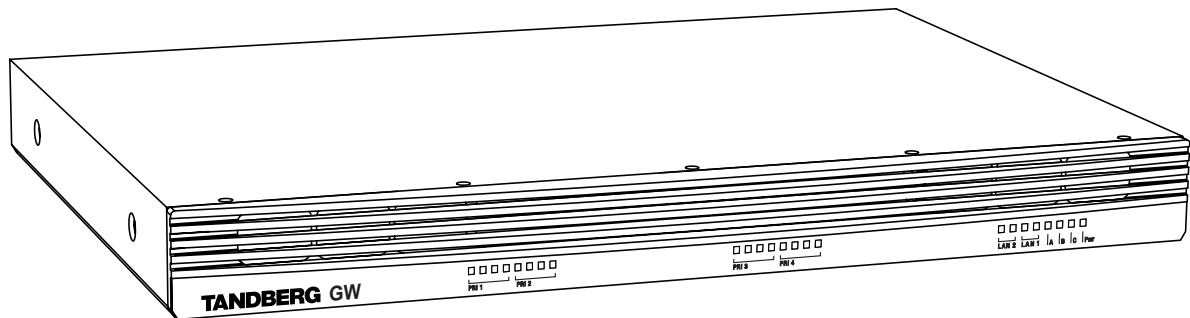


# TANDBERG Gateway

## User Manual



Software version G3

D13187-03

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This document was written by the Technical Support Department of TANDBERG, Norway. We are committed to maintaining a high level of quality in all our documentation. Towards this effort, we welcome your comments and suggestions regarding the content and structure of this document. Please fax or mail your comments and suggestions to the attention of:

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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 no or few consumable parts (chemicals, toner, gas, paper).

Our products are low energy consuming products.

### **Waste handling:**

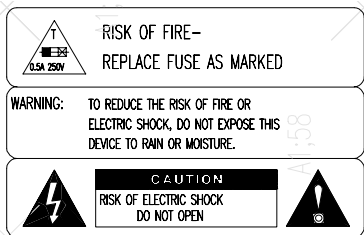
There is need to send material back to TANDBERG. Please contact your local dealer for information on recycling the product by sending the main parts of the product for disassembly at local electronic waste stations.

### **Production of products:**

Our factories employ the most efficient environmental methods for reducing waste and pollution by ensuring that the products are recyclable.

## Operator Safety Summary

For your protection, please read these 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.



### Equipment Markings

The lightning flash symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated “dangerous voltages” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.

The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions within literature accompanying the equipment.

### Warnings

**Water and moisture** - Do not operate the equipment under or near water - for example near a bathtub, kitchen sink, or laundry tub, in a wet basement, near a swimming pool or in areas with high humidity.

**Cleaning** - Unplug the apparatus from the wall outlet 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. Install in accordance with the installation instructions. 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.

**Grounding or Polarization** - Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician.

**Power-Cord Protection** - Route the power cord so as to avoid it being walked on or pinched by items placed upon or against it, paying particular attention to the plugs, receptacles, and the point where the cord exits from the apparatus.

**Attachments** - Only use attachments as recommended by the manufacturer.



53125A

**Accessories** - Use only with a cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

**Lightning** - Unplug this apparatus during lightning storms or when unused for long periods of time.

**ISDN cables** - CAUTION - To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

**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.

**Damaged Equipment** - Unplug the apparatus from the outlet and refer servicing to qualified personnel under the following conditions:

When the power cord or plug is damaged or frayed

If liquid has been spilled or 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, or the cabinet has been damaged

If the apparatus fails to operate in accordance with the operating instructions

# Contents

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**NOTE** IMPORTANT  
PLEASE READ THIS  
SECTION  
CAREFULLY FOR  
OPTIMAL SYSTEM  
SET-UP.

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<b>Introduction .....</b>	<b>7</b>
The TANDBERG Gateway .....	10
<b>Installation .....</b>	<b>12</b>
Precautions .....	12
Unpacking .....	12
Installation site preparations .....	13
Rack Mounting (optional) .....	13
Connecting cables .....	14
Gateway Configuration .....	15
Gateway start-up .....	16
Accessing the gateway .....	16
Call Overview .....	17
<b>Using the Gateway .....</b>	<b>17</b>
Dial from ISDN .....	21
Dial from IP .....	24
Manage the Phone Book .....	29
<b>View System Status .....</b>	<b>31</b>
PRI Status .....	31
H.323 Status .....	33
System Information .....	33
Available Resources .....	34
<b>Configure the Gateway .....</b>	<b>35</b>
System Configuration .....	35
IP Configuration .....	40
H.323 Configuration .....	42
Dataport Configuration .....	45
SNMP Configuration .....	46
Miscellaneous Configuration .....	47
Software Upgrade .....	49
File Management .....	50
ISDN Dial In Configuration .....	51

H.323 Services .....	54
Gateway Features .....	57
<b>Appendices .....</b>	<b>59</b>
Appendix 1: Using the file system .....	59
Appendix 2: Declaration of Conformity .....	60
Appendix 3: Capacity .....	61
<b>Index .....</b>	<b>62</b>

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# Introduction

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The TANDBERG Gateway enables sites on IP and sites on ISDN to participate in meetings with each other with the quality and reliability found in all TANDBERG equipment.

## IP Services and Procedures

- Service Prefix.
- Dial Parameters.

New Integrated Expressway™ firewall traversal technology.

New H.235 Authentication at Gatekeeper and Border Controller.

New Alternate Gatekeeper - Increased network reliability.

- Load balance.

New Bridging IP islands - Automatic call setup through two Gateways.

New Receives DTMF tones as audio tones or as control signals (H.245), converted into audio tones on ISDN.

New Possibility to request from the IP side two number 2x64k ISDN Dial-out (H.221)

## ISDN Services

The TANDBERG Gateway offers a variety of ISDN dial-in services:

- Direct Inward Dialing (DID) - The destination endpoint is determined from the dialed ISDN number.
- Interactive Voice Response (IVR) - The destination endpoint can be selected via touch tones.
- Terminal Control Session 4 (TCS-4) - The destination endpoint can be selected by endpoint signaling.
- Hotline/Operator Mode - The destination endpoint is a fixed one.

New Telephone Dial-Ins can be disabled.

New Two number 2x64k ISDN Dial-in - Best interoperability with legacy equipment.

## Security

- Secure Conference<sup>TF</sup> - using standard based AES 128 and DES encryption on IP and ISDN.

New Flexible encryption configuration - Transparent or independent.

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

### **Video Quality**

- Natural Video<sup>TF</sup> which provides 60 fields per second true interlaced picture.
- H.264, H.263 and H.261 video compression.

### **Presentations**

Allows to watch a presenter on one video channel and simultaneously a second video channel (live presentation, document camera and others).

- Duo Video<sup>TF</sup> support.

New Full ITU standard H.239 support.

New The Gateway allows to connect endpoints supporting Duo Video with endpoints supporting H.239 - Automatic conversion.

### **Interoperability**

- Worldwide compatibility with standards-based videoconferencing systems.

## 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 gateway.
- HTTP Web-interface for system management, call management such as call transfer, 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.

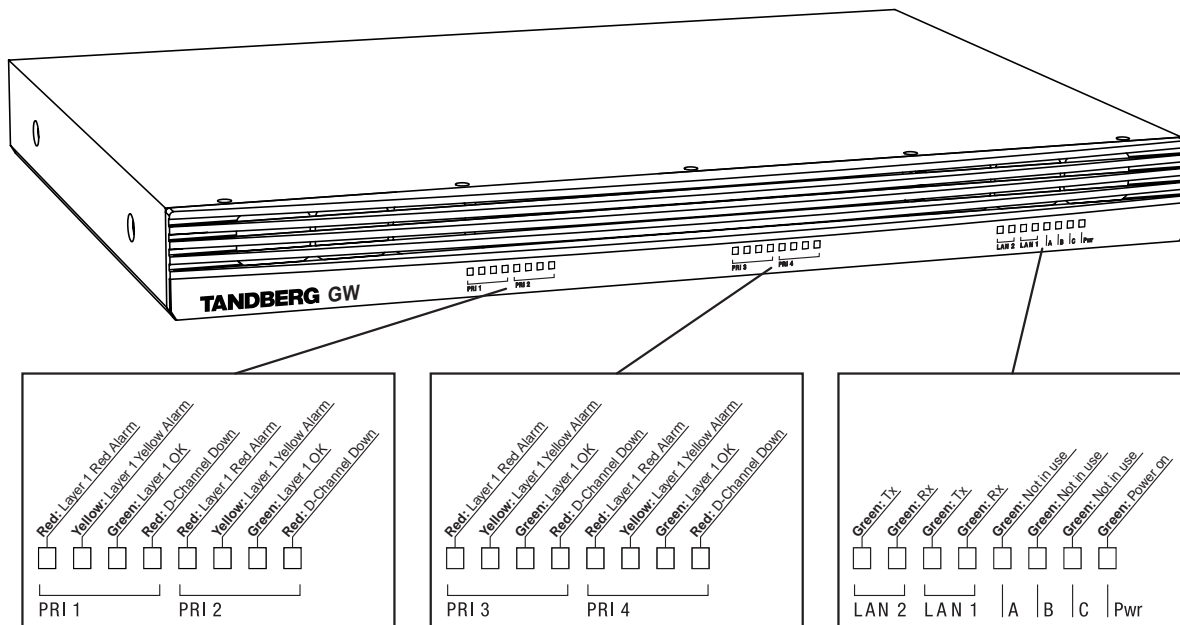
## Network and Features

- Up to 8 video sites and 8 telephony calls can be held at the same time.
- Call rate of up to 2 Mbps for each call is supported through the gateway.
- A maximum of 4 Mbps (2 Mbps standard) ISDN bandwidth is supported through the gateway.
- Downspeeding<sup>TF</sup> - Optimizes the end-to-end bandwidth automatically for the available network condition.
- Full H.243 Multipoint Control Unit (MCU) transparency, for seamless MCU connection through the gateway.
- Intelligent Packet Loss Recovery (IPLR).
- Far End Camera Control.
- Text Chat (T.140).

# The TANDBERG Gateway

## Front view

The front of the gateway contains 24 Light Emitting Diodes (LEDs) organized in three groups. These diodes provide information about PRI-line status, LAN (Ethernet) connection and power.

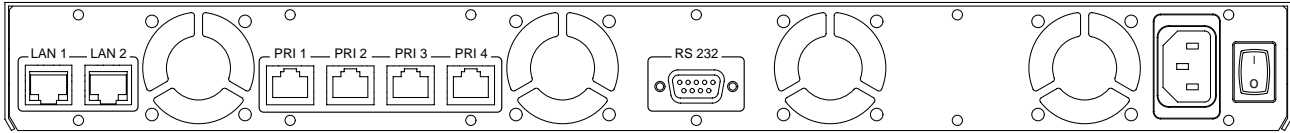


**Red Alarm** or Loss of signal (LOS) indicates that there is no signal and thus no framing info received. The same effect will be obtained by pulling out the PRI cable. This may also be caused by a broken connector in the receive (RX) part of the cable.

**Yellow Alarm** or Remote Alarm Indicator (RAI) means that the gateway is receiving framing info, but in this framing info the other side tells the 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.

## Rear view

The back panel provides four PRI interfaces, two LAN interfaces and one RS 232 interface located together with the power switch/connector and four cooling fans.




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**NOTE** THE 'LAN 2' CONNECTOR IS NOT USED.

---

## GATEWAY Capacity – typical scenarios (4 Mbps option)

Below is an overview of the number of video calls possible to connect on different bandwidths, when 2xE1 (or 3xT1) PRI ISDN lines are connected. In addition to the video calls, telephone calls can also be made through the gateway.

Bandwidth	Non-encrypted	Encrypted
128 kbps	8+8*	7+0
256 kbps	8+7	6+5**
384 kbps	8+4	5+5
512 kbps	7+4	5+0
768 kbps	5+0	3+8
1472 kbps (1.5 Mbps)	2+8	N/A
1920 kbps (2 Mbps)	2+0	N/A

\* 8+8 indicates 8 video calls and 8 telephone calls.

\*\* 6+5 indicates 6 encrypted video calls and 5 unencrypted telephone calls.

---

**TIP** FOR MORE DETAILS ON CAPACITY, SEE 'APPENDIX 3: CAPACITY'

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# 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, the product should be installed in the following manner:
  - Use the enclosed rack brackets marked "NEBS".
  - There should be a clearance of 9.1cm between the product and any other product mounted in the rack.

## Unpacking

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

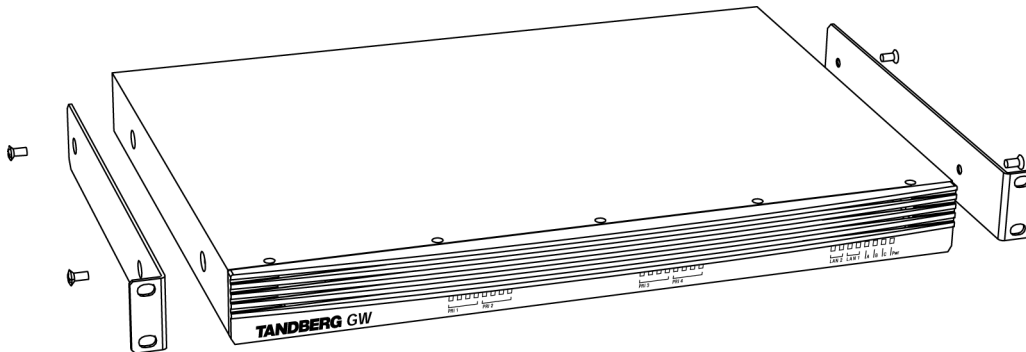
- TANDBERG GW.
- User Manual and other documentation on CD.
- Rack-ears, screws and screwdriver.
- Cables:
  - Power cable
  - Four ISDN PRI cables
  - Ethernet cable
  - RS232 cable

## Installation site preparations

- Make sure that the gateway is accessible and that all cables can be easily connected.
- For ventilation: Leave a space of at least 10cm (4 inches) behind the gateway's rear panel and 10cm (4 inches) in front of the front panel.
- The room in which you install the 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 gateway.
- Do not place hot objects directly on top, or directly beneath the gateway.
- Use a grounded AC power outlet for the gateway.
- You will need a CSU (Channel Service Unit) between your system and the PRI line from your network provider.

## Rack Mounting (optional)

The gateway comes with brackets for mounting in standard 19" racks.



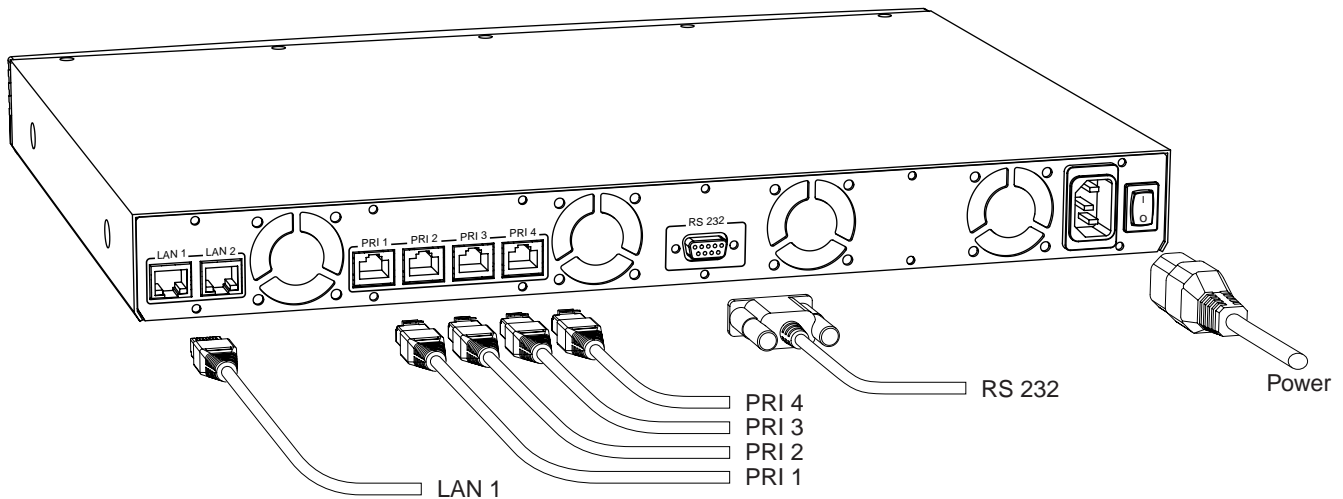
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**NOTE** BEFORE STARTING THE RACK MOUNTING, PLEASE MAKE SURE THE TANDBERG GW IS PLACED SECURELY ON A HARD, FLAT SURFACE.

---

1. Disconnect the AC power cable.
2. Make sure that the mounting space is according to the 'Installation site preparations' (see above).
3. Attach the brackets to the gateway on both sides of the unit.
4. Insert the gateway into a 19" rack, and secure with screws in the front (four screws).

## Connecting cables



### Power cable

Connect the system power cable to an electrical distribution socket.

### ISDN PRI cables

For each of the four PRI interfaces, the E1/T1 cable should be connected to a CSU (Channel Service Unit). You will need a CSU between your gateway and the PRI line from your network provider.

### LAN cable

To use the gateway on IP, connect a LAN cable from the 'LAN 1' connector on the gateway to your network. The LAN 2' connector is not used and should be left open.

### RS 232 cable

To control the gateway using the dataport, connect an RS 232 cable between the gateway's RS 232 connector and the COM-port on a PC. For further information, please refer to the 'Dataport' chapter in 'Configure the Gateway'.

## Gateway Configuration

The gateway requires some basic configurations before it can be used. It will be necessary to find the IP-address and program the ISDN-PRI Line numbers.

To do this configuration, follow the instructions below:

1. Connect the RS232 cable between the gateway and a PC and then switch on the gateway.
2. Start a terminal program on the PC and configure it to: 9600, 8, 1, None.
- 3a. To assign a static IP-address, type 'ipassign static' and 'ipaddress 1 static <IP-address>'.
- 3b. To assign an IP Subnetmask, type 'ipaddress 1 subnetmask <subnetmask>'.
- 3c. To assign an IP Gateway address, type 'ipaddress 1 gateway <gateway IP-address>'.
4. Restart the gateway.

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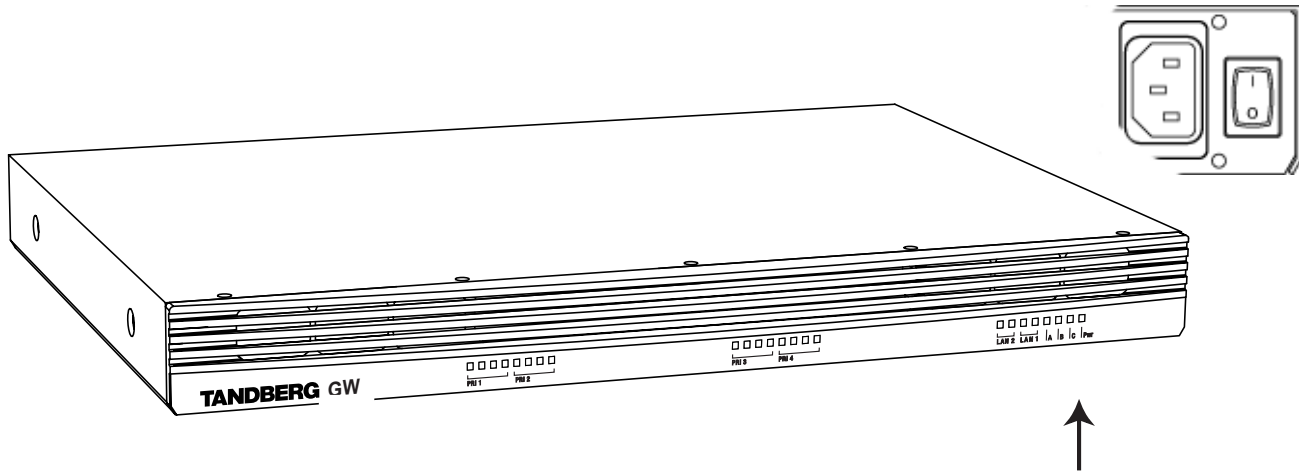
**TIP** DHCP ASSIGNED IP-ADDRESSES ARE SUPPORTED BY THE TANDBERG GATEWAY (FACTORY DEFAULT).

---

5. Start a WEB browser and enter the IP-address of the gateway. Default password: 'TANDBERG'.
6. To configure the gateway for ISDN dial in, enter PRI numbers and dial in number(s). For details, see the 'PRI Configuration' and the 'ISDN Dial in Configuration' section.
7. To configure the gateway for IP dial in, register the gateway to a gatekeeper and enter H.323 services. For details, see the 'H.323 Services' and 'H.323 Configuration' sections.

## Gateway start-up

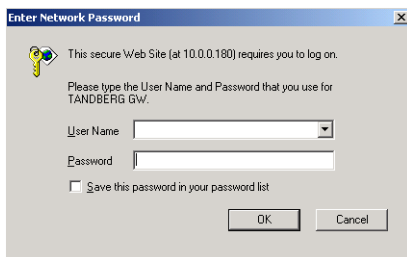
To start the gateway, please make sure that the power cable is connected, and press the power switch button to '1'.



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

## Accessing the gateway

You may access the gateway by entering the IP-address of the gateway in a standard WEB-browser. You will then be asked to enter a password. It is not necessary to enter 'User Name'. The default password for the gateway is 'TANDBERG'. Remember that the password is case sensitive.




---

**TIP** IF YOU DO NOT KNOW THE IP-ADDRESS, PLEASE FOLLOW THE PROCEDURE IN 'INSTALLATION', 'SYSTEM CONFIGURATION'.

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**TIP** THE PASSWORD CAN BE CHANGED IN 'SYSTEM CONFIGURATION', 'MISC'. SEE ALSO THE 'CONFIGURE MISCELLANEOUS PARAMETERS' SECTION IN 'CONFIGURE THE GATEWAY'.

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# Using the Gateway

## Call Overview

The following Web-page, called '**Overview**' will be shown when the correct password has been entered and shows all calls currently active through the gateway.

The screenshot displays the 'Overview' page of the Tandberg Gateway. The page has a navigation bar with tabs for 'Overview', 'Phone Book', 'System Status', 'System Configuration', and 'Gateway Configuration'. The 'Overview' tab is selected. Below the navigation bar, there is a table of active calls and several status panels.

GW Calls	Source	Destination	Duration	Actions
Status	Number Net Encryption	Status Number Net Encryption		
1: <a href="#">Active Call</a>	Connected 67828674 Telephone —	Connected, speech 99844 H.323 —	29m. 21s.	
2: <a href="#">Active Call</a>	Connected, 253 kbps 10.0.6.88 H.323  (AES 128)	Connected, 256 kbps 067126000 ISDN  (AES 128)	21m. 1s.	
3: <a href="#">Active Call</a>	Connected, 376 kbps 10.0.6.76 H.323  (AES 128)	Connected, 384 kbps 067828615 ISDN  (AES 128)	15m. 2s.	
4: <a href="#">Active Call</a>	Connected, 183 kbps 10.0.6.91 H.323  (DES)	Connected, 192 kbps 067828618 ISDN  (DES)	12m. 5s.	
5: <a href="#">Active Call</a>	Connected, 128 kbps 67828614 ISDN —	Connected, 114 kbps 97222 H.323 —	5m. 21s.	
6: <a href="#">Active Call</a>	Connected, 384 kbps 67828664 ISDN —	Connected, 371 kbps 99690 H.323 —	2m. 50s.	
7: <a href="#">Active Call</a>	Connected, 384 kbps 67828685 ISDN  (DES)	Connected, 376 kbps 99681 H.323  (DES)	0m. 46s.	
8: [Idle]				

Below the table, there are four panels:

- Status:** Shows 'PRI' and 'H.323' with green checkmarks and 'more...' links.
- Usage:** A progress bar showing 90% resource usage and a warning that H.323 is busy on load > 70%.
- ISDN Numbers:** A table listing IVR (6935), Hotline (6936), and DID (Disabled).
- H.323 Numbers:** A table listing Video (531) and Speech (530).

## GW Calls

Shows each active call through the gateway.

**[Idle]** No call is active.

**[Active Call](#)** A call is active. Click on [Active Call](#) to see call info in details.

## Source / Destination

Source shows the Status of the incoming call to the gateway, the number and which network the incoming call is using.

Destination shows the Status of the outgoing call from the gateway, the number and which network the outgoing call is using.

<b>Idle</b>	No active call, call been disconnected.
<b>Alerting</b>	Call is being connected.
<b>Connected</b>	Call is connected.
<b>Establish out</b>	Gateway is calling out to destination.
<b>Clear out</b>	Call is being disconnected.
<b>Number</b>	ISDN or IP number.
<b>ISDN</b>	Call connected is using the H.320 protocol over ISDN.
<b>IP/H.323</b>	Call connected is using the H.323 protocol over IP.

## Encryption (Secure conference<sup>TF</sup>)

The gateway supports Secure Conference DES and AES.



The open padlock symbol indicates that the encryption is being established.



The single padlock symbol indicates that DES (56 bit) encryption is used.



The double padlock symbol indicates that AES (128 bit) encryption is used.



Indicates that the call is not encrypted.

## Duration

Shows the length of the current call.

---

**NOTE** ENABLING ENCRYPTION WILL REDUCE THE CAPACITY OF THE GATEWAY.

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## Actions

When a call is active, the Administrator or Operator has the possibility to disconnect the call, or transfer the call from one IP endpoint to another.

### Disconnect Gateway Call



Will disconnect the selected gateway call. A confirmation window will be shown.

### Call Transfer



Will open the H.323 Call Transfer window. Here the Administrator or Operator can select an IP entry from the Phone Book or enter a H.323 Alias/IP address and transfer the H.323 (IP) call to another IP endpoint. If the transfer fails, the call will be disconnected.

## Status

Shows current status on the PRI and IP status.

### PRI:



Minimum one PRI line is synced and active. Click on [More...](#) to see status in detail.



No PRI lines are active. Click on [More...](#) to see status in detail.

### IP/H.323:



The gateway is registered with a Gatekeeper. Click on [More...](#) to see status in detail.



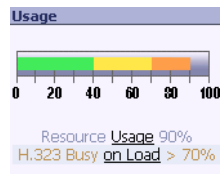
The gateway is not registered with a Gatekeeper. Click on [More...](#) to see status in detail.

If encryption mode is set to “Independent”, then a warning is shown in the Status area.

## Usage

The usage bar shows the current status of all the available resources (CPU, ISDN channels and number of calls)

When the Resource Usage reaches the “Busy on Load”-limit, the gateway will try to route outgoing IP calls to other gateways. This is done to maintain availability for incoming ISDN calls when using multiple gateways.



Resource Usage 90%. Click on Usage to see resource usage in detail.

H.323 Busy on Load> 70%. Click on on Load to adjust the value.

## ISDN Numbers

Shows the available ISDN dial-in numbers for IVR, TCS-4, DID and Hotline.

---

**TIP** FOR MORE INFO ABOUT IVR, HOTLINE OR DID, PLEASE READ THE 'DIAL FROM ISDN' SECTION IN 'USING THE GATEWAY'.

---

## H.323 Numbers

Shows the available H.323 Services (dial-out prefixes) for accessing/dialing the ISDN network.

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**TIP** FOR MORE INFO ABOUT H.323 SERVICES, PLEASE READ THE 'DIAL FROM IP' SECTION IN 'USING THE GATEWAY'.

---

## Dial from ISDN

The gateway supports four different ISDN Dial In services:

- IVR
- IVR + TCS4
- DID
- Hotline

---

**TIP** FOR MORE DETAILS ON ISDN DIAL IN SERVICES, SEE 'ISDN DIAL IN CONFIGURATION' UNDER 'CONFIGURE THE GATEWAY'.

---

Any of these services can be enabled or disabled, but at least one must be enabled for incoming call routing to take place.

In order to enable parallel incoming calls, a PRI number range must be defined.

### IVR

Interactive Voice Response (IVR), also called extention 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 Alias or extention.

IVR is useful if you have limited PRI numbers on your PRI line.

*Example:*

- A videoconferencing system calls into the Extention Dial In number with IVR active.
- The gateway activates the 'Welcome' picture and sound.
- The videoconferencing system enters the extention (H.323 Alias) followed by the # (pound-sign) to indicate end of number.
- The gateway starts to call the IP endpoint and the "Call proceeding" picture and sound are activated.
- When the call is connected audio and video are transmitted through the gateway.



---

**TIP** THE WELCOME PICTURE AND SOUND CAN BE CHANGED IN THE 'FILE MANAGEMENT' SECTION IN 'CONFIGURE THE GATEWAY'.

---

## IVR + TCS-4

IVR + Terminal Control Session 4 (TCS-4) is an extension dial-in method that combines IVR with TCS-4. In this mode the extension number can be indicated with IVR (see above) or TCS-4 signaling.

TCS-4 allows an ISDN based videoconferencing endpoint to dial an IP endpoint directly, without having to (manually) enter the extension number by DTMF. If no TCS-4 extension is given from the endpoint, then IVR will be used.

To use TCS-4, it needs to be supported by the videoconferencing endpoint. Refer to the User Manual of the videoconferencing endpoint to see how TCS-4 is supported.

### *Example:*

- A videoconferencing endpoint calls into the Extension Dial In number with IVR + TCS-4 active, using <Dial In number of gateway>\*<party's extension>.
- The gateway starts to call the IP endpoint and the "Call proceeding" picture and sound are activated.
- When the call is connected audio and video are transmitted through the gateway.
- TANDBERG endpoints allow to store the complete dial string in the phonebook to automate dial-through.

---

**NOTE** THE '\*' IS SPECIFIC TO TANDBERG ENDPOINTS. OTHER VENDORS WILL HAVE DIFFERENT METHODS OF ENTERING THE TCS-4 EXTENSION.

---

## DID

Direct Inward Dialing (DID) will provide you with direct ISDN numbers for your IP endpoints. I.e. it will do a direct mapping between your ISDN number and the H.323 Alias.

In order to use DID you will need to have assigned multiple ISDN numbers to your ISDN PRI line, as each ISDN number will map to a single IP endpoint.

We also recommend that if more than one PRI line is used all PRI lines should have the same numbers (use trunk groups).

### *Example:*

- Your ISDN PRI number range is from 67124000 to 67124050 and DID is enabled.
- You want your IP endpoints to have the numbers (H.323 Alias) in the range 94000 - 94050.
- In the ISDN Dial In Configuration, set 'No. Significant Digits' to 4 and 'Prefix (E.164)' to 9.
- To call an IP endpoint with H.323 Alias 94020 from ISDN, dial the ISDN number 67124020.

- The gateway starts to call the IP endpoint and the “Call proceeding” picture and sound are activated.
- When the call is connected audio and video are transmitted through the gateway.

## Hotline

Hotline is a service that allows incoming ISDN calls on a dedicated ISDN number, to be routed to an IP endpoint. This is useful if you want to have an operator or helpdesk functionality together with DID, IVR and/or TCS-4.

### *Example:*

- Your ISDN PRI number range is from 67124000 to 67124050 and DID is enabled.
- Hotline number assigned is 67124050.
- An operator/helpdesk has got the H.323 Alias (extention) 98660.
- A videoconferencing endpoint calls ISDN number 67124050.
- The gateway starts to call the IP endpoint and the “Call proceeding” picture and sound are activated.
- When the call is connected audio and video are transmitted through the gateway.
- If needed, the Hotline operator can use Call Transfer to transfer the call to another IP endpoint.

## Sequence of Services

To ensure best service to the incoming ISDN call, the gateway will first try to match the Hotline number, and then the IVR/TCS-4 number before using DID (if enabled). If DID is disabled and no other number programmed, the call will be routed to the IVR service (if enabled).

## Dial from IP

IP endpoints and MCUs can call out through the gateway by using one of the H.323 services defined on the gateway.

### H.323 Services

H.323 Service prefixes are used for IP endpoints to access the ISDN network. Up to twenty prefixes can be defined, but we recommend using one single prefix for simplicity.

*Example:*

- An H.323 Service prefix for outgoing video calls is defined as “0” (default).
- The IP endpoint dials 067121212 to dial the ISDN number 67121212.
- The gateway starts to call the ISDN endpoint and the “Call proceeding” picture and sound are activated.
- Audio and video are transported through the gateway when the call is connected.

---

**NOTE** DEFAULT H.323 SERVICE FOR OUTGOING VIDEO CALLS IS ‘0’.  
DEFAULT H.323 SERVICE FOR TELEPHONE CALLS IS ‘1’.

---



---

**NOTE** THE BANDWIDTH USED FOR THE CALL WILL BE THE BANDWIDTH SELECTED ON THE IP ENDPOINT.

---

---

**TIP** FOR MORE DETAILS ON H.323 SERVICES, SEE ‘H.323 SERVICES’ UNDER ‘CONFIGURE THE GATEWAY’.

---

## Dial out to 2x64k ISDN (H.221)

For improved interoperability with legacy equipment, the two number 2x64k dial-out method can be selected from the calling IP endpoint instead of using the standard BONDING method.

To instruct the Gateway to use this method, the calling IP endpoint has to combine the dialed number from:

- A Service Prefix offering at least 128k callrate,
- The (first) ISDN number to dial out to,
- Two stars (“\*\*”),
- The second ISDN number to dial out to.

*Example:*

- An H.323 Service prefix for outgoing video calls is defined as “0” (default).
- The user wants to dial the first ISDN number 67121212 and the second number 67121213.
- The user dials to “067121212\*\*67121213”.
- Audio and video are transported through the gateway when the call is connected.

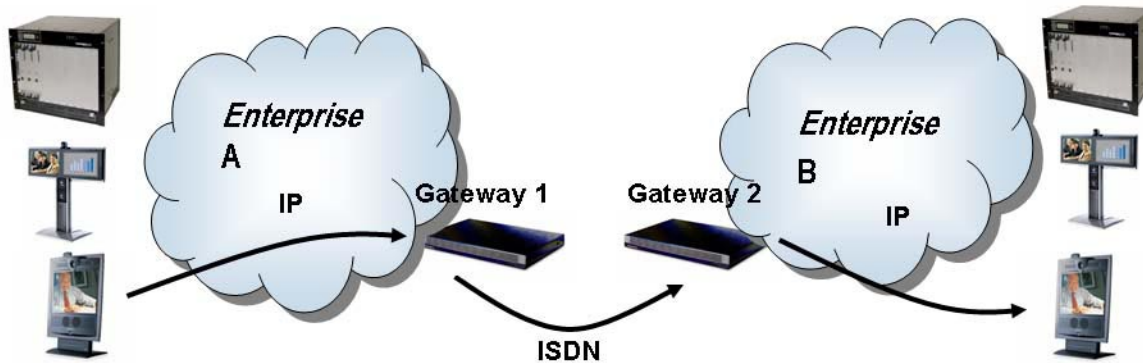
---

**NOTE** NOT ALL ENDPOINTS WILL SEND OUT THE NEEDED NUMBER (INCLUDING THE “\*\*” CHARACTERS). TO MAKE OLDER TANDBERG EQUIPMENT (CLASSIC SERIES, MXP UP TO F2) USING THIS SYNTAX, THE USER HAS TO SELECT H.323 AS THE NETWORK PROFILE TO BE USED. ALSO IF SUCH A NUMBER SHOULD BE STORED IN THE PHONEBOOK, THE H.323 PROFILE HAS TO BE SELECTED EXPLICITLY. SOME ENDPOINTS MIGHT HAVE A LIMITATION ON THE LENGTH OF THE DIAL STRING.

---

## Bridging IP Islands

Organizations that use IP based video conferencing internally in their LAN but not for external purposes can be called “IP Islands”. If a user in one IP island wants to call another user in another IP island, both organizations have to be connected with a Gateway. The TANDBERG Gateway can help the user to set up this type of call automatically without the need of invoking touch tones under call setup.



To dial to a remote IP endpoint through two Gateways, the calling IP endpoint has to combine the dialed number from:

- A Service Prefix at the first Gateway,
- The ISDN number of the second Gateway,
- One star character (“\*”),
- The extension address (E.164 alias) of the endpoint to dial.

---

**NOTE** THE SECOND GATEWAY MUST HAVE TCS-4 DIAL-IN METHOD ENABLED: FOR INFORMATION ABOUT RESTRICTIONS OF THE DIAL STRING, SEE THE NOTE IN THE PREVIOUS SECTION.

---

### Example:

- An H.323 Service prefix for outgoing video calls is defined as “0” (default).
- The second gateway has the ISDN number 67121212.
- The user wants to dial to an endpoint in the other network that has a E.164 alias 5012345.
- The user dials to “067121212\*5012345”.
- The user will get displayed poster from the first, then from the second Gateway.
- Audio and video are transported through the gateway when the call is connected.

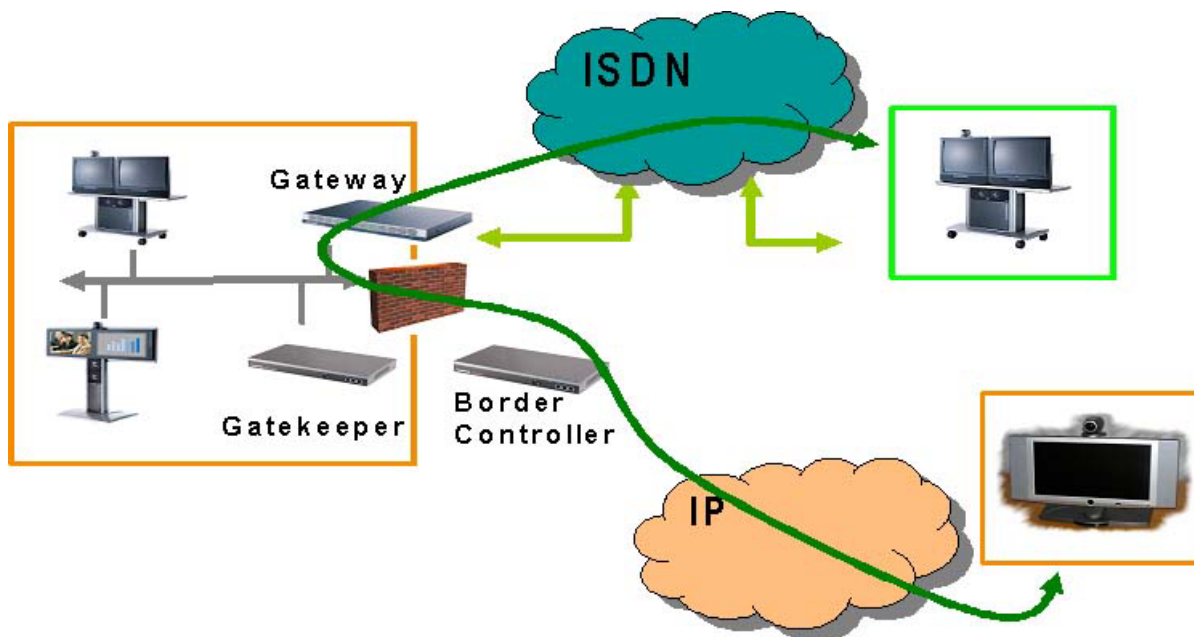
## The Expressway Solution

IP based video conferencing between organizations has been hindered by two major barriers:

- Firewalls which block audio and video traffic.
- Lack of a common dial plan for IP based video conferencing.

The Expressway solution solves both the firewall problem and the dial plan problem. Using Expressway, audio and video can traverse firewalls securely. Expressway is natively supported in the TANDBERG Gateway.

As part of an Expressway solution, a Gateway can be made accessible to e.g. home users and branch offices, reducing the need to deploy ISDN at all locations.



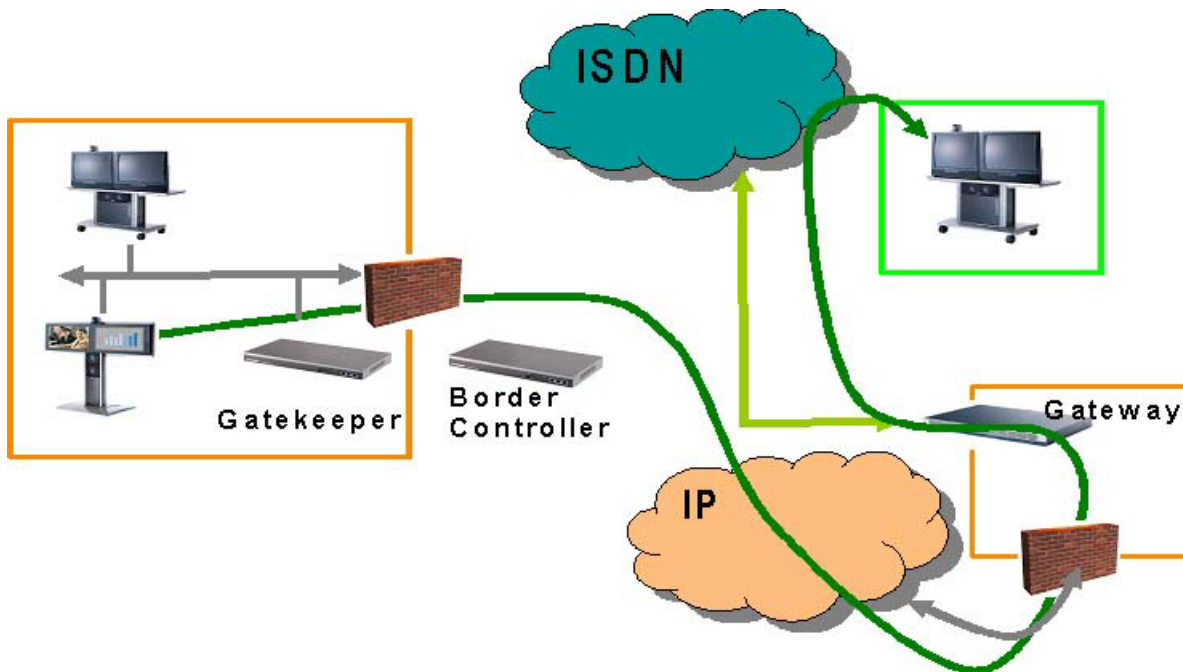
Users on IP in home offices or branch offices can now use all the features of the enterprise Gateway and can be reached by ISDN systems.

In a typical enterprise setup, such as the one in the previous figure, the Gateway is registered with a Gatekeeper, and the Gatekeeper is registered with the Border Controller. In this scenario, the native Expressway functionality in the Gateway enables media to be routed directly between the Gateway and the Border Controller, reducing latency.

The native Expressway support in the Gateway also enables the Gateway to register directly to a border controller through a firewall without the need for a Gatekeeper. Connecting the Gateway directly to a Border Controller enables new deployment possibilities, e.g.:

- An organization may want to have a firewall between the Gateway and the rest of the IP video conferencing infrastructure to add another layer of security.
- An organization may want to deploy Gateways at remote locations.

The figure below shows a scenario where IP is used between the enterprise and a remote location.

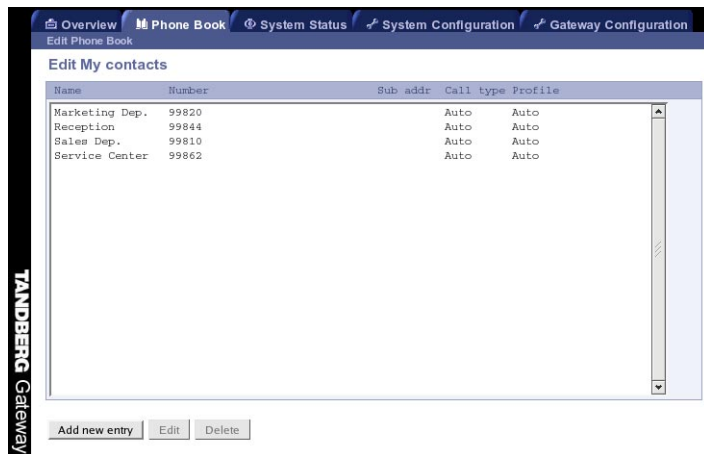


In this scenario, enterprise users can use a remotely deployed Gateway to do local calls on ISDN.

## Manage the Phone Book

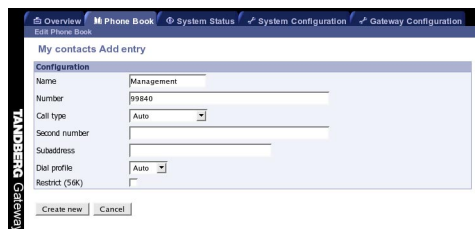
By selecting the '**Phone Book**' tab, you can add new or edit existing Phone Book entries in the gateway.

The Phone Book can be used when Transferring calls from one IP endpoint to another and can contain up to 99 single entries. They are listed alphabetically as can be seen in the figure below.



### Add new entry

To add a new entry in the Phone Book, press the 'Add New Entry' button and the 'Add New Entry' will open, as shown in the figure below.

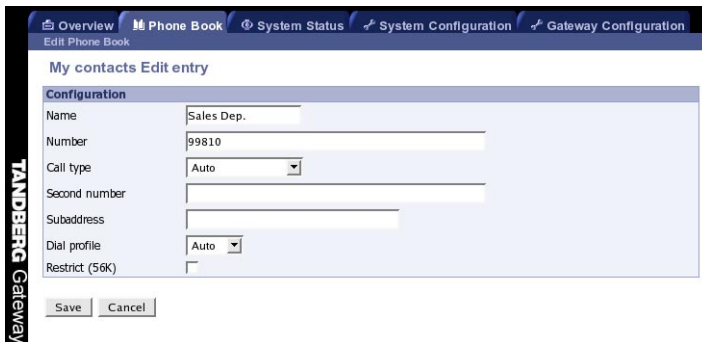


**Name** Name of the IP endpoint.  
**Number** IP number (E.164 Alias) of the IP endpoint.

Press '**Create New**' to save the entry in the phone book.

## Edit Entry

By selecting an existing Entry in the Phone Book and then pressing the '**Edit**' button, you will be able to edit the selected entry. The same fields as for the '**Add New Entry**' will be available.



The screenshot shows the 'Edit Entry' form in the TANDBERG Gateway interface. The form is titled 'My contacts Edit entry' and is part of the 'Edit Phone Book' section. The 'Configuration' section contains the following fields:

Name	Sales Dep.
Number	99810
Call type	Auto
Second number	
Subaddress	
Dial profile	Auto
Restrict (56K)	<input type="checkbox"/>

At the bottom of the form, there are two buttons: 'Save' and 'Cancel'.

### Save

The entry will be updated with the changes made.

### Create New

This will create a new entry instead of replacing the old one. The old entry will still be stored in the Phone Book.

### Cancel

Will discard all changes and display the '**Edit Phone Book**' page.

### Delete

By selecting an existing Entry in the Phone Book and then pressing the '**Delete**' button, you will delete the selected entry.

# View System Status

To view current gateway status, open 'System Status' as shown in the figure below.



## PRI Status

To view status of the PRI, open 'PRI Status' as shown in the figure below.

The screenshot shows the 'PRI Status' page. The navigation bar is the same as in the previous image. Below the navigation bar, the page title is 'PRI Status'. The main content is a table with four columns representing PRI 1, PRI 2, PRI 3, and PRI 4. Each column has a header indicating the status of the PRI (e.g., 'OK 27 of 30', 'Red Alarm 0 of 0'). The table lists 31 channels for each PRI, with their status (idle or active) and, if active, a cause code.

PRI 1 OK 27 of 30	PRI 2 OK 5 of 30	PRI 3 Red Alarm 0 of 0	PRI 4 Red Alarm 0 of 0
1: idle	1: idle	1: idle	1: idle
2: idle	2: idle	2: idle	2: idle
3: idle	3: idle	3: idle	3: idle
4: idle	4: idle	4: idle	4: idle
5: idle	5: idle	5: idle	5: idle
6: idle	6: active 67828685	6: idle	6: idle
7: idle	7: active 67828685	7: idle	7: idle
8: idle	8: active 67828685	8: idle	8: idle
9: idle	9: active 67828685	9: idle	9: idle
10: idle	10: active 67828685	10: idle	10: idle
11: idle	11: active 67828685	11: idle	11: idle
12: idle	12: active 67828664	12: idle	12: idle
13: idle	13: active 67828664	13: idle	13: idle
14: idle	14: active 67828664	14: idle	14: idle
15: idle	15: active 67828664	15: idle	15: idle
16: D-Channel	16: D-Channel	16: D-Channel	16: D-Channel
17: idle	17: active 67828664	17: idle	17: idle
18: idle	18: active 67828664	18: idle	18: idle
19: idle	19: active 67828614	19: idle	19: idle
20: idle	20: active 67828614	20: idle	20: idle
21: idle	21: active 067828618	21: idle	21: idle
22: idle	22: active 067828618	22: idle	22: idle
23: idle	23: active 067828615	23: idle	23: idle
24: idle	24: active 067828615	24: idle	24: idle
25: idle	25: active 067828615	25: idle	25: idle
26: idle	26: active 067828615	26: idle	26: idle
27: idle	27: active 067828615	27: idle	27: idle
28: idle	28: active 067126001	28: idle	28: idle
29: active 067828618	29: active 067126001	29: idle	29: idle
30: active 067828615	30: active 067126000	30: idle	30: idle
31: active 067126000	31: active 67828674	31: idle	31: idle

If a site has been disconnected, the cause code can be viewed by pressing the link next to the PRI channel that was disconnected. See next page for a cause code example.

## Example of Location Codes:

A videoconferencing endpoint was connected to channel 1 and 2 on PRI Line 1. The status shows disconnected with the cause code 2 : 16. The first part ( 2 ) is the Cause Location code and describes the origin of the cause code.



### Location Code 0 - User

#### Location Code 1 - Private network serving the local user

Note; depending on the location of the users, the local public network and remote public network may be the same network.

#### Location Code 2 - Public network serving the local user

Note; depending on the location of the users, the local public network and remote public network may be the same network.

## Example of ISDN Cause Codes:

The second part ( 16 ) describes the reason for the disconnect. In this case, a normal call clearing.



### Cause No. 16 - Normal Call Clearing

This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared.

#### Cause No. 16/4 or 17 - User Busy

This cause is used when the called user has indicated the inability to accept another call. This cause code may be generated by the called user or by the network. Please note that the use equipment is compatible with the call.

#### Cause No. 16/3 or 18 - No User Responding

This cause is used when a called party does not respond to a call establishment message with either an alerting or connect indication within the prescribed period of time allocated (in Q.931 by the expiry of either time T303 or T310).

## PRI Alarms

**Red Alarm** or Loss of signal (LOS) indicates that there is no signal and thus no framing info received. The same effect will be obtained by pulling out the PRI cable. This may also be caused by a broken connector in the receive (RX) part of the cable.

**Yellow Alarm** or Remote Alarm Indicator (RAI) means that the gateway is receiving framing info, but in this framing info the other side tells the 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.

## H.323 Status

To view H.323 gatekeeper status, open 'H.323 Status' as shown in the figure below.

H.323 Status	
Status	
GW IP Address	10.0.0.190
H.323 Gatekeeper Status	Registered 10.0.0.30:1719

**NOTE** IT IS NOT POSSIBLE TO USE THIS IP ADDRESS TO PLACE CALLS THROUGH THE GATEWAY.

### GW IP Address

Shows the IP address of the gateway.

### H.323 Gatekeeper Status

Shows status and IP address of the Gatekeeper, the gateway is registered to. **'Inactive'** means the gateway is not registered to a gatekeeper. **'Registering'** means the gateway is having problems registering with selected gatekeeper.

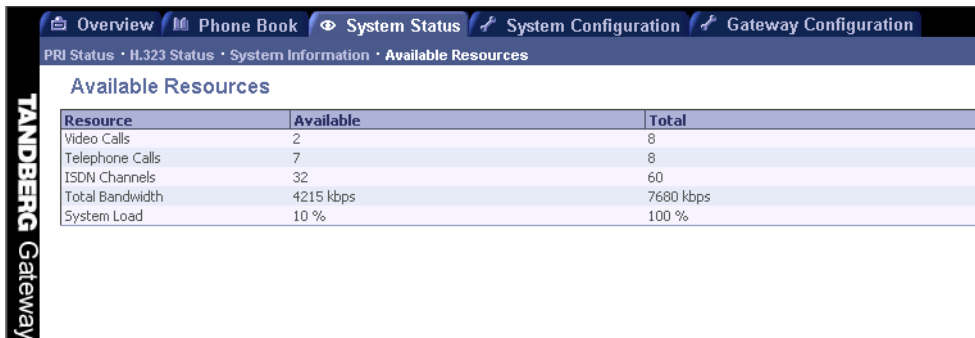
## System Information

To view gateway information, open 'System Information' as shown in the figure below. This page provides information on installed software and hardware.

System Information	
<b>Information</b>	
Software Release:	G3.0
Release Date:	2005-06-30
Boot Software Release:	Rev. 1.3, 2004-01-22
Hardware Serial Number:	00750442
Main Board:	100930 rev. 03
Board Temperature:	32° C / 89° F
Expansion Board:	100940 rev. 02
MAC Address:	00:50:60:00:E3:D6
LAN Speed:	100Mb Full

## Available Resources

To view available resources on the gateway, open 'Available Resources' as shown in the figure below.



The screenshot shows the 'System Status' page of a Tandberg Gateway. The navigation bar includes 'Overview', 'Phone Book', 'System Status' (selected), 'System Configuration', and 'Gateway Configuration'. Below the navigation bar, there are links for 'PRI Status', 'H.323 Status', 'System Information', and 'Available Resources'. The 'Available Resources' section contains a table with the following data:

Resource	Available	Total
Video Calls	2	8
Telephone Calls	7	8
ISDN Channels	32	60
Total Bandwidth	4215 kbps	7680 kbps
System Load	10 %	100 %

# Configure the Gateway

To configure the gateway, open 'System Configuration' and 'Gateway Configuration'. Shown in the figure below is the 'System Configuration'.



## System Configuration

### PRI Configuration

To configure the PRI, select 'System Configure - PRI' as shown in the figure below.

**PRI Configuration**

Configuration				
PRI Protocol	ETSI (Euro ISDN) ▾			
Parallel Dial	<input checked="" type="checkbox"/>			
Sending Complete	<input type="checkbox"/>			
Send Own Number	<input checked="" type="checkbox"/>			
NSF Code Video	<input type="text"/>			
NSF Code Telephony	<input type="text"/>			
PRI Trunk Grouping	<input checked="" type="checkbox"/>			
Interface Configuration				
	PRI 1	PRI 2	PRI 3	PRI 4
Number Range Start	<input type="text" value="4000"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Number Range Stop (inclusive)	<input type="text" value="4020"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
PRI CRC-4	<input type="text" value="On"/> ▾	<input type="text" value="On"/> ▾	<input type="text" value="Off"/> ▾	<input type="text" value="Off"/> ▾
T1 Cable Length	<input type="text" value="0-133ft"/> ▾	<input type="text" value="0-133ft"/> ▾	<input type="text" value="0-133ft"/> ▾	<input type="text" value="0-133ft"/> ▾
Channel Hunting				
Max Channels	<input type="text" value="30"/> ▾	<input type="text" value="30"/> ▾	<input type="text" value="23"/> ▾	<input type="text" value="23"/> ▾
Low Channel	<input type="text" value="1"/> ▾	<input type="text" value="1"/> ▾	<input type="text" value="1"/> ▾	<input type="text" value="1"/> ▾
High Channel	<input type="text" value="31"/> ▾	<input type="text" value="31"/> ▾	<input type="text" value="23"/> ▾	<input type="text" value="23"/> ▾
Search	<input type="text" value="High"/> ▾	<input type="text" value="High"/> ▾	<input type="text" value="High"/> ▾	<input type="text" value="High"/> ▾

**PRI Protocol**

Select between the following PRI protocols:

- ETSI (Euro ISDN)
- National ISDN
- AT&T Custom

All PRI lines must use the same PRI Protocol.

**Parallel Dial**

**On** Channels will be dialed and connected in parallel when setting up a BONDING call.

**Off** Channels will be dialed sequentially, which may increase call setup time.

**Sending Complete**

**On** The system will send the ISDN message information element "Sending Complete".

**Off** The system will not send "Sending Complete".

**Send Own Number**

**On** The system will send its own number to the far end

**Off** The system will not send its own number to the far end, but please note that the network may still send your number to the far end.

**PRI Trunk Grouping**

When Trunk Grouping is enabled, PRI 2, 3 and 4 will use the same number range as specified for PRI 1.

**NSF - Non Standard Facility**

Your network provider may require a service selection in your ISDN configuration. Enter the Service code here.

Valid NSF service codes are from 1 to 31. Enter 0 to disable NSF service codes.

*NSF Example:*

AT&T offers several digital switched services. These include SDN with service code 1 and ACCUNET with service code 6.

<i>Example:</i>			<u>Service profiles for Sprint:</u>	
Below is a list of common service profiles. As these profiles may change, contact your service provider to get the correct profile.			NSF Service	
			Reserved	0
			Private	1
			Inwatts	2
			Outwatts	3
			FX	4
			TieTrunk	5
<u>Service profiles for AT&amp;T:</u>			<u>Service profiles for MCI:</u>	
NSF Service			NSF Service	
Disable	0		VNET/Vision	1
SDN (including GSDN)	1		800	2
Megacom 800	2		PRISM1, PRISMII, WATS	3
Megacom	3		900	4
Accunet		6	DAL	5
Long Distance	7			
International 800	8			
MultiQuest	16			
Call Redirection Service	23			

**Save**

When all settings are entered, please press the 'Save' - button to affect the new settings

## Interface Configuration

This section configures each of the four PRI interfaces individually. There is one column for each PRI Interface. However, if PRI Trunk Grouping is enabled, the number range for PRI 1 will also apply for PRI 2, 3 and 4.

### Number Range Start

The PRI lines connected to the gateway should have at least one number each, to allow dial in from ISDN.

In order for the gateway to handle two or more simultaneous incoming ISDN calls for the ISDN services IVR and TCS-4, it is required to define a PRI number range in addition to the IVR number.

If the PRI line has a range of numbers, the start number must be entered here. Please contact your IT manager to obtain these numbers.

---

**NOTE** THE QUANTITY OF SIMULTANEOUS INCOMING ISDN CALLS IS DEFINED AS PRI NUMBER RANGE MINUS IVR AND HOTLINE NUMBER (IF USED).

---

It is only necessary to enter the digits indicating the range. If the range is 67124000 to 67125000, then just enter 4000. Maximum amount of digits is 24.

### Number Range Stop

Here is where the last number in the PRI number range is entered. If the range is 67124000 to 67125000, then just enter 5000.

### PRI CRC-4

Used for most E1-PRI configurations. If your network equipment does not support this feature, set PRI CRC-4 to Off.

### T1 Cable Length

Specifies the cable length between the gateway and the CSU for each of the PRI lines (only valid for T1 networks). Possible values are:

- 0 to 133 feet
- 133 to 266 feet
- 266 to 399 feet
- 399 to 533 feet
- 533 to 655 feet

## Channel Hunting

Should be used if your PRI is limited e.g.:

- If only channels 1 through 18 are digital, and the rest are analogue. Use Low = 1, High = 18.
- If you have a PRI with only 12 channels. Set Max channel to 12.

### Max Channels

Indicates the maximum number of B-channels the system is allowed to use for each of the PRI-interfaces. For E1 (ETSI/Euro ISDN), the maximum number of channels is 30. For T1 (National ISDN and AT&T Custom), the maximum number of channels is 23.

### 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.

### High Channel

Indicates the highest numbered E1/T1 B-channel the system is allowed to use for each PRI-line when selecting channels for outgoing calls.

### Search

Specifies where the system will start searching for available B-channels for each PRI-line. If 'Search' is set to 'High', the system will start to search for available B-channels at the highest numbered B-channel. If 'Search' is set to 'Low', the system will start searching for available B-channels at the lowest numbered B-channel.

## IP Configuration

To configure the IP settings on the gateway, open 'IP' as shown in the figure below.

The screenshot shows the 'IP Configuration' page of a Tandberg Gateway. The page has a navigation bar at the top with tabs for Overview, Phone Book, System Status, System Configuration, and Gateway Configuration. Below the navigation bar, there are sub-tabs for PRI, IP, H.323, Dataport, SHMP, Misc, Upgrade, and XML. The main content area is titled 'IP Configuration' and contains a section for 'IP Configuration Interface 1'. This section has several fields: 'Assignment' (a dropdown menu set to 'Static'), 'Address' (a text box containing '10.0.0.180'), 'Subnet mask' (a text box containing '255.0.0.0'), 'Gateway' (a text box containing '10.0.0.1'), and 'Ethernet speed' (a dropdown menu set to 'Auto'). To the right of these fields is a grey box with the text: 'For the settings to take effect, the unit must be reset after pressing 'save''. Below the IP Configuration section is a section for 'IP Services' with a field for 'NTP' containing '10.0.0.2'. At the bottom of the page are two buttons: 'Save' and 'Restart'. On the left side of the page, there is a vertical logo that reads 'TANDBERG Gateway'.

### IP Address Assignment

**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 gateway's IP-address and IP-subnet mask must be specified in the IP-address field.

### IP Ethernet Speed

**Auto** The gateway will automatically detect the speed/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.

**Static IP Address**

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

**Static IP Subnet Mask**

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

**Static IP Gateway**

The Static IP Gateway defines the Gateway address. Your LAN administrator will provide the correct value for this field.

**NTP**

The NTP Service defines the address of the NTP server. Your LAN administrator will provide the correct value for this field.

**Save**

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

**Restart**

This button will restart the gateway. Any changes made in IP Configuration and IP Service will then take effect.

## H.323 Configuration

To dial out from IP to ISDN, through the gateway, requires the use of H.323 numbers (E.164 aliases). This means that the gateway must be registered to a Gatekeeper.

The screenshot shows the 'H.323 Configuration' page in the Tandberg Gateway web interface. The page is divided into several sections:

- Gatekeeper Settings:** Includes fields for Gatekeeper (set to 'Gatekeeper'), Gatekeeper IP Address (10.47.9.1), Authentication Mode (Off), Authentication ID, and Authentication Password. A status box below indicates 'H.323 Gatekeeper Registered 10.47.9.1:1719 Status'.
- Quality of Service:** Includes RSVP (Off) and QoS Mode (Precedence).
- QoS Mode Configuration:** A table with columns for 'Precedence' and 'Diffserv'.
 

QoS Mode Configuration	Precedence	Diffserv
Telephone Audio	Auto	0
Telephone Signalling	Auto	0
Videotelephony Audio	Auto	0
Videotelephony Video	Auto	0
Videotelephony Data	Auto	0
Videotelephony Signalling	Auto	0
Type of Service	Off	

A 'Save' button is located at the bottom left of the configuration area.

---

**TIP** H.323 GATEKEEPER STATUS SHOWS CURRENT STATUS OF GATEKEEPER REGISTRATION.

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**NOTE** IF THE GATEKEEPER IS CONFIGURED WITH AN ALTERNATIVE GATEKEEPER, THE STATUS AREA MIGHT REPORT A REGISTRATION TO THE IP ADDRESS OF THE ALTERNATIVE GATEKEEPER.

---

## H.323 Configuration

### Gatekeeper

**Gatekeeper** Enables the gateway to register to a Gatekeeper. The Gatekeeper IP Address must also be filled in. When registered, the H.323 Gatekeeper Status shows Registered, Gatekeeper's IP address and what port used.

Problems with registration will be shown in the Status area and as a Red alarm on the 'Overview' page.

### Direct

No Gatekeeper registration will be performed, hence it is not possible to dial through the Gateway. The H.323 Gatekeeper Status window will show 'Inactive'.

---

## Gatekeeper IP Address

Enter the Gatekeeper IP Address that the gateway should register to.

---

**NOTE** THE GATEWAY MAY BE REGISTERED WITH A BORDER CONTROLLER IN THE SAME WAY IT IS REGISTERED WITH A GATEKEEPER. USE THE IP ADDRESS OF THE BORDER CONTROLLER IN THE GATEKEEPER ADDRESS FIELD.

---

## Authentication Mode

**Off** Register to the Gatekeeper without authentication.

**Auto** Register to the Gatekeeper with H.235 authentication using ID/Password given below.

## Authentication ID, Password

Enter the ID and password required to perform H.235 authentication at the Gatekeeper.

To register to a Gatekeeper that requires authentication, an NTP server has to be configured.

## Quality of Service

The network must support Quality of Service for these settings to work.

## RSVP

**Off** No RSVP Quality of Service is initiated for any connections.

**Auto** Resource Reservation Protocol enables the gateway to request the optimal amount of bandwidth for the duration of an IP video call.

## QoS Mode

**Off** No QoS is used

**Diffserv** Diffserv QoS method is used. Please see 'QoS Mode Configuration' for details.

**Precedence** IP Precedence QoS method is used. Please see 'QoS Mode Configuration' for details.

## QoS Mode Configuration

Diffserv is used to define which priority audio, video, data and signaling packets should have in an IP network. The priority ranges from 0 to 63 for each type of packets.

Precedence is used to define which priority audio, video, data and signaling should have in the network. The higher the number, the higher the priority. The priority ranges from 0 (off) - 7 for each type of packets.

In addition to Precedence, Type of Service can be used and enables the user to define what type of connection that should be chosen for the IP traffic. Helps a router select a routing path when multiple paths are available.

**Off** Service not active.

**Min. Delay** Will choose a route where minimum delay is prioritized.

**Max. Throughput** Will choose the route with highest bandwidth.

**Max. Reliable** Will choose the route with highest reliability.

**Min. Cost** Will choose the route with minimum cost.

## Dataport Configuration

To configure the Data port on the gateway, open 'Dataport' as shown in the figure below.

---

**NOTE** WHEN CONNECTING TO A PC THE CONNECTING CABLE *MUST* BE A STRAIGHT THROUGH RS232 CABLE.

---

Dataport Configuration is used to configure the RS 232 serial port on the gateway. If you want to connect a PC to the dataport, you must ensure that the PC and the gateway are identically configured.

### Configuration

#### Baudrate

Possible values are: 1200 bps, 2400 bps, 4800 bps, 9600 bps, 19200 bps, 38400 bps 56600 bps and 115200 bps.

#### Parity

Select 'None', 'Odd' or 'Even'.

---

**NOTE** THERE ARE NO HARDWARE OR SOFTWARE HANDSHAKE OPTIONS. MAKE SURE THE PC HANDSHAKING IS TURNED **OFF**.

---

#### Databits

Select 7 or 8 databits.

#### Stopbits

Select 1 or 2 stopbits.

#### Save

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

## SNMP Configuration

SNMP (Simple Network Management Protocol) is used for monitoring and configuring different units in a network. The 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.

The screenshot shows the 'SNMP Configuration' page in the TANDBERG Gateway web interface. The page has a dark blue header with navigation tabs: Overview, Phone Book, System Status, System Configuration (selected), and Gateway Configuration. Below the header is a sub-menu with links for PRI, IP, H.323, Dataport, SNMP, Misc, and Upgrade. The main content area is titled 'SNMP Configuration' and contains a form with the following fields:

Mode	On
Community name	public
System contact	IT Department
System location	Server Room
Host IP address[1]	10.0.0.25
Host IP address[2]	255.255.255.255
Host IP address[3]	255.255.255.255

A 'Save' button is located at the bottom left of the form.

**NOTE** THE SNMP COMMUNITY NAME IS CASE SENSITIVE.

### Configuration

#### 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 gateway.

#### SNMP Trap Host (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.

#### 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.

#### Save

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

## Miscellaneous Configuration

To configure the miscellaneous settings on the gateway, open 'Misc' as shown in the figure below.

The screenshot shows the 'Miscellaneous Configuration' page in the Tandberg Gateway web interface. The page has a navigation bar at the top with tabs for Overview, Phone Book, System Status, System Configuration, and Gateway Configuration. Below the navigation bar, there are links for PRI, IP, H.323, Dataport, SNMP, Misc, and Upgrade. The main content area is titled 'Miscellaneous Configuration' and is divided into three sections: Configuration, Password, and Services. The Configuration section has a 'System Name' field with the value 'TANDBERG GW'. The Password section has a 'New Administrator Password' field and a 'Delete Password' checkbox. The Services section has a list of services with checkboxes and dropdown menus: FTP Service (checked), Telnet Service (checked), Telnet Challenge Service (checked) with a 'Port' dropdown set to 57, HTTP Service (checked), HTTPS Service (unchecked), and SNMP Service (dropdown set to On). A message on the right side of the Services section states: 'A restart of the system is necessary for the services settings to take effect (after save)'. At the bottom of the page are 'Save' and 'Restart' buttons.

### Configuration

To change the system name of the gateway, enter the new system name in the '**System Name**'.

### Password

To change the system password of the gateway, enter the new password in the '**New Administrator Password**'.

To delete the existing password, select '**Delete Password**'.

### Services

The different IP services on the gateway - Telnet, Telnet Challenge, HTTP, HTTPS, SNMP and FTP can be independently disabled to prevent access to the system.

In addition, the SNMP Service Read Only/Traps Only will make it possible to read SNMP messages in addition to enable/disable SNMP.

**SNMP Security alert**

This function will notify any Management Application (such as TANDBERG Management Suite) if anyone tries to perform Remote Management on the gateway using an illegal password. The Security alert that is sent to the Management Application will contain information about the IP address and the service (WEB, Telnet, FTP) being used for the attempt.

If TANDBERG Management Suite is used, email notifications or alarms about the attempt can be sent to specified persons.

**Save**

Press '**Save**' and then the '**Restart**'.

# Software Upgrade

Software upgrade is where new software to the gateway can be installed from. It also shows current software version and the gateway's hardware serial number.

Software Upgrade

**System Information**

Software Version	G2.0
Hardware Serial Number	00182422
Installed Options	4 Mbps ISDN
Current Option Key	TFUTPWG

**Software Option**

Bandwidth Option Key

**Enable Option:** Enter the option key to enable 4Mbps bandwidth on ISDN in the Key field and press "Enable Option". The system will validate the key, and if valid a restart would be requested for the new option to take effect.

**Install Software**

Release Key

**Software Upgrade:** Enter the release key in the Key field and press "Install Software". You will be presented with a new page where you select the software package file to upload.

---

**NOTE** TO UPGRADE THE GATEWAY, A VALID RELEASE KEY AND SOFTWARE FILE IS REQUIRED. CONTACT YOUR TANDBERG REPRESENTATIVE FOR MORE INFO.

---

## System Information

### Software Version

Shows the currently installed Software version.

### Hardware Serial Number

This unique identifier number for the gateway must be provided when ordering Software Upgrade.

### Installed Options

Shows the currently installed Options.

### Current Option Key Key

Shows the current Option Key.

## Software Option

### Bandwidth Option Key

Enter the bandwidth option key in the Key field and press 'Enable Option'. The gateway will validate the key, and if valid a restart would be requested for the new bandwidth option to take effect.

## Install Software

### Release Key

Enter the release key in the Key field and press 'Install Software'. You will be presented with a new page where you select the software package file to upload.

## File Management

The File Management allows viewing or changing of pictures and sounds shown to the caller when connecting to the gateway.

File	Type	Upload
<b>Pictures</b>		
Encryption Required Screen	System Default	<input type="text"/> Browse... Upload
Gateway Call Proceeding	System Default	<input type="text"/> Browse... Upload
GW Extension Enquire Screen	User Defined	Delete <input type="text"/> Browse... Upload
Downspeeding In Progress	System Default	<input type="text"/> Browse... Upload
<b>Sounds</b>		
Gateway Welcome	System Default	<input type="text"/> Browse... Upload
Extension Enquire Sound	System Default	<input type="text"/> Browse... Upload
<b>System Settings</b>		
System Parameters	Special File	<input type="text"/> Browse... Upload
Directory	Special File	<input type="text"/> Browse... Upload
<b>Legal File Formats</b>		
Pictures	JPEG (.jpg) files that are not grayscale and non-progressive coded. Recommended maximum size is 352x288.	
Sounds	16bit 8KHz mono Wave (.wav) file.	
System Settings	TANDBERG parameter files.	

---

**NOTE** PLEASE REFER TO THE 'LEGAL FILE TYPES' FIELD AT THE BOTTOM OF THE PAGE FOR INFORMATION ABOUT LEGAL FILE FORMATS.

---

To view/hear the currently installed files, press the name of the 'File' on the left side of the window. The file will then be shown/played. At the bottom of the page, custom file requirements are listed for each of the file-types.

### The following can be specified:

- Encryption Required Picture
- Gateway Call Proceeding Picture
- Gateway Extension Enquire Screen Picture
- Downspeeding In Progress Picture
- Gateway Call Welcome Sound
- Gateway Extension Enquire Sound
- System Parameters
- Directory

To add a new file, press '**Browse...**' to find the file, and then press '**Upload**'.

For each of the customized files, a '**Delete**' button will be added in the '**Type**' column. By pressing '**Delete**', the default file will replace the custom file.

Pressing '**System Parameters**' allow you to do backup and restore the settings on the gateway.

Pressing '**Directory**' allow you to upload a Phone Book to the gateway. The Phone Book is used for the Call Transfer function.

## ISDN Dial In Configuration

The ISDN Dial In Configuration allows you to configure and enable the ISDN services used to access your IP endpoints.

The screenshot displays the 'ISDN Dial In Configuration' page in a web browser. The navigation bar at the top includes 'Overview', 'Phone Book', 'System Status', 'System Configuration', and 'Gateway Configuration'. The page title is 'ISDN Dial In Configuration'. The configuration is organized into three sections:

- Configuration:**
  - Extension Dial In: IVR-TCS4 (dropdown)
  - Dial In Number: 4000 (text input)
  - Dial In Max. Bandwidth: 768 kbps (dropdown)
  - 2nd Number (2x64) (optional): 4002 (text input)
  - Allow Incoming phonecalls: On (dropdown)
- Hotline:**
  - ISDN Number: 4001 (text input)
  - H.323 E.164 Alias: 99844 (text input)
  - Max. Bandwidth: 768 kbps (dropdown)
- Direct Inwards Dialing:**
  - Enabled: On (dropdown)
  - No. Significant Digits: 4 (text input)
  - Prefix (E.164): 9 (text input)
  - Max. Bandwidth: 768 kbps (dropdown)

A 'Save' button is located at the bottom left of the configuration area.

## Configuration

### Extension Dial In

Select between Off, IVR, IVR + TCS-4:

**Off:** Incoming calls will not be allowed, except those specified under Hotline and Direct Inwards Dialing.

**IVR:** Incoming calls will be prompted with the Gateway Extension Enquire Screen and Sound, except those specified under Hotline and Direct Inwards Dialing. The Gateway will wait for DTMF input (touch tones) that specifies the address of the outgoing call.

**IVR + TCS-4:** Incoming calls will be prompted with the Gateway Extension Enquire Screen and Sound, except those specified under Hotline and Direct Inwards Dialing. The Gateway will wait simultaneously for DTMF input (touch tones) and TCS-4 signalling that specifies the address of the outgoing call.

### Dial In Max. Bandwidth

The call rate (bandwidth) for incoming calls will automatically be determined by the endpoint. However, you can use this setting to restrict the call rate for incoming DID/TCS-4 calls.

Calls above the Dial In Max. Bandwidth will be downspeeded to the call rate specified in Dial In Max. Bandwidth.

---

**NOTE** REQUIRE SUPPORT OF DOWNSPEEDING ON THE ENDPOINT.

---

Calls below the Dial In Max. Bandwidth will be connected at the requested call rate.

### Dial In Number

All incoming calls received on this number will use the IVR/TCS-4 service.

### 2nd Dial In Number

This is the second number used for the 2x64k (H.221) dial in method. Most modern equipment used the default BONDING method and don't need the configuration of this number.

### Allow Incoming Phonecalls

Incoming phonecalls can be disabled.

### Hotline

#### ISDN Number

All incoming calls received on this number will be forwarded to the IP endpoint specified in 'H.323 E.164 Alias' field.

#### H.323 E.164 Alias

All incoming calls received to the Hotline ISDN number will be forwarded to this H.323 Alias.

#### Max. Bandwidth

The call rate for incoming calls will automatically be determined by the endpoint. However, you can use this setting to restrict the call rate for incoming Hotline calls.

---

**NOTE** REQUIRE SUPPORT OF DOWNSPEEDING ON THE ENDPOINT.

---

Calls above the Max. Bandwidth will be downspeeded to the call rate specified in Max. Bandwidth.

Calls below the Max. Bandwidth will be connected at the requested call rate.

## Direct Inwards Dialing

When DID is enabled, all incoming calls within the PRI number range will be forwarded to an IP/H.323 endpoint except calls received to the IVR and Hotline ISDN numbers.

### No. Significant Digits

Specify the number of significant digits in the PRI Number range that should be used to generate an H.323 Alias (IP number).

*Example:*

- Your ISDN PRI number range is from 67124000 to 67124050.
- You want your IP endpoints to have the numbers (H.323 Alias) in the range 4000 - 4050.
- Set 'No. Significant Digits' to 4.
- To call an IP endpoint with H.323 Alias 4020 from ISDN, dial the ISDN number 67124020.

### Prefix (E.164)

When receiving an incoming call, a number prefix can be added to the range of digits specified under 'No. Significant Digits'. This is useful where the IP endpoints also use H.323 Prefix for placing calls on IP.

*Example:*

- Your ISDN PRI number range is from 67124000 to 67124050.
- You want your IP endpoints to have the numbers (H.323 Alias) in the range 94000 - 94050.
- In the ISDN Dial In Configuration, set 'No. Significant Digits' to 4 and 'Prefix (E.164)' to 9.
- To call an IP endpoint with H.323 Alias 94020 from ISDN, dial the ISDN number 67124020.

### Max. Bandwidth

The call rate for incoming calls will automatically be determined by the endpoint. However, you can use this setting to restrict the call rate for Direct Inwards Dialing calls.

Calls above the Max. Bandwidth will be downspeeded to the call rate specified in Max. Bandwidth.

---

**NOTE** REQUIRE SUPPORT OF DOWNSPEEDING ON THE ENDPOINT.

---

Calls below the Max. Bandwidth will be connected at the requested call rate.

## H.323 Services

H.323 Service prefixes are used for IP endpoints to access the ISDN network. Up to twenty prefixes can be defined, but we recommend using one single prefix for simplicity.

The screenshot shows the 'H.323 Services' configuration window. The table contains the following data:

Description	Service	Max. Rate	ISDN Prefix	Restrict	Entry
Telephone calls	1	Tlph		Off	
Video call	0	384		Off	

The configuration section at the bottom shows 'Signal Busy on Load' set to 70%.

Default H.323 Services are '0' for Video calls and '1' for Telephone calls. Should other H.323 Services be required, they can be entered here.

### Description

Used to identify the H.323 Service.

### Service

Specifies the gateway service prefix that all IP endpoints must use when dialing from IP to ISDN. There can be up to 20 different H.323 Services.

If you have multiple gateways they should use the same Service prefixes. Then it can be useful to use "H.323 Load Balance" to balance resource usage between the gateways.

**TIP** IF YOU HAVE PROBLEMS DIALING A CONFIGURED H.323 SERVICE, CHECK THAT THE SERVICE PREFIX IS REGISTERED ON THE GATEKEEPER AS A GATEWAY SERVICE. IT COULD ALREADY BE REGISTERED AS ANOTHER SERVICE.

**Max. Rate**

The call rate for outgoing calls will automatically be determined by the call rate used by the endpoint. Use this setting to restrict the call rate for outgoing calls.

Possible configurations are Telephone, 64 kbps, 128 kbps, 192 kbps, 256 kbps, 320 kbps, 384 kbps, 512 kbps, 768 kbps, 1152 kbps, 1472 kbps and 1920 kbps.

We recommend having one service prefix for Video and one for Telephone calls unless Q.931 Speech signaling on IP/H.323 is supported by the endpoint.

**ISDN Prefix**

Can be used as an option to pick specific carriers or "outside"-lines and is automatically added to the ISDN number.

**Restrict**

Select 'Restrict' if the H.323 Service always should force restricted (56k) ISDN calls. If 'Restrict' is not selected, the gateway will dial an unrestricted call and downspeed to 56 kbps if necessary.

**Create New**

When Description, Service, Max. Rate, ISDN Prefix, Restrict (56k) has been entered, press '**Create New**' to activate the new H.323 Service.

**Save Changes**

To modify a H.323 Service, click on it, change the necessary settings and press '**Save Changes**' to activate the new settings.

**Clear**

Press '**Clear**' to empty any entries done under Entry.

**Save**

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

**Signal Busy on Load**

When the Resource Usage reaches the “Busy on Load”-limit, the gateway will try to route outgoing IP/H.323 calls to other gateways. This is done to maintain availability for incoming ISDN calls when using multiple gateways.

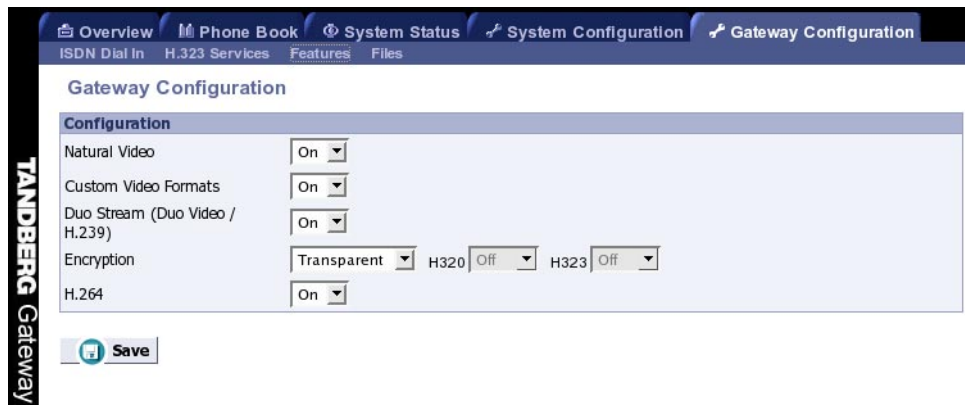
Value can be set from 0% to 100%.

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

## Gateway Features

Experience has shown that some features - even though they are standardized - might cause interoperability problems with legacy video conferencing products. If you disable features on this page, the gateway can be used as a filter to ensure interoperability with legacy products.

To configure the gateway features, open 'Gateway Configuration - Features' as shown in the figure below.



### Natural Video

Allows video formats and capabilities such as interlaced video (iCIF/iSIF) to be transmitted through the gateway. When disabled no interlaced video capabilities will be transmitted.

### Custom Video Formats

Allows H.263 custom video formats and capabilities such as SIF, 4SIF and VGA resolution to be transmitted through the gateway. When disabled no H.263 custom video formats or capabilities will be transmitted.

### Duo Stream (Duo Video / H.239)

Allows an additional video stream to be transmitted through the gateway using Duo Video or the H.239 protocol. When disabled no Duo Video or H.239 capabilities will be transmitted.

## Encryption

The gateway will allow DES and AES 128 encrypted conferences to take place. Encryption can operate in two modes.

---

**NOTE** WHEN 'ENCRYPTION' IS ENABLED, THE CAPACITY OF THE GATEWAY MAY BE REDUCED. SEE APPENDIX 3 FOR MORE INFO.

---

When set to **Transparent**, the Gateway will forward the encryption modes of the connected devices transparently. The encryption modes seen on each side of the Gateway are similar. The gateway will only encrypt calls if both sides support encryption. The settings for H.320 and H.323 doesn't have any meaning in this mode.

When set to **Independent**, the Gateway will use the settings made for the H.320 (ISDN) and H.323 (IP) side. The encryption modes on each side of the Gateway are independent of each other. One endpoint might show that the call is encrypted while the other endpoint shows an unencrypted call.

- On** Encryption is required. Gateway connection is only established if encryption can be established on this side.
- Off** No encryption. Gateway connection will be established without any encryption on this side.
- Auto** Use encryption if available. Gateway will try to establish an encrypted connection, the connection will be established regardless if encryption on this side is available.

A typical application of this feature is when an external crypto device is used on the ISDN interface. In this case might an administrator want to set the Gateway's encryption on the H.320 side to Off and on the H.323 side to On.

## H.264

Allows H.264 video capabilities to be transmitted through the gateway. When disabled no H.264 video capabilities will be transmitted.

## Save

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

---

# Appendices

---

## Appendix 1: Using the file system

It is possible to access a file system within the TANDBERG GATEWAY by using ftp:

DOS-window: ftp <IP-address of gateway>, or

Web-browser: ftp:// <IP-address of gateway>

### Description of the different folders

user	- a folder to be used for custom files, images and audio files etc.
tmp	- not used in the Gateway

### Description of the different files

all.prm	- all settings in the system (including directory)
dir.prm	- directory entries
event.log	- logs fault situations etc.
sw.pkg	- the system software
user/relkeys.v1	- storage for the last used release keys (when upgrading to a newer version)

### What can be done by using the file system?

- upload of custom images
- upload software

## Appendix 2: Declaration of Conformity

### EC DECLARATION OF CONFORMITY

**MANUFACTURER:** TANDBERG  
**TYPE NUMBER:** TTC2-01  
**MODEL NUMBER:** TANDBERG GW  
**DESCRIPTION:** Video Conferencing Equipment  
**DIRECTIVES:** LVD 73/23/EEC  
 This equipment EMC 89/336/EEC  
 complies with. R&TTE 99/5/EEC  
**HARMONISED STANDARDS:** EN 60950 (1999) 3<sup>rd</sup> edition  
 Applied in order to verify EN 55022 : 1994, A1/A2  
 compliance with directives. EN 55024 : 1998  
 EN 61000-3-2 : 1995 A1/A2  
 EN 61000-3-3 : 1995  
 TBR4 Layer 1, 2 and 3

<b>TEST REPORTS/ CERTIFICATES ISSUED BY:</b>		<b>Report/Certificates No.:</b>
LVD (Nemko AS)		200214280
EMC (Nemko AS)		200218144
R&TTE (Comlab)		2002/02826/3 2002/02826/4

**TECHNICAL CONSTRUCTION  
FILE NO.:** D13177  
**YEAR WHICH THE  
CE-MARK WAS AFFIXED:** 2003

**AUTHORISED REPRESENTATIVE**

**Date of issue**

  
**NAME:** PER BAKOGSTAD  
**TITLE:** Executive Vice President

30.05.2003

## Appendix 3: Capacity

### Gateway capacity - calculation

The total capacity in the gateway is defined by the following rules:

- 1) A maximum of 8 video calls and 8 telephone calls.
- 2) Software version defines maximum ISDN bandwidth:
  - 2 Mbps -> Maximum ISDN bandwidth is 1920 kbps (30x64 kbps).
  - 4 Mbps -> Maximum ISDN bandwidth is 3840 kbps (60x64 kbps).
- 3) In addition, each call has a weight depending on bandwidth/encryption:

Bandwidth	Teleph.	64	128	192	256	320	384	512	768	1152	1472	1920
<b>Non-encr.</b>	22	74	80	82	84	88	92	108	124	160	176	220
<b>Encrypted</b>	N/A	106	118	120	122	136	146	168	222	N/A	N/A	N/A

The sum of the call weights cannot exceed 845 and max. bandwidth. Users will be prevented from setting up calls that exceeds these limits.

When encryption mode is set to Independent, the Gateway calls may be weighted as encrypted calls even though on side of the connection might not be encrypted.

#### **Example (4 Mbps version):**

If the gateway has made 3 calls at 768, 2 calls at 384, and 2 encrypted calls at 192 the calculation will be:

$3 \times 124 + 2 \times 92 + 2 \times 120 = 372 + 184 + 240 = 796$ . Since 796 is less than 845 and the total bandwidth 3456 kbps, do not exceed the maximum bandwidth limit, this will be possible.

### Gateway capacity – typical scenarios (4 Mbps version)

Below some typical capacity scenarios are listed. They can be derived by the calculation above:

Bandwidth	Non-encrypted	Encrypted
128 kbps	8+8*	7+0
256 kbps	8+7	6+5**
384 kbps	8+4	5+5
512 kbps	7+4	5+0
<b>768 kbps</b>	<b>5+0</b>	<b>3+8</b>
1472 kbps (1.5 Mbps)	2+8	N/A
1920 kbps (2 Mbps)	2+0	N/A

\* 8+8 indicates 8 video calls and 8 telephone calls.

\*\* 6+5 indicates 6 encrypted video calls and 5 unencrypted telephone calls.

# Index

---

## A

Accessing the gateway 16  
Actions 19  
Add new entry 29  
Authentication 7, 43  
Available Resources 34

## B

Bandwidth Option Key 49  
Battery handling 3  
Baudrate 45  
BONDING 36  
Border Controller 7, 28, 43

## C

Cables 14  
Call Overview 17  
Call Transfer 19  
Capacity 61  
Channel Hunting 39  
Configuration 15  
Configure the Gateway 35  
Connecting cables 14  
Copyright 3  
CRC-4 38  
Current Option Key 49  
Custom Video Formats 57

## D

Databits 45  
Dataport Configuration 45  
Declaration of Conformity 60  
DHCP 40  
Dial from IP 24  
Dial from ISDN 21  
Dial In Max. Bandwidth 52

Dial In Number 52  
Diffserv 43  
Direct Inward Dialing (DID) 22  
Direct Inwards Dialing 53  
Directory 50  
Disconnect Gateway Call 19  
Downspeeding In Progress Picture 50  
Duo Stream (Duo Video / P+C) 57  
Duration 18

## E

Edit Entry 30  
Enable H.264 58  
Encryption 58  
Encryption (Secure conference) 18  
Environmental Issues 3  
ETSI (Euro ISDN) 36, 51  
Example of ISDN Cause Codes 32  
Example of Location Codes 32  
Expressway 7, 27  
Extension Dial In 51

## F

File Management 50  
File system 59  
Firewall Traversal 7, 27  
Front view of gateway 10

## G

Gatekeeper 42  
Gatekeeper IP Address 43  
Gateway Call Proceeding Picture 50  
Gateway Call Proceeding Sound 50  
GATEWAY Capacity 11  
Gateway capacity 61  
Gateway capacity - calculation 61  
Gateway Configuration 15  
Gateway Extension Enquire Screen Picture 50  
Gateway Extension Enquire Sound 50  
Gateway Features 57  
Gateway start-up 16

## H

H.264 58  
H.323 Configuration 42  
H.323 E.164 Alias 52  
H.323 Numbers 20  
H.323 Services 24, 54  
H.323 Status 33  
Hardware Serial Number 49  
High Channel 39  
Hotline 23, 52

## I

Install Software 49  
Installation 12  
Installation site preparations 13  
Installed Options 49, 52  
Interface Configuration 38  
Introduction 7  
IP Address Assignment 40  
IP Configuration 40  
IP Ethernet Speed 40  
IP Gateway 41  
IP Precedence 43  
IP Subnet Mask 41  
IP/H.323 Status 19  
ISDN Dial In Configuration 51  
ISDN Numbers 20  
ISDN Prefix 55  
ISDN PRI cables 14  
IVR 21  
IVR + TCS-4 22

## L

LAN cable 14  
LED 10  
Location 46, 58  
Low Channel 39

## M

Manage the Phone Book 29  
Max Channels 39

Max. Rate 55  
Miscellaneous Configuration 47

## N

National ISDN 51  
Natural Video 40, 57  
No. Significant Digits 53  
NSF - Non Standard Facility 36  
NSF Example 37  
Number Range Start 38  
Number Range Stop 38

## P

Parallel Dial 36  
Parity 45  
Password 16, 47  
Power cable 14  
Power on 16  
Precautions 12  
Prefix (E.164) 53  
PRI Alarms 32  
PRI Configuration 35  
PRI CRC-4 38  
PRI Protocol 36  
PRI Status 19, 31  
PRI Trunk Grouping 36  
Production of products 3

## Q

QoS Mode 43  
QoS Mode Configuration 44  
Quality of Service 43

## R

Rack Mounting (optional) 13  
Rear view of gateway 11  
Red Alarm 32  
Release Key 49  
Resource Reservation Protocol (RSVP) 43  
Restart 48  
Restrict 55  
RS 232 45

RS 232 cable 14

## S

Secure conference 18  
Send Own Number 36  
Sending Complete 36  
Sequence of Services 23  
Services 47  
Signal Busy on Load 56  
Site preparations 13  
SNMP 46  
SNMP Agent 46  
SNMP Community 46, 55, 57  
SNMP Community Name 46  
SNMP Community name 46, 54, 57  
SNMP Configuration 46  
SNMP Manager 46  
SNMP Security alert 48  
SNMP Trap Host 46, 54, 57  
SNMP traps 46  
Software Option 49  
Software Upgrade 49  
Software Version 49  
Sound 50  
Source 18  
Start-up 16  
Static 40  
Static IP Address 41  
Static IP Gateway 41  
Static IP Subnet Mask 41  
Stopbits 45  
System Configuration 35  
System Contact 46, 55, 57  
System Information 33, 49  
System Name 47  
System Parameters 50

## T

T1 38  
T1 Cable Length 38  
The TANDBERG Gateway 10  
Trademarks 3

Type of Service (TOS) 44

## U

Unpacking 12  
Usage 20  
Using the file system 59  
Using the Gateway 17

## V

View System Status 31

## W

Waste handling 3

## Y

Yellow Alarm 32