Hypermedia HG-4000
Product Manual

3U and 6U Cellular / VoIP Gateways

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Before You Begin

Conventions

The following symbols have been inserted on the left hand side of the operating instructions in order to make it easier for the User to perform procedures:

Symbol	Description
	**Note:** Information given in a note describes how the System functions or provides a tip on how best to use it.
	**Caution:** Information given in a message labeled ―caution‖ refers to the safe operation of the System and provides warnings where the possibility for loss of data or damage to the equipment exists.
	**Danger:** Information given in a message labeled ―danger‖ warns of possible hazard to personnel and extreme hazard to the System.

Notice

Information given in this document is subject to change without any notice.

1 Hardware and Installation

Note: 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 chapter contains:

- Contents of Package (section 1.1.1)
- Safety Information (section 1.2)
- System Components (section 1.3)
- Typical Board Configurations (section 1.4)

- Pre-Installation Preparation (section 1.5 .1)
- Router Settings – RO 1.X (section 1.6.3)
- Inserting the SIM Cards (section 1.7)
- Powering Up and LEDs (section 1.8)

1.1 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.

1.1.1 Contents of Package

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

- The Hypermedia Gateway unit
- Ethernet cables
- 1 or 2 power cords, depending upon the configuration
- 1 to 8 indoor antennas, depending upon the configuration
- Hypermedia Software CD-ROM
- The warranty certificate
- 1 SD card (standard gateway)

1.2 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.
- 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.

1.3 System Components

The HG-4000 Gateway comes in two main series:

Standard — based on an embedded CPU and is designed for the enterprise user.

Heavy-Duty — based on a PC board and is designed for the VoIP call operator.

- The Hypermedia Gateway is a 19" × 6U or 19" × 3U rack-mount unit that connects to the local PBX or network. The system enables any combination of

connectivity between its PRI and cellular interfaces (VoIP and BRI are optional).

- The unit is built of a **backplane** and slots for the system boards, as described in the following Table 1. The placement of the boards varies according to product configuration.
- The unit contains a single **power supply** module. A dual power supply module is also available.
- Depending upon system configuration, the Hypermedia Server is an application that is embedded on the HBN, HBS, HBD or on the PC1/2 board. The Hypermedia 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 connects to the gateway using TCP/IP and is accessed via a standard WEB browser.

1.4 Typical Board Configurations

The placement of the HG-4000 boards varies according to the product series. The names and function of the boards is described in the following Table 1.

Table 1. HG-4000 Boards and Function

Board Name	Description
Standard Gateway's Boards	
HBN, HBD, HBS	These Hybrid boards provide the gateway management function as well as VoIP functionality. Optionally, these cards can also support PRI functionality. The HBD supports dual PRI ports and the HBS supports a single PRI port.
Heavy-Duty Gateway's Boards	
PC1/PC2	The PC board runs the HyperGateway Server along with one of the following boards: MC, SU or MG.
MC1.0, MC1.1, MC1.2	These boards provide support for VoIP functionality (MC1.0) and the PRI connectivity function (MC1.1, MC1.2). Installed on PC-based systems. The MC1.2 card supports dual PRI ports and the MC1.1 card supports a single PRI port.

SU	This board provides support for VoIP functionality (32 ports) in 3U form board along with MG2.1
MG 2.1	This board contains a media matrix, and is used with an SU board.
MG1.2	This board provides support for VoIP functionality where 72 ports expansion is required. It also contains a media matrix.
Cross-Gateways Boards	
CG41/CC41/CU41	CG41 for GSM, CC41 for CDMA and CU41 for UMTS is a single-slot board that enables four (4) inbound and outbound cellular voice calls for the various cellular networks.
RO 1.X	This is an embedded router board
S-HUB	This board provides SIM server connectivity

Typical Board Configurations

1.4.1 Standard Series

1.4.1.1 3U Standard Gateway, up to 12 ports, SIP or H.323

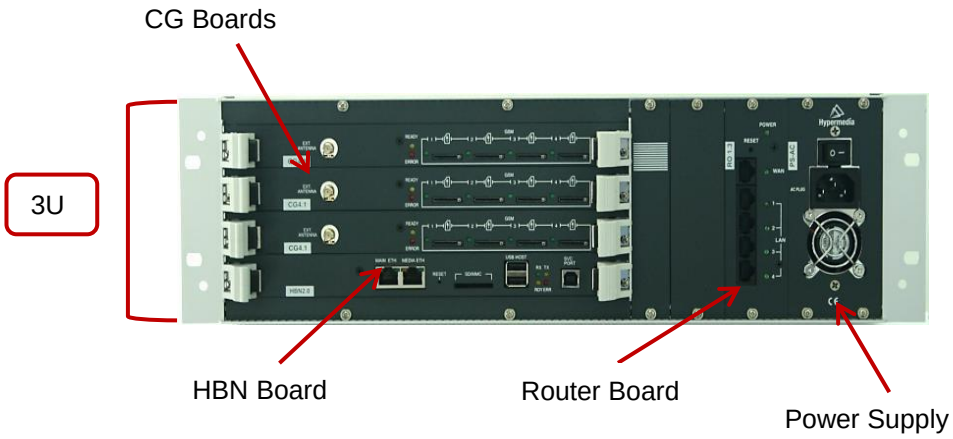


Figure 1. 3U Standard Gateway (up to 12 ports)

1.4.1.2 6U Standard Gateway, up to 32 ports, SIP

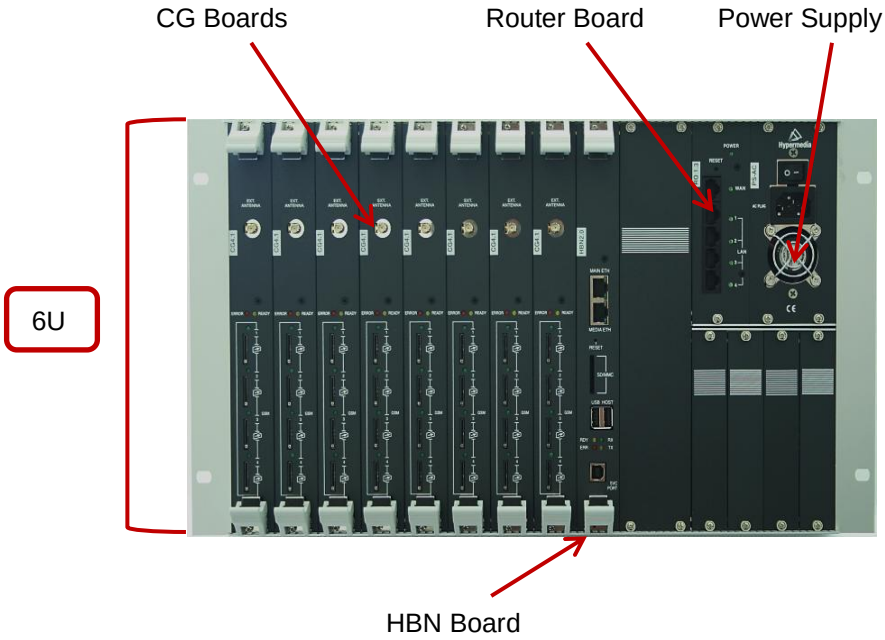


Figure 2. 6U Standard Gateway (up to 32 ports)

1.4.2 Heavy-Duty Series

1.4.2.1 6U Heavy-Duty, 32 ports – PC + MC, SIP or H.323

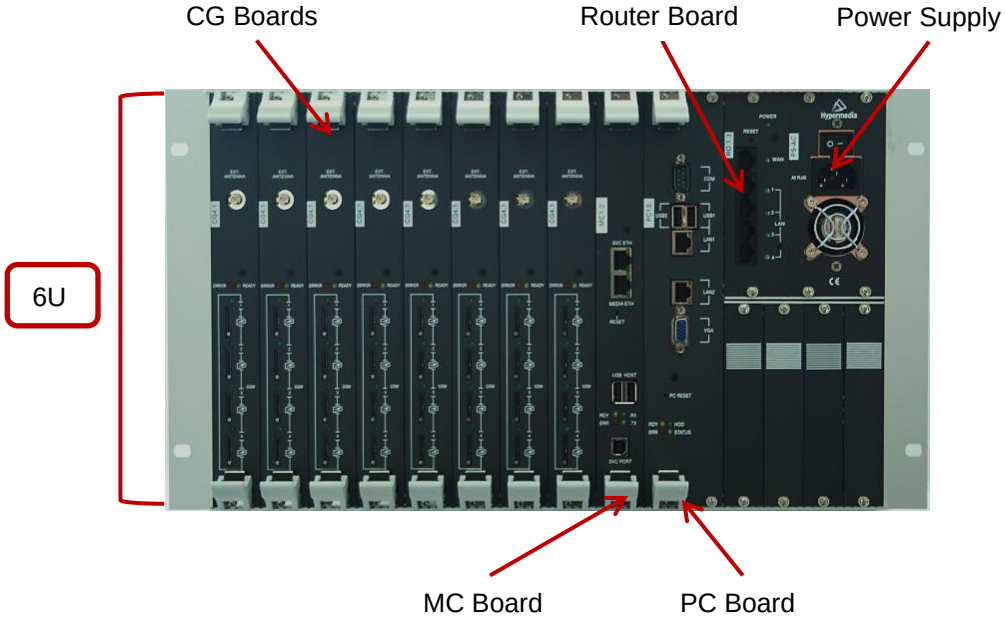


Figure 3. 6U Heavy-Duty (32 ports)

1.4.2.2 6U Heavy-Duty, up to 32 ports – PC +SU, SIP or H.323

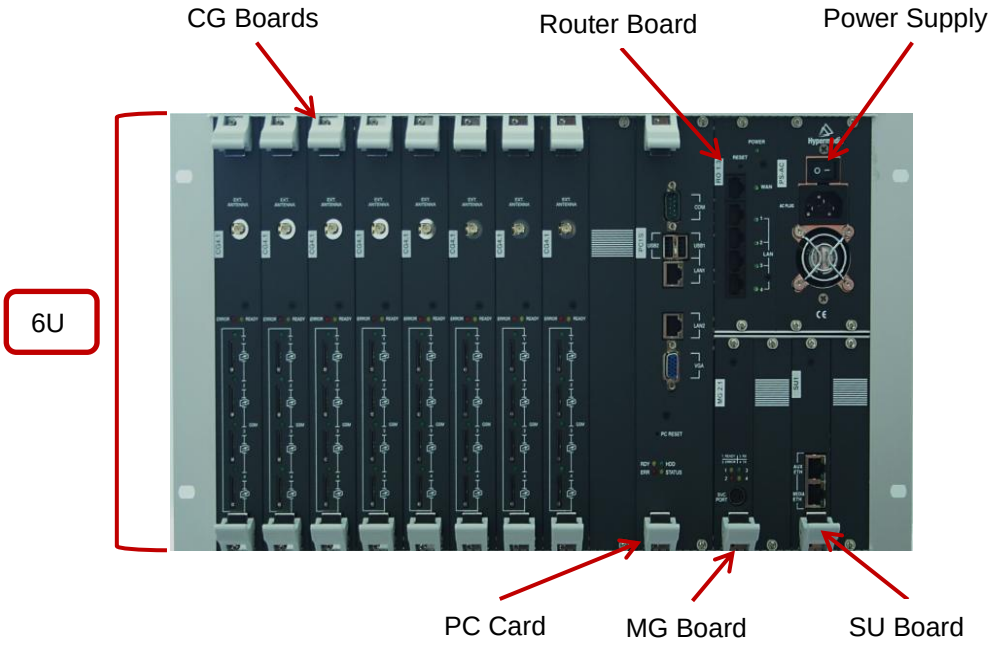


Figure 4. 6U Heavy-Duty (up to 32 ports)

Typical Board Configurations

1.4.2.3 6U Heavy-Duty, expandable up to 72 ports – PC+MG, SIP or H.323

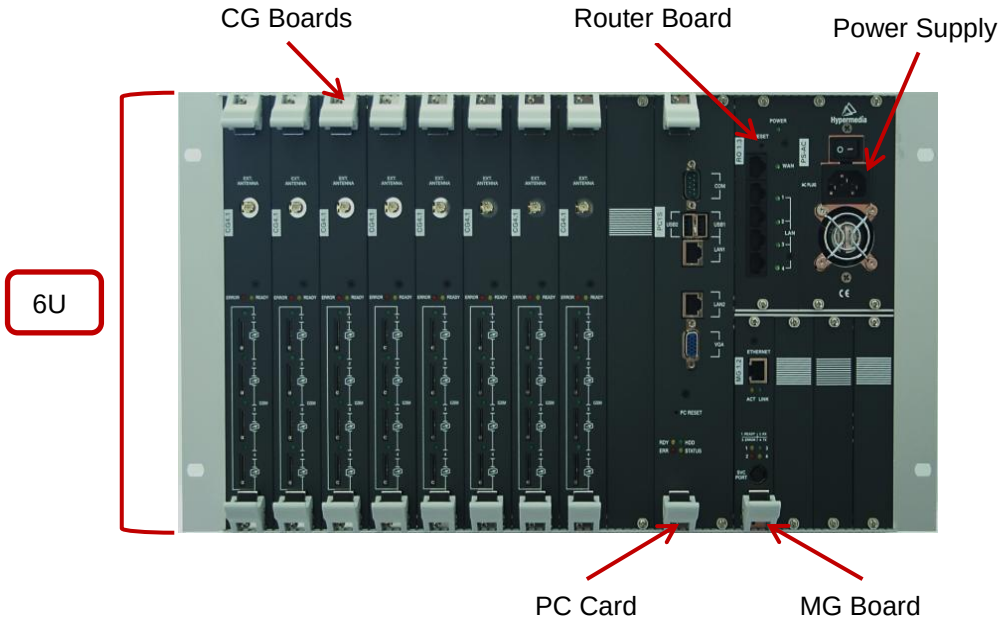


Figure 5. Heavy-Duty (expandable up to72 ports)

1.5 Installation

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

1.5.1 Pre-Installation Preparations

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: the following
   - 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 provided antennas are for indoor use only. RF combiners and external antennas are sold separately.
   - 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 card in your PBX
   - SIM cards from your GSM operator. One SIM card is required for each GSM channel
3. To configure the Router, get the following information from your Internet Service Provider:
   - WAN IP Address
   - Subnet Mask, and WAN Gateway

Note:

- The RO 1.X default LAN IP address for the Hybrid-Based Gateway is

192.168.9.254

- The RO 1.X default LAN IP address for the PC-Based Gateway is **192.168.0.1**

1.6 Cable Connections

There are two types of connections:

- Standard Gateway – Hybrid based (HBN, HBS, HBD)
- Heavy-Duty Gateway – PC Based (MC, MG+SU)

1.6.1 Standard Gateway - Hybrid Based (HBN, HBS and HBD)

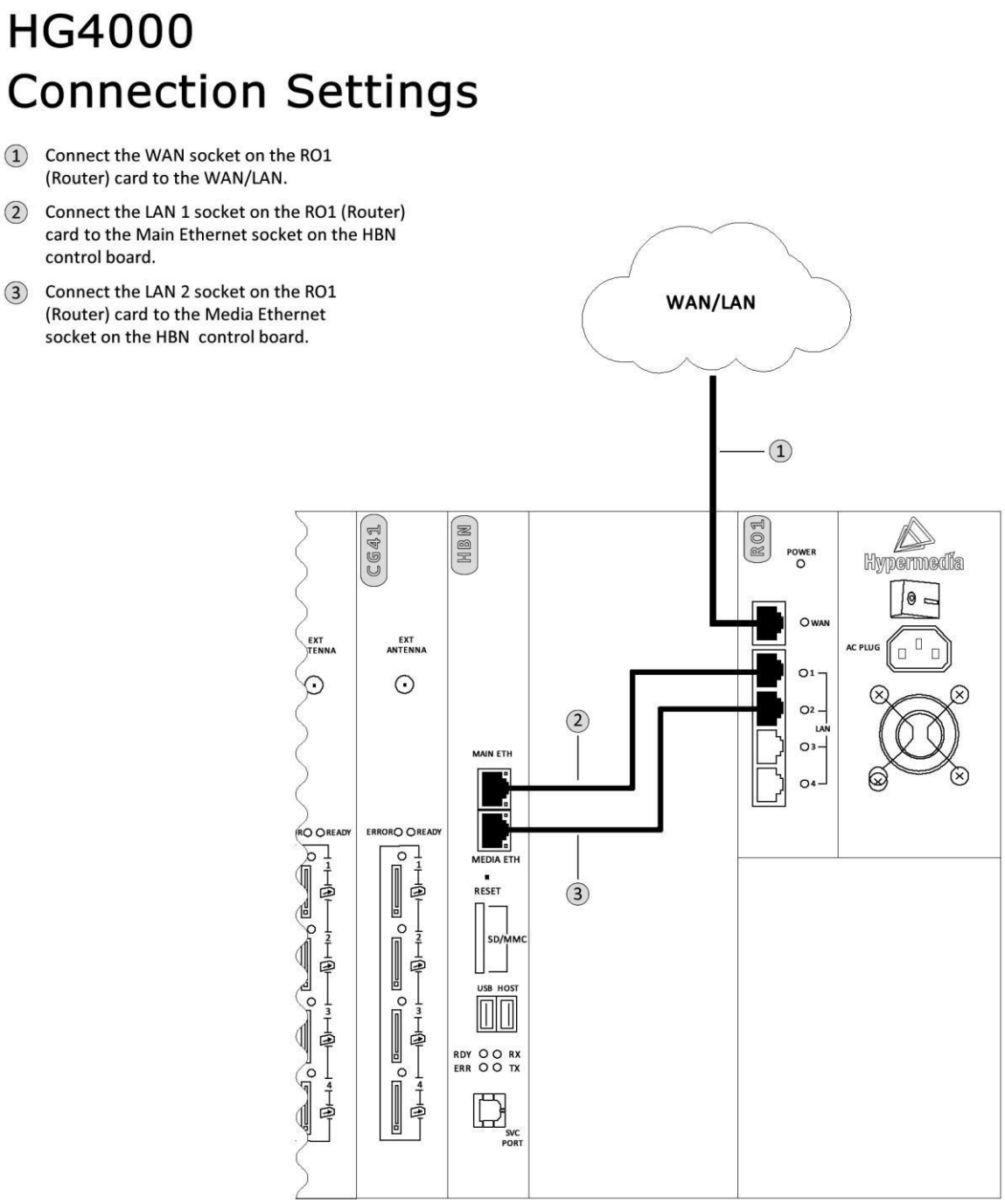


Figure 6. HG4000 - HBN Connection Settings

HG4100
Connection Settings

1. Connect the WAN socket on the RO1 (Router) card to the WAN/LAN.
2. Connect the PRI socket on the HBS control board to the PSTN or to the PBX.
3. Connect the LAN 1 socket on the RO1 (Router) card to the Main Ethernet socket on the HBS control board.
4. Connect the LAN 2 socket on the RO1 (Router) card to the Media Ethernet socket on the HBS control board.

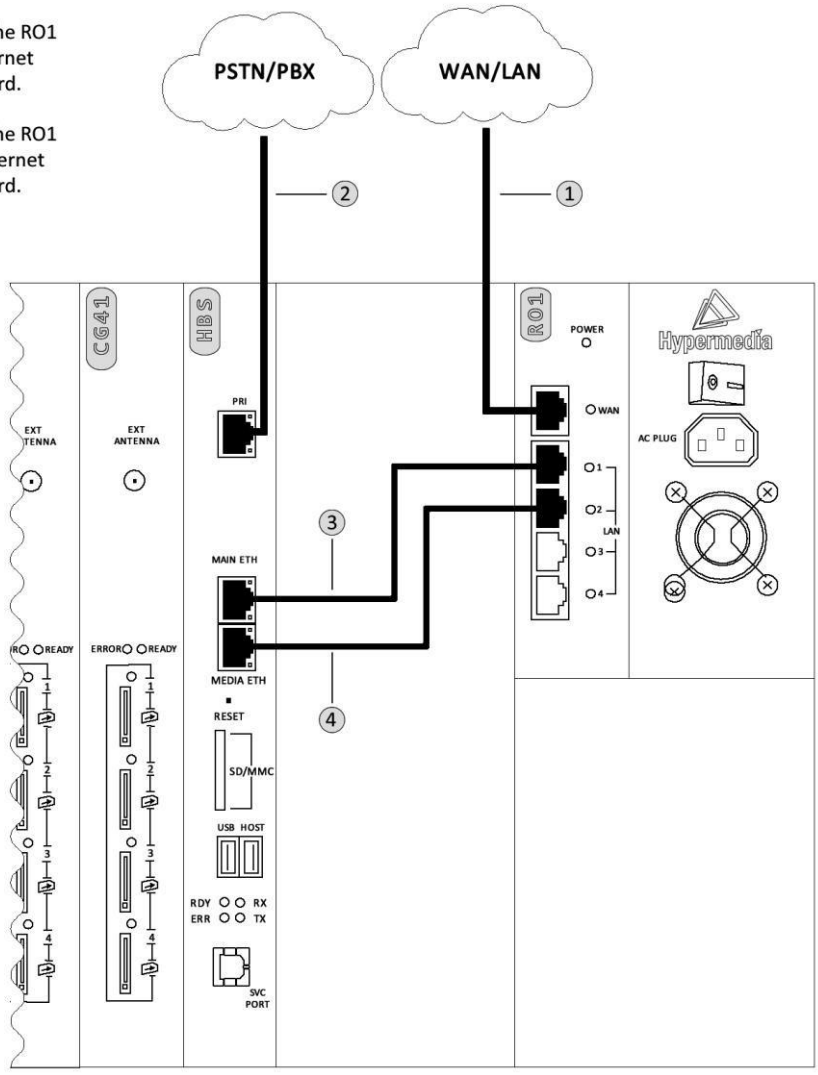


Figure 7. HG-4100 - HBS Connection Settings

HG4200
Connection Settings

1. Connect the WAN socket on the RO1 (Router) card to the WAN/LAN.
2. Connect the PRI 2 socket on the HBD control board to the PSTN or to the PBX.
3. Connect the PRI 1 socket on the HBD control board to the PSTN or to the PBX.
4. Connect the LAN 1 socket on the RO1 (Router) card to the Main Ethernet socket on the HBD control board.
5. Connect the LAN 2 socket on the RO1 (Router) card to the Media Ethernet socket on the HBD control board.

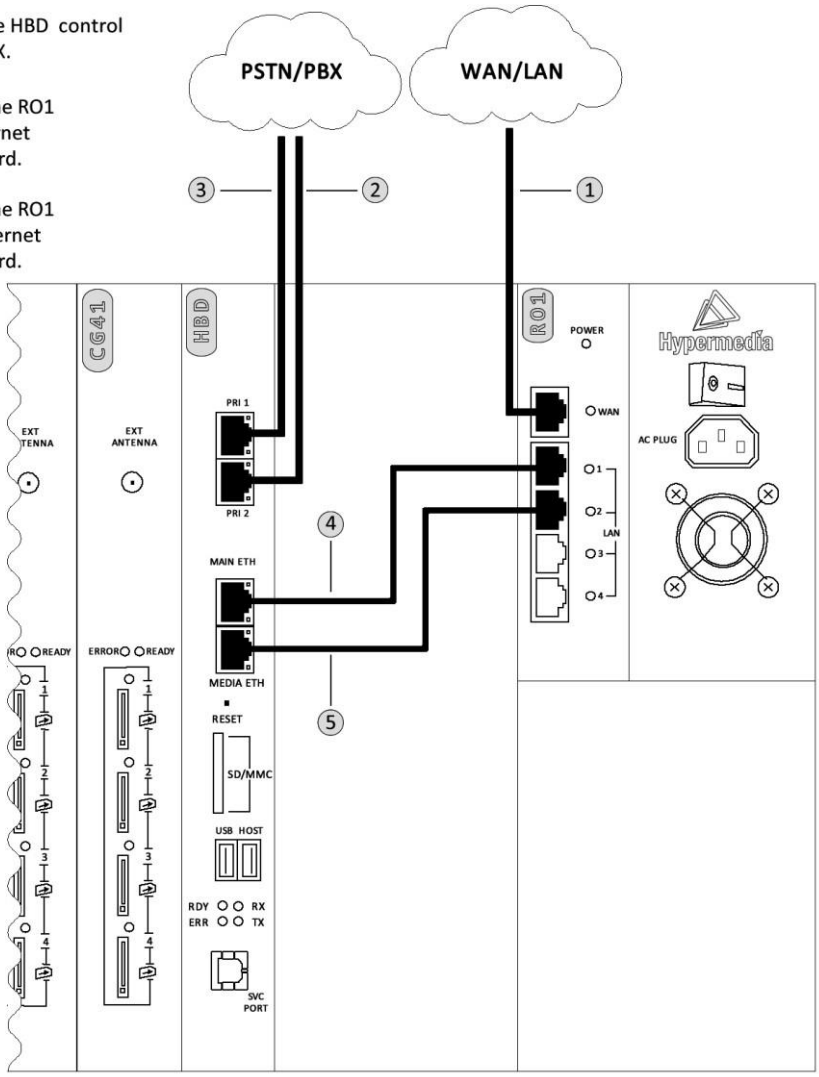


Figure 8. HG-4200 - HBD Connection Settings

1.6.2 Heavy-Duty Gateway – PC Based (MC, MG+SU)

HG4000 PC-MC
Connection Settings

1. Connect the WAN socket on the RO1 (Router) card to the WAN/LAN.
2. Connect the LAN 1 socket on the RO1 (Router) card to the LAN 1 socket on the PC control board.
3. Connect the LAN 2 socket on the RO1 (Router) card to the Media Ethernet socket on the MC control card.

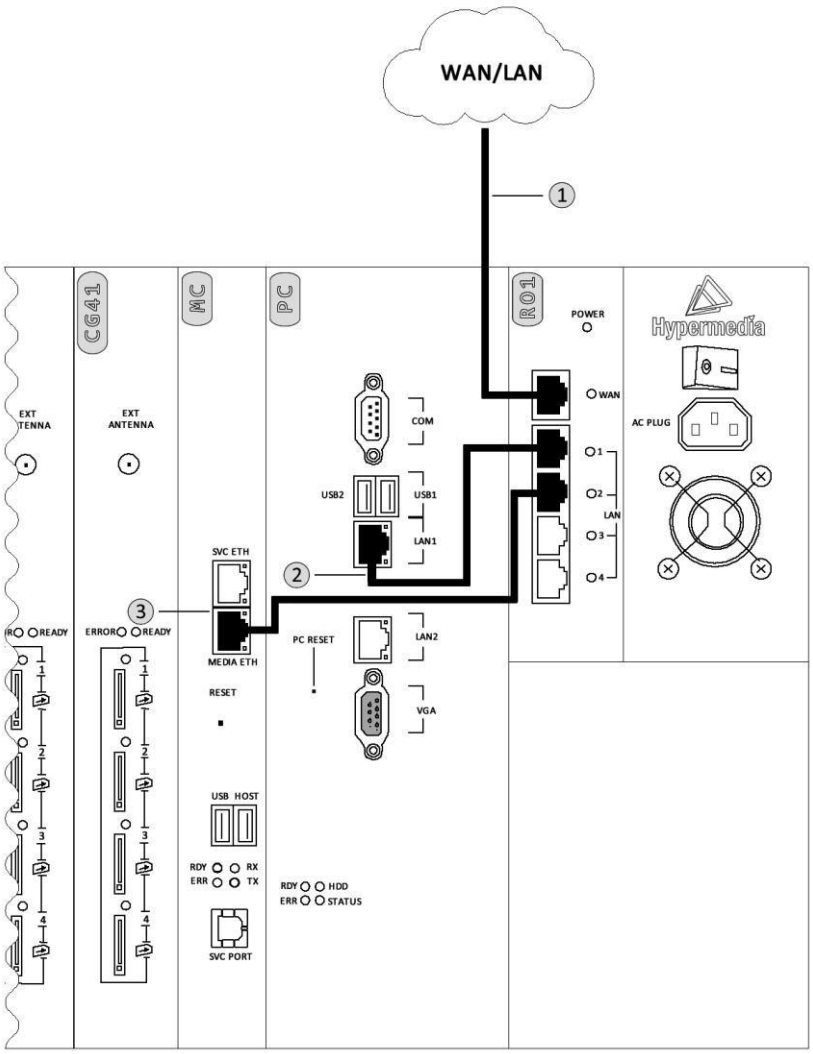


Figure 9. HG-4000 – PC-MC Connection Settings

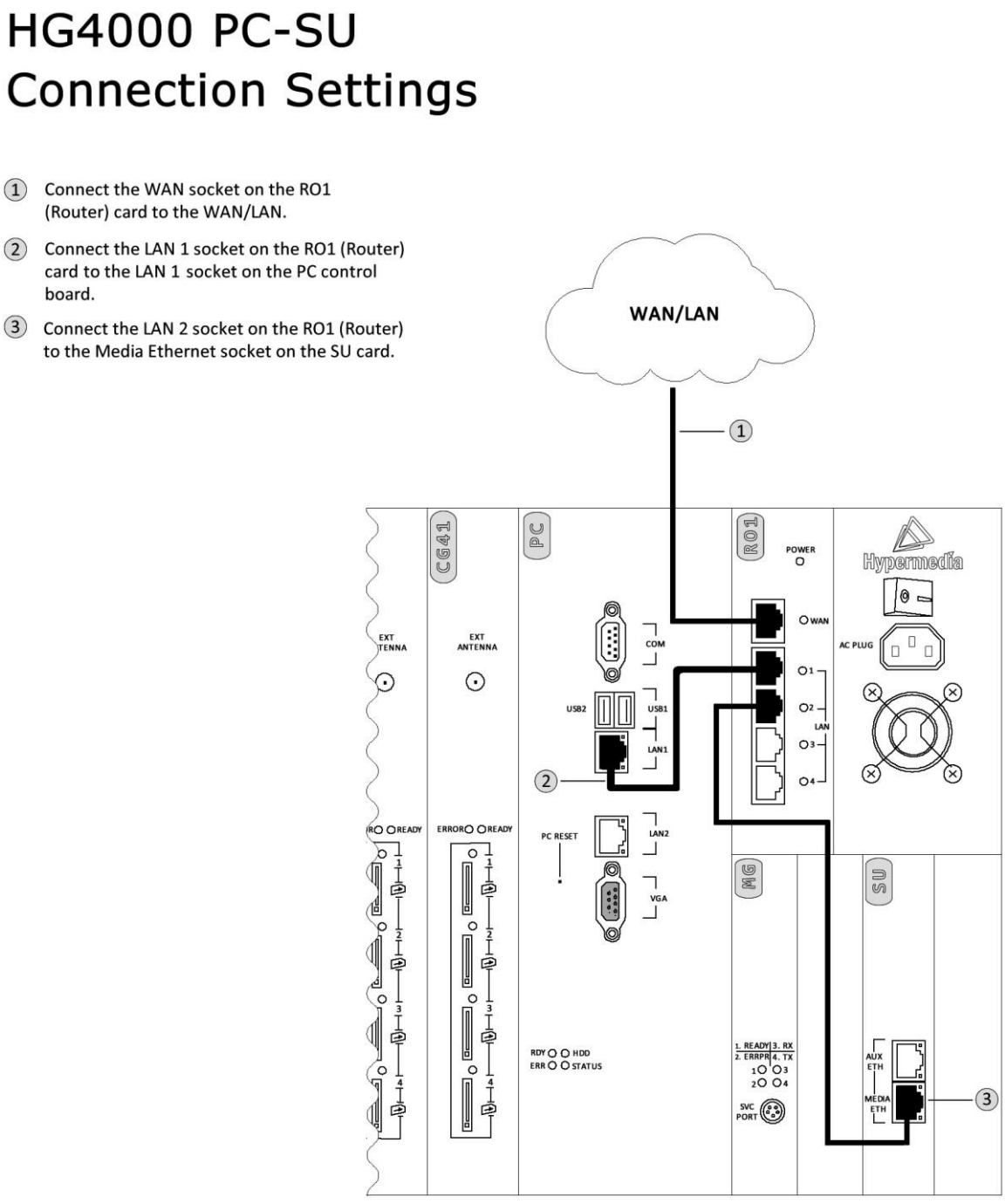


Figure 10. HG-4000 – PC-SU+MG Connection Settings

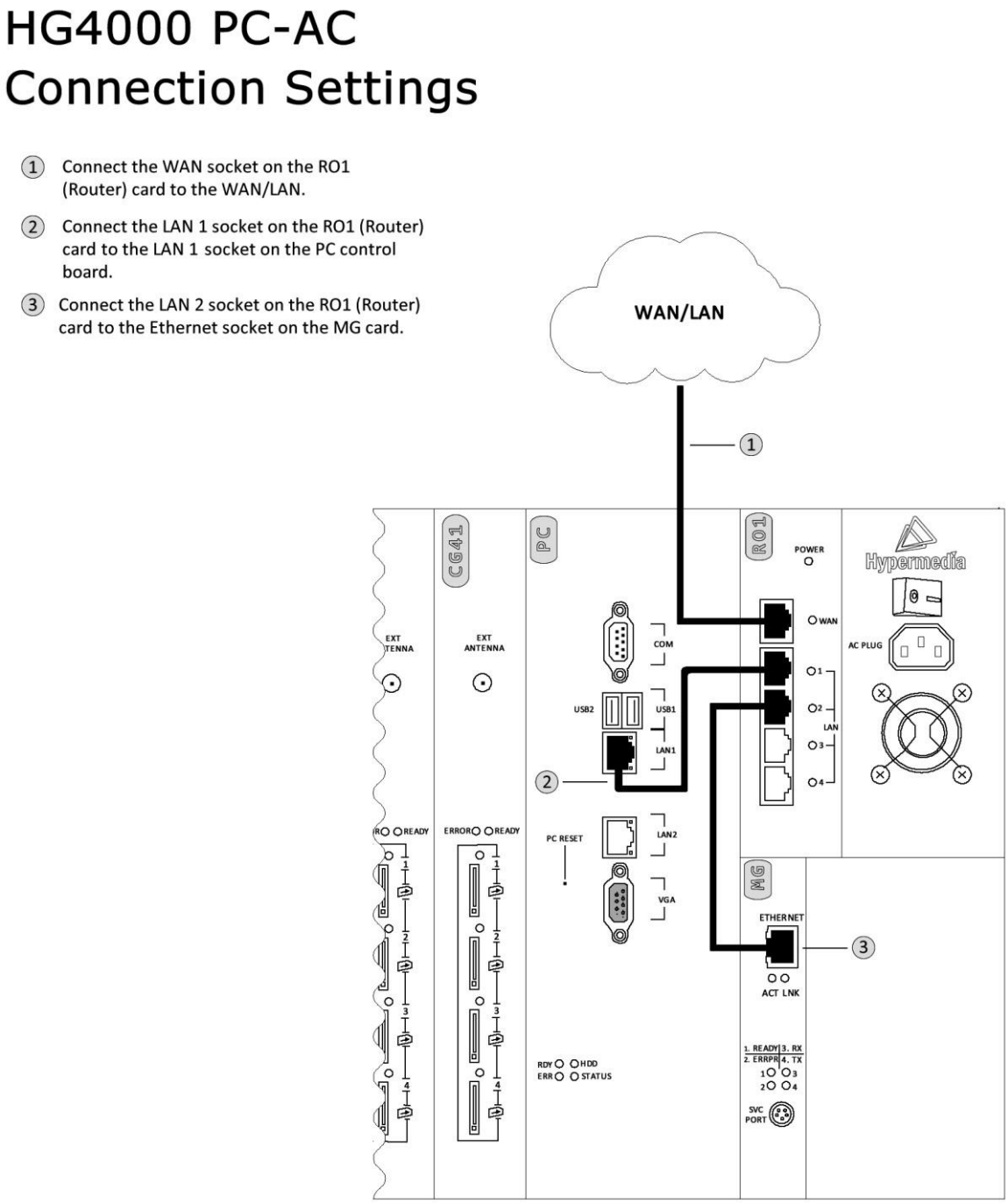


Figure 11. HG-4000 – PC + MG Connection Settings

1.6.3 Router Settings – RO 1.X

The RO 1.X board is an Ethernet Broadband Router 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).

Note: A router exists only on VoIP enabled gateway.

1.6.3.1 Standard Gateway (HBN, HBS, HBD) Router Setup

1.6.3.1.1 Assigning a Static WAN IP address (Public IP address)

Setting-up the RO 1.X board requires proper configuration of the computer network settings. The default LAN IP address of the RO 1.X is **192.168.9.254** and the default subnet mask is **255.255.255.0**. These addresses cannot be changed. If changed, connection with the Gateway will be lost.

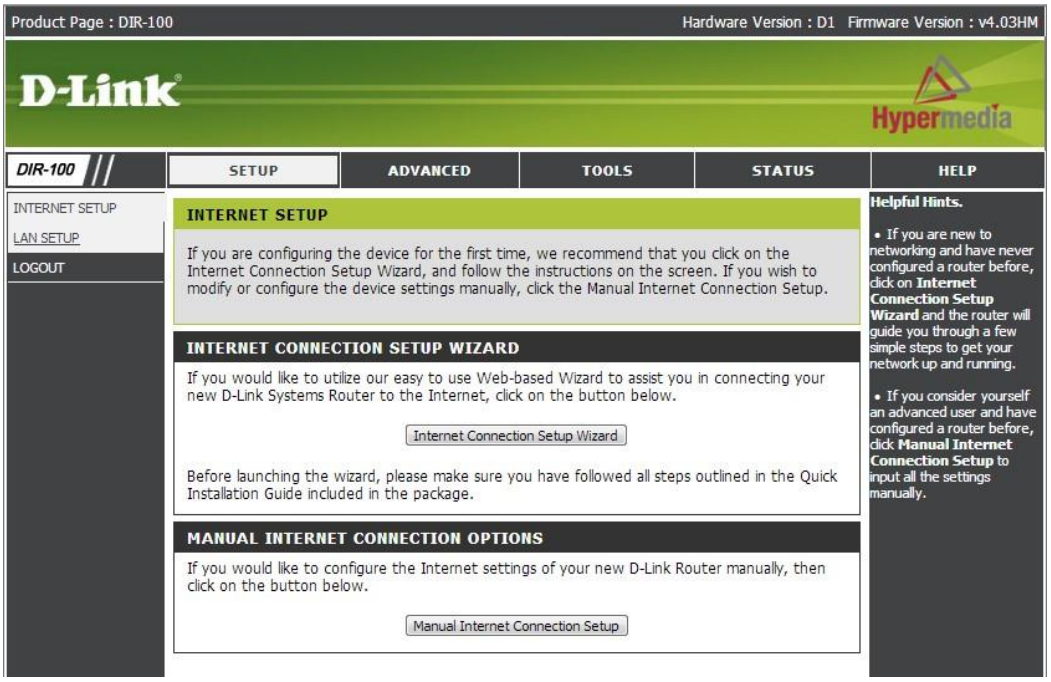
If the TCP/IP environment of your computer has not yet been configured, refer to configuring your PCs to connect to one of the free LAN ports of the RO 1.X board. Configure your computers to automatically obtain TCP/IP settings from the DHCP server embedded in the RO 1.X.

1.6.3.1.2 Start-up and Login

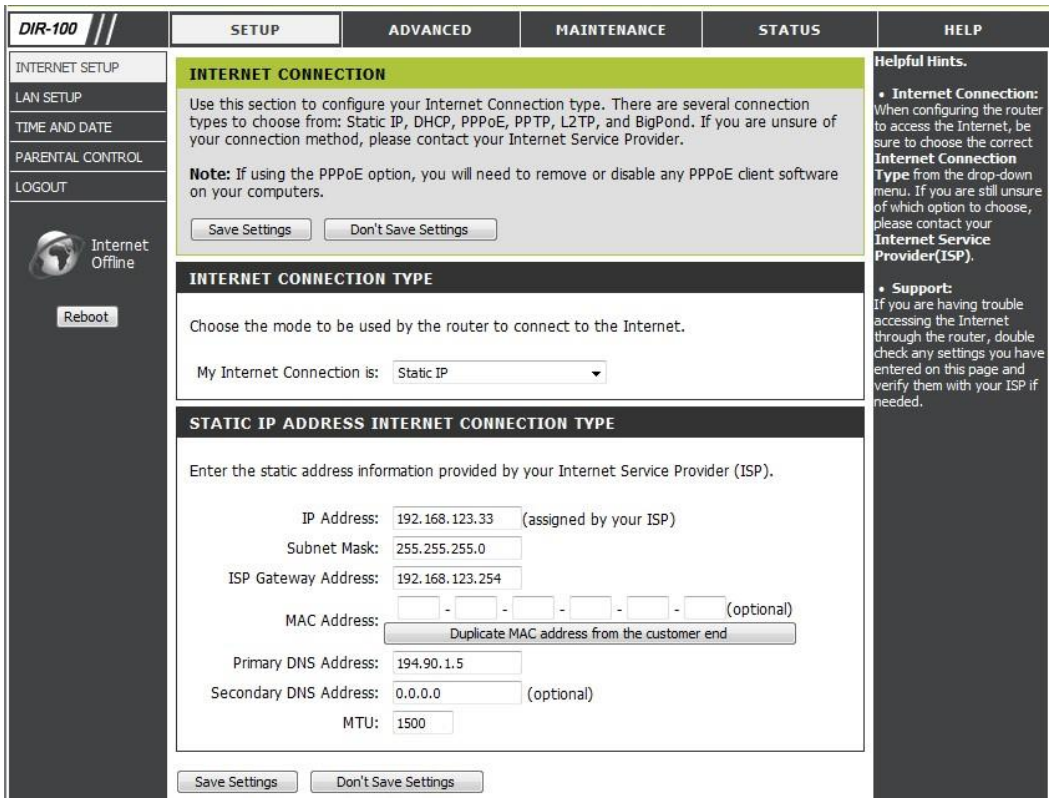
1. While connected to a free LAN port, activate your web browser and type in the IP address of the RO 1.X / DIR-100 into the Address field and press ―Enter.‖ The default LAN IP address of the RO 1.X / DIR-100 is **192.168.9.254**

2. After the connection is established, the logon screen opens. To log in as an administrator, enter the username of ―**admin**‖ and the password ―**hypergateway**''.

3. Click the **Log In** button. The Setup Wizard screen appears.



4. Click on **Manual Internet Connection Setup**. The following screen appears.



5. Fill in the Public IP address information provided by your ISP.
6. Fill in the Subnet Mask, ISP Gateway address and Primary DNS address (optional).
7. Click **Save Settings.**

1.6.3.2 Heavy-Duty Gateway (PC Based) Router Setup

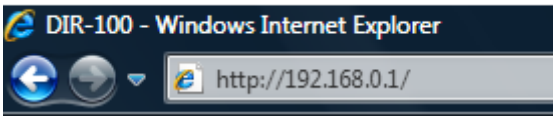
1.6.3.2.1 Assigning a Static IP address (Public IP address)

Setting-up the RO 1.X board requires proper configuration of the computer network settings. The default LAN IP address of the RO 1.X is **192.168.0.1** and the default subnet mask is **255.255.255.0**. These addresses cannot be changed. If changed, connection with Gateway will be lost and the default values are used in this manual.

If the TCP/IP environment of your computer has not yet been configured, refer to configuring your PCs to connect to one of the free LAN ports of RO 1.X board. Configure your computers to automatically obtain TCP/IP settings from the DHCP server embedded in the RO 1.X.

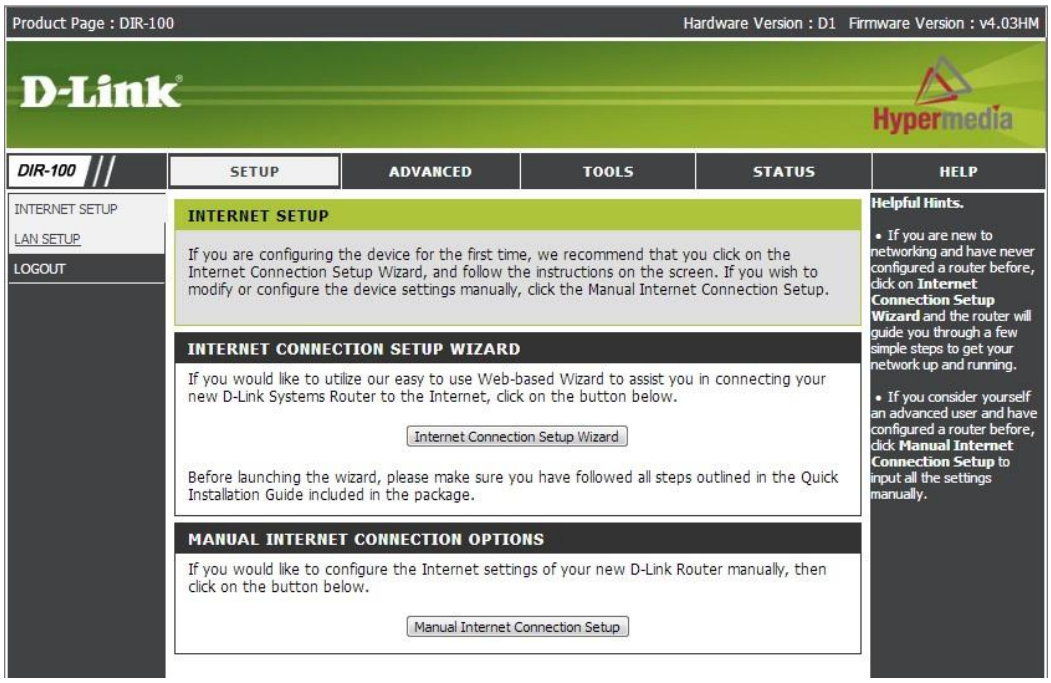
1.6.3.2.2 Start-up and Login

1. While connected to a free LAN port, activate your web browser and type in the IP address of the RO 1.X into the Address field and press ―Enter.‖ The default IP address of the RO 1.X is **192.168.0.1.**

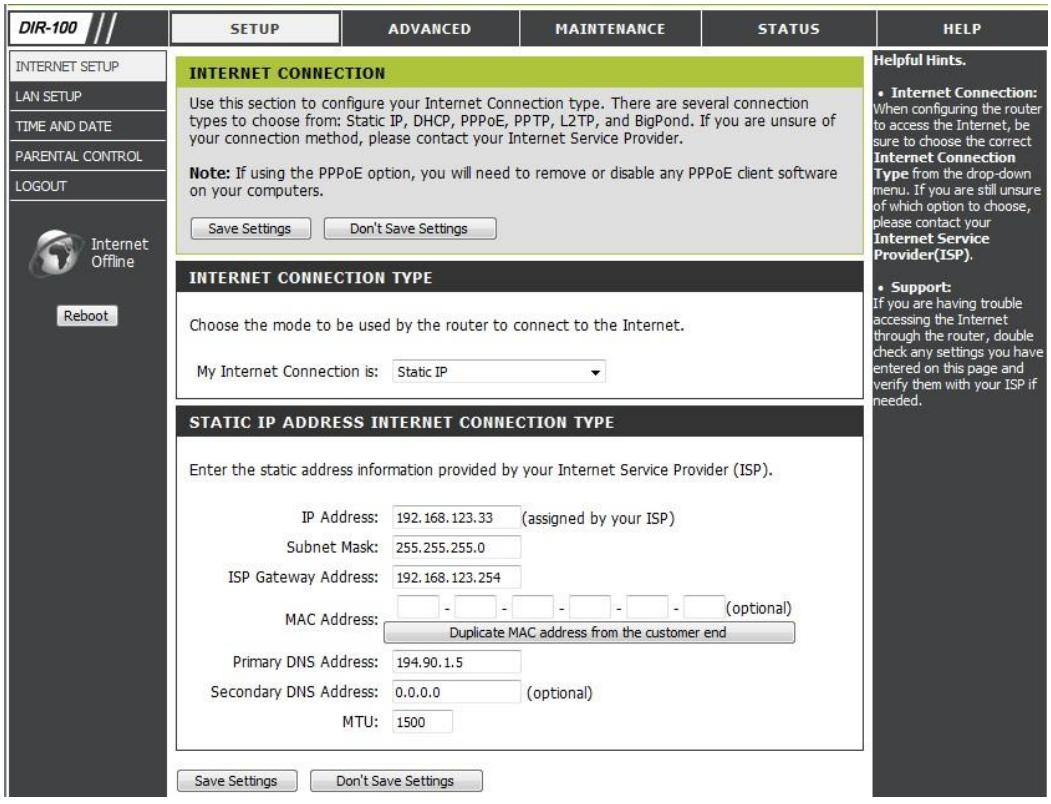


2. After the connection is established, the logon screen appears. To log in as an administrator, enter the username ―**admin**‖ and the password ―**hypergateway**".

3. Click the **Log In** button. The Setup Wizard screen appears.



4. Click on **Manual Internet Connection Setup**. The following page appears.



5. Fill in the Public IP address information provided by your ISP.
6. Fill in the Subnet Mask, ISP Gateway address and Primary DNS address (optional).
7. Click **Save Settings.**

1.7 Inserting the SIM Cards and Antennas

1. Insert the GSM SIM Cards. One SIM card for each cellular channel.

   The front SIM ports are spring loaded. Slide the SIM card into the slot until it is held in place. Press the SIM card until it pops out to remove.

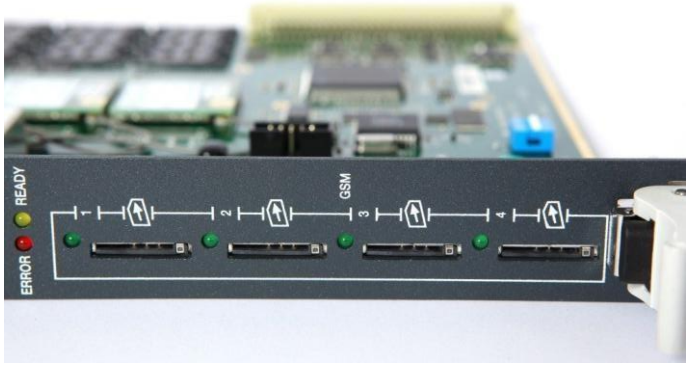


Figure 12. SIM Card Slots

Note: Some versions of the CG board have SIM drawers. Push the small yellow button for the SIM drawer to exit. Remove the SIM drawer, place the SIM card in the SIM drawer and replace the SIM drawer.

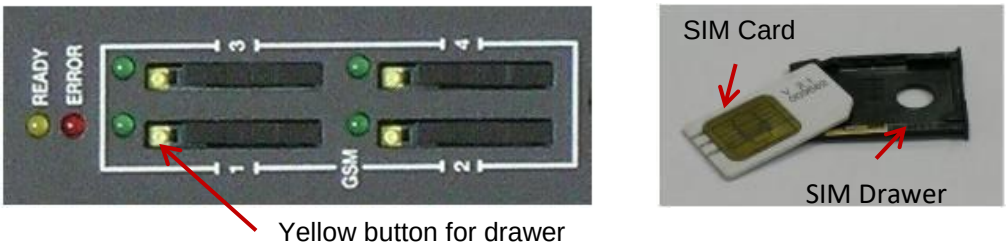


Figure 13. SIM Drawers

If more than four cellular channels are used, insert the additional required SIM cards into the CG board‘s multi-SIM extender: a. Pull out the CG board.

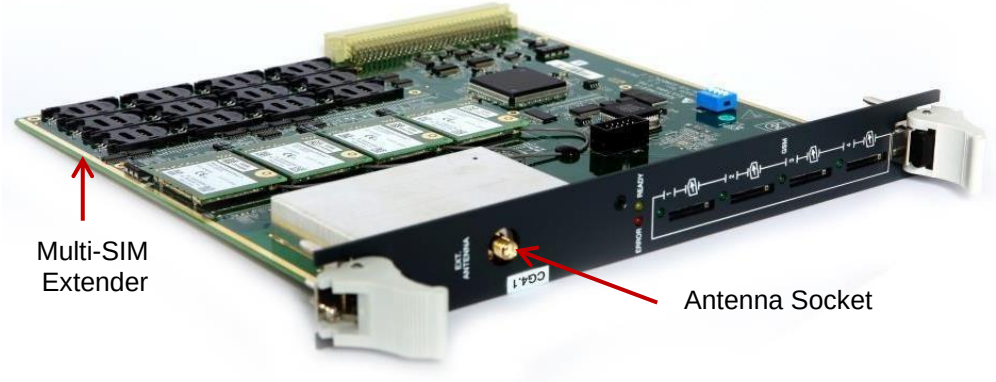


Figure 14. CG Card with a 12 Multi-SIM Extender

b. Slide back and pull up the SIM socket.

Caution: Do not use force on the SIM sockets.

c. Slide in the SIM cards.

d. Lock the SIM sockets.

2. Install the antennas. Each cellular card requires one antenna.

a. Locate the antenna socket (see Figure 14).

b. Fasten the antenna using the SMA connector. Do not use excess force.

c. Tether all cables securely. Tethering helps prevents breakage of connectors and damage to cellular cards.

Caution: 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.

1.7.1 Inserting the SD Card (Standard Gateway)

The Gateway saves Call Detail Records (CDRs) on a Secure Digital (SD) flash memory card that is supplied by Hypermedia. If CDRs are required, the SD card should be inserted.

Insert the SD card into the SD port of the HBN/HBS/HBD card.

Figure 15. SD Card and Port

Note: CDRs are displaced on a FIFO basis.

1.8 Powering Up and LEDs

1.8.1 Powering Up

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

Figure 16. Power Panel

Note: Redundant power supplies are optional. When installed, if one fails, or if the system is powered up 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:

- For **HBN, HBS and HBD** LEDs, see Table 2
- For **PC Board** status LEDs, see Table 3
- For **MC Board** Status LEDs, see Table 4
- For **SU Board** Status LEDs, see Table 5
- For **MG Board** Status LEDs, see Table 6
- For **Cellular Card Green SIM** LEDs, see Table 7
- For **RO 1.X Board** Status LEDs, see Table 8

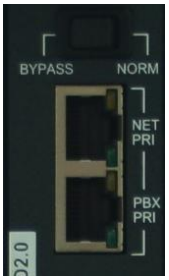
1.8.2 LEDs

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

Table 2. HBN LEDs

State	Explanation
HBN Status LEDs	
Main ETH	
Yellow	LAN Traffic
Green	LAN Connection
Media ETH	
Yellow	LAN Traffic
Green	LAN Connection
Red Led - ERR	
Blinking	Board Error: • Short blinks are usually due to a configuration error • A 50% duty cycle usually means a hardware failure
Yellow Led - RDY	
Off	Power is OFF
Short Blink	Board Ready
Fast Blink	Maintenance mode
Green Led - RX	
On	Internal Communication
Yellow Led - TX	
On	Internal Communication

Table

HBS and HBD PRI LEDs		
	**Green Led**	
	On	PRI connection OK
	Blinking	Powering- On
	Yellow Led	
	On / Blinking	Connection Error

3. PC Board status LEDs

	State	Explanation
	**LAN 1**	
	Yellow	LAN Traffic
	Green	LAN Connection
	LAN 2	
	Yellow	LAN Traffic
	Green	LAN Connection
	Red Led - ERR	
	Blinking	Board Error
	Yellow Led - RDY	
	Off	Power is OFF
	Short Blink	Board Ready
	Fast Blink	Maintenance mode
	Green Led - HDD	
	On	HD Activities

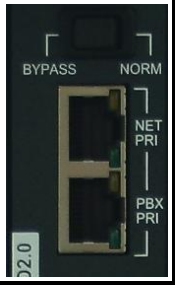
Table

	Yellow Led - Status	
	On	Internal communication

4. MC Board Status LEDs

State	Explanation
MC1.0 Status LEDs	
SVC ETH	
Yellow	LAN Traffic
Green	LAN Connection
Media ETH	
Yellow	LAN Traffic
Green	LAN Connection
Red Led - ERR	
Blinking	Board Error
Yellow Led - RDY	
Off	Power is OFF
Short Blink	Board Ready
Fast Blink	Maintenance mode
Green Led - RX	
On	Internal Communication
Yellow Led - TX	
On	Internal Communication

Table

MC1.1 and MC1.2 PRI LEDs		
	**Green Led**	
	On	PRI connection OK
	Blinking	Powering- On
	Yellow Led	
	On / Blinking	Connection Error

5. SU Board status LEDs

	State	**Explanation**
	**MAIN ETH**	
	Yellow	LAN Traffic
	Green	LAN Connection
	MEDIA ETH	
	Yellow	LAN Traffic
	Green	LAN Connection

Table 6. MG1.2 / MG 2.1 Board Status LEDs

		State	**Explanation**
		ETHERNET	
		ACT	LAN Traffic
		Link	LAN Connection
		Red Led - ERR	

Table

		Blinking	Board Error: • Short blinks are usually due to a configuration error • A 50% duty cycle usually means a hardware failure
		Yellow Led - RDY	
		Off	Power is OFF
		Short Blink	Board Ready
		Fast Blink	Maintenance mode
		Green Led - RX	
		On	Internal Communication
		Yellow Led - TX	
		On	Internal Communication

State	Explanation
Power Led - On	Router is powered on
WAN Led	Connection is established
On	Link established
Blinking	Network activity
Off	No link
LAN Led 1-4	

On	Link established
Blinking	Network activity
Off	No link

Table 7. Cellular Card LEDs Status

State	Explanation
Red - On	Board Error
Yellow - Short blink	Board Ready
SIM Cards - Green LED :	
Flashing	A SIM card is not installed in this channel or the port is still being initialized.
LED is off	No reception; the channel is not registered to a cellular network.
Short blink	Stand by; the channel is registered but no call is in progress.
Long blink	User is either dialing out or receiving a call on this channel.
Steady on	In use. A call is in progress.

Table 8. RO 1.X Board Status LEDs

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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.

This chapter contains:

- Installation (section 2.1)
- Start-up and Initial Connection (section 2.2)
- Save, Backup and Restore (section 2.3)

HMC Quick Start
Installation

2.1 Installation

To install the Hypermedia Management Console program:

1. Ensure that the computer matches the following minimum system requirements:
   - Windows XP, Vista, Windows 7 or 8
   - Internet Explorer 7 or above
2. Ensure that you have access to the installation file. It is included with the Hypermedia Gateway CD-ROM.

Figure 17. Hypermedia Gateway CD-ROM

The installation file-name begins with the letters **HMC** and ends with the extension **.exe**. The specific name depends on the type of installation.

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

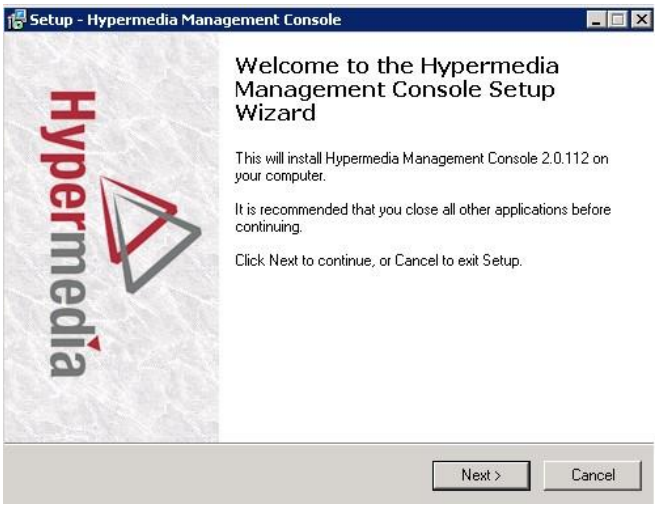

Figure 18. Setup Welcome Screen

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.

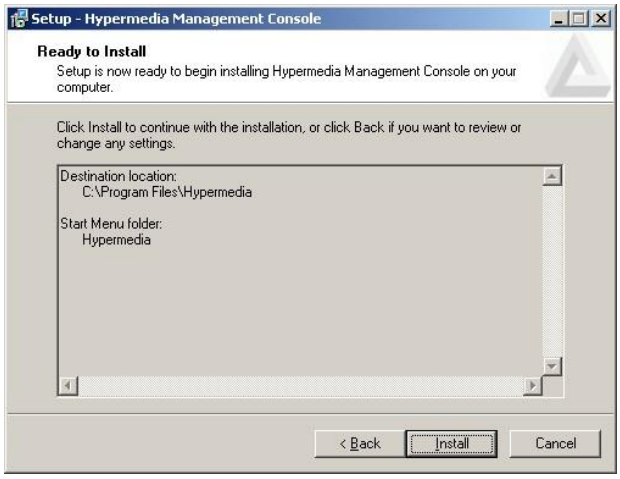

Figure 19. Setup Ready to Install Screen

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 shortcut.

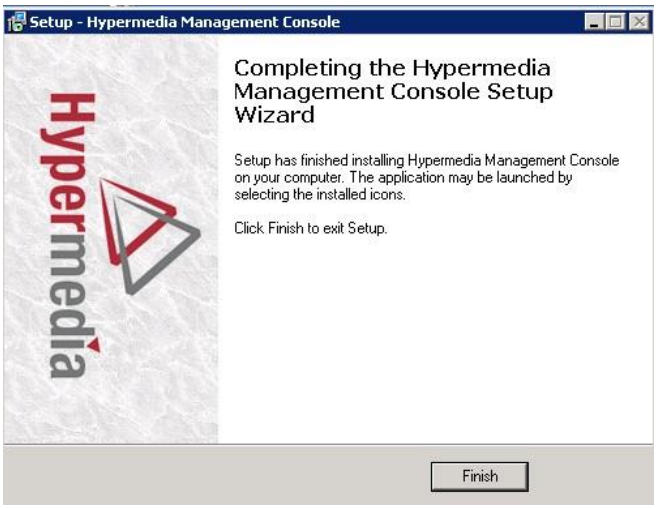

Figure 20. Setup Finish Screen

2.2 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.

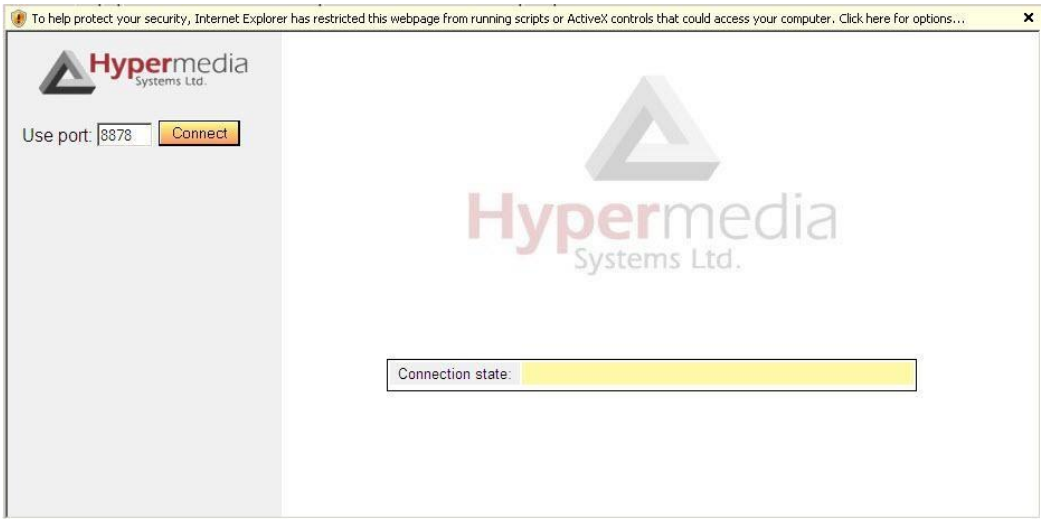

Figure 20. HMC Connection Screen

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 21. 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.
    d. Enter the IP address and click **Apply Settings**

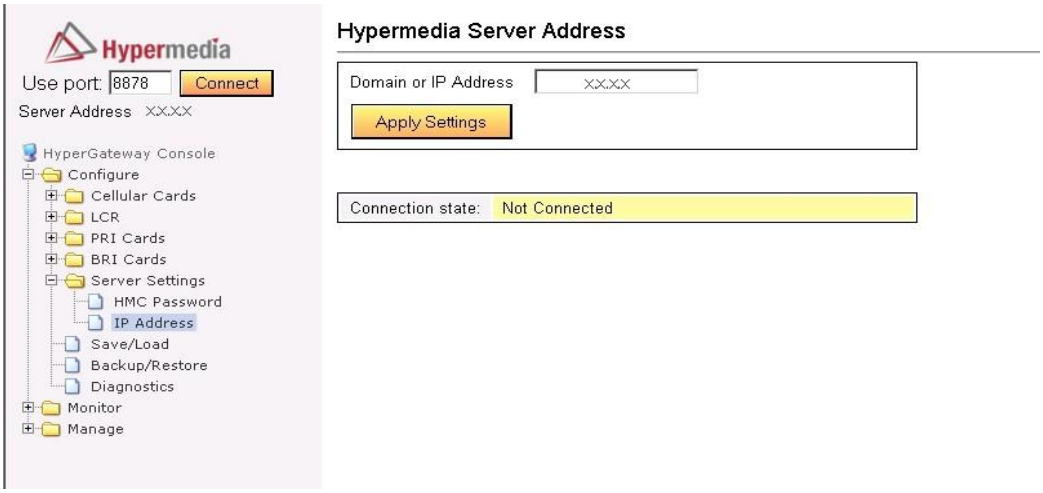

Figure 22. HMC Server Address Screen

Note: If the Gateway is located behind a firewall, enable traffic on TCP ports 8878, 8879, 80 and 22. Contact the network administrator for details.

Note: The IP address setting above does not affect the gateway's address but only defines the IP address to which HMC will attempt to connect.

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

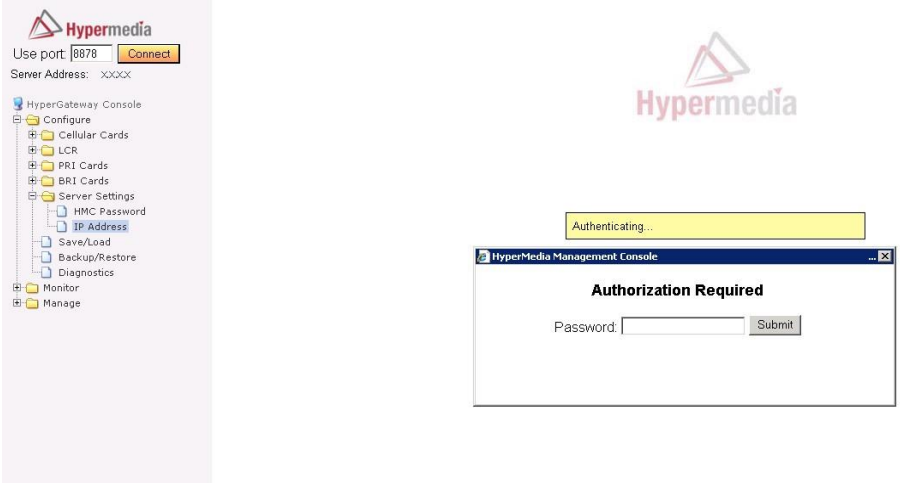

Figure 23. HMC Login Authorization Request

Note: The default password is admin.

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

HMC	2.0.176	
Model	PC SL	
Media Card	AC	
HGS	2.0.3826	ok
SGW	2.2.95	ok
HyperConnect	2.0.28	ok
HyperGuard	1.0.113	ok
HyperID	1.1.18	ok
LNP	2.0.100	ok
SMS Campaigner	2.0.220	ok
SMS Pro Server	3.0.278	ok

Figure 24. HMC Connection State Display

A list of all services will be displayed, including their versions and current activation/installation state.

2.3 Save, Backup and Restore

2.3.1 Save All

Use the configuration branch to permanently save all the configuration settings in the HyperGateway.

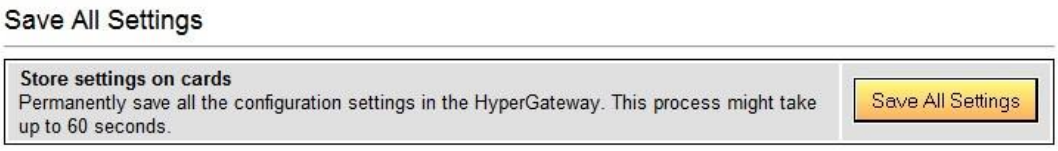

Figure 25. Save All Settings configuration branch

2.3.2 Save All Settings on Cards

Use this option to permanently save all the configuration settings in the Hypermedia Gateway. This process might take up to 60 seconds.

2.3.3 Backup/Restore

Use this option to download the entire configuration of the gateway to your PC. The downloaded backup file can then be uploaded by preforming a system restore.

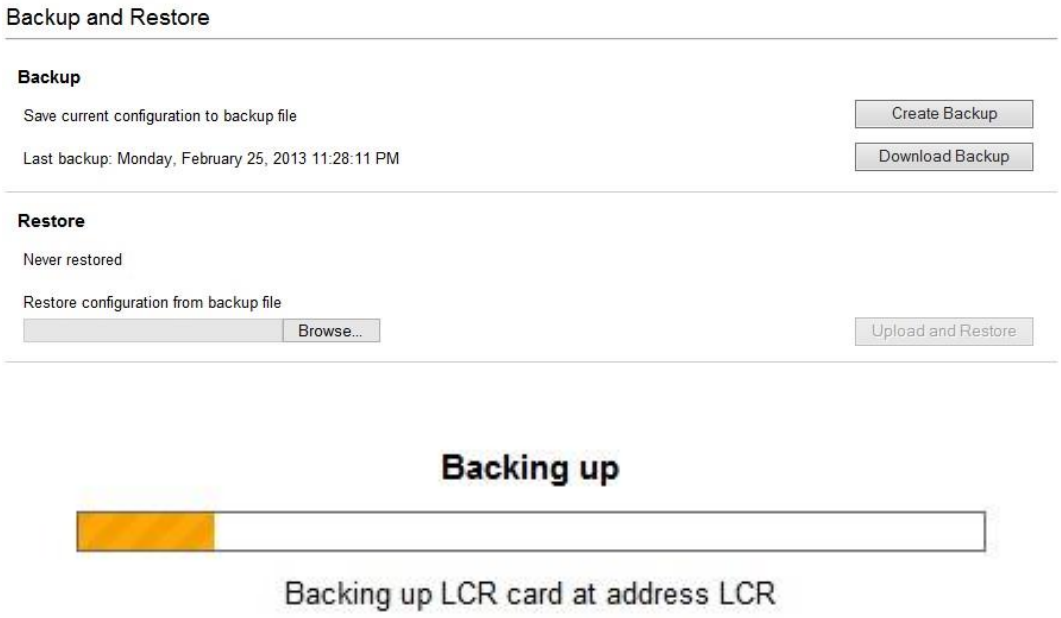

Figure 26. Backup and Restore

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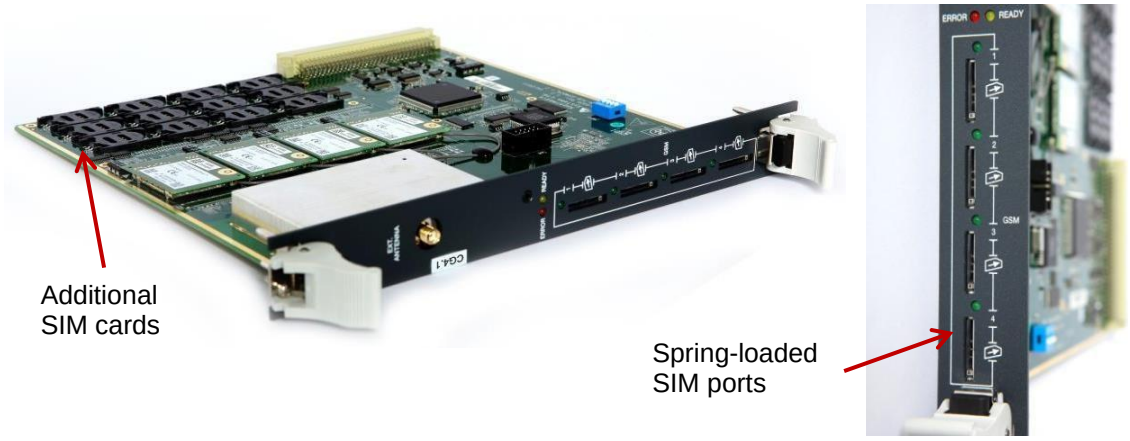
Configuring a Cellular Card

This chapter contains:

3.1 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. The Hypermedia Gateway can include several cards.

The first SIM cards of each module are loaded into the spring-loaded SIM port from the front of the Cellular Card.



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.

3.2 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.

Note: Hypermedia recommends not adjusting these

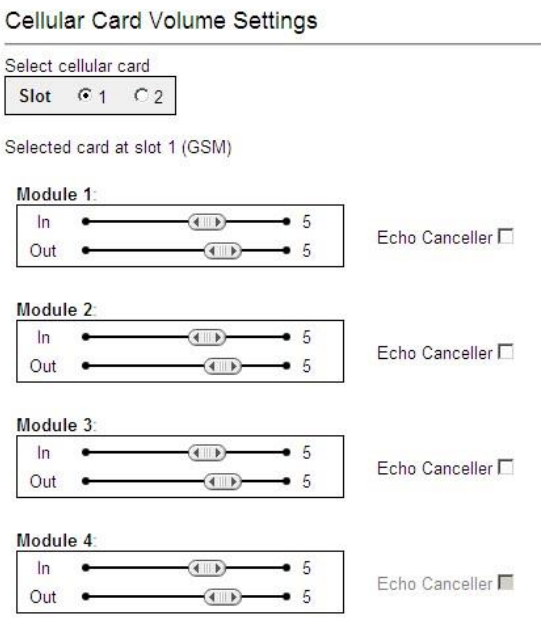


Figure 27. HMC Volume Settings Screen

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 causes for the echo effect. Selecting Echo Canceller minimizes or cancels the echo effect.
5. After selecting the Echo Canceller mode (from the HMC navigation pane), click the **Save/Load** branch and then click **Save All Settings**.

3.3 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 PRI and VoIP. 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 media 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.

3.3.1 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.

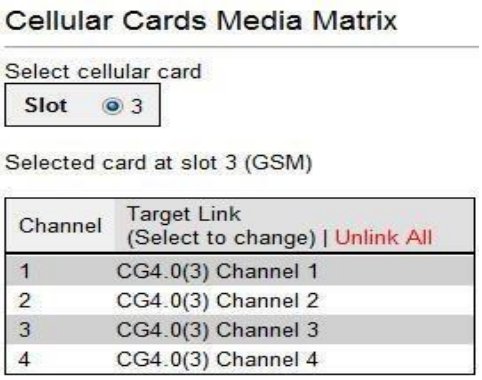


Figure 28. Cellular Media Matrix screen

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.

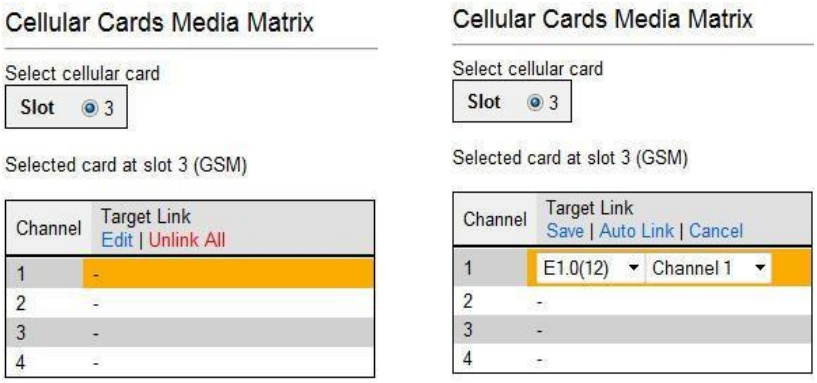


Figure 21. Media Matrix Row when Configurable

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.

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

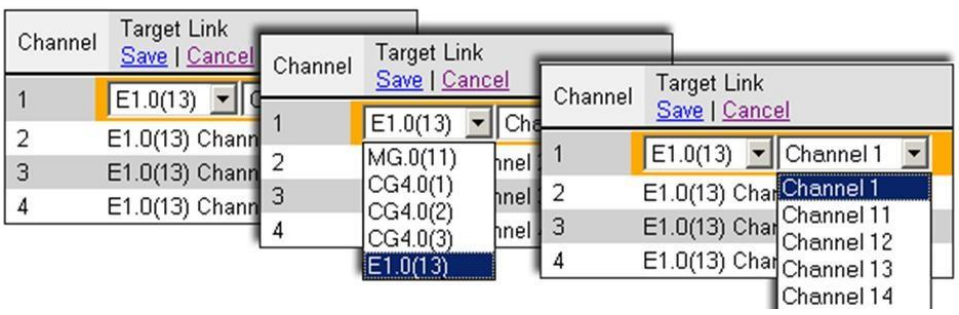


Figure 22. Assigning a Target Link

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

3.3.2 Auto Linking

Enables associating all channels of one media card to another media card.

To create an auto-link:

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

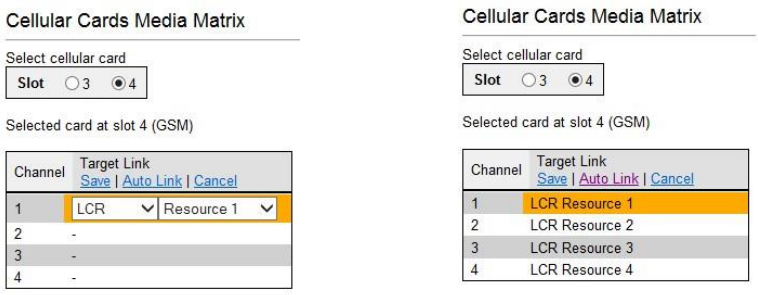


Figure 23. Auto Media connecting

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 **Auto Link**.
5. All channels can be associated of one media card to another media card: Card X channel 1 to Card Y channel 1, Card X channel 2 to Card Y channel 2 etc.

3.3.3 Unlinking Cellular Allocations

To break an allocation:

1. From the Cellular 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.

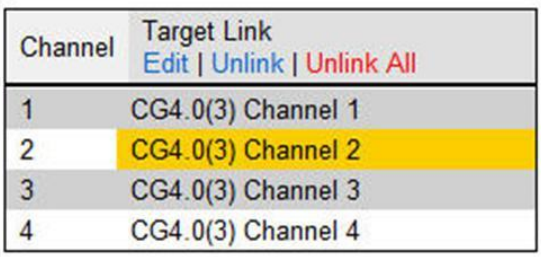


Figure 24. Breaking a Target Link

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

3.4 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.

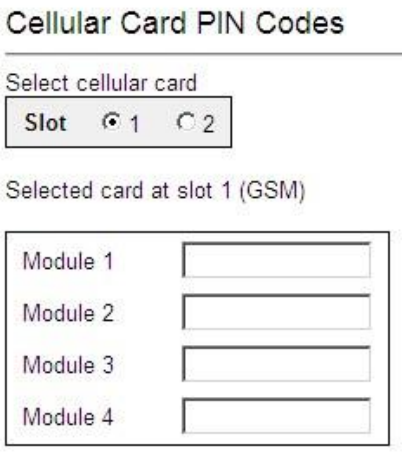


Figure 25. HMC Cellular PIN Codes Screen

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

3.5 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.

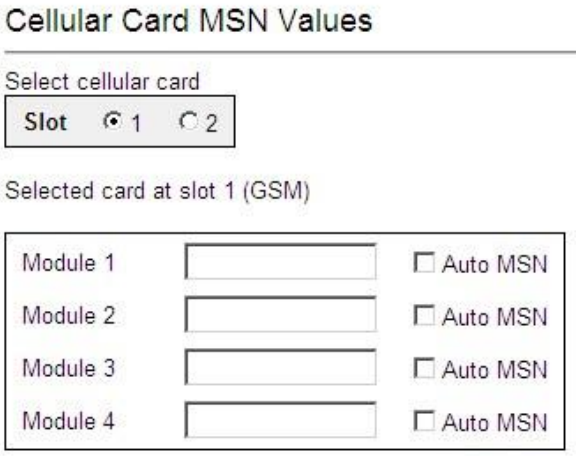


Figure 26. Cellular MSN Values

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.

3.6 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.

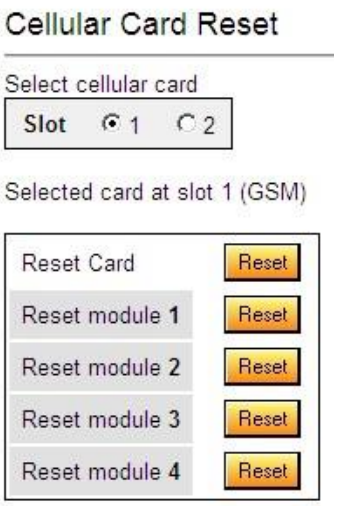


Figure 27. Cellular Card Reset screen

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

Caution: 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.

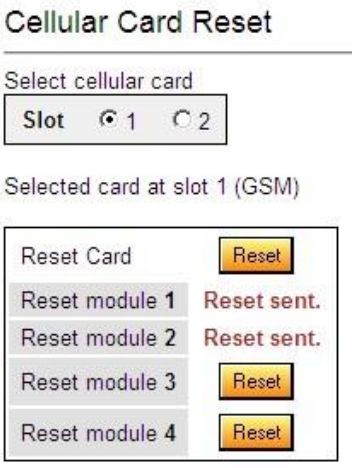


Figure 28. Reset Screen After Sending the Reset Command

3.7 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.

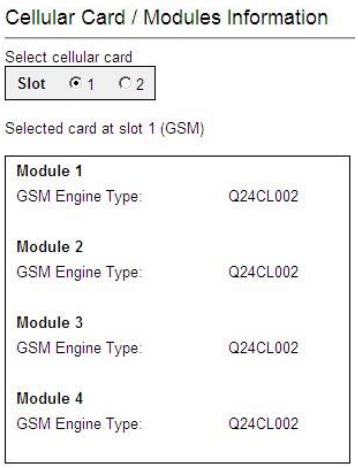


Figure 29. HMC Module Info Screen

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

3.7.2 Serial Numbers

Use the Serial Numbers screen to view the GSM Modules International Mobile Equipment Identity (IMEI) and the SIMs International Mobile Subscriber Identity (IMSI) and Integrated Circuit Card Identifier (ICCID) values.

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

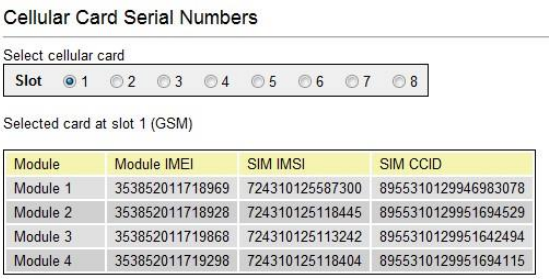


Figure 30. HMC Serial Numbers Screen

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

3.8 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 register to an operator network or allow 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.

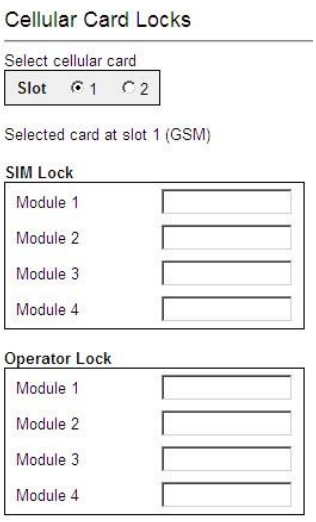


Figure 31. HMC Cellular Locks Screen

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

3.9 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 section 3.11 , SIM Auto Manage). 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 section 3.1 , Cellular Card and System Terminology).

To define which of the module‘s SIM cards is 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.

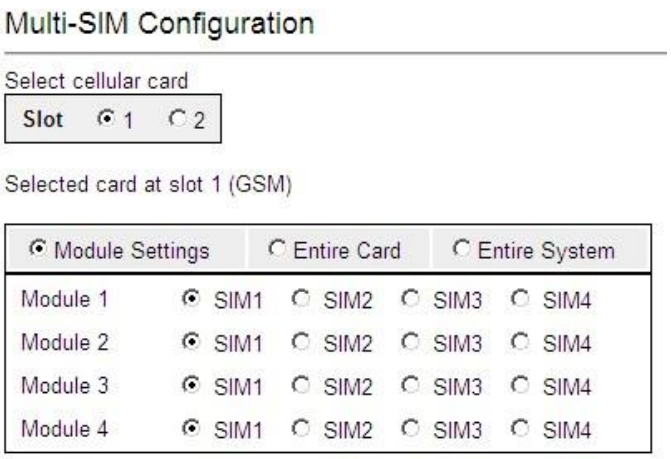


Figure 32. HMC SIM Select Screen

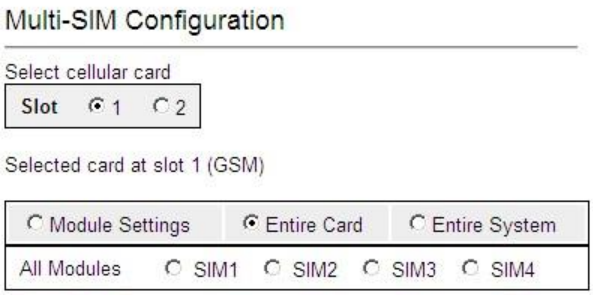
2. If more than one slot is displayed, select a specific Cellular Card. The SIM Select screen of that cellular card is displayed.
3. Select an application option.

   Module Settings

   Applies the SIM configuration to the specific module.

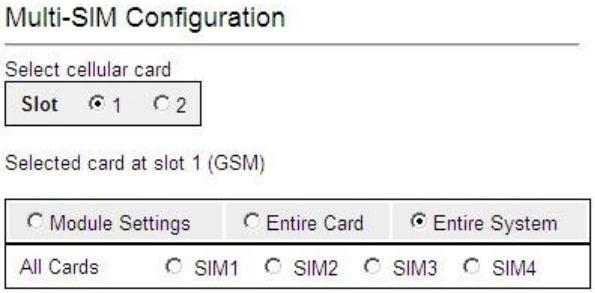
   Entire Card

   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.

3.10 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.

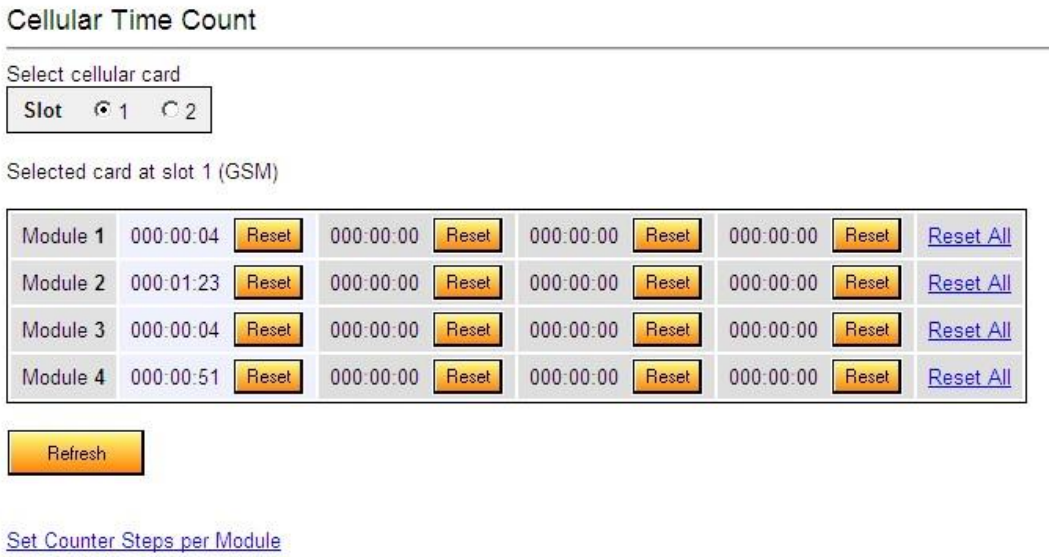


Figure 33. HMC SIM Counters Screen

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 section 3. 12, Call Counter Steps).

Note: Setting Counter Steps is important when using the SIM Auto Manage with prepaid SIM cards.

3.11 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.

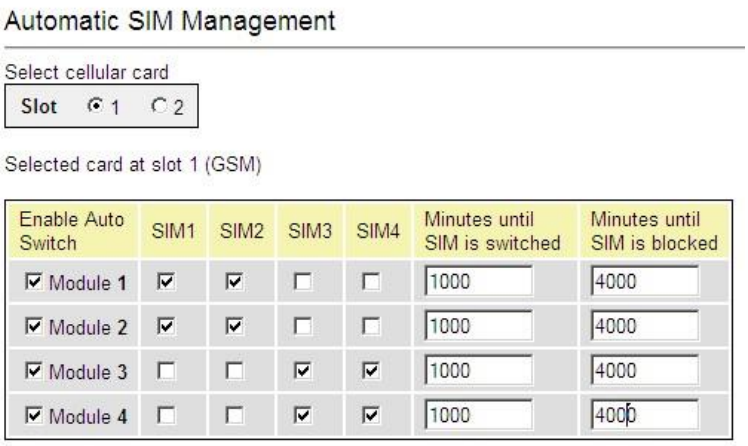


Figure 34. HMC SIM Auto Manage Screen

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 34, 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 total 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

3.12 Call Counter Steps

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

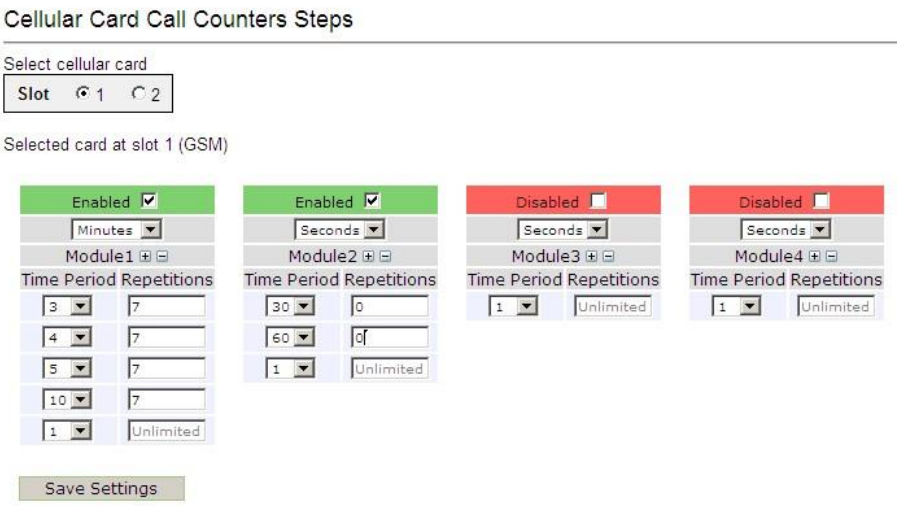


Figure 35. HMC Cellular Call Counter Steps Screen To configure Counters Steps:

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.

3.13 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.

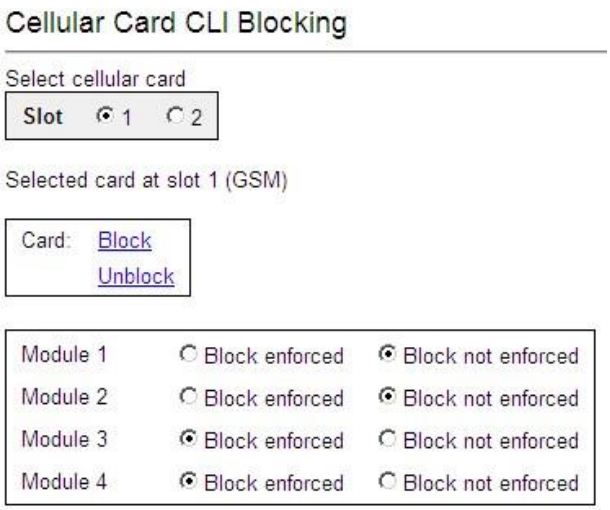


Figure 36. HMC Cellular CLI Blocking Screen

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

3.14 Call Limits

Use the Call Limits screen to configure various call-related timing parameters.

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.

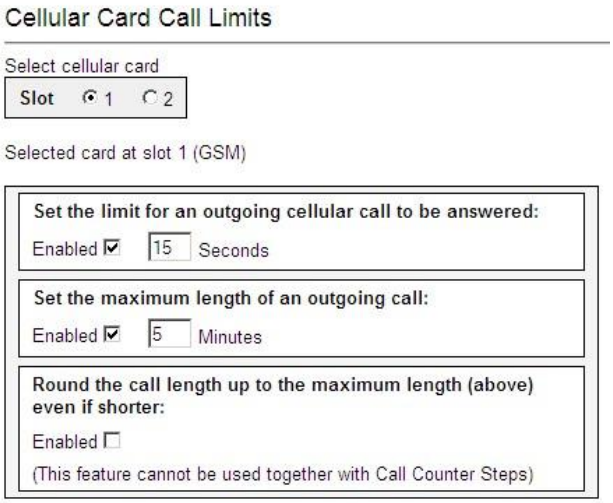


Figure 37. HMC Cellular Call Limits Screen

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 time duration (measured in seconds) that the gateway will wait for the call to be answered before ending the call.

   Set the maximum length of an outgoing call

   When enabled, enter a time duration (measured in seconds) for the maximum permitted length of an outgoing phone call through any of the card‘s cellular channels. 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, a call counter for a specific cellular channel will be rounded up to reflect the maximum length of an outgoing call through that channel (defined above) when such a call ends; 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 section 3.12 , Call Counter Steps).

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

3.15 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.

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.

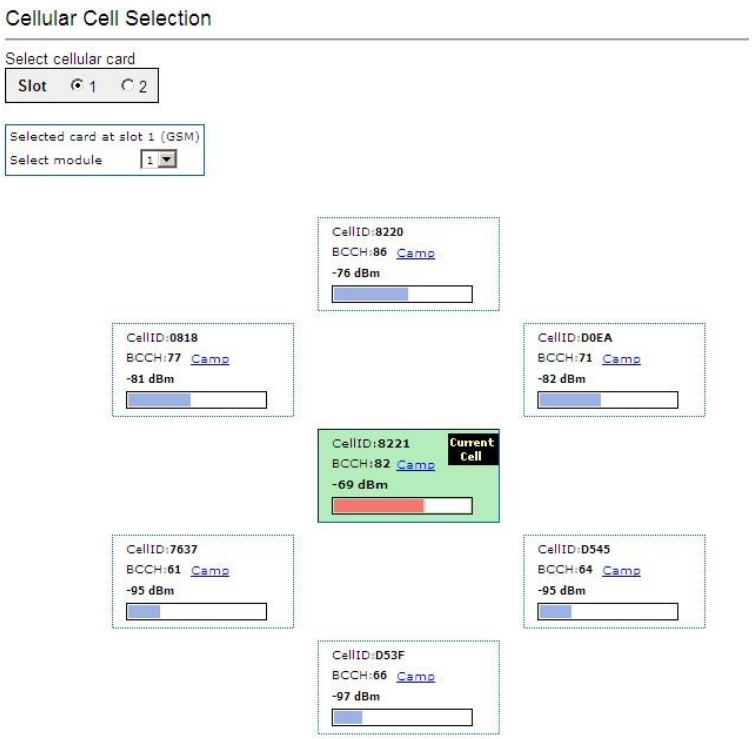


Figure 38. HMC Cellular Cell Selection Screen

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.

Cell Selection

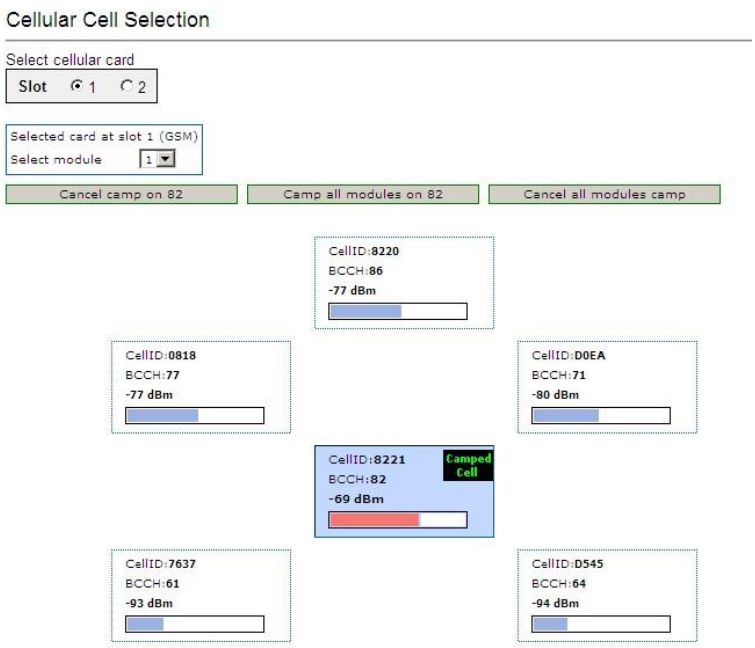


Figure 39. HMC Cellular Cell Selection with Options Screen

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

3.16 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.

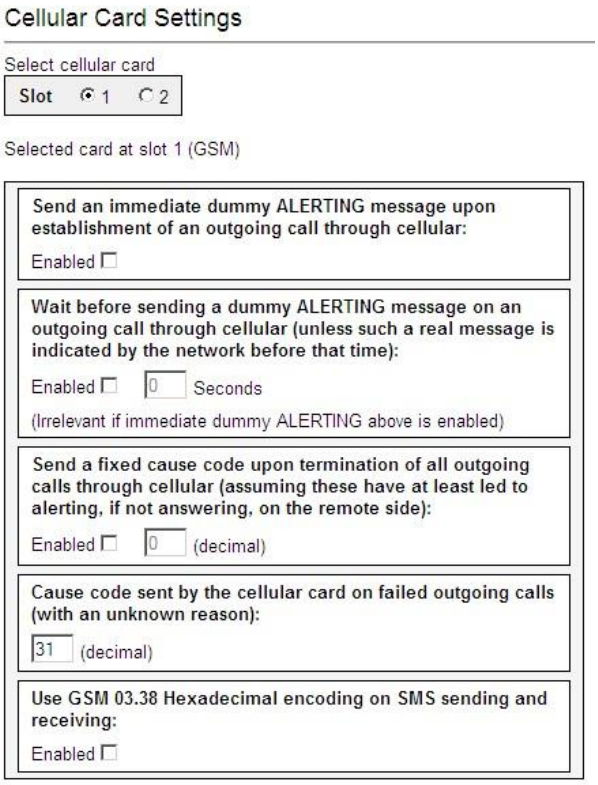


Figure 40. HMC Cellular Card Settings Screen

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.

Network Parameters

3.17 Network Parameters

Use the Network Parameters screen to define the bandwidth used by a carrier.

Note: Do not change the Voice Rate Selection unless instructed to do so by Technical Support.

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

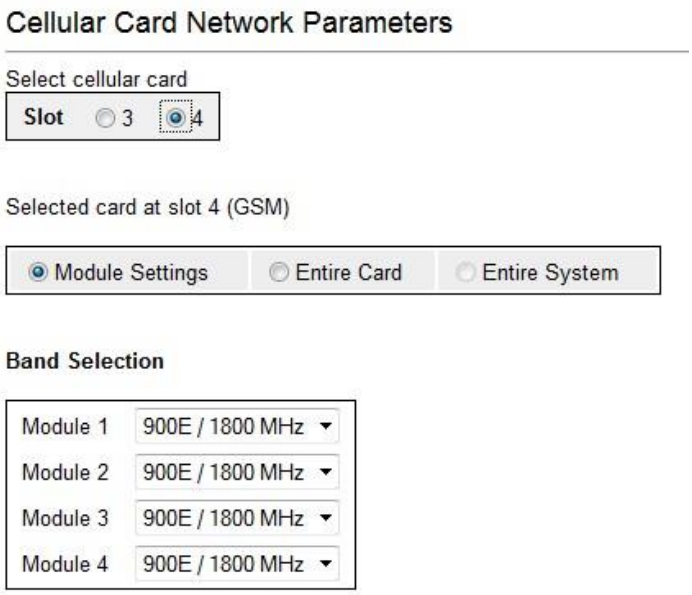


Figure 41. HMC Cellular Card Network Parameters Screen

2. If more than one slot is displayed, select a specific Cellular Card. The Network Parameters screen of that cellular card is displayed.
3. From the dropdown menu, select the required GSM bands for the cellular network to which you wish to connect. For a table of GSM bands per mobile carrier and per country, see en.wikipedia.org/wiki/**Mobile** country **code**.
4. From the HMC navigation pane, click the **Save/Load** branch and then click **Save All Settings**.

3.18 USSD SIM Balance

Use the USSD SIM Balance screen to check the balance remaining on a prepaid SIM card and to add value to a SIM card (recharge/top-up).

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

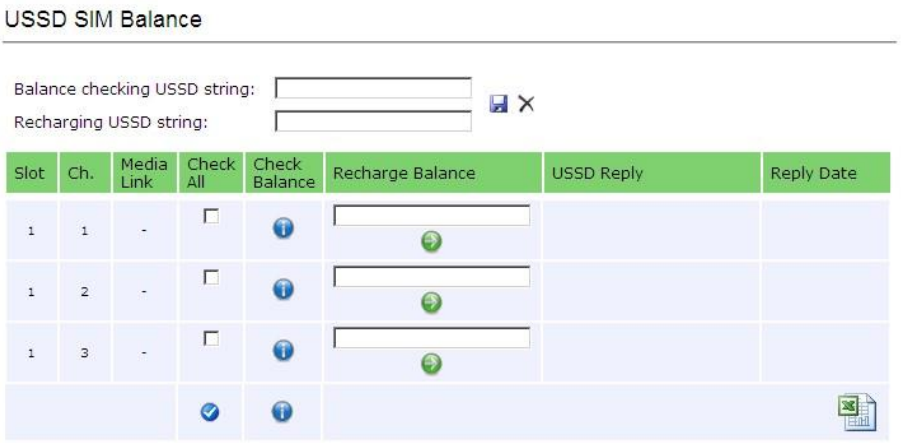


Figure 42. HMC Cellular USSD SIM Balance Screen

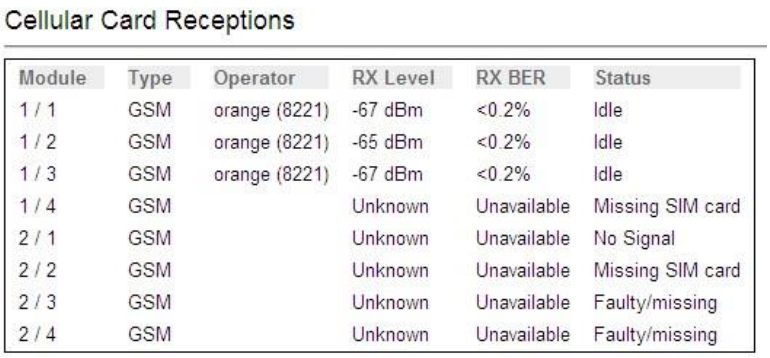
3. Enter the **Balance checking USSD string**.
4. Enter the **Recharging USSD string**.
5. Select or clear the **Check All** checkbox. When selected, the Hypermedia Management Console will check the balance of all the SIM cards.
6. Click (Check Balance). The balance is displayed in the USSD Reply column.
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.
      i. Click the (Recharge Balance) button.
8. Optionally, click the (Excel) icon to save the results as an Excel file.

3.19 Monitoring Cellular Cards

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

3.19.1 All Cells

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



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 43. 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 GSM, CDMA or UTMS.

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. The value can be between −51dBm and −110 dBm.

RX BER

Bit Error Rate (BER) is a calculated figure for the signal quality 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 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 antenna connections.

Status

This displays the status of the specific module.

3.19.2 Reception

To view information about the SIM slots on a specific cellular module, 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.

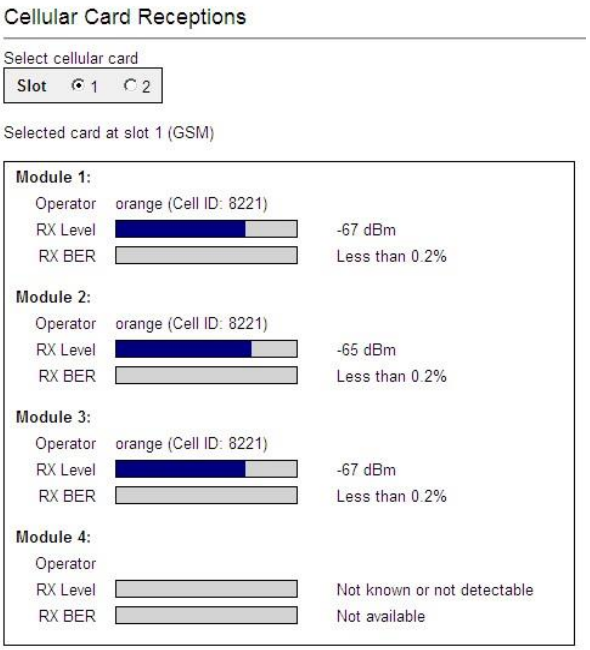


Figure 44. Specific Card's Cellular Reception Screen

The screen displays the following information:

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. The value can be between −51dBm and −110 dBm.

RX BER

Bit Error Rate (BER) is a calculated figure for the quality of the signal received from the cellular base-station (see more details in above section 3.19.1).

Monitoring Cellular Cards

3.19.3 Status

To view information about the status of cellular modules on a specific card:

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.

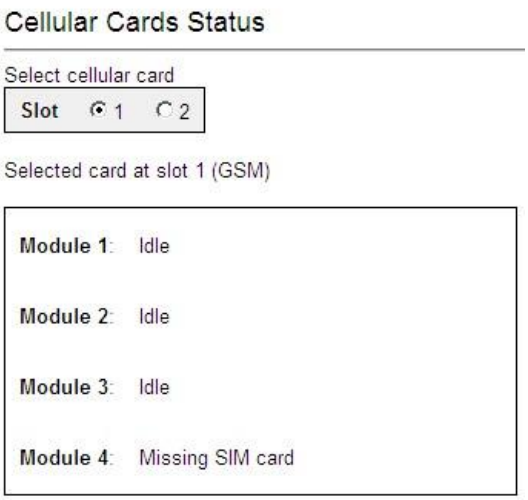


Figure 45. Cellular Cards Status Screen

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

4 Configuring the VoIP Card

This chapter contains:

4.1 VoIP Media Connection

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.

4.1.1 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.

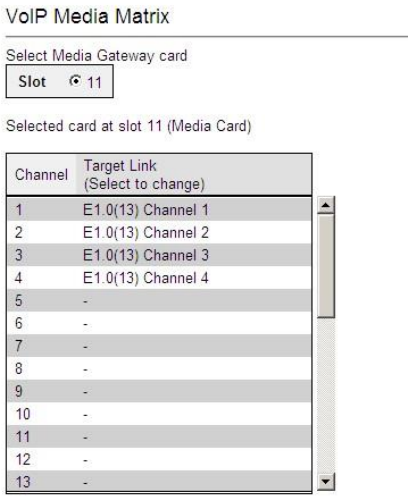


Figure 46. HMC VoIP Card Media Matrix Screen

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.

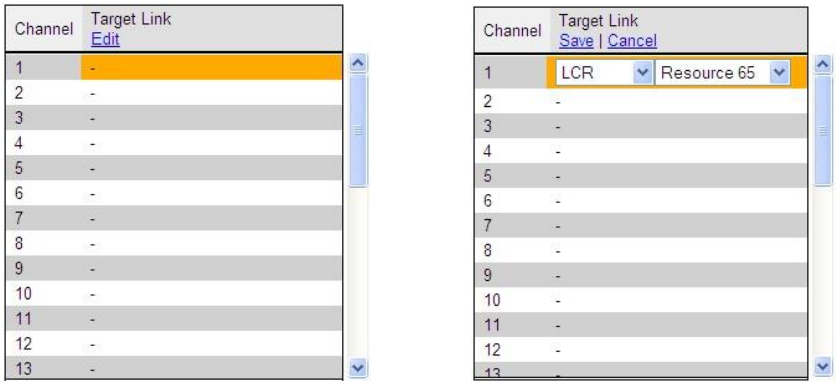


Figure 47. Media Matrix Row when Configurable

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.

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

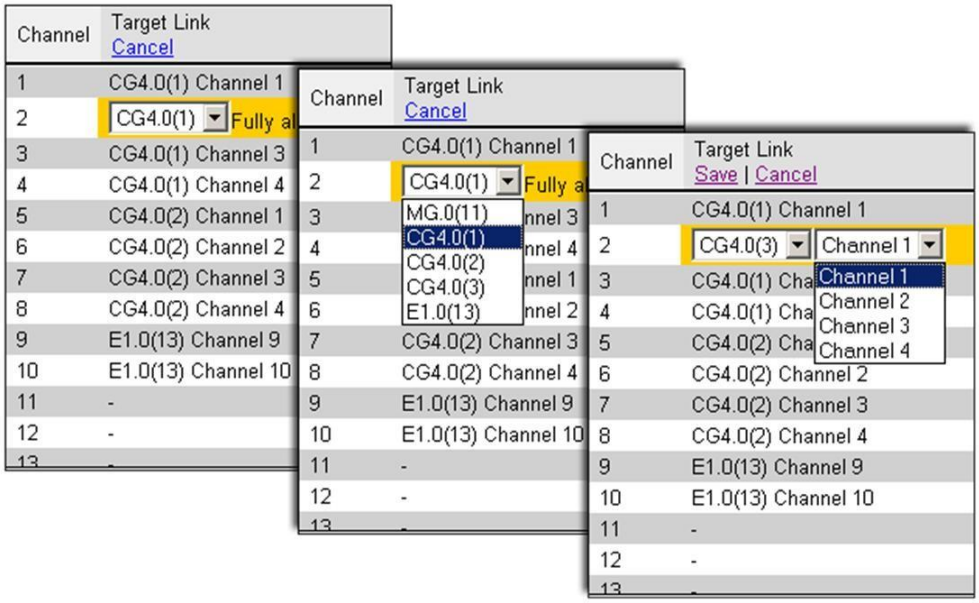


Figure 48. Assigning a Target Link

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

VoIP Media Connection

4.1.2 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.

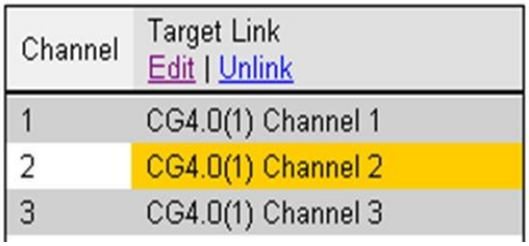


Figure 49. Breaking a PRI Target Link

3. Click **Unlink**.

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

4.2 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.

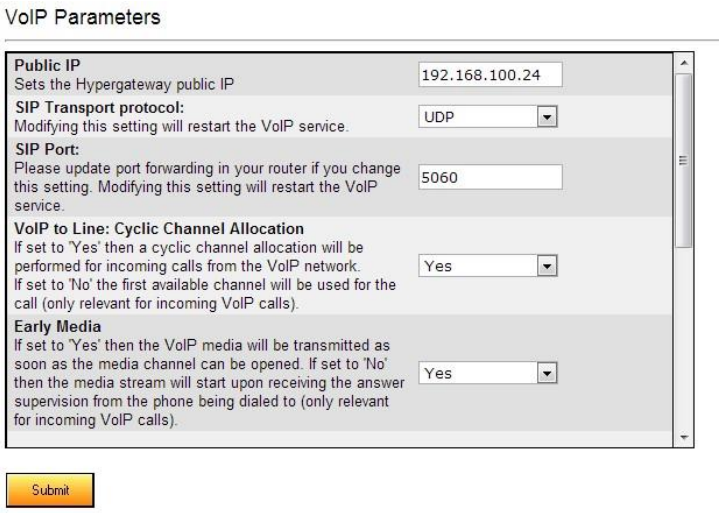


Figure 50. HMC VoIP Card VoIP Parameters Screen

2. Configure the settings:

Public IP

Enter the Hypergateway public.

SIP Transport protocol

Select the protocol type. Modifying this setting will restart the VoIP service.

SIP Port

Changing this setting requires updating the port forwarding in your router. Modifying this setting will restart the VoIP service.

VoIP to Line: Cyclic Channel Allocation

Select either Yes or No. When Yes is selected, incoming VoIP calls are assigned in a cyclic mode. When No is selected, incoming VoIP calls are assigned to the first available channel (applies only to incoming VoIP calls).

Early Media

Select either Yes or No. When Yes is selected, the VoIP media is transmitted as soon as the media channel is opened. When No is selected, the media stream starts upon receiving the answer supervision from the phone being dialed (applies only to incoming VoIP calls).

IP Precedence

Sets the value of the IP precedence field in the IP headers of the RTP media stream. Use IP Precedence to prioritize types of traffic:

- 0 − Routine Precedence
- 1 − Priority Precedence
- 2 − Immediate Precedence
- 3 − Flash Precedence
- 4 − Flash Override Precedence
- 5 − Critical Precedence
- 6 − Internetwork Precedence
- 7 − Network Precedence

IP Type of Service

Sets the value of the IP Type of Service field in the IP headers of the RTP media stream. Use Type of Service (ToS) to manage the Quality of Service (QoS) throughout a network.

- 0 − Normal Service
- 1 − Minimize Monetary Cost
- 2 − Maximize Reliability
- 4 − Maximize Throughput
- 8 − Minimize Delay

Number of Calls for ASR/ACD Statistics

Select the number of last calls on which to base the ASR (Answer Seizure Ratio or Average Success Rate) and ACD (Average Call Duration) averages. For example, if the number 80 is selected then the ASR and ACD average values will be calculated according to the history of the last 80 calls.

Note: Changing to a new value resets all existing ASR/ACD statistics.

Minimum ASR allowed

Minimum ASR allowed before channel is blocked.

Minimum ACD allowed

Minimum ACD allowed before channel is blocked.

User Input Indication

Defines the SIP user input indication method (protocol).

RFC2833 Payload

Set the payload value of RFC2833 in the RTP packets when using RFC2833 as the user input method in SIP.

Enable Codecs

Select which audio codecs the Gateway will support for incoming and outgoing SIP & H.323 calls.

Payloads per Packet

Sets the number of codec payloads that are packed into an RTP packet for G723 and G729. This can be changed to better utilize the available bandwidth.

Silence Compression / VAD

If set to Yes, Silence Compression will be enabled.

SIP Proxy

Set the Enable field to Yes in order to register with a SIP proxy. If set to Yes, the SIP proxy address and authentication information entered in the fields below will be used to register with the SIP proxy.

PIN Code Send Delay

Set the period (in milliseconds) after which PIN code, if exists, will be sent to remote gateway.

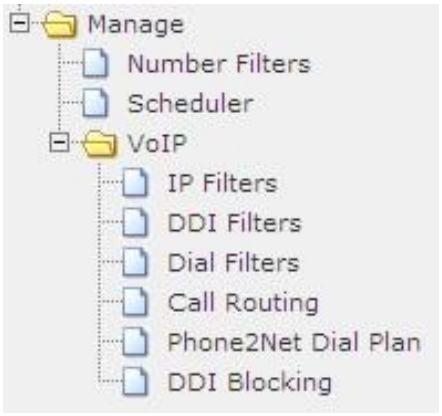
PIN Code Inter-Digit Delay

Set the delay period (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.

4.3 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.



4.3.1 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.

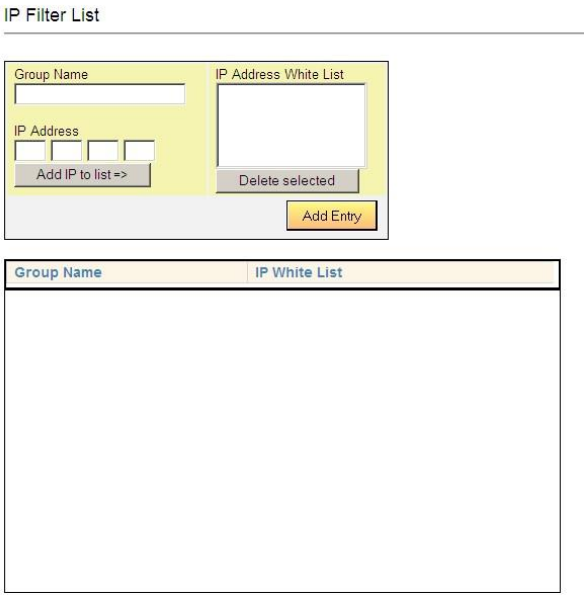


Figure 51. HMC VoIP Card IP Filters List Screen

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.

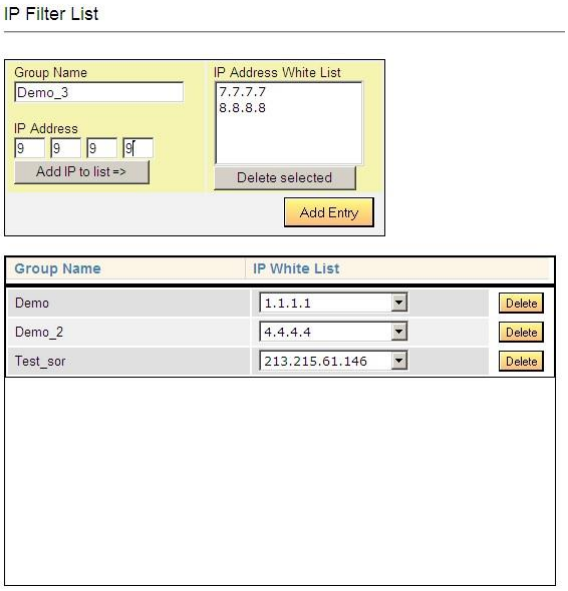


Figure 52. Configuring IP White List

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

To review the list of IP addresses associated with a Group, open the dropdown list in the Group‘s Row.

4.3.2 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.

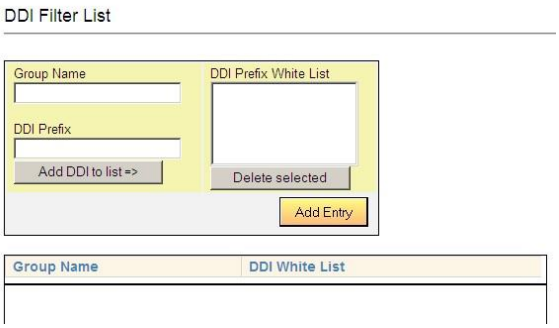


Figure 53. HMC VoIP Card DDI Filters List Screen

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.

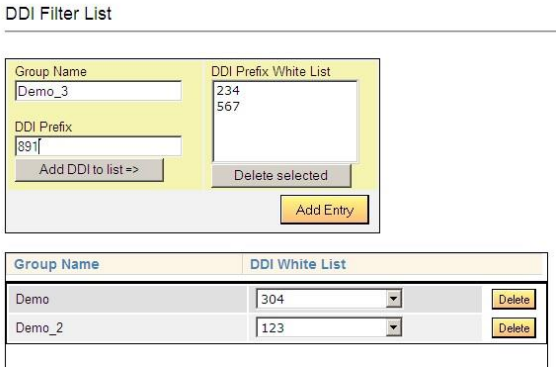


Figure 54. Configuring DDI White List

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.

4.3.3 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 in section 6.1.

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.

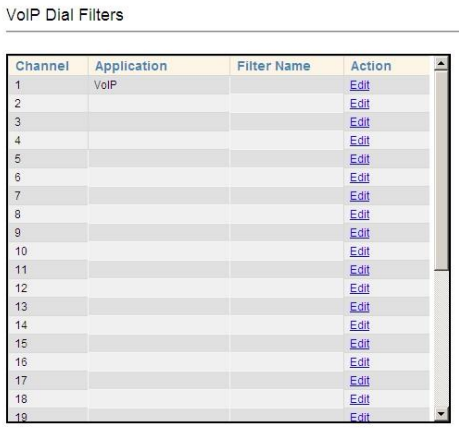


Figure 55. HMC VoIP Card Dial Filter List Screen

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.

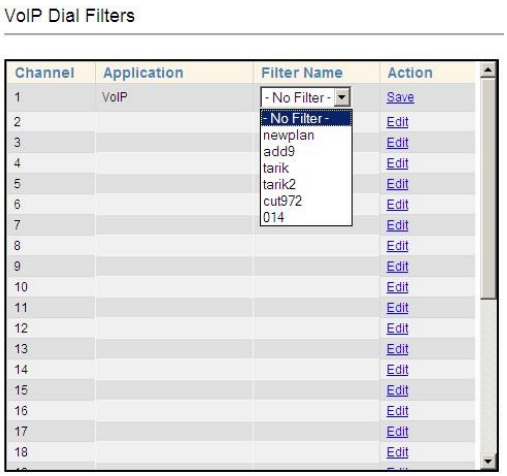


Figure 56. Configuring Dial Filters

6. Click **Save**.

4.3.4 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. 58) and IP filters (see p. 57) 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.

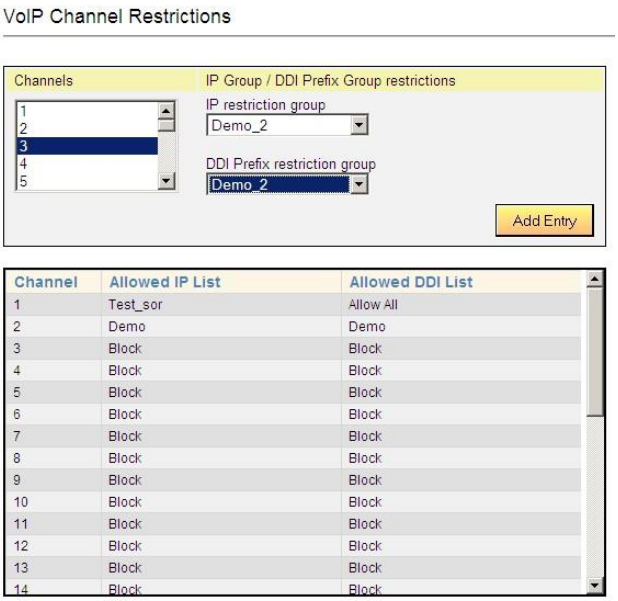


Figure 57. HMC VoIP Card VoIP Channel Restrictions Screen

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

4.3.5 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.

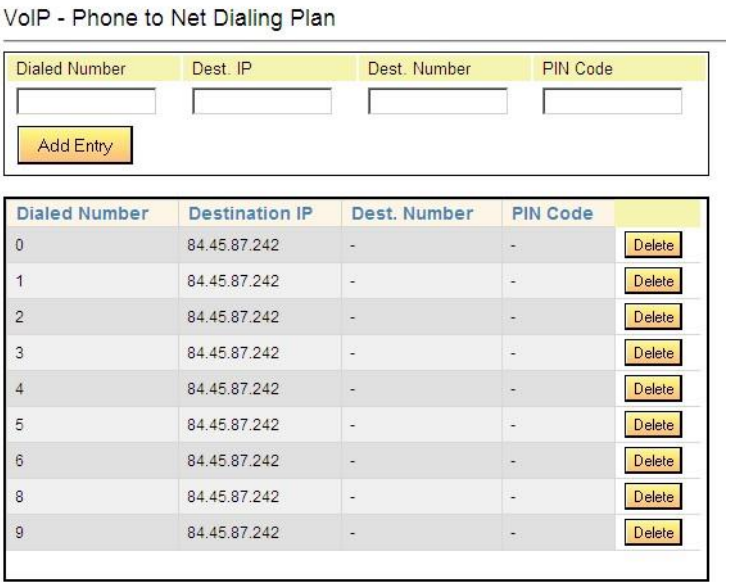


Figure 58. HMC VoIP Card Phone to Net Dialing Plan Screen

4. In the **Dialed Number** field, enter the phone number received by the Gateway.
5. Enter either:
   - The IP address that the call will be connected to in the **Dest. IP** field
   - The phone number that the call will be connected to in the **Dest. Number** field
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.

4.3.6 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.

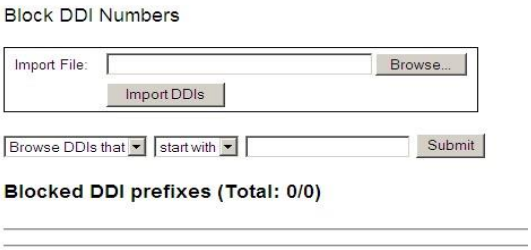


Figure 59. HMC VoIP Card DDI Blocking Screen

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.

4.3.7 Cause Codes

Cause codes represent the reason for releasing 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.

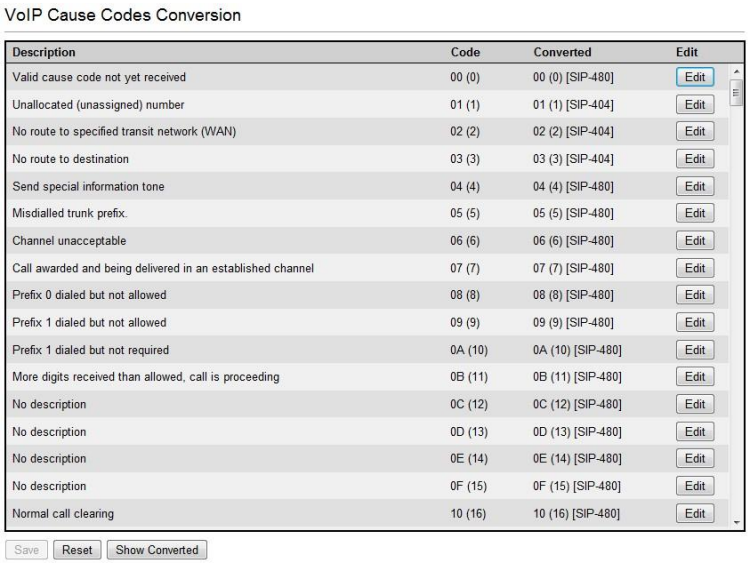


Figure 60. HMC VoIP Card Cause Codes Screen

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

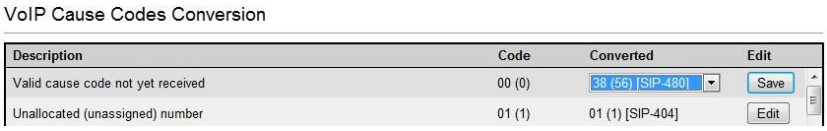


Figure 61. Editable Value Field

5. Select a new value.
6. Click **Save** and then **Submit**.
7. Two additional options exist:

   Show Converted

   Displays the converted values.

   Reset Codes

   Assigns the original cause code values.

8. Click **Save Conversions**.

4.4 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.

4.4.1 Reviewing the VoIP Card Information

To review VoIP Card information:

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

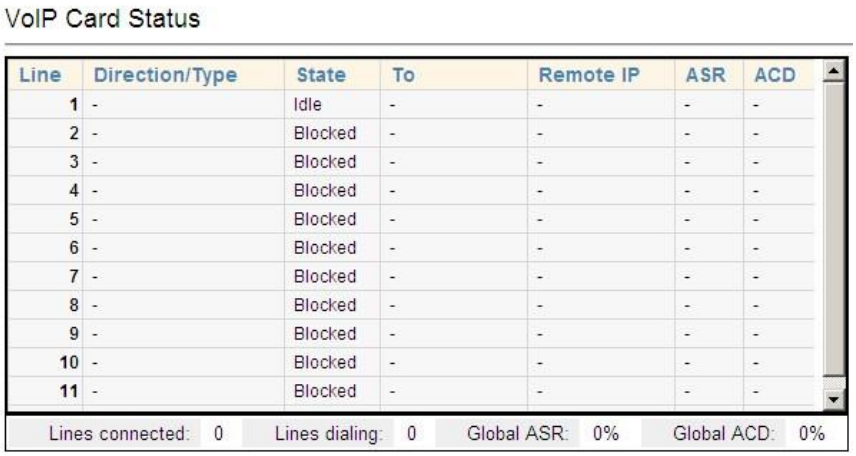


Figure 62. Figure 63: VoIP Card Status Screen

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.

4.4.2 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.

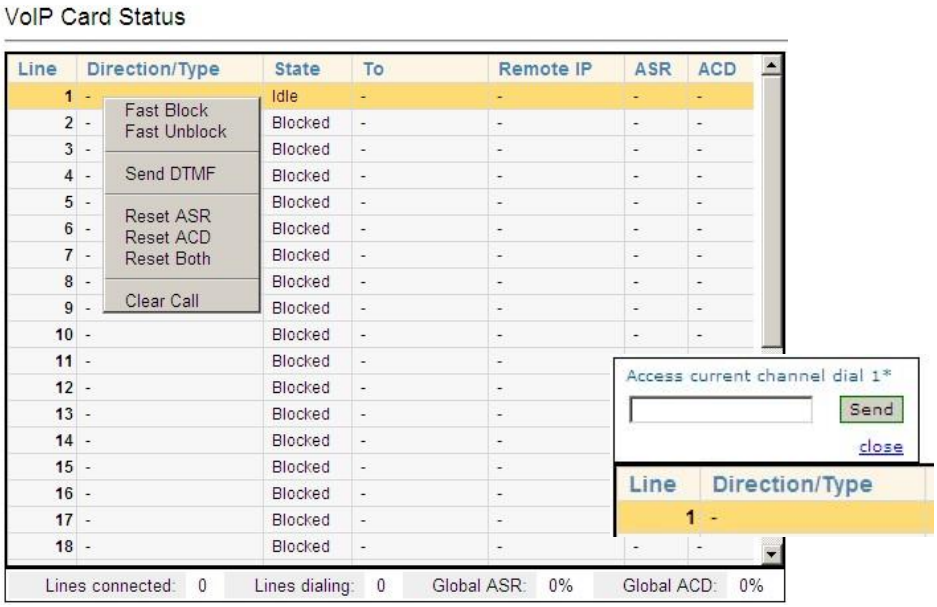


Figure 63. VoIP Card Monitor Dropdown Menu

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.

4.4.3 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.

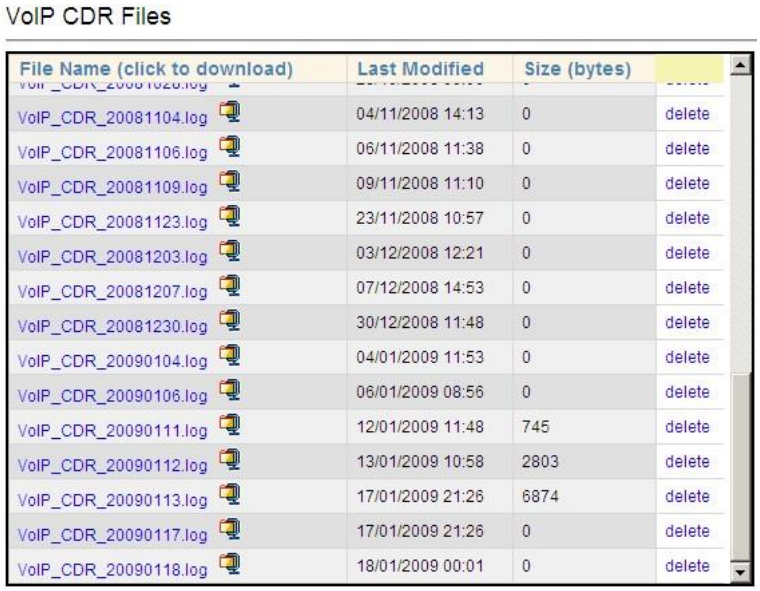


Figure 64. VoIP CDR Files Screen

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.

4.4.4 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",0774445003,,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 following Table 9.

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 case 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
Column Number	**Field Name**	**Description**
15	Slot, Module and SIM	Slot#module.sim (24#1.1) that the VoIP call is connected to.
16	Module IMEI	Module‘s IMEI that the VoIP call is connected to.

17	Called Direction	Direction of call. Possible values are: 0 – Call from network to line 1 – Call from line to network
18	Hangup Initiator	Initiator of hang-up. Possible values are: 0 – Network 1 – Line
19	TxRTP	Number of RTP packets sent during the session
20	RxRTP	Number of RTP packets received during the session
21	Lost RTP	Number of RTP packets lost during the session
22	Hangup Reason	Q.931 reason for call hang-up

5 Configuring LCR

This chapter contains:

5.1 Overview

Gateways with Least Cost Routing (LCR) route calls based on rules that are 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 for building the LCR plan is:

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

➥ **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. The following are optional:

- Create IN or OUT filters, to manipulate over dialed numbers
- Create Time Frames, to determine the time of day each of the Rules is active
- Configure the ACR, to analyze source and destination numbers and to enable rout/block/manipulate actions

This section follows the best-practice order.

5.2 Activating LCR

On some systems (mainly VoIP-enabled ones) the LCR service must be manually activated.

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.

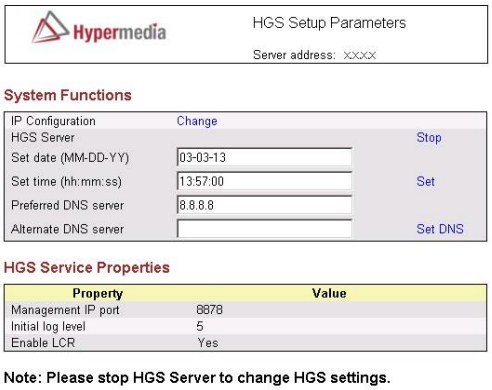


Figure 65. HGS Setup Parameters Screen

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.

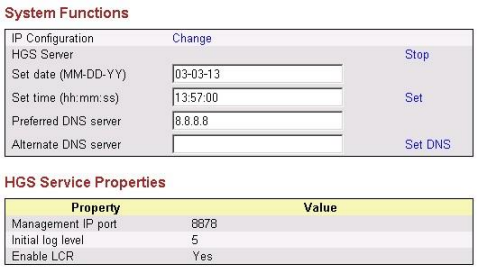


Figure 66. HGS Setup Parameters Screen in Edit Mode

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

Activating LCR

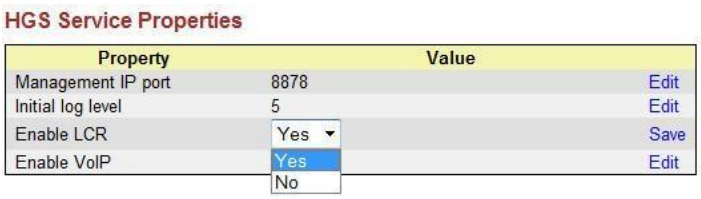


Figure 67. Editable Disable LCR Value Field

7. Select from the dropdown list **Yes** to enable the LCR or **No** to disable the LCR.
8. Click **Save**.
9. Click **Submit**.
10. From the HGS Server system function line, click **Start**. A confirmation message indicates that the service was started successfully.

5.3 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 media type branches (such as Cellular, BRI, PRI, and VoIP) includes a sub-branch named Media Connections.

5.3.1 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.

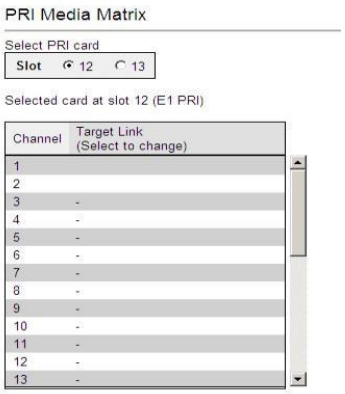


Figure 68. Media Matrix before LCR

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

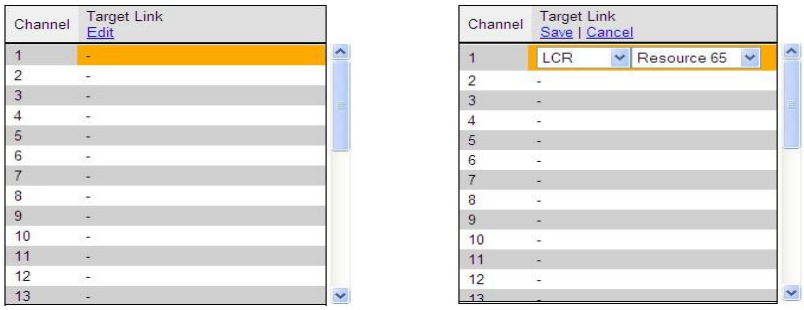


Figure 69. Channel Row when Configurable

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

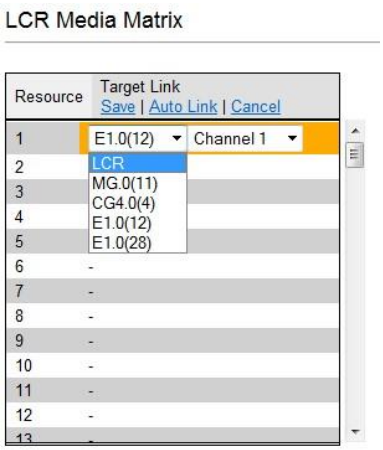


Figure 70. Channel Row Dropdown Lists

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

Figure 71. 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.

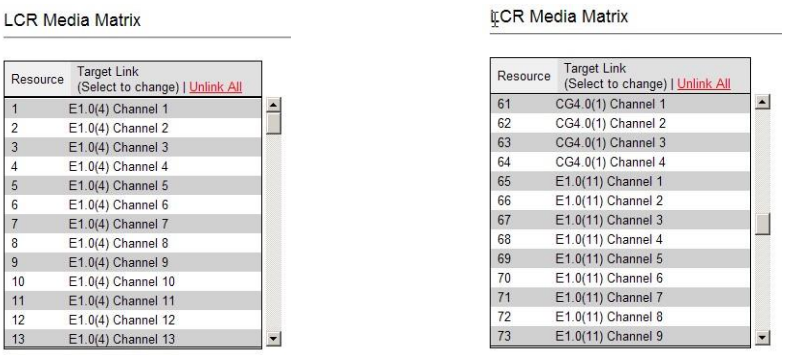


Figure 72. Two Views of the LCR Media Matrix Display

5.3.2 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.

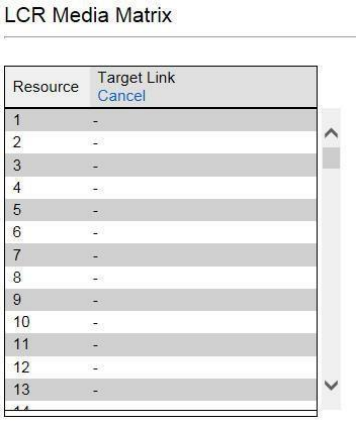


Figure 73. LCR Media Matrix 2.

Click within a Resource row. The row turns yellow.

3. Click **Edit**. The row becomes configurable.

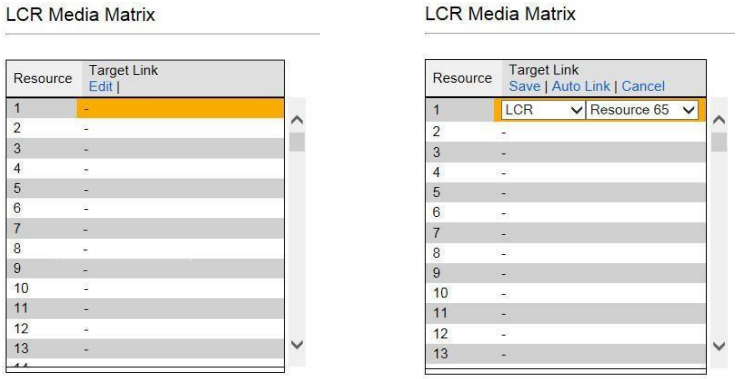


Figure 74. LCR Row when Configurable

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

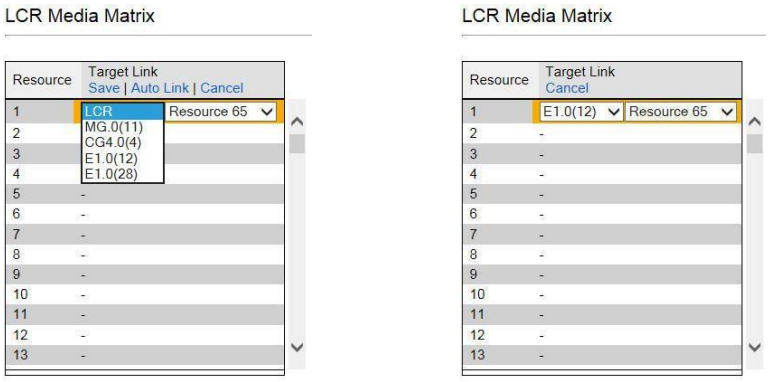


Figure 75. LCR Row Dropdown Lists

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

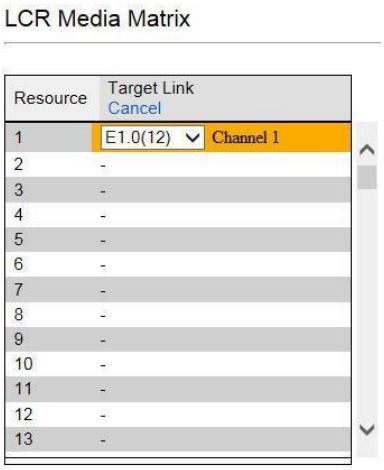


Figure 76. LCR Row Configured

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

5.3.3 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.

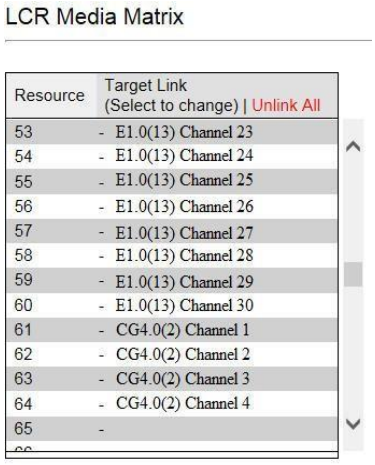


Figure 77. LCR Media Matrix 2.

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.

5.3.4 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.

5.4 Groups

Creating Groups simplifies consistent application of LCR strategies.

5.4.1 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.

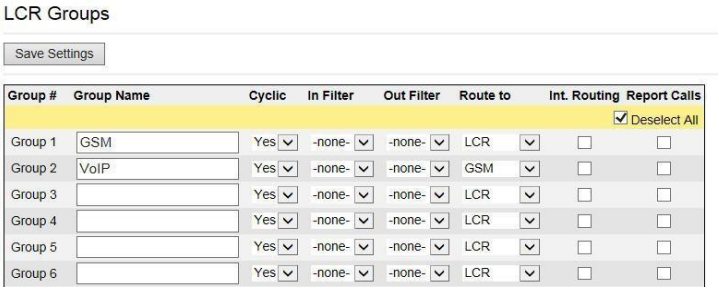


Figure 78. LCR Groups Screen

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 5.7 , Filters.
5. Optionally, and if already defined, from the **Out Filter** dropdown menu, select an Out Filter. See 5.7 , Filters.
6. From the **Route to Group** dropdown menu, define whether or not calls arriving to that Group will be rerouted to a specific Group, or dynamically routed according to the LCR rules:

   none

   The LCR Rules are applied and the call is routed to a specific channel accordingly.

< 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 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.
9. Click **Save Settings**.

5.4.2 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.

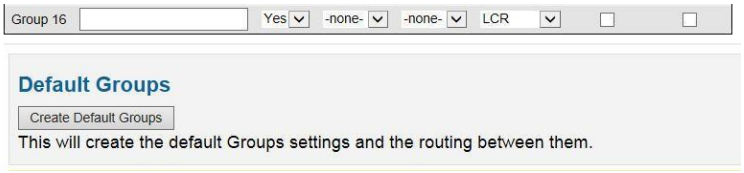


Figure 79. Create Default Groups Button

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

5.5 Resource Map

Use the LCR Resource Map to assign Resources to Groups.

5.5.1 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.

Figure 80. Sample Resource Assignment

5.5.2 Assigning LCR Resources

To assign LCR Resources to Groups:

1. From the HMC navigation pane‘s LCR branch, click the **Resource Map** subbranch. The Resource Map screen is displayed.

Figure 81. 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.

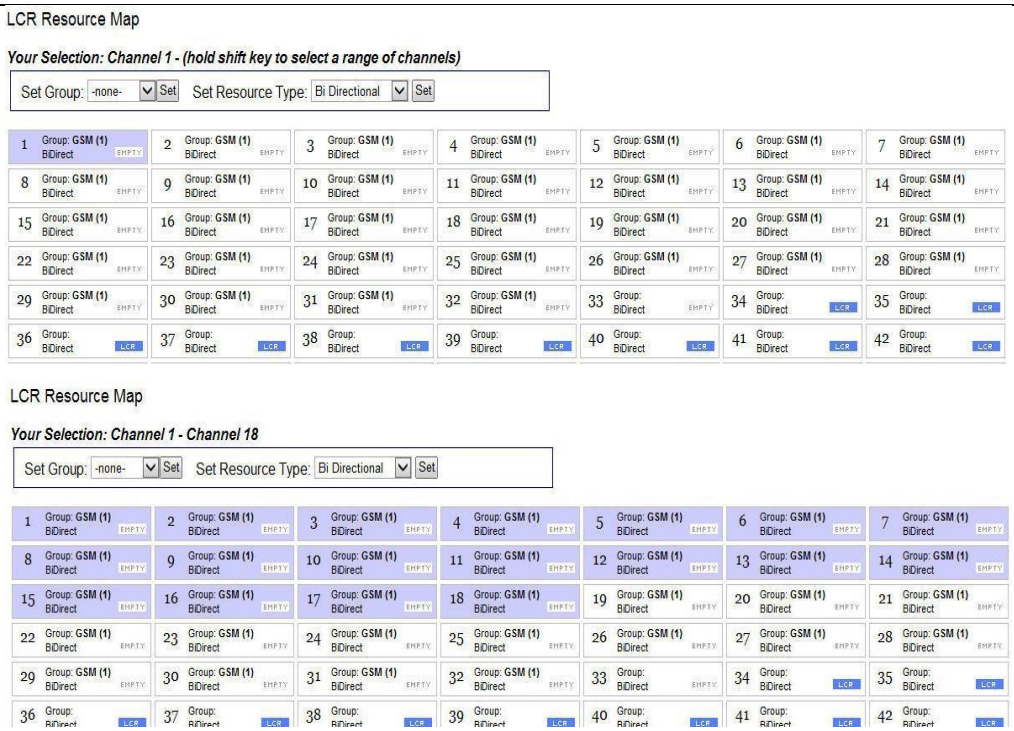


Figure 82. Selecting LCR Resources

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

Resource Map

Figure 83. 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.

5.6 Rules

Rules determine to which Group a call is routed.

5.6.1 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.

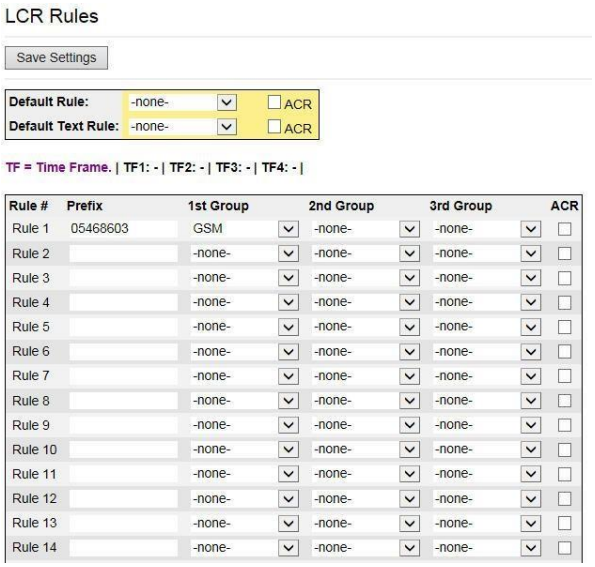


Figure 84. LCR Rules Screen

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.

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**. 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**.

5.6.2 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**.

5.7 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.

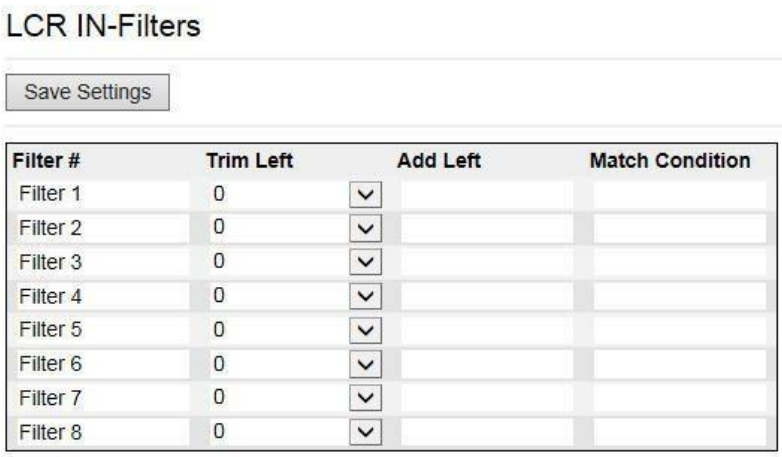


Figure 85. LCR Filters Screen

2. Configure the following for up to eight filters:

Trim Left

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

Add Left

Optionally enter the numeric prefix that will be added to the beginning of the destination number.

Match Condition

Optionally enter the exact expected numeric prefix with which the dialed number should begin, for this filter to be applied.

3. Click **Save Settings**.

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

Filters

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**.

5.8 Advanced Call Routing

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 as dialed destinations whereas a black list includes the phone numbers that are prevented from being dialed.

Enabling ACR requires the following steps:

a. Prepare and upload the Number List (optional)
b. Define the ACR rules.
c. Prioritize the rules by re-arranging them. The list of rules is scanned and applied from top to bottom.
d. Set the default action to be carried out when none of the rules above it were a match, or no rule provided an LCR group selection.

5.8.1 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 86. 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.

5.8.2 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 —listǁ 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**

Caution: A comma must separate the tag and the number or the list will not register properly.

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

Configuring LCR

Figure 87. ACR Number Lists Screen

6. Click **Browse**. The standard Windows browse dialog box is displayed.
7. 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.
8. 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.

9. Click **Import**. The report of total lists and total numbers is automatically updated.

5.8.3 ACR Rules

To create an ACR Rule:

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

Figure 88. ACR Rules Screen

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

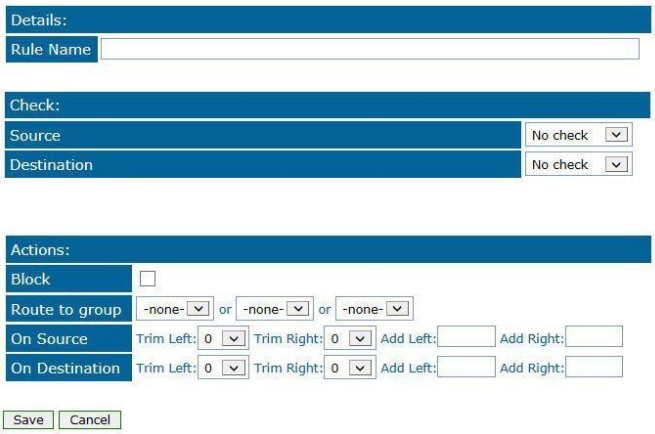


Figure 89. Add New Rule Screen

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:

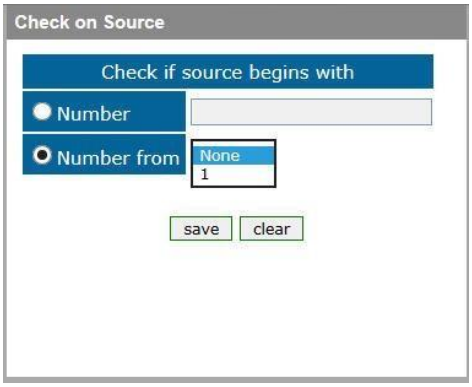


Figure 90. Sample Check Dialog Box

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.

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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 is 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.

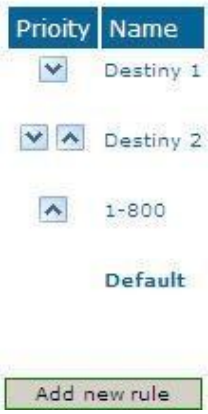

Figure 91. Rule Prioritization Arrows

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 LCR rule row that the ACR rules will be applied to and click **Save Settings**.

CDR

5.9 CDR

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

On systems equipped with an HBS/HBD card, an external storage device (an SD card) must be used. The active file is located within the internal system memory while completed files are moved onto the external storage device during the night.

Caution: 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 all systems (HBS/HBD based as well as PC based) 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.

5.9.1 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.

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.

Configuring LCR

5.9.2 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.

5.9.3 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 10. 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 10. CDR Line Entries Explained

Entry	Explanation
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 had first terminated the call.
Call Duration	In seconds, measured between AnswerTime and Hangup-Time.

6 Managing via the HMC

This chapter contains:

- Number Filters (section 6.1)
- Scheduler (section 6.2)

6.1 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.

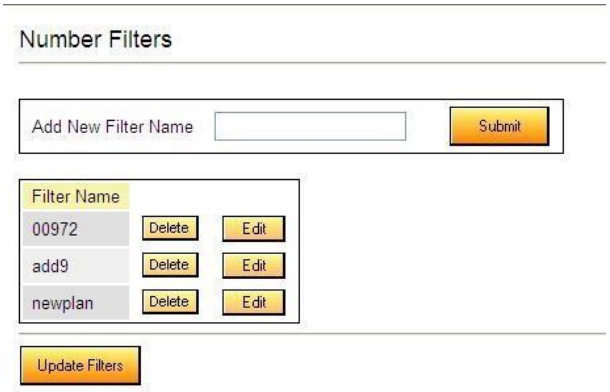

Figure 92. Number Filters Screen

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.

Figure 93. 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.

7. 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.regularexpressions.info

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

Figure 94. New Filter is Displayed

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

6.2 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.

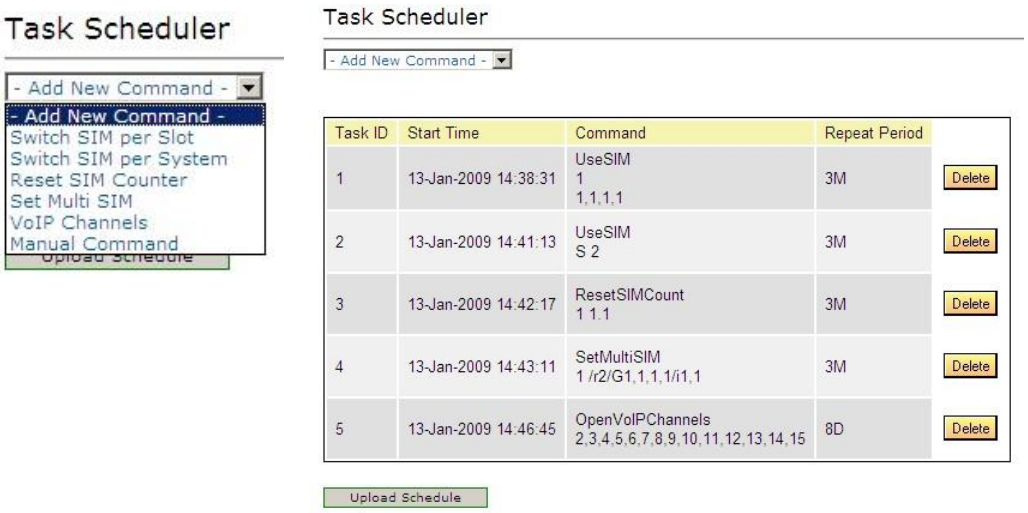

Figure 95. Dropdown Menu of Tasks and Table of Scheduled Tasks

6.2.1 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 96. 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.

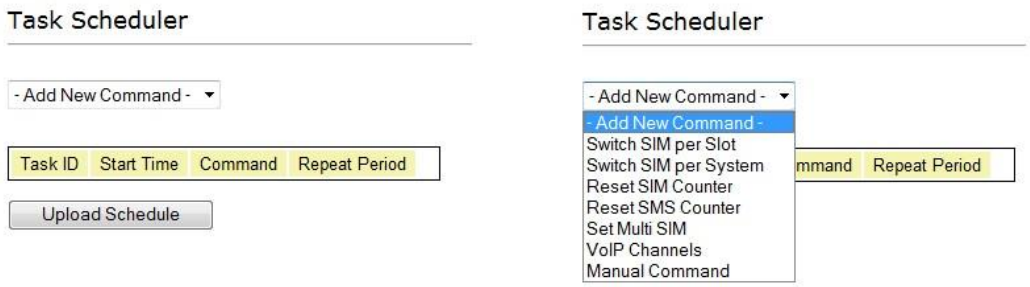

Figure 97. Task Scheduler Set Command Screen

Caution: 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.

6.2.2 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.

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 System**. The Task Scheduler automatically advances to the next screen.

Figure 98. Task Scheduler Switch SIM per System Screen

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

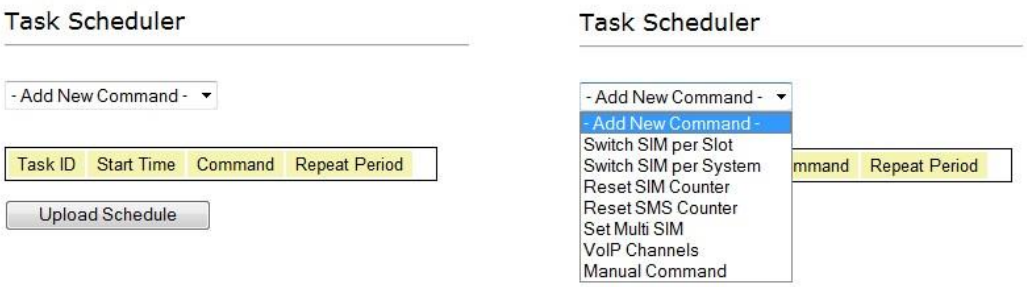

Figure 99. Task Scheduler Set Command Screen

Caution: 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.

6.2.3 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.

Figure 100. 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.

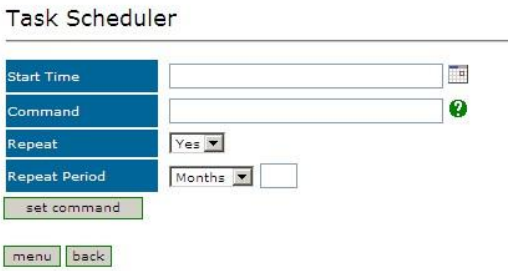

Figure 101. Task Scheduler Set Command Screen

Caution: 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.

6.2.4 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.

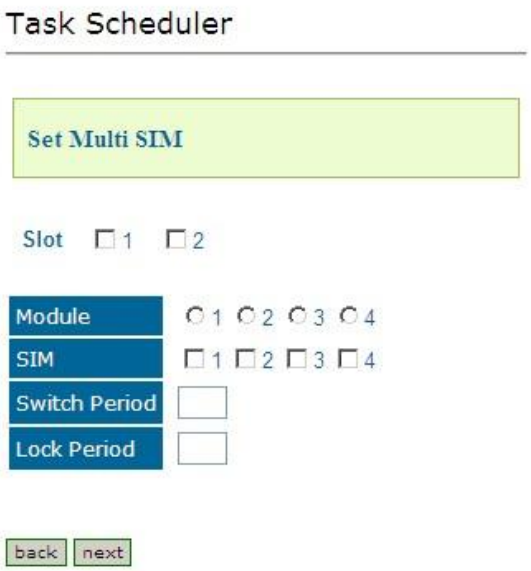

Figure 102. Task Scheduler Set Multi SIM Screen

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.

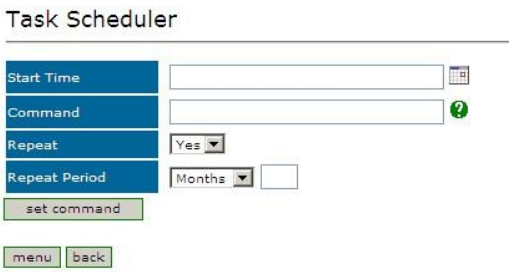

Figure 103. Task Scheduler Set Command Screen

Caution: 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.

6.2.5 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.

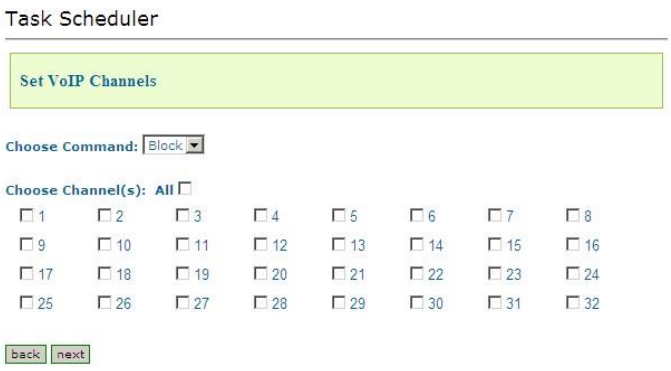

Figure 104. Task Scheduler Set VoIP Channels Screen

4. 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.

5. Select the checkboxes of the channels that the task will be applied to.

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

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

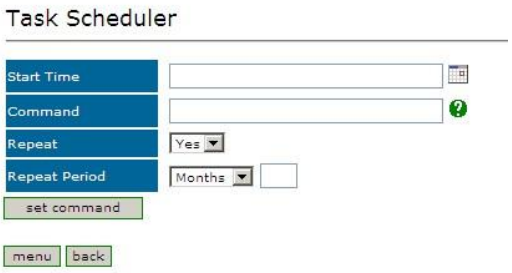

Figure 105. Task Scheduler Set Command Screen

Caution: 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.

6.2.6 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.

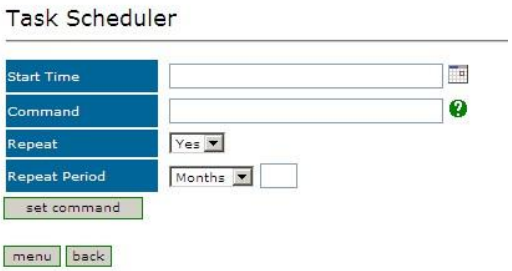

Figure 106. Task Scheduler Manual Command Screen

Caution: 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.

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7 Console Suite and Other Tools

This chapter contains:

- Console Suite (section 7.1)
- Hypermedia Gateway Server List (section 7.2)
- Troubleshooting (section 8)

7.1 Console Suite

7.1.1 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 107. 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.

7.1.2 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 108. 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.

7.1.3 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.

7.1.3.1 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-ad3c20dad44bfdec@192.168.1.67 remoteNumber: 30 localNumber: 0774445016 remoteIP: 192.168.1.67

…

[25/03-09:56:24.089] [debug] source DDI:0774445016 allowed DDI:^*[25/0309:56:24.093] [debug] FindLocalMediaResources (2cf9b58a-f8f3ae56-ad3c20dad44bfdec@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-ad3c20dad44bfdec@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-ad3c20dad44bfdec@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 resoruce: 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: 2cf9b58af8f3ae56-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. The HG 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.

7.1.3.2 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]

…

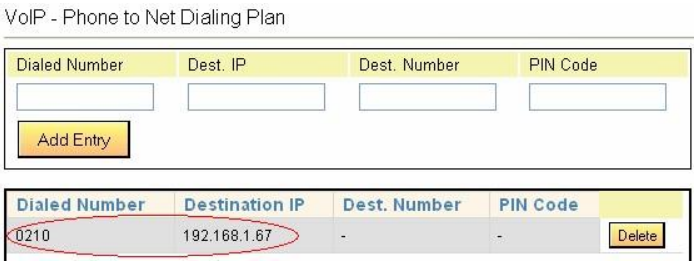
[25/03-10:08:00.224] [debug] CloseResources (YWZmYjRiMjY3OGMyYzJkMGU1MjQxZDcxODkzMDBjYTY./1031)

…

[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.



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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.

7.1.3.3 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 successful, 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 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.

7.1.3.4 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, cheking CLI

[26/03-10:21:25.826] Looking up CLI: 0544331123

[25/03-10:21:42.846] Authentication successful, CLI found: 0544331123

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[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.

7.1.3.5 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.

7.1.3.6 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: 5ea9f5a3-6193c5d452634512-50c08bcf@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:^*

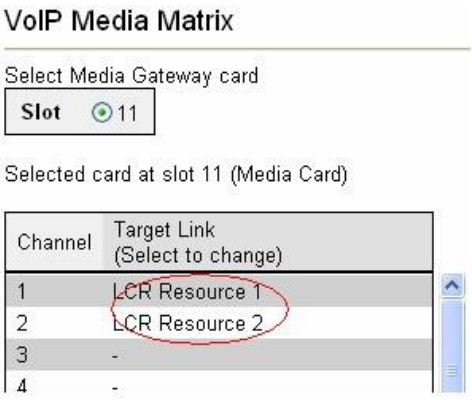
[26/03-10:52:16.541] [debug] FindLocalMediaResources (5ea9f5a3-6193c5d4-5263451250c08bcf@192.168.1.70/4) LocalHwyTS: 11:1 RemoteHwyTS: 12:2 media resource: 11.1

…

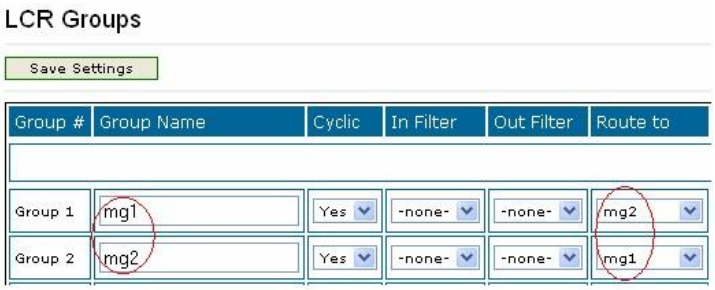
[26/03-10:52:46.353] [debug] onReadyToSend replaced h_CallID with [OGNhOTYwODA4MTZlNzQzZTM0ZTkzNDYyNzUwMjEzZTA

Explanation:

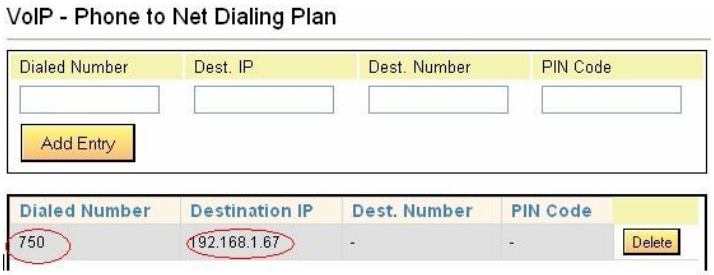
1. In this case, the originating party, 8888@192.168.1.70, is calling to the destination party, 750@192.168.1.67.
2. CreateIncomingSession indicates that a call is coming from (192.168.1.70) VoIP and the HG is starting to establish the call.
3. The originating party dials the digits: 750. The HG checks that this number is not in the BlockedDDIs list.
4. FindLocalMediaResources indicates that the HG is preparing to allocate local recourses.
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.



6. 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.



7. In order to make the connection between the originating party and destination party, the HG was configured as follows:



8. Every incoming VoIP call that dialed the digits 750 will terminate at the destination party 192.168.1.67.

9. When the destination party answers the call, the HG prints the following to the Log: provideAnswer.
10. Started media indicates that the HG has started streaming between both parties.
11. When one party hangs-up, the HG closes the session and removes the media resources.

7.1.4 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 **Tool**s > **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.

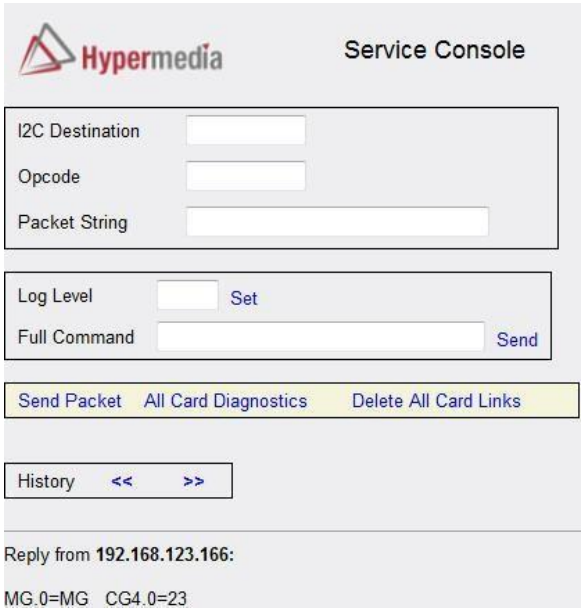


Figure 109. Service Console Screen

5. Follow the instructions given to you by Hypermedia Technical Support.

7.2 Hypermedia Gateway Server List

Use the Hypermedia Gateway Server list to review a list of existing servers, to add a new server, and to edit an existing 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 Hyper-Gateway 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.

Figure 110. 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**.

7.2.1 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.

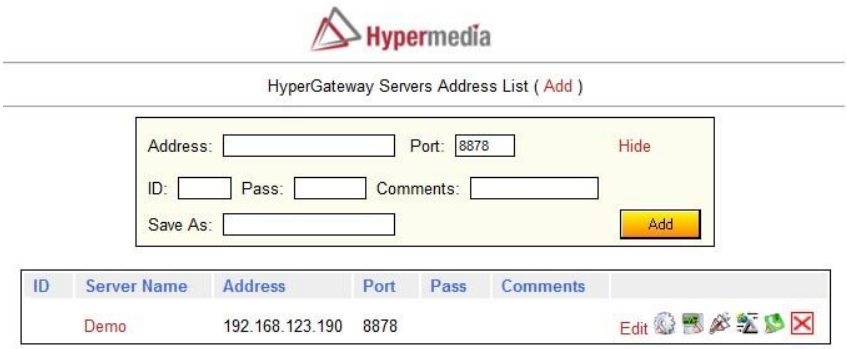


Figure 111. Add a New Server Screen

Hypermedia Gateway Server List

3. Enter the server parameters.
4. Click Add. The new server is added to the list.

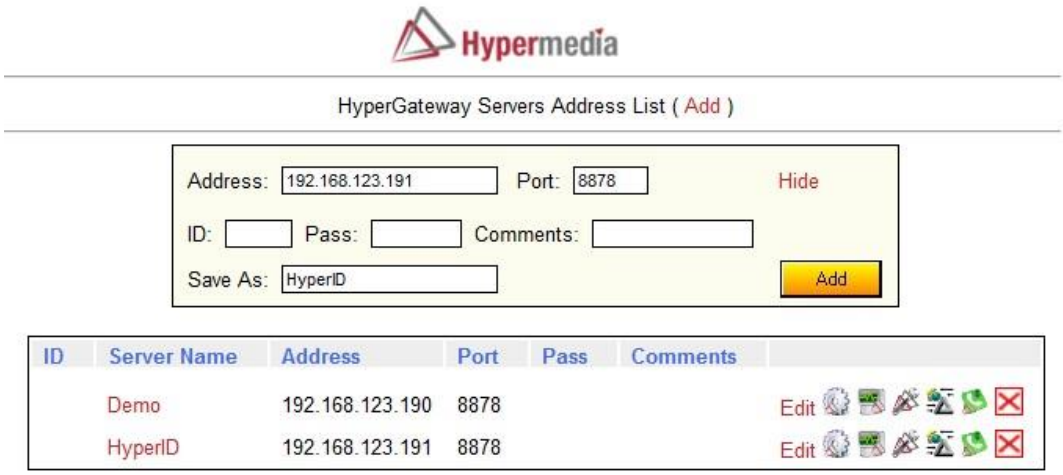


Figure 112. New Server Appears in List

7.2.2 Accessing Other Tools via the Server List

Use the Gateway Server List to open:

Table 11. Tools Available from the Server List

Clicking Action	Click Result

Clicking the name that appears in the Server Name column	Opens the Hypermedia Management Console
Clicking **Edit**	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

8 Troubleshooting

Following are possible causes and solutions for various possible issues.

Table 12. Power

Display	Possible Cause	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 13. PRI

Display	Possible Cause	Solution
Sync. LED (Orange) is blinking	No synchronization of PRI card	• Check connections to the PRI card at the PBX or line. • Verify that the PRI cable is connected. • Verify that all pins in the PRI connector are connected in accordance to the PRI specifications.
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 14. Cellular

Display	Possible Cause	Solution
No sync. with net- work (Green LED is off)	Antenna is not located properly	Position the antenna in a place with better reception.
No sync. with net- work (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 15. MG

Display	Possible Cause	Solution
LINK LED (Green) does not light	No LAN Connection	Check connections to the Router.
Error LED (Red) is blinking (50% duty cycle, not twinkling)	Card is faulty	Reinsert the card and restart the system.
Ready LED (Yellow) does not light	Card is either not inserted correctly, or faulty	If problem continues replace the card.

Table 16. VoIP

Display	Possible Cause	Solution
Call connected	One way audio	On VoIP Settings screen validate Public IP (should be same IP as RO card WAN IP address. See section 1.6.3.2.2).
Error on HMC media connection screen	Cannot connect any card to VoIP card	No LAN cable connected to Media ETH interface.

HMC->Monitor->VoIP Card Status=No Signal	The connected cellular card has no signal	Check the Antenna is properly connected to the Cellular card.