Affinity Systems

5250 Emulation Adapters

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Federal Communications Commission (FCC)

The 5250 adapter (hereafter called adapter) is an FCC Class A device designed for installation in any IBM compatible personal computer. The adapter supports the attachment of the personal computer as a workstation to the IBM midrange systems.

Warning: The personal computer with the adapter installed in it (hereafter called equipment) generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the user's manual, may cause interference to radio communications. The equipment has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

If this equipment does cause interference to radio or television, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: How to Identify and Resolve Radio-TV Interference Problems.

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Product Overview

The 5250 Adapters (MicroPLUS 5250-EA, 5250-PnP, 5250-PC Card, 5250-PCI Express and 5250-PCI[1]) allow emulation of IBM 5250 terminals and printers on your PC equipment. By installing this product you can access the full resources of an IBM midrange computer (i.e. S/36, S/38, AS/400) by simply connecting your PC over twinaxial cable.

The 5250 adapter is connected to the IBM host through a twinaxial cable. The adapter's cable-through feature allows multiple PCs to be connected to one port of the IBM host system. This feature is possible even if one of the connected PCs is not in operation.

5250 Adapter Features

- Easy connection to the IBM S/36, S/38 and AS/400.
- Automatic configuration with PnP compatible systems.
- Accommodates seven host station addresses on PCI Express cards, and two host stations on all other card types.
- Compatible with File Support Utility.
- Operates with IBM AS/400 PC Support/Client Access.

Adapter Package Inventory

- 5250 adapter, verify the type of adapter, EA, PnP, PCI (Express) or
   PC Card.
- Auto-terminating twinaxial cable assembly.
- Windows Utility diskette.
- This Installation Guide.

If any items are damaged or missing, contact your place of purchase for information on repair or replacement.

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Station Addresses

The adapter makes it possible for your PC to maintain up to two station addresses, or up to seven on a PCI Express card. The host system must be properly configured for each address you plan to use.

Note: Only one display station address is required for performing the adapter online diagnostics.

What is a Plug and Play (PnP) System?

A PC is considered a Plug and Play system if it contains one or a combination of the following software components:

- PnP system BIOS
- PnP operating system (such as Windows 95/98)
- PnP Configuration Utility

If a system does not contain any of these software components, it is **not** considered a PnP system. It is possible to upgrade a non-PnP (Legacy) system to a PnP system by simply adding one of these components, such as Windows 95.

A PnP system's BIOS will configure a PnP adapter automatically during system startup. A PnP operating system will configure all PnP adapters on the system which were not configured by the system BIOS, or all of the cards if no PnP BIOS is present. A PnP Configuration Utility or Resource Manager will configure PnP adapters in a similar manner as a PnP operating system.

If the operating system of the computer contains support for PnP devices, no external Configuration Utility is needed. This is the case with Windows 95/98.

If the operating system of the computer does not contain support for PnP devices, such as MS-DOS or Windows 3.1, then a Configuration Utility can be implemented as an application program. The Configuration Utility of a PnP system is usually supplied by the computer

2

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63

manufacturer. One example of this type of program is the ISA Configuration Utility, or ICU.

Section 1: Hardware Installation

Installation Procedures

Installing the 5250 Adapter
Your personal computer manual contains instructions for installing options such as this 5250 adapter. Follow the instructions in that manual to do the following:

- Power off and unplug the system unit.
- Remove the system unit cover. (N.A. for PC Card)
- Install the 5250 adapter.
- Install the system unit cover. (N.A. for PC Card)
    Do not turn on or plug in the personal computer until the twinax cables are properly connected.
- Connect the twinax cable to the external connector on the 5250 adapter. Tighten the screws firmly on the EA, PnP and PCI bracket.

Twinax Cables
DANGER
1. An improperly wired outlet or plug can place hazardous voltages on accessible metal parts. For your safety, the power cord and plug must be connected to a properly wired and grounded outlet. The customer is responsible for the outlet and plug wiring.
2. For each communications cable, turn off the power switches and disconnect the power plugs of all peripherals before installing the cable.
3. Do not touch the exposed metal surfaces of two separate communications cables at the same time.
4. Do not touch the communications cables during an electrical storm.
    FAILURE TO FOLLOW THESE PROCEDURES COULD RESULT IN SEVERE ELECTRICAL SHOCK.

For information on connecting twinax cables to workstations and splicing

cables, refer to the appropriate workstation documentation.
Note: The personal computer should be turned off and unplugged from the wall outlet before twinax cables are connected or disconnected.

Configuring the Adapter

The following procedures describe the steps to configure the 5250 adapters.

MicroPLUS 5250-EA Adapter
The following procedures describe the steps required to configure the 5250-EA adapter.

Note: If you are installing this adapter in a Plug and Play compatible computer please read the section on Plug and Play Installation prior to installing the adapter.

I/O Board Configuration
The default selection for I/O address is 2718H (318H in the 10 address bit terms used by most other PC adapter manufacturers).

The Interrupt level and Memory address defaults are set by the software and set for IRQ 5 and Memory address DC00H.

Only the I/O address is hardware selected. The memory address and interrupt level are determined by the software selections (refer to the 5250 Configuration program DCFG5250). If you have an I/O conflict with the default address, reconfigure your adapter for an alternate I/O address. Two alternate I/O address that rarely conflict with other device are 2508H (108H) all switches off or try 2688H (288H) switches 1,2,3 off and 4,5,6 on. It is highly recommended that you do not use any address settings in the range 2408H- 24F8H (008H - 0F8H).

■ - indicates switch position. Switch is shown configured for address 2718.

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Plug and Play Environments

This section describes the installation and configuration requirements for using the MicroPLUS 5250-EA adapter in a Plug and Play (PnP) compatible system.

In order to effectively use the 5250-EA adapter in a PnP computer, the part of the computer that manages system resources must be made aware of the 5250-EA adapter and the resources that it requires. This system resource manager can then use these requirements to configure the 5250-EA adapter in a manner that does not conflict with other components of the system.

If the operating system of the computer does not contain integral support for PnP devices, the system resource manager is implemented as an application program. This is the case with MS-DOS and Windows 3.1. This type of system resource manager program is usually supplied by the computer manufacturer. One example of this type is the ISA Configuration Utility, or ICU.

If the operating system of the computer contains support for PnP devices, no external system resource manager is needed. This is the case with Windows 95.

MS-DOS and Windows 3.1 Configuration

Since MS-DOS and Windows 3.1 do not contain integral PnP support, an external system resource manager must be used. While the functions performed by a system resource manager are well-defined, the interfaces that the various vendor's managers present to the user vary, and it is therefore impossible to describe each one in this manual.

Each system resource manager does however utilize a standard format to describe the resources required by a particular component. Information in this format is contained in a file with the extension .CFG. In the case of the 5250-EA adapter, this file is provided on the utility diskette, and is named TWX0020.CFG. This file must be integrated with the system resource manager. Refer to the documentation provided with your system resource manager for instructions on the handling of the .CFG files, and to continue with configuring the system resources for the 5250-EA adapter. Once the MicroPLUS 5250-EA adapter is configured, make a note of the hardware settings. These settings will be required when using the Perle DOS emulation software or other third party

software.

Windows 95/98 Configuration
In Windows 95, the system resource manager is an integral part of the operating system, and is known as the Device Manager. To add the MicroPLUS 5250-EA adapter to the system configuration, click on *Start*, then *Settings*, then *Control Panel*, and then double-click on the *Add New Hardware* icon.

The Add New Hardware Wizard then starts. Click on *Next* to get to the next screen. Click on the *No* radio button for Windows to not search for new hardware; then click on *Next*. If there is an entry in the window for *5250 Emulation Adapters*, highlight it. If not, highlight *Other Devices*, then click on *Next*.

If a window containing 5250 Emulation Adapter Models appears, click on *MicroPLUS 5250-EA Emulation Adapter*, and then click on *Next*. Otherwise, click on the *Have Disk...* button, and when the *Install from Disk* window opens, enter the drive letter of the diskette drive which contains the Utilities diskette, and click on *OK*. Windows 95/98 will search that drive for the file CEM5250.INF, which is part of the installation package. A window containing the 5250 Emulation Adapter models should then appear; click on *MicroPLUS Twinax Card*, and then click on *Next*.

Windows 95/98 will then configure the hardware, and display the hardware settings. Make a note of the hardware settings if you plan on using either DOS software or third party software. You will have to reboot Windows 95/98 in order for the new configuration to work. If Windows 95/98 cannot configure the MicroPLUS 5250-EA adapter due to configuration conflicts, it will inform you of the possible corrective actions to try.

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5250-PNP Adapter

Configuring the 5250-PNP Adapter

The following procedures describe the steps to configure the Affinity Systems 5250-PnP adapter. If you are installing this adapter in a non-Plug and Play computer, please read the section on non-Plug and Play Installation. Non-Plug and Play systems are those systems which do not meet the system software requirements described earlier.

Plug and Play Systems

The 5250-PnP adapter is fully compatible with the Plug and Play standard. When the adapter is installed in a PnP system, it will be **configured automatically when the system is powered on** regardless of the operating system used.

Non-Plug and Play Systems (Legacy PCs)

The 5250-PnP adapter can be configured in Legacy systems. The 5250-PnP adapter has been shipped with a Configuration Utility, which will allow you to select the system resources in Legacy systems.

In Legacy systems, all resources for this adapter are set by the DOS 5250 configuration program (DCFG5250) program. The adapter is not enabled until the Enabler (ENB5250) program is executed. When running the IBM emulation program or IBM adapter handler with PC Support, you must use the Configuration Utility and Enabler.

Note: The DCFG5250 program will enable the user to configure the 5250-PnP adapter and will attempt to identify potential conflicts; however, since non-PnP systems do not have a resource manager, you must take care to prevent conflicts. Online help provided on the Windows Utility diskette contains information about some typically used PC resources and will help prevent conflicts.

MS-DOS and Windows 3.1 Configuration

Since MS-DOS and Windows 3.1 do not contain integral PnP support, an external system resource manager must be used. In PnP systems, this resource manager will most likely be shipped with the PC. The resource manager will automatically detect the 5250-PnP adapter and assign its resources. While the functions performed by a system resource manager are well-defined, the interfaces that the various managers present vary, and it is therefore impossible to describe each one in this manual. In non-PnP systems, you must execute the ENB5250 program when the PC is started and use the DCFG5250 program to configure the adapter.

With either PnP or non-PnP systems, the CEM5250.386 Virtual Device Driver (VxD) should be used with programs such as the IBM Client Access/400 or Personal Communications AS/400. This will provide for seamless operation with the 5250-PNP adapter.

Windows 95/98 Configuration

In Windows 95, the system resource manager, known as the Device Manager, is an integral part of the operating system. Therefore, **when running Windows 95, the 5250-PNP adapter will automatically be configured.** The CEM5250.VXD is installed by Windows 95/98 the first time it sees the 5250-PnP adapter and will provide the interface between Windows 95/98 and the adapter. There are no resource configuration requirements.

When starting Windows 95, the operating system checks for any new hardware devices. The first time Windows 95/98 is started after the 5250-PNP adapter has been installed, the message *New Hardware Found* will appear in a dialog box. Under the New Hardware Found message, the new hardware will be identified; in this case it will have found the *Affinity Systems 5250 Plug 'n Play Adapter or Perle 5250 Plug 'n Play Adapter*. Another dialog box will then open asking the user to install the software for the adapter. Place the Windows Utility diskette into the floppy drive, select the correct drive, and press <ENTER>. The .INF and VxD drivers will be copied into the proper Windows 95/98 directory. The VxD will interface with Windows 95/98 and automatically pass the card resource information to the Affinity Systems Windows emulation program, Adapter Handler or IBM Client Access.

To observe the resources assigned by Windows 95/98 for the adapter, click on *Start*, then *Settings*, then *Control Panel*, and then double-click on *System*. Click on the *Device Manager Tab*, then double-click on *5250*

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Emulation Adapters. There will be an entry for the 5250-PnP Adapter. Double click on this entry and then select the *Resources* tab. The display will now show the adapter's resources.

The resources can also be observed by executing the GETW95C.EXE program in the 5250CARD directory. The resource information passed from Windows 95/98 to the CEM5250.VXD device driver will be displayed.

Since Windows 95/98 handles assigning all the resources, it is recommended that you do not use EMM386 or similar memory managers in CONFIG.SYS.

5250-PC Card Adapter

Installing the 5250-PC Card Adapter
The 5250 PC Card adapter is easily installed in the PC by simply inserting the adapter into the PCMCIA slot and connecting the twinax T-cable assembly. There are no switch or jumper requirements for this card. The 5250 PC Card adapter is a Type II card and requires at least one Type II or Type III slot available on the PC.

It is important to observe the markings on the 5250 PC Card adapter when inserting it into the PCMCIA slot. The 5250 PC Card adapter should be inserted with the arrow side up and pointing into the PCMCIA slot. Plug the adapter into the slot and press it into place. The 5250 PC Card adapter should slide easily into the PCMCIA slot. Do not force the card into the slot. If the 5250 PC Card adapter does not easily slide into the slot, then check to make sure it is not inserted upside down and that nothing is in the slot to prevent insertion. The 5250 PC Card adapter can be removed from the PCMCIA slot by pressing the eject button on the PC.

The 5250 PC Card adapter is supplied with a self-terminating twinax cable assembly. There is a small 15-pin connector which is plugged into the 5250 PC Card adapter. This connector is keyed and can only be plugged in one way. Please observe the keying and do not force the cable into the connector. It is recommended that the twinax cable assembly is attached to the 5250 PC Card adapter prior to applying power to the computer. There is electronic circuitry within the cable assembly. **Caution: use only the twinax cable supplied with the 5250 PC Card adapter, do not attempt to attach any other cable to**

the adapter.

The twinax cable from the host system can be connected to either twinax connector at the other end of the T-cable. The T-cable is self-terminating and will provide the proper termination if this device is the last workstation on the line. The T-cable can support the cable-through function when another twinax cable is connected to the open twinax connector.

Windows 95/98 Configuration

Card Services is an integral part of Windows 95/98 and will automatically configure the 5250 PC Card adapter. The configuration information can be observed by using the Device Manager and selecting the 5250 PC Card adapter. The CEM5250.VXD is installed by Windows 95/98 the first time it sees the 5250 PC Card adapter and will provide the interface between Windows 95/98 and the adapter. There are no resource configuration requirements.

When starting Windows 95, the operating system checks for any new hardware devices. The first time Windows 95/98 is started after the 5250 PC Card adapter has been installed, the message *New Hardware Found* will appear in a dialog box. Under this message, the new hardware will be identified; in this case it will have found the *5250 PC Card Adapter*. Another dialog box will then open asking the user to install the software for the adapter. Place the Windows Utility diskette into the floppy drive, select the drive letter and press <ENTER>. The .INF and VxD drivers will be copied into the proper Windows 95/98 directory. The VxD will interface with Windows 95/98 and automatically pass the card resource information to the Windows Emulation program, Adapter Handler or IBM Client Access.

To observe the resources assigned by Windows 95/98 for the adapter, click on *Start*, then *Settings*, then *Control Panel*, and then double-click on *System*. Click on the *Device Manager* tab, then double-click on *5250 Emulation Adapters*. There will be an entry for the 5250 PC Card adapter. Double-click on this entry and then select the *Resources* Tab. The display will now show the 5250 adapter resources.

The resources can also be observed by executing the GETW95C.EXE program in the 5250CARD directory. The resource information passed from Windows 95/98 to the CEM5250.VXD device driver will be displayed.

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Since Windows 95/98 handles assigning all the resources, no memory exclusion statements will be required as with Windows 3.1.

5250-PCI Adapter (Including PCI Express)

The 5250-PCI adapter is fully compatible with the PCI Rev. 2.1 standard. When the adapter is installed in a PCI system it will be configured automatically when the system is powered on.

MS-DOS and Windows 3.1 Configuration
In MS-DOS and Windows 3.1 systems the PCI BIOS will detect the 5250-PCI adapter and automatically assign its resources. These resources will be passed on to the CEM5250.386 Virtual Device Driver (VxD). The *CEM5250.386 Virtual Device Driver (VxD) should be used with programs such as the IBM Client Access/400 or Personal Communications AS/400.* This will provide for seamless operation with the 5250-PCI adapter.

Windows 95/98 Configuration
In Windows 95, the system resource manager is an integral part of the operating system, and is known as the Device Manager. Therefore, **when running Windows 95, the 5250-PCI adapter will automatically be configured.** The CEM5250.VXD is installed by Windows 95/98 the first time it sees the 5250-PCI adapter and will provide the interface between Windows 95/98 and the adapter. There are no resource configuration requirements.

When starting Windows 95, the operating system checks for any new hardware devices. The first time Windows 95/98 is started after the 5250-PCI adapter has been installed, the message *New Hardware Found* will appear in a dialog box. Under this message, the new hardware will be identified; in this case it will have found the *5250 PCI Adapter.* Another dialog box will then open asking the user to install the software for the adapter. Place the Windows Utility diskette into the floppy drive, select the drive letter and press <ENTER>. The .INF and VxD drivers will be copied into the proper Windows 95/98 directory. The VxD will interface with Windows 95/98 and automatically pass the card resource information to the Windows Emulation program, Adapter Handler or IBM Client Access.

To observe the resources assigned by Windows 95/98 for the adapter, click on *Start*, then *Settings*, then *Control Panel*, and then double-click on *System*. Click on the *Device Manager Tab*, then double-click on *5250 Emulation Adapters*. There will be an entry for the 5250-PCI adapter. Double-click on this entry and then select the *Resources* tab. The display will now show the 5250 adapter resources.

The resources can also be observed by executing the GETW95C.EXE program in the 5250CARD directory. The resource information passed from Windows 95/98 to the CEM5250.VXD device driver will be displayed.

PCI Memory Resources

The PCI specifications allow the PCI card to be assigned memory resources anywhere in system memory. In most cases the perfered memory location of the PCI card is in lower memory, (C800h, CC00h, D800h) to remain compatible with legacy applications.

Some PC manufactures have specifically reserved these memory locations for motherboard or ISA resources, this can cause a problem when the PC's BIOS tried to assign a memory resource to the PCI card. Problems can include memory conflicts, failure to boot, and system crashes.

In order to resolve this problem, the PCI card and the PCI Express card use the following methods:

PCI Card

The PCI can be programmed though software to function below and above one megabyte in memory. The utility to program the PCI card is call PCISET.EXE and is found on Disk 1 of the software disk. See section 2 to find out more detailed information about the PCISET program.

Important - Read carefully before using the software

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PCI Express Card

The PCI Express card has a onboard jumper which allows the card to be configured for above and below one megabyte memory usage. See Figure 1 for the location of this jumper.
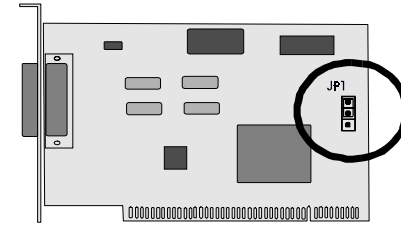
Figure 1 - PCI Express Jumper Location

The jumper can be placed either on the upper two pins or the lower two pins. (See Figure 2) When the jumper is placed in the high memory position, the card will function anywhere in memory (high or low). When the jumper is in the low memory position, it will only function in low memory.

Jumper Setting For
Low Memory

Jumper Setting For
High Memory
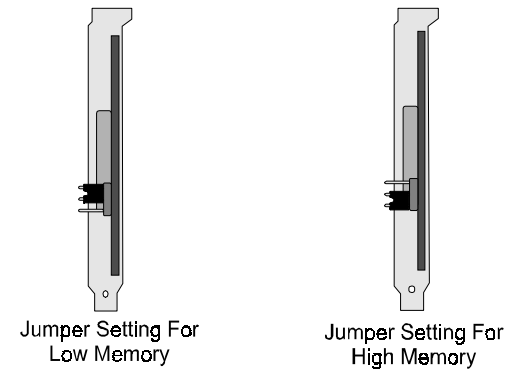
The following table describes the advantages and disadvantages to using the high and low memory configuration on your PCI or PCI express adapter.

	Advantages	Disadvantages
High Memory	Compatiable with all PCI v2.1 complient PC's.	Old legacy applications may not work.
Low Memory	All legacy applications will still work.	May fail in some PC's which reserve low memory.

The term legacy application refers to those applications which were build for Windows 3.x, or require the 5250 emulation card to be in low memory. Applications which use the Windows 95/98/NT driver directly are not effected by the memory resources held by the PCI card.

PCI Express Features

The PCI Express card contains three new features which provided improved performance and functionality.

Requirements
The OBS and 2MHz features require the following hardware and software combination on the AS/400 in order to operate.

Twinax Controller
PCI WAN/Twinaxial IOA (FC 2720/9720) or
PCI Twinaxial Workstation IOA (FC 2722/9722) or
Twinaxial Workstation IOA (FC 6180/9280)

Operating System
OS/400 V4R1 or V4R2

Cabling
Twinax Cable with a maximum length of 4000ft for 2 Mhz Mode or 5000ft for OBS mode.

Appendix G: Windows 2000

At the time of release the latest version of Microsoft's Windows 2000[1] operating system was Release Candidate 2. Since this operating system has not been released it is not supported.

However, the instructions below describe how to get an Affinity PCI, Pnp or PC Card to work under Windows 2000 RC2.

1. When Windows 2000 detects new hardware and asks to search for the drivers, insert the Affinity (Visilink, StepSaver or Client For Windows) **disk 2** (Disk 1 contains the Windows 95/98 Drivers) into the floppy drive.

2. Allow select floppy drive as a location to search for the driver, and allow Windows to install the driver found on the floppy disk.

3. Once the drivers have been installed, you may install the rest of the 5250 software by running the setup program found on Disk 1 of Visilink, Stepsaver or Client for Windows.

[1] *Windows and the Windows 2000 operating system are Registerd Trademarks of Microsoft Corporation.*

Rumba NT[2] (V5.2B)

Under Windows NT must use the TWAX driver. The TWAX service must be running and not the TwinaxOEM. To disable the TwinaxOEM service, open the Devices dialog (see figure 9), and click on the TwinaxOEM service. Next click on Startup, and select disable. NT should then be restarted, you can verify that TwinaxOEM is disabled by viewing the Devices dialog.

Software which requires the TwinaxOEM service, like Visilink will not be able to run if the TwinaxOEM service is disabled. To re-enable the TwinaxOEM service, open the Devices dialog, find the TwinaxOEM service and click on startup then on automatic. Make sure that you have disabled the TWAX service, since they cannot run simultaneously.

Note: The TWAX service will not function on PCI cards that are running above one megabyte in memory.

Windows 95/98

Client Access For Windows 95[1] (V3R2M0)

After installing Client Access, you must the the install program found in the /twinax directory of Client Access. When asked of you have a non-IBM or OEM adapter, select Yes. After rebooting the NS/Router should be able to detect and use the Affinity 5250 emulation adapter.

Note: If you are using the PCI Express adapter, you must select No to a non-IBM or OEM adapter. The utility SETTWX, which is found in the Client Access directory can be used to verify the driver status, and to configure the express features (2MB mode and OBS mode)

Rumba 95[2] (V5.2B)

Rumba 95 does not require any special configuration, however you must make sure that the Affinity 5250 emulation card and software has been installed before installing Rumba.

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[1] - Client Access is a registered trademark of IBM Corporation.
[2] - Rumba is a registered trademark of Wall Data Incorporated.

Seven Sessions

The Affinity PCI Express adapter allows up to seven simultaneous emulations sessions to be active, (6 display sessions and 1 printer, or 7 display sessions) using the Visilink v5.10 software. Each session must have its own unique station address.

SNA or APPC emulation programs such as Client Access For Windows or Rumba still only use one physical station address.

Optimized Bit Stream (OBS) Mode

The optimized bit stream is a method of compressing the twinax data. This data is compressed and uncompressed on the fly by the hardware which reduces the amount of data to be received and transmitted. Depending on the application, throughput can increase as much as 200%.

2Mhz Mode

2Mhz mode increases the rate at which data is transferred on the twinax line. Normally data is transferred at 1Mb/s, while the 2Mhz mode doubles the line speed allowing transfers to occur at 2Mb/s.

Note: All stations on the line must be 2Mhz capable in order for this function to work. If there is even one station at the lower speed, all stations will drop down to the lower speed.

Section 2: Software Installation

After installing the adapter, please install the 5250 adapter software. These diskettes contain the 5250 Windows Configuration Utility, Enabler, Diagnostics and other utilitiesr in a compressed format. Also included on this diskette are the CEM5250.386, CEM5250.VXD and TwinaxOEM.sys device drivers and an installation utility. There is a DOS version of the Utility diskette available for users operating in a DOS enviornment only. Please contact your reseller to obtain a copy of this diskette.

To install the software:

From Windows 3. or NT 3.51, select *File*, then *Run*;
                or
From Windows 95/98 or NT 4.0, select *Start*, then *Run*;

then type:

> <drive>:setup

where <drive> is the floppy drive containing the Utility diskette.

For DOS systems, from DOS, make your floppy drive the default drive, and at the DOS prompt type:

> install<ENTER>

The installation utility will prompt for a directory on your hard disk in which to place the software. If you do not enter a directory, the default value of C:\5250CARD will be used. The directory will be created if necessary, and the software will be copied from the floppy and uncompressed.

When done, the installation utility will provide directions for updating your AUTOEXEC.BAT files. The AUTOEXEC.BAT file can be updated automatically when installing these files or manually. Your system must be rebooted for the changes to the AUTOEXEC.BAT file to take effect.

The README.TXT file contains updates to this manual and other information which will aid the user if problems are encountered.

Appendix F: Third Party Software

The 5250 Card software was designed to function under third party software including IBM's Client Access, and WallData's Rumba. There are a few special instructions in order to allow these applications to correctly use the Affinity 5250 Emulation card.

Windows NT 4.0

The Windows Device Manager allows the user to view which services are running. Figure 9 shows an example of the TwinaxOEM service running, to view the devices dialog click on *Start -> Settings -> Control Panel -> Devices.*

Figure 9 - Windows NT Devices Dialog

Client Access For Windows NT[1] (V3R2M0)

Client Access should be installed after the adapter and 5250 Card software has been installed. The NS/Router should be able to automatically detect and use the Affinity 5250 Emulation card. To verify the drivers, you can use the utility SETTWX.EXE found in the client access directory.

In the Windows 95/98 environment, select the *Resources* tab on the Properties screen of the adapter board in *Device Manager* and select "Basic Configuration 2" in the *Settings Based On* list.

In Windows 3.x environment, run the PnP Configuration Manager and change the IRQ definition to "None" for the adapter or run the DOS program DCFG5250 in the 5250CARD directory and select "None" in the IRQ menu.

When running Affinity Systems VisiLink software in the Windows NT environment, from the VisiLink Main Menu, select the Configure Adapter followed by selecting "None" from the IRQ pulldown menu.

5250-PC Card
Non-interrupt mode is NOT available for the 5250-PC Card.
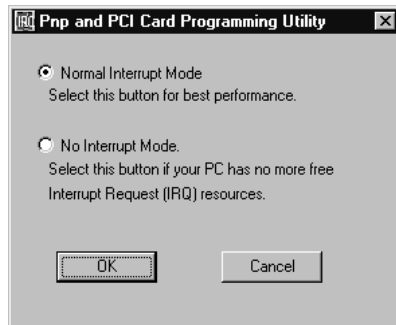
Figure 8 - Windows NT Card
Interrupt Mode Configuration

Section 3: Utility Software

Enabler Program

This program is primarily used for Windows 3.x applications, it will not work on PCI cards that are using memory above one megabyte. See the PCI card memory resources information found in Section 1.

The Enabler program is used to enable the adapter. This program is run automatically by the Diagnostic and Adapter Handler software. It may also be called from the DOS command line in order to test your configuration.

In order for the Diagnostic and Adapter Handler programs to find the Enabler program, you must have the enabler environment string set to the appropriate directory. This is normally done in your AUTOEXEC.BAT file. The installation utility describes the changes to the AUTOEXEC.BAT file.

The enabler environment string is of the form;

        SET ENB5250=<drive><path>

where <drive> and <path> specify the location of the 5250 adapter Utility software. An example would be:

        SET ENB5250=C:\5250CARD

Invocation
To run the Enabler program from the DOS command line, type:

        ENB5250<ENTER>

The Enabler program displays its title and version, card type, environment, the configured values and enabled successfully message unless an error is detected. If an error occurs, the error message is displayed. The Enabler program then exits.

For systems running Windows 3.1:

The Windows enabler is automatically executed from the startup group if the user has loaded the CEM5250.386 device driver during the installation process. Otherwise, the user must run ENBSTART from the 5250CARD directory to enable the card.

GETW95C Program

The GETW95C.EXE program is provided on the Utility diskette to allow the operator to get configuration information and will display the resources assigned to the 5250 adapter by Windows 95/98. The CEM5250.VXD driver must have been installed prior to executing this program. The CEM5250.VXD driver is normally installed automatically by Windows 95/98 when the 5250 adapter is first installed in the system.

Invocation
GETW95C is a DOS program for Windows 95/98 and can be executed by selecting the *Start* icon then *Run*. Enter the following at the prompt and then select *OK*. The following example assumes the default installation directory (5250CARD).

      C:\5250CARD\GETW95C

A DOS window will be opened and the program will execute showing the results. The following example shows the results of executing the GETW95C program. The values for the Memory Segment, I/O Port and IRQ fields will contain the information passed by Windows 95. The values in this example may not be the same as observed on your system.

Note: If the "Memory Segment" or "V86 Memory Segment" indicates 0000 you have a memory conflict or your PCI card is in upper memory you should refer to Appendix A - Memory Conflicts.

    Get W95 Configuration
    Version 2.05
    Copyright 1996-1999, Perle Systems Limited

    The VxD Version is 2.03.

    Adapter type is 5250 PCI.
    Memory Segment is DC00.

Appendix E: Non-Interrupt Mode

The 5250 Emulation Adapter normally uses one of the PC's Interrupt Request Lines (IRQ) for optimum performance. However, the 5250 Emulation Adapter may be configured to operate without using an IRQ. This non-interrupt mode is valuable for PCs that have no free IRQs.

Depending on the 5250 adapter and the PC operating system, you will have different options for configuring the interrupt mode. For more detailed information, see the online help.

5250-PCI and PnP Adapters

In the Windows 95/98 environment, select the *IRQ Mode* tab on the Properties screen on the 5250 adapter in *Device Manager* and select "No Interrupt Mode".

Figure 7 - Windows 95/98
Interrupt Mode Configuration

For Windows 3.x and Windows NT systems, run the Set IRQ Mode program in the 5250 Card program group/folder.

Note: The 5250-PCI Express cannot be placed into non-interrupt mode.
MicroPlus 5250-EA Adapter

Appendix D: Miscellaneous Problems

There are two other problems that you might encounter that are
described below.

Twisted Pair or Faulty Cable Problems

Error 5141 Link Connection Lost;
                        -PC Support & CA/400

Error 0042 | 0043 - Online queue data incorrect;
                        -Diagnostics

You may encounter Diagnostic error 42 or 43 above or intermittent "line
drops" if you are using twisted pair wire or incorrect cable termination.
For twisted pair wire try to reduce the number of cable runs to the TP
hub or move the problem connection to a port on the hub with only two
or three other connections. Another solution might be found in trying a
different brand of balun.

Missing -5 Volt Supply (5250-EA & 5250-PnP only)

Error 5140 - Wrap data latch did not set during offline test
                        -Diagnostics
This Diagnostic error message on the 5250-EA and 5250-PnP adapters
generally indicates that your PC motherboard is not supplying negative 5
volts to the 5250 adapter. Please try the 5250 adapter in another
motherboard or contact the motherboard manufacturer about the
availability of negative 5 volts at the ISA slots.

V86 Memory Segment is DC00.
Memory Size is 0x2000 bytes.
I/O Port is 118.
IRQ is 12.

SETPCI Program

The SETPCI.EXE program is used to configure the Affinity PCI Card to
function below and above one megabyte. This utility CANNOT be run
under Windows 95/98/NT, it must be run from a Dos or Windows 95/98
boot disk.

Invocation

After booting from a DOS or Windows boot disk the program can be run
by the following command line

    pciset.exe

The program will try and detect the presence of a PCI Bios and the
Affinity 5250 PCI Card. If found the following menu will be displayed.

    5250 PCI Card Configuration Utility v1.0
    Copyright (C) 1995-1999. Perle Systems Limited.

    DO NOT RUN THIS UTILITY FROM WINDOWS!

    5250 PCI I/O Port : 1401
    Current Card Configuration : Irq Mode (High Memory)

    Select a new configuration.

    1. Irq Mode (Low Memory)
    2. No Irq Mode (Low Memory)
    3. Irq Mode (High Memory)
    4. No Irq Mode (High Memory)

    Choice >

The card will display the current configuration of the card, and the
current memory location assigned to the card. You can abort the
programming process by hitting the enter key when asked to make a

menu selection.

The menu options are described below.

Option 1 : Irq Mode (Low Memory)
This mode sets the PCI card to run with an interrupt, and to run below the one megabyte boundary.

Option 2 : No Irq Mode (Low Memory)
This mode sets the PCI card to run without holding an interrupt, and to run below the one megabyte boundary. See Appendix E for more information on non-interrupt mode.

Option 3 : Irq Mode (High Memory)
This mode sets the PCI card to run with an interrupt, and to run anywhere in memory (the BIOS will usualy assign this to above one megabyte)

Option 4 : No Irq Mode (High Memory)
This mode sets the PCI card to run without holding an interrupt, and to run anywhere in memory. (the BIOS will usualy assign this to above one megabyte) See Appendix E for more information on non-interrupt mode.

If you do not which to change the settings, simply hit the <ENTER> key and the program will abort.

You must reboot the PC before these changes will take effect.

EXPCFG Program

This utility is used to toggle the PCI Express card's special features. The OBS mode and 2MB mode can be enabled or disabled independently of one another. You must reboot your computer before these settings can take effect.

Windows Device Drivers

There are two Windows Virtual Device Drivers (VxD) on the Utility diskette, and a third device driver for Windows NT 3.x, 4.0. These drivers are CEM5250.386, CEM5250.VXD and TwinaxOEM.sys respectively. The CEM5250.386 driver is used with Windows 3.1 while

To adjustment of settings can be done through Affinity software like Client For Windows+ or Visilink. Please see your dealer, or the Perle website for more information on obtaining these programs.

Appendix C: Windows NT 4.0 Resource Conflicts

The Windows NT operating system is not a plug and play operating system, therefore resources cannot be modified through the operating system. However the resources being held by the card can be viewed after installing the software for the adapter.   Once the adapter has been installed all resources that the adapter is holding can be viewed by click on *Start -> Programs -> Adaminstrator's Tools (Common) -> Windows NT Diagnostics*. Figure 6 shows an example of this dialog box.

Note: The resource held by the card are assigned to a service, which is call TwinaxOEM.sys in Windows NT 4.0

Figure 6 - Windows NT Diagnostics Program

---

the CEM5250.VXD is used with Windows 95. These VxD's will allow conflict-free installation of the 5250 adapter.

CEM5250.386
This device driver can be automatically installed by answering 'yes' to the prompt during the Install program. The installation procedure will copy the file to the \windows\system directory and also add an entry in the [386Enh] section of the SYSTEM.INI file. The entry can also be added by using any text editor and adding the following line to the [386Enh] section:

    Device=CEM5250.386

Once installed, the CEM5250.386 VxD will be loaded from the Windows startup files. The system must be rebooted in order for this change to take effect. Do not use this file on Windows 95/98 systems.

CEM5250.VXD
This device driver will automatically be installed by Windows 95/98 when it detects the 5250 adapter. This file will be loaded into the \windows\system directory. Windows 95/98 will request this file the first time the 5250 adapter is detected. This VxD is dynamic and will only be loaded when Windows 95/98 has detected the 5250 adapter. Do not use this file on Windows 3.1 systems.

TwinaxOEM.sys
There is a Windows NT device driver called TwinaxOEM.sys located in the install directory (default, C:\5250CARD). At system boot time, this driver will automatically reserve resources for the 5250 adapter. This driver is also compatible with applications such as Client Access 95/NT Mod 3 and NetSoft/NetManage Router for AS/400 Version 3.10. Do not use this file on Windows 3.1or 95/98 systems.

5250 Windows Diagnostics

The Windows utility diskette contains a Windows 95/98 and Windows 3.1 diagnostic program for the 5250 adapter. For Windows NT 3.51 and NT 4.0 you will need to create a DOS bootable floppy on a DOS or Windows 95/98 system and then use the "Make Diagnostic Diskette" icon to copy the DOS diagnostic programs to the DOS bootable floppy.

Then reboot from this floppy and follow the DOS diagnostic section of this manual. For DOS only users, a DOS utility diskette can be ordered separately.

16 Bit Windows Diagnostics

By default a 16-bit diagnostics (diag5250.exe) program is installed when the Affinity 5250 Card software is installed on a Windows 3.x machine. A Windows 95/98 machine can also use this diagnostics by running it manually from the 5250 Card directory.

This diagnostics utility uses the 5250 Enabler program to gain access to the 5250 emulation card (see the section on the "Enabler
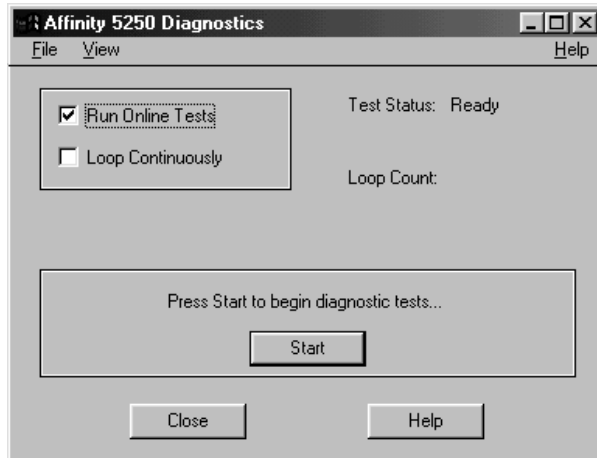
Figure 3 - 5250 Diagnostics (16 Bit)

Program") The enabler program will not work on a PCI card using memory above one megabyte, and hence the 16-Bit diagnostics will fail, however the 32-Bit diagnostics program will run properly.

32 Bit Windows Diagnostics

The 32-Bit diagnostics (diag32.exe) program is installed onto a Windows 95/98 machine and should be used rather then the 16-Bit diagnostics. The 32-Bit diagnostics program will run properly no matter

Resolving I/O Conflicts

Although rare, I/O conflicts can still occur in a Windows 95/98 system. On MicroPlus type adapter switches can be set to change the preset I/O address. On all other adapters the Windows Device Manager can be used to manually configure these settings.

PCI and PCI Express Adapters

PCI and PCI Express card users also have the limited number of interrupts which the adapter can use, however the PCI bus allows devices to share an interrupt.   When an interrup is shared between two or more PCI devices, Windows may report a conflict but in most cases the card will function as normal. PCI users (not PCI express) have the option of choosing non-interrupt mode as an alternative to using an interrupt or sharing an interrup, See Appendix E for mode information.

Resolving Memory Conflicts

PC Card,PnP and MicroPlus Adapters

The 5250 emulation card requires 8K of memory to be assigned to it, and this 8k must reside somewhere in the lower region of memory. In most cases this is not a problem since PC manufactures have reserved these lower regions of memory for ISA type peripherals.
     If Windows has identified a memory conflict, or the 5250 Diagnostics has identified a problem you will need to manually adjust the settings.

Note: It is possible for Windows and the 5250 Diagnostics to fail to detect a memory problem. The result of this is an inability to connect to the host, or erratic behavior during a connection.

Windows 95/98 allows you adjust your memory resources manually through the device manager (See Figure 5).

PCI and PCI Express Adapters

The PCI and PCI Express adapters are assigned resources by the system and often cannot be changed. If there is a memory conflict and you cannot adjust the settings, try using the PCISET program (on the PCI card) or the jumper setting on the PCI Express card to allow the system to have more flexibility in providing resources to your adapter.
     See Section 1 and section 2 for more information on these configurations.
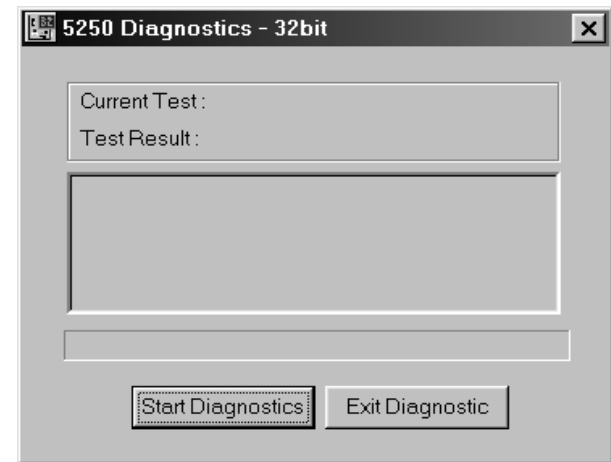
Figure 4 - 5250 Diagnostics (32 Bit)

where the 5250 emulation card is located in memory.   Note, the MicroPlus, PnP and PC Card adapter types are not capable of using memory above one megabyte, so the 16 or 32 bit diagnostics can be used.

Overview
The 5250 Windows diagnostics can be used in both Windows 3.x and Windows 95/98 systems (not NT). It will aid in determining if your adapter is functioning properly. Extensive help information can be viewed online by clicking on the Help button followed by the Search option.

Invocation
To invoke the 5250 Windows Diagnostic from Windows 95/98 click on *Start -> Programs -> Affinity Systems 5250 Card -> 5250 Diagnostics (32 bit)* or from Windows 3.x double click the group *Affinity Systems 5250 Card* then double click *5250 Diagnostics.* This will automatically run the 5250 Enabler and then the 5250 Windows Diagnostic program. You will see the 5250 Diagnostic control screen after the enabler runs:

Uninstall Program for Windows

The Uninstall program will remove the appropriate files in either the Windows 3.x or Windows 95/98 environment. The program will remove all files and programs from the \5250CARD directory in addition to removing the install directory (\5250CARD). The device driver and board information will be removed from the Windows 95/98 registry.

The user will be prompted with a dialog box to modify the autoexec.bat and system.ini files in order to remove the 5250 adapter entries.

5250 DOS Configuration Program

The configuration program is used to select and customize various configuration options for your system. The configuration program does not place the 5250 adapter in an operational state; it simply provides a method of specifying the configuration information. The adapter is actually enabled by the Enabler program. If system resources have been assigned by Windows 95, then a message will appear indicating the Windows 95/98 Device Manager should be used to modify any configurations rather than this program. The DCFG5250 program will not allow resource modifications if Windows 95/98 has been detected.

Executing the DCFG5250 program in a PnP system will not cause any problems. The program will know that system resources have already been assigned and will not allow you to modify any of the resources in the Hardware Menu.

Invocation
To run the configuration program, change directories to the directory in which you installed the software, and at the DOS prompt, type:

    DCFG5250<ENTER>

The configuration program displays the main menu at the top of the screen, and the current configuration in a window at the bottom. Context-sensitive help is available by pressing <F1>.

If the message:

    Cannot open cfg5250.dat
    Press any key to continue

Resolving IRQ Conflicts

PC Card, PnP and MicroPlus Adapters

These adapter type must have an IRQ which is unique and not shared. There usually 16 interrupts on a PC, but only several of these are usually available for the 5250 emulation card. The following table give a list of possible alternatives.

Interrupt	Function	Good Alternative
0	Interval Timer	
1	Keyboard	
2	Interrupt Vector	
3	Com 2	✓
4	Com 1	
5	Parallel Port 2	✓
6	Floppy Disk Controller	
7	Printer Port 1	
8	Real Time Clock	
9	IRQ 2 Redirect	✓
10	Available	✓
11	Available	✓
12	Mouse	
13	Math Coprocessor	
14	Fixed Disk	
15	Available	✓

There is a limited number of available interrupts and with additional peripheral cards in a PC the number is reduced even more. For PnP Card users they have an alternative to use non-interrupt mode which allows the same functionality, but does not require an interrupt resource, see Appendix E for more information.

Appendix B: Windows 95/98 Resource Conflicts

Problem with resource conflicts in Windows 95/98 can usual be solved by adjusting resources. Figure 5 shows a Windows 98 example configuration on an Affinity 5250 PCI card.

The conflicting device list box display any resources which are conflicting.

Figure 5 - Windows 98 : 5250 PCI Configuration

Note: The "Use automatic settings" box must be unchecked before any changes can be mode to resources.

appears, exit the configuration program and check to see that the CFG5250.DAT file exists, and that it is in the directory indicated by the enabler environment string (see the Enabler Program Section later in this chapter).

The configuration program presents a series of menus that allow you to select the configuration that works for your system. To select a menu item, use the cursor keys to select the item, and then press <ENTER>. On some menus, a shortcut key is available to select some menu items; these keys are indicated by a character of the item being in uppercase. Pressing <ESC> returns you to the previous menu, without changing the current selection.

Main Menu
The main menu allows the selection of either the Hardware menu or the Exit menu.

Hardware Menu
The Hardware menu provides menu items for selecting the base I/O port address, the memory segment address and the interrupt level. The 5250-PnP also has a PnP Config Mode menu. The 5250-PC Card adapter has two additional menu items: PC Card Controller and card socket. Selecting any of these items results in the display of the appropriate menu to select values for that item.

Note: Depending upon the current PnP Config Mode or PC Card controller selection (5250-PC Card only), the other menu items may not be accessible.

PnP Config Mode (5250-PnP only)
The PnP Config Mode allows the selection of either the Normal PnP Mode or Fixed Resource Mode. The Normal PnP Mode will allow you to assign the resources to be used in a non-PnP system. The Fixed Resource mode will cause the values selected to be programmed into the 5250-PnP adapter's non-volatile memory. In the Fixed Resource Mode, a PnP system would not be able to move the boards resources and would assign the fixed values programmed in the adapter's non-volatile memory. This should only be used when running an emulation program that does not support the flexible resource assignment of a PnP system. When using the 5250 Enabler and VxD, you should stay with the Normal PnP mode.

PC Card Controller (5250-PC Card only)

The PC Card Controller menu allows the selection of the method used to configure the 5250 PC CARD. Generally speaking, there are two methods: via software using Card Services, or via hardware using a selection for the type of PC Card Controller hardware in your system.

Card Services is an industry-standard software driver that is used to enable PC Cards. This driver was either provided with your PC, or is available from various sources. The Card Services driver is not provided with the 5250 PC CARD. The 5250 PC CARD can work with Card Services version 2.00 or greater.

By using Card Services to enable all PC Cards, it is possible to avoid conflicts between the cards and with other system components. Using Card Services is the recommended method of enabling the 5250 PC CARD.

When the Card Services menu item is selected on the PC Card Controller menu, the "Values Assigned by" menu appears. This menu allows further customization of the Card Services configuration method. There are three choices:

Values Assigned by Card Services:	With this selection, Card Services searches all sockets for the 5250 PC CARD, and assigns the base I/O port address, the memory segment, and the interrupt level. This is the recommended method.
Values Assigned by User:	With this selection, Card Services is used to enable the 5250 PC CARD, but the selection of all values including the socket) must be done by the user.
Values Assigned by Enabler:	With this selection, Card Services searches all sockets for the 5250 PC CARD, and is used to enable the card, but the Enabler program chooses the values from the CFG5250.DAT file.

If the "Values Assigned by" selection is either Card Services or Enabler, the base I/O port address, memory segment address, interrupt level, and socket items on the Hardware menu are inaccessible, since any user-selected values would be ignored.

Perle DOS emulation program

Execute the Perle CFGEA.EXE program and select the Hardware and segment address option.

IBM Enhanced 5250 Emulation

On the command line type <CTRL> <A> and then the first digit of the memory segment. The following example sets the memory segment at location E.

$$DP5250 \ ^\wedge AE$$

IBM Adapter Handler for PC Support

The adapter memory segment, port address and interrupt level can be set via the following command line parameters:

$$E5250AH \ /M \ x \ /I \ yy \ /L \ z$$

where "x" is the first digit of the memory segment C, D or E. "yy" is the middle two digits of the adapter port address. "z" is the interrupt level, 2-7.

This would cause an I/O conflict. In this case either the Ethernet card base I/O address or the MicroPLUS 5250-EA adapter base I/O address would need to be changed. Changing the 5250-EA adapter switches and programs for a base address of 2728H would eliminate the conflict. Please note that it is important to know the base I/O address and ranges of the other adapters in the PC in order to eliminate suspected I/O address conflicts.

Listed below are MS-DOS debug commands which will help determine if the 5250 adapter can be identified. If these commands execute with the proper results then there should not be an I/O conflict.

```
C:\> debug <CR>
- i 271E      ;this reads I/O location 271E and should return with a value
               of D0
D0            ; MicroPLUS 5250-EA board Identification byte.
```

configurations. Reboot and enter your CMOS setup (typically by pressing a key <Del>, <F1>, <Esc>or <F10>) before your PC's operating system loads. Then locate the shadow memory setting and adjust them to disable shadow memory in the area used by the 5250 adapter.

Another possibility is a conflict with another adapter that uses a large block of memory space or generates a "MEM16" ISA bus signal when the 5250 adapter is being accessed. Many 16 bit VGA adapters generate this "MEM16" signal requiring that the 5250 adapter to be located outside of the C000-DFFF memory segment. If a conflict occurs, try moving the 5250 adapter to the EC00 memory segment. The following methods will allow the 5250 adapter to be relocated with the different emulation programs.

Note: Windows 95/98/NT will not always report memory conflicts or memory problems. If your 5250 Card does not appear to have any memory conflicts and the diagnostics passes, but you fail to get a sign on screen during emulation, try using a different memory address.

I/O Conflicts

Many legacy PC adapter only use 10 address bits for decoding I/O space. The 5250 adapter uses all 16 bits of the I/O address space for decoding its location. Since the 5250 adapter uses all 16 bits it is possible for another adapter using only 10 bits for decode to be mapped in the same space even though the actual I/O port addresses are different. An example of this can be illustrated with an Ethernet local area network card and the 5250 adapter.

The default address for the MicroPLUS 5250-EA adapter is set at 2718H and for some Ethernet cards (e.g. Intel EtherExpress) is 310H. Ethernet cards generally use 16 addresses of I/O space which means that they would reside in 310H-31FH I/O space. The MicroPLUS 5250-EA adapter uses 8 addresses of I/O space from 2718H-271FH. If the Ethernet card only uses 10 address bits for decode, then an access to 2718H-271FH can also be decoded as 318H-31FH. Therefore, when the diagnostic software or twinax emulation programs attempt to access the MicroPLUS 5250-EA adapter's I/O space it is possible for the Ethernet card to also drive the PC bus.

When Card Services is selected, the PCDD5250.SYS device driver must be loaded via your CONFIG.SYS file, as instructed by the installation program.

Note that using Card Services with any of the "Values Assigned by" selections is preferable to using any of the hardware-specific selections, as the use of Card Services is more likely to avoid configuration conflicts.

If your system does not have Card Services, then one of the hardware controllers should be selected. These selections directly control the hardware of the PC Card sockets. It is important to remember that the configuration of the base I/O port address, memory segment address interrupt level, and socket are now your responsibility. The user must make the proper selections for these items on the Hardware menu when using a hardware controller. The enabler program currently supports the IBM Thinkpad, Intel 82365 PCIC, Sharp PHIC, and Toshiba ICCCNT controllers.

The Intel selection should be used if your system is using the Intel 82365 or compatible controller. Many systems use this controller; try it if you are unsure which controller is in your system. The Sharp controller supports the 67XX/68X series laptop systems. The Toshiba controller is found in the 45XX series laptop systems. Newer Toshiba laptops use an Intel-compatible controller.

Base I/O Address
The Base I/O Address item on the Hardware menu allows the selection of the base port address to be used by the 5250 adapter. The default value is 2718 or 0118 depending on which 5250 adapter you are using. The 5250 adapter will use eight I/O port addresses starting with the listed addresses e.g. 2718-271F hex. On a MicroPLUS 5250 adapter only, the selected address must match the switch settings. Refer to the address list in the online help.

Note: This menu item is inaccessible if Card Services is used as the PC Card Controller and the values are to be assigned by Card Services or the Enabler.

Segment Address
The Segment Address item on the Hardware menu allows the selection

of an 8k memory segment to be used by the 5250 adapter. The default value is DC00 hex. If an extended memory manager is in use, you may need to exclude the segment to be used by the 5250 adapter from that managed by the manager. The software will display possible memory conflicts.

Interrupt Level

The IRQ item on the Hardware menu allows the selection of an interrupt request line that will be used by the 5250 adapter. The default value is 5. In most systems, interrupt request levels cannot be shared.

DOS Diagnostics

The 5250 DOS diagnostics can be used in a DOS operating system environment only.

Invocation

To run the Diagnostics, ensure that the diagnostic program (DIA-EA.EXE, DIA-PNP.EXE, DIA-PCC.EXE or DIA-PCI.EXE) is located in your working directory (5250CARD), and at the prompt type: DIA-EA, DIA-PNP, DIA-PCC or DIA-PCI. For example:

[drive:]\5250CARD>DIA-PCI<ENTER>

Note: The ENB5250 program will automatically be executed when the diagnostics are run. The board resource information from the ENB5250 program will be passed to the diagnostic program.

Main Menu

On startup, the following screen is displayed:

```
Affinity Systems Diagnostics Version 3.1
Copyright Perle Systems Limited, 1996-1999
Port Address=0118  Interrupt Level=12   Segment Address=DC00

Enter
1 to run the tests once,
2 to have the tests loop,
3 to exit to DOS
```

Manager in a Windows 95/98 Plug and Play system or the use of an Expanded Memory Manager without the 'exclude' statement.

Note: If you are using Windows 95/98 we suggest you disable any memory manager such as EMM386 in your CONFIG.SYS file by placing a REM at the beginning of the line and then restarting your PC. After rebooting go into Device Manager under Control Panel - System and check if the 5250 Twinax adapter is "working properly". If not, check for resource conflicts.

Most PC's running DOS and Windows 3.1 have an Expanded Memory Manager included. These memory managers try to maximize the amount of RAM space available for the system. The 5250 adapter has 8K bytes of RAM already resident on the board which needs to be mapped into the memory space of the PC.

It may be necessary to modify the system's CONFIG.SYS file in order to reserve this 8K byte block of memory for the 5250 adapter. The 5250 adapter is typically located at DC00-DDFF space but can also be located at CC00-CDFF or EC00-EDFF space. To reserve this address space, add the following to your CONFIG.SYS files for the respective memory manager. If a different memory manager is used please find the proper syntax for excluding the space required for the 5250 adapter.

EMM386 (Microsoft)
  device=C:\DOS\EMM386.EXE X=DC00-DDFF

QEMM386 (Quarterdeck Office Systems)
  device=C:\QEMM\QEMM386.SYS ARAM=DC00-DDFF

386MAX or BLUEMAX (Qualitas)
  device=C:\386MAX\386MAX.SYS RAM=DC00-DE00
   (RAM parameter may be in 386MAX.PRO profile)

Netroom RM386 (Helix Software)
  device=C:\NETROOM\RM386.EXE X=DC00-DDFF

It is also possible that there is a conflict with shadow memory controlled by your PC's CMOS setup. This is common in non-Plug and Play

adapters and the motherboard. In Windows 95/98 it is easy to check for available IRQs from the Device Manager: *My Computer - Control Panel - System - Device Manager* (tab) - *Computer* (highlighted) - *Properties* (button) - (dot) *Interrupt request*. Used interrupts are listed from 00 to 15. If you do not see a number listed, Windows 95/98 believes it is unused and therefor available (beware of legacy adapters that have not had their resources reserved).

For DOS or non-Plug and Play systems, use the configuration program, DCFG5250, to change the adapter's IRQ setting. For most DOS 5250 emulators and IBM's adapter handler, E5250AH, you must use their configuration software or command line parameters e.g. E5250AH /L7.

The 5250 PCI card may share interrupts with other devices in the system, however if there are performance or stability problems these cards can be programmed to run in non-interrupt mode. See Appendix E for more information.

Memory Conflicts

There are several diagnostic and emulation program messages which will appear and generally indicate that the required space for the 5250 adapter has not been reserved or there is some form of memory conflict with the adapter. Some of these messages are:

No room in PC address space for 5250 RAM;
                    -IBM Enhanced 5250 Emulation

TWX 1315 Adapter Random Memory Is Full;
                    -AS/400 PC Support & CA/400

Error 0005 - The high order bits of the diagnostic test point...
Error 0006 - Adapter RAM visible with POR latch set;
Error 0007 - RAM low address error at offset xxx
Error : Ram Error
                    -Affinity 5250 Diagnostics

Memory conflict problems tend to be the second most common problems encountered and are often easily resolved. The most common memory conflict problem is due to the use of an Expanded Memory

---

```
   Enter selection:_


```

The top three lines of all screens display the program header, which includes the program name and version number, the copyright notice, and the current adapter settings. The adapter settings are the values assigned by the system. Following the header is a list of choices for the user.

The diagnostics program waits for the user to enter a selection. The selection is typed, followed by the <ENTER> key. An unrecognized entry to any selection results in a beep from the PC speaker, and a resolicitation of the entry.

Entering:
    '1' will result in the diagnostics being run once.
    '2' will result in the tests being run a user-specified number of
        times. *(This mode is useful when searching for an intermittent problem.)*
    '3' exits the diagnostic program, and returns control to MS-DOS.

Running the Tests
If option '1' on the main menu is selected, the diagnostic tests are run once. If any test fails, an error code and error message are displayed. Otherwise, if the main tests run successfully, the user is asked whether the online tests should be run.

If you enter 'NO', several tests run which check the adapter in an offline mode.

If you enter 'YES', the adapter must be connected to the host. A list of active addresses is then displayed, and you are prompted for the station addresses to use. Either one primary address, or a primary and a secondary address may be entered.

Note: A 'N' is entered for the secondary address if only one address is to be used.

If only one address is entered, this address is used twice during the tests.

If all tests run with no errors the message;

is displayed, and you are prompted to hit any key, which causes the main menu to be redisplayed.

If option '2' on the main menu is selected, the diagnostic tests are set to loop. You are then asked how many times to loop. This loop count may be set from 1 to 999 times, with an entry of 0 indicating loop infinitely.

Note: The PC must be rebooted to cancel the infinite loop.

You are next asked whether the diagnostics should pause when an error is detected.

If the response is 'NO', any errors detected by the diagnostics are displayed; however, the diagnostics will immediately clear the screen and restart on the next pass of the tests.

If you respond 'YES', any error detected is displayed and you must hit the <ENTER> key to continue.

Note: The tests may also be canceled when an error is detected by entering a 'C'.

The test will then solicit to run the online tests, as in option '1' above; however, it is solicited before the tests start, and is only solicited once, not on each pass of the tests.

Note: A problem with the adapter could result in an incorrect list of active station addresses in this situation.

Adapter Diagnostic error codes and problem determination are listed in Appendix A.

Note: On PCI cards the configuration file (CFG5250.DAT) may not contain the correct resources assigned to the card. Running the utility PCICFG.EXE (located on the 5250 Card directory) will recreate the 5250 configuration file with the settings found in the computer's BIOS. The DOS diagnostics program will NOT work if a PCI card is set to run above one megabyte

Adapter Handler Software

Overview

Appendix A: Errors and Conflicts

The following list describes the most common error codes and possible corrective action that can be taken. The corrective action is intended to help the user resolve the problem without having to make a service call.

Fast Online Technical Support

A Windows help file is included on the Windows Utility diskette which describes in detail how to configure the 5250 adapter with various third party applications.

Fast, free, up-to-date technical support information for your 5250 adapter is always available at our web site: **www.perle.com** or you call our technical support (see back of manual).   Almost all common problems and solutions can be solved.

Resource Conflicts And Error Messags

A good starting point for Windows 95/98 users that receive an error message after installing the adapter is to print a list of system hardware resources by selecting: *My Computer -> Control Panel -> System -> Device Manager* (tab) - *Print* (button on bottom right of screen). This printout will show which resources are being used: IRQ, I/O, DMA and memory.

IRQ Conflicts

Common IRQ error messages
5137 Router Timeout;
        -AS/400 PC Support & CA/400

Error 002D/002E - ...Interrupt occurred while level disabled;
Error 002E/002F - ...Counter interrupt occurred too soon;
Error 0033/0034 - ...No counter interrupt;
        -Affinity 5250 Diagnostics

IRQ conflicts tend to be the most common problems encountered. For some new PCs this is because all of the IRQs are used by other

auto-terminating twinax cable assembly. Caution: Use only the cable assembly provided with the 5250 adapter. Note: If this is the last connection in the twinax cable daisy-chain, leave one twinax connector open for proper auto-termination.

This section describes the procedure used to invoke the 5250 Enhanced Adapter Handler software (D5250AH).

Compatibility

D5250AH is fully compatible with IBM's Enhanced 5250 Adapter Handler (E5250AH) and may be used in place of E5250AH on the 5250 adapter, the IBM Enhanced 5250 Display Station Emulation Adapter and all boards fully compatible with the IBM boards. *It is recommended that the D5250AH is used since it supports the full resources available on the 5250 adapter.*

To use D5250AH.EXE in place of the IBM adapter handler, perform the following:

1) Copy the following files from the install directory or release diskette into your PCS directory:

   - D5250AH.EXE
   - AHANDEA.EXE

2) Using an ASCII editor, replace all references to "E5250AH" in your STARTPCS.BAT file with "D5250AH".

Software Interface

D5250AH provides a software interface between the IBM PC DOS Router Software (and all third party compatible routers) and the twinaxial hardware.

Invocation

To invoke D5250AH, enter the following at the DOS command prompt:

   D5250AH [/U]   [/?]

The items in the brackets are optional parameters. The brackets themselves are not entered. The parameter *U* may be entered in upper or lower case letters; parameter values are entered in hexadecimal notation.

The /U parameter specifies that the adapter handler is to be removed

34

from memory (i.e. unloaded):

      for example: *D5250AH /U*

The /? parameter specifies summary help to be displayed.

      for example: *D5250AH /?*

Affinity Systems Enhanced Twinaxial Adapter Handler
Version 1.20
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Valid options are:

/U   unload the Adapter Handler from memory.
/? or ?   this command-line help.

Section 4: Hardware Reference

Hardware Description

The adapter package consists of one printed circuit card and one cable assembly. The cable assembly connects the twinax cables to the adapter.

Circuit Card
The adapter dimensions and slot information is listed in the table below.

	Slot	Length	Width
5250-EA	ISA 8 or 16	4.0"	2.5"
5250-PnP	ISA 16 only	6.2"	2.2"
5250-PC	PCMCIA Type II	3.4"	2.1"
5250-PCI	PCI	4.25"	3.25"
5250-PCI Express	PCI	4.7"	2.75"

Power Requirements
The maximum currents used by the adapters are as follows:

	+5 volt	-5 volt	-12 volt
5250-EA	0.20 A max	0.12A max	---
5250-PnP	0.20 A max	0.12A max	---
5250-PC	0.25 A max	----	---
5250-PCI	0.35A max	----	0.10A max
5250-PCI Express	1.1A max	----	0.065A max

Twinax Connection
The external connector on the adapter provides a connection to the