

ISDN (PRI) – GSM Gateway



Powerful, Multi-channel GSM Solution for Large Enterprises and Service Providers

Product Description
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Abstract

The Hypermedia **HG-3000/6U** E1/T1 PRI GSM Gateway series is part of the HyperGateway family of flexible, scalable platforms which empower cost-effective corporate telephony over fixed, cellular and IP networks. Hypermedia Gateways provide integrated voice communications for both on-site and remote users of small-to-large enterprises.

This paper illustrates how HG-3000/6U can be integrated into an existing telephony environment. It describes the features, and benefits, of deployment of an HG-3000/6U.

Savings and Benefits

Hypermedia **HG-3000/6U** E1/T1 PRI GSM gateway connects the PSTN and the GSM mobile network. The system enables any combination of connectivity between the interfaces.

By using the HG-3000/6U, companies can significantly reduce their telephony costs. Savings are the result of:

- direct routing of an incoming call to a specific channel which contains a SIM card from a pre-defined provider
- forwarding calls to pre-designated extensions
- eliminating the cost of international calls placed from mobile phones
- eliminating roaming tariffs

Benefits of installing the HG-3000/6U include:

- direct connectivity solutions while reducing telephony expenses
- preserving and upgrading the telephony network
- familiar calling patterns mean successful integration, increased usage, and increased savings
- easy to expand

System Components

The **HG-3000/6U** unit consists of the components described in this section.

HG-3000/6U Unit

The HG-3000/6U unit is a 19" x 6U rack-mountable box that connects the PBX to the cellular network via up to 4 cellular cards, each card with 4 modules of cellular channels. The system enables any combination of connectivity between its various interfaces.

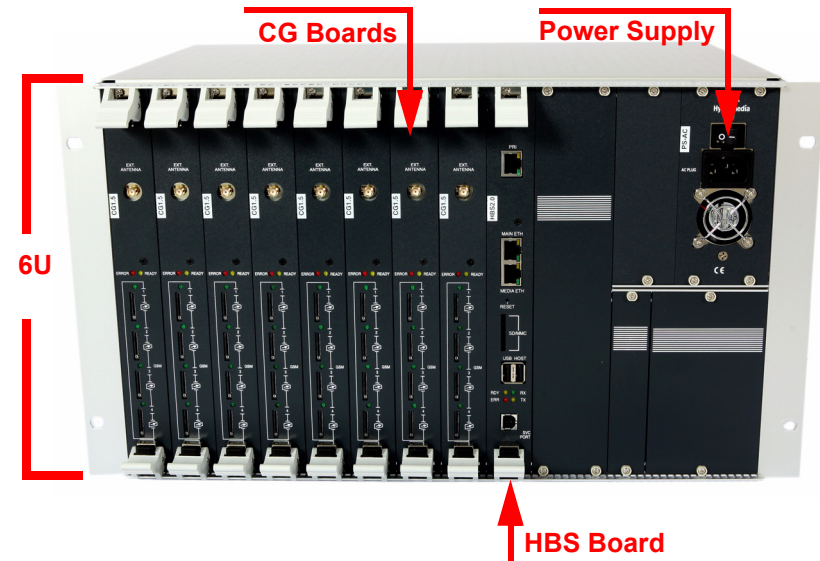


Figure 1: Board Location in the HG-3000/6U Unit

Boards

Following is a description of the boards included with the unit:

- **Cellular Gateway (CG) Boards**
CG for GSM, CC for CDMA RUIM, and CU for UMTS, are single-slot cards that enable inbound and out-bound cellular voice calls for cellular networks.
- **HBS Board**
The HBS board supports the following:
 - A media Gateway that enables flexible, pre-defined, and dynamic allocation of GSM channels and E1 PRI B-channels.
 - PRI functionality that enables signaling over a PRI channel on public or private ISDN at E1 and T1 reference points.
 - Optionally, the HBS card can also support the VoIP interface and is then capable of carrying 32–72 concurrent VoIP calls.

HyperGateway Server

The HyperGateway Server is an application that is embedded in the HBS Board. The HyperGateway Server is controlled and managed by the browser-based Hypermedia Management Console.

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 is installed on the customer's PC, connects to the Gateway system over TCP/IP, and is based on a standard WEB browser.

RO Board (Optional)

The RO board is an Ethernet Broadband Router equipped with NAT (Network Address Translation) technology. It enables the Hypermedia Gateway to connect to a public IP and to operate behind firewalls equipped with Network Address Translation; this provides maximum network security.

Hypermedia Management Console (HMC)

The Hypermedia Management Console, pictured to the right, opens in a browser. The interface is divided into a Navigation Pane and a Configuration and Monitor Pane.

In addition, the interface includes identifying information.

Server IP Address

Navigation Pane

Hypermedia

Server at: 2.2.2.2

HyperGateway Console

Configure

Cellular Cards

PRI Cards

Media Connections

Connection Settings

Dial Filters

Dial Plan

LCR

VoIP Card

Server Settings

Save/Load

Monitor

Manage

PRI General Settings

Select PRI card

Slot 12 13

These settings will be active only after saving changes to the system!

Selected card at slot 12 (E1 PRI)

PLL Clock Sync Slave Master

Remote Device PBX Network

Line Coding HDB3 AMI CMI NRZ

Framing Type Extended CRC4 CRC4 Double Framing

Long Haul Short Long

Dial Method EnBlock Overlap

Country Code EUROISDN

ISDN Version EUROISDN

Configuration and Monitor Pane

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

VoIP Card Status

Line	Direction/Type	State	To	Remote IP	ASR	ACD
1	-	Idle	-	-	-	-
2	Fast Block	Blocked	-	-	-	-
3	Fast Unblock	Blocked	-	-	-	-
4	Send DTMF	Blocked	-	-	-	-
5	Reset ASR	Blocked	-	-	-	-
6	Reset ACD	Blocked	-	-	-	-
7	Reset Both	Blocked	-	-	-	-
8	Clear Call	Blocked	-	-	-	-
9	-	Blocked	-	-	-	-
10	-	Blocked	-	-	-	-

Cellular Card Call Counters Steps

Select cellular card

Slot 1 2

Selected card at slot 1 (GSM)

Enabled ☒

Minutes

Module1

Time Period Repetitions

3 7

4 7

5 7

10 7

1 Unlimited

Save Settings

Enabled ☒

Seconds

Module2

Time Period Repetitions

30 0

60 0

1 Unlimited

Disabled ☐

Seconds

Module3

Time Period Repetitions

1 Unlimited

Disabled ☐

Seconds

Module4

Time Period Repetitions

1 Unlin

Cellular Card Dial Filters

Select cellular card

Slot 1 2

Selected card at slot 1 (GSM)

Module	Application	Filter Used	Status
Module 1		- No Filter -	Edit
Module 2	Callback-Leg1	- No Filter -	Save
Module 3	Callback-Leg2	- No Filter -	Edit
Module 4		- No Filter -	Edit

- No Filter -

newplan

add9

tanik

tanik2

cut972

014

Demo

ISDN (PRI) Features & Functionality

Designed as a PBX add-on solution for GSM connectivity, the HG-3000/6U connects directly to the E1/T1 PRI interface of the existing PBX (Private Branch eXchange), and provides seamless interoperability between the existing phone system and the GSM mobile network.

The HG-3000/6U enables the PBX to route incoming calls from the GSM mobile network directly to the PBX extensions. Similarly, outgoing calls originating on the extension side of the PBX can be terminated on the mobile network. Converting fixed-to-mobile and mobile-to-fixed calls into much cheaper mobile-to-mobile calls results in significant savings.

This simple yet powerful cellular Gateway delivers direct connectivity solutions with proven cost savings for corporations.

Connections and Settings

Specific call-routing requirements demand a flexible but powerful gateway. Variations between PBXs, locations and other variables necessitate a rich suite of advanced PRI settings. The HG-3000/6U can be configured to match almost any routing design in almost any setting.

PRI Connections: Cellular and VoIP

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

PRI Media Matrix

Select PRI card

Slot ☒ 12 ☐ 13

Selected card at slot 12 (E1 PRI)

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

Figure 2: PRI Media Matrix

PRI Settings

The PRI card connects between the HG-3000/6U and a PBX. It can also be assigned to connect directly to the operator's network.

From the PRI Card branch of the HMC navigation pane, click the **Connection Settings** sub-branch. The PRI General Settings screen is displayed.

On the General Settings screen, configure the parameters required for the specific installation, such as PLL Clock Sync, Line Coding, Framing Type, Dial Method, and ISDN Version.

PRI General Settings

Select PRI card

Slot ☐ 12 ☒ 13

These settings will be active only after saving changes to the system!

Selected card at slot 13 (E1 PRI)

PLL Clock Sync	<input checked="" type="radio"/> Slave	<input type="radio"/> Master
Remote Device	<input checked="" type="radio"/> PBX	<input type="radio"/> Network
Line Coding	<input checked="" type="radio"/> HDB3	<input type="radio"/> AMI <input type="radio"/> CMI <input type="radio"/> NRZ
Framing Type	<input checked="" type="radio"/> Extended CRC4	<input type="radio"/> CRC4 <input type="radio"/> Double Framing
Long Haul	<input checked="" type="radio"/> Short	<input type="radio"/> Long
Dial Method	<input checked="" type="radio"/> EnBlock	<input type="radio"/> Overlap
Country Code	EUROISDN	
ISDN Version	EUROISDN	

Figure 3: PRI General Settings Screen

Functionality Highlights

The HG-3000/6U gateway supports the vast majority of functions required by today’s demanding users. Following are several highlights.

Dial Filters

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

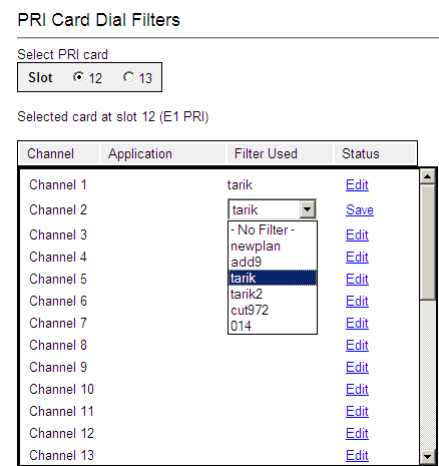


Figure 4: Configuring PRI Dial Filters

PRI Card Dial Plan

A dial plan establishes the expected number and pattern of digits for a telephone number. This includes country codes, access codes, area codes and all combinations of digits dialed. For instance, the North American public switched telephone network (PSTN) uses a 10-digit dial plan that includes a 3-digit area code and a 7-digit telephone number.

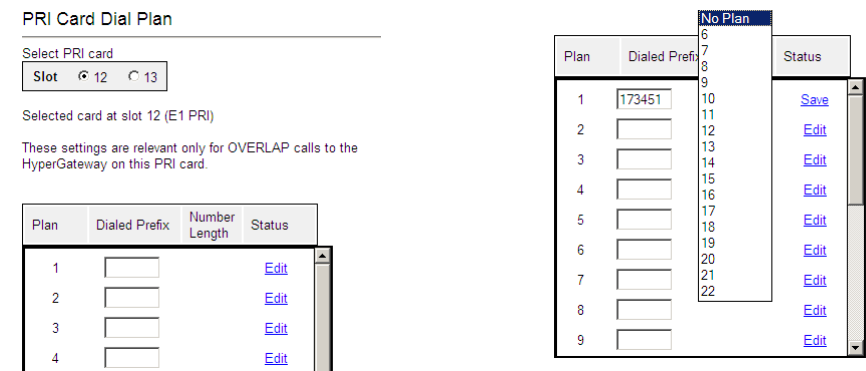


Figure 5: HMC PRI Card Dial Plan Screen

Most PBXs support variable-length dial plans that use 3 to 11 digits. Dial plans must comply with the telephone networks to which they connect. Use the PRI Card Dial Plan screen to configure the local dial plan.

Chapter 3

GSM Features and Functionality

Note: This document uses the term GSM to describe the cellular telephony network and service. GSM network is also known as: mobile network, cellular network, or wireless network.

The HG-3000/6U supports a full suite of GSM features and functionality. These enable a company to significantly reduce the money spent on telephony.

Using the HG-3000/6U, companies can eliminate the expense of international calls placed from mobile phones. The HG-3000/6U eliminates local and international inter-connection charges between fixed and mobile calls and capitalizes on mobile-to-mobile rates.

The HG-3000/6U's highly flexible GSM card can hold from 4 to 16 SIM cards enabling easy growth and adaptation to changing corporate needs.

GSM Overview

Typically, mobile network operators charge the least for calls within their own networks. Costs increase for calls either originating outside of the network or terminating outside of the network.

In addition, each mobile network is limited to a specific location or area. Costs increase for mobile calls originating or terminating outside of the mobile network's location.

The HG-3000/6U resolves both the above and, thereby, delivers significant savings. Moreover, this simple yet powerful cellular Gateway delivers direct connectivity solutions with proven cost savings for corporations.

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

It is worth mentioning that the GSM features answer the needs of the growing world of GSM-only users. Developing countries often leap frog land-line infrastructure and invest only in GSM infrastructure. Similarly, the rapidly growing trend amongst younger users is to rely entirely upon GSM telephony.



The first SIM cards of each module are loaded from the front of the Cellular Card.

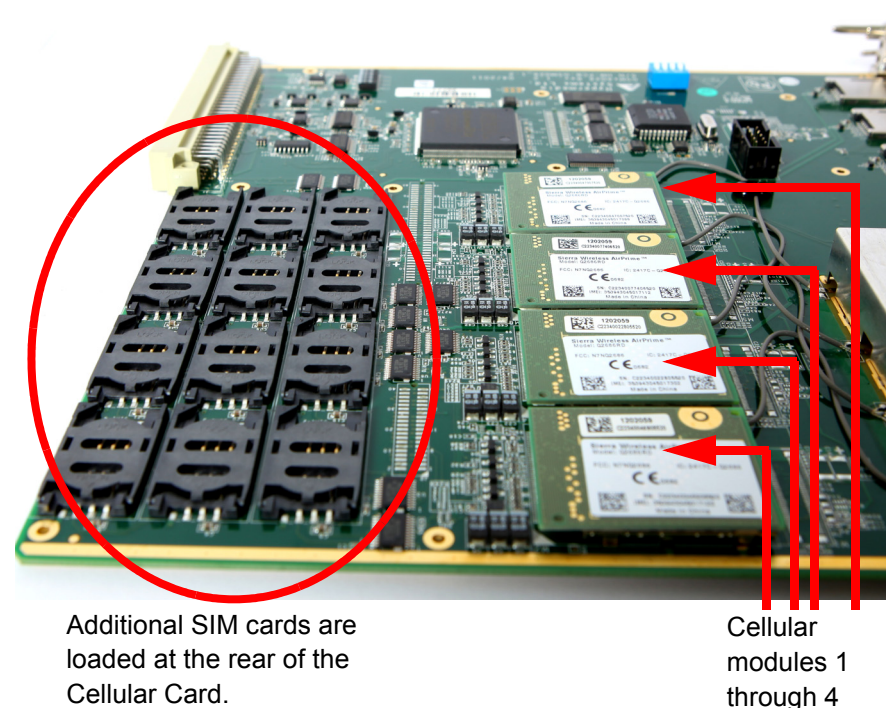


Figure 6: SIM Cards on a GSM Board

Some parameters can be applied either to specific SIM cards, or to specific modules, or to the entire GSM board, or to all the boards in the system.

Connections and Settings

Specific user requirements demand a flexible but powerful gateway. Variations between service providers, locations and other variables necessitate a rich suite of advanced GSM settings. The HG-3000/6U can be configured to match almost any routing design in almost any setting.

GSM Connections: VoIP and/or ISDN

Use the Media Connection screen to configure the connections from the channels of a GSM card to other cards and channels in the system. Connections can be either static or dynamic, as in the case of LCR.

GSM Settings

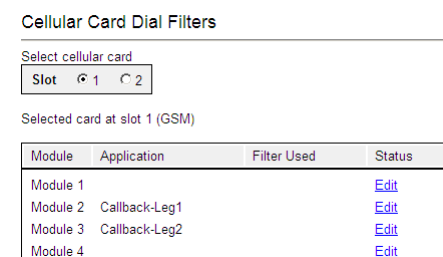
Use the Settings screen to enable and disable advanced parameters. For assistance with these, contact [Technical Support](#).

Functionality Highlights

The HG-3000/6U gateway supports the vast majority of functions required by today's demanding users. Following are several highlights.

Dial Filters

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



Select cellular card			
Slot 1 2			
Selected card at slot 1 (GSM)			
Module	Application	Filter Used	Status
Module 1			Edit
Module 2	Callback-Leg1		Edit
Module 3	Callback-Leg2		Edit
Module 4			Edit

Figure 7: Cellular Dial Filters Screen

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 GSM provider for more information regarding the PIN code.

Locks

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

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

Additional Functions

Following are additional popular functions supported by the HG-3000/6U.

- **Volume Settings**
Use Volume Settings to adjust a GSM module's audio level. This can be done for each of the GSM modules on a Hypermedia Gateway.
- **SIM Counters**
Use the SIM Counter screen to review the actual usage time of each SIM card and to set counter steps per module.
- **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. The

definition can be applied just to the module, to all 4 modules on the card, or to all the GSM cards in the system.

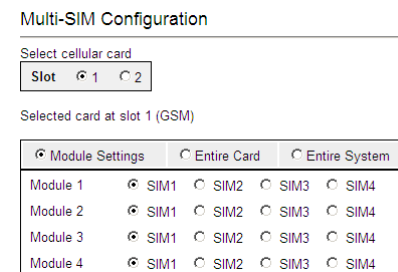


Figure 8: SIM Select Screen

- **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.
- **Reset**
Use the GSM Card Reset screen to reset either the entire GSM card or a specific GSM module.
- **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 pre-configured switched time cycle.

- **Call Counter Steps**

To match a carrier's billing method, rounding up the duration of a call is sometimes required. The HG-3000/6U supports multiple time periods and repetitions. For example, if the Time Period = 60 seconds and Repetition = 3, and the caller speaks for 10 seconds, the call counter advances by 60 seconds. If the caller speaks for 110 seconds, the counter advances by 120 seconds. This policy expires after 180 seconds, that being the Time Period (= 60 seconds) times the Repetition (= 3). Then, the next step is applied. The final step always has unlimited repetitions and is used as the default billing unit in case it is the only step defined.

- **Call Limits**

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

Cellular Card Call Limits

Select cellular card

Slot ☒ 1 ☐ 2

Selected card at slot 1 (GSM)

Set the limit for an outgoing cellular call to be answered:
Enabled ☒ 15 Seconds

Set the maximum length of an outgoing call:
Enabled ☒ 5 Minutes

Round the call length up to the maximum length (above) even if shorter:
Enabled ☐
(This feature cannot be used together with Call Counter Steps)

Figure 9: Call Limits Screen

- **CLI Blocking**

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



- **Cell Selection**



Use the Cell Selection screen to manually camp on a GSM site. Most often, a user selects the strongest cell site. However, if the Base Transceiver Station (BTS) or tower is fully loaded or temporarily disabled, a handover will not take place as long as this feature is active. This renders the GSM port temporarily unusable.

- **USSD SIM Balance**

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

USSD SIM Balance

Balance checking USSD string: *121#  

Recharging USSD string:  









Slot	Ch.	Media Link	Check All	Check Balance	Recharge Balance	USSD Reply	Reply Date
1	1	MG.0 (11) Ch.1	<input type="checkbox"/>			The balance of 08084 is 18.00 B. & valid until 06/03/13 Just75 Satang/min Pay75B.get100min all network for10days. Press*500*80#	14/11/2012 11:16:57
1	2	MG.0 (11) Ch.2	<input type="checkbox"/>				
1	3	MG.0 (11) Ch.3	<input type="checkbox"/>				
1	4	MG.0 (11) Ch.4	<input type="checkbox"/>				

Figure 10: USSD SIM Balance Screen

LCR Features and Functionality

HG-3000/6U's advanced Least Cost Routing (LCR) functionality enables greater customizing and, potentially, saves money.

HG-3000/6U's LCR capabilities maximize available resources according to the needs of the enterprise. Using HG-3000/6U's LCR functionalities, Hypermedia gateways route calls based on specific rules created by the administrator. This results in cost-effective per-call routing. In contrast, without LCR, all call routes are fixed.

Connections and Settings

Satisfying specific enterprise call-routing requirements demands a flexible but powerful gateway. The HG-3000/6U can be configured to match almost any routing design in almost any setting.

LCR Links: VoIP and/or GSM and/or ISDN

Use the Media Connection screen to link the channels of one media with the channels of a second media. Once linked, the resources can be allocated to match enterprise requirements.

Advantages of Grouping Resources

Creating Groups simplifies consistent application of LCR strategies. With the HG-3000/6U, Groups can also be assigned filters and outgoing calls can be logged.

Use the LCR Resource Map to assign Resources to Groups. Resources can be either bi-directional or be reserved for outbound calls only.

Functionality Highlights

The LCR module supports the vast majority of functions required by today's demanding users. Following are several highlights.

LCR Rules

Rules determine to which Group a call is routed. When Time Frames (next section) are not used, the Rule is applied continuously.

LCR Rules

[Save Settings](#)

Default Rule: ☐ ACR

Default Text Rule: ☐ ACR

[TF = Time Frame](#), | TF1: - | TF2: - | TF3: - | TF4: - |

Rule #	Prefix	1st Group	2nd Group	3rd Group	ACR
Rule 1	052	GSM	-none-	-none-	<input type="checkbox"/>
Rule 2	9	PBX	-none-	-none-	<input type="checkbox"/>
Rule 3	00	PSTN	-none-	-none-	<input type="checkbox"/>
Rule 4	013	VOIP	-none-	-none-	<input type="checkbox"/>
Rule 5		-none-	-none-	-none-	<input type="checkbox"/>

Figure 11: LCR Rules Screen

Time Frames

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

LCR Time Frames

Save Settings

Frame #	Start Time	End Time
Frame 1:	08:00	17:00
Frame 2:	17:00	08:00
Frame 3:		
Frame 4:		

+ More - Less Disable Feature

Figure 12: Time Frames Screen

Filters

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

The HG-3000/6U supports both IN and OUT filters. 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.

Number Filters

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

LCR IN-Filters

Save Settings

Filter #	Trim Left	Add Left	Match Condition
Filter 1	3	0	972
Filter 2	0		
Filter 3	0		
Filter 4	0		
Filter 5	0		
Filter 6	0		
Filter 7	0		
Filter 8	0		

Figure 13: LCR IN Filters Screen

Advanced Call Routing (ACR)

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

Chapter 5

Monitoring and Management

With the HG-3000/6U's browser-based Hypermedia Management Console and suite of monitors, network administrators simply and efficiently review usage, identify problems, and increase system effectiveness.

Monitoring via the HMC

To review the Hypermedia Gateway's cards and CDRs, Network Administrators simply access the associated Hypermedia Management Console monitor.

Monitoring Board (Card) Usage

Monitoring the system is essential. The Hypermedia Management Console enables the network administrator to monitor cards and CDRs.

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

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

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 14: All Cells Screen

- To view information about the SIM slots on a specific cellular modules, especially the reception level and the BER level, expand the Monitor > Cellular Cards sub-branch and select **Reception**. Then, select a specific slot. The Cellular Cards Reception screen for that card is displayed.
- To view information about the status of SIM slots on a specific cellular module, expand the Monitor > Cellular Cards sub-branch and select **Status**. Then, select a specific slot. The Cellular Cards Status screen for that card is displayed.

Use the Monitor VoIP Cards > VoIP Status screen to review information about the status of the VoIP card, to control line activity, and to manage and download the daily VoIP CDR files.

To view information about the status of either BRI or PRI channels on a specific card, expand either the Monitor > BRI Cards or the Monitor > PRI Cards sub-branch and select either **BRI Status** or **PRI Status**. Then, select a specific slot. The status screen for that card is displayed.

Review the card status, the status of channels, and the totals.

Monitoring CDRs

Network Administrators simply and efficiently review Call Detail Records (CDR) using the Hypermedia Gateway CDR monitors.

- **Callback and Callthrough CDRs**
Use the **Monitor > CB/CT > CB/CT CDRs** screen to manage and download the Callback and Callthrough CDR files.
- **LCR CDRs**
Use the **Monitor > LCR Card > LCR CDRs** screen to manage and download the LCR CDR files.

The Console Suite

The following three consoles are installed during initial installation:

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



Figure 15: The Log Console

- Use the CDR Console to download and review Call Detail Records.
- Hypermedia Technical Support might ask you to assist them by completing tasks using the Service Console.

Management via the HMC

Hypermedia equipment includes a suite of management tools.

Managing Users

Use the Add User branch to define Gateway users and to manage their Callback access. Use the User List to review a list of defined Gateway users and to modify their definitions.

Managing VPN Groups

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

VPN Groups

Group Name

Add Group

Available Groups	
General	
e1	Delete Group
Anyone	Delete Group
Demo	Delete Group

Figure 16: VPN Groups Screen

Managing 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.

Managing Tasks with the Scheduler

Use the Task Scheduler to configure the Gateway to repeat commands at scheduled intervals. Several commands are pre-configured. In addition, it is possible to manually configure a command.

Task Scheduler

- Add New Command -

- Add New Command -

Switch SIM per Slot

Switch SIM per System

Reset SIM Counter

Set Multi SIM

VoIP Channels

Manual Command

Upload Schedule

- Add New Command -

Task ID	Start Time	Command	Repeat Period	
1	13-Jan-2009 14:38:31	UseSIM 1 1,1,1,1	3M	Delete
2	13-Jan-2009 14:41:13	UseSIM S 2	3M	Delete
3	13-Jan-2009 14:42:17	ResetSIMCount 1 1 1	3M	Delete
4	13-Jan-2009 14:43:11	SetMultiSIM 1 /i2/G1,1,1,1/i1,1	3M	Delete
5	13-Jan-2009 14:46:45	OpenVolPCchannels 2,3,4,5,6,7,8,9,10,11,12,13,14,15	8D	Delete

Upload Schedule

Figure 17: Dropdown Menu of Tasks and Table of Scheduled Tasks

Managing Global Parameters

Use the HGS Setup Parameters tool to configure parameters affecting global Hypermedia Gateway behavior.

Managing Cause Code

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. Use the PRI or VoIP Cause Conversion pages for this.

Hypermedia Gateway Server List

Use the Hypermedia Gateway Server list to review a list of existing servers and to add a new server. Other Hypermedia configuration and management tools can be accessed from the Hypermedia Gateway Server list. When accessed from here, the IP address and the password from the list are used, avoiding the need to re-enter these.

Chapter 6

Add-on Packages

A selection of software packages are available that expand the functionality of Hypermedia Gateways. They are described in this section.

HyperConnect Package

The HyperConnect Package supplies the following functionality.

DISA/Callthrough

Direct Inward System Access (DISA)—also called Callthrough—is the ability to access internal PBX features from an outside telephone line. For example, DISA allows someone calling in from outside the PBX to obtain an internal system dial-tone and to dial calls as if from one of the extensions attached to the PBX.

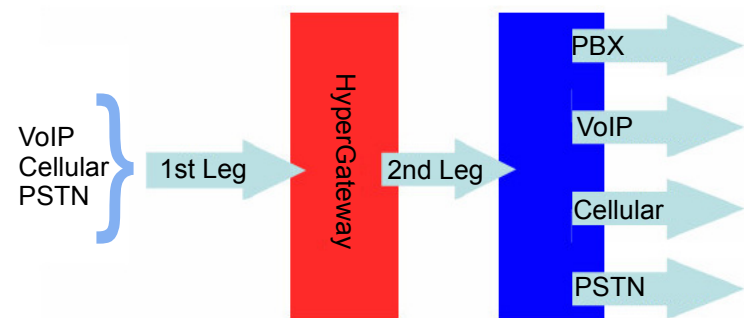


Figure 18: Callthrough Diagram

For resource control, the user is required to call a DISA number which connects him to the resources allocated to DISA. For security, the user can be required to enter his

personal code. If the personal code is authorized, the user will receive a dial-tone.

Similarly, calling a pre-allocated corporate telephone (DDI) number using a cellular, land-line or IP phone, users receive a dial-tone from the PBX, just as if they were calling from within the organization. After receiving permission, users can place calls to external numbers.

This service is useful when companies wish to enable employees to dial long-distance calls using company lines, or when several branches of the same company wish to use a single PBX.

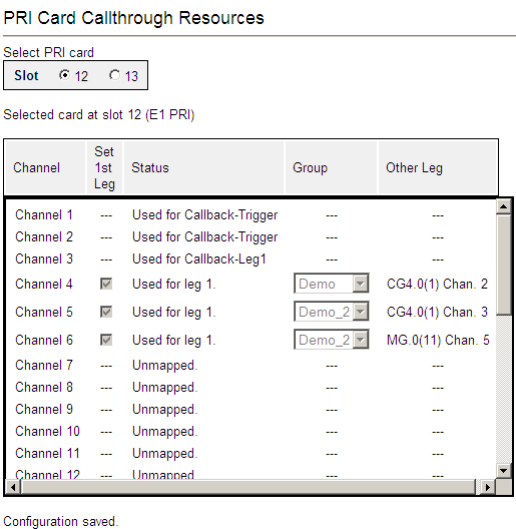


Figure 19: Allocation of Resources to Callthrough

Corporate Callback

This service is used mainly for savings on international calls.

The Hypermedia Gateway can provide callback service that is available for corporate users equipped with mobile handsets from anywhere in the world. Hypermedia Callback is designed for users who are making calls from any international destination back to their home country.

A variation of this service enables the pre-ordering of the destination party. Upon receiving the order, the service initiates a call to the authorized originating number (first-leg party). As soon as the first party answers, the system calls to the pre-ordered number (second-leg party) and initiates a call between the two parties.

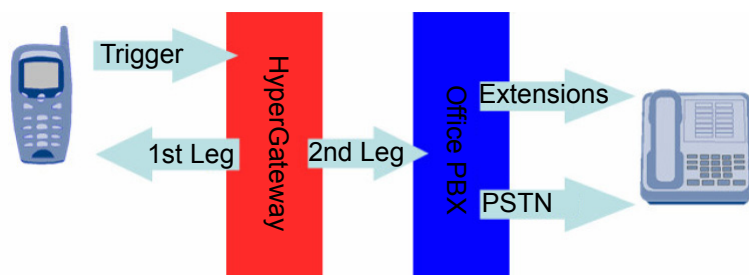


Figure 20: Callback Diagram

There are several ways to trigger a call back.

- **CLI Callback**

The CLI Callback service is used in countries where CLI (calling line identification or caller ID) is available

through the PTT. The user dials the DDI number to trigger the callback to the registered user. The user then can make unlimited consecutive outbound calls by keying double pound key (#, #).

- **Fixed Trigger Callback**

With the Fixed Trigger Callback service, users call a pre-allocated corporate telephone number, often called a DDI (direct dial in) number, and then receive a callback call on their registered callback number. After receiving the callback call, users can make unlimited consecutive outbound calls by keying double pound key (#, #).

- **SMS Callback**

Users can initiate a callback by sending an SMS message, which should include the destination number, to the designated number. After receiving the callback call, users can make unlimited consecutive outbound calls by keying double pound key (#, #).

Cellular Card Callback Resources					PRI Card Callback Resources				
Select cellular card					Select PRI card				
Slot <input type="radio"/> 1 <input type="radio"/> 2					Slot <input type="radio"/> 12 <input type="radio"/> 13				
Selected card at slot 1 (GSM)					Selected card at slot 12 (E1 PRI)				
Module	Set 1st Leg	Status	Group	2nd Leg	Channel	Set 1st Leg	Status	Group	Other Leg
Module 1	<input checked="" type="checkbox"/>	Allocated.	Demo_2	E1.0(12) Chan. 5	Channel 1	---	Used for Callback-Trigger	---	---
Module 2	---	Unmapped.	---	---	Channel 2	---	Used for Callback-Trigger	---	---
Module 3	---	Unmapped.	---	---	Channel 3	---	Unmapped.	---	---
Module 4	---	Unmapped.	---	---	Channel 4	---	Unmapped.	---	---
Configuration saved.					Channel 5	<input checked="" type="checkbox"/>	Used for leg 2.	---	CG4.0(1) Ct
					Channel 6	---	Unmapped.	---	---
					Channel 7	---	Unmapped.	---	---
					Channel 8	---	Unmapped.	---	---

Figure 21: Allocation of Resources to Callback

- **Web Based Callback**

With the Web based Callback service, users initiate a Callback call from their browser-based phone book. Additionally, the application supports sending an SMS message to trigger the callback.

The Hypermedia application supporting the Web based Callback service is pictured below.

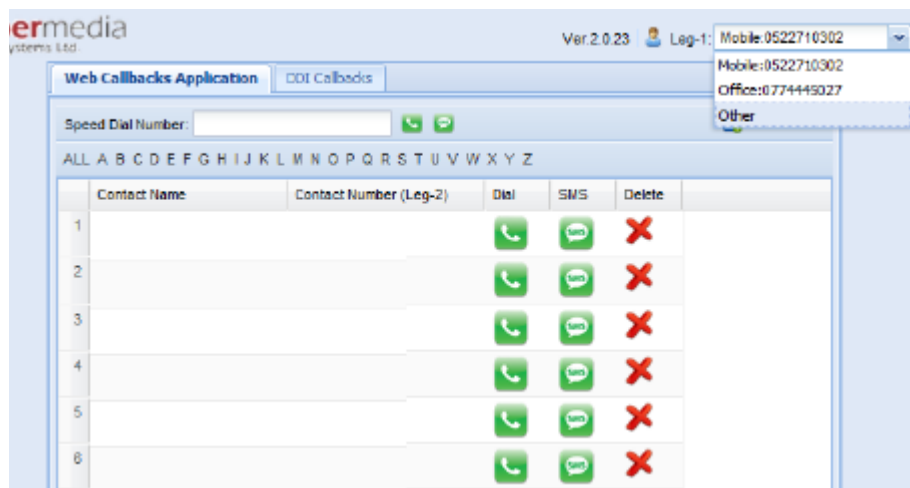


Figure 22: Web Callback Phone Book

From the upper-right corner, you select your mobile phone or any other phone number programmed into the application. Then, dial an entry or enter a new number and dial. Alternately, send an SMS instead of dialing. The Web based Callback service sets up the call for you.

Support for Smart Phones

HyperConnect's Callback and Callthrough services are also available as smart phone applications. Nokia, Blackberry, Android, and iPhone support the Callback and Callthrough applications. With Web based Callback, users initiate a Callback from a browser using their address book. Additionally, it is possible to send an SMS to a user from within this web application.



Figure 23: HyperConnect on Various Mobile Phones