	E1.0(12) Channel 2
3	E1.0(12) Channel 3
4	E1.0(12) Channel 4
5	E1.0(12) Channel 5
6	E1.0(12) Channel 6
7	E1.0(12) Channel 7
8	E1.0(12) Channel 8
9	E1.0(12) Channel 9
10	E1.0(12) Channel 10
11	E1.0(12) Channel 11
12	E1.0(12) Channel 12
13	E1.0(12) Channel 13

Resource	Target Link (Select to change)
53	E1.0(13) Channel 23
54	E1.0(13) Channel 24
55	E1.0(13) Channel 25
56	E1.0(13) Channel 26
57	E1.0(13) Channel 27
58	E1.0(13) Channel 28
59	E1.0(13) Channel 29
60	E1.0(13) Channel 30
61	CG4.0(2) Channel 1
62	CG4.0(2) Channel 2
63	CG4.0(2) Channel 3
64	CG4.0(2) Channel 4
65	-

Figure 57: Two Views of the LCR Media Matrix Display



## Linking from the LCR Branch

---

To link a media to LCR:

1. From the HMC navigation pane's LCR branch, click the **Media Connections** sub-branch. The LCR Media Matrix is displayed.

LCR Media Matrix

Resource	Target Link (Select to change)
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-
12	-
13	-

Figure 58: LCR Media Matrix

2. Click within a Resource row. The row turns yellow.
3. Click **Edit**. The row becomes configurable.

LCR Media Matrix

Resource	Target Link <a href="#">Edit</a>
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-
12	-
13	-

LCR Media Matrix

Resource	Target Link <a href="#">Save</a>   <a href="#">Cancel</a>
1	LCR   Resource 65
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-
11	-
12	-
13	-

Figure 59: LCR Row when Configurable

4. From the dropdown menus, select the **media** and the Resource number.

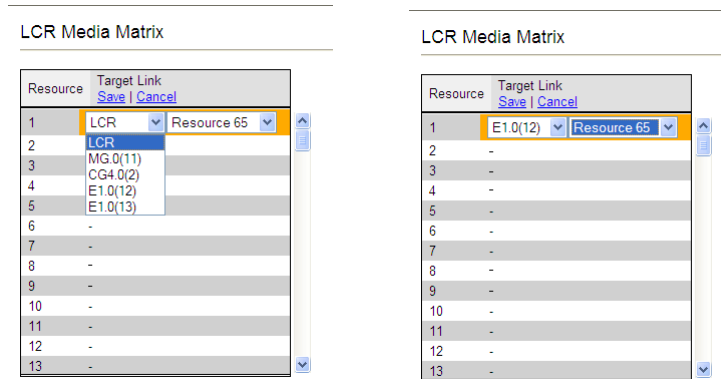


Figure 60: LCR Row Dropdown Lists

5. Click **Save**. The configuration dropdown boxes are hidden.



Figure 61: LCR Row Configured

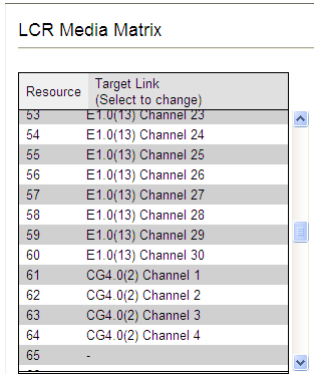
6. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Editing a Target Link

---

To edit a link:

1. From the HMC navigation pane's LCR branch, click the **Media Connections** sub-branch. The LCR Media Matrix is displayed.



Resource	Target Link (Select to change)
53	E1.0(13) Channel 23
54	E1.0(13) Channel 24
55	E1.0(13) Channel 25
56	E1.0(13) Channel 26
57	E1.0(13) Channel 27
58	E1.0(13) Channel 28
59	E1.0(13) Channel 29
60	E1.0(13) Channel 30
61	CG4.0(2) Channel 1
62	CG4.0(2) Channel 2
63	CG4.0(2) Channel 3
64	CG4.0(2) Channel 4
65	-

Figure 62: LCR Media Matrix

2. Click within a Resource row. The row turns yellow.
3. Click **Edit**. The row becomes configurable.
4. From the dropdown menus, edit the settings.
5. Click **Save**. The configuration dropdown boxes are hidden.
6. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Breaking a Link (Unlink)

---

To break a link:

1. From the HMC navigation pane's LCR branch, click the **Media Connections** sub-branch. The LCR Media Matrix is displayed.
2. Click within a Resource row. The row turns yellow.
3. Click **Unlink**. The settings disappear.
4. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Groups

Creating Groups simplifies consistent application of LCR strategies.

### Creating a Group

To create a group:

1. From the HMC navigation pane's LCR branch, click the **Groups** sub-branch. The Groups screen is displayed.

LCR Groups

Save Settings

Group #	Group Name	Cyclic	In Filter	Out Filter	Route to	Int. Routing	Report Calls
<input checked="" type="checkbox"/> Deselect All							
Group 1	PBX	Yes	-none-	Filter 1	LCR	<input type="checkbox"/>	<input type="checkbox"/>
Group 2	Gsm	Yes	-none-	-none-	LCR	<input type="checkbox"/>	<input type="checkbox"/>
Group 3	Voip	Yes	-none-	-none-	LCR	<input type="checkbox"/>	<input type="checkbox"/>
Group 4		Yes	-none-	-none-	LCR	<input type="checkbox"/>	<input type="checkbox"/>
Group 5		No	-none-	-none-	LCR	<input type="checkbox"/>	<input type="checkbox"/>
Group 6		No	-none-	-none-	LCR	<input type="checkbox"/>	<input type="checkbox"/>

Figure 63: LCR Groups Screen

2. Name the Group. Since the Group name appears in other places, we recommend using an identifiable name.
3. In the **Cyclic** column dropdown menu, define whether or not the Group will be cyclic.
 

**Yes**  
The LCR module begins searching for an available channel from the last used channel.

**No**  
The LCR module begins searching for an available channel from the first channel in that group.
4. Optionally, and if already defined, from the **In Filter** dropdown menu, select an In Filter. See "Filters" on page 75.
5. Optionally, and if already defined, from the **Out Filter** dropdown menu, select an Out Filter. See "Filters" on page 75.
6. From the **Route to Group** dropdown menu, define whether or not calls arriving to that Group will be rerouted to a specific Group.
 

**none**  
The LCR Rules are applied before the call is routed to a specific channel.

**< Specific Group Name >**

All calls coming from Resources assigned to this Group are rerouted to the selected Group. The LCR rules are not analyzed for calls entering the LCR module from this group.

7. Select or clear the **Int. Routing** checkbox. When selected, all outgoing calls through the group are logged. The logs are then checked to determine the destination number for an incoming calls. If a match is found, the original destination number is ignored.
8. Select or clear the **Report Calls** checkbox. When selected, calls are sent to an external Hypermedia application for billing.

***Note:** To purchase the billing application, contact Hypermedia.*

9. Click **Save Settings**.

## Using the Default Group Settings

---

The HMC includes pre-defined Group settings. These can be used instead of customized settings.

To apply the default Group settings:

1. From the HMC navigation pane's LCR branch, click the **Groups** sub-branch. The Groups screen is displayed.
2. Scroll to the bottom of the screen. The Create Default Groups button appears within the Default Groups prompt.

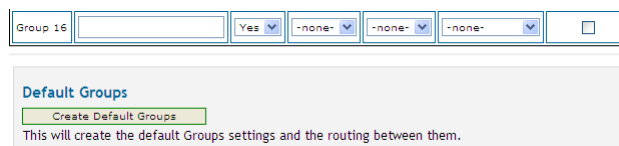


Figure 64: Create Default Groups Button

3. Click **Create Default Groups**.
4. Scroll to the top of the page.
5. Click **Save Settings**.

## Resource Map

Use the LCR Resource Map to assign Resources to Groups.

### Sample Assignment

The picture below illustrates Resource assignment. The first 30 Resources are assigned to the PBX, the second 30 are assigned to the PSTN, and the final 4 are assigned to Cellular.

LCR Resource Map

1	Group: PBX (1) BiDirect	2	Group: PBX (1) BiDirect	3	Group: PBX (1) BiDirect	4	Group: PBX (1) BiDirect	5	Group: PBX (1) BiDirect
6	Group: PBX (1) BiDirect	7	Group: PBX (1) BiDirect	8	Group: PBX (1) BiDirect	9	Group: PBX (1) BiDirect	10	Group: PBX (1) BiDirect
11	Group: PBX (1) BiDirect	12	Group: PBX (1) BiDirect	13	Group: PBX (1) BiDirect	14	Group: PBX (1) BiDirect	15	Group: PBX (1) BiDirect
16	Group: PBX (1) BiDirect	17	Group: PBX (1) BiDirect	18	Group: PBX (1) BiDirect	19	Group: PBX (1) BiDirect	20	Group: PBX (1) BiDirect
21	Group: PBX (1) BiDirect	22	Group: PBX (1) BiDirect	23	Group: PBX (1) BiDirect	24	Group: PBX (1) BiDirect	25	Group: PBX (1) BiDirect
26	Group: PBX (1) BiDirect	27	Group: PBX (1) BiDirect	28	Group: PBX (1) BiDirect	29	Group: PBX (1) BiDirect	30	Group: PBX (1) BiDirect
31	Group: PSTN (2) BiDirect	32	Group: PSTN (2) BiDirect	33	Group: PSTN (2) BiDirect	34	Group: PSTN (2) BiDirect	35	Group: PSTN (2) BiDirect
36	Group: PSTN (2) BiDirect	37	Group: PSTN (2) BiDirect	38	Group: PSTN (2) BiDirect	39	Group: PSTN (2) BiDirect	40	Group: PSTN (2) BiDirect
41	Group: PSTN (2) BiDirect	42	Group: PSTN (2) BiDirect	43	Group: PSTN (2) BiDirect	44	Group: PSTN (2) BiDirect	45	Group: PSTN (2) BiDirect
46	Group: PSTN (2) BiDirect	47	Group: PSTN (2) BiDirect	48	Group: PSTN (2) BiDirect	49	Group: PSTN (2) BiDirect	50	Group: PSTN (2) BiDirect
51	Group: PSTN (2) BiDirect	52	Group: PSTN (2) BiDirect	53	Group: PSTN (2) BiDirect	54	Group: PSTN (2) BiDirect	55	Group: PSTN (2) BiDirect
56	Group: PSTN (2) BiDirect	57	Group: PSTN (2) BiDirect	58	Group: PSTN (2) BiDirect	59	Group: PSTN (2) BiDirect	60	Group: PSTN (2) BiDirect
61	Group: Gsm_Orange (3) BiDirect	62	Group: Gsm_Orange (3) BiDirect	63	Group: Gsm_Cell (4) BiDirect	64	Group: Gsm_Pele (5) BiDirect	65	Group: BiDirect

Figure 65: Sample Resource Assignment

## Assigning LCR Resources

---

To assign LCR Resources to Groups:

1. From the HMC navigation pane's LCR branch, click the **Resource Map** sub-branch. The Resource Map screen is displayed.

LCR Resource Map

1 Group: BiDirect	2 Group: BiDirect	3 Group: BiDirect	4 Group: BiDirect	5 Group: BiDirect
6 Group: BiDirect	7 Group: BiDirect	8 Group: BiDirect	9 Group: BiDirect	10 Group: BiDirect
11 Group: BiDirect	12 Group: BiDirect	13 Group: BiDirect	14 Group: BiDirect	15 Group: BiDirect
16 Group: BiDirect	17 Group: BiDirect	18 Group: BiDirect	19 Group: BiDirect	20 Group: BiDirect
21 Group: BiDirect	22 Group: BiDirect	23 Group: BiDirect	24 Group: BiDirect	25 Group: BiDirect
26 Group: BiDirect	27 Group: BiDirect	28 Group: BiDirect	29 Group: BiDirect	30 Group: BiDirect
31 Group: BiDirect	32 Group: BiDirect	33 Group: BiDirect	34 Group: BiDirect	35 Group: BiDirect
36 Group: BiDirect	37 Group: BiDirect	38 Group: BiDirect	39 Group: BiDirect	40 Group: BiDirect
41 Group: BiDirect	42 Group: BiDirect	43 Group: BiDirect	44 Group: BiDirect	45 Group: BiDirect
46 Group: BiDirect	47 Group: BiDirect	48 Group: BiDirect	49 Group: BiDirect	50 Group: BiDirect

Figure 66: LCR Resource Map Before Assignments

2. Click a cell to select it. To select many cells, hold down the Shift key and click a cell elsewhere on the map. The selected cells are shaded blue and the Set Group and Set Resource Type dropdown lists appear near the top of the screen.

**LCR Resource Map**

Your Selection: Channel 1 - (hold shift key to select a range of channels)

Set Group:   Set Resource Type:

1	Group: BiDirect	2	Group: BiDirect	3	Group: BiDirect	4	Group: BiDirect	5	Group: BiDirect
6	Group: BiDirect	7	Group: BiDirect	8	Group: BiDirect	9	Group: BiDirect	10	Group: BiDirect
11	Group: BiDirect	12	Group: BiDirect	13	Group: BiDirect	14	Group: BiDirect	15	Group: BiDirect
16	Group: BiDirect	17	Group: BiDirect	18	Group: BiDirect	19	Group: BiDirect	20	Group: BiDirect
21	Group: BiDirect	22	Group: BiDirect	23	Group: BiDirect	24	Group: BiDirect	25	Group: BiDirect
26	Group: BiDirect	27	Group: BiDirect	28	Group: BiDirect	29	Group: BiDirect	30	Group: BiDirect
31	Group: BiDirect	32	Group: BiDirect	33	Group: BiDirect	34	Group: BiDirect	35	Group: BiDirect
36	Group: BiDirect	37	Group: BiDirect	38	Group: BiDirect	39	Group: BiDirect	40	Group: BiDirect

**LCR Resource Map**

Your Selection: Channel 1 - Channel 25

Set Group:   Set Resource Type:

1	Group: BiDirect	2	Group: BiDirect	3	Group: BiDirect	4	Group: BiDirect	5	Group: BiDirect
6	Group: BiDirect	7	Group: BiDirect	8	Group: BiDirect	9	Group: BiDirect	10	Group: BiDirect
11	Group: BiDirect	12	Group: BiDirect	13	Group: BiDirect	14	Group: BiDirect	15	Group: BiDirect
16	Group: BiDirect	17	Group: BiDirect	18	Group: BiDirect	19	Group: BiDirect	20	Group: BiDirect
21	Group: BiDirect	22	Group: BiDirect	23	Group: BiDirect	24	Group: BiDirect	25	Group: BiDirect
26	Group: BiDirect	27	Group: BiDirect	28	Group: BiDirect	29	Group: BiDirect	30	Group: BiDirect
31	Group: BiDirect	32	Group: BiDirect	33	Group: BiDirect	34	Group: BiDirect	35	Group: BiDirect
36	Group: BiDirect	37	Group: BiDirect	38	Group: BiDirect	39	Group: BiDirect	40	Group: BiDirect
41	Group: BiDirect	42	Group: BiDirect	43	Group: BiDirect	44	Group: BiDirect	45	Group: BiDirect
46	Group: BiDirect	47	Group: BiDirect	48	Group: BiDirect	49	Group: BiDirect	50	Group: BiDirect

Figure 67: Selecting LCR Resources

- From the Select Group dropdown list, select a Group. This is the Group the shaded cells will be associated with.



**LCR Resource Map**

Your Selection: Channel 1 - Channel 25

Set Group:	PSTN	Set	Set Resource Type:	Bi Directional	Set
1	Group: BiDirect	0	Group: BiDirect	3	Group: BiDirect
6	Group: BiDirect	7	Group: BiDirect	8	Group: BiDirect
11	Group: BiDirect	2	Group: BiDirect	13	Group: BiDirect
16	Group: BiDirect	7	Group: BiDirect	18	Group: BiDirect
21	Group: BiDirect	2	Group: BiDirect	23	Group: BiDirect
26	Group: BiDirect	7	Group: BiDirect	28	Group: BiDirect
31	Group: BiDirect	2	Group: BiDirect	33	Group: BiDirect
36	Group: BiDirect	37	Group: BiDirect	38	Group: BiDirect
41	Group: BiDirect	42	Group: BiDirect	43	Group: BiDirect
46	Group: BiDirect	47	Group: BiDirect	48	Group: BiDirect
				49	Group: BiDirect
				50	Group: BiDirect

Figure 68: Group Dropdown List

4. Click **Set**. The assignment is applied and saved.
5. From the **Resource Type** dropdown list, select either:
  - Bi Directional**  
This Resource can be used for both incoming calls and for outbound calls.
  - Outbound Only**  
This Resource can only be used for outbound calls.
6. Click **Set**. This completes the procedure.

## Rules

Rules determine to which Group a call is routed. When Time Frames are not used, the Rule is applied continuously. See “Time Frames” on page 76.

### Creating a Rule

To create a Rule:

1. From the HMC navigation pane’s LCR branch, click the **Rules** sub-branch. The Rules screen is displayed.

LCR Rules

Save Settings

Default Rule:   ACR

Default Text Rule:   ACR

TF = Time Frame | TF1: 08.00 - 17.00 | TF2: 17.00 - 08.00 | TF3: - | TF4: - |

Rule #	Prefix	1st Group	2nd Group	3rd Group	ACR	TF 1	TF 2
Rule 1	054	Gsm	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 2	052	Gsm	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 3	050	Gsm	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 4	10	Voip	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 5	0	PBX	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 6		-none-	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 7		-none-	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 8		-none-	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 9		-none-	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 10		-none-	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 11		-none-	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Rule 12		-none-	-none-	-none-	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 69: LCR Rules Screen

2. Place the cursor in an empty Rule # Prefix cell.
3. Enter the **Prefix**, that is, the first numbers of the destination number. The Prefix is often the first numbers of a mobile phone service provider.
4. Configure the following:
  - 1st Group**  
From the dropdown list, select the Group to which the LCR module will first route calls with this prefix.
  - 2nd / 3rd Group**  
Optionally, enter a second and third choice for where the call should be routed. These choices are used when the 1st Group’s Resources are busy.

### **ACR**

When this checkbox is selected, the gateway redirects the call to a database containing Advanced Call Routing lists. The call is routed according to rules on an external application with advanced routing options.

**Note:** *The number of TF columns is determined by the number of Time Frames defined.*

### **TF1 / TF2**

Select or clear the Time Frame checkboxes. When selected, the Time Frame is applied to the Rule.

5. Optionally, repeats steps 2 until 4 for additional rules.
6. Ensure that the Rules are in the correct order. Rules are applied from top to bottom. Therefore, place a Rule with a prefix identical to but shorter than another Rule's prefix *after* the longer Rule.

For example, if Rule 1's prefix is 082 and Rule 2's prefix is 08, calls beginning with 082 will be routed according to Rule 1 and all other calls beginning with 08 will be routed according to Rule 2. If Rule 2 is placed above, the 082 calls will also be routed according to it and the 082 Rule will be rendered ineffective.

7. Optionally, select a **Default Rule**.

**WARNING!** *Do not confuse this Default Rule with the Default Rule Wizard at the bottom of the screen. For an explanation of the second Default Rule Wizard, see "Creating a Default Set of Rules" on page 74.*

This rule is applied when a call's prefix does not match one of the defined prefixes. Time Frames are not applied to the Default Rule.

- a. From the dropdown list, select a rule.
  - b. Select or clear the ACR checkbox. When selected, the gateway redirects the call to a database containing Advanced Call Routing lists. The call is routed according to rules on an external application with advanced routing options.
8. Disregard the Default Text Rule. For more information, contact Technical Support.
  9. Click **Save Settings**.

## Creating a Default Set of Rules

---

The HMC includes a Wizard for defining a set of simple Rules. These can be used instead of customized Rules.

To use the Default Rules Wizard:

1. From the HMC navigation pane's LCR branch, click the **Rules** sub-branch. The Rules screen is displayed.
2. Scroll to the bottom of the screen. The Create button appears within the Create Default Rules prompt.

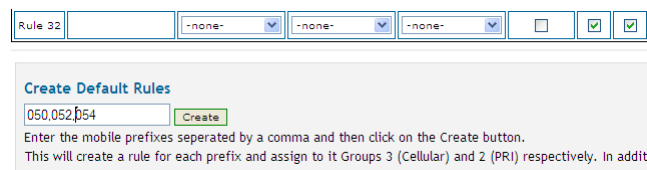


Figure 70: Create Default Rules Button

3. Enter the first numbers (prefixes) of phone numbers used by mobile service providers.

**Note:** Separate prefixes with a comma. Do not add spaces.

4. Click **Create**.
5. Scroll to the top of the page.
6. Click **Save Settings**.

## Deleting a Rule

---

To delete a Rule:

1. From the HMC navigation pane's LCR branch, click the **Rules** sub-branch. The Rules screen is displayed.
2. Place the cursor in the Prefix cell on the Rule's row.
3. Delete the entry.
4. Click **Save Settings**.

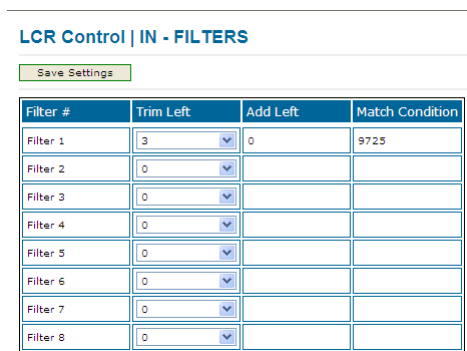
## Filters

Filters enable consistent, automatic management of phone numbers before they are routed.

An IN filter changes the destination number before the list of rules is processed. An OUT filter changes the destination number after the list of rules has been processed and the destination group has been chosen. The process is identical for both.

To create a Filter:

1. From the HMC navigation pane's LCR branch, click either the **IN** or **OUT Filters** sub-branch. The Filters screen is displayed.



Filter #	Trim Left	Add Left	Match Condition
Filter 1	3	0	9725
Filter 2	0		
Filter 3	0		
Filter 4	0		
Filter 5	0		
Filter 6	0		
Filter 7	0		
Filter 8	0		

Figure 71: LCR Filters Screen

2. Configure the following for up to eight filters:

### Trim Left

From the dropdown menu, select the quantity of numbers that will be deleted from the beginning of the destination number.

### Add Left

Enter the number or numbers that will be added to the beginning of the destination number.

### Match Condition

Enter the exact numbers appearing in the incoming calls that this filter will be applied to. "Condition" means the numbers appearing at the beginning of the phone number. This filter will be applied to phone numbers with exactly those numbers.

3. Click **Save Settings**.
4. From the HMC navigation pane's LCR branch, click the **Groups** sub-branch. The Groups screen is displayed.
5. Optionally, from a Group's **In Filter** dropdown menu, select an In Filter. The IN filter will be applied to calls entering the LCR module from one of the system's interfaces.
6. Optionally, from a Group's **Out Filter** dropdown menu, select an Out Filter. The OUT filter will be applied to calls exiting the LCR module to one of the system's interfaces.
7. Click **Save Settings**.

## Time Frames

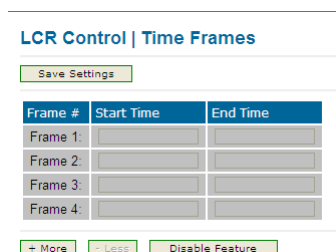
The Time Frame determines the hours of the day when a Rule is applied. When Time Frames are not used, the Rule is applied continuously.

### Creating a Time Frame

---

To create a Time Frame:

1. From the HMC navigation pane's LCR branch, click the **Time Frames** sub-branch. The Time Frames screen is displayed. All four rows are gray.



LCR Control | Time Frames

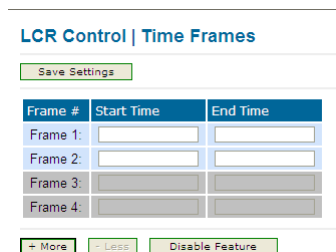
Save Settings

Frame #	Start Time	End Time
Frame 1:		
Frame 2:		
Frame 3:		
Frame 4:		

More Less Disable Feature

Figure 72: LCR Time Frames Screen

2. Click **More**. Two rows are enabled.



LCR Control | Time Frames

Save Settings

Frame #	Start Time	End Time
Frame 1:		
Frame 2:		
Frame 3:		
Frame 4:		

More Less Disable Feature

Figure 73: Time Frame Rows when Configurable

3. In the **Frame 1: Start Time** cell, enter the time of day the first Time Frame will begin. Disregard the Frame 1: End Time cell.
4. In the **Frame 2: Start Time** cell, enter the time of day the second Time Frame will begin. Set the cursor in the End Time cell and the Frame 1 and Frame 2: End Time cells display the alternate times.

LCR Control | Time Frames

Save Settings

Frame #	Start Time	End Time
Frame 1:	08.00	17.00
Frame 2:	17.00	08.00
Frame 3:		
Frame 4:		

+ More   - Less   Disable Feature

Figure 74: End Time Displayed Automatically

**Note:** To erase all the entries and start over, or to disable use of Time Frames, click *Disable Feature*.

5. Optionally, to add additional Time Frames, click More and enter the Start Time.
6. Click **Save Settings**.

## Disabling Time Frames

---

To disable the Time Frames feature:

1. From the HMC navigation pane's LCR branch, click the **Time Frames** sub-branch. The Time Frames screen is displayed.
2. Click **Disable Feature**. All Time Frame definitions are erased.
3. Click **Save Settings**.

## Advanced Call Routing (ACR)

Use ACR to define, for example, white lists and black lists. ACR supplements the LCR rules created on the Rules screen.

**Note:** A white list includes the phone numbers that are authorized to use LCR whereas a black list includes the phone numbers that are prevented from using the LCR.

Enabling ACR requires the following three steps:

- a. Prepare and upload the Number List.
- b. Define the ACR rules.
- c. Enable a specific rule, or the default ACR rule, on the LCR Rules screen.

### Modifying the Existing ACR Number List

---

To modify the existing ACR Number List:

1. From the HMC navigation pane's LCR branch, click the **ACR Numbers Lists** sub-branch. The ACR Number Lists screen is displayed.

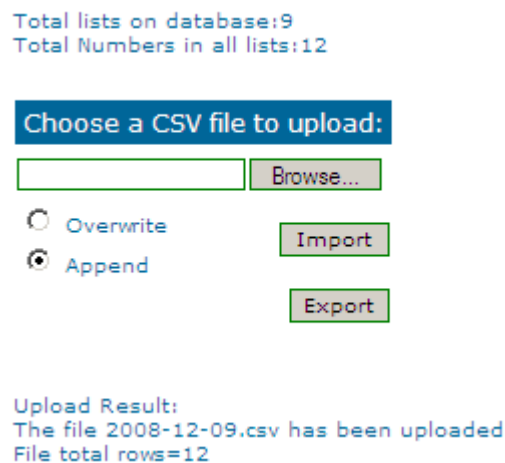


Figure 75: ACR Number Lists Screen

2. Click **Export**. The standard Windows browse dialog box is displayed.
3. Save the .csv file.
4. Open the file in a text-editor, such as Notepad.
5. Modify the file. Preserve the format, that is, the words **tag,number** must appear as the first row of the list.



6. Save and close the file.
7. On the ACR Number Lists Screen, click **Browse**. The standard Windows browse dialog box is displayed.
8. Locate the .csv file containing the lists. Select it and click **Open**. The path to the .csv file is displayed on the Number Lists Screen.
9. Select either:
  - Overwrite**  
When selected, the old .csv file is deleted and the new file replaces it.
  - Append**  
When selected, the entries on the new .csv file are added to the entries on the old .csv file.
10. Click **Import**. The report of total lists and total numbers is automatically updated.

## Creating a New ACR Number List File

---

To define a number list:

1. Create a new file whose file-name ends with the extension .csv.
2. Open the file in a text-editor, such as Notepad.
3. Enter the words **tag,number** as the first row of the list.

***Note:** In step 4, the term “list” indicates all entries that are share the same tag.*

4. Add the tag and number of each entry. Ensure that a comma separates the tag and number.

The following example includes 5 lists:

```
tag,number
XYZ,0774445004
XYZ,0509080704
XYZ,0523030303
ABC,0509380137
ABC,0509380136
CLCOM,052
PHONE,054
CELLC,050
```

***WARNING!** A comma must separate the tag and the number or the list will not register properly.*

- From the HMC navigation pane's LCR branch, click the **ACR Numbers Lists** sub-branch. The ACR Number Lists screen is displayed.

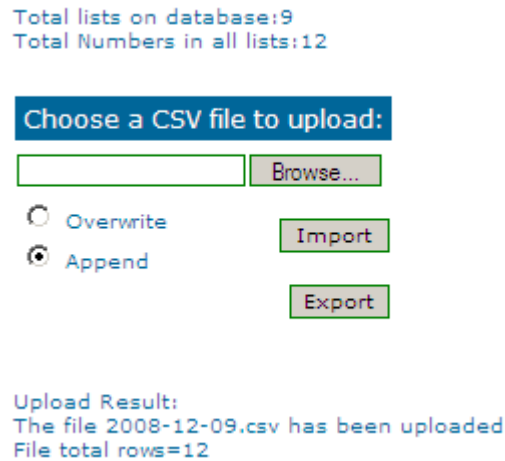


Figure 76: ACR Number Lists Screen

- Click **Browse**. The standard Windows browse dialog box is displayed.
- Locate the .csv file containing the lists. Select it and click **Open**. The path to the .csv file is displayed on the Number Lists Screen.
- Select either:
  - Overwrite**  
When selected, the old .csv file is deleted and the new file replaces it.
  - Append**  
When selected, the entries on the new .csv file are added to the entries on the old .csv file.
- Click **Import**. The report of total lists and total numbers is automatically updated.

## ACR Rules

---

To create an ACR Rule:

- Ensure that an up-to-date ACR Number Lists .csv file has been uploaded to the Gateway.
- From the HMC navigation pane's LCR branch, click the **ACR Rules** sub-branch. The ACR Rules screen is displayed.

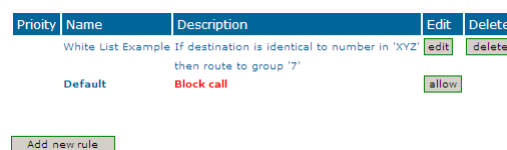


Figure 77: ACR Rules Screen

3. Click **Add new rule**. The Add New Rule screen is displayed.

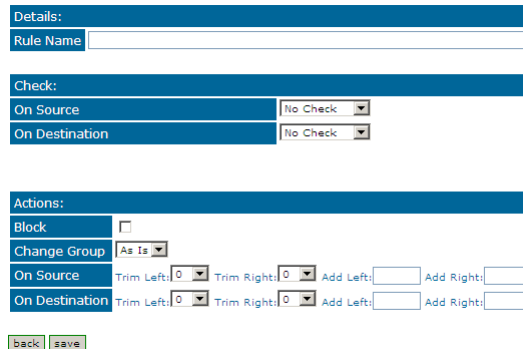


Figure 78: Add New Rule Screen

4. In the Rule Name field, enter the name of the rule.
5. In the Check area, from either or both the **On Source** and the **On Destination** dropdown menu, define the indication the rule will evaluate.

**Note:** *On Source checks the origination phone number, that is, the phone number from which the call was placed. On Destination checks the target phone number, that is, the phone number of the called party.*

If an indication is selected, a dialog box similar to the following is displayed:

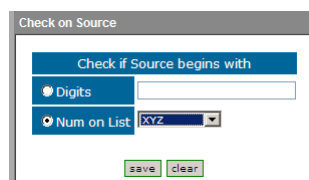


Figure 79: Sample Check Dialog Box

#### **No Check**

The rule does not check the Source number.

#### **Begins With**

The rule checks if the On Source begins with either specific digits or a tag that appears on the list.

#### **Ends With**

The rule checks if the On Source ends with either specific digits or a tag that appears on the list.

#### **In Range**

The rule checks if the On Source range is within a specific range.

**Identical to**

The rule checks if the On Source is exactly the specific digits or tag that appears on the list.

6. Complete the dialog box and click **Save**.
7. In the Actions area, define what ACR does when it identifies a number matching the indications defined in the Check area.

**No Actions are Defined**

If no actions are defined, the call are allowed as is.

**Block**

Calls matching the indications are not allowed.

**Change Group**

Calls matching the indications are routed through the LCR Group defined here.

**On Source**

Phone numbers of calls matching the indications are altered as defined here.

**On Destination**

Phone numbers of calls matching the indications are altered as defined here.

8. Click Save. The new rule is added to the ACR Rules screen.
9. Prioritize the rule. Use the arrows in the Priority column to increase or decrease a rules prioritization.




Priority	Name
<input type="checkbox"/>	White List Example
<input checked="" type="checkbox"/>  	Example 17
 <input type="checkbox"/>	Example 34
Default	

Figure 80: Rule Prioritization Arrows

10. From the HMC navigation pane's LCR branch, click the **Rules** sub-branch. The Rules screen is displayed.
11. From the ACR column, select the checkbox in the Rule row that the ACR rules will be applied to and click **Save Settings**.

## Callthrough

Use Callthrough to place calls, via the Hypergateway, to external numbers.

**Note:** Callthrough belongs to the Hypersavings Package and requires a separate license.

Users receive a dial-tone from the Hypergateway and can then place calls either:

- via the PBX to a corporate extension
- to a VoIP phone number
- to a Cellular phone number
- to a PSTN phone number

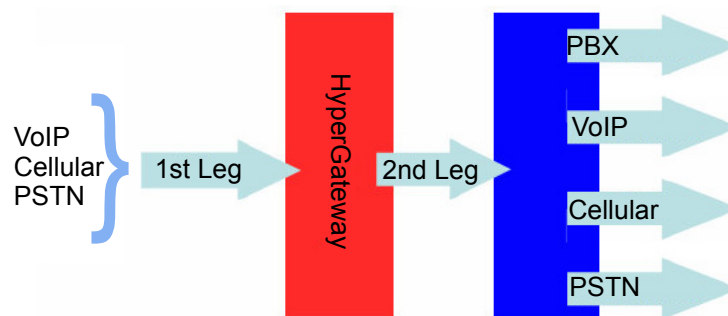


Figure 81: The Callthrough Sequence

To configure Callthrough:

1. From the HMC navigation pane's LCR branch, click the **Callthrough** sub-branch. The Callthrough screen is displayed.

**Note:** The Resources column lists the Resources found on the LCR Media Matrix screen. See "Linking from the LCR Branch" on page 63.

LCR Callthrough Resources

Resource	Set 1st Leg	Status	Group	Other Leg
Resource 1	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 1
Resource 2	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 2
Resource 3	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 3
Resource 4	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 4
Resource 5	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 5
Resource 6	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 6
Resource 7	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 7
Resource 8	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 8
Resource 9	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 9
Resource 10	<input type="checkbox"/>	Free. (Gateway)	General	E1.0(12) Chan. 10

Figure 82: The Callthrough Screen

2. Select a Resource's **Set 1st Leg** checkbox. When selected, this Resource can accept Callthrough calls from the user. Also, when selected, this Resource is not used for standard calls.

**Note:** To clear a checkbox, from the LCR Media connections branch, select the Resource and click Unlink.

**Note:** The Status column indicates if the Resource is or is not available. It also indicates the type of equipment used to process the Callthrough.

**Note:** The Other Leg column displays the equipment used for the 2nd leg of the Callthrough.

3. From the **Group** dropdown list, select the Group that will be allowed to use this Callthrough Resource. These are the Groups that are defined in the VPN Groups sub-branch of the Manage branch.
4. Repeat the procedure for other Resources that will be allocated to Callthrough calls.
5. Click **Apply Settings**.

## Number Filters

Use Number Filters to manipulate numbers that are sent to, or received by, the Gateway. All numbers are compared to the configured set of rules. If the number matches a rule, the rule is applied and a new number is dialed.

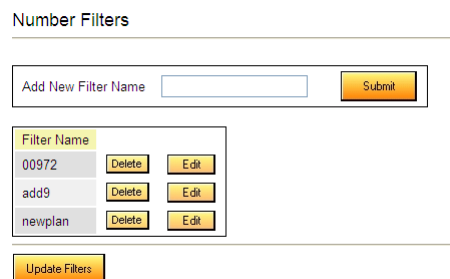
***Note:** Number Filters belong to the Hypersavings Package and require a separate license.*

### Creating a Number Filter

---

To create a Number Filter:

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Number Filters** sub-branch. The Number Filters screen is displayed.



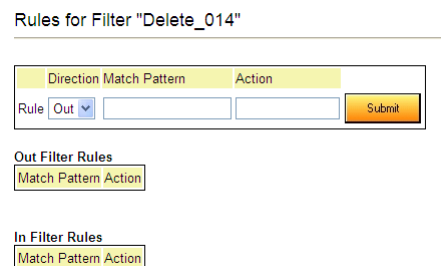
Number Filters

Add New Filter Name

Filter Name	Delete	Edit
00972	<input type="button" value="Delete"/>	<input type="button" value="Edit"/>
add9	<input type="button" value="Delete"/>	<input type="button" value="Edit"/>
newplan	<input type="button" value="Delete"/>	<input type="button" value="Edit"/>

Figure 83: Number Filters Screen

3. In the **Add New Filter Name** field, enter a name for the new filter.
4. Click **Submit**. The Number Filters screen is displayed; the new filter appears in the list of Filter Names.
5. Click the **Edit** button beside the new filter's name. The **Rules for Filter <name>** screen is displayed.



Rules for Filter "Delete\_014"

Direction	Match Pattern	Action
Rule: Out	<input type="text"/>	<input type="text"/>

Out Filter Rules

Match Pattern	Action
---------------	--------

In Filter Rules

Match Pattern	Action
---------------	--------

Figure 84: Edit Number Filters Screen

6. Select a Rule **Direction**.

### Out

Use Out filters to apply the filters to outgoing calls. For example, if a number begins with the Country Code 44 and is followed by seven or more digits, this filter—  
`^44(d\d\d\d\d\d\d+) $1` —removes the country code and dials only the digits following the Country Code.

This second example is an Out filter that adds the suffix ‘9’ to all outgoing calls which have five or more digits (for getting an outside line)— `(d\d\d\d\d+) 9$1`

### In

Use In filters to apply the filters to incoming calls.

- Using standard Regular Expressions, enter the Match Pattern and the Action that will occur when the pattern is matched.

**Note:** For more information about Regular Expressions, see:  
<http://www.regular-expressions.info>

- Click **Submit**. The Rule is listed in either the Out Filter Rules or the In Filter Rules list.

Rules for Filter "Delete\_014"

Direction	Match Pattern	Action
Rule   Out	<input type="text"/>	<input type="text"/>

Out Filter Rules

Match Pattern	Action
<input type="text"/>	<input type="text"/>

In Filter Rules

Match Pattern	Action
<code>^014(d\d\d\d\d\d\d+) \$1</code>	<input type="button" value="Delete"/>

Figure 85: New Filter is Displayed

- Click the **Number Filters** sub-branch.
- Click **Update Filters**.



## Applying a Callthrough Filter

To apply a Callthrough Filter:

**Note:** Callthrough Filters belong to the Hypersavings Package and require a separate license.

1. From the HMC navigation pane's LCR branch, click the **Callthrough Filters** sub-branch. The Callthrough Filters screen is displayed.

LCR Callthrough Filters

Resource	Application	Filter Used	Status
Resource 1	Callthrough-Leg1	00972	<a href="#">Edit</a>
Resource 2	Callthrough-Leg1		<a href="#">Edit</a>
Resource 3	Callthrough-Leg1		<a href="#">Edit</a>
Resource 4	Callthrough-Leg1		<a href="#">Edit</a>
Resource 5	Callthrough-Leg1		<a href="#">Edit</a>
Resource 6	Callthrough-Leg1		<a href="#">Edit</a>
Resource 7	Callthrough-Leg1		<a href="#">Edit</a>
Resource 8	Callthrough-Leg1		<a href="#">Edit</a>
Resource 9	Callthrough-Leg1		<a href="#">Edit</a>
Resource 10	Callthrough-Leg1		<a href="#">Edit</a>
Resource 11	Callthrough-Leg2		<a href="#">Edit</a>
Resource 12	Callthrough-Leg2		<a href="#">Edit</a>
Resource 13	Callthrough-Leg2		<a href="#">Edit</a>

Figure 86: Callthrough Filter Screen

2. In the **Status** column, click **Edit**. In the Filter Used column, a dropdown list is displayed.

LCR Callthrough Filters

Resource	Application	Filter Used	Status
Resource 1	Callthrough-Leg1	00972	<a href="#">Edit</a>
Resource 2	Callthrough-Leg1	- No Filter -	<a href="#">Save</a>
Resource 3	Callthrough-Leg1	- No Filter -	<a href="#">Edit</a>
Resource 4	Callthrough-Leg1	newplan	<a href="#">Edit</a>
Resource 5	Callthrough-Leg1	add9	<a href="#">Edit</a>
Resource 6	Callthrough-Leg1	00972	<a href="#">Edit</a>
Resource 7	Callthrough-Leg1		<a href="#">Edit</a>
Resource 8	Callthrough-Leg1		<a href="#">Edit</a>
Resource 9	Callthrough-Leg1		<a href="#">Edit</a>
Resource 10	Callthrough-Leg1		<a href="#">Edit</a>
Resource 11	Callthrough-Leg2		<a href="#">Edit</a>
Resource 12	Callthrough-Leg2		<a href="#">Edit</a>

Figure 87: Filter Dropdown List

3. Select the filter.
4. Click **Save**.
5. Click **Apply Settings**.

## Callback Triggers

A Callback Trigger is a number dialed by a User that causes the Gateway to authorize the user, disconnect the call, and then call-back the User.

**Note:** *Callback belongs to the Hypersavings Package and requires a separate license.*

The most common type of Callback Trigger is a dedicated channel.

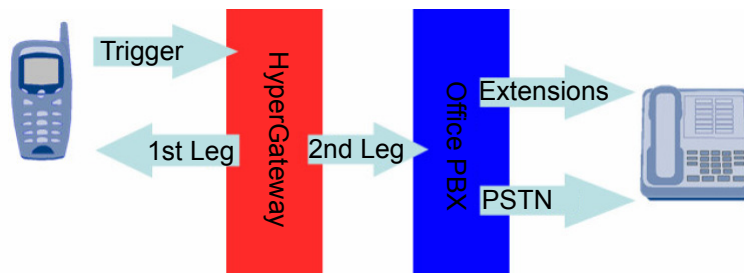


Figure 88: Callback Triggers Diagram

**Note:** *If several Resources are dedicated to Callback, incoming calls are automatically routed to the first available Resource.*

For a Resource to be allocated to Callback, it **must be linked to itself**. Its Target Link from the LCR Media Matrix must be “LCR Resource #” (see Figure # 89).

To configure Callback Trigger Resources:

1. From the HMC navigation pane’s LCR branch, click the **Media Connections** sub-branch. The LCR Media Matrix is displayed.
2. Link an unassigned Resource to LCR. See “Linking from the LCR Branch” on page 63.

Resource	Target Link
1	LCR Resource 1
2	LCR Resource 2
3	LCR Resource 3
4	LCR Resource 4
5	E1.0(12) Channel 5
6	E1.0(12) Channel 6
7	E1.0(12) Channel 7
8	E1.0(12) Channel 8
9	E1.0(12) Channel 9
10	E1.0(12) Channel 10
11	E1.0(12) Channel 11
12	E1.0(12) Channel 12
13	E1.0(12) Channel 13

Figure 89: LCR Media Linked as Dedicated Channel

- From the HMC navigation pane's LCR branch, click the **Callback Triggers** sub-branch. The Callback Triggers page is displayed. A checkbox appears beside Resources that can now be allocated as Callback Triggers.

Channel	Status	Set As Trigger
Channel 1	Free.	<input type="checkbox"/>
Channel 2	Free.	<input type="checkbox"/>
Channel 3	Free.	<input type="checkbox"/>
Channel 4	Free.	<input type="checkbox"/>
Channel 5	Used as Callthrough-Leg1	---
Channel 6	Used as Callthrough-Leg1	---
Channel 7	Used as Callthrough-Leg1	---
Channel 8	Used as Callthrough-Leg1	---
Channel 9	Used as Callthrough-Leg1	---
Channel 10	Used as Callthrough-Leg1	---
Channel 11	Used as Gateway	---
Channel 12	Used as Gateway	---

Figure 90: LCR Callback Triggers Screen

- Select the checkboxes. When selected, the Resource is allocated to Callback.

**Note:** To clear a checkbox, from the LCR Media connections branch, select the Resource and click *Unlink*.

- Click **Apply Settings** and wait for **Configuration Saved** to be displayed. The status changes to "Used as Callback Trigger".

Channel	Status	Set As Trigger
Channel 1	Used as Callback Trigger	<input checked="" type="checkbox"/>
Channel 2	Free.	<input type="checkbox"/>
Channel 3	Free.	<input type="checkbox"/>
Channel 4	Free.	<input type="checkbox"/>
Channel 5	Unmapped.	---
Channel 6	Used as Callthrough-Leg1	---
Channel 7	Used as Callthrough-Leg1	---
Channel 8	Used as Callthrough-Leg1	---
Channel 9	Used as Callthrough-Leg1	---
Channel 10	Used as Callthrough-Leg1	---
Channel 11	Used as Gateway	---
Channel 12	Used as Gateway	---

Figure 91: Status "Used as Callback Trigger"

## CDR

Use the LCR **Settings** branch to enable the collection of Call Detail Records (CDR) and to access CDR files.

On systems equipped with a CB card, an external storage device must be used. An SD card is usually used but a USB disk-on-key may be used as well. The active file is located within the internal system memory while completed files are moved onto the external storage device during the night.

**WARNING!** *Failure to plug in an external storage device will result in loss of CDR data. The memory device should not be removed.*

On PC-based systems, the CDR files are stored on the hard-drive.

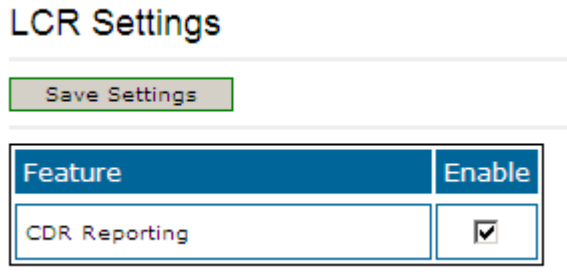
On CB as well as PC based systems, the user is responsible for deleting old CDR files. This is required both in order to prevent memory overflow as well as to be able to easily locate a file.

### Enabling Collection of CDR

---

To enable collection of CDR files:

1. From the HMC navigation pane's LCR branch, click the **Settings** sub-branch. The Feature list is displayed.



The screenshot shows the 'LCR Settings' page. At the top, there is a 'Save Settings' button. Below it is a table with two columns: 'Feature' and 'Enable'. The 'CDR Reporting' feature is listed with a checked checkbox in the 'Enable' column.

Feature	Enable
CDR Reporting	<input checked="" type="checkbox"/>

2. Select or clear the checkbox. When selected, the HMC collects Call Detail Records.

**Note:** *Unless its size exceeds a predefined limit, only one CDR file is created each day.*

## Downloading a CDR File

---

To download a CDR file:

1. From the HMC navigation pane, expand the **Monitor** branch.
2. Expand the **LCR Card** sub-branch and select **LCR CDRs**. The list of CDR files is displayed.

LCR CDR Files

File Name (click to download)	Last Modified	Size (bytes)	
Remaining space (disk): 18.66 megabytes			
LCR_CDR_20081211.log	11/12/2008 12:25	14944	
Remaining space (external): 964.75 megabytes			
LCR_CDR_20080630.1214873338.log	30/06/2008 21:25	25015	delete
LCR_CDR_20080701.1214959931.log	01/07/2008 21:59	26726	delete
LCR_CDR_20080702.1215046530.log	02/07/2008 22:11	25259	delete
LCR_CDR_20080703.1215133121.log	03/07/2008 20:52	6678	delete
LCR_CDR_20080704.1215216106.log	04/07/2008 21:17	2540	delete
LCR_CDR_20080706.1215388874.log	06/07/2008 22:57	17568	delete
LCR_CDR_20080707.1215475467.log	07/07/2008 22:23	29035	delete
LCR_CDR_20080708.1215562061.log	08/07/2008 19:50	26728	delete
LCR_CDR_20080709.1215648652.log	09/07/2008 21:29	30487	delete
LCR_CDR_20080710.1215735247.log	10/07/2008 21:55	27894	delete
LCR_CDR_20080711.1215821844.log	11/07/2008 22:35	1660	delete
LCR_CDR_20080712.1215908009.log	12/07/2008 19:20	282	delete

3. Click a file name. The standard Windows Open dialog box is displayed.
4. Define the location where the file will be saved and click **OK**. The file is downloaded to that location.

## Deciphering the CDR File

---

A CDR line is created in the file each time a LCR call ends. All CDR fields appear on a single line. For example:

12364,5003,0546858576,0546858576,1,2,2008-09-05 13:48:13,2008-09-05 13:48:14,2008-09-05 13:48:24,2008-09-05 13:50:42,31,23,1,0,10,138

The entries are explained in Table 7. The format of the line is:

Call Index Number, Source Number, Original Destination Number, Filtered Destination Number, Source Group Number, Destination Group Number, Dial Date & Time, Alert Date & Time, Answer Date & Time, Hangup Date & Time, From Resource, To Resource, Source Hangup Direction, Destination Hangup Direction, Hangup Reason, Call Duration

**Table 7: CDR Line Entries Explained**

<b>Entry</b>	<b>Explanation</b>
Call Index Number	Counts from 0, does not reset when a new file is created (i.e. when the date changes).
Source Number, Original Destination Number	Dialing and dialed numbers respectively.
Filtered Destination Number	Dialed number after a filter was applied to it (where relevant). Otherwise identical to the Original Destination Number.
Source Group Number, Destination Group Number	Group of LCR resources from which the call had arrived to the LCR, as well as the group through which the call is sent out from the LCR.
Dial Date & Time	The moment the gateway received the call request (format = YYYY-MM-DD HH:MM:SS).
Alert Date & Time	The moment the remote party had begun ringing (if reported by the remote party, and supported by the outgoing resource).
Answer Date & Time	The moment the call had been connected (i.e. answered by the remote party).
Hangup Date & Time	The moment any of the parties had terminated the call.
From Resource	The resource through which the call entered the LCR entity.
To Resource	The resource through which the call was placed (after being routed according to the LCR rules).
Source Hangup Direction	0 = source party had terminated the call 1 = call was terminated by LCR (due to termination by the destination party, no route to destination, unavailable destination resource, etc.)

**Table 7: CDR Line Entries Explained**

<b>Entry</b>	<b>Explanation</b>
Destination Hangup Direction	0 = destination party had terminated the call 1 = call was terminated by LCR (due to termination by the source party etc.)
Hangup Reason	Cause code as reported by the party that had first terminated the call.
Call Duration	In seconds, measured between Answer-Time and Hangup-Time.


## Activating LCR in PC Cards

When PC1 and PC2 cards are used, you must manually activate the LCR service. This is not necessary when using PRI CB cards.

To manually activate LCR:

1. Click the Windows **Start** button > **All Programs**.
2. From the Hypermedia program group, select **HGS Setup Parameters**. The HGS Setup Parameters logon screen is displayed.
3. Enter your password and click **Submit**. The HGS Setup Parameters screen is displayed.

Note! you must stop server in order to edit and submit HGS parameters!


HGS Setup Parameters

Server address:

**System Functions**

HGS Server		<a href="#">Stop</a>
Set date (MM-DD-YY)	<input type="text" value="11-15-09"/>	
Set time (hh:mm:ss)	<input type="text" value="16:46:44"/>	<a href="#">Set</a>

**HGS Service Properties**

Property	Value
Management IP port	8878
Initial log level	3
Enable LCR	Yes
Enable VoIP	Yes

**VoIP Gateway Properties**

Property	Value
Max VoIP channels	32

**Note: Please stop HGS Server to change HGS settings.**

Figure 92: HGS Setup Parameters Screen

4. From the HGS Server system function line, click **Stop**. A confirmation message indicates that the service was stopped successfully.
5. Refresh the browser page, reenter your password and click **Submit**. The HGS Setup Parameters screen is displayed in Edit mode.

**System Functions**

HGS Server		<a href="#">Start</a>
Set date (MM-DD-YY)	<input type="text" value="11-15-09"/>	
Set time (hh:mm:ss)	<input type="text" value="16:47:47"/>	

**HGS Service Properties**

Property	Value	
Management IP port	8878	<a href="#">Edit</a>
Initial log level	3	<a href="#">Edit</a>
Enable LCR		<a href="#">Edit</a>
Enable VoIP		<a href="#">Edit</a>

**VoIP Gateway Properties**

Property	Value	
Max VoIP channels	32	<a href="#">Edit</a>

Figure 93: HGS Setup Parameters Screen in Edit Mode



- On the Disable LCR line, click **Edit**. The Value field becomes editable.

**HGS Service Properties**

Property	Value	
Management IP port	8878	<a href="#">Edit</a>
Initial log level	3	<a href="#">Edit</a>
Enable LCR	Yes	<a href="#">Save</a>
Enable VoIP	Yes	<a href="#">Edit</a>

**VoIP Gateway Properties**

Property	Value	
Max VoIP channels	32	<a href="#">Edit</a>

Figure 94: Editable Disable LCR Value Field

- Enter **0** (zero). Zero indicates that LCR is enabled.
- Click **Save**.
- Click **Submit**.
- From the HGS Server system function line, click **Start**. A confirmation message indicates that the service was started successfully.

## LCR CDRs

To manage and download the daily LCR CDR files:

1. From the HMC navigation pane, expand the **Monitor** branch.
2. Expand the **LCR Card** sub-branch and select **LCR CDRs**. The list of CDR files is displayed.

LCR CDR Files

File Name (click to download)	Last Modified	Size (bytes)	
Remaining space (disk): 18.66 megabytes			
LCR_CDR_20081211.log	11/12/2008 12:25	14944	
Remaining space (external): 964.75 megabytes			
LCR_CDR_20080630.1214873338.log	30/06/2008 21:25	25015	delete
LCR_CDR_20080701.1214959931.log	01/07/2008 21:59	26726	delete
LCR_CDR_20080702.1215046530.log	02/07/2008 22:11	25259	delete
LCR_CDR_20080703.1215133121.log	03/07/2008 20:52	6678	delete
LCR_CDR_20080704.1215216106.log	04/07/2008 21:17	2540	delete
LCR_CDR_20080706.1215388874.log	06/07/2008 22:57	17568	delete
LCR_CDR_20080707.1215475467.log	07/07/2008 22:23	29035	delete
LCR_CDR_20080708.1215562061.log	08/07/2008 19:50	26728	delete
LCR_CDR_20080709.1215648652.log	09/07/2008 21:29	30487	delete
LCR_CDR_20080710.1215735247.log	10/07/2008 21:55	27894	delete
LCR_CDR_20080711.1215821844.log	11/07/2008 22:35	1660	delete
LCR_CDR_20080712.1215908009.log	12/07/2008 19:20	282	delete

Figure 95: LCR CDR Files Screen

3. Click a file name. The standard Windows Open dialog box is displayed.
4. Define the location where the file will be saved and click **OK**. The file is downloaded to that location.

## Deciphering the CDR File

A CDR line is created in the file each time a LCR call ends. All CDR fields appear on a single line. For example:

12364,5003,0546858576,0546858576,1,2,2008-09-05 13:48:13,2008-09-05 13:48:14,2008-09-05 13:48:24,2008-09-05 13:50:42,31,23,1,0,10,138

The entries are explained in Table 8 on page 97. The format of the line is:

Call Index Number, Source Number, Original Destination Number, Filtered Destination Number, Source Group Number, Destination Group Number, Dial Date & Time, Alert Date & Time, Answer Date & Time, Hang-up Date & Time, From Resource, To Resource, Source Hang-up Direction, Destination Hang-up Direction, Hang-up Reason, Call Duration

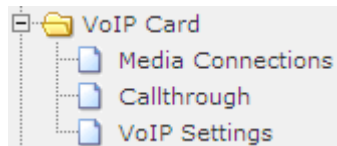
**Table 8: CDR Line Entries Explained**

<b>Entry</b>	<b>Explanation</b>
Call Index Number	Counts from 0, does not reset when a new file is created (i.e. when the date changes).
Source Number, Original Destination Number	Dialing and dialed numbers respectively.
Filtered Destination Number	Dialed number after a filter was applied to it (where relevant). Otherwise identical to the Original Destination Number.
Source Group Number, Destination Group Number	Group of LCR resources from which the call had arrived to the LCR, as well as the group through which the call is sent out from the LCR.
Dial Date & Time	The moment the gateway received the call request (format = YYYY-MM-DD HH:MM:SS).
Alert Date & Time	The moment the remote party had begun ringing (if reported by the remote party, and supported by the outgoing resource).
Answer Date & Time	The moment the call had been connected (i.e. answered by the remote party).
Hangup Date & Time	The moment any of the parties had terminated the call.
From Resource	The resource through which the call entered the LCR entity.
To Resource	The resource through which the call was placed (after being routed according to the LCR rules).
Source Hangup Direction	0 = source party had terminated the call 1 = call was terminated by LCR (due to termination by the destination party, no route to destination, unavailable destination resource, etc.)
Destination Hangup Direction	0 = destination party had terminated the call 1 = call was terminated by LCR (due to termination by the source party etc.)
Hangup Reason	Cause code as reported by the party that terminated the call.
Call Duration	In seconds, measured between Answer-Time and Hangup-Time.

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## Chapter 5

# CONFIGURING THE VOIP CARD



This section contains:

- “VoIP Media Connections” on page 100
- “Callthrough” on page 103
- “VoIP Settings” on page 105
- “VoIP Management Features” on page 107
- “Monitoring VoIP Cards” on page 115

## VoIP Media Connections

Use the Media Connection screen to configure the connections from a VoIP card to other cards and channels in the system, including the Cellular cards (CG) and the PRI cards (E1). The matrix can be configured in any combination.

### Associating/Linking VoIP Channels

To associate a VoIP channel with another media channel:

1. From the VoIP Card branch of the HMC navigation pane, click the **Media Connections** sub-branch. The Media Matrix is displayed.

VoIP Media Matrix

Select Media Gateway card

Slot

Selected card at slot 11 (Media Card)

Channel	Target Link (Select to change)
1	E1.0(13) Channel 1
2	E1.0(13) Channel 2
3	E1.0(13) Channel 3
4	E1.0(13) Channel 4
5	-
6	-
7	-
8	-
9	-
10	-
11	-
12	-
13	-

Figure 96: HMC VoIP Card Media Matrix Screen

2. If more than one slot is displayed, select a specific VoIP card. The Media Matrix of that VoIP card is displayed.
3. Click within a channel row. The row turns yellow.
4. Click **Edit**. The row becomes configurable.

Channel	Target Link <a href="#">Edit</a>
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-

Channel	Target Link <a href="#">Save</a>   <a href="#">Cancel</a>
1	LCR Resource 65
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-

Figure 97: Media Matrix Row when Configurable

5. From the first dropdown list, allocate this channel to a card by selecting the card.

**Note:** If all of the card's channels are already allocated, the message "Fully allocated" appears.

- From the second dropdown list, assign this channel to a specific channel on the target card.

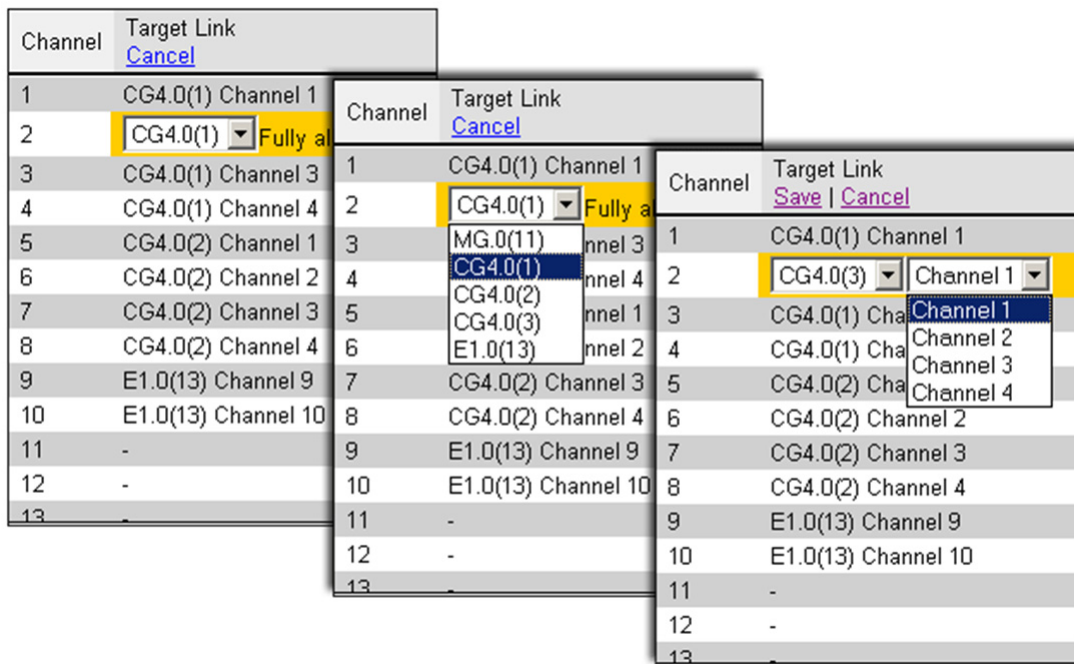


Figure 98: Assigning a Target Link

- Click **Save**. The configuration dropdown boxes are hidden.
- Optionally, repeat the process for additional channels and other media types.
- Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## Unlinking VoIP Allocations

---

To break an allocation:

1. From the VoIP Card branch of the HMC navigation pane, click the **Media Connections** sub-branch. The Media Matrix is displayed.
2. Click within a channel row. The row turns yellow.

Channel	Target Link <a href="#">Edit</a>   <a href="#">Unlink</a>
1	CG4.0(1) Channel 1
2	CG4.0(1) Channel 2
3	CG4.0(1) Channel 3

Figure 99: Breaking a PRI Target Link

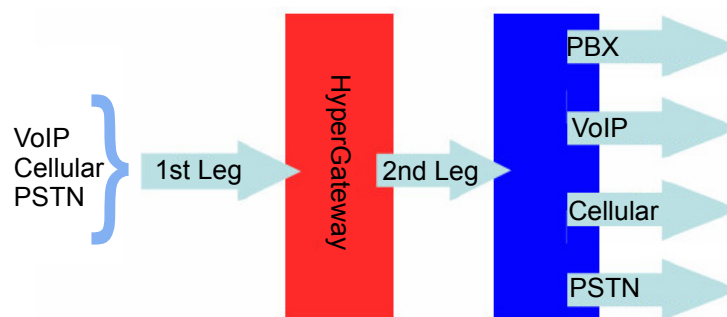
3. Click **Unlink**.
4. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.



## Callthrough

Use Callthrough to place calls, via the Hypermedia Gateway, to external numbers. Users receive a dial-tone from the Gateway and can then place calls either:

- via the PBX to a corporate extension
- to a VoIP phone number
- to a Cellular phone number
- to a PSTN phone number



To configure Callthrough:

1. Ensure that at least one VoIP Card > Media Connection channel is linked to the target Callthrough equipment and is unallocated (see “VoIP Media Connections” on page 100).
2. From the VoIP Card branch of the HMC navigation pane, click the **Callthrough** sub-branch. The Callthrough screen is displayed.

VOIP Card Callthrough Resources

Select MG card  
Slot

Selected card at slot 11

Channel	Set 1st Leg	Status	Group	Other Leg
Channel 1	<input type="checkbox"/>	Free (VoIP GW)	General	E1.0(13) Chan. 1
Channel 2	---	Unmapped.	---	---
Channel 3	---	Unmapped.	---	---
Channel 4	---	Unmapped.	---	---
Channel 5	---	Unmapped.	---	---
Channel 6	---	Unmapped.	---	---
Channel 7	---	Unmapped.	---	---
Channel 8	---	Unmapped.	---	---
Channel 9	---	Unmapped.	---	---
Channel 10	---	Unmapped.	---	---
Channel 11	---	Unmapped.	---	---
Channel 12	---	Unmapped.	---	---
Channel 13	---	Unmapped.	---	---

Figure 100: HMC VoIP Card Callthrough Resources Screen

3. Select a Channel's **Set 1st Leg** checkbox. When selected, this Channel can accept Callthrough calls from the user. Also, when selected, this Channel is not used for standard calls.

**Note:** *To clear a checkbox, from the VoIP Card Media Connection branch, select the channel and click Unlink.*

**Note:** *The Other Leg column displays the equipment used for the 2nd leg of the Callthrough.*

4. From the **Group** dropdown list, select the Group that will be allowed to use this Callthrough Resource. These are the Groups that are defined in the VPN Groups sub-branch of the Manage branch.
5. Repeat the procedure for other Resources that will be allocated to Callthrough calls.
6. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.

## VoIP Settings

An extensive set of parameters is used to support a Voice over IP network. Use the VoIP Settings screen to configure VoIP parameters.

**Note:** Different versions of the VoIP Settings screen exist depending upon which VoIP protocol is installed, H.323 or SIP.

1. From the VoIP Card branch of the HMC navigation pane, click the **VoIP Settings** sub-branch. The VoIP Parameters screen is displayed.

VoIP Parameters

<b>VoIP to Line: Cyclic Channel Allocation</b> If set to 'Yes' then a cyclic channel allocation will be performed for incoming calls from the VoIP network. If set to 'No' the first available channel will be used for the call (only relevant for incoming VoIP calls).	Yes
<b>Early Media</b> If set to 'Yes' then the VoIP media will be transmitted as soon as the media channel can be opened. If set to 'No' then the media stream will start upon receiving the answer supervision from the phone being dialed to (only relevant for incoming VoIP calls).	Yes
<b>Public IP</b> Sets the Hypergateway public IP	62.219.233.78

Figure 101: HMC VoIP Card VoIP Parameters Screen

2. Configure the settings:

### VoIP to Line: Cyclic Channel Allocation

Select either Yes or No. When Yes is selected, the Gateway assigns incoming VoIP calls sequentially. Channel use is distributed evenly. When No is selected, the Gateway assigns incoming VoIP calls to the first available channel.

### Early Media

Select either Yes or No. When Yes is selected, the Gateway transmits VoIP media as soon as the media channel is opened. When No is selected, the Gateway waits to transmit VoIP media until it receives answer supervision from the destination phone.

### Public IP

Enter the IP address that is used to access the Gateway from a remote location.

### IP Precedence

Use IP Precedence to assign values from 0 (default) to 7 to classify and prioritize types of traffic.

### IP Type of Service

Use Type of Service (ToS) to manage the Quality of Service (QoS) throughout a network.

### Number of Calls for ASR/ACD Statistics

This parameter determines how many of the most recent calls are evaluated for determination of ASR and ACD statistics. For example, if the number 20 is entered only the last 20 calls will be calculated and evaluated.

**User Input Indication**

There are several protocols defining how VoIP handles the input of DTMF tones by users. This parameter determines which of those protocols are used by the Gateway.

**RFC2833 Payload**

This defines the payload type used for creating/recreating DTMF tones.

**Enable Codecs**

From each drop-down menu, select the Codecs the Gateway will support. Order them according to the sequence which the Gateway will use.

**Payloads per Packet**

Enter the number of Codec payloads that are carried by each RTP packet.

**SIP Proxy**

Enable or disable use of a SIP Proxy. When enabled, enter the IP address, Username, and Password.

**PIN Code Send Delay**

Enter a period of time, measured in milliseconds, after which the PIN code will be sent to the destination Gateway.

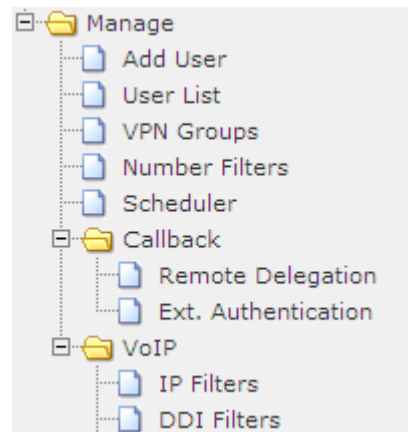
**PIN Code Inter-Digit Delay**

Enter a period of time, measured in milliseconds, between each PIN code digit sent.

3. Click **Submit**.
4. From the HMC navigation pane, click **Save Configuration**. Initialization takes about 15 seconds.

## VoIP Management Features

Use VoIP Management Features to enhance the overall performance of the VoIP network. VoIP Management Features enable you to restrict incoming calls, refined routing, and review VoIP messages.



### IP Filters

Use IP Filters to create a White List of IP addresses. This is a list of destinations prefixes that can be dialed through the system.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Expand the **VoIP** branch.
3. Click **IP Filters**. The IP Filter List screen is displayed.

IP Filter List

---

Group Name <input type="text"/>	IP Address White List <input type="text"/>
IP Address <input type="text"/>	<input type="button" value="Delete selected"/>
<input type="button" value="Add IP to list =&gt;"/>	<input type="button" value="Add Entry"/>

Group Name	IP White List

Figure 102: HMC VoIP Card IP Filters List Screen

4. In the **Group Name** field, enter the name of an existing group or of a new group.

5. Enter an endpoint IP Address that the user is permitted to access via the VoIP Gateway.
6. Click **Add IP to list**. The new IP address appears in the IP Address White List box.
7. Repeat steps 5–6 until all IP addresses associated with that Group have been entered.

IP Filter List

---

<p>Group Name Demo_3</p> <p>IP Address 9 9 9 9</p> <p style="text-align: center;">Add IP to list =&gt;</p>	<p>IP Address White List 7.7.7.7 8.8.8.8</p> <p style="text-align: center;">Delete selected</p>
<p>Add Entry</p>	

Group Name	IP White List
Demo	1.1.1.1 <span style="float: right;">Delete</span>
Demo_2	4.4.4.4 <span style="float: right;">Delete</span>
Test_sor	213.215.61.146 <span style="float: right;">Delete</span>

Figure 103: Configuring IP White List

8. Click **Add Entry**. The new Group and the IP White List are displayed in the box below.

**Note:** To review the list of IP addresses associated with a Group, open the dropdown list in the Group's Row.

## DDI Filters (Direct Dial-in)

---

Use DDI Filters to create a White List of Direct Dial-In numbers and prefixes. This is a list of endpoints from which a user is permitted to receive calls via the VoIP Gateway.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Expand the **VoIP** branch.
3. Click **DDI Filters**. The DDI Filter List screen is displayed.

DDI Filter List

---

Group Name <input type="text"/> DDI Prefix <input type="text"/> <input type="button" value="Add DDI to list =&gt;"/>	DDI Prefix White List <input type="text"/> <input type="button" value="Delete selected"/>
--	---

Group Name	DDI White List

Figure 104: HMC VoIP Card DDI Filters List Screen

4. In the **Group Name** field, enter the name of an existing group or of a new group.
5. Enter a phone number—or a prefix to allow a group of numbers—from which a user is permitted to receive calls via the VoIP Gateway.
6. Click **Add DDI to list**. The new DDI appears in the DDI Prefix White List box.
7. Repeat steps 5–6 until all DDI Prefixes associated with that Group have been entered.

DDI Filter List

---

Group Name <input type="text" value="Demo_3"/> DDI Prefix <input type="text" value="891"/> <input type="button" value="Add DDI to list =&gt;"/>	DDI Prefix White List <input type="text" value="234"/> <input type="text" value="567"/> <input type="button" value="Delete selected"/>
---	---

Group Name	DDI White List	
Demo	<input type="text" value="304"/>	<input type="button" value="Delete"/>
Demo_2	<input type="text" value="123"/>	<input type="button" value="Delete"/>

Figure 105: Configuring DDI White List

8. Click **Add Entry**. The new Group and the DDI White List are displayed in the box below.

**Note:** To review the list of DDI Prefixes associated with a Group, open the dropdown list in the Group's Row.

## Dial Filters

Use the VoIP Dial Filters screen to apply Number Filters to a VoIP channel.

**Note:** For information on defining Number Filters, see “Number Filters” on page 125.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Expand the **VoIP** branch.
3. Click **Dial Filters**. The VoIP Dial Filter List screen is displayed.

VoIP Dial Filters

Channel	Application	Filter Name	Action
1	VoIP		<a href="#">Edit</a>
2			<a href="#">Edit</a>
3			<a href="#">Edit</a>
4			<a href="#">Edit</a>
5			<a href="#">Edit</a>
6			<a href="#">Edit</a>
7			<a href="#">Edit</a>
8			<a href="#">Edit</a>
9			<a href="#">Edit</a>
10			<a href="#">Edit</a>

Figure 106: HMC VoIP Card Dial Filter List Screen

4. Click **Edit**. A dropdown list of existing filters is displayed in the Filter Name column.
5. Select a filter from the dropdown list. The prompt in the Action column changes to Save.

VoIP Dial Filters

Channel	Application	Filter Name	Action
1	VoIP	- No Filter -	<a href="#">Save</a>
2		- No Filter -	<a href="#">Edit</a>
3		newplan	<a href="#">Edit</a>
4		add9	<a href="#">Edit</a>
5		tarik	<a href="#">Edit</a>
6		tarik2	<a href="#">Edit</a>
7		cut972	<a href="#">Edit</a>
8		014	<a href="#">Edit</a>
9			<a href="#">Edit</a>
10			<a href="#">Edit</a>
11			<a href="#">Edit</a>
12			<a href="#">Edit</a>

Figure 107: Configuring Dial Filters

6. Click **Save**.



## Call Routing

Use Call Routing to create a list of IP resources that can dial through the system.

1. Ensure that the required DDI filters (see p. 108) and IP filters (see p. 107) are defined. Call Routing makes use of pre-defined DDI filters and IP filters.
2. From the HMC navigation pane, expand the **Manage** branch.
3. Expand the **VoIP** branch.
4. Click **Call Routing**. The VoIP Channel Restrictions screen is displayed.
5. From the **Channel** box, select the channel that the restrictions will be applied to.

VoIP Channel Restrictions

Channels	IP Group / DDI Prefix Group restrictions
<div style="border: 1px solid gray; padding: 2px;">           1 2 3 4 5         </div>	<div style="border: 1px solid gray; padding: 2px;">           IP restriction group            Demo_2         </div> <div style="border: 1px solid gray; padding: 2px; margin-top: 5px;">           DDI Prefix restriction group            Demo_2         </div> <div style="text-align: right; margin-top: 10px;"> <input type="button" value="Add Entry"/> </div>

Channel	Allowed IP List	Allowed DDI List
1	Test_sor	Allow All
2	Demo	Demo
3	Block	Block
4	Block	Block
5	Block	Block
6	Block	Block
7	Block	Block
8	Block	Block

Figure 108: HMC VoIP Card VoIP Channel Restrictions Screen

6. From the **IP restriction group** dropdown menu, select a pre-defined filter.
7. From the **DDI Prefix restriction group** dropdown menu, select a pre-defined DDI filter.
8. Click **Add Entry**. The restrictions are displayed in the table in the channel's row.

## Phone2Net Dial Plan

The Phone2Net Dial Plan connects phone calls to IP network phones. For example, when the Hypermedia Gateway system receives an incoming call to: Dialed Number = 077444 it can forward the call to the IP Phone at Destination IP = 192.168.1.67.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Expand the **VoIP** branch.
3. Click **Phone2Net Dial Plan**. The Phone2Net Dialing Plan screen is displayed.

VoIP - Phone to Net Dialing Plan

Dialed Number	Dest. IP	Dest. Number	PIN Code
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Add Entry"/>			

Dialed Number	Destination IP	Dest. Number	PIN Code	
0	84.45.87.242	-	-	<input type="button" value="Delete"/>
1	84.45.87.242	-	-	<input type="button" value="Delete"/>
2	84.45.87.242	-	-	<input type="button" value="Delete"/>
3	84.45.87.242	-	-	<input type="button" value="Delete"/>
4	84.45.87.242	-	-	<input type="button" value="Delete"/>
5	84.45.87.242	-	-	<input type="button" value="Delete"/>
6	84.45.87.242	-	-	<input type="button" value="Delete"/>
8	84.45.87.242	-	-	<input type="button" value="Delete"/>
9	84.45.87.242	-	-	<input type="button" value="Delete"/>

Figure 109: HMC VoIP Card Phone to Net Dialing Plan Screen

4. In the **Dialed Number** field, enter the phone number received by the Gateway.
5. Enter either:
  - in the **Dest. IP** field, the IP address that the call will be connected to
  - in the **Dest. Number** field, the phone number that the call will be connected to
6. If necessary, in the **PIN Code** field, enter the PIN code.
7. Click **Add Entry**. The new entry is displayed in the area below.

## DDI Blocking

Use the DDI Blocking screen to import a comma-separated file (csv) file of phone numbers. The Hypermedia Gateway will not dial those phone numbers.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Expand the **VoIP** branch.
3. Click **DDI Blocking**. The DDI Blocking screen is displayed.

Block DDI Numbers

Import File:	<input type="text"/>	<input type="button" value="Browse..."/>
<input type="button" value="Import DDIs"/>		
Browse DDIs that	start with	<input type="text"/>
<input type="button" value="Submit"/>		

**Blocked DDI prefixes (Total: 0/0)**

---



---

Figure 110: HMC VoIP Card DDI Blocking Screen

4. Click **Browse** and locate the file containing the DDIs.

5. Click **Import DDIs**.
6. Use the two dropdown lists to refine the list of DDI numbers that will be blocked.
7. Click **Submit**. The list is displayed in the area below.

## Cause Codes

Cause codes represent the reason for releasing the a call. The Hypermedia Gateway can manipulate the releasing Cause code—that is, Convert to Value—if we do not want to report the exact reason for call release.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Expand the **VoIP** branch.
3. Click **Cause Codes**. The Cause Codes screen is displayed.

Code Description	Code Value	Convert to Value	
Valid cause code not yet received	00 (0)	00 (0)	<a href="#">Edit</a>
Unallocated (unassigned) number	01 (1)	01 (1)	<a href="#">Edit</a>
No route to specified transit network (WAN)	02 (2)	02 (2)	<a href="#">Edit</a>
No route to destination	03 (3)	03 (3)	<a href="#">Edit</a>
Send special information tone	04 (4)	04 (4)	<a href="#">Edit</a>
Misdialed trunk prefix.	05 (5)	05 (5)	<a href="#">Edit</a>
Channel unacceptable	06 (6)	06 (6)	<a href="#">Edit</a>
Call awarded and being delivered in an established channel	07 (7)	07 (7)	<a href="#">Edit</a>

[Show Converted](#)    [Reset Codes](#)    [Save Conversions](#)

Figure 111: HMC VoIP Card Cause Codes Screen

4. On a code description line, click **Edit**. A dropdown menu is displayed in the Convert to Value field.

Code Description	Code Value	Convert to Value	
Valid cause code not yet received	00 (0)	00 (0)	<a href="#">Edit</a>
Unallocated (unassigned) number	01 (1)	01 (1)	<a href="#">Edit</a>
No route to specified transit network (WAN)	02 (2)	02	<a href="#">Save</a>
No route to destination	03 (3)	03 (3)	<a href="#">Edit</a>
Send special information tone	04 (4)	04 (4)	<a href="#">Edit</a>
Misdialed trunk prefix.	05 (5)	05 (5)	<a href="#">Edit</a>
Channel unacceptable	06 (6)	06 (6)	<a href="#">Edit</a>
Call awarded and being delivered in an established channel	07 (7)	07 (7)	<a href="#">Edit</a>

[Show Converted](#)    [Reset Codes](#)    [Save Conversions](#)

Figure 112: Editable Value Field

5. Select a new value.
6. Click **Save**.
7. Click **Submit**.
8. Two additional options exist:
  - Show Converted**  
Displays the converted values.
  - Reset Codes**  
Assigns the original cause code values.
9. Click **Save Conversions**.

## Monitoring VoIP Cards

Use the Monitor VoIP Cards > VoIP Status screen to review information about the status of the VoIP card and to control line activity.

### Review VoIP Card Information

---

To review VoIP Card information:

1. Expand the Monitor > VoIP Cards sub-branch and select **VoIP Status**.

VoIP Card Status

Line	Direction/Type	State	To	Remote IP	ASR	ACD
1	-	Idle	-	-	-	-
2	-	Blocked	-	-	-	-
3	-	Blocked	-	-	-	-
4	-	Blocked	-	-	-	-
5	-	Blocked	-	-	-	-
6	-	Blocked	-	-	-	-
7	-	Blocked	-	-	-	-
8	-	Blocked	-	-	-	-
9	-	Blocked	-	-	-	-
10	-	Blocked	-	-	-	-
11	-	Blocked	-	-	-	-

Lines connected: 0    Lines dialing: 0    Global ASR: 0%    Global ACD: 0%

Figure 113: VoIP Card Status Screen

2. Review the status of VoIP Lines. The following information is displayed:

**Direction/Type**

Calls can either be from network to the line or from the line to network.

**State**

“Connected” indicates that the channel is busy. “Idle” indicates that there is no call activity on a channel.

**To**

This displays the destination number that the call is being made to.

**Remote IP**

This displays the IP address of destination endpoint or gateway.

**ASR (Answer-Seizure Ratio)**

This is the ratio of successfully connected calls to attempted calls and is also known as the Call Completion Rate.

**ACD (Average Call Duration)**

This is the average duration of the calls routed by a VoIP provider. It is a quality parameter given by the VoIP providers.

3. Review the totals. The total numbers of lines connected, lines dialing, and global ASR and ACD are displayed below table.

## Controlling VoIP Line Activity

To control VoIP line activity:

1. Expand the Monitor > VoIP Cards sub-branch and select **VoIP Status**.
2. Right-click within a line. The line turns yellow and a popup menu is displayed.

### VoIP Card Status

Line	Direction/Type	State	To
1	-	Idle	-
2	-	Blocked	-
3	-	Blocked	-
4	-	Blocked	-
5	-	Blocked	-
6	-	Blocked	-
7	-	Blocked	-
8	-	Blocked	-
9	-	Blocked	-
10	-	Blocked	-

Figure 114: VoIP Card Monitor Dropdown Menu

3. Select from the following controls:

#### **Fast Block**

Changes the State to Fast Blocked. The line cannot be used.

#### **Fast Unblock**

Returns the State to Idle. The line is available.

#### **Send DTMF**

Opens the Send DTMF tool. Enter the number of the DTMF and click Send.

#### **Reset ASR**

Restarts the calculating of the ASR.

#### **Reset ACD**

Restarts the calculating of the ACD.

#### **Reset Both**

Restarts the calculating of both the ASR and the ACD.

#### **Clear Call**

Disconnects the current call. A confirmation message is displayed. Click OK to disconnect the call.

Access current channel dial 1\*



[close](#)

Line	Direction/Type
1	-

## VoIP CDRs

---

To manage and download the daily VoIP CDR files:

1. Expand the Monitor > VoIP Cards sub-branch and select **VoIP CDRs**. The VoIP CDR Files screen is displayed.

VoIP CDR Files

File Name (click to download)	Last Modified	Size (bytes)	
VoIP_CDR_20081104.log	04/11/2008 14:13	0	delete
VoIP_CDR_20081106.log	06/11/2008 11:38	0	delete
VoIP_CDR_20081109.log	09/11/2008 11:10	0	delete
VoIP_CDR_20081123.log	23/11/2008 10:57	0	delete
VoIP_CDR_20081203.log	03/12/2008 12:21	0	delete
VoIP_CDR_20081207.log	07/12/2008 14:53	0	delete
VoIP_CDR_20081230.log	30/12/2008 11:48	0	delete
VoIP_CDR_20090104.log	04/01/2009 11:53	0	delete
VoIP_CDR_20090106.log	06/01/2009 08:56	0	delete
VoIP_CDR_20090111.log	12/01/2009 11:48	745	delete
VoIP_CDR_20090112.log	13/01/2009 10:58	2803	delete
VoIP_CDR_20090113.log	17/01/2009 21:26	6874	delete
VoIP_CDR_20090117.log	17/01/2009 21:26	0	delete
VoIP_CDR_20090118.log	18/01/2009 00:01	0	delete

Figure 115: VoIP CDR Files Screen

2. Double-click a log-file. The standard browser Open or Save dialog box is displayed.
3. Click either **Open** or **Save**.
4. Review the file.

## Deciphering the VoIP CDR File

---

A CDR line is created in the file each time a VoIP call ends. All CDR fields appear on a single line without text-wrapping. Below is an example of a VoIP CDR entry but distorted by text-wrapping:

```
60,2009-01-12 T 11:48:51,2009-01-12 T 11:48:51,"102",07744445003,,2009-01-12 T
11:48:55,,212.143.136.19,212.143.136.19,16386,2,12,0,0,0,0,0,10
```

The entries are explained in Table 9 on page 118.

**Table 9: Deciphering the VoIP CDR File**

Column Number	Field Name	Description
1	CallID	A unique identifier for the call
2	Received	The time when the incoming call was received
3	Dialed	The time when the remote party was dialed to (may be empty if no resources were available to place the call)
4	Alerting	The time when an alerting signal was received from the remote party (may be in the if no resources were available to complete the call or a fan error or hang-up event was received prior to this stage).
5	E164Src	The number that the call is being made from.
6	E164Dest	The number that the call is being made to.
7	Start Time	Time when the call started in ISO 8601 format (two-way RTP audio channels open) (e.g. 2004-08-08 T 10:24:18 +0200). May be empty if call did not connect.
8	End Time	Time when call ended in ISO 8601 format (two-way RTP audio channels closed)
9	Duration	Duration of call in seconds
10	Remote Signal IP	IP address of remote H.323/SIP endpoint / gateway
11	RemoteMediaADDR	IP address of remote RTP endpoint
12	Remote Media Port	IP Port of remote RTP endpoint
13	Local Channel	Channel used on VoIP card
14	Remote Card Slot	Slot number of card connected to VoIP channel
15	Called Direction	Direction of call. Possible values are: 0 – Call from network to line 1 – Call from line to network



**Table 9: Deciphering the VoIP CDR File**

<b>Column Number</b>	<b>Field Name</b>	<b>Description</b>
16	Hangup Initiator	Initiator of hang-up. Possible values are: 0 – Network 1 – Line
17	TxRTP	Number of RTP packets sent during the session
18	RxRTP	Number of RTP packets received during the session
19	Lost RTP	Number of RTP packets lost during the session
20	Hangup Reason	Q.931 reason for call hang-up

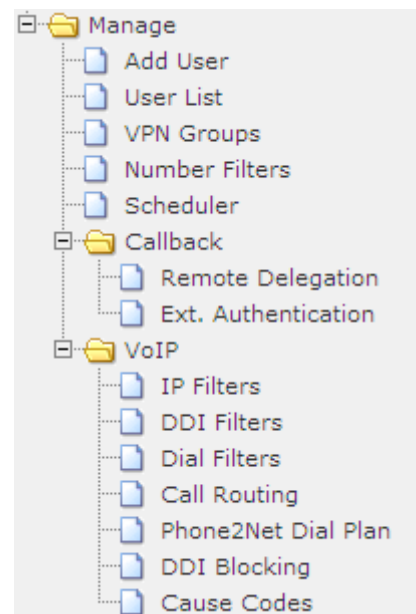
*This page is intentionally blank.*

## Chapter 6

# MANAGING via the HMC

This section contains:

- “Add User” on page 122
- “User List” on page 123
- “VPN Groups” on page 124
- “Number Filters” on page 125
- “Scheduler” on page 127
- “Callback” on page 137



## User Management

Use this screen when configuring Callback and Callthrough. Perform initial user configuration using the Add User screen. To change a user's configuration, and to delete a user, use the User List screen.

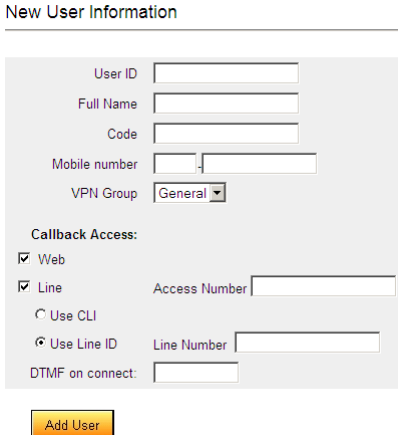
***Note:** These User Management features belong to the Hypersavings Package and require a separate license.*

### Add User

Use the Add User branch to define Gateway users and to manage their Callback access.

To add a new user:

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Add User** sub-branch. The New User Information screen is displayed.



New User Information

User ID

Full Name

Code

Mobile number

VPN Group

Callback Access:

Web

Line

Use CLI

Use Line ID

DTMF on connect:

Figure 116: HMC New User Screen

3. Enter the following user information:

**User ID**

This can be any string. The information reappears in the All Users table.

**Full Name**

This information reappears in the All Users table.

**Code**

Any random string of numbers and letters.

**Mobile Number**

Enter the user's mobile device number.

### VPN Group

From the dropdown menu, assign the user to a VPN Group.

4. Define the users Callback access:

#### Web

This feature is currently being developed. Contact Technical Support for information about using a browser-based visual Callback Dialer to dial a destination number and receive a callback call on a registered callback number.

#### Line

When selected, the user is able to trigger a Callback via a telephone call. If selected:

- a. In the Access Number field, enter the phone number the user dials to access the Hypermedia Gateway.
- b. Select one of the following:
  - Use CLI  
The Hypermedia Gateway uses Caller Line Identification (CLI) to automatically identify the phone number to be called back.
  - Use Line ID  
Enter the Line Number. The Hypermedia Gateway calls back the number entered in the Line Number field.

#### DTMF on connect

Enter the DTMF sequence the user must push to gain access to the Gateway.

5. Click **Add User** and wait for the “User added successfully” message.

## User List

---

Use the User List to review a list of defined Gateway users and to modify their definitions.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **User List** sub-branch. The User List screen is displayed.

User List

User ID	Name	Code	Number	Access #	Line ID		
123	123	123	8001441796322495			Modify	Delete
matti	matti	12345	0548409120			Modify	Delete
matti2	mart	12378	052-3776882			Modify	Delete
mdavidi		5025	0011	054-5227842		Modify	Delete
moti	moti	12345678	052-4558888			Modify	Delete
user		3563686	442084561997			Modify	Delete
user3		0977	442084567359			Modify	Delete

Figure 117: HMC User List

3. Optionally, click a table heading cell to resort the entries.
4. Optionally, click **Modify** to change a User’s definitions.

## VPN Groups

Create VPN Groups to enable organized assignment of features or parameters. For example, Callback resources can be reserved for members of a specific VPN Group.

**Note:** VPN Groups belong to the *Hypersavings Package* and require a separate license.

To create a VPN Group:

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **VPN Groups** sub-branch. The VPN Groups screen is displayed.

VPN Groups

---

Group Name

[Add Group](#)

---

Available Groups	
General	
e1	<a href="#">Delete Group</a>
Anyone	<a href="#">Delete Group</a>
Demo	<a href="#">Delete Group</a>

Figure 118: HMC VPN Groups Screen

3. In the **Group Name** field, enter a name for the new Group.
4. Click **Add Group**. The new Group Name will be saved and added to the column of Available Groups.

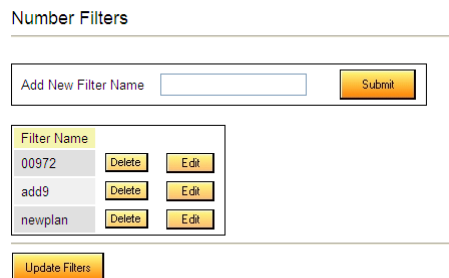
## Number Filters

Use Number Filters to perform advanced manipulations on numbers that are sent to, or received by, the Gateway. All numbers are compared to the configured set of rules. If the number matches a rule, the rule is applied and a new number is dialed.

***Note:** The Number Filters feature is relevant only to Hypermedia HG4000 Gateways.*

To create a Number Filter:

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Number Filters** sub-branch. The Number Filters screen is displayed.



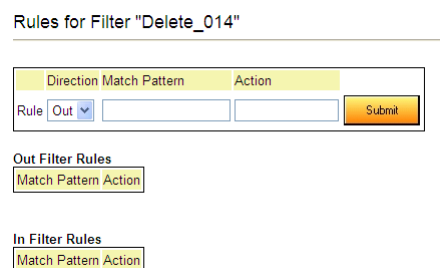
Number Filters

Add New Filter Name

Filter Name	Delete	Edit
00972	<input type="button" value="Delete"/>	<input type="button" value="Edit"/>
add9	<input type="button" value="Delete"/>	<input type="button" value="Edit"/>
newplan	<input type="button" value="Delete"/>	<input type="button" value="Edit"/>

Figure 119: Number Filters Screen

3. In the **Add New Filter Name** field, enter a name for the new filter.
4. Click **Submit**. The Number Filters screen is displayed; the new filter appears in the list of Filter Names.
5. Click the **Edit** button beside the new filter's name. The **Rules for Filter <name>** screen is displayed.



Rules for Filter "Delete\_014"

Direction	Match Pattern	Action
Rule: Out	<input type="text"/>	<input type="text"/> <input type="button" value="Submit"/>

**Out Filter Rules**  
Match Pattern Action

**In Filter Rules**  
Match Pattern Action

Figure 120: Edit Number Filters Screen

6. Select a Rule **Direction**.

### Out

Use Out filters to apply the filters to outgoing calls. For example, if a number begins with the Country Code 44 and is followed by seven or more digits, this filter—  
`^44(d\d\d\d\d\d\d+) $1` —removes the country code and dials only the digits following the Country Code.

This second example is an Out filter that adds the suffix ‘9’ to all outgoing calls which have five or more digits (for getting an outside line)— `(d\d\d\d\d+) 9$1`

### In

Use In filters to apply the filters to incoming calls.

- Using standard Regular Expressions, enter the Match Pattern and the Action that will occur when the pattern is matched.

**Note:** For more information about Regular Expressions, see: <http://www.regular-expressions.info>

- Click **Submit**. The Rule is listed in either the Out Filter Rules or the In Filter Rules list.

Rules for Filter "Delete\_014"

Direction	Match Pattern	Action
Rule: Out	<input type="text"/>	<input type="text"/>

**Out Filter Rules**

Match Pattern	Action
<input type="text"/>	<input type="text"/>

**In Filter Rules**

Match Pattern	Action
<code>*014(d\d\d\d\d\d\d+) \$1</code>	<input type="button" value="Delete"/>

Figure 121: New Filter is Displayed

- Click the **Number Filters** sub-branch.
- Click **Update Filters**.



## Scheduler

Use the Task Scheduler to configure the Gateway to repeat commands at scheduled intervals. Five commands are preconfigured. In addition, it is possible to manually configure a command.

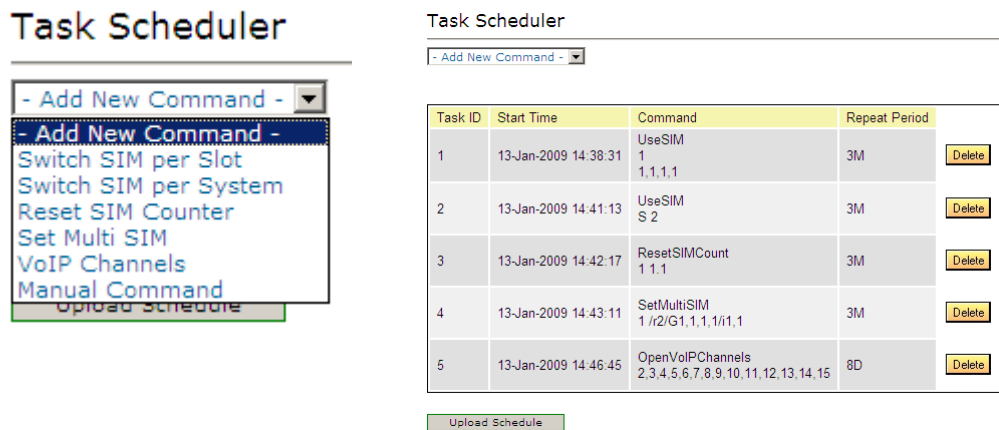


Figure 122: Dropdown Menu of Tasks and Table of Scheduled Tasks

## Switch SIM per Slot

Use the Switch SIM per Slot task to configure a GSM slot to use specific SIM cards for a defined period of time.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Scheduler** sub-branch. The Task Scheduler screen is displayed.
3. From the **Add New Command** dropdown menu, select **Switch SIM per Slot**. The Task Scheduler automatically advances to the next screen.

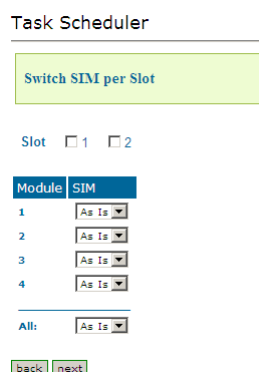


Figure 123: Task Scheduler Switch SIM per Slot Screen

4. Configure the task parameters:

**Slot**

Select or clear the checkboxes. Each checkbox represents the GSM card located in the numbered slot counting from the left.

**SIM**

From each module's dropdown menu, select the SIM card that that module will use. Select **As Is** if the Gateway does not change the SIM activity.

**Note:** Use the *All* dropdown menu to assign the same SIM card to all four modules.

5. Click **Next**. The Set Command screen, with the command syntax, is displayed.

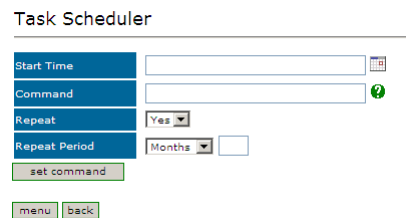



Figure 124: Task Scheduler Set Command Screen

**WARNING!** Clicking *menu* deletes the new task. The table of schedules tasks is redisplayed.

6. Configure the task's schedule:

- a. Click  (calendar icon). A calendar opens in a new browser tab.

**Note:** First, set the time. As soon as you click the date, the browser tab closes and the date and time are entered into the Start Time field.

- b. Enter the time that the command will start.
  - c. Enter the date that the command will start. When you click the date, the browser tab closes and the date and time are entered into the Start Time field.
  - d. From the Repeat drop-down menu, select either Yes or No.
  - e. If the task is configured to repeat, select a **Repeat Period**. The Repeat Period can be either months, days, hours, or minutes.
7. Click **Set Command**. The new Task is displayed in the Task Scheduler screen.

- Click **Upload Schedule**. The Server activates the schedule according to the defined dates and times.

## Switch SIM per System

---

Use the Switch SIM per System task to configure a Gateway to use one specific SIM card for a defined period of time.

- From the HMC navigation pane, expand the **Manage** branch.
- Click the **Scheduler** sub-branch. The Task Scheduler screen is displayed.
- From the **Add New Command** dropdown menu, select **Switch SIM per System**. The Task Scheduler automatically advances to the next screen.

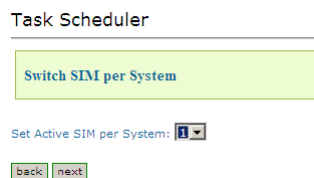


Figure 125: Task Scheduler Switch SIM per System Screen

- From the Set Active SIM per System dropdown menu, select the SIM card that the entire system will use.
- Click **Next**. The Set Command screen, with the command syntax, is displayed.

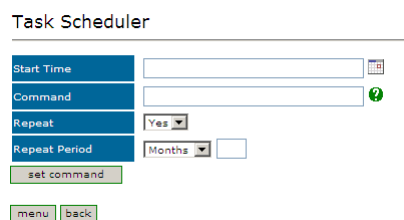



Figure 126: Task Scheduler Set Command Screen

**WARNING!** Clicking **menu** deletes the new task. The table of schedules tasks is redisplayed.

6. Configure the task's schedule:

- a. Click  (calendar icon). A calendar opens in a new browser tab.

**Note:** First, set the time. As soon as you click the date, the browser tab closes and the date and time are entered into the Start Time field.

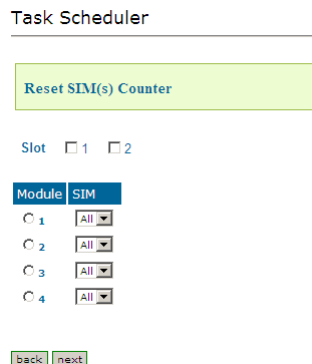
- b. Enter the time that the command will start.
  - c. Enter the date that the command will start. When you click the date, the browser tab closes and the date and time are entered into the Start Time field.
  - d. From the Repeat drop-down menu, select either Yes or No.
  - e. If the task is configured to repeat, select a **Repeat Period**. The Repeat Period can be either months, days, hours, or minutes.
7. Click **Set Command**. The new Task is displayed in the Task Scheduler screen.
8. Click **Upload Schedule**. The Server activates the schedule according to the defined dates and times.

## Reset SIM Counter

---

Use the Reset SIM Counter task to configure a GSM slot's module to restart the recording of time in use.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Scheduler** sub-branch. The Task Scheduler screen is displayed.
3. From the **Add New Command** dropdown menu, select **Reset SIM Counter**. The Task Scheduler automatically advances to the next screen.



Task Scheduler

Reset SIM(s) Counter

Slot  1  2

Module	SIM
<input type="radio"/> 1	All
<input type="radio"/> 2	All
<input type="radio"/> 3	All
<input type="radio"/> 4	All

back next

Figure 127: Task Scheduler Reset SIM Counter Screen

4. Configure the task parameters:

### Slot

Select or clear the checkboxes. Each checkbox represents the GSM card located in the numbered slot counting from the left.

### Module

From the Module column, select the module upon which the task will be performed. Only one Module can be selected.

### SIM

From the module's SIM dropdown menu, select the SIM card for which the count will be reset.

**Note:** Select *All* to reset the count on all of the module's SIM cards.

5. Click **Next**. The Set Command screen, with the command syntax, is displayed.

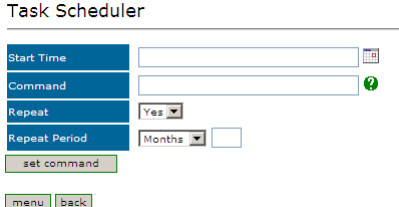



Figure 128: Task Scheduler Set Command Screen

**WARNING!** Clicking *menu* deletes the new task. The table of schedules tasks is redisplayed.

6. Configure the task's schedule:
  - a. Click  (calendar icon). A calendar opens in a new browser tab.

**Note:** First, set the time. As soon as you click the date, the browser tab closes and the date and time are entered into the Start Time field.

- b. Enter the time that the command will start.
- c. Enter the date that the command will start. When you click the date, the browser tab closes and the date and time are entered into the Start Time field.
- d. From the Repeat drop-down menu, select either Yes or No.
- e. If the task is configured to repeat, select a **Repeat Period**. The Repeat Period can be either months, days, hours, or minutes.

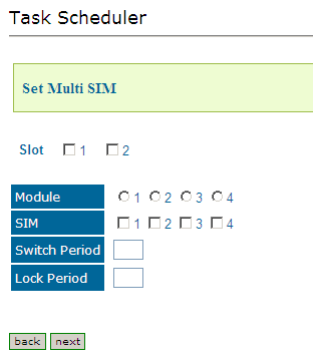
7. Click **Set Command**. The new Task is displayed in the Task Scheduler screen.
8. Click **Upload Schedule**. The Server activates the schedule according to the defined dates and times.

## Set Multi SIM

---

Use the Set Multi SIM task to create cycles that define when each SIM card is used and after how much time a SIM card is removed from usage.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Scheduler** sub-branch. The Task Scheduler screen is displayed.
3. From the **Add New Command** dropdown menu, select **Set Multi SIM**. The Task Scheduler automatically advances to the next screen.



Task Scheduler

Set Multi SIM

Slot  1  2

Module	<input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4
SIM	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4
Switch Period	<input type="text"/>
Lock Period	<input type="text"/>

back next

Figure 129: Task Scheduler Set Multi SIM Screen

4. Configure the task parameters:

### Slot

Select or clear the checkboxes. Each checkbox represents the cellular card located in the numbered slot counting from the left.

### Module

From the Module row, select the module number on the cellular card upon which the task will be performed. Only one Module can be selected.

### SIM

From the SIM row, select the checkbox to include the SIM card in the cycle.

### Switch Period

Enter an amount of time measured in minutes that each SIM card is active. When the period of time expires, the next SIM card become active.

### Lock Period

Enter an amount of time measured in minutes after which the SIM cards can no longer be used to place calls.

5. Click **Next**. The Set Command screen, with the command syntax, is displayed.

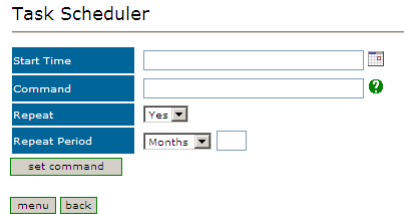



Figure 130: Task Scheduler Set Command Screen

***WARNING!*** Clicking **menu** deletes the new task. The table of schedules tasks is redisplayed.

6. Configure the task's schedule:

- a. Click  (calendar icon). A calendar opens in a new browser tab.

***Note:*** First, set the time. As soon as you click the date, the browser tab closes and the date and time are entered into the Start Time field.

- b. Enter the time that the command will start.
  - c. Enter the date that the command will start. When you click the date, the browser tab closes and the date and time are entered into the Start Time field.
  - d. From the Repeat drop-down menu, select either Yes or No.
  - e. If the task is configured to repeat, select a **Repeat Period**. The Repeat Period can be either months, days, hours, or minutes.
7. Click **Set Command**. The new Task is displayed in the Task Scheduler screen.
  8. Click **Upload Schedule**. The Server activates the schedule according to the defined dates and times.

## VoIP Channels

---

Use the VoIP Channels task to block, open, or clear VoIP channels at a specific time.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Scheduler** sub-branch. The Task Scheduler screen is displayed.
3. From the **Add New Command** dropdown menu, select **VoIP Channels**. The Task Scheduler automatically advances to the next screen.

Task Scheduler

---

Set VoIP Channels

Choose Command:

Choose Channel(s): All

<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3	<input type="checkbox"/> 4	<input type="checkbox"/> 5	<input type="checkbox"/> 6	<input type="checkbox"/> 7	<input type="checkbox"/> 8
<input type="checkbox"/> 9	<input type="checkbox"/> 10	<input type="checkbox"/> 11	<input type="checkbox"/> 12	<input type="checkbox"/> 13	<input type="checkbox"/> 14	<input type="checkbox"/> 15	<input type="checkbox"/> 16
<input type="checkbox"/> 17	<input type="checkbox"/> 18	<input type="checkbox"/> 19	<input type="checkbox"/> 20	<input type="checkbox"/> 21	<input type="checkbox"/> 22	<input type="checkbox"/> 23	<input type="checkbox"/> 24
<input type="checkbox"/> 25	<input type="checkbox"/> 26	<input type="checkbox"/> 27	<input type="checkbox"/> 28	<input type="checkbox"/> 29	<input type="checkbox"/> 30	<input type="checkbox"/> 31	<input type="checkbox"/> 32

Figure 131: Task Scheduler Set VoIP Channels Screen

- From the **Choose Command** dropdown menu, select either:
  - Block**  
Disables the selected channels.
  - Open**  
Enables the selected channels.
  - Clear**  
Disconnects all current calls on the selected channels.
- Select the checkboxes of the channels that the task will be applied to.

**Note:** Select **All** to apply the task to all the channels.

- Click **Next**. The Set Command screen, with the command syntax, is displayed.

Task Scheduler


---

Start Time	<input type="text"/>	<input type="button" value="calendar"/>
Command	<input type="text"/>	<input type="button" value="info"/>
Repeat	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Repeat Period	Months	<input type="text"/>

Figure 132: Task Scheduler Set Command Screen

**WARNING!** Clicking **menu** deletes the new task. The table of schedules tasks is redisplayed.



7. Configure the task's schedule:
  - a. Click  (calendar icon). A calendar opens in a new browser tab.
 

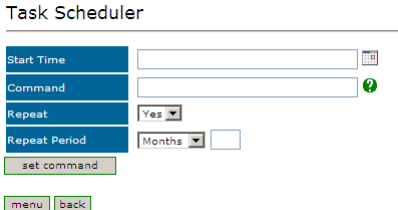
***Note:** First, set the time. As soon as you click the date, the browser tab closes and the date and time are entered into the Start Time field.*
  - b. Enter the time that the command will start.
  - c. Enter the date that the command will start. When you click the date, the browser tab closes and the date and time are entered into the Start Time field.
  - d. From the Repeat drop-down menu, select either Yes or No.
  - e. If the task is configured to repeat, select a **Repeat Period**. The Repeat Period can be either months, days, hours, or minutes.
8. Click **Set Command**. The new Task is displayed in the Task Scheduler screen.
9. Click **Upload Schedule**. The Server activates the schedule according to the defined dates and times.

## Manual Command

---

Use the Manual Command task to customize a task and its schedule.

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Scheduler** sub-branch. The Task Scheduler screen is displayed.
3. From the **Add New Command** dropdown menu, select **Manual Command**. The Task Scheduler automatically advances to the next screen.



Task Scheduler

Start Time	<input type="text"/>
Command	<input type="text"/>
Repeat	Yes
Repeat Period	Months <input type="text"/>


set command

menu back


Figure 133: Task Scheduler Manual Command Screen

**WARNING!** Clicking **menu** deletes the new task. The table of schedules tasks is redisplayed.

4. Configure the task and its schedule:

- a. Click  (calendar icon). A calendar opens in a new browser tab.

***Note:** First, set the time. As soon as you click the date, the browser tab closes and the date and time are entered into the Start Time field.*

- b. Enter the time that the command will start.
  - c. Enter the date that the command will start. When you click the date, the browser tab closes and the date and time are entered into the Start Time field.
  - d. Enter the command. For help with command syntax, click .
  - e. From the Repeat drop-down menu, select either Yes or No.
  - f. If the task is configured to repeat, select a **Repeat Period**. The Repeat Period can be either months, days, hours, or minutes.
5. Click **Set Command**. The new Task is displayed in the Task Scheduler screen.
6. Click **Upload Schedule**. The Server activates the schedule according to the defined dates and times.

## Callback

Hypermedia Gateway Callback includes tools which expand the feature's flexibility.

### Remote Delegation

---

Use Remote Delegation to forward a Callback trigger to another Hypermedia Gateway. After the receiving Hypermedia Gateway authenticates the calling party, it forwards the Callback trigger to another Gateway, that is, it delegates the Callback request. The remote Hypermedia Gateway performs the Callback.

To configure Remote Delegation:

1. From the HMC navigation pane, expand the **Manage** branch and the **Callback** sub-branch.
2. Click the **Remote Delegation** sub-branch. The Remote Delegation screen is displayed.

Callback Event Delegation

Match CLI Rule	and/or	Match DDI Rule	Delegate to IP
<input type="text"/>	and	<input type="text"/>	<input type="text"/>
<input type="button" value="Add Entry"/>			

Match CLI Rule	and/or	Match DDI Rule	Delegate to IP	
	or	9902504	17.34.51.68	<input type="button" value="Delete"/>

Figure 134: HMC Remote Delegation Screen

3. In the **Match CLI Rule** field, enter the user's phone number. When the Gateway identifies the number, it delegates the call to the remote Gateway.
4. Select either **and** or **or**.
5. In the **Match DDI Rule** field, enter the PBX extension. When a user dials the extension number, the Gateway receives the Callback request and delegates it to the remote Gateway.
6. In the **Delegate to IP** field, enter the IP address of the Hypermedia Gateway which receives the delegated Callback requests.
7. Click **Add Entry**. The new entry is added to the Callback Event Delegation table.

## Ext. Authentication

---

Use Extended Authentication to reserve Callback resources for a specific user or Group of users.

**Note:** This feature operates independent of the authentication registered on the User List (see “User List” on page 123).

To configure Extended Authentication:

1. From the HMC navigation pane, expand the **Manage** branch and the **Callback** sub-branch.
2. Click the **Ext. Authentication** sub-branch. The Extended Authentication screen is displayed.

Callback Extended Authentication

Match CLI Rule	Set to Group	
<input type="text"/>	General ▾	
<input type="button" value="Add Entry"/>		
Match CLI Rule	Set to Group	
9902504	Demo	<input type="button" value="Delete"/>

Figure 135: HMC Extended Authentication Screen

3. In the **Match CLI Rule** field, enter the user’s phone number. When the Gateway identifies the number, it associates the Callback request with reserved resources.
4. From the **Set to Group** drop-down menu, select a Group. These are the Groups that are defined on the VPN Groups screen. Resources are reserved for members of the Group.
5. Click **Add Entry**. The new entry is added to the Callback Extended Authentication table.

**Note:** For Extended Authentication to work, a resource has to be allocated to Callback and then assigned to the specific VPN Group.

## Chapter 7

# CALLBACK and CALLTHROUGH

This section provides an overview of Callback and Callthrough and documents Best Practices for configuring each.

**Note:** *A best-practice is a technique or methodology that, through experience and research, has been proven to efficiently and reliably lead to the desired result.*

A Hypermedia Gateway includes many additional Callback and Callthrough parameters that are used in specific settings and are not related to Best Practices. They are documented elsewhere in this manual.

This section includes:

- “Callback Overview” on page 140
- “Callback Best Practice” on page 141
- “Callthrough Overview” on page 149
- “Callthrough Best Practice” on page 150
- “CB/CT CDRs” on page 154

**Note:** *Callback and Callthrough belong to the Hypersavings Package and require a separate license.*

## Callback Overview

A Hypermedia Gateway can be configured to authorize an incoming call, disconnect the incoming call, and then call-back the User. This feature is called Callback and is designed, for example, for users who are making calls from an international location to their home country.

A Callback is initiated by a trigger. The trigger can be either a phone call, an SMS message, or a message sent via the Hypermedia Web-based Callback dialer. The trigger initiates the following sequence:

- a. the Gateway identifies the user as a user authorized to activate Callback
- b. the Gateway disconnects the call
- c. the Gateway searches for an available Callback Resource
- d. the Gateway calls-back the User
- e. optionally, the Gateway calls the destination party.

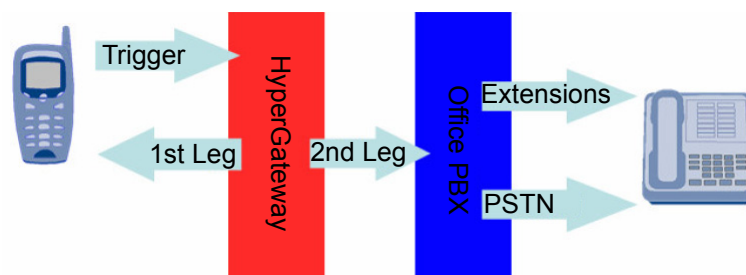


Figure 136: Callback Triggers Diagram

**Note:** *If several Resources are dedicated to Callback, incoming calls are automatically routed to the first available Resource.*

The most common type of Callback Trigger is a dedicated channel, that is, the Resource **must be linked to itself**.

Once connected, the user can then make unlimited consecutive outbound calls by double-keying the pound/hash key (#, #).

Callback is available using cellular cards and PRI cards, but not VoIP cards.

## Callback Best Practice

The best-practice order for configuring Callback is:

1. Determine a trigger strategy.
2. Allocate the Trigger resource.
3. Allocate the Callback resource.
4. Optionally, require PIN code authorization.
5. Authorize the user.
6. Inform users.

### Determine a Trigger Strategy

---

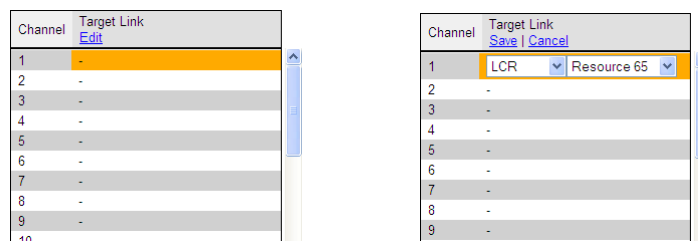
Not all triggers are supported by all PSTNs. The Hypermedia Gateway supports the following types of triggers:

- **CLI trigger**  
The CLI Callback service is used in countries where CLI (calling line identification or caller ID) is available through the PSTN. The user dials a Trigger resource. The Hypermedia Gateway identifies the CLI and begins the Callback process.
- **Fixed trigger**  
With a fixed trigger, the Hypermedia Gateway does not authorize the user. Users call a pre-allocated corporate telephone number that has been allocated as a Trigger resource. This number is called a DDI (Direct Dial-in) number. The Hypermedia Gateway is configured to call back a specific phone number each time the DDI is triggered.
- **SMS trigger (cellular resources only)**  
Users also can initiate a Callback by sending an SMS message. The text of the SMS must include the destination phone number the Hypermedia Gateway must call.
- **Web-based Callback Dialer**  
This feature is currently being developed. Contact Technical Support for information about using a browser-based visual Callback Dialer to dial a destination number and receive a callback call on a registered callback number. Allocate the Trigger Resource

## Allocate the Trigger Resource

The most common type of Callback Trigger is a dedicated channel, that is, the Resource *must first be linked to itself* and then allocated as a trigger.

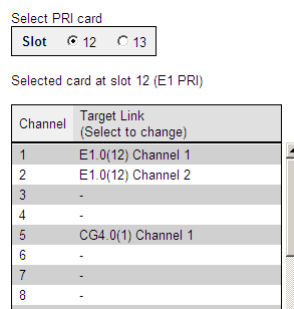
1. Link the Resource to itself:
  - a. From the HMC navigation pane, click the **Media Connections** sub-branch of either the Cellular Cards, PRI Cards, or LCR. The Media Matrix is displayed.
  - b. If more than one slot is displayed, select a specific card. The Media Matrix of that card is displayed.
  - c. Click within a Resource row. The row turns yellow.
  - d. Click **Edit**. The row becomes configurable.



Channel	Target Link
1	-
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-

Figure 137: Media Matrix Row when Configurable

- e. From the first dropdown list, allocate this card to itself by selecting the same card.
- f. From the second dropdown list, assign this channel to itself by selecting the same channel.



Select PRI card

Slot 12 13

Selected card at slot 12 (E1 PRI)

Channel	Target Link (Select to change)
1	E1.0(12) Channel 1
2	E1.0(12) Channel 2
3	-
4	-
5	CG4.0(1) Channel 1
6	-
7	-
8	-

Figure 138: Assigning a Target Link

- g. Click **Save**. The configuration dropdown boxes are hidden.
- h. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.



2. Allocate the Resource to Trigger:
  - a. Select one of the Triggers sub-branches (either the PRI Cards > Callback Triggers sub-branch or Cellular Cards > Callbacks > Call Triggers). The Callback Triggers screen is displayed.
  - b. Select the checkboxes of the Resources that are allocated as Callback Triggers.

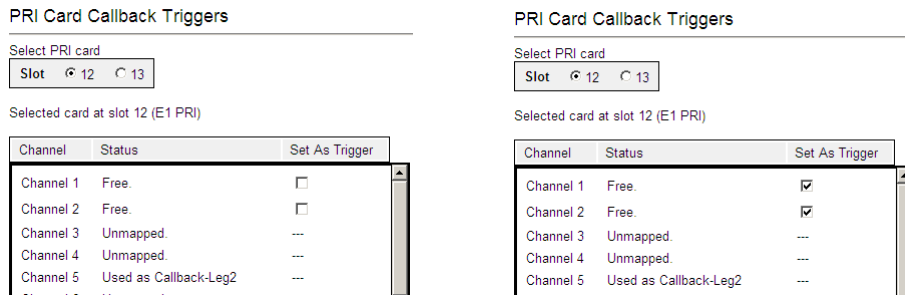


Figure 139: Allocating Resources to Callback Triggers

- c. Click **Apply Settings** and wait for **Configuration Saved** to be displayed. The allocation is confirmed in the Callback Trigger table.

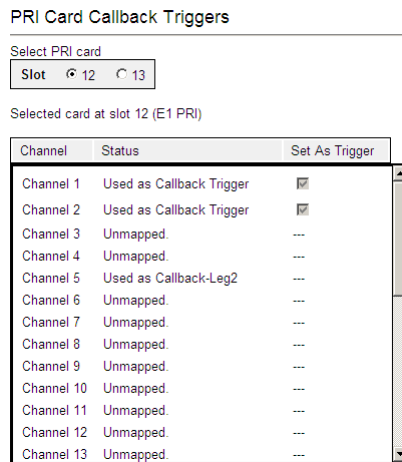


Figure 140: Callback Trigger Table

## Allocate the Callback Resource

---

Allocating a Callback Resources requires, first, linking it, and then setting it as 1st Leg.

1. Link the Resource to another resource:
  - a. From the HMC navigation pane, click the **Media Connections** sub-branch of either the Cellular Cards, PRI Cards, or LCR. The Media Matrix is displayed.
  - b. If more than one slot is displayed, select a specific card. The Media Matrix of that card is displayed.
  - c. Click within a Resource row. The row turns yellow.
  - d. Click **Edit**. The row becomes configurable.

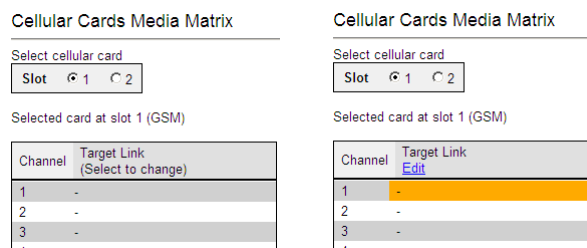


Figure 141: Media Matrix Row when Configurable

- e. From the first dropdown list, allocate this card to a target card by selecting the second card.

**Note:** *If all of the second card's channels are already allocated, the message "Fully allocated" appears.*

- f. From the second dropdown list, assign this Resource (channel) to a specific Resource (channel) on the target card.

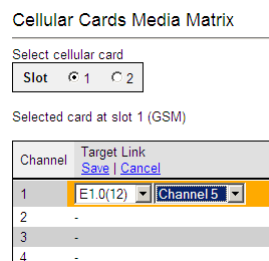


Figure 142: Assigning a Target Link

- g. Click **Save**. The configuration dropdown boxes are hidden.

- h. Optionally, repeat the process for additional channels and other media types.
  - i. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.
2. Set the Resource as 1st Leg:
- a. Select one of the Callback Resources sub-branches (either the PRI Cards > Callbacks sub-branch or Cellular Cards > Callbacks > Resources). The Callback Resources screen is displayed.

Cellular Card Callback Resources

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Module	Set 1st Leg	Status	Group	2nd Leg
Module 1	<input type="checkbox"/>	Free.	General	E1.0(12) Chan. 5
Module 2	---	Unmapped.	---	---
Module 3	---	Unmapped.	---	---
Module 4	---	Unmapped.	---	---

Figure 143: Callback Resources Screen

- b. Select the checkbox of the Resources that is allocated as Callback 1st Leg.
- c. Select the Group that is authorized to access this Resource.

Cellular Card Callback Resources

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Module	Set 1st Leg	Status	Group	2nd Leg
Module 1	<input checked="" type="checkbox"/>	Free.	Demo_2	E1.0(12) Chan. 5
Module 2	---	Unmapped.	---	---
Module 3	---	Unmapped.	---	---
Module 4	---	Unmapped.	---	---

Apply Settings

Figure 144: Selecting the Authorized Group

- d. Click **Apply Settings** and wait for **Configuration Saved** to be displayed. The allocation is confirmed in the Callback Resources table of both legs.

**Cellular Card Callback Resources**

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Module	Set 1st Leg	Status	Group	2nd Leg
Module 1	<input checked="" type="checkbox"/>	Allocated.	Demo_2	E1.0(12) Chan. 5
Module 2	<input type="checkbox"/>	Unmapped.	---	---
Module 3	<input type="checkbox"/>	Unmapped.	---	---
Module 4	<input type="checkbox"/>	Unmapped.	---	---

Configuration saved.

Selected card at slot 12 (E1 PRI)

Channel	Set 1st Leg	Status	Group	Other Leg
Channel 1	---	Used for Callback-Trigger	---	---
Channel 2	---	Used for Callback-Trigger	---	---
Channel 3	---	Unmapped.	---	---
Channel 4	---	Unmapped.	---	---
Channel 5	<input checked="" type="checkbox"/>	Used for leg 2.	---	CG4.0(1) Chan. 1
Channel 6	<input type="checkbox"/>	Unmapped.	---	---
Channel 7	<input type="checkbox"/>	Unmapped.	---	---
Channel 8	<input type="checkbox"/>	Unmapped.	---	---
Channel 9	<input type="checkbox"/>	Unmapped.	---	---

Figure 145: Confirmation of Allocation of Resource to Callback

## Optionally, Require PIN Code Authorization

Hypermedia Gateways can be configured to require that users enter a Personal Identification Number (PIN) before receiving Callback resources.

To require PIN code authorization:

1. From the Configure branch of the HMC navigation pane, click the **Call Parameters** sub-branch. The Call Configuration screen is displayed.
2. Scroll down to the **Callback Authentication Policy** parameter.

**Callback Authentication Policy**  
Select 'Yes' to require users to enter a personal access code when receiving callbacks.

No

Figure 146: Callback Authentication Policy Parameter

3. Select either Yes or No. If Yes is selected, users are required to enter a personal access code when receiving callbacks.

**Note:** *Optionally, configure other Callback parameters. For documentation on the other parameters, see “Call Parameters” on page 27.*

4. Click **Submit**.
5. Wait for the **Successfully updated** message.

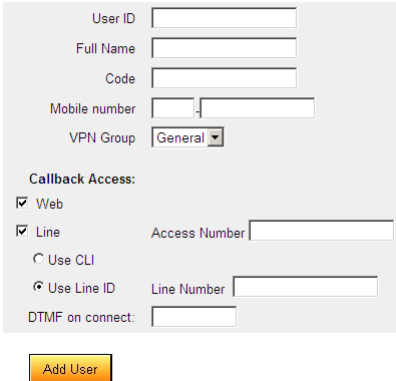
## Authorize the User

---

Perform initial user configuration using the Add User screen. To change a user's configuration, and to delete a user, use the User List screen.

To add a new user:

1. From the HMC navigation pane, expand the **Manage** branch.
2. Click the **Add User** sub-branch. The New User Information screen is displayed.



New User Information

User ID

Full Name

Code

Mobile number

VPN Group

Callback Access:

Web

Line

Use CLI

Use Line ID

DTMF on connect:

Figure 147: New User Information Screen

3. Enter the following user information:

**User ID**

This can be any string. The information reappears in the All Users table.

**Full Name**

This information reappears in the All Users table.

**Code**

Any random string of numbers and letters.

**Mobile Number**

Enter the user's mobile device number.

**VPN Group**

From the dropdown menu, assign the user to a VPN Group.

4. Define the users Callback access:

**Web**

This feature is currently being developed. Contact Technical Support for information about using a browser-based visual Callback Dialer to dial a destination number and receive a callback call on a registered callback number.

### **Line**

When selected, the user is able to trigger a Callback via a telephone call. If selected:

- a. In the Access Number field, enter the phone number the user dials to access the Hypermedia Gateway. This is the DDI number that is allocated as a trigger.
- b. Select one of the following:
  - Use CLI  
The Hypermedia Gateway uses Caller Line Identification (CLI) to automatically identify the phone number to be called back.
  - Use Line ID  
Enter the Line Number. The Hypermedia Gateway calls back the number entered in the Line Number field.

### **DTMF on connect**

Enter the DTMF sequence. This is a DTMF string that the Gateway will automatically dial and which connects the user to an Automated Voice Response (AVR) system.

5. Click **Add User** and wait for the “User added successfully” message.

## **Inform Users**

---

It is the system administrator’s responsibility to inform end-users. They need to know the DDI numbers that allocated to Callback.

## Callthrough Overview

Use Callthrough to place calls, via the Hypermedia Gateway, to external numbers. Users receive a dial-tone from the Hypermedia Gateway and can then place calls either:

- via the PBX to a corporate extension
- to a VoIP phone number
- to a Cellular phone number
- to a PSTN phone number

A Callthrough is initiated by a call to a Resource allocated to Callthrough. The call initiates the following sequence:

- a. the Gateway searches for an available Callthrough Resource
- b. the Gateway connects the call with the linked resource.

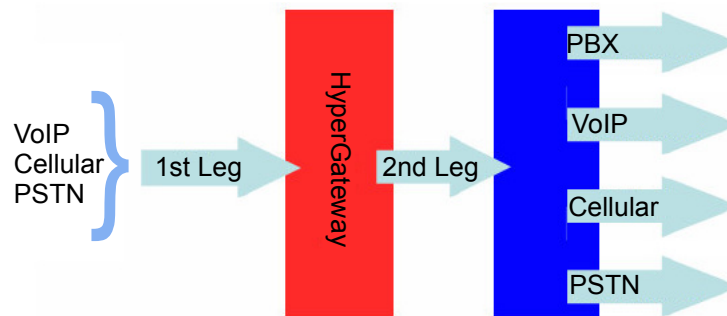


Figure 148: Callthrough Diagram

## Callthrough Best Practice

The best-practice order for configuring Callthrough is:

1. Allocate the Callthrough resource.
2. Determine and configure a user authentication strategy.
3. Inform users.

### Allocate the Callthrough Resource

---

Allocating a Callthrough Resource requires, first, linking it, and then setting it as 1st Leg.

1. Link the Resource to another resource:
  - a. From the HMC navigation pane, click the **Media Connections** sub-branch of either the Cellular Cards, PRI Cards, or LCR. The Media Matrix is displayed.
  - b. If more than one slot is displayed, select a specific card. The Media Matrix of that card is displayed.
  - c. Click within a Resource row. The row turns yellow.
  - d. Click **Edit**. The row becomes configurable.

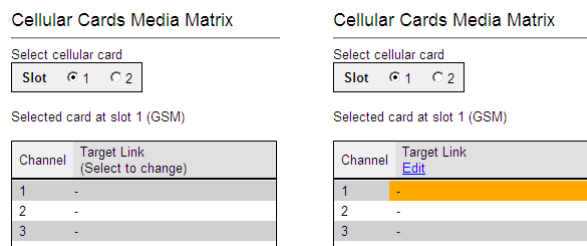


Figure 149: Media Matrix Row when Configurable

- e. From the first dropdown list, allocate this card to a target card by selecting the second card.

**Note:** *If all of the second card's channels are already allocated, the message "Fully allocated" appears.*

- f. From the second dropdown list, assign this Resource (channel) to a specific Resource (channel) on the target card.



Cellular Cards Media Matrix

Select cellular card

Slot  1  2

Selected card at slot 1 (GSM)

Channel	Target Link
1	E1.0(12) Channel 5
2	-
3	-
4	-

Figure 150: Assigning a Target Link

- g. Click **Save**. The configuration dropdown boxes are hidden.
  - h. Optionally, repeat the process for additional channels and other media types.
  - i. Click **Apply Settings** and wait for **Configuration Saved** to be displayed.
2. Set the Resource as 1st Leg:
- a. Select one of the Callthrough Resources sub-branches (either the Cellular, PRI, LCR, or VoIP Cards > Callthroughs sub-branch). The Callthrough Resources screen is displayed. Empty checkboxes appear beside available (Free) resources.

PRI Card Callthrough Resources

Select PRI card

Slot  12  13

Selected card at slot 12 (E1 PRI)

Channel	Set 1st Leg	Status	Group	Other Leg
Channel 1	<input type="checkbox"/>	Used for Callback-Trigger	---	---
Channel 2	<input type="checkbox"/>	Used for Callback-Trigger	---	---
Channel 3	<input type="checkbox"/>	Used for Callback-Leg1	---	---
Channel 4	<input type="checkbox"/>	Free (PRI/Cell GW)	General	CG4.0(1) Chan. 2
Channel 5	<input type="checkbox"/>	Free (PRI/Cell GW)	General	CG4.0(1) Chan. 3
Channel 6	<input type="checkbox"/>	Free (VoIP GW)	General	MG.0(11) Chan. 5
Channel 7	<input type="checkbox"/>	Unmapped.	---	---
Channel 8	<input type="checkbox"/>	Unmapped.	---	---
Channel 9	<input type="checkbox"/>	Unmapped.	---	---
Channel 10	<input type="checkbox"/>	Unmapped.	---	---

Figure 151: PRI Card Callthrough Resources Screen

- b. Select the checkboxes of the Resources that are allocated as Callthrough 1st Leg.
- c. Select the Group that is authorized to access this Resource.

PRI Card Callthrough Resources

Select PRI card

Slot  12  13

Selected card at slot 12 (E1 PRI)

Channel	Set 1st Leg	Status	Group	Other Leg
Channel 1	---	Used for Callback-Trigger	---	---
Channel 2	---	Used for Callback-Trigger	---	---
Channel 3	---	Used for Callback-Leg1	---	---
Channel 4	<input checked="" type="checkbox"/>	Free (PRI/Cell GW)	Demo	CG4.0(1) Chan. 2
Channel 5	<input checked="" type="checkbox"/>	Free (PRI/Cell GW)	Demo_2	CG4.0(1) Chan. 3
Channel 6	<input checked="" type="checkbox"/>	Free (VoIP GW)	Demo_2	MG.0(11) Chan. 5
Channel 7	---	Unmapped.	---	---
Channel 8	---	Unmapped.	---	---
Channel 9	---	Unmapped.	---	---
Channel 10	---	Unmapped.	---	---
Channel 11	---	Unmapped.	---	---
Channel 12	---	Unmanned	---	---

Apply Settings

Figure 152: Selecting the Authorized Group

- d. Click **Apply Settings** and wait for **Configuration Saved** to be displayed. The allocation is confirmed in the Callback Resources table of both legs.

PRI Card Callthrough Resources

Select PRI card

Slot  12  13

Selected card at slot 12 (E1 PRI)

Channel	Set 1st Leg	Status	Group	Other Leg
Channel 1	---	Used for Callback-Trigger	---	---
Channel 2	---	Used for Callback-Trigger	---	---
Channel 3	---	Used for Callback-Leg1	---	---
Channel 4	<input checked="" type="checkbox"/>	Used for leg 1.	Demo	CG4.0(1) Chan. 2
Channel 5	<input checked="" type="checkbox"/>	Used for leg 1.	Demo_2	CG4.0(1) Chan. 3
Channel 6	<input checked="" type="checkbox"/>	Used for leg 1.	Demo_2	MG.0(11) Chan. 5
Channel 7	---	Unmapped.	---	---
Channel 8	---	Unmapped.	---	---
Channel 9	---	Unmapped.	---	---
Channel 10	---	Unmapped.	---	---
Channel 11	---	Unmapped.	---	---
Channel 12	---	Unmanned	---	---

Configuration saved.

Figure 153: Confirmation of Allocation of Resource to Callback

## Determine and Configure a User Authentication Strategy

---

The Hypermedia Gateway can be configured to require that the Callthrough user be authorized through a form of authentication.

To configure user authentication:

1. From the Configure branch of the HMC navigation pane, click the **Call Parameters** sub-branch. The Call Configuration screen is displayed.
2. Scroll down to the Callthrough Authentication Policy parameter.
3. From the dropdown menu, select an option described in the table of authentication policies.

Callthrough Authentication Policy	
The following table summarizes the different call authentication policies and their effect on callthrough sessions:	
OnlyCLI	Call is disconnected if the caller ID is unknown.
OnlyCode	Call is accepted and code always required.
Either	Call is accepted. If caller ID is unknown then code is required
Both	Both known caller ID and code are required.

Figure 154: Table of Authentication Policies

**Note:** Optionally, configure other Callback parameters. For documentation on the other parameters, see “Call Parameters” on page 27.

4. Click **Submit**.
5. Wait for the **Successfully updated** message.

## Inform Users

---

It is the system administrator’s responsibility to inform end-users. They need to know the DDI numbers that allocated to Callthrough.

## CB/CT CDRs

To manage and download the Callback and Callthrough CDR files:

1. From the HMC navigation pane, expand the **Monitor** branch.
2. Expand the **LCR Card** sub-branch and select **CB/CT CDRs**. The list of CDR files is displayed.

Callback/Callthrough CDR Files






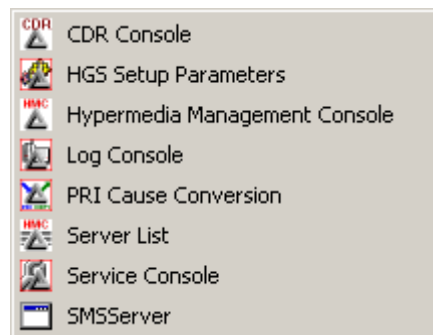
File Name (click to download)	Last Modified	Size (bytes)	
<a href="#">Calls-01-2008.log</a> 	06/01/2009 08:56	0	<a href="#">delete</a>
<a href="#">Calls-09-2008.log</a> 	02/10/2008 08:34	2035	<a href="#">delete</a>
<a href="#">Calls-10-2008.log</a> 	07/10/2008 16:51	139	<a href="#">delete</a>
<a href="#">Calls-11-2008.log</a> 	23/11/2008 10:56	0	<a href="#">delete</a>
<a href="#">Calls-12-2008.log</a> 	07/12/2008 14:53	0	<a href="#">delete</a>

Figure 155: Callback/Callthrough CDR Files Screen

3. Click a file name. The standard Windows Open dialog box is displayed.
4. Define the location where the file will be saved and click **OK**. The file is downloaded to that location.

## Chapter 8

# CONSOLE SUITE and other TOOLS



This section contains:

- The Console Suite including:
  - “CDR Console” on page 156
  - “Log Console” on page 157
  - “Decoding Logs” on page 158
  - “Service Console” on page 167
- Additional Configuration and Management Tools including:
  - “HGS Setup Parameters Tool” on page 168
  - “PRI Cause Conversion” on page 170
  - “Hypermedia Gateway Server List” on page 172

## Console Suite

The following three consoles are installed during initial installation.

### CDR Console

---

Use the CDR Console to download and review Call Detail Records.

**Note:** *The CDR Console feature is relevant only to Hypermedia HG4000 Gateways.*

To run the CDR Console:

1. Click the Windows **Start** button > **All Programs**.
2. From the Hypermedia program group, select **CDR Console**. The CDR Console logon screen opens in the default browser.
3. Click the warning bar at the top of the screen and, from the dropdown menu, click **Allow Blocked Content**. Confirm your choice by clicking **Yes** at the confirmation message.

**Note:** *To avoid recurring displays of the warning bar, from the menu bar click **Tools** > **Internet Options** > **Advanced** > **Allow active content to run in files on My Computer**.*

4. Enter your password and click **Submit**. The CDR Console screen is displayed.

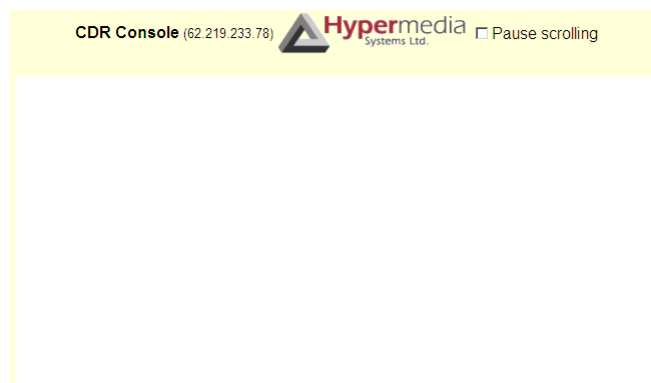


Figure 156: CDR Console Screen

5. Click a file name. The standard Windows Open dialog box is displayed.
6. Define the location where the file will be saved and click **OK**. The file is downloaded to that location.

## Log Console

---

Use the Log Console to review the primary system log. All events and alarms are printed to this log.

To run the Log Console:

1. Click the Windows **Start** button > **All Programs**.
2. From the Hypermedia program group, select **Log Console**. The Log Console logon screen opens in the default browser.
3. Click the warning bar at the top of the screen and, from the dropdown menu, click **Allow Blocked Content**. Confirm your choice by clicking **Yes** at the confirmation message.

**Note:** To avoid recurring displays of the warning bar, from the menu bar click **Tools > Internet Options > Advanced > Allow active content to run in files on My Computer**.

4. Enter your password and click **Submit**. The Log Console screen is displayed.



Figure 157: Log Console Screen

5. Select a log level from 1 to 10. The Log Console filters the recorded logs and displays only the logs matching the level.

## Decoding Logs

---

Following are sample Logs that have been edited. Only the relevant entries remain. The excerpted content is explained in following the Log sample.

### VoIP to GSM Log

Following are excerpts from a VoIP to GSM Log.

```
[25/03-09:56:24.032] [debug] getRemoteSignalIP=192.168.1.67
...
[25/03-09:56:24.067] [debug] CreateIncomingSession token: 2cf9b58a-f8f3ae56-ad3c20da-d44bfdec@192.168.1.67 remoteNumber: 30 localNumber: 0774445016 remotelIP: 192.168.1.67
...
[25/03-09:56:24.089] [debug] source DDI:0774445016 allowed DDI:^*
[25/03-09:56:24.093] [debug] FindLocalMediaResources (2cf9b58a-f8f3ae56-ad3c20da-d44bfdec@192.168.1.67/3) LocalHwyTS: 11:0 RemoteHwyTS: 5:31 media resource: 11.0
...
[25/03-09:56:24.121] getApplication for:MG.1-VoIP
...
[25/03-09:56:24.242] [debug] provideAnswer
...
[25/03-09:56:24.302] [debug] Started media, accepting call [2cf9b58a-f8f3ae56-ad3c20da-d44bfdec@192.168.1.67]
...
[25/03-09:57:04.233] * Received Packet: HangingUp /A24/I3/o1/R10
...
[25/03-09:57:04.380] [debug] Close (2cf9b58a-f8f3ae56-ad3c20da-d44bfdec@192.168.1.67/3) closing session timeslot:0 handle: -1
...
[25/03-09:57:04.392] [debug] (2cf9b58a-f8f3ae56-ad3c20da-d44bfdec@192.168.1.67/3) remove media resource: 11.0
...
[25/03-09:57:04.991] * Received Packet: GenericReply /#90/@2b/x0,1/I2974/G
```

#### Explanation:

1. CreateIncomingSession indicates that the HG has received an incoming VoIP call and is attempting to establish the call.
2. In this case, SIP phone 192.168.1.67 is calling 0774445016 via the HG GSM module.
3. A unique token is produced for each call. In this case, the token is:  
2cf9b58a-f8f3ae56-ad3c20da-d44bfdec
4. The HG checks connection authorization for each call before connecting the call. In this case, the authorization is: source DDI:0774445016 allowed DDI:^\*



5. JAVA analyzes to which application the call should be connected. In this case: getApplication for:MG.1-VoIP.
6. When the call recipient answers the call, the HG prints the following to the Log: provideAnswer.
7. Started media indicates that the HG has started streaming between both parties.
8. When one party hangs-up, the HG closes the session and removes the media resources.

## GSM to VoIP Log

Following are excerpts from a GSM to VoIP Log.

```
[25/03-10:07:14.422] HMCServer received [ping] from 127.0.0.1/127.0.0.1:3883
...
[25/03-10:07:21.791] * Received Packet: Dialing /A24/I1031/o0/H5/S31/h11/s0/n0210/N0774445016
...
[25/03-10:07:22.114] [debug] Sending INVITE
    [YWZmYjRiMjY3OGMyYzJkMGU1MjQxZDcxODkzMDBjYTY], m_tokenToSession.insert
...
[25/03-10:07:24.283] [debug] Started media, accepting call
    [YWZmYjRiMjY3OGMyYzJkMGU1MjQxZDcxODkzMDBjYTY.]
[25/03-10:07:24.288] Received from MGW: [Answering /A24/I1031/x0,0/o1/#0]
...
[25/03-10:08:00.224] [debug] CloseResources
    (YWZmYjRiMjY3OGMyYzJkMGU1MjQxZDcxODkzMDBjYTY./1031)
...
[25/03-10:08:00.544] updateReplyContext: no effect
```

Explanation:

1. CreateIncomingSession indicates that the HG has received an incoming VoIP call and is attempting to establish the call.
2. In this case, analog phone 0774445016 is calling the SIM number 0546858579. This causes the HG to dial the MSN Value=0210.
3. The HG extracts the related called party's IP Address from the Phone2Net table. In our case: 192.168.1.67.

VoIP - Phone to Net Dialing Plan

Dialed Number	Dest. IP	Dest. Number	PIN Code
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Add Entry"/>			
Dialed Number	Destination IP	Dest. Number	PIN Code
0210	192.168.1.67	-	-
<input type="button" value="Delete"/>			

4. A unique token is produced for each call. In this case, the token is: YWZmYjRiMjY3OGMyYzJkMGU1MjQxZDcxODkzMDBjYTY.
5. JAVA analyzes to which application the call should be connected. In this case: getApplication for:24.1-VoIP (24.1=CG card).
6. When the call recipient answers the call, the HG prints the following to the Log: Received from MGW: [Answering. . .
7. Started media indicates that the HG has started streaming between both parties.
8. When one party hangs-up, the HG closes the session and removes the media resources.

## Callthrough Log

Following are excerpts from a Callthrough Log.

```
[25/03-10:21:41.783] * Received Packet: Dialing /A24/I1032/o0/H5/S31/h5/s32/n0210/N0544331123
...
[25/03-10:21:42.327] Application:Callthrough-Leg1
...
[25/03-10:21:42.563] MGWCallthrough (1032) Authentication successfull, CLI found:0544331123
...
[25/03-10:21:45.997] [debug] OnDTMF notification: Digit=0, nHW=11, nTS.Type=0.2
...
[25/03-10:21:46.396] [debug] OnDTMF notification: Digit=7, nHW=11, nTS.Type=0.2
...
[25/03-10:21:46.757] [debug] OnDTMF notification: Digit=7, nHW=11, nTS.Type=0.2
...
[25/03-10:21:47.417] [debug] OnDTMF notification: Digit=4, nHW=11, nTS.Type=0.2
...
[25/03-10:21:47.896] [debug] OnDTMF notification: Digit=4, nHW=11, nTS.Type=0.2
...
[25/03-10:21:48.286] [debug] OnDTMF notification: Digit=4, nHW=11, nTS.Type=0.2
...
[25/03-10:21:48.796] [debug] OnDTMF notification: Digit=5, nHW=11, nTS.Type=0.2
...
[25/03-10:21:49.216] [debug] OnDTMF notification: Digit=0, nHW=11, nTS.Type=0.2
...
[25/03-10:21:49.636] [debug] OnDTMF notification: Digit=1, nHW=11, nTS.Type=0.2
...
[25/03-10:21:50.176] [debug] OnDTMF notification: Digit=6, nHW=11, nTS.Type=0.2
...
[25/03-10:21:53.339] Sending: [Dialing /A24/x0,0/I0/o0/H5/S31/h5/s32/N0544331123/n0774445016], Client
ID:11
...
```

[25/03-10:21:57.688] **MGWCallthrough (1032) Leg2 event [SysAlerting /A24/I0/o1]**  
...  
[25/03-10:22:09.470] Sending: [.MGWRequest /AMG/I888531/\*resCloseChannel/H11/S0], Client ID:8  
...  
[25/03-10:22:20.969] ConnectionPing /AMG/I56/S1

#### Explanation:

Callthrough works as follows. The User dials the SIM number. The SIM is recognized as a the register user and the HG sends the user a dial tone. The User can dial the destination number. HG successfully establishes the call between both parties.

1. An external cellular phone number (in our case: 0544331123) dials to the SIM number.
2. Application: Callthrough-Leg1 indicates that the HG has established the connection between the authorized user and Leg1.
3. Authentication successful, CLI found:0544331123 indicates that the HG has checked user authentication.
4. The HG matches between the originating user (CLI and/or PIN Code) and the predefined registered user.
5. After the HG assumes the correct user authentication, the User gets a dial tone from the HG.
6. The User can dial the destination number by sending each digit of the destination number using DTMF. In our case, that is 0774445016.
7. The HG dials to the destination called party (0774445016) and connects between Leg1 and Leg2. This is indicated by: MGWCallthrough (1032) Leg2 event [SysAlerting . . .
8. When one party hangs-up the call, the HG Closes Resources and removes media resources.

## CallBack Log

Following are excerpts from a Callthrough Log.

[26/03-10:21:01.422] ConnectionPing /AMG/I16/S1  
...  
[26/03-10:21:17.647] \* Received Packet: Dialing /A24/I1048/o0/H5/S31/h5/s31/n0210/**N0544331123**  
...  
[26/03-10:21:17.660] **getApplication for:24.1-Callback-Trigger**  
...  
[26/03-10:21:25.824] **Error: no users defined for DDI 0210,checking CLI**  
[26/03-10:21:25.826] Looking up CLI: 0544331123  
[25/03-10:21:42.846] **Authentication successfull, CLI found:0544331123**  
[26/03-10:21:25.862] Creating session: Code=[0602], UserId=[udi2], AccessNum=[], EventSource=[null]

```
[26/03-10:21:25.866] Sending: [Dialing /A24/x0,0/I0/o0/H5/S33/h5/s32/N/n0544331123], Client ID:10
...
[26/03-10:21:26.041] MGWCallback (0) Leg1 event [DialAck /A24/I0/o1]
...
[26/03-10:21:36.752] playDialTone 0 5.32
...
[26/03-10:21:39.113] [debug] OnDTMF /c11.0/d0/t438010
...
[26/03-10:21:41.082] [debug] OnDTMF /c11.0/d7/t1770
...
[26/03-10:21:41.812] [debug] OnDTMF /c11.0/d7/t510
...
[26/03-10:21:43.712] [debug] OnDTMF /c11.0/d4/t1680
...
[26/03-10:21:44.233] [debug] OnDTMF /c11.0/d4/t330
...
[26/03-10:21:44.892] [debug] OnDTMF /c11.0/d4/t360
...
[26/03-10:21:45.442] [debug] OnDTMF /c11.0/d5/t330
...
[26/03-10:21:46.023] [debug] OnDTMF /c11.0/d0/t330
...
[26/03-10:21:46.632] [debug] OnDTMF /c11.0/d1/t420
...
[26/03-10:21:47.213] [debug] OnDTMF /c11.0/d6/t330
...
[26/03-10:21:50.365] Sending: [Dialing /A24/x0,0/I1/o0/H5/S32/h5/s33/N/n0774445016], Client ID:10
...
[26/03-10:22:20.336] HMCServer received [ping] from 127.0.0.1/127.0.0.1:4043
```

#### Explanation:

Callback works as follows. SIM 1 is defined to ‘listen’ for an incoming call from a registered user. SIM 2 is defined as LEG 1 and calls back the registered user and cross-connects with SIM 3. SIM 3 is defined as LEG 2 and calls to the destination party and cross connects with SIM 2.

1. In this case, the registered user 0544331123 is calling to the number of SIM1.
2. The HG answers the call, starts its callback engine—indicated by: `getApplication for:24.1-Callback-Trigger`—and hangs up the user’s line.

**Note:** *The HG always prints the following error message: “Error: no users defined for DDI 0210, checking CLI” Ignore this message.*

3. The HG checks user authentication. Successful authentication is indicated by: `Authentication successful, CLI found:0544331123`.

4. The HG matches the originating user (CLI and/or PIN Code) to the predefined registered user.
5. After HG assumes a correct user authentication, the HG redials to the registered user. This is indicated by: MGWCallback (0) Leg1 event [DialAck.
6. After the User answers, the HG plays a dial tone. This is indicated by: playDialTone.
7. The User can dial the desired destination called party by sending each digit of the destination called party number using DTMF: 0774445016.
8. When one party hangs-up the call, the HG starts to Close Resources and removes media resources.

## SMS Callback Log

Following are excerpts from a SMS Callback Log.

```
[26/03-10:39:40.805] HMCServer received [ping] from 127.0.0.1/127.0.0.1:4043
...
SMSRawCallback /A24/z/I1050/r1/N"+972544331123"/i0/G"0774445016"
...
[26/03-10:39:44.391] Adding message [SMSRawCallback /A24/z/I1050/r1/N"+972544331123"/i0/
G"0774445016"] to eventQueue for Client -1 Application ID 0
...
[26/03-10:39:47.459] Creating session: Code=[0602], UserId=[udi2], AccessNum=[], EventSource=[/tSMS/
A24/r1]
...
[26/03-10:39:47.680] MGWCallback (4) Leg1 event [DialAck /A24/I4/o1]
...
[26/03-10:39:59.131] MGWCallback (4) Leg2 event [DialAck /A24/I5/o1]
...
[26/03-10:40:44.917] * Received Packet: Ack /A2b/x0,1/I32
```

### Explanation

SMS Callback works as follows. SIM 1 is defined to 'listen' for an incoming SMS from a registered user. SIM 2 is defined as LEG 1 and calls back the registered user and cross-connects with SIM 3. SIM 3 is defined as LEG 2 and calls to the destination party and cross connects with SIM 2.

1. In this case the registered user 0544331123 is sending an SMS message to the number of SIM1. The SMS message contains the destination number.
2. The HG receives the SMS and starting its SMS callback engine. This is indicated by: Adding message [SMSRawCallback . . .

3. The HG checks user authentication. Successful authentication is indicated by: Authentication successful, CLI found:0544331123.
4. The HG matches the originating user (CLI and/or PIN Code) to the predefined registered user.
5. After HG assumes a correct user authentication, the HG redials to the registered user. This is indicated by: MGWCallback (4) Leg1 event [DialAck.
6. The HG calls the destination called party (Leg2) and connects it to Leg 1. This is indicated by: MGWCallback (4) Leg2 event [DialAck /A24/I5/o1
7. When one party hangs-up the call, the HG starts to Close Resources and removes media resources.

## LCR Log

Following are excerpts from an LCR Log.

```
[26/03-10:52:16.490] [debug] getRemoteSignalIP=192.168.1.70
...
[26/03-10:52:16.516] [debug] CreateIncomingSession token: 5ea9f5a3-6193c5d4-52634512-
50c08bcf@192.168.1.70 remoteNumber: 8888 localNumber: 750 remoteIP: 192.168.1.70
...
[26/03-10:52:16.534] [debug] Number is not in BlockedDDIs list
[26/03-10:52:16.537] [debug] source DDI:750 allowed DDI:^*
[26/03-10:52:16.541] [debug] FindLocalMediaResources (5ea9f5a3-6193c5d4-52634512-
50c08bcf@192.168.1.70/4) LocalHwyTS: 11:1 RemoteHwyTS: 12:2 media resource: 11.1
...
[26/03-10:52:46.353] [debug] onReadyToSend replaced h_CallID with
[OGNhOTYwODA4MTZINzQzZTM0ZTkzNDYyNzUwMjEzZTA
```

Explanation:

1. In this case, the originating party, 8888@192.168.1.70, is calling to the destination party, 750@192.168.1.67.
2. CreateIncomingSession indicates that a call is coming from (192.168.1.70) VoIP and the HG is starting to establish the call.
3. The originating party dials the digits: 750. The HG checks that this number is not in the BlockedDDIs list.
4. FindLocalMediaResources indicates that the HG is preparing to allocate local resources.
5. In this case, the HG has been configured to have two uppermost LCR media connections at the top of the VoIP Media Matrix. As a result, every incoming VoIP call to the VoIP

Media Matrix will be forwarded to LCR resources. In our case, the incoming call (192.168.1.70) is forwarded to LCR.

### VoIP Media Matrix

Select Media Gateway card

Slot  11

Selected card at slot 11 (Media Card)

Channel	Target Link (Select to change)
1	LCR Resource 1
2	LCR Resource 2
3	-
4	-

- As a regular LCR configuration it was separated for two groups - incoming and terminating:
  - 1st LCR Group accepts the incoming VoIP call from 192.168.1.70.
  - 2nd LCR Group moves the incoming VoIP call to the terminating LCR channel.

### LCR Resource Map

1	Group: <b>mg1 (1)</b> BiDirect	EMPTY	2	Group: <b>mg2 (2)</b> BiDirect	EMPTY	3	Gr Bil
7	Group: BiDirect	EMPTY	8	Group: BiDirect	EMPTY	9	Gr Bil

### LCR Groups

Save Settings

Group #	Group Name	Cyclic	In Filter	Out Filter	Route to
Group 1	mg1	Yes	-none-	-none-	mg2
Group 2	mg2	Yes	-none-	-none-	mg1

- In order to make the connection between the originating party and destination party, the HG was configured as follows:

### VoIP - Phone to Net Dialing Plan

Dialed Number	Dest. IP	Dest. Number	PIN Code
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="Add Entry"/>			

Dialed Number	Destination IP	Dest. Number	PIN Code	
750	192.168.1.67	-	-	<input type="button" value="Delete"/>

- Every incoming VoIP call that dialed the digits 750 will terminate at the destination party 192.168.1.67.
- When the destination party answers the call, the HG prints the following to the Log: provideAnswer.
- Started media indicates that the HG has started streaming between both parties.
- When one party hangs-up, the HG closes the session and removes the media resources.



## Service Console

---

Hypermedia Technical Support might ask you to assist them by completing tasks using the Service Console.

To run the Service Console tool:

1. Click the Windows **Start** button > **All Programs**.
2. From the Hypermedia program group, select **Service Console**. The Service Console logon screen opens in the default browser.
3. Click the warning bar at the top of the screen and, from the dropdown menu, click **Allow Blocked Content**. Confirm your choice by clicking **Yes** at the confirmation message.

**Note:** To avoid recurring displays of the warning bar, from the menu bar click **Tools** > **Internet Options** > **Advanced** > **Allow active content to run in files on My Computer**.

4. Enter your password and click **Connect**. The Service Console screen is displayed.

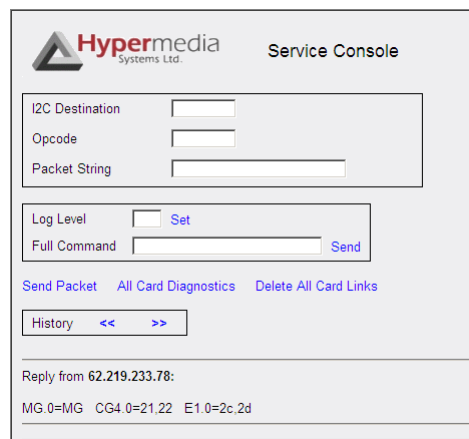


Figure 158: Service Console Screen

5. Follow the instructions given to you by Hypermedia Technical Support.


## HGS Setup Parameters Tool

Use the HGS Setup Parameters tool to configure parameters affecting global Hypermedia Gateway behavior.

To use the HGS Setup Parameters tool:

1. Click the Windows **Start** button > **All Programs**.
2. From the Hypermedia program group, select **HGS Setup Parameters**. The HGS Setup Parameters logon screen is displayed.
3. Enter your password and click **Submit**. The HGS Setup Parameters screen is displayed.

Note! you must stop server in order to edit and submit HGS parameters!


HGS Setup Parameters  
Server address:

**System Functions**

HGS Server		<a href="#">Stop</a>
Set date (MM-DD-YY)	11-15-09	
Set time (hh:mm:ss)	16:46:44	<a href="#">Set</a>

**HGS Service Properties**

Property	Value
Management IP port	8876
Initial log level	3
Enable LCR	Yes
Enable VoIP	Yes

**VoIP Gateway Properties**

Property	Value
Max VoIP channels	32

Note: Please stop HGS Server to change HGS settings.

Figure 159: HGS Setup Parameters Screen

4. From the HGS Server system function line, click **Stop**. A confirmation message indicates that the service was stopped successfully.

- Refresh the browser page, reenter your password and click **Submit**. The HGS Setup Parameters screen is displayed in Edit mode.

HGS Server	Start	
Set date (MM-DD-YY)	<input type="text" value="01-18-09"/>	
Set time (hh:mm:ss)	<input type="text" value="18:45:19"/>	

HGS Service Properties		
Property	Value	
Management IP port	8878	<a href="#">Edit</a>
Card query timeout	3000	<a href="#">Edit</a>
XPort password	admin	<a href="#">Edit</a>
Disable LCR	1	<a href="#">Edit</a>
Delay for media card service	16000	<a href="#">Edit</a>
XPort port number	10001	<a href="#">Edit</a>
XPort IP address	0.0.0.0	<a href="#">Edit</a>

Figure 160: HGS Setup Parameters Screen in Edit Mode

- On a parameter line, click **Edit**. The Value field becomes editable.

**System Functions**

HGS Server	Start	
Set date (MM-DD-YY)	<input type="text" value="01-18-09"/>	
Set time (hh:mm:ss)	<input type="text" value="18:45:19"/>	

HGS Service Properties		
Property	Value	
Management IP port	8878	<a href="#">Edit</a>
Card query timeout	3000	<a href="#">Edit</a>
XPort password	<input type="text" value="admin"/>	<a href="#">Save</a>
Disable LCR	1	<a href="#">Edit</a>
Delay for media card service	16000	<a href="#">Edit</a>
XPort port number	10001	<a href="#">Edit</a>
XPort IP address	0.0.0.0	<a href="#">Edit</a>

Figure 161: Editable Value Field

- Enter the new value.
- Click **Save**.
- Click **Submit**.
- From the HGS Server system function line, click **Start**. A confirmation message indicates that the service was started successfully.

## PRI Cause Conversion

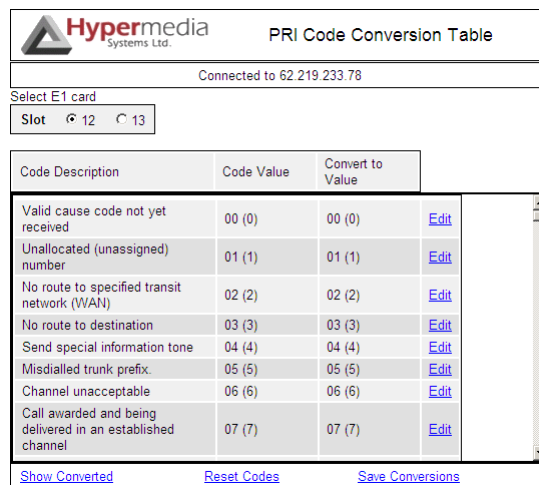
Cause codes represent the reason for releasing the a call. The Hypermedia Gateway can manipulate the releasing Cause code—that is, Convert to Value—if we do not want to report the exact reason for call release.

To run the PRI Cause Conversion tool:

1. Click the Windows **Start** button > **All Programs**.
2. From the Hypermedia program group, select **PRI Cause Conversion**. The PRI Cause Conversion logon screen opens in the default browser.
3. Click the warning bar at the top of the screen and, from the dropdown menu, click **Allow Blocked Content**. Confirm your choice by clicking **Yes** at the confirmation message.

**Note:** To avoid recurring displays of the warning bar, from the menu bar click **Tools** > **Internet Options** > **Advanced** > **Allow active content to run in files on My Computer**.

4. Enter your password and click **Submit**. The PRI Cause Conversion screen is displayed.



The screenshot shows a web browser window with the title "PRI Code Conversion Table". At the top left is the Hypermedia Systems Ltd. logo. Below the logo, it says "Connected to 62.219.233.78". There is a "Select E1 card" section with a "Slot" dropdown menu showing "12" selected. The main content is a table with the following data:

Code Description	Code Value	Convert to Value	
Valid cause code not yet received	00 (0)	00 (0)	<a href="#">Edit</a>
Unallocated (unassigned) number	01 (1)	01 (1)	<a href="#">Edit</a>
No route to specified transit network (WAN)	02 (2)	02 (2)	<a href="#">Edit</a>
No route to destination	03 (3)	03 (3)	<a href="#">Edit</a>
Send special information tone	04 (4)	04 (4)	<a href="#">Edit</a>
Misdialled trunk prefix.	05 (5)	05 (5)	<a href="#">Edit</a>
Channel unacceptable	06 (6)	06 (6)	<a href="#">Edit</a>
Call awarded and being delivered in an established channel	07 (7)	07 (7)	<a href="#">Edit</a>

At the bottom of the table, there are three links: [Show Converted](#), [Reset Codes](#), and [Save Conversions](#).

Figure 162: PRI Cause Conversion Screen

- On a code description line, click **Edit**. A dropdown menu is displayed in the Convert to Value field.

Code Description	Code Value	Convert to Value	
Valid cause code not yet received	00 (0)	00 (0)	<a href="#">Edit</a>
Unallocated (unassigned) number	01 (1)	01 (1)	<a href="#">Edit</a>
No route to specified transit network (WAN)	02 (2)	02	<a href="#">Save</a>
No route to destination	03 (3)	03 (3)	<a href="#">Edit</a>
Send special information tone	04 (4)	04 (4)	<a href="#">Edit</a>
Misdialled trunk prefix.	05 (5)	05 (5)	<a href="#">Edit</a>
Channel unacceptable	06 (6)	06 (6)	<a href="#">Edit</a>
Call awarded and being delivered in an established channel	07 (7)	07 (7)	<a href="#">Edit</a>

[Show Converted](#)      [Reset Codes](#)      [Save Conversions](#)

Figure 163: Editable Value Field

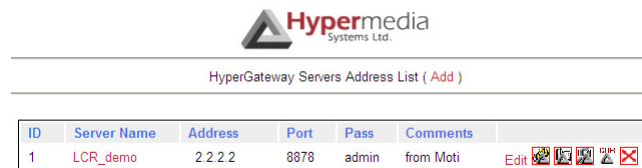
- Select a new value.
- Click **Save**.
- Click **Submit**.
- Two additional options exist:
  - Show Converted**  
Displays the converted values.
  - Reset Codes**  
Assigns the original cause code values.
- Click **Save Conversions**.

## Hypermedia Gateway Server List

Use the Hypermedia Gateway Server list to review a list of existing servers and to add a new server. Other Hypermedia configuration and management tools can be accessed from the Hypermedia Gateway Server list. When accessed from here, the IP address and the password from the list are used, avoiding the need to re-enter these.

To run the Hypermedia Gateway Server List tool:

1. Click the Windows **Start** button > **All Programs**.
2. From the Hypermedia program group, select **Server List**. The HyperGateway Servers Address List screen opens in the default browser.
3. Click the warning bar at the top of the screen and, from the dropdown menu, click **Allow Blocked Content**. Confirm your choice by clicking **Yes** at the confirmation message.



ID	Server Name	Address	Port	Pass	Comments
1	LCR_demo	2.2.2.2	8878	admin	from Moti

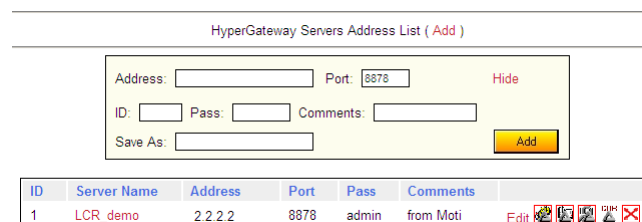
Figure 164: Hypermedia Gateway Server List

**Note:** To avoid recurring displays of the warning bar, from the menu bar click **Tools** > **Internet Options** > **Advanced** > **Allow active content to run in files on My Computer**.

## Adding a New Server


To add a new server:

1. Ensure that you know the IP address of the new server.
2. From the top of the screen, click **Add**. An additional dialog box is displayed.



ID	Server Name	Address	Port	Pass	Comments
1	LCR_demo	2.2.2.2	8878	admin	from Moti

Figure 165: Add a New Server Screen

3. Enter the server parameters.
4. Click . The new server is added to the list.











ID	Server Name	Address	Port	Pass	Comments	
1	LCR_demo	2.2.2.2	8878	admin	from Moti	Edit     
2	Levys Demo	2.2.2.2	8878	admin	Demo_delete	Edit     






Figure 166: New Server Appears in List

## Accessing Other Tools via the Server List

---

Use the Gateway Server List to open:

**Table 10: Tools Available from the Server List**

Clicking the name that appears in the Server Name column	Opens the Hypermedia Management Console
Clicking <b>Edit</b>	Opens the Server Information window
	Opens the HGS Setup Parameters tool
	Launches the Log Console
	Launches the Service Console
	Launches the CDR Console
	Deletes the entry

## Troubleshooting

**Table 11: Power**

Display	Problem	Solution	
System does not start up	No power to the unit	Connect power cables	
Alarm sounds every time the system boots up	When a dual power supply is used, one power unit is not functioning or only one power unit is present	Replace faulty power unit. Add a power unit	

**Table 12: PRI**

Display	Problem	Solution	
Sync. LED (Green) is blinking	No synchronization of PRI card	<ul style="list-style-type: none"> <li>Check connections to the PRI card at the PBX or line.</li> <li>Verify that the PRI cable is connected.</li> <li>Verify that all pins in the PRI connector are connected in accordance to the PRI specifications.</li> </ul>	
(PRI 1.1 only) Ready LED (Yellow) does not light Error LED (Red) is blinking	Card is either not inserted correctly, or faulty Card is faulty	Reinsert the card and restart the system. If problem continues replace the card.	
Noise on the line while call in progress	Synchronization of PRI card is not set correctly.	Verify PRI settings for synchronization. Typically the PRI Sync. settings at the HyperGateway should be "Slave".	



**Table 13: Cellular**

Display	Problem	Solution	
No sync. with network (Green LED is off)	Antenna is not located properly	Position the antenna in a place with better reception.	
No sync. with network (Green LED blinks)	No SIM card	Put a working SIM card in the appropriate channel	
Error LED (Red) is blinking  Ready LED (Yellow) does not light	Card is either not inserted correctly, or faulty	Reinsert the card and restart the system. If problem continues replace the card.	

**Table 14: MG Card**

Display	Problem	Solution	
<ul style="list-style-type: none"> <li>• LINK LED (Green) does not light</li> <li>• Error LED (Red) is blinking (50% duty cycle, not twinkling)</li> <li>• Ready LED (Yellow) does not light</li> </ul>	No LAN Connection Card is faulty Card is either not inserted correctly, or faulty	Check connections to the Router. Reinsert the card and restart the system. If problem continues replace the card.	

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## Chapter 9

# INDEX

### Numerics

1st group .....	72
2nd / 3rd group .....	72

### A

ACD .....	105, 115, 116
ACR .....	73, 78
add left .....	75
adding a new server .....	172
advanced call routing .....	73
allow blocked content warning .....	20
allow duplicate CLIs .....	27
answer maximum wait .....	50
ASR .....	105, 115, 116
authentication	
callback .....	27, 146
callthrough .....	27, 153
authentication for callback .....	138

### B

balancing SIMs .....	53
BCCH .....	51
BER .....	55, 56

bi-directional LCR resource .....	71
billing .....	67
blocking .....	82
calling line identification .....	49
DDI .....	112
SIM card .....	47
voip channels .....	133
voip lines .....	116

### C

call routing .....	111
callback	
activation/delegation delay .....	28
authentication policy .....	27, 146
automatic DTMF digit duration .....	28
automatic DTMF send delay .....	28
automatic inter-digit duration .....	28
borrowing resources from callthrough	28
cellular .....	34
cellular resources .....	34
dial timeout .....	28
extended authentication .....	138
line trigger .....	123, 148
log .....	161, 163

remote delegation .....	137	cyclic .....	66, 105
user access .....	123, 147	<b>D</b>	
web trigger .....	123, 147	dBm .....	51
callback triggers		DDI	
cellular callback trigger .....	35	blocking .....	112
cellular SMS trigger .....	35	filters .....	108
LCR .....	88	delay	
overview .....	140, 149	PIN code inter-digit .....	106
calling line identification		PIN code send .....	106
blocking .....	49	delay after DTMF code sent .....	28
callthrough		delegation for callback .....	137
authentication policy .....	27, 153	delete	
cellular .....	37	saved configuration .....	26
LCR .....	83	dial filters	
log .....	160	cellular .....	39
overview .....	149	dialtone length .....	28
using resources for callback .....	28	downloading	
voip .....	103	CDR file .....	91
camp .....	51	DTMF	
cause codes		delay .....	28
PRI conversion .....	170	digit duration .....	28
voip .....	113	send delay .....	28
CDR		DTMF on connect .....	123, 148
callback .....	154	<b>E</b>	
callthrough .....	154	early media .....	105
console .....	156	echo canceller .....	31
downloading .....	91	enable codecs .....	106
LCR .....	96	<b>F</b>	
LCR records .....	90	filters	
voip .....	117	add left .....	75
clear voip call .....	116	cellular .....	39
CLI		DDI .....	108
allow duplicate .....	27	IP .....	107
blocking .....	49	LCR .....	75, 85
callback trigger .....	123, 148	match condition .....	75
code .....	122, 147	number .....	85
codecs .....	106	number filters .....	125
consoles		trim left .....	75
CDR .....	156	voip dial .....	110
log .....	157		
service .....	167		
counters .....	46, 48		
reset SIM .....	130		

frame 1	
start time .....	76
fully allocated .....	101

## G

groups	
default .....	67
LCR .....	66
LCR rules .....	72
LCR selection .....	70
voip linking .....	104
VPN .....	124

## H

hangup	
closes session .....	27
voip call .....	116
HMC	
installation .....	18
startup .....	20

## I

in filter .....	66, 75
inter-digit duration .....	28
internal routing .....	67
IP precedence .....	105

## L

LCR log .....	164
line callback trigger .....	123, 148
line ID .....	123, 148
linking	
cellular channels .....	32
LCR .....	61, 63
voip channels .....	100
lock period .....	132
locks .....	44
log	
callback .....	161, 163
callthrough .....	160
GSM to VoIP .....	159

LCR .....	164
VoIP to GSM .....	158
log console .....	157

## M

match condition .....	75
maximum length of call .....	50
media card fallback .....	27
media connections	
cellular .....	32
LCR .....	61, 63
voip .....	100
mobile number .....	122, 147
multiple subscriber number .....	41

## N

number filters .....	85, 125
number lists and ACR .....	78
number of calls for ASR/ACD statistics	105
number send delay .....	28

## O

operator .....	55, 56
operator locks .....	44
out filter .....	66, 75
outbound only LCR resource .....	71

## P

payloads per packet .....	106
PC1 cards .....	94
phone2net dial plan .....	111
PIN code .....	40
inter-digit delay .....	106
send delay .....	106
public IP .....	105

## R

reception .....	56
remote hangup closes session .....	27
remote party answer timeout .....	28
repeat period .....	128, 130, 131, 133, 135

repetitions .....	48	counters .....	46, 48
reset		locks .....	44
ACD count .....	116	minutes until blocked .....	47
ASR count .....	116	minutes until switched .....	47
cellular card .....	42	multi set .....	132
SIM counter .....	130	reset counters .....	130
resources		schedule switch per slot .....	127
assigning LCR .....	69	schedule switch per system .....	129
LCR .....	61, 63	select .....	45
LCR map .....	68	SIP proxy .....	106
restore saved configuration .....	26	SMS	
RFC2833 payload .....	106	callback log .....	163
round call length up .....	50	SMS trigger .....	35
rules		start times of frames .....	76
ACR .....	80	steps .....	48
creating default .....	74	store settings on cards .....	26
LCR callthrough filters .....	85	switch period .....	132
LCR groups .....	72		
on destination .....	81	<b>T</b>	
on source .....	81	tag,number heading .....	78
RX BER .....	55, 56	time frames .....	72, 73, 76
RX level .....	55, 56	time periods .....	48
		timeout	
<b>S</b>		answering outgoing call .....	50
save		callback dial .....	28
existing configuration .....	26	length of call .....	50
new configuration .....	26	remote party answer .....	28
select SIM .....	45	triggers	
serial numbers .....	43	callback .....	140, 149
server		cellular callback .....	35
adding .....	172	LCR callback .....	88
list .....	172	line callback .....	123, 148
settings .....	21	SMS .....	35
service console .....	167	web callback .....	123, 147
set 1st leg		trim left .....	75
LCR 84		type of service .....	105
cellular .....	34, 38		
voip .....	104	<b>U</b>	
setup parameters .....	168	unstructured supplementary service data .....	53
SIM		user	
automatic management .....	47	add .....	122
balance .....	53	callback access .....	123, 147

code .....	122, 147
ID .....	122, 147
mobile number .....	122, 147
user input indication .....	106
USSD .....	53

## **V**

voip to line cyclic channel allocation ....	105
volume settings .....	31
VPN .....	123, 124, 147

## **W**

waiting for answer timeout .....	50
web callback trigger .....	123, 147
white lists .....	107

