# Panasonic

## **4-Channel VoIP Gateway Card**

## **Getting Started**

## KX-TDA5480 Model KX-TDA0484



Thank you for purchasing the Panasonic 4-Channel VoIP Gateway Card, KX-TDA5480/KX-TDA0484. Please read this manual carefully before using this product and save this manual for future use.

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## Section 1 Overview

Panasonic PBX with VoIP Gateway Card will allow organizations 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 analog 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 two 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.

#### <u>Note</u>

CLIP service is the only QSIG service available between the KX-TDA5480/KX-TDA0484 and KX-TDA0480 VoIP Gateway Cards. There is no compatibility for other QSIG services.

#### **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 such as the Internet, where quality of service is not guaranteed.

#### Examples of recommended IP networks

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

- Not recommended
- Internet

(Delays and loss in data transmission can cause degradation in speech quality.)

#### **Firewall**

A firewall protects the internal networks of an organization against unauthorized 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.

## 1.2.2 Numbering Plan Example

There are two 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 two 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.

#### <u>Note</u>

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
			A unique number (ranging from 1 to 7 digits) assigned to identify each PBX within a network.
PBX Code	35	41	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 (CO Line) Number	9	9	An access number to seize a local PSTN trunk (CO line).
Extension Number	200 to 299	300 to 399	A number assigned to each extension.

	Los Angeles Office	Chicago Office	Description
Fax Extension Number	500 to 599	600 to 699	A number assigned to each fax extension.

#### **Dialing 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 dialed 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)		
	Extensions	FAX Extensions	PSTN Access	Extensions	FAX Extensions	PSTN Access
Leading Number	352	355	359	413	416	419
Remaining Digits	2	2	7	2	2	7
Card IP Address	2	200.45.11.35		1	99.176.64.41	

## 1.2.3 Numbering Plan Summary

Reproduce 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.



Card IP Address	
Default Gateway IP Address	
Subnet Mask Address	

PBX Code	
TIE Line Access Number	
PSTN Trunk (CO Line) 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 KX-TDA50 PBX

This section describes the physical installation process of the KX-TDA5480 VoIP Gateway Card covering the following topics: (1) installing the card in the KX-TDA50 PBX, and (2) connecting the card to a network device using a category 5 (CAT 5) 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 Color		Description
		On-line status indication
		ON: On-line mode
		OFF: Off-line mode
ONLINE	Green	Flashing: Maintenance mode
		Note
		If the LINK indicator is OFF, the ONLINE indicator will also be OFF.
		Alarm indication
ALARM	Red	ON: Alarm
		OFF: Normal
		Link status indication
LINK	Green	ON: Normal connection
		OFF: Connection error
		Data transmission indication
DATA	Green	ON: Data transmitting
		OFF: No data transmitted

## 2.1.2 Installing the VoIP Gateway Card in the PBX

Install the VoIP Gateway Card in slot 05, 06, or 07 of the KX-TDA50 PBX.

**1.** Before installing the card, cut and remove the dummy cover plate for the appropriate slot from the main unit.



#### **CAUTION**

For safety reasons, smooth the cut edges after removing the dummy cover plate.

2. Position the card in the open slot, making sure that the tabs on both sides of the card fit into place. Then, holding the card firmly in place, lower the rear end so that the hole of the card fits over the extension bolt.



**3.** Insert the new extension bolt (included with the card) into the hole on the card, and tighten it to secure the card.



## 2.2 Cable Connection

Use a category 5 (CAT 5) 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 CAT 5 Ethernet cable for connection.

## 2.2.1 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.



## 2.2.2 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.

# RJ45 Ethernet Straight Cable PC

#### Connecting to a switching hub

#### Connecting directly to a router



## Section 3

## Installing in the KX-TDA100/KX-TDA200 PBX

This section describes the physical installation process of the KX-TDA0484 VoIP Gateway Card covering the following topics: (1) installing the card in the KX-TDA100/KX-TDA200 PBX, and (2) connecting the card to a network device using a category 5 (CAT 5) Ethernet cable.

## 3.1 Installation

## 3.1.1 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 indication
		OFF: Power Off
CARD	Green/Bed	Green ON: Normal (all ports are idle)
STATUS	Green/rieu	• 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
		On-line status indication
	IE Green	ON: On-line mode
		OFF: Off-line mode
ONLINE		Flashing: Maintenance mode
		Note
		If the LINK indicator is OFF, the ONLINE indicator will also be OFF.
		Alarm indication
ALARM	A Red	ON: Alarm
		OFF: Normal
		VoIP (H.323) process indication
VoIP BUSY	JSY Green	OFF: VoIP process inactive
		ON: VoIP process active

Indication	Colour	Description				
LINK	Green	<ul> <li>Link status indication</li> <li>ON: Normal connection</li> <li>OFF: Connection error</li> </ul>				
DATA	Green	<ul><li>Data transmission indication</li><li>ON: Data transmitting</li><li>OFF: No data transmitted</li></ul>				

## 3.1.2 Installing the VoIP Gateway Card in the PBX

Install the VoIP Gateway Card in a free slot of the KX-TDA100/KX-TDA200 PBX.



**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.



#### <u>Note</u>

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

## 3.2 Cable Connection

Use a category 5 (CAT 5) 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.

#### <u>Note</u>

Use only CAT 5 Ethernet cable for connection.

## 3.2.1 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.



## 3.2.2 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



#### Connecting directly to a router



## Section 4

## 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 program the cards in the Los Angeles and Chicago offices.

## 4.1 **Preparations**

A web programming utility called the IP-GW4 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-GW4 Maintenance Utility requires Microsoft® Internet Explorer 5.0 or above.

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#### 4.1.1 Preparing the PC

To prepare for programming using the IP-GW4 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.

#### <u>Note</u>

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

Internet Protocol (TCP/IP) Prope	rties 🔹 🛛 🛛						
General							
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.							
O Obtain an IP address automatically							
Use the following IP address:							
IP address:	192.168.1.100						
S <u>u</u> bnet mask:	255.255.255.0						
Default gateway:	· · ·						
Obtain DNS server address autom	atically						
● Use the following DNS server add	resses:						
Preferred DNS server:							
Alternate DNS server:	· · ·						
Advanced							
	OK Cancel						

- 1. Open Internet Protocol (TCP/IP) Properties from the Start menu.
- 2. a. Click Use the following IP address.
  - 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.

General Security Privacy Content Connections Programs Advanced	
To set up an Internet connection, click Setup	
Dial-up and Virtual Private Network settings	
A <u>d</u> d	
<u>R</u> emove	
Choose Settings if you need to configure a proxy Settings	
Never dial a <u>c</u> onnection	
Dial whenever a network connection is not present	
Always dial my default connection	
Current None Set Default	
Local Area Network (LAN) settings	
Choise settings above for trian-up settings.	
OK Cancel Apply	
	5.
Local Area Network (LAN) Settings 🛛 👔 🔯	•••
Automatic configuration	
Automatic configuration may override manual settings. To ensure the	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.           Automatically detect settings           Use automatic configuration script	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.           Automatically detect settings           Use automatic configuration script           Address	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.           Automatically detect settings           Use automatic configuration script           Address	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.           Automatically detect settings           Use automatic configuration script           Address   Proxy server Use a propulse service for your LAN (These settings will a these to be the settings and the settings and the settings and the settings are setti	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.          Automatically detect settings         Use automatic configuration gcript         Address         Proxy server         Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.          Automatically detect settings         Use automatic configuration gcript         Address         Proxy server         Use a proxy server for your LAN (These settings will not apply to dal-up or VPN connections).         Address:	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.          Automatically detect settings         Use automatic configuration script         Address         Proxy server         Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).         Address:       Ports:         Address:       Ports:	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.          Automatically detect settings         Use automatic configuration gcript         Address         Proxy server         Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).         Address:       Port:         Address	
Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.          Automatically detect settings         Use automatic configuration gcript         Address         Proxy server         Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).         Address:       Ports:         Address	

- 4. a. Click the Connections tab.
  - D. Click Never dial a connection.
  - 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 program 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:

Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.						
Automatica	ally detect settings					
📃 Use autom	atic configuration <u>s</u> cript					
Add <u>r</u> ess						
Proxy server						
Use a prox dial-up or \	y server for your LAN (These settings will not apply to /PN connections).					
Addr <u>e</u> ss:	200.45.1.100 Port: 8080 Advanged					
✓ Bypass proxy server for local addresses						

5. Click Advanced.

80	Туре	Proxy address to use	I	Port	
ζ	HTTP:	200.45.1.100	:	8080	
	Secure:	200.45.1.100	:	8080	
	ETP:	200.45.1.100	:	8080	
	<u>G</u> opher:	200.45.1.100	:	8080	
	So <u>c</u> ks:		:		
	<mark>⊻</mark> <u>U</u> se the	same proxy server for all prot	ocols		
Exceptions Do not use proxy server for addresses beginning with: 200.45.11.35					

- 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.

# 4.2 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 program 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 two offices will be possible when the cards, as well as the PBXs, in both offices are fully programmed.

The procedure to program the card in the Chicago office is given in "4.3 Programming the VoIP Gateway Card in the Chicago Office". In addition, the procedure to program the PBXs is given in "5 Programming the PBX".

## 4.2.1 Starting the IP-GW4 Maintenance Utility

Make sure that a PC is connected directly to the VoIP Gateway Card with an Ethernet cross cable (see "2.2.1 Connection for Programming" or "3.2.1 Connection for Programming"). The card should not be connected to the LAN at this point.

省 IP-GW4 Maintenance Utility - Microsoft							
Eile	Edi	t <u>V</u> iew	F <u>a</u> vorites	<u>T</u> ools	<u>H</u> elp		
A <u>d</u> dre	ss	http://	192.168.1.20	00			

🚰 IP-GW4 Maintenance Utility - Microsoft Internet Explorer						
<u>Eile E</u> dit <u>\</u>	/iew F <u>a</u> vorites	Tools	Help			
Address 🕘 hi	ttp://192.168.1.20	00				
Panasonic Enter Username and Password, and click the LOGIN button.						
Username	Administrator					
Password	•••••					
LOGIN	CLEAR		-			

- 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 "4.1.1 Preparing the PC" and confirm that your PC has been configured appropriately.
- If you forget the IP address, you must initialize the card to the default setting (see "C1 Initializing 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.

#### <u>Note</u>

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

🖹 IP	-GW4	Maint	enance Ut	ility - i	Microsoft Internet Explorer
Eile	Edit	⊻iew	Favorites	<u>T</u> ools	Help
A <u>d</u> dre	ss 🙆	http://1	92.168.1.20	)0/ad_m	enu.html
ME	NU				
1. I	rogra	mming	:		
1	.1 Ne	twork	Settings,	Genera	<u>al</u>
1	.2 H.	<u>323 D</u>	etailed Set	ttings	
1	. <u>3 Vo</u>	ice Co	mmunicat	ion De	tailed Settings
1	.4 Vo	IP Ga	teway/IP-	PBX I	nterface Settings
1	5 Hu	nt Pat	tern (for Ir	ncomin	<u>g Calls)</u>
1	6 D1	<u>42IP (</u>	Dialed Nu	mber t	o IP Address Translation)
1	7 Ini	halizati	on		

The main menu appears.

#### <u>Note</u>

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

#### <u>Note</u>

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.

## 4.2.2 Changing the Status of the VoIP Gateway Card

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

IP-GW4 Maintenance Utility - Microsoft Internet Explorer     Ele Edit View Favorites Tools Help	<ol> <li>Click 2.1 Change RUN/STOP status in the main menu.</li> </ol>
Address 🍘 http://192.168.1.200/ad_menu.html	
MENU	
1. Programming	
<u>1.1 Network Settings, General</u>	
<u>1.2 H 323 Detailed Settings</u>	
1.3 Voice Communication Detailed Settings	
1.4 VoIP Gateway/IP-PBX Interface Settings	
1.5 Hunt Pattern (for Incoming Calls)	
1.6 DN2IP (Dialed Number to IP Address Translation)	
1.7 Initialization	
2. Maintenance	
2.1 Change RUN/STOP status	
0.036 internet denter	
IP-GW4 Maintenance Utility - Microsoft Internet Explorer	2. a. Click STOP for Status after changing.
Elle Edit View Favorites Iools Help	<b>b.</b> Click <b>OK</b> .
2. Maintenance	
2.1 Change RUN/STOP status	
Current RUN/STOP Status RUN Status after changing O RUN • STOP	
Forced Disconnect when executing STOP	
OK MENU LOGOUT	
IP-GW4 Maintenance Utility - Microsoft Internet Explorer	3. Click OK.
Address a http://192.168.1.200/state_chg_conf.html	
Change the status to STOP.	
If you are sure, click OK. If you don't change the status, click BACK button on your browser.	
ОК	
IP-GW4 Maintenance Utility - Microsoft Internet Explorer     File Edit New Examine Tools Heb	4. Click OK.
Address 💩 http://192.168.1.200/state_chg_ok.html	
RUN/STOP status was successfully changed.	
ОК	

## 4.2.3 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	P-GW	4 Maint	enance Ut	ility -	Microsoft Internet Explorer
Eile	Edit	⊻iew	Favorites	Tools	Help
Add	ress 🧯	http://	192.168.1.20	00/ad_m	enu.html
М	ENU				
1.	Progr	amming	g		
	<u>1.1 N</u>	etwork	: Settings,	Genera	<u>al</u>
	<u>1.2 H</u>	.323 D	etailed Se	ttings	
	<u>1.3 V</u>	oice C	ommunical	tion De	etailed Settings
	<u>1.4 V</u>	oIP Ga	ateway/IP-	PBX I	nterface Settings
	<u>1.5 H</u>	unt Pat	tern (for L	ncomin	g Calls)
	<u>1.6 D</u>	N2IP (	Dialed Nu	umber t	to IP Address Translation)
	<u>1.7 Ir</u>	itializat	ion		
a P	-GW4 Ma	intenance	• Utility - Micro	osoft Inter	rnet Explorer
Ele	Edit y	ew Fgvorit	es Iaols Help		
Agdre	iss 🙋 htt	p://192.168.	1.200/ad_network	.html	
	ок 🖌	ALL CLEAP	R MENU	LOGOU	л

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.

192.168.1.20

255.255.255.0

200.45.11.35

200.45.11.1

200.45.11.35

200.45.11.1

3. Confirm your entry, and then click OK.

Ν	ote
	010

1. Programming 1.1 Network Settings, General

Current IP Addres

# IP Address # Subnet Mask # Default Gate

Programming
 Are the following settings OK?
 1.1 Network Settings, General
 1.1 IP Address Settings

IP Address Subnet Mask Default Gatew

urrent Subnet Mask

Current Default Gatewa 1.1.1 IP Address Settings

🗿 IP-GW4 Maintenance Utility - Microsoft Internet Explore

Ele Edit View Favorites Iools Help Address 🗃 http://192.168.1.200/ad\_network\_conf.html

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

## 4.2.4 Assigning the Hunt Pattern

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

P-GW4 Maintenance Utility	- Microsoft Internet Explorer	1.	Cli	ck 1.5 Hunt Pattern (for Incoming Calls)
File Edit View Favorites Tool	ls <u>H</u> elp		in t	he main menu.
Address 🕘 http://192.168.1.200/ad	_menu.html			
MENU				
1. Programming				
1.1 Network Settings, Gene	eral			
1.2 H.323 Detailed Settings	<u>8</u>			
1.3 Voice Communication I	Detailed Settings			
1.4 VoIP Gateway/IP-PBX	<u>CInterface Settings</u>			
1.5 Hunt Pattern (for Incom	<u>uing Calls)</u>			
1.6 DN2IP (Dialed Numbe	r to IP Address Translation)			
1.7 Initialization				
			_	In the House Dettern No. Is an invest
IP-GW4 Maintenance Utility - Micro File File View Fermities Tests High	soft Internet Explorer	Ζ.	a.	In the <b>Hunt Pattern No.</b> box, type 1.
Address a http://192.168.1.200/ad_hunt_pat	ittern.html			A hunt pattern will be created with this
OK ALL CLEAR MENU	LOGOUT			numbering.
1. Programming 1.5 Hunt Pattern (for Incoming Calls)			b.	In the <b>Receive Leading Number</b> box, type <b>35</b> (PBX code).
1.5.1 Hunt Group	Port1 Port2		c.	Click ENTRY.
Hunt Group Hunt grou	p 1 🛩 Hunt group 1 🛩		٦	
1.5.2 Hunt Pattern Entry			a.	Click <b>UR</b> .
Hunt Pattern No. (1-16)	1			
* Receive Leading Number	35			
Hunt Group (Priority1)	1 🗠			
Hunt Group (Priority2)	• •			
* indicates setting must be done in the	STOP status, and is not followed by a REI	BOOT.		
ENTRY				
A ID CHIEF H-1-1-1-1-1 HURL		3	Co	nfirm your entry and then click <b>OK</b>
Ele Edit View Figvorites Tools Help	ner oxponer	0.	00	mining your charg, and men click <b>Cix</b> .
Address a http://192.168.1.200/ad_hunt_pattern_conf.h	tml			
1. Programming				
Are the following settings OK?				
1.5 Hunt Pattern (for Incoming Calls)				
1.5.1 Hunt Group	Port1 Port2			
Hunt Group Hunt g	group 1 Hunt group 1			
Hunt Pattern No. Ro	eceive Leading Number Hunt Gr 5 1	roup		
OK CANCEL				

#### <u>Note</u>

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

### 4.2.5 **Programming the Address Translation Table**

The function of an address translation table in a VoIP network is to provide two-way translation of telephone numbers and IP addresses<sup>\*1</sup>. 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 program 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 "4.2.6 Downloading the Address Translation Table from the VoIP Gateway Card", and "Uploading Address Translation Table to the VoIP Gateway Card" in "4.3 Programming the VoIP Gateway Card in the Chicago Office").

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".



<sup>\*1</sup> 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.

P-GW4 Maintenance Utility - Microsoft Internet Explorer							
E	ile <u>E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp						
Address 🕘 http://192.168.1.200/ad_register_gw.html							
1. Programming 1.6 DN2IP (Dialed Number to IP Address Translation)							
	CUIDI (0 511)						
	GW 146. (0-511)						
	* Comment Los Angeles						
	IP Address 200.45.11.35						
	Group No. 0						
* indicates setting must be done in the STOP status, and is not followed by a REBOOT.							
	ENTRY						

P-GW4 Maintenance Utility - Microsoft Internet Explorer								
File Edit View Favorites Tools Help								
Address 截 http://192.168.1.200/ad_register_gw.html								
OK MENU PREVIOUS LOGOUT 1. Programming 1. 6 DN2IP (Dialed Number to IP Address Translation)								
1.6.1 GW Entry								
GW No. (0-511)	1							
Comment	Chicago							
IP Address	199.176.64.41							
Group No.	0							
* indicates setting must be done in the STOP status, and is not followed by a REBOOT.								
A 10 CM/ Heisterson IDillin. History 6 Internet Fundame								
Ble Edit View Favorites Iools Help								
Address 🕘 http://192.168.1.200/ad_register_gw_conf.html								
1. Programming								
Are the following settings OK?								
1.6 DN2IP (Dialed Number to IP Address Translation)								
1.6.1 GW Entry								
CHUN- Comment	TD A Library	Course No.						

OK CANCEL

200.45.11.35 99.176.64.4

- **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.

#### <u>Note</u>

- 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.
  - In the IP Address box, type 199.176.64.41.
  - d. In the Group No. box, type 0.
  - e. Click ENTRY.
  - f. Click OK.
- Confirm your entry, and then click OK.
   The gateway entries for the Los Angeles and Chicago offices are now configured.

P-GW4 Maintenance Utility - Microsoft Internet Explorer	6.	Clic	k PREVIOUS.
Eile Edit View Favorites Tools Help			
Address a http://192.168.1.200/ad_register_gw.html			
OK MENU PREVIOUS LOGOUT			
1. Programming 1.6 DN2IP (Dialed Number to IP Address Translation)			
1.6.1 GW Entry			
GW No. (0-511) 0			
* Comment Los Angeles			
IP Address 200.45.11.35			
Group No. 0			
* indicates setting must be done in the STOP status, and is not followed by a REBOOT.			
ENTRY			
	7	Clic	k 1 6 2 DN2ID Entry
P-GW4 Maintenance Utility - Microsoft Internet Explorer	7.	Ciic	
File Edit View Favorites Tools Help			
Aguress C http://192.166.1.200/ag_phone_no_mend.html			
1. Programming 1.6 DN2IP (Dialed Number to IP Address Translation)			
1.6.1 GW Entry			
1.6.2 DN2IP Entry			
(Note) If the Gatekeeper is used, this DN2IP function dosen't work. Refer to 1.2.3 Gatekeeper Settings			
	Q	Do	the following to configure the Les Angeles
IP-GW4 Maintenance Utility - Microsoft Internet Explorer		00	the following to configure the Los Angeles
Hie Eak view Favorikes Loois Help		exte	ensions:
		a.	In the Leading Number box, type 352
OK MENU PREVIOUS LOGOUT			(DBV code [25] + extension starting digit
1. Programming			(PDX code [35] + extension starting digit
1.6 DN2IP (Dialed Number to IP Address Translation)			[2]).
1.6.2 DN2IP Entry		b.	In the Remaining Number of Digits
Leading Number 352			box type 2 (2 digits to dial [00 to 99]
* GW No/Group No. Selection			following the leading number)
GW No/Group No. 0			ionowing the leading number).
· · · · ·		C.	Click <b>GW</b> for <b>GW No/Group No.</b>
* indicates setting must be done in the STOP status, and is not followed by a REBOOT.			Selection
ENTRY			
		d.	In the GW No/Group No. box, type 0 (the
			gateway entry for the card).
		•	
		с.	
P GWS Maintenance Utility Microsoft Internet Explorer     E GR Ven Evolute Took Heb	9.	a.	Referring to step 8, complete the
falten 🔊 http://152.158.1.200.[od.].regizer_ghourero_conf.html 💌 💽 t			address translation table as shown on
1. Programming Are the following retinge OK?			
1.6 DN2IP (Dialed Number to IP Address Translation)			the left.
1.6.2 DN2IP Entry           DN2IP Table No.         Lesding Number         Remaining Number of Digits         Group No.         GW No.         Comment		b.	Click <b>OK</b> .
0 352 2 - 0 Los Angeles 1 355 2 - 0 Los Angeles 2 350 7 - 0 Los Angeles			
3 413 2 - 1 Chitago		C.	Confirm your entry, and then click <b>OK</b> .

#### <u>Note</u>

OK CANCEL

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.
#### 4.2.6 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 "4.3 Programming the VoIP Gateway Card in the Chicago Office"), so that all the cards can communicate with each other over the network.

P-GW4 Maintenance Utility - Microsoft Internet Explorer	<b>1.</b> Cli	ck <b>3.4 Download of I</b>
Eile Edit View Favorites Iools Help	Ga	teway -> PC) in the i
Address 🕘 http://192.168.1.200/ad_menu.html		
MENU		
1. Programming		
3. Data Management	=	
3.1 Upload of Configuration data (PC -> VoIP Gateway)		
3.2 Download of Configuration data (VoIP Gateway -> PC)		
3.3 Upload of DN2IP data (PC -> VoIP Gateway)		
3.4 Download of DN2IP data (VoIP Gateway -> PC)		
REBOOT		
LOGOUT		
a in cuid Maintean Indian - Marcado Intean tourisme	2. a	
2 IP-GW4 Maintenance Officy - Microsoft Internet Explorer	u.	
Address 🗿 http://192.168.1.200/ad_routing_data_down.html	b.	Specify the file nam
		which to save the m
3. Data Management 3.4 Download of DN2IP data (VoIP Gateway -> PC)		
S. Download of Differi data (1011 Gateway - PTO)		
DOWNLOAD		

#### 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.

### ownload of DN2IP data (VoIP > PC) in the main menu.

the file name and the folder in o save the file.

## 4.2.7 Rebooting the VoIP Gateway Card

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

P-GW4 Maintenance Utility - Microsoft Internet Explorer	1. Click <b>REBOOT</b> in the main menu.
<u>E</u> ile <u>E</u> dit <u>V</u> iew F <u>a</u> vorites <u>I</u> ools <u>H</u> elp	
Address 🕘 http://192.168.1.200/ad_menu.html	
MENU	
1. Programming	
3. Data Management	
3.1 Upload of Configuration data (PC -> VoIP Gateway)	
3.2 Download of Configuration data (VoIP Gateway -> PC)	
3.3 Upload of DN2IP data (PC -> VoIP Gateway)	
3.4 Download of DN2IP data (VoIP Gateway -> PC)	
REBOOT	
LOGOUT	
🗿 IP-GW4 Maintenance Utility - Microsoft Internet Explorer	2. Click REBOOT.
Eile Edit View Favorites Tools Help	
Address 🗃 http://192.168.1.200/restart.html	
Are you give it is OV to repost?	
When rebooting, click REBOOT button.	
To cancel REBOOT, click CANCEL button.	
REBOOT CANCEL	
4	

## 4.2.8 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 "2.2.2 Connection to the LAN" or "3.2.2 Connection to the LAN").

Follow the procedure below, referring to "4.1.1 Preparing the PC" and "4.2.1 Starting the IP-GW4 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.
- 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.

## 4.3 Programming the VoIP Gateway Card in the Chicago Office

This section details the procedure to program 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 "4.2 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-GW4 Maintenance Utility

🕙 IP-GW4 Maintenance Utility - Microsoft							
Eile	<u>E</u> dit	<u>V</u> iew	F <u>a</u> vorites	<u>T</u> ools	Help		
A <u>d</u> dre	ss	http://	192.168.1.2	00			

A) ID	CW4	Maint	onanco I li	iliter (	Microsoft Internet Explorer
File	Edit	View	Favorites	Tools	Help
A <u>d</u> dre	ss 者	- http://	-	- 00	
F	<b>an</b> er Use	<b>as</b> ername	onic e and Pass	word,	and click the LOGIN button.
Us	ernam	e Adr	ninistrator		
Pa	swor	d eee			
Ŀ	OGIN		EAR		

- 1. Start Internet Explorer from the Start menu.
- 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 "4.1.1 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

Elle Edit View Favorites Tools Help	rnet Explorer				
Address 🗃 http://192.168.1.200/state_chg.html					
2. Maintenance 2.1 Change RUN/STOP status					
Current RUN/STOP Status	RUN				
Current RUN/STOP Status Status after changing	RUN ● RUN ● STOP				
Current RUN/STOP Status Status after changing Forced Disconnect when executing STOP	RUN O RUN O STOP Tes				

- 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.

Edit View Favorites Icols Help	
dress 🗿 http://192.168.1.200/ad_network.html	
. Programming	
.1 Network Settings, General	
Current TD Address	100 160 1 000
Current Subnet Mask	255 255 255 0
Current Default Gateway	0.0.0.0
1.1.1 IP Address Settings	
# IP Address	199.176.64.41
	255.255.255.0
# Subnet Mask	

🗿 IP-GW4 Maintenance Utility - Microsoft Internet I	Explorer
File Edit View Favorites Tools Help	
Address 🕘 http://192.168.1.200/ad_network_conf.html	
1. Programming Are the following settings OK? 1.1 Network Settings, General	
1.1.1 IP Address Settings	
IP Address	199.176.64.41
Subnet Mask	255.255.255.0
Default Gateway	199.176.64.1

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

-						
IP-GW4 Maintenance Uti	lity - Microsoft In	ternet Explo	rer			
Ele Edit View Favorites	Tools Help					
Address 💩 http://192.168.1.200/ad_hunt_pattern.html						
OK ALL CLEAR MENU LOGOUT						
1. D						
1. Programming 1.5 Hunt Pattern (for Incor	ning Calls)					
1.5.1 Hunt Group						
*	Port1		Port2			
Hunt Group	Hunt group 1 🔽	Hu	nt group 1 💌			
1.5.2 Hunt Pattern Entry				_		
Hunt Pattern No. (1-16)	ļ.	1				
* Receive Leading Numbe	r	41				
Hunt Group (Priority1)		1 🕶				
Hunt Group (Priority2)						
* indicates setting must be	done in the STO	etatue and	is not followed by	* REBOOT		
Indexes towns more to		onarao, aara				
ENTRY						
🗿 IP-GW4 Maintenance Utility - M	icrosoft Internet Exp	lorer				
Ele Edit View Favorites Tools	Help					
Agaress E http://192.168.1.200/ad_hur	k_pattern_conf.html					
1. Programming						
Are the following settings OK?						
1.5 Hunt Pattern (for Incoming Calls)						
151 Hunt Group						
1.5.1 Hunt Group	Por	:1	P	ort2		
Hunt Group	Hunt group 1		Hunt group	1		
II D. thorn M	Dest			Test Classic		
Hunt Pattern No.	Keceive 41	Leading Numb	ber 1	1 I I I I I I I I I I I I I I I I I I I		
				-		
OK CANCEL						

- 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 "4.2.6 Downloading the Address Translation Table from the VoIP Gateway Card") to the card in the Chicago office.

P-GW4 Maintenance Utility - Microsoft Internet Explorer	1. Click 3.3 Upload of DN2IP data (PC -> VoIP
Elle Edit View Favorites Iools Help	Gateway) in the main menu.
Address 🛃 http://192.168.1.200/ad_menu.html	
MENU	
1. Programming	
3. Data Management	
3.1 Upload of Configuration data (PC -> VoIP Gateway)	
3.2 Download of Configuration data (VoIP Gateway -> PC)	
3.3 Upload of DN2IP data (PC -> VoIP Gateway)	
3.4 Download of DN2IP data (VoIP Gateway -> PC)	
REBOOT	
LOGOUT	
P-GW4 Maintenance Utility - Microsoft Internet Explorer	<b>2. a.</b> Click <b>Browse</b> and choose a file to
File Edit View Favorites Tools Help	
	<b>b.</b> Click UPLOAD(PC->VoIP Gateway).
3. Data Management 3.3 Upload of DN2IP data (PC -> VoIP Gateway)	
Enter upload file name	
Browse	
If you are sure, click UPLOAD.	
UPLOAD(PC->VolP Gateway)	
③ D. GW4 Maintonanco Utility Microsoft Internet Explorer	3. Click REBOOT.
Ele Edit View Favorites Iools Help	
Address Addres	
3. Data Management	
3.3 Upload of DN2IP data (PC -> VoIP Gateway)	
Upload of DN2IP data has finished OK. Reboot this device.	
When rebooting, click REBOOT button. When not rebooting, click OK button.	
P-GW4 Maintenance Utility - Microsoft Internet Explorer	4. Click REBOOT.
Ele Edit View Favorites Icols Help	
Address 🗃 http://192.168.1.200/restart.html	
Are you sure it is OK to reboot?	
when rebooting, click KEBOOT button. To cancel REBOOT, click CANCEL button.	
REBOOT	

#### <u>Note</u>

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.
- 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 5 Programming the PBX

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 program the PBX to use the card.

## 5.1 Programming the PBX in the Los Angeles Office

This section details the procedure to program the PBX in the Los Angeles office. 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 (see "5.2 Programming the PBX in the Chicago Office").

#### <u>Note</u>

It is assumed that you have already installed the KX-TDA50 Maintenance Console (PC programming software for the KX-TDA50 PBX) in your PC.

						2
						۷.
En	ter Programme	er Code :				
		<u>o</u> ĸ	<u></u> a		Help	
🔣 K	X-TDA50	) Mainte	enance	Console		3.
File	Connect	Tool U	tility Wir	ndow He	elp	
l D	RS-232	2C			?	
	USB				*	
	Meder					
	Modell	·				
	Discon	nect				
🕅 КХ-	TDA50 Maint	enance Con	sole - [1.Co	nfiguration	-6.IP-GW Port]	4.
🧾 Eile	<u>C</u> onnect <u>T</u> oo	l <u>U</u> tility <u>W</u> ir	ndow <u>H</u> elp			
	8 🖬   X 🖻	n 🛍   🕾 🕅	<b>≥∣</b> ?			_
□ □ - 1.Co	nfiguration 1.Slot		QK	Cancel	Apply	
	2.Portable Station 3 Option	n	Co	mmand		
	4.LCO Port		Slot	Port	Connection	-
	5.Extension Port 5.IP-GVV Port		05	01	INS	
. ⊕ - 2.Sy	stem		05	02	INS	
14-0.0	oabo					
🔣 КХ-ТОЛ	150 Maintenance C	onsole - [10.CO	& Incoming Call-	I.CO Line Setting	ł	5.
Ele Ge	onnect Iool Utility    👗 🖻 🛍 🛃	Window Help				
€ 1.Config € 2.Syster	uration n	<u>o</u> k	⊆ancel Ap	oly		
3.Group	s		Physical			

-TRK#2

1.	Start the KX-TDA50 Maintenance Console
	from the Start menu.

- 2. a. Type the Installer Level Programmer Code (default: INSTALLER).
  - **b.** Click **OK**.
- 3. a. Click Connect  $\rightarrow$  RS-232C or USB.
  - **b.** In the next screen, type the system password for installer (default: **1234**).
  - c. Click OK. The program menu appears.
  - a. Double-click Configuration.
    - Double-click IP-GW Port.
       Confirm that ports 1 and 2 are in service (INS).
- 5. a. Double-click CO & Incoming Call.
  - b. Double-click CO Line Setting.
  - c. Type the CO Name and assign an unused Trunk Group Number to be used for all VoIP gateway trunks (CO lines).
  - d. Click OK.

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4.Timers & Counters	1	Operator Call	0				
S.Time Service     C.Numberland	2	Idle Line Access (Local Access)	9				
-1 Extension	3	Trunk Group Access	8				
- 2 Feature	4	Tie Line Access	7				

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+ 5.Optional Device				Priority 1					
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	00		MPR(M)	)		0.022
2.System	01	Fixed Slot	DHLC4		INS	
3.Groups     4.Extension	02	Free Slots Type	A		Idle	
	03	Free Slots Type	A		Idle	
6.Feature     For TRS	04	Free Slots Type	A		Idle	
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I.Configuration		<u>o</u> k	Cancel	App	ly	
- 1.Slot - 2.Portable Station	ſ	Slot 05				
- 41 CO Port		C	escription		V	alue
- 5.Extension Port		En-bloc Dialing setting Overlap				

- 6. a. Double-click System.
  - b. Double-click Numbering Plan.
  - c. Double-click Feature.
  - **d.** In the **Tie Line Access** box, type the dialing number.
  - e. Click OK.
- 7. a. Double-click Private Network.
  - **b.** In the **Own PBX Code** box, type **35** (the PBX code of the local PBX in the network).
  - **c.** In the **Leading Number** box, type **41** (the PBX code of the remote PBX in the network).
  - **d.** In the corresponding **Trunk Group** list, click the number of the trunk (CO line) group to be used when making calls.
  - e. Set the number modification pattern, if necessary.
  - f. Click OK.
- 8. a. Double-click Configuration.
  - b. Double-click Slot.
  - c. Click Status of the card.
  - d. Set the status to OUS.
  - e. Click Card Type of the card.
  - In the Value list, click Overlap (default) or En-bloc<sup>\*1</sup>.
  - g. Click OK.
  - h. Click Status of the card.
  - i. Set the status to INS.
- <sup>\*1</sup> When "En-bloc" is selected, you need to press "#" after dialing the phone number.

#### <u>Note</u>

For details about network parameter settings, refer to the relevant sections of the Hybrid IP-PBX Feature Guide.

## 5.2 Programming the PBX in the Chicago Office

This section details the procedure to program the PBX in the Chicago office. Follow the same procedure as you did for the PBX in the Los Angeles office, entering the setting values as appropriate for the Chicago office.

#### <u>Note</u>

It is assumed that you have already installed the KX-TDA Maintenance Console (PC programming software for the KX-TDA100/KX-TDA200 PBX) in your PC.

1.

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									2.
Ent	ter Programme	er Code :							
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	7.T1 Port 8 Extension Por	•		05	02	INS			
	9.CSI/F Port								
	10.IP-GW Port								
Fill you may				C-11 4 - CP-1					5
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1.Configur	ration	ok Co	ncel	Apply					

the	Start menu.	
a.	Type the Installer Level Programmer	

Start the KX-TDA Maintenance Console from

- Code (default: **INSTALLER**).
  - b. Click OK.
- 3. a. Click Connect  $\rightarrow$  RS-232C or USB.
  - **b.** In the next screen, type the system password for installer (default: **1234**).
  - c. Click OK. The program menu appears.
  - a. Double-click Configuration.
    - b. Double-click IP-GW Port.
       Confirm that ports 1 and 2 are in service (INS).
- 5. a. Double-click CO & Incoming Call.
  - b. Double-click CO Line Setting.
  - c. Type the CO Name and assign an unused Trunk Group Number to be used for all VoIP gateway trunks (CO lines).
  - d. Click OK.

Trunk Group Number

CO Name (20 characters)

KX-TDA Maintenance Console - [2.System-6.Numbering Plan-2.Feature]							
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1.Date & Time / Daylight Savir     2.PBX Operator     DOM (Value on Value)	No.	Feature	Dial (4 digits)				
	1	Operator Call	9				
5.Time Service	2	Idle Line Access (Local Access)	0				
-1 Extension	3	Trunk Group Access	8				
- 2.Feature	4	Tie Line Access	7				

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2.System     3.Groups	Ow	Own PBX Code (7 digits) 41					
S.Optional Device				Priority 1			
€ 6.Feature ⊕ 7.TRS	No.	(3 digits)	Removed Number of Digits	Added Number (32 digits)	Trunk Group		
+ 8.ARS 9.Private Network	1	35	0		2		
10.CO & Incoming Call	2		0		None		

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E 1.Configuration	QK	Çancel	Apply				
- 1.Slot							
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- 5 LCO Part - 6 PRI Part	00	MPF	R(M)		1.100		
-7.T1 Port	01	DHL	.C8	INS	0.038		
- 8 Extension Port - 9.CSMF Port	02			Idle			
10 JP-GW Port	03			Idle			
	04	04		Idle			
4.Extension	05	IP-GW4(T	DA0484)	INS	1.017		
KX-TDA Maintenance	Console iity <u>Wi</u> nd	e - <mark>[1.Config</mark> i low <u>H</u> elp	iration-1.	Slot-IP-GW Ca	rd Property]		
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1.Configuration		<u>ο</u> κ	<u>C</u> ancel	Apply			
- 1.Slot - 2.Portable Station			Slot	05			
- 4.Option			Descript	ion	Value		
5.LCO Port		En-bloc Dialing setting Overlap					

- 6. a. Double-click System.
  - b. Double-click Numbering Plan.
  - c. Double-click Feature.
  - **d.** In the **Tie Line Access** box, type the dialing number.
  - e. Click OK.
- 7. a. Double-click Private Network.
  - b. In the Own PBX Code box, type 41 (the PBX code of the local PBX in the network).
  - **c.** In the **Leading Number** box, type **35** (the PBX code of the remote PBX in the network).
  - **d.** In the corresponding **Trunk Group** list, click the number of the trunk (CO line) group to be used when making calls.
  - e. Set the number modification pattern, if necessary.
  - f. Click OK.
- 8. a. Double-click Configuration.
  - b. Double-click Slot.
  - c. Click Status of the card.
  - d. Set the status to OUS.
  - e. Click Card Type of the card.
  - In the Value list, click Overlap (default) or En-bloc<sup>\*1</sup>.
  - g. Click OK.
  - h. Click Status of the card.
  - i. Set the status to INS.

<sup>\*1</sup> When "En-bloc" is selected, you need to press "#" after dialing the phone number.

#### <u>Note</u>

For details about network parameter settings, refer to the relevant sections of the Hybrid IP-PBX Feature Guide.

## Appendix A

**Guidance for VoIP Installation** 

## A1 VoIP Requirements

## A1.1 Bandwidth Assessment

To establish a VoIP network, you must ensure that the network has enough bandwidth to support VoIP communications. 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 Fax Communication) + [(4 - No. of Fax Machines) × Required Bandwidth for Voice Communication]

Required bandwidth for fax and voice communications 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 Voice Communication**

#### Via LAN

CODEC	Packet Sending Interval						
CODEC	20 ms	30 ms	40 ms	60 ms	90 ms		
G.711	87.2 kbps	79.5 kbps	75.6 kbps	—	—		
G.729A	31.2 kbps	23.5 kbps	19.6 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						
CODEC	20 ms	30 ms	40 ms	60 ms	90 ms		
G.711	84 kbps	77.3 kbps	74 kbps	—	—		
G.729A	28 kbps	21 kbps	18 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		

## **Required Bandwidth for Fax Communication**

## Via LAN

EAV High Polichia Mathad	G.711 Packet Sending Interval				
FAA nigii heliable melilou	20 ms	30 ms	40 ms		
Don't Use	87.2 kbps	79.5 kbps	75.6 kbps		
Use	224.8 kbps	213.9 kbps	208.4 kbps		

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

EAX High Paliable Method	G.711 Packet Sending Interval				
	20 ms	30 ms	40 ms		
Don't Use	84 kbps	77.3 kbps	74 kbps		
Use	221.6 kbps	211.7 kbps	206.8 kbps		

## Example

Consider the following case as an example:

- Communication: via LAN
- No. of Fax Machines: 1
- Required Bandwidth for Fax Communication: 75.6 kbps
- Required Bandwidth for Voice Communication: 23.5 kbps

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

## Required Bandwidth

 $= (1 \times 75.6) + (3 \times 23.5)$ 

= 146.1

Therefore, inform your network administrator and make sure that the network can support a bandwidth of 146.1 kbps even when the network is under conditions of maximum traffic.

#### <u>Note</u>

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

## 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 the IP network a managed network?

A VoIP network should be implemented on a managed IP network such as Frame Relay, Leased Line, or IP-VPN (Virtual Private Network).

An unmanaged network—that is, the Internet—cannot be used to employ a VoIP network because delays and loss in data transmission can cause huge degradation in speech quality.

## 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.



#### <u>Note</u>

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, two routers provide access to the IP network as shown in the diagram below. However, the VoIP Gateway Card cannot take the advantage of having two 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 two 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.

Protocol	TCP/UDP	Default Port No.
HTTP <sup>*1</sup>	TCP	80
RTP/RTCP*2	UDP	5004 to 5011
H.225.0 Call Signaling*2	TCP	1720
H.245 <sup>*2</sup>	ТСР	1712 to 1724
H.225.0 RAS*2	UDP	1719

For more information, consult your network administrator.

\*1 For the actual setting values, refer to "2.2.2 H.323 Parameters" in the VoIP Gateway Card Programming Guide.

\*2 For the actual setting values, refer to "2.2.1 Network 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 may result in degradation in speech quality.

To ensure the performance, it is strongly recommended that you use layer 2 or higher switches.

## Are category 5 (CAT 5) cables used?

When connecting network devices, make sure to use CAT 5 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.

#### <u>Note</u>

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

## A2 VolP Requirements Checklist

Use the following checklists to see if you can implement a VoIP network. The answers identified in **<u>underlined bold-face letters</u>** 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.	□ <u>Yes</u> □ <sub>No</sub>	<ul> <li>IP network bandwidth         <ul> <li>kbps</li> <li>Available bandwidth for VoIP</li> <li>kbps</li> </ul> <ul> <li>Required bandwidth for VoIP</li> <li>kbps</li> </ul> </li> </ul>

## **Network Configuration**

No.	Question	Answer	Memo	Ref.
2-a	Is the IP network a managed network? Make sure to use a managed IP network such as Frame Relay, Leased Line, or IP- VPN (Virtual Private Network). The VoIP Gateway Card is not intended for use on the Internet.	□ <u>Yes</u> □ <sub>No</sub>	Type of IP network:	p. 53
2-b	Is it possible to have static IP addressing?	□ <u>Yes</u> □ <sub>No</sub>		p. 54
2-c	Is network address translation (NAT/ NAPT) disabled?	□ <u>Yes</u> □ <sub>No</sub>		p. 54
2-d	Does only a single router provide access to the IP network?	□ <u>Yes</u> □ <sub>No</sub>		p. 55
2-e	Is there only a single IP network between two ends of a call?	□ <u>Yes</u> □ <sub>No</sub>		p. 56
2-f	Is the card located appropriately?	Yes No	No. of hops (routers/switches) within one location:	p. 57

## **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.	□ <u>Yes</u> □ <sub>No</sub>	Model of the firewall:	p. 57
3-b	Are layer 2 or higher switches used? Do not use repeater hubs as they can increase the network load.	□ <u>Yes</u> □ <sub>No</sub>	Model of the switch:	p. 58
3-с	Are category 5 (CAT 5) cables used?	□ <u>Yes</u> □ No		p. 58

## 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. 58

## 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		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 (CO Line) 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 (CO Line) Access Number	802	803	An access number to seize a VoIP gateway trunk (CO line).
PSTN Trunk (CO Line) Number	92	93	An access number to seize a local PSTN trunk (CO line).
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.

## **Dialing 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

VoIP Gateway trunk (CO line) access no.	Chicago PBX PSTN trunk (CO line) no.	phone no.
Dial <b>802</b> .	Dial <b>93</b> .	Dial <b>123-4567</b> .

## **Calling from Chicago to Los Angeles**

To extension 201 via VoIP network

extension no.)	
Dial <b>201</b> .	

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



## **PBX Connection Information**

	Los Angeles Office			Chicago Office		
	Extensions	FAX Extensions	PSTN Access	Extensions	FAX Extensions	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 two 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 "4.2.4 Assigning the Hunt Pattern".

🕘 IP	-GW4	Maint	enance Ut	tility -	Microsoft	Internet	Explorer			
Eile	Edit	⊻iew	F <u>a</u> vorites	<u>T</u> ools	Help					
Addre	Address 🛃 http://200.45.11.35/ad_hunt_pattern_conf.html									
1. ]	1. Programming									
Are	Are the following settings OK?									
1.5	1.5 Hunt Pattern (for Incoming Calls)									
1.5	1 Hu	nt Gro	up							
							Port1			Port2
	Hu	nt Gro	up			Hunt gro	up 1		Hu	nt group 1
	Н	lunt P	attern No	<b>)</b> .		Reco	eive Leadin	g Number		Hunt Group
		1				2				1
		2				5				1
		3				92				1

Program an address translation table with the setting values shown below, following the procedure in "4.2.5 Programming the Address Translation Table".

🛛 IP-GW4 Maintenance Utility - Microsoft Internet Explorer 📃 💽								
<u>File E</u> dit <u>V</u> iew Favori	jie Edit View Fayvorites Iools Help							
Address 🛃 http://200.45.	11.35/ad_register_phoneno_conf.l	ntml			💌 🄁 🛛			
1. Programming	1. Programming							
Are the following settings OK?								
1.6 DN2IP (Dialed N	1.6 DN2IP (Dialed Number to IP Address Translation)							
1.6.2 DN2IP Entry								
DN2IP Table No.	Leading Number	Remaining Number of Digits	Group No.	GW No.	Comment			
0	2	2	-	0	Los Angeles			
1	5	2	-	0	Los Angeles			
2	92	7	-	0	Los Angeles			
3	3	2	-	1	Chicago			
4	6	2		1	Chicago			
5	93	7	-	1	Chicago			
OK CANCEL								

## 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 "4.3 Programming the VoIP Gateway Card in the Chicago Office".

IP-GW4 Maintenance Utility - M	icrosoft Internet Explorer					
jle Edit View Favorites Iools Help						
Address 🕘 http://199.176.64.41/ad_hun	t_pattern_conf.html					
Programming     Are the following settings OK?     If there for provide (1.1)						
1.5 Hunt Pattern (for Incoming Ca	шз)					
1.5.1 Hunt Group						
	Port1	Port2				
Hunt Group	Hunt group 1	Hunt group 1				
Hunt Pattern No.	Receive Leading Number	Hunt Group				
1	3	1				
2	6	1				
3	1					
	22	-				

## B2.2 Programming the PBX

The steps below are provided in substitution for steps 6 and 7 of the procedure detailed in "5.1 Programming the PBX in the Los Angeles Office" and "5.2 Programming the PBX in the Chicago Office". Program the PBXs in both offices using the extension number method, following these steps.

## **Programming the PBX in the Los Angeles Office**

## Step 6

Assign the PSTN trunk (CO line) access number:

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

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	<u>о</u> к	Cancel	Apply							
2.System										
1.Date & Time / Daylight Savir     2.PBX Operator	No.		Dial (4 digits)							
	4.Timers & Counters     1 Operator Call									
	2	Idle Line Access (I	Local Access)		92					
- 6 Numbering Plan	3	Trunk Group Acce	88		8					
2.Feature	4	Tie Line Access			7					
	5	Redial			#					

### Step 7

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

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

🔣 KX-TDA50 Maintenance Cons	sole - [2.	System-6.Numl	pering Plan-	3.Other P	BX Extension
Eile Connect Tool Utility Win	dow <u>H</u> elp	)			
0 🛩 🖬 👗 🖻 🛍 🕰 📀	9				
	<u>o</u> k	Cancel	Apply		
È-2.System				1	
	No.			Dial (3 digits)	
	1	Other PBX Extension Number (TIE) 01 Other PBX Extension Number (TIE) 02			3
	2				6
-1.Extension	3	Other PBX Extension	on Number (TIE)	03	
- 2.Feature	4				
	5	Other PBX Extension	on Number (TIE)	05	

#### 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).

#### <u>Note</u>

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

🕅 KX-TDA50 Maintenance Console - [9.Private Network]									
Eile Connect Tool Utility Win	ndow <u>H</u> elp								
0 🛩 🖬 👗 🖻 🛍 😂 🕅	≥ ?								
	<u>o</u> k	Cancel	Apply						
主 2.System									
庄 - 3.Groups	Own PBX Code (7 digits)								
4.Extension			1						
5.0ptional Device		Priority 1							
€.Feature	No.	Leading Number	Removed				Removed		
E-7.TRS		(5 digits)	Number of Digits	Added Number	(32 digits)	Trunk Group	Number of Dig		
€-8.ARS			1 -	1					
- 9.Private Network	1	3	0			2	0		
∎-10.CO & Incoming Call	2	6	0			2	0		
⊞-11.Maintenance	3	93	0			2	0		

After the above step, follow step 8 of the procedure in "5.1 Programming the PBX in the Los Angeles Office".

## Programming the PBX in the Chicago Office

## Step 6

Assign the PSTN trunk (CO Line) access number:

In the Idle Line Access (Local Access) box, type 93 (for Chicago office PSTN access).

🕅 KX-TDA Maintenance Console - [2.System-6.Numbering Plan-2.Feature]									
🛅 Eile Connect Iool Utility Window Help									
] D 📽 🔲 👗 🖻 🛍   🕾 🕅	D 📽 🖶 👗 🛍 🕮 🕾 📎 💡								
	<u>o</u> k	Cancel	Apply						
E-2.System				1					
🗈 1.Date & Time / Daylight Savir									
- 2.PBX Operator	No.		Feat	ure	Dial (4 digits)				
- 3.BGM / Music on Hold									
	1	Operator Call							
	2	Idle Line Access (	Local Access)		93				
6.Numbering Plan									
-1.Extension	3	Trunk Group Acce	226		8				
- 2.Feature	4	Tie Line Access			7				
3.Other PBX Extension	· · ·	110 2010 1 100000							
4.Quick Dialing	5	Redial			#				

## Step 7

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

In the **Other PBX Extension Number (TIE)** box (01 and 02), type **2** (for the Los Angeles office extensions) and **5** (for the Los Angeles office fax extensions).

KX-TDA Maintenance Console - [2.System-6.Numbering Plan-3.Other PBX Extension]									
🖺 Eile Connect Iool Utility Window Help									
🗅 📽 🔛 👗 🖻 🛍 🚑 🤇	D 🖆 🗐 👗 ங 🛍 🚑 🐼 💡								
	<u>о</u> к	Cancel	Apply						
🖻 2.System									
	No.		Feature		Dial (3 digits)				
3.BGM / Music on Hold		Officer BENCE to a site	- Number (TIE)	04	2				
4.Timers & Counters	1	Other PBX Extensio	n Number (TIE)	01	2				
	2	Other PBX Extensio	n Number (TIE)	02	5				
6.Numbering Plan									
-1.Extension	3	Other PBX Extensio	n Number (TIE)	03					
- 2.Feature	4	Other PBX Extensio	n Number (TIE)	04					
<ul> <li>3.Other PBX Extension</li> </ul>			. ,						
<ul> <li>4.Quick Dialing</li> </ul>	5	Other PBX Extensio	n Number (TIE)	05					

## Step 8

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

In the **Leading Number** box, type **2** (for the Los Angeles office extensions), **5** (for the Los Angeles office fax extensions), and **92** (for Los Angeles office PSTN access).

#### <u>Note</u>

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

🗮 KX-TDA Maintenance Console - [9.Private Network]									
Eile Connect Tool Utility Window Help									
D 📽 🖶   👗 🛍 🔀 🕾 🔕 💡									
	<u>о</u> к	Cancel	Apply						
2.System									
Groups	Owni	PBX Code (7 digits)							
4.Extension			1						
		La sulla subbase bases		Priority 1					
€.Feature	No.	(2 diate)	Removed Number	Added Number		Removed			
7.TRS		(J ulgits)	of Digits	(32 digits)	Trunk Group	of D			
🗄 8.ARS			1 -		-				
9.Private Network	1	2	0		2	0			
± 10.CO & Incoming Call	2	5	0		2	C			
	3	92	0		2	C			

After the above step, follow step 8 of the procedure in "5.2 Programming the PBX in the Chicago Office".

## Appendix C

Initialization of the VoIP Gateway Card

## C1 Initializing 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.

#### <u>Note</u>

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

## **KX-TDA5480**

1. Install the card to the KX-TDA50 PBX, and then turn on the power to the PBX.



2. Using the KX-TDA50 Maintenance Console, confirm that the card is in service (INS).

🗮 KX-TDA50 Maintenance Console - [1.Configuration-1.Slot]										
Eile Connect Tool Utility Window Help										
0 📽 🔛 👗 🛍 🛍 🚑 🤇	🗅 🖆 🖬 👗 🛍 📸 😔 🚫 🤶									
- 1.Configuration	Г	<u>o</u> k	Cancel		Apply					
			Dramautu		C		1			
- 3.Option	Property Command									
- 4.LCO Port		Slot Slot Type Card Type					Status	Version		
		00 MPR(M)					-	0.022		
TE-2.System										
T 3 Groups		- 01	Fixed Slot			.4	INS	-		
		02 Free Slots Type A Idle								
€-5.Optional Device		03 Free Slots Type A Idle								
⊕ 6.Feature		04 Free State Ture A								
± 7.TRS		- 04	1100 01000 1990	~			iuic			
⊕ 8.ARS		05	Free Slots Type	в	IPGW	4	INS			

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



## **CAUTION**

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

- 4. Using the KX-TDA50 Maintenance Console, set the status of the card to **OUS**, then set it back to **INS**.
- 5. Return the System Initialize Switch to the "NORMAL" position.

## **KX-TDA0484**

1. Install the card to the KX-TDA100/KX-TDA200 PBX, and then turn on the power to the PBX.



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

KX-TDA Maintenance Console - [1.Configuration-1.Slot]									
III File Connect Iool Utility Window Help									
D 📽 🖬 👗 🛍 🛍 😂 🚱 🤋									
- 1.Configuration	ŌK	Cancel	Apply						
	Pro	perty	Comma	nd					
- 4.Option	Slot	Carc	Туре	Status	Version				
- 5.LCO Port - 6.PRI Port	00	MPI	R(M)	-	1.100				
-7.T1 Port	01	DH	LC8	INS	0.038				
	02			Idle					
10.IP-GW Port	03			Idle					
	04			Idle					
	05	IP-GVV4(	DA0484)	INS	1.017				

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



System Initialize Switch

## **CAUTION**

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

- **4.** Using the KX-TDA Maintenance Console, set the status of the card to **OUS**, then set it back to **INS**.
- 5. Return the System Initialize Switch to the "NORMAL" position.
# Appendix D

## Using the KX-TDA5480/KX-TDA0484 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-TDA5480/KX-TDA0484 and KX-TDA0480 VoIP Gateway Cards.

## Adding the KX-TDA5480/KX-TDA0484 to the Network Using the KX-TDA0480 Maintenance Console Software

For the KX-TDA0480 to recognize the KX-TDA5480/KX-TDA0484 in the network, you must add it as an "Other Unit" in a Unit Group (network) when programming with the MCS as shown below:

Advintenance Console Software				
<u>U</u> nit <u>E</u> dit <u>T</u> ools <u>V</u> iew <u>H</u> elp				
<u>Deserver and the second secon</u>				
🗎 Main	Unit name		IP address	Type
🦳 🔄 New group	₩KX-TDA0480		192.168. 1.100	BV1250 System V1.6
			192.168. 1.200	Other Unit
	Incold			
	<			>
Click F1 for help		GW= 1 GK= 0	VoIP-TA= 0 Othe	r= 1

#### <u>Note</u>

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-TDA5480/KX-TDA0484 with the KX-TDA0480, as detailed below:

- CLIP service is the only QSIG service available between the KX-TDA5480/KX-TDA0484 and KX-TDA0480. There is no compatibility for other QSIG services.
- Fax communications cannot take place between the KX-TDA5480/KX-TDA0484 and KX-TDA0480.

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