DEVICE·MASTER® ATS-XPE

Installation and Configuration Guide

COMTROL

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URL References

All URLs in this document worked at the time of publication. Due to the nature of web sites, some links may not work, and you may need to search their site to locate the referenced information.

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Installation and Setup

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- Starting the Routing and Remote Access service for remote access and for use with Remote Desktop
- Configuring dial-in on the ATS-XPE

  Note: Appropriate user accounts and permissions must be set up for dial-in and Remote Desktop to work on the ATS-XPE.

Please refer to the End-User License Agreement for Microsoft® Windows® XP Embedded shipped with the ATS-XPE for licensing information.

Audience

The DeviceMaster ATS-XPE requires that you have a working knowledge and familiarity with the Windows XP operating system including areas such as:

- System administration
- Network configuration
- Operating system installation

Product Overview

The DeviceMaster ATS-XPE is a standalone, user-programmable microcomputer designed to run Microsoft® Windows® applications in a solid-state environment. The ATS-XPE model provides built-in Ethernet connectivity and is designed for remote deployment and management of local programs and the attached serial devices.
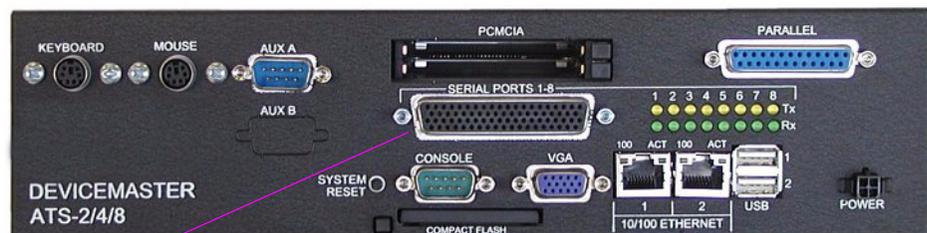
SERIAL PORTS 1-8 connector and fanout cable, if RocketPort PC104 option ordered.

The ATS-XPE is designed as a deployment platform, not a development platform. The solid-state compact flash technology does not support an unlimited number of writes. While development could be done on the ATS-XPE, it is recommended that application development is conducted on a different machine and the resulting

application moved to, tested, and run on the ATS-XPE.

The ATS-XPE is running Comtrol Corporation's customized version of the Windows XP® Embedded operating system. See *Appendix B. Specifications and Notices* starting on Page 63 for detailed default system information.

If you are unfamiliar with using an embedded operating system, you should review information about the operating system before installation. Please refer to the existing documentation provided by Microsoft at http://www.microsoft.com/windows/embedded/xp/.

Initial Hardware Installation

Installation of the hardware may vary depending on the configuration you ordered from Comtrol. Although the ATS-XPE can be placed in a remote location, you will need to connect a monitor, keyboard, and mouse (optional) to configure the ATS-XPE before it is placed into service.

Use the following procedures to setup the DeviceMaster ATS-XPE.

Note: If you need pin out information about any of the connectors on the ATS-XPE, see Appendix A.Connectors starting on Page 59.

1. Verify that the compact flash is fully inserted. When installed correctly, the compact flash is recessed into the ATS-XPE and the eject button protrudes about 1/4 inch. If necessary, without using excessive force or sharp objects, seat the compact flash in its socket. Too much force can damage the device.

2. *If you ordered the PCMCIA option*, insert one of the Comtrol approved PCMCIA devices into one of the **PCMCIA** slots.The PCMCIA device must be inserted in the slot if you want to configure the device in the following sections.

    Note: The PCMCIA option supports two Type II PCMCIA slots or one Type III slot, which is installed at the factory. Drivers for Comtrol approved PCMCIA devices are installed in the system.

    - **Linksys® Wireless PC Card (WPC11)**

        Carefully align the adapter (with the label side facing up) and gently seat it into either the top or bottom rail of the **PCMCIA** slot.

    - **Linksys EtherFast 10/100 + 56K Modem PC Card (PCMLM56)**

        a. Carefully align the adapter (with the triangle on the face of the card facing up) and gently seat it into the **PCMCIA** slot. The driver is already installed and configured as COM3.

        b. For modem use, connect a phone line, if you want to use the modem.

        c. Connect a standard Ethernet cable between the Ethernet port and the network, if you want to use the PCMCIA Ethernet port.

    - **PCMCIA to Compact Flash Adapter**

        a. Insert a compact flash into the PCMCIA to Compact Flash adapter.

        b. Carefully align the PCMCIA adapter (compact flash facing up) with the bottom rail and gently seat it into the **PCMCIA** slot.

    When the ATS-XPE is powered up, the system automatically installs the PCMCIA compact flash as drive d.

3. Place the DeviceMaster ATS-XPE on a stable surface or attach it to a suitable surface using the mounting brackets shipped with the device.

    Note: *Optionally, mount the ATS-XPE to a DeviceMaster Rackmount Shelf.*

4. *If you ordered the PC104 RocketPort® option*, connect the PC104 RocketPort cable (quad- or octacable) to the **SERIAL PORTS 1-8** connector.

    Note: *If you have the PC104 RocketPort card option installed, do not connect any RS-422 or RS-485 devices to the serial ports until you have configured the driver.*
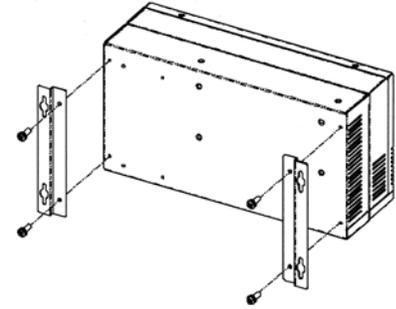
5. Connect a standard PS/2 (6-pin mini DIN) compatible keyboard into the **KEYBOARD** connector or a USB-compatible keyboard into one of the **USB** ports (**1** or **2**).

6. Connect a PS/2 (6-pin mini DIN) compatible mouse into the **MOUSE** connector or a USB-compatible mouse into one of the **USB** ports (**1** or **2**).

7. Connect the 15-pin monitor cable from a standard VGA monitor to the **VGA** connector.

8. To use the built-in Ethernet ports, connect a standard Ethernet cable to the Ethernet port (or ports) that you want to configure for the network. The ports are labeled **1** and **2 (10/100 ETHERNET)**.

9. .

10. If you want to connect a parallel printer to the system, connect the printer cable to the **PARALLEL** connector. You may need a driver to install your printer.

11. Optionally, connect up two USB devices to the **USB** ports. You may need to install a driver to support your USB device.

Powering on the ATS-XPE

After connecting the cables and devices, you are ready to power on the ATS-XPE.

1. Connect the power cable into the power supply and connect the power supply (with the latch and key up) into the **POWER** connector.

2. Connect the power cable to a power source.

    Note: *The system beeps during the power on cycle. If you have the RocketPort PC104 option installed, solid yellow Tx LEDs also indicate that you have power to the unit.*

3. You may receive a Display Settings balloon. Select **Yes** to the Display Settings popup message:
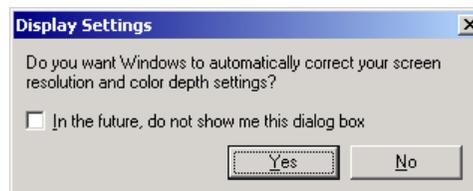
If you installed a PCMCIA compact flash, it will display as drive d: on the system.

Other Installation and Configuration Procedures

After the initial installation of the hardware there are other procedures you may need to perform to complete installation and configuration of the ATS-XPE.

- If you want to connect and configure the ATS-XPE to a network (Ethernet or PCMCIA wireless adapter), review and perform the appropriate procedures:
    - *PCMCIA wireless option*, see *Linksys Wireless PC Card (WPC11)* on Page 43 to complete the wireless card installation.
    - *Configuring the Network Settings on the ATS-XPE* on Page 9, for initial setup of the Ethernet ports or the Linksys PCMLM56 Ethernet card.
    - *Changing the Default Computer and Workgroup Names* on Page 11, if you are configuring multiple ATS-XPE units on your network.
- If you installed a PCMCIA modem, perform the appropriate procedures:
    - *Starting Routing and Remote Access Services* starting on Page 13, to start remote services.
    - *Setting Up Dial-In* on Page 15, if you want to configure the PCMCIA modem for dial-up on the ATS-XPE.
- If you ordered the PC104 RocketPort option, see *Configuring the RocketPort Serial Ports* on Page 26 before connecting your serial devices.

    Note: *Only install serial device drivers for the Windows XP Embedded operating system. Refer to the Customer Support Policy on Page 56, before installing any drivers.*
- See *Installing Modems* starting on Page 49, if you want to connect an external modem to the **AUX A** or **CONSOLE** ports.

Configuring the Network Settings on the ATS-XPE

After installing the hardware, you are ready to configure the network. The ATS-XPE provides Ethernet ports that function as two independent Ethernet network interface cards and support for an optional wireless adapter in the PCMCIA slot. See _Linksys Wireless PC Card (WPC11)_ on Page 43 for wireless configuration procedures before configuring the network settings.

Each network port must be connected to a different network segment or the ports will conflict with each other.

**Note:** If you did not connect a standard Ethernet cable between the Ethernet (1 or 2) or the PCMCIA (PCMLM56) Ethernet port that you want to configure and the network hub, do so now.

Use the following procedure to configure the port for DHCP or a static IP address, or to set DNS server addresses.

1. If necessary, log into the ATS-XPE and open the Network Connections control panel.
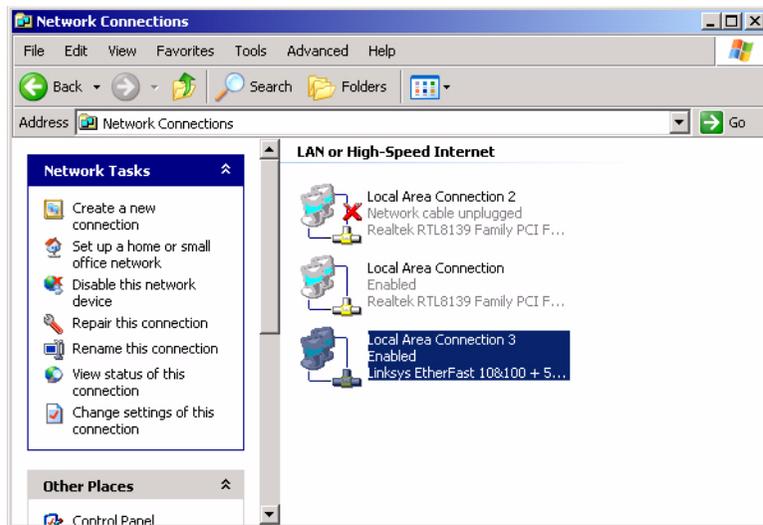
2. Right-click on the enabled Local Area Network (LAN) Connection that you want to configure and select **Properties**.

3. Highlight **Internet Protocol (TCP/IP)** and select **Properties**.
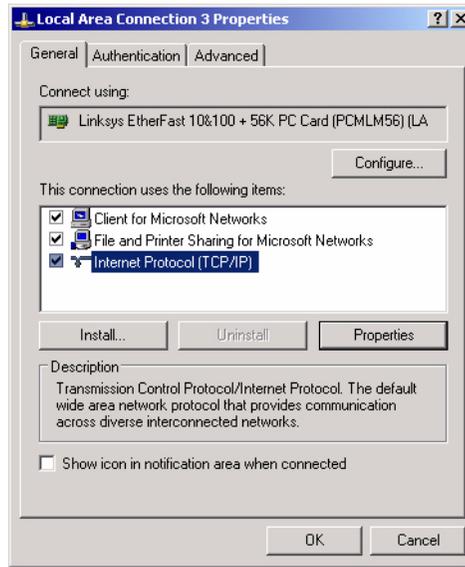
4. Configure the network connection to your network as needed, and select **Ok**.

    The default network settings for the adapters are:

    Adapter#1
    IP Address
    192.168.250.251
    Subnet mask   255.255.255.0
    Gateway   192.168.250.1

    Adapter#2
    IP Address
    192.168.255.252
    Subnet mask   255.255.255.0
    Gateway   192.168.255.1

    Note: *The PCMCIA adapter is set to obtain an IP address and has no default address unless it is manually configured.*
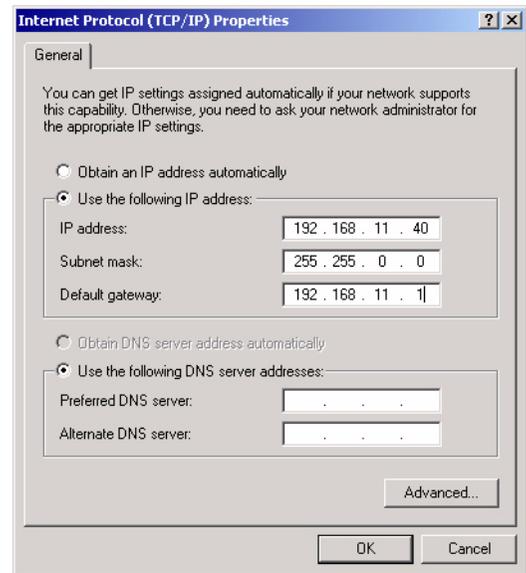
5. Select **Ok** to save the Local Area Connection Properties sheet and **Close** the Network Connections control panel. The network connection will be available momentarily.

Changing the Default Computer and Workgroup Names

If you plan on installing more than one ATS-XPE on your network, you must change the default computer name.

1. Right-click **My Computer**, select **Properties** and the **Computer Name** tab.
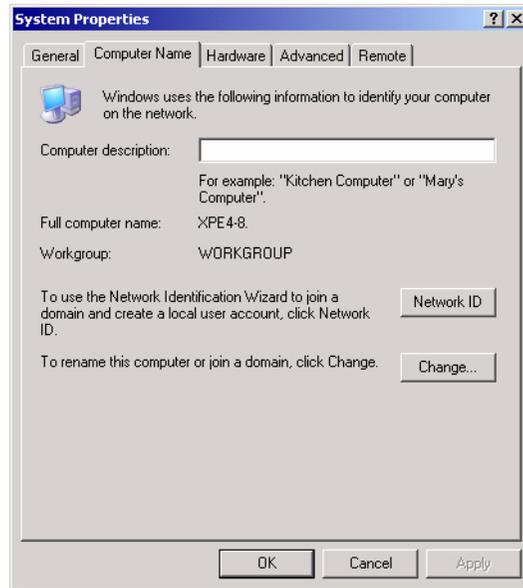
2. Select the **Change** button and enter the new computer name.

    Note: *Use standard characters (A-Z, a-z), digits (0-9), and hyphens. Using non-standard characters may prevent other users from locating this system unless the network is using the Microsoft DNS Server.*
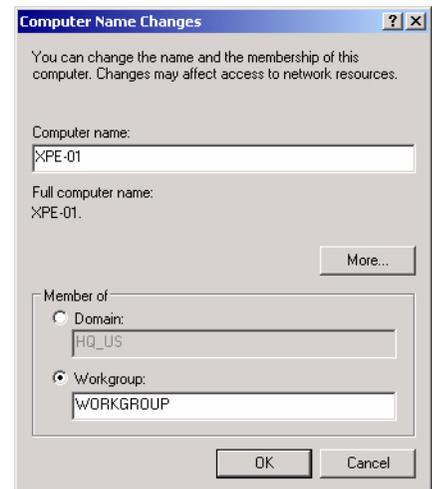
3. Optionally, select the **More...** button to enter the primary DNS suffix of this computer.
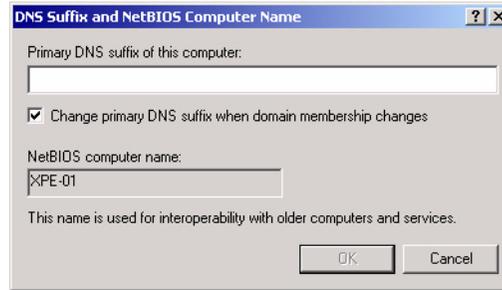
4. Optionally, select **Domain** to enter a domain name or change the default name of the Workgroup.
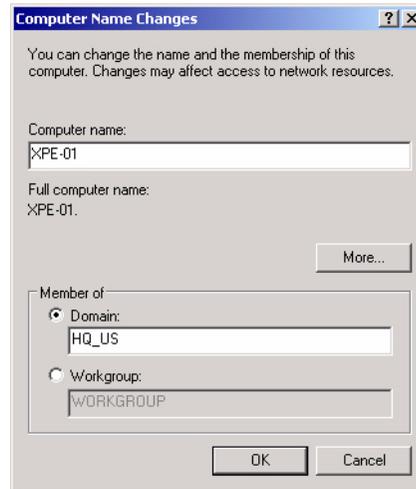
5. After completing all changes, select the **Ok** button.

6. Select **Ok** to close the popup message.

7. Select the **Ok** button to close the System Properties window.
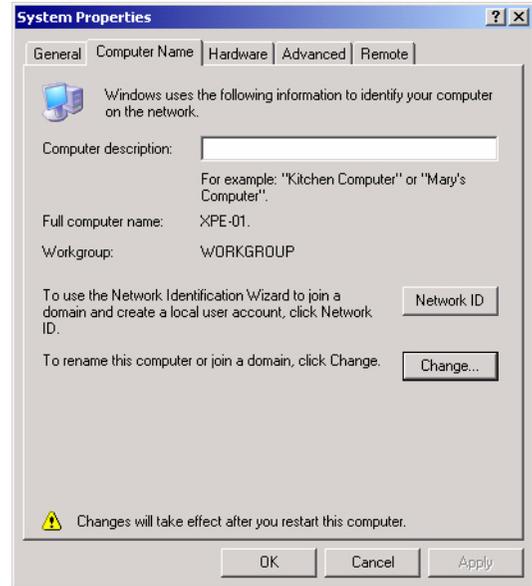
8. Select **Yes** to restart the system now.
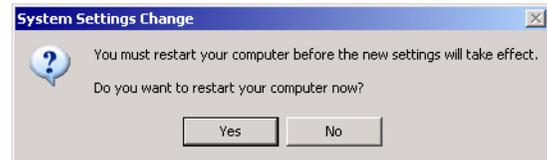
Starting Routing and Remote Access Services

Use the following procedure if you want to enable the Routing and Remote Access service. You must enable this service before you can configure dial-in.

1. Access the Computer Management console, open the **Services** folder, right-click **Routing and Remote Access**, and select **Properties**.
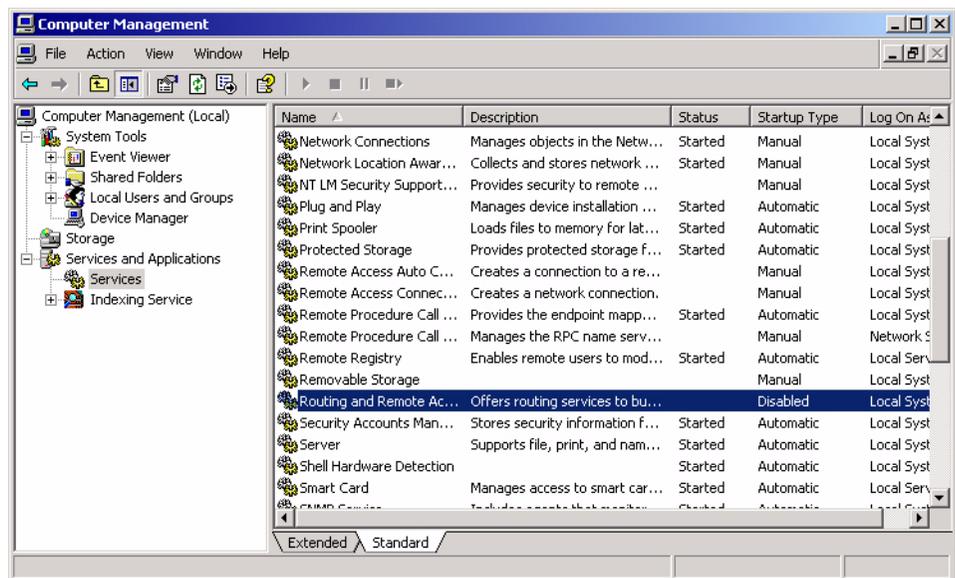
2. Select **Automatic** in the Startup type drop list and **Apply**.
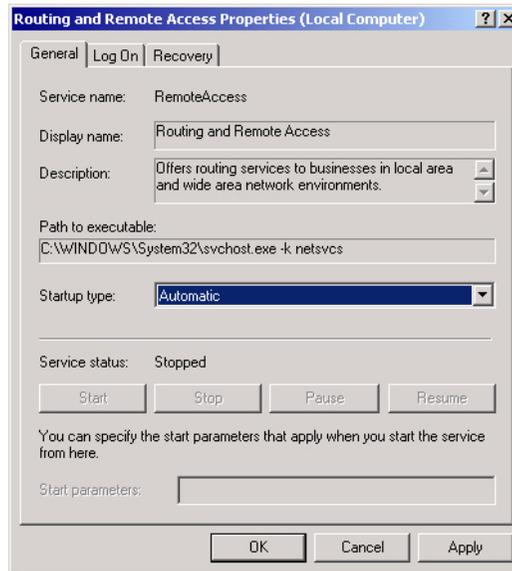
3. Select the **Start** button and **Ok** to close.
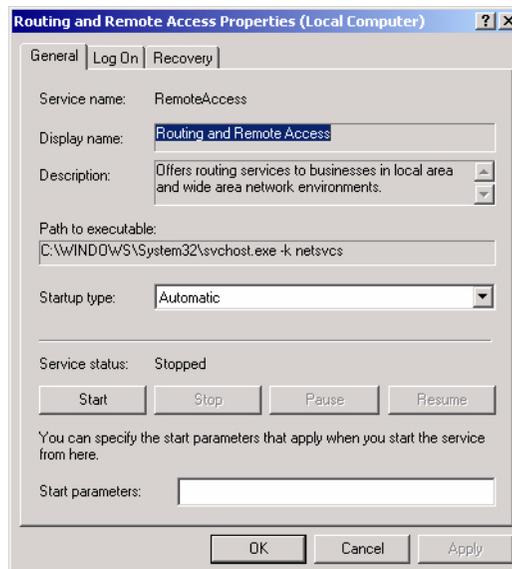
4. To configure remote desktop use, select the **Log On** tab, **Allow service to interact with desktop**, and **Ok**.

5. Close the Computer Management console.
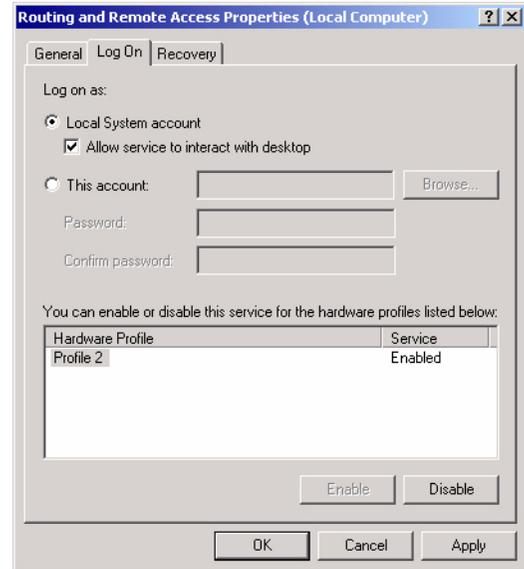
Setting Up Dial-In

Use the following procedure if you want to enable dial-in on the ATS-XPE. The modem must be installed and configured before configuring dial-in. You must start the Routing and Remote Access service before an Incoming Connections entry appears in the Network Connections control panel.

If you need to create additional users, use the User Accounts control panel. A password is required on any dial-in account. To use the default Administrator account for dial-in, you must create a password for the account.

Note: See Installing Modems on Page 49, to install modems other than the Linksys PCMCIA PCMLM56 modem.

1. Open the **Network Connections** control panel, right-click **Incoming Connections**, and select **Properties**.

2. Check the appropriate entry under **Devices**.
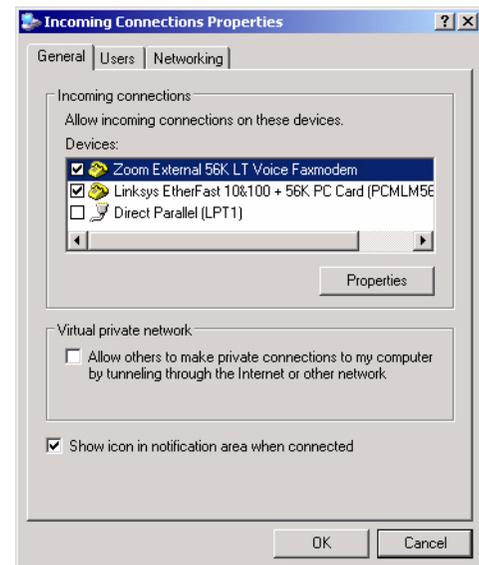
3. Select the **Users** tab, check the user (or users) that you want to allow dial-in access.
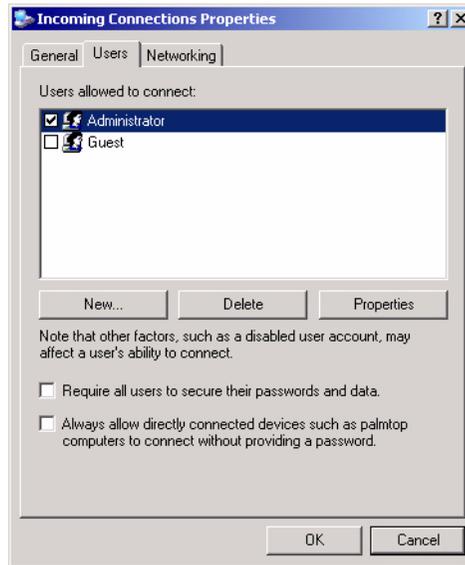
4. To set up callback capabilities for a user, highlight the user name, select **Properties**, and the **Callback** tab.
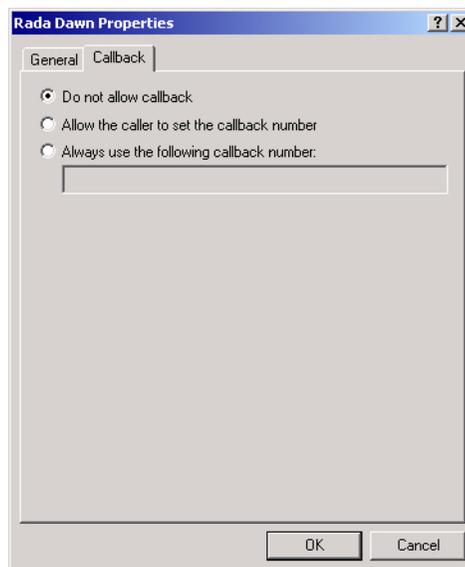
5. If you are not using DHCP, select the **Networking** tab, highlight **Internet Protocol (TCP/IP)** and select **Properties**.
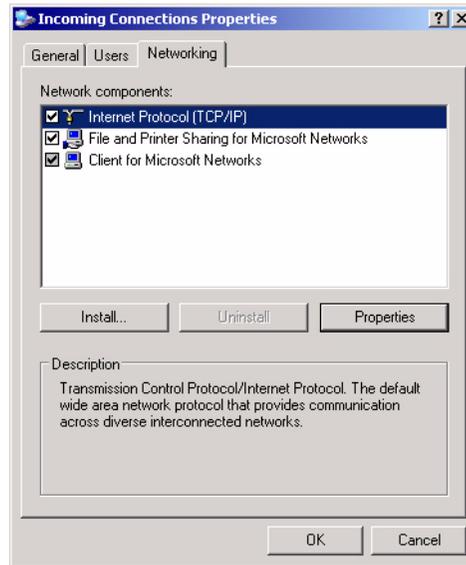
6. Check **Allow calling computers to specify its own IP address** or specify an IP address and select **Ok**.
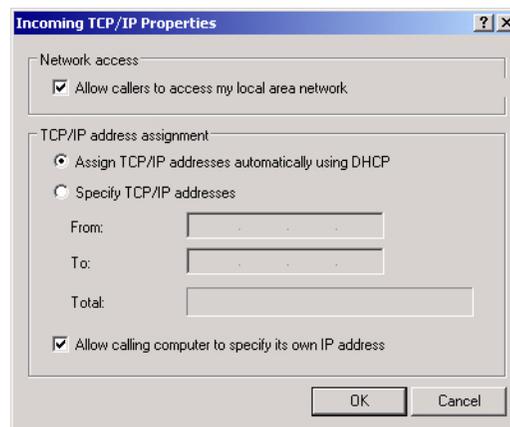
7. If necessary, select the **Properties** button to configure *Call Preferences* or *Data Connection Preferences* on the **General** tab or *Terminal Window* usage or *Hardware Settings* on the **Advanced** tab.
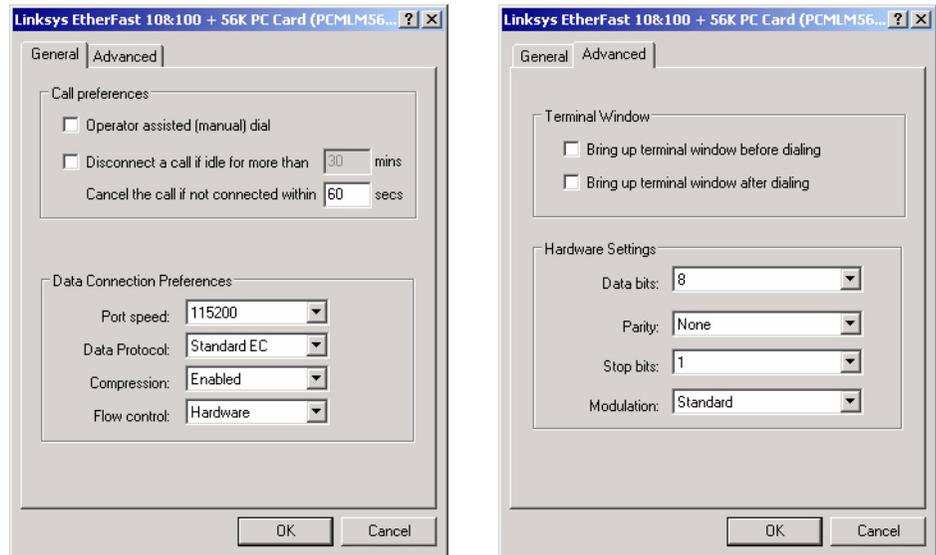
8. Select the **Ok** button on the Incoming Connections Properties screen after completing the set up procedures.

Setting Up Remote Desktop Access

Remote Desktop is installed and configured on the ATS-XPE so that administrators can control the ATS-XPE (host) from a remote location through a modem or a network connection. See the *Installation and Configuration Guide* to enable remote users that do not have administrative permissions.

You may need to install Remote Desktop on a Windows XP client or Terminal Services on a Microsoft client with an operating system previous to Windows XP. You can download the Terminal Services client (**msrdpcli.exe**) from Microsoft or install Remote Desktop (**msrdpcli.exe**) from a Windows XP CD.

Note: *If you need to create additional users, use the User Accounts control panel. A password is required on any dial-in account. To use the default Administrator account for dial-in, you must create a password for the account.*

The following procedure is only required if the Remote Desktop user does not have administrative rights.

1. Open the **System** control panel on the ATS-XPE (host) and select the **Remote** tab.
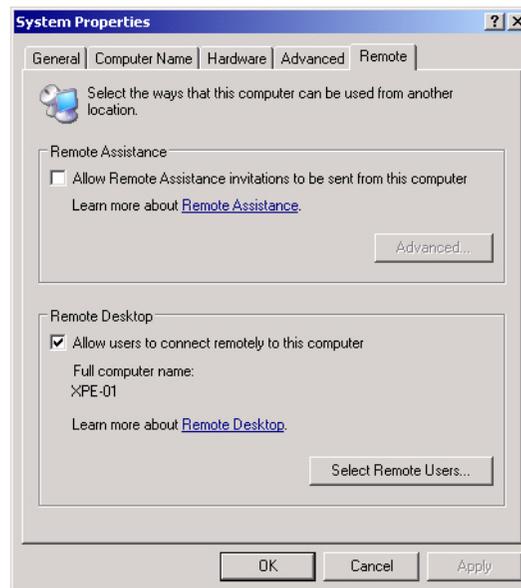
2. Select the **Select Remote Users...** button and add those users to the list using the **Add** button.
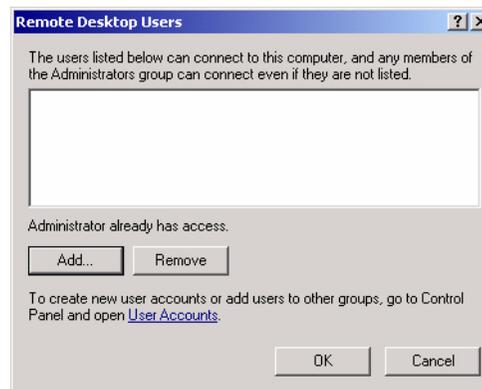
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Managing Files on the ATS-XPE

You can share the ATS-XPE and use Windows Explorer to access or move files or applications to or from any remote system. In addition, you may want to use Remote Desktop (called Terminal Services in operating systems previous to Windows XP) to control the ATS-XPE from a remote (client) system.

Note: *Compact flash technology does not support an unlimited number of writes. Use the compact flash to store applications but avoid using it for file storage. If your application generates files, save the files on a remote system.*

Accessing the ATS-XPE Using Remote Desktop

After installing and configuring the client for Remote Desktop, use the appropriate procedure for your environment. Remote Desktop is included on Windows XP systems. To use an operating system previous to Windows XP, you must download the Terminal Services client from Microsoft or copy it from a Windows XP CD.

You can refer to Microsoft help systems for more information about using Remote Desktop or Terminal Services.

Using Remote Desktop through the Network

Use this procedure to initiate a Remote Desktop session.

1. From the **Start** button, select **Programs**, **Accessories**, **Communications**, **Remote Desktop**.

2. Complete the *Logon settings* information on the **General** tab.

3.   Select the **Experience** tab and the appropriate connection speed.

4.   Select the **Connect** button.
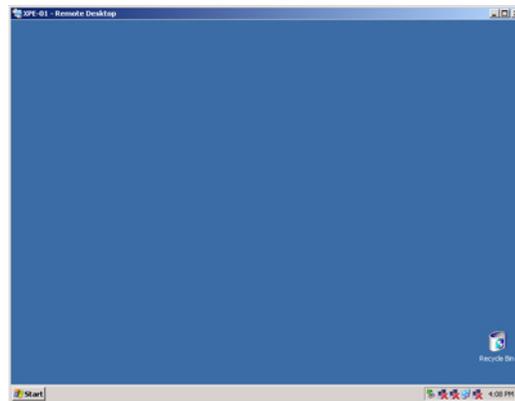
**Using Remote
Desktop through a
Modem**

Use this procedure to initiate a Remote Desktop session.

1. If necessary, create a dial-up connection on the client to the ATS-XPE.

2. Initiate the dial-up connection to the ATS-XPE.

3. From the **Start** button, select **Programs**, **Accessories**, **Communications**, **Remote Desktop**.

4. Complete the Logon settings information on the **General** tab,
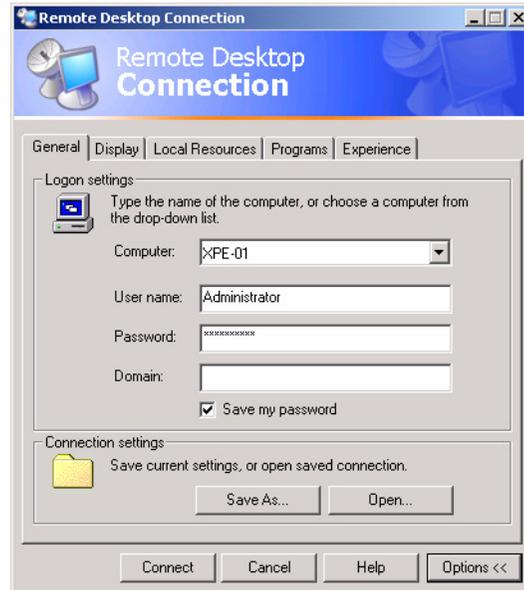
5. Select the **Experience** tab and select the appropriate modem line.
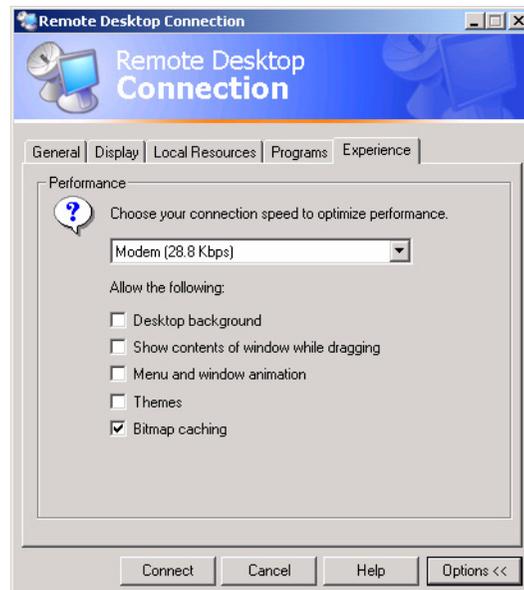
6. Select the **Connect** button.
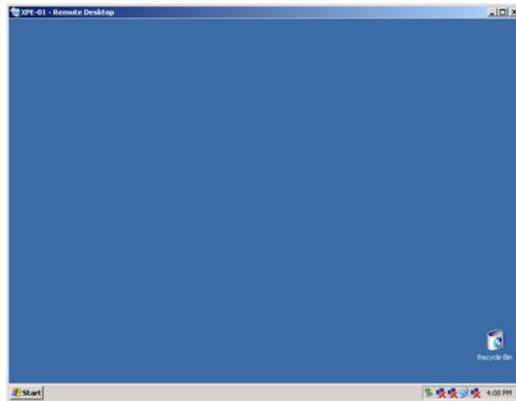
PC104 RocketPort Option

The PC104 RocketPort serial card is optional in the DeviceMaster ATS-XPE.

Note: This option can only be installed by Comtrol.

This section discusses the following topics:

- PC104 RocketPort default settings.
- Configuring the serial ports for your serial devices. Review *Default PC104 Port Configuration* (below) to determine whether you need to reconfigure any of the default settings.

    Note: The driver default for the ports is RS-232.

- Connecting your serial devices to the ATS-XPE.
- Adding modems on the serial ports:
    - Using the ATS-XPE default driver.
    - Using the modem manufacturer's driver.
- RocketPort quad- or octacable:
    - Connector pinouts
    - Building loopback plugs
    - Building cables (null-modem and straight-through).
- Troubleshooting serial ports with Comtrol tools (Test Terminal and PortMon).
- Device driver and operating system capabilities and limitations.

Default PC104 Port Configuration

This subsection lists the default configuration values for the RocketPort PC104. If these settings are suitable for your installation, you do not need to configure the driver and can begin connecting your devices using *Configuring the RocketPort Serial Ports* on Page 26.

Item	Default Value
Mode	RS-232
Starting COM Port	COM4 (see Page 28 for more information)
Verbose Event log	Off
Scan Rate	10 ms (see Page 29 for more information)
Override and lock baud rate to	None
Timeout on transmit data on port close	0 sec
Map 2 stop bits to 1	Disabled
Wait on physical transmission before completing write	Disabled

Configuring the RocketPort Serial Ports

Use the following procedure if you need to reconfigure the RocketPort driver for your serial devices.

1. Access the *RocketPort 8 Port Properties* page through the Device Manager.

   a. Right-click **My Computer** and select **Properties**.

   b. Select the **Hardware** tab and the **Device Manager** button.

   c. Expand the **Multi-port serial adapters** selection, right-click **RocketPort 8 Port, ISA-BUS**, and select **Properties**.

2. Select the **Main Setup** tab.
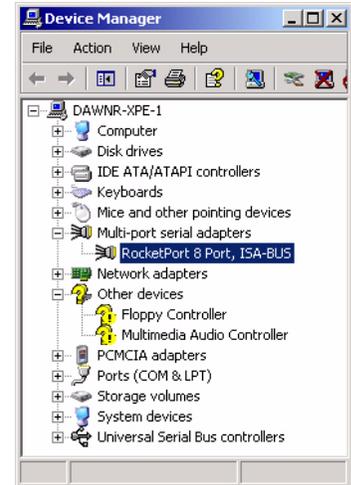
3. To change the name of the PC104 RocketPort adapter or the starting COM port number, highlight **RK #2** and select **Properties**.

a. Change the **Name** or the **Starting COM Port** number.

- COM1 is assigned to the **CONSOLE** port.

- COM2 is assigned to the **AUX A** port.

- COM3 is assigned to the optional PCMCIA Ethernet/Modem card.

   Note: *The default starting COM port number is COM4.*

b. Select **Ok** to return to the Main Setup screen.
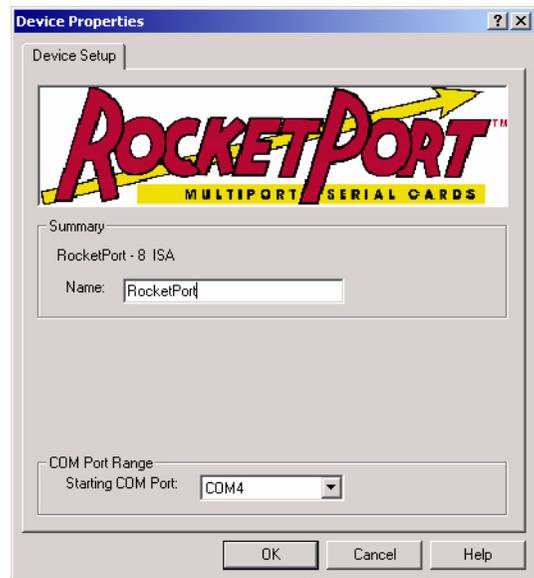
4. Highlight the port for which you want to configure COM port characteristics and select **Properties**.

   Note: *COM4 is the default starting COM port.*

   - COM1 is assigned to the **CONSOLE** port.

   - COM2 is assigned to the **AUX A** port.

   - COM3 is assigned to the optional PCMCIA Ethernet/Modem cards.
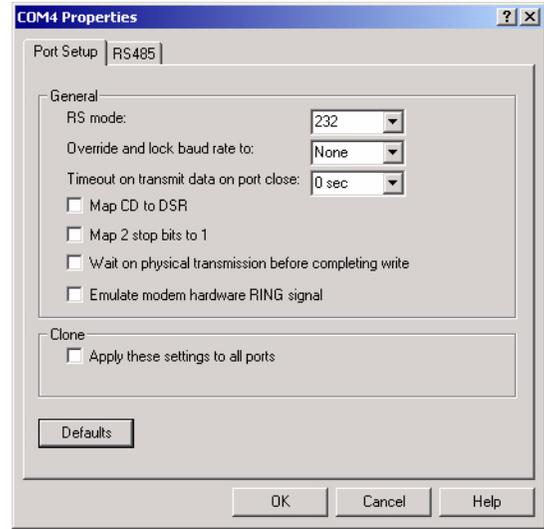
a. Change the communications mode to match the device you plan to connect.

b. If necessary, set an **Override and lock baud rate to** value.

   This option lets you lock selected ports to specific baud rates. After you do so, no matter what baud rate is selected in a host application, the *actual* rate used is the rate specified here.

c. If necessary, set the **Time on transmit data on port close** value.

   Use this drop list to select the length of time to wait for data to clear the transmit buffer after a host application has closed the port. This is typically used with peripheral devices such as printers, to give the data sufficient time to flush through the system.

d. If necessary, select the **Map CD to DSR** option.

   This option is used in installations where there is no connection to the port's DSR input. Check this box to cause the CD input to appear as DSR to the host application, and to perform hardware handshaking with CD rather than DSR. This is ignored if flow control is not enabled via IOCTL_SERIAL_SET_HANDFLOW.

e. If necessary, select the **Map 2 stop bits to 1** option for your application.

f. If necessary, set the **Wait on physical transmission before completing write** option.

   This option forces all write packets to wait until the transmit data has physically completed the transmission before returning completion to the host application. The default mode (box not checked) is to buffer the data in the transmit hardware buffer, and return completion as soon as the packet is in the buffer.

g. If necessary, set **Emulate modem hardware RING signal**.

   Note: *This emulates a hardware RI (ring indicator) signal.*

h. Select the **Clone** option if you want to clone all of the ports on the adapter with the characteristics set in this port.

   Note: *If this box is not checked, changes apply to the selected port only.*

i. Select **Ok** to make the changes to the selected port.

j. Repeat Step 4 for each port that requires configuration.

5. If you selected RS-485 as the communications mode, highlight the port, select **Properties** and then the RS-485 tab.

   a. Check the **Check the RS-485 Port Properties - RTS Toggle RTS Low** box to toggle the RTS output signal low during data transmission. If this box is not checked, RTS is toggled high (asserted) during data transmission.

   b. Check the **RS-485 Port Properties - Override and lock to RTS toggle mode** box to lock the port in RTS toggle mode, then set the mode (low or high) as desired. If this box is not checked, the RTS output signal is ignored.

   c. Select **Ok** to make the changes to the selected port.

6. If you want to set the verbose event log or change the scan rate, select the **Options** tab.
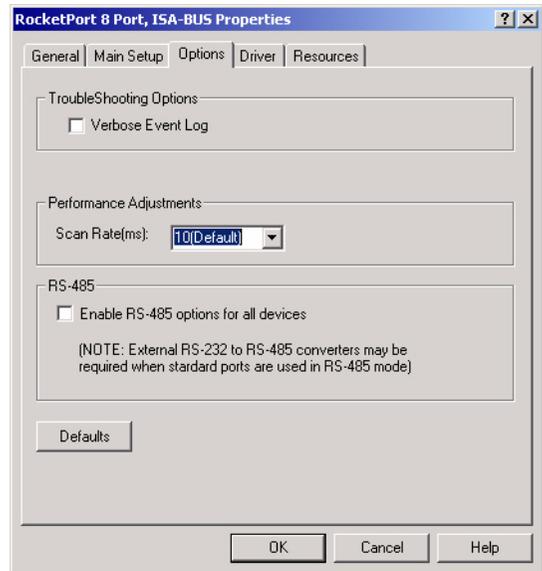
   a. Check **Verbose Event Log** if you want more information logged in to the Event Viewer when the driver loads.

   b. Use the **Scan Rate** drop list to select a driver servicing rate.

   c. Check Enable RS-485 options for all devices if external RS-232 to RS-485 converters are connected to the ports.

7. Select **Ok** to close the Setup window and select **Yes** to add the program group.

8. Close the Device Manager and select **Ok** to close the System Properties page.

9. Reboot if requested by the system.

RocketPort Serial Port Connectors

The following subsections illustrate the pinouts for the quad- and octacable connector types and how to build loopback plugs for testing serial ports.

DB9 Connectors

This illustrates the pinouts for DB9 quad- or octacables.
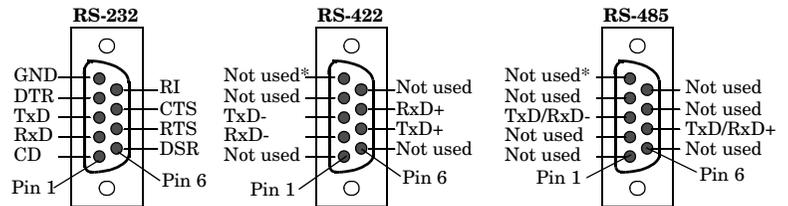
* Pin 5 is tied to ground on the board, but is not used in the cable.

Building Additional DB9 Loopback Plugs

Loopback connectors are DB9 female serial port plugs that you can use to test serial ports. The ATS-XPE is shipped with a a single loopback plug (RS-232/422) that corresponds to your quad- or octacable type.

Note: You can run loopback tests with Test Terminal.

Wire the following pins together to build additional plugs or replace a missing RS-232 loopback plug:

- Pins 1 to 4 to 6
- Pins 2 to 3
- Pins 7 to 8 to 9
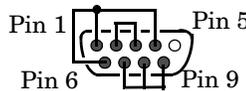
RS-232 Only (Back View)

The RS-232 loopback plug also works for RS-422.

Wire the following pins together for an RS-422 loopback plug:

- Pins 2 to 3
- Pins 7 to 8
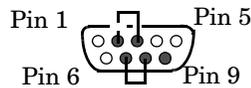
RS-422 Only (Back View)

DB25 Connectors

This illustrates the pinouts for DB25 quad - or octacables.
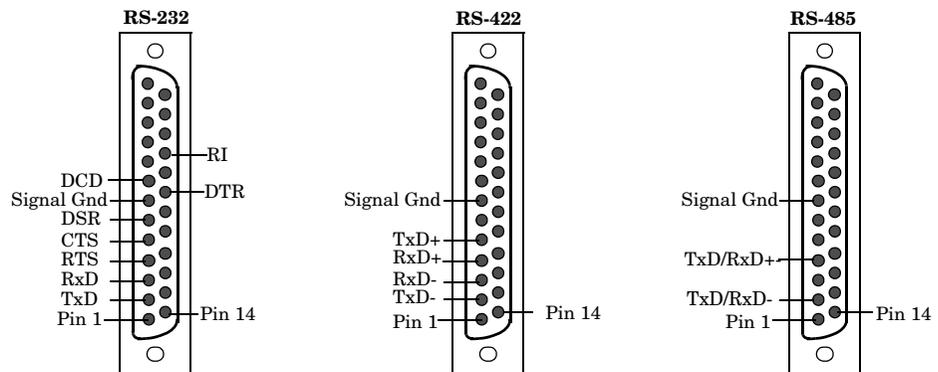
Building Additional DB25 Loopback Plugs

Loopback connectors are DB25 female serial port plugs that you can use to test serial ports. The ATS-XPE is shipped with a a single loopback plug (RS-232/422) that corresponds to your quad- or octacable type.

Note: You can run loopback tests with Test Terminal.

Wire the following pins together to build additional plugs or replace a missing RS-232 loopback plug:

- Pins 2 to 3
- Pins 4 to 5 to 22
- Pins 6 to 8 to 20
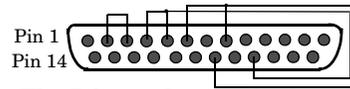
Pin 1
Pin 14

RS-232 Only (Back View)

The RS-232 loopback plug also works for RS-422.

Wire the following pins together for an RS-422 loopback plug:

- Pins 2 to 3
- Pins 4 to 5

Pin 1
Pin 14
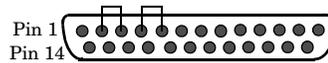
RS-422 Only (Back View)

RJ45 Connectors

This illustrates the pinouts for RJ45 quad- or octacables.

RS-232

Pin 1
RTS
DTR
Signal GND
TxD
RxD
DCD
DSR
CTS

RJ45

RS-422

Pin 1
TxD+
Not used
Not used**
TxD-
RxD-
Not used
Not used
RxD+

RJ45

RS-485

Pin 1
TxD/RxD+
Not used
Not used**
TxD/RxD-
Not used
Not used
Not used
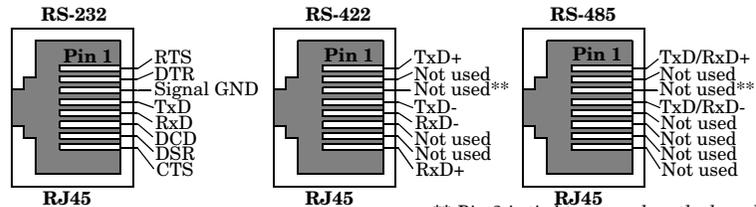
RJ45

*** Pin 3 is tied to ground on the board, but is not used in the cable.*

Building Additional RJ45 Loopback Plugs

Loopback connectors are RJ45 serial port plugs that can be used to test serial ports. The ATS-XPE is shipped with a a single loopback plug (RS-232/422) that corresponds to your quad- or octacable type.

Note: You can run loopback tests with Test Terminal.

- Pins 4 to 5
- Pins 1 to 8
- Pins 2 to 6 to 7

1
Plug
Top View
8
Cable
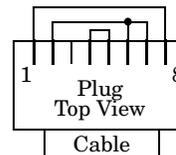
The RS-232 loopback plug also works for RS-422.

Building an RS-485 Test Cable

You can use a straight-through cable as illustrated previously, or build your own cable.

Signal	RJ45 Pins		DB9 Pins	RJ45 Pins	DB25 Pins	Signal
TxD or TRX-	4	→	3	4	2	TxD or TRX-
RTS or TRX+	1	→	7	1	4	RTS or TRX+

Building Null-Modem Cables

Use the following figure if you need to build a null-modem cable. A null-modem cable is required to connect the **CONSOLE** port to a PC COM port or to connect DTE devices.

	Signal	DB9 Pins	DB25 Pins	RJ45 Pins		DB9 Pins	DB25 Pins	RJ45 Pins	Signal	
ATS Female	TxD	3	2	4	→	2	3	5	RxD	PC COM Port
	RxD	2	3	5	←	3	2	4	TxD	
	RTS	7	4	1	→	8	5	8	CTS	
	CTS	8	5	8	←	7	4	1	RTS	
	DSR	6	6	7	←	4	20	2	DTR	
	DCD	1	8	6	←	1	8	6	DCD	
	DTR	4	20	2	→	6	6	7	DSR	
	GND	5	7	3	—	5	7	3	GND	
	RI	9	22	N/A	← →	9	22	N/A	RI	
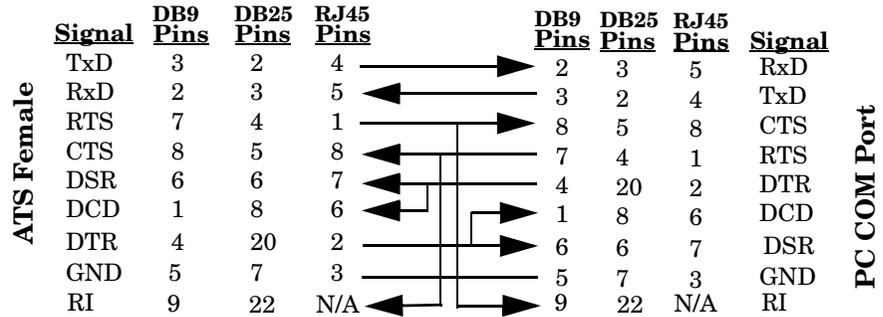
Note: *You may want to purchase or build a straight-through cable and purchase a null-modem adapter.*

Building Straight-Through Cables

Use the following figure if you need to build a straight-through cable. Straight-through cables are used to connect DCE devices.

	Signal	DB9 Pins	RJ45 Pins		DB9 Pins	RJ45 Pins	DB25 Pins	Signal	
ATS Female	DCD	1	6	→	1	6	8	DCD	Device
	RxD	2	5	→	2	5	3	RxD	
	TxD or TRx-	3	4	→	3	4	2	TxD or TRx-	
	DTR	4	2	→	4	2	20	DTR	
	GND	5	3	→	5	3	7	GND	
	DSR	6	7	→	6	7	6	DSR	
	RTS or TRx+	7	1	→	7	1	4	RTS or TRx+	
	CTS	8	8	→	8	8	5	CTS	
	RI	9	N/A	→	9	N/A	22	RI	
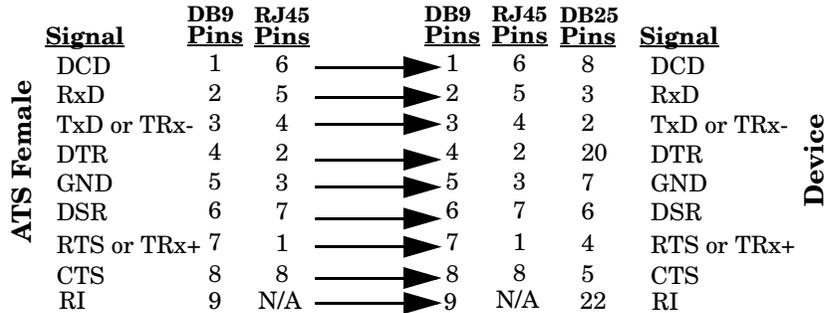
Troubleshooting Serial Ports

The following subsections discuss the following utilities that are installed on the ATS-XPE:

- Test Terminal program (**wcom32.exe**), which can be used to troubleshoot communications on a port-by-port basis.

- Port Monitor program (**portmon.exe**), which checks for errors, modem control, and status signals (*Using Port Monitor* on Page 35). In addition, it provides you with raw byte input and output counts.

- Peer Tracer program (**peer.exe**), which traces driver events (*Using Peer Tracer* on Page 40).

Using Test Terminal

WCOM32 is a terminal program that enables you to open a port, send characters and commands to the port, and toggle the control signals.

*Note: WCOM32 will **not** work on ports used by RRAS **if Remote Access Service is running** or any other application is using the port.*

If you have started RRAS service on any of the ports you want to test, you must stop RRAS on those ports before starting WCOM32. To test ports that are not used by RRAS, you do not need to stop RRAS.

Follow these steps:

1. To start WCOM32, select **Test Terminal** from the Comtrol program group. The program window displays:
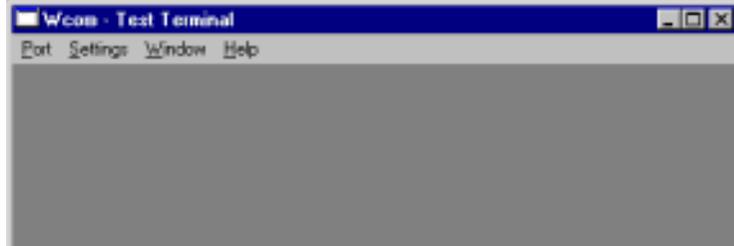
2. Select **Open Port** from the **Port** menu. A list of possible COM port numbers displays.

3. Select the COM port you want to test.

   If the COM port does not exist or if it is currently being used by another program, a *Create File Error* message displays.

   If the COM port is available, a terminal window pops up:

   Note: Notice the <loop> button in the terminal window. If this option is activated, it is green and uppercase (LOOP), the COM port internal loopback feature is activated, and the data is returned by the COM port hardware. If this option is deactivated, it is gray and lowercase (loop), the internal loopback is deactivated, and the data is sent out the COM port.

Testing a Comtrol Port

Use the following procedure to test the RocketPort PC104 serial port.

1. Place a loopback plug on the COM port you are testing. Make sure all connectors are seated firmly and that the loop button is **off**.

   Note: *Test terminal works for RS-232 and RS-422 mode.*

   To build loopback plugs, see *Building Additional DB9 Loopback Plugs* on Page 30, *Building Additional DB25 Loopback Plugs* on Page 31, or *Building Additional RJ45 Loopback Plugs* on Page 31.

2. From the **Port** menu, select **Send Test Data**. The program sends out a repeating data stream.

   Note: *To stop the data stream, select **Send Test Data** again.*

   - If the loopback plug is in place and the port is working correctly, the test data should be echoed back to the screen.

   - If the loopback plug is **not** in place or the port is not working correctly, no data or garbled data is echoed back to the screen.

   Note: *If no characters appear, try putting the loopback plug on an adjacent port. It may be that you have the ports mixed up.*

3. If further testing is required, select **Loopback Test** from the **Port** menu.

   If the loopback plug is in place and the port is working correctly, the system should return the message *Passed*.

   If the loopback plug is not in place or the port is not working correctly, the system will return the message *Failed*.

Testing an RS-485 Port

Perform the following procedure to determine if a port or ports are functioning properly.

1. Connect a straight-through cable from Port 1 to Port 2.

   Note: *See Building an RS-485 Test Cable on Page 31 for the cable information. If testing ports other than Ports 1 and 2, connect the cable between the two ports being tested.*

2. Open a session for each port.

3. Enter data into the Port 1 session, the data should appear in the *Port 2* window.

4. Enter data into the Port 2 session, the data should appear in the *Port 1* window.

   Note: *If the data appears as described in Steps 3 and 4, the hardware is functioning properly.*

Test Terminal Modem Control Signals

The terminal window displays the modem control signals as gray or green lights at the top of the window. The first four are inputs:

The lights are green if they are turned on, or gray if off. The text on the light also changes from uppercase (CTS), which is on, to lowercase (cts), which is off. The next two lights are outputs:

Note: *If you have a loopback plug connected and you click on one of the outputs, the corresponding signal is sent to the input and the input lights should toggle accordingly.*

The right most light is the loop indicator: (loop)

If this is on, the COM port internal loopback feature is activated and any information or code entered in the terminal window loops back through the COM port circuitry. If this is off, the COM port internal loopback is deactivated, and any information or code entered in the terminal window is sent out of the port.

Using Port Monitor

The Port Monitor program (**portmon.exe**) offers a summary of all Comtrol device statistics in one spreadsheet view. It also enables you to verify operation of all Comtrol device ports from a single window.

The Port Monitor display follows the familiar spreadsheet model: each COM port is a horizontal row, and each vertical column displays a variable or value for the respective COM port. For definitions of the abbreviations used, see *Port Monitor Variables* on Page 38.

Port Monitor can also produce statistics and reports that can help you verify the operation of the COM ports and connected peripherals. Some immediate feedback includes:

- The state of the modem control and status signals
- Open ports
- Raw byte input and output counts obtained from NS-Link
- Port errors

The available statistics include:

- Instantaneous characters per second (CPS) calculations
- Minute, hour, and day CPS averages and peaks
- Carrier detect (CD) signal runtime and transition count

Reports can be automatically generated on an hourly and/or daily basis, and can cover all ports collectively or a separate report for each port. You can also set how often the values are recalculated, fine-tuning thoroughness against system efficiency, and automatically run external batch files to perform additional processing and analysis.

Starting Port Monitor

To run Port Monitor, select **Port Monitor** from the Comtrol program group. The monitor window displays:
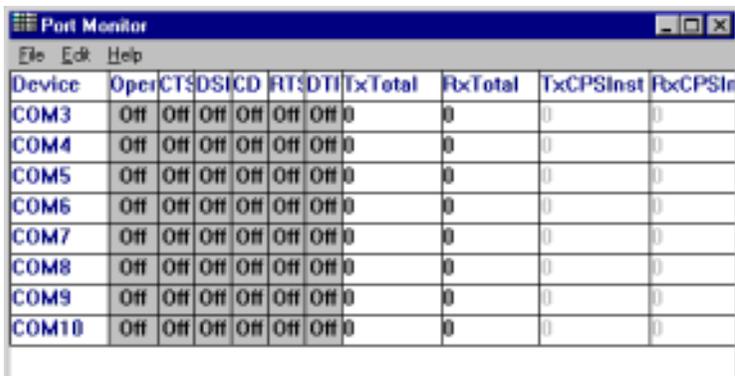
Device	Oper	CTS	DSI	CD	RTS	DTI	TxTotal	RxTotal	TxCPSInst	RxCPSIn
COM3	Off	Off	Off	Off	Off	Off	0	0	0	0
COM4	Off	Off	Off	Off	Off	Off	0	0	0	0
COM5	Off	Off	Off	Off	Off	Off	0	0	0	0
COM6	Off	Off	Off	Off	Off	Off	0	0	0	0
COM7	Off	Off	Off	Off	Off	Off	0	0	0	0
COM8	Off	Off	Off	Off	Off	Off	0	0	0	0
COM9	Off	Off	Off	Off	Off	Off	0	0	0	0
COM10	Off	Off	Off	Off	Off	Off	0	0	0	0

Note: To change the appearance of the screen, see the following discussion.

Once the monitor window displays, Port Monitor is active and collecting data. If any cumulative data has been saved from previous sessions, it is automatically brought in and used.

Port Monitor continues to run and collect data until you terminate it, at which point all accumulated data is automatically saved for use in the next session.

Changing Screen Appearance

While Port Monitor is running, there are a number of commands and controls that change the appearance of the screen.

Desired Change	Procedure
Change the monitor window font.	Select **Font** from the **Edit** menu.
Change width of a single column.	Left-click on the column separator (vertical) line and drag it to the desired width.
Change column placement.	Left-click in the middle of the column you want to move and drag it to the desired location.
Remove a column.	Right-click on the column you want to remove and select **Remove** from the pop-up menu.
Clear all fields and reset them to null values.	Right-click on the upper left cell in the table and select **Reset** from the pop-up menu.*
Clear any single field *except* the upper left cell.	Right-click on the field to be cleared and select **Reset** from the pop-up menu.*
Add a column.	Right-click on the column now occupying the desired location and select **Add** from the pop-up menu. You are prompted to name the variable you want to display, as well as other information. (See *Column Setup*, below.) After you click **OK**, the column is inserted in the selected location and the existing column is moved to the right.
Change other properties of a column.	Right-click on the column and select **Properties** from the pop-up menu. (See *Column Setup*, below.)

resets the selected display fields to their null values.

Column Setup

When you select **Add** or **Properties** from the column pop-up menu, the Column Setup window displays:

- Use the **Input** drop list to select the variable displayed in the column.

- Use the **Type** drop list to select the way in which the value displays: either as an integer, as an on/off state, as an integer with a kilo, mega, or giga suffix, or as an hh:mm:ss time stamp. This defaults to the appropriate type for the selected Input variable.

- Use the **Name** variable to change the column heading name.

- Use the **Width** variable to specify the column width in characters.

- Use **Color0** to set the column character color when the value is zero.

- Use **Color1** to set the column character color when the value is not zero.

- When done, click **OK** to save your changes and return to Port Monitor.
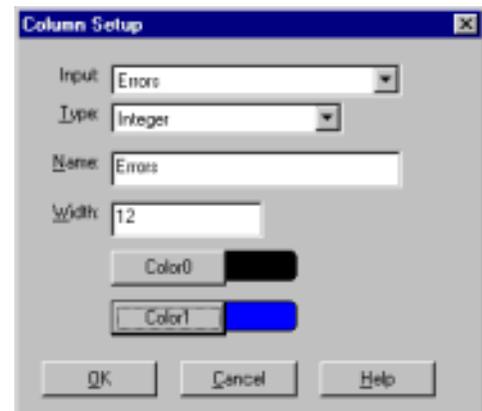
*Report
Configuration*

To configure reports, select **Config** from the Edit menu.

The **Single** report options cover all ports and are overwritten each time the reports are generated. The **Multiple** report options generate a separate report for each port, and each report file is appended each time the report is generated.

For **Hour** reports, use the Single and Multiple drop lists to select whether you are generating single or multiple reports, or both.

For each report type, select from the following types of data to include:

- None: no report is generated.
- Hour Data: only variables with "Hour" in the name are included.
- All Data: all variables are included.
- View Data: only variables that appear on-screen are included.

The **External Program** field is used to enter a command line to run another program after the hourly reports have been generated. For example, you can use this to run a batch file that performs custom report processing. The **Test** button causes the command line to be executed immediately.

For *Day* reports, the single and multiple drop lists behave the same:

- None: no report is generated.
- Day Data: only variables with the words *Day* or *Raw* in the names are included.
- All Data: all variables are included.
- View Data: only the variables that appear in the Port Monitor window are included.

Likewise, the **External Program** field is used to enter a command line to be executed after the daily reports have been generated.

The **Update Time** option allows you to set the rate at which the port information is obtained and the calculations performed. There is a trade-off between Port Monitor efficiency and response time. If you are using Port Monitor to view the port activity on the screen, you may want to set the update time to 1 or 2 seconds, so that the screen is updated frequently. If you are concerned about the monitor program using CPU resources, set this to a higher value, (6 to 20 seconds) in order to decrease the time required by the program to perform the calculations and update the screen.

If Port Monitor is left active to generate reports, minimizing or reducing the display area of the program helps reduce the CPU overhead of updating the screen.
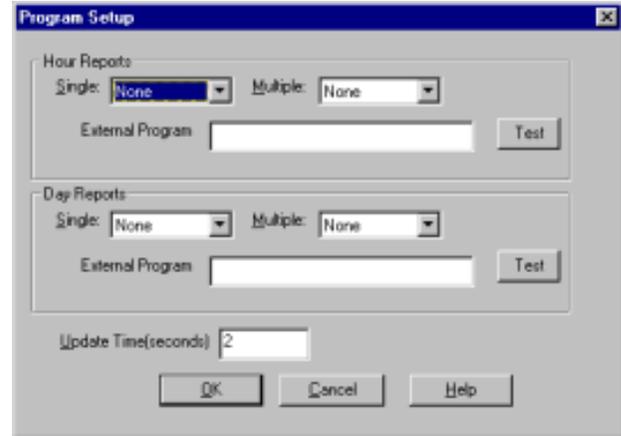
Port Monitor Files

Port Monitor creates and uses the following files:

- **portmon.vew**
- **calcs.dat**

The default column layout is saved in **portmon.vew**. If you have been experimenting with the appearance of the monitor screen, you can use the File menu **Save** option to save your customized layout in another **.vew** file. You can retrieve this file later by using the File menu **Open** option, or you can use the Edit menu **View Default** option to retrieve **portmon.vew** and restore the default view.

All Port Monitor calculations are saved at program exit and on the hour in a binary file named **calcs.dat**. This enables you to halt Port Monitor execution without losing accumulated data.

Port Monitor also creates a **\REPORTS** directory. All hourly and daily reports are saved in this directory, under the following names:

- **hall.txt** — hourly single report
- **dall.txt** — daily single report
- **hcomx.txt** — hourly multiple reports, where *x* is the port number
- **dcomx.txt** — daily multiple reports, where *x* is the port numb

Caution

> *Compact flash technology does not support an unlimited number of writes. Use the compact flash to store applications but avoid using it for file storage. If your application generates files, save the files on a remote system.*

Some safeguards are built into the program to avoid filling up a hard disk drive due to growing report files. The monitoring program stops writing additional data to the multiple reports if they reach a size of 2 MB. Also, the program will not write out data files to the disk drive if the spare room on the drive is less than 2 MB in size.

To view or edit an hourly or daily report, use the Edit Report option on the File menu, or use a system tool such as NOTEPAD.

For more information, see the Port Monitor **Help** file.

Port Monitor Variables

The following table lists Port Monitor variables.

Variable	Description
Open	Open status, on if open, off if closed.
Cts	Input CTS pin status.
Dsr	Input DSR pin status.
Cd	Input CD (carrier detect) pin status.
Rts	Output RTS pin status.
Dtr	Output DTR pin status.
TxTotal	Total bytes transmitted.
RxTotal	Total bytes received.
TxCPSInst	Instantaneous average of transmit characters per second.
RxCPSInst	Instantaneous average of receive characters per second.
Errors	Total hardware receive errors (parity, framing, and overruns.)
TxMinCPS	Last minute average of transmit characters per second.
RxMinCPS	Last minute average of receive characters per second.
TxCPSMinAvMax	Peak TxCPSInst for the last minute.
RxCPSMinAvMax	Peak RxCPSInst for the last minute.
TxCPSHourAvMax	Peak TxMinCPS for the last hour.
RxCPSHourAvMax	Peak RxMinCPS for the last hour.
TxCPSDayAvMax	Peak TxMinCPS for the last day.
RxCPSDayAvMax	Peak RxMinCPS for the last day.
TxTotalRaw	Total number of transmit bytes raw data from driver.
RxTotalRaw	Total number of receive bytes raw data from driver.
TxMinCnt	Count of transmit bytes sent in last minute.
TxHourCnt	Transmit bytes count sent in the last hour.

Variable	Description
TxDayCnt	Transmit bytes count sent in the last day.
RxMinCnt	Receive bytes count sent in the last minute.
RxHourCnt	Receive bytes count sent in the last hour.
RxDayCnt	Receive bytes count sent in the last day.
TxMinCntWrk	Transmit bytes count sent in this minute.
TxHourCntWrk	Transmit bytes count sent in this hour.
TxDayCntWrk	Transmit bytes count sent in this day.
RxMinCntWrk	Receive bytes count sent in this minute.
RxHourCntWrk	Receive bytes count sent in this hour.
RxDayCntWrk	Receive bytes count sent in this day.
TxCPSMinAvMaxWrk	Peak TxCPSInst for the current minute.
TxCPSHourAvMaxWrk	Peak TxMinCPS for the current hour.
TxCPSDayAvMaxWrk	Peak TxHourCPS for the current day.
RxCPSMinAvMaxWrk	Peak RxCPSInst for the current minute.
RxCPSHourAvMaxWrk	Peak RxMinCPS for the current hour.
RxCPSDayAvMaxWrk	Peak RxHourCPS for the current day.
CDRuns	Carrier detect turn-on count.
CDDayRuns	Carrier detect turn-on count in the last day.
CDDayRunsWrk	Carrier detect turn-on count in the current day.
CDRunTime	Time in seconds carrier detect has been on.
CDHourRunTime	Time in seconds carrier detect has been on in the last hour.
CDDayRunTime	Time in seconds carrier detect has been on in the last day.
CDHourRunTimeWrk	Time in seconds carrier detect has been on this hour.
CDDayRunTimeWrk	Time in seconds carrier detect has been on this day.
StatusFlags	Bit flags, Open, CTS, DSR, CD, RTS, DTR
TxPkts	Raw count of total transmit packets sent.
RxPkts	Raw count of total receive packets sent.
OverrunErrors	Total count of receive overrun errors.
FramingErrors	Total count of receive framing errors.
ParityErrors	Total count of receive parity errors.
OverrunErrorsRaw	Total count of receive overrun errors, from NS-Link.
FramingErrorsRaw	Total count of receive framing errors, from NS-Link.
ParityErrorsRaw	Total count of receive parity errors, from NS-Link.

Using Peer Tracer

The **Peer Tracer** program (**peer.exe**) is specifically designed to view the internal operations of NS-Link for the purpose of troubleshooting communications on Windows NT systems. **Peer** enables you to see:

- Receive and transmit data

- Internal driver event traces

- Advanced configuration and status information

Like Test Terminal, **Peer** acts as a simple terminal session, and is used to send and receive text information to and from NS-Link. To use **Peer**, you type in commands, and status and information are sent back.

Unlike Test Terminal, **Peer** enables you to keep a continuous log of the commands sent and the results received in a file named **peer.log**.

Comtrol Technical Support may ask you to run **Peer** in order to help diagnose reported problems.

Starting Peer

Peer Tracer does not appear in the Comtrol program group. To use it, you must open **Windows Explorer**, access the **C:\WINDOWS\system32\Rocket** directory, and double-click on **peer.exe**. The Peer Tracer window displays (at right).

Log Functions

All logging functions are found under the File menu. To start keeping a log, select **Log to Disk** from the File menu. The other options on this menu are View Disk Log, Clear Disk Log, Clear Screen, and Exit.

Caution

Compact flash technology does not support an unlimited number of writes. Use the compact flash to store applications but avoid using it for file storage. If your application generates files, save the files on a remote system.

Using Peer

To use peer, simply type in commands at the **: prompt**. (It may be necessary to press **Enter** to make the **: prompt** appear.) For example, to examine COM5, type: **PORT COM5 <Enter>**

To gather some information about the port, type: **STAT <Enter>**. This should return details about the port.

To turn on monitoring of any calls into driver (events), type: **MON EV <Enter>**

To send strings and commands to attached peripherals—for example, to send "ATH0" to a modem—type: **SEND ATH0 <Enter>**. A return and linefeed are always appended to each string sent.

Other Peer Commands

Enter commands at the **:** prompt and follow each command with **Enter**.

Command	Effect
MON TX	Monitor data being transmitted through the selected port.
MON RX	Monitor data being received through the selected port.
M	Turn off all monitoring.
?	Display Peer Tracer command summary.
PORT COM*xx*	Change port being examined to COM*xx*.

Keep in mind that all commands are processed in the driver, and that **Peer** simply acts as a conduit for this information.

For more information, see the **Peer.hlp** help file.

Device Driver and OS Capabilities and Limitations

This device driver supports the Win32 API. The following tables list known device driver and operating system capabilities and limits. This information is not relevant to ordinary users, but is important to software developers.

Note: *In Windows NT, device names above COM9 require the \\.\ prefix in order to be recognized by the system. For example, to reference COM20, use \\.\COM20 as the file name.*

Device Control Block Settings	Status
ByteSize	7 or 8
ErrorChar	Supported
EofChar	Not supported, supports only binary
EvtChar	Supported
fAbortOnError	Supported
fBinary	Always binary mode
fDtrControl	Supported
fDsrSensitivity	Not supported
fErrorChar	Supported

Device Control Block Settings	Status
fInX, fOutX	Supported
fNull	Supported
fParity	Supported
fOutxCtsFlow	Supported
fRtsControl RTS_CONTROL_DISABLE, RTS_CONTROL_ENABLE, RTS_CONTROL_HANDSHAKE, RTS_CONTROL_TOGGLE fTXContinueOnXoff	Supported as always TRUE
Parity	EVENPARITY, NOPARITY, or ODDPARITY
StopBits	ONESTOPBIT or TWOSTOPBITS
XonChar, XoffChar	Supported

Certified PCMCIA Adapters

This section discusses configuration issues for Comtrol certified PCMCIA options.

Comtrol Certified PCMCIA Devices

The ATS-XPE supports the following PCMCIA devices.

- Any standard PCMCIA to Compact Flash adapter
- Linksys Wireless PC Card (WPC11)
- Linksys EtherFast 10/100 + 56K Modem PC Card (PCMLM56)

Note: *The ATS-XPE PCMCIA option supports two Type II PCMCIA slots or one Type III slot, which is installed at the factory. Drivers for Comtrol approved PCMCIA devices are installed in the system.*

Linksys Wireless PC Card (WPC11)

The device driver for the Linksys Wireless PC Card (WPC11) is installed on the ATS-XPE. To configure the Linksys Ethernet card, it is necessary to have a configured and operating wireless access point connected to the local network and have it situated within range of the wireless adapter (preferably less than 100 feet indoors with no obstructions).

For support of the card, see http://www.linksys.com.

1. Select **Install from a specific list or specific location (Advanced)** and **Next**.

2. Select **Don't search. I will choose the driver to install** and **Next**.
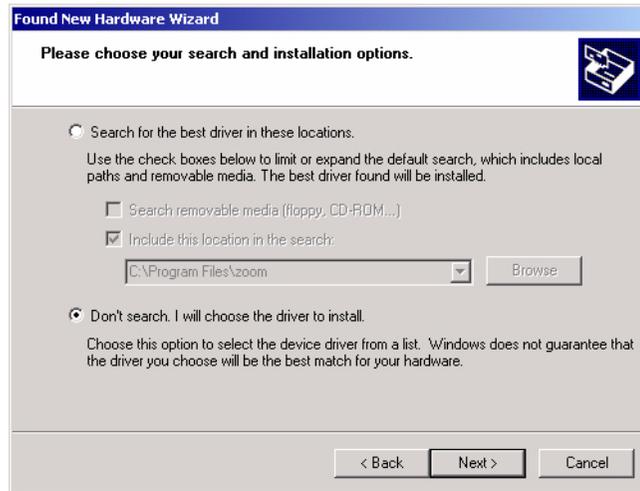
3. Select **Network adapters** from the Common hardware types list and **Next**.
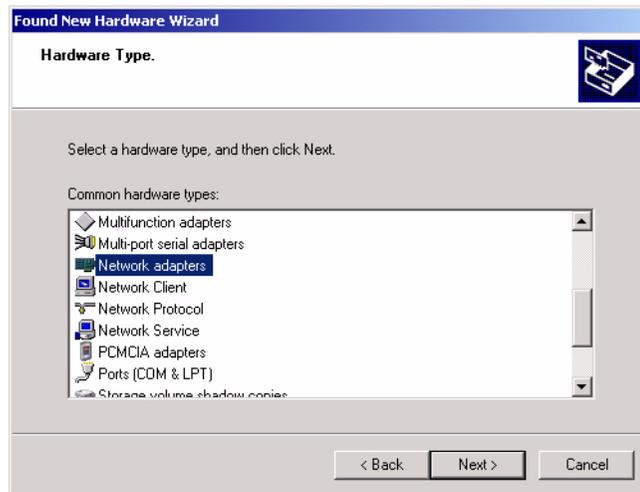
4. Select **LINKSYS Corporation** from the Manufacture list, **Instant Wireless - Network PC CARD** from the Network Adapter list, and **Next**.

5. Select **Yes** to the Update Driver Warning message.

6. Select **Finish**.

7. Open the **Network Connections** control panel, right click **Wireless Network Connection** from LAN or High-Speed Internet, and select **View Available Wireless Networks**.

8. Highlight the network to which you want to connect.
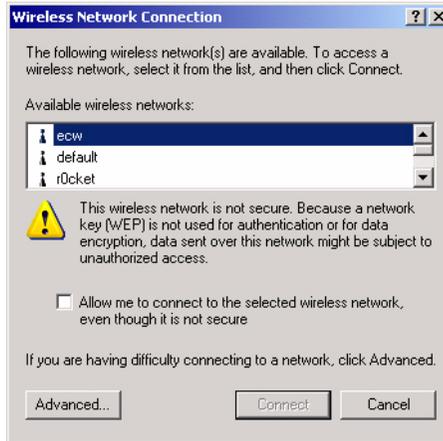
9. If requested, enter the appropriate information in the Network key and Confirm network key fields, and select **Connect**.
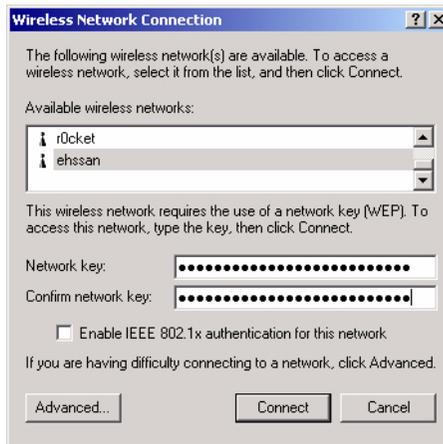
10. Right-click the **Wireless Network Connection** and select **Properties**.
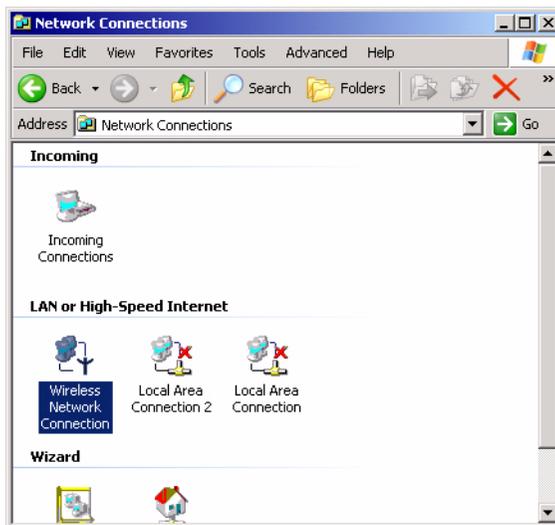
11. To configure the card exclusively for a specific network, select **View Available Wireless Networks**.
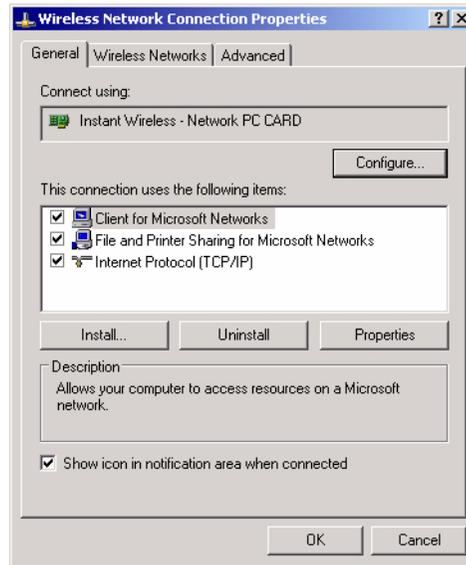
12. Highlight the appropriate network connection and **Advanced**.

13. Select **Access point (infrastructure) networks only** and **Close**.
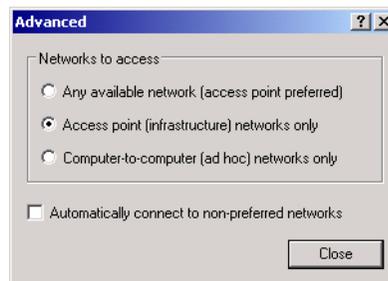
14. Select **Ok** to close the Wireless Network Connection Properties window and close the Network Connections control panel.

15. Go to *Configuring the Network Settings on the ATS-XPE* on Page 9 to configure the card for your network.

Linksys EtherFast 10/100 + 56K Modem PC Card (PCMLM56)

Although the Linksys PCMLM56 driver for this adapter is pre-configured into the ATS-XPE as COM3, you must start remote access service and you may need to select a country code if you are using it outside North America.

See *Starting Routing and Remote Access Services* on Page 13 and *Setting Up Dial-In* on Page 15, if necessary to complete the configuration.

For support of the card, see http://www.linksys.com.

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Installing Serial Devices

Overview

The COM ports provided by the **SERIAL PORTS 1-8** can support any asynchronous serial modem for use by any application that uses TAPI.

There is a remote possibility that connecting a peripheral using the wrong configuration (***RS-232 device connected to a RS-422 configured port***) could damage the peripheral. Configure each serial port specifically for the peripheral that will be connected prior to connecting the peripheral to the ATS-XPE. See *Configuring the RocketPort Serial Ports* on Page 26 for information about configuring port characteristics.

Note: If your serial devices require a driver that does not support the Windows XP Embedded system, contact Comtrol before driver installation.

Connect your serial devices to the configured ports using the appropriate cables. If you need to build cables for RocketPort serial ports, see *RocketPort Serial Port Connectors* on Page 30.

Installing Modems

This subsection illustrates how to install modems on ATS-XPE serial ports.

1. Make sure that you have the driver available to the ATS-XPE system.

2. If you have not done so, connect a modem to the **AUX A**, **CONSOLE**, or one of the RocketPort serial ports.

   Note: The ATS-XPE will automatically detect the modem and start the Found New Hardware Wizard.

3. Select **Install from a list or specific location (Advanced)** and **Next**.

4. Select **Don't search. I will choose the driver to install** and **Next**.
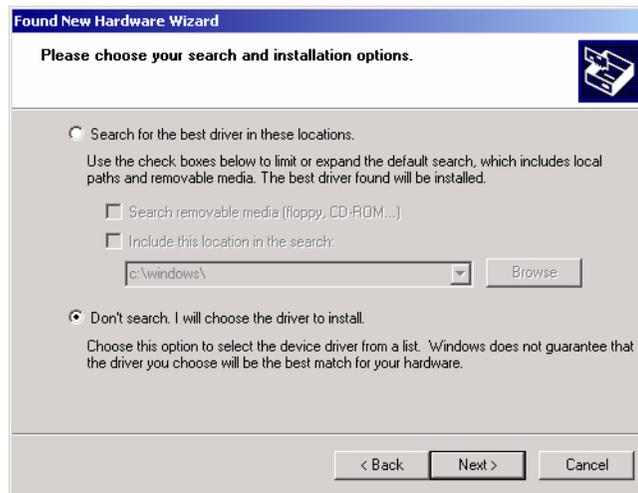
5. Select **Modems** from the Common hardware types list and **Next**.
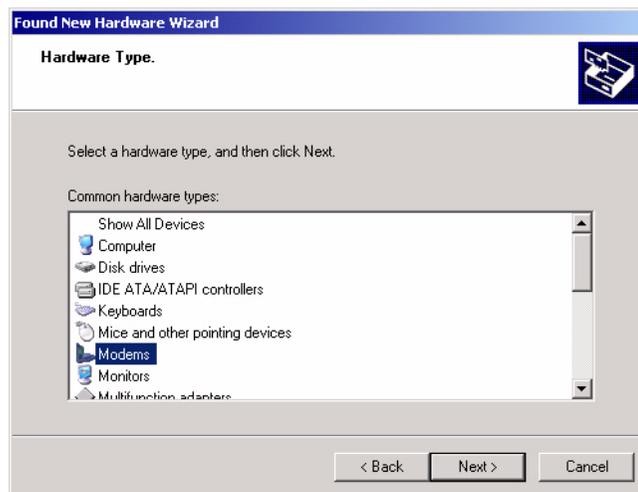
6. Select **Have Disk** and **Next**.
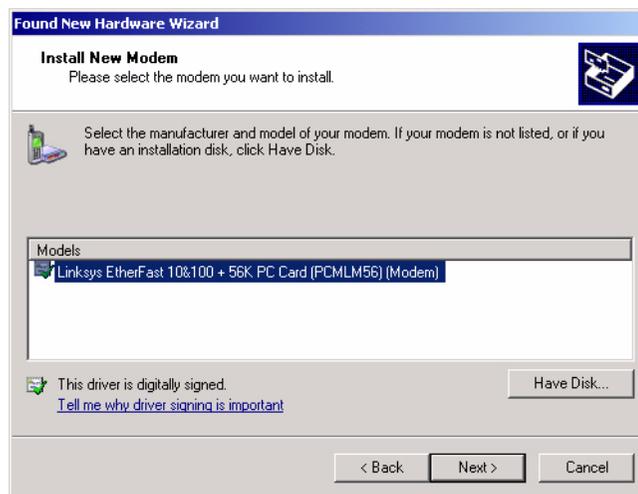
7. Browse to the location of the driver for your modem and select **Open**.
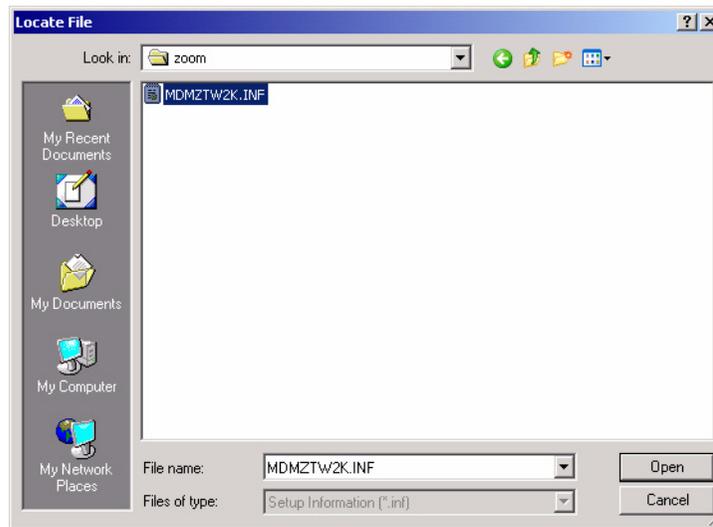
8. Select **Ok**.

9. Select **Next**.
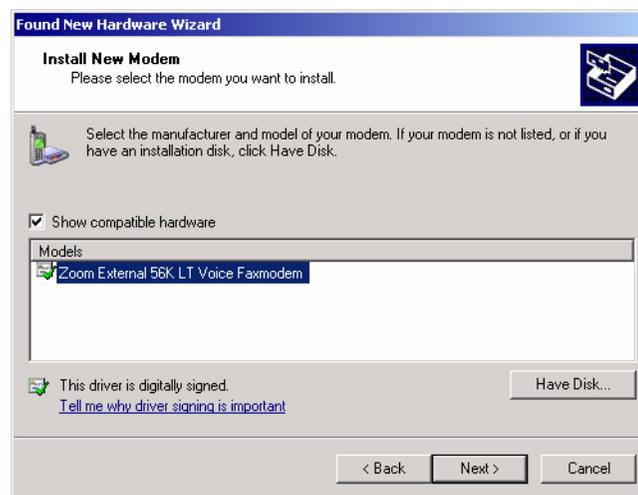
10. Select **Continue Anyway**.

11. Select **Finish**.

In some installations you may get the following message, so you may need to verify that the modem installed properly through the Device Manager.

12. See *Starting Routing and Remote Access Services* on Page 13 and *Setting Up Dial-In* on Page 15 to complete modem configuration.

Troubleshooting and Technical Support

This section contains troubleshooting information for your Comtrol device. You should review the following subsections before calling Technical Support because they will request that you perform many of the procedures or verifications before they will be able to help you diagnose the problem.

- Troubleshooting checklist
- Enabling the Windows Event Viewer
- Using the recovery CD
- Customer support policy

If you cannot diagnose the problem, you can contact Technical Support using *Technical Support* on Page 57.

Troubleshooting Checklist

The following checklist may help you diagnose your problem:

- Verify that you are using the correct types of cables on the correct connectors and that all cables are connected securely using the hardware documentation.

  Note: Most customer problems reported to Comtrol Technical Support are eventually traced to cabling or network problems. Use a standard Ethernet cable to connect from the 1 or 2 port to an Ethernet hub or a cross-over cable if connected directly to a NIC in a server.

- Verify that the Ethernet hub and any other network devices between the server and the Comtrol device are powered up and operating.

- Reset the power on the Comtrol device by disconnecting and reconnecting the power cord.

- Verify that the network IP address is correct. If IP addressing is being used, the server should be able to ping the Comtrol device.

- Verify that the IP address programmed into the Comtrol device matches the unique reserved IP configured address assigned by the system administrator.

Note: See Using Test Terminal on Page 33, if you need to test the PC104 ports.

- Verify that you are addressing the serial port correctly. In many applications, device names above COM9 require the prefix **\\.** in order to be recognized. For example, to reference COM20, use \\.**COM20** as the file or port name.

- If using a PC104 RocketPort adapter, you can use one of the tools bundled with the drivers. See *Troubleshooting Serial Ports* on Page 33 for information about using these tools.

  - Test Terminal program (**wcom32.exe**), which can be used to troubleshoot communications on a port-by-port basis.
  - Port Monitor program (**portmon.exe**), which checks for errors, modem control, and status signals. In addition, it provides you with raw byte input and output counts.
  - Peer Tracer program (**peer.exe**), which traces driver events.

- Enable the **Verbose Event Log** feature under the **Options** tab and then reboot the ATS.

Enabling the Event Viewer

The Windows Event Viewer has been disabled in the ATS-XPE to prevent excess file logging. Compact flash technology does not support an unlimited number of writes. We recommend using the compact flash to store applications but avoid using it for file storage.

Use the following procedure if you wish to enable the Event Viewer.

1. Access the Computer Management console, open the **Services** folder, right-click **Event Log**, and select **Properties**.
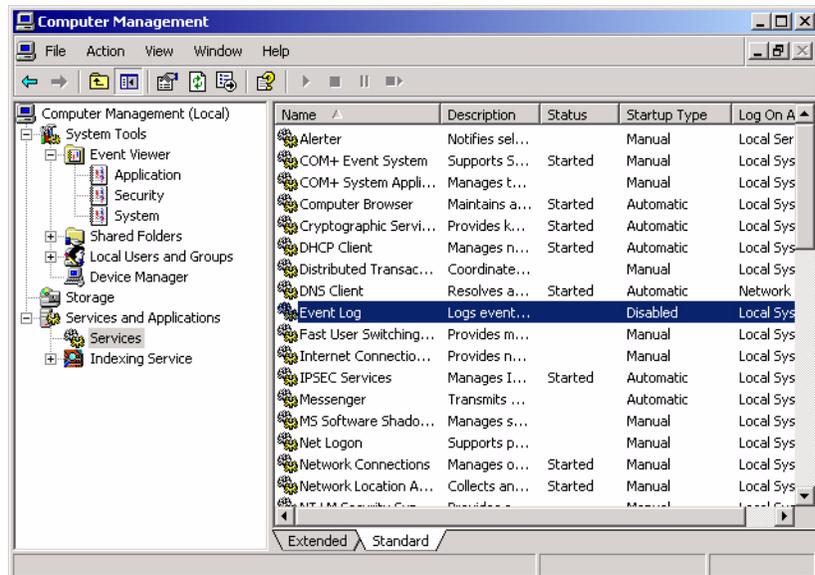
2. Select **Manual** in the Startup type drop list and **Ok**.
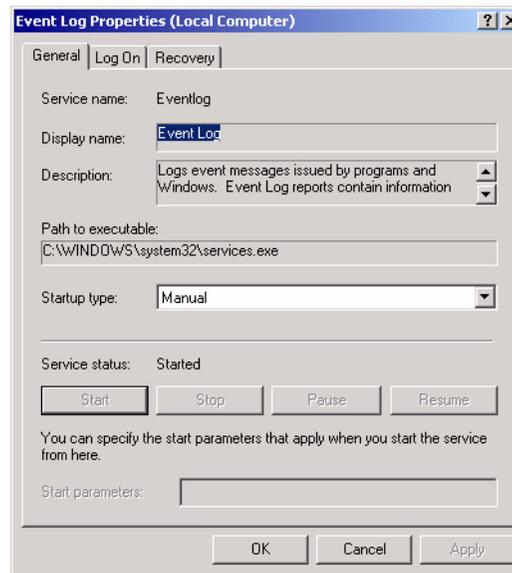
3. Close the Computer Management console.

Using the Recovery CD

Comtrol ships a Recovery CD with each ATS-XPE system. You can use the Recovery CD to:

*   Reflash the compact flash in the event that the Windows XP Embedded system becomes corrupt.
*   Recover the default image to the ATS-XPE compact flash.
*   Replace the existing flash with a larger flash.

To use the Recovery CD, you will need the following:

- A PC with a Windows operating system and a CD-ROM that supports bootable CDs.
- One of the compact flash adapters or readers:
    - IDE

        Note: *The IDE flash adapter must be a master with no other devices on that channel because the recovery process is propagated to all devices on the channel.*
    - USB
    - PCMCIA
- A compact flash.

Use the following procedure to recover the default ATS-XPE image onto a compact flash.

1. Install the compact flash adapter or reader using the instructions that came with the device.

2. Insert a compact flash into the compact flash adapter or reader.

3. Disconnect any IDE hard drives.

⚠️ **Warning**

   If you do not disconnect the PC hard drives, run the risk of accidentally overwriting the contents of an existing IDE drive. Comtrol strongly recommends that you disconnect all IDE hard drives until the recovery process has been completed.

4. Insert the Recovery CD and power on the PC.

    Note: *You may need to enter the system BIOS and have the CD-ROM boot first.*

5. Select the **2. Boot from CD-ROM** item.

6. Select the **1. Restore Hard Drive From CD-ROM** item.

7. Select the **Restore** button when the Hard Disk Recovery Menu appears.

8. During the reboot cycle:

    a. Remove the CD from the drive.

    b. Turn off the system power.

    c. Remove the compact flash from the adapter and insert it into the ATS-XPE.

9. Reconnect the hard drives disconnected in Step 3.

    Note: *If necessary, you may need to enter the BIOS and reset the boot sequence.*

Customer Support Policy

Comtrol will provide no charge support on the installation, use, and configuration of the ATS-XPE product with the original operating system and any "Comtrol Certified" hardware options.

Support beyond normal installation and configuration, including operating system modifications and installation or use of untested hardware options will be provided on a fee for services basis.

Fees will be $100 per hour with a $100 minimum per case. Customers wishing support on a fee for services basis must be pre-approved by Comtrol prior to receiving support. Please contact Comtrol Customer Service for information on fees for services.

Technical Support

If you need technical support, contact Comtrol using one of the following methods.

Contact Method	Corporate Headquarters	Comtrol Europe
FAQ/Online	http://support.comtrol.com/support.asp	
Downloads	ftp://ftp.comtrol.com/Dev_Mstr/ATS/XPE	
Email	support@comtrol.com	support@comtrol.co.uk
Web site	http://www.comtrol.com	http://www.comtrol.co.uk
Fax	(763) 494-4199	+44 (0) 1 869-323-211
Phone	(763) 494-4100	+44 (0) 1 869-323-220

Repair and Return Policy

The DeviceMaster ATS-XPE has a Microsoft licensed operating system on the compact flash installed in the unit. According to the OEM license agreement with Microsoft, the operating system must be installed on the unit at Comtrol and may not be shipped on a separate compact flash media.

To comply with this requirement, Comtrol has instituted the following policy:

- The customer can return a unit for repair provided that the compact flash containing the operating system is installed in the unit and that the Certificate of Authenticity (COA) label is affixed to the unit.

  Note: *You will be billed $150 for a new license if the COA label is missing from the unit.*

- See the *Warranty* statement shipped with the product.

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Appendix A. Connectors

This section contains information about the standard connectors on the ATS-XPE. For connector information for the optional **SERIAL PORTS 1-8** connector, see the section that discusses the PCMCIA option.

VGA Connector

This table illustrates the 15-pin female **VGA** connector pinouts.

Pin	Signal	Pin	Signal	Pin	Signal
1	Red	6	Ground	11	Not connected
2	Green	7	Ground	12	DDCDAT
3	Blue	8	Ground	13	HSYNC
4	Not connected	9	Not connected	14	VSYNC
5	Ground	10	Ground	15	DDCCLK

PS/2 Keyboard and Mouse Connectors

This table illustrates the DIN 6-pin (PS/2) keyboard and mouse connector pinouts.

Pin	Signal	Pin	Signal
1	Keyboard Data	4	+5V
2	Mouse Data	5	Keyboard Clock
3	Ground	6	Mouse Clock

Ethernet Connectors

This table illustrates the RJ45 LAN connector pinouts.

Pin	Signal	Pin	Signal
1	TX+	5	Not connected
2	TX-	6	RX-
3	RX+	7	Not connected
4	Not connected	8	Not connected

USB Interfaces

The USB interfaces provide plug and play for up to 127 external devices.

Pin	Description	Pin	Description
1	USBVCC1	2	D1F-
3	D1F+	4	GND
5	USBVCC2	6	D2F-
7	D2F+	8	GND
9	GND	10	GND

Compact Flash Disk Connector

This table illustrates the compact flash connector pinouts.

Pin	Signal	Pin	Signal
1	Ground	26	VCC-IN, CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15
7	HDC_CS0#	32	HDC_CS1
8	Not connected	33	Not connected
9	Ground	34	IOR#
10	Not connected	35	IOW#
11	Not connected	36	Not connected
12	Not connected	37	Interrupt
13	VCC_COM	38	VCC_COM
14	Not connected	39	CSEL
15	Not connected	40	Not connected
16	Not connected	41	HDD_RESET
17	Not connected	42	IORDY
18	SA2	43	N/C
19	SA1	44	VCC_COM
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	Not connected
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	Not connected	49	DATA 10
25	VCC-IN, CHECK2	50	Ground

AUX A and CONSOLE Port Connectors

This table illustrates the DB9 pinouts for the **AUX A** and **CONSOLE** connectors.

Pin	Signal	Pin	Signal	Pin	Signal
1	CD	4	DTR	7	RTS
2	RxD	5	Ground	8	CTS
3	TxD	6	DSR	9	RI

PARALLEL Port

This table illustrates the DB25 **PARALLEL** pinouts.

Pin	Signal	Pin	Signal
1	Strobe#	14	Auto form feed #
2	Data 0	15	Error#
3	Data 1	16	Initialize
4	Data 2	17	Printer select line#
5	Data 3	18	Ground
6	Data 4	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	Acknowledge	23	Ground
11	Busy	24	Ground
12	Paper empty	25	Ground
13	Printer select	26	Not connected

Note: The default printer is the Epson FX80.

Serial Ports 1-8 Connector (Optional)

This table lists the pinouts for the DB78 connector.

Pin	Signals			Pin	Signals		
	RS232	**RS422**	**RS485**		**RS232**	**RS422**	**RS485**
1	DTR 7	NC	NC	40	TXD 4	TXD- 4	TX/RX- 4
2	TXD 5	TXD- 5	TX/RX- 5	41	RTS 5	TXD+ 5	TX/RX+ 5
3	DTR 5	NC	NC	42	DSR 5	NC	NC
4	CTS 5	RXD+ 5	NC	43	CD 4	NC	NC
5	DSR 4	NC	NC	44	RI 4	NC	NC
6	CD 7	NC	NC	45	CTS 7	RXD+ 7	NC
7	RI 7	NC	NC	46	RXD 6	RXD- 6	NC
8	RXD 5	RXD- 5	NC	47	RI 6	NC	NC
9	CTS 6	NC	NC	48	CD 6	NC	NC
10	TXD 3	TXD- 3	TX/RX- 3	49	DTR 0	NC	NC
11	TXD 2	TXD- 2	TX/RX- 2	50	TXD 1	TXD- 1	TX/RX- 1
12	RTS 2	TXD+ 2	TX/RX+ 2	51	RTS 0	TXD+ 0	TX/RX+ 0
13	DTR 2	NC	NC	52	DTR 3	NC	NC
14	RTS 3	TXD+ 3	NC	53	CTS 1	RXD+ 1	NC
15	RI 1	NC	NC	54	DSR 0	NC	NC
16	CTS 0	RXD+ 0	NC	55	RXD 0	RXD- 0	NC
17	RXD 1	RXD- 1	NC	56	RXD 3	RXD- 3	NC
18	CD 3	NC	NC	57	CTS 3	RXD+ 3	NC
19	RI 3	NC	NC	58	DSR 2	NC	NC
20	RI 2	NC	NC	59	CTS 2	RXD+ 2	NC
21	RTS 4	TXD+ 4	TX/RX+ 4	60	RTS 7	TXD+ 7	TX/RX+ 7
22	DTR 4	NC	NC	61	DTR 6	NC	NC
23	CD 5	NC	NC	62	RTS 6	TXD+ 6	TX/RX+ 6
24	RI 5	NC	NC	63	TXD 6	TXD- 6	TX/RX- 6
25	CTS 4	RXD+ 4	NC	64	TXD 7	TXD- 7	TX/RX- 7
26	DSR 7	NC	NC	65	Ground	Ground	Ground
27	RXD 7	RXD- 7	NC	66	Ground	Ground	Ground
28	RXD 4	RXD- 4	NC	67	8 PORT	8 PORT	8 PORT
29	DSR 6	NC	NC	68	Ground	Ground	Ground
30	TXD 0	TXD- 0	TX/RX- 0	69	Ground	Ground	Ground
31	RTS 1	TXD+ 1	TX/RX+ 1	70	Ground	Ground	Ground
32	DTR 1	NC	NC	71	Ground	Ground	Ground
33	CD 1	NC	NC	72	Ground	Ground	Ground
34	DSR 1	NC	NC	73	Ground	Ground	Ground
35	CD 0	NC	NC	74	Ground	Ground	Ground
36	RI 0	NC	NC	75	Ground	Ground	Ground
37	RXD 2	RXD- 2	NC	76	Ground	Ground	Ground
38	DSR 3	NC	NC	77	Ground	Ground	Ground
39	CD 2	NC	NC	78	Ground	Ground	Ground

Note: This option must be ordered or installed at the Comtrol factory.

Appendix B. Specifications and Notices

This section discusses the following topics:

- Product specifications
    - Electromagnetic compliances
    - Environmental condition specifications
    - Hardware specifications
    - Technical specifications
    - Default operating system configuration
- FCC Part 15 Class A notices

Product Specifications

The following subsections provide a variety of information about the DeviceMaster ATS-XPE.

Electromagnetic Compliances

The following table illustrates the status of electromagnetic compliance for the ATS-XPE.

Electromagnetic Compliances	Status
Emission: Canadian EMC requirements CISPR-22/EN55022 Class A FCC Part 15 Class A	 Yes Yes Yes

Immunity (motherboard):
EN55024: 1998
    EN61000-4-2: 1995 ESD
    EN61000-4-3: 1996 RF
    EN61000-4-4: 1994 Fast Transient
    EN61000-4-5: 1995 Surge
    EN61000-4-6: 1996 Conducted disturbance
    EN61000-4-8: 1993 Magnetic field
    EN61000-4-11: 1994 Dips and Voltage Variations
	
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes
	Yes

Safety (power supply): EN60950 UL / C-UL Listed	 Yes Yes

Environmental Condition Specifications

The following table illustrates environmental condition specifications for the DeviceMaster ATS-XPE.

Environmental Condition	Value

Air temperature:*
    System on (operational)
    System off (storage)
	0 to 60ºC
	-20 to 85ºC

Altitude	0 to 10,000 feet
Heat output	47 BTU/Hr

Humidity (non-condensing):
    System on (operational)
    System off (storage)
	8% to 80%
	20% to 80%

* *If the DeviceMaster ATS-XPE is stacked, the environment air flow must insure that the Ambient Operating Temperature does NOT exceed these limits.*

Hardware Specifications

This table lists hardware specifications for the ATS-XPE.

Specification	Description

Baud rates (default):
    COM1 - AUX A
    COM2 - CONSOLE
    COM3 - PCMCIA modem
        (optional)*
    COM4 to COM11 - SERIAL PORTS
        1-8 (optional)
	57.6 Kbps
	28.8 Kbps
	57.6 Kbps
	
	300 bps to 230.4 Kbps

Optional PC104 driver control	Data bits: 7 or 8 Parity: Odd, even, none Stop bits: 1 or 2

Power input:
    Frequency
    Voltage
	50/60 Hz
	5 VDC

Power consumption	13.75 W
Current consumption	2.75 A
Dimensions	11" x 5.69" x 2.75" (W x L x H)

Weight:
 	
Fully-configured system with
    RocketPort PC104 and
    PCMCIA options installed
 	
Power supply
 	
Octacable
	
	3.52 lbs
	
	0.62 lbs
	
	1.12 lbs

* See <u>*Certified PCMCIA Adapters*</u> on Page 43 for the list of Comtrol approved adapters.

Technical Specifications

This subsection lists the DeviceMaster ATS-XPE technical specifications.

- Compact flash (512 MB) with pre-configured Windows XP operating system. See *Default Operating System Configuration* on Page 66 for detailed information.

- NS GXLV/GX1-300 MMX 32-Bit x86 Processor that supports the Intel® MMX instruction set extension for the acceleration of multi media applications. It has 16 KB unified L1 cache, five-stage pipe lined integer unit, and an integrated Floating Point Unit (FPU).

- 128 MB SDRAM system memory

- AWARD 256 Kb flash memory BIOS

- Display controller that has a MediaGx processor with 4 MB memory that supports non-interlaced CRT monitors resolutions up to 1280 x 1024 @ 256 colors or 1024 x 768 @ 16 bpp.

- 10/100M bps Ethernet Controller, with two Realtek™ RTL8139 IEEE802.u 100 BASE-TX standard dual auto-sensing interface to 10 Mbps or 100 Mbps networks. On board RJ45 connectors provide for easy connection.

- Serial ports on the motherboard.
  - **AUX A** (COM2)
  - **CONSOLE** (COM1)

- Parallel port (DB25), which supports SPP/EPP/ECP mode.

- PS/2 mouse connector (6-pin mini DIN) connector.

- PS/2 keyboard connector (6-pin mini DIN) connector.

- USB connector, which supports up to two USB devices.

- Optional PC104 serial ports with a quadcable or octacable interface that is software configurable with speeds up to 230.4 Kbps.

- Optional PCMCIA slot for Comtrol approved devices that are pre-configured in the ATS-XPE system.

  Note: *The ATS-XPE PCMCIA option supports two Type II PCMCIA slots or one Type III slot, which is installed at the factory. Drivers for Comtrol approved PCMCIA devices are installed in the system.*
  - Linksys EtherFast 10/100 + 56K Modem PC Card (PCMLM56)
  - Linksys Wireless PC card (WPC11)

The hardware supports Power management, but it is not supported by the Windows XP Embedded operating system.

Default Operating System Configuration

The following list is a baseline operating system configuration for the ATS-XPE. For information about the operating system, see Windows XP Embedded on the Microsoft web site at: http://www.microsoft.com/windows/embedded/xp/

Hardware

Devices

Computers

Standard PC

Disk drives

Disk drive

Disk drive

IDE ATA/ATAPI controllers

Standard Dual-Channel PCI IDE controller

Primary IDE Channel

Secondary IDE Channel

PCMCIA IDE/ATAPI Controller

Keyboards

Standard 101/102-Key or Microsoft Natural PS/2 Keyboard

Mice and other pointing devices

PS/2 Compatible Mouse

Modems

Linksys Etherfast 10&100 + 56K PC Card (PCMLM56) (Modem)

Monitors

Default Monitor

Multiport serial adapters

RocketPort 8 Port, PC104-Bus

Multifunction adapters

Linksys Etherfast 10&100 + 56K PC Card (PCMLM56)

Network adapters

Realtek RTL8139 Family PCI Fast Ethernet NIC

Linksys Etherfast 10&100 + 56K PC Card (PCMLM56) (LAN)

Linksys WPC11 Wireless Network PC Card

MAC Bridge Miniport

PCMCIA adapters

Intel PCIC compatible PCMCIA controller

Ports (COM and LPT)

Communications port

Printer port

System devices

PCI standard host CPU bridge

PCI standard ISA bridge

Programmable interrupt controller

Direct memory access controller

System timer

System CMOS/real time clock

System speaker

Numeric data processor

System board

Motherboard resources

PCI bus

ISAPNP Read Data Port

ISA Plug and Play bus

Comtrol hardware controller

Comtrol display controller

Plug and Play Software Device Enumerator

Universal Serial Bus controllers

Compaq PCI to USE Open Host Controller

USB Root Hub

Software

System

User Interface

Shells

Explorer Shell

Windows Shell

Accessories/Communications

Add Hardware Control Panel

Add/Remove Programs Control Panel

Base Support Binaries

Common Ctl Libraries Ver 5

Common Ctl Libraries Ver 6 (1.0.0.0)

Common Ctl Libraries Ver 6 (1.10.0.0)

Common File Dialogs

Date/Time Control Panel

Device Manager

Display Control Panel

Down-level Shell Compatible

Explorer Application

Friendly Logon User

Map Network Drives

Network Setup Wizard

Power Meter Control Panel

Registry Editor

Safely Remove Hardware Program

Shell Control Panel Registry Data

Shell Core Registry Data

Shell Explorer Registry Data (Pro)

Shell Explorer Registry Data

Shell Group Conversion Registry Data

Shell Hyperterminal Registry Data

Shell Legacy Registry Data

Shell Namespace Extensions

Shell Namespace Registry Data

Shell Notepad Registry Data

Shell Paint Registry Data

Shell Utilities Registry Data

Standard Start Menu Shortcuts

System Control Panel

Task Manager

Tray Icon Add/Remove Support

USB User Interface

User Interface Core

Users Control Panel

Windows Accessories

Infrastructure

GUI Base Format Common Libraries

System Services

Base

CDFS

FAT

NTFS

Administrator Account

Client For Microsoft Networks

Core Networking

Workstation Service

Administration Support Tools

Base Performance Counters

Class Installer - Stream

Client / Server Runtime

CMD - Windows Command Processor

Compression & Expansion Tools

FBA: Crypto

Filter MIME Messages For Indexing Svc

Intel Microcode Update

MSFS

NT Loader

Performance Counter Configurations

PnP (User-mode)

Remote Registry Service

Session Manager (Windows Subsystem)

Setup & Safe Mode VGA

System Cloning Tool

System Event Notification Service

Volume Shadow Copy Service

Application Support

Application Compatibility Core

COM Base

COM+ Services

Distributed Transaction Coordinator

DOS Windows on Windows Support

HTML Help Engine

Jet Database Engine

Jet Database OLEDB Support

Microsoft Data Access Components (MDAC)

Microsoft Foundation Class Library (Legacy)

Microsoft Foundation Class Library (MFC)

Microsoft Line Services

Microsoft Visual C++ Run Time (Legacy)

Microsoft Visual C++ Run Time

Msxml 3.1

OLE Dialog Services

Rich Edit Control Version 1.0

Rich Edit Control Version 3.0

Rich Edit Control Version 4.1

Standard Template Libraries

Task Scheduler

Windows Script Engines

Storage & File Systems

Infrastructure

Disk Management Basic Volume Runtime

Disk Performance Counters

Format Common User Interface

Removable Storage Service

File Systems

Webdav Client Redirector

Applications

Active Template Library

FAT Format

I/O Error Log Messages

Misc. File System Utilities

Security

   Infrastructure

      Certificate Request Client & Certificate Autoenrollment

      Certificate User Interface Services

      Credential Management User Interface

      Cryptographic Network Services

      Cryptographic Service Providers

      Kernel Mode Crypto Driver for RSA

      Key Manager

      Netlogon/Net Join

      RPC Local Support

      RPC Remote

      Secure RPC over Kerberos

      Secure RPC over Negotiate

      Secure RPC over NTLM

      Security Accounts Manager Server Library

      Smart Card Cryptographic Service Providers

      Smart Card Subsystem

      Time Service Core

      Windows Logon

      Windows NT MARTA Provider

      Windows Security Configuration Editor

Networking & Communications

   Domain Participation

   TCP/IP Networking with Client For MS Networks

   Infrastructure

      Computer Browser Service

      Computer Name User Interface

      DHCP Client Service

      Dial-up Client for Windows

      Dial-up Networking Common Libraries

      Dial-up Server for Windows

      File Server for Macintosh Management Interface

      File Sharing

      H323 Telephony Service Provider

      HID Phone Telephony Service Provider

      Home Networking Monitory Library

      Internet Authentication Service (IAS) & Remote Access Common Files

      Internet Authentication Service (IAS) Server Data Object (SDO) and RAP Engine

      IP Conference Telephony Provider

      IP Security Services

      Local Network Bridge

Mapi32 Libraries

Ndisuio Inf

Netbios Driver

Netbrdgs Inf

NetDav Inf

Netmscli Inf

Netrib Inf

Netrasa Inf

Netrass Inf

Netrast Inf

Netserv Inf

Netshell

Nettcpip Inf

Network Diagnostics

Network Performance Counters

Network Routing

Netwzc Inf

Other TCP/IP Services

Routing Common Files

SDP Blob Parser

SNMP

SMB Redirector

TAPI 2.2 Client

TAPI Audio, Video & RTP Filters

TAPI COM Client

TAPI Terminal Manager

TAPI User Interface

TCP/IP Networking

Telephony

Unimodem

Wireless Zero Configuration

Applications

Internet Explorer

IP Router Monitor Library

Net.exe Utility

Network Command Shell

Network Command Shell Interface Context

Phone & Modem Control Panel

Remote Access Monitory

TCP/IP Utilities

Multimedia & Graphics

Infrastructure

Analog TV

GDI+ 1.0.0.0

GDI+ 1.0.10.0

Kernel Streaming User Mode Support

MCI Support

Microsoft Audio Compression Manager (MME Core)

Video for Windows Core

DirectX

DIrect3D

DirectShow ASF/DMO

DirectShow Capture

DirectShow Core

DirectSound

Management

Terminal Services

Infrastructure

Active Directory Service Interface (ADSI) Core

Active Directory Service Interface (ADSI) LDAP Provider

Active Directory Service Interface (ADSI) Windows NT Provider

Lightweight Directory Access Protocol (LDAP)

Terminal Server Remote Desktop

Terminal Services Core

Terminal Services Runtime

WMI Core

WMI Correlation

WMI Filter

Applications

Event Log

Microsoft Management Console (MMC)

Windows Installer Service

International

Regional & Language Options

Infrastructure

Font: Marlett

Fonts: EGA

Fonts: Fonts Arial

Fonts: Fonts Microsoft_San_Serif

Fonts: Fonts Tahoma

Fonts: Fonts tahoma_bold

Fonts: Fonts verdana

Fonts: Fonts webdings

Fonts: Fonts wingdings

Fonts: vgaoem_fon

English Language Support

          NLS: Core Files

          NLS: Locale Map Ids

          NLS: Time Zones

      Accessibility

        Infrastructure

          Accessibility Core

Default Component Settings

Hardware

    Devices

      Computers

        Standard PC

          System Identification

            Computer name: XPE4-8

            Registered owner: OEM

            Registered organization: OEM

          Pagefile

            no pagefile support

          Power Management Settings

            Power mgmt. Policy: Presentation

Software

    System

      System Services

        Base

          Client/Server Runtime

            Console screen window width: 80 columns

            Console screen window height: 50 lines

            Console screen buffer width 80 columns

            Console screen buffer height: 300 lines

        Application Support

          HTML Help Engine

            Include art and shared help files that XP help content (*.CHM) requires

        International

          Infrastructure

            English Language Support

              #1252 (ANSI -Latin I) Code pages conversion table

              Support all system locales for English

              Include multi-language user interface resources (partial)

Management

    Infrastructure

        Lightweight Directory Access Protocol (LDAP)

            Default LDAP Connection Signing: Connections signed if possible

International

    Regional and Language Options

        User interface language: English

        Standards and formats: English US

        Default input language: English US

        Language for non-Unicode programs: English US

        Geographical location: United States

Security

    Infrastructure

        Windows Logon

            Show Friendly Winlogon

            Show *Welcome to Windows* screen before Winlogon

User Interface

    Shells

        Windows Shell

            User Interface Core

                Show My Computer on Start Menu

                Show My Network Places on Start Menu

                Show Desktop icons

                Show Control Panel on Start Menu

                Show Network Connections on Start Menu

                Show Search on Start Menu

                Show Run on Start Menu

                Show Log Off on Start Menu

                Show Shut Down on Start Menu

                Show Internet Explorer on Start Menu

                Show All Programs list on Start Menu

                Show context menu on Shell folders

                Show context menu on Task bar

                Show Notifications on Task bar

                Lock Task bar

                Use Windows Classic folders

                Enable Drag & Drop on Start Menu

Notices

Radio Frequency Interference (RFI) (FCC 15.105)

This equipment has been tested and found to comply with the limits for Class A digital devices pursuant to Part 15 of the FCC Rules.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Labeling Requirements (FCC 15.19)

This equipment complies with part 15 of FCC rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

Modifications (FCC 15.21)

Changes or modifications to this equipment not expressly approved by Comtrol Corporation may void the user's authority to operate this equipment.

Serial Cables (FCC 15.27)

This equipment is certified for Class A operation when used with unshielded cables.

Underwriters Laboratory

This equipment is Underwriters Laboratory "UL" listed.

Important Safety Information

To avoid contact with electrical current:

- Never install electrical wiring during an electrical storm.
- Never install the power plug in wet locations.
- Use a screwdriver and other tools with insulated handles.

Warning

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Appendix C. Default System Values

The following section provides information for changing default configuration of the DeviceMaster ATS motherboard. In most cases, it will not be necessary to reconfigure the motherboard.

Note: *The information in this document is for reference only. The DeviceMaster ATS is pre-configured before shipment.*

You may want to access the motherboard to perform the following tasks:

- Change the watch-dog timer settings.
- Clear CMOS setup. For example, to clear the BIOS password.
- Apply +5V or +12V to **AUX A** serial port.

Before you can perform any of the above tasks, you should use the following *Accessing the Motherboard* section.

This subsection contains the following information:

- System I/O address map
- First MB memory map

Accessing the Motherboard

Use this procedure to access the motherboard on the DeviceMaster ATS. A detailed illustration of the motherboard is available on the following page.

1. Follow standard ESD procedures (outlined below) to remove the two screws.

    Some components of the motherboard are very sensitive to static electric charges and can be damaged by a sudden rush of power. To protect the motherboard from damage, use the following precautions:

    * *Ground yourself to remove any static charge before touching the motherboard. You can do so by using a grounded wrist strap or by frequently touching any conductive material that is connected to ground.*

    * *Handle the motherboard by its edges. Do not touch the IC chips, leads, or circuitry unless it is necessary.*

    * *Do not plug any connector or jumper while the unit is powered on.*
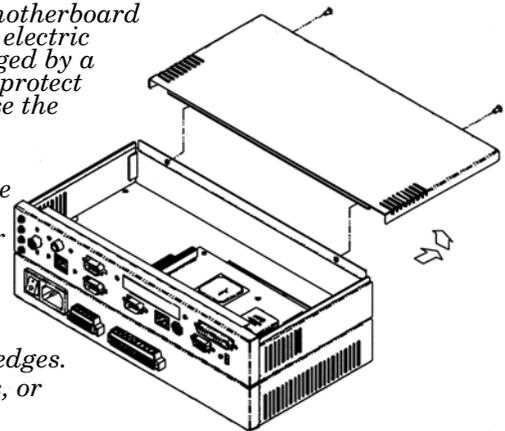
2. Use the following motherboard illustration (on the next page) to locate the jumper reference in the specific procedure that you are performing.

WAFER-5823
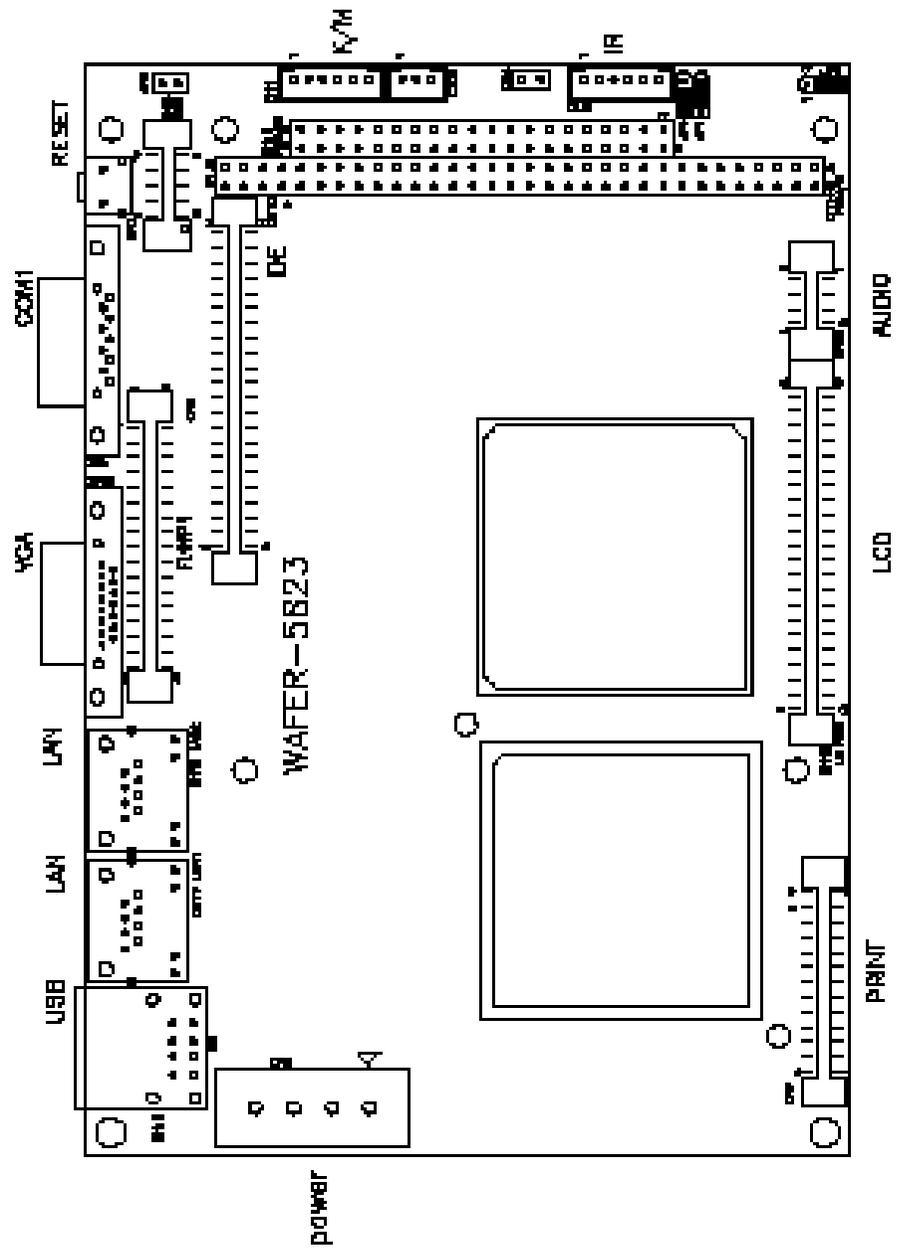
Clearing the CMOS Setup

If you need to clear the CMOS Setup. For example, if you forgot the password you should clear the setup and then set the password again. You should close the **JP1** jumper for about 3 seconds and then open it again. To set the CMOS back to normal operation mode, open **JP1**.

JP1	Description
1-2	**Normal Operation.**
2-3	Clear CMOS Setup.

Note: *Use the screenshots in* [Changing BIOS Configuration](#) *on Page 83 to reconfigure the factory default BIOS settings.*

Applying Power to the AUX A Port

The AUX A (**CN9**) connector can supply +5V or +12V power to the serial devices through the RI pin (Pin 8) of the COM2 (AUX A) port connector. The maximum current is 1 A with fuse protection, from these two connector's 5V/12V output. If the output is set to 12V, make sure that you have 12V to supply to the board.

CN9 Pin 8 (RS-232)	JP13	JP12
RI Signal	**2-3**	Not applicable.
+5V	1-2	**2-3**
+12V	1-2	1-2

Changing the Watch-Dog Timer

The Watch-Dog Timer is a device used to ensure that standalone systems can reset themselves and recover from catastrophic conditions that cause the CPU to hang or crash. The Watch-Dog Timer is a countdown timer that will reset the CPU when it times out.

The Watch-Dog Timer is enabled by reading port **443H**. It should be triggered before the time-out period ends, otherwise it will assume that the program operation is abnormal and will issue a reset signal to restart, or activate NMI to CPU. The Watch-Dog Timer is disabled by reading port **843H**.

JP4	Watch-Dog Timer Settings Description
1-2	Activate NMI to CPU when WDT times-out.
2-3	**Reset when WDT time-out.**
Open	Disable WDT.

Note: *Bold text that is shaded green illustrates the default value.*

Three I/O ports control the Watch-Dog Timer and are accessed using the addresses defined in the following table.

Hex Address	Read/Write	Description
443H	Write	Set Watch-Dog Time period
443H	Read	Enable and refresh the Watch-Dog Timer.
843H	Read	Disable the Watch-Dog Timer.

Prior to enabling the Watch-Dog Timer, the user has to define the time interval to be used. The timer interval is defined by writing a value to address 443H. This value is within the range from 01 (hex) to FF (hex) and defines an interval between 1 second to 255 seconds, respectively. The following table illustrates this correlation:

Hex Value	Time Interval
01	1 sec
02	2 sec
03	3 sec
04	4 sec
.	.
.	.
.	.
FF	255 sec

The Watch-Dog Timer is activated by reading the value at address 443H. To ensure that a reset condition does not occur, the timer must be periodically reset to restart the countdown at the beginning of the defined interval before the time out period has expired. This is achieved by first disabling the timer by reading address 843H and then re-enabling it by reading the value at 443H before the timer reaches zero. Refer to the example of the assembly program below.

A tolerance of at least 5% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time consuming. Therefore if the time out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: *When exiting a program it is necessary to disable the Watch-Dog Timer, otherwise the system will reset.*

Example of Assembly Program

```
TIMER_PORT =  443H
TIMER_START = 443H
TIMER_STOP =   843H

;;INITIAL TIME PERIOD COUNTER

MOV DX, TIME_PORT
MOV AL, 8:;;8 SECONDS
OUT DX,AL

;;ADD YOUR APPLICATION HERE

MOV DX, TIMER_START

IN  AL, DX.;;START COUNTER

;;ADD YOUR APPLICATION HERE

W_LOOP:
MOV DX, TIMER_STOP
IN  AL, DX
```

```
        MOV DX, TIMER_START
        IN  AL,  DX.

        ;;RESTART COUNTER
        ;;ADD YOUR APPLICATION HERE

        CMP EXIT_AP, 0
        JNE W_LOOP
        MOV DX,     TIMER_STOP
        IN  AL,      DX

        ;;EXIT AP
```

System I/O Address Map

This table illustrates the system I/O address map for the ATS.

I/O Address	Map Description
000-01F	DMA Controller #1
020-021	Interrupt Controller # 1, Master
022-023	Chipset address
040-05F	System Timer
060-06F	Standard 101/102 keyboard Controller
070-07F	Real time Clock, NMI Controller
080-0BF	DMA Page Register
0A0-0BF	Interrupt Controller # 2
0C0-0DF	DMA Controller # 2
0F0-0F0	Clear Math Coprocessor Busy
0F1-0F1	Reset Math Coprocessor
0F8-OFF	Math Coprocessor
1F0-1F8	VIR BUS Master PCI IDE Controller
200-207	Game I/O
278-27F	Reserved
2F8-2FF	Serial Port 2
378-37F	Parallel Printer Port 1
3B0-3DF	Cyrix Graphic Adapter
3F0-3F7	Available
3F8-3FF	Serial Port 1
443	Watch-Dog timer enable
843	Watch-Dog timer disable

First MB Memory Map

This table illustrates the first MB memory map.

Address	Description
F000h-FFFFh	System ROM
D800h-EFFFh	Unused
C800h-D7FFh	Ethernet ROM
C000h-C7FFh	Expansion ROM
B800h-BFFFh	CGA/EGA/VGA text
B000h-B7FFh	Unused
A000h-AFFFh	EGA/VGA graphics
0000h-9FFFh	Base memory

Appendix D. Changing BIOS Configuration

This section discusses using the BIOS to change the system defaults. The DeviceMaster ATS-XPE uses the AWARD PCI/ISA BIOS for system configuration. The AWARD BIOS setup program is designed to provide maximum flexibility in configuring the system by offering various options which may be selected to meet your requirements.

Note: *The information in this appendix is for reference only. The DeviceMaster ATS-XPE is pre-configured before shipment. If you need to recover the Comtrol BIOS default, use this Appendix to reconstruct the proper BIOS settings.*

The Recovery CD does not recover the Comtrol BIOS settings.

Getting Started

When you apply power on the DeviceMaster ATS-XPE, the BIOS enters Power-on--Self Test (POST) routines. These routines are executed for system test, initialization, and system configuration verification. After the POST routines are completed, the following message appears:

" Hit DEL if you want to run SETUP"

To access the **AWARD BIOS SETUP UTILITY**, press the **<Del>** key. This screen displays.

```
                    ROM PCI/ISA BIOS (2A434I9F)
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.

     STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

     BIOS FEATURES SETUP              SUPERVISOR PASSWORD

     CHIPSET FEATURES SETUP           USER PASSWORD

     POWER MANAGEMENT SETUP           IDE HDD AUTO DETECTION

     PNP/PCI CONFIGURATION            SAVE & EXIT SETUP

     LOAD BIOS DEFAULTS               EXIT WITHOUT SAVING

     LOAD SETUP DEFAULTS

     Esc : Quit                      ↑ ↓ → ←   : Select Item
     F10 : Save & Exit Setup         (Shift)F2 : Change Color
```

Standard CMOS Setup

The **Standard CMOS Setup** screen is used for basic hardware system configuration, such as the Date and Time settings.

```
                    ROM PCI/ISA BIOS (2A434I9F)
                        STANDARD CMOS SETUP
                        AWARD SOFTWARE, INC.

    Date (mm:dd:yy) : Thu, Apr 26 2001
    Time (hh:mm:ss) : 11 : 25 : 55

    HARD DISKS          TYPE    SIZE    CYLS HEAD PRECOMP LANDZ SECTOR  MODE

    Primary Master   : None      0 M     0    0      0     0      0   -----
    Primary Slave    : None      0 M     0    0      0     0      0   -----
    Secondary Master : None      0M      0    0      0     0      0   -----
    Secondary Slave  : Auto      0M      0    0      0     0      0    AUTO

    Drive A : None
    Drive B : None

    Video   : EGA/VGA
    Halt On : No Errors


    ESC : Quit              ↑ ↓ → ←   : Select Item      PU/PD/+/- : Modify
    F1  : Help              (Shift)F2 : Change Color
```

This figure illustrates the DeviceMaster ATS-XPE factory defaults.

Use the following procedure to change the system date.

1. Press either the Arrow or **<Enter>** key on your keyboard to select one of the fields (Month, Date or Year).

2. Press either **<PgUp>** or **<PgDn>** to increase or decrease the value of that field.

3. Use the same key sequence to change the time setting.

BIOS Features Setup

The **BIOS Features Setup** screen is designed for fine-tuning your system and improving its performance. Typically, you do not have to change the default settings, which are pre-set for the most reliable operation.

```
                    ROM PCI/ISA BIOS (2A434I9F)
                        BIOS FEATURES SETUP
                        AWARD SOFTWARE, INC.

    Virus Warning            : Disabled   Video  BIOS Shadow   : Enabled
    CPU Internal Cache       : Enabled    C8000-CBFFF Shadow   : Disabled
                                          CC000-CFFFF Shadow   : Disabled
    Quick Power On Self Test : Enabled    D0000-D3FFF Shadow   : Disabled
    Boot From LAN First      : Disabled   D4000-D7FFF Shadow   : Disabled
    Boot Sequence            : C only     D8000-DBFFF Shadow   : Disabled
    Swap Floppy Drive        : Disabled   DC000-DFFFF Shadow   : Disabled
    Boot Up Floppy Seek      : Disabled   Cyrix 6x86/MII CPUID: Enabled
    Boot Up NumLock Status   : On
    Boot Up System Speed     : High
    Gate A20 Option          : Fast
    Memory Parity Check      : Enabled
    Typematic Rate Setting   : Disabled
    Typematic Rate (Chars/Sec) : 6
    Typematic Delay (Msec)   : 250
    Security Option          : Setup      ESC : Quit        ↑↓→← : Select Item
    PCI/VGA Palette Snoop    : Disabled   F1  : Help        PU/PD/+/- : Modify
    OS Select For DRAM > 64MB : Non-OS2   F5  : Old Values  (Shift)F2 : Color
    Report No FDD For WIN 95 : Yes        F6  : Load BIOS  Defaults
                                          F7  : Load Setup Defaults
```

This figure illustrates the DeviceMaster ATS-XPE factory defaults.

Chipset Features Setup

Chipset Features Setup

The **Chipset Features Setup** screen primarily controls the board's chipset and is used to change the chipset configuration.

This figure illustrates the DeviceMaster ATS-XPE factory defaults.

```
              ROM PCI/ISA BIOS (2A434I9F)
                 CHIPSET FEATURES SETUP
                   AWARD SOFTWARE, INC.
 ┌─────────────────────────────────┬──────────────────────────────────┐
 │ SDRAM CAS latency Time  : 3 T    │                                  │
 │ SDRAM Clock Ratio Div By : 4     │                                  │
 │                                  │                                  │
 │ 16-bit I/O Recovery (CLK): 5     │                                  │
 │ 8-bit  I/O Recovery (CLK): 5     │                                  │
 │                                  │                                  │
 │ USB Controller        : Enabled  │                                  │
 │ USB Legacy Support    : Disabled │                                  │
 │                                  │                                  │
 │                                  │                                  │
 │                                  │                                  │
 │                                  │ ESC : Quit      ↑↓→← : Select Item│
 │                                  │ F1  : Help      PU/PD/+/- : Modify│
 │                                  │ F5  : Old Values  (Shift)F2 : Color│
 │                                  │ F6  : Load BIOS  Defaults        │
 │                                  │ F7  : Load Setup Defaults         │
 └─────────────────────────────────┴──────────────────────────────────┘
```

Note: *Improperly changing these default settings can result in an unstable system.*

Power Management Setup

The **Power Management Setup** screen helps you handle the ROCKY-568SEV board's *green* function. This feature can shut down the video display and hard disk to save energy.

This figure illustrates the DeviceMaster ATS-XPE factory defaults.

```
              ROM PCI/ISA BIOS (2A434I9F)
                 POWER MANAGEMENT SETUP
                   AWARD SOFTWARE, INC.
 ┌─────────────────────────────────┬──────────────────────────────────┐
 │ Power Management    : Disabled   │ IRQ1  (KeyBoard)    : ON         │
 │                                  │ IRQ3  (COM 2)       : OFF        │
 │      ** PM Timers **             │ IRQ4  (COM 1)       : OFF        │
 │ Doze Mode           : Disabled   │ IRQ5  (LPT 2)       : OFF        │
 │ Standby Mode        : Disabled   │ IRQ6  (Floppy Disk): OFF         │
 │ HDD Power Down      : Disabled   │ IRQ7  (LPT 1)       : OFF        │
 │ MODEM Use IRQ       : NA         │ IRQ9  (IRQ2 Redir)  : OFF        │
 │                                  │ IRQ10 (Reserved)    : OFF        │
 │ Throttle Duty Cycle : 33.3 %     │ IRQ11 (Reserved)    : OFF        │
 │                                  │ IRQ12 (PS/2 Mouse)  : OFF        │
 │                                  │ IRQ13 (Coprocessor): OFF         │
 │                                  │ IRQ14 (Hard Disk)   : OFF        │
 │                                  │ IRQ15 (Reserved)    : OFF        │
 │                                  │                                  │
 │                                  │ ESC : Quit      ↑↓→← : Select Item│
 │                                  │ F1  : Help      PU/PD/+/- : Modify│
 │                                  │ F5  : Old Values  (Shift)F2 : Color│
 │                                  │ F6  : Load BIOS  Defaults        │
 │                                  │ F7  : Load Setup Defaults         │
 └─────────────────────────────────┴──────────────────────────────────┘
```

PNP/PCI Configuration

This menu is used to assign IRQ numbers to your PNP/PCI devices manually. This figure illustrates the DeviceMaster ATS-XPE factory defaults.

```
                      ROM PCI/ISA BIOS (2A434I9F)
                        PNP/PCI CONFIGURATION
                         AWARD SOFTWARE, INC.

 PNP OS Installed        : No       PCI IRQ Actived By  : Level
 Resources Controlled By : Manual
 Reset Configuration Data : Disabled

 IRQ-3  assigned to : PCI/ISA PnP
 IRQ-4  assigned to : PCI/ISA PnP   Used MEM base addr      : N/A
 IRQ-5  assigned to : Legacy ISA
 IRQ-6  assigned to : Legacy ISA
 IRQ-7  assigned to : Legacy ISA
 IRQ-9  assigned to : PCI/ISA PnP
 IRQ-10 assigned to : PCI/ISA PnP
 IRQ-11 assigned to : PCI/ISA PnP
 IRQ-12 assigned to : PCI/ISA PnP
 IRQ-14 assigned to : PCI/ISA PnP
 IRQ-15 assigned to : PCI/ISA PnP
 DMA-0  assigned to : PCI/ISA PnP
 DMA-1  assigned to : PCI/ISA PnP   ESC : Quit        ↑↓→← : Select Item
 DMA-3  assigned to : PCI/ISA PnP   F1  : Help       PU/PD/+/- : Modify
 DMA-5  assigned to : PCI/ISA PnP   F5  : Old Values  (Shift)F2 : Color
 DMA-6  assigned to : PCI/ISA PnP   F6  : Load BIOS  Defaults
 DMA-7  assigned to : PCI/ISA PnP   F7  : Load Setup Defaults
```

- **PNP OS Installed:** If you install a Plug and Play operating system (OS), the OS will reassign the interrupt even if you choose **Yes** for this option. If you install a non-Plug and Play OS or if you want to prevent the OS from reassigning the board's IRQ settings, choose **No** for this option.

- **Resources Controlled By:** Select **Auto** if you want the computer to assign the IRQs.

- **Reset Configuration Data:** Enabling this field means you allow the configuration data to be reset.

- **IRQ-xx assigned to**: These fields show whether a certain IRQ is used by a PCI/ISA card.

Load BIOS Defaults

If you choose to activate the **Load BIOS Defaults** menu and then answer **Y** to load the Load BIOS Defaults prompt, the AWARD defaults load with the exception of the Standard CMOS setup.

```
                    ROM PCI/ISA BIOS (2A434I9F)
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.

     STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

     BIOS FEATURES SETUP              SUPERVISOR PASSWORD

     CHIPSET FEATURES SETUP           USER PASSWORD

     POWER MANAGEMENT SETUP           IDE HDD AUTO DETECTION

     PNP/PCI CONFIGURA                            ETUP
                        Load BIOS  Defaults (Y/N)? N
     LOAD BIOS DEFAULT                            SAVING

     LOAD SETUP DEFAULTS

    Esc : Quit                    ↑ ↓ → ←   : Select Item
    F10 : Save & Exit Setup       (Shift)F2 : Change Color
```

Note: *If you load the default BIOS, you will change Comtrol™ Corporation's default settings and may experience unreliable results and an unstable platform.*

Select **N** to abort this screen.

Load Setup Defaults

If you select **Y** to this field, the **Setup Defaults** load except Standard CMOS SETUP.

```
                    ROM PCI/ISA BIOS (2A434I9F)
                        CMOS SETUP UTILITY
                       AWARD SOFTWARE, INC.

     STANDARD CMOS SETUP              INTEGRATED PERIPHERALS

     BIOS FEATURES SETUP              SUPERVISOR PASSWORD

     CHIPSET FEATURES SETUP           USER PASSWORD

     POWER MANAGEMENT SETUP           IDE HDD AUTO DETECTION

     PNP/PCI CONFIGURA                            ETUP
                        Load SETUP Defaults (Y/N)? N
     LOAD BIOS DEFAULT                            SAVING

     LOAD SETUP DEFAULTS

    Esc : Quit                    ↑ ↓ → ←   : Select Item
    F10 : Save & Exit Setup       (Shift)F2 : Change Color
```

Note: *If you load the Setup defaults, you will change Comtrol Corporation's default settings.*

The screens in this document illustrate the Comtrol default settings, which are optimal configuration settings for your system.

Integrated Peripherals

This option is used to assign Onboard I/O, IRQ, DMA, etc.

```
                    ROM PCI/ISA BIOS (2A434I9F)
                     INTEGRATED PERIPHERALS
                       AWARD SOFTWARE, INC.

 IDE HDD Block Mode       : Enabled
 Primary IDE Channel      : Enabled    Onboard Parallel Port    : 378/IRQ7
   Master Drive PIO Mode  : Auto       Parallel Port Mode       : SPP
   Slave Drive PIO Mode   : Auto
 Secondary IDE Channel    : Enabled
   Master Drive PIO Mode  : Auto
   Slave Drive PIO Mode   : Auto

 IDE Primary Master UDMA  : Auto
 IDE Primary Slave  UDMA  : Auto
 IDE Secondary Master UDMA: Auto
 IDE Secondary Slave  UDMA: Auto

 KBC input clock          : 8 MHz      Multiple Monitor Support : M/B First
 Onboard FDC Controller   : Enabled
 Onboard Serial Port 1    : 3F8/IRQ4   Video Memory Size        : 2.5 M
 Onboard Serial Port 2    : 2F8/IRQ3   Flat Panel Status        : Both
 UART Mode Select         : Normal     Flat Panel Resolution    : 800x600
```

This figure illustrates the DeviceMaster ATS-XPE factory default settings.

- Multiple Monitor Support -- No Onboard, PCI first, M/B first
  Use to select the primary VGA for multiple monitor support in Windows.
- Video Memory Size -- 4.0M
  Use to select the size of video memory.

Supervisor Password and User Password

The **Supervisor Password** screen sets a password that is used to protect your system and Setup Utility. The Supervisor Password has higher priority than User Password. Once you setup the Supervisor password, the system will always ask you to key-in the Supervisor Password every time you enter the BIOS SETUP.

If you enter the BIOS SETUP with Supervisor Password, you can choose every setup/option on the main menu. When entering the BIOS with the User Password, however, you can only choose three setup/options (USER PASSWORD, SAVE & EXIT SETUP and EXIT WITHOUT SAVING).

Use the following procedure to disable the Supervisor and User passwords:

1. Enter the BIOS SETUP program with the Supervisor password.

2. Press the **<Enter>** key when prompted for a new password.

Note: *If you forget the password, follow the Clear/Reset CMOS procedure. See*

SVGA Setup Introduction

The DeviceMaster ATS-XPE is equipped with an on-board LCD/VGA interface. The following subsections discuss its specifications and features.

Chipset

The DeviceMaster ATS-XPE uses a Cyrix™ CX5530 chipset as its SVGA controller. The chipset is compatible with most traditional analog CRT monitors and also accepts most interlaced and non-interlaced analog monitors (color and monochrome VGA) with high-resolution quality while maintaining complete IBM™ VGA compatibility.

Digital monitors (i.e. MDA, CGA, and EGA) cannot be supported. Multiple frequency (multisync) monitors operate as if they are analog monitors.

Display Memory

With the 4 MB UMA memory, the VGA controller can make CRT displays or color panel displays perform with resolutions up to 1024 x 768 at 64K colors.

Display Driver

A standard VGA driver is loaded.

PCI Bus Ethernet Interface

The DeviceMaster ATS-XPE provides a high performance 32-bit Ethernet chipset which is fully compliant with the IEEE 802.3 standard. The Ethernet port supports a standard RJ45 connector and is both 100Base-T and 10Base-T compatible. The major network operating system fits it. The Ethernet port supplies a standard RJ45 connector on board.

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Appendix E. Changing the WatchDog Timer

The hardware watch-dog timer is not supported by the installed Linux kernel. However, it may be accessed directly by user applications if desired.

The Watch-Dog Timer is a device used to ensure that standalone systems can reset themselves and recover from catastrophic conditions that cause the CPU to hang or crash. The Watch-Dog Timer is a countdown timer that will reset the CPU when it times out.

The Watch-Dog Timer is enabled by reading port **443H**. It should be triggered before the time-out period ends, otherwise it will assume that the program operation is abnormal and will issue a reset signal to restart, or activate NMI to CPU.

The Watch-Dog Timer is disabled by reading port **843H**.

JP4	Watch-Dog Timer Settings Description
1-2	Activate NMI to CPU when WDT times-out.
2-3	**Reset when WDT time-out.**
Open	Disable WDT.

Note: Bold text (shaded green in the online version) illustrates the default value.

Three I/O ports control the Watch-Dog Timer and are accessed using the addresses defined in the following table.

Hex Address	Read/Write	Description
443H	Write	Set Watch-Dog Time period
443H	Read	Enable and refresh the Watch-Dog Timer.
843H	Read	Disable the Watch-Dog Timer.

Prior to enabling the Watch-Dog Timer, the user has to define the time interval to be used. The timer interval is defined by writing a value to address 443H. This value is within the range from 01 (hex) to FF (hex) and defines an interval between 1 second to 255 seconds, respectively. The following table illustrates this correlation:

Hex Value	Time Interval
01	1 sec
02	2 sec
03	3 sec
04	4 sec
.	.
.	.
.	.
FF	255 sec

The Watch-Dog Timer is activated by reading the value at address 443H. To ensure that a reset condition does not occur, the timer must be periodically reset to restart the countdown at the beginning of the defined interval before the time out period has expired. This is achieved by first disabling the timer by reading address 843H and then re-enabling it by reading the value at 443H before the timer reaches zero. Refer to the example of the assembly program below.

A tolerance of at least 5% must be maintained to avoid unknown routines within the operating system, such as disk I/O that can be very time consuming. Therefore if the time out period has been set to 10 seconds, the I/O port 443H must be read within 7 seconds.

Note: *When exiting a program it is necessary to disable the Watch-Dog Timer, otherwise the system will reset.*

Example of Assembly Program

```
TIMER_PORT =  443H
TIMER_START = 443H
TIMER_STOP =   843H

;;INITIAL TIME PERIOD COUNTER

MOV DX, TIME_PORT
MOV AL, 8:;;8 SECONDS
OUT DX,AL

;;ADD YOUR APPLICATION HERE

MOV DX, TIMER_START

IN  AL, DX.;;START COUNTER

;;ADD YOUR APPLICATION HERE

W_LOOP:
MOV DX, TIMER_STOP
IN  AL, DX
MOV DX, TIMER_START
IN  AL,  DX.
;;RESTART COUNTER
;;ADD YOUR APPLICATION HERE

CMP EXIT_AP, 0
JNE W_LOOP
MOV DX,      TIMER_STOP
IN  AL,       DX

;;EXIT AP
```

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