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NS1000

CLASSROOM MATERIAL (TRAINER)

Introduction

This material refers to the KX-NS1000 PBX system, and details the basic information that should be covered in a classroom session (1 day)

The Session comprises of the following sections;

NS1000 – Installation & Initialisation
NS1000 – WebMC
NS1000 – Terminal Registration
NS1000 – User Profiles
NS1000 – DSP Resources
NS1000 – Networking
NS1000 – Upgrade & Backup
NS1000 - Maintenance

From following this course element, participants will be gain an understanding of how to install, initialize and maintain the NS1000 system.

Further information about feature implementation and specifications, may be found in the associated Installation Manual, Feature Guide and User Manual.

Section - 1

INSTALLATION AND INITIALIZATION

Introduction

This material refers to the KX-NS1000 PBX system, and details the basic steps necessary to install and initialize the unit.

The Module comprises of the following sections;

NS1000 – Installation

NS1000 – System Initialization

From following this course element, participants will be gain an understanding of how to install and initialize the NS1000 ready for first use.

Further information about feature implementation and specifications, may be found in the associated Installation Manual, Feature Guide and User Manual.

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Chapter 1

INSTALLATION

NOTE

IMPORTANT:

Before installing the NS1000 system, refer to the Installation Manual. The Installation Manual contains specific information regarding the safe installation of the unit and also details specific installation and wiring precautions.

The information contained in this presentation is intended to supplement the NS1000 Installation Manual by providing an overview of the installation and initialization process and in no way replaces the published Installation Manual.

Where any information contained herein appears unclear or incomplete, the information contained in the published NS1000 Installation Manual shall take precedence.

1.1 Unpacking (1)

Unpacking

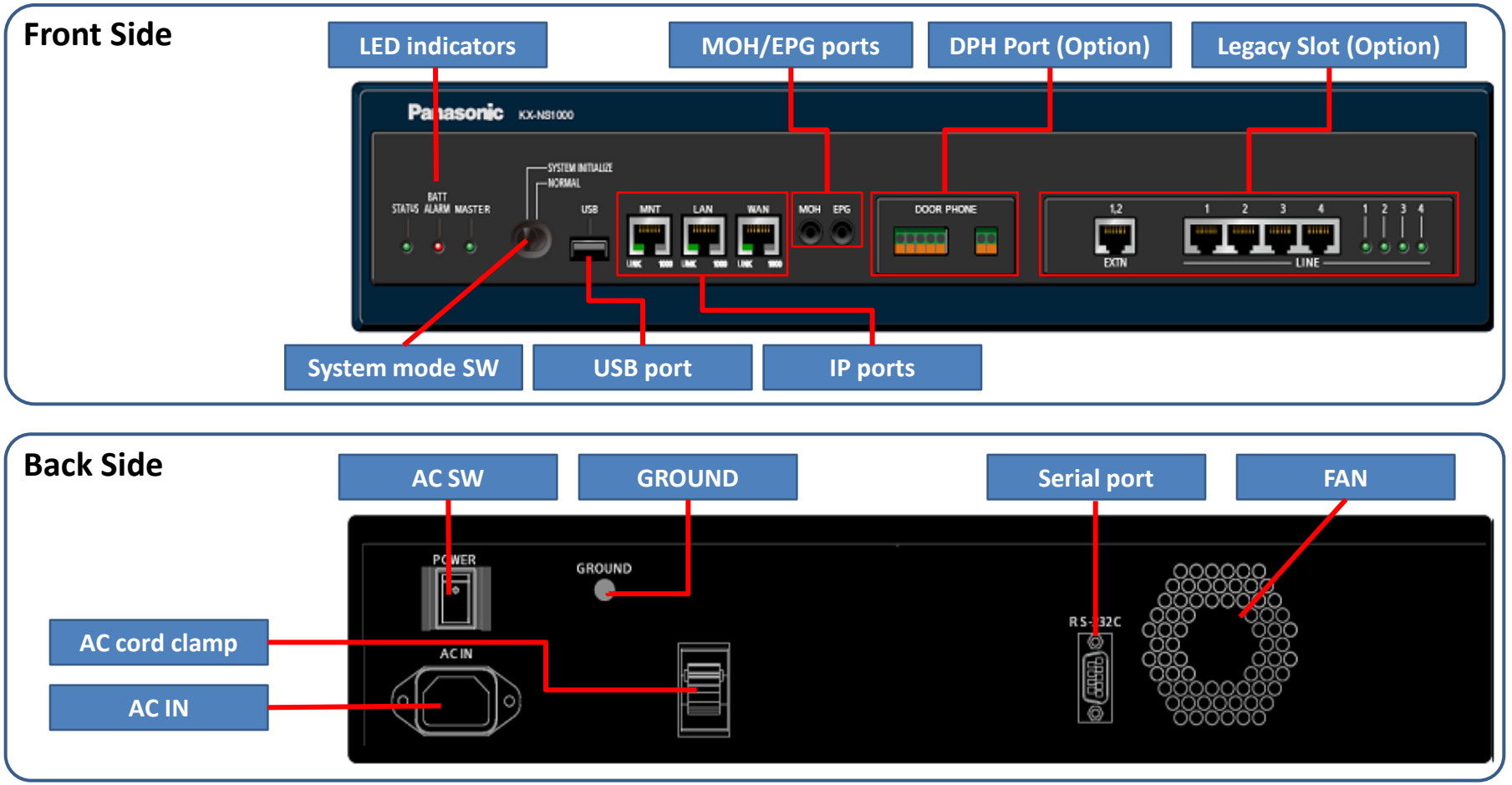
Remove the NS1000 from the box and check that the following items are present;

Description	Quantity
NS1000 Main Unit	1
AC Cord	1
19” Rack-mounting bracket	2
AC Cord Hook Clip	1
Screws	6

1.2 Component Location (1)

Component location (External)

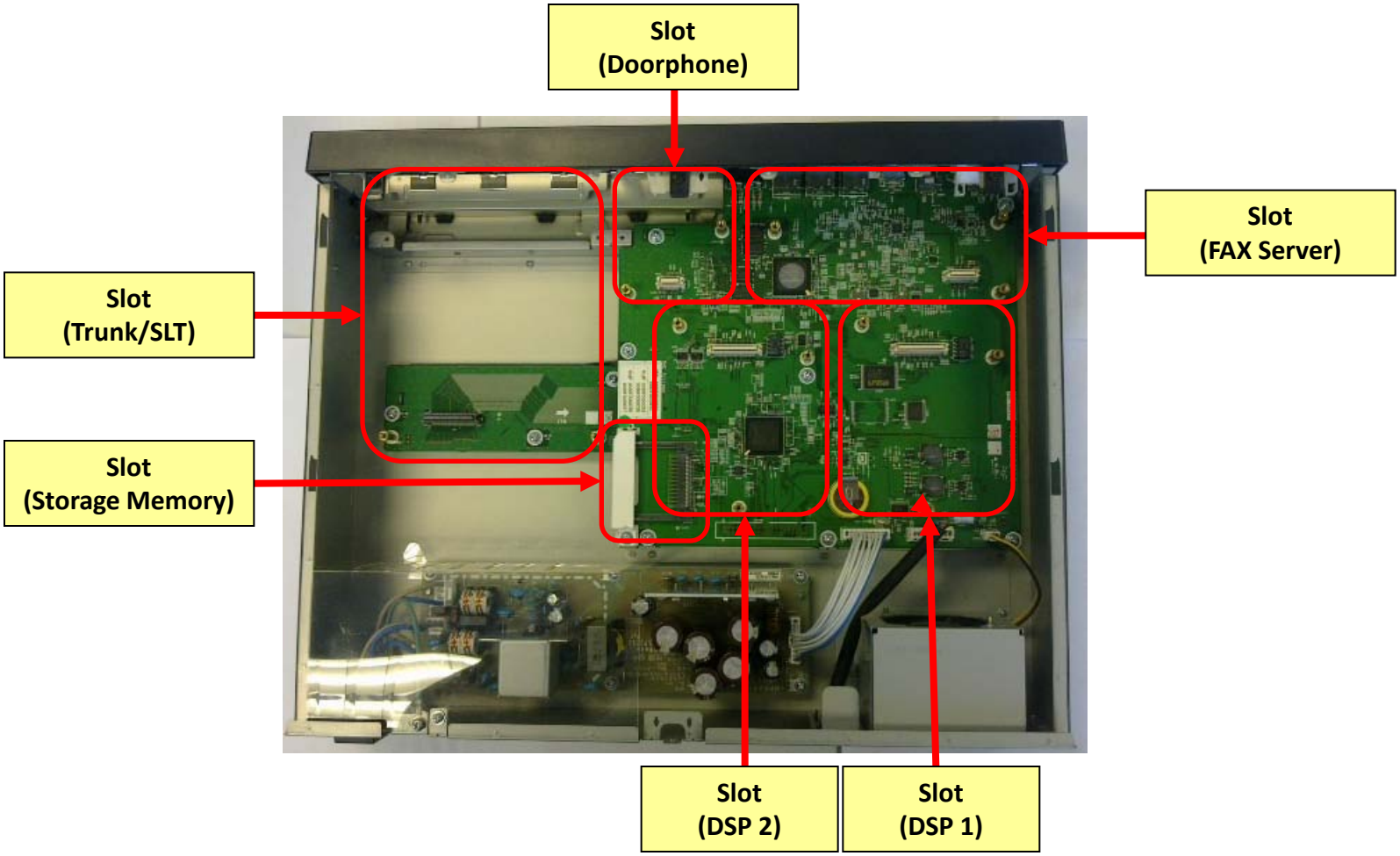
The main ports, jacks and LEDs etc are shown below;



1.2 Component Location (2)

Component location (Internal)

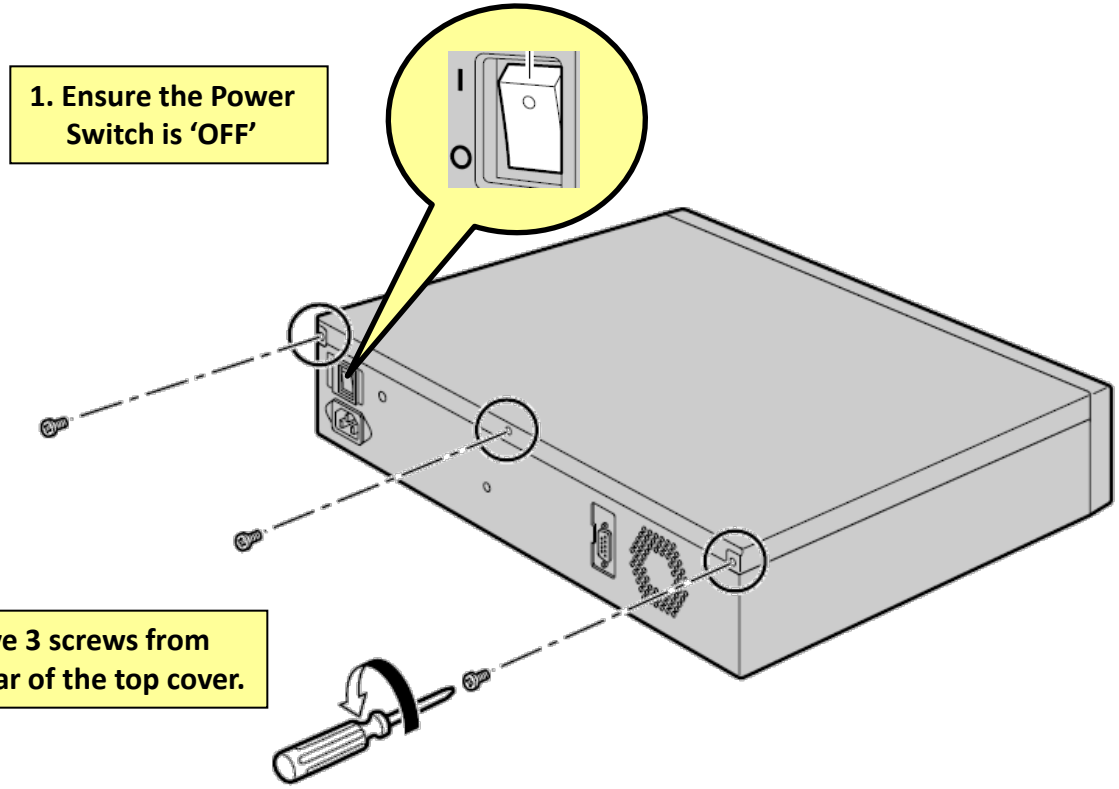
The expansion/option slots are shown below;



1.3 Option Installation (1)

Option Installation

- Optional cards can be installed when the top cover is removed.
- Option Cards are not “Hot-Swap”
- Power must be removed from the unit before optional cards are installed



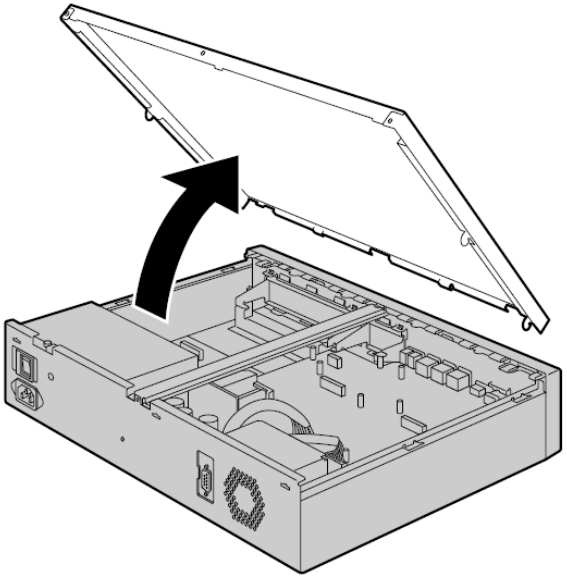
NB: Where possible, Option cards should be installed before installing and powering-on the unit for the first time. When this is not possible, the system must first be ‘SHUTDOWN’ using the Web Maintenance Console.
Removing the power without shutting down the unit may damage the systems file-structure and render the system inoperable.

1.3 Option Installation (2)

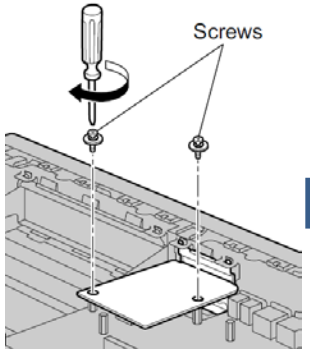
Option Installation

The required options can now be installed.

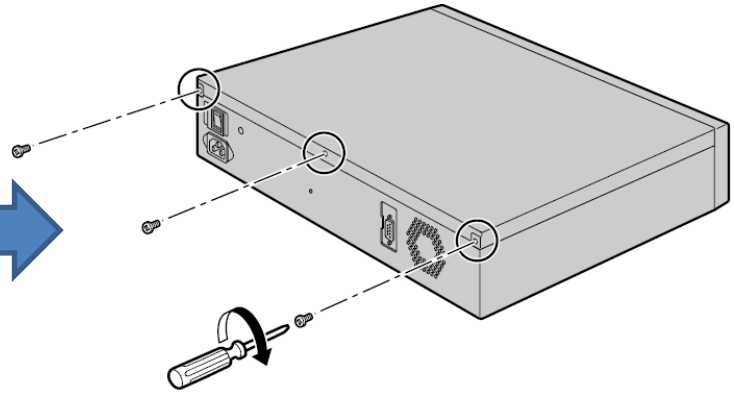
3. Remove the cover



4. Install the required options



5. Replace the top cover and screws.



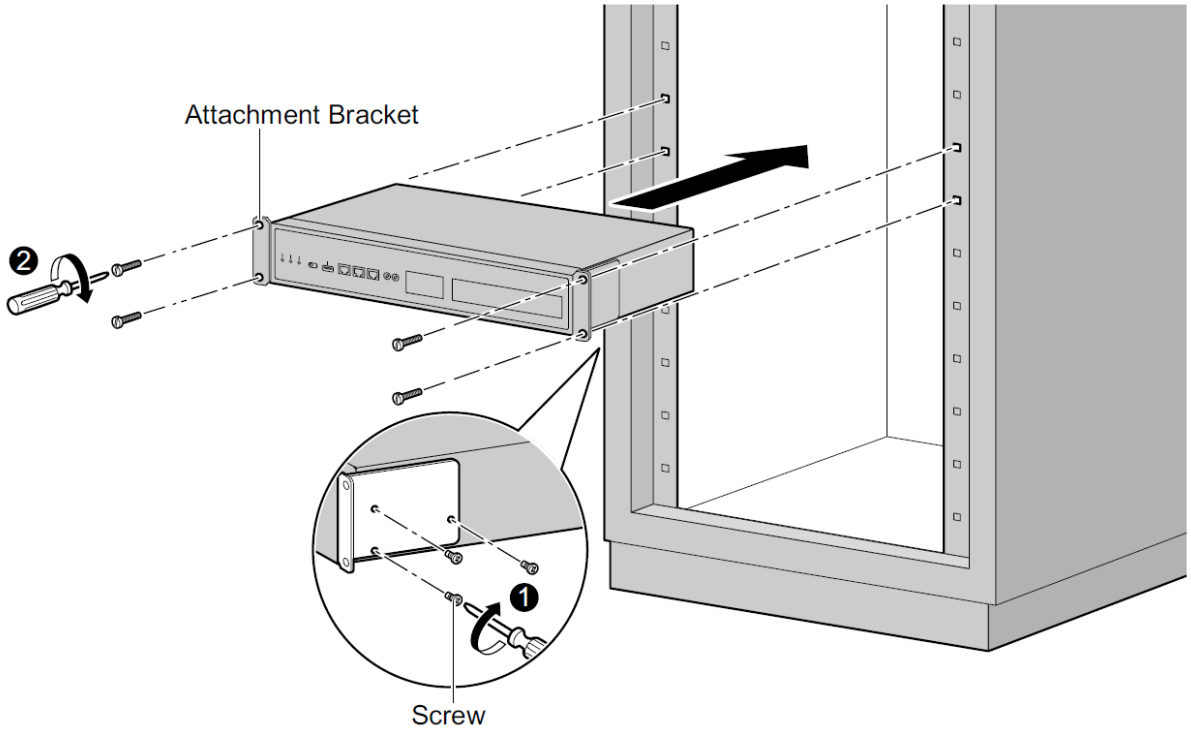
CAUTION:
When installing or removing option cards, do not put pressure on the main board. Damage to the option and main board may result.

1.4 Rack Mounting

Rack Mounting the NS1000

The NS1000 can be rack-mounted using the supplied brackets and screws.

1. Mount the brackets onto the NS1000.
2. Bolt the NS1000 into the rack using the hardware supplied by the rack manufacturer.



Size = 2U

Dimensions:
430mm×88mm×340mm

Weight : Under 4.5kg
(Fully Mounted)

NB: Ensure that there is sufficient ventilation around the system and that the rack temperature limit is not exceeded. (Refer to the Installation manual for further details)

1.5 Desk Mounting

Desk Mounting the NS1000

The NS1000 can be installed on a flat surface.

- The unit MUST be placed flat on it's base (Not on it's back, sides or upside-down etc)
- The units FAN opening MUST be clear
- A 10cm gap around the sides and 20cm over the top of the unit MUST be maintained.
- DO NOT place flammable (wood etc) objects behind the unit (Refer to the Installation Manual for more details)

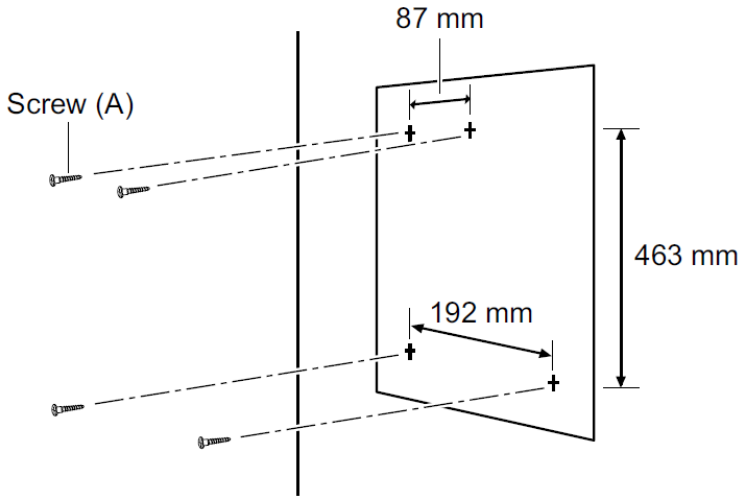
1.6 Wall Mounting

Wall Mounting the NS1000

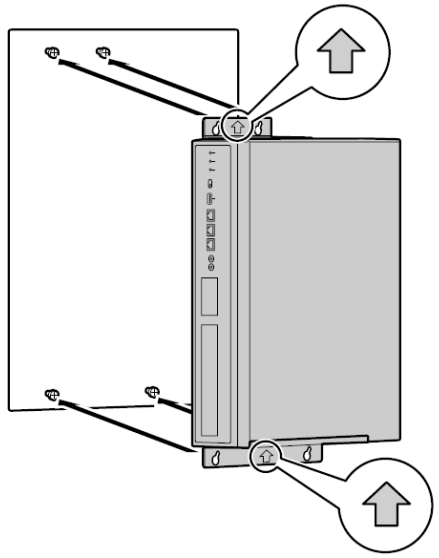
The NS1000 can be installed onto a suitable wall using the optional Wall Mounting kit.

(Refer to the Installation Manual for further details)

1. Install the screws (with suitable wall anchors etc)



2. Mount the unit to the wall (using the Wall Mounting Kit)



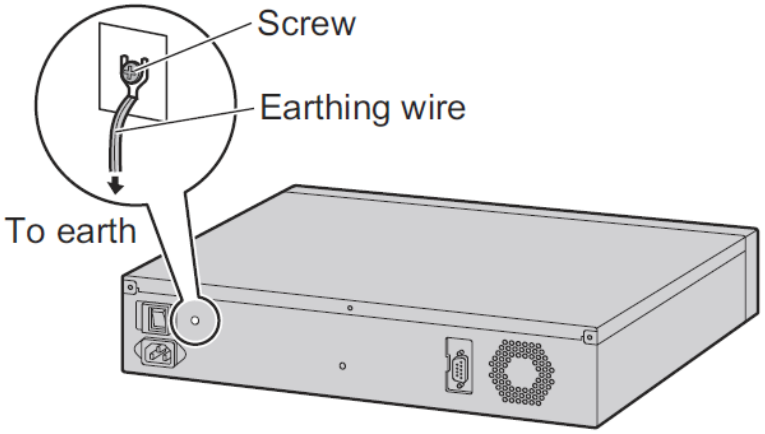
NB: The unit must be installed with the arrows on the Wall Mounting brackets pointing "UP". In any other orientation, the unit will not be secured correctly to the wall and may fall.

1.7 Earth / Surge Protector connection

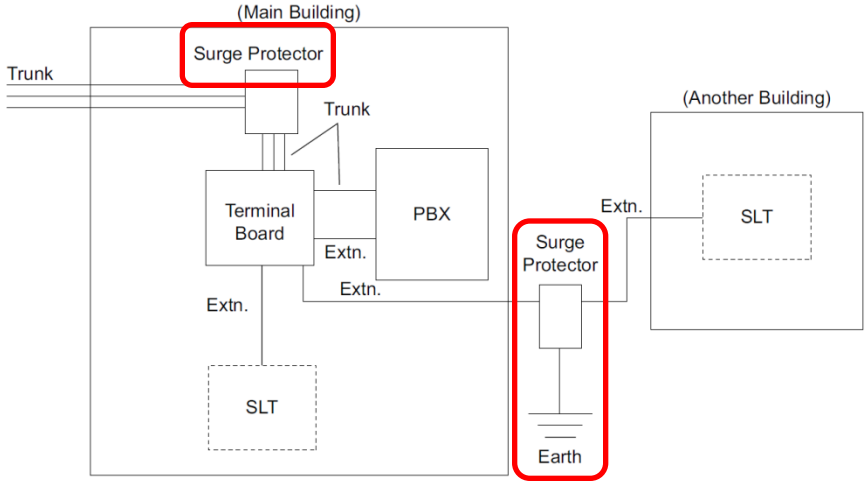
Frame Ground (Earth) and Surge Protection

(Refer to the Installation Manual!)

Frame Ground



Surge Protection



WARNING

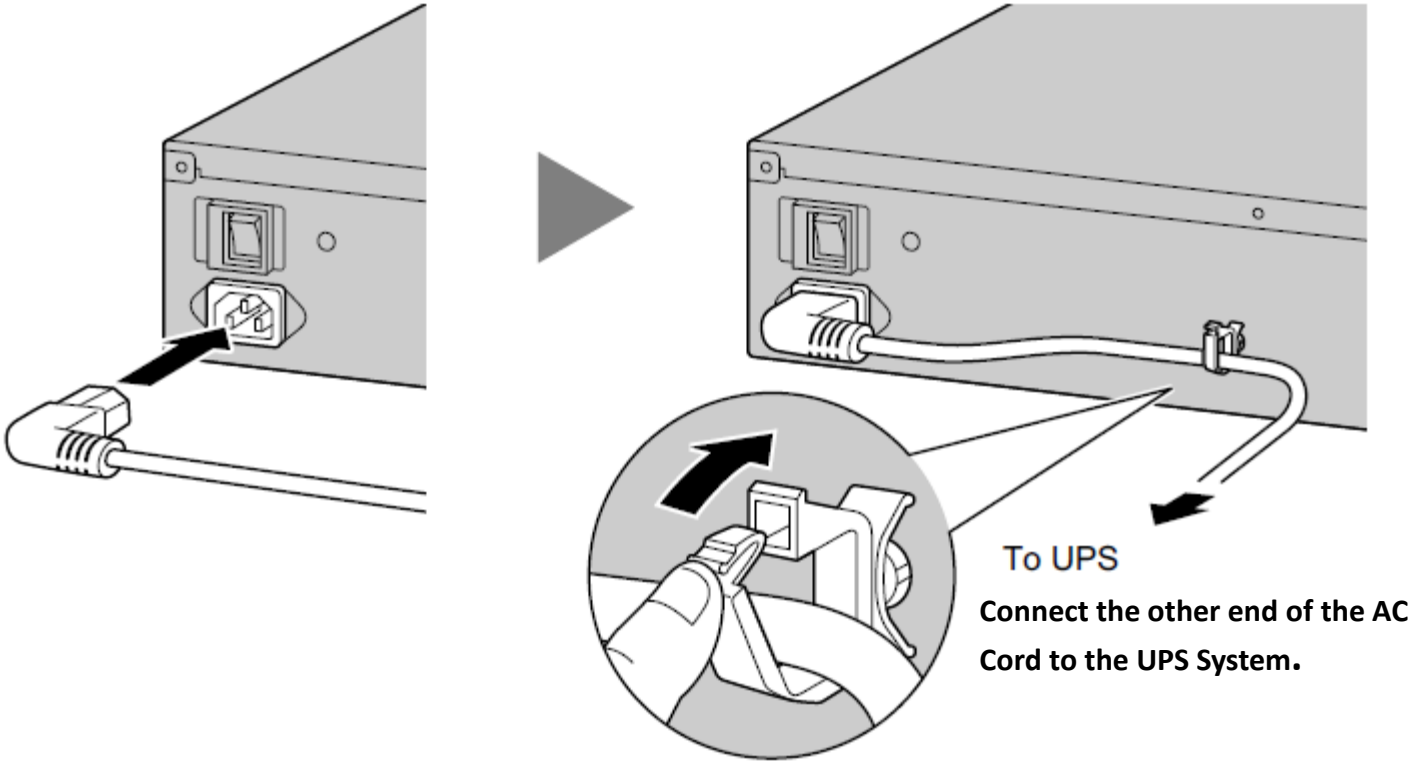
- Proper connection to earth is very important to reduce the risk to the user of electrocution or to protect the PBX from the effects of external noise or lightning strike.
- The earth wire of the AC cable has an effect against external noise and lightning strikes, but it may not be enough to protect the PBX and to ensure electromagnetic compatibility. A permanent connection between earth and the earth terminal of the PBX must be made.
- To protect the system from electrical surges, it is strongly recommend to connect the system to a surge protector that meets the following specifications:
    - Surge arrestor type: 3-electrode arrestor
    - DC spark-over voltage: 230 V
    - Maximum peak current: at least 10 kA

Many countries/areas have regulations requiring surge protection.
Be sure to comply with all applicable laws, regulations, and guidelines.

1.8 Connecting Power

Connecting the AC Cord

Using the AC Cord supplied with the unit, connect it to the PBX and secure with the supplied AC Cord Clip.



UPS System:

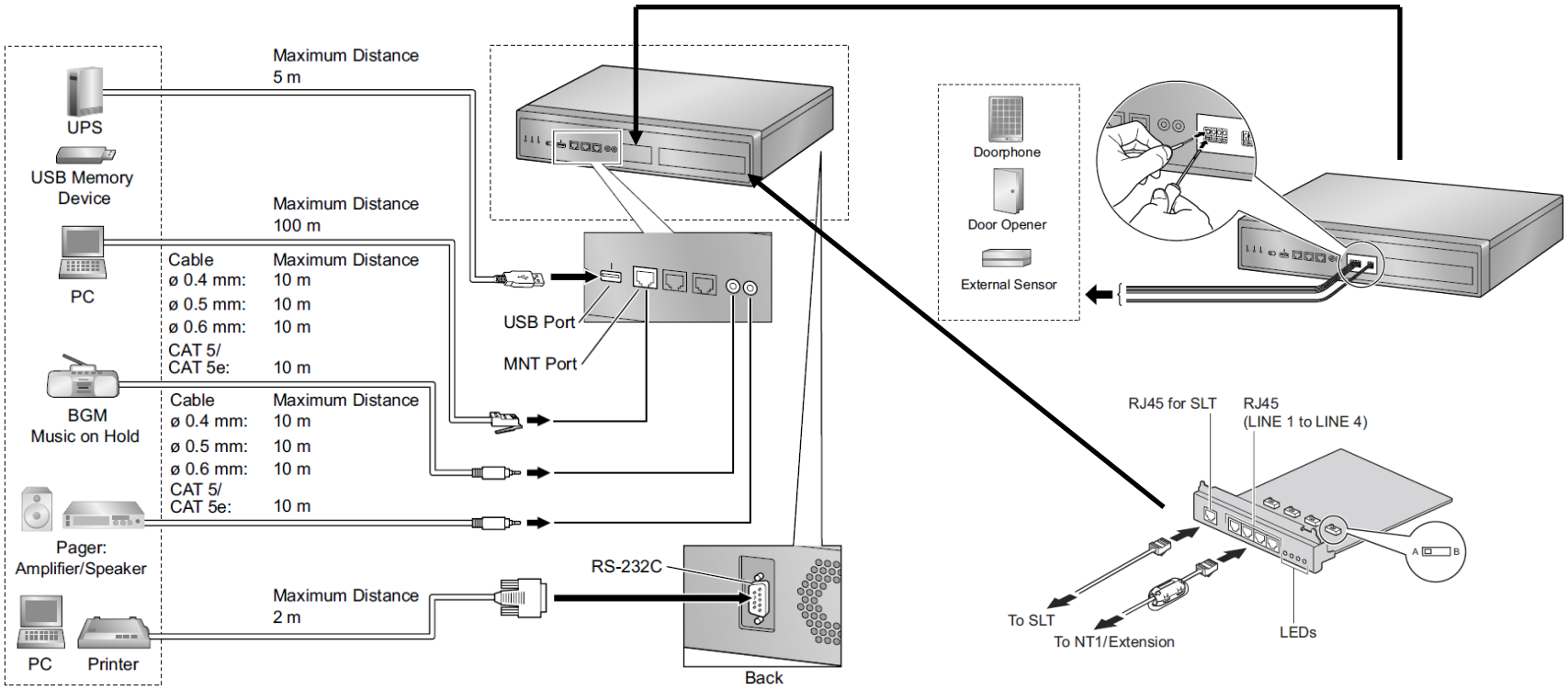
A UPS should be connected to the PBX to provide temporary in the event of a power failure.
When using the recommended UPS (APC RS Series with USB interface), the PBX can shutdown automatically by sending a warning signal to the PBX through the USB port.
By shutting down correctly, data loss or serious damage to the PBX caused by a sudden power cut can be prevented.
When power is restored, turn off the PBX using the power switch first, and then turn the PBX back on before starting the PBX.

1.9 External connections

Connecting Peripherals and Options

Once the NS1000 has been mounted, various peripherals and options can be connected.

(Refer to the Installation Manual for further details)



Chapter 2

SYSTEM INITIALISATION

2.1 System Initialisation

After installing the option cards, initialize the system (factory default settings)

1. Ensure the power switch is OFF.
2. Slide the System Mode Switch to the “SYSTEM INITIALIZE” position.

3. Turn the power switch ON. (STATUS and MASTER LED will flash AMBER), the STATUS LED will then flash GREEN.
4. Slide the System Mode Switch back to the “NORMAL” position. (When the STATUS LED is flashing.)

STATUS = RED (No DHCP)
STATUS = GREEN (DHCP)
MASTER = Flashing AMBER
(Master/Slave not assigned)

5. When successfully executed, the STATUS indicator will stop flashing and stay lit. (RED or GREEN)

Refer to Appendix for LED Sequence Detail.

2.2 Web Console Preparation

Below are the system requirements necessary for Web Connection to the NS1000

PC Requirements

	Minimum	Recommended
CPU	1.0GHz Intel Pentium/Celeron processor, or higher spec CPU	Intel Core 2 Duo/3.2GHz Intel Pentium/ Celeron processor, or higher spec CPU
RAM	256MB (1024MB for Windows Vista)	2048MB
OS	Windows XP Professional Windows XP HOME Edition Windows Vista Windows 7	Windows XP Professional Windows XP HOME Edition Windows Vista Windows 7
HDD	1.5GB or more available hard disk space	10GB or more available hard disk space
Display	Screen resolution: XGA (1024 * 768) DPI setting: Normal size (96 DPI)	Screen resolution: XGA (1024 * 768) DPI setting: Normal size (96 DPI)

Supported Browsers

Windows Internet Explorer 7 or 8

Mozilla Firefox 4

Browser Settings

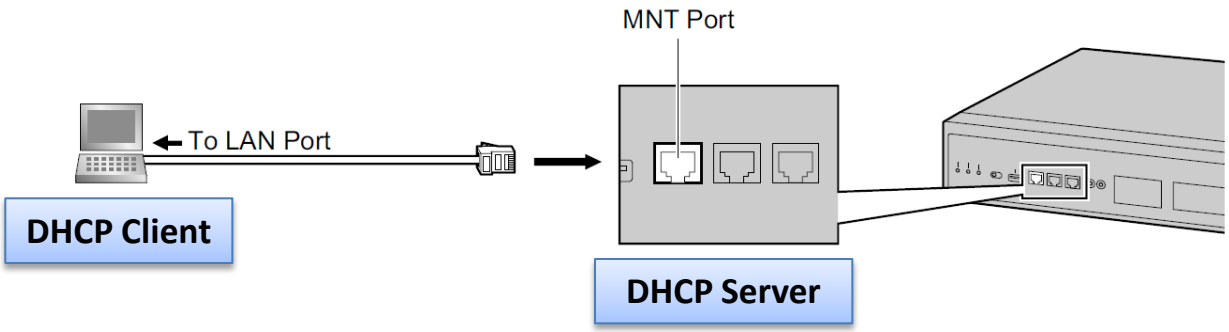
Enable the following functions in the browser's settings:

- Cookies
- JavaScript
- The ability to download files
- The display of animations
- The display of images

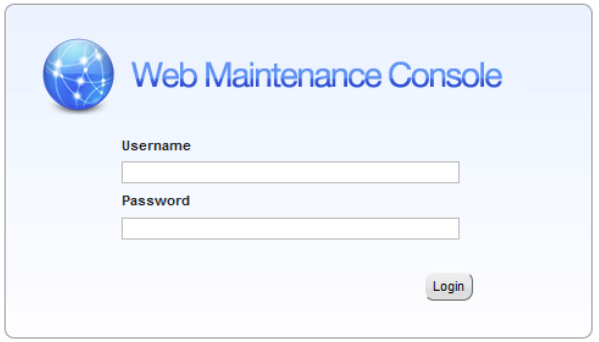
2.3 Web Console Connection

When the system has been initialized, the Setup Wizard can be run via the Web Maintenance Console (Web-MC).

Connecting a PC to the NS1000 via the Web-MC



1. Set your PC as a DHCP Client (Automatically Obtain IP Address.)
2. Connect your PC to the MNT Port of the NS1000 (Default IP Address 223.0.0.1)
3. Open you Browser and enter the URL **http://223.0.0.1/WebMC**
4. The Web Maintenance Console login screen will then be displayed in your browser.

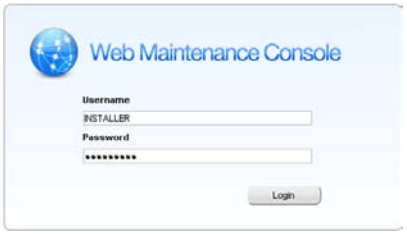


2.4 First Login (Factory Default Setting)

When connecting to the system for the first time, the Easy Setup Wizard will launch.

1st Login
(The PBX is in the factory default state)

Default Settings:
Username: INSTALLER
Password: 1234



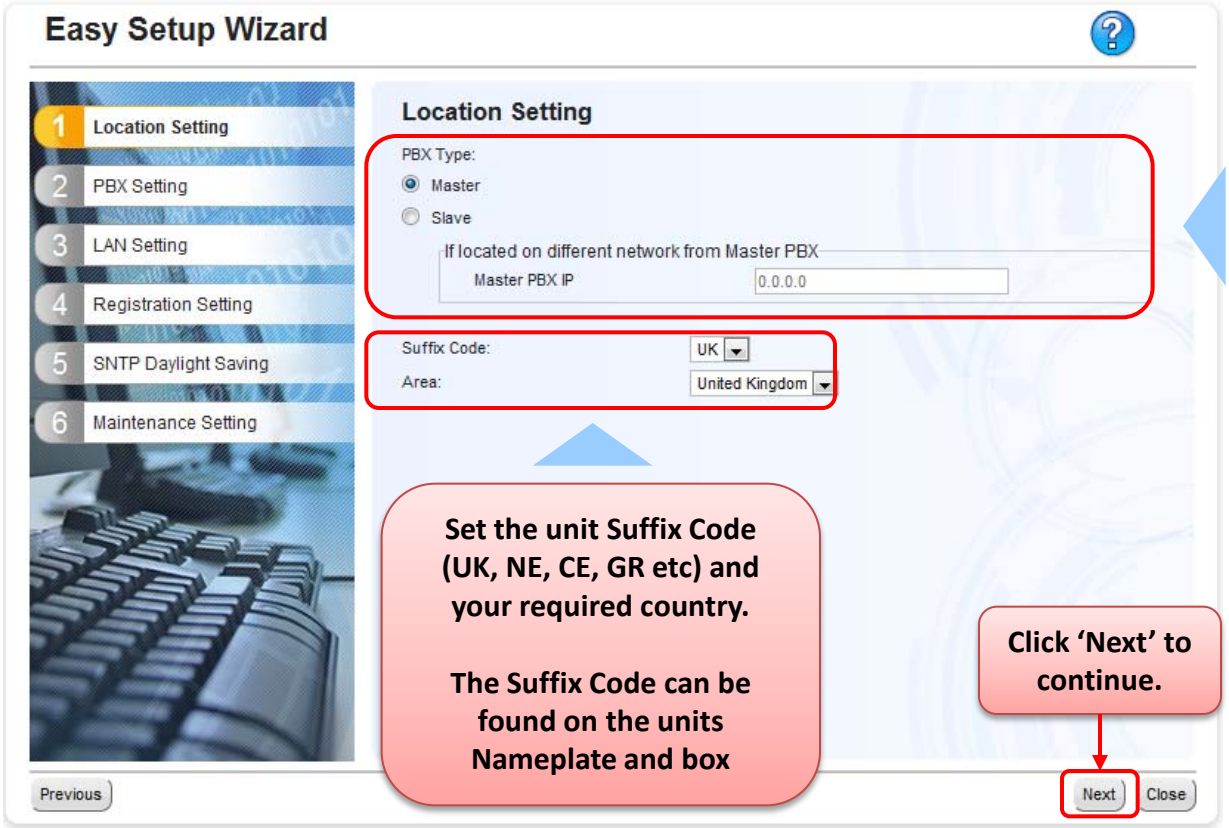
2. Click Install

1. Select the Web-MC Language

2.5 Easy Setup (1)

Location Setting

1. Set the unit status (Master/Slave), Suffix and Area

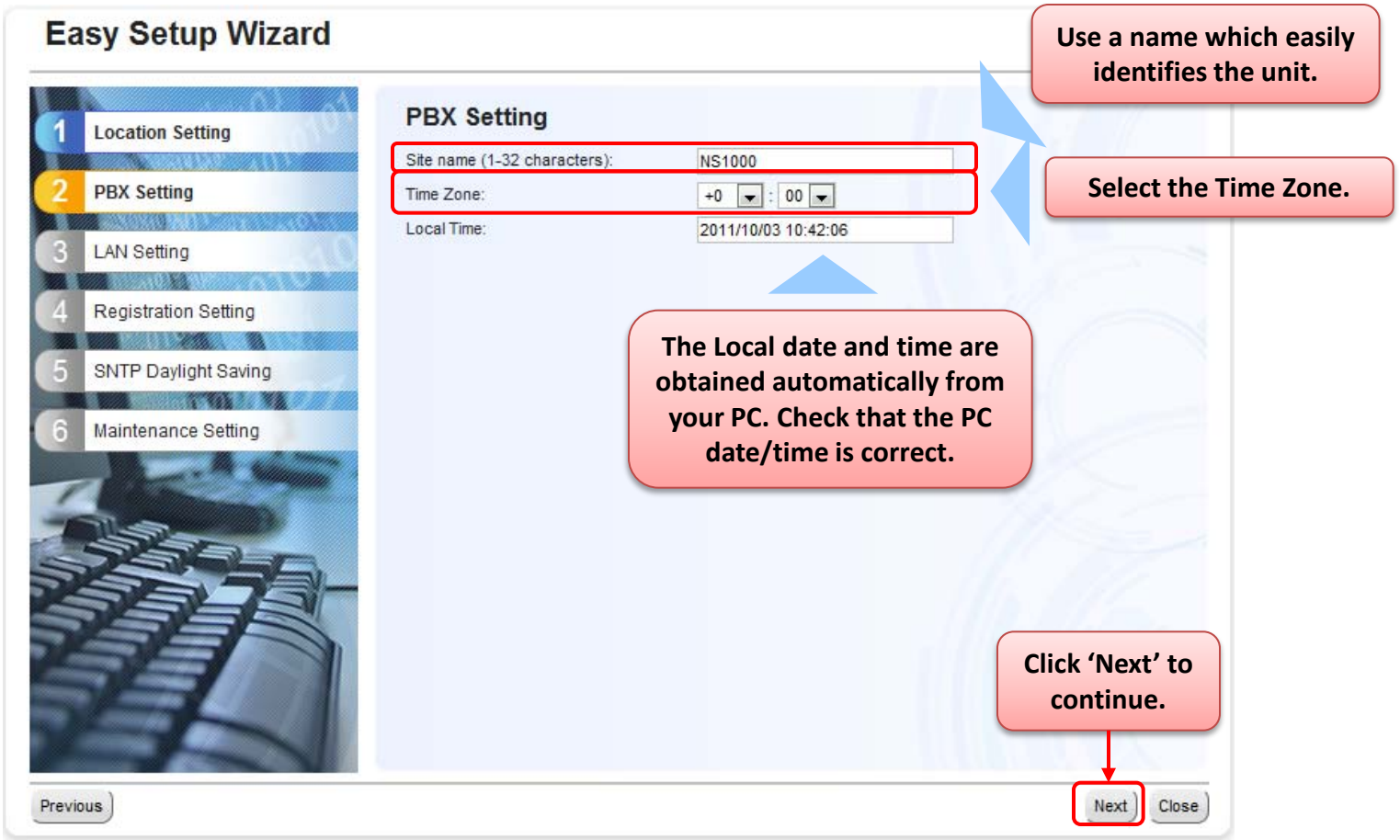


- If the Unit is to be configured as a Slave unit of a One-Look System on a Remote Site (Different Network than the Master), then set the PBX Type as 'Slave' and enter the Master PBX IP Address in the Location Setting. (Master units in a One-Look system or Stand-Alone units must be configured as a 'Master'.
- It is important to select the correct Suffix/Country settings so that the correct default tones, emergency dial and other country specific data are set automatically.

2.5 Easy Setup (2)

PBX Setting

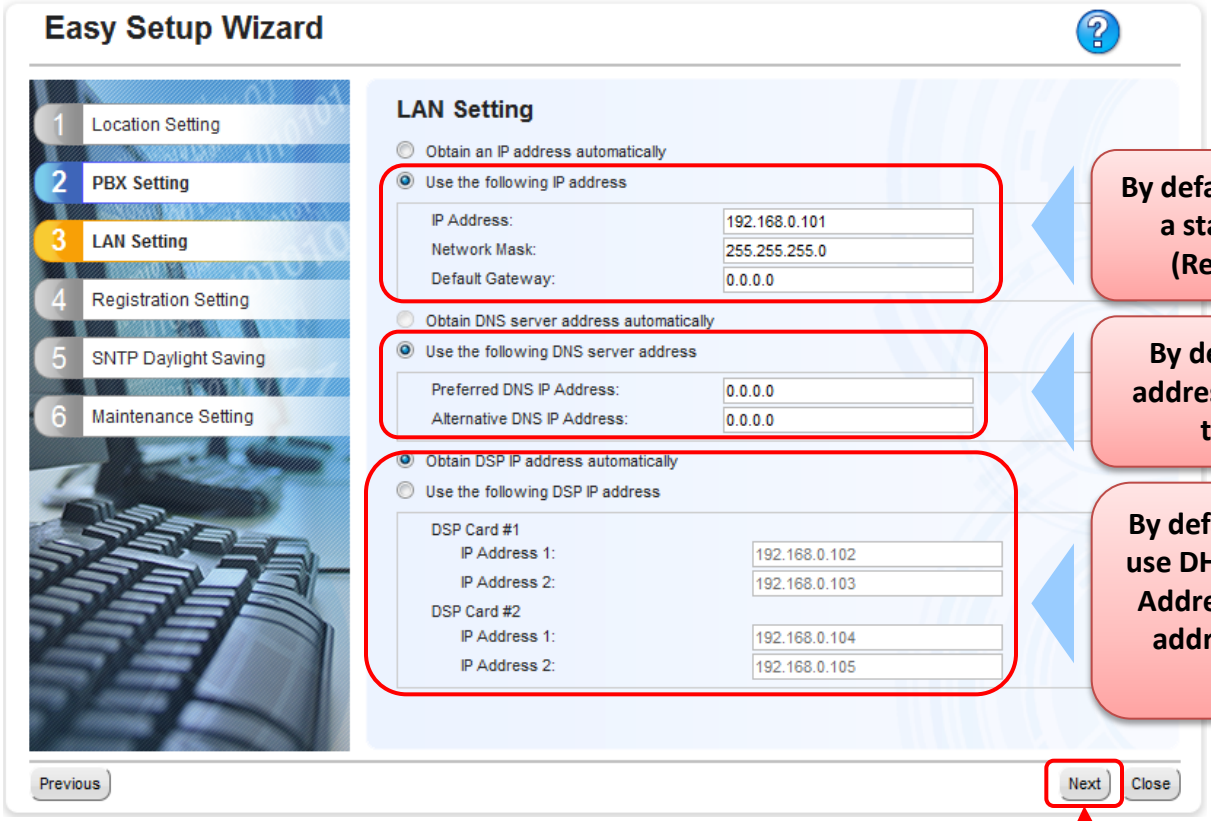
2. Give the system an appropriate name and set the Time Zone



2.5 Easy Setup (3)

LAN Setting

3. Enter the required LAN Settings



By default, the PBX uses a static IP Address (Recommended)

By default, no DNS server addresses are set. Configure them as required.

By default, the DSP Cards use DHCP to obtain an IP-Address, however static addresses can also be assigned.

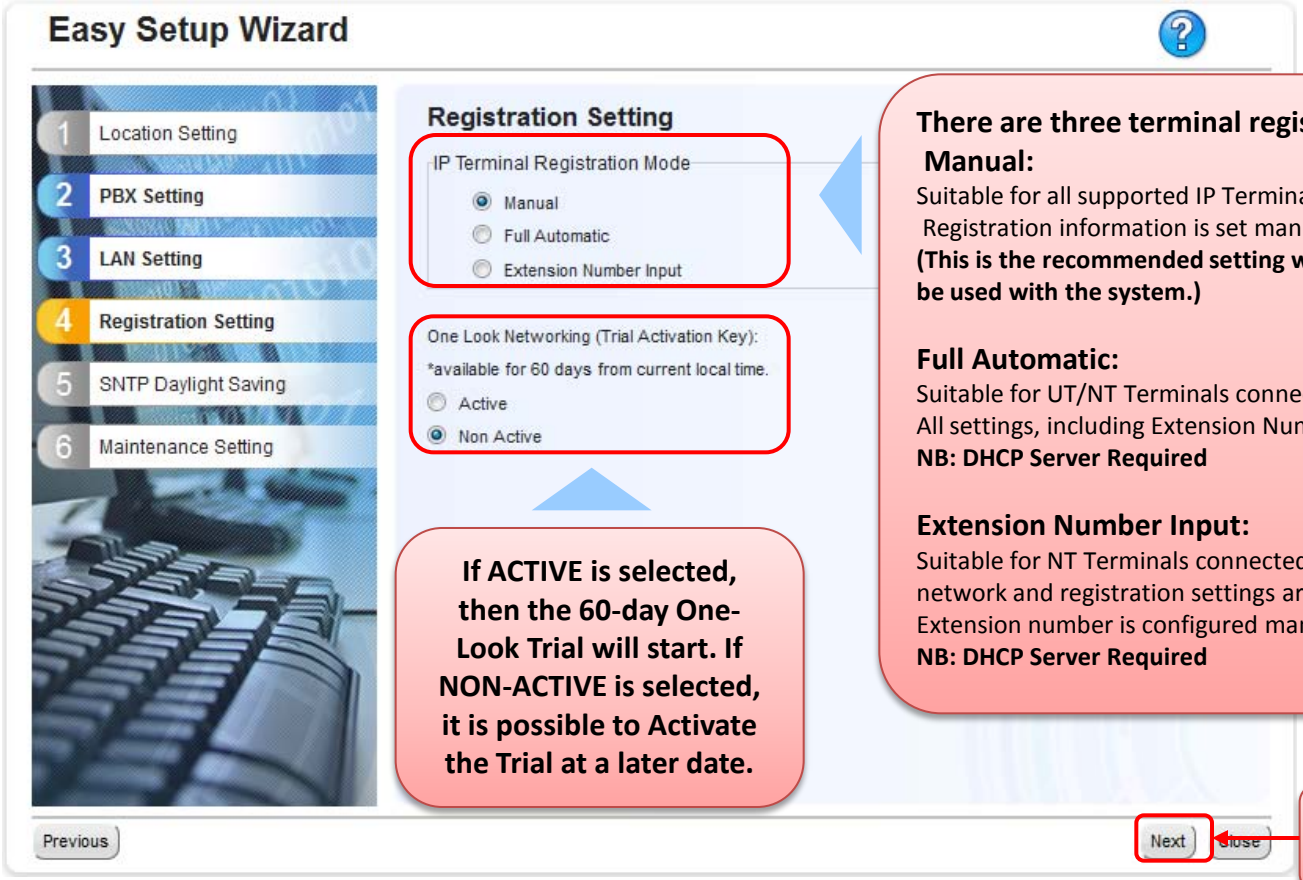
Click 'Next' to continue.

Note: If you are Not using DHCP then you Must assign a DSP IP Address Manually.

2.5 Easy Setup (4)

LAN Setting

4. Enter the IP Terminal Registration Mode setting and select if 'One-Look' Trial should start.



There are three terminal registration Modes;

Manual:
Suitable for all supported IP Terminals and network configurations. Registration information is set manually in the Terminal and PBX.
(This is the recommended setting when a range of IP/SIP Terminals will be used with the system.)

Full Automatic:
Suitable for UT/NT Terminals connected to the same network as the PBX. All settings, including Extension Number are registered automatically.
NB: DHCP Server Required

Extension Number Input:
Suitable for NT Terminals connected to the same network as the PBX. All network and registration settings are registered automatically. The Extension number is configured manually via the Terminal.
NB: DHCP Server Required

If ACTIVE is selected, then the 60-day One-Look Trial will start. If NON-ACTIVE is selected, it is possible to Activate the Trial at a later date.

Click 'Next' to continue.

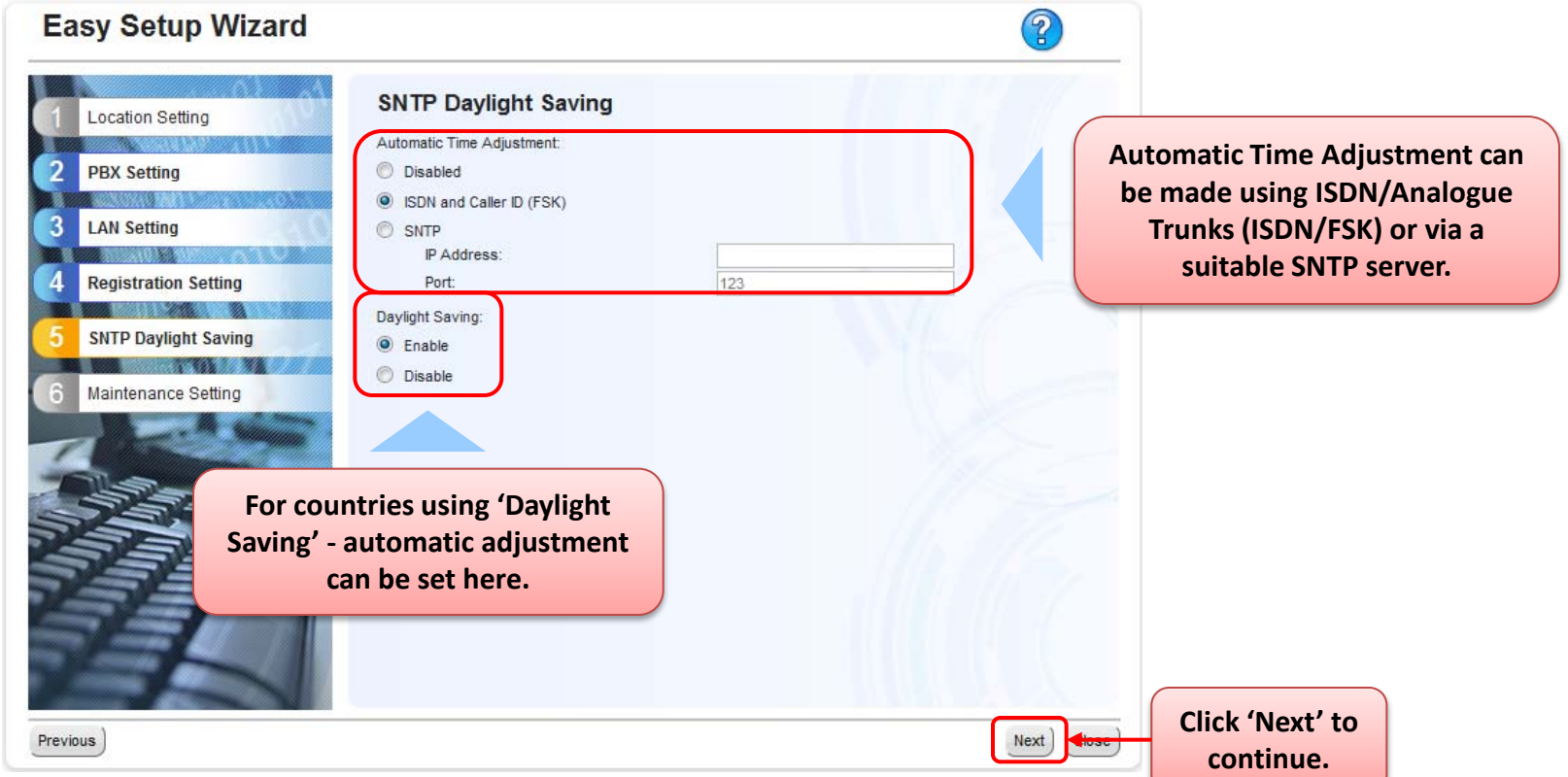
Note:
1. Non-UT Series SIP Terminals must be registered manually.
2. By default, the UT-Series SIP Extension password is automatically set to '1234'

2.5 Easy Setup (5)

SNTP (Simple Network Time Protocol) / Daylight Saving Setting

5. The source used for automatic time adjustment and the Daylight Saving mode is set here.

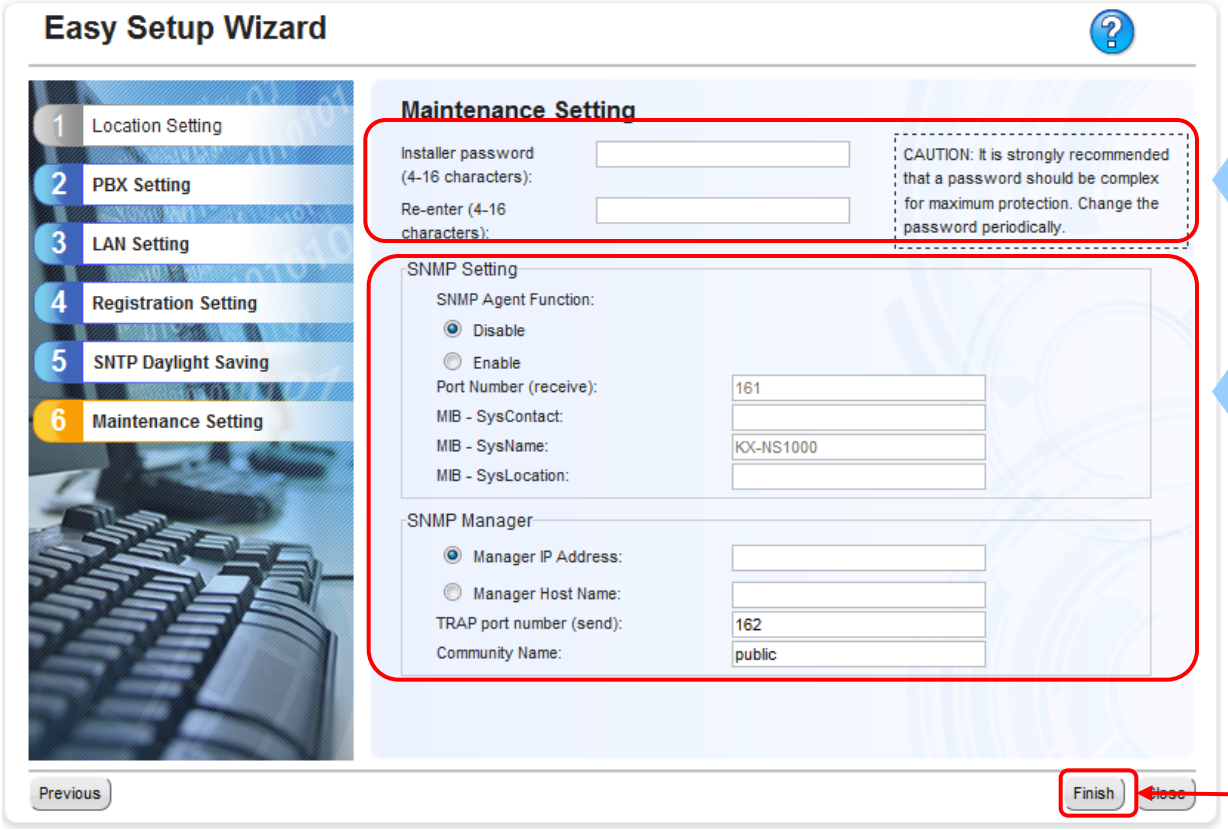
This is useful to keep the time displayed on the terminals and SMDR records etc accurate.



2.5 Easy Setup (6)

Maintenance / Remote Management Settings

6. The Installer Password can be changed (Strongly Recommended) and SNMP (Simple Network Management Protocol) can be configured here.



Be sure to change the default Installer password up installation.
Use a strong password.

Check the required SNMP settings with the Network Administrator and enter as required to enable Remote Management.

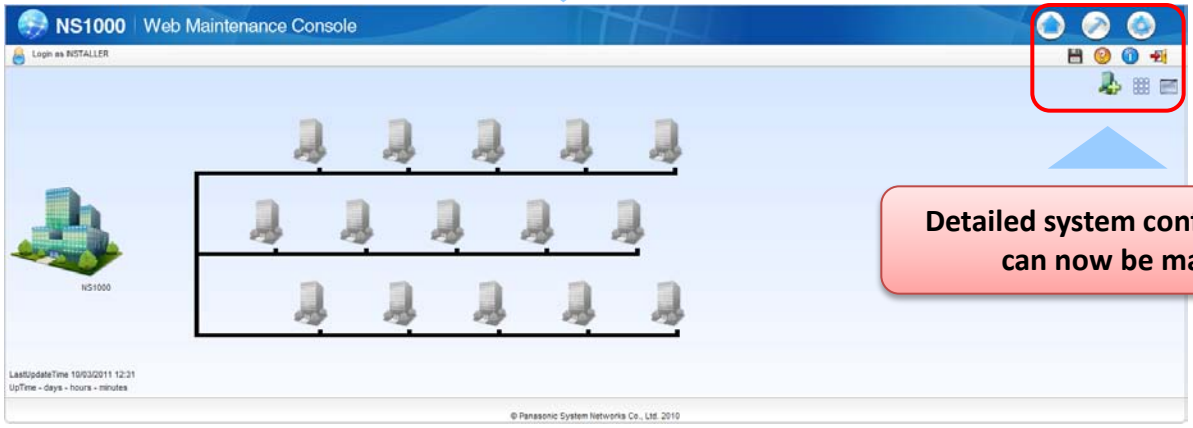
Click 'Finish' to complete Easy Setup.

2.5 Easy Setup (7)

If the systems LAN settings were changed during Easy Setup, you will be prompted to restart the PBX so that the changes can take effect. Be sure to login with the new password etc

2nd Login
(Easy Setup has been completed)

Login with the new password.

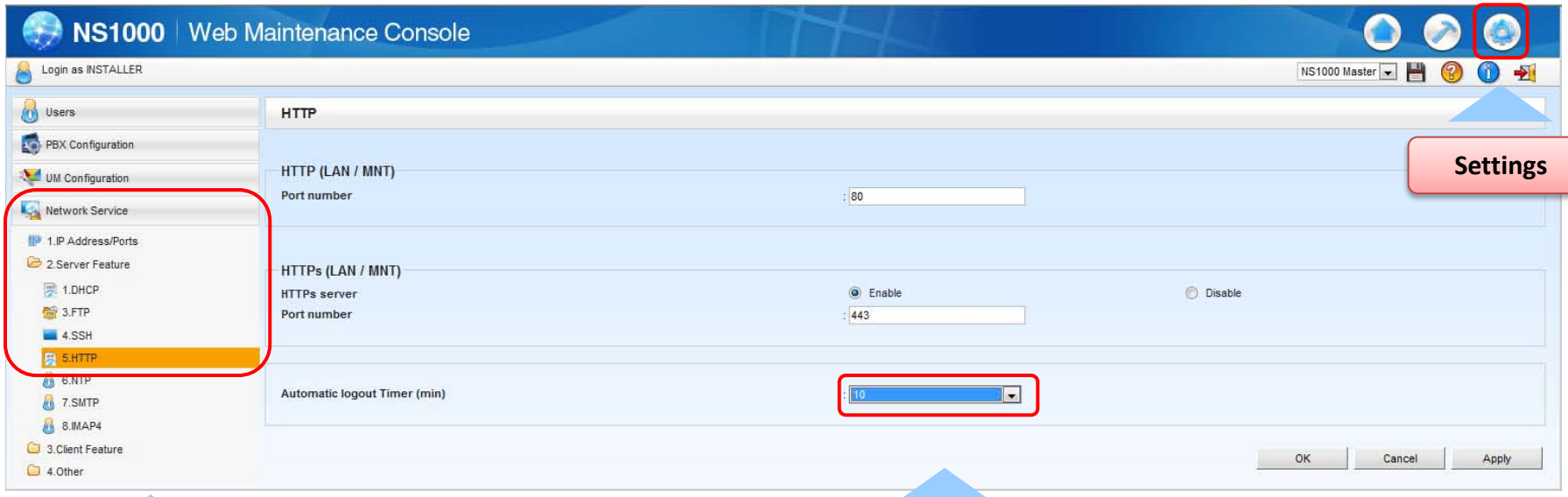


Detailed system configuration can now be made.

2.5 Easy Setup (8)

By Default, the WebMC portal will remain active (without activity) for 60 minutes.

To change the WebMC Portal settings, change the time here after 2nd login :-



Chapter 3

SLAVE INITIAL CONFIGURATION

3.1 Slave Initial Configuration

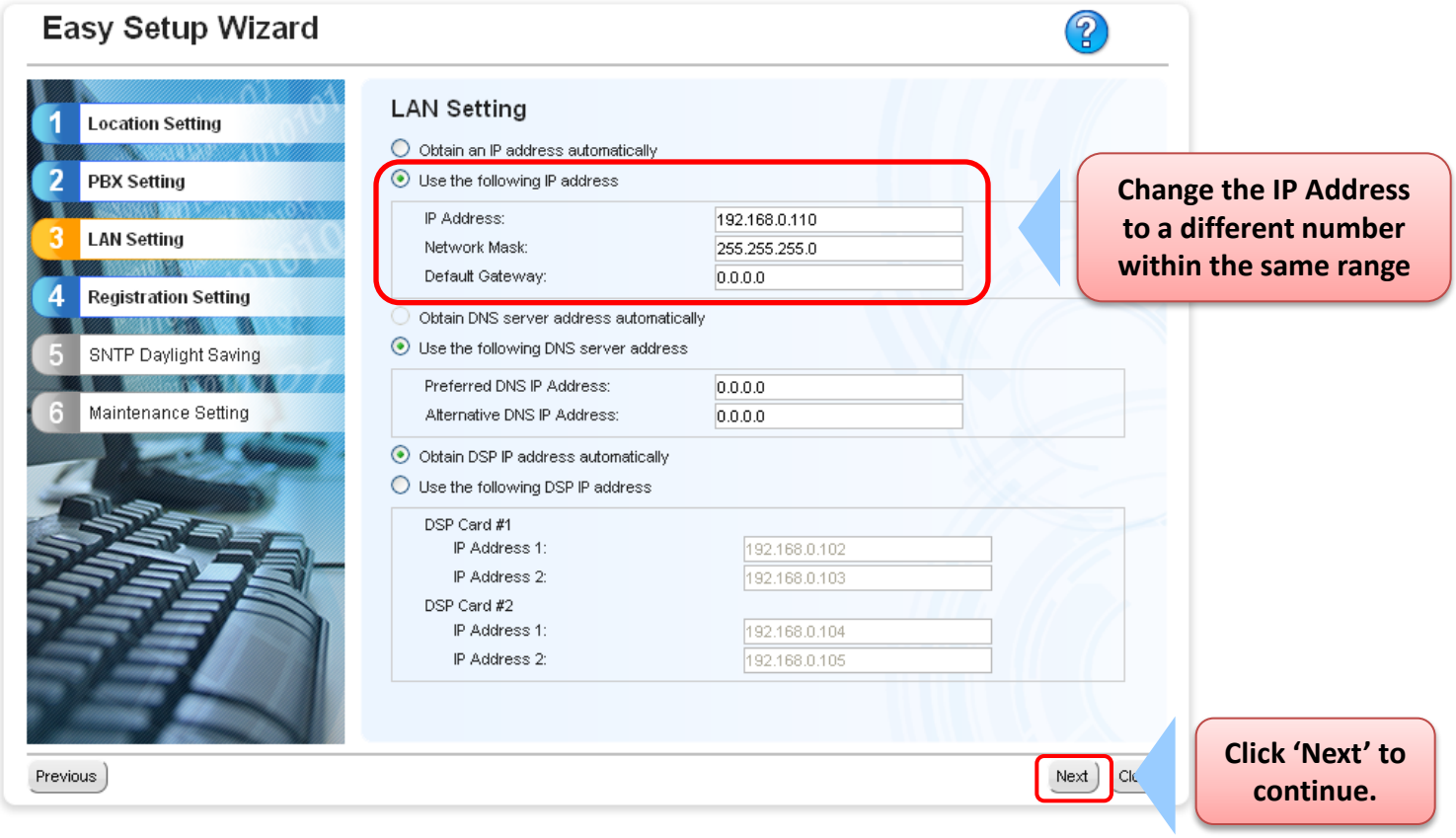
Location Setting

1. Set the unit status as Slave.
2. Enter the IP Address of the Master System.

3.1 Slave Initial Configuration

LAN Setting

3. Enter the required LAN Settings. Change the IP Address to a different number within the same range



Note: If you are Not using DHCP then you Must assign a DSP IP Address Manually.

3.1 Slave Initial Configuration

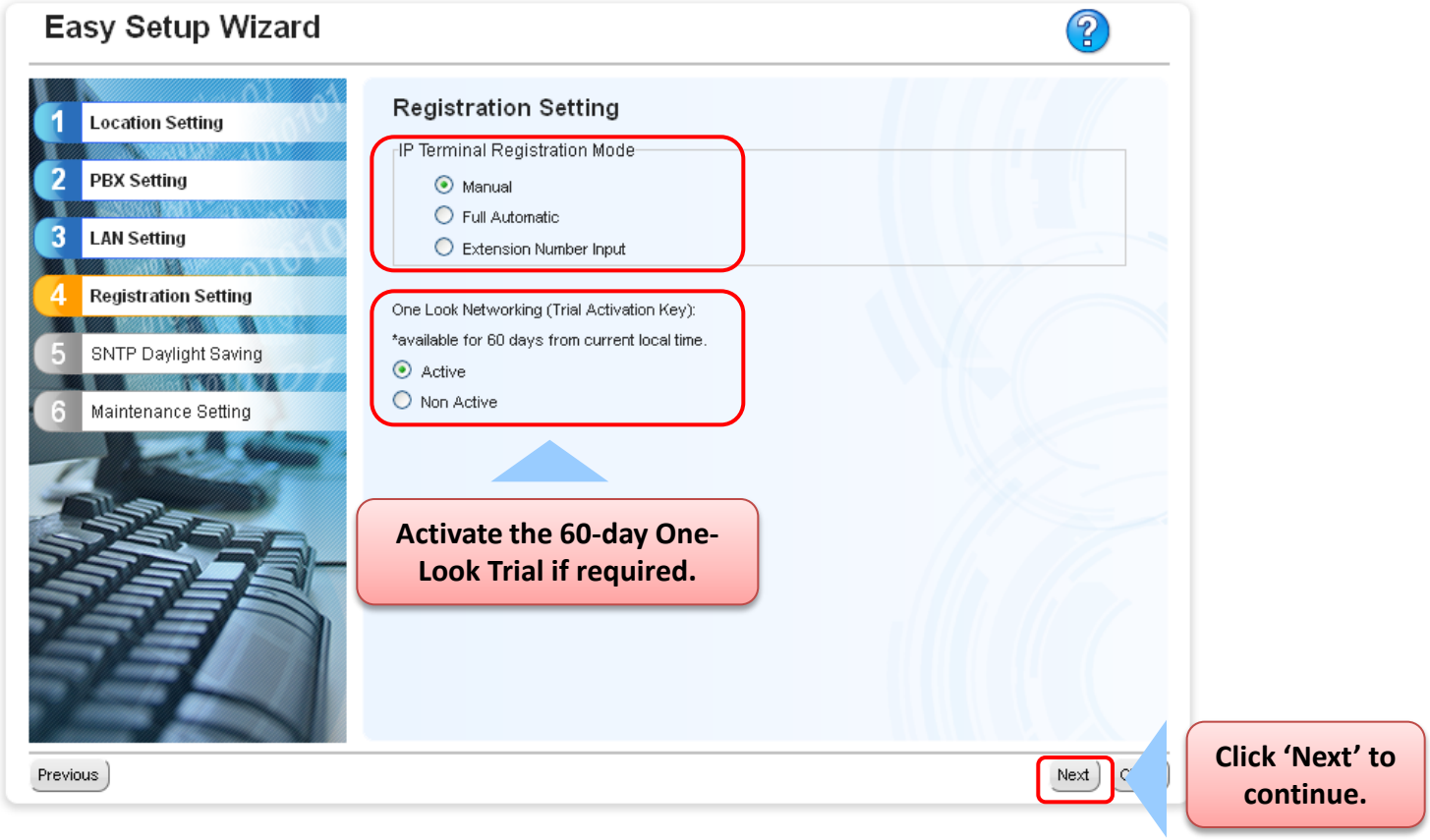
LAN Setting

Note: Once the LAN settings has changed, the system will need to reboot.
The bellow pop-up will be displayed. Click OK to reboot system.

3.1 Slave Initial Configuration

Registration Setting

4. Enter the IP Terminal Registration Mode as Manual. Full automatic can be used but is not covered in this document. Manual entry reduces the number of Empty Extension numbers in CA.



Note:

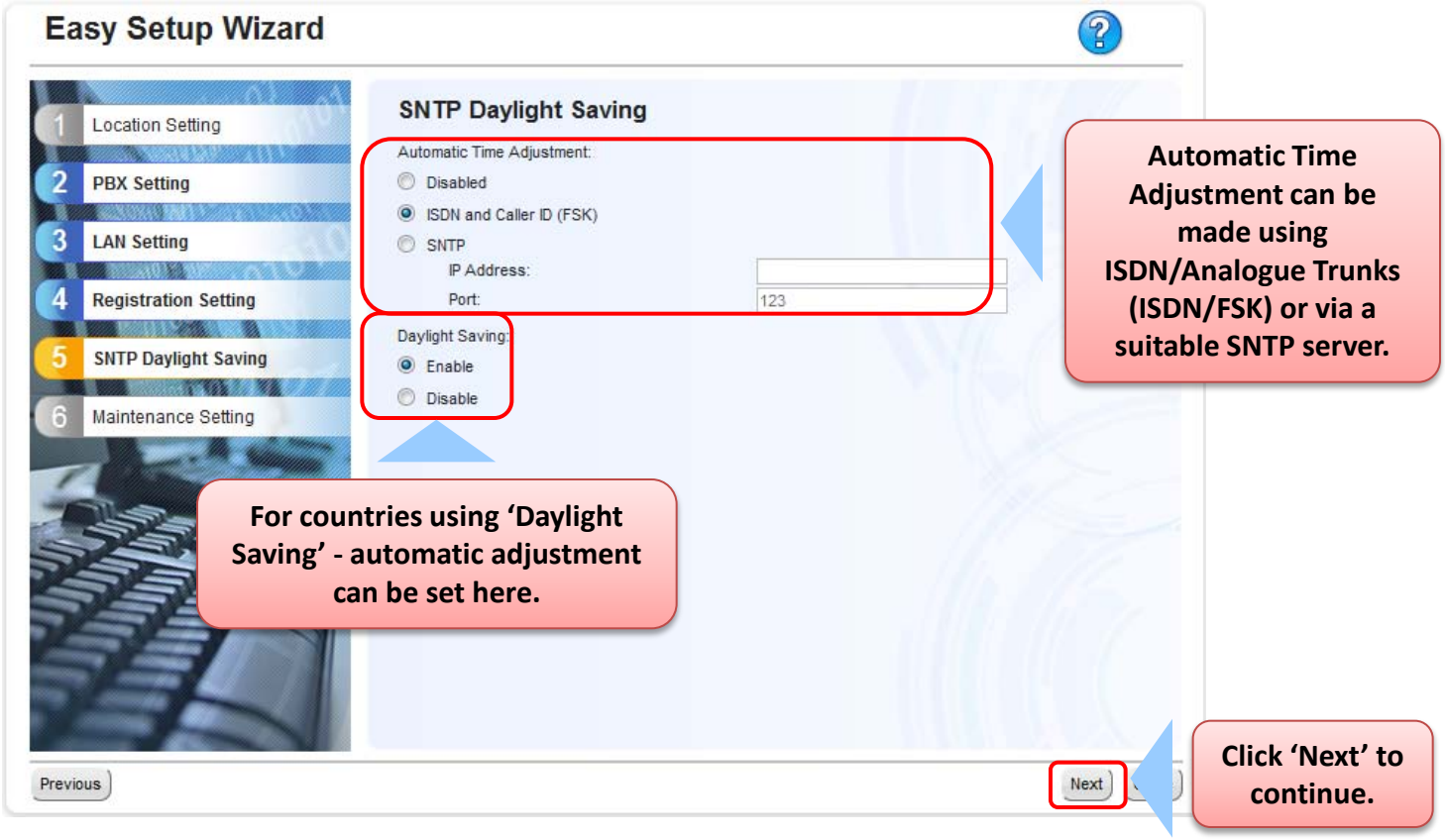
1. Non-UT Series SIP Terminals must be registered manually.
2. By default, the UT-Series SIP Extension password is automatically set to '1234'

3.1 Slave Initial Configuration

SNTP (Simple Network Time Protocol) / Daylight Saving Setting

5. The source used for automatic time adjustment and the Daylight Saving mode is set here.

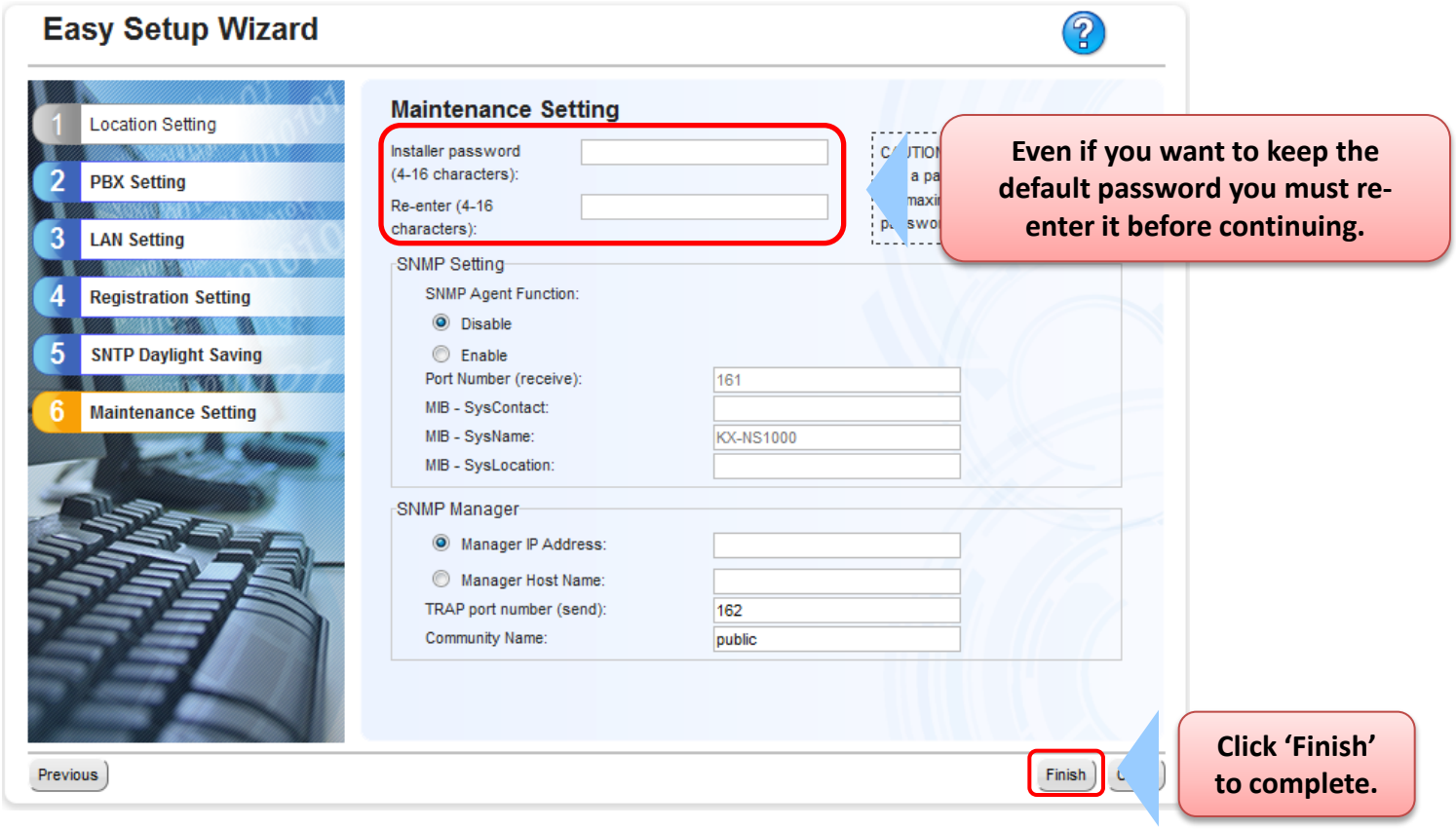
This is useful to keep the time displayed on the terminals and SMDR records etc accurate.



3.1 Slave Initial Configuration

Maintenance / Remote Management Settings

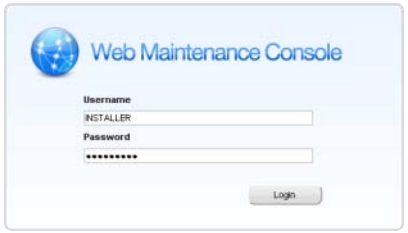
6. The Installer Password can be changed if required. Even if you want to keep as default (1234) you must re-enter it here before continuing.



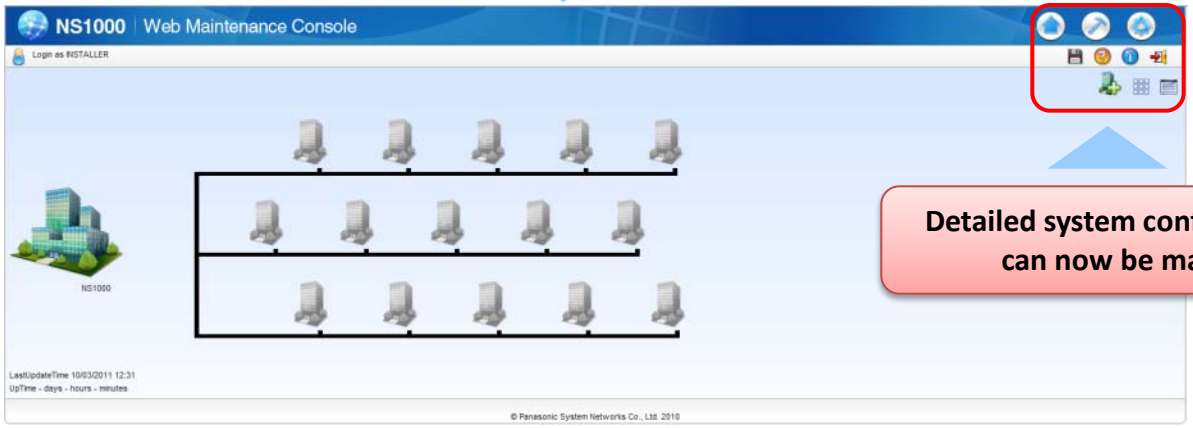
3.1 Slave Initial Configuration

If the systems LAN settings were changed during Easy Setup, you will be prompted to restart the PBX so that the changes can take effect. Be sure to login with the new password etc

2nd Login
(Easy Setup has been completed)



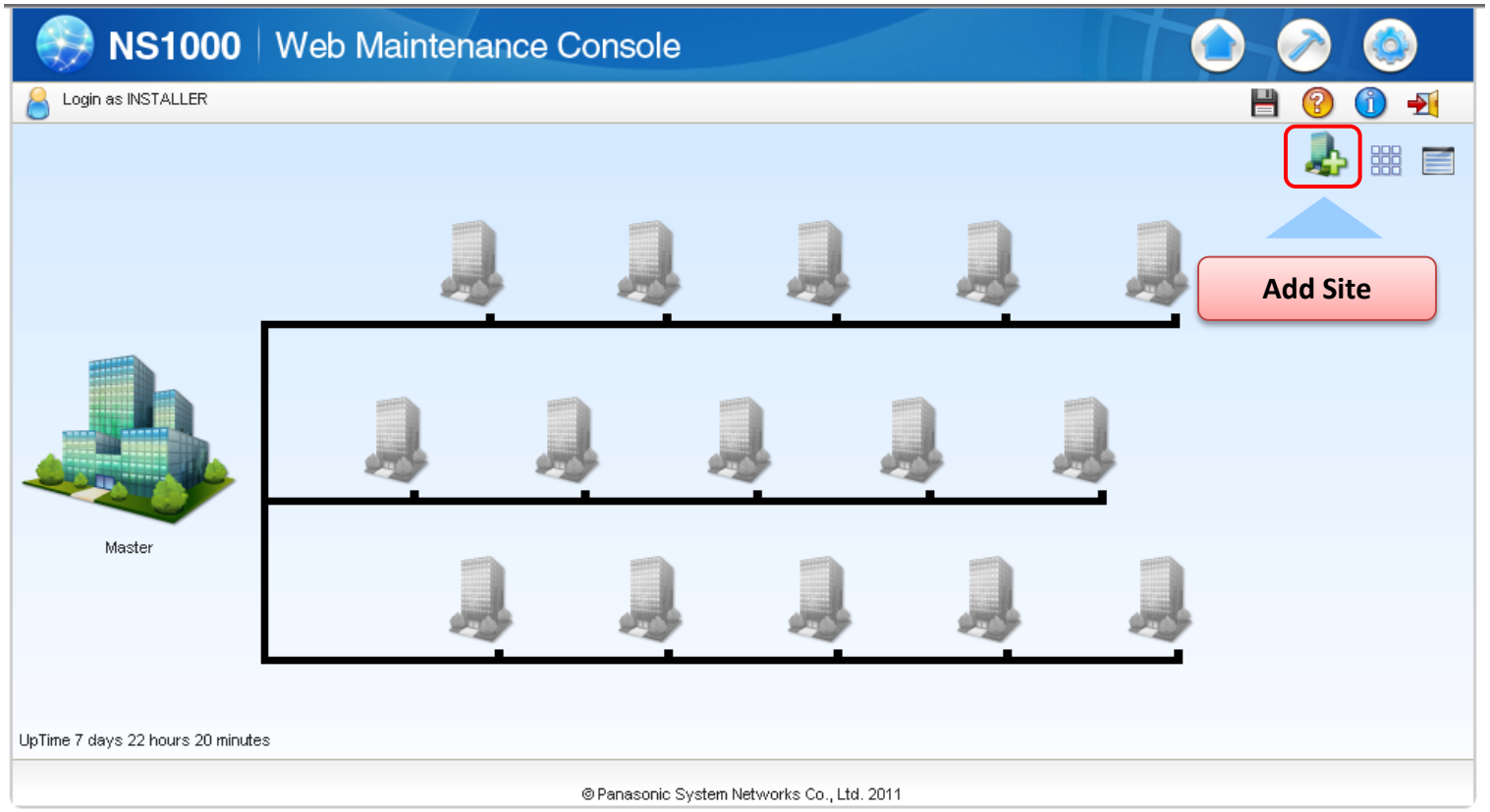
Login with the new password.



Detailed system configuration can now be made.

3.2 Slave Registration

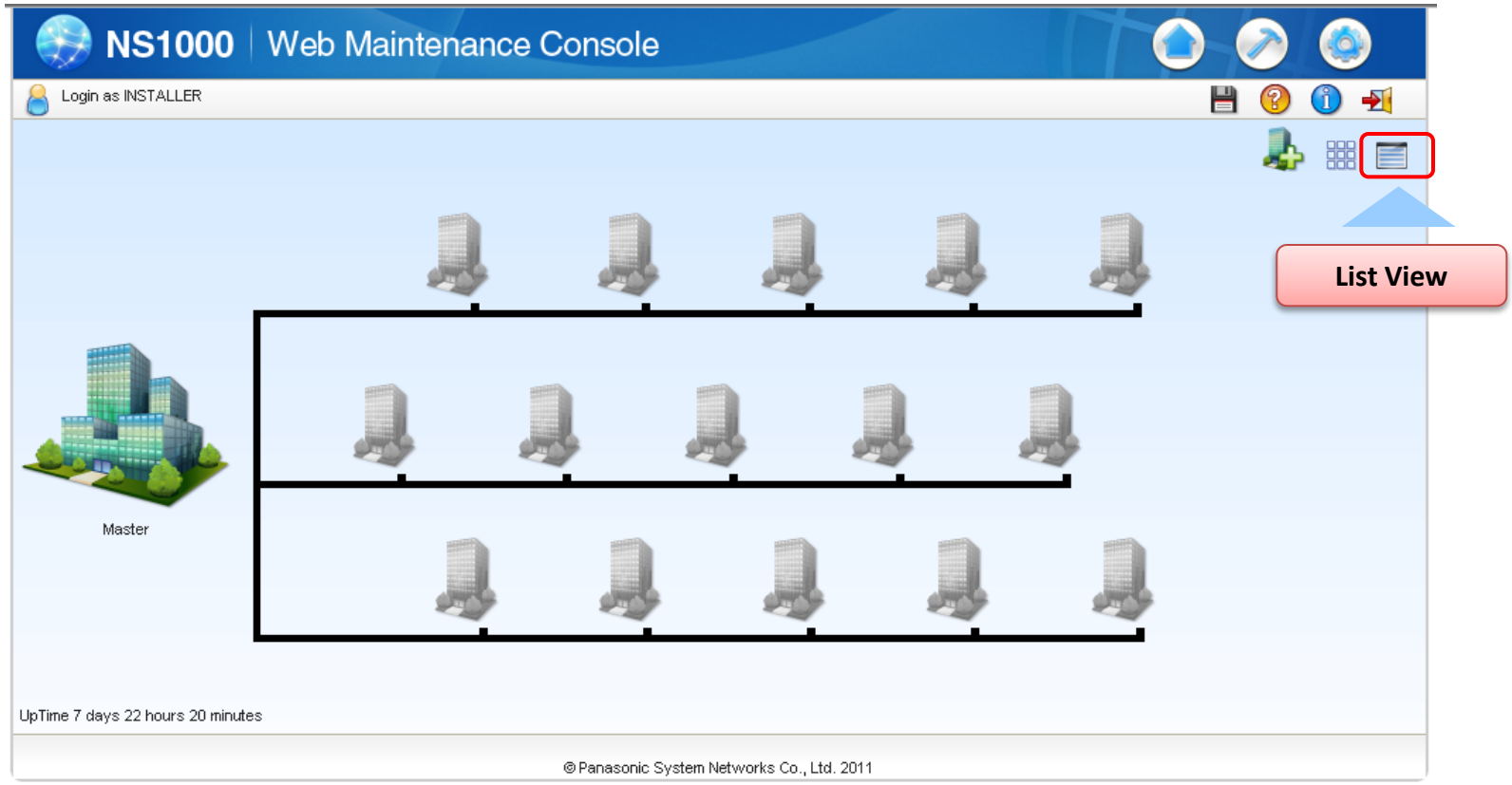
Once the both systems have been initially configured, the Slave system needs to be added to the Master system network. Log into the Master system. You will be presented with the bellow screen. Click on the Add Site Button.



Follow the prompts to add the desired Slave site.

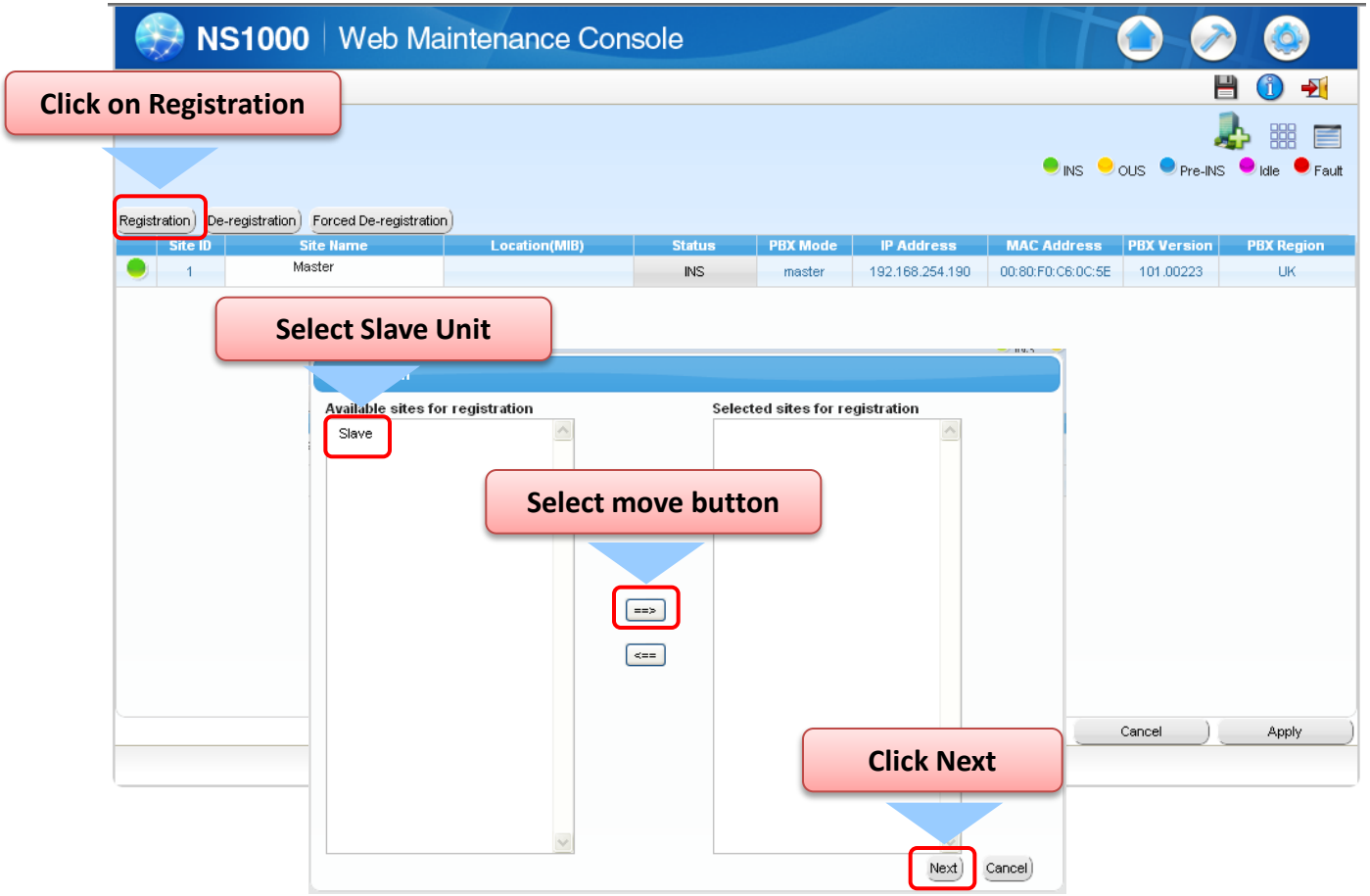
3.2 Slave Registration

Once the Slave system has been added to the network, the Slave system needs to be registered to the Master system. Log into the Master system. You will be presented with the bellow screen. Click on the List button.



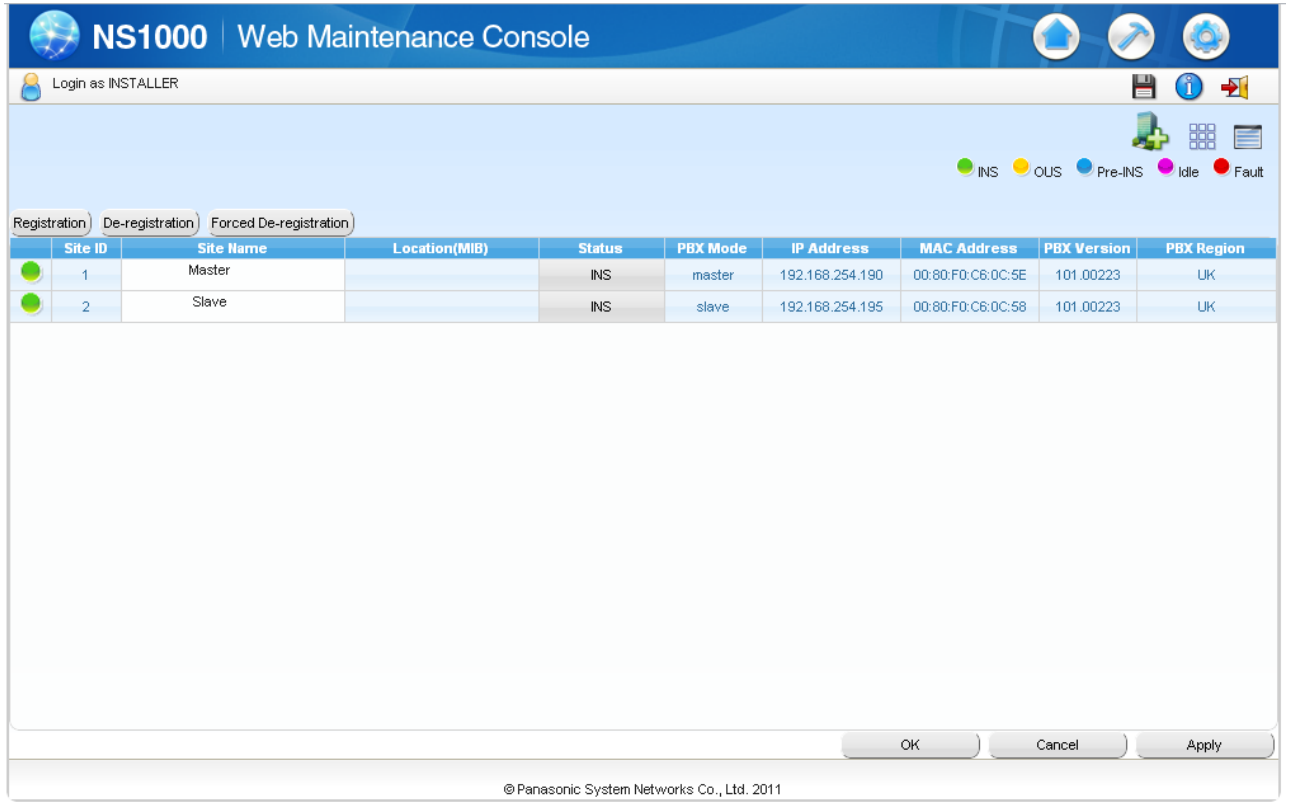
3.2 Slave Registration

Click on the Registration button. From the popup, select the Slave system displayed in the list and click Next.



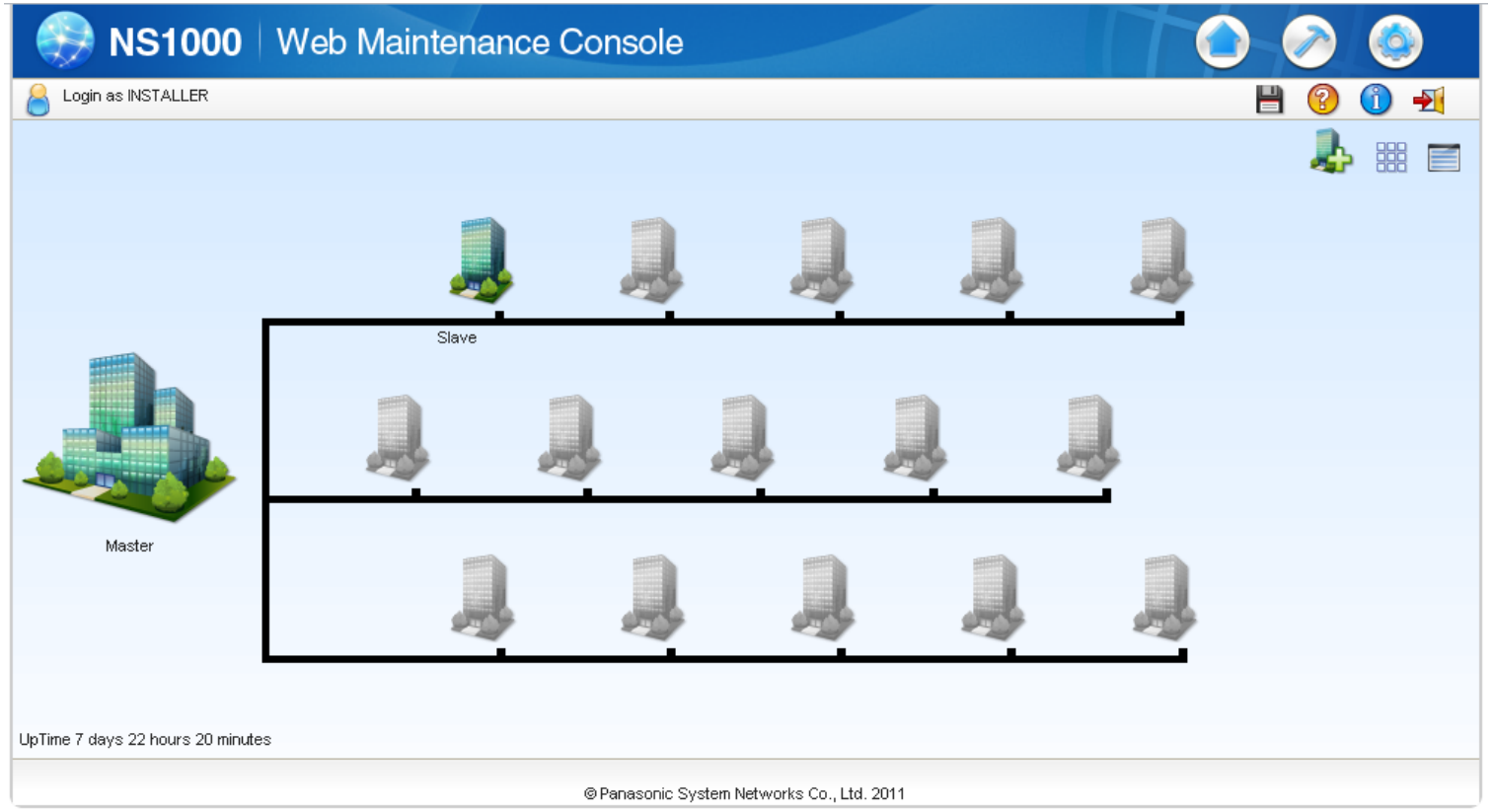
3.2 Slave Registration

Once the Slave is registered, it will show in the list view. Pressing the Home button will show the systems in the Tree view. This is displayed on the next slide.



3.2 Slave Registration

Once the Slave has been registered, it will show on the Home screen (In-Service).



Chapter 4

UPS CONNECTION

4.1 UPS Connection and setting (1)

UPS (Uninterruptible Power Supply) Integration

Description

An uninterruptible power supply unit (UPS) is a device that supplies power for several minutes to a connected device when a power failure occurs.

If the PBX is connected to a compatible UPS via USB when a power failure occurs, the PBX can determine how much power remains in the UPS and shut down when the remaining power drops below a specified amount to prevent data loss or corruption.

The following features are also available:

- Specify the remaining battery level at which to shut down the PBX.
- Receive e-mail notifications of changes to the status and availability of a UPS.

Conditions

- For details about UPS units that are compatible with the automatic shutdown feature of this PBX, consult your dealer. If an incompatible UPS is connected and the UPS runs out of power, the PBX will turn off without shutting down.
- The power cord and USB cable must be connected to the same UPS. Connecting them to different UPS's can result in incorrect operation.

IMPORTANT

- When power is restored after a power outage, the PBX operates in the following manner:

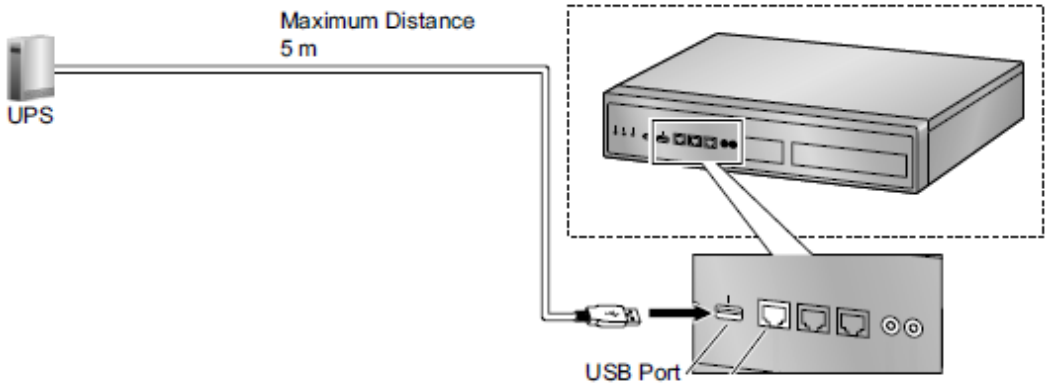
– If the PBX did not shut down, normal operation continues uninterrupted.

– If the PBX shut down and power remains in the UPS, the PBX must be started again manually. (The power switch must be turned off and then on again.)

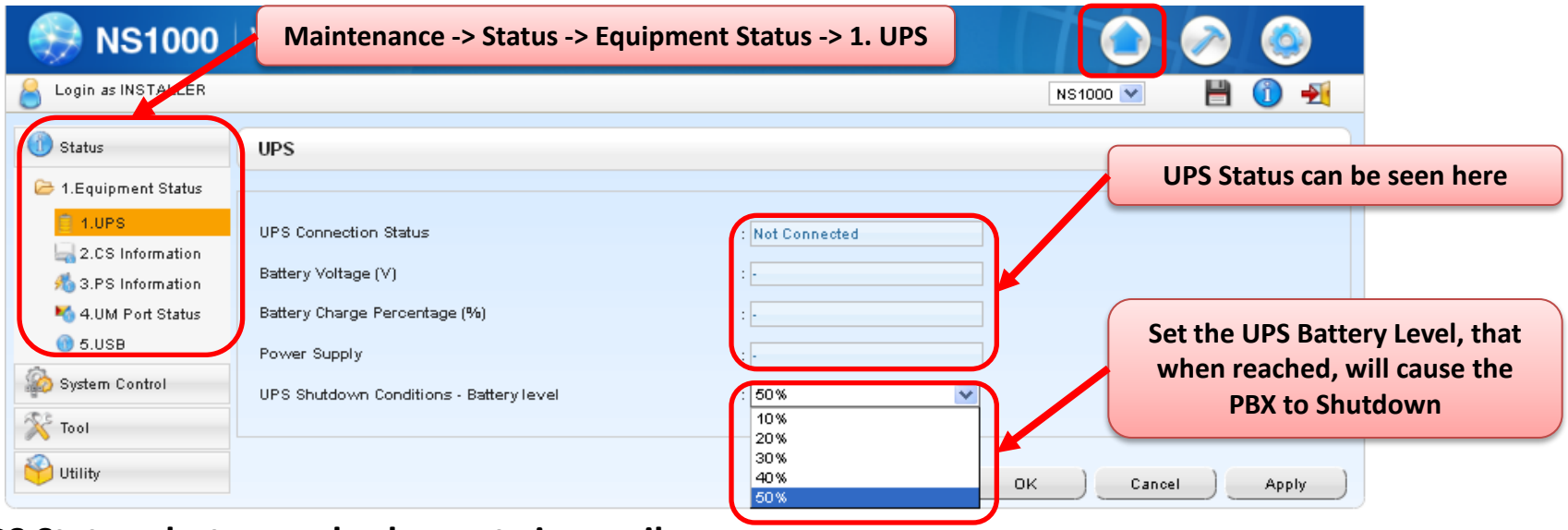
– If the PBX shut down and no power remains in the UPS, the PBX starts automatically. (This is because the PBX's power switch is on.)

4.1 UPS Connection and setting (2)

1. Connect the UPS as described in the Installation manual



2. Set the NS1000 Shutdown threshold via the WebMC



NB: UPS Status alerts can also be sent via email.

SYSTEM INITIALIZATION COMPLETE

Section - 2

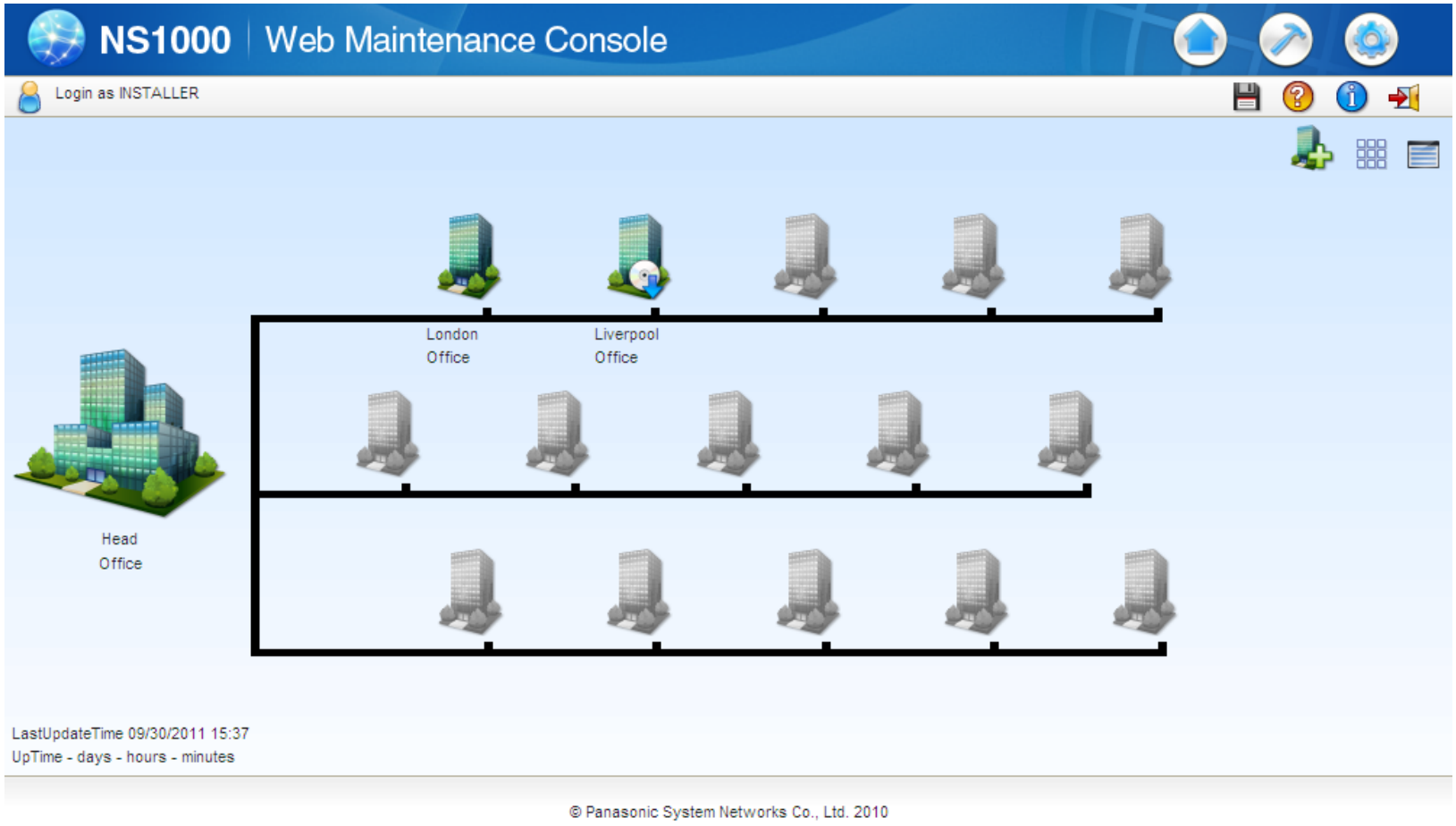
WEB MAINTENANCE CONSOLE

Introduction

Web Maintenance Console (Web MC)

All features and settings of the PBX can be set through system programming with the Web Maintenance Console.

The following explains the installation procedure, basic structure and operation of the WebMC.



Contents

Chapter 1 Overview

1-1. Web Maintenance Console

1-2. Operating Modes

1-3. User's Account

Chapter 2 Connections

2-1. System Requirements

2-2. Available Connections

2-3. Accessing Web MC

2-4. Logging into Web MC

Chapter 3 WebMC – Tour

3-1. Screen Descriptions

3-2. Button Descriptions

3-3. SLOT View

Chapter 4 Appendix

Static NAT Setting Example

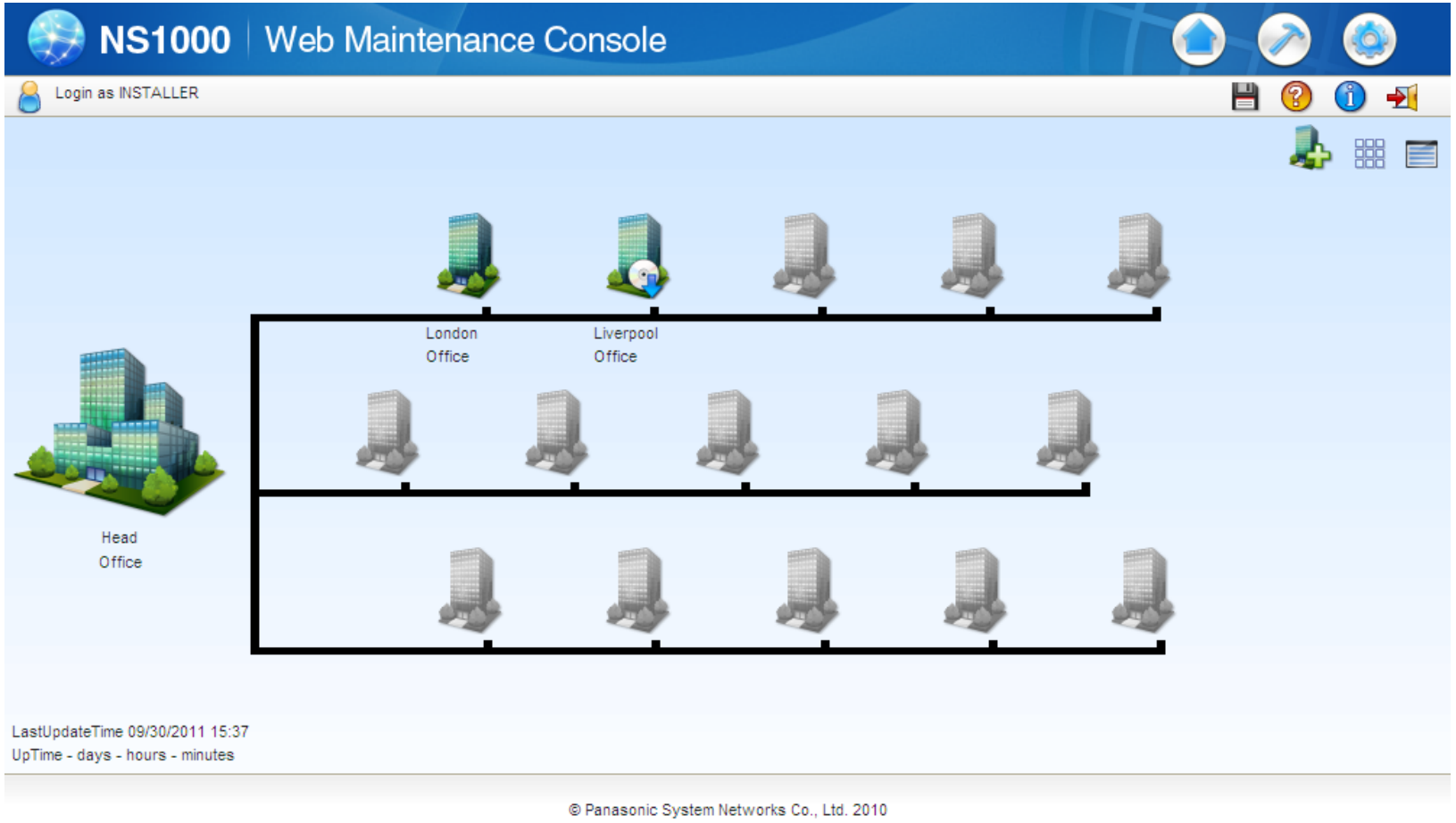
Chapter 1

OVERVIEW

1-1. Web Maintenance Console - Overview

There is only one Programming Tool for KX-NS1000.

The NS1000 WebMC is a web-based application which allows you to manage the PBX system easily.

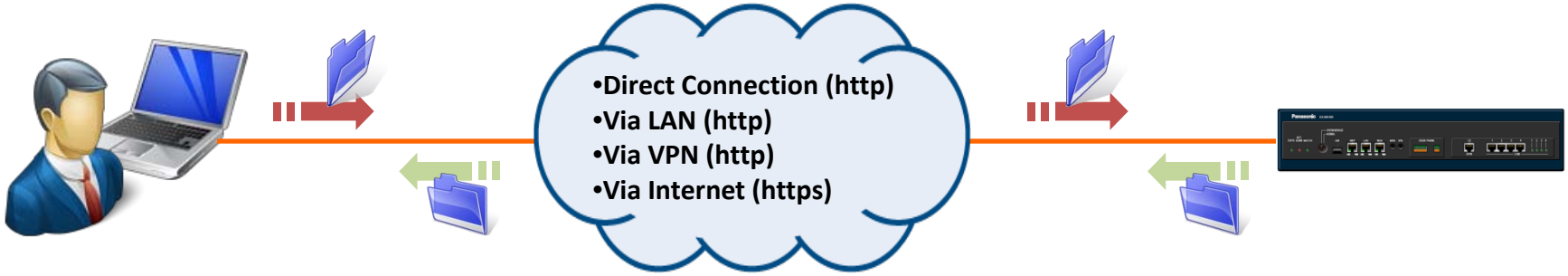


- KX-NS1000 does NOT support Unified PC Maintenance Console (UPCMC) for KX-NCP/TDE/TDA.
- KX-NS1000 does NOT support the system programming using proprietary telephones.

1-2. Operating Modes

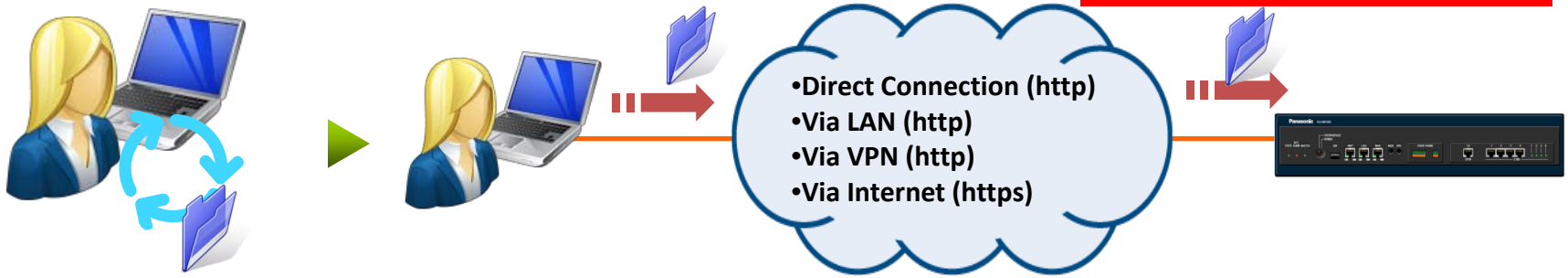
There are two programming modes; Interactive Mode & Batch Mode

- Interactive Mode (Allows real-time access and configuration of the PBX system.)



- Off-Line Mode (Configuration is done Off-Line and applied to the PBX at a later date.)

Available 2012



1-3. User Accounts

Account Levels

The WebMC supports 3 different account types (Access Levels). The number of users who can simultaneously login to the system are shown below.

Account Levels

Level	For	Description
Installer	Dealers and system installers	For all system programming settings. "Installer" can specify which system programming settings are available for "Administrator" (the accessible settings for "User" are pre-defined and fixed).
User (Administrator)	On-site system managers	For general maintenance of users and user settings, such as backing up the system data, confirming extension information, etc.
User (User)	End users	For changing user's extension settings, such as changing profiles, storing personal speed dial numbers, etc.

Number of Accounts

Level	Single Unit	One-look	Simultaneous Login
Installer	1	1	1
User (Administrator)	0-16	0-16*1	32
User (User)	0-16	0-1512*1	

***1 The total number of administrator and user accounts combined cannot exceed 1512.**

Chapter 2

CONNECTIONS

2-1. System Requirements

System Requirements

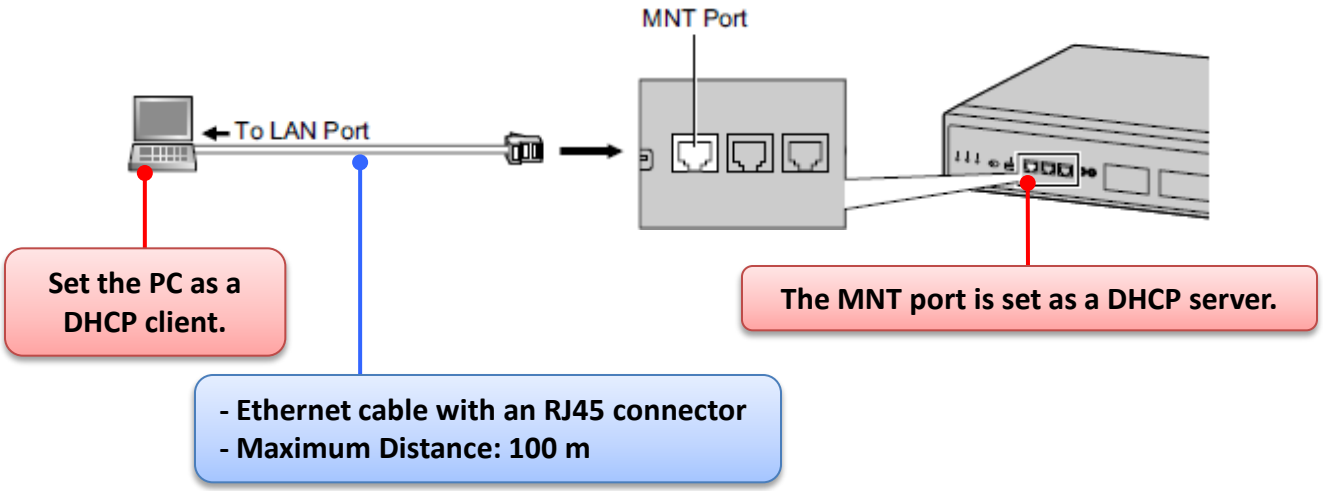
	Requirements	Descriptions
OS	- Windows XP - Windows Vista Business - Windows 7 Professional	Both 32bit and 64bit version is available. TBD
HDD	100MB of available hard disk space	Minimum Requirements
Display	-Screen resolution: XGA (1024 * 768) -DPI setting: Normal size (96 DPI)	Recommended Settings
Browsers	- Windows Internet Explorer 8 or 9 - Mozilla Firefox version 5.0 or later	Make sure you are using the latest version of the above Web browser software. For details, refer to the Web browser's documentation.
Browser Settings	- Cookies - Java Script - The ability to download files - The display of animations - The display of images	These functions must be enabled in the Web browser's settings to use Web Maintenance Console. For details, refer to your Web browser's documentation.

2-2. Available Connections (1/3)

In order to program or manage the PBX, you need to connect your PC to the PBX.

Several connection methods are provided, and here you can see the outline of the direct connection.

1. Direct Connection (MNT Port)

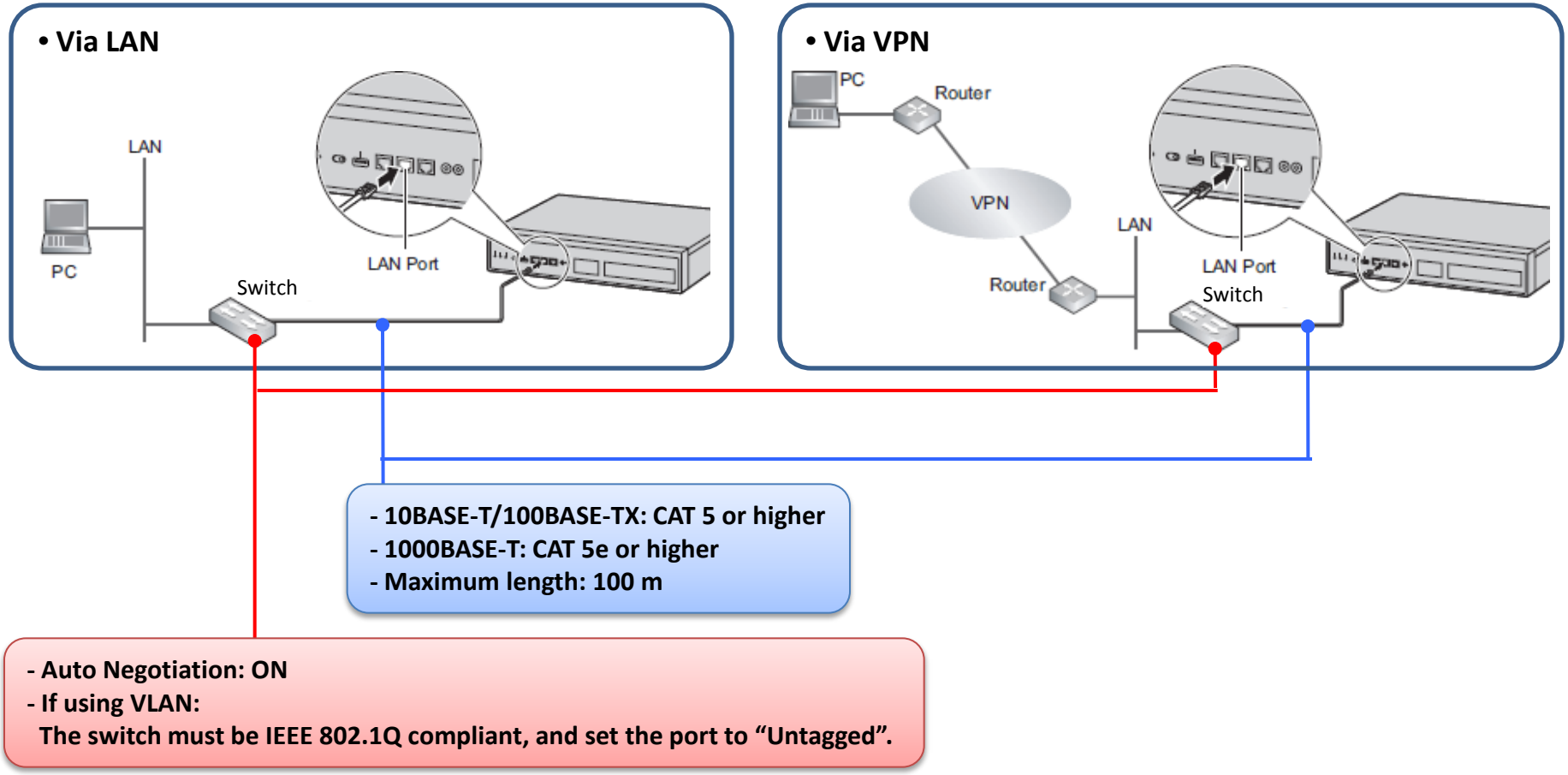


If the PC has “Gigabit Ethernet interface”, an Ethernet “crossover cable may be needed.
It depends on the specification of the PC.

2-2. Available Connections (2/3)

It is also possible to manage the PBX via a LAN or VPN connection.

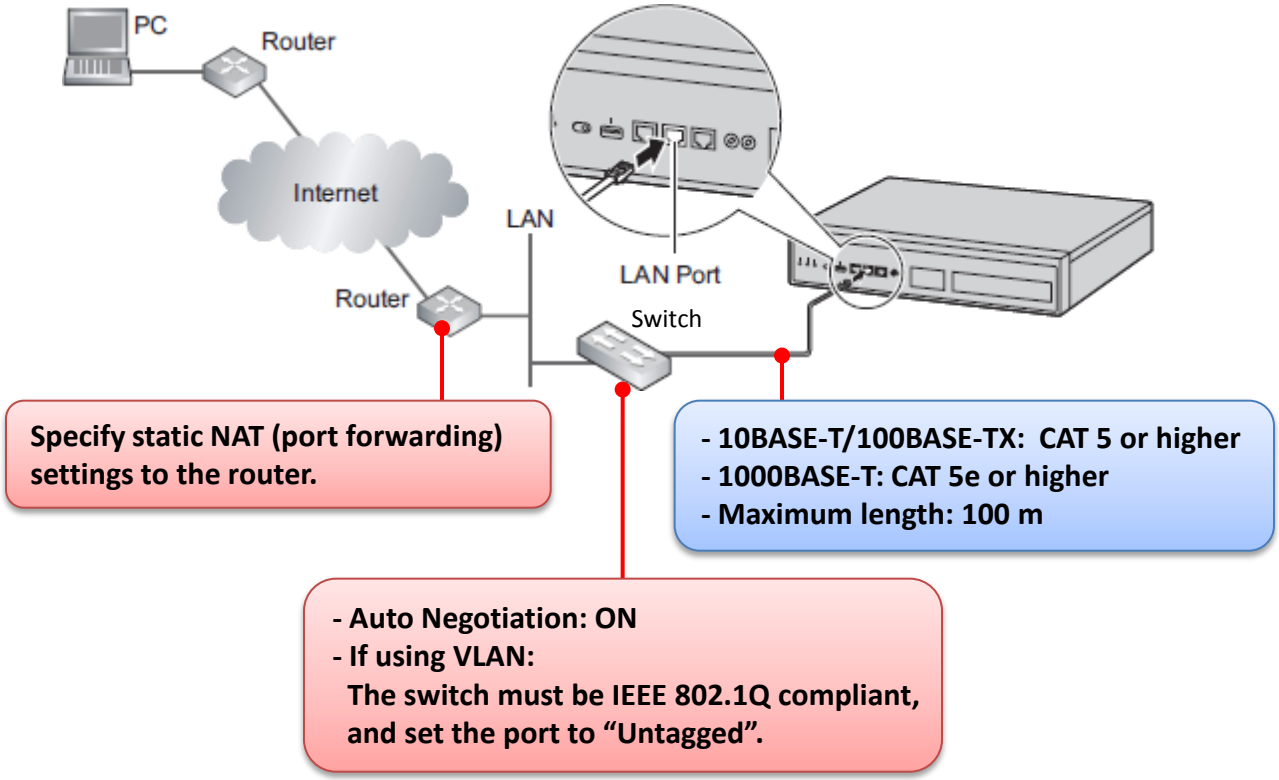
2. LAN/VPN Connection (LAN Port)



2-2. Available Connections (3/3)

Using the WebMC and suitable network routing, it is possible to access the PBX system via the Internet. Ensure that appropriate security measures are in-place before attempting this. (Firewall etc)

3. Connection via Internet



The WAN port on the KX-NS1000 is not supported with ver. 1.0.

2-3. Accessing the Web MC

There are different addresses depending on Connection Types:

1. When Connecting via MNT Port

http://kx-ns1000. (or http://223.0.0.1)

Be sure to include the period (.) at the end as shown.

“223.0.0.1”: the default IP address of the MNT port = Fixed

2. When Connecting via LAN or VPN

http://192.168.0.101/WebMC

“192.168.0.101”: the default IP address of the LAN port = Variable

3. When Connecting via Internet (SSL Connection)

https://xxx.xxx.xxx.xxx/yyy

“xxx.xxx.xxx.xxx” will be an IP address, and “yyy” will be a port numbers that can be accessed from the internet, for example the IP address and port number of a router.

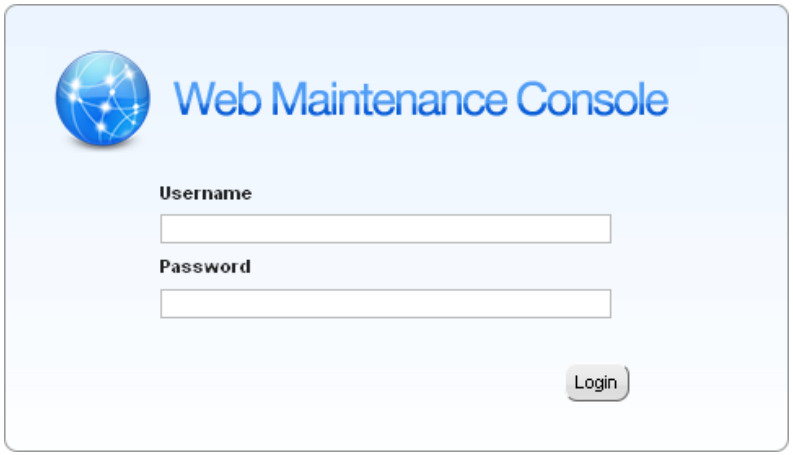
Port forwarding settings must specify the IP address and the port number of the network router ("xxx.xxx.xxx.xxx:yyy") to transfer the packets to the PBX in the LAN, so that the packets sent to the global IP address and specified port of the router will be transferred to the IP address and specified

The URL is case-sensitive. Enter the uppercase and lowercase letters exactly as shown above.

2-4. LOGIN / LOGOUT (1)

LOGIN

After establishing a connection to Web Maintenance Console, the login window is displayed, and a login name and password must be entered.



Login Restrictions

- Up to 33 users may log in at one time to Web Maintenance Console. However, only 1 user may change PBX system settings at a time. (1 Installer / 32 Admin/Users)
  If a User is making changes, and the Installer logs in, the Installer may override the user's ability to make changes so that programming can be performed.
  Users that are logged in to Web Maintenance Console, but do not have the ability to make changes, may only view menus and setting items they would normally be able to edit.

- If a user fails to log in three times (wrong password), the failure is recorded in the error log of the PBX and the user cannot log in again for 5min.

2-4. LOGIN / LOGOUT (2)

LOGOUT

Be sure to log out from the Web MC using the Logout button, otherwise any unsaved changes will be lost.

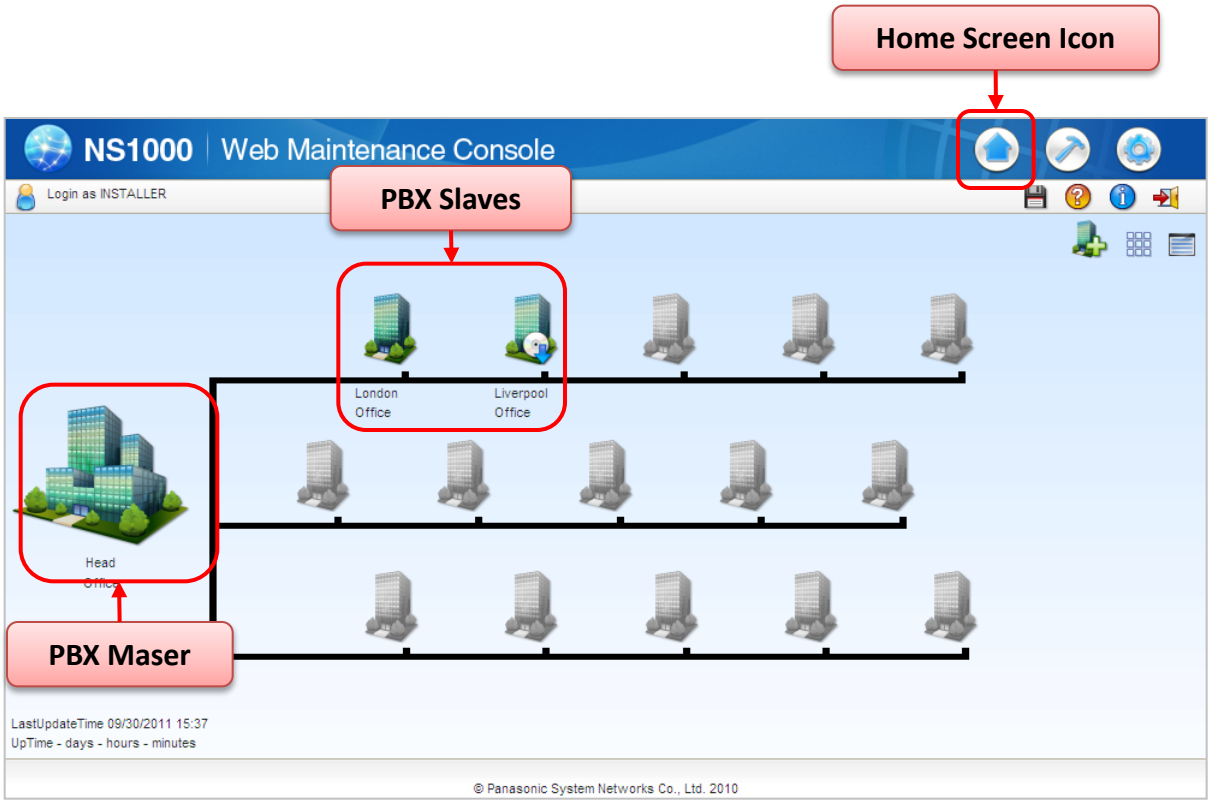
Clicking this button will save any programming changes to the PBX's Storage Memory Card and log you out of Web Maintenance Console.

Chapter 3

WEBMC - TOUR

3-1. Screen Descriptions (1/4)

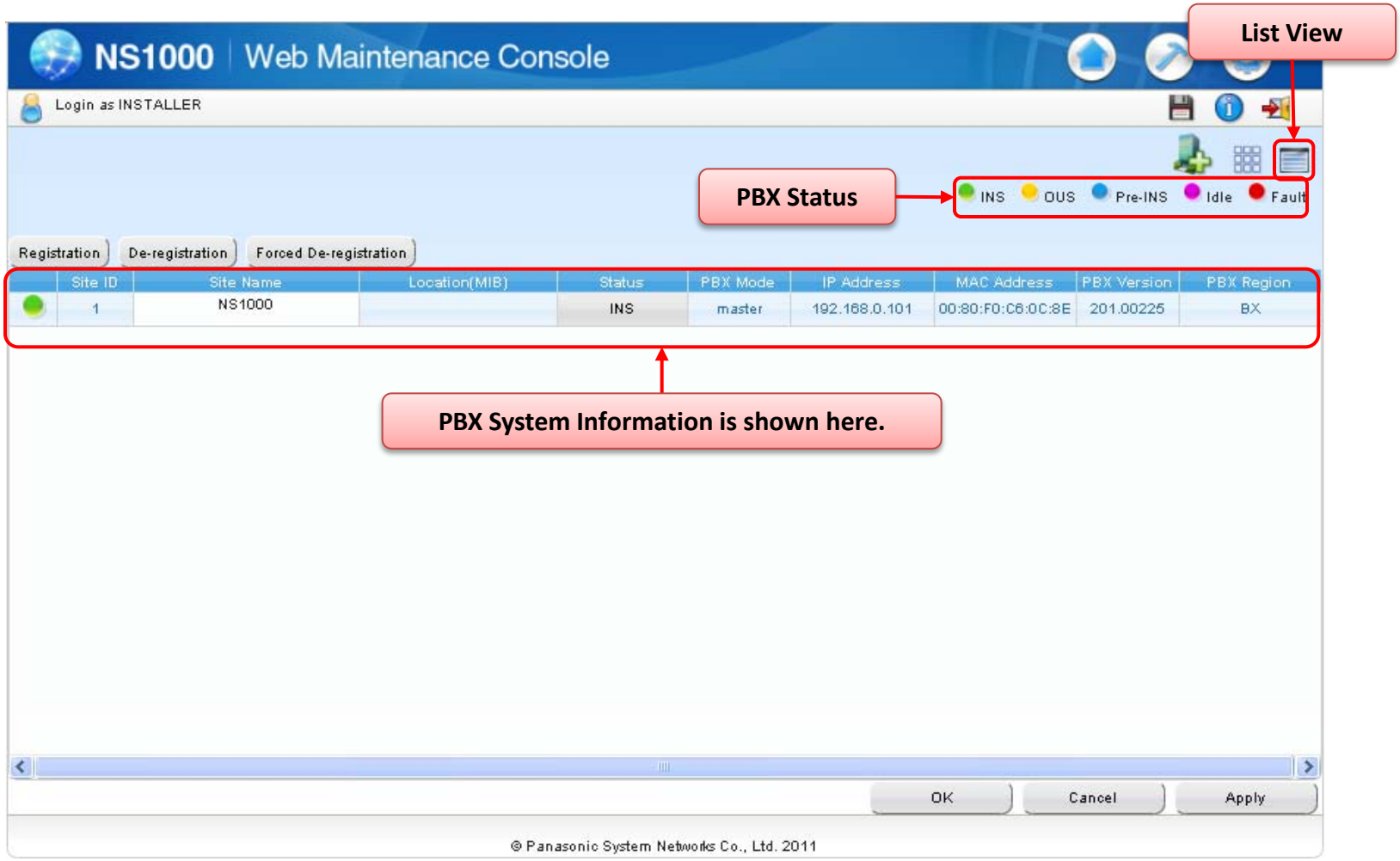
Upon LOGIN, you are presented with the 'Home' Screen



	Loads the Home screen.
	Displays the Maintenance screen.
	Displays the Setup screen.
	Saves the data.
	Opens the on-line help.
	Displays the Web MC version info.
	Saves the data and logs you out.
	Adds slave units.
	Displays the Home screen in icon view.
	Displays the Home screen in list view.

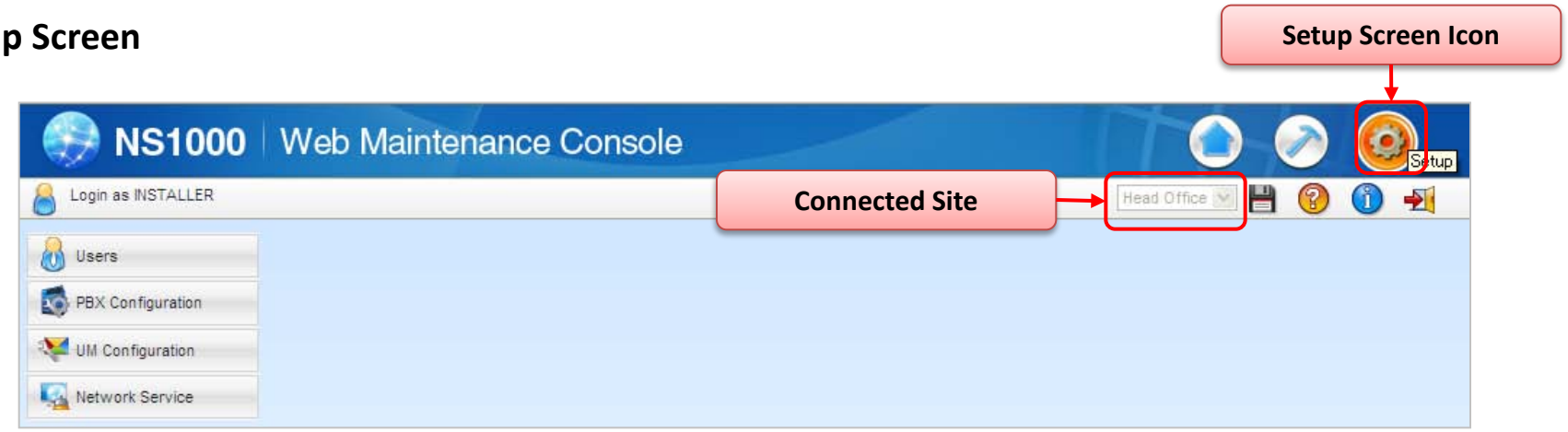
3-1. Screen Descriptions (2/4)

Using the ‘List’ view in the ‘Home’ Screen allows you to see the PBX Type (Master/Slave), IP-Address, MAC address, S/W Version and Region type of all PBXs in a One-Look system.



3-1. Screen Descriptions (3/4)

Setup Screen

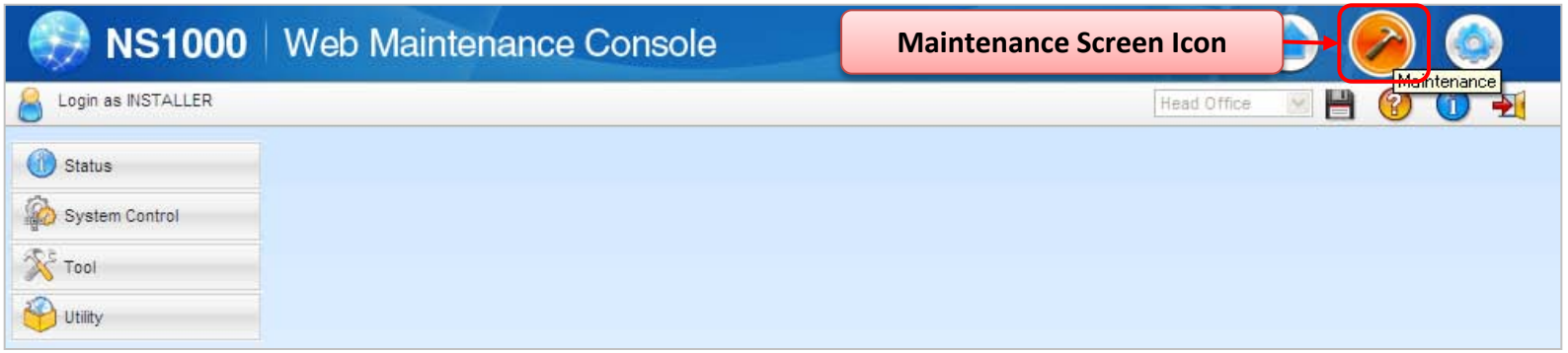


Setup Screen Tree Items

Item	Primary Functions
Users	• Manage, view, and add PBX user profiles and account information
PBX Configuration	• Configure PBX hardware settings for cards, equipment, and networking • Configure network-wide programming such as BGM and Class of Service • Configure dialing features, call routing, and incoming call settings • Configure call logging (SMDR) and other PBX maintenance items
UM Configuration	• Configure Unified Messaging mailboxes and voice mail subscriber settings • Configure service settings and system parameters • Configure hardware options
Network Services	• Configure server and client features for the PBX • Configure connections settings and network security

3-1. Screen Descriptions (4/4)

Maintenance Screen



Maintenance Screen Tree Items

Item	Primary Functions
Status	• Check the status of the PBX's system hardware • Check the status of PBX equipment (PSs, CSs, UPS, etc.) • Check the status of extensions used by the Unified Messaging system
System Control	• Download and update PBX software files • Manage music on hold (MOH) data • Reset or shutdown the system
Tool	• Backup system data to a USB memory device • View a list of PBX extensions • Import and export PBX settings and user information • Backup or restore Unified Messaging data
Utility	• Perform tests for PBX cards and network connections • Transfer files between the PBX and a connected PC • View reports, error logs, event logs, and program update logs • Monitor and trace PBX communications and protocols • Manage activation keys and license information

3-2. Button Descriptions (1/2)

Standard Buttons

OK	Temporarily saves changes to DRAM and closes the current screen.
Cancel	Abandons changes and returns to the previous screen.
Apply	Temporarily saves changes to DRAM and remains on the same screen.

To save setting while programming, click this button on the Home screen.

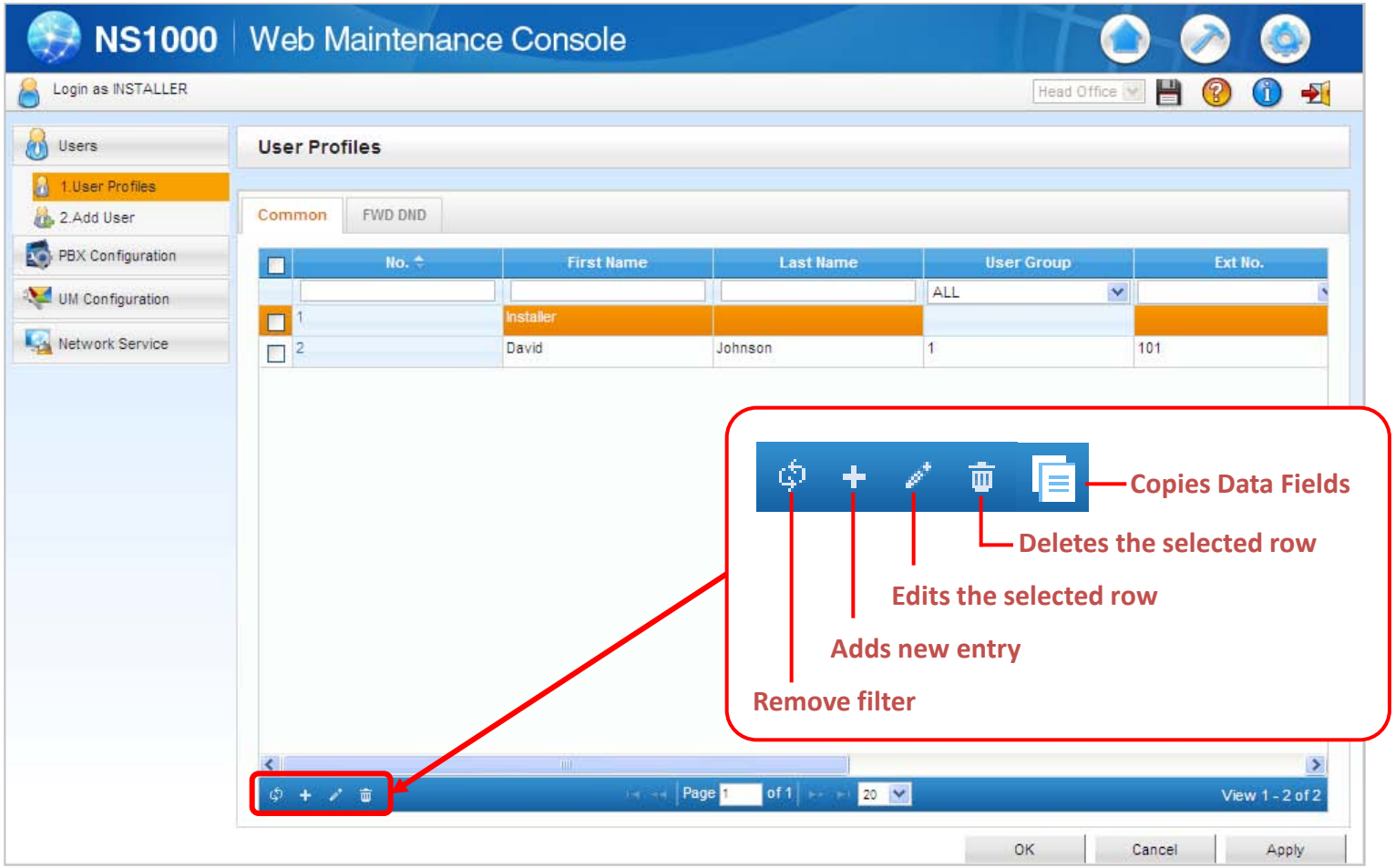
When this button is clicked to logout of Web Maintenance Console, system data is automatically backed up from the PBX to the Storage Memory Card.

NB: Be sure to SAVE your programming frequently

3-2. Button Descriptions (2/2)

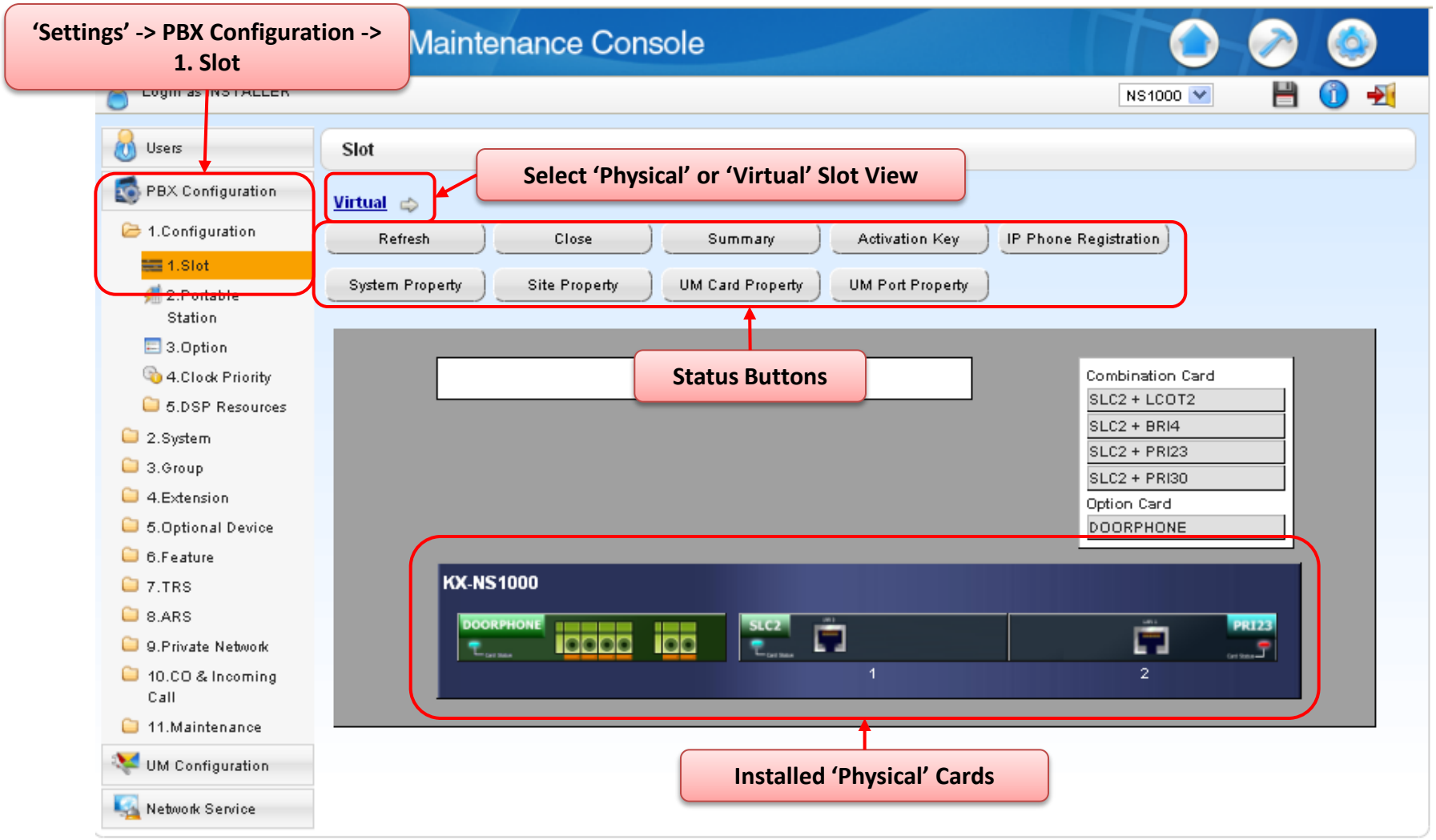
Each Setting screen has a number of helpful icons available. The available icons will differ, depending on the screen.

Standard Icons



3-3. Slot View

In the ‘Settings’ View, the ‘SLOT’ view shows what Physical and Virtual cards are installed. May other system properties or features can also be viewed.

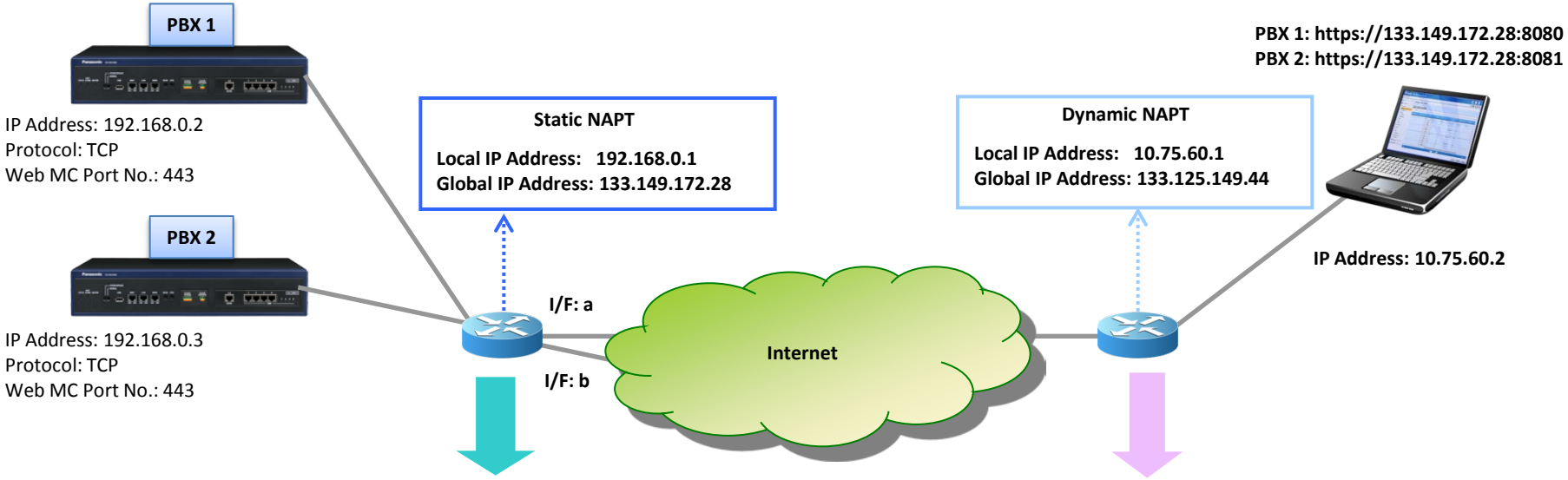


Chapter 4

APPENDIX

A-1 Static NAT Setting Example

	Setting Items	Descriptions
1	Interface	WAN-side interface
2	Protocol	TCP or UDP
3	Receiving Port No. (WAN side)	Outside network port number （1～65535）
4	IP Address of Transfer Destination (LAN Side)	The destination IP address to which the packets are transferred.
5	Port No. of Transfer Destination (LAN Side)	The port number of （1～65535）



Setting Items	For PBX 1	For PBX 2
Interface	a	b
Protocol	TCP	TCP
Receiving Port No. (WAN Side)	8080	8081
IP Address of Transfer Destination	192.168.0.2	192.168.0.3
Port No. of Transfer Destination	443	443

WEBMC COMPLETE

Section - 3

TERMINAL REGISTRATION

Introduction

The NS1000 supports 3 methods of IP terminal registration.

1. **Full Automatic Mode**

When an IP terminal is connected to the network, the IP terminal will automatically discover the main unit and an unallocated extension number will automatically assigned to the IP Terminal.

2. **Extension Input Mode**

When an IP terminal is connected to the network, the IP terminal will automatically discover the main unit and the user will be asked to input an extension number.

3. **Manual Mode**

Same operation as TDE/NCP.

Supported Modes – by terminal type.

	1. Full Automatic Mode	2. Extension Input Mode	3. Manual Mode
UT series	Yes	No	Yes
NT3xx / NT265	Yes	Yes	Yes
NT700	No	No	Yes
General SIP Phone	No	No	Yes*

(*) Only input the Password

NB: DHCP Server is required for Full/Extension Input Modes

Contents

Chapter 1 UT/NT Series Registration

1-0. NS1000 – DCHP Server Setting

1-1. Full Automatic Mode – Overview

1-2. PBX System Configuration

Chapter 2 NT Series Registration

2-1. Extension Number Mode – Overview

2-2. PBX System Configuration

Chapter 3 UT Series Registration

3-1. Manual Registration Mode – Overview

3-2. Manual Registration (UT)

3-3. PBX Configuration (UT)

3-4. Registration Confirmation (UT)

Chapter 4 NT Series Registration

4-1. Manual Registration (NT)

4-2. PBX Configuration (NT)

4-3. Registration Confirmation (NT)

Contents

Chapter 5 DECT CS Installation

5-0. DECT CS Installation

Chapter 6 Registration – Other Terminals

6-0. Registration

6-1. De-registration

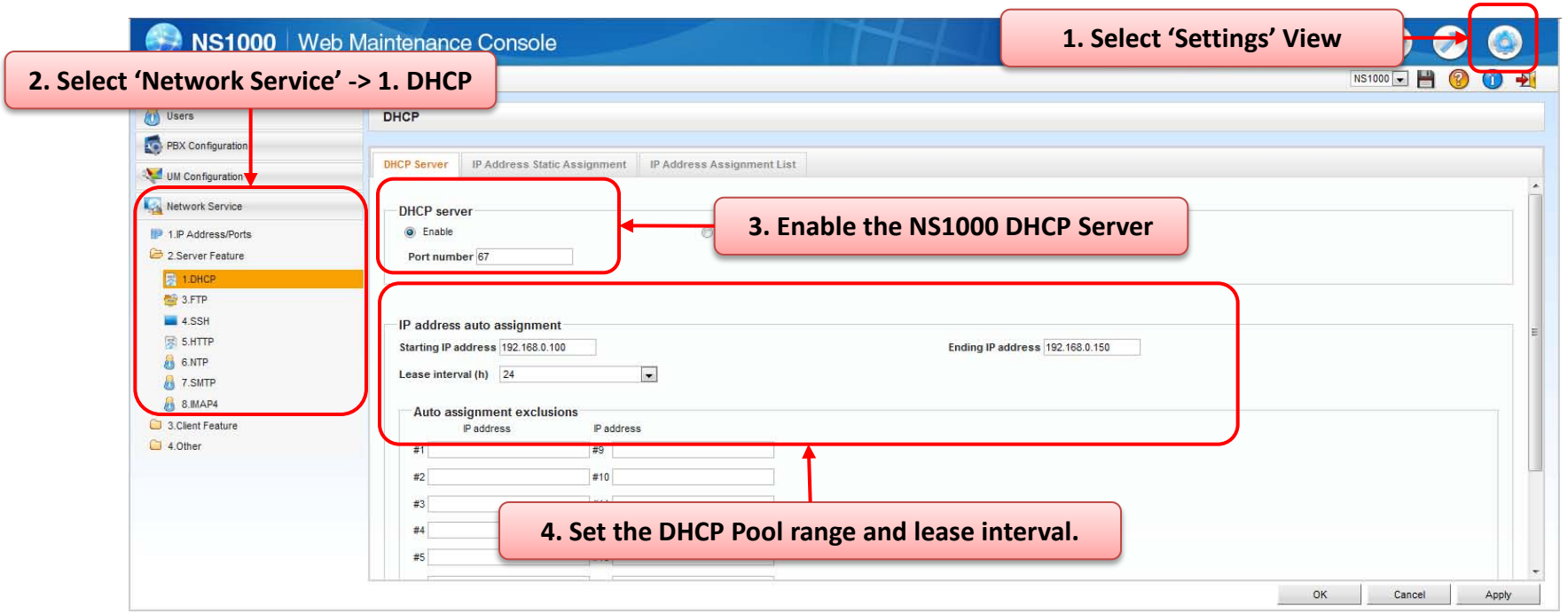
Chapter 1

UT/NT SERIES REGISTRATION FULL AUTOMATIC MODE

1-0. NS1000 – DHCP Server setting

The NS1000 can be configured as a DHCP Server.

Where a 3rd party networked DHCP Server is not available, the NS1000 can be configured to provide DHCP Services.



NB: Be sure to 'Apply' and 'Save' the changes before proceeding.

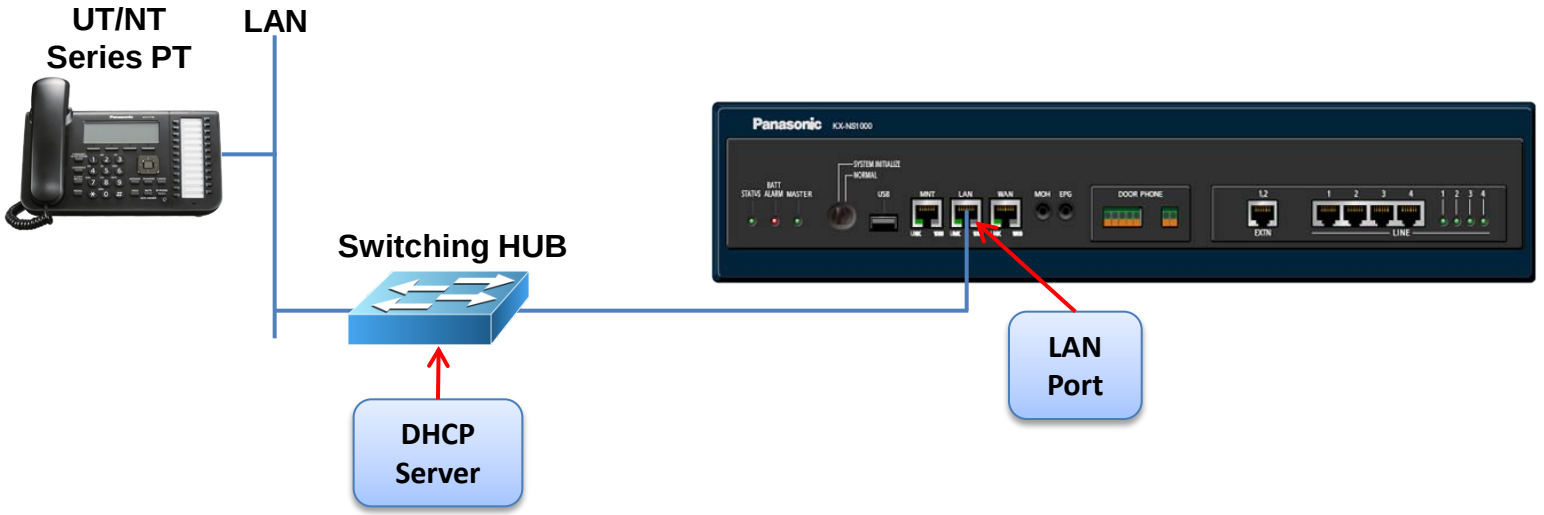
1.1 ‘Full Automatic’ Registration Mode

Full Automatic Mode – Overview

When UT/NT PTs are connected to the NS1000 on the same network – Full Automatic Registration of the Terminals is possible. No manual setting of the PTs or PBX is required.

Requirements;

1. DHCP Server (NS1000 or External DHCP Server)
2. V-IPEXT32 or V-UTEXT32 Card is installed in the NS1000
3. Sufficient IP-PT A/Ks are installed.

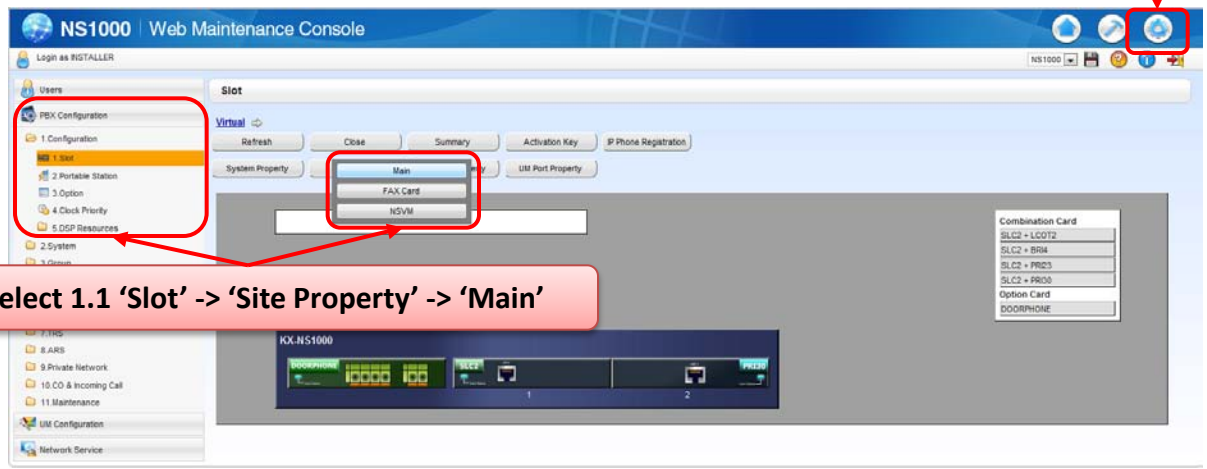


1.2 PBX System Configuration (1)

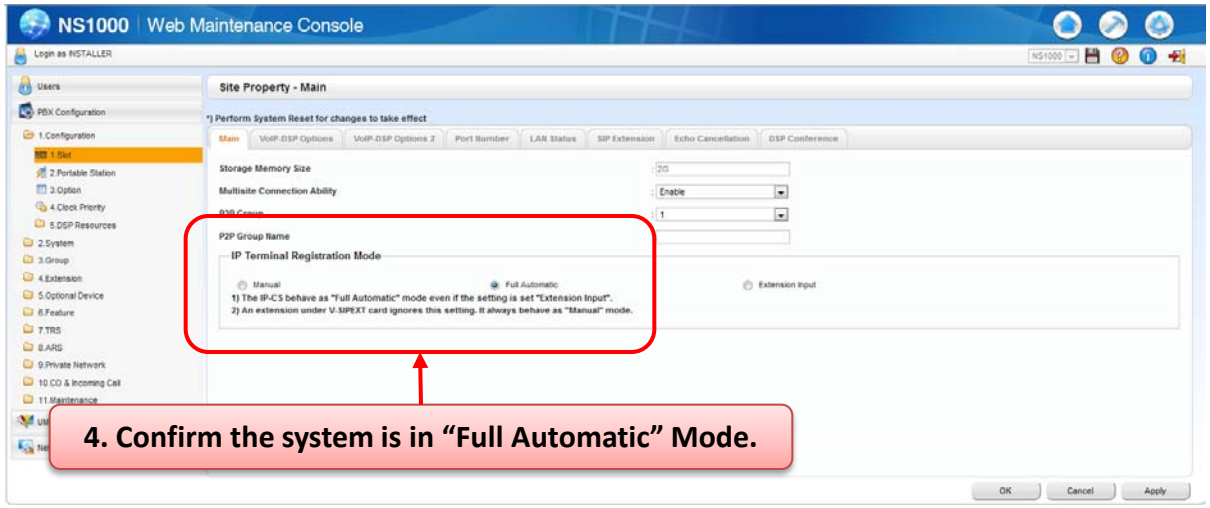
Confirm the IP Terminal Registration Mode

1. Login to the Web-MC

2. Select ‘Setup’



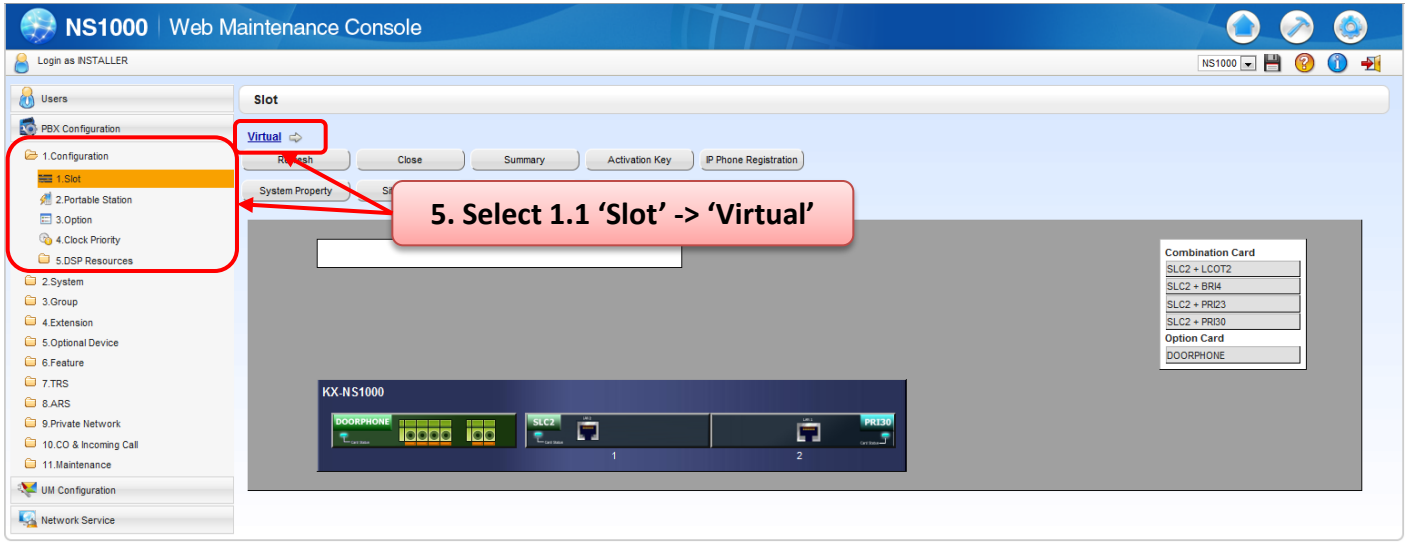
3. Select 1.1 ‘Slot’ -> ‘Site Property’ -> ‘Main’

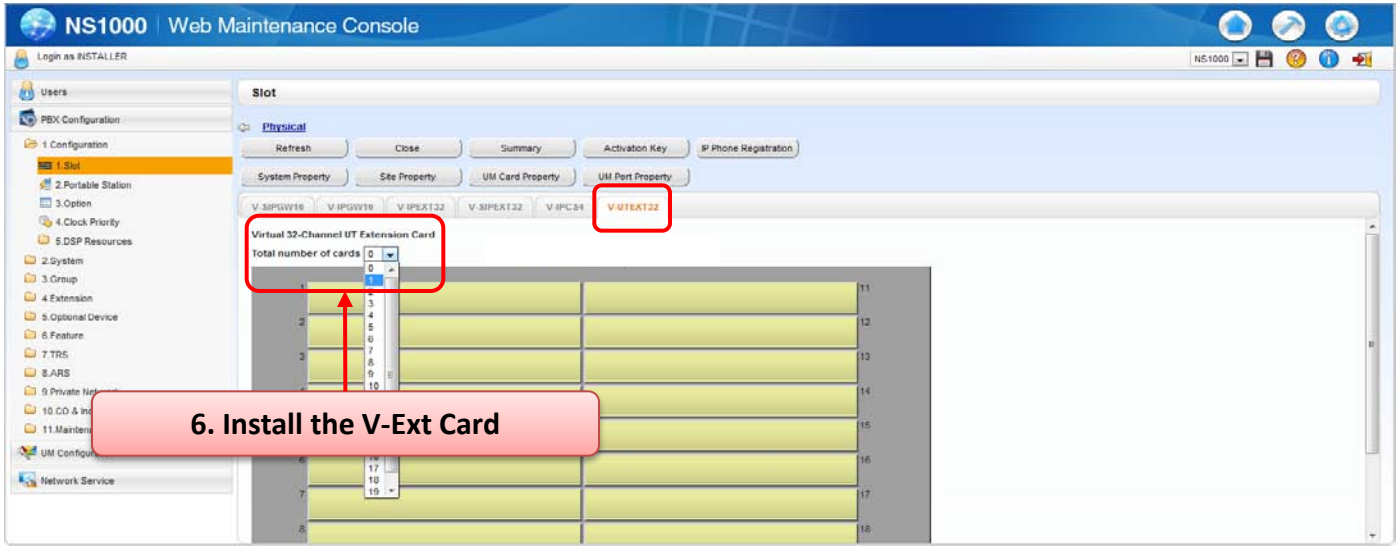


4. Confirm the system is in “Full Automatic” Mode.

1.2 PBX System Configuration (2)

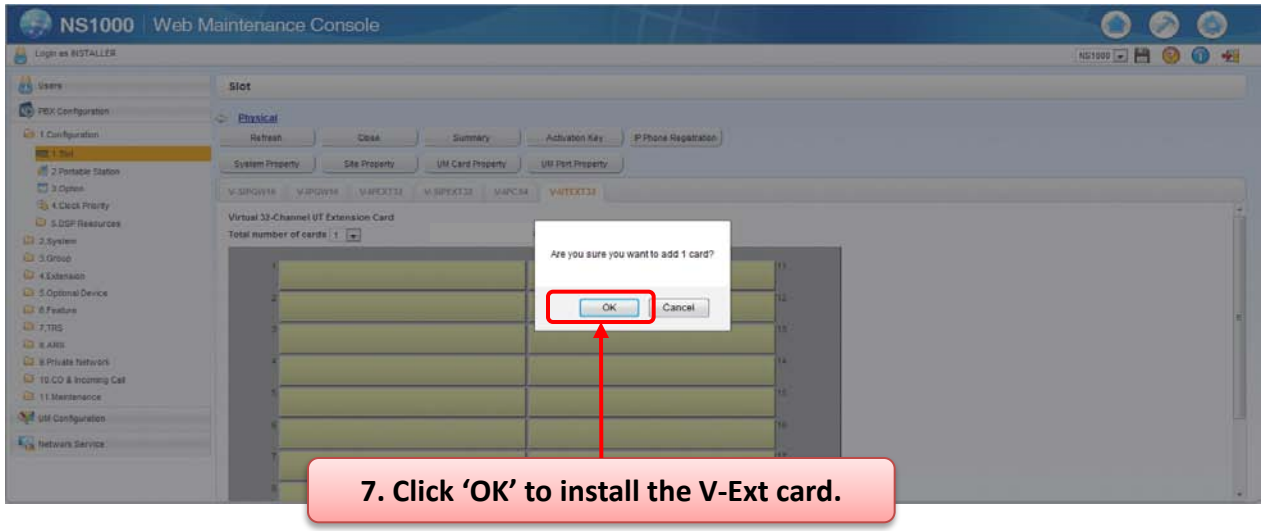
Install a Virtual Extension card (V-IPEXT32 or V-UTEXT32) - 1

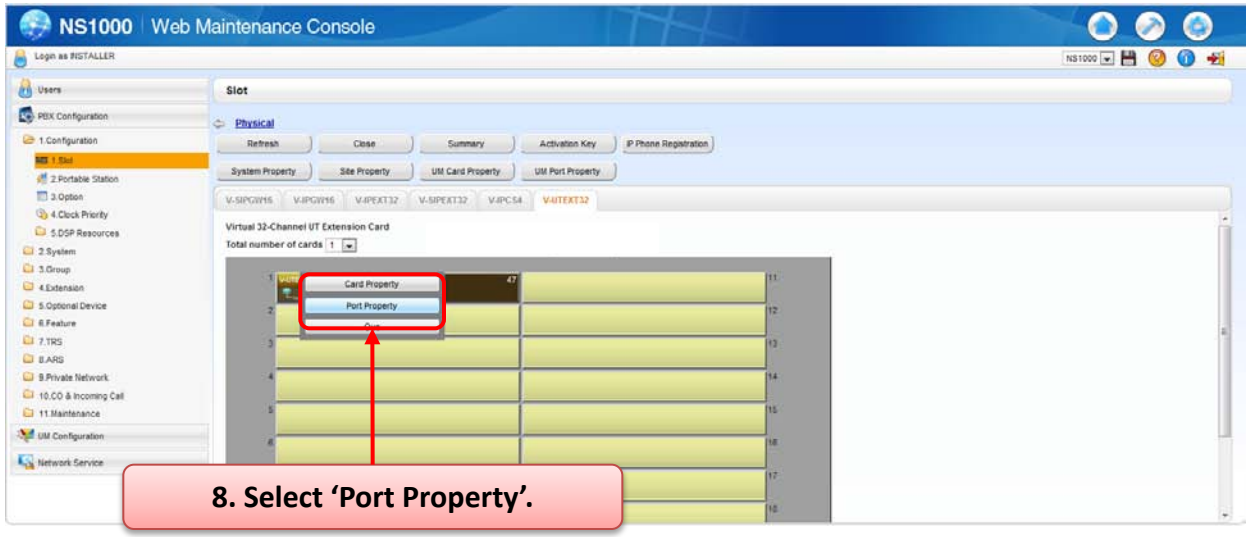




1.2 PBX System Configuration (3)

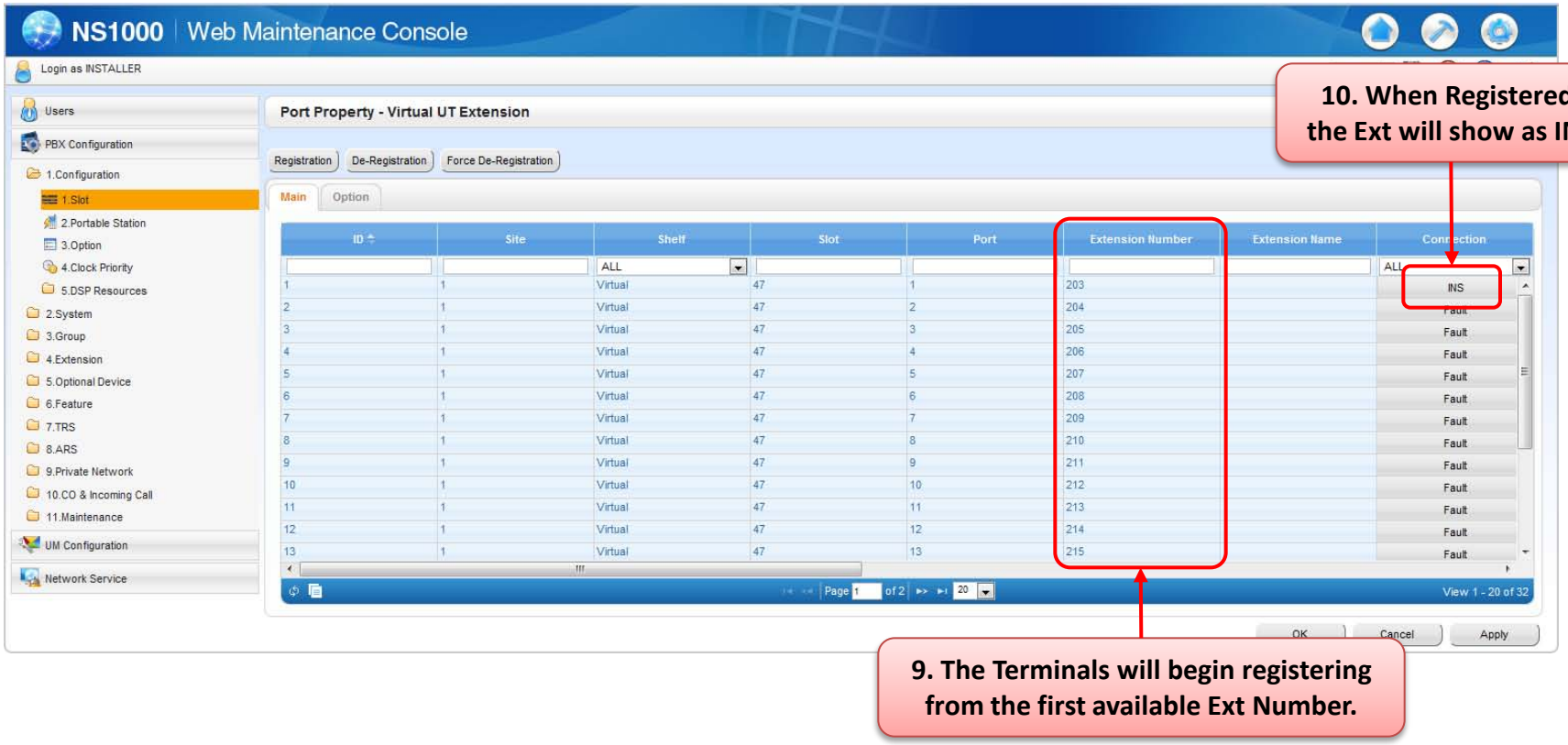
Install a Virtual Extension card (V-IPEXT32 or V-UTEXT32) - 2





1.2 PBX System Configuration (4)

Confirming the available Extension Numbers.



Chapter 2

NT SERIES REGISTRATION EXTENSION NUMBER MODE

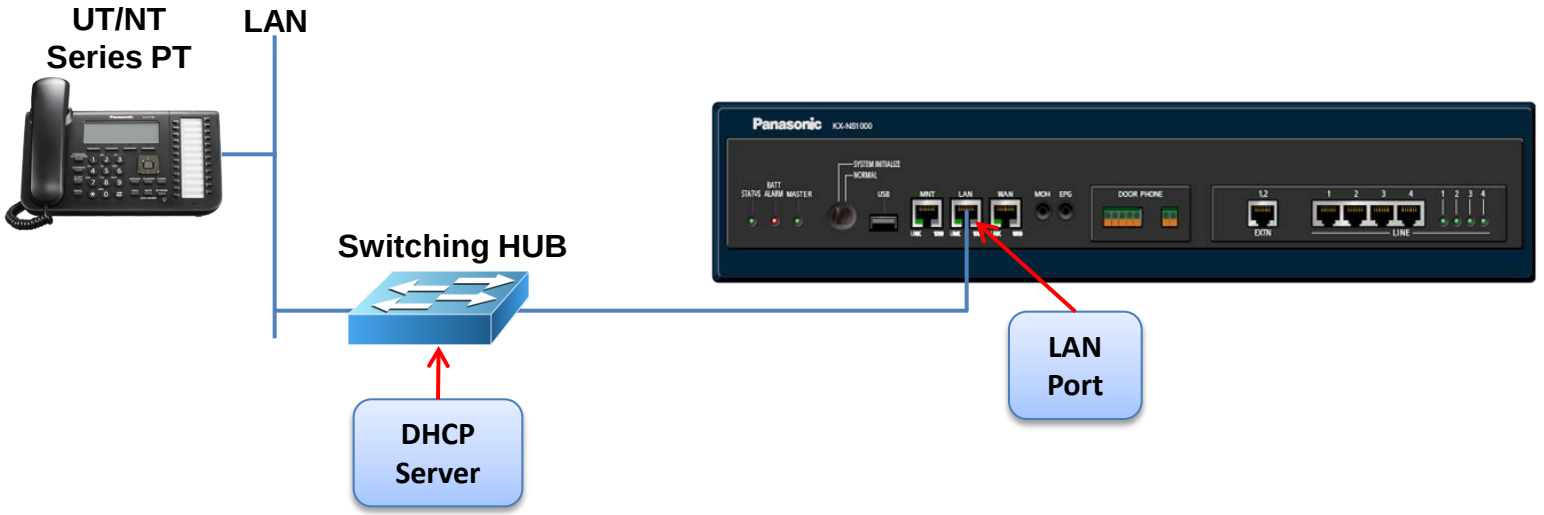
2.1 ‘Extension Number’ Registration Mode

Extension Number Mode – Overview

When NT PTs are connected to the NS1000 on the same network – Registration of the Terminals, inputting only the desired Extension Number is possible. No manual setting of the PTs or PBX is required.

Requirements;

1. DHCP Server (NS1000 or External DHCP Server)
2. V-IPEXT32 Card is installed in the NS1000
3. Sufficient IP-PT A/Ks are installed.

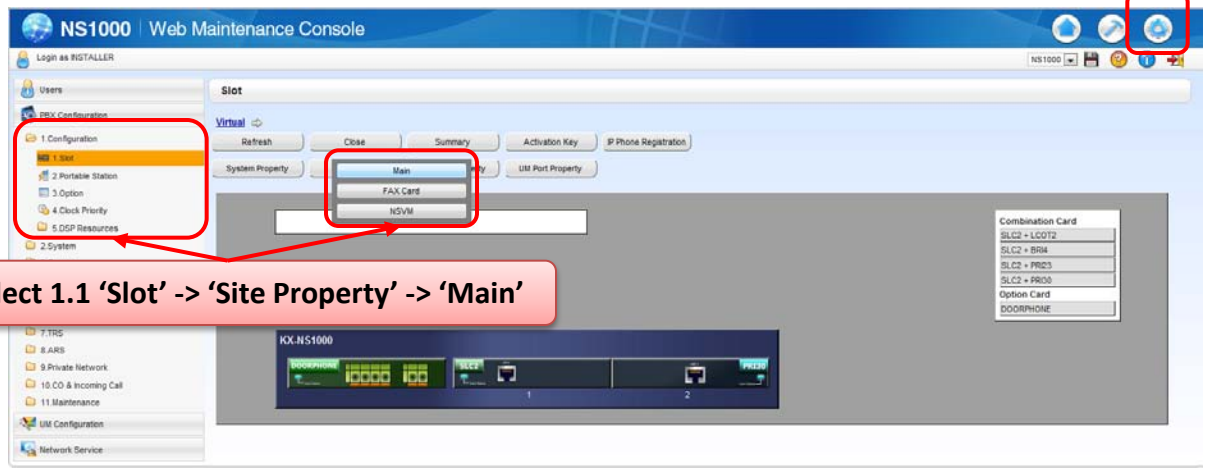


2.2 PBX System Configuration (1)

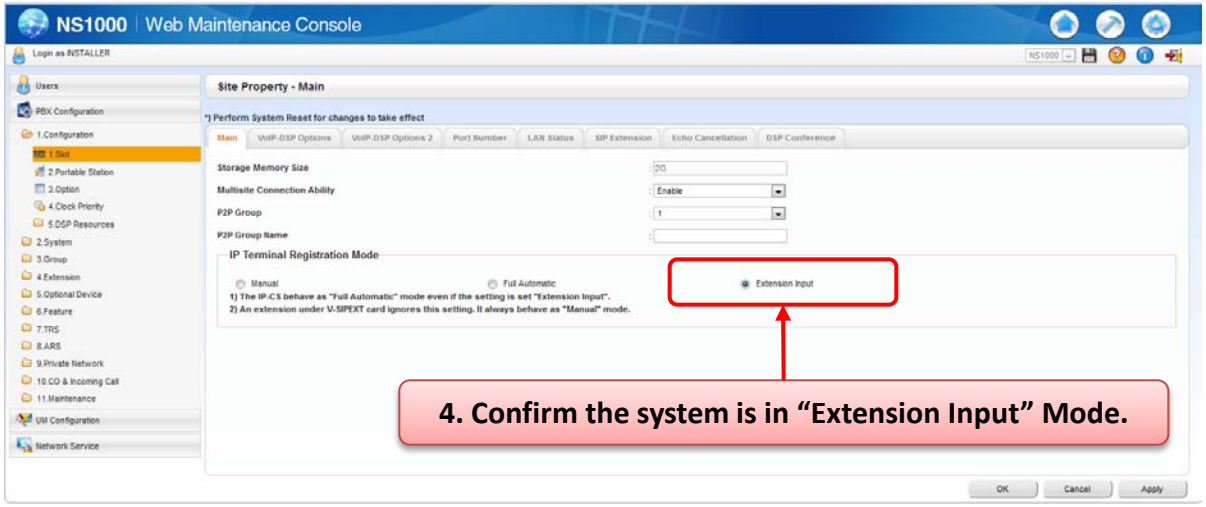
Confirm the IP Terminal Registration Mode

1. Login to the Web-MC

2. Select ‘Setup’



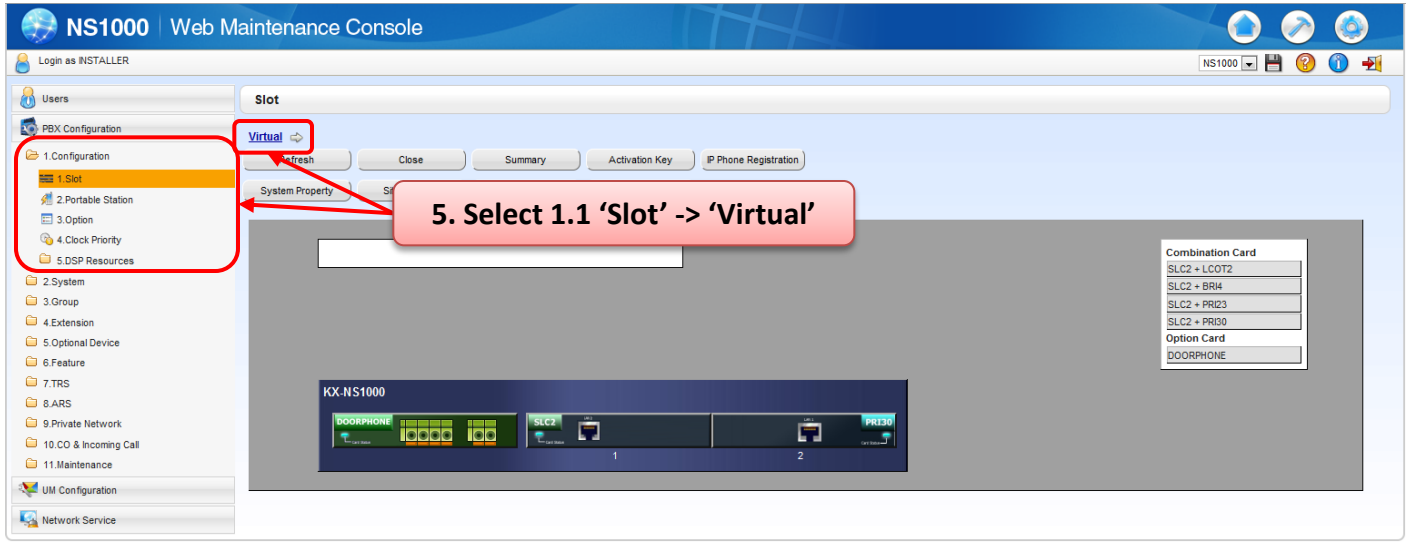
3. Select 1.1 ‘Slot’ -> ‘Site Property’ -> ‘Main’

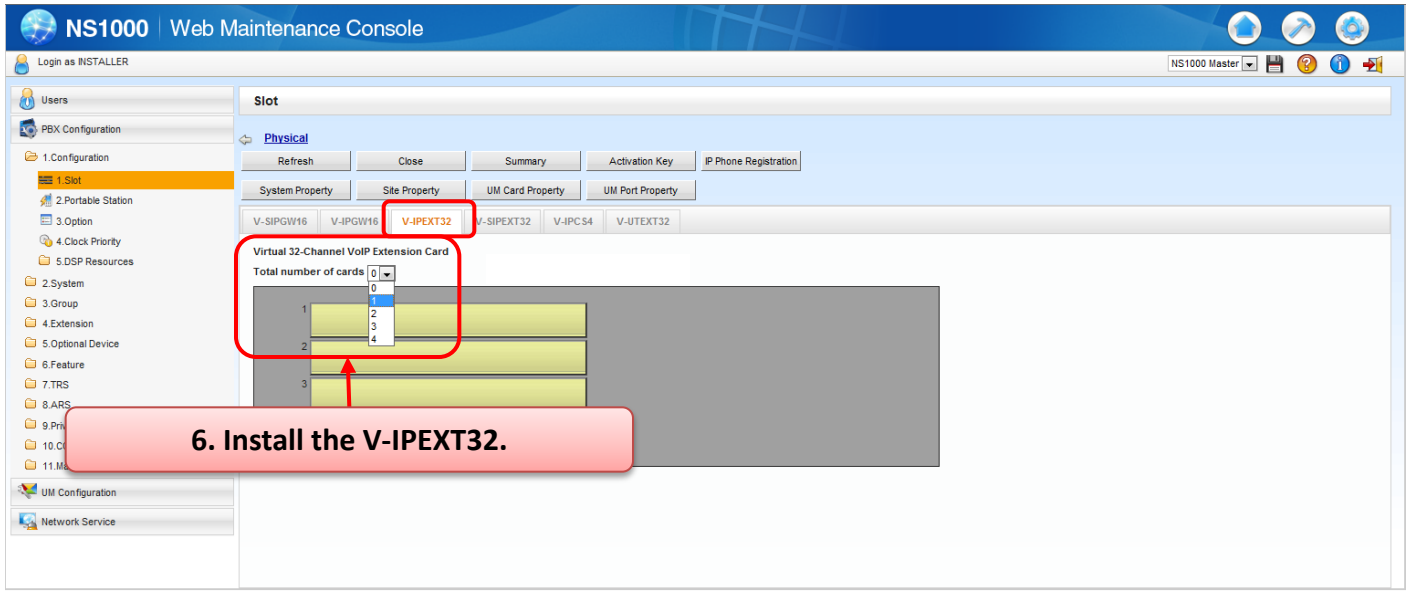


4. Confirm the system is in “Extension Input” Mode.

2.2 PBX System Configuration (2)

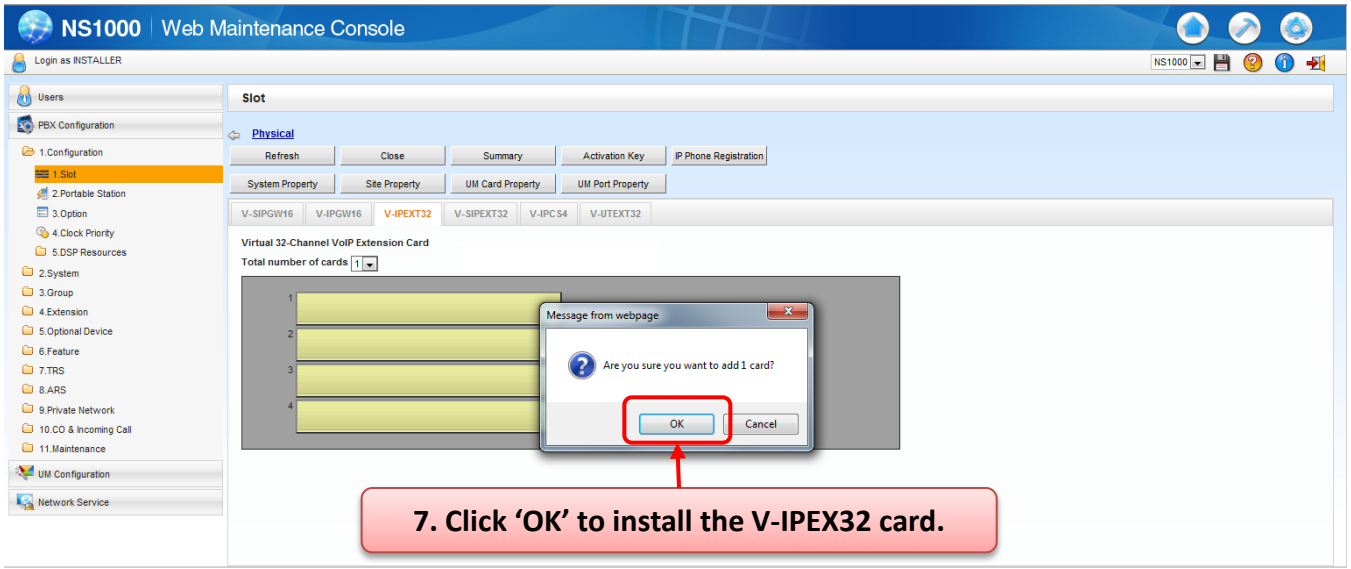
Install a Virtual Extension card (V-IPEXT32) - 1

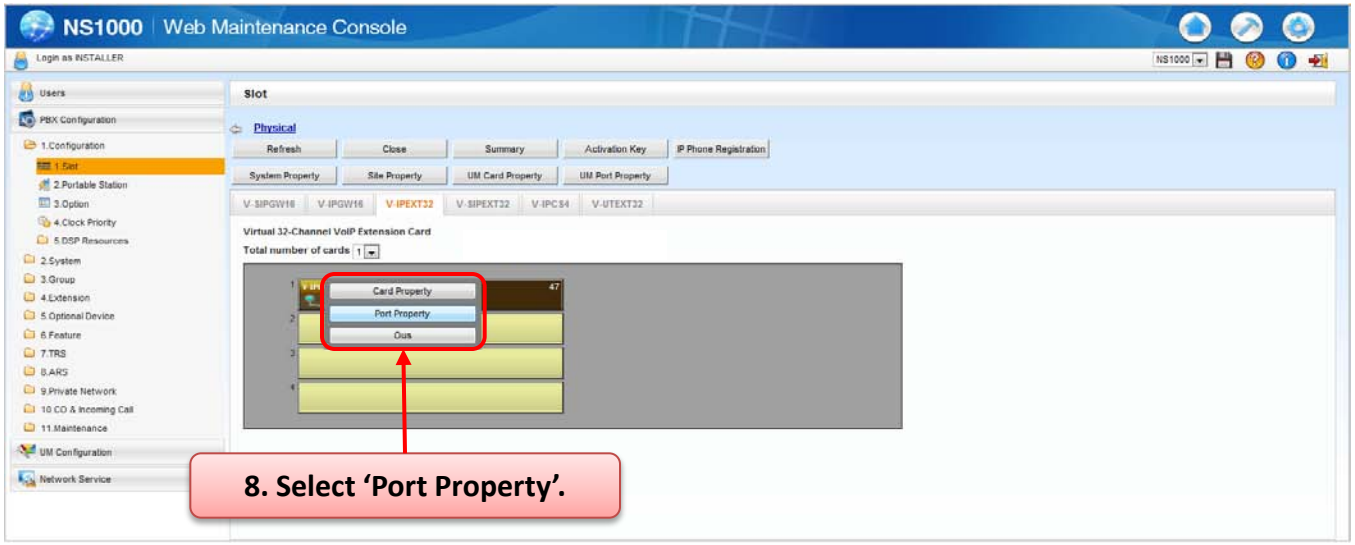




2.2 PBX System Configuration (3)

Install a Virtual Extension card (V-IPEXT32) - 2





2.2 PBX System Configuration (4)

Connect the NT Series IP-PT to the network (which includes DHCP Server) and input the desired Ext number via the IP-PT Keypad when prompted.

Note:

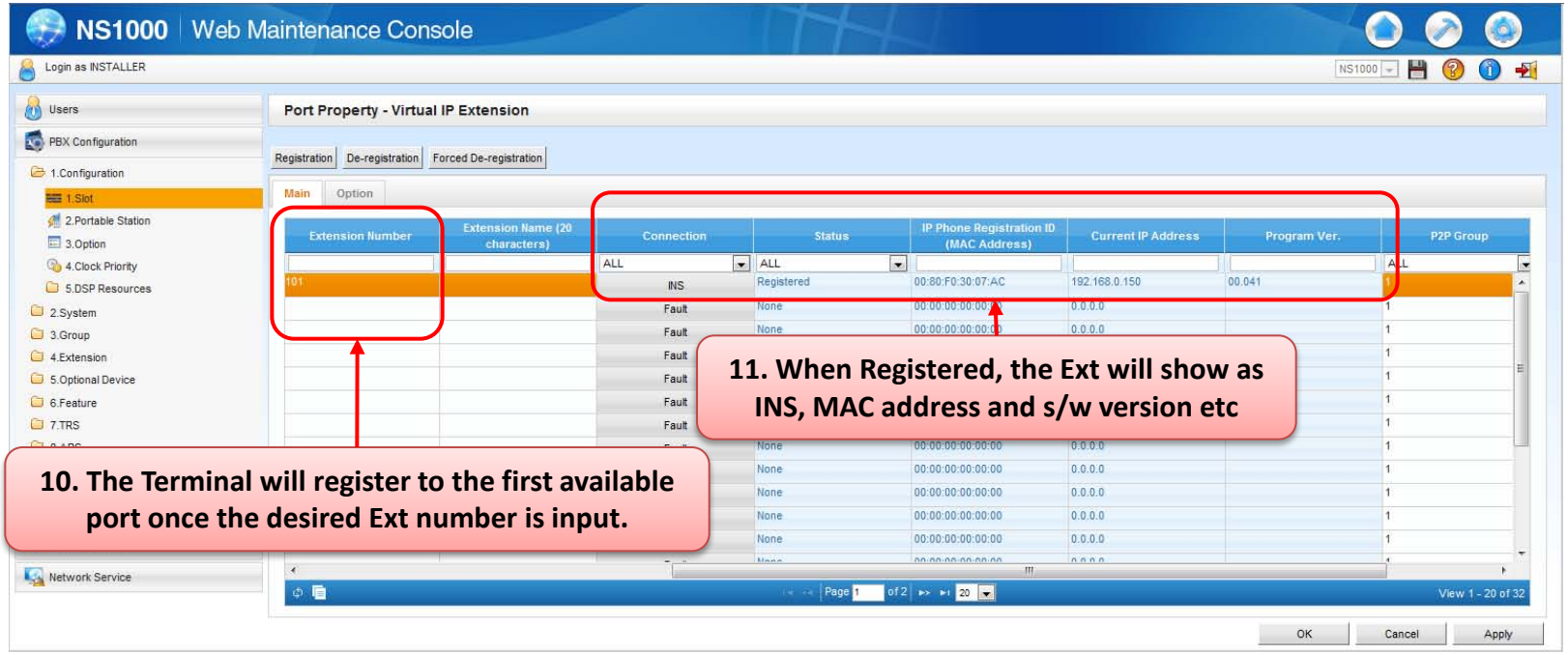
a.) If extension number is set in V-IPEXT32, but has no PT registration, the IP-PT will automatically register to the first available Port/ Ext number (you will not be prompted to enter an Ext number from the PT.)

b.) If you enter a number which is already used, you will hear an error tone.

c.) If you do not input an Ext number within 60s, then the IP-PT will register to an available port (No Ext Number). The desired Ext Number can then be set via the WebMC.

9. Enter the desired Ext number and press ENTER

(NT3xx Display)



Chapter 3

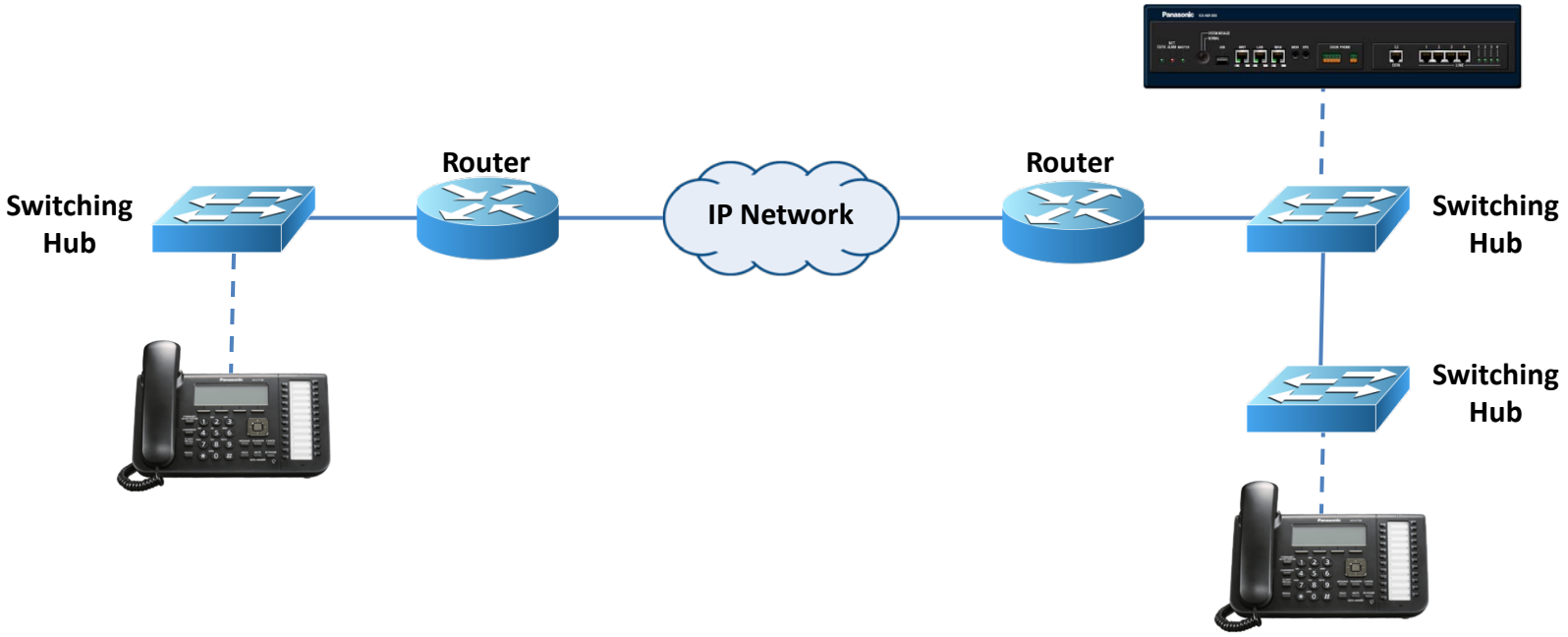
UT SERIES REGISTRATION ‘MANUAL’ MODE

3.1 Manual Registration Mode

Manual Mode - Overview

When Terminals are connected to an NS1000 which exists on a different network, or a DHCP Server is not available – Registration of the Terminals must be carried out manually by entering the necessary Network/PBX IP Addresses.

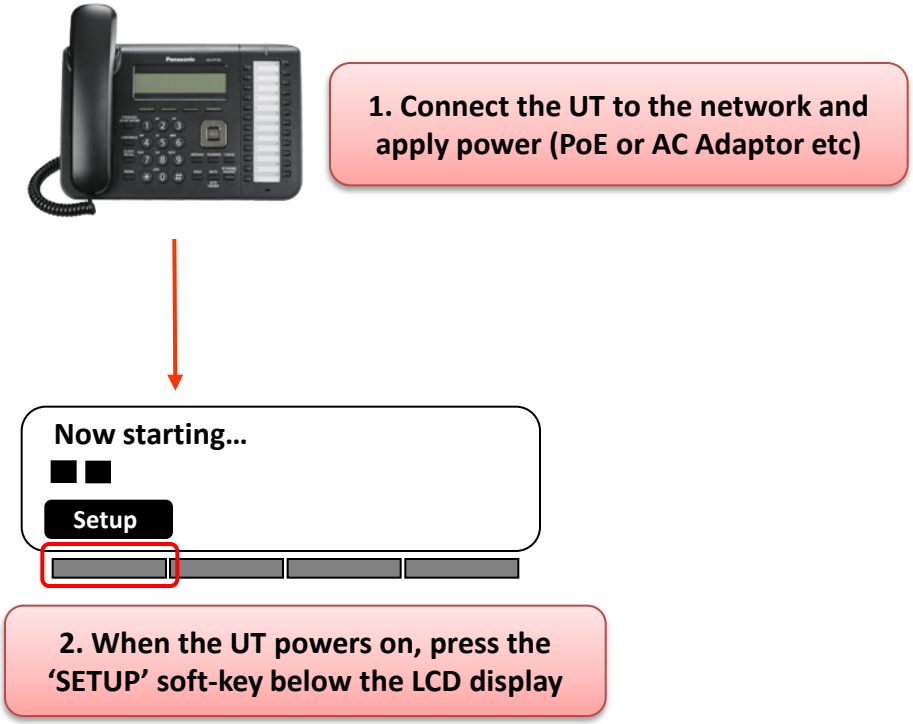
IP-CS and 3rd Party SIP Phones must always be registered manually, regardless of their network location.



3.2 Manual Registration Mode – UT series

1. Registering an UT-PT to the PBX (Manual Registration Mode)

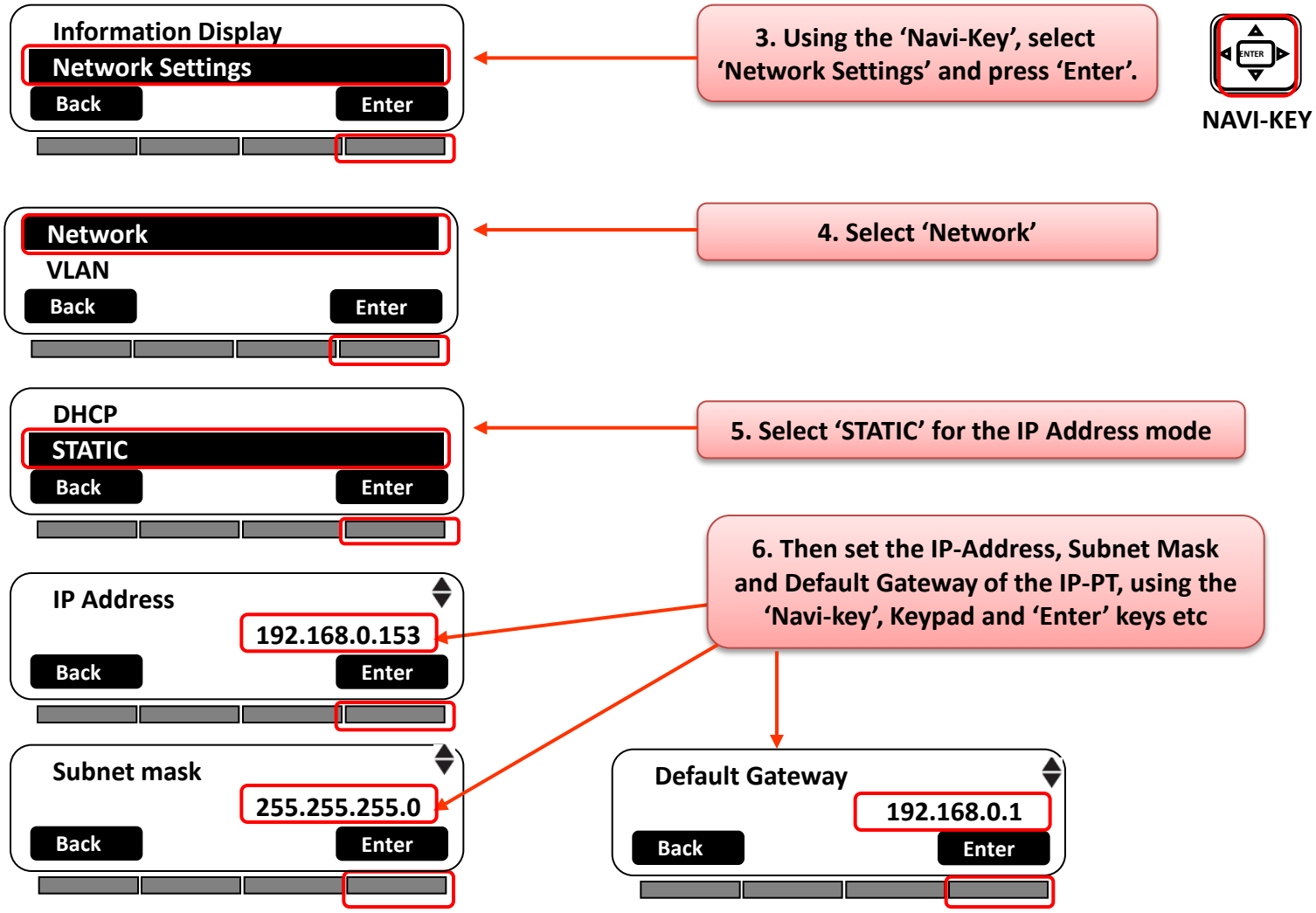
When registering a UT without a local DHCP server OR when registering the UT from a remote location etc, you will need to enter the IP Address of the UT AND the IP Address of the PBX into the UT manually (Manual Registration Mode).



3.2 Manual Registration Mode – UT series

1. Registering an IP-PT to the PBX (Manual Registration Mode) – cont….

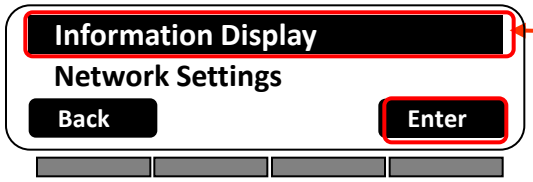
(UT-PT IP Address Setting)



3.2 Manual Registration Mode – UT series.

1. Registering an IP-PT to the PBX (Manual Registration Mode) – cont….

(UT-PT IP Address Setting)



7. The Network address and MAC information can be confirmed by navigating back to the 'Information Display' screen

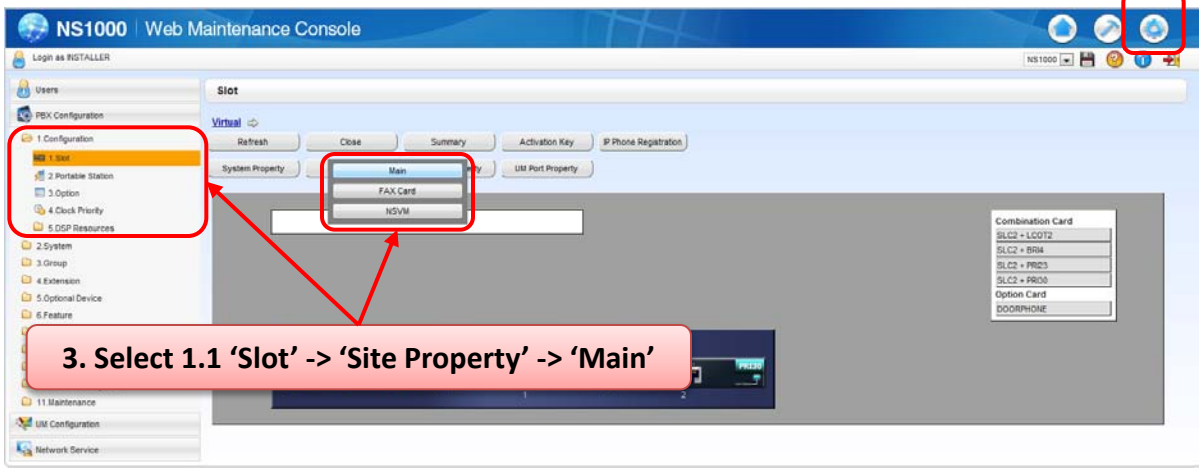
The PBX IP-Address (location) will be set automatically during the registration process. The registration process (UT <-> PBX) must be carried out within the same Broadcast domain.

3.3 PBX System Configuration (1)

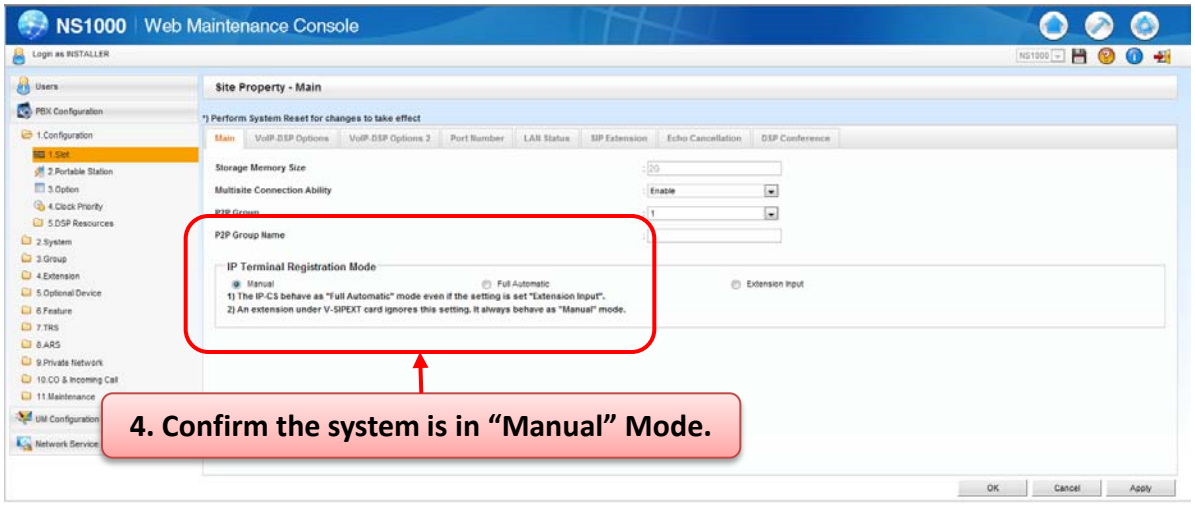
Confirm the UT Terminal Registration Mode (Manual)

1. Login to the Web-MC

2. Select ‘Setup’



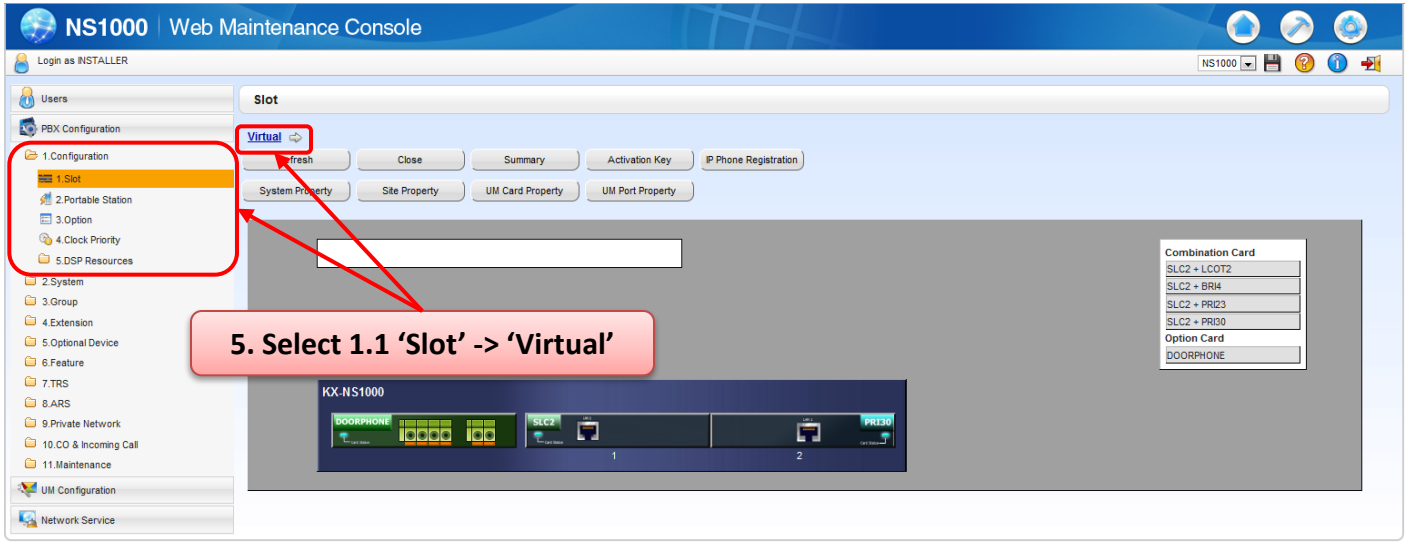
3. Select 1.1 ‘Slot’ -> ‘Site Property’ -> ‘Main’

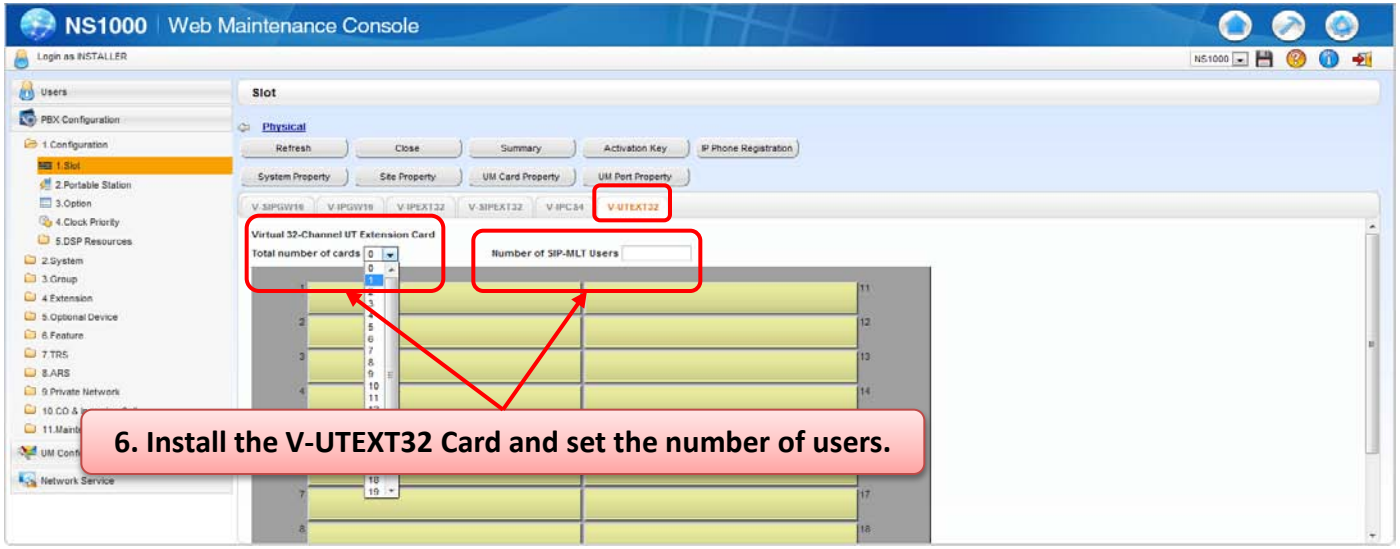


4. Confirm the system is in “Manual” Mode.

3.3 PBX System Configuration (2)

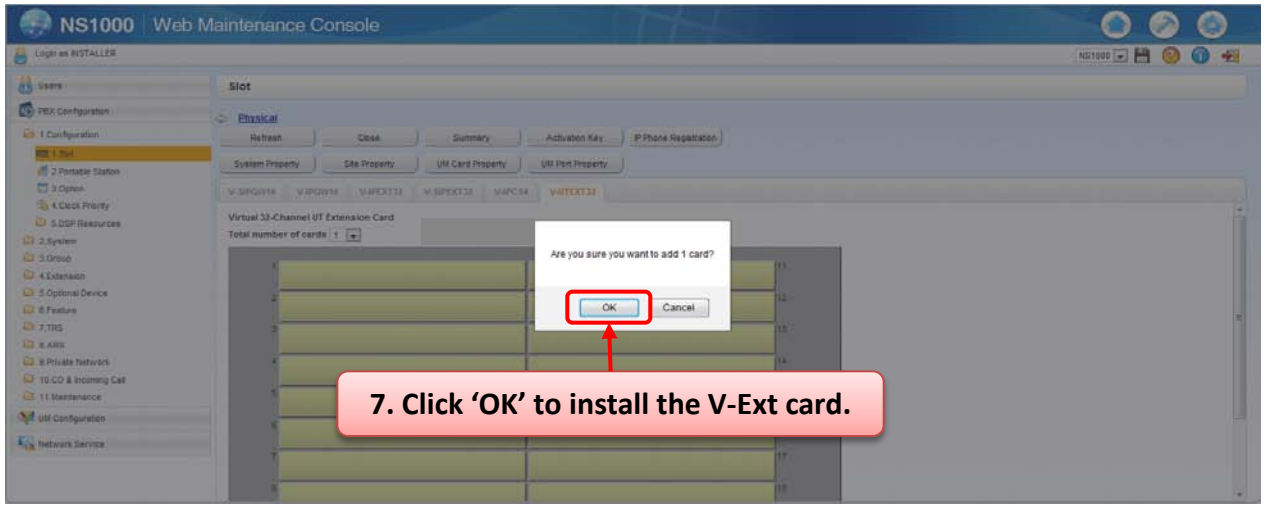
Install a Virtual Extension card (V-UTEXT32) - 1

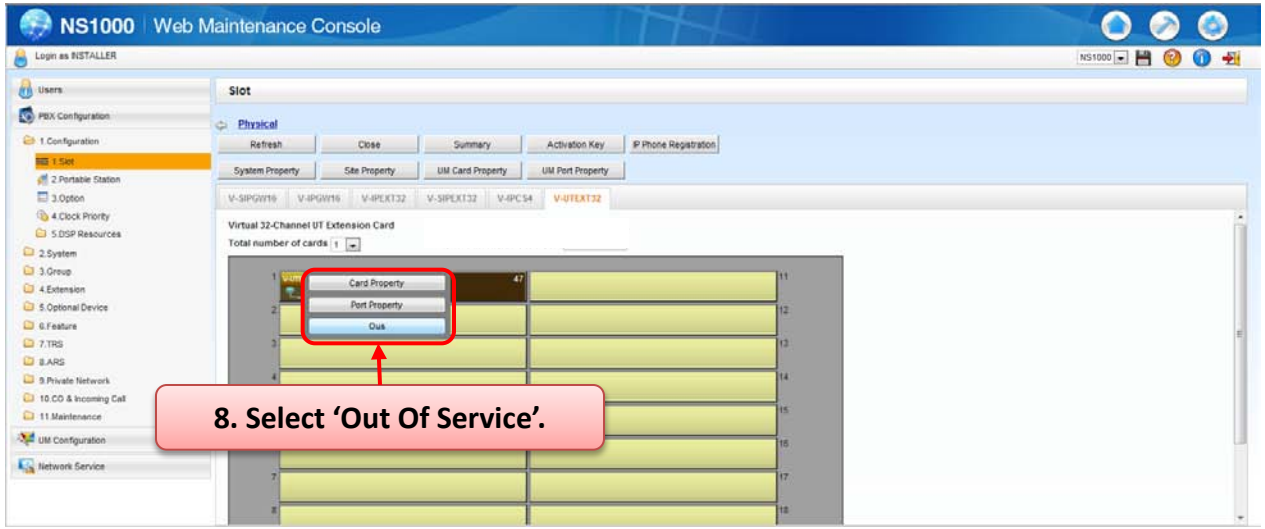




3.3 PBX System Configuration (3)

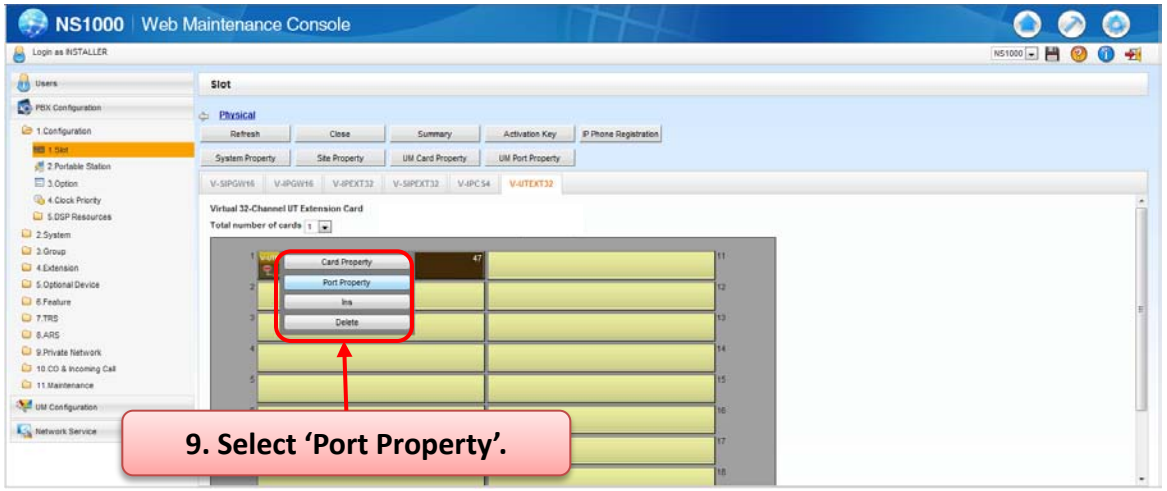
Install a Virtual Extension card (V-UTEXT32) - 2

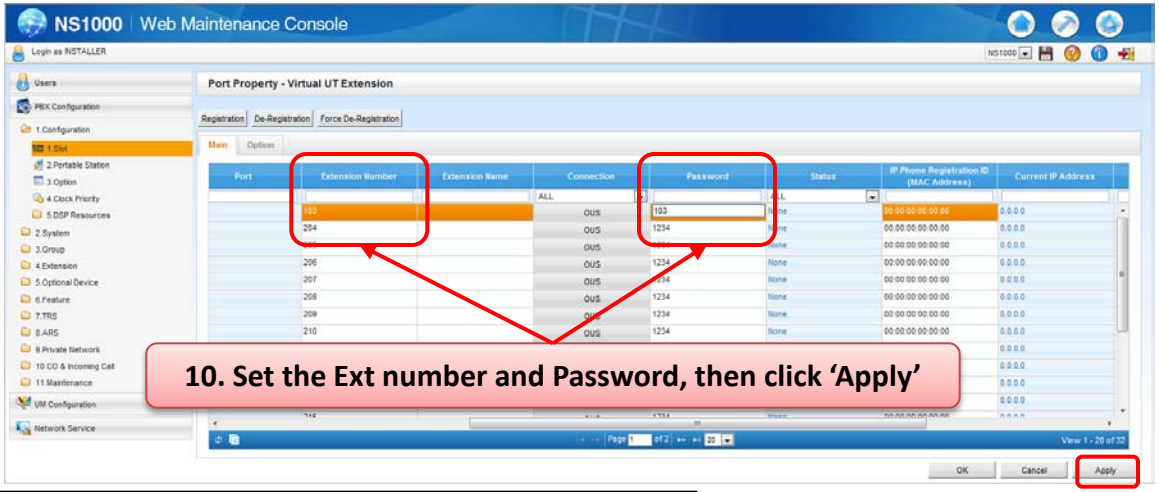




3.3 PBX System Configuration (4)

Install a Virtual Extension card (V-UTEXT32) - 3

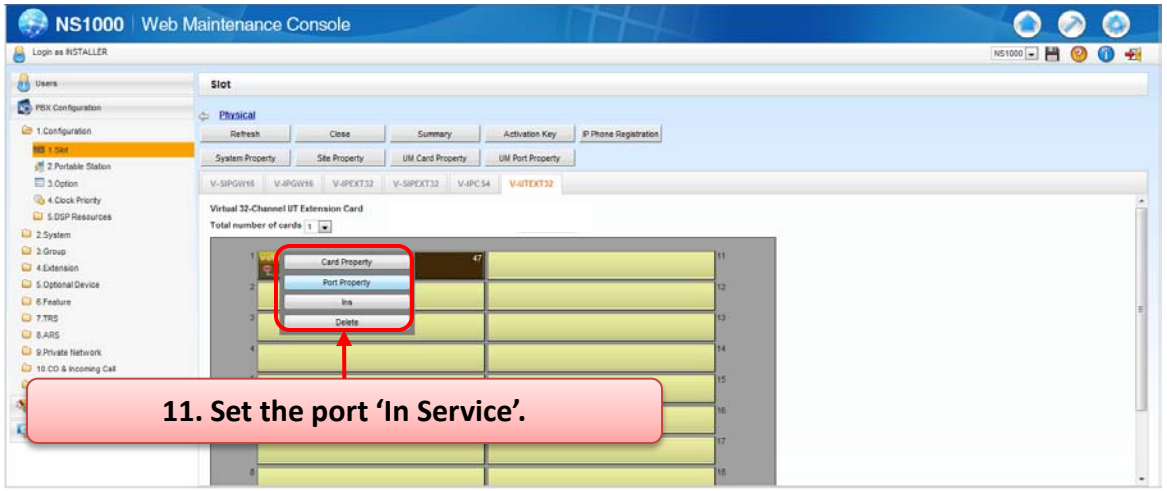


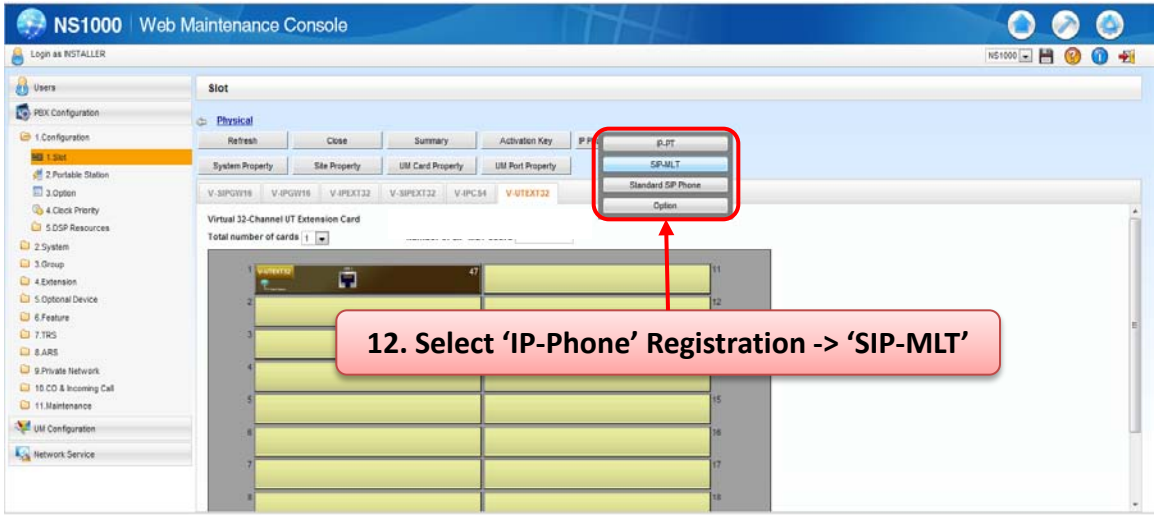


NB: By Default, the extension Password is set to '1234'

3.3 PBX System Configuration (5)

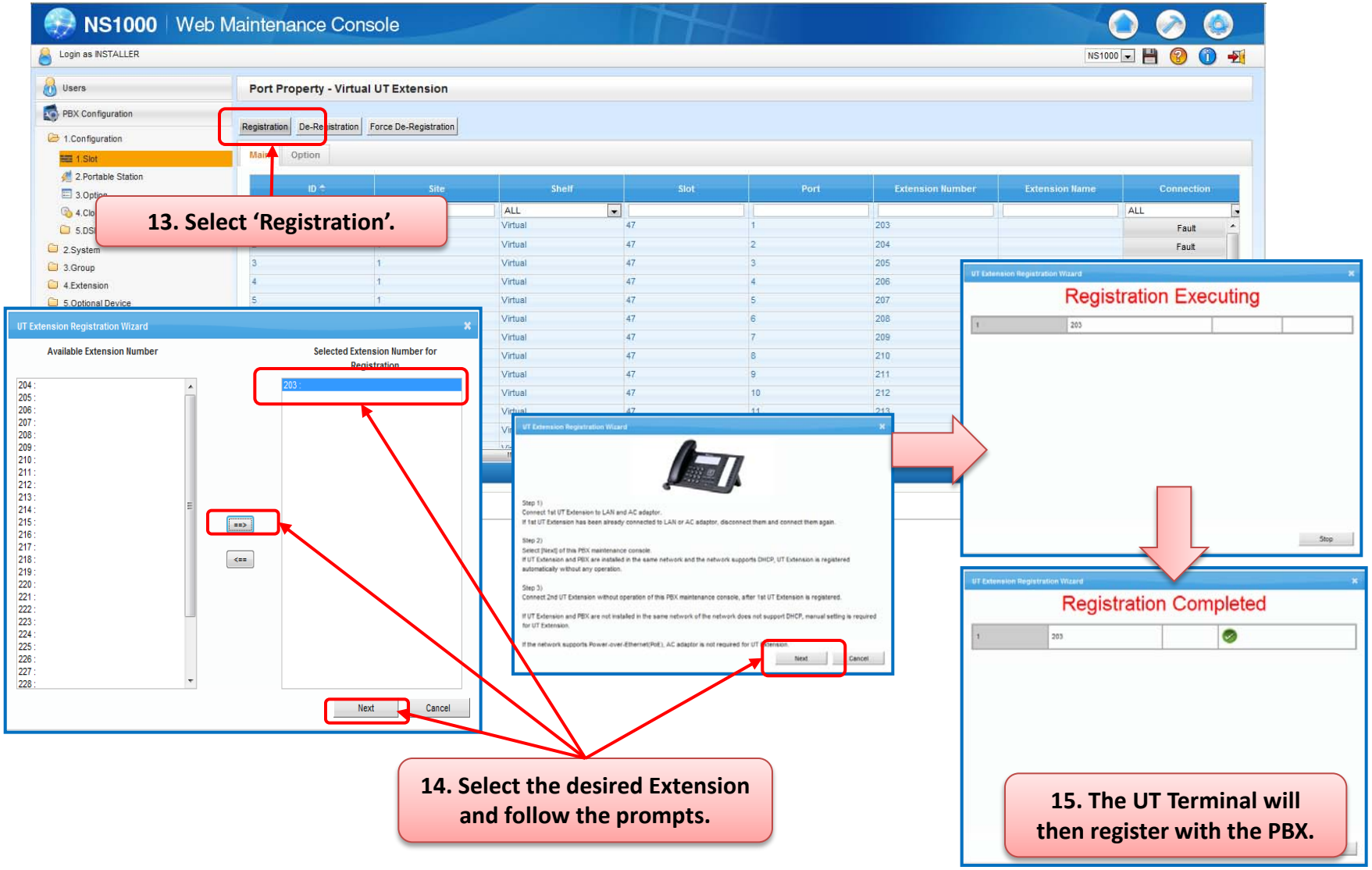
Install a Virtual Extension card (V-UTEXT32) - 4





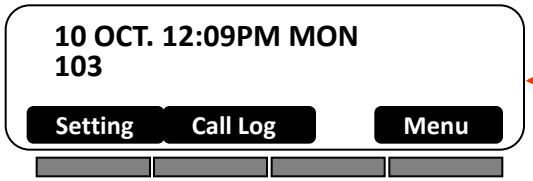
3.3 PBX System Configuration (6)

Install a Virtual Extension card (V-UTEXT32) - 5



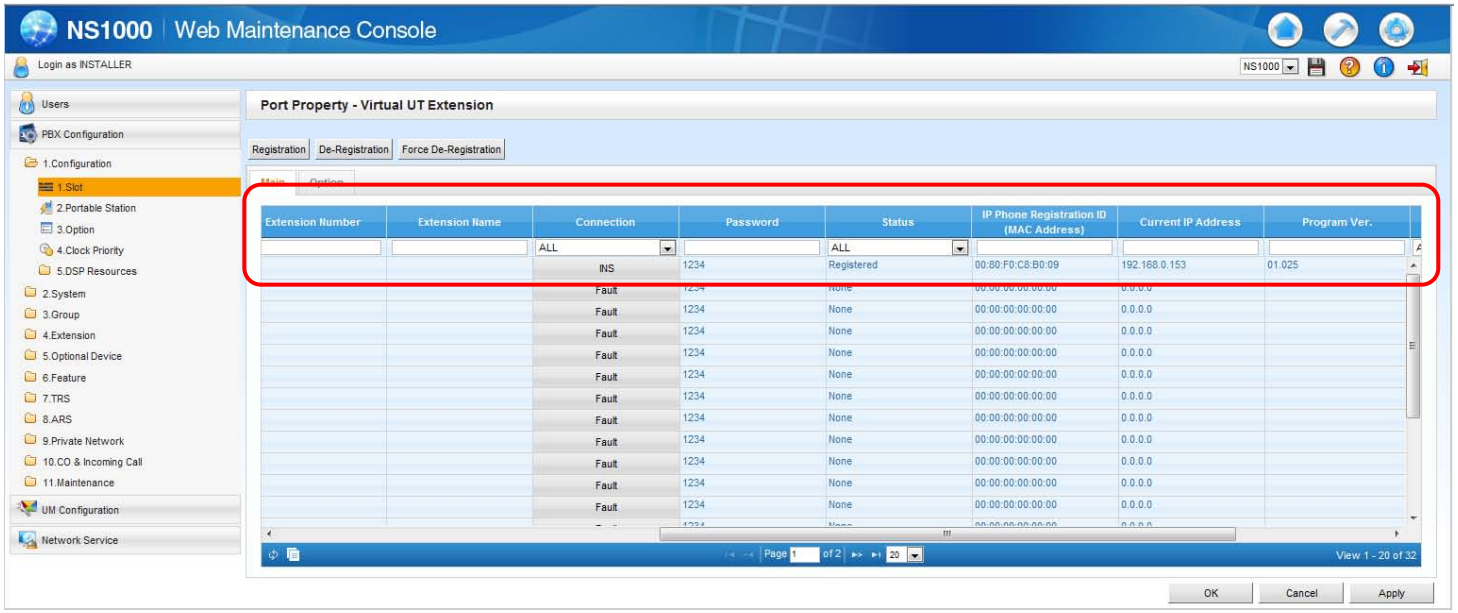
3.4 Registration Confirmation (UT)

Confirm the registration



11. After the UT-PT has re-booted and the WebMC Registration process has been completed, the UT-PT will be in-service.

Further Extension configuration can now be made via the WebMC, using the Extension Number of the IP-PT.



From the V-UTEXT32 Port Properties screen, the UT registration status, Password, MAC, IP-Address and firmware version can be seen.

Chapter 4

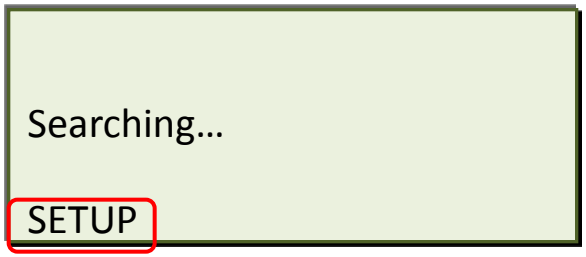
NT SERIES REGISTRATION ‘MANUAL’ MODE

4.1 Manual Registration Mode – NT series

1. Registering an IP-PT to the PBX (Manual Registration Mode)

When registering an IP-PT without a local DHCP server OR when registering an IP-PT from a remote location etc, you will need to enter the IP Address of the IP-PT AND the IP Address of the PBX into the IP-PT manually (Manual Registration Mode).

1. Connect the IP-PT to the network and apply power (PoE or AC Adaptor etc)

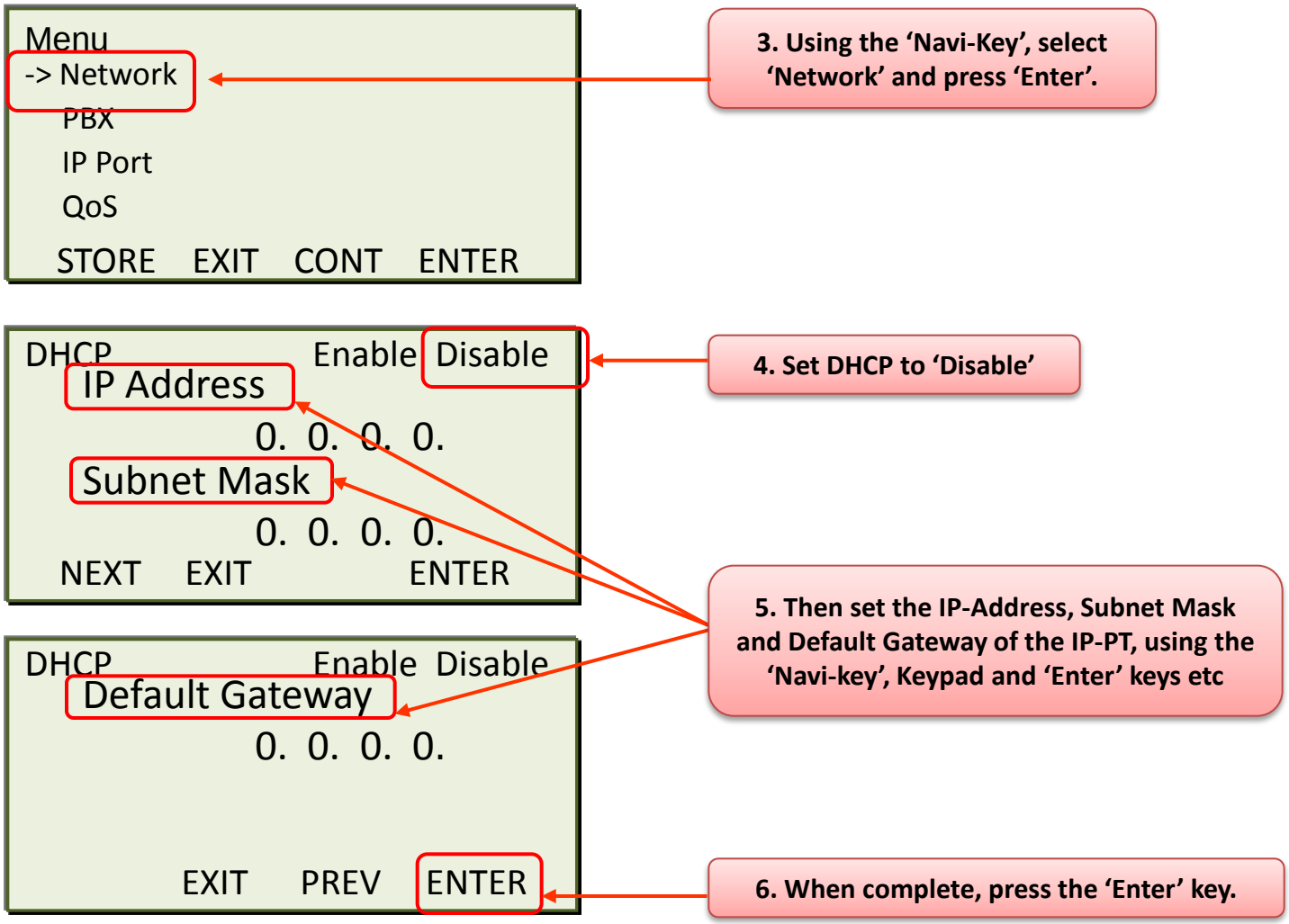


2. When the IP-PT powers on, press the 'SETUP' soft-key below the LCD display

4.1 Manual Registration Mode – NT series

1. Registering an IP-PT to the PBX (Manual Registration Mode) – cont….

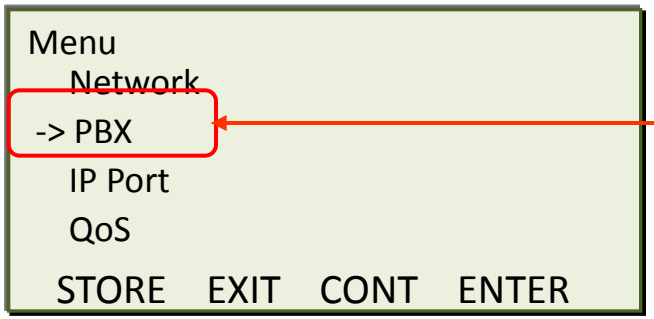
(IP-PT IP Address Setting)



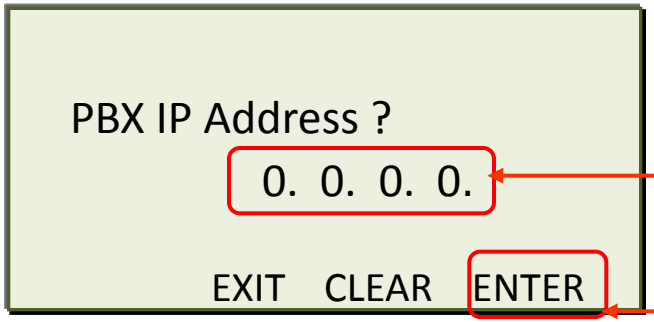
4.1 Manual Registration Mode – NT series.

1. Registering an IP-PT to the PBX (Manual Registration Mode) – cont….

(IP-PT IP Address Setting)

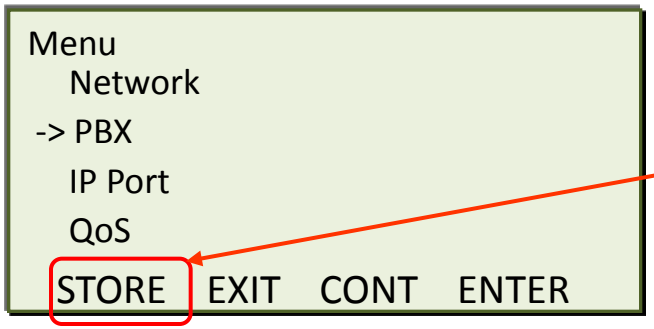


7. Using the 'Navi-Key', select 'PBX' and press 'Enter'.



8. Then set the IP-Address of the IP-PT, using the 'Navi-key', Keypad and 'Enter' keys etc

9. When complete, press the 'ENTER' key to return to the 'Menu' screen.



10. Press 'Store' to save the settings in the IP-PT and re-boot the unit.

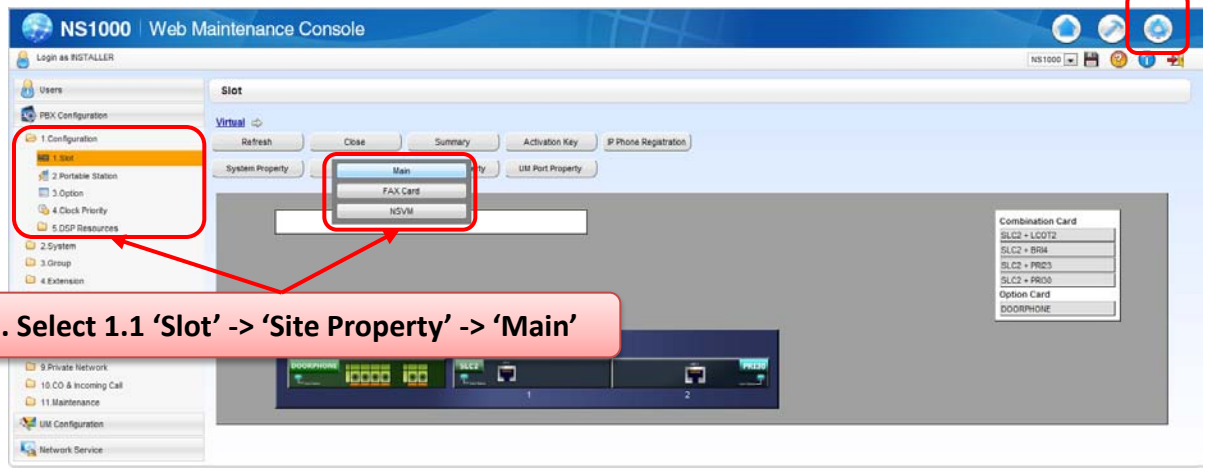
The IP-PT can then be registered to the PBX using the WebMC.

4.2 PBX System Configuration (1)

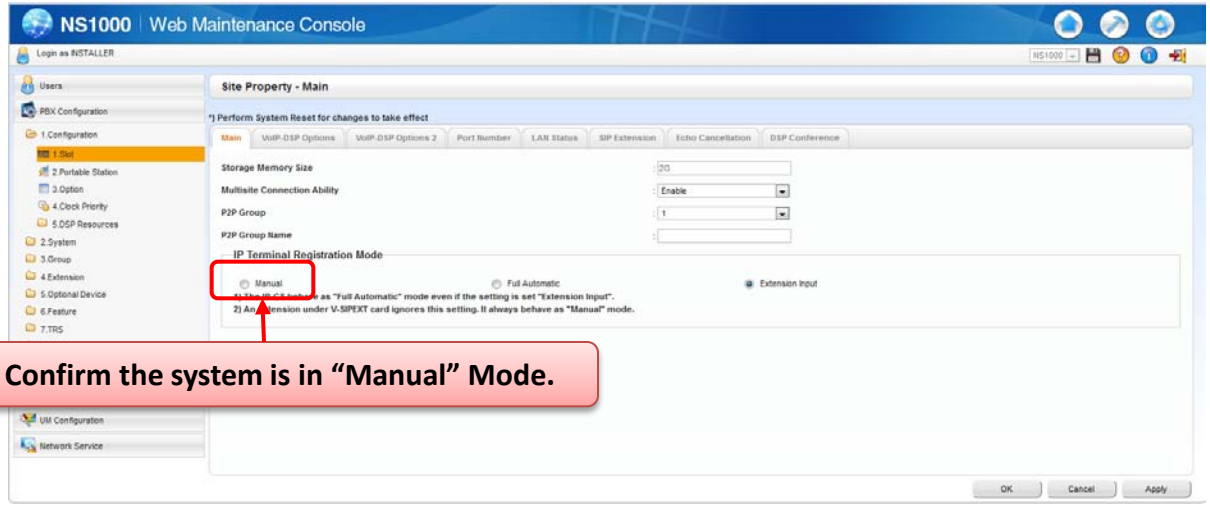
Confirm the IP Terminal Registration Mode

1. Login to the Web-MC

2. Select ‘Setup’



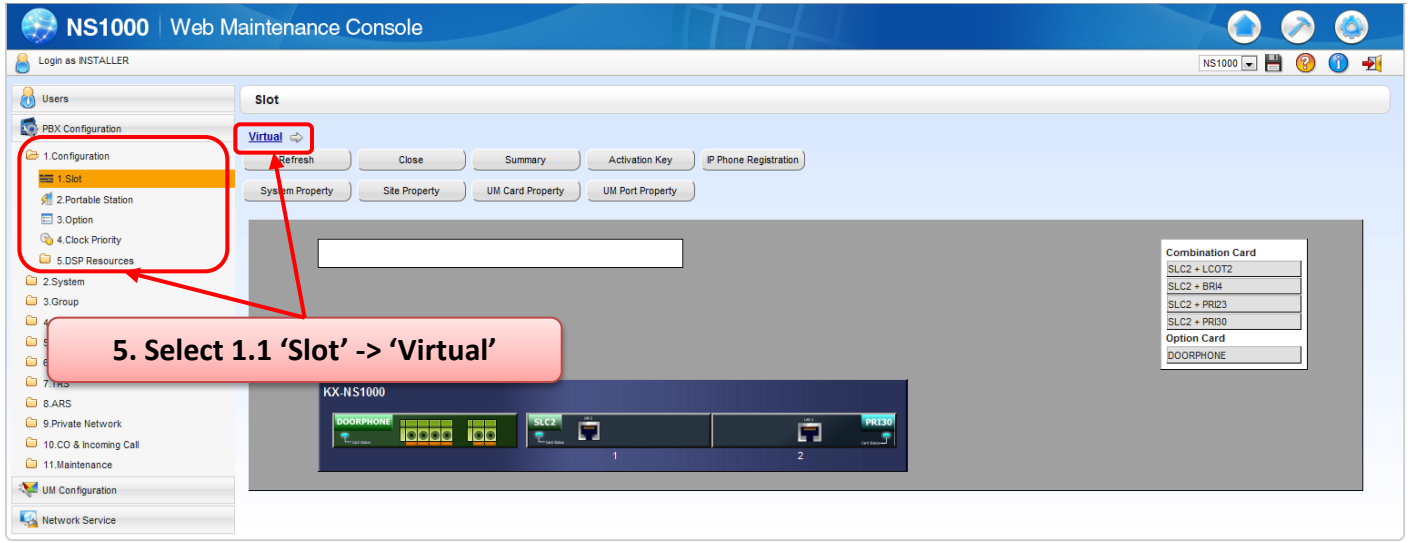
3. Select 1.1 ‘Slot’ -> ‘Site Property’ -> ‘Main’

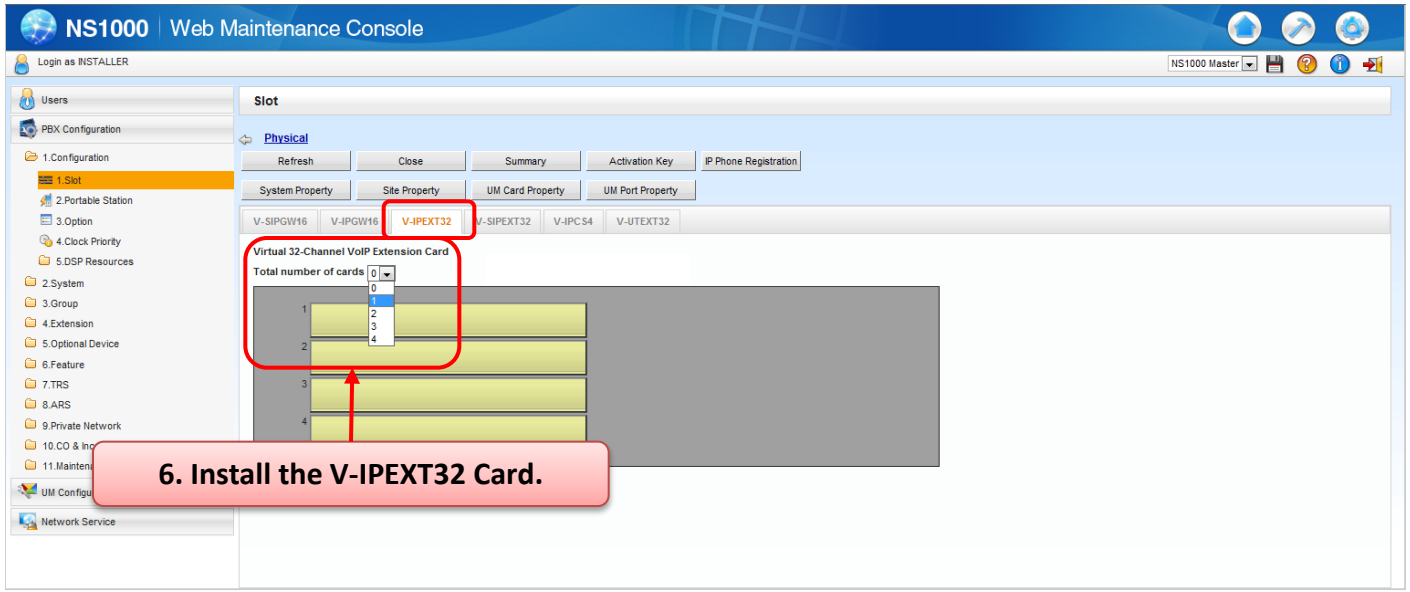


4. Confirm the system is in “Manual” Mode.

4.2 PBX System Configuration (2)

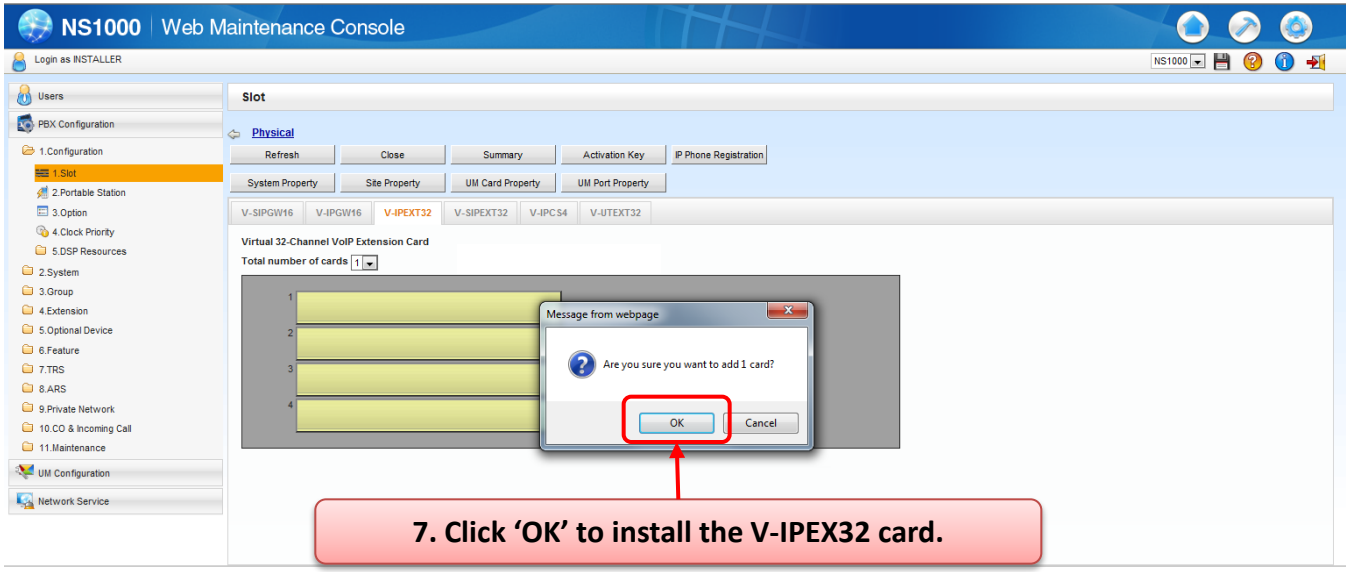
Install a Virtual Extension card (V-IPEXT32) - 1





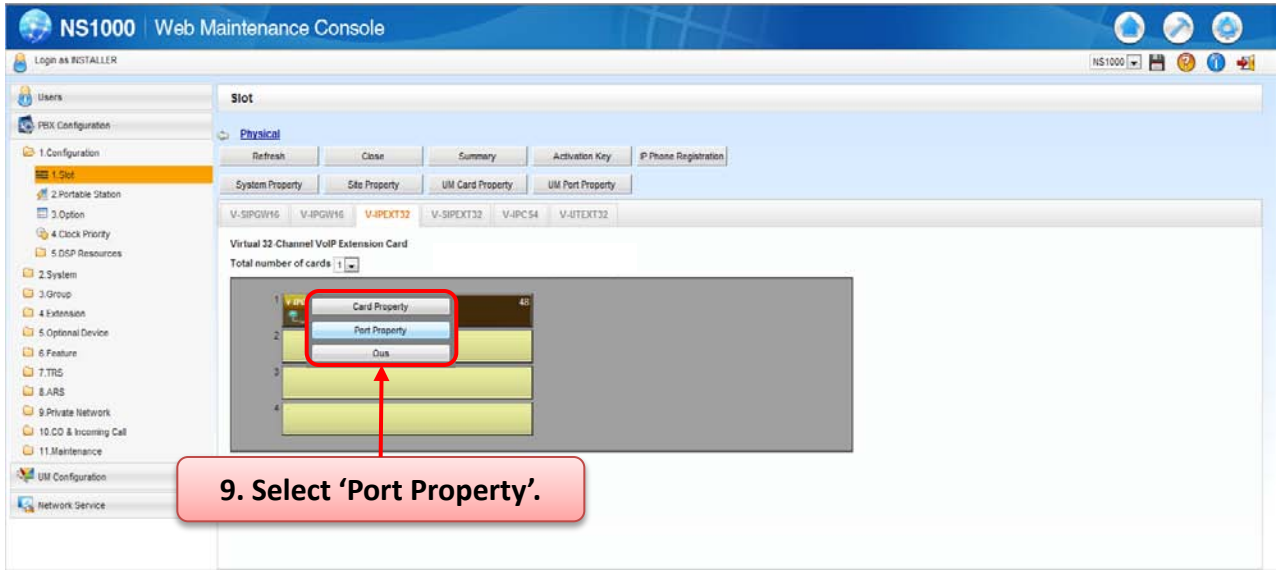
4.2 PBX System Configuration (3)

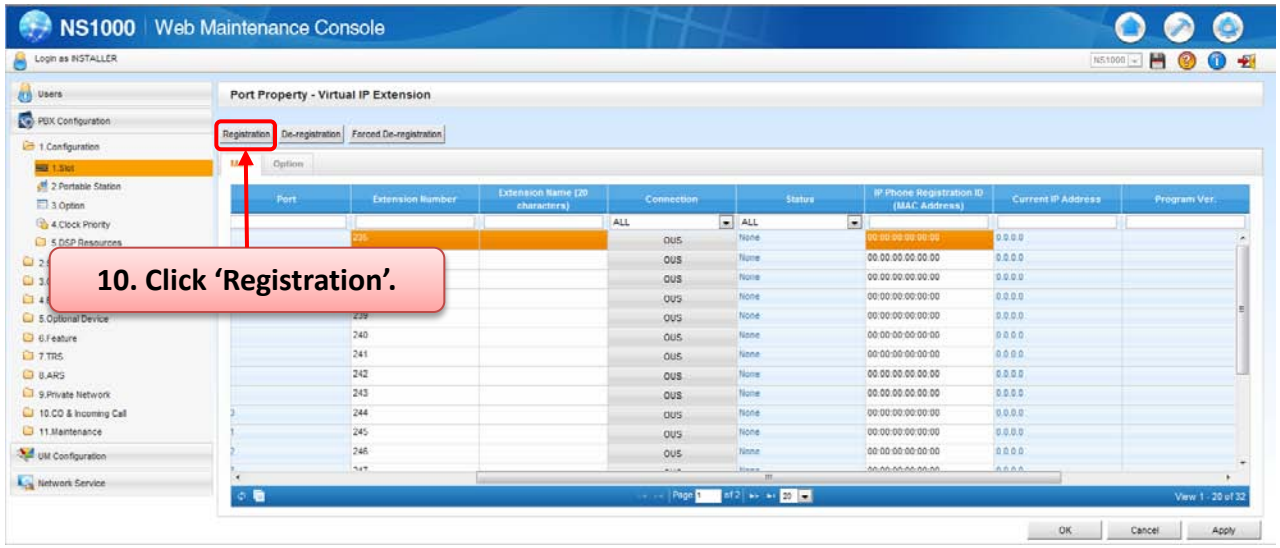
Install a Virtual Extension card (V-IPEXT32) - 2



4.2 PBX System Configuration (4)

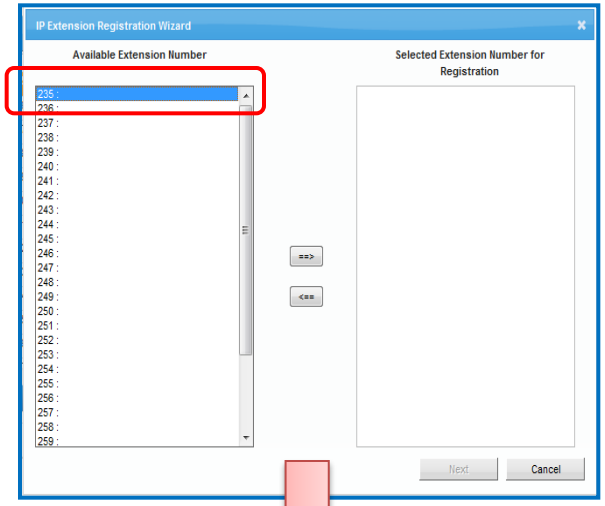
Setting Registration Mode - 1

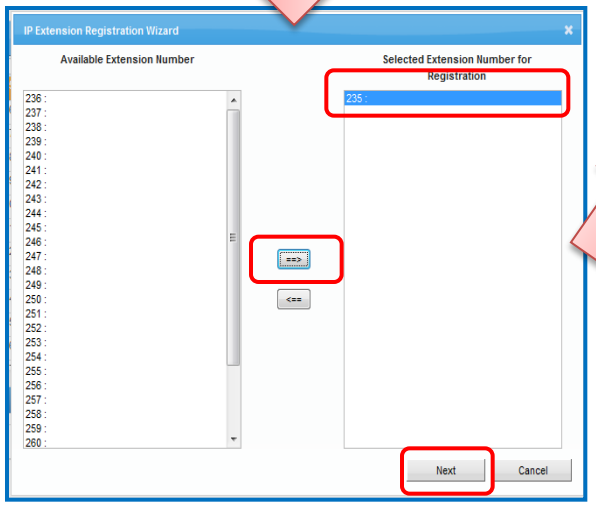




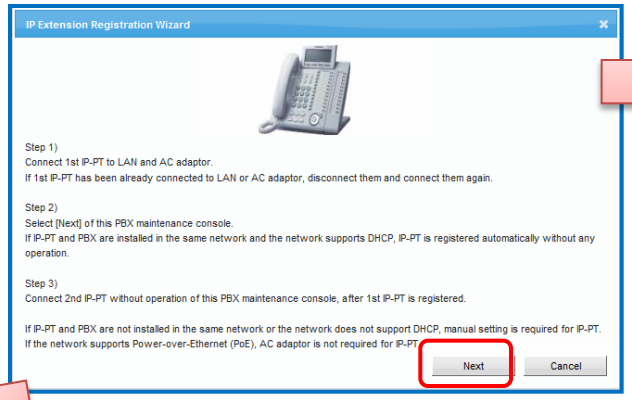
4.2 PBX System Configuration (5)

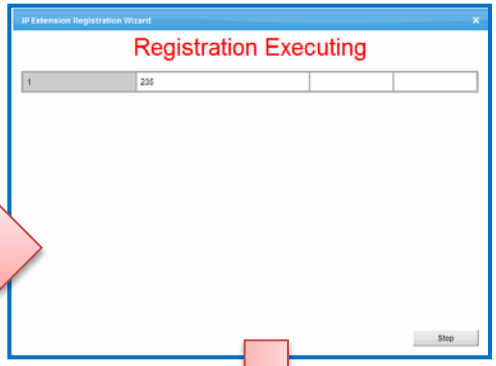
Setting Registration Mode - 2

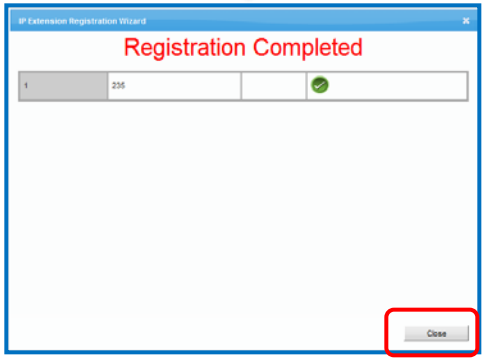




11. Select the desired Extension number and follow the prompts.

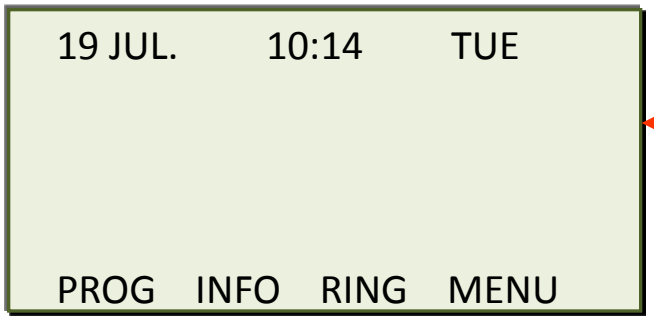






4.3 Registration Confirmation – NT series

When the NT-PT has been registered, it's display will display the following information;



12. After the IP-PT has re-booted and the WebMC Registration process has been completed, the IP-PT will be in-service.

Further Extension configuration can now be made via the WebMC, using the Extension Number of the IP-PT.

Chapter 5

DECT CS INSTALLATION

5-0. DECT CS Installation (KX-NCP0158CE) – (1)

To assign a static IP Address to the KX-NCP0158CE IP-CS, the Panasonic UPCMC Tool is required. It is not possible to set a static IP Address on the IP-CS via the NS1000 WebMC.

Step 1. Assign the IP-CS IP address, subnet, PBX IP address, . etc,

UPCMC Tool is required. (Available from your NSC)

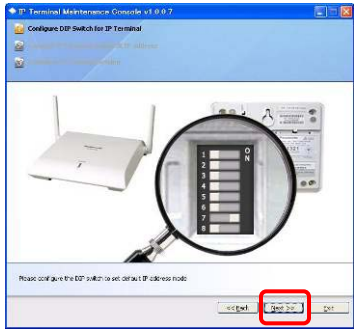
1

Select IP Terminal

2

Press next

3

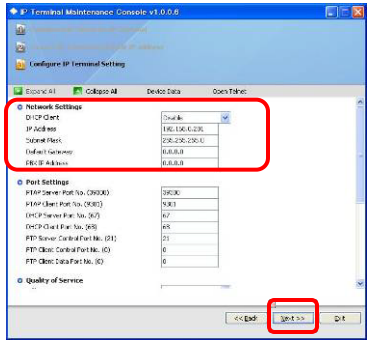


Change DIP SW 7 to ON and Power off/on the IP-CS.

4

Assign 192.168.2.xxx as PC IP address and press next.

5



Assign IP-CS data like IP address, PBX IP address, etc., and press next. After that, Power off/on the IP-CS.

NB: By default, the KX-NCP0158CE is set to DHCP. It is only necessary to set a static IP Address if there is no available DHCP Server or if the IP-CS is to be placed on a Network different than then PBX.

5-0. DECT CS Installation (KX-NCP0158CE) – (2)

Continued from previous slide

6

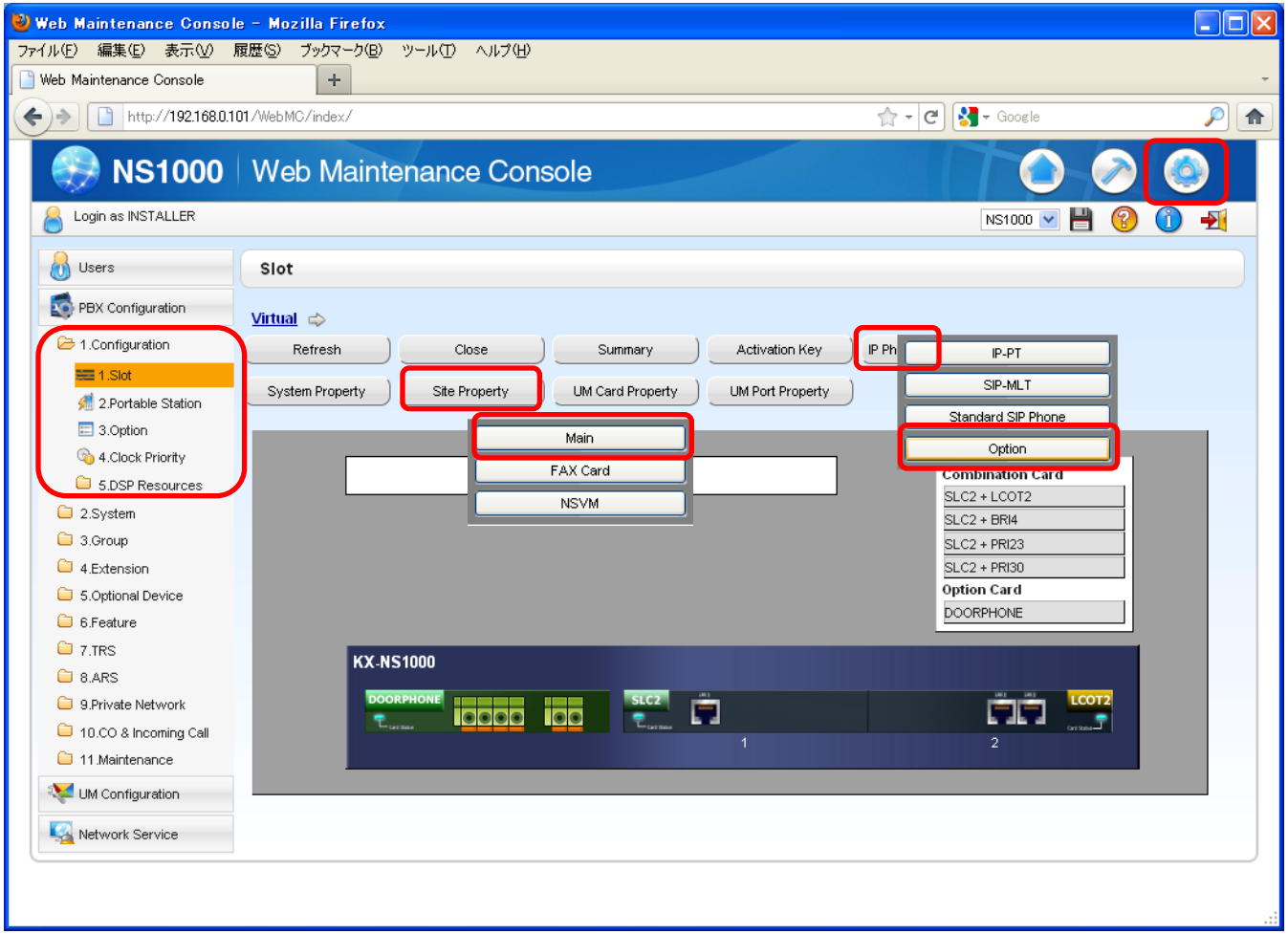
- **Next Device**: Assign IP addressing information to other IP-CSs.
- **Main Screen**: Return to the main screen.

4. Turn off the IP-CS.
5. Return DIP switch no. 7 to the OFF position.
6. Return the IP address and subnet mask address of the PC to their original values.

5-0. DECT CS Installation (KX-NCP0158CE) – (3)

Step 2 - Registering IP-CSs to the PBX

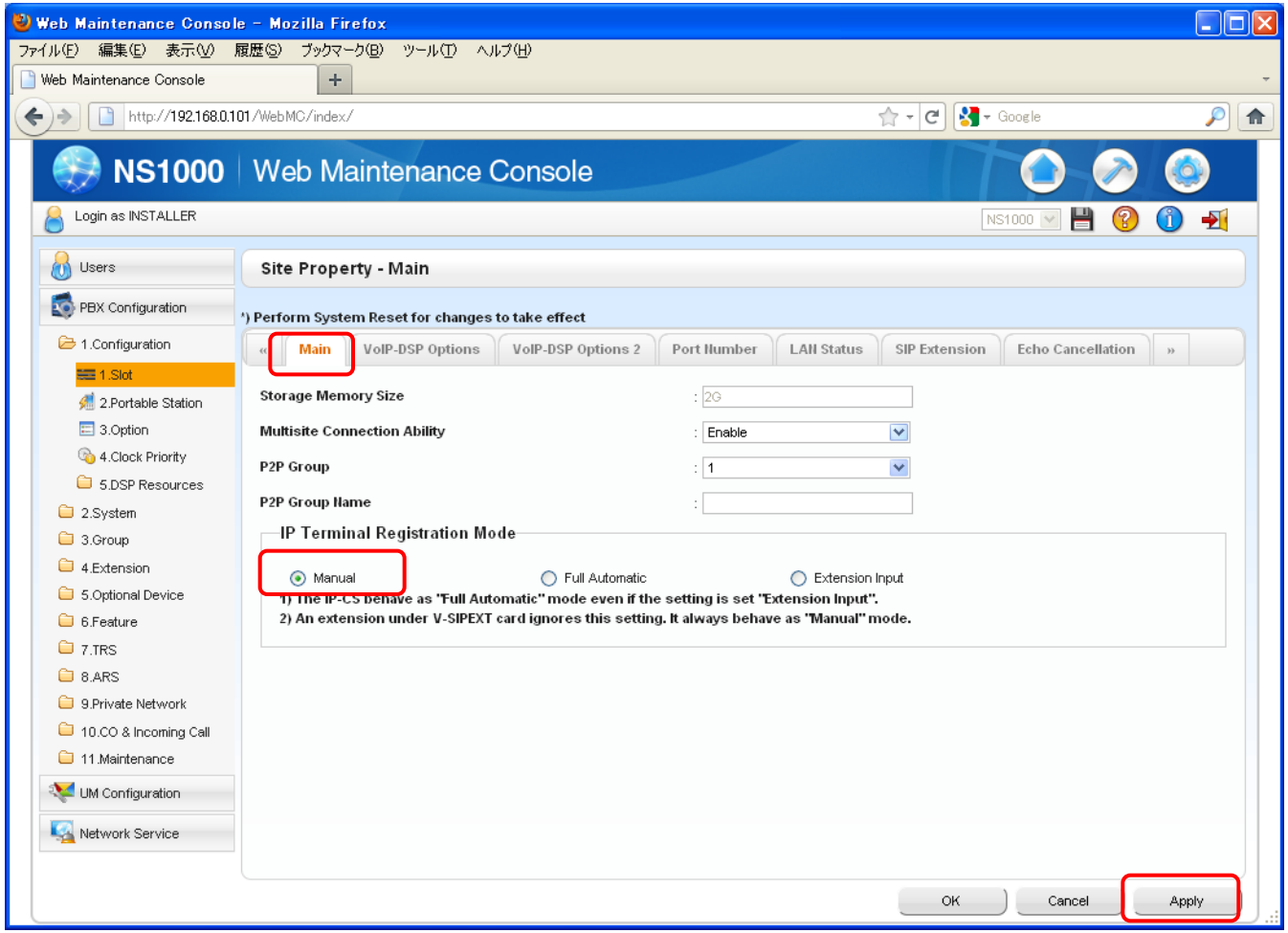
Click [Setup] → select [PBX Configuration] – [1.Configration] – [1.Slot] →
[IP Phone Registration] – [Option] or [Site Property] – [Main]



5-0. DECT CS Installation (KX-NCP0158CE) – (4)

Continued from previous slide

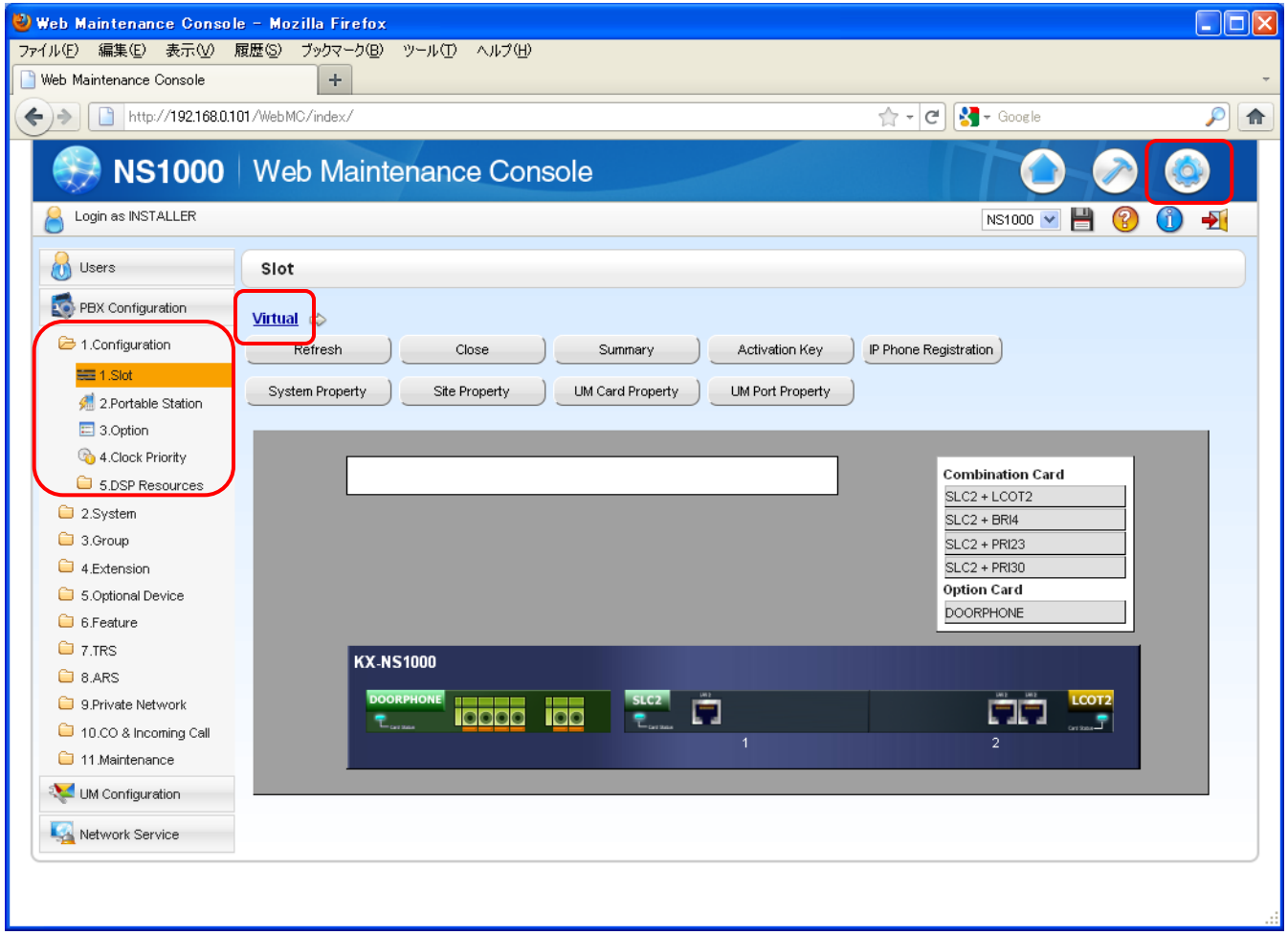
Select “Manual” in “IP Terminal Registration Mode”, then click [Apply].



5-0. DECT CS Installation (KX-NCP0158CE) – (5)

Continued from previous slide

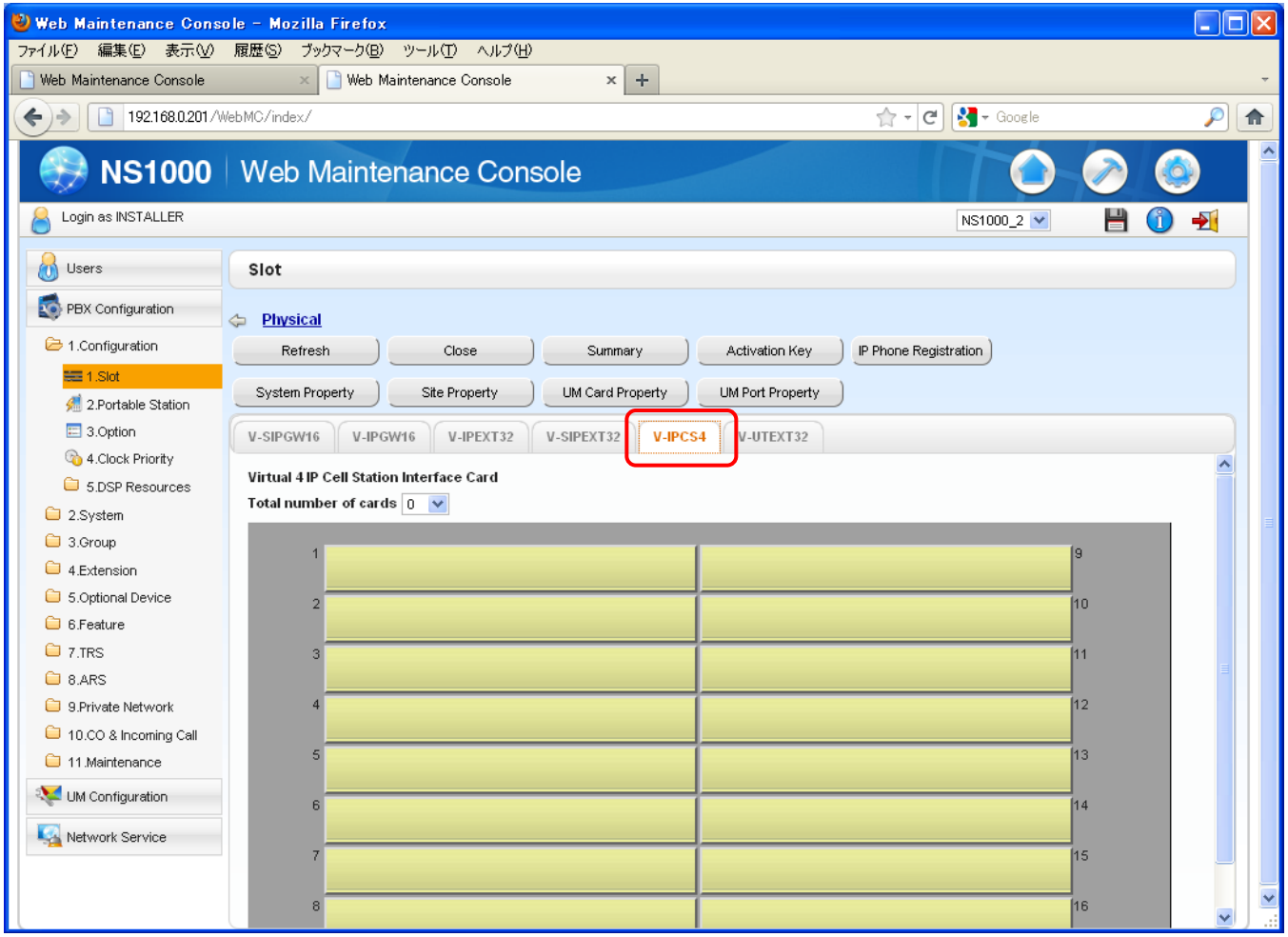
1. Click [Setup] → select [PBX Configuration] – [1.Configuration] – [1.Slot] → select [Virtual]



5-0. DECT CS Installation (KX-NCP0158CE) – (6)

Continued from previous slide

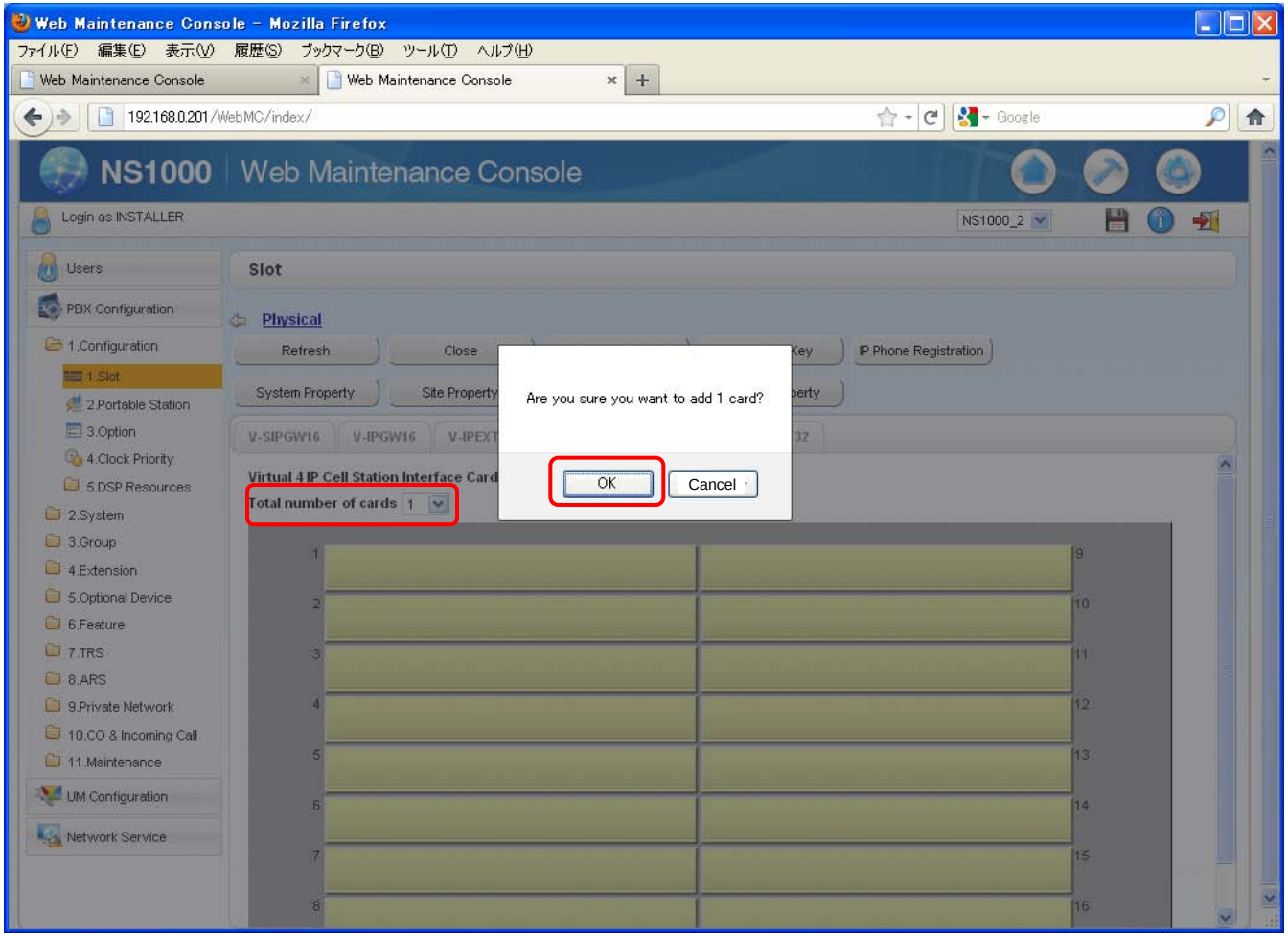
2. Select [V-IPCS4]



5-0. DECT CS Installation (KX-NCP0158CE) – (7)

Continued from Previous slide

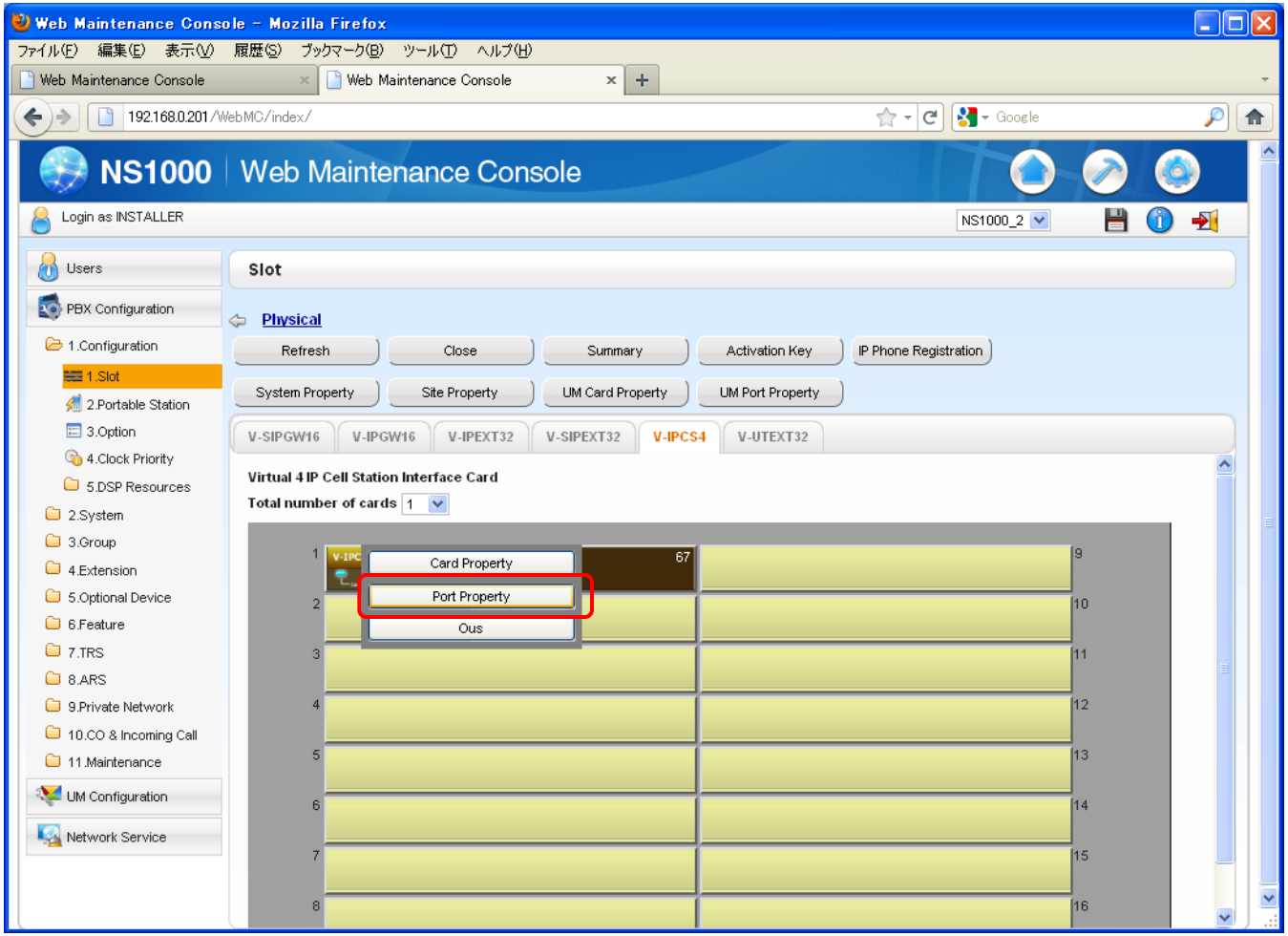
3. Select [Number of cards], then click [OK]



5-0. DECT CS Installation (KX-NCP0158CE) – (8)

Continued from previous slide

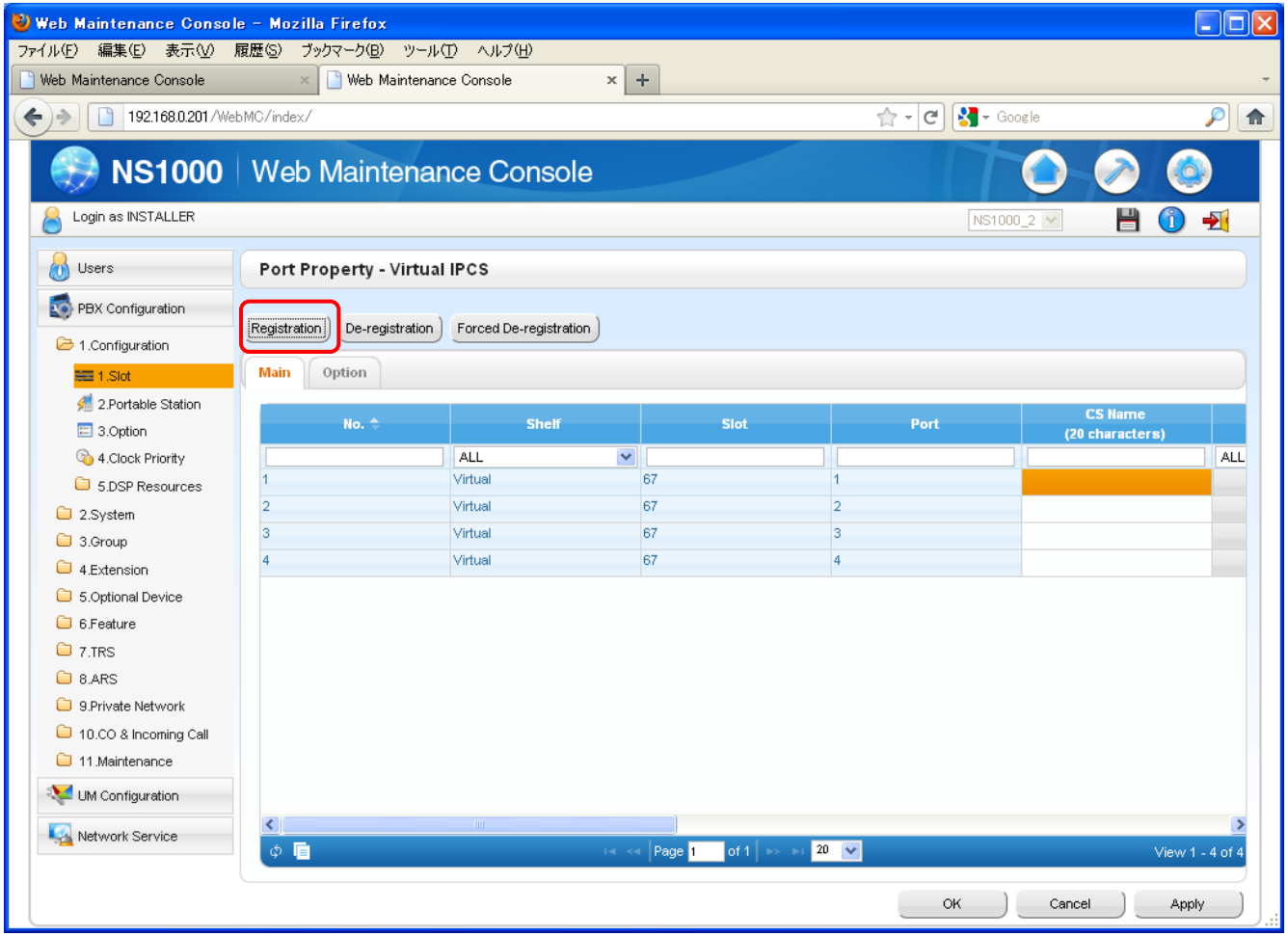
4. Select [Port property]



5-0. DECT CS Installation (KX-NCP0158CE) – (9)

Continued from previous slide

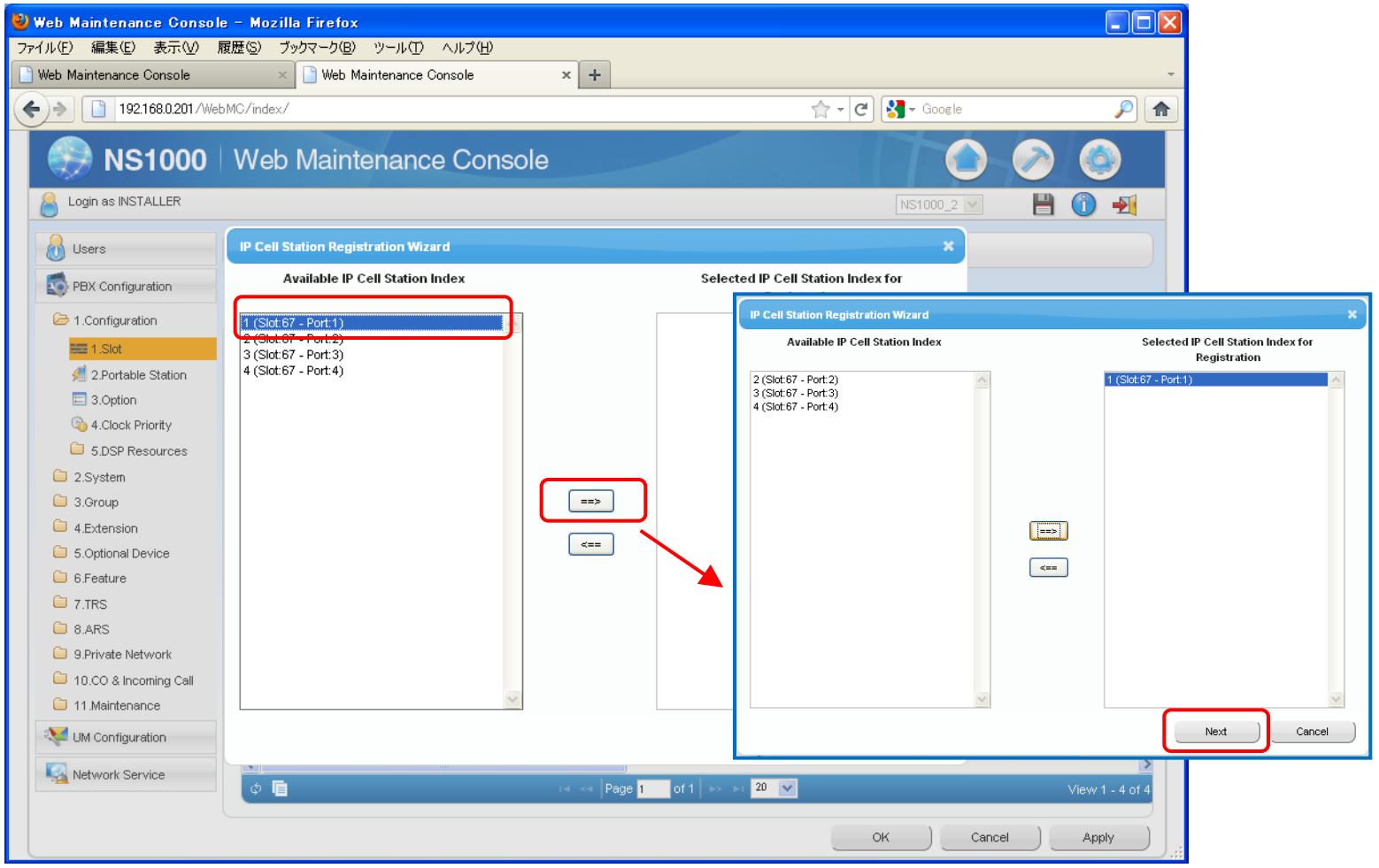
5. Click [Registration]



5-0. DECT CS Installation (KX-NCP0158CE) – (10)

Continued from previous slide

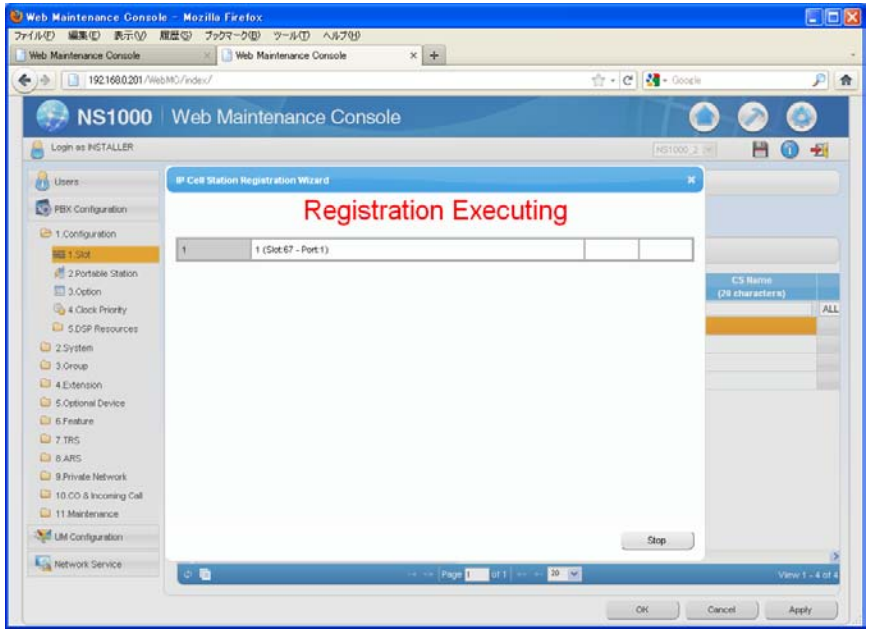
6. Select [IP-CS Index], then click [Next]

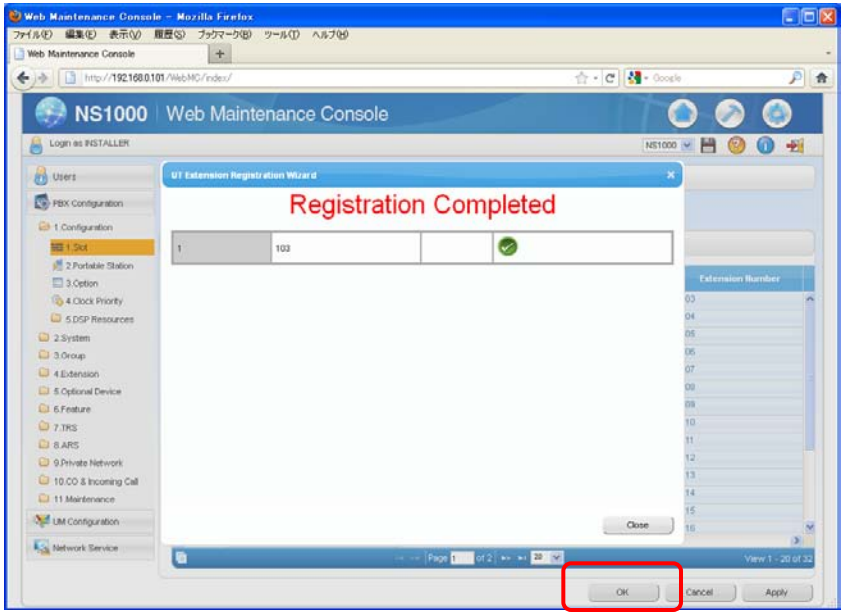


5-0. DECT CS Installation (KX-NCP0158CE) – (11)

Continued from previous slide

7. After Registration completed, then click [Close]





Chapter 6

REGISTRATION – OTHER TERMINALS

6-1. Registration – Other Terminals

Other Terminals such as:

- KX-NT700 (Conferencing Unit)
- TCA/WT Series DECT Terminals
- 3rd Party SIP Telephones

Must all be registered using ‘Manual’ Registration mode.

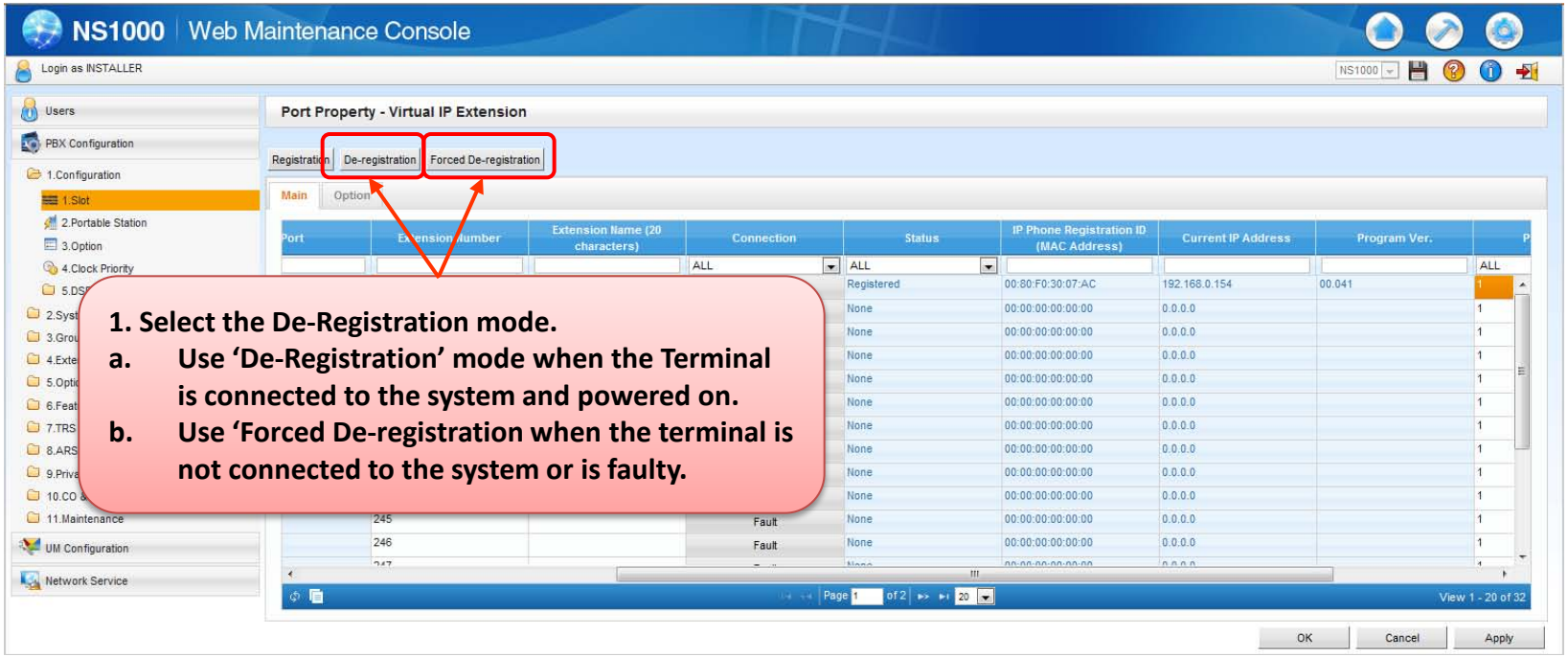
Notes:

For KX-NT700 and 3rd Party SIP Telephones – ensure a V-SIPEXT32 (inc A/Ks) is installed.

DECT Handsets (TCA/WT) are registered in the same manner as TDE/NCP PBX systems.

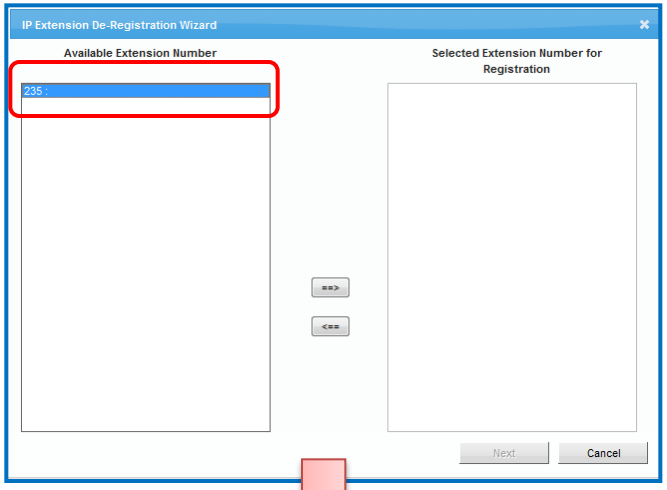
6-2. De-Registration (1)

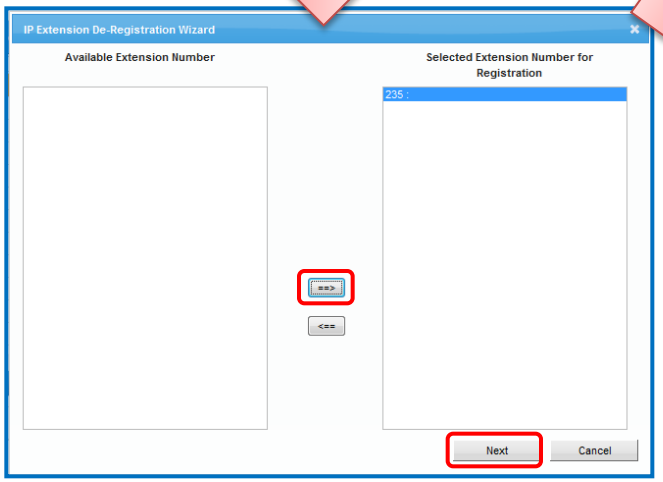
Registered Terminals can be de-registered from the system via the Virtual Cards 'Port Properties'

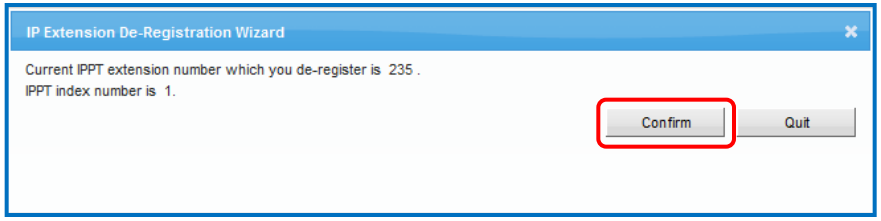


6-2. De-Registration (2)

After selecting the de-registration mode, select the desired extension and follow the prompts.







When the de-registration process is complete, the display of the terminal will indicate that it is not registered. (Fault, Poor Connection etc)

TERMINAL REGISTRATION COMPLETE

SECTION - 4

NS1000

USER / ADMIN / INSTALLER PROFILES

Contents

Chapter 1 UT/NT Series Registration

1-1. Overview

1-2 . Default Profile (INSTALLER)

1-3. Creating a Profile

1-4. Profile Types (User)

1-5. Profile Types (User + Rec Control)

1-6. Profile Types (Administrator)

1-7. Profile Types (Installer)

1-1. Overview

Setting a ‘Profile’ within the NS1000 allows for PBX Management settings to be made on a individual-user level.

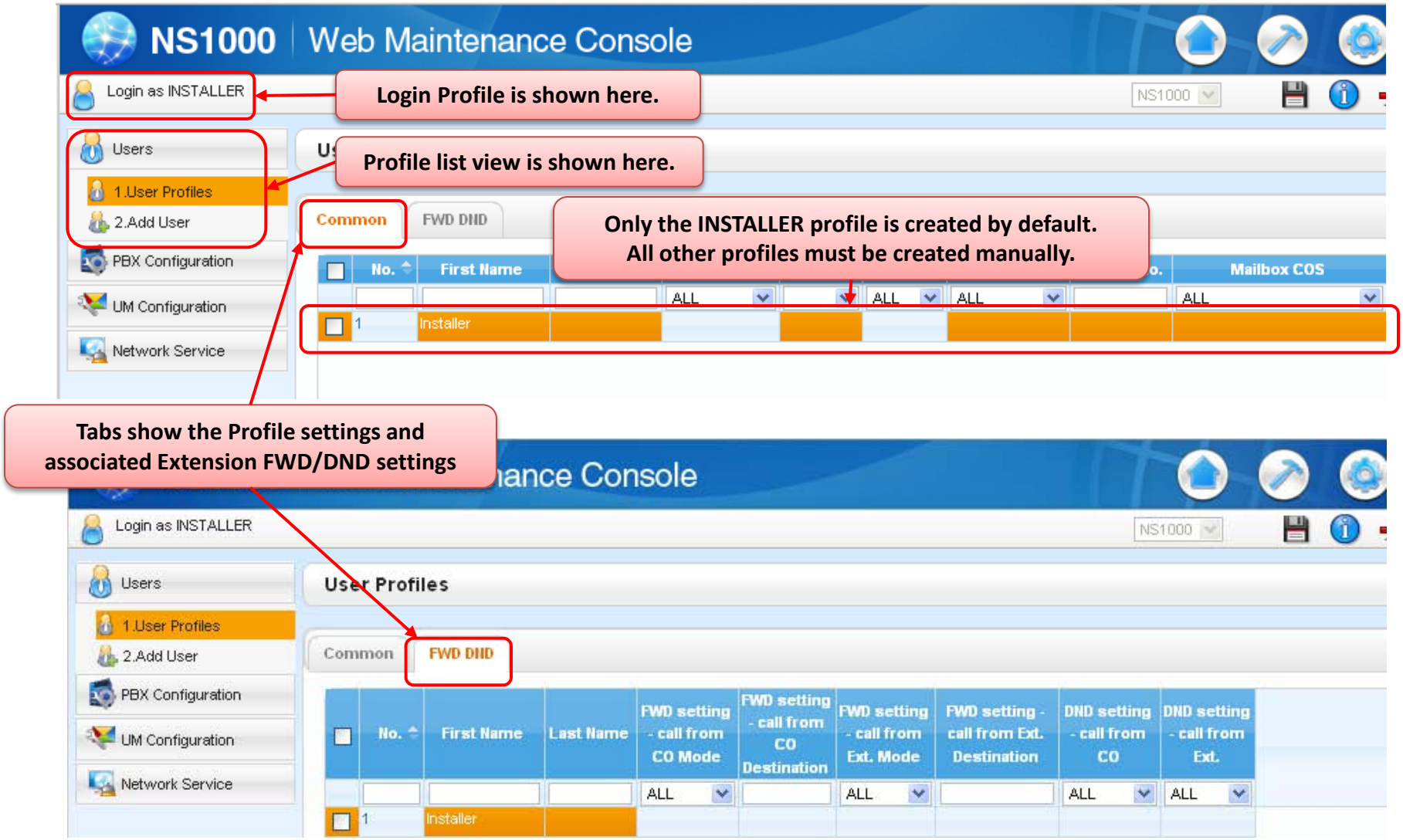
i.e. Each person having their own ‘Profile’ can login to the NS1000 system and make setting changes as allowed by their profile level (User, Administrator, Installer)

Information for each User account can be added, edited, or and deleted by an Administrator or Installer level account.

Available Via	Profile Type		Capacity
Web Maintenance	Users	User Level	1512 accounts
		Admin Level	32 accounts
	Installer		One account
	Password		4 to 16 digits per account

1-2. Default Profile - Installer (1)

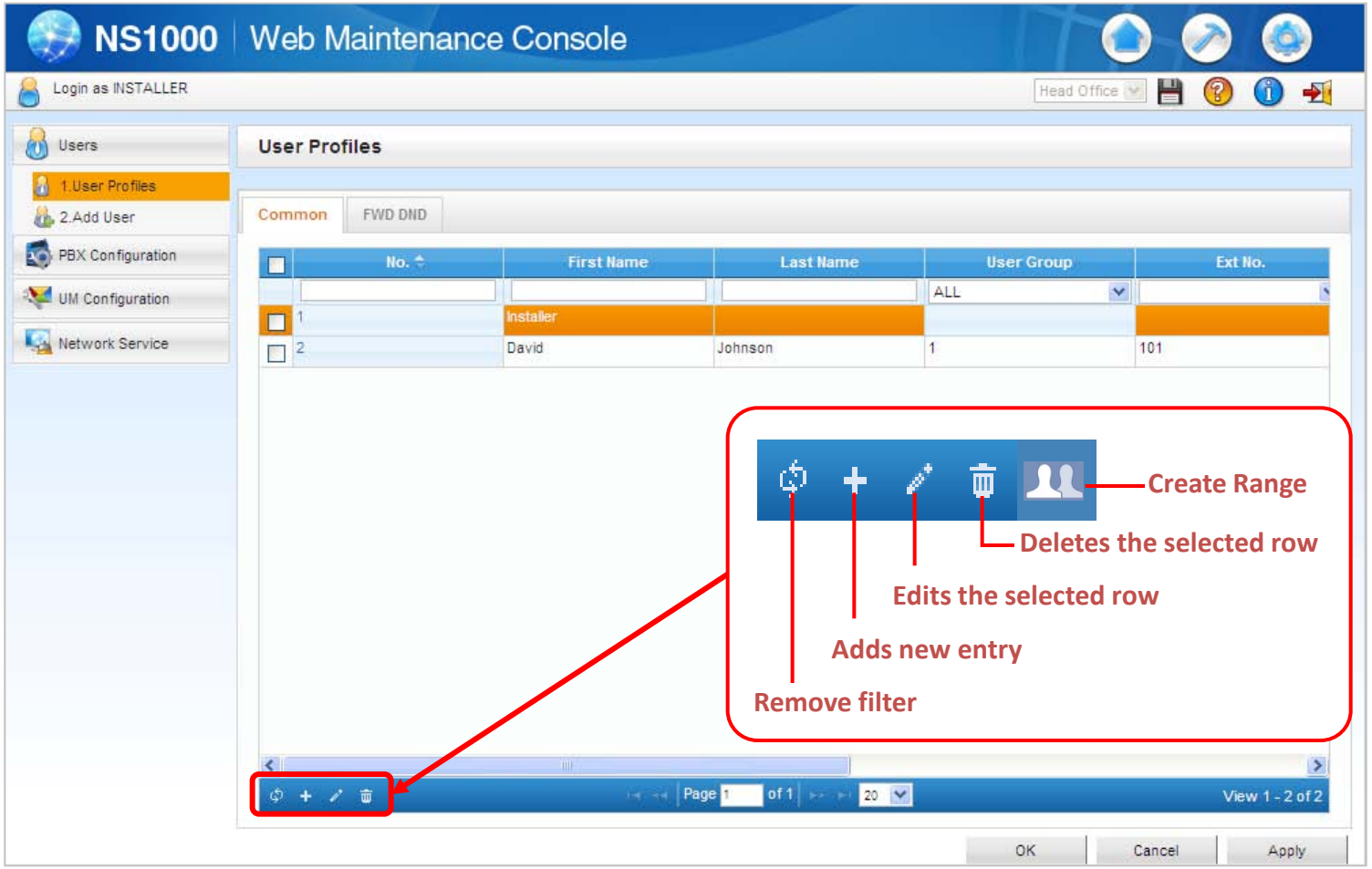
By Default, an single INSTALLER Profile is pre-defined in the WebMC



Only the INSTALLER Password is stored by default, all other fields are empty (default)

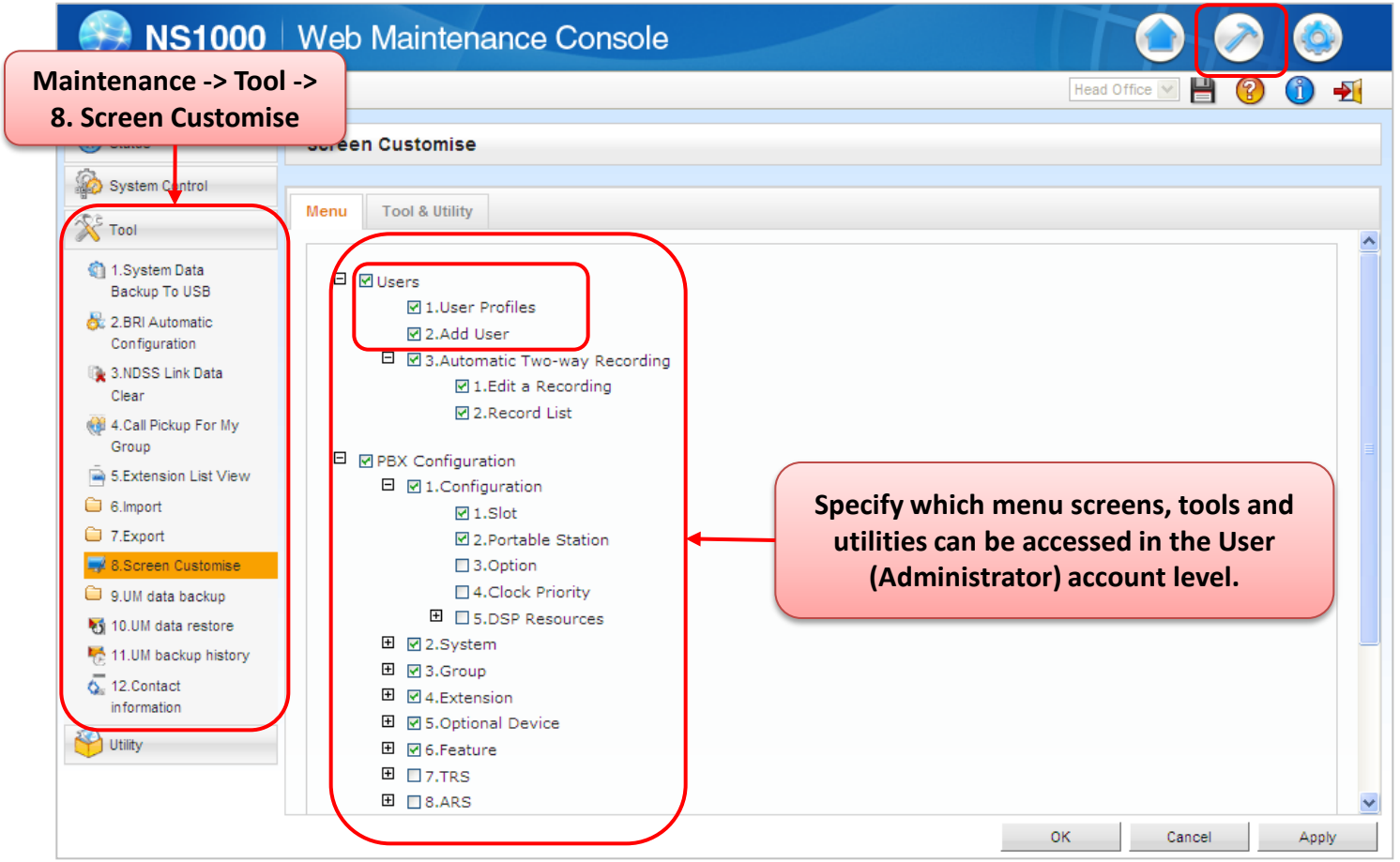
1-2. Default Profile - Installer (2)

In the profile screen, it is possible to Add, Edit, Delete and Filter profiles depending on the Profile Level.



1-2. Default Profile - Installer (3)

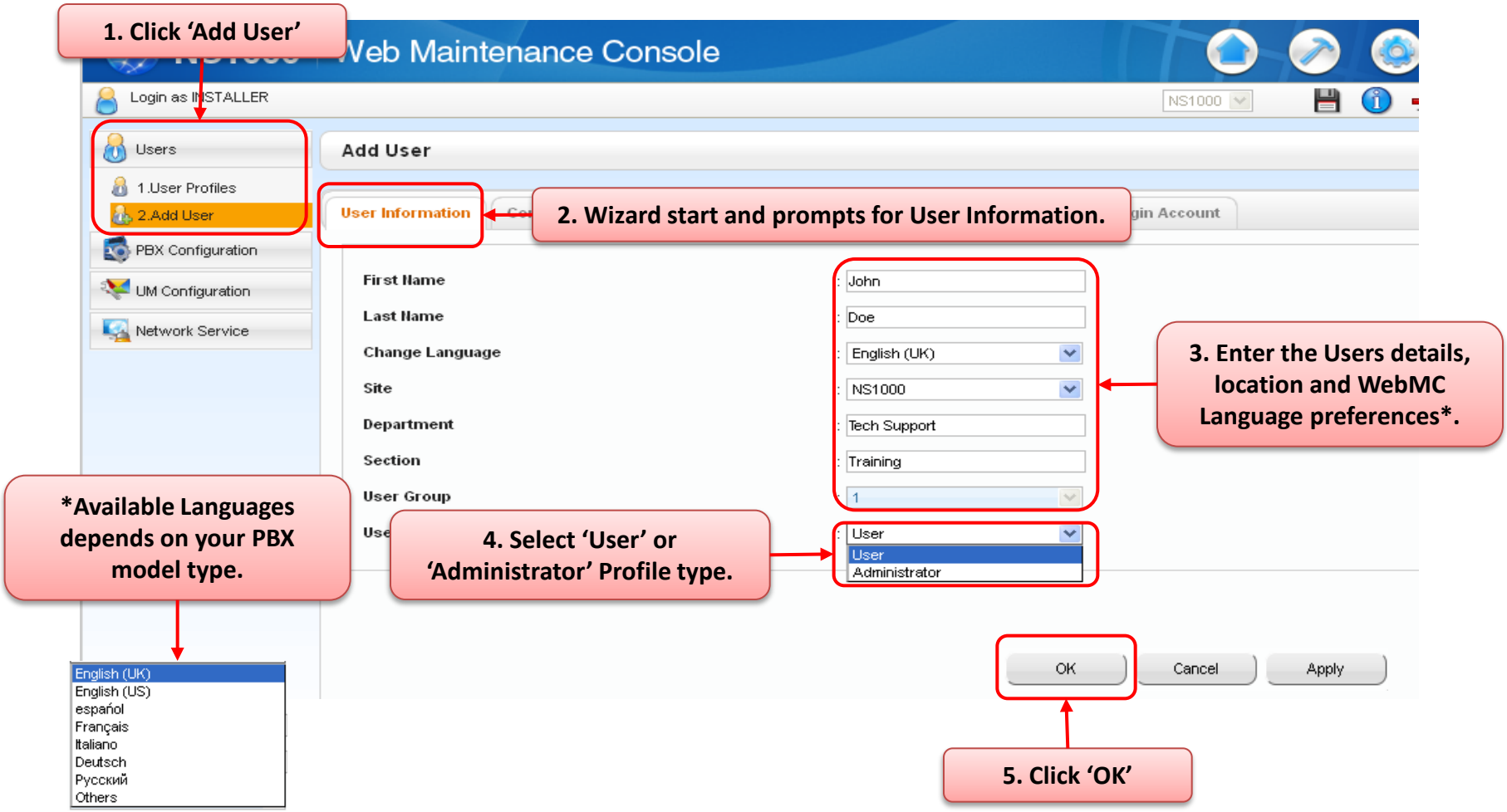
From the Installer Level profile (Maintenance Screen), it is possible to select which screens the Administrator Profiles can see



NB: By Default, an Administrator cannot see any Profile screen – this must be selected here to enable an Admin to view their own Profile etc.

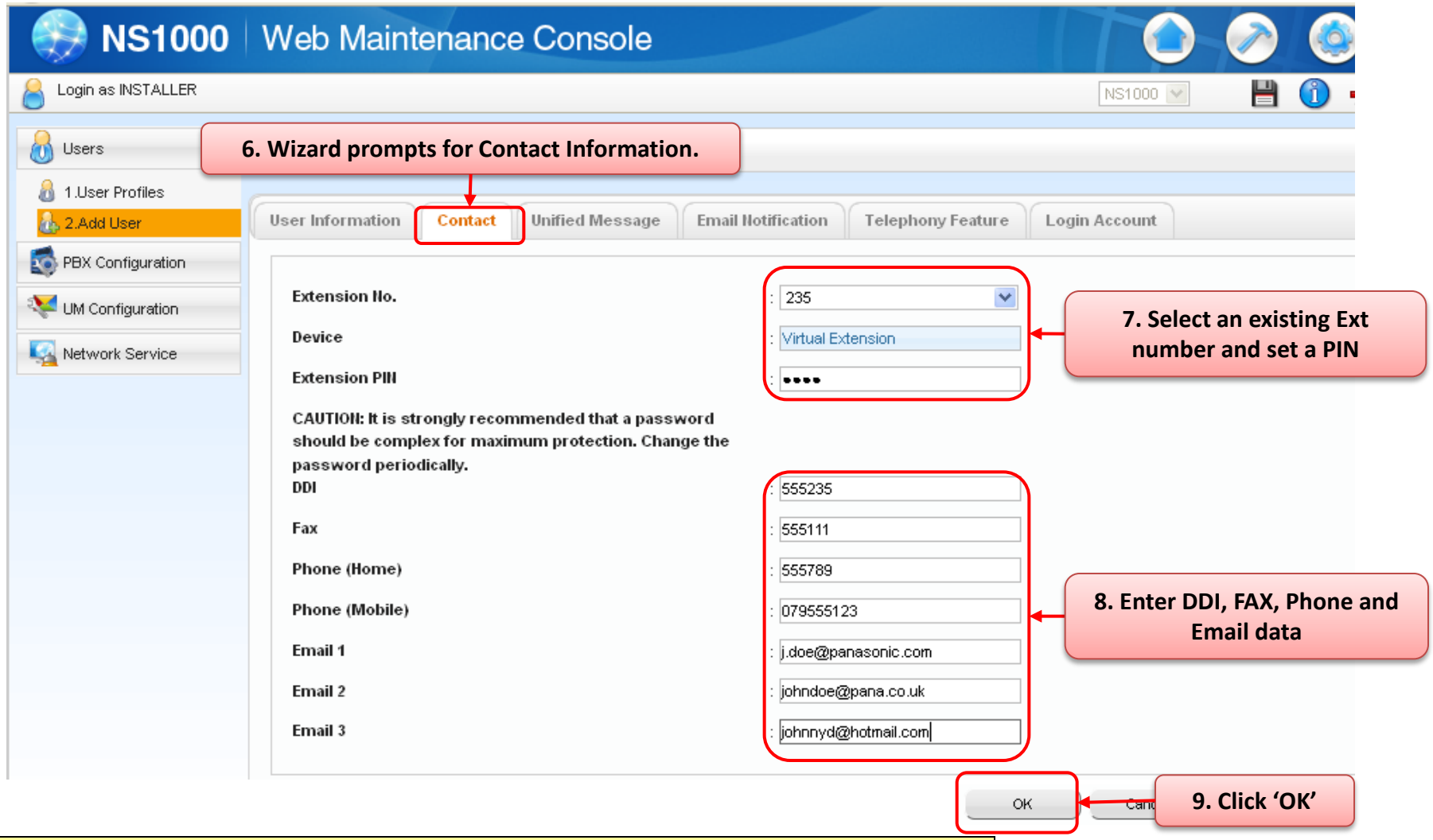
1-3. Creating a Profile – 'Add User Wizard' (1)

By clicking the 'Add User' option, the Add User Wizard starts



1-3. Creating a Profile – 'Add User Wizard' (2)

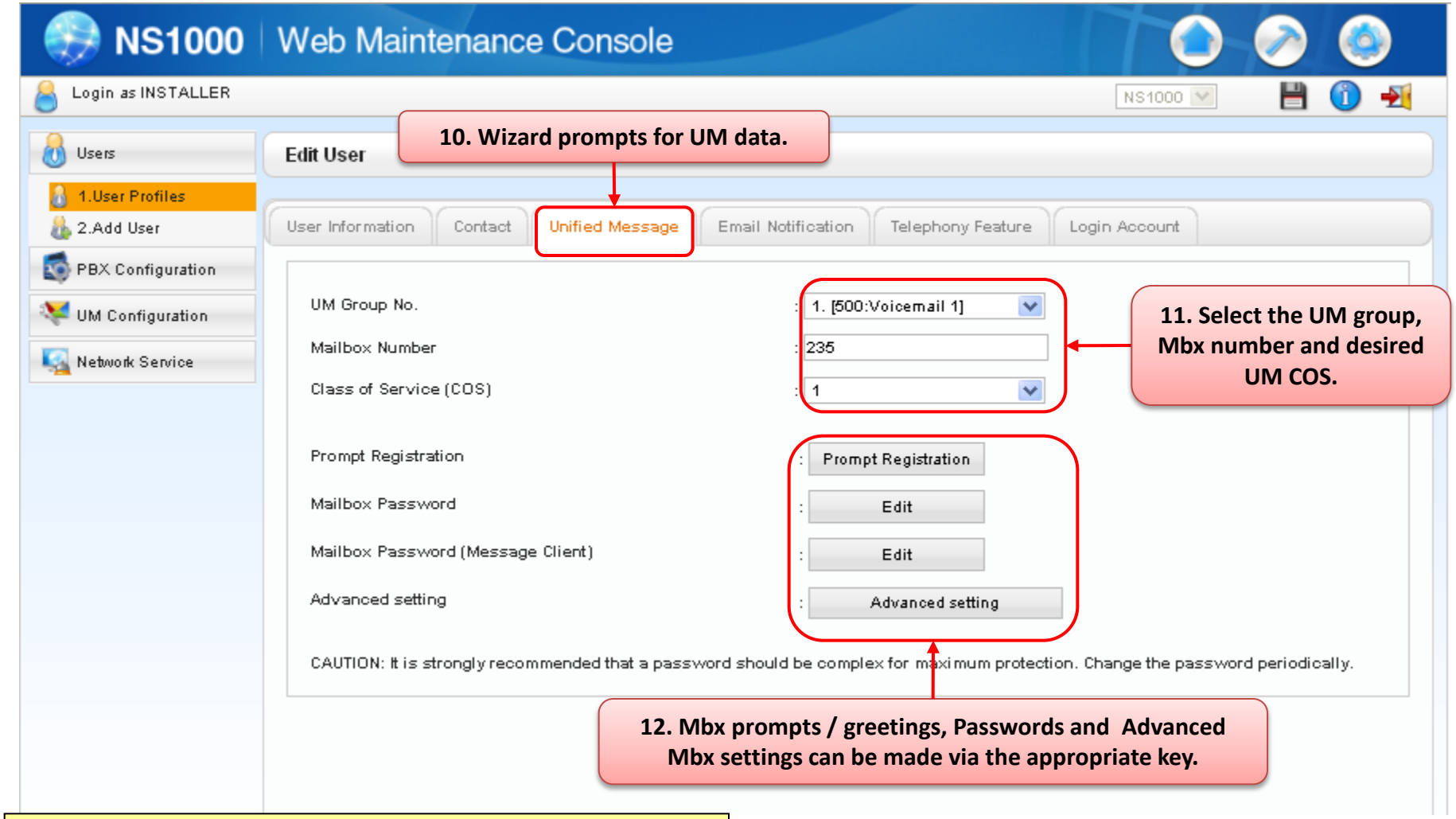
Next step is to enter the users Contact information, this is necessary for CA



NB: Extension numbers must be pre-existing. It is not possible to input a 'New' Ext number.

1-3. Creating a Profile – 'Add User Wizard' (3)

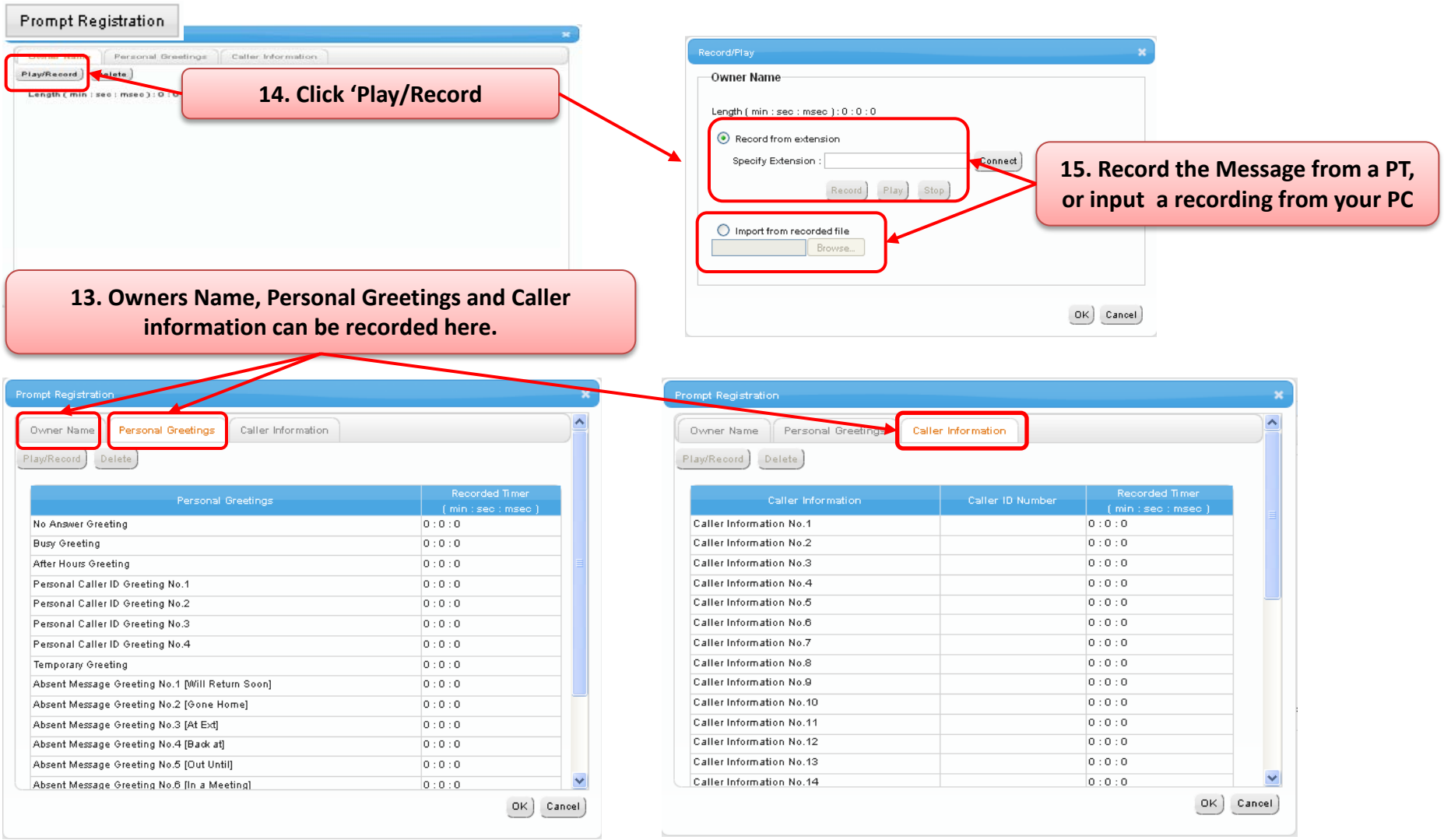
Next step is to configure the users Mailbox



NB: Mbx numbers must not pre-existing.
Mbxs are automatically created by this step.

1-3. Creating a Profile – 'Add User Wizard' (4)

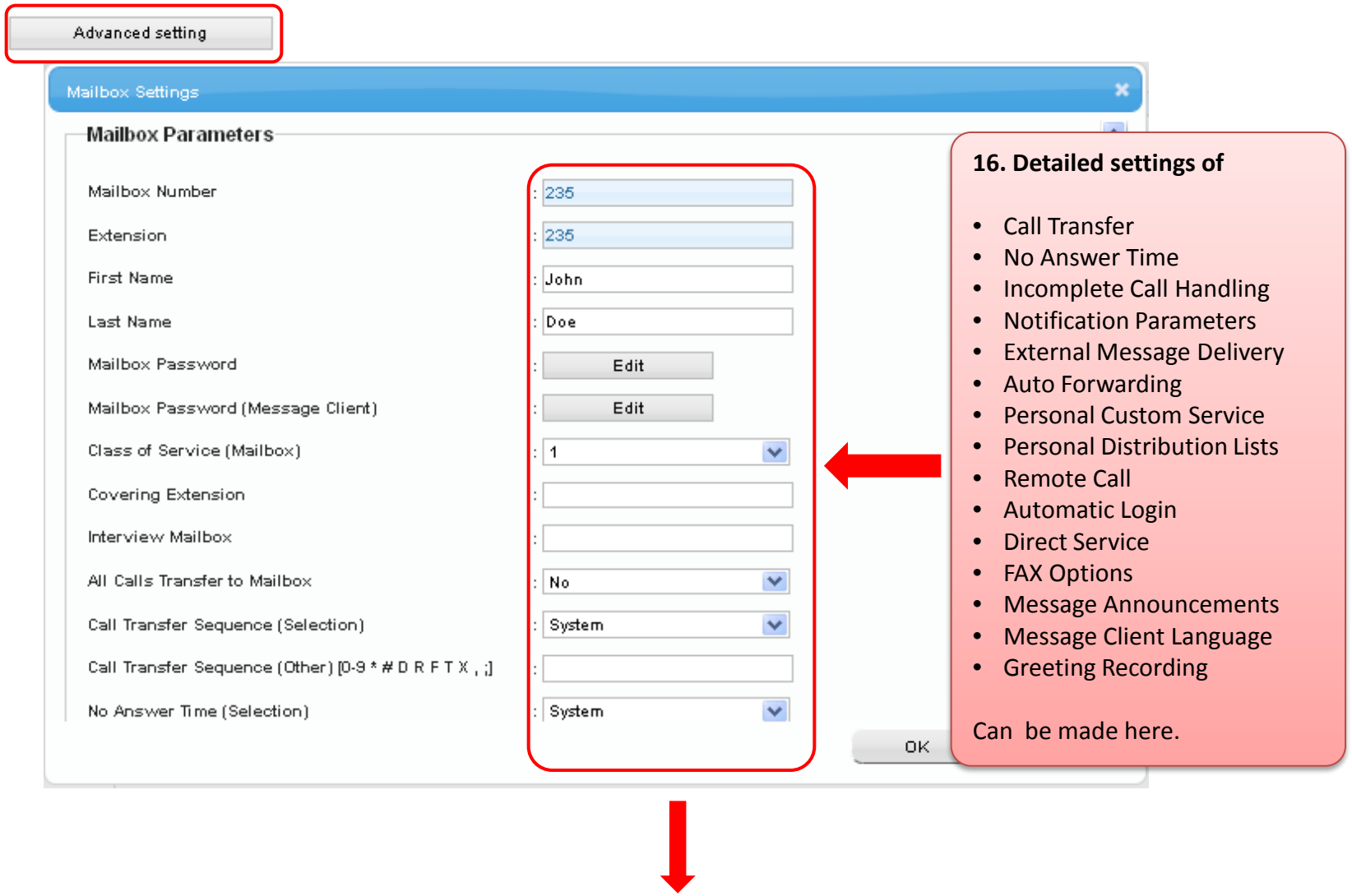
Individual Mbx prompts can be set via the 'Prompt' Registration button;



NB: File format is: CCITT A-law, 64kbps, 8kHz, 8bit, Mono (After conversion from .wav)

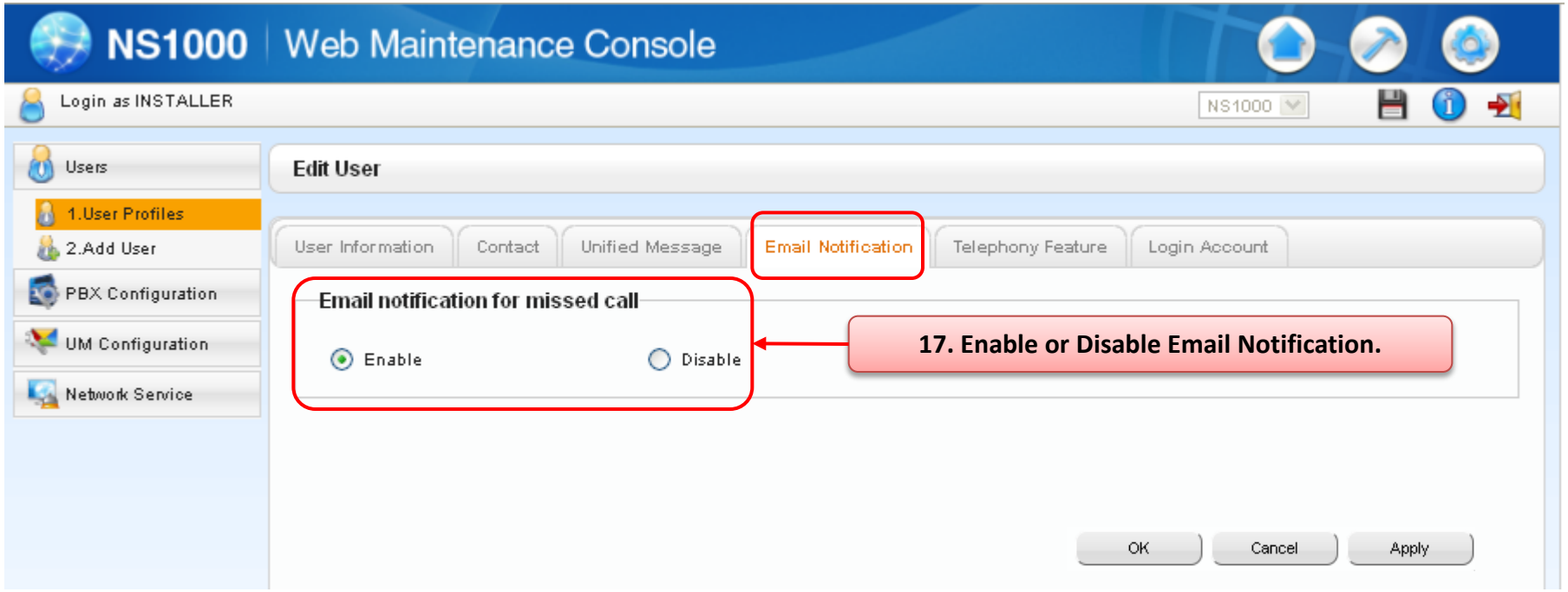
1-3. Creating a Profile – 'Add User Wizard' (5)

Advance Mbx configuration can be made via the 'Advanced Setting button



1-3. Creating a Profile – 'Add User Wizard' (6)

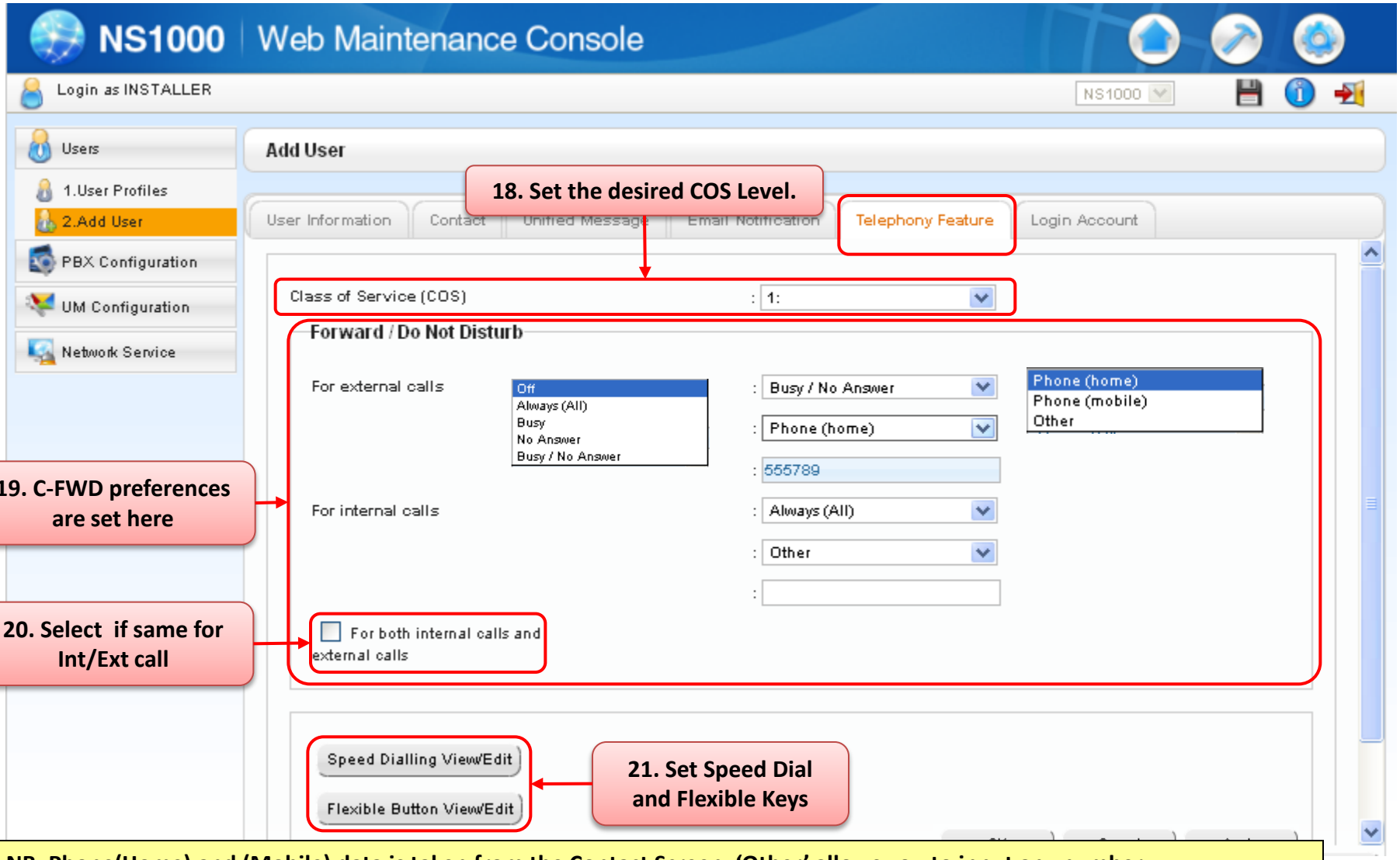
It is possible to set if the user will receive and email for missed call (Email Notification).



NB: Email Activation Key is required per User.

1-3. Creating a Profile – 'Add User Wizard' (7)

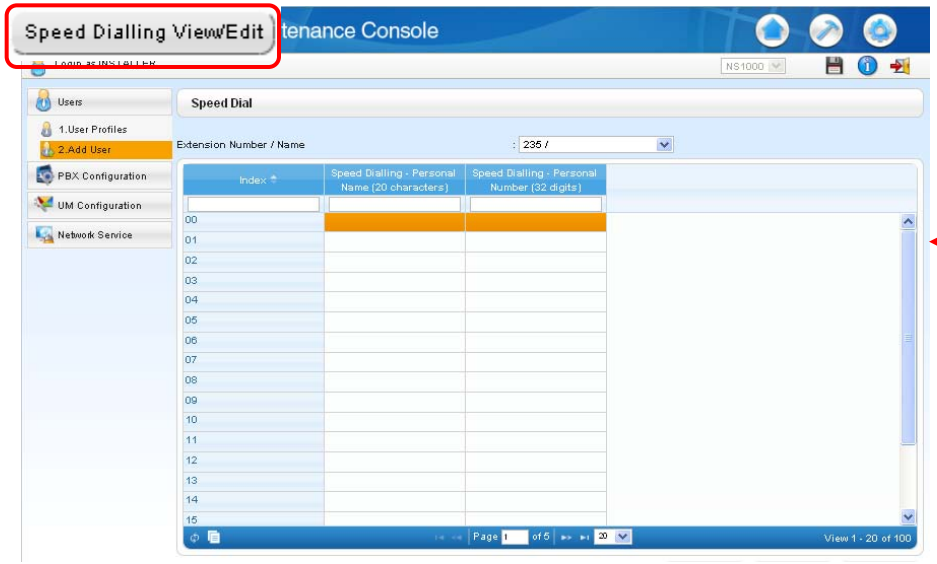
The users PBX COS and Call-FWD/DND options can be set here; in 'Telephony Features'



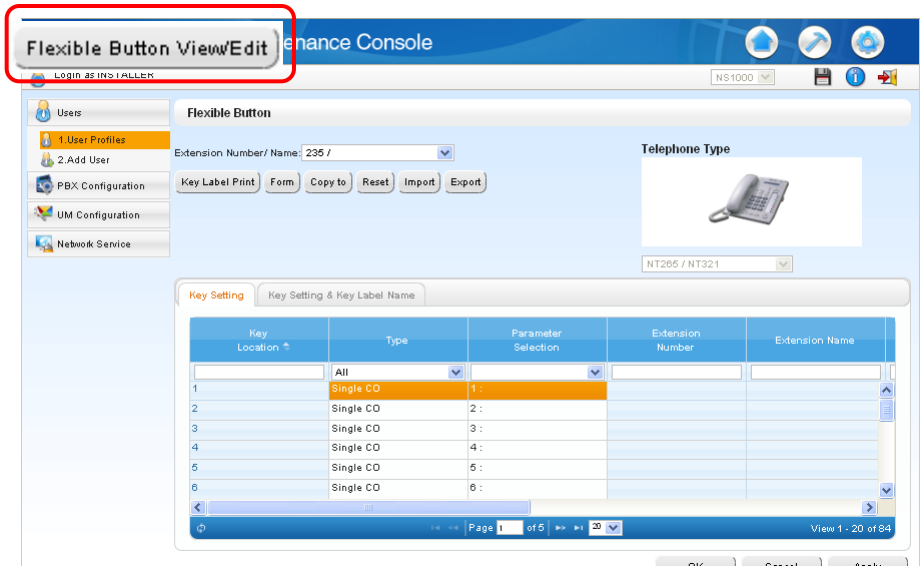
NB: Phone(Home) and (Mobile) data is taken from the Contact Screen. 'Other' allows you to input any number.

1-3. Creating a Profile – 'Add User Wizard' (8)

The users Personal Speed Dial and Flexible Key Assignment can be made here;



22. Up to 100 Personal Speed Dials can be set

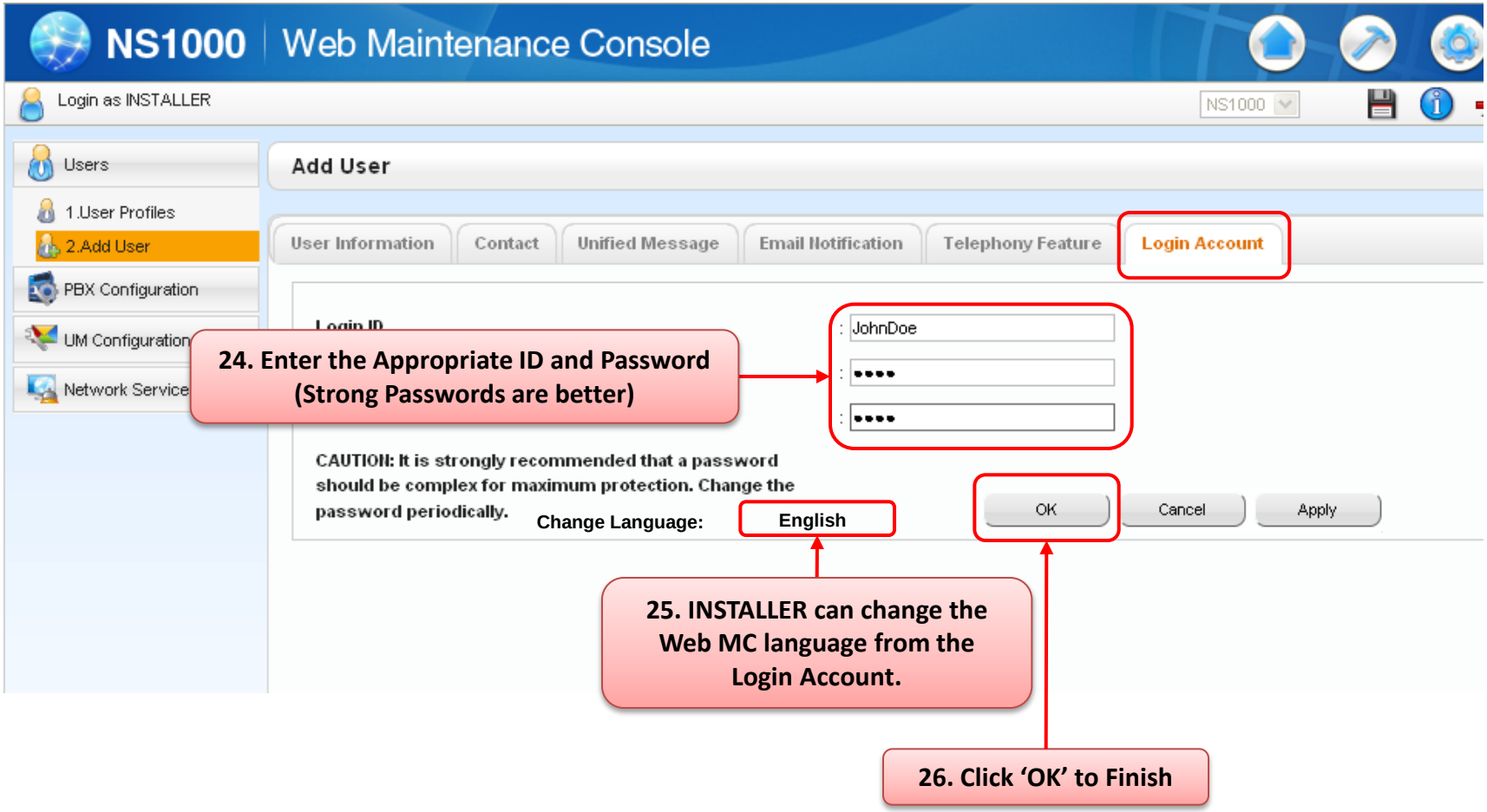


23. UT Flexible Key assignment must be done via WebMC (User Profile)

1-3. Creating a Profile – 'Add User Wizard' (9)

Last step is to create the users Login Account (ID and Password).

This will allow the user to Login via the WebMC and change their details / settings etc in future.

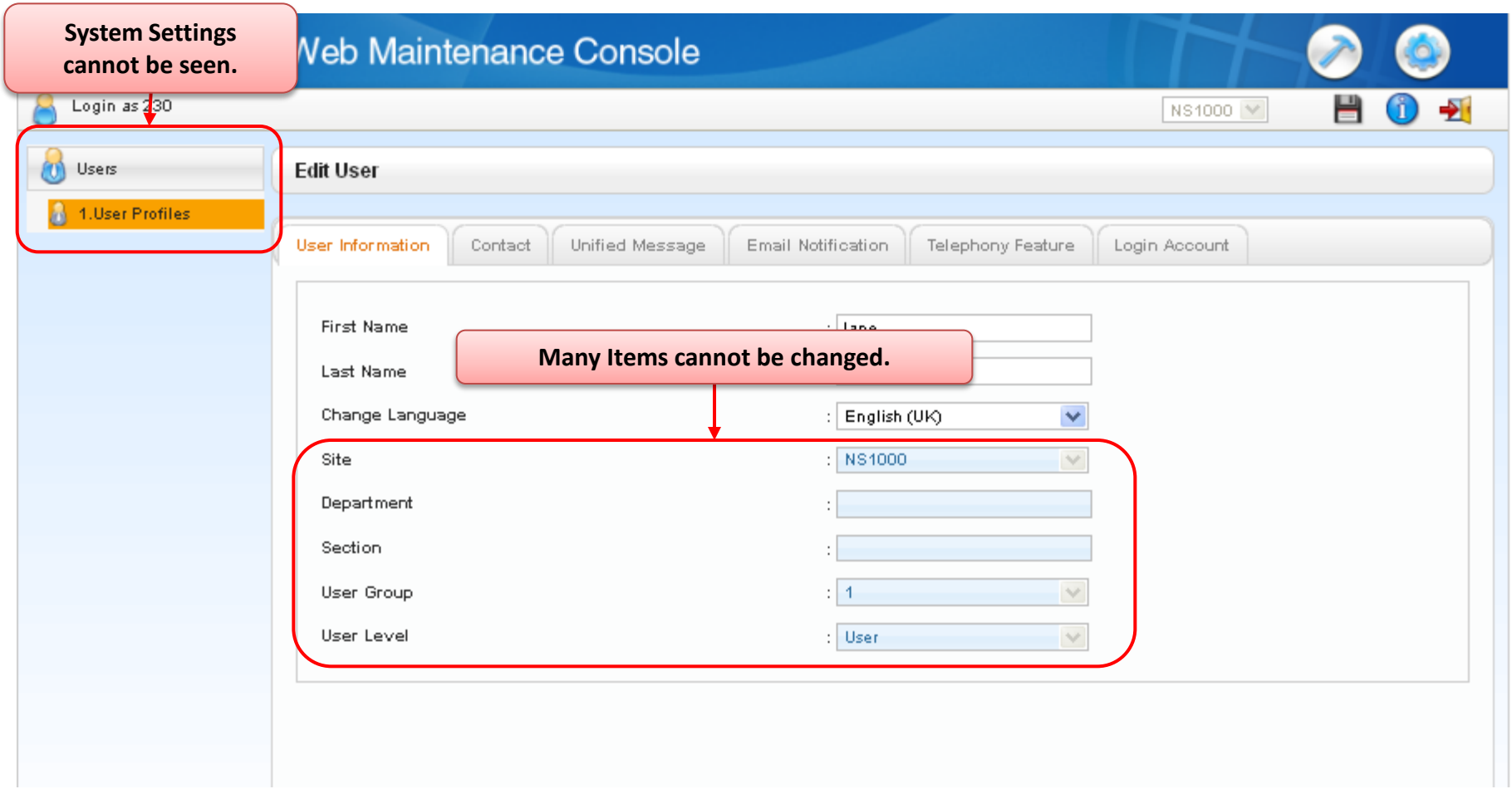


NB: When Logging In, the user will only see the screens / data that they are allowed to change based on their profile (User / Administrator / Installer etc)

1-4. Profile Types – ‘User’

A User profile only allows changes to limited settings;

Many setting options are not displayed or cannot be changed by the user.

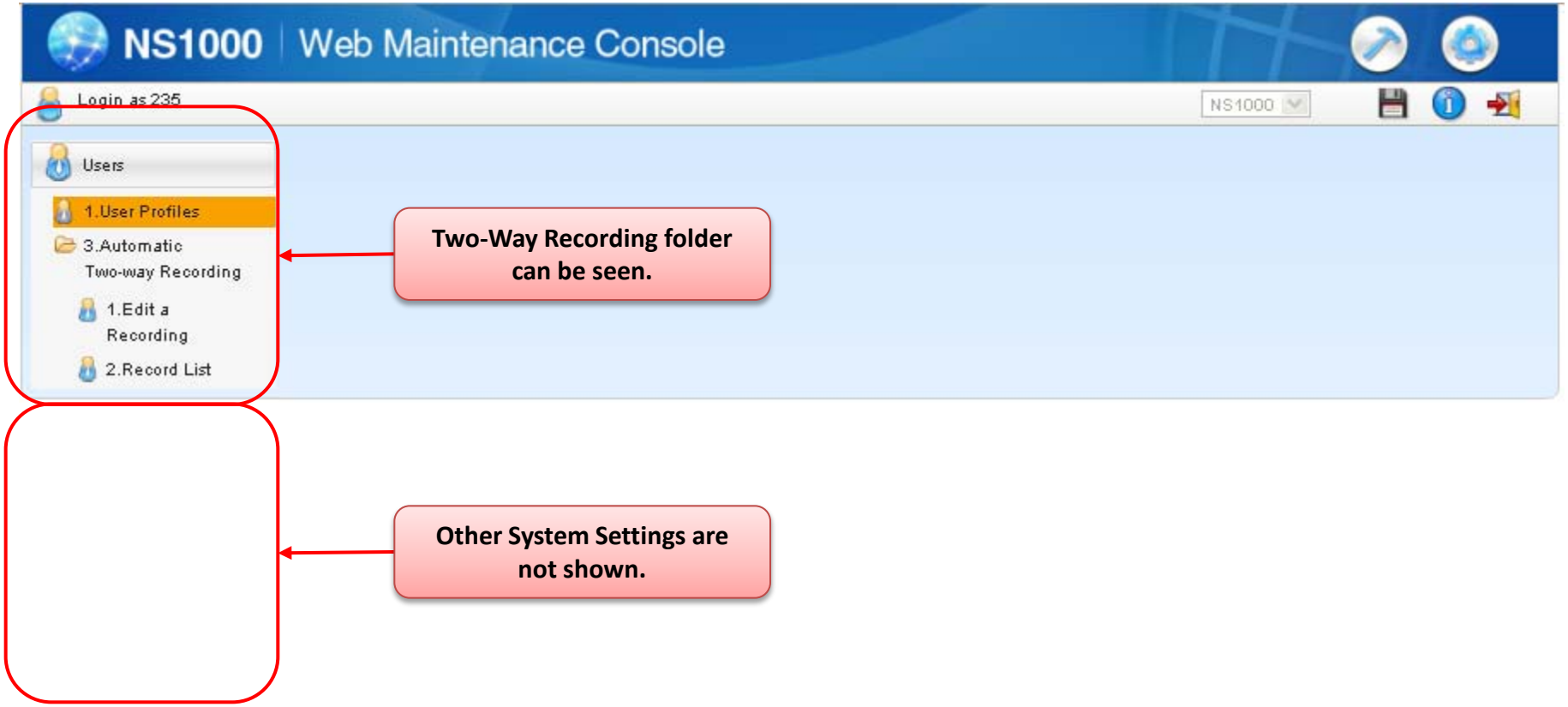


For details of what can be changed via a User profile, refer to the Appendix;

1-5. Profile Types – ‘User’ + ‘REC Control’

A User profile with Rec Control only allows changes to limited settings, however the user can access the necessary recordings.

Many other setting options are not displayed or cannot be changed by the user.

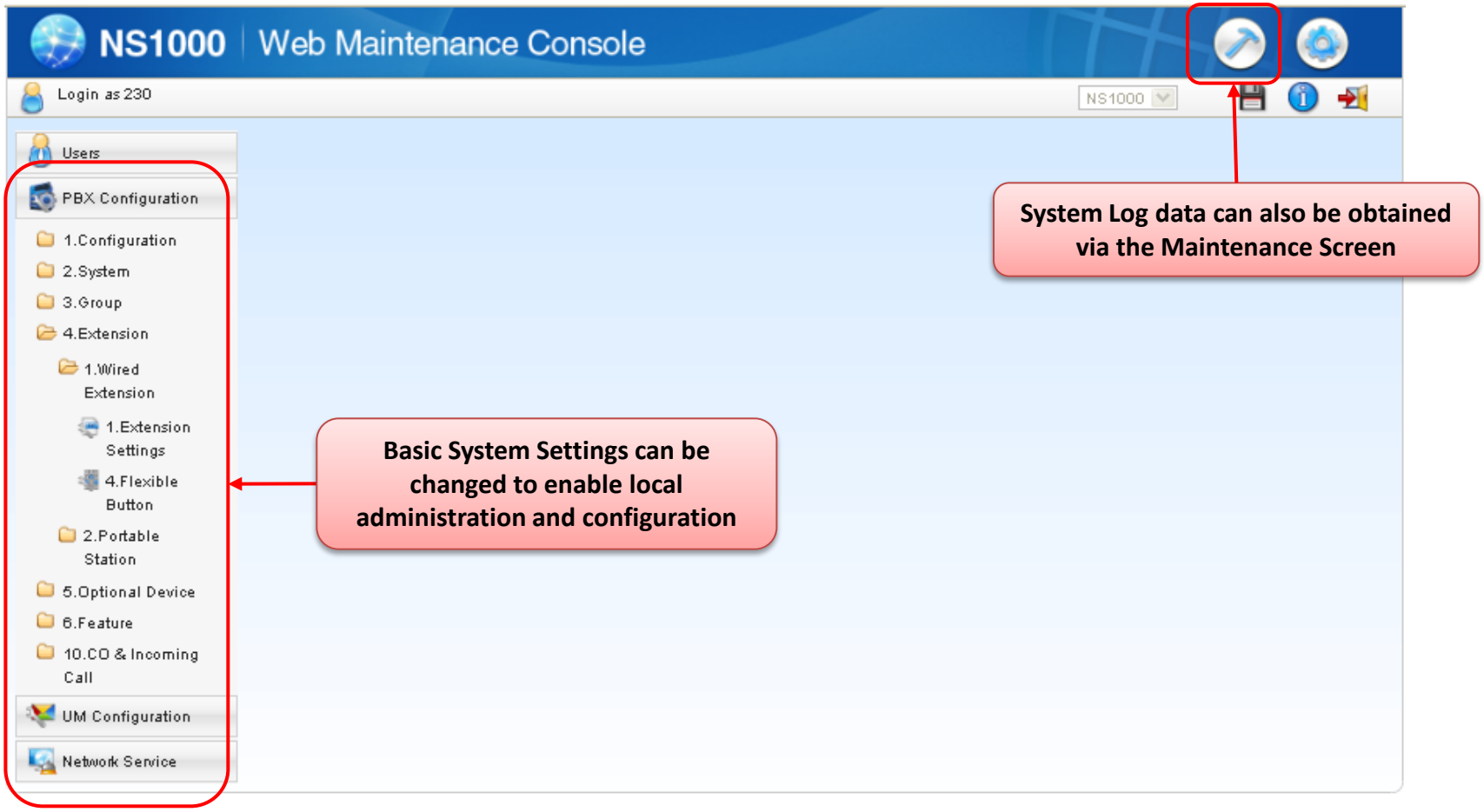


For details of what can be changed via a User + 2-Way Rec profile, refer to the PC-Programming Guide

1-6. Profile Types – 'Administrator'

An Administrator profile allows changes to limited system settings;

An Administrator is able to manage User profiles.

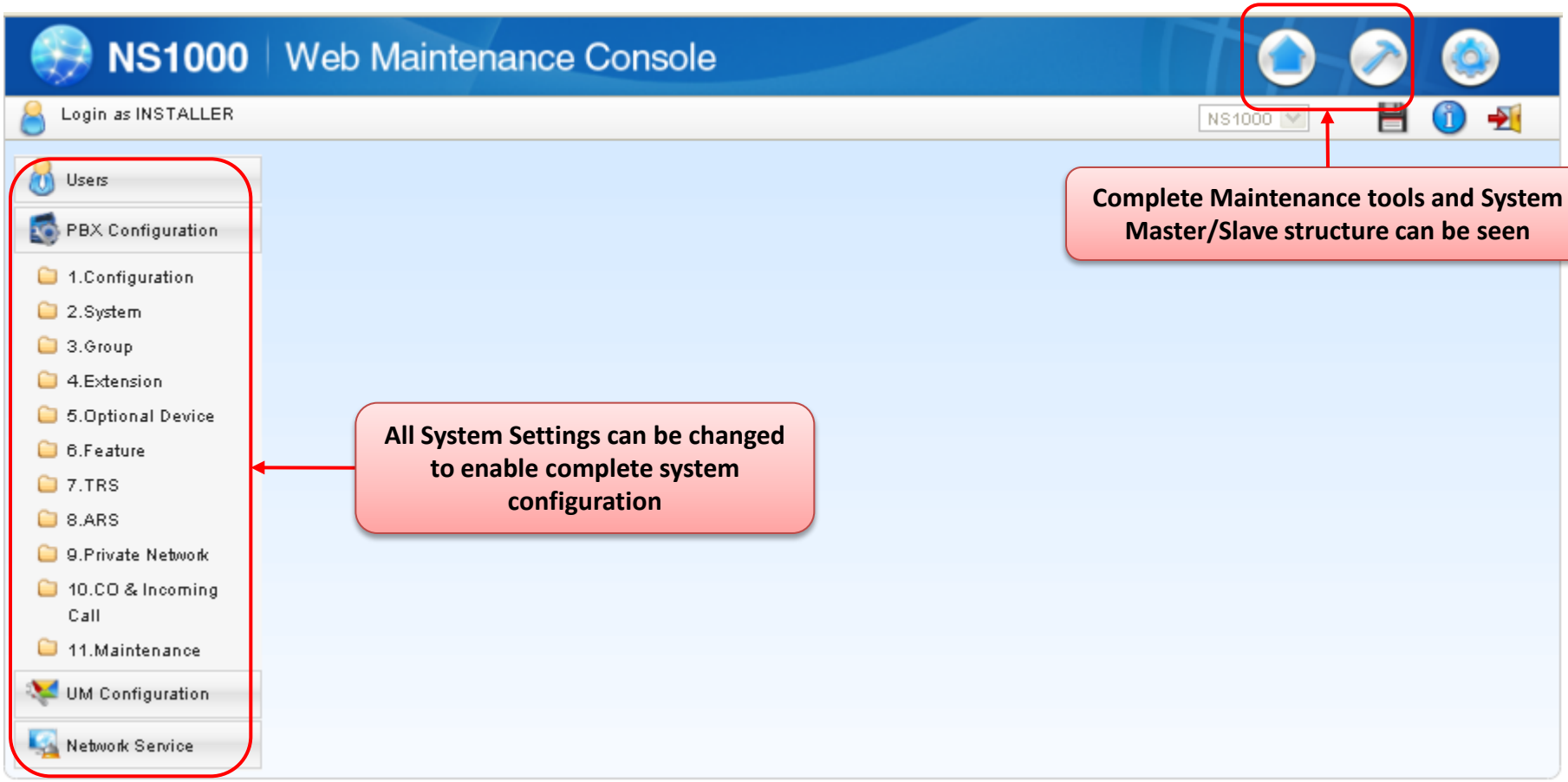


For details of what can be changed via an Administrator profile, refer to the PC-Programming Guide

1-7. Profile Types – ‘Installer’

An Installer profile allows System wide configuration and Maintenance;

An Installer is able to manage Administrator and User profiles.



For details of what can be changed via an Installer profile, refer to the PC-Programming Guide

USER PROFILES COMPLETE

Section - 5

DSP RESOURCES

Contents

1.1 Overview

1.2 DSP Resource Capacity

1.3 DSP Resource Usage

1.4 DSP Usage – Summary

2.1 DSP Resource Advisor

2.2 DSP Resource Reservation

2.3 DSP Usage Graph

1.1 Overview

To digitally process telephone calls, the PBX must use a certain number of DSP (Digital Signal Processing) resources.

DSP resources are provided by the DSP cards installed in the PBX.

Since the DSP resources are limited, no further operations (e.g., telephone calls, playing an OGM) can be performed if all resources are in use.

The following basic operations require DSP resources.

- IP extension call (To Trunk)
- IP trunk call (To Ext)
  Calls via IP-CS (Does not support P2P)
- Conferencing
- Accessing the Unified Messaging system (including recording calls)
- OGM playback
- Echo canceller (for trunk-to-trunk analogue calls)

Note.

For IP Ext/Trunk calls, the required DSP resource depends on the codec (Compression) used (G.711 or G.729) .

The Higher the Compression (G.729), the more DSP resource is required (but less Bandwidth)

The Lower the Compression (G711), the less DSP resource is required (but more Bandwidth)

P2P Calls (within the same P2P Group) can be considered NOT to use DSP resources.

DSP Resources are not ‘shared’ between Master/Slave systems – Calculate Resources for each PBX individually.

1.2 DSP Resource Capacity

Each optional DSP card provides a number of resources that can be called upon to provide VOIP processing when the system requires them.

(The NS1000 requires at least 1 DSP card to be installed for it to operate.)

Model	Card Name	Resources
KX-NS0110	DSP-S	63
KX-NS0111	DSP-M	127
KX-NS0112	DSP-L	254

(Up to 2 DSP cards can be installed in each NS1000, therefore the maximum DSP resource available per system is 508)

In Addition to the above 'Free' Resources, 2 Resources are always reserved for UM Tones – not programmable.

1.3 DSP Resource Usage (1)

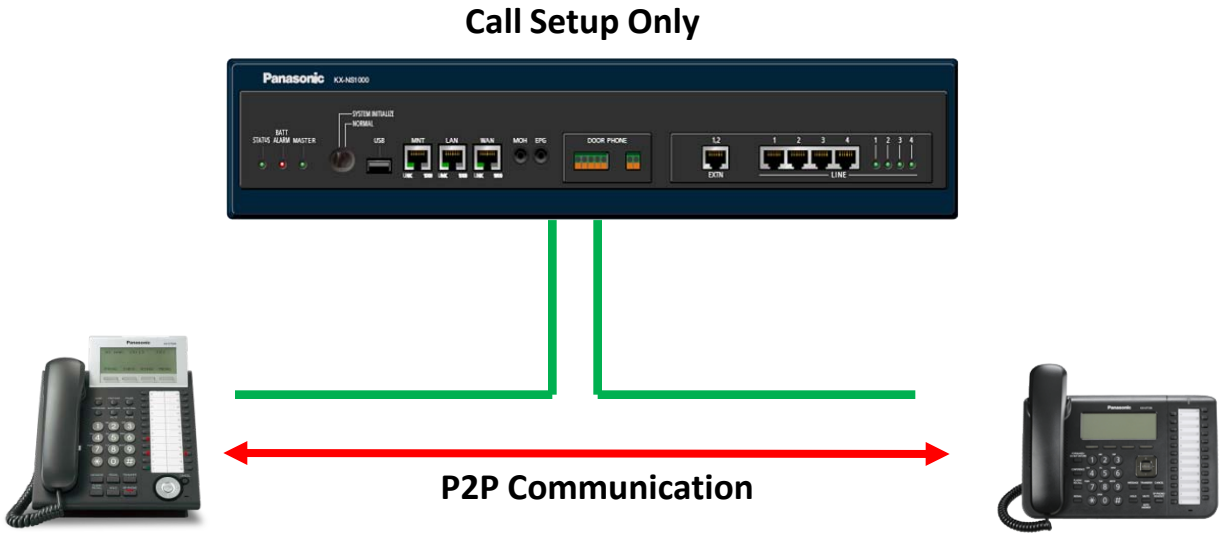
The required DSP Resources are calculated using the following values

Service/Feature	Required DSP Resource
Trunk (G.729)	2.2
Trunk (G.711)	1
Legacy Trunk (ISDN/Analogue)	1
Extension (G.729)	2.2
Extension (G.711)	1
IP-CS (G.729)	2.2
IP-CS (G.711)	2
Unified Messaging (UM) *1	1.3
2-Way Recording *2	2.3
OGM	2
Conferencing	0.5

*1 This does not include the DSP cost of the IP-PT/Trunk using the UM Service.
*2 Two-Way recording also requires a Conference Trunk

1.3 DSP Resource Usage (2)

IP Phones – “P2P”



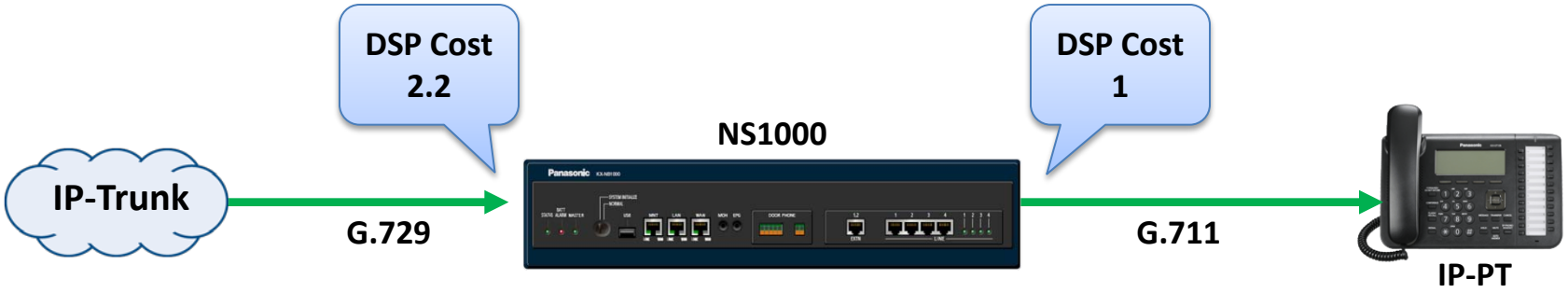
1. DSP is not used at any stage of a P2P call – DSP function is taken care of within handset itself once connected.

2. If selected compression method of phones differs, the handsets negotiate the lowest bandwidth codec of the two:
(G729 > G711 > G722)

3. This applies to both SIP and IP-PT types - makes no difference

1.3 DSP Resource Usage (3)

IP-Trunk to IP-Extension

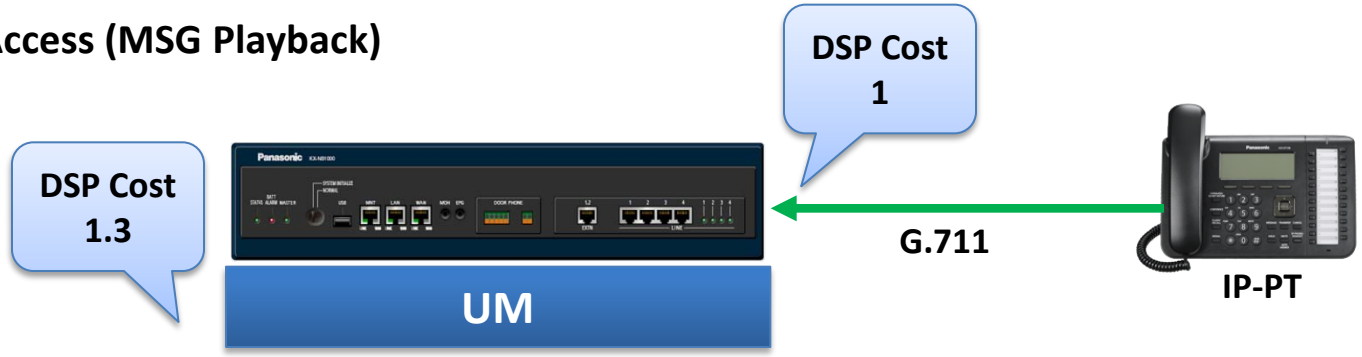


From the previous Resource table, we can calculate the DSP Resources required for the above call scenario:

2.2 + 1 = 3.2 DSP Resources Required

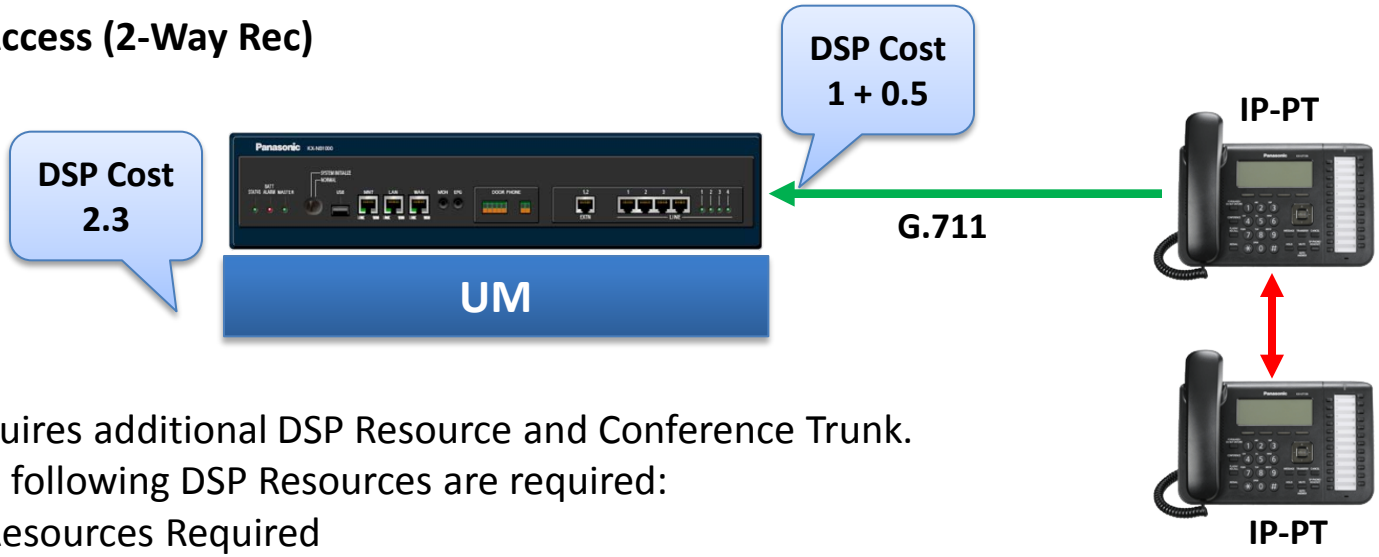
1.3 DSP Resource Usage (4)

Unified Messaging Access (MSG Playback)



Recording or playing back messages from the UM requires DSP Resource. For this example, the following DSP Resource is required:
1.3 + 1 = 2.3 DSP Resources Required

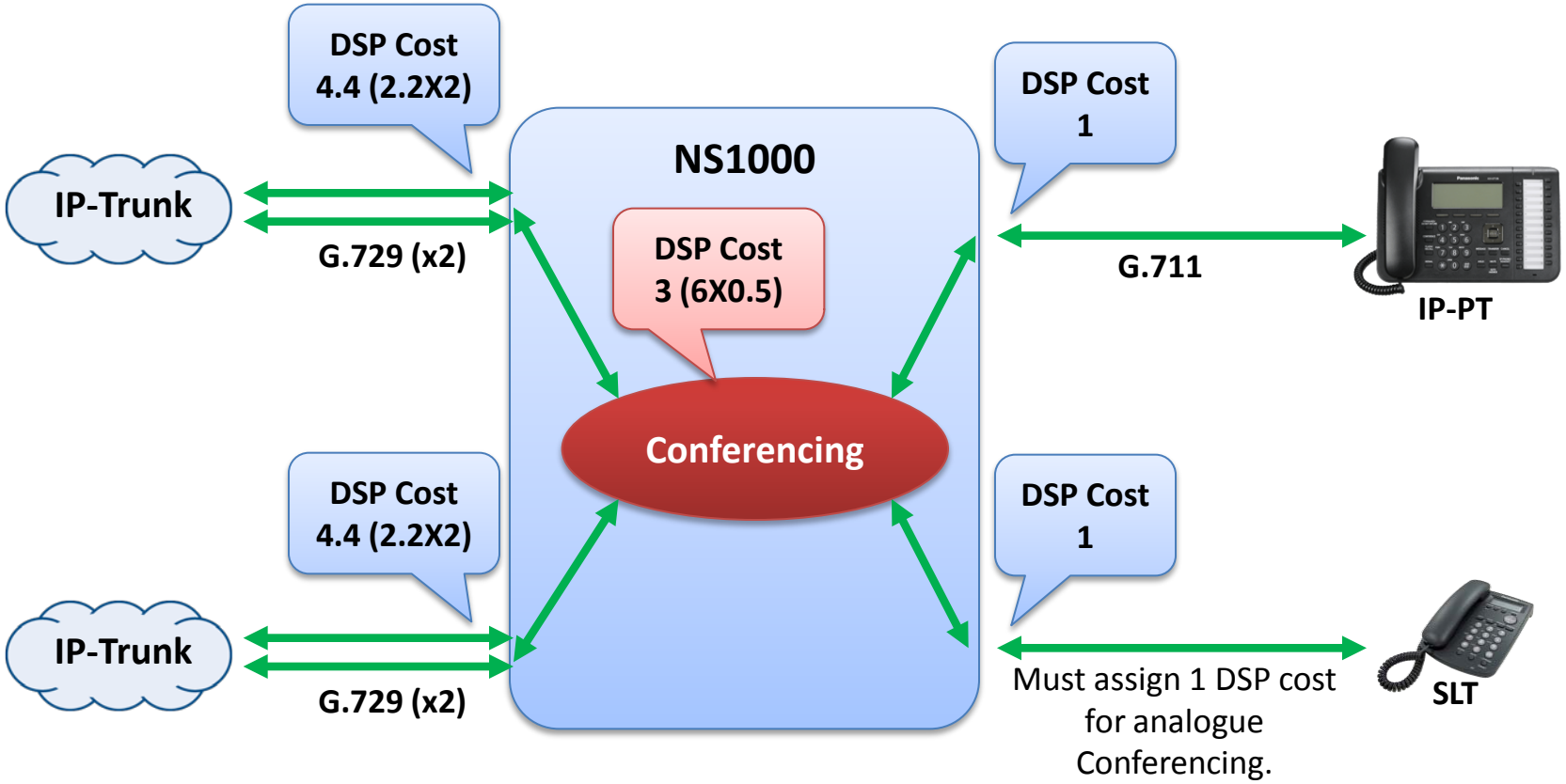
Unified Messaging Access (2-Way Rec)



2-Way Recording requires additional DSP Resource and Conference Trunk.
For this scenario, the following DSP Resources are required:
2.3 + 1.5 = 3.8 DSP Resources Required

1.3 DSP Resource Usage (5)

Conferencing (Example – 6pty conference).



A conference requires additional resources to handle multiple voice channels.
Also, in standard two-way conversations, analogue lines do not require any DSP resources, but in a conference they do.
In addition, IP trunks in a conference require additional DSP resources.
For this example the number of required resources are 4.4 + 4.4 + 3 + 1 + 1 = 13.8.

1.4 DSP Resource Usage - Summary

DSP Resource Summary

- Accurate DSP selection is only possible when you know the maximum concurrent scenarios that will be required by the system
- In most cases, IP phones used in the office will use G722 for extension to extension calls and G711 for ISDN trunk calls so DSPs are used lightly.
- Typically only remote IP phones would use G729 mode. (Low Bandwidth)
- SIP trunk providers can use either G711 or G729 – available bandwidth on the internet/broadband service will dictate if G711 or G729 is used.
- Use the NS1000 DSP Resource tool and Usage graph to guide you to the required DSP card.

NS1000

DSP RESOURCE ADVISOR

2.1 DSP Resource Advisor (1)

DSP Resource Advisor

The WebMC provides a tool for calculating the number of resources required for given scenarios. The Installer provides information such as the number of ports/resources required (e.g., 16 extension ports using the G.729 codec) and the expected load (e.g., 50%busy), and the resource advisor calculates the number of DSP resources required to meet those conditions.

Example: Call Centre

In a call centre, both the number of trunks and number of extensions required are likely to be high. Also, since employees are constantly receiving calls, the system load will be high. Additionally, calls are often recorded at call centers to provide quality-of-service monitoring.

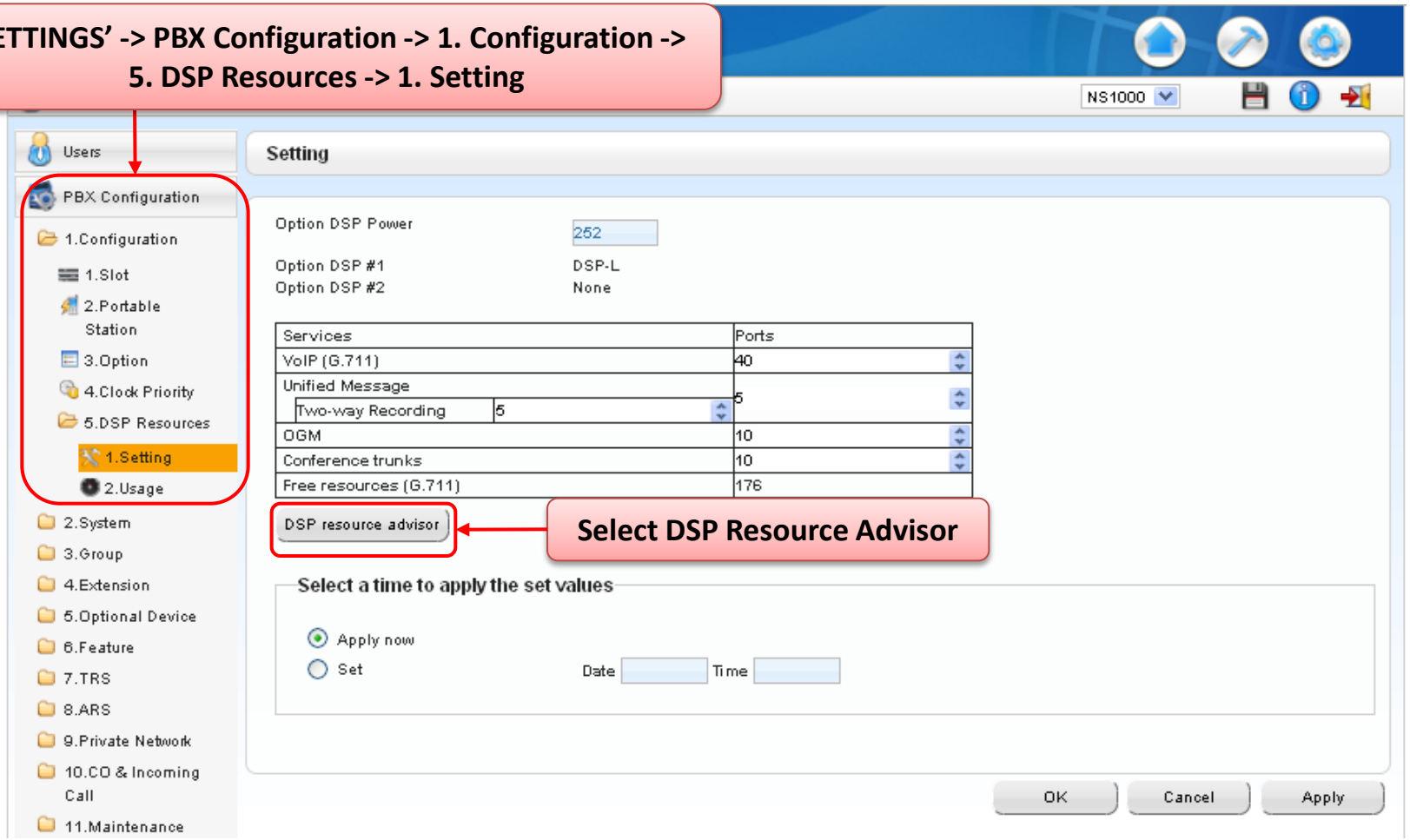
Service	Ports	Busy Ratio (%)
Trunks (G729)	8	50
Trunks (G711)	128	80
Exts (G729)	32	50
Exts (G711)	128	80
IP-CS (G729)	8	50
Unified Messaging (UM)	8	-
2-Way Recording	12	-
OGM	4	-
Conference	12	-

2.1 DSP Resource Advisor (2)

Example: Call Centre (Cont..)

The Web MC DSP Resource advisor can be used to select the necessary DSP combination

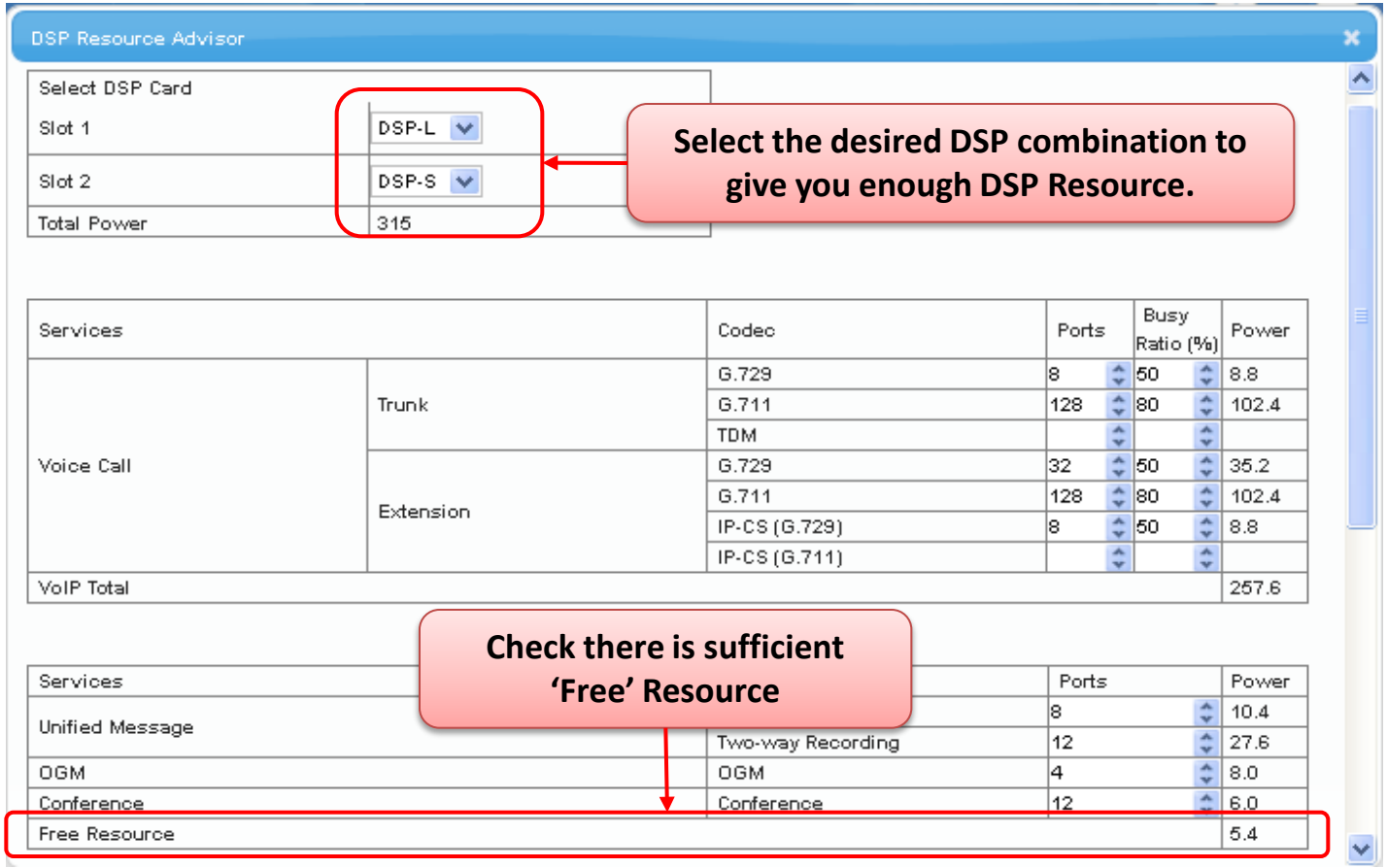
'SETTINGS' -> PBX Configuration -> 1. Configuration -> 5. DSP Resources -> 1. Setting



2.1 DSP Resource Advisor (3)

Example: Call Centre (Cont..)

Enter the Scenario details;

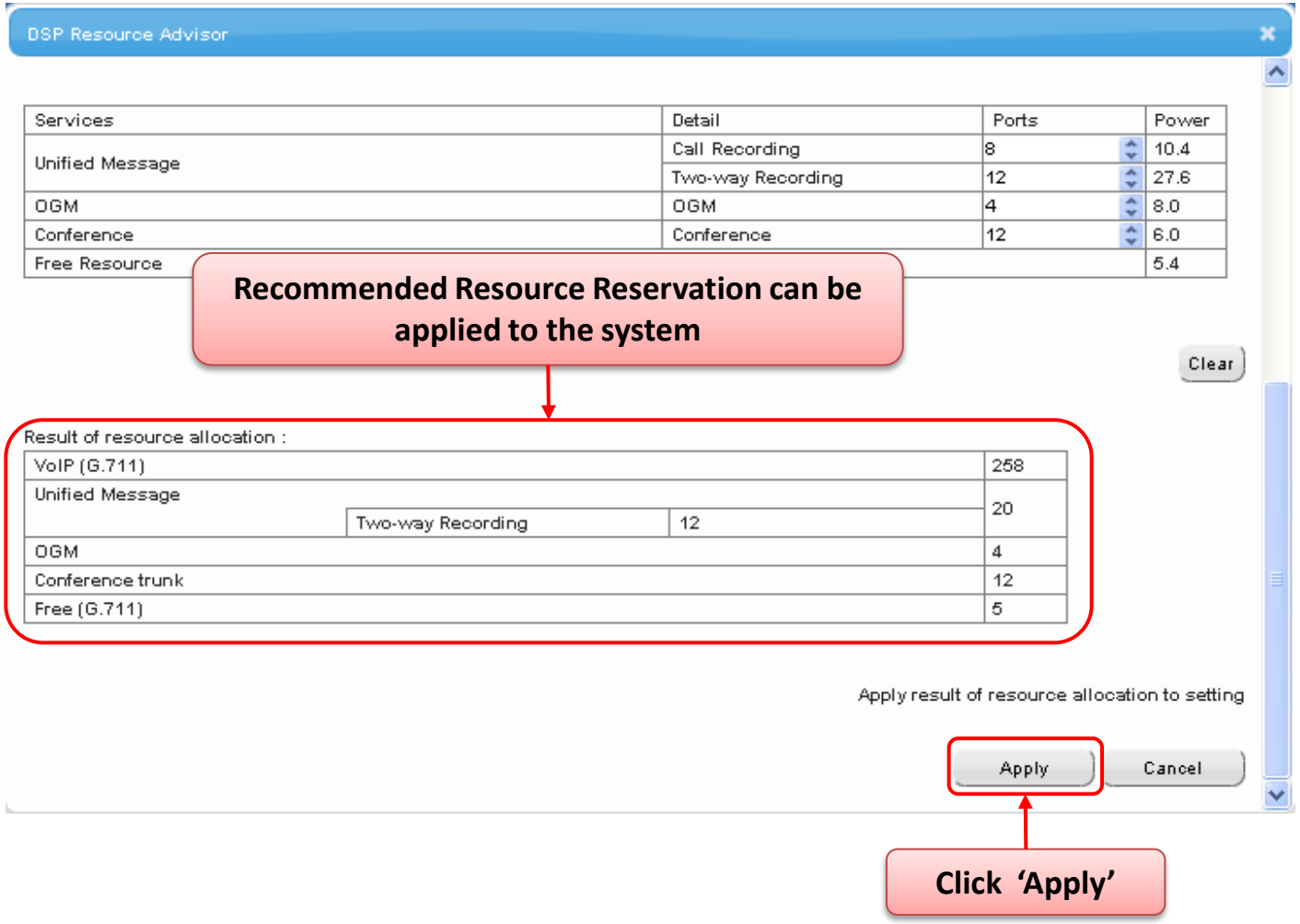


In this example, it can be seen that both a DSP-L (252) and DSP-S (63) will be required. (Total 315 Available Resources)

2.1 DSP Resource Advisor (4)

Example: Call Centre (Cont..)

It is possible to Apply the necessary DSP Reservation scheme from this scenario also:



2.2 DSP Resource Reservation (1)

Specific resources can be reserved to guarantee a minimum level of service.

Resources reserved for a particular service (e.g., conferencing) cannot be used for another service (e.g., Unified Messaging). i.e. You may want to reserve resources for OGM (Outgoing Message) to ensure that recorded messages can be played to incoming callers.

The resources can be reserved for the following types of services:

- VoIP (G.711)
- Conference trunk
- Unified Messaging
- Two-way Recording
- OGM

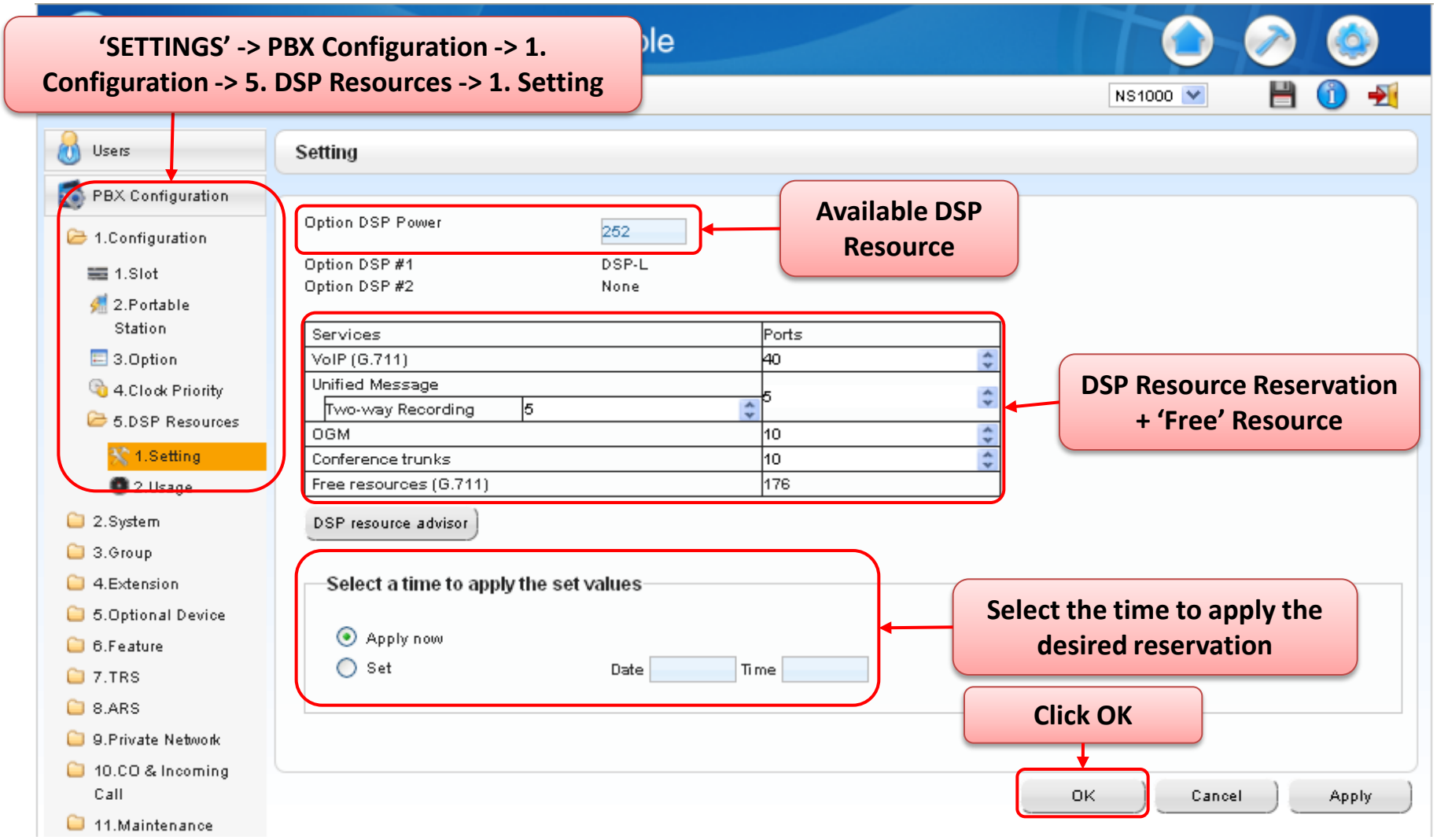
Example

Service	Simultaneous Operation
VoIP Call (G711)	40
Unified Messaging	5
2-Way Recording	3
OGM	10
Conference Trunk	10
UM Tone	2

NB: UM Tone (required for 2-way recording) is reserved automatically (cannot change)

2.2 DSP Resource Reservation (2)

DSP Resource Reservation Screen



2.3 DSP Usage Graph

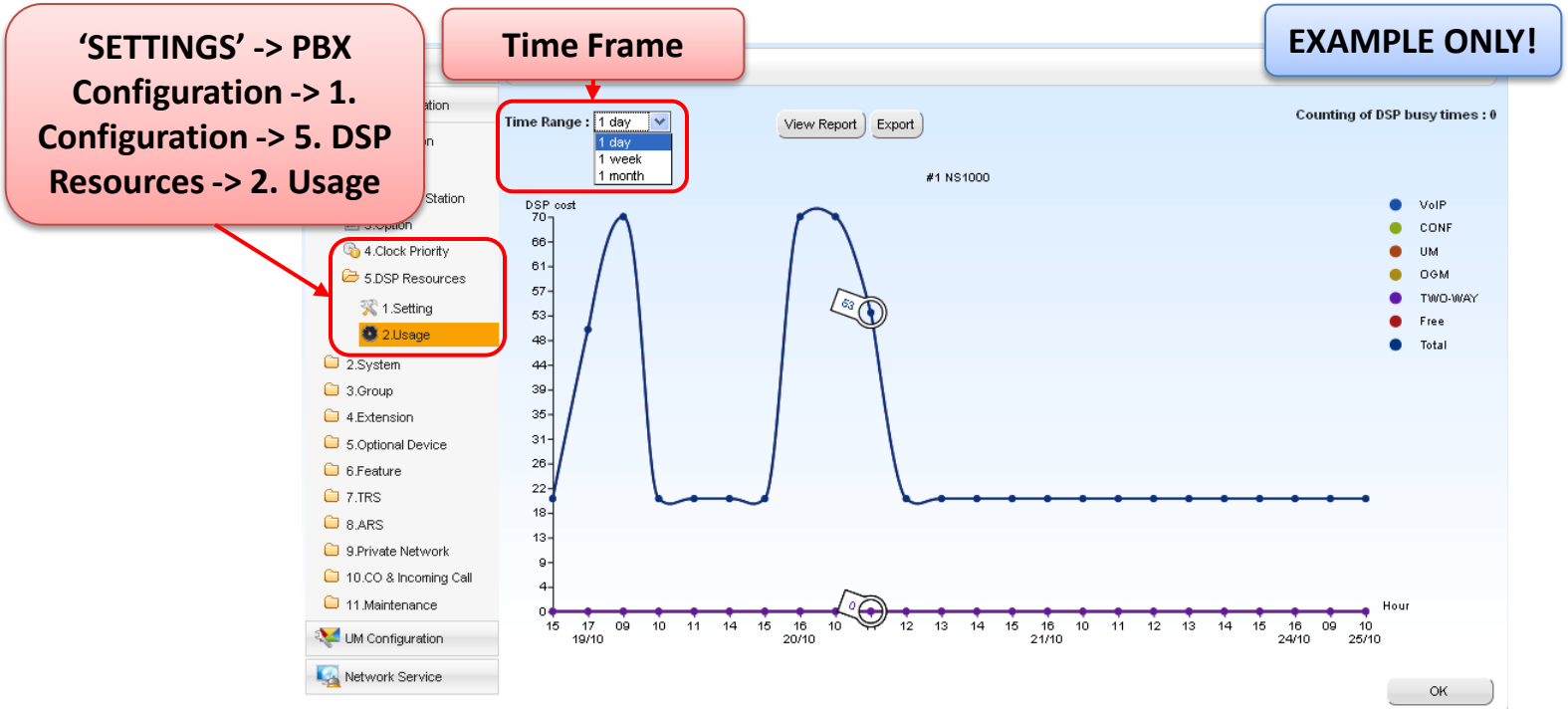
DSP usage graph

The PBX keeps a record of the maximum DSP usage per hour for each of the following features/services.

- VoIP (IP trunk, IP extension and IP-CS usage)
- Conference
- Unified Messaging
- OGM
- Two-way recording

This data is displayed via the WebMC and shows trends in DSP usage over time, as well as the number of calls / operations abandoned due to lack of resources. (Up to 30 days usage is logged)

The graph allows you to confirm that sufficient resources are available, or if a larger DSP is required.



DSP RESOURCES COMPLETE

Section - 6

NETWORKING

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Chapter 1 Introduction
1-1. Introduction

Chapter 2 One-Look Networking
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2-2. Main One-Look Features
2-3. Master and Slave Unit

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3-1. IP Capacity – Trunks
3-2. IP Capacity – Extensions

Chapter 4 Peer – to- Peer (P2P) Networking
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4-2. Peer to Peer Group Setting

Chapter 5 QSIG Networking
5-1. QSIG Networking Overview

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Chapter 1

INTRODUCTION

1-1. Introduction

KX-NS1000 provides two methods of private networking:

1. One-Look Networking
2. QSIG Networking (via ISDN and H.323)

This module will focus on the new NS1000 feature “One-Look Networking”.

- The main benefits of One-look networking are;
  - It looks like one PBX system, even though two or more PBXs are networked together.
  - The system can be expanded easily via a Web based maintenance console.
  - No additional servers are required for call control.

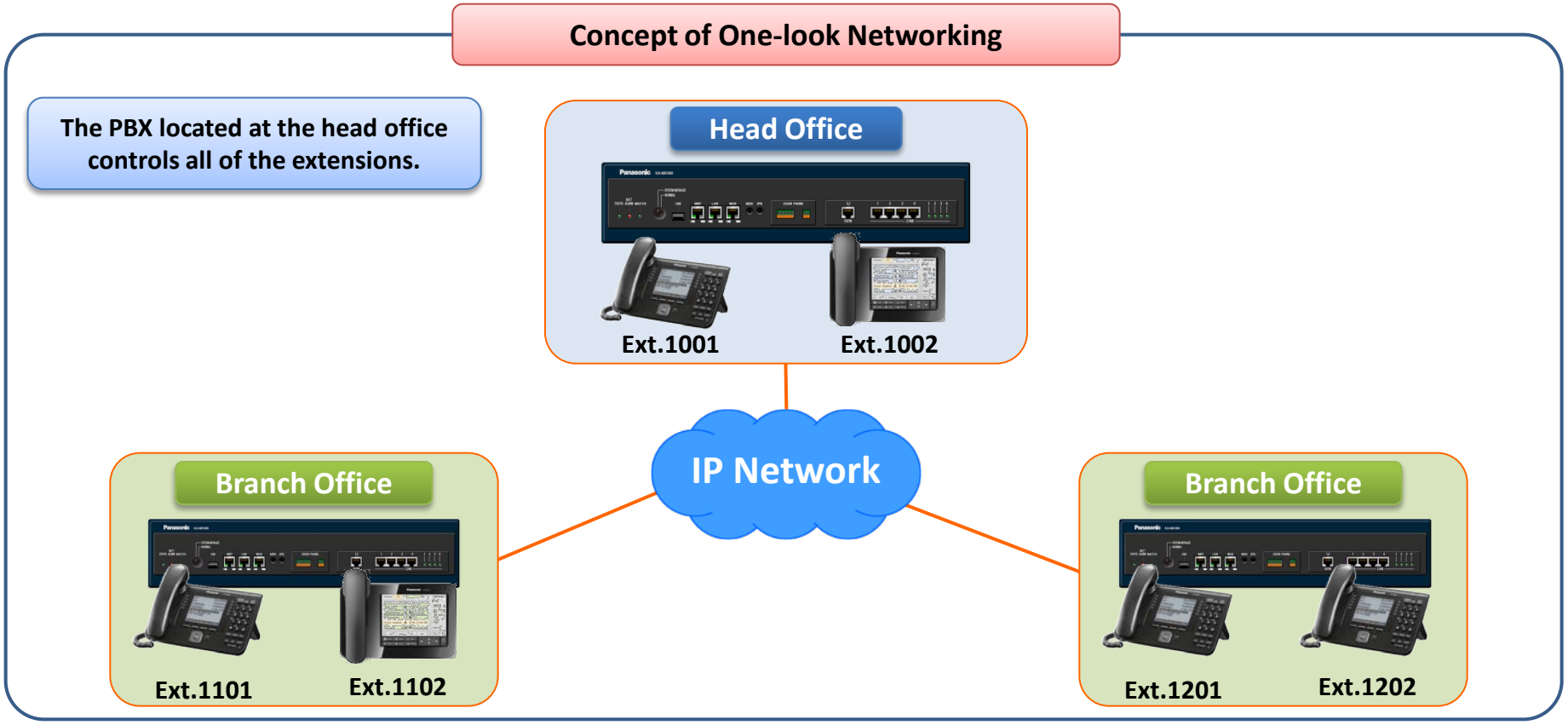
- The main differences between “One-look” and “QSIG” Networking are the following;
  - For “One-look”, the ‘Master’ PBX controls all extensions within the network.
    In a “QSIG” network, each PBX controls its own extensions.
  - For “QSIG”, each PBX needs to be programmed individually.
    For “One-look”, almost all settings are made in the master PBX only.
  - “QSIG” is suitable for connecting the NS1000 to the existing KX-TDE/NCP systems, or when there are 17 or more NS1000s in the network.
  - “One-Look” is available for up to 16 connected NS1000 systems (Max)

Chapter 2

ONE-LOOK NETWORKING

2-1. One-look Networking Concept

The system looks like one PBX, even when connected though an IP Network

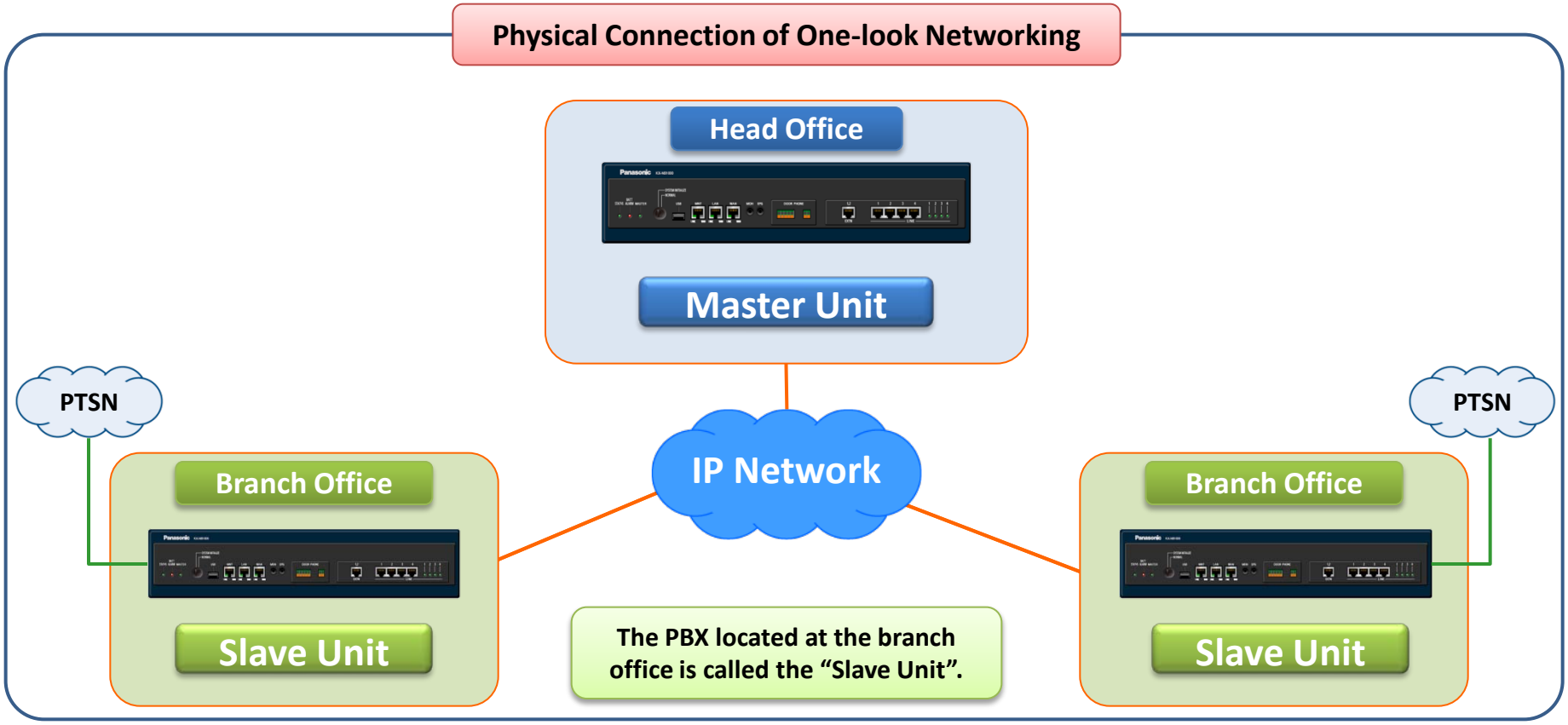


All extensions within the One-look Network behave as if they were part of the Main Office, regardless of their actual location.

*** The network can be easily expanded with simple programming.**
- up to 1,000 extensions can be configured easily.

2-1. One-look Networking Concept

The Master Unit controls one or more Slave Units (15 Max).



If ‘Slave’ units are installed in Branch Offices, local calls can be made using local trunks.

The Slave units can also support additional extensions and UM features.

NB: System redundancy is not supported, if the Master unit fails, calls will not be possible via the Slave units (TBC)

2-1. One-look Networking Concept

Specifications

The maximum number of units within an one-look networking is 16.

- Master : 1
- Slave : 15

The maximum number of extensions within an one-look networking is 1,000.

- Max. 1,000 extensions / networked system
- Max. 640 extensions * / site (unit)

SIP Phone : 640

- IP-PT and IP Softphone : 128
- Extension (SLC on Physical Extension Card) : 2

No external (additional) server for network call control is required.

- Major competitors need server for 5 or more PBXs.

The one-look network should be consist of the PBXs which have the same model suffix of model number (e.g., KX-NS1000NE), This information can be found on the name plate).

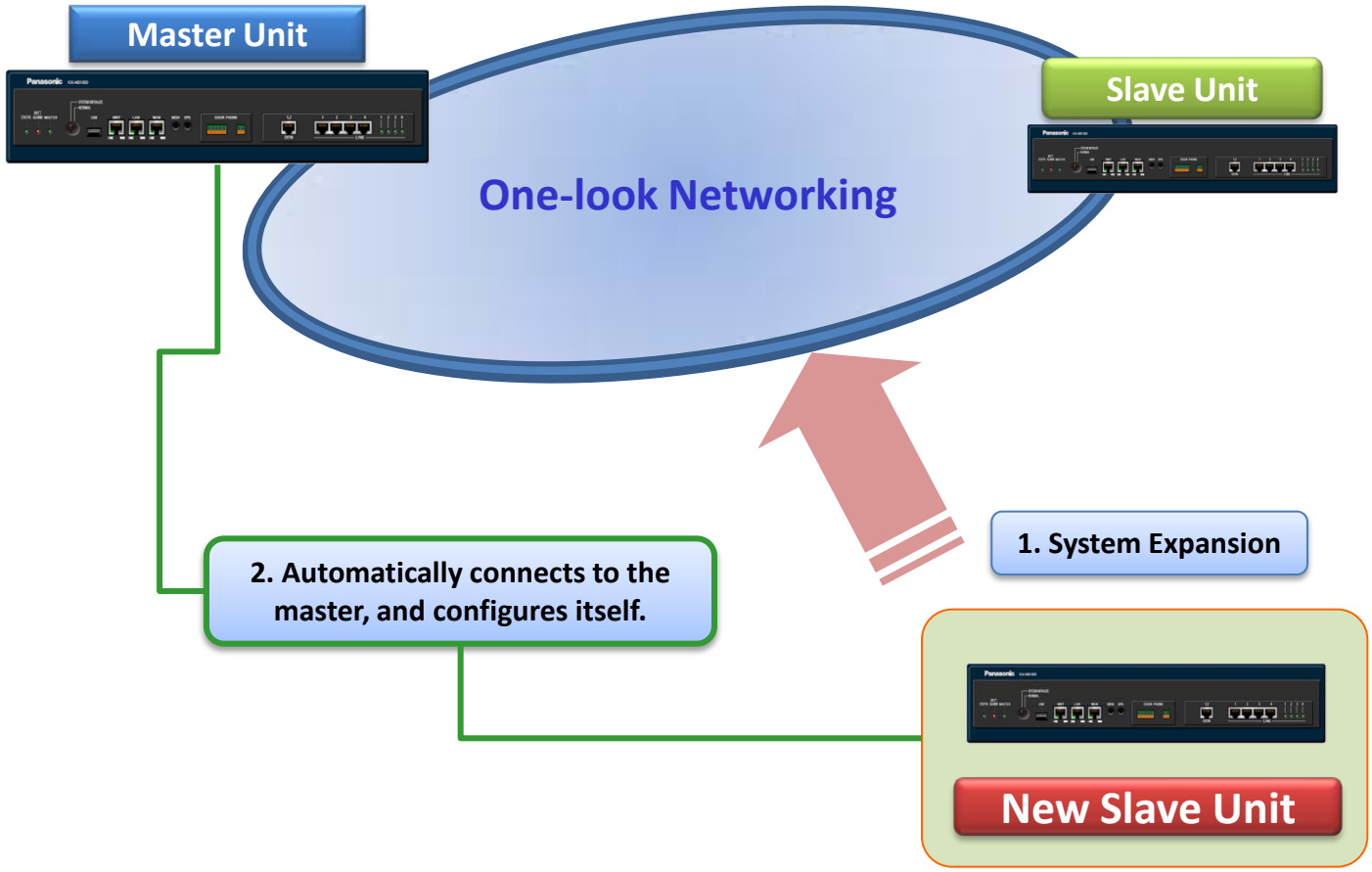
2-2. Main ‘One-Look’ Features

A ‘One-Look’ system can be expanded easily without complicated programming.

Dealers can easily add additional slave units.

Slave units automatically connect to the Master and configure themselves accordingly.

Configuration is simple compared NCP/TDEs, (GW no. settings, DN2IP settings, Hunt pattern settings, etc.).

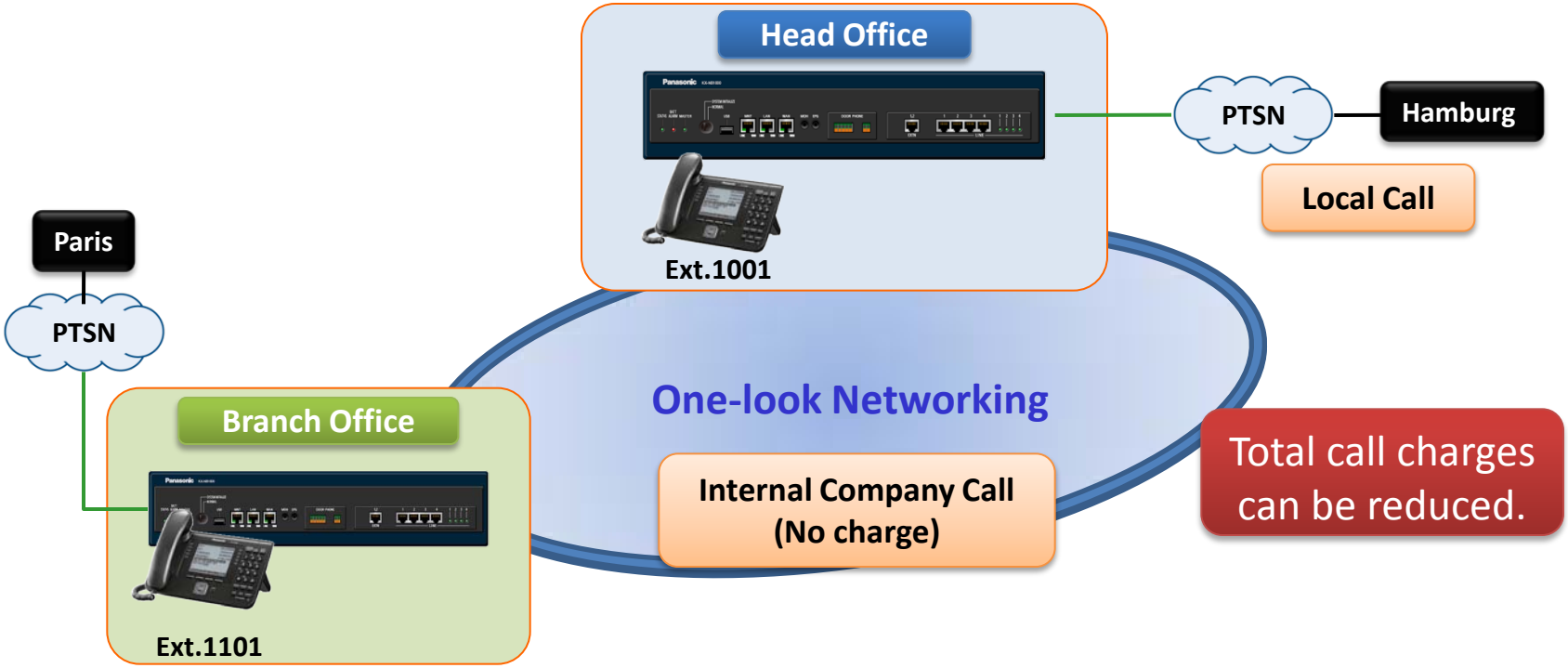


2-2. Main 'One-Look' Features

Trunk calls via Remote (Slave) Units.

An extension user can access trunks connected to remote units thus reducing call costs.

An International call can be reduced to Local Call charges.



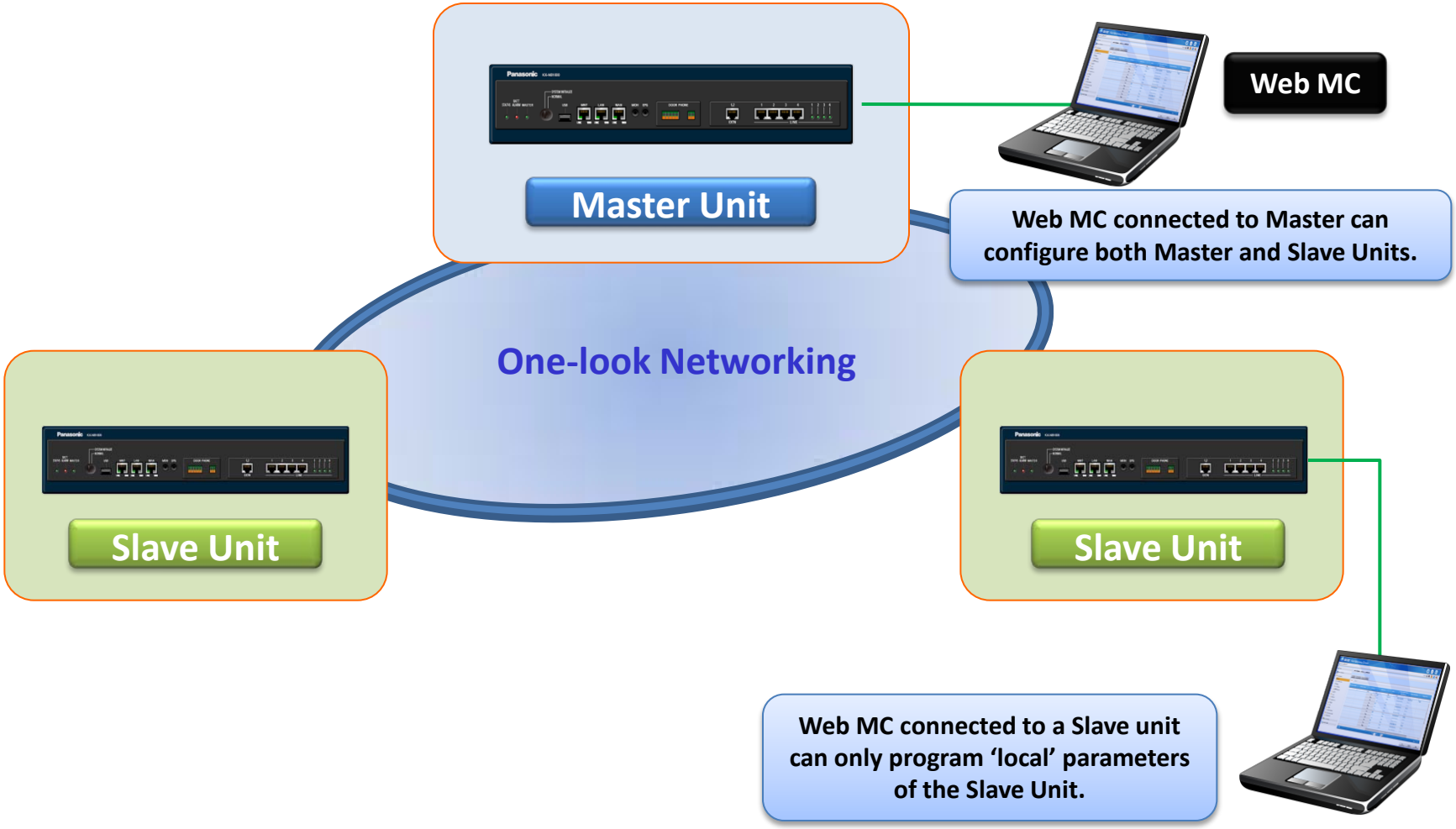
Through ARS programming, outgoing calls can be routed so as to reduce call charges.

The Master unit has the ARS tables (System Common Setting) and controls all outgoing calls.

2-2. Main 'One-Look' Features

Simplified Programming via embedded Web Maintenance tool (WebMC)

The Web MC connection to the Main unit can be used to program all the Slave Units.



2-3. Master Unit and Slave Unit

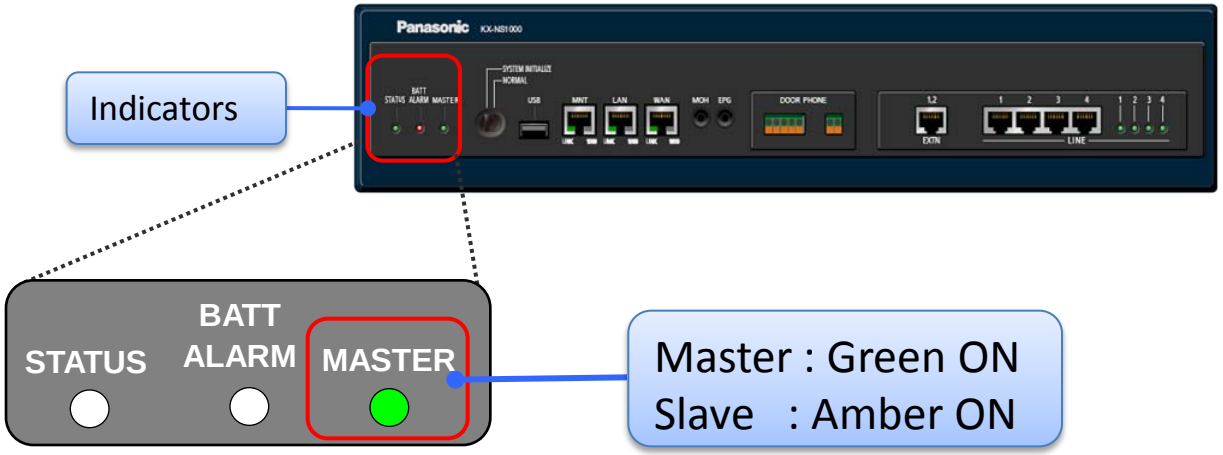
Master and Slave units are the same physical PBX model.

The PBX mode (Master or Slave) is set via system programming (Initialization).

The key parameters assigned to each unit are:

- Master : PBX Type=Master + IP address
- Slave : PBX Type=Slave + IP address + IP address of the master unit

The PBX mode (Master or Slave) is indicated by the (MASTER) LED on the front of the unit.



2-3. Master Unit and Slave Unit

Common and Individual Unit Settings

To configure One-Look Networking, some settings must be configured for each individual unit.

Main Settings

Common Settings (Master)	Individual Settings (Master & Slave)
- Numbering Plan - COS - Group Settings - Extension Settings - Co Line Settings - DDI/DID Table - TRS - ARS - etc.	- Slot (Installing Physical and Virtual card) - Card and port property - IP Terminal Registration - Network service (IP address, DHCP server, etc.) - E-mail Notification - Data backup / restore - etc.

“Common settings” include Numbering Plan, COS, Group settings, etc.

“Individual Settings” include Installing Physical and Virtual cards, IP terminal registration, etc.

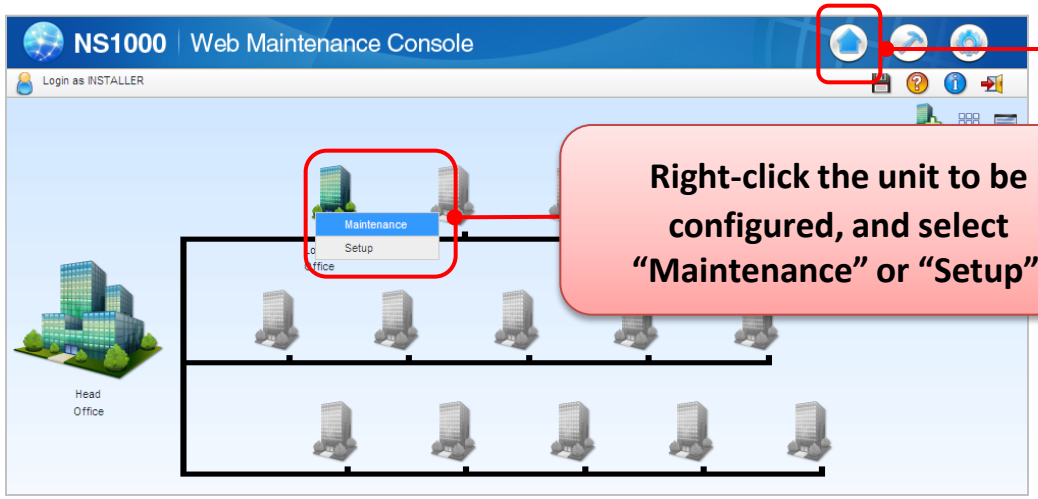
2-3. Master Unit and Slave Unit

How to configure each individual unit

To configure each unit, select the unit via the Web MC.

There are two ways to select the desired unit

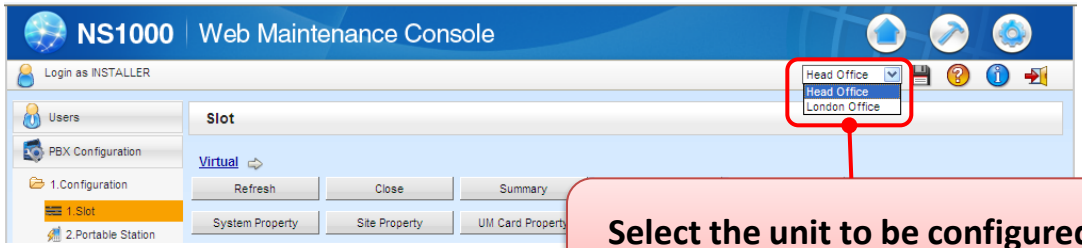
1



Via 'Home' Screen Icon

Right-click the unit to be configured, and select "Maintenance" or "Setup".

2



Select the unit to be configured from the pull-down menu.

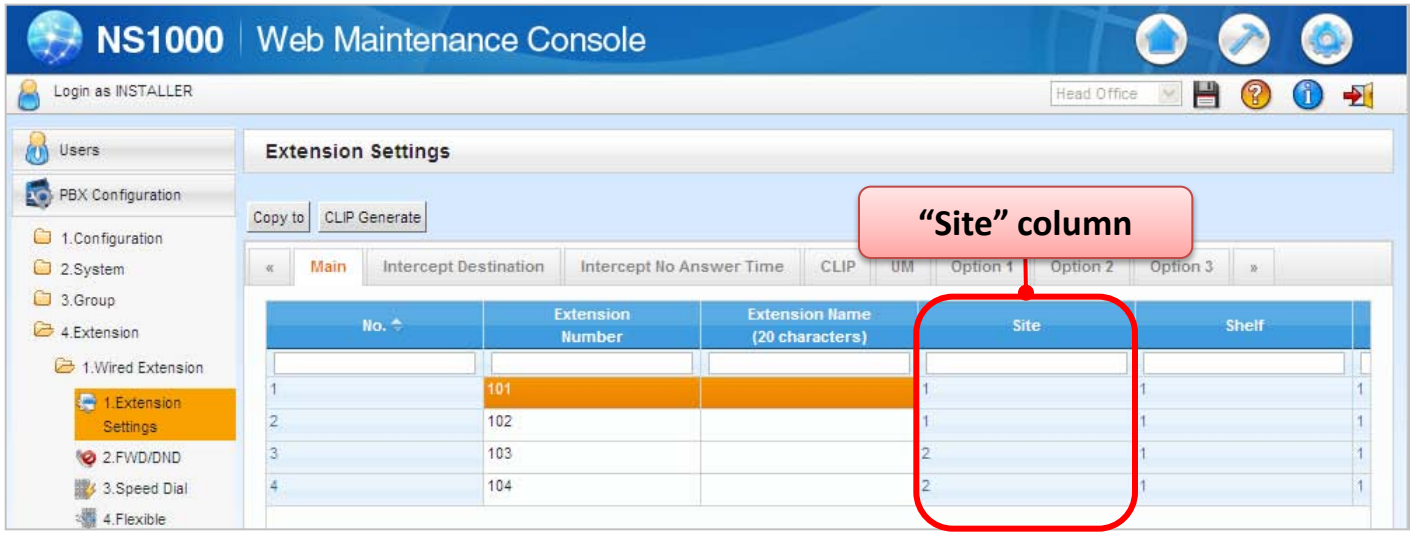
2-3. Master Unit and Slave Unit

The Site ID is used for “Common settings”.

The Site ID is assigned to each unit via the “Add Site” Wizard.

On the PBX setting screen, the Site ID is used instead of “Site name”.

Extension Setting example



*** The “Site ID” is used for “CO Line Settings”, “DIL Table & port Settings”, “Door-phone”, “External Relay”, “External Sensor”, etc.**
*** To confirm the Site ID, click “List View” on the Home screen.**

Chapter 3

ONE-LOOK NETWORKING: SYSTEM DESIGN

3-1. IP Capacity Expansion - IP Trunks

The overall IP trunk capacity does not increase in proportion to the number of sites.

Type	Stand Alone System	Networked System
Total Number of Trunks	256	600
Trunk (Virtual Trunk Card)	256	256
H.323 Trunks	48	96
SIP Trunks	256	256
Trunk (Physical Trunk Card (PRI30))	30	480

SIP Trunking example

Max. per networked Systems ->256ch.
Max. per site -> 256

*** The number of available H.323 or Legacy Trunks increases depending on the number of sites, however the OVERALL IP Trunk capacity does not increase (256 IP Trunks over 16 sites Max).**

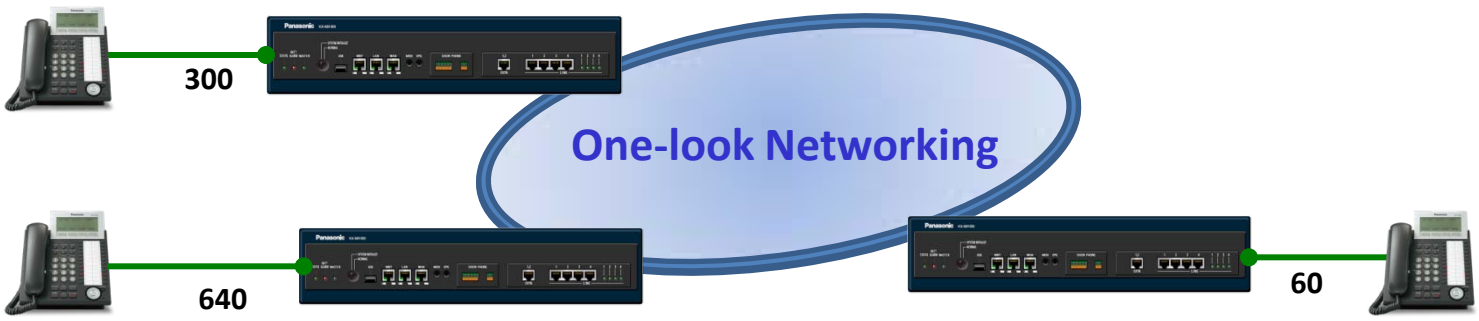
3-2. IP Capacity Expansion - IP Extensions

The IP extension capacity does not increase in proportion to the number of sites.

Type			Stand Alone System	Networked System
Total Number of Extensions			640	1,000
	Extension (Virtual Extension Card)		640	1,000
		IP-PT and IP Softphone	128	1,000
		SIP (UT & 3rd Party) Phone	640	1,000
	Extension (Physical Extension Card (SLC)		2	32

SIP-Extension example

Max. per networked Systems ->1000.
Max. per site -> 640



*** The number of available extension increases depending on the number of sites, however the OVERALL Extension capacity does not increase PROPORTIONALLY.**

Chapter 4

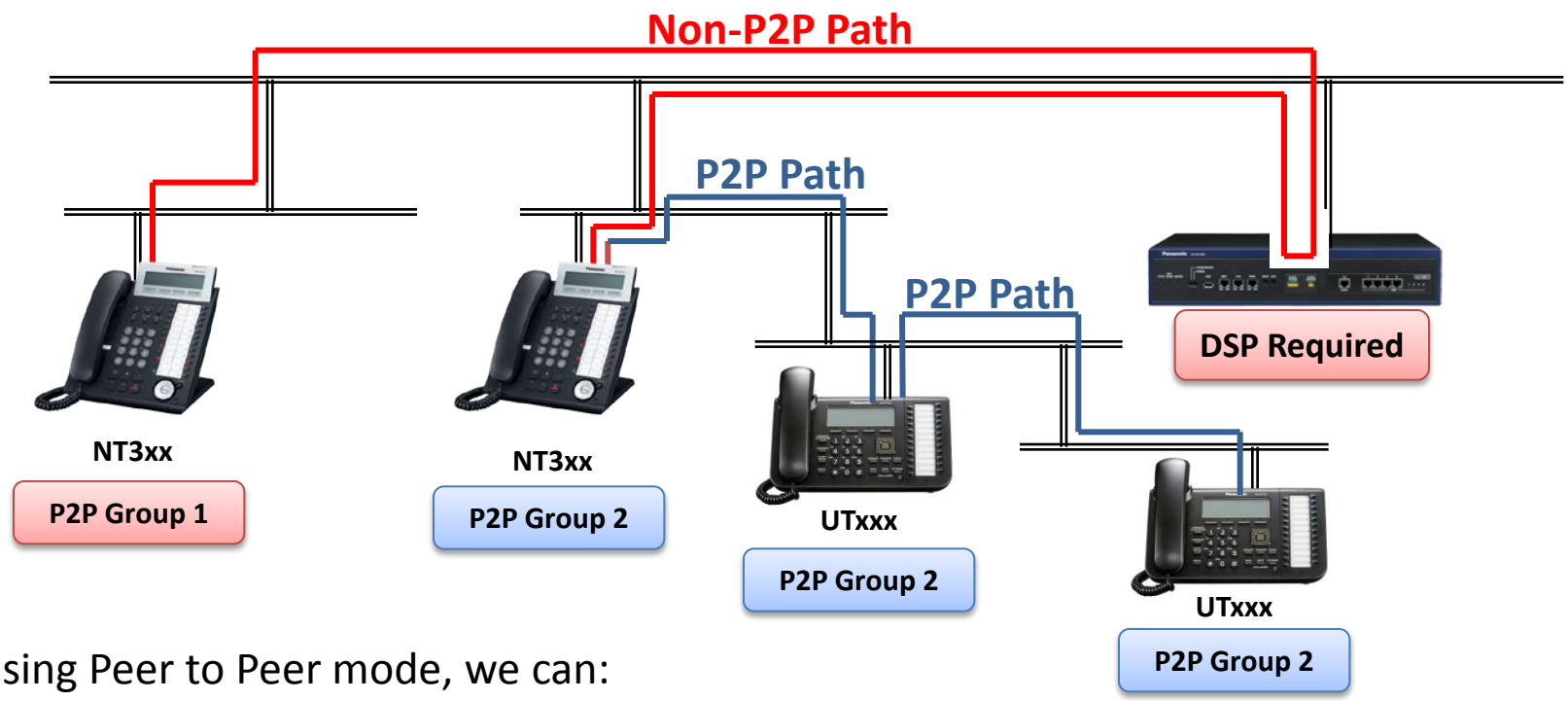
PEER – TO- PEER (P2P) NETWORKING

4-1. Peer to Peer (P2P) Communication

Peer to Peer (P2P) Communications.

The NS1000 automatically establishes peer-to-peer communication between peer-to-peer compatible IP extensions (i.e., NT3xx and UT series) that belong to the same P2P group.

Non P2P Calls require DSP Resource.



By using Peer to Peer mode, we can:

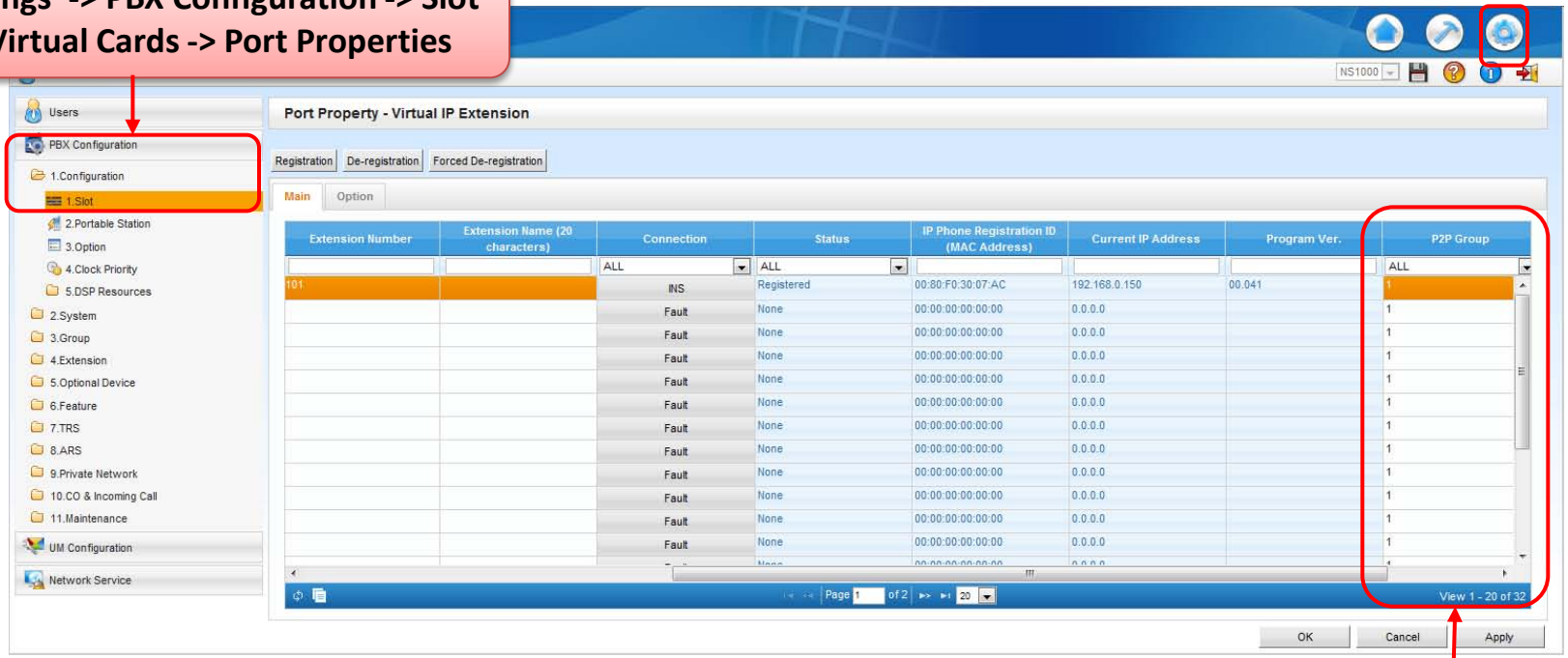
- Potentially reduce network wide traffic to the PBX
- Improve voice quality for P2P calls (By using G722 codec – Only supported for P2P

Note: P2P cannot be disabled but, using P2P Group function, phones assigned to different P2P Group can make non P2P calls.

4-2. P2P Group Setting

The P2P Group for IP-Extensions can be set in the appropriate Port-Properties screen;

'Settings' -> PBX Configuration -> Slot -> Virtual Cards -> Port Properties



The P2P Group for the desired extension can be set here.

NB: IP-CS do not support P2P communication, so no P2P Group setting is available for IP-CS.

Chapter 5

QSIG NETWORKING

5-1. QSIG - Overview

Connections between different PBX systems / types can be established via QSIG.

PBXs (KX-NS1000, KX-TDE, KX-NCP) can be connected to each other via ISDN private network or VoIP network (H.323), and provide QSIG features. (Programming is same as existing NCP/TDE Programing)

When using QSIG enhanced features, KX-TDE / NCP must be with MPR software version 4.1000 or later.
When using QSIG enhanced features, Activation Keys are needed.

Appendix 1

BANDWIDTH

Bandwidth (1/4)

Bandwidth for voice data, call control (signalling), and system control between units must be considered when site planning.

Required Bandwidth per Call for Voice : Determined by CODEC and Packet Sending Interval

CODEC	Packet Sending Interval			
	20ms	30ms	40ms	60ms
G.711 / G.722	80kbps	74.7kbps	72kbps	69.4kbps
G.729A	24kbps	18.7kbps	16kbps	13.4kbps

Required Bandwidth per Call for Signaling

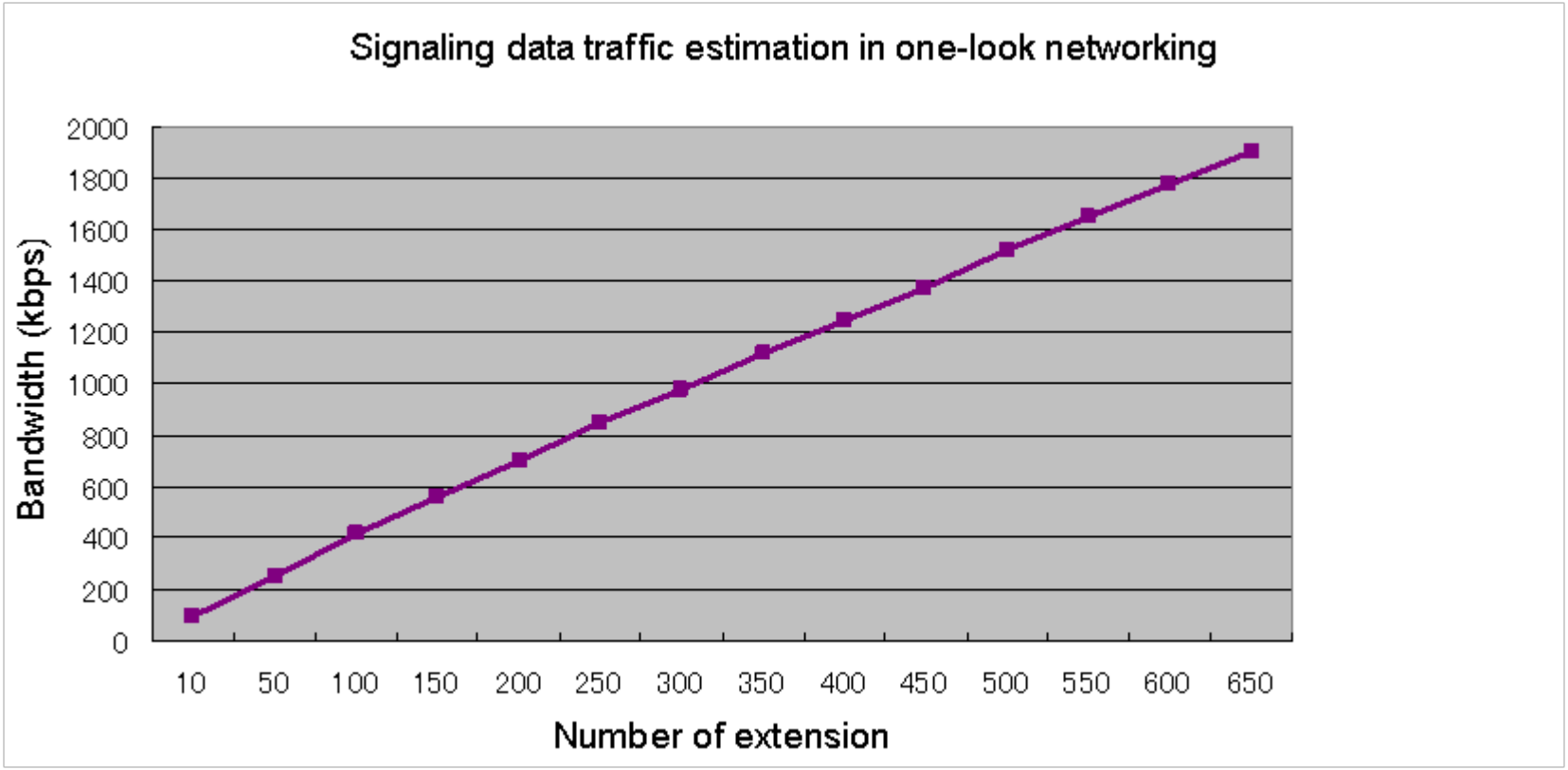
Phone Type	Required Bandwidth
IP Telephones (except SIP phones)	7.2kbps
SIP Phone	16.0kbps

NB: In addition to the above, Basic Ethernet frame, VPN headers, etc., should also be considered.

Bandwidth (2/4)

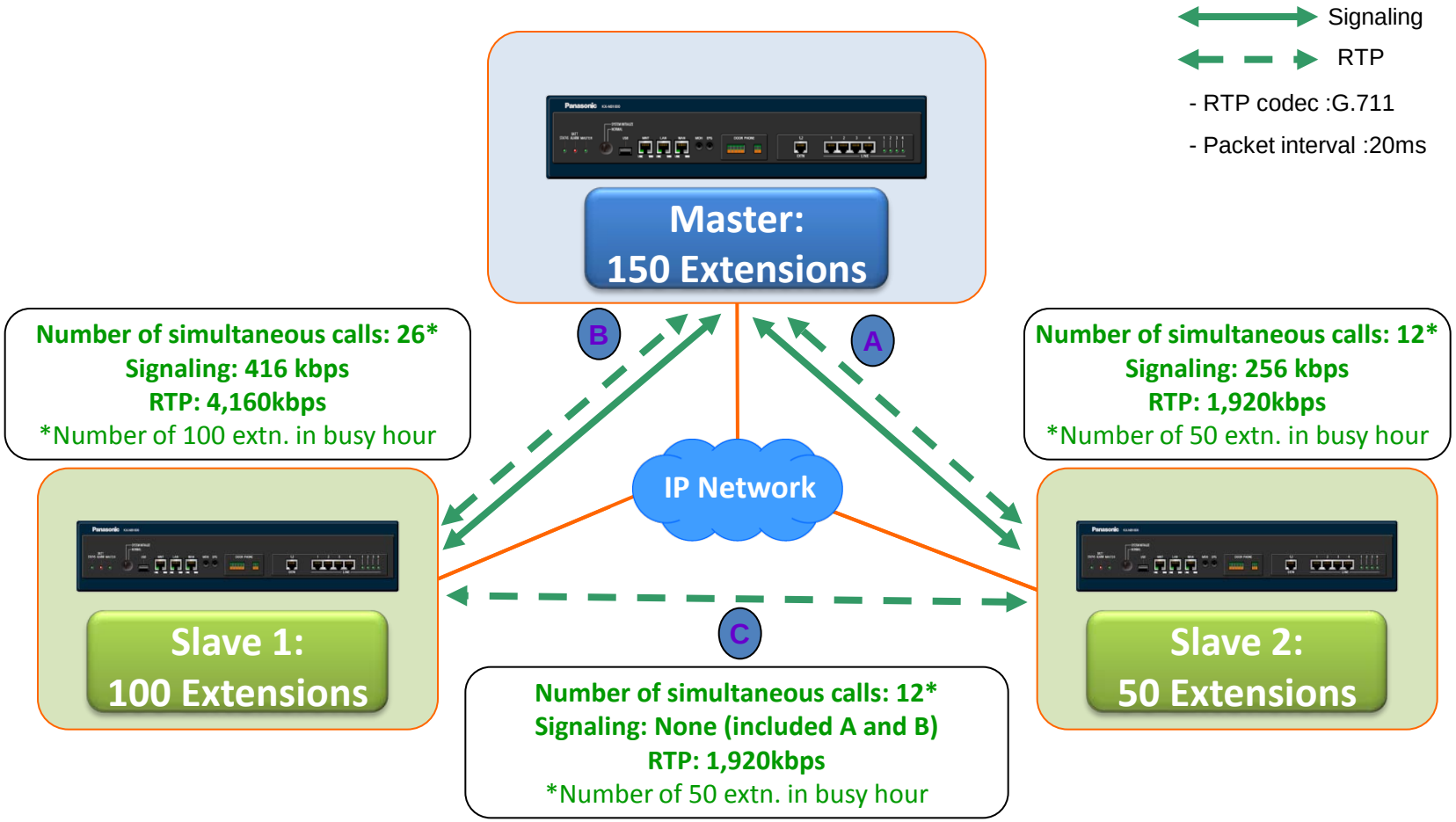
Network bandwidth for One-look networking

- The signaling data traffic between main unit is estimated by the number of extension deployed in main unit.
- The table below shows estimated signaling data traffic in case 2 main units are connected as one-look networking in a pair.
- The values are calculated in case the most busy hour traffic.
- The system is essentially non-blocking.



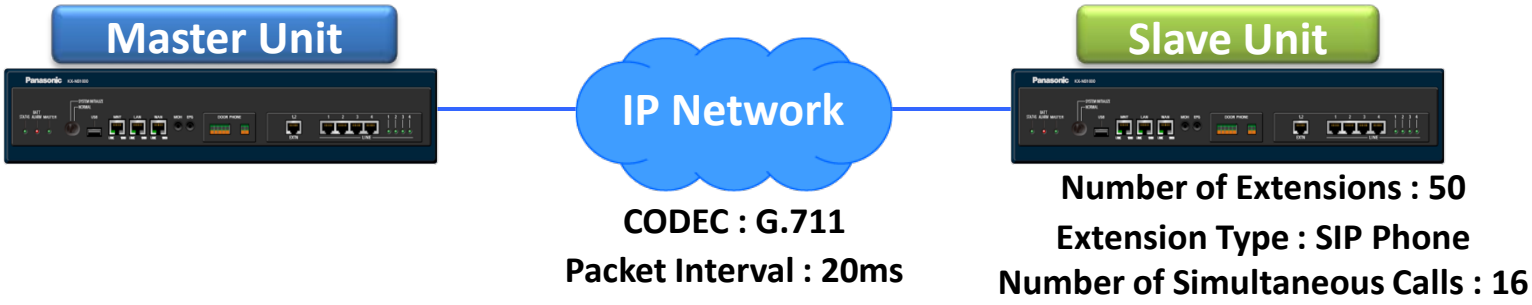
Bandwidth (3/4)

Example of One-look networking configuration



Bandwidth (4/4)

Assessing bandwidth – Example



Bandwidth required for Voice data

= Number of simultaneous calls x 2 x Required bandwidth for codecs (kbps)

= 16 x 2 x 80 = 2560kbps

Bandwidth required for Signalling

= Number of simultaneous calls x signalling bandwidth per call for SIP phones (kbps)

= 16 x 16 = 256kbps

Total required bandwidth

= Bandwidth required for Voice data (kbps) + Bandwidth required for signalling (kbps)

= 2560 + 256 = 2816kbps

*** In this example, Basic Ethernet frame, VPN headers, system control data, etc., are not considered.**

Appendix 2

IP-PORT SECURITY

Port Security

Port Security

If the VoIP network contains a firewall, the firewall must be configured appropriately to allow VoIP packets to pass through certain ports of the ports listed below without being blocked by filtering.

The ports for which you need to configure the firewall may vary depending on the network conditions.

For more information, consult your network administrator.

The following tables show the PBX ports used for IP communications.

Any access to the ports not on these lists are ignored.

Port Numbers (Default) (1/5)

LAN Port Numbers

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
8080	TCP	Web Maintenance Console	-	Changeable
9300	UDP	PTAP	-	Changeable
10000– 10655	TCP	H.323 Dynamic Port (H.225 Send, H.245 Send/ Receive, Connection-less [TCP] Send Port)	-	Changeable
20000	TCP	UM-VMA*3	Server	Fixed
30021	TCP/UDP	FTP/FTPS	Server	Changeable
30022	TCP	SSH	Server	Changeable
32727	UDP	MGCP*1 for IP-CS	-	Changeable
33090	UDP	ACS-MDW	Server	Fixed
33091				
33092	TCP			
33131				
33321	TCP	Access Point Login (Telnet)	Server	Changeable
33333	TCP	CTI 3rd Party Connection	-	Changeable
33334	TCP	CTI 1st Party Connection	-	Changeable
33478	UDP	STUN	Client	Changeable
33702	UDP	ACS-MDW (WSD)	Server	Fixed
35060	UDP	SIP UA (CO)	-	Changeable
39300	UDP	PTAP for IP-CS	-	Changeable
40000– 40095	TCP/UDP	FTP/FTPS-Data	Server	Changeable
50000– 65535 (Ephemeral)	UDP	SNMP TRAP	Client	Fixed
	TCP/UDP	FTP	Client	
	TCP/UDP	FTP/FTPS-Data	Client	
	UDP	NTP	Client	
	UDP	DNS	Client	
	UDP	SYSLOG	Client	
	TCP/UDP	SMTP	Client	
	TCP/UDP	SMTP over SSL	Client	
	TCP/UDP	POP3	Client	

Port Numbers (Default) (2/5)

MNT Port Numbers (1)

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
21	TCP/UDP	FTP/FTPS	Server	Changeable
25	TCP/UDP	SMTP	Server	Changeable
53	UDP	DNS	Server	Changeable
67	UDP	DHCP	Server	Changeable
80	TCP	HTTP	Server	Changeable
123	UDP	NTP	Server	Fixed
143	TCP	IMAP	Server	Changeable
161	UDP	SNMP	Server	Changeable
443	TCP	HTTPS	Server	Changeable
465	TCP/UDP	SMTP over SSL	Server	Changeable
993	TCP	IMAP over SSL	Server	Changeable
2103	TCP	CMM	Server	Fixed
2300	TCP	Telnet-SMDR	-	Changeable
3493	UDP	UPS*1	-	Fixed
3702	UDP	WSD	Server	Changeable
7574	TCP	CWMP	Server	Changeable
8080	TCP	Web Maintenance Console	-	Changeable
30022	TCP	SSH	Server	Changeable
33090	UDP	ACS-MDW	Server	Fixed
30091				
30092	TCP			
33131				
33321	TCP	Access Point Login (Telnet)	Server	Changeable
33333	TCP	CTI 3rd Party Connection	-	Changeable
33334	TCP	CTI 1st Party Connection	-	Changeable
33702	UDP	ACS-MDW (WSD)	Server	Fixed

Port Numbers (Default) (3/5)

MNT Port Numbers (2)

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
40000– 40095	TCP/UDP	FTP/FTPS-Data	Server	Changeable
50000– 65535 (Ephemeral)	UDP	SNMP TRAP	Client	Fixed
	TCP/UDP	FTP	Client	
	TCP/UDP	FTP/FTPS-Data	Client	
	UDP	NTP	Client	
	UDP	DNS	Client	
	UDP	SYSLOG	Client	
	TCP/UDP	SMTP	Client	
	TCP/UDP	SMTP over SSL	Client	
	TCP/UDP	POP3	Client	
	TCP/UDP	ACS-MDW	Server	

Port Numbers (Default) (4/5)

DSP Port Numbers (1)

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
21	TCP/UDP	FTP/FTPS	Server	Changeable
25	TCP/UDP	SMTP	Server	Changeable
53	UDP	DNS	Server	Changeable
67	UDP	DHCP	Server	Changeable
68	UDP	DHCP	Client	Changeable
123	UDP	NTP	Server	Fixed
143	TCP	IMAP	Server	Changeable
161	UDP	SNMP	Server	Changeable
465	TCP/UDP	SMTP over SSL	Server	Changeable
993	TCP	IMAP over SSL	Server	Changeable
2103	TCP	CMM	Server	Fixed
3493	TCP	UPS	-	Fixed
3702	UDP	WSD	Server	Changeable
7547	TCP	CWMP	Server	Changeable
8000	UDP	Conference*1	-	Fixed
8080	TCP	Web Maintenance Console	-	Changeable

Port Numbers (Default) (5/5)

DSP Port Numbers (2)

Port Number	Protocol	Application	Client/Server	Changeable/ Fixed
12000 – 13535	UDP	RTP/RTCP	-	Changeable
16000 – 18047	UDP	RTP/RTCP for NAT traversal	-	Changeable
30022	TCP	SSH	Server	Changeable
33090	UDP	ACS-MDW	Server	Fixed
33091				
33092	TCP			
33131				
33702	UDP	ACS-MDW (WSD)	Server	Fixed
40000 – 40095	TCP/UDP	FTP/FTPS-Data	Server	Changeable
50000 – 65535 (Ephemeral)	UDP	SNMP TRAP	Client	Fixed
	TCP/UDP	FTP	Client	
	TCP/UDP	FTP/FTPS-Data	Client	
	UDP	NTP	Client	
	UDP	DNS	Client	
	UDP	SYSLOG	Client	
	TCP/UDP	SMTP	Client	
	TCP/UDP	SMTP over SSL	Client	
	TCP/UDP	POP3	Client	
	TCP/UDP	ACS-MDW	Server	

NETWORKING COMPLETE

Section - 7

FILE MANAGEMENT

SYSTEM UPGRADE (PCMPR)
BACKUP (DCSYS)
OGM
MOH
BGM UPLOAD
BACKUP
SETTING

Contents

0.0 Upgradeable Firmware

1.1 PBX Firmware version
1.2 System Firmware Download
1.3 System Firmware Upgrade
1.4 Check Firmware version

2.1 System Backup to USB
2.2 System Restore from USB
2.3 System File Backup – PC
2.4 System File Restore – PC

3.1 OGM File Upload – PC
3.2 OGM Recording – PT
3.1 MOH/BGM File upload

4.1 MOH/BGM File Status
4.2 MOH/BGM File Upload
4.3 MOH/BGM File Deletion
4.4 MOH/BGM File Backup
4.5 MOH/BGM File Assignment

FIRMWARE UPGRADE

0.0 Upgradable Firmware by WebMC

The following firmware can be managed and uploaded via the WebMC .

Target devices	
Main Unit（Master Unit/Slave Unit）	
Legacy Card	LPR
IP Equipment	NT3xx(IP-PT)
	NCP0158(IP-CS)
	UT133(SIP-MLT)
	UT136(SIP-MLT)
	UT113(SIP-MLT)
	UT123(SIP-MLT)

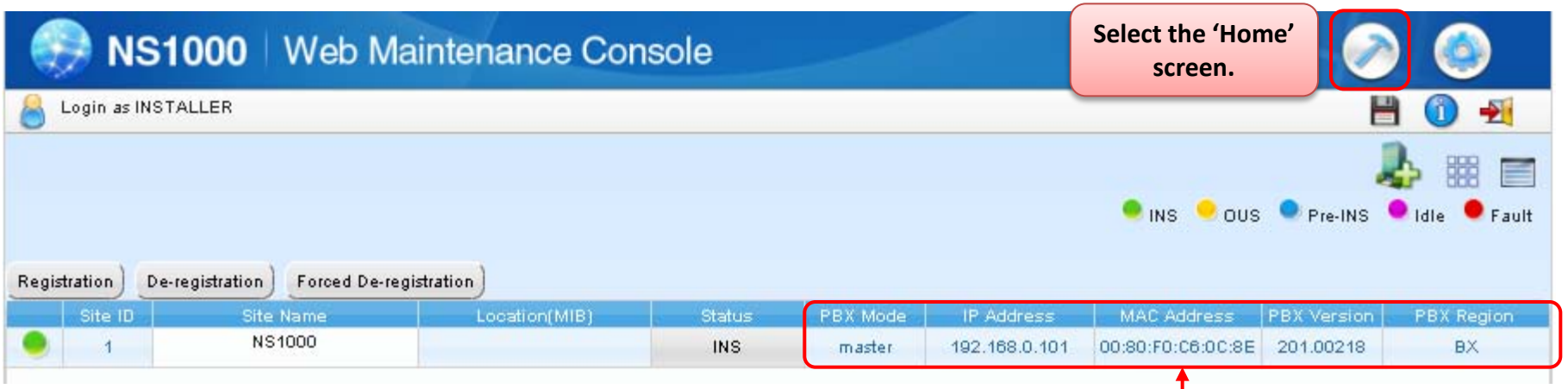
Firmware upgrade of DECT PS is not possible with TCA/WT Handsets and NS1000 V1.0

IMPORTANT:
Do not change the Filename of the Firmware files – System upgrade will not be possible if the files are named in an incorrect format.

1.1 PBX System Firmware Version

Over the course of the life of the PBX system and terminals etc, it is necessary to keep the System Firmware updated so that the latest features and improvements can be enjoyed.

The Firmware version the PBX system is currently running can be seen below



Select the 'Home' screen.

The PBX system's
- **Mode**
- **IP-Address**
- **MAC Address**
- **Firmware (PBX) Version**
- **Region**

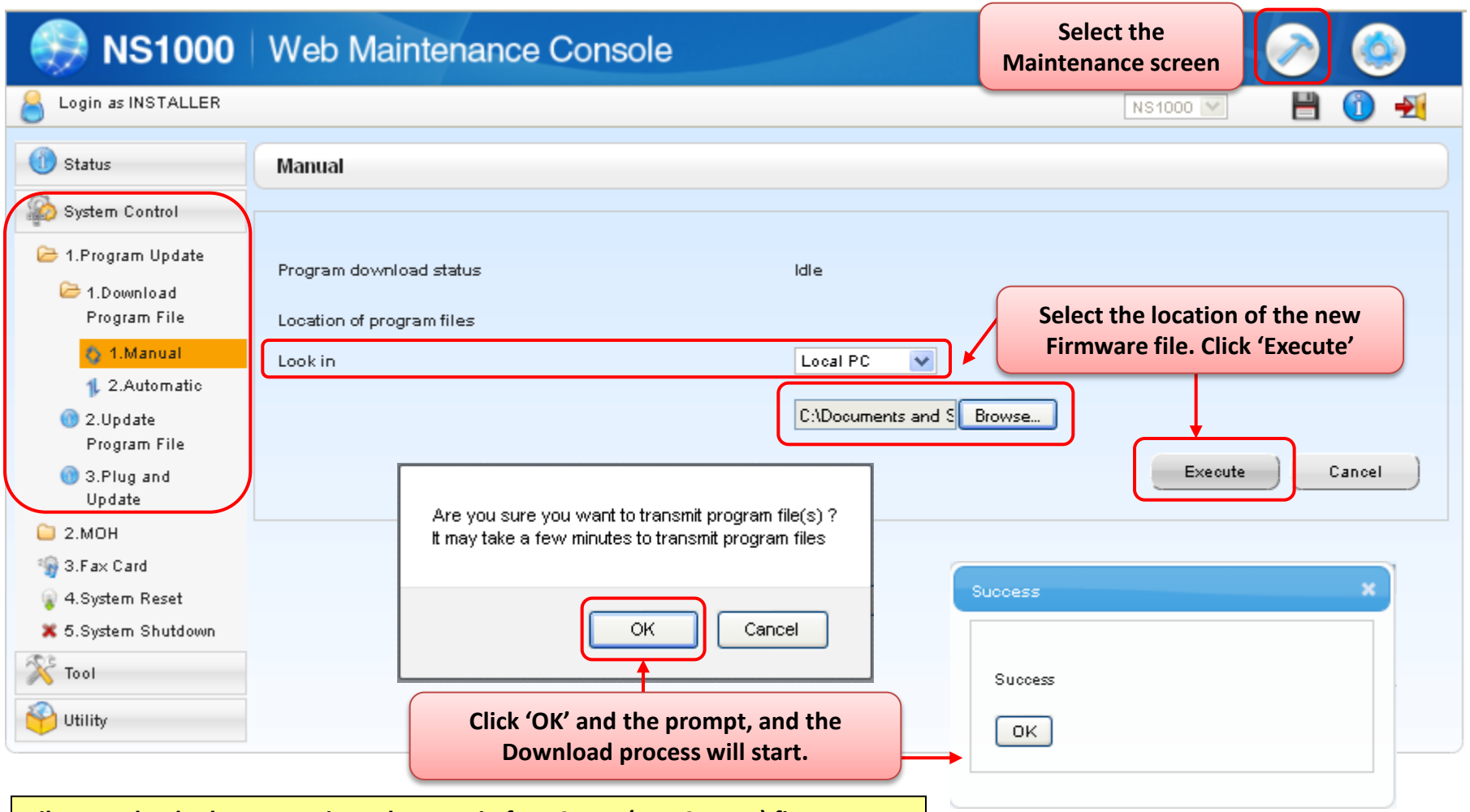
Can be seen here.

In a Onelook System, all registered units (Master + Slave) information will be displayed on this screen.

1.2 System Firmware Download

Before the system or it terminals can be upgraded, new Firmware must first be downloaded to the System. This can be a Manual or Automatic process depending on the system settings;

Manual Download (1) - Download from PC

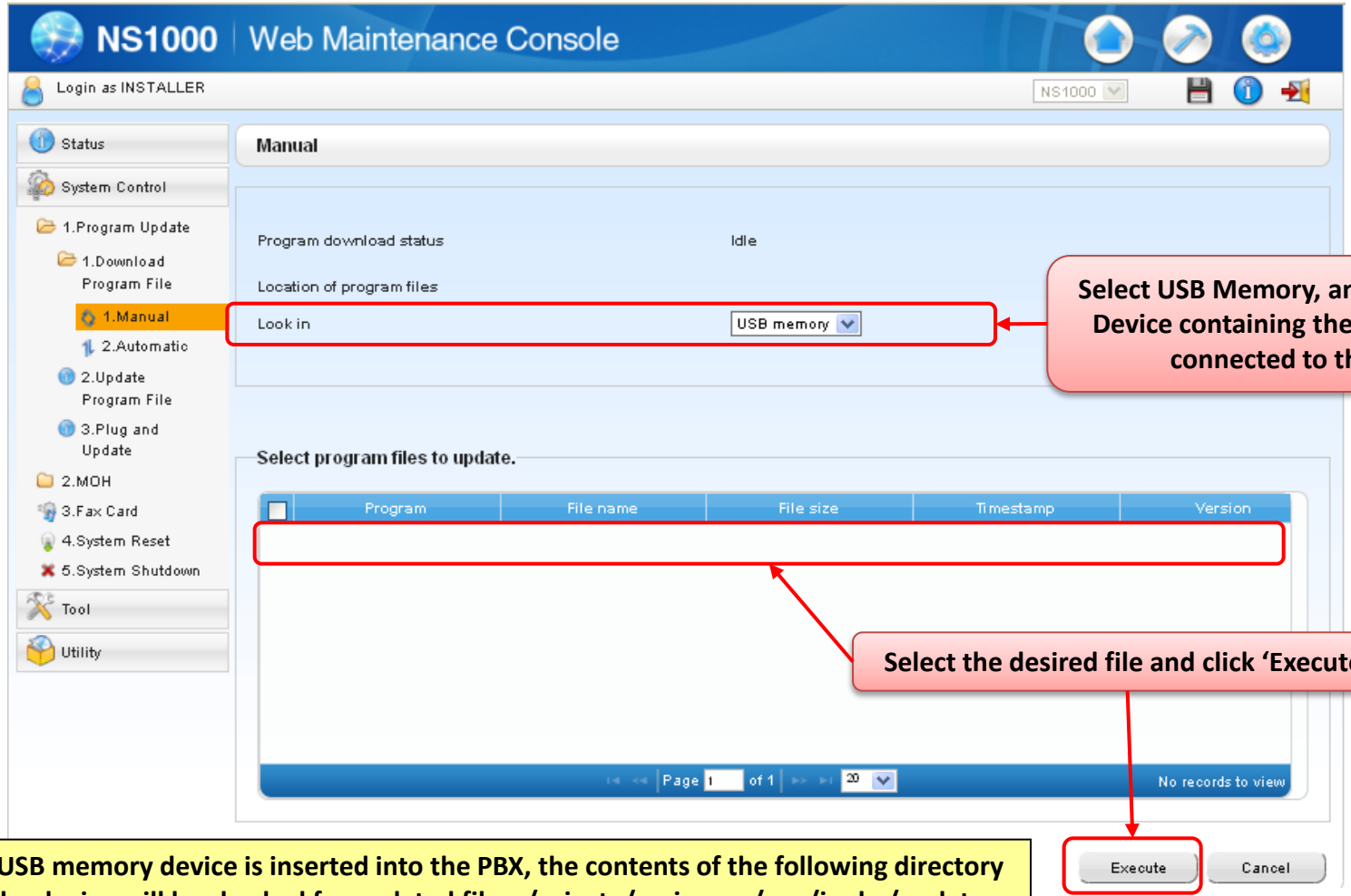


File Download takes approximately 4~5 min for PCMPR (PBX System) firmware

1.2 System Firmware Download

There are several other methods available to Download the Firmware files; PC, USB, FTP and a PBX Master system

Manual Download (2) - Download from USB



Select USB Memory, and ensure the USB Device containing the Firmware file is connected to the system.

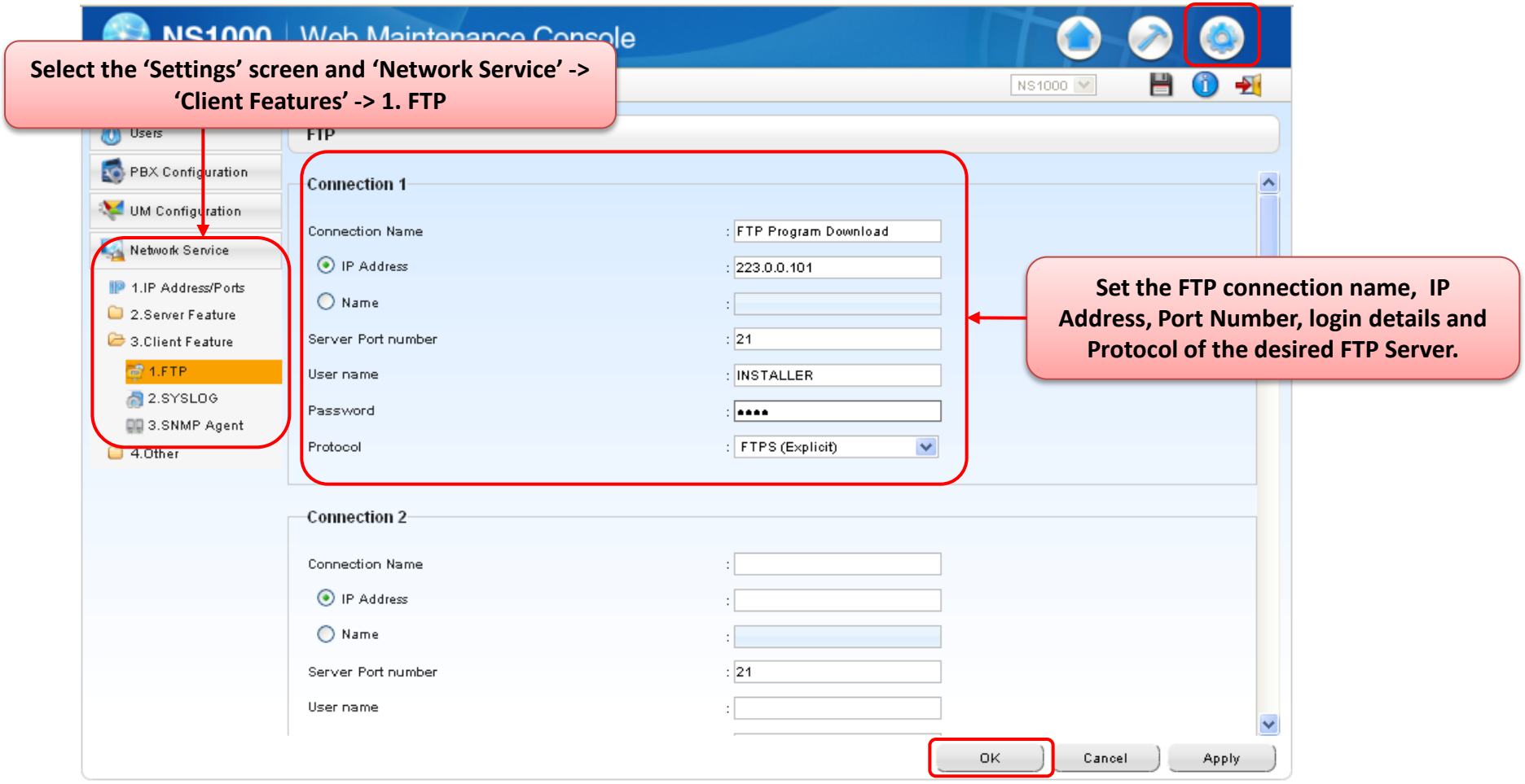
Select the desired file and click 'Execute'

If a USB memory device is inserted into the PBX, the contents of the following directory on the device will be checked for updated files: /private/meigroup/psn/ippbx/update

1.2 System Firmware Download

To support FTP download, the details of the desired FTP server must first be set in the PBX system

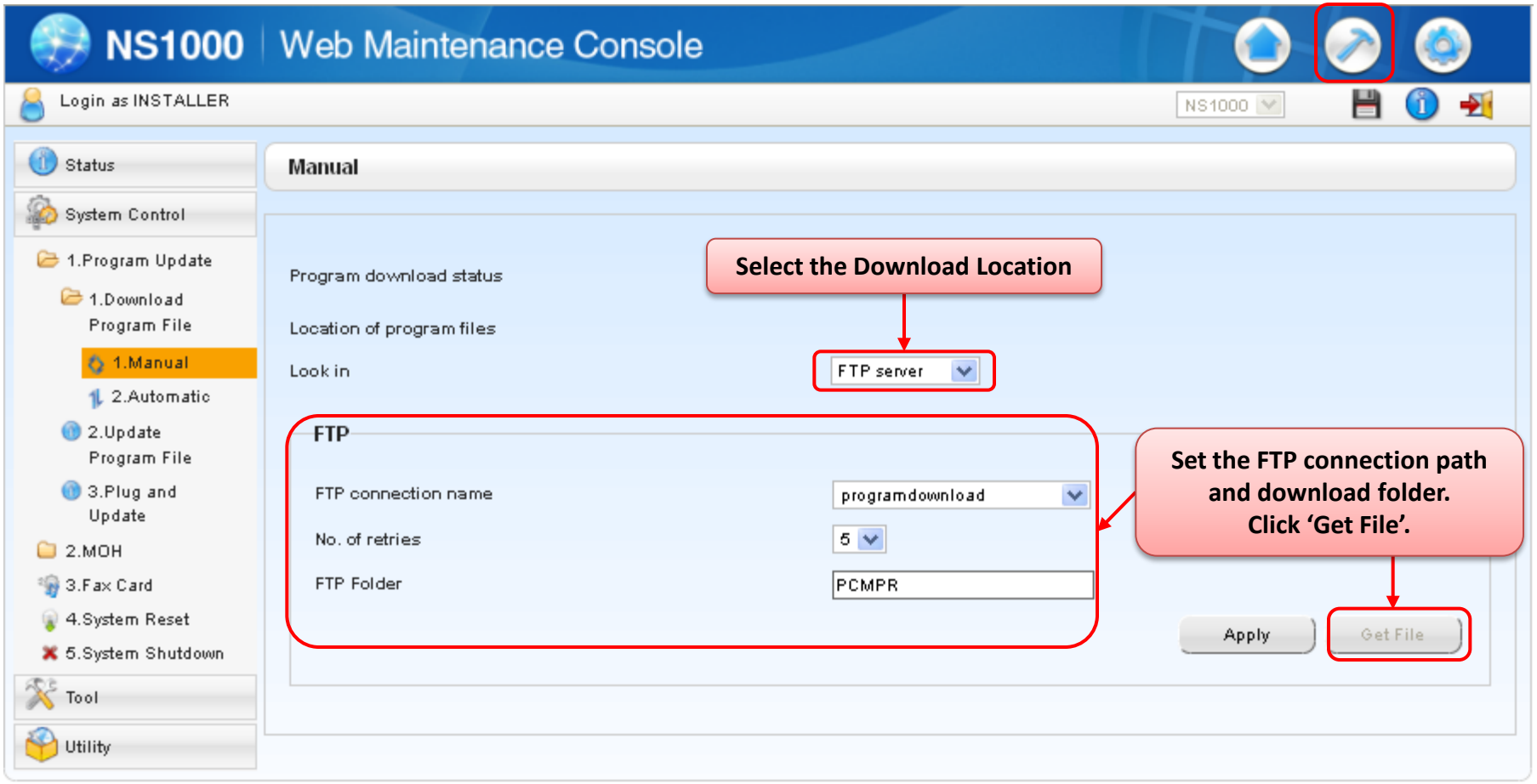
Manual Download (3) - Download from FTP (Available from MASTER Unit only)



1.2 System Firmware Download

Once the FTP Server location is set, the download can be started from the Maintenance screen

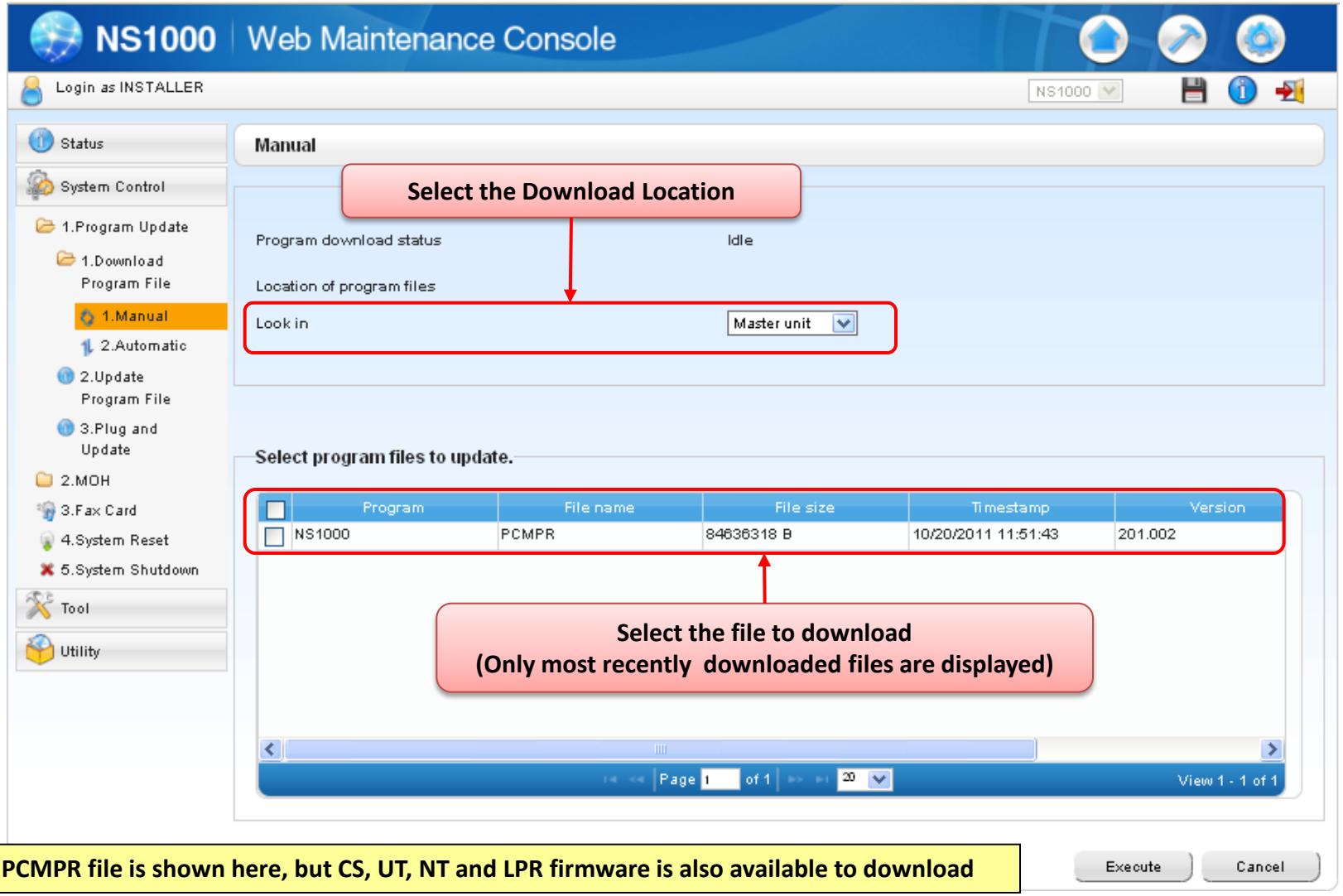
Manual Download (3) - Download from FTP (Available from MASTER Unit only)



1.2 System Firmware Download

A Slave PBX can also obtain it's firmware from a MASTER

Manual Download (4) - Download from MASTER PBX



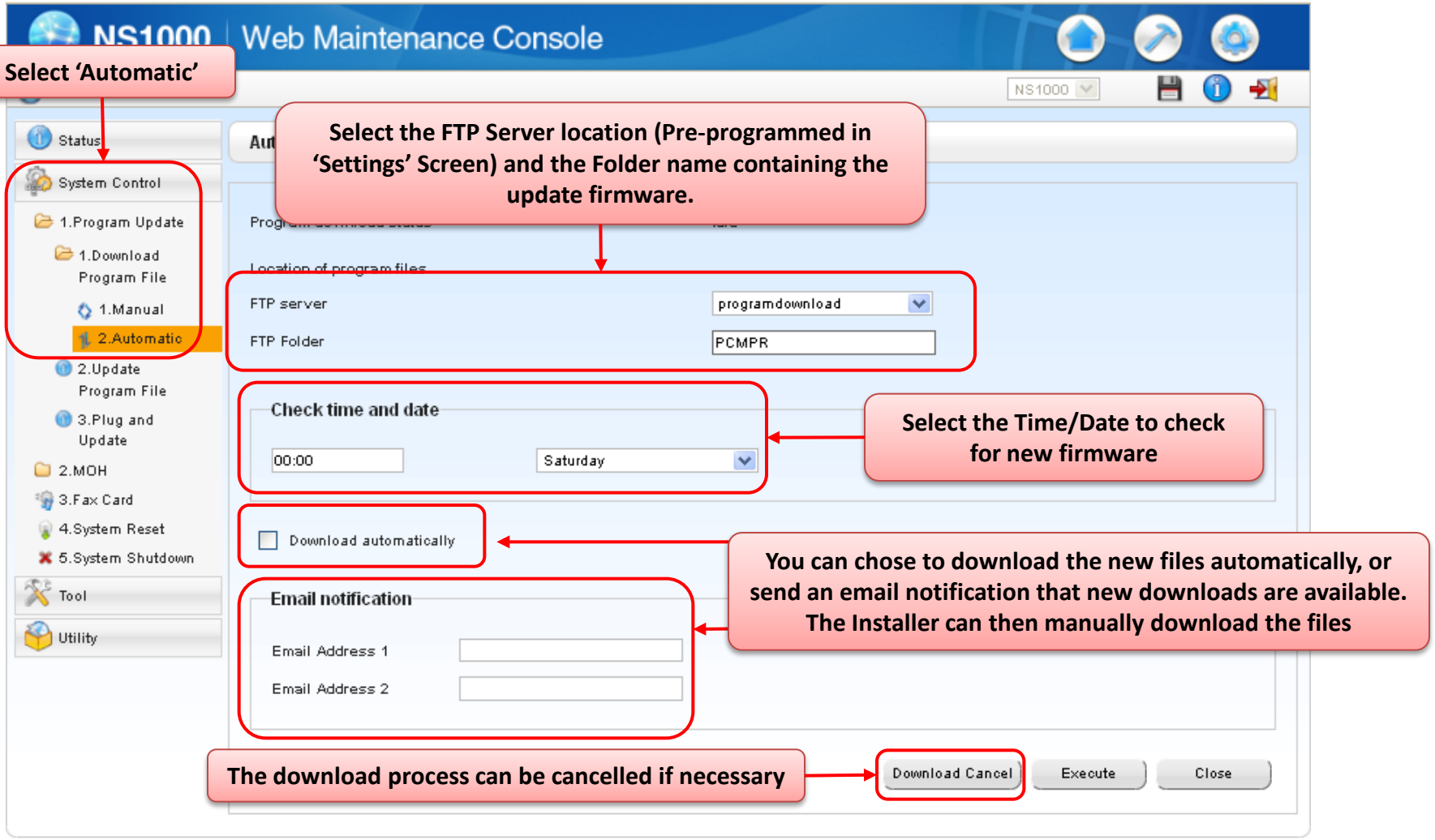
NB: PCMPR file is shown here, but CS, UT, NT and LPR firmware is also available to download

1.2 System Firmware Download

It is possible to download all available firmware updates automatically from an FTP server.

It is also possible to set the system to automatically check for updates at a specific time/day.

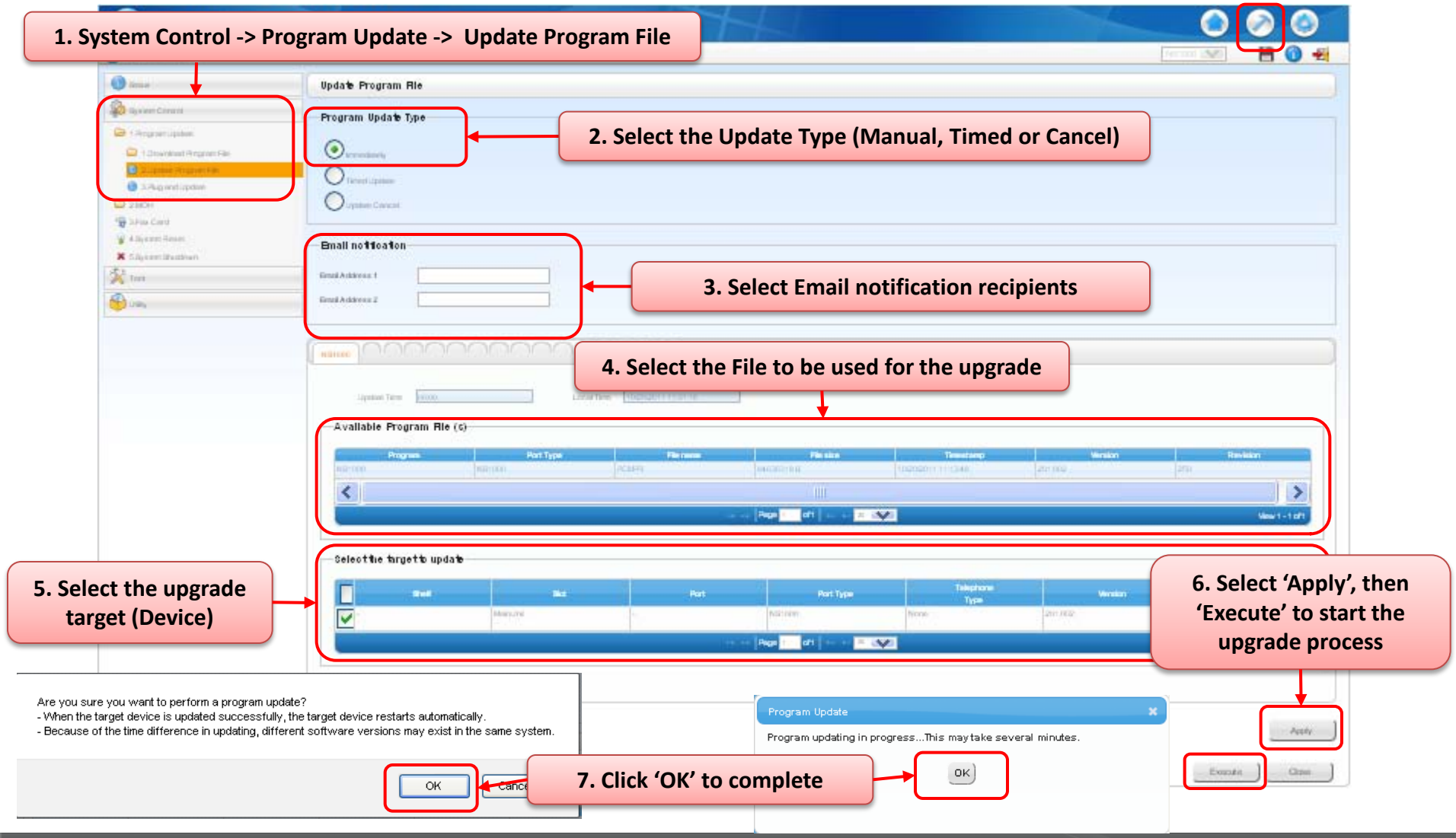
Automatic Download (4) - Download from FTP Server – MASTER UNIT ONLY



1.3 PBX System Firmware Upgrade (1)

Once download, the new firmware can be 'pushed' to the relevant device Manually or Automatically

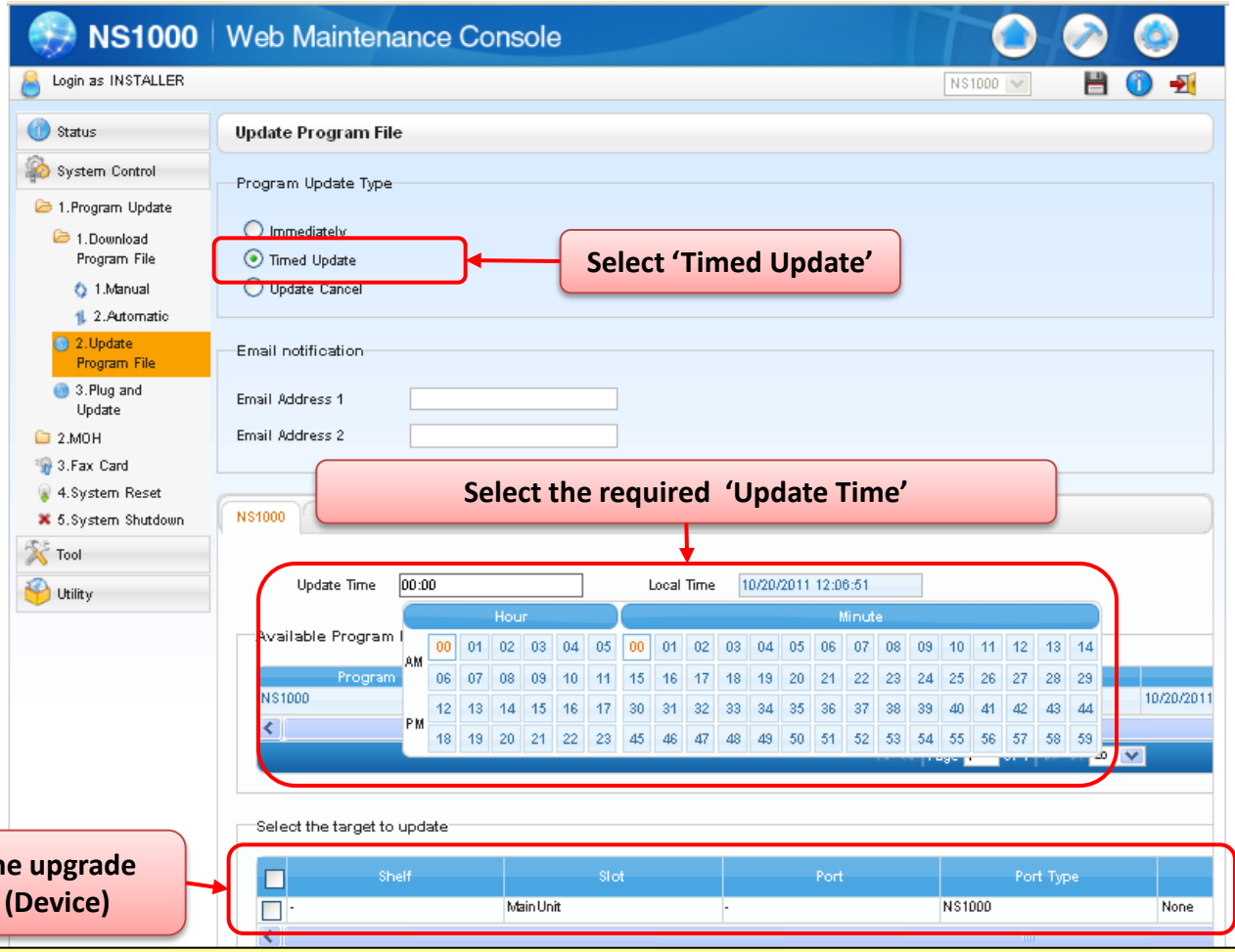
System Upgrade (1) - Manual



1.3 PBX System Firmware Upgrade (2)

Devices can be upgraded automatically at a specified time.

System Upgrade (2) - Timed

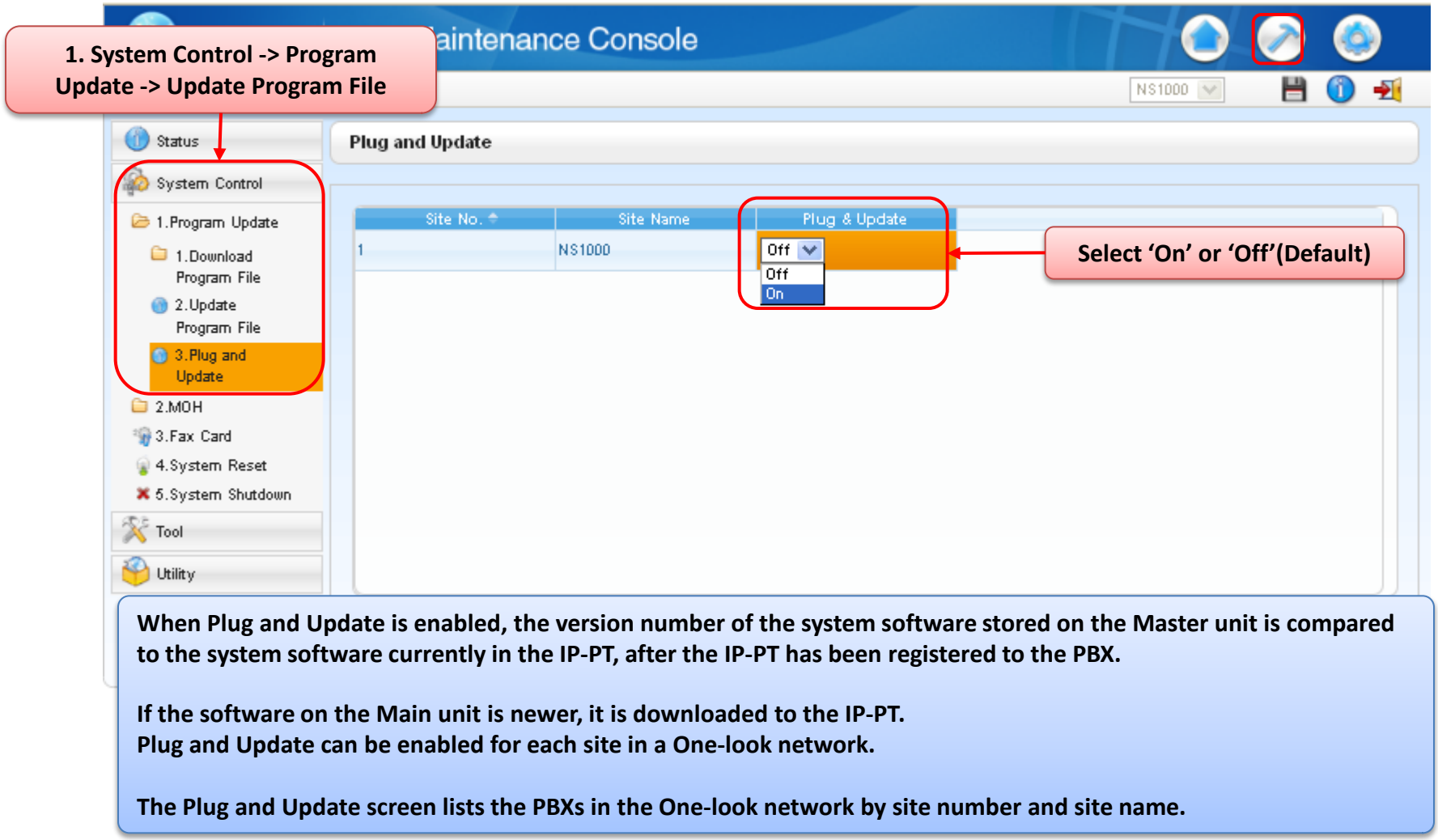


NB: Once devices have received the firmware updates, they will automatically re-boot – Take care at busy times!
If the upgrade process is made via a SLAVE Unit, only the SLAVE and Terminals registered to the SLAVE are upgraded.

1.3 PBX System Firmware Upgrade (3)

The Plug and Update feature allows IP-PTs to be automatically updated to the latest software version when they are registered to the PBX.

Plug and Update



When Plug and Update is enabled, the version number of the system software stored on the Master unit is compared to the system software currently in the IP-PT, after the IP-PT has been registered to the PBX.

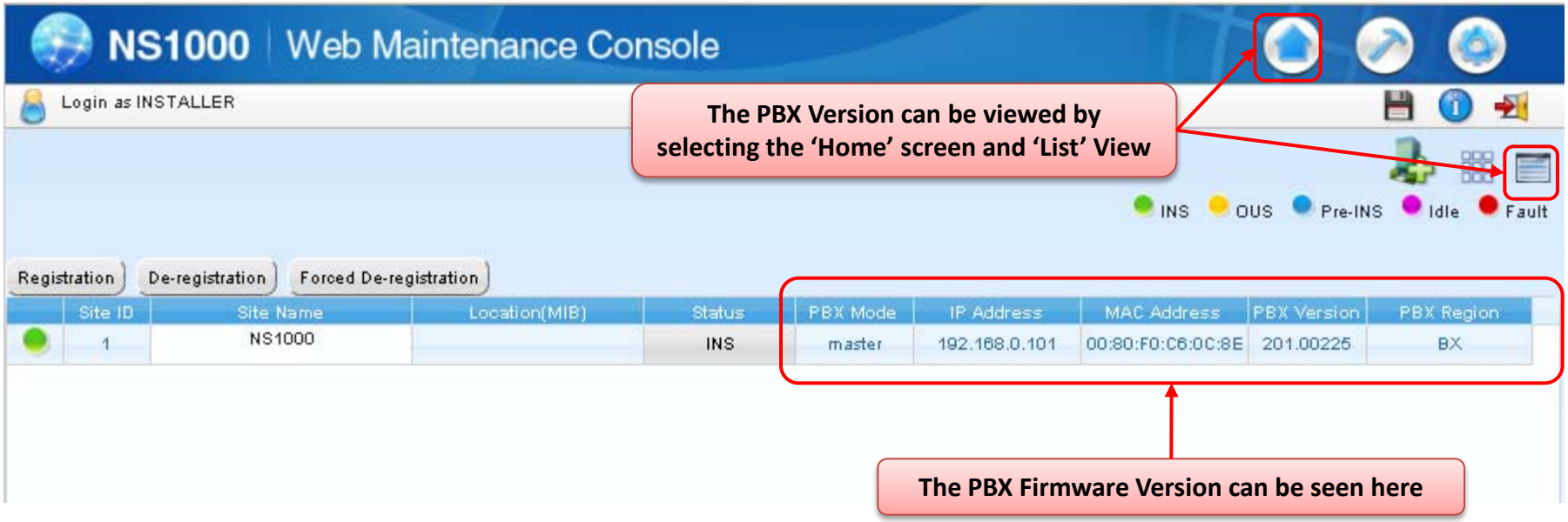
If the software on the Main unit is newer, it is downloaded to the IP-PT.
Plug and Update can be enabled for each site in a One-look network.

The Plug and Update screen lists the PBXs in the One-look network by site number and site name.

1.4 Check Firmware Version

It is possible to check the Firmware versions of each device

PBX Firmware version - check

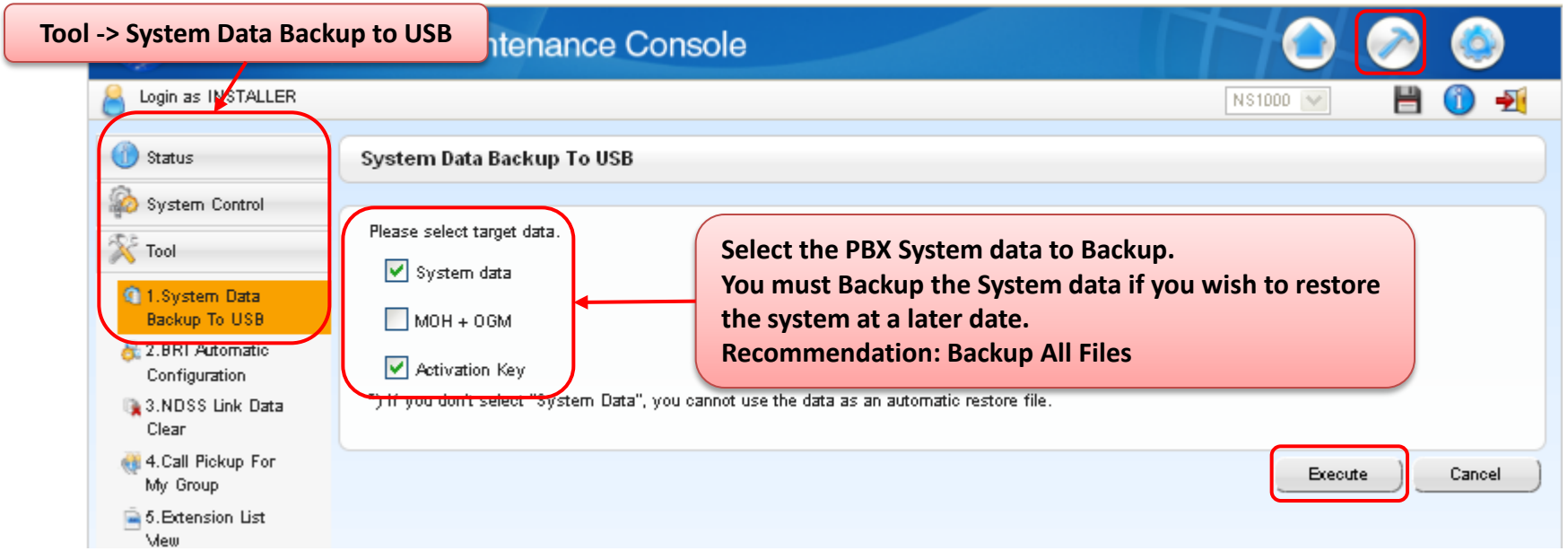


PBX SYSTEM BACKUP AND RESTORE (NOT UM)

2.1 System Backup – to USB

A PBX's system data can be backed up to a USB memory device inserted into the PBX's USB port.
At a later time, the USB memory device can be used to restore the backed up system data to a PBX.

System Backup to USB



NB:
- **The UPS connection must be removed before inserting the USB Device – re-connect it afterwards.**
- **UM data is backed up using a different process – only PBX data is backed-up by this process.**
- **Use a USB Device with minimum 512MB free space.**

2.2 System Restoration – From USB

Restoring backed up data from a USB memory device to a PBX.

Follow the procedure below to restore the backed up data to a PBX.
Note: The restoration process requires that the PBX is initialised, which returns the PBX to its factory default state.

Under the following conditions, restoration may not be possible, even though the PBX has been initialised.

- The USB memory device hardware is faulty.
- The data on the USB memory device has become corrupted.
- The USB memory device is removed from the USB port of the PBX during the restoration process.

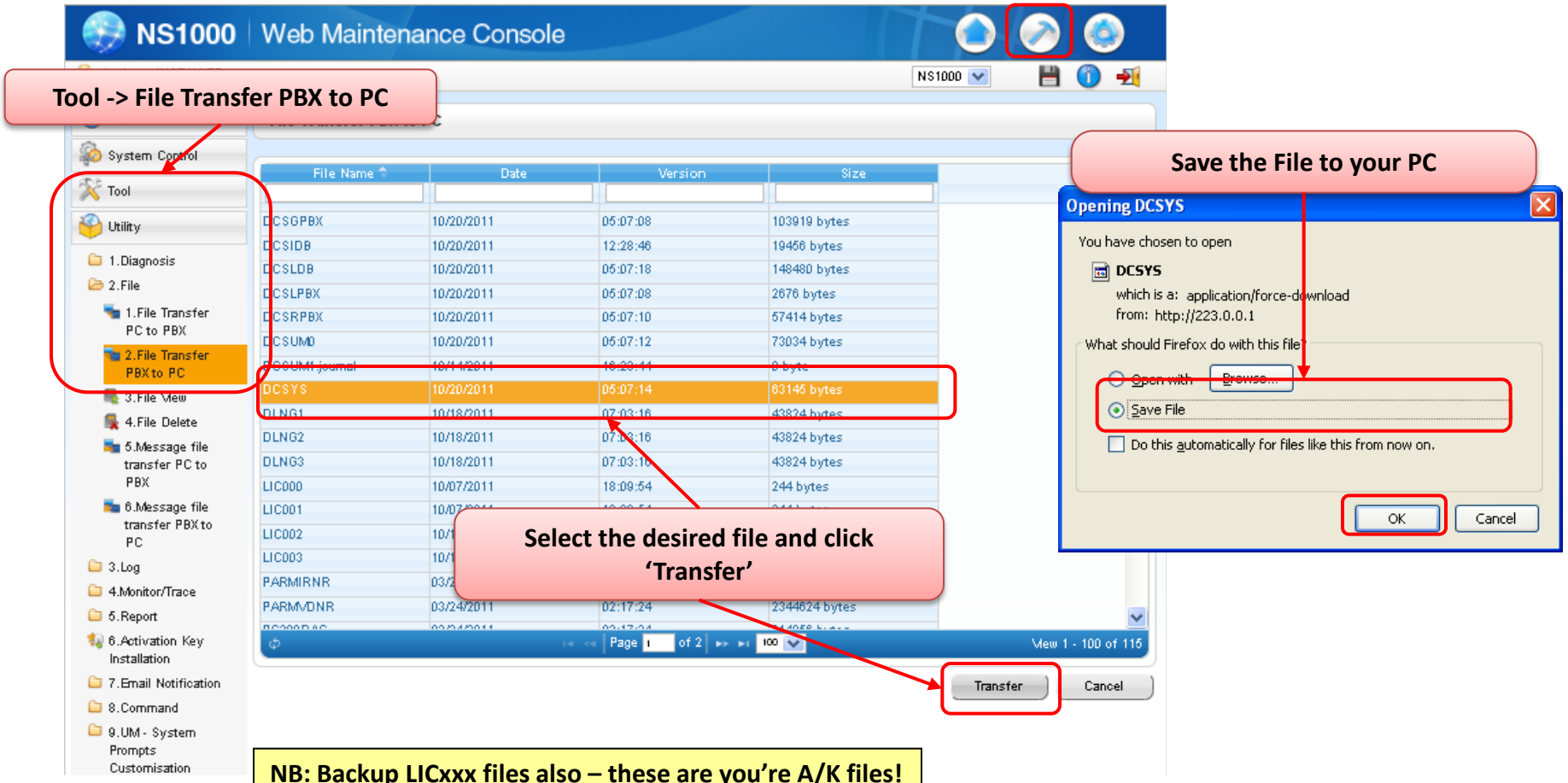
To minimise the potential of a failed backup, connect the USB memory device to a PC to confirm the USB memory device is operational and that the backup data is intact before starting this restore process.

1. The PBX must be in a powered-off state.
2. Insert the USB memory device with the backup data into the USB port of the PBX.
3. Set the PBX's System Mode Switch to the "SYSTEM INITIALIZE" position.
4. Turn on the PBX's power switch. The STATUS indicator will flash green.
   Slide the System Mode Switch back to the "NORMAL" position.
   The restore process will begin and the STATUS indicator will flash rapidly.
5. When the restoration process is completed, the PBX will restart automatically.

2.3 System File Backup - PC

A PBX's system data (DCSYS File and LICxx Files) can be backed up to PC if a USB device is not available.

At a later time, the files can be transferred back to the PBX and a restore made.

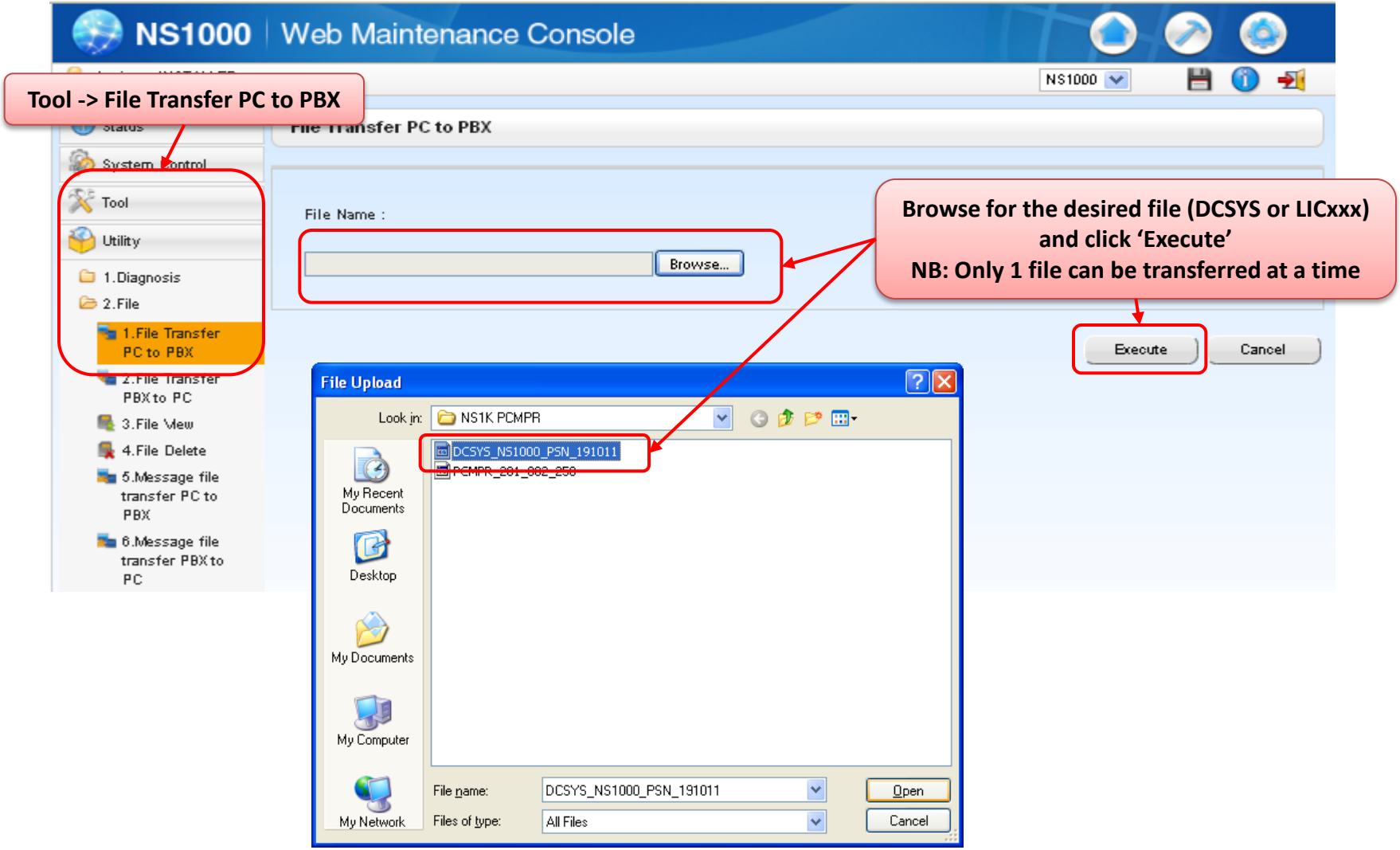


NB: Backup LICxxx files also – these are you're A/K files!

It is possible to restore the system using the 'File Transfer PC to PBX tool, followed by a system Reset (via WebMC).

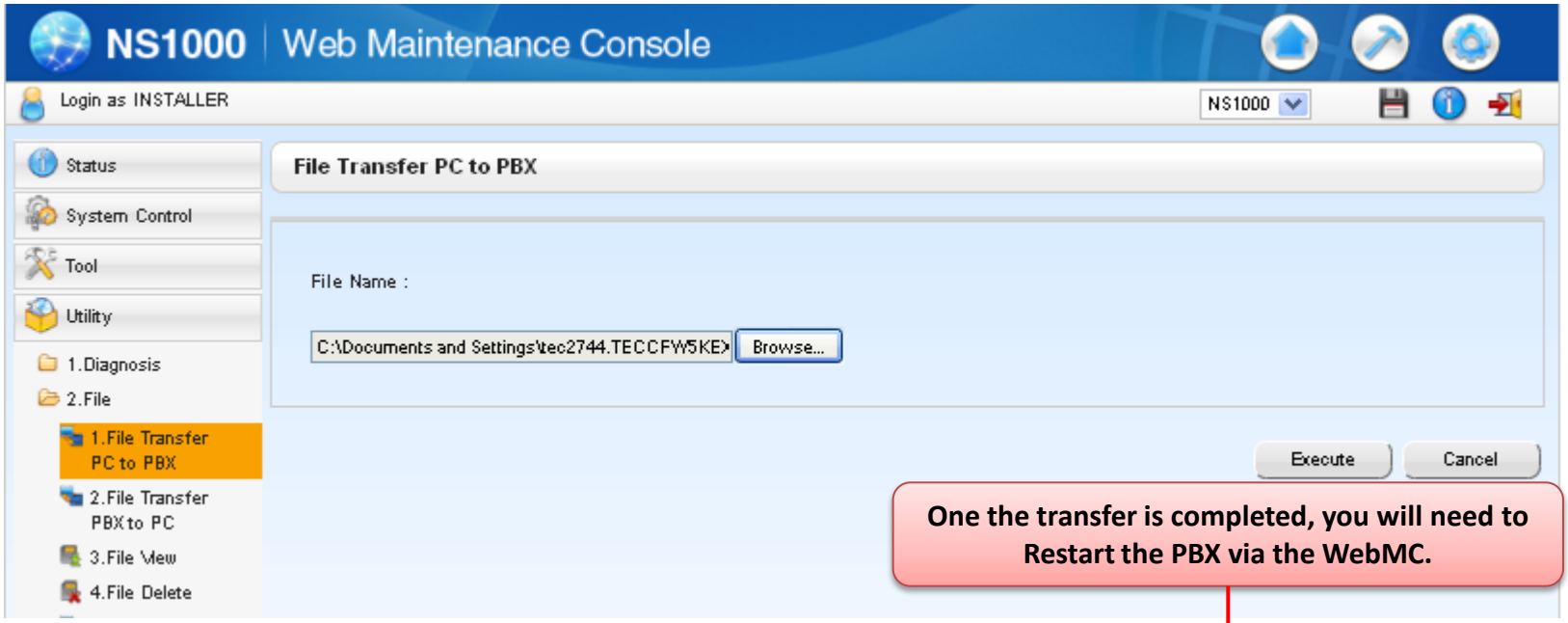
2.4 System File Restore – PC (1)

A PBX's system data (DCSYS File and LICxx Files) can be restored from a PC .

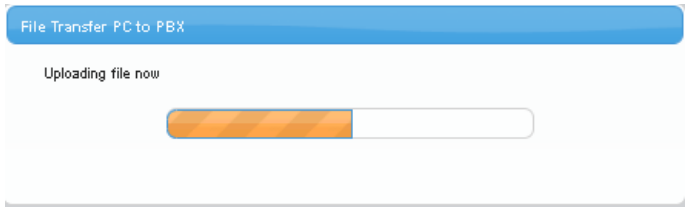


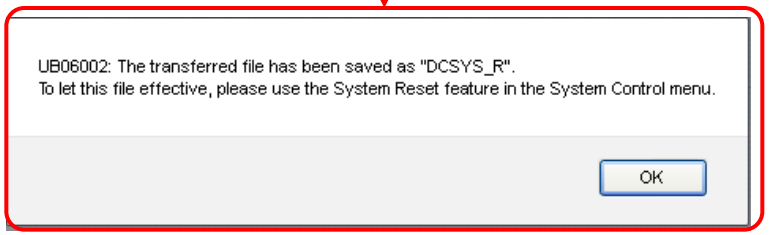
2.4 System File Restore – PC (2)

The files will be transferred from the PC to the PBX.



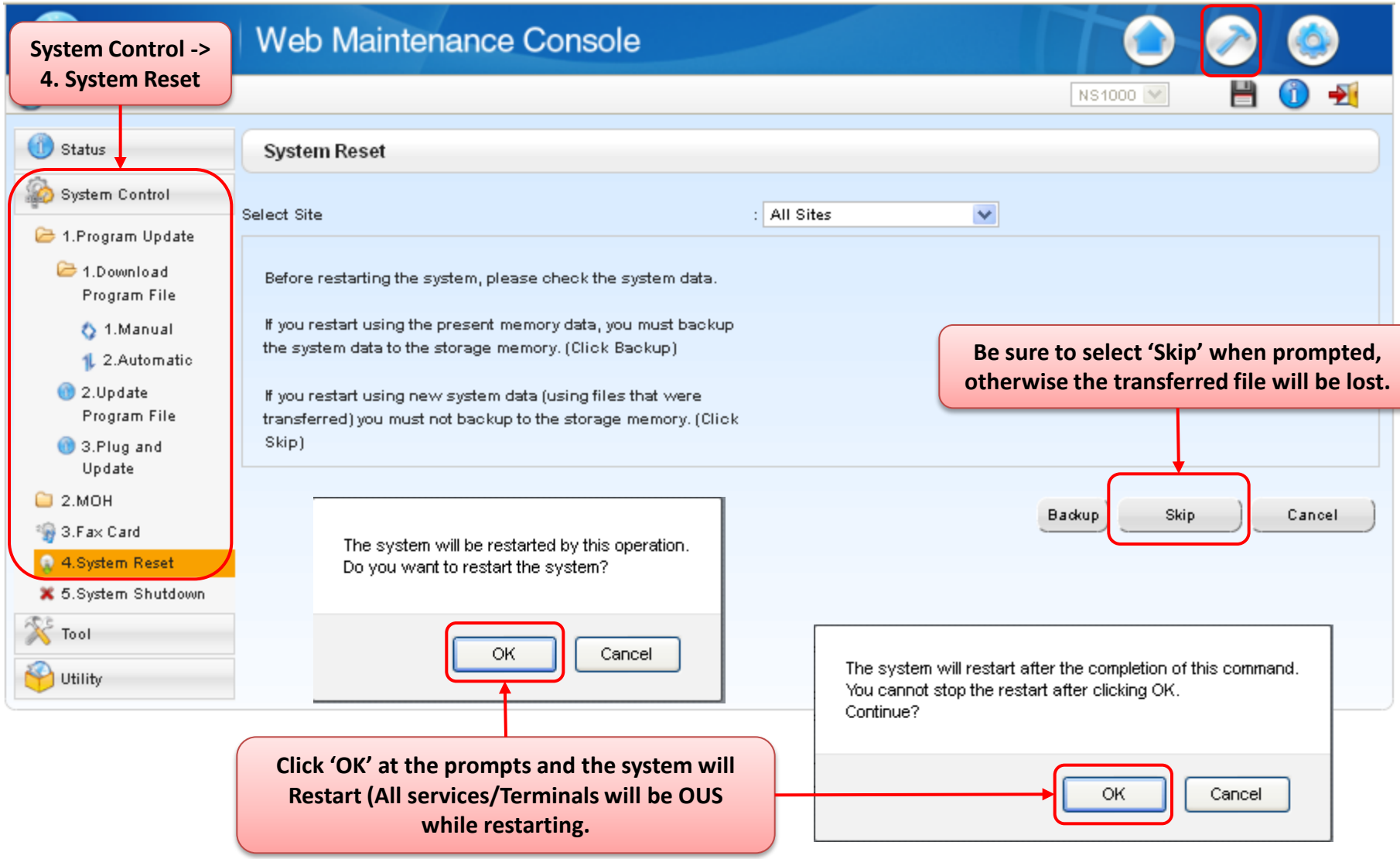
One the transfer is completed, you will need to Restart the PBX via the WebMC.





2.4 System File Restore – PC (3)

Select ‘System Reset’ to make the transferred file active .

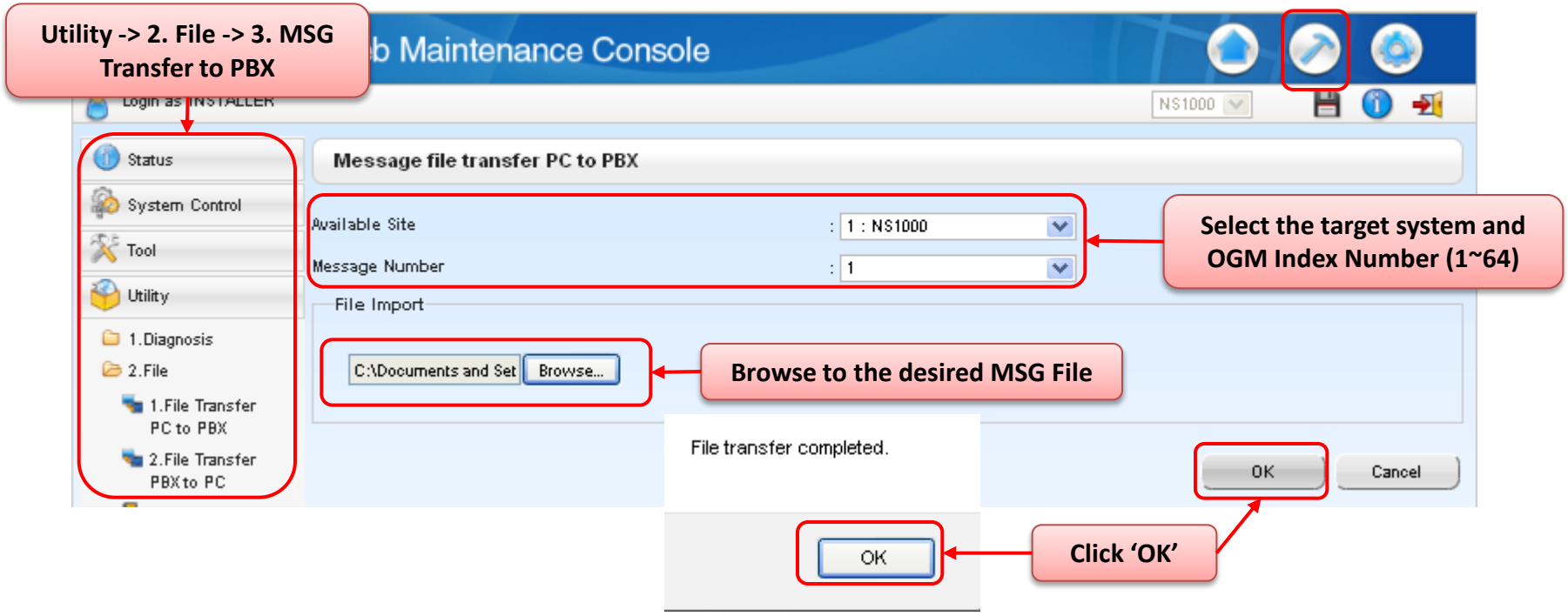


OGM
OUT GOING MESSAGES

3.1 OGM File Upload - PC (1)

A maximum of 64 Outgoing messages (OGM)can be recorded on a PBX.
In a One-look network, 64 messages can be recorded at each site (Max 64min recording time per site).
Using a PC, OGM files can be easily managed between PBX Units.
It is also possible to download MSG files from the PBX using the 'MSG Transfer to PC' Utility.

Messages downloaded to a PC are WAV (G.711a/μ) format.
Messages uploaded from a PC must be in one of the following formats:
WAV (linear PCM) or WAV (G.711a/μ).



Messages at all sites can be recorded, listened to, and deleted using the Master unit. However, in operation a PBX can only use messages stored locally. E.g. when incoming callers queue, only an OGM from the PBX at which the callers are queuing can be used. An OGM from another site cannot be used.

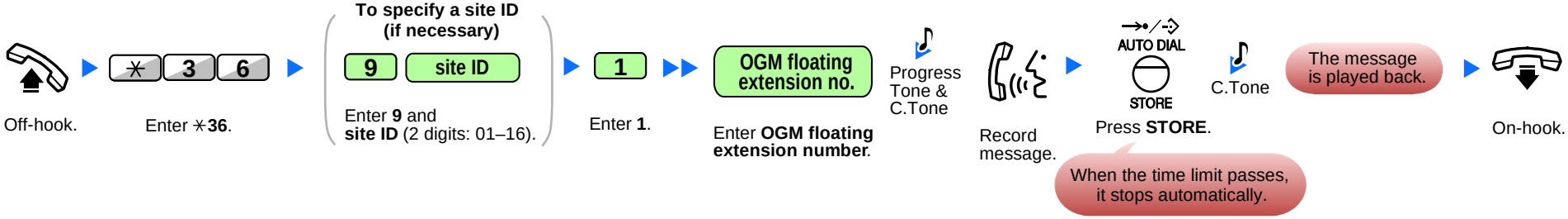
3.2 OGM Recording – IP-PT

The manager extension (COS Setting) can record three kinds of greeting messages (OGM) as follows:

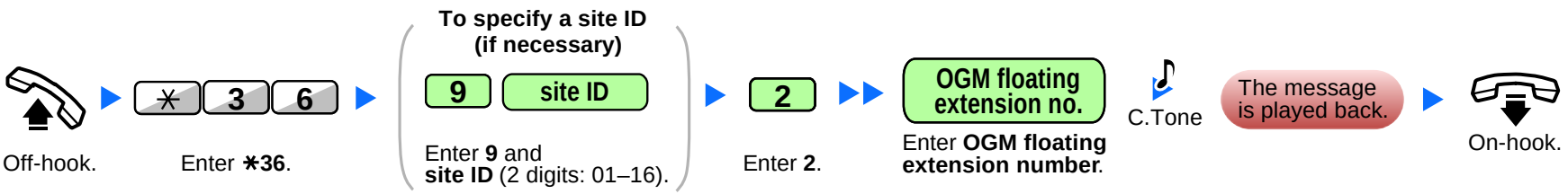
1. DISA message: Used to greet and guide callers.
2. Incoming Call Distribution Group message: Used to greet and guide callers to an ICD-G
3. Timed Reminder message: Used for a wake-up call message.

OGM recording can be accomplished via a Manager Extension using the sequence below

To Record



To Playback



MOH (MUSIC ON HOLD)
BGM (BACKGROUND MUSIC)
UPLOAD / BACKUP

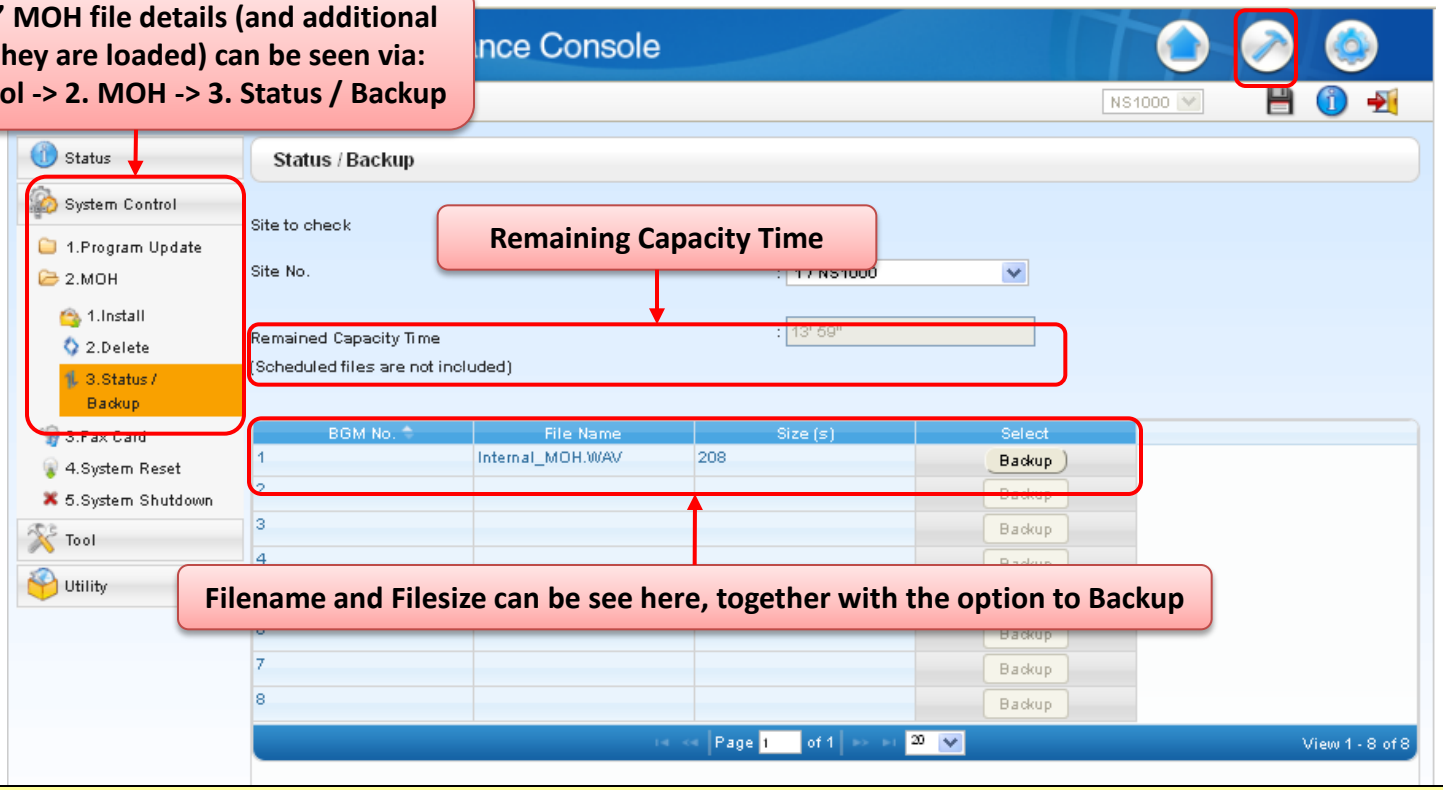
4.1 MOH/BGM File Status

Initially, a preinstalled audio file is set as the audio source for BGM 1.

Through system programming, this file can be removed or replaced like any other BGM audio file.

However, if the PBX is re-initialised, this preinstalled audio file is set to BGM 1 again.

The 'Default' MOH file details (and additional files when they are loaded) can be seen via: System Control -> 2. MOH -> 3. Status / Backup

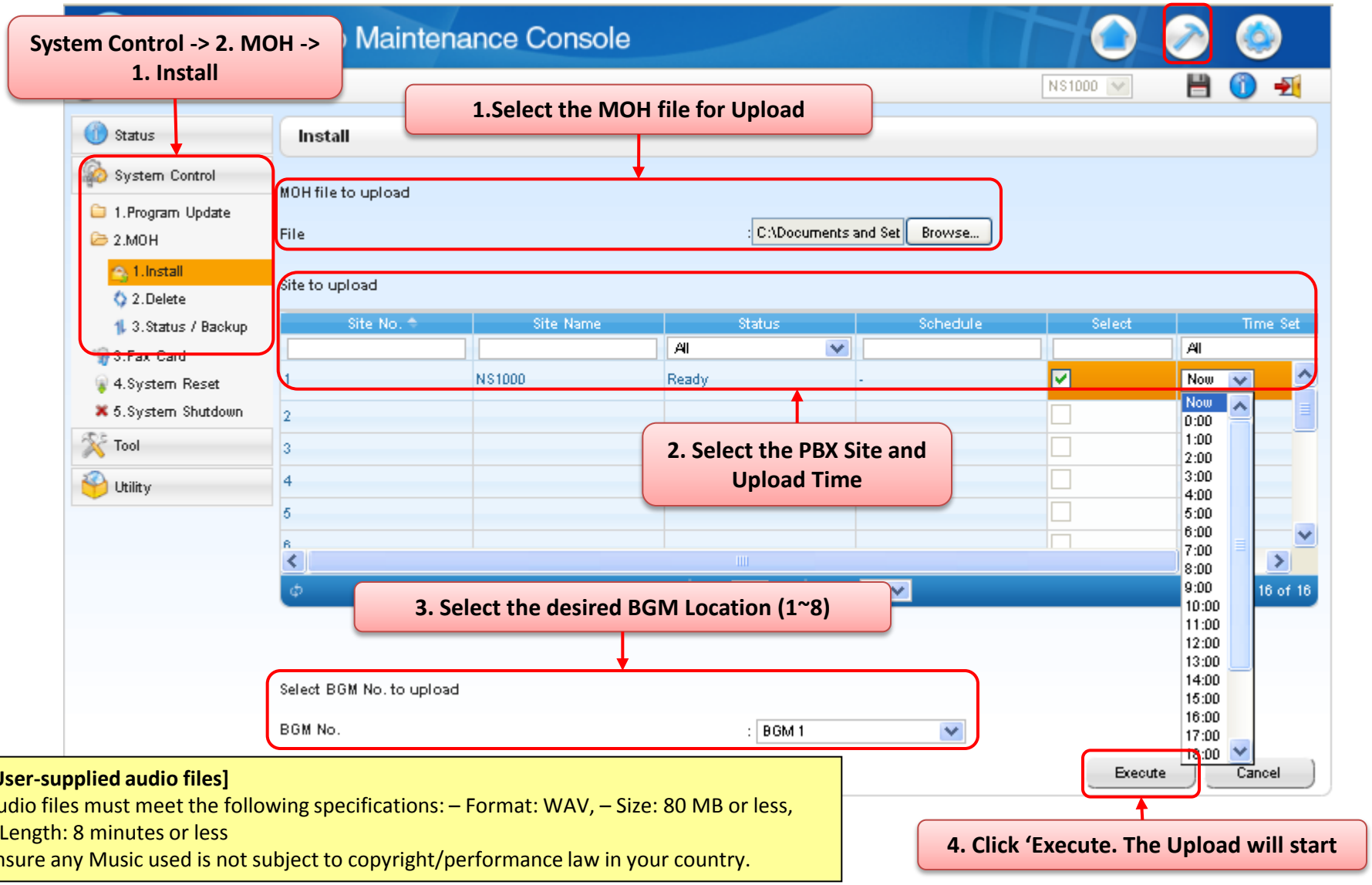


Notes

- Users logged in to the Master unit can see the status of all One-look network sites. Users logged in to a Slave unit may only view the status of that PBX.
- Only WAV files can be installed and file names must not exceed 14 ASCII characters in length.
- Files may not be larger than 80 MB.
- User (User) level accounts cannot perform this procedure.

4.2 MOH/BGM File upload

MOH Files can be uploaded to 8 different BGM locations over multiple sites using a PC .

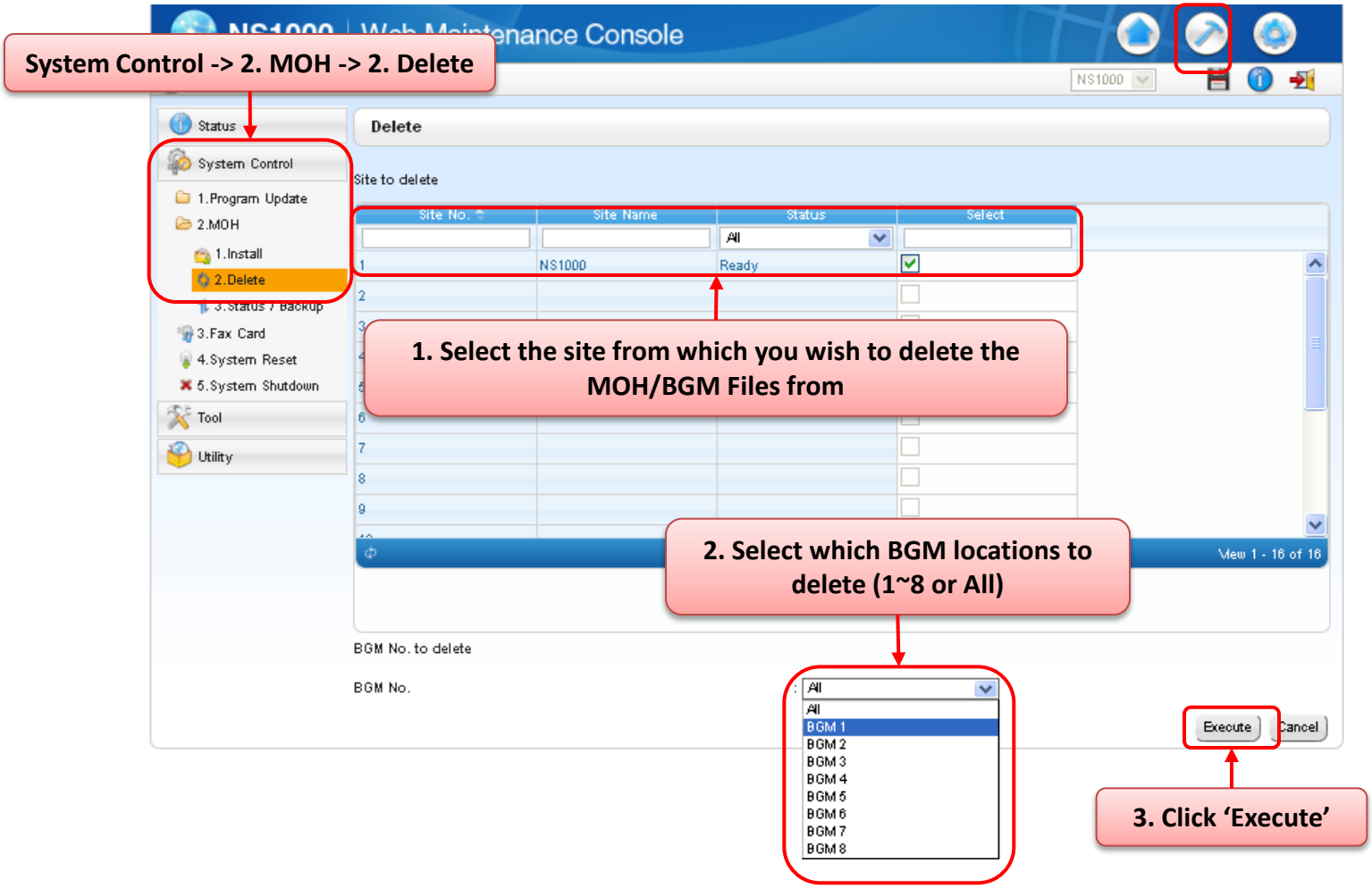


[User-supplied audio files]
Audio files must meet the following specifications: – Format: WAV, – Size: 80 MB or less, – Length: 8 minutes or less
Ensure any Music used is not subject to copyright/performance law in your country.

4.3 MOH/BGM File Deletion

MOH Files can be managed across all sites via the MASTER unit.

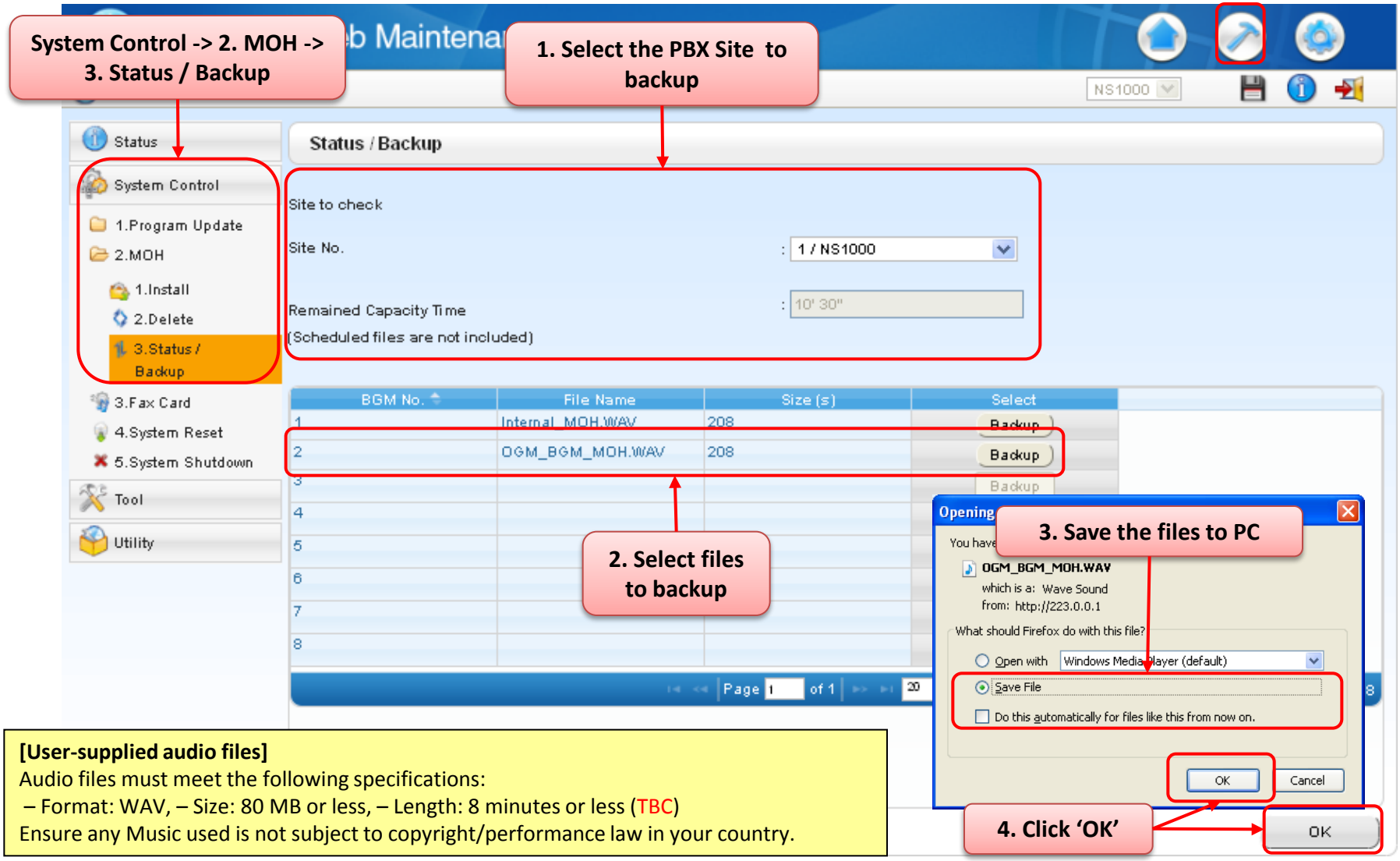
Existing files can be deleted, allowing new files to be uploaded in their place.



4.4 MOH/BGM File Backup

It is possible to backup MOH/BGM files to a PC.

In the event of a system failure, the files can be easily re-uploaded



[User-supplied audio files]

Audio files must meet the following specifications:

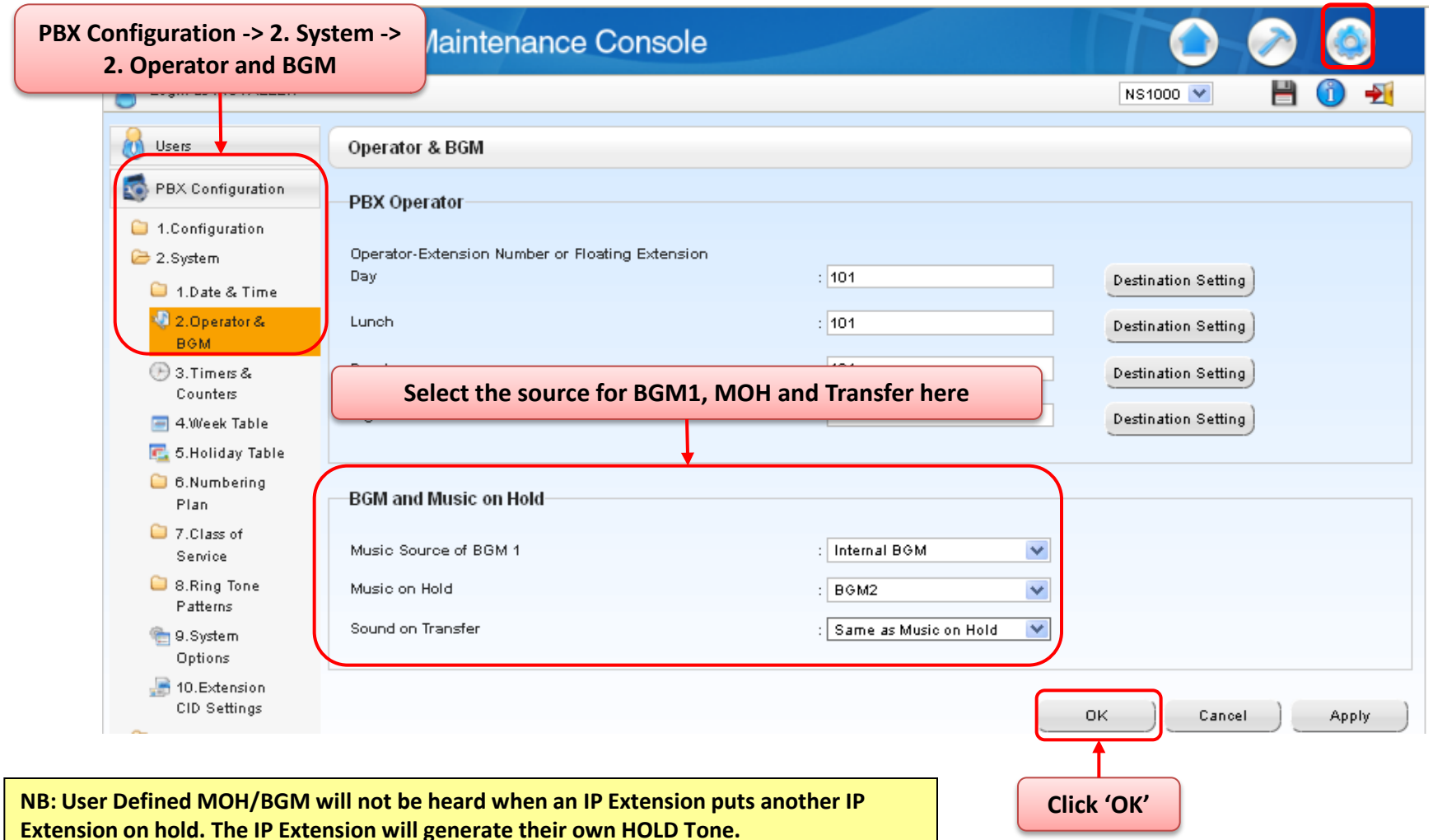
– Format: WAV, – Size: 80 MB or less, – Length: 8 minutes or less (TBC)

Ensure any Music used is not subject to copyright/performance law in your country.

4.5 MOH/BGM Assignment

Via System Programming, the appropriate MOH/BGM source can be selected.

(For details of External MOH Sources, refer to the Installation Manual)



NB: User Defined MOH/BGM will not be heard when an IP Extension puts another IP Extension on hold. The IP Extension will generate their own HOLD Tone.
(Any P2P communication (No DSP) will not hear User defined MOH)

UPGRADE & BACKUP COMPLETE

Section - 8

MAINTENANCE

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Appendix 1 - MIB
Appendix 2 - Supported USB

Chapter 1

SYSTEM SHUTDOWN - RESET

1.1 UPS Connection and setting (1)

UPS (Uninterruptible Power Supply) Integration

Description

An uninterruptible power supply unit (UPS) is a device that supplies power for several minutes to a connected device when a power failure occurs.

If the PBX is connected to a compatible UPS via USB when a power failure occurs, the PBX can determine how much power remains in the UPS and shut down when the remaining power drops below a specified amount to prevent data loss or corruption.

The following features are also available:

- Specify the remaining battery level at which to shut down the PBX.
- Receive e-mail notifications of changes to the status and availability of a UPS.

Conditions

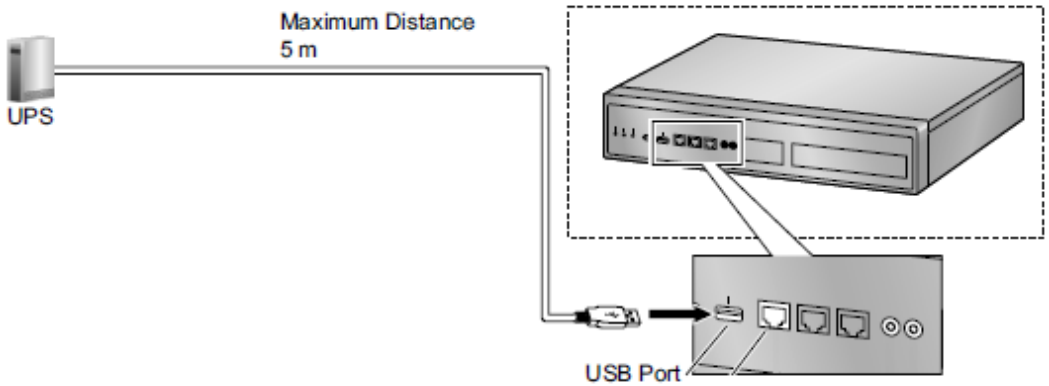
- For details about UPS units that are compatible with the automatic shutdown feature of this PBX, consult your dealer. If an incompatible UPS is connected and the UPS runs out of power, the PBX will turn off without shutting down.
- The power cord and USB cable must be connected to the same UPS. Connecting them to different UPSs can result in incorrect operation.

IMPORTANT

- When power is restored after a power outage, the PBX operates in the following manner:
  - If the PBX did not shut down, normal operation continues uninterrupted.
  - If the PBX shut down and power remains in the UPS, the PBX must be started again manually.
    (The power switch must be turned off and then on again.)
  - If the PBX shut down and no power remains in the UPS, the PBX starts automatically.
    (This is because the PBX's power switch is on.)

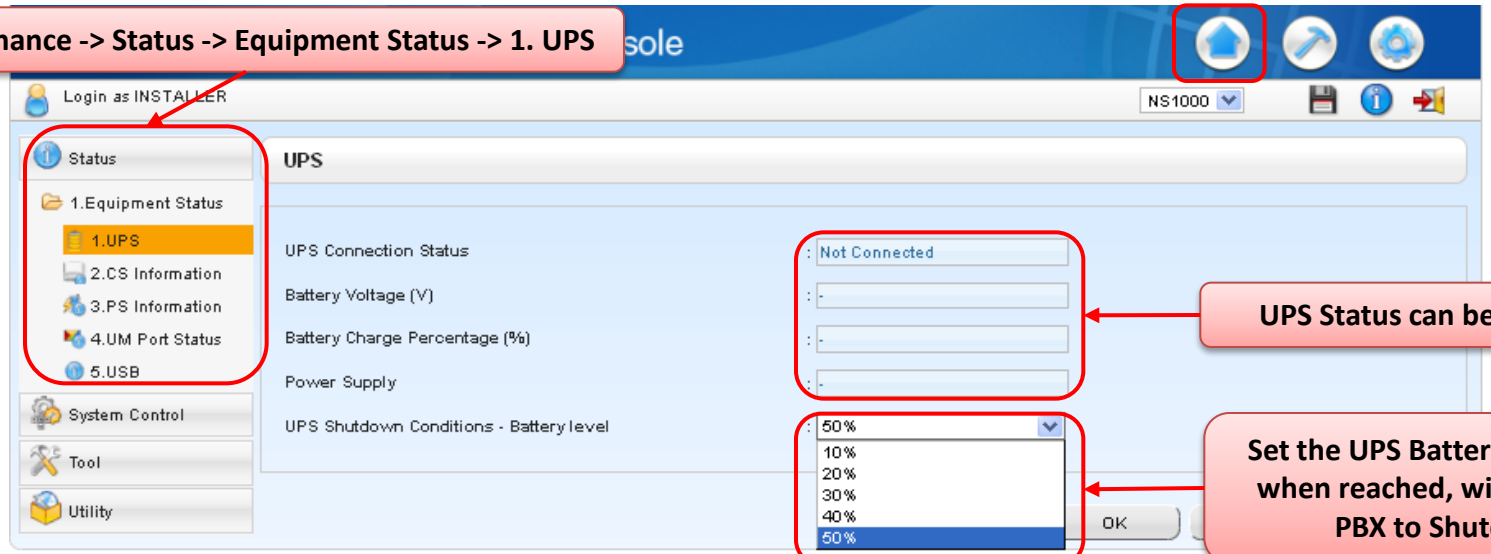
1.1 UPS Connection and setting (2)

1. Connect the UPS as described in the Installation manual



2. Set the NS1000 Shutdown threshold via the WebMC

Maintenance -> Status -> Equipment Status -> 1. UPS



UPS Status can be seen here

Set the UPS Battery Level, that when reached, will cause the PBX to Shutdown

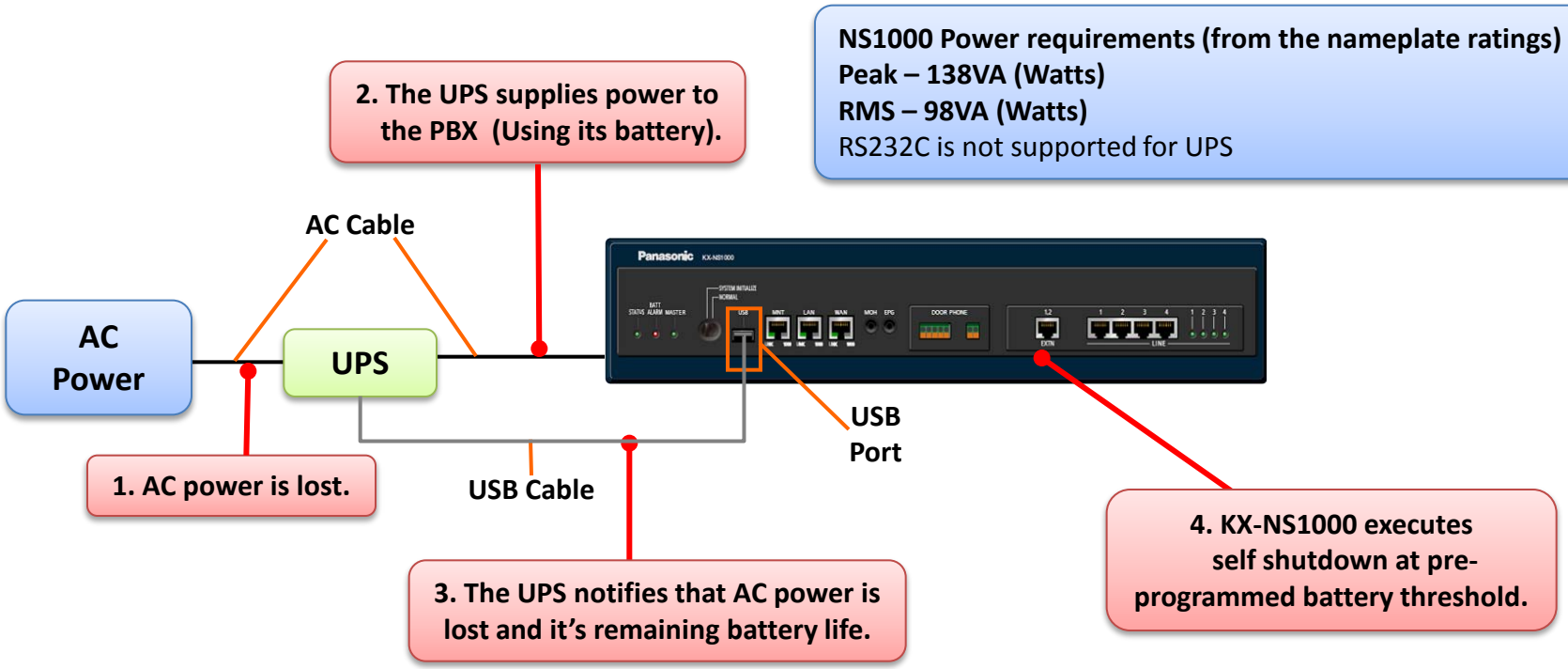
NB: UPS Status alerts can also be sent via email.

1.2 System Shutdown with UPS

The UPS Provides a Safe Shutdown Process during AC Power Failure

Because the NS1000 system uses a Linux Based OS, the KX-NS1000 must be powered down using the Shutdown process to avoid possible damage to the systems File Structure.

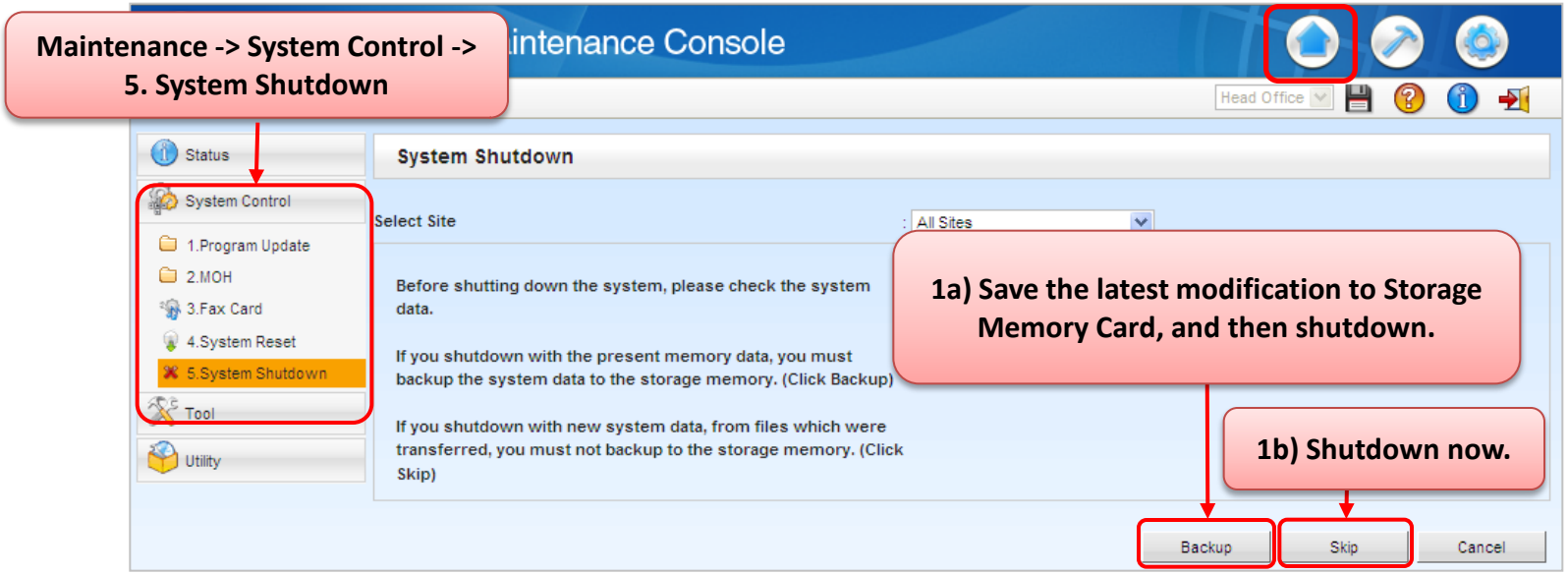
UPS Connection diagram and automatic shutdown process



NB: When NS1000 is 'Shutdown', it will not power back on automatically when power is restored – the AC Switch needs to be switched OFF/ON

1.3 System Shutdown - Manual

The NS1000 system can be safely Shutdown by the following process



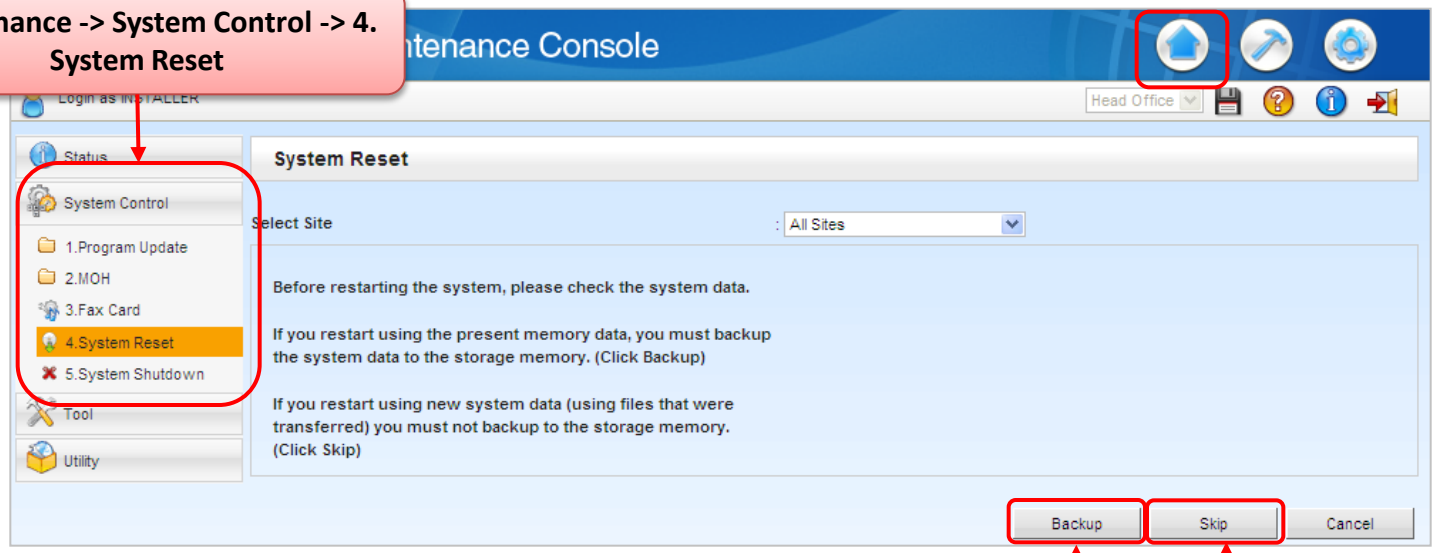
2.) Flashing Amber → Amber ON

3.) Turn AC Switch OFF

1.4 System Reset/Restart

The NS1000 system can Reset/Restarted by the following process

Maintenance -> System Control -> 4. System Reset



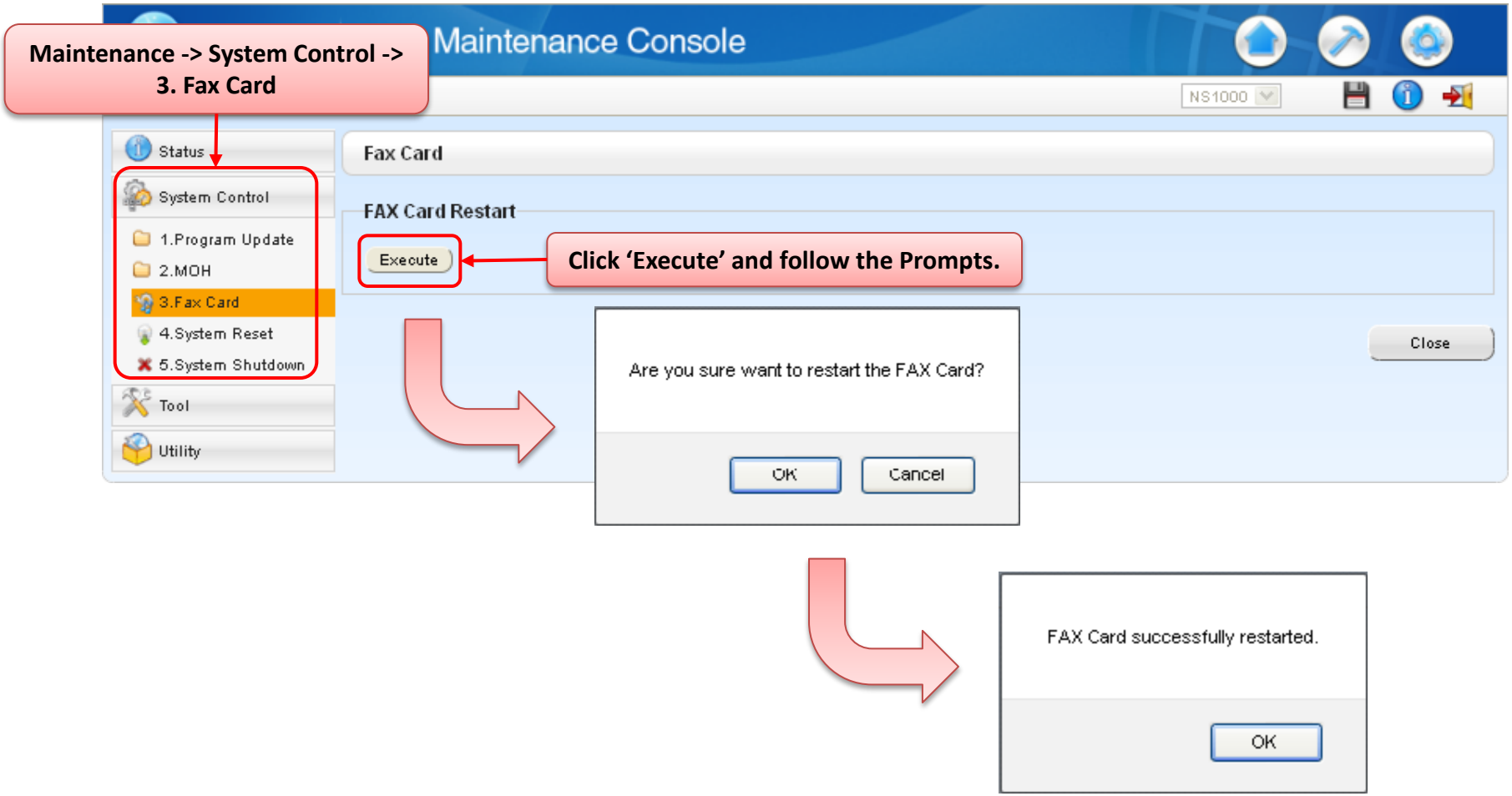
Save the latest modification to Storage Memory Card, and then reset.

Reset now.

NB: This process does not set the system back to 'Factory Default'.
To reset ALL settings, the system must be re-initialised.

1.5 FAX Card Reset/Restart

The NS1000 FAX Card (if fitted) can be safely Restarted by the following process



Chapter 2

UM BACKUP AND RESTORE

2-1. UM Data Backup / Restore

System Prompts / Mailbox Prompts / Mailbox Messages

The following system programming data, system parameters, and voice data can be backed up or restored as individual files

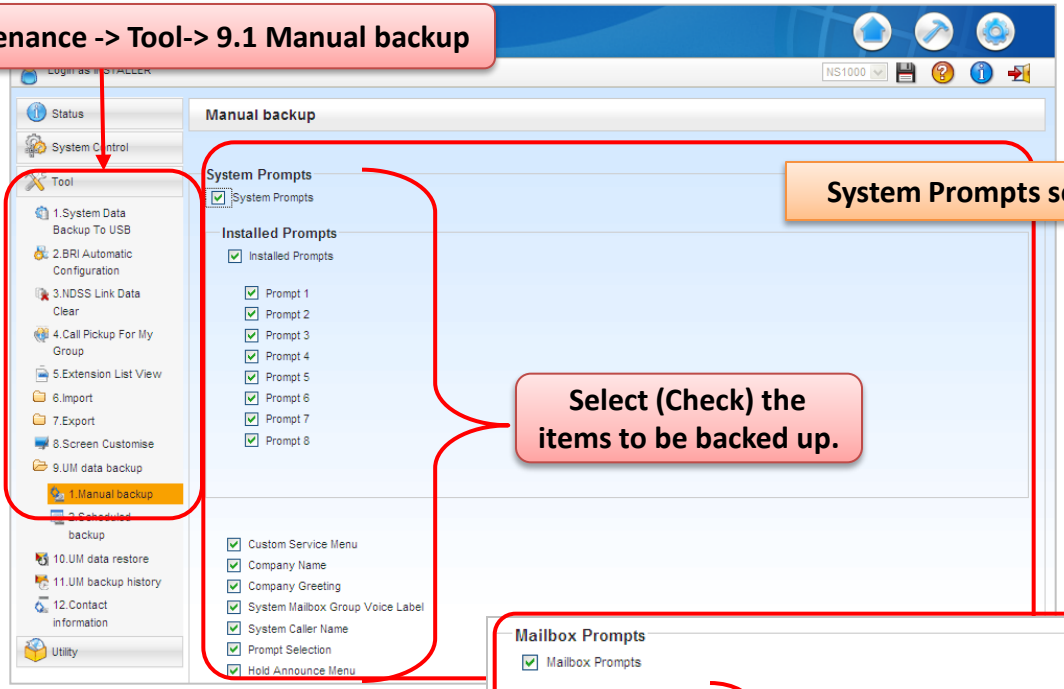
Type	Main Items
System Prompts	- Installed Prompt - Custom Service Menu - etc.
Mailbox Prompts	- Owner Name - Personal Greetings - etc.
Mailbox Message	

* Please refer to the PC Programming Manual for details.

The UM data backup can be executed manually or scheduled to run automatically at regular intervals.

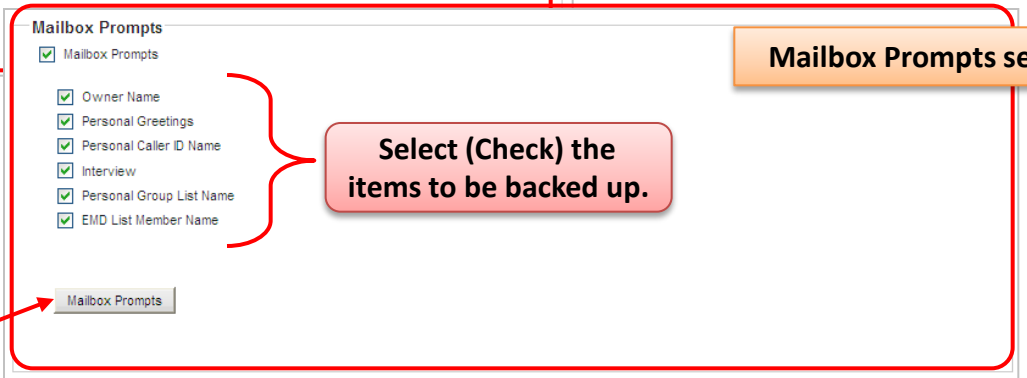
2.2. Backing up the UM Data (manual) (1)

Maintenance -> Tool-> 9.1 Manual backup



System Prompts settings

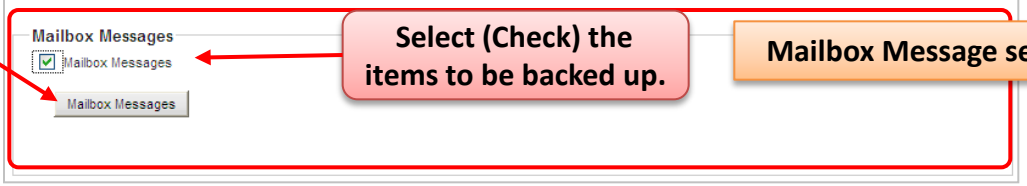
Select (Check) the items to be backed up.



Mailbox Prompts settings

Select (Check) the items to be backed up.

To configure more detailed settings, click these buttons.

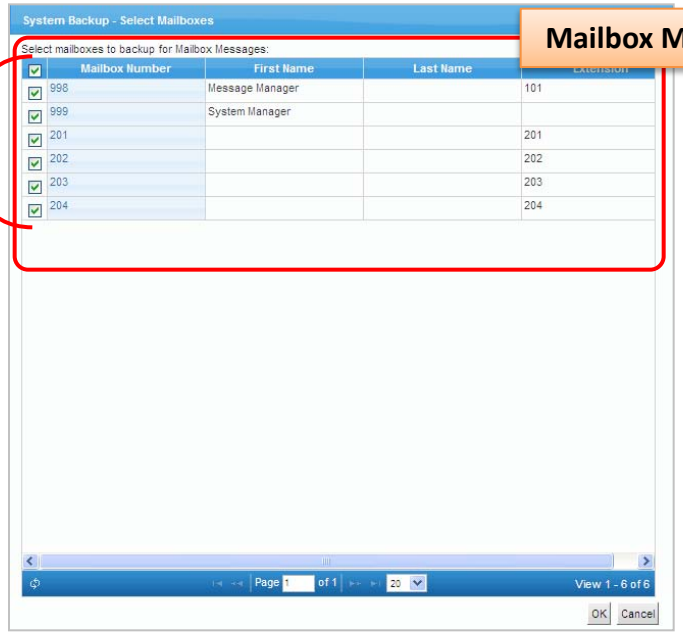


Select (Check) the items to be backed up.

Mailbox Message settings

2.2. Backing up the UM Data (manual) (2)

Select (Check) the mailboxes to be backed up.

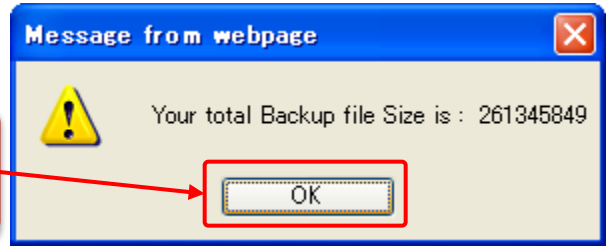


Mailbox Message settings example

Select (Check) the destination method.

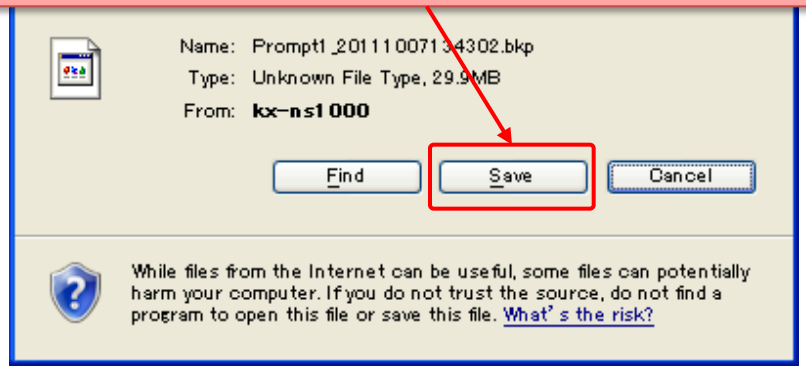
2.2. Backing up the UM Data (manual) (3)

When “Local PC” is selected



Confirm the backup file size and click “OK”.

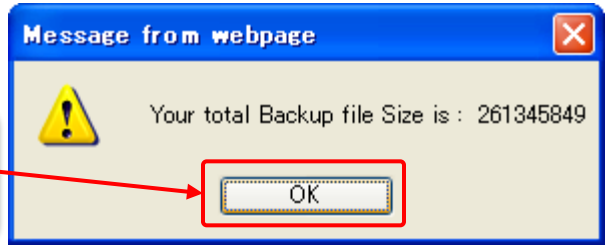
When the message window is displayed, click “Save” , specify the destination folder and file name, and save the backup files. (Standard Windows Interface)



When “USB (Main Unit)” is selected

When you select “USB (Master Unit)”, you can specify the destination folder of the USB memory device.
* In this case, you

Confirm the backup file size and click “OK”.

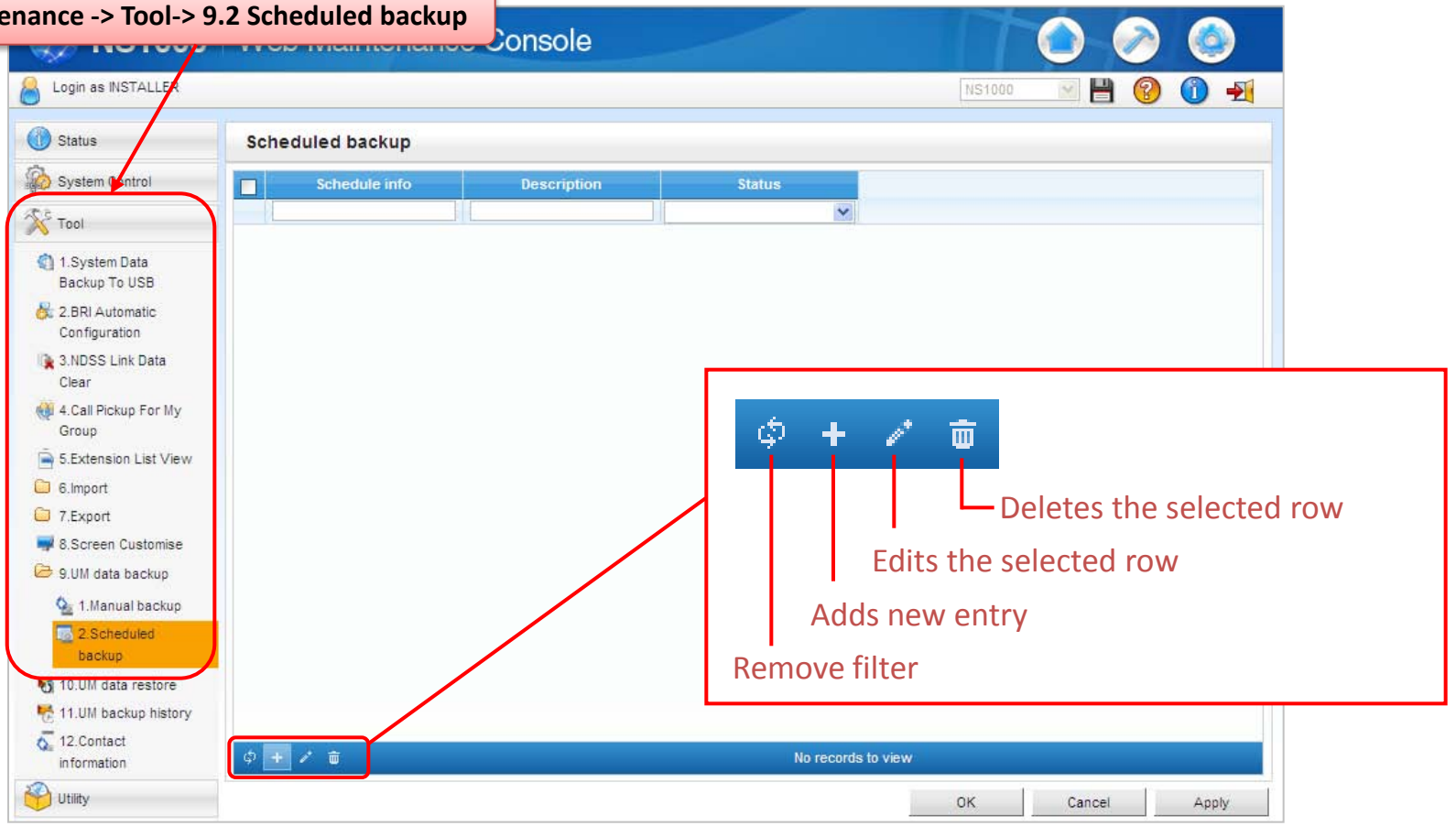


*** Ensure that the USB memory device is connected to the PBX and create the corresponding folder on the USB device in advance.**

2.3. Backing up the UM Data (Scheduled) (1)

To create a new scheduled backup, “Add new entry” icon.

Maintenance -> Tool-> 9.2 Scheduled backup

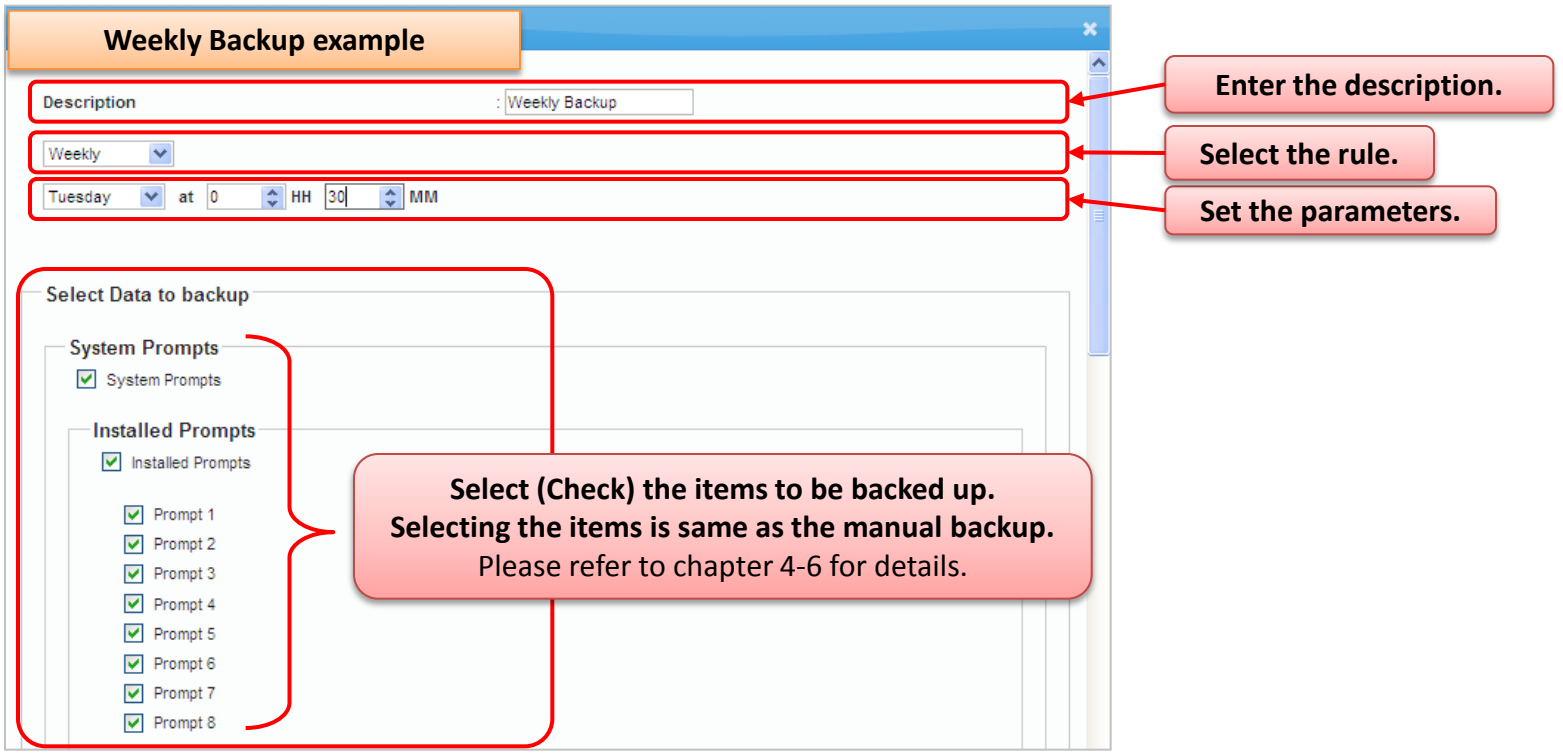


2.3. Backing up the UM Data (Scheduled) (2)

You can select the following backup frequency.

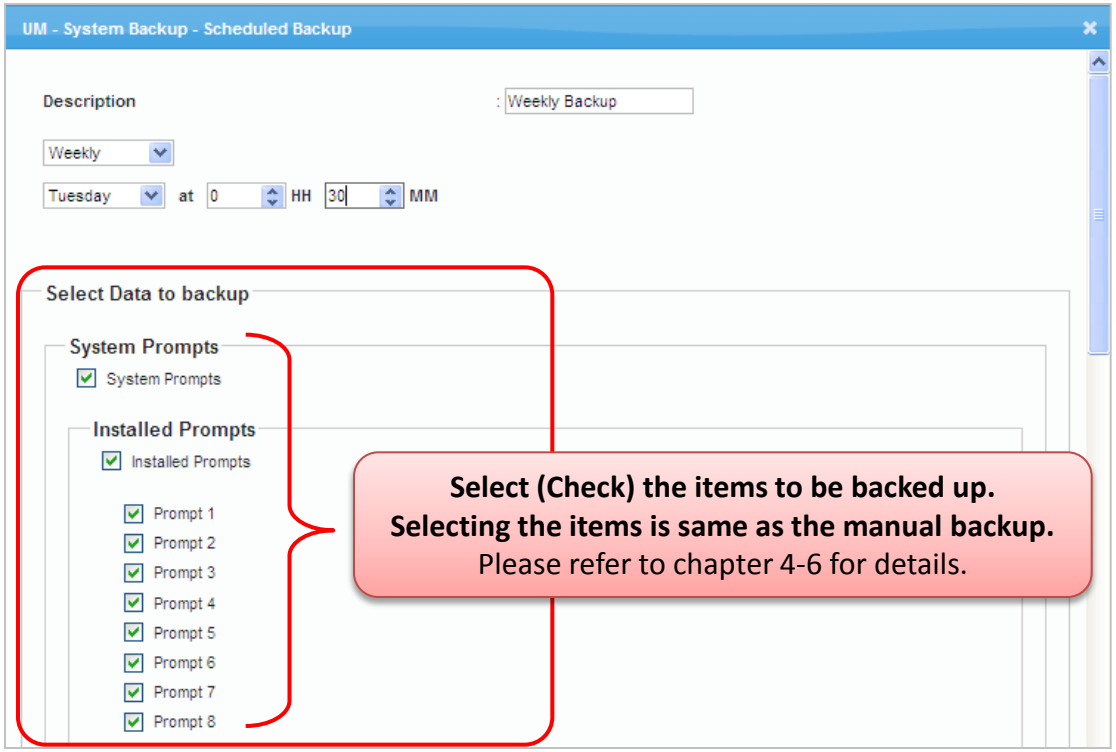
Rule	Parameters - When the backup is executed
Daily	Hour, Minute
Weekly	A day of the week, Hour, Minute
Monthly	A day of the month, Hour, Minute
Yearly	A day of the year, Hour, Minute
Specific Date	A specific date, Hour, Minute

*** Up to 20 backup events can be scheduled.**

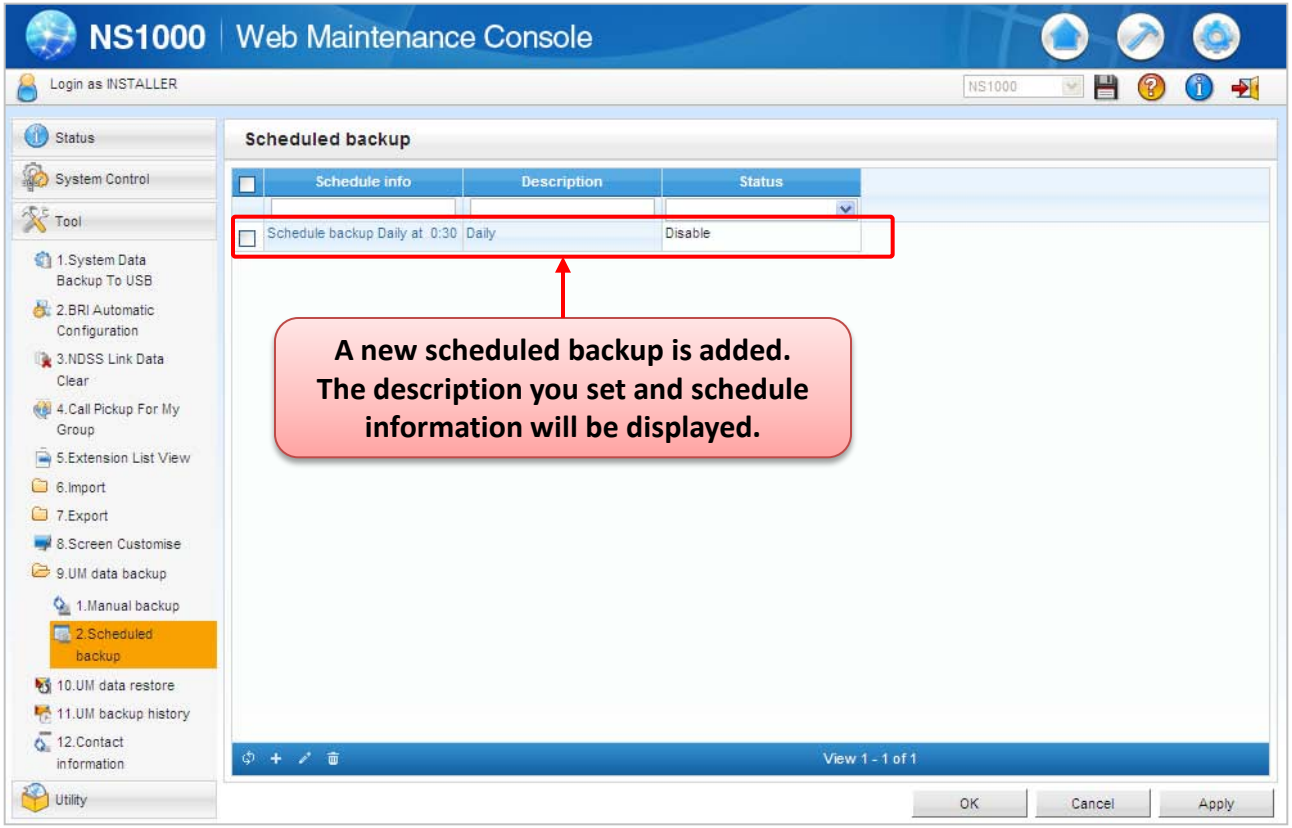


2.3. Backing up the UM Data (Scheduled) (3)

Continued from the previous slide

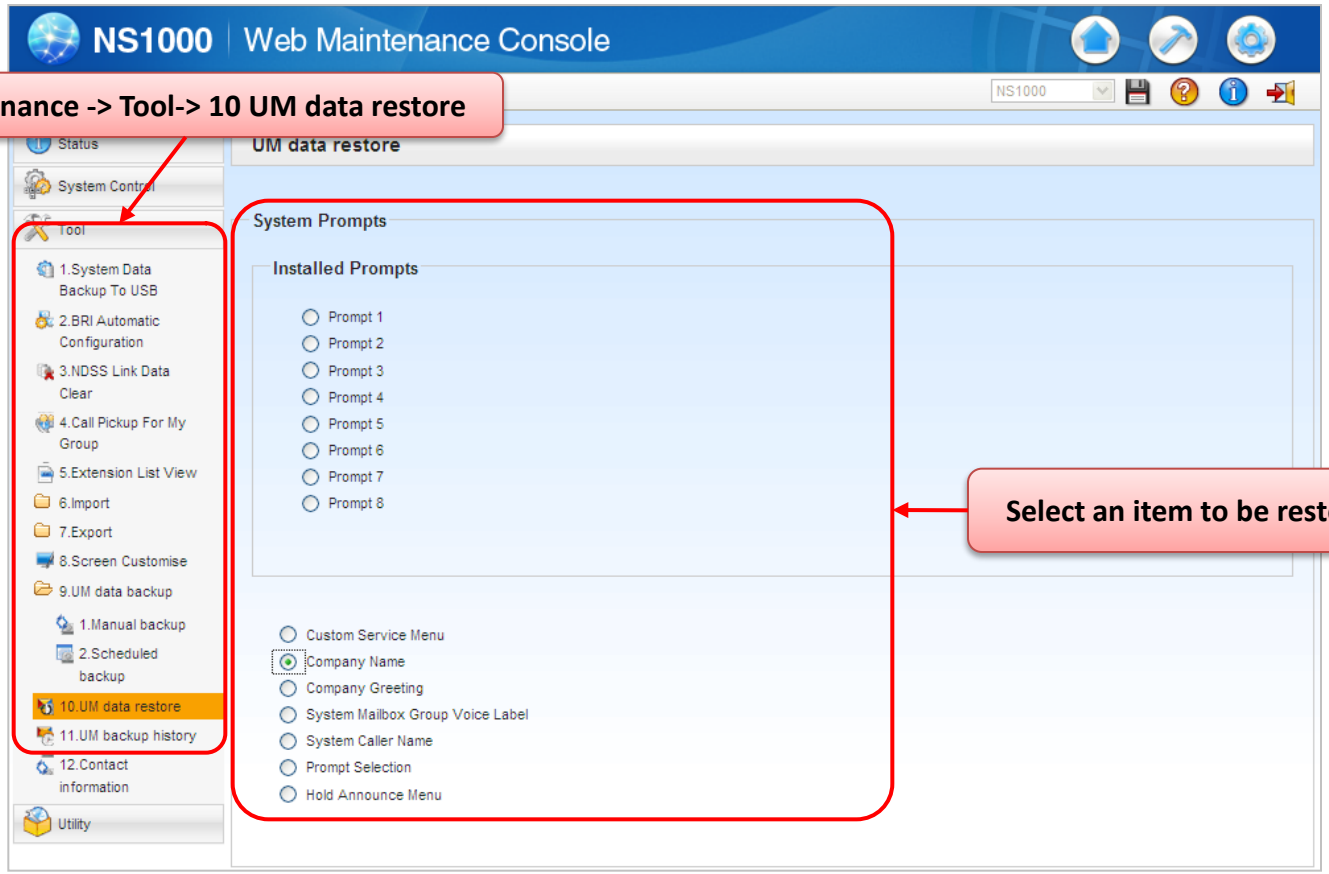


2.3. Backing up the UM Data (Scheduled) (4)



Activation Key (KX-NSU003) is required to use the scheduled backup feature.

2.4. Restoring the UM Data (1)

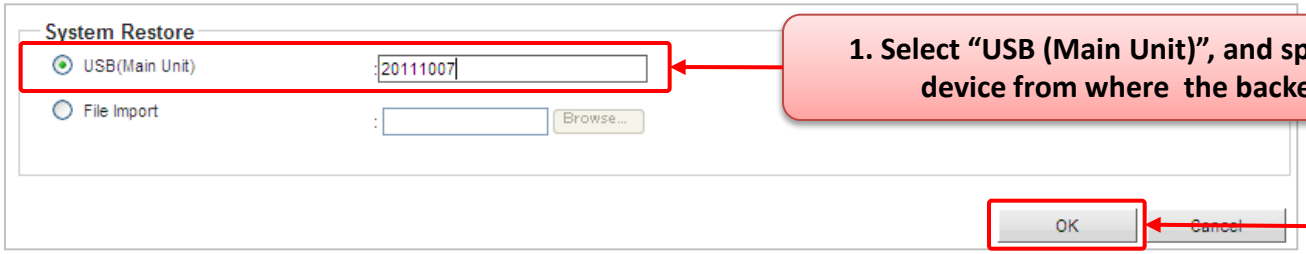


*** Multiple items can NOT be restored at one time.**

2.4. Restoring the UM Data (2)

Continued from the previous slide

Restoring from the USB device

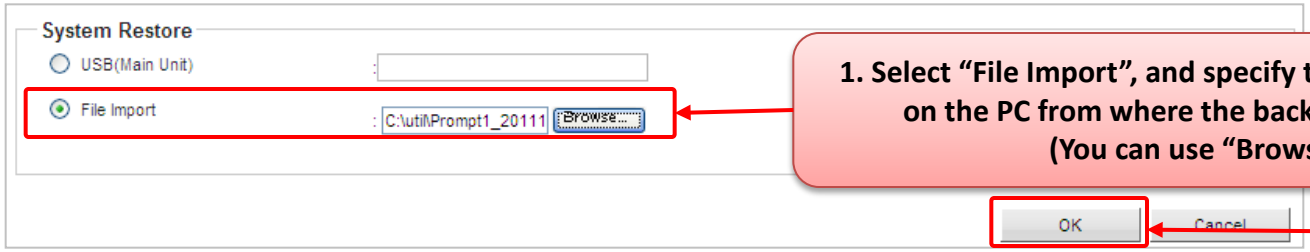


1. Select “USB (Main Unit)”, and specify the folder on the USB device from where the backed up data is restored.

2. Click “OK” to execute.

*** Ensure that the USB memory device is connected to the PBX.**

Restoring from the PC



1. Select “File Import”, and specify the folder and the file name on the PC from where the backed up data is restored. (You can use “Browse” button.)

2. Click “OK” to execute.

Chapter 3

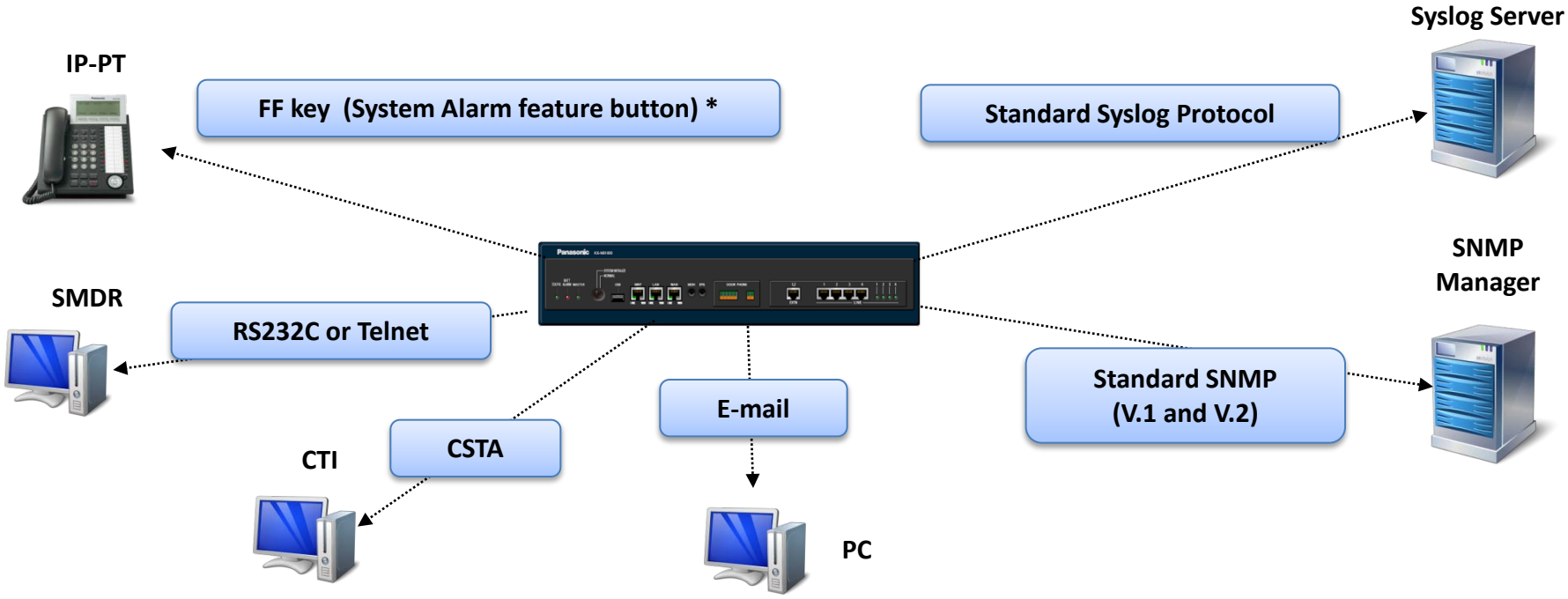
SYSTEM ALARMS

3.1. System Alarms

NS1000 can indicate that a system alarm occurred in several ways.

Error information (error codes, sub codes, etc.) are notified.

(Refer to Installation Manual for error code detail).



*: When a system error occurs, the button light turns on red. Pressing the button will show the error information on the display. UT Series / SIP Phone does not support this feature.

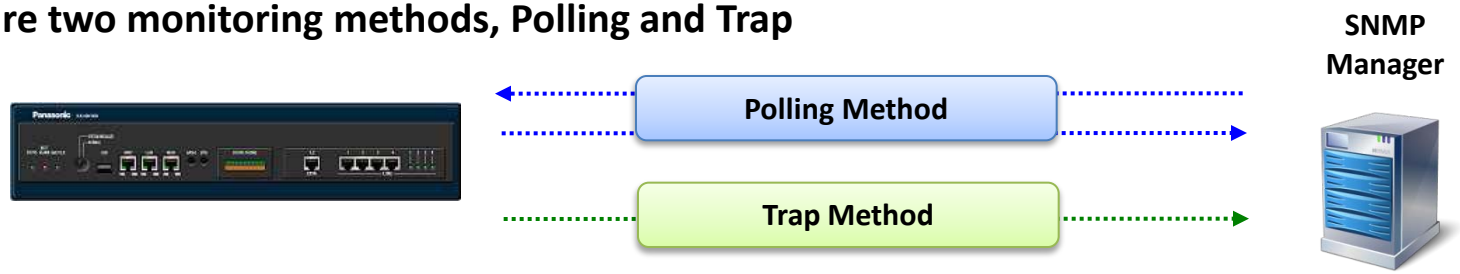
3.2 SNMP Agent (1)

SNMP Agent Features

NS1000 includes SNMP features. It is possible for a PC assigned as an SNMP manager to manage and receive PBX system status information, such as alarm information and general system activity using SNMP.

Management Information Bases (MIBs) are sent to a PC (i.e., the SNMP manager) connected to the PBX over a LAN and can then be stored and analyzed using SNMP manager software.

There are two monitoring methods, Polling and Trap



Polling Method

The SNMP Manager sends request messages to collect the status of KX-NS1000, and then KX-NS1000 sends response to the SNMP Manager.

Trap Method

KX-NS1000 sends information when a status change occurs or an alarm is detected.

- **Up to 2 SNMP managers can be assigned.**
- **This PBX supports SNMP Protocol Version 1.0 and SNMP Version 2c.**
- **This PBX can only receive read-only MIBs. Write MIBs are not supported.**
- **This PBX supports MIB II.**

3.2 SNMP Agent (2)

The KX-NS1000 will send the following types of Trap.

Type	Trap Name	Description
Standard Trap	cold Start	Information is sent after turning on the power of KX-NS1000 or resetting KX-NS1000.
	Authentication Failure	Information is sent when an unregistered Community Name and/or Manager IP address is entered.
Enterprise Specific Trap *1	Major Alarm	Information is sent when a major alarm is detected.
	Minor Alarm	Information is sent when a minor alarm is detected.

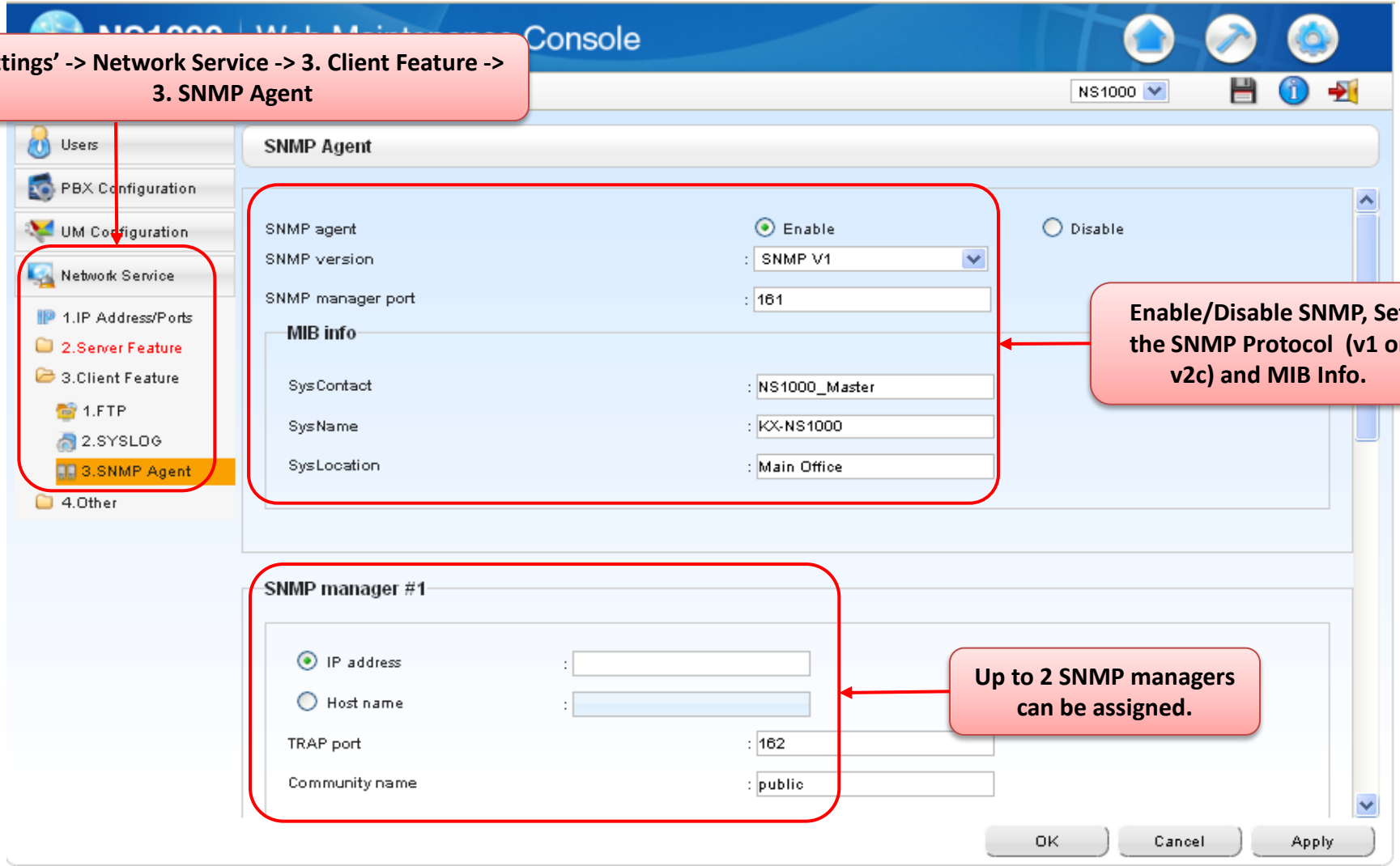
Note: In addition to the standard SNMP v1 MIB files, the NS1000 supports the Panasonic Enterprise MIB (Management Information Base) file for more detailed alarms.

This MIB file may be loaded into in the SNMP manager and it is available from the PCC CS website.

3.3 SNMP Agent Setting (1)

SNMP Agent Setting;

The SNMP Agent needs to be configured for the type of SNMP Manager being used.



3.3 SNMP Agent Setting (2)

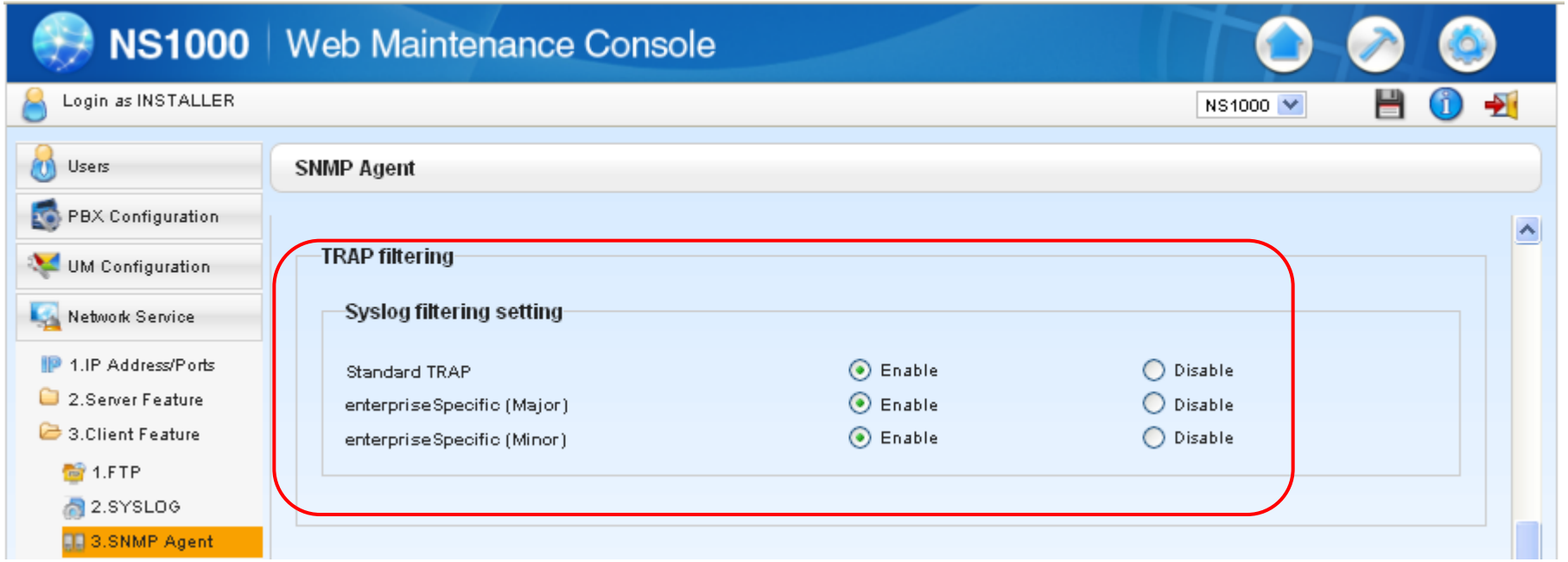
SYSLOG (Trap Filtering)

The required TRAP output can be set.

In addition to the standard SNMP v1 MIB and MIB II files, the NS1000 supports the Panasonic Enterprise MIB (Management Information Base) file for more detailed alarms.

This MIB file may be loaded into in the SNMP manager and it is available from the PCC CS website.

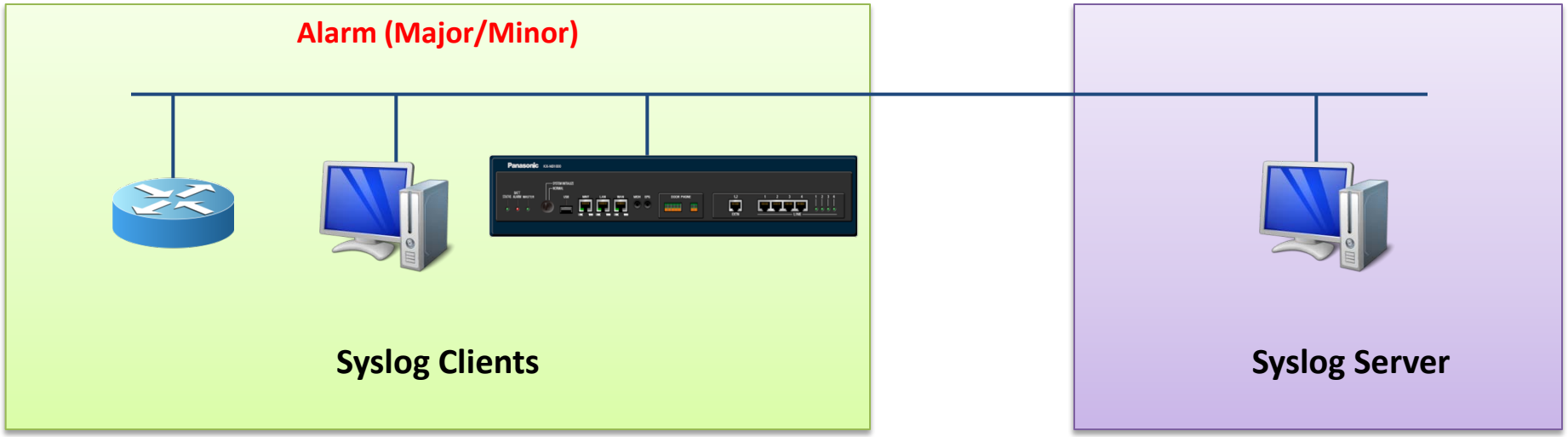
Refer to the Appendix for details of the Standard MIB.



3.4 SYSLOG (1)

NS1000 can send alarm information (Major alarm/Minor alarm) to a UDP Syslog server on port 514 (default).

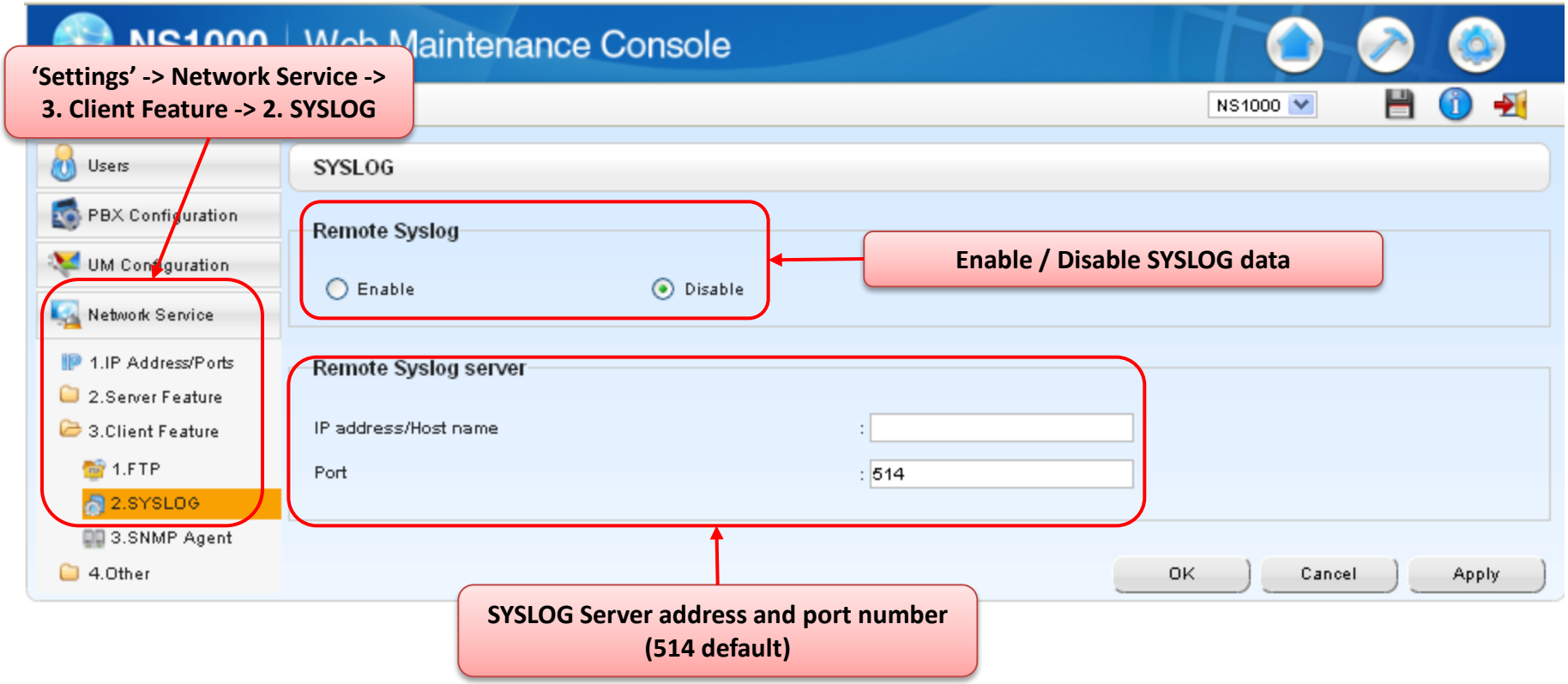
By using Syslog, you can save all NS1000 alarms remotely to a PC.
These alarms may then be managed and responded to as required.



3.4 SYSLOG (2)

SYSLOG (System Settings)

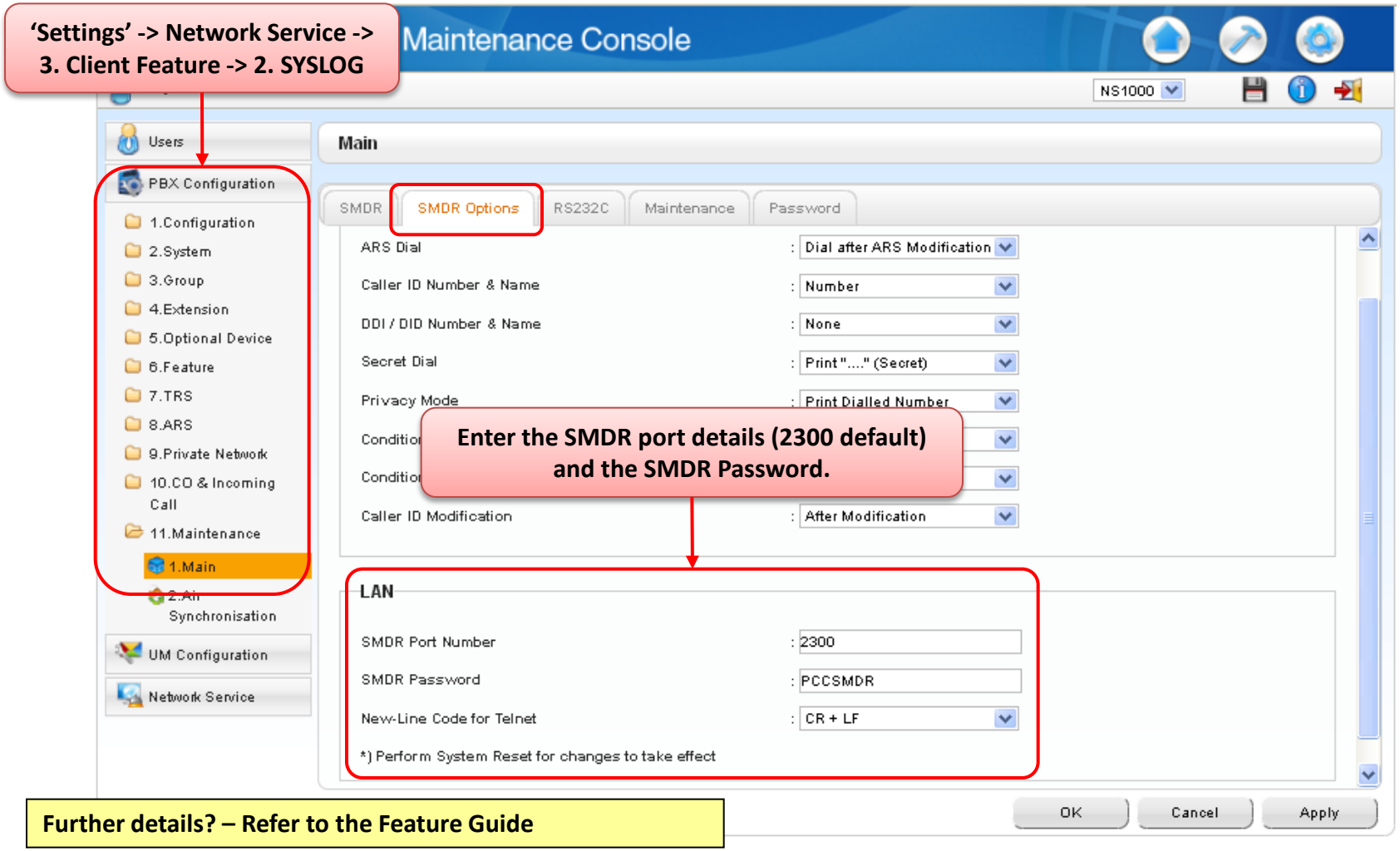
The output of SYSLOG data needs to be enabled and the IP-Address/Host Name of the SYSLOG Server need to be set.



3.5 SMDR via LAN

SMDR(System Message Data Recording)

Call information (SMDR) can be output to the LAN (as well as via RS232c). Applications such as CA Call Accounting can then use this information.



Further details? – Refer to the Feature Guide

3.6 CTI (TAPI / CSTA)

CTI (TAPI / CSTA) Under study

By connecting KX-NS1000 to a CTI server over a LAN, it is possible to output local alarm information (major alarms/minor alarms) to a external PC.

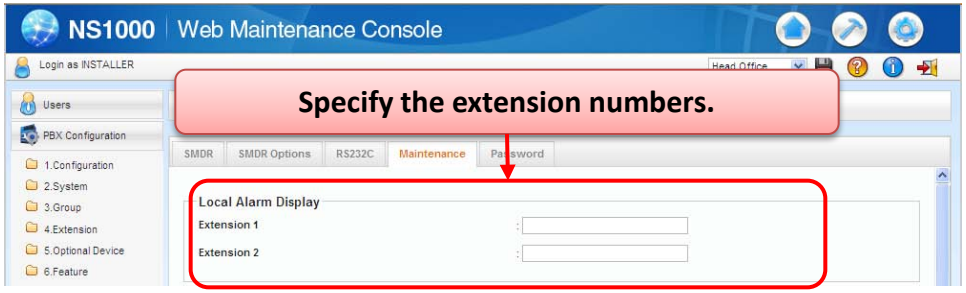
- EMCA CSTA Phase3
- TAPI 2.1 based Panasonic original interface

3.7 System Alarms via PT

Settings to notify the system alarms via IP-PT

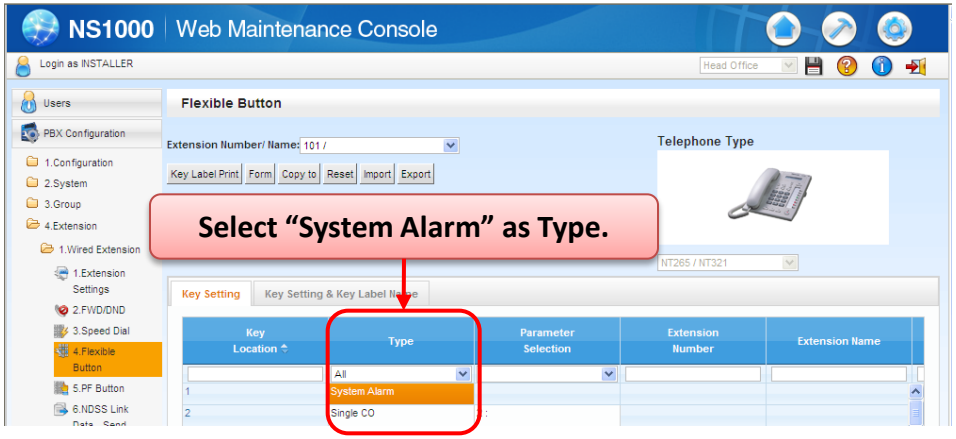
The extension numbers of IP-PTs that can display System Alarm Information.

Setup -> PBX Configuration -> 11.1 Main -> Maintenance Tab



The System Alarm button setting (PT Flexible Button)

Setup -> PBX Configuration -> 4.1.4 Flexible Button



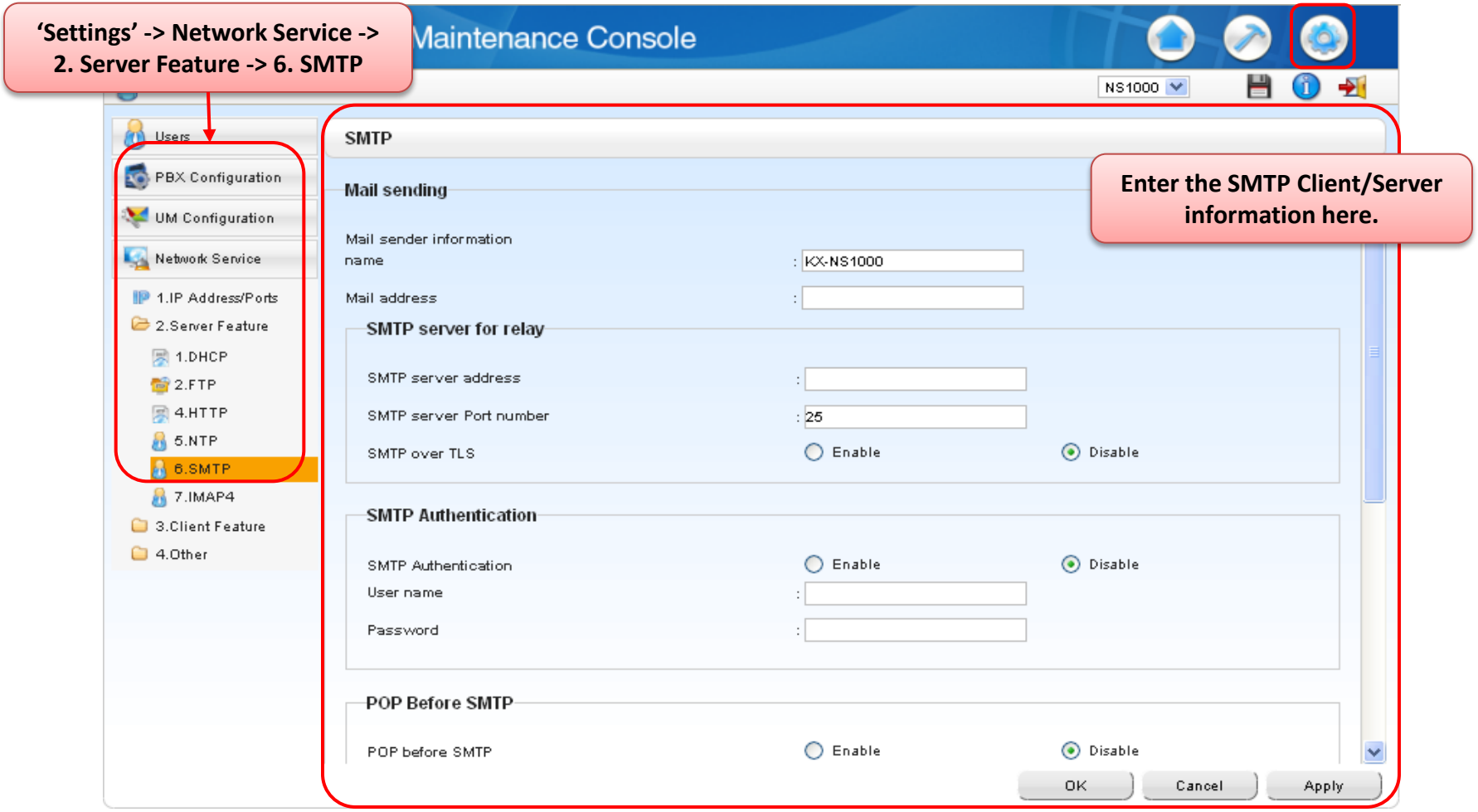
Chapter 4

EMAIL NOTIFICATION

4.1 SMTP Client Settings

SMTP settings (Email Client)

So that Email notification can take place, the SMTP Server details must be entered.

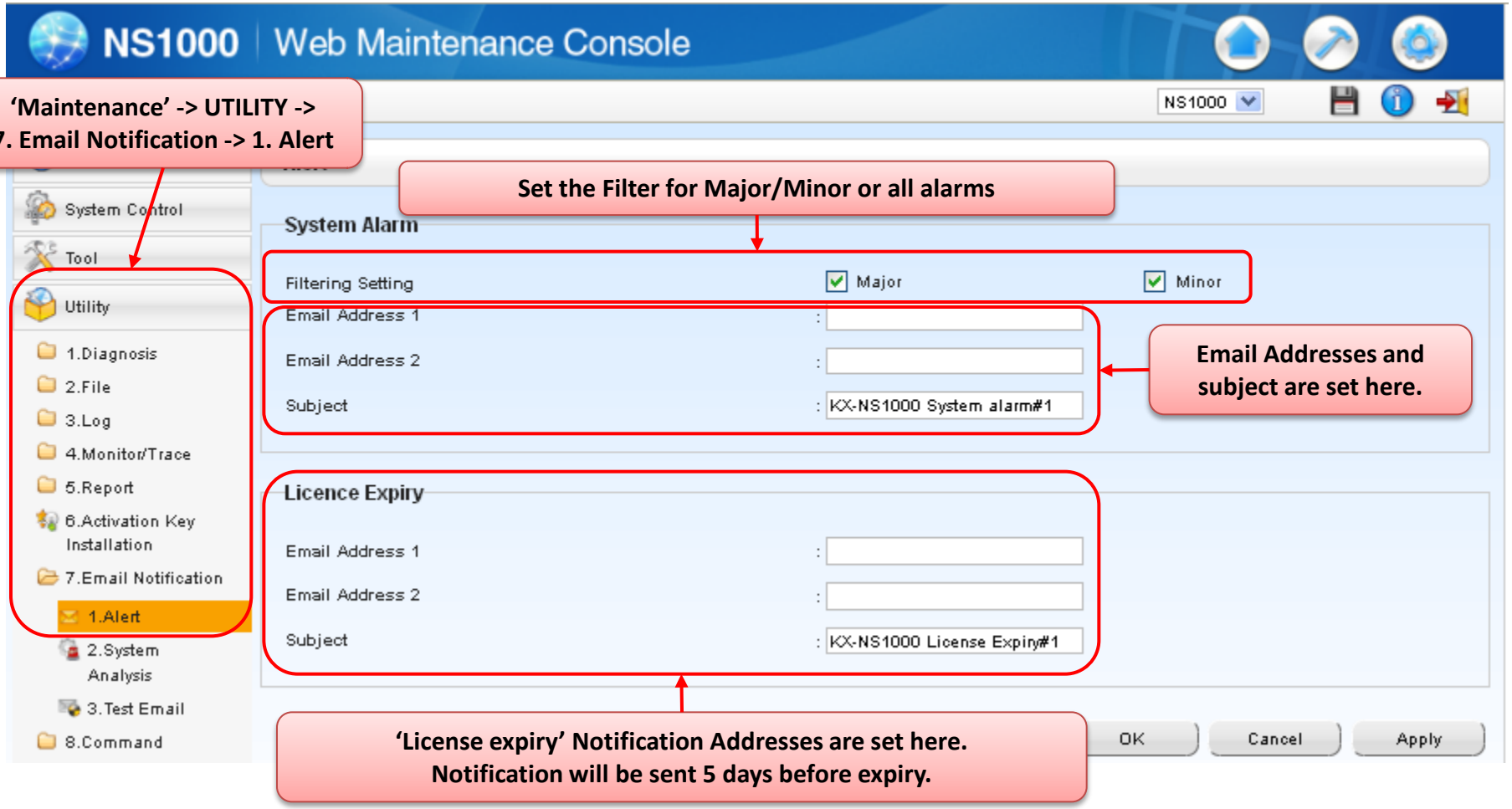


Enter the details required by your Email Server. The NS1000 only sends email to the Server as a 'Client'.

4.2 Email Notification Settings

Email Notification settings (System Alarms)

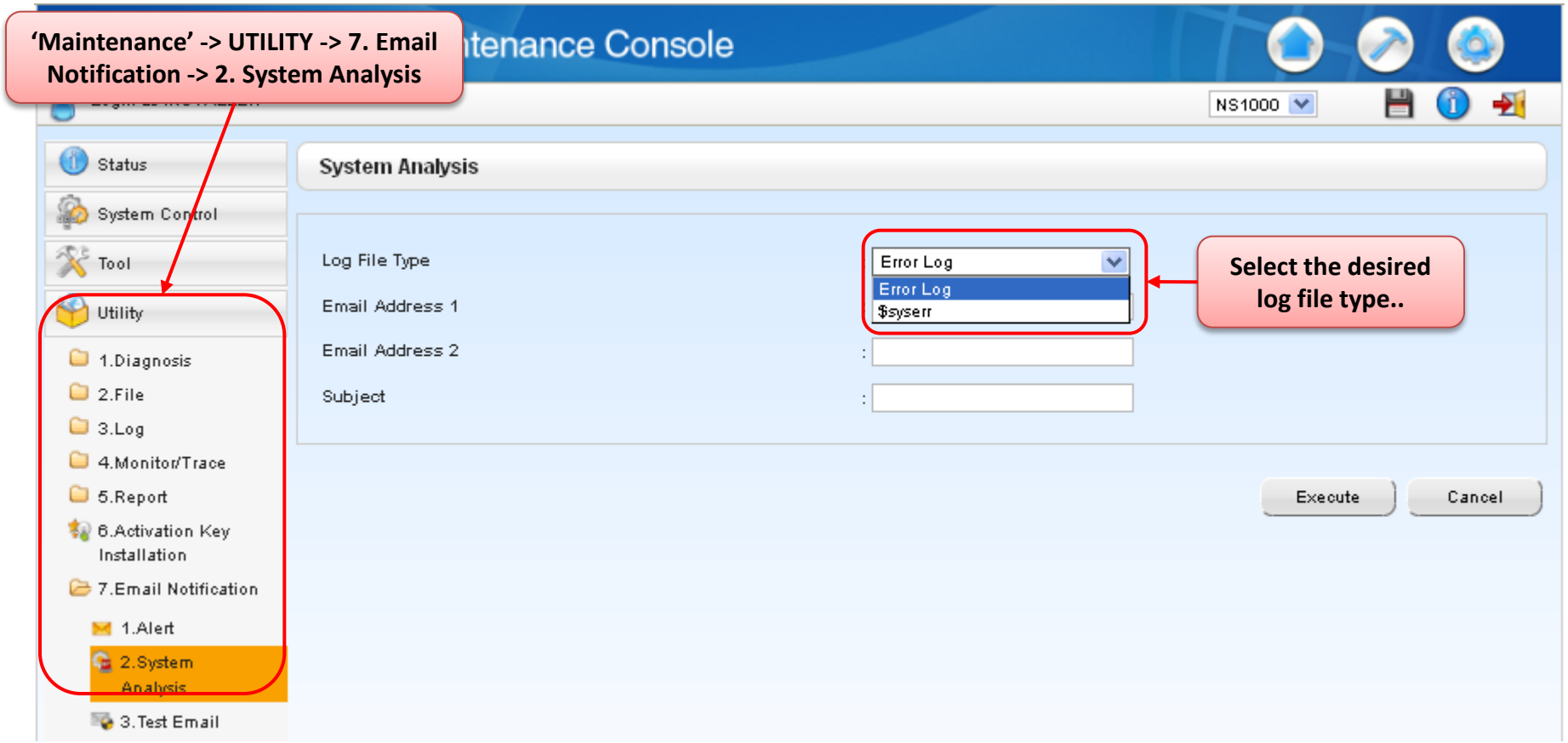
The system can be configured to automatically send notification emails in the case of System Alarms or A/K Expiry.



4.3 Email Log Files

System Log Files (Email)

System Troubleshooting data files can be emailed from the system .

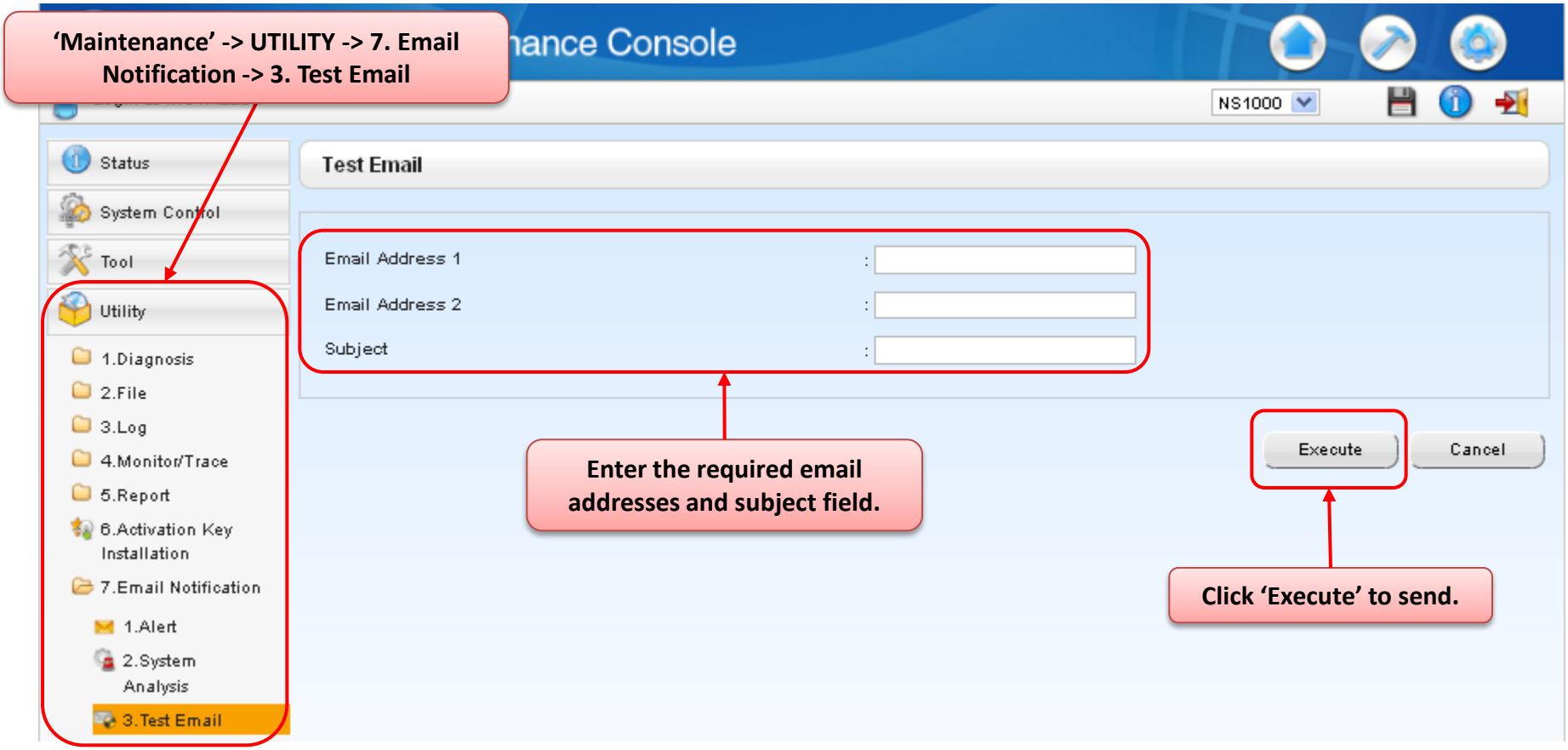


This information, together with the system parameter file (DCSYS) or system backup, is required for detailed fault analysis.

4.4 Test Email

TEST Email (SMTP Client)

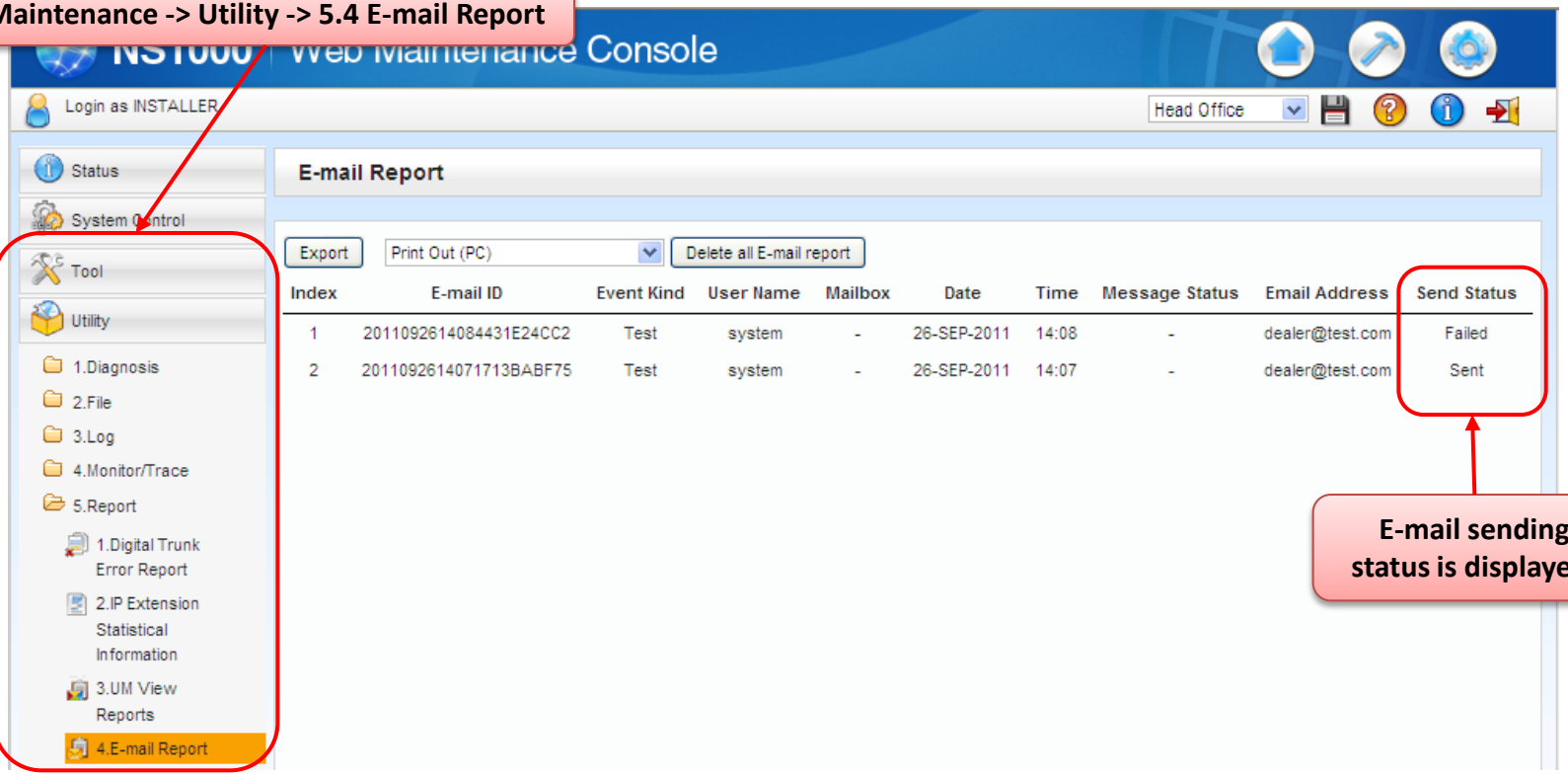
To test the SMTP Client setting are correct, it is possible to send a test email.



3.5. E-mail Report

E-mail sending status can be confirmed.

Maintenance -> Utility -> 5.4 E-mail Report



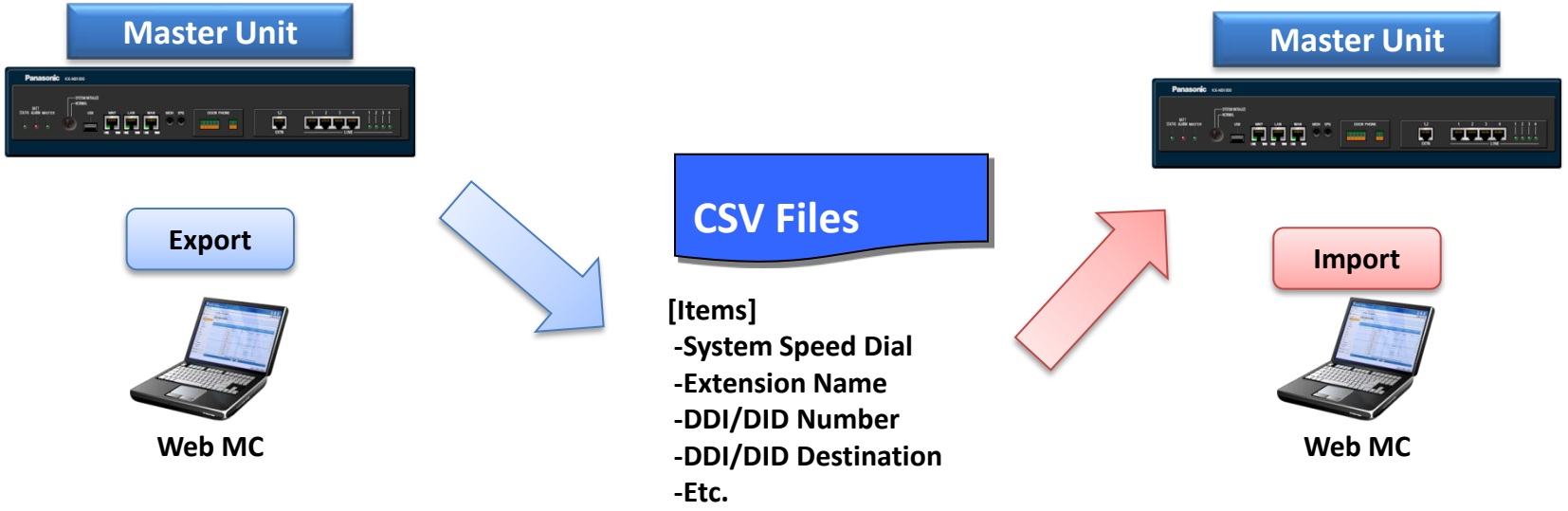
Chapter 5

DATA IMPORT AND EXPORT (.CSV)

5.1 Export / Import Tool (.csv) (1)

Several types of data can be exported / imported using the Web MC.

Exported data is saved as CSV file. The data can be imported to other units.

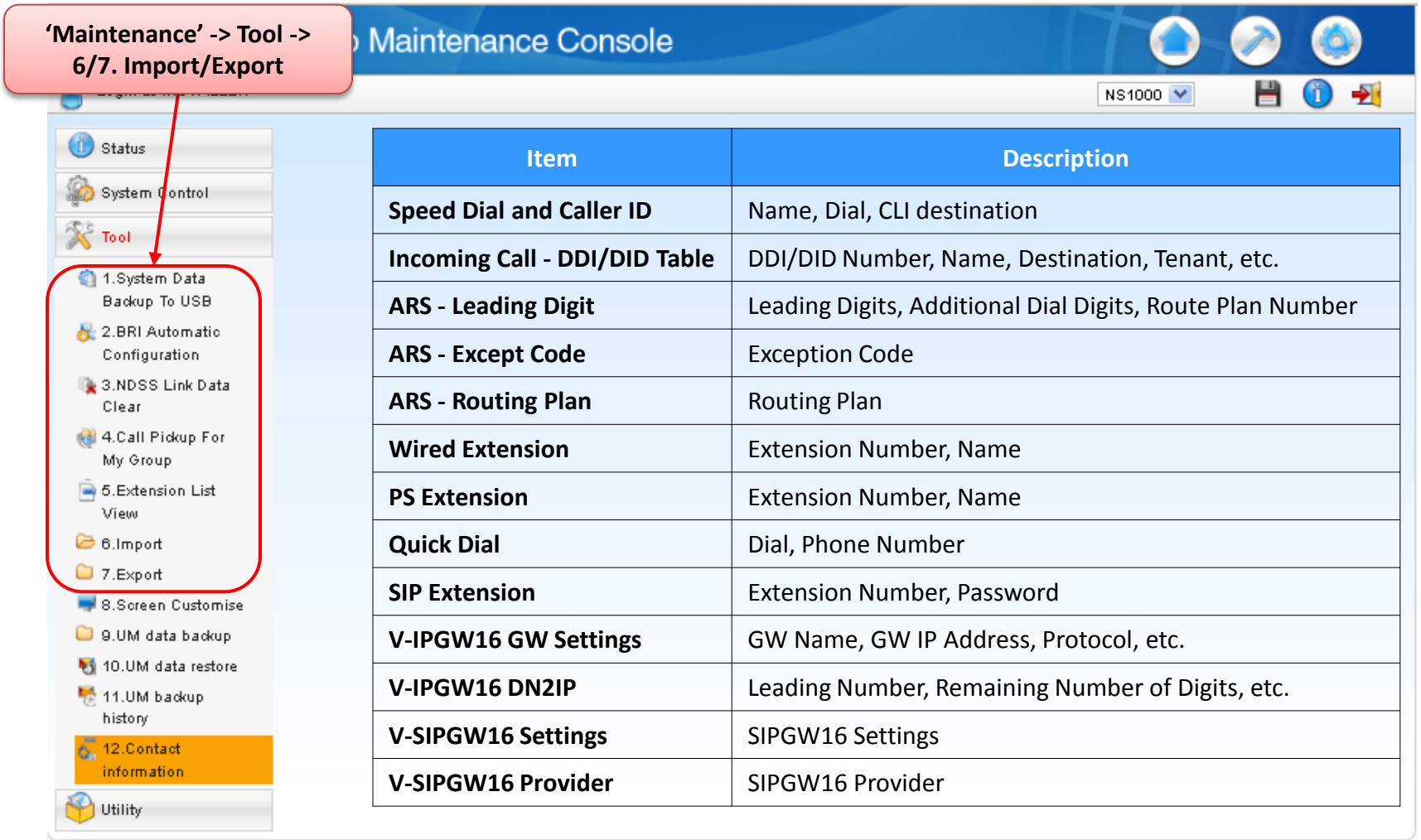


- The items to be exported / imported are selectable.
- The CSV file format is the same as KX-TDE/NCP. So, the CSV file exported from KX-TDE/NCP can be imported to KX-NS1000. However, there is no ‘PBX-Replacement’ tool.

5.1 Export / Import Tool (.csv) (2)

Exportable / Importable items (List)

Using the Import/Export Tool, some data can be transferred between systems;



Item	Description
Speed Dial and Caller ID	Name, Dial, CLI destination
Incoming Call - DDI/DID Table	DDI/DID Number, Name, Destination, Tenant, etc.
ARS - Leading Digit	Leading Digits, Additional Dial Digits, Route Plan Number
ARS - Except Code	Exception Code
ARS - Routing Plan	Routing Plan
Wired Extension	Extension Number, Name
PS Extension	Extension Number, Name
Quick Dial	Dial, Phone Number
SIP Extension	Extension Number, Password
V-IPGW16 GW Settings	GW Name, GW IP Address, Protocol, etc.
V-IPGW16 DN2IP	Leading Number, Remaining Number of Digits, etc.
V-SIPGW16 Settings	SIPGW16 Settings
V-SIPGW16 Provider	SIPGW16 Provider

***Refer to the PC programming Manual for details.**

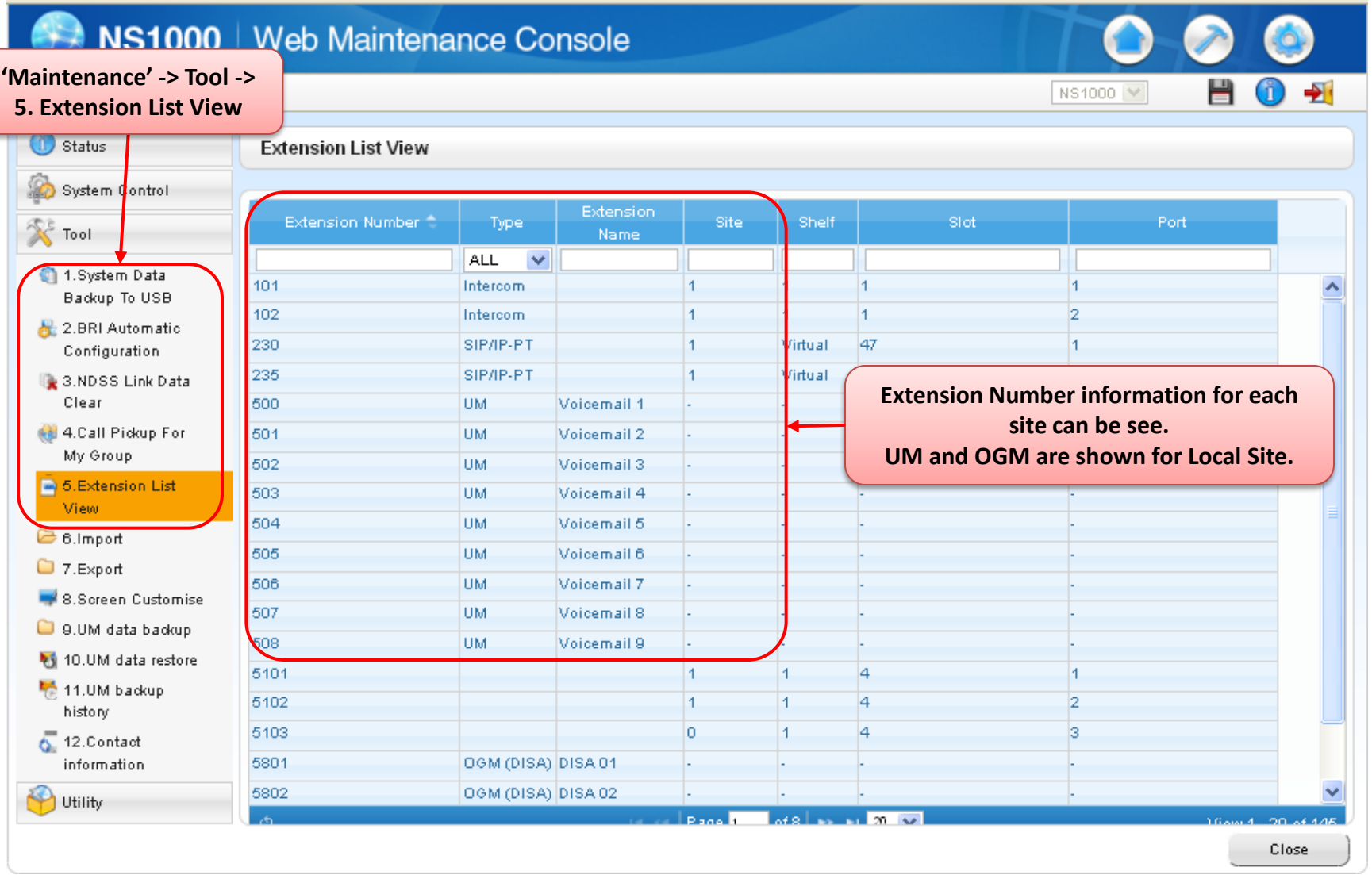
Chapter 6

EXTENSION LISTS

6.1 Extension List View

Extension List View

Specific Ext Names/Numbers can be found easily using the Extension List View Tool.



Chapter 7

PORT SETTINGS (LAN/MNT) DNS, PORT SPEED, DUPLEX, MIRROR, PING

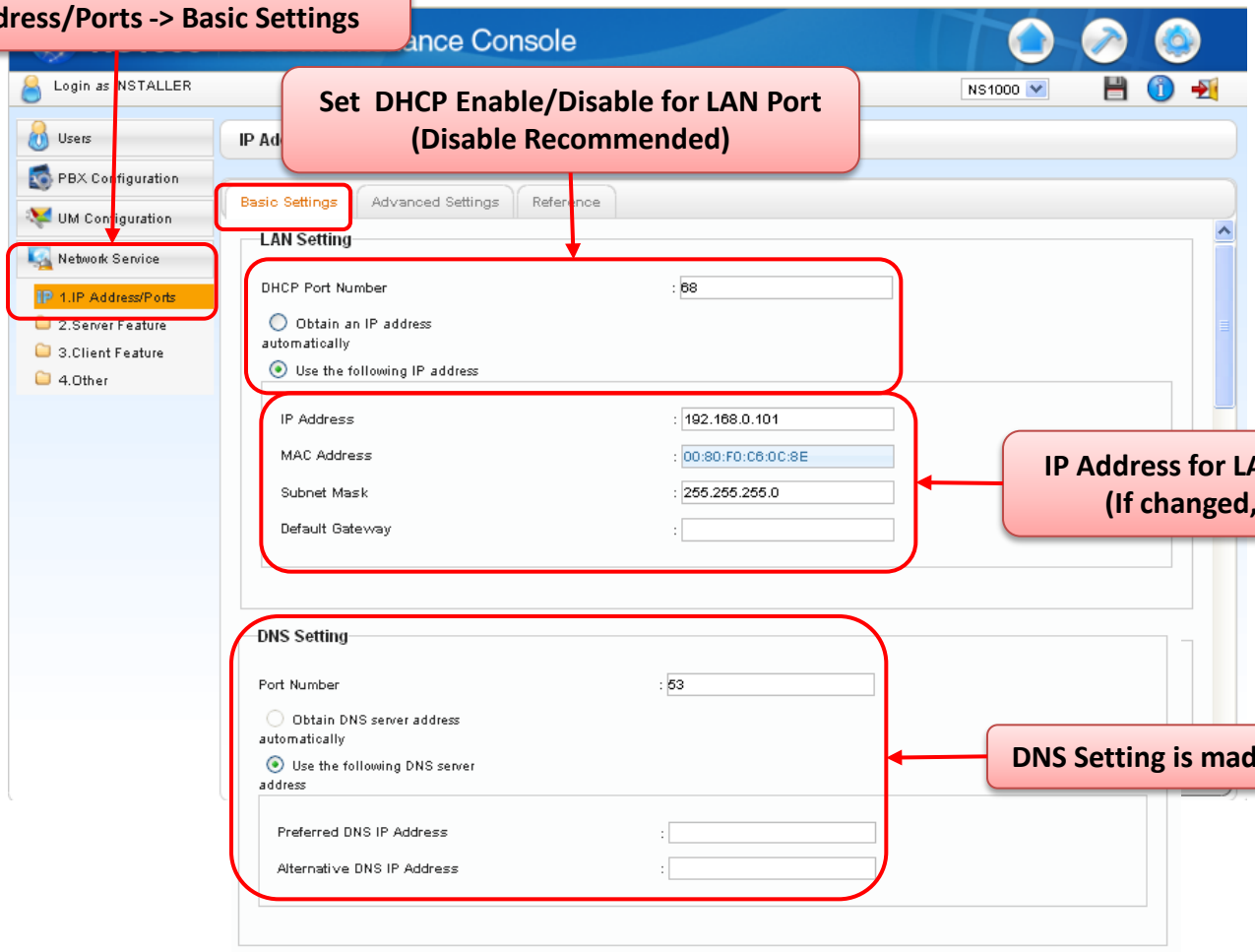
7.1 IP-Address Information (1)

IP-Address Information (LAN Port / DNS)

The LAN/DNS IP settings can be checked and re-programmed here.

DHCP can also be enabled / Disabled for LAN/DSP.

'Settings' -> Network Service->
51. IP-Address/Ports -> Basic Settings



Set DHCP Enable/Disable for LAN Port (Disable Recommended)

IP Address for LAN Port can be seen here (If changed, Restart is required)

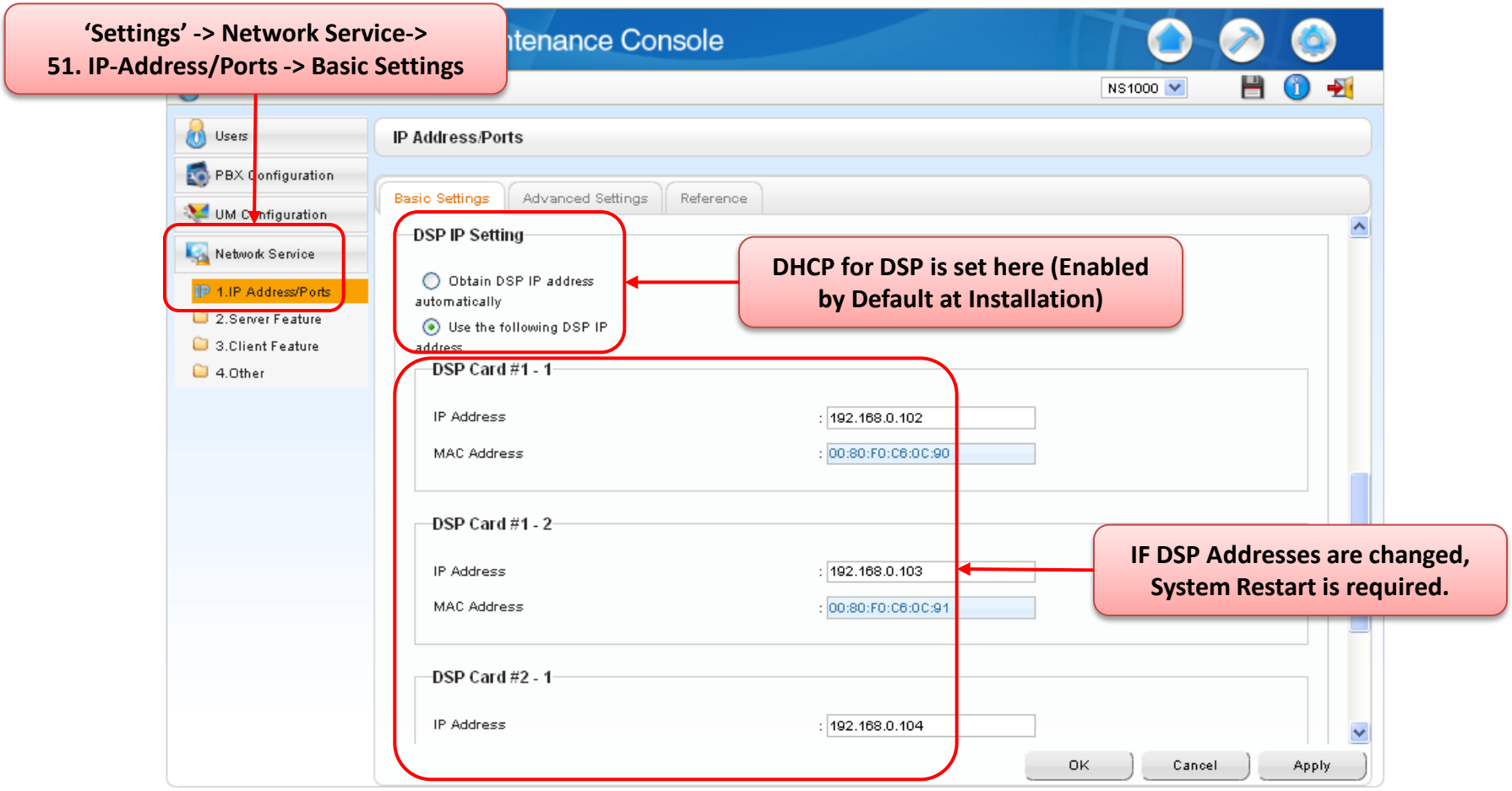
DNS Setting is made here

7.1 IP-Address Information (2)

IP-Address Information (DSP)

The DSP IP settings can be checked and re-programmed here.

DHCP can also be enabled / Disabled for DSP.

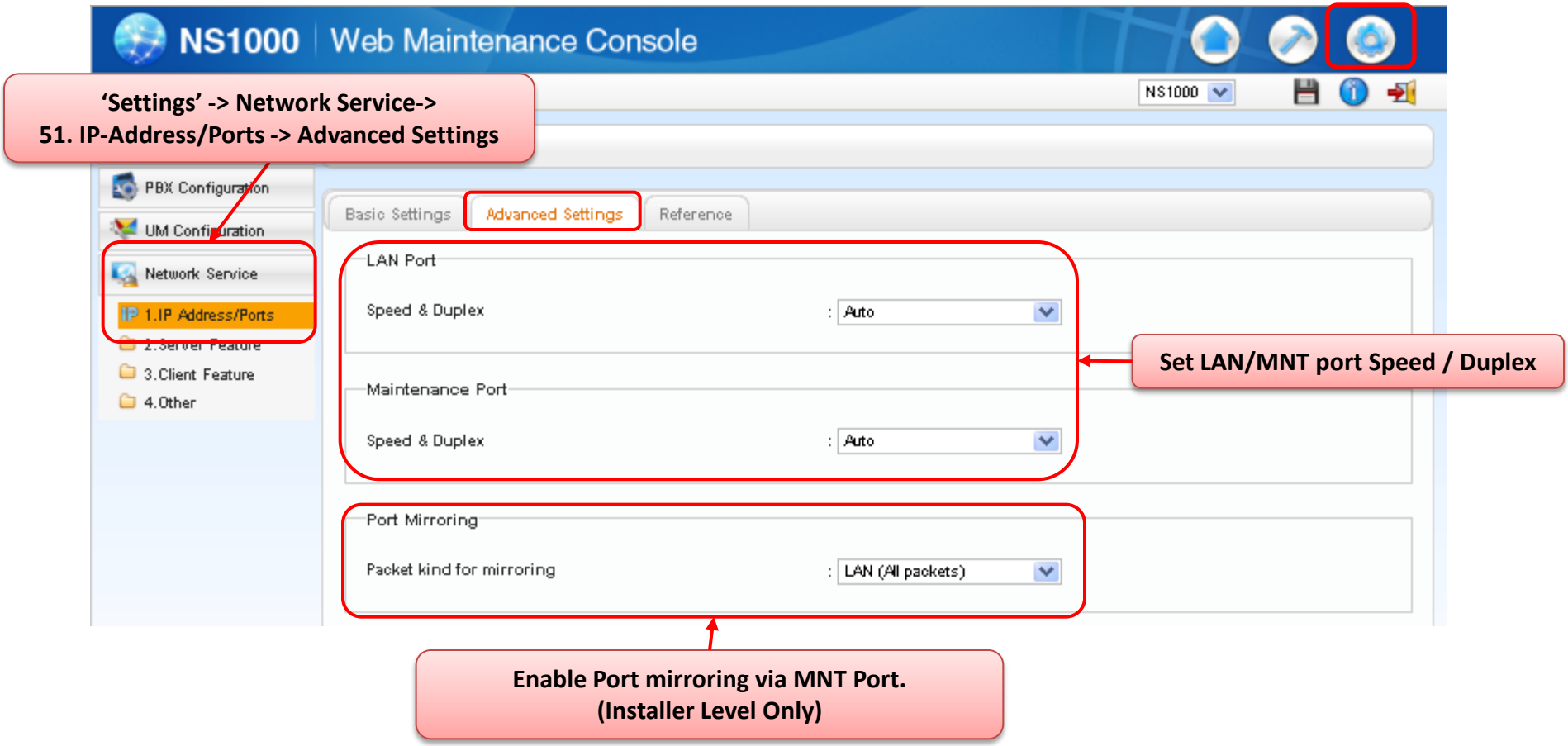


7.2 Port Settings

Port Settings (Speed / Duplex / Mirroring)

The Speed / Duplex settings of the LAN / MNT ports can be set here.

The MNT port can also be configured as a Mirror port.



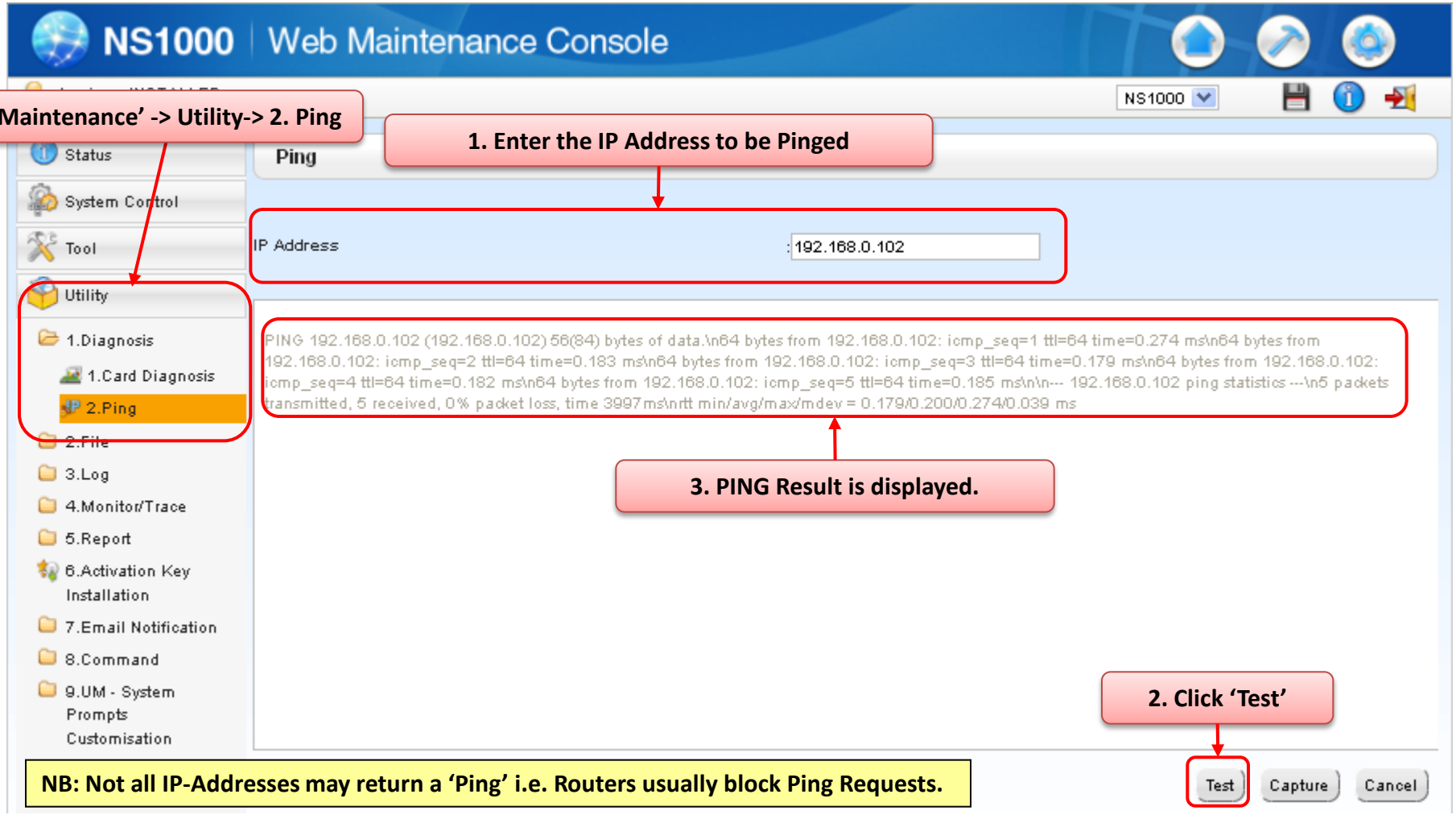
NB: Once Port Mirroring is enabled on the MNT Port, you will not be able to use the MNT port to access the WebMC. Use the LAN port to login and change the port mirror settings back.

7.3 ‘Ping’

Ping UTILITY

To aid network troubleshooting, the Ping Utility can be used.

Ping is most reliable within a single broadcast domain.



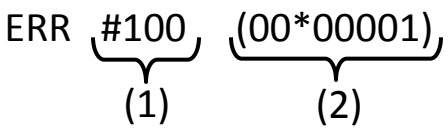
NB: Not all IP-Addresses may return a ‘Ping’ i.e. Routers usually block Ping Requests.

Chapter 8

ERROR LOGS

8.1 Error Codes (PT, SMDR, CTI)

How to read error codes.

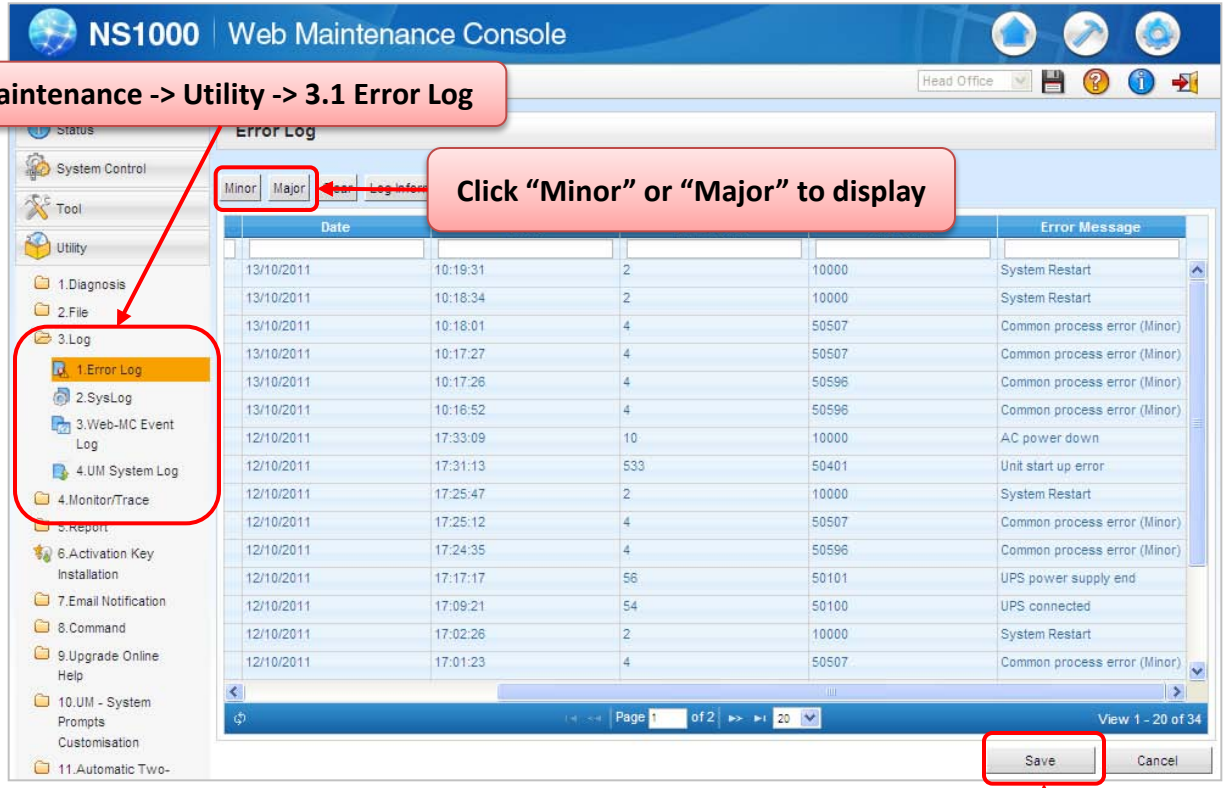


Number in the Example	Item	Description
(1)	Error Code	Shows three-digit error code.
(2)	Sub Code	Shows 8-digit sub code (BBW0YYZZ). BB: Site number (00 to 15) W: Slot type (Physical shelf: blank, Virtual shelf: *) 0: Unit number YY: Slot number (00–32) ZZ: Port number

*** For more information, please refer to the following slides.**

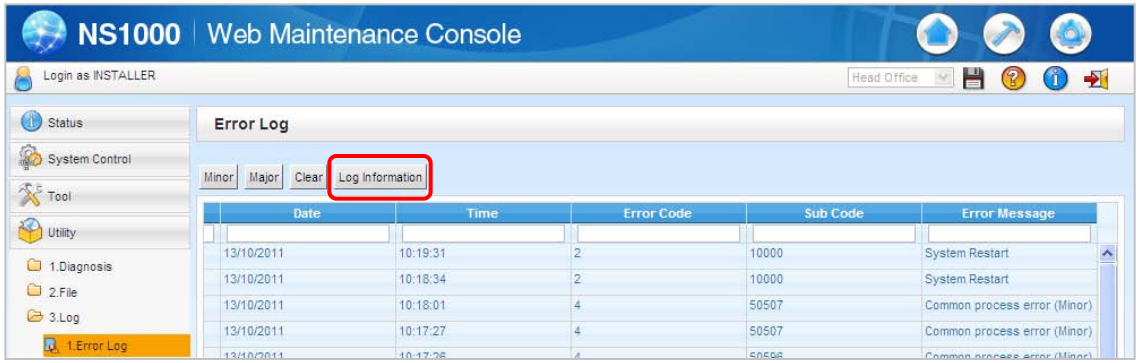
8.2 How to show Error Log via Web MC (1)

How to display system error information via Web MC

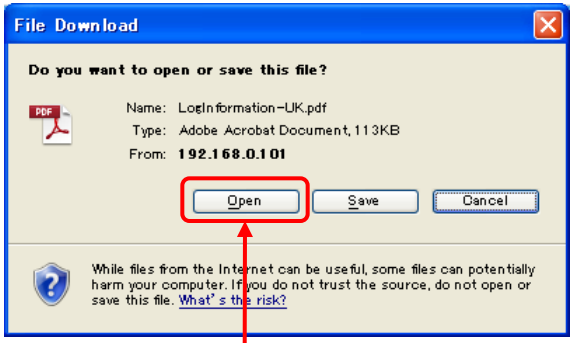


8.2 How to get Error Codes on Web MC (2)

1 Maintenance -> Utility -> 3.1 Error Log

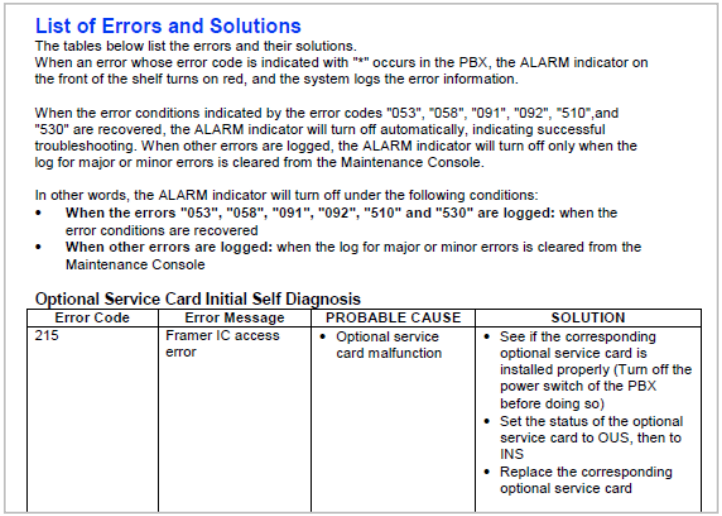


2



Click “Open”.

3 Error information will be opened (PDF file).



List of Errors and Solutions

The tables below list the errors and their solutions.
When an error whose error code is indicated with "*" occurs in the PBX, the ALARM indicator on the front of the shelf turns on red, and the system logs the error information.

When the error conditions indicated by the error codes "053", "058", "091", "092", "510",and "530" are recovered, the ALARM indicator will turn off automatically, indicating successful troubleshooting. When other errors are logged, the ALARM indicator will turn off only when the log for major or minor errors is cleared from the Maintenance Console.

In other words, the ALARM indicator will turn off under the following conditions:

- **When the errors "053", "058", "091", "092", "510" and "530" are logged:** when the error conditions are recovered
- **When other errors are logged:** when the log for major or minor errors is cleared from the Maintenance Console

Optional Service Card Initial Self Diagnosis

Error Code	Error Message	PROBABLE CAUSE	SOLUTION
215	Framer IC access error	• Optional service card malfunction	• See if the corresponding optional service card is installed properly (Turn off the power switch of the PBX before doing so) • Set the status of the optional service card to OUS, then to INS • Replace the corresponding optional service card

*** For more information, please contact your sales companies.**

Appendix - 1

MIB – MANAGEMENT INFORMATION BASE

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyse information.

Both Standard MIB (MIB2) and Enterprise MIB is supported.

System Group (1.3.6.1.2.1.1)

Object ID	Item	Description
1	sysDescr	Information of Hardware type and Software version of the Device.
2	sysObjectID	Object identifier of this product.
3	sysUpTime	Elapsed time since the system was restarted.
4	sysContact	Device Administrator.
5	sysName	Name of Device.
6	sysLocation	Installation Location of Device.
7	sysService	Support Layer.

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

Interface Group (1.3.6.1.2.1.2)

Object ID	Item	Description
1	ifNumber	The number of Network Devices.
2	IfTable (NA)	Management Table by each Network Device.
2.1	IfEntry (NA)	Components of ifTable.
2.1.1	ifIndex	Each interface identifier.
2.1.2	ifDescr	Explanation of Interface.
2.1.3	ifType	Type of Interface.
2.1.4	ifMtu	Maximum Datagram Length which can be sent/received.
2.1.5	ifSpeed	Maximum Transfer Speed.
2.1.6	ifPhysAddress	Physical Address (MAC Address).
2.1.7	ifAdminStatus	The desired state of the interface.
2.1.8	ifOperStatus	The current operational state of the interface.
2.1.9	ifLastChange	The value of sysUpTime at the time the interface entered its current operational state (up or down).
2.1.10	ifInOctets	The number of Octets received.

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

Interface Group (Continued) (1.3.6.1.2.1.2)

Object ID	Item	Description
2.1.11	ifInUcastPkts	The number of Unicast Packets delivered to a higher-layer protocol.
2.1.12	ifInNUcastPkts	The number of Non Unicast Packets delivered to a higher-layer protocol.
2.1.14	ifInErrors	The number of inbound Packets that contained errors.
2.1.15	ifInUnKnownProtos	The number of Packet received which are discarded because of an unknown/unsupported protocol.
2.1.16	ifOutOctets	The number of Octets transmitted.
2.1.17	ifOutUcastPkts	The number of Unicast Packets which are received from upper protocol.
2.1.18	ifOutNUcastPkts	The number of Non Unicast Packets which are received from upper protocol.
2.1.21	ifOutQLen	The length of the output packet queue (in packets).
2.1.22	ifSpecific	Relevant MIB object identifier.

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

IP Group (1.3.6.1.2.1.4)

Object ID	Item	Description
1	ipForwarding	The value which indicates operation availability as a router (whether Datagram is transferred or not).
2	ipDefaultTTL	Default value for IP Packet TTL (Time to Live).
3	ipInReceives	The total number of Packets received (including packet received in error).
4	ipnHdrErrors	The number of Packets discarded due to errors in their header.
5	ipInAddrError	The number of Packets discarded because IP Address of the destination was invalid.
7	ipInUnknownProtos	The number of Packets discarded because the protocol was unknown/unsupported.
8	ipInDiscards	The number of incoming Packets discarded because of an insufficient reception buffer.
9	ipInDelivers	The total number of Packets received (including ICMP) normally.
10	ipOutRequests	The total number of IP Packets (ICMP) which are tried to be transmitted (relay Packets is not included).

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

IP Group (continued) (1.3.6.1.2.1.4)

Object ID	Item	Description
13	ipReasmTimeout	The maximum number of seconds required in the buffer to rebuild a fragmented Packet.
14	ipReasmReqds	The number of Packets that required rebuilding from a fragmented state.
15	ipReasmOKs	The number of Packets that were rebuilt correctly from a fragmented state.
16	ipReasmFails	The number of Packets that could not be rebuilt correctly from a fragmented state.
17	ipFragOKs	The number of Packets that were fragmented correctly.
18	ipFragFails	The number of Packets that could not be fragmented correctly.
19	ipFragCreates	The number of IP datagrams created due to fragmentation.
20	ipAddrTable (NA)	Management Table of addressing information relevant to this entity's IP addresses.
20.1	IpAddrEntry (NA)	Components of ipAddrTable.
20.1.1	IpAdEntAddr	IP Address.

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

IP Group (continued) (1.3.6.1.2.1.4)

Object ID	Item	Description
20.1.2	IpAdEntIfindex	Index value of the Interface which is assigned to IP address.
20.1.3	IpAdEntNetMask	The Subnet Mask associated with IP address.
20.1.4	ipAdEntBcastAddr	Broadcast Address Value associated with IP Address.
20.1.5	IpAdEntReasmMaxSize	The size of the largest IP Datagram which can be sent/received through IP Address.

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

ICMP Group (1.3.6.1.2.1.5)

Object ID	Item	Description
1	cmpInMsgs	The total number of ICMP messages received (excluded, with error).
2	icmpInErrors	The total number of ICMP messages received which contained error.
8	icmpInEchos	The total number of ICMP echo request messages received.
9	icmpInEchoReps	The total number of ICMP echo answering messages received.
14	icmpOutMsgs	The number of ICMP messages which were sent.
15	icmpOutErrors	The number of ICMP messages which were not sent because of error.
21	icmpOutEchos	The number of ICMP Echo request messages sent.
22	icmpOutEchoReps	The number of ICMP Echo Reply messages sent.

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

TCP Group (1.3.6.1.2.1.6)

Object ID	Item	Description
1	tcpRtoAlgorithm	The algorithm used to determine the timing of retransmitting when a response was unacknowledged.
2	tcpRtoMin	Minimum value permitted for retransmission timeout (in milliseconds).
3	tcpRtoMax	Maximum value permitted for retransmission timeout (in milliseconds).
4	tcpMaxConn	Maximum number of TCP connections which can be supported.
5	tcpActiveOpens	The total number of Active open TCP connections.
6	tcpPassiveOpens	The total number of Passive open TCP connections.
7	tcpAttemptFails	The total number of connections error.
8	tcpEstabResets	The total number of resets.
10	tcpInSegs	The total number of segments received.
11	tcpOutSegs	The total number of segments sent.
12	tcpRetransSegs	The total number of segments retransmitted.

Appendix - MIBs (Management Information Bases)

NS1000 supports MIBs for SNMP manager to analyze information.

TCP Group (1.3.6.1.2.1.6)

Object ID	Item	Description
14	tcpInErrs	The total number of segments received in error.
15	tcpOutRsts	The total number of TCP segments sent containing the RST flag (reset connection).

Appendix - 2

RECOMMENDED USBS

Recommended Models Table

Each model might have several items which each have different capacity.

The capacity shown in this table is the capacity of the items which are tested.

Manufacturer	Model	Capacity
Transcend	JetFlash300	2GB
	JetFlash620	32GB
Imation	NANO-f	2GB , 4GB
Lexar	Jump Drive RETRAX	4GB
pqi	Traveling Disk U262	4GB
CORSAIR	Flash Voyager mini	4GB
San Disk	Cruzer Micro	2GB
HP	v155w	4GB
Apacer	AH128	8GB
	AH129	8GB
OCZ	Rally2 Dual Channel	32GB

MAINTENANCE COMPLETE

THE END.