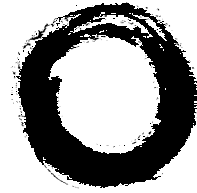


Lucent Technologies
Bell Labs Innovations



**PassageWay[®] Service Provider
for MERLIN LEGEND[®]
Communications System**
Getting Started

560-201-122
Comcode 108363003
Issue 1
October 1998

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Contents

1	Introduction	1-1
	■ What is the PassageWay Service Provider?	1-1
	■ About This Guide	1-2
	■ User Responsibilities	1-4
	■ Conventions Used in This Guide	1-4
	■ Getting Help	1-5
2	Installing and Configuring the PassageWay Service Provider	2-1
	■ Overview	2-1
	■ New PassageWay Solution Users	2-2
	■ Existing PassageWay Solution Users	2-3
	■ PassageWay Service Provider Components	2-4
	■ PassageWay Service Provider Requirements	2-6
	■ Before You Begin	2-9
	■ Installing the PassageWay Adapter	2-11
	■ Installing the Software	2-15
	■ Removing the PassageWay Service Provider	2-30

Contents

3	Troubleshooting	3-1
	■ Overview	3-1
	■ General Troubleshooting	3-2
	■ PassageWay Adapter LED	3-15
	■ Troubleshooting the Connect Application	3-16

A	PC Serial Ports	A-1
	■ Overview	A-1
	■ Background	A-2
	■ Workarounds and Solutions to the IRQ Conflict Problem	A-7
	■ Selecting an Add-On Serial Port Card	A-10

B	Installing the PassageWay Adapter with a Local Power Supply	B-1
	■ Overview	B-1

IN	Index	IN-1
-----------	--------------	------

Figures

2	Installing and Configuring the PassageWay Service Provider	2-1
	2-1. Components of the PassageWay Adapter	2-5
	2-2. PassageWay Adapter Installed without a Local Power Supply	2-12
	2-3. Find PassageWay Link Dialog Box	2-19
	2-4. Sample PassageWay Configurator - COM Port Dialog Box	2-22
	2-5. MERLIN LEGEND System Version Dialog Box	2-23
	2-6. Telephone Models Dialog Box	2-24
	2-7. Sample Phone Line Information Dialog Box	2-25

B	Installing the PassageWay Adapter with a Local Power Supply	B-1
	B-1. PassageWay Adapter Installed with a Local Power Supply	B-2

Introduction

1

What is the PassageWay Service Provider?

The PassageWay[®] Service Provider is a device driver that enables applications that are compliant with the Microsoft Windows[®] Telephony Application Programming Interface (TAPI) (such as PassageWay Telephony Manager) to communicate with your telephone and your company's MERLIN LEGEND[®] Communications System. The PassageWay Service Provider accepts the basic TAPI requests from your TAPI-compliant application and translates these requests into instructions to the PassageWay adapter to control your telephone and interact with your company's MERLIN LEGEND system.

The PassageWay Service Provider runs with Microsoft[®] Windows[®] 95, Microsoft Windows version 3.1 or later, and Microsoft Windows for Workgroups version 3.11 or later and provides you with an interface between your PC and your company's MERLIN LEGEND system via your telephone.

⇒ NOTE:
Microsoft Windows NT[®] and Microsoft Windows 98 are not supported.

About This Guide

This document describes how to install, configure, and troubleshoot the PassageWay Service Provider. This guide contains three chapters, two appendices, and an index:

- **Chapter 1 - Introduction**

This chapter describes the structure and content of this guide. This chapter also provides a brief introduction to the PassageWay Service Provider.

- **Chapter 2 - Installing and Configuring the PassageWay Service Provider**

This chapter describes how to install and configure the PassageWay Service Provider software.

- **Chapter 3 - Troubleshooting**

This chapter provides information about possible error conditions and how to respond to them when you use the PassageWay Service Provider.

- **Appendix A - PC Serial Ports**

This appendix provides detailed information about PC serial ports.

- **Appendix B - Installing the PassageWay Adapter with a Local Power Supply**

This appendix describes how to install the PassageWay adapter with a local power supply. You must install a local power supply if your telephone system wiring does not support the remote powering of adjuncts (such as the PassageWay adapter).

- **Index**

The index provides a quick way of locating information within this guide.



NOTE:

To determine whether you are using the proper issue of the Getting Started Guide for the PassageWay Service Provider installed on your PC, perform the following steps:

- a. Start the PassageWay Configurator.
 - If you have Windows 95, select **PassageWay Configurator** from the application folder that contains the PassageWay Service Provider. (The default application folder is **PassageWay for MERLIN LEGEND**.)
 - If you have Windows 3.1 or later or Windows for Workgroups 3.11 or later, open the program group that contains the PassageWay Service Provider, and double-click on the PassageWay Configurator icon. (The default program group is **PassageWay for MERLIN LEGEND**.)

The PassageWay Configurator - COM Port dialog box appears.

- b. Choose the Help button.
- c. Depending on your system, perform one of the following steps:
 - If you have Windows 95, choose **Version** from the Help menu. The Version Information message box appears, displaying the issue of the Getting Started Guide that the software requires. The issue number should match the issue number on the cover of this book.
 - If you have Windows 3.1 or later or Windows for Workgroups 3.11 or later, choose **About Help** from the Help menu. The About Help message box appears, displaying the issue of the Getting Started Guide that the software requires. The issue number should match the issue number on the cover of this book.
- d. Choose the OK button.

User Responsibilities

Before using the PassageWay Service Provider, you should be familiar with basic Windows functions and procedures. If not, consult your *Microsoft Windows User's Guide*.

You also may need to contact your PC vendor for information on configuring your PC to meet the PassageWay Service Provider requirements.

Conventions Used in This Guide

The following conventions are used in this guide:

- Commands and text you should enter appear ***in this style of type***.
- Values, instructions, and prompts that appear on the screen are in ***this style of type***.
- Components of dialog boxes (such as boxes) appear *in this style of type*.
- Key names that are always located on the keyboard in the same place appear in all capital letters (for example, ENTER).
- Key combinations (holding down one key while pressing another key) are connected with a "+" (for example, SHIFT+TAB).
- Only active windows are displayed.
- The terms *option buttons* and *radio buttons* refer to the same object.

- Throughout this guide, the term *MERLIN LEGEND* refers to the following versions of the MERLIN LEGEND system:
 - Release 2.0
 - Release 3.0
 - Release 3.1
 - Release 4.0
 - Release 4.1
 - Release 4.2
 - Release 5.0
 - Release 6.0
 - Release 6.1

Getting Help

If you have questions about or problems with the PassageWay Service Provider that this guide does not resolve, call the Lucent Technologies National Customer Care Center at **1 800 628-2888** or your local Authorized Dealer.

Installing and Configuring the PassageWay Service Provider

2

Overview

This chapter provides the procedures for installing and configuring the PassageWay Service Provider.

The information you must follow in this chapter depends on whether you have an earlier version of PassageWay Solution installed on your PC.



NOTE:

The appearance of dialog boxes and message boxes in this chapter may differ from the dialog boxes and message boxes that appear on your system, depending on the operating system you are using (that is, Windows 95 or Windows 3.1 or later).

New PassageWay Solution Users

This section applies to new PassageWay Solution users. If you have an existing version of PassageWay Solution, proceed to the next section, "Existing PassageWay Solution Users."

If you are a new PassageWay Solution user, perform the following steps:

1. Read the section "PassageWay Service Provider Components" to make sure that you have all of the PassageWay Service Provider components.
2. Read the section "PassageWay Service Provider Requirements" to make sure that you have the required hardware and software to run the PassageWay Service Provider.
3. Read the section "Before You Begin" to make sure that you have the necessary information to set up and configure the PassageWay Service Provider.
4. Connect your PassageWay adapter to your PC and your telephone by performing the procedures in the section "Installing the PassageWay Adapter."
5. Install and configure the PassageWay Service Provider software by performing the procedures in the section "Installing the Software."

Existing PassageWay Solution Users

This section applies to users who have an earlier version of PassageWay Solution installed. If you do not have an existing version of PassageWay Solution installed, refer to the previous section, “New PassageWay Solution Users.”

If you have an earlier version of PassageWay Solution installed on your PC, perform the following steps:

1. Read the section “PassageWay Service Provider Components” to make sure that you have all of the PassageWay Service Provider components.
2. Read the section “PassageWay Service Provider Requirements” to make sure that you have the required hardware and software to run the PassageWay Service Provider.
3. Read the section “Before You Begin” to make sure that you have the necessary information to set up and configure the PassageWay Service Provider.
4. Install and configure the PassageWay Service Provider software by performing the procedures in the section “Installing the Software.”

PassageWay Service Provider Components

The PassageWay Service Provider consists of the following components:

- software
- this guide
- the PassageWay adapter

The PassageWay adapter provides an interface between your MLX telephone and an available serial (COM) port on your PC by connecting to the following objects:

- the DSS jack on an MLX-28D™ or MLX-20L™ telephone or the Adjunct jack on an MLX-16DP™ or MLX-10DP™ telephone
- the serial port on your PC

- a 9-pin to 25-pin adapter for personal computers that have 9-pin serial ports
- a 4-foot, 4-pair, keyed modular phone cord (D8AC)

This modular phone cord connects your PassageWay adapter to your MLX telephone. For MLX-28D and MLX-20L telephones, this modular phone cord connects to the DSS jack. For MLX-16DP and MLX-10DP telephones, this modular phone cord connects to the Adjunct jack.

Figure 2-1 shows the components of the PassageWay adapter.

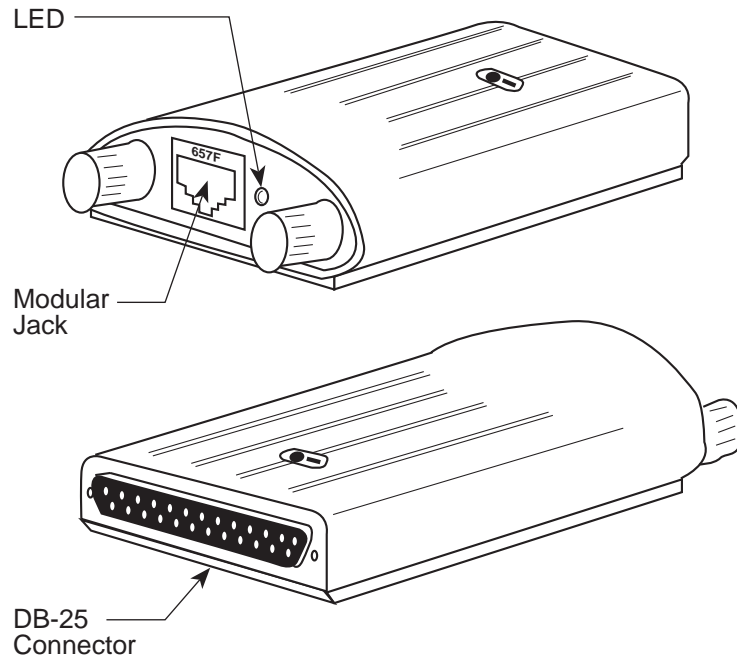


Figure 2-1. Components of the PassageWay Adapter

PassageWay Service Provider Requirements

The PassageWay Service Provider requires the hardware and software listed below. Install the required hardware and software before installing the PassageWay Service Provider software. Note that system performance may be adversely affected by lower system speeds and lower memory capacities.

- an IBM-PC compatible PC with the following hardware:

⇒ NOTE:

The PC hardware requirements for the operating system you are using (for example, Windows 95) most likely will be greater than the PC hardware requirements for the PassageWay Service Provider.

- an 80386 or higher processor
- an available serial port
- a minimum of 4 MB of RAM
- a 3.5-inch, 1.44-MB, high-density diskette drive
- a hard disk with at least 4 MB of space available
- a VGA or better monitor

- a Windows-compatible pointing device (a mouse or trackball is recommended)

 **NOTE:**

You must have an available serial port in your PC that is dedicated to the PassageWay Service Provider. The PassageWay Service Provider cannot share a serial port with other devices.

If all the serial ports in your PC are already in use, you must purchase an additional serial port or free up an existing serial port to use with the PassageWay Service Provider. Consult Appendix A for more information on choosing a suitable serial port for the PassageWay Service Provider.

- any of the following operating systems:

 **NOTE:**

Only English (United States) is supported.

- Microsoft Windows 3.1 or later
- Microsoft Windows for Workgroups 3.11 or later

 **NOTE:**

Throughout this document, the phrase *Windows 3.1 or later* is used to refer to Windows 3.1 or later and Windows for Workgroups 3.11 or later.

- Microsoft Windows 95

 **NOTE:**

Microsoft Windows NT and Microsoft Windows 98 are not supported.

- an MLX telephone connected to a MERLIN LEGEND system that is configured and operating properly in Hybrid/PBX mode or Key mode

 **NOTE:**

A complete list of all the telephones supported by the PassageWay Service Provider is provided in the PassageWay Service Provider software (also known as the “PassageWay Configurator”).

The PassageWay Service Provider operates with the following releases of the MERLIN LEGEND system:

- Release 2.0
- Release 3.0
- Release 3.1
- Release 4.0
- Release 4.1
- Release 4.2
- Release 5.0
- Release 6.0
- Release 6.1

 **NOTE:**

Throughout this document, the term *MERLIN LEGEND* is used to refer to all of the systems listed above.

Before You Begin

This section describes the information that is required to install and configure the PassageWay Service Provider.

Before installing the PassageWay Service Provider, you must know the following information:

- the release of the MERLIN LEGEND system your company has (for example, R6.1). To determine the release of your MERLIN LEGEND system, press the Intercom button or System Access (SA) button on your MLX telephone and then press ***05**. The release number appears on the display of your telephone.
- the mode in which the MERLIN LEGEND system is operating (that is, **Hybrid/PBX mode** or **Key mode**). To determine the operating mode, check if you have an Intercom button or a System Access (SA) button on your telephone. If you have an Intercom button, the MERLIN LEGEND system is operating in Key mode. If you have a System Access button, the MERLIN LEGEND system is operating in Hybrid/PBX mode. If you are unsure, consult your MERLIN LEGEND System Manager.
- the type of telephone you have
- the location and telephone number of each outside line button on your telephone
- the location and telephone number of each System Access (SA) button on your telephone. (System Access buttons are only available when the MERLIN LEGEND system is operating in Hybrid/PBX mode.)

- the location and extension number of each Intercom button on your telephone. (Intercom buttons are only available when the MERLIN LEGEND system is operating in Key mode.)
- the number of the COM port (for example, COM1, COM2, COM3, COM4, etc.) to which you are connecting the serial cable from the PassageWay adapter. (PassageWay supports up to COM9.) If you are unable to determine the number of the COM port, you can set PassageWay to determine the COM port for you when you install the software.

Installing the PassageWay Adapter

This section describes how to connect the PassageWay adapter to your telephone and your PC. Only perform the steps in this section if your PassageWay adapter is not installed already.

The PassageWay adapter provides an interface between the serial port on your PC and your MLX telephone, enabling you to access the MERLIN LEGEND system from your PC. The PassageWay adapter has a 25-pin connector for 25-pin serial ports. If you have a 9-pin serial port on your PC, use the 9-pin to 25-pin cable to connect the PassageWay adapter to your serial port.

Your MLX telephone must be wired with 4-pair station wiring for the PassageWay adapter to work. Otherwise, local telephone power is required via a local power supply.



NOTE:

Local telephone power is required if you use a console and DSS configuration with the PassageWay Service Provider. Appendix B describes how to install a local telephone power supply.

Refer to Figure 2-2 while installing the PassageWay adapter.



NOTE:

Do not install the PassageWay adapter while you are active on a call.

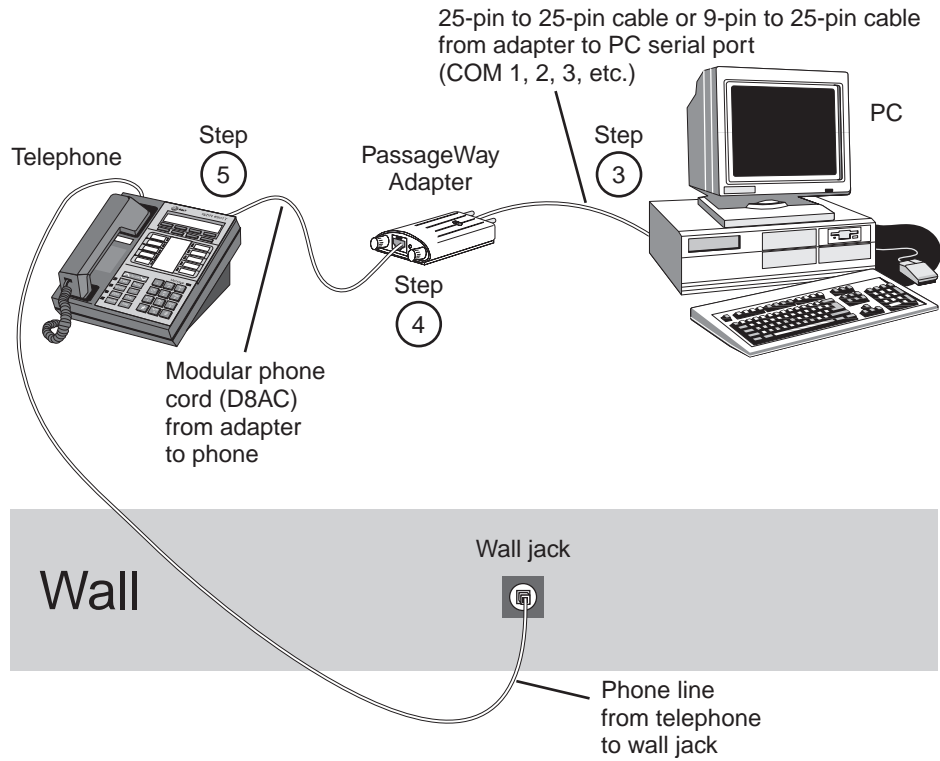


Figure 2-2. PassageWay Adapter Installed without a Local Power Supply

To install the PassageWay adapter:

1. Turn off your PC.
2. Unplug the line cord from your telephone.
3. Connect the DB-25 connector on the PassageWay adapter to the serial (COM) port on your PC. If your PC has a 9-pin serial port, connect the 9-pin to 25-pin adapter to the 9-pin serial port, and then connect the PassageWay adapter to the 25-pin connector on the 9-pin to 25-pin adapter.

 **NOTE:**

You can use an RS-232 cable to connect the adapter to the PC if you do not want to connect the adapter directly to the PC.

4. Connect one end of the 4-foot, 4-pair, keyed modular phone cord (D8AC) to the PassageWay adapter.
5. Perform one of the following steps:
 - If you have an MLX-28D or MLX-20L telephone, connect the other end of the 4-foot, 4-pair, keyed modular phone cord (D8AC) to the DSS jack on your telephone.
 - If you have an MLX-16DP or MLX-10DP telephone, connect the other end of the 4-foot, 4-pair, keyed modular phone cord (D8AC) to the Adjunct jack on your telephone.
6. Reconnect the line cord to the Line jack on your telephone.

7. Check the LED on the PassageWay adapter.

If the LED is amber or green, proceed to Step 8.

If the LED is any color other than amber or green (including no color), your PassageWay adapter requires auxiliary power. Proceed to Appendix B, "Installing the PassageWay Adapter with a Local Power Supply."

8. Turn on your PC.

Now, proceed to "Installing the Software."

Installing the Software

This section describes how to install and configure the PassageWay Service Provider. You can modify the PassageWay Service Provider configuration information later by running the PassageWay Configurator.



NOTE:

If you have an earlier version of PassageWay Solution, you must exit Connect or AT&TConnect (if it is running) before installing the new PassageWay Service Provider.

To install the PassageWay Service Provider:

1. Start Windows (if it is not running already).
2. Shut down all applications running on your PC.
3. If you have an earlier version of PassageWay Solution applications (for example, AT&TCall, AT&TConnect, or AT&TBuzz) installed already, perform one of the following steps:
 - If you do not want to run the earlier version of PassageWay Solution applications again, delete the Connect icon or AT&TConnect icon from your StartUp group (if present).
 - If you want to run the earlier version of PassageWay Solution applications again, leave the Connect icon or AT&TConnect icon in your StartUp group (if present). Be sure to install the PassageWay Service Provider in the directory that contains the PassageWay Solution applications. If you install the PassageWay Service Provider in a different directory, you must manually change the properties of the Connect icon or AT&TConnect icon in the StartUp group so that it uses the new Connect application. (See your Windows User's Guide to change the properties of an icon in the StartUp group.)

4. If you are installing from diskette, insert diskette #1 of the PassageWay Service Provider software into the diskette drive of your PC.

If you are installing from a shared directory on a network server, proceed to Step 5.

5. Perform one of the following steps:

— If you have Windows 95:

- a. From the Task Bar, click on the Start button.

The Start menu appears.

- b. Select **Run**.

The Run dialog box appears.

— If you have Windows 3.1 or later, select **Run** from the File menu of Program Manager.

The Run dialog box appears.

6. Depending on whether you are installing from diskette or a shared directory, perform one of the following steps:

— If the diskette is in drive A, type **a:\setup** in the Command Line box, and choose the OK button.

— If the diskette is in drive B, type **b:\setup** in the Command Line box, and choose the OK button.

— If you are installing from a shared directory, type the shared directory path (including the drive letter) provided by your Network Administrator and **setup** in the Command Line box, and choose the OK button.

The PassageWay for MERLIN LEGEND Service Provider Setup dialog box appears.

7. Choose the Next button.

The Select Destination Directory dialog box appears. This dialog box displays the name of the directory where the PassageWay Service Provider software will be installed by default.

8. If the default directory is unacceptable, choose the Browse button and specify an alternate directory. Otherwise, proceed to Step 9.
9. Choose the Next button.

If you are using Windows 95, the Select App Folder dialog box appears. This dialog box displays the name of the application folder to which the PassageWay Service Provider icons will be added. Proceed to Step 10.

If you are using Windows 3.1 or later, the Select ProgMan Group dialog box appears. This dialog box displays the name of the Program Manager group to which the PassageWay Service Provider icons will be added. Proceed to Step 10.

10. If the default application folder (for Windows 95) or Program Group (for Windows 3.1 or later) is unacceptable, enter the name of the new folder or group to be created or select an existing folder or group. Otherwise, proceed to Step 11.
11. Choose the Next button.

The Ready to Install dialog box appears.

12. Choose the Next button.

The installation program copies files from the source diskette to the destination directory. The installation program displays a message box to inform you of its status as it installs files.

If you are using Windows 95, the Creating Application Folder & Short Cuts message box appears.

If you are using Windows 3.1 or later, the Creating Program Group & Icons message box appears.

13. Choose the OK button.

The Installation Completed message box appears.

14. Choose the Finish button.

If you are using Windows 95, the PassageWay Configurator is launched, and it displays the Find PassageWay Link dialog box.

If you are using Windows 3.1 or later, the Configuring PassageWay Service Provider message box appears. Perform the following steps:

- a. Choose the OK button in the Configuring PassageWay Service Provider message box.

The Telephony window appears.

- b. In the Telephony window, choose the Driver Setup button.

The Telephony Drivers dialog box appears.

c. Perform one of the following steps:

- If the Lucent PassageWay Service Provider is listed in the Telephony Drivers dialog box, select it, and then choose the Setup button.
- If the Lucent PassageWay Service Provider is not listed in the Telephony Drivers dialog box:

i. Choose the Add button.

The Add Driver dialog box appears.

ii. Select the **Lucent PassageWay Service Provider**, and then choose the Add button.

The PassageWay Configurator is launched, and it displays the Find PassageWay Link dialog box.

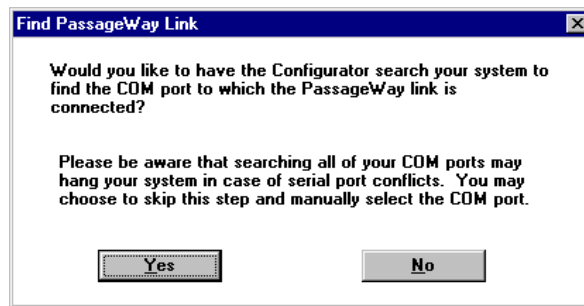


Figure 2-3. Find PassageWay Link Dialog Box

The PassageWay Configurator is a software application that enables you to set up the PassageWay Service Provider. Until you set up the PassageWay Service Provider, you will be unable to use any TAPI applications.

Setting up the PassageWay Service Provider consists of specifying the following information:

- the COM port to which the PassageWay adapter is connected
- the release of the MERLIN LEGEND system your company has (for example, R6.1). To determine the release of your MERLIN LEGEND system, press the Intercom button on your MLX telephone and then press ***05**. The release number appears on the display of your telephone.
- the mode in which the MERLIN LEGEND system is operating (that is, **Hybrid/PBX mode** or **Key mode**). To determine the operating mode, check if you have an Intercom button or a System Access (SA) button on your telephone. If you have an Intercom button, the MERLIN LEGEND system is operating in Key mode. If you have a System Access button, the MERLIN LEGEND system is operating in Hybrid/PBX mode. If you are unsure, consult your MERLIN LEGEND System Manager.
- type of telephone you have
- the location and telephone number of each outside line button on your telephone
- the location and telephone number of each System Access (SA) button on your telephone. (SA buttons are only available when the MERLIN LEGEND system is operating in Hybrid/PBX mode.)

- the location and extension number of each Intercom button on your telephone. (Intercom buttons are only available when the MERLIN LEGEND system is operating in Key mode.)

 **NOTE:**

The PassageWay Configurator does not verify whether the information you enter is correct. When you run a TAPI application (for example, Telephony Manager), the PassageWay Service Provider tries to use the information you entered via the PassageWay Configurator. If the information you entered in the PassageWay Configurator was correct, the TAPI application works properly. If any of the information you entered is incorrect, the TAPI application will not work. You must then run the PassageWay Configurator and change the incorrect information.

The Find PassageWay Link dialog box enables you to have the PassageWay Configurator determine the COM port to which your PassageWay adapter is connected.

15. Choose the Yes button.

If the PassageWay Configurator found the COM port to which your PassageWay adapter is connected, the PassageWay Link Found message box appears. Choose the OK button. The PassageWay Configurator - COM Port dialog box appears, and the option button for the corresponding COM port is selected.

If the PassageWay Configurator did not find the COM port to which your PassageWay adapter is connected, the PassageWay Link Not Found message box appears. Choose the OK button. The PassageWay Configurator - COM Port dialog box appears, and no COM port option button is selected.

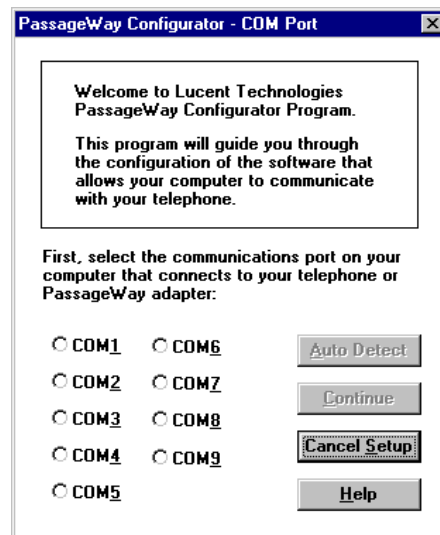


Figure 2-4. Sample PassageWay Configurator - COM Port Dialog Box

16. Perform one of the following steps:
- If PassageWay “found” the COM port for you, choose the Continue button.
 - If PassageWay did not find the COM port for you, select the option button of the COM port in your PC to which your PassageWay adapter is connected, and then choose the Continue button.

The MERLIN LEGEND System Version dialog box appears.

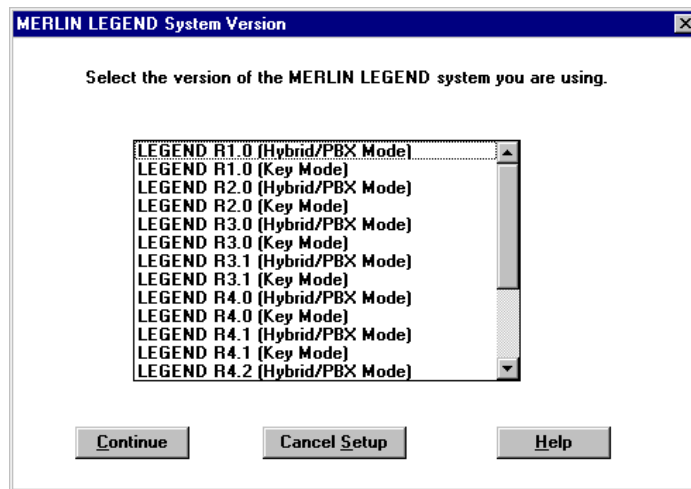


Figure 2-5. MERLIN LEGEND System Version Dialog Box

17. From the MERLIN LEGEND System Version dialog box, select the release and operating mode (that is, Hybrid/PBX mode or Key mode) for the MERLIN LEGEND system you are using, and then choose the Continue button.

The Telephone Models dialog box appears.

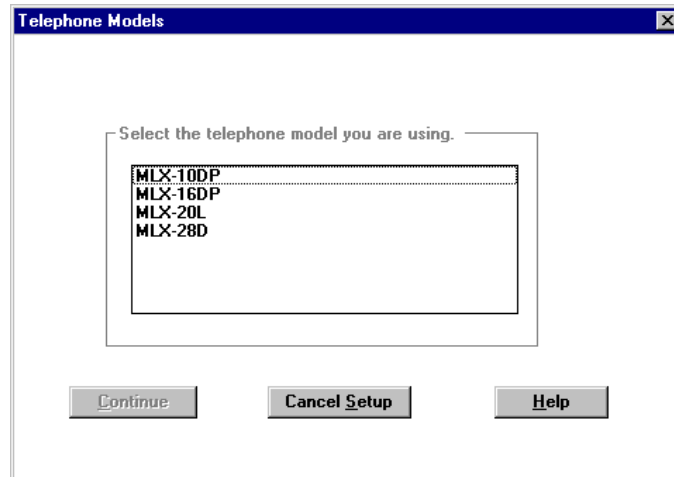


Figure 2-6. Telephone Models Dialog Box

18. Select the telephone you are using, and then choose the Continue button.

The Phone Line Information dialog box appears for the telephone type you specified.

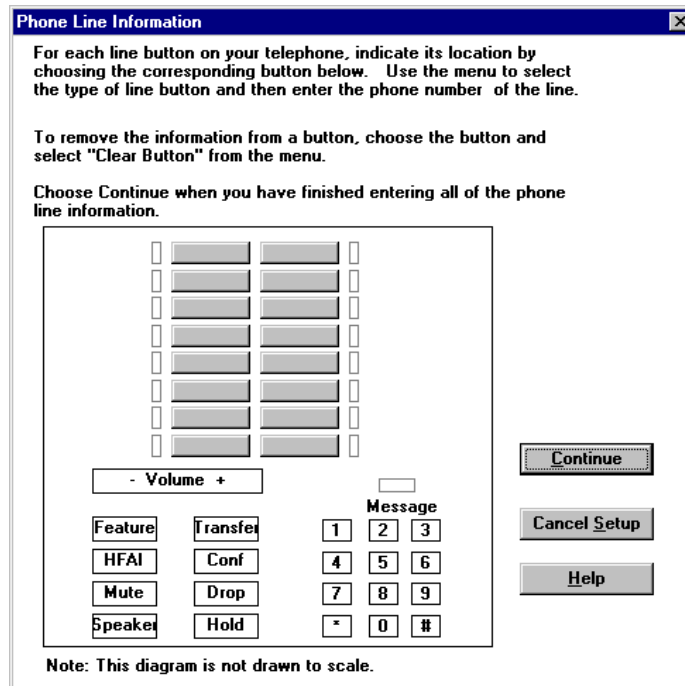


Figure 2-7. Sample Phone Line Information Dialog Box

This dialog box presents a representation of the buttons on your telephone. Using this dialog box, you will specify the location and telephone number for each outside line and System Access button (if your MERLIN LEGEND system is operating in Hybrid/PBX mode) or Intercom button (if your MERLIN LEGEND system is operating in Key mode)

19. Choose the location of an outside line on your telephone.

A submenu appears, displaying the following options:

- Clear Button, which removes the programming (if any) and label (if any) from the selected button.
- Intercom, which enables you to specify the extension number for the selected button. This option is only available if your MERLIN LEGEND system is operating in Key mode.
- Outside Line, which enables you to specify the telephone number of the outside line for the selected button.
- System Access, which enables you to specify the system access number for the selected button. This option is only available if your MERLIN LEGEND system is operating in Hybrid/PBX mode.
- Cancel, which closes the submenu without changing the programming for the selected button.

 **NOTE:**

Make sure you specify the correct location of each outside line and System Access button or Intercom button on your telephone. If you incorrectly specify this information, your system will not work as expected.

20. Choose **Outside Line**.

The Enter Number dialog box appears.

21. Enter the telephone number for the outside line, and then choose the OK button.

The button displays "LINE."

22. Repeat Steps 19 through 21 for any other outside lines on your telephone.

23. Depending on the mode in which your MERLIN LEGEND system is operating (that is, Hybrid/PBX mode or Key mode), choose the location of a System Access button or Intercom button on your telephone.

A submenu appears.

24. Depending on your system, choose **System Access** or **Intercom**.

The Enter Number dialog box appears.

25. Enter the number for the System Access button or Intercom button, and then choose the OK button.

The button displays the number you entered.

26. Repeat Steps 23 through 25 for any other System Access buttons or Intercom buttons on your telephone.

27. When you are finished, choose the Continue button.

The PassageWay Configurator - Complete message box appears.

28. Choose the OK button.

If you are using Windows 95, the Configuration Complete message box appears. Proceed to Step 29.

If you are using Windows 3.1 or later, the Telephony Drivers dialog box appears. Perform the following steps:

- a. In the Telephony Drivers dialog box, choose the Close button.
- b. In the Telephony window, choose the Close button.

The Configuration Complete message box appears. Proceed to Step 29.

29. Choose the OK button.

The View README File dialog box appears. If you want to view the Readme file now, make sure the check box is selected. (This check box is selected by default.) If you do not want to view the Readme file now, make sure the check box is not selected.

30. Choose the Finish button.

If the *Readme file* check box was selected, the Notepad window appears, displaying the contents of the Readme file. Proceed to Step 31.

If the *Readme file* check box was not selected, the About To Restart Windows message box appears. Proceed to Step 32.

31. When you are finished reading the Readme file, select **Exit** from the File menu to close the Notepad window.

 **NOTE:**

If you have any other Notepad windows open, you must close all of them now. The installation will not continue until all Notepad windows are closed.

The About To Restart Windows message box appears.

32. Choose the OK button.

The Install dialog box appears.

33. Remove the diskette from the diskette drive, and choose the OK button.

Depending on your version of Windows, either the system or Windows restarts.

The PassageWay Service Provider is now installed.

If you need to modify any of the information for your telephone (for example, lines are added to or removed from your telephone), run the PassageWay Configurator. The PassageWay Configurator is located in the application folder/program group that contains the PassageWay Service Provider. (The default application folder is **PassageWay for MERLIN LEGEND**.)



NOTE:

If you experience any difficulties running telephony applications, ask your MERLIN System Manager to check the administration of your telephone and then run the PassageWay Configurator again to correct any errors you may have made.

Removing the PassageWay Service Provider

Use the following procedure to remove the PassageWay Service Provider.

If you are using Windows 95, proceed to "Removing the PassageWay Service Provider in Windows 95."

If you are using Windows 3.1 or later, proceed to "Removing the PassageWay Service Provider in Windows 3.1 or Later."

Removing the PassageWay Service Provider in Windows 95

To remove the PassageWay Service Provider from your PC in Windows 95:

1. Close all PassageWay applications and telephony applications.
2. Select the Start button.
The Start menu appears.
3. Select **Programs**.
4. Select the application folder that contains the PassageWay Service Provider. (The default application folder is **PassageWay for MERLIN LEGEND**.)
5. Select **UnInstaller for Service Provider**.
The PassageWay for MERLIN LEGEND UnInstaller dialog box appears.
6. Choose the Next button.
The Ready to UnInstall dialog box appears.

7. Choose the Finish button.

The Perform Uninstall status box appears, displaying the status of the uninstall process. When the uninstall is completed, the UnInstaller Finished message box appears.

8. Choose the OK button.

Removing the PassageWay Service Provider in Windows 3.1 or Later

To remove the PassageWay Service Provider from your PC in Windows 3.1 or later:

1. Close all PassageWay applications and telephony applications.
2. Open the program group that contains the PassageWay Service Provider. (The default program group is **PassageWay for MERLIN LEGEND**.)

3. Double-click on the UnInstaller for Service Provider icon.

The PassageWay for MERLIN LEGEND UnInstaller dialog box appears.

4. Choose the Next button.

The Remove Service Provider dialog box appears.

5. Choose the OK button.

The Telephony window appears.

6. Choose the Driver Setup button.

The Telephony Drivers dialog box appears.

7. In the Installed Drivers box, select **Lucent PassageWay Service Provider**, and choose the Remove button.

A Telephony dialog box appears, prompting you to confirm that you want to remove the selected Telephony Service Provider.

8. Choose the Yes button.

The PassageWay Service Provider is removed from your PC and is no longer displayed in the Installed Drivers box of the Telephony Drivers dialog box.

9. Choose the Close button to close the Telephony Drivers dialog box.
10. Choose the Close button to close the Telephony window.

The Ready to UnInstall dialog box appears prompting you to confirm that you want to remove the PassageWay Service Provider and all associated files.

11. Choose the Finish button.

The Perform Uninstall status box appears, displaying the status of the uninstall process. When the uninstall is completed, the UnInstaller Finished message box appears.

 **NOTE:**

If you are running SHARE, a Share Violation error message box appears soon after the PassageWay Service Provider UnInstaller starts removing the files from your system. Choose the Cancel button (you may have to choose it two or more times), and you will be able to continue uninstalling the files. Two PassageWay UnInstaller files will not be removed from your PC. As a result, the directory containing the PassageWay Service Provider will not be removed. (The default directory for the PassageWay Service Provider is `pwm1`.) The Share Violation error message box will appear two or more times.

12. Choose the OK button.

Troubleshooting

3

Overview

This chapter provides information that can assist you in solving problems you might encounter when you use the PassageWay Service Provider. This chapter is divided into the following sections:

- General troubleshooting
- PassageWay adapter LED
- Troubleshooting the Connect application

Refer to the appropriate section to find the information required to solve your particular problem.

Keep in mind that TAPI applications depend on Connect in order to communicate with your telephone. Connect is installed when you install the PassageWay Service Provider. As a result, Connect may be used to help diagnose problems.

General Troubleshooting

This section presents some common problems you might encounter while using TAPI applications (for example, Snap Connection). For each problem, a strategy is presented that you can follow to isolate and solve your problem.

Starting TAPI Applications

This section presents some common problems you might encounter when you start TAPI applications (for example, Snap Connection).

Problem 1: A message box appears displaying the message:

A required component of the MERLIN LEGEND Service Provider is corrupt. The registry does not contain a SwitchType setting. Re-installing the MERLIN LEGEND software may fix this problem.

Uninstall and reinstall the PassageWay Service Provider.

Problem 2: A message box appears displaying the message:

A required component of the MERLIN LEGEND Service Provider is corrupt. The registry contains an inconsistent SwitchType. Re-installing the MERLIN LEGEND software may fix this problem.

Uninstall and reinstall the PassageWay Service Provider.

Problem 3: A message box appears displaying the message:

A required component of the MERLIN LEGEND Service Provider is corrupt. The registry does not contain a valid PassageWayPath setting. Re-installing the MERLIN LEGEND software may fix this problem.

Uninstall and reinstall the PassageWay Service Provider.

Problem 4: A message box appears displaying the message:

A required component of the MERLIN LEGEND driver (file name) is missing. Re-installing the MERLIN LEGEND software may fix this problem.

Uninstall and reinstall the PassageWay Service Provider.

Problem 5: A message box appears displaying the message:

A required component of the MERLIN LEGEND driver (file name) is corrupt. Re-installing the MERLIN LEGEND software may fix this problem.

Uninstall and reinstall the PassageWay Service Provider.

Problem 6: A message box appears displaying the message:

A required component of the MERLIN LEGEND driver (file name) could not initialize properly. Check your COM port setting.

Uninstall and reinstall the PassageWay Service Provider.

Problem 7: A message box appears displaying the message:

A required component of the MERLIN LEGEND driver (file name) could not initialize properly. Re-installing the MERLIN LEGEND software may fix this problem.

Uninstall and reinstall the PassageWay Service Provider.

Problem 8: A message box appears displaying the message:

A required registry entry of the MERLIN LEGEND Service Provider is missing (MERLIN LEGEND). Re-installing the MERLIN LEGEND software may fix this problem.

Uninstall and reinstall the PassageWay Service Provider.

Answering Calls

This section presents some common problems you might encounter when you answer calls via TAPI applications (for example, Snap Connection).

Problem 1: You cannot answer calls via your TAPI application.

If you are trying to use your TAPI application and find that an incoming call is not seen by the application, it is possible that the PC link to the MERLIN LEGEND adapter has not been properly established. To verify whether this is the cause of the failure, you should restart all of your telephony applications and try the application again.

Please keep in mind that there are many types of applications that classify as telephony applications. For example, Microsoft Exchange and Microsoft Schedule+ are both telephony applications. If either are running, they will have to be shutdown and restarted.

Problem 2: Your TAPI application does not properly reflect the status of your phone.

During the use of your application, it is possible that the application may get out of sync with the phone. There are many reasons why this may occur. Some of these reasons may be attributed to some of the issues documented in the above items.

If you are experiencing these problems, such as “phantom calls,” where there are calls displayed on the application without a corresponding call on the phone, or the opposite, where there are calls on the phone that are not displayed on the application, then you should restart the application and any other telephony application that you have running on your system.

Please keep in mind that there are many types of applications that classify as telephony applications. For example, Microsoft Exchange and Microsoft Schedule+ are both telephony applications. If either are running, they will have to be shutdown and restarted.

Making Calls

This section presents some common problems you might encounter when you make calls via TAPI applications (for example, Snap Connection).

Problem 1: You are unable to dial from a TAPI-compliant application.

Perform the following steps:

1. Start the PassageWay Configurator and verify that the PassageWay Service Provider was installed and configured properly.
2. Close all telephony applications, and then run Connect.
3. From the Setup menu in Connect, select **Test Adapter**, and follow the instructions on the screen.

If the PassageWay Adapter Test fails, note the error number and refer to the next section, "Troubleshooting Connect."

If all tests pass successfully, run the TAPI-compliant application.

Problem 2: You cannot make calls via your TAPI application.

If you are trying to use your TAPI application and find that it is unable to initiate a call or an incoming call is not seen by the application, it is possible that the PC link to the MERLIN LEGEND adapter has not been properly established. To verify whether this is the cause of the failure, you should restart all of your telephony applications and try the application again.

Please keep in mind that there are many types of applications that classify as telephony applications. For example, Microsoft Exchange and Microsoft Schedule+ are both telephony applications. If either are running, they will have to be shutdown and restarted.

Problem 3: You cannot make a call with the speakerphone.

If you are using a TAPI application, like Microsoft Dialer (Dialer is an add-on package for Windows 3.1x but is provided with Windows 95 to operate your telephone), you may encounter a problem. You can make calls on the phone using the TAPI application. However, if the TAPI application is running and you try to make a call on the speakerphone manually, the line will be disconnected. This problem is the result of a problem with Microsoft TAPI. To correct this problem, you should close the offending TAPI application. Or, as a workaround, you should lift the hand-set first and then turn on the speakerphone.



NOTE:

This problem will exist with some TAPI applications. One application that does not exhibit this problem is Microsoft Phone (only available for Windows 95).

Problem 4: Your TAPI application does not properly reflect the status of your phone.

During the use of your application, it is possible that the application may get out of sync with the phone. There are many reasons why this may occur. Some of these reasons may be attributed to some of the issues documented in the above items.

If you are experiencing these problems, such as “phantom calls,” where there are calls displayed on the application without a corresponding call on the phone, or the opposite, where there are calls on the phone that are not displayed on the application, then you should restart the application and any other telephony application that you have running on your system.

Please keep in mind that there are many types of applications that classify as telephony applications. For example, Microsoft Exchange and Microsoft Schedule+ are both telephony applications. If either are running, they will have to be shutdown and restarted.

Placing Calls on Hold

This section presents some common problems you might encounter when you place calls on hold via TAPI applications (for example, Snap Connection).

Problem 1: When you place an outgoing, ringing call on hold via your TAPI-compliant application, the call is dropped (that is, disconnected).

You should not place outgoing, ringing calls on hold. The PassageWay Service Provider will disconnect these calls.

Conferencing Calls

This section presents some common problems you might encounter when you conference calls via TAPI applications (for example, Snap Connection).

Problem 1: You are unable to add more parties to a conference.

The MERLIN LEGEND system supports a maximum of five parties in a conference (including you). The members of the conference is limited to:

- a maximum of two internal extensions/intercoms
- a maximum of two outside lines

If you have established a conference and there are less than five parties in the conference, there are times that you will not be able to add more parties to the conference. If parties that are currently on the conference drop from the conference, this information may not be properly reflected in the application. Once this occurs, it may not be possible to add more parties to the conference.

At this point, you will have to add more parties using the phone. After the conference is completed, you should restart the application to resync the application with your phone. This problem will be addressed in a later release of the PassageWay Service Provider.

Problem 2: When you conference an outgoing, ringing call via your TAPI-compliant application, the outgoing call is dropped, but your application indicates that the conference exists.

You should not conference outgoing, ringing calls. The PassageWay Service Provider will disconnect these calls. Even though the call was dropped, your application may incorrectly indicate that the call is part of the conference.

Problem 3: During a conference call started by another caller, you are unable to drop/hang up from the call while using the telephone handset.

If you are participating in a conference call that was started by another caller (that is, you did not start the conference) and you are not using your speakerphone, you will be unable to use the TAPI application to hang up from the conference. To hang up, you must place the handset back in the cradle.

Problem 4: You are unable to use the Conference feature.

If your telephone is configured with one bridged call appearance or multiple bridged call appearances to different extensions, you will be unable to conference calls using the TAPI application. This situation will not occur if you have more than one bridged appearance for each number.

Problem 5: Your TAPI application completes a conference without a real conference existing.

If you drop the consultation call or if the party on the other end of the consultation call hangs-up in midst of setting up a conference, the application may incorrectly show that the conference was completed. Meanwhile, there is only one call active on the phone. This is a known problem that will be addressed in a later release of the PassageWay Service Provider.

If you are experiencing this problem, then you should restart the application and any other telephony application that you have running on your system. Please keep in mind that there are many types of applications that classify as telephony applications. For example, Microsoft Exchange and Microsoft Schedule+ are both telephony applications. If either are running, they will have to be shutdown and restarted.

Transferring Calls

This section presents some common problems you might encounter when you transfer calls via TAPI applications (for example, Snap Connection).

Problem 1: You are unable to use the Conference and Transfer features.

If your telephone is configured with one bridged call appearance or multiple bridged call appearances to different extensions, you will be unable to conference and transfer calls using the TAPI application. This situation will not occur if you have more than one bridged appearance for each number.

Using the PassageWay Configurator

This section presents some common problems you might encounter when you use the PassageWay Configurator.

Problem 1: When you start the PassageWay Configurator and use the Auto Detect feature (that is, the Find PassageWay Link dialog box), the PassageWay Link Not Found message box appears.

This message box appears if there is a problem with the connection between your PC and your PassageWay adapter.

Perform the following steps:

1. Make sure no telephony applications are running on your PC. If any telephony applications are running, close them.
The PassageWay Configurator - COM Port dialog box appears.
2. Verify that the PassageWay adapter is installed properly. Refer to "Installing the PassageWay Adapter" in Chapter 2.
3. Look at the back of your PC and verify the COM port to which the PassageWay adapter is connected.
4. In the PassageWay Configurator - COM Port dialog box, select the option button of the COM port to which your adapter is connected, and then choose the Auto Detect button.

If the PassageWay Configurator found the COM port to which your PassageWay adapter is connected, a message box appears, stating that the PassageWay link was found and providing the number of the COM port. Choose the OK button and finish configuring the PassageWay Service Provider.

If the PassageWay Configurator could not find the COM port to which your PassageWay adapter is connected, the PassageWay Link Not Found message box appears. Choose the OK button, and then proceed to Step 5.

5. Choose the Continue button in the PassageWay Configurator - COM Port dialog box and finish configuring the PassageWay Service Provider.
6. Start Connect after the PassageWay Service Provider is configured.
 - If you are using Windows 95, select **PassageWay Connect** from the application folder that contains the PassageWay Service Provider. (The default application folder is **PassageWay for MERLIN LEGEND**.)
 - If you are using Windows 3.1 or later, double-click on the PassageWay Connect icon in the program group that contains the PassageWay Service Provider. (The default program group is **PassageWay for MERLIN LEGEND**.)

The Connect - Communications Error dialog box appears.
7. Choose the Test button and follow the instructions on the screen.

If the PassageWay Adapter Test fails, note the error number and refer to the next section, "Troubleshooting Connect." If you still cannot solve the problem, proceed to Step 8.

If all tests pass successfully, run your TAPI-compliant application.
8. Contact the Lucent Technologies National Customer Care Center at **1-800-628-8888**.

Problem 2: When you start the PassageWay Configurator and use the Auto Detect feature, you receive the message “Device Not Present.”

In configuring the service provider, you may choose to let the Configurator search for the COM port to which the PassageWay link is connected. All of the COM ports known to the system will be searched. If the Windows system comes across a PCMCIA COM port that is not physically there, but is available to Windows, you will receive the following error message (“Device Not Present”). The following example is for COM4.

“A PCMCIA Card for the COM4 port is not present in a slot. Insert a card for the port and select the OK button. You may have to reconfigure the COM port.”

Problem 3: The PassageWay Link is not always detected.

During the installation, you will be asked if you would like the system to search for your PassageWay link/adaptor. If you choose to have this done for you, it is possible that the link will not be found. Assuming that you know the proper serial port, you can use the Auto Detect button on the PassageWay Configurator - COM Port dialog box to verify that the system can find the PassageWay adapter. Even though the automatic search did not find the link, assuming that you are properly connected and there isn't a conflict in the system, the adapter should be found. This problem will be addressed in a later release of the PassageWay Service Provider.

Problem 4: Your COM (serial) port is not recognized.

If all of the COM Ports that are listed in the PassageWay Configurator - COM Port dialog box are disabled, then you may have a newer PC that supports Plug-n-Play (PnP) for the serial ports. The PassageWay software is trying to identify the location of the COM ports through the System BIOS. If that information is not there, as seen in PnP systems, then PassageWay does not know of the existence of the COM ports. If you have PnP, you will have to access the PC BIOS information to turn off Plug-n-Play for the serial ports. This problem will be addressed in a later release of the PassageWay Service Provider.

Installing and Uninstalling the PassageWay Configurator

This section presents some common problems you might encounter when you install and uninstall the PassageWay Configurator.

Problem 1: The PassageWay Setup screen does not display properly.

On some PCs, depending on the type of video display adapter that is installed, some of the Setup screens may not display properly. That is, the background image for Setup may not be totally clear. This is an interaction with the video adapter and how the adapter switches from one resolution to another. This does not last throughout the entire Setup session.

Additionally, on some systems, if you move the current dialogue box displayed during Setup, it is possible that the painting of the dialogue box in its new position might also be accompanied with a residual image of the dialogue box in its old position. This phenomenon does not last and is cleared once the current dialogue is dismissed. Again, this problem is a result of the interaction with the video display adapter.

Problem 2: You experience problems while uninstalling the PassageWay service provider.

While running the UnInstaller on Windows 3.1x, the focus may change from the UnInstaller to the Program Manager. Assuming your Program Manager is not maximized, you will see the blue gradient screen of the UnInstaller in the background. Please give focus to the UnInstaller at this point by using ALT-TAB until you cycle back to the UnInstaller.

For Windows 3.1x, if you are running SHARE and try to UnInstall, you will get a Share Violation error message soon after the UnInstaller starts removing the files from your system. Choose the Cancel button (you may have to choose it about two or three times) and you will be able to continue with the UnInstall. You will see this error message box twice. This has no known detrimental impact on your system.



NOTE:

When SHARE is loaded, the two UnInstaller files will not be removed from the system. This will prevent the removal of the PassageWay directory.

If you choose the Cancel button while running the UnInstaller, you may not be able to run UnInstaller again. You may also find pieces of the PassageWay software still installed. Your best bet at this point is to install the software again, run the UnInstaller, and allow the UnInstaller to complete its operation. When the UnInstaller has completed its operation, the PassageWay software will have removed itself.

PassageWay Adapter LED

This section describes the error conditions represented by the LED on the PassageWay adapter.

Problem 1: The LED is “off.”

This indicates that your PassageWay adapter is not receiving power. Your telephone system wiring may not support the remote powering of adjuncts. (You must have 4-pair station wiring to support the remote powering of adjuncts such as the PassageWay adapter.) Consult your MERLIN LEGEND System Manager to obtain the proper wall power supply to power your PassageWay adapter or to correct any wiring problems that may be the cause.

If you already have an auxiliary power supply installed, make sure it is installed properly. Refer to Appendix B, “Installing the PassageWay Adapter with a Local Power Supply.”

Troubleshooting the Connect Application

This section presents some common problems that you might encounter while using Connect. For each problem, a strategy is presented that you can follow to isolate and solve your problem.

Problem 1: Connect displays the message: This application requires a serial port and terminates.

This message indicates that Connect cannot find an available serial port on your system. This message will most likely appear immediately after you have completed the installation of the PassageWay software using the setup program since this is the first time Connect tries to run.

If you do not have an available serial port (for example, if you have only one serial port, and this port is being used by your mouse), you will need to add an additional serial port to your PC in order to use the PassageWay Service Provider. Your computer vendor can assist you in obtaining the necessary hardware to add another serial port. See Appendix A for more information.

If you are certain that you have an available serial port (other than a port being used by your mouse), the available port might be disabled, in which case Connect will be unable to detect its presence.

If you are able to determine that your PC has no active COM ports, or only COM1 is active (but is used by your mouse under Windows), you will need to either purchase an additional COM port for your PC or consult your PC's hardware documentation to determine how to re-enable a COM port that might be disabled. (Refer to Appendix A for information on COM ports.) Re-enabling a COM port may require changing the placement of a jumper on your computer's system board or running your PC's setup program.

Problem 2: Connect displays its Communications Error dialog box within a few seconds after it is run.

This message indicates that Connect cannot communicate properly with your telephone. This message can appear for one of the following reasons:

- Your PassageWay adapter is not connected properly to your PC serial port and/or telephone.
- Your PassageWay adapter is not receiving power.
- Connect is administered to use a different serial port than the one to which the telephone is connected.
- One or more cables and/or adapters are damaged, not properly attached, or not compatible with the PassageWay Service Provider.

You should follow the instructions provided in this dialog box to troubleshoot the problem. These instructions ask you to verify the following items:

- The PC-side and phone-side cabling are connected properly.

Insure that the phone cord between the jack marked "Line" on the telephone and the jack marked "Phone" on the PassageWay adapter is completely inserted into both jacks. A proper connection is confirmed by a tactile "click" as the cord is fully inserted.

Also insure that any RS-232 cables and adapters that you might be using to connect the PassageWay adapter to your PC are NOT null modem cables (a special type of cable), and that the total length of the combined RS-232 cabling does not exceed about 40 feet (the length should be as short as is convenient for your setup).

- Insure your PassageWay adapter is receiving power (as indicated by the illumination of the power LED).

If you have verified that the PassageWay adapter is properly connected to your telephone, yet the LED on the adapter is NOT illuminated, your telephone system wiring may not support the remote powering of adjuncts. If this is the case, you should consult your account representative or authorized dealer to obtain the proper wall supply to power your PassageWay adapter or to correct any wiring problems that may be the cause.

- Connect's software-based link test passes.

To assist you in diagnosing problems, Connect contains a built-in link test procedure. This test can be run directly from the Communications Error dialog box by choosing the Test button.

If the test procedure concludes successfully, Connect is communicating properly with your PassageWay adapter over the COM port you selected, and you should select the Continue button on the Communications Error dialog box to restore normal operation.

If, however, the test fails, an error number will be provided. Refer to the following pages to interpret the error numbers and to find suggestions for how to resolve the particular error you encountered.

Failure Code -121

Meaning: Connect is not receiving data over the specified COM port.

Things to Try:

- Verify that the connection between your PC's COM port and the telephone is secure.
- Verify that the COM port number you selected during the Connect setup procedure matches the number of the COM port that is physically connected to your telephone.
- If you are using an auxiliary power supply, verify that it is properly installed.
- If you are not using an auxiliary power supply, you will need to obtain one unless your MERLIN LEGEND system is wired to provide adjunct power to your extension (your System Manager can provide this information). Your Lucent sales representative can supply you with the proper power supply, if needed.
- Verify the connections between your telephone and your MERLIN LEGEND system.

Failure Code -131, -132, -133, and -135

Meaning: Connect is receiving incorrect data over the specified COM port.

Things to Try: Verify that the COM port number you selected during the PassageWay Service Provider setup procedure (via the PassageWay Configurator) matches the number of the COM port that is physically connected to your PassageWay adapter. This failure usually indicates that the specified COM port is connected to a modem or data module rather than your PassageWay adapter.

Failure Code -134 and -141

Meaning: The PassageWay adapter is not properly connected to your telephone.

Things to Try: Verify the connection between your PassageWay adapter and your telephone.

Failure Code -2xx

Meaning: An unexpected Windows communications error has occurred.

Things to Try: Try closing all applications except Connect and Program Manager, and then repeat the Link test procedure.

Problem 3: Connect will not work on COM ports other than COM1 and COM2.

By default, many PCs are not configured to permit the simultaneous use of three or more COM ports. Specifically, most PCs are configured such that COM ports are grouped into pairs: COM1 is paired with COM3, and COM2 is paired with COM4. By default, such PCs permit only one COM port from each pair to be operating at the same time (for example, COM1 with COM2). COM ports within the same pair will usually conflict with one another and are not supported (that is, COM1 with COM3, or COM2 with COM4).

If you cannot get Connect to work properly on COM3, check if another device is using COM1 at the same time. Similarly, if you cannot get Connect to work on COM4, determine if another device is using COM2 at the same time. If so, you may need to make some changes to your PC configuration to support using the PassageWay Service Provider on COM3 or COM4. Refer to Appendix A for more information. If you need additional assistance in setting up devices on COM ports other than COM1 and COM2, consult your PC hardware vendor.

Problem 4: Connect occasionally displays its initialization window while one or more PassageWay applications are running.

Connect displays its initialization window whenever it establishes (or re-establishes) communication with the telephone. Generally, this window is displayed only once, at the time when a single PassageWay application is first executed. However, if a communications problem occurs at any time, Connect attempts to clear the problem by reinitializing itself, which causes the initialization window to reappear temporarily. If this occurs while a PassageWay application is performing a task involving the telephone, the operation in progress will be aborted and must be restarted manually once the initialization window disappears. If no task involving the telephone is in progress during this process, the operation of PassageWay applications is unaffected.

The chance of a communications problem depends on your PC's configuration. The PassageWay Service Provider operates at a data rate of 9600 baud, and it relies on Windows to manage the flow of data through your PC's serial port. Depending upon the speed of your PC, the number and type of applications you are using, and various hardware components in your PC configuration, Windows will be able to manage serial communications with varying degrees of effectiveness.

If you encounter frequent communications errors using the PassageWay Service Provider, your PC's current hardware configuration may not support reliable high-speed communications under Windows. Appendix A includes information about choosing serial port hardware that can work reliably at high speeds under Windows.

Problem 5: Connect will not run. It displays the message: Connect must terminate due to an unexpected communications error and then terminates.

This message indicates that Connect cannot communicate with the COM port you specified using the PassageWay Configurator. Run the PassageWay Configurator and select a different COM port.

PC Serial Ports



Overview

This appendix provides detailed information about PC serial ports, including background information about what they are and how they work. It also explains how Microsoft Windows 3.1 manages serial ports, how to resolve problems using COM3 or COM4 under Windows, and how to choose serial port hardware that is well-suited to the PassageWay adapter. If you are familiar with serial port terminology (for example, I/O port addresses, IRQs, etc.), you may wish to skip over the background section. If not, you should review the background section before reading further.

If you are having problems using the PassageWay adapter on COM3 or COM4, you should refer to "Workarounds and Solutions to the IRQ Conflict Problem." If you intend to purchase an add-on serial port card for use with the PassageWay adapter, you should refer to "Selecting an Add-On Serial Port Card" for information that can assist you in selecting a card.

Background

Serial ports (also sometimes referred to as communications ports or COM ports) are hardware interfaces that permit your PC's microprocessor to communicate with peripheral devices using a communications standard called RS-232 (hence, serial ports are also sometimes referred to as RS-232 ports). Many common computer accessories make use of serial ports, including serial mice, modems, and serial printers.

Under DOS (and Windows, which works cooperatively with DOS), the serial port interfaces in a PC are uniquely identified by specific device names: COM1 ("serial communications port 1"), COM2 ("serial communications port 2"), and so on, usually up through COM4. A particular PC might have none of these devices, some of them, or all of them installed. For example, most PCs currently on the market arrive from the manufacturer with two serial ports already installed (COM1 and COM2), often integrated onto the computer's main system board. Installing additional serial ports (for example, COM3 or COM4) is usually accomplished by purchasing an add-on card and installing it into a free expansion slot.

For most purposes (such as configuring software), the generic description of serial ports provided by their device names is sufficient. For example, during the PassageWay Service Provider installation procedure, you are asked to provide the device name of the serial port to which you have connected the telephone (for example, COM2). Unfortunately, this abstract view of serial ports is not sufficient for other purposes, notably for troubleshooting problems: To be able to do this effectively, a basic understanding of serial port hardware is required. In particular, it is essential to understand the mechanics by which the computer's microprocessor communicates with serial port hardware.

The microprocessor/serial port communication consists of two aspects: an I/O port address and an interrupt request signal (IRQ). The I/O port address represents a small region of the microprocessor's input/output memory space that is used to pass data back and forth to the serial port. This memory region acts something like a mailbox: Outgoing mail (data from the microprocessor to be transmitted to the peripheral device) is placed in the mailbox by the owner (the microprocessor) to be picked up by the mail carrier (the serial port hardware) for subsequent delivery to the destination party (the peripheral device). In turn, the mail carrier (the serial port hardware) places incoming mail (data from the peripheral device) into the box to be picked up by the owner (the microprocessor). This analogy illustrates an additional important point about I/O port addresses: Just as individual mailboxes help the residents in a neighborhood keep their mail from getting mixed up, each device using an I/O port address to communicate with the microprocessor should have a unique address that does not conflict with that of any other device.

IRQ Mechanism

The mailbox analogy is also helpful in understanding the IRQ mechanism. Normally, we place our outgoing mail in our mailbox at any convenient time before the mail carrier arrives to pick it up. The outgoing mail sits in our mailbox until the mail carrier arrives, at which time it is picked up and possibly some incoming mail is placed in the mailbox. Then, some time later, we check our mailbox and retrieve our new incoming mail. The problem with this scheme is that it is not very efficient; both the outgoing and incoming mail spend some time just sitting in the mailbox. A better approach would be if the mail carrier provided some sort of signal (for example, ringing the doorbell) to announce his or her arrival, in which case we could hand over the outgoing mail and pick up the incoming mail immediately.

In the PC architecture, IRQs act like the doorbell in our analogy: They provide a method by which hardware devices in the computer can get the microprocessor's attention to deal efficiently with some process. The serial port hardware makes use of an IRQ to announce that it is ready to receive more outgoing data and/or that new data have arrived from the peripheral device that need to be processed.

Like I/O port addresses, IRQs must generally be unique among the active hardware devices in a computer system. In the mailbox analogy, the doorbell is probably not a good signal since virtually anyone could ring the doorbell for any number of reasons, not just to indicate the arrival of mail. Similarly, if a particular IRQ signal is used (PCs generally support 16 unique IRQ signals, denoted IRQ0, IRQ1, and so on, up through IRQ15), the microprocessor must take the appropriate action for the device associated with that IRQ. If there is a mix-up, or if more than one device attempts to use the same IRQ at the same time, a conflict occurs, and the outcome is often unpredictable and usually undesirable (for example, the computer may "hang"). Because IRQs are a limited resource, some newer PCs support IRQ sharing, a hardware mechanism that permits more than one device to make use of the same IRQ, but most PCs do not. For example, all PCs that use IBM's MicroChannel Architecture (MCA) support IRQ sharing, as do most PCs that use the Enhanced Industry Standard Architecture (EISA) design. However, most PCs in the marketplace -- even new models -- are based on the traditional Industry Standard Architecture (ISA), which generally does not support IRQ sharing.

 **NOTE:**

IRQ sharing is a PC feature. If your PC supports IRQ sharing, you can put two COM ports on one IRQ. You will not encounter the types of complications that this appendix addresses if your PC supports IRQ sharing.

The specific I/O port address and IRQ that a particular serial port uses is determined by the hardware configuration of the serial port. Generally, these parameters cannot be changed for built-in serial ports, but add-on cards containing serial ports often provide jumpers or switches that can be used to configure them to use one of several I/O port addresses and IRQ combinations.

The table below lists the default I/O port addresses and IRQs used by the serial ports of IBM-PC/AT-compatible computers:

Serial Port Device Name	I/O Port Address	IRQ
COM1	03F8	4
COM2	02F8	3
COM3	03E8	4
COM4	02E8	3

The values in this table play an important part in understanding the "wrinkles" associated with serial ports: although there is provision for up to four serial ports, with four unique I/O addresses, there are only two unique IRQs associated with them (recall that most PCs require the IRQs used by each active device to be unique to avoid conflicts). To understand why, it is useful to recall what the PC world was like before the widespread availability of products like Windows.

When the architecture of the current generation of PCs was first being designed (for the IBM PC/AT), the concept of multitasking was not nearly as important in the PC marketplace as it is today. Consequently, since DOS (before Windows) did not permit multiple applications to run simultaneously (with the notable exception of certain specialized programs such as mouse drivers), there was little need to provide a mechanism by which several serial ports could be operated simultaneously. Consequently, the strategy used was to conserve IRQs by assigning the same IRQ to more than one COM port (that is, the COM1 and COM3 ports were both assigned to IRQ4, and the COM2 and COM4 ports were both assigned to IRQ3). Then, under the assumption that at most two serial ports would be active simultaneously (for example, COM1 and COM2, which have unique IRQs), conflicts would not occur.

Serial Ports Under Windows 3.1

Unlike the DOS-only world of yesterday, today's multitasking environments like Windows permit the microprocessor to communicate with up to four active serial port devices at the same time (COM1 through COM4). For example, under Windows, if you are using a serial mouse (on COM1) within a terminal emulator program that operates a data modem (on COM2), while using a fax board (on COM3) to transmit or receive a fax "in the background," you are using three serial port devices simultaneously. You might even wish to make a phone call using the PassageWay Service Provider (on COM4) at the same time, bringing the total up to four simultaneously active serial port devices.

The fact that Windows permits this kind of powerful multitasking does not guarantee that the underlying PC hardware can support this level of operation, at least without some customizing at the hardware level. Since some PCs can support it by default (for example, those that support IRQ sharing), Windows does not prohibit you from configuring your system and attempting tasks like the one in the previous paragraph. Unfortunately, most PCs cannot support this operation by default, and the most likely result of attempting the above scenario is "hanging" the PC due to an IRQ conflict. On such systems, using COM1 along with COM2 is generally fine (recall that these devices have unique IRQs by default), but the addition of COM3 or COM4 causes the system to fail.

Fortunately, Windows 3.1 permits complete customization of all parameters involving serial ports through the Control Panel, including configuring nonstandard I/O port addresses and IRQs (that is, values different from those in the table -- these parameters can be viewed and/or modified by selecting the desired port in the Control Panel's Ports icon, selecting the Settings... button, and then selecting the Advanced... button). This flexibility offers the opportunity of salvation for owners of PCs that do not support IRQ sharing who require the use of three or more COM ports simultaneously.

Workarounds and Solutions to the IRQ Conflict Problem

It is important to remember that the IRQ conflict is a problem in hardware; it cannot be resolved in software alone. Consequently, there are only three alternatives for working around or resolving it:

Workaround 1: Configure your serial devices such that you use only two at any one time, and those two use serial ports with unique IRQs.

This is the simplest workaround to the IRQ conflict problem, but it does not solve the underlying conflict. The idea is to assign your peripheral devices to your available serial ports in such a way as to avoid using any devices simultaneously which might conflict. For example, if you have a serial mouse on COM1 (IRQ4), a fax/modem card on COM2 (IRQ3), and your PassageWay adapter on COM3 (IRQ4), you cannot effectively use the PassageWay Service Provider since you need to use your mouse under Windows while TAPI applications are running.

A better arrangement would be to move the PassageWay adapter to COM4 (IRQ3), which then could be safely used with your mouse on COM1 (IRQ4). In this case, the workaround is to avoid trying to use the PassageWay Service Provider at the same time you use the fax/modem on COM2, since the conflict now would be over IRQ3 (COM2 and COM4).

Workaround 2: Replace one or more of your serial peripherals with equivalent devices that do not require a serial port.

The idea with this approach is to eliminate the conflict by reducing the number of peripherals in your system that require serial ports. For example, replacing a serial mouse with a bus mouse (that is, a mouse that requires its own add-on card) would make another serial port available that then could be used by another device.

Given the scenario described in item (1) above (that is, a mouse on COM1, a fax/modem card on COM2, and the PassageWay adapter on COM3), you might buy a bus mouse and configure it to use, say, IRQ2 or IRQ5. This would then permit you to move the PassageWay adapter onto COM1 (IRQ4), where it then could be used simultaneously with both the mouse and the fax/modem.

Likely candidates for conversion from a serial interface to some other interface include mice (which can be converted to bus mice) and serial printers (which can be converted to an additional parallel printer port).

Workaround 3: If your serial port hardware permits you to select IRQs other than the default ones (IRQ3 and IRQ4), make use of one or more unused IRQs in your system to assign to each COM port a unique IRQ.

This solution is generally not possible for built-in serial ports since these are usually "hard-wired" and cannot be changed. Although most add-on cards containing serial ports permit you to change the IRQs assigned to them, many cards do not let you select IRQs other than IRQ3 and IRQ4. For example, an internal modem card generally has jumpers or switches that permit you to administer the serial interface on the card to be COM1, COM2, COM3, or COM4, but the I/O port addresses and IRQs associated with each of these configurations are usually fixed to the settings in the table.

Fortunately, some serial port add-on cards do permit you to select IRQs other than 3 or 4 (the additional choices are often IRQ2 and IRQ5). If your serial port hardware provides this flexibility — and at least one of the IRQ numbers available as an option is currently unused in your PC setup — you can solve the IRQ conflict directly.

For example, consider once again the scenario of a COM1 mouse, a COM2 fax/modem card, and a COM3 PassageWay Service Provider. If the COM3 serial port is located on an add-on card that permits IRQs other than 3 or 4 to be selected, you could configure the COM3 serial port to use a different (available) IRQ in your system, say IRQ5. After making the necessary changes to the card (for example, adding or removing some jumpers or adjusting the positions of some switches), the last step would be to configure Windows to monitor IRQ5 rather than IRQ4 for the COM3 serial port -- this is accomplished using the Windows Control Panel under the "Ports" option (see your Windows documentation for details).

If you attempt this solution, you must be certain that you do not choose an IRQ that is in use by some other device in your system -- if so, you will only trade one type of IRQ conflict for another. You should be aware that many common add-on cards use IRQs, including network cards and multimedia sound cards, both of which are commonly used under Windows. Your PC hardware vendor can assist you in configuring IRQs. You may also need to consult the documentation for your PC and any add-on cards that are installed to determine which IRQs, if any, are available on your system.

Selecting an Add-On Serial Port Card

This section presents advice on how to choose an add-on serial port card for use with the PassageWay adapter. Because the PassageWay adapter does not have any unique requirements with respect to serial ports, this advice applies generically to selecting a serial port for use with any peripheral.

In general, there are two main things to consider when selecting a serial port for use with the PassageWay adapter:

1. Choose a card that offers the flexibility to configure its serial port IRQs to values other than IRQ3 and IRQ4 (for example, to IRQ2 or IRQ5).

This capability often proves to be very beneficial, especially if you are purchasing the card to add a COM3 and/or COM4 port to your system. As was described at length in "Workarounds and Solutions to the IRQ Conflict Problem," for PCs that do not support IRQ sharing (which includes most PCs, unfortunately), the ability to relocate the IRQ for COM3 or COM4 away from the defaults (IRQ4 and IRQ3, respectively) represents the only direct solution to conflicts that may arise when attempting to use COM1 along with COM3 or COM2 along with COM4 under Windows.

If you know that your PC does not support IRQ sharing, or if you are not sure, it is a good idea to purchase a card with this capability. If you know that your PC supports IRQ sharing, this capability is not as potentially important.

2. For best performance with the PassageWay adapter, choose a card that has hardware support for high-speed communications.

The PassageWay adapter operates at a data rate of 19.2 Kbps, and it relies on Windows to manage the flow of data through your PC's serial port. Depending upon your configuration, Windows may have problems maintaining high data rates through traditional serial ports. In these situations, a serial port designed for high-speed communications can eliminate such problems while providing a reduced load on the microprocessor (thus increasing the performance of Windows during data transfers relative to standard serial ports). In most cases, the price differential for such a card is quite modest and a worthwhile investment.

Many serial port cards on the market (and most built-in serial ports) use either the 8250 or 16450 Universal Asynchronous Receiver Transmitter (UART) as their key component. Although these UARTs can operate at high speeds, they do not assist the PC's microprocessor in dealing with high-speed data transfer. Under Windows, in particular, data can be lost at high baud rates using these UARTs. If this data loss occurs, the PassageWay adapter cannot function properly.

Whenever possible, select a serial port card that uses the 16550 UART. This industry-standard UART is an improved version of the 16450 with hardware support to help offload the microprocessor during high-speed data transfers. Windows 3.1 has built-in support for the 16550, so no special software configuration is required to obtain the benefits of the 16550's enhanced capabilities. In addition, any high-speed peripheral can benefit from the 16550 (for example, a 9.6-Kbps or 14.4-Kbps data and/or fax modem), not only the PassageWay adapter.

In general, since there is no way of knowing ahead of time if your particular PC configuration requires an enhanced serial port for the PassageWay adapter, Lucent strongly recommends that you purchase a card based on the 16550 UART to insure trouble-free operation with the PassageWay adapter.

Installing the PassageWay Adapter with a Local Power Supply

B

Overview

This appendix describes how to install the PassageWay adapter with a local power supply. You must install a local power supply in the following situations:

- You use a console and DSS configuration with the PassageWay Service Provider.
- You installed the PassageWay adapter, but the LED on the PassageWay adapter is a color other than amber or green (including no color).

To install a local power supply, you will need:

- a 400B or 400B2 adapter
- a D6AP cord
- a power supply

Refer to Figure B-1 while installing the PassageWay adapter.



NOTE:

Do not install the PassageWay adapter while you are active on a call.

Installing the PassageWay Adapter with a Local Power Supply

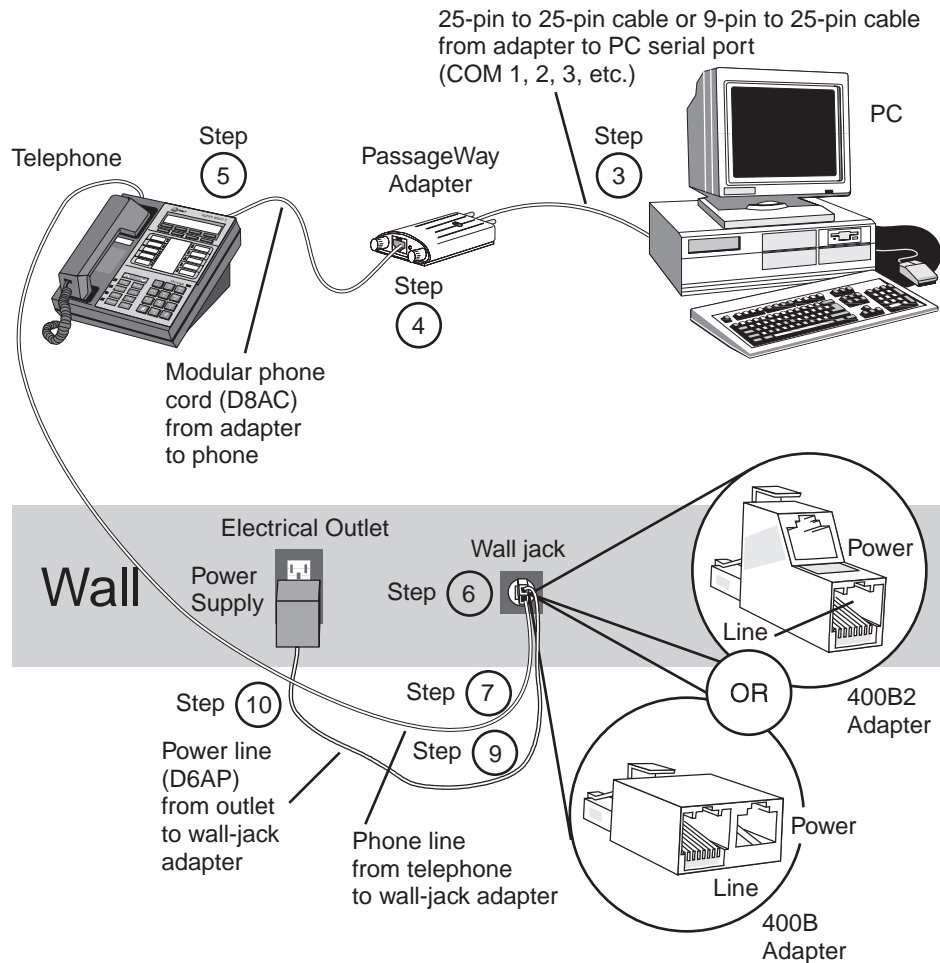


Figure B-1. PassageWay Adapter Installed with a Local Power Supply

Installation Procedure

To install the PassageWay adapter with a local power supply:

1. Turn off your PC.
2. Unplug the line cord from the wall jack.
3. Connect the DB-25 connector on the PassageWay adapter to the serial (COM) port on your PC. If your PC has a 9-pin serial port, connect the 9-pin to 25-pin adapter to the 9-pin serial port, and then connect the PassageWay adapter to the 25-pin connector on the 9-pin to 25-pin adapter.

 **NOTE:**

You can use an RS-232 cable to connect the adapter to the PC if you do not want to connect the adapter directly to the PC.

4. Connect one end of the 4-foot, 4-pair, keyed modular phone cord (D8AC) to the PassageWay adapter.
5. Perform one of the following steps:
 - If you have an MLX-28D or MLX-20L telephone, connect the other end of the 4-foot, 4-pair, keyed modular phone cord (D8AC) to the DSS jack on your telephone.
 - If you have an MLX-16DP or MLX-10DP telephone, connect the other end of the 4-foot, 4-pair, keyed modular phone cord (D8AC) to the Adjunct jack on your telephone.
6. Place the 400B or 400B2 adapter into the wall jack.
7. Connect the line cord to the Line jack on the 400B or 400B2 adapter.
8. Connect the D6AP power line to the power supply.
9. Connect the other end of the D6AP power line to the Power jack on the 400B or 400B2 adapter.
10. Plug the power supply into an AC electrical outlet.

11. Check the LED on the PassageWay adapter.

If the LED is amber or green, proceed to Step 12.

If the LED is any color other than amber or green (including no color),
proceed to "PassageWay Adapter LED" in Chapter 3.

12. Turn on your PC.

Now, proceed to "Installing the Software" in Chapter 2 if the PassageWay
Service Provider is not installed already.

Index

C

COM ports
 overview, A-1
Connect
 troubleshooting, 3-16

D

documentation conventions, 1-4

H

help, 1-5

I

installation checklist, 2-9
installing
 auxiliary power supply, B-1
 PassageWay adapter, 2-11
 PassageWay Service Provider, 2-15

P

PassageWay adapter
 installing, 2-11
 installing auxiliary power supply, B-1
 troubleshooting, 3-15
PassageWay Configurator
 starting, 1-3
PassageWay Service Provider
 components, 2-4
 installing, 2-15
 overview, 1-1
 removing, 2-30
 requirements, 2-6
 setting up, 2-9
 troubleshooting, 3-2
 uninstalling, 2-30
 upgrading, 2-3
PassageWay Solution
 new users, 2-2
power supply
 installing, B-1

S

serial ports
 overview, A-1
support, 1-5

T

TAPI

- installing PassageWay Service Provider, 2-15
 - removing PassageWay Service Provider, 2-30
 - setting up, 2-9
 - troubleshooting, 3-2
- technical support, 1-5
- troubleshooting
- Connect, 3-16
 - overview, 3-1
 - PassageWay adapter, 3-15
 - PassageWay Service Provider, 3-2
 - TAPI, 3-2

U

- uninstalling
- PassageWay Service Provider, 2-30
- upgrade PassageWay Service Provider, 2-3
- user responsibilities, 1-4