

Spectrum Enterprise SIP Trunking Service Panasonic KX-NS700/1000 V4.10060 IP PBX Configuration Guide

About Spectrum Enterprise:

Spectrum Enterprise is a division of Charter Communications following a merger with Time Warner Cable and acquisition of Bright House Networks. Spectrum Enterprise is a national provider of scalable, fiber technology solutions. The Spectrum Enterprise portfolio includes networking and managed services solutions, including Internet access, Ethernet and Managed Network Services, Voice, TV and Cloud solutions. Our industry-leading team of experts works closely with clients to achieve greater business success.

About this document:

Spectrum Enterprise assures IP PBX compatibility by conducting interoperability testing to ensure any potential compatibility issues have been resolved prior to installation. Please review the IP PBX configuration instructions in this guide prior to your installation date.

Be advised that this document may contain references to Charter or Charter Business. All references to Charter should be read as Spectrum Enterprise.

Thank you,

**Spectrum Enterprise** 



Subject:	KX-NS700/1000 SIP Trunk Configuration Guide for Charter Communications
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Platform tested**	Version
KX-NS1000	V4.10060

\*\* Configuration steps apply to both KX-NS700 and KX-NS1000 platforms

# Overview

This document outlines the configuration settings required for the KX-NS700 and KX-NS1000 to make full use of the capabilities of Charter Communications SIP Trunk Services.

The SIP trunk services of the KX-NS700/71000 PBX are provided through virtual CO line cards (VSIPGW16) which are designed to be easily integrated with an Internet Telephony Service provided by an ITSP (Internet Telephony Service Provider).

This guide describes the specific configuration items for the Virtual SIP Gateway Card in addition to the basic PBX configuration related to SIP trunk functionality. It also describes basic Network configuration to familiarize dealers with the network setup. It does not describe the purpose and use of all programming options on the Virtual SIP Gateway Card. For those details, see the KX-NS700/1000 Manuals for Virtual SIP CO Line Card available on the Panasonic Reseller website.

# **DSP card and Activation keys**

- ✓ The PBX must be equipped with a DSP card in order to provide communication between the TDM side of the PBX and the SIP trunks
- ✓ Activation keys for SIP-Trunks must be installed in the PBX to provide SIP-trunk functionality

To check the number of activation keys installed in the PBX and add new licenses, please refer to **Page 13** in this configuration guide.





# **Architecture Overview**



The above diagram illustrates simple VoIP networks connecting the NS700/1000 PBX. Charter Communications will provide its services over the Public Internet.

## Port Forwarding rules on the end router:

- Forward Port (UDP) **<SIP Client Port Number>** to the PBX IP address
- Forward Port Range (UDP) < Enter RTP Port Range > to the VOIP-DSP#1-1 IP address
- Forward Port Range (UDP) < Enter RTP Port Range > to the VOIP-DSP#1-2 IP address
- Forward Port Range (UDP) < Enter RTP Port Range > to the VOIP-DSP#2-1 IP address
- Forward Port Range (UDP) < Enter RTP Port Range> to the VOIP-DSP#2-2 IP address





# **Basic V-SIPGW16 Settings for Charter Communications SIP Trunks**

# **1.** Install the NS Unified Web Maintenance console on your PC

a. The maintenance console is available for certified dealers. Dealers can get the latest version of the UPCMC from <u>www.panasonicpartnerportal.com</u> (UPCMC version 5.10.1 or higher)

# 2. Connect to the PBX

a. Start the UPCMC







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b. Click Connect(O) and enter the IP Address to connect to your PBX for interactive configuration

# **KX-NS700**

### **KX-NS1000**

NS Unified Web Maintenance Console
Connect
Profile File(P)
Profile Name : default 🗸 🔳 📳
Connection Property
PBX Model : KX-NS1000 🗸
● IP Address : 192.168.0.101
Port :
O URL : http://
Connect(O) Cancel(C)

- c. Enter the username and password to log into the PBX
  - Default Username: INSTALLER
  - Default Password: 1234

Web Maintenance Console	
Username	
INSTALLER	
Password	
****	
Login	

d. Complete the Easy Setup Wizard configuration (if starting at factory default)



Setup

# 3. Configure the LAN Settings of the PBX

a. Click on Setup

Web Maintenance Console [Off-line]

b. Go to Network Service > 1.IP Address/Ports > Basic Settings tab

👸 Users	A IP Address/Ports	
PBX Configuration	Basic Settings Advanced Settings Reference	
VM Configuration	LAN Setting	~
Router Configuration	DHCP Port Number : 68	
Network Service	O Obtain an IP address automatically	
P 1.IP Address/Ports	Use the following IP address	
2.Server Feature	IP Address : 192.168.0.101	
3.Client Feature	MAC Address : 00:00:00:00:00:00	
- 4.0ther	Subnet Mask : 255.255.255.0	
	Default Gateway :	
	Local Domain :	
	DNS Setting	
	Port Number : 53	
	Obtain DNS server address automatically	
	Use the following DNS server address	
	Preferred DNS IP Address :	
	Alternative DNS IP Address :	
	DSP IP Settina	~
	OK	Cancel Apply
	DSP IP Setting	
	Obtain DSP IP address automatically	
	Use the following DSP IP address DSP Card #1 - 1	
	IP Address : 192.168.0.102	
	MAC Address : 00:00:00:00:00:00	
	DSP Card #1 - 2	
	IP Address : 192.168.0.103	
	MAC Address : 00:00:00:00:00:00	
	DSP Card #2 - 1	
	IP Address : 192.168.0.104	~
	ОК	Cancel Apply





c. Based on your Local LAN, assign static IP addresses to the PBX. The default gateway should be the end router's network IP address.

<provided by LAN administrator>

<provided by LAN administrator>

provided by LAN administrator>

<provided by LAN administrator>

- IP Address:
- Subnet Mask:
- Default Gateway:
- Preferred DNS IP Address:
- Alternative DNS IP Address: <provided by LAN administrator>
- DSP Card #1 1:
- DSP Card #1 2:
  - (NS1000 Only)
- DSP Card #2 1:
- DSP Card #2 2:
- d. Click Apply
- e. Click OK

# 4. Installing V-SIPGW16 cards

# **KX-NS1000**

a. Go to PBX Configuration > 1.Configuration > 1.Slot > Virtual Shelf > V-SIPGW16 tab

Users Users	∧ Slot
PBX Configuration	Select Shelf: Physical Virtual Legacy-GW1 Legacy-GW2
🗁 1.Configuration	Refresh Close Summary Activation Key IP Phone Registration
EE 1.Slot	
🐖 2.Portable Station	System Property Site Property UM Card Property UM Port Property
E 3.Option	V-SIPGW16 V-IPGW16 V-IPEXT32 V-SIPEXT32 V-IPC S4 V-UTEXT32
4.Clock Priority	
5.DSP Resources	Virtual 16-Channel VolP SIP Gateway Card
2.System	Iotal number of cards 0
3.Group	
4.Extension	
5.Optional Device	
6.Feature	
7.TRS	
8.ARS	
9.Private Network	
🗀 10.CO & Incoming Call	
11.Maintenance	
UM Configuration	
Router Configuration	
Ketwork Service	





b. Click the drop down menu and select the number of V-SIPGW16 Cards to add for your installation

Users	Slot	
PBX Configuration	Select Shelf : Physical Virtual Legacy-GW1 Legacy-GW2	
1.Configuration	Refresh Close Summary Activation Key IP Phone Registration	
EE 1.Slot	System Property Site Property UM Card Property UM Port Property	
A 2.Portable Station		
E 3.Option	V-SIPGW16 V-IPGW16 V-IPEXT32 V-SIPEXT32 V-IPC S4 V-UTEXT32	
4.Clock Priority		
5.DSP Resources	Virtual 16-Channel VoIP SIP Gateway Card	
2.System	Total number of cards 0	
3.Group	2	
4.Extension	3 4	
5.Optional Device		
6.Feature		
C 7.TRS		
8.ARS	10	
9.Private Network		
🗀 10.CO & Incoming Call		
11.Maintenance	15	
	16	

### **KX-NS700**

- a. Go to PBX Configuration > 1.Configuration > 1.Slot > Select the Virtual Shelf
- b. Drag and Drop V-SIPGW16 Cards to the virtual Trunk slots (1 4) as needed
- c. Click OK





Users	SIOT							
PBX Configuration	System Property	Activation Key IP	Phone Registration	VolP Property	UM Prop	erty		
1.Configuration	1			<u> </u>		17. 2		
I.Slot	Virtual 16-Cha	annel VolP SIP Gateway Card		Т	runk Slot Card		Extension Slot Card	
di 2.Portable Station					/-SIPGW16		V-IPEXT32	
3.Option		V-SIDGW16			/-IPGW16		V-SIPEXT32	
4.Clock Priority							V-UTEXT32	3
5.DSP Resources							V-IPCS4	
2.System	-							_
3.Group	Panas	ONIC KX-NS700					Virtu	Jal
4.Extension			_				• 11 66	
5.Optional Device	4		8		12			16
6.Feature								
7.TRS	3	Trunk	7 5	xtension	11	IP-CS	IP-CS	15
3.ARS			-			_		
9.Private Network	2		6		10			14
🗎 10.CO & Incoming Call			V-SIPGW16					
11.Maintenance	1				9			13
VM Configuration						_		
Ketwork Service								
	and the main			M			And a state of the	
	Virtu	al Slot						

# 5. Configuring the V-SIPGW16 Card

a. Move the mouse over the V-SIPGW16 Card and click OUS to take the card out of service

# b. Shelf Property settings:

Move the mouse over the V-SIPGW16 Card and choose Shelf Property

员 Users	^	Slot	
PBX Configuration		Select Shelf : Physical Virtual Legacy-GW1 Legacy-GW2	
😂 1.Configuration		Refresh Close Summary Activation Key IP Phone Registration	
1.Slot 2.Portable Station		System Property     Site Property     UM Card Property     UM Port Property	
E 3.Option		V-SIPGW16 V-IPGW16 V-IPEXT32 V-SIPEXT32 V-IPCS4 V-UTEXT32	
4.Clock Priority		Virtual 46 Channel VolD SID Cateway Card	
5.DSP Resources		Total memory of early Card	
2.System			_
3.Group			
4.Extension		1 Shelf Property V-SIDOVIE	
5.Optional Device		Card Property Oritage	
6.Feature		Port Property Annual	
C 7.TRS		Delete	
8.ARS			
9.Private Network			





<b>Users</b>	Shelf Property - Virtual SIP Gateway	
PBX Configuration	Main Timer	
😂 1.Configuration		
1.Slot	SIP Client Port Number : 35060	
2.Portable Station	NAT Traversal : Off	
3.Option	NAT - Voice (RTP) UDP Port No.	
a.Clock Priority		
5.DSP Resources	IIAI - keep Alive Packet Sending Ability	
2.System	NAT - Keep Alive Packet Type	
3.Group	NAT - Keep Alive Packet Sending Interval (s)	
4.Extension 5.Optional Davias	NAT - Fixed Global IP Address : 0.0.0.0	
6 Feature	STUN Ability	
7.TRS		
8.ARS	STUR Crent Port number : 33478	
9.Private Network	STUN External Address Detection Retry Counter	
🗀 10.CO & Incoming Call	STUN Resending Interval 500 ms	
11.Maintenance	SIP Called Party Number Check Ability : Disable(High->Low)	
VM Configuration	SIP Called Party Number Search Mode : Mode1	
Router Configuration	Symmetric Response Routing Ability	
Network Service	100rel Ability Enable(Passive)	
	Ringback Tone to Outside Caller	~
	OK Cancel Appl	У

c. Change the following parameters from their default value

#### Main Tab

- SIP Client Port Number: 5060

#### **Timer Tab**

- <leave at factory default setting>
- d. Click Apply and then OK to exit the Shelf Property settings screen

#### e. Card Property settings:

Move the mouse over the V-SIPGW16 card and choose Card Property





👌 Users	∧ Slot
PBX Configuration	Select Shelf: Physical Virtual Legacy-GW1 Legacy-GW2
1.Configuration	Refresh Close Summary Activation Key IP Phone Registration
EE 1.Slot	
2.Portable Station	System Property Site Property UM Card Property UM Port Property
3.Option	V-SIPGW16 V-IPEXT32 V-SIPEXT32 V-IPCS4 V-UTEXT32
🚳 4.Clock Priority	
5.DSP Resources	Virtual 16-Channel VolP SIP Gateway Card
2.System	Total number of cards 1
3.Group	
4.Extension	1 Shelf Property V-SIPGW16
5.Optional Device	Card Property Card Decision
6.Feature	Port Property
C 7.TRS	Delete Delete
8.ARS	

👌 Users	^	Card Property - Virtual SIP Gateway							
PBX Configuration		Site : 1	Shelf: Virtual		Slot: 1				
🗁 1.Configuration		Common Settings							
1.Slot 2.Portable Station		DNS SRV Record Resolve Abilit	у		Enable	V			
3.Option 4.Clock Priority							ОК	Cancel	Apply
5.DSP Resources									

- <leave at factory default setting>
- f. Click Apply and then OK to exit the Card Property settings screen

#### g. Port Property settings:

Move the mouse over the V-SIPGW16 card and choose Port Property



9.Private Network



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# h. Change the following parameters from their default value

PBX Configuration		Select	Provider	Add Pr	ovider	Trunk	Adaptor									
1.Configuration		«	Main Ac	count	Regis	ter N.	AT Option Ca	alling Party Calle	d Party	Voice/FAX RTP/R	ТСР	T.38	T.38 Option	DSP	»	
1.Slot		_			2			2 3	-							
2.Portable Station		No.	She	lf		Port	Connection	Connection Att	ribute	Trunk Property			hannel Attril	bute		Provid
3.Option			ALL	V			ALL	ALL	V	ALL	V	ALL		[		(20 CH
4.Clock Priority		1	Virtual	-	1	1	OUS	SIP Provider		Public		Not Used		L	-	
5.DSP Resources		2	Virtual		1	2		SIP Provider		Public		Not Used				
2.System		3	Virtual		1	3	005	SIP Provider		Public		Not Used				
3.Group		4	Virtual		1	4	005	SIP Provider		Public		Not Used			_	
4.Extension		5	Virtual		1	5	000	SIP Provider		Public		Not Used			-	
5.Optional Device		6	Virtual		1	6	003	SIP Provider		Public		Notlised			_	
6.Feature		7	Virtual		1	7	005	SIP Provider		Public		Notlised			_	
7.TRS		9	Virtual		1	2	005	SID Provider		Public		Notllead				
ARS		0	Virtual		4	0	ous	SIP Provider		Public		Netlland			_	
9.Private Network		10	Virtual		4	10	ous	SIP Provider		Public		Netlland			_	
0.CO & Incoming Call		10	Virtual		1	10		SIP Provider		Public		Not Used				
1.Maintenance		11	Virtual		1	11	OUS	SIP Provider		Public		Not Used				
UM Configuration		12	Virtual		1	12		SIP Provider		Public		Not Used			_	
om oornigeredon		13	Virtual		1	13	OUS	SIP Provider		Public		Not Used				
Router Configuration		14	Virtual		1	14	OUS	SIP Provider		Public		Not Used				
Network Service		15	Virtual		1	15	OUS	SIP Provider		Public		Not Used				`
		<u></u>						Dane 1	of 1	20 20					16	
		9.1	=					in the second second		20 🗸					viev	1 - 10 01
	~											-	NK I	Canaal		Apply

Connection Attribute:Provider Name: Charter

# **Basic Channel + Additional Channels**



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- SIP Server IP address: Provided IP address.

#### Account Tab

- User Name: Provided by Charter
- Authorization ID: Provided by Charter
- Authorization Password: Provided by Charter

### **Register Tab**

<leave at factory default setting>

### **NAT Tab**

<leave at factory default setting>

### **Option Tab**

<leave at factory default setting>

### **Calling Party Tab**

From Header – User Port: PBX-CLIP

### **Called Party Tab**

<leave at factory default setting>

### Voice/FAX Tab

<leave at factory default setting>

## **RTP/RTCP** Tab

<leave at factory default setting>

#### T.38 Tab

<leave at factory default setting>

#### **T.38 Option Tab**

<leave at factory default setting>

## DSP Tab

<leave at factory default setting>

#### **Supplementary Service Tab**

<leave at factory default setting>

#### Advanced

- <leave at factory default setting>
- i. Click Apply, then OK to exit the Port Property settings screen

## 4. Configuring Incoming DID Call Routing

a. Go to PBX Configuration > 10.CO & Incoming Call > 3.DDI/DID Table



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💧 Users	^	DDI /	DID Table											
PBX Configuration		Automat	tic Registration	Name Genera	ate Destination	Setting								
1.Configuration			DDI / DID I	Number	DDI / DID	Name	DDI / DID Dest	tination -	DDI / DID Dest	ination -	DDI / DID De	stination -	DDI / DID	Destinat
2.System		ID 🤤	(32 di	gits)	(20 char	acters)	Day		Luncl	n	Bre	ak	1	Night
🗎 3.Group														
4.Extension		1												~
5.Optional Device		2												
6.Feature		3												
C 7.TRS		4												
🗀 8.ARS		5												
9.Private Network		6												
🗁 10.CO & Incoming Call		7												
💐 1.CO Line Settings		8												
2.DIL Table & Port Settings		9												
3.DDI / DID Table		10												
5.Miscellaneous		11												
11.Maintenance		12												
VM Configuration		13												
		14												
Router Configuration		15												

- b. Enter the 10-digit DDI / DID Numbers
- c. Enter the Day/Lunch/Break/Night destination extension for each DDI / DID
- d. Click Apply and then OK to exit the DDI / DID Table settings screen

# 5. Backup and Reset

- a. Click on Maintenance > System Control > 4.System Reset
- b. Click Backup
- c. Click OK
- d. Click OK
- e. NS system will restart

# SIP Trunk Activation keys:

1. To obtain Activation Keys, you need to purchase the appropriate IP Trunk activation key models and access the Key Management System to register them to your PBX at



### http://tde.panacare.com.

-	KX-NSM102:	2-Channel IP Trunk Activation Key (2 IP Trunk)
	INV NONTO A	

- KX-NSM104: 4-Channel IP Trunk Activation Key (4 IP Trunk) 8-Channel IP Trunk Activation Key (8 IP Trunk)
- KX-NSM108:
- KX-NSM116:
- 16-Channel IP Trunk Activation Key (16 IP Trunk)
- 2. You will need the MPR ID from the PBX to register the Activation Key(s) on the Key Management System
- 3. To check the Number of Activation Keys Installed in your system and the MPR ID: PBX Configuration > 1.Configuration > 1.Slot > Activation Key

👌 Users	^	Activation Key Status					
PBX Configuration							
읃 1.Configuration		MPR-ID :		Number of activat	ed IP- :	/ 0	
1.Slot		Number of activated IP-	/0	Number of activat	ed :	/0	
🐖 2.Portable Station		Softphone		IPSec (VPN) for M	ultiSite		
3.Option		Activate Pre-installed Activation keys					
a.Clock Priority							
5.DSP Resources		Activated feature	Pre-installed	Activation key	Features in total	System total	
2.System		IP Phone Capacity (ch)					~
3.Group		IP Trunk (ch)					
4.Extension		IP Proprietary Telephone/IP Softphone (ch)					
5.Optional Device		IP Proprietary Telephone (ch)					
G.Feature		SIP Extension (ch)					
		IP-CS channel expansion (CS unit)					
~		One-look Network					

# **Minimum System Software** requirements:

**NS Unified Web Maintenance Console** 

v5.10.1





KX-NS1000	v4.10060
KX-NS700	v4.10064

### **Useful Hints:**

- 1. Update your system software once an update is available through the Dealer website to make use of added features and improved functionality
- 2. Update your UPCMC (Maintenance Tool) with the latest version available on the BTS website
- 3. Back up your PBX configuration file with the good known settings
- 4. Consult with your network administrator prior to installation to guarantee a smooth setup for your system over the existing network

### **Important Notes:**

1. Fax and Modem communication:

Fax or Modem communication may require additional POTS or PSTN lines to be connected to the Panasonic PBX in order to provide service reliability. Most of Charter Communications VOIP services are provided over Best Effort internet which can adversely affect Fax /Modem Transactions that are time sensitive and depend on accurate Tone detection for successful operation. Charter Communications cannot guarantee FAX service.

2. <u>E911:</u>

Please work closely with Charter Communications Provisioning team to ensure that E911 service is configured and tested properly.

