HOSTESS

Hostess *i*8™
Hostess *i*16™

User's Guide
Second Edition

COMTROL
Powerful Choices

Before You Begin

Use this guide to set up and install the Hostess *i* controller hardware. See the appropriate software driver installation manual to install the optional Comtrol device driver for your system.

Scope

The Second Edition of the *Hostess* i *User's Guide* discusses features and functionality of the Hostess *i* controller, part number HIXX0008B. The Hostess *i* is available in an 8-port model and a 16-port model. The only difference between the 8-port controller and the 16-port controller is that the 16-port controller has an upgrade module mounted to the base (8-port) controller. The part number for the controller is located on the inside of the mounting bracket.

If your controller has a part number other than HIXX008B, call Comtrol to order the Hostess *i* controller or the correct User's guide.

Purpose

This guide explains

- Setting up the Comtrol Hostess *i* controller including:
  - Input/Output (I/O) addresses for your computer.
  - Setting shorting jumpers to configure the controller for RS-422 or RS-485 mode. The controller is set to RS-232 mode as the default mode. (RS-485 mode requires an 8-port upgrade module.)
- Installing additional memory on the controller.
- Installing the controller into your computer.
- Connecting the controller and the peripherals, including detailed information about
  - The connectors, interface boxes, and cables that you use.
  - Setting jumpers in the DB25 interface box for synchronous mode or for RS-422 mode, or both. Synchronous RS-485 mode is not supported.

- Testing your controller using the diagnostic diskette and the test plug.
- Solving any problems you may encounter during installation.
- The controller specifications, such as hardware interrupts, power information, and FCC certification.

Audience

This manual is for the person who sets up and installs the controller.

Prerequisites

This guide assumes that you are running an ISA personal computer.

Future Hardware Changes

Comtrol continues to refine the Hostess *i*, based on your input. Our customer support engineers can help you plan for future modifications. Upcoming revisions to the hardware may occur. You can call Comtrol to find out what changes are planned.

Suggestions

Use Chapter 2 to install the controller in your system. If you plan on using asynchronous RS-232 mode on your controller, you do not need to change the port settings on the controller or the interface box.

If you plan on using RS-422 asynchronous mode with a DB25 interface box, you can use Chapter 2 to set the ports on the controller and Chapter 3 to set the jumpers in the interface box.

Before you install the Comtrol Hostess *i* controller for synchronous applications, you should scan Chapter 3 for basic information about connectors and cables. Then use Appendix A to set up the DB25 interface box for synchronous operation on ports 1 and 2. To use ports 3 through 8 or 16 in asynchronous mode, use Chapter 3.

Organization

Chapter 1. Overview of the Hostess *i* Controller

This chapter introduces the Hostess *i* controller.

Chapter 2. Installing the Controller

This chapter lists procedures that you may need to perform before installing the controller into your computer. In addition, it details installation procedures.

Chapter 3. Asynchronous Cabling and Interfaces

This chapter provides detailed information about the connectors, interface boxes, and cables for the controller in asynchronous mode. It also discusses connecting the interface box to the controller and peripherals. Use this chapter to set the DB25 interface box jumpers for asynchronous RS-422 mode. To use synchronous mode on ports 1 and 2, you must also use Appendix A.

Chapter 4. Testing the Controller

This chapter discusses using the diagnostic diskettes and the test plug to test the controller.

Chapter 5. Troubleshooting

This chapter discusses general software and hardware problems with the corresponding solutions.

Chapter 6. Controller Specifications

This chapter details Hostess *i* specifications.

Appendix A. Synchronous Cabling and Interfaces

This appendix discusses how to set up the controller and interface box for synchronous communications on ports 1 and 2.

Appendix B. Upgrading the Hostess *i* 8 Controller

This appendix details how to upgrade an 8-port controller to a 16-port controller.

Appendix C. Memory Addresses

This appendix illustrates the system memory map and the I/O address map for many PCs.

Appendix D. ASCII Character Set

This appendix contains the ASCII character set.

Appendix E. 100-Pin Connector Pinout Information

This appendix provides details about the 100-pin connector on the controller.

Appendix F. Warranty and Technical Support

This appendix provides details about the warranty and technical support on your controller. In addition, it provides information about certification. It also discusses the Canadian EMC regulations.

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Chapter 1.
Overview of the Hostess *i* Controller

Introduction

This chapter provides you an overview of your new Hostess *i* controller.

The Hostess *i* controller is an intelligent serial communications controller that you can install in a computer that contains 80286, 80386™, or 80486™ technology.

The Hostess *i* controller supports up to 16 serial ports from one expansion slot in a personal computer. The Hostess *i* controller plugs into the AT bus in your personal computer.

The Hostess *i* controllers provide several features:

- Easy system expansion because the controller fits into one ISA bus expansion slot in your computer.
- Multiple users for one PC with a maximum of four controllers per system, up to 64 people can use your system.
- Maximized throughput by using a NEC V53™ processor as a front-end processor that manages the input and output from the ports.
- Memory expansion - the controller has 128K of dual-ported random-access memory onboard. This RAM extends the amount of system memory. Both the onboard processor and the system processor can access this memory and can exchange data between themselves using it.

The Hostess *i* controller has the following characteristics:

- A Dual In-Line Package (DIP) switch for setting input/output (I/O) addresses.
- A NEC V53 processor that provides fast data communication and input/output (I/O) support.
- Four AMD™ AmZ8530 or Zilog Z8530™ Serial Communication Controllers (SCCs), expandable to eight SCCs.
- RS-232 and RS-422 port jumpers that allow you to set up your system for RS-232 or RS-422 communications, or both. With the RS-232/RS-422/RS-485 upgrade module, you can set ports 9 through 16 to RS-485 mode.

- SIMM slots to upgrade the local RAM to 640 Kbytes, 2 megabytes, or 8 megabytes.
- A DRAM with the basic 128K of memory.
- An EPROM that contains the boot up code and interrupt routines for the controller.

Figure 1-1 illustrates the Hostess *i* 8 controller.

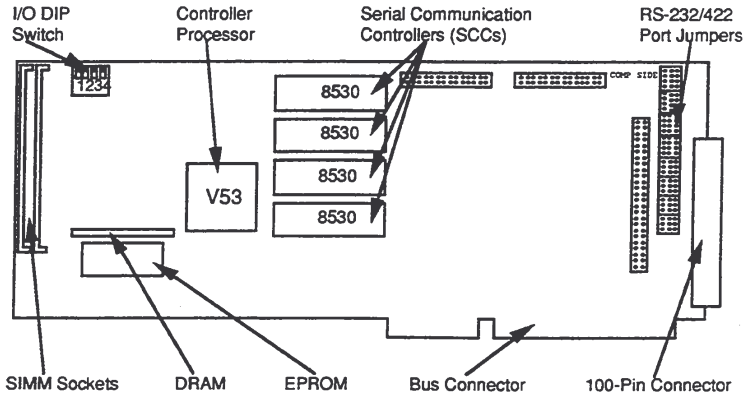


Figure 1-1. Hostess *i*8 Controller (HIXX0008B)

The Hostess *i* 16 controller uses the Hostess *i* 8 as the base module. This allows you to expand an 8-port controller to a 16-port controller by simply installing the 8-port upgrade module kit.

There are several versions of the 8-port upgrade module kit available for different types of communications modes. The following upgrade modules are available:

- The RS-232/RS-422 8-port upgrade module kit in which you configure eight ports on the base controller (ports 1 through 8) and eight ports on the upgrade module (ports 9 through 16).
- The RS-232/RS-485 8-port upgrade kit in which you configure all 16 ports on the upgrade module.

- The RS-232/RS-422/RS-485 16-port upgrade module kit allows you to implement a variety of mode operations. This upgrade module permits RS-232/RS-422 mode operation on the lower 8 ports of the base controller and RS-232/RS-485 mode on the upper 8 ports (9 through 16) of the upgrade module.

  Ports 1 through 8 are jumper selectable on the base controller. You must configure the lower ports for RS-232 or RS-422 mode before installing the upgrade module. Ports 9 through 16 are jumper selectable on the upgrade module. Ports 1 through 8 must be set for RS-232 mode on the upgrade module.

For more information about the upgrade modules, see Chapter 2.

Figure 1-2 illustrates the Hostess *i* 16 (RS-232/RS-485) controller. If you want to see an illustration of a different version of the 16-port controller, see Chapter 2.

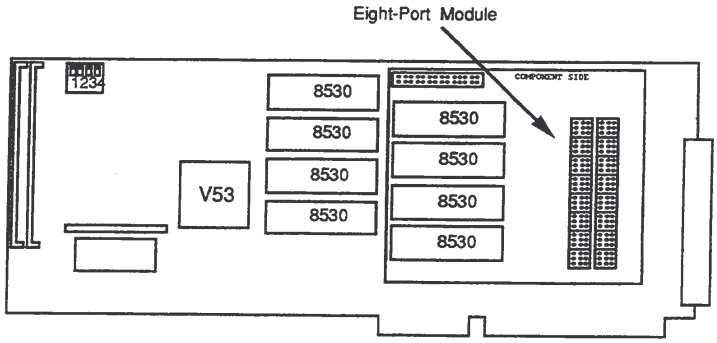


Figure 1-2. Hostess *i* 16 Controller (RS-232 and RS-485)

A system that contains several adapters, boards, and controllers can demand more power than the power supply can provide. Anytime you add a new component to your system that draws power from the system's power supply, you must ensure that you do not exceed the limits of this supply.

Table 1-1 illustrates the power requirements for the Hostess *i* controller.

Table 1-1. Hostess *i* Controller Power Requirements

Power Requirements (+ or - 10 percent)	Hostess *i* 8 Port	Hostess *i* 16 Port
+5 volts DC (VDC)	1.74 A	2.54 A
+12 VDC	3.5 mA	5.0 mA
-12 VDC	66.0 mA	220.0 mA
	32.5 British Thermal Units/hour (BTUs)	52.4 BTUs/hour

Notes: *The recommended minimum power supply is 200 watts. for the maximum number of the Hostess* i *controllers (up to four) in a system.*

Check the manuals for your system to determine the power limits for your computer. Exceeding the power can damage sensitive electronic devices, or cause them to malfunction. Determine your needs and measure them against what your system can provide.

Chapter 2.
Installing the Controller

Introduction

This chapter explains how to set up and install your new Hostess *i* controller. This includes information about the following topics:

- A checklist of the contents of the box that your controller arrived in and the tools necessary for installation.
- An overview of the default switches and jumpers set at the factory.
- How to set the I/O DIP switch for your particular application or device driver (operating system).
- How to set the shorting jumpers on the controller for RS-232, RS-422, and RS-485 modes. All versions of the controller and interface boxes default to asynchronous RS-232 communications mode. If you wish to use RS-422 or RS-485 modes, you must change the placement of your shorting jumpers on the controller.
- How to install optional memory upgrades before installing the controller.
- How to install the Hostess *i* controller in the PC.
- How to attach the interface box. The default mode is asynchronous RS-232 mode.

Note: *If you plan on using the DB25 interface box for RS-422 mode or synchronous mode, or both, use Chapter 3 or Appendix A to set the shorting jumpers in the DB25 interface box before attaching the interface box.*

After you install the controller, you may need to use Chapter 3 or Appendix A to move jumpers in the interface box before mounting the interface box

After installing the controller, setting up the interface box, and mounting the interface box, you connect your peripherals to the interface box. See Chapter 3 (asynchronous mode) or Appendix A (synchronous mode) if you need information about cabling your system.

After you have connected all of your peripherals, use Chapter 4 to run the diagnostics test diskette and the loopback plug to verify your installation. After you have verified your installation, you can install your device driver (if applicable). Use the separate software installation instructions to install the device driver for your system.

Preparing for Installation

The Hostess *i* controller is packaged with the following items:

- This guide (and possibly supplements)
- An interface housing with cable. The interface box connects to the controller. You will connect the terminals, printers, and other devices of your system.
- Diskettes that usually contain the device driver and diagnostic software needed to communicate with the operating system and test the controller.

  The test software is a diagnostic program that checks the controller. For information about how to test your system after installation, see Chapter 4.

  The software that communicates with the operating system is called a software device driver. Software device driver installation instructions are contained in a separate installation guide included in your delivery. Software installation instructions are separate from this guide because software changes frequently.
- Rubber feet and Dual Lock™ squares to fasten the interface box to the computer or to set on a table.
- A test plug, which is a loop-back plug. Use the test plug with the diagnostic software to test the signals sent and received.

Compare this list with what is in the box. If anything is missing, please call Comtrol at the number listed in the Technical Support section in Appendix F.

Warning! The Hostess *i* controller is extremely sensitive to static electricity. Static electricity may destroy the controller.

When you unpack the Hostess *i* controller, it is packed in a conductive, anti-static bag that protects it from damaging static electricity. When touching the controller, wear a grounding strap. Hold the controller by its edges only. Do not touch the connector, pins, nor any metal parts.

You will need the following items to set up your system:

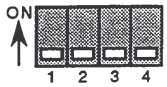
- An 80286, 80386, or 80486 based personal computer system with at least one high-density diskette drive, 512K bytes of RAM, and a 200-watt power supply.
- A monitor, display adapter, and keyboard.
- A flat-head screwdriver, a Phillips screwdriver, or a 3/16" nut-driver or wrench.
- Serial cables to connect to the interface box. (see Chapter 3 (asynchronous) or Appendix A (synchronous mode) to build these cables.)
- Computer system hardware manuals, monitor hardware manuals, and operating system manuals to refer to while you install the Hostess *i* controller.

Controller Settings Overview

Initially, the controller is set to operate at input/output (I/O) address range 218 through 21B (hexadecimal). The operating system for your computor may require different addresses. Refer to the software installation instructions, your computer reference manuals, or operating system manuals for specific instructions for I/O addresses.

Table 2-1 illustrates the factory settings for the Hostess *i* controller.

Table 2-1. Default I/O Address Settings

Factory Settings for the Hostess *i* Controller	
Communications protocol	Asynchronous
Operating mode	AT
Hexadecimal I/O Address Ranges (DIP switch SW1)	 218 - 21B
Standard Interface	EIA-232-D

The input/output base address is the start of a reserved range of I/O address space for each controller in the system. This range is a distinct I/O address space and is unrelated to ordinary memory addresses. (The base memory address is the address that is the starting location of the memory found on the controller. An interrupt vector is a reserved location in memory that specifies where the interrupt handler program for that interrupt type is located. Interrupts (IRQs) differ depending on the operating system you use; your operating system may use different interrupts, or none at all.)

Figure 2-1 illustrates the following:

- The Dual In-line Package (DIP) switch that you use to set the I/O base address.
- The jumper header pins, commonly referred to as jumpers, that you use to set communication modes (RS-232 and RS-422) for the first eight ports of the controller. If you purchased the RS-232/RS-422/RS-485 upgrade module, your board look more like Figure 2-2.

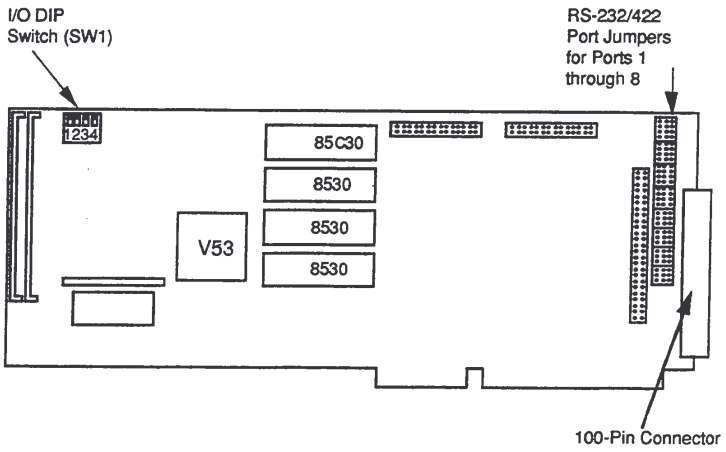


Figure 2-1. Jumper Headers and DIP Switch Location

The following sections in this chapter explain how to set DIP switches and how to place shorting jumpers on header pins.

Setting the I/O DIP Switch for Your Operating System

Before you install the Hostess *i* controller into your system, you need to set the appropriate I/O address for your operating system. Use the Dual In-line Package (DIP) switch to set the base I/O address for the Hostess *i* controller. The base I/O address is the address for I/O throughput. The system needs this I/O address identified, to pass data to and from the controller.

There are two things to consider when setting addresses:

- You can place up to four Hostess *i* controllers in your system, however, controllers cannot use the same address.
- System architectures are not standard and therefore have different addressing requirements. The operating system for your computer may require different addresses. Refer to your computer reference manuals, or operating system manuals for specific information about I/O addresses.

If you look at the controller with the component side up, and the bus connector pointing down, the switch block to set the address is at the top left of the controller.

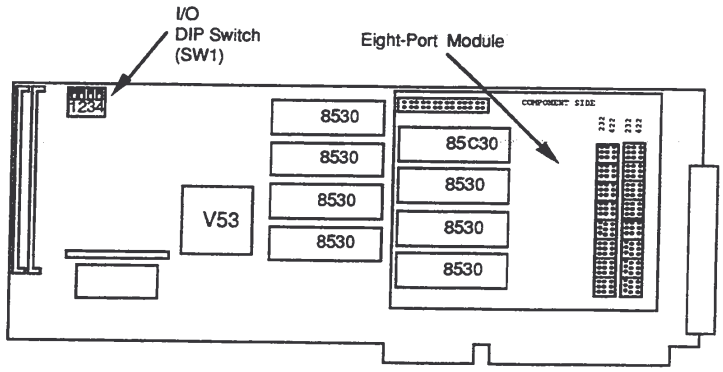
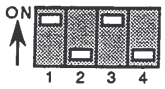


Figure 2-2. Setting the I/O Memory Addresses

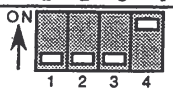
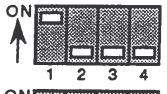
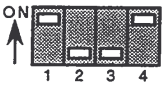
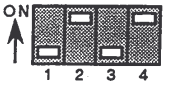
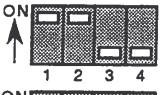
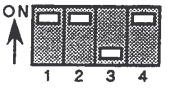
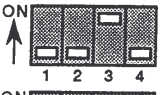
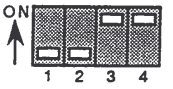
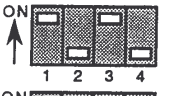
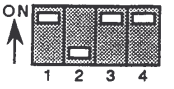
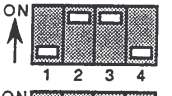
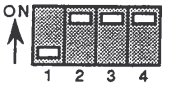
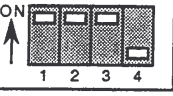
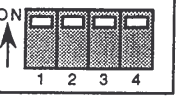
In this chapter, a white square shown at the top of the switch indicates ON. A white square at the bottom of the switch indicates OFF.

For example, the following diagram shows that switches one and three are ON, and switches two and four are OFF:



The four-position DIP switch block on the controller sets the system I/O addresses. The controller reserves four consecutive I/O addresses starting with the address set by the switches. Table 2-2 shows possible I/O addresses and their switch settings.

Table 2-2. Hostess *i* I/O Addresses

I/O Address	Dip Switch Settings (1 2 3 4)	I/O Address	Dip Switch Settings (1 2 3 4)
218h		618h	
21Ch		61Ch	
238h		638h	
23Ch		63Ch	
318h		718h	
31Ch		71Ch	
338h		738h	
33Ch		73Ch	

Setting the Shorting Jumpers for Communication Modes

The Hostess *i* controller provides several communications modes:

- RS-232 and RS-422 modes (8- or 16-port controller)

  Each port is jumper selectable. The 16 port version provides 8 ports on the base controller and an additional 8 ports on the upgrade module (part number HIUK0016A) You must configure the lower ports for RS-232 or RS-422 mode before installing the upgrade module.

- RS-232 and RS-485 modes (16-port controller, only)

  This option is available as an upgrade module to the 8-port controller or orderable with the 16-port RS-232/RS-485 option (part number HIUK1645A).

  Each port is jumper selectable, with all 16 ports configured on the upgrade module.

- RS-232, RS-422, and RS-485 modes (16-port controller, only)

  This option is available as an upgrade module to the 8-port controller or orderable with the 16-port RS-232/RS-422/RS-485 option (HIUK1655A).

  This permits RS-232 and RS-422 mode operation on the lower 8 ports of the controller and RS-232 and RS-485 mode on the upper 8 ports (9 through 16).

  Ports 1 through 8 are jumper selectable on the base controller. You must configure the lower ports for RS-232 or RS-422 mode before installing the upgrade module. Ports 9 through 16 are jumper selectable on the upgrade module. Ports 1 through 8 must be set for RS-232 mode on the upgrade module.

Note: *Make sure that you install the upgrade module (if necessary) before setting the communications mode. See Appendix B for installation instructions.*

Using RS-232 and RS-422 Modes (8 Port and 16 Port)

The controller defaults to asynchronous RS-232 communications mode. If you plan on using RS-232 mode with a Comtrol device driver, you do not need to change the default position of the shorting jumpers.

Figure 2-3 shows the location of these jumper blocks on the Hostess *i* 8 controller.

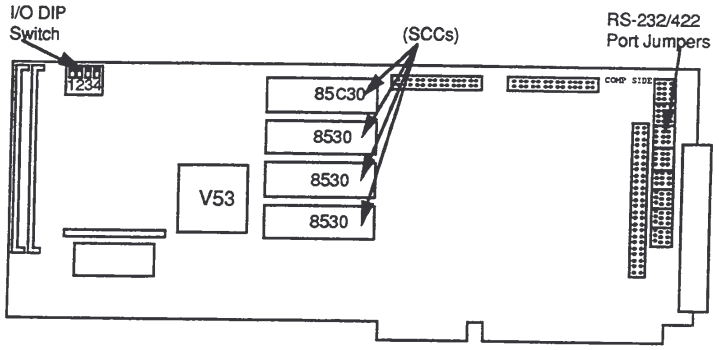


Figure 2-3. Location of the Port Jumpers Controller (8 Port)

Figure 2-4 shows the port jumpers for the Hostess *i* 16 set for RS-232 mode. Ports 1 through 8 have jumpers on the base controller, and ports 9 through 16 are located on the upgrade module.

If you wish to use RS-422 mode, you must change the placement of your shorting jumpers. For example, if you wanted to set all the ports in the following figure to RS-422 mode, you would move all the jumper pins from pins 1 and 2 to pins 2 and 3.

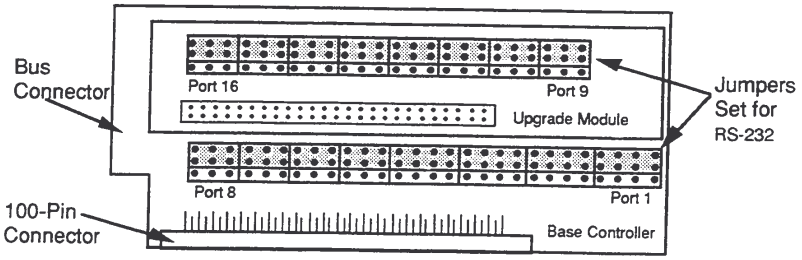
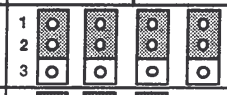
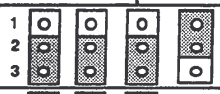
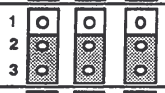
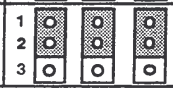
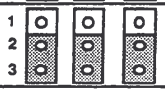


Figure 2-4. Port Jumpers Set for RS-232 on All Ports (16 Port)

The default mode is RS-232 mode, you can set any or all of the ports to RS-422 mode by simply moving the jumper pins. Use the following table to change the jumper settings for a particular port.

Table 2-3. Port Shorting Jumper Settings for RS-232/RS-422 Mode

Port Number	RS-232 Jumper Settings	RS-422 Jumper Settings
Ports 1 through 4 4) 3-pin jumpers		
Ports 5 through 8 3) 3-pin jumpers		
Ports 9 though 16 3) 3-pin jumpers		

Notes: *Place the shorting jumpers over pins 1 and 2 for RS-232 mode.*

Place the shorting jumpers over pins 2 and 3 for RS-422 mode.

If you use port 1 in synchronous RS-422 mode, you cannot use port 3 and you must set port 3 to RS-422 mode.

If you use port 2 in synchronous RS-422 mode, you cannot use port 4 and you must set port 4 to RS-422 mode.

A line terminator is jumper selectable only on ports 1 through 4. Line terminator resistors are required for ports 5 through 8 when ports 9 through 16 use RS-485/RS-232 instead ofRS-422 mode. You must request this option when ordering your controller.

Using RS-232 and RS-485 Mode (16 Port)

This controller option is available as an upgrade module to the 8- port controller or orderable with the 16-port RS-232/RS-485 option (1645A).

Figure 2-5 shows the port jumpers for the Hostess *i* 16 set for RS-232 mode. If you wish to use RS-485 mode, you must change the placement of your shorting jumpers corresponding to the port you want to change.

For example, if you wanted to set all the ports in the following figure to RS-485 mode, you would move all the jumper pins from pins 1 and 2 to pins 2 and 3.

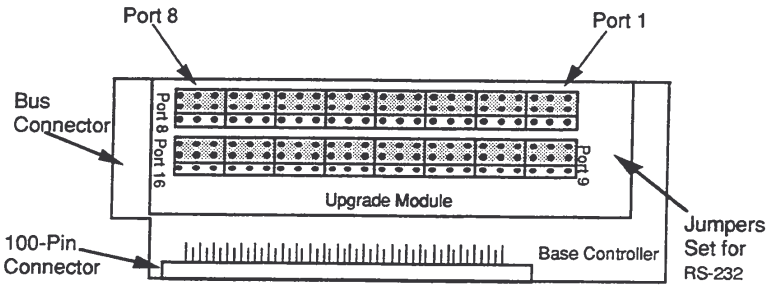


Figure 2-5. Port Jumpers Set for RS-232 on All 16 Ports

The default mode is RS-232 mode, you can set any or all of the ports to RS-485 mode by simply moving the jumper pins. Use the following table to change the jumper settings for a particular port.

Table 2-4. Port Shorting Jumper Settings for RS-232/RS-485 Mode

Port Number	RS-232 Jumper Settings	RS-485 Jumper Settings
Ports 1 through 16 3) 3-pin jumpers	1 2 3	1 2 3

Notes: *Place the shorting jumpers over pins 1 and 2 for RS-232 mode.*

Place the shorting jumpers over pins 2 and 3 for RS-485 mode.

Using RS-232, RS-422, and RS-485 Mode (16 Port)

This option is available as an upgrade module to the 8- port controller or orderable with the 16-port RS-232/RS-422/RS-485 option (1655). This permits RS-232 and RS-422 mode operation on the lower 8 ports of the controller and RS-232 and RS-485 mode on the upper 8 ports (9 through 16). Jumpers for ports 1 through 8 on the upper module must be set to RS-232 mode (default).

Figure 2-6 shows the port jumpers for the Hostess *i* 16 set for RS-232 mode. If you wish to use RS-485 mode, you must change the placement of your shorting jumpers. For example, if you wanted to set all of the upper 8 ports (ports 9 through 16) in the following figure to RS-485 mode, you would move all the jumper pins from pins 1 and 2 to pins 2 and 3. If you want to set port 3 to RS-422 mode, you would move the jumpers from pins 1 and 2 to pin 2 and 3 (on port 3 of the base controller).

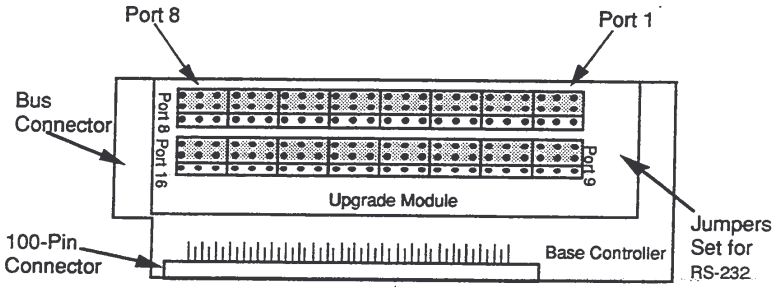
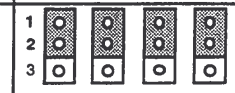
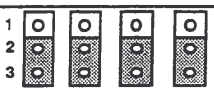
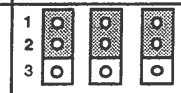
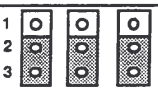
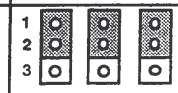
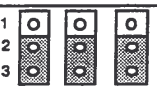
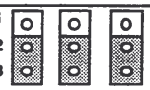


Figure 2-6. Port Jumpers Set for RS-232 on All 16 Ports

The default mode is RS-232 mode, you can set any or all of the upper 8 ports to RS-485 mode by simply moving the jumper pins on the upgrade module. Use the following table to change the jumper settings for a particular port.

Table 2-5. Port Shorting Jumper Settings for RS-232/RS-422/RS-485 Mode

Port Number	RS-232	RS-422	RS-485
Ports 1 through 4 (Base controller) 4) 3-pin jumpers			Not applicable.
Ports 5 through 8 (Base controller) 3) 3-pin jumpers			Not applicable.
Ports 9 through 16 (Upgrade module) 3) 3-pin jumpers			

Notes: *Place the shorting jumpers over pins 1 and 2 (on the base controller) for RS-232 mode on ports 1 through 8.*

Place the shorting jumpers over pins 2 and 3 (on the base controller) for RS-422 mode on ports 1 through 8.

Place the shorting jumpers over pins 2 and 3 (on the upgrade module) for RS-485 mode.

If you use port 1 in synchronous RS-422 mode, you cannot use port 3 and you must set port 3 to RS-422 mode.

If you use port 2 in synchronous RS-422 mode, you cannot use port 4 and you must set port 4 to RS-422 mode.

A line terminator is jumper selectable only on ports 1 through 4. Line terminator resistors are required for ports 5 through 8 when ports 9 through 16 use RS-485/RS-232 instead ofRS-422 mode. You must request this option when ordering your controller.

Installing Additional Memory to Upgrade the Controller

If you want to upgrade the memory size on your controller, you can add additional 80ns SIMM memory to the controller. The controller supports the following memory upgrades:

- 512K (2-256K by 8 or 2-256K by 9)
- 2M (2-1M by 8 or 2-1M by 9)
- 8M (2-4M by 8 or 2-4M by 9)

Figure 2-7 illustrates the SIMM sockets that you should insert the additional memory into.

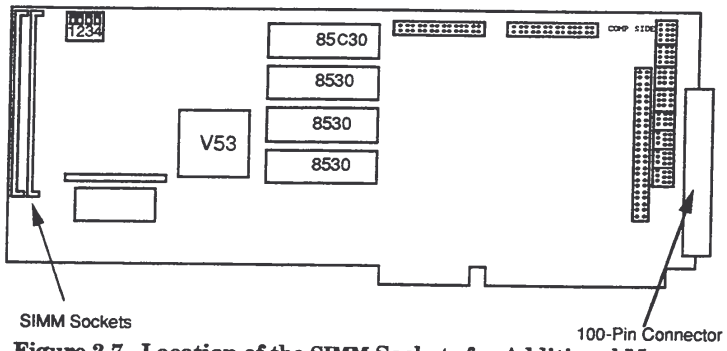


Figure 2-7. Location of the SIMM Sockets for Additional Memory

Note: *The following device drivers do not utilize the additional SIMM memory: SCO UNIX System V/386, SCO XENIX, SVR3.2, and SVR4.0 STREAMS.*

Installing the Controller

If you have performed the following tasks appropriate for your system, you are now ready to install the Hostess *i* controller into your personal computer:

- Verified that you received all of the items discussed previously in Preparing for Installation and you have the appropriate tools.
- Set the I/O address for your operating system (if required).
- Set any required jumpers for RS-232/RS-422/RS-485 communcations.
- Installed any additional memory in the SIMM sockets.

Figure 2-8 summarizes installation steps for the Hostess *i* controller after configuring the controller for the I/O address and communications modes.

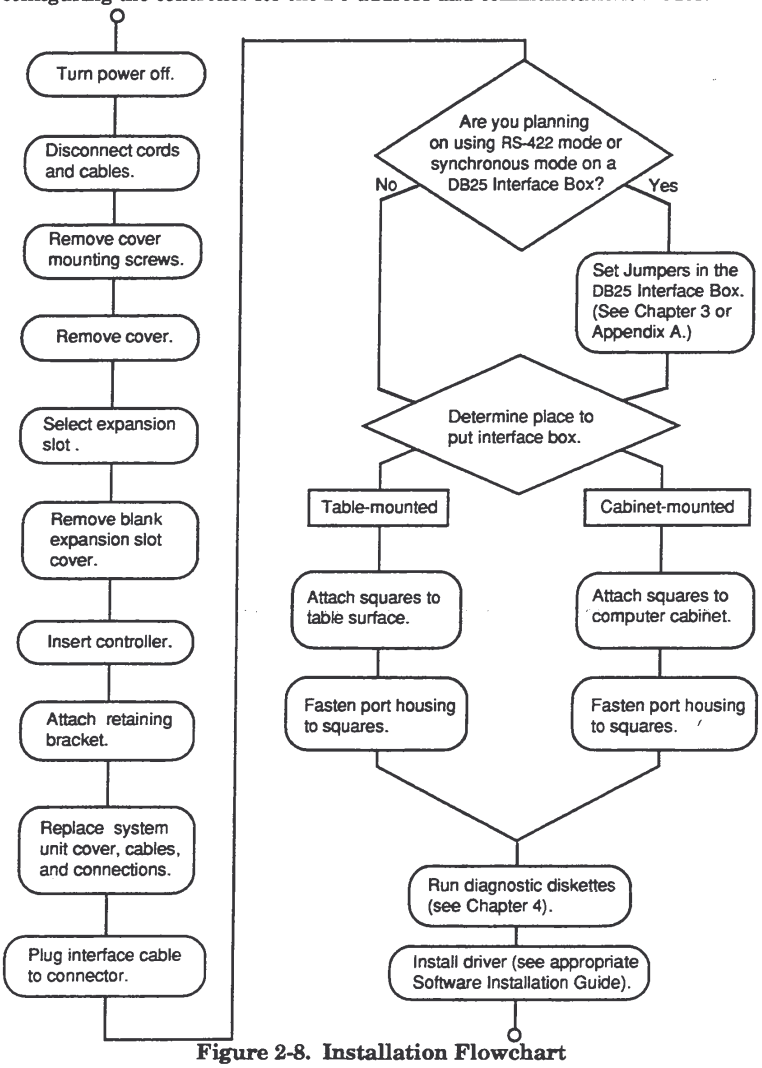


Figure 2-8. Installation Flowchart

The following steps explain in detail with illustrations of how to install your controller.

1. Turn the power switch for the system unit to the OFF position. Remove the AC power cord from the system unit AC power unit.

   WARNING: *If you ignore this step, you may expose yourself to severe electric shock.*

2. Remove system unit cover.

3. Select the slot to place the controller. Remove the machine screw that holds the expansion slot cover in place and remove the cover.

   Note: *Make sure that you have set the communications mode and the I/O address.*

4. Seat the controller in the ISA expansion slot. Hold the controller by the edges and carefully insert the controller into the adapter slot on the system controller. You will feel some resistance as you press the controller down into the slot.

5. Attach the controller to the chassis with the expansion slot screw.

6. Replace the cover on the system unit.

7. Plug the interface cable into the high-density connector on the controller. Manually twist the plug's thumbscrews into the connector. Do not twist too tightly, nor use a screwdriver to tighten; this may strip the threads of the screw.

The controller is now in place. If you are installing more than one controller, repeat Steps 3 through 5 for each controller.

If you do not planning on using synchronous mode or RS-422 mode, you can continue with the following procedures to attach the interface box.

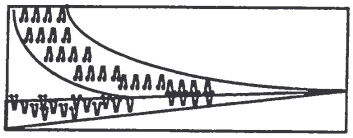
Note: *If you plan on using the DB25 interface box for RS-422 mode or ports 1 or 2 for synchronous mode, or both, you must first set jumpers in the interface box. See Chapter 3 for information about setting the DB25 interface box to RS-422 asynchronous mode. See Appendix A for information about setting jumpers in the DB25 interface box for synchronous mode.*

Attaching the Interface Box

The interface box is an interface housing that has the DB25, DB9, or modular connectors. To the back of this box you will attach either squares of Dual Lock™ fasteners, (which is similar to Velcro®), or rubber feet. You can attach this box to the back of your computer, to the top of a desk or table; anywhere that is easy to reach.

Note: *If you plan on using the DB25 interface box for RS-422 mode or ports 1 or 2 for synchronous mode, or both, you must first set jumpers in the interface box. See Chapter 3 for information about setting the DB25 interface box to RS-422 asynchronous mode. See Appendix A for information about setting jumpers in the DB25 interface box for synchronous mode.*

You will notice that the interface box comes with eight one-inch, squares mated together (four pairs) These squares allow you to securely attach the interface box. If you look closely at the strips, you can see the hooking connectors:



This material snaps together, and can be opened and closed hundreds of times.

The easiest way to align the squares to each other is to peel off the adhesive backing of one side of the mated pairs, attach them to the interface box, peel off the other side of the pairs, and place the interface box either on the back of the computer, or on a flat surface.

The easiest way to remove an interface box once the Dual Lock squares are attached is to twist the box slightly to one side, and then pull the box away.

Warning: Do not attach Velcro® to these squares. The two types of fasteners connect to each other and are very difficult to remove.

Attaching the Interface Box to the Back of the Computer

To attach the interface box to the back of the computer, use the following steps:

Note: *If you plan on using the DB25 interface box for RS-422 mode or ports 1 or 2 for synchronous mode, or both, you must first set jumpers in the interface box. See Chapter 3 for information about setting the DB25 interface box to RS-422 asynchronous mode. See Appendix A for information about setting jumpers in the DB25 interface box for synchronous mode.*

1. Plug the interface cable into the controller connector.
2. Select an area on the back that is clear of power cables, fan cover, or other cables.
3. Clean the area so that it is free of any dust or oil.
4. Peel the backing off one side of the mated pairs. Place the mated pairs in two rows, with each pair three inches apart, on the back surface of the interface box. Press firmly on the square pairs. Let the squares bond for a few minutes.
5. Peel the remaining backing off the square pairs you set on the interface box. Put the box on the back of the computer and press firmly.

Attaching the Interface Box to a Table

To attach the box to a table, use the following steps:

Note: *If you plan on using the DB25 interface box for RS-422 mode or ports 1 or 2 for synchronous mode, or both, you must first set jumpers in the interface box. See Chapter 3 for information about setting the DB25 interface box to RS-422 asynchronous mode. See Appendix A for information about setting jumpers in the DB25 interface box for synchronous mode.*

1. Plug the interface cable into the controller connector.
2. Select an area on the table that is clear of power cables, monitor cables, or other cables. The cable is 12 inches long, so you should place the box near the computer system.
3. Clean the area so that it is free of any dust or oil.
4. Peel the backing off one side either of the mated pairs of Dual Lock, or the rubber feet.

   For the Dual Lock squares, place the mated pairs in two rows, with each pair three inches apart, on the back surface of the interface box. Press firmly on the square pairs. Let the squares bond for a few minutes.

   For the rubber feet, place a foot in each corner of the interface box's back plate. Skip to step 5.
5. Peel the backing off the squares you set on the interface box.
6. Put the box on the surface of the table.

After you have installed the controller and connected the interface box, you can connect your peripherals. You may need to install a device driver for your operating system. See the separate software installation instructions to install the device driver.

Overview of Post-Installation Procedures

If you need information about connectors for your peripherals:

- See Chapter 3 for information about asynchronous cabling issues.
- See Appendix A for information about synchronous cabling issues.

After connecting the interface box to your peripherals, you can begin the controller test described in Chapter 4. After completing the controller test, go to the software installation instructions, and install the device driver for the controller.

Comtrol provides a variety of device drivers for the Hostess *i*. Device drivers establish communications between the controller and your operating system. Comtrol supports the following device drivers for the Hostess *i*:

- DOS
- DR Multiuser DOS™
- AT&T® UNIX™ System V/386
- AT&T UNIX System VR4 STREAMS and System VR4.2 STREAMS
- INTERACTIVE UNIX
- SCO™ UNIX System V/386
- SCO XENIX® System V/386
- OS/2®
- QNX® 2.15

Chapter 3.
Asynchronous Cabling and Interfaces

After installing the controller, the next phase is to connect terminals, modems, printers or other peripheral devices to the interface box. Usually this is not difficult; you can buy the correct cables from distributors and electronics stores.

Read this chapter if you want to know more about what interfaces are, or what cables are recommended.

This chapter includes the following information:

- A cabling and interface overview that discusses the parts you need to connect your controller to peripherals.
- The differences between Data Terminal Equipment (DTE) and Data Communications Equipment (DCE).
- An introduction to interface basics such as, the differences between the three supported interfaces (RS-232, RS-422, and RS-485).
- A subsection that discusses the following for DB25 (D-type, 25-pin) connectors:
  - Pin arrangement for DB25 connectors
  - Jumper settings, Hostess *i* signals, and pinouts for the DB25 interface box in RS-232 mode
  - Jumper settings, Hostess *i* signals, and pinouts for the DB25 interface box in RS-422 mode
  - Jumper settings, Hostess *i* signals, and pinouts for the DB25 interface box in RS-485 mode
- A subsection that discusses the following for DB9 (D-type, 9-pin) connectors:
  - Pin arrangement for DB9 connectors
  - Hostess *i* signals and pinouts for the DB9 interface box in RS-232 mode
  - Hostess *i* signals and pinouts for the DB9 interface box in RS-422 mode
  - Hostess *i* signals and pinouts for the DB9 interface box in RS-485 mode

- A subsection that discusses the following for the RJ45 (8-pin modular) connector :
  - Pin arrangement for RJ45 connectors
  - Hostess *i* signals and pinouts for the RJ45 interface box in RS-232 mode
  - Hostess *i* signals and pinouts for the RJ45 interface box in RS-422 mode
  - Hostess *i* signals and pinouts for the RJ45 interface box in RS-485 mode
- Discussions about basic asynchronous cables (for D-type and modular connectors) used to connect the Hostess *i* controller and peripherals.

To set up RS-422 mode or synchronous mode on ports 1 or 2, or both, you also need to set jumpers on the controller (see Chapter 2) and in DB25 the interface box.

See the subsection titled, Using Asynchronous RS-422 Mode (DB25 Interface Box) in this chapter.

See Appendix A for more detailed information about setting jumpers for synchronous mode in the DB25 interface box.

Cabling and Interface Overview

Use the following to connect the controller to your peripherals:

- The interface box that connects to the controller.
- Cables and connectors that connect the interface box to the peripherals.

The following types of interface boxes available for RS-232, RS-422, and RS-485 modes in either an 8- or 16-port version:

- DB25 (male or female 25-pin connectors)—available for asynchronous and synchronous modes
- DB9 (male or female 9-pin connectors)—available for asynchronous modes only
- RJ45 (male or female 8-pin, modular connectors)—available for asynchronous mode only

All versions of the DB9 and RJ45 interface boxes do not require any additional set up.

The default mode is RS-232 asynchronous mode, if you are using RS-232 asynchronous mode you do not need to set up the DB25 interface box.

If you are planning on using RS-422 mode or synchronous mode (ports 1 and 2, only), you need to set up the DB25 interface box.

Use this chapter to set the DB25 interface box to RS-422 asynchronous mode. Use Appendix A to set the DB25 interface box for synchronous mode.

RS-485 synchronous mode is not supported.

Connecting Peripherals

You can connect the Hostess *i* controller to several types of Data Terminal Equipment (DTE) and Data Communications Equipment (DCE). All Comtrol serial connectors are configured as DTE.

DTE and DCE conventions specify the direction of information flow for data and control signals. The DTE and DCE designations are used in both the EIA Standards RS-232, RS-422, and RS-485. (The most recent standard replaced the "RS" with "EIA." As of this printing the standard is officially called EIA-232-D. The more familiar "RS" prefix is used throughout this guide.)

The Electronic Industries Association (EIA) has defined two basic types of serial interfaces

- Data Terminal Equipment (DTE)

  The connectors on most serial boards for IBM PC™/AT compatible computers are DTE, as are most terminals.

- Data Communications Equipment (DCE)

  Most modems are configured DCE.

Other types of equipment, such as printers or plotters, may be either DTE or DCE. You should always check your equipment's documentation to determine if it is DTE or DCE.

The DTE and DCE designations become important when choosing a serial cable because a line that sends on one end must receive on the other end. Any pin that is sending in a DTE interface will be receiving in a DCE interface. This means that a DTE to DCE cable simply connects pins with the same numbers, (that is, pin 2 to pin 2, pin 3 to pin 3, and so forth.) This is often called a straight-through cable, and is usually used to connect a computer to a modem.

Figure 3-1 shows a typical computer-to-computer communications link using DTE to DCE RS-232 cables and modems.

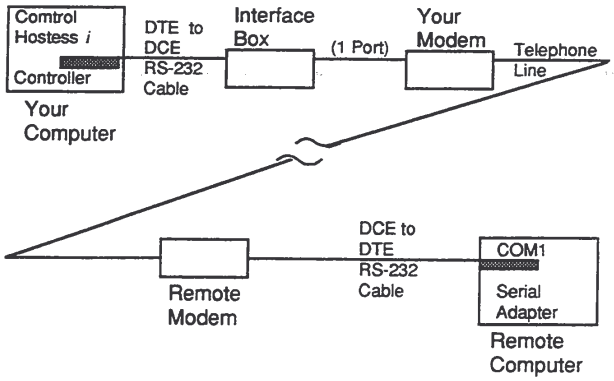


Figure 3-1. DTE to DCE Communications Link

To establish a communications link directly between a DTE Hostess *i* controller and another DTE device, such as a computer or a terminal, a DTE to DTE cable is required.

To establish a communications link, you must connect the sending pins to the receiving pins. This is done by *crossing* wires in the cable. That is, pin 2 to pin 3, pin 3 to pin 2, and so forth. This is often called a null modem cable because it has the effect of eliminating the modems in the communications link. It may also be called a crossover cable. Some typical communications links using DTE to DTE RS-232 cables are shown in Figure 3-2.

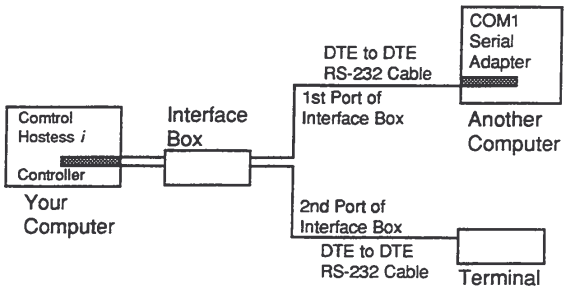


Figure 3-2. DTE to DTE Communications Link

Interface Basics

An interface is an electronic component (in this case, the Hostess *i* controller and the interface box) that links an external device to a computer. The Electronic Industries Association (EIA) has a set of standards that defines the electronic signals, the physical connection, and the circuits to use to connect computers and peripherals. The Hostess *i* controller supports three types of interfaces, using jumper settings on the controller (and in some cases in the interface box):

- RS-232
- RS-422
- RS-485 (requires a special upgrade module option)

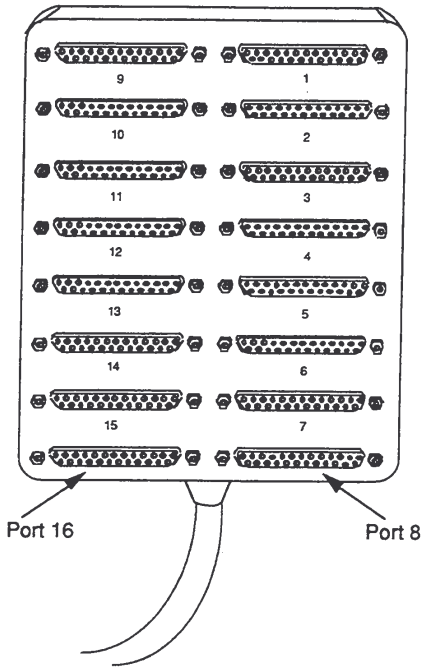


Figure 3-3. Outside View of the 16-Port DB25 Interface Box

The basic differences between the interfaces illustrated in Table 3-1.

Table 3-1. Basic Differences Between Interfaces

Interface	Transmission Distance	Data Transfer	Connector
RS-232*	(EIA-232-D) Up to 50 feet (15.24 meters). With high-quality cabling and proper conditions, transmission distance can extend beyond 200 feet (60.96 meters).	Full duplex using three lines. Modem control lines are also available.	D-type: - 9-pin male - 25-pin female Modular: 8-pin RJ45
RS-422**	(EIA-422-A) Up to 4,000 feet (1,219.20 meters).	Full duplex using two twisted pair lines.	D-type: - 9-pin male - 25-pin female Modular: 8-pin RJ45
RS-485	(EIA-485) Up to 4,000 feet (1,219.20 meters)	Half-duplex using a single twisted pair of lines.	D-type: - 9-pin male - 25-pin female Modular: 8-pin RJ45

* RS-232 asynchronous mode is the controller and interface box default.

** RS-422 uses differential transmitters and receivers, you must set the jumpers to RS-422 mode in the interface box and on the controller.

The interface box uses either D-type or modular connectors. There are two types of D-type connectors, the 9-pin and the 25-pin.

Each pin carries a signal. There are essentially two types of signals

- Data signals used to transfer information through the cable.
- Control signals used to control the flow of data in the cable.

For more detailed information about the pin arrangements and common signals for these connectors see one of the appropriate subsections.

Using Asynchronous RS-232 Mode (DB25 Interface Box)

The following subsections discuss the following topics

- Pin arrangements for 25-pin connectors
- Jumper settings for the DB25 interface box
- Hostess *i* signals assignments for the connectors on the DB25 interface box
- Pinout data for each port on the DB25 interface box

Pin Arrangements for DB25 Connectors

This subsection discusses male and female DB25 (25-pin, D-Type) connectors and the Hostess *i* signals associated with the connectors.

Figure 3-4 shows the pin arrangement of the male DB25 connector.

Figure 3-4. Pin Arrangement of the Male 25-Pin D-Type Connector

Figure 3-5 shows the pin arrangement of the female DB25 connector.

Figure 3-5. Pin Arrangement of the Female 25-Pin D-Type Connector

RS-232 Jumper Settings for the DB25 Interface Box (Default)

If you are not planning on using synchronous mode or RS-422 mode, you do not need to change any jumpers in the interface box. The DB25 interface box by default is configured for asynchronous RS-232 mode. Tables 3-2 and 3-3 illustrate the jumper settings for 8- and 16-port asynchronous RS-232 mode DB25 interface boxes.

Table 3-2. RS-232 8-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 8-Port Pin Positions	Female 8-Port Pin Positions
Port 3	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
Port 4	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
Port 5	JP21	Pin 1 to pin 2	Pin 1 to pin 2
	JP22	Pin 1 to pin 2	Pin 1 to pin 2
Ports 1, 2, 6, 7, and 8	JP5 through JP 20	Not installed	Not installed

Table 3-3. RS-232 16-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 16-Port Pin Position	Female 16-Port Pin Position
Port 3	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
Port 4	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
Port 5	JP37	Pin 1 to pin 2	Pin 1 to pin 2
	JP38	Pin 1 to pin 2	Pin 1 to pin 2
Ports1, 2, and 6 through 16	JP5 through JP36	Not installed	Not installed

RS-232 DB25 Hostess *i* Signals

Table 3-4 shows the relationship of the Hostess *i* pin signal assignments and their DTE and DCE directions for RS-232. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-232 cables and is not discussed here.

Table 3-4. Hostess *i* RS-232 DB25 Signals

Signal Name	Type	DTE Direction	DCE Direction	DB25 Pin Number
Protective ground (not used)[1]	Ground	N/A	N/A	1
Transmit Data (TxD)	Data	Send	Receive	2
Receive Data (RxD)	Data	Receive	Send	3
Request to Send (RTS)	Control	Send	Receive	4
Clear to Send (CTS)	Control	Receive	Send	5
Data Set Ready (DSR)	Control	Receive	Send	6
Signal Ground (SG)	Ground	N/A	N/A	7
Data Carrier Detect (DCD)	Control	Receive	Send	8
Not used	N/A	N/A	N/A	9 through 14
Transmit Clock (DCE)	Timing	Receive	Send	15
Not used	N/A	N/A	N/A	16
Receive Clock	Timing			17
Not used	N/A	N/A	N/A	18
Not used	N/A	N/A	N/A	19
Data Terminal Ready (DTR)	Control	Send	Receive	20
Not used	N/A	N/A	N/A	21
Not used	N/A	N/A	N/A	22
Not used	N/A	N/A	N/A	23
Not used	N/A	N/A	N/A	24
Not used	N/A	N/A	N/A	25

1. Connect cable shielding to the metal hood covering the 25-pin connector.

RS-232 Pinout Data for the DB25 Interface Box (Default)

Table 3-5 illustrates connector pinout information for the 8- and 16-port DB25 interface boxes.

Table 3-5. RS-232 DB25 Interface Box Pinout Data

Port Number	Pin Number	Name	Comments
Port 1	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	6	DSR	Port 5 CTS is disabled in RS-232 mode and DSR1 read from Port 5 CTS. Port 5 RS-422 mode is not allowed.when DSR is used.
	7	GND	None.
	8	CD	None.
	15	TXCLK	Port 3 CD is disabled in RS-232 mode and TXCLK is input to port 1 when TXCLK is used..
	17	RXCLK	Port 3 CTS is disabled in RS-232 mode and RXCLK is input to port 1. Port 3 RS-422 mode is not allowed when RXCLK is used.
	20	DTR	None.
Port 2	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	6	DSR	Port 5 CD is disabled in RS-232 mode and DSR2 is read from port 5 CD when DSR is used.
	7	GND	None.
	8	CD	None.
	15	TXCLK	Port 4 CD is disabled in RS-232 mode and TXCLK is input to port 1 when TXCLK2 is used.

(continued)

Note: *Synchronous support is available only on ports 1 and 2 at the expense of the control lines on ports 3, 4, and 5. DTR is not supported on ports 11 and 12.*

Table 3-5. RS-232 DB25 Interface Box Pinout Data (Continued)

Port Number	Pin Number	Name	Comments
Port 2 (continued)	17	RXCLK	Port 4 CTS is disabled in RS-232 mode and RXCLK is input to port 2 when RXCLK2 is used. Port 4 RS-422 mode is not allowed.
	20	DTR	None.
Ports 3 through 10	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	7	GND	None.
	8	CD	None.
	20	DTR	None.
Ports 11 and 12	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	7	GND	None.
	8	CD	None.
Ports 13 through 16	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	7	GND	None.
	8	CD	None.
	20	DTR	None.

Note: *Synchronous support is available only on ports 1 and 2 at the expense of the control lines on ports 3, 4, and 5. DTR is not supported on ports 11 and 12.*

Using Asynchronous RS-422 Mode (DB25 Interface Box)

The following subsections contain detailed information about

- Jumper settings for the DB25 interface box
- Hostess *i* signals assignments for the connectors on the DB25 interface box
- Pinout data for each port on the DB25 interface box

RS-422 Jumper Settings for the DB25 Interface Box

The DB25 interface box by default is configured for asynchronous RS-232 mode. If you want to use RS-422 mode or synchronous mode, you need to set jumpers in the interface box.

Use Figure 3-6 or Figure 3-7 and Table 3-6 to set jumpers in the 8-port interface box.

Use Figure 3-8 or Figure 3-9 and Table 3-7 to set jumpers in the 16-port interface box.

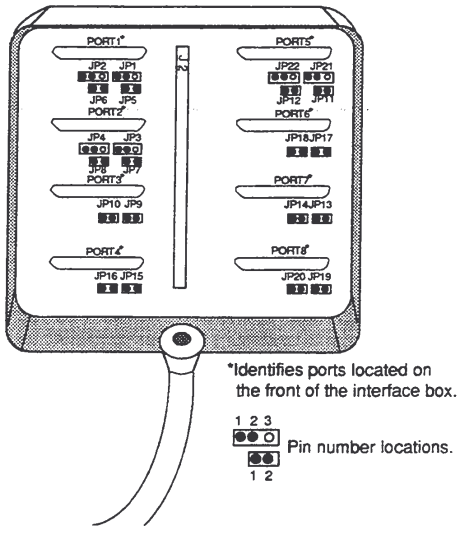


Figure 3-6. Inside View of the 8-Port Male DB25 Interface Box

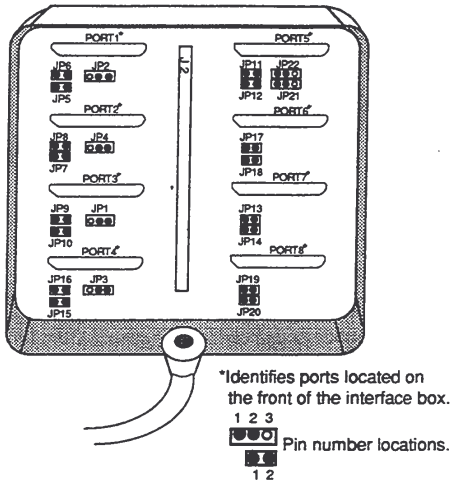


Figure 3-7. Inside View of the 8-Port Female DB25 Interface Box

Table 3-6. RS-422 8-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 8-Port Pin Positions	Female 8-Port Pin Positions
Port 1	JP5	Pin 1 to pin 2	Pin 1 to pin 2
	JP6	Pin 1 to pin 2	Pin 1 to pin 2
Port 2	JP7	Pin 1 to pin 2	Pin 1 to pin 2
	JP8	Pin 1 to pin 2	Pin 1 to pin 2
Port 3	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
	JP9	Pin 1 to pin 2	Pin 1 to pin 2
	JP10	Pin 1 to pin 2	Pin 1 to pin 2
Port 4	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
	JP15	Pin 1 to pin 2	Pin 1 to pin 2
	JP16	Pin 1 to pin 2	Pin 1 to pin 2
Port 5	JP11	Pin 1 to pin 2	Pin 1 to pin 2
	JP12	Pin 1 to pin 2	Pin 1 to pin 2
	JP21	Pin 1 to pin 2	Pin 1 to pin 2
	JP22	Pin 1 to pin 2	Pin 1 to pin 2
Port 6	JP17	Pin 1 to pin 2	Pin 1 to pin 2
	JP18	Pin 1 to pin 2	Pin 1 to pin 2
Port 7	JP13	Pin 1 to pin 2	Pin 1 to pin 2
	JP14	Pin 1 to pin 2	Pin 1 to pin 2
Port 8	JP19	Pin 1 to pin 2	Pin 1 to pin 2
	JP20	Pin 1 to pin 2	Pin 1 to pin 2

Note: *The pins are numbered 1 through 13, from left to right (with the cable of the interface box pointing down).*

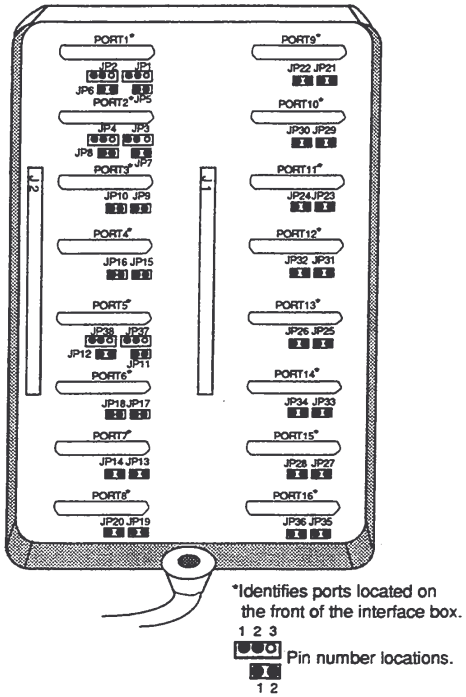


Figure 3-8. Inside View of the 16-Port Male DB25 Interface Box

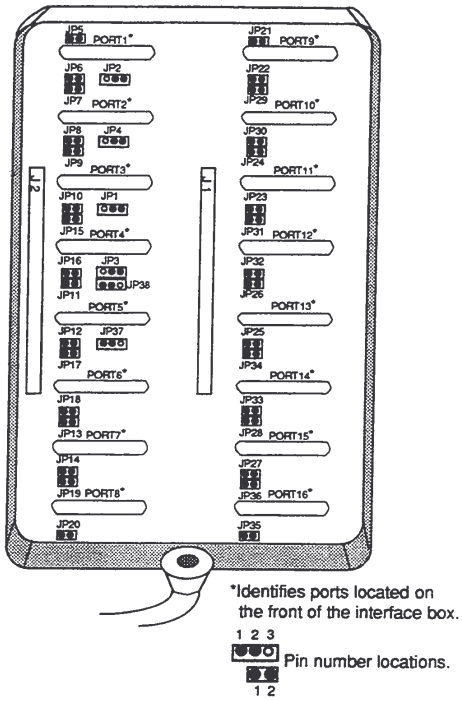


Figure 3-9. Inside View of the 16-Port Female DB25 Interface Box

Table 3-7. RS-422 16-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 16-Port Pin Position	Female 16-Port Pin Position
Port 1	JP5	Pin 1 to pin 2	Pin 1 to pin 2
	JP6	Pin 1 to pin 2	Pin 1 to pin 2
Port 2	JP7	Pin 1 to pin 2	Pin 1 to pin 2
	JP8	Pin 1 to pin 2	Pin 1 to pin 2
Port 3	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
	JP9	Pin 1 to pin 2	Pin 1 to pin 2
	JP10	Pin 1 to pin 2	Pin 1 to pin 2
Port 4	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
	JP15	Pin 1 to pin 2	Pin 1 to pin 2
	JP16	Pin 1 to pin 2	Pin 1 to pin 2
Port 5	JP11	Pin 1 to pin 2	Pin 1 to pin 2
	JP12	Pin 1 to pin 2	Pin 1 to pin 2
	JP37	Pin 1 to pin2	Pin 1 to pin 2
	JP38	Pin 1 to pin 2	Pin 1 to pin 2
Port 6	JP17	Pin 1 to pin 2	Pin 1 to pin 2
	JP18	Pin 1 to pin 2	Pin 1 to pin 2
Port 7	JP13	Pin 1 to pin 2	Pin 1 to pin 2
	JP14	Pin 1 to pin 2	Pin 1 to pin 2
Port 8	JP19	Pin 1 to pin 2	Pin 1 to pin 2
	JP20	Pin 1 to pin 2	Pin 1 to pin 2
Port 9	JP21	Pin 1 to pin 2	Pin 1 to pin 2
	JP22	Pin 1 to pin 2	Pin 1 to pin 2
Port 10	JP29	Pin 1 to pin 2	Pin 1 to pin 2
	JP30	Pin 1 to pin 2	Pin 1 to pin 2
Port 11	JP23	Pin 1 to pin 2	Pin 1 to pin 2
	JP24	Pin 1 to pin 2	Pin 1 to pin 2
Port 12	JP31	Pin 1 to pin 2	Pin 1 to pin 2
	JP32	Pin 1 to pin 2	Pin 1 to pin 2
Port 13	JP25	Pin 1 to pin 2	Pin 1 to pin 2
	JP26	Pin 1 to pin 2	Pin 1 to pin 2
Port 14	JP33	Pin 1 to pin 2	Pin 1 to pin 2
	JP34	Pin 1 to pin 2	Pin 1 to pin 2
Port 15	JP27	Pin 1 to pin 2	Pin 1 to pin 2
	JP28	Pin 1 to pin 2	Pin 1 to pin 2
Port 16	JP35	Pin 1 to pin 2	Pin 1 to pin 2
	JP36	Pin 1 to pin 2	Pin 1 to pin 2

RS-422 DB25 Hostess *i* Signals

Table 3-8 shows the relationship of the Hostess *i* pin signal assignments and their DTE and DCE directions for RS-422. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-422 cables and is not discussed here.

Table 3-8. Hostess *i* RS-422 DB25 Signals

Signal Name	Type	DTE Direction	DCE Direction	DB25 Pin Number
Protective ground (not used)[1]	Ground	N/A	N/A	1
Not used	N/A	N/A	N/A	2 – 6
Signal ground (SG)	Ground	N/A	N/A	7
Not used	N/A	N/A	N/A	8
+Receive clock (RXCLK+)	Clock	Receive	Send	9
-Receive clock (RXCLK-)	Clock	Receive	Send	10
Not used	N/A	N/A	N/A	11
+Transmit clock (TXCLK+)	Clock	Send	Receive	12
-Transmit clock (TXCLK-)	Clock	Send	Receive	13
Not used	N/A	N/A	N/A	14
+Receive Data (RxD+)	Data	Receive	Send	15
Not used	N/A	N/A	N/A	16
-Receive Data (RxD-)	Data	Receive	Send	17
Not used	N/A	N/A	N/A	18
+Transmit Data (TxD+)	Data	Send	Receive	19
Not used	N/A	N/A	N/A	20 – 24
-Transmit Data (TxD-)	Data	Send	Receive	25

1. Connect cable shielding to the metal hood covering the 25-pin connector.

RS-422 Pinout Data for the DB25 Interface Box

Table 3-9 illustrates connector pinout information for the DB25 interface box.

Table 3-9. RS-422 DB25 Interface Pinout Data

Port Name	Pin Number	Name	Comments
Port 1	9	RXCLK+	Port 3 is unavailable in any mode, set port 3 on the controller to RS-422 mode.
	10	RXCLK-	Port 3 is unavailable in any mode, set port 3 on the controller to RS-422 mode.
	12	TXCLK+	Port 3 is unavailable in any mode, set port 3 on the controller to RS-422 mode.
	13	TXCLK-	Port 3 is unavailable in any mode, set port 3 on the controller to RS-422 mode.
	15	RX+	None.
	17	RX-	None.
	19	TX+	None.
	25	TX-	None.
Port 2	9	RXCLK+	Port 4 is unavailable in any mode, set port 4 on the controller to RS-422 mode.
	10	RXCLK-	Port 4 is unavailable in any mode, set port 4 on the controller to RS-422 mode.
	12	TXCLK+	Port 4 is unavailable in any mode, set port 4 on the controller to RS-422 mode.
	13	TXCLK-	Port 4 is unavailable in any mode, set port 4 on the controller to RS-422 mode.
Ports 3 through 16	15	RX+	None.
	17	RX-	None.
	19	TX+	None.
	25	TX-	None.

Using Asynchronous RS-485 Mode (DB25 Interface Box)

The following subsections contain detailed information about

- Jumper settings for the DB25 interface box
- Hostess *i* signals assignments for the connectors on the DB25 interface box
- Pinout data for each port on the DB25 interface box

RS-485 Jumper Settings for the DB25 Interface Box

The DB25 interface box by default is configured for asynchronous RS-232 mode. If you want to use RS-485 mode or synchronous mode, you need to set jumpers in the interface box.

Use the previously illustrated Figures 3-6 or 3-7 and Table 3-10 to set jumpers in the 8-port interface box.

Table 3-10. RS-485 8-Port DB25 Interface Jumper Settings

Port Number	Jumper	Male 8-Port Pin Positions	Female 8-Port Pin Positions
Port 3	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
Port 4	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
Port 5	JP21	Pin 1 to pin 2	Pin 1 to pin 2
	JP22	Pin 1 to pin 2	Pin 1 to pin 2
Ports 1, 2, 6, 7, and 8	JP5 through JP 20	Not installed	Not installed

Use the previously illustrated Figures 3-8 or 3-9 and Table 3-11 to set jumpers in the 16-port interface box.

Table 3-11. RS-485 16-Port DB25 Interface Jumper Settings

Port Number	Jumper	Male 16-Port Pin Position	Female 16-Port Pin Position
Ports 1 and 2		Not installed	Not installed
Port 3	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
Port 4	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
Port 5	JP37	Pin 1 to pin 2	Pin 1 to pin 2
	JP38	Pin 1 to pin 2	Pin 1 to pin 2
Port 6 through port 16	JP5 through JP36	Not installed	Not installed

RS-485 DB25 Hostess *i* Signals

Table 3-12 shows the relationship of the Hostess *i* pin signal assignments and their DTE and DCE directions for RS-485. The following table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-485 cables and is not discussed here.

Table 3-12. Hostess *i* RS-485 DB25 Signals

Signal Name	Type	DB25 Pin Number
Transmit/Receive (TX/RX)	Data	19
Transmit/Receive (TX/RX)	Data	25

RS-485 Pinout Data for the DB25 Interface Box

Table 3-13 illustrates the pinout data for the DB25 interface box.

Table 3-13. RS-485 DB25 Interface Pinout Data

Port Name	Pin Number	Name
Ports 1 through 16	19	TX/RX+
	25	TX/RX-

Using DB9 Connectors and the DB9 Interface Box

The following subsections discuss the following topics

- Pin arrangements for 9-pin connectors
- Hostess *i* signals assignments for the connectors on the DB9 interface box
- Pinout data for each port on the DB9 interface box

Pin Arrangements for DB9 Connectors

This subsection discusses male and female DB9 (9-pin D-type) connectors.

Figure 3-10 shows the pin arrangement of the male DB9 connector.

Figure 3-10. Male DB9 Connector Pin Arrangement

Figure 3-11 shows the pin arrangement of the female DB9 connector.

Figure 3-11. Female DB9 Connector Pin Arrangement

RS-232 DB9 Hostess *i* Signals

Table 3-14 shows Hostess *i* RS-232 signals the 9-pin connector. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-232 cables and is not discussed here.

Table 3-14. Hostess *i* RS-232 DB9 Signals

Signal Name	Signal Type	DTE Direction	DCE Direction	DB9 Pin Number
Data Carrier Detect (DCD)	Control	Receive	Send	1
Receive Data (RxD)	Data	Receive	Send	2
Transmit Data (TxD)	Data	Send	Receive	3
Data Terminal Ready (DTR)	Control	Send	Receive	4
Signal Ground (SG)	Ground	N/A	N/A	5
Data Set Ready (DSR) (not supported)	Control	Receive	Send	6
Request to Send (RTS)	Control	Send	Receive	7
Clear to Send (CTS)	Control	Receive	Send	8
Ring Indicator (RI) (not supported)	Control	Receive	Send	9

RS-232 Pinout Data for the DB9 Interface Box (Default)

The DB9 interface box by default is configured for asynchronous RS-232 mode. Table 3-15 illustrates connector pinout information for the DB9 interface box.

Table 3-15. RS-232 DB9 Interface Pinout Data

Port Number	Pin Number	Name
Ports 1 through 10 and Ports 13 through 16	1	CD
	2	RX
	3	TX
	4	DTR
	5	GND
	7	RTS
	8	CTS
Ports 11 through 12	1	CD
	2	RX
	3	TX
	5	GND
	7	RTS
	8	CTS

Note: *The DTR signal is not supported on ports 11 and 12.*

RS-422 DB9 Hostess *i* Signals

Table 3-16 shows Hostess *i* RS-422 signals the 9-pin connector. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-422 cables and is not discussed here.

Table 3-16. Hostess *i* RS-422 DB9 Signals

Signal Name	Signal Type	DTE Direction	DCE Direction	DB9 Pin Number
Not used	N/A	N/A	N/A	1
-Receive Data (RxD-)	Data	Receive	Send	2
-Transmit Data (TxD-)	Data	Send	Receive	3
Not used	N/A	N/A	N/A	4
Signal Ground (SG)	Ground	N/A	N/A	5
Not used	N/A	N/A	N/A	6
+Receive Data (RxD+)	Data	Receive	Send	7
+Transmit Data (TxD+)	Data	Send	Receive	8
Not used	N/A	N/A	N/A	9

RS-422 Pinout Data for the DB9 Interface Box

The DB9 interface box by default is configured for asynchronous RS-422 mode. Table 3-17 illustrates connector pinout information for the 8- and 16-port DB9 interface boxes.

Table 3-17. RS-422 DB9 Interface Pinout Data

Port Number	Pin Number	Name
Ports 1 through 16	2	RX-
	3	TX-
	7	RX+
	8	TX+

RS-485 DB9 Hostess *i* Signals

Table 3-18 shows Hostess *i* RS-485 signals the 9-pin connector. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-485 cables and is not discussed here.

Table 3-18. Hostess *i* RS-485 DB9 Signals

Signal Name	Type	DB9 Pin Number
Transmit/Receive (TX/RX)	Data	8
Transmit/Receive (TX/RX)	Data	3

RS-485 Pinout Data for the DB9 Interface Box

The DB9 interface box by default is configured for asynchronous RS-485 mode. Table 3-19 illustrates connector pinout information for the 8- and 16-port DB9 interface boxes.

Table 3-19. RS-485 DB9 Interface Pinout Data

Port Number	Pin Number	Name
Ports 1 through 16	8	TX/RX+
	3	TX/RX-

Using Modular Connectors and the RJ45 Interface Box

The following subsections discuss the following topics.

- Pin arrangements for modular connectors
- Hostess *i* signals assignments for the connectors on the RJ45 interface box
- Pinout data for each port on the RJ45 interface box

Pin Arrangements for RJ45 Connectors

A modular connector is a phone-jack type connector. The most common RS-232-C signals are located on pins two through seven. This allows a six-position modular plug (RJ-11) to be used if all signals are not required. Do not use a four-position modular plug; this can damage the modular connectors. Figure 3-12 illustrates the pin arrangement for the modular connector.

For reference, pin 1 is on the left end of the modular jack, when viewed from the edge of the board. Pin 1 of the modular plug is on the left side of the plug when viewed with the key on the underside of the plug, and the gold contacts visible on the top.

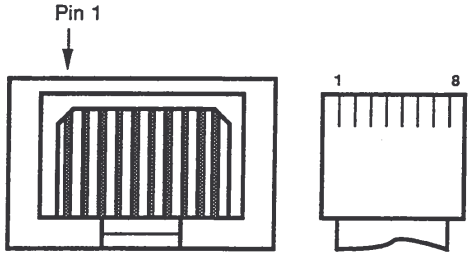


Figure 3-12. Modular (RJ45) Jack and Plug

RS-232 Pinout Data for the RJ45 Interface Box

The RJ45 interface box by default is configured for asynchronous RS-232 mode. Table 3-20 illustrates connector pinout information for the RJ45 8- and 16-port interface boxes.

Table 3-20. RS-232 RJ45 Interface Pinout Data

Port Number	Pin Number	Name
Ports 1 through 10	1	RTS
and	2	DTR
Ports 13 through 16	3	GND
	4	TX
	5	RX
	6	CD
	8	CTS
Ports 11 through 12	1	RTS
	3	GND
	5	TX
	6	CD
	8	CTS

RS-232 RJ45 Hostess *i* Signals

Table 3-21 shows Hostess *i* RS-232 signals for the modular connector. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-232 cables and is not discussed here.

Table 3-21. Hostess *i* RS-232 RJ45 Signals

Signal Name	Signal Type	DTE Direction	DCE Direction	RJ45 Pin Number
Request to Send (RTS)	Control	Send	Receive	1
Data Terminal Ready (DTR)	Control	Send	Receive	2
Signal Ground (SG)	Ground	N/A	N/A	3
Transmit Data (TxD)	Data	Send	Receive	4
Receive Data (RxD)	Data	Receive	Send	5
Data Carrier Detect (DCD)	Control	Receive	Send	6
Not used	N/A	N/A	N/A	7
Clear to Send (CTS)	Control	Receive	Send	8

RS-422 Pinout Data for the RJ45 Interface Box

Table 3-22 illustrates connector pinout information for the 8- and 16-port RJ45 interface boxes.

Table 3-22. RS-422 RJ45 Interface Pinout Data

Port Number	Pin Number	Name
Ports 1 through 16	1	RX+
	4	TX-
	5	RX-
	8	TX+

RS-422 RJ45 Hostess *i* Signals

Table 3-23 shows Hostess *i* RS-422 signals for the modular connector. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-422 cables and is not discussed here.

Table 3-23. Hostess *i* RS-422 RJ45 Signals

Signal Name	Signal Type	DTE Direction	DCE Direction	RJ45 Pin Number
Receive Data (RxD+)	Data	Receive	Send	1
Not used	N/A	N/A	N/A	2-3
Transmit Data (TxD-)	Data	Send	Receive	4
Receive Data (RxD-)	Data	Send	Receive	5
Not used	N/A	N/A	N/A	6-7
Transmit Data (TxD+)	Data	Receive	Send	8

RS-485 Pinout Data for the RJ45 Interface Box

Table 3-24 illustrates connector pinout information for the 8- and 16-port RJ45 interface boxes.

Table 3-24. RS-485 RJ45 Interface Pinout Data

Port Number	Pin Number	Name
Ports 1 through 16	8	TX/RX+
	4	TX/RX-

RS-485 RJ45 Hostess *i* Signals

Table 3-25 shows Hostess *i* RS-485 signals for the modular connector. The table shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-485 cables and is not discussed here.

Table 3-25. Hostess *i* RS-485 RJ45 Signals

Signal Name	Type	RJ45 Pin Number
Transmit/Receive (TX/RX)	Data	8
Transmit/Receive (TX/RX)	Data	4

Cables for D-Type Connectors

The cable used to connect DTEs and DCEs have specific requirements; including how to shield cables, the layout of the wires, and which connectors to use.

A cable consists of two connectors connected by wires. These wires connect the pins of one connector to the pins of another connector. The interface box has either eight or sixteen ports (using either 9-pin or 25-pin male or female connectors), so one end of the cable must use the reciprocal connector.

Different peripherals use specific cables. Check your equipment to understand what kind of cable to use. Determine what signals the device supports; this may help you choose the appropriate cable.

Figures 3-13 and 3-14 illustrate two basic cabling examples.

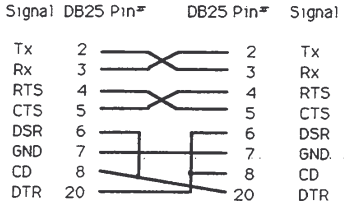


Figure 3-13. DTE to DTE Null-Modem Cable

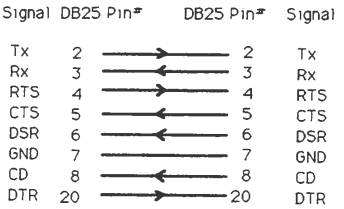


Figure 3-14. DTE to DCE Modem Cable

Shielding Cables

The RS-232-D Comtrol Hostess *i* controller falls within the limits for a Class A computing device established by the FCC. To comply with these limits, the serial cables used to connect the Hostess *i* controller to external devices should be shielded.

If shielding is used in the serial cable, this shield should be connected to a metal or metallized connector shroud on the opposite end of the cable. It is not necessary to connect the shield to a connector pin on the end of the cable connected to the Hostess *i* controller.

Cables for Modular Connectors

Cables for the modular connector are easily available from your distributor or any electronics store. One way to connect peripherals with D-shell connectors to a modular interface box is to use a straight-through cable and build an adapter.

A cable consists of two connectors connected by wires. These wires connect the pins of one connector to the pins of another connector. The interface box has either eight or sixteen ports (using modular connectors), so one end of the cable must use the reciprocal connector. Figure 3-15 illustrates a cabling scheme for RJ45.

Different peripherals use specific cables. Check your equipment to understand what kind of cable to use. Determine what signals the device supports; this may help you choose the appropriate cable.

The following pages show how to build adapters if you want to connect RJ45 cables to DB25 pin connectors. RJ45 to RJ45 cable is inexpensive and easily available, as are RJ45 to DB25 adapters.

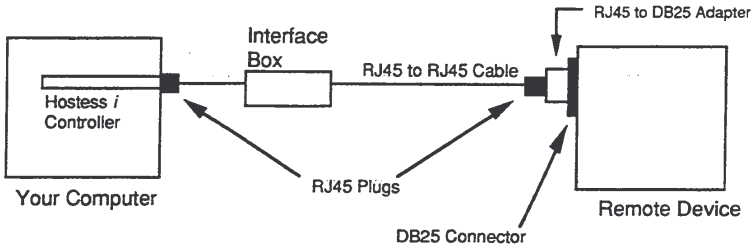


Figure 3-15. RJ45 Cabling Scheme

Configuring RJ45 to DB Shell Adapters

The RJ45 to DB25 adapters are readily available and easily customized for different needs. The following figures showing how these adapters must be internally wired for three popular applications. These figures assume that the adapter is used with the crossover cable.

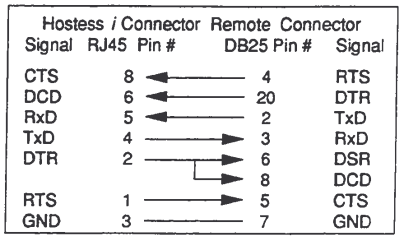


Figure 3-16. RJ45 to DB25 Adapter, RS-232 DTE to DTE Cable

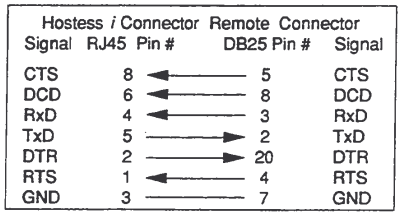


Figure 3-17. RJ45 to DB25 Adapter, RS-232 DTE to DCE Cable

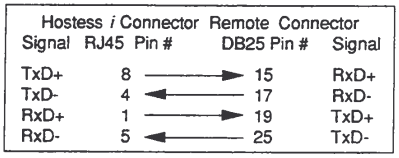


Figure 3-18. RJ45 to DB25 Adapter, RS-422 DTE to DTE cable

Chapter 4.
Testing the Controller

This chapter discusses how to use the

- Diagnostic diskette to test the controller circuitry.
- Test plug to test each port.

The first part of the diagnostic test sets up the memory address for the controller. You can set the memory address for above 1 megabyte or below 1MB.

Testing the Controller Using the Diagnostic Diskette

Use the *Controller Diagnostic for Hostess i* to check each port of the controller. The diagnostic test is operating system independent; you use it at start-up, or after you restart your system. The diagnostic is a series of messages and tests of the controller circuitry. This diagnostic can test all Comtrol intelligent controllers.

The diagnostic test is a bootable 5.25 inch or 3.5 inch, low density diskette.

Note: *If your system cannot start-up from a diskette, you cannot use this test.*

Use the following procedure to test the controller.

1. Insert the diagnostic diskette into the appropriate diskette drive, and turn-on the system.

   The program is a series of prompts that asks you for responses. After starting the system, the program begins and the following screen appears:

```
                    COMTROL Corporation


                Controller Diagnostic for HOSTESS i

                     Release 2.XX  MM DD, 19XX


            Copyright (C) 1989-92 COMTROL Corporation
                       All rights reserved


                     Press <ENTER> to continue:
```

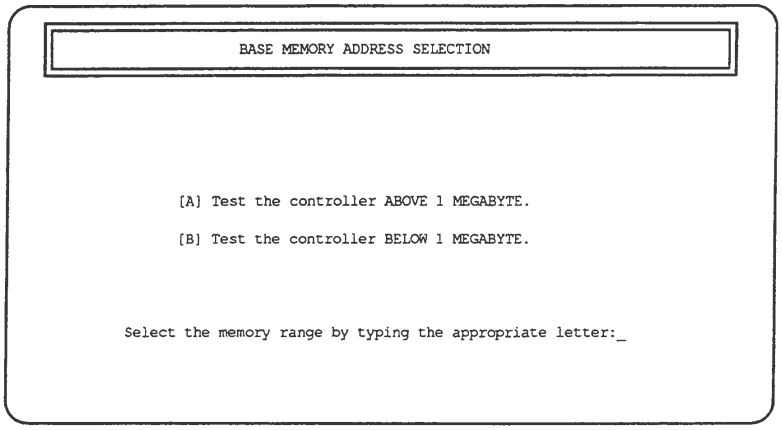
2. Press <Enter> to start the program.

   The program prompts you for the controller's I/O address.

```
                    I/O BASE ADDRESS SELECTION

        The four-position DIP switch on the Hostess i sets the
        I/O address.  The address you choose here must match
        the actual switch setting on the Hostess i.

              [A] 218h              [I] 618h
              [B] 21Ch              [J] 61Ch
              [C] 238h              [K] 638h
              [D] 23Ch              [L] 63Ch
              [E] 318h              [M] 718h
              [F] 31Ch              [N] 71Ch
              [G] 33Ch              [O] 738h
              [H] 33Ch              [P] 73Ch

      Select the I/O base address by typing the appropriate letter:_
```

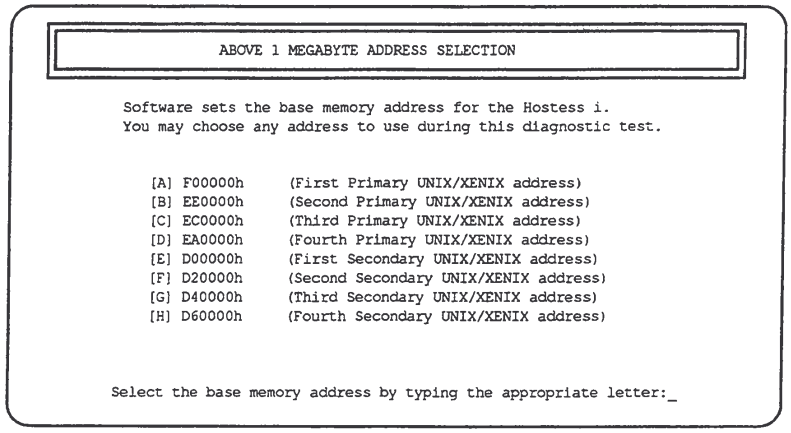
3. Determine where in memory the controller should be tested and select `A` or `B`.

   - If you select option A (testing the controller above 1 MB, go to the following subsection.
   - If you select option B (testing the controller below 1 MB, go to the subsection titled, Testing Below the One Megabyte Address Space.



Testing Above the One Megabyte Address Space

4. Select an address for the controller.

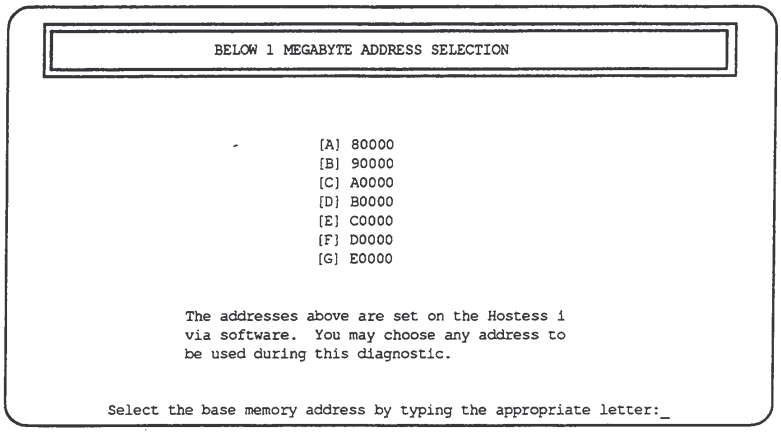


The test searches for the controller at the chosen I/O address and base memory address.

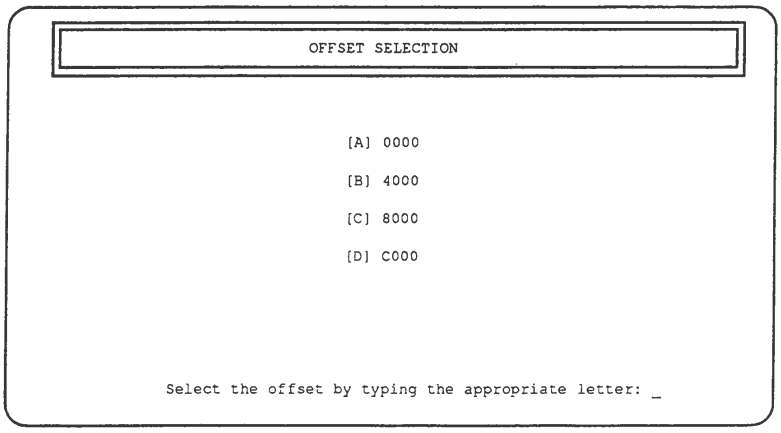
5. To complete the testing, see the subsection titled, Continuing the Test.

Testing Below the One Megabyte Address Space

4. Select a base memory address for the controller.



5. Select an offset into this address.



To complete the testing, see the subsection titled, Continuing the Test.

Continuing the Test

This subsection assumes that you performed Steps 1 through 5.

The program searches for the controller in your system (where XXXXXH is the hexadecimal address). When the diagnostic test finds a Comtrol intelligent controller, the program reports the address (or, for an above one-megabyte address, the address plus a 64K offset) to you.

```
SEARCHING FOR COMTROL MULTIUSER BOARD AT ADDRESS XXXXXH

Found controller at address XXXXXH
Do you wish to continue testing [Y]: y
```

Note: *At each prompt throughout the test, the default answer appears in brackets.*

6. Press <Enter> or `y` to continue the diagnostic test.

   The first test finds the Input/Output (I/O) base address (where XXXH is the hexadecimal address).

```
I/O BASE ADDRESS SEARCH

Found I/O address XXXH
Do you wish to continue testing [Y]: y
```

7. Press <Enter> or `y` to continue the diagnostic test.

   The second test identifies the controller:

```
CONTROLLER TYPE SEARCH

Controller type has been verified as HOSTESS i
Do you wish to continue testing [Y]: y
```

8. Press <Enter> or `y` to continue the diagnostic test.

The next series of tests check the registers and random access memory on the Hostess *i* controller:

```
SYSTEM DUAL PORT RAM TEST
Testing ...........OK
START REGISTER & MEMORY CONTROL PROGRAM - OK

ON BOARD PROCESSOR RAM TEST

Testing ..............................

128K RAM tested good
Do you wish to continue testing [Y]: y
```

9. Press <Enter> or y to continue the diagnostic test.

The next step of the diagnostic program concentrates on the Comtrol Hostess *i* serial ports using the test plug. Go to the next subsection to continue testing your controller.

Testing the Ports Using the Test Plug

The serial port tests follow the circuitry tests. This subsection assumes that you have already performed steps 1 through 9 in the subsection titled, Testing the Controller Using the Diagnostic Diskette.

The following series of tests concentrate on the signals sent and received through the serial ports using the test plug. The test plug is a loop-back plug (also known as a wrap plug) which returns the signals sent to it.

The following message appears for each port before the tests start.

```
EXIT REGISTER & MEMORY CONTROL PROGRAM - OK

START SERIAL I/O CONTROL PROGRAM - OK


SERIAL CONTROLLER TEST, PORT 1

Install test plug on PORT 1, press <ENTER> when ready to continue.
```

10. Press <Enter> or `y` to continue the test.

    The Serial Controller Test checks the modem control signals for the port and presents a message for each signal.

```
SERIAL CONTROLLER TEST, PORT 1

Install test plug on PORT 1, press <Enter> when ready to continue
Serial I/O test ............. - OK
Modem control RTS to CTS - OK
Modem control DTR to CD - OK

Install test plug on PORT 2, unless there are no more ports to test.
Are there more ports to test [Y]: y
```

11. You can test every port on the controller the same way. Move the loop-back plug from one port to the next port (see Figure 4-1 for the order of the ports).

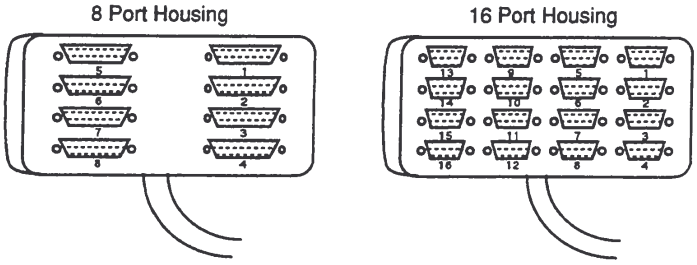


Figure 4-1. Port Locations For the 8-Port or 16-Port Interface Box

When you finish testing the ports, the program resets the controller.

```
EXIT SERIAL I/O CONTROL PROGRAM - OK
SOFTWARE RESET TEST - OK
Reset issued, waiting for controller to reboot .. - OK
```

12. When testing is complete, a table appears that summarizes the test results. If you have problems, see the following subsection that describes what to do if you encounter diagnostic problems.

```
TEST SUMMARY

COMTROL CONTROLLER SEARCH                  - OK
I/O BASE ADDRESS SEARCH                    - OK
CONTROLLER TYPE SEARCH                     - OK
SYSTEM DUAL-PORT RAM TEST                  - OK
START REGISTER & MEMORY CONTROL PROGRAM    - OK
ON BOARD PROCESSOR RAM TEST                - OK
EXIT REGISTER & MEMORY CONTROL PROGRAM     - OK


Press <ENTER> to view remainder of summary:



TEST SUMMARY

START SERIAL I/O PROGRAM                   - OK
SERIAL CONTROLLER TEST, PORT 1             - OK
SERIAL CONTROLLER TEST, PORT 2             - OK
 .
 .
 .
SERIAL CONTROLLER TEST, PORT 16            - OK
EXIT SERIAL I/O CONTROL PROGRAM            - OK
```

Note: *If you test in RS-422 mode, the RTS to CTS test fails. CTS and RTS signals are not supported in RS-422.*

13. The diagnostics ask you if you want to test a different Hostess *i* controller. If you install more than one controller, you should test the remaining boards.

    To test any remaining boards, press <Enter> or `y` and go back to step 2 of this chapter.

    If you only have one Hostess *i* controller or have tested the last controller, go to step 14.

14. Remove the diskette from drive A, reboot the system, and install the driver software. See the appropriate software device driver installation guide.

What to Do If You Encounter a Diagnostic Problem

The purpose of a diagnostic program is to test your controller. If you encounter any problems, first check your system and connectors, then rerun the test. If problems persist, write down the diagnostic codes and contact Comtrol. See Chapter 5 for troubleshooting information.

In the following example, Port 1 does not pass the Serial I/O Test, nor does it recognize the modem control signals:

```
SERIAL CONTROLLER TEST, PORT 1
Install test plug on PORT 1, unless there are no more ports to test.
Are there more ports to test [Y]: y
Serial I/O test . - FAIL
Modem control RTS to CTS - FAIL
Modem control DTR to DSR - FAIL
Modem control DTR to CD - FAIL

Serial I/O test error.  Check that the test plug is on the correct port.
Please report the following number when calling for technical support: 11 - 24

The modem control failures shown above will occur if your Comtrol board does
not support these signals.  For each of the following questions, respond (Y) if
your board does not support the signal mentioned.
 Disable RTS to CTS testing on remaining ports [Y]:
 Disable DTR to DSR testing on remaining ports [Y]:
 Disable DTR to CD testing on remaining ports [Y]:

If you are unable to resolve the problem, call Comtrol Technical Support at
(800) 926-6876 or (612) 631-7654

Do you wish to continue testing [Y]: y
```

In this example, you may call Comtrol and describe the problem (The Serial I/O Test fails) and refer to the error number (11-24).

Chapter 5.
Troubleshooting

Should you experience difficulty using the Hostess *i* controller, this chapter provides some simple diagnostics to follow. Table 5-1 lists simple problems, possible causes, and possible solutions.

If your problem appears in Table 5-1, first try the suggested solutions. If problems persist:

1. Remove the device driver and reinstall it.
2. Remove the controller and reinstall it.
3. Run the Comtrol operating system independent diagnostic test diskette.
4. Check-out your system using system diagnostics provided by your computer manufacturer (if any).

Table 5-1. Possible Solutions for Problems

Problem	What May Be Wrong	What to Do
'No Adapter Active' message.	1) Controller set at wrong address.	Check address settings of DIP switch.
	2) Controller not seated all the way in the adapter slot.	Power down, reseat adapter, and power up.
	3) Address collision.	Use secondary addresses.
Controller active, but data garbled.	Wrong parity, baud, or speed set.	Check settings or reinstall device driver.
Controller active, can send but not receive data.	Memory caching.	Check version of BIOS chip, use appropriate address configuration.
Transparent Print active, but printer cannot receive or send data.	Mismatched port names.	Enable the "normal" ports. Match correct `tpru0X` with `ttyU0X`.
Modem cannot send or receive data.	DSR or DCD signal is set high.	Check modem signal settings.
Inconsistent data on screen.	Power overload.	Determine if system components exceed power supply.

In Case of Difficulty

If you encounter problems or have questions about the drivers or the installation procedures, call

Comtrol Corporation

Phone:

(612) 631-7654

1-800-926-6876 (US),

(44) 844-261-634 (UK)

or

FAX:

(612) 631-8117 (US),

(44) 844-261-227 (UK)

Chapter 6.
Controller Specifications

This chapter lists Hostess *i* controller specifications.

The Hostess *i* controller is an eight- or sixteen-port, intelligent controller, which offers several features:

- The V53 processor found on the Hostess *i* controller relieves the system processor of port I/O processing.
- Dual-ported RAM shared between the system processor and the controller processor allows for easy memory transfers.
- Sixteen bit memory transfers increase the amount of data passed from the peripherals to the processor.
- Modem control provides easy data communications.

The Comtrol Hostess *i* controller operates under these conditions:

Table 6-1. Conditions Specifications

Condition	Values
Air temperature: System on System off	 0 to 50 degrees C -65 to 150 degrees C
Humidity: System on System off	 8% to 80% 20% to 80%
Altitude:	 0 to 10,000 feet 0 to 3,048 meters
Heat output: 8-port Hostess *i* controller with 128K 16-port Hostess *i* controller with 128K	 32.5 BTU/Hr 52.4 BTU/Hr

Tables 6-2 lists the specifications for the Comtrol Hostess *i* controller.

Table 6-2. Controller Specifications

Function	Specification
I/O ports/expansion slot	8 to 16 ports per 1 expansion slot
Interface	EIA-232-D, EIA-422-A, EIA-485
Base memory address	Software selected
I/O port address	Switch selected
Processor	12 MHz NEC V53
Serial Communication Controller	Z8530
Hardware interrupt	Software selected (IRQ 3, 4, 5, 9, 10, 11, 12, 15)
Control (by device driver software): Baud rate Data bits Stop bits	 50 thru 38.4K bit/sec. 5, 6, 7, or 8 1, 1.5, or 2
Modem control	RTS, CTS, DCD, DTR
Synchronous communication	Available on ports 1 and 2 only.
Power requirements (+ or -10%): +5 VDC +12 VDC -12 VDC	8-Ports 16-Ports 1.74 A 2.54 A 3.5 mA 5.0 mA 66.0 mA 220.0 mA
Power consumption: (8 and 16 port) +5 VDC +12 VDC -12 VDC	Total power consumption: 8-Port 16-Ports 8.70 W 12.7 W 0.42 W 0.06 W 0.792 W 2.64 W
RAM	128K dual-ported upgrade to 640K, 2M, or 8M with 512K dual port using 80 ns or faster SIMMs
EPROM	32K
Bus interface	ISA or compatible 16-bit data, 24-bit address.
FCC certification	FCC Class A for section 15 subpart J conducted and radiated types of interface. Rounded shielded cable EIA-232-D.
Dimensions	AT height, full length card.

Appendix A.
Synchronous Cabling and Interfaces

This appendix provides the information that you need to set up synchronous mode for your controller. The only interface box that supports synchronous mode is the DB25 interface box. The DB25 interface box is set to asynchronous mode by default. If you want to use synchronous mode on ports 1 and 2, you need to set jumpers in the DB25 interface box. Synchronous mode is permitted only on ports 1 and 2.

After installing the controller, the next phase is to connect terminals, modems, printers or other peripheral devices to the DB25 interface box. Usually this is not difficult; you can buy the correct cables from distributors and electronics stores.

Read the beginning of Chapter 3 if you want to know more about the following topics:

- The difference between Data Terminal Equipment (DTE) and Data Communications Equipment (DCE).
- An introduction to interface basics such as, the differences between the two supported interfaces (RS-232 and RS-422).

This appendix includes the following information:

- A cabling and interface overview that discusses the parts you need to connect your controller to peripherals.
- A subsection that discusses the following for DB25 (D-type, 25-pin) connectors:
  - Pin arrangement for DB25 connectors (RS-232 and RS-422)
  - Jumper settings, Hostess *i* signals,and pinouts for the DB25 interface box in RS-232 mode
  - Jumper settings, Hostess *i* signals, and pinouts for the DB25 interface box in RS-422 mode
- Discussions about basic synchronous cables for DB25 connectors used to connect the Hostess *i* controller and peripherals.

If you need information about setting the DB25 interface box for asynchronous mode, see Chapter 2.

Cabling and Interface Overview

To connect the controller to your peripherals, you use the following:

- An interface box that connects to the controller
- Cables and connectors that connect the interface box to the peripherals

To operate your controller in synchronous mode, you need a DB25 interface box. You can only configure ports 1 and 2 in synchronous mode (if available). The remaining ports operate in asynchronous mode. The DB25 interface box is available in either an 8- or 16-port version that you can configure for RS-232 and RS-422 modes.

Using Synchronous RS-232 Mode

The following subsections discuss these topics for synchronous RS-232 mode:

- Jumper settings for the inside of the interface box
- Signal assignments for the D-type connectors on the DB25 interface box
- Pinout data for each port on the DB25 interface box

Pin Arrangements for DB25 Connectors

This subsection discusses male and female DB25 (25-pin, D-Type) ©9 connectors. See Table

Figure A-1 shows the pin arrangement of the male DB25 connector.

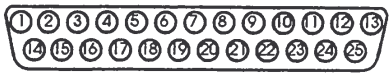


Figure A-1. Pin Arrangement of the Male 25-Pin D-Type Connector

Figure A-2 shows the pin arrangement of the female DB25 connector.

Figure A-2. Pin Arrangement of the Female 25-Pin D-Type Connector

RS-232 Jumper Settings (Default)

The DB25 interface box by default is configured for asynchronous RS-232 mode. Figures A-3 and A-4 illustrate the 8-port male and female DB25 interface boxes. Figures A-5 and A-6 illustrate the 16-port male and female DB25 interface boxes.

Tables A-1 and A-2 illustrate the jumper settings for 8- and 16-port synchronous RS-232 mode in the DB25 interface box.

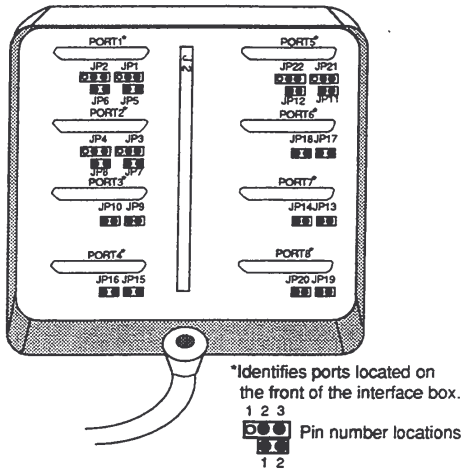


Figure A-3. Inside View of the 8-Port Male DB25 Interface Box

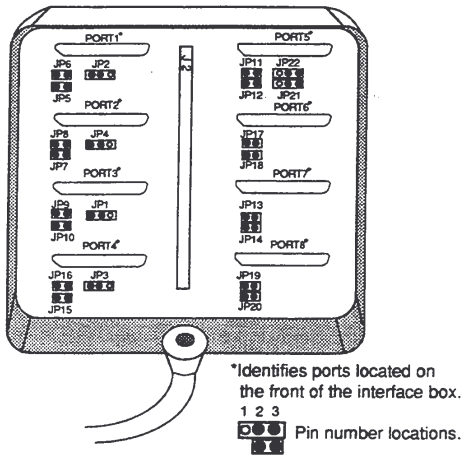


Figure A-4. Inside View of the 8-Port Female DB25 Interface Box

Table A-1. RS-232 8-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 8-Port Pin Position	Female 8-Port Pin Position
Port 1	JP1	Pin 2 to pin 3	Pin 1 to pin 2
	JP2	Pin 2 to pin 3	Pin 1 to pin 2
	JP21	Pin 2 to pin 3	Pin 2 to pin 3
Port 2	JP3	Pin 2 to pin 3	Pin 1 to pin 2
	JP4	Pin 2 to pin 3	Pin 1 to pin 2
	JP22	Pin 2 to pin 3	Pin 2 to pin 3
Ports 3 through 8	JP5 through JP20	Not installed	Not installed

Notes: *CD (Carrier Detect) and CTS (Clear to send) are not supported on ports 3 through 5 in this mode. Only ports 1 and 2 can be configured for RS-232 synchronous operation. Ports 1 and 2 support DSR in this mode.*

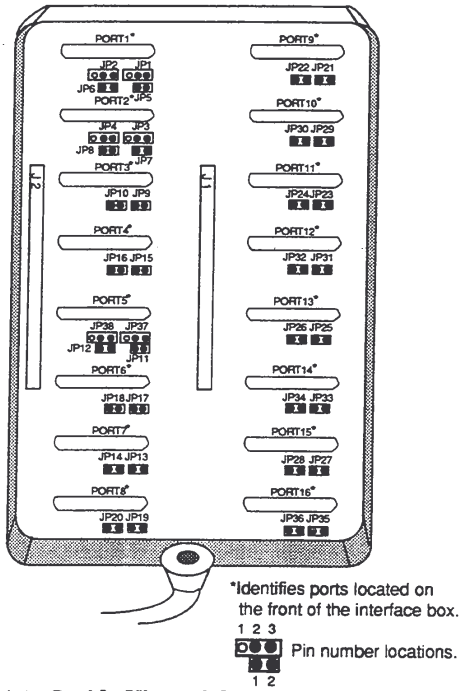


Figure A-5. Inside View of the 16-Port Male DB25 Interface Box

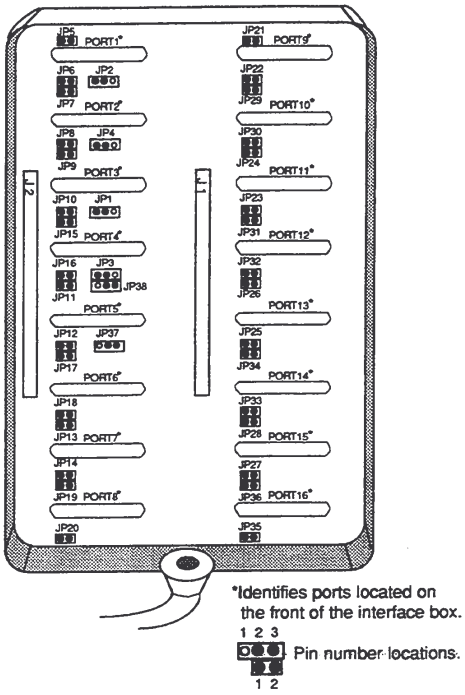


Figure A-6. Inside View of the 16-Port Female DB25 Interface Box

Table A-2. RS-232 16-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 16-Port Pin Position	Female 16-Port Pin Position
Port 1	JP1	Pin 2 to pin 3	Pin 1 to pin 2
	JP2	Pin 2 to pin 3	Pin 1 to pin 2
	JP37	Pin 2 to pin 3	Pin 2 to pin 3
Port 2	JP3	Pin 2 to pin 3	Pin 1 to pin 2
	JP4	Pin 2 to pin 3	Pin 1 to pin 2
	JP38	Pin 2 to pin 3	Pin 2 to pin 3
Ports 3 through port 16	JP5 through JP36	Not installed	Not installed

Notes: *CD (Carrier Detect) and CTS (Clear to send) are not supported on ports 3 through 5 in this mode. Only Ports 1 and 2 can be configured for RS-232 synchronous operation. Ports 1 and 2 support DSR in this mode.*

The pins are numbered 1 through 3, from left to right (with the cable of the interface box pointing down).

RS-232 DB25 Hostess *i* Signals

The next table shows the relationship of the Hostess *i* pin signal assignments and their DTE and DCE directions for RS-232. The tables shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-232 cables and is not discussed here.

Table A-3. Hostess *i* RS-232 DB25 Signals

Signal Name	Type	DTE Direction	DCE Direction	DB25 Pin Number
Protective ground (not used)[1]	Ground	N/A	N/A	1
Transmit Data (TxD)	Data	Send	Receive	2
Receive Data (RxD)	Data	Receive	Send	3
Request to Send (RTS)	Control	Send	Receive	4
Clear to Send (CTS)	Control	Receive	Send	5
Data Set Ready (DSR)[2]	Control	Receive	Send	6
Signal Ground (SG)	Ground	N/A	N/A	7
Data Carrier Detect (DCD)	Control	Receive	Send	8
Not used	N/A	N/A	N/A	9 through 14
Transmit Clock (DCE)	Timing	Receive	Send	15
Not used	N/A	N/A	N/A	16
Receive Clock	Timing			17
Not used	N/A	N/A	N/A	18
Not used	N/A	N/A	N/A	19
Data Terminal Ready (DTR)[3]	Control	Send	Receive	20
Not used	N/A	N/A	N/A	21
Not used	N/A	N/A	N/A	22
Not used	N/A	N/A	N/A	23
Not used	N/A	N/A	N/A	24
Not used	N/A	N/A	N/A	25

1. Connect cable shielding to the metal hood covering the 25-pin connector.
2. Only for use on ports 1 and 2.
3. Not for use on ports 11 and 12.

RS-232 Pinout Data

Table A-4 illustrates the pinout data for the DB25 interface box.

Table A-4. RS-232 DB25 Interface Box Pinout Data

Port Number	Pin Number	Name	Comments
Port 1	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	6	DSR	Port 5 CTS is disabled in RS-232 mode and DSR1 read from Port 5 CTS. Port 5 RS-422 mode is not allowed when DSR is used.
	7	GND	None.
	8	CD	None.
	15	TXCLK	Port 3 CD is disabled in RS-232 mode and TXCLK is input to port 1 when TXCLK is used..
	17	RXCLK	Port 3 CTS is disabled in RS-232 mode and RXCLK is input to port 1. Port 3 RS-422 mode is not allowed when RXCLK is used.
	20	DTR	None.
Port 2	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	6	DSR	Port 5 CD is disabled in RS-232 mode and DSR2 is read from port 5 CD when DSR is used.
	7	GND	None.
	8	CD	None.
	15	TXCLK	Port 4 CD is disabled in RS-232 mode and TXCLK is input to port 1 when TXCLK2 is used.
	17	RXCLK	Port 4 CTS is disabled in RS-232 mode and RXCLK is input to port 2 when RXCLK2 is used. Port 4 RS-422 mode is not allowed.
	20	DTR	None.

(continued)

Note: *Synchronous support is available only on ports 1 and 2 at the expense of the control lines on ports 3, 4, and 5. DTR is not supported on ports 11 and 12.*

Table A-4. RS-232 DB25 Interface Box Pinout Data (Continued)

Port Number	Pin Number	Name	Comments
Ports 3 through 10	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	7	GND	None.
	8	CD	None.
	20	DTR	None.
Ports 11 and 12	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	7	GND	None.
	8	CD	None.
Ports 13 through 16	2	TX	None.
	3	RX	None.
	4	RTS	None.
	5	CTS	None.
	7	GND	None.
	8	CD	None.
	20	DTR	None.

Note: *Synchronous support is available only on ports 1 and 2 at the expense of the control lines on ports 3, 4, and 5. DTR is not supported on ports 11 and 12.*

Using Synchronous RS-422 Mode

The next several subsections discuss the following topics for RS-422 mode:

- Jumper settings for the inside of the interface box
- Signal assignments for the D-type connectors on the DB25 interface box
- Pinout data for each port on the DB25 interface box

RS-422 Jumper Settings

The DB25 interface box by default is configured for asynchronous RS-232 mode. If you want to use RS-422 mode or synchronous mode, you need to set jumpers in the interface box.

You can use the previously illustrated figures and Table A-5 to set jumpers in the 8-port interface box. You can use the previously illustrated figures and Table A-6 to set jumpers in the 16-port interface box.

Table A-5. RS-422 8-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 8-Port Pin Position	Female 8-Port Pin Position
Port 1	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
	JP5	Pin 1 to pin 2	Pin 1 to pin 2
	JP6	Pin 1 to pin 2	Pin 1 to pin 2
	JP9	Not installed	Not installed
	JP10	Not installed	Not installed
	JP21	Pin 1 to pin 2	Pin 1 to pin 2
Port 2	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
	JP7	Pin 1 to pin 2	Pin 1 to pin 2
	JP8	Pin 1 to pin 2	Pin 1 to pin 2
	JP15	Not installed	Not installed
	JP16	Not installed	Not installed
	JP22	Pin 1 to pin 2	Pin 1 to pin 2
Ports 3 through 8	JP11 through JP14	Not installed	Not installed
	JP17 through JP20	Not installed	Not installed

Notes: *Ports 3 and 4 cannot be used in this mode.*

Only ports 1 and 2 can be configured for RS-422 synchronous operation.

Table A-6. RS-422 16-Port DB25 Interface Box Jumper Settings

Port Number	Jumper	Male 16-Port Pin Position	Female 16-Port Pin Position
Port 1	JP1	Pin 1 to pin 2	Pin 2 to pin 3
	JP2	Pin 1 to pin 2	Pin 2 to pin 3
	JP5	Pin 1 to pin 2	Pin 1 to pin 2
	JP6	Pin 1 to pin 2	Pin 1 to pin 2
	JP9	Not installed	Not installed
	JP10	Not installed	Not installed
	JP37	Pin 1 to pin 2	Pin 1 to pin 2
Port 2	JP3	Pin 1 to pin 2	Pin 2 to pin 3
	JP4	Pin 1 to pin 2	Pin 2 to pin 3
	JP7	Pin 1 to pin 2	Pin 1 to pin 2
	JP8	Pin 1 to pin 2	Pin 1 to pin 2
	JP15	Not installed	Not installed
	JP16	Not installed	Not installed
	JP38	Pin 1 to pin 2	Pin 1 to pin 2
Ports 3 through 16	JP11 through JP36	Not installed	Not installed

Notes: *Ports 3 and 4 cannot be used in this mode.*

Only ports 1 and 2 can be configured for RS-422 synchronous operation.

RS-422 Hostess *i* DB25 Signals

The next table shows the relationship of the Hostess *i* pin signal assignments and their DTE and DCE directions for RS-232. The tables shows that signals with the same name have opposite directions in DTE interfaces as in DCE interfaces. The ground is present in all RS-232 cables and is not discussed here.

Table A-7. Hostess *i* RS-422 DB25 Signals

Signal Name	Type	DTE Direction	DCE Direction	DB25 Pin Number
Protective ground (not used)[1]	Ground	N/A	N/A	1
Not used	N/A	N/A	N/A	2 – 6
Signal ground (SG)	Ground	N/A	N/A	7
Not used	N/A	N/A	N/A	8
+Receive clock (RXCLK+)	Clock	Receive	Send	9
-Receive clock (RXCLK-)	Clock	Receive	Send	10
Not used	N/A	N/A	N/A	11
+Transmit clock (TXCLK+)	Clock	Send	Receive	12
-Transmit clock (TXCLK-)	Clock	Send	Receive	13
Not used	N/A	N/A	N/A	14
+Receive Data (RxD+)	Data	Receive	Send	15
Not used	N/A	N/A	N/A	16
-Receive Data (RxD-)	Data	Receive	Send	17
Not used	N/A	N/A	N/A	18
+Transmit Data (TxD+)	Data	Send	Receive	19
Not used	N/A	N/A	N/A	20 – 24
-Transmit Data (TxD-)	Data	Send	Receive	25

1. Connect cable shielding to the metal hood covering the 25-pin connector.

RS-422 Pinout Data

Table A-8 illustrates connector pinout information for the DB25 interface box.

Table A-8. RS-422 DB25 Interface Pinout Data

Port Name	Pin Number	Name	Comments
Port 1	9	RXCLK+	Port 3 is unavailable in any mode, set the controller to RS-422 mode.
	10	RXCLK-	Port 3 is unavailable in any mode, set the controller to RS-422 mode.
	12	TXCLK+	Port 3 is unavailable in any mode, set the controller to RS-422 mode.
	13	TXCLK-	Port 3 is unavailable in any mode, set the controller to RS-422 mode.
	15	RX+	None.
	17	RX-	None.
	19	TX+	None.
	25	TX-	None.
Port 2	9	RXCLK+	Port 4 is unavailable in any mode, set the controller to RS-422 mode.
	10	RXCLK-	Port 4 is unavailable in any mode, set the controller to RS-422 mode.
	12	TXCLK+	Port 4 is unavailable in any mode, set the controller to RS-422 mode.
	13	TXCLK-	Port 4 is unavailable in any mode, set the controller to RS-422 mode.
Ports 3 through 16	15	RX+	None.
	17	RX-	None.
	19	TX+	None.
	25	TX-	None.

Note: *Ports 3 and 4 are not available for use when using ports 1 and 2 for synchronous mode.*

Synchronous Cables for RS-232 DB25 Connectors

The cable used to connect DTEs and DCEs have specific requirements; including how to shield cables, the layout of the wires, and which connectors to use.

A cable consists of two connectors connected by wires. These wires connect the pins of one connector to the pins of another connector. The DB25 interface box has either eight or sixteen ports (using 25-pin female connectors), so one end of the cable must use the reciprocal connector.

Different peripherals use specific cables. Check your equipment to understand what kind of cable to use. Determine what signals the device supports; this may help you choose the appropriate cable.

Figure A-7 illustrates a basic cabling example.

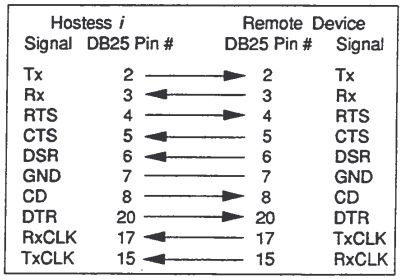


Figure A-7. DTE to DCE Modem Cable (Hostess *i* RS-232 Synchronous Ports 1 & 2 Only)

Shielding Cables

The RS-232-D Hostess *i* controller falls within the limits for a Class A computing device established by the FCC. To comply with these limits, the serial cables used to connect the Hostess *i* controller to external devices should be shielded. This shield should be connected to a metal or metallized connector shroud on each end of the cable. It is not necessary to connect the shield to a connector pin on the end of the cable connected to the controller.

If shielding is used in the serial cable, this shield should be connected to a metal or metallized connector shroud on the opposite end of the cable. It is not necessary to connect the shield to a connector pin on the end of the cable connected to the Hostess *i* controller.

Appendix B.
Upgrading the Hostess *i* 8 Controller

Comtrol provides you with three 16-port upgrade options:

- 16-port RS-232 and RS 422
- 16-port RS-232 and RS-485
- 16-port RS-232, RS-422, and RS-485

Use one of the following sets of installation instructions.

Upgrading to 16 Ports (RS-232 and RS-422)

To upgrade your Hostess *i* 8 controller to an Hostess *i* 16 controller, follow these steps:

1. Purchase an upgrade kit and a 16-port interface box from your distributor or from Comtrol Corporation. The kit contains the module.
2. Remove the controller from your system.
3. Set ports 1 through 8 on the base board for the appropriate modes (RS-232 or RS-422). See Chapter 2 for information about setting the controller for RS-232 or RS-422 mode.

   Note: *This version allows you to configure ports 1 through 8 on the base controller and and ports 9 through 16 on the upgrade module.*

4. Connect the module to the controller using the following procedure:

   a. Put the controller on a horizontal, flat surface (a table or work area, for example).

   b. Align the module's P1 connector to the Hostess *i* 8 J1 socket, and P2 to J2. Press down, putting pressure directly over the module's connectors. The module will snap into place.

   c. If you are planning on using RS-422 mode on ports 9 through 16, you need to move the jumpers on the upgrade module. See Chapter 2 to set your controller for RS-422 mode.

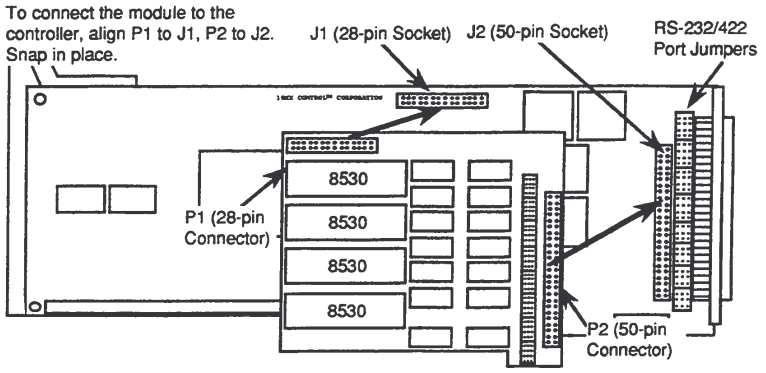


Figure B-1. Aligning Sockets to Connectors

5. Replace the controller in your system. Attach the retaining bracket to the system unit chassis.

   If you plan on using synchronous mode or RS-422 mode, you also need to move the jumpers in the DB25 interface box.

   See Chapter 3 for information about configuring the interface box for asynchronous RS-422 mode.

   See Appendix A for information about configuring the interface box for synchronous mode.

   After configuring the interface box, you can go on to Step 6.

6. Plug the interface box cable onto the 100-pin connector.

7. Determine where you want to put the interface box. You can use the instructions in Chapter 2 to mount the interface box.

8. Reinstall the device driver to upgrade from 8 ports to 16 ports. Refer to your device driver installation instructions to reinstall the software.

9. Enable the ports on the module using the device driver installation instructions .

Upgrading to 16 Ports (RS-232 and RS-485)

To upgrade your Hostess *i* 8 controller to an Hostess *i* 16 controller with RS-232 and RS-485 capabilities, follow these steps:

1. Purchase an upgrade kit and a 16-port interface box from your distributor or from Comtrol Corporation. The kit contains the module.
2. Remove the controller from your system.
3. Connect the module to the controller.
   a. Put the controller on a horizontal, flat surface (a table or work area, for example).
   b. Remove all of the port jumpers from the Hostess *i* 8 controller.
   c.. Align the module's top two connectors to the controller's J1 and J4 sockets, align P2 to J2. Align the P3 box found along the right edge over the pins on the RS-232 jumper header pins.
   d. Press down, putting pressure directly over the module's connectors, the module snaps into place.

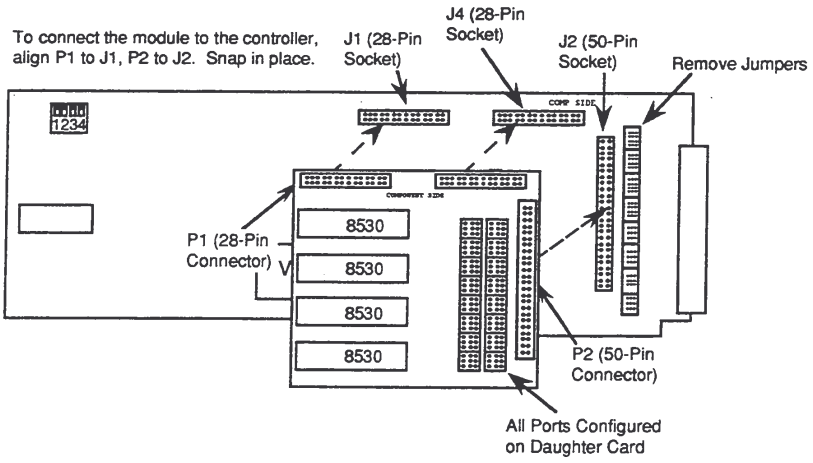


Figure B-2. Aligning Sockets to RS-485 Upgrade Module Connectors

4. Set the jumpers for RS-232 or RS-485 mode using the 16 ports on the upgrade module . See Chapter 2 to set your controller for RS-485 mode.

   Note: *This version requires that you configure all 16 ports on the upgrade module.*

5. Replace the controller in your system. Attach the retaining bracket to the system unit chassis.

6. If you plan on using synchronous RS-232 mode on ports 1 and 2, you also need to move the jumpers in the interface box. See Appendix A for information about configuring the interface box for synchronous mode. After configuring the interface box, you can go on to Step 7.

   Note: *The default interface box is set to RS-232 or RS-485. You only need to configure the interface box if you want to use ports 1 and 2 for synchronous mode.*

7. Plug the interface cable onto the 100-pin connector.

8. Determine where you want to put the interface box. You can use the instructions in Chapter 2 to mount the interface box.

Note: *If the number of ports has changed or the port mode, you should reinstall your device driver. Comtrol does not support a device driver for RS-485.*

Upgrading to 16 Ports (RS-232, RS-422, and RS-485)

To upgrade your Hostess *i* 8 controller to an Hostess *i* 16 controller with RS-232, RS-422, and RS-485 capabilities, follow these steps:

1. Purchase an upgrade kit and a 16-port interface box from your distributor or from Comtrol Corporation. The kit contains the module.

   Note: *This module permits RS-232 and RS-422 mode operation on the lower 8-ports of the controller and RS-232 and RS-485 mode operation on the upper 8-ports (9 through 16).*

2. Remove the controller from your system.

3. Configure RS-232/RS-422 mode on ports 1 through 8 on the base controller. If you set any ports to RS-422 mode, make sure that you set those same ports on the interface box to RS-422.

   If you plan on using synchronous mode on ports 1 and 2, you also need to move the jumpers in the interface box. See Appendix A for information about configuring the interface box for synchronous mode.

4. Connect the module to the controller.

   a. Put the controller on a horizontal, flat surface (a table or work area, for example).

   b.. Align the module's top two connectors to the controller's J1 and J4 sockets, align P2 to J2.

   c. Press down, putting pressure directly over the module's connectors. The module will snap into place.

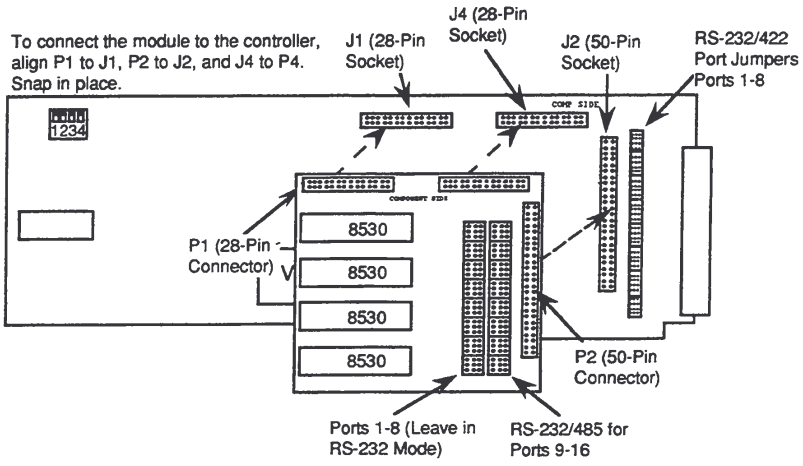


Figure B-3. Aligning Sockets to RS-232, RS-422, and RS-485 Upgrade Module Connectors

5. Set the jumpers for ports 9 through 16 on the update module for RS-232 or RS-485 mode. See Chapter 2 to set the controller to the mode you require.

   Make sure that if you set any ports to RS-422 mode, that you also set those ports to RS-422 mode in the interface box.

6. Replace the controller in your system. Attach the retaining bracket to the system unit chassis.

7. Plug the interface cable into the 100-pin connector.

8. Determine where you want to put the interface box. You can use the instructions in Chapter 2 to mount the interface box.

Note: *If the number of ports has changed or the port mode, you should reinstall your device driver. Comtrol does not support a device driver for RS-485.*

Appendix C.
Memory Addresses

The Hostess *i* contains 128K of memory on the controller. The controller uses this memory to store data that moves between the peripheral device and personal computer system. To use this memory, the controller's device driver communicates to the operating system and tells it where the memory resides in the system. PCs and compatible computers have memory mapped out for specific uses.

Table C-1 illustrates the system memory map for IBM PC™, IBM AT™, and PS/2 computers.

Table C-1. System Memory Map for IBM PC, AT, and PS/2 Computors

Address	Used By	Comments
0000 through 9FFFF	640K on system board	May be 64K to 640KB, depending on the model.
A0000 through BFFFF	Display adapter reserved	EGA and VGA™ use all of this, CGA and MDA use a portion of it.
C0000 through DFFFF	Reserved for ROM expansion	Used for I/O channel BIOS as in the disk controller). • C0000 through C7FFF (EGA/VGA BIOS) • C8000 through CBFFF (Hard disk BIOS) • D0000 through DFFFF (Cluster/network adapter BIOS)
E0000 through EFFFF	Expansion of system ROM	For the AT and PS/2
F0000 through FFFFF	System ROM	May be duplicate of ROM in higher memory.
100000 through FDFFFF	Memory expansion	AT and PS/2 only.
FE0000 through FEFFFF	Reserved	AT and PS/2 only.
FF0000 through FFFFFF	64K ROM BIOS	AT and PS/2 only.

The following table is a map of the I/O memory addresses in IBM AT and PS/2 computers.

Table C-2. I/O Map Address (IBM AT and PS/2)

Hexadecimal Range	Device
000 through 01F	DMA controller 1, 8237A-5
020 through 03F	Interrupt controller 1, 8559A Master
040 through 05F	System timers
060 through 06F	Keyboard
070 through 07F	Realtime clock, non-maskable interrupt (NMI) mask
080 through 08F	DMA page registers
090 through 09F	Arbitration control port, card selected feedback, system control port and setup
0A0 through ABF	Interrupt controller 2, 8259A
0C0 through 0DF	DMA controller
0E0	Split address register
0E1	Memory encoding register
0F0 through 0FF	Math coprocessor
010 through 01E	Programmable option select
1F0 through 1F8	Fixed disk
200 through 207	Game I/O
278 through 27F	Parallel printer port 2 (AT) port 3 (PS/2)
2F8 through 2FF	Serial port 2 (RS-232-C)
300 through 31F	Prototype card
360 through 36F	Reserved
378 through 37F	Parallel printer port 1 (AT), port 2 and port 3 (PS/2)
380 through 38F	SDLC, bisynchronous 2
3A0 through 3AF	Bisynchronous 1
3C0 through 3CF	Reserved (AT), Video subsystem (PS/2)
3D0 through 3DF	Color/Graphics monitor adapter
3F0 through 3F7	Diskette controller
3F8 through 3FF	Serial port 1 (RS-232-C)

Different operating systems have particular requirements for managing input to and output from, peripheral devices. The Hostess *i* provides several options for both base memory and input/output addresses. The possible base memory addresses range from 218 to 73C. It is between these areas of memory where the controller holds data from the ports, and where the sytem accesses this data.

Your system may have specific base address and I/O address requirements. Computer hardware design dictates which base memory addresses you may use. Operating systems dictate which I/O addresses you may use.

Appendix D.
ASCII Character Set

Table D-1. ASCII Character Set

Decimal	Hexa-decimal	ASCII	Decimal	Hexa-decimal	ASCII	Decimal	Hexa-decimal	ASCII
0	00	NUL	43	2B	+	86	56	V
1	01	SOH	44	2C	,	87	57	W
2	02	STX	45	2D	-	88	58	X
3	03	ETX	46	2E	.	89	59	Y
4	04	EOT	47	2F	/	90	5A	Z
5	05	ENO	48	30	0	91	5B	[
6	06	ACK	49	31	1	92	5C	\
7	07	BEL	50	32	2	93	5D	]
8	08	BS	51	33	3	94	5E	^
9	09	HT	52	34	4	95	5F	_
10	0A	LF	53	35	5	96	60	`
11	0B	VT	54	36	6	97	61	a
12	0C	FF	55	37	7	98	62	b
13	0D	CR	56	38	8	99	63	c
14	0E	SO	57	39	9	100	64	d
15	0F	SI	58	3A	:	101	65	e
16	10	DLE	59	3B	;	102	66	f
17	11	DC1	60	3C	<	103	67	g
18	12	DC2	61	3D	=	104	68	h
19	13	DC3	62	3E	>	105	69	i
20	14	DC4	63	3F	?	106	6A	j
21	15	NAK	64	40	@	107	6B	k
22	16	SYN	65	41	A	108	6C	l
23	17	ETB	66	42	B	109	6D	m
24	18	CAN	67	43	C	110	6E	n
25	19	EM	68	44	D	111	6F	o
26	1A	SUB	69	45	E	112	70	p
27	1B	ESC	70	46	F	113	71	q
28	1C	FS	71	47	G	114	72	r
29	1D	GS	72	48	H	115	73	s
30	1E	RS	73	49	I	116	74	t
31	1F	US	74	4A	J	117	75	u
32	20	SP	75	4B	K	118	76	v
33	21	!	76	4C	L	119	77	w
34	22	"	77	4D	M	120	78	x
35	23	#	78	4E	N	121	79	y
36	24	$	79	4F	O	122	7A	z
37	25	%	80	50	P	123	7B	{
38	26	&	81	51	Q	124	7C	|
39	27	'	82	52	R	125	7D	}
40	28	(	83	53	S	126	7E	~
41	29	)	84	54	T	127	7F	DEL
42	2A	*	85	55	U			

Appendix E.
100-Pin Connector Pinout Information

This appendix provides detailed information about the 100-pin connector for the controller. You can use this information if you are building your own interfaces.

Figure E-1 illustrates pinout information for the 100-pin connector.

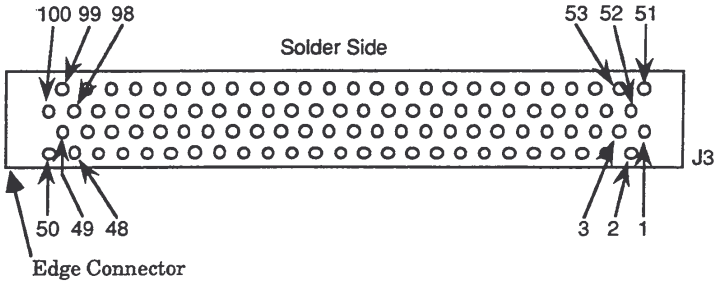


Figure E-1. 100-Pin Connector Pinout

Table E-1 lists the Hostess *i* Signals for the 100-pin connector for RS-232 mode.

Table E-2 lists the Hostess *i* Signals for the 100-pin connector for RS-422 mode.

Table E-3 lists the Hostess *i* Signals for the 100-pin connector for RS-485 mode.

Table E-1. Hostess *i* Signals for the 100-Pin Connector (RS-232)

Pin Number	Asynchronous Signals	Synchronous Signals
1	CD1	CD1
2	CD2	CD2
3	RX1	RX1
4	RX2	RX2
5	TX1	TX1
6	TX2	TX2
7	DTR1	DTR1
8	DTR2	DTR2
9	CTS1	CTS1
10	CTS2	CTS2
11	RTS1	RTS1
12	RTS2	RTS2
13	GND	GND
14	GND	GND
15	DTR5	DTR5
16	DTR6	DTR6
17	TX5	TX5
18	TX6	TX6
19	RX5	RX5
20	RX6	RX6
21	CD5	DSR2
22	CD6	CD6
23	RTS5	RTS5
24	RTS6	RTS6
25	CTS5	DSR1
26	CTS6	CTS6
27	CD3	TXCLK1
28	CD4	TXCLK2
29	RX3	RX3
30	RX4	RX4
31	TX3	TX3
32	TX4	TX4
33	DTR3	DTR3
34	DTR4	DTR4

(Continued)

Table E-1. Hostess *i* Signals for the 100-Pin Connector (RS-232) (Continued)

Pin Number	Asynchronous Signals	Synchronous Signals
35	CTS3	RXCLK1
36	CTS4	RXCLK2
37	RTS3	RTS3
38	RTS4	RTS4
39	DTR7	DTR7
40	DTR8	DTR8
41	TX7	TX7
42	TX8	TX8
43	RX7	RX7
44	RX8	RX8
45	CD7	CD7
46	CD8	CD8
47	RTS7	RTS7
48	RTS8	RTS8
49	CTS7	CTS7
50	CTS8	CTS8
51	CD9	CD9
52	CD10	CD10
53	RX9	RX9
54	RX10	RX10
55	TX9	TX9
56	TX10	TX10
57	DTR9	DTR9
58	DTR10	DTR10
59	CTS9	CTS9
60	CTS10	CTS10
61	RTS9	RTS9
62	RTS10	RTS10
63	GND	GND
64	GND	GND

(Continued)

Table E-1. Hostess *i* Signals for the 100-Pin Connector (RS-232) (Continued)

Pin Number	Asynchronous Signals	Synchronous Signals
65	DTR13	DTR13
66	DTR14	DTR14
67	TX13	TX13
68	TX14	TX14
69	RX13	RX13
70	RX14	RX14
71	CD13	CD13
72	CD14	CD14
73	RTS13	RTS13
74	RTS14	RTS14
75	CTS13	CTS13
76	CTS14	CTS14
77	CD11	CD11
78	CD12	CD12
79	RX11	RX11
80	RX12	RX12
81	TX11	TX11
82	TX12	TX12
83	CTS11	CTS11
84	CTS12	CTS12
85	RTS11	RTS11
86	RTS12	RTS12
87	GND	GND
88	GND	GND
89	DTR15	DTR15
90	DTR16	DTR16
91	TX15	TX15
92	TX16	TX16
93	RX15	RX15
94	RX16	RX16
95	CD15	CD15
96	CD16	CD16
97	RTS15	RTS15
98	RTS16	RTS16
99	CTS15	CTS15
100	CTS16	CTS16

Table E-2. Hostess *i* Signals for the 100-Pin Connector (RS-422)

Pin Number	Asynchronous Signals	Synchronous Signals
1	Not connected	Not connected
2	Not connected	Not connected
3	RX1-	RX1-
4	RX2-	RX2-
5	TX1-	TX1-
6	TX2-	TX2-
7	Not connected	Not connected
8	Not connected	Not connected
9	TX1+	TX1+
10	TX2+	TX2+
11	RX1+	RX1+
12	RX2+	RX2+
13	Not connected	Not connected
14	Not connected	Not connected
15	Not connected	Not connected
16	Not connected	Not connected
17	TX5-	TX5-
18	TX6-	TX6-
19	RX5-	RX5-
20	RX6-	RX6-
21	Not connected	Not connected
22	Not connected	Not connected
23	RX5+	RX5+
24	RX6+	RX6+
25	TX5+	TX5+
26	TX6+	TX6+
27	Not connected	Not connected
28	Not connected	Not connected
29	RX3-	RXCLK1-
30	RX4-	RXCLK2-
31	TX3-	TXCLK1-
32	TX4-	TXCLK2-
33	Not connected	Not connected
34	Not connected	Not connected

(Continued)

Table E-2. Hostess *i* Signals for the 100-Pin Connector (RS-422) (Continued)

Pin Number	Asynchronous Signals	Synchronous Signals
35	TX3+	TXCLK1+
36	TX4+	TXCLK2+
37	RX3+	RXCLK1+
38	RX4+	RXCLK2+
39	Not connected	Not connected
40	Not connected	Not connected
41	TX7-	TX7-
42	TX8-	TX8-
43	RX7+	RX7+
44	RX8+	RX8+
45	Not connected	Not connected
46	Not connected	Not connected
47	RX7+	RX7+
48	RX8+	RX8+
49	TX7+	TX7+
50	TX8+	TX8+
51	Not connected	Not connected
52	Not connected	Not connected
53	RX9-	RX9-
54	RX10-	RX10-
55	TX9-	TX9-
56	TX10-	TX10-
57	Not connected	Not connected
58	Not connected	Not connected
59	TX9+	TX9+
60	TX10+	TX10+
61	RX9+	RX9+
62	RX10+	RX10+
63	Not connected	Not connected
64	Not connected	Not connected

(Continued)

Table E-2. Hostess *i* Signals for the 100-Pin Connector (RS-422) (Continued)

Pin Number	Asynchronous Signals	Synchronous Signals
65	Not connected	Not connected
66	Not connected	Not connected
67	TX13-	TX13-
68	TX14-	TX14-
69	RX13-	RX13-
70	RX14-	RX14-
71	Not connected	Not connected
72	Not connected	Not connected
73	RX13+	RX13+
74	RX14+	RX14+
75	TX13+	TX13+
76	TX14+	TX14+
77	Not connected	Not connected
78	Not connected	Not connected
79	RX11-	RX11-
80	RX12-	RX12-
81	TX11-	TX11-
82	TX12-	TX12-
83	TX11+	TX11+
84	TX12+	TX12+
85	RX11+	RX11+
86	RX12+	RX12+
87	Not connected	Not connected
88	Not connected	Not connected
89	Not connected	Not connected
90	Not connected	Not connected
91	TX15-	TX15-
92	TX16-	TX16-
93	RX15-	RX15-
94	RX16-	RX16-
95	Not connected	Not connected
96	Not connected	Not connected
97	RX15+	RX15+
98	RX16+	RX16+
99	TX15+	TX15+
100	TX16+	TX16+

Table E-3. Hostess *i* Signals for the 100-Pin Connector (RS-485)

Pin Number	Asynchronous Signals
1 through 4	Not connected
5	TX1-/RX1-
6	TX2-/RX2-
7 and 8	Not connected
9	TX1+/RX1+
10	TX2+/RX2+
11 through 16	Not connected
17	TX5-/RX5-
18	TX6-/RX6-
19 through 23	Not connected
24	TX5+/RX5+
25	TX6+/RX6+
26 through 30	Not connected
31	TX3-/RX3-
32	TX4-/RX4-
33 through 35	Not connected
36	TX3+/RX3+
37	TX4+/RX4+
38 through 40	Not connected
41	TX7-/RX7-
42	TX8-/RX8-
43 through 48	Not connected
49	TX7+/RX7+
50	TX8+/RX8+
51 through 54	Not connected
55	TX9-/RX9-
56	TX10-/RX10-
57 and 58	Not connected
59	TX9+/RX9+
60	TX10+/RX10+
61 through 66	Not connected
67	TX13-/RX13-
68	TX14-/RX14-
69 through 74	Not connected
75	TX13+/RX13+
76	TX14+/RX14+
77 through 80	Not connected

(Continued)

Table E-3. Hostess *i* Signals for the 100-Pin Connector (RS-485) (Continued)

Pin Number	Asynchronous Signals
81	TX11-/RX11-
82	TX12-/RX12-
83	TX11+/RX11+
84	TX12+/RX12+
85 through 90	Not connected
91	TX15-/RX15-
92	TX16-/RX16-
93 through 98	Not connected
99	TX15+/RX15+
100	TX16+/RX16+

Appendix F.
Warranty and Technical Support

Comtrol Corporation provides:

- A 30-day money-back guarantee
- A five (5) year limited warranty* (US and Canada)
- Support for your Comtrol controller for five years from the purchase date.

*Check with your distributor for guarantee conditions in countries other than the U.S.A. and Canada.

Limited Warranty

Comtrol Corporation, Inc. ("the Company") and its affiliate (Comtrol Europe, Ltd.) make no representations or warranties, expressed or implied including warranties of merchantability, noninfringement, and fitness for a particular purpose except as provided below.

Hardware

Comtrol warrants to the original purchaser that its Hostess *i* is free of defect in design, materials and workmanship for five years from the date of delivery of a new Hostess *i*. Comtrol (or its authorized repair center), at its option, will repair or replace, at the business location of Comtrol each part of the Hostess *i* which is proven to the satisfaction of Comtrol to have been defective in design, material or workmanship.

This warranty shall not apply to any part of the Hostess *i* which, in the judgment of Comtrol, has been subjected to misuse, negligence, alteration, accident, improper maintenance, or damage by excessive physical or electrical stress. Adjustment of the Hostess *i*, where warning labels and operation manuals warn against such adjustments, will void this warranty.

This warranty is void if the serial number of the Hostess *i* has been defaced, altered or removed. This warranty does not apply to expendable components such as fuses or bulbs. Repair and replacement parts will be furnished on an exchange basis and may be either reconditioned or new. All replaced parts or controllers become the property of Comtrol.

The sole remedy for breach of warranty shall be repair, replacement, or refund, at the option of Comtrol, of the defective product provided as follows.

Software

Comtrol warrants that for a period of ninety (90) days from the date of delivery to you as evidenced by a copy of your receipt, the disks on which the program is furnished will under normal use be free from defects in materials and workmanship and the program under normal use will perform substantially in accordance with the documentation without significant errors that make it unusable.

Comtrol's entire liability and your exclusive remedy under this warranty (which is subject to you returning the program to Comtrol or an authorized dealer with a copy of your receipt) will be, at Comtrol's option, to attempt to correct or help you around errors with efforts that Comtrol believes suitable to the problem, to replace the program or disks with functionally equivalent software or disks, as applicable, or to refund the purchase price and terminate this Agreement.

No Comtrol dealer, distributor, agent or employee is authorized to modify this warranty.

Comtrol does not warrant that the functions contained in the programs will meet your requirements or that the operation of the programs will be uninterrupted or error-free. You assume the responsibility for the selection of the programs and hardware to achieve your intended results and for the installation, use and results obtained from the programs.

Some programs contained on the disk are specifically for and have been optimized to run with Comtrol products. Therefore, the programs on these disks will not run effectively and will cause errors in data or operation when this software is attempted to be used with non-Comtrol products.

This warranty shall not apply if the serial number has been defaced, altered or removed, or if the software has been altered in any fashion.

General

To qualify for the previously discussed warranty, the original purchaser must follow the procedure outlined below:

1. Comtrol must be notified in writing within thirty (30) days of the date that the defect is discovered. Comtrol will then issue a Return Material Authorization (RMA) Number which the purchaser must include with all correspondence and display on the outside of the shipping container when returning the Hostess *i*.

2. All Hostess *i* controllers must be shipped freight and insurance prepaid, in the original shipping container, or in a container providing equal or better protection, with the Return Material Authorization (RMA) Number displayed on the outside of the container in a prominent manner.

3. A written description of the defect together with a copy of your receipt or other proof of purchase, and the name of the dealer which sold you the Comtrol product, must be shipped with the Hostess *i*. All defects must be reproducible at Comtrol's location to qualify for this limited warranty. Ship the controller to:

   Comtrol Corporation
   2675 Patton Road, Dock D
   Saint Paul, MN 55113

Comtrol will return a Hostess *i* which qualifies under this warranty freight and insurance prepaid. Comtrol will repair or replace Hostess *i* controllers that do not qualify under the terms of this warranty at the option of the purchaser, in which case the purchaser will pay the cost of repair or replacement, and return freight and insurance.

This limited warranty is in lieu of all other warranties and conditions expressed, implied or statutory including merchantability, fitness for purpose, non-infringement, course of dealing, trade or performance and all other liabilities of Comtrol all of which are hereby disclaimed.

In no event will Comtrol be liable for damages, including lost profits, lost savings or other special, punitive, incidental, or consequential damages arising out of the use of or inability to use the Hostess *i*, even if Comtrol or an authorized dealer has been advised of the possibility of such damages, or for any claim by any other party. This warranty gives you specific legal rights and you may also have other rights that vary from state to state (U.S.) or in your home country.

Limited Liability

Independent of the warranty or any other agreement between you and Comtrol, regardless of the basis for any claim, neither Comtrol nor anyone else who has been involved in the creation, production, or delivery of this software or hardware shall be liable for any direct, indirect, consequential or incidental damages; Comtrol's maximum liability shall be limited to refund of the purchase price. Some consumer laws may not allow the limitation or exclusion of incidental or consequential damages for consumer products, so the above limitations or exclusions may not apply to you. The price of the materials and programs reflects this allocation of risk.

Technical Support

If you have questions about your controller, please call or FAX Comtrol at:

Toll free: 1-800-926-6876 (US)

Phone: (44) 869-323-220 (UK)
or
(612) 631-7654 (US)

FAX: 612-631-8117 (US)
or
(44) 869-323-211 (UK)

Comtrol has a staff of engineers, programmers, technicians, and managers available for help.

Information About Possible TV and Radio Interference

The Comtrol Hostess *i* controller described in this guide has been certified to comply with the requirements for a Class A computing device according to the standards set forth in the United States, Code of Federal Regulations: Title 47: Telecommunications; Chapter I - Federal Communications Commission (FCC); Part 15 - Radio Frequency (RF) Devices; Subpart J - Computing Devices provided the equipment is used with FCC type-approved cables.

Equipment meeting these requirements provides reasonable protection against radio frequency interference in a residential installation. If radio frequency interference occurs, turn the computer equipment off and back on to determine if it is the source of the interference.

If the computer equipment appears to be the source of the interference, first disconnect one Input/Output (I/O) device cable from the computer. If the interference stops, it may have been caused by the cable connecting the I/O device to the computer or the I/O device itself. You may need to provide additional shielding for the cable here.

If the interference does not stop, disconnect each cable connected to additional I/O devices, one at a time, to determine which cable or I/O device is causing the interference. Alternatively, try moving the I/O devices and cables away from the computer.

If the interference is not caused by the I/O device or cables, the interference may be caused by the computer itself or one of the installed I/O devices. Try removing I/O devices one at a time to determine which device is causing the problem. If you discover that the computer equipment is the source or interference, you can try to correct the problem by one or more of the following measures:

- Turn the TV or radio antenna.
- Move the computer equipment away from the TV or radio.
- Move the computer equipment to one side or the other of the TV or radio.
- Plug the computer equipment into a different power outlet so that the computer and TV or radio are powered from different circuits.
- Ensure that all computer I/O devices and peripherals are properly installed.

If necessary, ask your distributor or service representative for more suggestions.

You may find the booklet *How to Identify and Resolve Radio-TV Interference Problems*, published by the FCC, to be helpful. You can obtain a copy of this booklet from the U.S. Government Printing Office, Washington, D.C. 20402.

Canadian EMC Regulations

The Hostess *i* described in this manual does not exceed the Class B limits for radio noise for digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Glossary

asynchronous
Serial communication where each character has a preceding start bit that lets the receiver know that the character is about to be sent, a stop bit that lets the receiver know that the character is finished, and in some cases, a parity bit for error detection.

buffering
A way to temporarily store data.

dual-ported RAM
An area of memory where software instructions may be stored. Either the system CPU or the intelligent chip on the controller may access the resident Random Access Memory (RAM) on the Comtrol controller.

eight-bit versus sixteen-bit
Information is passed from the system to add-in peripherals in either bytes (eight bits) or words (16 bits). A word write in 16-bit mode takes one write cycle. A word write in an eight-bit mode takes two write cycles.

full modem control
An ambiguous term. Full modem control should have all the necessary signal lines to support RS-232 communication between DTE and DCE devices (this is, transmit, receive, signal ground, RTS, CTS, DSR, DTR, CD, and RI signals). Some full-modem definitions do not include the DSR, DTR, or RI signals.

Note: *SCO XENIX (and other operating systems) do not support the DSR and RI signals.*

interface
An electronic component that connects two different devices.

local printing
Printing through a terminal. SCO (and others) support this capability. Local printing locks the terminal until the data has been sent to the printer.

transparent printing
The capability to print a document from any terminal in a multiuser system without locking-up the terminal and keyboard. Supported by Comtrol intelligent controllers.

RJ5
Definition of a standard 8-pin modulator, telephone-type connector. RJ45 is the industry designation for the 8-place receptacle and plug.

RS-232
The Electronics Industry Association (EIA) standard that defines the 25 connectors used in the interface of Data Terminal Equipment (DTE) and Data Communications Equipment (DCE) hardware.

RS-422
The Electronics Industry Association (EIA) standard that defines the six connectors used in the interface of Data Terminal Equipment (DTE) and Data Communications Equipment (DCE) hardware.

SCC
An acronym for Serial Communication Controller.

SCO
The Santa Cruz Operation, Incorporated, (SCO) is a primary developer of systems software and applications for the XENIX and UNIX environments.

synchronous
Serial communication where the data is clocked by a signal on another wire. The sync signal keeps the transmitter and receiver coordinated in time with each other. This allows for more efficient communication, because only 8 bits are sent, versus 10 or 11 bits for asynchronous.

UART
The Universal Asynchronous Receiver Transmitter (UART) device that performs the parallel-to-serial conversion of transmitted digital data.

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