TANDBERG

3G GATEWAY

ADMINISTRATOR GUIDE

Software version R3
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OCTOBER 2007

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3G Gateway

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Patent Information

TANDBERG technology described in this manual is protected by one or more of the following U.S. Patent Nos. 5,584,077 - 5,838,664 - 5,600,646 - 7,010,119 - 7,034,860 and other patents are pending in the United States and/or other countries.

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Operator Safety / Environmental Issues

For your own protection, please read the overleaf safety instructions completely, before operating the equipment and keep this manual for future reference. The information in this summary is intended for operators. Carefully observe all warnings, precautions and instructions both on the apparatus and in the operating instructions.

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Safety Instructions

For your protection please read these safety instructions completely before you connect the equipment to the power source. Carefully observe all warnings, precautions and instructions both on the apparatus and in these operating instructions.

Retain this manual for future reference.

Water and Moisture

- Do not operate the apparatus under or near water – for example near a bathtub, kitchen sink, or laundry tub, in a wet basement, near a swimming pool or in other areas with high humidity.
- Never install jacks for communication cables in wet locations unless the jack is specifically designed for wet locations.
- Do not touch the product with wet hands.

Cleaning

- Unplug the apparatus from communication lines, mains power-outlet or any power source before cleaning or polishing. Do not use liquid cleaners or aerosol cleaners. Use a lint-free cloth lightly moistened with water for cleaning the exterior of the apparatus.
- Unplug the apparatus from communication lines before cleaning or polishing. Do not use liquid cleaners or aerosol cleaners. Use a lint-free cloth lightly moistened with water for cleaning the exterior of the apparatus.

Ventilation

- Do not block any of the ventilation openings of the apparatus. Never cover the slots and openings with a cloth or other material. Never install the apparatus near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- Do not place the product in direct sunlight or close to a surface directly heated by the sun.

Lightning

Never use this apparatus, or connect/ disconnect communication cables or power cables during lightning storms.

Dust

Do not operate the apparatus in areas with high concentration of dust.

Vibration

Do not operate the apparatus in areas with vibration or place it on an unstable surface.

Power Connection and Hazardous Voltage

- The product may have hazardous voltage inside. Never attempt to open this product, or any peripherals connected to the product, where this action requires a tool.
- This product should always be powered from an earthed power outlet.
- Never connect attached power supply cord to other products.
- In case any parts of the product has visual damage never attempt to connect mains power, or any other power source, before consulting service personnel
- The plug connecting the power cord to the product/power supply serves as the main disconnect device for this equipment. The power cord must always be easily accessible.
- Route the power cord so as to avoid it being walked on or pinched by items placed upon or against it. Pay particular attention to the plugs, receptacles and the point where the cord exits from the apparatus.
- Do not tug the power cord.
- If the provided plug does not fit into your outlet, consult an electrician.
- Never install cables, or any peripherals, without first unplugging the device from it's power source.

Servicing

- Do not attempt to service the apparatus yourself as opening or removing covers may expose you to dangerous voltages or other hazards, and will void the warranty. Refer all servicing to qualified service personnel.
- Unplug the apparatus from its power source and refer servicing to qualified personnel under the following conditions:
  - If the power cord or plug is damaged or frayed.
  - If liquid has been spilled into the apparatus.
  - If objects have fallen into the apparatus.
  - If the apparatus has been exposed to rain or moisture
  - If the apparatus has been subjected to excessive shock by being dropped.
  - If the cabinet has been damaged.
  - If the apparatus seems to be overheated.
  - If the apparatus emits smoke or abnormal odour.
  - If the apparatus fails to operate in accordance with the operating instructions.

Accessories

Use only accessories specified by the manufacturer, or sold with the apparatus.

Communication Lines

Do not use communication equipment to report a gas leak in the vicinity of the leak.

Electromagnetic Compatibility (EMC)

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EC Declaration of Conformity

MANUFACTURER: TANDBERG Telecom AS

PRODUCT NAME: TANDBERG 3G Gateway

TYPE NUMBER: TTC2-03

DESCRIPTION: Network unit

This product complies with Commission Directives:

LVD 73/23/EEC
EMC 89/336/EEC
R&TTE 99/5/EEC

This product complies with harmonized Standards:

EN 60950-1 : 2001, A11
EN 55022 : 1994, A1/A2
EN 55024 : 1998, A1/A2
EN 61000-3-2 : 2000
EN 61000-3-3 : 1995, A1
TBR 3 Layer 1, 2 and 3
TBR4 Layer 1, 2 and 3

TECHNICAL CONSTRUCTION FILE NO.: X13526

YEAR WHICH THE CE-MARK WAS AFFIXED: 2005

For an official, signed version of this document, or details regarding documentation from the technical construction file, please contact TANDBERG.

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Environmental Issues

Thank you for buying a product which contributes to a reduction in pollution, and thereby helps save the environment. Our products reduce the need for travel and transport and thereby reduce pollution. Our products have either none or few consumable parts (chemicals, toner, gas, paper). Our products are low energy consuming products.

TANDBERG's Environmental Policy

Environmental stewardship is important to TANDBERG's culture. As a global company with strong corporate values, TANDBERG is committed to following international environmental legislation and designing technologies that help companies, individuals and communities creatively address environmental challenges.

TANDBERG's environmental objectives are to:

- Develop products that reduce energy consumption, CO_2 emissions, and traffic congestion
- Provide products and services that improve quality of life for our customers
- Produce products that can be recycled or disposed of safely at the end of product life
- Comply with all relevant environmental legislation.

European Environmental Directives

As a manufacturer of electrical and electronic equipment TANDBERG is responsible for compliance with the requirements in the European Directives 2002/96/EC (WEEE) and 2002/95/EC (RoHS).

The primary aim of the WEEE Directive and RoHS Directive is to reduce the impact of disposal of electrical and electronic equipment at end-of-life. The WEEE Directive aims to reduce the amount of WEEE sent for disposal to landfill or incineration by requiring producers to arrange for collection and recycling. The RoHS Directive bans the use of certain heavy metals and brominated flame retardants to reduce the environmental impact of WEEE which is landfilled or incinerated.

TANDBERG has implemented necessary process changes to comply with the European RoHS Directive (2002/95/EC) and the European WEEE Directive (2002/96/EC).

Waste Handling

In order to avoid the dissemination of hazardous substances in our environment and to diminish the pressure on natural resources, we encourage you to use the appropriate take-back systems in your area. Those systems will reuse or recycle most of the materials of your end of life equipment in a sound way.

TANDBERG products put on the market after August 2005 are marked with a crossed-out wheelie bin symbol that invites you to use those take-back systems.

Please contact your local supplier, the regional waste administration, or http://www.tandberg.net/recycling if you need more information on the collection and recycling system in your area.

Information for Recyclers

As part of compliance with the European WEEE Directive, TANDBERG provides recycling information on request for all types of new equipment put on the market in Europe after August 13th 2005.

Please contact TANDBERG and provide the following details for the product for which you would like to receive recycling information:

- Model number of TANDBERG product
- Your company's name
- Contact name
- Address
- Telephone number
- E-mail.

Digital User Guides

TANDBERG is pleased to announce that we have replaced the printed versions of our User Guides with a digital CD version. Instead of a range of different user manuals, there is now one CD – which can be used with all TANDBERG products – in a variety of languages. The environmental benefits of this are significant. The CDs are recyclable and the savings on paper are huge. A simple web-based search feature helps you directly access the information you need. In addition, the TANDBERG video systems now have an intuitive on-screen help function, which provides a range of useful features and tips. The contents of the CD can still be printed locally, whenever needed.

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部件名称	有毒有害物质或元素					
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金属部件	X	O	O	O	O	O
印刷电路板及组件	X	O	O	O	O	O
线缆和线缆组装	X	O	O	O	O	O
显示器（包括照明灯）	X	X	O	O	O	O

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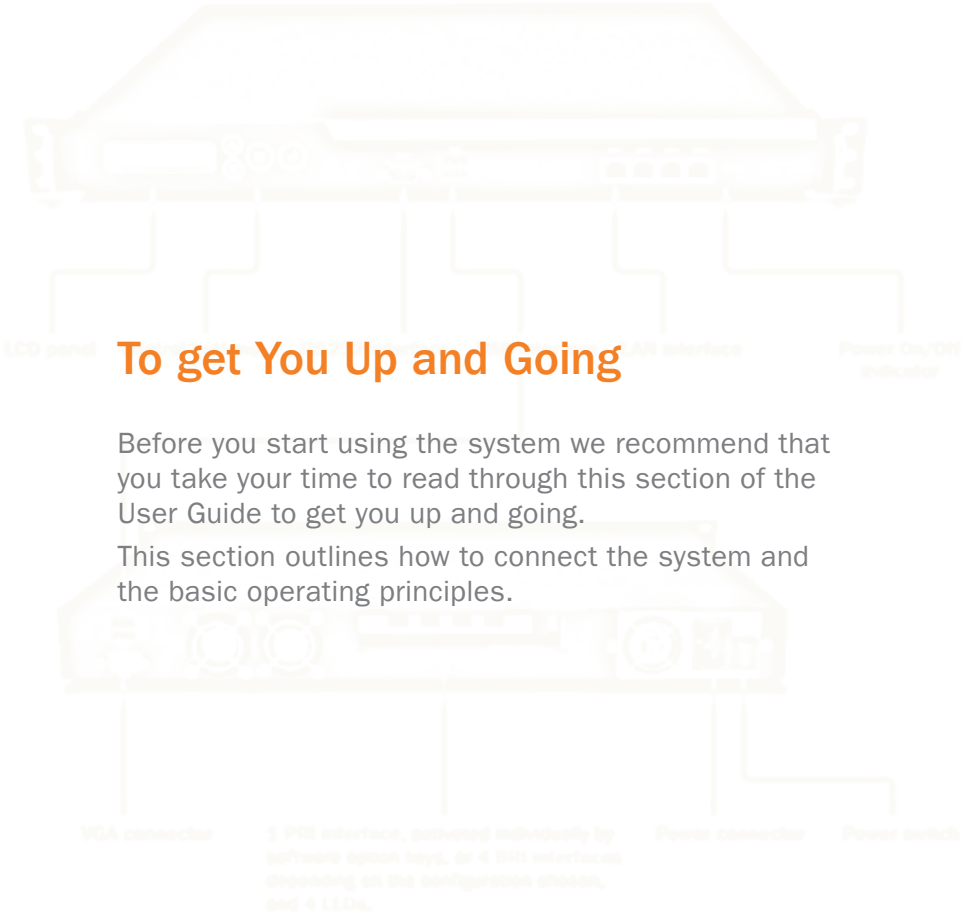

To get You Up and Going

Before you start using the system we recommend that you take your time to read through this section of the User Guide to get you up and going.

This section outlines how to connect the system and the basic operating principles.

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Unpacking and Installation

What's in the Box?

To avoid damage to the unit during transportation, the 3G Gateway is delivered in a special shipping box, which should contain the following components:

- 3G Gateway Server
- Network cables
  - ISDN cables (5m) (Qty 4) – only if the 3G/Audio GW 4xBRI option is chosen
  - ISDN cables (5m) (Qty 1) – only if the 3G/Audio GW 1xPRI option is chosen
  - Ethernet cable (5m).
- Power Cables
- Install Sheet
- User Manual CD
- Registration Card
- Accessories bag (Console cable, rack ears, rubber feet)

Please report any discrepancies to your TANDBERG representative immediately.

A brief, yet detailed presentation of the procedure to get you up and going can be found in the Installation Sheet accompanying your TANDBERG product.

Installation Site Preparations

- Make sure that the 3G Gateway is accessible and that all cables can be easily connected.
- For ventilation: Leave a space of at least 10cm (4 inches) behind the 3G Gateway's rear panel and 10cm (4 inches) in front of the front panel.
- The room in which you install the 3G Gateway should have an ambient temperature between 0°C and 35°C (32°F and 95°F) and between 10% and 90% non-condensing relative humidity.
- Do not place heavy objects directly on top of the 3G Gateway.
- Do not place hot objects directly on top, or directly beneath the 3G Gateway.
- Use a grounded AC power outlet for the 3G Gateway.
- You will need a CSU (Channel Service Unit) between your system and the PRI line from your network provider.
- Make sure that it is possible to receive and to make mobile (H.324M) video calls from behind this line. Check this with your network operator!
- If you are behind a PABX make sure that the PABX is capable of routing mobile (H.324M) video calls.

General Installation Precautions

- Never install telephone wiring during a lightning storm.
- Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
- Never touch uninstalled telephone wires or terminals unless the telephone line has been disconnected at the network interface.
- Use caution when installing or modifying telephone lines.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.
- The socket outlet shall be installed near to the equipment and shall be easily accessible.
- Never install cables without first switching the power OFF.
- This product complies with directives: LVD 73/23/EC, EMC 89/366/EEC, R&TTE 99/5/EEC.
- This product complies with the standards GR-63-CORE and GR-1089-CORE and is NEBS approved by UL. For NEBS compliance, there should be a clearance of 9.1cm between the product and any other product mounted in the rack.

Connecting the Cables

RS232 cable. To control the 3G Gateway using the data port, connect an RS232 cable between the 3G Gateway's RS232 connector and the COM-port on a PC. See 3G Gateway Configuration and the **Data Port Command Interface User Guide** (available separately) for more on this.

LAN cable. To use the 3G Gateway on IP, connect a LAN cable from the **LAN 1** connector on the 3G Gateway to your network. The **LAN 2**, **3** and **4** connectors are not used and should be left open.

Power cable. Connect the system power cable to an electrical distribution socket.

ISDN PRI or BRI cables. The E1/T1 cable should be connected to a CSU (Channel Service Unit). You will need a CSU between your 3G Gateway and the PRI line from your network provider.

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3G Gateway Features at a Glance

About the 3G Gateway

The TANDBERG 3G Gateway enables sites on IP and UMTS Handsets to participate in meetings with each other with the quality and reliability found in all TANDBERG equipment. An 3G Gateway system opens up a wide range of interactive video and call routing services.

3G Gateway Capacity – Typical Scenarios

Due to the fixed bandwidth of UMTS video telephony every call will be limited to 64 Kbits/s. This offers a capacity of 30 simultaneous calls through an E1 PRI, 23 simultaneous calls through a T1 PRI, or 8 calls through a 4×BRI. Due to audio transcoding (AMR to G.711) the bandwidth at IP side is 109 Kbits/s per session, 64 Kbits/s G.711 audio and 45 Kbits/s H.263 video calling 3G to H.323 or SIP endpoints. For calls between H.323 endpoints it is possible to set up 60 sessions between 768 and 192 kbit.

Features Highlights

IP Services and Procedures

- H.324m, SIP and H.323 support
- Service Prefix
- Load balance.

UMTS Services

The TANDBERG 3G Gateway offers a variety of UMTS dial-in services:

- Direct Inward Dialing (DID) – the destination endpoint is determined from the dialled number
- Interactive Video Response (IVR) – the destination endpoint can be selected via touch tones.
- TMS Corporate Directory – the destination end point can be selected via a search in a TMS phonebook.

Security

- Secure Access - support XML/SOAP over HTTPS, Web (HTTP) encrypted password and the services that can be disabled.

Video Quality

- H.263 video compression.
- MPEG-4 video compression

Audio Quality

- AMR, G.711 audio compression
- Support AMR bit rate 4.75 Kbit – 12.2 Kbit.

Interoperability

- Worldwide compatibility with standards-based videoconferencing systems
- Compatible with all available WCDMA H.324M video telephony capable handsets supporting DTMF tones.

Management Interfaces

SOAP (Simple Object Access Protocol) is a lightweight protocol for exchange of information in a decentralized, distributed environment.

XML (Extensible Markup Language) is a flexible way to create common information formats and share both the format and the data on the World Wide Web, intranets, and elsewhere. This functionality can be used by management systems like the TANDBERG Management Suite to control the 3G Gateway

HTTP Web-interface for system management, call management such as diagnostics and software uploads

HTTPS Hypertext Transfer Protocol over Secure Socket Layer is a Web protocol that encrypts and decrypts user page requests as well as the pages that are returned by the Web server. It uses Secure Socket Layer (SSL) as a sublayer under its regular HTTP application layering. HTTPS uses port 443 instead of HTTP port 80 in its interactions with the lower layer, TCP/IP. SSL uses a 40-bit key size for the RC4 stream encryption algorithm, which is considered an adequate degree of encryption for commercial exchange.

Network and Features

- Call rate of 64 kbit on ISDN side and 768 kbps on IP side for each call is supported through the 3G Gateway.
- Interactive Video and voice Response (IVR).
- Default 3G Gateway service when calling Border Controller IP number
- Support voice only calls (VoIP gateweying)

Video IVR

- Selecting IP endpoint from address book.

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The Front and Rear Panels

About the Rear Panel LED Operation

- **Green**: Normal operation.
- **Red Alarm** or Loss of Signal (LoS) indicates that there is no signal and thus no framing information received. A defective or unplugged PRI cable will produce the same effect.
- **Yellow Alarm** or **Remote Alarm Indicator** (RAI) means that the 3G Gateway is receiving framing info, but in this framing info the other side tells the 3G Gateway that it is not reading the Gateway's transmitted framing information. Typically, this may be a broken connector in the transmit (TX) part of the PRI cable. This could also indicate weak or noisy signal in the transmit (TX) part of the PRI cable.
- **Blue Alarm** indicates that the received frames are not synchronized properly.
- **No LED's illuminate**, indicates that layer one framing is working (right protocol like for example EURO ISDN selected), however, there is a problem at layer 2 caused by for example a CRC4 configuration mismatch.

3G Gateway Start-up

To start the 3G Gateway, simply connect the power cable, and press the power switch button at the back side to position **1**.

On the front panel of the system the power indicator LED, marked **Pwr**, will turn **GREEN**.

Connectors, Switches, Display, and Buttons

LCD panel **Control buttons** **RS232 interface** **USB interface** **LAN interface** **Power On/Off indicator**

VGA connector **1 PRI interface** or **4 BRI interfaces** depending on the configuration ordered,. **Power connector** **Power switch**

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Configuring Your 3G Gateway via the RS232

About Gateway Configuration

The 3G Gateway requires some basic configurations before it can be used. It will be necessary to find the IP-address and to create the dial-in and dial-out services to program the ISDN-PRI Line numbers.

Configuration via the Front Panel

As an alternative to the configuration via RS232 you may use the LCD panel to configure and check the IP settings, as well as to reboot the system. This is outlined on the next page.

Configuring via the RS232

1. Make sure the 3G Gateway is **Off** and connect an RS232 cable between the 3G Gateway and a PC.

2. Switch on the 3G Gateway.

3. Start a terminal program on the PC and configure it to:

   `115200, 8, 1, None`

4. To assign a **static IP-address**, type
   `Xconf ip Assigment: "Static"`
   and
   `Xconf ip address <IPAddr>`

   To assign an **IP Subnetmask**, type
   `Xconf ip address subnetmask <subnetmask>`

   To assign an **IP Gateway** address, type
   `Xconf ip address gateway <gateway IP-address>`

5. Restart the 3G Gateway.

6. Start a WEB browser and enter the IP-address of the 3G Gateway. Default password: `TANDBERG`

   Note the case sensitivity!

7. To configure the 3G Gateway for UMTS dial-in, enter PRI or BRI numbers and dial in number(s). For details, see Configuring the 3G Gateway.

8. To configure the 3G Gateway for IP dial in, register the 3G Gateway to a Gatekeeper and enter H.323 services. For details, see Configuring the 3G Gateway

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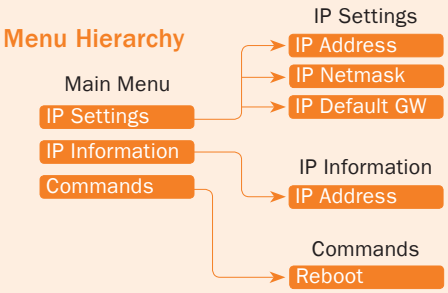
Configuring the IP Address via the Front Panel

About 3G Gateway Configuration

The 3G Gateway requires some basic configurations before it can be used. It is necessary to configure the IP-address and to create the dial-in and dial-out services to program the ISDN-PRI Line numbers.

Configuring via the Front Panel

The LCD panel makes it possible to configure and check the IP settings as well as to reboot the system. The front panel LCD menu items are as follows:



Configuration via RS232

As an alternative to the configuration via the LCD Panel you may use RS232 to configure and the system. This is treated on the previous page.

Switching On the Unit

Configuring the IP Address via the Front Panel

1. Switch on and press any key to produce the Main Menu. Use UP/DOWN to navigate to the IP Settings, if needed.
2. Press ENTER to access the IP Settings submenu.
3. Use the UP/DOWN keys to select IP Address.
4. In addition to configure the IP address you must also configure the default-gateway, netmask and set IP assignment to static.
5. Press ENTER again to produce the cursor.
6. Use UP/DOWN keys to navigate between the digits of the number.
7. Use ENTER to enter Digit Altering Mode.
8. Use UP/DOWN to alter the digit value.
9. Press ENTER as many times as needed to move to the next digit to be altered and alter this digit.
10. When finished editing use ESC to go to the Confirm change menu.
11. Use the UP/DOWN key to select yes or no and ENTER to confirm.
12. Use ESC key to navigate back to the main menu.

DHCP assigned IP-addresses are supported by the TANDBERG 3G Gateway (factory default).

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Using the 3G Gateway

This section of the 3G Gateway User Guide shows you how to gain access to the system, how to get an overview of ongoing calls, the menu operating principles, and how to dial from UMTS as well as from IP. Examples are provided for your convenience.

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Starting Up the 3G Gateway

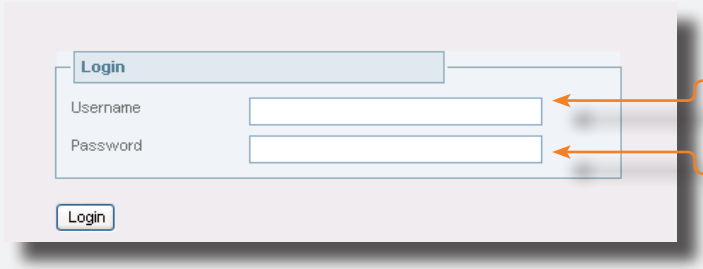
3G Gateway Start-up

To start the 3G Gateway, simply connect the power cable, and set the power switch button (both at the rear) to position I.

On the front panel of the system the power indicator LED, marked PWR, will turn GREEN.

Accessing the 3G Gateway

You may access the 3G Gateway by entering the IP-address of the 3G Gateway in a standard WEB-browser. You will then be asked to enter a password. You will need to enter `admin` as user name. The default password for the 3G Gateway is `TANDBERG`. Remember that the password is case sensitive. Note that you may also use SSH and Telnet to configure the 3G Gateway.



USER NAME is `admin`

PASSWORD. Default password is `TANDBERG` (NB! case sensitive)

Forgot the Password?

1. Reboot the 3G Gateway.
2. Connect to the 3G Gateway via the serial interface once it has restarted.
3. Login with User Name `pwrec`. No password is required.
4. You will be prompted for a new password.

The pwrec account is active for one minute following a restart. Beyond that time, the system will have to be restarted to change the password.

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An Overview of the Management Menu System

The Overview Window

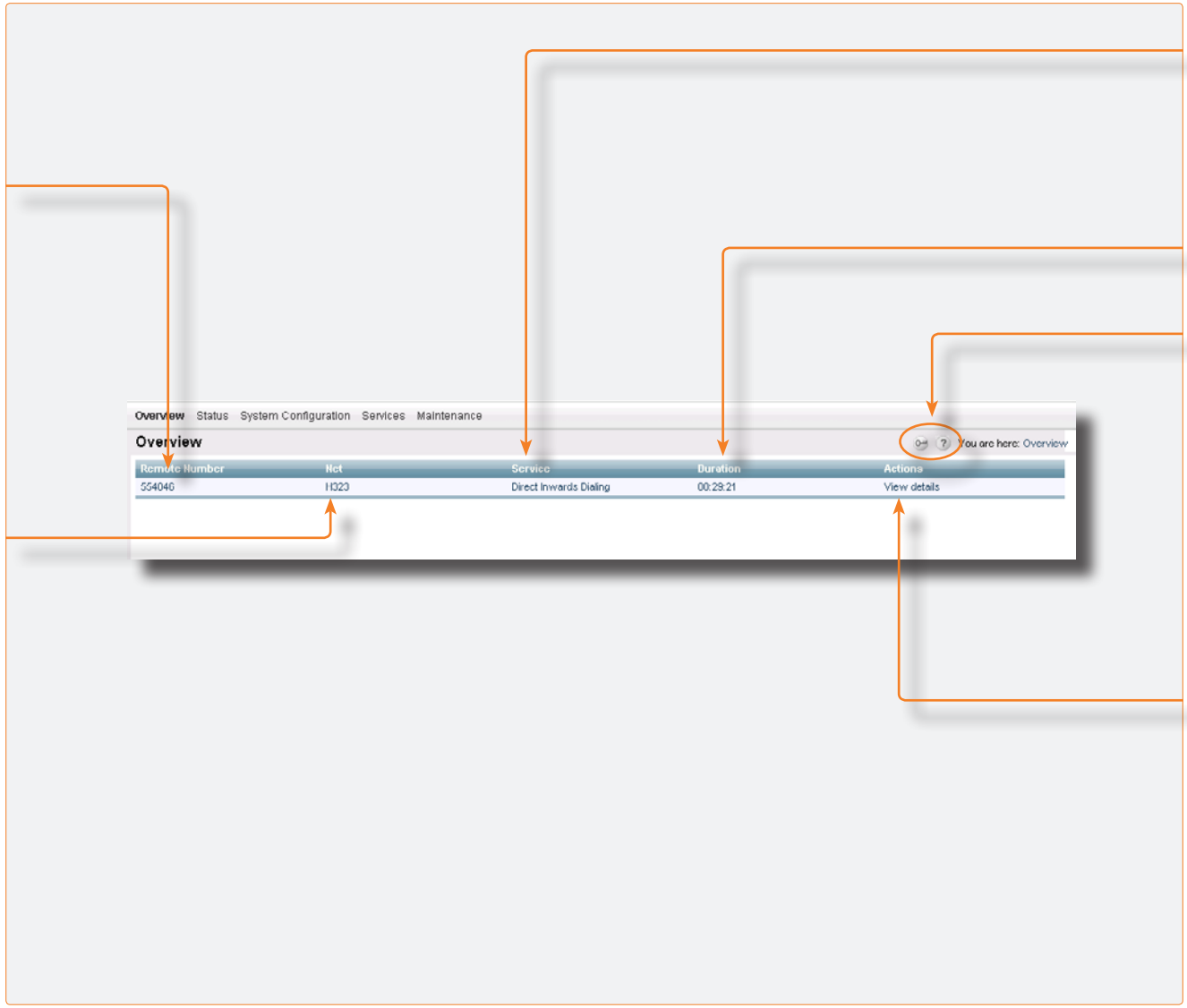
The **System Status** windows of the 3G Gateway can be accessed via the default URL: http://3G Gateway_IP_Address/overview.

Remote Number. This is the inbound number.

Net. Indicates the net type, i.e. H.323, H.324m, SIP or Streaming.

The **Overview** window presents information about all calls routed through the 3G Gateway.

How to access the **Management Menu System** is described on the previous page.



Service. Indicates the service type, i.e. DID, IVR, TMS phonebook.

Duration. Duration of the call in hours, minutes and seconds.

Log out and **Help**. Click on the little key icon to log out and on the question mark to gain access to Help features.

Actions. Clicking on view details reveals both incoming and outgoing call leg information.

Clicking on a service call entry shows the **Service Call** details of the respective call, like e.g. inbound and outbound numbers – see the next page for more on this.

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Service Call Details

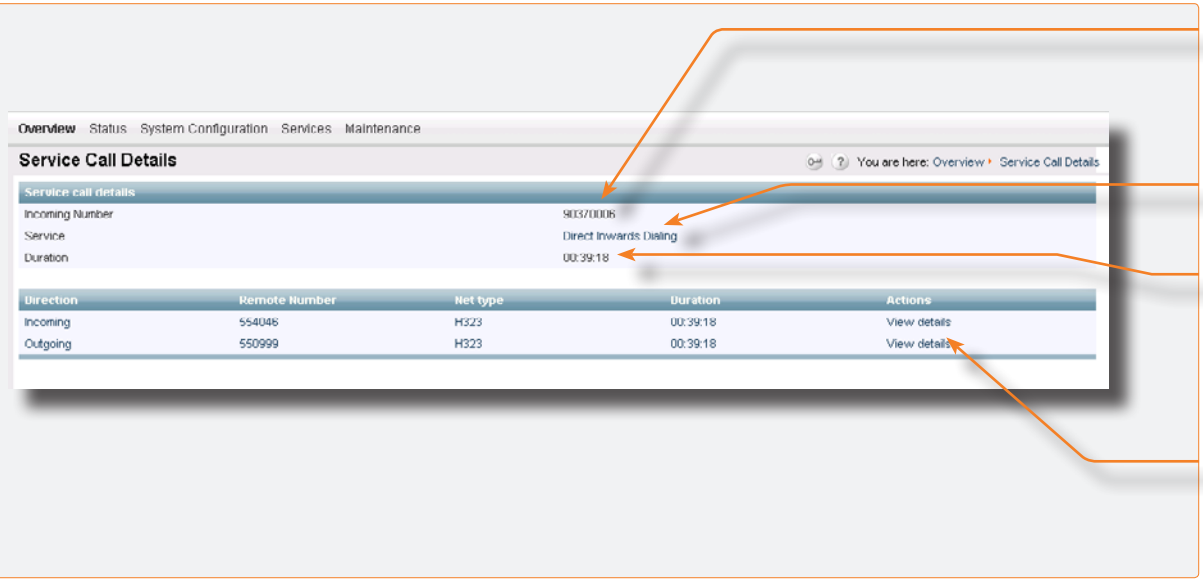
About Service Call Details

The **View Call Details** tab presents information about all calls routed through the 3G Gateway, i.e. inbound and outbound numbers, duration of the calls and call status – i.e. ringing (alerting), connecting and connected.

Incoming. Indicates the information belonging to the call leg of the calling party.

Outgoing. Indicates the information belonging to the call leg of the called party/ service.

The Service Call Details Window



Incoming number. The service number, i.e. the number an external user dialed to get access to a portal service.

Service. Indicates the service name, i.e. DID, IVR, TMS Phonebook.

Duration. Indicates the duration of the call in hours, minutes and seconds.

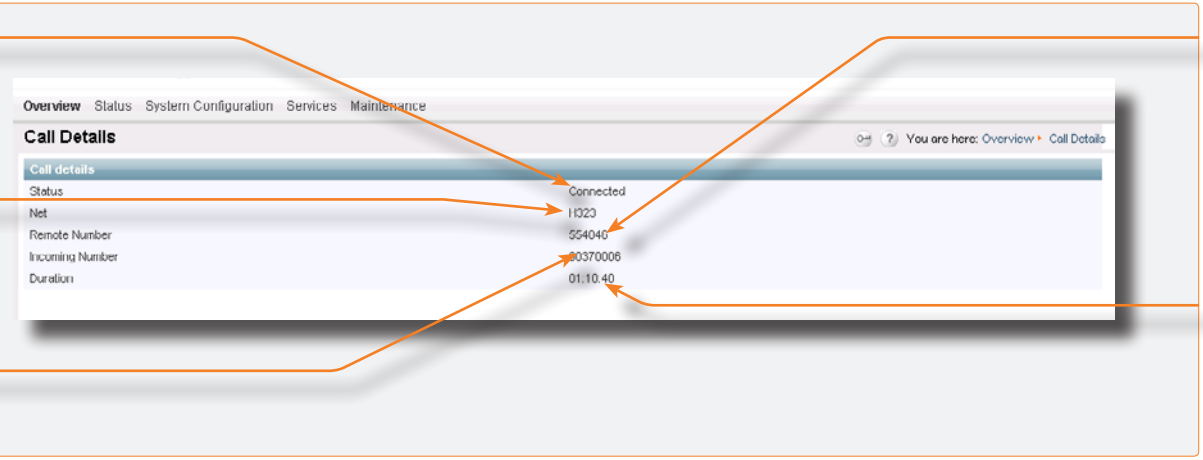
Details. Remote numbers of the Incoming calls are the numbers of the calling party and remote numbers of the Outgoing calls are the numbers of the called party or service. Clicking **View details** reveals the **Call Details**, i.e. details belonging to the respective call leg.

When View Details Has Been Selected

Status. Either alerting, connected or disconnected.

Net. Indicates the net type, i.e. H.323, H.324m, SIP or Streaming.

Incoming Number. Service number; can only be represented for inbound call legs.



Remote Number. For inbound call legs it represents the number of the calling party, for outbound call legs it represents the number of the called party or service

Duration. Duration of this call leg in hours, minutes and seconds.

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Call Setup via Default Services

About Default Services

The 3G Gateway is equipped with a number of persistent default services, i.e. services stored in the on-board non-volatile memory. Therefore, these services will always be available after a system restart. The following persistent default services can be distinguished:

- **Direct Inwards Dialing (DID)** – Defines a one-on-one relation between an inbound and an outbound number.
- **Dial Extension (IVR)** – Also known as Interactive Voice/Video Response (IVR), defines a relation between an inbound number and an interactive service, i.e. a menu, via which an outbound service can be connected to. The outbound service can be an audio or video service or an externally connected endpoint.
- **TMS Corporate Directory** (phone book) – A connection with the installed TANDBERG Management System (TMS) phone book is set up. Via the phone book menu an outbound call to another endpoint, e.g. a 3G Mobile, H.323 or SIP endpoint, can be set up.

DID – Direct Inward Dialing

Example Hotline

Entry details:

Enabled: Check
Name: H.324m-H.323
Net Type: H.324m
Prefix: 67890000
Suffix:
Service Type: Direct Inwards Dialing

Arguments:

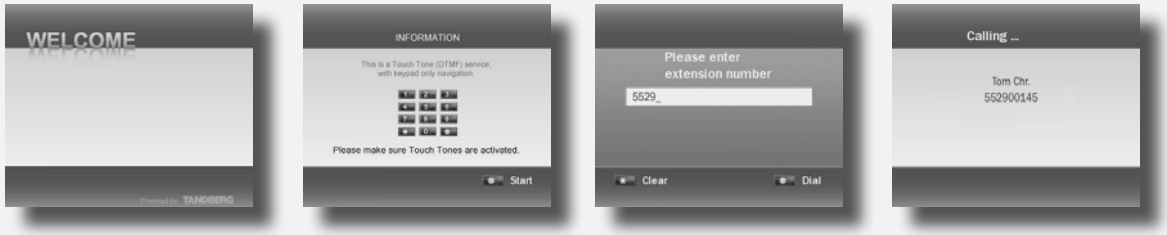
Net Type: H.323
AV Mode: Auto + fallback to audio
Prefix: 51234
Suffix
Use Remainder: No
Allow Forwarding: No

When dialing number 67890000 this will match without leaving a remainder. The H.323 number that will be connected to will be: 51234 (construction: prefix). When dialing number 67894321 there will be no match. When dialing number 678900009876 one is also connected to the same H.323 endpoint, since there is a match on 67890000 and the remainder, i.e. 9876, is discarded. Note that **Use Remainder** is set to No!

Dial Extension (IVR) Example

Example

1. A 3G handset user calls a Dial Extension service number.
2. The 3G Gateway activates the **Welcome** screen and sound.
3. The 3G Gateway, when set in the dial plan, shows the DTMF Information screen.
4. The 3G handset user enters the extension (H.324m, H.323 or SIP alias) followed by the **#** (pound-sign) to indicate end of number.
5. The 3G Gateway starts to call the endpoint and the **Connecting** picture and sound are activated.
6. When the call is connected audio and video are transmitted through the 3G Gateway.



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Dialing from UMTS – Using Phone Book

About TMS Corporate Directory

The TMS Corporate Directory service allows one Endpoint, i.e. a UMTS phone, H.323 or SIP, to dial another Endpoint directly, without knowing or having to (manually) enter the extension number via DTMF. TMS Corporate Directory is a menu based dial-in method, which combines a directory listing from TMS with IVR. In this mode the user can search in the global address book provided via TMS using the alphanumeric part of the keypad. The TMS Corporate Directory service searches and displays entries matching the user input string.

Example of IVR – Using the Phone Book

Example 1

1. Pressing 8 once, twice and three times in a row followed by a # sign, will result in a list with names starting with a letter t, u or v respectively.
2. Pressing 8 once, thereafter pressing 6 three times results in the search string to. Pressing 8 twice and 6 once, results in um. Pressing 8 three time and 6 three times results in vo. If one wants to reach Tom Arne press 8 followed by three times 6, i.e. search string to.
3. To select the person you wish to dial, press the corresponding key to place a call to that person.

   The star (*) key on the keypad is used as backspace.

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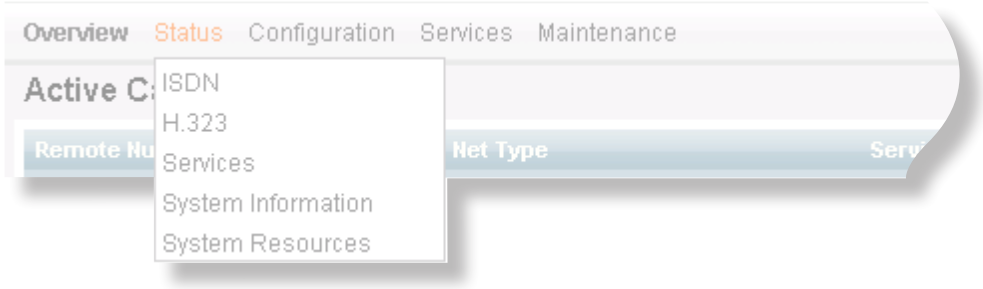
Viewing the System Status

To view the current status of the system, hover with the mouse pointer over Status to produce a drop-down menu as shown here. This section discusses the respective menu items.



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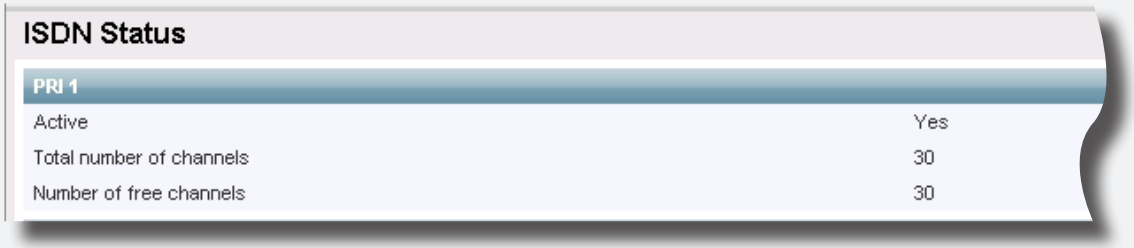
ISDN/PRI Status (PRI Versions only)



Select **PRI Status** to access the **PRI Status** pane.

The PRI status indication consist of 3 fields (see **About the Rear Panel LED Operation** below for PRI status):

- Active – Indicates weather the PRI port is active or not.
- Total number of channels – indicates the maximum available number of simultaneous ISDN slots (calls) per port; typically 30 for an E1 PRI and 8 for an E1 BRI.
- Number of free channels – indicates the number of free B-channels on ISDN.
- To view the ISDN PRI status, select the **ISDN status** item of the Status tab.

About the Rear Panel LED Operation

In addition to the web page indications, the ISDN interface also contains 4 LEDs, located at the the 3G Gateway rear panel.

These LEDs indicate the following PRI status:

- **Green**: Normal operation
- **Red Alarm** or Loss of signal (LOS) indicates that there is no signal and thus no framing info received. A defect or unplugging the PRI cable will produce the same effect.
- **Yellow Alarm** or **Remote Alarm Indicator** (RAI) means that the 3G Gateway is receiving framing info, but in this framing info the other side tells the 3G Gateway that it is not reading the Gateway's transmitted framing info. Typically, this may be a broken connector in the transmit (TX) part of the PRI cable. This could also indicate weak or noisy signal in the transmit (TX) part of the PRI cable.
- **Blue Alarm** indicates that the received frames are not synchronized properly.
- **No LED's illuminate**, indicates that layer one framing is working (right protocol like for example EURO ISDN selected), however there is a problem at layer 2 caused by for example a CRC4 configuration mismatch.

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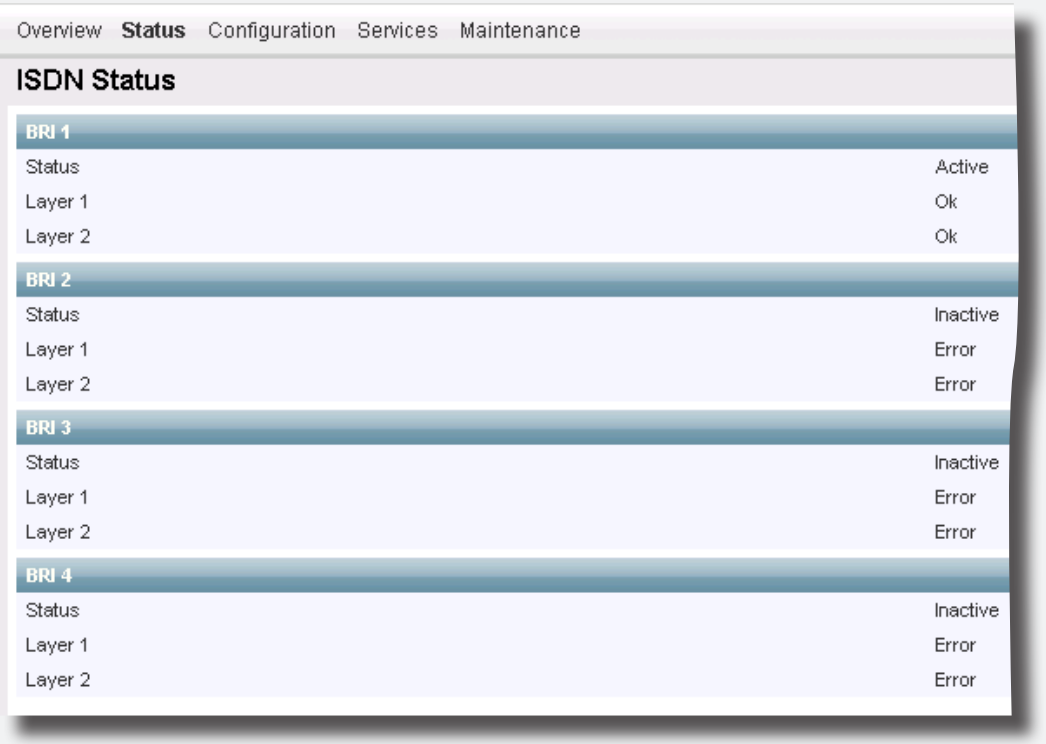
ISDN/BRI Status (BRI Versions only)



Select **ISDN/BRI Status** to access the **ISDN/BRI Status** pane.

BRI hardware status indication

The screenshot shows the status page of a BRI version of the 3G Gateway. The BRI status displays the conditions of ISDN layer 1 and 2 separately. Green indicates up and in sync. Red indicates not in sync and indicate probably a disconnected ISDN line.

Besides the indications on the webpage each ISDN BRI interface located at the back-side of the 3G Gateway has a green and orange LED. The meanings of these LEDs are:

- **Green**: Layer 1 of the ISDN signalling is up.
- **Green and Orange**. This indicates that both layers 1 and 2 are up. In some countries the orange LED can blink on a regular interval, or is turned on when there is an active call.
- **No LED's illuminate**. This indicates that there is no connection or a wrongly wired connection.

In some countries layer 2 can be down when there is no activity (ongoing connections).

However, layer 2 should become active once a call is made or received.

In case the BRI 3G Gateway is connected with less than 4 BRI lines, the BRI interfaces with the highest number(s) should be left open. For example when only 2 ISDN lines are used they should be connected with interface 1 and 2.

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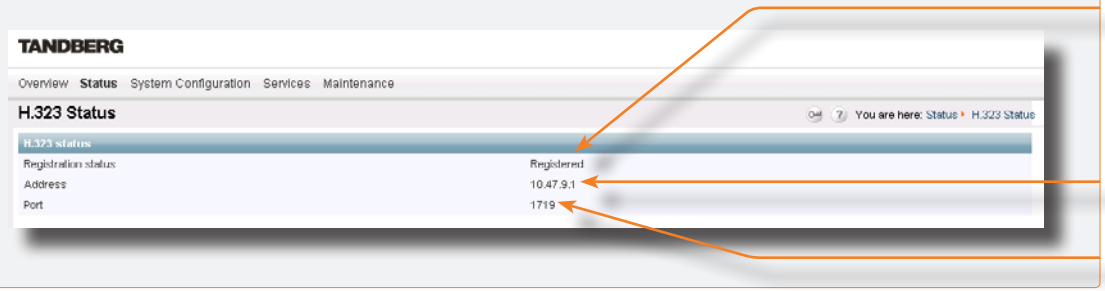
H.323 Gatekeeper Status

About H.323 Status

H.323 Gatekeeper Status shows the current status of the Gatekeeper registration. To view H.323 gatekeeper status, as indicated in the screenshot shown here, select **H.323 Status** item of the **Status** tab.

Note that, since this target system is not an endpoint it is not possible to use its IP address to place calls to or through the 3G Gateway!

Registration Status Registered



Registration Status. If **Registered**, the 3G Gateway is registered to the Gatekeeper with below mentioned Address and Port.

IP Address. Shows the IP address of the Gatekeeper.

Port. Shows the destination port number on the Gatekeeper.

Registration Status Inactive

In case the 3G Gateway is in direct mode or in case the gatekeeper IP address is filled in incorrectly, the 3G Gateway will not be registered with the Gatekeeper, and the Registration status is stated as **Inactive**.

Registration Status Rejected

Registration status will show **Rejected** when:

- Gatekeeper unreachable; the 3G Gateway's H.323 stack returns this reject message in case the gatekeeper is down.
- Duplicate alias; a system with an identical name has already been registered.
- Authentication failure; Authentication ID and/or Authentication Password are incorrect.

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Services

The default services, which come standard with an 3G Gateway system, are:

- Direct Inwards Dialing
- IVR
- TMS Corporate Directory

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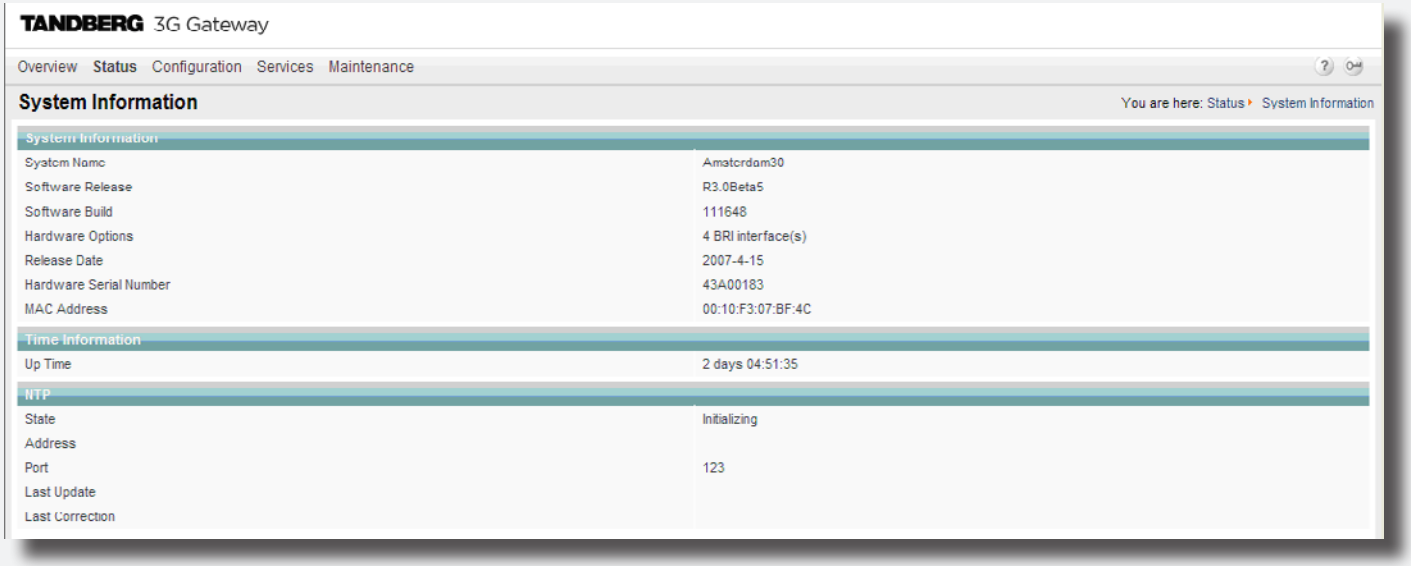
System Information



Select **System Information** to access the **System Information** pane.

This pane provides an overview of installed software and hardware.

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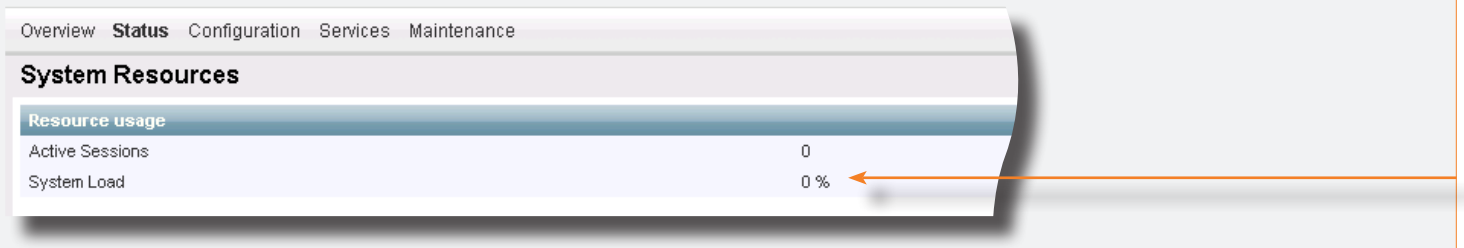
System Resources



To view available resources of the 3G Gateway, open **System Resources** of the **Status** tab, as shown here.

This menu item shows the amount of active sessions, i.e. video and audio calls on this system. The system load percentage indicates the processor load.

These figures depend on the system's use of resources. The use of **Call Forwarding** in dial plans reduces system load and therefore increases the number of simultaneous calls.

A System Load of 0% indicates no load on the 3G Gateway!

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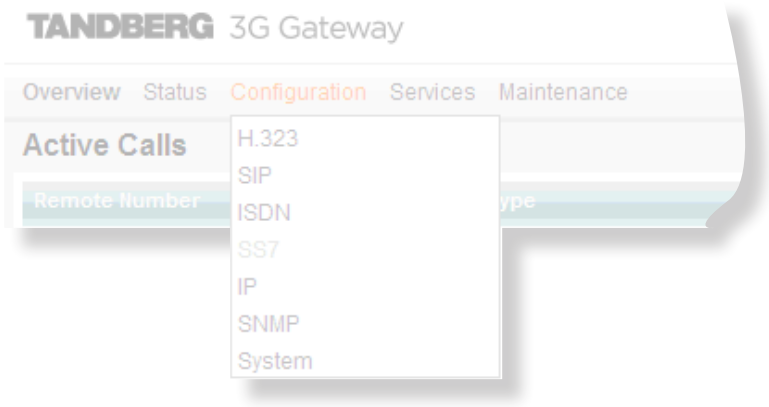
Configuring the 3G Gateway

To configure the 3G Gateway, hover with the mouse pointer over the System configuration to produce a drop-down menu. The drop-down menu consists of 6/7 items, i.e. ISDN, IP, H.323, SIP, SNMP and System, to configure respective system parts.

Changing settings in the menus belonging to the ISDN, IP and System items only become effective after a system reboot, therefore these items all contain Restart buttons. Every configuration item is supported with a ? button for information about this specific item.



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ISDN/PRI Configuration (ISDN/PRI Versions only)

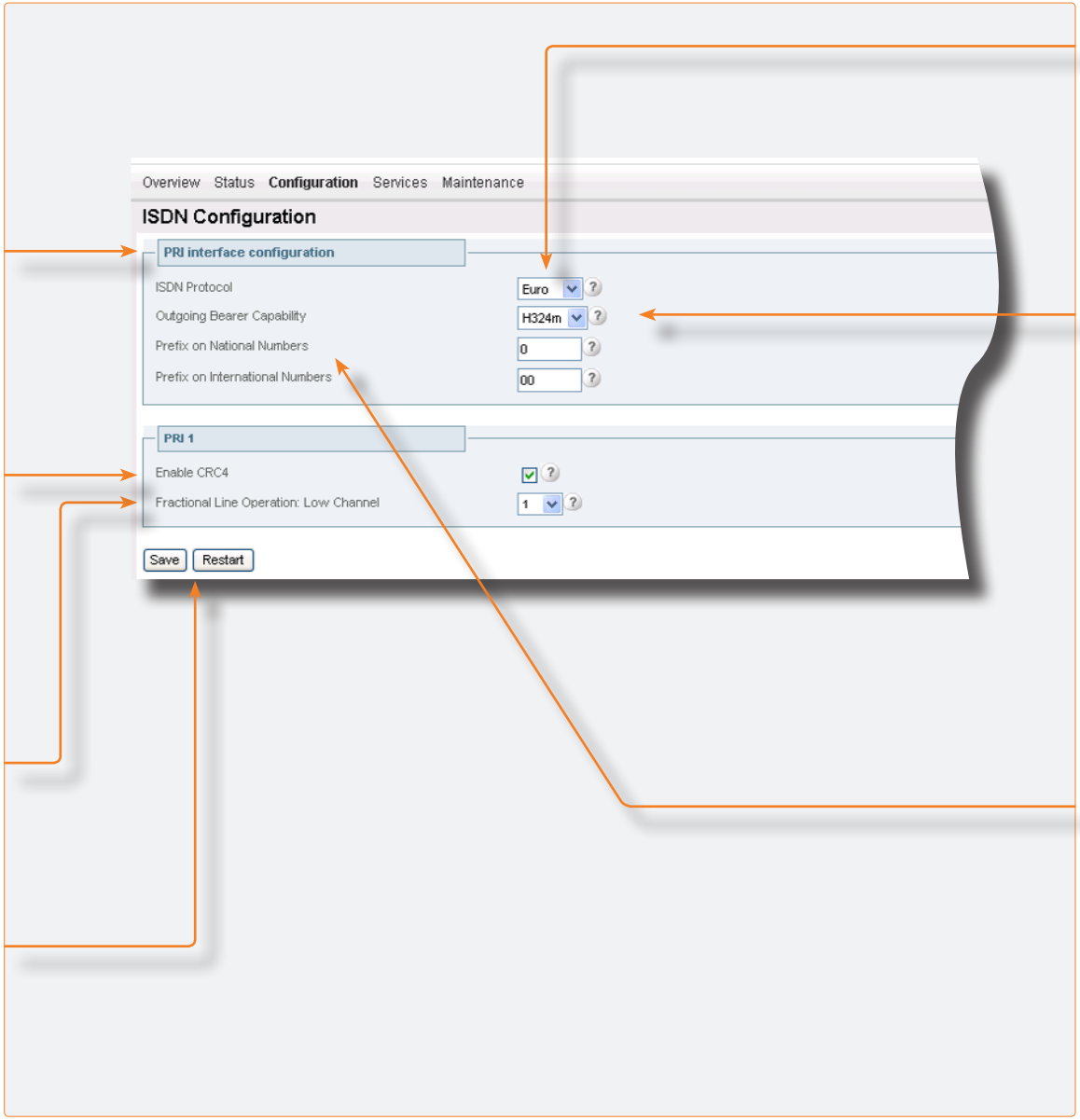
PRI Interface Configuration. Indicates the lowest numbered E1/T1 B-channel the system is allowed to use for each PRI-line when selecting channels for outgoing calls. Not in use in this version.

Enable CRC-4. Used for most E1-PRI configurations. If your network equipment does not support this feature, switch off PRI CRC-4.

Fractional line operation: Low Channel. Indicates the lowest numbered E1/T1 B-channel the system is allowed to use for each PRI-line when selecting channels for outgoing calls. Presently, this setting has no effect.

Save. When all settings are entered, click on **Save** to store the new settings.

Note that changing from E1 to T1 configuration requires a restart of the unit (click **Restart** to restart the unit).



PRI Protocol. Select between the following PRI protocols:

- NI (National ISDN)
- ATT (AT&T Custom)
- Euro (ETSI = Euro ISDN)
- Japan (Japan/Taiwan ISDN)

Outgoing Bearer capability

Within ISDN different bearer capabilities are used to signal the type of data (Voice, Data, H320, H.324M), which is used by telephony switches and other equipment to determine how to handle data or calls (compressing voice data neglect etc). The outgoing bearer capability sets the ISDN bearer capability for the outgoing telephone (voice only) and video telephone calls.

- **H.324M:** This ITU standardized capability is selected for outgoing calls by default.
- **UDI:** In some situations the switch does not accept calls which use the correct H.324M capability. This setting makes it possible to use the 3G Gateway in these situations via selecting UDI.

- **Prefix on National/International Numbers**
- Specifies the prefix, which has to be added to National and International numbers, respectively.
- The signalling specifies whether the call is national or international. Since these prefixes are removed from inbound telephone numbers, the correct prefixes have to be added on call-backs.

These settings only apply if the Service providers network uses prefixes for national and international calls.

All incoming calls are accepted independent of their bearer capabilities, consequently audio calls are accepted as well.

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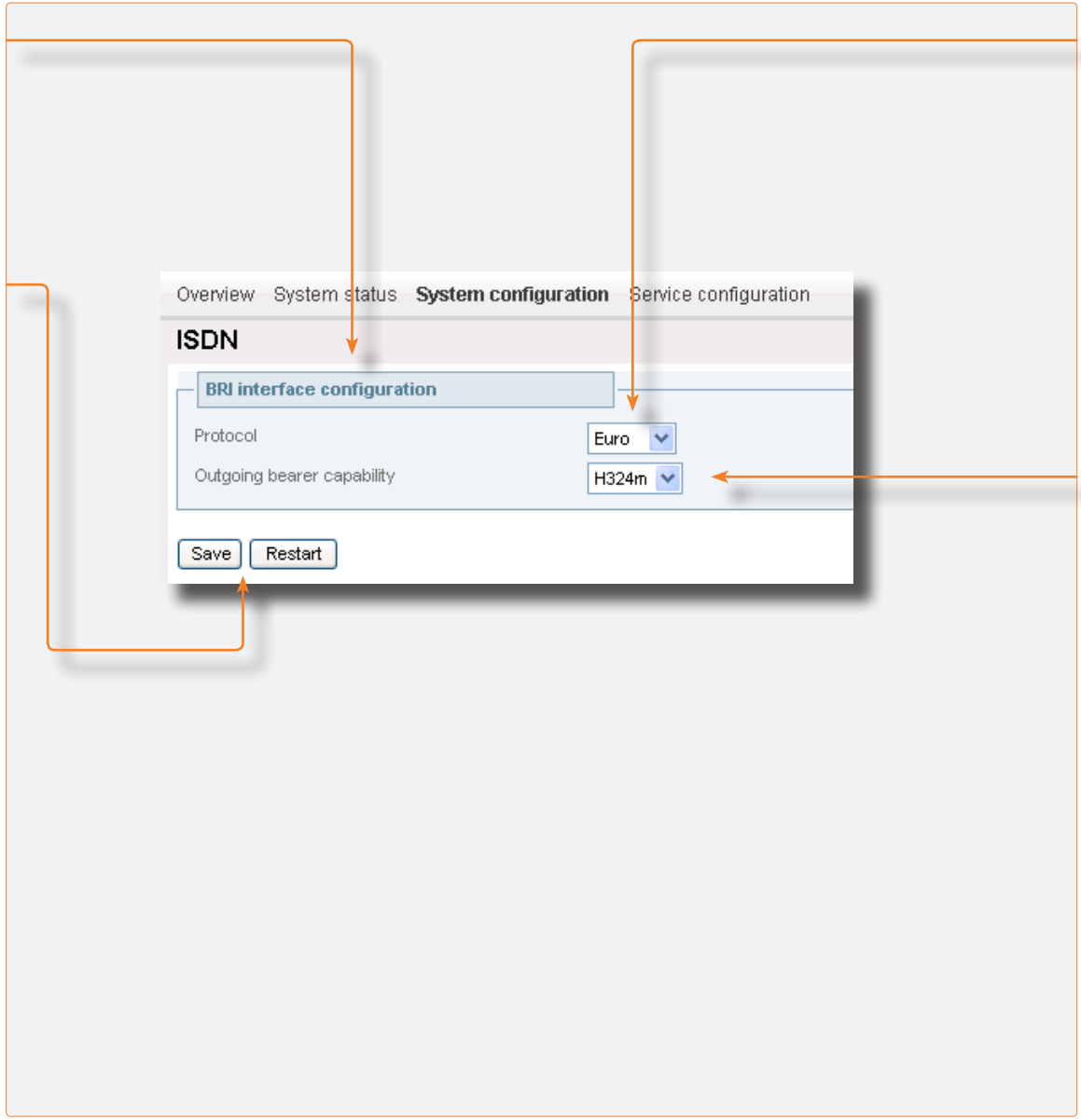
ISDN/BRI Configuration (ISDN/BRI Versions only)

Select **BRI** to access the **BRI Configuration** pane.

Save. When all settings are entered, click on **Save** to make the new settings become effective.

You cannot configure ISDN BRI lines for special functions like dial out only! The Gateway will automatically select a free BRI line for H.323 to 3G calls and possibly block a DiD or an IVR menu when the BRI lines have different numbers. Consequently, we strongly recommend that all ISDN BRI lines have the same number range!

Contact your ISDN or telecom supplier about numbering plans of ISDN lines.



BRI Protocol. Select between the following BRI protocols:

- ETSI (Euro ISDN)
- National ISDN
- AT&T Custom
- Japan/Taiwan ISDN

Outgoing Bearer capability. Within ISDN different bearer capabilities are used to signal the type of data (Voice, Data, H320, H.324M), which is used by telephony switches and other equipment to determine how to handle data or calls (compressing voice data neglect etc). The outgoing bearer capability sets the ISDN bearer capability for the outgoing telephone (voice only) and video telephone calls.

- H.324M: This ITU standardized capability is selected for outgoing calls by default.
- UDI: In some situations the switch does not accept calls which use the correct H.324M capability. This setting makes it possible to use the 3G Gateway in these situations via selecting UDI.

All incoming calls are accepted independent of their bearer capabilities, therefore audio calls are accepted as well.

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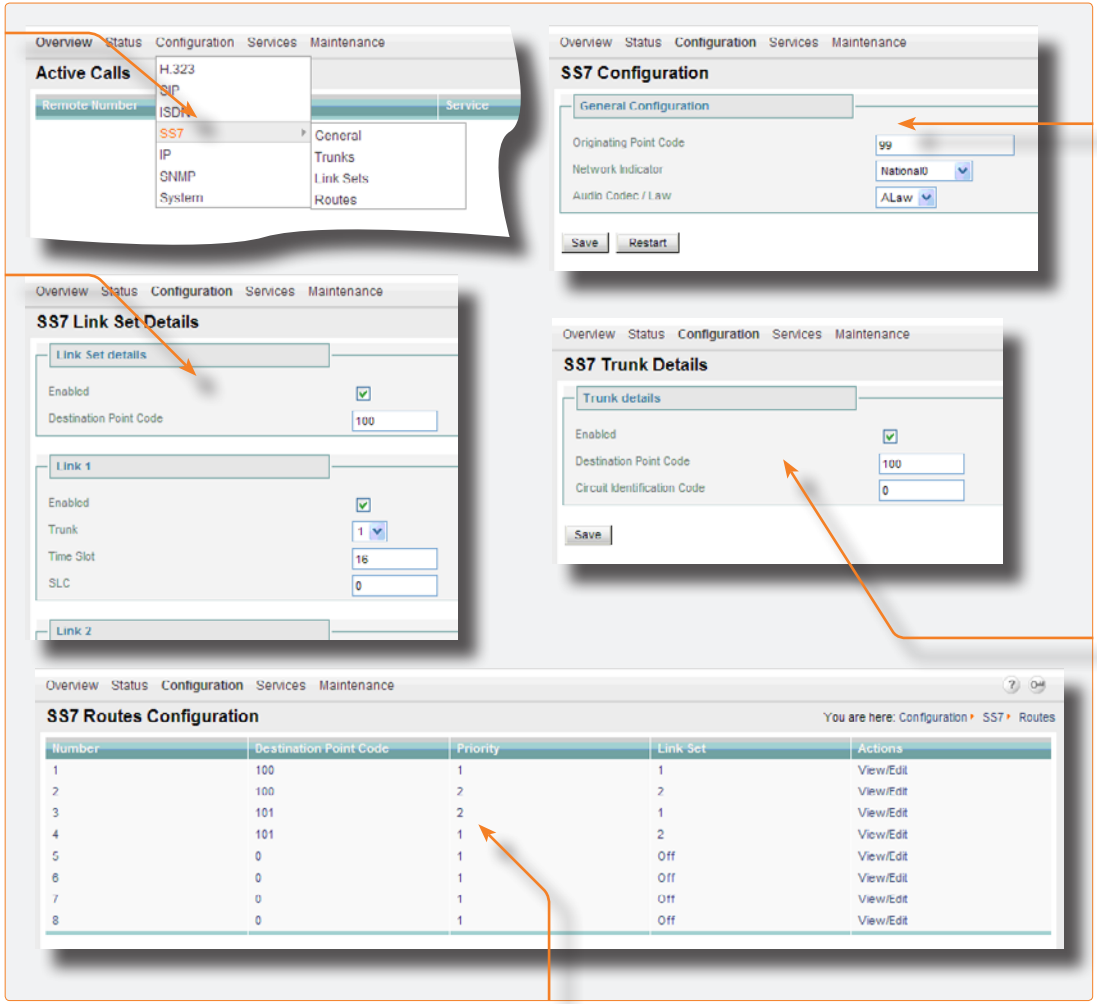
SS7 Configuration

Select SS7 to access the SS7 Configuration pane.

Link Set Details

A link is a time slot within a trunk used for signalling. Link sets are typically used for signalling fail-over purposes to one switch.

- **Enabled.** Checking this box enables at least one signalling link in a link set.
- **Destination Point Code.** Uniquely identifies the destination signalling point of the link. This can differ from the DPC of the trunk, e.g. the DPC of a Signalling Transfer Point (STP), see example 2 on the following pages.
  - **Enabled.** Link1 is checked by default. Whereas, a second link box can be checked to define an extra signalling link for fail-over purposes.
  - **Trunk.** Number of the trunk (1–4) in which a time slot is reserved for signalling.
  - **Time slot.** Number of the time slot, within aforementioned trunk, reserved for signalling.
  - **SLC.** A Signalling Link Code is a unique link number provided by the network operator to identify a link.



General

- **Originating Point Code (OPC).** A number in the range 0–2^{14}, which uniquely identifies a signalling point, in this case the 3G Gateway, within a telephone network. This number consists of three parts, viz. a network, cluster and member number, and will be provided by the network operator.
- **Network indicator.** A two bit data field within the Service Information Octet of the Message Signal Unit that permits discrimination between national and international messages.
- **Audio Codec / Law.** Either ALAW or ULAW. An a-law algorithm is a standard companding, i.e. compressing and expanding, algorithm, used in European digital communication systems to optimize, i.e. modify, the dynamic range of an analogue signal for digitizing. The μ-law algorithm is similar to a-law and used in North American and Japanese systems.

Trunks

A maximum of four PRIs or SS7 trunks, i.e. cables carrying E1/T1, can be enabled in the 3G Gateway.

- **Mode.** Enable or disable a trunk.
- **Destination Point Code (DPC).** Uniquely identifies the destination signalling point of the trunk. It will be provided by the network operator.
- **CIC.** The Circuit Identification Code is a unique identifier for a data time slot in a cable (trunk). In this case the CIC acts as base address and can be defined for each SS7 trunk and sets the first time-slot number of the respective SS7 trunk.

Routes

Routes are typically used for signalling fail-over purposes via multiple switches.

- **Destination Point Code.** Unique identifier indicating the destination signalling point of a trunk.
- **Priority.** Priority level of the route to the destination signalling point. Fail-over signalling paths will be followed according to this priority.
- **Link set.** Indicates the link to the destination signalling point according to the above mentioned priority setting. When set to off the respective route is disabled.

To provide a better understanding of the settings discussed here, two examples are given on the following pages.

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SS7 Configuration – Example 1

Suppose all four SS7 trunks of one 3G Gateway are connected to one switch, as indicated in the connection schematic to the right.

In this example the Originating Point Code (OPC) of the 3G Gateway equals 99, and the Destination Point Codes (DPCs) for all trunks equal 100.

Both OPC and DPC are provided by the telephone network operator.

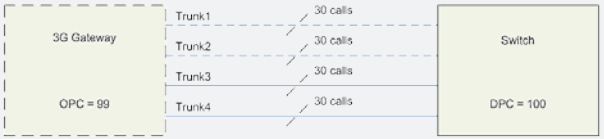
These settings can be seen in the schematic and in the screen shot of the SS7 window below right. All trunks can carry a maximum of 30 calls, i.e. 30 data time slots.

Each data time slot is identified uniquely by its OPC, DPC and Circuit Identification Code (CIC). The “absolute” CIC consist of a CIC “base address”, which has to be defined for each trunk in the SS7 window, i.e. in this case 0, 32, 64 and 96, and a relative address. The latter is a number between 0 and 31 and depends on the choice of the framing time slot and signalling time-slot numbers.

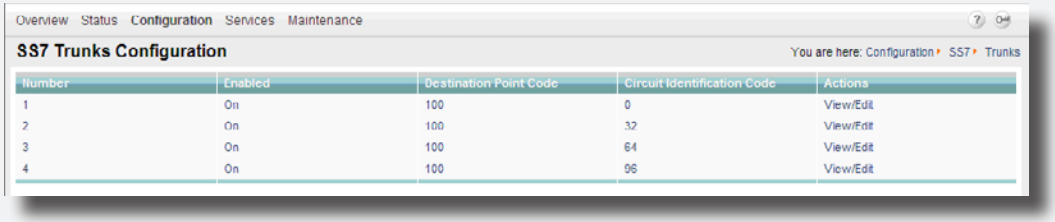
Since one time slot is reserved for framing, in this case set to time slot 0 by default, and one time slot has to be defined for signalling (16 in this example), 30 time slots are left to transport call related data, i.e. time slots with relative addresses 1–15 and 17–31, see the table in the schematic.

For signalling fail-over purposes a maximum of 2 SS7 trunks, also called links, can be defined to take care of the SS7 signalling of all 4 trunks in the 3G Gateway,

In this case trunks 1 and 2 are used for SS7 signalling. Since there is a direct connection between the 3G Gateway and the switch, both links are defined in the same link set with the DPC of the switch, i.e. 100. Since fail-over has been arranged within one link set, no routes can be defined.



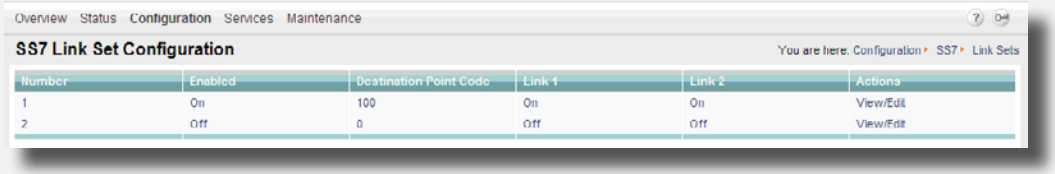
	CIC	Signaling time slot		
Trunk1 (OPC = 99, DPC = 100, CIC_{base} = 0)	1-15, 17-31	16	Signaling slot used for SS7 signaling	SLC = 0
Trunk2 (OPC = 99, DPC = 100, CIC_{base} = 32)	33-47, 49-63	16	Signaling slot used for SS7 signaling	SLC = 1
Trunk3 (OPC = 99, DPC = 100, CIC_{base} = 64)	65-79, 81-95	-	No slot is used for signaling: Slot 16 unused	
Trunk4 (OPC = 99, DPC = 100, CIC_{base} = 96)	97-111, 113-127	-	No slot is used for signaling: Slot 16 unused	


Overview Status Configuration Services Maintenance

SS7 Trunks Configuration

You are here: Configuration › SS7 › Trunks

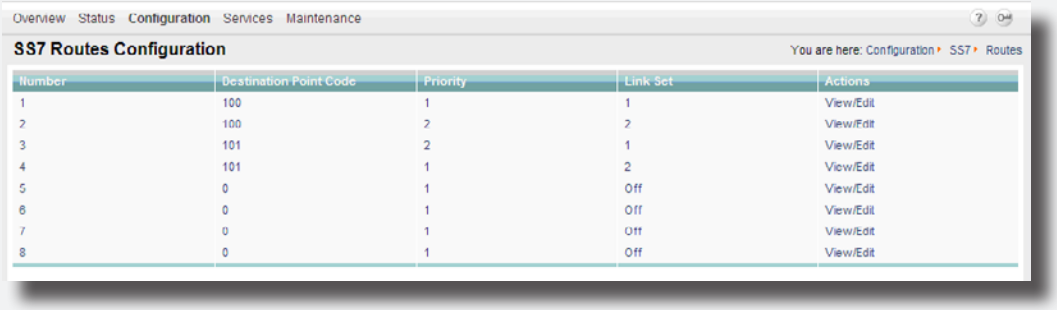
Number	Enabled	Destination Point Code	Circuit Identification Code	Actions
1	On	100	0	View/Edit
2	On	100	32	View/Edit
3	On	100	64	View/Edit
4	On	100	96	View/Edit


Overview Status Configuration Services Maintenance

SS7 Link Set Configuration

You are here: Configuration › SS7 › Link Sets

Number	Enabled	Destination Point Code	Link 1	Link 2	Actions
1	On	100	On	On	View/Edit
2	Off	0	Off	Off	View/Edit


Overview Status Configuration Services Maintenance

SS7 Routes Configuration

You are here: Configuration › SS7 › Routes

Number	Destination Point Code	Priority	Link Set	Actions
1	100	1	1	View/Edit
2	100	2	2	View/Edit
3	101	2	1	View/Edit
4	101	1	2	View/Edit
5	0	1	Off	View/Edit
6	0	1	Off	View/Edit
7	0	1	Off	View/Edit
8	0	1	Off	View/Edit

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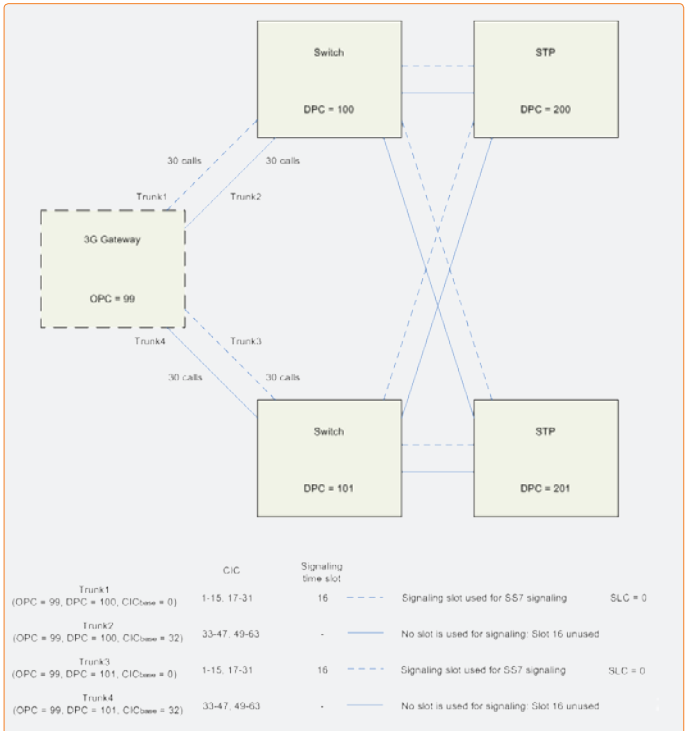
SS7 Configuration – Example 2

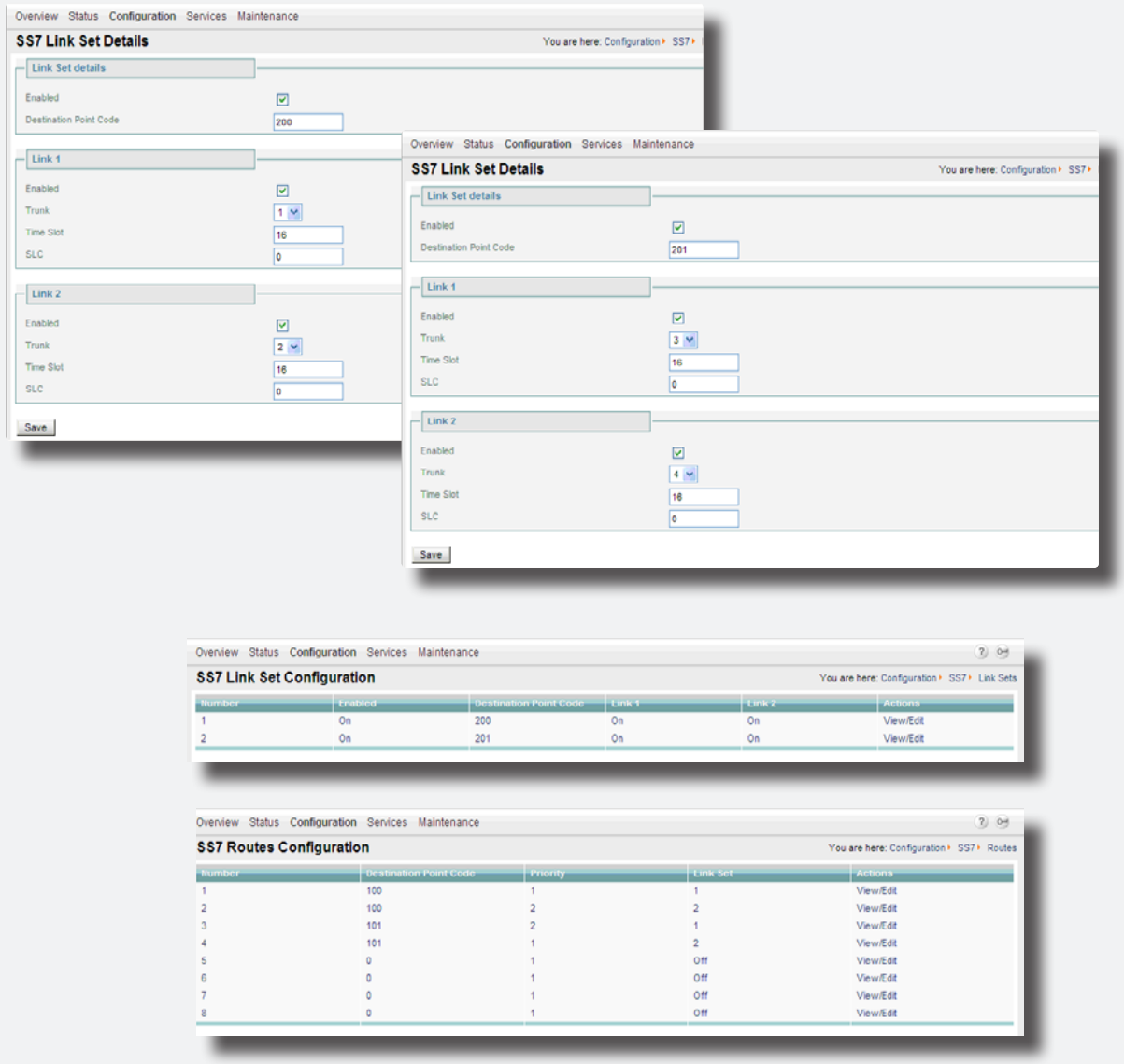
Suppose two out of four trunks are connected to one switch and the other two to another switch.

Now SS7 signalling fail-over is arranged via two switches and two Signalling Transfer Points (STPs) over 2 link sets, as can be seen from the schematic and the SS7 window below. Since the trunks are terminated by the switches, the DPCs of trunk 1 and 2 are 100 and 101, respectively.

However, both links are terminated by the STPs. Link set 1 contains SS7 trunk 1 and is terminated by an STP with DCP 200. Link set 2 contains SS7 trunk 3 and is terminated by an STP with DCP 201.

For each link two routes are available to two switches, one directly and one via an STP. Priority 1 is assigned to all direct links, whereas all links via STPs have the lower priority 2.





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IP Configuration

Select **IP** from the **Configuration** to access the **IP Configuration** pane.

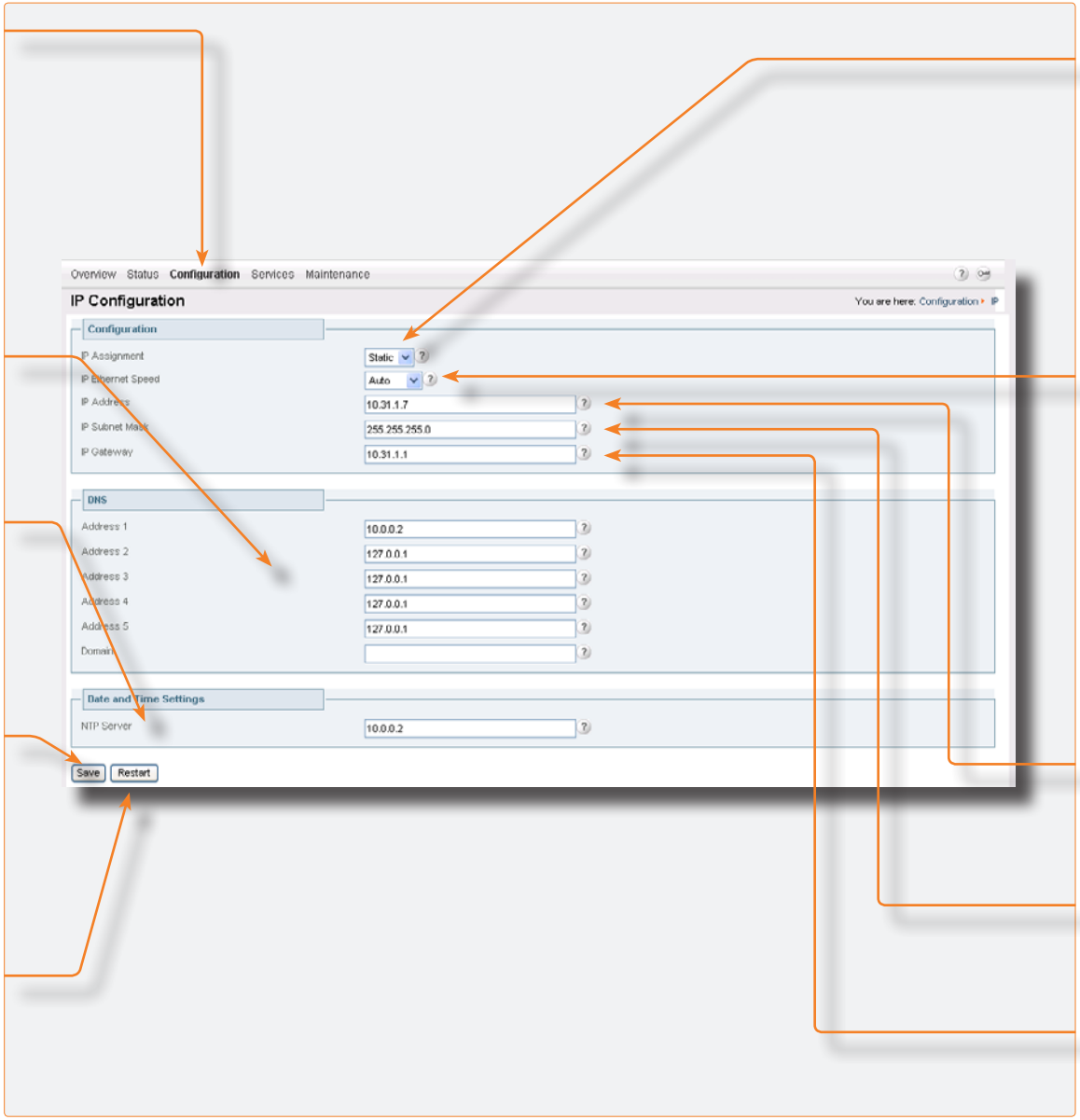
DNS Interface

Up to five Domain Name Server IP addresses can be specified here. Your LAN administrator will provide the correct values for these fields. By default these fields are set to **127.0.0.1**

Date and Time Settings. An NTP server address can be specified here to provide the 3G Gateway with up-to-date time and date information.

Save. When ready to store the new settings, press **Save**. These settings will take effect when the system has been restarted.

Restart. This button will restart the 3G Gateway. Any changes made in the IP Configuration of the 3G Gateway will take effect after the system has been restarted.



IP Address Assignment is DHCP or Static:

- **DHCP:** Dynamic Host Configuration Protocol can be selected when a DHCP server is present. Static IP Address, Static IP Subnet Mask and Static IP Gateway are ignored because these parameters are assigned by the DHCP server.
- **Static:** If Static assignment is used, the 3G Gateway's IP address, IP subnet mask, and the Gateway's IP address must be specified in the respective IP address fields.

IP Ethernet Speed provides five settings to choose from:

- **Auto** The Gateway will negotiate detect the speed and duplex on the LAN.
- **10Half** The Gateway will connect to the LAN using 10 Mbps/Half Duplex.
- **10Full** The Gateway will connect to the LAN using 10 Mbps/Full Duplex.
- **100Half** The Gateway will connect to the LAN using 100 Mbps/Half Duplex.
- **100Full** The Gateway will connect to the LAN using 100 Mbps/Full Duplex.

IP Address. The Static IP Address defines the network address of the 3G Gateway. This address is only used in static mode. Your LAN administrator will provide you with the correct address for this field.

IP Subnet Mask. The Static IP Subnet Mask defines the type of network. Your LAN administrator will provide the correct value for this field.

IP Gateway. The Static Gateway IP address is set to 127.0.0.1 by default. In case of a router enter its address here. Your LAN administrator will provide the correct value for this field.

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H.323 Configuration

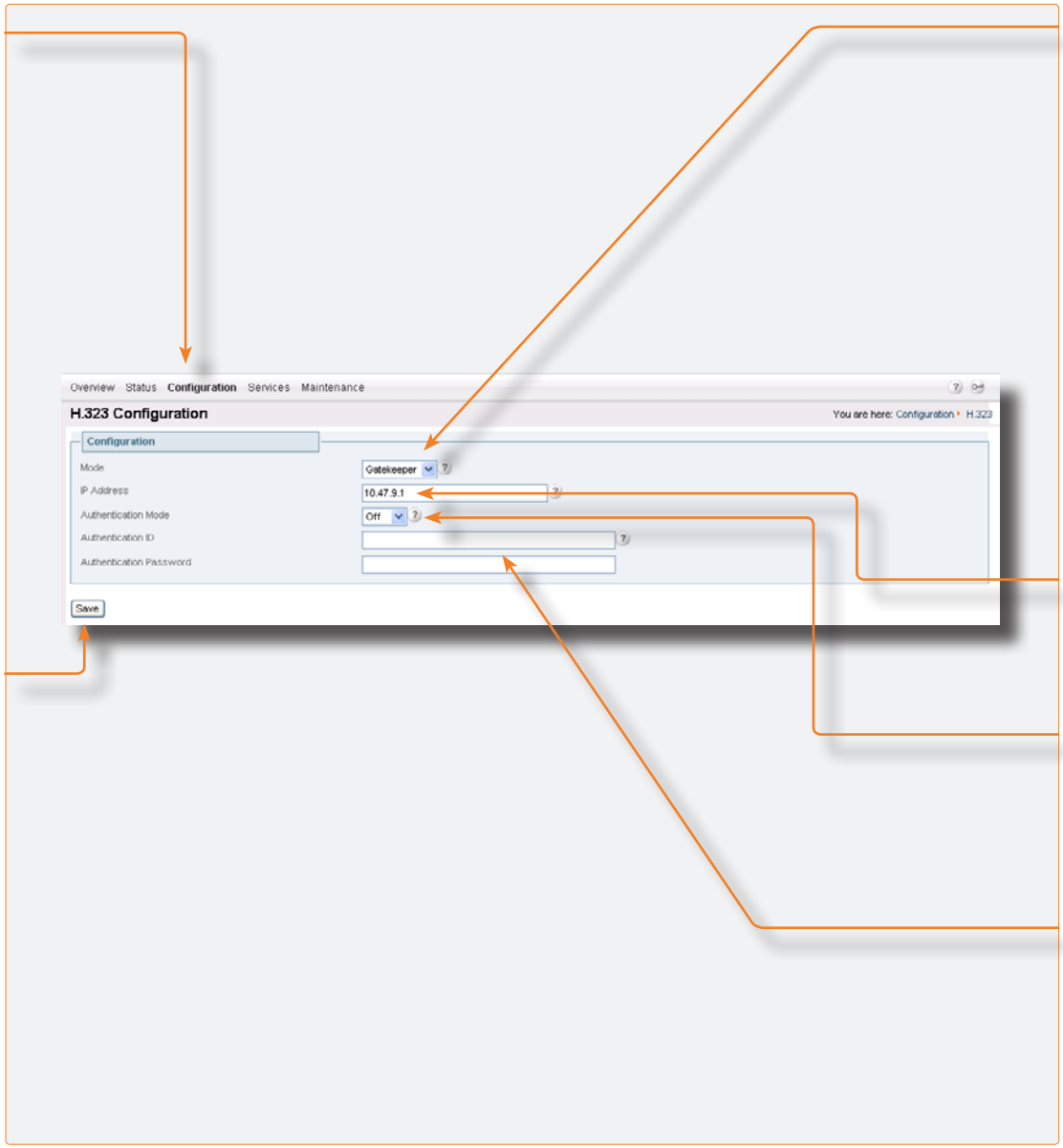
Select **H.323** to access the **H.323 Configuration** pane.

When registered with a gatekeeper, the H.323 Status shows Registered, the Gatekeeper's IP address and the Port used (see also Status, H.323 Status).

Dialing out from IP to IP or ISDN, through the 3G Gateway, requires the use of H.323 numbers (E.164 aliases and service prefixes). This means that the 3G Gateway must be registered to a Gatekeeper; select the **H.323** menu item in the Configuration menu.

Save. When ready to store the new settings, press **Save**.

In case password is not set/configured/inserted, the 3G Gateway will still use the Authentication ID to register with the gatekeeper. However, when the Authentication ID is left "unused", the System Name field. will be used to register the 3G Gateway with the gatekeeper instead. In case both the Authentication ID field and the System Name field are "unused" the 3G Gateway can not be registered with the gatekeeper.



Mode. Enables the 3G Gateway to register with a Gatekeeper or leave it unregistered, i.e. in direct mode. When registered with a gatekeeper, the H.323 Status shows Registered, the Gatekeeper's IP address and the Port used.

When the registration fails, the Registration status will be 'rejected'. Three cases can be distinguished:

- **Gatekeeper unreachable**; the 3G Gateway's H.323 stack returns this reject message in case the gatekeeper is down.
- **Duplicate alias**; a system with an identical name has already been registered.
- **Authentication failure**; Authentication ID and/or Authentication Password are incorrect.

Selecting direct mode will result in no Gatekeeper registration; hence it is not possible to dial through the 3G Gateway via alias names. The H.323 Status shows Inactive.

IP Address. Enter the Gatekeeper IP Address that the 3G Gateway should register to. Leaving this empty will result in direct dialing without the use of aliases.

Authentication Mode is **Off** or **Auto**.

- **Off.** Register to the Gatekeeper without authentication.
- **Auto.** Register to the Gatekeeper with H.235 authentication using ID/Password given below.

Authentication ID and **Password.** Enter the ID and password required to perform H.235 authentication at the Gatekeeper. To register with a Gatekeeper that requires authentication, an NTP server has to be configured.

If the Gatekeeper is configured with an alternative Gatekeeper, the Status area may report a registration to the IP address of the alternative Gatekeeper.

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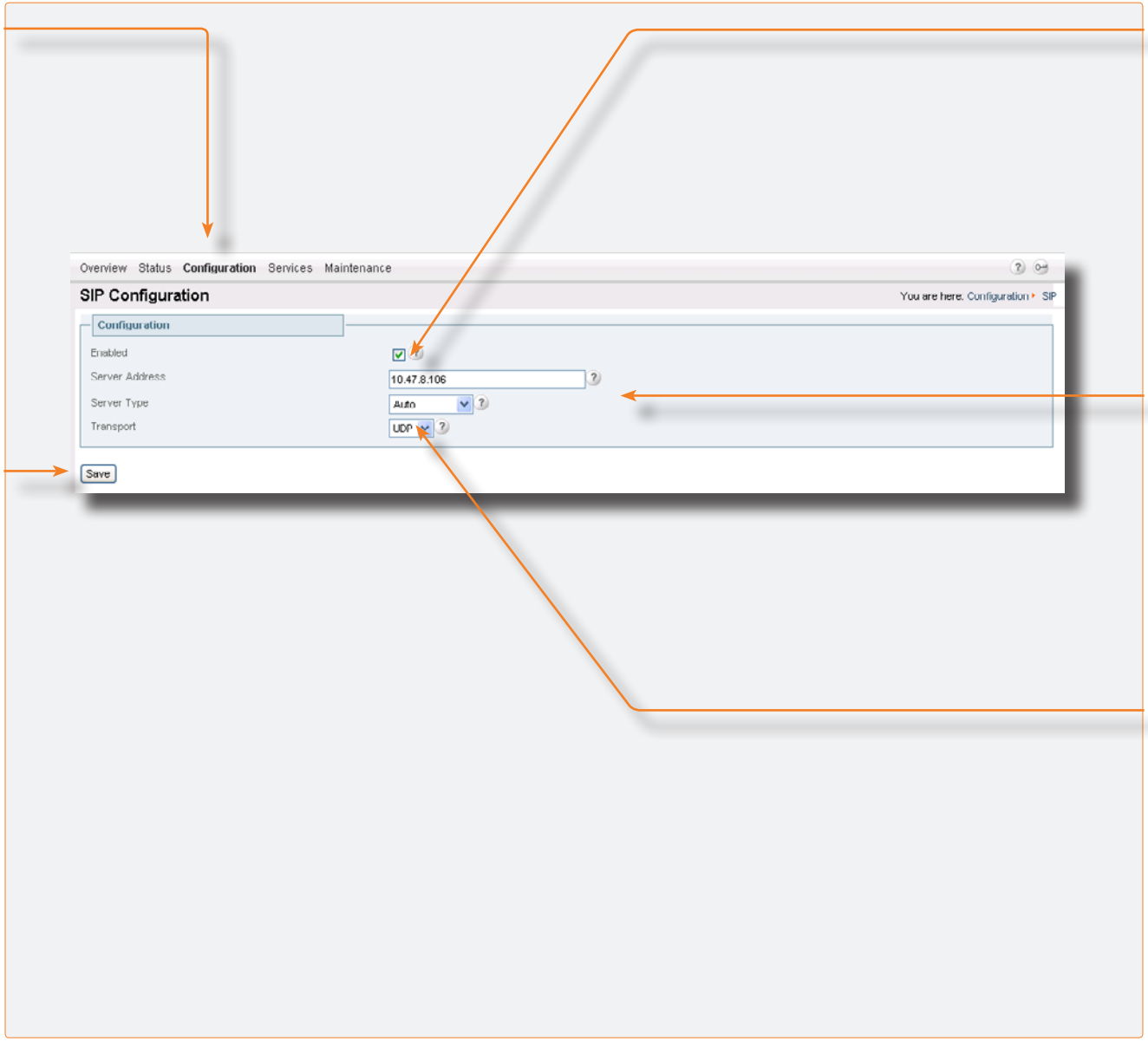
SIP Configuration

Select **SIP** to access the **SIP Configuration** pane.

Save. When ready to store the new settings, press **Save**. These settings will take effect when the system has been restarted.



SIP settings

Enabled. 3G Gateway will use this Proxy for call setup.

SIP proxy address. Enter the IP Address of the proxy server to which the 3G Gateway will use for call setups.

SIP proxy port. Enter the port number belonging to that SIP proxy IP address.

Setting **Mode** to **Off** will not hide the SIP proxy address and port settings!

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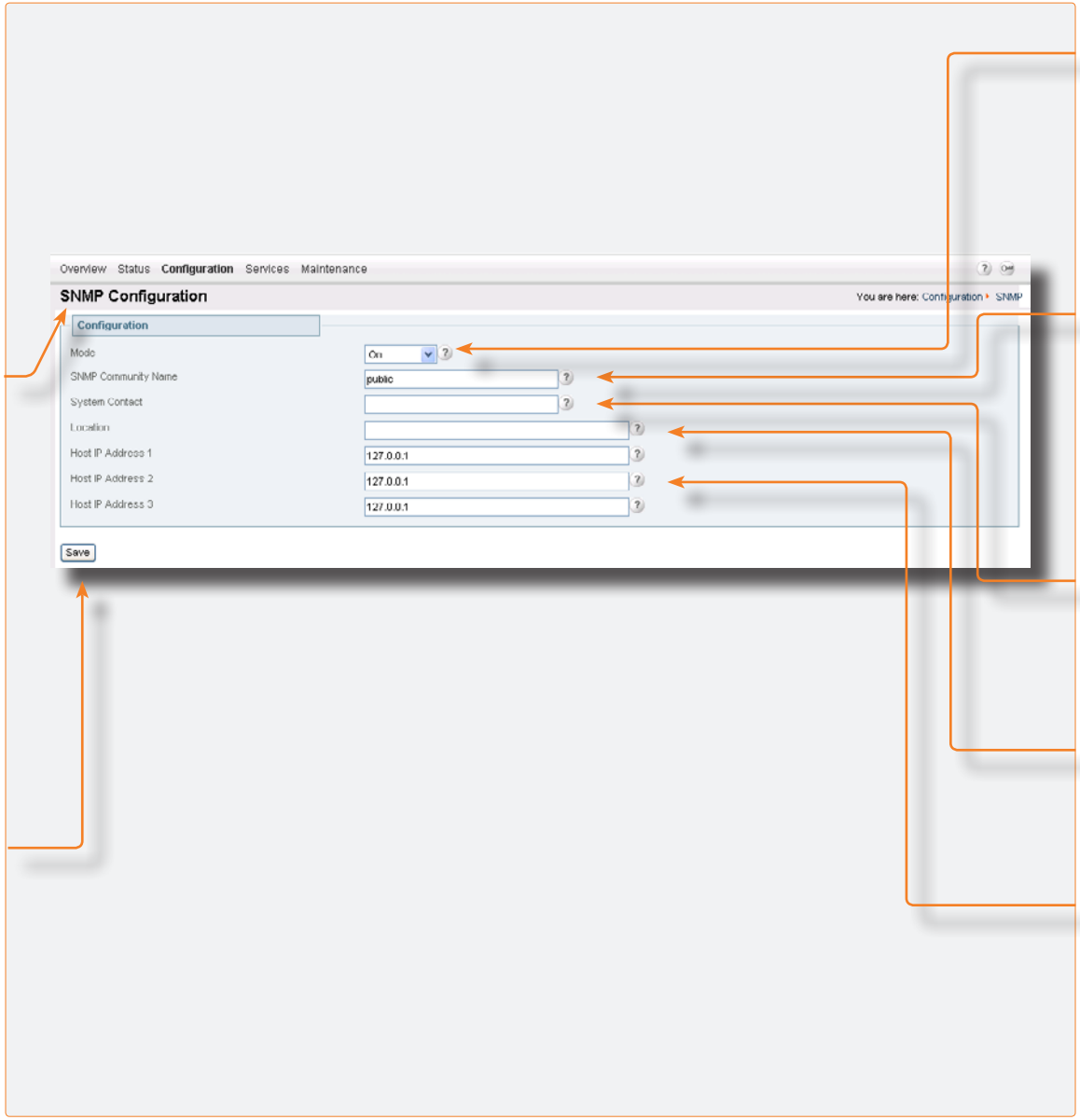
SNMP Configuration

SNMP (Simple Network Management Protocol) is used for monitoring and configuring different units in a network. The 3G Gateway's SNMP Agent responds to requests from SNMP Managers (a PC program etc.). SNMP traps are generated by the agent to inform the manager about important events.

Select **SNMP** to access the **SNMP Configuration** pane.

Save. Press **Save** to activate new settings.



SNMP Mode. The SNMP operation modus can be set to:

- **On**. Turns SNMP On
- **Off**. Turns SNMP Off
- **ReadOnly**. Do not send SNMP information to the host
- **TrapsOnly**. Only send SNMP information identified as TRAPS to the host.

SNMP Community name. SNMP Community names are used to authenticate SNMP requests. SNMP requests must have this 'password' in order to receive a response from the SNMP agent in the 3G Gateway.

The SNMP Community name is case sensitive!

System contact. Used to identify the system contact via SNMP tools such as HPOpenView or TANDBERG Management Suite.

Location. Used to identify system location via SNMP tools such as HPOpenView or TANDBERG Management Suite.

Host IP Address (**1**, **2** and **3**). Identifies the IP-address of the SNMP manager. Up to three different SNMP Trap Hosts can be defined. Your LAN administrator should provide the correct values for these fields.

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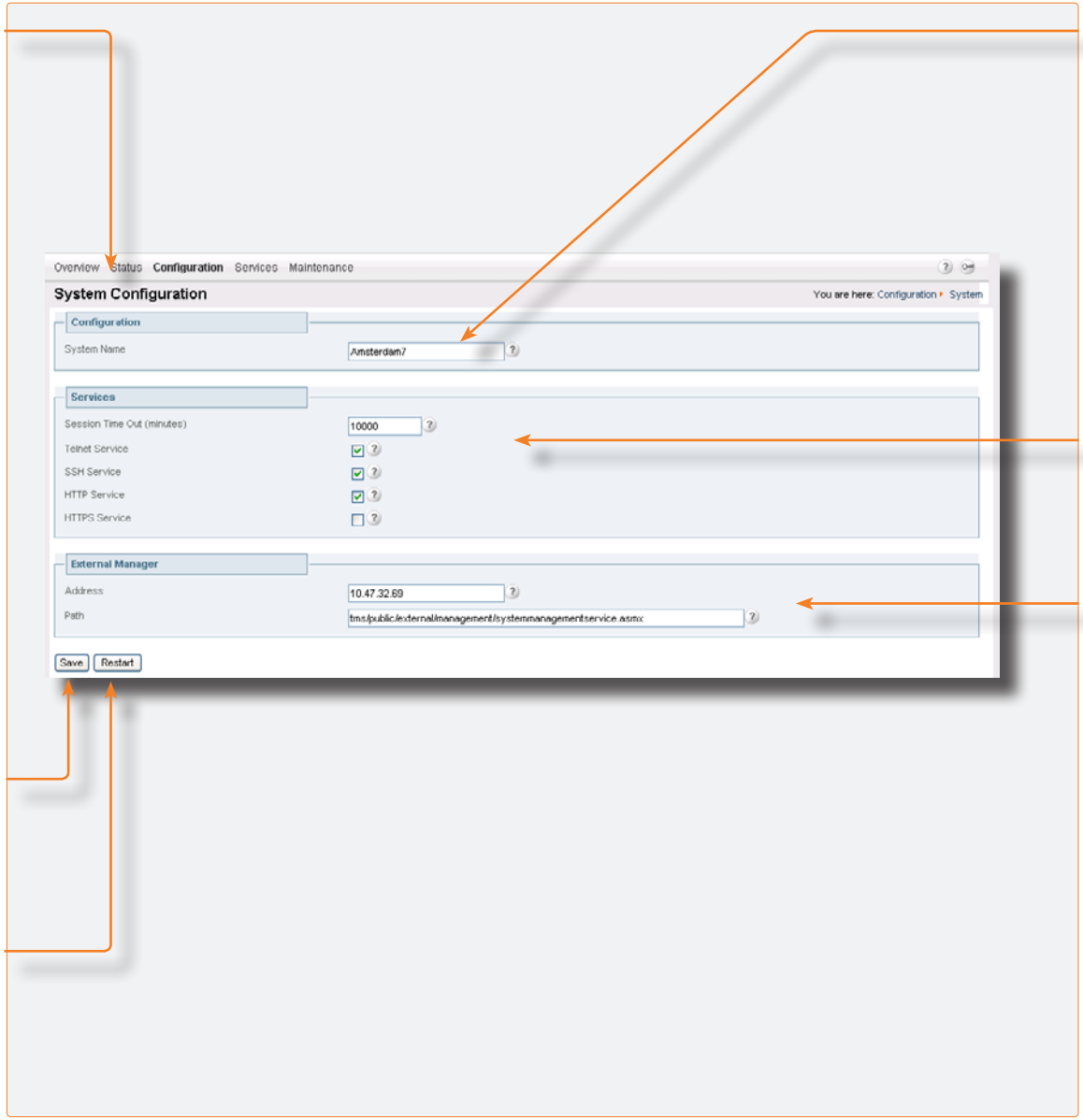
System

To configure the miscellaneous settings on the 3G Gateway, select the **System Configuration** item.



Configuration. To change the system name of the 3G Gateway, enter the new system name in the **System Name** field.

Note that when the Authentication ID in the H.323 link is left empty, the System Name field will be used to register the 3G Gateway with the gatekeeper in stead. In case both the Authentication ID field and the System Name field are left empty the 3G Gateway can not be registered with the gatekeeper.

Services. The different IP services on the 3G Gateway – Telnet, SSH, HTTP and HTTPS, can be disabled independently to prevent access to the system. Moreover, with Session Time Out, a maximum login time can be set.

External Manager settings. To enable cooperation between the 3G Gateway and an external TANDBERG Management System (TMS) enter both its IP address and its path.

Save. When ready to store the new settings, press **Save**. These settings will take effect when the system has been restarted.

Restart. This button will restart the 3G Gateway. Any changes made in the IP Configuration of the 3G Gateway will take effect after the system has been restarted.

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Maintenance and Upgrade

The Maintenance section describes how the system software can be upgraded, how new options can be made available via the installation of option keys, how the system password can be changed, and how the system is restarted.

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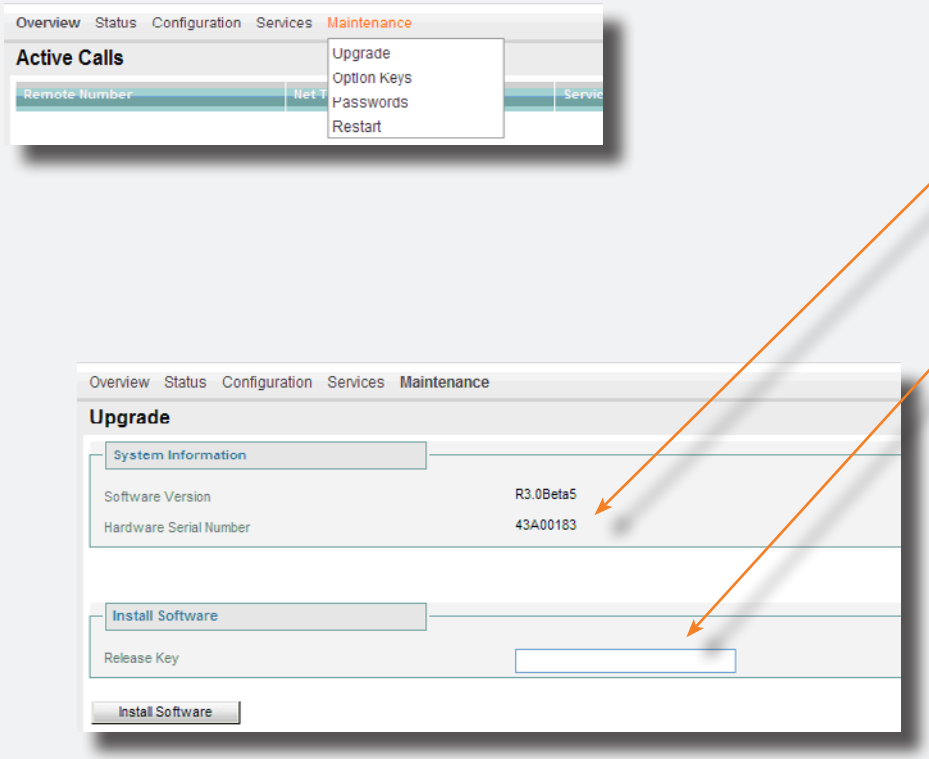
Maintenance – General

Under the **Maintenance** tab the system software can be upgraded, new options can be made available via the installation of option keys, the system password can be changed, and the system can be restarted.

The 3G Gateway's system software can be upgraded via the **Upgrade** item in the **Maintenance** menu. It also shows current software version and the 3G Gateway's hardware serial number. For new software versions a release key must be entered before the upgrade can be activated.

To upgrade the 3G Gateway, a valid Release key and Software file are required. However, for dot-release upgrades a Release Key won't be needed.

To expand software options additional Option keys are required. Contact your TANDBERG representative for more details.



System Information

- **Software Version.** Shows the currently installed Software version.
- **Hardware Serial Number.** This unique identifier number for the 3G Gateway must be provided when ordering Software Upgrades and Option Keys.

Release Key. Needed to upgrade a system to a new version. Dot releases do not require an option key.

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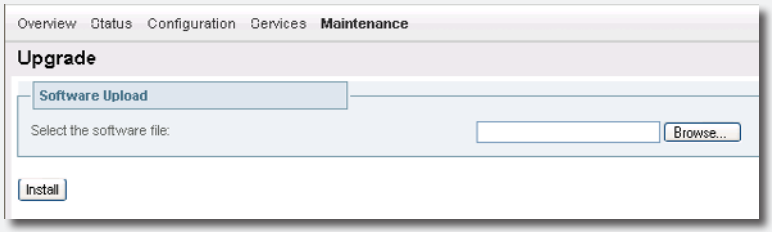
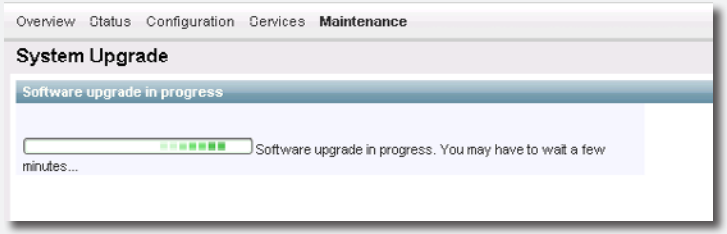
Maintenance – Upgrading the System

Upgrading the System

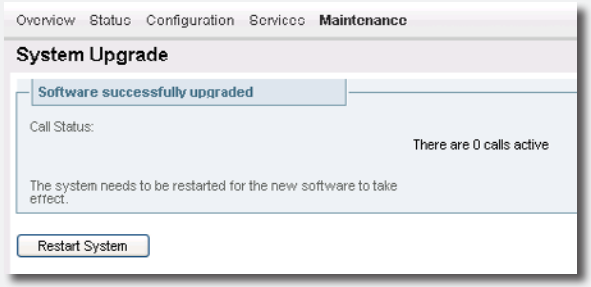
1. Once you have entered the release key in the Release Key field (see the previous page) and pressed Install Software a new window will appear, which enables the entry of the software package, i.e. a .pkg, file to be uploaded For dot release upgrades a Release Key won't be needed.



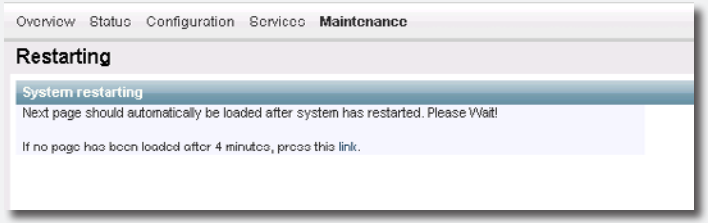
2. After the .pkg file has been selected, this will be uploaded into the flash memory of the 3G Gateway.



3. After the upload has been completed, this message is shown.



4. This screen appears after clicking the Restart System button.



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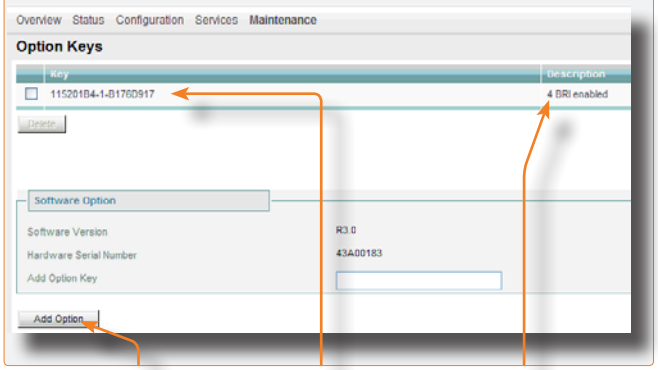
Maintenance – Option Keys, Password and Restart

Option Keys

To expand software options additional Option keys are required. Contact your TANDBERG representative for more details.



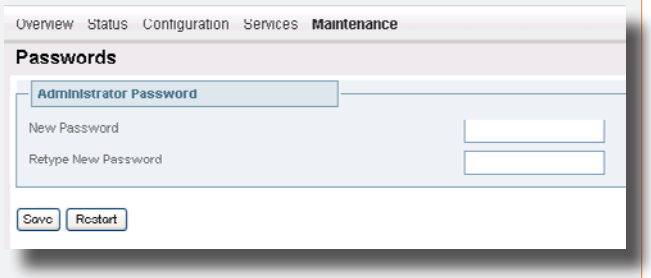
Add Option key. Enter the supplied option keys and press **Add Option**.

Key. Shows the option-key number.

Description. Shows the software function belonging to the key number.

New options take effect after the next restart only.

Password

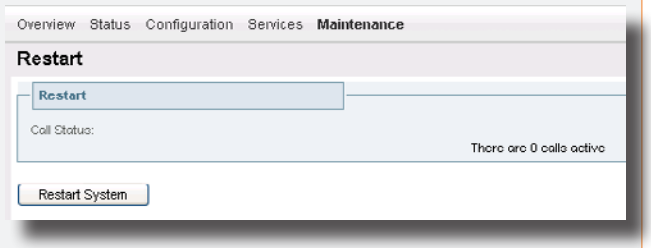


Forgot the password? Use the following procedure to set a new password:

- Reboot the 3G Gateway and connect to the 3G Gateway via the serial interface once it has restarted.
- Login with User Name `pwrec`. No password is required.
- You will be prompted for a new password.

The **pwrec account** is only active for one minute following a restart. Beyond that time the system will have to be restarted again to change the password.

Restart



The 3G Gateway can be restarted either via the **Restart System** menu item in the System configuration menu or via the **Restart System** buttons in the **ISDN**, **IP**, **Misc** and **Upgrade System** menus.

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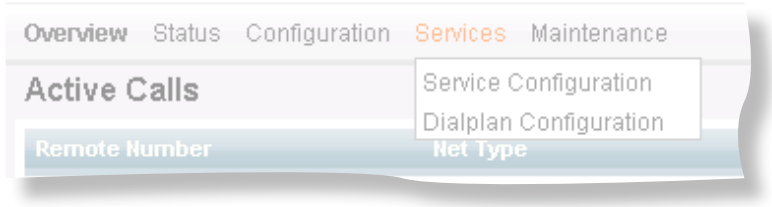
Services

On 3G Gateway systems dial plans can be configured with default services. Three default services can be distinguished:

- Direct Inwards Dialing
- Dial Extension (IVR)
- TMS Corporate Directory

These services can be found under the Service Configuration tab. Each default service has a specific number of parameters which can be set by the user.

To configure a dial plan select the Dialplan Configuration item.



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Default Services

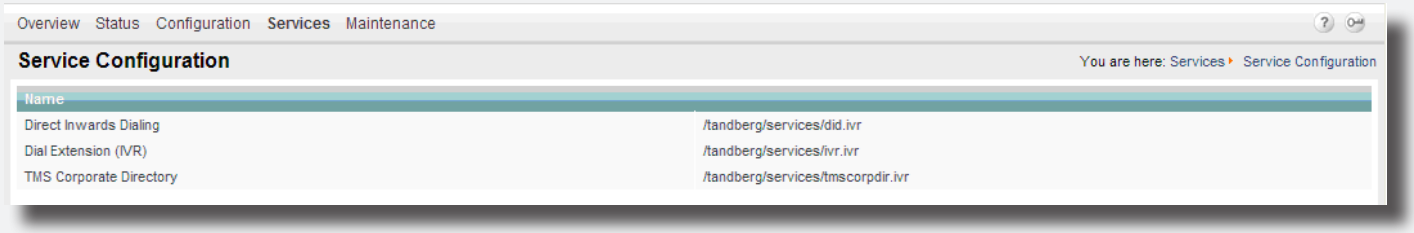
About Default Services

The 3G Gateway is equipped with a number of persistent default services, i.e. services stored in the on-board non-volatile memory. Therefore, these services will always be available after a system restart. The following persistent default services can be distinguished:

- **Direct Inwards Dialing** (DID). Defines a one-on-one relation between an inbound and an outbound number.
- **Dial Extension** (IVR). Also known as Interactive Voice/Video Response (IVR), defines a relation between an inbound number and an interactive service, i.e. a menu, via which an outbound service can be connected to. The outbound service can be an audio or video service or an externally connected endpoint.
- **TMS Corporate Directory** (phone book). A connection with the installed TANDBERG Management System (TMS) phone book is setup. Via the phone book menu an outbound call to another endpoint, e.g. a 3G Mobile, H.323 or SIP endpoint, can be setup.

To view all service entries select the **Service Configuration** menu from the **Service** tab.

The Service Configuration Window



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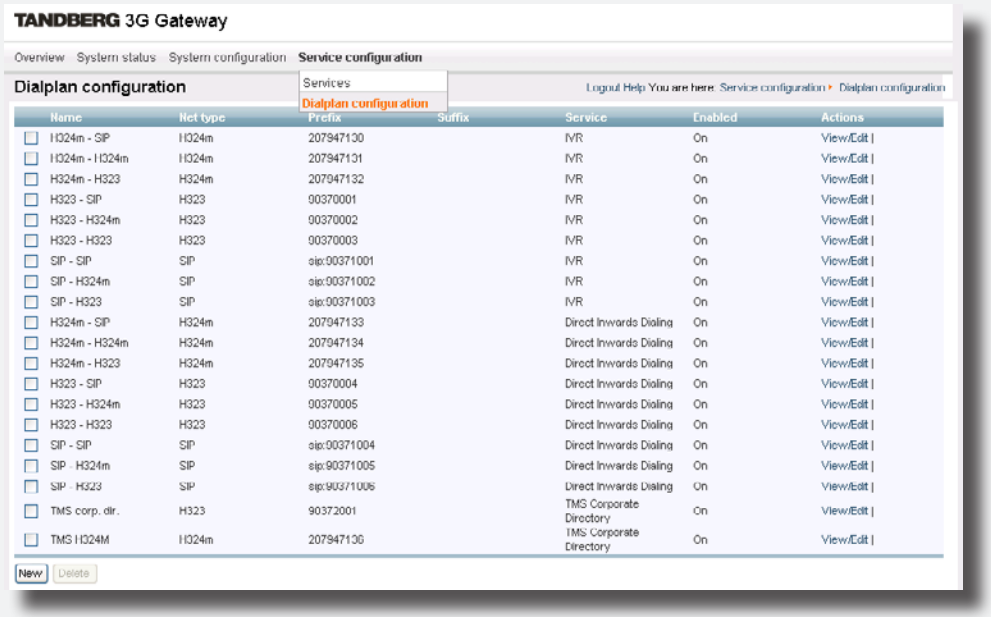
Dialplan Configuration

About Dialplan Configuration

To view all dialplan configuration entries or create a new dial plan select the **Dialplan configuration** menu item from the **Services** tab.

Dialplan Configuration Window



Dialplan Details

To view the dialplan entry details, click on the dialplan entry or on View/Edit of the respective dial plan. As has been discussed on the previous page four default services can be distinguished:

- Direct Inwards Dialing
- Dial Extension (IVR)
- TMS Corporate Directory (Phone book)

For each default service the dialplan setup will be illustrated with an example on the following pages.

Note: Number matching is performed on dial plans from the top to bottom.

Each dial plan has the following general fields, i.e. Dialplan entry details:

- **Enabled.** If the box is checked the service becomes available.
- **Name.** The name of the dial plan as represented in the Dialplan Configuration overview.
- **Net type.** Inbound call net type; either H.324m, H.323, SIP or All. All means that independent of the net type the call is accepted on a match with the predefined **Prefix** and **Suffix**.
- **Prefix.** Number to which the first part of the inbound number (bnr) is matched. The prefix is specified in the dial plan entry. The prefix is stripped from the inbound number.
- **Suffix.** Number to which the last part of the inbound number (bnr) is matched. The suffix is specified in the dial plan entry. The suffix is also stripped from the inbound number. The part of the number which remains after stripping both prefix and suffix is called remainder (See also the “useremainder” option in a DID service).

In the dialplan: When the **Net Type** is set to **All** make sure that the prefix and/or suffix is a valid H.323 prefix.

Setting it to **All** means that the prefix will be registered to the gatekeeper.

Example:
An existing dialplan entry:
name: Test 123
nettype: SIP
prefix: HYPERLINK “mailto:12@10.47.8.74”12@10.47.8.74”
service: FOO

Is changed to:
name: Test 123
nettype: All
prefix: HYPERLINK “mailto:12@10.47.8.74”12@10.47.8.74”
service: FOO

The H.323 registration will now fail, because “HYPERLINK “mailto:12@10.47.8.84”12@10.47.8.84” is not a valid H.323 prefix

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Argument Details for the Default DID Service

DID Argument Details

Use Remainder. Specifies whether a particular part, i.e. the remainder, of the inbound number will be used to form a part of the outbound number.

For a remainder to become non-zero a specified inbound **Prefix** has to match the first part and/or a specified inbound **Suffix** has to match the last part of an inbound number, however individually or combinations of both never fully match the complete inbound number.

Both inbound Prefix and Suffix can be defined under **Dialplan entry details**. When **Use Remainder**, is active the previously mentioned "remainder" will be appended to and precede the **Prefix** and the **Suffix** of the outbound number, respectively. The outbound **Prefix** and **Suffix** precede and append, respectively, the "remainder" as to form the complete outbound number.

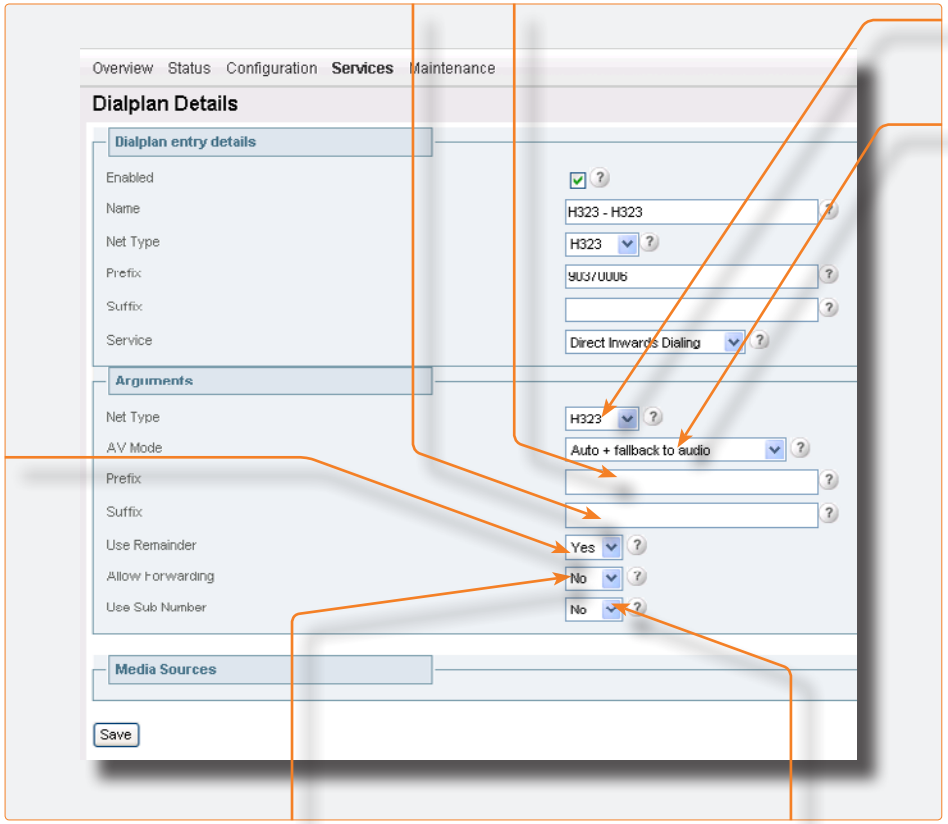
The latter prefix and suffix can be defined under **Arguments**. Prefixes and suffixes are standard parameters of dial plans.

Suppose, as an example, in the **Dialplan entry details** the inbound Prefix equals 9876 and inbound suffix equals 54. In the **Arguments** settings the outbond prefix equals 1234. For an inbound connection to phone number 9876154 the 3G Gateway will strip the prefix 9876 and the suffix 54 from the called number, hence the remainder equals 1. For the outbound connection the 3G Gateway will add the prefix (configured in arguments) in front of the remainder, hence the outbound number equals 12341.

For the same settings with an inbound number 9876254 results in an outbound number 12342. In case the prefix and/or suffix fully match the inbound number the remainder will be empty and the useremainder value will be ignored.

Suffix. Specifies the last part, i.e. the part appended to the remainder, of the Outbound number. The outbound suffix can be defined under **Arguments**.

Prefix. Specifies the first part, i.e. the part preceding the remainder, of the outbound number. The outbound prefix can be defined under **Arguments**.



Allow forwarding. After call setup the call is offloaded from the 3G Gateway system, i.e. not routed via the 3G Gateway system any longer, to free resources.

Use sub number. The sub number is a number extension following the main number separated from the main number by an *. In this way a number plan behind a main number can be reached directly.

No Media Sources can be added to DID service.

Net type. Either **H.324m**, **H.323** or **SIP** of the outbound call.

AV mode. This mode determines the outbound audio and video call settings. It is either **Audio Only**, **Audio + Video**, **Auto(matic) no fallback to audio**, **Auto + fallback to audio** and **Auto + always fallback to audio**.

- In the **Audio Only** mode a voice call is being setup, even when all endpoints support both audio and video capabilities. Note that this setting will be overruled in case Allow Forwarding is set to Yes and both endpoints possess audio and video capabilities.
- In the **Audio + Video** mode a call is only being setup when endpoints support both audio and video capabilities and a call with both these capabilities can be set up.
- In the **Auto** mode a call is being setup according to the capabilities of the endpoints. Of the latter, 3 versions can be distinguished: no fallback to audio, fallback to audio or always fallback to audio.
- In the **no fallback to audio** case either an **audio + video** or an audio only call is being setup, depending on the capabilities choice of the initiating endpoint, i.e. when an **audio + video** call is being set up, whereas the receiving endpoint only supports audio, the call is terminated.
- In the **fallback to audio** case capabilities can be changed to an audio only call when the receiving endpoint supports only audio, even when an **audio + video** call is being set up by the initiating endpoint.
- The **always fallback to audio** case is used in case the telephony switch interferes or cannot handle capability renegotiation, therefore when an **audio + video** call fails automatically an audio call will be set up.

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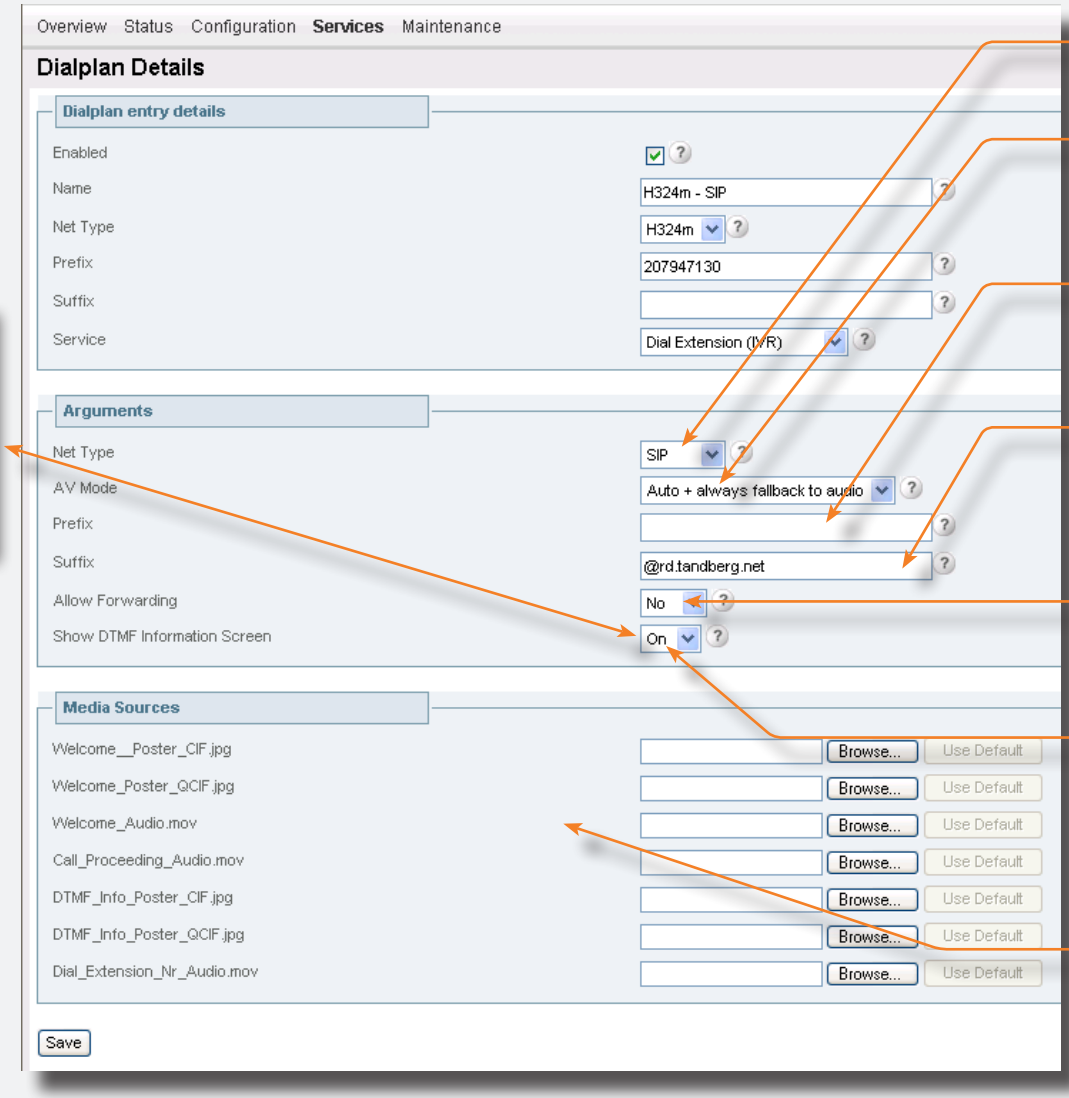
Argument Details for a Default IVR Service

IVR Argument Details



Net type. Identical to DID service (see the previous page for details).

AV mode. Identical to DID service (see the previous page for details).

Prefix. Identical to DID service (see the previous page for details).

Suffix. Identical to DID service (see the previous page for details).

Allow forwarding. Identical to DID service (see the previous page for details).

Show DTMF Information Screen. This is a screen used within the service to draw the attention of the user to activate DTMF tones on its endpoint. This screen can be turned on (default value) or off.

Media Sources. Some of the default Media Sources, like the Welcome Screen and the DTMF Information Screen as mentioned under the **Media Sources** of this service, can be replaced by the user.

Note that the Dial Extension number can also be used in audio only mode.

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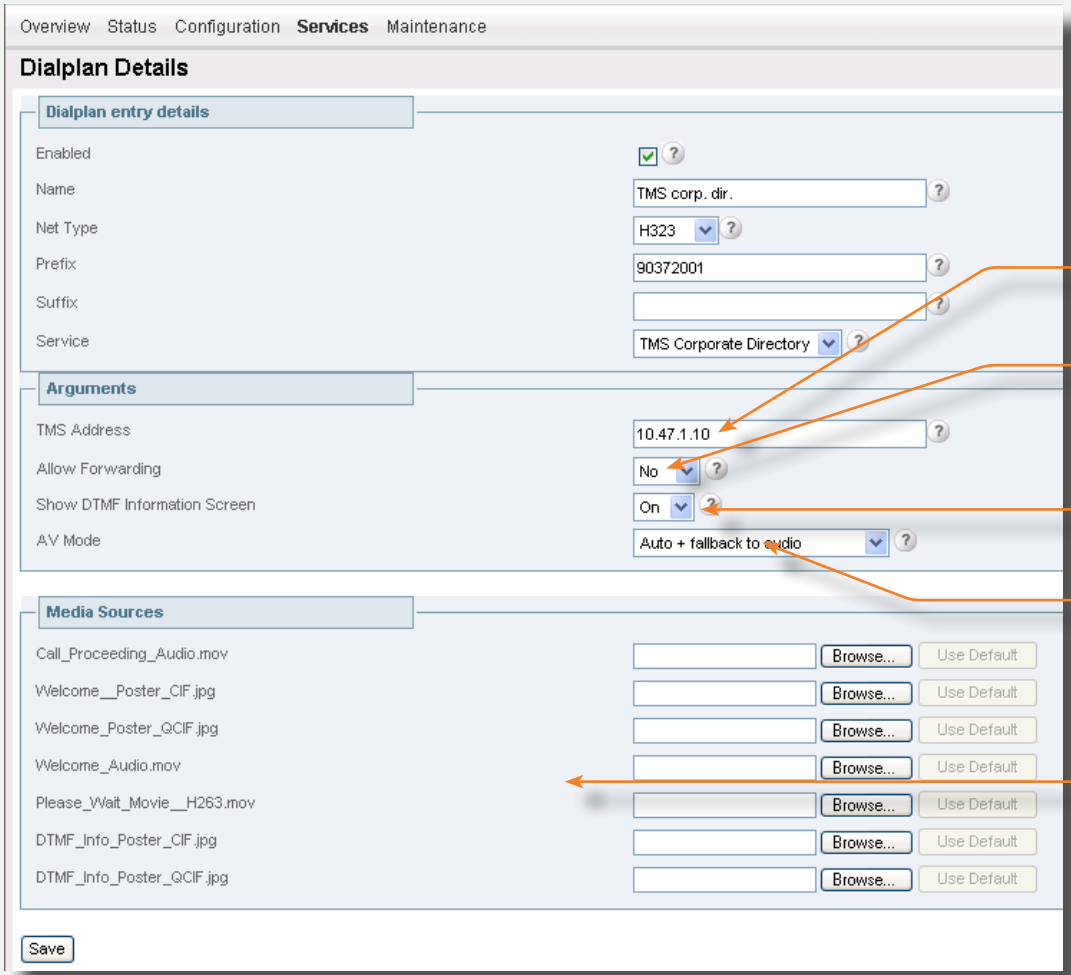
Argument Details for a Default TMS Corporate Directory (Phone Book Service)

TMS Corporate Directory Argument Details



TMS address. IP address of Tandberg Management System (TMS).

Allow forwarding. Identical to DID service – for details, see three pages back.

Show DTMF Information Screen. Identical to Dial Extension (IVR) service.

AV mode. Identical to DID service – for details, see three pages back.

Media Sources. Some of the default Media Sources, like the Welcome Screen, the DTMF Information Screen and the Please wait movie as mentioned under the **Media Sources** of this service, can be replaced by the user.

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Dial Plan Examples

Given the supported net types, H.324m, H.323 and SIP, 9 unique inbound and outbound net type combinations for both DID and IVR dial plans can be defined

Some of these combinations will be discussed in a few examples.

Example 1: Number-plan mapping

Entry details:	Enabled:	Check
	Name:	H.324m-H.323
	Net Type:	H.324m
	Prefix:	6789
Suffix:	Service:	Direct Inwards Dialing
Arguments:	Net Type:	H.323
	A V Mode:	Auto + fallback to audio
	Prefix:	5
Suffix:	Use Remainder:	Yes
	Allow Forwarding:	No

When dialing the number 67890000 there will be a match with “0000” as the remaining number. The H.323 number that will be connected to will be: 50000 (construction: Prefix + Use remainder number). When dialing number 67894321 this will match with “4321” as the remaining number. The H.323 number to call will be: 54321. In this way a range of ISDN numbers can be mapped onto for instance a range of H.323 numbers.

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Some Dial Plan Examples (I)

About the Examples

Given the supported net types, H.324m, H.323 and SIP, 9 unique inbound and outbound net type combinations for both DID and IVR dial plans can be defined:

1. H.324m–SIP
2. H.324m–H.324m
3. H.324m–H.323
4. H.323–SIP
5. H.323–H.324m
6. H.323–H.323
7. SIP–SIP
8. SIP–H.324m
9. SIP–H.323

Some of the above combinations will be discussed in a few examples. Examples on this page deal with DID dial plans, whereas examples on the next page describe IVR scenarios.

DID Dial Plan Examples

Example 1: Number-plan mapping

Entry details:	Enabled:	Check
	Name:	H.324m-H.323
	Net Type:	H.324m
	Prefix:	6789
Suffix:	Service:	Direct Inwards Dialing
Arguments:	Net Type:	H.323
	A V Mode:	Auto + fallback to audio
	Prefix:	5
Suffix:	Use Remainder:	Yes
	Allow Forwarding:	No

When dialing the number 67890000 there will be a match with “0000” as the remaining number. The H.323 number that will be connected to will be: 50000 (construction: Prefix + Use remainder number). When dialing number 67894321 this will match with “4321” as the remaining number. The H.323 number to call will be: 54321. In this way a range of ISDN numbers can be mapped onto for instance a range of H.323 numbers.

Example 2: Hotline

Entry details:	Enabled:	Check
	Name:	H.324m-H.323
	Net Type:	H.324m
	Prefix:	67890000
Suffix:	Service:	Direct Inwards Dialing
Arguments:	Net Type:	H.323
	A V Mode:	Auto + fallback to audio
	Prefix:	51234
Suffix	Use Remainder:	No
	Allow Forwarding:	No

When dialing number 67890000 this will match without leaving a remainder. The H.323 number that will be connected to will be: 51234 (construction: prefix). When dialing number 67894321 there will be no match. When dialing number 678900009876 one is also connected to the same H.323 endpoint, since there is a match on 67890000 and the remainder, i.e. 9876, is discarded.

Note that Use Remainder is set to No!

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Some Dial Plan Examples (II)

Dial Extension (IVR) Examples

Interactive Video Response (IVR), also called extension dial-in, is an automated answering system that directs the call to the IP endpoint indicated by the caller. The caller uses telephone tones (DTMF) to enter the H.323/ SIP alias or extension.

IVR is useful in case a limited amount of numbers, e.g. ISDN PRI or BRI lines, is available.

An example shall be provided:

1. An endpoint user calls a Dial Extension service number.
2. The 3G Gateway activates the **Welcome** picture and sound.
3. The 3G Gateway, when set in the dial plan, shows the DTMF Information screen.
4. The endpoint user enters the extension (H.324m/H.323/SIP alias) followed by the # (pound-sign) to indicate end of number.
5. The 3G Gateway starts to call the endpoint and the **Connecting** picture and sound are activated.
6. When the call is connected audio and video are transmitted through the 3G Gateway (SIP to SIP calls and H323 to H323 calls will only go through the 3G Gateway when **Allow Forwarding** is set to **No**).

It is not possible to configure ISDN BRI lines for special functions like dial out only. The 3G Gateway will automatically select a free BRI line for H.323 to 3G calls and possibly block a DID or an IVR menu when the BRI lines have different numbers.

Consequently, we strongly recommend that all ISDN BRI lines have the same number range.

Dial Extension (IVR) Dial Plan Examples

Example 4: 3G to H.323 IVR

Entry details:	Enabled:	Check
	Name:	3G-H.323-IVR
	Net Type:	H.324m
	Prefix:	123478
Suffix:	Service Type:	Dial Extension
Arguments:	Net Type:	H.323
	A V Mode:	Auto
Prefix:		
Suffix:	Allow Forwarding:	No

When dialing number 123478 on a 3G handset, one is connected to an IVR service, from which an H.323 endpoint number can be entered.

Example 5: 3G to H.323 via a Phone book

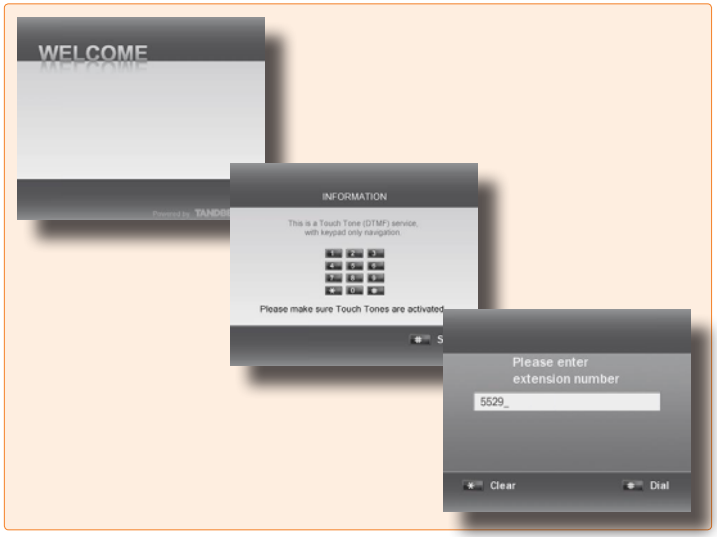
Entry details:	Enabled:	Check
	Name:	3G-H.323- Phonebook
	Net Type:	H.324m
	Prefix:	123489
Suffix:	Service Type:	TMS Corporate Directory
Arguments:	Net Type:	e.g. H.323
	A V Mode:	Auto
Prefix:		
Suffix:	Allow Forwarding:	No

When dialing number 123489 on a 3G handset, one is connected to an TMS Corporate Directory, from which an H.323 or SIP endpoint can be selected. Note that the **Net Type** to be selected in arguments is irrelevant, since the endpoint to be called is selected from a phone book.

Example 6: 3G to SIP IVR

Entry details:	Enabled:	Check
	Name:	3G-SIP-IVR
	Net type:	H.324m
	Prefix:	1234790
Suffix:	Service type:	Dial Extension
Arguments:	Net Type:	SIP
	A V Mode:	Auto
Prefix:		
Suffix:	@<SIP_Proxy_Address or Registrar_Address>	
	Allow Forwarding:	No

When dialing number 1234790 on a 3G handset, one is connected to <UserInputNumber>@<SIP_Proxy_Address or Registrar_Address>, where UserInputNumber is the number keyed in by the user from within the IVR menu.



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TMS Corporate Directory

The TMS Corporate Directory service allows one Endpoint, i.e. a UMTS phone, H323 or SIP, to dial another Endpoint directly, without knowing or having to (manually) enter the extension number via DTMF.

TMS Corporate Directory is a menu based dial-in method, which combines a directory listing from TMS with IVR. In this mode the user can search in the global address book provided via TMS using the alphanumeric part of the keypad.

The TMS Corporate Directory service searches and displays entries matching the user input string. A maximum of 6 entries per page are displayed.

One can browse back and forth through the pages by pressing the * button or the # button, respectively. With the 0 button one can go back to a previous stage in the service or even back to the previous service when the phone book is entered via the entry point or dial extension service.

A menu option is available when text is present next to the respective button. In case access to multiple phone books is available, the user can select one in the first stage. In the second stage, either a search string can be entered by the user, or you can use DTMF to search alphabetically.

All names matching the search string will be displayed up to a maximum of 10 pages, where each page contains a maximum of 6 names. Pressing the # button will commence the search. Entering an empty search string, i.e. pressing the # button without entering any character, will show a two-stage alphabetical menu structure providing the first letter of the search string only.

In the third stage one of the matched names can be selected by pressing the number preceding the name. When multiple numbers are provided with the selected name one can select the number of choice and the dialing of the outbound number will be commenced immediately.

If the above left search field is left empty and **Search** (lower right corner) is clicked on, the alphabetical search as shown to the right will be displayed.

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