Nortel Communication Server 2000/2100

Nortel IP Phone Key Expansion Module

User Guide

Revision history

June 2005

Standard 1.00. The information contained in this user guide applies to IP Phone Key Expansion Modules used in Communication Server 2100 and Communication Server 2000 networks.

Contents

About the Key Expansion Module (KEM)

This document describes the Nortel IP Phone Key Expansion Module (KEM) and how to use it with the Nortel IP Phone 2002 and Nortel IP Phone 2004 when used in a Communication Server 2100 network.

> ***Note:*** The IP Phone 2001 does not support the Key Expansion Module.

Audience

This user guide is written for end users who use the Key Expansion Module during their everyday communications.

Description

The IP Phone Key Expansion Module is a hardware component that connects to the IP Phone 2002 and IP Phone 2004 and provides additional line appearances and feature keys. See Figure 1 on page 9.

The IP Phone Key Expansion Module provides 24 additional line/feature keys (with labels) for your IP Phone 2002 or IP Phone 2004. However, the Communication Server to which the terminal or Key Expansion Module is connected determines the number of supported keys, not the devices themselves. Therefore, when used with the IP Client Manager the Key Expansion Module only provides 22 additional keys, despite there being 24 physical keys on the Key Expansion Module.

The keys are displayed in two columns of 12 keys on either side of a central Liquid Crystal Display (LCD). When deployed with the IP Client Manager, only the bottom 11 keys in each of the left- and right-hand columns are available.

Each Key Expansion Module has a desk-mount bracket and structural base plate to connect the Key Expansion Module to a Nortel IP Phone 2002, 2004 or another Key Expansion Module.

You can connect up to two Key Expansion Modules to your IP phone. Table 1 describes the number of additional keys that can be added to the IP Phone 2002 and IP Phone 2004.

Table 1:
Line/feature key availability

IP terminal	Standalone	With one KEM	With two KEMs
2002	14 See Note.	14 + 22 = 36	14 + 44 = 58
2004	11 See Note.	11 + 22 = 33	11 + 44 = 55
Note: Although the IP Client Manager defaults to these numbers as a maximum, they are configurable.			

Note: Not all features are available on all telephone types. Consult your network administrator to verify which features are available for your use.

When an IP Phone Key Expansion Module is installed on an IP Phone 2002 or IP Phone 2004, the controls on the IP Phone affect both the IP Phone and the IP Phone Key Expansion Module.

Figure 1: IP Phone Key Expansion Module

Features

The IP Phone Key Expansion Module has the following features:

- 24 keys, with 22 keys available for use, set in two columns on either side of an LCD display. These keys provide up to 44 logical self-labeled feature keys or additional line (DN) appearances for use by the IP phone.
- Desk-mount bracket and structural base plate to connect the Key Expansion Module to an IP Phone 2002 or 2004, or to another Key Expansion Module.
- Wall-mount bracket to install the Key Expansion Module alongside a wall-mounted IP Phone 2002 or 2004.

Your telephone option menu and the Key Expansion Module

The Key Expansion Module does not have an option menu of its own. All its features and options are set through the telephone option menu on the IP phone to which it is attached.

You can use your telephone's option menu to set characteristics for the Key Expansion Module such as the following:

- Language displayed
- Screen contrast
- Display diagnostics
- Local dialpad tone
- Feature key label

The only Key Expansion Module-specific options under the IP Client Manager terminal setting menu are available under "Display", which allows contrast adjustments.

IP Phone Key Expansion Module display

This section summarizes the display features of the Key Expansion Module.

The Key Expansion Module has one LCD display area set between the two rows of 12 keys as shown in the Idle display in Figure 2.

Figure 2:
IP Phone 2002 and Key Expansion Module display areas

Each of the 24 physical keys on the Key Expansion Module can have a 10-character display label. This label is set using the controls on the IP phone. The Key Expansion Module keys are numbered sequentially after the last defined key on the IP phone.

> ***Note:*** When connected to an IP Client Manager, the Key Expansion Module only supports 22 keys.

You can adjust the contrast of a Key Expansion Module through the IP Client Manager “Display” entry by using the terminal settings menu. You can adjust the display for the IP phone and the Key Expansion Module individually. In other words, the IP Client Manager supports different contrast settings between the IP phone and the Key Expansion Module and between the two Key Expansion Modules, if two are attached.

Setup and assembly

The IP Phone Key Expansion Module mounts on the right side of an IP Phone 2002 or IP Phone 2004 as shown in Figure 2 on page 11. It is secured by snapping into a receptacle on the back of the IP Phone using the desk-mount bracket and structural baseplate supplied with the IP Phone Key Expansion Module.

The IP Phone Key Expansion Module connects to the IP Phone 2002 or IP Phone 2004 using the Accessory Expansion Module (AEM) port on the IP Phone.

How it connects

The Key Expansion Module mounts on the right side of an IP Phone 2002 or 2004. The Key Expansion Module snaps into the receptacle on the back of the IP phone, using the desk-mount bracket and structural base plate supplied with the Key Expansion Module. Completed connections are covered by the attachment bridge. Figure 3 shows the back view of a Key Expansion Module attached to an IP Phone 2002.

Figure 3:
Key Expansion Module attached to an IP Phone 2002

The Key Expansion Module attaches to the IP Phone 2002, 2004, or another Key Expansion Module using an Accessory Expansion Module (AEM) interface.

Extending from the left side of the Key Expansion Module is a 10-pin female header on a ribbon cable attached inside the Key Expansion Module. It is positioned to enable you to perform the following:

- Connect Key Expansion Module 1 to the Accessory Expansion Module (AEM) connector on the right side of the IP phone.
- Connect Key Expansion Module 2 to Key Expansion Module 1.

The Key Expansion Module also has a 10-pin recessed male header. Plug the 10-pin female header on the ribbon cable of Key Expansion Module 2 into the 10-pin recessed male header of Key Expansion Module 1.

Installing the Key Expansion Module

Use the following instructions to install an IP Phone Key Expansion Module:

1. Remove the IP Phone from the stand by pressing the IP Phone tilt handle, and pulling the IP Phone away from the stand.

   Note: For the IP Phone 2004, you can also adjust the stand angle to maximum, instead of removing the stand.

2. Place the telephone and the Key Expansion Module face down on a nonabrasive surface and align them.
3. Place the connecting arm of the IP Phone Key Expansion Module behind the IP Phone and align the IP Phone Key Expansion Module connection plug to the AEM port on the back of the IP Phone.

   Note: Some older IP Phone 2002s have shorter connector pins than a more recent IP Phone 2002. If your IP Phone 2002 has a shorter connector pin, you must detach the ribbon cable connector in the IP Phone Key Expansion Module from the retaining clip and press the ribbon cable connector into the header connector before you attach the IP Phone Key Expansion Module.

4. Wrap the clamp around the cable and screw the clamp into the back of the telephone with a 3 and 8 mm screw.
5. Thread the cable through the opening in the side of the IP phone.
6. Insert the clips on the IP phone into the hinges on the footstand and then press onto the front of the footstand until it snaps into place.
7. While squeezing the telephone tilt handle, swing the footstand into the desired position.
8. Insert the clips on the Key Expansion Module into the hinges on the Key Expansion Module footstand; then, while squeezing the Key Expansion Module tilt handle, swing the footstand into the desired position.
9. The Key Expansion Module powers up.

   Note: The IP Phone Key Expansion Module uses the electrical connection of the IP Phone 2002 or IP Phone 2004 for power. It does not have its own power source.

Using the wall-mount option

The IP Phone and IP Phone Key Expansion Module combination can be wall-mounted using the optional bracket kit provided. The second IP Phone Key Expansion Module is attached to the right side of the first IP Phone Key Expansion Module.

Adjusting the tilt base

The tilt base for the IP Phone 2002 cannot be adjusted; however, the tilt base on the IP Phone Key Expansion Module can be adjusted to match the fixed angle of the IP Phone 2002.

The IP Phone 2004 has an adjustable tilt base. Adjust the tilt of both the IP Phone 2004 and the IP Phone Key Expansion Module as desired.

Initializing the Key Expansion Module

Once the Key Expansion Module has been installed and powered up on your IP Phone 2002 or 2004, the Key Expansion Module initializes itself. Table 2 describes how the process works.

Table 2:
Initialization process on the Key Expansion Module

Phase	Description
Key Expansion Module performs self-test	The self-test confirms the operation of the Key Expansion Modules local memory, CPU, and other circuitry. While undergoing this self-test, the Key Expansion Module display lights up. If the Key Expansion Module display does not light up, or lights up and then goes blank, or fails to begin flashing, contact your system administrator.
Key Expansion Module establishes communication with the base IP phone	The Key Expansion Module display flashes until it establishes communication with the base IP phone. If the Key Expansion Module display does not stop flashing, communication has not been established with the IP phone. Contact your system administrator for further assistance.
Key Expansion Module downloads keymaps	The keymaps download to the Key Expansion Module. The display on the Key Expansion Module is blank. The KEM uses keymaps to download the KEM key assignments (this is the process of mapping key numbers from the IP phone to the KEM).

Table 2:
Initialization process on the Key Expansion Module (Continued)

Phase	Description
Keys on your KEM display labels for features	When the three phases complete successfully, the keys on the KEM will display labels for features as assigned by your administrator. You are ready to use the Key Expansion Module.
Troubleshooting tip: On the IP Client Manager platform, in some circumstances, it may be necessary for the user to log out and log back in to their IP phone after attaching the device(s) to the terminal in order for the Key Expansion Module to become operational.	

When the three phases complete successfully, you are ready to use the additional feature and line (DN) keys on your Key Expansion Module.

Note: If you have more than one Key Expansion Module installed on your IP phone, the one to the immediate right of the telephone (KEM 1) must be functional for the subsequent Key Expansion Module (KEM 2) to work as well. This is because the second Key Expansion Module gets its power and communicates with the IP phone through the first Key Expansion Module.

Controls and settings

When an IP Phone Key Expansion Module is installed on an IP Phone 2002 or IP Phone 2004, the controls and settings of the IP Phone control both the IP Phone and the IP Phone Key Expansion Module. Use the **Telephone Options** menu on the attached IP Phone to set the contrast and feature key labels of the IP Phone Key Expansion Module.

For example, feature keys on the IP phone, such as Quit, Navigation, and Handsfree function the same for DNs terminating on the Key Expansion Module as they do for DNs terminating on the IP phone. Feature and soft keys, such as the Navigation keys, the Shift key, and Quit soft key work on the Key Expansion Module as they do on the IP phone. Features such as Autodial and Predial also work the same on both units.

For more information about controls and settings (including the **Telephone Options** menu) for your IP Phone, see the *IP Phone 2002 User Guide* or the *IP Phone 2004 User Guide*.

Terms you should know

Accessory Expansion Module

A built-in port on an Nortel IP Phone 2002 and Nortel IP Phone 2004 that enables accessory components (such as a Nortel IP Phone KEM) to connect and communicate with the IP Phone.

Directory Number (DN)

A one- to seven-digit number assigned to a system telephone.

Feature display

An area that shows status information about the feature in use. It also displays the name and status of the active session.

IP Phone Key Expansion Module

A hardware expansion module that provides 24 additional 10-character, self-labeled keys for your Nortel IP Phone 2002 or Nortel IP Phone 2004.

Soft keys (self-labeled)

A set of keys programmed by your system administrator. The four keys located directly below the display area have four programmable layers.

User-defined Feature Key Labels

The six keys located at the sides of the upper area of the display on the IP Phone. On the IP Phone KEM, the Feature Key Labels display in the LCD in the middle of the Nortel IP Phone KEM.

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