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IP Twinax Controller

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**I-O 5794ip Twinax Controller  
User's Guide**

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# Preface

Thank you for purchasing the I-O 5794ip Twinax Controller. This guide contains information to setup and use the controller.

The guide consists of the following chapters:

- **Introduction:** Provides an overview of the product.
- **Installation:** Provides detailed information on the installation of the hardware, the installation of I-O Configuration Utility for remote management of I-O LAN based products, configuration of the controller, and configuration of the AS/400, iSeries or eServer i5 host.
- **Controller Operation:** Provides detailed instructions on the use of display and printer sessions.
- **Troubleshooting:** Provides solutions to problems that may be encountered while using the product.
- **Manufacturer's Warranty & Repair Policy:** States the warranty and how to obtain service and support.

The following symbols are used in the guide.



**Caution:** This symbol highlights procedures that, if not correctly performed or adhered to, could damage or corrupt the product or adversely affect the security and functionality of the product. Do not proceed beyond such points until the required conditions are fully understood and achieved.



**Note:** This symbol denotes useful additional information that is relevant to the procedure or feature being described.



**Tip:** This symbol denotes a hint, shortcut or alternate method to aid or supplement the procedure being described.

**Consistent with our policy of continuous development, the product you received may have features different from those described in this guide. Please visit our web-site [www.iocorp.com](http://www.iocorp.com) for current information.**

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# Table of Contents

<b>INTRODUCTION .....</b>	<b>6</b>
OVERVIEW .....	6
STANDARD FEATURES .....	6
UNPACKING .....	6
ABOUT THE 5794IP TWINAX CONTROLLER.....	7
<i>LED Indicators</i> .....	7
<i>Physical Connectors</i> .....	9
<b>INSTALLATION.....</b>	<b>10</b>
HARDWARE INSTALLATION .....	10
INSTALL THE I-O CONFIGURATION UTILITY .....	11
<b>CONFIGURE THE AS/400, ISERIES OR ESERVER I5 HOST .....</b>	<b>12</b>
SELECTING THE PROTOCOL TO COMMUNICATE WITH THE CONTROLLER.....	12
CONFIGURE THE HOST TO USE TN5250E.....	14
CONFIGURE THE HOST TO USE ANYNET .....	15
<i>AnyNet Configuration Worksheet</i> .....	15
<i>Setting the Host Values</i> .....	17
<i>Disabling the Host's Switched Disconnect Function</i> .....	20
CONFIGURE THE HOST TO USE SNA.....	21
<i>SNA Configuration Worksheet</i> .....	21
<i>Setting the Host for Auto Configuration</i> .....	22
CONFIGURING THE HOST FOR IPDS PRINTING.....	23
<i>Requirements</i> .....	23
<i>Creating a Line Description on the AS/400</i> .....	23
<i>Configuring a TCP/IP Host Table Entry</i> .....	24
<i>Configuring V3R1 or V3R6</i> .....	24
<i>Configuring V3R2</i> .....	25
<i>Configuring V3R7 or V4R1</i> .....	26
<i>Configuring V4R2 and Above</i> .....	28
<i>Verifying the IPDS Configuration on the AS/400</i> .....	30
<b>CONFIGURE THE 5794IP TWINAX CONTROLLER.....</b>	<b>31</b>
SETTING THE GENERAL INFORMATION AND IP ADDRESS .....	31
SELECT THE HOST COMMUNICATION PROTOCOL .....	33
CONFIGURE THE CONTROLLER TO USE TN5250E.....	34
CONFIGURE THE CONTROLLER TO USE ANYNET.....	36
CONFIGURE THE CONTROLLER TO USE SNA .....	38
CONFIGURE THE CONTROLLER FOR IPDS PRINTING VIA PPR/PPD.....	39
<b>CONTROLLER OPERATION.....</b>	<b>40</b>
TOGGLING BETWEEN DISPLAY SESSIONS.....	40
CHANGING A DISPLAY SESSION FROM ONE HOST TO ANOTHER .....	40
SHARING A PRINTER WITH MULTIPLE HOSTS .....	40
TN5250E OPERATION.....	41
<i>Starting Display Sessions</i> .....	41
<i>Starting Printer Sessions</i> .....	41
<i>Re-Connect Sessions</i> .....	42
<i>Disconnect Sessions</i> .....	42
<i>How Telnet Names Devices</i> .....	42
<i>Display Emulations</i> .....	43
ANYNET OPERATION.....	44
<i>Starting Display Sessions</i> .....	44
<i>Starting Printer Sessions</i> .....	44

---

<i>Re-Connect Sessions</i> .....	44
<i>Disconnect Sessions</i> .....	44
<i>How AnyNet Names Devices</i> .....	45
<i>Display Emulations</i> .....	46
SNA OPERATION.....	47
<i>Starting Display Sessions</i> .....	47
<i>Starting Printer Sessions</i> .....	47
<i>Re-Connect Sessions</i> .....	47
<i>Disconnect Sessions</i> .....	47
<i>Display Emulations</i> .....	48
IPDS OPERATION VIA PPR/PPD .....	49
<b>TROUBLESHOOTING .....</b>	<b>50</b>
GENERAL ERROR CONDITIONS .....	50
GENERAL CONTROLLER STATUS MESSAGES .....	52
TN5250E HOST COMMUNICATION STATUS MESSAGES .....	53
TN5250E PRINTER CONNECTION STATUS MESSAGE .....	55
ANYNET HOST COMMUNICATION STATUS MESSAGES .....	58
SNA HOST COMMUNICATION STATUS MESSAGES .....	61
IPDS ERROR CONDITIONS .....	64
LED INDICATORS .....	65
FIRMWARE UPGRADE PROCESS .....	67
I-O CONFIGURATION UTILITY UPGRADE PROCESS .....	68
UNINSTALLING THE I-O CONFIGURATION UTILITY .....	69
RESTORING FACTORY DEFAULTS .....	70
<i>Restoring Factory Defaults Using the I-O Configuration Utility</i> .....	70
<i>Restoring Factory Defaults for the I-O Print Server Using the Mode Button</i> .....	70
HOST COMMUNICATION TRACE.....	71
<i>Start a Trace</i> .....	71
<i>End a Trace</i> .....	71
<i>Print a Trace</i> .....	71
<b>MANUFACTURER'S WARRANTY &amp; REPAIR POLICY .....</b>	<b>72</b>

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# Introduction

This chapter provides a brief overview of the I-O 5794ip Twinax Controller.

## Overview

The I-O 5794ip Twinax Controller is designed to connect up to fourteen IBM Twinax displays and printers to IBM AS/400, iSeries or eServer i5 midrange computer systems via Ethernet using industry standard TCP/IP and SNA protocols. Configuration of the controller is accomplished through I-O's simple and easy to use remote administration software, the I-O Configuration Utility.

## Standard Features

I-O 5794ip Twinax Controller contains the following features:

- Attaches up to 14 display and printer devices
- Connects up to a maximum of 4 hosts
- Allows up to 4 sessions per twinax address
- Supports TCP/IP (TN5250e, AnyNet) for remote and local connections
- Supports SNA protocol for local connections.
- Supports all 5250 twinax display stations. Display model type is matched to Telnet models: 5251m11, 5291-1, 5292-2, 3180-2, 3179-2, 3196-A1, 3477-FG, 3477-FC (InfoWindow II features are not supported).
- When using TN5250e, the host configures all SCS printers as 3812-1, the 5794ip controller converts 3812-1 commands to 4214, 5224, 5225, or 5256 depending upon the printer attached.
- When using AnyNet or SNA, the host recognizes all SCS and IPDS printer's native model types.
- 10/100BaseT RJ45 auto-sensing connector
- Ethernet (IEEE 802.2, 802.3)
- DHCP client
- DB9 for Twinax Dual-Phase "V" Connector (cable included)

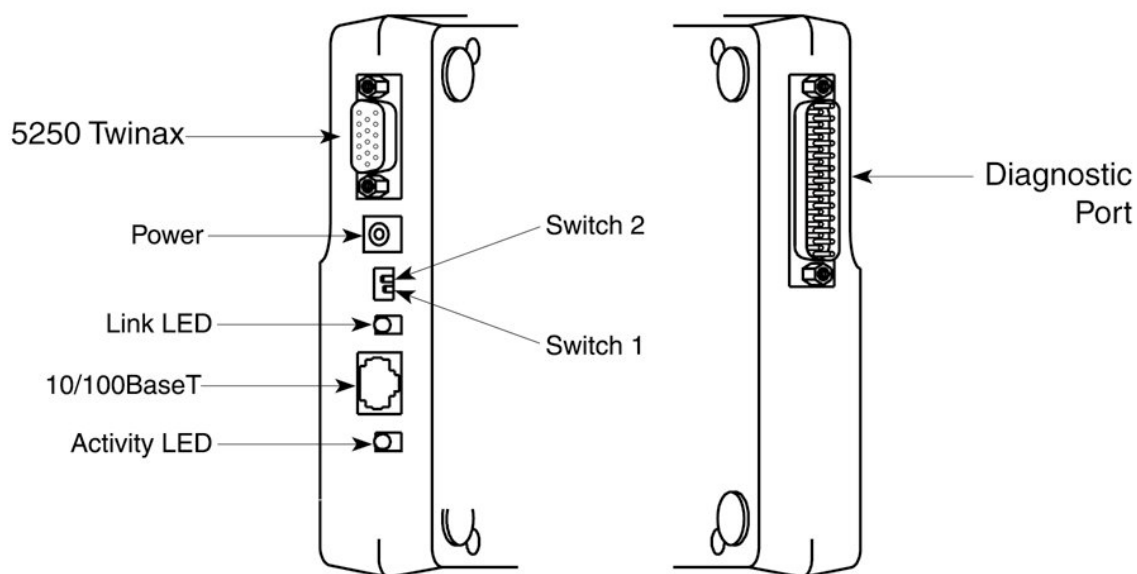
## Unpacking

When you receive the controller, check the packaging for water or physical damage, and notify the carrier immediately if any damage is evident. Keep the original packaging in case the interface needs to be moved or shipped. The following items are included in the package:

- An I-O 5794ip Twinax Controller
- An I-O dual-phase Twinax "V" connector
- A CD-ROM containing:
  - I-O 5794ip Twinax Controller User's Guide
  - I-O Configuration Utility
- Getting Started Guide
- Power Supply

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## About the 5794ip Twinax Controller



### LED Indicators & Mode Button on the Top of the Unit

Link	This LED will be on indicating the controller has a good link with the Ethernet LAN.
Activity	This LED will flash on and off as Ethernet packets are detected on the LAN.
Power	This LED indicates when the controller is in a ready state (powered up and running). It will be on, except for a 'heartbeat' (a momentary blink off approximately every five seconds).
Host	In the Ready state, this Host Communication Status LED can have one of three values: <ul style="list-style-type: none"><li>• Off – No host connections. The controller has no connection to any of the configured host computers.</li><li>• Blinking – Some hosts are connected. The controller currently has established connections to some of the configured host computers, but not to all.</li><li>• On Steady – All hosts are connected. The controller currently has established connections to all of the configured host computers.</li></ul>

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Device	<p>In the Ready state, this Device Session Status LED can have one of three values:</p> <ul style="list-style-type: none"> <li>• Off – No device sessions. The controller has no established host session for any attached printer or display station.</li> <li>• Blinking – Some devices have sessions. The controller currently has established host sessions for some of the attached (and powered-up) printers and display sessions, but at least one powered-up printer or display does not yet have all of the sessions it should have.</li> <li>• On Steady – All powered-up devices have all sessions.</li> </ul>
Line 1	<p>In the Ready state, this Twinax Cable Status LED indicates whether a twinax device is currently responding to polls on the first twinax cable (the long leg).</p> <ul style="list-style-type: none"> <li>• On with a heartbeat – Indicates that at least one printer or display is responding to polls.</li> <li>• Off with a heartbeat – Indicates no devices are currently responding on the cable.</li> </ul>
Line 2	<p>In the Ready state, this Twinax Cable Status LED indicates whether a twinax device is currently responding to polls on the second twinax cable (the short leg).</p> <ul style="list-style-type: none"> <li>• On with a heartbeat – Indicates that at least one printer or display is responding to polls.</li> <li>• Off with a heartbeat – Indicates no devices are currently responding on the cable.</li> </ul>
Mode Button	<p>Generates a configuration report when the button is pressed. Requires a parallel printer to be attached to the Diagnostics Port.</p> <p>Alternately, the Mode Button, when held down for 30 seconds, will cause the factory default settings to be restored to the unit. The unit may then be reconfigured.</p>
Mode LEDs	<p>The right LED will come on when the Mode button is pressed. This indicates that the unit is preparing to print the configuration report. It will go out when the report has been printed.</p> <p>The left LED is not used.</p> <p>When the Mode Button is held down for 30 seconds to cause factory defaults to be restored, this LED will stay on during that time. At the end of 30 seconds, this LED along all the other LEDs on the top of the case will go off. The LEDs will then go through the normal power up cycle.</p>



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## Physical Connectors

### 5250 Twinax

This DB-9 connector is where the dual-phase Twinax “V” connector is attached to the logic unit. The twinax connector will be marked for Line 1 and Line 2. Some early connectors had a long and a short lead. Devices attached on the longer of the two leads are on Line 1. Those attached to the shorter lead are on Line 2.

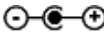


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**NOTE:** THE SECOND LINE HAS BEEN MODIFIED TO SEND REVERSE POLARITY SIGNALS TO NORMAL POLARITY TWINAX DEVICES. DEVICES THAT ARE HARDWIRED AS REVERSE POLARITY CANNOT BE USED WITH THIS CONTROLLER. FOR STAR PANELS THAT CANNOT SUPPORT REVERSE POLARITY SIGNALS, A SETTING IS AVAILABLE IN THE I-O CONFIGURATION UTILITY TO PROVIDE STAR PANEL SUPPORT (THE TOTAL NUMBER OF DEVICES SUPPORTED WILL DROP FROM 14 TO 7 WHEN THIS OPTION IS TAKEN).

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### Power

This connector is used for 5VDC 2.5A  switching power supply shipped with the controller.



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**CAUTION:** USING A POWER SUPPLY OTHER THAN THAT SPECIFIED MAY CAUSE DAMAGE TO THE LOGIC UNIT.

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### Switch 1 and 2

These switches are used to select whether the controller will be connecting to a 10 or 100 Mb Ethernet line. If the controller does not connect properly, it may be necessary to set the switches for the actual speed of the Ethernet line.

- Auto-sensing: Switch 1 up, Switch 2 Up
- 100BaseT: Switch 1 down, Switch 2 up
- 10 BaseT: Switch 1 down, Switch 2 down

### 10/100 Base T

This RJ45 connector is where the Ethernet cable is attached. The controller will automatically link at the speed of the network.

### Diagnostic Port

This standard DB-25 IEEE 1284 compliant connector is for connecting to parallel printers. It will only be used when technical support requires certain types of printouts.

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# Installation

No special training is needed to install the I-O 5794ip Twinax Controller. There are four phases involved in setting up the controller:

1. Install the controller – see Hardware Installation in this chapter.
2. Install the I-O Configuration Utility – see Install the I-O Configuration Utility in this chapter.
3. Configure the AS/400, iSeries or eServer i5 host – see the Configure the AS/400, iSeries or eServer i5 Host chapter.
4. Configure the 5794ip controller – see the Configure the 5794ip Twinax Controller chapter.

## Hardware Installation

1. Inspect the package for damage.
2. Connect each Twinax device to a Twinax cable (maximum of 7 devices on a twinax cable).



**NOTE:** TWISTED-PAIR CABLE & BALUN USE

IBM'S TWINAX SPECIFICATION ALLOWS FOR UP TO 14 PHYSICAL DEVICES TO BE ATTACHED TO A SINGLE TWINAX LINE WITH SEVEN OF THOSE DEVICES ACCEPTING NORMAL POLARITY SIGNAL AND THE OTHER SEVEN DEVICES ACCEPTING A REVERSE POLARITY SIGNAL. THE DUAL-POLARITY V-CONNECTOR SHIPPED WITH THE CONTROLLER HAS TWO TWINAX CONNECTORS. ONE SIDE (LINE 1 OR THE LONGER LEAD) SENDS AND RECEIVES NORMAL POLARITY SIGNALS, AND THE OTHER SIDE (LINE 2 OR THE SHORTER LEAD) SENDS REVERSE POLARITY SIGNALS. TO THE HOST, THE COMBINATION OF THESE TWO PHYSICAL LINES IS SEEN AS A SINGLE TWINAX LINE.

IF TWISTED-PAIR CABLE AND BALUNS ARE TO BE USED, THEY MUST BE USED ON LINE 1. THIS IS BECAUSE BALUNS CANNOT HANDLE REVERSE POLARITY SIGNALS. IF MORE THAN ONE DEVICE IS TO BE CONNECTED BY TWISTED-PAIR CABLE, THEN A STAR PANEL MUST BE CONNECTED TO LINE 1. THE STAR PANEL ARRANGEMENT MEETS IBM'S SPECIFICATION OF HAVING ONLY ONE SET OF MATCHED BALUNS BETWEEN THE DEVICE AND THE HOST. THE STAR PANEL CAN ONLY BE ATTACHED TO LINE 1 AS STAR PANELS DO NOT SUPPORT REVERSE POLARITY SIGNALS. IF ONLY ONE DEVICE IS TO BE ATTACHED TO THE CONTROLLER USING TWISTED-AIR CABLING, THEN IT MUST BE CONNECTED TO LINE 1.

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3. Set the Twinax address on each device (each device must have a different address).
4. Connect Twinax lines to the V-Connector. (For V-Connectors with a long and short lead, the long lead is Line 1, and the short lead is Line 2.)



**NOTE:** THE SECOND LINE HAS BEEN MODIFIED TO SEND REVERSE POLARITY SIGNALS TO NORMAL POLARITY TWINAX DEVICES. DEVICES THAT ARE HARDWIRED AS REVERSE POLARITY CANNOT BE USED WITH THIS CONTROLLER. IF A STAR PANEL IS TO BE USED, IT MUST BE CONNECTED TO LINE 1 AND A SETTING IN THE I-O CONFIGURATION UTILITY FOR STAR PANEL SUPPORT MUST BE TAKEN (THE TOTAL NUMBER OF DEVICES SUPPORTED WILL DROP FROM 14 TO 7 WHEN THIS OPTION IS TAKEN).

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5. Connect the V-Connector to the logic unit.
6. Connect the Ethernet cable.
7. Power up all Twinax devices.
8. Connect the power supply to the logic unit and a wall outlet.

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## Install the I-O Configuration Utility.

The I-O Configuration Utility is used to configure the 5794ip controller. It is also used to download firmware updates, and help diagnose connection problems.

1. Insert the I-O Configuration Utility CD in the CD-ROM drive of a Windows 95 or newer PC.
2. Click Start | Run, and enter "d:\configuration utility\setup.exe", click OK.
3. Follow the on screen prompts.
4. Navigate to the I-O Configuration menu and start the I-O Configuration Utility.



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**NOTE:** THE I-O CONFIGURATION UTILITY IS A REMOTE ADMINISTRATIVE UTILITY THAT IS USED TO SETUP I-O LAN BASED PRODUCTS INCLUDING PRINT SERVERS, ETHERNET DISPLAYS, AND THE 5794IP CONTROLLER. IT IS RECOMMENDED THAT THE MOST RECENT VERSION OF THE I-O CONFIGURATION UTILITY ALWAYS BE USED. THE MOST RECENT VERSION IS AVAILABLE ON I-O'S FTP SITE, [FTP.IOCORP.COM](http://FTP.IOCORP.COM).

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# Configure the AS/400, iSeries or eServer i5 Host

Prior to configuring the I-O 5794ip Twinax Controller, it is necessary to configure the AS/400, iSeries or eServer i5 host. Configuring the host involves determining which of three protocols to use for communicating with the controller, and then setting up the appropriate configuration settings on the host.

## Selecting the Protocol to Communicate with the Controller

Three protocols are available to connect to the AS/400, iSeries or eServer i5 host. All protocols are auto configuring on the host. Choose the protocol based upon the type of devices that are being attached and whether the 5794ip controller is being attached locally or remotely to the host.



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**NOTE:** THE CONTROLLER WILL SUPPORT UP TO FOUR HOSTS. ON THE FIRST HOST, ANY ONE OF THE THREE PROTOCOLS MAY BE SELECTED. ON THE SECOND, THIRD AND FOURTH HOSTS, ONLY TN5250E MAY BE USED.

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- **TN5250e** is a routable protocol. This means that it can be used at remote locations (or where there is a router between the controller and the host). It is the easiest protocol to setup for displays and SCS printers. IBM does not support IPDS printers over TN5250e.

Printers are auto configured on the host as 3812-1 SCS page printers. The controller will customize the data stream to the attached twinax printer's capability removing SCS commands that the printer cannot support. This allows printers like a 4214, 5224, etc. to be attached. However, TN5250e is limited in that it does not support posting the dot-matrix form alignment message as well as the IBM dot-matrix functions of backspace, bold, underscore or overstrike.

Displays will automatically be matched to the closest TN5250e emulation by the controller. For example, a 3180 will be matched to a 3180, but a 3489 will be matched to a 3477. The display models that Telnet supports are: 5251m11, 5291-1, 5292-2, 3180-2, 3179-2, 3196-A1, 3477-FG and 3477-FC non-InfoWindow (InfoWindow II features are not supported).



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**TIP:** TN5250E IS RECOMMENDED WHEN ALL PRINTERS ARE SCS PRINTERS, ARE 3812-1 LASER PRINTERS OR DOT-MATRIX PRINTERS NOT AFFECTED BY THE FORMS ALIGNMENT OR BACKSPACING LIMITATIONS.

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- **AnyNet** is actually SNA encapsulated in TCP/IP and is a routable protocol. It is more difficult than TN5250e to initially configure, but has the advantage of reporting to the host each twinax device's native model so that the actual device will be auto configured by the host. AnyNet does not have the limitations of TN5250e in that it fully supports all SCS and IPDS printers. I-O's implementation of AnyNet supports all display functions except InfoWindow II features (like Extended Character Display and Extended User Interface).



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**TIP:** ANYNET IS THE RECOMMENDED PROTOCOL TO USE WHEN CONNECTING IPDS PRINTERS OR WHERE THERE ARE IBM SCS DOT-MATRIX PRINTERS THAT ARE PRINTING APPLICATIONS THAT REQUIRE FEATURES NOT SUPPORTED BY TN5250E.

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- **SNA** is IBM's most robust protocol. However, SNA cannot be routed. Like AnyNet, SNA is more difficult than TN5250e to initially configure. This protocol can only be used when the 5794ip controller is located within the same Ethernet link as the host (there cannot be a router between them). Like AnyNet, each twinax device's actual model will be auto configured on the host. SNA also does not have the limitations of TN5250e in that it fully supports all SCS and IPDS printers. I-O's implementation of SNA supports all display functions except InfoWindow II features (like Extended Character Display and Extended User Interface).



**TIP:** SNA IS THE RECOMMENDED PROTOCOL TO USE FOR LOCAL CONNECTIONS.

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- **IPDS via PPR/PPD.** This TCP/IP protocol is used by IBM hosts to communicate with LAN attached IPDS printers. It is an alternate protocol to using AnyNet for IPDS printer attachment. PPR/PPD does not require any configuration of hosts and printer devices on the controller with the exception of assigning the controller an IP Address, sub-net mask, and default router (if applicable). All setup is done at the IBM host side.

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## Configure the Host to use TN5250e

To configure the AS/400, iSeries or eServer i5 host to support TN5250e, the host must meet the following requirements:

- Be running OS/400 V3R2 or newer, with the most recent applicable PTFs applied.
- Have the most recent version of Client Access installed on the host.
- Have the most recent version of the Telnet server installed on the host.
- Have the host's auto configuration function turned on. This is done using the host command:

### **CHGSYSVAL QAUTOCFG**

Find the "Autoconfigure device" entry, and set the value to "1".

- Make certain that the host can create virtual devices and there are a sufficient number of devices available to be created. This is done using the host command:

### **CHGSYSVAL SYSVAL(QAUTOVRT)**

In the New Value field, enter the maximum number of user-created virtual devices that can be created.

- If the OS/400 version is earlier than V4R2, the Telnet server will need to be started using the host command:

### **STRTCPSVR SERVER(\*TELNET)**

V4R2 and newer versions will automatically start the Telnet server.

- Identify the host's TCP/IP address. This will be used in configuring the 5794ip controller. This is done using the host command:

### **CFGTCP**

Take option "10. Work with TCP/IP host table entries", then look for the Host Name and *record the host's TCP/IP address* as it will be used when configuring the 5794ip controller.

After these requirements are met and the host settings are completed, the AS/400, iSeries or eServer i5 host will automatically configure the 5250 display and printer sessions the first time you attempt to make a connection. The IBM host will use the Telnet device name created from the default name entered or the name manually entered when configuring the display and printer sessions.

SCS printers are auto configured on the host as 3812-1 page printers. The controller will customize the data stream sent to the attached twinax printer's capability removing SCS commands the printer cannot support, allowing printers like 4214's, 5524's etc. to be attached. However, if forms and alignment messaging for line and dot-matrix printers is needed, TN5250e does not support it – use the AnyNet or SNA protocols. Also, IBM does not support IPDS printers over TN5250e.

Displays will automatically be matched to the closest TN5250e emulation by the controller. For example, a 3180 will be matched to a 3180, but a 3489 will be matched to a 3477. The display models Telnet supports are: 5251m11, 5291-1, 5292-2, 3180-2, 3179-2, 3196-A1, 3477-FG and 3477-FC non-InfoWindow (InfoWindow II features are not supported).

---

## Configure the Host to Use AnyNet

The process of configuring the AS/400, iSeries or eServer i5 host includes:

1. Fill out the AnyNet Configuration Worksheet that will be used when configuring the 5794ip controller.
2. Setting the host values so the host will auto configure the controller and its attached devices when the 5794ip controller is brought on line.
3. After the 5794ip controller is brought on line, disable the host's Switched Disconnect function.



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**CAUTION:** IT IS ABSOLUTELY NECESSARY THAT THE HOST'S SWITCHED DISCONNECT FUNCTION BE DISABLED OR ANYTIME A DEVICE ATTACHED TO THE 5794IP CONTROLLER IS POWERED DOWN, THE HOST WILL DROP SOME OR ALL OF THE DEVICES ON THE CONTROLLER.

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### AnyNet Configuration Worksheet



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**TIP:** PRINT THIS WORKSHEET AND FILL IN THE REQUIRED VALUES. YOU WILL USE THIS INFORMATION WHEN SETTING UP THE CONTROLLER.

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### Host TCP/IP Address

The AS/400, iSeries or eServer i5 host's Local Adapter Address is: \_\_\_\_\_ . \_\_\_\_\_ . \_\_\_\_\_ . \_\_\_\_\_

1. On the host command line, enter **CFGTCP**, press ENTER.
2. Select Option 10 – Work with TCP/IP Host Table Entries, press ENTER. Scroll down until you find an entry with the host's name (the Local Control Point name). Write the IP address in the blank above.
3. As an alternate to step 2, select Option 1 – Work with TCP/IP Interfaces, press ENTER. The IP address will be shown on the entry with a line type of "\*\*ELAN". Write the address in the blank above.

### Host Control Point Name

The AS/400, iSeries or eServer i5 host's Host Control Point Name is: \_\_\_\_\_

1. On the host command line, enter **DSPNETA**, press ENTER.
2. Locate the **Local Control Point Name**. Write the name in the blank above.

### Host Network ID

The AS/400, iSeries or eServer i5 host's Host Network ID is: \_\_\_\_\_

1. On the host command line, enter **DSPNETA**, press ENTER.
2. Locate the **Local Network ID** field. Write the name in the blank above.

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## Interface Control Point Name

The Interface Control Point name the host will use is: \_\_\_\_\_

This name must be unique and meet the following requirements:

- The name can be no shorter than two characters and no longer than eight characters in length.
- The name must start with an alpha character (A-Z).
- The name must contain only alpha-numeric characters (A-Z, 0-9).
- The first four characters must uniquely identify the 5794ip controller, since the controller will automatically create printer and display devices on the host using the first four characters of this name followed by five additional host assigned characters.

## AnyNet Controller and Remote Control Point Names

The AnyNet Controller Name is: \_\_\_\_\_

The AnyNet Remote Control Point Name is: \_\_\_\_\_



**NOTE:** IF THERE IS NOT AN ANYNET CONTROLLER ALREADY CONFIGURED ON THE HOST, YOU WILL HAVE TO CREATE ONE. THEN COME BACK TO THIS WORKSHEET AND FILL IN THE BLANKS USING THE INSTRUCTIONS BELOW. REFER TO THE CREATING AN ANYNET CONTROLLER SECTION FOR INSTRUCTIONS ON CREATING A NEW CONTROLLER.

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Generally, it is recommended that one AnyNet controller on the host be shared with all 5794ip controllers. When configuring the AnyNet Controller and Remote Control Point names on the host, the same name may be used for both. This name is different from the Interface Control Point Name for the 5794ip controller.

However, if your host supports more than 254 AnyNet devices, configure one AnyNet controller for each 5794ip controller. In this case, the AnyNet Controller Name, the AnyNet Remote Control Point Name and the Interface Control Point Name for the 5794ip controller must be the same name.

If there is already an AnyNet Controller defined on the host and you plan to use the 5794ip controller under the host's AnyNet controller, do the following:

1. On the host command line, type **WRKCTLD**, press ENTER.
2. Locate the AnyNet Controller (it will have a Type of "\*\*APPC"), enter the value "5" in front of that controller. Press ENTER.
3. Locate the Link Type field. If it has a value of "\*\*ANYNW", continue to the next step. Otherwise, press F12, and repeat steps 2 and 3 on each AnyNet Controller until the right controller is found.
4. Locate the Controller Description field and write the name in the blank for the AnyNet Controller Name above.
5. Locate the Remote Control Point name and write the name in the blank for the AnyNet Remote Control Point Name above.



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## Setting the Host Values

Before installing the 5497ip Controller the host's system values must be set to allow AnyNet Communication and auto configuration of devices.



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**TIP:** USE THE INFORMATION ON THE ANYNET WORKSHEET IN SETTING THE HOST VALUES IN THIS SECTION.

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## Enabling AnyNet

AnyNet support must be enabled on the host. Check the current setting by doing the following:

1. On the host's command line, enter **DSPNETA**, press ENTER.
2. Scroll down to the last page of the available parameters. If the Allow AnyNet Support value is set to \*No, return to the command prompt (press the CMD3 key).
3. On the host's command line, enter:

**CHGNETA ALWANYNET (\*YES)**

## Enabling Auto Configuration

Make certain that the AS/400, iSeries or eServer i5 host is set up for auto-configuration of new devices by doing the following:

1. On the host command line, enter **CHGSYSVAL SYSVAL(QAUTOCFG) VALUE('1')**, press ENTER.
2. On the host command line, enter **CHGSYSVAL SYSVAL(QAUTORMT) VALUE('1')**, press ENTER.
3. On the host command line, enter **CHGSYSVAL SYSVAL(QAUTOVRT) VALUE('512')**, press ENTER. The Number of devices to auto configure should be large enough to account for all virtual (APPC) devices on your network. If you are unsure, you may want to increase this number by using the CHGSYSVAL command.
4. On the host command line, enter **WRKLIND**, press ENTER. Enter a 2 to change or 5 to display in front of the line the 5794ip controller is attached to. Press ENTER several times until Autocreate controller is displayed in the lower section of the menu options. Verify that the **Autocreate controller** parameter is set to **\*Yes**.

## Creating an AnyNet Controller



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**NOTE:** IF YOU ALREADY HAVE AN ANYNET CONTROLLER DEFINED ON YOUR HOST, SKIP TO THE SECTION, VARYING ON THE ANYNET CONTROLLER.

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I-O recommends only one AnyNet APPC Controller on the host. However, this limits the maximum AnyNet devices to 254. If there are more than 254 AnyNet devices on the host I-O recommends creating one AnyNet controller for each 5797ip controller.

### **To Create a "Global" AnyNet Controller**

1. On the host command line, enter **CRTCTLAPPC**, press F4.
2. In the Controller Description field, enter the name of your choice. I-O recommends "ANYNET".
3. In the Link Type field, enter **\*ANYNW**.
4. Press ENTER.

- 
5. In the Remote Net ID field, enter **\*NETATR**.
  6. In the Remote Control Point Name, enter the name of your choice. I-O recommends "AnyNet".
  7. Press ENTER.

### **To Create one AnyNet Controller for Each 5794ip Controller**

It is possible to create an individual AnyNet controller for every 5794ip controller attached to the host. However, this approach can be confusing since any programmable AnyNet APPC device will randomly configure under the different APPC controllers. Although this does not affect operation, it does make it more difficult to locate and administer the various AnyNet APPC devices.

1. On the host command line, enter **CRTCTLAPPC**, press F4.
2. In the Controller Description field, enter the 5794ip Controller Name from the AnyNet Worksheet.
3. In the Link Type field, enter **\*ANYNW**.
4. Press ENTER.
5. In the Remote Net ID field, enter **\*NETATR**.
6. In the Remote Control Point Name, enter the 5794ip Controller Name from the AnyNet Worksheet.
7. Press ENTER.

### **Varying on the AnyNet Controller**

Vary On the AnyNet controller by typing the following on the host command line:

1. **WRKCFGSTS \*CTL** [AnyNet Controller Name]
2. Press ENTER.
3. Type a "1" in front of the APPC controller, press ENTER

### **Adding the 5794ip Controller to the TCP/IP Host Table**



**NOTE:** THIS PROCESS WILL NEED TO BE COMPLETED AFTER THE 5794IP CONTROLLER'S IP ADDRESS HAS BEEN ASSIGNED.



**CAUTION:** MAKE SURE THAT THE TCP/IP ADDRESS BEING ASSIGNED TO THE 5794IP CONTROLLER HAS NOT BEEN USED BY ANOTHER DEVICE. TO DETERMINE IF ANOTHER DEVICE IS NOT USING THE IP ADDRESS, WITH THE 5794IP CONTROLLER POWERED OFF, PING THE IP ADDRESS. IF THERE IS A RESPONSE, THEN THE IP ADDRESS IS BEING USED BY ANOTHER DEVICE.

1. On your host's command line, enter **CFGTCP**, press ENTER.
2. Select 10 Work with TCP/IP host table entries.
3. Scroll down and make sure the IP address being assigned to the 5794ip Controller is not already in use. Then return to the top of the list.
4. Place a "1" on the blank line on top of the list to add a TCP/IP device, press ENTER.
5. Enter the TCP/IP address of the 5794ip controller in the Internet address field.
6. In the Host names field, enter the following: [Interface Control Point Name from the AnyNet Worksheet].[Host Network ID].SNA.IBM.COM  
  
For example: if the Interface Control Point Name is IO5794 and the Host Network ID is APPN, the value entered would be "IO5794.APPN.SNA.IBM.COM".
7. If desired, enter an additional description for the 5794ip controller in the Text description field.

- 
8. Press ENTER.

### **Changing the AS/400, iSeries or i5's APPN Remote Configuration List**

When using one AnyNet APPC controller for all AnyNet APPC devices, each 5794ip controller needs to be added to the host's APPN remote configuration list. To accomplish this, follow these steps:

1. On the host command line, type **CHGCFGL \*APPNRMT**, press ENTER.
2. Scroll to the bottom of the displayed list and enter the following required information directly from the AnyNet worksheet:

Remote Location:	Interface Control Point Name
Remote Network ID:	Host Network ID
Local Location:	Host Control Point Name
Remote Control Point:	AnyNet Remote Control Point Name
Control Point Net ID:	Host Network ID

3. Press ENTER.

---

## Disabling the Host's Switched Disconnect Function



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**CAUTION:** IT IS ABSOLUTELY NECESSARY THAT THE HOST'S SWITCHED DISCONNECT FUNCTION BE DISABLED OR ANYTIME A DEVICE ATTACHED TO THE 5794IP CONTROLLER IS POWERED DOWN, THE HOST WILL DROP SOME OR ALL OF THE DEVICES ON THE CONTROLLER.

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After the 5794ip controller has been configured and is on-line, the Switched Disconnect function *must* be set to “\*NO”.

To disable the Switched Disconnect function:

1. On the host command line, type **WRKCTLD**, press ENTER.
2. Locate the controller that was just created. It will be a Type of “5495” and have a name that consists of the first five characters of the Interface Control Point Name plus “RMT. For example, if the Interface Control Point Name was EXAMPLE, then the controller name would be “EXAMPRMT”  
Enter the value “8” in front of the controller, press ENTER.
3. The controller and its attached devices will be displayed. Vary off the controller by entering the value “2” in front of the controller. After the controller and its devices have been varied off, press F12.
4. Enter the value “2” in front of the controller. Press ENTER.
5. Locate the Switched Disconnect field, and change the value to “\*NO”. Press ENTER, then F3 if needed to close the function.
6. Enter the value “8” in front of the controller. Vary on the controller by entering the value “1” in front of the controller. After the controller and its devices have been varied on, press F12.

---

# Configure the Host to Use SNA

The process of configuring the AS/400, iSeries or eServer i5 host includes:

1. Complete the SNA Configuration Worksheet.
2. Set the host values so that the host will auto configure the devices attached to the controller.

## SNA Configuration Worksheet



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**TIP:** PRINT THIS WORKSHEET AND FILL IN THE REQUIRED VALUES. YOU WILL USE THIS INFORMATION WHEN SETTING UP THE CONTROLLER.

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### Host Local Adapter Address

The AS/400, iSeries or eServer i5 host's Local Adapter Address is: \_\_\_\_ : \_\_\_\_ : \_\_\_\_ : \_\_\_\_ : \_\_\_\_ : \_\_\_\_

1. On the host command line, enter **WRKLIND**, press ENTER.
2. Scroll down until the Ethernet line is shown where the 5794ip controller will be attached.
3. Enter "5" for Display in the Opt column.
4. Scroll down until the **Local Adapter Address** field is shown. Write the address in the format of XX:XX:XX:XX:XX:XX in the blank above.

### Host Control Point Name

The AS/400, iSeries or eServer i5 host's Host Control Point Name is: \_\_\_\_\_

1. On the host command line, enter **DSPNETA**, press ENTER.
2. Scroll down until the **Local Control Point Name** is shown. Write the name in the blank above.

### Host Network ID

The AS/400, iSeries or eServer i5 host's Host Network ID is: \_\_\_\_\_

1. On the host command line, enter **DSPNETA**, press ENTER.
2. Scroll down until the **Local Network ID** field is shown. Write the name in the blank above.

### Interface Control Point Name

The Interface Control Point name that the host will use is: \_\_\_\_\_

This name must be unique and meet the following requirements:

- The name can be no shorter than two characters and no longer than eight characters in length.
- The name must start with an alpha character (A-Z).
- The name must contain only alpha-numeric characters (A-Z, 0-9).
- The first four characters must uniquely identify the 5794ip controller, since the controller will automatically create printer and display devices on the host using the first four characters of this name followed by five additional host assigned characters.

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## Setting the Host for Auto Configuration

Make certain that the AS/400, iSeries or eServer i5 host is set up for auto-configuration of new devices by doing the following:

1. On the host command line, enter **CHGSYSVAL SYSVAL(QAUTOCFG) VALUE('1')**, press ENTER.
2. On the host command line, enter **CHGSYSVAL SYSVAL(QAUTORMT) VALUE('1')**, press ENTER.
3. On the host command line, enter **CHGSYSVAL SYSVAL(QAUTOVRT) VALUE('512')**, press ENTER. The Number of devices to auto configure should be large enough to account for all virtual (APPC) devices on your network. If you are unsure, you may want to increase this number by using the CHGSYSVAL command.
4. On the host command line, enter **WRKLIND**, press ENTER. Enter a 5 to display, or 2 to change in front of the line that the 5794ip controller is attached to. Press ENTER several times until Autocreate controller is displayed in the lower section of the menu options. Verify that the **Autocreate controller** parameter is set to **\*Yes**.

---

## Configuring the Host for IPDS Printing

Several steps are required to configure the IBM host system to enable IPDS printing to a twinax IPDS printer. These include ensuring that PSF/400 is installed, that your AS/400 has the required PTF's installed and configured properly to support TCP/IP printing, verifying that line descriptions and host TCP/IP table entries are made, creating the PSF object, and configuring printer devices for use with PSF/400.

### Requirements

Make sure that the AS/400 host is running a version of OS/400 that supports TCP/IP, has PSF/400 installed, and that the most recent PTF's are installed and configured.

The PTF information presented below may have been superceded with more recent releases. For versions not shown below, check with IBM for the appropriate PTF information. Additional information about PTF's to use can be obtained from IBM's AS/400 service Web site: <http://as400service.rochester.ibm.com>.

### OS/400 V3R1

General	C6198310 Cumulative tape or later SF35164 TCP/IP for PSF/400 (order cover letter only) SF24140 IPDS pass through (order cover letter only)
Sockets	SF30018
WRKAFF2	SF40039
PSF/400	APAR SA44304

### OS/400 V3R2

PSF/400	APAR SA44304
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### OS/400 V3R6

General	C5346360 Cumulative tape or later SF45620 TCP/IP for PSF/400 (order cover letter only) SF45624 IPDS pass through
Sockets	SF30508
WRKAFF2	SF31461
PSF/400	APAR SA44304

### OS/400 V3R7

PSF/400	APAR SA44304
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### Creating a Line Description on the AS/400

If the controller and the AS/400 host are not on the same LAN segment, have the system administrator verify that there is a route defined in the TCP/IP route List. If there is not a route defined, use the AS/400

**ADDTCPRTE** COMMAND to create a route definition.

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Also, verify if a line description has been created for the line to which the controller will be attached. If there is not a line description, have the system administrator use the AS/400 **CRTLINETH** to create an Ethernet line description.

#### Configuring a TCP/IP Host Table Entry

**This step is optional** – IBM suggests that a host entry may be created in the TCP/IP table. Have the system administrator use the AS/400 **CFGTCP** command to add the host name and TCP/IP address of the printer's Ethernet connection.

#### Configuring V3R1 or V3R6

##### **PSF/400 for V3R1 or V3R6**

The following instructions are used to create a printer device description:

1. At the AS/400 command line, enter the command **CRTDEVPRT**.
2. Press the F11 key to display the keywords.
3. In the "Device Description" (**DEV**) field, enter the name of the printer. The name may comprise of the letters A-Z and numerals 0-9. It must begin with a letter, and a maximum of 10 characters is allowed.
4. In the "Device Class" (**DEVCLS**) field, enter **\*RMT**.
5. In the "Device Type" (**TYPE**) field, enter **\*IPDS**.
6. In the "Device Model" (**MODEL**) field, enter **0**.
7. In the "Advanced Function Printing" (**AFP**) field, enter **\*YES**.
8. In the "AFP Attachment" (**AFPATTACH**) field, enter **\*APPC**.
9. In the "Font" (**FONT**) field, enter an appropriate value such as **11**.
10. In the "Form Feed" (**FORMFEED**) field, enter **\*AUTOCUT**.
11. In the "Remote Location" (**RMTLOCNAME**) field, enter **TCPIP**.

##### **AFP for V3R1 or V3R6**

The following instructions are used to create a data area that is used by PSF/400:

1. At the AS/400 command line, enter the command **WRKAFF2**.
2. Press the F11 key to display the keywords, then press F10 to display additional values.
3. In the "Printer Device Name (**DEV**)" field, enter the name of the printer. This name must be identical to the name entered for the device name in the **DEV** field in the **CRTDEVPRT** command.
4. In the "IPDS Pass Through" (**IPDSPASTHR**) field, enter **\*NO**.  

You may set this value to **\*YES** if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following uses apply: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM's *Printer Device Programming Version 5 (SC41-5713-05)* publication.
5. In the "TCP/IP Support" (**TCPIP**) field, enter **\*YES**.
6. In the "Remote System" (**RMTSYS**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional **CFGTCP** command to create a TCP/IP Host Table entry.



7. In the “Port” (**PORT**) field, enter port number based upon which twinax address and which line on the controller that the IPDS printer is attached. Use the following table to assign the port:

Port	Line	Twinax Address	Port	Line	Twinax Address
5001	1	0	5008	2	0
5002	1	1	5009	2	1
5003	1	2	5010	2	2
5004	1	3	5011	2	3
5005	1	4	5012	2	4
5006	1	5	5013	2	5
5007	1	6	5014	2	6

For example, if the IPDS printer were attached to Line 2 and had a twinax address of 6, then the value to enter in the Port field would be 5014.

8. In the “Activation Timer” (**ACTTMR**) field, enter **\*NOMAX**. This will cause PSF/400 to wait indefinitely for a response to an activation request.
9. In the “Inactivity Timer” (**INACTTMR**) field for V3R1, or “Release Timer” (**RLSTMR**) field for V3R6, enter **\*SEC15**. This parameter should be set to a value less than the timeout value on the printer. This is the time PSF/400 will maintain a session with the I-O Printer while there are no spooled files with a status of RDY.

## Configuring V3R2

### PSF/400 for V3R2

The following instructions are used to create a printer device description:

- At the AS/400 command line, enter the command **CRTDEVPRT**.
- Press the F11 key to display the keywords.
- In the “Device Description” (**DEVVD**) field, enter the name of the laser printer with the IPDS DIMM/FLASH. The name may comprise of the letters AZ and numerals 0-9. It must begin with a letter, and a maximum of 10 characters is allowed.
- In the “Device Class” (**DEVCLS**) field, enter **\*RMT**.
- In the “Device Type” (**TYPE**) field, enter **\*IPDS**.
- In the “Device Model” (**MODEL**) field, enter **0**.
- In the “Advanced Function Printing” (**AFP**) field, enter **\*YES**.
- In the “AFP Attachment” (**AFPATTACH**) field, enter **\*APPC**.
- In the “Font” (**FONT**) field, enter an appropriate value such as **11**.
- In the “Form Feed” (**FORMFEED**) field, enter **\*AUTOCUT**.
- In the “Remote Location” (**RMTLOCNAME**) field, enter **TCPIP**.

### AFP for V3R2

The following instructions are used to create a data area that is used by PSF/400:

1. At the AS/400 command line, enter the command **CRTPSFCFG**.
2. Press F11 to display the keywords, then press F10 to display additional values.
3. In the “PSF Configuration” (**PSFCFG**) field, enter the name of the printer.
4. In the “Library” field, enter **QGPL**.
5. In the “IPDS Pass Through” (**IPDSPASTHR**) field, **\*NO**.  
 You may set this value to **\*YES** if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following applies: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM’s *Printer Device Programming Version 5 (SC41-5713-05)* publication.
6. In the “Activation Release Timer” (**ACTRLSTMR**) field, enter **\*NORDYF**. This will cause PSF/400 to print all spooled files with a status of RDY before releasing the session (which does not terminate the writer).
7. In the “Release Timer” (**RLSTMR**) field, enter **\*SEC15**. This parameter should be set to a value less than the timeout value on the printer. This is the time PSF/400 will maintain a session with the printer while there are no spooled files with a status of RDY.
8. In the “Remote Location Name or Address” (**RMTLOCNAME**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.
9. In the “Port” (**PORT**) field, enter port number based upon which twinax address and which line on the controller that the IPDS printer is attached. Use the following table to assign the port:

Port	Line	Twinax Address		Port	Line	Twinax Address
5001	1	0		5008	2	0
5002	1	1		5009	2	1
5003	1	2		5010	2	2
5004	1	3		5011	2	3
5005	1	4		5012	2	4
5006	1	5		5013	2	5
5007	1	6		5014	2	6

For example, if the IPDS printer were attached to Line 2 and had a twinax address of 6, then the value to enter in the Port field would be 5014.

10. In the “TCP/IP Activation Timer” (**ACTTMR**) field, enter **\*NOMAX**. This will cause PSF/400 to wait indefinitely for a response to an activation request.

#### Configuring V3R7 or V4R1

#### AFP for V3R7 or V4R1

1. At the AS/400 command line, enter the command **CRTPSFCFG**.
2. Press Enter or F4 to display the keywords.
3. In the “PSF Configuration” (**PSFCFG**) field, enter the name of the printer. Remember this name as it will also be entered in the User-Defined Object (USRDFNOBJ) field in the printer device

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description that will be created in the next section.

4. In the "IPDS Pass Through" (**IPDSPASTHR**) field, enter **\*NO**.

You may set this value to **\*YES** if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following uses apply: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM's *Printer Device Programming Version 5 (SC41-5713-05)* publication.

5. In the "Activation Release Timer" (**ACTRLSTMR**) field, enter **\*NORDYF**. This will cause PSF/400 to print all spooled files with a status of RDY before releasing the session (which does not terminate the writer).
6. In the "Release Timer" (**RLSTMR**) field, enter **\*SEC15**. This parameter should be set to a value less than the timeout value on the printer. This is the time PSF/400 will maintain a session with the printer while there are no spooled files with a status of RDY.

### PSF/400 for V3R7 or V4R1

The following instructions are used to create a printer device description:

1. At the AS/400 command line, enter the command **CRTDEVPRT**.
2. Press the F4 key to display the keywords.
3. In the "Device Description" (**DEVVD**) field, enter the name of the printer. The name may comprise of the letters A-Z and numerals 0-9, must begin with a letter, with a maximum of 10 characters allowed.
4. In the "Device Class" (**DEVCLS**) field, enter **\*LAN**.
5. In the "Device Type" (**TYPE**) field, enter **\*IPDS**.
6. In the "Device Model" (**MODEL**) field, enter **0**.
7. In the "LAN Attachment" (**LANATTACH**) field, enter **\*IP**. Then press F10.
8. In the "Advanced Function Printing" field, enter **\*YES**.
9. In the "Port" (**PORT**) field, enter port number based upon which twinax address and which line on the controller that the IPDS printer is attached. Use the following table to assign the port:

Port	Line	Twinax Address	Port	Line	Twinax Address
5001	1	0	5008	2	0
5002	1	1	5009	2	1
5003	1	2	5010	2	2
5004	1	3	5011	2	3
5005	1	4	5012	2	4
5006	1	5	5013	2	5
5007	1	6	5014	2	6

For example, if the IPDS printer were attached to Line 2 and had a twinax address of 6, then the value to enter in the Port field would be 5014.

10. In the "Font" (**FONT**) field, enter an appropriate value such as **11**.
11. In the "Form Feed" (**FORMFEED**) field, enter **\*AUTOCUT**.

- 
12. In the “Activation Timer” (**ACTTMR**) field, enter **\*NOMAX**. This will cause the AS/400 host to wait indefinitely for a response to an activation request.
  13. In the “Remote Location” (**RMTLOCNAME**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.
  14. In the “User-Defined Object” (**USRDFNOBJ**) field enter the printer name that you entered in the PSF Configuration (PSFCFG) field when setting up AFP (section 3.1.6.1, step 3 above). This is the PSF configuration object that is used internally by the AS/400 when referring the I-O Print Server.

Leave the “Library” blank unless you know its name.

Enter **\*PSFCFG** as the “Object Type”.

Configuring V4R2 and Above

### **AFP for V4R2 and Above**

1. At the AS/400 command line, enter the command **CRTPSFCFG**.
2. Press Enter or F4 to display the keywords.
3. In the “PSF Configuration” (**PSFCFG**) field, enter the name of the printer. Remember this name as it will also be entered in the User-Defined Object (USRDFNOBJ) field in the printer device description that will be created in the next section.
4. In the “IPDS Pass Through” (**IPDSPASTHR**) field, enter **\*NO**.  

You may set this value to **\*YES** if you have applications that generate SCS or IPDS data streams that are printed to an AFP printer if the following uses apply: 1) An application like Business Graphics Utilities, GDDM, or Virtual Print that does not support AFPDS is used; or 2) The SCS or IPDS application does not contain any reference to overlay page segments or host font character sets. Certain limitations and other configuration considerations are discussed in IBM's *Printer Device Programming Version 5 (SC41-5713-05)* publication.
5. In the “Activation Release Timer” (**ACTRLSTMR**) field, enter **\*NORDYF**. This will cause PSF/400 to print all spooled files with a status of RDY before releasing the session (which does not terminate the writer).
6. In the “Release Timer” (**RLSTMR**) field, enter **\*SEC15**. This parameter should be set to a value less than the timeout value on the printer. This is the time PSF/400 will maintain a session with the printer while there are no spooled files with a status of RDY.
7. In the “**Automatic Session Recovery**” field, enter **\*YES**. This causes the PSF/400 to automatically attempt to resume printing when a session has been unexpectedly ended.
8. In the “**Acknowledgement Frequency**” field, enter “**10**”. This value is the frequency, in number of pages, that the AS/400 sends an acknowledgement request to the printer for status of pages printed. This value is used to determine where to restart printing after a connection has been lost and re-established. However, if acknowledgement frequency requests are made with great frequency, such as once per page, a performance degradation may be noticed.
9. Optional selection – In the “Page Size Control” field, enter **\*YES**. This causes PSF/400 to set the page size (forms) in lieu of using the printer's default size. Generally this parameter is used when a 4028 printer emulation is selected.
10. Optional Selection – In the “Edge Orien” field, enter **\*YES**. When the page rotation value of a spooled file is **\*COR** or **\*AUTO** and the system rotates the output, 90 degree rotation is normally used. When this parameter is **\*Yes**, PSF/400 rotates the output 270 degrees instead of 90 degrees.
11. APPC and TCP/IP Retry Count – In the “Retry” field, enter **\*NOMAX**. This causes the host to continually attempt to reconnect to the device.

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## PSF/400 for V4R2 and Above

The following instructions are used to create a printer device description:

1. At the AS/400 command line, enter the command **CRTDEVPRT**.
2. Press the F4 key to display the keywords.
3. In the “Device Description” (**DEV**) field, enter the name of the printer. The name may comprise of the letters A-Z and numerals 0-9, must begin with a letter, with a maximum of 10 characters allowed.
4. In the “Device Class” (**DEVCLS**) field, enter **\*LAN**.
5. In the “Device Type” (**TYPE**) field, enter **\*IPDS**.
6. In the “Device Model” (**MODEL**) field, enter **0**.
7. In the “LAN Attachment” (**LANATTACH**) field, enter **\*IP**. Then press F10.
8. In the “Advanced Function Printing” field, enter **\*YES**.
9. In the “Port” (**PORT**) field, enter port number based upon which twinax address and which line on the controller that the IPDS printer is attached. Use the following table to assign the port:

Port	Line	Twinax Address		Port	Line	Twinax Address
5001	1	0		5008	2	0
5002	1	1		5009	2	1
5003	1	2		5010	2	2
5004	1	3		5011	2	3
5005	1	4		5012	2	4
5006	1	5		5013	2	5
5007	1	6		5014	2	6

For example, if the IPDS printer were attached to Line 2 and had a twinax address of 6, then the value to enter in the Port field would be 5014.

10. In the “Font” (**FONT**) field, enter an appropriate value such as **11**.
11. In the “Form Feed” (**FORMFEED**) field, enter **\*AUTOCUT**.
12. In the “Activation Timer” (**ACTTMR**) field, enter **\*NOMAX**. This will cause the AS/400 host to wait indefinitely for a response to an activation request.
13. In the “Remote Location” (**RMTLOCNAME**) field, enter the TCP/IP address of the printer. You may also enter the host name if you used the optional CFGTCP command to create a TCP/IP Host Table entry.
14. In the “User-Defined Object” (**USRDFNOBJ**) field, enter the printer name that you entered in the PSF Configuration (PSFCFG) field when setting up AFP (section 3.1.7.1, step 3 above). This is the PSF configuration object that is used internally by the AS/400 when referring the I-O Print Server.

Leave the “Library” blank unless you know its name.

Enter **\*PSFCFG** as the “Object Type”.

---

## Verifying the IPDS Configuration on the AS/400

To test that the AS/400 and the printer are connected and communicating, ping the printer from an AS/400 workstation with the following command:

**PING 'TCP/IP ADDRESS' or PING HOST NAME**

'TCP/IP Address' is the address of the printer (be sure to include the single quote marks around the address). Host name is the optional name you may have defined for the printer if you created an optional TCP/IP Host Table entry. If the pings are successful, vary on the printer's device description by typing this command (all on one line):

**VRYCFG(printer device name)**

**CFGTYPE(\*DEV) STATUS(\*ON)**

To use PSF/400 to send IPDS files to the printer, start the writer by typing this command:

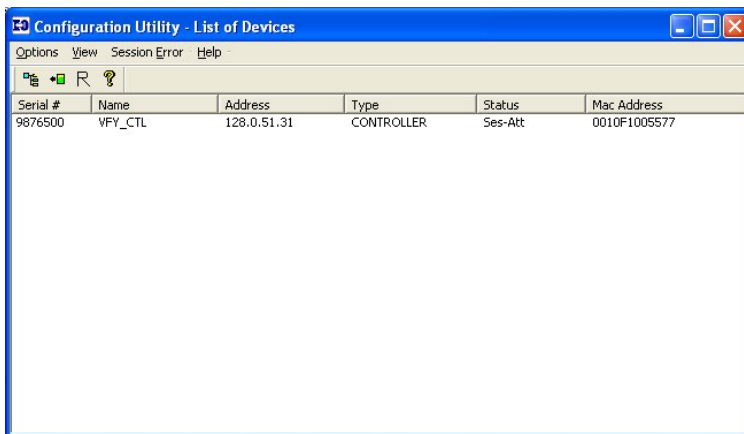
**STRPRTWTR DEV(printer device name)**


# Configure the 5794ip Twinax Controller

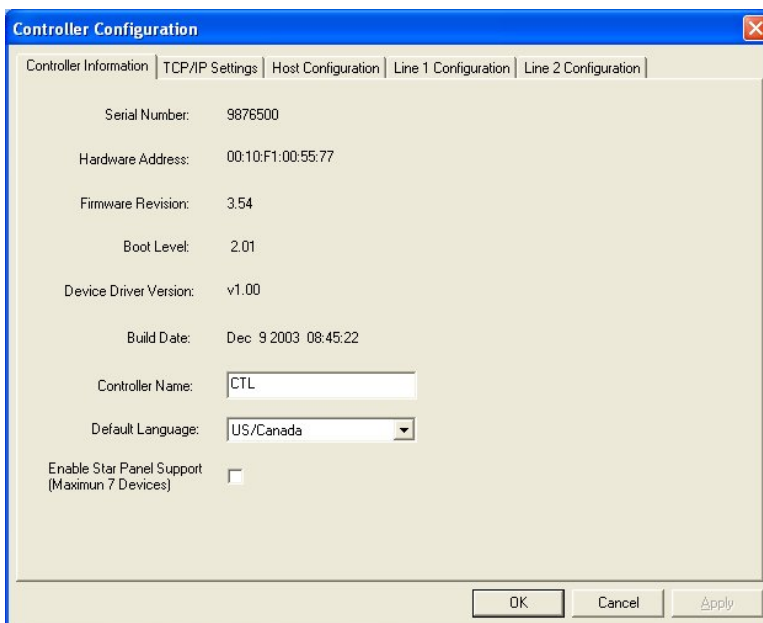
The process of configuring the controller involves setting an IP address for the controller, selecting the appropriate protocol for communicating to the AS/400, iSeries or eServer i5 host, and setting up the controller to use the appropriate protocols. Depending upon the protocol selected, there also may be a need to do some setup on the host (refer to the Configuring the AS/400, iSeries or eServer i5 section).

## Setting the General Information and IP Address

1. Run the I-O Configuration Utility by clicking on Start | Programs, navigate to the I-O Configuration Utility Group, and click on the I-O Configuration Utility option.



2. In the List of Devices, you will find an entry with a type of Controller and the serial number for the 5794ip controller that you want to configure. If there is no entry, click on the Rescan icon  to refresh the list. Double click on the desired 5794ip controller.
3. On the Controller Information tab:



- a. In the **Controller Name** field, enter the name that will be used on the I-O Configuration Utility's List of Devices screen. This name is used only with the I-O Configuration Utility.

- b. In the **Default Language** field, select the default language for all devices. This may be overridden on a device-by-device basis in the Line 1 Configuration and Line 2 Configuration tabs.
- c. If your Twinax devices are connected using twisted-pair cabling to a “star panel”, check the Enable Star Panel Support box.



**NOTE:** GENERALLY STAR PANELS ARE NOT CAPABLE OF SUPPORTING REVERSE POLARITY SIGNALS. THE CONTROLLER USES REVERSE POLARITY TWINAX SIGNALS TO EXPAND THE NORMAL 7 DEVICE TWINAX LINE LIMITATION TO 14 DEVICES. SELECTING THIS OPTION WILL DEACTIVATE THE REVERSE POLARITY SIGNALS REDUCING THE MAXIMUM NUMBER OF DEVICES SUPPORTED TO SEVEN.



**NOTE:** THE STAR PANEL MUST BE CONNECTED TO LINE 1.

4. On the TCP/IP Settings tab, assign the IP address for the 5794ip controller:

The screenshot shows the 'Controller Configuration' dialog box with the 'TCP/IP Settings' tab selected. The 'IP Address' field contains '128 . 0 . 51 . 31', the 'Default Router' field contains '128 . 0 . 250 . 254', and the 'Subnet Mask' field contains '255 . 255 . 0 . 0'. The 'DHCP Enabled' checkbox is unchecked. The dialog has 'OK', 'Cancel', and 'Apply' buttons at the bottom.

- a. To have the IP address automatically assigned by DHCP, select the DHCP Enabled check box and then skip to the next section entitled Select the Host Communication Protocol.
- b. Otherwise uncheck the DHCP Enabled check box to assign the IP address manually.
  - i. In the IP Address field, enter the TCP/IP address of the 5794ip controller.
  - ii. In the Default Router field, enter the IP address of the router or gateway serving the 5794ip controller.
  - iii. In the Subnet Mask field, enter the subnet mask of the 5794ip controller.



## Select the Host Communication Protocol

Three protocols are available to connect to the AS/400, iSeries or eServer i5 host – two TCP/IP protocols (TN5250e and AnyNet) and IBM's SNA. All protocols are auto configuring on the host. The 5794ip controller will support up to four hosts. On the first host, any one of the three protocols may be selected. Choose the protocol based upon the type of devices that are being attached.




---

**NOTE:** AFTER SELECTING THE PROTOCOL, GO TO THE APPROPRIATE SECTION IN THIS CHAPTER FOR INSTRUCTIONS ON COMPLETING THE CONFIGURATION OF THE 5794IP CONTROLLER.

---

- **TN5250e** is a routable protocol. This means that it can be used at remote locations (or where there is a router between the controller and the host). It is the easiest protocol to setup for displays and SCS printers. When configuring an IPDS Printer using the TN5250 protocol, you must have PSF/400 installed and manually configure the IPDS Printer on the iSeries Host. Use the IP Address of the 5794ip as the Remote Location and the proper Port Number shown on Page 29, based on the actual Twinax Address of the IPDS Printer.

Non-IPDS Printers are auto configured on the host as 3812-1 SCS page printers. The controller will customize the data stream to the attached twinax printer's capability removing SCS commands the printer cannot support. This allows printers like a 4214, 5224, etc. to be attached. However, TN5250e is limited in that it does not support posting the dot-matrix form alignment message as well as the IBM dot-matrix functions of backspace, bold, underscore or overstrike.

Displays will automatically be matched to the closest TN5250e emulation by the controller. For example, a 3180 will be matched to a 3180, but a 3489 will be matched to a 3477. The display models that Telnet supports are: 5251m11, 5291-1, 5292-2, 3180-2, 3179-2, 3196-A1, 3477-FG and 3477-FC non-InfoWindow (InfoWindow II features are not supported).




---

**TIP:** TN5250E IS RECOMMENDED WHEN ALL PRINTERS ARE SCS PRINTERS, ARE 3812-1 LASER PRINTERS OR DOT-MATRIX PRINTERS NOT AFFECTED BY THE FORMS ALIGNMENT OR BACKSPACING LIMITATIONS.

---




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**NOTE:** FORMS ALIGNMENT MESSAGES ON DOT MATRIX PRINTERS CAN BE ENABLED BY CHANGING THE FORM FEED PARAMETER IN THE PRINTER CONFIGURATION TO: \*CONT.

---

- **AnyNet** is actually SNA encapsulated in TCP/IP and is a routable protocol. It is more difficult than TN5250e to initially configure, but has the advantage of reporting to the host each twinax device's native model so that the actual device will be auto configured on the host. AnyNet fully supports all SCS and IPDS printers. For displays, AnyNet supports all display functions except InfoWindow II features (like Extended Character Display and Extended User Interface).




---

**TIP:** ANYNET IS THE RECOMMENDED PROTOCOL TO USE WHEN CONNECTING IPDS PRINTERS WHEN A LICENSE FOR PSF IS NOT INSTALLED OR WHERE THERE ARE IBM SCS DOT-MATRIX PRINTERS PRINTING APPLICATIONS THAT REQUIRE FEATURES NOT SUPPORTED BY TN5250E.

---

- **SNA** is IBM's most robust protocol. However, SNA cannot be routed. Like AnyNet, SNA is more difficult than TN5250e to initially configure. This protocol can only be used when the 5794ip controller is located within the same Ethernet link as the host (there cannot be a router between them). Like AnyNet, each twinax device's actual model will be auto configured on the host. SNA also does not have the limitations of TN5250e in that it fully supports all SCS and IPDS printers. I-O's implementation of SNA supports all display functions except InfoWindow II features (like Extended Character Display and Extended User Interface).




---

**TIP:** SNA IS THE RECOMMENDED PROTOCOL TO USE FOR LOCAL CONNECTIONS.

---

## Configure the Controller to Use TN5250e



**TIP:** USE THIS PROTOCOL IF ALL PRINTERS TO BE ATTACHED TO THE 5794PI CONTROLLER ARE: SCS PRINTERS THAT DO NOT NEED TO UTILIZE THE BACKSPACE, UNDERSCORE, BOLD OR OVERSTRIKE FUNCTIONS, OR THEY ARE IPDS AND YOU HAVE A LICENSE FOR PSF/400. IPDS PRINTERS WILL REQUIRE MANUALLY CONFIGURING A PSF OBJECT AND THE IPDS PRINTER. ALIGNMENT MESSAGES FOR SCS PRINTERS CAN BE OBTAINED BY CHANGING THE FORM FEED PARAMETER IN THE PRINTER CONFIGURATION TO \*CONT.

1. After setting up the controller's general information and the IP address, select the **Host Configuration tab**.

- a. For each host to be configured, **select the TN5250e** radio button.
- b. In the Host IP Address field, **enter the IP address of the AS/400, iSeries or eServer i5 host**.



**NOTE:** IN GENERAL, A HOST SHOULD ONLY BE ASSIGNED ONE TIME. HOWEVER, THE SAME HOST MAY BE USED IN SESSION 1 WITH ANYNET OR SNA AND AGAIN IN SESSION 2 WITH TN5250E.

- c. In the Telnet Options section, **enter up to six characters** in the Default Device Name field that will become the first part of the name the controller will use when assigning a name to each device.



**NOTE:** IF THIS FIELD IS LEFT BLANK YOU WILL NOT SEE THE ATTACHED DEVICES IN THE LINE 1 AND LINE 2 CONFIGURATION TABS. NOR WILL YOU BE ABLE TO SELECT THE OVERRIDE DEFAULT DEVICE NAME AND ASSIGN A SPECIFIC DEVICE NAME.

When the controller assigns a name, it will take the value in this field, and add a “D” or “P” indicating that the device is a display or printer. This will be followed by a “1” or “2” indicating the line the device is attached to. The next digit is the twinax address of the device. For example, if “TEST” were entered into this field, and there was a display on the first line with the twinax address of 4, then the controller would assign the name of “TESTD141”. The last digit represents the session number.

The controller will allow up to four display sessions to be assigned to the same host. If all four sessions were assigned to the first host, the host would assign the session names as TESTD141, TESTD142, TESTD143, and TESTD144. (See the sections entitled Controller Operation for instructions on how to assign sessions to a host and how to toggle between the sessions.)

Printer devices also support four sessions, one session on each host. Therefore, if only two hosts are configured, only two printer sessions will be available – one on each host. The Telnet device name will be the same on each host.

2. On the **Line 1 Configuration** and **Line 2 Configuration** tabs, you can manually enter the Telnet device names for each individual Twinax device by overriding the controller's automatically assigned names as well as select an overriding language for that device. For each device, do the following:

- a. If you want to override the Telnet Default Device Name the controller created using the name entered into the Default Device Name on the Host Configuration Tab, or are manually entering the Telnet device name the host will use for this device, **check the Override Default Device Name box**. In the Telnet Device Name field, **enter the name the host will use** for this device. The Default Device Name must be filled in on the Host Configuration tab.



**NOTE:** A PHYSICAL DEVICE MUST BE ATTACHED TO THE CONTROLLER BEFORE THE CHECK BOX BECOMES AVAILABLE TO USE. ALSO THE NAME FIELD WILL BE GRAYED OUT UNTIL THE CHECK BOX IS ENABLED BY A CHECK.

- b. If the default language selected on the Controller Information tab is to be overridden, in the Language field, **select a different language** for the device.
3. When all settings on all the tabs have been completed, **click OK**. You will be presented with a confirmation screen, **click Yes to save the settings** and the controller will reset.
4. After the controller restarts, the host sign-on screen will appear on the attached displays. Be patient as it may take the host a few minutes to create the devices.

## Configure the Controller to Use AnyNet



**TIP:** USE THIS PROTOCOL IF THE CONTROLLER IS REMOTELY LOCATED (OR THERE ARE ROUTERS BETWEEN THE CONTROLLER AND THE HOST). IF THERE ARE IPDS PRINTERS TO BE SUPPORTED AND A LICENSE FOR PSF/400 IS NOT AVAILABLE, OR IF THERE ARE IBM DOT-MATRIX PRINTERS THAT REQUIRE THE BACKSPACE, UNDERSCORE, BOLD OR OVERSTRIKE FUNCTIONS.

1. After setting up the controller's general information and the IP address, select the **Host Configuration tab**.

The screenshot shows the 'Controller Configuration' dialog box with the 'Host Configuration' tab selected. The dialog is divided into sections for Host 1, Host 2, Host 3, and Host 4. Host 1 is the active host, and its settings are as follows:

- Host Connection Type:  AnyNet
- Host IP Address: 128 . 0 . 11 . 11
- Host Local Adapter Address: (empty)
- Host Control Point Name: S100AA1G
- Host Network ID: APPN
- Interface Control Point Name: SNACTL
- Telnet Options: Default Device Name: TSTCTL,  Disable Connection Status Report

Host 2 and Host 3 have 'Telnet 5250' selected for their connection types and IP addresses of 128.0.11.11 and 128.0.22.22 respectively. Host 4 has 'None' selected for its connection type and an empty IP address field. The dialog includes 'OK', 'Cancel', and 'Apply' buttons at the bottom.

2. Select the AnyNet radio button.
3. In the Host IP Address field, enter the IP address of the AS/400, iSeries or eServer i5 host.
4. In the Host Control Point Name field, enter the Local Control Point Name for the AS/400, iSeries or eServer i5 host.
5. In the Host Network ID field, enter the Local Network ID name.
6. In the Interface Control Point Name field, enter a name for the 5794ip controller. The name must meet the following requirements:
  - The name can be no shorter than two characters and no longer than eight characters in length.
  - The name must start with an alpha character (A-Z).
  - The name must contain only alpha-numeric characters (A-Z, 0-9).
  - The first four characters must uniquely identify the 5794ip controller, since the controller will automatically create printer and display devices on the host using the first four characters of this name followed by five additional host assigned characters.

7. On the **Line 1 Configuration** and **Line 2 Configuration** tabs, in the Language fields, select a different language for the device if the default language selected on the Controller Information tab is to be overridden

The screenshot shows the 'Controller Configuration' dialog box with the 'Line 1 Configuration' tab selected. The dialog is divided into seven sections, each representing a different address on Line 1:

- Line 1 - Address 0 - Display:** Telnet Device Name: TSTCTLD10, Language: Use Default.
- Line 1 - Address 1 - No Device Connected:** Telnet Device Name: (empty), Language: Use Default.
- Line 1 - Address 2 - No Device Connected:** Telnet Device Name: (empty), Language: Use Default.
- Line 1 - Address 3 - Display:** Telnet Device Name: Testdisp, Override Device Name: , Language: Use Default.
- Line 1 - Address 4 - Display:** Telnet Device Name: TSTCTLD14, Language: Use Default.
- Line 1 - Address 5 - No Device Connected:** Telnet Device Name: (empty), Language: Use Default.
- Line 1 - Address 6 - Display:** Telnet Device Name: TSTCTLD16, Language: Use Default.

Buttons for OK, Cancel, and Apply are located at the bottom right of the dialog.

8. When complete with all settings on all the tabs, **click OK**. **Click Yes** to save the settings and the controller will reset.
9. After the controller resets, the host sign-on screen will appear on the attached displays. Be patient as it may take the host a few moments to create the devices.

The following devices will now automatically be created on the host:

- An APPC Controller with the name assigned as the “Interface Control Point”.
- A 5494 Controller with the first five characters of the “Interface Control Point” name followed by the identifier RMT.
- A printer and display device for every printer and display attached to the controller at the time the controller was configured and reset. The names will follow the format of ABCDXXXYY where ABCD are the first four characters of the Interface Control Point Name. The XXX will either be DSP indicating a display or PRT indicating a printer. The YY will be a hexadecimal value assigned by the host.

## Configure the Controller to Use SNA



**TIP:** USE THIS PROTOCOL ONLY IF THE CONTROLLER AND THE HOST ARE WITHIN THE SAME ETHERNET LINK (IE. THERE ARE NO ROUTERS BETWEEN THE CONTROLLER AND THE HOST).

1. After setting up the controller's general information and the IP address, select the **Host Configuration** tab.

The screenshot shows the 'Controller Configuration' dialog box with the 'Host Configuration' tab selected. It contains four host configuration panels (Host 1 to Host 4). Host 1 is configured for SNA connection, while Hosts 2, 3, and 4 are configured for Telnet 5250. The 'Host Local Adapter Address' field for Host 1 is filled with '01-AA-C1:03:17:FF'. The 'Host Control Point Name' is 'S100AA1G', 'Host Network ID' is 'APPN', and 'Interface Control Point Name' is 'SNACTL'. Under 'Telnet Options', 'Default Device Name' is 'TSTCTL' and 'Disable Connection Status Report' is checked. Buttons for 'OK', 'Cancel', and 'Apply' are at the bottom.

2. In the host Adapter Address field, enter the Local Adapter Address for the line this controller will be connected on. Make certain the address is entered in the format of XX:XX:XX:XX:XX:XX.
3. In the Host Control Point Name field, enter the Local Control Point Name for the AS/400, iSeries or eServer i5 host.
4. In the Host Network ID field, enter the Local Network ID name.
5. In the Interface Control Point Name field, enter a name for the 5794ip controller. The name must meet the following requirements:
  - The name can be no shorter than two characters and no longer than eight characters in length.
  - The name must start with an alpha character (A-Z).
  - The name must contain only alpha-numeric characters (A-Z, 0-9).
  - The first four characters must uniquely identify the 5794ip controller, since the controller will automatically create printer and display devices on the host using the first four characters of this name followed by five additional host assigned characters.

6. On the **Line 1 Configuration** and **Line 2 Configuration** tabs, in the Language fields, select a different language for the device if the default language selected on the Controller Information tab is to be overridden.

7. When you have completed all settings on all the tabs, **click OK**. **Click Yes** to save the settings and the controller will reset.
8. After the controller restarts, the host sign-on screen will appear on the attached displays. Be patient as it may take the host a few moments to create the devices.

The following devices will now be automatically created on the host:

- An APPC Controller with the name assigned as the “Interface Control Point”.
- A 5494 Controller with the first five characters of the “Interface Control Point” name followed by the identifier RMT.
- A printer and display device for every printer and display attached to the controller at the time the controller was configured and reset. The names will follow the format of ABCDXXXYY where ABCD are the first four characters of the Interface Control Point Name. The XXX will either be DSP indicating a display or PRT indicating a printer. The YY will be a hexadecimal value assigned by the host.

## Configure the Controller for IPDS Printing via PPR/PPD

No configuration is required for connection of IPDS printers to the host via PPR/PPD.

When IPDS printers are attached to a twinax cable, they are given a twinax address. This address along with the line number the printer is attached to (Line 1 or Line 2) are used to configure the host's PSF object and printer device description. Refer to page 28, Configuring V4R2 and Above for PPR/PPD configuration.

# Controller Operation

## Toggling between Display Sessions

Each twinax display address has four sessions. To move from one session to another:

- Press ALT, HEX, then the F7 key to move forward a session.
- Press ALT, HEX, then the F6 key to move back a session.

## Changing a Display Session from one Host to Another

When the controller is configured for the first time and goes through its initial connection process with the hosts, the first logical display session is created on the first host even if multiple hosts have been configured. The remaining three sessions are not attached to any host.

To attach or change a display session to a different host:

1. Toggle to the desired session using the ALT-HEX-F7 key sequence to move forward a session, or ALT-HEX-F6 key sequence to move back a session.
2. Press the System Request key
3. On the new command line, select the host you want this logical session attached to by entering "h1" for host 1, "h2" for host 2, "h3" for host 3, or "h4" for host. Then press the Enter key.



---

**NOTE:** TO DISCONNECT A LOGICAL SESSION FROM A HOST, ENTER "H0" AS THE HOST IN STEP 3.

---

## Sharing a Printer with Multiple Hosts

When a printer is idle, the controller will report to all hosts that the printer is available. The first host to send a job to the printer will get exclusive use of the printer until the writer is stopped. While the host's writer is active, all other hosts are told the printer is not available. When the active writer is ended, all hosts are told (after a short time-out) that the printer is now powered-up and available.



## TN5250e Operation

### Starting Display Sessions

After the controller has been configured, the controller will cycle through a restart process. During this process, displays will show a block cursor in the upper right-hand corner, then the cursor will move to the upper left-hand corner as the controller is connecting to the hosts and the host is creating the devices. After a brief pause, a host sign-on screen for the first session will be presented on each display.



**NOTE:** THE FIRST TIME THE CONTROLLER IS CONFIGURED (OR AFTER THE CONTROLLER HAS HAD THE FACTORY DEFAULTS RESTORED), THE FIRST SESSION ON EACH DISPLAY WILL AUTOMATICALLY BE CONFIGURED ON THE FIRST HOST. TO USE THE OTHER SESSIONS, EACH SESSION WILL NEED TO BE ASSIGNED TO A HOST (SEE CHANGING A DISPLAY SESSION FROM ONE HOST TO ANOTHER). THE SESSIONS MAY THEN BE ACCESSED USING THE SESSION TOGGLE FUNCTION (SEE TOGGING BETWEEN DISPLAY SESSIONS).

If a sign-on screen is not presented, and the cursor is in the upper left-hand corner, then the host has not accepted the request to connect. This can be caused by the following conditions:

- Incorrect IP address for the host – reenter the proper IP address.
- Incorrect IP address of the controller (another device may have the same address) – reenter a valid IP address.
- The host may not be set for auto-configuration – the system administrator will need to turn this on, or manually configure a device.
- The host may not have enough virtual device sessions available – the system administrator will need to use the CHGSYSVAL command to increase the number of available sessions.
- The host may believe there is another device with the same name and IP address already active – the system administrator will need to vary off the device and end the TCP/IP session (see Troubleshooting for details on how to handle this issue).



**TIP:** SEE TROUBLESHOOTING FOR MORE INFORMATION ON CONNECTION ISSUES.

### Starting Printer Sessions

Printer sessions will start automatically at the same time that the display sessions are started.



**NOTE:** THE FIRST TIME THE CONTROLLER IS CONFIGURED (OR AFTER THE CONTROLLER HAS HAD THE FACTORY DEFAULTS RESTORED), ONE PRINTER SESSION WILL BE CONFIGURED ON EACH HOST.

When the printer session has completed the start up process and has established a connection with the host, a Printer Connection Status message will be generated and sent to the printer. It will look like this:

```
AS/400 Host Communication Status:
Connection attempt succeeded
Host system S101256R
Printer name TNPRT00
Status code I902 - Session successfully started
```

The status code (I902) shown in the above example is the normal code indicating successful host communication.

If the printer session is not able to establish a connection to the host, the Printer Connection Status message will still be printed, but with a different status code and brief explanation. Refer to the Troubleshooting chapter for possible solutions to connection errors.

## Re-Connect Sessions

There are several methods of reconnecting TN5250e sessions to the hosts:

- Ping the controller. This will initiate the controller's reconnection process.
- The controller will automatically attempt to reconnect with the hosts every five minutes.
- At the host, vary off and back on all sessions for the device.
- At the host, end the TCP/IP sessions. Then either ping the controller, or reset the controller.
- For an individual device, sign off, power the device off and back up again.
- For a display session, do a System Request + h1 (h2, h3 or h4) keystroke sequence and change to a different host.

## Disconnect Sessions

In normal use the controller should never be powered down. In the unlikely event the controller is to be powered down, sign off all display sessions. Then, either power down the display and printer devices, or at the host, end the TCP/IP session for each display and printer session using either the IBM NETSTAT or WRKTCPSTS commands.



**CAUTION:** IF POWER IS ACCIDENTLY CYCLED ON THE CONTROLLER, THE HOST WILL STILL HAVE OPEN TELNET SESSIONS AND WILL NOT ALLOW THE CONTROLLER TO RE-ESTABLISH THE CONNECTIONS FOR A PERIOD OF ONE TO TWO HOURS. SEE TROUBLESHOOTING FOR THE RECOVERY PROCESS.

## How Telnet Names Devices

In the I-O Configuration Utility, a unique Telnet device name is assigned to each display and printer device. This is done in one of two ways:

- The controller will automatically assign a name based upon the Default Telnet Device Name that is enter on the Telnet Options box on the Host Configuration screen in the I-O Configuration Utility.
- Or
- Manually enter a unique name for each twinax device on the Line 1 and Line 2 Configuration screen in the I-O Configuration Utility.



**TIP:** USE THE DEFAULT NAMING PROCESS TO HAVE THE CONTROLLER AUTOMATICALLY ASSIGN NAMES, THEN FOR A SPECIFIC DEVICE, OVERRIDE THE AUTOMATICALLY CREATED NAME.

Each host will use the same name for the printer. For example, if there was a 3812-1 printer on line 1 using the Twinax address of 1, and the Telnet device name assigned in the I-O Configuration Utility was "ACCNTG", then this printer would be known as "ACCNTG" on each host.

When the controller is configured for the first time, each defined host will create a 3812-1 page printer device for each attached printer. This means each printer will support up to four different hosts.



**NOTE:** SHARING A PRINTER USING THE SAME NAME WITH MULTIPLE HOSTS IS ONLY AVAILABLE WHEN USING TN5250E PROTOCOL. IF ANYNET OR SNA IS USED FOR THE FIRST HOST, AND TN5250E IS USED FOR THE SECOND, THIRD AND FOURTH HOSTS, ANYNET AND SNA ASSIGN THEIR OWN UNIQUE DEVICE NAMES WHILE THE TN5250E HOSTS WILL USE THE SAME TELNET DEVICE NAME. ONCE CREATED, THE ANYNET OR SNA DEVICE NAME CAN BE RENAMED TO MATCH THE TN5250 NAME IF DESIRED.

## Display Emulations

The TN5250e display protocol as implemented by IBM has a limited number of supported display models. In general, the supported display models will provide 24 x 80, 25 x 80, and/or 27 x 132 line support (all include the message line).

I-O has enhanced the 5794ip controller so the controller will automatically match the actual display model to the closest TN5250e emulation. For example, a 3180 will be matched to a 3180, but a 3489 will be matched to a 3477. The display models Telnet supports are: 5251m11, 5291-1, 5292-2, 3180-2, 3179-2, 3196-A1, 3477-FG and 3477-FC non-InfoWindow.

InfoWindow II features are not supported. These include, but are not limited to: extended character attributes, extended user interface, mouse, light pen, magnetic stripe readers, 5292 graphics, shared addressing, viewing faxes and calculator support.

The following is a list of common IBM terminals and the model type that is configured by TN5250e at the host:

<i><b>IBM Terminal</b></i>	<i><b>Host Configures As ...</b></i>
5251	5251 -11
5291	5291-1
3180	3180-2
3196	3196-A1
3197c	3179-2
3197d	3180-2
3487 InfoWindow II	3477-FC
3487c Non-InfoWindow	3477-FC

## AnyNet Operation

### Starting Display Sessions

After the controller has been configured, the controller will cycle through a restart process. During this process, displays will show a block cursor in the upper right-hand corner, then the cursor will move to the upper left-hand corner as controller is connecting to the host and the host is creating the devices. After a brief pause, a host sign-on screen for the first session will be presented on each display.




---

**NOTE:** THE FIRST TIME THE CONTROLLER IS CONFIGURED (OR AFTER THE CONTROLLER HAS HAD THE FACTORY DEFAULTS RESTORED), ALL SESSIONS ON EACH DISPLAY WILL BE CONFIGURED ON THE FIRST HOST.

---

If a sign-on screen is not presented, and the cursor is in the upper left-hand corner, then the host has not accepted the request to connect. This can be caused by the following conditions:

- Incorrect IP address of the controller (another device may have the same address) – reenter a valid IP address.
- Incorrect host information may have been entered on the controller's Host Configuration screen– verify that the host IP address, Host Network ID, Host Control Point Name, and Remote Control Point Name are entered correctly.
- The host may not be set for auto-configuration – the system administrator will need to turn this on.
- The host may not have enough virtual device sessions available – the system administrator will need to increase the number of available sessions.




---

**TIP:** SEE TROUBLESHOOTING FOR MORE INFORMATION ON CONNECTION ISSUES.

---

### Starting Printer Sessions

Printer sessions will start automatically at the same time the display sessions are started.




---

**NOTE:** THE FIRST TIME THE CONTROLLER IS CONFIGURED (OR AFTER THE CONTROLLER HAS HAD THE FACTORY DEFAULTS RESTORED), ONE PRINTER SESSION WILL BE CONFIGURED ON EACH HOST.

---

### Re-Connect Sessions

There are several methods of reconnecting sessions to the hosts:

- Ping the controller. This will initiate the controller's reconnection process.
- Cycle power on the Twinax device.
- At the host, vary off and then back on the devices attached to the controller, then cycle power on the device.
- For a display session, do a System Request + h1 (h2, h3 or h4) keystroke sequence and change to a different host.

### Disconnect Sessions

In normal use the controller should never be powered down. In the unlikely event that the controller is to be powered down, sign off all display sessions. Then, power down the display and printer devices.



---

**CAUTION:** IF POWER IS ACCIDENTLY CYCLED ON THE CONTROLLER, THE HOST MAY STILL HAVE OPEN SESSIONS AND IT MAY TAKE SEVERAL MINUTES TO RECONNECT.

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### How AnyNet Names Devices

After the 5794ip controller has been configured and restarts, the following devices will automatically be created on the host:

- An APPC Controller with the name assigned as the “Interface Control Point”.
- A 5494 Controller with the first five characters of the “Interface Control Point” name followed by the identifier RMT.
- A printer and display device for every printer and display attached to the controller at the time the controller was configured and reset. The names will follow the format of ABCDXXXYY where ABCD are the first four characters of the Interface Control Point Name. The XXX will either be DSP indicating a display or PRT indicating a printer. The YY will be a hexadecimal value assigned by the host.

The host will configure the YY value in the following manner:

- Hex values 00 to 0D represent session 1 on display and printer devices 1 through 14
- Hex values 0E to 1B represent session 2 on display devices 1 through 14
- Hex values 1C to 29 represent session 3 on display devices 1 through 14
- Hex values 2A to 37 represent session 4 on display devices 1 through 14

When a printer is being used, the host will leave a gap in the hexadecimal number sequence for sessions 2, 3 and 4. This is because only one printer session is configured on the first host.

## Display Emulations

AnyNet will automatically recognize the actual IBM Terminal model type and will report it to the host.

InfoWindow II features are not supported. These include, but are not limited to: extended character attributes, extended user interface, mouse, light pen, magnetic stripe readers, 5292 graphics, shared addressing, viewing faxes and calculator support.

The following is a list of common IBM terminals and the model type that is configured by AnyNet at the host:

<i><b>IBM Terminal</b></i>	<i><b>Host Configures As ...</b></i>
5251	5251 -11
5291	5291-1
3180	3180-2
3196	3196-A1
3197c	3197-C1
3197d	3197-D1
3487 InfoWindow II	3487-HC
3487c Non-InfoWindow	3487-HC

# SNA Operation

## Starting Display Sessions

After the controller has been configured, the controller will cycle through a restart process. During this process, displays will show a block cursor in the upper right-hand corner, then the cursor will move to the upper left-hand corner as the controller is connecting to the host and the host is creating the devices. After a brief pause, a host sign-on screen for the first session will be presented on each display.



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**NOTE:** THE FIRST TIME THE CONTROLLER IS CONFIGURED (OR AFTER THE CONTROLLER HAS HAD THE FACTORY DEFAULTS RESTORED), ALL SESSIONS ON EACH DISPLAY WILL BE CONFIGURED ON THE FIRST HOST.

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## Starting Printer Sessions

Printer sessions will start automatically at the same time the display sessions are started.



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**NOTE:** THE FIRST TIME THAT THE CONTROLLER IS CONFIGURED (OR AFTER THE CONTROLLER HAS HAD THE FACTORY DEFAULTS RESTORED), ONE PRINTER SESSION WILL BE CONFIGURED ON EACH HOST.

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## Re-Connect Sessions

There are several methods of reconnecting sessions to the hosts:

- Ping the controller. This will initiate the controller's reconnection process.
- Cycle power on the twinax device.
- At the host, vary off and then back on the devices attached to the controller, then cycle power on the device.
- For a display session, do a System Request + h1 (h2, h3 or h4) keystroke sequence and change to a different host.

## Disconnect Sessions

In normal use the controller should never be powered down. In the unlikely event that the controller is to be powered down, sign off all display sessions. Then, power down the display and printer devices.



---

**CAUTION:** IF POWER IS ACCIDENTLY CYCLED ON THE CONTROLLER, THE HOST MAY STILL HAVE OPEN SESSIONS AND IT MAY TAKE SEVERAL MINUTES TO RECONNECT.

---

## Display Emulations

SNA will automatically recognize the actual IBM Terminal model type and will report it to the host.

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3180	3180-2
3196	3196-A1
3197c	3197-C1
3197d	3197-D1
3487 InfoWindow II	3487-HC
3487c Non-InfoWindow	3487-HC



## IPDS Operation via PPR/PPD

The controller automatically passes all communication and data streams to and from the IBM host and the IPDS printers. No operator action is required at the controller.


# Troubleshooting

This chapter contains solutions for problems you may encounter while using the product. If a problem persists after implementing the solutions provided here, or if a problem not listed here, please contact your dealer, or I-O Corporation can be contacted at 801-972-1446 or by email at [support@iocorp.com](mailto:support@iocorp.com).

Please have the following information available when requesting assistance:

- Model number
- Version number of firmware
- Version number of the I-O Configuration Utility
- Serial number of the controller (found on the bottom label of the logic unit)
- Date of purchase
- Version of operating system on the AS/400, iSeries or eServer i5system
- Concise description of problem
- Summary of events and actions that occurred just prior to the failure
- Model number of displays and printers that are attached to the controller
- Copy of the configuration report (requires connecting an ASCII printer to the 5794ip controller's parallel port)

## General Error Conditions

<i><b>Problem</b></i>	<i><b>Solution</b></i>
<ul style="list-style-type: none"> <li>• No power to the 5794ip controller (Power LED is off)</li> </ul>	<ul style="list-style-type: none"> <li>✓ The power supply may not be the correct supply. Verify the switching power supply is a 5 VDC 2.5 Amp supply, shield is negative.</li> </ul> <hr/> <p> <b>CAUTION:</b> PLUGGING IN A DIFFERENT POWER SUPPLY COULD DAMAGE THE 5794IP CONTROLLER.</p> <hr/>
<ul style="list-style-type: none"> <li>• On the displays, the System Available indicator does not appear on the left side of the status line.</li> </ul>	<ul style="list-style-type: none"> <li>✓ There is no communication with the host. <ul style="list-style-type: none"> <li>• The host is not operating.</li> <li>• The 5794ip controller is not operating.</li> <li>• Check all cable connections, routers, etc. for proper connection.</li> </ul> </li> <li>✓ Communication configuration on the host does not match the display station. <ul style="list-style-type: none"> <li>• Check the host's device description to make sure the display type matches (or closely matches) the actual display. In Telnet, the display type reported to the host may not be the same type as the actual display because Telnet only supports a limited number of types (5251m11, 5291-1, 5292-2, 3180-2, 3179-2, 3196-A1, 3477-FG, 3477-FC (InfoWindow II features are not supported)).</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• On the displays, there is a status line, but no sign on screen, and there is a block cursor in the upper</li> </ul>	<ul style="list-style-type: none"> <li>✓ Check the following: <ul style="list-style-type: none"> <li>• Verify the IP address of the host is entered correctly in the I-O Configuration Utility.</li> </ul> </li> </ul>

left corner of the screen.

- The host assigns a 3812-printer device with a name of QPADEVPnn (where nn is a 2-digit number).
  - The writer is in a writing status, but no printing is occurring and there are no messages on the host.
  - The printer device is in a Vary On Pending state.
- Make sure there are no other devices in the network that are using the same IP address as the 5794ip controller.
  - Answer any host messages.
  - If using AnyNet or SNA, vary the device off and then back on, then cycle the power on the device.
  - If using Telnet, end the Telnet sessions. At a command line on the host, enter "netstat", select the Work with TCP/IP Connection Status option, press ENTER. (You may also use the "wrktcpsts \*dev [device name]" command.) Scroll until entries for the IP address of the 5794ip controller are found (there will be one entry for each session). Select the option to end the sessions.
- ✓ If the Telnet Printer Name is left blank when configuring the printer session, the host will create a 3812 device but will give the printer the name of QPADEVPnn, with nn being a 2-digit number. The first "n" is the line number and the second "n" is the printer address.
    - To correct the problem, using the I-O Configuration Utility, either enter a default Telnet Device Name on the Host Configuration screen, or enter individual Telnet device names for each device on the Line 1 and Line 2 Configuration screens.
- ✓ This usually occurs when TN5250e communication has been lost with the host.
    - Re-establish the session by doing the following:
      1. Vary off the device. At a command line on the host, enter "wrkdevd [device name]", press ENTER. Select the work with status option, then vary off the device.
      2. Cycle power on the display or printer device.
- ✓ This usually occurs when TN5250e communication has been lost with the host.
    - Re-establish the session by doing the following: Vary off the device and end the Telnet session:
      1. To vary off a device, at a command line on the host, enter "wrkdevd [device name]", press ENTER. Select the work with status option, then vary off the device.
      2. To end the Telnet sessions, at a command line on the host, enter "netstat", select the Work with TCP/IP Connection Status option, press ENTER. (You may also use the "wrktcpsts \*dev [device name]" command.) Scroll until entries for the IP address of the 5794ip controller are found (there will be one entry for each session). Select the option to end the session.

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|---|--|
| <ul style="list-style-type: none"> <li>• The printer session has ended on the /400 host after a period of inactivity.</li> </ul>  | <ul style="list-style-type: none"> <li>✓ The host has a timeout value that can be set to terminate any Telnet display or printer session. Setting this value to a longer timeout will allow the printer session to remain connected for a longer period. However, this longer timeout will also allow an unattended Telnet display session to remain open for a longer period and may create a security issue.<br/><br/>To change the Telnet inactivity timer, follow these steps:             <ol style="list-style-type: none"> <li>1. Using the host CFGTCP command, select menu option 20, Configure TCP/IP Applications.</li> <li>2. Select menu option 11, Configure Telnet.</li> <li>3. On the next screen, select menu option 12, Inactive Job Time Out.</li> <li>4. Change the QINACTITV value to a longer value, or use *NONE to deactivate the inactivity timeout.</li> </ol> </li> </ul> |
| <ul style="list-style-type: none"> <li>• Devices are dropped when powering down another device when using AnyNet or SNA</li> </ul>  | <ul style="list-style-type: none"> <li>✓ The host's Switched Disconnect function must be set to "NO" or anytime a device attached to the 5794ip controller is powered down, the host will drop some or all of the devices.             <ul style="list-style-type: none"> <li>• To correct the problem, follow the steps outlined in the Disabling the Host's Switched Disconnect Function section.</li> </ul> </li> </ul>   |
| <ul style="list-style-type: none"> <li>• The host gets an error message indicating that the printer has received invalid data and the IBM dot-matrix printer will not bold, backspace, overstrike or underscore when using TN5250e</li> </ul> | <ul style="list-style-type: none"> <li>✓ TN5250e does not support dot-matrix backspace functions.             <ul style="list-style-type: none"> <li>• Change the protocol used to connect to the host to either AnyNet or SNA.</li> </ul> </li> </ul>   |

## General Controller Status Messages

The following messages appear on the Status Error | Controller Status screen in the I-O Configuration Utility:

<i>Message</i>	<i>Solution</i>
<ul style="list-style-type: none"> <li>• 0: Session status is normal.</li> </ul>	<ul style="list-style-type: none"> <li>✓ This status means that a display or printer has been recognized on the twinax cable, and there is currently an active host communication session.</li> </ul>
<ul style="list-style-type: none"> <li>• 1: Device not connected.</li> </ul>	<ul style="list-style-type: none"> <li>✓ No device is responding to polling on the twinax address for this session.</li> </ul>

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|--|---|
| <ul style="list-style-type: none"> <li>• 2: (Printer only) - Host not configured.</li> </ul> | <ul style="list-style-type: none"> <li>✓ A printer has been recognized on the twinax cable, but the controller is not attempting to start a host connection for this session because there is no host configured for the session. This condition can arise only if fewer than four hosts are included in the controller configuration.</li> </ul> |
| <ul style="list-style-type: none"> <li>• 3: (Printer only) - Host not active</li> </ul>      | <ul style="list-style-type: none"> <li>✓ A printer has been recognized on the twinax cable, and there is a host computer configured for this session, but at this time the controller is telling the host that this printer is not available (powered-down) because the printer is currently in use by a different host.</li> </ul>               |
| <ul style="list-style-type: none"> <li>• 4: (Printer only) - Paper Out.</li> </ul>           | <ul style="list-style-type: none"> <li>✓ The printer is out of paper.</li> </ul>  |
| <ul style="list-style-type: none"> <li>• 5: (Printer only) - Printer Offline.</li> </ul>     | <ul style="list-style-type: none"> <li>✓ The printer is off line.</li> </ul>  |

## TN5250e Host Communication Status Messages

The following messages appear on the Status Error | Controller Status screen in the I-O Configuration Utility:

<i>Message</i>	<i>Solution</i>
<ul style="list-style-type: none"> <li>• 301: Host is unreachable.</li> </ul>	<ul style="list-style-type: none"> <li>✓ The controller is currently unable to establish any TCP connection to this host on behalf of any attached printer or display. <ul style="list-style-type: none"> <li>• The host for this session is not powered-up. Verify that the host is powered-up and operational.</li> <li>• TCP has not been started on the host computer. Verify that TCP/IP, including telnet, has been configured and started on the host computer.</li> <li>• The controller was configured with the wrong IP address for this host. Check the configuration of the controller to be sure that the IP address entered for the host computer is correct.</li> <li>• TCP/IP communication is not possible between the locations of the controller and this host computer. Verify (as by pinging the host computer from a location near the controller) that IP communication is possible between the two locations on the network. Also check to see that network traffic from the controller's location to that of the host computer is not excluded for telnet (normally port 23) by communication equipment such as a firewall. Take any steps required to make the path available.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• 302: No TCP session for this device.</li> </ul>	<ul style="list-style-type: none"> <li>✓ The controller has successfully established TCP connections for some printer or display sessions, but has</li> </ul>

- failed to make a TCP connection for this session.
- The host computer considers a previous TCP connection for this session from this controller to be still active. This situation may arise if the controller has been shut down while printers or displays were powered on. Check the device status for this device on the host. If the host shows the device to be active while the controller is showing status code 302, and if you know that the device description is used only by this controller, vary the device off. Then retry the connection.
  - The device name (specified during controller configuration) for this session is in use on this host by some other remote device. Verify that all device names specified during configuration of the controller are not duplicated by any device otherwise connected to this host.
  - The host shows an invalid status for this device. Verify that the host shows the device status as being either 'varied off' or 'vary on pending'. If device status is any value other than these, vary the device on or off.
- 303: No TN5250 negotiation started by host.
    - ✓ The controller has successfully established a TCP connection to the host for this session, but the host has not yet initiated TN5250 negotiations on the TCP connection. This condition should never last more than a few seconds. If this status lasts more than a few seconds at a time, it indicates a host computer malfunction or mis-configuration. Report the problem to the administrator of the host computer.
  - 304: TN5250 session negotiation proceeding.
    - ✓ A TN5250e TCP connection for this session has been established with the host, and values for TN5250e parameters for the session are being negotiated by the host and the controller.
 

This is a normal but transient status that exists briefly during startup of the host session for every device. No action is required. A 304 status should be considered to be an indication that session startup is proceeding normally. If a session reaches the 304 state and does not move on to some other state within a few seconds, contact I-O support.
  - 305: TN5250 session negotiation aborted by host.
    - ✓ The controller has successfully established a TCP connection to the host for this session, but negotiation of TN5250 parameters for the session was aborted at the request of the host computer.
 

This status should never be seen. If the controller and the host computer successfully begin TN5250 negotiations, startup of the session should always complete successfully. Contact I-O support for help in resolving the problem.

## TN5250e Printer Connection Status Message

The 5794ip controller reports the success or failure of an attempt to communicate with the host(s) by printing a brief connection status message on each attached printer.

The message will show whether the connection succeeded or not, the name of the AS/400, iSeries or eServer i5 host the printer session is connected to, the printer name, and the session status. (If there is no Host or printer name in the message it is because the host did not send the information.)

The connection status message will look somewhat like:

```
AS/400 Host Communication Status:
Connection attempt succeeded
Host system S101256R
Printer name TNPRT00
Status code I902 - Session successfully started
```

The status code (I902) shown in the above example is the normal code indicating successful host communication. The possible values of the status code and suggested actions to take for that status code are as follows:

<b>Message</b>	<b>Solution</b>
<ul style="list-style-type: none"> <li>• 0101 — Host not responding to pings</li> </ul>	<ul style="list-style-type: none"> <li>✓ This message usually indicates one of the following: <ul style="list-style-type: none"> <li>• TCP/IP has not been started on the host.</li> <li>• The host's IP address has not been correctly entered in the I-O 5250 Printer's configuration on the thin client.</li> <li>• The 5794ip has not been correctly connected to the LAN.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• 0102 — Host rejected connect to Telnet port</li> </ul>	<ul style="list-style-type: none"> <li>✓ The host answers pings, but rejects a TCP/IP connect attempt, probably because its Telnet server has not been started.</li> </ul>
<ul style="list-style-type: none"> <li>• 0111 — Host Telnet session lost</li> </ul>	<ul style="list-style-type: none"> <li>✓ Usually means that the printer has been varied off at the host, the host has gone down, or there has been a communication (e.g. router) failure.</li> </ul>
<ul style="list-style-type: none"> <li>• 2777 — Damaged device description</li> </ul>	
<ul style="list-style-type: none"> <li>• 8902 — Device not available</li> </ul>	<ul style="list-style-type: none"> <li>✓ This code appears when the I-O 5250 Printer connection attempts to start a session for a printer whose name duplicates the name of a printer already active on the host. In many cases, this means that the 5794ip with an I-O 5250 Printer session has been powered-off and then powered back on within a few minutes. When the 5794ip with an active I-O 5250 Printer session is turned off, it takes the host about 10-20 minutes to determine that the TCP/IP sessions for the printers are no longer active. If the I-O 5250 Printer session is restarted while the host shows the old</li> </ul>

- 8906 — Session initiation failed
  - 8907 — Session failure
  - 8920 — Object partially damaged
  - 8921 — Communications error
  - 8922 — Negative response received
  - 8925 — Creation of device failed
  - 8928 — Change of device failed
  - 8930 — Message queue does not exist
  - 8935 — Session rejected
  - 8940 — Automatic configuration failed or not allowed
  - E001 — No Telnet printer support at host
- printer sessions is still active, requests for new sessions will be rejected with this code.
- You can recover by doing one of the following:
- Wait 10-20 minutes before trying to establish another printer session.
  - At the host, manually terminate the old TCP/IP sessions.
  - Avoid the problem by allowing the I-O 5250 Printer session to end its TCP/IP connection gracefully before powering the 5794ip off. Do this by powering-off the attached printer 2 minutes or more before closing the printer session.
- ✓ The operating system on the host supports only display (not printer) devices in Telnet sessions. Update your host to support TN5250e printer sessions.



- I902 — Session successfully started
- I904 — Source system at incompatible release

## AnyNet Host Communication Status Messages

The following messages appear on the Status Error | Controller Status screen in the I-O Configuration Utility:

<b>Message</b>	<b>Solution</b>
<ul style="list-style-type: none"> <li>99: No SNA session for device.</li> </ul>	<ul style="list-style-type: none"> <li>✓ The controller is able to communicate with the host computer, but the host has not started an SNA session for this device.           <ul style="list-style-type: none"> <li>The device is varied off at the host. At the host computer, vary the device on.</li> <li>No controller description for this controller exists on the host computer. Enable auto-creation of controller descriptions on the host, or manually create a controller description.</li> <li>No device description for this device exists on the host computer. Enable auto-creation of devices for this controller on the host, or manually create a device description for the device.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>401: Host is unreachable.</li> </ul>	<ul style="list-style-type: none"> <li>✓ The controller is currently unable to establish any TCP connection to this host on behalf of any attached printer or display.           <ul style="list-style-type: none"> <li>The host for this session is not powered-up. Verify that the host is powered-up and operational.</li> <li>TCP has not been started on the host computer. Verify that TCP/IP and AnyNet have been configured and started on the host computer.</li> <li>The controller was configured with the wrong IP address for this host. Check the configuration of the controller to be sure that the IP address entered for the host computer is correct.</li> <li>TCP/IP communication is not possible between the locations of the controller and this host computer. Verify (as by pinging the host computer from a location near the controller) that IP communication is possible between the two locations on the network. Also check to see that network traffic from the controller's location to that of the host computer is not excluded for AnyNet (port 397, TCP and UDP) by communication equipment such as a firewall. Take any steps required to make the path available.</li> <li>This controller's AnyNet APPC controller on the host computer is not varied on. Check the host's configuration to determine which AnyNet APPC controller is selected to service this controller. Then verify that that APPC controller is varied on.</li> <li>The host's TCP/IP Host Table does not include an entry that identifies this controller as an AnyNet location. Verify the appropriate Host Table entry exists. If there is no entry, create one as described in the User Guide.</li> </ul> </li> </ul>

- |  |   |
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| <ul style="list-style-type: none"> <li>• 402: Waiting to attempt host connect.</li> </ul>                | <ul style="list-style-type: none"> <li>✓ The controller currently has no connection to the host computer, and is not currently attempting to establish a connection.           <ul style="list-style-type: none"> <li>• The host computer has disconnected all device sessions because all display sessions on this controller have been logged-off. Initiate a re-connect to the host computer by using the 'connect' procedure described in the User Guide.</li> <li>• This controller's 5494 controller description on the host computer is not varied on. Verify the controller description on the host computer is varied on.</li> <li>• This controller has been configured with the wrong control point name for the host computer. Verify the local configuration data in the controller correctly describes the host computer.</li> </ul> </li> </ul>  |
| <ul style="list-style-type: none"> <li>• 403: Ready to connect to host.</li> </ul>                       | <ul style="list-style-type: none"> <li>✓ A TCP/IP session with the host computer is being opened. This is a normal but transient status that exists briefly during startup of the main controller connection to the host. No action is required. A 403 status should be considered to be an indication that session startup is proceeding normally. If a session reaches the 403 state and does not move on to some other state within a few seconds, contact I-O support.</li> </ul>   |
| <ul style="list-style-type: none"> <li>• 404: Negotiation proceeding on controller session.</li> </ul>   | <ul style="list-style-type: none"> <li>✓ A TCP/IP session with the host computer has been initiated, and parameters for the session are being exchanged between the controller and the host. This status exists transiently during a normal successful session startup, but if the status persists more than a few seconds, it indicates a configuration problem.           <ul style="list-style-type: none"> <li>• The controller has been configured with the wrong network id for the host computer. Verify the local configuration data in the controller correctly describes the host computer.</li> </ul> </li> </ul>  |
| <ul style="list-style-type: none"> <li>• 405: Host has not started a session for this device.</li> </ul> | <ul style="list-style-type: none"> <li>✓ The main TCP/IP connection between the controller and the host computer has been started successfully, but the host computer has not yet started the TCP/IP session for this particular device.           <ul style="list-style-type: none"> <li>• The device description for this device is not varied on at the host. Verify the device is varied on at the host computer.</li> <li>• The TCP/IP Host Table entry for this controller on the host computer contains either an incorrect IP address or an incorrect location name. Check the Host Table entry for this controller, and correct it if it contains incorrect information.</li> <li>• The host computer's APPN configuration list does not include an entry for this controller, or the entry contains incorrect information. Refer to the User Guide to determine whether the AnyNet setup you are using on your host computer requires that the host's APPN</li> </ul> </li> </ul> |

configuration list include an entry for this controller. If such an entry is required, verify that a correct entry exists.

## SNA Host Communication Status Messages

The following messages appear on the Status Error | Controller Status screen in the I-O Configuration Utility.

On a display press and hold the ALT key, press the HEX key, release both keys and then press F1 to display these error codes. If the display's screen is blank, these codes may also be displayed by pressing ENTER.

In the error codes below, the 3<sup>rd</sup> digit of the error code (the "x") is a digit from 0 to 5 that indicates the most advanced stage that the 5794ip controller has ever reach (since power-up) in its attempts to establish communication with the host. The meanings of the values for this digit are:

- 0 = Adapter open failed, and no connection is requested
- 1 = Adapter open failed, connection is requested
- 2 = No connection is requested.
- 3 = No TEST received the host.
- 4 = No SABME received the host.
- 5 = Connection to the host established successfully.

<i><b>Message</b></i>	<i><b>Solution</b></i>
<ul style="list-style-type: none"> <li>• 99: No SNA session for device.</li> </ul>	<ul style="list-style-type: none"> <li>✓ The controller is able to communicate with the host computer, but the host has not started an SNA session for this device. <ul style="list-style-type: none"> <li>• At the host computer, vary the device on.</li> <li>• No controller description for this controller exists on the host computer. Enable auto-creation of controller descriptions on the host, or manually create a controller description.</li> <li>• No device description for this device exists on the host computer. Enable auto-creation of devices for this controller on the host, or manually create a device description for the device.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• 10x: No LAN connection to the host has been established.</li> </ul>	<ul style="list-style-type: none"> <li>✓ The communication status is 'adapter open failed, and no connect is requested', meaning that the LAN adapter in the 5794ip controller has failed to open, and an operator at an attached display has requested a 'disconnect'. The 5795ip controller will periodically re-try to open the LAN adapter; but if a retry succeeds, no attempt will be made to contact the host until an operator requests a 'connect'. <ul style="list-style-type: none"> <li>• The most probable cause for failure of the adapter to open is a bad cable connection between the 5794ip controller's LAN adapter and the LAN segment or hub. Other possible causes are a failed LAN adapter, or hardware failure of some other piece of LAN equipment.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• 11x: No LAN connection to the host has been established.</li> </ul>	<ul style="list-style-type: none"> <li>✓ The communication status is 'adapter open failed, connect is requested', meaning the LAN adapter in the 5794ip controller has failed to open, but connection to the host is requested. The 5794ip controller will periodically retry to open the LAN adapter; and if a retry succeeds, attempts to</li> </ul>

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|---|--|
| <ul style="list-style-type: none"> <li>• 12x: No LAN connection to the host has been established.</li> </ul>              | <p>contact the host will commence immediately.</p> <ul style="list-style-type: none"> <li>✓ The most probable cause for failure of the adapter to open is a bad cable connection between the 5794ip controller's LAN adapter and the LAN segment or hub. Other possible causes are a failed LAN adapter, or hardware failure of some other piece of LAN equipment.</li> </ul>  |
| <ul style="list-style-type: none"> <li>• 13x: Establishment of LAN connection to the host is not yet complete.</li> </ul> | <ul style="list-style-type: none"> <li>✓ The communication status is 'no connection is requested', meaning that an operator at an attached display has requested a 'disconnect', canceling attempts to contact the host. <ul style="list-style-type: none"> <li>• An operator has requested that the 5794ip controller make no attempts to establish communication with the host. Make a 'connect' request at any display attached to the 5794ip controller in order to re-enable connection attempts.</li> </ul> </li> </ul>  |
| <ul style="list-style-type: none"> <li>• 14x: Establishment of LAN connection to the host is not yet complete.</li> </ul> | <ul style="list-style-type: none"> <li>✓ The communication status is 'no TEST received from host', meaning that the 5794ip controller is periodically sending TEST commands to the host, but has not yet received a TEST in response. <ul style="list-style-type: none"> <li>• The most likely cause for this condition is that the LAN line description on the host is varied off. The problem may also be caused by configuration errors on the host or on the controller. Verify that all LAN addresses entered during configuration are correct. Other possible causes are poor connections to the LAN, or failure of LAN cabling or hub.</li> </ul> </li> </ul>   |
| <ul style="list-style-type: none"> <li>• 402: Waiting to attempt host connect.</li> </ul>                                 | <ul style="list-style-type: none"> <li>✓ The communication status is 'no SABME received from host', meaning that some communication messages have been successfully exchanged between the 5794ip controller and the host, but no SABME mode-setting command has yet been received from the host. <ul style="list-style-type: none"> <li>• The most likely cause for this condition is that the 5794ip's controller description on the host is varied off.</li> </ul> </li> </ul>   |
| <ul style="list-style-type: none"> <li>• 402: Waiting to attempt host connect.</li> </ul>                                 | <ul style="list-style-type: none"> <li>✓ The controller currently has no connection to the host computer, and is not currently attempting to establish a connection. <ul style="list-style-type: none"> <li>• The host computer has disconnected all device sessions because all display sessions on this controller have been logged-off. Initiate a re-connect to the host computer by using the 'connect' procedure described in the User Guide.</li> <li>• This controller's 5494 controller description on the host computer is not varied on. Verify the controller description on the host computer is varied on.</li> <li>• This controller has been configured with the wrong control point name for the host computer. Verify the local configuration data in the controller correctly describes the host computer.</li> </ul> </li> </ul> |

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| • 403: Ready to connect to host.                       | ✓ A SNA session with the host computer is being opened. This is a normal but transient status that exists briefly during startup of the main controller connection to the host. No action is required. A 403 status should be considered to be an indication that session startup is proceeding normally. If a session reaches the 403 state and does not move on to some other state within a few seconds, contact I-O support.   |
| • 404: Negotiation proceeding on controller session.   | ✓ A SNA session with the host computer has been initiated, and parameters for the session are being exchanged between the controller and the host. This status exists transiently during a normal successful session startup, but if the status persists more than a few seconds, it indicates a configuration problem. <ul data-bbox="721 625 1403 743" style="list-style-type: none"><li>• The controller has been configured with the wrong network id for the host computer. Verify that the local configuration data in the controller correctly describes the host computer.</li></ul> |
| • 405: Host has not started a session for this device. | ✓ The main SNA connection between the controller and the host computer has been started successfully, but the host computer has not yet started the SNA session for this particular device. <ul data-bbox="721 947 1430 1117" style="list-style-type: none"><li>• The device description for this device is not varied on at the host. Vary on the device at the host computer.</li><li>• The host computer's APPN configuration list includes an entry for this controller that contains incorrect information. Remove the entry.</li></ul>   |

## IPDS Error Conditions

<b><i>Problem</i></b>	<b><i>Solution</i></b>
<ul style="list-style-type: none"><li data-bbox="293 321 643 436">• IBM host shows IPDS printer still active yet the printer has been powered down.</li></ul>	<ul style="list-style-type: none"><li data-bbox="670 321 1422 468">✓ When a printer has been powered off, the IBM host must be informed that the printer is not available. Do this by manually stopping the print writer – take the *IMMED option ends the writer immediately eliminating the lengthy delay that will otherwise occur.</li></ul>



## LED Indicators

The following table describes the function of each LED on the 5794ip controller. Use this information when troubleshooting the communication problems.

<b>LED</b>	<b>Function</b>
<ul style="list-style-type: none"> <li>• Link</li> </ul>	<p>✓ This LED will be on indicating that the controller is up and running and has a good link with the Ethernet LAN.</p>
<ul style="list-style-type: none"> <li>• Activity</li> </ul>	<p>✓ This LED will flash on and off as Ethernet packets are detected on the LAN.</p>
<ul style="list-style-type: none"> <li>• Power</li> </ul>	<p>✓ This LED indicates when the controller has completed its startup operations and has entered the 'Ready' (normal operation) state. When the controller is in the Ready state, the Power LED is on steady, except for a 'heartbeat' (a momentary blink off) approximately every five seconds.</p> <p>When power is first applied, the controller performs a startup routine that may take up to 30 seconds to complete. During this time, the LEDs flash in a sequence that indicates progress of the startup operation. If the Power LED does not switch to the Ready state within 30 seconds of power-up, a hardware failure has been encountered during the startup procedure. In this case, the state of all five green LEDs should be recorded to help in diagnosing the problem.</p> <p>If the Power LED heartbeat stops at some point after the Ready state has been reached, the system has ceased to function, because of either a hardware or a firmware failure.</p>
<ul style="list-style-type: none"> <li>• Host</li> </ul>	<p>✓ In the Ready state, this LED can have one of three values:</p> <ul style="list-style-type: none"> <li>• Off – No host connections. The controller has no connection to any of the configured host computers. Note: This may indicate normal operation if all configured hosts are set up to use Telnet connections, and no displays or printers are currently powered up.</li> <li>• Blinking – Some hosts are connected. The controller currently has established connections to some but not to all of the configured host computers.</li> <li>• On Steady – All hosts are connected. The controller currently has established connections to all of the configured host computers.</li> </ul>
<ul style="list-style-type: none"> <li>• Device</li> </ul>	<p>✓ In the Ready state, this Device Session Status LED can have one of three values:</p> <ul style="list-style-type: none"> <li>• Off – No device sessions. The controller has no established host session for any attached printer or display station. Note that this may indicate normal operation if no displays or printers are currently powered up.</li> </ul>

- Line 1
  - ✓ In the Ready state, this Twinax Cable Status LED indicates whether a twinax device is currently responding to polls on the first twinax cable (for V-Connectors with two different size legs, this is the long leg).
    - On with a heartbeat – Indicates that at least one printer or display is responding to polls.
    - Off with a heartbeat – Indicates no devices are currently responding on the cable.
  - ✓ If there is no heartbeat, the twinax communication processor has ceased to function.
- Line 2
  - ✓ In the Ready state, this Twinax Cable Status LED indicates whether a twinax device is currently responding to polls on the second twinax cable (for V-Connectors with two different size legs, this is the short leg).
    - On with a heartbeat – Indicates that at least one printer or display is responding to polls.
    - Off with a heartbeat – Indicates no devices are currently responding on the cable.
  - ✓ If there is no heartbeat, the twinax communication processor has ceased to function.

## Firmware Upgrade Process

Periodically new firmware is made available that contains enhancements and corrections. This firmware may be downloaded using the following process:

1. Using your Web browser, navigate to <ftp://ftp.iocorp.com>
2. Open the Controller | 5794ip folder
3. Download to a temporary directory on your PC the zip file that contains the desired firmware version. Look for a file in the format of F5794Vxxx.zip. The xxx will be the version number. It is suggested that you download the latest firmware version.




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**NOTE:** THE README.TXT FILE CONTAINS UP TO DATE INSTRUCTIONS ON OBTAINING THE LATEST FIRMWARE UPDATES AND I-O CONFIGURATION UTILITY




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**TIP:** IT IS HIGHLY SUGGESTED THAT WHEN YOU UPGRADE THE FIRMWARE, THAT YOU ALSO UPGRADE THE I-O CONFIGURATION UTILITY AT THE SAME TIME. GENERALLY YOU WILL WANT TO USE THE MOST RECENT VERSION OF THE I-O CONFIGURATION UTILITY.

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4. Extract the firmware file from the zip file, and move the firmware file to the directory where the I-O Configuration Utility was installed. (After the upgrade is complete, delete the zip file.)
5. Sign off all display sessions.
6. At the host(s), vary off all devices attached to the controller.
7. Start the I-O Configuration Utility.
8. In the List of Devices, highlight the desired controller to be upgraded.
9. Select the Options Menu | Firmware Update menu item.
10. Use the Browse button to browse the directory to find the firmware file. It will be called FIRM5794.xxx (the xxx is the version number).




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**NOTE:** DO NOT CHECK THE BOOT BLOCK BOX UNLESS A BOOTCODE FILE IS BEING DOWNLOADED TO THE CONTROLLER.

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11. Click OK.
12. A message will appear on the screen indicating that the download process is progressing. Be patient, this process takes several minutes.




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**CAUTION:** DO NOT TURN OFF THE CONTROLLER DURING THIS PROCESS. DOING SO WILL CORRUPT THE FLASH AND REQUIRE THE UNIT TO BE RETURNED TO THE MANUFACTURER FOR REPAIR.

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13. The process is complete when the controller goes through a restart process.




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**TIP:** IF SIGN ON SCREENS DO NOT APPEAR ON THE DISPLAYS, SEE TROUBLESHOOTING FOR THE PROCESS TO VARY OFF AND ON DEVICES.




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**NOTE:** OCCASIONALLY IT MAY BE NECESSARY TO CYCLE THE POWER TO THE CONTROLLER FOR THE NEW FIRMWARE TO BE RECOGNIZED. IN SOME RARE CIRCUMSTANCES, IT MAY BE NECESSARY TO RESTORE FACTORY DEFAULTS TO GET THE NEW FIRMWARE TO BE RECOGNIZED.

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## I-O Configuration Utility Upgrade Process

Periodically a new version of the I-O Configuration Utility is made available that contains enhancements and corrections. This software may be downloaded using the following process:

1. Using your Web browser, navigate to <ftp://ftp.iocorp.com>
2. Open the Configuration\_UTILITY folder
3. Download to a temporary directory on your PC the zip file that contains the latest version of the I-O Configuration Utility (some of the files may be self-extracting zip files and will have an extension of exe). Look for a file in the format of IOCUxxx.zip. The xxx will be the version number.



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**NOTE:** THE README.TXT FILE CONTAINS UP TO DATE INSTRUCTIONS ON OBTAINING THE LATEST I-O CONFIGURATION UTILITY AND FIRMWARE UPDATES.



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**TIP:** THE I-O CONFIGURATION UTILITY IS BACKWARD COMPATIBLE AND WILL MANAGE CONTROLLERS, PRINT SERVERS AND IP CONTROLLERS USING OLDER VERSIONS OF FIRMWARE.

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4. Extract the firmware file from the zip file. (After the upgrade is complete, delete the zip file.)
5. From within the temporary directory, run the SETUP.EXE file.
6. Follow the on-screen prompts.

## Uninstalling the I-O Configuration Utility

The I-O Configuration Utility may be uninstalled using Microsoft's Add/Remove Programs process.

1. Click START | SETTINGS | CONTROL PANEL
2. Select the Add/Remove Programs icon.
3. Scroll to the I-O Configuration Utility entry and take the remove option.
4. Follow the on-screen prompts.

## Restoring Factory Defaults

Factory defaults can be restored for all of the configuration options. To restore factory defaults refer to the corresponding section below.

### Restoring Factory Defaults Using the I-O Configuration Utility

1. If you haven't already done so, start the I-O Configuration Utility.
2. Select the desired 5794ip controller from the displayed list.
3. Click on the Options menu and select Restore Factory Defaults.
4. Answer the next question with Yes.

### Restoring Factory Defaults for the I-O Print Server Using the Mode Button

1. Locate the Mode button in the lower right hand corner of the 5794ip controller.
2. Hold down this button for at about 30 seconds. When you press this button, the LED next to the Mode button will turn on
3. Release the button when the orange LED next to the Mode button turns off. The Power and Host LEDs will quickly flicker. Then the Power, Host and Device LEDs will turn off. The Line 1 and Line 2 LEDs may remain on until the restart procedure begins to process.
4. At this point the factory defaults are restored and the 5794ip controller will cycle through the startup process.

## Host Communication Trace

It may be necessary to capture a complete communications trace of data being passed between the 5794ip controller and an host. This is done by starting, ending and printing a trace using IBM's commands at STRCMNTRC, ENDCMNTRC, and PRTCMNTRC.

See your IBM manuals for specific instruction on using these commands. You may also find on-line references to these commands at IBM's support site as follows:

### Start a Trace

<http://publib.boulder.ibm.com/pubs/html/as400/v4r5/ic2924/index.htm?info/cl/strcmntr.htm>

### End a Trace

<http://publib.boulder.ibm.com/pubs/html/as400/v4r5/ic2924/index.htm?info/cl/endcmntr.htm>

### Print a Trace

<http://publib.boulder.ibm.com/pubs/html/as400/v4r5/ic2924/index.htm?info/cl/prtcmntr.htm>

# Manufacturer's Warranty & Repair Policy

## **Manufacturer's Three Year Limited Warranty (United States)**

The following warranty applies only to products purchased and operated within the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of three years commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain a replacement product by meeting the terms of the I-O Customer On-Site Exchange Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

I-O shall not be liable for non-performance or delays hereunder due to causes beyond its control. These shall include, but not be limited to, acts of God, wars, strikes, fires, flood, storm, earthquake, shortages of labor or materials, labor disputes, transportation embargoes, acts of any government or agency thereof.

MODIFICATIONS OR RECONFIGURATION OF THE HARDWARE BY ANYONE OTHER THAN I-O OR I-O'S AUTHORIZED REPAIR FACILITY WILL VOID THIS HARDWARE WARRANTY.



## **Customer On-Site Exchange Repair Policy**

Terms, Conditions, and Limitations  
Effective May 1, 1994<sup>a</sup>

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (United States), I-O's Customer On-Site Exchange (COE) Repair Policy provides customers with a replacement unit for a defective product, subject to the following terms and conditions:

### **Call Customer Support**

If a product fails, call I-O Customer Support for assistance at (801) 972-1446.

### **Verify Product Failure**

I-O will verify the product serial number, warranty coverage and product failure.

You are responsible for assisting in verifying the product failure.

When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number for the failed product.

### **Replacement Units**

Replacement units are shipped from I-O's stock of refurbished units, subject to availability.

Replacement units carry the same warranty as remaining on the original product.

I-O's COE Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs or replacement.

Buyer will pay reasonable labor and handling charges for each product returned for repair which is found to have no defect.

### **Return Your Failed Unit**

When you return the failed product it must be shipped freight prepaid. Always note the RMA number on the outside of the package.

### **Install the Replacement Unit**

You are responsible for installing the replacement unit.

After receiving the replacement unit please call I-O Customer Support if any assistance is required.

I-O<sup>®</sup> reserves the right to change the terms and conditions of this policy without notice.

## **Manufacturer's Three Year Limited Warranty (International)**

The following warranty applies only to products purchased or operated outside the United States.

I-O Corporation (I-O) warrants this product against defects in material and workmanship for a period of three years commencing from date of purchase by the original customer, when operated and maintained in accordance with I-O's published specifications. I-O's liability shall be limited, at its option and expense, to refund to buyer the actual amount paid by buyer or to repair or replace any defective or nonconforming product or part thereof, F.O.B. I-O's authorized repair depot. Buyer may obtain warranty service by meeting the terms of the I-O Return-to-Depot Repair Policy in effect at the time of the request.

THE EXPRESS WARRANTY SET FORTH ABOVE IS IN LIEU OF ALL OTHER EXPRESS OR IMPLIED WARRANTIES. OTHERWISE, THE PRODUCTS ARE SOLD AS IS WITHOUT FURTHER OBLIGATION OR LIABILITY ON THE PART OF I-O. I-O EXPRESSLY EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

EXCEPT AS EXPRESSLY SET FORTH HEREIN, IN NO EVENT SHALL I-O BE LIABLE FOR ANY CLAIMS OR DAMAGE ARISING DIRECTLY OR INDIRECTLY FROM THE FURNISHING OR FAILURE TO FURNISH PRODUCTS, SPARE OR REPLACEMENT PARTS, INFORMATION OR SERVICES HEREUNDER. UNDER NO CIRCUMSTANCES SHALL I-O BE LIABLE IN ANY WAY FOR INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, INCLUDING, BUT NOT LIMITED TO LOST BUSINESS OR PROFITS, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BASED ON BREACH OF WARRANTY, CONTRACT, OR NEGLIGENCE.

I-O shall not be liable for non-performance or delays hereunder due to causes beyond its control. These shall include, but not be limited to, acts of God, wars, strikes, fires, flood, storm, earthquake, shortages of labor or materials, labor disputes, transportation embargoes, acts of any government or agency thereof.

MODIFICATIONS OR RECONFIGURATION OF THE HARDWARE BY ANYONE OTHER THAN I-O OR I-O'S AUTHORIZED REPAIR FACILITY WILL VOID THIS HARDWARE WARRANTY.

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## **Return-to-Depot Repair Policy**

### **Terms, Conditions, and Limitations**

Effective May 1, 1994<sup>a</sup>

For products covered by the I-O Corporation (I-O) Manufacturer's Limited Warranty (International), I-O's Return-to-Depot (RTD) Repair Policy provides customers with warranty service for a defective product, subject to the following terms and conditions:

#### **Call Customer Support**

If a product fails, call I-O Customer Support for assistance at:  
(801) 972-1446 for all locations outside the United States.

#### **Verify Product Failure**

I-O will verify the product serial number, warranty coverage and product failure.

You are responsible for assisting in verifying the product failure

When I-O Customer Support verifies a product failure they will issue a Return Merchandise Authorization (RMA) number to authorize return of the failed product.

#### **Select Your Preferred Repair Location**

I-O's Customer Support Representative will assist you in identifying the nearest I-O authorized repair depot.

I-O's Customer Support Representative will provide you with an RMA transmittal form referencing the assigned RMA number and the authorized repair depot address.

#### **Return Your Failed Unit**

Return the failed product to the I-O authorized repair depot previously identified, enclosing the RMA transmittal form. When you return the failed product it must be shipped freight prepaid.

I-O's RTD Repair Policy applies only to warranted product failures. Buyer guarantees payment for non-warranted product repairs.

Buyer will pay reasonable labor and handling charges for each product returned for repair which is found to have no defect.

#### **Install Your Repaired Unit**

I-O's authorized repair depot will service the faulty unit and return it to you, freight prepaid.

You are responsible for installing the returned unit.

After receiving the repaired unit please call I-O Customer Support if any assistance is required.

I-O<sup>®</sup> reserves the right to change the terms and conditions of this policy without notice.