INTELLIPORT PLUS EX HARDWARE REFERENCE GUIDE

COMPUTONE *Corporation*

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Industry Canada Statement: "This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations."

"Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le materiél brouilleur du Canada.

NOTE: This product family is designed to use shielded cables.

Support Information: If you require technical support, contact your Computone dealer or Computone Technical Support. The Computone Technical Support staff can be reached by phone at the following numbers, from 8:30 a.m. to 8:00 p.m. Eastern time, Monday through Friday:

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> (770) 625-0000 ext. 2002
> (770) 625-0013 (FAX)

You are also encouraged to write to the address above. See the "Product Support" release note accompanying your Computone product for further information.

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Table of Content

IntelliPort Plus EX Hardware Guide

CHAPTER 1   *Introduction*

This chapter provides general information about Computone's IntelliPort Plus EX line of multi-port serial products and covers the following topics:

- Product overview
- IntelliPort Plus EXpandable
- Specifications

Product Overview

The IntelliPort Plus EX is a line of high-speed multi-port asynchronous communications products that let you connect nearly any serial device to a system, such as:

- Terminals
- Printers and plotters
- Modems
- Point-of-sale (POS) devices, including cash registers
- Data collection devices, including bar code readers
- Industrial devices with RS-232 interfaces
- Industrial devices with RS-422 and RS-485 interface

IntelliPort Plus EX products can operate at data rates of up to 460,800 bps and are available for PCI bus and ISA (AT-compatible) bus architectures. The IntelliPort Plus EXpandable is a scalable multi-port system that is designed for both intermediate and large-scale applications. Its modular design lets you purchase the capacity you need now, then add more ports (in multiples of 16) in the future. Each controller card supports from 16 to 64 serial devices. Figure 1-1 illustrates the IntelliPort Plus EX line.
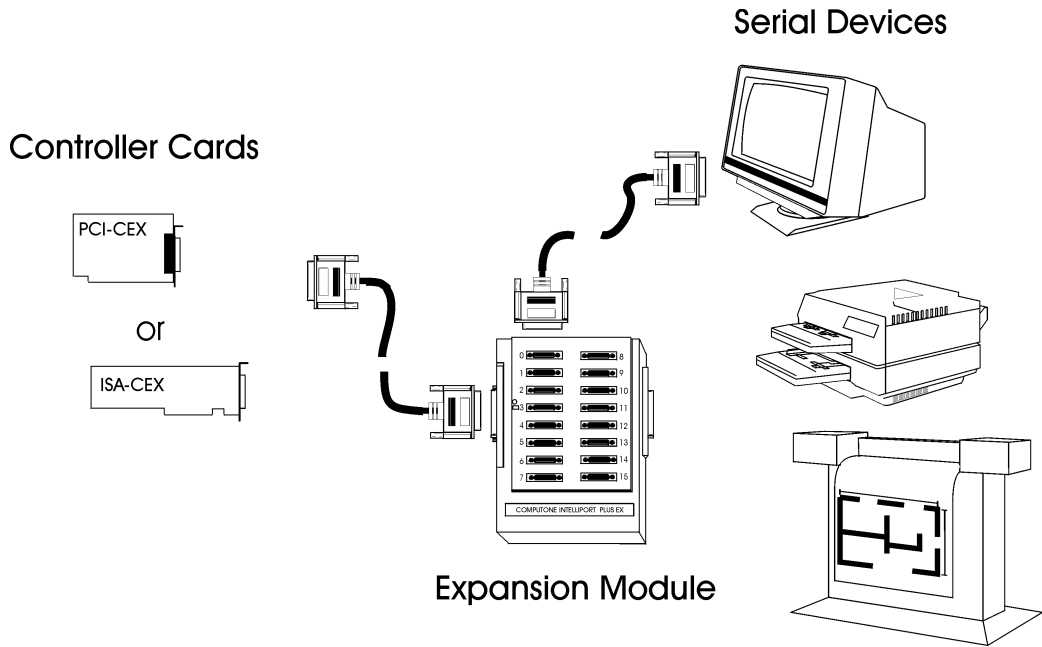
Figure 1-1 IntelliPort Plus EX Product Line

The following sections describe the IntelliPort Plus EXpandable products in further detail.

IntelliPort Plus EXpandable

The IntelliPort Plus EXpandable products consist of the following:

- An intelligent, high-performance communications controller card (adapter). Controllers are available for ISA (AT-compatible) and PCI architectures.

- One to four expansion modules. An expansion module is an intelligent I/O manager that provides 16 RS-232 serial connections.

Table 1-2 summarizes the available IntelliPort Plus EX products.

Table 1-1 IntelliPort Plus EX Products

Computone P/N	Description
PCI-EX	PCI-EX Controller. UNIX, NT, Linux (others avail.) Requires SlimLine Modules.
ISA-EX	ISA-EX Controller. Unix, NT, Linux. Requires SlimLine Modules.
EX-16DB Slim	16-port DB25 Expansion Module.
EX-16RJ Slim	16-port RJ-45 Expansion Module.
EX-16DB-485	16-port DB25 Expansion Module with RS-485.
EX-PAM Slim	Power Adapter Module for the Plus EX Series. **Required only if connecting 33 or more ports.**

Serial devices (terminals,
printers, modems, plotters,
and so on)

Up to four IntelliPort Plus Ex
Expansion Modules per controller

Controller card
manages up to
64 serial devices
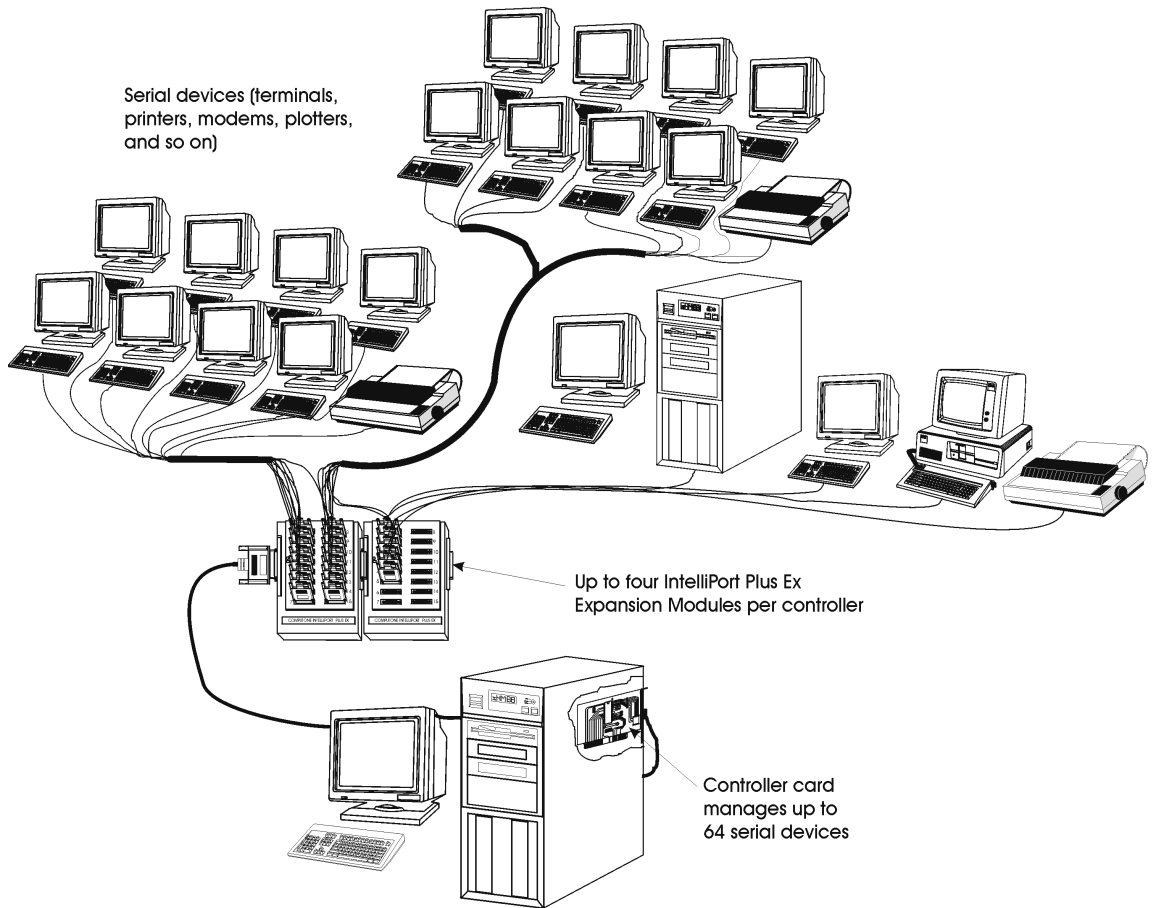
Figure 1-2 Example IntelliPort Plus EX Application

Specifications

This section provides specifications for components used with the IntelliPort Plus EX.

PCI-EX Board

The following lists the specifications for the PCI-EX board.

Table 1-2 PCI-EX Specifications

Physical Characteristics	
Length	6 in. (15.24 cm)
Width	4.25 in. (10.8 cm)
Weight	4.8 oz. (136 g)
Operating Characteristics	
Speed	20 MHz, 80186
Bus Type	PCI Ver. 2.1
Output Connector	DB-37
IRQ Sharing	PCI Ver. 2.1
Operating Environment	
Operating Temperature	10 - 40 °C
Temperature Gradient	10 °C / hr
Relative Humidity	10 - 90% non-condensing
Wet Bulb Temperature	35 °C maximum
Altitude	-300 - 3000 m
Certifications	FCC, CE, UL, cUL
Warranty	5 years

ISA-EX Board

The following lists the specifications for the ISA-EX card.

Table 1-3 **ISA-EX Specifications**

Physical Characteristics	
Length	6.5 (16.5 cm)
Width	3.5 (8.9 cm)
Weight	4.8 oz. (136 g)
Operating Characteristics	
Speed	20 MHz, 80186
Bus Type	IBM, PC-AT, IEEE, P996 compatible
Output Connector	DB-37
Operating Environment	
Operating Temperature	10 - 40 °C
Temperature Gradient	10 °C / hr
Relative Humidity	10 - 90% non-condensing
Required Airflow Clearance	35 °C maximum
Altitude	-300 - 3000 m
Certifications	FCC, CE, UL, cUL
Warranty	5 years

Plus EX Expansion Modules

The following tables list the Plus EX expansion module's specifications.

Table 1-4 Physical Characteristics

	EX-16D	EX-16RJ	EX-16D/485
LENGTH	10 $^1/_2$ in. (26.67 cm)	10 $^1/_2$ in. (26.67 cm)	10 $^1/_2$ in.(26.67 cm)
WIDTH	8 $^1/_2$ in. (21.59 cm)	8 $^1/_2$ in. (21.59 cm)	8 $^1/_2$ in. (21.59 cm)
HEIGHT	1 $^5/_8$ in. (4.128 cm)	1 $^7/_8$ in. (4.763 cm)	1 $^5/_8$ in. (4.128 cm)
WEIGHT	2.05 lb (0.93 kg)	1.85 lb (0.84 kg)	2.05 lb (0.93 kg)

Table 1-5 Environmental Conditions

OPERATING		
Temperature		10 ^{o}C (50 ^{o}F) to 40 ^{o}C (104 ^{o}F)
Temperature Gradient		10 ^{o}C/Hr (18 ^{o}F/Hr)
Relative Humidity		10% to 90% non-condensing
Wet Bulb Temperature		35 ^{o}C (95 ^{o}F) maximum
Altitude		-300m (-985 ft) to 3000m (9842 ft)
NON-OPERATING STATIONARY		
Temperature		5 ^{o}C (41 ^{o}F) to 45 ^{o}C (113 ^{o}F)
Temperature Gradient		20 ^{o}C/Hr (36 ^{o}F/Hr)
Relative Humidity		5% to 95% non-condensing
Wet Bulb Temperature		35 ^{o}C (95 ^{o}F) maximum
Altitude		-300m (-984 ft) to 3000m (9842 ft)
NON-OPERATING SHIPMENT OF PACKAGED PRODUCT		
Temperature		-40 ^{o}C (-40 ^{o}F) to 60°C (140 ^{o}F
Temperature Gradient		20°C/Hr (36 ^{o}F/Hr)
Relative Humidity		5% to 95% non-condensing
Wet Bulb Temperature		29.4 ^{o}C (85 ^{o}F) maximum
Altitude		-300m(-984 ft) to 9000m (29527 ft)

Table 1-6 Operating Characteristics

OPERATING CHARACTERISTICS		
Speed		50 - 460 Kbps
Serial Interface		EX-16DB - RS-232
		EX-16RJ - RS-232
		EX-16D/485 - configurable TIA/EIA-485 & TIA EIA-422/RS-232
Surge Protection		Yes, Tx & Rx Data Lines[1]

[1] The IntelliPort Plus EX products include surge/spike protection on all Transmit (TxD) and Receive (RxD) signals. If your require surge/spike protection on all signals, place a **T** suffix after the **DB** or **RJ** in the part number. For example, a **Plus EX-16DB** with extra protection would be **Plus EX-16DBT**.

Plus EX Expansion Module Connector Pin-out

The following table lists the connector pin-outs for the Plus EX Expansion Module.

Table 1-7 RS-232 Connector Pin-outs

RS-232 Signal	Direction	Plus EX-16D	Plus EX-16RJ	Plus EX-16D/485
TXD	IN	3	7	3
RXD	OUT	2	6	2
RTS	OUT	5	9	5
CTS	IN	4	8	4
DTR	OUT	6, 8	4	6, 8
DSR	IN	11	10	11
DCD	IN	20	3	20
RI	IN	22	2	22
Signal GND	-	7	5	7
CHASSIS	-	1	1	1
RS-485 RXA	IN			14
RS-485 RXB	IN			15
RS-485 TXA	OUT			16
RS-485 TXB	OUT			17

Figure 1-3 illustrates the DB-25 connector pin-out.
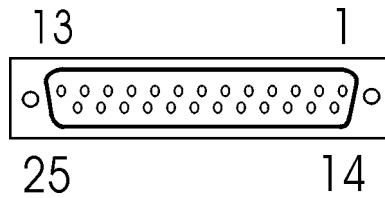
Figure 1-3 DB-25 Connector Pin-out

Figure 1-4 illustrates the RJ-45 connector pin-out.
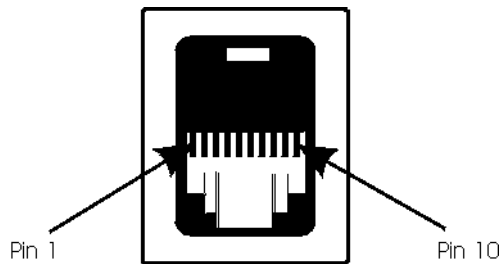
Figure 1-4 RJ-45 Connector Pin-out

EX-PAM Slim

The following lists the specifications for the EX-PAM SlimLine expansion module.

Table 1-8 EX-PAM SlimLine Specifications

Physical Characteristics	
Length	10.5 in. (26.67 cm)
Width	5.5 in. (13.97 cm)
Height	1.5 in. (3.81 cm)
Weight	1.05 lb (0.48 kg)
Operating Environment	
Temperature	5 ^{o}C (41 ^{o}F) to 45 ^{o}C (113 ^{o}F)
Temperature Gradient	20 ^{o}C/Hr (36 ^{o}F/Hr)
Relative Humidity	5% to 95% non-condensing
Wet Bulb Temperature	35 ^{o}C (95 ^{o}F) maximum
Altitude	-300m (-984 ft) to 3000m (9842 ft)
Certifications	FCC, CE
Power Requirements	90 - 250VAC, 50 / 60 Hz; 1 Amp max
Warranty	5 years

EX-16DB-485 Serial Interface

The following lists the specifications for the EX-16DB-485 SlimLine expansion module.

The serial port interface for the EX-16DB-485 is implemented as shown in Figure 1 -5 . The port physical interface consists of RS-232 and RS-485 interface circuits such that both interfaces transmit data independent of the port mode. A port selection module determines which of the RS-232 and RS-485 receive interface circuits drive the UART RXD input.
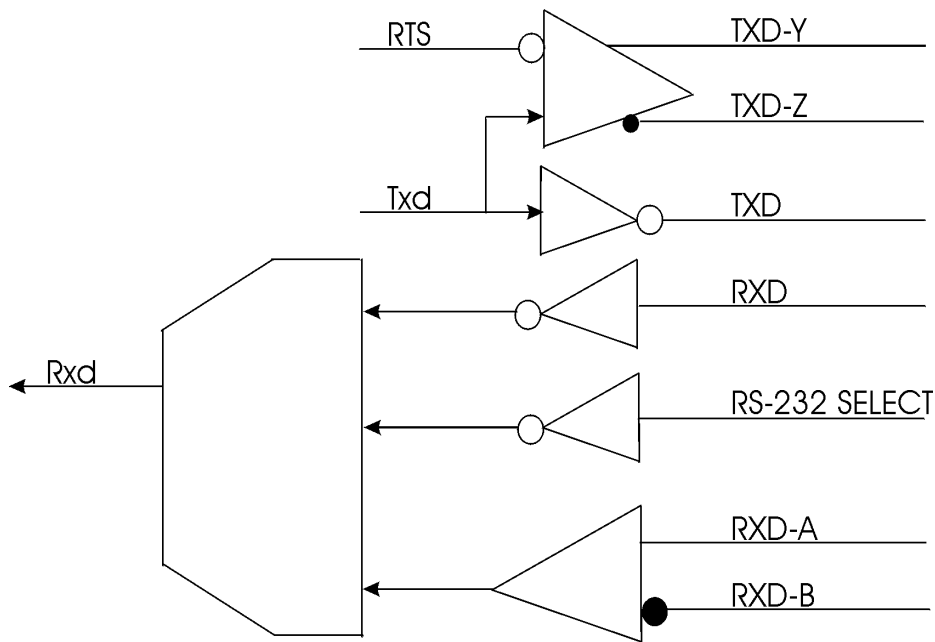
Figure 1-5 Port Interface Schematic

I/O Drivers and Receivers

The RS-485 data signals are implemented using low power transceivers designed to meet the requirements of RS-422 and RS-485. The RS485 output enable for multi-point communications is controlled by the UART Request To Send (RTS) signal. A select line for the RS-232/RS-485 interface is implemented using a RS232 receiver. This line when grounded, causes the input interface of the particular port to direct the RS-232 RXD data to the UART. Otherwise, the default mode of the port is to direct the RS-485/422 data RXD to the UART.

Protection

Transorb protection is provided for all Receive Data signals and all Transmit Data signals. The RS-232/RS-485 select line is protected in the same way.

RS-485 signals are protected to +/15KV ESD (using the Human Body Model). Each driver interface is short circuit limited and protected against excessive power dissipation by thermal shutdown. The receiver interface is fail-safe protected to guarantee a valid output when the receiver interface is open circuit.

CHAPTER 2   *Installation*

This chapter describes the hardware installation procedures and covers the following topics:

- Before You Start
- System Resources
- Installing in a PCI System
- Installing in an ISA System
- Connecting Expansion Modules
- Wall Mounting Procedure and Templates

Before You Start

Installing an IntelliPort Plus EX is a two-part process:

1. Installing the IntelliPort Plus EX hardware, and

2. Installing and configuring the software device drivers for your operating system.

Depending on the operating system you are using, these two parts may be somewhat interrelated. This manual covers only the hardware installation procedures. The complete installation procedure depends on your host operating system.

Software Dependencies

IMPORTANT: Before you begin installation, read the manuals and Release Notes supplied with your IntelliPort Plus EX drivers. Also, make sure all necessary back-ups are completed and verified before proceeding.

The IntelliPort Plus EX works under several different operating systems. Different operating systems have different requirements for IntelliPort Plus EX installation. These include the following:

Table 2-1 Software Dependencies

Software Dependency	Description
Installation order.	Some systems require you to install the drivers first, while other systems require you to install the hardware first.
Number of IntelliPort Plus EX controllers in a system.	The driver software may limit the total number of IntelliPort Plus EX controllers in the system.
Number of ports supported.	Supported are up to four expansion IntelliPort Plus EX modules per controller, for a total of 64 ports. Some systems may impose stricter limits. For example, some device drivers support up to 32 ports only
IRQ (interrupt) selection.	Some operating systems require multiple IntelliPort Plus EX controllers to share one IRQ. Other systems require a unique IRQ for each controller. Some operating systems poll the controller and do not use an IRQ at all.
ISA and PCI controllers in one system.	Systems that require a unique IRQ for each IntelliPort Plus EX controller allow both ISA and PCI controllers in one system. Other systems require that all IntelliPort Plus EX controllers be either all ISA or all PCI.

System Resources

This section explains the system resources required by the IntelliPort Plus EX.

System Memory

The IntelliPort Plus EX uses I/O mapping and does not use any memory address space.

DMA Channels

The IntelliPort Plus EX does not use any DMA channels.

IRQ

You can configure the IntelliPort Plus EX to use IRQ 3, 4, 5, 7, 10, 11, 12, or 15. Some device drivers do not use interrupts, some require an unique interrupt for each IntelliPort Plus EX controller, and others require that you use the same interrupt for all controllers. See your driver software manuals and release notes for more information. PCI systems have a system configuration utility that assigns an IRQ to the controller. The IRQ assigned by the configuration utility must match the IRQ specified by the driver. ISA systems set the IRQ through the driver software when the operating system boots.

The IntelliPort Plus EX can use one of eight IRQs. Table 2-1 lists the valid IRQ for the IntelliPort Plus EX and what other hardware may make use of them.

Table 2-2 IRQs Supported by IntelliPort Plus E

IRQ	Typical Use
3	Serial port #2
4	Serial port #1
5	Parallel port #2
7	Parallel port #1
10	Usually available
11	Usually available
12	Bus mouse
15	Second disk controller

I/O Addresses

The computer uses I/O addresses to communicate with peripheral devices. Each IntelliPort Plus EX controller requires a block of eight I/O addresses and you specify the location of the block with the *base I/O address* (the lowest I/O address in the block).

Depending on the hardware architecture (ISA or PCI), the system assigns a group of I/O addresses to the IntelliPort Plus EX controller, as follows:

- PCI systems use a unique range of I/O addresses based on the slot in which you install the controller.
- ISA systems require you to manually assign the base I/O address by setting a bank of switches on the controller. (If you install an ISA controller in an PCI system, you must set the switches on the controller based on the I/O address provided by the PCI configuration program. The PCI installation utility shows you a picture of how you should set the controller switches for the assigned I/O address.)

Depending on the order of installation, you may already have specified an I/O address. See your driver manuals and release notes for more information.

Installing in a PCI System

The procedure for installing a PCI or ISA IntelliPort Plus EX controller in a PCI system consists of the following steps:

1. Run the PCI Configuration program supplied with your computer.
2. Set the I/O address switches (SW1 through SW7) to match the I/O address supplied by the PCI Configuration program, if you are installing an ISA controller in an PCI system. Set switch SW8 to ON.
3. Power OFF the system.

IMPORTANT: DO NOT attempt to install the controller while the system is powered ON. If you do, you can damage both the controller and the system.

4. Remove the cover from your system. If you are not sure which screws secure the cover, follow the instructions in the manual that came with your computer.
5. Install the controller in any available PCI slot. Make sure the controller doe not touch components on the motherboard or other adjacent hardware, such as SIMMs or other high-profile parts.
6. Replace the system cover.
7. Attach external modules, as needed.

NOTE: If you remove or replace the system battery, configuration information is lost. To restore the configuration, boot the system from the backup configuration diskette and follow the instructions supplied with your system.

■   End of Procedure

After installing the controller, go to the section ***Connecting Expansion Modules.***

Installing in an ISA System

Installing the IntelliPort Plus EX controller in an ISA system consists of three major steps:

1. Selecting an IRQ and base I/O address for the controller.
2. Setting the I/O address switches (SW1 through SW7). Make sure switch SW8 is ON. (Setting SW8 OFF selects 8-bit I/O, which is very rarely required.)
3. Installing the IntelliPort Plus EX controller in your system and connecting interface modules or expansion modules to the controller.

If you are installing an ISA controller in an PCI system, read the ***Connecting Expansion Modules*** section.

Selecting the IRQ

In ISA systems, the IntelliPort Plus EX drivers set the controller's IRQ during system initialization. If you have already installed the drivers, you should have already selected the IRQ and written it down in the *Hardware Configuration Log* in Appendix A.

If you are installing the controller first, skip to the next section, *Setting I/ Address Switche* . You determine the IRQ while installing the drivers.

Setting I/O Address Switches

On the IntelliPort Plus EX ISA controllers, a block of eight DIP switches determine the I/O address. Figure 2-1 shows the location of the switches on the ISA-4 controller. The switches are in a similar location for all IntelliPort Plus EX ISA controllers.
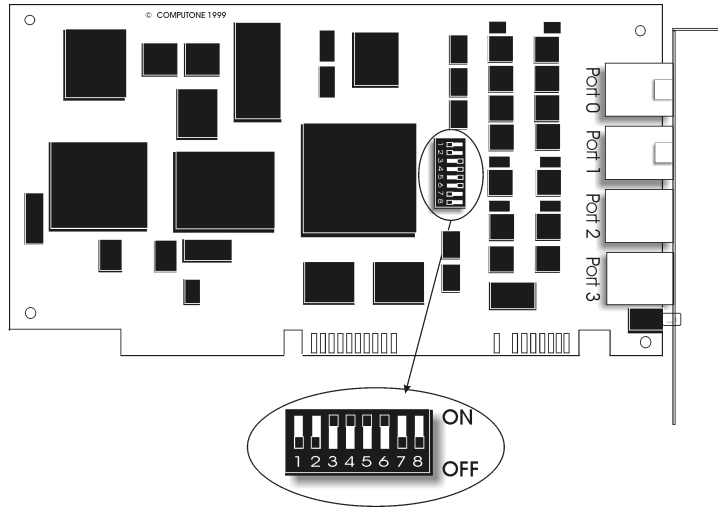
Figure 2-1 Location of I/O address DIP switches (ISA)

To determine which base I/O address to use, follow these steps:

1. If you have already installed the drivers, you should have already selected the I/O address and written it down in the *Hardware Configuration Log* in Appendix A. In this case, set the switches to correspond to the I/O address a shown in Table 2-2 or Appendix B.

2. If you install the hardware first, you can pick any free I/O addresses. Use one of the settings from Table 2-2, unless this conflicts with other hardware or drivers installed in your system. The factory default I/O address is 308h. Write down the selected I/O address in the *Hardware Configuration Log* in Appendix A.

For a complete listing of I/O addresses, see Appendix B, *I/O Address Considerations*.

Table 2-3 Commonly Available I/O Address Switch Settings (ISA)

I/O Addr.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
308 - 30F	off	off	on	on	on	on	off	on
310 - 317	off	off	on	on	on	off	on	on
318 - 31F	off	off	on	on	on	off	off	on
320 - 327	off	off	on	on	off	on	on	on

Installing the ISA Controller

To install the IntelliPort Plus EX ISA controller in your system, follow these steps:

1. Power OFF the system.

IMPORTANT: DO NOT attempt to install the controller while the system is powered ON. If you do, you can damage both the controller and the system.

2. Remove the cover from your system. If you are not sure which screws secure the cover, follow the instructions in the manual that came with your computer.

3. Install the controller in any available 16-bit slot. Make sure the controller does not touch components on the motherboard or other adjacent hardware, such as SIMMs or other high-profile parts.

4. Replace the system cover.

Upon booting-up you must enter CMOS set-up and change IRQ type to "Legacy ISA" or remove CMOS reference to "Plug n Play" for the IRQ being used.

■   End of Procedure

After installing the controller, proceed to the section, *Connecting Expansio Modules.*

Connecting Expansion Modules

The following steps assume that you have already installed the IntelliPort Plus EX controller in your system and performed any necessary system configuration. You must connect the expansion modules while the system is powered OFF.

1. Find a convenient location for the expansion modules. The RS-232 specification recommends that you limit serial cables to 50 feet (15 m) or less.

2. Power down your system.

NOTE: You *must* power down before connecting or disconnecting IntelliPort Plus EXpansion modules. Changing connections on a live system will damage both the controller and attached expansion modules.

3. Attach the expansion modules to each other, if necessary.

If you have more than one expansion module, connect them together and secure the expansion modules to each other with the supplied clips (see Figur e2-2).

Mounting Clip

Connecting Clip
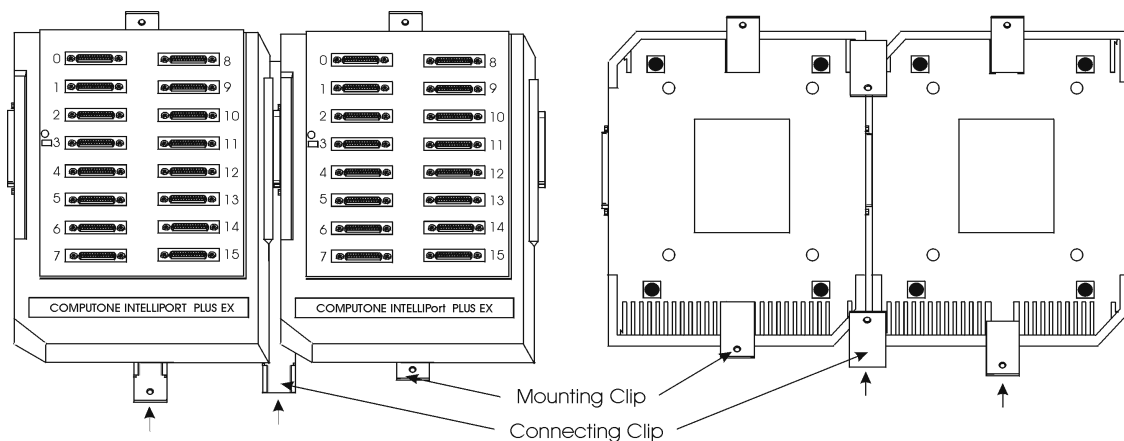
Figure 2-2 Expansion Module Attachment Scheme

4. Attach a Power Adapter Module (PAM), if necessary.

■   End of Procedure

NOTE: Under normal conditions, you need a PAM if you have more than 32 serial devices connected and active. Conditions that affect power consumption

include the number of terminals connected, the number of slots in use, and the host's power supply capacity. See chapter 4, *Troubleshootin* , for information about power-related problems.

If you need aPAM, follow these steps:

1. Attach the Power Adapter Module(PAM) between the first expansion module and the interface cable, as shown in Fig ure2-3 .

2. Connect the power cord from the PAM power supply to the power connector on thePAM.
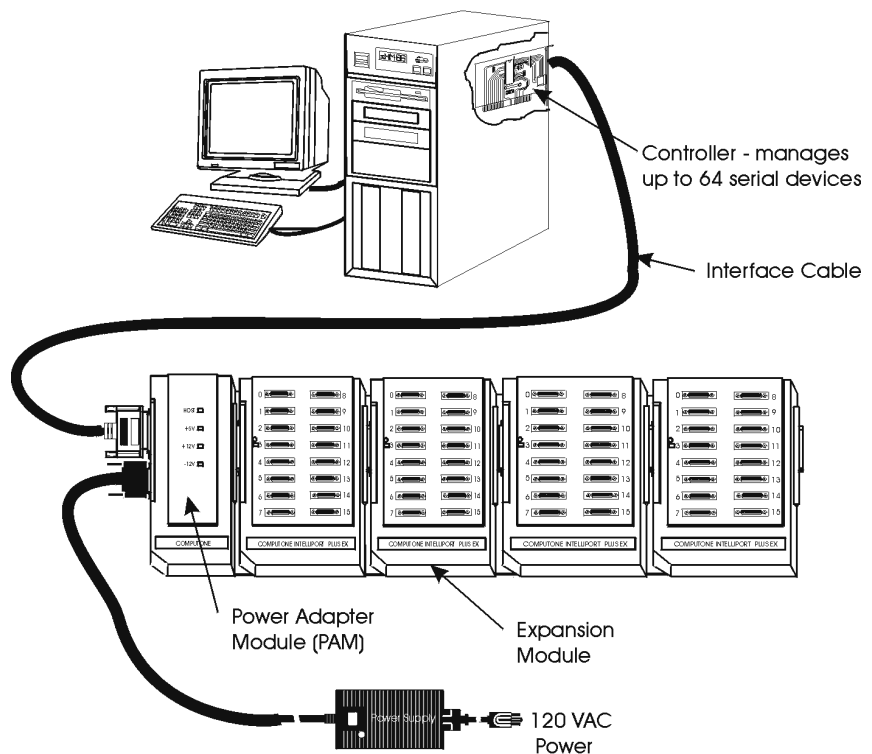
Figure 2-3 PAM Attachment Scheme

3. Connect the IntelliPort Plus Expansion modules together using the supplied clips.

4. Connect the controller card to the PAM data connector using the supplied interface cable.

IMPORTANT: Use only the supplied interface cable to connect the controller to the expansion modules. If you try using a longer cable in place of the interface cable, operation may become unreliable.

For more information on data cables, see Chapter 3, *Cabling*.

■   End of Procedure

Wall Mounting Procedure and Templates

Before you start, locate the Hardware Kit included with your enclosure(s). The kit includes hollow wall anchors for mounting the enclosure and clips to attach two or more enclosures.

Required Tools

Before you start wall-mounting an IntelliPort Plus EX enclosure, you should have the following tools:

- A level to make sure the enclosures are mounted straight (this is not required, but helps the appearance of the installation).
- A small nail or punch for marking anchor insertion points.
- A hammer for driving the hollow wall anchors.
- A #2 flat-blade screwdriver for tightening screws.

Wall-mounting Procedure

To mount a Computone enclosure, follow these steps:

1. Select the appropriate template. There are three provided: 8 port to 8 port, 16 port to 16 port, and 16 port to 8 port.
2. Remove the template from the other templates.
3. Mount the template to the wall using cellophane tape or thumbtacks. Use the level along one of the template borders to make sure the template is level.
4. Place a nail or punch at the cross hairs labeled "WALL MOUNTING TARGETS" and push the point through the paper into the wall. Tap lightly with a hammer, if necessary, to make a visible mark on the wall. Repeat for all four targets.

NOTE: If you are installing more that two enclosures, slide the template over (or choose a different template, as necessary, so that the target holes on the left side of the template line up with the right-hand nail or punch marks. Mark the new holes as done previously.

5. Remove the template and install the hollow wall mounts at the nail or punch marks. Repeat for all four anchors.

NOTE: The anchors are the "no drill" type. You can hammer them into the wall, although drilling a small (1/8 in.) pilot hole makes the job easier.

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6. Tighten the wall anchor screws to secure the anchors into the wall. Remove and set aside the screws for later use.

7. Remove the clips from the middle slots of each enclosure (the enclosure is shipped with the clips inserted in the hidden position). Turn the clips over and slide them back into the middle slots of each enclosure so that the clip protrudes from the enclosure and the mounting hole is clear (this is the mounting position). See **Figure 2-2** .

If you are mounting multiple enclosures, prepare each enclosure.

8. Plug the enclosures together as shown in **Figure 2 -3.** Secure the expansion modules to each other using the clips from the wall-mounting kit.

9. Align the holes in the wall mounting clips with the holes in the wall anchors. Fasten the enclosures to the wall by installing the wall anchor screws. It may be helpful to have another person hold the enclosure while you install the mounting screws.

■   End of Procedure

IntelliPort Plus EX Hardware Guide

Cabling

In this chapter you learn how to use the proper cable to connect the IntelliPort Plus EX to serial devices such as modems, terminals, and printers. Some of the topics covered include:

- Standard Cables
- Guidelines for Custom Built Cables
- Connecting RS-422 and RS-485 Device

CAUTION: **At some installation sites, it may be necessary to connect the chassis ground at one end of the cable *but not at both ends*. This is because the "earth ground" connection through the power source is not always perfect, and different "earth grounds" at different locations may have a voltage potential between them. If you connect the two devices together through the cable shield or chassis ground pin, current may flow through the shield and damage your hardware.**

Standard Cables

To connect the IntelliPort Plus EX to serial devices, you may buy standard IntelliPort Plus EX cables from Computone, or build your own according to the guidelines in section, *Guidelines for Custom Built Cables*.

Computone Standard Cables

Computone supplies two types of standard cables for the IntelliPort Plus EX. One is for modems, ISDN terminal adapters and other DCE devices. The other is for terminals, printers, and other DTE devices.

Table 3-1 Computone Standard Cables

Sales Order Number	Description	Cable ID (Label)
Provided w / Controller Card	6 foot (1.8 meters) cable that connects controller card to IntelliPort Plus EX.	2-20020
VP-RJ-DB/T CABLE	10-wire cable, 6 foot long (1.8 meters), RJ-45 to DB-25 (male). Connects an IntelliPort Plus EX RJ-45 port to most terminals, printers, and other RS-232 DTE devices	2-20121
VP-RJ-DB/M CABLE	10-wire cable, 6 foot long (1.8 meters), RJ-45 to DB-25 (male). Connects an IntelliPort Plus EX RJ-45 port to most modems. ISDN terminal adapters, and other RS-232 DCE devices.	2-20122
DB-DB/M Cable	10-wire cable, 6 foot long (1.8 meters), DB-25 (male) to DB-25 (male). Shielded cable for connection to modem (DCE) devices.	2-20118
8-10 Cable Pack	10-wire cable, 1 foot long (.3 meters), RJ-45 (female, 8-pin) to RJ-45 (female, 10-pin), translation cable. Used when installing the IntelliPort Plus EX (10-pin RJ-45) into an existing IntelliPort II EX (8-pin RJ-45) site.	2-20145
DB9 Patch Pack	9-wire cable, 1 foot long (.3 meters), RJ-45 (female, 10-pin) to DB-9 (female).	2-25031
DB25 Patch Pack	9-wire cable, 1 foot long (.3 meters), RJ-45 (female, 10-pin), to DB-25 (male).	2-25032

Controller Interface Cable 2-20020

The interface cable connects the controller board to the IntelliPort Plus EX data connector.
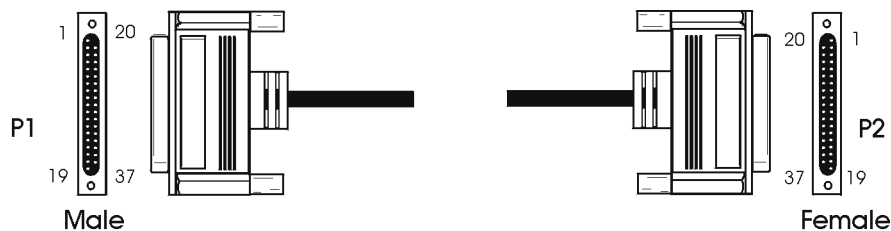
	From	To	From	To
Pair 1	P1-1	P2-1	P1-2	P2-2
Pair 2	P1-3	P2-3	P1-4	P2-4
Pair 3	P1-5	P2-5	P1-6	P2-6
Pair 4	P1-7	P2-7	P1-8	P2-8
Pair 5	P1-9	P2-9	P1-10	P2-10
Pair 6	P1-11	P2-11	P1-12	P2-12
Pair 7	P1-13	P2-13	P1-14	P2-14
Pair 8	P1-15	P2-15	P1-16	P2-16
Pair 9	P1-17	P2-17	P1-18	P2-18
Pair 10	P1-19	P2-19	P1-20	P2-20
Pair 11	P1-21	P2-21	P1-22	P2-22
Pair 12	P1-23	P2-23	P1-24	P2-24
Pair 13	P1-25	P2-25	P1-26	P2-26
Pair 14	P1-27	P2-27	P1-28	P2-28
Pair 15	P1-29	P2-29	P1-30	P2-30
Pair 16	P1-31	P2-31	P1-32	P2-32
Pair 17	P1-33	P2-33	P1-34	P2-34
Pair 18	P1-35	P2-35	P1-36	P2-36
P1-37 and P2-37 are unused.				

Figure 3-1 Controller Interface Cable 2-20020

Standard Cable 2-20121 - Terminals and Other DTE Devices
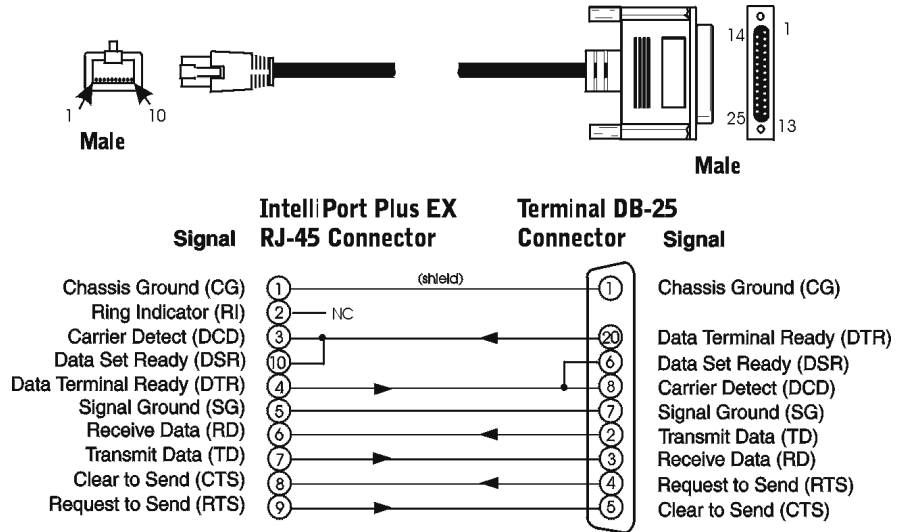
Figure 3-2 Cable Pin-out for Terminals & DTE Devices

Table 3-2 Specifications Terminal & DTE Devices Cable

Order Number:	VP-RJ-DB/T CABLE
Description:	A 6-foot (1.8 meter) shielded cable with a 10-pin RJ-45 connector at one end, and a male DB-25 connector at the other end.
Devices:	Most terminals, printers, and other DTE devices.
Marking:	The cable is marked 2-20121 for identification purposes.
NOTE:	
Many DTE devices have special requirements. See section, **Guidelines for Custom Built Cables**.	

Standard Cable 2-20122 - Modems and Other DCE Devices
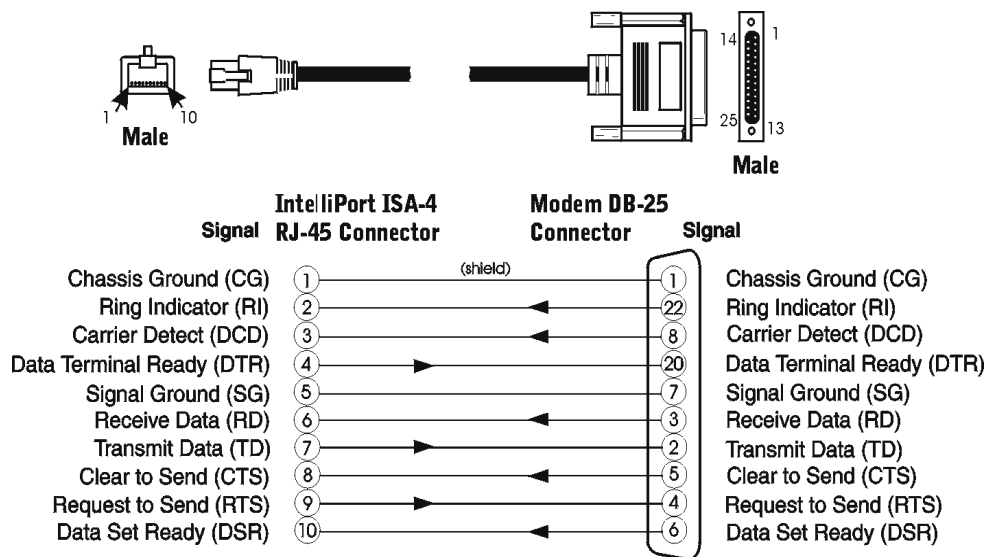
Figure 3-3 Modem & DCE Cable Pin-out

Table 3-3 Specifications for Modem & DCE Cable

Order Number:	VP-RJ-DB/M CABLE
Description:	A 6-foot (1.8 meter) shielded cable with a 10-pin RJ-45 plug at one end and a male DB-25 connector at the other end.
Devices:	Modems, ISDN terminal adapters, and other DCE devices.
Marking:	This cable is marked 2-20122 for identification purposes.

Standard Cable 2-20118 - Modems
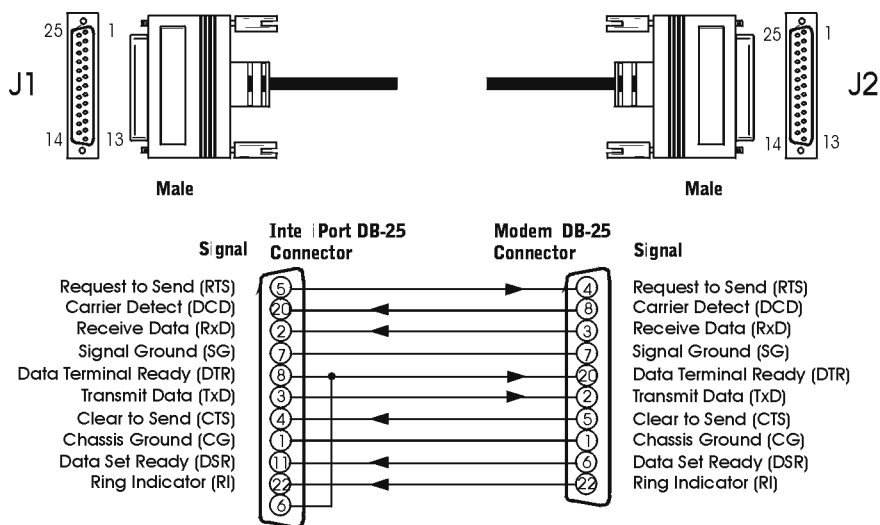
Figure 3-4 Modem (DCE) Cable Pin-out

Table 3-4 Specifications for Cable 2-20118

Order Number:	DB-DB/M CABLE
Description:	10-wire cable, 6 ft long (1.8 meters), DB-25 (male) to DB-25 (male). Shielded cable for connection to modem (DCE) devices.
Devices:	Modems and other DCE devices.
Marking:	This cable is marked 2-20118 for identification purposes.

Standard Cable 2-20145 - 8-10 Cable Pack

The Translation Cable (Figure 3 -5) is used to connect the 10-pin RJ connector on the IntelliPort Plus EX to an IntelliPort II or IntelliPort II EX, which uses an 8-pin RJ-45 connector.
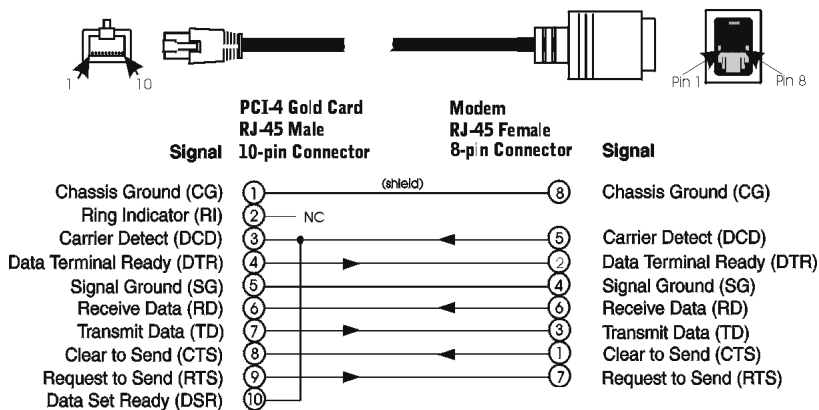
Figure 3-5   Translation Cable

NOTE: Older IntelliPort II units reference pin 1 in a different location.

Table 3-5   Specifications for Modem & DCE Cable

Order Number:	8-10 Cable Pack
Description:	A 1-foot (.3 meter) cable with a 10-pin RJ-45 male plug at one end and a female 8-pin RJ-45 connector at the other end.

Standard Patch Cables

Two standard patch cables are offered to support the Plus EX product family:

- Standard Cable 2-25031 - DB25 Patch Cable
- Standard Cable 2-25032 - DB9 Patch Cable

Figure 3 -6 shows how the patch cables are used.
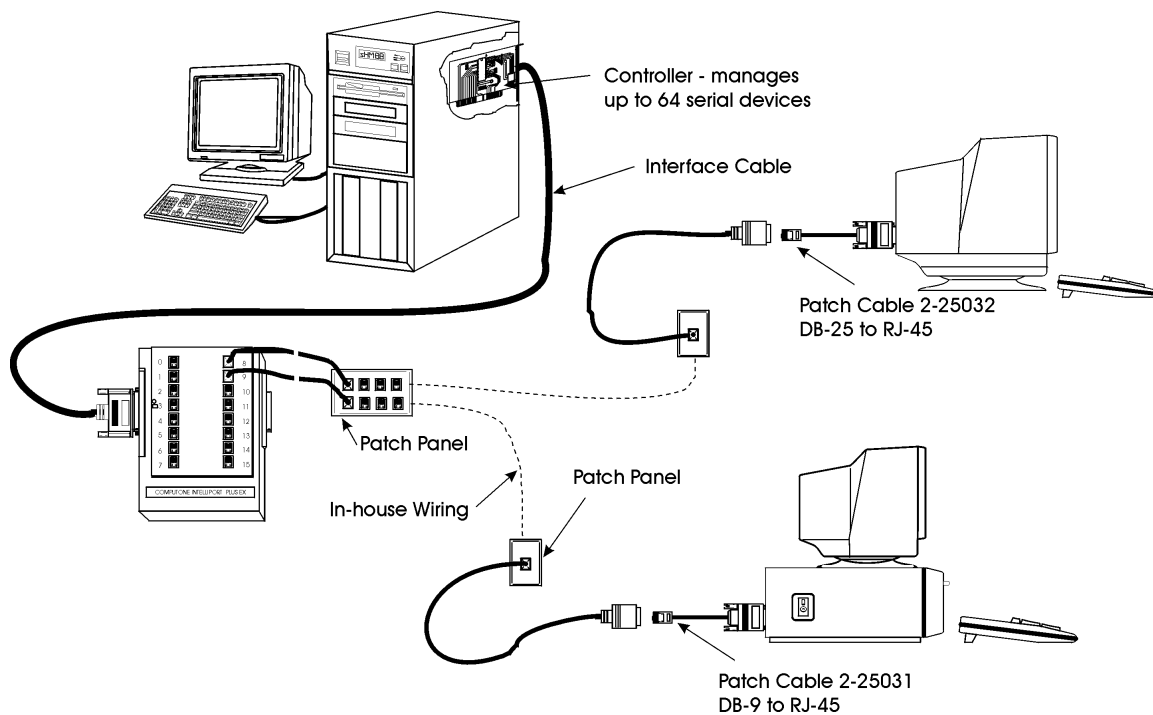
Figure 3-6 Using the Patch Cables

Standard Cable 2-25031 DB25 Patch Cable

The DB25 Patch Cable is used to connect a RJ-45 10-pin connector to a DB-25 connector. Fig ure3-7 shows the DB25 Patch Cable.
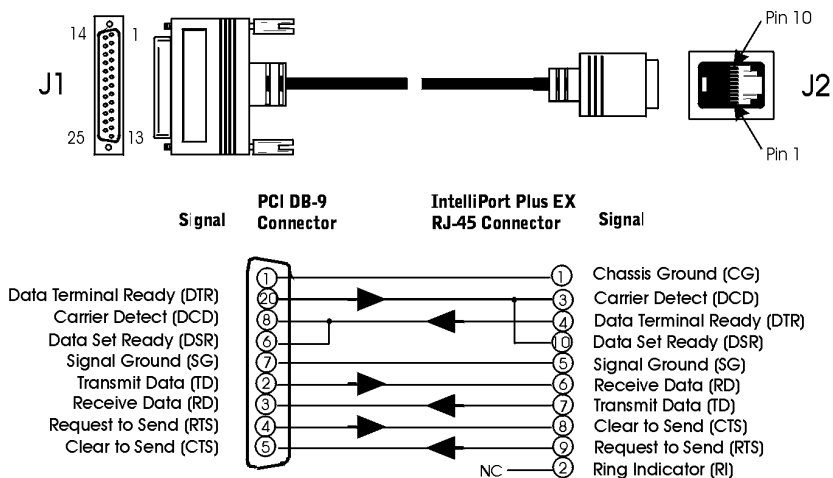
Figure 3-7 DB25 Patch Cable

Table 3-6 Specifications for DB25 Patch Cable

Order Number:	DB25 Patch Pack
Description:	A 9-wire cable, 1 foot long (.3 meters), RJ-45 (female, 10-pin) to DB-25 (male).

This cable is intended to be used at the device end (i.e. DB25 or a terminal or other DTE device) and allows its use of twisted pair patch cables to connect to Plus EX modules, as shown in Figure 3 -6.

Standard Cable 2-25032 DB9 Patch Cable

The DB9 Patch Cable is used to connect a RJ-45 10-pin connector to a DB-9
connector. Figur e3-8 shows the DB9 Patch Cable.
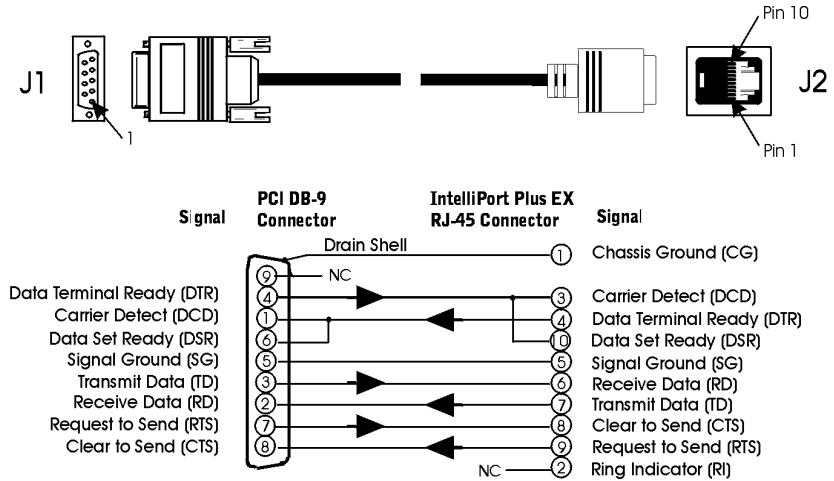
Figure 3-8 DB9 Patch Cable

Table 3-7 Specifications for DB9 Patch Cable

Order Number:	DB9 Patch Pack
Description:	A 9-wire cable, 1 foot long (.3 meters), RJ-45 (female, 10-pin) to DB-9 (female).

Guidelines for Custom Built Cables

Pin-out Guidelines for DCE Devices

For most modems and other DCE devices, use the pin-outs shown in Figur e3-3. You can omit the RTS and CTS signals if you are not using RTS/CTS flow control. However, it is not recommended since most of the network configurations in place require hardware flow control.

Pin-out Guidelines for DTE Devices

The standard cable shown Figur e3-2 supports a device that could use RTS/CTS flow control. If your device uses different signals for hardware flow control, adjust your cable accordingly. If you are using XON/XOFF flow control, you may be able to omit RTS/CTS entirely.

The standard cable connects the CD pin (DCD) to the device's DTR. This allows the IntelliPort Plus EX to log a user off when he turns off his terminal, for example. You can omit this signal if you don't require this feature.

RS-232 Cable Selection Guidelines

Consider the following points when selecting a cable:

- Cable length
- For maximum noise immunity and lowest RF emissions, use a shielded cable with a 100%-coverage foil shield at the RJ-45 end.
- Conductors in the cable should be 26-28 AWG.
- While there is no particular advantage to using twisted-pair cables with RS-232 installations, they are commonly available and often found in pre-wired installations. When using twisted-pair cable, make sure that it adheres to the EIA/TIA-568 standard for assigning cable pairs to RJ-45 plug pins, as shown on the following page.

Table 3-8 is an example of how to connect a twisted-pair cable to the IntelliPort Plus EX's RJ-45 connector. In this example, the four twisted pairs are made up of the following colored wires:

- White-on-green twisted with green-on-white
- White-on-orange twisted with orange-on-white
- White-on-blue twisted with blue-on-white
- White-on-brown twisted with brown-on-white

Table 3-8 Assigning Cable Pairs - RJ-45 Pins

Example: Assigning Cable Pairs to RJ-45 Pins		
Pin	**Signal**	**Color of Wire**
1	Chassis Ground (CG)	None
2	Ring Indicator (RI)	White on Green
3	Carrier Detect (CD)	Green on White
4	Data Terminal Read (DTR)	White on Orange
5	Signal Ground (SG)	White on Blue
6	Receive Data (RD)	Blue on White
7	Transmit Data (TD)	Orange on White
8	Clear to Send (CTS)	White on Brown
9	Request to Send (RTS)	Brown on White
10	Data Set Ready (DSR)	None

While your twisted-pair cable may not use the same color scheme as the one listed in this example, the colored wires in your cable should be twisted together in a similar fashion.

NOTE: Under no circumstances should you assign pins 6 (RD) and 7 (TD) to wires from the same pair.

RS-422 / RS-485 Cable Selection Guidelines

Consider the following points when selecting a cable:

- Cable length - The longer the cable, the slower the data rate, and vice versa.
- Noise immunity - For maximum noise immunity and lowest RF emissions, use a shielded cable with a 100%-coverage foil shield at the RJ-45 end.
- Cable wires - Conductors in the cable should be 26-28 AWG.
- Stub lengths - Keep stub lengths to a minimum.

Table 3-9 EX-16D/485 DB-25 Pin-out

Pin No.	Signal	Direction	Term
1	CHAS	---	Safety GN
2	RxD	IN	RS-232
3	TxD	OUT	RS-232
4	CTS	IN	RS-232
5	RTS	OUT	RS-232
6	DTR	OUT	RS-232
7	GNS	---	Signal GND
8	DSR	OUT	RS-232
9	---	---	---
10	Rx-Term		EIA-485 Receive Termination
11	DSR	IN	RS-232
12	485SEL	IN	RS-232
13	---	---	---
14	RxA	IN	EIA-422 / EIA-485
15	RxB	IN	EIA-422 / EIA-485
16	TxA	OUT	EIA-422 / EIA-485
17	TxB	OUT	EIA-422 / EIA-485
20	DCD	IN	RS-232
22	RI	IN	RS-232

Cable for RS-232 Terminals with DTR Flow Control
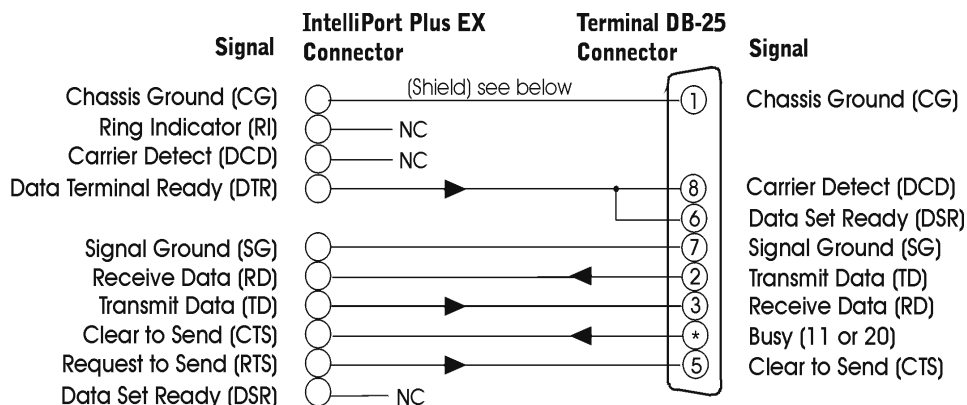
Figure 3-9 Cable Pin-outs for Terminals w/DTR Flow Control

NOTES:

1. The cable shown in Fig ure3-9 assumes that the terminal or other devices use its RTS signal for flow control. Many terminals use DTR instead. If this is the case, connect the terminal's DTR to CTS, and configure the port for CTS flow control.

2. Terminals that use DTR for flow control often use RTS to indicate that the terminal is turned on. That is why the diagram on this page shows the DB-25's RTS signal connected to the IntelliPort Plus EX's CD signal (DCD). This can be used for logging off when the terminal powers down.

Cable for RS-232 Terminals Using Xon/Xoff Flow Control
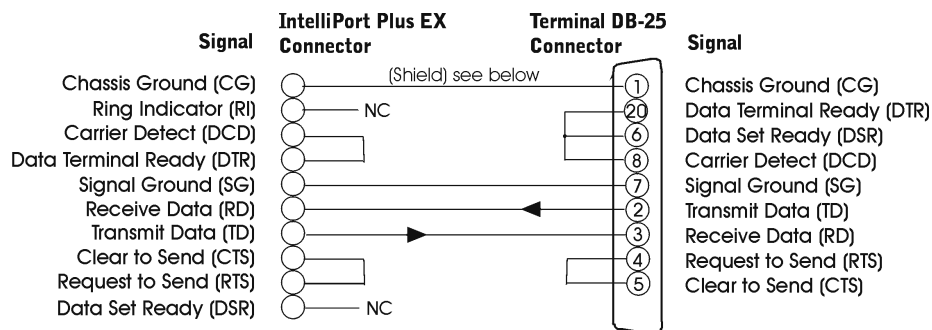
Figure 3-10 Cable Pin-outs for Terminals Using Xon/Xoff Flow Control

Notes:

1. Since the terminal is using XON/XOFF flow control, the RTS/CTS signals are not used.

2. The DTR/CD signals are not used because the local terminal should always be connected and turned on.

3. On the terminal side, DTR is connected to CTS. Many terminals will not operate unless their CTS, DSR, or DCD inputs are asserted. To reduce the wires in the cable, use the terminal's DTR and RTS to satisfy these inputs.

WARNING: When using this cable, you should avoid powering down the terminal while it i running an application. Since the DTR and CD signals are not used, the IntelliPort Plus EX (and the host system) will not know that the terminal has been turned off. This means that the application will continue to run and could produce unexpected results when the terminal is again turned on.

Cable for Connecting Printer

Figure 3 -11 shows the pin-out for a cable to connect a printer.
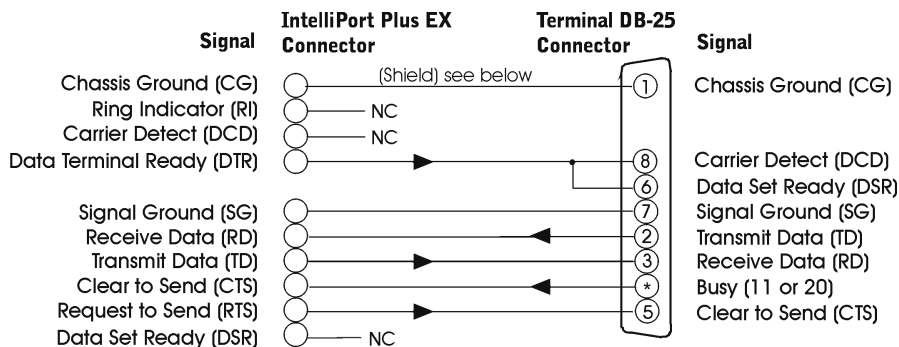
Figure 3-11 Cable Pin-out for Connecting Printers

NOTES:

1. If you are using hardware flow control, configure the IntelliPort Plus EX port for CTS flow control. Printers usually support hardware flow control using pin 11 or 20. Consult your printer manual to see which pin is appropriate and connect it to the CTS pin. If you are using XON/XOFF flow control this wire is not needed.

2. The printer's Transmit Data (TD) signal is connected to the IntelliPort Plus EX's Receive Data (RD) signal to support XON/XOFF flow control. It can often be omitted when CTS flow control is used.

3. The IntelliPort Plus EX's DTR is connected to the printer's DSR and CD inputs, and the RTS is connected to the printer's CTS input. This is done because some printers will not operate properly unless these inputs are asserted. Check your printer manual to see if these connections are required for your printer.

Cable for Connecting to a DB9 Com. Port on a PC
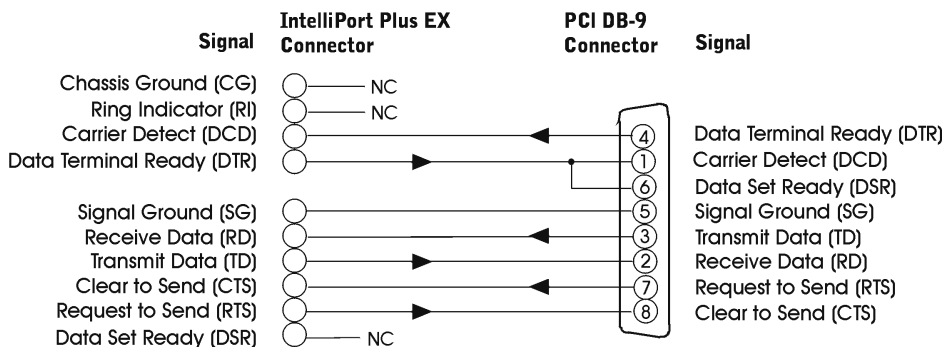
Figure 3-12 Cable Pin-out for Connecting to a DB9 Com. Port on a PC

NOTES:

1. This pin-out is functionally similar to the standard DTE cables shown in Figure 3 -2, adjusted for the fact that the DB9 connector uses different pin-outs.

2. Since DB9 communication ports generally use male connectors, the DB9 end of your cable should be female.

CHAPTER 4 *Troubleshooting*

This chapter describes the hardware problems that may be encountered by Computone users and provides solutions. This chapter covers the following information:

- Common problem
- LED error code

Common Problems

This section discusses hardware-related problems that may occur with IntelliPort Plus EX products. This section covers each problem under a separate heading. Under each heading is a step-by-step list of actions that may resolve the problem.

This section covers the following problems, in order:

- No LED activity on the controller
- System does not boot or reset properly
- Ports appear dead or seem to be receiving garbage
- "Board Not Found" message at start-up

No LED Activity on the Controlle

Use the following table to resolve a problem of no LED activity on the controller.

Table 4-1   No LED Activity On The Controller

Action	Procedure
Verify the controller is seated firmly seated in its slot.	1. Shut down and power off the host system. 2. Push the controller firmly into the slot and secure the controller with a screw 3. Resume normal operation.
Move the controller to a different slot.	1. Shut down and power off the host system. 2. Disconnect any cables from the controller and place the controller in another suitable slot. Reconnect the cables. 3. If an EISA system, reconfigure the system to correspond to the slot change. 4. Resume normal operation.
Check the interface cable.	1. Verify the interface cable is connected securely. Use the thumbscrews to secure the bus cable and to prevent accidental disconnection. 2. Check the interface cable for obvious damage such as cuts, breaks, or deformation from physical impact. 3. Replace the interface cable, if needed. 4. Resume normal operation.
If the problem persists...	Call Computone Technical Support at: **1-800-241-3946, x2002**

System Does Not Boot Or Reset Properly

The system may boot with the IntelliPort Plus EX controller installed, but the system generates a message instructing you to check the status LED on the IntelliPort Plus EX controller for an error code. Check the following:

Table 4-2   System Does Not Boot or Reset Properly

Action	Procedure
Check the status of the controller and of each expansion module.	See *LED Error Codes* for information on controller status.
Remove the controller and start the system.	1. Shut down and power off the host system.
	2. Disconnect the interface cable from the controller and remove the controller.
	3. Power on the host system. If the system boots properly, this indicates either an I/O address conflict or a faulty controller. You can also try moving the IntelliPort Plus EX controller to a different slot (see the previous section for details).
	If the system does not boot properly, this indicates a problem with other hardware in the system. Replace the IntelliPort Plus EX controller and attach the interface cable. Remove other cards, one at a time, and boot the system until the problem clears.
	4. Resume normal operation.
Run system diagnostics.	Refer to your system documentation for available diagnostics and their use.
If the problem persists...	Call Computone Technical Support at: **1-800-241-3946, x2002**

Ports Appear Dead or Seem to be Receiving Garbage

Problems with individual ports may be caused by hardware (for example, mis-wired cables), or incorrect software configuration. This section covers only those port problems caused by hardware. For software troubleshooting, see the manual and release notes that came with your drivers.

NOTE: Before you can determine whether ports are working, you must first install the software drivers.

Table 4-13 lists possible actions to correct this problem:

Table 4-3 Ports Appear Dead or Seem to be Receiving Garbage

Action	Procedure
Verify proper cable wiring.	If the received data looks correct at first, then turns to garbage, this indicates a flow control problem. Make sure the IntelliPort Plus EX port and the serial device are set for identical flow control and communication parameters (data rate, parity, etc.). Some printers use pins 11 or 20 for flow control.
	If the device does not receive any data at all, this indicates a miswired cable or a flow control problem. If the device is a terminal, make sure you are using a straight-through cable to connect to the IntelliPort Plus EX. If the device is a modem, make sure you are using a standard null modem cable. See Chapter 3 for standard wiring diagrams.
Run cable tests.	Connect a breakout box between the IntelliPort Plus EX controller and the serial device, and watch the signal lights. If the same lights are ON for both sides, you need a cross-over cable. If a different set of lights are ON, try a straight-through cable. Remember that many printers use different pins for flow control.
	If the lights on the cable end of the breakout box do not show all the expected signals, the cable may be damaged or wired incorrectly.
Check your software configuration.	Refer to the manual and release notes that came with your software drivers for more serial port troubleshooting tips.
If problem persists …	Call Computone Technical Support at: **1-800-241-3946, x2002**

"Board Not Found" Message at Start-up

A "Board Not Found" message indicates either an I/O address conflict or a problem with the IntelliPort Plus EX hardware.

NOTE: Before you can determine whether the controller can be found by the software drivers, you must first install the software drivers.

Table 4-4   "Board Not Found" Message at Startup

Action	Procedure
Check your system configuration for I/O conflicts.	For ISA controllers, make sure the I/O address DIP switches on the controller correspond to the I/O address you selected (check the *Hardware Reference Log* in Appendix A). If the switches are set properly, check all peripherals in the system to make sure none of them are attempting to use the same I/O address.
If problem persists …	Call Computone Technical Support at: **1-800-241-3946, x2002**

LED Error Codes

All controllers have a tri-color status LED (light emitting diode). You can use this LED to determine whether the controller is operating properly, and if not, what error the controller has detected. On ISA and EISA controllers, the status LED is visible on the end bracket of the controller without removing the system cover.

Normal Operation

When power is applied to the host, the LED should:

- Flash GREEN quickly (controller running memory diagnostics)
- Flash YELLOW slowly (controller waiting for loadware to download)
- Flash YELLOW quickly (driver found, downloading begins)
- Flash GREEN continuously (indicates that the first port of controller is open, which implies normal operation).

Error Indicators

If the controller detects a software or hardware-related problem, the LED continuously repeats a sequence that begins with a RED flash. If you see the LED flash RED, the controller indicates an error number by a sequence of GREEN and YELLOW flashes. Each GREEN flash indicates a value of 10, and each YELLOW flash indicates a value of 1. For example, the controller LED could flash the following error sequence:

RED GREEN GREEN YELLOW YELLOW YELLOW

This indicates error number 23 (two GREEN flashes means 20, three YELLOW flashes means 3). No GREEN flashes indicates an error number of 1 through 9.

NOTE: If the controller encounters any sort of error, write down the error code sequence for future reference.

You can usually resolve error code 3 (bad checksum) by replacing the loadware file with a backup copy (see your software manual for the name and location of the loadware file), and error code 30 (no expansion modules attached) by attaching the expansion modules. Call Computone Technical Support if you see any other error codes.

If the controller encounters a fatal error, it cannot communicate with the host through the FIFO. You must reset the controller (e.g., system power-off, bu reset) to bring the controller out of this condition.

Firmware Error Codes

The controller bootstrap firmware can generate error codes 1 through 5.

Table 4-5 **Firmware Error Codes 1-5**

Code	Description
1	**Bad FIFO.**
	Full/empty flags cannot properly track the state of the FIFO; internal registers are bad.
2	**Bad DRAM**.
	The expansion module's on-board dynamic RAM failed a simple random-pattern test.
3	**Bad Checksum Sensed During Download**.
	The FIFO may be unreliable or the loadware file may be corrupted.Reinstall the load-ware file and reboot the system.
4	Product ID is invalid.
5	**Dead UAR** . A 1400 UXART is not responding to reset.

If you see error 3, try reinstalling the loadware file (see your software manual for the name and location of the loadware file) before calling Computone Technical Support.

Loadware Error Codes

The controller loadware can generate error codes 6 through 34.

Table 4-6 Firmware Codes 6 - 34

Code	Description
6	**Bad Mailbox.** A FIFO mailbox register failed.
7, 8	Not used.
9	**Invalid Interrupt.** The CPU on the controller received an unexpected interrupt vector. This may indicate bad DRAM, an internal CPU problem, or a software problem.
10	**Bad First Command From Host**. This error code may appear if: 1. The Set Interrupt Level command was not the first command received after writing the loadware. 2. An invalid interrupt was requested. This may indicate an unreliable FIFO, or a problem with the driver or loadware.
11	**Zero Count Data Packet.** A data packet from the host had a zero count.
12	**Invalid Command Number From Host**. A packet received from the host contained a command number that is out of range (too large). This may indicate an unreliable FIFO or a problem with the driver or loadware.
13	**Bad Synchronous Command From Host**. A synchronous packet received from the host contained a command number that is valid only in a bypass packet, or an unassigned command was sent. This may indicate an unreliable FIFO or a problem with the driver or loadware.
14	**Internal Software Check**. The `dss_enable()` command was called with one or more illegal arguments. This may indicate bad DRAM or a problem with the loadware.
15	**Empty Data Packet**. A line discipline task received a packet with no data.
16	Not used.

Table 4-6   Firmware Codes 6 - 34

Code	Description
17	**Internal Software Check**. The list of running tasks may be corrupt. This may indicate bad DRAM or a problem with the loadware.
18	**Bad Bypass Command From Host.** A bypass packet received from the host contained a command number that is valid only in a synchronous packet, or an unassigned command was sent.This may indicate an unreliable FIFO or a problem with the driver or loadware.
19	**Internal Software Check.** Table full; unable to spawn a new process. This may indicate bad DRAM or a problem with the loadware.
20	**Internal Software Check.** The process stack has overflowed. This may indicate bad DRAM, a problem with the loadware, or a problem with the interrupt.
21	**Internal Software Check**. A transmit interrupt was received while processing a send break command. This may indicate a bad 1400 UXART or a problem with the loadware.
22	**Incoming Data or Command Overflo** . The host has sent more commands or data than the controller has room for, in violation of the flow-control credits established between the driver and the loadware. This may indicate an unreliable FIFO, or a problem with the driver or loadware.
23	**Channel Number Too Large**. The host sent a packet to a channel number higher than the maximum channel number for the controller. This may indicate an unreliable FIFO, or a problem with the driver or loadware.
24	Not used.
25	**Unexpected UART Shutdown.** The UART transmitter has shutdown for an unknown reason.
26	Not used.
27	**Stuck Mailbox-Interrupt Bit**. The controller received a mailbox interrupt from the host. However, when servicing the interrupt, the mailbox interrupt bit was clear. This may indicate an unreliable FIFO or a problem with the loadware.
28	**Dead UAR** . One of the 1400 UXARTs is not responding to a reset. This may indicate a bad 1400 UXART or a problem with the loadware.

Table 4-6 Firmware Codes 6 - 34

Code	Description
29	**Unsupported Product** Loadware Version 1.0.2 or earlier.
30	**No Expansion Modules Connected**. No expansion modules are connected to the IntelliPort Plus EX controller. Shut down the system and connect the expansion modules.
31	**Reserved**. Reserved for development/debugging. If this code appears, it may indicate bad DRAM or a problem with the software.
32	**Invalid Channel Number.** The host sent a packet for a channel that does not exist. This may indicate an unreliable FIFO, or a problem with the driver or loadware.
33	**Bad Buffer Pointer.** A buffer head pointer is not word-aligned.
34	**Bad Buffer Pointer.** A buffer tail pointer is not word-aligned.

Appendix A   *Hardware Configuration Log*

Use this Hardware Configuration Log to record the configuration of each controller you install in your system. This information is useful both for future reference and in case you need to call Computone Technical Support.

Table 5. IntelliPort II Hardware Configuration Log

Controller	Type (ISA, PCI)	Slot #	IRQ	I/O Address	Number of ports
1					
2					
3					
4					

Controller	Port Device Names or Numbers
1	
2	
3	
4	

I/O Address Considerations

This appendix covers complete I/O address settings for IntelliPort Plus EX ISA controllers.

ISA I/O Addresses

IntelliPort Plus EX ISA controllers use a block of eight DIP switches to set the I/O address. The following table is a short I/O address list that covers the most common switch settings.

I/O Addr.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
308 - 30F	OFF	OFF	ON	ON	ON	ON	OFF	ON
310 - 317	OFF	OFF	ON	ON	ON	OFF	ON	ON
318 - 31F	OFF	OFF	ON	ON	ON	OFF	OFF	ON
320 - 327	OFF	OFF	ON	ON	OFF	ON	ON	ON

IMPORTANT: Check other hardware installed in your system for I/O address usage before changing the IntelliPort Plus EX I/O address.

The following table lists all the I/O addresses and corresponding switch settings for IntelliPort Plus EX ISA controllers. You should use this list in the event that you can not map your controller to one of the recommended I/O addresses shown on the previous page.

I/O addr.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
158-15F	ON	OFF	ON	OFF	ON	OFF	OFF	ON
160-167	ON	OFF	ON	OFF	OFF	ON	ON	ON
168-16F	ON	OFF	ON	OFF	OFF	ON	OFF	ON
170-177	ON	OFF	ON	OFF	OFF	OFF	ON	ON
178-17F	ON	OFF	ON	OFF	OFF	OFF	OFF	ON
180-187	ON	OFF	OFF	ON	ON	ON	ON	ON
188-18F	ON	OFF	OFF	ON	ON	ON	OFF	ON
190-197	ON	OFF	OFF	ON	ON	OFF	ON	ON
198-19F	ON	OFF	OFF	ON	ON	OFF	OFF	ON
1A0-1A7	ON	OFF	OFF	ON	OFF	ON	ON	ON
1A8-1AF	ON	OFF	OFF	ON	OFF	ON	OFF	ON
1B0-1B7	ON	OFF	OFF	ON	OFF	OFF	ON	ON
1B8-1BF	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
1C0-1C7	ON	OFF	OFF	OFF	ON	ON	ON	ON
1C8-1CF	ON	OFF	OFF	OFF	ON	ON	OFF	ON
1D0-1D7	ON	OFF	OFF	OFF	ON	OFF	ON	ON
1D8-1DF	ON	OFF	OFF	OFF	ON	OFF	OFF	ON

Table B-1. I/O Addresses and Switch Settings

I/O addr.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
1E0-1E7	ON	OFF	OFF	OFF	OFF	ON	ON	ON
1E8-1EF	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
208-20F	OFF	ON	ON	ON	ON	ON	OFF	ON
210-217	OFF	ON	ON	ON	ON	OFF	ON	ON
218-21F	OFF	ON	ON	ON	ON	OFF	OFF	ON
220-227	OFF	ON	ON	ON	OFF	ON	ON	ON
228-22F	OFF	ON	ON	ON	OFF	ON	OFF	ON
230-237	OFF	ON	ON	ON	OFF	OFF	ON	ON
238-23F	OFF	ON	ON	ON	OFF	OFF	OFF	ON
240-247	OFF	ON	ON	OFF	ON	ON	ON	ON
248-24F	OFF	ON	ON	OFF	ON	ON	OFF	ON
250-257	OFF	ON	ON	OFF	ON	OFF	ON	ON
258-25F	OFF	ON	ON	OFF	ON	OFF	OFF	ON
260-267	OFF	ON	ON	OFF	OFF	ON	ON	ON
268-26F	OFF	ON	ON	OFF	OFF	ON	OFF	ON
270-277	OFF	ON	ON	OFF	OFF	OFF	ON	ON
280-287	OFF	ON	OFF	ON	ON	ON	ON	ON
288-28F	OFF	ON	OFF	ON	ON	ON	OFF	ON
290-297	OFF	ON	OFF	ON	ON	OFF	ON	ON
298-29F	OFF	ON	OFF	ON	ON	OFF	OFF	ON

Table B-1. I/O Addresses and Switch Settings

I/O addr.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
2A0-2A7	OFF	ON	OFF	ON	OFF	ON	ON	ON
2A8-2AF	OFF	ON	OFF	ON	OFF	ON	OFF	ON
2B0-2B7	OFF	ON	OFF	ON	OFF	OFF	ON	ON
2B8-2BF	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
2C0-2C7	OFF	ON	OFF	OFF	ON	ON	ON	ON
2C8-2CF	OFF	ON	OFF	OFF	ON	ON	OFF	ON
2D0-2D7	OFF	ON	OFF	OFF	ON	OFF	ON	ON
2D8-2DF	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
2E0-2E7	OFF	ON	OFF	OFF	OFF	ON	ON	ON
2E8-2EF	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
2F0-2F7	OFF	ON	OFF	OFF	OFF	OFF	ON	ON
2F8-2FF	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
300-307	OFF	OFF	ON	ON	ON	ON	ON	ON
308-30F	OFF	OFF	ON	ON	ON	ON	OFF	ON
310-317	OFF	OFF	ON	ON	ON	OFF	ON	ON
318-31F	OFF	OFF	ON	ON	ON	OFF	OFF	ON
320-327	OFF	OFF	ON	ON	OFF	ON	ON	ON
328-32F	OFF	OFF	ON	ON	OFF	ON	OFF	ON
330-337	OFF	OFF	ON	ON	OFF	OFF	ON	ON
338-33F	OFF	OFF	ON	ON	OFF	OFF	OFF	ON

Table B-1. I/O Addresses and Switch Settings

I/O addr.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
340-347	OFF	OFF	ON	OFF	ON	ON	ON	ON
348-34F	OFF	OFF	ON	OFF	ON	ON	OFF	ON
350-357	OFF	OFF	ON	OFF	ON	OFF	ON	ON
358-35F	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
360-367	OFF	OFF	ON	OFF	OFF	ON	ON	ON
368-36F	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
370-377	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
378-37F	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
380-387	OFF	OFF	OFF	ON	ON	ON	ON	ON
388-38F	OFF	OFF	OFF	ON	ON	ON	OFF	ON
390-397	OFF	OFF	OFF	ON	ON	OFF	ON	ON
398-39F	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
3A0-3A7	OFF	OFF	OFF	ON	OFF	ON	ON	ON
3A8-3AF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
3B0-3B7	OFF	OFF	OFF	ON	OFF	OFF	ON	ON
3B8-3BF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
3C0-3C7	OFF	OFF	OFF	OFF	ON	ON	ON	ON
3C8-3CF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
3D0-3D7	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
3D8-3DF	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON

Table B-1. **I/O Addresses and Switch Settings**

I/O addr.	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
3E0-3E7	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
3E8-3EF	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON
3F0-3F7	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON
3F8-3FF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON

EMI Conformance Statements

The following products comply with the directive set forth for the CE compliance:

> IntelliPort EX-16DB SlimLine
> IntelliPort EX-16RJ SlimLine
> IntelliPort EX-16DB-485 SlimLine
> IntelliPort EX-PAM SlimLine
> With IntelliPort ISA-EX
> With IntelliPort PCI-CEX

This equipment contains sensitive electronic devices. Do not ship or store near strong electrostatic, electromagnetic, magnetic, or radioactive fields.

FCC Information

This equipment has been tested and found to comply with the limits of a Class A device, pursuant to Part 15 of the United States FCC regulations. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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 offending equipment off and then on), you are encouraged to try to correct or remove the interference using one or more of the following methods: (a) reorient or relocate the receiving antenna; (b) increase the separation between the equipment and the receiver; (c) connect the equipment to an outlet on a circuit different from that of the receiver; (d) consult the dealer or an experienced radio/television technician for assistance.

DOC Compliance Notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

DOC Avis de Conformation

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques (de la class A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

DECLARATION OF CONFORMITY

Statement of Compliance

Name of Manufacturer: Computone Corporation
1060 Windward Pwy, Ste 100
Alpharetta, GA 30005

Model Name: IntelliPort Plus EX Family
including:
ISA-EX Board
PCI-EX Board
Plus EX-16RJ
Plus EX-16DB
Plus EX-16D/485
EX-PAM SlimLine

This is to certify that the listed equipment above has been tested and found to be in compliance with the following Directives and Product Standard(s):

* FCC Part 15 Class A verification
* EMC Directive 89/336/EEC using EN55022 and EN55024: 1998

Notes(s): (1) Product meets the class A limits and methods of EN55022:1994+A1:1995+A2:1997
(2) The EUT was tested to meet the requirements of EN55024: 1998

Product meets or exceeds the levels and methods of:
IEC 61000-4-2: 1995 for ESD
(8 kV air, 4 kV contact, Criteria B)

IEC 61000-4-3: 1995 for RFI
(3 V/m 80-1000 MHz, 80% @ 1 kHz, Criteria A)

IEC 61000-4-4: 1995 for EFT
(AC Power leads 1 kV, DC & signal leads 0.5 kV, Criteria B)

IEC 61000-4-5: 1995 for Surge
(AC Power leads 1 kV L-L, L-E 2 kV; DC & signal leads 0.5 kV, Criteria B)

IEC 61000-4-6: 1996 for Conducted Immunity
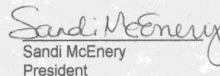(3 V/m, 0.15-80 MHz, 80% @ 1 kHz, Criteria A)

IEC 61000-4-11: 1994 for Voltage Dips and Interruptions
(>95% for 0.5 period to Criteria B, 30% for 25 periods for Criteria C)
(>95% for 250 periods, Criteria C)

* UL 1950 3rd Edition and CAN/CSA-C22.2 No. 950 (up to 32 port configuration)

U.S. Technologies Inc. is accredited by NIST through their NVLAP program for Emissions (Lab Code: 200162-0)

Tested, Approved and Prepared By:

Tim R. Johnson
NARTE Certified EMC Engineer
No. EMC-002205-NE

U S TECH

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Sandi McEnery
President