Panasonic

16-Channel VoIP Gateway Card

Getting Started

Model No. KX-TDA0490

Thank you for purchasing a Panasonic 16-Channel VoIP Gateway Card.
Please read this manual carefully before using this product and save this manual for future use.

Table of Contents

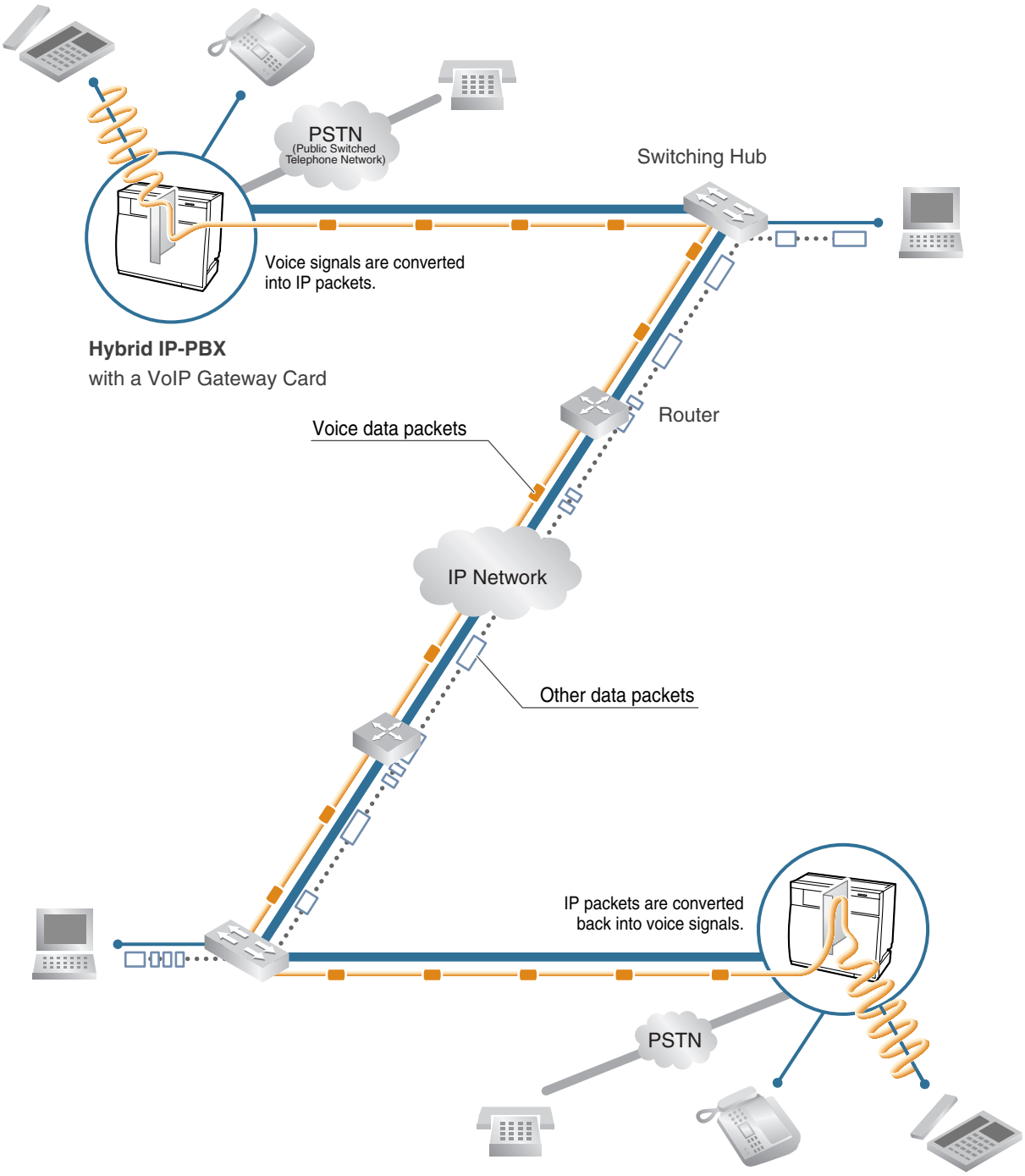
Section 1
Overview

Panasonic PBX with VoIP Gateway Card will allow organisations to route both voice and fax communications over digital data networks.

The VoIP Gateway Card, designed to be easily integrated into existing IP networks, seamlessly bridges Public Switched Telephone Network (PSTN) and analogue telephones with digital data networks without interrupting pre-existing data communications. Because communications do not take place over conventional telephone networks, the high cost of long distance communications is virtually eliminated.

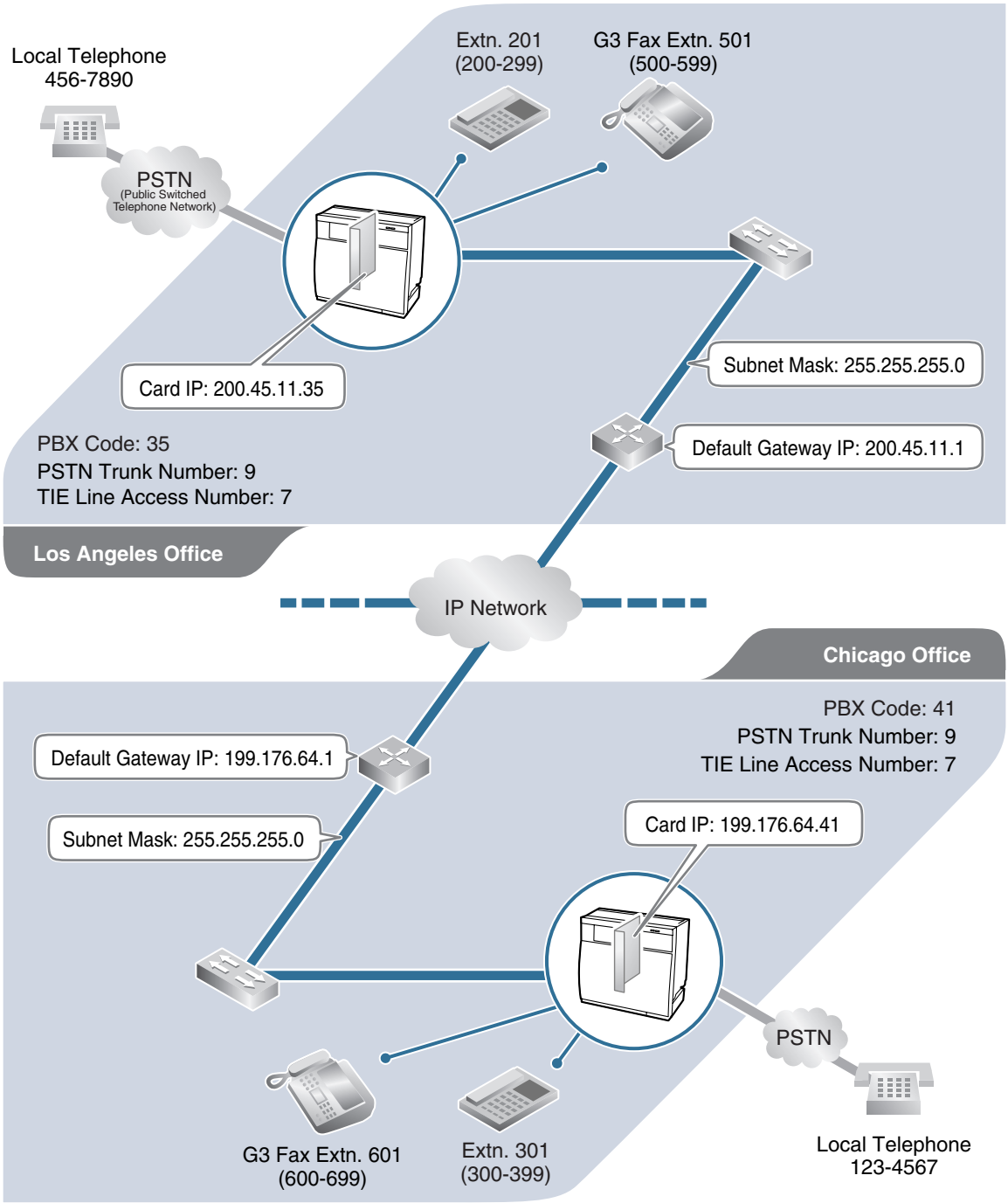
1.1 Example Network Diagram

The following diagram illustrates a simple VoIP network connecting PBXs at 2 locations. The VoIP Gateway Card converts outgoing voice or fax signals into IP packets for transmission. On the incoming side, it reverses this process and translates the packets back into appropriate voice or fax signals.



1.2 Network Devices and Numbering Plan

You will need to have network configuration information available to install VoIP Gateway Cards. Referring to this example diagram, consult your network administrator to obtain necessary information to configure your own VoIP network.



1.2.1 Network Application

QSIG Network Interface

QSIG is a protocol based on ISDN (Q.931) that offers enhanced PBX features in a private network. The QSIG network supports private communications by the TIE line service method. Implementation of VoIP Gateway Cards provides a VoIP interface to employ a QSIG network between PBXs at different locations by using an IP network instead of conventional telephone networks.

Types of IP Network

The VoIP Gateway Card's quality of performance depends on the type of IP network in use. Managed IP networks provide better quality of service compared to unmanaged networks, where quality of service is not guaranteed.

Examples of recommended IP networks

- Digital Leased Line
- IP-VPN (Virtual Private Network)
- Frame Relay

Notice

The performance of the VoIP Gateway Card may deteriorate when it is used on the Internet. Delays and loss in data transmission can degrade speech quality, and impair the card's capability to use the enhanced networking features of the PBX (for more information about these features, refer to the relevant sections of the Hybrid IP-PBX documentation.)

Firewall

A firewall protects the internal networks of an organisation against unauthorised penetration from outside. When routing a VoIP network through a firewall, some performance degradation may result. If for practical reasons you must route the VoIP network through a firewall, refer to "A1.3 Network Devices" for more details.

Using the KX-TDA0490 with Other KX-TDA Series VoIP Gateway Cards

When using the KX-TDA0490 in a network that contains other KX-TDA series VoIP Gateway Cards, keep in mind the following points:

1. Making and Receiving Calls

   Calls can be made and received between the KX-TDA0490 and other KX-TDA series VoIP Gateway Cards. However, the KX-TDA0480 requires a special setting to be able to communicate with the KX-TDA0490 on the network. Refer to "D1 Considerations in Installation" for more details.

2. Using QSIG Services

   All QSIG services available with the PBX can be used between the KX-TDA0490 and KX-TDA0484/KX-TDA3480. However, CLIP service is the only available QSIG service between the KX-TDA0490 and KX-TDA0480.

1.2.2 Numbering Plan Example

There are 2 methods to plan your numbering system, as follows:

PBX code method	In addition to the destination number, the caller dials the unique PBX code of the PBX to which the called party is connected. Therefore, extension numbers at separate PBXs in the network can overlap. For example, each PBX in the network can have an extension whose number is 201.
Extension number method	The caller dials only the destination number of the called party to call through PBXs at different locations (hence there are fewer digits to dial than with the PBX code method). To employ the extension number method, no 2 PBXs can have extensions sharing the same number. For example, if one PBX in the network has an extension whose number is 201, no other PBX can have an extension with the same number (201).

This section provides a network numbering mechanism using the PBX code method based on the previous example diagram. Configure your network referring to this example.

Note

An example using the extension number method is provided in "B Alternative Numbering Plan Example".

IP Addressing Information

IP addressing information is typically supplied by a network administrator. Consult your network administrator for specific values.

	Los Angeles Office	Chicago Office	Description
Card IP Address	200.45.11.35	199.176.64.41	Identifies the location of each VoIP Gateway Card in the network during VoIP communications. A unique IP address must be assigned to each card.
Default Gateway Address	200.45.11.1	199.176.64.1	Identifies the IP address of the primary gateway (typically a router or similar device) that exchanges IP packets with the other gateways on the VoIP network.
Subnet Mask Address	255.255.255.0	255.255.255.0	Defines which digits of an IP address are used for the network address and the host address at each network location. A card IP address must fall within the same subnet as that of the default gateway (e.g., router) that is connected to the card.

PBX Numbering Information

PBX numbering information is necessary to set up phone numbers for a VoIP network. Set the numbers conforming to existing PBX numbering systems.

	Los Angeles Office	Chicago Office	Description
PBX Code	35	41	A unique number (ranging from 1 to 7 digits) assigned to identify each PBX within a network. In this example, for convenience, each PBX code corresponds to the last portion of the IP address of its card; that is, because the Los Angeles office card has the IP address 200.45.11.35, Los Angeles PBX code is 35.
TIE Line Access Number	7	7	An access number to use the TIE line service.
PSTN Trunk Number	9	9	An access number to seize a local PSTN trunk.
Extension Number	200 to 299	300 to 399	A number assigned to each extension.
Fax Extension Number	500 to 599	600 to 699	A number assigned to each fax extension.

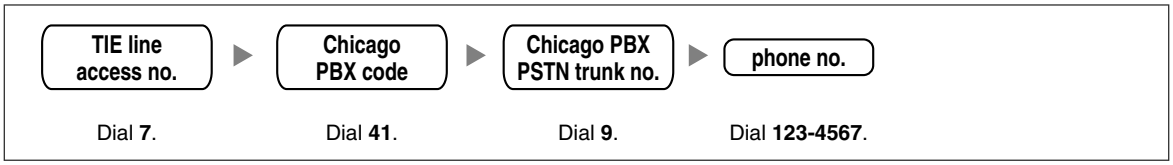
Dialling Examples

The VoIP network allows you to access the PBX at one location from another to establish: (1) an extension call, or (2) an outside call through the local PSTN as if you are calling from the same area.

Calling from Los Angeles to Chicago

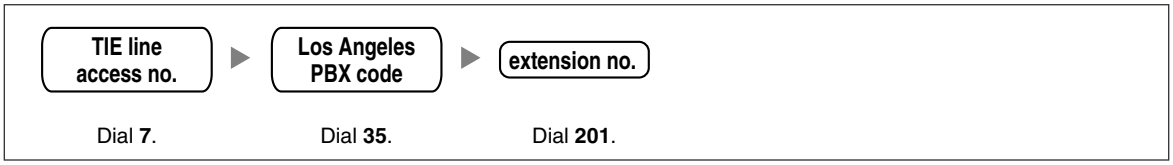
To extension 301 via VoIP network

To local telephone 123-4567 via VoIP network through local PSTN

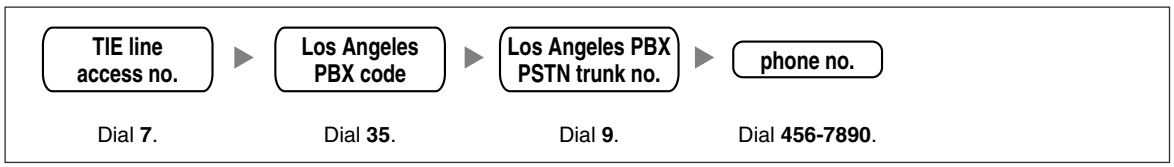


Calling from Chicago to Los Angeles

To extension 201 via VoIP network



To local telephone 456-7890 via VoIP network through local PSTN



PBX Connection Information

PBX connection information is created by combining IP Addressing Information and PBX Numbering Information. Referring to the sample below, create your own PBX connection information.

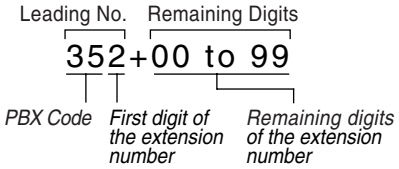
Leading Number:

A number composed of the PBX code followed by the first digit of the destination number. See the example on the right.

Remaining Digits:

The maximum number of digits to be dialled following the leading number to access the destination. (However, for example, setting the remaining digits to 7 does not mean that the user must dial all 7 digits when making a call.) See the example on the right.

Los Angeles extensions



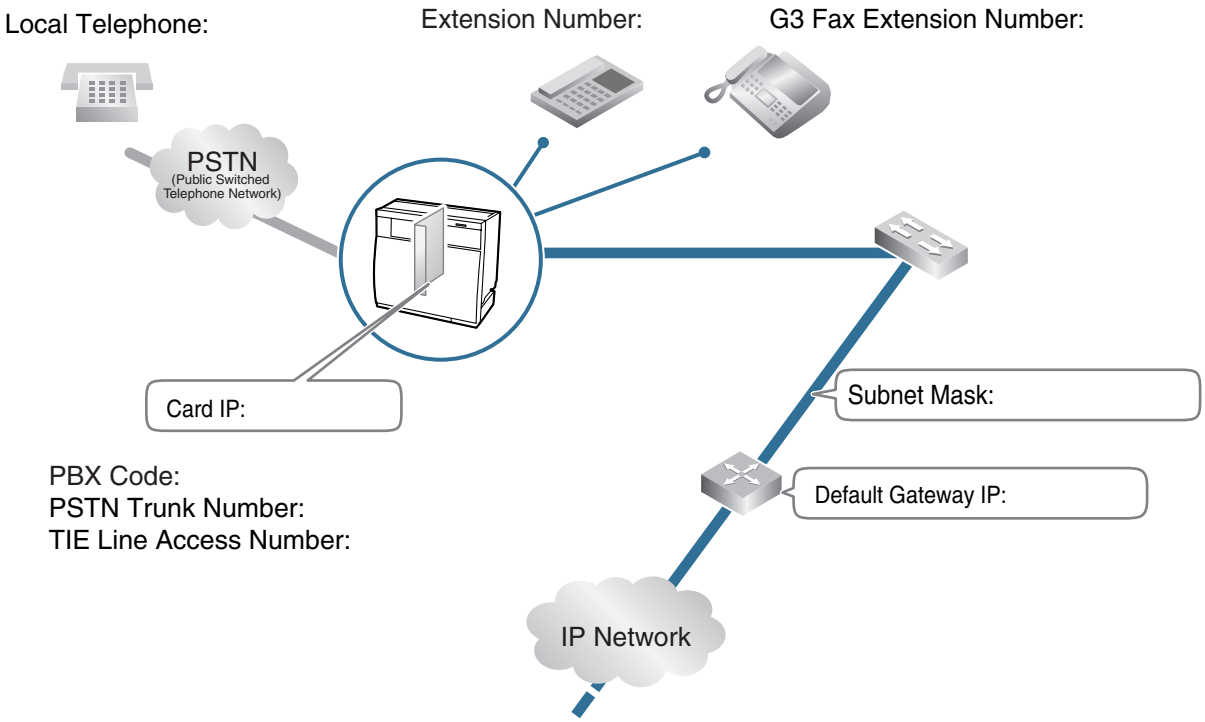
Card IP Address:

The IP address of each card in the network (as the access destination).

	Los Angeles Office (PBX Code: 35)			Chicago Office (PBX Code: 41)		
	Extn.	**FAX Extn.**	**PSTN Access**	**Extn.**	**FAX Extn.**	**PSTN Access**
Leading Number	352	355	359	413	416	419
Remaining Digits	2	2	7	2	2	7
Card IP Address	200.45.11.35			199.176.64.41		

1.2.3 Numbering Plan Summary

Print this page and write down your network information in the space provided below for each card in the network. Consult your network administrator to fill in the shaded entries.



IP Address

Card IP Address	
Default Gateway IP Address	
Subnet Mask Address	

PBX Numbering

PBX Code	
TIE Line Access Number	
PSTN Trunk Number	
Extension Number	
Fax Extension Number	

PBX Connection

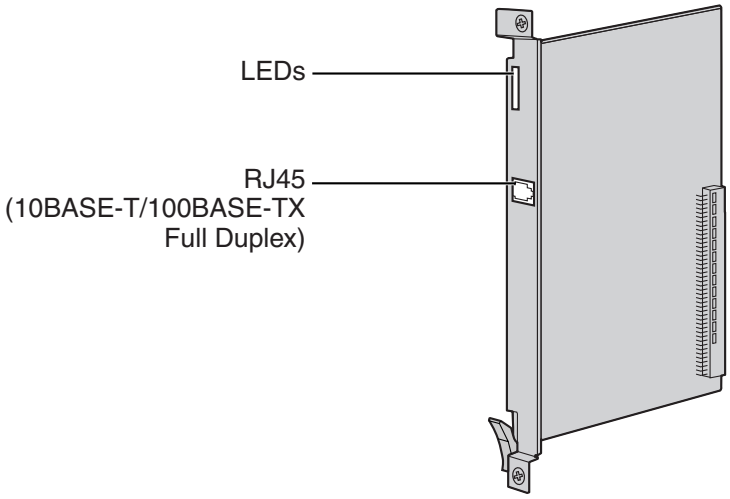
	Extensions	Fax Extensions	PSTN Access
Leading Number			
Remaining Digits			
Card IP Address			

Section 2
Installing in the PBX

This section describes the physical installation process of the VoIP Gateway Card covering the following topics: (1) installing the card in the PBX, and (2) connecting the card to a network device using a Category 5 (CAT5) Ethernet cable.

2.1 Installation

2.1.1 Names and Locations



Indication Light (LED)

When the VoIP Gateway Card is operating, each LED should show the status identified in **bold-face letters** under normal conditions.

Indication	Colour	Description
CARD STATUS	Green/Red	Card status indication • OFF: Power Off • **Green ON: Normal (all ports are idle)** • Green Flashing (60 times per minute): Normal (a port is in use) • Red ON: Fault (includes reset) • Red Flashing (60 times per minute): Out of Service
ONLINE	Green	On-line status indication • **ON: On-line mode** • OFF: Off-line mode • Flashing: Maintenance mode **Note** If the LINK indicator is OFF, the ONLINE indicator will also be OFF.
ALARM	Red	Alarm indication • ON: Alarm • **OFF: Normal**
VoIP BUSY	Green	VoIP (H.323) process indication • OFF: VoIP process inactive • ON: VoIP process active

Indication	Colour	Description
LINK	Green	Link status indication • **ON: Normal connection** • OFF: Connection error
DATA	Green	Data transmission indication • ON: Data transmitting • OFF: No data transmitted

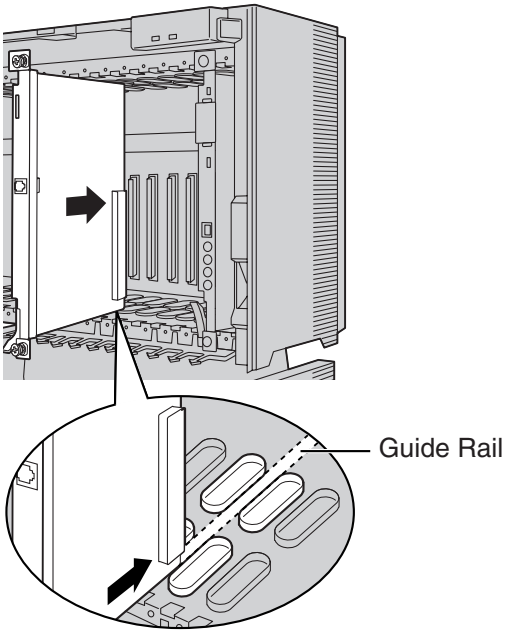
2.1.2 Installing the VoIP Gateway Card in the PBX

Install the VoIP Gateway Card in a free slot of the PBX.

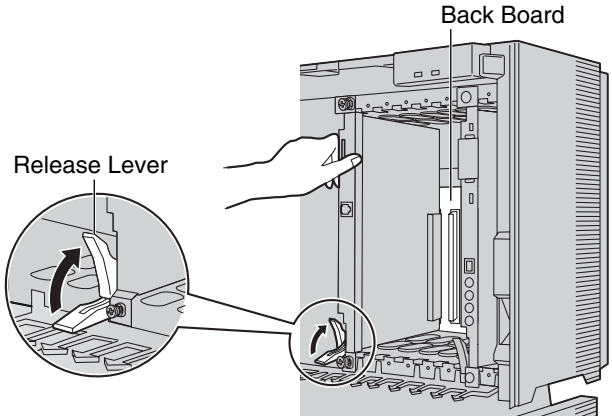
Note

The illustrations of the PBX shown in the installation procedure are based on the KX-TDA600.

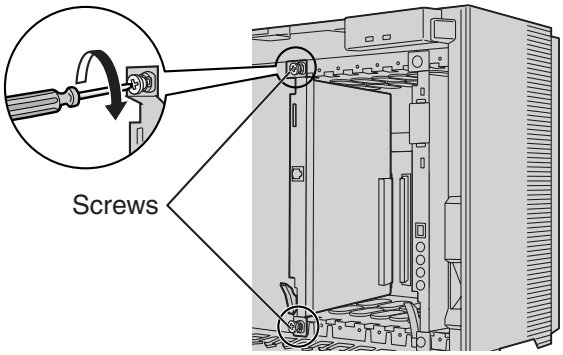
1. Insert the card along the guide rails.



2. Holding the card as shown below, push the release lever in the direction of the arrow so that the card engages securely with the connector on the back board.



3. Turn the 2 screws clockwise to fix the card in place.



Note

Make sure the screws are tightened to earth the card securely.

2.2 Cable Connection

Use a Category 5 (CAT5) Ethernet cable (10BASE-T/100BASE-TX) with an RJ45 connector to connect the VoIP Gateway Card to a network device.

When connecting the card to a switching hub, use an Ethernet straight cable; when connecting directly to a router or PC, use an Ethernet cross cable.

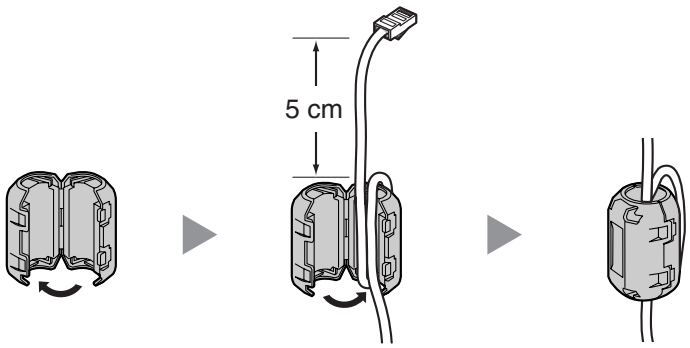
Note

Use only CAT5 Ethernet cable for connection.

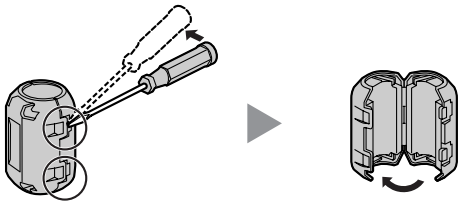
2.2.1 Attaching a Ferrite Core to the Cable

When connecting the VoIP Gateway Card to a network device, first attach a ferrite core (included with the card) to the cable.

1. Wrap the cable once around the ferrite core, leaving 5 cm between the ferrite core and the connector.
2. Close the case of the ferrite core.



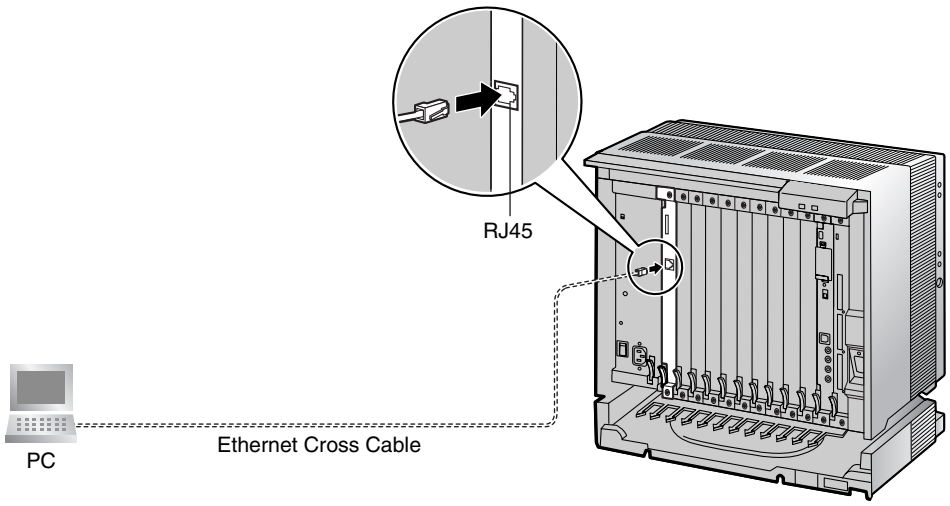
If you need to open the ferrite core, use a flathead screwdriver to unlatch the case of the ferrite core.



2.2.2 Connection for Programming

When assigning a new IP address to the VoIP Gateway Card for the first time, connect a PC directly to the card using an Ethernet cross cable.

1. Connect the Ethernet cable to the RJ45 connector of the card.
2. Connect the other end of the cable to the PC.

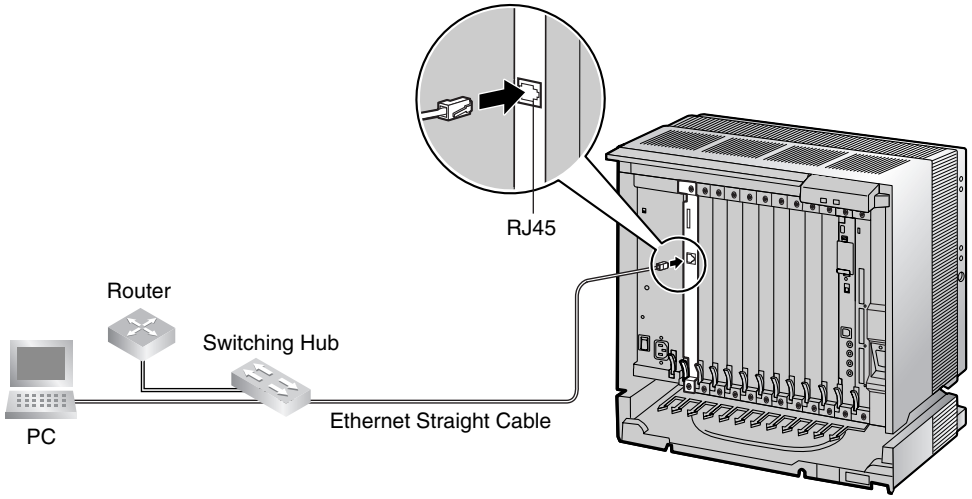


2.2.3 Connection to the LAN

Do not connect the VoIP Gateway Card to the LAN unless it has been assigned an IP address for actual VoIP operations on the network. Doing so may result in the default IP address of the card overlapping with an existing IP address on the LAN, or cause network failure.

1. Connect the Ethernet cable to the RJ45 connector of the card.
2. Connect the other end of the cable to the remote LAN equipment.

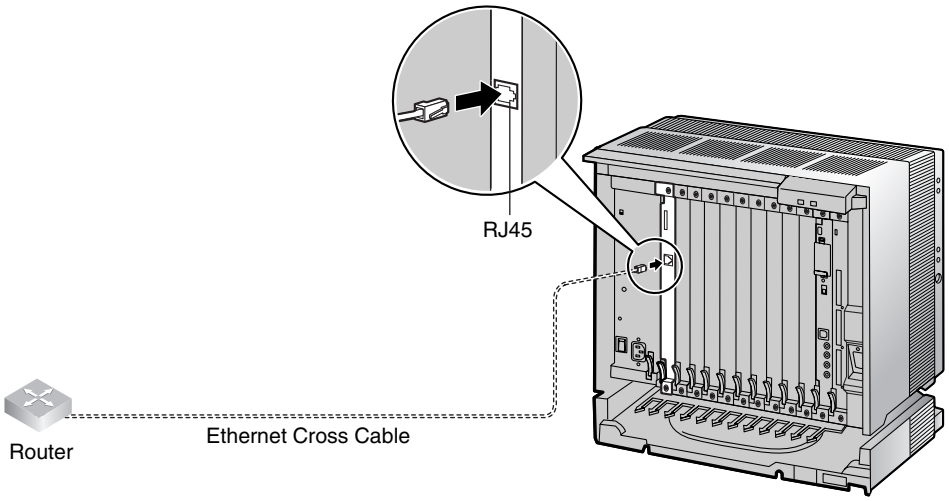
Connecting to a switching hub



Notes

- Make sure to connect to a switching hub. Do not connect to a repeater hub, as this will result in degradation in speech quality.
- Also, make sure to set the port of the switching hub that connects to the card to operate under "Auto Negotiation" mode. This will help assure error-free communication between the card and the switching hub.

Connecting directly to a router



Section 3

Programming the VoIP Gateway Card

One way of setting up a VoIP network for the first time is to go through the whole programming process of a VoIP Gateway Card at one location in the network, then start programming the other cards at different locations.

Based on the theoretical network illustrated previously in this manual, this section demonstrates the procedure to programme the cards in the Los Angeles and Chicago offices.

3.1 Preparations

A web programming utility called the IP-GW16 Maintenance Utility is available for programming of the VoIP Gateway Card.

For a complete discussion of web programming, refer to the VoIP Gateway Card Programming Guide.

System Requirements

- The IP-GW16 Maintenance Utility requires Microsoft® Internet Explorer 5.0 or above.

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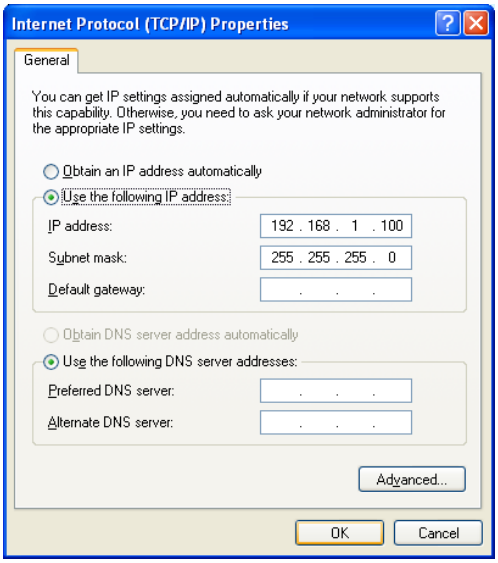
3.1.1 Preparing the PC

To prepare for programming using the IP-GW16 Maintenance Utility, configure your PC by (1) assigning an IP address that belongs to the same network as that of the VoIP Gateway Card, and (2) choosing the appropriate options for the Internet properties.

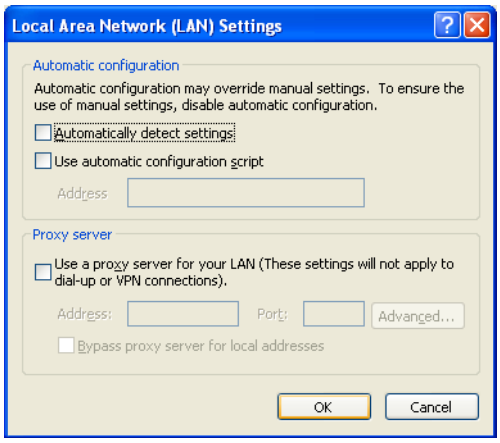
Note

The procedure below is based on the Windows XP operating system as an example.



1. Open **Internet Protocol (TCP/IP) Properties** from the **Start** menu.
2. **a.** Click **Use the following IP address**.
   b. In the **IP address** box, type **192.168.1.100**.
   This is an example entry for the case when the card has the default IP address (192.168.1.200).
   c. In the **Subnet mask** box, type **255.255.255.0**.
   d. Click **OK**.
3. **a.** Start Internet Explorer from the **Start** menu.
   b. Click **Internet Options** from the **Tools** menu.

4. **a.** Click the **Connections** tab.
   b. Click **Never dial a connection**.
   c. Click **LAN Settings**.

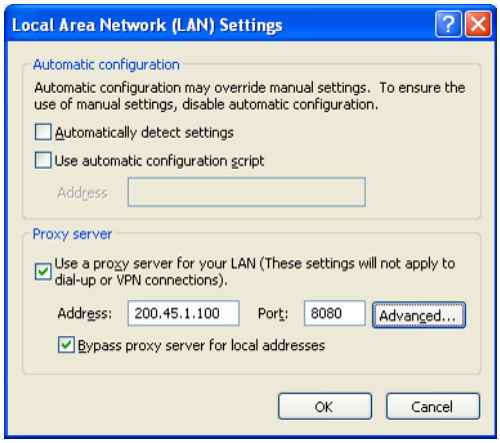


5. **a.** Click to clear all check boxes.
   b. Click **OK**.

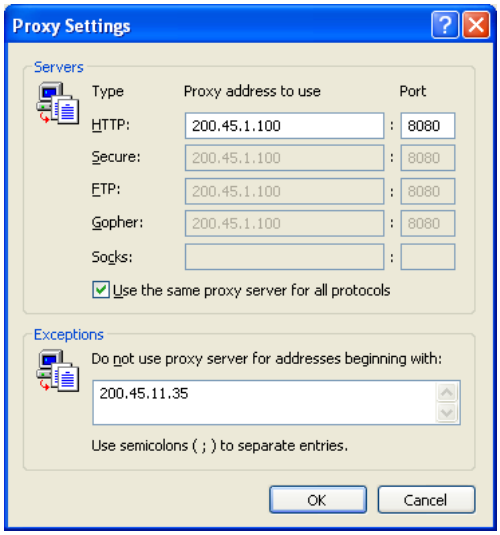
   Your PC is now ready for programming through direct access to the card.

Notice When Programming the Card through an IP Network

When the card is put in actual operation on an IP network, you can access and programme the card through the network. However, if the network has a proxy server installed, you must apply appropriate proxy settings to your PC. In this case, follow the steps below in substitution for step 5 above:



5. Click **Advanced**.



6. **a.** Under **Do not use proxy server for addresses beginning with:**, type the IP address of the card.
   b. Click **OK**.

Your PC is now ready for programming the card through an IP network.

3.2 Programming the VoIP Gateway Card in the Los Angeles Office

Based on the example network in "1.2 Network Devices and Numbering Plan", this section demonstrates the procedure to programme a VoIP Gateway Card for use in the Los Angeles office, as the first step of setting up a VoIP network. VoIP communications between the 2 offices will be possible when the cards, as well as the PBXs, in both offices are fully programmed.

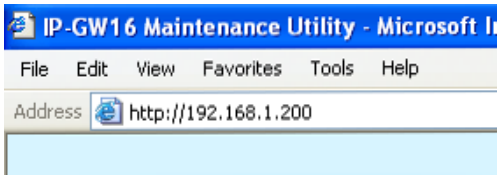
The procedure to programme the card in the Chicago office is given in "3.3 Programming the VoIP Gateway Card in the Chicago Office". In addition, the procedure to programme the PBX in the Los Angeles office is given in "4.1 Programming the PBX in the Los Angeles Office".

3.2.1 Starting the IP-GW16 Maintenance Utility

Make sure that a PC is connected directly to the VoIP Gateway Card with an Ethernet cross cable (see "2.2.2 Connection for Programming").

The card should not be connected to the LAN at this point.

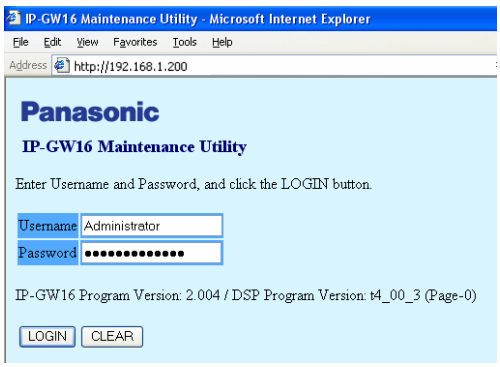
1. Start Internet Explorer from the **Start** menu.



2. **a.** In the **Address** box of Internet Explorer, type **http://192.168.1.200** (default IP address of the card).
   b. Press the ENTER key on the keyboard.

Notes

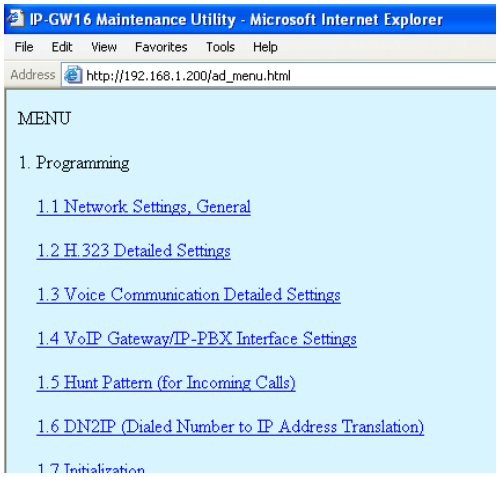
- If you cannot see the log-in screen, return to "3.1.1 Preparing the PC" and confirm that your PC has been configured appropriately.
- If you forget the IP address, you must initialise the card to the default setting (see "C1 Initialising the VoIP Gateway Card").



3. **a.** In the **Username** box, type **Administrator** (default user name).
   b. In the **Password** box, type **Administrator** (default password).
   c. Click **LOGIN**.

Note

If you forget the user name or password, you must initialise the card to the default setting (see "C1 Initialising the VoIP Gateway Card").



The main menu appears.

Note

For readability of the text on the screen, it is recommended that you adjust the text size of Internet Explorer to below medium.

Note

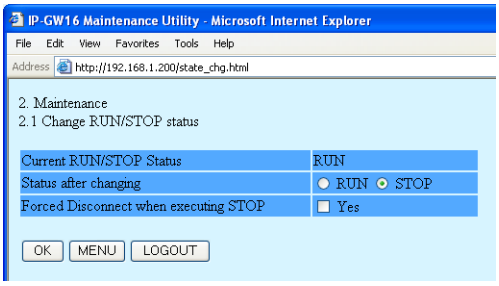
If you finish a programming session without logging out from the card (e.g., quitting Internet Explorer, or returning to the log-in screen with the "Back" button of Internet Explorer), you cannot log in again for the period of time specified by the parameter **Programming Auto Disconnect Time** (default: 10 min).

For the log-out procedure and **Programming Auto Disconnect Time** setting, refer to "2.5.2 Log Out" and "2.3.2 Maintenance Settings" of the VoIP Gateway Card Programming Guide, respectively.

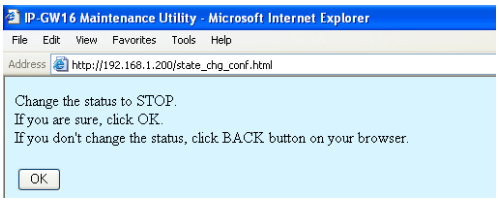
3.2.2 Changing the Status of the VoIP Gateway Card

When programming the VoIP Gateway Card, place the card in the "STOP" status.

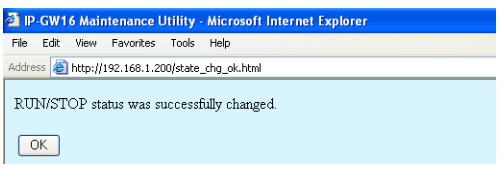
1. Click **2.1 Change RUN/STOP status** in the main menu.



2. **a.** Click **STOP** for **Status after changing**.
   b. Click **OK**.



3. Click **OK**.

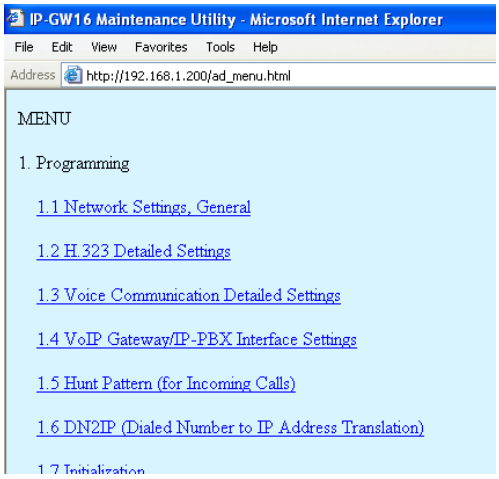


4. Click **OK**.

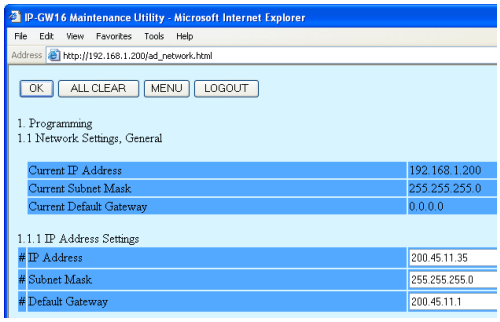
3.2.3 Assigning the IP Address

When programming the VoIP Gateway Card for the first time, a new IP address must be assigned. Once this is done and the card is on-line, it will be able to communicate with the other cards over the VoIP network.

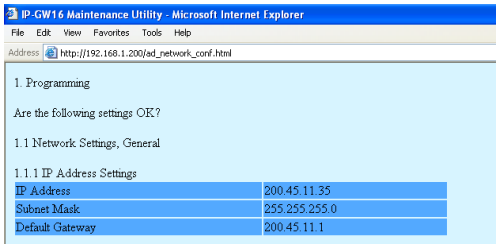
The specific setting values are based on the table under "IP Addressing Information" in "1.2.2 Numbering Plan Example".



1. Click **1.1 Network Settings, General** in the main menu.



2. **a.** In the **IP Address** box, type **200.45.11.35**.
   b. In the **Subnet Mask** box, type **255.255.255.0**.
   c. In the **Default Gateway** box, type **200.45.11.1**.
   d. Click **OK**.



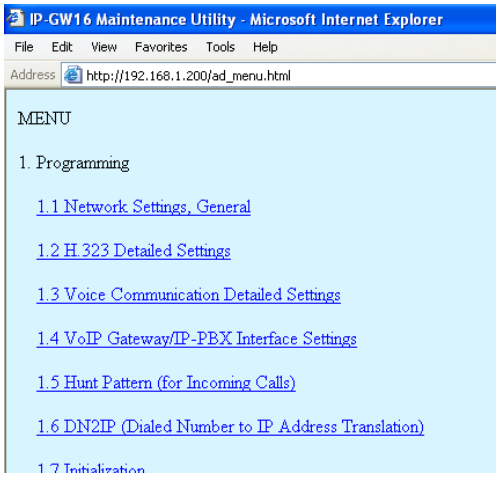
3. Confirm your entry, and then click **OK**.

Note

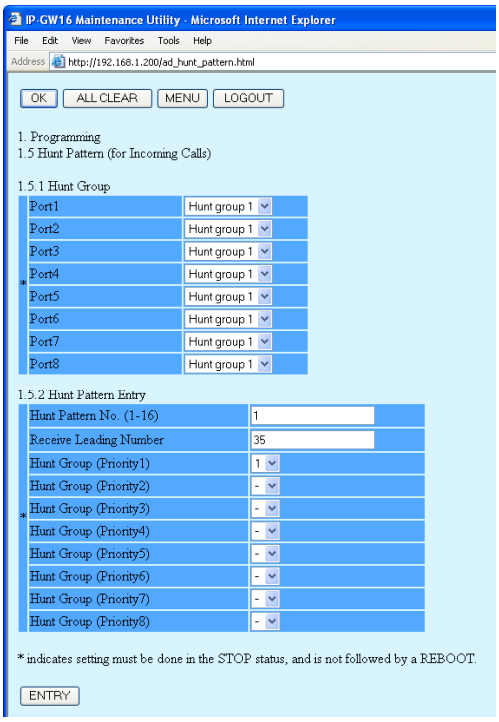
For more details about IP address assignment, refer to "2.2.1 Network Parameters" of the VoIP Gateway Card Programming Guide.

3.2.4 Assigning the Hunt Pattern

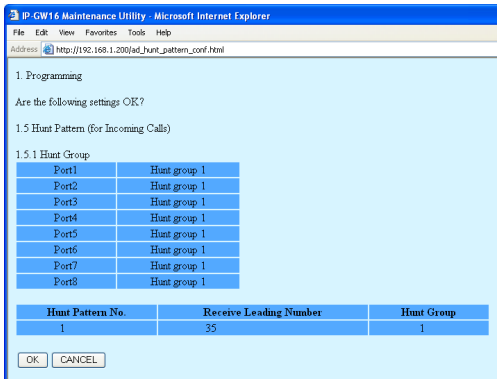
The hunt pattern determines how to route incoming calls through the VoIP Gateway Card to the PBX.



1. Click **1.5 Hunt Pattern (for Incoming Calls)** in the main menu.



2. **a.** In the **Hunt Pattern No.** box, type **1**.
   A hunt pattern will be created with this numbering.
   b. In the **Receive Leading Number** box, type **35** (PBX code).
   c. Click **ENTRY**.
   d. Click **OK**.



3. Confirm your entry, and then click **OK**.

Note

For more details about hunt pattern assignment, refer to "2.2.5 Hunt Pattern Parameters" of the VoIP Gateway Card Programming Guide.

3.2.5 Programming the Address Translation Table

The function of an address translation table in a VoIP network is to provide 2-way translation of telephone numbers and IP addresses*1. The address translation table is owned jointly by all VoIP Gateway Cards in the network. Therefore, whenever the address translation table is changed, it is important to update all the cards in the network with the latest information; otherwise VoIP communications cannot be established.

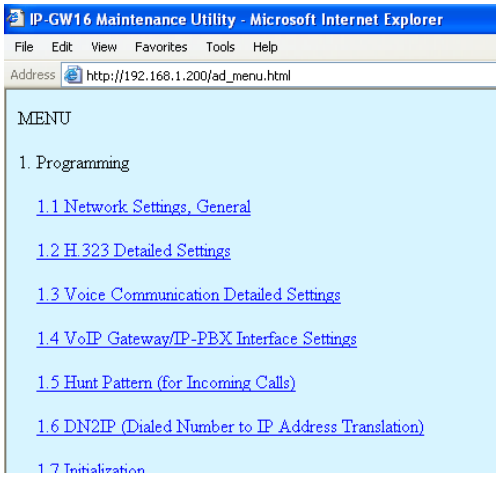
It is possible, at one location in the network, to programme the address translation table that contains information for the entire network. The completed address translation table can then be distributed across the network, so that all the cards share the same information (see "3.2.6 Downloading the Address Translation Table from the VoIP Gateway Card", and "Uploading Address Translation Table to the VoIP Gateway Card" in "3.3 Programming the VoIP Gateway Card in the Chicago Office").

Note

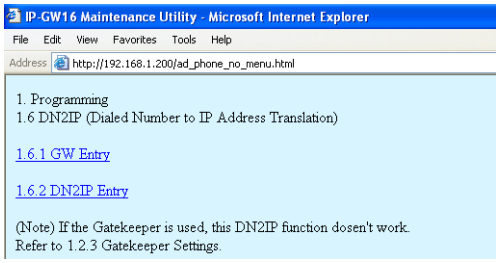
The address translation table created for the KX-TDA0490 can be shared with the KX-TDA0484 and KX-TDA3480.

The procedure below demonstrates the process of programming the address translation table necessary for VoIP communications between the Los Angeles and Chicago offices.

The specific setting values are based on the table under "PBX Connection Information" in "1.2.2 Numbering Plan Example".

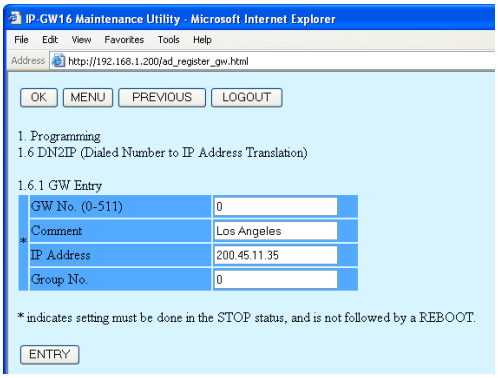


1. Click **1.6 DN2IP (Dialed Number to IP Address Translation)** in the main menu.



2. Click **1.6.1 GW Entry**.

*1 IP address-to-telephone number translation can also be handled by using an H.323 Gatekeeper device. To configure Gatekeeper devices, refer to the manufacturer's documentation. This manual focuses on the method using the VoIP Gateway Card's internal address translation capabilities.

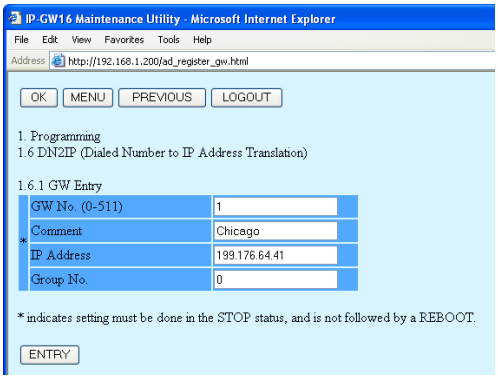


3. Do the following to configure the gateway entry for the Los Angeles office:
   a. In the **GW No.** box, type **0**.

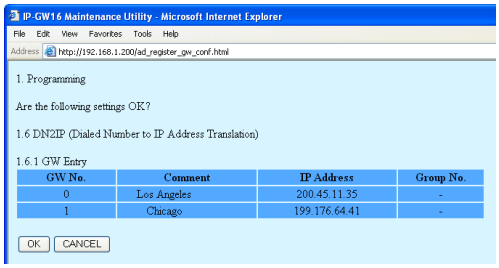
      A gateway entry for the card will be created with this numbering.
   b. In the **Comment** box, type **Los Angeles** (a unique identifier of the card in the VoIP network).
   c. In the **IP Address** box, type **200.45.11.35**.
   d. In the **Group No.** box, type **0**.

   Note

   Having the value **0** for **Group No.** means that the card does not belong to any gateway group. Grouping is useful when installing multiple cards at one location. For details, refer to "2.2.6 Address Translation Table—GW Entry" of the VoIP Gateway Card Programming Guide.
   e. Click **ENTRY**.

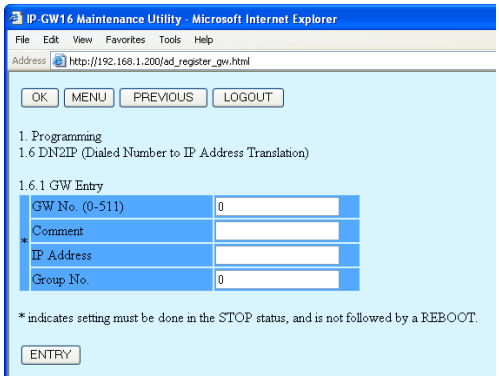


4. Do the following to configure the gateway entry for the Chicago office:
   a. In the **GW No.** box, type **1**.
   b. In the **Comment** box, type **Chicago**.
   c. In the **IP Address** box, type **199.176.64.41**.
   d. In the **Group No.** box, type **0**.
   e. Click **ENTRY**.
   f. Click **OK**.

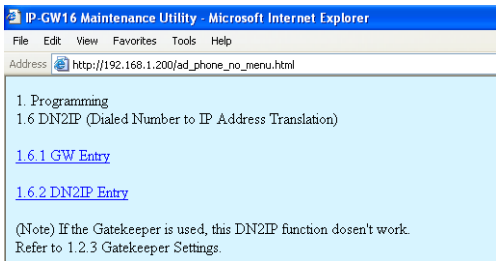


5. Confirm your entry, and then click **OK**.

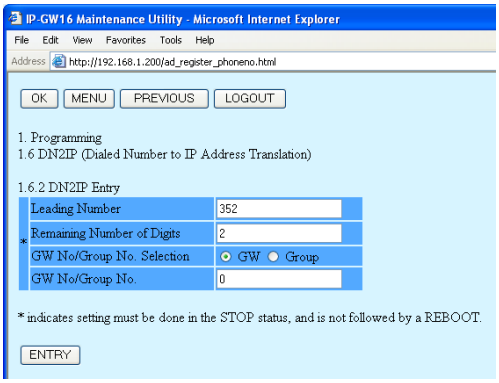
   The gateway entries for the Los Angeles and Chicago offices are now configured.



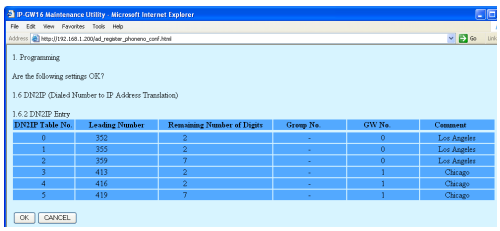
6. Click **PREVIOUS**.



7. Click **1.6.2 DN2IP Entry**.



8. Do the following to configure the Los Angeles extensions:
   a. In the **Leading Number** box, type **352** (PBX code [35] + extension starting digit [2]).
   b. In the **Remaining Number of Digits** box, type **2** (2 digits to dial [00 to 99] following the leading number).
   c. Click **GW** for **GW No/Group No. Selection**.
   d. In the **GW No/Group No.** box, type **0** (the gateway entry for the card).
   e. Click **ENTRY**.



9. a. Referring to step 8, complete the address translation table as shown on the left.
   b. Click **OK**.
   c. Confirm your entry, and then click **OK**.

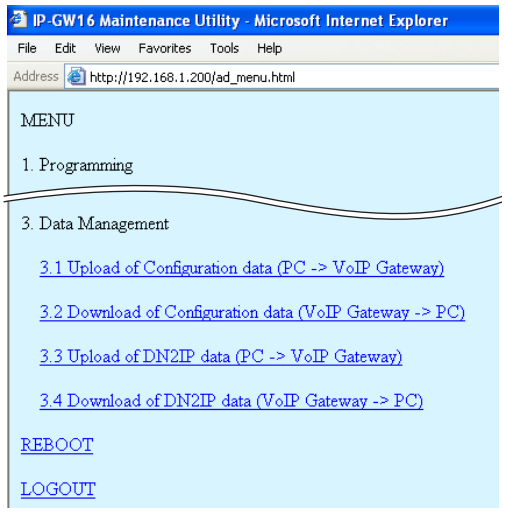
Note

For more details about address translation programming, refer to "2.2.6 Address Translation Table—GW Entry" and "2.2.7 Address Translation Table—DN2IP Entry" of the VoIP Gateway Card Programming Guide.

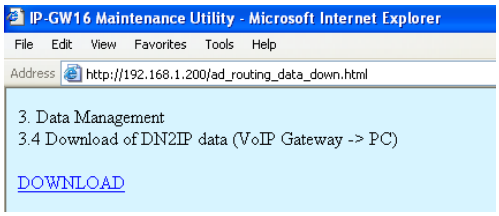
3.2.6 Downloading the Address Translation Table from the VoIP Gateway Card

After the address translation table has been fully programmed, download the data from the VoIP Gateway Card.

The downloaded data can be uploaded to the other cards on the VoIP network (see "Uploading Address Translation Table to the VoIP Gateway Card" in "3.3 Programming the VoIP Gateway Card in the Chicago Office"), so that all the cards can communicate with each other over the network.



1. Click **3.4 Download of DN2IP data (VoIP Gateway → PC)** in the main menu.



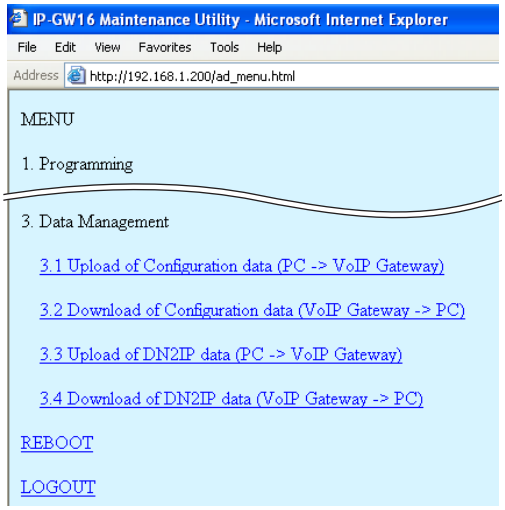
2. **a.** Click **DOWNLOAD**.
   b. Specify the file name and the folder in which to save the file.

Note

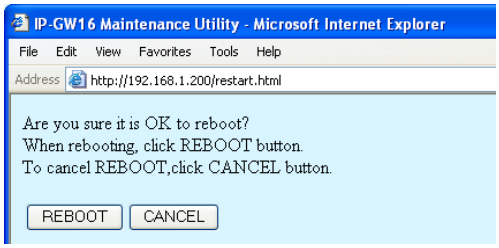
For more details about downloading the address translation table, refer to "2.4.4 Download of Address Translation Table" of the VoIP Gateway Card Programming Guide.

3.2.7 Rebooting the VoIP Gateway Card

For all the changes to the parameters to become effective, you must reboot the VoIP Gateway Card.



1. Click **REBOOT** in the main menu.



2. Click **REBOOT**.

3.2.8 Confirming the IP Address Assignment

After programming of the VoIP Gateway Card is finished, try to access the card with the new IP addressing information. If you can connect to the card without problems, the card can be placed on the LAN for VoIP operations (see "2.2.3 Connection to the LAN").

Follow the procedure below, referring to "3.1.1 Preparing the PC" and "3.2.1 Starting the IP-GW16 Maintenance Utility".

1. Set the IP address settings of the PC to the following values:
   - IP address: 200.45.11.100
   - Subnet Mask address: 255.255.255.0
2. Start Internet Explorer from the **Start** menu.
3. In the **Address** box of Internet Explorer, type **http://200.45.11.35** (the new IP address of the card).
4. Press the ENTER key on the keyboard.

   If you can log in, then the card has been successfully programmed.

After you have confirmed that the card has been successfully programmed, it is strongly recommended that you download the configuration data from the card and save it on your PC for backup and archive purposes.

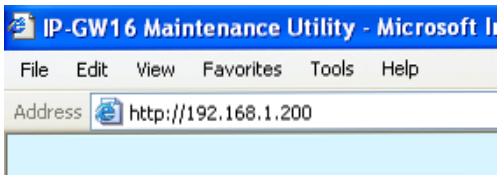
The procedure for downloading the configuration data is provided in "2.4.2 Download of Configuration Data" of the VoIP Gateway Card Programming Guide.

3.3 Programming the VoIP Gateway Card in the Chicago Office

This section details the procedure to programme the VoIP Gateway Card in the Chicago office, which for the most part is a duplication of that for the Los Angeles office. For general information that is not discussed here, refer to the relevant sections in "3.2 Programming the VoIP Gateway Card in the Los Angeles Office".

There are differences in the procedure where distinct setting values are required for parameters that are dependent on the specific network configuration of the Chicago office. Also, the address translation table does not need to be programmed, because the one downloaded from the card in the Los Angeles office already contains the information for the entire network. You can simply upload the address translation table from the Los Angeles office, and the cards can communicate with each other on the network.

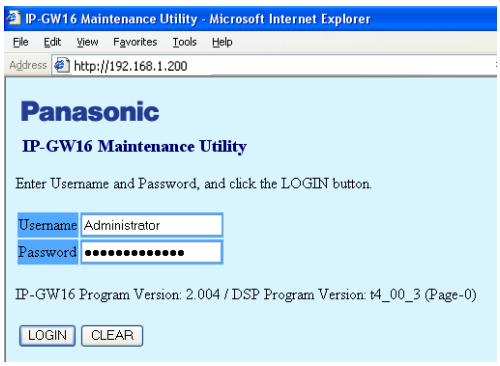
Starting the IP-GW16 Maintenance Utility



1. Start Internet Explorer from the **Start** menu.
2. **a.** In the **Address** box of Internet Explorer, type **http://192.168.1.200** (default IP address of the card).

   Make sure that the PC has the appropriate IP address setting to access the card (refer to "3.1.1 Preparing the PC").

   b. Press the ENTER key on the keyboard.



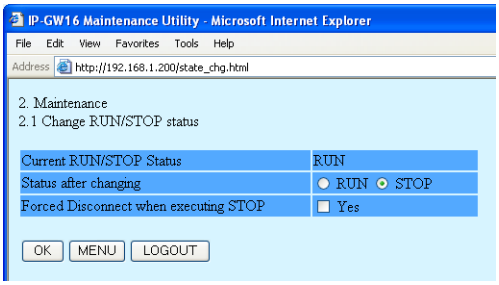
3. **a.** In the **Username** box, type **Administrator** (default user name).

   b. In the **Password** box, type **Administrator** (default password).

   c. Click **LOGIN**.

   The main menu appears.

Changing the Status of the VoIP Gateway Card



1. Click **2.1 Change RUN/STOP status** in the main menu.
2. **a.** Click **STOP** for **Status after changing**.

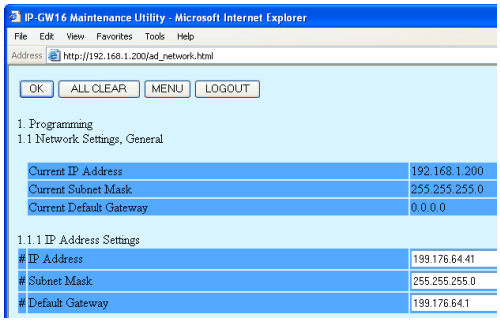
   b. Click **OK**.

   c. Click **OK**.

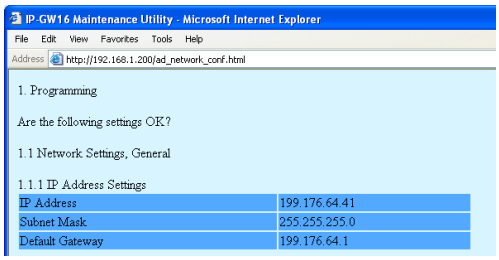
   d. Click **OK**.

Assigning the IP Address

Note that the card in the Chicago office requires different IP address settings from the card in the Los Angeles office.



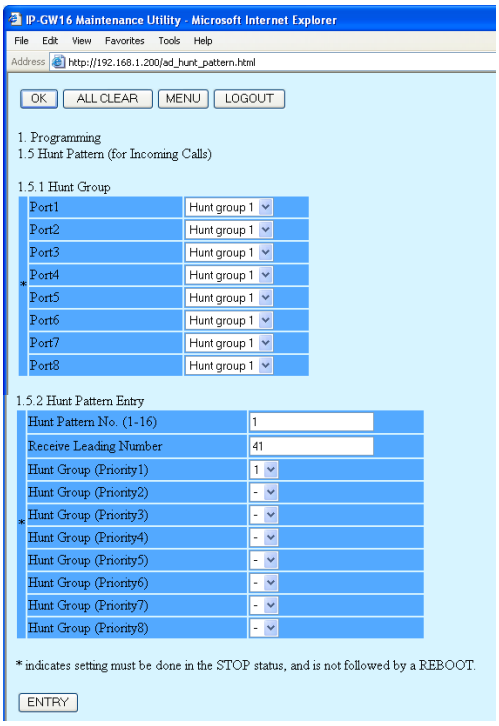
1. Click **1.1 Network Settings, General** in the main menu.
2. **a.** In the **IP Address** box, type **199.176.64.41**.
   b. In the **Subnet Mask** box, type **255.255.255.0**.
   c. In the **Default Gateway** box, type **199.176.64.1**.
   d. Click **OK**.



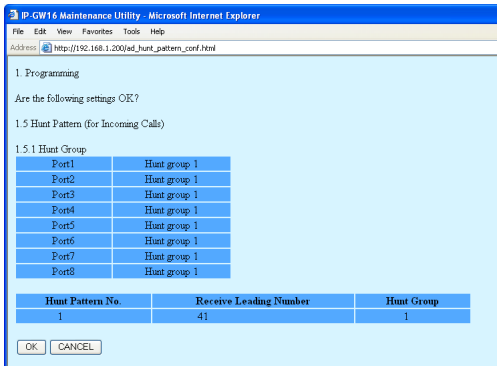
3. Confirm your entry, and then click **OK**.

Assigning the Hunt Pattern

Note that the card in the Chicago office requires a different PBX code from the card in the Los Angeles office.



1. Click **1.5 Hunt Pattern (for Incoming Calls)** in the main menu.
2. **a.** In the **Hunt Pattern No.** box, type **1**.
   b. In the **Receive Leading Number** box, type **41** (PBX code).
   c. Click **ENTRY**.
   d. Click **OK**.

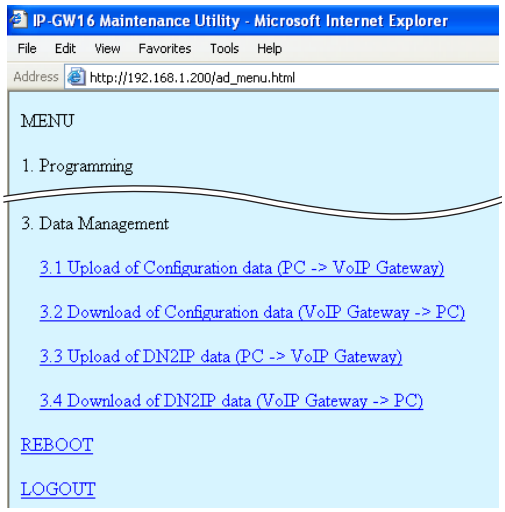


3. Confirm your entry, and then click **OK**.

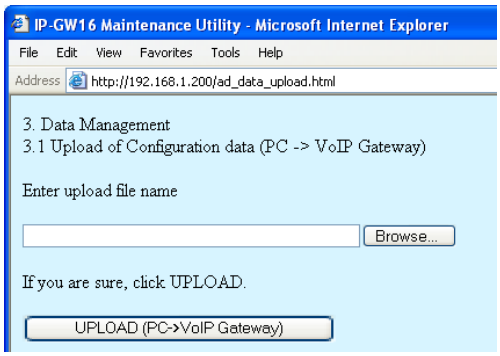
Uploading Address Translation Table to the VoIP Gateway Card

For the VoIP Gateway Cards in the Los Angeles and Chicago offices to communicate properly over the VoIP network, the cards must share the same address translation table.

Follow the procedure below to upload the address translation table downloaded from the card in the Los Angeles office (see "3.2.6 Downloading the Address Translation Table from the VoIP Gateway Card") to the card in the Chicago office.

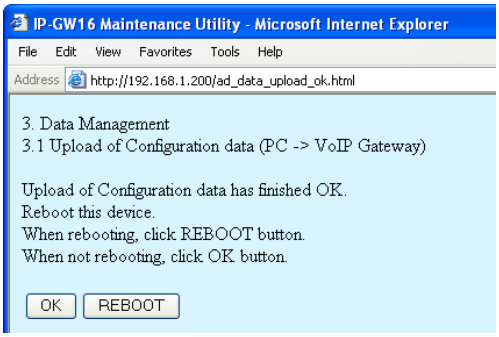


1. Click **3.3 Upload of DN2IP data (PC → VoIP Gateway)** in the main menu.

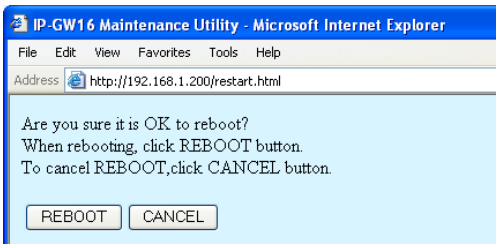


2. **a.** Click **Browse** and choose a file to upload.

b. Click **UPLOAD(PC→VoIP Gateway)**.



3. Click **REBOOT**.



4. Click **REBOOT**.

Note

For more details about uploading the address translation table, refer to "2.4.3 Upload of Address Translation Table" of the VoIP Gateway Card Programming Guide.

Confirming the IP Address Assignment

Note that the card in the Chicago has been assigned a different IP address from the card in the Los Angeles office.

1. Set the IP address settings of the PC to the following values:
   - IP address: 199.176.64.100
   - Subnet Mask address: 255.255.255.0
2. Start Internet Explorer from the **Start** menu.
3. In the **Address** box of Internet Explorer, type **http://199.176.64.41** (the new IP address of the card).
4. Press the ENTER key on the keyboard.

   If you can log in, then the card has been successfully programmed.

After you have confirmed that the card has been successfully programmed, it is strongly recommended that you download the configuration data from the card and save it on your PC for backup and archive purposes.

The procedure for downloading the configuration data is provided in "2.4.2 Download of Configuration Data" of the VoIP Gateway Card Programming Guide.

Section 4

Programming the PBX

This section details the procedure to programme the PBX to use the VoIP Gateway Card.

4.1 Programming the PBX in the Los Angeles Office

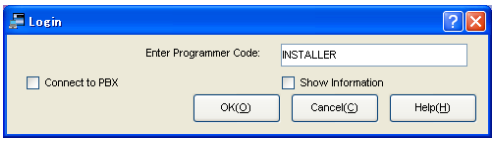
For successful operation of a VoIP network using the VoIP Gateway Card as a QSIG network interface, the PBX at each location in the network must be programmed appropriately. For a detailed discussion of related features, refer to the Hybrid IP-PBX Feature Guide.

This section details the procedure to programme the PBX in the Los Angeles office using the Maintenance Console (PC programming software of the PBX). After the PBX in the Los Angeles office has been fully programmed, repeat the procedure for the PBX in the Chicago office with the appropriate setting values.

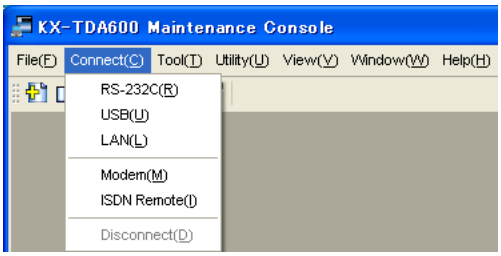
Notes

- It is assumed that you have already installed the Maintenance Console (KX-TDA100/KX-TDA200: KXTDA Maintenance Console; KX-TDA600: KX-TDA600 Maintenance Console) in your PC.
- The screenshots shown in the installation procedure are based on the KX-TDA600 Maintenance Console.
- The contents and design of the software are subject to change without notice.

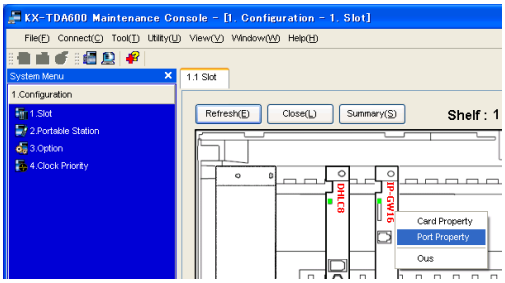
1. Start the Maintenance Console from the **Start** menu.



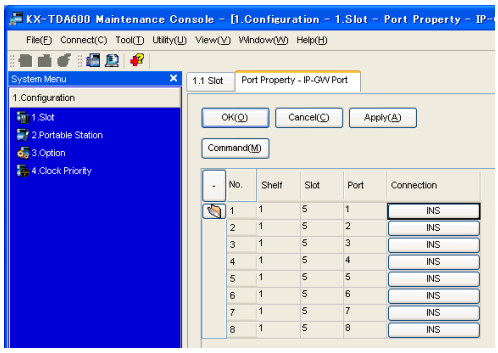
2. **a.** Type the Installer Level Programmer Code (default: **INSTALLER**).
   b. Click **OK**.



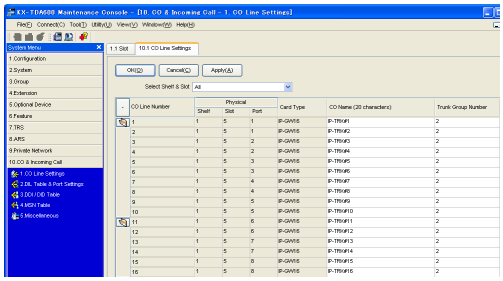
3. **a.** Click **Connect** → **RS-232C** or **USB**.
   b. In the next screen, type the system password for installer (default: **1234**).
   c. Click **OK**.
   The system menu appears.



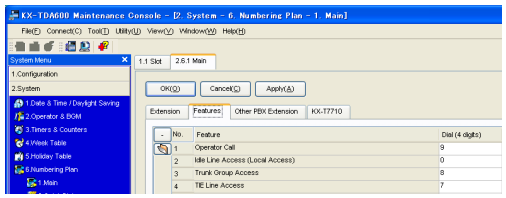
4. **a.** Under **Configuration**, click **Slot**.
   b. Move the mouse pointer over the installed VoIP Gateway Card to display the menu of options.
   c. Click **Port Property**.



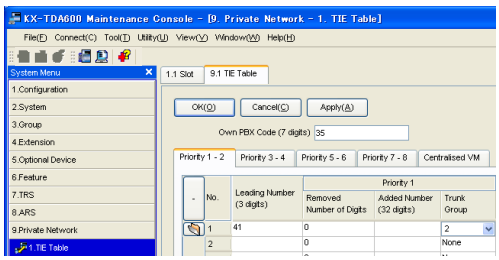
Confirm that ports 1 through 8 are in service (**INS**).



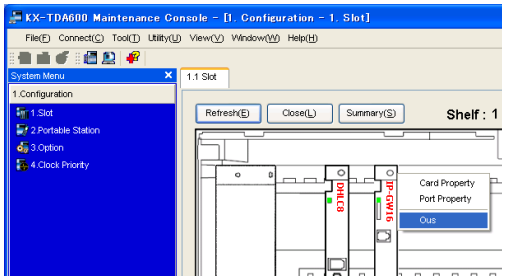
5. **a.** From the System Menu, click **CO & Incoming Call**.
   b. Click **CO Line Settings**.
   c. Type the **CO Name** and assign an unused **Trunk Group Number** to be used for all VoIP gateway trunks.
   d. Click **OK**.

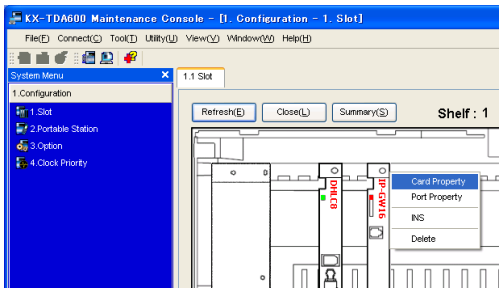


6. **a.** From the System Menu, click **System**.
   b. Click **Numbering Plan**.
   c. Click **Main**.
   d. Click the **Features** tab.
   e. In the **TIE Line Access** box, type the dialling number.
   f. Click **OK**.



7. **a.** From the System Menu, click **Private Network**.
   b. Click **TIE Table**.
   c. In the **Own PBX Code** box, type **35** (the PBX code of the local PBX in the network).
   d. In the first unused **Leading Number** box, type **41** (the PBX code of the remote PBX in the network).
   e. In the corresponding **Trunk Group** list, select the number of the trunk group to be used when making calls.
   f. Set the number modification pattern, if necessary.
   g. Click **OK**.





8.

a. From the System Menu, click **Configuration**.

b. Click **Slot**.

c. Move the mouse pointer over the installed VoIP Gateway Card to display the menu of options.

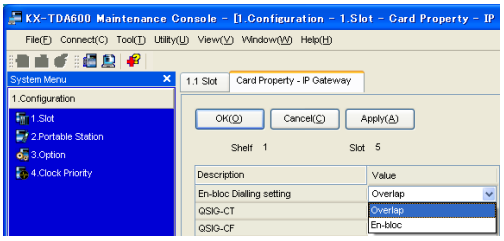
d. Click **OUS**.

You will see a confirmation message.

e. Click **OK**.

f. Move the mouse pointer over the installed VoIP Gateway Card to display the menu of options.

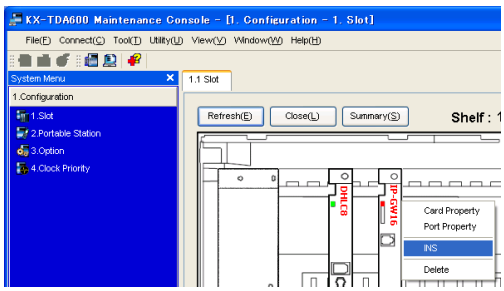
g. Click **Card Property**.



9.

a. Select the preferred **En-bloc Dialling setting** (**Overlap** [default] or **En-bloc***1).

b. Click **OK**.



10.

a. Move the mouse pointer over the installed VoIP Gateway Card to display the menu of options.

b. Click **INS**.

*1 When "En-bloc" is selected, users need to press "#" after dialling the phone number to enter the dialled digits.

Note

For details about network parameter settings, refer to the relevant sections of the Hybrid IP-PBX PC Programming Manual.

Appendix A
Guidance for VoIP Installation

A1 VoIP Requirements

A1.1 Bandwidth Assessment

When using the VoIP Gateway Card, you must ensure that the IP network in use has enough bandwidth to support VoIP communications. If the amount of bandwidth required for VoIP communications is larger than what the network can accommodate, speech quality will be compromised. In addition, there may be some adverse effect on the performance of other applications (e.g., email or web applications) that use the same network. Therefore, care must be taken when assessing bandwidth requirements.

Inform your network administrator of the required bandwidth, and make sure that the network can support VoIP communications even under conditions of maximum network traffic.

Bandwidth Calculation

Provided below is the formula to find out the amount of bandwidth required for VoIP communications:

Required Bandwidth
= (No. of Fax Machines × Required Bandwidth for the G.711 CODEC) +
[(16 - No. of Fax Machines) × Required Bandwidth for Voice Communication]

Required bandwidth for one VoIP channel is shown in the tables below (for more details, refer to "2.2.3 Voice Communication Parameters" in the VoIP Gateway Card Programming Guide).

Required Bandwidth for One VoIP Channel

The required bandwidth depends on what combination of CODEC and packet sending interval is used. Keep in mind the following points about the type of CODEC and packet sending interval, in terms of the speech quality:

- The speech quality of the CODECs varies as follows: (High) G.711, G.729A, G.723.1 (Low)
- The shorter the packet sending interval, the higher the speech quality.
- The higher the speech quality the VoIP Gateway Card provides, the more bandwidth the card requires.

Via LAN

CODEC	Packet Sending Interval				
	20 ms	30 ms	40 ms	60 ms	90 ms
G.711	87.2 kbps	79.5 kbps	75.6 kbps	71.7 kbps	—
G.729A	31.2 kbps	23.5 kbps	19.6 kbps	15.7 kbps	—
G.723.1 5.3 kbps	—	20.8 kbps	—	13.1 kbps	10.5 kbps
G.723.1 6.3 kbps	—	21.9 kbps	—	14.1 kbps	11.6 kbps

Via WAN (PPP: Point-to-Point Protocol)

CODEC	Packet Sending Interval				
	20 ms	30 ms	40 ms	60 ms	90 ms
G.711	84 kbps	77.3 kbps	74 kbps	70.7 kbps	—
G.729A	28 kbps	21 kbps	18 kbps	14.7 kbps	—
G.723.1 5.3 kbps	—	18.7 kbps	—	12 kbps	9.8 kbps
G.723.1 6.3 kbps	—	19.7 kbps	—	13.1 kbps	10.8 kbps

Example

Consider the following case as an example:

- Communication: via LAN
- No. of Fax Machines: 2
- G.711 Packet Sending Interval: 20 ms (requiring 87.2 kbps per channel)
- G.729A Packet Sending Interval for Voice Communication: 20 ms (requiring 31.2 kbps per channel)

In this case, the required bandwidth will be as follows:

Required Bandwidth
= (2 × 87.2) + [(16 - 2) × 31.2]
= 611.2 (kbps)

Therefore, inform your network administrator and make sure that the network can support a bandwidth of 611.2 kbps even when the network is under conditions of maximum traffic.

Note

It is recommended that all cards in a VoIP network have the same packet sending interval.

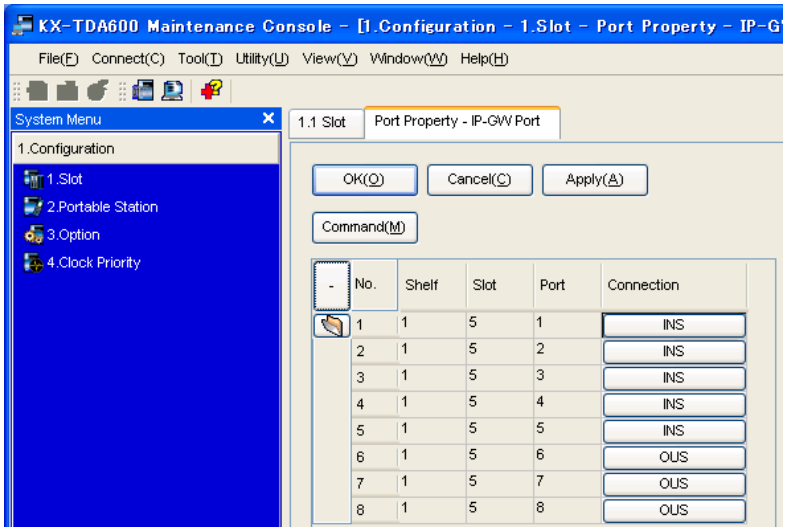
Additional Information

As described above, it is possible to control the required bandwidth by selecting a certain combination of CODEC and packet sending interval. However, it is also possible to control required bandwidth by limiting the number of available VoIP channels.

The card supports a total of 8 ports, each having 2 separate channels. By disabling some of the ports, you can reduce the bandwidth required for VoIP communications.

To limit the number of VoIP channels:

- Set the status of the ports you wish to disable (starting from the highest-numbered port) to **OUS**.
  For example, if you wish to use only 10 of the available 16 VoIP channels (i.e., disable 6 channels), set the ports 8, 7, and 6 to **OUS** as shown below:



In this case, the equation for bandwidth calculation, based on the previous example, will be changed as follows:

Required Bandwidth
= (No. of Fax Machines × Required Bandwidth for the G.711 CODEC) +
[(**10** - No. of Fax Machines) × Required Bandwidth for Voice Communication]
= (2 × 87.2) + [(**10** - 2) × 31.2]
= 424 (kbps)

A1.2 Network Configuration

You must evaluate the structure of the existing network to see if a VoIP network can be implemented. Below are the points that should be taken into your evaluation.

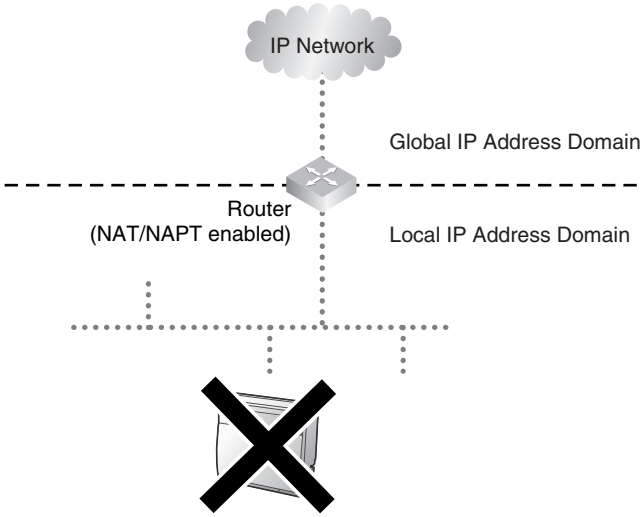
Is it possible to have static IP addressing?

Because the maintenance of the VoIP Gateway Card is carried out from a personal computer (PC) through an IP network, the card must be assigned a static IP address.

Static IP addressing must be made possible even when the DHCP feature is used. For more details, refer to "2.2.1 Network Parameters" in the VoIP Gateway Card Programming Guide.

Is network address translation (NAT/NAPT) disabled?

In a network where address translation techniques (e.g., NAT/NAPT) are used to convert between global and local IP addresses, VoIP communications based on the H.323 protocol cannot be carried out appropriately. Generally, NAT/NAPT are features that are available with routers.



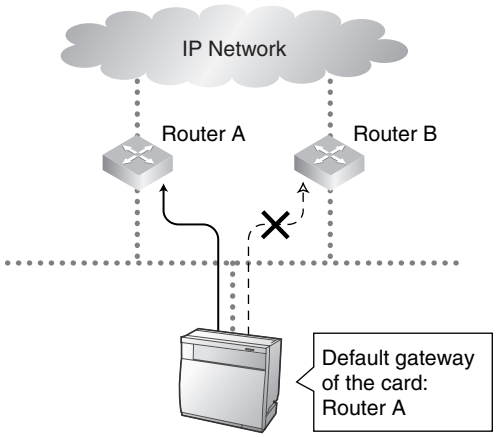
Note

If the router on the network supports the "H.323 NAT" feature, it may be possible to have VoIP communications over the network. For more information, consult your network administrator.

Does only a single router provide access to the IP network?

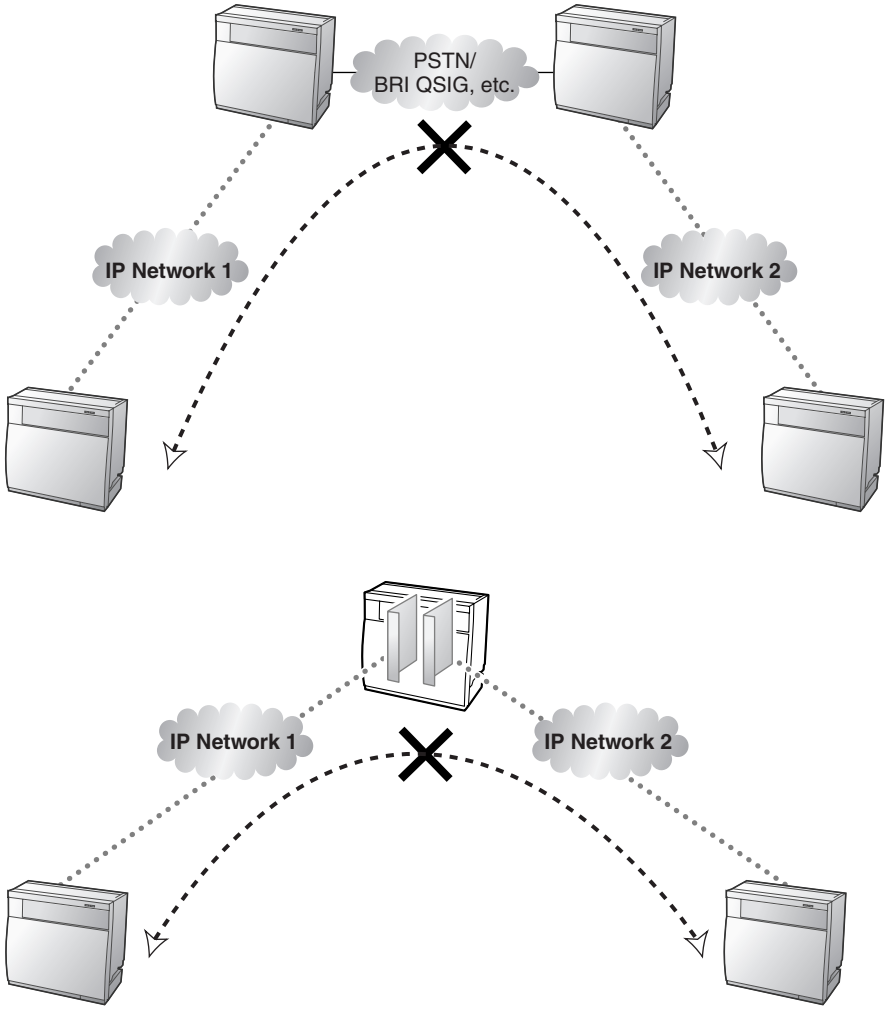
In a dual network, 2 routers provide access to the IP network as shown in the diagram below. However, the VoIP Gateway Card cannot take the advantage of having 2 routers as access points to the IP network.

For example, if router A, whose IP address is assigned as the default gateway IP address of the card, fails, VoIP communications are no longer possible; the card is not able to switch its default gateway from router A to router B to access the IP network. For more details about the default gateway setting, refer to "2.2.1 Network Parameters" of the VoIP Gateway Card Programming Guide.



Is there only a single IP network between 2 ends of a call?

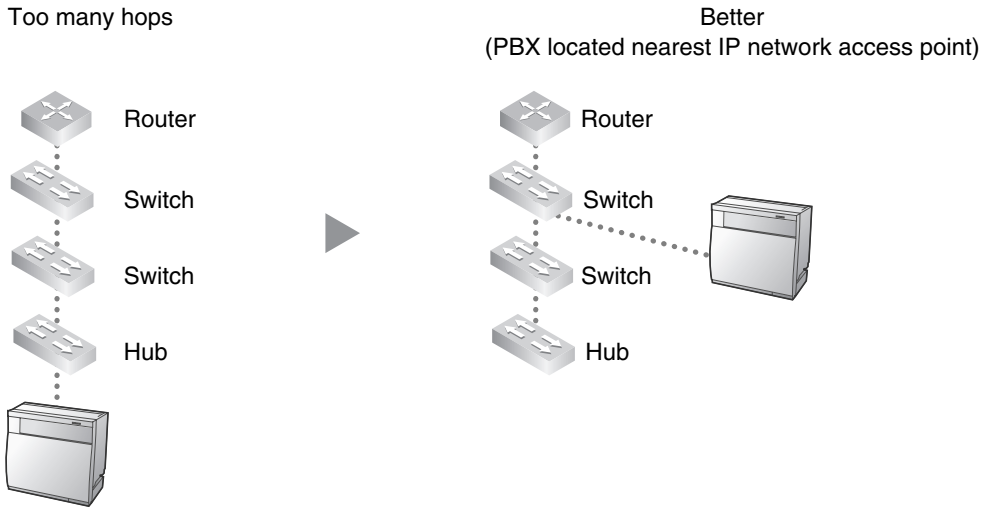
A huge degradation in speech quality will be produced when calls are made through multiple IP networks as shown below; therefore, it is recommended that you avoid establishing a VoIP network in this fashion.



Is the card located appropriately?

Transmission delays can cause pauses and loss in VoIP communications. The more network devices (e.g., routers and switches) there are between the communicating cards, the larger the transmission delays, because a certain amount of delay is inevitable when packets go through each network device (hop).

One preventative measure is to install the card so that the number of transmission hops is kept to a minimum. In the diagram below, the card is located as close to the IP network interface as possible.



A1.3 Network Devices

You must evaluate the network devices that are used in the existing network to see if a VoIP network can be implemented. Below are the points that should be taken into your evaluation.

Can the firewall pass packets from the VoIP Gateway Card?

If the VoIP network contains a firewall, the firewall must be configured appropriately to allow VoIP packets, which are listed in the table below, to pass through the network without being blocked by filtering.

For more information, consult your network administrator.

Protocol	TCP/UDP	Default Port No.
HTTP*1	TCP	80
RTP/RTCP*2	UDP	5004 to 5035
H.225.0 Call Signalling*2	TCP	1720
H.245*2	TCP	1712 to 1724
H.225.0 RAS*2	UDP	1719
QSIG Connectionless Tunnelling*1	TCP	1718

*1 For the actual setting values, refer to "2.2.1 Network Parameters" in the VoIP Gateway Card Programming Guide.

*2 For the actual setting values, refer to "2.2.2 H.323 Parameters" in the VoIP Gateway Card Programming Guide.

Are layer 2 or higher switches used?

Use of repeater hubs can increase the network load, and therefore will result in degradation in speech quality.

To ensure high speech quality, use only layer 2 or higher switches.

Note

Also note that the port of the switch that connects to the card should be set to operate under "Auto Negotiation" mode. This will help assure error-free communication between the card and the switch.

Are Category 5 (CAT5) cables used?

When connecting network devices, make sure to use CAT5 cables. If other types of cables are used, communications may not be carried out normally.

A1.4 QoS (Quality of Service)

Some routers permit the configuration of priority control features. This allows the router to give higher priority to voice packets and lower the rate of loss and delays during transmissions, hence improving speech quality. It is strongly recommended that you use this feature, especially in networks where traffic is heavy.

Typically, a router identifies what packets to pass in priority by checking the value in the ToS field of the header of IP packets. The VoIP Gateway Card has the ability to set the ToS field of outgoing voice packets (see "2.2.3 Voice Communication Parameters" in the VoIP Gateway Card Programming Guide). When the card is appropriately configured, the router can give voice packets from the card higher priority.

Consult your network administrator when setting the ToS field, as the setting value must conform to the router's specifications.

Note

Some switches also permit the configuration of priority control features. For more information, consult your network administrator.

A2 VoIP Requirements Checklist

Use the following checklists to see if you can implement a VoIP network. The answers identified in **underlined bold-face letters** are the required answers for the corresponding questions.

Bandwidth Assessment

No.	Question	Answer	Memo	Ref.
1	**Does the network have enough bandwidth to support VoIP communications?** Make sure that there is more bandwidth available for VoIP communications than the amount actually required.	☐ **Yes** ☐ No	• IP network bandwidth = kbps • Available bandwidth for VoIP = kbps • Required bandwidth for VoIP = kbps	p. 46

Network Configuration

No.	Question	Answer	Memo	Ref.
2-a	**Is it possible to have static IP addressing?**	☐ **Yes** ☐ No		p. 48
2-b	**Is network address translation (NAT/NAPT) disabled?**	☐ **Yes** ☐ No		p. 49
2-c	**Does only a single router provide access to the IP network?**	☐ **Yes** ☐ No		p. 49
2-d	**Is there only a single IP network between 2 ends of a call?**	☐ **Yes** ☐ No		p. 50
2-e	**Is the card located appropriately?**	☐ Yes ☐ No	No. of hops (routers/switches) within one location:	p. 51

Network Devices

No.	Question	Answer	Memo	Ref.
3-a	**Can the firewall pass packets from the VoIP Gateway Card?** When a firewall is used, make sure to configure the firewall appropriately to allow VoIP packets to pass through the network without being blocked by filtering.	☐ **Yes** ☐ No	Model of the firewall:	p. 51

No.	Question	Answer	Memo	Ref.
3-b	**Are layer 2 or higher switches used?** Do not use repeater hubs as they can increase the network load. Also note that the port of the switch that connects to the card should be set to operate under "Auto Negotiation" mode.	☐ **Yes** ☐ No	Model of the switch:	p. 52
3-c	**Are Category 5 (CAT5) cables used?**	☐ **Yes** ☐ No		p. 52

QoS (Quality of Service)

No.	Question	Answer	Memo	Ref.
4	**Can the router or switch be configured to use priority control features?**	☐ Yes ☐ No	Model of the router/switch: VoIP Gateway Card's ToS field setting:	p. 52

Appendix B

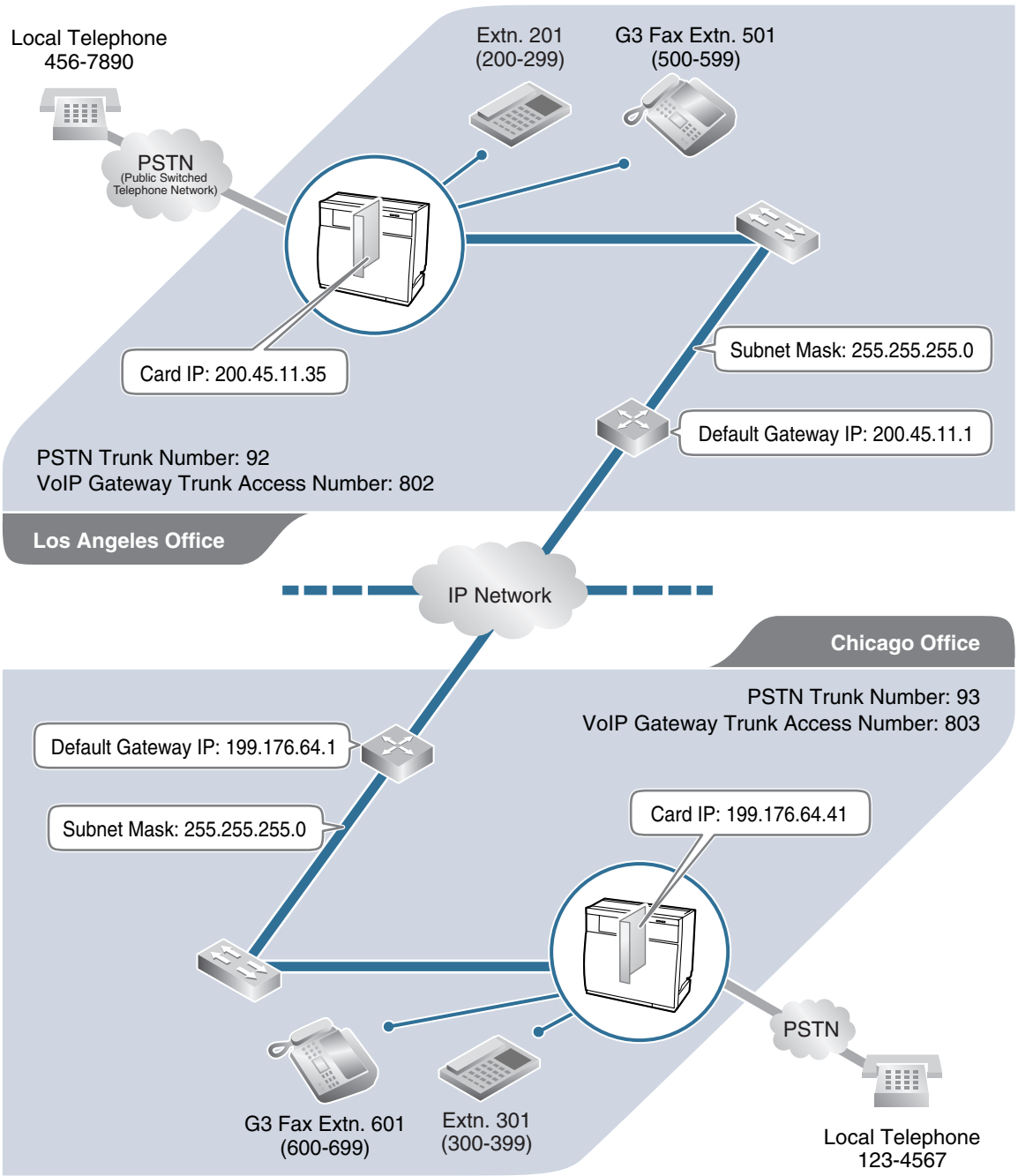
Alternative Numbering Plan Example

B1 Extension Number Method

This section provides a numbering plan example using the extension number method, as supplementary information to the PBX code method discussed in "1.2.2 Numbering Plan Example".

B1.1 Example Network

The following diagram illustrates a simple VoIP network configured for the extension number method.



B1.2 Numbering Plan Example

IP Addressing Information

The following table is a duplication of the table used for the PBX code method.

	Los Angeles Office	Chicago Office	Description
Card IP Address	200.45.11.35	199.176.64.41	Identifies the location of each VoIP Gateway Card in the network during VoIP communications. A unique IP address must be assigned to each card.
Default Gateway Address	200.45.11.1	199.176.64.1	Identifies the IP address of the primary gateway (typically a router or similar device) that exchanges IP packets with the other gateways on the VoIP network.
Subnet Mask Address	255.255.255.0	255.255.255.0	Defines which digits of an IP address are used for the network address and the host address at each network location. A card IP address must fall within the same subnet as that of the default gateway (e.g., router) that is connected to the card.

PBX Numbering Information

The following table contains "VoIP Gateway Trunk Access Number", instead of "PBX Code" and "TIE Line Access Number" as used in the PBX code method.

	Los Angeles Office	Chicago Office	Description
VoIP Gateway Trunk Access Number	802	803	An access number to seize a VoIP gateway trunk.
PSTN Trunk Number	92	93	An access number to seize a local PSTN trunk.
Extension Number	200 to 299	300 to 399	A number assigned to each extension.
Fax Extension Number	500 to 599	600 to 699	A number assigned to each fax extension.

Dialling Examples

With the extension number method, the caller dials only the destination number of the called party to call through PBXs at different locations.

Calling from Los Angeles to Chicago

To extension 301 via VoIP network

To local telephone 123-4567 via VoIP network through local PSTN

Calling from Chicago to Los Angeles

To extension 201 via VoIP network

To local telephone 456-7890 via VoIP network through local PSTN

PBX Connection Information

	Los Angeles Office			Chicago Office		
	Extn.	**FAX Extn.**	**PSTN Access**	**Extn.**	**FAX Extn.**	**PSTN Access**
Leading Number	2	5	92	3	6	93
Remaining Digits	2	2	7	2	2	7
Card IP Address	200.45.11.35			199.176.64.41		

B2 Programming for the Extension Number Method

When programming the VoIP Gateway Cards and PBXs for use in a network configured for the extension number method instead of the PBX code method, some of the steps in the programming procedures require different setting values.

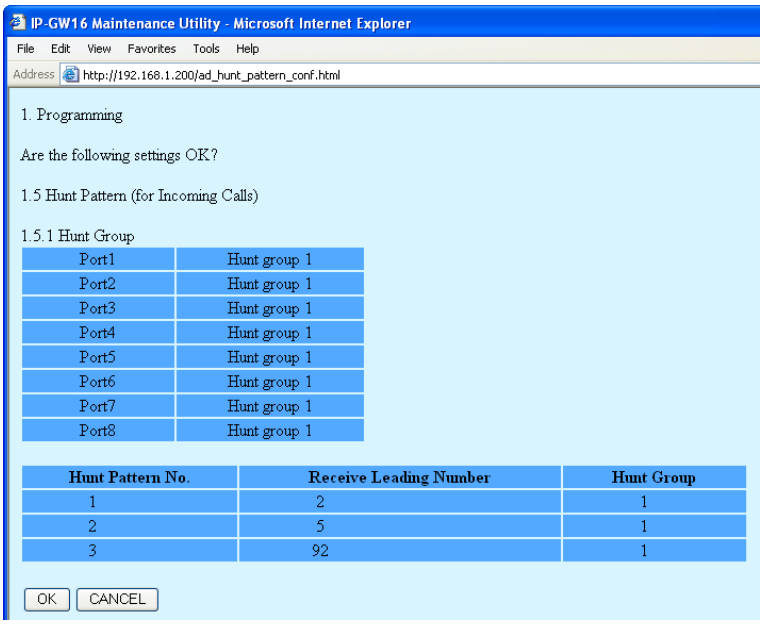
The following 2 sections provide specific steps that require different setting values. The steps other than those provided here have common setting values, and are therefore omitted from this explanation.

B2.1 Programming the VoIP Gateway Card

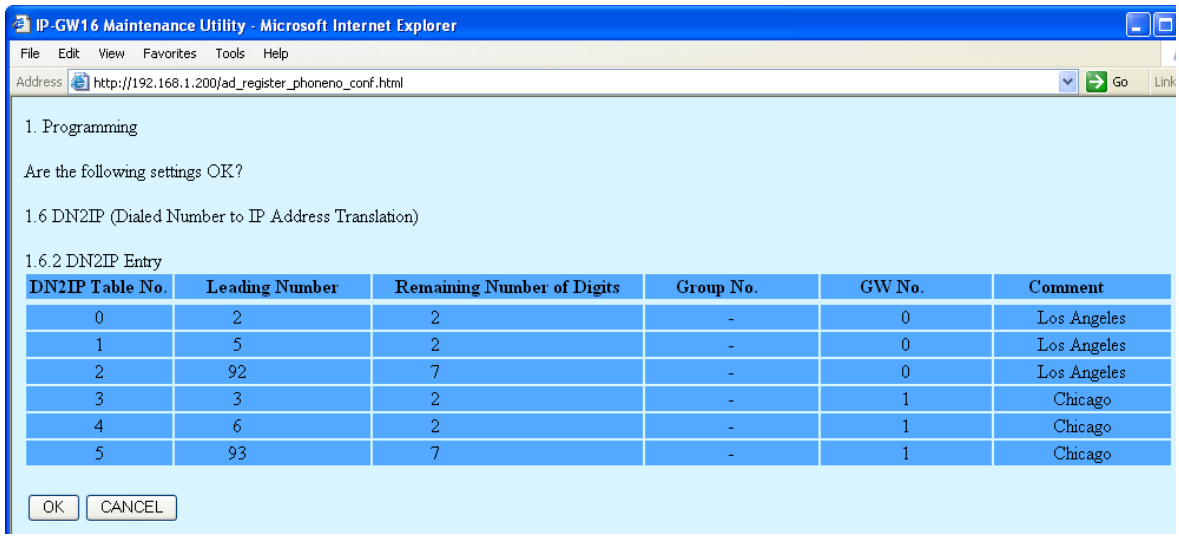
The hunt patterns and address translation table need different setting values for the extension number method, as shown in the screen shots provided below.

Programming the VoIP Gateway Card in the Los Angeles Office

Create hunt patterns with the setting values shown below, following the procedure in "3.2.4 Assigning the Hunt Pattern".

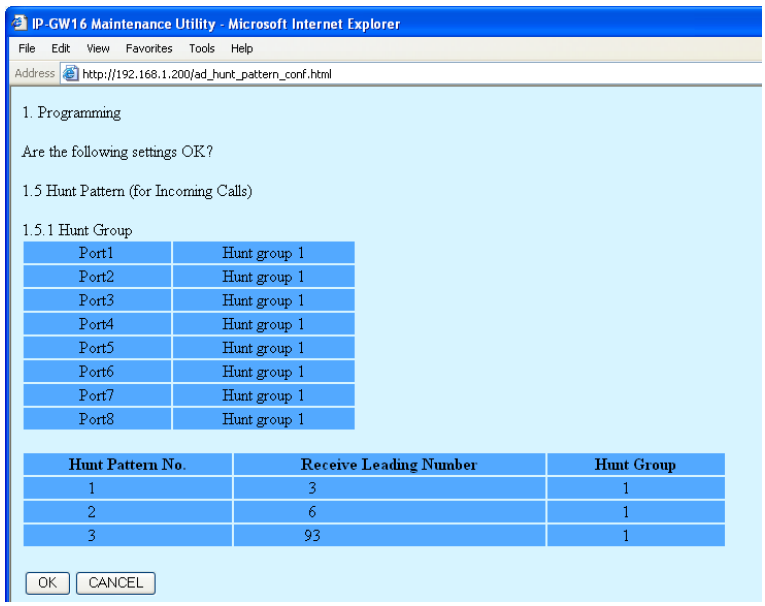


Programme an address translation table with the setting values shown below, following the procedure in "3.2.5 Programming the Address Translation Table".



Programming the VoIP Gateway Card in the Chicago Office

Create hunt patterns with the setting values shown below, following the procedure in "Assigning the Hunt Pattern" under "3.3 Programming the VoIP Gateway Card in the Chicago Office".



B2.2 Programming the PBX in the Los Angeles Office

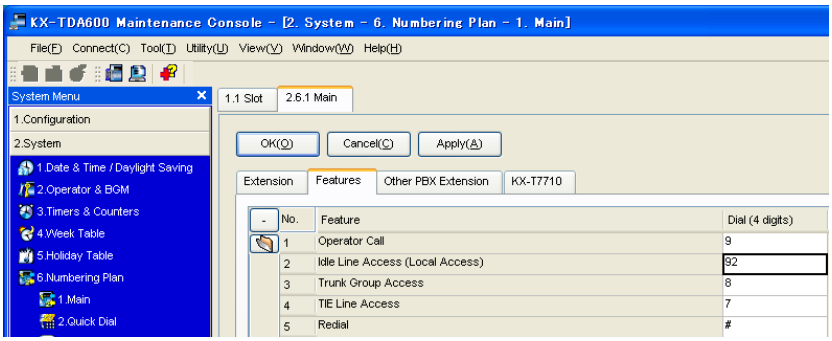
The steps below are provided in substitution for steps 6 and 7 of the procedure detailed in "4.1 Programming the PBX in the Los Angeles Office". Programme the PBX in the Los Angeles office using the extension number method, following these steps.

After programming the PBX in the Los Angeles office, follow the same procedure to programme the PBX in the Chicago office with the appropriate setting values.

Step 6

Assign the PSTN trunk access number:

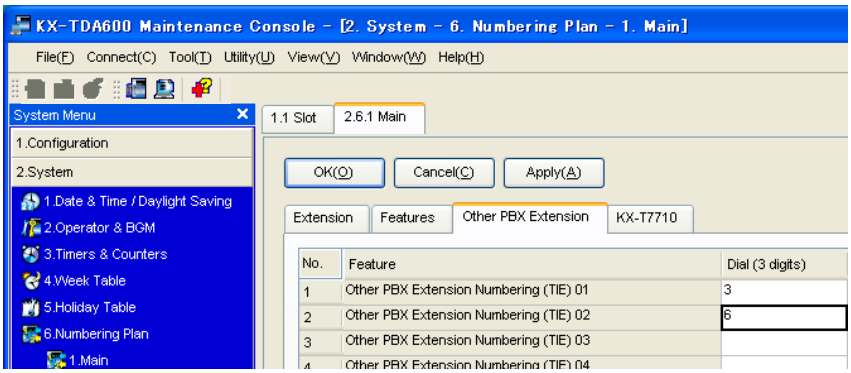
In the **Idle Line Access (Local Access)** box, type **92** (for Los Angeles office PSTN access).



Step 7

Assign the leading number used to reach the extensions of the remote PBX:

In the **Other PBX Extension Numbering (TIE)** box (01 and 02), type **3** (for the Chicago office extensions) and **6** (for the Chicago office fax extensions).



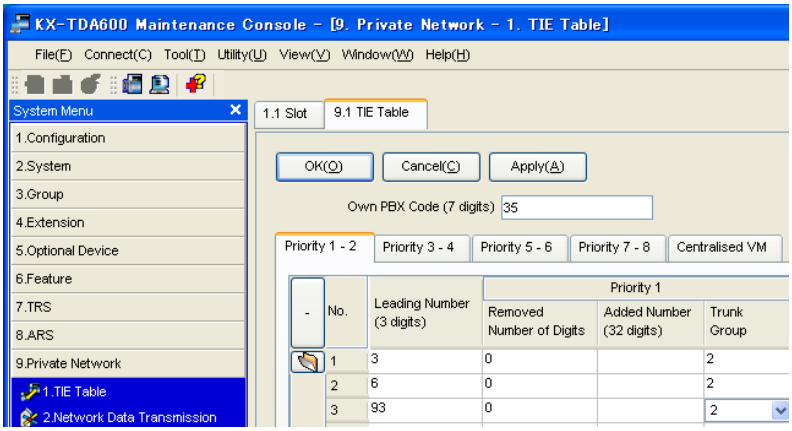
Step 8

Assign the routing information to route calls to the remote PBX:

In the **Leading Number** box, type **3** (for the Chicago office extensions), **6** (for the Chicago office fax extensions), and **93** (for Chicago office PSTN access).

Note

Do not set any value in the **Own PBX Code** box.



After the above step, follow the procedure in "4.1 Programming the PBX in the Los Angeles Office", starting from step 8.

Appendix C

Initialisation of the VoIP Gateway Card

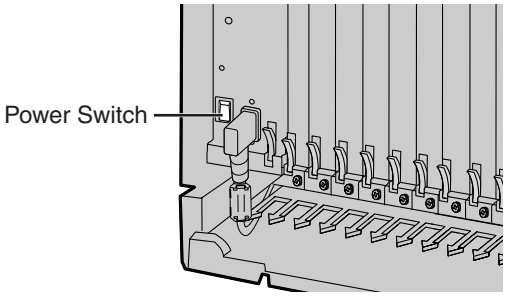
C1 Initialising the VoIP Gateway Card

In case you have forgotten, for example, the IP address or log-in password you set to the VoIP Gateway Card, follow the procedure below to return the settings of the card to the factory default.

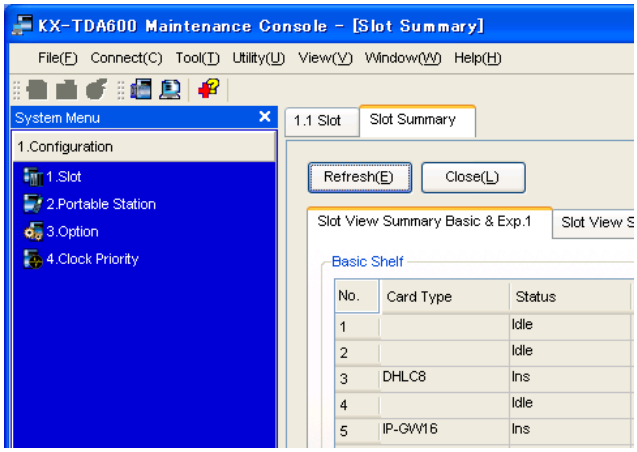
Note

Resetting the card will restore all settings, not just the IP address and log-in password, to the factory default.

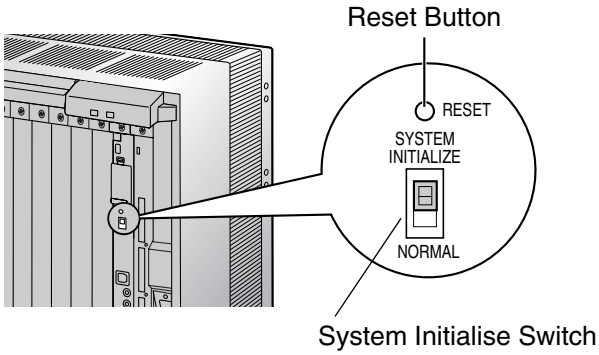
1. Install the card to the PBX, and then turn on the power to the PBX.



2. Using the Maintenance Console, confirm that the card is in service (INS).



3. Set the System Initialise Switch to the "SYSTEM INITIALIZE" position.



CAUTION

Do not press the Reset Button nor turn the power off then on while the System Initialise Switch is in this position. Doing so will initialise the PBX.

4. Using the Maintenance Console, set the status of the card to **OUS**, then set it back to **INS**.

5. Return the System Initialise Switch to the "NORMAL" position.

Appendix D

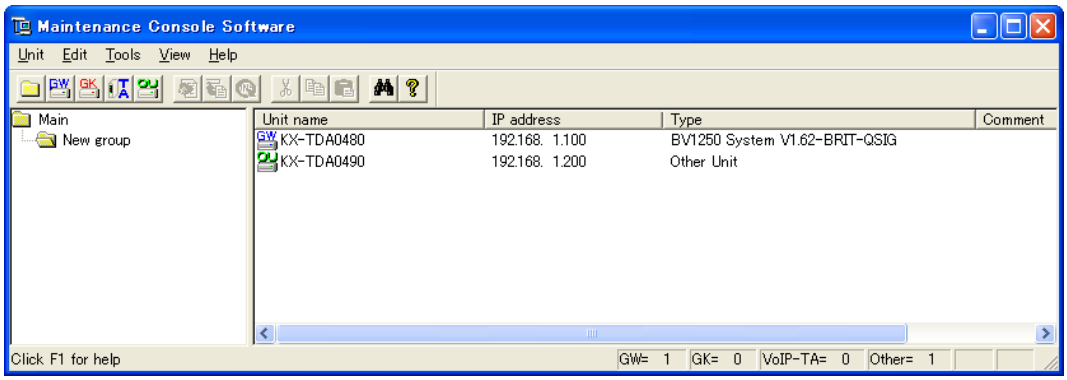
Using the KX-TDA0490 and KX-TDA0480 in One Network

D1 Considerations in Installation

Provided below are the points to consider when the VoIP network contains both the KX-TDA0490 and KX-TDA0480 VoIP Gateway Cards.

Adding the KX-TDA0490 to the Network Using the KX-TDA0480 Maintenance Console Software

For the KX-TDA0480 to recognise the KX-TDA0490 in the network, you must add it as an "Other Unit" in a Unit Group (network) when programming with the MCS as shown below:



Note

For programming instructions and other information about the KX-TDA0480, refer to the documentation for the KX-TDA0480.

Restrictions on Feature Compatibility

Some restrictions exist when using the KX-TDA0490 with the KX-TDA0480, as detailed below:

- CLIP service is the only QSIG service available between the KX-TDA0490 and KX-TDA0480. There is no compatibility for other QSIG services.
- Fax communications cannot take place between the KX-TDA0490 and KX-TDA0480.

Panasonic Communications Co., Ltd.
1-62, 4-chome, Minoshima, Hakata-ku, Fukuoka 812-8531, Japan

PSQX3945YA KK0805AH1076

Panasonic

16-Channel VoIP Gateway Card

Programming Guide

Model No. KX-TDA0490

Thank you for purchasing a Panasonic 16-Channel VoIP Gateway Card.
Please read this manual carefully before using this product and save this manual for future use.

Table of Contents

Section 1

IP-GW16 Maintenance Utility

Programming of the VoIP Gateway Card is carried out through a web programming utility called the IP-GW16 Maintenance Utility. This section provides the start-up procedure for the IP-GW16 Maintenance Utility.

1.1 Starting the IP-GW16 Maintenance Utility

The IP-GW16 Maintenance Utility is a web programming utility for the VoIP Gateway Card. There are 2 different log-in levels available: Administrator level and Installer level. These levels provide different programming options.

For full discussions of Administrator-level programming and Installer-level programming, refer to "2 Administrator Functions" and "3 Installer Functions", respectively.

System Requirements

- The IP-GW16 Maintenance Utility requires Microsoft® Internet Explorer 5.0 or above.

Trademarks

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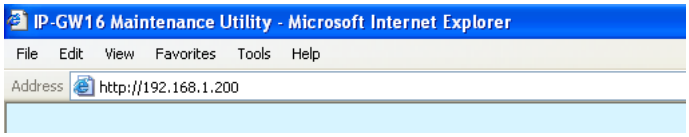
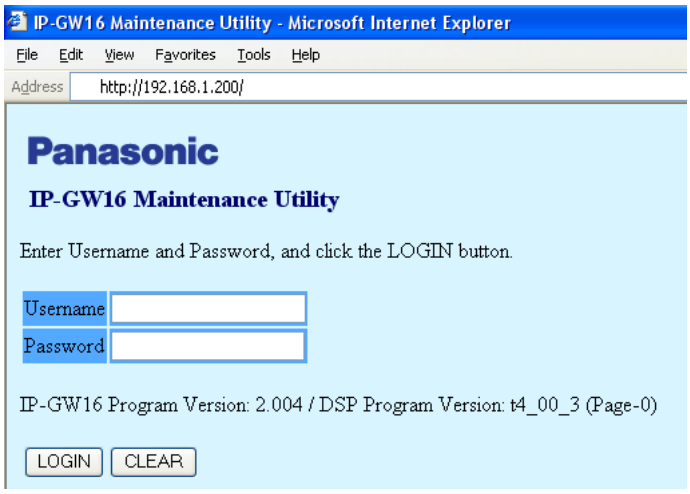
1. Run Internet Explorer from the **Start** menu.
2. In the **Address** box of Internet Explorer, type **http://192.168.1.200**.

   192.168.1.200 is the default IP address of the VoIP Gateway Card.



3. Press the ENTER key on the keyboard.
4. In the **Username** box, type the user name.
   - Default Administrator-level user name: **Administrator**
   - Default Installer-level user name: **Installer**
5. In the **Password** box, type the password.
   - Default Administrator-level password: **Administrator**
   - Default Installer-level password: **Installer**



6. Click **LOGIN**.

   To clear your entry, click **CLEAR**.

Notes

- If another user is already logged in, you will be rejected.
- For readability of the text on the screen, it is recommended that you adjust the text size of Internet Explorer to below medium.
- If you finish a programming session without logging out from the card (e.g., quitting Internet Explorer, or returning to the log-in screen with the "Back" button of Internet Explorer), you cannot log in again for the period of time specified by the parameter **Programming Auto Disconnect Time** (default: 10 min).
  For the log-out procedure and **Programming Auto Disconnect Time** setting, refer to "2.5.2 Log Out"/"3.4.2 Log Out" and "2.3.2 Maintenance Settings", respectively.

Section 2

Administrator Functions

This section provides operating instructions for the IP-GW16 Maintenance Utility when logged in as the Administrator.

2.1 Main Menu for the Administrator

The IP-GW16 Maintenance Utility provides the following menu to a user logged in as the Administrator.

Programming

Menu	Section Reference
1.1 Network Settings, General	2.2.1 Network Parameters
1.2 H.323 Detailed Settings	2.2.2 H.323 Parameters
1.3 Voice Communication Detailed Settings	2.2.3 Voice Communication Parameters
1.4 VoIP Gateway/IP-PBX Interface Settings	2.2.4 VoIP Gateway/IP-PBX Interface Parameters
1.5 Hunt Pattern (for Incoming Calls)	2.2.5 Hunt Pattern Parameters
1.6 DN2IP (Dialed Number to IP Address Translation)	2.2.6 Address Translation Table—GW Entry 2.2.7 Address Translation Table—DN2IP Entry
1.7 Initialization	2.2.8 Initialisation

Maintenance

Menu	Section Reference
2.1 Change RUN/STOP status	2.3.1 Status Control
2.2 Maintenance Settings	2.3.2 Maintenance Settings
2.3 Diagnosis	2.3.3 Diagnosis
2.4 Log Information	2.3.4 Log Information

Data Management

Menu	Section Reference
3.1 Upload of Configuration data (PC → VoIP Gateway)	2.4.1 Upload of Configuration Data
3.2 Download of Configuration data (VoIP Gateway → PC)	2.4.2 Download of Configuration Data
3.3 Upload of DN2IP data (PC → VoIP Gateway)	2.4.3 Upload of Address Translation Table
3.4 Download of DN2IP data (VoIP Gateway → PC)	2.4.4 Download of Address Translation Table

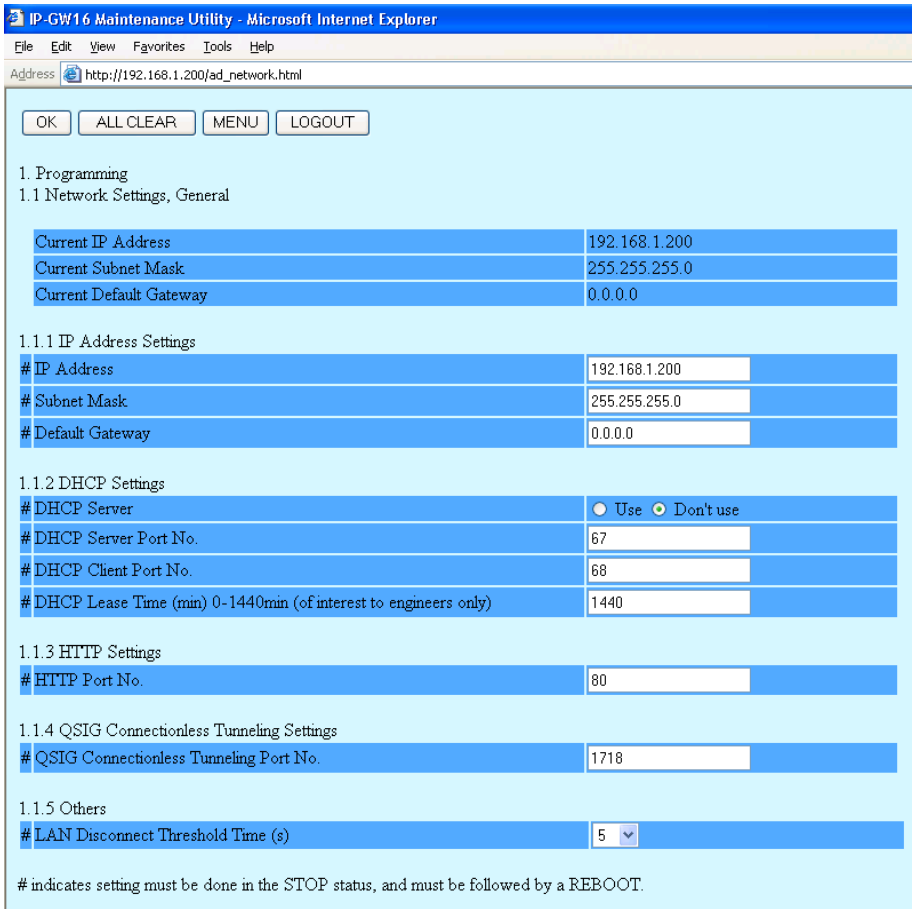
Others

Menu	Section Reference
REBOOT	2.5.1 Reboot
LOGOUT	2.5.2 Log Out

2.2 Programming

2.2.1 Network Parameters

1. Click **1.1 Network Settings, General** in the main menu.



Current IP Address, **Current Subnet Mask**, and **Current Default Gateway** show the current IP address settings of the VoIP Gateway Card.

2. Assign each parameter referring to the descriptions below.

   At any time during the session, you can:

   - Click **ALL CLEAR** to return all parameters to their previous values.
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **OK**.

   You will see a confirmation screen.

   Note

   If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.

4. Confirm your entry and click **OK**.

   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

The parameters indicated with "**#**" must be changed while the card is in the "STOP" status (see "2.3.1 Status Control"). The changes must be followed by a reboot to become effective (see "2.5.1 Reboot").

IP Address Settings

Parameter & Description	Default	Value Range
# IP Address Specifies the IP address of the card. For more information, consult your network administrator.	192.168.1.200	The following addresses are invalid: • Class D addresses • Class E addresses • Loopback addresses • Addresses with host number all 0s or 1s
# Subnet Mask Specifies the subnet mask address of the card. For more information, consult your network administrator.	255.255.255.0	Any address is valid.
# Default Gateway Specifies the default gateway IP address of the card. For more information, consult your network administrator.	0.0.0.0	Same as the parameter **IP Address**, except that the address 0.0.0.0. is allowed.

DHCP Settings

Parameter & Description	Default	Value Range
# DHCP Server Specifies the use of a DHCP server. For details, refer to "Detailed Explanations".	Don't use	Use, Don't use
# DHCP Server Port No. Specifies the port number for DHCP communications by the DHCP server. Generally, there is no need to change the default value.	67	1 to 65535
# DHCP Client Port No. Specifies the port number for DHCP communications by the card (the DHCP client). Generally, there is no need to change the default value.	68	1 to 65535
# DHCP Lease Time (min) 1-1440min This parameter is provided for engineer use only.	1440	0 (disable), 1 to 1440

HTTP Settings

Parameter & Description	Default	Value Range
# HTTP Port No. Specifies the port number for HTTP communications by the card. Generally, there is no need to change the default value.	80	1 to 65535

QSIG Connectionless Tunneling Settings

Parameter & Description	Default	Value Range
# QSIG Connectionless Tunneling Port No. Specifies the port number for connectionless tunnelling between cards at different locations in a QSIG network. Generally, there is no need to change the default value. **Notes** • Connectionless tunnelling enables the PBXs on a QSIG network to use enhanced networking features. (For more information about these features, refer to the relevant sections of the Hybrid IP-PBX documentation.) • If you are using a gatekeeper, and "**Routed**" is specified for the parameter **Call Signaling Model** (see "2.2.2 H.323 Parameters"), connectionless tunnelling is not possible. In this case, the PBX cannot use the enhanced networking features.	1718	1 to 65535

Others

Parameter & Description	Default	Value Range
# LAN Disconnect Threshold Time (s) Specifies the time (in seconds) until disconnection from the LAN is recognised. For example, even if a LAN cable is disconnected during a call, reconnecting the cable within this time period maintains the call.	5	1 to 10

Detailed Explanations

DHCP Server

When using the DHCP feature, the IP address settings of the card (IP address, subnet mask, and default gateway) will be assigned by a DHCP server.

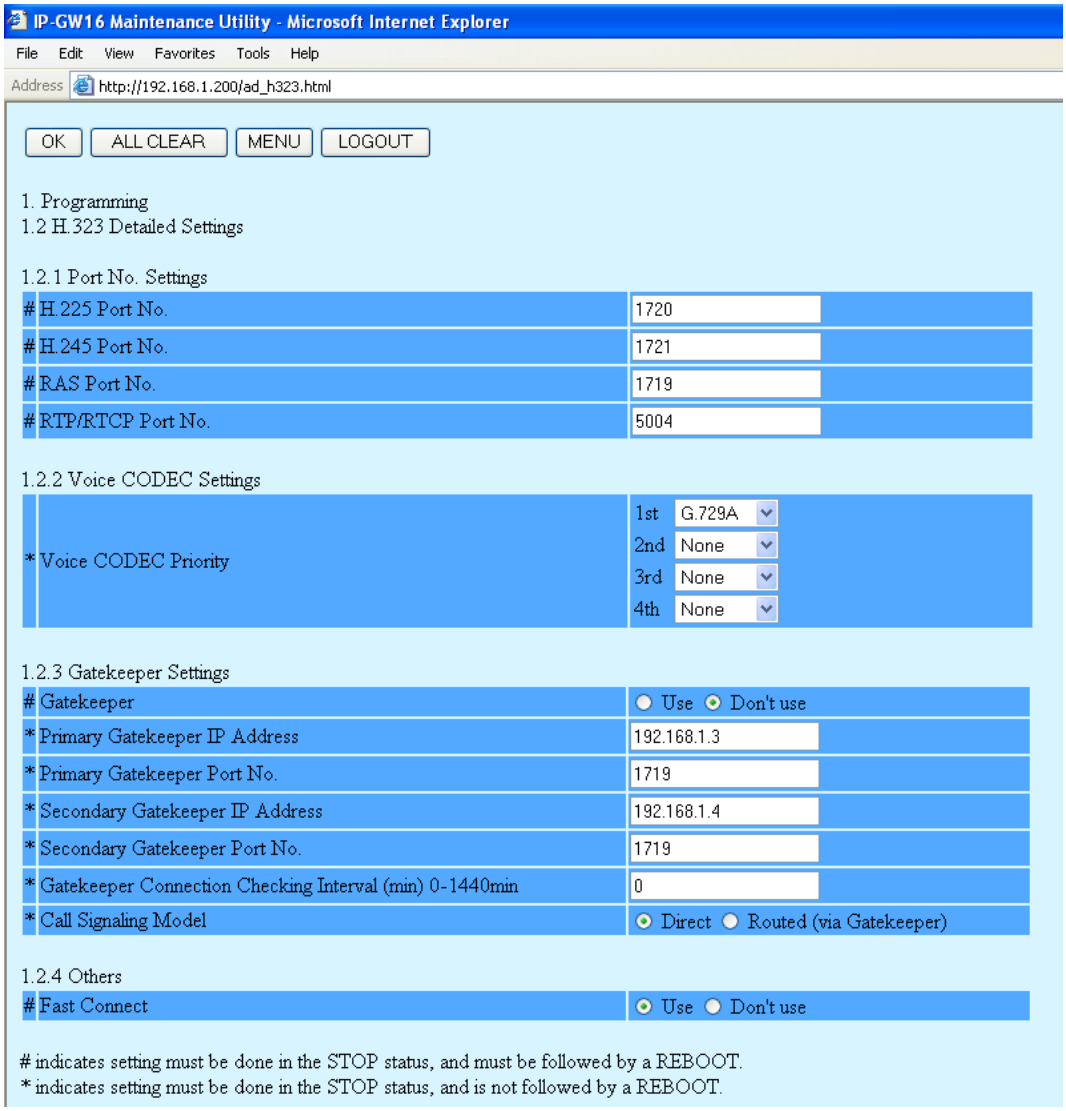
However, keep in mind that the maintenance of the card is performed through a web browser from a PC; hence you must know the IP address of the card. Therefore, it is necessary to set up the DHCP

server to assign a static IP address to the card from a pool of IP addresses that is defined in advance. For more information about DHCP server settings, consult your network administrator.

In addition, it is also necessary to specify the values for the parameters under **IP Address Settings** as they will be assigned by the DHCP server.

2.2.2 H.323 Parameters

1. Click **1.2 H.323 Detailed Settings** in the main menu.



2. Assign each parameter referring to the descriptions below.

   At any time during the session, you can:

   - Click **ALL CLEAR** to return all parameters to their previous values.
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **OK**.

   You will see a confirmation screen.

   Note

   If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.

4. Confirm your entry and click **OK**.

   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

The parameters indicated with "**#**" must be changed while the VoIP Gateway Card is in the "STOP" status (see "2.3.1 Status Control"). The changes must be followed by a reboot to become effective (see "2.5.1 Reboot").

The parameters indicated with "*" must be changed while the card is in the "STOP" status (see "2.3.1 Status Control"). The changes do not have to be followed by a reboot to become effective.

Port No. Settings

Parameter & Description	Default	Value Range
# H.225 Port No. Specifies the port number for the H.225 protocol (call control) in an H.323 protocol suite. Generally, there is no need to change the default value.	1720	1 to 65535
# H.245 Port No. Specifies the port number for the H.245 protocol (negotiation of channel usage and capabilities) in an H.323 protocol suite. 32 consecutive ports, starting with the specified port, will be used (by default, 1721 to 1752). Generally, there is no need to change the default value.	1721	1 to 65504
# RAS Port No. Specifies the port number for the H.225 protocol (RAS) in an H.323 protocol suite. Generally, there is no need to change the default value.	1719	1 to 65535
# RTP/RTCP Port No. Specifies the port number for RTP/RTCP. 64 consecutive ports, starting with the specified port, will be used (by default, 5004 to 5067). Generally, there is no need to change the default value.	5004	1 to 65472

Voice CODEC Settings

Parameter & Description	Default	Value Range
* **Voice CODEC Priority 1st–4th** Specifies the type of CODEC for voice communications. Choose the appropriate CODEC for the network environment (e.g., bandwidth, CODEC conditions of the remote terminal). When using multiple CODECs, set them in an appropriate priority order. Prior to establishing a call, a negotiation takes place over the network and the CODEC to be used will be decided depending on the setting of this parameter. For details about relations between bandwidth and CODEC, refer to "Detailed Explanations" in "2.2.3 Voice Communication Parameters". **Note** When the Fast Connect feature (see under "Others" below) is disabled, the communicating cards must have the same first priority CODEC set.	1st: G.729A 2nd: No default 3rd: No default 4th: No default	G.723.1, G.729A, G.711Mu, G.711A

Gatekeeper Settings

Parameter & Description	Default	Value Range
# **Gatekeeper** Specifies the use of a gatekeeper. For details, refer to "Detailed Explanations".	Don't use	Use, Don't use
* **Primary Gatekeeper IP Address** Specifies the IP address of the primary gatekeeper.	192.168.1.3	The following addresses are invalid: • Class D addresses • Class E addresses • Loopback addresses
* **Primary Gatekeeper Port No.** Specifies the port number of the primary gatekeeper.	1719	1 to 65535
* **Secondary Gatekeeper IP Address** Specifies the IP address of the secondary gatekeeper. Set this parameter when setting up a secondary gatekeeper as a redundant backup system.	192.168.1.4	The following addresses are invalid: • Class D addresses • Class E addresses • Loopback addresses
* **Secondary Gatekeeper Port No.** Specifies the port number of the secondary gatekeeper. Set this parameter when setting up a secondary gatekeeper as a redundant backup system.	1719	1 to 65535

Parameter & Description	Default	Value Range
* **Gatekeeper Connection Checking Interval (min) 0-1440min** Specifies the time (in minutes) between periodic checks of connection to the gatekeeper. When the primary gatekeeper fails, these checks can detect the failure. In this case, the connection automatically switches to the secondary gatekeeper if it is available, so that the network remains functional.	0	0 (disable), 1 to 1440
* **Call Signaling Model** Specifies whether to carry out a call control (H.225) process directly between the cards or through a gatekeeper. Direct call control is typically preferred because it involves less network load.	Direct	Direct, Routed (via Gatekeeper)

Others

Parameter & Description	Default	Value Range
# **Fast Connect** Specifies the use of the Fast Connect feature. Using Fast Connect simplifies the communication process so that calls can be established quickly. Generally, there is no need to change the default value.	Use	Use, Don't use

Detailed Explanations

Gatekeeper

The following are the general functions of a gatekeeper:

- Dialled number-to-IP address translation
- Authentication
- Bandwidth control

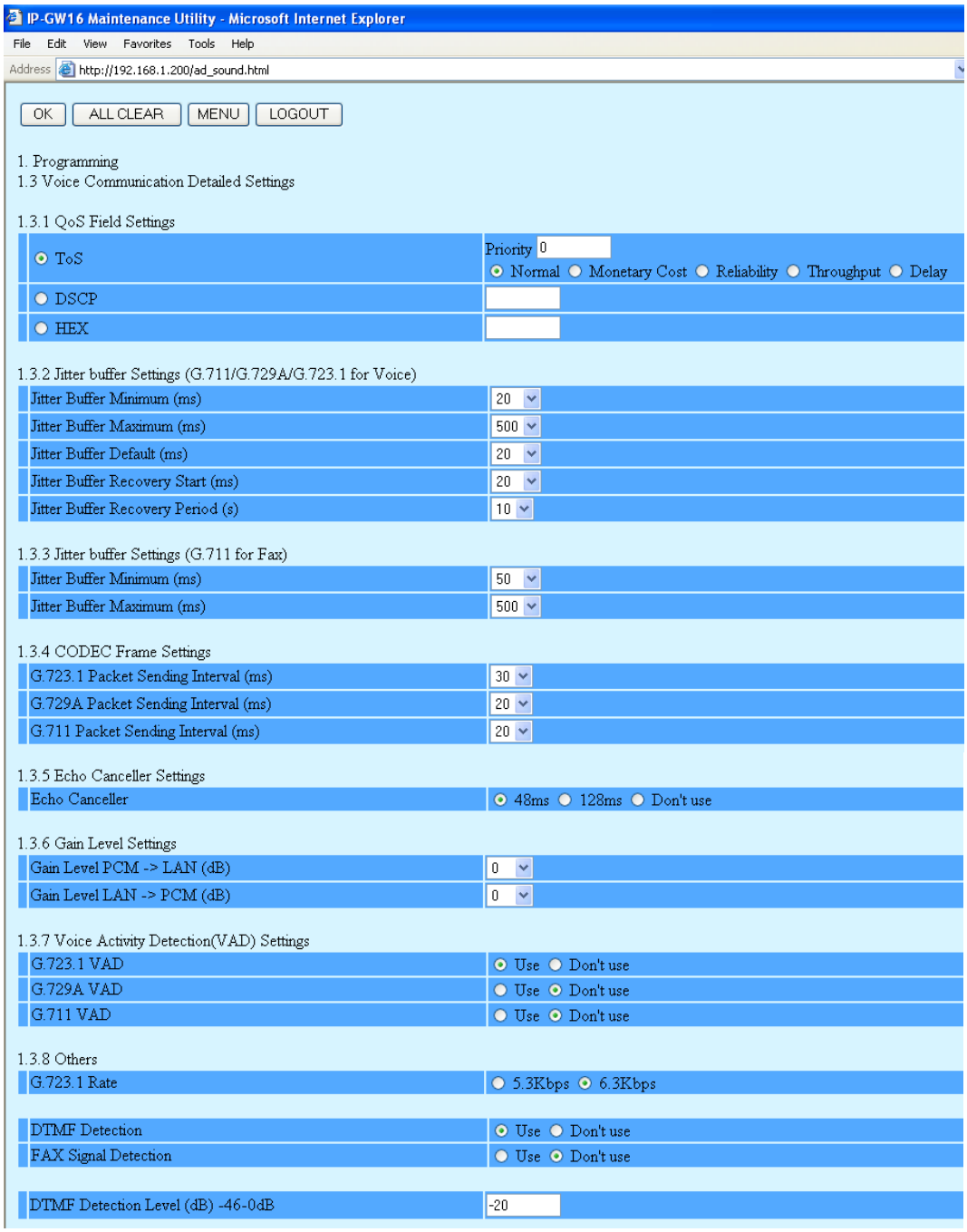
It is possible to employ a VoIP network without the use of a gatekeeper, because the card is equipped with internal address translation capabilities. However, should the network contain dozens of cards, maintenance of address translation tables in individual cards can become a strain.

A gatekeeper is useful in this case, because with the gatekeeper it is possible to consolidate the maintenance. (However, you still need to programme each card on the network with its own address translation information. For details, refer to "2.2.6 Address Translation Table—GW Entry" and "2.2.7 Address Translation Table—DN2IP Entry".) For more information about gatekeeper functions, consult the documentation of the gatekeeper.

When using a gatekeeper, make sure to choose a compatible model. For more information about gatekeeper compatibility with the card, consult a certified dealer.

2.2.3 Voice Communication Parameters

1. Click **1.3 Voice Communication Detailed Settings** in the main menu.



2. Assign each parameter referring to the descriptions below.

   At any time during the session, you can:

   - Click **ALL CLEAR** to return all parameters to their previous values.
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **OK**.

You will see a confirmation screen.

Note

If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.

4. Confirm your entry and click **OK**.

   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

QoS Field Settings

The parameters below are used to set the ToS (Type of Service) field in the header of IP packets to control QoS of VoIP communications.

For more information about QoS, refer to "A1.4 QoS (Quality of Service)" of the VoIP Gateway Card Getting Started. For the actual setting values, consult your network administrator.

Parameter & Description	Default	Value Range
ToS Specifies the value in the ToS field by a generic term. For details, refer to "Detailed Explanations".	Priority: 0	0 to 7
	Normal	Normal, Monetary Cost, Reliability, Throughput, Delay
DSCP Specifies the value in the ToS field by a DSCP for DiffServ.	No default	0 to 63
HEX Specifies the value in the ToS field by a hexadecimal number.	No default	00 to FF

Jitter Buffer Settings

When voice signals are packetised and transmitted, individual packets can take different paths through the network and arrive at the destination at varied timings. This is referred to as "jitter", and it can cause degradation in speech quality. To compensate for jitter problems, the "jitter buffer" accumulates the packets temporarily for processing.

The parameters below are used to adjust the size of the jitter buffer. However, in general, there is no need to change the default values.

Jitter buffer Settings (G.711/G.729A/G.723.1 for Voice)

Parameter	Default	Value Range
Jitter Buffer Minimum (ms)	20	10 × n (n = 2–10)
Jitter Buffer Maximum (ms)	500	10 × n (n = 2–50)
Jitter Buffer Default (ms)	20	10 × n (n = 2–10)
Jitter Buffer Recovery Start (ms)	200	10 × n (n = 2–10)
Jitter Buffer Recovery Period (s)	10	1 to 20

Jitter buffer Settings (G.711 for Fax)

Parameter	Default	Value Range
Jitter Buffer Minimum (ms)	50	10 × n (n = 4–10)
Jitter Buffer Maximum (ms)	500	10 × n (n = 4–50)

CODEC Frame Settings

The parameters below are used to set the interval between packet transmissions for each type of CODEC. It is recommended that all VoIP Gateway Cards in a VoIP network have the same settings for these parameters.

For details, refer to "Detailed Explanations".

Parameter	Default	Value Range
G.723.1 Packet Sending Interval (ms)	30	30, 60, 90
G.729A Packet Sending Interval (ms)	20	20, 30, 40, 60
G.711 Packet Sending Interval (ms)	20	20, 30, 40, 60

Echo Canceller Settings

Parameter & Description	Default	Value Range
Echo Canceller Specifies the length of the echo canceller (in milliseconds) when using the echo cancellation feature (G.168), or disables the feature. Echo is the audible duplication of a caller's voice on the return path; when echo exists, the caller hears his or her own voice after some delay. The echo canceller eliminates this echo. Generally, the default length of 48 ms will suffice. However, if an echo is still heard, it is recommended that you set the length to 128 ms. **Note** There are various factors that may cause an echo. In some cases, this feature does not eliminate the echo entirely.	48	48, 128, Don't use

Gain Level Settings

The parameters below are used to adjust the gain level. However, in general, there is no need to change the default values.

Parameter & Description	Default	Value Range
Gain Level PCM → LAN (dB) Specifies the gain level (in decibels) output from the PBX, through the card, to the LAN.	0	-14 to 6
Gain Level LAN → PCM (dB) Specifies the gain level (in decibels) output from the LAN, through the card, to the PBX.	0	-14 to 6

Voice Activity Detection (VAD) Settings

Parameter & Description	Default	Value Range
G.723.1/G.729A/G.711 VAD Specifies the use of the VAD feature for each available CODEC (G.723.1, G.729A, and G.711). The VAD conserves bandwidth by detecting silent periods during a call and suppressing the packets of silence from being sent to the network. **Notes** • To use the VAD feature for a certain CODEC, be sure to enable it for that CODEC on both the local and remote cards. • To use the VAD feature between the KX-TDA0490 and KX-TDA3480/KX-TDA0484, you must enable it for the G.723.1 CODEC. Otherwise, the VAD feature cannot be used between these cards (although calls can be made and received as normal).	Use	Use, Don't use

Others

Parameter & Description	Default	Value Range
G.723.1 Rate Specifies the rate of the G.723.1 CODEC.	6.3Kbps	5.3Kbps, 6.3Kbps
DTMF Detection Specifies the use of the DTMF detection feature. DTMF detection enables end-to-end DTMF relay over the network. For details, refer to "Detailed Explanations".	Use	Use, Don't use

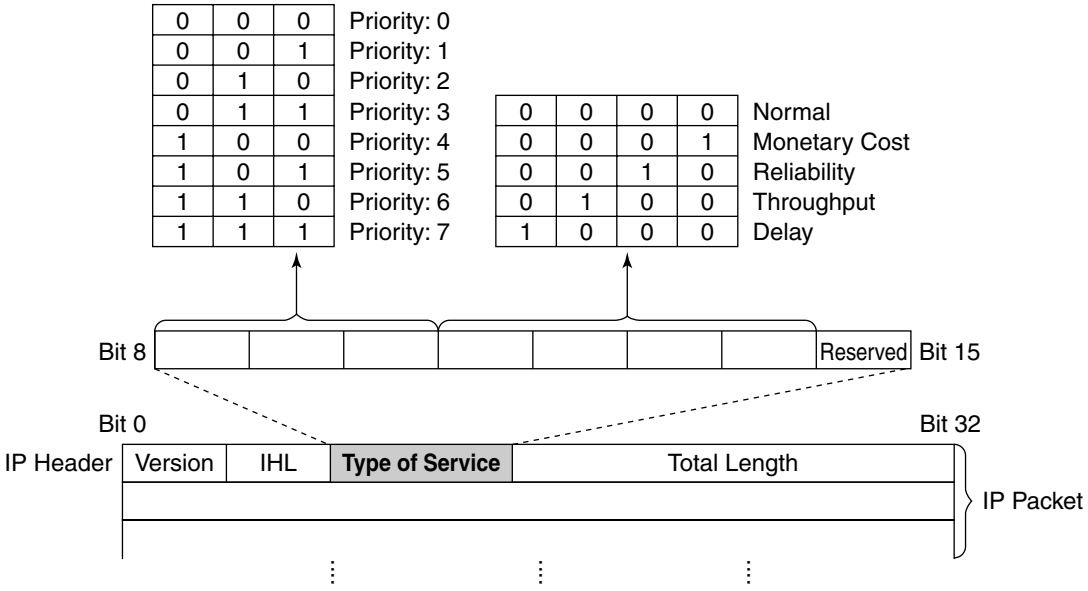
Parameter & Description	Default	Value Range
FAX Signal Detection Specifies the use of the fax signal detection feature. Fax signal detection enables end-to-end fax signal relay over the network. For details, refer to "Detailed Explanations".	Don't use	Use, Don't use
DTMF Detection Level (dB) -46-0dB Specifies the level (in decibels) of DTMF detection. Generally, there is no need to change the default value.	-20	-46 to 0

Detailed Explanations

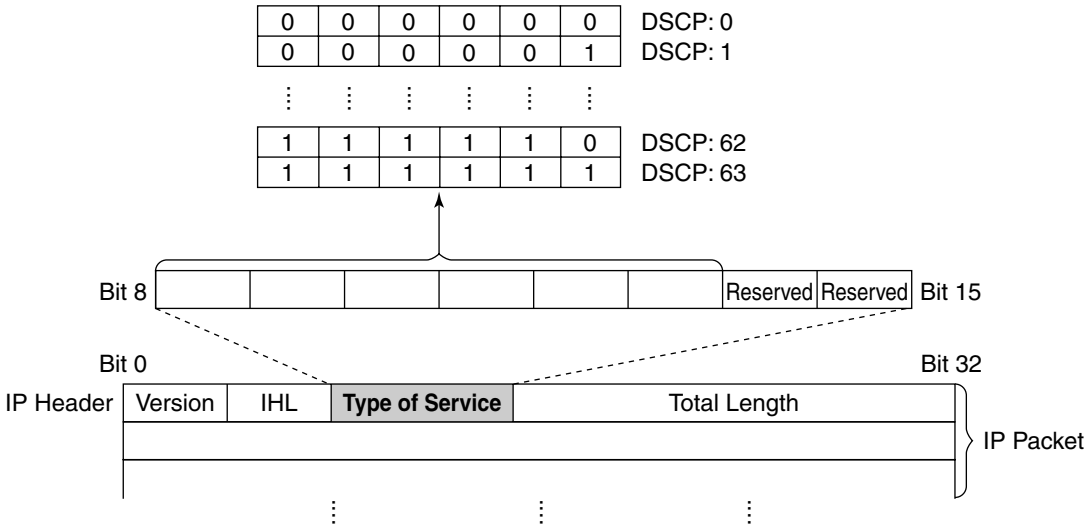
QoS Field Settings

The following diagrams show the bit values of the ToS field in the IP header in relation to the setting values for the parameters under **QoS Field Settings**:

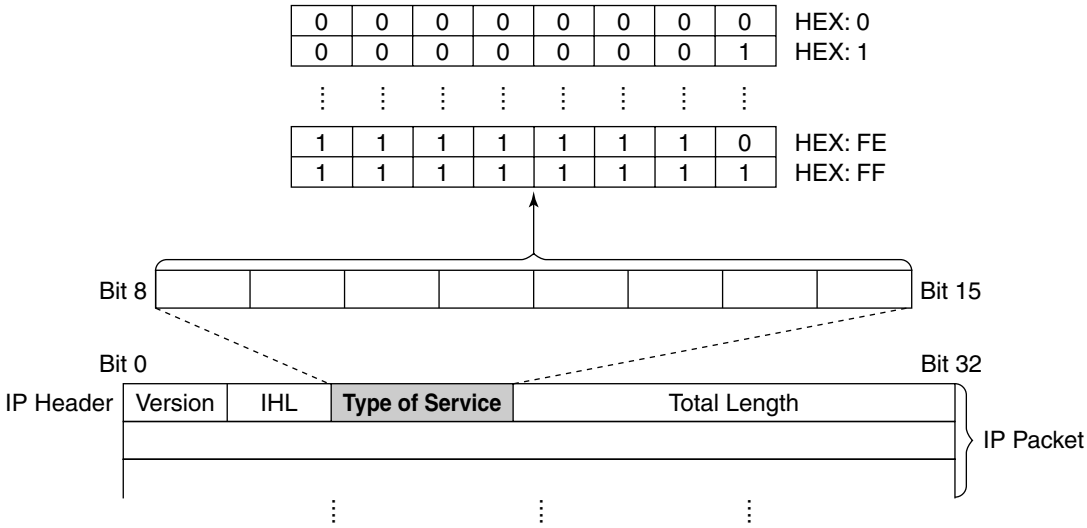
ToS



DSCP



HEX



CODEC Frame Settings

The amount of required bandwidth depends on the type of CODEC and the selected packet sending interval. The tables below show the amount of bandwidth required for one VoIP channel in each case:

Required Bandwidth for Voice Communication via LAN

CODEC	Packet Sending Interval				
	20 ms	30 ms	40 ms	60 ms	90 ms
G.711	87.2 kbps	79.5 kbps	75.6 kbps	71.7 kbps	—
G.729A	31.2 kbps	23.5 kbps	19.6 kbps	15.7 kbps	—
G.723.1 5.3 kbps	—	20.8 kbps	—	13.1 kbps	10.5 kbps
G.723.1 6.3 kbps	—	21.9 kbps	—	14.1 kbps	11.6 kbps

Required Bandwidth for Voice Communication via WAN (PPP: Point-to-Point Protocol)

CODEC	Packet Sending Interval				
	20 ms	30 ms	40 ms	60 ms	90 ms
G.711	84 kbps	77.3 kbps	74 kbps	70.7 kbps	—
G.729A	28 kbps	21 kbps	18 kbps	14.7 kbps	—
G.723.1 5.3 kbps	—	18.7 kbps	—	12 kbps	9.8 kbps
G.723.1 6.3 kbps	—	19.7 kbps	—	13.1 kbps	10.8 kbps

When assessing your bandwidth requirements, keep in mind that the longer the packet sending interval, the smaller the amount of required bandwidth, and vice versa.

However, also consider that the shorter the packet sending interval, the clearer the expected speech quality, because delays in packet transmissions will be small. When the packet sending interval is long, delays are more likely to occur, resulting in overall degradation in speech quality with more pauses and loss in voice communications.

Therefore, it is recommended that you select the shortest packet sending interval that network bandwidth can accommodate.

DTMF Detection

A VoIP network does not guarantee accurate end-to-end transmission of DTMF signals because the DTMF signals are coded/decoded during VoIP communications, in the same way as voice signals. In addition, packets can get lost during transmission.

To compensate for this problem, it is possible to enable DTMF detection for the VoIP Gateway Card to carry out accurate end-to-end DTMF relay over the network. Upon detecting DTMF signals from the PBX, the card encodes the signals and then sends them to the destination, instead of as voice signals. Then at the destination, the card regenerates the DTMF signals from the received encoded signals, and then sends them to the PBX.

Note that when this feature is enabled, the sending of packets is delayed by approximately 30 ms. Therefore, it is recommended that you disable this feature unless DTMF detection is necessary.

FAX Signal Detection

When sending fax signals using a CODEC other than G.711, the signals cannot be received accurately at the destination because they are coded/decoded over the VoIP network, in the same way as voice signals.

To compensate for this problem, it is possible to enable fax detection for the card. Upon detecting fax signals (CED tones) from the PBX, the card automatically switches the CODEC to G.711 to communicate with the card at the destination. With the G.711 CODEC, it is possible to assure error-free fax communications to a certain extent.

To further assure fax communications, it is strongly recommended that the communicating fax machines be equipped with the ECM (Error Correction Model) feature, an automatic error correction feature. When, for example, the receiving fax machine detects errors in transmission, it can have the sending fax machine resend the relevant data.

When using the fax detection feature, the communicating cards must share the same value (either "**G.711Mu**" or "**G.711A**") for the parameter **Voice CODEC Priority** (see "Voice CODEC Settings" in "2.2.2 H.323 Parameters").

Notes

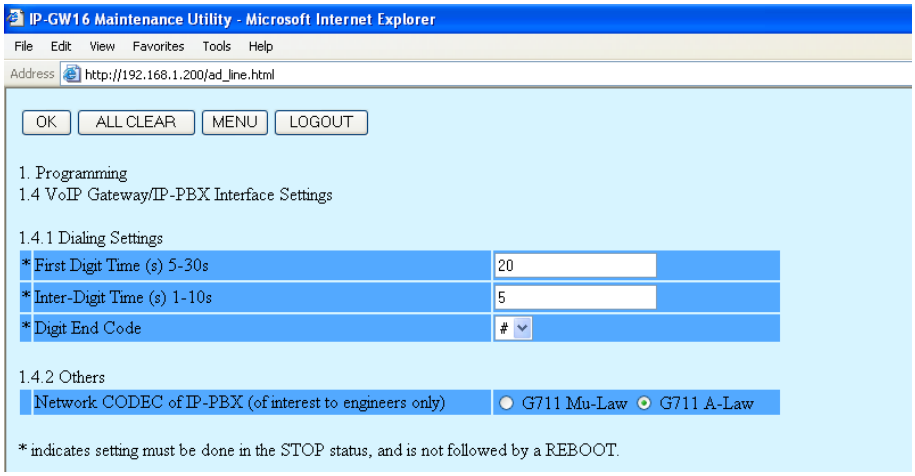
- To carry out fax communications between the KX-TDA0490 and KX-TDA3480/KX-TDA0484 VoIP Gateway Cards, it is necessary to disable the "**FAX High Reliable Method**" for the KX-

TDA3480/KX-TDA0484 card. (For more information about this feature, refer to the KX-TDA3480/KX-TDA0484 Programming Guide.)

- Fax communications cannot take place between the KX-TDA0490 and KX-TDA0480 VoIP Gateway Cards.
- Fax communications in the Super G3 mode are not guaranteed.

2.2.4 VoIP Gateway/IP-PBX Interface Parameters

1. Click **1.4 VoIP Gateway/IP-PBX Interface Settings** in the main menu.



2. Assign each parameter referring to the descriptions below.

   At any time during the session, you can:

   - Click **ALL CLEAR** to return all parameters to their previous values.
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **OK**.

   You will see a confirmation screen.

   Note

   If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.

4. Confirm your entry and click **OK**.

   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

The parameters indicated with "*" must be changed while the VoIP Gateway Card is in the "STOP" status (see "2.3.1 Status Control"). The changes do not have to be followed by a reboot to become effective.

Dialing Settings

Parameter & Description	Default	Value Range
* **First Digit Time (s) 5-30s** Specifies the length of time (in seconds) within which the first digit of a dial number must be dialled after seizing a VoIP gateway trunk. Generally, there is no need to change the default value.	20	5 to 30
* **Inter-Digit Time (s) 1-10s** Specifies the length of time (in seconds) within which subsequent digits of a dial number must be dialled. Generally, there is no need to change the default value.	5	1 to 10

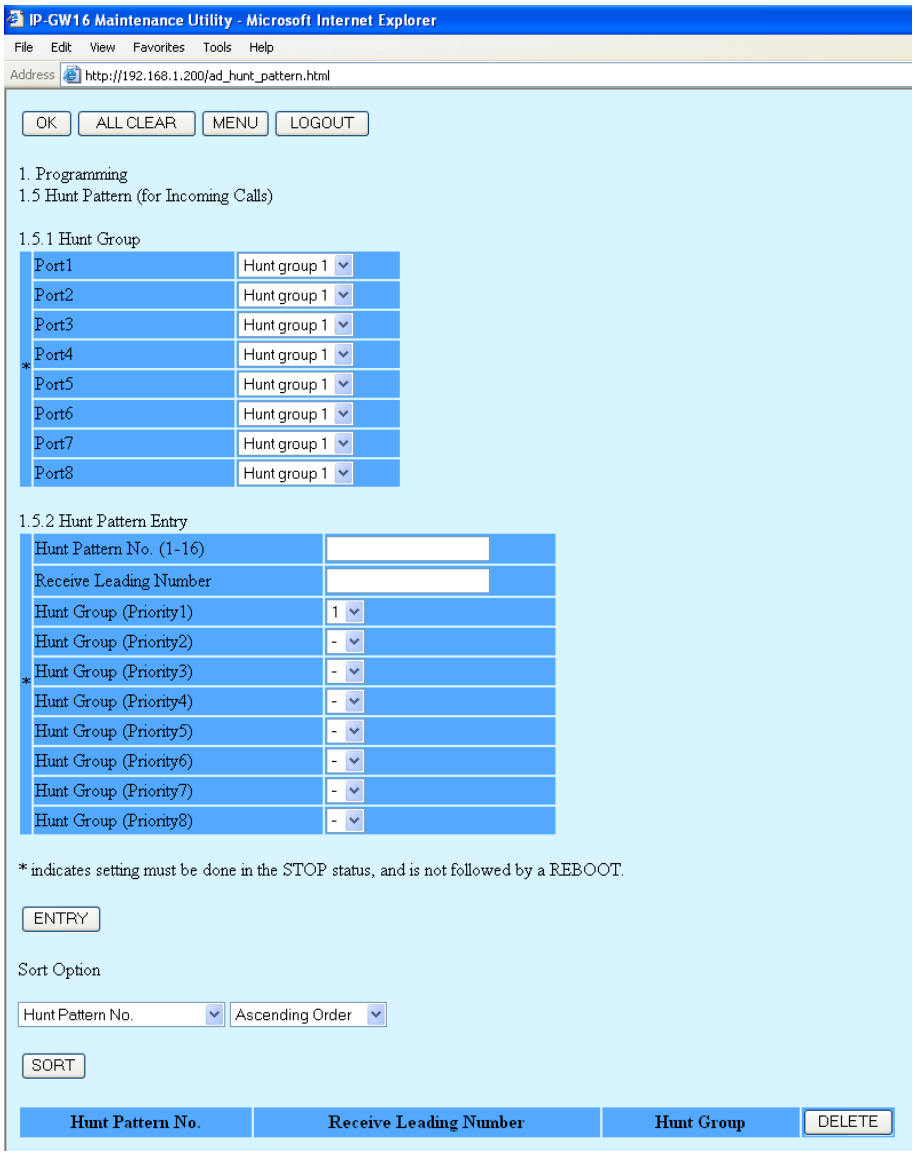
Parameter & Description	Default	Value Range
* **Digit End Code** Specifies the delimiter code to be used to signal the end of a dial number. Generally, there is no need to change the default value.	#	0 to 9, #, *

Others

Parameter & Description	Default	Value Range
Network CODEC of IP-PBX The value of this parameter is set automatically as appropriate to the setting of the PBX. There is no need to change the value.	Not applicable	G.711 Mu-Law, G.711 A-Law

2.2.5 Hunt Pattern Parameters

1. Click **1.5 Hunt Pattern (for Incoming Calls)** in the main menu.



2. Assign each parameter referring to the descriptions below.

   At any time during the session, you can:

   - Click **ALL CLEAR** to return all parameters to their previous values.
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Sort the hunt patterns in the table at the bottom of the screen:
     a. Click the desired sort key and sort order from the **Sort Option** lists.
     b. Click **SORT**.
   - Delete the desired hunt pattern from the table at the bottom of the screen:
     a. Select the appropriate check box for the hunt pattern you want to delete.
     b. Click **DELETE**.
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **ENTRY**.
   A maximum of 16 hunt patterns can be created.
4. Click **OK**.
   You will see a confirmation screen.

   Note

   If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.
5. Confirm your entry and click **OK**.
   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

The parameters indicated with "*" must be changed while the VoIP Gateway Card is in the "STOP" status (see "2.3.1 Status Control"). The changes do not have to be followed by a reboot to become effective.

Hunt Group

Parameter & Description	Default	Value Range
* **Port1–8** Assigns a hunt group to a VoIP gateway port. For details, refer to "Detailed Explanations".	Hunt group 1	Hunt group 1 to 8

Hunt Pattern Entry

The parameters below are used to create hunt patterns.

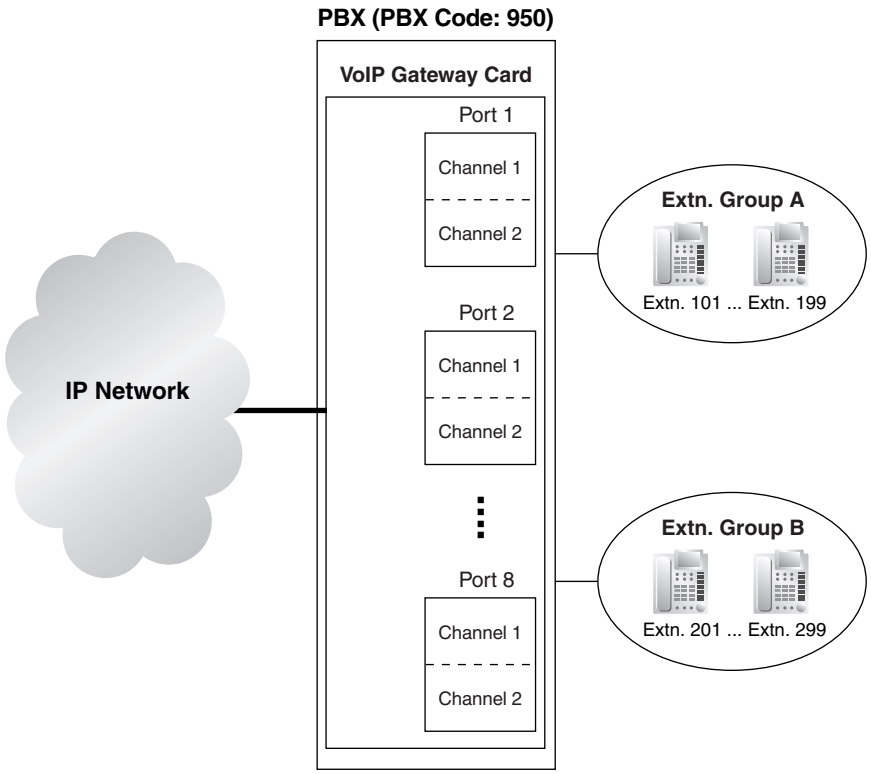
For details, refer to "Detailed Explanations".

Parameter & Description	Default	Value Range
* **Hunt Pattern No.** Specifies the number for the hunt pattern to be created. When changing the current settings of an existing hunt pattern, first delete the hunt pattern and then re-create with new values.	No default	1 to 16
* **Receive Leading Number** Specifies the leading digits in received numbers by which to determine the hunt group to direct incoming calls. For example, to direct incoming calls with numbers starting with "9", specify the number "9" in this parameter. Likewise, to direct incoming calls with numbers starting with "1", specify the number "1". However, if you want to direct incoming calls with numbers starting with "950" and "951" to separate hunt groups, it is necessary to make 2 hunt patterns with respective numbers, "950" and "951".	No default	Max. 30 digits

Parameter & Description	Default	Value Range
* **Hunt Group (Priority1)** Specifies the hunt group to which incoming calls are directed first.	1	1 to 8
* **Hunt Group (Priority2)–(Priority8)** Specifies the hunt group to which incoming calls are directed when the hunt group specified in the previous priority level is busy.	-	1 to 8, - (disable)

Detailed Explanations

The card and the PBX are connected with 8 VoIP gateway ports, each of which has 2 communication channels, in much the same way as an ISDN BRI port.



Hunt pattern programming determines the VoIP gateway ports through which to route incoming calls, depending on the received numbers. The following examples provide 2 different methods of hunt pattern programming.

Example 1

The following configuration is used to allocate 8 VoIP gateway ports (16 channels) to route incoming calls to both extension groups A and B.

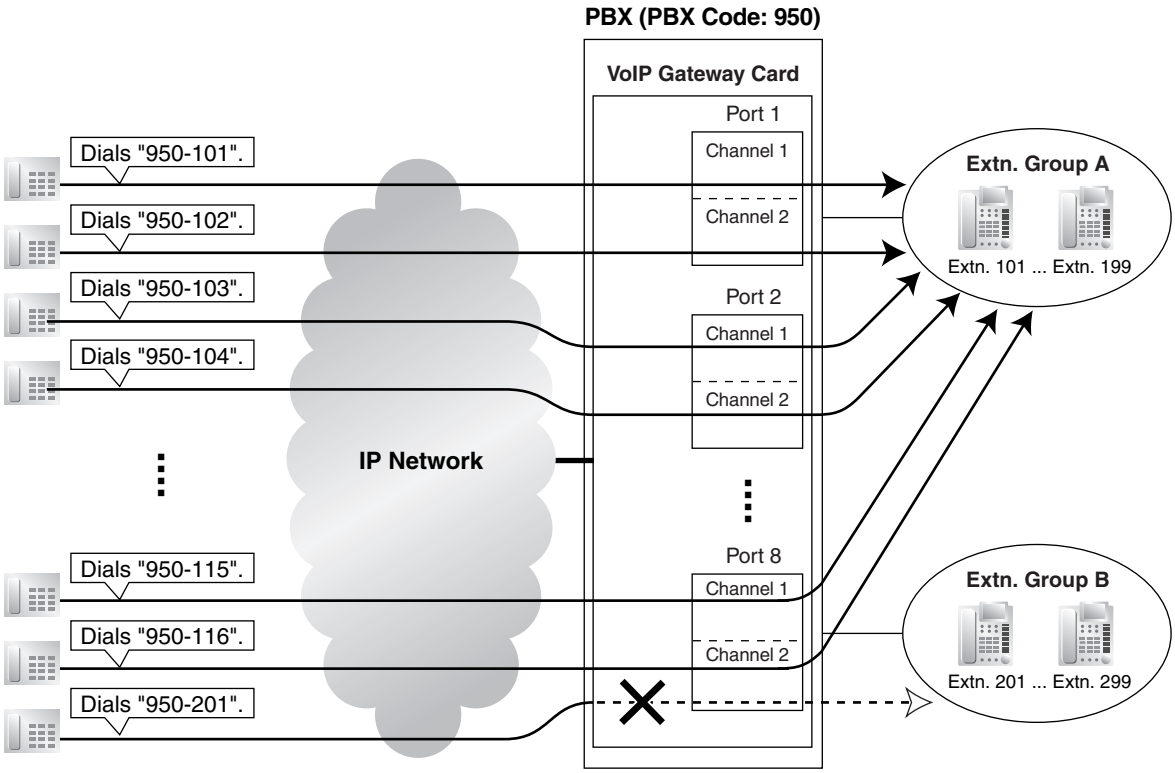
When there are 16 incoming calls to extension group A in this configuration, no call can be routed to extension group B.

Hunt Group

Port1	Hunt group 1
Port2	Hunt group 1
:	:
Port8	Hunt group 1

Hunt Pattern Entry

Hunt Pattern No.	1
Receive Leading Number	9
Hunt Group (Priority1)	1
Hunt Group (Priority2)	-
:	:
Hunt Group (Priority8)	-



Example 2

The following configuration is used to divide 8 VoIP gateway ports (16 channels) into 2 groups of 4, and then allocate each group to individual extension groups. Specifically, with this configuration, calls to extension group A are routed through the first group of ports (consisting of ports 1 to 4). Likewise, calls to extension group B are routed through the second group of ports (consisting of ports 5 to 8).

When all 8 channels in the first group of ports are being used, this configuration rejects the 9th call to extension group A. However, the other 8 channels in the second group of ports remain available to route calls to extension group B.

Hunt Group

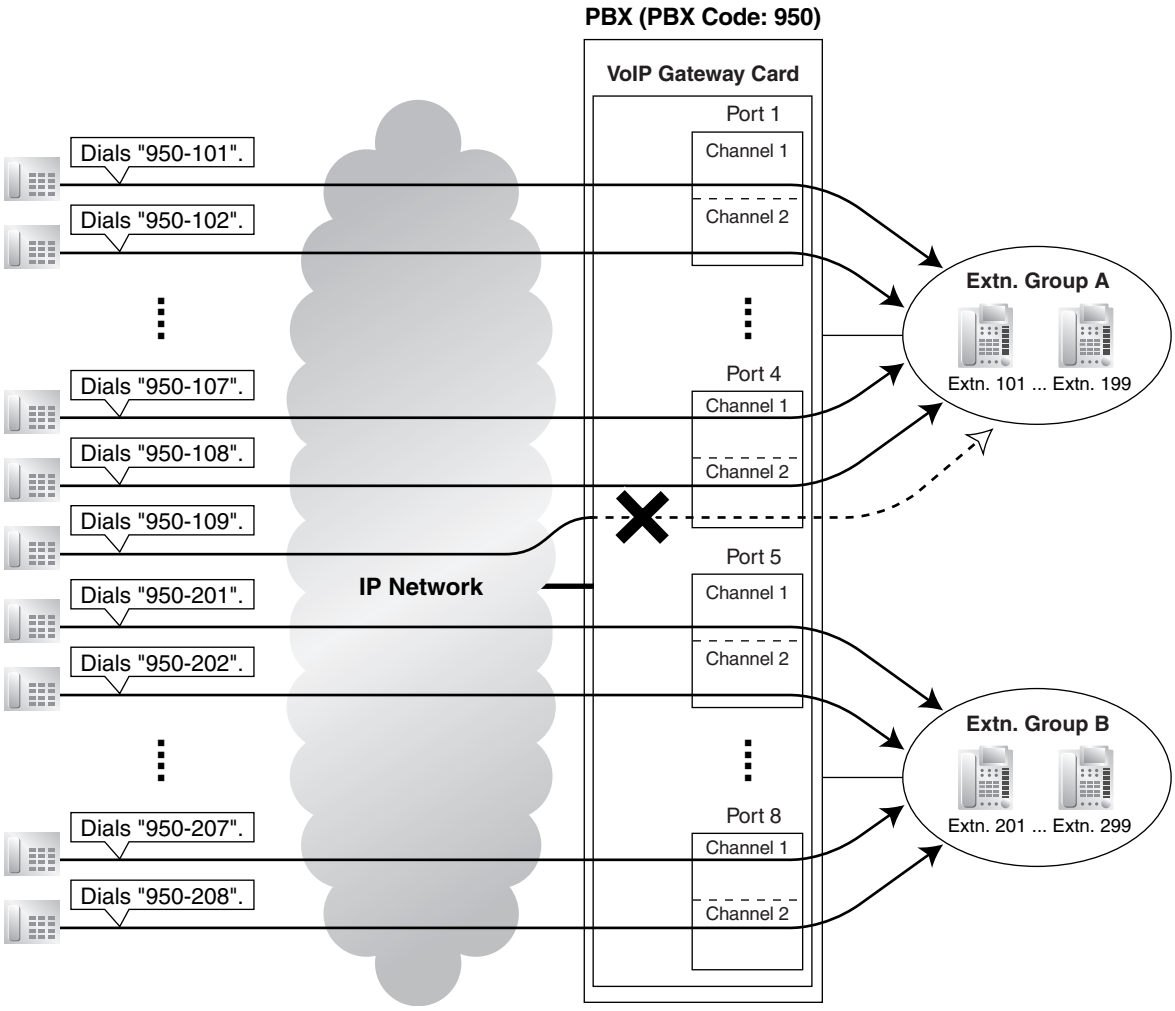
Port1	Hunt group 1
:	:
Port4	Hunt group 1
Port5	Hunt group 2
:	:
Port8	Hunt group 2

Hunt Pattern Entry—1

Hunt Pattern No.	1
Receive Leading Number	9501
Hunt Group (Priority1)	1
Hunt Group (Priority2)	-
:	:
Hunt Group (Priority8)	-

Hunt Pattern Entry—2

Hunt Pattern No.	2
Receive Leading Number	9502
Hunt Group (Priority1)	2
Hunt Group (Priority2)	-
:	:
Hunt Group (Priority8)	-



It is possible to programme the PBX to allocate separate groups of VoIP gateway ports to individual extension groups A and B for making outgoing calls. With this programming, each extension group, A and B, can have a group of ports for its exclusive use.

For example:

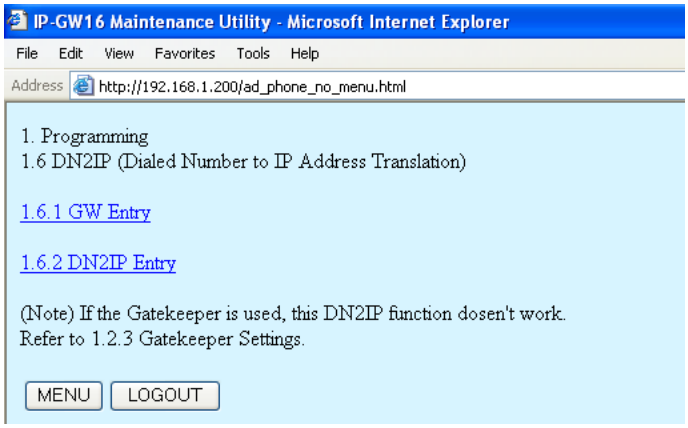
- The VoIP gateway ports that extension group A uses to make outgoing calls: ports 1 to 4
- The VoIP gateway ports that extension group B uses to make outgoing calls: ports 5 to 8

Note

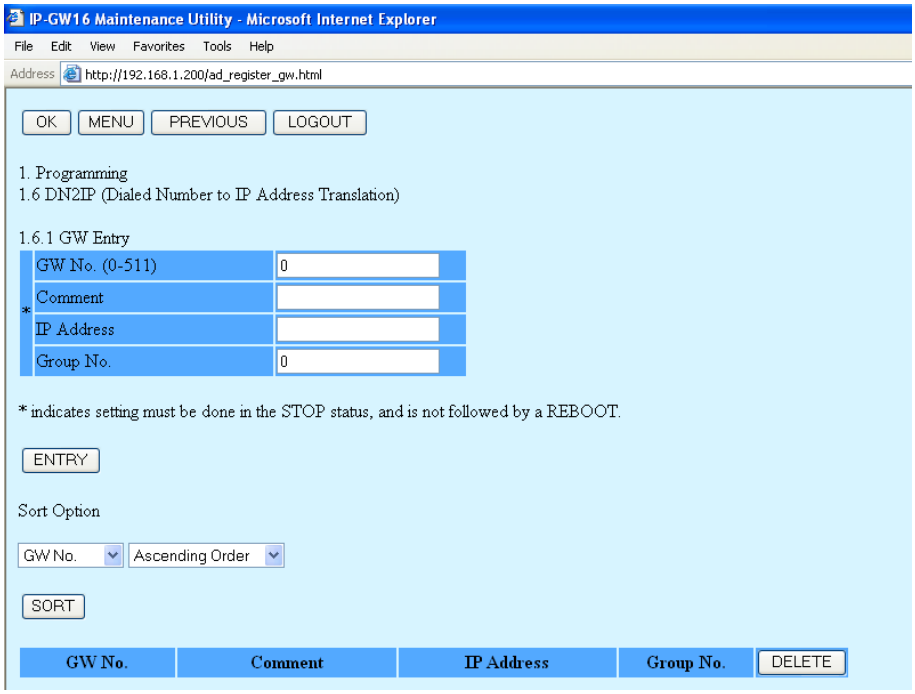
The example above details the configuration to route incoming calls to 2 separate hunt groups, each of which is associated with an individual extension group. However, note that various other types of configurations are possible. For example, it is possible to route calls to 8 separate hunt groups, so that you can distribute the calls to 8 different extension groups.

2.2.6 Address Translation Table—GW Entry

1. Click **1.6 DN2IP (Dialed Number to IP Address Translation)** in the main menu.



2. Click **1.6.1 GW Entry**.



3. Assign each parameter referring to the descriptions below.

   At any time during the session, you can:

   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **PREVIOUS** to return to the previous screen.
   - Sort the gateway entries in the table at the bottom of the screen:
     a. Click the desired sort key and sort order from the **Sort Option** lists.
     b. Click **SORT**.
   - Delete the desired gateway entry from the table at the bottom of the screen:
     a. Select the appropriate check box for the gateway entry you want to delete.

Note

If the gateway entry is registered to a DN2IP entry (see "2.2.7 Address Translation Table—DN2IP Entry"), no check box will be shown for the gateway entry.

b. Click **DELETE**.

- Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

4. Click **ENTRY**.

A maximum of 512 gateway entries can be created.

5. Click **OK**.

You will see a confirmation screen.

Note

If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.

6. Confirm your entry and click **OK**.

To return to the previous screen, click **CANCEL**.

Parameter Descriptions

The parameters indicated with "*" must be changed while the VoIP Gateway Card is in the "STOP" status (see "2.3.1 Status Control"). The changes do not have to be followed by a reboot to become effective.

GW Entry

The parameters below are used to create gateway entries for both local and remote cards on the network, as a preliminary step to programming the address translation table (DN2IP).

For a programming example, refer to "3.2.5 Programming the Address Translation Table" of the VoIP Gateway Card Getting Started.

Note

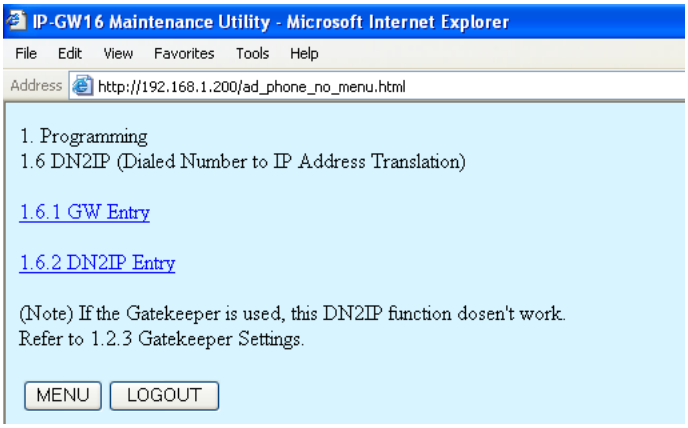
If you are using a gatekeeper, create the gateway entry only for the local card.

Parameter & Description	Default	Value Range
* **GW No.** Specifies the number for the gateway entry to be created. When changing the current settings of an existing gateway entry, first delete the gateway entry and then re-create with new values.	0	0 to 511
* **Comment** Specifies the comment for the gateway entry.	No default	Max. 16 characters
* **IP Address** Specifies the IP address of the card.	No default	The following addresses are invalid: • Class D addresses • Class E addresses • Loopback addresses

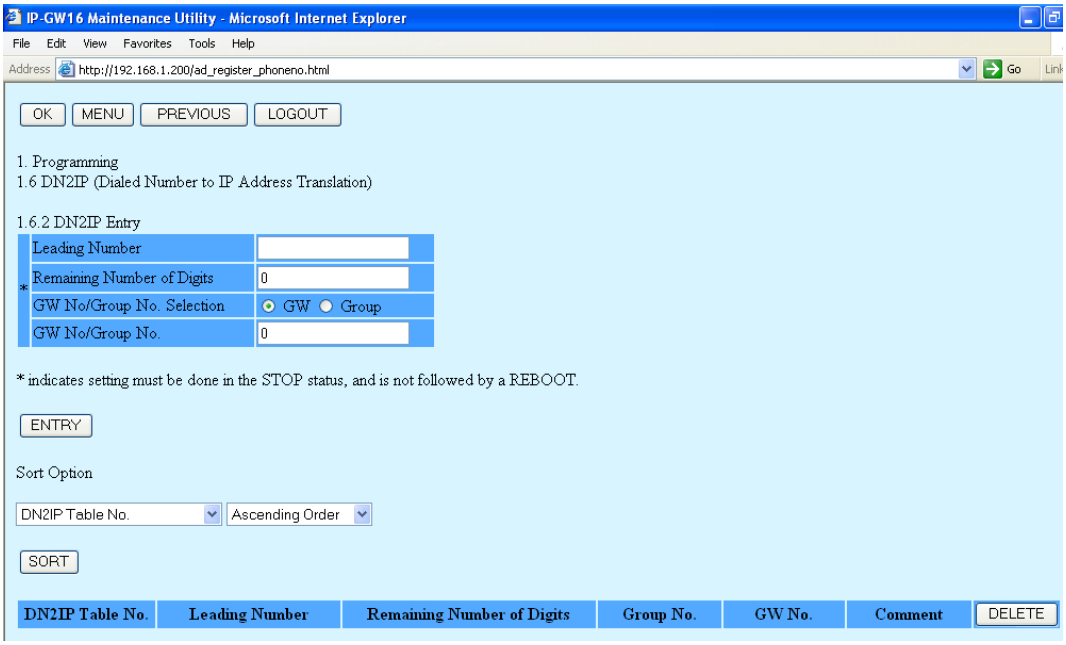
Parameter & Description	Default	Value Range
* **Group No.** Specifies the number of the gateway group to which the gateway entry belongs. Grouping is useful when there is more than one card installed in a PBX, because it allows you to use the automatic route redirection feature. For details, refer to "Detailed Explanations" in the next section, "2.2.7 Address Translation Table—DN2IP Entry".	0	0 (belong to no group), 1 to 256

2.2.7 Address Translation Table—DN2IP Entry

1. Click **1.6 DN2IP (Dialed Number to IP Address Translation)** in the main menu.



2. Click **1.6.2 DN2IP Entry**.



3. Assign each parameter referring to the descriptions below.
   At any time during the session, you can:
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **PREVIOUS** to return to the previous screen.
   - Sort the DN2IP entries in the table at the bottom of the screen:
     a. Click the desired sort key and sort order from the **Sort Option** lists.
     b. Click **SORT**.
   - Delete the desired DN2IP entry from the table at the bottom of the screen:
     a. Select the appropriate check box for the DN2IP entry you want to delete.
     b. Click **DELETE**.
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").
4. Click **ENTRY**.

A maximum of 512 DN2IP entries can be created.

5. Click **OK**.
   You will see a confirmation screen.

   Note

   If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.

6. Confirm your entry and click **OK**.
   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

The parameters indicated with "*" must be changed while the VoIP Gateway Card is in the "STOP" status (see "2.3.1 Status Control"). The changes do not have to be followed by a reboot to become effective.

DN2IP Entry

The parameters below are used to create DN2IP entries based on the gateway entries created previously (see "2.2.6 Address Translation Table—GW Entry"). The DN2IP entries associate dialled numbers and IP address of the destination; therefore, a caller can reach the destination by dialling the number without knowing the destination IP address.

For a programming example, refer to "3.2.5 Programming the Address Translation Table" of the VoIP Gateway Card Getting Started.

Note

If you are using a gatekeeper, create the DN2IP entries only for the local card. In this case, you can create up to 4 DN2IP entries per card.
Note that if you are not using a gatekeeper, there is no maximum number of DN2IP entries.

Parameter & Description	Default	Value Range
* **Leading Number** Specifies the leading digits in dialled numbers by which to associate calls with the appropriate destination. For example, to associate calls with dialled numbers "950-xxxx" and "951-xxxx" with separate destinations, it is necessary to make 2 DN2IP entries with respective numbers, "950" and "951".	No default	Max. 30 digits
* **Remaining Number of Digits** Specifies the number of digits to be dialled following the leading number to access the destination. For example, if the dialled numbers are either "950-xxxx" or "951-xxxx" and the numbers "950" and "951" are specified for the parameter **Leading Number** respectively, specify the number "4" in this parameter.	0	0 to 29
* **GW No/Group No. Selection** Specifies the type of destination when making calls: a gateway or a gateway group.	GW	GW, Group

Parameter & Description	Default	Value Range
* **GW No/Group No.** Specifies the number of the destination gateway or gateway group.	GW No: 0, Group No.: 1	GW No: 0 to 511, Group No.: 1 to 256

Detailed Explanations

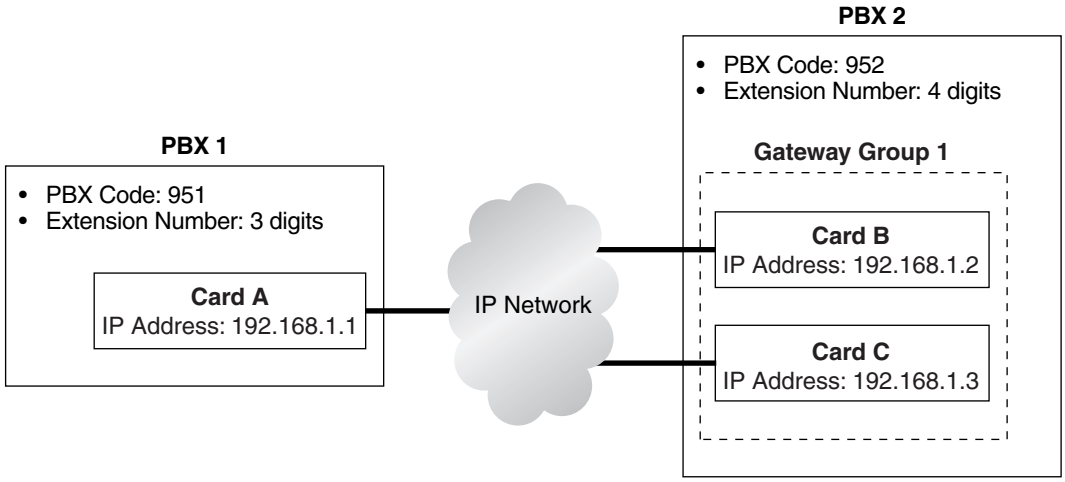
Automatic Route Redirection

When more than one card is installed in a PBX, you can assign them to a single gateway group. Grouping allows you to logically combine the channels of multiple cards in a PBX (there are 16 channels per card). This aids the effective use of channels in a PBX.

The following diagram and tables provide an example of this configuration.

Example of Configuration

In the diagram below, there are 2 cards (cards B and C) installed in PBX 2.



Example of Gateway Entry Programming

Through gateway entry programming, cards B and C are grouped into a single gateway group.

Parameter	Card A	Card B	Card C
GW No	0	1	2
Comment	IP-GW Card A	IP-GW Card B	IP-GW Card C
IP Address	192.168.1.1	192.168.1.2	192.168.1.3
Group No.	0	**1**	**1**

Example of DN2IP Entry Programming

When DN2IP entries are programmed as in the table below, calls through card A arrive at gateway group 1, which includes cards B and C.

Parameter	To Card A	To Gateway Group 1 (Cards B and C)
Leading Number	951	952

Parameter	To Card A	To Gateway Group 1 (Cards B and C)
Remaining Number of Digits	3	4
GW No/Group No. Selection	GW	**Group**
GW No/Group No.	0	**1**

The automatic route redirection feature activates in this configuration. If a call is made through card A to gateway group 1 when all 16 channels of card B are busy, card A automatically redirects the call to card C.

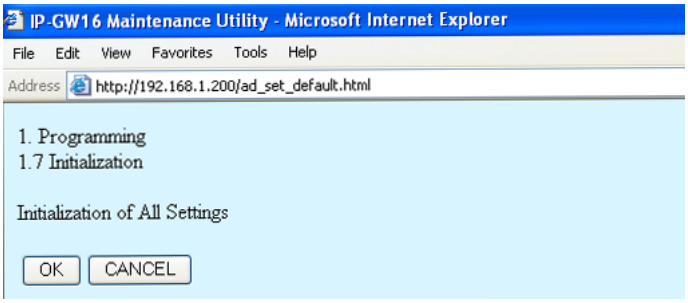
This is possible because by grouping, PBX 1 sees PBX 2 as having a combined set of 32 channels, not 2 separate sets of 16 channels.

Note

The automatic route redirection feature cannot be used in a network where a gatekeeper is used. For details about gatekeeper settings, refer to "Gatekeeper Settings" in "2.2.2 H.323 Parameters".

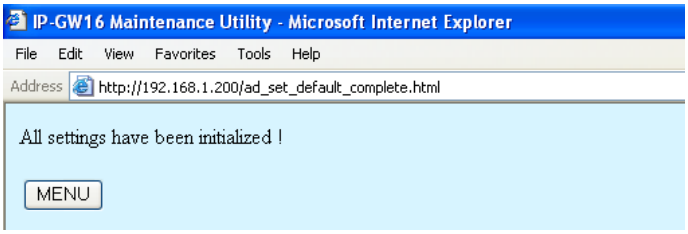
2.2.8 Initialisation

1. Click **1.7 Initialization** in the main menu.



2. Click **OK** to initialise all parameters to the default values.

   To abort initialisation, click **CANCEL**. You will be taken back to the main menu (see "2.1 Main Menu for the Administrator").



   Initialisation has to be followed by a reboot to make the default values effective for the parameters indicated with "**#**" (e.g., IP address of the VoIP Gateway Card). If not followed by a reboot, the current setting values will remain effective instead.

3. Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
4. Refer to "2.5.1 Reboot" and finish the reboot.

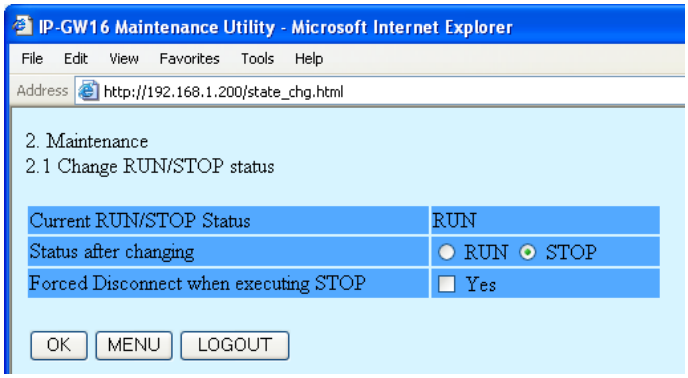
Note

If you have forgotten the IP address or log-in password of the VoIP Gateway Card, follow the procedure detailed in "C1 Initialising the VoIP Gateway Card" of the VoIP Gateway Card Getting Started to return all settings to the factory default.

2.3 Maintenance

2.3.1 Status Control

1. Click **2.1 Change RUN/STOP status** in the main menu.



Current RUN/STOP Status shows the current status of the VoIP Gateway Card.

2. Click **RUN** or **STOP** for **Status after changing**.

   If you want to forcibly change the status from "RUN" to "STOP" while there are ongoing calls, click the **Yes** check box for **Forced Disconnect when executing STOP**. This will allow you to place the card in the "STOP" status even when there are ongoing calls.

   At any time during the session, you can:

   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **OK**.

   You will see a confirmation screen.

4. Click **OK**.

   You will see a result screen.

   Note

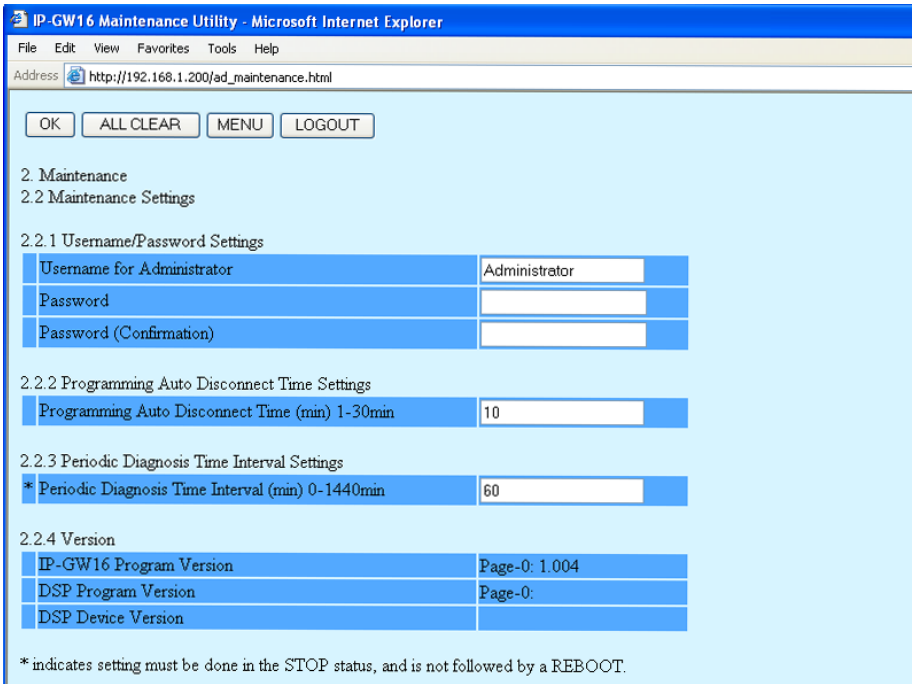
   If the operation is not successful, you will see an error screen. Click **OK** to return to the previous screen, and then try again.

5. Click **OK**.

   You will be taken back to the **Change RUN/STOP status** screen.

2.3.2 Maintenance Settings

1. Click **2.2 Maintenance Settings** in the main menu.



2. Assign each parameter referring to the descriptions below.

   At any time during the session, you can:

   - Click **ALL CLEAR** to return all parameters to their previous values.
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **OK**.

   You will see a confirmation screen.

   Note

   If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.

4. Confirm your entry and click **OK**.

   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

The parameters indicated with "*" must be changed while the VoIP Gateway Card is in the "STOP" status (see "2.3.1 Status Control"). The changes do not have to be followed by a reboot to become effective.

Username/Password Settings

Parameter & Description	Default	Value Range
Username for Administrator Administrator-level log-in user name.	Administrator	Max. 16 characters

Parameter & Description	Default	Value Range
Password Administrator-level log-in password.	Administrator	Max. 16 characters
Password (Confirmation) Confirmation of the administrator-level log-in password.	No default	Max. 16 characters

Programming Auto Disconnect Time Settings

Parameter & Description	Default	Value Range
Programming Auto Disconnect Time (min) 1-30min Specifies the time (in minutes) until programming is automatically terminated. If the specified period of time passes with no programming input, programming will automatically be terminated. This prevents problems caused by continuation of log-in status in cases such as being unable to log out due to the sudden failure of a PC.	10	1 to 30

Periodic Diagnosis Time Interval Settings

Parameter & Description	Default	Value Range
* **Periodic Diagnosis Time Interval (min) 0-1440min** Specifies the time (in minutes) between periodic self-diagnoses to test operation as described in "2.3.3 Diagnosis". If failures are detected during the self-diagnosis, the card will alert the PBX.	60	0 (no periodic diagnosis), 1 to 1440

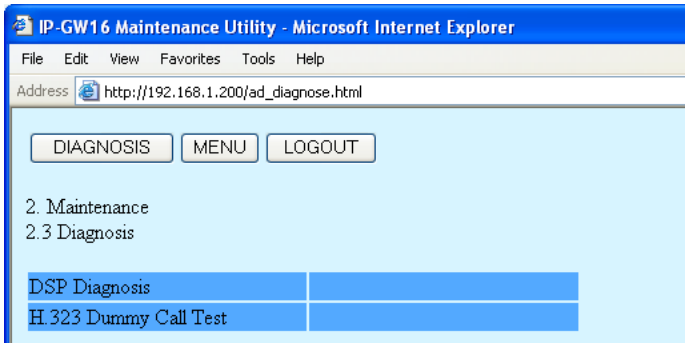
Version

Parameter & Description	Default	Value Range
IP-GW16 Program Version Indicates the version of the VoIP Gateway Card's main programme. The main programme controls the VoIP protocol.	Display only	
DSP Program Version Indicates the version of the VoIP Gateway Card's DSP programme. The DSP programme controls a DSP device, which controls speech and audio processing.		
DSP Device Version Indicates the version of the VoIP Gateway Card's DSP device. The DSP device is a processor that controls speech and audio processing.		

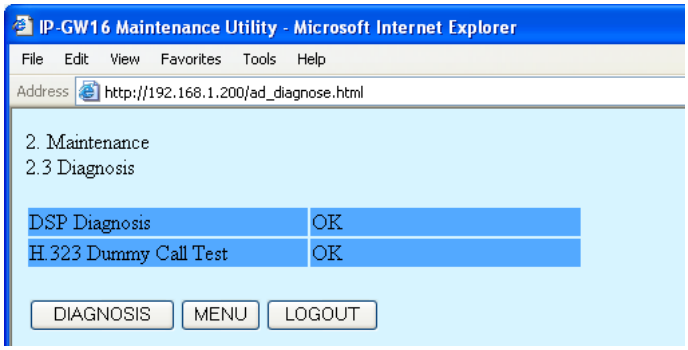
2.3.3 Diagnosis

This function is used to carry out the self-diagnostic programme manually.
If failures are detected, there is a potential for trouble with the operation of the VoIP Gateway Card.

1. Click **2.3 Diagnosis** in the main menu.



2. Click **DIAGNOSIS** to carry out the self-diagnostic programme.

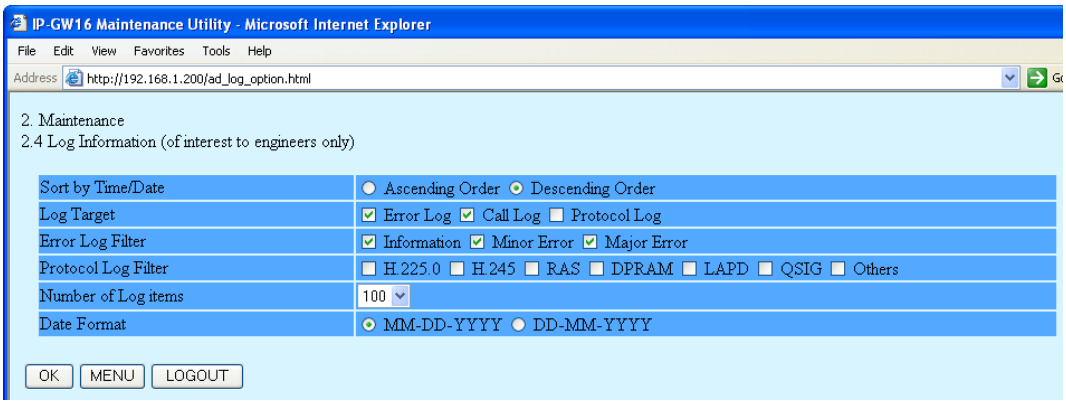


3. Do one of the following:
   - Click **DIAGNOSIS** to carry out the self-diagnostic programme again.
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

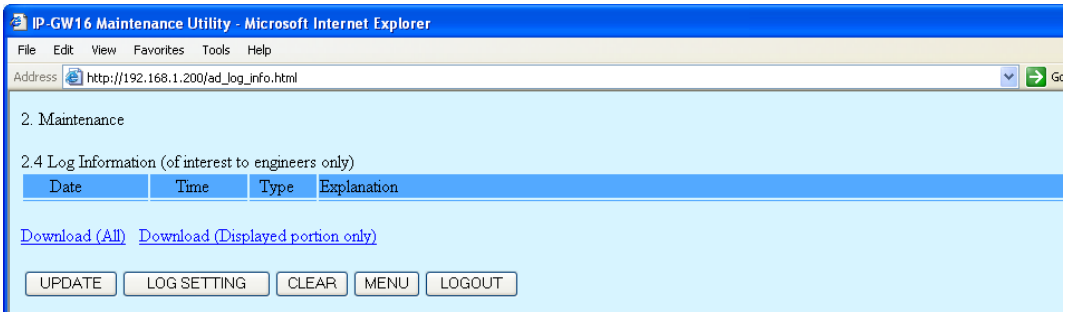
2.3.4 Log Information

The function to collect log information is provided for engineer use only. However, in the case that a need should arise, this section provides the procedure for collecting the log information.

1. Click **2.4 Log Information** in the main menu.



2. Click **OK**.
   Log information is displayed.



3. Click **Download (All)** to download the log information.

2.4 Data Management

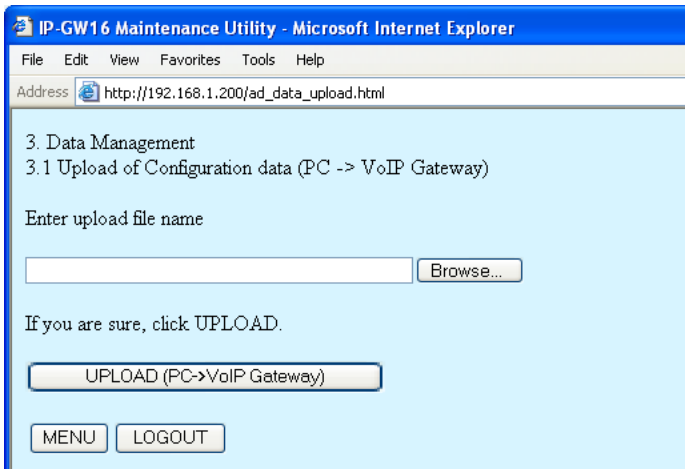
It is strongly recommended that you download the configuration data and the address translation table (DN2IP) data from the VoIP Gateway Card for backup and archive purposes.

The following sections provide the procedures for downloading and uploading.

2.4.1 Upload of Configuration Data

Before uploading the data, place the card in the "STOP" status (see "2.3.1 Status Control").

1. Click **3.1 Upload of Configuration data (PC → VoIP Gateway)** in the main menu.



2. Click **Browse** and choose a file to upload.

   At any time during the session, you can:

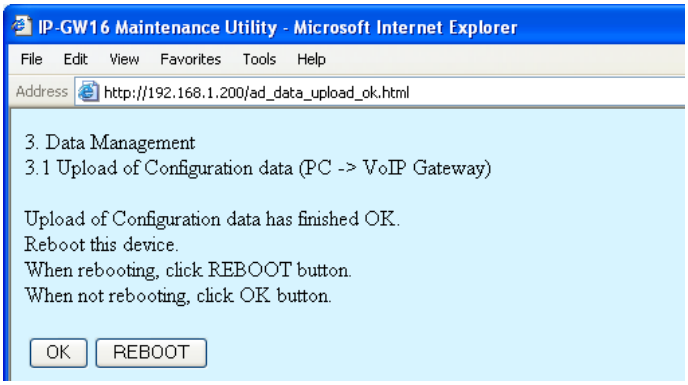
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Click **UPLOAD (PC→VoIP Gateway)**.

   The upload operation starts.

Notes

- If the upload operation is executed while the card is in the "RUN" status, you will see an error screen. Click **Change RUN/STOP status Screen** and place the card in the "STOP" status (see "2.3.1 Status Control"), and then upload the data again.
- If the operation is not successful for other reasons, you will see another error screen. Click **OK** to return to the previous screen, and then upload the data again.



4. Do one of the following:

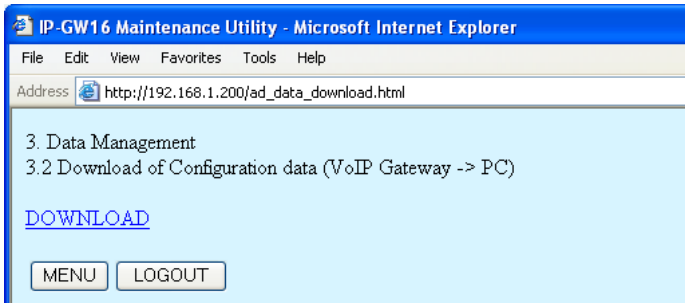
- Click **REBOOT** to make the changes effective now.

  You will see a confirmation screen. Refer to "2.5.1 Reboot" and finish the reboot.
- Click **OK** to return to the previous screen without rebooting.

  However, remember to reboot the card at the end of the programming session to make changes effective.

2.4.2 Download of Configuration Data

1. Click **3.2 Download of Configuration data (VoIP Gateway → PC)** in the main menu.



2. Click **DOWNLOAD**.

   At any time during the session, you can:

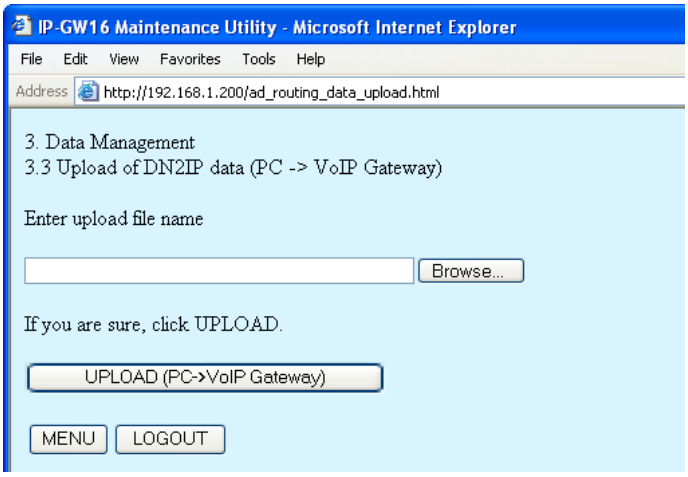
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Specify the file name and the folder in which to save the file.

2.4.3 Upload of Address Translation Table

Before uploading the data, place the card in the "STOP" status (see "2.3.1 Status Control").

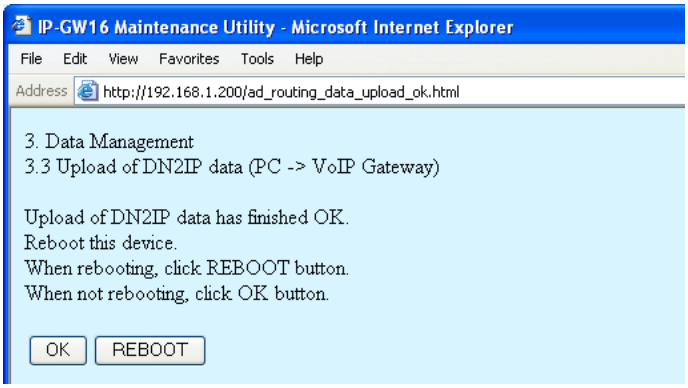
1. Click **3.3 Upload of DN2IP data (PC → VoIP Gateway)** in the main menu.



2. Click **Browse** and choose a file to upload.
   At any time during the session, you can:
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").
3. Click **UPLOAD (PC→VoIP Gateway)**.
   The upload operation starts.

Notes

- If the upload operation is executed while the card is in the "RUN" status, you will see an error screen. Click **Change RUN/STOP status Screen** and place the card in the "STOP" status (see "2.3.1 Status Control"), and then upload the data again.
- If the operation is not successful for other reasons, you will see another error screen. Click **OK** to return to the previous screen, and then upload the data again.

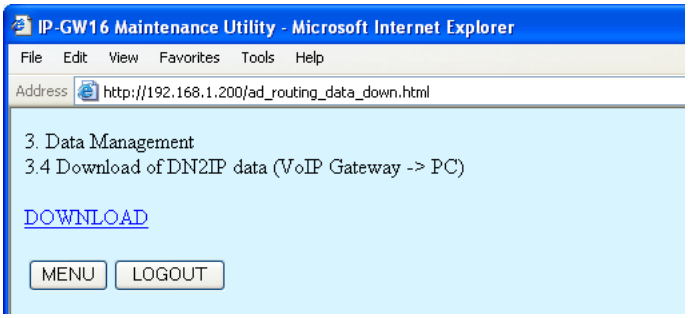


4. Do one of the following:
   - Click **REBOOT** to make the changes effective now.
     You will see a confirmation screen. Refer to "2.5.1 Reboot" and finish the reboot.
   - Click **OK** to return to the previous screen without rebooting.

However, remember to reboot the card at the end of the programming session to make changes effective.

2.4.4 Download of Address Translation Table

1. Click **3.4 Download of DN2IP data (VoIP Gateway → PC)** in the main menu.



2. Click **DOWNLOAD**.

   At any time during the session, you can:

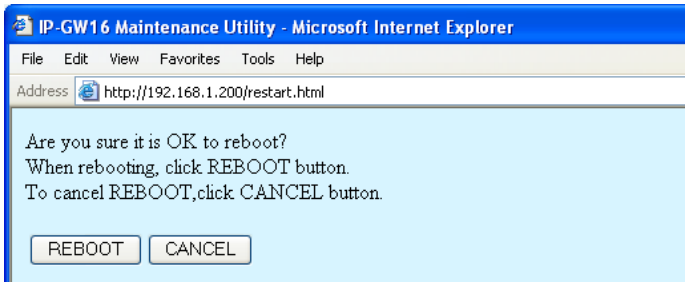
   - Click **MENU** to return to the main menu (see "2.1 Main Menu for the Administrator").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "2.5.2 Log Out").

3. Specify the file name and the folder in which to save the file.

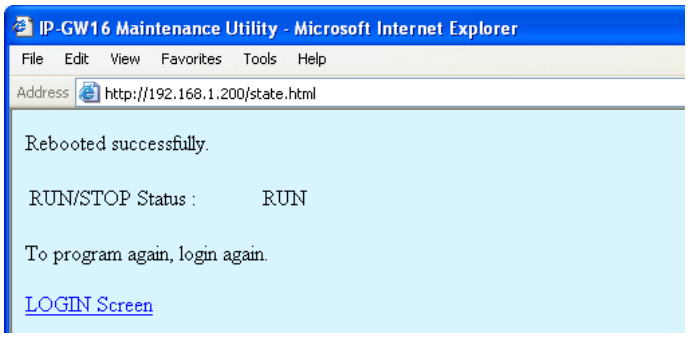
2.5 Others

2.5.1 Reboot

1. Click **REBOOT** in the main menu.



2. Click **REBOOT**.
   To return to the main menu, click **CANCEL** (see "2.1 Main Menu for the Administrator").



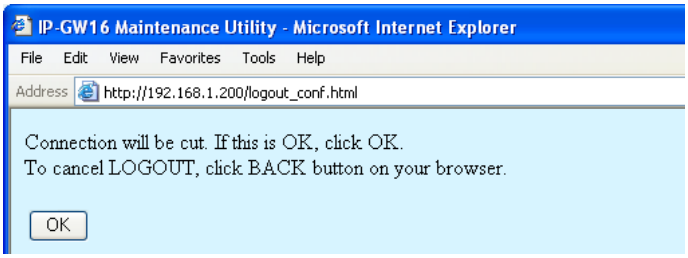
Note

If the reboot operation is not successful, you will see an error page.

3. To continue programming, click **LOGIN Screen** and log in again.
   You will see the log-in screen (see "1.1 Starting the IP-GW16 Maintenance Utility").

2.5.2 Log Out

1. Click **LOGOUT** in the main menu.



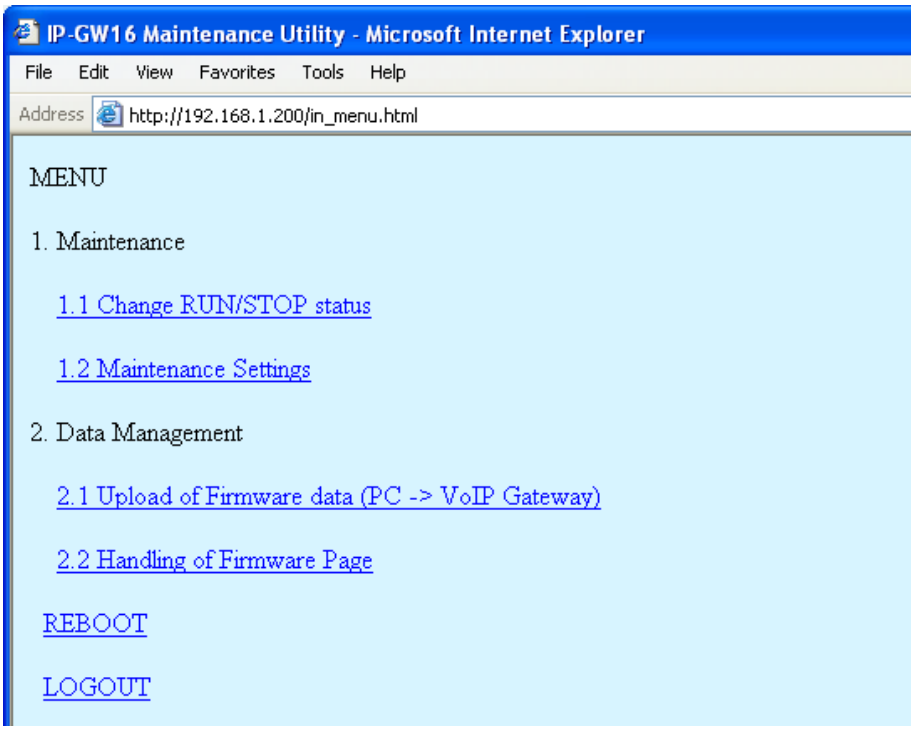
2. Click **OK** to log out.

Section 3
Installer Functions

This section provides operating instructions for the IP-GW16 Maintenance Utility when logged in as the Installer.

3.1 Main Menu for the Installer

The IP-GW16 Maintenance Utility provides the following menu to a user logged in as the Installer.



Maintenance

Menu	Section Reference
1.1 Change RUN/STOP status	3.2.1 Status Control
1.2 Maintenance Settings	3.2.2 Maintenance Settings

Data Management

Menu	Section Reference
2.1 Upload of Firmware data (PC → VoIP Gateway)	3.3.1 Upload of Firmware Data
2.2 Handling of Firmware Page	3.3.2 Handling of Firmware Page

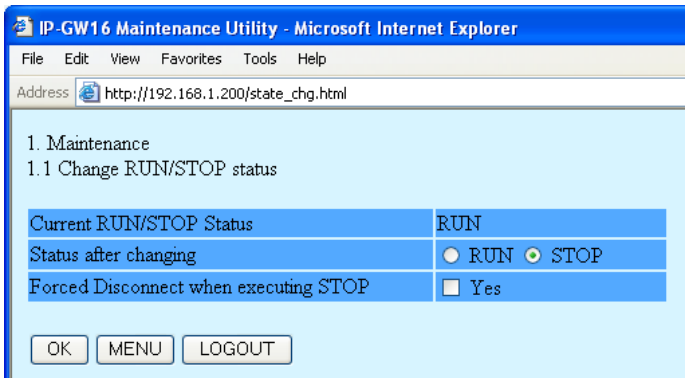
Others

Menu	Section Reference
REBOOT	3.4.1 Reboot
LOGOUT	3.4.2 Log Out

3.2 Maintenance

3.2.1 Status Control

1. Click **1.1 Change RUN/STOP status** in the main menu.



Current RUN/STOP Status shows the current status of the VoIP Gateway Card.

2. Click **RUN** or **STOP** for **Status after changing**.

   If you want to forcibly change the status from "RUN" to "STOP" while there are ongoing calls, click the **Yes** check box for **Forced Disconnect when executing STOP**. This will allow you to place the card in the "STOP" status even when there are ongoing calls.

   At any time during the session, you can:

   - Click **MENU** to return to the main menu (see "3.1 Main Menu for the Installer").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "3.4.2 Log Out").

3. Click **OK**.

   You will see a confirmation screen.

4. Click **OK**.

   You will see a result screen.

   Note

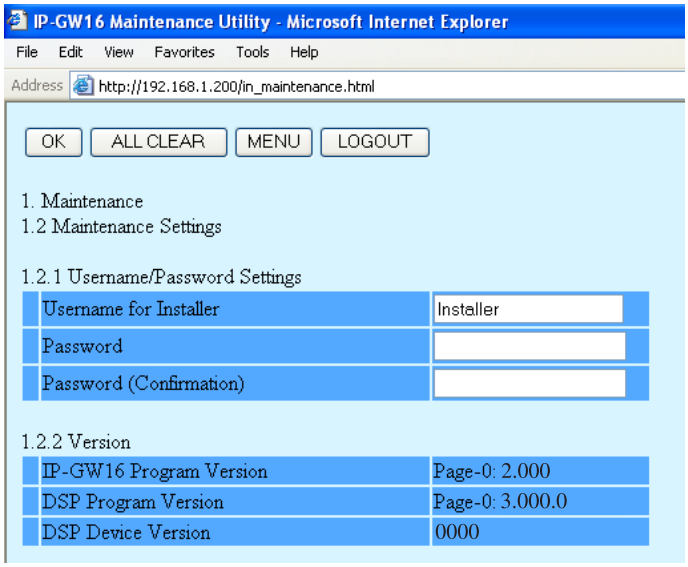
   If the operation is not successful, you will see an error screen. Click **OK** to return to the previous screen, and then try again.

5. Click **OK**.

   You will be taken back to the **Change RUN/STOP status** screen.

3.2.2 Maintenance Settings

1. Click **1.2 Maintenance Settings** in the main menu.



2. Assign each parameter referring to the descriptions below.
   At any time during the session, you can:
   - Click **ALL CLEAR** to return all parameters to their previous values.
   - Click **MENU** to return to the main menu (see "3.1 Main Menu for the Installer").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "3.4.2 Log Out").
3. Click **OK**.
   You will see a confirmation screen.

   Note

   If your entry contains an invalid value, you will be prompted to correct your input. Enter correct values for the parameters shown in red and try again.
4. Confirm your entry and click **OK**.
   To return to the previous screen, click **CANCEL**.

Parameter Descriptions

Username/Password Settings

Parameter & Description	Default	Value Range
Username for Installer Installer-level log-in user name.	Installer	Max. 16 characters
Password Installer-level log-in password.	Installer	Max. 16 characters
Password (Confirmation) Confirmation of the installer-level log-in password.	No default	Max. 16 characters

Version

Parameter & Description	Default	Value Range
IP-GW16 Program Version Indicates the version of the VoIP Gateway Card's main programme. The main programme controls the VoIP protocol.	Display only	
DSP Program Version Indicates the version of the VoIP Gateway Card's DSP programme. The DSP programme controls a DSP device, which controls speech and audio processing.		
DSP Device Version Indicates the version of the VoIP Gateway Card's DSP device. The DSP device is a processor that controls speech and audio processing.		

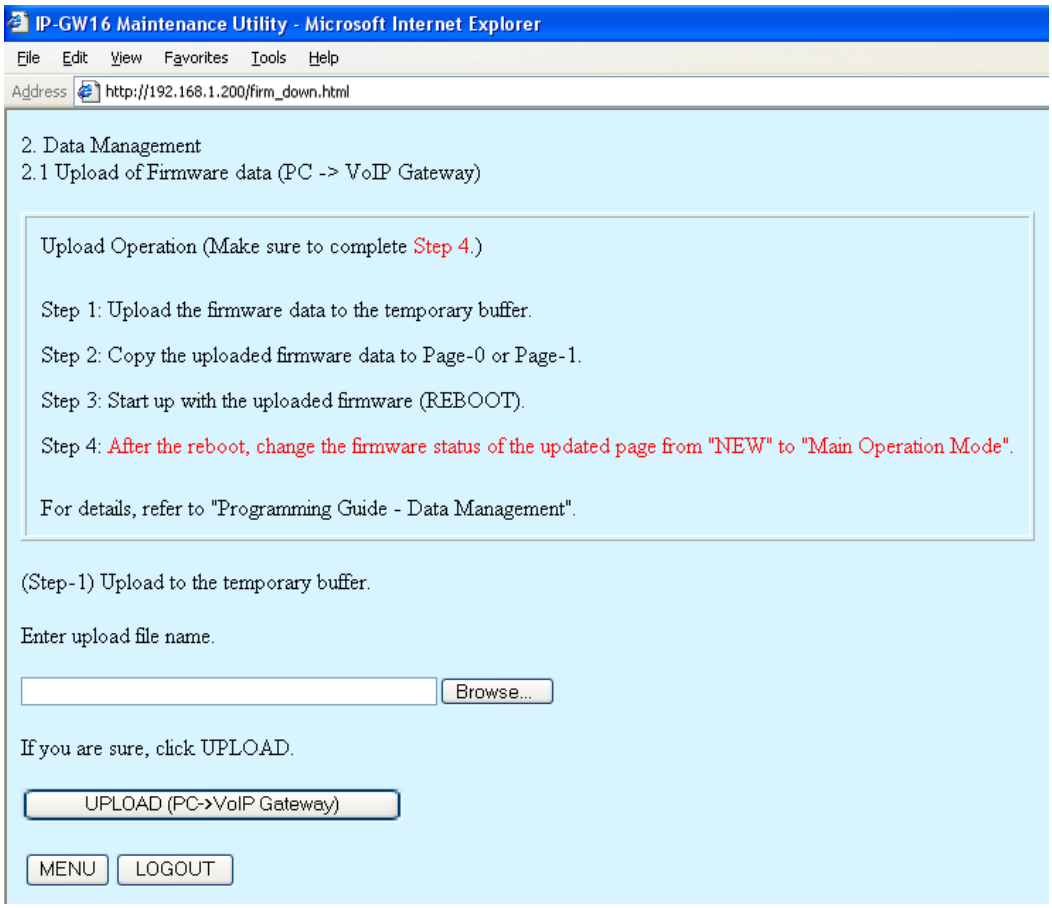
3.3 Data Management

The upload and update operations of the firmware data are closely related. First follow the procedure as described in "3.3.1 Upload of Firmware Data" to upload new firmware data to the VoIP Gateway Card, and then go on to "3.3.2 Handling of Firmware Page" to update the card with the newly uploaded firmware data.

3.3.1 Upload of Firmware Data

Before uploading the data, place the card in the "STOP" status (see "3.2.1 Status Control").

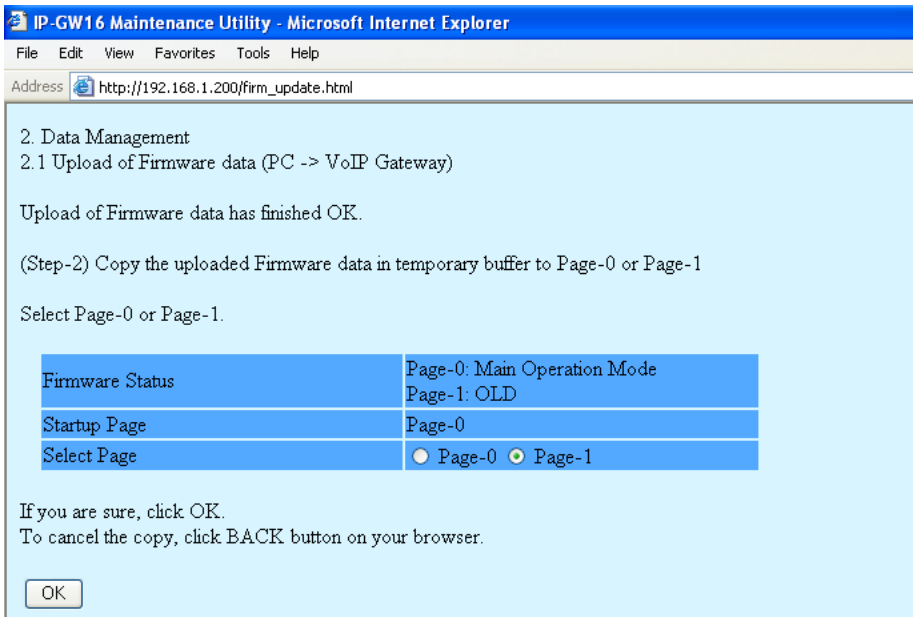
1. Click **2.1 Upload of Firmware data (PC → VoIP Gateway)** in the main menu.



2. Do the following to upload the firmware data to the temporary buffer in the VoIP Gateway Card:
   a. Click **Browse** and choose a file to upload.
      At any time during the session, you can:
      - Click **MENU** to return to the main menu (see "3.1 Main Menu for the Installer").
      - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "3.4.2 Log Out").
   b. Click **UPLOAD (PC→VoIP Gateway)**.
      The upload operation starts.

Note

If the upload operation is executed while the card is in the "RUN" status, you will see an error screen. Click **Change RUN/STOP status Screen** and place the card in the "STOP" status (see "3.2.1 Status Control"), and then upload the data again.



Firmware Status shows the current firmware status of page 0 and page 1, and **Startup Page** shows the current active page on startup. For details about these parameters, refer to "3.3.2 Handling of Firmware Page".

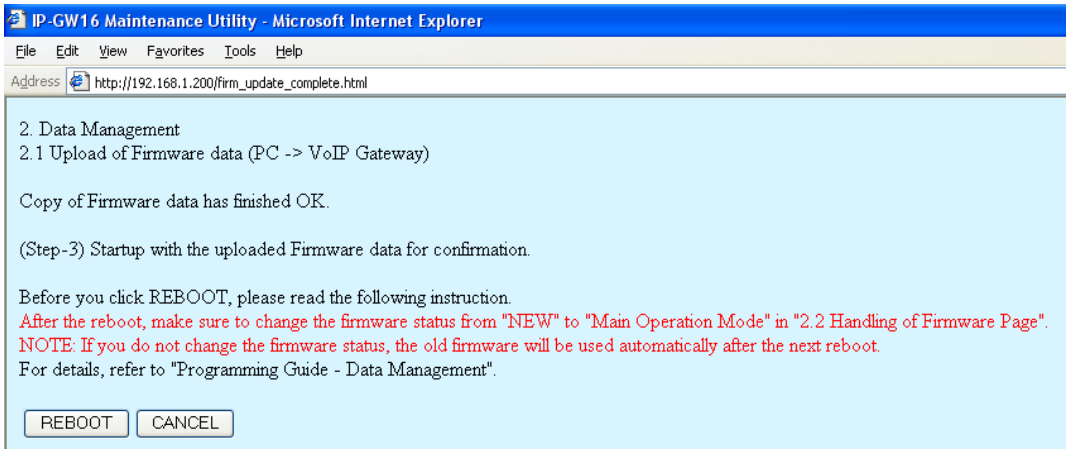
3. Do the following to update the desired page with the uploaded firmware data:

a. In **Select Page**, click the page whose current firmware status is not "Main Operation Mode".

b. Click **OK**.

You will see a confirmation screen.

c. Click **OK**.



4. Click **REBOOT** to start up the card with the updated page.

   You will see a reboot confirmation screen.

5. Click **REBOOT** again.

   Notice

   Please note that rebooting the card does not finish the upload operation. The startup page will be updated only temporarily for confirmation purposes.

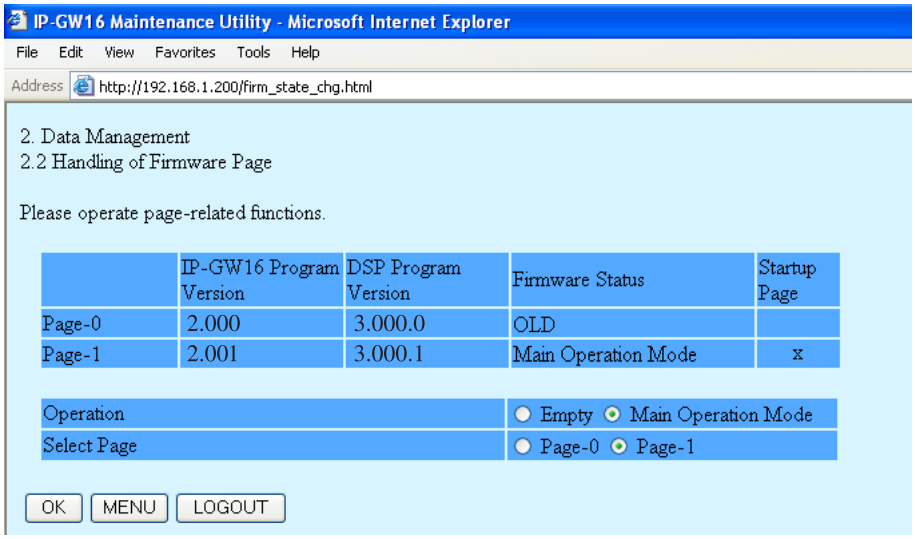
6. Click **Login Screen** to continue the upload operation.

   The card has rebooted with the new firmware data temporarily so that you can confirm the result of the upload operation.

   At this point, the firmware status of the updated page is "NEW". To complete the upload operation, you must proceed to the next step and change the status to "Main Operation Mode". (If you do not, the card will start up with the old firmware data after the next reboot.)

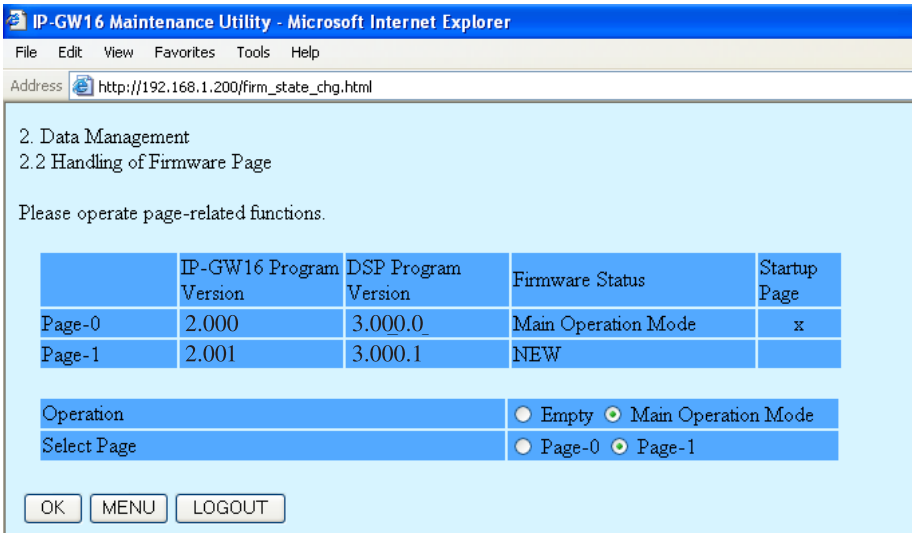
7. Switch the firmware status of the updated page from "NEW" to "Main Operation Mode", referring to "3.3.2 Handling of Firmware Page".

   The following is an example of the screen where the updated page has been set to "Main Operation Mode". To set the updated page as the active page on startup, you must apply this setting.



3.3.2 Handling of Firmware Page

1. Click **2.2 Handling of Firmware Page** in the main menu.



   For details about the parameters on this screen, refer to the descriptions below.

2. In **Operation**, click **Main Operation Mode** to set the desired page as the active page on startup.

   Note

   Do not click **Empty**, as it is an option provided for engineer use only.

   At any time during the session, you can:

   - Click **MENU** to return to the main menu (see "3.1 Main Menu for the Installer").
   - Click **LOGOUT** to log out from the IP-GW16 Maintenance Utility (see "3.4.2 Log Out").

3. In **Select Page**, click the page whose current firmware status is not "Main Operation Mode" to specify it as the target page of the operation.
4. Click **OK**.

   You will see a confirmation screen.

5. Click **OK**.

   You will see a result screen.

6. Click **OK**.

   You will be taken back to the **Handling of Firmware Page** screen.

Parameter Descriptions

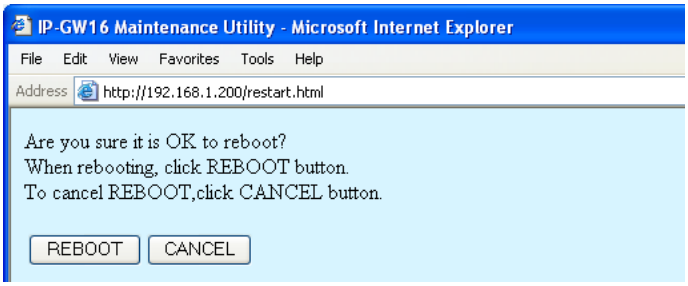
Parameter & Description	Default	Value Range
IP-GW16 Program Version Indicates the version of the VoIP Gateway Card's main programme in the firmware data of the corresponding page.	Display only	
DSP Program Version Indicates the version of the VoIP Gateway Card's DSP programme in the firmware data of the corresponding page.	Display only	

Parameter & Description	Default	Value Range
Firmware Status Indicates the current firmware status of the corresponding page. There are 3 kinds of status indications: • Main Operation Mode: Active firmware data on startup under normal operation. • OLD: Firmware data uploaded to the card before the firmware data in the "Main Operation Mode" status was uploaded. • NEW: Firmware data uploaded to the card after the firmware data in the "Main Operation Mode" status was uploaded. **Note** The status indications "OLD" and "NEW" are irrelevant to the version of the firmware data.	Display only	
Startup Page Indicates (with an "x" sign) the active page on startup. Generally, the startup page is the firmware data whose status is "Main Operation Mode". The exception is when the card undergoes a reboot after a firmware data upload operation; in this case, the card starts up with the page in the "NEW" status. This is for the purposes of confirming the result of the upload operation. If you reboot again, the card starts up with the page in the "Main Operation Mode" status. To set the updated page as the active page on startup, you must change its firmware status to "Main Operation Mode".	Display only	
Operation Specifies whether to set the page (selected with the parameter **Select Page**) as the active page on startup ("**Main Operation Mode**"), or delete the page ("**Empty**"). "**Empty**" is an option provided for engineer use only.	Not applicable	Empty, Main Operation Mode
Select Page Specifies the target page of the operation selected with the parameter **Operation**.	Not applicable	Page-0, Page-1

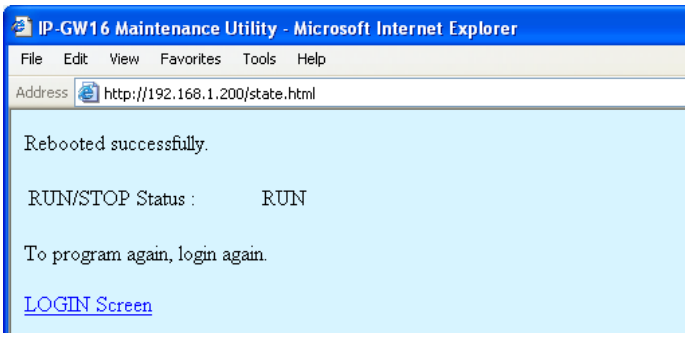
3.4 Others

3.4.1 Reboot

1. Click **REBOOT** in the main menu.



2. Click **REBOOT**.
   To return to the main menu, click **CANCEL** (see "3.1 Main Menu for the Installer").



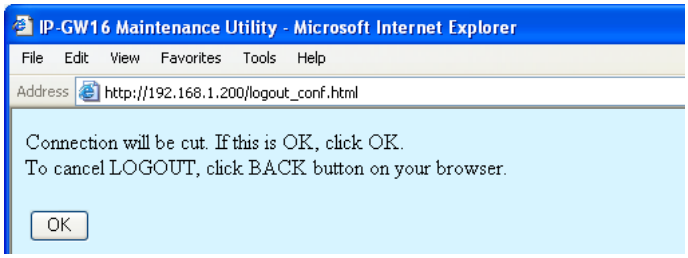
Note

If the reboot operation is not successful, you will see an error page.

3. To continue programming, click **LOGIN Screen** and log in again.
   You will see the log-in screen (see "1.1 Starting the IP-GW16 Maintenance Utility").

3.4.2 Log Out

1. Click **LOGOUT** in the main menu.



2. Click **OK** to log out.

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