

KENWOOD

NEXEDGE 2nd Generation

Function Reference (FUNC)

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Last Updated:	November 30, 2017
Language:	English
Type:	K

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About this Manual

This manual describes the NEXEDGE 2nd Generation trunking system.

This document is created for the product having the following design specifications.

Item	Specifications	How to Verify
Market Code	K	Printed or labeled on the packaging and the model name plate on the repeater or subscriber unit.
Firmware Version of the System	1.70.00 or later	Can be viewed in the Firmware Update screen of System Configuration Utility (SCU).
Firmware Version of the NXR-700/ NXR-800/ NXR-900/ NXR-901 Repeater	6.70.00 or later (included in the system firmware)	Can be viewed in the Repeater Information dialog box of KPG-109D/ KPG-109DN.
Firmware Version of the NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 Repeater	6.40.00 or later (included in the system firmware)	Can be viewed in the Repeater Information dialog box of KPG-D2/ KPG-D2N.
Version of KPG-109D/ KPG-109DN	V 5.00 or later	Can be viewed in the About KPG-109D dialog box or About KPG-109DN dialog box of KPG-109D/ KPG-109DN.
Version of KPG-D2/ KPG-D2N	V 5.20 or later	Can be viewed in the About dialog box of KPG-D2/ KPG-D2N.

K: Designed for the North American markets.

Option Name	Version
Network Manager	Version 1.70
KPG-150AP	Version 2.00 or later
KPG-180AP	Version 2.30 or later
KTI-4	Version 3.14.00

Supporting Transceivers

The following transceivers support the NEXEDGE 2nd Generation trunking system:

Model Name	Version
NX-5x00 series	Firmware version 2.00 or later
NX-3xx0 series	Firmware version 1.00 or later
NX-200, NX-300, NX-210, NX-410, NX-220, NX-320, NX-420, NX-230, NX-330, NX-700, NX-800, NX-900, NX-720, NX-820, and NX-920 series	Firmware version 5.10 or later

How to Read the In-depth Manual

The In-depth Manual has the following sections.

NEXEDGE 2nd Generation Function Reference (FUNC) (this document)

Describes the NEXEDGE 2nd Generation system.

NX-3000 Series Function Reference (FUNC)

Describes the NXDN functions of an NX-3000 series subscriber unit.

NX-5000 Series NXDN Function Reference (NXDN FUNC)

Describes the NXDN functions of an NX-5000 series subscriber unit.

NEXEDGE 2nd Generation Basic Configuration

Describes software configurations to build the NEXEDGE 2nd Generation system.

About Notations

The following notations are used in this manual.

[]

The characters in [] indicate the name of the operating portion of each device and the key of the PC.

“ ” (**Double Quotation Mark**)

The characters in “ ” indicate the name of functions, buttons, and menus shown on the FPU.

Bold Letters

The characters in bold letters indicate the names of the FPU functions, panes, sections, dialog boxes, tabs, edit boxes, dropdown lists, and checkboxes.

[] + []

This notation is used for describing functions activated by pressing 2 keys on the PC keyboard at the same time. For example, the notation to enter a capitalized A on the PC is **[Shift]** + **[a]** for pressing the **[a]** key while pressing the **[Shift]** key.

PF (Programmable Function) Keys

This notation is used for describing some function assigned to each key of the transceiver. For example, **[A]** key is described as “**Reset** key” if the Reset function is assigned to **[A]** key.

About the Notation of the Supported Models

This manual describes the supported models according to the following rules:

Model Name	Notation	
NX-200	Portable	VHF
NX-200S		
NX-200G		
NX-200T		
NX-203		
NX-210		
NX-210G		
NX-220		
NX-3200		
NX-3220		
NX-5200		UHF
NX-300		
NX-300S		
NX-300G		
NX-300T		
NX-303		
NX-320		
NX-3300		
NX-3320		
NX-5300		
NX-410		800 MHz
NX-420		900 MHz
NX-411		700 MHz/ 800 MHz
NX-5400		

Model Name	Notation	
NX-700	Mobile	VHF
NX-700H		
NX-720HG		
NX-3720H		
NX-3720HG		
NX-5700		UHF
NX-800		
NX-800H		
NX-820HG		
NX-3820H		
NX-3820HG		
NX-5800		800 MHz
NX-900		
NX-920G		
NX-901		
NX-5900		700 MHz/ 800 MHz
NXR-700	Repeater	VHF
NXR-800		UHF
NXR-900		800 MHz
NXR-901		900 MHz
NXR-5700		VHF
NXR-5800		UHF
NXR-5900		800 MHz
NXR-5901		900 MHz

Notations for FPU names

KPG-109D and KPG-109DN are referred to collectively as “KPG-109D/ DN”, and KPG-D2 and KPG-D2N are referred to collectively as “KPG-D2/ D2N” in this document.

Abbreviations Used in this Document

The following abbreviations are used in this in-depth manual. Refer to the abbreviation table below.

Abbreviation	Full Spelling or Meaning
ACK	Acknowledgment
AUX	Auxiliary
CCH	Control Channel
CH	Channel
COS	Class of Service
CW	Continuous Wave

Abbreviation	Full Spelling or Meaning
DFA	Direct Frequency Assign
DQT	Digital Quiet Talk
Gen2	NEXEDGE 2nd Generation
GID	Group ID
OCXO	Oven-controlled Crystal Oscillator
PF	Programmable Function
QT	Quiet Talk
RX	Reception, Receiver
SCU	System Configuration Utility
SNMP	Simple Network Management Protocol
TCXO	Temperature-compensated Crystal Oscillator
TX	Transmission, Transmitter
UID	Unit ID
UTC	Universal Time Coordinated

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Furthermore, any reselling, assigning or transferring of the firmware is also strictly prohibited without embedding the firmware in KENWOOD product memories.

Firmware is equipped with the AMBE+2™ voice encoding technology under license from Digital Voice Systems.

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NXDN™ is a trademark of JVC KENWOOD Corporation and Icom Incorporated.

All other product names referenced herein are trademarks or registered trademarks of their respective manufacturers.

About NXDN

NXDN™ is a very narrowband protocol employing 6.25 kHz/ 12.5 kHz FDMA technology.

NXDN™ is the result of a joint technical alliance between Icom Incorporated and JVC KENWOOD Corporation.

About NEXEDGE

NEXEDGE is a generic term to describe the KENWOOD proprietary digital communications system which complies with NXDN common air interface specifications.

About the NEXEDGE 2nd Generation System

The NEXEDGE 2nd Generation system is the system to build a larger-scaled system than the NEXEDGE 1st Generation system by combining an NXR-700/ NXR-800/ NXR-900/ NXR-901/ NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 digital repeater with PC servers.

Devices Structuring the NEXEDGE 2nd Generation System

System controller



Figure 1 System Controller

A system controller is a device for managing information of a system consisting of a maximum of 48 sites. One system controller is required in each system.

A system controller functions after installed on a PC server. System Configuration Utility (SCU) functions on the system controller and manages the system.

In a Wide-Area System structure, one of the system controllers structuring the system is a Primary System Controller.

For configuring a NEXEDGE 2nd Generation system, access SCU by using the web browser of a PC. Installation of the software to a PC for configuration is not required. Refer to “[OPERATION OF SYSTEM CONFIGURATION UTILITY](#)” for the method of connecting to and operating SCU.

Site controller



Figure 2 Site Controller

A site controller is a device for managing channels that structure a site or communicating with a system controller. A site controller functions after installed on a PC server. In a site consisting of 9 channels or less, a repeater can also be used as a site controller.

Repeater



Figure 3 Repeater

An NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 repeater supporting a NEXEDGE 2nd Generation system can be used.

An NXR-700/ NXR-800/ NXR-900/ NXR-901 repeater used for a NEXEDGE 1st Generation system can also be used. For connecting to a NEXEDGE 2nd Generation system, the firmware needs to be overwritten with the NEXEDGE 2nd Generation system firmware. However, the repeater firmware of a NEXEDGE 1st Generation system and repeater firmware of a NEXEDGE 2nd Generation system cannot coexist.

IP Gateway



Figure 4 IP Gateway

IP Gateway is an application required for IP connection of KTI-4 and NXIP console, etc. An IP Gateway functions after installed on a PC server. A maximum of 10 IP Gateways can be connected to a single system controller. A maximum of 100 units of consoles can be added to a single IP Gateway, so that a maximum of 1,000 units of consoles can be added to a single system controller.

Roaming Gateway



Figure 5 Roaming Gateway

A Roaming Gateway is the device to connect a system controller in the own system to a system controller of another system code.

By using a Roaming Gateway, a subscriber unit can roam to the connected system controller in order to communicate.

Network Manager

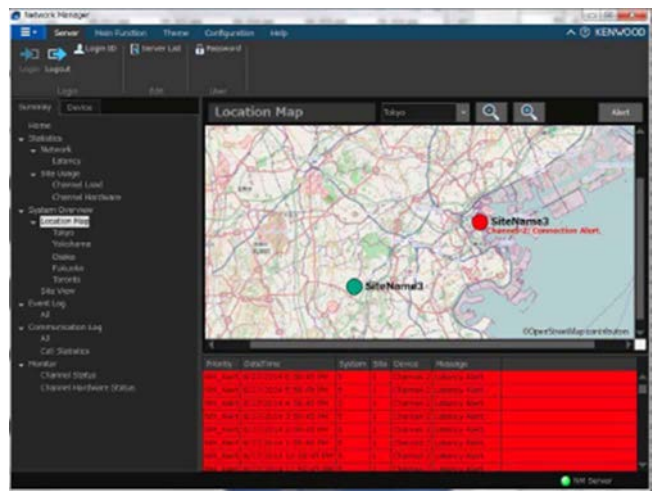


Figure 6 Network Manager

Network Manager is a monitoring application which monitors a NEXEDGE 2nd Generation system and notifies when a failure occurs.

Network Manager consists of the software that functions after installed on a PC server (Network Manager Server) and the software that functions on Windows (Network Manager Client). Devices such as repeaters, system controllers, and routers can be a monitored target.

Network Manager Server can share up to 100 monitored targets with a PC server on which a system controller is functioning. If the number of monitored targets exceeds 100, another PC server needs to be installed. If another PC server for Network Manager Server is installed, a maximum of 1000 monitored targets can be specified.

KPG-D2/ KPG-D2N/ KPG-109D/ KPG-109DN

In the NEXEDGE 2nd Generation system, all configurations can be configured on SCU. KPG-D2/ KPG-D2N/ KPG-109D/ KPG-109DN is required only for adjusting a repeater and confirming the MAC Address.

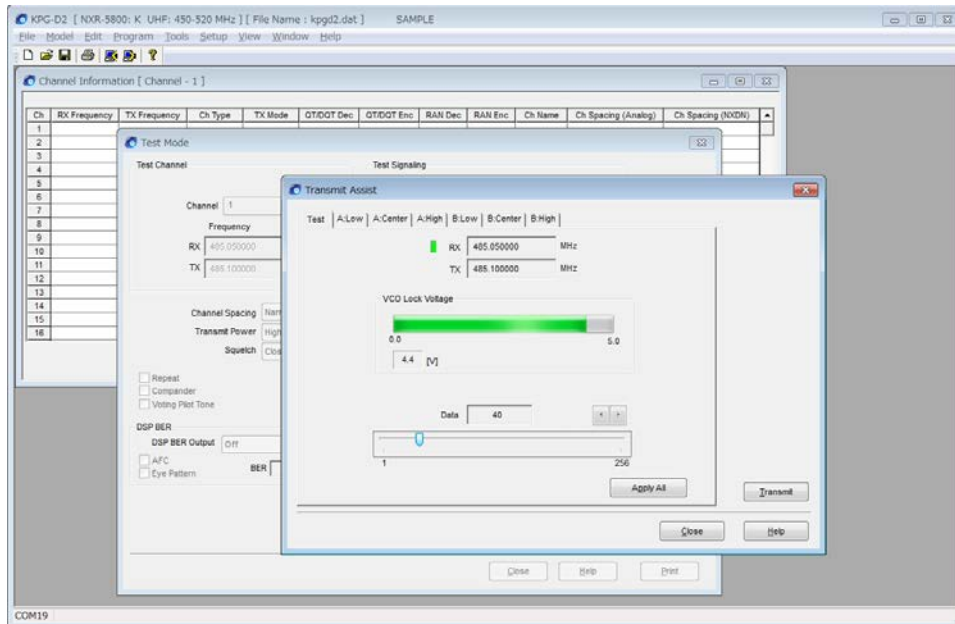


Figure 7 KPG-D2/ D2N

If the firmware of the NEXEDGE 2nd Generation system is written in the NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 repeater, version 5.20 or later of KPG-D2/ D2N is required.

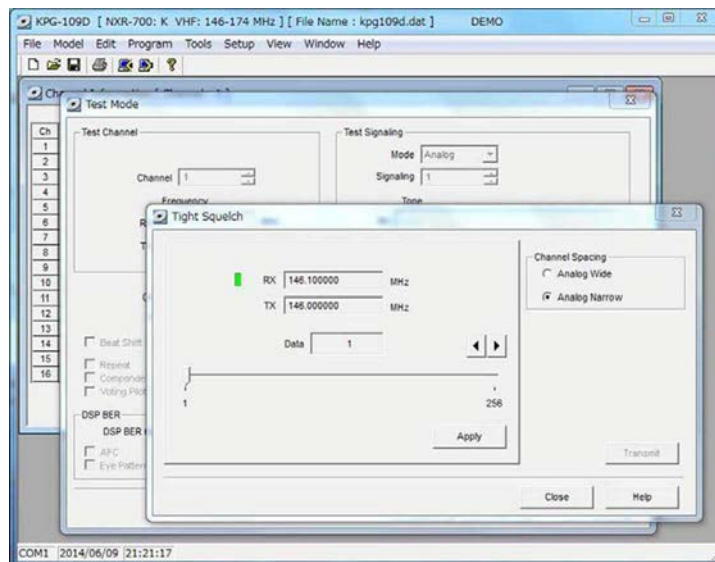


Figure 8 KPG-109D/ DN

If the firmware of the NEXEDGE 2nd Generation system is written in the NXR-700/ NXR-800/ NXR-900/ NXR-901 repeater, version 5.00 or later of KPG-109D/ DN is required.

About the Programming Software

KPG-109D/ DN or KPG-D2/ D2N is used when adjusting a repeater and when confirming the MAC Address of the repeater.

About KPG-109DN/ KPG-D2N

KPG-109DN/ KPG-D2N is the programming software to configure functions for the repeater to be used in the U.S.A. KPG-109DN/ KPG-D2N is compliant with the FCC Part 90 standard so that the specification does not allow configuring "Wide" (25 kHz) for Channel Spacing with a VHF or UHF repeater in the frequency band regulated by the FCC Part 90. Except for the function above, the specifications of KPG-109D and KPG-109DN, KPG-D2 and KPG-D2N are the same.

About System Configuration Utility (SCU)

Each function of a system can be configured by using System Configuration Utility (SCU). In this manual, a corresponding reference is written for the description of each function in the help texts of SCU, such as "Edit > System Configuration > General". View each reference of the help texts of SCU when actually configuring.

About the Web Browser

SCU can be accessed by using a web browser (Internet Explorer version 9 to 11 are supported) on a client PC.

About Options to Use the Functions Described in This Document

To use the functions described in this document, the following KENWOOD optional accessories need to be prepared on your own as necessary.

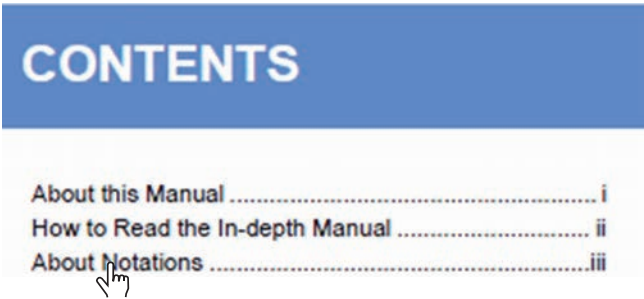
- KPG-109D/ DN
- KPG-D2/ D2N
- FPRO
- KFL
- Network Manager
- KPG-150AP
- KPG-180AP
- KTI-4

How to Search for Information

For your convenience of reading through this document using Adobe Acrobat or Adobe Reader, a link to a corresponding item is pasted in the Contents page, Index page, the lower part of each page and in the context. Clicking the portion where a link is pasted enables a jump to the corresponding page. Placing a pointer over the portion where a link is pasted changes the shape of the pointer to a hand (👉).

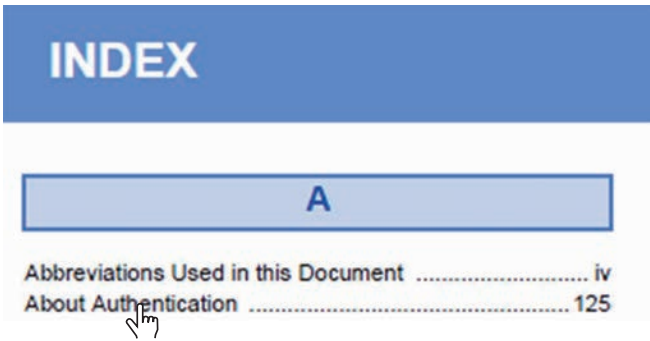
CONTENTS

Clicking a title in the Contents page allows a jump to the corresponding page.



INDEX

Clicking a function name, a title or a page number in the Index pages allows a jump to the corresponding page.



Blue Characters in the Main Text

Clicking a portion with blue characters in the main context allows a jump to the corresponding page.

1) DC power connector cable

The connector cable is for supplying power to KTI-5 by connecting to an external power supply unit.

2) Indicator (Status LED)

The status of KTI-5 is notified. (Refer to [Indicators](#).)



Blue Characters at the Bottom of Each Page

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Revision History

Date	Description
2015.10.30	1) Corrected each version information of “Supporting Transceivers”. 2) Deleted the footnote for the table of “About the Notation of the Supported Models”. 3) Added the description of Home System in “Table 2-7 Configuration of Telephone Line List”. 4) Added “2.17 Exporting and Importing GID/ UID Data”. 5) Added the description of Dynamic CCH in “3.1 Using a Control Channel as a Traffic Channel (Non-dedicated Control Channel)”. 6) Corrected the diagram of Figure 3-1. Added the description of Dynamic CCH. 7) Added “3.5 Controlling Transmission from a Subscriber Unit (Mobile Station Restriction Control)”. 8) Added the description of Unauthorized ESN Detection in “Removing Unregistered Subscriber Units (NXDN ESN Validation)”. 9) Added “Preventing the Subscriber Unit of an Unmatched ESN from Being Used (Unauthorized ESN Detection)” in “6.1 Managing a System by Using the ESN of a Subscriber Unit”. 10) Added “Import” and “Export” in “Access Permission (Maintenance)” of “Table 6-3 Configuration of the User Level”. 11) Changed the number of Call Restriction Tables that can be configured from “16” to “1,000” in “Restricting Telephone Numbers to Be Called (Call Restriction)”. 12) Changed the number of Speed Dial Tables that can be configured from “255” to “1,000” in “Configuring the Speed Dial (Speed Dial)”. 13) Added the following items in “Configuring Fleet Information”: Configuring Unauthorized ESN Detection (Fleet) Configuring whether to make a subscriber unit the target of the transmission control (Priority Mobile Station Class (Fleet)) 14) Added the following items in “Configuring UID Information”: Configuring Unauthorized ESN Detection (UID) Making the subscriber unit unavailable/ restoring the subscriber unit from being unavailable (Automatically ESN Stun/Revive) Configuring whether to make a subscriber unit the target of the transmission control (Priority Mobile Station Class (UID)) 15) Added the following items in “10.9 Making a Telephone Call”: Configuring a home system controller used for a telephone line (Home System) Restricting an outgoing call to a telephone line (Call Restriction Table Number (Device List)) 16) Changed the version number from 1.00 to 1.20.

Date	Description
2015.12.25	1) Added NXR-5700 and NXR-5800 as supported models. 2) Corrected each version information in "About this Manual". 3) Added the description about NXR-5700/ NXR-5800 to the following items: • Devices Structuring the NEXEDGE 2nd Generation System • Manually Updating the Firmware of a Repeater (Firmware Programming Mode) • Configuring the channel of the repeater controlling the site (Primary Channel Number) • Configuring the backup channel of the repeater controlling the site (Secondary Channel Number) • Configuring transmit and receive bandwidths (Channel Spacing) • OCXO LED 4) Added the description about KPG-D2/ KPG-D2N to the following items: • Devices Structuring the NEXEDGE 2nd Generation System • About the Programming Software • Testing the Transmit and Receive Capabilities of the Repeater (PC Test Mode) • Adjusting the Transmit and Receive Capabilities of the Repeater (PC Tuning Mode) 5) Changed "Confirming Free GID/ UID" to "Confirming Available GIDs/ UIDs" in "Contents by Purpose". 6) Deleted the description of the optional KAS-10. 7) Changed the number of communication logs that can be recorded from "4 million" to "72000" in "4.5 Acquiring Communication Records of a Subscriber Unit (Communication Log)". 8) Added the supplementary description about the Fleet configuration to the following items: • 2.7 Limiting the Occupation Time of a Traffic Channel (Occupation Timer) • 2.10 Holding a Traffic Channel for Always Calling Back (Hold Timer) 9) Changed "2.8 Forcibly Communicating from a Console Even When No Traffic Channel Is Available" to "2.8 Prioritizing a Call from a Console Even When No Traffic Channel Is Available". 10) Changed "2.15 Optimizing the Call Time" to "2.15 Optimizing the Usage Time of Traffic Channel Resources". 11) Changed "4.13 Acquiring Internal Information of a NEXEDGE System When a Failure Occurs (Diagnostic Data)" to "4.13 Acquiring Internal Information of a NEXEDGE System (Diagnostic Data)". 12) Corrected the diagram of Figure 7-7. 13) Corrected the diagram of Figure 7-11. 14) Added "Delaying the startup time of a repeater (Adjusted Boot Timing)" in "Configuring Site Information (Site Information)". 15) Added the following items in "Configuring the Channel Information (Channel Information)": • Configuring the model type of the repeater to be used (Model Type) • Terminating an external reference signal input terminal (50 Ohm Termination) • Configuring the oscillator of an external reference signal (External Reference) • Configuring the conditions for fan rotation (Fan Action) 16) Added "Configuring the timer information (Timers)" in "Configuring Fleet Information". 17) Corrected the information of "C. Error Messages of the Communication Log". 18) Changed the version number from 1.20 to 1.30.

Date	Description
2016.5.31	1)Corrected each version information in “About this Manual”. 2)Added “GPS Data Transmission Behavior and Configurations” in “Contents by Purpose”. 3) Added “Trap Destination IP Address 1 to Trap Destination IP Address 4” to “Table 2-1 Configuration of SNMP Interface”. 4)Added description for GPS Report Channel in “Allocating a Traffic Channel for a Specific Call (Channel Allocation)”. 5)Changed the reference of the supplementary described as follows: 2.7 Limiting the Occupation Time of a Traffic Channel (Occupation Timer) 2.9 Determining the System Behavior of When Starting or Ending a Voice Call (Trunking Type) 6)Corrected the supplementary of “Queue Level”. 7)Added “Connecting the path for providing external reference signals” in “Configuring the Channel Information (Channel Information)”. 8)Added supplementary to “Configuring Trunking Type”. 9) Added “Specifying a GPS format for sending using GPS Report Channel (GPS Report Format (Fleet))” and “Configuring the interval for sending GPS messages (GPS Report Interval (Fleet))” in “Configuring Fleet Information”. 10) Added “Specifying a GPS format for sending using GPS Report Channel (GPS Report Format (UID))” and “Configuring the interval for sending GPS messages (GPS Report Interval (UID))” in “Configuring UID Information”. 11)Added “11 About GPS”. 12)Changed the version number from 1.30 to 1.40.

Date	Description
2016.9.30	1) Corrected each version information in "About this Manual". 2) Added "Roaming Gateway". 3) Added "1.5 Changing the Color Tone of the SCU Screen (Theme)". 4) Added "2.2 About the Multi-System". 5) Added and corrected the description in "About Queue Behavior". 6) Added the note in "2.7 Holding a Specific Fleet Dedicated Channel (Channel Allocation)". 7) Changed "Queue Level" to "Queue". Added and corrected the description in "Queue". 8) Added the description of the "Browse" button in "About System Key File". 9) Added "Confirming the importing results beforehand" in "Importing GID/ UID Data". 10) Changed "4.2 Remotely Controlling a System Controller (Remote Control)" to "4.2 Remotely Controlling a Device (Remote Control)". 11) Added and corrected the description in "4.2 Remotely Controlling a Device (Remote Control)". Added "Pausing and Resuming a Behavior of a Site during an Emergency (Remote System Standby)". 12) Added "Remote Control" to Table 4-1. 13) Corrected the description in "4.5 Acquiring Communication Records of a Subscriber Unit (Communication Log)". Added "Selecting the System and User to Target for Acquiring a Communication Log". 14) Added and corrected the description in "Updating the Firmware of a NEXEDGE System (Firmware Update)". Added the following items: Configuring the sites targeted for the firmware update (Target Site) Confirming the progress status of the firmware update (Progress Status) 15) Added the following items to Table 6-4: Guest Class of Service Multi-System List Theme Roaming Gateway 16) Added the note in "Configuring the IP Network Information of a System Controller (IP Configuration)". 17) Added the following items in "Configuring System Information (System Information)": Configuring the IP address of a system controller (IP Address) Enabling or disabling the multi-system (Multi-System) 18) Added the note in "11.6 Configuring the Interval for Sending GPS Messages (GPS Report Interval)". 19) Added "12 COMMUNICATIONS USING MULTIPLE SYSTEMS (MULTI-SYSTEM ROAMING)". 20) Changed the following screens: Figure 2-16 Figure 2-18 Figure 4-1 Figure 4-8 Figure 4-13 Figure 4-19 Figure 7-23 21) Changed the version number from 1.40 to 1.50.

Date	Description
2017.6.12	1) Corrected each version information in "About this Manual". 2) Added description on redundancy configuration in "4.2 Remotely Controlling a Device (Remote Control)". 3) Added "Checking the System Controller Status and Switching the System Controller to Run (System Controller Redundancy Status)". 4) Added the descriptions of the progress status display and of the "Cancel" button to "4.5 Acquiring Communication Records of a Subscriber Unit (Communication Log)". 5) Changed the descriptions of the download of system logs to the procedure. Added the descriptions of the progress status display and of the "Cancel" button. 6) Added the download procedure of the diagnostic data. 7) Added "5.5 Configuring a Redundant System Controller (System Controller Redundancy)". 8) Added "Configuring the channel table number for each site (Channel Table Number)" to "7.4 Registering a Site". 9) Added the descriptions of Primary Channel Number and Secondary Channel Number to "Configuring the Channel to Transmit a Synchronization Signal (Sync)". 10) Added "Using a Commercial Oscillator for the External Reference Signal" to "Configuring the Channel Information (Channel Information)". 11) Added "7.6 Configuring the Channel Tables of Different Frequencies". 12) Added "Configuring the channel table number for each system (Channel Table Number)" to "7.8 Configuring a System (System List)". 13) Revised the description of "Configuring the IP address of a system controller" in "Configuring System Information (System Information)" (added separate descriptions for Main IP Address and Sub IP Address). 14) Added the information of Voice Logger to the description of "Maximum Number of Sessions" in Table 7-14. 15) Added "7.13 Configuring the Voice Logging Function". 16) Added "Codec conversion of the voice data" to "10.10 Making a Console Call". 17) Changed the following screens: Figure 7-8 Figure 7-34 18) Changed the version number from 1.50 to 1.60.
2017.11.30	1) Added NXR-5900 and NXR-5901 as supported models. 2) Corrected each version information in "About this Manual". 3) Added the note in "Delaying the startup time of a repeater (Adjusted Boot Timing)". 4) Added and corrected the description in "Configuring the oscillator of an external reference signal (Startup Delay)". 5) Added the note in "Connecting the path for providing external reference signals". 6) Added the note in "Using a Commercial Oscillator for the External Reference Signal". 7) Changed the version number from 1.60 to 1.70.

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System Configuration Tools

By using System Configuration Utility, a repeater and various controllers of the system can be configured on a web browser.

[OPERATION OF SYSTEM CONFIGURATION UTILITY](#)

Page 1

Using an Analog System, Such as MPT Trunking, and a Digital System at the Same Time

A traffic channel in a NEXEDGE system can be shared with analog mode.

[Using an Analog System and a Digital System at the Same Time](#)

Page 27

[Operating a system same as an MPT Trunking system](#)

Page 36

Operating a Trunking System by a Single Repeater

A single site can be built with a single repeater.

[Using a Control Channel as a Traffic Channel \(Non-dedicated Control Channel\)](#)

Page 48

Building a System with More than 48 Sites

By connecting multiple NEXEDGE systems, a system exceeding the limit of 48 sites in a multi-site system can be built.

[About Wide-Area System](#)

Page 12

Confirming Available GIDs/ UIDs

By using System Configuration Utility, the available range of UIDs or GIDs can be searched.

[Confirming Available GIDs/ UIDs \(Available ID Map\)](#)

Page 28

Allocating a Traffic Channel by Purpose

The number of traffic channels dedicated to various calls can be allocated for each site.

[Allocating a Traffic Channel for a Specific Call \(Channel Allocation\)](#)

Page 29

Allocating a Traffic Channel for a Specific Fleet

The traffic channel dedicated for use in a specific Fleet can be specified.

[Holding a Specific Fleet Dedicated Channel \(Channel Allocation\)](#)

Page 34

Prioritizing a Call from a Console

A channel can be allocated to an IP console in priority to the channel currently communicating.

[Prioritizing a Call from a Console Even When No Traffic Channel Is Available](#)

Page 35

Limiting the Occupation Time of a Traffic Channel The maximum length of time to maintain the call when the connection to a traffic channel is held by the Hold Timer can be configured. Limiting the Occupation Time of a Traffic Channel (Occupation Timer) Page 34	Using a Traffic Channel Even If All the Traffic Channels Are Being Used in a Site A control channel can be used as a traffic channel when all the traffic channels in a site are being used. Using a Control Channel as a Traffic Channel (Non-dedicated Control Channel) Page 48
Periodically Switching a Control Channel A control channel in a site can automatically be switched at specified intervals. Averaging the Operation Time of a Repeater By Periodically Switching a Control Channel (Automatic Rollover) Page 57	Remotely Controlling a System Controller A system controller can remotely be controlled. Remotely Controlling a Device (Remote Control) Page 59
Operating Without Overwriting the Configuration Data of a Subscriber Unit When Adding a Channel Even if a channel is added to a NEXEDGE system, the new channel can be used without overwriting the configuration data of a subscriber unit. Using a Subscriber Unit without Changing Configurations Even If a Frequency Is Added (Direct Frequency Assignment) Page 73	System Down Time The approximate time required for restarting a repeater is described as reference information. About the Downtime of a NEXEDGE System Page 78
Updating the Firmware of a System or Repeater By using System Configuration Utility, FPRO, or FPU, the firmware of each device making up a NEXEDGE system can be updated. Updating Various Firmware Page 81	Removing Access By Unauthorized Subscriber Units By using the ESN of a subscriber unit, access by unauthorized subscriber units can be prevented. Managing a System by Using the ESN of a Subscriber Unit Page 98

Managing a System by Multiple Administrators A NEXEDGE system can be configured or operated by multiple administrative users by registering them to System Configuration Utility. Managing a System with Multiple Administrators (System Administrators) Page 103	Preventing the Duplication of a Subscriber Unit That Can Access a System By delivering a System Key File to FPU users after creating the file by using System Configuration Utility, creating a subscriber unit that gains unauthorized access can be prevented. Preventing the Duplication of a Subscriber Unit That Can Access the System (System Key File) Page 110
Confirming License Information of a System By reading license information of a NEXEDGE system to System Configuration Utility, the information can be confirmed. Reading the License Information of a System Page 113	Registration Behavior Registration is the function to register the location in a NEXEDGE system when a subscriber unit uses the NEXEDGE system. Registering a Subscriber Unit in a System (Registration) Page 115
Channel Hunt Behavior The control channel hunt is the function to automatically search for and acquire an available control channel in a NEXEDGE system such as when the subscriber unit is turned on. About Control Channel Hunt Page 234	Confirming the Operational Status of a System By using a Network Manager system, a NEXEDGE system can be monitored to check if any problems may occur. Remotely Checking the Status of a Repeater Page 70 Configuring Network Manager Page 176
LED Display of a Repeater Various LEDs are equipped on a repeater to notify the repeater status. LED Page 300 17-segment LED Page 304	GPS Data Transmission Behavior and Configurations The NEXEDGE 2nd Generation system allows the sending of GPS data received from a subscriber unit to the corresponding IP console by using a dedicated channel for transmitting GPS data. ABOUT GPS Page 251

This chapter introduces the basic operations of System Configuration Utility (hereinafter referred to as “SCU”) for configuring a repeater and various controllers of the system.

Refer to the help text attached to the SCU for details of the configuration method. Also, refer to “NEXEDGE 2nd Generation Basic Configuration” for the basic configuration with the SCU of the system.

1.1 SCU

SCU is a web tool for configuring a repeater and various controllers of the system. SCU can be accessed by opening a web browser (Internet Explorer version 9 to 11 are supported) on a client PC and entering the IP address of a system controller in the URL. Using SCU, a repeater and various controllers of the system can be configured via an IP network.



Figure 1-1 Connecting to SCU

Note

- To access SCU, the initial configuration of the PC server to be used as a system controller needs to be configured beforehand. Also, to configure various configurations by using SCU, the license information of the Activation File needs to be read into the SCU. (Refer to [Authenticating a System Controller](#).)

Login/Logout

Accessing SCU displays the login screen.

Clicking the “Login” button after entering the user name and password of an Administrator allows you to login.

The default configuration of the user name and password of an Administrator is as follows. Because the password is not configured under the default configuration, change the password after login as required. (Refer to [Changing the Password of the User \(System User Password\)](#).)

User Name: admin

Password: (blank)

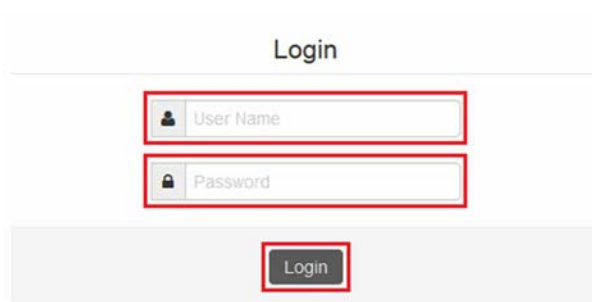
The image shows a web-based login interface. At the top, the word "Login" is centered. Below it, there are two input fields: "User Name" with a person icon and "Password" with a lock icon. Both fields are outlined with a red border. Below these fields is a "Login" button, also outlined with a red border. The entire form is set against a light gray background.

Figure 1-2 Login

After logging in to SCU, clicking the logout icon () displayed at the top-right of each screen allows you to log out.

1.2 Basic Screen Layout

Logging in displays the home screen of SCU.

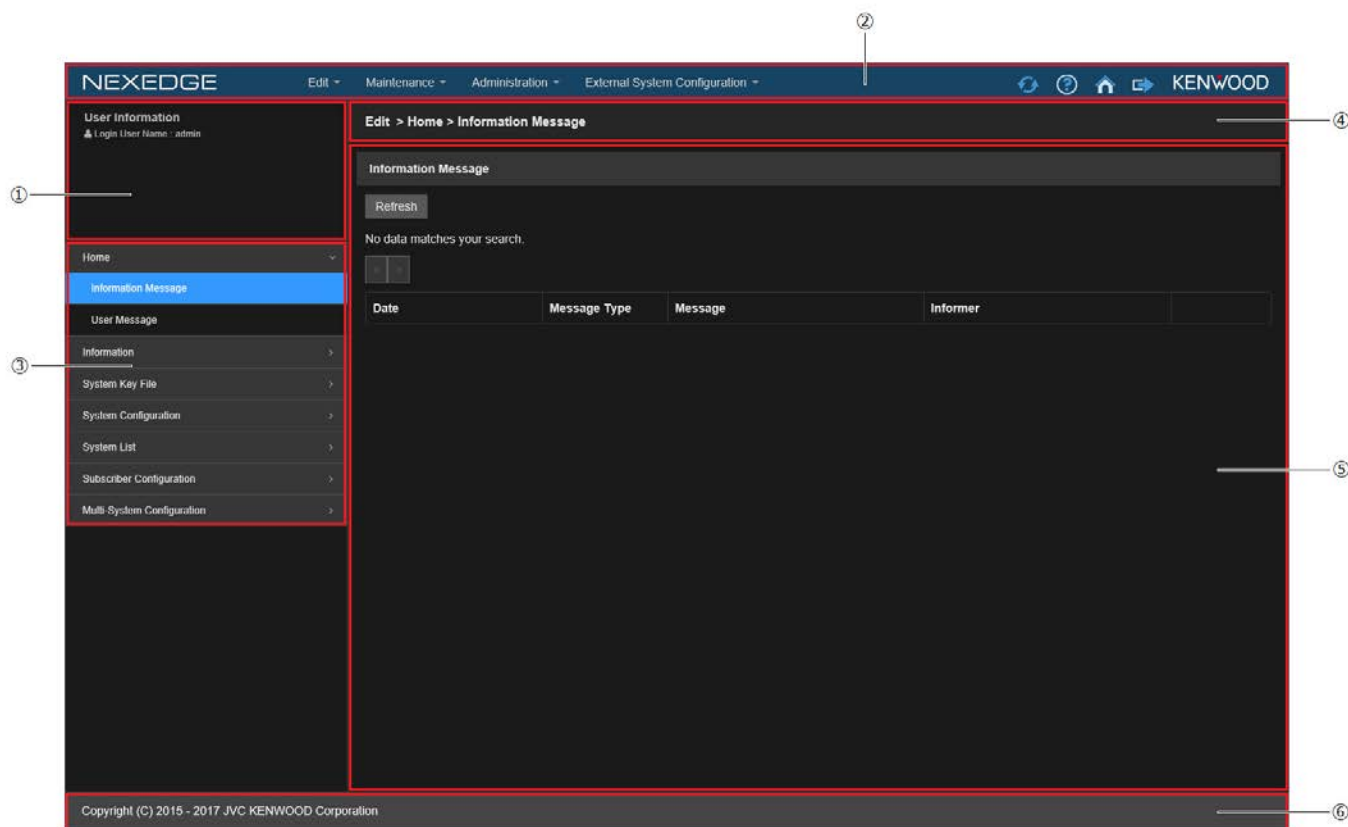


Figure 1-3 Basic Screen Layout of SCU

Table 1-1 Basic Screen Layout of SCU

No.	Name	Description
①	User Information Pane	The login information and the update information of each configuration screen are displayed.
②	Header	This field is displayed in common on every screen. Links to the main configuration screens, etc. are displayed.
③	Navigation Pane	Links to detailed configuration screens related to the displayed screen are displayed.
④	Screen Hierarchy Pane	The hierarchy is displayed sequentially from the top screen to the currently displayed screen.
⑤	Configuration Pane	This field displays the configuration items of each screen.
⑥	Footer	This field is displayed in common on every screen. The copyrights appear.

Basic Operation Keys

The “Save” button for saving configuration data, the “Cancel” button for canceling configuration data changes, and the “Back” button for returning to the previous screen are located on each configuration screen of SCU. Also, depending on the configuration item, the Page Access Bar is displayed.

Save

Clicking the “Save” button on the configuration screen of the **Maintenance** menu writes the configuration data to the system controller.

Click the “Save” button on the configuration screen of the menu other than the **Maintenance** menu saves the changes added to the displayed screen. If writing the configuration data to the system controller, click the “Update” button.

Note

- Clicking the “Save” button without entering the required entry items causes an entry error and the configuration data is not saved.
- If a user changes the configuration and saves the configuration data when multiple users are logged in to SCU and accessing the same configuration screen, the other users cannot save changes until the other users update the screen. Clicking the “Save” button without updating displays the error message.

Cancel

Clicking the “Cancel” button discards a change added to the displayed screen, and restores the previous saved state.

Depending on the configuration item, a warning message appears to confirm the discarding of a change.

Back

Clicking the “Back” button discards a change added to the displayed screen, and returns to the previous page.

Page Access Bar

Page Access Bar is a key for easily moving to another page of a configuration list spanning multiple pages.

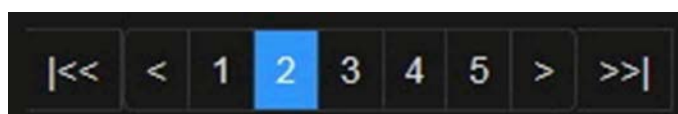


Figure 1-4 Page Access Bar

- Clicking the “|<<” button moves to the first page amongst the pages of the displayed configuration list.
- Clicking the “<” button moves to the previous page amongst the pages of the displayed configuration list.
- Clicking the “>” button moves to the next page amongst the pages of the displayed configuration list.
- Clicking the “>>|” button moves to the last page amongst the pages of the displayed configuration list.

User Information Pane

The login information and the updated information of each configuration screen appear on the **User Information** pane.

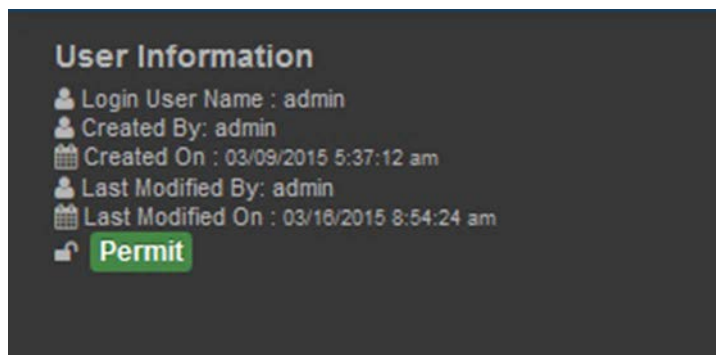


Figure 1-5 User Information Pane

Login User Name

Displays the name of the logged in user.

A SCU can be logged in with one user name. If logging in with the same user name is attempted from another browser or PC while logged in, a message box warning that the user name is already logged in appears and logging in with the user name is unavailable.

Created By

Displays the name of the user first creating the configuration data of the current screen.

Created On

Displays the date and time of first creating the configuration data of the current screen.

Last Modified By

Displays the name of the last user to edit the configuration data of the current screen.

Last Modified On

Displays the date and time when the configuration data of the current screen was last edited.

Record Status

Displays the update status of the current screen as follows:

 (permit):

Indicates no user has edited and saved data on the current screen. All users can edit data on the screen displaying this icon.

 (permit):

Indicates the user has edited and saved data on the current screen. Only the user can edit data on the screen displaying this icon.

 (forbid):

Indicates another user has edited and saved data on the current screen. Data cannot be edited on the screen displaying this icon.

Note

- As for the configuration items in the **Edit** and **External System Configuration** menus, a series of editing must be collectively reflected in system behavior, so that reflecting in the system behavior is suspended until the “Update” button displayed in the header area is clicked. Other users cannot edit the same item until the reflection in the system behavior is executed after saving the edited data. As for the configuration items in the **Maintenance** and **Administration** menus, operation is determined at the time of clicking the “Save” button, etc. and the “Update” button is not used.

Header

The header is displayed in common on all screens. On the header, the links to main configuration screens and the various operational buttons are displayed.



Figure 1-6 Header

- ① Menu
- ② Update
- ③ Help
- ④ Home
- ⑤ Logout

Menu

Links to the following configuration screens are displayed. By clicking each menu, the user can migrate to the corresponding screen.

Edit:

The menu to view and edit each of the following functions:

- Home
- Information
- System Key File
- System Configuration
- System List
- Subscriber Configuration
- Multi-System Configuration

Maintenance:

The menu to view and edit each of the following functions:

- Log
- System
- Setting

Administration:

The menu to view and edit each of the following functions:

- System Administrators
- User Levels

External System Configuration:

The menu to view and edit the following function:

- Roaming Gateway
- Network Manager

Update

Clicking this button writes the data saved on a configuration screen other than the **Maintenance** menu to the system controller.

Help

Clicking this button displays the Help about the function of the displayed screen in a separate window. A table of contents appears on the Help screen to the left, the user migrates to the Help screen of a content by selecting the content.

Home

Clicking this button migrates to the home screen.

Logout

Clicking this button logs out of SCU.

Navigation Pane

Links to detailed configuration screens related to the displayed screen are displayed on the **Navigation** pane.

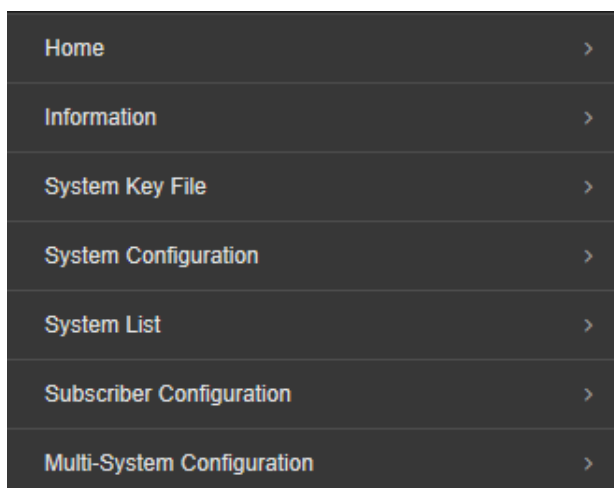


Figure 1-7 Navigation Pane

Clicking the menu displayed on the **Navigation** pane of each screen migrates to the selected screen.

Screen Hierarchy Pane

The hierarchy is displayed sequentially from the top screen to the currently displayed screen on the **Screen Hierarchy** pane.

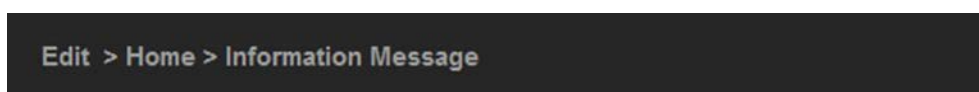


Figure 1-8 Screen Hierarchy Pane

Configuration Pane

The configuration items of each screen are displayed on the **Configuration** pane. Clicking the menu displayed on the header and navigation pane migrates to the selected screen.

The image shows a 'Network Setting' configuration pane with the following fields:

- MAC Address: 00:0D:4F:00:00:00
- Setting Mode: Auto (dropdown menu)
- IP Address: 172.16.0.65
- Subnet Mask: 255.255.255.192
- Default Gateway: 172.16.0.126

Figure 1-9 Configuration Pane (Example)

1.3 Saving Configuration Data as a File (Backup)

All data configured by SCU can be read from the system controller and saved as a file. By saving configuration data as a file, the configuration data can be restored when unforeseen circumstances occur, such as a breakdown of the system controller or the incorrect editing of the configuration data.

The image shows the 'Backup' screen in the NEXEDGE interface. The breadcrumb navigation is 'Maintenance > System > Backup & Restore'. The left sidebar shows the 'Backup & Restore' menu item highlighted. The main content area has two sections: 'Backup' and 'Restore'. The 'Backup' section has a 'Backup' button (highlighted with a red box) and a 'Comment' text field. The 'Restore' section has a 'File Name' text field with a 'Browse...' button, a 'Comment' text field, and a 'Restore' button.

Figure 1-10 Backup

In **Backup** of **Maintenance > System > Backup & Restore**, configuration data can be saved specifying the save location by clicking the "Backup" button. In **Comment**, a comment for the configuration data to be saved can be entered.

1.4 Writing the Saved Configuration Data in the System Controller (Restore)

The configuration data saved by the **Backup** function can be written in the system controller by using the **Restore** function.

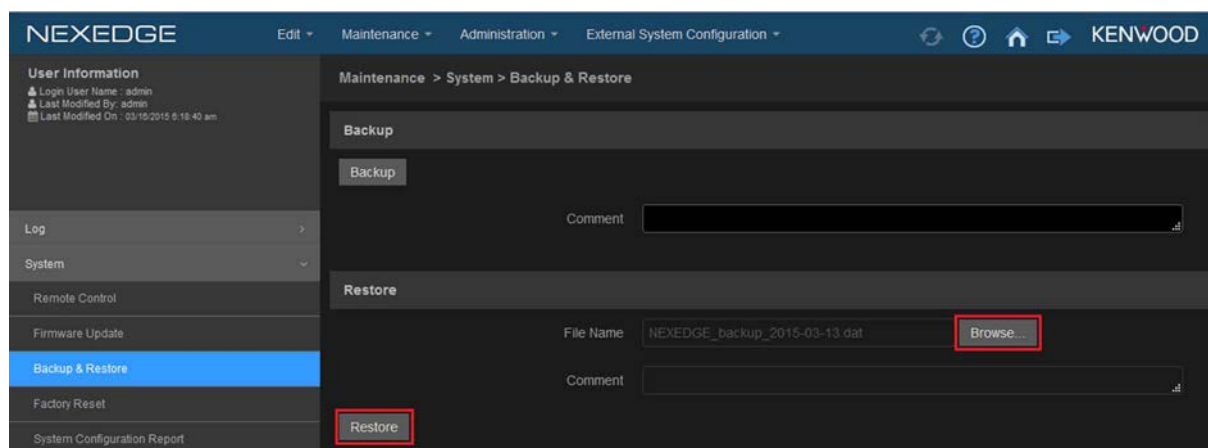


Figure 1-11 Restore

In **Restore** of **Maintenance > System > Backup & Restore**, the writing of configuration data starts by clicking the "Browse" button and selecting the configuration data file to be written, and then clicking the "Restore" button. Selecting the configuration data file to be written displays the file name of the configuration data file in **File Name**. Comments provided by the selected configuration data file appear in **Comment**.

1.5

Changing the Color Tone of the SCU Screen (Theme)

The color tone of the screen used by SCU can be changed in **Maintenance > Setting > Theme** of SCU.

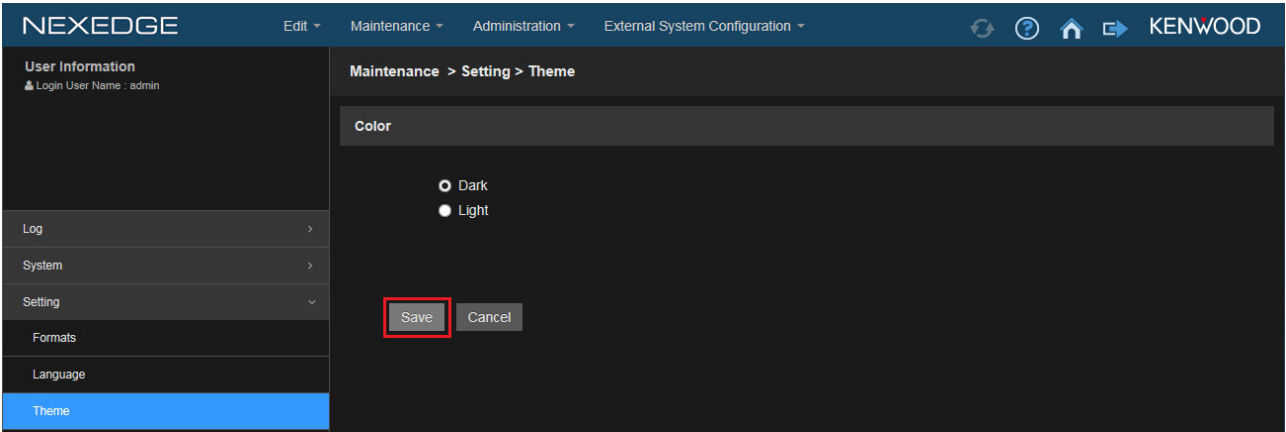


Figure 1-12 Theme

Table 1-2 Theme

Item	Description
Dark	Makes the color tone of the screen used by SCU dark.
Light	Makes the color tone of the screen used by SCU light.

After configuration, click the “Save” button to save.

This chapter explains the function configurations and operation framework required to be considered for structuring a NEXEDGE 2nd Generation system.

2.1 About Wide-Area System

Wide-Area System is a system structured by connecting multiple single site or multi-site systems that have same system code.

More than 48 systems can be built by connecting multiple systems that have the same system code in the structure. A maximum of 1,000 sites can be built.

One of the system controllers in each system structuring the Wide-Area System is a Primary System Controller. SCU is operated by a Primary System Controller, and other Secondary System Controllers are operated by sharing the data of the Primary System Controller.

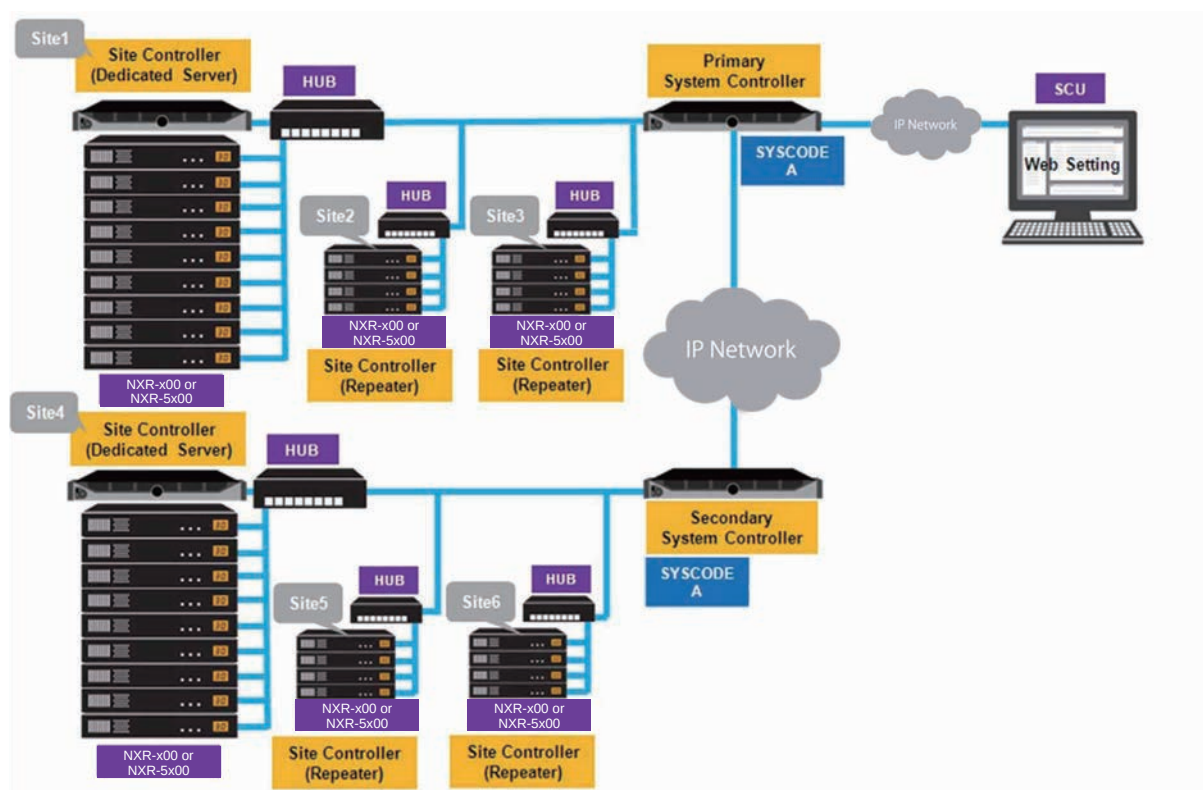


Figure 2-1 Wide-Area System

By clicking the “Add” button in **Edit > System List** of SCU, a system can be added and a Wide-Area System can be built. (Refer to [Configuring a System \(System List\)](#).)

A Multi-System is the system structured by connecting multiple systems of different system codes. By installing a single roaming gateway in each system, a subscriber unit in the system roams into the other system and can communicate with devices, such as subscriber units, IP console devices, and telephones, of the same system code.

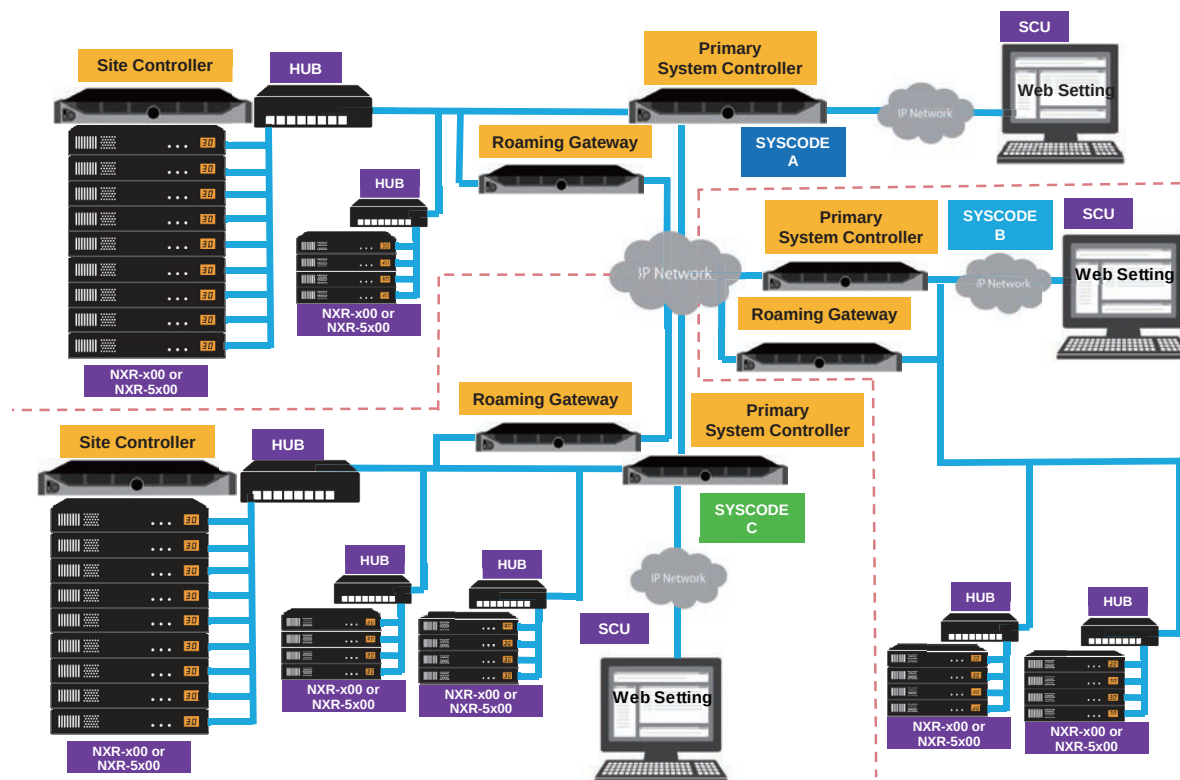


Figure 2-2 Multi-System

To structure a Multi-System, a Roaming System needs to be configured for each system by using SCU. (Refer to [12 COMMUNICATIONS USING MULTIPLE SYSTEMS \(MULTI-SYSTEM ROAMING\)](#).)

- Wide-Area Systems are also included in systems that structure a Multi-System.

2.3 Connection to External Devices

A system can be operated by connecting an IP Gateway device or SNMP device such as an IP console or telephone, or an NTP server in a NEXEDGE system.

About SNMP Interface

SNMP Interface is the function to monitor a NEXEDGE system by using SNMP (Simple Network Management Protocol). By connecting a device that supports SNMP to a NEXEDGE system, the operational status of the NEXEDGE system can be checked.

SNMP is a protocol to monitor and control network devices on an IP network.

SNMP Interface can be configured in **Edit > System List > Network** of SCU.

The screenshot displays the NEXEDGE SCU web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar lists various system configuration options, with 'Network' highlighted. The main panel shows the 'Edit > System List > System Number1:Network' configuration page. It includes sections for 'Jitter Buffer' (Maximum Jitter Buffer Size [ms] set to 400, Minimum Jitter Buffer Size [ms] set to 80), 'Unicast/Multicast Group Call' (Unicast/Multicast Group Call set to Unicast, Maximum Number of Group Calls set to Unlimited, Mask Multicast IP Address set to 255.255.255.0, Start Multicast IP Address set to 239.192.1.1, End Multicast IP Address set to 239.192.1.255), and the 'SNMP Interface' section. The 'SNMP Interface' section features a toggle switch labeled 'SNMP Interface' which is currently 'ON', a 'Community Name' field containing 'Nexedge', and four 'Trap Destination IP Address' fields. At the bottom of the page, there are 'Save', 'Cancel', and 'Back' buttons.

Figure 2-3 SNMP Interface

Table 2-1 Configuration of SNMP Interface

Item	Description
SNMP Interface	SNMP Interface allows a system administrator to configure whether a NEXEDGE system responds to a request from a device that supports SNMP and notifies of status changes. If “ON” is configured, a NEXEDGE system responds to a request from a device that supports SNMP.
Community Name	Community Name allows a system administrator to configure the Community Name for SNMP. If the Community Name matches, a NEXEDGE system responds according to the request from a device that supports SNMP.
Trap Destination IP Address 1 to Trap Destination IP Address 4	Trap Destination IP Address 1 to Trap Destination IP Address 4 allows a system administrator to configure up to 4 IP addresses for an SNMP trap destination.

Click the “Save” button to save after configuration. And then, click the “Update” button to reflect the configuration in a system controller.

Adjusting the current time of a system automatically

The time can be adjusted in a NEXEDGE system automatically by specifying a connectable NTP Server.

Configuring the NTP server

The NTP server can be configured in **Maintenance > System > Time Settings > General** of SCU.

If automatically matching the time by synchronizing with the NTP server, “ON” is configured in **Synchronize NTP Server**.

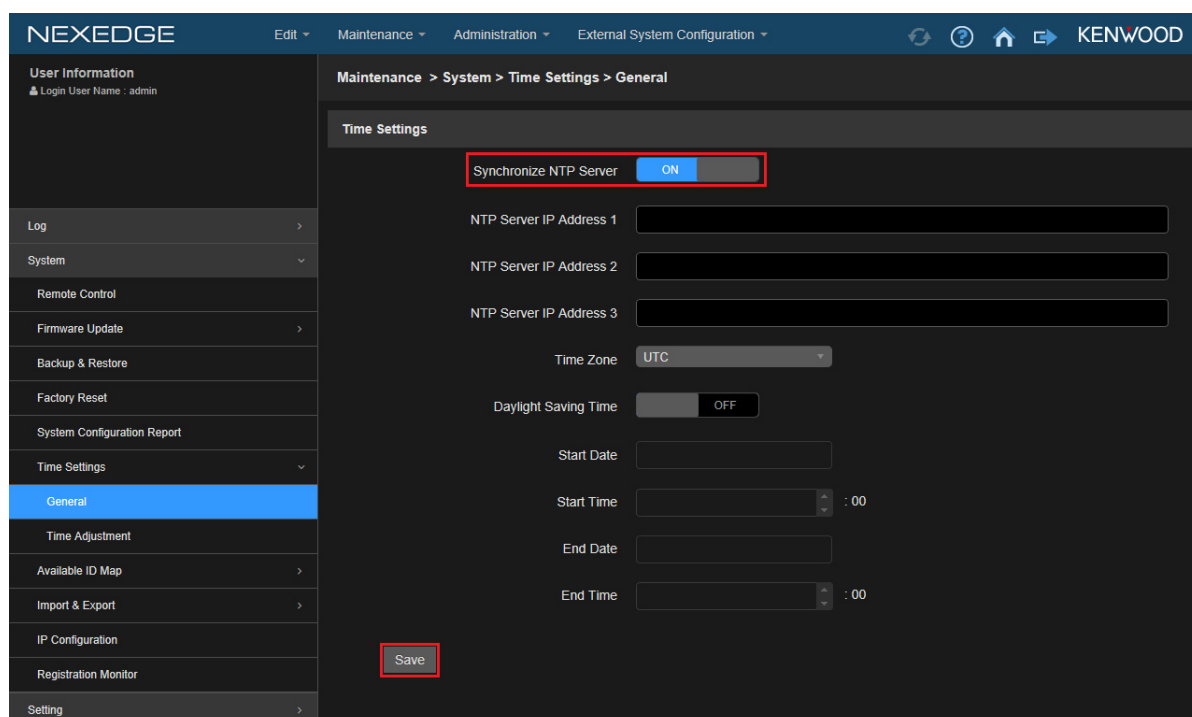


Figure 2-4 Time Settings

Table 2-2 Time Settings

Item	Description
Synchronize NTP Server	Synchronize NTP Server allows a system administrator to configure whether Synchronize NTP Server is used. If “ON” is configured, an NTP server can be used.
NTP Server IP Address 1 to NTP Server IP Address 3	NTP Server IP Address allows a system administrator to configure the IP address of an NTP server. A maximum of 3 NTP servers can be specified.
Time Zone	Time Zone allows a system administrator to configure the time difference with UTC.
Daylight Saving Time	Daylight Saving Time allows a system administrator to configure whether summer time (daylight saving time) is used. If “ON” is configured, Daylight Saving Time can be used.
Start Date/ Start Time	Start Date/ Start Time allows a system administrator to configure the date and time to start Daylight Saving Time.
End Date/ End Time	End Date/ End Time allows a system administrator to configure the date and time to end Daylight Saving Time.

Click the “Save” button to save after configuration.

Starting synchronization with an NTP server

By clicking the “Synchronize” button in **Maintenance > System > Time Settings > Time Adjustment** of SCU, the time is acquired from the specified NTP server and the time of the entire system is automatically updated.

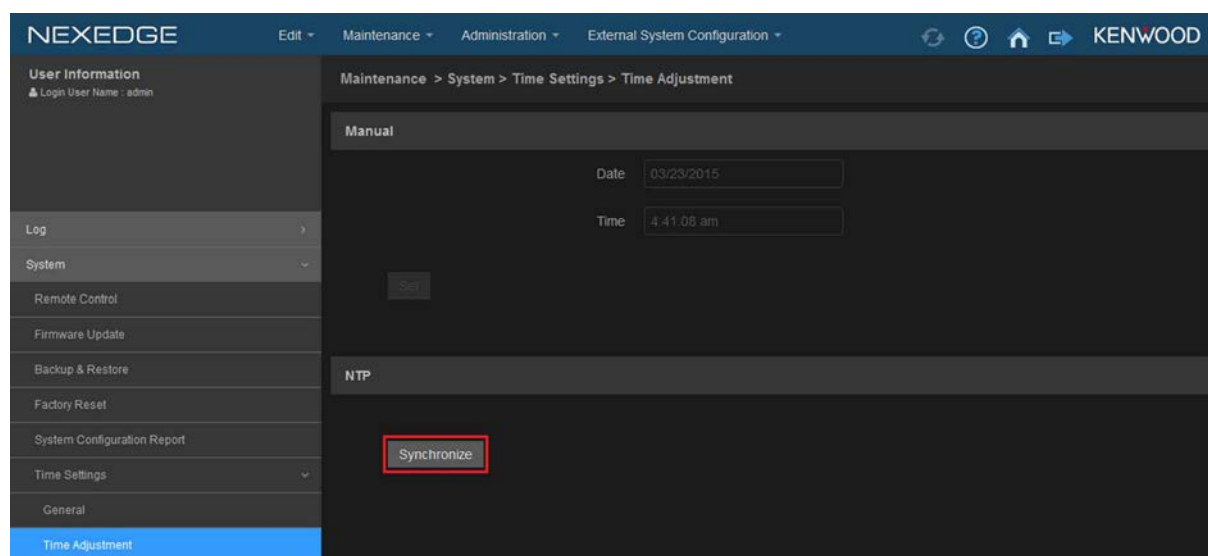


Figure 2-5 Time Adjustment

Note

- In **Maintenance > System > Time Settings > Time Adjustment > Manual**, the time can be manually configured by entering the date and time.

Connecting an IP Gateway server

IP Gateway is an application required for IP connection of KTI-4 and NXIP console, etc. A maximum of 10 IP Gateways can be connected to a single system controller. A maximum of 100 units of consoles can be added to a single IP Gateway, so that a maximum of 1,000 units of consoles can be added to a single system controller. The configuration for connecting the NEXEDGE system to the IP Gateway server can be configured by using SCU.

Note

- Refer to “NEXEDGE 2nd Generation Basic Configuration” for the detailed configuration procedure.

Adding an IP Gateway server to the system controller

By clicking the “Add” button in **Edit > System List > IP Gateway List** of SCU, a new IP Gateway server can be created.

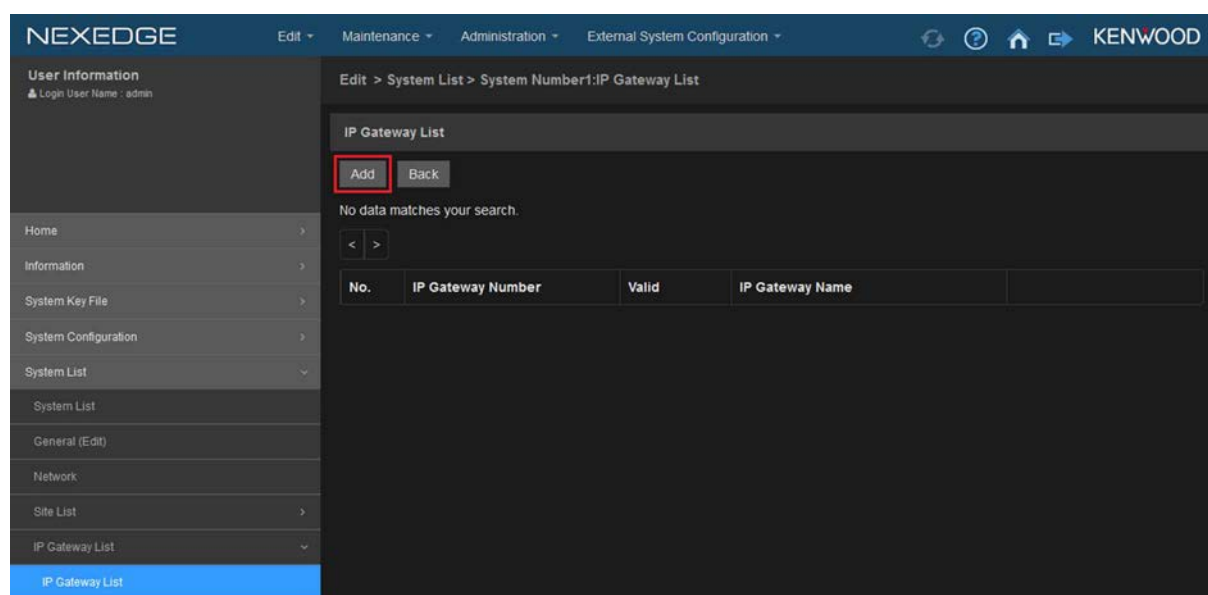


Figure 2-6 IP Gateway List

Detailed configuration of an IP Gateway server

When creating a new IP Gateway server, the details of the IP Gateway are configured in **Edit > System List > IP Gateway List > General (Add)**.

The screenshot shows the NEXEDGE web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar shows a menu with 'System List' expanded, and 'General (Add)' selected. The main content area is titled 'Edit > System List > System Number1:IP Gateway List > General (Add)'. It contains a 'General' section with the following fields: 'IP Gateway Number' (1), 'Valid' (ON), 'IP Gateway Name' (IP Gateway-1), and 'IP Address' (172.16.0.65). At the bottom, there are 'Save' and 'Back' buttons, with the 'Save' button highlighted by a red rectangle.

Figure 2-7 General (Add)

Table 2-3 Configuration of an IP Gateway Server

Item	Description
Valid	Valid allows a system administrator to configure whether an IP Gateway server is enabled. If “ON” is configured, the IP Gateway server is enabled.
IP Address	IP Address allows a system administrator to configure the IP address of an IP Gateway server.
IP Gateway Number	IP Gateway Number allows a system administrator to configure the number of an IP Gateway server. Although a number from 1 to 240 can be configured when creating a new IP Gateway in IP Gateway Number , configure an IP Gateway Number from 1 to 48 if continuing to use a device developed until now in a NEXEDGE 1st Generation system (such as KPG-150AP/ KTI-4).
IP Gateway Name	IP Gateway Name allows a system administrator to configure the name of an IP Gateway server.

Click the “Save” button to save after configuration.

Note

- A list of the registered IP Gateway servers appears in **Gateway List**.
- By clicking the “Details” button in **Gateway List**, the configuration contents of the corresponding IP Gateway server can be viewed.
- By clicking the “Edit” button in **Gateway List**, the configuration of the corresponding IP Gateway server can be changed.
- By clicking the “Delete” button in **Gateway List**, the corresponding IP Gateway server can be deleted.

Connecting to an IP console device

An IP console can be connected to a NEXEDGE system via an IP Gateway server.

The configuration for connecting the NEXEDGE system to the IP console can be configured by using SCU.

Note

- Refer to “NEXEDGE 2nd Generation Basic Configuration” for the detailed configuration procedure and communication test.

Adding a device to Device List

By clicking the “Add” button in **Edit > Subscriber Configuration > Device List** of SCU, a new device can be created.

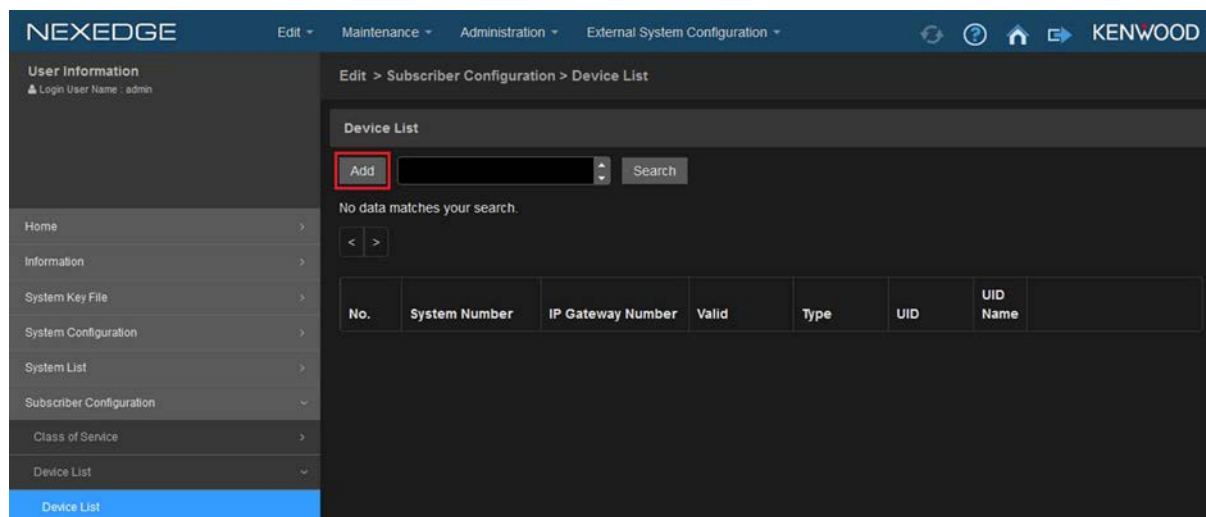


Figure 2-8 Device List

Detailed configuration of device

When creating a new device, the details of the device are configured in **Edit > Subscriber Configuration > Device List > General (Add)**.

The screenshot shows the NEXEDGE web interface for configuring a device. The breadcrumb trail is **Edit > Subscriber Configuration > Device List > General (Add)**. The left sidebar contains a menu with options like Home, Information, System Key File, System Configuration, System List, Subscriber Configuration, Class of Service, Device List, and Device List. The main content area is titled **General (Add)** and contains three sections: **General**, **Console**, and **Telephone Line**. The **General** section includes fields for Type (Console), System Number (1), IP Gateway Number (1), Valid (ON), UID (1), UID Name (UID-1), and Comment. The **Console** section includes UID Class of Service (Common), Maximum Registration GID (1), and Talkpath (OFF). The **Telephone Line** section includes Bi-directional Use (ON), Home System (1), and Call Restriction Table Number (None). At the bottom, there are **Save** and **Back** buttons, with the **Save** button highlighted by a red box.

Figure 2-9 General (Add)

Table 2-4 Configuration of a Device

Item	Description
Type	Type allows a system administrator to select the type of device to be connected to a NEXEDGE system. For an IP console, select “Console”.
System Number	System Number is the number of a system to which a device is to be connected. A system administrator can configure the system number configured in System List .
IP Gateway Number	IP Gateway Number is the number of an IP gateway to which a device is to be connected. A system administrator can configure the IP gateway number configured in IP Gateway List .
Valid	Valid allows a system administrator to configure whether the device is enabled. If “ON” is configured, the device is enabled.
UID	UID allows a system administrator to configure the UID of the device to be connected to the IP Gateway server.
UID Name	UID Name allows a system administrator to configure the name of an UID.
Comment	Comment allows a system administrator to enter the supplementary information related to the device.
UID Class of Service	UID Class of Service allows a system administrator to configure the desired COS registered in UID COS List if “Console” is configured in Type . (Refer to Configuring a UID COS .)
Maximum Registration GID	Maximum Registration GID allows a system administrator to restrict the number of GIDs that the IP console uses if “Console” is configured in Type .
Talkpath	Talkpath allows a system administrator to configure whether multiple parallel sessions to communicate with the IP console are permitted if “Console” which supports multiple sessions is configured.

Click the “Save” button to save after configuration.

Note

- A list of the registered devices appears in **Device List**.
- By clicking the “Details” button in **Device List**, the configuration contents of the corresponding device can be viewed.
- By clicking the “Edit” button in **Device List**, the configuration of the corresponding device can be changed.
- By clicking the “Delete” button in **Device List**, the corresponding device can be deleted.

Registering the UID of an IP console in a Fleet

The UID of a registered IP console is selected in **Edit > Subscriber Configuration > Fleet List > Console List** of SCU. If multiple IP Gateway servers are added, the **IP Gateway Number** and the UID of a IP console are selected depending on the operation.

NEXEDGE Edit Maintenance Administration External System Configuration KENWOOD

User Information
 ▲ Login User Name : admin
 ▲ Last Modified By : admin
 ▲ Last Modified On : 2023/10/17 9:30:51 am
 ▼ Permit

Home Information System Key File System Configuration System List Subscriber Configuration Class of Service Device List Call Restriction List Speed Dial List Fleet List Fleet List General (Edit) Timers QID List UID List Console List Telephone Line List Voice Logger

Edit > Subscriber Configuration > Fleet List > Fleet Number1: Console List

Console List

Page 1 out of 10 pages is displayed. Total number of records is 100.

No.	System Number	IP Gateway Number	UID	Valid	UID Class of Service
1	1	1	1-UID-1	ON	Common
2	1	1	None	OFF	
3	1	1	None	OFF	
4	1	1	None	OFF	
5	1	1	None	OFF	
6	1	1	None	OFF	
7	1	1	None	OFF	
8	1	1	None	OFF	
9	1	1	None	OFF	
10	1	1	None	OFF	

Save Cancel Back

Figure 2-10 Console List

Table 2-5 Configuration of Console List

Item	Description
System Number	System Number is the number of a system to which an IP console is connected. A system administrator can configure the system number configured in System List .
IP Gateway Number	IP Gateway Number is the number of an IP gateway to which an IP console is connected. A system administrator can configure the IP gateway number configured in IP Gateway List .
UID	UID is the UID of the IP console belonging in a Fleet. A system administrator can register the IP console used in a Fleet.
Valid	Whether a UID can be used is displayed in Valid . A system administrator can check whether the UID registered in the Fleet can be used in a system.
UID Class of Service	The value of UID Class of Service configured for a UID is displayed in UID Class of Service . A system administrator can check the Class of Service configured for the UID. If "Common" is configured in UID Class of Service , the use of each function is permitted according to the configuration in Common Class of Service (UID) of the Fleet. (Refer to Configuring COS to be used by GIDs registered in a Fleet (Common Class of Service (GID)) .)

Click the "Save" button to save after configuration.



- Refer to ["Registering a Fleet \(Fleet List\)"](#) for details of Fleet List.

Connecting to the Telephone

A telephone, such as KTI-4, can be connected to a NEXEDGE system via an IP Gateway server. The configuration for connecting the NEXEDGE system to the telephone can be configured by using SCU.

Note

- Refer to “NEXEDGE 2nd Generation Basic Configuration” for the detailed configuration procedure and communication test.

Adding a device to Device List

By clicking the “Add” button in **Edit > Subscriber Configuration > Device List** of SCU, a new device can be created.

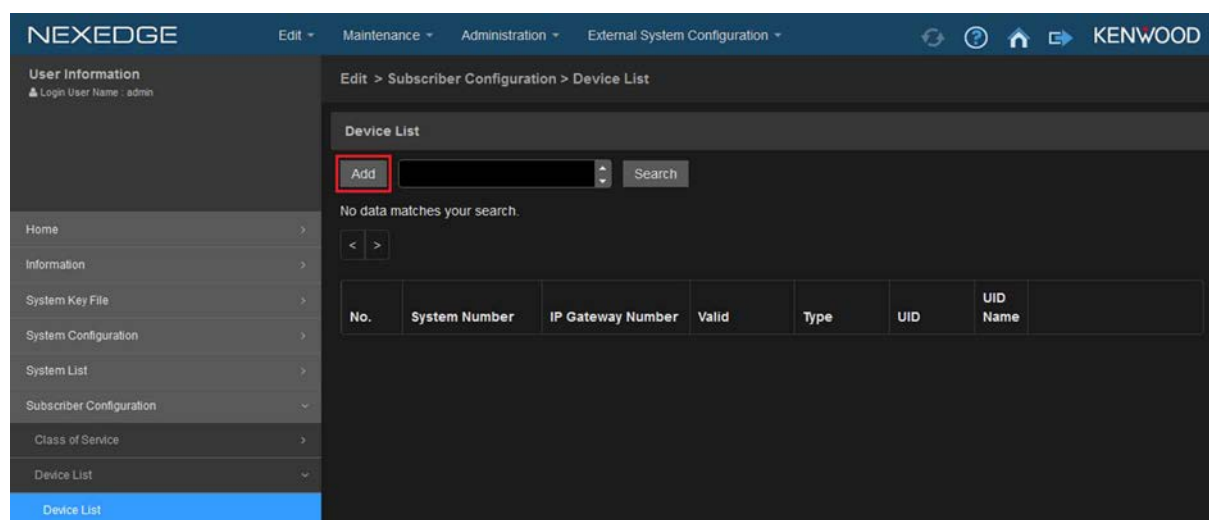


Figure 2-11 Device List

Detailed configuration of device

When creating a new device, the details of the device are configured in **Edit > Subscriber Configuration > Device List > General (Add)**.

The screenshot displays the NEXEDGE web interface for configuring a device. The breadcrumb trail at the top indicates the path: Edit > Subscriber Configuration > Device List > General (Add). The left sidebar shows a navigation menu with options like Home, Information, System Key File, System Configuration, System List, Subscriber Configuration, Class of Service, Device List, and Device List. The 'General (Add)' option is selected. The main content area is divided into three sections: General, Console, and Telephone Line. The General section contains fields for Type (Telephone), System Number (1), IP Gateway Number (1), Valid (ON), UID (2), UID Name (UID-2), and Comment. The Console section contains fields for UID Class of Service (Common), Maximum Registration GID (1), and Talkpath (OFF). The Telephone Line section contains fields for Bi-directional Use (ON), Home System (1), and Call Restriction Table Number (None). A 'Save' button is highlighted with a red box at the bottom left.

Figure 2-12 General (Add)

Table 2-6 Configuration of a Device

Item	Description
Type	Type allows a system administrator to select the type of device to be connected to a NEXEDGE system. For a telephone, select "Telephone".
System Number	System Number is the number of a system to which a device is to be connected. A system administrator can configure the system number configured in System List .
IP Gateway Number	IP Gateway Number is the number of an IP gateway to which a device is to be connected. A system administrator can configure the IP gateway number configured in IP Gateway List .
Valid	Valid allows a system administrator to configure whether the device is enabled. If "ON" is configured, the device is enabled.
UID	UID allows a system administrator to configure the UID of the device to be connected to the IP Gateway server.
UID Name	UID Name allows a system administrator to configure the name of an UID.
Comment	Comment allows a system administrator to enter the supplementary information related to the device.
Bi-directional Use	Bi-directional Use allows a system administrator to configure whether the connection of the subscriber unit to a telephone line in a NEXEDGE system is permitted if "Telephone" is configured in Type . "ON" is configured in Bi-directional Use . (Refer to Restricting the Connection from a Subscriber Unit to a Telephone Line (Bi-directional Use) .)
Home System	In Home System , the number of Telephone Lines handled by each system when multiple system controllers are connected can be averaged. A system administrator can configure the system number configured in System List. Configuring the system controller that manages an IP Gateway to which a Telephone Line is to be connected is recommended.
Call Restriction Table Number	Call Restriction Table Number allows a system administrator to configure the number of Call Restriction Table referenced by a subscriber unit when making a call to a telephone line.

Click the "Save" button to save after configuration.

 Note

- A list of the registered devices appears in **Device List**.
- By clicking the "Details" button in **Device List**, the configuration contents of the corresponding device can be viewed.
- By clicking the "Edit" button in **Device List**, the configuration of the corresponding device can be changed.
- By clicking the "Delete" button in **Device List**, the corresponding device can be deleted.

Registering the UID of an telephone in a Fleet

The UID of a registered telephone is selected in **Edit > Subscriber Configuration > Fleet List > Telephone Line List** of SCU. If multiple IP Gateway servers are added, the **IP Gateway Number** and the UID of a telephone are selected depending on the operation.

Figure 2-13 Telephone Line List

Click the “Save” button to save after configuration.

Table 2-7 Configuration of Telephone Line List

Item	Description
Home System	Home System is a home system controller to which the telephone is to be connected. A system administrator can select the system controller from Home System of KTI-4 configured in Device List . In Telephone Line List , a UID (KTI-4) can be registered from the selected Home System .
System Number	System Number is the number of a system to which a telephone is connected. A system administrator can configure the system number configured in System List .
IP Gateway Number	IP Gateway Number is the number of an IP gateway to which a telephone is connected. A system administrator can configure the IP gateway number configured in IP Gateway List .
UID	UID is the UID of the telephone belonging in a Fleet. A system administrator can register the telephone used in the Fleet.
Valid	Whether a UID can be used is displayed in Valid . A system administrator can check whether the UID registered in the Fleet can be used in a system.

Note

- Refer to “[Registering a Fleet \(Fleet List\)](#)” for details of **Fleet List**.

2.4 Using an Analog System and a Digital System at the Same Time

By using a Shared channel (a channel where “Shared” is configured in **Channel Type**), the traffic channel of a NEXEDGE system can be shared with Analog Conventional mode. With this function, digital subscriber units are added sequentially, and a flexible system structure operating in trunking mode is enabled. An analog subscriber unit already operating can be used continuously, and existing devices can be effectively used. In accordance with the budget, the analog subscriber unit can be replaced with a digital subscriber unit with high security and various available functions.

Also, by using an AUX channel (a channel where “AUX” is configured in **Channel Type**), an analog trunking system such as an MPT Trunking system and a repeater can be shared. (Refer to [Configuring the usage type of a channel \(Channel Type\)](#).)

The following diagram is an example of the structure for sharing a NEXEDGE system and MPT Trunking system. TCH 2 and TCH 3 where “AUX” is configured in **Channel Type** are shared as analog traffic channels in an MPT Trunking system. By using the Cross-busy Input/ Output function, the channel busy status can be mutually notified. (Refer to [Sharing a Traffic Channel With a Different System \(Cross-busy\)](#).)

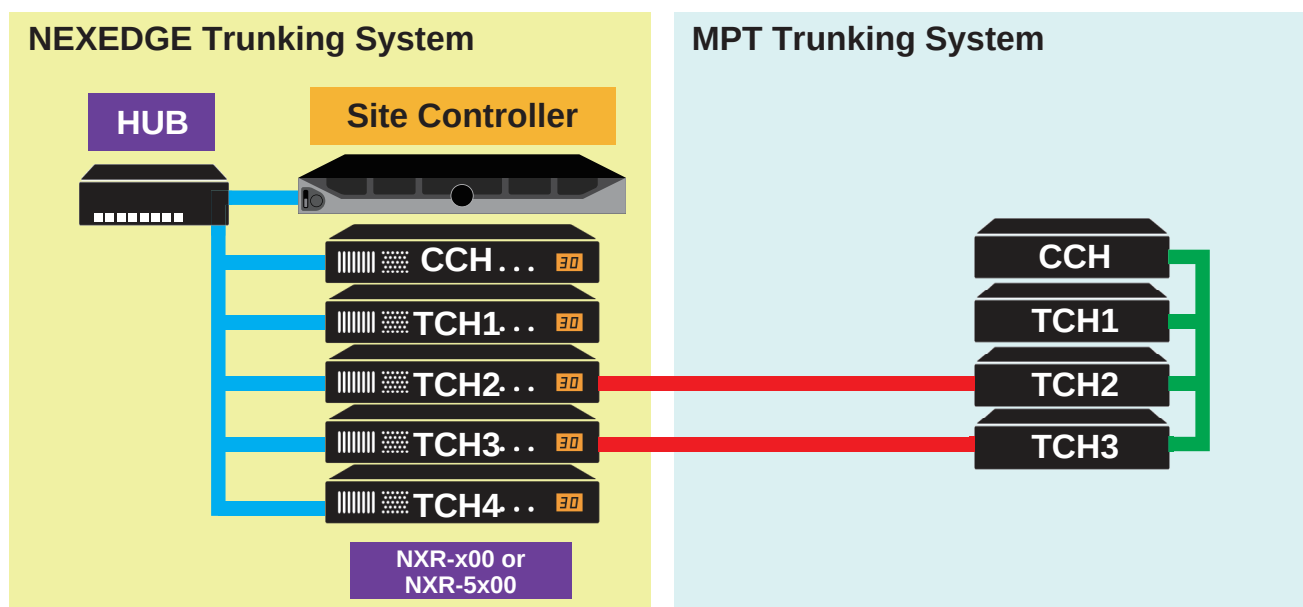


Figure 2-14 Using an Analog System and a Digital System at the Same Time

2.5 Confirming Available GIDs/ UUIDs (Available ID Map)

Available ID Map is the function to search for the available range of UUIDs or GIDs. If adding a new Fleet or UUID/ GID, the number of continuous IDs to hold can be searched and confirmed.

The continuous GIDs/ UUIDs available for holding can be searched and confirmed in **Maintenance > System > Available ID Map > Available GID List** or **Available UUID List** of SCU. The following screen is **Available GID List**, but **Available UUID List** is the same screen layout and operation method.

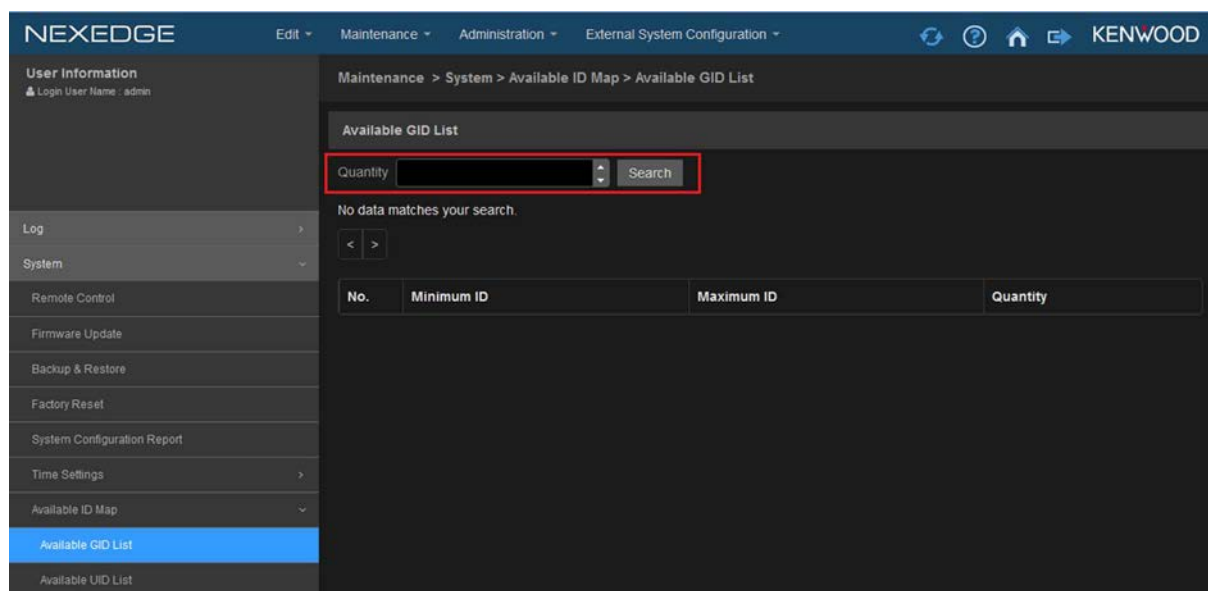


Figure 2-15 Available ID Map (Available GID List)

A search starts when the number of continuous IDs to hold is entered in Quantity and the “Search” button is clicked. For example, when registering 50 new continuous UUIDs with the UUIDs from 1 to 15 and from 101 to 200 already used, the search results by entering “50” in **Quantity** are as follows:

No.	Minimum ID	Maximum ID	Quantity
1	16	100	85
2	201	65,519	65,319

If multiple areas are free, multiple search results appear.

Table 2-8 Display of Search Results

Item	Description
Minimum ID	In Minimum ID , the minimum value of the searched free area of GIDs or UUIDs appears.
Maximum ID	In Maximum ID , the maximum value of the searched free area of GIDs or UUIDs appears.
Quantity	In Quantity , the results of the GID or UUID free area search with the number of continuous GIDs or UUIDs available for holding appear.

2.6

Allocating a Traffic Channel for a Specific Call (Channel Allocation)

Channel Allocation is the function to allocate the number of traffic channels dedicated to each of the channels dedicated to GPS, Fleets, and the following 5 calls:

- Voice Call
- Long Data Call
- Emergency Call
- IP Console Call
- Telephone Call

The number of traffic channels dedicated to each call (hereafter referred to as “dedicated traffic channels”) can be configured for each site. By configuring the number of dedicated traffic channels, the configured number of channels for calls are not used for other calls, and the traffic channels can be held for the calls to be protected.

A dedicated traffic channel which behaves as a GPS Report Channel with priority can also be allocated.

Also, if “Fleet Priority A to Fleet Priority J” is configured, the number of dedicated traffic channels can be configured for each Fleet Priority. In this case, the number of channels configured in Fleet Priority A to Fleet Priority J is prioritized over the number of channels configured for each call.

“General” is configured for the remaining traffic channels not configured as dedicated traffic channels, and can be allocated to all calls.

Various calls that can be configured and allocation conditions in **Channel Allocation** are as follows:

Table 2-9 Channel Allocation

Channel Allocation	Description
Voice Call	Only a Voice Call can be allocated. If a channel dedicated to Voice Call is configured and one of the following conditions is satisfied, the channel dedicated to Voice Call is automatically allocated. • When a Voice Call request is received from IP Console if a channel dedicated to IP Console is not configured • When a call request is received from PSTN or a call request to PSTN is sent if a channel dedicated to Telephone Call is not configured • When an Emergency Voice Call request is received if a channel dedicated to Emergency Call is not configured
Long Data Call	Only a Long Data Call can be allocated. If a channel dedicated to Long Data Call is configured and a channel dedicated to transmission from IP Console is not configured, the channel dedicated to Long Data Call is allocated to a Long Data Call request from IP Console.
Emergency Call	Only an Emergency Call can be allocated. If a channel dedicated to Emergency Call is configured and a channel dedicated to transmission from IP Console is not configured, the channel dedicated to Emergency Call is allocated to an Emergency Call request from IP Console.

Channel Allocation	Description
IP Console Call	Only transmission from IP Console can be allocated. Call requests from a subscriber unit to IP Console cannot be allocated.
Telephone Call	Only calls from PSTN or calls from a subscriber unit to PSTN can be allocated.
GPS Report Channel	A GPS Report Channel can be allocated, which acts as a dedicated traffic channel that behaves with priority. Priority is given to the acquisition of a GPS Report Channel over other Channel Allocation .
Fleet Priority A to Fleet Priority J	The channel dedicated for use in a Fleet can be specified. Fleet Priority of Fleet Priority A to Fleet Priority J configured here can be specified in Channel Allocation of Fleet List . One Fleet Priority can be used for multiple Fleets.
General	When dedicated traffic channels are not configured or when dedicated traffic channels are all in use, the call of a call request is allocated.

 Note

- For Voice Call, Long Data Call, and Emergency Call, if a channel dedicated to transmission from IP Console is configured, the channel dedicated to IP Console is preferentially used.
- If configuring **Channel Allocation**, one or more Dual-functional Channels or Traffic Channels need to be configured in a site, excluding a control channel.
- If specifying the dedicated traffic channels of **Fleet Priority A** to **Fleet Priority J**, **Channel Allocation** is configured in **Fleet List** for each Fleet. (Refer to [Configuring Channel Allocation](#).)
- **Fleet Priority** functions only for a communication in the Home System.

Configuration items using SCU

Configuring **Channel Allocation** ( **See** Edit > System List > Site List > Channel List > Channel Allocation)

About General channel

The total number of dedicated traffic channels that can be configured in **Channel Allocation** cannot exceed the number of General channels configured in a site. If one dedicated traffic channel is configured, the number of General channels is decreased by one. If the number of General channels is decreased to zero, no more dedicated traffic channels can be configured.

If one of the following conditions is satisfied while dedicated traffic channels are configured in **Channel Allocation**, all of the channels do not behave as dedicated traffic channels but as General channels:

- If the total number of configured dedicated traffic channels is larger than the number of channels in a site when a channel configured in the site is deleted
- If the total number of configured dedicated traffic channels is larger than the number of channels in a site when a channel configured in the site is disabled (Valid: OFF)
- If the total number of configured dedicated traffic channels is larger than the number of channels in a site when a channel configured in the site becomes unavailable as a traffic channel, such as because of Failure Traffic Channel Remove or power turning off (Refer to [Allocating Another Channel As a New Control Channel \(Failure Control Channel Switching/ Failure Traffic Channel Remove\)](#).)

About Queue Behavior

When dedicated traffic channels are configured in **Channel Allocation** if a call request is received, the Queue behaves according to the Queue Level configuration of the call request if all traffic channels are in use as follows:

- If a General channel is not configured and all traffic channels dedicated to the communication service corresponding to the call request are in use
- If a General channel is configured and all traffic channels dedicated to the communication service corresponding to the call request are in use, and if all General channels are also in use
- If behaving on a General channel such as because the traffic channel cannot be used, and if all traffic channels are in use

Note

- Refer to “[About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use \(Queue\)](#)” for Queue behaviors.

About the behavior to allocate queued calls to free channels

The behaviors to allocate calls retained in the Queue to available free channels if a dedicated traffic channel is configured in **Channel Allocation** are as follows:

If a General channel is not configured

If calls that can be allocated to the dedicated traffic channel to become available are retained in the Queue, the call with the highest **Queue Level** amongst the calls is allocated to a free channel.

If no call that can be allocated to the dedicated traffic channel to become available is retained in the Queue, the channel becomes available as a dedicated traffic channel of the call.

If a General channel is configured

- **If corresponding traffic channels are all in use and General channels are also in use**
 - The type of dedicated traffic channel to become available is the same as the type of dedicated traffic channel of the call that used the channel to become available, or is a General channel.
 - The call that can be allocated to an available channel and has the highest **Queue Level** amongst the calls retained in the Queue is allocated to a free channel.
- **If corresponding traffic channels are all in use and General channels are not used**
 - The type of dedicated traffic channel to become available is the same as the type of dedicated traffic channel of the call that used the channel to become available.
 - If the types of calls that can be allocated to the available dedicated traffic channel are retained in the Queue, the call with the highest **Queue Level** amongst the calls is allocated to the channel to become available.
 - If the types of calls that can be allocated to the available dedicated traffic channel are not retained in the Queue, the channel becomes available as a dedicated traffic channel of the same communication type as the call that used the channel to become available.

About Queue behavior of Preemption

For a call specified as **Preemption**, a new call request is prioritized over the currently ongoing call. By releasing the channel used by the lowest level call amongst the calls lower than the **Queue Level** of the own station (if levels are the same, the call of the longest communication time), a call is initiated. If a call lower than the **Queue Level** of the own station does not exist, the channel of the currently ongoing call is not released and the call is held in the Queue. The general behavior does not change even if a dedicated traffic channel is configured, but the Queue behavior differs as follows:

- 1) If the lowest level call amongst the calls lower than the **Queue Level** of the own station (if levels are the same, the call of the longest communication time) is allocated to a General channel, the channel is released to initiate a call.
- 2) If a General channel is not configured, or if a call lower than the **Queue Level** of the own station does not exist on a General channel, a dedicated traffic channel of the same type of call as the own station is released to initiate a call.
- 3) If no call can be released, the call request of the own station is held in the Queue in a NEXEDGE system.

Note

- The targets of **Preemption** are the calls in the same NEXEDGE system.
- If a call that is being transmitted from a subscriber unit is to be released, the call is released after a wait for the transmission from the subscriber unit to complete. The targets of **Preemption** are only Voice Calls.

About the Behavior of GPS Report Channel

GPS Report Channel is used to configure the maximum number of GPS Report Channels, which behaves with priority over other traffic channels. Channels that can be allocated as a GPS Report Channel will be assigned according to the number of GPS Report Channels configured in **GPS Report Channel**. If the number of GPS Report Channels that can be allocated is less than that configured in **GPS Report Channel**, prioritized GPS Report Channels will not be allocated. In this case, the channels that are not acquired will behave as a General channel. If there are no channels left that can be allocated as other dedicated traffic channels after GPS Report Channels are being allocated, the remaining channels that have been acquired as a GPS Report Channel will behave as a General channel.

GPS Report Channels that are allocated in **Channel Allocation** will not be allocated a traffic channel but behave as a prioritized GPS Report Channel.

2.7 Holding a Specific Fleet Dedicated Channel (Channel Allocation)

Channel Allocation is the function to specify the traffic channel dedicated to Fleet. By using this function, a specific Fleet dedicated traffic channel can be held if services such as mission critical are provided for a fire department and a police station.

To specify a traffic channel dedicated to a Fleet, the dedicated channel to be used in a Fleet needs to be configured in **Fleet Priority A to Fleet Priority J** of **Channel Allocation** of **Site List**. **Fleet Priority** of Fleet Priority A to Fleet Priority J configured in **Site List** can be specified in **Channel Allocation** of **Fleet List**. One Fleet Priority can be used for multiple Fleets. (Refer to [Configuring Channel Allocation](#).)

Refer to “[Allocating a Traffic Channel for a Specific Call \(Channel Allocation\)](#)” for details of **Channel Allocation**.

Note

- **Channel Allocation** is available only in the own system.

2.8 Limiting the Occupation Time of a Traffic Channel (Occupation Timer)

Occupation Timer is the maximum length of time to maintain the call if the connection to a traffic channel is held. This timer is used to restrict a group call or individual call by the same group or caller if the call is overly long.

If the amount of time configured in **Occupation Timer** elapses and the **PTT** switch of the transmitting subscriber unit is released, the traffic channel is available. A traffic channel needs to be held again to continue the call.

The following 7 types of Occupation Timers can be configured:

● Voice Call

- Broadcast Call
- Conference Call
- Individual Call
- Telephone Call

● Data Call

- Broadcast Call
- Conference Call
- Individual Call

A system administrator can construct the system that suits the operation environment of the system by configuring these timers. For example, shortening the occupation time of a traffic channel for the system where congestion frequently occurs can allocate traffic channels for more calls.

Note

- If Occupation Timer is configured individually in a Fleet, the configuration values of the Fleet have priority. (Refer to [Configuring the timer information \(Timers\)](#).)

Configuration items using SCU

Configuring **Occupation Timer** ( **See** Edit > System Configuration > Default Timers)

2.9 Prioritizing a Call from a Console Even When No Traffic Channel Is Available

By configuring “Preemption” in **Queue Level** of IP Console, a channel can be preferentially allocated to an IP console from the channel currently communicating. This allows preferentially communicating from an IP console even when no traffic channel is available.

Follow the procedure below to configure “Preemption” in **Queue Level** of IP Console:

- 1) Configure **UID Class of Service**.
- 2) Configure **Fleet**.
- 3) In **UID List**, configure the equivalent level to “Preemption” in **UID Class of Service**.

Refer to “NEXEDGE 2nd Generation Basic Configuration” for the detailed configuration method.

2.10 Determining the System Behavior of When Starting or Ending a Voice Call (Trunking Type)

In an NXDN Trunking system, the system behavior of when starting or ending a voice call can be configured. The system behavior of when starting or ending a voice call can be adapted to the system operation according to the configuration in **Trunking Type**.

There are two types of **Trunking Type**: “Transmission Trunked” and “Message Trunked”.

“Message Trunked” is configured if starting an Individual Call by the connection operation from the receiving subscriber unit.

“Transmission Trunked” is configured if starting a Group Call or Individual Call by pressing the **PTT** switch on the transmitting subscriber unit.

Table 2-10 Trunking Type

Item	Description
Message Trunked	The transmitting subscriber unit and the receiving subscriber unit can start a call.
Transmission Trunked	Only the transmitting subscriber unit can start a call.

Note

- The call procedure for an Individual Call is different in **Message Trunked** and **Transmission Trunked**. Therefore, an Individual Call may not be communicated if the configuration in **Trunking Type** for the system and for the subscriber unit differs. **Trunking Type** of the system and that of the subscriber unit needs to be the same configuration.
- If “Message Trunked” is configured in **Trunking Type**, the configuration in **Individual Call Response Type (Voice)** is disabled. (Refer to [Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using a Voice Call \(Individual Call Response Type \(Voice\)\)](#).)
- If **Trunking Type** is configured individually in a Fleet, the configuration values of the Fleet have priority. (Refer to [Configuring Trunking Type](#).)

Configuration items using SCU

Configuring **Trunking Type** ( See Edit > System Configuration > General)

Operating a system same as an MPT Trunking system

If “Message Trunked” is configured in **Trunking Type**, the behaviors to communicate can be the same as an MPT Trunking system, because an Individual Call can be started by the connection of the receiving subscriber unit, and an Individual Call or Group Call can be ended by the disconnection of the subscriber unit.

2.11 Holding a Traffic Channel for Always Calling Back (Hold Timer)

Hold Timer is the length of time to maintain the connection to a traffic channel after the **PTT** switch of the transmitting subscriber unit is released. By pressing the **PTT** switch of the transmitting subscriber unit or of the receiving subscriber unit during this period, the call can be continued without acquiring a traffic channel again. When the system is busy and the traffic channels are fully occupied when a subscriber unit attempts to respond to the call, the interruption in the communication can be avoided.

Hold Timer can be configured for each Message Trunked/ Transmission Trunked of Broadcast Call, Conference Call and Individual Call, and for Telephone Call. While making these calls, a subscriber unit stays on a traffic channel as long as **Hold Timer** is active. A subscriber can continue the communication without pressing the **PTT** switch in order to re-link to the system as long as the subscriber unit is on a traffic channel.

Note

- Even if “Transmission Trunked” is configured in **Trunking Type** and **Hold Timer** is 0 sec, **Hold Timer** is 3 sec for a Data Call. This configuration is because data is transmitted divided over multiple pieces in a Data Call. This configuration is also because a communication is not successful unless an ACK is returned by the responder in the Data Call of an individual call.
- If Hold Timer is configured individually in a Fleet, the configuration values of the Fleet have priority. (Refer to [Registering a Fleet \(Fleet List\)](#).)

Configuration items using SCU

Configuring **Hold Timer** ( See Edit > System Configuration > Default Timers)

2.12

About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use (Queue)

Queue is the function to allocate a channel to a call request retained in order in a Queue as soon as a traffic channel is opened while all channels that can be used as traffic channels are in use in a NEXEDGE system.

If all traffic channels are being used in a busy system, a call cannot immediately be allocated even if a subscriber unit requests the call. In this state, a subscriber unit needs to request a call again if the call request from the subscriber unit is rejected by a NEXEDGE system.

If this function is used, a new call request is retained in Queue when the call request is received from a subscriber unit while all traffic channels are in use in a NEXEDGE system. Then, a call is allocated according to the Queue order of the call as soon as a traffic channel is opened. Convenience is improved because this allows waiting to allocate a call by the system while pressing and holding the **PTT** switch of the subscriber unit.

The Queue order is determined depending on the **Queue Level** of the subscriber unit requesting the call. An Emergency Call is a call request of the highest priority in **Queue Level**.

Also, because a **Queue Level** can be assigned to a subscriber unit, the wait time when busy can be controlled according to the priority order, such as receiving call allocations by prioritizing high priority subscriber units such as dispatchers.

 Note

- Because a control channel is used as a traffic channel if all traffic channels are in use, the **Queue** function cannot be used by a site with **Non-dedicated Control Channel** enabled. (Refer to [Using a Control Channel as a Traffic Channel \(Non-dedicated Control Channel\)](#).)
- Refer to “[Allocating a Traffic Channel for a Specific Call \(Channel Allocation\)](#)” for the Queue behavior and allocation behavior from the Queue if a dedicated traffic channel is configured in **Channel Allocation**.

Queue

Queue is the function to specify the behavior of a NEXEDGE system for each Queue Level if the available traffic channels in a site are all in use when a new call request is received.

One of “Preemption” which prioritizes a new call request, “Queue” which waits until a channel is open, or “None” which rejects receipt of a new call request can be specified for the behavior in a NEXEDGE system.

The Queue Level has 8 levels, and Level 1 has the highest priority and Level 8 has the lowest priority. Also, an Emergency Call has a higher priority than all calls because the Emergency Call is Level 1 in a NEXEDGE system.

The three behaviors (**Preemption**, **Queue**, and **None**) can each be selected and configured to the levels. These three behaviors are a priority order of **Preemption** > **Queue** > **None**, and the lower level behavior cannot be configured to exceed the higher level behavior in priority.

The configuration of these three behaviors uses the values configured in the Home System even if the transceiver is roaming to the other system.

Table 2-11 Queue Level

Item	Description
Preemption	Preemption is configured if a new call request is to be prioritized over the currently ongoing call. The call in which Preemption is configured is prioritized over the currently ongoing call in allocating a traffic channel. If no traffic channel for allocation is available or a call request with a higher Queue Level is held in the Queue when a call request with Preemption configured is received, the new call request is held in the Queue in the order according to the Queue Level. The traffic channel of the currently ongoing call to be released is selected in the following order: 1) The lowest Queue Level call amongst the calls lower than the Queue Level of a new call request 2) The call of the longest communication time if multiple calls with the same Queue Level exist amongst the calls targeted for releasing If a call lower than the Queue Level of a new call request does not exist, the new call request is held in the Queue. If the new call request is from a subscriber unit, the traffic channel is immediately released after the PTT switch of the transmitting subscriber unit is released in a call targeted for releasing. In this case, the value configured in Hold Timer is ignored. If the new call request is from an IP console, the traffic channel is immediately released in a call targeted for releasing even if the subscriber unit is transmitting. The call targeted for releasing by the new call request is a call in the same Home System.
Queue	Queue is configured if the currently ongoing call is prioritized over a new call request. A traffic channel is allocated to the call in which Queue is configured after the channel is opened. When a call request in which Queue is configured is received, the new call request is held in the Queue in the order according to the Queue Level if no traffic channel for allocation is available. A subscriber unit that is roaming in the system currently in use behaves at the Queue Level configured for roaming units. A subscriber unit currently using the Home System behaves at the Queue Level configured in the Home System.
None	None is configured if the currently ongoing call is prioritized and if the call is canceled when a free channel does not exist. When the call request in which None is configured is received, the call request is not held in the Queue and the call is canceled in the system if no traffic channel for allocation is available.

 Note

- In a **Message Trunked** system, if the traffic channel allocated by the **Preemption** behavior cannot be used temporarily by the Cross-busy function, the first call is transmitted, but the response from a subscriber unit or IP console on the traffic channel is restricted.
- The start of the preempted and prioritized call may be cut off because a preempted call is allocated on the traffic channel allocated by **Preemption** after ending the call to be released.

Configuration items using SCU

Configuring **Queue Level** ( **See** Edit > System Configuration > Queue)

Number of Queues

Call requests held in the Queue are sorted in the following order:

- 1) In descending order of the **Queue Level**
- 2) If the order in condition 1) is the same, in order of consoles > subscriber units
- 3) If the orders in condition 1) and 2) are the same, in order of arrival

The number configured in **Number of Queues** becomes the number of call requests that can be held in the Queue, and a call request more than the configured number is canceled.

Calls held in the Queue wait for allocation of a traffic channel up to 30 seconds. A call request waiting for longer than 30 seconds is canceled.

Call requests held in the Queue can be canceled by the requesters.

Configuration items using SCU

Configuring **Number of Queues** ( **See** Edit > System Configuration > Queue)

2.13 Enabling Subscriber Units Selecting Different GIDs to Participate in the Same Communication (GID Association)

GID Association is the function to associate the call area of a GID selected in **GID Association** as the call area of another GID.

To use this function, the Target GID needs to be included in the ID targeted for scanning or the Target GID needs to be configured as a **Priority Monitor ID** in the subscriber unit selecting the Associated GID. (Refer to [Receiving a High-priority Group Call \(Priority Monitor\)](#).)

When sending a Group Call from the subscriber unit by using an arbitrary GID (referred to as Target GID), the subscriber unit selecting the GID associated in **GID Association** can also be called.

Since an Associated GID can associate a Target GID, the subscriber unit can participate in a Group Call for the Target GID even if the subscriber unit selects a GID other than the Target GID.

When the NEXEDGE system starts a Group Call by the Target GID, both the site called by the Target GID and the site called by the Associated GID are called by the Target GID. This enables the subscriber unit selecting the Associated GID to participate on a traffic channel allocated for the Group Call with the Target GID.

A maximum of 4 Associated GIDs can be configured for one Target GID.

According to the values configured in **Intersite Call** and **Dynamic Allocation**, a system allocates a traffic channel to the site as follows: (Refer to [Making an Intersite Call](#), [Making a Group Call to Only the Site Where the Subscriber Unit Exists](#).)

Table 2-12 GID Association

Target GID		Associated GID		Traffic Channel Allocation
Intersite Call	Dynamic Allocation	Intersite Call	Dynamic Allocation	
ON	OFF	OFF	OFF	Static
ON	ON	OFF	OFF	Variable
ON	OFF	ON	OFF	Static
ON	OFF	ON	ON	Static
ON	ON	ON	OFF	Static
ON	ON	ON	ON	Variable

Static: A traffic channel is always allocated.

Variable: A traffic channel is allocated only if the Group Registration for the Target GID or Associated GID has succeeded.

Note

- Refer to ["Registering a GID in a System \(Group Registration\)"](#) for details of Group Registration.

Configuration items using SCU

Configuring **GID Association** ( [See](#) Edit > Subscriber Configuration > Fleet List > GID List > General)

Examples of the GID Association behavior

Examples of the **GID Association** behavior are explained. GID 1 is the Target GID, GID 2 is the Associated GID, and the Group Registration of each GID succeeded in the call sites of GID 1 and GID 2. Examples of starting a Group Call from GID 1 in this case:

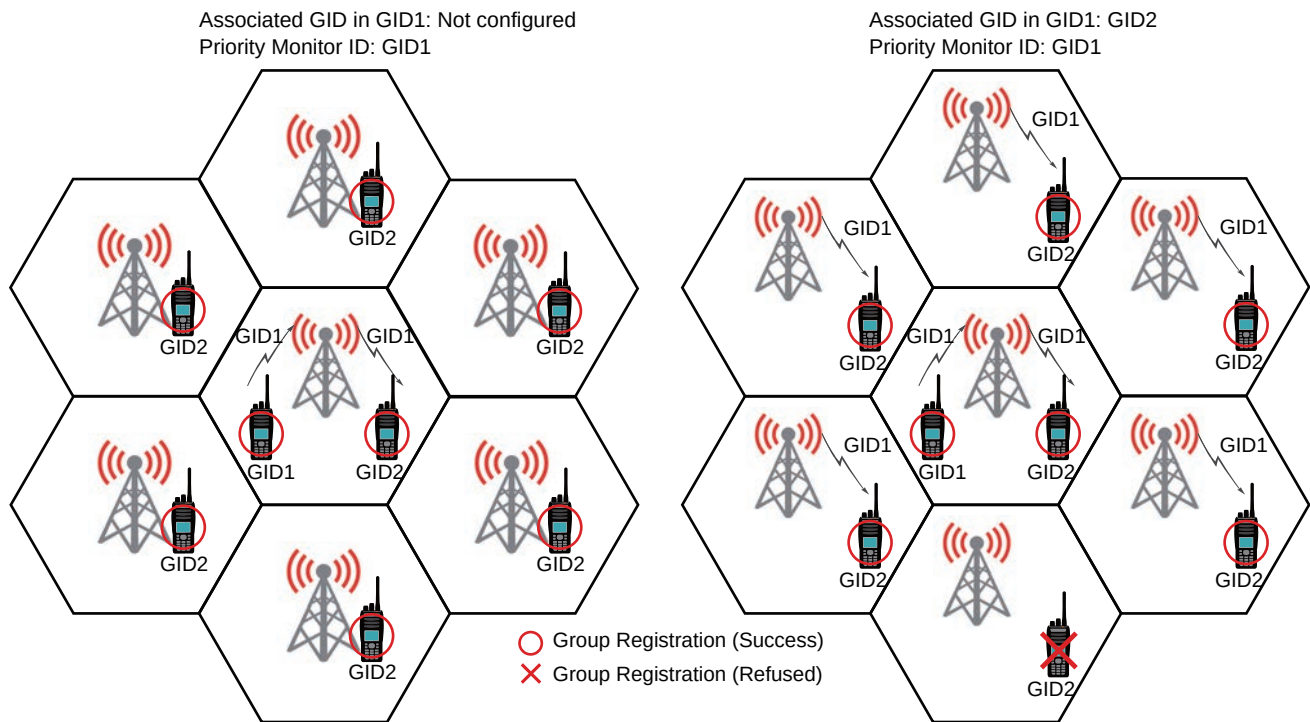


Figure 2-16 Examples of the GID Association Behavior

The left diagram is the behavior if Associated GID is not configured in GID 1. A Group Call is made only in a site with GID 1 available.

The right diagram is the behavior if GID 2 is configured as the Associated GID in GID 1. Because even the site with GID 2 can place a Group Call, all subscriber units including GID 1 as a scan target or all subscriber units configuring GID 1 as a **Priority Monitor ID** can be called.

Note

- A subscriber unit selecting the Associated GID needs to include the Target GID as a scan target or configure the Target GID as a **Priority Monitor ID** for receiving a call with the Target GID. If the Target GID is configured as a **Priority Monitor ID**, voice communications by Group Call apply and data communication does not apply.
- In the case of Unicast transmission, the number of sites that can be registered in **Intersite Call List** is limited. (Refer to [Configuring Whether to Deliver by Using Unicast or Multicast \(Unicast/Multicast Group Call\)](#).)

2.14 Participating in an On-going Voice Call Midway Through the Call (Late Entry)

Late Entry is the function that enables a subscriber unit to participate in a Group Call or Individual Call midway through the call after returning to the communication area even if a message by Group Call or Individual Call cannot be received because the subscriber unit is temporarily outside the communication area.

The system sends an instruction message to a traffic channel on a control channel at certain intervals using Group Call and Individual Call. This behavior enables a subscriber unit to participate in a Group Call or Individual Call midway through the call.

Note

- If a control channel is used as a traffic channel by the **Non-dedicated Control Channel** function, **Late Entry** is temporarily disabled. When the **Non-dedicated Control Channel** is restored as the control channel, **Late Entry** of the communication continuing at that time resumes. (Refer to [Using a Control Channel as a Traffic Channel \(Non-dedicated Control Channel\)](#).)

Configuration items using SCU

- Configuring **Late Entry** (GID COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > GID COS List > General (Edit))
- Configuring **Late Entry** (UID COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > UID COS List > General (Edit))
- Configuring **Late Entry** (All Groups Call COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > All Groups Call COS > General)
- Configuring **Late Entry** (Secondary GID COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > Secondary GID COS)
- Configuring **Late Entry** (Secondary UID COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > Secondary UID COS)

2.15 Receiving a High-priority Group Call (Priority Monitor)

Priority Monitor is the function to receive another high-priority Group Call when the high-priority Group Call is initiated during a Group Call.

The subscriber unit can detect a Group Call having higher priority than the current Group Call by using the Group Call information that is notified on a traffic channel, and participate in the Group Call having higher priority.

The following information of the Group Call initiated on another channel is notified as a group call message on a traffic channel where a Group Call is established in the system:

- The UID of the transmitting subscriber unit
- The GID of the call
- The traffic channel number to be used

If the group of a call message notified later has higher priority than the group currently being received, the subscriber unit can migrate to the channel of this higher priority group.

Note

- The priorities among Group Calls are determined depending on the configuration in **Priority Monitor ID** of the subscriber unit. When the Non-Dedicated Control Channel communicates as a traffic channel while the subscriber unit is roaming a site in the Roaming System, Priority Monitor does not function.

Configuration items using SCU

- Configuring **Priority Monitor** (GID COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > GID COS List > General (Edit))
- Configuring **Priority Monitor** (All Groups Call COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > All Groups Call COS > General)
- Configuring **Priority Monitor** (Secondary GID COS) ( [See](#) Edit > Subscriber Configuration > Class of Service > Secondary GID COS)

2.16 Optimizing the Usage Time of Traffic Channel Resources

In a NEXEDGE system are various timers, such as **Hold Timer** and **Occupation Timer**, for limiting a call on a traffic channel to optimize the state of traffic channel resources.

A system administrator can construct the system that suits the operation environment by optimizing these timers. For example, shortening the maximum length of time to maintain a call in a system where congestion frequently occurs allows more users to use the system.

- [Limiting the Occupation Time of a Traffic Channel \(Occupation Timer\)](#)
- [Holding a Traffic Channel for Always Calling Back \(Hold Timer\)](#)

2.17 About the Configuration of a Subscriber Unit

A subscriber unit to operate in a NEXEDGE system needs various configurations of an NXDN Trunking system to be configured in a FPU such as KPG-D1/ D1N. The subscriber unit is registered in a NEXEDGE system after configuration.

About System Key File

A System Key File is required to configure various configurations of an NXDN Trunking system with an NXDN FPU in a subscriber unit. Follow the procedure below to create a System Key File using SCU:

- 1) Enter the **License ID** and **System Name** of the FPU for the subscriber unit to be used in **Edit > System Key File** of SCU. Or, click the “Browse” button to read the License ID file, and then enter the **System Name**.
- 2) Click the “Create” button.
- 3) Specify the save location.

A System Key File (extension: .skf) is created in the specified save location.

The **System Name** is the name used when selecting a System Key File on the FPU of the subscriber unit. The **System Name** can be entered as a maximum of 16 alphanumeric characters and symbols.
If no System Key File exists, an NXDN Trunking system cannot be configured for the subscriber unit by the FPU for the subscriber unit. Therefore, a System Key File needs to be delivered to FPU users. (Refer to [Preventing the Duplication of a Subscriber Unit That Can Access the System \(System Key File\).](#))

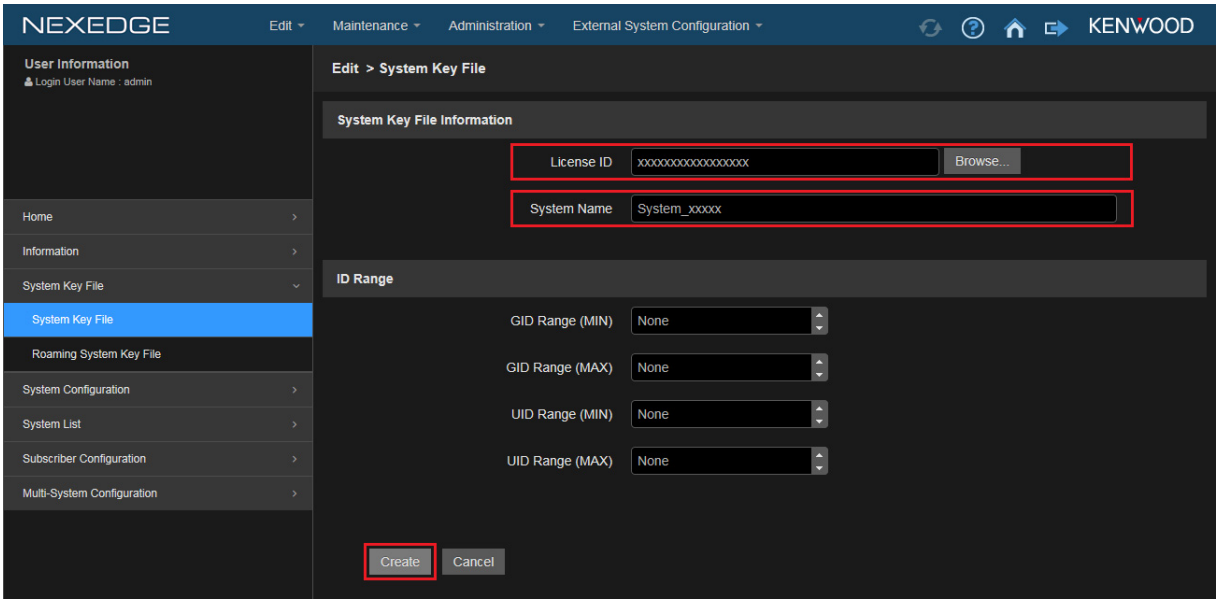


Figure 2-17 System Key File

About the registration of a subscriber unit

Using SCU, a subscriber unit can be registered in a NEXEDGE system.

The registration procedure is as follows:

- 1) Configure Class of Service defined with the functionality permitting use of a UID or GID registered in a system. (Refer to [CONTROLLING SERVICES OF A SUBSCRIBER UNIT](#).)
Class of Service can be individually configured by each Fleet unit, or by each specific UID and GID.
- 2) Add the Fleet that is the assembly of UIDs and GIDs. (Refer to [Registering a Fleet \(Fleet List\)](#).)
- 3) Register UIDs and GIDs to be used in a system to the Fleet. (Refer to [Registering a GID](#), [Registering a UID](#).)

Note

- Refer to “NEXEDGE 2nd Generation Basic Configuration” for the detailed configuration procedure of SCU.

2.18 Exporting and Importing GID/ UID Data

The data of GIDs (Fleet) and UIDs (Fleet, Device List) configured by using SCU can be exported as a CSV file. Also, the exported CSV file can be imported to SCU.

By editing the exported CSV file, the GIDs and UIDs can be added and deleted, and the Fleet List to which the GIDs and UIDs belong can be changed. By importing the CSV file to SCU after each data is changed, the configuration contents can be applied to SCU.

Note

- If SCU is waiting for an update before importing or exporting is executed, importing and exporting cannot be executed. Importing and exporting can be executed after the data saved in each configuration screen is written to a system controller by clicking the “Update” button.
- Other users cannot perform any edit operations (Add, Del, Modify) while importing or exporting is being executed.

Exporting GID/ UID Data

The data of GIDs (Fleet) and UIDs (Fleet, Device List) can be exported as a CSV file in **Maintenance > System > Import & Export > Export of SCU**.

Figure 2-18 Export

The following operations can be executed in **Export**:

Table 2-13 Export

Item	Description
Export All	Extracts each configuration data of GIDs (Fleet) and UIDs (Fleet, Device List) from all Fleets registered in SCU and exports the configuration data as a CSV file.
Export	Extracts each configuration data of GIDs (Fleet) and UIDs (Fleet, Device List) from Fleets where Valid of Fleet Management is enabled and exports the configuration data as a CSV file. If Valid is disabled for all Fleets, the “Export” button is deactivated.
Fleet Management	Displays Fleet Management of the login user configured in System Administrators .
Valid	Selects the Fleet to be exported when clicking the “Export” button. The checkbox can be edited only if Fleet Range (MIN-MAX) is configured. The configuration status of Valid is saved when the “Save”, “Export”, or “Export All” button is clicked.
Save	Saves the configuration status of Valid .

Note

- The file name of an exported CSV file is “NEXEDGE_export_1-100_yyyy-mm-dd.csv” for Export All, and “NEXEDGE_export_○-△_yyyy-mm-dd.csv” for Export. (*○ corresponds to Fleet Range (MIN) and △ corresponds to Fleet Range (MAX).) A maximum of 10 Fleet Ranges can be specified in **Fleet Management**, therefore, a maximum of 10 sets of Fleet Range (MIN) and Fleet Range (MAX) may exist.
- Exporting cannot be executed if “None” is configured in Access Permission of Device List or Fleet List.

Importing GID/ UID Data

The exported CSV file can be imported to SCU in **Maintenance > System > Import & Export > Import** of SCU.

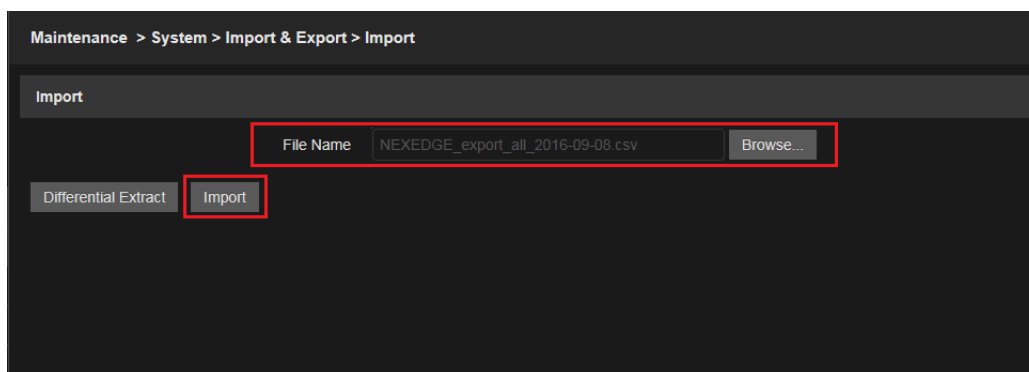


Figure 2-19 Import

Clicking the “Browse” button to select the CSV file to import and then clicking the “Import” button executes import. Write the read data to a system controller by clicking the “Update” button after importing completes.

Note

- Up to 2,000 items can be imported at (the total number of addition, deletion, and changes) at one time.
- Importing is executed according to the Fleet administrative privileges configured in **Fleet Management**. For example, an error occurs if user A who is allowed for only Fleet 1 imports Fleet 2.
- An error occurs if the configuration with no editing privileges in Access Permission is imported.
- The determination of error is made when importing, and if importing cannot be executed because of an error, the content of the error is saved in a text file and automatically downloaded. The file name of the downloaded file is “ImportError_Importfilename.txt”.

Confirming the importing results beforehand

By clicking the “Differential Extract” button after the “Browse” is clicked and the CSV file to import is selected, the configuration to be applied when importing is executed can be exported to the CSV file and confirmed.

To avoid rewriting the SCU configuration data into unintended data by the importing operation, a system administrator can confirm the importing results beforehand.

This chapter explains various functions for the NEXEDGE system to continue or maintain behavior without stopping, such as the function to temporarily use a control channel as a traffic channel, and the function to provide the minimum communication capability for a subscriber unit in a site even if a NEXEDGE system cannot provide trunking capability for the site.

3.1 Using a Control Channel as a Traffic Channel (Non-dedicated Control Channel)

Non-dedicated Control Channel is the function to use a control channel as a traffic channel when all the traffic channels in a site are being used.

If a control channel is operated as a dedicated channel, the number of traffic channels becomes 1 less than the total number of channels stored in a site. When all of the traffic channels are being used in a site with a small number of channels, temporarily dedicating a control channel as a traffic channel and handling an additional channel for calls may be better.

Using this function can temporarily use a control channel as a traffic channel when all the traffic channels in a site are being used. While the control channel is behaving as a traffic channel, the site enters the state where no control channel exists. Therefore, even if another call finishes and the channel becomes available, the system cannot accept a new call request while no control channel exists.

A Non-dedicated Control Channel immediately starts the behavior as a traffic channel if a call request is received from a subscriber unit while all the traffic channels are being used.

The Non-dedicated Control Channel is allocated as a traffic channel only if all the traffic channels are being used.

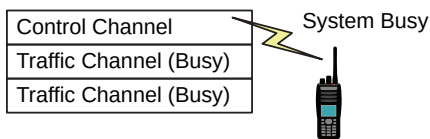
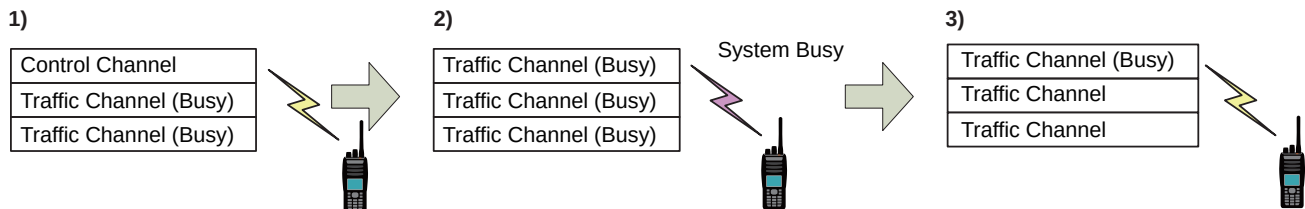
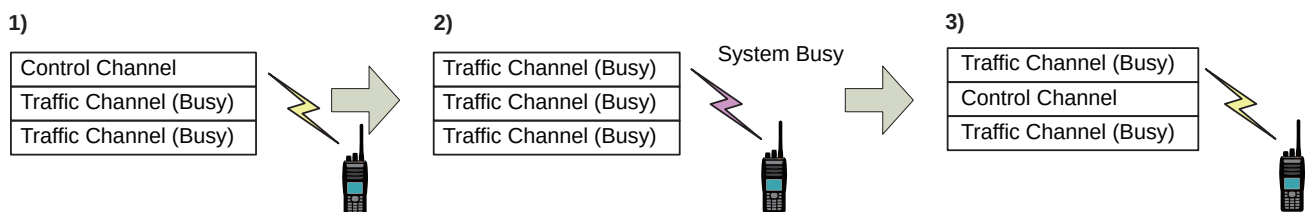
The NEXEDGE system behaves as follows according to depending on the configuration in **Non-dedicated Control Channel**:

Table 3-1 Configuration of Non-dedicated Control Channel

Item	Description
None	The Non-dedicated Control Channel function does not function.
Fixed CCH	A control channel is used as a traffic channel when all of the traffic channels in a site are used. The system temporarily has no control channel while a Non-dedicated Control Channel is used as a traffic channel. Even if another call finishes and the traffic channel becomes available, the system cannot accept a new call request while no control channel exists. Late Entry is temporarily disabled when the Non-dedicated Control Channel is used as a traffic channel. When the call is finished and the channel is activated again as a control channel, Late Entry becomes enabled and a subscriber unit can participate in the ongoing call midway through the call.
Dynamic CCH	A control channel is used as a traffic channel when all of the traffic channels in a site are used. The system temporarily has no control channel while a Non-dedicated Control Channel is used as a traffic channel. Even if another call finishes and the traffic channel becomes available, the system cannot accept a new call request while no control channel exists. Late Entry is temporarily disabled when the Non-dedicated Control Channel is used as a traffic channel. When the call and any of the calls in the site ended and the traffic channel is activated as a control channel, Late Entry becomes enabled and a subscriber unit can participate in the ongoing call midway through the call.

Note

- To use Dynamic CCH, the firmware versions of all subscriber units need to support Dynamic CCH.

A) Non-Dedicated Control Channel = None**B) Non-Dedicated Control Channel = Fixed CCH****C) Non-Dedicated Control Channel = Dynamic CCH****Figure 3-1 Examples of Non-dedicated Control Channel behavior****A)**

Because “None” is configured in **Non-Dedicated Control Channel**, the number of traffic channels is two. And because the two of the traffic channels are busy, a call cannot be initiated even if a new call request is received.

B)

- 1) Because “Fixed CCH” is configured in **Non-Dedicated Control Channel**, the control channel behaves as a traffic channel when a new call request is received and accepts the call while the two of the traffic channels are busy.
- 2) When the 3 traffic channels are busy, a call cannot be initiated even if a new call request is received.
- 3) Even if another call finishes and the traffic channel becomes available, the system cannot accept a new call request while no control channel exists.

C)

- 1) Because “Dynamic CCH” is configured in **Non-Dedicated Control Channel**, the control channel behaves as a traffic channel when a new call request is received and accepts the call while the two of the traffic channels are busy.
- 2) When the 3 traffic channels are busy, a call cannot be initiated even if a new call request is received.
- 3) When another call is finished and a traffic channel becomes available, the traffic channel that is released first in the site and that can be a control channel is activated as a control channel and accepts a call request.

Note

- In a site where the **Non-dedicated Control Channel** is used, Queue behaviors cannot be accepted because a control channel is allocated as a traffic channel when all traffic channels in the site are being used.
- The site cannot receive a new call while the **Non-dedicated Control Channel** is used as a traffic channel.
- **Non-dedicated Control Channel** does not behave on a channel with “Control Channel” or “Traffic Channel” configured in **Channel Mode**.
- In a NEXEDGE system which has **Hold Time** and is operated by **Transmission Trunked**, the traffic channel is retained while the **Hold Time** is counting down in consideration of the continuity of communications even if a subscriber unit completes transmission, but if a control channel is used as the traffic channel, the NEXEDGE system immediately returns to the control channel behavior without counting the **Hold Time** when the subscriber unit completes transmission. The subscriber unit necessarily performs the link behavior after the call is completed.
- While making an Individual Call by **Message Trunked**, a traffic channel cannot be allocated to the **Non-dedicated Control Channel**. In this case, the **Non-dedicated Control Channel** cannot be allocated to the traffic channel, therefore, caution is required when configuring.
- A channel where “Dynamic CCH” is configured in **Non-dedicated Control Channel** does not behave as a traffic channel for Long Data Messages.
- If the channel with “Control Channel” configured in **Channel Mode** is registered, anything other than “None” cannot be configured in **Non-dedicated Control Channel**.
- If the site for which **Non-Dedicated Control Channel** is configured and which consisted of 2 or more channels has one channel remaining such as because of a failure, the site enters Failsoft mode.

Configuration items using SCU

- Configuring **Non-dedicated Control Channel** ( **See** Edit > System List > Site List > General (Edit))
- Configuring **Channel Mode** ( **See** Edit > System List > Site List > Channel List > General (Edit))

3.2

Securing the Minimal Communication Capability When a Network Failure Occurs (Failsoft Mode)

Failsoft Mode is the function that can provide the minimal communication capability for subscriber units in a site even if the NEXEDGE system cannot provide the trunking capability for the site due to a failure of a device in the site.

The channel where "ON" is configured for this function enters Failsoft mode when a network connection between channels is disconnected due to the failure of a hub or repeater etc., or if a control channel candidate or traffic channel candidate, or both a control channel candidate and traffic channel candidate do not exist among channels which can function normally.

The channel which detects such as a network failure behaves as a Failsoft channel if the channel is a channel where **Failsoft Mode** is enabled. The channel where **Failsoft Mode** is disabled stops serving. A Failsoft channel behaves as a channel dedicated to Failsoft. The Failsoft channel periodically notifies subscriber units that the channel has been in Failsoft mode.

While in Failsoft mode, UIDs and GIDs are not checked, and all digital call requests are repeated. Only group voice calls within the same Failsoft channel are available.

If a failure such as a network failure is resolved, the channel which detects the failure resolution resumes normal operation.

If "OFF" is configured for this function, Failsoft does not work. The channel which detects the failure stops transmission and enters the standby mode. If the failure is resolved, the channel which detects the failure resolution resumes normal operation.

 Note

- During Failsoft mode, the control channel information of adjacent sites is periodically sent. However, if a failure occurs in network communications, the information before the failure occurrence is sent, therefore, the content may not be correct.
- A subscriber unit executes a channel hunt while the NEXEDGE system is restarting.
- A call during Failsoft mode is not recorded in a communication log.
- The **Repeat Disable** status before the channel enters Failsoft mode continues when the channel enters Failsoft mode. The **Repeat Disable** operation during Failsoft mode operates as a function to stop and resume transmission for each channel, and the status change is not retained. Therefore, the **Repeat Disable** status after the channel restores from Failsoft mode is the same status as before the channel enters Failsoft mode.
- A Station ID is not sent during Failsoft mode.
- No analog signal is repeated even if the channel configured as a Shared Channel starts working as a Failsoft channel.

Configuration items using SCU

Configuring **Failsoft Mode** ( See Edit > System List > Site List > Channel List > General (Edit))

About Failsoft Mode Viewed From a Subscriber Unit

If a control channel starts working as a Failsoft channel, a subscriber unit executes a channel hunt, and then enters Failsoft mode when the subscriber unit finds the Failsoft channel. If transmission on the Failsoft channel stops and the control channel enters normal operation, the subscriber unit executes a channel hunt and exits Failsoft mode. The subscriber unit executes a background hunt during Failsoft mode.

Restricting a Continuous Transmission of a Repeater during Failsoft Mode (Time-out Timer)

Time-out Timer is the function to configure a time limit for a continuous transmission of a repeater during in Failsoft mode.

This function is used to avoid occupying a repeater in Failsoft mode.

The configuration value of the timer is periodically notified to subscriber units on a Failsoft channel. The subscriber units determines the continuous transmission time on the Failsoft channel by receiving this notification.

If “Unlimited” is configured in **Time-out Timer**, the continuous transmission time of the subscriber unit is the length of time configured for the subscriber unit.

Configuration items using SCU

Configuring **Time-out Timer (Failsoft Mode)** ( See Edit > System Configuration > Default Timers)

3.3

Notifying Subscriber Units that the Network Between Sites Is Disconnected (Network Failure Information)

Network Failure Information is the function to notify subscriber units that the site is temporarily isolated from the network because a network failure occurred among sites in a multi-site system.

With this function, a user notices that the site the user is currently accessing cannot provide a function to use the network.

If the site determines that the network connection between sites has been disconnected because of the incapability of connecting to any site, the site notifies subscriber units that the site has been isolated from the network. When the site connects to another site again via the network, the site notifies the subscriber units that the site has recovered from the isolated status.

When a subscriber unit receives the notification of the network failure from the NEXEDGE system, the subscriber unit notifies the site status to the user by showing it on the display and by an alert tone according to the configuration of the subscriber unit.

 Note

- Each site monitors whether a network failure occurs in the communication with a system controller every 10 sec, and detects a network disconnection if the communication with a system controller cannot be monitored for 30 sec. Therefore, when a network disconnection occurs among sites, a maximum of 30 sec are required before the network disconnection is detected.

About Relationship with Secondary COS

If the Home Site is disconnected from the network and the service class configuration cannot be identified, the NEXEDGE system accepts use by the subscriber unit connected to each site within the range permitted by secondary COS. If the connection to the network is restored and communication to another site is re-established, the call between the sites can automatically be recovered and a normal intersite call is allowed. (Refer to [Configuring a Secondary GID COS](#), [Configuring a Secondary UID COS](#).)

Configuration items using SCU

Configuring **Network Failure Information** ( **See** Edit > System Configuration > Broadcast Message)

3.4 Avoiding Interruption of Received Audio (Jitter Buffer)

Jitter Buffer is the buffer memory to tolerate a variation in the intervals for packet data to reach the network (jitter). To tolerate jitters, a traffic channel stores the received packet data in the buffer memory, and then the packet data stored in the buffer memory is sent by RF transmission at regular intervals. This behavior can avoid interruption of received audio on the receiving subscriber unit by reducing the effect of jitters when transmitting and receiving audio packets among sites.

Larger jitter buffer size increases delay of the received audio, but the risk of interruption of the received audio reduces.

Smaller jitter buffer size increases the risk of interruption of the received audio, but delay of the received audio reduces.

Minimum Jitter Buffer Size

In **Minimum Jitter Buffer Size**, the minimum value of the packet data stored in the buffer memory can be configured. The traffic channel stores the amount of packet data equivalent to the configured amount of time in the buffer memory.

If the packet data stored in the buffer memory exceeds the configuration in **Minimum Jitter Buffer Size**, the traffic channel starts sending the packet data stored in the buffer memory by RF transmission. If the packet data to be sent by RF transmission does not exist in the buffer memory after starting RF transmission, interruption of received audio occurs on the receiving subscriber unit.

Note

- **Minimum Jitter Buffer Size** functions only for a voice communication. The received packet data is not stored in the buffer memory if data communications are made.

Configuration items using SCU

Configuring **Minimum Jitter Buffer Size** ( **See** Edit > System List > Network)

Maximum Jitter Buffer Size

In **Maximum Jitter Buffer Size**, the maximum value of the packet data stored in the buffer memory can be configured. The traffic channel stores the amount of packet data equivalent to the configured amount of time in the buffer memory. Such as the sending speed of the packet data is slower than the receiving speed of the packet data, if the amount of packet data stored in the buffer memory exceeds the configuration in **Maximum Jitter Buffer Size**, the traffic channel discards the received packet data.

Note

- **Maximum Jitter Buffer Size** functions only for a voice communication. The received packet data is not stored in the buffer memory if data communications are made.

Configuration items using SCU

Configuring **Maximum Jitter Buffer Size** ( **See** Edit > System List > Network)

3.5**Controlling Transmission from a Subscriber Unit (Restriction Control)**

Restriction Control is the function to temporarily control transmission from a subscriber unit when congestion occurs in a site.

Congestion is caused by the excess of communication requests, such as when a disaster has occurred, and the efficiency of communication may decrease extremely and congestion collapse may occur under certain circumstances. By controlling transmission from a subscriber unit when congestion occurs, a NEXEDGE system quickly recovers from the congestion state and avoids congestion collapse.

When a site detects excessive congestion, the site notifies the transmission control information in the site according to the degree of congestion. The subscriber unit that received the transmission control information temporarily defers an access to the site according to the control information. Deferring the access to the site reduces collisions of communication requests in the site and helps the site recover from the congestion state. When the site detects the recovery from the congestion state, the site removes the transmission control.

The following controlling behaviors are contained in the transmission control information of a subscriber unit:

● Group control

- A site notifies the group control to change the target of control at regular intervals (controlling the traffic to 50 %).
- A subscriber unit defers an access to the site according to the group control information.
- By reducing hourly accesses from subscriber units to the site, the collision probability of communication requests in the site is lowered.
- For the group control, the fairness of the subscriber units behaving according to the control is maintained by changing the target of control at regular intervals.

● Access cycle control

- A site notifies an access cycle based on the time of when a transmission request or location registration request is sent from a subscriber unit (20 frames).
- If a subscriber unit is under the transmission control, the subscriber unit accesses the site next time according to the access cycle.
- For the access cycle control, the access of communication requests is distributed when the transmission control is removed.

● General subscriber unit control

- For the transmission control, a subscriber unit of the general type behaves under the transmission control according to the control information.

● Random access control

- A site notifies the delay time of the random access.
- A subscriber unit extends the maximum value of the delay time of the random access.
- The random access control lowers the collision probability of the random access.

A NEXEDGE system behaves as follows according to the configuration in **Restriction Control**:

Table 3-2 Configuration of Restriction Control

Configuration	Description
ON	Controls the transmission of a subscriber unit depending on the congestion state of the site.
OFF	Does not control the transmission of a subscriber unit.

 Note

- Restriction Control functions only for a subscriber unit having firmware supporting this behavior.
- Whether to make a subscriber unit the target of the transmission control can be configured in **Priority Subscriber Class** of Fleet List or UID List. (Refer to [Configuring whether to make a subscriber unit the target of the transmission control \(Priority Subscriber Class \(Fleet\)\)](#), [Configuring whether to make a subscriber unit the target of the transmission control \(Priority Subscriber Class \(UID\)\)](#).)
- A subscriber unit for which “Priority Subscriber” is configured in **Priority Subscriber Class** is not the target of the transmission control.

Configuration items using SCU

Configuring **Restriction Control** ( **See**) Edit > System Configuration > General)

This chapter explains various functions such as switching configuration of a control channel, remote control from SCU, sharing information by using SCU, checking the status of a subscriber unit in operation, acquiring communication records and operating records of a system, and checking the status of a system or a repeater, used to maintain and manage each device making up a NEXEDGE system.

4.1

Averaging the Operation Time of a Repeater By Periodically Switching a Control Channel (Automatic Rollover)

Automatic Rollover is the function to automatically switch a control channel in a site at specified intervals. This function is used to level off the deterioration of peripheral equipments such as the power amplifier connected to the repeater by averaging the transmission time of the control channel.

Use **Rollover Time** to switch the control channel at a certain time of a day. For example, the switching time can be configured such as to late at night when the operation rate of the system is low.

Rollover Interval Timer is used to switch a control channel a little more frequently. Using this function can switch the control channel at regular interval of times based on the time configured in **Rollover Time**. The switching interval can be configured by hours.

The control channel is switched to a channel in order from the lowest channel number among the channels where “Control Channel” or “Dual-functional Channel” is configured in **Channel Mode**.

 Note

- The subscriber unit and the system needs to be configured so that the subscriber unit can acquire a control channel even if the control channel is switched.
- At a timing when the control channel is switched, if a channel where “Dual-functional Channel” is configured is used as a traffic channel or is used in analog transmission, the channel is skipped, and the next available channel for a control channel is selected.

Configuration items using SCU

Configuring **Automatic Rollover** ( See Edit > System List > Site List > General (Edit))

Rollover Time

Rollover Time is the time to automatically switch a control channel in a site. The control channel can automatically be switched by using a time slot when the operation rate of the system is low. Use this function to switch the control channel once a day.

If **Automatic Rollover** is enabled, the time to switch the control channel can be configured by hours.

For example, if "1" is configured in **Rollover Time**, the control channel is automatically switched at 1 o'clock in the night.

Configuration items using SCU

Configuring **Rollover Time** ( See Edit > System List > Site List > General (Edit))

Rollover Interval Timer

Rollover Interval Timer is the interval to automatically switch a control channel in a site. **Rollover Interval Timer** is configured to frequently switch a control channel in a site.

The control channel can be switched at regular interval of times based on the time configured in **Rollover Time**. The switching interval can be configured by hours.

For example, if "12" is configured in **Rollover Interval Timer**, the control channel is automatically switched at 12-hour intervals.

For example, if "1" is configured in **Rollover Time** and "13" is configured in **Rollover Interval Timer**, the control channel is switched at 1 o'clock and 14 o'clock, and then switched at 1 o'clock configured in **Rollover Time**.

Configuration items using SCU

Configuring **Rollover Interval Timer** ( See Edit > System List > Site List > General (Edit))

4.2

Remotely Controlling a Device (Remote Control)

Remote Control is the function to remotely control a device such as a system controller. This function is used such as when the system becomes unstable or when restarting a program is attempted. At the same time, it can be used to check the status of the redundant system controller and switch the system controller to run.

In **Maintenance > System > Remote Control** of SCU, a system controller can be restarted, and the operations such as stopping and restarting a behavior of the system controller can be enabled.

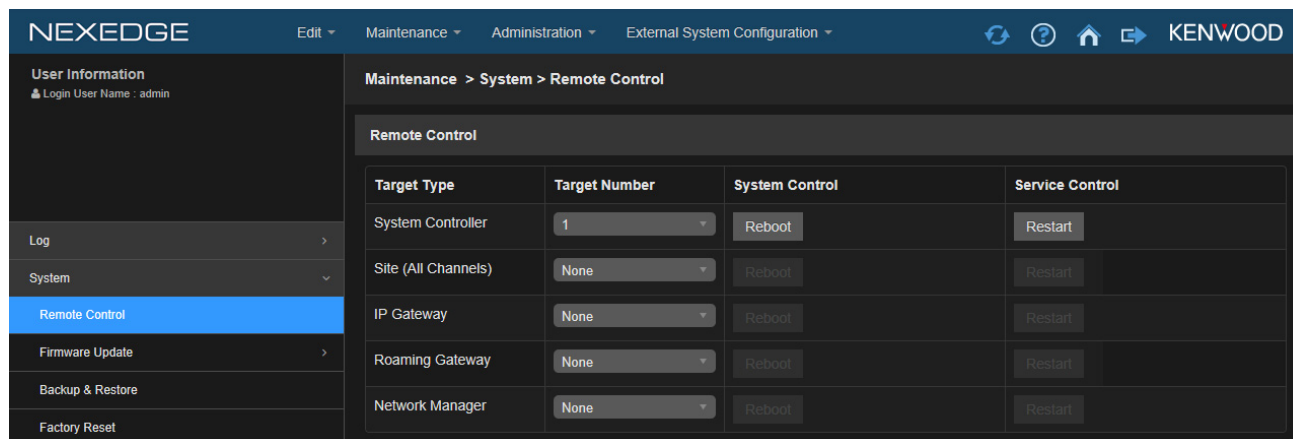


Figure 4-1 Remote Control

Table 4-1 Remote Control

Item		Description
Remote Control	Target Type	The type of device to be controlled by the remote control is displayed. The following devices are displayed: • System Controller • Site (All Channels) • IP Gateway • Roaming Gateway • Network Manager
	Target Number	Target Number allows a system administrator to configure the number of the device to be controlled by the remote control. Target Number can be configured by selecting a number from the numbers registered in each Target Type. Number configuration: 1 to 24 (System Controller) 1 to 4094 (Site (All Channels)) 1 to 240 (IP Gateway) None: The devices registered in Target Type are not controlled by the remote control. All: All of the devices registered in Target Type are controlled by the remote control. Note • To make these devices controlled by the remote control if “Network Manager” or “Roaming Gateway” is configured in Target Type, configure “All” in Target Number.
System Control	Reboot	Clicking this button restarts the specified device.
Service Control	Restart	Clicking this button stops a behavior of the specified device and then restarts the behavior.

Restarting a Device (Reboot)

Clicking the “Reboot” button in **Maintenance > System > Remote Control > System Control** of SCU can restart a device such as a system controller.

Rebooting the device can restore it to the same state as when the device is turned on. The device cannot be used while rebooting. While the system controller is restarted, each site in a NEXEDGE system behaves in Site Trunking mode.

Note

- In the system where the system controllers are redundant, the system controllers can be switched if a reboot is executed. Refer to “[Configuring a Redundant System Controller \(System Controller Redundancy\)](#)” for the redundancy of system controllers.

Resuming a Behavior of a Device (Restart)

Clicking the “Restart” button in **Maintenance > System > Remote Control > Service Control** of SCU can stop a behavior of a device and then restarts the behavior.

The behavior can be resumed in shorter time than **Reboot**, but the status may not be improved depending on the status of the device.

Note

- Even if other services are activated on the device, these services are not affected.
- In the system where the system controllers are redundant, the currently Active system controller is retained even if a restart is executed. The system controllers will not be switched.

Pausing and Resuming a Behavior of a Site during an Emergency (Remote System Standby)

Remote System Standby is the function to pause a site during an emergency and then restart the behavior. Also, whether a site is in the standby state can be confirmed.

This function is used if confirming interference with other stations and if pausing transmission of the site for any other reason.

NEXEDGE Edit Maintenance Administration External System Configuration KENWOOD

User Information
 Login User Name : admin
 Last Used By : admin
 Last Used On : 09/08/2016 7:27:29 pm

Maintenance > System > Remote Control

Remote Control

Target Type	Target Number	System Control	Service Control
System Controller	None	Shutdown Reboot	Stop Start Restart
Site (All Channels)	None	Reboot	Restart
IP Gateway	None	Reboot	Restart
Roaming Gateway	None	Reboot	Restart
Network Manager	None	Reboot	Restart

Remote System Standby

Target System Number 1 Check

No.	Site Number	Site Name	Repeat Disable
1	1	Site-1	ON Change
2	2	Site-2	OFF Change

Figure 4-2 Remote System Standby

Table 4-2 Remote System Standby

Item	Description
Target System Number	Target System Number allows a system administrator to configure the system number for confirming the site operation status. Target System Number can be configured by selecting a system number from the system numbers registered in System List. Note If Target System Number is changed, the results of the operation statuses are reset.
Check	If this button is clicked, a system administrator can confirm whether each site in the system specified in Target System Number is in the standby state.
Repeat Disable	In Repeat Disable , whether each site in the system specified in Target System Number is in operation or in the standby state is displayed. Also, a system administrator can switch the site status to the in-operation state (OFF) or the standby state (ON).
Change	If this button is clicked, a system administrator can switch a site to the status specified in Repeat Disable. Note This button becomes enabled when the status of Repeat Disable is changed.

Checking the System Controller Status and Switching the System Controller to Run (System Controller Redundancy Status)

System Controller Redundancy Status is the function to check the status of the system controller during redundancy operation and to switch the system controller to run.

It allows the status of a redundant system controller that is currently running to be checked. Also, it is possible to switch the system controller to enable a specific system controller to run or stand by such as during maintenance.

System Controller Redundancy Status

Target System Number

1

Check

Switch

No.	System Number	System Name	IP Address	Redundancy	Status
1	1	System-1	172.16.1.125	Main	Active
2	1	System-1	172.16.1.127	Sub	Standby

Figure 4-3 System Controller Redundancy Status

Table 4-3 System Controller Redundancy Status

Item	Description
Target System Number	Target System Number allows the system administrator to check the system controller status during redundancy operation or configure the number of the system for switching the system controller to run. The primary system controller is used for checking the system controller status during redundancy operation or switching the system controller to run with regard to the system controller of the system specified in Target System Number. Note Target System Number only allows configuration of system numbers for which Sub IP Address is configured. (Refer to: Configuring the IP address of a system controller (Main IP Address/ Sub IP Address))
Check	Clicking this button acquires the status information of the system controller that is currently running on the system specified in Target System Number . Information that is acquired is displayed in the Status field.

Item	Description
Switch	After the status of the system controller is acquired using the “Check” button, clicking the “Switch” button enables switching of the system controller to run on the system specified in Target System Number. The behavior when switching of the system controller is successful varies as follows depending on whether the system controller of the system specified in Target System Number is the primary system controller. ● When the Target System Number corresponds to the primary system controller The SCU shifts to the login screen and a pop-up window indicating that switching is successful is displayed on the login screen. ● When the Target System Number does not correspond to the primary system controller The status after switching is shown in the Status field.  Note • The “Switch” button is operable only when the system controller status has been acquired using the “Check” button. However, the “Switch” button cannot be operated if the Status field contains “Synchronous” or “Not Connected”. • If the Target System Number is changed after the system controller status is acquired using the “Check” button, the “Switch” button cannot be operated. When this occurs, press the “Check” button again to obtain the system controller status before operating the “Switch” button. • The “Switch” button cannot be operated repeatedly after the system controller status is acquired using the “Check” button. In this case, press the “Check” button again to obtain the system controller status before operating the “Switch” button.
System Number	System Number displays the number of the system that is acquired via operation using the “Check” or “Switch” button.
System Name	System Name displays the name of the system that is acquired via operation using the “Check” or “Switch” button.
IP Address	IP Address displays the IP address that is acquired via operation using the “Check” or “Switch” button (Main IP Address or Sub IP Address). (Refer to: Configuring the IP address of a system controller (Main IP Address/ Sub IP Address))
Redundancy	Redundancy shows whether redundancy operation is applied to the main or sub system controller with regard to the respective system controller statuses of the system that are acquired via operation using the “Check” or “Switch” button. (Refer to: Configuring the IP address of a system controller (Main IP Address/ Sub IP Address)) ● Main The system controller behaves as the main system controller. Main system controller is the system controller with the IP address configured in Main IP Address. ● Sub The system controller behaves as the sub system controller. Sub system controller is the system controller with the IP address configured in Sub IP Address.
Status	Status displays the status of the redundancy operation for the respective system controllers of the system that are acquired via operation using the “Check” or “Switch” button. ● Active The system controller is running and in the state of controlling the system. ● Standby The system controller is in the standby state and not controlling the system. Also, data synchronization is not carried out with the active system controller. ● Synchronous Data is in sync between the system controller and the active system controller. ● Not Connected Appears when the operating status of the system controller cannot be acquired for some reasons, such as when the network connection between the primary system controller and the system specified in Target System Number has been cut off.

4.3

Sharing Information Among Multiple Operators (Information Message)

Information Message is the function to transmit information among SCU users. If the information to be notified to SCU users such as notifications of adding a site or of maintenance time is written in **User Message**, each user can check the contents in **Information Message** when logging in SCU and use like a bulletin board.

Displaying Messages from Other Operators When Logging in SCU

In **Edit > Home > Information Message** of SCU, various information can be checked.

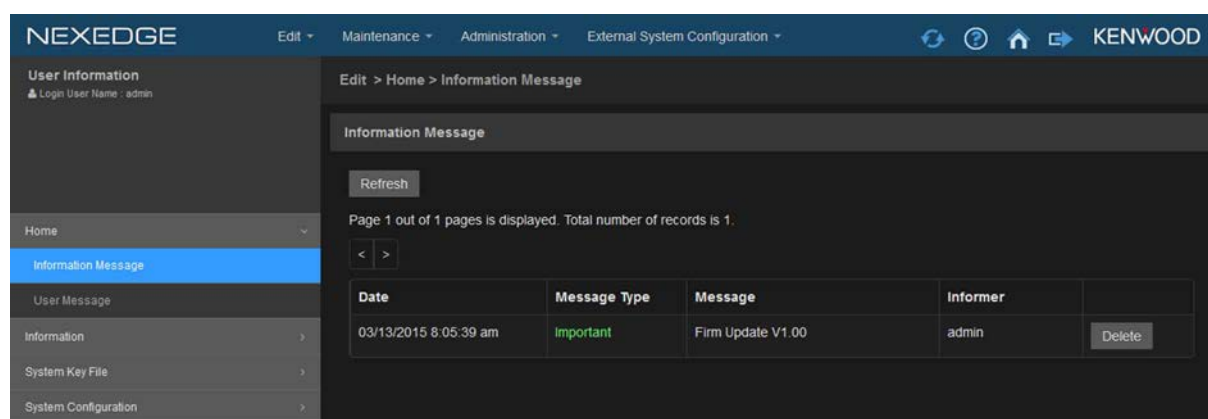


Figure 4-4 Information Message

In **Information Message**, messages are displayed starting with the latest one, and a maximum of 1,000 messages can be recorded. If the number of messages exceeds 1,000, messages in the order of the oldest are deleted. The messages are displayed in color coded according to the message type.

Table 4-4 Information Message

Item	Description
Date	In Date , the time when a message was written is displayed.
Message Type	In Message Type , the message type configured in User Message is displayed. The characters of the messages are displayed in color coded according to the configuration in Message Type as follows: Urgent: Red Important: Green Priority: Blue Normal: White
Message	In Message , the messages written by SCU users are displayed.
Informer	In Informer , the name of the user who wrote the message is displayed. A person who wrote the message can be checked.
Delete	The user who created a message can delete only the message that the user created. Clicking the "Delete" button displays the confirmation message, and then clicking the "Yes" button deletes the message.
Refresh	Clicking this button updates the displayed contents in Information Message . This function is used when confirming the latest information is required such as when multiple users are logging in.

Writing a Message (User Message)

In **Edit > Home > User Message** of SCU, a message displayed in **Information Message** can be written.

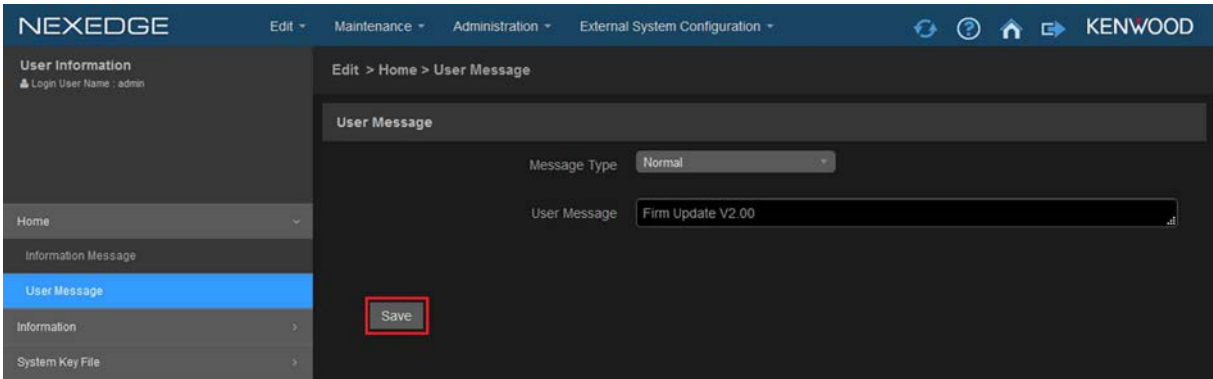


Figure 4-5 User Message

Clicking the “Save” button after selecting a message type from **Message Type** and entering a message in **User Message** writes the entered message to the database.

Table 4-5 Configuration of User Message

Item	Description
Message Type	Message Type allows a system administrator to configure the type of a message. By configuring Message Type , the urgency and importance of a message can be indicated. In Information Message , the characters are displayed in color coded according to the configuration in Message Type as follows: Urgent: Red Important: Green Priority: Blue Normal: White
User Message	User Message allows a system administrator to enter a message to be displayed in Information Message . A maximum of 150 characters can be entered.

4.4

Confirming in Which Site a Subscriber Unit Is Registered (Registration Monitor)

Registration Monitor is the function to monitor the registration status of a subscriber unit. A system administrator can confirm the NEXEDGE system and site in which the specified UID is currently registered.

In **Maintenance > System > Registration Monitor** of SCU, the registration information of a subscriber unit can be confirmed after acquiring from the NEXEDGE system.

Figure 4-6 Registration Monitor

Entering the UID of a subscriber unit whose registration information is acquired in **Target UID**, and then clicking the “Unit Search” button acquires the registration information of the subscriber unit specified in **Target UID** and displays it in each item of **User Location**.

Table 4-6 User Location

Item	Description
Network Category	In Network Category , the Network Category of the NEXEDGE system in which the UID specified in Target UID is registered is displayed.
System Code	In System Code , the system code of the NEXEDGE system in which the UID specified in Target UID is registered is displayed.
Site Number	In Site Number , the site number of the NEXEDGE system in which the UID specified in Target UID is registered is displayed.

Note

- If a UID not configured in the NEXEDGE system or a UID not allowed to be used in the NEXEDGE system is specified, the registration information is not acquired.
- If a UID not configured in the NEXEDGE system or a UID without registration information is searched, “--” is displayed in each item of **User Location**.

4.5

Acquiring Communication Records of a Subscriber Unit (Communication Log)

Communication Log is the communication records which occurred in a NEXEDGE system. The communication log can be acquired in a CSV format file. A system administrator can acquire the communication log to check the details of communications. By processing the acquired communication log, the communication log can also be used as billing information of system users.

A maximum of 72,000 communication logs can be recorded. The communication log is a ring buffer and has a certain amount of recording capacity. If the recording capacity is reached maximum, the record from the oldest is automatically deleted. Also, the communication log is deleted when **Factory Reset** is performed. (Refer to [Resetting the Configurations of a System Controller to the Initial State \(Factory Reset\)](#).)

In **Maintenance > Log > Communication Log** of SCU, the communication log can be downloaded in the CSV format.

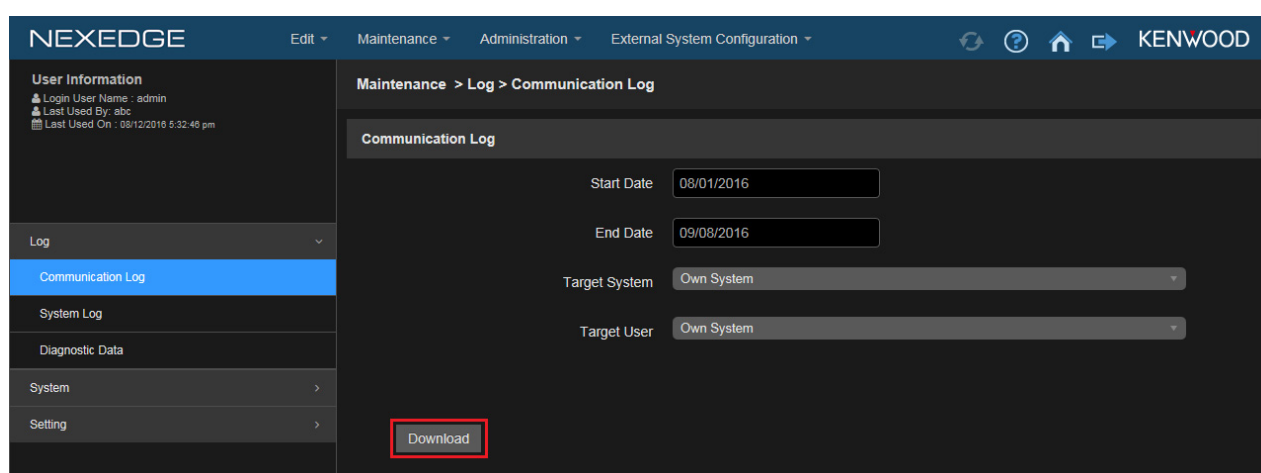


Figure 4-7 Communication Log

- 1) Specify the period of the communication log to download in **Start Date** and **End Date**.
Clicking **Start Date** or **End Date** displays the calendar, and a date can be selected.
- 2) In **Target System** and **Target User**, select the system and user to target for acquiring a communication log.
(Refer to [Selecting the System and User to Target for Acquiring a Communication Log](#).)
- 3) Click the "Download" button.
 - The communication log of the specified period is downloaded. While downloading the communication log, the progress status is displayed. Download can be canceled by pressing the "Cancel" button.
 - The steps for saving vary depending on the browser.
 - The contents of the downloaded file can be checked in software such as Excel, as the file is in the CSV format.

Selecting the System and User to Target for Acquiring a Communication Log

Target System

Target System is the function to select the system where the call was made.

A system administrator can confirm calls made in the own system and calls made in the other system.

Table 4-7 Target System

Item	Description
Own System	A system acquires a communication log of the calls made in the own system. By using this item in combination with the Target User configuration, the communication log of the subscriber units in a specific system alone can be acquired.
1: System Name to 23: System Name	A system acquires a communication log of the calls made in the selected other system. If anything other than "Own System" is selected from Target System , only the communication log of the subscriber units in the own system can be acquired.

Target User

Target User is the function to select the system to which a subscriber unit that made a call belongs.

A system administrator can confirm the calls made by the subscriber units in a specific system.

Target User can be configured if "Own System" is configured in **Target System**.

Table 4-8 Target User

Item	Description
All	A system acquires a communication log of the calls made by all subscriber units.
Own System	A system acquires a communication log of the calls made by the subscriber units in the own system.
1: System Name to 23: System Name	A system acquires a communication log of the calls made by the subscriber units in the selected other system.

4.6

Acquiring Operating Records of a System (System Log)

System Log is the record of events such as the status, user operations, startup, and shutdown of a NEXEDGE system. The system log can be acquired in a CSV format file. A system administrator can acquire the system log to check the status of the NEXEDGE system. The system log is the record for the early detection of a failure by a system administrator when the NEXEDGE system is in abnormal operations, such as breakdown or misconfiguration.

A maximum of 200 thousand system logs can be recorded. The system log is a ring buffer and has a certain amount of recording capacity. If the recording capacity is reached maximum, the record from the oldest is automatically deleted. The system log is deleted when **Factory Reset** is performed. (Refer to [Resetting the Configurations of a System Controller to the Initial State \(Factory Reset\)](#).)

In **Maintenance > Log > System Log** of SCU, the system log can be downloaded in the CSV format.

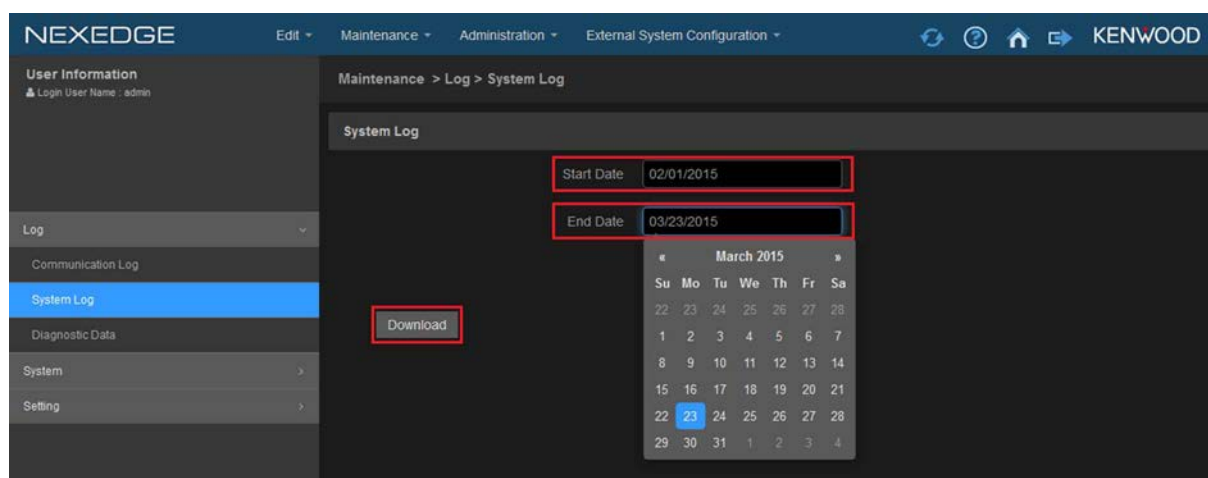


Figure 4-8 System Log

- 1) Specify the period of the system log to download in **Start Date** and **End Date**.
Clicking **Start Date** or **End Date** displays the calendar, and a date can be selected.
- 2) Click the “Download” button.
 - The system log of the specified period is downloaded. While downloading the system log, the progress status is displayed. Download can be canceled by pressing the “Cancel” button.
 - The steps for saving vary depending on the browser.
 - The contents of the downloaded file can be checked in software such as Excel, as the file is in the CSV format.

4.7 Remotely Checking the Status of a Repeater

By using a Network Manager system, a NEXEDGE system can be monitored to check if any problems may occur. Network Manager Client and Network Manager Server work together in monitoring. Network Manager can also configure devices, such as repeaters, system controllers or routers to be monitored. If the number of monitored targets is not exceeding 100, Network Manager Server can be operated on the same PC as the system controller. If the number of monitored targets exceeds 100, Network Manager Server needs to be installed separately. A maximum of 1000 monitored targets can be specified if Network Manager Server is installed.

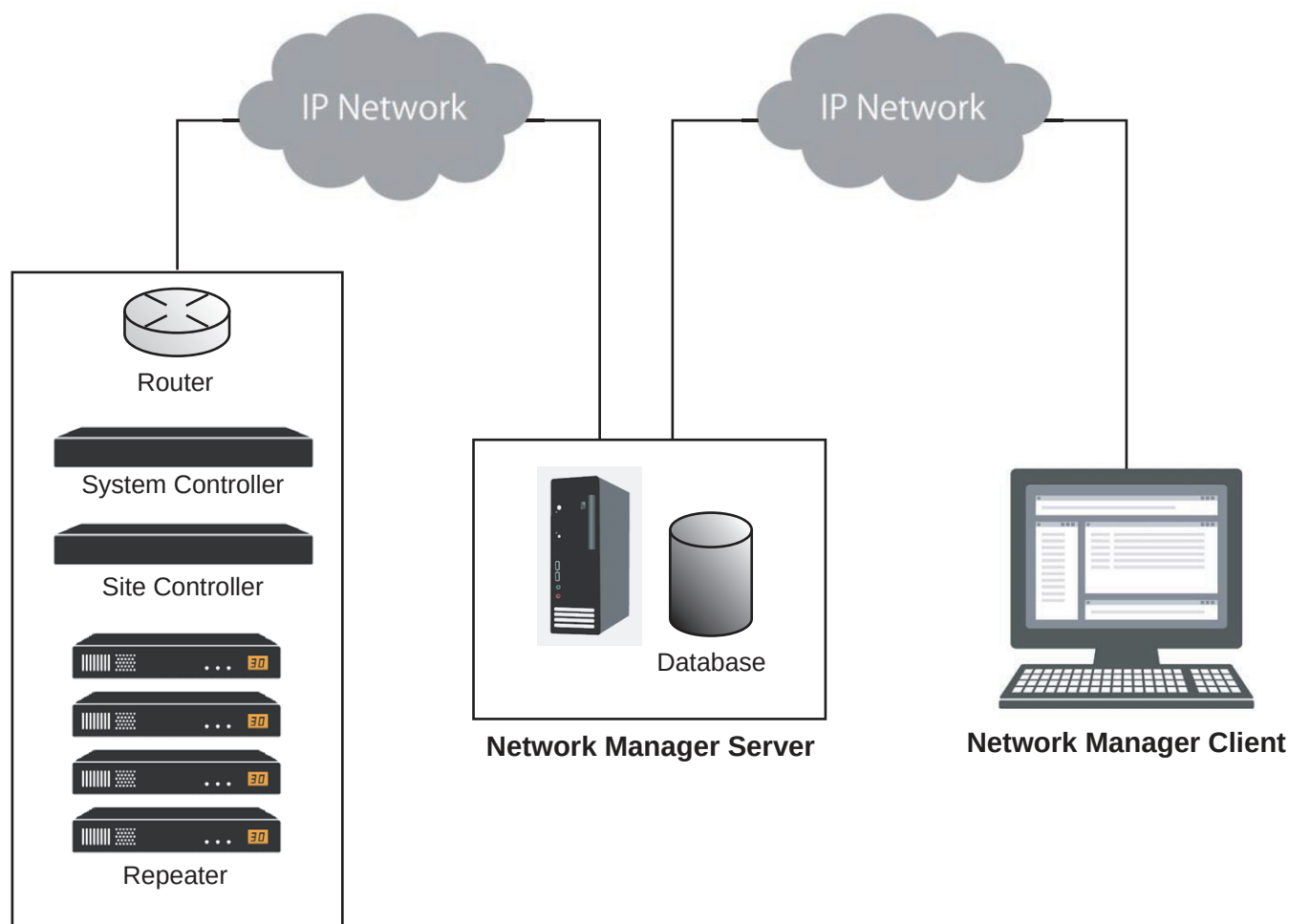


Figure 4-9 Configuration Diagram of a Network Manager System

Note

- Refer to "Network Manager Client Basic Operations" for details of the Network Manager System.

About Network Manager Server

Via an IP network, Network Manager Server monitors the status of devices that make up an NEXEDGE system, such as PC servers and repeaters.

Whether a system controller is used for Network Manager Server or a dedicated PC server is used for Network Manager Server in a Network Manager system can be configured in **External System Configuration > Network Manager** of SCU. Also, if the dedicated PC server is used for Network Manager Server, the IP address of Network Manager Server can be configured.

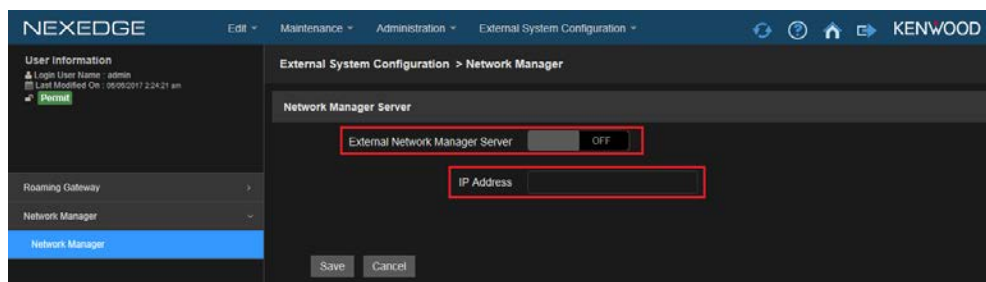


Figure 4-10 Network Manager

If using a system controller for Network Manager Server, configure **External Network Manager Server** to remain “OFF”. The same IP address as that of the system controller is used.

If using a dedicated PC server for Network Manager Server, change **External Network Manager Server** to “ON” and configure the IP address.

About Network Manager Client

Network Manager Client is the software to view the monitoring information acquired by connecting to Network Manager Server via an IP network.

Monitoring Center appears when starting Network Manager Client. In **Monitoring Center**, the status of the NEXEDGE system is displayed and can intensively be monitored.

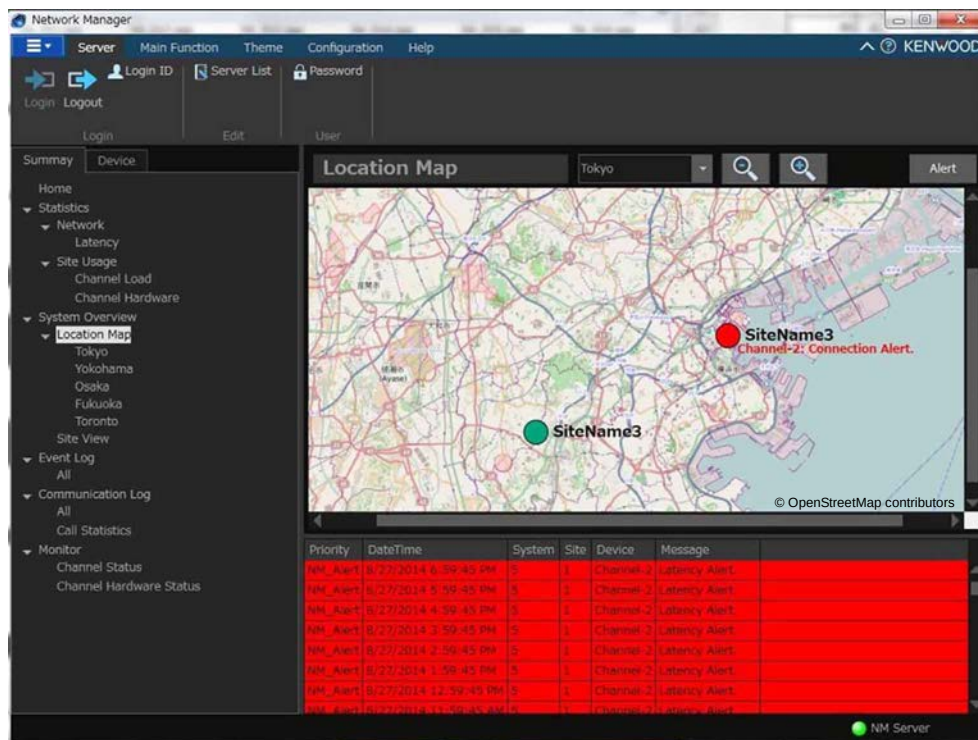


Figure 4-11 Network Manager Client (Monitoring Center)

The main functions are as follows:

- The monitoring results acquired from the connected Network Manager Server can be displayed in a list and on a map, and the monitoring status related to the network or related to the hardware on the channel can be displayed by category. Also, the detailed information on problems can be displayed.
- Statistics information such as the network delay time and channel usage rate between a monitored target and Network Manager Server, and the hardware information of a channel can be viewed.
- The event log data that Network Manager Server acquired and saved from a monitored target can be displayed in a list.
- The communication log data that Network Manager Server acquired and saved from a NEXEDGE system can be displayed in a list. Also, each data of **Record Type**, **Call Type**, and **Direction** of the acquired communication log data can be displayed in a color-coded pie chart.
- The availability of the current channel and the hardware status of a repeater can be monitored.
- The monitoring results acquired from the connected Network Manager Server can be viewed by system controller, site controller, and repeater.

4.8 Site Behavior When a System Controller Stops

Even if a system controller stops for any reason, a minimal communication capability can be provided to subscriber units in a site because the site behaves in Site Trunking mode when the site controller is functioning.

4.9 Using a Subscriber Unit without Changing Configurations Even If a Frequency Is Added (Direct Frequency Assignment)

Direct Frequency Assignment (DFA) is the function to directly notify subscriber units of frequency information in the form of the frequency information. In a NEXEDGE 1st Generation system, the frequency information was notified by using a channel number. Therefore, when a repeater (channel) using a new frequency was added, the frequency information of the subscriber units using the new channel is needed to be overwritten. In a NEXEDGE 2nd Generation system, the subscriber units can use a new channel without overwriting the FPU data, by using DFA. To use this function, configure “Direct Frequency Assignment” in **Channel Announcement**. However, to use this function, all the subscriber units in the NEXEDGE system need to support DFA.

Note

- If “Channel Number” is configured in **Channel Announcement**, the NEXEDGE system notify subscriber units of frequency information by using a channel number. If a subscriber unit does not support DFA, use this notification method.

Configuration items using SCU

Configuring **Channel Announcement** ( Edit > System Configuration > Channel Table > Frequency Allocation)

4.10 Using a Subscriber Unit without Changing Configurations Even If a Control Channel Is Added/ Deleted (Adjacency)

Adjacency is the function to notify subscriber units of information of adjacent sites to select the optimal site. The NEXEDGE system notifies the information of adjacent sites by using information of adjacent sites preconfigured for each site.

The **Additional Control Channels** function notifies subscriber units of added control channel information of adjacent sites, and the **Delete Control Channels** function notifies subscriber units of deleted control channel information of adjacent sites.

Additional Control Channels

Additional Control Channels is the function that notifies a subscriber unit of added control channel information of adjacent sites by using a Broadcast Message. If this function is used, the subscriber unit can find a control channel quickly even if a control channel not preconfigured for the subscriber unit is added.

The NEXEDGE system notifies the added control channel information of adjacent sites by using a Broadcast Message at 60-sec intervals.

If the subscriber unit receives an Additional Control Channel Message, the subscriber unit stores the message in non-volatile memory. At this time, the recorded channel is used in the Normal Hunt Sequence as a control channel candidate.

Note

- If "Local" is configured in **Network Category**, **Additional Control Channels** can be configured in the sites from 1 to 30.
- If "Regional" is configured in **Network Category**, **Additional Control Channels** can be configured in the sites from 1 to 48.

Configuration items using SCU

Configuring **Additional Control Channels** ( **See** Edit > System List > Site List > Adjacency > Additional Control Channels)

Delete Control Channels

Delete Control Channels is the function that notifies a subscriber unit of deleted control channel information of adjacent sites by using a Broadcast Message. If this function is used, the subscriber unit can find a control channel quickly even if a control channel preconfigured for the subscriber unit is deleted.

The NEXEDGE system notifies the deleted control channel information of adjacent sites by using a Broadcast Message at 60-sec intervals.

If the subscriber unit receives a Deleted Control Channel Message, the subscriber unit stores the message in volatile memory. At this time, the recorded channel is not included in the hunt sequence for a control channel even if the recorded channel is written in the subscriber unit as a control channel candidate.

Also, if a control channel that is received by **Delete Control Channels** is stored as an **Additional Control Channel** in non-volatile memory of the subscriber unit, the memory is deleted.

Note

- Because **Delete Control Channels** is not applied at the Comprehensive Hunt stage, for the subscriber unit allowed for the Comprehensive Hunt stage, a hunt may stop on the deleted control channel.
- If "Local" is configured in **Network Category**, **Delete Control Channels** can be configured in the sites from 1 to 30.
- If "Regional" is configured in **Network Category**, **Delete Control Channels** can be configured in the sites from 1 to 48.

Configuration items using SCU

Configuring **Delete Control Channels** ( See Edit > System List > Site List > Adjacency > Delete Control Channels)

4.11 Confirming Various Information of a NEXEDGE System

The system version, the status of each device, the system code, and license articles of a NEXEDGE system can be confirmed.

Confirming the Version Information of a NEXEDGE System

In **Maintenance > System > Firmware Update > Firmware Update > Current Firmware** of SCU, the system version and checksum of a NEXEDGE system can be confirmed.

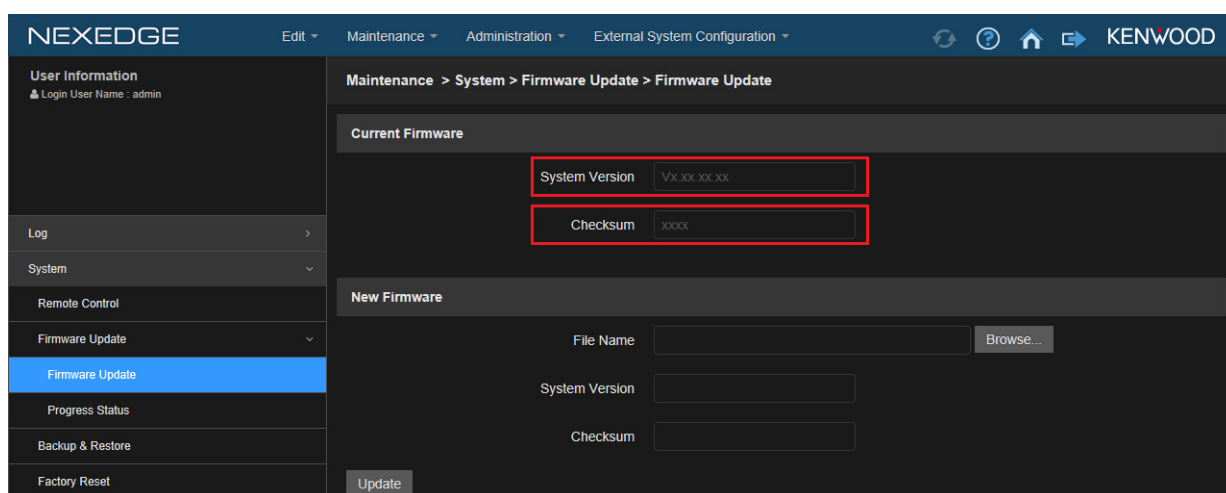


Figure 4-12 Current Firmware

Confirming Whether the Version and Configuration Data Written in a NEXEDGE System Match

Clicking the “Download” button in **Maintenance > System > System Configuration Report** of SCU downloads the configuration information and status of a NEXEDGE system as a file.

The information that can be acquired from **System Configuration Report** is as follows:

- The firmware version of each server and repeater
- The connection status between each server or repeater and a system controller
- The availability status of the frequency of each repeater

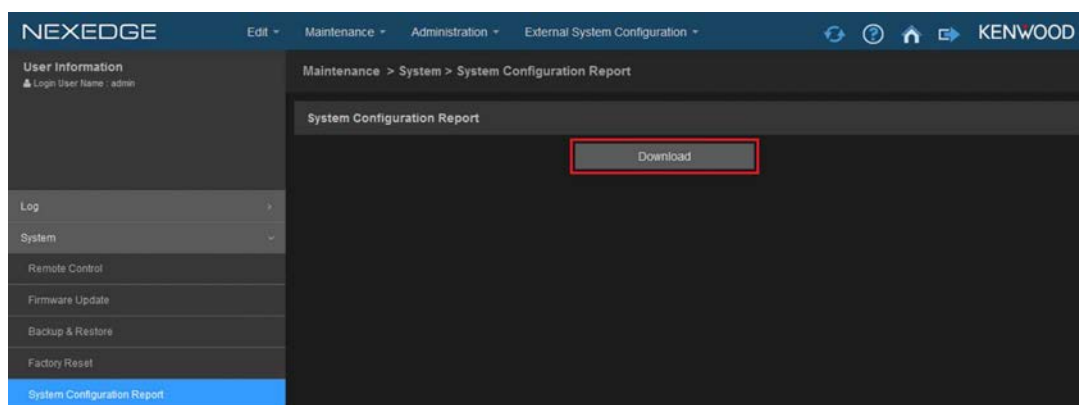


Figure 4-13 System Configuration Report

Confirming the System Code

In **Edit > Information > System Information** of SCU, the system code of a NEXEDGE system can be confirmed. The system code is the unique number of the NEXEDGE system, and KENWOOD specifies and manages it individually. KENWOOD assigns a unique number to this number and manages it globally.

The screenshot shows the NEXEDGE SCU web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar shows a menu with 'Home', 'Information', 'System Key File', 'System Configuration', 'System Ltd', 'Subscriber Configuration', and 'Multi-System Configuration'. The main content area is titled 'Edit > Information' and contains three sections: 'System Information' with fields for Device ID, Network Category, and System Code; 'License Information' with fields for Number of Systems, Number of Sites, and Number of Channels; and 'Trunking Activation' with a System Owner field. There are also buttons for 'Browse...' and 'Software License Agreement'.

Figure 4-14 System Information

The system code varies as follows depending on **Network Category**:

Table 4-9 System Code

Network Category	Location ID			Remarks
	Category BIT	System Code	Site Number	
Global	00	1 to 1022 (10 bit)	1 to 4094 (12 bit)	A maximum of 1152 sites
Regional	10	1 to 16382 (14 bit)	1 to 254 (8 bit)	A maximum of 254 sites
Local	01	1 to 131070 (17 bit)	1 to 30 (5 bit)	A maximum of 30 sites

Note

- For the system code, a unique code of the system is given by KENWOOD. If a new system is assumed to be built with 30 or more sites, be sure to consult with our technical staff about the system scale. To change **Network Category** after the operation, all the subscriber units need to be collected and the configurations need to be changed.

Confirming License Articles

Clicking the “Software License Agreement” button in **Edit > Information** of SCU displays the articles of each license of a NEXEDGE system.

The license agreement of the NEXEDGE system, the articles of the Apache License 2.0, BSD License, LGPL License, and MIT License used in the NEXEDGE system, and important announcements regarding the software in the NEXEDGE system are displayed.

If the license is requested to be disclosed or submitted by Free Software Foundation, Inc. or others, check the information such as the software to be used in the NEXEDGE system in **Software License Agreement**.

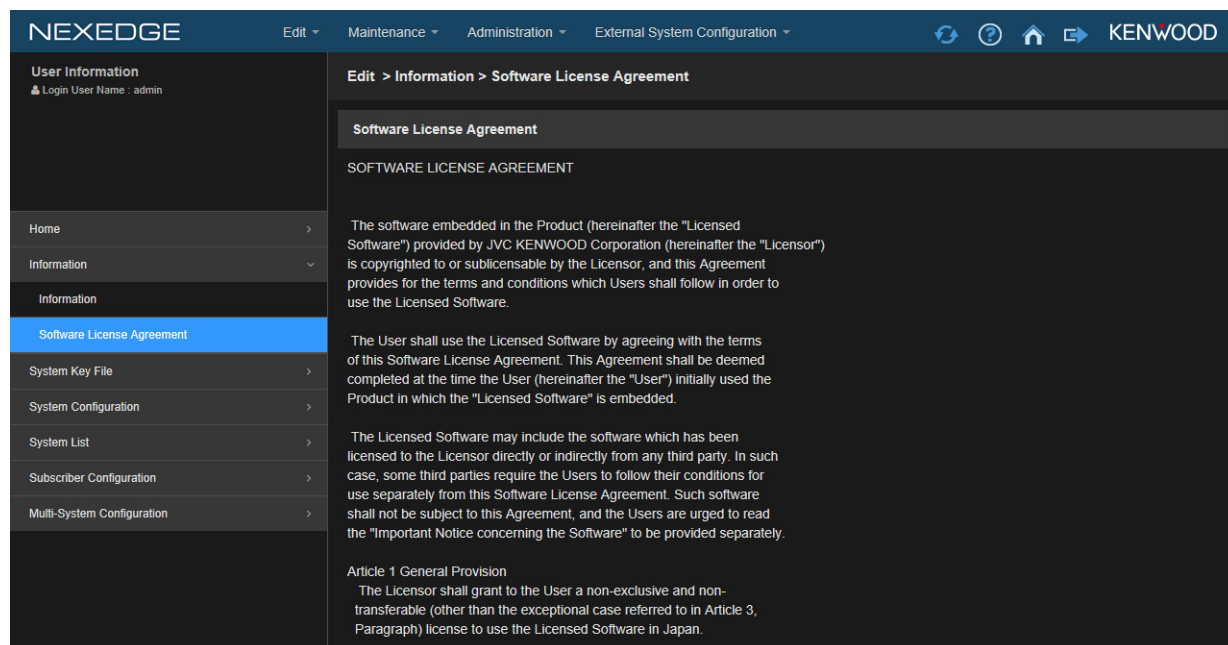


Figure 4-15 Software License Agreement

4.12 About the Downtime of a NEXEDGE System

In a NEXEDGE 1st Generation system, a repeater needed to be restarted when adding or deleting a channel or when changing a system configuration, and starting the system took time. In a NEXEDGE 2nd Generation system, a repeater does not need to be restarted in many cases, reducing the system downtime due to configuration changes.

4.13 Acquiring Internal Information of a NEXEDGE System (Diagnostic Data)

Diagnostic Data is the internal information of a NEXEDGE system such as configuration data and various logs. The Diagnostic Data is the information for the purpose of failure diagnosis, such as when a failure occurs in a NEXEDGE system, and is used by engineers at KENWOOD.

In **Maintenance > Log > Diagnostic Data** of SCU, the diagnostic data can be downloaded.

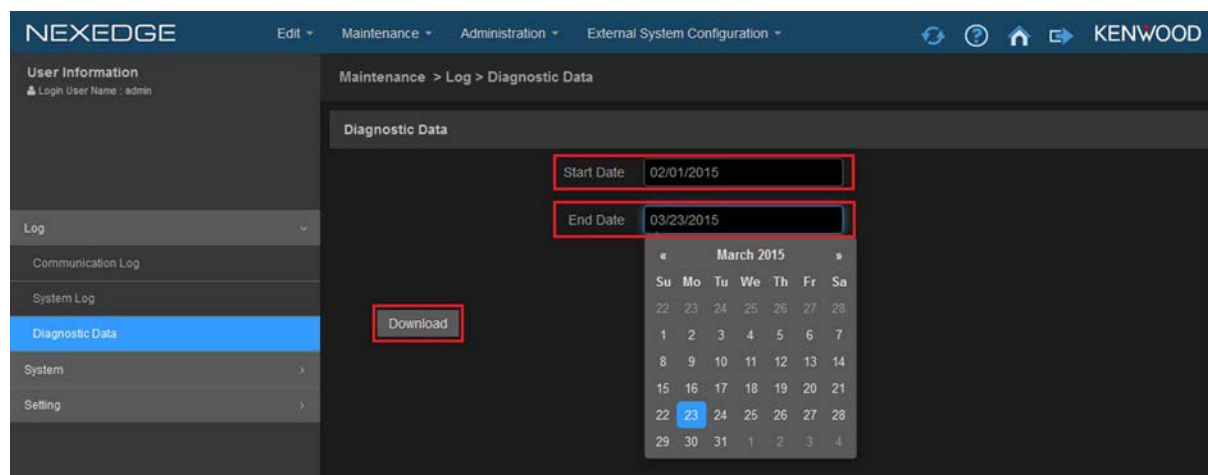


Figure 4-16 Diagnostic Data

- 1) Specify the period of the diagnostic data to download in **Start Date** and **End Date**.
Clicking **Start Date** or **End Date** displays the calendar, and a date can be selected.
- 2) Click the “Download” button.
 - The diagnostic data of the specified period is downloaded. While downloading the diagnostic data, the progress status is displayed. Download can be canceled by pressing the “Cancel” button.
 - The steps for saving vary depending on the browser.

4.14 Resetting the Configurations of a System Controller to the Initial State (Factory Reset)

Factory Reset is the function to reset the configurations of a system controller to the initial state.

Clicking the “Factory Reset” button in **Maintenance > System > Factory Reset** of SCU performs the **Factory Reset**.

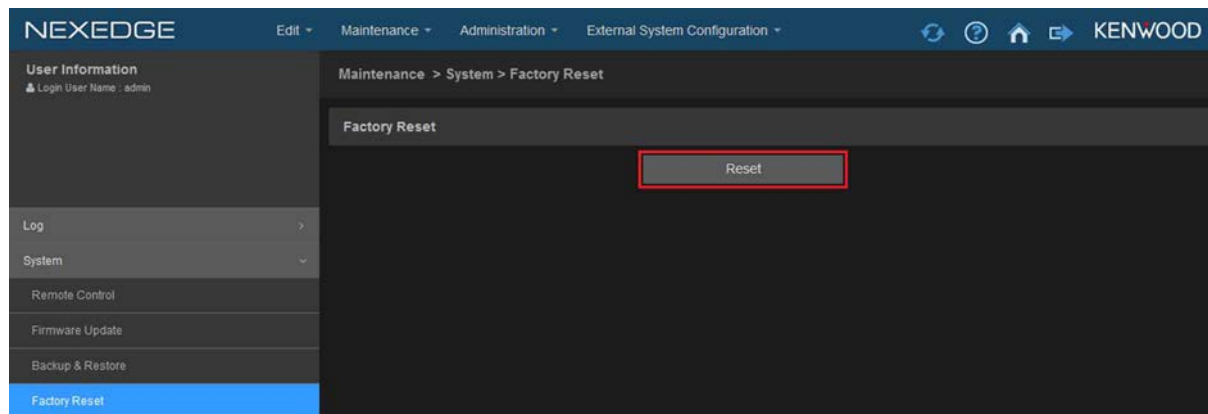


Figure 4-17 Factory Reset

Note

- The **Factory Reset** can be performed only by a user with Administrative privileges.

4.15 Updating Various Firmware

The firmware of each device making up a NEXEDGE system can be updated. Also, the firmware of each repeater can manually be updated.

Updating the Firmware of a NEXEDGE System (Firmware Update)

In **Maintenance > System > Firmware Update** of SCU, the firmware currently used in a NEXEDGE system can be confirmed and the firmware can be updated.

Performing firmware update stops the behavior of a system controller and overwrites the firmware. The firmware file includes the firmware of system controllers, site controllers, repeaters, IP gateways, roaming gateways, and network manager servers, and the firmware of each device in the NEXEDGE system is automatically updated. When the firmware update completes, each device resumes the behavior after restart.

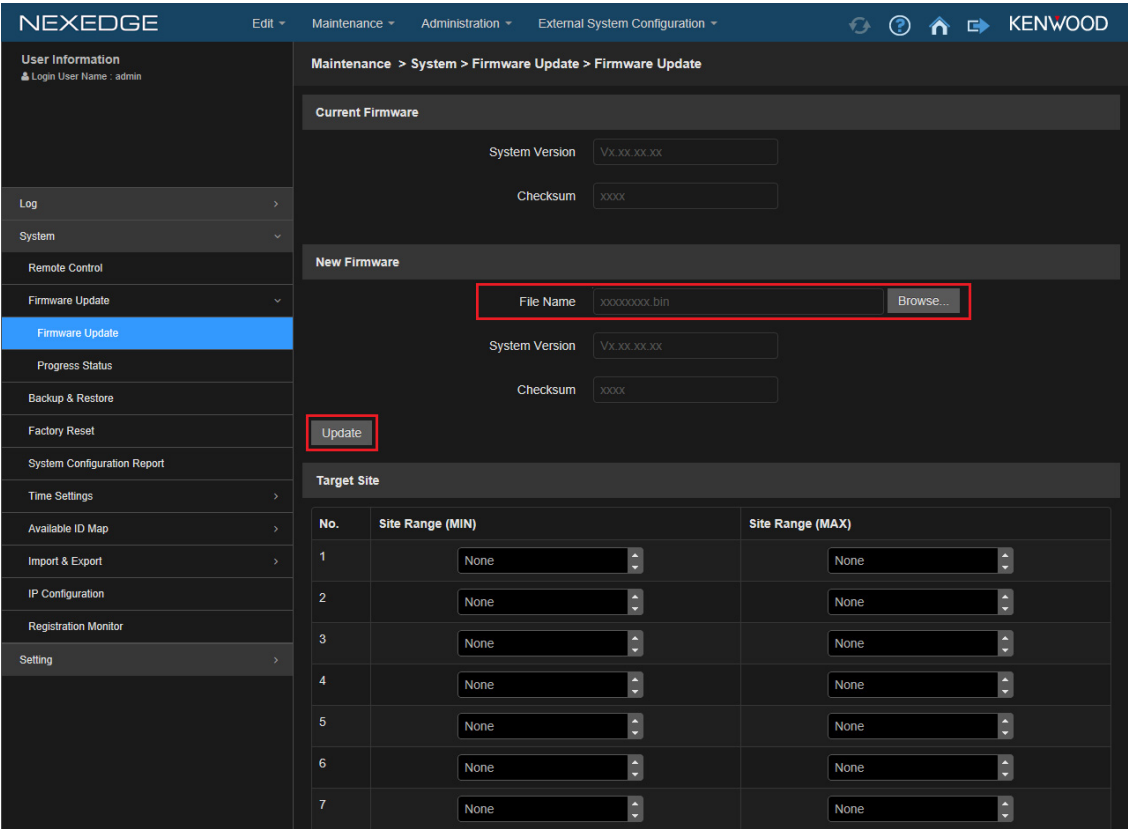


Figure 4-18 Firmware Update

- 1) Click the “Browse” button in **New Firmware** to select the firmware file to write.
- 2) In **Site Range (MIN)** and **Site Range (MAX)** of **Target Site**, configure the range of site numbers that execute the firmware update. (Refer to [Configuring the sites targeted for the firmware update \(Target Site\).](#))
- 3) Click the “Update” button.

The firmware update is executed. When the firmware update for system controllers completes, **Progress Status** appears, and the progress status of the firmware update for each device is displayed. (Refer to [Confirming the progress status of the firmware update \(Progress Status\).](#))

Note

- Selecting a firmware file to be written displays the file name, version, and checksum of the selected firmware file.
- The firmware earlier than version 1.60.00 cannot be written.

Configuring the sites targeted for the firmware update (Target Site)

Target Site allows a system administrator to configure the range of site numbers that execute the firmware update. By configuring **Target Site**, the sites targeted for the firmware update can be restricted. A maximum of 10 site ranges can be configured.

Confirming the progress status of the firmware update (Progress Status)

In **Progress Status**, the progress statuses and update results of all devices appear.

When the firmware update for system controllers completes, **Progress Status** appears.

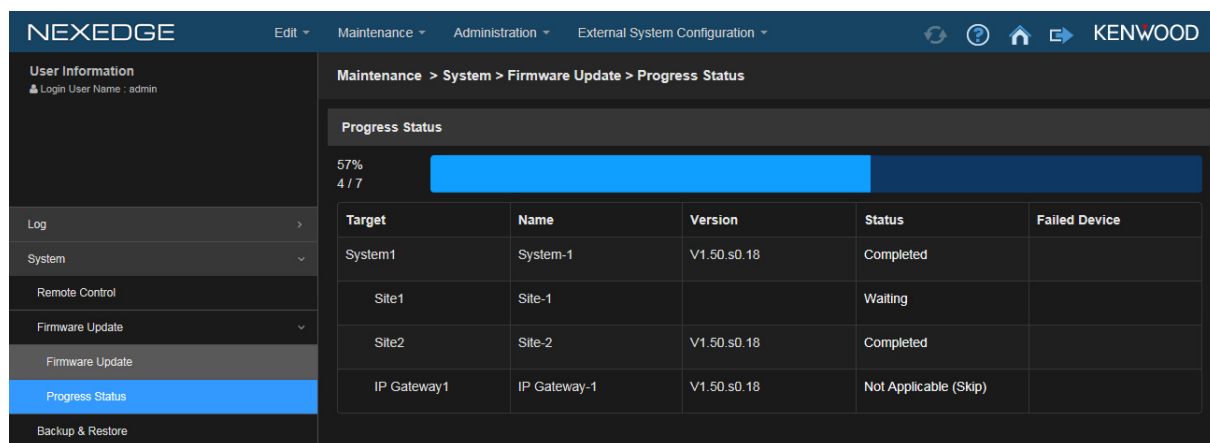


Figure 4-19 Progress Status

The displayed contents are as follows:

Table 4-10 Displayed Contents in Progress Status

Item	Description
Progress bar	Displays the progress rate of the update as a percentage (%) and a bar. Also, the number of all devices, including devices not targeted for update, and the number of devices for which update is completed are displayed.
Target	Displays the devices registered in SCU (system controllers, sites (including repeaters in the sites), IP gateways, roaming gateways, and network manager servers).
Name	Displays the name of each device configured by a system administrator.
Version	Displays the firmware version of each device.
Status	Displays the progress status of each device as follows: Waiting: Waiting for the firmware update In Progress: Updating the firmware Success: Succeeded in the firmware update Fail: Failed in the firmware update Not Applicable: Not the target for the firmware update Not Applicable (Skip): Not the target for the firmware update because the firmware version is the same
Failed Device	Displays the devices for which the firmware update failed.

Manually Updating the Firmware of a Repeater (Firmware Programming Mode)

Firmware Programming Mode is the mode to overwrite the firmware stored in the flash memory of a repeater. For each repeater, functions can be added and software problems can be improved.

In NXR-700/ NXR-800/ NXR-900/ NXR-901/ NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901, the firmware is automatically overwritten from a site controller or system controller by using the **Firmware Update** function, therefore, the firmware normally does not need to be overwritten manually. The firmware of a repeater can be overwritten manually as required at the time of initial configuration such as when migrating the NEXEDGE system from the first to the second generation.

Connect a PC to the repeater with a commercially available USB Type-B cable (NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901) or a 9-pin crossover cable (NXR-700/ NXR-800/ NXR-900/ NXR-901), and write the firmware by using FPRO activated on the PC.

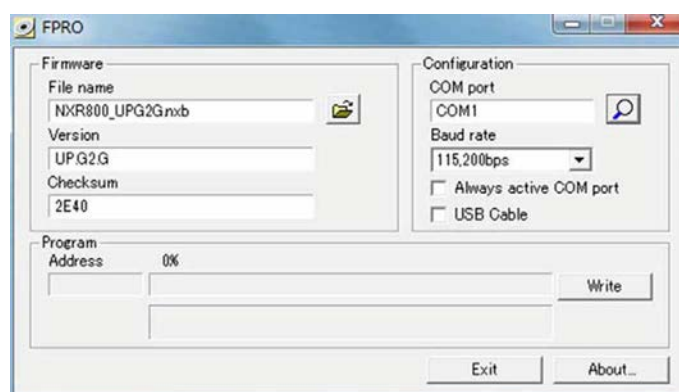


Figure 4-20 FPRO

Clicking the “Write” button of FPRO starts writing the firmware. When checking information such as the model completes, FPRO starts transferring the firmware. The firmware is written to the repeater after transfer completes. “PG” appears during transfer or writing, and the repeater automatically restarts when the writing completes.

Note

- Refer to the service manual for instructions on how to store the firmware in the flash memory.

4.16 Testing the Transmit and Receive Capabilities of the Repeater (PC Test Mode)

PC Test Mode is the mode to test transmit and receive capabilities by using the FPU (KPG-109D/ DN or KPG-D2/ D2N). Selecting “Test Mode” from **Program** in KPG-109D/ DN or KPG-D2/ D2N displays the **Test Mode** dialog box.

Test Channel and **Test Signaling** can be changed by pressing the up and down arrow keys on the keyboard while receiving. Also, functions such as **Squelch** (Open/ Close), **Transmit Power**, Repeat, and Compander can be switched.

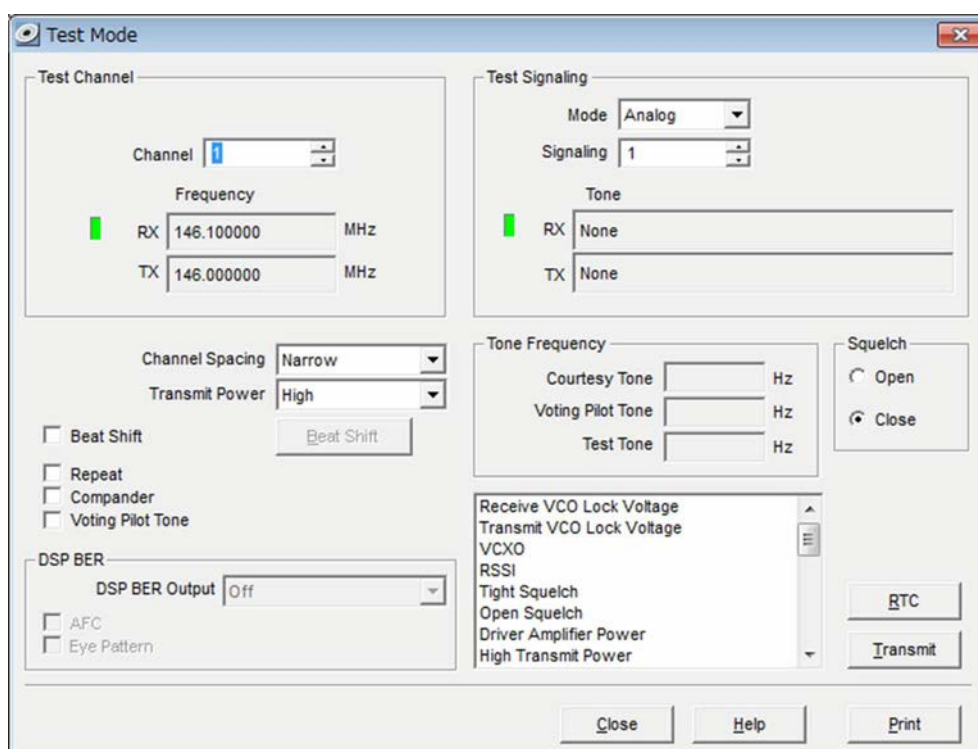


Figure 4-21 Test Mode

Note

- Figure 4-21 shows the Test Mode dialog box of KPG-109D/ DN.
- Use the KPG-109D/ DN FPU for an NXR-700/ NXR-800/ NXR-900/ NXR-901 repeater, and the KPG-D2/ D2N FPU for an NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 repeater.
- In PC Test Mode, functions such as **Channel Select** on the rear panel of the repeater are disabled, and the **Test Channel** already configured is selected.
- Refer to CSI Edition or service manual of NXR-700/ NXR-800/ NXR-900/ NXR-901 for the operation in PC Test Mode.

4.17 Adjusting the Transmit and Receive Capabilities of the Repeater (PC Tuning Mode)

PC Tuning Mode is the mode to adjust transmit and receive capabilities by using the FPU (KPG-109D/ DN or KPG-D2/ D2N).

Selecting “Test Mode” from **Program** in KPG-109D/ DN or KPG-D2/ D2N displays the **Test Mode** dialog box.

Selecting a tuning item in the **Test Mode** dialog box places the repeater in PC Tuning Mode.

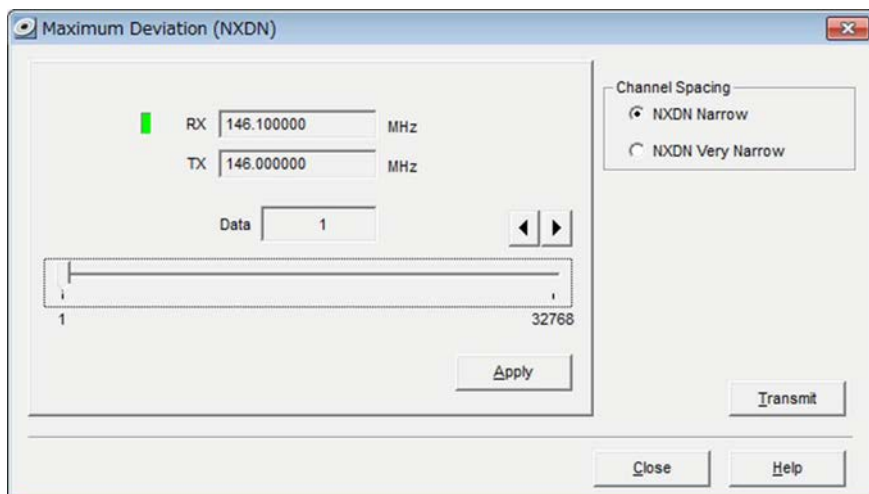


Figure 4-22 PC Tuning Mode (display example: Maximum Deviation (NXDN))

Note

- Figure 4-22 shows the PC Tuning Mode dialog box of KPG-109D/ DN.
- Use the KPG-109D/ DN FPU for an NXR-700/ NXR-800/ NXR-900/ NXR-901 repeater, and the KPG-D2/ D2N FPU for an NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 repeater.
- Refer to CSI Edition or service manual of NXR-700/ NXR-800/ NXR-900/ NXR-901 for the operation in PC Tuning Mode.

This chapter explains various functions to maintain the whole system behavior even if any failure occurs in a NEXEDGE system.

5.1 Sharing a Traffic Channel With a Different System (Cross-busy)

Cross-busy is the function that prevents own system from interference by other stations and also from interfering other stations in case an existing system may be coexistent with own system in the same frequency.

This function is provided by use of the 3 functions below:

● Control Channel Burst

Control Channel Burst is the function to stop transmission on the control channel and to monitor the busy state of the receiver and the external busy trigger at constant time intervals. If interference from other parties is detected after monitoring the busy state, the repeater continues to stop using the control channel and the control channel is served again when the interference disappears. (Refer to [Control Channel Burst](#).)

● Cross-busy Input

Cross-busy Input is the function to restrict the use of the repeater as a channel in an NXDN Trunking system by sending a signal from an external device.

Example of use:

- Acquiring the busy signal from an external device that monitors the transmit frequency
- Acquiring the usage request from an external device (transmission request from the LTR controller, etc.)

● Cross-busy Output

Cross-busy Output is the function to notify external devices that the repeater is serving as a channel in an NEXEDGE system.

Example of use:

- Sending a command for suspending request of use to external devices (suspension of use control for the LTR controller, etc.)

Operations of Cross-busy are as follows:

Common behavior of repeaters served as a control channel and a traffic channel

● Cross-busy Input

If low-level signals are entered to the Cross-busy Input port (pin 4 of the 25-pin D-sub connector (AUXI 1)), the repeater detects and recognizes its state that an external device is being used, and if high-level signals are entered, the repeater detects and recognizes its state that no external device is in use.

Cross-busy Input enables the repeater to restrict the use of channel by determining the busy state by an internal trigger, an external trigger, or both internal and external triggers. The external trigger determines the level (high or low) on the Cross-busy Input port. If low-level signals are entered to the Cross-busy Input port, the repeater detects and recognizes that the frequency is occupied by another system, and then restricts the use of that channel. Also, an internal trigger will activate a signal detection, and result of the detection will be used as an internal trigger.

● Cross-busy Output

While the repeater is served in an NXDN Trunking system, low-level signals can be transferred via a Cross-busy Output port (pin 25 of the 25-pin D-sub connector (AUXIO 6)). An external device can recognize the busy state of the repeater by detecting the logic level of the Cross-busy Output port.

Behavior of repeaters served as a control channel

● Control Channel Burst

A control channel pauses transmission at the intervals configured in **Control Channel Active Timer**.

A control channel pauses transmission for the amount of time configured in **Control Channel Wait Timer**. The transmission resumes on the control channel when the amount of time configured in **Control Channel Wait Timer** elapses. (Refer to [Control Channel Active Timer](#), [Control Channel Wait Timer](#).)

● Cross-busy Input

The busy state by receiving signals on a control channel can be monitored during the amount of time configured in **Control Channel Wait Timer**. In the case of the busy state as a result of monitoring, the repeater stops serving as a control channel. In this case, the repeater cannot start transmitting as a control channel even after the amount of time configured in **Control Channel Wait Timer** elapses. If a control channel does not enter the busy state from when the control channel exits the busy state until the amount of time configured in **Control Channel Wait Timer** elapses, the repeater resumes the transmission as a control channel.

● Cross-busy Output

The Cross-busy Output port is always active (low) on a control channel regardless of **Control Channel Active Timer** and **Control Channel Wait Timer**.

Behavior of repeaters served as a traffic channel

● Cross-busy Input

On a traffic channel, the busy state can be monitored using the internal trigger or external trigger, and whether the repeater can be used as a traffic channel is determined. While the repeater is being used as a traffic channel, it continues functioning as a traffic channel and the call cannot be interrupted midway. If a traffic channel enters the busy state while the repeater is not being used as a traffic channel, the channel cannot be allocated as a traffic channel. In the case of internal trigger, the repeater recognizes that a traffic channel is in the busy state while a signal is detected on the traffic channel or it is being used. Therefore, **Traffic Channel Release Delay Timer** is activated after the current communication ends, and then the traffic channel cannot be used for a certain length of time. (Refer to [Traffic Channel Release Delay Timer](#).)

Conditions for the repeater to use a traffic channel again vary depending on the configuration for Cross-busy Input Trigger. (Refer to [Cross-busy Input Trigger](#).)

● Cross-busy Output

While a traffic channel is being used, low-level signals are transferred from the Cross-busy Output port and the repeater notifies other controllers (LTR, etc.) sharing the frequency that the frequency is being used.

While the repeater is allocated as a traffic channel and additionally the amount of time configured in **Traffic Channel Release Delay Timer** is counting down, low-level signals are transferred from the Cross-busy Output port. If no traffic channel is used, high-level signals are transferred from the Cross-busy Output port.

● Congestion on the Shared Channel

If the busy input from an external device and use of an internal channel simultaneously occur on a traffic channel and the shared channel is simultaneously used, the traffic channel is used until the current transmission ends. When the transmission ends, the traffic channel is immediately available.

Note

- If **Cross-busy** is enabled, the repeater receives analog signals while the repeater is not used as a traffic channel. In this case, the received analog audio can sound from the speaker. Therefore, interfering signals are also audible when the repeater receives interfering signals; hence the interfering signals can be identified.

Configuration items using SCU

Configuring **Cross-busy** to be enabled or disabled ( [See](#) Edit > System Configuration > Cross-busy)

Control Channel Burst

Control Channel Burst is the function to stop transmission on the control channel and to monitor the busy state of the receiver and the external busy trigger at constant time intervals. If interference from other parties is detected after monitoring the busy state, the repeater continues to stop using the control channel and the control channel is served again when the interference disappears.

Using this function can build a site even if the control channel cannot acquire a frequency license for a continuous transmission.

If this function is enabled, transmission on a control channel continues for the amount of time configured in **Control Channel Active Timer** and then the transmission pauses when the amount of time configured in **Control Channel Active Timer** elapses. The transmission on the control channel starts when the amount of time configured in **Control Channel Wait Timer** elapses after the transmission pauses. Subsequently, the control channel becomes active at the intervals configured in **Control Channel Active Timer** and **Control Channel Wait Timer**.

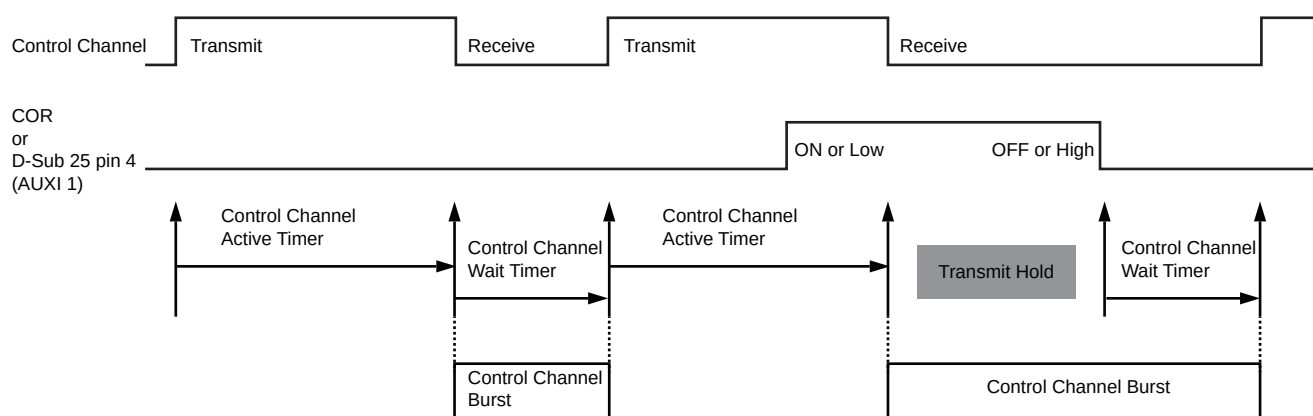


Figure 5-1 Basic Behaviors of Control Channel Burst

Note

- If the activation of the **Control Channel Burst** function and Station ID (Analog CW ID) transmission occurs at the same time, Station ID transmission has priority.
- While transmission on a control channel is disabled, no message can be sent on the control channel; hence, the message will be discarded. To avoid this problem, the dedicated frequency must be retained as the control channel and the **Control Channel Burst** function must not be used.

Configuration items using SCU

Configuring **Control Channel Bursts** ( See Edit > System Configuration > Cross-busy)

Control Channel Active Timer

Control Channel Active Timer is the length of time a repeater can continuously transmit on a control channel. Transmission on a control channel continues for the amount of time configured in **Control Channel Active Timer** and then the transmission pauses when the amount of time configured in **Control Channel Active Timer** elapses. The transmission on the control channel starts when the amount of time configured in **Control Channel Wait Timer** elapses after the transmission pauses.

- If the timing of Station ID (Analog CW ID) transmission comes while the **Control Channel Active Timer** is counting down, the Station ID transmission immediately starts on the control channel. The counting of the **Control Channel Active Timer** internally continues as shown in the diagram below.

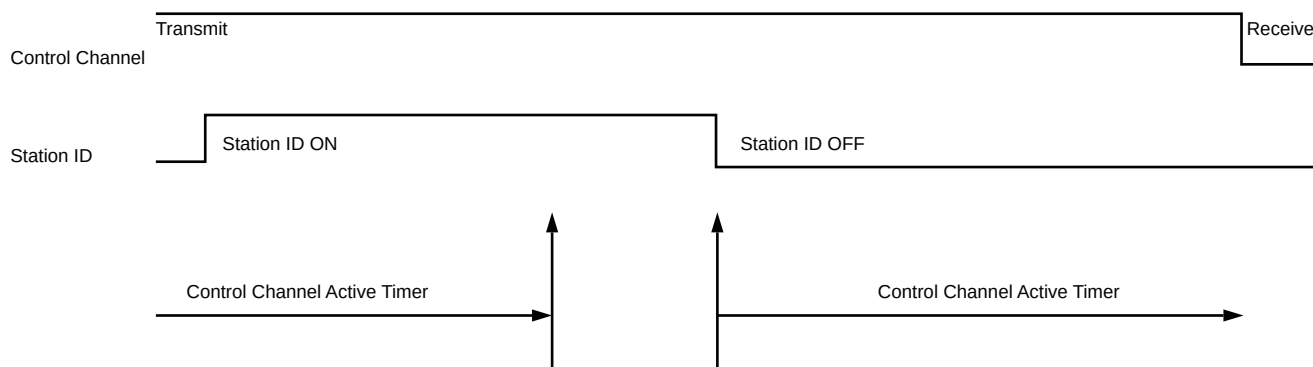


Figure 5-2 The Behavior of the Control Channel Active Timer During Station ID Transmission

- If **Repeat Disable** is activated while the **Control Channel Active Timer** is counting down, the transmission on the control channel immediately stops.

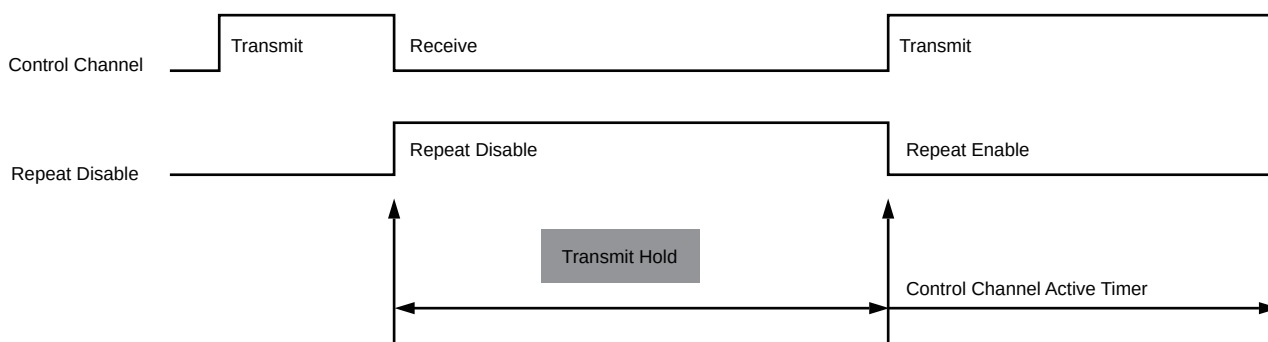


Figure 5-3 Behaviors of Cross-busy Burst Transmission and Repeat Disable (Control Channel Active Timer)

Configuration items using SCU

Configuring **Control Channel Active Timer** ( See Edit > System Configuration > Cross-busy)

Control Channel Wait Timer

Control Channel Wait Timer is the length of a time slot that transmission on a control channel is paused.

Transmission on a control channel continues for the amount of time configured in **Control Channel Active Timer** and then the transmission pauses when the amount of time configured in **Control Channel Active Timer** elapses. The transmission on the control channel starts when the amount of time configured in **Control Channel Wait Timer** elapses after the transmission pauses.

- If the timing of Station ID (Analog CW ID) transmission comes while the **Control Channel Wait Timer** is counting down, the Station ID transmission immediately starts on the control channel even in the reception state. The counting of the **Control Channel Wait Timer** internally continues as shown in the diagram below.

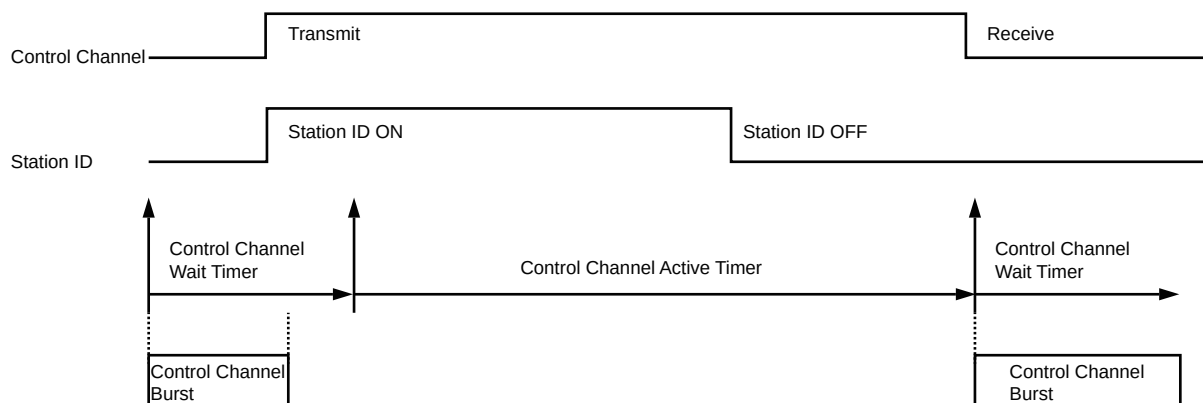


Figure 5-4 The Behavior of the Control Channel Wait Timer During Station ID Transmission

- If the repeater recognizes that the control channel is in the busy state by Cross-busy Input while **Repeat Disable** is active, the transmission stops until the busy state is reset even if **Repeat Disable** is deactivated. If the **Control Channel Wait Timer** elapses after the busy state is reset, the transmission on the control channel resumes.

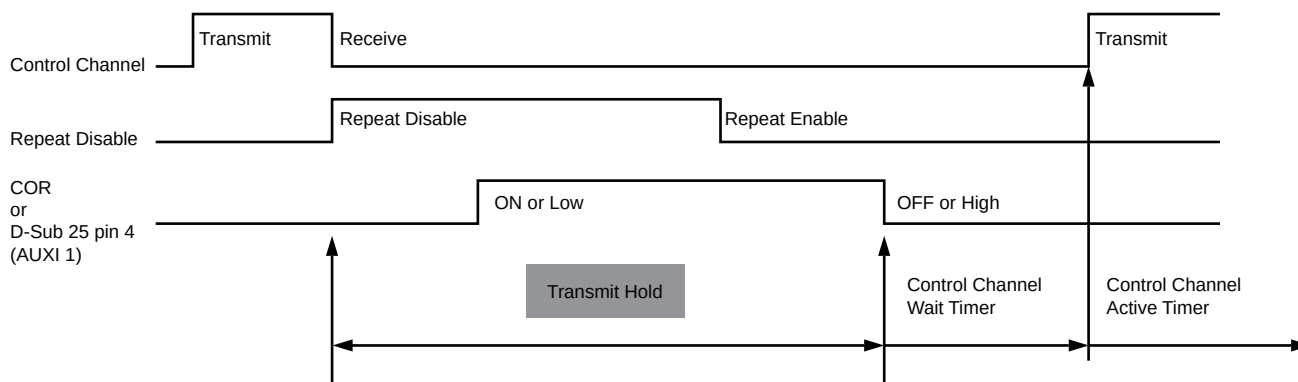


Figure 5-5 Behaviors of Cross-busy Burst Transmission and Repeat Disable (Control Channel Wait Timer)

Note

- The length of one time slot is 40 ms if "Narrow" is configured in **Channel Spacing**, and 80 ms if "Very Narrow" is configured in **Channel Spacing**.

Configuration items using SCU

Configuring **Control Channel Wait Timer** ( See Edit > System Configuration > Cross-busy)

Traffic Channel Release Delay Timer

Traffic Channel Release Delay Timer is the amount of time from when the busy state of a traffic channel controlled by an external device is reset until the traffic channel becomes available again.

- **Cross-busy Input behavior**

The traffic channel is unavailable from when **Cross-busy Input Trigger** (External, Internal, Both) is disabled until the **Traffic Channel Release Delay Timer** elapses.

- **Cross-busy Output behavior**

While a channel is allocated as a traffic channel and additionally the amount of time configured in **Traffic Channel Release Delay Timer** is counting down, low-level signals are transferred from the Cross-busy Output port (pin 25 of the 25-pin D-sub connector (AUXIO 6)). If a channel is not used, high-level signals are transferred.

Configuration items using SCU

Configuring **Traffic Channel Release Delay Timer** ( See Edit > System Configuration > Cross-busy)

Cross-busy Input Trigger

Cross-busy Input Trigger is the function to control the busy state of a traffic channel using the **Cross-busy** function.

Table 5-1 Configuration of Cross-busy Input Trigger

Configuration	Description
External	The repeater cannot be used as a traffic channel from when the external trigger is disabled until the Traffic Channel Release Delay Timer elapses. The repeater can be used as a traffic channel when the amount of time configured in Traffic Channel Release Delay Timer elapses.
Internal	The repeater cannot be used as a traffic channel from when the internal trigger is disabled until the Traffic Channel Release Delay Timer elapses. The repeater can be used as a traffic channel when the amount of time configured in Traffic Channel Release Delay Timer elapses. If the repeater receives a signal on the receive frequency for a traffic channel or "Shared" is configured for a traffic channel, the internal trigger is enabled after the call is completed in Conventional mode.
Both	The repeater cannot be used as a traffic channel from when either internal trigger or external trigger is disabled until the Traffic Channel Release Delay Timer elapses. The repeater can be used as a traffic channel when the amount of time configured in Traffic Channel Release Delay Timer elapses. If the repeater receives a signal on the receive frequency for a traffic channel or "Shared" is configured for a traffic channel, the internal trigger is enabled after the call is completed in Conventional mode.

Configuration items using SCU

Configuring **Cross-busy Input Trigger** ( See Edit > System List > Site List > Channel List > General (Edit))

5.2 Failsoft Mode

Failsoft Mode is the function that can provide the minimal communication capability for subscriber units in a site if the NEXEDGE system cannot provide the trunking capability for the site due to an error or malfunction of a device in the site. Refer to “[Securing the Minimal Communication Capability When a Network Failure Occurs \(Failsoft Mode\)](#)” for details of **Failsoft Mode**.

5.3 Allocating Another Channel As a New Control Channel (Failure Control Channel Switching/ Failure Traffic Channel Remove)

Failure Control Channel Switching is the function to allocate another traffic channel as a new control channel if the current control channel cannot be used due to detectable hardware problems, such as an unlocked state of the control channel. This is the function to continue operating the NEXEDGE system even if a failure occurs on the control channel.

In the case that the repeater cannot transmit a signal, for instance, due to a malfunction of an external device, such as the power amplifier, etc., other repeaters that are properly working can be allocated as a control channel by emitting the malfunction status of the external device to the external input port (pin 6 on the 25-pin D-sub connector (AUX1 3)).

The alternative control channel can be selected from channels where “Control Channel” or “Dual-functional Channel” is configured in **Channel Type**.

If there are multiple control channel candidates, the channel dedicated as a control channel has the highest priority and other channels will be allocated in ascending order. Alternative control channels having the same frequency can be used by preparing repeaters having the same frequency as control channels.

Failure Traffic Channel Remove is the function that does not allow the repeater to be allocated as a traffic channel when the system detects that the repeater serving as a traffic channel cannot properly send signals due to a malfunction of the repeater.

In the case that the repeater cannot transmit a signal, for instance, due to the malfunction of an external device such as the power amplifier failure, this repeater cannot be allocated as a traffic channel by emitting the malfunction status of the external device to the external input port (pin 6 on the 25-pin D-sub connector (AUX1 3)). After the external device recovers from its malfunction so that the repeater can properly send a signal, the repeater can be reallocated as a traffic channel.

 Note

- The frequency of the control channel will be changed if the channel that is generally used as the traffic channel is substituted for the control channel. In this case, channels may not be able to be hunted depending on the subscriber unit configuration. To avoid this problem, all control channel candidates must be preconfigured for the subscriber unit.
- This function is automatically activated if multiple control channel candidates exist. The following are triggers to activate this function:
 - PLL Unlock (RX, TX, and standard signals)
 - No receive frequency or transmit frequency is configured when the control channel becomes active
 - External input port (Pin 6 on the 25-pin D-sub Connector (AUX1 3))
- The repeater behaves as follows depending on the state of the external input port.
 - The external input port remains active until the repeater is turned off, or restarts.
 - The error code (E8) appears on the 17-segment LED display while the external input port remains active.
 - **Take Over** automatically becomes enabled when the external input port becomes active.
 - The repeater can recover from its malfunction by disabling **Take Over** when the external input port becomes inactive.

5.4**Allocating Another Channel As a New Site Controller
(Primary Channel Number/ Secondary Channel Number)**

Primary Channel Number is the channel of a repeater to control a site.

Secondary Channel Number is the channel of an alternative repeater to control a site if the communications with the repeater configured in **Primary Channel Number** become unavailable.

If the communications with the repeater configured in **Primary Channel Number** become unavailable, the repeater configured in **Secondary Channel Number** controls a site instead, and resumes operations.

 Note

- **Primary Channel Number** and **Secondary Channel Number** function only if "Repeater" is configured in **Controller Type**.

Configuration items using SCU

- Configuring **Controller Type** ( **See** Edit > System List > Site List > General (Edit) > Site Controller)
- Configuring **Primary Channel Number** ( **See** Edit > System List > Site List > General (Edit) > Site Controller)
- Configuring **Secondary Channel Number** ( **See** Edit > System List > Site List > General (Edit) > Site Controller)

5.5

Configuring a Redundant System Controller
(System Controller Redundancy)

System Controller Redundancy is the function that enables the entire system to continue running by having a backup system controller to control the system when the system cannot be controlled due to reasons such as failure of the active system controller.

In a system with a redundant system controller, two system controller units function in tandem with each other. Each of these system controllers is assigned with a Main or Sub role according to the SCU configuration.

Upon starting up, the system controller checks for operating status and role configuration (Main/ Sub) of the system controller it is linked to via the IP network at a fixed interval (every 6 seconds). When a response is not received from an active system controller over a certain period of time (6 sec. x 3 tries = 18 seconds), the standby system controller is activated to control the system.

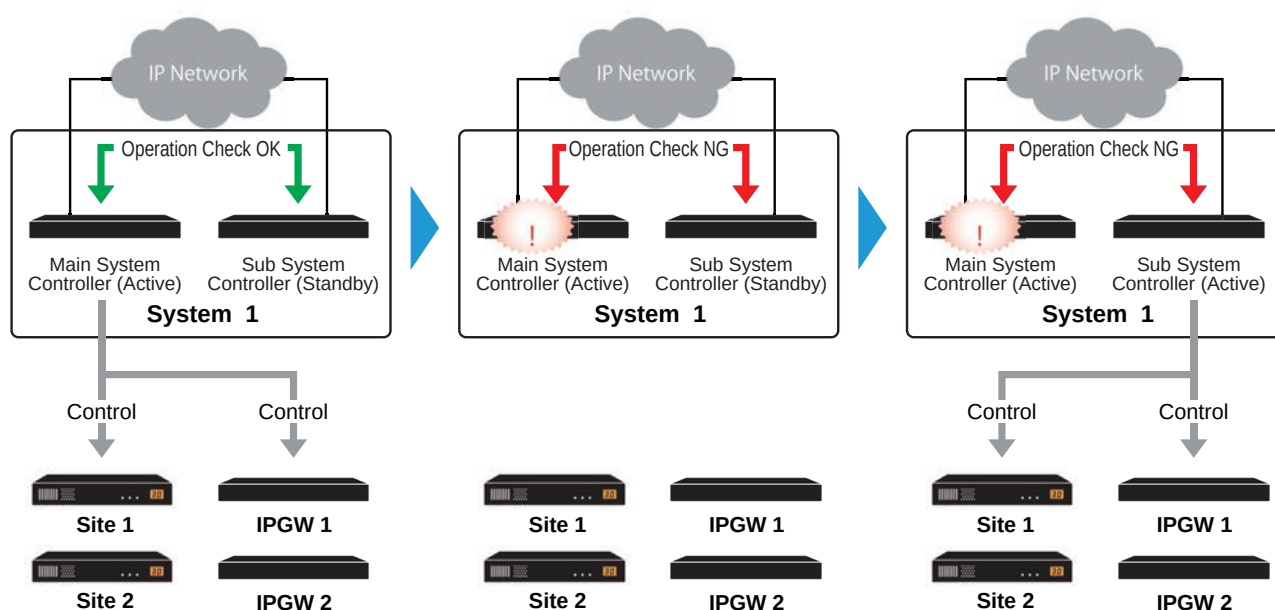


Figure 5-6 System Controller Redundancy Behavior

To make provision for any failure that may occur in the active system controller, the standby system controller synchronizes data that is needed with the active system controller, including the firmware information, SCU configuration values and registration information. Data synchronization is carried out when there is a difference in the data configuration or information between the two system controller units. Data that is synchronized includes the following.

Table 5-2 Synchronized Data

Data	Description
Firmware information	Firmware of the system.
SCU configuration value	Information on the SCU configuration.
Registration information	Information on the registered positions of the transceiver or IP console.

Note

- When a Remote Control operation such as Restart is executed in the SCU with regard to a redundant system, the Remote Control operation is executed only for the active system controller.
- Logs such as call logs are only recorded for the active system controller in a redundant system.
- If an operation between Main/ Sub cannot be confirmed, the GID registration is not deleted even if **Group Registration Reset Timer** is completed. In this case, the GID registration is deleted after recovery from a failure.

About Receiving of Duplicate Information

System Controller Redundancy determines the status of the system controller (active or standby) through an operation check via the IP network. Therefore, if a failure occurs only with the network connection without any trouble in the main and sub system controllers, both the main and sub system controllers will be active. When this happens, each device within the system, such as the site or IP Gateway server, may receive duplicate information, which includes the firmware and configuration information. In this case, the devices within the system will behave according to the notification from the main system controller.

Configuring a Redundant System Controller

To configure a redundant system controller, the SCU is used to configure the IP address in **Sub IP Address**. The IP address corresponding to the one that functions as the main system controller is configured in **Main IP Address**, while the IP address of the one that functions as the sub system controller is configured in **Sub IP Address**.

For more information on **Main IP Address/ Sub IP Address**, refer to “[Configuring the IP address of a system controller \(Main IP Address/ Sub IP Address\)](#)”.

Note

- To deactivate the redundancy configuration of the primary system controller, access the SCU of the system controller configured in **Main IP Address** and delete the **Sub IP Address**.
- When redundancy is configured for the primary system controller, SCU is accessed using the IP address of the main or sub system controller. The behavior upon accessing SCU varies as follows according to the operating status of the system controller. (Refer to: [Behavior of a Redundant System Controller](#))
- To configure the redundancy of the primary system controller, the Activation File to which the same system information (Network Category/ System Code) is registered needs to be read to SCU of Main and Sub respectively.

Table 5-3 Behavior during Access to SCU

Status	Behavior during Access to SCU
Active	Enable changes to the configuration upon logging in (normal behavior).
Standby	Login is possible, but changes to the configuration are not allowed except for that of the Activation File.
Syncing	An error screen appears during access to SCU. Login is disabled.

Behavior of a Redundant System Controller

A redundant system controller behaves in the ways as described below.

Table 5-4 System Controller Status

Status	Description
Active	Currently running as a system controller.
Standby	Currently in the standby state and not running as a system controller. Data is also not synchronized. When data synchronization is required, the system controller shifts to the syncing mode and starts data synchronization. Also, the system controller shifts to the active state and starts running if communication with the active system controller cannot be established.
Syncing	Not running as a system controller. Data synchronization is in progress. After data synchronization is complete, the system controller shifts back to the standby state. Also, the system controller shifts to the active state and starts running if communication with the active system controller cannot be established.

Note

- The status of the system controller is available in SCU. (Refer to: [Checking the System Controller Status and Switching the System Controller to Run \(System Controller Redundancy Status\)](#))
- The system controller starts up in the standby state.
- Data synchronization refers to the copying of files that contain information such as the SCU configuration values and registration information. Any changes to the registration information will be automatically copied and updated even in the standby state.
- If a failure occurs to only the network connection of the main system controller to the sub system controller, both the main system controller and the sub system controller are active. Then, if operation can be confirmed between the main system controller and the sub system controller by network failure recovery, the sub system controller stops operation and the main system controller continues operation.

Checking the System Controller Status and Switching the System Controller to Run (System Controller Redundancy Status)

System Controller Redundancy Status is the function to check the status of the system controller during redundancy operation and to switch the system controller to run.

It allows the status of a redundant system controller that is currently running to be checked. Also, it is possible to switch the system controller to enable a specific system controller to run or stand by such as during maintenance.

For more information on **System Controller Redundancy Status**, refer to “[Checking the System Controller Status and Switching the System Controller to Run \(System Controller Redundancy Status\)](#)” in “4.2 Remotely Controlling a Device (Remote Control)”.

Various functions, such as **NXDN ESN Validation** and **Manufacturer Limitation**, are provided in a NEXEDGE system for preventing unauthorized access of the NEXEDGE system.

Also, the administrative users to configure and operate a NEXEDGE system can be registered beforehand by using SCU, and the NEXEDGE system can be managed by only permitted multiple administrative users.

6.1 Managing a System by Using the ESN of a Subscriber Unit

Access by unauthorized subscriber units can be prevented by verifying the ESN of the subscriber unit during registration in a NEXEDGE system. Also, the manufacturers with access can be limited by distinguishing the manufacturer codes of ESNs during registration in a NEXEDGE system.

Duplication is very difficult because ESNs are written by manufacturers and closely managed. Strong security can be provided by checking the ESNs in a NEXEDGE system.

Removing Unregistered Subscriber Units (NXDN ESN Validation)

NXDN ESN Validation is the function to prevent access by unauthorized subscriber units. Unauthorized use of a NEXEDGE system can be prevented by associating a Unit ID with an NXDN ESN and checking.

If the authentication of a subscriber unit ESN is not complete when the subscriber unit is registered, the ESN of the subscriber unit is requested in a NEXEDGE system. The received ESN is compared to the ESNs of individual subscriber units registered beforehand in a NEXEDGE system. If the comparison results match, registration of the subscriber unit is permitted. If the comparison results do not match, registration of the subscriber unit is rejected.

In this case, the NEXEDGE system behaves according to the configuration in **Unauthorized ESN Detection**.

(Refer to [Preventing the Subscriber Unit of an Unmatched ESN from Being Used \(Unauthorized ESN Detection\)](#).)

Note

- Although **NXDN ESN Validation** can be configured as the default of the overall NEXEDGE system, whether **NXDN ESN Validation** is used can also be configured for each **Fleet List**. (Refer to [Configuring NXDN ESN Validation](#).)
- If NXDN ESN Validation is configured individually in **Fleet List**, the configuration values of **Fleet List** have priority.

Configuration items using SCU

- Configuring **NXDN ESN Validation** (the default of the overall NEXEDGE system) ( [See](#) Edit > System Configuration > General)
- Configuring **NXDN ESN Validation** for each **Fleet List** ( [See](#) Edit > Subscriber Configuration > Fleet List > General (Edit))

Automatically Registering the ESN Collected from a Subscriber Unit (Automatic ESN Collection)

Automatic ESN Collection is the function to automatically register an ESN in the system when a registration request is received from a subscriber unit with a UID of a not configured ESN.

If an ESN is registered by **Automatic ESN Collection** and then a registration request is received from the same UID with a different ESN, registered is rejected by **NXDN ESN Validation**. In this case, the unauthorized ESN is recorded in the system log with a warning.

The need for ESN entry can be avoided by using this function.



- If the ESN information of a UID registered in a NEXEDGE system is cleared, **Automatic ESN Collection** functions again when registering with the UID.
- Although **Automatic ESN Collection** can be configured as the default of the overall NEXEDGE system, whether **Automatic ESN Collection** is used can also be configured for each UID. (Refer to [Configuring Automatic ESN Collection](#).)
- **NXDN ESN** collected from the subscriber unit by using **Automatic ESN Collection** is collectively reflected in the system every 1 min. To prevent competing data edits, a corresponding UID cannot be edited on SCU for a maximum of 1 min from the collection of **NXDN ESN** to the reflection in the system.

Configuration items using SCU

- Configuring **Automatic ESN Collection** (the default of the overall NEXEDGE system) ([See](#) Edit > System Configuration > General)
- Configuring **Automatic ESN Collection** for Each UID ([See](#) Edit > Subscriber Configuration > Fleet List > UID List > General (Edit))

Specifying the Time and Clearing Registration Information (NXDN Validation Reset Time)

NXDN ESN Validation Reset Time is the function to record ESN authentication for each UID in the NEXEDGE system, and to delete the ESN authentication records at the configured time.

When registration is executed, such as when the subscriber unit migrates sites, if the ESN of the UID is already authenticated, an ESN request is not made to the subscriber unit in a NEXEDGE system. An ESN is requested of the subscriber unit in a NEXEDGE system only if the ESN of the UID is not authenticated.

If **NXDN ESN Validation** is enabled, the authentication of an ESN occurs when registering the subscriber unit. Therefore, when multiple subscriber units migrate simultaneously to one site, such as if, for example, some of the close-by sites are stopped, registration of all subscriber units takes more time compared to when **NXDN ESN Validation** is disabled. By configuring **NXDN ESN Validation Reset Time**, the time to complete registration of all subscriber units can be shortened even if this state occurs.

Table 6-1 Configuration of NXDN ESN Validation Reset Time

Configuration	Description
OFF	The authentication of an ESN in a NEXEDGE system is not recorded. Every time registration of a subscriber unit is executed, an ESN is requested of the subscriber unit in a NEXEDGE system.
0 to 23	ESN authentication is recorded for each UID in a NEXEDGE system, and the authentication record of the ESN is cleared at the configured time. If the ESN matches and registration of the subscriber unit is permitted, the completion of ESN authentication for the UID of the subscriber unit is recorded in a NEXEDGE system. If registration of the subscriber unit of an authenticated ESN is executed, an ESN is not requested of the subscriber unit in a NEXEDGE system. ESN authentication records are retained even if a NEXEDGE system restarts. At the time configured in NXDN ESN Validation Reset Time, the ESN authentication records are cleared and the ESNs of all UIDs are no longer authenticated. In the registration of the next subscriber unit, an ESN is requested of the subscriber unit in a NEXEDGE system. If the ESN matches, the completion of ESN authentication for the UID is recorded again in a NEXEDGE system. By configuring any configuration other than "OFF" in ESN Validation Reset Time, the occupation of a traffic channel for ESN authentication can be reduced.

Note

- Although **NXDN ESN Validation Reset Time** can be configured as the default of the overall NEXEDGE system, whether **NXDN ESN Validation Reset Time** is used can also be configured for each **Fleet List**. (Refer to [Configuring NXDN ESN Validation Reset Time](#).)
- If **NXDN ESN Validation Reset Time** is configured individually in **Fleet List**, the configuration values of **Fleet List** have priority.
- This function functions only when **NXDN ESN Validation** is enabled.

Configuration items using SCU

- Configuring **NXDN ESN Validation Reset Time** (the default of the overall NEXEDGE system) ( **See** Edit > System Configuration > General)
- Configuring **Automatic ESN Collection** for Each **Fleet List** ( **See** Edit > Subscriber Configuration > Fleet List > General (Edit))

Limiting the Manufacturers of Available Subscriber Units (Manufacturer Limitation)

Manufacturer Limitation is the function to limit the manufacturers of available subscriber units.

Because ESN authentication occurs using the ESN of a subscriber unit with the manufacturer unique number included, a function preventing unauthorized use can be provided with easy configuration. Also, because the KENWOOD subscriber unit supports configuration restrictions using **System Key File**, a strong function preventing unauthorized use can be easily provided along with **Manufacturer Limitation**. (Refer to [Preventing the Duplication of a Subscriber Unit That Can Access the System \(System Key File\)](#).)

If the authentication of a subscriber unit ESN is not complete when the subscriber unit is registered, the ESN of the subscriber unit is requested in a NEXEDGE system. The received ESN is compared to the manufacturer unique numbers of **Manufacturer Limitation** registered beforehand in a NEXEDGE system. If the comparison results match, registration of the subscriber unit is permitted. If the comparison results do not match, registration of the subscriber unit is rejected.

Note

- A maximum of 8 manufacturer codes (**Code**) can be configured.
- If **Manufacturer Limitation** is enabled and a manufacturer code is not configured, registrations of all subscriber units in a NEXEDGE system are rejected.
- The manufacturer code of KENWOOD is "68".
- This function functions only when **NXDN ESN Validation** is enabled.

Configuration items using SCU

- Configuring **Manufacturer Limitation** ( [See](#) Edit > System Configuration > General)
- Configuring **Code** ( [See](#) Edit > System Configuration > General)

Preventing the Subscriber Unit of an Unmatched ESN from Being Used (Unauthorized ESN Detection)

Unauthorized ESN Detection is the function to prevent a subscriber unit that does not match an ESN configured in SCU from being used.

The NEXEDGE system behaves as follows according to the configuration in **Unauthorized ESN Detection** if an ESN that does not match an ESN configured in SCU is received when authentication of the ESN is done by the registration of a subscriber unit.

Table 6-2 Configuration of Unauthorized ESN Detection

Configuration	Description
None	Registration of a subscriber unit is rejected. The NEXEDGE system does not send a Remote Stun/ Kill Message to the subscriber unit.
Stun	The NEXEDGE system sends a Remote Stun Message to the subscriber unit. The subscriber unit becomes unavailable to use if a Remote Stun Message is received.
Kill	The NEXEDGE system sends a Remote Kill Message to the subscriber unit. The subscriber unit is prohibited from use if a Remote Kill Message is received, and no operations can be done.

Note

- If a Remote Stun/ Kill Message is sent to a subscriber unit, the NEXEDGE system records the type of Remote Control executed, the UID and the ESN in the system log.
- If a response to the Remote Stun/ Kill Message is received from a subscriber unit, the NEXEDGE system records the type of Remote Control and the UID in the system log.
- This function behaves if **NXDN ESN Validation** is enabled. (Refer to [Removing Unregistered Subscriber Units \(NXDN ESN Validation\)](#).)
- Although **Unauthorized ESN Detection** can be configured as the default of the overall NEXEDGE system, **Unauthorized ESN Detection** can also be configured for each Fleet List or UID List. (Refer to [Configuring Unauthorized ESN Detection \(Fleet\)](#), [Configuring Unauthorized ESN Detection \(UID\)](#).)
- If **Automatically ESN Stun/Revive** is used, even a subscriber unit of a matching ESN can be placed in the Stun state by sending a Remote Stun Message is received. Also, even if a subscriber unit enters the Stun state in error because of the incorrect configuration of **Unauthorized ESN Detection**, the subscriber unit can be restored by using **Automatically ESN Stun/Revive** to send a Remote Revive Message. (Refer to [Making the subscriber unit unavailable/ restoring the subscriber unit from being unavailable \(Automatically ESN Stun/Revive\)](#).)

Configuration items using SCU

Configuring **Mobile Station Restriction Control** ( See Edit > System Configuration > General)

6.2 Managing a System with Multiple Administrators (System Administrators)

Using the SCU, the configuration of a NEXEDGE system and the administrative users to operate the system can be registered beforehand.

Multiple administrative users can be registered, and the Fleet and sites that can be managed by each administrative user and the function restrictions that can be operated on the SCU can be configured.

Only permitted administrative users can configure and operate a NEXEDGE system logging in to the SCU.

Configuring the User for System Configuration and Operation

A maximum of 1,000 accounts of the administrative users to configure and operate a NEXEDGE system can be configured in **Administration > System Administrators** of SCU. The configured accounts can be confirmed in a list. Clicking the “Add” button adds an account, and clicking the “Delete” button deletes an account other than the Administrator account.

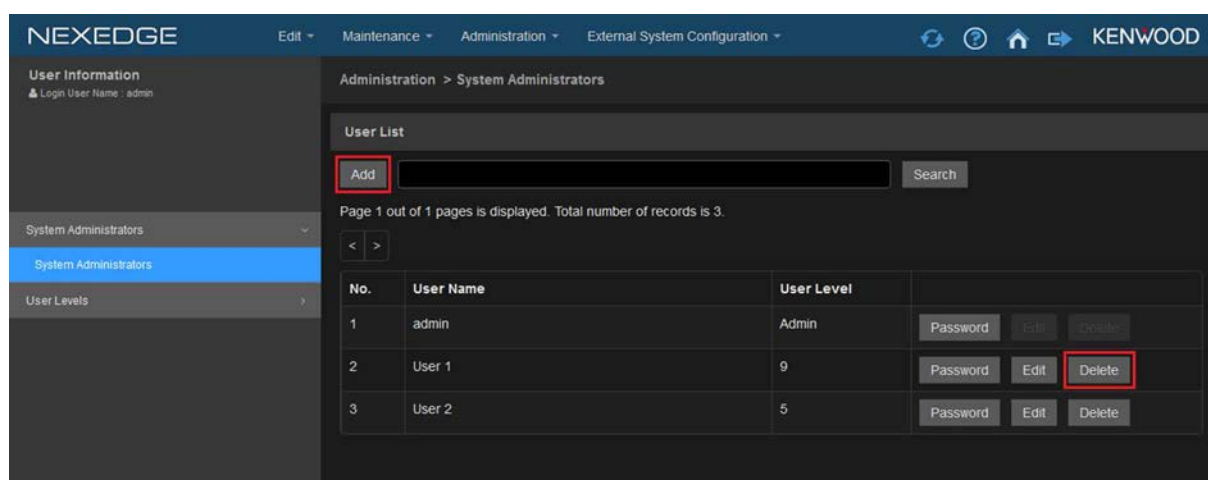


Figure 6-1 System Administrators

Configuring User Information (System User)

Clicking the “Add” or “Edit” button in **Administration > System Administrators** of SCU displays **System User**. The user information of the account can be configured in **User Information** of **System User**.

The screenshot shows the NEXEDGE web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar has a 'System Administrators' section with 'System User (Edit)' highlighted. The main content area is titled 'Administration > System Administrators > User 1: System User (Edit)'. Below this is the 'User Information' form with the following fields:

- User Name: User 1
- User Level: 9
- First Name: (empty)
- Last Name: (empty)
- Company Name: (empty)
- Department Name: (empty)
- Primary Phone: (empty)
- Secondary Phone: (empty)
- Email Address: (empty)
- Street Address: (empty)

Figure 6-2 User Information

Table 6-3 Configuration of the User Information

Item	Description
User Name	User Name allows a system administrator to configure the name of the user. A maximum of 64 alphanumeric characters and symbols can be entered.
User Level	User Level allows a system administrator to configure the user level assigned to the user.
First Name	First Name allows a system administrator to configure the first name of the user.
Last Name	Last Name allows a system administrator to configure the last name of the user.
Company Name	Company Name allows a system administrator to configure the name of the company to which the user belongs.
Department Name	Department Name allows a system administrator to configure the name of the department to which the user belongs.
Primary Phone	Primary Phone allows a system administrator to configure the main telephone number of the user.
Secondary Phone	Secondary Phone allows a system administrator to configure the spare telephone number of the user.
Email Address	Email Address allows a system administrator to configure the email address of the user.
Street Address	Street Address allows a system administrator to configure the address of the user. The field can also be used for remarks.

After configuration, click the “Save” button to save.

Configuring the Fleet to Be Managed by Each User (Fleet Management)

Clicking the “Add” or “Edit” button in **Administration > System Administrators** of SCU displays **System User**. The Fleet administrative privileges of the account can be configured in **Fleet Management** of **System User**.

No.	Fleet Range (MIN)	Fleet Range (MAX)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Figure 6-3 Fleet Management

If limiting the Fleet to be managed by each user, the range of the Fleet with privileges to be specified can be specified in **Fleet Range (MIN-MAX)**.

A maximum of 10 ranges of the Fleet can be specified. The privileges specified in **Fleet List** of **User Level** apply for the Fleet with no specified privileges. The editing privileges of the GID List and the UID List (Modify or View) can be operated under the Fleet privileges. For example, if the Fleet privilege of User A is “View”, the privilege of User A is limited to viewing only (View) even if the GID List privilege of User A is “Modify”, because Fleet privileges have priority.

After configuration, click the “Save” button to save.

Specifying and Limiting the System/Site That Can Be Managed by the User (Site Management)

Clicking the “Edit” button in **Administration > System Administrators** of SCU and clicking **Site Management** in the navigation displays **Site Management**. Clicking the “Edit” button in **Site Management** allows you to configure a site that the account is permitted to manage in a system. For the site to be permitted, configure “ON” in **Valid** to remain as default.

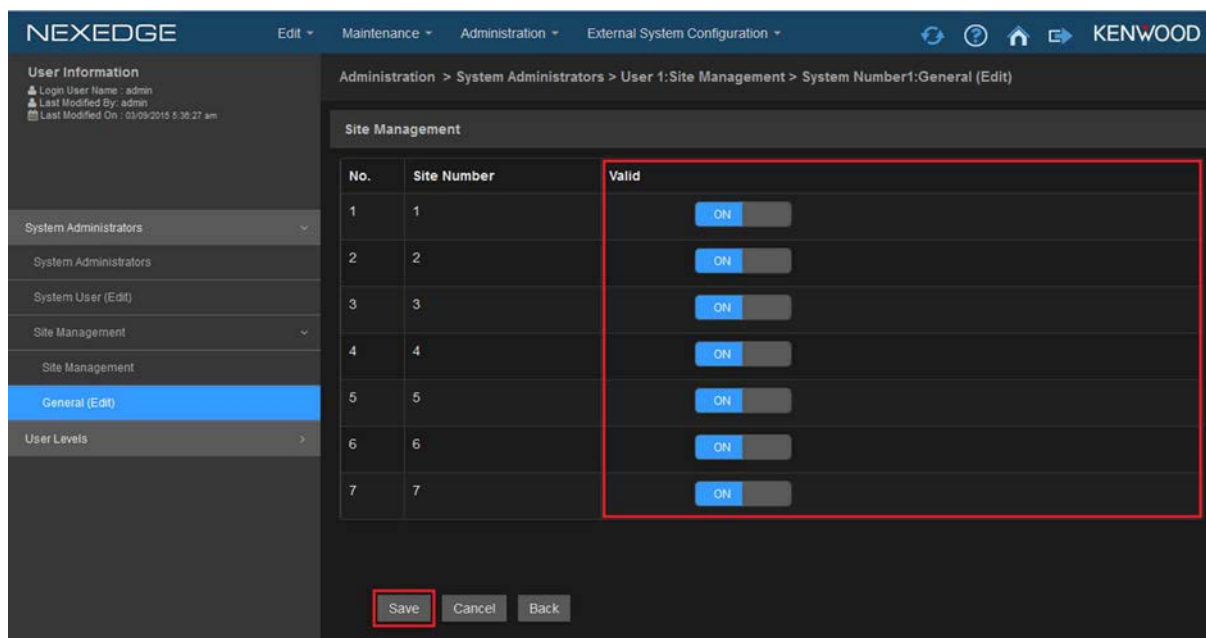


Figure 6-4 Site Management

After configuration, click the “Save” button to save.

Changing the Password of the User (System User Password)

Clicking the “Password” button in **Administration > System Administrators** of SCU displays **System User Password**, and the password of the account can be entered or changed. The password can be entered as a maximum of 64 alphanumeric characters and symbols. The password is not configured by default.

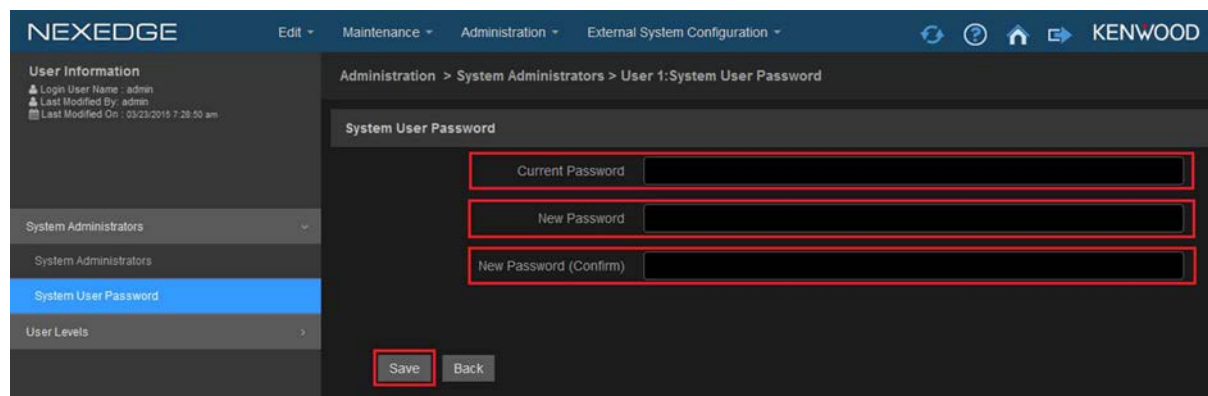
The screenshot shows the NEXEDGE web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar has 'User Information', 'System Administrators', 'System User Password' (highlighted), and 'User Levels'. The main content area is titled 'Administration > System Administrators > User 1: System User Password'. It contains three password input fields: 'Current Password', 'New Password', and 'New Password (Confirm)'. Each field has a red rectangular border. At the bottom, there are 'Save' and 'Back' buttons, with the 'Save' button also highlighted by a red rectangular border.

Figure 6-5 System User Password

After configuration, click the “Save” button to save.

Configuring the User Privileges for System Configuration and Operation (User Level)

In **Administration > User Levels** of SCU, the user level can be confirmed in the list.

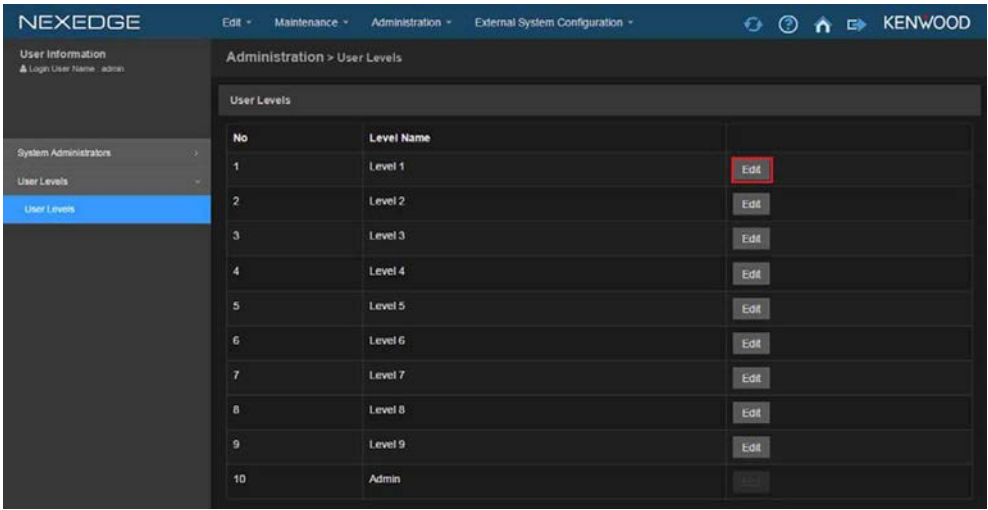


Figure 6-6 User Levels

Clicking the “Edit” button in **Administration > User Levels** of SCU displays **User Level**, and the permitted operations for the user level can be configured.

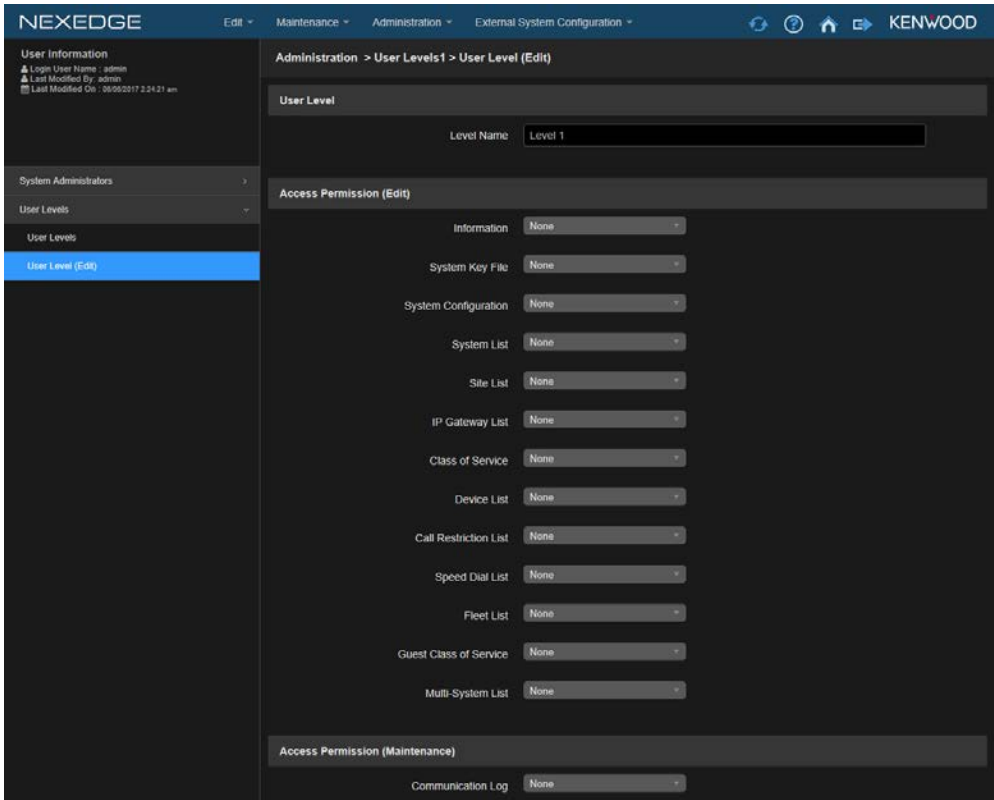


Figure 6-7 User Level

Table 6-4 Configuration of the User Level

Item		Description
User Level	Level Name	Level Name allows a system administrator to configure the name of the user level. A maximum of 32 alphanumeric characters and symbols can be entered.
Access Permission (Edit)	Information	Configures the Information configuration privileges.
	System Key File	Configures the System Key File configuration privileges.
	System Configuration	Configures the System Configuration configuration privileges.
	System List	Configures the System List configuration privileges.
	Site List	Configures the Site List configuration privileges.
	IP Gateway List	Configures the IP Gateway List configuration privileges.
	Class of Service	Configures the Class of Service configuration privileges.
	Device List	Configures the Device List configuration privileges.
	Call Restriction List	Configures the Call Restriction List configuration privileges.
	Speed Dial List	Configures the Speed Dial List configuration privileges.
	Fleet List	Configures the Fleet List configuration privileges.
	Guest Class of Service	Configures the Guest Class of Service configuration privileges.
	Multi-System List	Configures the Multi-System List configuration privileges.
Access Permission (Maintenance)	Communication Log	Configures the Communication Log privileges.
	System Log	Configures the System Log privileges.
	Diagnostic Data	Configures the Diagnostic Data privileges.
	Remote Control	Configures the Remote Control privileges.
	Firmware Update	Configures the Firmware Update privileges.
	Backup	Configures the Backup privileges.
	Restore	Configures the Restore privileges.
	Factory Reset	Configures the Factory Reset privileges.
	System Configuration Report	Configures the System Configuration Report privileges.
	Time Settings	Configures the Time Adjustment privileges.
	Available ID Map	Configures the Available ID Map privileges.
	Import	Configures the Import privileges.
	Export	Configures the Export privileges.
	Export All	Configures the Export All privileges.
	IP Configuration	Configures the IP Configuration privileges.
	Registration Monitor	Configures the Registration Monitor privileges.
	Formats	Configures the Formats privileges.
	Language	Configures the Language privileges.
	Theme	Configures the Theme privileges.

Item		Description
Access Permission (Administrator)	System Administrators	Configures the System User privileges.
	User Levels	Configures the System User Level privileges.
Access Permission (External System Configuration)	Roaming Gateway	Configures the Roaming Gateway privileges.
	Network Manager	Configures the Network Manager privileges.

After configuration, click the “Save” button to save.

6.3

Preventing the Duplication of a Subscriber Unit That Can Access the System (System Key File)

System Key File is the function to prevent an illegally duplicated subscriber unit from accessing the system.

Using the SCU, a System Key File required for configuring each subscriber unit for use in a NEXEDGE system can be created. Various configurations for the subscriber unit in an NXDN Trunking system can be configured by reading the created System Key File on the NXDN FPU such as KPG-D1.

The system administrator creates the System Key File and distributes the file to the FPU users. The configuration data of the subscriber unit written by using System Key File cannot be read unless items such as the Network Category of System Key File configured in the FPU match. This can prevent the illegal duplicating of a subscriber unit that can access the NEXEDGE system.

Note

- Security can be improved by using the **Manufacturer Limitation** function along with the **System Key File** function. (Refer to [Limiting the Manufacturers of Available Subscriber Units \(Manufacturer Limitation\)](#).)

Creating the System Key File

In **Edit > System Key File** of SCU, by entering the **License ID** and **System Name** of the FPU to configure the subscriber unit, and then clicking the “Create” button to specify the save location, a System Key File (extension: .skf) is created at the specified save location.

Figure 6-8 System Key File

Table 6-5 Configuration of System Key File

Item	Description
License ID	In License ID , the system administrator enters the license ID of the FPU to be provided with a System Key File. License ID is recorded in a System Key File, and recorded in a system log when a System Key File is created.
System Name	In System Name , the system administrator enters the name of the System Key File. The System Name is the name used when selecting a System Key File on the FPU of the subscriber unit. A maximum of 16 alphanumeric characters and symbols can be entered. System Name is recorded in a System Key File, and recorded in a system log when a System Key File is created.
GID Range/ UID Range	GID Range/ UID Range allows a system administrator to configure the range of GIDs or UIDs that can be configured in the FPU. By configuring the range of GIDs or UIDs that can be configured, a System Key File with the restriction on GIDs or UIDs that can be configured in the FPU can be created. This function is configured to avoid registering wrong GIDs or UIDs in a subscriber unit and to restrict the configuration range of GIDs or UIDs by using the FPU. GID Range/ UID Range is recorded in a System Key File and recorded in a system log when creating a System Key File.

Note

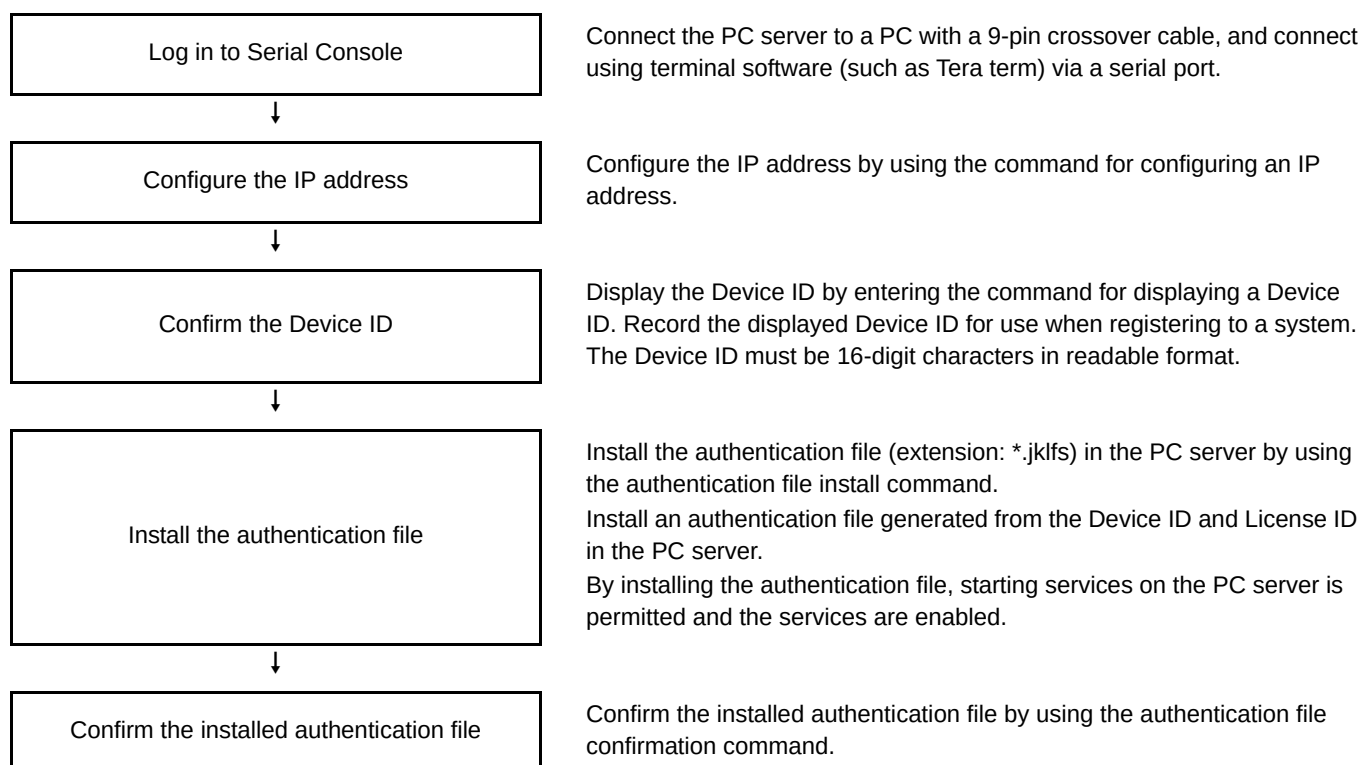
- If the license ID of the System Key File and the license ID of the FPU do not match, the configuration of an NXDN Trunking system for the subscriber unit cannot be configured.
- The default file name of a System Key File is “NEXEDGE_system_key_(System Name)_(date).skf”.

To configure and operate a NEXEDGE system by using SCU, the initial configuration of a PC server to be used as a system controller is required.

After the initial configuration of the PC server, the repeaters and various controllers of the system can be configured by connecting to SCU via an IP network. (Refer to [OPERATION OF SYSTEM CONFIGURATION UTILITY](#).)

7.1 Authenticating a System Controller

The following are the steps for the initial configuration of the PC server. For the initial configuration, Serial Console is used since Serial Console allows the PC server to be configured even if the network is not configured. Refer to “NEXEDGE 2nd Generation Basic Configuration” for the detailed configuration procedure.



After the initial configuration of the PC server, SCU can be connected and logged in via an IP network. (Refer to [Login/Logout](#).)

Reading the License Information of a System

By clicking the “Browse...” button in **Edit > Information** and selecting an Activation File, the license information of a NEXEDGE system can be read into SCU. In **Information**, the license information of the NEXEDGE system read from the Activation File is displayed. The configuration range and functions of the NEXEDGE system which can be built by SCU are restricted according to the parameters in the Activation File.

The Activation File is a data file with license information required for building the NEXEDGE system. By reading the license information of the Activation File into SCU, a NEXEDGE system can be built by using SCU.

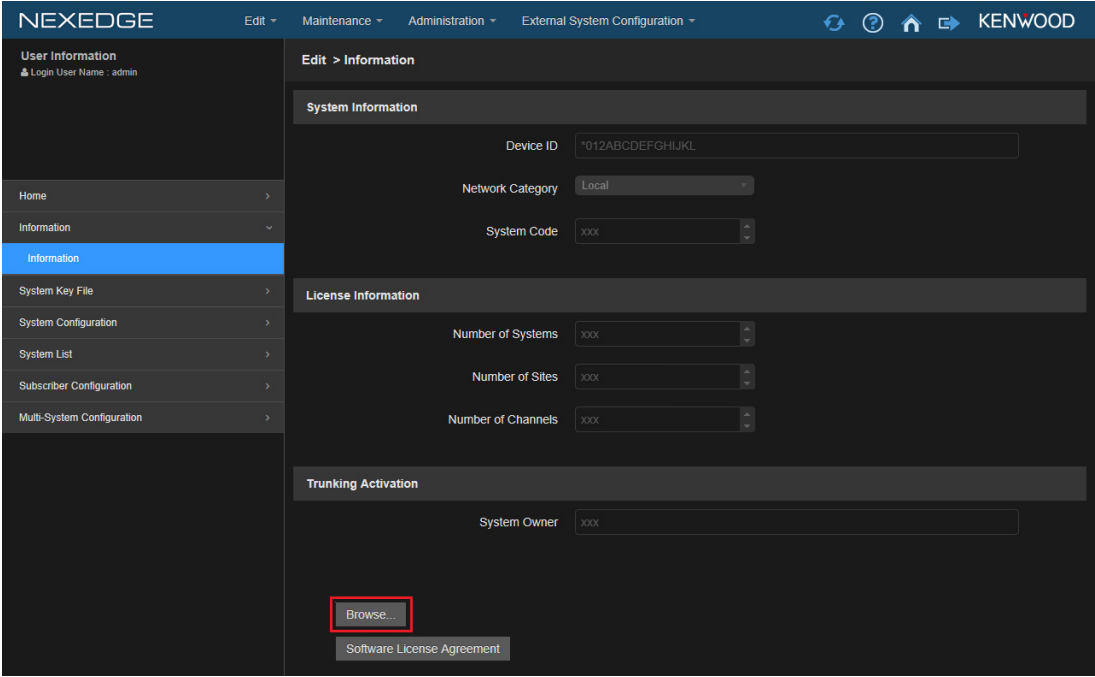


Figure 7-1 Information

The following information appears in **Information**:

Table 7-1 License Information of a System

Item		Description
System Information	Device ID	In Device ID , the unique information of a PC server in which a system controller to be installed is displayed.
	Network Category	In Network Category , the scale of the network that can be expanded (Regional, Local, or Global) is displayed. The maximum number of sites that can be connected varies by each Network Category .
	System Code	In System Code , the unique number of the system is displayed. The range of System Code varies depending on the Network Category . Global: 1 to 1022 (10 bit) Regional: 1 to 16382 (14 bit) Local: 1 to 131070 (17 bit)
License Information	Number of Systems	In Number of Systems , the maximum number of systems that can be added is displayed. A number of systems greater than Number of Systems cannot be built.
	Number of Sites	In Number of Sites , the maximum number of sites that can be added to a single system is displayed. A system with a number of sites greater than Number of Sites cannot be built.
	Number of Channels	In Number of Channels , the maximum number of channels that can be added to a single system is displayed. A system with the number of channels greater than Number of Channels cannot be built.
Trunking Activation	System Owner	In System Owner , the name of the customer registered in an Activation File is displayed.

7.2 Registering a Subscriber Unit in a System (Registration)

Registration is the function to register the location in a NEXEDGE system when a subscriber unit, such as a transceiver or IP console, uses the NEXEDGE system. The NEXEDGE system registers a UID in the system when a registration request is received from a subscriber unit.

The location of the subscriber unit is registered in the NEXEDGE system when the subscriber unit searches and acquires a control channel, such as when the subscriber unit is turned on. By registering the location, the NEXEDGE system can recognize the site in which the subscriber unit exists and identify the site in the communication area. Therefore, an incoming call request can be sent immediately to the site in which the subscriber unit which can be called by an Individual Call exists, and the system can be operated efficiently because the search for the subscriber unit is no longer needed.

Registering a GID in a System (Group Registration)

Group Registration is the function that allows a subscriber unit to register the Group ID to be used in a Group Call to a NEXEDGE system.

If Group Call is used in a multi-site system, subscriber units belonging to a group are called using the channel resources (frequencies) across multiple sites. In this case, to use channel resources effectively, it is necessary to efficiently and appropriately recognize the locations of subscriber units that are waiting for a Group Call and also suppress transmissions on channels where there is no subscriber unit to receive the Group Call.

If a subscriber unit executes Group Registration, the NEXEDGE system records the information. If a Group Call occurs in a multi-site, the NEXEDGE system determines the call range of the GID and then initiates the call. By using Group Registration, the GID can be called in a dynamic site configuration, and frequencies can be used efficiently.

The following are the behaviors of Group Registration:

Behavior of a subscriber unit

- If a subscriber unit finds an available site in the hunt sequence and registers the own station in the site, the subscriber unit registers the own UID and GID. If the preconfigured GID is changed by key operation, a new GID is registered.
- If a subscriber unit accesses a control channel with anything other than an already registered GID, the subscriber unit always sends a group registration request for the NEXEDGE system. However, the subscriber unit does not send the group registration request when accessing the traffic channel, such as when receiving a call. After communications on the traffic channel are completed, if the preconfigured GID on the control channel is different from the registered GID, the subscriber unit sends a group registration request again.
- The subscriber unit always registers a GID when the subscriber is turned on.
- The subscriber unit deletes the registered GID when the subscriber unit is turned off or when migrating to a Conventional zone.

Behavior of the system

- The NEXEDGE system registers the GID upon receipt of a group registration request from a subscriber unit. If the GID is previously registered by the subscriber unit, the NEXEDGE system deletes the registration information of the GID and registers a new GID.
- Upon receipt of a Group Call request from a subscriber unit, the NEXEDGE system refers to the configuration for Service Class of the GID and then identifies whether the called site exists in **Intersite Call List** if **Intersite Call** is enabled. If the called site is configured in **Intersite Call List**, the NEXEDGE system accepts a Group Call request and initiates a Group Call in the area covered by the called site.
- The NEXEDGE system deletes the registration information of the GID if the GID is not used from when the registration information of the GID is last updated until the amount of time configured in **Group Registration Reset Timer** elapses. The registration information is updated when initiating or responding to a Group Call and when executing Group Registration. (Refer to [Automatically Deleting the Registration Information of a GID \(Group Registration Reset Timer\)](#).)
- If no subscriber unit successful in Group Registration exists in the site where **Dynamic Allocation** is enabled, the traffic channel is not allocated to a Group Call.
- If **Group Refusal** is enabled, the call area of a Group Call (a site where Group Registration succeeded) can be configured as the service area of the subscriber unit. The subscriber unit outside the call area of the Group Call (a site where Group Registration failed) indicates that the subscriber unit is out of range.

Automatically Deleting the Registration Information of a GID (Group Registration Reset Timer)

Group Registration Reset Timer is the amount of time until the registration information of a GID is automatically deleted from a NEXEDGE system.

The NEXEDGE system deletes the registration information of the GID if the GID is not used from when the registration information of the GID is last updated until the amount of time configured in **Group Registration Reset Timer** elapses. The registration information is updated when initiating or responding to a Group Call and when executing Group Registration.

The registration information of a GID is the only information deleted when the **Group Registration Reset Timer** elapses. The registration information of a UID is not deleted.

Note

- **Group Registration Reset Timer** can be configured as the default of the overall system, but **Group Registration Reset Timer** can also be configured for each **Fleet List**. (Refer to [Configuring Group Registration Reset Timer](#).)

Configuration items using SCU

- Configuring **Group Registration Reset Timer** (default of the overall NEXEDGE system) ( [See](#) Edit > System Configuration > General)
- Configuring **Group Registration Reset Timer** for each **Fleet List** ( [See](#) Edit > Fleet List > General (Add))

7.3 Configuring the IP Network Information

By using SCU, an IP address used for a Multicast Group Call can be configured, and the IP network information of each system controller, IP Gateway, and Network Manager Server can be confirmed and configured.

Configuring Whether to Deliver by Using Unicast or Multicast (Unicast/Multicast Group Call)

Unicast/Multicast Group Call is the function to deliver voice data and Long Data packets of a Group Call from a system controller to the site by the Unicast or Multicast method.

- **Multicast method (Multicast Group Call)**

A system controller delivers voice data and Long Data packets of a Group Call by the Multicast method.

By using the Multicast method, a NEXEDGE system can reduce the bandwidth consumption of an IP network from a Group Call.

- **Unicast method (Unicast Group Call)**

A system controller delivers voice data and Long Data packets of a Group Call by the Unicast method. The number of sites that a single system controller can call by Group Call is limited to 16 sites.

The parameters of various functions of **Unicast/Multicast Group Call** can be configured in **Edit > System List > Network > Unicast/Multicast Group Call** of SCU.

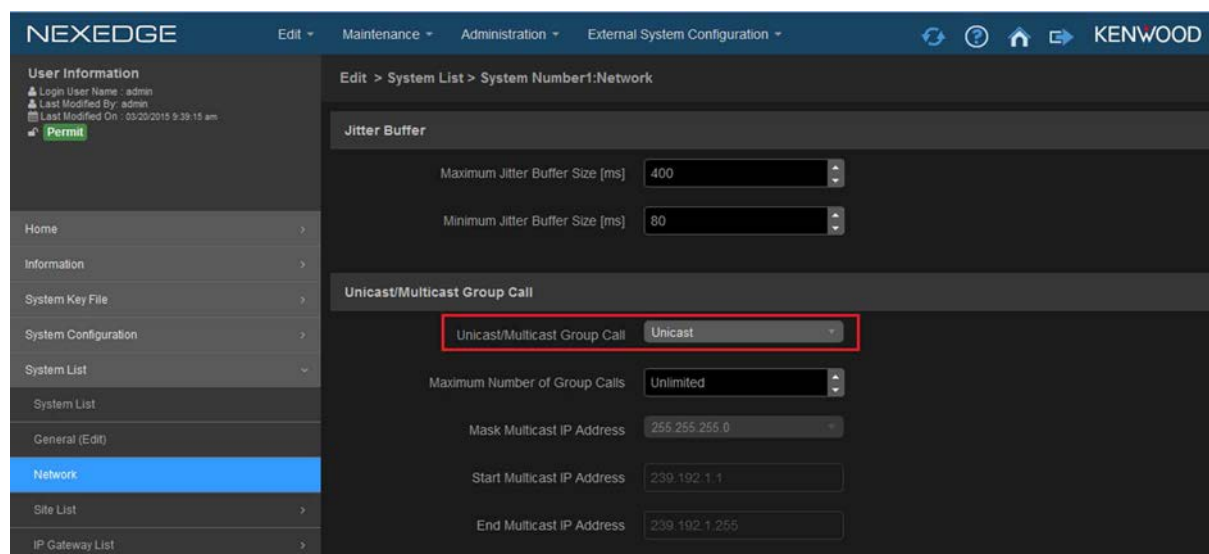


Figure 7-2 Unicast/Multicast Group Call

Note

- A network device supporting IP Multicast is required if Multicast Group Call is used.
- Use Multicast Group Call if the call area of the Group Call in a NEXEDGE system is more than 17 sites.

Limiting the number of Group Calls that can be executed at the same time (Maximum Number of Group Calls)

Maximum Number of Group Calls is the maximum number of Group Calls that a system controller can execute at the same time.

Configuring the maximum number of Group Calls a system controller can execute at the same time prevents the network from being congested when the NEXEDGE system sends multiple Group Calls in the Multicast method at the same time.

If the number of call requests for Group Call exceeds the number configured in **Maximum Number of Group Calls**, the NEXEDGE system becomes busy and the call will be canceled.

Configuring a Multicast IP Address

By using SCU to configure the mask of a Multicast IP Address allocated by a system controller in **Mask Multicast IP Address** and to configure the range of the Multicast IP Address in **Start Multicast IP Address** and **End Multicast IP Address**, a Multicast IP Address can be configured.

The number of available Multicast IP Addresses is determined as follows depending on the configuration in **Mask Multicast IP Address**:

Table 7-2 Mask Multicast IP Address

Mask Multicast IP Address	Number of Available Multicast IP Addresses
255.255.240.0	4096
255.255.248.0	2048
255.255.252.0	1024
255.255.254.0	512
255.255.255.0	256
225.225.225.128	128
255.255.255.192	64
255.255.255.224	32

Configuring the IP Network Information of a Repeater (Network Setting)

The network information, such as the MAC address and IP address of each repeater (channel), can be configured in **Edit > System List > Site List > Channel List > General (Edit) > Network Setting** of SCU.

Figure 7-3 Network Setting

Configuring a MAC address

The MAC address is a unique value written in each repeater during production. Configuring the MAC address of a repeater for a NEXEDGE system links the configured MAC address to the configuration data of the repeater. This allows the NEXEDGE system to configure all configuration data of the repeater.

Note

- The MAC address configured for the NEXEDGE system needs to match the MAC address of the repeater to be used. Therefore, the MAC address needs to be configured again when the repeater is replaced, such as because of failure of the repeater.
- Each repeater needs to be previously adjusted to the frequency linked to a NEXEDGE system before connecting to the NEXEDGE system.
- NEXEDGE system supports only IPv4. It does not support IPv6.
- The MAC address of the repeater can be read by **Network Information** of KPG-109D/ DN after connecting the repeater to a PC with KPG-109D/ DN (V5.00 or later) installed using a crossover cable.

Automatically configuring an IP address, Subnet Mask, and Default Gateway

Configuring “Auto” in **Setting Mode** by using SCU, the IP address, Subnet Mask, and Default Gateway of a repeater can be automatically configured according to the following calculation method:

- **IP Address**

$$172.(16 + (\text{site number} \gg 10)).((\text{site number} \& 0x3fe) \gg 2).(\text{channel number} + ((\text{site number} \& 0x3) \ll 6))$$
- **Subnet Mask**
 255.255.255.192 (fixed)
- **Default Gateway**

$$172.(16 + (\text{site number} \gg 10)).((\text{site number} \& 0x3fe) \gg 2).(62 + ((\text{site number} \& 0x3) \ll 6))$$

Manually configuring an IP address, Subnet Mask, and Default Gateway

Configuring “Manual” in **Setting Mode** by using SCU, the IP address, Subnet Mask, and Default Gateway of a repeater can be manually configured.

Configuring the IP Network Information of a System Controller (IP Configuration)

The IP address of a system controller can be confirmed and changed by using SCU.

Confirming the current IP network information

The IP address of a system controller can be confirmed in **Maintenance > System > IP Configuration > Current Setting** of SCU.

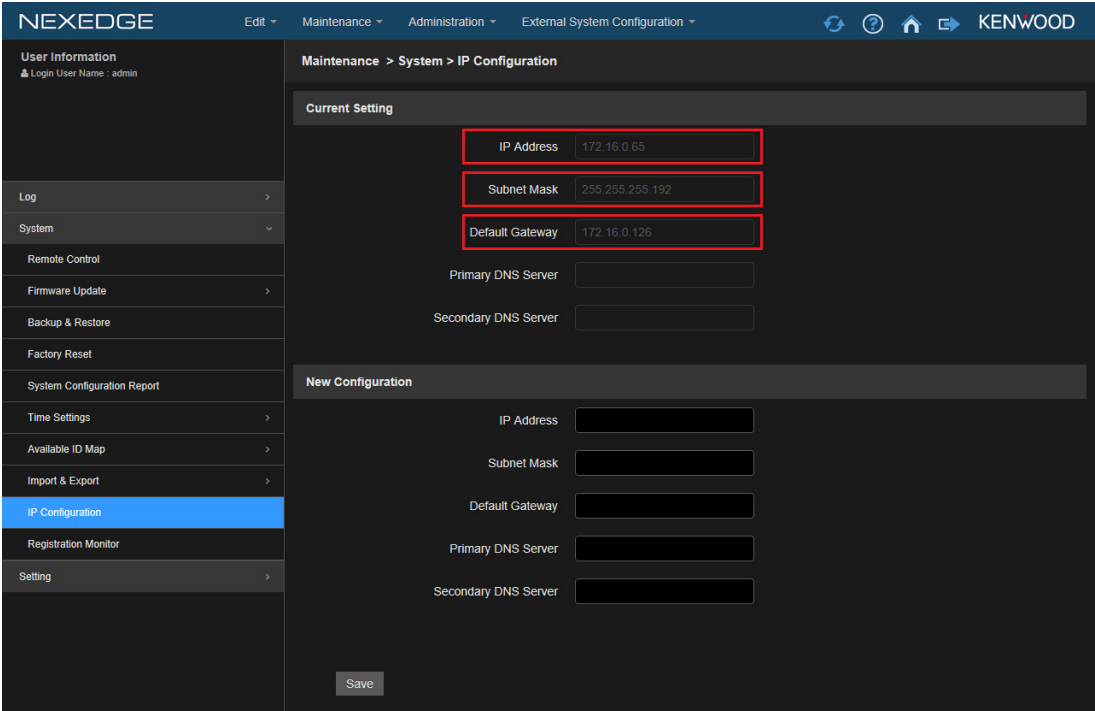


Figure 7-4 Current Setting

Configuring the new IP network information

The IP address of a system controller can be changed in **Maintenance > System > IP Configuration > New Configuration** of SCU.

The screenshot displays the NEXEDGE SCU web interface. The breadcrumb navigation at the top reads 'Maintenance > System > IP Configuration'. On the left, a sidebar menu lists various system functions, with 'IP Configuration' selected and highlighted in blue. The main content area is divided into two sections: 'Current Setting' and 'New Configuration'. The 'Current Setting' section displays the existing network parameters: IP Address (172.16.0.65), Subnet Mask (255.255.255.192), and Default Gateway (172.16.0.126). The 'New Configuration' section provides input fields for these same parameters. In this view, the 'IP Address', 'Subnet Mask', and 'Default Gateway' fields are each enclosed in a red rectangular box. Below these fields, there are empty input fields for 'Primary DNS Server' and 'Secondary DNS Server'. At the bottom left of the configuration area, a 'Save' button is also highlighted with a red rectangular box.

Figure 7-5 New Configuration

After configuration, click the “Save” button to save.

Note

- Changing the IP address restarts the services in the NEXEDGE system.
- Changing the IP address disconnects SCU. Reconnect using the changed IP address.
- If the system controller is redundant, the IP address cannot be confirmed or configured in **IP Configuration**.

Configuring the IP network information of an IP Gateway

An IP Gateway is the device for connecting a device compliant with NXIP Console Interface. The configuration for connecting the NEXEDGE system to the IP Gateway server can be configured by using SCU. (Refer to [Connecting an IP Gateway server](#).)

Configuring the IP network information of Network Manager Server

Via an IP network, Network Manager Server monitors the status of devices that make up an NEXEDGE system, such as PC servers and repeaters.

Whether a system controller or a dedicated PC server is used for Network Manager Server in a Network Manager system can be configured in **External System Configuration > Network Manager** of SCU. Also, if a dedicated PC server is used for Network Manager Server, the IP address of Network Manager Server can be configured. (Refer to [About Network Manager Server](#).)

7.4 Registering a Site

The sites that make up the NEXEDGE system can be registered, and site information, such as a site number, a channel to transmit a synchronization signal, and parameters of various functions for a site controller to function can be configured.

Clicking the “Add” button in **Edit > System List > Site List** of SCU displays **General (Add)**, and a site can be added.

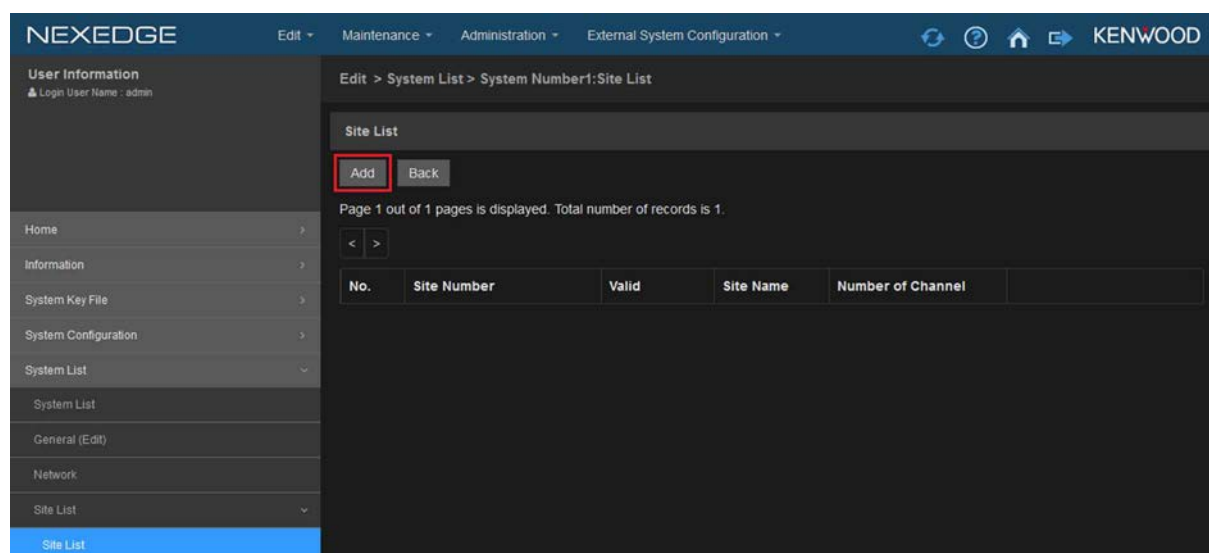


Figure 7-6 Site List

Note

- A list of the registered sites appears in **Site List**.
- By clicking the “Details” button in **Site List**, the configuration contents of the corresponding site can be viewed.
- By clicking the “Edit” button in **Site List**, the configuration of the corresponding site can be changed.
- By clicking the “Delete” button in **Site List**, the corresponding site can be deleted.

Configuring Site Information (Site Information)

Site information such as a site number can be configured in **Edit > System List > Site List > General (Add or Edit) > Site Information** of SCU.

Figure 7-7 Site Information

After configuration, click the “Save” button to save.

Configuring a site number (Site Number)

Site Number is the number of a site. Available site numbers vary depending on the **Network Category**. (Refer to [Confirming the System Code](#).)

Table 7-3 Site Number

Network Category	Site Number
Global	1 to 4094 (12 bit)
Regional	1 to 254 (8 bit)
Local	1 to 30 (5 bit)

Note

- Already used site numbers cannot be configured.
- The site number cannot be changed after creating a site.

Configuring whether to use a site or not (Valid)

Valid allows a system administrator to configure whether the configured site is used in the NEXEDGE system. To use a site in the NEXEDGE system, configure “ON” in **Valid**. To not use a site in the NEXEDGE system, configure “OFF” in **Valid**.

Configuring a site name (Site Name)

Site Name is the name of a site. Site Name is configured to distinguish the configured sites. The name configured for each site appears in the list of **Site List**.

Displaying the number of channels configured in a channel list (Number of Channel)

In **Number of Channel**, the number of channels configured in **Channel List** appears. The number of channels registered in a site can be checked.

Configuring the channel table number for each site (Channel Table Number)

In **Channel Table Number**, the channel table number to be used in each site can be configured. By allocating a channel table number to each site, a different frequency can be used in each site.

Table 7-4 Configuration of Channel Table Number

Item	Description
Default	Behaves according to the configuration of Channel Table Number in Edit > System List > General (Add or Edit) > System Information . (Refer to Configuring the channel table number for each system (Channel Table Number) .)
General	The frequencies configured in the channel table that is common in a Wide-Area System can be used. This channel table can be configured in Edit > System Configuration > Channel Table . (Refer to Configuring Frequencies of the Repeater (Channel Table) .)
1: Table Name to 23: Table Name	The frequencies configured in the channel table registered in Additional Channel Table can be used. This channel table can be configured in Edit > System Configuration > Additional Channel Table . (Refer to Configuring the Channel Tables of Different Frequencies .)

Restricting the repeat behaviors after startup (Power-on Standby)

Power-on Standby is the function that places a control channel in the standby state when a repeater starts.

This is a function that disables the transmission capability until the frequency is stabilized when the optional reference oscillator OCXO (KXK-3) is used. The control channel can be activated when the frequency is stabilized after the repeater starts.

If "ON" is configured for this function, the control channel is activated in the standby state when the repeater starts. The LED of the **[RPT DISABLE]** key for a control channel lights while in the standby state. If the **[RPT DISABLE]** key on any of the repeaters in the site is pressed, the LED on all the repeaters is turned off, the standby state is reset, and then transmission starts on a control channel.

If "OFF" is configured for this function, the control channel is not activated in the standby state and transmission immediately starts when the repeater starts.

Inhibiting the transmission of a Station ID on a control channel (Station ID Inhibit)

Station ID Inhibit is the function to disable transmission of a Station ID on a control channel.

If this function is enabled in a site, the channel in the site being operated as a control channel cannot transmit a Station ID even if the channel is configured to be enabled to transmit a Station ID.

The transmission of a Station ID can be disabled if multiple Dual-Functional Channels behave as a control channel by using such functions as **Automatic Rollover** or **Failure Control Channel Switching**.

Delaying the startup time of a repeater (Adjusted Boot Timing)

Adjusted Boot Timing is the function to delay the startup time of NXR-5700/ NXR-5800. Since the length of time to stabilize the external reference frequency varies depending on the repeater if a system is operated in a site where different types of repeaters coexist, a channel can become available by the same timing as NXR-700/ NXR-800 that is slow to stabilize the external reference frequency by delaying the startup time of NXR-5700/ NXR-5800.

If "ON" is configured for this function, the startup time of NXR-5700/ NXR-5800 is extended.

Note

- If external reference signals are used, the blinking time of the channel number on the LED display of when the repeater starts up is extended depending on the configuration of **Startup Delay**.
- For NXR-5900/ NXR-5901, the startup time is not extended even if "ON" is configured in this function. Configuring "5min" in **Startup Delay** allows the timing of startup to match NXR-900/ NXR-901.

Configuring the Channel to Transmit a Synchronization Signal (Sync)

In **Primary Channel Number** and **Secondary Channel Number** via **Edit > System List > Site List > General (Add or Edit) > Sync** of SCU, the repeater channel to transmit a synchronization signal for synchronizing repeaters in the site can be configured.

In the site where NXR-700/ NXR-800/ NXR-900/ NXR-901 and NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 coexist, NXR-700/ NXR-800/ NXR-900/ NXR-901 cannot be used as the repeater to transmit a synchronization signal.

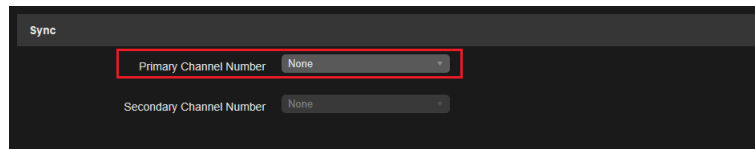


Figure 7-8 Sync

Primary Channel Number

Primary Channel Number allows a system administrator to configure the repeater channel to transmit a synchronization signal for synchronizing repeaters in the site.

From the channels registered in the site, the desired repeater channel can be configured in **Primary Channel Number**.

If one or more NXR-5700, NXR-5800, NXR-5900, or NXR-5901 exist in a site, an NXR-5700, NXR-5800, NXR-5900, or NXR-5901 repeater needs to be configured in **Primary Channel Number**.

Secondary Channel Number

Secondary Channel Number allows a system administrator to configure the alternative repeater channel to transmit a synchronization signal when the repeater configured in **Primary Channel Number** cannot transmit the synchronization signal because of a failure, etc.

From the channels registered in the site, the desired repeater channel can be configured in **Secondary Channel Number**.

If the repeater configured in **Primary Channel Number** is disconnected from the network and cannot transmit a synchronization signal, the repeater configured in **Secondary Channel Number** transmits the synchronization signal instead and synchronizes the repeaters in the site.

If two or more NXR-5700, NXR-5800, NXR-5900, or NXR-5901 exist in a site, an NXR-5700, NXR-5800, NXR-5900, or NXR-5901 repeater needs to be configured in **Primary Channel Number** and **Secondary Channel Number**.

Note

- If the primary repeater does not respond for 40 sec, the NEXEDGE system determines that the primary repeater is disconnected from the network and switches to the secondary repeater.
- Status LED 1 of the repeater that behaves as the primary repeater flashes.

Configuring a Site Controller (Site Controller)

In **Edit > System List > Site List > General (Add or Edit) > Site Controller** of SCU, whether a dedicated PC server or a repeater is used as the device to control the site can be configured.

Figure 7-9 Site Controller

Configuring whether a dedicated PC server or a repeater is used for site control (Controller Type)

Controller Type allows a system administrator to configure whether a dedicated PC server or a repeater is used as a device for controlling the site.

Table 7-5 Controller Type

Item	Description
Dedicated Server	A dedicated PC server is used to control the site.
Repeater	A repeater is used to control the site. (If the layout of repeaters is up to 9 repeaters)

Configuring the IP address of a dedicated PC server

IP Address allows a system administrator to configure the IP address of a dedicated PC server. This IP address is configured if “Dedicated Server” is configured in **Controller Type**.

Configuring the channel of the repeater controlling the site (Primary Channel Number)

Primary Channel Number allows a system administrator to configure the channel number of the repeater used for site control.

Primary Channel Number is configured if “Repeater” is configured in **Controller Type**.

If one or more NXR-5700, NXR-5800, NXR-5900, or NXR-5901 exist in a site, an NXR-5700, NXR-5800, NXR-5900, or NXR-5901 repeater needs to be configured in **Primary Channel Number**.

Configuring the backup channel of the repeater controlling the site (Secondary Channel Number)

Secondary Channel Number allows a system administrator to configure the channel number of the backup repeater used for site control.

If communications with the repeater configured in **Primary Channel Number** become unavailable, the repeater configured in **Secondary Channel Number** controls the site as an alternative, and normal operations are resumed.

Secondary Channel Number is configured if “Repeater” is configured in **Controller Type**.

If two or more NXR-5700, NXR-5800, NXR-5900, or NXR-5901 exist in a site, NXR-5700, NXR-5800, NXR-5900, or NXR-5901 repeaters need to be configured in **Primary Channel Number** and **Secondary Channel Number**.

7.5 Registering a Channel

Each channel (repeater) installed in the sites that make up a NEXEDGE system can be registered in the system, and channel information such as the receive frequency and transmit frequency to activate each channel can be configured.

Clicking the “Add” button in **Edit > System List > Site List > Channel List** of SCU displays **General (Add)**, and a channel can be added.

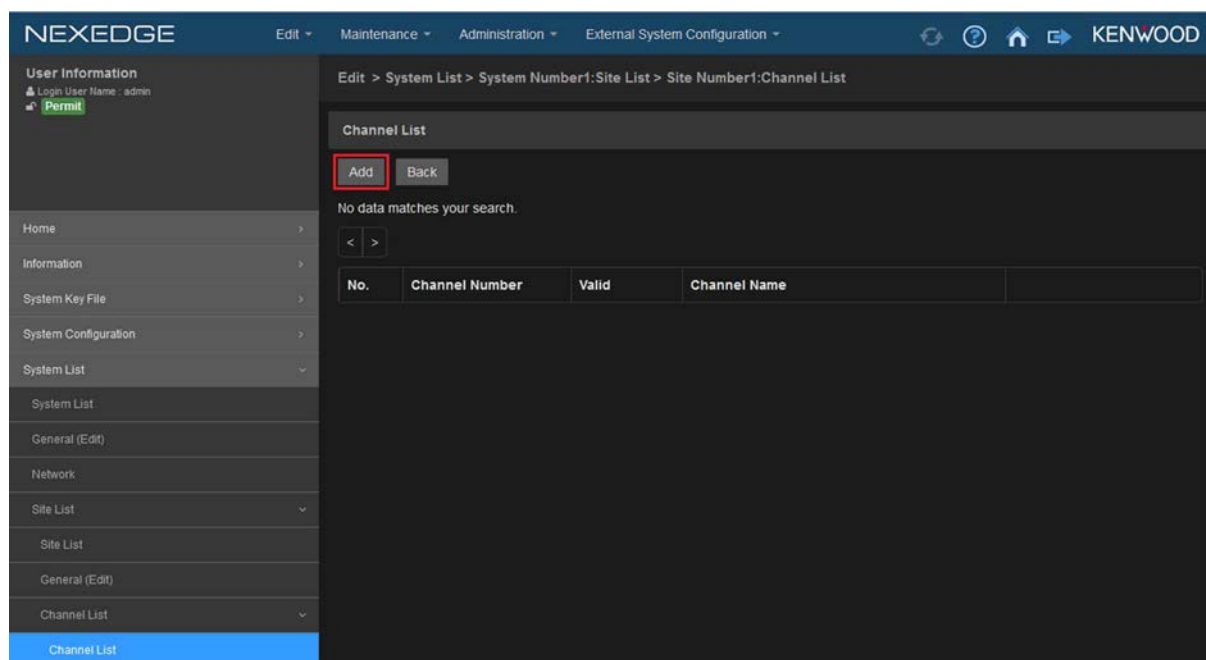


Figure 7-10 Channel List

Note

- A list of the registered channels appears in **Channel List**.
- By clicking the “Details” button in **Channel List**, the configuration contents of the corresponding channel can be viewed.
- By clicking the “Edit” button in **Channel List**, the configuration of the corresponding channel can be changed.
- By clicking the “Delete” button in **Channel List**, the corresponding channel can be deleted.

Configuring the Channel Information (Channel Information)

In **Edit > System List > Site List > Channel List > General (Add or Edit) > Channel Information** of SCU, channel information such as a channel number, receive frequency, transmit frequency, and usage type of a channel can be configured.

The screenshot displays the 'Channel Information' configuration page in the NEXEDGE web interface. The breadcrumb trail at the top reads: **Edit > System List > System Number1: Site List > Site Number1: Channel List > General (Add)**. The left sidebar shows a navigation menu with 'Channel List' selected. The main area contains various configuration fields for a channel, including:

- Channel Number: 1
- Model Type: NXR-5700/5800
- Valid: ON
- Frequency Number: 1
- RX Frequency: 150.150000
- TX Frequency: 131.150000
- Channel Type: NXDN
- Channel Mode: Control Channel
- GPS Report Channel: OFF
- Channel Name: 1
- Cross-busy Input Trigger: External
- Falsify Mode: OFF
- Station ID: [Empty field]
- Station ID Transmit Interval Timer [min]: 30
- Station ID Type: Digital
- Transmit Power: High
- Beat Shift 1: OFF
- Beat Shift 2: OFF
- Beat Shift 3: OFF
- Beat Shift 4: OFF
- Beat Shift 5: OFF
- 50 Ohm Termination: OFF
- Startup Delay: None
- Fan Action: Temperature

Figure 7-11 Channel Information

After configuration, click the “Save” button to save.

Configuring a channel number (Channel Number)

Channel Number is the number assigned to each repeater in the site. Channel Number is used as the identification number in the system along with the site number.

If multiple control channels exist in the NEXEDGE system, the control channel having the lowest channel number is preferentially configured as the control channel. If **Automatic Control Channel Rollover** or **Backup Control Channel** functions, a control channel in order from the lowest channel number behaves as the control channel.



- The channel number cannot be changed after creating a channel.

Configuring whether to use the channel in a system (Valid)

Valid allows a system administrator to configure whether the configured channel is used in the NEXEDGE system. To use a channel in the NEXEDGE system, configure “ON” in **Valid**.

To make the channel temporarily unavailable, such as when replacing the repeater, configure “OFF” in **Valid**.



- If “OFF” is configured in **Valid** of a channel where “Control Channel” is configured in **Channel Mode**, the control channel is not a target channel for **Automatic Control Channel Rollover** or **Backup Control Channel**. (Refer to [Configuring the usage mode of a channel \(Channel Mode\)](#).)
- If “OFF” is configured in **Valid** of a channel where “Traffic Channel” is configured in **Channel Mode**, the traffic channel is not allocated to a call or data communications.
- If “OFF” is configured in **Valid** of a channel where “Dual-Functional Channel” is configured in **Channel Mode**, the channel functions neither as a control channel nor as a traffic channel.

Configuring the model type of the repeater to be used (Model Type)

In **Model Type**, the model type of the repeater to be used on the channel having the channel number configured in **Channel Number** can be configured.

Table 7-6 Configuration for Model Type

Item	Description
NXR-700/ NXR-800/ NXR-900/ NXR-901	NXR-700, NXR-800, NXR-900, or NXR-901 is used on the channel having the channel number configured in Channel Number .
NXR-5700/ NXR-5800/ NXR-5900/ MXR-5901	NXR-5700, NXR-5800, NXR-5900, or NXR-5901 is used on the channel having the channel number configured in Channel Number .

Configuring the frequency number corresponding to a transmit and receive frequencies (Frequency Number)

Frequency Number is a number in a frequency table configured in **Frequency List** of **Channel Table**. By specifying **Frequency Number**, the transmit and receive frequencies to be used in the channel can be configured. To configure **Frequency Number**, a frequency table needs to be preconfigured in **Edit > System Configuration > Channel Table > Frequency List** of SCU. (Refer to [Configuring Frequencies of the Repeater \(Channel Table\)](#).)

Note

- Configure a frequency number configured in **Frequency List**. If a frequency number not configured in **Frequency List** is configured, a subscriber unit cannot recognize the NEXEDGE system, and a call cannot be initiated.

Configuring transmit or receive frequencies

By configuring **Frequency Number**, the transmit or receive frequency of the repeater linked to a frequency number is automatically configured.

The repeater transmits and receives on the frequencies configured in **Frequency List** of **Channel Table**.

Note

- Deleting **Frequency List** of **Channel Table** after configuring **Frequency Number** displays “No Frequency”.

Configuring the usage type of a channel (Channel Type)

Channel Type is the usage type of a channel in an NEXEDGE system. “NXDN”, “Shared” or “AUX” can be configured in **Channel Type**.

Table 7-7 Configuration for Channel Type

Item	Description
AUX	Using the Cross-busy function at the same time enables the connection to a Trident or Zetron LTR controller.
NXDN	The channel transmits and receives NXDN digital signals as a traffic channel. Or, the channel controls the communications using NXDN digital signals as a control channel.
Shared	The channel can share the traffic channel of an NXDN Trunking system with Analog Conventional mode. An analog subscriber unit already operating is not dropped and can be continue to be used by using the Shared Channel function. Then, digital subscriber units can be installed sequentially as additions, and can be operated in the NXDN Trunking system. With this function, existing functions can be effectively used.

Configuring the usage mode of a channel (Channel Mode)

Channel Mode is the usage mode of a channel in the NEXEDGE system. “Control Channel”, “Traffic Channel” or “Dual-Functional Channel” can be configured in **Channel Mode**.

Table 7-8 Configuration for Channel Mode

Item	Description
Control Channel	Control Channel is the channel used to constantly transmit control signals and control a NEXEDGE system. If multiple control channels exist in the NEXEDGE system, the channel having the lowest channel number is preferentially configured as the control channel. If Automatic Control Channel Rollover or Backup Control Channel functions, a control channel in order from the lowest channel number behaves as the control channel. The following are main functions of the control channel: • Processing Voice Call requests and Data Call requests • Specifying the channel used to make a Voice Call and Data Call • Providing information of adjacent sites. • Accepting the location registration request.
Traffic Channel	Traffic Channel is the channel used for communications such as Voice Calls and Data Calls. The following are main functions of the traffic channel: • Repeating Voice Calls and Data Calls • Terminating Voice Calls and Data Calls • Notifying of a Priority Monitor Call
Dual-Functional Channel	Dual-functional Channel is the channel that can behave as both a control channel and a traffic channel. If Automatic Control Channel Rollover or Backup Control Channel functions, the channel that normally behaved as the traffic channel behaves as the control channel.

Note

- **Dual-functional Channel** needs to be preconfigured as a control channel candidate for the subscriber unit as well.
- If anything other than “None” is configured in **Non-dedicated Control Channel**, Control Channel cannot be configured.

Configuring a channel name (Channel Name)

Channel Name is the name of a channel. Channel Name is configured to distinguish the configured channels. The name configured for each channel appears in the list of **Channel List**.

Also, the configured channel name appears on the 17-segment LED display of the repeater.

Avoiding interference with other communications (Cross-busy Input Trigger)

Cross-busy is the function that avoids the interference of other stations and prevents interference to other stations if an existing system coexist with the own system on the same frequency. (Refer to [Sharing a Traffic Channel With a Different System \(Cross-busy\)](#).)

Cross-busy Input Trigger is the function to control the busy state of a traffic channel using the **Cross-busy** function. Refer to “[Cross-busy Input Trigger](#)” for details of **Cross-busy Input Trigger**.

Configuring Failsoft Mode

Failsoft Mode is the function that can provide the minimal communication capability for subscriber units in a site if the NEXEDGE system cannot provide the trunking capability for the site due to an error or malfunction of a device in the site. Refer to “[Securing the Minimal Communication Capability When a Network Failure Occurs \(Failsoft Mode\)](#)” for details of **Failsoft Mode**.

Sending a preconfigured Station ID at certain time intervals (Station ID)

Station ID is the function that uses the downlink frequency of the repeater to notify the identifier that is preconfigured in the repeater site for certain time intervals on the hour every hour as a standard. A maximum of 32 alphanumeric characters and symbols can be configured and sent.

In some countries and regions, it is legally required to send the identification number of the repeater site. If the identifier transmission by using a Station ID is allowed, the identification number preconfigured for the repeater site can be sent in a short amount of time by using a Station ID.

By configuring **Station ID Transmit Interval Timer**, a Station ID can be automatically sent at certain time intervals based on the hour every hour. Whether to send a Station ID can be configured for each channel.

A Station ID can be sent in digital format or in analog format according to the configuration in **Station ID Type**.

Table 7-9 Configuration for Station ID Type

Item	Description
Digital	If a Station ID is sent on a traffic channel, the repeater checks whether the traffic channel is used when the amount of time configured in Station ID Transmit Interval Timer elapses and the time to initiate Station ID transmission arrives. If the traffic channel is already busy, the repeater sends the Station ID when the call ends. If a Station ID is sent on a control channel, the repeater sends the Station ID when the amount of time configured in Station ID Transmit Interval Timer elapses and the time to initiate Station ID transmission arrives.
Analog	If a Station ID is sent on a traffic channel, the repeater checks whether the traffic channel is used when the amount of time configured in Station ID Transmit Interval Timer elapses and the time to initiate Station ID transmission arrives. If the traffic channel is already busy, the repeater sends the Station ID when the call ends. If a Station ID is sent on a control channel, the repeater forcibly stops the control channel behavior and migrates to analog mode after sending a Station ID notice when the amount of time configured in Station ID Transmit Interval Timer elapses and the time to initiate Station ID transmission arrives. After that, the repeater sends the Station ID. When the Station ID transmission completes, the control channel is immediately available. A subscriber unit which does not receive a Station ID notice during this period starts the channel hunt behavior to search for another site, because the subscriber unit does not see the control channel.

Configuring the transmit power of a repeater (Transmit Power)

Transmit Power is the transmission power of a repeater. Either “High” or “Low” (NXR-700/ NXR-800/ NXR-900/ NXR-901/ NXR-5900/ NXR-5901), or one of “High”, “Mid”, and “Low” (NXR-5700/ NXR-5800) can be configured for the transmission power of each channel.

Avoiding the deterioration of reception performance caused by oscillators in the repeater (Beat Shift)

Beat Shift is the function for avoiding the deterioration of reception performance caused by oscillators in the repeater.

The harmonic from the oscillators in the repeater may interfere with the repeater depending on the receive frequency. Using this function can avoid degrading receive performances by slightly shifting an oscillator frequency.

The repeater is equipped with the following 5 internal oscillators: (NXR-700/ NXR-800/ NXR-900/ NXR-901)

- Beat Shift 1: 14.7456 MHz oscillator circuit 1
- Beat Shift 2: 16.515072 MHz oscillator circuit
- Beat Shift 3: 14.7456 MHz oscillator circuit 2
- Beat Shift 4: 25 MHz oscillator circuit
- Beat Shift 5: 25.8048 MHz oscillator circuit

Terminating an external reference signal input terminal (50 Ohm Termination)

50 Ohm Termination is the function to connect a 50 ohm termination to an external reference signal input terminal (Reference In).

If “ON” is configured for this function, a 50 ohm termination is connected to an external reference signal input terminal (Reference In) in a repeater.

Note

- This function can be configured only for a channel with “NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901” configured in **Model Type**.

Configuring the oscillator of an external reference signal (Startup Delay)

Startup Delay is the function to switch the waiting time until the frequency stabilizes depending on the oscillation source of an external reference signal.

Table 7-10 Configuration for Startup Delay

Item	Description
None	The built-in reference signal is used. The repeater starts immediately. For NXR-5900/ NXR-5901, the displayed channel name blinks for 1 min until it remains lit. A PF key cannot be operated while the displayed channel name is blinking.
5min	OCXO is used as the oscillation source of an external reference signal. The repeater starts up after the channel number blinks for 5 minutes on the LED display. For NXR-5900/ NXR-5901, a PF key cannot be operated for 1 min from when the displayed channel name starts blinking.

When the reference signal is used, **Startup Delay** is configured as shown in the following table:

- If only NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 exists in a site

Repeater Configuration	
Source of Reference Signal	Startup Delay
NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 with TCXO	None
NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 with OCXO Unit (KXK-3), External Reference	5min

- If NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 and NXR-700/ NXR-800/ NXR-900/ NXR-901 exist in a site
 - If OCXO is not used, and if a reference signal between NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 and NXR-700/ NXR-800/ NXR-900/ NXR-901 is not used

Repeater Configuration	
Source of Reference Signal	Startup Delay
NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 with TCXO	None

- If a reference signal between NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 and NXR-700/ NXR-800/ NXR-900/ NXR-901 is used

Repeater Configuration	
Source of Reference Signal	Startup Delay
NXR-700/ NXR-800 with OCXO Unit (KXK-3), NXR-900/ NXR-901 with TCXO, External Reference	5min

Note

- This function can be configured only for a channel with “NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901” configured in **Model Type**.

Connecting the path for providing external reference signals

This section explains the steps to connect the path for providing external reference signals when adding NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 (henceforth referred to collectively as “NXR-5x00”) to an existing site that is made up of NXR-700/ NXR-800/ NXR-900/ NXR-901 (henceforth referred to collectively as “NXR-x00”) or when configuring a site that consists only of NXR-5x00.

● When adding NXR-5x00 to an existing site that is made up of NXR-x00

To add NXR-5x00 to an existing site that is made up of NXR-x00, connect the respective repeaters for providing external reference signals according to the diagram below.

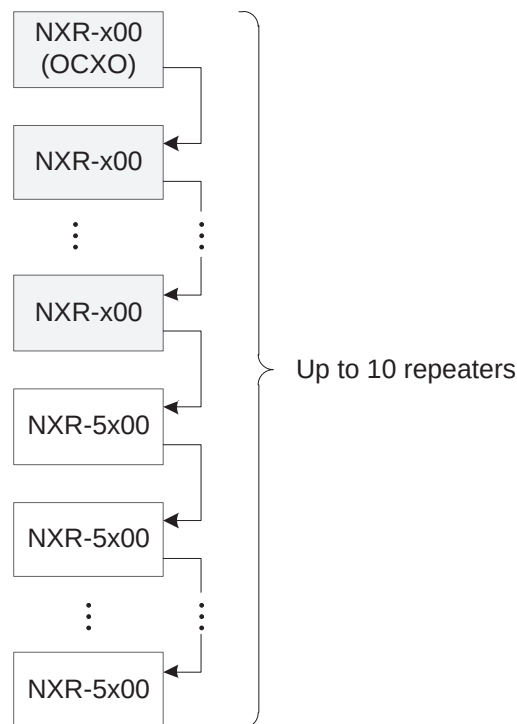


Figure 7-12 Connection of Path for Providing External Reference Signals (Configuration of site that consists of both NXR-x00 and NXR-5x00)

Enable **Adjusted Boot Timing** by using SCU. If **Adjusted Boot Timing** is enabled, NXR-5x00 can be started by the timing to start NXR-x00.

To structure a site for NXR-x00 and NXR-5x00 to coexist, configure “5min” in **Startup Delay** of NXR-5x00 regardless of the presence of OCXO.

Note

- For NXR-5900/ NXR-5901, the startup time does not change even if **Adjusted Boot Timing** is enabled. If a system is operated in a site where NXR-900/ NXR-901 also coexists, configure “5min” in **Startup Delay** regardless of the presence of OCXO. In this case, a **PF** key cannot be operated for 1 min from when the displayed channel name starts blinking.

To configure a site that is made up of both NXR-x00 and NXR-5x00, do not synchronize the frequency using external reference signal from NXR-5x00. Configure the site such that it does not contain NXR-x00 that synchronizes the frequency using the output of the external reference signal from NXR-5x00.

When adding NXR-5x00 to a site that uses 11 NXR-x00 units or more, use NXR-5x00 for the second or third repeater, which is connected using a T-connector.

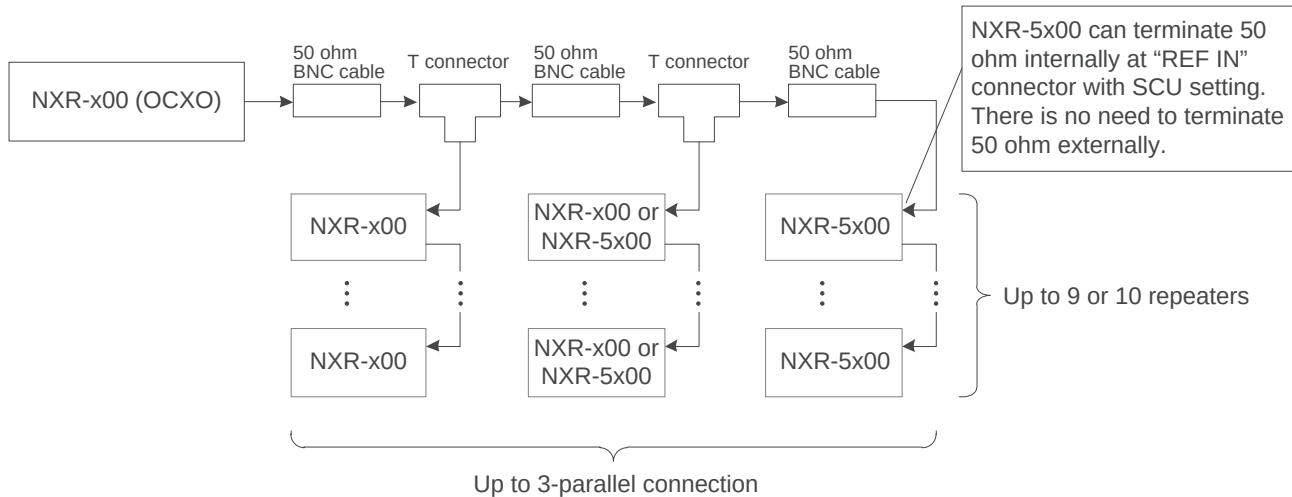


Figure 7-13 Connection of Path for Providing External Reference Signals (Configuration of site that consists of both NXR-x00 and NXR-5x00) (11 units or more)

Note

- For NXR-5x00, if **50 Ohm Termination** is enabled, a 50 ohm termination can be connected to an external reference signal input terminal (RF IN) in a repeater. If the repeater in the upper right of Figure 7-13 is NXR-5x00, enable **50 Ohm Termination**. Also, to connect a T connector to a 50 ohm external terminator, disable **50 Ohm Termination**. In a site structured with NXR-x00, if the repeater in the upper right of Figure 7-13 is connected to a 50 ohm external terminator, the external terminator can be used.
- For a trunking system structured with a maximum of 30 repeaters, always synchronize frequencies with one external reference signal for all NXR-5x00 units in the system.

- **Adding NXR-5x00 to the Digital Narrow mode system of an asynchronous frequency**

If the frequency of each repeater is not synchronized and if Digital Narrow mode is configured in a site structured only with NXR-x00, connect NXR-5x00 as shown in the diagram below:

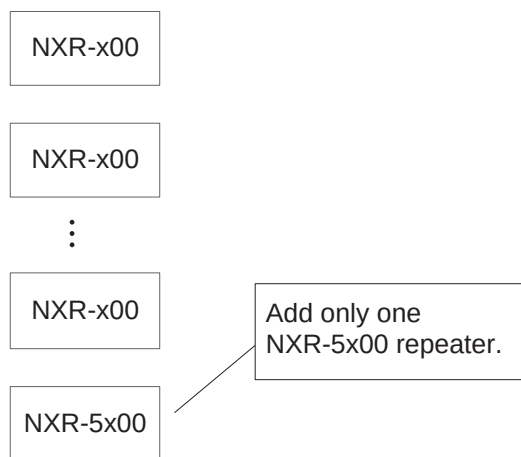


Figure 7-14 Connection in Digital Narrow Mode (if adding a single NXR-5x00 unit)

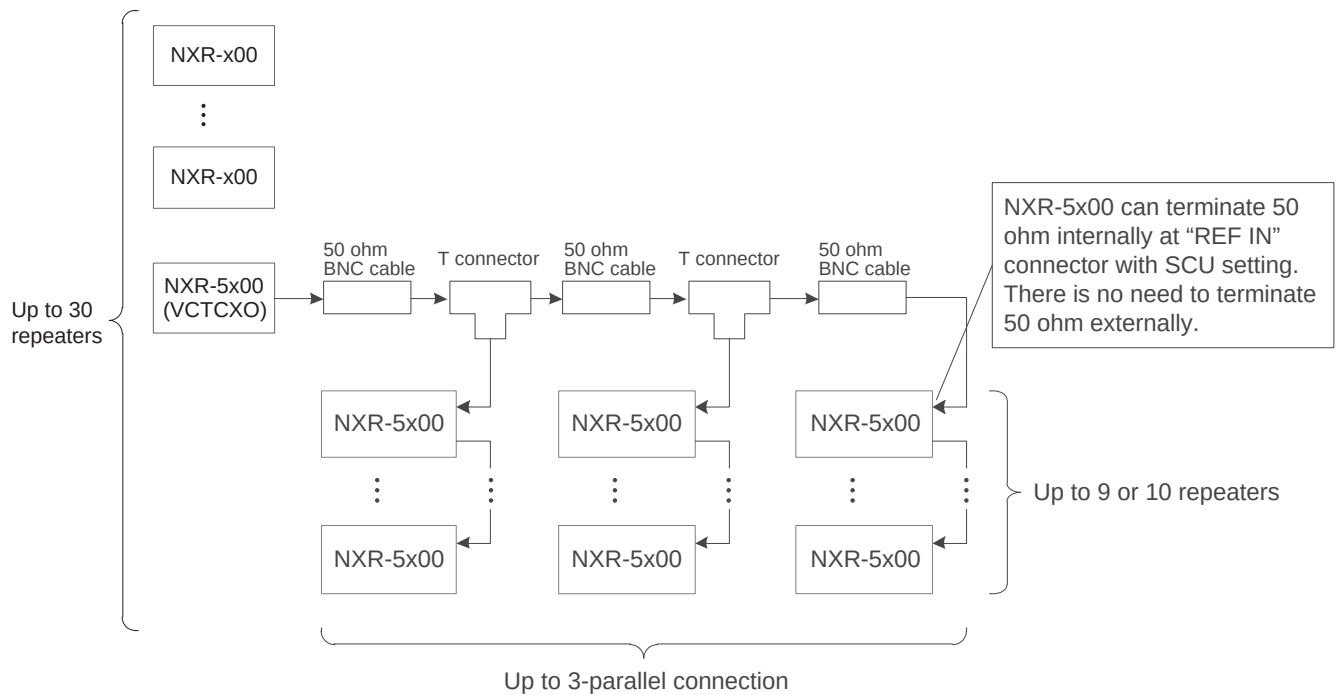


Figure 7-15 Connection in Digital Narrow Mode (connection of an external reference signal if adding multiple NXR-5x00 units)

If NXR-5x00 is added in Digital Narrow mode, the first part of a communication may not be communicated in a weak electric field. Therefore, adding the OCXO to NXR-x00 and synchronizing the frequencies of repeaters, including the frequency of the NXR-5x00 unit to be added, is recommended. If installation of OCXO is difficult, frequency synchronization for all repeaters by using the VCTCXO of NXR-5x00 as shown in Figure 7-15 is recommended. If frequency synchronization for the existing NXR-x00 is difficult, always add NXR-5x00 to a site after frequency synchronization for all NXR-5x00 units.

Note

- Frequency synchronization is not required if only a single NXR-5x00 unit is to be added to an NXR-x00 site.
- If multiple NXR-5x00 units are added to an NXR-x00 site, always synchronize the frequencies of all NXR-5x00 units to be added. For the external reference signal for synchronizing frequencies, the built-in VCTCXO of NXR-5x00 is used.

● Configuring a site that consists only of NXR-5x00

To configure a site that consists only of NXR-5x00, you can use either OCXO or the built-in VCTCXO as the oscillator for the external reference signal.

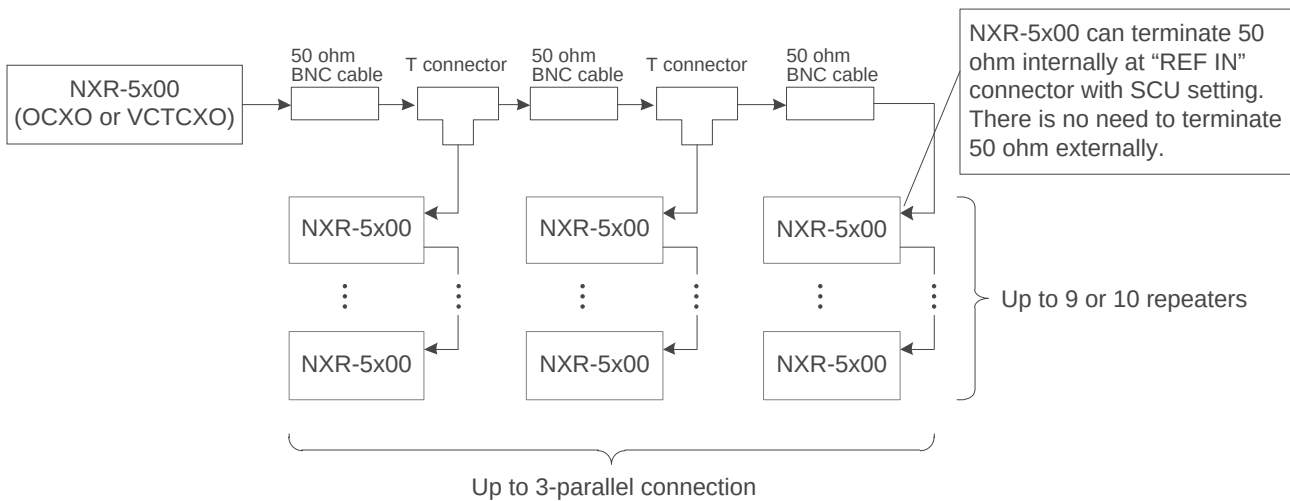


Figure 7-16 Connection of Path for Providing External Reference Signals (Configuration of site that consists only of NXR-5x00)

To use the built-in VCTCXO, configure "None" in **Startup Delay** for each of the repeaters, and check and adjust the frequency every five months.

To use the OCXO unit (KXK-3 M3), configure "5min" in **Startup Delay** for each of the repeaters. By doing so, the repeater warms up for about five minutes each time the power is turned on. However, if "5min" is not configured in **Startup Delay**, the system may not start up correctly.

For a trunking system structured with a maximum of 30 repeaters, always synchronize the frequency with one external reference signal.

Note

- For NXR-5900/ NXR-5901, if "None" is configured in **Startup Delay**, the displayed channel name blinks for 1 min until it remains lit. A **PF** key cannot be operated while the displayed channel name is blinking. If "5min" is configured in **Startup Delay**, a **PF** key cannot be operated for 1 min from when the displayed channel name starts blinking.

● Startup time for repeater

When configuring a site that consists of both NXR-x00 and NXR-5x00, configure “ON” in **Adjusted Boot Timing** using SCU. By doing so, NXR-5x00 will start up according to the startup time of NXR-x00 when the power of NXR-5x00 is turned on. (Refer to [Delaying the startup time of a repeater \(Adjusted Boot Timing\)](#).)

On a trunking system with synchronized frequency, it is recommended that you turn on the power of all the repeaters at the same time. To turn on the power of the repeaters by group at different timings, you need to turn on the repeaters in the remaining groups within five seconds after turning on the power of those in the first group.

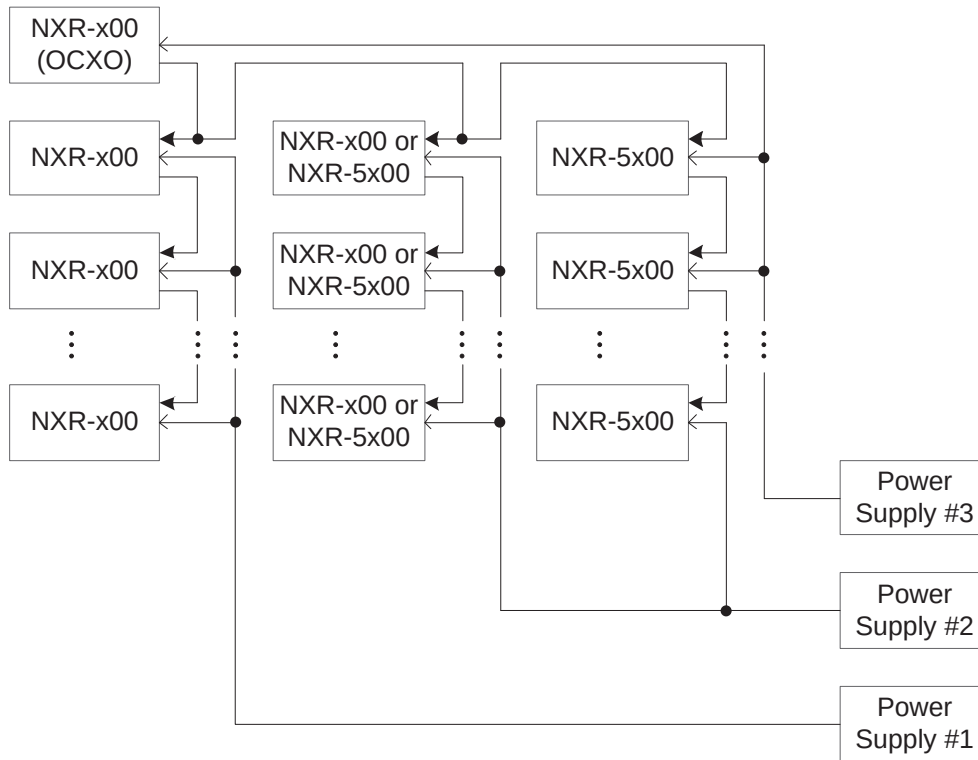


Figure 7-17 Power Supply to the Repeaters

There is no restriction on the sequence for turning on the repeaters. For example, Power Supply #3 supplies power to repeaters that are installed with OCXO in the above diagram. In this case, there are no restrictions such as one that requires you to turn on the power for this group of repeaters first.

Note

- This function can be configured only for a channel with “NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901” configured in **Model Type**.

Using a Commercial Oscillator for the External Reference Signal

This section describes the method for constructing an NXDN Trunking System using external reference signals.

Caution:

KENWOOD guarantees the frequency accuracy of the product with the optional OCXO reference oscillator unit (KXK-3). The user will be responsible for assuring the frequency accuracy if an external reference oscillator other than the KXK-3 is used. When using an external reference oscillator other than the KXK-3, please pay attention to the following.

- For the NXR-x00 and NXR-5x00, the warming-up process takes about 5 minutes to complete after turning on the power. Users therefore need to guarantee that the external reference oscillator reaches the prescribed frequency accuracy before the warming-up process is complete.
- The reference signal input terminal of the repeater is able to receive an amplitude of up to 5 Vp-p. Prolonged use of a reference oscillator with an output that exceeds 20 dBm may cause damage to the input amplifier of the repeater.

● Configuring a site with NXR-x00 only

The external reference signal of the NXR-x00 synchronizes the operating frequency of the transmission and reception operation. If the NXR-x00 is provided with an external reference signal, the reference signal is deemed as the OCXO signal from the KXK-3. For this reason, a waiting time of about 5 minutes is needed after turning on the repeater and before the trunking system starts up.

When using multiple reference oscillators or when an oscillator has multiple output terminals, it is recommended that the number of repeaters be reduced by arranging the NXR-x00 in a serial connection as follows.

Shown below is a connection example of an expanded system with 2 reference oscillator output ports on a single site.

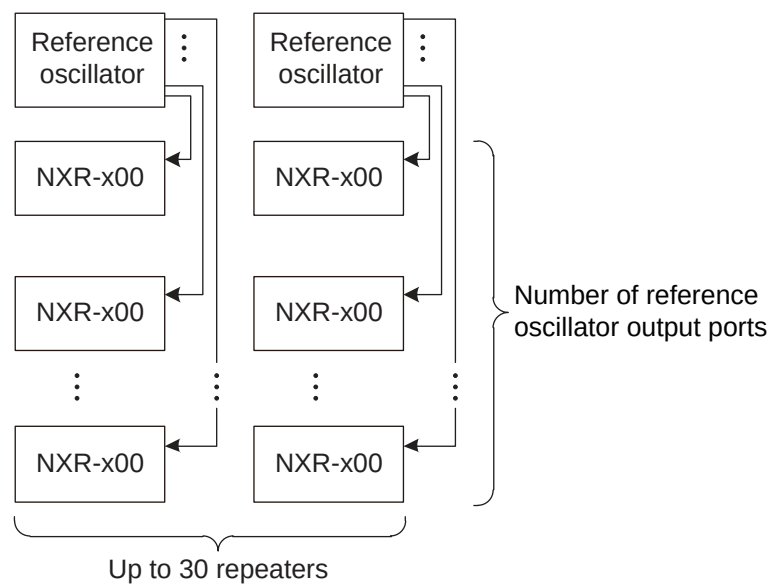


Figure 7-18 Configuring a Site with NXR-x00 Only (Connection Example 1)

Shown below is a connection example when repeaters are arranged in a serial connection with 2 reference oscillator output ports on a single site.

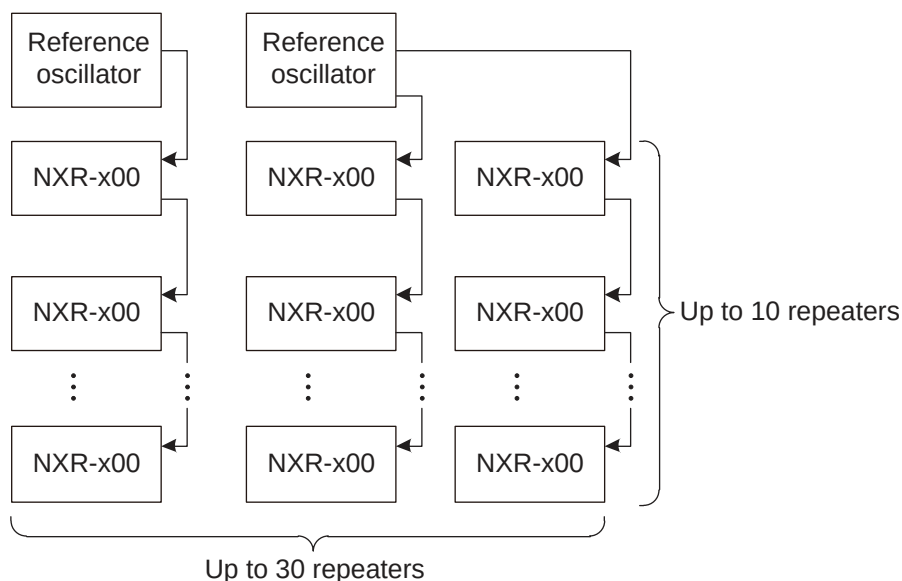


Figure 7-19 Configuring a Site with NXR-x00 Only (Connection Example 2)

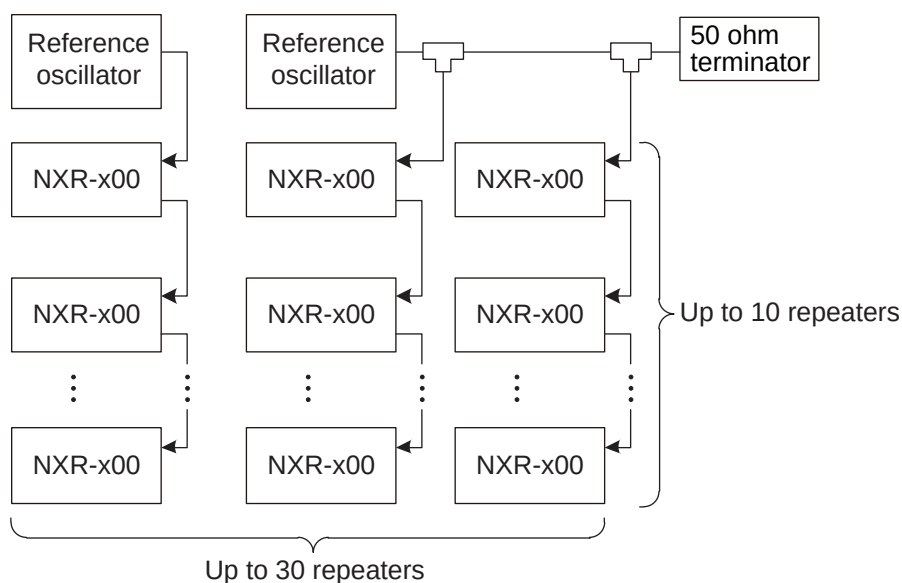


Figure 7-20 Configuring a Site with NXR-x00 Only (Connection Example 3)

● Configuring a site with NXR-5x00 only

The external reference signal of the NXR-5x00 synchronizes the operating frequency of the transmission and reception operation as well as the timing of the 12.5 Hz (80 ms) frame timing (SYNC) signal. For this reason, it is necessary for the trunking system to perform synchronization with 1 reference oscillator.

When the system comprises only of the NXR-5x00, and stability is guaranteed with power constantly supplied to the external reference oscillator, configure **Startup Delay** as "None" with SCU. By doing so, the system is able to start up faster than the OCXO system. However, in the event of an abnormal condition (e.g., power recovery after shutdown of the reference oscillator due to power failure), the NXR-5x00 may start up with the frequency of the reference oscillator in an unstable state. In this case, transmission may take place without the frequency reaching the specified frequency accuracy. To avoid this from occurring, it is necessary to configure **Startup Delay** as "5min" with SCU. By doing so, the system will start up approximately 5 minutes after the repeater is turned on.

Shown below is a connection example when the output port of the reference oscillator is expanded using an amplifier and divider on a single site. The phase difference due to the difference in the cable length can be ignored. However, the frequency needs to be synchronized.

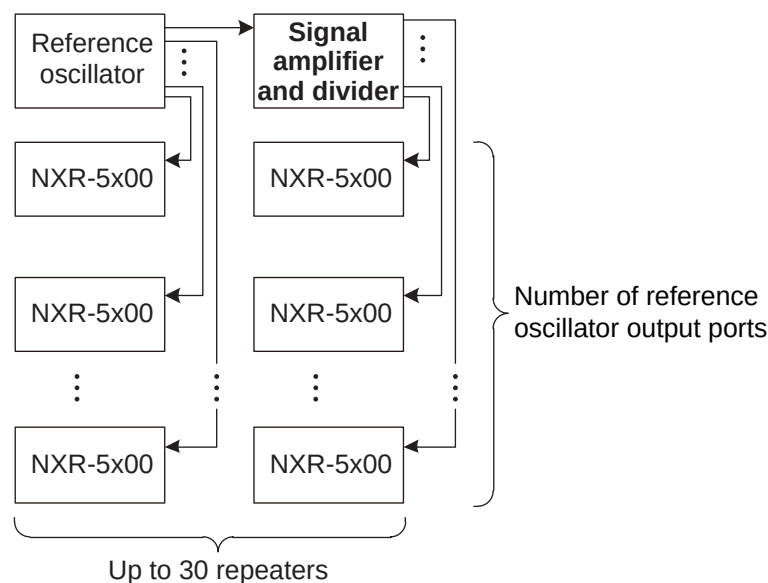


Figure 7-21 Configuring a Site with NXR-5x00 Only (Connection Example 1)

Note

- For NXR-5900/ NXR-5901, if "None" is configured in **Startup Delay**, the displayed channel name blinks for 1 min until it remains lit. A **PF** key cannot be operated while the displayed channel name is blinking. If "5min" is configured in **Startup Delay**, a **PF** key cannot be operated for 1 min from when the displayed channel name starts blinking.

Shown below is a connection example of the repeaters in a serial connection.

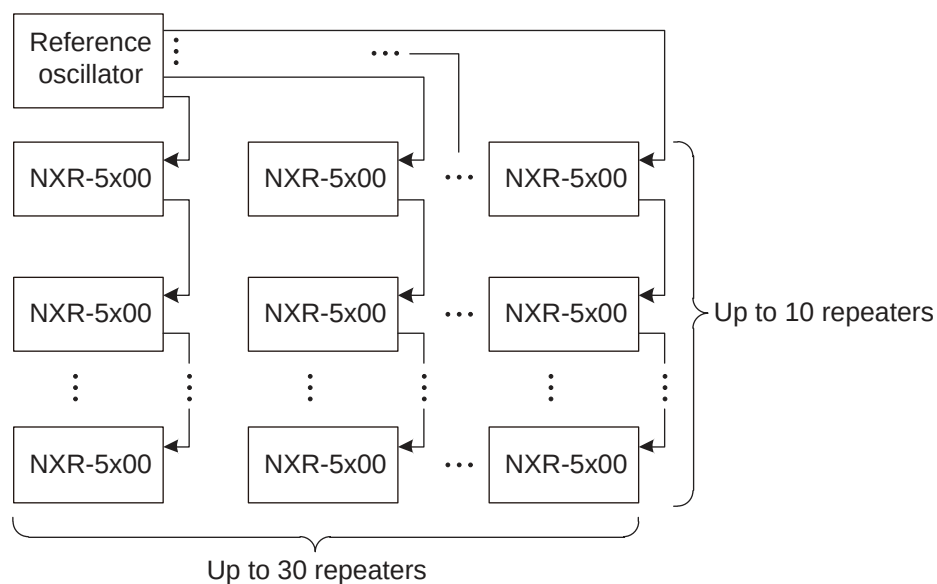


Figure 7-22 Configuring a Site with NXR-5x00 Only (Connection Example 2)

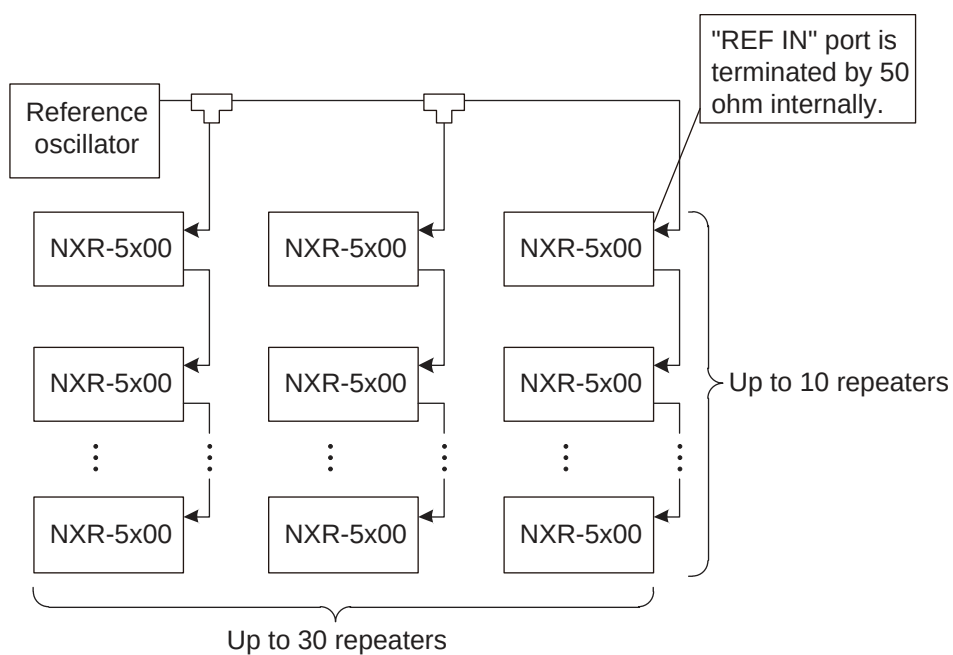


Figure 7-23 Configuring a Site with NXR-5x00 Only (Connection Example 3)

● Adding an NXR-5x00 to an existing site configured using the NXR-x00

As with the case of configuring a site that comprises the NXR-5x00 only, it is necessary to synchronize the frequency with 1 reference oscillator. Also, it is necessary to configure **Startup Delay** as "5min" with SCU. By doing so, the system will start up approximately 5 minutes after the repeater is turned on, which is similar to the startup of the NXR-x00.

To add an NXR-x00 to an existing NXR-5x00 site, it is necessary to reconfigure the system for it to receive reference signals from the NXR-x00 or reference oscillator.

Shown below is a connection example when an NXR-5x00 is added to a site on which NXR-x00 is operated using 2 reference oscillators.

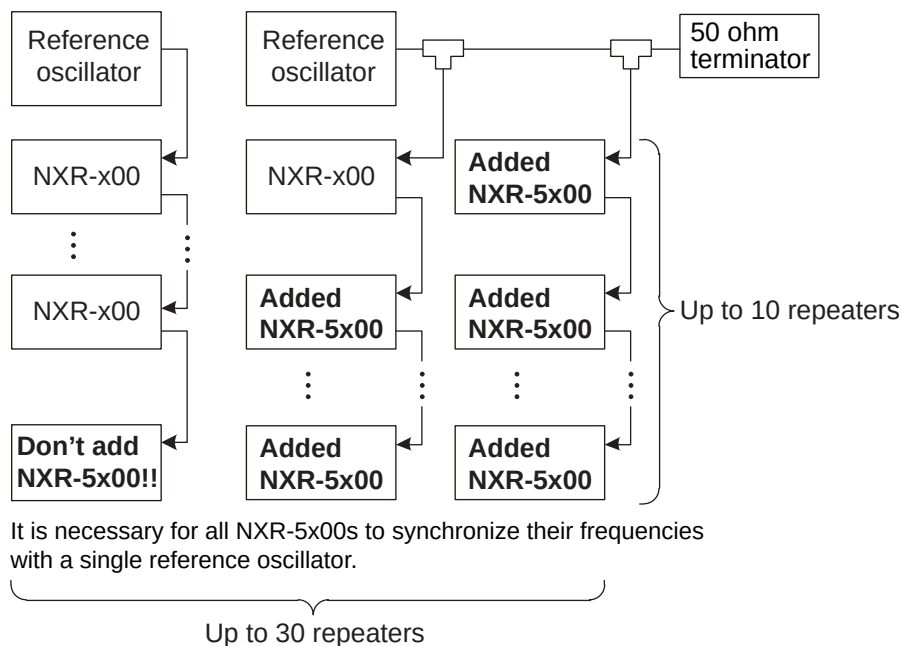


Figure 7-24 Adding an NXR-5x00 to an Existing Site Configured Using the NXR-x00 (Connection Example)

When there are multiple reference oscillators, it is necessary for the NXR-5x00 to synchronize the frequency with signals from a single reference oscillator. The NXR-5x00 at the bottom left of Figure 7-24 is unable to synchronize the frequency with other NXR-5x00 units, and is thus not added to the system.

Note

- By enabling the **50 Ohm Termination** for the NXR-5x00 at the top right of Figure 7-24 using SCU, it is possible to connect a 50-ohm termination inside the repeater via the external reference signal input terminal (RF IN). To use an external termination, disable the **50 Ohm Termination** to increase the level of input impedance.
- For NXR-5900/ NXR-5901, if "5min" is configured in **Startup Delay**, a **PF** key cannot be operated for 1 min from when the displayed channel name starts blinking.

Configuring the conditions for fan rotation (Fan Action)

A repeater has a cooling fan on the rear panel to lower the heat generated by the transmission by the repeater. The conditions of rotating this cooling fan can be changed according to the configuration of Fan Action.

Table 7-11 Configuration of Fan Action

Item	Description
Temperature	The cooling fan behaves at 2 levels of rotation speed according to the temperature conditions. The cooling fan is stopped when the power is turned on. The cooling fan starts rotating at a low speed when the temperature reaches approximately 55°C or higher. The cooling fan rotates at a high speed when the temperature reaches approximately 80°C or higher. The cooling fan rotates at a low speed if the temperature drops to approximately 70°C while the cooling fan is rotating at a high speed, and stops if the temperature drops to 40°C or lower. The cooling fan makes no sound from rotating while stopped, and the repeater can be operated quietly.
Continuous	The cooling fan enters the state of continuously rotating at the same time as turning the power on. The cooling fan stops rotating if the temperature drops to 0°C or lower.

Note

- This function can be configured only for a channel with “NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901” configured in **Model Type**.

Configuring Analog Mode Functions (AUX/ Shared Channel)

On a channel where “AUX” or “Shared” is configured in **Channel Type**, analog functions are available when the channel behaves in Analog Conventional mode. (Refer to [Configuring the usage type of a channel \(Channel Type\)](#).)

The parameters of various functions used when the channel behaves in Analog Conventional mode can be configured in **Edit > System List > Site List > Channel List > General (Edit) > Shared Channel** of SCU.

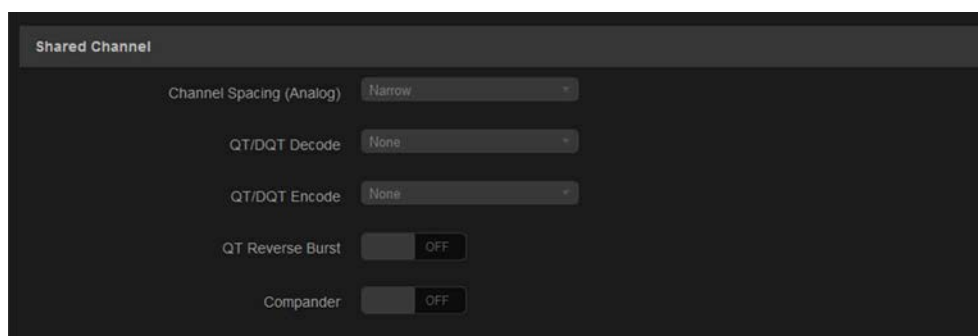


Figure 7-25 Shared Channel

After configuration, click the “Save” button to save.

Configuring transmit and receive bandwidths (Channel Spacing)

Channel Spacing is the channel spacing used by the repeater to transmit and receive.

The channel spacing used by the repeater to transmit and receive in Analog Conventional mode is specified from the Channel Spacing values corresponding to the Model Name.

Table 7-12 Channel Spacing (Analog)

Model Name	Channel Spacing (Analog)
NXR-700 (K, K2), NXR-800 (K, K2, K3, K4, K5, E3, E4), NXR-5700 (K), NXR-5800 (K, K3)	Wide, Narrow
NXR-700 (E, E2), NXR-800 (E), NXR-900 (K), NXR-5700 (E), NXR-5800 (E), NXR-5900 (K)	Wide 5k, Wide 4k, Narrow
NXR-901 (K), NXR-5901 (K)	Narrow

Configuring QT/DQT Decode

QT/DQT Decode is the signaling that is used if on standby to receive analog signals.

Configuring QT tone or DQT code for use when the same channel is shared among several groups allows a subscriber not to hear communications not intended for them by muting conversations in other groups.

If the received QT tone or DQT code matches the QT tone or DQT code configured for the channel, the repeater unmutes the received audio.

Configuring QT/DQT Encode

QT/DQT Encode is the call signaling that is used to transmit analog signals.

Configuring QT tone or DQT code for use when the same channel is shared among several groups allows a subscriber not to hear communications not intended for them by muting conversations in other groups.

If the received QT tone or DQT code matches the QT tone or DQT code configured for the channel, the repeater unmutes the received audio.

Eliminating tail noise of the receiving subscriber unit (QT Reverse Burst)

QT Reverse Burst prevents the speaker of the receiving subscriber unit from emitting the squelch tail noise by sending a QT Reverse Burst code after transmission ends.

If the receiving subscriber unit receives a QT Reverse Burst code, the received audio is muted and the squelch tail noise is eliminated.

Improving the sound quality for transmitting and receiving (Compander)

Compander is the combination term of COMPressor and exPANDer, and is the function to improve the quality of the received signal by reducing the noise in communications. This function is used for improving the S/N ratio of voice communications by compressing the audio during modulation, and then expanding the audio after demodulation.

Note

- We recommend that **Compander** is enabled for both the transmitting party and the receiving party to effectively use this function.

Configuring Frequencies of the Repeater (Channel Table)

The range of frequencies, the bandwidth of a channel, and the conversion table of frequencies can be configured.

Configuring the range of frequencies and the bandwidth of a channel for frequency configuration of the repeater (Frequency Allocation)

The range for frequencies and the bandwidth for a channel (digital) required for configuring the frequencies of the repeater can be configured in **Edit > System Configuration > Channel Table > Frequency Allocation** of SCU.

The screenshot displays the NEXEDGE SCU web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar shows a menu with 'Frequency Allocation' selected. The main content area shows the 'Frequency Allocation' configuration page with the following settings:

- Base Frequency [MHz]: VHF: 100
- Channel Step [kHz]: 3.125
- Channel Spacing (NXDN): Very Narrow
- Channel Announcement: Channel Number

At the bottom of the configuration area, there are 'Save' and 'Cancel' buttons. The 'Save' button is highlighted with a red rectangle.

Figure 7-26 Frequency Allocation

After configuration, click the “Save” button to save.

Configuring a frequency table (Frequency List)

The frequency table of a repeater can be configured in **Edit > System Configuration > Channel Table > Frequency List** of SCU.

By configuring the **Frequency Number** allocated by **Basic Frequency** and **Channel Step** configured in **Frequency Allocation** for each channel in **Channel List**, the frequencies of the repeater can be allocated. (Refer to [Configuring the frequency number corresponding to a transmit and receive frequencies \(Frequency Number\)](#).)

RX/TX Frequency is automatically corrected according to **Base Frequency** and **Channel Step** configured in **Frequency Allocation**.

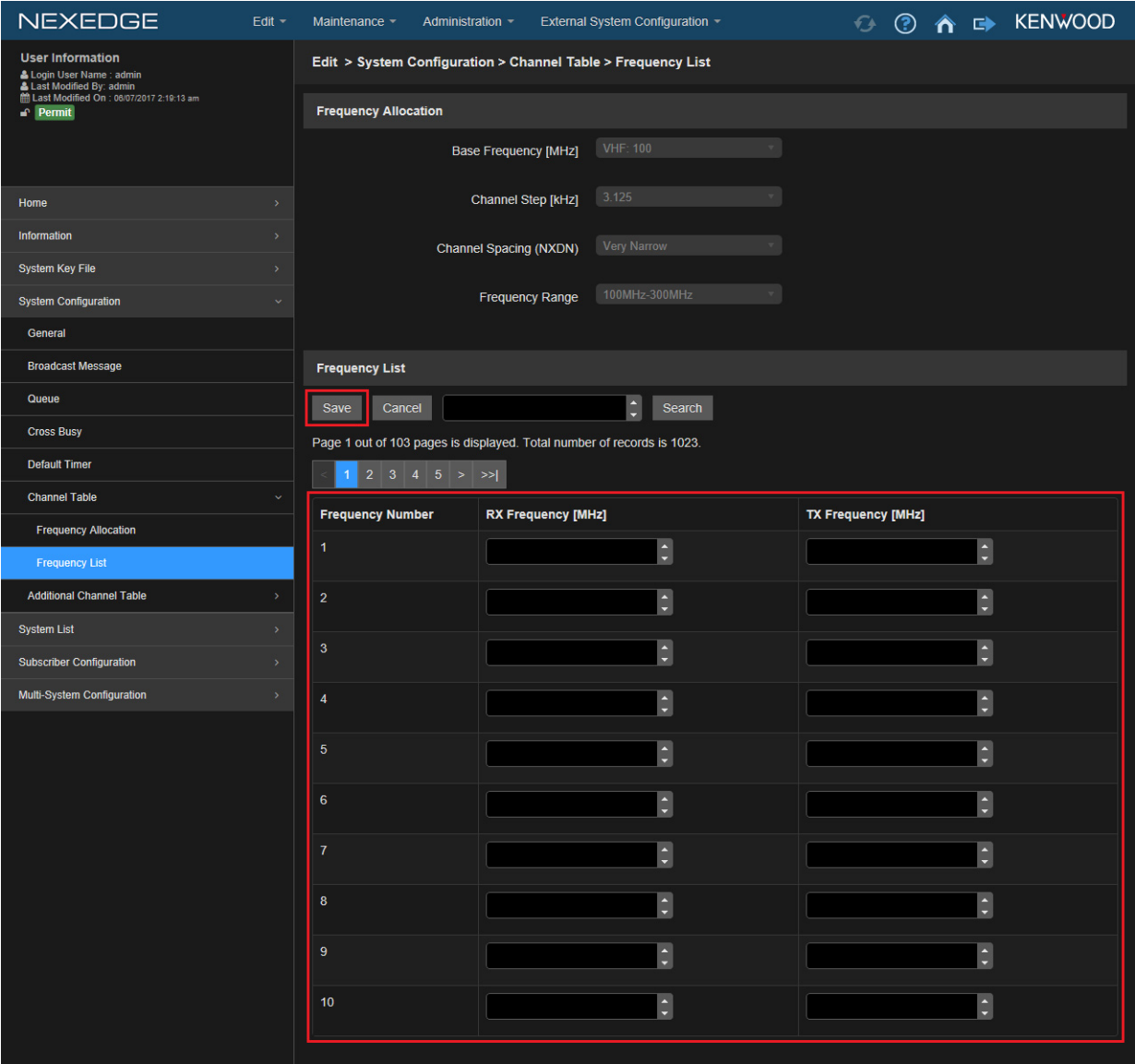


Figure 7-27 Frequency List

After configuration, click the “Save” button to save.

7.6 Configuring the Channel Tables of Different Frequencies

The channel tables to be used when the NEXEDGE system is operated with a different frequency in each system or site are configured.

A maximum of 23 channel tables can be added in **Additional Channel Table**, in addition to the Channel Table (General) that is common in a Wide-Area System. By allocating a channel table number to each system or each site, a different frequency can be used in each system or site. (Refer to [Configuring the channel table number for each system \(Channel Table Number\)](#), [Configuring the channel table number for each site \(Channel Table Number\)](#).)

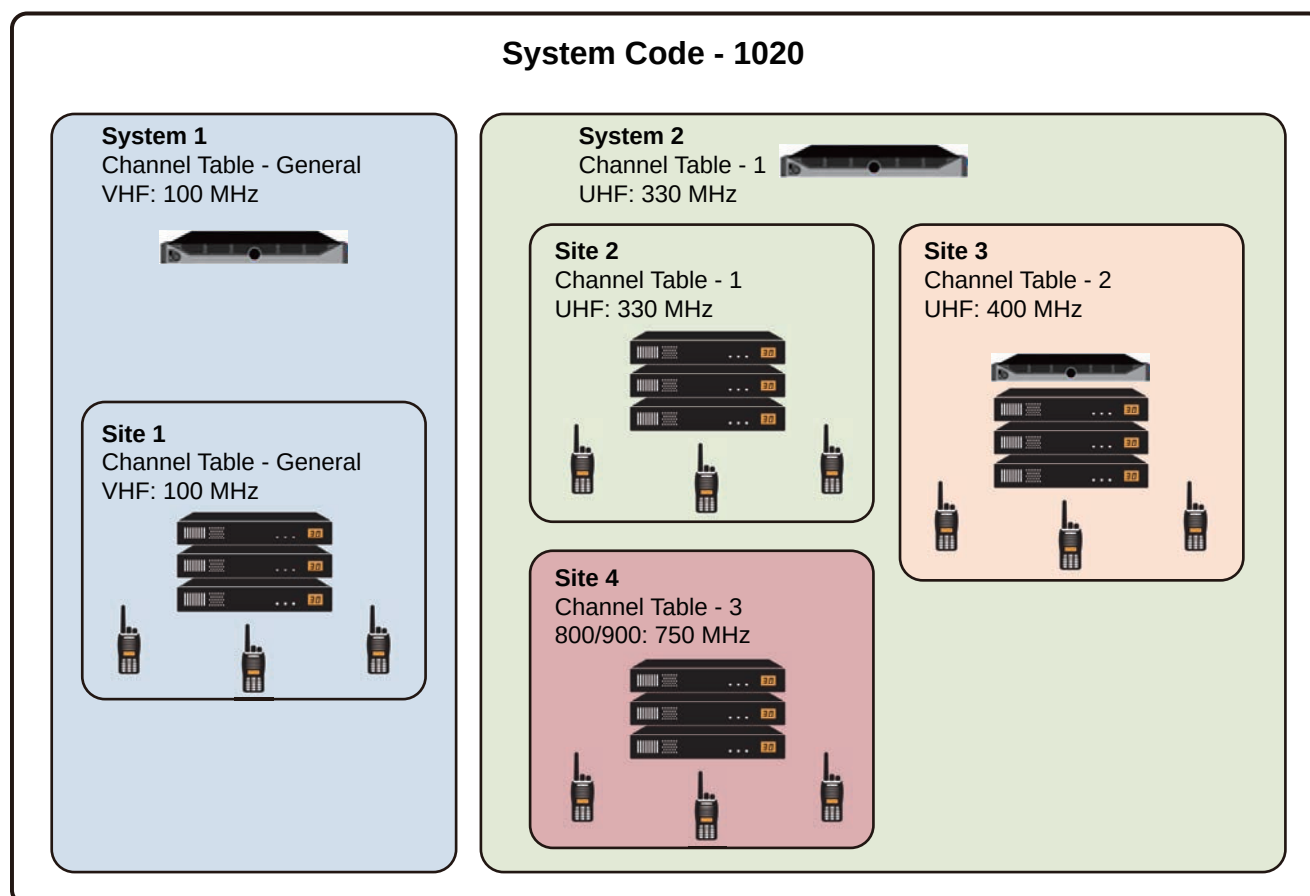


Figure 7-28 Image of System Operation When Channels Are Added

Clicking the “Add” button in **Edit > System Configuration > Additional Channel Table** of SCU displays **General (Add)**, and a channel table can be added.

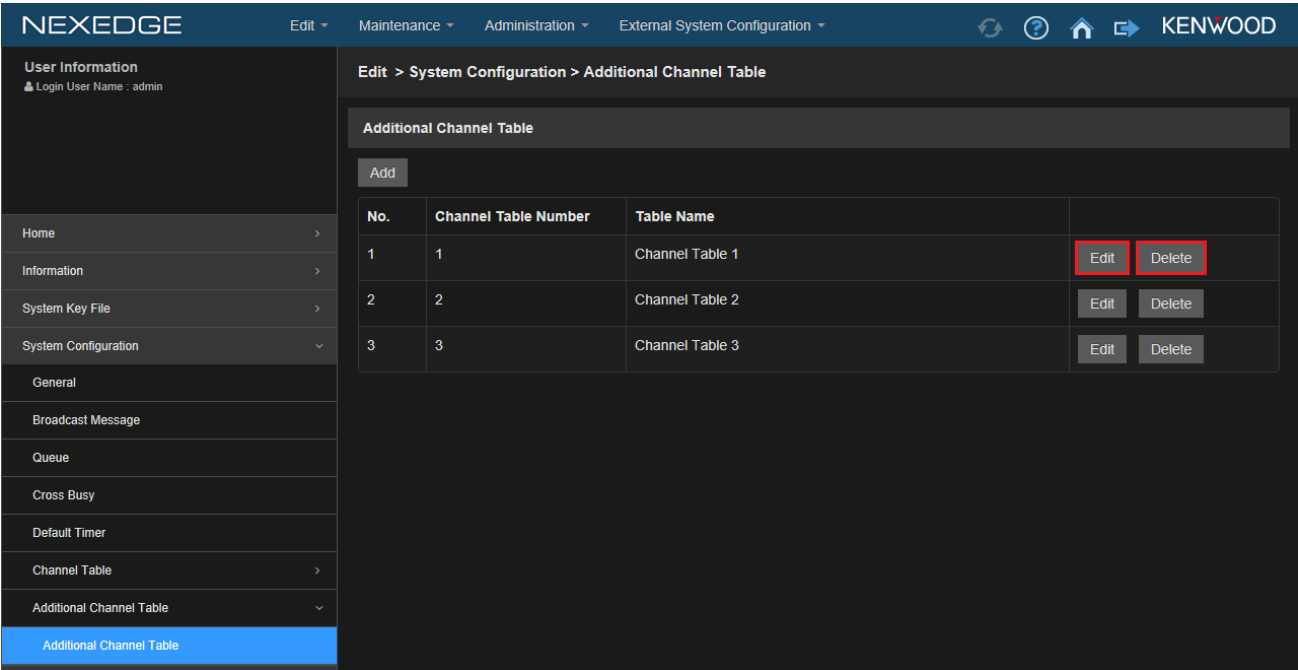


Figure 7-29 Additional Channel Table

Note

- A list of the registered channel tables appears in **Additional Channel Table**.
- By clicking the “Details” button in **Additional Channel Table**, the configuration contents of the corresponding channel table can be viewed.
- By clicking the “Edit” button in **Additional Channel Table**, the configuration of the corresponding channel table can be changed.
- By clicking the “Delete” button in **Additional Channel Table**, the corresponding channel table can be deleted.

Configuring the Channel Table (Additional Channel Table/ Frequency Allocation)

The channel table number and the range of frequencies for configuring the frequency of the repeater can be configured in **Edit > System Configuration > Additional Channel Table > General (Add or Edit) > Additional Channel Table/ Frequency Allocation** of SCU.

NEXEDGE Edit Maintenance Administration External System Configuration KENWOOD

User Information
 Login User Name : admin
 Created By : admin
 Created On : 04/05/2017 12:47:09 pm
 Last Modified By : admin
 Last Modified On : 05/10/2017 3:49:32 pm
 Permit

Home >
 Information >
 System Key File >
 System Configuration >
 General
 Broadcast Message
 Queue
 Cross Busy
 Default Timer
 Channel Table >
 Additional Channel Table >
 Additional Channel Table
 General (Edit)
 Frequency List

Edit > System Configuration > Additional Channel Table > Channel Table Number1:General (Edit)

Additional Channel Table

Channel Table Number 1
 Table Name Channel Table 1

Frequency Allocation

Base Frequency [MHz] UHF: 330
 Channel Step [kHz] 3.125

Save Cancel Back

Figure 7-30 Additional Channel Table/ Frequency Allocation

After configuration, click the “Save” button to save.

Configuring a channel table number (Channel Table Number)

Channel Table Number is the allocated number to identify a channel table.

By allocating a channel table number to each system or each site, a different frequency can be used in each system or site.



- The channel table number cannot be changed after creating a channel table.

Configuring a channel table name (Table Name)

Table Name is the name of a channel table. Table Name is configured to distinguish the configured channel tables. The name configured for each channel table appears in the list of **Additional Channel Table**.

Configuring the range of frequencies (Base Frequency)

Base Frequency is the lowest frequency in the configuration range of frequencies. **Base Frequency** is configured according to the available frequencies in the NEXEDGE system.

The configuration ranges of **RX Frequency** and **TX Frequency** in **Frequency List** are determined according to the configured **Base Frequency** and **Channel Step**.

Configuring the frequency step (Channel Step)

Channel Step is the frequency step. **Channel Step** is configured according to the available frequencies in the system.

RX Frequency and **TX Frequency** in **Frequency List** are automatically corrected according to the configured **Channel Step**.

Also, the configuration ranges of **RX Frequency** and **TX Frequency** in **Frequency List** are determined according to the configured **Base Frequency** and **Channel Step**.

Configuring a Frequency List (Frequency List)

The frequency list of a channel table can be configured in **Edit > System Configuration > Additional Channel Table > Frequency List** of SCU.

A frequency configured in **Frequency List** can be used in each system or site.

The values of **Frequency Range** and the configuration ranges of **RX Frequency** and **TX Frequency** are determined according to **Basic Frequency** and **Channel Step** configured in **Frequency Allocation** of **Additional Channel Table**.

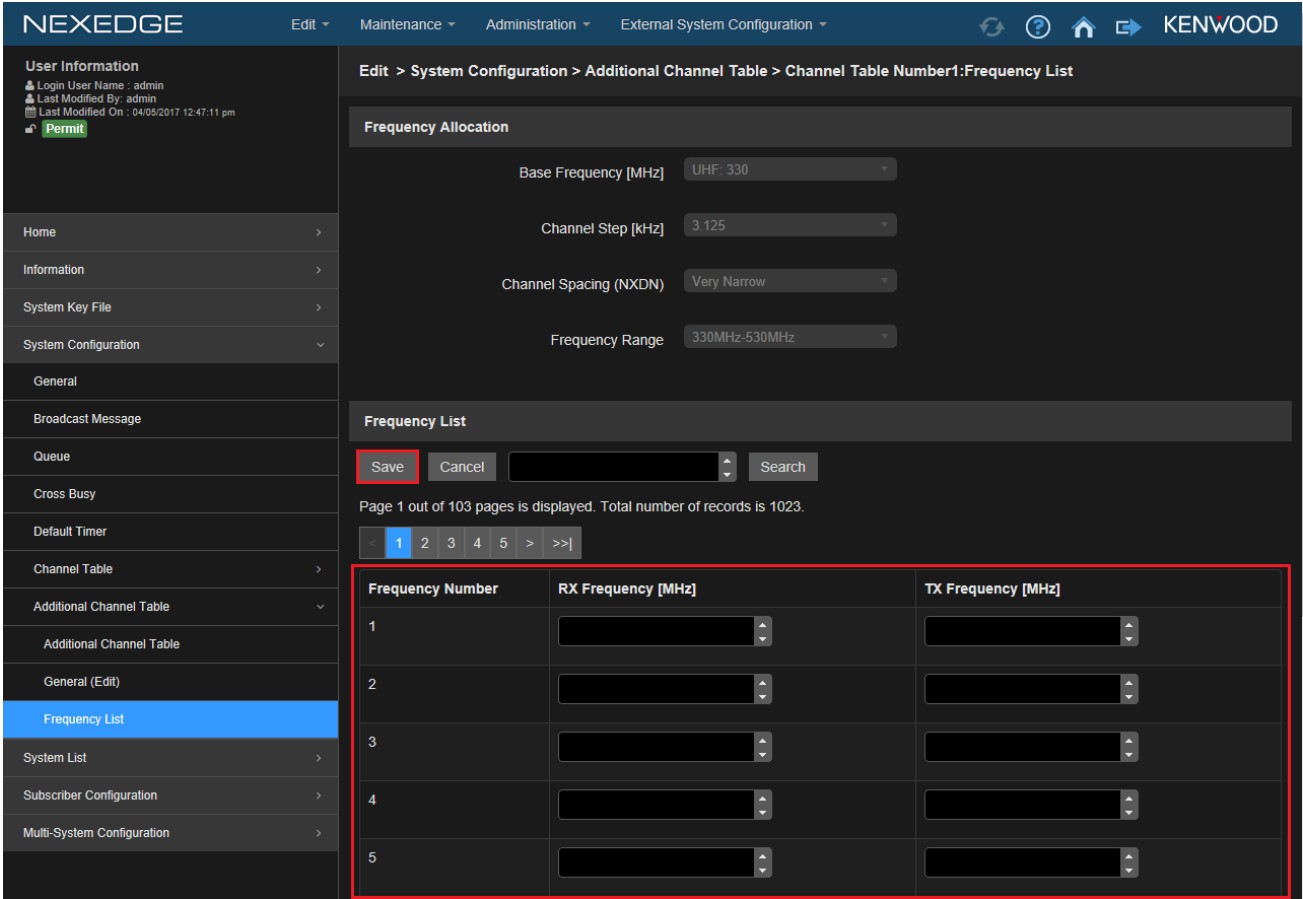


Figure 7-31 Frequency List

After configuration, click the “Save” button to save.

7.7 Configuring a Multi-site

A multi-site is a system consisting of one system controller and multiple sites (site controllers (shared/dedicated) and multiple repeaters). This system operates in multiple sites (a maximum of 48 sites), and Intersite Call can be used.

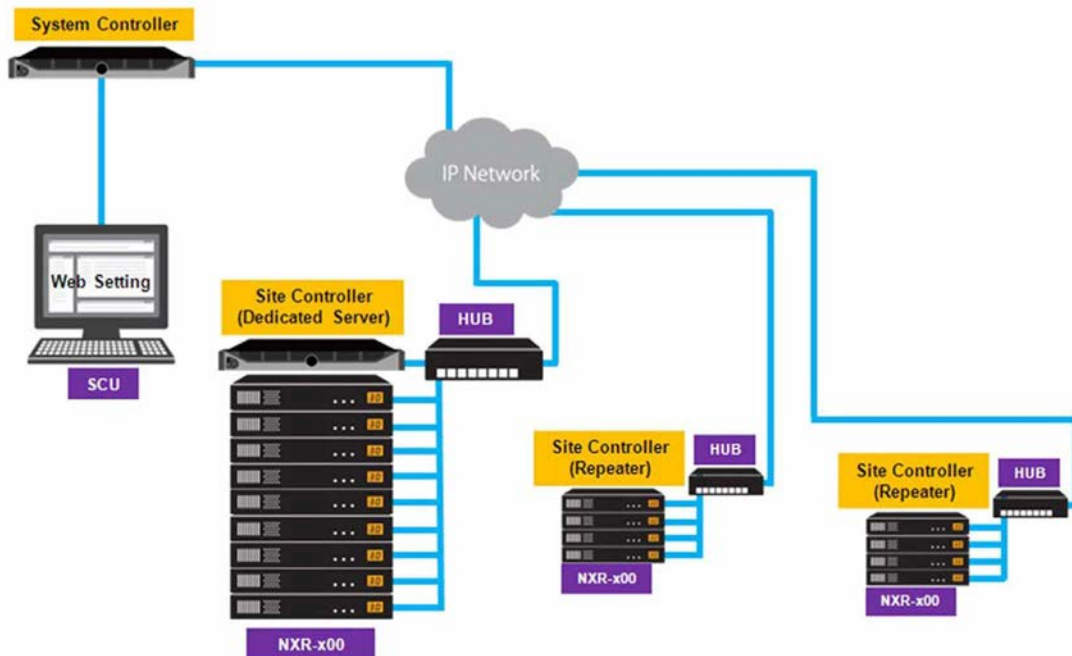


Figure 7-32 Multi-Site System

Intersite Call is the function that permits communication by a Voice Call or Data Call between sites. By using this function, a Voice Call and Data Call can be initiated between sites configured in **Intersite Call List**. (Refer to [Controlling an Intersite Call \(GID COS\)](#).)

Also, by using Adjacency functions, the NEXEDGE system induces a subscriber unit to migrate to a control channel in a site providing better receiving conditions by sending a Broadcast Message notifying the subscriber unit of the control channel information of adjacent sites. By using this function, the subscriber unit can roam smoothly.

Configuring the Interval to Notify of the Frequency Code of an Adjacent Site Control Channel (Adjacent Site Information Interval)

Adjacent Site Information Interval Timer is the interval to notify of the frequency code of an adjacent site control channel.

The frequency code of an adjacent site control channel notified from the NEXEDGE system can be used for the Background Hunt of the subscriber unit.

Note

- Shortening **Adjacent Site Information Interval Timer** shortens the period until the subscriber unit can use all adjacent sites, but the control channel may be busy because the interval to notify a Broadcast Message from the control channel is also shortened.

Configuration items using SCU

Configuring **Adjacent Site Information Interval Timer** ( See Edit > System Configuration > Broadcast Message)

Configuring a Site Number of Adjacent Sites to Be Used for Notifying Control Channel Information (Adjacent Control Channels)

Adjacent Control Channels is the function that induces a subscriber unit to use a control channel providing better receiving conditions by sending a Broadcast Message notifying the subscriber unit of the control channel information of adjacent sites.

A NEXEDGE system can notify a subscriber unit of the control channel information of a maximum of 8 adjacent sites. To use this function, the **Site Number** of an adjacent site and the **Frequency Number** configured for the site need to be specified.

If “Auto” is configured in **Frequency Number**, the NEXEDGE system automatically collects control channel information of an adjacent site and notifies the subscriber unit.

Configuration items using SCU

Configuring **Adjacent Control Channels** ( See Edit > System List > Site List > Adjacency > Adjacent Control Channels)

Adding Control Channel Information (Additional Control Channels)

Additional Control Channels is the function that notifies a subscriber unit of added control channel information of adjacent sites by using a Broadcast Message.

Refer to “[Using a Subscriber Unit without Changing Configurations Even If a Control Channel Is Added/ Deleted \(Adjacency\)](#)” for details of **Additional Control Channels**.

Deleting Control Channel Information (Delete Control Channels)

Delete Control Channels is the function that notifies a subscriber unit of deleted control channel information of adjacent sites by using a Broadcast Message.

Refer to “[Using a Subscriber Unit without Changing Configurations Even If a Control Channel Is Added/ Deleted \(Adjacency\)](#)” for details of **Delete Control Channels**.

7.8 Configuring a System (System List)

All system data is listed in **Edit > System List** of SCU, and a system administrator can confirm each system data that is operating. Also, the system administrator can add, clear, and edit the system data.

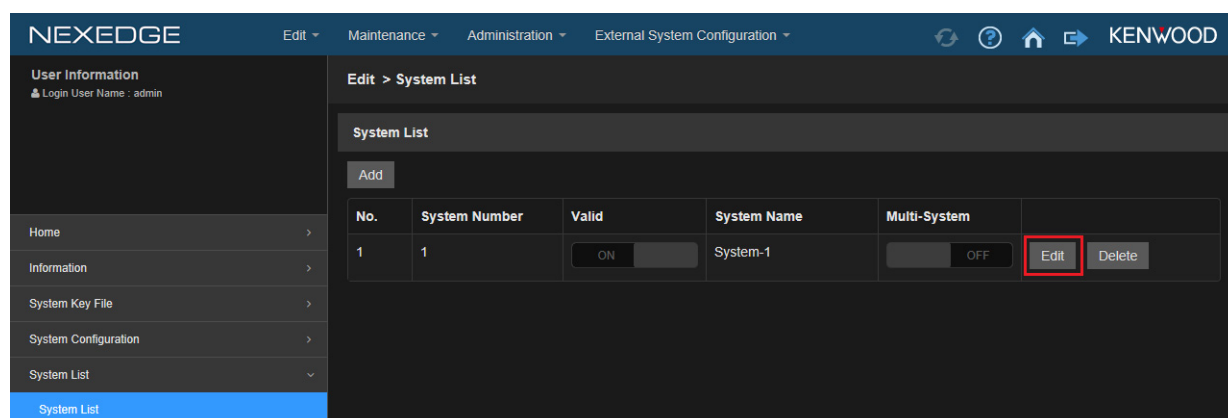


Figure 7-33 System List

Clicking the “Edit” button in **System List** displays **General (Edit)**, and system data can be edited. Clicking the “Add” button displays **General (Add)**, and a Wide-Area System can be structured. (Refer to [About Wide-Area System](#).)

Note

- A maximum of 24 pieces of system data can be configured.
- A list of the registered systems appears in **System List**.
- By clicking the “Details” button in **System List**, the configuration contents of the corresponding system can be viewed.
- By clicking the “Edit” button in **System List**, the configuration of the corresponding system can be changed.
- By clicking the “Delete” button in **System List**, the corresponding system can be deleted.

Configuring System Information (System Information)

System information such as a system number can be configured in **Edit > System List > General (Add or Edit) > System Information** of SCU.

The screenshot shows the NEXEDGE web interface. On the left is a sidebar with a menu including 'Home', 'Information', 'System Key File', 'System Configuration', 'System List', 'General (Edit)', 'Network', 'Site List', 'IP Gateway List', 'Subscriber Configuration', and 'Multi-System Configuration'. The 'General (Edit)' option is selected. The main content area is titled 'Edit > System List > System Number1:General (Edit)'. Below this is a 'System Information' section with the following fields: 'System Number' (set to 1), 'Valid' (toggle set to ON), 'System Name' (set to System-1), 'Main IP Address' (set to 172.16.0.65, highlighted with a red box), 'Sub IP Address' (empty), 'Multi-System' (toggle set to OFF), and 'Channel Table Number' (set to General). At the bottom of the form are three buttons: 'Save' (highlighted with a red box), 'Cancel', and 'Back'.

Figure 7-34 System Information

After configuration, click the “Save” button to save.

Configuring a system number (System Number)

System Number is the number of a system. The desired number from 1 to 24 can be configured.

Note

- Already used system numbers cannot be configured.
- The system number cannot be changed after creating a system.

Configuring whether to use a system or not (Valid)

Valid allows a system administrator to configure whether the configured system is used. To use a system, configure “ON” in **Valid**. To not use a system, configure “OFF” in **Valid**.

Configuring a system name (System Name)

System Name is the name of a system. System Name is configured to distinguish the configured system data. The name configured for each system appears in the list of **System List**.

Configuring the IP address of a system controller (Main IP Address/ Sub IP Address)

● Main IP Address

Main IP Address allows the system administrator to configure the IP address of the system controller.

When the **Sub IP Address** has been preconfigured, it is possible to configure a redundant system controller. In this case, the system controller with the IP address configured in **Main IP Address** will behave as the main system controller.

● Sub IP Address

Sub IP Address allows the system administrator to configure the IP address of the backup system controller.

When the **Sub IP Address** is configured, the entire system is able to continue running by having a backup system controller control the system even when a failure has occurred on the system controller with the IP address configured in **Main IP Address**. The system controller with the IP address configured in **Sub IP**

Address will behave as the sub system controller. (Refer to: [5.5 Configuring a Redundant System Controller \(System Controller Redundancy\)](#))

Enabling or disabling the multi-system (Multi-System)

Multi-System allows a system administrator to configure the multi-system to be enabled or disabled.

A multi-system is the system that interconnects multiple systems of different system information (Network Category/ System Code) by using an IP network via the roaming gateway. (Refer to [Enabling the Multi-system \(Multi-System\)](#).)

Configuring the channel table number for each system (Channel Table Number)

In **Channel Table Number**, the channel table number to be used for each system can be configured.

By allocating a channel table number to each system, a different frequency can be used in each system.

Table 7-13 Configuration of Channel Table Number

Item	Description
General	The frequencies configured in the channel table that is common in a Wide-Area System can be used. This channel table can be configured in Edit > System Configuration > Channel Table . (Refer to Configuring Frequencies of the Repeater (Channel Table) .)
1: Table Name to 23: Table Name	The frequencies configured in the channel table registered in Additional Channel Table can be used. This channel table can be configured in Edit > System Configuration > Additional Channel Table . (Refer to Configuring the Channel Tables of Different Frequencies .)

Configuring the IP Network Information (IP Configuration)

The IP address of a system controller can be confirmed and changed by using SCU.

Refer to “[Configuring the IP Network Information of a System Controller \(IP Configuration\)](#)” for details on confirming and changing the IP address of a system controller.

Configuring the Language to Display (Language)

The language displayed in SCU can be selected in **Maintenance > Setting > Language** of SCU.

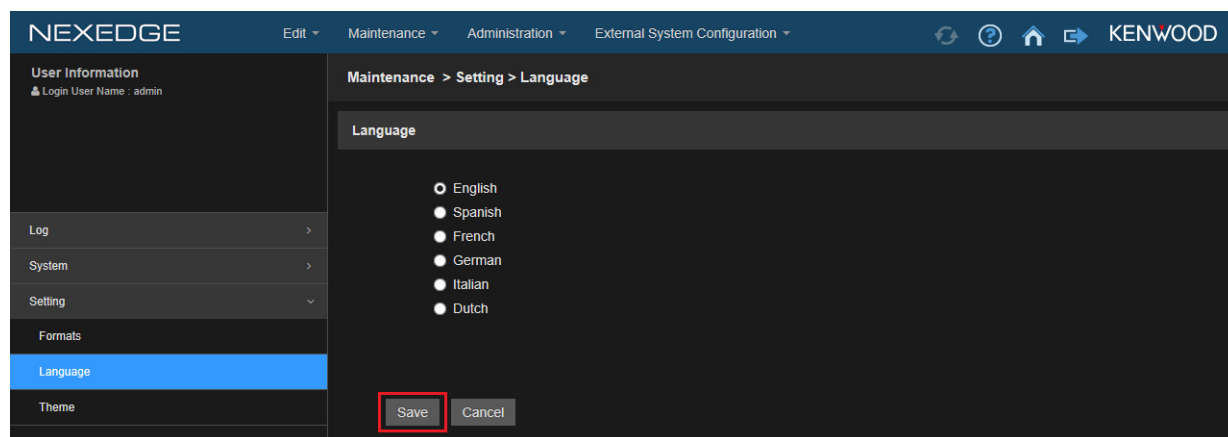


Figure 7-35 Language

After configuration, click the “Save” button to save.

7.9 Configuring the System Date and Time

By using SCU, the time configuration can be adjusted for each site, the time of the NEXEDGE system can be automatically adjusted by synchronizing with an NTP server, and the time can be manually configured.

Adjusting the Time Configuration of Each Site (Time Settings)

Time Settings is the function to adjust the time configuration of each site. If the Time Zone and summer time of each site is different, the time configuration of each site can be individually adjusted.

The time configuration of a site can be adjusted in **Edit > System List > Site List > General (Edit) > Time Settings** of SCU.

Figure 7-36 Time Settings

After configuration, click the “Save” button to save.

Synchronizing to the time configuration of a system controller (System Default)

System Default is the function for a site to synchronize to the time configuration of a system controller.

If “ON” is configured in **System Default**, the site synchronizes to the time configuration of a system controller.

To configure the time in the site's own Time Zone when the site is installed at a location using a Time Zone different from the Time Zone of the system controller, configure “OFF” in **System Default** and the site does not synchronize to the time configuration of the system controller.

Normally, this function is configured “ON”, and the time configuration is synchronized to time configuration of the system controller and used.

Configuring Time Zone

Time Zone allows a system administrator to configure the time difference to UTC (Coordinated Universal Time).

Time Zone can be configured in the range of -12 hours to +13 hours for the difference with UTC.

Configuring summer time (Daylight Saving Time)

Daylight Saving Time allows a system administrator to configure whether summer time is used.

If “ON” is configured in **Daylight Saving Time**, summer time can be used.

Start Date/ Start Time and **End Date/ End Time** allows a system administrator to configure date and time to start and end summer time.

Specifying Whether to Use an NTP Server

The time can be adjusted in a NEXEDGE system automatically by specifying the NTP server to be connected. Refer to “[Adjusting the current time of a system automatically](#)” for configuration methods.

Manually Configuring the Current Date

In **Maintenance > System > Time Settings > Time Adjustment > Manual** of SCU, the time can be manually configured by entering the date and time. Entering the date and time in **Date** and **Time** and clicking the “Set” button configures the date and time.

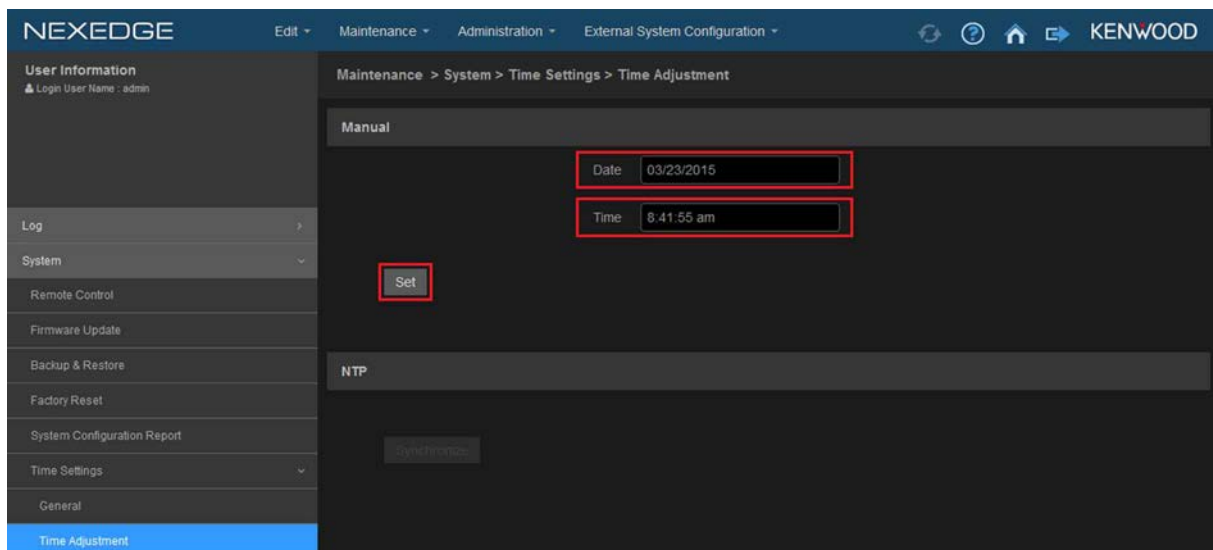


Figure 7-37 Manual

After configuration, click the “Set” button to save.

Switching the Year-Month-Day Format and Time Format (Formats)

In **Date Format** and **Time Format** via **Maintenance > Setting > Formats** of SCU, the year-month-day format and time format displayed in SCU can be switched.

To change the date format, select any radio button in **Date Format**.

To change the time format, select any radio button in **Time Format**.

The screenshot shows the NEXEDGE SCU interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar shows 'User Information' (Login User Name: admin) and a menu with 'Log', 'System', 'Setting', 'Formats' (selected), 'Language', and 'Theme'. The main content area is titled 'Maintenance > Setting > Formats'. It contains three sections: 'Date Format' with three radio buttons (MM/DD/YYYY, DD/MM/YYYY, YYYY/MM/DD), 'Time Format' with four radio buttons (h : mm : ss tt, hh : mm : ss tt, H : mm : ss, HH : mm : ss), and 'Decimal Format' with two radio buttons (123.4567, 123,4567). At the bottom are 'Save' and 'Cancel' buttons. Red boxes highlight the radio button groups in Date and Time Format, and the Save button.

Figure 7-38 Formats

After configuration, click the “Save” button to save.

7.10 Configuring the External Extended Functions

An IP console and a telephone such as KTI-4 can be connected to a NEXEDGE system via an IP Gateway server. Register an IP Gateway server in the NEXEDGE system by using SCU, and register each device in the NEXEDGE system by specifying the IP Gateway server to be connected.

Confirming, Adding, Editing and Deleting the IP Gateway Server Registered in the System

In **Edit > System List > IP Gateway List** of SCU, an IP Gateway server registered in the NEXEDGE system can be viewed, and an IP Gateway server can be added, edited and deleted.

A maximum of 10 IP Gateway servers can be registered in **IP Gateway List**.

Refer to “[Connecting an IP Gateway server](#)” for configuration methods.

Confirming, Adding, Editing and Deleting the Device Registered in the System

In **Edit > Subscriber Configuration > Device List** of SCU, a device registered in the NEXEDGE system can be viewed, and a device can be added, edited and deleted.

The capacity of a single IP Gateway server is as follows:

Table 7-14 Device List

Number of Devices that Can Be Connected	100
Number of GIDs that Can Be Registered per 1 IP Console	100
Number of IP Consoles that Can Deliver a Group Call	100 (the maximum of 100 IP consoles can be registered per 1 GID)
Maximum Number of Sessions	1,000 (including the number of Voice Logger sessions)

The device data registered in **Device List** needs to be linked to a Fleet in **Fleet List > Console List**.

For configuration methods, refer to “[Connecting to an IP console device](#)” and “[Connecting to the Telephone](#)”.

7.11 Configuring a Telephone

The telephone connected to a NEXEDGE system via an IP Gateway server is available by registering the UID of the telephone in **Telephone Line List** of a Fleet. (Refer to [Connecting to the Telephone](#).)

By using SCU, the parameters of various functions used by the telephone connected to the NEXEDGE system, such as speed dial numbers and restrictions of telephone numbers to be called, can be configured.

Restricting Telephone Numbers to Be Called (Call Restriction)

Call Restriction is the function to restrict telephone numbers to be called from a subscriber unit.

This function can restrict the number of digits and area codes of the telephone number to be called from a subscriber unit. For example, long-distance calls to the telephone number with certain area codes can be restricted by using this function.

Clicking the “Add” button in **Edit > Subscriber Configuration > Call Restriction List** of SCU displays **Call Restriction Table (Add)**, and a new **Call Restriction Table** can be created. A maximum of 1,000 **Call Restriction Tables** can be configured in **Call Restriction List**.

No.	Telephone Number	Valid
1		OFF
2		OFF
3		OFF
4		OFF
5		OFF

Figure 7-39 Call Restriction Table

After configuration, click the “Save” button to save.

Note

- A list of registered **Call Restriction Tables** appears in **Call Restriction List**.
- By clicking the “Details” button in **Call Restriction List**, the configuration contents of the corresponding **Call Restriction Table** can be viewed.
- By clicking the “Edit” button in **Call Restriction List**, the configuration of the corresponding **Call Restriction Table** can be changed.
- By clicking the “Delete” button in **Call Restriction List**, the corresponding **Call Restriction Table** can be deleted.

Configuring an identification number for a Call Restriction Table (Call Restriction Table Number)

Call Restriction Table Number is the allocated number to identify a **Call Restriction Table**.



- **Call Restriction Table Number** cannot be changed after a **Call Restriction Table** is created.

Configuring a table name (Table Name)

Table Name is the name of a **Call Restriction Table**. Table Name is configured to distinguish the configured **Call Restriction Tables**. The name configured for each table appears in the list of **Call Restriction List**.

Restricting the minimum and maximum number of digits of a telephone number to be called (Minimum/ Maximum Number of Digits)

Minimum/ Maximum Number of Digits is the function to restrict the minimum and maximum numbers of digits of a telephone number to be called from a subscriber unit. A system administrator can restrict the telephone numbers that the system administrator does not want a user to use by the number of digits.

The NEXEDGE system prevents a call with a telephone number that is less than the number of digits specified in **Minimum Number of Digits**. For instance, to stop the use of a telephone number that is 4 digits or less, configure "5" in **Minimum Number of Digits**.

The NEXEDGE system stops a call with a telephone number that is greater than the number of digits specified in **Maximum Number of Digits**. For example, if the number of digits of a local telephone number in an area is 7 digits, configure "7" in **Maximum Number of Digits** to prevent a user from making a long-distance call (8 digits or more).



- Dial patterns registered in speed dial are not restricted by this function. (Refer to [Configuring the Speed Dial \(Speed Dial\)](#).)

Configuring the telephone numbers that are allowed to be called or stopped from being called (Telephone Number)

Telephone Number is a telephone number that is allowed to be called or stopped from being called. A system administrator can stop an outgoing call from a subscriber unit based on the telephone number.

When the telephone number entered using a subscriber unit is compared to the telephone number configured in **Telephone Number** and the prefix of these telephone numbers match, the NEXEDGE system allows or stops an outgoing call. Whether a call to the telephone number is allowed or stopped depends on the configuration in **Valid**. The NEXEDGE system compares the telephone number entered using a subscriber unit with **Telephone Number** only if the number of digits of the telephone number is within the range configured in **Minimum/ Maximum Number of Digits**.

This function can be used, for instance, to restrict long-distance calls and international calls, or to allow outgoing calls to only a specific area code.

- **Example of how to block a long-distance call**

For the area where the long-distance access code is "1", configure "1" in **Telephone Number** and "OFF" in **Valid**.

- **Example of how to block an international call**

For the area where the international access code is "011", configure "011" in **Telephone Number** and "OFF" in **Valid**.

- **Example of how to allow outgoing calls to only a specific telephone number**

For the area where the telephone numbering system is (3-digit area code) - (3-digit city code) - (4-digit subscriber number), configure the combination of restricted numbers and allowed numbers in **Telephone Number** as follows to allow only a specific telephone number (234-5678):

- Configure "0", "1", "2", "3", "4", "5", "6", "7", "8", and "9", and configure "OFF" in **Valid** of all numbers.
- Configure "2345678", and configure "ON" in **Valid**.

Note

- A maximum of 32 **Telephone Numbers** can be configured in each **Call Restriction Table**.
- If nothing is configured in **Telephone Number**, an outgoing call using a subscriber unit to any telephone number is allowed.

Allowing or stopping the outgoing call to a specific number (Valid)

Valid is the function to allow or stop an outgoing call to a telephone number when the telephone number entered using a subscriber unit is compared to the telephone number configured in **Telephone Number** and the prefix of these numbers match.

To allow an outgoing call to the corresponding number in **Telephone Number**, configure "ON" in **Valid**. To not allow an outgoing call to the corresponding number, configure "OFF" in **Valid**.

Configuring the Speed Dial (Speed Dial)

Speed Dial is the function that enables a subscriber unit to make a call to a preconfigured telephone number in the NEXEDGE system by entering the speed dial number.

Clicking the “Add” button in **Edit > Subscriber Configuration > Speed Dial List** of SCU displays **Speed Dial Table (Add)**, and a new Speed Dial Table can be created. A maximum of 1,000 **Speed Dial Tables** can be configured in **Speed Dial List**.

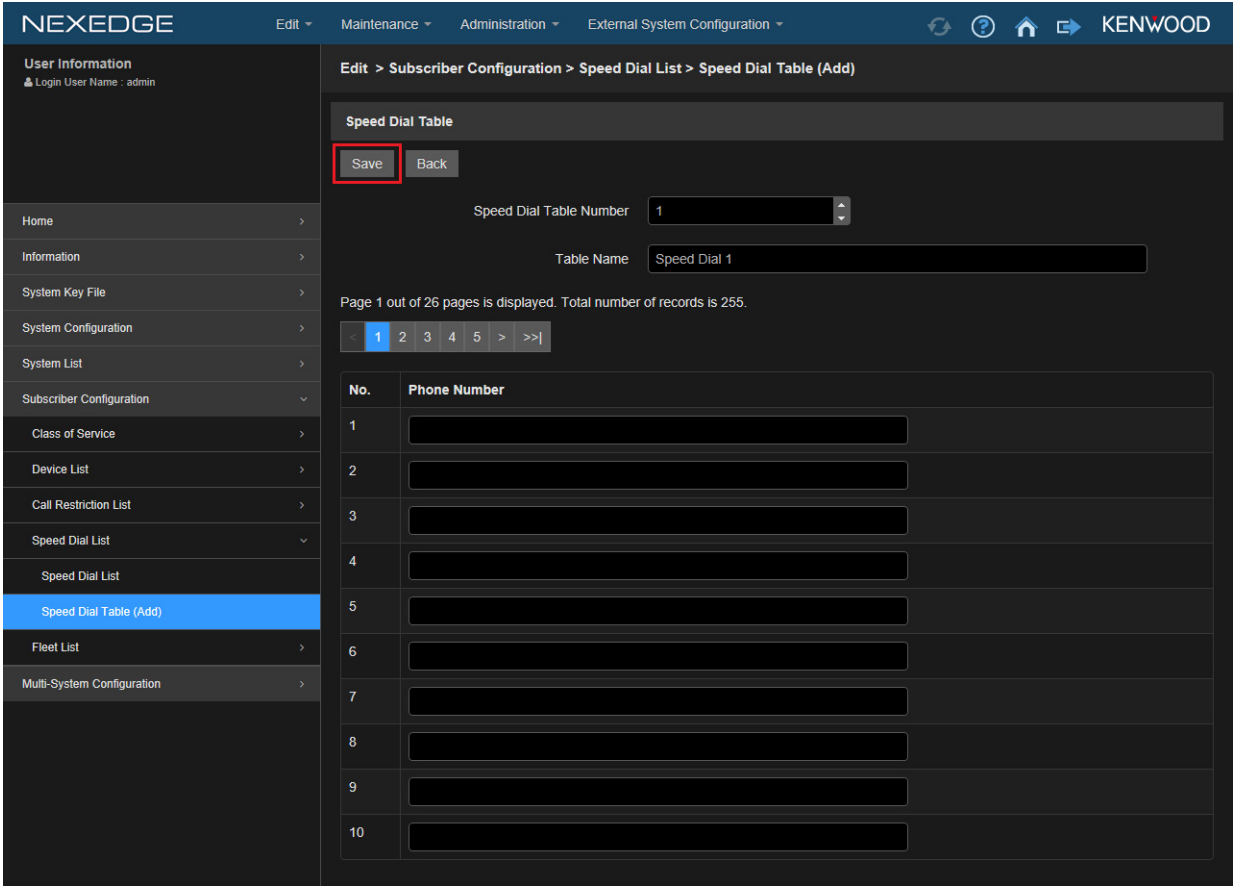


Figure 7-40 Speed Dial Table

After configuration, click the “Save” button to save.

Note

- A list of registered **Speed Dial Tables** appears in **Speed Dial List**.
- By clicking the “Details” button in **Speed Dial List**, the configuration contents of the corresponding **Speed Dial Table** can be viewed.
- By clicking the “Edit” button in **Speed Dial List**, the configuration of the corresponding **Speed Dial Table** can be changed.
- By clicking the “Delete” button in **Speed Dial List**, the corresponding **Speed Dial Table** can be deleted.

Configuring an identification number for a Speed Dial Table (Speed Dial Table Number)

Speed Dial Table Number is the allocated number to identify a **Speed Dial Table**.



- **Speed Dial Table Number** cannot be changed after a **Speed Dial Table** is created.

Configuring a table name (Table Name)

Table Name is the name of a **Speed Dial Table**. Table Name is configured to distinguish the configured **Speed Dial Tables**. The name configured for each table appears in the list of **Speed Dial List**.

Configuring the telephone number corresponding to a speed dial number (Phone Number)

Phone Number is the telephone number corresponding to a speed dial number. Entering a speed dial number using a subscriber unit makes a call to the corresponding telephone number.

The speed dial number ranges from No. 1 to No. 255, and the telephone number can be configured to each speed dial number.

Restricting the Connection from a Subscriber Unit to a Telephone Line (Bi-directional Use)

Bi-directional Use is the function to restrict the connection of a subscriber unit to a telephone line.

This function is used to avoid call loss when an outgoing call collides with an incoming call on the same telephone line. The call loss caused by a rare collision between an incoming call and an outgoing call can be avoided by configuring and using a dedicated telephone line for an outgoing call and a dedicated telephone line for an incoming call. Prepare multiple telephone lines, and enable **Bi-directional Use** for the dedicated telephone line for an outgoing call and disable **Bi-directional Use** for the dedicated telephone line for an incoming call.

To allow the connection of a subscriber unit to a telephone line, configure "ON" in **Bi-directional Use**. To not allow the connection of a subscriber unit to a telephone line, configure "OFF" in **Bi-directional Use**.

Configuration items using SCU

Configuring **Bi-directional Use** (**See** Edit > Subscriber Configuration > Device List > General (Add or Edit) > Telephone Line)

7.12 Configuring a Console

The IP console connected to a NEXEDGE system via an IP Gateway server is available by registering the UID of the IP console in **Console List** of a Fleet.

Refer to “[Connecting to an IP console device](#)” for registering the UID of the IP console.

By using SCU, the parameters of various functions used by the IP console connected to the NEXEDGE system can be configured.

Configuring the Functions Available for an IP Console (UID Class of Service)

UID Class of Service is data in which available functions are defined by UIDs.

The IP console connected to the NEXEDGE system is allowed to use each function according to the configuration of **UID Class of Service**.

About a UID, available basic functions for Fleet are configured in **Common Class of Service (UID)**, but configure **UID Class of Service** if using or restricting a function different only for the IP console.

Table 7-15 Configuration of UID Class of Service

Item	Description
Common	An IP console is allowed to use each function according to the configuration of Common Class of Service (UID) that is configured for the registration destination Fleet. (Refer to Configuring COS to be used by UIDs registered in a Fleet (Common Class of Service (UID)) .)
1: Class Name to 5000: Class Name	An IP console is allowed to use each function according to the specified configuration of UID Class of Service . (Refer to Configuring a UID COS .)

Configuration items using SCU

Configuring **UID Class of Service** ( [See](#) Edit > Subscriber Configuration > Device List > General (Add or Edit) > Console)

Restricting the GIDs Available for an IP Console (Maximum Registration GID)

Maximum Registration GID is the number of GIDs that an IP console can register. A system administrator can restrict the number of GIDs that the IP console uses.

When Group Registration is executed by the IP console, if the value configured in **Maximum Registration GID** is exceeded, the NEXEDGE system rejects the Group Registration.

Configuration items using SCU

Configuring **Maximum Registration GID** ( [See](#) Edit > Subscriber Configuration > Device List > General (Add or Edit) > Console)

7.13 Configuring the Voice Logging Function

Voice Logging is the function to transfer the voice call in the system to a Voice Logger by using Voice Logging Interface (VLI). By recording voice calls (audio packet data) transferred to the Voice Logger, the recorded data can be managed, etc.

Voice Logging Interface is the interface defined for connecting the Voice Logger to the IP Gateway server. The Voice Logger to be connected to the IP Gateway server can be configured for each Fleet by SCU. When a voice call is initiated from a transceiver, an IP console, or a telephone that belongs to the Fleet where the Voice Logger is enabled, audio packet data is transferred from the IP Gateway server to the Voice Logger.

To use this function, the Voice Logger that supports a NEXEDGE system is required.

The communication functions in which **Voice Logging** is available are as follows:

- Group Call (Broadcast/ Conference)
- Individual Call
- Telephone Call
- All Groups Call

Voice Logging behavior in a Group Call

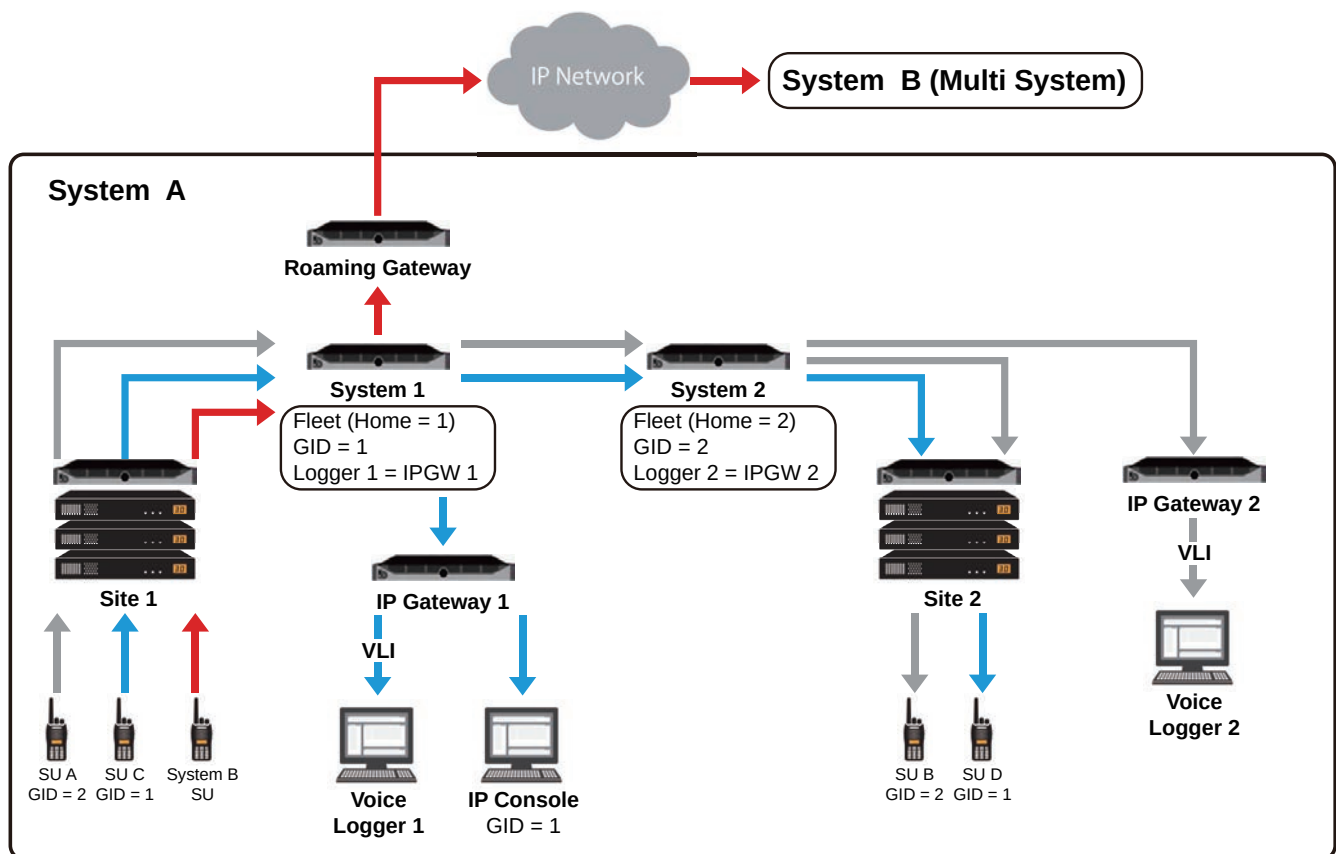


Figure 7-41 Image of the Voice Logging Behavior in a Group Call

- **When a Group Call occurs from SU A:**

If the Voice Logger is enabled in the Fleet to which the target GID belongs, voice packet data is transferred from the IP Gateway 2 connected to the Voice Logger via the Home System (System 2) of the target Fleet.

- **When a Group Call occurs from SU C:**

If the Voice Logger is enabled in the Fleet to which the target GID belongs, voice packet data is transferred from the IP Gateway 1 connected to the Voice Logger via the Home System (System 1) of the target Fleet.

- **When a call occurs from System B SU:**

A call of another system cannot be recorded.

- **When an All Groups Call occurs:**

Voice packet data is transferred from the IP Gateway server according to the Voice Logger configuration of the Fleet to which the transmitting UID belongs.

Voice Logging behavior in an Individual Call

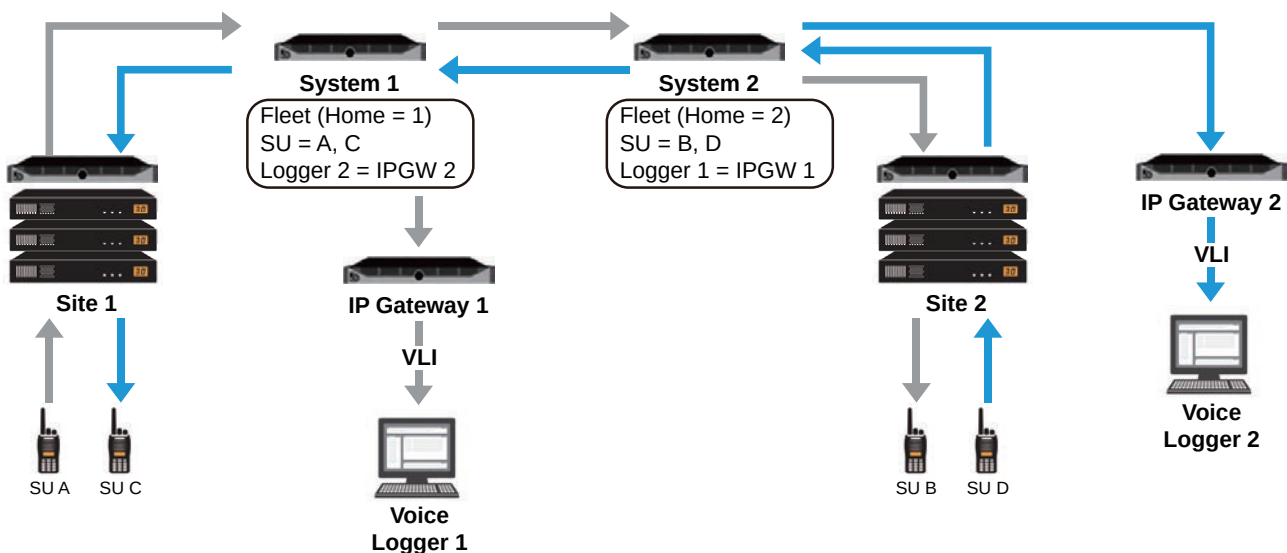


Figure 7-42 Image of the Voice Logging Behavior in an Individual Call

- **When an Individual Call from SU A to SU B occurs:**

If the Voice Logger is enabled in the Fleet to which the target UID (SU B) belongs, voice packet data is transferred from the IP Gateway 1 connected to the Voice Logger via the Home System (System 2) of the target Fleet.

- **When an Individual Call from SU D to SU C occurs:**

If the Voice Logger is enabled in the Fleet to which the target UID (SU C) belongs, voice packet data is transferred from the IP Gateway 2 connected to the Voice Logger via the Home System (System 1) of the target Fleet.

Note

- The location management of Voice Loggers does not occur because Voice Loggers do not have UIDs.

Configuring the Voice Logger for each Fleet

The configuration to use the Voice Logger for each Fleet can be configured in **Edit > Subscriber Configuration > Fleet List > Voice Logger** of SCU.

The screenshot displays the NEXEDGE web interface for configuring the Voice Logger. The breadcrumb trail at the top reads: **Edit > Subscriber Configuration > Fleet List > Fleet Number1:Voice Logger**. The main configuration area, titled **Voice Logger**, includes the following elements:

- Voice Logging**: A toggle switch currently set to **OFF**.
- IP Gateway Number**: A dropdown menu with the value **1** selected.
- IP Address**: An empty text input field.
- Port**: A dropdown menu with the value **50800** selected.
- Buttons**: **Save**, **Cancel**, and **Back** buttons are located at the bottom of the configuration area.

The left sidebar contains a navigation menu. Under the **Fleet List** section, the **Voice Logger** option is highlighted in blue.

Figure 7-43 Voice Logger

Note

- Refer to “[CONFIGURATION OF FLEET](#)” for details of the Fleet configuration.

Configuring whether to use a Voice Logger (Voice Logging)

Voice Logging allows a system administrator to configure whether to use a Voice Logger.

To use a Voice Logger, configure "ON" in **Voice Logging**. Voice packet data is transferred to the Voice Logger via the IP Gateway server.

Configure "OFF" in **Voice Logging** if a Voice Logger is not used. Voice packet data is not transferred to the Voice Logger.

Configuring the IP Gateway server to connect (IP Gateway Number)

IP Gateway Number allows a system administrator to configure the number of an IP Gateway server to which the Voice Logger is connected. The number of an IP Gateway server configured in **IP Gateway List** can be configured. (Refer to [Connecting an IP Gateway server](#).)

The maximum number of sessions of a single IP Gateway server is 1,000 sessions including the Voice Logger sessions.

Configuring the IP address of the Voice Logger (IP Address)

IP Address allows a system administrator to configure the IP address of the Voice Logger to which the IP Gateway server transfers voice packet data.

Note

The following addresses cannot be configured:

- 127.xxx.xxx.xxx (cannot be configured because the address is for a loopback address)
- 128.000.xxx.xxx (cannot be configured because the address is a reserved address)
- 191.255.xxx.xxx (cannot be configured because the address is a reserved address)
- 192.000.001.xxx (cannot be configured because the address is a reserved address)
- 223.255.255.xxx (cannot be configured because the address is a reserved address)

Configuring the standby port number of the Voice Logger (Port)

Port allows a system administrator to configure the standby port number of the Voice Logger to which the IP Gateway server transfers voice packet data.

The default port number is 50800.

7.14 Configuring Network Manager

Via an IP network, Network Manager Server monitors the status of devices that make up an NEXEDGE system, such as PC servers and repeaters. (Refer to [About Network Manager Server](#).)

Configurations related to Network Manager Server can be configured by using SCU.

Configuring Whether a Dedicated PC Server or a System Controller Is Used for Network Manager Server (External Network Manager Server)

Whether a system controller or a dedicated PC server is used for Network Manager Server in a Network Manager system can be configured in **External System Configuration > Network Manager** of SCU. Also, if a dedicated PC server is used for Network Manager Server, the IP address of Network Manager Server can be configured.

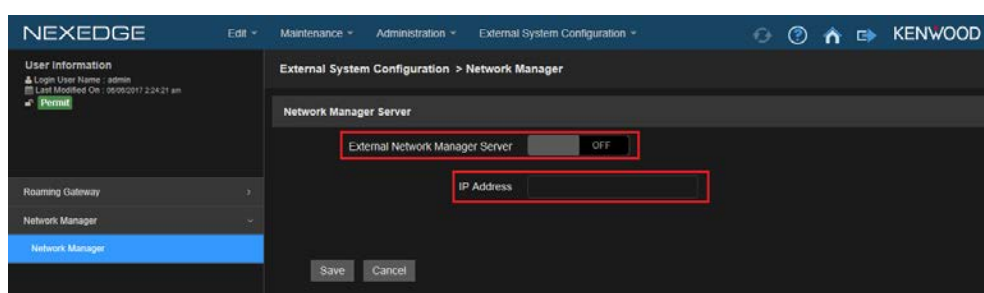


Figure 7-44 Network Manager

If using a system controller for Network Manager Server, configure "OFF" in **External Network Manager Server**. The same IP address as that of the system controller is used.

If using a dedicated PC server for Network Manager Server, configure "ON" in **External Network Manager Server** and configure the IP address.

7.15 Turning Each Device On/ Off

To start a NEXEDGE system, turn on repeaters and various controllers that make up the NEXEDGE system. Also, the behavior when a repeater starts can be configured by using SCU.

Turning Repeater and Various Controllers On/ Off

Repeaters and various controllers (system controllers/ site controllers/ IP gateways) that make up the NEXEDGE system can be turned on or off. Because a repeater does not have a power switch, the repeater can be turned on or off by turning the connected external power switch on or off, or by plugging or unplugging the connected power cable. Because the various controllers are applications running on a PC server, various controllers can be turned on or off by turning the PC server on or off.

Starting a Repeater

If regular data is written in a repeater, the repeater starts in User Mode when the repeater is turned on.

If the repeater does not receive channel information from a site controller, the repeater starts in Unprogramming Mode when the repeater is turned on.

Starting a System Controller

The application of a system controller automatically starts by turning on the PC server on which the system controller is installed.

Starting a Site Controller

The application of a site controller automatically starts by turning on the PC server on which the site controller is installed.

Starting an IP gateway

The application of an IP gateway automatically starts by turning on the PC server on which the IP gateway is installed.

The following data is backed up even when the power is turned off.

Table 7-16 Backed Up Data

Data	Memory Location	Conditions for Backup
Registration Information (UID/ GID)	System controller	Registration information in a system
Information Message	System controller	Information Message in a system
Communication Log (communication records)	System controller	Communication Log in a system
System Log (record of system status and user operations)	System controller	System Log in a system
Diagnostic Data (record of the internal information of a system)	System controller	Diagnostic Data in a system

 Note

- **Remote Control** of SCU can turn off and restart a system controller. (Refer to [Remotely Controlling a Device \(Remote Control\)](#).)

Configuring the Repeat Behaviors of Startup (Power-on Standby)

Power-on Standby is the function that places a control channel in the standby state when a repeater starts.

This is a function that disables the transmission capability until the frequency is stabilized when the optional reference oscillator OCXO (KXK-3) is used. The control channel can be activated when the frequency is stabilized after the repeater starts.

If “ON” is configured for this function, the control channel is activated in the standby state when the repeater starts. The LED of the **[RPT DISABLE]** key for a control channel lights while in the standby state. If the **[RPT DISABLE]** key on any of the repeaters in the site is pressed, the LED on all the repeaters is turned off, the standby state is reset, and then transmission starts on a control channel.

If “OFF” is configured for this function, the control channel is not activated in the standby state and transmission immediately starts when the repeater starts.

Configuration items using SCU

Configuring **Power-on Standby** ( **See** Edit > System List > Site List > General (Add or Edit) > Site Information)

By configuring Class of Service (COS) which defines available functions for UIDs and GIDs to be registered in a NEXEDGE system, available services for a subscriber unit can be controlled.

8.1 Subscriber Unit

A subscriber unit is the transceiver and IP console operated in a NEXEDGE system.

The subscriber unit initiates various communications by using GIDs and UIDs. Registering GIDs and UIDs in a NEXEDGE system (registration) enables various communications in the NEXEDGE system. (Refer to [Registering a Subscriber Unit in a System \(Registration\)](#).)

About GID

GID is an ID that indicates a group for a call, and a Group Call becomes available by using a GID.

A Group Call (Broadcast/ Conference) can be made among the subscriber units by sharing the same GID. By using a Group Call, information can be transmitted to multiple subscriber units at the same time. An arbitrary GID can be used in Conventional mode and Trunking mode independently, but a call cannot be initiated if one subscriber unit is in Conventional mode and other subscriber units are in Trunking mode.

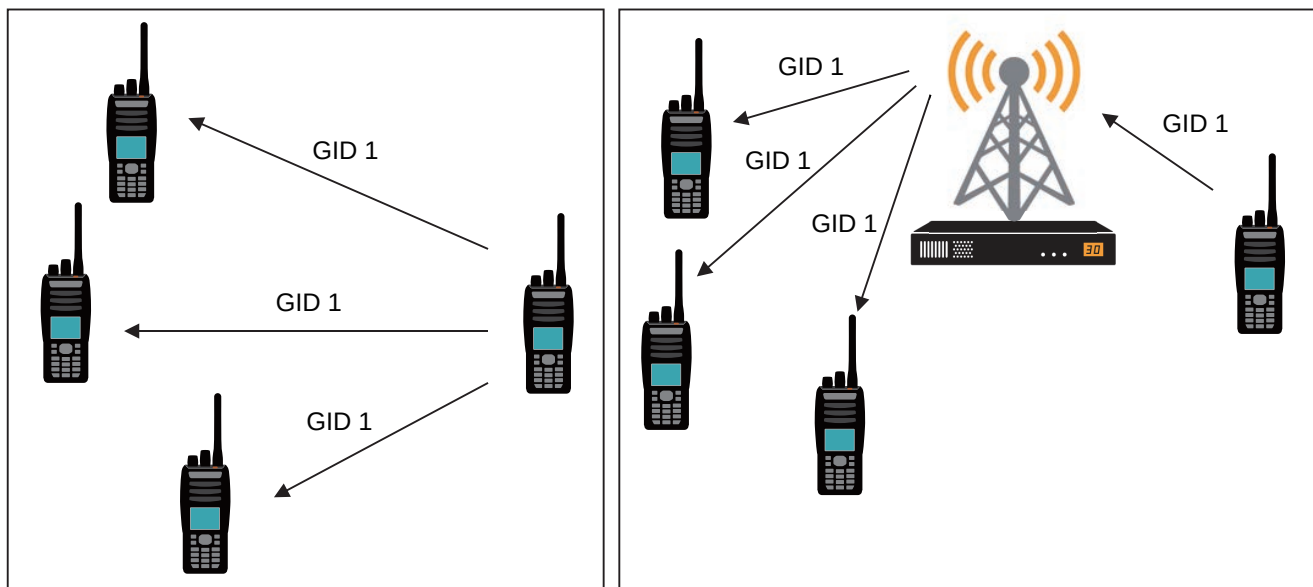


Figure 8-1 A Call by Use of a GID

About UID

UID is a unique number provided for every subscriber unit. A subscriber unit without a UID cannot be operated in a NEXEDGE system. The NEXEDGE system identifies a subscriber unit by this identification number.

A subscriber unit can call a specific subscriber unit by specifying a UID. An arbitrary UID can be used in Conventional mode and Trunking mode independently, but a call cannot be initiated if one subscriber unit is in Conventional mode and other subscriber units are in Trunking mode.

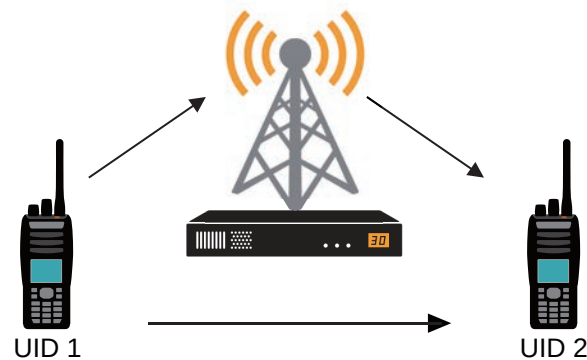


Figure 8-2 A Call by Use of a UID

8.2 COS

Class of Service (hereafter referred to as “COS”) is the function to pattern and consolidate the service function of a subscriber unit as a class usage restrictions.

For instance, creating a COS where only voice communication is enabled and a COS where both data communication and voice communication are enabled and sorting COS by UID/GID according to users' use cases restricts available services per subscriber unit.

By using this function, billing plans and various options can be configured.

There are 2 types of COS: primary COS and secondary COS.

- **Primary COS**

Primary COS is applied when a NEXEDGE system functions normally.

- **Secondary COS**

Secondary COS is applied when a site cannot connect to a system controller, such as with a disconnected IP network. In this case, the site accepts communication requests within the range permitted by secondary COS.

8.3 Registration of a Subscriber Unit

A COS which defines available functions for UIDs and GIDs to be registered in a system is configured.

The following primary COS required for basic behaviors are configured:

- **GID COS**

→ [Configuring a GID COS](#)

- **UID COS**

→ [Configuring a UID COS](#)

- **All Groups Call COS**

→ [Configuring an All Groups Call COS](#)

The following secondary COS are configured considering the case that a site cannot connected to a system controller, such as with a disconnected IP network.

- **Secondary GID COS**

→ [Configuring a Secondary GID COS](#)

- **Secondary UID COS**

→ [Configuring a Secondary UID COS](#)

8.4 Configuring a GID COS

A GID COS is a COS which defines available functions for GIDs.

Clicking the “Add” button in **Edit > Subscriber Configuration > Class of Service > GID COS List** displays **General (Add)**, and a new GID COS can be created. A maximum of 5,000 GID COSs can be configured in **GID COS List**.

The screenshot displays the NEXEDGE web interface for configuring a GID COS. The breadcrumb trail is: **Edit > Subscriber Configuration > Class of Service > GID COS List > General (Add)**. The left sidebar shows the navigation menu with 'General (Add)' selected. The main content area is divided into three sections:

- General:** Contains fields for 'COS Number' (set to 1), 'Valid' (OFF), 'COS Name' (empty), 'Comment' (empty), 'Late Entry' (OFF), 'Priority Monitor' (OFF), and 'Time-out Timer [s]' (set to 60).
- Available Calls:** Contains four toggle switches, all set to OFF: 'Voice Call', 'Status Call', 'Short Data Call', and 'Long Data Call'.
- Telephone:** Contains two toggle switches: 'Incoming Call from Telephone Line' (OFF) and 'Telephone Call Auto Response' (ON).

At the bottom of the form, there are 'Save' and 'Back' buttons. The 'Save' button is highlighted with a red rectangular box.

Figure 8-3 General (Add)

Table 8-1 Configuration of GID COS

Item		Description
General	COS Number	COS Number is an allocated number to identify a GID COS. The COS number cannot be changed after creating a GID COS.
	Valid	Valid allows a system administrator to configure whether a GID COS is enabled. If “ON” is configured, the GID COS is enabled and services are provided according to the configuration of the GID COS. If “OFF” is configured, the GIDs to which the GID COS is allocated cannot use all the services.
	COS Name	COS Name is the name of a GID COS. COS Name is configured to distinguish the configured GID COS. The name configured for each table appears in the list of GID COS List .
	Comment	Comment allows a system administrator to enter text of complementary information about a GID COS.
	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a GID COS. (Refer to Participating in an On-going Voice Call Midway Through the Call (Late Entry) .)
	Priority Monitor	Priority Monitor allows a system administrator to configure whether the Priority Monitor function is enabled for a GID COS. (Refer to Receiving a High-priority Group Call (Priority Monitor) .)
	Time-out Timer	Time-out Timer allows a system administrator to configure the maximum continuous transmission time for a subscriber unit to communicate by use of a Group Call. (Refer to Restricting the Continuous Transmission Time of a Group Call (Time-out Timer) .)
Available Calls	Voice Call	A system administrator can restrict available various calls for a subscriber unit. (Refer to Restricting Various Calls (Available Calls (GID COS)) .)
	Status Call	
	Short Data Call	
	Long Data Call	
Telephone	Incoming Call from Telephone Line	Incoming Call from Telephone Line allows a system administrator to configure whether or not to enable a subscriber unit to receive an incoming call from a telephone line. (Refer to Restricting an incoming call from a telephone line (Incoming Call from Telephone Line (GID COS)) .)
	Telephone Call Auto Response	Telephone Call Auto Response allows a system administrator to configure how to initiate a call when receiving an incoming call from a telephone line. (Refer to Responding automatically to an incoming call from a telephone line (Telephone Call Auto Response) .)

Click the “Save” button to save after configuration.

 Note

- A list of the registered GID COS appears in **GID COS List**.
- By clicking the “Details” button in **GID COS List**, the configuration contents of the corresponding GID COS can be viewed.
- By clicking the “Edit” button in **GID COS List**, the configuration of the corresponding GID COS can be changed.
- By clicking the “Delete” button in **GID COS List**, the corresponding GID COS can be deleted.

Controlling Late Entry

Late Entry is the function to repeatedly send an instruction message to a traffic channel on a control channel at certain intervals using a Group Call.

Even if a message by Group Call cannot be received because the subscriber unit is temporarily outside the communication area, the subscriber unit can participate in a Group Call midway through the call after returning to the communication area.

Refer to "[Participating in an On-going Voice Call Midway Through the Call \(Late Entry\)](#)" for details of **Late Entry**.

Controlling Priority Monitor

Priority Monitor is the function to notify the Group Call information even on a traffic channel.

If the subscriber unit detects a Group Call having higher priority than the current Group Call using the Group Call information that is notified on a traffic channel, the subscriber unit can participate in the Group Call having higher priority.

Refer to "[Receiving a High-priority Group Call \(Priority Monitor\)](#)" for details of **Priority Monitor**.

Restricting the Continuous Transmission Time of a Group Call (Time-out Timer)

Time-out Timer is the maximum continuous transmission time for a subscriber unit to communicate using a Group Call. The maximum continuous transmission time for a subscriber unit is instructed by an instruction message for communication allocation of a Voice Call.

The subscriber unit restricts the maximum continuous transmission time of a Voice Call up to the notified value in **Time-out Timer**.

Note

- If "Unlimited" is configured in **Time-out Timer**, the subscriber unit behaves according to the configuration in **Time-out Timer** configured for the subscriber unit.
- In **Time-out Timer**, do not configure a value longer than **Occupation Timer**. (Refer to [Limiting the Occupation Time of a Traffic Channel \(Occupation Timer\)](#).)
- The configuration in **Time-out Timer** is applied only to a Voice Call.

Restricting Various Calls (Available Calls (GID COS))

Available Calls is the function to restrict available various calls for a subscriber unit.

The NEXEDGE system checks for the value in **Available Calls** for a communication request from a subscriber unit and sends an error back to the subscriber unit if the requested call has been inhibited.

Table 8-2 Available Calls (GID COS)

Item	Description
Voice Call	Voice Call allows a system administrator to configure whether or not to permit communications using a Voice Call for GIDs.
Status Call	Status Call allows a system administrator to configure whether or not to permit communications using a Status Call for GIDs.
Short Data Call	Short Data Call allows a system administrator to configure whether or not to permit communications using a Short Data Call for GIDs.
Long Data Call	Long Data Call allows a system administrator to configure whether or not to permit communications using a Long Data Call for GIDs.

Controlling a Telephone Call

An incoming call from a telephone line to a subscriber unit belonging to a group can be restricted, and how to initiate a call when receiving an incoming call from a telephone line can be controlled.

Restricting an incoming call from a telephone line (Incoming Call from Telephone Line (GID COS))

Incoming Call from Telephone Line is the function to restrict an incoming call from a telephone line to a subscriber unit belonging to the group which receives the call.

This function is configured to permit a Voice Call (Broadcast/ Conference) from a telephone line.

If "ON" is configured in **Incoming Call from Telephone Line**, a Voice Call (Broadcast/ Conference) from a telephone line is permitted. If "OFF" is configured, a Voice Call (Broadcast/ Conference) from a telephone line is inhibited.

Note

- To use this function, a subscriber unit and optional KTI-4 which support this behavior are required.

Responding automatically to an incoming call from a telephone line (Telephone Call Auto Response)

Telephone Call Auto Response is the function to respond automatically when receiving an incoming call from a telephone line.

If “ON” is configured in **Telephone Call Auto Response**, an audio path to a telephone is automatically opened after a wait for a connection to a Voice Call (Broadcast/ Conference). If “OFF” is configured, a ringing tone is emitted from the NEXEDGE system after connecting to a Voice Call (Broadcast/ Conference). If transmission from any subscriber unit which received a Group Call is detected, an audio path to a telephone is opened.

Note

- To use this function, a subscriber unit and optional KTI-4 which support this behavior are required.

Controlling an Intersite Call (GID COS)

After adding GID COS, Intersite Call is configured for selecting a site that uses GIDs.

Clicking the “Edit” button of the GID COS added to **GID COS List** of SCU and clicking **Intersite Call List** on the navigation menu displays **Intersite Call List**.

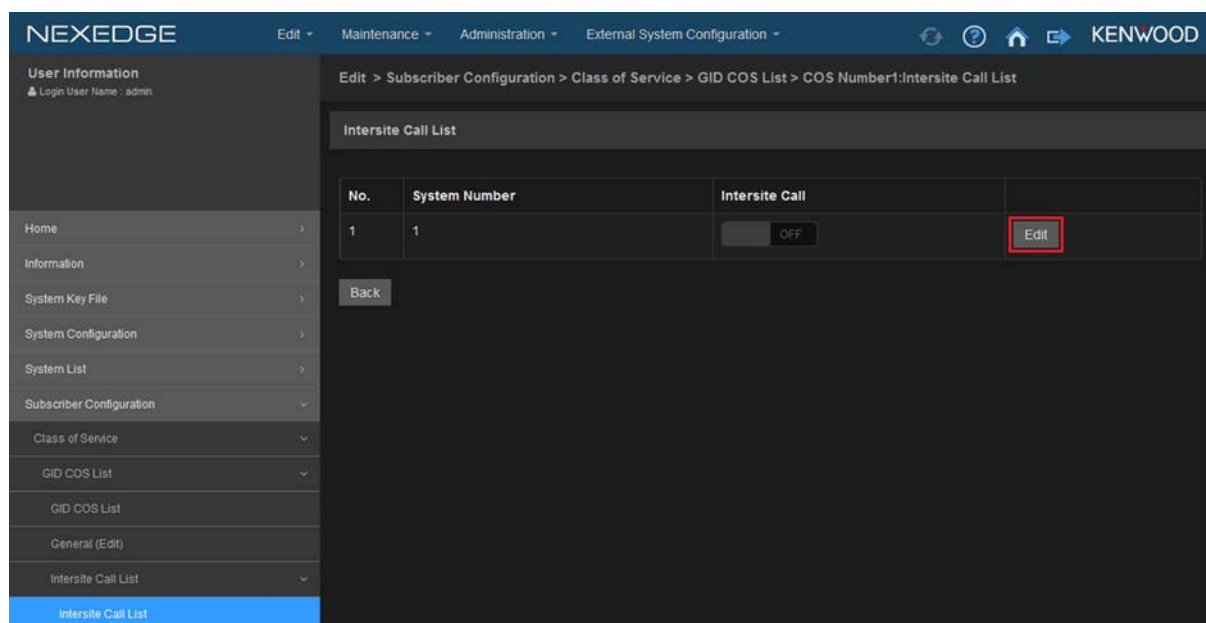


Figure 8-4 Intersite Call List

In **System Number** of **Intersite Call List**, selecting a system for which Intersite Call is configured and clicking the “Edit” button displays **General (Edit)**, and then Intersite Call can be configured.

NEXEDGE

Edit Maintenance Administration External System Configuration

KENWOOD

User Information

Login User Name : admin

Last Modified By : admin

Last Modified On : 03/15/2015 8:40:54 am

Permit

Home

Information

System Key File

System Configuration

System List

Subscriber Configuration

Class of Service

GID COS List

GID COS List

General (Edit)

Intersite Call List

Intersite Call List

General (Edit)

UID COS List

All Groups Call COS

Secondary GID COS

Edit > Subscriber Configuration > Class of Service > GID COS List > COS Number1: Intersite Call List > System Number1: General (Edit)

General

Intersite Call OFF

Voice Call

Busy System Connect Ignore

Wait Timer [s] 10

Long Data Call

Busy System Connect Wait

Wait Timer [s] 10

Available Sites

Group Refusal OFF

No.	Site	Dynamic Allocation
1	None	OFF
2	None	OFF

Figure 8-5 General (Edit)

Table 8-3 Configuration of Intersite Call (GID COS)

Item		Description
General	Valid	Valid allows a system administrator to configure whether or not to permit an Intersite Call for GID COS. If "ON" is configured, Intersite Calls are permitted. If "OFF" is configured, Intersite Calls are inhibited.
Voice Call/ Long Data Call	Busy System Connect	Busy System Connect allows a system administrator to configure connection conditions for the start of communication when initiating communication using a Group Call (Group) or Long Data Call (Group) between sites. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (GID COS)) .)
	Wait Timer	Wait Timer allows a system administrator to configure the maximum length of time to wait for a connection to an Intersite Group Call. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (GID COS)) .)
Available Sites	Group Refusal	Group Refusal is the function for the NEXEDGE system to notify a subscriber unit not to stay in the site when the NEXEDGE system determines from the configuration conditions of Available Sites that the site for which the subscriber unit executed Group Registration is a site where Group Registration is disabled. If "ON" is configured, the subscriber unit determines that the subscriber unit cannot be used in the corresponding site, and searches for another site. If "OFF" is configured, the subscriber unit cannot make a Group Call of the selected GID in the corresponding site, but the subscriber unit stays in the corresponding site because other communications such as an Individual Call are available.
	Site	Site allows a system administrator to configure an available site for Group Calls and Group Registration by selecting from the sites configured in Site List . (Refer to Configuring a site to use GIDs (Available Sites (GID COS)) .)
	Dynamic Allocation	If a site where no subscriber unit succeeded in Group Registration exists, Dynamic Allocation allows a system administrator to configure whether or not to allocate a traffic channel to the site.

Click the "Save" button to save after configuration.

Configuring connection conditions for the start of communication (Busy System Connect (GID COS))

Busy System Connect is the connection conditions for the start of communication when initiating communication using a Group Call (Group) or Long Data Call (Group) between sites.

The NEXEDGE system behaves as follows depending on the configuration in **Busy System Connect**:

Table 8-4 Busy System Connect (GID COS)

Item	Description
Ignore (Voice Call only)	Initiates an Intersite Group Call between connectable sites. A site that could not connect because no channel is available can participate in an Intersite Group Call midway through the call.
Wait	If a site where no channel is available exists, an Intersite Group Call or Inter-Site Long Data Call is initiated after having wait for a channel becomes available until the amount of time configured in Wait Timer elapses. If the connections to all the sites to be connected complete until the amount of time configured in Wait Timer elapses, an Intersite Group Call or Inter-Site Long Data Call is initiated at that time. For an Intersite Group Call, a site that could not connect while the amount of time configured in Wait Timer elapses can participate in the Intersite Group Call midway through the call when a channel becomes available. For an Inter-Site Long Data Call, a site that could not connect until the amount of time configured in Wait Timer elapses cannot participate in the Inter-Site Long Data Call.
Busy	If the connections to all the sites to be connected complete until the amount of time configured in Wait Timer elapses, an Intersite Group Call or Inter-Site Long Data Call is initiated at that time. If the connections to all the sites to be connected do not complete or if a connection to a site fails until the amount of time configured in Wait Timer elapses, the system becomes busy and cannot initiate an Intersite Group Call or Inter-Site Long Data Call.

Configuring a site to use GIDs (Available Sites (GID COS))

Available Sites allows a system administrator to configure an available site for Group Calls and Group Registration by selecting from the sites configured in Site List.

If Intersite Call is enabled, a Group Call is delivered to sites configured in **Available Sites**.

The selectable upper limit is restricted by the number of sessions that the NEXEDGE system can deliver by using an Intersite Call. Therefore, if "Unicast" is configured in **Unicast/Multicast Group Call**, sites for the maximum of 16 sessions can be selected, and if "Multicast" is configured, sites for the maximum of 48 sessions can be selected. However, sites where **Dynamic Allocation** is enabled are collectively counted as one session. (Refer to [Configuring Whether to Deliver by Using Unicast or Multicast \(Unicast/Multicast Group Call\)](#).)

Note

- If **Dynamic Allocation** is enabled, an Intersite Call can be undelivered to a site when no subscriber unit is in the Group Registration of the corresponding site, even if the site uses a GID.

8.5 Configuring a UID COS

A UID COS is a COS which defines available functions for UIDs.

Clicking the “Add” button in **Edit > Subscriber Configuration > Class of Service > UID COS List** of SCU displays **General (Add)**, and a new UID COS can be created. A maximum of 5,000 UID COSs can be configured in **UID COS List**.

The screenshot displays the NEXEDGE web interface for configuring a UID COS. The breadcrumb trail at the top reads: **Edit > Subscriber Configuration > Class of Service > UID COS List > General (Add)**.

General section:

- COS Number: 1
- Valid: OFF
- COS Name: [Text Field]
- Comment: [Text Field]
- Late Entry: OFF
- Queue Level: 8
- Time-out Timer [s]: 60
- Individual Call Response Type (Voice): Response
- Individual Call Response Type (Data): Response

Available Calls section:

- Group Call: OFF
- Individual Call: OFF
- Voice Call: OFF
- Status Call: OFF
- Short Data Call: OFF
- Long Data Call: OFF
- All Groups Call: OFF

Telephone section:

- Queue Level: 8
- Incoming Call from Telephone Line: OFF
- Outgoing Call to Telephone Line: OFF

At the bottom, there are **Save** and **Back** buttons. The **Save** button is highlighted with a red rectangle.

Figure 8-6 General (Add)

Table 8-5 Configuration of UID COS

Item		Description
General	COS Number	COS Number is an allocated number to identify a UID COS. The COS number cannot be changed after creating a UID COS.
	Valid	Valid allows a system administrator to configure whether a UID COS is enabled. If "ON" is configured, the UID COS is enabled and services are provided according to the configuration of the UID COS. If "OFF" is configured, the UIDs to which the UID COS is allocated cannot use all the services.
	COS Name	COS Name is the name of a UID COS. COS Name is configured to distinguish the configured UID COS. The name configured for each UID COS appears in the list of UID COS List.
	Comment	Comment allows a system administrator to enter text of complementary information about a UID COS.
	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a UID COS. (Refer to Participating in an On-going Voice Call Midway Through the Call (Late Entry) .)
	Queue Level	Queue Level allows a system administrator to configure the priority order of a behavior in a NEXEDGE system if the available traffic channels in a site are in use when a new call request is received. (Refer to About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use (Queue) .)
	Time-out Timer	Time-out Timer allows a system administrator to configure the maximum continuous transmission time for a subscriber unit to communicate by use of an Individual Call. (Refer to Restricting the Continuous Transmission Time of an Individual Call (Time-out Timer) .)
	Individual Call Response Type (Voice)	Individual Call Response Type (Voice) allows a system administrator to configure the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Voice Call (Individual). (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using a Voice Call (Individual Call Response Type (Voice)) .)
	Individual Call Response Type (Data)	Individual Call Response Type (Data) allows a system administrator to configure the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Long Data Call (Individual). (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using Data Communications (Individual Call Response Type (Voice)) .)

Item		Description
Available Calls	Group Call	A system administrator can restrict available various calls for a subscriber unit. (Refer to Restricting Various Calls (Available Calls (UID COS)) .)
	Individual Call	
	Voice Call	
	Status Call	
	Short Data Call	
	Long Data Call	
	All Groups Call	
Telephone	Queue Level	Queue Level allows a system administrator to configure the Queue Level to be applied when a subscriber unit makes a Telephone Call. (Refer to Configuring the priority order for Telephone Calls (Queue Level) .)
	Incoming Call from Telephone Line	Incoming Call from Telephone Line allows a system administrator to configure whether or not to enable a subscriber unit to receive an incoming call from a telephone line. (Refer to Restricting an incoming call from a telephone line (Incoming Call from Telephone Line (UID COS)) .)
	Outgoing Call to Telephone Line	Outgoing Call to Telephone Line allows a system administrator to configure whether or not to enable a subscriber unit to send an outgoing call to a telephone line. (Refer to Restricting an outgoing call to a telephone line (Outgoing Call to Telephone Line) .)

Click the “Save” button to save after configuration.

Note

- A list of the registered UID COS appears in **UID COS List**.
- By clicking the “Details” button in **UID COS List**, the configuration contents of the corresponding UID COS can be viewed.
- By clicking the “Edit” button in **UID COS List**, the configuration of the corresponding UID COS can be changed.
- By clicking the “Delete” button in **UID COS List**, the corresponding UID COS can be deleted.

Controlling Late Entry

Late Entry is the function to repeatedly send an instruction message to a traffic channel on a control channel at certain intervals using an Individual Call.

Even if a message by Individual Call cannot be received because the subscriber unit is temporarily outside the communication area, the subscriber unit can participate in an Individual Call midway through the call after returning to the communication area.

Refer to “[Participating in an On-going Voice Call Midway Through the Call \(Late Entry\)](#)” for details of **Late Entry**.

Controlling Queue Level

Queue Level is the function to configure the priority order of a behavior in a NEXEDGE system if the available traffic channels in a site are in use when a new call request is received.

Refer to “[About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use \(Queue\)](#)” for details of **Queue Level**.

Restricting the Continuous Transmission Time of an Individual Call (Time-out Timer)

Time-out Timer is the maximum continuous transmission time for a subscriber unit to communicate using a Individual Call.

The maximum continuous transmission time for a subscriber unit is instructed by an instruction message for communication allocation of a Voice Call.

The subscriber unit restricts the maximum continuous transmission time of a Voice Call up to the notified value in **Time-out Timer**.

Note

- If “Unlimited” is configured in **Time-out Timer**, the subscriber unit behaves according to the configuration in **Time-out Timer** configured for the subscriber unit.
- In **Time-out Timer**, do not configure a value longer than **Occupation Timer**. (Refer to [Limiting the Occupation Time of a Traffic Channel \(Occupation Timer\)](#).)
- The configuration in **Time-out Timer** is applied only to a Voice Call.

Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using a Voice Call (Individual Call Response Type (Voice))

Individual Call Response Type (Voice) is the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Voice Call (Individual).

The calling behavior using a Voice Call (Individual) can be configured according to the operation method of the NEXEDGE system.

Table 8-6 Configuration of Individual Call Response Type (Voice)

Item	Description
Normal	The NEXEDGE system allocates a traffic channel without waiting for a response from the receiving subscriber unit. Since the NEXEDGE system does not wait for a response from the receiving subscriber unit, the link speed is the same as a Group Call, but whether communications are actually established cannot be confirmed until a response is sent from the receiving subscriber unit.
Response	The NEXEDGE system allocates a traffic channel after a wait for a response from the receiving subscriber unit. If no response is received for a certain time, an error message is sent back to the transmitting subscriber unit. Since the NEXEDGE system waits for a response from the receiving subscriber unit, the link speed is slower than a Group Call.

Note

- This function functions only if “Transmission Trunked” is configured in **Trunking Type**. If “Message Trunked” is configured in **Trunking Type**, the calling method of Message Trunked is used. (Refer to [Determining the System Behavior of When Starting or Ending a Voice Call \(Trunking Type\)](#).)

Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using Data Communications (Individual Call Response Type (Voice))

Individual Call Response Type (Data) is the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Long Data Call (Individual).

The calling behavior using a Long Data Call (Individual) can be configured according to the operation method of the NEXEDGE system.

Table 8-7 Configuration of Individual Call Response Type (Data)

Item	Description
Normal	The NEXEDGE system allocates a traffic channel without waiting for a response from the receiving subscriber unit. However, whether communications are actually established cannot be confirmed until a response is sent from the receiving subscriber unit. Configure "Normal" to use a Long Data Call (Individual) mainly for notifying a data message.
Response	The NEXEDGE system allocates a traffic channel after a wait for a response from the receiving subscriber unit. If no response is received for a certain time, an error message is sent back to the transmitting subscriber unit. Configure "Response" mainly to make data communications with the receiving subscriber unit.

 Note

- This function functions regardless of the configuration in **Trunking Type**. (Refer to [Determining the System Behavior of When Starting or Ending a Voice Call \(Trunking Type\)](#).)

Restricting Various Calls (Available Calls (UID COS))

Available Calls is the function to restrict available various calls for a subscriber unit.

The NEXEDGE system checks for the value in **Available Calls** for a communication request from a subscriber unit and sends an error back to the subscriber unit if the requested call has been inhibited.

Table 8-8 Available Calls (UID COS)

Item	Description
Group Call	Group Call allows a system administrator to configure whether or not to permit communications using a Group Call for UIDs.
Individual Call	Individual Call allows a system administrator to configure whether or not to permit communications using an Individual Call for UIDs.
Voice Call	Voice Call allows a system administrator to configure whether or not to permit communications using a Voice Call for UIDs.
Status Call	Status Call allows a system administrator to configure whether or not to permit communications using a Status Call for UIDs.
Short Data Call	Short Data Call allows a system administrator to configure whether or not to permit communications using a Short Data Call for UIDs.
Long Data Call	Long Data Call allows a system administrator to configure whether or not to permit communications using a Long Data Call for UIDs.
All Groups Call	All Groups Call allows a system administrator to configure whether or not to permit communications using an All Groups Call for UIDs. To permit a use of All Groups Call , an All Groups Call COS needs to be configured. (Refer to Configuring an All Groups Call COS .)

Controlling a Telephone Call

The priority order for Telephone Calls can be configured, and an incoming call from a telephone line to a subscriber unit and an outgoing call from a subscriber unit to a telephone line can be restricted.

Configuring the priority order for Telephone Calls (Queue Level)

Queue Level is the priority order to be applied when a subscriber unit initiates a Telephone Call.

When multiple Voice Calls or Long Data Calls occur and the Queue waiting for allocation of a traffic channel functions, the priority order in the Queue can be configured.



- An Emergency Call functions at level 1 for the highest priority of **Queue Level**.
- **Queue Level** for Telephone Calls can be configured in addition to normal calls.

Restricting an incoming call from a telephone line (Incoming Call from Telephone Line (UID COS))

Incoming Call from Telephone Line is the function to restrict an incoming call from a telephone line to a subscriber unit.

This function is configured to permit a Voice Call (Interconnect) from a telephone line.

If "ON" is configured in **Incoming Call from Telephone Line**, a Voice Call (Interconnect) from a telephone line is permitted. If "OFF" is configured, a Voice Call (Interconnect) from a telephone line is inhibited.



- To use this function, a subscriber unit and optional KTI-4 which support this behavior are required.

Restricting an outgoing call to a telephone line (Outgoing Call to Telephone Line)

Outgoing Call to Telephone Line is the function to restrict an outgoing call from a subscriber unit to a telephone line.

This function is configured to permit a Voice Call (Interconnect) from a subscriber unit to a telephone line.

If "ON" is configured in **Outgoing Call to Telephone Line**, a Voice Call (Interconnect) from a subscriber unit to a telephone line is permitted. If "OFF" is configured, a Voice Call (Interconnect) from a subscriber unit to a telephone line is inhibited.



- To use this function, a subscriber unit and optional KTI-4 which support this behavior are required.

8.6

Configuring an All Groups Call COS

If a use of **All Groups Call** is permitted in the configuration in **Available Calls** of UID COS, an All Groups Call COS needs to be configured.

All Groups Call COS is a special COS when All Groups ID (0xFFFF) is specified. The All Groups Call COS is the same as a GID COS except the All Groups Call COS is connected with a specific ID and a part of the configuration is restricted.

Clicking **All Groups Call COS > General** on the navigation menu of SCU displays **General**, and All Groups Call COS can be configured.

The screenshot displays the NEXEDGE web interface for configuring the All Groups Call COS. The breadcrumb trail at the top indicates the path: **Edit > Subscriber Configuration > Class of Service > All Groups Call COS**. The left sidebar shows the navigation menu with **General** selected under the **All Groups Call COS** category. The main content area is divided into three sections: **General**, **Available Calls**, and **Telephone**. In the **General** section, **Late Entry** and **Priority Monitor** are both set to **ON**, and the **Time-out Timer [s]** is set to **60**. In the **Available Calls** section, **Voice Call**, **Status Call**, **Short Data Call**, and **Long Data Call** are all set to **ON**. In the **Telephone** section, **Incoming Call from Telephone Line** is set to **OFF**. At the bottom left, the **Save** button is highlighted with a red box, and a **Cancel** button is also visible.

Figure 8-7 General

Table 8-9 Configuration of All Groups Call COS

Item		Description
General	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for an All Groups Call COS. (Refer to Participating in an On-going Voice Call Midway Through the Call (Late Entry) .)
	Priority Monitor	Priority Monitor allows a system administrator to configure whether the Priority Monitor function is enabled for an All Groups Call COS. (Refer to Receiving a High-priority Group Call (Priority Monitor) .)
	Time-out Timer	Time-out Timer allows a system administrator to configure the maximum continuous transmission time for a subscriber unit to communicate by use of an All Groups Call. (Refer to Restricting the Continuous Transmission Time of an All Groups Call (Time-out Timer) .)
Available Calls	Voice Call	A system administrator can restrict available various calls for a subscriber unit. (Refer to Restricting Various Calls (Available Calls (GID COS)) .)
	Status Call	
	Short Data Call	
	Long Data Call	
Telephone	Incoming Call from Telephone Line	Incoming Call from Telephone Line allows a system administrator to configure whether or not to enable a subscriber unit to receive an incoming call from a telephone line. (Refer to Restricting an incoming call from a telephone line (Incoming Call from Telephone Line (All Groups Call COS)) .)

Click the “Save” button to save after configuration.

Controlling Late Entry

Late Entry is the function to repeatedly send an instruction message to a traffic channel on a control channel at certain intervals using an All Groups Call.

Even if a message by All Groups Call cannot be received because the subscriber unit is temporarily outside the communication area, the subscriber unit can participate in an All Groups Call midway through the call after returning to the communication area.

Refer to “[Participating in an On-going Voice Call Midway Through the Call \(Late Entry\)](#)” for details of **Late Entry**.

Controlling Priority Monitor

Priority Monitor is the function to notify the All Groups Call information even on a traffic channel.

If a subscriber unit finds an All Groups Call having higher priority than that for the current All Groups Call by use of the All Groups Call information that is provided on a traffic channel, the subscriber unit can participate in the All Groups Call having higher priority.

Refer to “[Receiving a High-priority Group Call \(Priority Monitor\)](#)” for details of **Priority Monitor**.

Restricting the Continuous Transmission Time of an All Groups Call (Time-out Timer)

Time-out Timer is the maximum continuous transmission time for a subscriber unit to communicate using an All Groups Call.

The maximum continuous transmission time for a subscriber unit is instructed by an instruction message for communication allocation of a Voice Call.

The subscriber unit restricts the maximum continuous transmission time of a Voice Call up to the notified value in **Time-out Timer**.

Note

- If "Unlimited" is configured in **Time-out Timer**, the subscriber unit behaves according to the configuration in **Time-out Timer** configured for the subscriber unit.
- In **Time-out Timer**, do not configure a value longer than **Occupation Timer**. (Refer to [Limiting the Occupation Time of a Traffic Channel \(Occupation Timer\)](#).)
- The configuration in **Time-out Timer** is applied only to a Voice Call.

Restricting Various Calls (Available Calls (All Groups Call COS))

Available Calls is the function to restrict available various calls for a subscriber unit.

The NEXEDGE system checks for the value in **Available Calls** for a communication request from a subscriber unit and sends an error back to the subscriber unit if the requested call has been inhibited.

Table 8-10 Available Calls (All Groups Call COS)

Item	Description
Voice Call	Voice Call allows a system administrator to configure whether or not to permit communications using a Voice Call for All Groups IDs.
Status Call	Status Call allows a system administrator to configure whether or not to permit communications using a Status Call for All Groups IDs.
Short Data Call	Short Data Call allows a system administrator to configure whether or not to permit communications using a Short Data Call for All Groups IDs.
Long Data Call	Long Data Call allows a system administrator to configure whether or not to permit communications using a Long Data Call for All Groups IDs.

Restricting an incoming call from a telephone line
(Incoming Call from Telephone Line (All Groups Call COS))

Incoming Call from Telephone Line is the function to restrict an incoming call from a telephone line to a subscriber unit.

This function is configured to permit a Voice Call (Interconnect) from a telephone line.

If “ON” is configured in **Incoming Call from Telephone Line**, a Voice Call (Interconnect) from a telephone line is permitted. If “OFF” is configured, a Voice Call (Interconnect) from a telephone line is inhibited.

Note

- To use this function, a subscriber unit and optional KTI-4 which support this behavior are required.

Controlling an Intersite Call (All Groups Call COS)

After configuring All Groups Call COS, Intersite Call is configured for selecting a site that uses All Groups IDs. Clicking **Intersite Call List** on the navigation menu of SCU displays **Intersite Call List**.

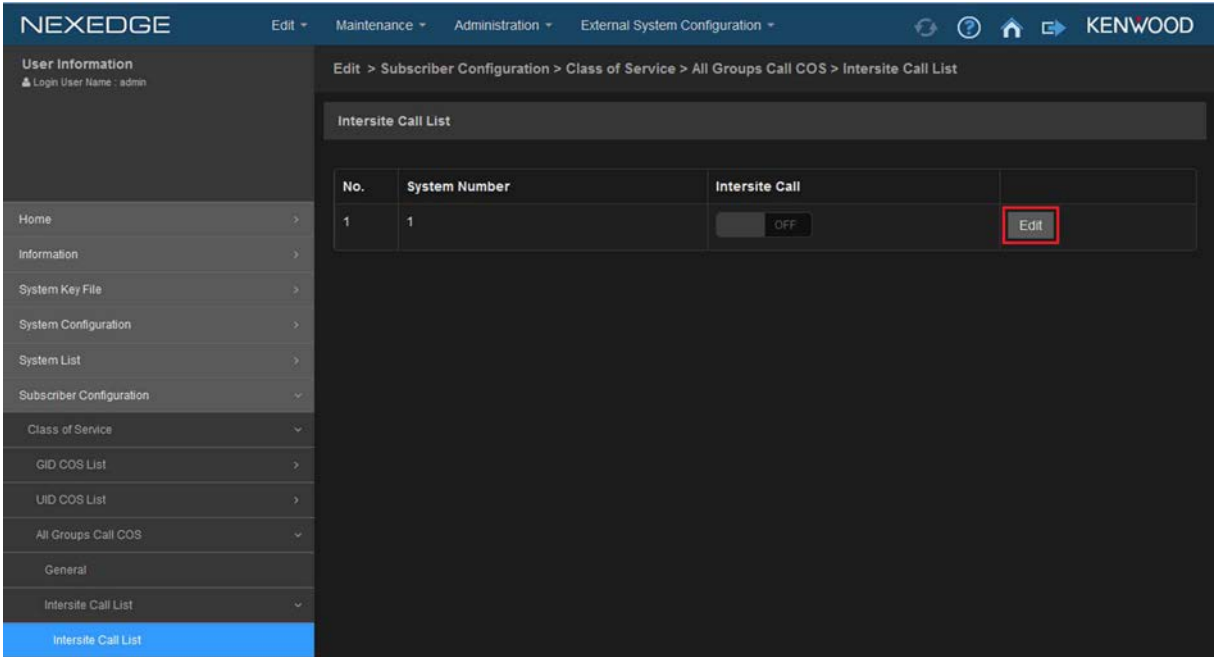


Figure 8-8 Intersite Call List

In **System Number** of **Intersite Call List**, selecting a system for which Intersite Call is configured and clicking the “Edit” button displays **General (Edit)**, and then Intersite Call can be configured.

Edit > Subscriber Configuration > Class of Service > All Groups Call COS > Intersite Call List > System Number1:General (Edit)

General

Intersite Call ☐ OFF

Voice Call

Busy System Connect

Wait Timer [s]

Long Data Call

Busy System Connect

Wait Timer [s]

Available Sites

No.	Site
1	None
2	None

Figure 8-9 General (Edit)

Table 8-11 Configuration of Intersite Call (All Groups Call COS)

Item		Description
General	Valid	Valid allows a system administrator to configure whether or not to permit an Intersite Call for All Groups Call COS. If “ON” is configured, Intersite Calls are permitted. If “OFF” is configured, Intersite Calls are inhibited.
Voice Call/ Long Data Call	Busy System Connect	Busy System Connect allows a system administrator to configure connection conditions for the start of communication when initiating communication using a Group Call (All Groups) or Long Data Call (All Groups) between sites. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (All Groups Call COS)) .)
	Wait Timer	Wait Timer allows a system administrator to configure the maximum length of time to wait for a connection to an Inter-Site All Groups Call. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (All Groups Call COS)) .)
Available Sites	Site	Site allows a system administrator to configure an available site for All Groups Calls by selecting from the sites configured in Site List . (Refer to Configuring a site to use All Groups IDs (Available Sites (All Groups Call COS)) .)

Click the “Save” button to save after configuration.

Configuring connection conditions for the start of communication (Busy System Connect (All Groups Call COS))

Busy System Connect is the connection conditions for the start of communication when initiating communication using a Group Call (All Groups) or Long Data Call (All Groups) between sites.

The NEXEDGE system behaves as follows depending on the configuration in **Busy System Connect**:

Table 8-12 Busy System Connect (All Groups Call COS)

Item	Description
Ignore (Voice Call only)	Initiates an Inter-Site All Groups Call between connectable sites. A site that could not connect because no channel is available can participate in an Inter-Site All Groups Call midway through the call if a channel becomes available.
Wait	If a site where no channel is available exists, an Inter-Site All Group Call or Inter-Site Long Data Call is initiated after having wait for a channel to become available until the amount of time configured in Wait Timer elapses. If the connections to all the sites to be connected complete until the amount of time configured in Wait Timer elapses, an Inter-Site All Groups Call or Inter-Site Long Data Call is initiated at that time. For an Inter-Site All Groups Call, a site that could not connect until the amount of time configured in Wait Timer elapses can participate in the Inter-Site All Groups Call midway through the call if a channel becomes available. For an Inter-Site Long Data Call, a site that could not connect until the amount of time configured in Wait Timer elapses cannot participate in the Inter-Site Long Data Call.
Busy	If the connections to all the sites to be connected complete until the amount of time configured in Wait Timer elapses, an Inter-Site All Groups Call or Inter-Site Long Data Call is initiated at that time. If the connections to all the sites to be connected do not complete or if a connection to a site fails until the amount of time configured in Wait Timer elapses, the system becomes busy and cannot initiate an Inter-Site All Groups Call or Inter-Site Long Data Call.

Configuring a site to use All Groups IDs (Available Sites (All Groups Call COS))

Available Sites allows a system administrator to configure an available site for All Groups Calls by selecting from the sites configured in **Site List**.

If Intersite Call is enabled, an All Groups Call is delivered to sites configured in **Available Sites**.

If "Unicast" is configured in **Unicast/Multicast Group Call**, sites for the maximum of 16 sessions can be selected. If "Multicast" is configured in **Unicast/Multicast Group Call**, all the sites are available sites. (Refer to [Configuring Whether to Deliver by Using Unicast or Multicast \(Unicast/Multicast Group Call\)](#).)

8.7 Configuring a Secondary GID COS

Secondary GID COS is a COS which defines available functions for GIDs when a site is in a state where the site cannot connect to a system controller.

Secondary GID COS can be configured in **Edit > Subscriber Configuration > Class of Service > Secondary GID COS** of SCU.

Figure 8-10 Secondary GID COS

Table 8-13 Configuration of Secondary GID COS

Item		Description
General	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a Secondary GID COS. (Refer to Participating in an On-going Voice Call Midway Through the Call (Late Entry) .)
	Priority Monitor	Priority Monitor allows a system administrator to configure whether the Priority Monitor function is enabled for a Secondary GID COS. (Refer to Receiving a High-priority Group Call (Priority Monitor) .)
	Time-out Timer	Time-out Timer allows a system administrator to configure the maximum continuous transmission time for a subscriber unit to communicate by use of a Group Call. (Refer to Restricting the Continuous Transmission Time of a Group Call (Time-out Timer) .)
Available Calls	Voice Call	A system administrator can restrict available various calls for a subscriber unit. (Refer to Restricting Various Calls (Available Calls (GID COS)) .)
	Status Call	
	Short Data Call	
	Long Data Call	

Click the “Save” button to save after configuration.

8.8 Configuring a Secondary UID COS

Secondary UID COS is a COS which defines available functions for UIDs when a site is in a state where the site cannot connect to a system controller.

Secondary UID COS can be configured in **Edit > Subscriber Configuration > Class of Service > Secondary UID COS** of SCU.

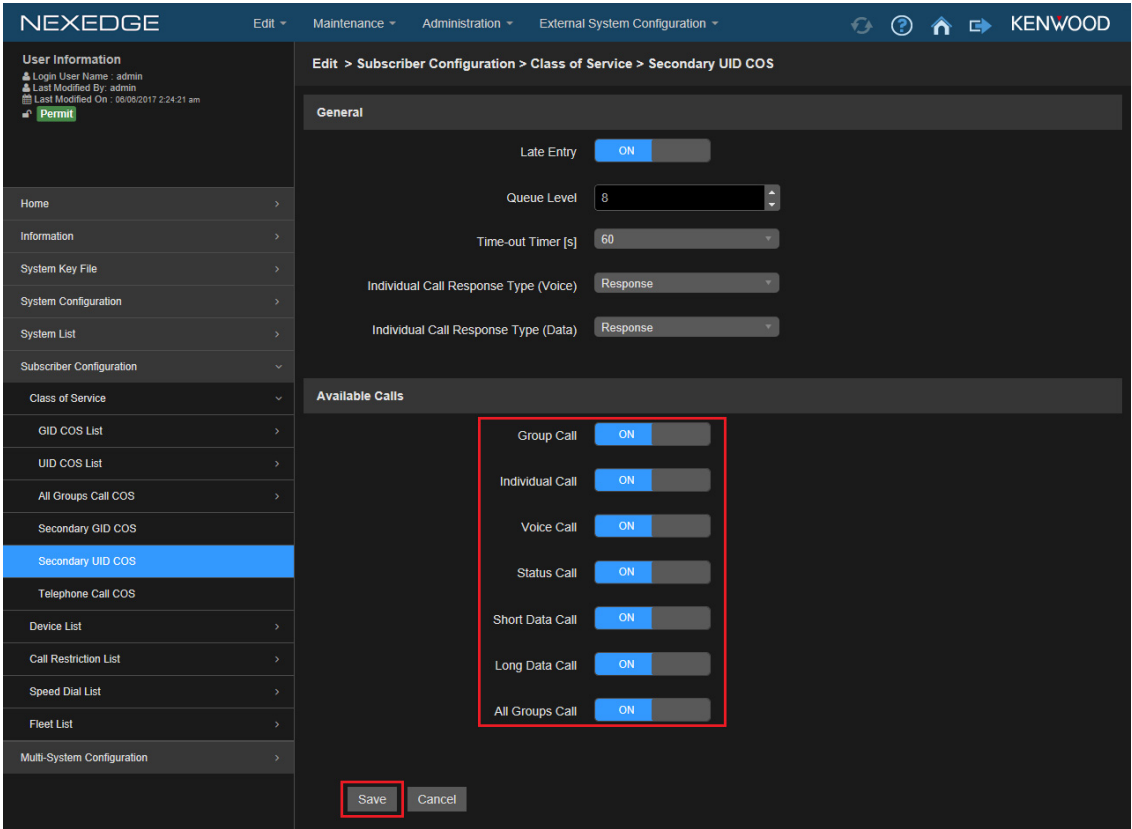


Figure 8-11 Secondary UID COS

Table 8-14 Configuration of Secondary UID COS

Item		Description
General	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a Secondary UID COS. (Refer to Participating in an On-going Voice Call Midway Through the Call (Late Entry) .)
	Queue Level	Queue Level allows a system administrator to configure the priority order of a behavior in a NEXEDGE system if the available traffic channels in a site are in use when a new call request is received. (Refer to About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use (Queue) .)
	Time-out Timer	Time-out Timer allows a system administrator to configure the maximum continuous transmission time for a subscriber unit to communicate by use of an Individual Call. (Refer to Restricting the Continuous Transmission Time of an Individual Call (Time-out Timer) .)
	Individual Call Response Type (Voice)	Individual Call Response Type (Voice) allows a system administrator to configure the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Voice Call (Individual). (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using a Voice Call (Individual Call Response Type (Voice)) .)
	Individual Call Response Type (Data)	Individual Call Response Type (Data) allows a system administrator to configure the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Long Data Call (Individual). (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using Data Communications (Individual Call Response Type (Voice)) .)
Available Calls	Group Call	A system administrator can restrict various calls available for a subscriber unit. (Refer to Restricting Various Calls (Available Calls (UID COS)) .)
	Individual Call	
	Voice Call	
	Status Call	
	Short Data Call	
	Long Data Call	
	All Groups Call	

Click the “Save” button to save after configuration.

8.9 Configuring a Telephone Call COS

Telephone Call COS is a special COS for a Telephone Call. The Telephone Call COS is the same as a UID COS except the Telephone Call COS is connected with a specific ID and a part of the configuration is restricted.

Telephone Call COS can be configured in **Edit > Subscriber Configuration > Class of Service > Telephone Call COS** of SCU.

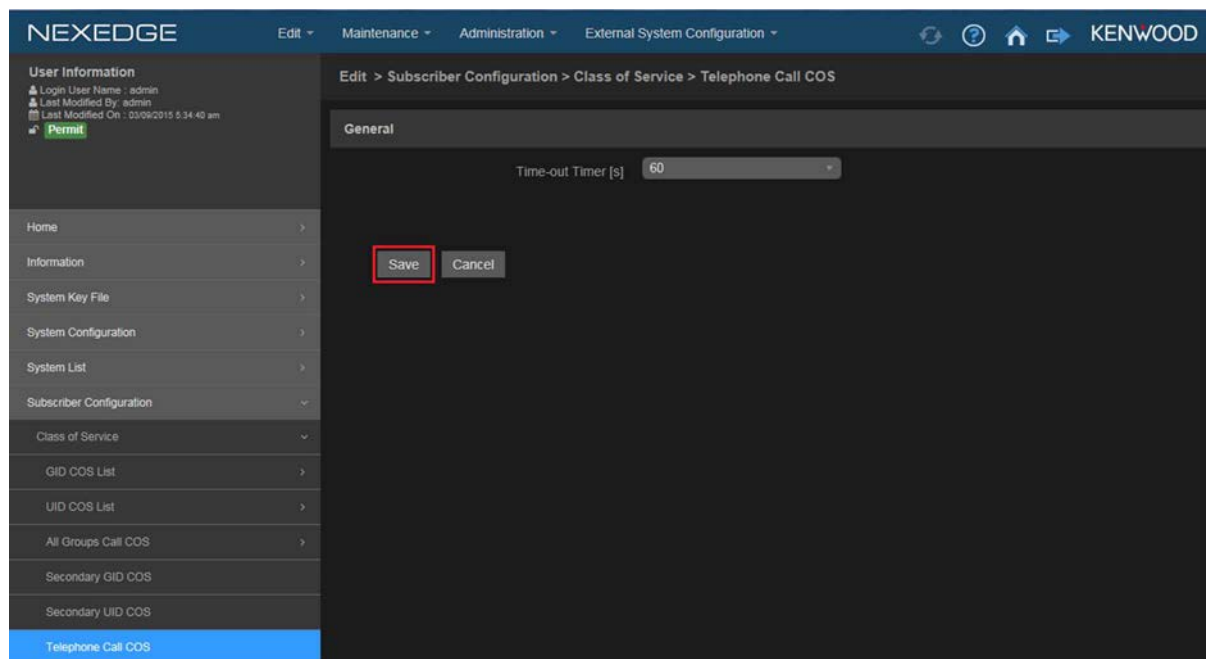


Figure 8-12 Telephone Call COS

In **Telephone Call COS**, the Time-out Timer for Telephone Call COS can be configured.

Click the “Save” button to save after configuration.

Restricting the Continuous Transmission Time of a Telephone Call (Time-out Timer)

Time-out Timer is the maximum continuous transmission time for a subscriber unit to communicate using a Telephone Call.

The maximum continuous transmission time for a subscriber unit is instructed by an instruction message for communication allocation of a Voice Call.

The subscriber unit restricts the maximum continuous transmission time of a Voice Call up to the notified value in **Time-out Timer**.

Note

- If “Unlimited” is configured in **Time-out Timer**, the subscriber unit behaves according to the configuration in **Time-out Timer** configured for the subscriber unit.
- In **Time-out Timer**, do not configure a value longer than **Occupation Timer**. (Refer to [Limiting the Occupation Time of a Traffic Channel \(Occupation Timer\)](#).)
- The configuration in **Time-out Timer** is applied only to a Voice Call.

8.10 Restricting GIDs/UIDs That Can be Registered in a Subscriber Unit by Using the FPU

When a System Key File is created in **Edit > System Key File** of SCU, the range of GIDs or UIDs that can be configured by the FPU can be configured in **GID Range (MAX/MIN)** and **UID Range (MAX/MIN)**. (Refer to [Creating the System Key File](#).)

The screenshot shows the NEXEDGE web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar shows a menu with 'System Key File' selected. The main content area is titled 'Edit > System Key File'. It contains a 'System Key File Information' section with fields for 'License ID' (XXXXXXXXXXXXXXXX) and 'System Name' (System_XXXXXXXX). Below this is an 'ID Range' section with four dropdown menus: 'GID Range (MIN)', 'GID Range (MAX)', 'UID Range (MIN)', and 'UID Range (MAX)', all set to 'None'. At the bottom, there are 'Create' and 'Cancel' buttons. The 'Create' button is highlighted with a red box.

Figure 8-13 System Key File

By configuring the range of GIDs or UIDs that can be configured, a System Key File with the restriction on GIDs or UIDs that can be configured by the FPU can be created.

This function is configured to avoid registering wrong GIDs or UIDs in a subscriber unit and to restrict the configuration range of GIDs or UIDs by using the FPU.

GID Range/UID Range is recorded in a System Key File and recorded in a system log when creating a System Key File.

UIDs and GIDs to be used in a NEXEDGE system are registered in Fleet that is an assembly of UIDs and GIDs. UID and GID are managed as Fleet units.

9.1 Fleet

Fleet indicates an assembly of subscriber units and groups. A Fleet is a unit used for effectively managing multiple subscriber units. For each Fleet, the NEXEDGE system provides optional services that can be used by all subscriber units belonging to each Fleet.

If subscriber units need not communicate with one another though the subscriber units are using the same communication system, various services can be provided for each Fleet by registering call groups as Fleet units. For example, an SMR business (a rental business of subscriber units) lends subscriber units to a security company and transport company. The security company and transport company do not communicate with each other, but use the same communication system. In this case, by allocating a GID/ UID to the security company as Fleet 1 and to the transport company as Fleet 2, the subscriber units can be operated as Fleet units.

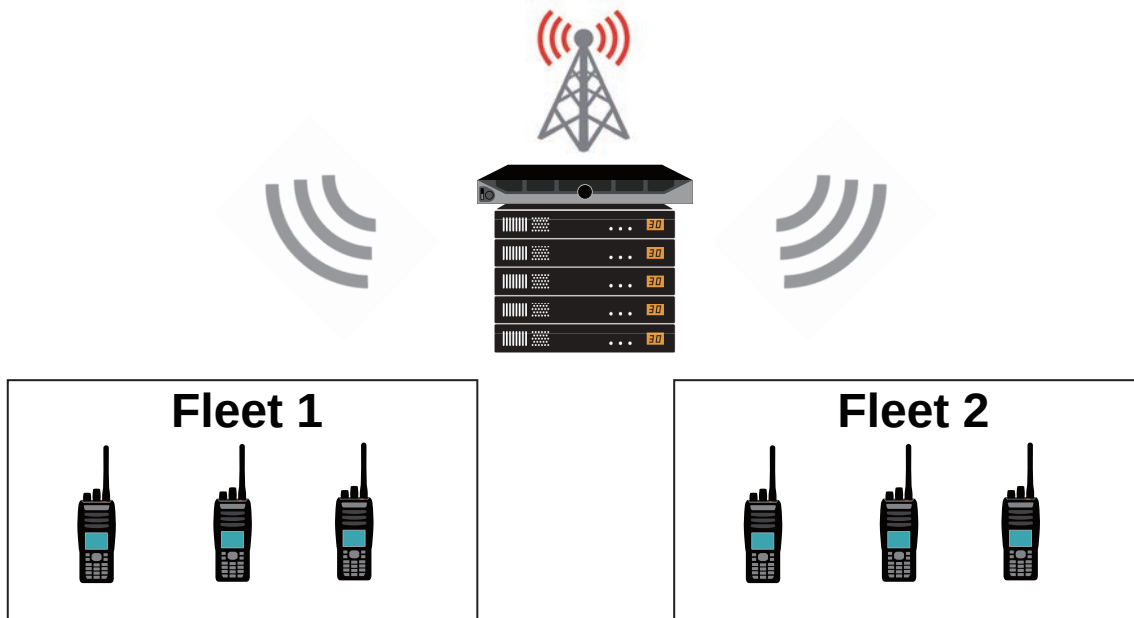


Figure 9-1 Conceptual Diagram of Fleet

The diagram below indicates the configuration of the subscriber units within Fleet 1 (the security company):

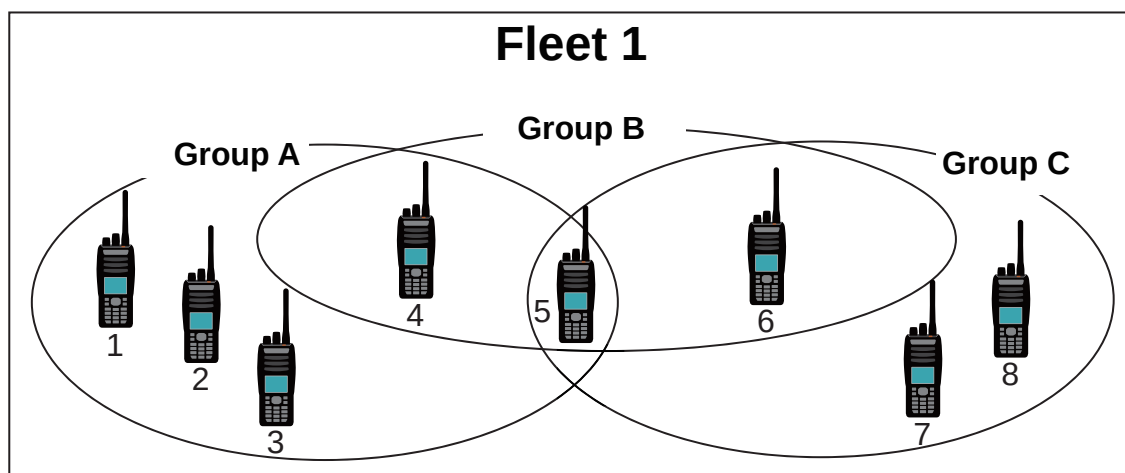


Figure 9-2 Configuration Diagram of Fleet 1

For example, the security company guards an event site which has an entrance, an exit, and 2 gates. The subscriber units from 1 to 8 belong to Fleet 1. Employees of the security company have the subscriber units from 1 to 8. Group A, Group B, and Group C belong to Fleet 1. The subscriber unit 1, 2, 3, 4, and 5 belong to Group A, the subscriber unit 4, 5, and 6 belong to Group B, and the subscriber unit 5, 6, 7, and 8 belong to Group C. The employees with the subscriber unit 1, 2, 3, and 4 guard the entrance gate. The employee with the subscriber unit 4 is the leader of the team. The employees with the subscriber unit 6, 7, and 8 guard the exit gate. The employee with the subscriber unit 6 is the leader of the team. The employee with the subscriber unit 4 issues an order to the team members by using Group A. The employee with the subscriber unit 6 issues an order to the team members by using Group C.

The employee with the subscriber unit 5 is the security chief at the event site. The employee with the subscriber unit 5 issues instructions to each team leader by using Group B, and grasps the situation by hearing all wireless calls by using Group A and Group C.

In this way, a system administrator can configure and manage subscriber units and call groups as an organization in Fleet units.

9.2 Registering a Fleet (Fleet List)

Clicking the “Add” button in **Edit > Subscriber Configuration > Fleet List** of SCU displays **General (Add)**, and a Fleet can be added. A maximum of 5,000 Fleets can be configured in **Fleet List**.

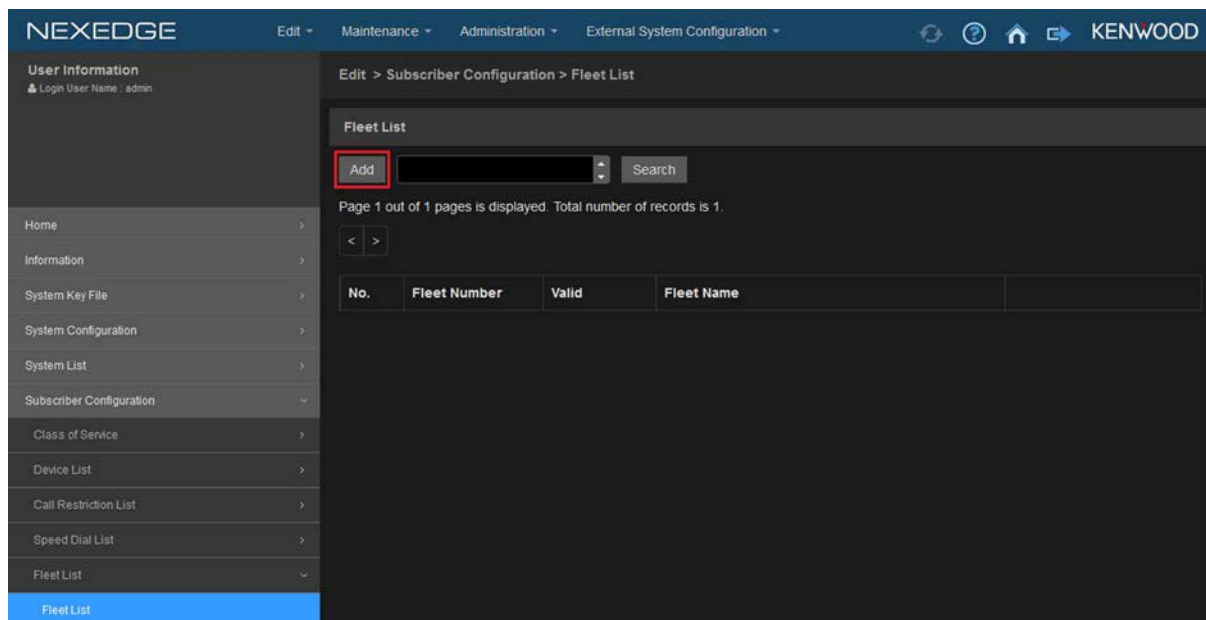


Figure 9-3 Fleet List

Note

- A list of the registered Fleets appears in **Fleet List**.
- By clicking the “Details” button in **Fleet List**, the configuration contents of the corresponding Fleet can be viewed.
- By clicking the “Edit” button in **Fleet List**, the configuration of the corresponding Fleet can be changed.
- By clicking the “Delete” button in **Fleet List**, the corresponding Fleet can be deleted.

Configuring Fleet Information

In **Edit > Subscriber Configuration > Fleet List > General (Add or Edit)** of SCU, parameters for various functions used by a Fleet such as COS to be used by UIDs/ GIDs registered in the Fleet, the range of UIDs/ GIDs that can be registered in the Fleet, the configurations of **Trunking Type** and **NXDN ESN Validation** for each Fleet, and transmission restriction from a subscriber unit to a telephone line, can be configured.

The screenshot displays the 'General (Add or Edit)' configuration page for a Fleet. The page is titled 'Edit > Subscriber Configuration > Fleet List > Fleet Number1:General (Edit)'. The 'General' tab is selected. The following settings are visible:

- Fleet Number: 1
- Valid: ON
- Fleet Name: Fleet-1
- Home System: 1
- Common Class of Service (GID): 1
- GID Range (MIN): None
- GID Range (MAX): None
- Common Class of Service (UID): 1
- UID Range (MIN): None
- UID Range (MAX): None
- Trunking Type: Default
- Group Registration Reset Timer [h]: Default
- NXDN ESN Validation: Default
- Unauthorized ESN Detection: Default
- NXDN ESN Validation Reset Time: Default
- Call Restriction Table Number: None
- Speed Dial Table Number: None
- Customer Name:
- Customer Address:
- Customer Phone:
- Channel Allocation: None
- GPS Report Format: None
- GPS Report Interval [s]: 384
- Priority Subscriber Class: General

The 'Save' button is highlighted with a red box.

Figure 9-4 General (Add or Edit)

Click the “Save” button to save after configuration.

Configuring a Fleet Number (Fleet Number)

Fleet Number is an allocated number to identify a **Fleet**.



- The Fleet number cannot be changed after creating a Fleet.

Configuring whether to use a Fleet in a system (Valid)

Valid allows a system administrator to configure whether the configured Fleet is used in a NEXEDGE system.

To use a Fleet in the NEXEDGE system, configure "ON" in **Valid**. The NEXEDGE system allows a use of an ID for which **Valid** is enabled.

Not to use a Fleet in the NEXEDGE system, configure "OFF" in **Valid**.

Configuring a Fleet Name (Fleet Name)

Fleet Name is the name of a Fleet. Fleet Name is configured to distinguish the configured Fleets. The name configured for each Fleet appears in the list of **Fleet List**.

Configuring COS to be used by GIDs registered in a Fleet (Common Class of Service (GID))

Common Class of Service (GID) is the initial configuration for COS to be used by GIDs registered in a Fleet.

Available basic functions for the Fleet can be configured by selecting from the preconfigured Class of Service (GID). (Refer to [Configuring a GID COS](#).)

Configuring **Common Class of Service (GID)** saves time and effort to configure a GID Class of Service for each GID when registering a GID in the Fleet.

Configuring a home system controller (Home System)

Home System is the function to average the number of subscriber units processed by each system controller in a Wide Area Network System where multiple system controllers are connected.

Normally, a call is transferred from the site which initiates the call to the home system controller of each UID, and then transferred to necessary systems and sites. Therefore, configuring the system controller that manages the sites mainly used by the UIDs configured in each Fleet as the home system in **Home System** is efficient.

Home System can be changed freely after configuration, therefore, even if the number of system controllers increases after starting operation, the management of the Fleet can be transferred to a different system controller with flexibility.

Configuring the range of GIDs that can be registered in the Fleet (GID Range (MIN/MAX))

GID Range is the range of GIDs that can be registered in the Fleet. A system administrator can avoid registering a wrong GID in the Fleet and restrict a restricted user from registering a GID by configuring **GID Range**.

 Note

- A duplicate range of GIDs across Fleets cannot be configured.
- For a restricted user, the range of GIDs is simply displayed in **GID Range** and the configuration cannot be changed.

Configuring COS to be used by UIDs registered in a Fleet (Common Class of Service (UID))

Common Class of Service (UID) is the initial configuration for COS to be used by UIDs registered in a Fleet. Available basic functions for the Fleet can be configured by selecting from the preconfigured Class of Service (UID). (Refer to [Configuring a UID COS](#).)

Configuring **Common Class of Service (UID)** saves time and effort to configure a UID Class of Service for each UID when registering a UID in the Fleet.

Configuring the range of UIDs that can be registered in the Fleet (UID Range (MIN/MAX))

UID Range is the range of UIDs that can be registered in the Fleet. A system administrator can avoid registering a wrong UID in the Fleet and restrict a restricted user from registering a UID by configuring **UID Range**.

 Note

- A duplicate range of UIDs across Fleets cannot be configured.
- For a restricted user, the range of UIDs is simply displayed in **UID Range** and the configuration cannot be changed.

Configuring Trunking Type

Trunking Type are the behavior types of when starting or ending a voice call in a NEXEDGE system. For starting and ending a voice call, system behaviors synchronized to operations can be configured.

Trunking Type can be configured as the default of the whole NEXEDGE system in **Edit > System Configuration > General** of SCU, but configuring **Trunking Type** for each Fleet can make a specific Fleet behave differently from the other Fleets.

Table 9-1 Configuration of Trunking Type (Fleet)

Item	Description
Default	The NEXEDGE system behaves according to the configuration in Trunking Type of System Configuration when calling by using UIDs/ GIDs registered in the Fleet.
Message Trunked/ Transmission Trunked	The NEXEDGE system behaves according to the configuration in Trunking Type of the Fleet when calling by using UIDs/ GIDs registered in the Fleet. Refer to " Determining the System Behavior of When Starting or Ending a Voice Call (Trunking Type) " for details of Trunking Type .

Note

- If a call is made across Fleets and the configuration in **Trunking Type** is different for each Fleet, the call is executed according to the Fleet configuration of the ID of the receiving subscriber unit.

Configuring Group Registration Reset Timer

Group Registration Reset Timer is the amount of time until the registration information of a GID is automatically deleted from a NEXEDGE system.

Group Registration Reset Timer can be configured as the default of the whole NEXEDGE system in **Edit > System Configuration > General** of SCU, but configuring **Group Registration Reset Timer** for each Fleet can make a specific Fleet behave differently from the other Fleets.

Table 9-2 Configuration of Group Registration Reset Timer (Fleet)

Item	Description
Default	The NEXEDGE system behaves according to the configuration in Group Registration Reset Timer of System Configuration when performing Group Registration by using GIDs registered in the Fleet.
OFF/ 1 to 254	The NEXEDGE system behaves according to the configuration in Group Registration Reset Timer of the Fleet when performing Group Registration by using GIDs registered in the Fleet. Refer to " Automatically Deleting the Registration Information of a GID (Group Registration Reset Timer) " for details of Group Registration Reset Timer .

Configuring NXDN ESN Validation

NXDN ESN Validation is the function to prevent accesses from invalid subscriber units. Unauthorized use of the system can be prevented by associating a Unit ID with an NXDN ESN.

NXDN ESN Validation can be configured as the default of the whole NEXEDGE system in **Edit > System Configuration > General** of SCU, but configuring **NXDN ESN Validation** for each Fleet can make a specific Fleet behave differently from the other Fleets.

Table 9-3 Configuration of NXDN ESN Validation (Fleet)

Item	Description
Default	The NEXEDGE system behaves according to the configuration in NXDN ESN Validation of System Configuration when authenticating a UID registered in the Fleet.
ON/ OFF	The NEXEDGE system behaves according to the configuration in NXDN ESN Validation of the Fleet when authenticating a UID registered in the Fleet. Refer to " Removing Unregistered Subscriber Units (NXDN ESN Validation) " for details of NXDN ESN Validation .

Note

- When **NXDN ESN Validation** of the Fleet is enabled, the UID authentication of the corresponding Fleet is also executed by using the unique number of each manufacturer if **Manufacturer Limitation** of **System Configuration** is enabled. (Refer to [Limiting the Manufacturers of Available Subscriber Units \(Manufacturer Limitation\)](#).)

Configuring NXDN ESN Validation Reset Time

NXDN ESN Validation Reset Time is the function to record ESN authentication for each UID in the NEXEDGE system, and to delete the ESN authentication records at the configured time.

NXDN ESN Validation Reset Time can be configured as the default of the whole NEXEDGE system in **Edit > System Configuration > General** of SCU, but configuring **NXDN ESN Validation Reset Time** for each Fleet can make a specific Fleet behave differently from the other Fleets.

Table 9-4 Configuration of NXDN ESN Validation Reset Time (Fleet)

Item	Description
Default	The NEXEDGE system behaves according to the configuration in NXDN ESN Validation Reset Time of System Configuration when authenticating a UID registered in the Fleet.
Off/ 00-23	The NEXEDGE system behaves according to the configuration in NXDN ESN Validation Reset Time of the Fleet when authenticating a UID registered in the Fleet. Refer to " Specifying the Time and Clearing Registration Information (NXDN Validation Reset Time) " for details of NXDN ESN Validation Reset Time .

Restricting an outgoing call to a telephone line (Call Restriction Table Number (Fleet List))

Call Restriction is the function to restrict telephone numbers to be called from a subscriber unit.

This function can restrict the number of digits and area codes of the telephone number to be called from a subscriber unit. For example, long-distance calls to the telephone number with certain area codes can be restricted by using this function.

By specifying the table number of a Call Restriction Table configured in **Edit > Subscriber Configuration > Call Restriction List** of SCU, telephone numbers to be called from a subscriber unit can be restricted.

Refer to “[Restricting Telephone Numbers to Be Called \(Call Restriction\)](#)” for details of **Call Restriction**.

Note

- If “None” is configured in **Call Restriction Table Number**, the Call Restriction Table is not checked, and all outgoing calls are allowed.

Configuring Speed Dial (Speed Dial List Number)

Speed Dial is the function that enables a subscriber unit to make a call to the preconfigured telephone numbers in the NEXEDGE system by entering the speed dial number.

By specifying the table number of a Speed Dial Table configured in **Edit > Subscriber Configuration > Speed Dial List** of SCU, a speed dial number can be configured to be available.

Refer to “[Configuring the Speed Dial \(Speed Dial\)](#)” for details of **Speed Dial**.

Note

- To connect to a telephone line from the NEXEDGE system, the optional KTI-4 is required.

Configuring Customer Information

The name, address, and telephone number of a customer who uses the Fleet can be configured.

Configuring Channel Allocation

Channel Allocation is the function to specify the traffic channel dedicated to Fleet. The specified Fleet dedicated traffic channel can be held if this function is used.

Table 9-5 Configuration of Channel Allocation (Fleet)

Item	Description
None	The NEXEDGE system does not hold a Fleet dedicated traffic channel.
Fleet Priority A to Fleet Priority J	Configures Fleet Priority for the Fleet to hold a dedicated traffic channel from Fleet Priority A to Fleet Priority J configured in Channel Allocation of Site List . The NEXEDGE system holds a Fleet dedicated traffic channel according to the specified Fleet Priority and the configuration in Channel Allocation of Site List . One Fleet Priority can be specified by multiple Fleets.

Note

- To specify a Fleet dedicated traffic channel, **Channel Allocation** of **Site List** needs to be configured. Refer to “[Allocating a Traffic Channel for a Specific Call \(Channel Allocation\)](#)” for details of **Channel Allocation**.

Specifying a GPS format for sending using GPS Report Channel (GPS Report Format (Fleet))

GPS Report Format is the function to specify the GPS format to be used when a subscriber unit sends GPS messages using the GPS Report Channel. **GPS Report Format** can be configured for each Fleet.

Refer to “[Specifying a GPS Format for Sending Using a GPS Report Channel \(GPS Report Format\)](#)” for details of **GPS Report Format**.

Configuring the interval for sending GPS messages (GPS Report Interval (Fleet))

GPS Report Interval is the interval for a subscriber unit that supports the GPS Report Channel to send GPS messages using the GPS Report Channel. **GPS Report Interval** can be configured for each Fleet.

Refer to “[Configuring the Interval for Sending GPS Messages \(GPS Report Interval\)](#)” for details of **GPS Report Interval**.

Configuring Unauthorized ESN Detection (Fleet)

Unauthorized ESN Detection is the function to prevent a subscriber unit that does not match an ESN configured in SCU from being used.

The NEXEDGE system behaves as follows according to the configuration in **Unauthorized ESN Detection** if an ESN is received that does not match an ESN configured in SCU when authentication of the ESN is done by the registration of a subscriber unit registered in the Fleet:

Table 9-6 Configuration of Unauthorized ESN Detection (Fleet)

Configuration	Description
Default	Behaves according to the configuration in Unauthorized ESN Detection of System Configuration . (Refer to Preventing the Subscriber Unit of an Unmatched ESN from Being Used (Unauthorized ESN Detection) .)
None	Registration of a subscriber unit is rejected. The NEXEDGE system does not send a Remote Stun/ Kill Message to the subscriber unit.
Stun	The NEXEDGE system sends a Remote Stun Message to the subscriber unit. The subscriber unit becomes unavailable to use if a Remote Stun Message is received.
Kill	The NEXEDGE system sends a Remote Kill Message to the subscriber unit. The subscriber unit is prohibited from use if a Remote Kill Message is received, and no operations can be done.

Unauthorized ESN Detection can be configured as the default of the whole NEXEDGE system in **Edit > System Configuration > General** of SCU, but configuring individual **Unauthorized ESN Detection** for each Fleet can make a specific Fleet behave differently from the other Fleets.

Note

- This function behaves if **NXDN ESN Validation** is enabled. (Refer to [Removing Unregistered Subscriber Units \(NXDN ESN Validation\)](#).)
- If **Automatically ESN Stun/Revive** is used, even a subscriber unit of a matching ESN can be placed in the Stun state by sending a Remote Stun Message is received. Also, even if a subscriber unit enters the Stun state in error because of the incorrect configuration of **Unauthorized ESN Detection**, the subscriber unit can be restored by using **Automatically ESN Stun/Revive** to receive a Remote Revive Message. (Refer to [Making the subscriber unit unavailable/ restoring the subscriber unit from being unavailable \(Automatically ESN Stun/Revive\)](#).)

Configuring whether to make a subscriber unit the target of the transmission control (Priority Subscriber Class (Fleet))

Priority Subscriber Class is the function to assign the type of subscriber unit to a subscriber unit that registered a location in a site.

When the location registration of a subscriber unit is successful, the NEXEDGE system responds by carrying the type of subscriber unit (General Subscriber or Priority Subscriber) on the response message. The subscriber unit reads the type and determines the type assigned to the subscriber unit. (Refer to [Controlling Transmission from a Subscriber Unit \(Restriction Control\)](#).)

Table 9-7 Configuration of Priority Subscriber Class (Fleet)

Configuration	Description
General Subscriber	The subscriber unit is assigned the general type. The subscriber unit assigned this type is the target of the transmission control.
Priority Subscriber	The subscriber unit is assigned the priority type. The subscriber unit assigned this type is not the target of the transmission control.

By configuring an individual **Priority Subscriber Class** for each Fleet, a system administrator can make a specific Fleet behave differently from the other Fleets.

Note

- Only the subscriber unit of firmware supporting the behavior of **Priority Subscriber Class** can recognize the priority type.

Configuring the timer information (Timers)

Hold Timer and **Occupation Timer** can be configured as the default of the whole NEXEDGE system in **Edit > System Configuration > Default Timers** of SCU, but configuring **Hold Timer** and **Occupation Timer** for each Fleet can make a specific Fleet behave differently from the other Fleets.

For the following 7 types of communications, **Hold Timer** and **Occupation Timer** can be configured for each Fleet:

- **Voice Call**

- Broadcast Call
- Conference Call
- Individual Call
- Telephone Call

- **Data Call**

- Broadcast Call
- Conference Call
- Individual Call

Figure 9-5 Fleet Number1:Timers

Table 9-8 Hold Timer (Except Telephone Call)

Configuration	Description
Default	The NEXEDGE system behaves according to the configuration in Default Timers of System Configuration when calling by using UIDs/ GIDs registered in the Fleet.
0 to 10	The NEXEDGE system behaves according to the configuration in Timers of the Fleet when calling by using UIDs/ GIDs registered in the Fleet. Refer to " Holding a Traffic Channel for Always Calling Back (Hold Timer) " for details of Hold Timer .

Table 9-9 Hold Timer (Telephone Call)

Configuration	Description
Default	The NEXEDGE system behaves according to the configuration in Default Timers of System Configuration when calling by using UIDs/ GIDs registered in the Fleet.
5 to 60	The NEXEDGE system behaves according to the configuration in Timers of the Fleet when calling by using UIDs/ GIDs registered in the Fleet. Refer to " Holding a Traffic Channel for Always Calling Back (Hold Timer) " for details of Hold Timer .

Table 9-10 Occupation Timer

Configuration	Description
Default	The NEXEDGE system behaves according to the configuration in Default Timers of System Configuration when calling by using UIDs/ GIDs registered in the Fleet.
15 to 1200	The NEXEDGE system behaves according to the configuration in Timers of the Fleet when calling by using UIDs/ GIDs registered in the Fleet. Refer to " Limiting the Occupation Time of a Traffic Channel (Occupation Timer) " for details of Occupation Timer .

9.3 Registering a GID

GIDs used in the NEXEDGE system are registered to a Fleet.

Selecting a Fleet to which a GID is registered in **Edit > Subscriber Configuration > Fleet List** of SCU, clicking the “Edit” button, and then clicking **GID List** on the navigation menu displays **GID List**.

Clicking the “Add” button in **GID List** displays **General (Add)**, and then the GID can be added to the selected Fleet. A maximum of 5,000 GIDs can be configured in **GID List**.

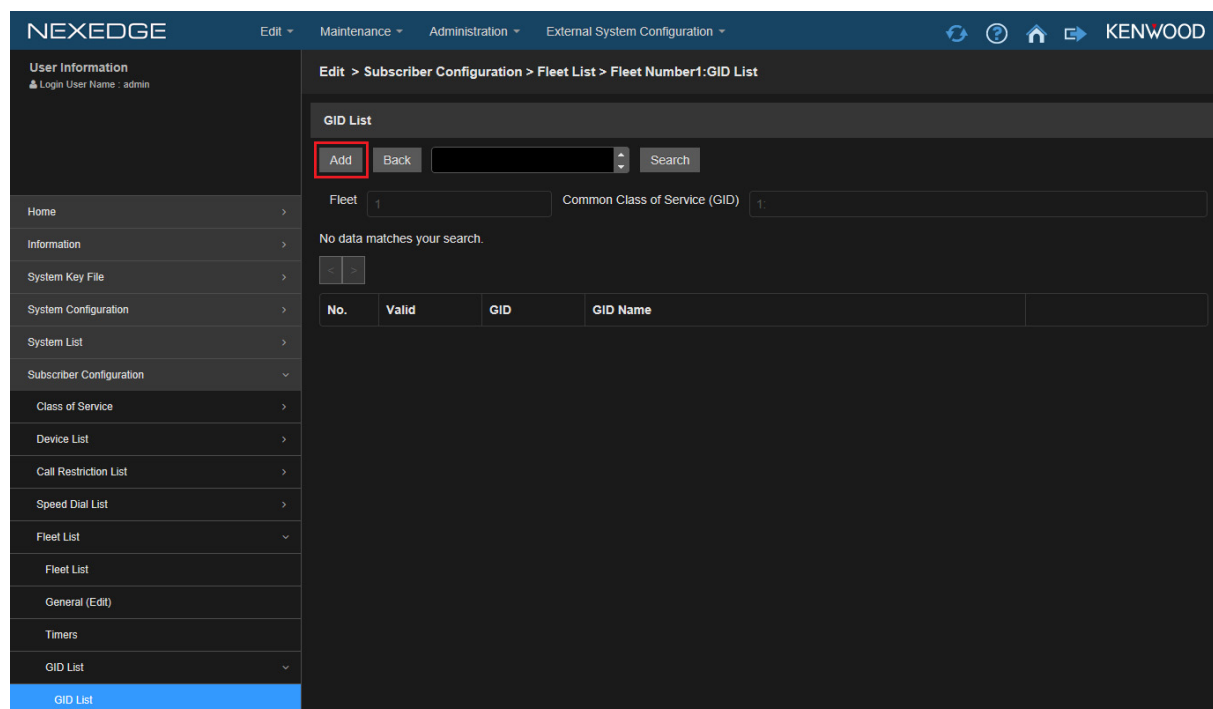


Figure 9-6 GID List

Note

- A list of the registered GIDs appears in **GID List**.
- By clicking the “Details” button in **GID List**, the configuration contents of the corresponding GID can be viewed.
- By clicking the “Edit” button in **GID List**, the configuration of the corresponding GID can be changed.
- By clicking the “Delete” button in **GID List**, the corresponding GID can be deleted.

Configuring GID Information

In **Edit > Subscriber Configuration > Fleet List > GID List > General (Add or Edit)**, parameters for various functions used by a GID such as Group ID, GID COS, and **GID Association**, can be configured.

Edit > Subscriber Configuration > Fleet List > Fleet Number1:GID List > General (Add)

General

Common Class of Service (GID)1:ValidONGID1GID NameGID-1GID Class of ServiceCommon

GID Association

No.	GID
1	
2	
3	
4	

Save

Back

Figure 9-7 General (Add or Edit)

Click the “Save” button to save after configuration.

Confirming a COS Used By a GID (Common Class of Service (GID))

In **Common Class of Service (GID)**, the value of **Common Class of Service (GID)** configured for the Fleet to which a GID is registered appears. A system administrator can confirm the configuration value in **Common Class of Service (GID)** of the Fleet to which the GID to be registered or edited belongs. (Refer to [Configuring COS to be used by GIDs registered in a Fleet \(Common Class of Service \(GID\)\)](#).)

Configuring whether to use a GID in a system (Valid)

Valid allows a system administrator to configure whether the configured GID is used in the NEXEDGE system. To use a GID in the NEXEDGE system, configure “ON” in **Valid**. The NEXEDGE system allows a use of a GID for which **Valid** is enabled. A Group Call can be made among the subscriber units by sharing the permitted GID. Not to use a GID in the NEXEDGE system, configure “OFF” in **Valid**.

Configuring a Group ID (GID)

GID is a Group ID that belongs to a Fleet. A system administrator can register a Group ID to be used in a Fleet. The NEXEDGE system only permits the use of GIDs that belong to any of the Fleets. Group Registration cannot be performed and a Group Call cannot be made by using a GID not registered in a Fleet.

Configuring a GID Name (GID Name)

GID Name is the name of a GID. GID Name is configured to distinguish the configured GIDs. The name configured for each GID appears in the list of **GID List**.

Configuring a GID COS (GID Class of Service)

GID Class of Service is data in which available functions are defined by GIDs.

As for a GID, available basic functions for Fleet are configured in **Common Class of Service (GID)**, but configure **GID Class of Service** to use or to restrict a different function only for a specific GID.

Table 9-11 Configuration of GID Class of Service

Item	Description
Common	The NEXEDGE system permits the use of each function according to the configuration in Common Class of Service (GID) that is configured for the registration destination Fleet. (Refer to Configuring COS to be used by GIDs registered in a Fleet (Common Class of Service (GID)) .)
1: Class Name to 5000: Class Name	The NEXEDGE system permits the use of each function according to the configuration in the specified GID Class of Service . (Refer to Configuring a GID COS .)

Configuring GID Association

GID Association is a function that enables the subscriber units selecting different GIDs to participate in the same communication.

Refer to “[Enabling Subscriber Units Selecting Different GIDs to Participate in the Same Communication \(GID Association\)](#)” for details of **GID Association**.

9.4 Registering a UID

UIDs used in the NEXEDGE system are registered to a Fleet.
Selecting a Fleet to which a UID is registered in **Edit > Subscriber Configuration > Fleet List** of SCU, clicking the “Edit” button, and then clicking **UID List** on the navigation menu displays **UID List**.
Clicking the “Add” button in **UID List** displays **General (Add)**, and then the UID can be added to the selected Fleet.
A maximum of 5,000 UIDs can be configured in **UID List**.

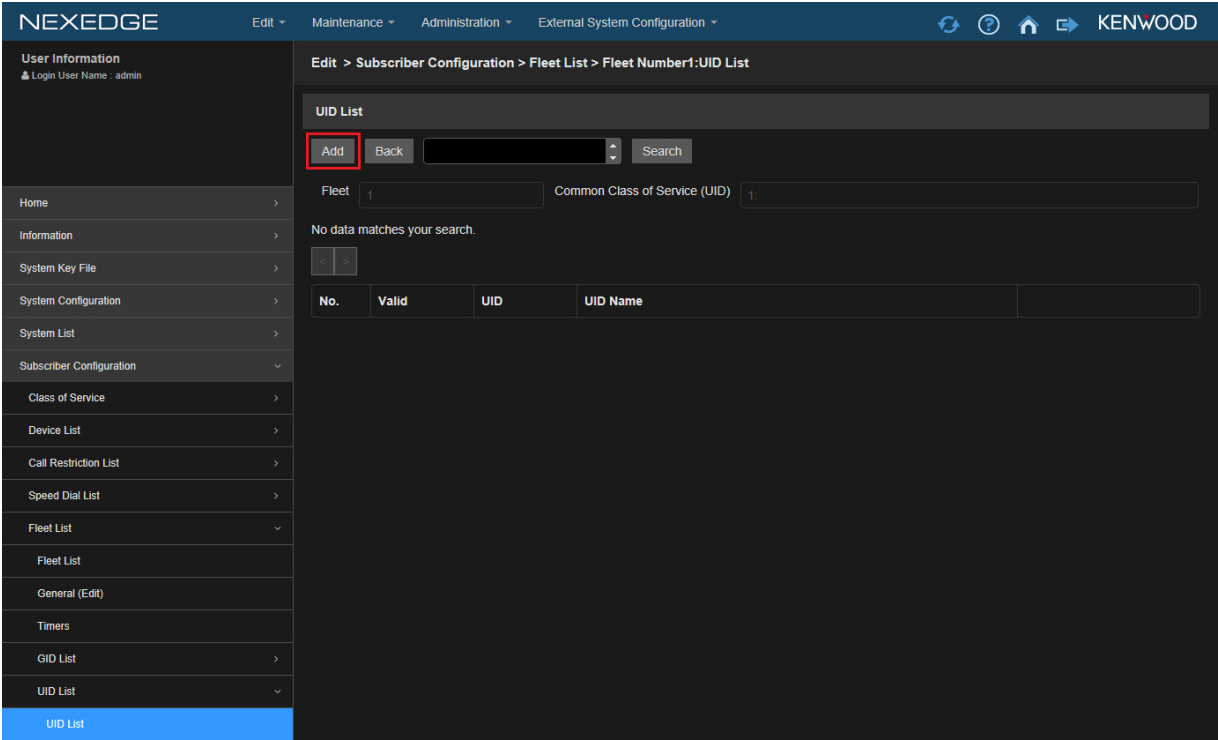


Figure 9-8 UID List

Note

- A list of the registered UIDs appears in **UID List**.
- By clicking the “Details” button in **UID List**, the configuration contents of the corresponding UID can be viewed.
- By clicking the “Edit” button in **UID List**, the configuration of the corresponding UID can be changed.
- By clicking the “Delete” button in **UID List**, the corresponding UID can be deleted.

Configuring UID Information

In **Edit > Subscriber Configuration > Fleet List > UID List > General (Add or Edit)**, parameters for various functions used by a UID, such as Unit ID, UID COS, and **NXDN ESN**, can be configured.

Figure 9-9 General (Add or Edit)

Click the “Save” button to save after configuration.

Confirming a COS Used By a UID (Common Class of Service (UID))

In **Common Class of Service (UID)**, the value of **Common Class of Service (UID)** configured for the Fleet to which a UID is registered appears. A system administrator can confirm the configuration value in **Common Class of Service (UID)** of the Fleet to which the UID to be registered or edited belongs. (Refer to [Configuring COS to be used by UIDs registered in a Fleet \(Common Class of Service \(UID\)\)](#).)

Configuring whether to use a UID in a system (Valid)

Valid allows a system administrator to configure whether the configured UID is used in the NEXEDGE system.

To use a UID in the NEXEDGE system, configure “ON” in **Valid**. The NEXEDGE system allows a use of a UID for which **Valid** is enabled. A subscriber unit with a permitted UID can be operated in the NEXEDGE system.

Not to use a UID in the NEXEDGE system, configure “OFF” in **Valid**.

Configuring a Unit ID (UID)

UID is a Unit ID that belongs to a Fleet. A system administrator can register a Unit ID used in a Fleet. The NEXEDGE system only permits the use of UIDs that belong to any of the Fleets. Registration cannot be executed and a Group Call cannot be made by using a UID not registered in a Fleet.

Configuring a UID Name (UID Name)

UID Name is the name of a UID. UID Name is configured to distinguish the configured UIDs. The name configured for each UID appears in the list of **UID List**.

Configuring a UID COS (UID Class of Service)

UID Class of Service is data in which available functions are defined by UIDs.

As for a UID, available basic functions for Fleet are configured in **Common Class of Service (UID)**, but configure **UID Class of Service** to use or to restrict a different function only for a specific UID.

Table 9-12 Configuration of UID Class of Service

Item	Description
Common	The NEXEDGE system permits the use of each function according to the configuration in Common Class of Service (UID) that is configured for the registration destination Fleet. (Refer to Configuring COS to be used by UIDs registered in a Fleet (Common Class of Service (UID)) .)
1: Class Name to 5000: Class Name	The NEXEDGE system permits the use of each function according to the specified configuration in UID Class of Service . (Refer to Configuring a UID COS .)

Configuring an NXDN ESN

ESN (Electronic Serial Number) is a serial number allocated to each subscriber unit. Configuring the ESN of a subscriber unit that uses UIDs in **NXDN ESN** can avoid the unauthorized use of the subscriber unit by using the **NXDN ESN Validation** function.

Refer to “[Managing a System by Using the ESN of a Subscriber Unit](#)” for details of various managing functions that use an ESN such as **NXDN ESN Validation**.

Configuring Automatic ESN Collection

Automatic ESN Collection is the function to automatically register an ESN in the system when a registration request is received from a subscriber unit with a UID of a not configured ESN.

Refer to “[Automatically Registering the ESN Collected from a Subscriber Unit \(Automatic ESN Collection\)](#)” for details of **Automatic ESN Collection**.

Specifying a GPS format for sending using GPS Report Channel (GPS Report Format (UID))

GPS Report Format is the function to specify the GPS format to be used when a subscriber unit sends GPS messages using the GPS Report Channel. **GPS Report Format** can be configured as the default of the whole Fleet in **Edit > Subscriber Configuration > Fleet List > General (Add or Edit)**. Configuring an individual **GPS Report Format** for each UID registered in this Fleet can make a specific UID behave differently from the other UIDs.

Refer to “[Specifying a GPS Format for Sending Using a GPS Report Channel \(GPS Report Format\)](#)” for details of **GPS Report Format**.

Configuring the interval for sending GPS messages (GPS Report Interval (UID))

GPS Report Interval is the interval for a subscriber unit that supports the GPS Report Channel to send GPS messages using the GPS Report Channel. **GPS Report Interval** can be configured as the default of the whole Fleet in **Edit > Subscriber Configuration > Fleet List > General (Add or Edit)**. Configuring an individual **GPS Report Interval** for each UID registered in this Fleet can make a specific UID behave differently from the other UIDs.

Refer to “[Configuring the Interval for Sending GPS Messages \(GPS Report Interval\)](#)” for details of **GPS Report Interval**.

Configuring Unauthorized ESN Detection (UID)

Unauthorized ESN Detection is the function to prevent a subscriber unit that does not match an ESN configured in SCU from being used.

The NEXEDGE system behaves as follows according to the configuration in **Unauthorized ESN Detection** if an ESN that does not match an ESN configured in SCU is received when authentication of the ESN is done by the registration of a subscriber unit.

Table 9-13 Configuration of Unauthorized ESN Detection (Fleet)

Configuration	Description
Default	Behaves according to the configuration in Unauthorized ESN Detection of a Fleet. (Refer to Configuring Unauthorized ESN Detection (Fleet) .)
None	Registration of a subscriber unit is rejected. The NEXEDGE system does not send a Remote Stun/ Kill Message to the subscriber unit. The NEXEDGE system sends a Remote Stun Message to the subscriber unit. The subscriber unit becomes unavailable to use if a Remote Stun Message is received.
Kill	The NEXEDGE system sends a Remote Kill Message to the subscriber unit. The subscriber unit is prohibited from use if a Remote Kill Message is received, and no operations can be done.

Unauthorized ESN Detection can be configured as the default of the whole Fleet in **Edit > Subscriber Configuration > Fleet List > General (Add or Edit)** of SCU, but configuring individual **Unauthorized ESN Detection** for each UID registered in this Fleet can make a specific UID behave differently from the other UIDs.

Note

- This function behaves if **NXDN ESN Validation** is enabled. (Refer to [Removing Unregistered Subscriber Units \(NXDN ESN Validation\)](#).)
- If **Automatically ESN Stun/Revive** is used, even a subscriber unit of a matching ESN can be placed in the Stun state by sending a Remote Stun Message is received. Also, even if a subscriber unit enters the Stun state in error because of the incorrect configuration of **Unauthorized ESN Detection**, the subscriber unit can be restored by using **Automatically ESN Stun/Revive** to receive a Remote Revive Message. (Refer to [Making the subscriber unit unavailable/ restoring the subscriber unit from being unavailable \(Automatically ESN Stun/Revive\)](#).)

Making the subscriber unit unavailable/ restoring the subscriber unit from being unavailable (Automatically ESN Stun/Revive)

Automatically ESN Stun/Revive is the function to make a subscriber unit matching an ESN configured in SCU unavailable for use, and to restore a subscriber unit from being unavailable for use.

This function is used to prevent the corresponding subscriber unit from the use of a NEXEDGE system such as when the fee for usage of the NEXEDGE system is unpaid, and to restore the use of a NEXEDGE system for a subscriber unit prevented from the use of the system.

Also, even if a subscriber unit enters the Stun state in error because of the incorrect configuration of **Unauthorized ESN Detection**, the subscriber unit can be restored by using this function. (Refer to [Preventing the Subscriber Unit of an Unmatched ESN from Being Used \(Unauthorized ESN Detection\)](#).)

The NEXEDGE system behaves as follows according to the configuration in **Automatically ESN Stun/Revive** if an ESN matching an ESN configured in SCU is received when authentication of the ESN is done by the registration of a subscriber unit:

Table 9-14 Configuration of Automatically ESN Stun/Revive

Configuration	Description
None	The NEXEDGE system does not send a Remote Stun/ Revive Message to the subscriber unit. The registration request from the subscriber unit is permitted.
Stun	The NEXEDGE system sends a Remote Stun Message to the subscriber unit. The subscriber unit becomes unavailable to use if a Remote Stun Message is received.
Revive	The NEXEDGE system sends a Remote Revive Message to the subscriber unit. The Stun state is reset for the subscriber unit if a Remote Revive Message is received.

Note

- If a Remote Stun/ Revive Message is received by the subscriber unit, the NEXEDGE system records the type of Remote Control executed, the UID and the ESN in the system log.
- If a response to the Remote Stun/ Revive Message is received from the subscriber unit, the NEXEDGE system records the type of Remote Control and the UID in the system log.
- This function behaves if **NXDN ESN Validation** is enabled. (Refer to [Removing Unregistered Subscriber Units \(NXDN ESN Validation\)](#).)

Configuring whether to make a subscriber unit the target of the transmission control (Priority Subscriber Class (UID))

Priority Subscriber Class is the function to assign the type of subscriber unit to a subscriber unit that registered a location in a site.

When the location registration of a subscriber unit is successful, the NEXEDGE system responds by carrying the type of subscriber unit (General Subscriber or Priority Subscriber) on the response message. The subscriber unit reads the type and determines the type assigned to the subscriber unit. (Refer to [Controlling Transmission from a Subscriber Unit \(Restriction Control\)](#).)

Table 9-15 Configuration of Priority Subscriber Class (UID)

Configuration	Description
Default	Behaves according to the configuration in Priority Subscriber Class of a Fleet. (Refer to Configuring whether to make a subscriber unit the target of the transmission control (Priority Subscriber Class (Fleet)) .)
General Subscriber	The subscriber unit is assigned the general type. The subscriber unit assigned this type is the target of the transmission control.
Priority Subscriber	The subscriber unit is assigned the priority type. The subscriber unit assigned this type is not the target of the transmission control.

Priority Subscriber Class can be configured as the default of the whole Fleet in **Edit > Subscriber Configuration > Fleet List > General (Add or Edit)** of SCU, but configuring an individual **Priority Subscriber Class** for each UID registered in this Fleet can make a specific UID behave differently from the other UIDs.

10 VARIOUS TYPES OF CALLS

A subscriber unit can communicate communications such as an individual call using a UID or a group call using a GID via a NEXEDGE system.

Two types of channels, control channels and traffic channels, are used in a NEXEDGE system. A control channel is used for sending various messages to control a NEXEDGE system. A control channel is also used for calls such as a Status Call or a Short Data Call.

A traffic channel is used for sending various types of communication information of subscriber units.

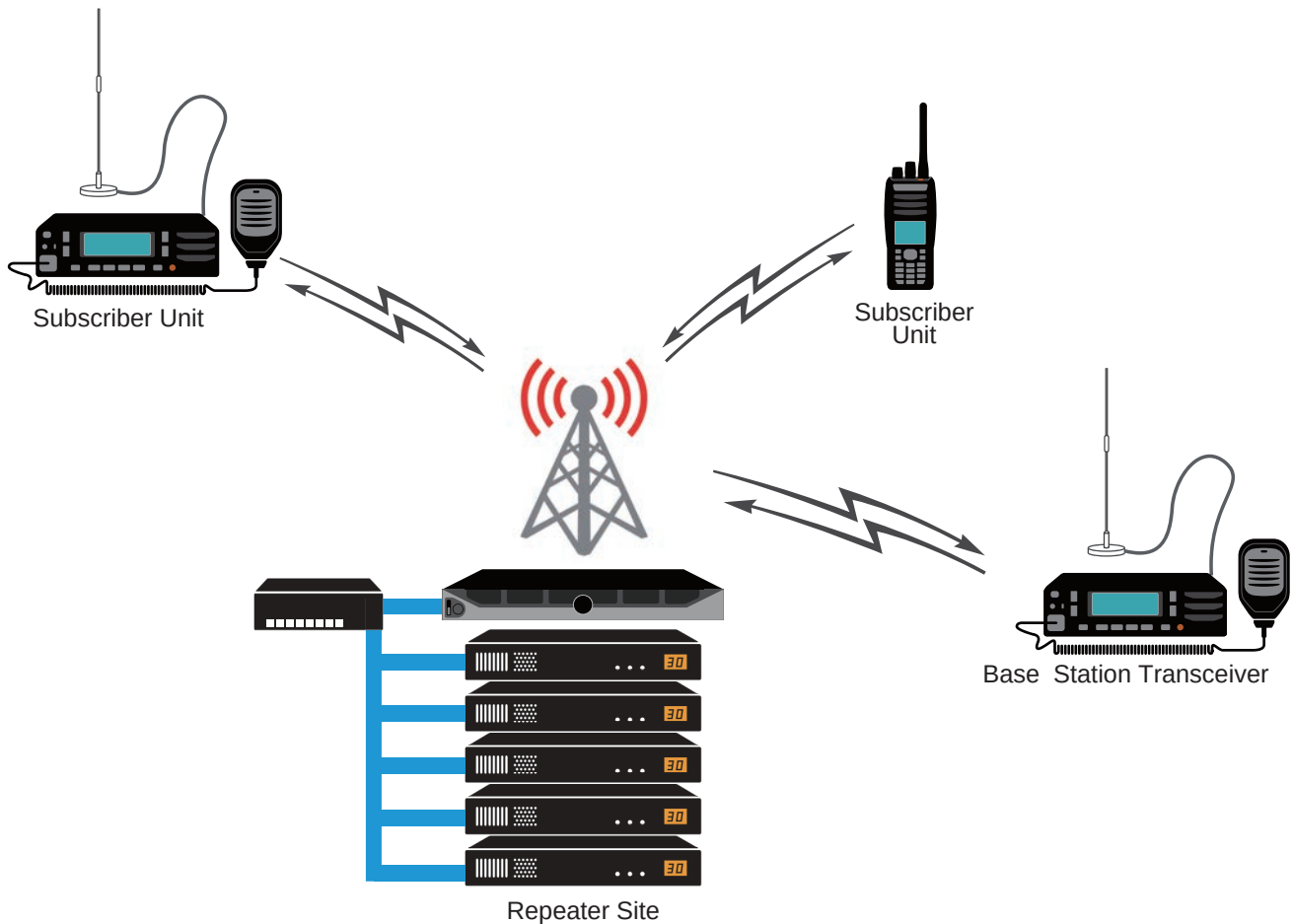


Figure 10-1 Diagram of Communications

A subscriber unit can use the following types of calls in a NEXEDGE system:

- Individual Call (Transmission Trunked)
- Group Call (Transmission Trunked)
- Individual Call (Message Trunked (Enhanced))
- Group Call (Message Trunked (Enhanced))
- Broadcast Group Call
- Status Call
- Short Data Call
- Long Data Call

For an Individual Call and Group Call, the subscriber unit behavior varies depending on the configuration in **Trunking Type** ("Transmission Trunked" or "Message Trunked (Enhanced)"). (Refer to [Determining the System Behavior of When Starting or Ending a Voice Call \(Trunking Type\)](#).)

 Note

- Refer to "NXDN TRUNKING SYSTEM" of "NXDN FUNC" for the operation and behavior of a subscriber unit in various types of calls.

10.1 About Control Channel Hunt

The control channel hunt is the function to automatically search for and acquire an available control channel in a NEXEDGE system when the subscriber unit is turned on.

By searching for a control channel according to the hunt sequence, the subscriber unit can acquire a control channel providing better communication conditions, such as a control channel having better signal strength or higher priority.

The control channel hunt is automatically started when the subscriber unit is in the following states:

- When the subscriber unit is turned on
- When an NXDN Trunking zone in another NEXEDGE system from the current system is selected
- When the subscriber unit cannot receive a signal on a control channel
- When the subscriber unit receives a DISC message on a traffic channel

Table 10-1 Hunt Sequence

Order	Hunt Sequence	Description
1	Resuming a Control Channel Sequence	The control channel search which was stopped before the subscriber unit was turned off is resumed.
2	Preferential Hunt Sequence	The two channels configured as Preferential Hunt Control Channels are searched. A Preferential Hunt Control Channel is a channel having the highest priority when searching for a control channel.
3	Normal Hunt Sequence	A channel configured as a Normal Hunt Control Channel is searched. A Normal Hunt Control Channel is a channel that can be used as a control channel in each site.
4	System Add Channel Sequence	48 channels that are additionally registered by a broadcast message sent from a NEXEDGE system are searched.
5	Site Hunt Sequence	A channel configured as a Site Hunt Control Channel in each site is searched. A Site Hunt Control Channel is a channel that can be used as a control channel in each site.
6	Comprehensive Hunt Sequence	All channels that can be used as a control channel are searched based on the frequencies configured in Frequency Table .
7	Failsoft Channel Sequence	A channel configured as a Failsoft Channel is searched.

Background Hunt

Background Hunt is the function to periodically search for a control channel to acquire a control channel providing better conditions than the current control channel while the subscriber unit is in the steady state on the control channel.

When the subscriber unit receives a message or notification information from a NEXEDGE system after acquiring a control channel, the subscriber unit starts the Background Hunt to acquire a control channel providing better conditions, such as a control channel having better signal strength or higher priority.

If the subscriber unit finds a site providing better conditions compared with the current control channel, the subscriber unit will migrate to this control channel, and then enter a standby state after starting the process to acquire a control channel.

Comprehensive Hunt

Comprehensive Hunt is the function to check for all channels configured in the Frequency Table as candidate control channels if the subscriber unit cannot acquire a control channel according to the normal control channel acquisition procedure.

If the acquisition tests of all candidate control channels fail, the subscriber unit reactivates the Preferential Hunt Sequence.



- Since the Comprehensive Hunt Sequence attempts the acquisition for all candidate control channels, it may take an overly long time to acquire the control channel.
- Each of the following functions used in each hunt sequence can be configured in a subscriber unit by using KPG-D1/ D1N. Refer to the help texts of KPG-D1/ D1N for details of each function.
 - Preferential Hunt Control Channel
 - Normal Hunt Control Channel
 - Site Hunt Control Channel
 - Frequency Table
 - Failsoft Channel
 - Background Hunt
 - Comprehensive Hunt

10.2 Making an Individual Call

Individual Call allows two subscriber units to communicate with each other. Individual Call is used if a subscriber wishes to communicate only with a specific party. Pressing the **PTT** switch of the transmitting subscriber unit initiates the call. The receiving subscriber unit can hear the content of communications of the caller.

Individual Call needs to be permitted in **Available Calls** of **Edit > Subscriber Configuration > Class of Service > UID COS List > General (Add or Edit)** of SCU to use Individual Call. (Refer to [Restricting Various Calls \(Available Calls \(UID COS\)\)](#).)

Behavior of Individual Call

The following are behaviors of an Individual Call:

1. If an Individual Call request from a subscriber unit is received on the control channel, an instruction message for communication allocation is sent to the receiving subscriber unit to check for the presence of the subscriber unit in a NEXEDGE system.
2. A traffic channel is acquired as follows in the NEXEDGE system:
 - If the trunking behavior is Transmission Trunked:**
If the presence of the receiving subscriber unit is confirmed, a traffic channel is acquired in a NEXEDGE system.
 - If the trunking behavior is Message Trunked:**
A traffic channel is acquired in a NEXEDGE system if a connection request is received from the receiving subscriber unit after the presence of the receiving subscriber unit can be confirmed.
3. After the traffic channel is acquired, the number of the transmitting subscriber unit, the Individual number of the call and the number of the traffic channel to be used are notified by an instruction message for Individual communication allocation on the control channel.
4. The transmitting and receiving subscriber units migrate to the channel specified in this call message.
 - If the trunking behavior is Transmission Trunked:**
The transmitting subscriber unit automatically starts transmission after migrating to the traffic channel. The receiving subscriber unit starts the reception behavior after migrating to the traffic channel.
 - If the trunking behavior is Message Trunked:**
The transmitting and receiving subscriber units can start transmission after migrating to the traffic channel.

5. To end a call, release the **PTT** switch of the subscriber unit. The subscriber unit automatically sends a call end message for a NEXEDGE system.

If the traffic channel does not have the Hold Timer:

After receiving a call end message in a NEXEDGE system, a message for disconnection is sent over the traffic channel.

If the traffic channel has the Hold Timer:

After a call end message is received in a NEXEDGE system, a message for disconnection is sent over the traffic channel when the **Hold Timer** elapses, or when the message for disconnection is received from the subscriber unit while the **Hold Timer** is counting down.

The subscriber unit on the traffic channel restores the control channel by receiving the message for disconnection.

About Transmission Trunked and Message Trunked

The trunking behavior can be selected “Transmission Trunked” or “Message Trunked” in a NEXEDGE system.

Transmission Trunked is the communication method that starts a call by pressing the **PTT** switch, and that automatically opens a traffic channel by releasing the **PTT** switch. Because the call is connected 2-ways, **Hold Timer** can be configured as desired for holding a traffic channel. **Transmission Trunked** can be operated by simple operations that are the same as a Convention or LTR system because the traffic channel is automatically opened.

Message Trunked acquires a traffic channel by pressing the **PTT** switch and then communicates interconnected on the acquired traffic channel, and releases the traffic channel by pressing the **Clear** key to end the call. By occupying the traffic channel, the response speed improves because linking is not required when responding. Also, the continuity of communications is assured without the channel becoming busy when responding.

The trunking behavior can be configured “Transmission Trunked” or “Message Trunked” in **Trunking Type** of **Edit > System Configuration > General** of SCU. (Refer to [Determining the System Behavior of When Starting or Ending a Voice Call \(Trunking Type\)](#).)

 Note

- If the trunking behavior in a NEXEDGE system is configured “Message Trunked”, “Message Trunked (enhanced)” needs to be configured in **Trunking Type** of the subscriber unit operated in the NEXEDGE system.

10.3 Making a Group Call

Group Call allows multiple subscriber units to communicate with each other. Group Call is used if a subscriber wishes to communicate with multiple subscriber units at the same time. Pressing the **PTT** switch of the transmitting subscriber unit initiates the call. The subscriber unit belonging to the group receiving the call can hear the content of communications of the caller.

Group Call needs to be permitted in **Available Calls** of **Edit > Subscriber Configuration > Class of Service > UID COS List > General (Add or Edit)** of SCU to use Group Call. (Refer to [Restricting Various Calls \(Available Calls \(UID COS\)\)](#).)

Behavior of Group Call

The following are behaviors of a Group Call:

1. If a Group Call request is received from a subscriber unit on a control channel, a NEXEDGE system acquires a traffic channel.
2. After the traffic channel is acquired, the number of the transmitting subscriber unit, the Group number of the call, and the number of the traffic channel to be used are notified by an instruction message for Group communication allocation on the control channel.
3. The transmitting subscriber unit and the subscriber unit belonging to the group receiving the call migrate to the specified channel if the instruction message for communication allocation is received.

If the trunking behavior is Transmission Trunked:

The transmitting subscriber unit automatically starts transmission after migrating to the traffic channel. The receiving subscriber unit belonging to the group called starts the reception behavior after migrating to the traffic channel.

If the trunking behavior is Message Trunked:

The transmitting and receiving subscriber units can start transmission after migrating to the traffic channel.

4. To end a call, release the **PTT** switch of the subscriber unit. The subscriber unit automatically sends a call end message for a NEXEDGE system.

If the traffic channel does not have the Hold Timer:

After receiving a call end message in a NEXEDGE system, a message for disconnection is sent over the traffic channel.

If the traffic channel has the Hold Timer:

After a call end message is received in a NEXEDGE system, a message for disconnection is sent over the traffic channel when the **Hold Timer** elapses, or when the message for disconnection is received from the subscriber unit while the **Hold Timer** is counting down.

The subscriber unit on the traffic channel restores the control channel by receiving the message for disconnection.

About Transmission Trunked and Message Trunked

The trunking behavior can be selected “Transmission Trunked” or “Message Trunked” in a NEXEDGE system.

Transmission Trunked is the communication method that starts a call by pressing the **PTT** switch, and that automatically opens a traffic channel by releasing the **PTT** switch. Because the call is connected 2-ways, **Hold Timer** can be configured as desired for holding a traffic channel. **Transmission Trunked** can be operated by simple operations that are the same as a Convention or LTR system because the traffic channel is automatically opened.

Message Trunked acquires a traffic channel by pressing the **PTT** switch and then communicates interconnected on the acquired traffic channel, and releases the traffic channel by pressing the **Clear** key to end the call. By occupying the traffic channel, the response speed improves because linking is not required when responding. Also, the continuity of communications is assured without the channel becoming busy when responding.

The trunking behavior can be configured “Transmission Trunked” or “Message Trunked” in **Trunking Type** of **Edit > System Configuration > General** of SCU. (Refer to [Determining the System Behavior of When Starting or Ending a Voice Call \(Trunking Type\)](#).)

Note

- If the trunking behavior in a NEXEDGE system is configured “Message Trunked”, “Message Trunked (enhanced)” needs to be configured in Trunking Type of the subscriber unit operated in the NEXEDGE system.

10.4 Making an Intersite Call

Intersite Call is the function that communicates communications by a Voice Call or Data Call (Status Call, Short Data Call and Long Data Call) between sites.

To use Intersite Call, the sites that can be called by Intersite Call need to be configured in **Intersite Call List** of SCU. (Refer to [Controlling an Intersite Call \(GID COS\)](#), [Controlling an Intersite Call \(All Groups Call COS\)](#).)

1 Making a Group Call to All Sites in the System (Multicast Group Call)

The subscriber unit can communicate a call by Voice Call and Data Call between sites configured in **Intersite Call List**.

Multicast enables the system to send the audio packet data to each site with low loads.

To use Multicast Group Call, “Multicast” is configured in **Unicast/Multicast Group Call** in **Edit > System List > Network** of SCU and a Multicast IP Address needs to be configured. (Refer to [Configuring Whether to Deliver by Using Unicast or Multicast \(Unicast/Multicast Group Call\)](#).)

Making a Group Call to Only the Site Where the Subscriber Unit Exists

By using the **Dynamic Allocation** function, the Intersite Call can be delivered to only the site where the subscriber unit being registered in Group Registration exists.

If **Dynamic Allocation** is enabled for a site, even if the site is configured as a site where an Intersite Call is available in **Intersite Call List**, an Intersite Call is not delivered to the site because a traffic channel is not allocated to the site if a subscriber unit registered in Group Registration does not exist in the site. (Refer to [Controlling an Intersite Call \(GID COS\)](#).)

Also, if using the **Group Refusal** function, the call area for a Group Call (the site where Group Registration succeeded) can be configured as the service area of the subscriber unit. The subscriber unit outside the call area for a Group Call (the site where Group Registration fails) indicates that the subscriber unit is out of range. (Refer to [Controlling an Intersite Call \(GID COS\)](#).)

10.5 Making an All Groups Call

All Groups Call is the function to call all groups being used in a NEXEDGE system. All Groups Call is used if the parties to call are in the entire system. Pressing the **PTT** switch of the transmitting subscriber unit initiates the call. The subscriber unit belonging to all groups being used in the NEXEDGE system receiving the call can hear the content of communications of the caller.

All Groups Call needs to be permitted in **Available Calls** of **Edit > Subscriber Configuration > Class of Service > UID COS List > General (Add or Edit)** of SCU to use All Groups Call. (Refer to [Restricting Various Calls \(Available Calls \(UID COS\)\)](#).)

Note

- If using multiple system codes, a subscriber unit can make an All Groups Call with only the one system code. (Refer to [Confirming the System Code](#).)
- If using All Groups Call, configuring "Ignore" or "Wait" in **Busy System Connect** is recommended. If "Busy" is configured in **Busy System Connect**, a call cannot be made when the channels in all sites are not acquired. Therefore, the state where an All Groups Call calling all sites cannot be made may continue. (Refer to [Configuring connection conditions for the start of communication \(Busy System Connect \(All Groups Call COS\)\)](#).)

10.6 Making a Status Call

Status Call is the data communication function used for status communication on the control channel. Status Call is suitable for quickly transmitting and receiving preconfigured short information in real time. This function can be used to notify the status of a user to the dispatcher or the status of the peripheral devices that are input to the base station such as from a sensor.

A Status Message consists of 8 bits, 1 to 199 is the free area, 200 to 207 is the system reserved area, and 208 to 255 is the CAI definition area.

To use Status Call, Status Call needs to be permitted in each **Available Calls** of GID COS, UID COS and All Groups Call COS. Refer to each item below:

- [Restricting Various Calls \(Available Calls \(GID COS\)\)](#)
- [Restricting Various Calls \(Available Calls \(UID COS\)\)](#)
- [Restricting Various Calls \(Available Calls \(All Groups Call COS\)\)](#)

Behavior of Status Call

The following are behaviors of a Status Call:

1. If a Status Call request from a subscriber unit is received on a control channel, a Status Message is sent to the receiving subscriber unit in a NEXEDGE system.
2. In the case of a Status Call (Group), the receiving subscriber unit displays the received status on the display. In the case of a Status Call (Individual), the receiving subscriber unit displays the received status on the display after notifying a NEXEDGE system of receiving the Status Message.

Note

- Although status communications can be used in both Group Call and Individual Call, all subscriber units in a group may not always receive the status if Group Call is used.

10.7 Making a Short Data Call

Short Data Call is the data communication function to forward a Short Data Message on the control channel. Short Data Call is suitable for quickly sending and receiving short messages in real time. This function can be used such as to send and receive GPS data and short text messages.

Short Data Call can send and receive data with a maximum of 100 bytes.

To use Short Data Call, Short Data Call needs to be permitted in each **Available Calls** of GID COS, UID COS and All Groups Call COS. Refer to each item below:

- [Restricting Various Calls \(Available Calls \(GID COS\)\)](#)
- [Restricting Various Calls \(Available Calls \(UID COS\)\)](#)
- [Restricting Various Calls \(Available Calls \(All Groups Call COS\)\)](#)

Behavior of Short Data Call

The following are behaviors of a Short Data Call:

1. If a Short Data Call request from a subscriber unit is received on a control channel, a Short Data Message is sent to the receiving subscriber unit in a NEXEDGE system.
2. In the case of a Short Data Call (Group), the receiving subscriber unit displays the received text message on the display. In the case of a Short Data Call (Individual), the receiving subscriber unit displays the received text message on the display after notifying a NEXEDGE system of receiving the Short Data Message.

Note

- Although data transfer can be used in both Group Call and Individual Call, all subscriber units in a group may not always receive the Short Data Message if Group Call is used. This is because whether the data reaches the receiving subscriber units is not confirmed in order to prioritize the simultaneous notification to all subscriber units.

10.8 Making a Long Data Call

Long Data Call is the data communication function to forward a Long Data Message on a traffic channel. Long Data Call is suitable for communicating large amounts of data. This function can be used for file transfers, database access, and other purposes.

Long Data Call can send and receive data with a maximum of 4,096 bytes.

To use Long Data Call, Long Data Call needs to be permitted in each **Available Calls** of GID COS, UID COS and All Groups Call COS. Refer to each item below:

- [Restricting Various Calls \(Available Calls \(GID COS\)\)](#)
- [Restricting Various Calls \(Available Calls \(UID COS\)\)](#)
- [Restricting Various Calls \(Available Calls \(All Groups Call COS\)\)](#)

Behavior of Long Data Call

The following are behaviors of a Long Data Call:

1. If a Long Data Call request is received from a subscriber unit on a control channel, the behavior is as follows in a NEXEDGE system:

In the case of a Long Data Call (Group):

The traffic channel is acquired in a NEXEDGE system, and the number of the transmitting subscriber unit, the group number of the call and the number of the traffic channel to be used are notified by an instruction message for Group call allocation on the control channel.

In the case of a Long Data Call (Individual):

If the availability of the receiving subscriber unit can be confirmed, a traffic channel is acquired in a NEXEDGE system, and the number of the transmitting subscriber unit, the Individual number of the call and the number of the traffic channel to be used are notified by an instruction message for Individual call allocation.

2. The transmitting and receiving subscriber units migrate to the channel specified in the call message. The receiving subscriber unit automatically starts data transmission after migrating to the traffic channel. The receiving subscriber unit starts the data reception behavior after migrating to the traffic channel.
3. The transmitting subscriber unit automatically sends a call end message for the system if all data transmission ends. When the **Hold Timer** elapses after a call end message is received in the system, a message for disconnection is sent on the traffic channel. The subscriber unit on the traffic channel restores the control channel by receiving the message for disconnection.

Note

- Although data transfer can be used in both Group Call and Individual Call, all subscriber units in a group may not always receive the Long Data Message if Group Call is used. This is because whether the data reaches the receiving subscriber units is not confirmed in order to prioritize the simultaneous notification to all subscriber units.

10.9 Making a Telephone Call

Telephone Call is the function allowing a telephone and subscriber unit to communicate with each other.

The following functions are available in Telephone Call:

- **Interconnect Call Outgoing to Telephone**

Enables a subscriber unit to send to a telephone.

Outgoing Call to Telephone Line needs to be permitted in **Telephone of Edit > Subscriber Configuration > Class of Service > UID COS List > General (Add or Edit)** of SCU to use this function. (Refer to [Restricting an outgoing call to a telephone line \(Outgoing Call to Telephone Line\)](#).)

- **Interconnect Call Incoming from Telephone/ Group Call Incoming from Telephone**

Enables a telephone to call a specified subscriber unit or group.

To use these functions, **Incoming Call from Telephone Line** needs to be permitted for each in GID COS, UID COS and All Groups Call COS. Refer to each item below:

- [Restricting an incoming call from a telephone line \(Incoming Call from Telephone Line \(GID COS\)\)](#)
- [Restricting an incoming call from a telephone line \(Incoming Call from Telephone Line \(UID COS\)\)](#)
- [Restricting an incoming call from a telephone line \(Incoming Call from Telephone Line \(All Groups Call COS\)\)](#)

Basic procedure of Interconnect Call Outgoing to Telephone

1. If an Interconnect Call request from a subscriber unit is received on the control channel, the telephone number and instruction message for communication allocation are sent to the receiving Telephone Interface (KTI-4) and the connection starts in a NEXEDGE system.
2. When the connection to the Telephone Interface (KTI-4) is connected, a traffic channel is acquired in a NEXEDGE system.
3. After a traffic channel is acquired, the transmitting subscriber unit is notified of the number of the transmitting subscriber unit, the PSTN-ID number, and the number of the traffic channel to be used by an instruction message for Interconnect Call communication allocation on the control channel.
4. The transmitting subscriber units migrate to the specified channel when the instruction message for communication allocation is received.
5. The Telephone Interface (KTI-4) calls the specified telephone number. During a voice call on a telephone network, the user of the transmitting subscriber unit can determine the telephone status, such as calling, connected, and busy.
6. As the stream of voice calls normally flows from a telephone in the direction of the subscriber unit in the communication state, the stream of voice calls only flows from the subscriber unit in the direction of a telephone when requesting a call.
7. To end a call, release the **PTT** switch of the subscriber unit. The subscriber unit automatically sends a call end message for a NEXEDGE system. A message for disconnection is sent over the traffic channel in the NEXEDGE system in one of the following conditions:
 - When the **Hold Timer** elapses
 - When a message for disconnection is received from the Telephone Interface (KTI-4) while the **Hold Timer** is counting down
 - When a message for disconnection from a subscriber unit is received

The subscriber unit on the traffic channel restores the control channel by receiving the message for disconnection.

Basic procedure of Interconnect Call Incoming from Telephone

1. If an Interconnect Call request is received from the Telephone Interface (KTI-4), an instruction message for communication allocation is sent to the receiving subscriber unit in a NEXEDGE system.
2. If the user of the receiving subscriber unit responds, a traffic channel is acquired in a NEXEDGE system.
3. After a traffic channel is acquired, the receiving subscriber unit is notified of the PSTN-ID number, the number of the receiving subscriber unit, and the number of the traffic channel to be used by an instruction message for Interconnect Call communication allocation on the control channel.
4. The receiving subscriber units migrate to the specified channel when the instruction message for communication allocation is received.
5. As the stream of voice calls normally flows from a telephone in the direction of the subscriber unit in the communication state, the stream of voice calls only flows from the subscriber unit in the direction of a telephone when requesting a call.
6. To end a call, release the **PTT** switch of the subscriber unit. The subscriber unit automatically sends a call end message for a NEXEDGE system. A message for disconnection is sent over the traffic channel in the NEXEDGE system in one of the following conditions:
 - When the **Hold Timer** elapses
 - When a message for disconnection is received from the Telephone Interface (KTI-4) while the **Hold Timer** is counting down
 - When a message for disconnection from a subscriber unit is received

The subscriber unit on the traffic channel restores the control channel by receiving the message for disconnection.

Basic procedure of Group Call Incoming from Telephone

1. If a Group Call request is received from the Telephone Interface (KTI-4), a traffic channel is acquired in a NEXEDGE system.
2. After the traffic channel is acquired, the group is notified of the PSTN-ID number, the number of the receiving group, and the number of the traffic channel to be used by an instruction message for Group communication allocation on the control channel.
3. The subscriber unit belonging to the group receiving the call migrates to the specified channel if the instruction message for communication allocation is received. The subscriber unit belonging to the group called starts the reception behavior after migrating to the traffic channel, and then a transmission behavior that is the same as a normal Group Call can start.
4. To end a call, release the **PTT** switch of the subscriber unit. The subscriber unit automatically sends a call end message for a NEXEDGE system. A message for disconnection is sent over the traffic channel in a NEXEDGE system when the **Hold Timer** elapses, or when the message for disconnection is received from the Telephone Interface (KTI-4) while the **Hold Timer** is counting down. The subscriber unit on the traffic channel restores the control channel by receiving the message for disconnection.

Note

- The behavior of Telephone Call occurs regardless of the configuration of the trunking behavior in a NEXEDGE system.
- Time dedicated to Telephone Call is used in **Hold Timer** and **Occupation Timer** for Telephone Call, and the time becomes longer than normal time.
- A subscriber unit supporting each Telephone Call and the Telephone Interface (KTI-4) are required to use Telephone Call.
- A call cannot be made by telephone during a Group Call.
- The area of a Group Call to be called from a telephone is limited in Group Call Incoming from Telephone.

Using Speed Dial (Speed Dial)

Speed Dial is the function that enables a subscriber unit to make a call to the preconfigured telephone numbers in the NEXEDGE system by entering the speed dial number.

Speed Dial Table can be configured in **Edit > Subscriber Configuration > Speed Dial List** of SCU.

The speed dial number ranges from No. 1 to No. 255, and the telephone number can be assigned to each speed dial number.

Refer to "[Configuring the Speed Dial \(Speed Dial\)](#)" for details of **Speed Dial**.

Restricting the Telephone Numbers That Can Be Entered (Call Restriction)

Call Restriction is the function to restrict telephone numbers to be called from a subscriber unit.

This function can restrict the number of digits and area codes of the telephone number to be called from a subscriber unit. For example, long-distance calls to the telephone number with certain area codes can be restricted by using this function.

Call Restriction Table can be configured in **Edit > Subscriber Configuration > Call Restriction List** of SCU.

Refer to "[Restricting Telephone Numbers to Be Called \(Call Restriction\)](#)" for details of **Call Restriction**.

Restricting the Telephone Connection from a Subscriber Unit (Outgoing Call to Telephone Line)

Outgoing Call to Telephone Line is the function to restrict an outgoing call from a subscriber unit to a telephone line.

This function is configured to permit a Voice Call (Interconnect) from a subscriber unit to a telephone line.

Outgoing Call to Telephone Line can be configured in **Telephone of Edit > Subscriber Configuration > Class of Service > UID COS List > General (Add or Edit)** of SCU. (Refer to [Restricting an outgoing call to a telephone line \(Outgoing Call to Telephone Line\)](#).)

Using a Dedicated Telephone Line for an Incoming Call (Bi-directional Use)

Bi-directional Use is the function to restrict the connection of a subscriber unit to a telephone line.

This function is used to avoid call loss when an outgoing call collides with an incoming call on the same telephone line. The call loss caused by a rare collision between an incoming call and an outgoing call can be avoided by configuring and using a dedicated telephone line for an outgoing call and a dedicated telephone line for an incoming call. Prepare multiple telephone lines, and enable **Bi-directional Use** for the dedicated telephone line for an outgoing call and disable **Bi-directional Use** for the dedicated telephone line for an incoming call.

Bi-directional Use can be configured in **Edit > Subscriber Configuration > Device List > General (Add or Edit) > Telephone Line** of SCU. (Refer to [Restricting the Connection from a Subscriber Unit to a Telephone Line \(Bi-directional Use\)](#).)

Restricting the Call from a Telephone (Incoming Call from Telephone Line)

Incoming Call from Telephone Line is the function to restrict an incoming call from a telephone line to a subscriber unit.

Incoming Call from Telephone Line can be configured in each of GID COS, UID COS, and All Groups Call COS. Refer to each item below:

- [Restricting an incoming call from a telephone line \(Incoming Call from Telephone Line \(GID COS\)\)](#)
- [Restricting an incoming call from a telephone line \(Incoming Call from Telephone Line \(UID COS\)\)](#)
- [Restricting an incoming call from a telephone line \(Incoming Call from Telephone Line \(All Groups Call COS\)\)](#)

Restricting the Call Duration (Time-out Timer)

Time-out Timer is the maximum continuous transmission time for a subscriber unit to communicate using a Telephone Call.

The maximum continuous transmission time for a subscriber unit is instructed by an instruction message for communication allocation of a Voice Call.

The subscriber unit restricts the maximum continuous transmission time of a Voice Call up to the notified value in **Time-out Timer**.

Time-out Timer can be configured in **Edit > Subscriber Configuration > Class of Service > Telephone Call COS** of SCU. (Refer to [Restricting the Continuous Transmission Time of a Telephone Call \(Time-out Timer\)](#).)

Connecting the Group Call from a Telephone Line After the Subscriber Unit Responds (Telephone Call Auto Response)

Telephone Call Auto Response is the function to respond automatically to an incoming call from a telephone line. **Telephone Call Auto Response** can be configured in **Telephone** of **Edit > Subscriber Configuration > Class of Service > GID COS List > General (Add or Edit)** of SCU. (Refer to [Responding automatically to an incoming call from a telephone line \(Telephone Call Auto Response\)](#).)

Configuring a home system controller used for a telephone line (Home System)

Home System is the function to average the number of KTI-4 processed by each system controller in a Wide Area Network System where multiple system controllers are connected.

An Interconnect Call from a subscriber unit is transferred to a home system controller of the receiving KTI-4 after the NEXEDGE system determines a telephone line available for a home system controller of a transmitting subscriber unit. After the transferred Interconnect Call is transferred from the KTI-4 to the IP Gateway, the telephone line is connected. Therefore, configuring the system controller that manages the IP Gateway connected by KTI-4 as the home system in **Home System** is efficient.

Home System can be configured in **Edit > Subscriber Configuration > Device List > General (Add or Edit) > Telephone Line** of SCU.

Restricting an outgoing call to a telephone line (Call Restriction Table Number (Device List))

Call Restriction is the function to restrict telephone numbers to be called from a subscriber unit. (Refer to [Restricting Telephone Numbers to Be Called \(Call Restriction\)](#).)

This function can restrict the number of digits and area codes of the telephone number to be called from a subscriber unit. For example, long-distance calls to the telephone number with certain area codes can be restricted by using this function.

By configuring for each device (KTI-4), the table number of **Call Restriction Table** configured in **Edit > Subscriber Configuration > Call Restriction List** of SCU, telephone numbers to be called from a subscriber unit can be restricted. The restriction can be done for each KTI-4.

If **Call Restriction Table Number** is also configured for a Fleet, an outgoing call from a subscriber unit is restricted according to both the **Call Restriction Table** specified by the Device List and the Fleet.

Call Restriction Table Number can be configured in **Edit > Subscriber Configuration > Device List > General (Add or Edit) > Telephone Line** of SCU.

Note

- If "None" is configured in **Call Restriction Table Number**, the Call Restriction Table is not checked, and all outgoing calls are allowed.

10.10 Making a Console Call

Console Call is the function that enables connecting to a subscriber unit even from outside a wireless area by the use of an NXIP Network Interface.

Each of the following communication functions can be used:

Status Call

Status Call provides simple communications using the fixed messages. User-definable statuses (1 to 207) and Emergency Termination (226) can be sent by the user.

Remote Control

The subscriber unit can be controlled from an IP Console. The following functions are available:

- Remote Stun
- Remote Revive
- Remote Kill

Short Data Call

Text data (a maximum of 100 digits) can be transmitted and received. The following functions are available by the original extensions using User Data Area:

- AUX Status Request
- GPS Data Request
- ESN Data Request
- Remote Regrouping
- Transparent

Voice Call

The following voice communications are available:

- Group Call
- Individual Call

Data Call

Data of a maximum of 4,096 digits, such as data and images, can be transmitted and received. The following functions are available:

- Long Data Call
- Transparent

To use an IP console, the IP console needs to be connected to a NEXEDGE system via an IP Gateway server. (Refer to [Connection to External Devices](#).)

Codec conversion of the voice data

When a voice call is initiated from a transceiver to an IP console, the IP Gateway server can convert AMBE+2™ voice data to G.711 (PCMU/PCMA) voice data and send the data to the IP console.

When a voice call is initiated from an IP console to a transceiver, the IP Gateway server can convert G.711 (PCMU/PCMA) voice data to AMBE+2™ voice data and send the data to the transceiver.

Note

- NXIP Console Interface is the interface specifications defined for directly connecting an IP console to a Conventional IP Network/ NXDN Type-C Trunking system. If you wish to develop an original device by using the NXIP Console Interface, contact technical staff at KENWOOD.
- Group Registration needs to be executed in a NEXEDGE system for an IP console to receive a Group Call from the NEXEDGE system.
- In Group Registration from an IP console, multiple GIDs can be registered in a NEXEDGE system at the same time.

10.11 Making an Emergency Call

Emergency Call is used to prioritize a call from a party in an emergency situation. If an Emergency Call request is received from the subscriber unit, a traffic channel is allocated with the highest priority in a NEXEDGE system. However, a traffic channel cannot be immediately allocated if all traffic channels are busy in the NEXEDGE system. In this case, the call having the lowest priority is disconnected and the traffic channel is allocated to the Emergency Call in the NEXEDGE system.

Note

- How a channel is allocated varies depending on the configuration in **Queue Level**. (Refer to [About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use \(Queue\)](#).)

The NEXEDGE 2nd Generation system allows the use of a dedicated channel (GPS Report Channel) for sending GPS data from a subscriber unit. For subscriber units that make use of GPS, the use of a GPS Report Channel helps to increase the number of subscriber units that a system can accommodate compared to the conventional method of transmission (ShortData/ LongData).

Note

- To handle GPS data using a GPS Report Channel, a subscriber unit (transceiver) that is equipped with a firmware that supports GPS Report Channel as well as an AVL application (PC) are required.

11.1 Using GPS Report Channel for Sending GPS Data

By using a GPS Report Channel, the subscriber unit is able to send out GPS data at the timing specified by the NEXEDGE system without going through the control channel. In this case, the subscriber unit makes use of the slot allocated by the GPS Report Channel to send the GPS data.

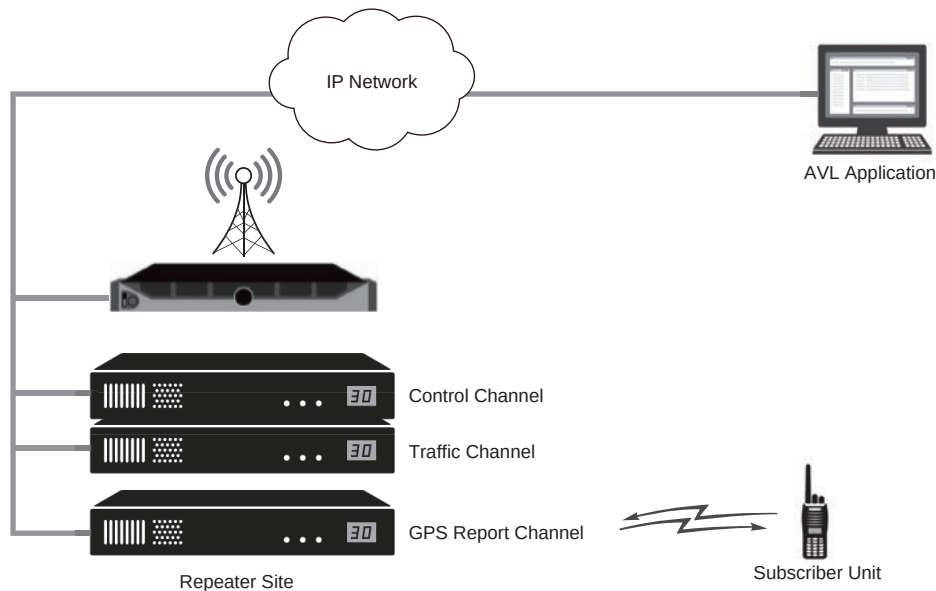


Figure 11-1 Overview of GPS Report Channel

Traffic load on the control channel can be reduced when a subscriber unit sends out GPS data by using a GPS Report Channel.

The interval for the subscriber unit to send out GPS data on the NEXEDGE system by Fleet or by UID can also be configured. For subscriber units that need to refresh the GPS data frequently (e.g., police and emergency uses), a short interval for sending out the GPS data can be configured.

When sending GPS data by using a GPS Report Channel, the behaviors of the NEXEDGE system and subscriber unit are as follows:

- 1) When registration is complete, the subscriber unit sends out a GPS slot allocation request message on the control channel to the NEXEDGE system.
- 2) The NEXEDGE checks the GPS data transmission configuration on the subscriber unit, and allocates the timing for sending out GPS data from the subscriber unit to a GPS Report Channel. Next, it returns a GPS slot designation message that is added with the GPS Report Channel allocation information to the subscriber unit. The subscriber unit retains the information specified in the GPS slot designation message that it has received, and makes use of this information when sending out GPS data using a GPS Report Channel.
- 3) The NEXEDGE system sends out notifications on the operation information of the GPS Report Channel that is enabled on a control channel.

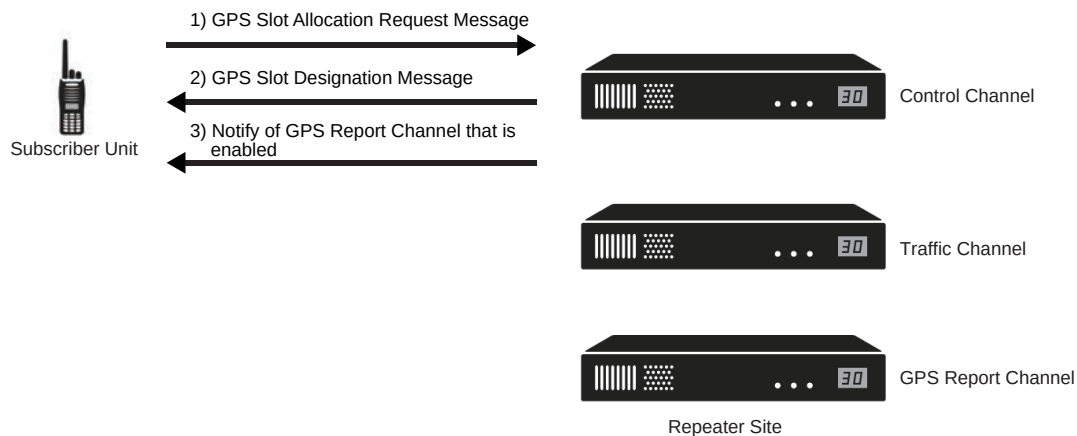


Figure 11-2 Behavior of NEXEDGE System and Subscriber Unit (1)

- 4) The subscriber unit moves to the designated GPS Report Channel, acquires information on the frame number that supports the current GPS data transmission, and returns to the control channel.

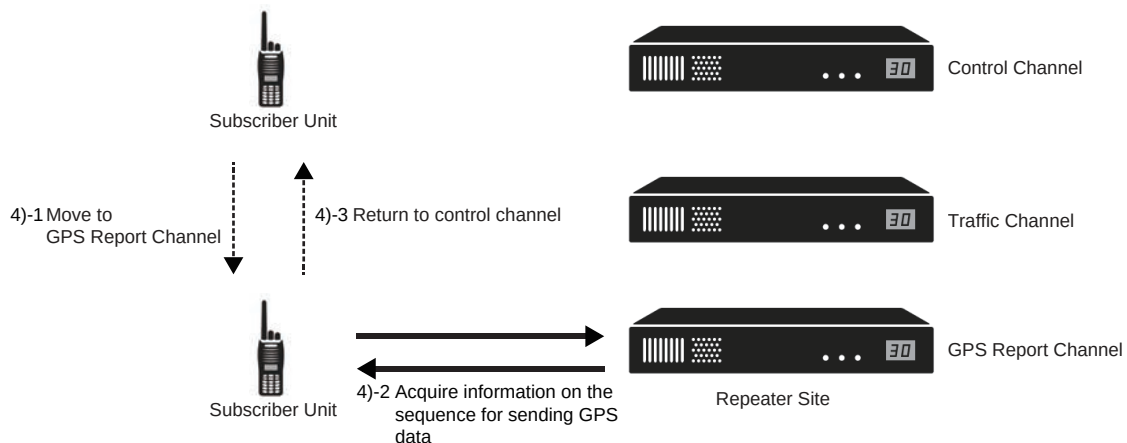


Figure 11-3 Behavior of NEXEDGE System and Subscriber Unit (2)

- 5) The subscriber unit moves to the GPS Report Channel immediately before its turn to send data according to the sequence specified in the GPS slot designation message.
- 6) After the subscriber unit confirms the timing allocated for sending the GPS data that is specified in the GPS slot designation message, it sends out the GPS data on the GPS Report Channel at the said timing.
- 7) After transmission of the GPS data is complete, the subscriber unit returns to the control channel.

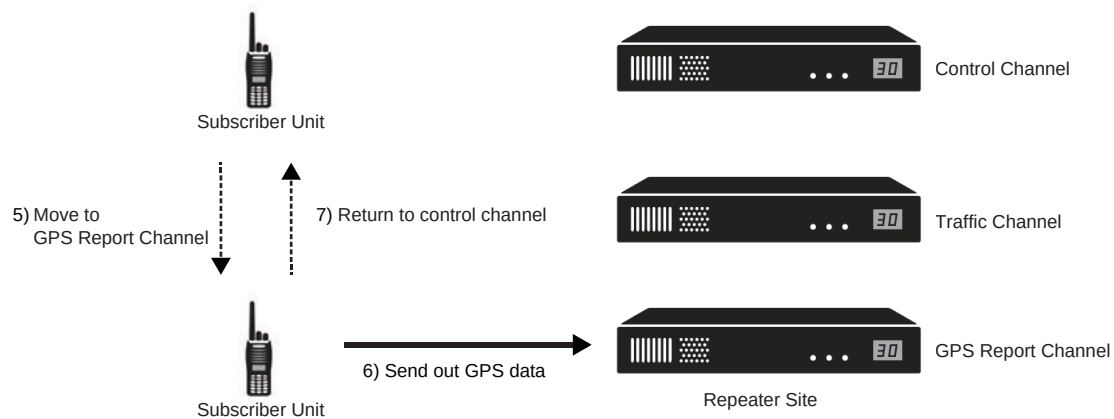


Figure 11-4 Behavior of NEXEDGE System and Subscriber Unit (3)

- 8) The NEXEDGE system makes use of the GPS Report Channel to send out GPS messages received from a subscriber unit to the designated AVL application (PC) via the IP network.

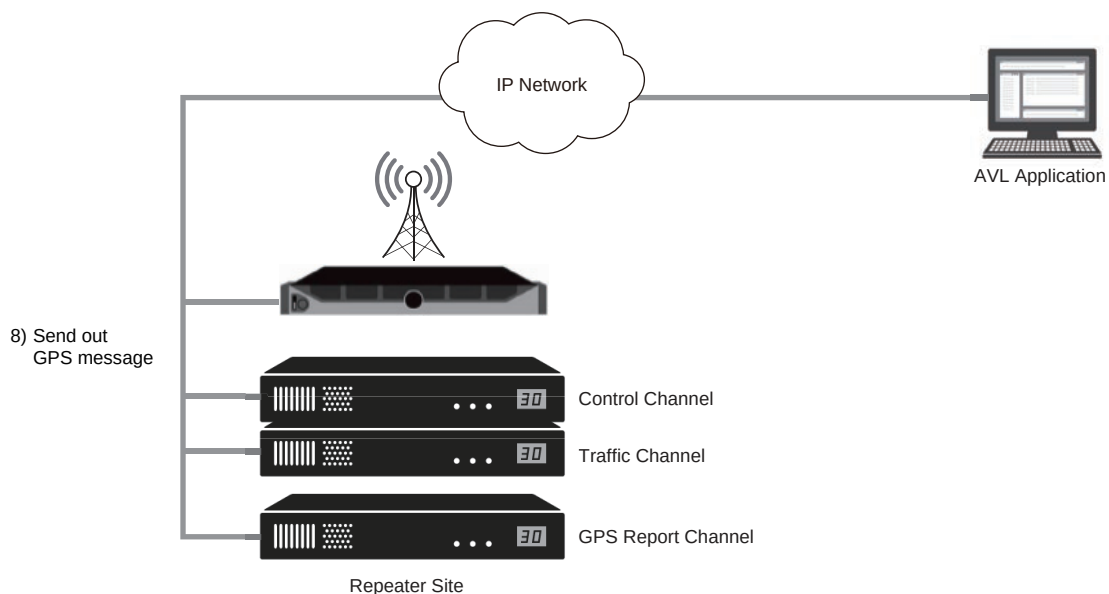


Figure 11-5 Behavior of NEXEDGE System and Subscriber Unit (4)

About GPS Data, GPS Message and GPS Slot

● GPS Data

GPS data refers to the location information that is used in the subscriber unit based on information received from a GPS satellite. The length of the GPS data is determined by the configuration of **GPS Data Format**.

● GPS Message

GPS message refers to data transmitted on the air from the subscriber unit with information such as the UID of a subscriber unit, GPS destination and encryption added. The interval for sending out GPS messages is determined by the configuration of **GPS Report Interval**.

● GPS Slot

GPS slot refers to the aggregation of continuous NXDN frames that is used for sending out a GPS message on a GPS Report Channel. One GPS message can be sent from each of the GPS slots.

GPS Report Channel allocates three continuous frames as a GPS slot.

Two continuous frames can be allocated as a GPS slot under the following conditions:

- Only GPS data in the Very Short (unencrypted) **GPS Report Format** can be stored in a GPS message and sent.
- Only a subscriber unit with the same system code as that of the NEXEDGE system can make use of GPS Report Channel to send out GPS data.

The interval for sending out a GPS message using a GPS Report Channel is 384 sec.

For the NXDN Common Air Interface, the length of one frame in the Narrow channel spacing (12.5 kHz) is 40 ms, and the length of one frame in the Very Narrow (6.25 kHz) channel spacing is 80 ms.

The number of frames required for one cycle of the GPS Report Channel is calculated as follows:

- Narrow (12.5 kHz): $384 \text{ sec} \div 40 \text{ ms} = 9,600 \text{ frames}$
- Very Narrow (6.25 kHz): $384 \text{ sec} \div 80 \text{ ms} = 4,800 \text{ frames}$

Behavior When Using the GPS Report Channel

- When the NEXEDGE system receives a GPS slot allocation request message from a subscriber unit that is configured not to use a GPS Report Channel, the NEXEDGE system will return a GPS slot designation message indicating that allocated is denied to the subscriber unit.
- As with GPS message transmission by using a Short Data Call or Long Data Call, other calls cannot be received while the subscriber unit is sending a GPS message by using a GPS Report Channel.
- The subscriber unit is unable to send out GPS data while a behavior such as voice communication is executed.
- If there is no allocatable GPS slot for an allocated GPS Report Channel, the NEXEDGE system acquires a new GPS Report Channel and allocates a GPS slot to the subscriber unit. If a new GPS Report Channel cannot be acquired, a GPS slot cannot be allocated to the subscriber unit.
- In the event that a subscriber unit did not send out any GPS message for a certain period of time with the specified GPS Report Channel, the NEXEDGE system will cancel the GPS slot that is allocated to the subscriber unit from the GPS Report Channel. This canceled GPS slot of the GPS Report Channel can be reallocated to another subscriber unit.
- A traffic channel can be allocated to the GPS Report Channel if the traffic channel is not allocated to the other free channels. Information that has been allocated to the GPS Report Channel will be retained even while it functions as a traffic channel. However, the subscriber unit is unable to send out a GPS message while the GPS Report Channel functions as a traffic channel.
- **Channel Allocation** allows you to acquire a dedicated channel as the GPS Report Channel. When a dedicated channel has been acquired, a traffic channel cannot be allocated to the GPS Report Channel. In other words, the GPS Report Channel can be used as a dedicated channel for sending GPS messages only. (Refer to [Allocating a Traffic Channel for a Specific Call \(Channel Allocation\)](#).)
- Information such as CW-ID (analog) and Station ID can also be configured in a channel that is allocated with a GPS Report Channel. These will have priority over the transmission of GPS messages. The allocation status of the GPS Report Channel will be retained even while sending the CW-ID (analog) or Station ID. However, the subscriber unit is unable to send out a GPS message while the GPS Report Channel functions as a CW-ID (analog) or Station ID.
- Normally, channels that are allocated with a GPS Report Channel will not function as a control channel. However, in cases such as breakdown of the repeater where no other channels can be used as a control channel, allocation of the GPS Report Channel will be canceled for it to function as a control channel.
- GPS Report Channel is not usable for **Non-dedicated Control Channel** sites with only one channel. (Refer to [Using a Control Channel as a Traffic Channel \(Non-dedicated Control Channel\)](#).)
- If the subscriber unit cannot transmit by using the specified GPS slot of the GPS Report Channel, the subscriber unit transmits by using the next specified GPS slot.
- For a subscriber unit that frequently transmits and receives audio, the failure of sending a GPS message becomes more frequent because voice communications may be executing during the period of the specified GPS slot of the GPS Report Channel.
- If the NEXEDGE system cancels the GPS slot allocation of a GPS Report Channel, the NEXEDGE system does not allocate a GPS slot to the subscriber unit until the NEXEDGE system receives a GPS slot allocation request message again from the subscriber unit.

11.2 Various GPS Configurations

To send a GPS message by using a GPS Report Channel, it is necessary to configure the various configurations related to the NEXEDGE system, site and channel by using SCU. Also, it is necessary to configure whether a subscriber unit is able to use a GPS Report Channel for each Fleet or UID.

- **Channel configuration**

For configuring the GPS Report Channel allocation conditions for each channel.

→ [Configuring the GPS Report Channel Allocation Conditions \(GPS Report Channel\)](#)

- **NEXEDGE system configuration**

For configuring the configurations for making use of GPS Report Channel on the NEXEDGE system.

→ [GPS Configurations \(GPS Report Channel \(System\)\)](#)

- **Site configuration**

For configuring the GPS Report Channel allocation conditions for each site.

→ [GPS Configurations \(GPS Report Channel Parameters \(Site\)\)](#)

- **Fleet configuration (GPS Report Interval)**

For configuring the interval for sending out GPS messages by a subscriber unit on a GPS Report Channel according to each Fleet.

→ [Configuring the Interval for Sending GPS Messages \(GPS Report Interval\)](#)

- **UID configuration (GPS Report Interval)**

For configuring the interval for sending out GPS messages by a subscriber unit on a GPS Report Channel according to each UID.

→ [Configuring the Interval for Sending GPS Messages \(GPS Report Interval\)](#)

- **Fleet configuration (GPS Report Format)**

For configuring whether to enable the use of GPS Report Channel, and also the GPS format for each Fleet if used.

→ [Specifying a GPS Format for Sending Using a GPS Report Channel \(GPS Report Format\)](#)

- **UID configuration (GPS Report Format)**

For configuring whether to enable the use of GPS Report Channel, and also the GPS format for each UID if used.

→ [Specifying a GPS Format for Sending Using a GPS Report Channel \(GPS Report Format\)](#)

11.3 Configuring the GPS Report Channel Allocation Conditions (GPS Report Channel)

The allocation conditions of the GPS Report Channel can be configured for each channel in **Edit > System List > Site List > Channel List > General > Channel Information** of SCU.



Figure 11-6 Channel Information

GPS Report Channel is used to configure whether to enable allocation of a channel as a GPS Report Channel when “Traffic Channel” or “Dual-Functional Channel” is configured in **Channel Mode**. (Refer to [Configuring the usage mode of a channel \(Channel Mode\)](#).)

Channels for which **GPS Report Channel** is enabled (Traffic Channel or Dual-Functional Channel) can be allocated as a GPS Report Channel.

Click the “Save” button to save after configuration is complete.

Note

- When “Control Channel” is configured in **Channel Mode**, the channel cannot be allocated as a **GPS Report Channel**, and the **GPS Report Channel** configurations will not be applied.
- The Dual-Functional Channel that is allocated as a GPS Report Channel cannot be allocated as a control channel. However, in cases such as breakdown of the repeater where no other Dual-Functional Channels can be used as a control channel, allocation of the GPS Report Channel will be canceled for it to function as a control channel.

11.4

GPS Configurations (GPS Report Channel (System))

The parameters for the various functions related to the sending and receiving of GPS messages can be configured in **Edit > System Configuration > General > GPS Report Channel** of SCU.

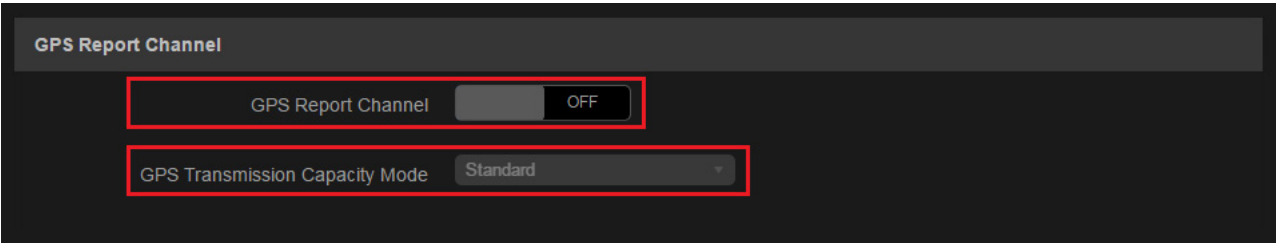


Figure 11-7 GPS Report Channel (System)

Click the “Save” button to save after configuration is complete.

Configuring Whether to Use the GPS Report Channel (GPS Report Channel)

GPS Report Channel is a configuration to specify whether to use a dedicated channel (GPS Report Channel) for sending GPS messages from the NEXEDGE system. (Refer to [Using GPS Report Channel for Sending GPS Data.](#))

Configuring the Transmission Mode on the GPS Report Channel (GPS Transmission Capacity Mode)

GPS Transmission Capacity Mode is a configuration for specifying the number of continuous frames to be allocated to the GPS slot for storing the GPS message on the GPS Report Channel.

GPS Transmission Capacity Mode offers two transmission modes: “Standard” is the standard mode, while “Compact” has a greater capacity for storing the GPS message.

Table 11-1 Configuration of GPS Transmission Capacity Mode

Configuration	Description
Standard	Standard transmission mode of the GPS Report Channel with three frames allocated to the GPS slots at a time.
Compact	Transmission mode of the GPS Report Channel with two frames allocated to the GPS slots at a time. Because the size of the message that can be sent is smaller, the GPS data to be sent is restricted, but the storage capacity becomes higher. Only a subscriber unit with the same system code as that of the NEXEDGE system can make use of GPS Report Channel to send out GPS data. The subscriber unit also uses unencrypted GPS messages and is only able to send GPS data in the Very Short format.

Theoretical maximum number of GPS messages that can be accommodated

The theoretical maximum number of GPS messages that a GPS Report Channel can accommodate in the interval time of 384 sec is determined as follows according to the configurations of **GPS Transmission Capacity Mode** and **Channel Spacing**.

Table 11-2 Theoretical maximum number of GPS messages that a GPS Report Channel can accommodate in the interval time of 384 sec

GPS Transmission Capacity Mode	Narrow (12.5 kHz)	Very Narrow (6.25 kHz)
Standard	3,200	1,600
Compact	4,800	2,400

Note

- 384 sec is the maximum value for the cycle for a subscriber unit to send out GPS messages. (Refer to [Configuring the Interval for Sending GPS Messages \(GPS Report Interval\)](#).)
- **GPS Transmission Capacity Mode** cannot be altered for each GPS Report Channel.
- For normal use, "Standard" is recommended.
- If a roaming system is to be operated, or if encrypted communication is to be executed, use "Standard".

11.5 GPS Configurations (GPS Report Channel Parameters (Site))

The conditions for allocating the GPS Report Channel can be configured for each site in **Edit > System List > Site List > General (Add or Edit) > GPS Report Channel Parameters (Site)** of SCU. The number of channels and operating subscriber units vary with each site, so the conditions for allocating the GPS Report Channel can be configured according to the channel composition as well as the number of operating subscriber units in each site.

Figure 11-8 GPS Report Channel Parameters (Site)

Click the "Save" button to save after configuration is complete.

Configuring the Maximum Number of Allocatable GPS Report Channels (Maximum Report Channel Number)

Maximum Report Channel Number refers to the maximum number of GPS Report Channels that can be allocated for each site.

The maximum configuration value of **Maximum Report Channel Number** will vary according to the number of GPS slot allocation request messages from the subscriber unit.

The maximum configurable number of GPS Report Channels varies between the cases in which a dedicated site controller is in use and the case in which the repeater functions also as a site controller.

Table 11-3 Configuration of Maximum Report Channel Number

Configuration	Description
0	GPS Report Channel cannot be allocated to this Site.
1 to 8	When a dedicated site controller is in use, the maximum number of GPS Report Channels can be configured to a value between 1 and 8.
1 to 2	When a repeater functions also as a site controller, the maximum number of GPS Report Channels can be configured to a value between 1 and 2.

 Note

- **Maximum Report Channel Number** is the theoretical maximum number of GPS Report Channels. The number of GPS Report Channels may increase further when there are other channels that can be allocated.
- GPS Report Channels cannot be allocated if there are no channels that are allocatable.

Configuring the GPS Transmission Occupancy Rate within the 384-sec Interval (Transmission Occupancy Rate)

Transmission Occupancy Rate is the rate for permitting GPS transmission on the GPS Report Channel within the interval time of 384 sec.

The rate for permitting GPS transmission on the GPS Report Channel can be configured to one of the eight levels below.

12.5 %, 25 %, 37.5 %, 50 %, 62.5 %, 75 %, 87.5 %, 100 %

When 100 % is selected, the GPS Report Channel can be used at all times.

Before transmission starts on a GPS Report Channel, ensure that the frequency to be used for GPS transmission is not currently in use.

If the use of the frequency to be used for GPS transmission by another party is detected, all GPS transmissions from the subscriber unit on the GPS Report Channel are stopped during the next interval time.

The estimated durations for permitting and stopping GPS transmission are as follows:

Table 11-4 Estimated Durations for Permitting and Stopping GPS Transmission

Transmission Occupancy Rate	Duration for Permitting GPS Transmission	Duration for Stopping GPS Transmission
100 %	384 sec	0 sec
87.5 %	336 sec	48 sec
75 %	288 sec	96 sec
62.5 %	240 sec	144 sec
50 %	192 sec	192 sec
37.5 %	144 sec	240 sec
25 %	96 sec	288 sec
12.5 %	48 sec	336 sec

Maximum number of GPS messages that can be accommodated

The maximum number of GPS messages that each GPS Report Channel can accommodate is calculated from **Transmission Occupancy Rate**.

Channel Spacing: Very Narrow (6.25 kHz)

GPS Transmission Capacity Mode: Standard

For example, for the configurations above, the maximum number of GPS messages that a GPS Report Channel can accommodate within the interval time of 384 sec is 1,600. (Refer to [Theoretical maximum number of GPS messages that can be accommodated](#).)

In this case, the maximum number of GPS messages that can be accommodated can be calculated as follows:

Table 11-5 Maximum Number of GPS Messages that can be Accommodated

Transmission Occupancy Rate	Maximum Number of GPS Messages that can be Accommodated in the Interval Time of 384 Sec
100 %	1,600
87.5 %	1,400
75 %	1,200
62.5 %	1,000
50 %	800
37.5 %	600
25 %	400
12.5 %	200

Note

- When **GPS Report Interval** is configured to a value other than 384 sec, the subscriber unit sends out a GPS message for multiple times within one cycle of the interval time. For this reason, the NEXEDGE system needs to allocate the timing for sending GPS messages for a multiple number of times within one cycle of the interval time. Also, it may not be possible to accommodate the number of subscriber units as calculated depending on the **Transmission Occupancy Rate** as well as the sequence of the allocation request for the GPS Report Channel from the subscriber unit.
- Transmission Occupancy Rate** can be configured separately for each site. However, Transmission Occupancy Rate cannot be configured for each channel.
- The subscriber unit is unable to send GPS data when the transmission is stopped by the **Transmission Occupancy Rate** function. However, the interval for sending GPS messages as specified in **GPS Report Interval** will be retained.

Configuring the GPS Report Channel Allocation Time (Rollover Interval Timer)

Rollover Interval Timer is the time that a GPS Report Channel can be allocated continuously to one channel. The GPS Report Channel will switch automatically according to the time configured in **Rollover Interval Timer**.

Table 11-6 Configuration of Rollover Interval Timer

Configuration	Description
OFF	Rollover Interval Timer does not function.
1 to 24	The time for allocating a GPS Report Channel continuously can be configured. After the specified duration has elapsed, the GPS Report Channel will switch automatically. Only the channel number of GPS Report Channel switches. Information allocated to the GPS Report Channel will be retained.

Note

- The GPS Report Channel will not switch if there is no available destination to switch to.
- During the process of switching, the GPS Report Channel is temporarily allocated to both the source and the destination channel.

Display on the Maximum Number of Available GPS Report Channels (Maximum Available Channel Number)

Maximum Available Channel Number displays the maximum number of channels that can be used as a GPS Report Channel under the current configurations of the site. However, this is not a guaranteed value during actual operation. Please use it as a reference value.

11.6 Configuring the Interval for Sending GPS Messages (GPS Report Interval)

GPS Report Interval is the interval for a subscriber unit that supports the GPS Report Channel to send GPS messages using the GPS Report Channel.

GPS Report Interval can be configured to any of the following values: 24 sec, 48 sec, 96 sec, 192 sec, 384 sec.

The subscriber unit automatically sends a GPS message according to the interval time specified by the NEXEDGE system.

- Shortening the interval time for sending a GPS message increases the frequency for refreshing the GPS data. The number of GPS message transmissions sent out by a subscriber unit also increases as a result.
- Lengthening the interval time for sending a GPS message decreases the frequency for refreshing the GPS data. The number of GPS message transmissions sent out by a subscriber unit also decreases as a result.

GPS Report Interval can be configured for each Fleet or UID.

● GPS Report Interval (Fleet)

GPS Report Interval can be configured for each Fleet in **Edit > Subscriber Configuration > Fleet List > General (Add or Edit)** of SCU.

Configuring an individual **GPS Report Interval** for each Fleet allows a specific Fleet to behave differently from the other Fleets.



Figure 11-9 GPS Report Interval (Fleet)

● GPS Report Interval (UID)

GPS Report Interval can be configured for each UID in **Edit > Subscriber Configuration > Fleet List > UID List > General (Add or Edit)** of SCU.

GPS Report Interval can be configured as the default of the whole Fleet in **GPS Report Interval (Fleet)**, but configuring individual **GPS Report Interval (UID)** for the UID registered in each Fleet allows a specific UID to behave differently from the other UIDs.



Figure 11-10 GPS Report Interval (UID)

Note

- “Default” can be configured in **GPS Report Interval** of UID. If “Default” is configured, the configuration of the **GPS Report Interval** for the Fleet is applied.
- To increase the number of UIDs that can be accommodated in a GPS Report Channel, lengthen the interval in **GPS Report Interval**.
- **GPS Report Interval** in the Roaming System functions by using the value in the Home System.

Number of GPS Messages that can be Sent in Each Interval Time

The number of times a GPS message is sent out by a subscriber unit in 384 sec in the respective interval times are as follows:

Table 11-7 Number of GPS Messages that can be Sent in 384 Sec

GPS Report Interval	Number of GPS Messages that are Sent in 384 Sec
24 sec	16
48 sec	8
96 sec	4
192 sec	2
384 sec	1

Number of Subscriber Units that Each GPS Report Channel can Accommodate

When all the subscriber units have the same transmission interval time

When all the subscriber units have the same transmission interval time, the number of subscriber units that a GPS Report Channel can accommodate are as follows:

Table 11-8 Number of Subscriber Units that Each GPS Report Channel can Accommodate

Channel Spacing	GPS Transmission Capacity Mode	Theoretical Maximum Number of GPS Messages that can be Accommodated	Number of Subscriber Units that Each GPS Report Channel can Accommodate				
			24 sec	48 sec	96 sec	192 sec	384 sec
Narrow	Compact	4,800	300	600	1,200	2,400	4,800
Narrow	Standard	3,200	200	400	800	1,600	3,200
Very Narrow	Compact	2,400	150	300	600	1,200	2,400
Very Narrow	Standard	1,600	100	200	400	800	1,600

When there are multiple transmission intervals

When there are multiple transmission intervals, the number of subscriber units that a GPS Report Channel can accommodate can be calculated from the respective number of GPS messages as follows:

- Theoretical maximum number of GPS messages that can be accommodated (Refer to [Theoretical maximum number of GPS messages that can be accommodated.](#))
- Number of GPS messages that can be sent in each interval time (Refer to [Number of GPS Messages that can be Sent in Each Interval Time.](#))

For example, for a NEXEDGE system with the following configurations and 100 subscriber units running at an interval time of 24 sec, the following is a calculation of the number of remaining subscriber units that can run within the 384-sec interval:

Channel Spacing: Very Narrow (6.25 kHz)

GPS Transmission Capacity Mode: Compact

The respective number of GPS messages required for calculation are as follows:

Theoretical maximum number of GPS messages that can be accommodated: 2,400

Number of GPS messages that is sent in a 24-sec interval: 16

Number of GPS messages that is sent in a 384-sec interval: 1

- 1) To calculate the number of GPS messages that can be allocated to 100 subscriber units in a 24-sec interval:
 $16 \text{ (number of GPS messages that is sent in a 24-sec interval)} \times 100 = 1,600$
- 2) To calculate the number of GPS messages other than those allocated with the 24-sec interval:
 $2,400 \text{ (theoretical maximum number of GPS messages that can be accommodated)} - 1,600 \text{ (value in 1)} = 800$
- 3) To calculate the remaining number of subscriber units that can run in the 384-sec interval:
 $800 \div 1 \text{ (number of 384-sec interval messages)} = 800$

In other words, a GPS Report Channel can accommodate up to 100 subscriber units with a 24-sec interval and 800 subscriber units with a 384-sec interval.

Note

- If **GPS Report Interval** is configured to a value other than 384 sec, the NEXEDGE system needs to allocate the timing for sending GPS messages for a multiple number of times within one cycle of the interval time. As such, it may not be possible to accommodate the number of subscriber units as calculated depending on the sequence of the allocation request for the GPS Report Channel from the subscriber unit.

11.7

Specifying a GPS Format for Sending Using a GPS Report Channel (GPS Report Format)

GPS Report Format is the function to specify the GPS format to be used when a subscriber unit sends GPS messages using the GPS Report Channel.

GPS Report Format can be configured for each Fleet or UID.

- **GPS Report Format (Fleet)**
GPS Report Format can be configured for each Fleet in **Edit > Subscriber Configuration > Fleet List > General (Add or Edit)** of SCU.
Configuring an individual **GPS Report Format** for each Fleet allows a specific Fleet to behave differently from the other Fleets.



Figure 11-11 GPS Report Format (Fleet)

Table 11-9 Configuration of GPS Report Format (Fleet)

Configuration	Description
None	The NEXEDGE system does not allocate a GPS Report Channel to the subscriber unit.
Short	The NEXEDGE system allocates a GPS Report Channel to the subscriber unit. GPS messages are sent to the subscriber unit in the Short format.
Very Short	The NEXEDGE system allocates a GPS Report Channel to the subscriber unit. GPS messages are sent to the subscriber unit in the Very Short format.

- Note
- For a NEXEDGE system with “Compact” configured in **GPS Transmission Capacity Mode**, a GPS slot will not be allocated to subscriber units that are configured to the Short format. (Refer to [Configuring the Transmission Mode on the GPS Report Channel \(GPS Transmission Capacity Mode\)](#).)
 - Whether transmission is encrypted or not depends on the configuration of the subscriber unit that sends out the GPS message.
 - The IP console that receives the GPS message needs to support the format of the specified GPS data.

● GPS Report Format (UID)

GPS Report Format can be configured for each UID in **Edit > Subscriber Configuration > Fleet List > UID List > General (Add or Edit)** of SCU.

GPS Report Format can be configured as the default of the whole Fleet in **GPS Report Format (Fleet)**, but configuring individual **GPS Report Format (UID)** for the UID registered in each Fleet allows a specific UID to behave differently from the other UIDs.



Figure 11-12 GPS Report Format (UID)

Table 11-10 Configuration of GPS Report Format (UID)

Configuration	Description
Default	Behaves according to the configuration in GPS Report Format of a Fleet.
None	The NEXEDGE system does not allocate a GPS Report Channel to the subscriber unit.
Short	The NEXEDGE system allocates a GPS Report Channel to the subscriber unit. GPS messages are sent to the subscriber unit in the Short format.
Very Short	The NEXEDGE system allocates a GPS Report Channel to the subscriber unit. GPS messages are sent to the subscriber unit in the Very Short format.

Note

- For a NEXEDGE system with “Compact” configured in **GPS Transmission Capacity Mode**, a GPS slot will not be allocated to subscriber units that are configured to the Short format. (Refer to [Configuring the Transmission Mode on the GPS Report Channel \(GPS Transmission Capacity Mode\)](#).)
- Whether transmission is encrypted or not depends on the configuration of the subscriber unit that sends out the GPS message.
- If a GPS Report Channel is available in the Roaming System, the system and the subscriber units behave with the GPS slot allocated.
- **GPS Report Format** in the Roaming System functions by using the value in the Home System.

A multi-system is the system that interconnects multiple systems of different system information (Network Category/ System Code) by using an IP network via the roaming gateway.

By connecting systems of different system information, a subscriber unit that belongs to the own system can be used in the other system, and a subscriber unit that belongs to the other system can be used in the own system.

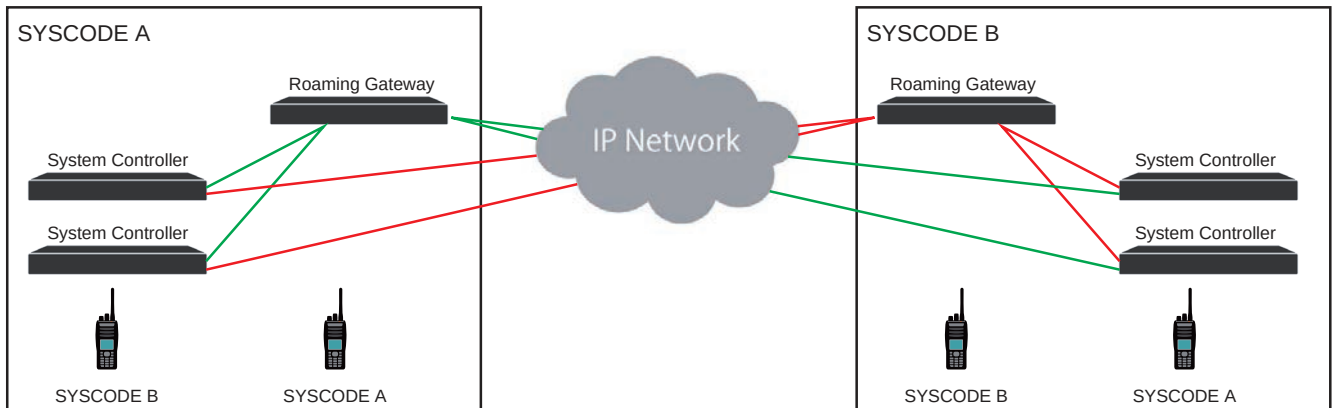


Figure 12-1 Multi-System Roaming

The diagram above is an example of when 2 systems are connected and a subscriber unit that belongs to the other system is made available in each system. In this case, the SCU configuration for using the other system and the SCU configuration for the other system to use the own system are required for both systems. A roaming gateway is installed for each system (each Network Category/ System Code).

A roaming gateway is connected to a system controller in the own system and a system controller in the other system. A roaming gateway can be connected to a maximum of 24 system controllers (including a system controller in the own system). Also, whether to connect to a roaming gateway can be configured for each system controller by using SCU.

Note

- The firmware of a roaming gateway is included in the firmware file in the same manner as the firmware of other devices such as system controllers. If the firmware is updated, the firmware of the roaming gateway in the own system is automatically updated. (Refer to [Updating Various Firming](#).)

12.1 About the SCU Configuration

The SCU configuration is independent between systems; however in a system used from the other system (Roaming System), the parameters that determine the system behaviors related to registration and calls basically correspond to the configuration of the system to which a subscriber unit of the other system belongs (Home System). This prevents a situation in which a subscriber unit cannot basically behave because the SCU configurations are different among systems. However, for the functions that affect the resources of the system (such as **Registration Site Restriction** and **Late Entry**), the functions that are allowed or not allowed to be used by a subscriber unit of the other system can be configured by using SCU.

Refer to “[About the SCU Configuration That Behaves on the Roaming System](#)” for details on which SCU configuration the subscriber unit of the other system corresponds to in order to behave, the SCU configuration of the Home System or the SCU configuration of the Roaming System.

Configuration of the COS to Be Used by a Subscriber Unit of the Other System (Guest Class of Service)

Guest Class of Service (hereafter Class of Service is referred to as “COS”) is the function to pattern and consolidate the service function usage restrictions of a subscriber unit of the other system as a class.

For instance, creating a COS where only voice communication is enabled, creating a COS where both data communication and voice communication are enabled, and configuring a COS for each system according to the purpose of use of a user in the other system restricts available services per the system to which a subscriber unit belongs.

By using this function, billing plans and various options can be configured.

There are 2 types of COS: primary COS and secondary COS.

- **Primary COS**

Primary COS is applied when a NEXEDGE system functions normally.

- **Secondary COS**

Secondary COS is applied to a subscriber unit of the other system that exists in the own system when the network connection between the own system and the other system is disconnected or when in Site Trunking mode. In this case, the site accepts communication requests within the range permitted by secondary COS.

Registration of a Subscriber Unit of the Other System

In a system, a COS which defines the functions that allow UIDs and GIDs of the other system to use the system is configured.

The following primary COS required for basic behaviors are configured:

- Guest GID COS
→ [Configuring a Guest GID COS](#)
- Guest UID COS
→ [Configuring a Guest UID COS](#)

Also, the following secondary COS are configured in consideration to cases such as when the network connection between the own system and the other system is disconnected:

- Secondary Guest GID COS
→ [Configuring a Secondary Guest GID COS](#)
- Secondary Guest UID COS
→ [Configuring a Secondary Guest UID COS](#)

12.2 Enabling the Multi-system (Multi-System)

Configuring “ON” in **Multi-System** of **Edit > System List > General (Add or Edit) > System Information** of SCU enables the multi-system.

In a system with **Multi-System** enabled, an outgoing call to the other system and an incoming call from the other system are available in various communications such as Voice Calls.

The screenshot shows the NEXEDGE web interface. On the left is a sidebar with navigation links: Home, Information, System Key File, System Configuration, System List, System List, General (Edit), Network, Site List, IP Gateway List, Subscriber Configuration, and Multi-System Configuration. The main content area is titled 'Edit > System List > System Number1:General (Edit)'. Below this is the 'System Information' section. It contains several fields: 'System Number' (1), 'Valid' (ON), 'System Name' (System-1), 'Main IP Address' (172.16.0.65), 'Sub IP Address' (empty), 'Multi-System' (ON), and 'Channel Table Number' (General). The 'Multi-System' toggle is highlighted with a red box. At the bottom, there are three buttons: 'Save' (highlighted with a red box), 'Cancel', and 'Back'.

Figure 12-2 System Information

After configuration, click the “Save” button to save.

12.3 Specifying a System for Creating Control Channel Information (Adjacent Control Channels > System)

Adjacent Control Channels is the function that induces a subscriber unit to use a control channel providing better receiving conditions by sending a Broadcast Message notifying the subscriber unit of the control channel information of adjacent sites. (Refer to [Configuring a Site Number of Adjacent Sites to Be Used for Notifying Control Channel Information \(Adjacent Control Channels\)](#).)

Whether to create control channel information based on the system information of the own system or the system information of the other system can be configured in **System of Edit > System List > Site List > Adjacency > Adjacent Control Channels** of SCU.

Figure 12-3 Adjacent Control Channels

Table 12-1 Adjacent Control Channels > System

Item	Description
Own System	Creates control channel information based on the system information of the own system.
System Name 1 to System Name 23	Creates control channel information based on the system information of the other system. Select a system from the systems configured in Multi-System List . (Refer to Registering the System to Be Connected via a Roaming Gateway (Multi-System List) .)

Click the “Save” button to save after configuration.

Note

- If “Direct Frequency Assignment” is configured in **Channel Announcement**, only the sites using the Channel Table whose Base Frequency and Channel Step match the Base Frequency and Channel Step of the Channel Table for own site can be selected.

12.4 Configuring a Guest GID COS

A Guest GID COS is a COS which defines the available functions for GIDs of the other system that use the own system.

Clicking the “Add” button in **Edit > Multi-System Configuration > Guest Class of Service > Guest GID COS List** displays **General (Add)**, and a new Guest GID COS can be created. A maximum of 23 Guest GID COS can be configured in **Guest GID COS List**.

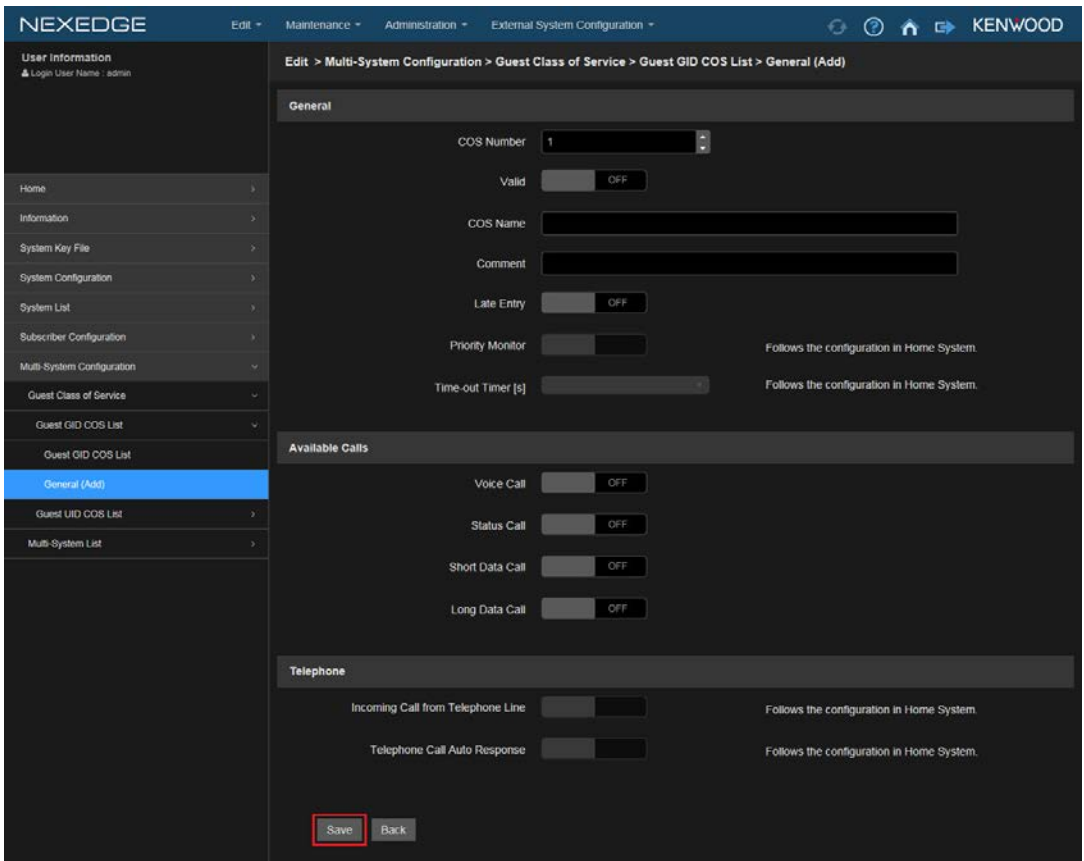


Figure 12-4 General (Add)

Table 12-2 Configuration of Guest GID COS

Item		Description
General	COS Number	COS Number is an allocated number to identify a GID COS. The COS number cannot be changed after creating a GID COS.
	Valid	Valid allows a system administrator to configure whether a GID COS is enabled. If “ON” is configured, the GID COS is enabled and services are provided according to the configuration of the GID COS. If “OFF” is configured, the GIDs to which the GID COS is allocated cannot use all the services.
	COS Name	COS Name is the name of a GID COS. COS Name is configured to distinguish the configured GID COS. The name configured for each table appears in the list of GID COS List .
	Comment	Comment allows a system administrator to enter text of complementary information about a GID COS.
	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a GID COS. (Refer to Controlling Late Entry .)
	Priority Monitor	This function cannot be configured. This function functions according to the configuration of the Home System to which a group belongs. (Refer to Controlling Priority Monitor .)
	Time-out Timer	This function cannot be configured. If a subscriber unit of the other system initiates a call in the own system, the system notifies the subscriber unit of the configuration value in Time-out Timer according to the configuration of the Home System to which the subscriber unit belongs. (Refer to Restricting the Continuous Transmission Time of a Group Call (Time-out Timer) .)
Available Calls	Voice Call	A system administrator can restrict the various calls available to a subscriber unit of the other system that uses the own system. (Refer to Restricting Various Calls (Available Calls (Guest GID COS)) .)
	Status Call	
	Short Data Call	
	Long Data Call	
Telephone	Incoming Call from Telephone Line	This function cannot be configured. If a subscriber unit of the other system has received an incoming call from a telephone line in the own system, the system behaves according to the configuration in Incoming Call from Telephone Line of the Home System to which the subscriber unit belongs. (Refer to Restricting an incoming call from a telephone line (Incoming Call from Telephone Line (GID COS)) .)
	Telephone Call Auto Response	This function cannot be configured. If a subscriber unit of the other system has received an incoming call from a telephone line in the own system, the system behaves according to the configuration in Telephone Call Auto Response of the Home System to which the subscriber unit belongs. (Refer to Responding automatically to an incoming call from a telephone line (Telephone Call Auto Response) .)

Click the “Save” button to save after configuration.

 Note

- A list of the registered Guest GID COS appears in **Guest GID COS List**.
- By clicking the “Details” button in **Guest GID COS List**, the configuration contents of the corresponding Guest GID COS can be viewed.
- By clicking the “Edit” button in **Guest GID COS List**, the configuration of the corresponding Guest GID COS can be changed.
- By clicking the “Delete” button in **Guest GID COS List**, the corresponding Guest GID COS can be deleted.

Controlling Late Entry

Late Entry is the function to repeatedly send an instruction message to a traffic channel on a control channel at certain intervals using a Group Call.

Even if a message by Group Call cannot be received because the subscriber unit is temporarily outside the communication area, the subscriber unit can participate in a Group Call midway through the call after returning to the communication area.

Refer to “[Participating in an On-going Voice Call Midway Through the Call \(Late Entry\)](#)” for details of **Late Entry**.

Controlling Priority Monitor

Priority Monitor is the function to notify the Group Call information even on a traffic channel.

If the subscriber unit detects a Group Call having higher priority than the current Group Call using the Group Call information that is notified on a traffic channel, the subscriber unit can participate in the Group Call having higher priority.

If the site in the system where the subscriber unit is roaming is a Non-dedicated Control Channel and if the channel has migrated to a traffic channel, **Priority Monitor** does not function.

Refer to “[Receiving a High-priority Group Call \(Priority Monitor\)](#)” for details of **Priority Monitor**.

Restricting Various Calls (Available Calls (Guest GID COS))

Available Calls is the function to restrict the various calls available to a subscriber unit of the other system that uses the own system.

The NEXEDGE system checks for the value in **Available Calls** for a communication request from a subscriber unit and sends an error back to the subscriber unit if the requested call has been inhibited.

Table 12-3 Available Calls (GID COS)

Item	Description
Voice Call	Voice Call allows a system administrator to configure whether or not to permit communications using a Voice Call for Guest GIDs.
Status Call	Status Call allows a system administrator to configure whether or not to permit communications using a Status Call for Guest GIDs.
Short Data Call	Short Data Call allows a system administrator to configure whether or not to permit communications using a Short Data Call for Guest GIDs.
Long Data Call	Long Data Call allows a system administrator to configure whether or not to permit communications using a Long Data Call for Guest GIDs.

Controlling an Intersite Call (Guest GID COS)

After adding Guest GID COS, Intersite Call is configured for selecting a site that uses Guest GIDs. Clicking the “Edit” button of the Guest GID COS added to **Guest GID COS List** of SCU and clicking **Intersite Call List** on the navigation menu displays **Intersite Call List**.

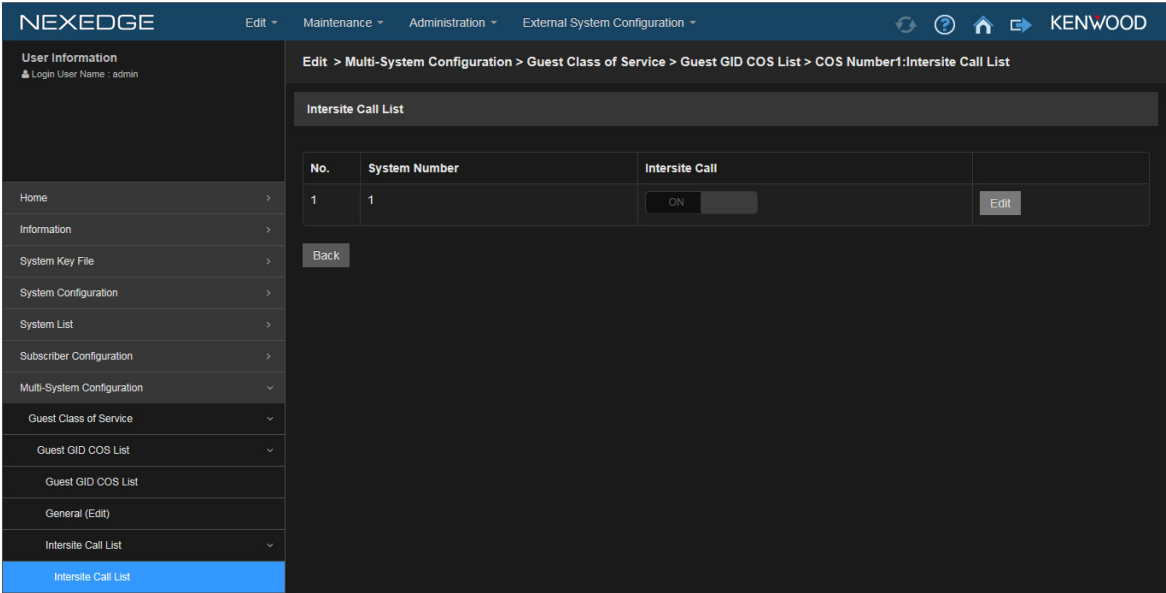


Figure 12-5 Intersite Call List

In **System Number** of **Intersite Call List**, selecting a system for which Intersite Call is configured and clicking the “Edit” button displays **General (Edit)**, and then Intersite Call can be configured.

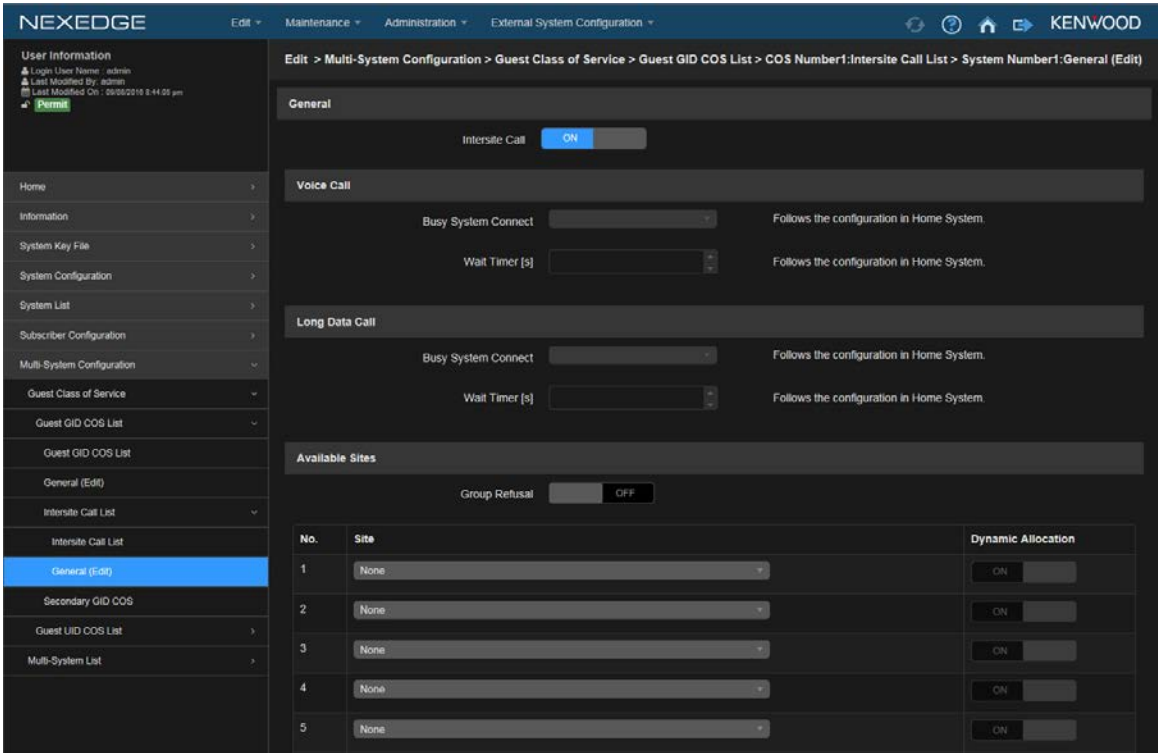


Figure 12-6 General (Edit)

Table 12-4 Configuration of Intersite Call (Guest GID COS)

Item		Description
Intersite Call		Intersite Call allows a system administrator to configure whether or not to permit an Intersite Call for Guest GID COS. If "ON" is configured, Intersite Calls are permitted. If "OFF" is configured, Intersite Calls are inhibited.
Voice Call/ Long Data Call	Busy System Connect	This function cannot be configured. If a subscriber unit of the other system has initiated a call in the own system, the own system behaves according to the configuration in Busy System Connect of the Home System to which the subscriber unit belongs. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (GID COS)) .)
	Wait Timer	This function cannot be configured. If a subscriber unit of the other system has initiated a call in the own system, the own system behaves according to the configuration in Wait Timer of the Home System to which the subscriber unit belongs. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (GID COS)) .)
Available Sites	Group Refusal	Group Refusal is the function for the NEXEDGE system to notify a subscriber unit not to stay in the site when the NEXEDGE system determines from the configuration conditions of Available Sites that the site for which the subscriber unit executed Group Registration is a site where Group Registration is disabled. If "ON" is configured, the subscriber unit determines that the subscriber unit cannot be used in the corresponding site, and searches for another site. If "OFF" is configured, the subscriber unit cannot make a Group Call of the selected GID in the corresponding site, but the subscriber unit stays in the corresponding site because other communications such as an Individual Call are available.
	Site	Site allows a system administrator to configure an available site for Group Calls and Group Registration by selecting from the sites configured in Site List . (Refer to Configuring a site to use GIDs (Available Sites (Guest GID COS)) .)
	Dynamic Allocation	Dynamic Allocation allows a system administrator to configure whether or not to allocate a traffic channel to a site where no subscriber unit succeeded in Group Registration.

After configuration, click the "Save" button to save.

Configuring a site to use GIDs (Available Sites (Guest GID COS))

Available Sites allows a system administrator to configure an available site for Group Calls and Group Registration by selecting from the sites configured in Site List.

If **Intersite Call** is enabled, a Group Call is delivered to sites configured in **Available Sites**.

The selectable upper limit is restricted by the number of sessions that the NEXEDGE system can deliver by using an Intersite Call. Therefore, if "Unicast" is configured in **Unicast/Multicast Group Call**, sites for the maximum of 16 sessions can be selected, and if "Multicast" is configured, sites for the maximum of 48 sessions can be selected. However, sites where **Dynamic Allocation** is enabled are collectively counted as one session. (Refer to [Configuring Whether to Deliver by Using Unicast or Multicast \(Unicast/Multicast Group Call\)](#).)

Note

- If **Dynamic Allocation** is enabled, an Intersite Call can be undelivered to a site when no subscriber unit is in the Group Registration of the corresponding site, even if the site uses a GID.

12.5 Configuring a Guest UID COS

A Guest UID COS is a COS which defines the available functions for UIDs of the other system that use the own system.

Clicking the “Add” button in **Edit > Multi-System Configuration > Guest Class of Service > Guest UID COS List** displays **General (Add)**, and a new Guest UID COS can be created. A maximum of 23 Guest UID COS can be configured in **Guest UID COS List**.

The screenshot shows the NEXEDGE web interface. The top navigation bar includes 'Edit', 'Maintenance', 'Administration', and 'External System Configuration'. The left sidebar lists various configuration options, with 'Guest UID COS List' selected. The main content area is titled 'Edit > Multi-System Configuration > Guest Class of Service > Guest UID COS List > General (Add)'. It contains three main sections: 'General', 'Available Calls', and 'Telephone'. The 'General' section includes fields for 'COS Number' (set to 1), 'Valid' (OFF), 'COS Name', 'Comment', 'Late Entry' (OFF), 'Queue Level' (set to 8), 'Time-out Timer [s]', 'Individual Call Response Type (Voice)', and 'Individual Call Response Type (Data)'. The 'Available Calls' section includes toggle switches for 'Group Call', 'Individual Call', 'Voice Call', 'Status Call', 'Short Data Call', 'Long Data Call', and 'All Groups Call', all currently set to OFF. The 'Telephone' section includes 'Queue Level' (set to 8), 'Incoming Call from Telephone Line', and 'Outgoing Call to Telephone Line'. At the bottom, there are 'Save' and 'Back' buttons, with the 'Save' button highlighted by a red box.

Figure 12-7 General (Add)

Table 12-5 Configuration of Guest UID COS

Item		Description
General	COS Number	COS Number is an allocated number to identify a Guest UID COS. The COS number cannot be changed after creating a Guest UID COS.
	Valid	Valid allows a system administrator to configure whether a Guest UID COS is enabled. If "ON" is configured, the Guest UID COS is enabled and services are provided according to the configuration of the Guest UID COS. If "OFF" is configured, the UIDs to which the Guest UID COS is allocated cannot use all the services.
	COS Name	COS Name is the name of a Guest UID COS. COS Name is configured to distinguish the configured Guest UID COS. The name configured for each Guest UID COS appears in the list of Guest UID COS List .
	Comment	Comment allows a system administrator to enter text of supplementary information about a Guest UID COS.
	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a Guest UID COS. (Refer to Controlling Late Entry .)
	Queue Level	Queue Level allows a system administrator to configure the Queue Level to be applied when a subscriber unit of the other system that uses the own system makes a Voice Call or Long Data Call. (Refer to About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use (Queue) .)
	Time-out Timer	This function cannot be configured. If a subscriber unit of the other system initiates a call in the own system, the system notifies the subscriber unit of the configuration value in Time-out Timer according to the configuration of the Home System to which the subscriber unit belongs. (Refer to Restricting the Continuous Transmission Time of an Individual Call (Time-out Timer) .)
	Individual Call Response Type (Voice)	This function cannot be configured. If a subscriber unit of the other system has initiated a call in the own system, the system behaves according to the configuration in Individual Call Response Type (Voice) of the Home System to which the subscriber unit belongs. (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using a Voice Call (Individual Call Response Type (Voice)) .)
Available Calls	Individual Call Response Type (Data)	This function cannot be configured. If a subscriber unit of the other system has initiated a call in the own system, the system behaves according to the configuration in Individual Call Response Type (Data) of the Home System to which the subscriber unit belongs. (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using Data Communications (Individual Call Response Type (Voice)) .)
	Group Call	A system administrator can restrict the various calls available to a subscriber unit of the other system that uses the own system. (Refer to Restricting Various Calls (Available Calls (Guest GID COS)) .)
	Individual Call	
	Voice Call	
	Status Call	
	Short Data Call	
	Long Data Call	
	All Groups Call	

Item		Description
Telephone	Queue Level	Queue Level allows a system administrator to configure the Queue Level to be applied when a subscriber unit of the other system that uses the own system makes a Telephone Call. (Refer to Controlling Queue Level .)
	Incoming Call from Telephone Line	This function cannot be configured. If a subscriber unit of the other system has received an incoming call from a telephone line in the own system, the system behaves according to the configuration in Incoming Call from Telephone Line of the Home System to which the subscriber unit belongs. (Refer to Restricting an incoming call from a telephone line (Incoming Call from Telephone Line (GID COS)) .)
	Outgoing Call to Telephone Line	This function cannot be configured. If a subscriber unit of the other system has received an incoming call from a telephone line in the own system, the system behaves according to the configuration in Telephone Call Auto Response of the Home System to which the subscriber unit belongs. (Refer to Restricting an outgoing call to a telephone line (Outgoing Call to Telephone Line) .)

Click the “Save” button to save after configuration.

Note

- A list of the registered UID COS appears in **UID COS List**.
- By clicking the “Details” button in **UID COS List**, the configuration contents of the corresponding UID COS can be viewed.
- By clicking the “Edit” button in **UID COS List**, the configuration of the corresponding UID COS can be changed.
- By clicking the “Delete” button in **UID COS List**, the corresponding UID COS can be deleted.

Controlling Late Entry

Late Entry is the function to repeatedly send an instruction message to a traffic channel on a control channel at certain intervals by using an Individual Call.

Even if a message by Individual Call cannot be received because the subscriber unit is temporarily outside the communication area, the subscriber unit can participate in an Individual Call midway through the call after returning to the communication area.

Refer to “[Participating in an On-going Voice Call Midway Through the Call \(Late Entry\)](#)” for details of Late Entry.

Controlling Queue Level

In **Queue Level**, the priority level can be configured in the own system for a subscriber unit of the other system that uses the own system.

Queue Level is used as the priority order for assigning free channels to the subscriber units of the own system and subscriber units of the other system that use the own system.

Regardless of the configuration in this **Queue Level**, the Queue and Preemption behave according to the Queue configuration and the configuration in **Queue Level** of the Home System of each subscriber unit.

The Preemption behaves only in the call group to which a subscriber unit that executes Preemption belongs.

Refer to “[About the Behavior of a System When a New Call Request Is Received While All Traffic Channels Are in Use \(Queue\)](#)” for details of the Queue Level.

Note

- An Emergency Call functions at level 1 for the highest priority of **Queue Level**.

Restricting Various Calls (Available Calls (Guest UID COS))

Available Calls is the function to restrict available various calls for a subscriber unit.

The NEXEDGE system checks for the value in **Available Calls** for a communication request from a subscriber unit and sends an error back to the subscriber unit if the requested call has been inhibited.

Table 12-6 Available Calls (UID COS)

Item	Description
Group Call	Group Call allows a system administrator to configure whether or not to permit communications using a Group Call for Guest UIDs.
Individual Call	Individual Call allows a system administrator to configure whether or not to permit communications using an Individual Call for Guest UIDs.
Voice Call	Voice Call allows a system administrator to configure whether or not to permit communications using a Voice Call for Guest UIDs.
Status Call	Status Call allows a system administrator to configure whether or not to permit communications using a Status Call for Guest UIDs.
Short Data Call	Short Data Call allows a system administrator to configure whether or not to permit communications using a Short Data Call for Guest UIDs.
Long Data Call	Long Data Call allows a system administrator to configure whether or not to permit communications using a Long Data Call for Guest UIDs.
All Groups Call	All Groups Call allows a system administrator to configure whether or not to permit communications using an All Groups Call for Guest UIDs.

Configuring the Priority Order for Telephone Calls (Queue Level)

Queue Level is the priority order to be applied when a subscriber unit initiates a Telephone Call.

When multiple Voice Calls or Long Data Calls occur and the Queue waiting for allocation of a traffic channel functions, the priority order in the Queue can be configured.

Note

- An Emergency Call functions at level 1 for the highest priority of **Queue Level**.
- **Queue Level** for Telephone Calls can be configured in addition to normal calls.

Restricting the Sites That a Subscriber Unit of the Other System Can Register (Registration Site Restriction)

Registration Site Restriction is the function to restrict the sites in the own system that a subscriber unit of the other system can register with locations.

A list of the own systems available to a subscriber unit of the other system appears in **Edit > Multi-System Configuration > Guest Class of Service > Guest UID COS List > Registration Site Restriction List** of SCU.

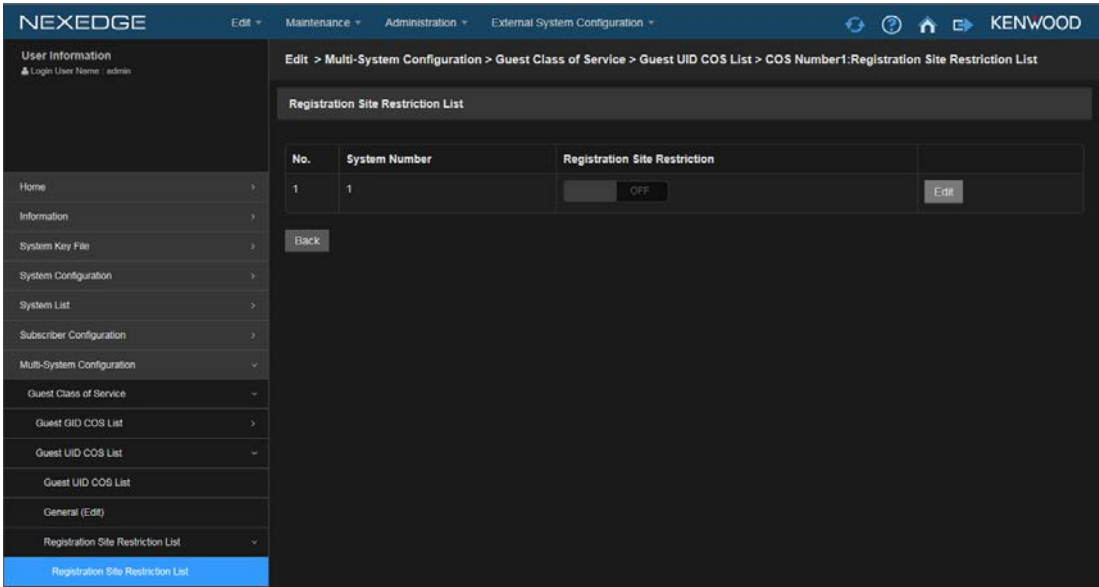


Figure 12-8 Registration Site Restriction List

Clicking the “Edit” button of the system for which **Registration Site Restriction** is to be configured displays **General (Edit)**, and the sites in the own system that can be registered with locations can be configured.

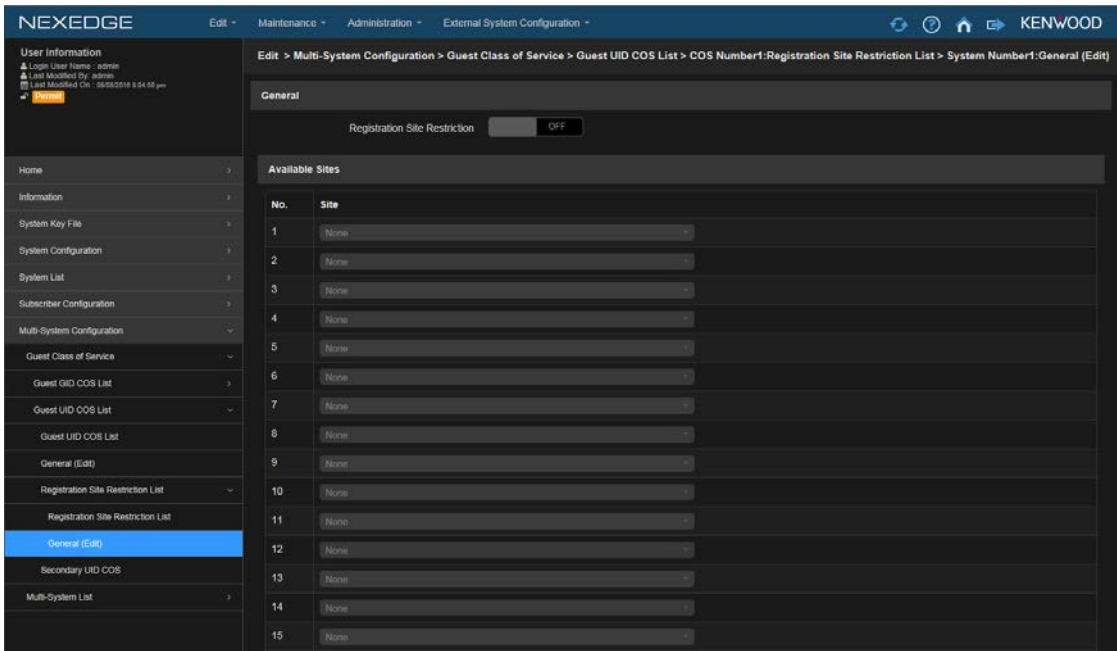


Figure 12-9 General (Edit)

Table 12-7 Registration Site Restriction

Item	Description
Registration Site Restriction	Registration Site Restriction allows a system administrator to configure whether or not to enable a subscriber unit of the other system to register sites with locations. If “ON” is configured, the sites in the own system that a subscriber unit of the other system can register with locations are restricted. If “OFF” is configured, the sites in the own system that a subscriber unit of the other system can register with locations are not restricted.  Note • The enabled or disabled status of Registration Site Restriction appears in Registration Site Restriction of Registration Site Restriction List.
Site	Site allows a system administrator to configure the sites in the own system that a subscriber unit of the other system can register with locations.

After configuration, click the “Save” button to save.

12.6 Configuring a Secondary Guest GID COS

Secondary Guest GID COS is a COS which defines the functions available to a subscriber unit of the other system that exists in the own system when the network connection between the own system and the other system is disconnected or when in Site Trunking mode.

Secondary Guest GID COS can be configured in **Edit > Multi-System Configuration > Guest Class of Service > Guest GID COS List > Secondary GID COS** of SCU.

The screenshot shows the NEXEDGE web interface for configuring a Secondary Guest GID COS. The breadcrumb trail is: **Edit > Multi-System Configuration > Guest Class of Service > Guest GID COS List > COS Number1:Secondary GID COS**.

User Information:

- Login User Name: admin
- Last Modified By: admin
- Last Modified On: 2018/02/18 9:44:08 pm
- Permission: Permit

Navigation Menu:

- Home
- Information
- System Key File
- System Configuration
- System List
- Subscriber Configuration
- Multi-System Configuration
 - Guest Class of Service
 - Guest GID COS List
 - Guest GID COS List
 - General (Edit)
 - Inter-site Call List
 - Secondary GID COS**
 - Guest UID COS List
 - Multi-System List

Configuration Fields:

General

- Late Entry: ☒ ON
- Priority Monitor: ☒ ON
- Time-out Timer [s]: 60

Available Calls

- Voice Call: ☒ ON
- Status Call: ☒ ON
- Short Data Call: ☒ ON
- Long Data Call: ☒ ON

Voice Call

- Busy System Connect: Ignore
- Wait Timer [s]: 10

Long Data Call

- Busy System Connect: Wait
- Wait Timer [s]: 5

Buttons: Save, Cancel, Back

Figure 12-10 Secondary Guest GID COS

Table 12-8 Configuration of Secondary Guest GID COS

Item		Description
General	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a Secondary Guest GID COS. (Refer to Controlling Late Entry .)
	Priority Monitor	Priority Monitor allows a system administrator to configure whether the Priority Monitor function is enabled for a Secondary Guest GID COS. (Refer to Controlling Priority Monitor .)
	Time-out Timer	Time-out Timer allows a system administrator to configure the maximum continuous transmission time for a subscriber unit of the other system that uses the own system to communicate by use of a Group Call. (Refer to Restricting the Continuous Transmission Time of a Group Call (Time-out Timer) .)
Available Calls	Voice Call	A system administrator can restrict the various calls available to a subscriber unit of the other system that uses the own system. (Refer to Restricting Various Calls (Available Calls (Guest GID COS)) .)
	Status Call	
	Short Data Call	
	Long Data Call	
Voice Call/ Long Data Call	Busy System Connect	Busy System Connect allows a system administrator to configure connection conditions for the start of communication when initiating communication using a Group Call (Group) or Long Data Call (Group) between sites. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (GID COS)) .)
	Wait Timer	Wait Timer allows a system administrator to configure the maximum length of time to wait for a connection to an Intersite Group Call. (Refer to Configuring connection conditions for the start of communication (Busy System Connect (GID COS)) .)

Click the “Save” button to save after configuration.

12.7 Configuring a Secondary Guest UID COS

Secondary Guest UID COS is a COS which defines the functions available to a subscriber unit of the other system that exists in the own system when the network connection between the own system and the other system is disconnected or when in Site Trunking mode.

Secondary Guest UID COS can be configured in **Edit > Multi-System Configuration > Guest Class of Service > Guest UID COS List > Secondary UID COS** of SCU.

The screenshot shows the NEXEDGE web interface for configuring a Secondary Guest UID COS. The breadcrumb path is: **Edit > Multi-System Configuration > Guest Class of Service > Guest UID COS List > COS Number: Secondary UID COS**.

User Information:

- Login User Name: admin
- Last Modified By: admin
- Last Modified On: 20/05/2018 9:04:50 pm
- Buttons: Home

Navigation Menu:

- Home
- Information
- System Key File
- System Configuration
- System List
- Subscriber Configuration
- Multi-System Configuration
 - Guest Class of Service
 - Guest GID COS List
 - Guest UID COS List (Selected)
 - Guest UID COS List
 - General (Edit)
 - Registration Site Restriction List
 - Secondary UID COS (Highlighted)
 - Multi-System List

Configuration Fields:

- Late Entry: ☒ ON
- Queue Level: 8
- Time-out Timer [s]: 60
- Individual Call Response Type (Voice): Follows the configuration in Home System
- Individual Call Response Type (Data): Follows the configuration in Home System

Available Calls:

- Group Call: ☒ ON
- Individual Call: ☒ ON
- Voice Call: ☒ ON
- Status Call: ☒ ON
- Short Data Call: ☒ ON
- Long Data Call: ☒ ON
- All Groups Call: ☒ ON

Buttons: Save, Cancel, Back

Figure 12-11 Secondary Guest UID COS

Table 12-9 Configuration of Secondary Guest UID COS

Item		Description
General	Late Entry	Late Entry allows a system administrator to configure whether the Late Entry function is enabled for a Secondary Guest UID COS. (Refer to Controlling Late Entry .)
	Queue Level	Queue Level allows a system administrator to configure the Queue Level to be applied when a subscriber unit of the other system that uses the own system makes a Voice Call or Long Data Call. (Refer to Controlling Queue Level .)
	Time-out Timer	Time-out Timer allows a system administrator to configure the maximum continuous transmission time for a subscriber unit to communicate by use of an Individual Call. (Refer to Restricting the Continuous Transmission Time of an Individual Call (Time-out Timer) .)
	Individual Call Response Type (Voice)	Individual Call Response Type (Voice) allows a system administrator to configure the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Voice Call (Individual). (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using a Voice Call (Individual Call Response Type (Voice)) .)
	Individual Call Response Type (Data)	Individual Call Response Type (Data) allows a system administrator to configure the behavior of a NEXEDGE system when calling the receiving subscriber unit by using a Long Data Call (Individual). (Refer to Establishing a Call Even If the Receiving Subscriber Unit Does Not Respond Using Data Communications (Individual Call Response Type (Voice)) .)
Available Calls	Group Call	A system administrator can restrict the various calls available to a subscriber unit of the other system that uses the own system. (Refer to Restricting Various Calls (Available Calls (Guest GID COS)) .)
	Individual Call	
	Voice Call	
	Status Call	
	Short Data Call	
	Long Data Call	
	All Groups Call	

Click the “Save” button to save after configuration.

12.8

Registering the System to Be Connected via a Roaming Gateway (Multi-System List)

The other systems to be connected via a roaming gateway are listed in **Edit > Multi-System Configuration > Multi-System List** of the SCU. A maximum of 23 systems can be registered in **Multi-System List**.

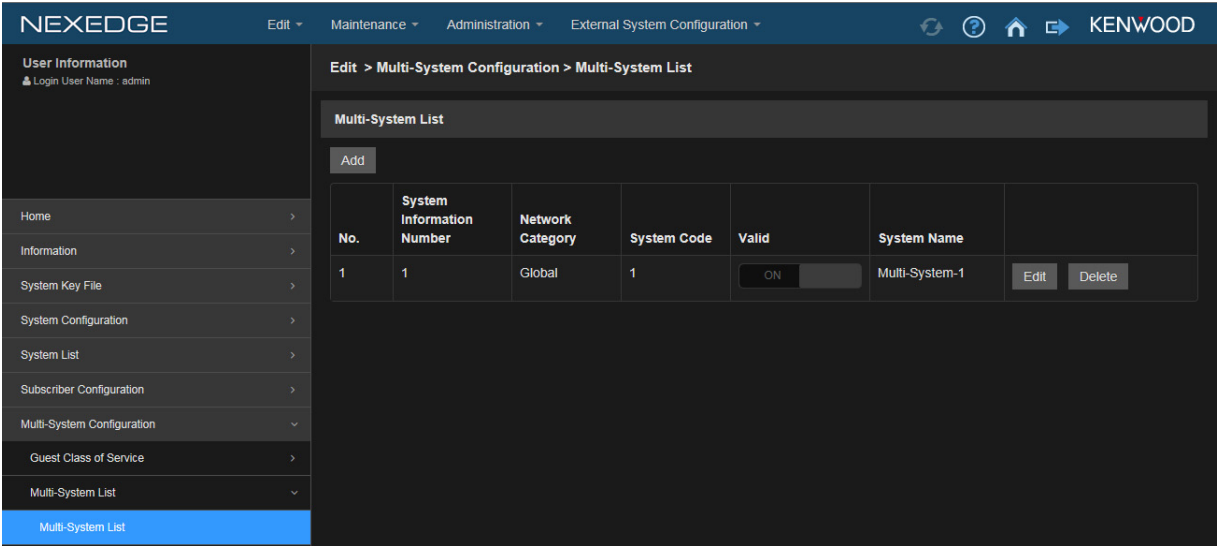


Figure 12-12 Multi-System List

By clicking the “Add” button in **Multi-System List**, **General (Add)** appears and a system to be connected via a roaming gateway can be added.

In a Multi-System structure, the own system can be connected to only the other system registered in **Multi-System List**.

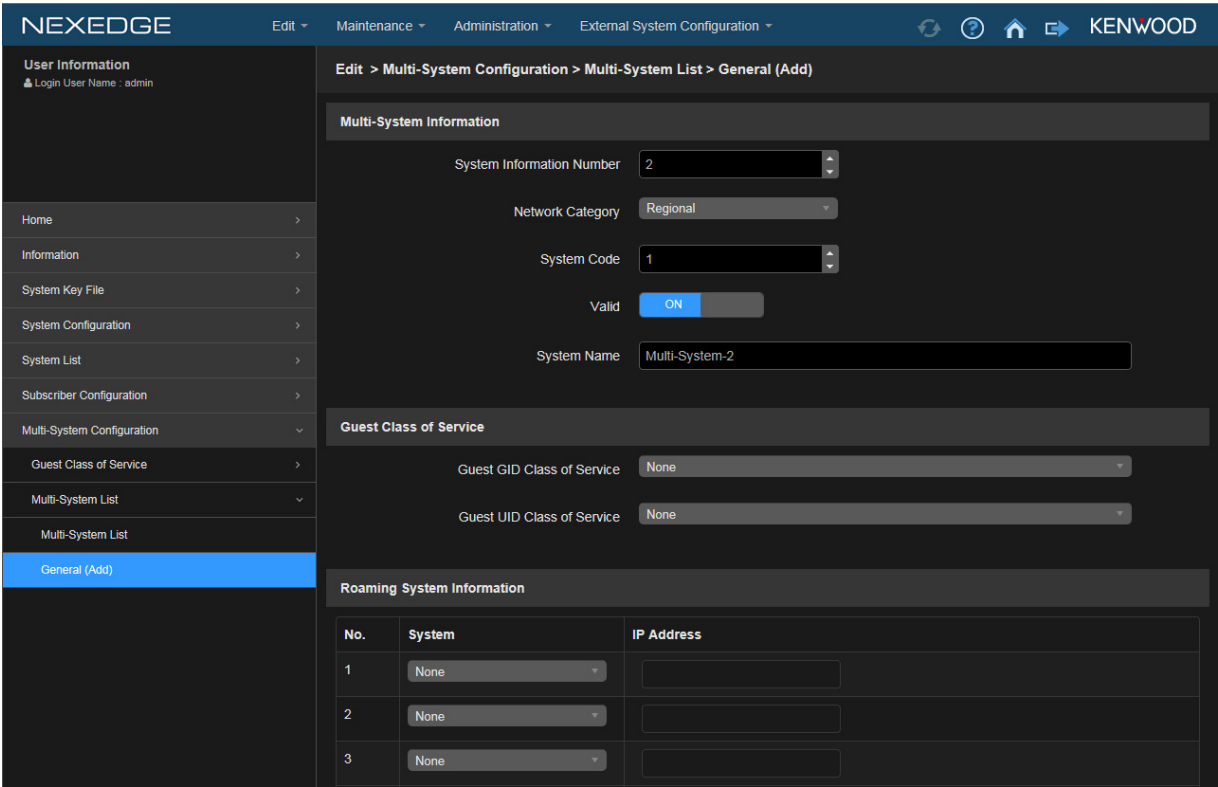


Figure 12-13 General (Add)

Table 12-10 Multi-System List Configuration

Item		Description
Multi-System Information	System Information Number	System Information Number allows a system administrator to configure a number in the range from 1 to 23 to indicate system information. A system administrator can identify and manage system information according to System Information Number .
	Network Category	Network Category indicates the scale of the network that can be expanded. Network Category allows a system administrator to configure "Global", "Regional", or "Local" in Network Category of the other system to be connected via a roaming gateway. A system can identify the other system to be connected via a roaming gateway according to a combination of Network Category and System Code .
	System Code	System Code is the unique number of the system. System Code allows a system administrator to configure the system code of the other system to be connected via a roaming gateway. The range of System Code varies as follows according to the configuration in Network Category : Global: 1 to 1022 (10 bit) Regional: 1 to 16382 (14 bit) Local: 1 to 131070 (17 bit) A system can identify the other system to be connected via a roaming gateway according to a combination of Network Category and System Code .
	Valid	Valid allows a system administrator to configure whether to connect to a registered other system via a roaming gateway. To connect to a registered other system via a roaming gateway, configure "ON" in Valid . To disconnect from the other system, configure "OFF" in Valid .
	System Name	System Name allows a system administrator to configure the name of the registered other system. The name configured for each system appears in the list of Multi-System List .
Guest Class of Service	Guest GID Class of Service	Guest GID Class of Service allows a system administrator to configure the COS used for a GID of the registered other system. To use a subscriber unit of the other system in the own system, configure Guest GID Class of Service . (Refer to Configuring the COS Used for a GID of the Other System.)
	Guest UID Class of Service	Guest UID Class of Service allows a system administrator to configure the COS used for a UID of the registered other system. To use a subscriber unit of the other system in the own system, configure Guest UID Class of Service . (Refer to Configuring the COS Used for a UID of the Other System.)

Item		Description
Roaming System Information	System	System allows a system administrator to configure a system number in the range from 1 to 24 for a system controller in the other system to be connected to the own system. To use the subscriber unit of the own system in the other system, configure the system number for a system controller in the other system. A roaming gateway of the own system is connected to the system controller in the other system configured in System.
	IP Address	IP Address allows a system administrator to configure an IP address for a system controller in the other system to be connected to the own system. To use the subscriber unit of the own system in the other system, configure the IP address for a system controller in the other system. A roaming gateway of the own system is connected to the system controller in the other system configured in IP Address.  Note - The following reserved addresses cannot be configured: 127.xxx.xxx.xxx 128.000.xxx.xxx 191.255.xxx.xxx 192.000.001.xxx 223.255.255.xxx

After configuration, click the “Save” button to save.

 Note

- A list of the registered system information appears in **Multi-System List**.
- By clicking the “Details” button in **Multi-System List**, the configuration contents of the corresponding system can be viewed.
- By clicking the “Edit” button in **Multi-System List**, the configuration of the corresponding system can be changed.
- By clicking the “Delete” button in **Multi-System List**, the corresponding system can be deleted.

Configuring the COS Used for a GID of the Other System

Guest GID Class of Service is the COS used for a GID of the registered other system.

By linking the system information of the other system to **Guest GID Class of Service**, a system administrator can specify the functions and sites permitted for use by a GID of the other system.

Table 12-11 Guest GID Class of Service

Configuration	Description
None	The system does not permit the use of Guest GID Class of Service for the corresponding GID of the other system. Configure "None" if only a subscriber unit of the own system uses the other system and if a subscriber unit of the other system does not use the own system.
1: Class Name to 23: Class Name	The system permits the use of the configured Guest GID Class of Service for the corresponding GID of the other system. Configure anything other than "None" if a subscriber unit of the other system uses the own system.

Configuring the COS Used for a UID of the Other System

Guest UID Class of Service is the COS used for a UID of the registered other system.

By linking the system information of the other system to **Guest UID Class of Service**, a system administrator can specify the functions and sites permitted for use by a UID of the other system.

Table 12-12 Guest UID Class of Service

Configuration	Description
None	The system does not permit the use of Guest UID Class of Service for the corresponding UID of the other system. Configure "None" if only a subscriber unit of the own system uses the other system and if a subscriber unit of the other system does not use the own system.
1: Class Name to 23: Class Name	The system permits the use of the configured Guest UID Class of Service for the corresponding UID of the other system. Configure anything other than "None" if a subscriber unit of the other system uses the own system.

12.9 Configuring the Roaming Gateway

A roaming gateway is a device to connect the own system to the other system having differing system information (Network Category/ System Code). By configuring a roaming gateway, a subscriber unit operated in the own system can be used in the other system having differing system information.

Various configurations related to a roaming gateway can be configured in **External System Configuration > Roaming Gateway** of SCU.

Figure 12-14 Roaming Gateway

Note

- Whether a dedicated PC server is used or a system controller is used can be configured in a roaming gateway. In a system with many system controllers, the use of a dedicated PC server is recommended.
- A roaming gateway is connected to a system controller in the own system and a system controller in the other system. A roaming gateway can be connected to a maximum of 24 system controllers (including a system controller in the own system).

Table 12-13 Roaming Gateway Configuration

Item		Description
Roaming Gateway Server	Roaming Gateway Server	Roaming Gateway Server allows a system administrator to configure whether to use a roaming gateway in the own system. None: A roaming gateway is not used. Dedicated Server: A dedicated PC server is used as a roaming gateway. Shared Server: A system controller is used as a roaming gateway.
	IP Address	IP Address allows a system administrator to configure the IP address of a roaming gateway.  Note • If “Dedicated Server” is configured in Roaming Gateway Server, the IP address of a roaming gateway can be configured. • The following reserved addresses cannot be configured: • 127.xxx.xxx.xxx • 128.000.xxx.xxx • 191.255.xxx.xxx • 192.000.001.xxx • 223.255.255.xxx
	System Number	System Number allows a system administrator to configure the number of a system controller if the system controller is used as a roaming gateway.  Note • If “Shared Server” is configured in Roaming Gateway Server, System Number can be configured.
SNMP Interface	SNMP Interface	SNMP Interface allows a system administrator to configure whether a roaming gateway is to be monitored by using the SNMP (Simple Network Management Protocol). By using this function, various operational statuses of a roaming gateway can be confirmed. If “ON” is configured in SNMP Interface, the roaming gateway server notifies the system with a response to an SNMP request and of a status change.  Note • If “Dedicated Server” is configured in Roaming Gateway Server, SNMP Interface can be configured.
	Community Name	Community Name allows a system administrator to configure the name for the network range to be monitored by using the SNMP. Community Name is used as the password when acquiring roaming gateway information by using the SNMP. Devices targeted to be monitored can be grouped by configuring Community Name.  Note • If “Dedicated Server” is configured in Roaming Gateway Server, Community Name can be configured. • The default is “Nexedge”.

12.10 Creating the System Key File for Roaming (Roaming System Key File)

The Roaming System Key File is a file required for a subscriber unit of the other system to configure an NXDN Trunking system for roaming by the FPU. Follow the procedure below to create a Roaming System Key File by using SCU:

- 1) Click the “Browse” button in **Edit > System Key File > Roaming System Key File** of SCU to read the License ID file of the FPU for the subscriber unit to be used, and then enter the **System Name**.
- 2) Click the “Create” button.
- 3) Specify the save location.

A Roaming System Key File (extension: .rskf) is created in the specified save location.

The **System Name** is the name used when selecting a Roaming System Key File on the FPU of the subscriber unit. The **System Name** can be entered as a maximum of 16 alphanumeric characters and symbols.

If no Roaming System Key File exists, an NXDN Trunking system for roaming cannot be configured for the subscriber unit by the FPU for the subscriber unit. Therefore, a Roaming System Key File needs to be delivered to FPU users in the other system.

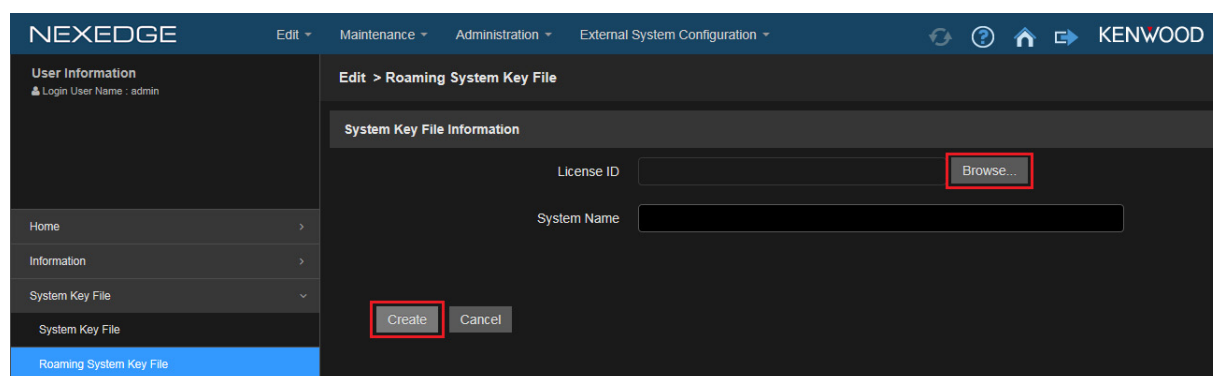


Figure 12-15 Roaming System Key File

Note

- An NXDN Trunking system with roaming enabled can be configured even in a System Key File.

12.11 About the SCU Configuration That Behaves on the Roaming System

The table below shows whether a subscriber unit of the other system behaves according to the SCU configuration of the Home System to which the subscriber unit belongs or the Roaming System.

The functions not listed in the table below behave according to the unique SCU configuration of the Roaming System and of the Home System (such as **Frequency List** and **Site List**).

Table 12-14 SCU Configuration That Behaves on the Roaming System

Function Name	Home System	Roaming System	Remarks
System Configuration > General			
Trunking Type	V		
Group Registration Reset Timer	V		
NXDN ESN Validation	V		
Unauthorized ESN Detection	V		
NXDN ESN Validation Reset Time	V		
Automatic ESN Collection	V		
GPS Report Channel		V	System unique configuration
GPS Transmission Capacity Mode		V	System unique configuration
Restriction Control		V	System unique configuration
Manufacturer Limitation	V		
Code	V		
System Configuration > Default Timer			
Hold Timer (Message Trunked)	V		
Hold Timer (Transmission Trunked)	V		
Occupation Timer	V		
Time-out Timer (Failsoft Mode)		V	System unique configuration
Subscriber Configuration > Class of Service > GID COS List > General			
Valid	V	V	Corresponds to the configurations in Valid in the Home System and Valid of Guest GID COS .
Late Entry		V	Corresponds to the configuration in Guest GID COS .
Priority Monitor	V		
Time-out Timer	V		
Voice Call	V	V	Corresponds to the configurations in Voice Call in the Home System and Voice Call of Guest GID COS .
Status Call	V	V	Corresponds to the configurations in Status Call in the Home System and Status Call of Guest GID COS .
Short Data Call	V	V	Corresponds to the configurations in Short Data Call in the Home System and Short Data Call of Guest GID COS .
Long Data Call	V	V	Corresponds to the configurations in Long Data Call in the Home System and Long Data Call of Guest GID COS .

Function Name	Home System	Roaming System	Remarks
Subscriber Configuration > Class of Service > GID COS List > General			
Incoming Call from Telephone Line	V		
Telephone Call Auto Response	V		
Subscriber Configuration > Class of Service > GID COS List > Intersite Call List > General			
Intersite Call		V	Corresponds to the configuration in Guest GID COS .
Busy System Connect	V		
Wait Timer	V		
Group Refusal		V	Corresponds to the configuration in Guest GID COS .
Site		V	Corresponds to the configuration in Guest GID COS .
Dynamic Allocation		V	Corresponds to the configuration in Guest GID COS .
Subscriber Configuration > Class of Service > UID COS List > General			
Valid	V	V	Corresponds to the configurations in Valid in the Home System and Valid of Guest UID COS .
Late Entry		V	Corresponds to the configuration in Guest GID COS .
Queue Level		V	Corresponds to the configuration in Guest GID COS .
Time-out Timer	V		
Individual Call Response Type (Voice)	V		
Individual Call Response Type (Data)	V		
Group Call	V	V	Corresponds to the configurations in Group Call in the Home System and Group Call of Guest GID COS .
Individual Call	V	V	Corresponds to the configurations in Individual Call in the Home System and Individual Call of Guest GID COS .
Voice Call	V	V	Corresponds to the configurations in Voice Call in the Home System and Voice Call of Guest GID COS .
Status Call	V	V	Corresponds to the configurations in Status Call in the Home System and Status Call of Guest GID COS .
Short Data Call	V	V	Corresponds to the configurations in Short Data Call in the Home System and Short Data Call of Guest GID COS .
Long Data Call	V	V	Corresponds to the configurations in Long Data Call in the Home System and Long Data Call of Guest GID COS .
All Groups Call	V	V	Corresponds to the configurations in All Groups Call in the Home System and All Groups Call of Guest GID COS .
Incoming Call from Telephone Line	V		
Outgoing Call to Telephone Line	V		

Function Name	Home System	Roaming System	Remarks
Subscriber Configuration > Class of Service > UID COS List > Registration Site Restriction List > General			
Registration Site Restriction		√	Corresponds to the configuration in Guest GID COS .
Site		√	Corresponds to the configuration in Guest GID COS .
Subscriber Configuration > Class of Service > All Groups Call COS			
Late Entry		√	Corresponds to the configuration in Guest GID COS .
Priority Monitor	√		
Time-out Timer	√		
Voice Call	√	√	Corresponds to the configurations in Voice Call in the Home System and Voice Call of Guest GID COS .
Status Call	√	√	Corresponds to the configurations in Status Call in the Home System and Status Call of Guest GID COS .
Short Data Call	√	√	Corresponds to the configurations in Short Data Call in the Home System and Short Data Call of Guest GID COS .
Long Data Call	√	√	Corresponds to the configurations in Long Data Call in the Home System and Long Data Call of Guest GID COS .
Incoming Call from Telephone Line	√		
Subscriber Configuration > Class of Service > All Groups Call COS > Intersite Call List > General			
Intersite Call		√	Corresponds to the configuration in Guest GID COS .
Busy System Connect	√		
Wait Timer	√		
Site		√	Corresponds to the configuration in Guest GID COS .
Subscriber Configuration > Class of Service > Secondary GID COS			
Late Entry		√	Corresponds to the configuration in Guest GID COS > Secondary GID COS .
Priority Monitor		√	Corresponds to the configuration in Guest GID COS > Secondary GID COS .
Time-out Timer		√	Corresponds to the configuration in Guest GID COS > Secondary GID COS .
Voice Call		√	Corresponds to the configuration in Guest GID COS > Secondary GID COS .
Status Call		√	Corresponds to the configuration in Guest GID COS > Secondary GID COS .
Short Data Call		√	Corresponds to the configuration in Guest GID COS > Secondary GID COS .
Long Data Call		√	Corresponds to the configuration in Guest GID COS > Secondary GID COS .

Function Name	Home System	Roaming System	Remarks
Subscriber Configuration > Class of Service > Secondary UID COS			
Late Entry		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Queue Level		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Time-out Timer		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Individual Call Response Type (Voice)	V		
Individual Call Response Type (Data)	V		
Group Call		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Individual Call		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Voice Call		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Status Call		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Short Data Call		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Long Data Call		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
All Groups Call		V	Corresponds to the configuration in Guest GID COS > Secondary GID COS.
Subscriber Configuration > Class of Service > Telephone Call COS			
Time-out Timer	V		
Subscriber Configuration > Call Restriction List > Call Restriction Table			
Minimum Number of Digits	V		
Maximum Number of Digits	V		
Telephone Number	V		
Valid	V		
Subscriber Configuration > Speed Dial List > Speed Dial List Table			
Phone Number	V		

Function Name	Home System	Roaming System	Remarks
Subscriber Configuration > Fleet List > General			
Valid	V		
Home System	V		
Common Class of Service (GID)	V		
Common Class of Service (UID)	V		
Trunking Type	V		
Group Registration Reset Timer	V		
NXDN ESN Validation	V		
Unauthorized ESN Detection	V		
NXDN ESN Validation Reset Time	V		
Call Restriction Table Number	V		
Speed Dial Table Number	V		
Channel Allocation	V		Becomes disabled in the Roaming System.
GPS Report Format	V		
GPS Report Interval	V		
Priority Subscriber Class	V		
Subscriber Configuration > Fleet List > Times			
Hold Timer	V		
Occupation Timer	V		
Subscriber Configuration > Fleet List > GID List > General			
Valid	V		
GID	V		
GID Class of Service	V		
GID Association	V		
Subscriber Configuration > Fleet List > UID List > General			
Valid	V		
UID	V		
UID Class of Service	V		
NXDN ESN	V		
Automatic ESN Collection	V		
GPS Report Format	V		
GPS Report Interval	V		
Priority Subscriber Class	V		
Unauthorized ESN Detection	V		
Automatically Stun/Revive (ESN)	V		

A.1 LED

Various LEDs are equipped on the repeater.

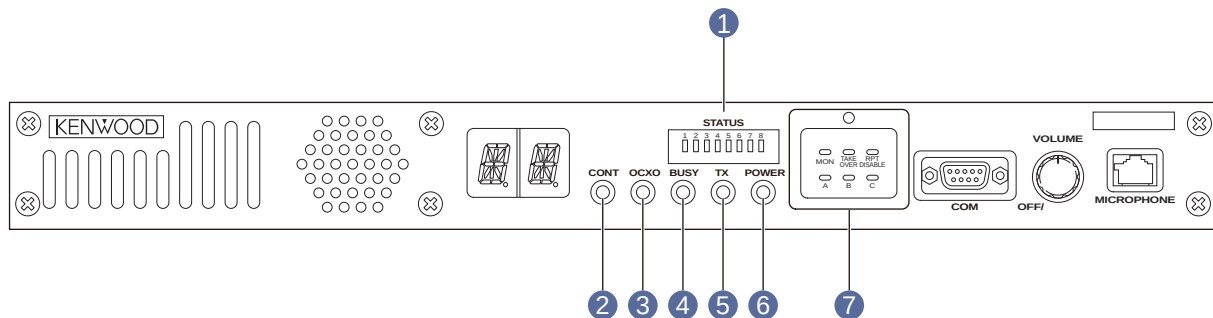


Figure A-1 Front Panel

① STATUS LED

The repeater status appears using 8 STATUS LEDs. (Refer to [STATUS LED](#).)

② CONT LED (Control Channel LED)

The LED lights or flashes green while the repeater operates as a control channel. (Refer to [CONT LED \(Control Channel LED\)](#).)

③ OCXO LED

The LED shows the status of the 10 MHz reference oscillator. (Refer to [OCXO LED](#).)

④ BUSY LED

The LED lights green while the repeater is receiving a signal. (Refer to [BUSY LED](#).)

⑤ TX LED

The LED lights red while the repeater is transmitting. (Refer to [TX LED](#).)

⑥ POWER LED

The LED lights green when the repeater is turned on. (Refer to [POWER LED](#).)

⑦ PF key

If any **PF** key is pressed, the LED lights red and the function assigned to the key is activated or enabled.

While the repeater is operating in Trunking mode, the functions assigned to the **[MON]**, **[TAKE OVER]** and **[RPT DISABLE]** keys at the top are fixed. The **[A]**, **[B]** and **[C]** keys at the bottom cannot be used. (Refer to [PF Key with LED](#).)

STATUS LED

The repeater is equipped with 8 STATUS LEDs that display the communication status of the repeater in digital mode. The STATUS LEDs are the LEDs for checking whether a NEXEDGE system is operating properly. If a problem occurs in the NEXEDGE system, the cause of the problem can be identified. STATUS LEDs are STATUS LED 1 to STATUS LED 8 in order from the left. STATUS LEDs notify the user of the statuses indicated below:

Table A-1 STATUS LED

STATUS LED	Description
1	LED 1 flashes when the NEXEDGE system starts up. LED 1 turns off when the NEXEDGE system starts up properly. LED 1 lights if the repeater is the master unit of a SYNC signal when the repeater is in Trunking Mode.
2	LED 2 lights while the repeater is transmitting a Long Data Call.
3	LED 3 lights while the repeater is transmitting a Voice Call.
4	If the repeater is used as a control channel, LED 4 shows that a trunking control signal is being transmitted. While the trunking control signal is transmitting properly, LED 4 rapidly flashes. While the repeater is used as a traffic channel or Conventional Channel, LED 4 shows the following behaviors: • LED 4 momentarily lights upon transmission of data, such as Status, along with the Voice Call. • While making a Voice Call in a Digital Narrow System, because the audio frames and data frames are alternately transmitted, LED 4 flashes at these transmission intervals. • LED 4 momentarily lights upon completion of a Voice Call or Long Data Call.
5	LED 5 lights while the repeater is receiving a Long Data Call.
6	LED 6 lights while the repeater is receiving a Voice Call.
7	If the repeater is being used as a control channel, LED 7 shows that a trunking control signal is being received. If a subscriber unit transmits by random access and if the repeater receives the control signal, LED 7 momentarily lights. If access is congested from multiple subscriber units, LED 7 may flash rapidly. While the repeater is used as a traffic channel or Conventional Channel, LED 7 shows the following behaviors: • LED 7 momentarily lights upon reception of data, such as Status, along with the Voice Call. • While making a Voice Call in a Digital Narrow System, because the audio frames and data frames are alternately received, LED 7 flashes at these reception intervals. • LED 7 momentarily lights upon completion of a Voice Call or Long Data Call.
8	If an error is detected in the received data, LED 8 lights. LED 8 may also light in response to noise. Although LED 8 may also momentarily light when a call is completed, this is not an error.

CONT LED (Control Channel LED)

The CONT LED is the LED showing the status of the traffic channel when the repeater behaves in Trunking mode. The CONT LED behaves as follows according to the status of the control channel:

Table A-2 CONT LED

State of the LED	Description
Green (solid)	The repeater operates as a control channel.
Green (flashing)	The repeater functions as a traffic channel by Non-dedicated Control Channel . The LED stops flashing and remains lit when the repeater returns to a normal control channel. (Refer to Using a Control Channel as a Traffic Channel (Non-dedicated Control Channel) .)
Disappears	The repeater operates as a traffic channel. Or, the repeater functions in Conventional mode.

OCXO LED

The OCXO LED shows the status of the 10 MHz reference oscillator.

If operating the system using Very Narrow channel spacing for NXR-700/ NXR-800, a very accurate reference oscillator is required for the repeater. A reference oscillator needs to be externally connected to the repeater or the OCXO unit (KXK-3) needs to be installed in the repeater.

For NXR-900/ NXR-901, the VCTCXO installed in the repeater automatically changes all reference signals so that no KXK-3 needs to be installed in the repeater even if the system is operated using Very Narrow. However, if the calibration intervals of the VCTCXO need to be longer, the OCXO unit (KXK-3) needs to be installed in the repeater. The OCXO LED behaves as follows according to the status of the reference oscillator:

Table A-3 OCXO LED

State of the LED	Description
Disappears	The reference signal from the VCXO installed in the repeater is used.
Green (solid)	OCXO is correctly installed in the repeater and OCXO supplies reference signals to other repeaters.
Orange (solid)	The repeater receives reference signals from external devices or other repeaters.
Red (solid)	Reference signal cannot be correctly detected even though reference signals are inputted from OCXO or external resource.
Orange (flashing) (NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901)	With "ON" configured in 50 Ohm Termination for an NXR-5700/ NXR-5800/ NXR-5900/ NXR-5901 repeater, the reference signals are provided from external devices or other repeaters.

BUSY LED

The LED lights green when the repeater receives a signal regardless of digital mode and analog mode. Also, the LED flashes green when the reception PLL unlocks.

TX LED

The LED lights red while the repeater is transmitting. Also, the LED flashes red when the transmission PLL or reference signal PLL unlocks.

POWER LED

The LED lights green when the repeater is turned on.

PF Key with LED

While the repeater is operating in Trunking mode, the functions assigned to the **[MON]**, **[TAKE OVER]** and **[RPT DISABLE]** keys at the top are fixed. The **[A]**, **[B]** and **[C]** keys at the bottom cannot be used.

The following is the behavior when the PF key is pressed:

Table A-4 Behavior of PF Key

PF Key	Description
MON	With the traffic channel behaving as Shared or AUX Channel, and pressing the [MON] key while receiving a signal of signaling that does not match, the received audio sounds from the speaker with the LED lighting red. This function is a toggle behavior. Although audio can sound even if the Monitor key is not pressed in digital mode, the encrypted audio cannot be monitored.
TAKE OVER	The function that can release a channel from the trunking behavior for testing transmission on a traffic channel. By pressing the [TAKE OVER] key to enable Take Over , the repeater enters the following states: • The PTT switch can be used by connecting a microphone to the repeater. • The repeater transmits on a Narrow bandwidth in analog mode. • The error tone does not sound on a channel transmitting as the control channel.
RPT DISABLE	Repeat Disable is the function that can temporarily place the repeater on standby. The same behavior as Power-on Standby can occur by operating the key. (Refer to Configuring the Repeat Behaviors of Startup (Power-on Standby).) The behavior in a NEXEDGE system is the same even when the [RPT DISABLE] key of a control channel or traffic channel is pressed. Behavior of a Control Channel: By pressing the [RPT DISABLE] key to enable Repeat Disable, the control channel enters the standby state and stops transmission. Because transmission of control data from the control channel stops, if the control channel enters the standby state, a subscriber unit starts a channel hunt and searches for another site. Repeat Disable can also be used as the key to release Power-on Standby. On a site permitting Power-on Standby, the repeater enters the standby state when turned on and does not immediately transmit. At this time, the LEDs for the [RPT DISABLE] keys of all repeaters in a NEXEDGE system light and the function is active. Behavior of a Traffic Channel: By pressing the [RPT DISABLE] key to enable Repeat Disable, the traffic channel stops transmission.

A.2 17-segment LED

Various LEDs are equipped on the repeater.

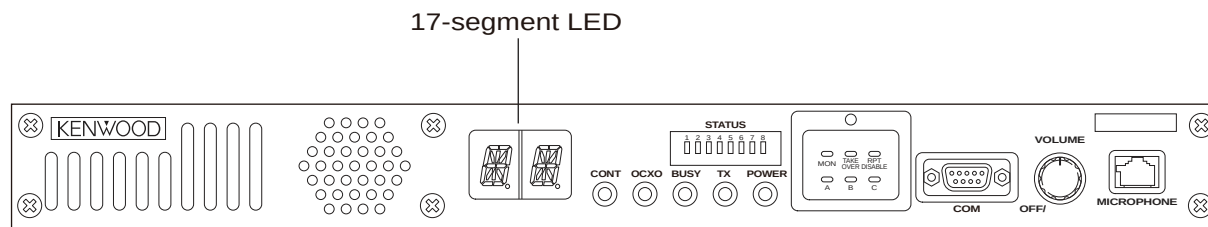


Figure A-2 Front Panel

The repeater displays alphanumeric characters and symbols by lighting or turning off 16-segment LEDs and a decimal point LED.



Figure A-3 17-segment LED

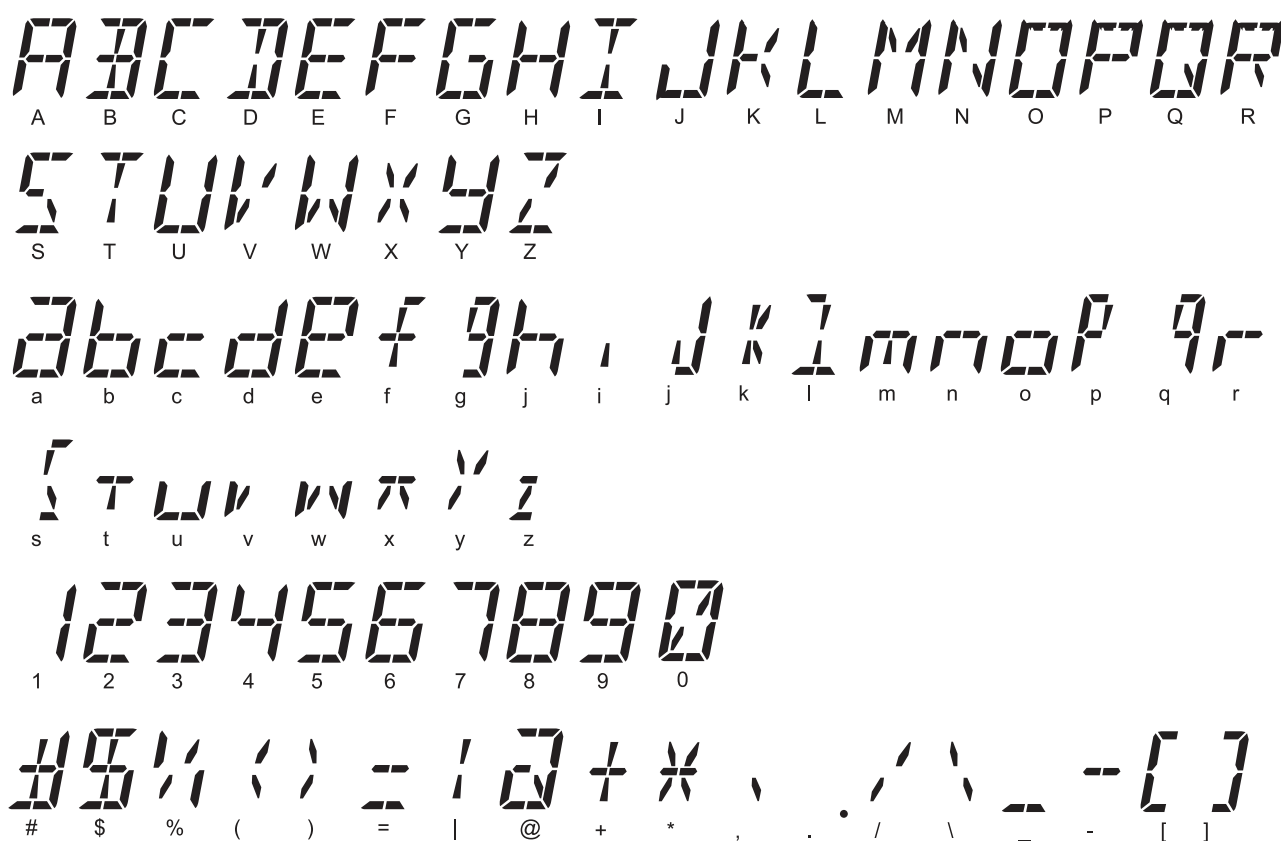


Figure A-4 Displayable Alphanumeric Characters and Symbols

Table A-5 Display of 17-segment LED

Repeater Status	LED Display	Remarks
PC Programming Mode PC Test Mode PC Tuning Mode	PC	-
Firmware Programming Mode	PG	Can change the Baud Rate by using FPRO.
Un-Programmed	E1	Appears if no channel data is configured.
Channel data blank	E2	Appears if a channel for which no data is configured is selected.
PLL Un-Lock	E3	TX PLL Unlock: TX LED flashes. TX PLL Unlock: BUSY LED flashes.
TX frequency data blank	E4	Appears if the repeater attempts to transmit on a channel for which no transmit frequency is configured.
IP configuration error	E5	Appears if an error is detected in the configuration of an IP address.
Flame Pulse Error	E6	Appears if no frame clock is entered while the repeater is in Trunking mode.
Temperature protection operated	E7	Appears upon activation of temperature protection by a temperature of the Final Unit exceeding the preset temperature, such as due to an abnormality in the PA Module. If the temperature protection becomes active, transmission is disabled and this state cannot be reset until the repeater is turned off.
Failure Channel Detected	E8	Appears if the Failure Channel Input port (AUX Input 3) becomes active.

A.3 Error Messages of the Communication Log

Communication Log - Cause (Normal Messages)

Table A-6 Communication Log - Cause (Normal Messages)

Code	Cause	Description
300	Channel Busy	All the traffic channels cannot be used on the site that is transmitting (Channel Busy).
301	not offered	A parameter value other than parameter values provided within a system is specified when a traffic channel is assigned.
302	Queuing interruption	A queued call terminated due to timeout
304	Disconnect by Hold Timer	Communication terminated with the completion of Hold Timer
305	Disconnect by Occupation Timer	Communication terminated with the completion of Occupation Timer
307	Disconnect by Console Preemption	A call disconnected due to the initiation of a Console Preemption call
308	Disconnect by SU Preemption	Communication terminated with the initiation of Preemption from a subscriber unit
309	Traffic Channel Failure	Communication terminated due to a traffic channel failure
310	Other Failure	Communication terminated due to other cause
311	Call Disconnect by user	Communication terminated due to a request for disconnection from a subscriber unit
312	Call Disconnect by PSTN	Communication terminated due to a request for disconnection from PSTN
316	Other Disconnect	Communication terminated due to disconnection from the system for other reasons
317	Network disconnected	Temporary network failure detected Multi-site network disconnected

Communication Log - Cause

Table A-7 Communication Log - Cause

Code	Cause	Description
400	Receive Success	A short message or status message successfully completed with acknowledgment
404	Memory Full	Receiver unit abort due to over buffer
405	Abort	Other cause of receiver unit abort
411	Send Success	A short message or status message successfully completed without acknowledgment

Communication Log - Cause (Registration Information)

Table A-8 Communication Log - Cause (Registration Information)

Code	Cause	Description
500	Registration accepted	A registration request successfully accepted
501	Authentication rejected (Authentication is refused.)	An ESN does not match. An ESN is not configured.
502	Service unconfigured	UID is unconfigured. GID is unconfigured. System is unconfigured. Site is unconfigured. IP Gateway is unconfigured.
503	Service invalid	UID/ GID is invalid. UID/ GID COS is invalid. Fleet is invalid. System/Site/IP Gateway is invalid.
504	Unavailable Area	A site not included as an available site of a Unit ID A site not included as an available site of a Group ID
505	Excess Number of Group Registrations	The maximum number of permitted group registrations is reached.

Communication Log - Cause (Receiver SU effect Messages)

Table A-9 Communication Log - Cause (Receiver SU effect Messages)

Code	Cause	Description
600	No response	No response from the receiver unit
601	Incoming call rejection	Incoming call rejected by receiver unit

Communication Log - Cause (Error Messages)

Table A-10 Communication Log - Cause (Error Messages)

Code	Cause	Description
700	Caller SU unavailable	The service of the caller UID is not permitted in the system.
701	Receiver SU unavailable	The service of the receiver UID is not permitted in the system.
702	Group unavailable	The service of the GID is not permitted in the system.
703	Caller SU Unregistered	The location of the caller UID is not registered.
704	Receiver SU Unregistered	The location of the receiver UID is not registered.
705	Group Unregistered	The group registration of the GID is not done.
706	Caller SU Busy	The caller UID is busy.
707	Receiver SU Busy	The receiver UID is busy.
708	Group Busy	The GID is busy.
709	Caller ID not available	A communication from a UID not configured in the system occurs.
710	Receiver ID not available	A communication to a UID not configured in the system occurs.
711	Group ID not available	A communication by using a GID not configured in the system occurs.

System Log - Common Error

Table A-11 System Log - Common Error

Code	Cause	Description
800	Registration request timeout	Timed out without a response from a system controller for the location registration request or the group registration request.
801	Registration Equipment congestion	Congestion occurred due to the high traffic of location registration requests or group registration requests
802	Registration resource unavailable	Insufficient resources for a location registration request or a group registration request
810	Channel unavailable	Traffic channel not available (channel restriction, Failsoft, etc)
811	Network failure	No response from all the sites even though calling all the sites to be called (Busy System Connect = BUSY)
812	Temporary failure	Temporary system failure detected
813	Equipment congestion	All traffic channels cannot be used on the site to be called. (Channel Busy). Group Calls in excess of Maximum Number Of Group Calls are made in the system.
815	Internal error	A parameter error occurred within the system.
816	Other error	Other errors

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