



## **IPDS DIMM for HP LaserJet 2100 Installation & Operator's Guide**

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# 1 Introduction

The IPDS DIMM provides more features than any other competitive product in the world.

The IPDS DIMM is an internal module for AFP print using the IPDS printing capabilities. As one of the very few companies MPI Tech offers total connectivity flexibility as the solution operates with both HP JetDirect and MPI Tech LAN connectivity solutions for TCP/IP attachment to S/390, AS/400 and AIX systems for AFP printing. Direct connection to IBM mainframe or AS/400 using coax or twinax attachments is also possible.

MPI Tech's IPDS printing solution is one of the most widely used within the industry and offers a wide range of features and added value enhancements. The IPDS DIMM™ provides plug-in IPDS support as an additional Printer Driver Language.

Installation can be performed by simply inserting the IPDS DIMM in the HP printer. Once the IPDS DIMM is installed, configuration of the IPDS setup options can be performed via your web browser. The IPDS DIMM uses the TCP/IP PPD protocol, which is sent by your IBM host system from supported IBM PSF products using TCP/IP host attachment.

Note: IRQ-reporting is not supported when the IPDS DIMM is used with an interface other than MPI Tech's own.

## 2 Installation

The installation of the IPDS DIMM is described in detail below.

Requirements: Minimum 8MB RAM installed in the printer.

**Note:** Before you start installing the IPDS DIMM, make sure that the printer is powered off and that the power cord has been disconnected.

### CAUTION

Static electricity can damage your IPDS Dual Inline Memory Module (DIMM). When handling the IPDS DIMM, you should either wear an antistatic wrist strap, or frequently touch the metal surface of the printer.

#### 2.1.1 Actual installation

1. Open the interface cable door on the right side of the printer by pressing on the release tabs. Disconnect all interface cables.
2. Facing the printer front, lift up the top cover.
3. Press the release button on the right side below the top cover. Slide the right side panel forward until the alignment arrows line up.
4. Take the cover off, pulling it away from the printer. You will now have access to the available DIMM slots.
5. Remove the IPDS DIMM from the antistatic bag. Hold by the edges, component side facing towards the back of the printer. Make certain that the locks on each side of the slot are open, and that the notches on the IPDS DIMM are aligned with the DIMM slot. For best results, use the DIMM slots in 1-2-3 order.
6. Press the DIMM straight into the slot (press firmly) Make certain that the locks above and below the DIMM snap inward into place (to remove a DIMM, the locks must be released).

#### **Repeat steps 5 and 6 for each DIMM that is being installed**

7. To replace the side panel, line up the alignment arrows and slide the panel backwards until the release button latches into place. Close the top cover.
8. Reinstall the interface cable(s) and power cord. Turn on the printer.

# 3 Configuration

## 3.1 Using the Web Browser

Through a web browser it is possible to configure the IPDS DIMM and to perform various advanced test functions.

### 3.1.1 Requirements

A web browser, for example Microsoft Internet Explorer 4.0 or Netscape Navigator 4.0 or higher.

A TCP/IP enabled EIO Interface Card with an IP address.

### 3.1.2 Getting Started

1. Start the web browser.
2. After http://, type the IP address of the PrintServer followed by :9100/ipds/ in the web browser's Address or Location box. The web browser will load the IPDS Menu from the IPDS DIMM.

Note: The loading of the page may take more than a minute.

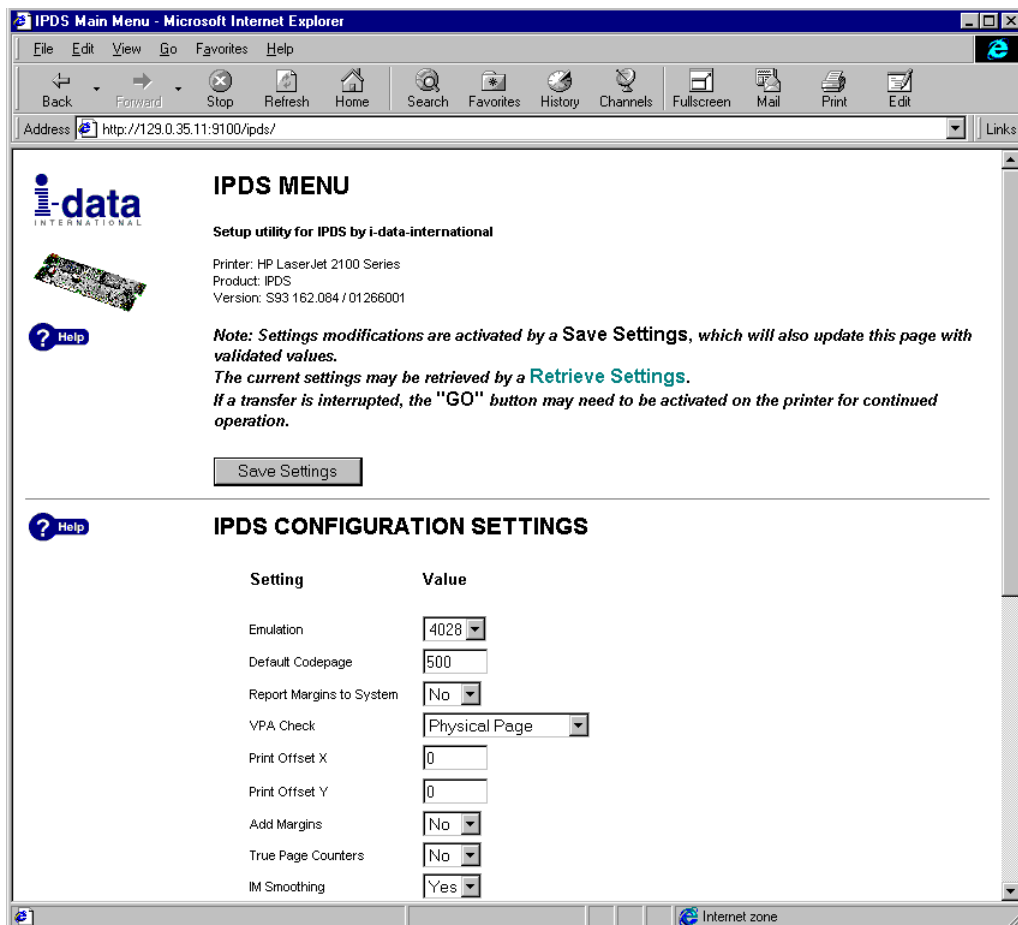



Figure 1, IPDS Menu

### 3.1.3 IPDS Configuration

1. Go to IPDS CONFIGURATION SETTINGS to configure the IPDS DIMM. The settings are shown in *Figure 1*.
2. Customize the settings with your preferred values. If you click , you will see a list of the different settings, the range of the values and the default values. These are also listed in section 3.1.6, *IPDS Configuration Settings* below.

In order to configure the printer's input trays, scroll down to the heading IPDS INPUT TRAY SETTINGS.

### 3.1.4 Configuration of Input Trays

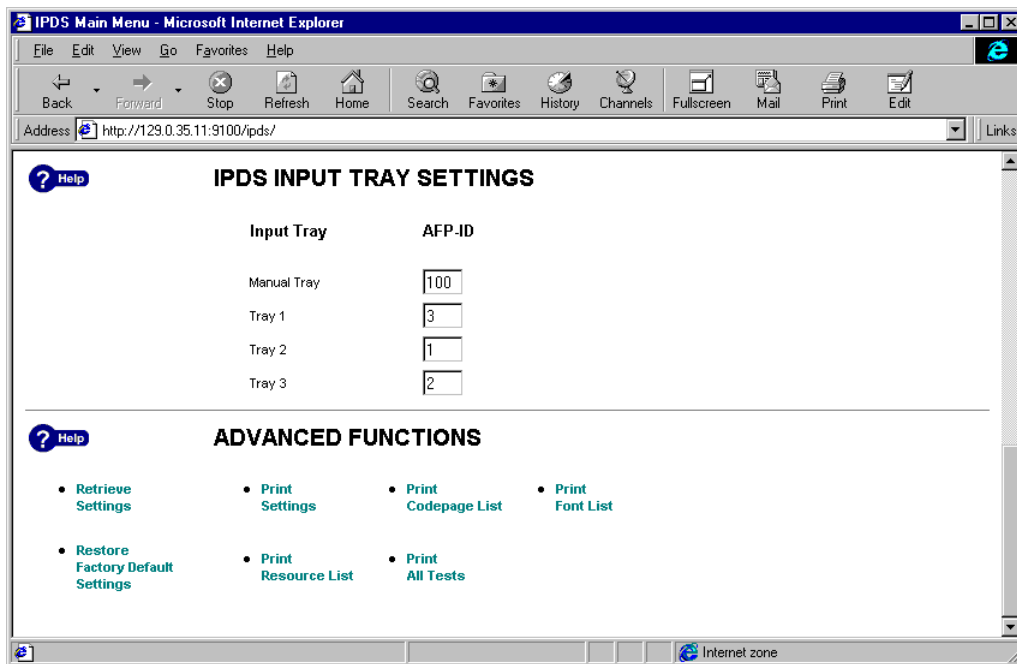


Figure 2, Input tray settings and advanced functions

Here, you can set the AFP IDs of the different input trays. There is a description of the ranges and defaults of the AFP IDs in section 3.1.7, *IPDS Input Trays* below.

**Note:** If you stop the loading of the pages at any point during the configuration, you may need to press the Go button on the printer again in order to continue.

### 3.1.5 Advanced Functions

Clicking these functions, you can retrieve settings, restore factory default settings or print out different test prints.

**Note:** If you stop the loading of the pages at any point during the configuration, you may need to press the Go button on the printer again in order to continue.

### 3.1.6 IPDS Configuration Settings

Below is a short description of the configurable items:

**EMULATION**

Defines the type of IPDS printer to emulate.

Range:

3812

3816

4028

Default:

4028

**DEFAULT CODEPAGE**

Defines which codepage to use as printer default.

Range:

1..65534 (0xFFFE). Validated when the ppd line opens.

Default:

500

**REPORT MARGINS TO SYSTEM**

Defines whether the margins should be reported in the OPC reply or not. If not, the entire page is reported as the printable area.

Range:

YES, NO.

Default:

NO

**VPA CHECK**

Defines which margins should be used to determine the existence of a VPA exception condition, which must be reported to the system.

Range:

MARGINS

PHYSICAL PAGE

IPDS LOGICAL PAGE

NONE.

Default:

PHYSICAL PAGE

[Note: VPA CHECK=MARGINS will be changed to PHYSICAL PAGE if the margins are not reported to the system.](#)

**PRINT OFFSET X**

Defines X-offset to move the output print position. The value is defined in 300 dpi dots.

Range:

-999..999

Default:

0

**PRINT OFFSET Y**

Defines Y-offset to move the output print position. The value is defined in 300 dpi dots.

Range:

-999..999

Default:

0

**ADD MARGINS**

Defines whether the printable area margins should be added to the IPDS LPP (Logical Page Position) or not.

Range:  
NO  
YES  
Default:  
NO

### **TRUE PAGE COUNTER**

Defines whether to query for printed pages.

Range:  
NO  
YES  
Default:  
NO

### **IM SMOOTHING**

Defines whether the 240 to 300 dpi scaling in IM 3812 mode should be smoothed in the same way as characters or not at all.

Range:  
NO  
YES  
Default:  
YES

## **3.1.7 IPDS Input Trays**

Below is a short description of the configurable items:

### **MANUALTRAY**

Defines AFP ID for Manual tray.

Range:  
AFP ID 0..255  
Default:  
AFP ID 100

### **TRAY 1**

Defines AFP ID for Tray 1.

Range:  
AFP ID 0..255  
Default:  
AFP ID 2

### **TRAY 2**

Defines AFP ID for Tray 2.

Range:  
AFP ID 0..255  
Default:  
AFP ID 1

### **TRAY 3**

Defines AFP ID for Tray 3.

Range:  
AFP ID 0..255  
Default:  
AFP ID 3



Note: The default value is actually '0', indicating that the AFP ID will be automatically assigned. By default Tray 1 (the fold down tray) will actually be assigned the highest (normal tray) AFP ID

## 3.2 Hints and Guidelines for Configuration

This section describes where settings are stored. There is also a description of the configuration of timers in combination with HP JetDirect cards or compatible PrintServers.

### 3.2.1 HP JetDirect PrintServers

On these PrintServers, the settings are stored in the printer's non-volatile RAM (NVRAM). Only those settings accessible from the IPDS web pages can be changed. In order to browse the IPDS web pages, the host print queue will need to be stopped and restarted after settings have been modified (on some systems, e.g. PSF/6000 under AIX, the PPD connection is not established until a print job is submitted to the queue).

If you cannot access the IPDS web pages, you may try to reach the web pages of the PrintServer by browsing the base IP address in order to see its status.

In order to close down the TCP/IP connection properly, the timeout period of the PrintServer must be longer than the inactive timeout period of the host. However, the timeout period of the PrintServer, as well as the host's active timeout period (the time the host will wait for a printer to reply) must be sufficiently large to allow the printer to flush the paper pipeline.

300 seconds is recommended as a reasonable choice for the PrintServer timeout. A somewhat lower value should be used for the host's inactive timeout.

Note: As all data go through port 9100, you cannot browse the web pages as the printer is printing and vice versa.

## 4 PSF/400 AFP Printing Using TCP/IP

This chapter provides configuration guidelines for OS/400 using TCP/IP. The versions differ somewhat in the setup.

For the different OS/400 versions, use the cross-references below:

- [4.1, AS/400 Settings for Version 3.1](#)
- [4.2, AS/400 Settings for Version 3.2](#)
- [4.3, AS/400 Settings for Version 3.6](#)
- [4.4, AS/400 Settings for Version 3.7](#)
- [4.5, AS/400 Settings for Version 4.1](#)
- [4.6, AS/400 Settings for Version 4.2](#)
- [4.7, AS/400 settings for Version 4.3](#)

### Requirements:

Before IPDS printing using TCP/IP can be accomplished, the following points need to be checked:

- TCP/IP is installed and enabled
- The relevant PTFs are applied
- The WRKAFF2 command is compiled  
(for AS/400 3.1 and 3.6 only)

Details on how to verify these items can be found on the internet. Consult the following IBM web address for details:

<http://as400service.rochester.ibm.com/>

In the *Technical Information database*, you find the following links:

- *AS/400 Knowledge Base*  
This link directs you to the area of the Knowledge Base, which is specifically about Print. IBM Doc. No. 8414724, PTF Listing for AFP Printing is a good entry.
- *Preventive Service Planning (PSP)*  
This link directs you to the area of the Knowledge Base about Cumulative PTF Package for all OS/400 versions. IBM Doc. No. 8203740, PTF Listing for TCP/LAN Printing is a good entry.

## Printer Requirements:

The recommended memory configuration is as follows:

| Requirement       | Minimum installed memory | Recommended minimum memory (simple text) | Recommended minimum memory (pages with overlays or graphics) |
|-------------------|--------------------------|--|--|
| A4/Letter simplex | 8 MB                     | 8 MB                                     | 12 MB  |

| Printer | Minimum Printer firmware date code | IPDS DIMM firmware (or later versions) |
|---------|------------------------------------|--|
| HP2100  | 19990105                           | S93 162.084                            |

HP JetDirect EIO (600 N J3111A/Ethernet)  
HP JetDirect EIO (600 N J3112A/Tokenring)  
HP JetDirect EIO (600 N J3113A/10/100Tx Eth)

### HP settings:

1. Set the IP, Subnet Mask, and Gateway address on the JetDirect card.
2. The printer's PS wait time-out shall be set to 300 sec.
3. The JetDirect card's IDLE TIMEOUT shall be set to 3600 sec or 0 (zero).
4. Remember to power cycle printer to enable new settings.

## 4.1 AS/400 Settings for Version 3.1

To configure IPDS printing on AS/400 V3R1, you must use two commands:

- CRTDEVPRT
- WRKAFP2

### 4.1.1 Configuring PSF with CRTDEVPRT on V3R1

On V3R1, at the AS/400 command line, enter a command in the form:

```
CRTDEVPRT DEVD(HP_IPDS) DEVCLS(*RMT) TYPE(*IPDS)  
MODEL(0) AFP(*YES) AFPATTACH(*APPC)  
FONT(11)RMTLOCNAME(TCPIP) FORMFEED(*AUTOCUT)  
TEXT('IDATA IPDS DIMM')
```

A completed screen looks like the following example:

```

Display Device Description          Page 1
5763SS1 V3R1M0 940909 BLDSYS1 09/11/96 11:15:40
Device description . . . . . : DEVD          HP_IPDS
Option . . . . . : OPTION          *ALL
Category of device . . . . . :           *PRT
Automatically created . . . . . :           NO
Device class . . . . . : DEVCLS        *RMT
Device type . . . . . : TYPE          *IPDS
Device model . . . . . : MODEL         0
Advanced function printing . . . . : AFP    *YES
AFP attachment . . . . . : AFPATTACH  *APPC
Online at IPL . . . . . : ONLINE      *YES
Font . . . . . : FONT
Identifier . . . . . :                011
Point size . . . . . :                *NONE
Form feed . . . . . : FORMFEED        *AUTOCUT
Separator drawer . . . . . : SEPDRAWER *FILE
Separator program . . . . . : SEPPGM   *NONE
Library . . . . . :
Printer error message . . . . . : PRTERMSG *INQ
Message queue (V3R1) . . . . . : MSGQ    QSYSOPR
Shadowing message queue (V3R6) . . : MSGQ    QSYSOPR
Library . . . . . :                *LIBL
Maximum pending requests . . . . . : MAXPNDRQS 6
Print while converting . . . . . : PRTCVT   *YES
Print request timer . . . . . : PRTRQSTMR *NOMAX
Form definition . . . . . : FORMDF       F1C10110
Library . . . . . :                *LIBL
Character identifier . . . . . : CHRID     *SYSVAL
Remote location . . . . . : RMTLOCNAME   TCPIP
Local location . . . . . : LCLLOCNAME   *NETATR
Remote network identifier . . . . . : RMTNETID *NETATR
Mode . . . . . : MODE                  QSPWTR
Text . . . . . : TEXT                  IDATA IPDS DIMM

```

#### 4.1.2 Configuring AFP with WRKAFF2 on V3R1

On V3R1, at the AS/400 command line, enter a command in the form:

**WRKAFF2 DEVD(HP\_IPDS) IPDSPASTHR(\*YES) TCPIP(\*YES)  
RMTSYS('128.9.12.134') PORT(9100) INACTTMR(\*SEC15)**

A printout should look like the following:

```
QPQXWAFP
-----
DEVD                HP_IPDS
IPDSPASTHR          *YES
TCPIP               *YES
RMTSYS              192.194.134.90
PORT                9100
ACTTMR              *NOMAX
INACTTMR            *SEC15
SBP                 *NO
PSC                 *YES
DRF                 *NO
DRR                 *NO
EDGSNSTV            *NO
```

Then do the following:

Ping the IP address to verify communication with the printer:

**PING '192.194.134.90'**

Vary the printer on:

**VRYCFG HP\_IPDS CFGTYPE(\*DEV) STATUS(\*ON)**

Start the print writer:

**STRPRTWTR HP\_IPDS**

## 4.2 AS/400 Settings for Version 3.2

To configure IPDS on AS/400 V3R2, use the following commands:

- CRTDEVPRT
- CRTPSFCFG

### 4.2.1 Configuring PSF with CRTDEVPRT on V3R2

On the AS/400 command line, enter a command in the form:

```
CRTDEVPRT DEVD(HP_IPDS) DEVCLS(*RMT) TYPE(*IPDS)
MODEL(0) AFP(*YES) AFPATTACH(*APPC)
FONT(11)RMTLOCNAME(TCPIP) FORMFEED(*AUTOCUT)
TEXT('IDATA IPDS DIMM')
```

A completed screen looks like this:

| Display Device Description Page 1    |              |                 |
|--------------------------------------|--------------|-----------------|
| Device description . . . . .         | : DEVD       | HP_IPDS         |
| Option . . . . .                     | : OPTION     | *ALL            |
| Category of device . . . . .         | : *PRT       |                 |
| Automatically created. . . . .       | : NO         |                 |
| Device class . . . . .               | : DEVCLS     | *RMT            |
| Device type. . . . .                 | : TYPE       | *IPDS           |
| Device model . . . . .               | : MODEL      | 0               |
| Advanced function printing . . . . . | : AFP        | *YES            |
| AFP attachment . . . . .             | : AFPATTACH  | *APPC           |
| Online at IPL . . . . .              | : ONLINE     | *YES            |
| Font . . . . .                       | : FONT       |                 |
| Identifier . . . . .                 | : 011        |                 |
| Point size . . . . .                 | : *NONE      |                 |
| Form feed . . . . .                  | : FORMFEED   | *AUTOCUT        |
| Separator drawer . . . . .           | : SEPDRAWER  | *FILE           |
| Separator program. . . . .           | : SEPPGM     | *NONE           |
| Library. . . . .                     | :            |                 |
| Printer error message . . . . .      | : PRTERMSG   | *INQ            |
| Message queue . . . . .              | : MSGQ       | QSYSOPR         |
| Library . . . . .                    | : *LIBL      |                 |
| Maximum pending requests . . . . .   | : MAXPNDRQS  | 6               |
| Print while converting . . . . .     | : PRTCVT     | *YES            |
| Print request timer . . . . .        | : PRTRQSTMR  | *NOMAX          |
| Form definition . . . . .            | : FORMDF     | F1C10110        |
| Library . . . . .                    | : *LIBL      |                 |
| Character identifier . . . . .       | : CHRID      | *SYSVAL         |
| Remote location . . . . .            | : RMTLOCNAME | TCPIP           |
| Local location . . . . .             | : LCLLOCNAME | *NETATR         |
| Remote network identifier . . . . .  | : RMTNETID   | NETATR          |
| Mode. . . . .                        | : MODE       | QSPWTR          |
| Dependent location name . . . . .    | : DEPLOCNAME | *NONE           |
| Text . . . . .                       | : TEXT       | IDATA IPDS DIMM |

#### 4.2.2 Configuring AFP with CRTPSFCFG on V3R2.

On the AS/400 command line, enter a command in the form:

```
CRTPSFCFG PSFCFG(HP_IPDS) IPDSPASTHR(*YES)
RLSTMR(*SEC15) TEXT(IDATA IPDS
DIMM)RMTLOCNAME('194.192.134.90) PORT(9100)
```

A completed screen looks like this:

```
PSF configuration: HP_IPDS                      Library: QGPL
User resource library . . . . . : *JOBLIBL
IPDS pass through . . . . . : *YES
Activate release timer . . . . . : *NORDYF
Release timer . . . . . : *SEC15
Restart timer . . . . . : *IMMED
SNA retry count . . . . . : 2
Delay time between retries . . . . . : 0
Blank page . . . . . : *YES
Page size control . . . . . : *YES
Resident fonts . . . . . : *YES
Resource retention . . . . . : *YES
Edge orient . . . . . : *NO
Remote location:
Name or address . . . . . : 194.192.134.90
TCP/IP port . . . . . : 9100
TCP/IP activation timer . . . . . : 170
PSF defined options: *NONE
Text description . . . . . : IDATA IPDS DIMM
Device resource library list: *DFT
```

Then do the following:

Ping the IP address to verify communication with the printer:

**PING '192.194.134.90'**

Vary the printer on:

**VRYCFG HP\_IPDS CFGTYPE(\*DEV) STATUS(\*ON)**

Start the print writer:

**STRPRTWTR HP\_IPDS**

## 4.3 AS/400 Settings for Version 3.6

To configure IPDS on AS/400 V3R6, you use the following commands:

- CRTDEVPRT
- WRKAFF2

### 4.3.1 Configuring PSF with CRTDEVPRT on V3R6

At the AS/400 command line, enter a command in the form:

```
CRTDEVPRT DEVD(HP_IPDS) DEVCLS(*RMT) TYPE(*IPDS)
MODEL(0) AFP(*YES) AFPATTACH(*APPC) FONT(11)
RMTLOCNAME(TCPIP) FORMFEED(*AUTOCUT) TEXT('IDATA IPDS
DIMM')
```

A completed screen looks like this:

|                                      |              |                 |
|--------------------------------------|--------------|-----------------|
| Display Device Description Page 1    |              |                 |
| Device description . . . . .         | : DEVD       | HP_IPDS         |
| Option . . . . .                     | : OPTION     | *ALL            |
| Category of device . . . . .         | :            | *PRT            |
| Automatically created . . . . .      | :            | NO              |
| Device class . . . . .               | : DEVCLS     | *RMT            |
| Device type . . . . .                | : TYPE       | *IPDS           |
| Device model . . . . .               | : MODEL      | 0               |
| Advanced function printing . . . . . | : AFP        | *YES            |
| AFP attachment . . . . .             | : AFPATTACH  | *APPC           |
| Online at IPL . . . . .              | : ONLINE     | *YES            |
| Font . . . . .                       | : FONT       |                 |
| Identifier . . . . .                 | :            | 011             |
| Point size . . . . .                 | :            | *NONE           |
| Form feed . . . . .                  | : FORMFEED   | *AUTOCUT        |
| Separator drawer . . . . .           | : SEPDRAWER  | *FILE           |
| Separator program . . . . .          | : SEPPGM     | *NONE           |
| Library . . . . .                    | :            |                 |
| Printer error message . . . . .      | : PRTERMSG   | *INQ            |
| Message queue . . . . .              | : MSGQ       | QSYSOPR         |
| Library . . . . .                    | :            | *LIBL           |
| Maximum pending requests . . . . .   | : MAXPNDRQS  | 6               |
| Print while converting . . . . .     | : PRTCVT     | *YES            |
| Print request timer . . . . .        | : PRTRQSTMR  | *NOMAX          |
| Form definition . . . . .            | : FORMDF     | F1C10110        |
| Library . . . . .                    | :            | *LIBL           |
| Character identifier . . . . .       | : CHRID      | *SYSVAL         |
| Remote location . . . . .            | : RMTLOCNAME | TCPIP           |
| Local location . . . . .             | : LCLLOCNAME | *NETATR         |
| Remote network identifier . . . . .  | : RMTNETID   | *NETATR         |
| Mode . . . . .                       | : MODE       | QSPWTR          |
| Dependent location name . . . . .    | : DEPLOCNAME | *NONE           |
| Text . . . . .                       | : TEXT       | IDATA IPDS DIMM |

### 4.3.2 Configuring PSF with WRKAFF2 on V3R6

On V3R6, at the AS/400 command line, enter a command in the form:

**WRKAFF2 DEVD(HP\_IPDS) IPDSPASTHR(\*YES) TCPIP(\*YES)  
RMTSYS('128.9.12.134') PORT(9100) RLSTMR(\*SEC15)**



A printout should look like the following:

```
QPQXWAFP
-----
DEVD  HP_IPDS
IPDSPASTHR  *YES
TCPIP      *YES
RMTSYS     192.194.134.90
PORT      9100
ACTTMR     *NOMAX
RLSTMR     *SEC15
SBP        *NO
PSC        *YES
DRF        *NO
DRR        *NO
EDGSNSTV   *NO
```

Then do the following:

Ping the IP address to verify communication with the printer:

```
PING '192.194.134.90'
```

Vary the printer on:

```
VRYCFG HP_IPDS CFGTYPE(*DEV) STATUS(*ON)
```

Start the print writer:

```
STRPRTWTR HP_IPDS
```

## 4.4 AS/400 Settings for Version 3.7

To configure IPDS on AS/400 V3R7, you use the following commands:

- CRTDEVPRT
- CRTPSFCFG

### 4.4.1 Configuring PSF with CRTDEVPRT on V3R7

At the AS/400 command line, enter a command in the form:

```
CRTDEVPRT DEVD(HP_IPDS) DEVCLS(*LAN) TYPE(*IPDS)
MODEL(0) LANATTACH(*IP) AFP(*YES) PORT(9100)FONT(11)
FORMFEED(*AUTOCUT) RMTLOCNAME('192.194.134.90)
USRDFNOBJ(AFP/NETWRKPRT *PSFCFG) TEXT('IDATA IPDS
DIMM')
```

A completed screen looks like this:

```
Display Device Description                               Page 1
5716SS1 V3R7M0 961108  BLDRB1      09/11/96 12:02:59
Device description . . . . . : DEVD                HP_IPDS
Option . . . . . : OPTION                *ALL
Category of device . . . . . : *PRT
Device class . . . . . : DEVCLS            *LAN
Device type . . . . . : TYPE              *IPDS
Device model . . . . . : MODEL            0
LAN attachment . . . . . : LANATTACH      *IP
User-defined object . . . . . : USRDFNOBJ  NETWRKPRT
Library . . . . . : AFP
Object type . . . . . : *PSFCFG
Data transform program . . . . . : USRDTATFM *NONE
User-defined driver program . . : USRDRVPGM *NONE
Advanced function printing . . . : AFP      *YES
Port number . . . . . : PORT 9100
Online at IPL . . . . . : ONLINE          *YES
Font . . . . . : FONT
Identifier . . . . . : 011
Point size . . . . . : *NONE
Form feed . . . . . : FORMFEED           *AUTOCUT
Separator drawer . . . . . : SEPDRAWER    *FILE
Separator program . . . . . : SEPPGM     *NONE
Library . . . . . :
Printer error message . . . . . : PRTERMSG  *INQ
Message queue . . . . . : MSGQ           QSYSOPR
Library . . . . . : *LIBL
Activation timer . . . . . : ACTTMR      170
Maximum pending requests . . . . : MAXPNDRQS 6
Print while converting . . . . . : PRTCVT  *YES
Print request timer . . . . . : PRTRQSTMR *NOMAX
Form definition . . . . . : FORMDF      F1C10110
Library . . . . . : *LIBL
Remote location . . . . . : RMTLOCNAME
Name or address . . . . . : '194.192.134.90'
Dependent location name . . . . . : DEPLOCNAME *NONE
Text . . . . . : TEXT                   IDATA IPDS DIMM
User-defined options . . . . . : USRDFNOPT
-----User-defined options-----
```

#### 4.4.2 Configuring AS/400 for IPDS printing on V3R7

On the AS/400 command line, enter a command in the form:

**CRTPSFCFG PSFCFG(AFP/NETWRKPRT) IPDSPASTHR(\*YES)  
RLSTMR(\*SEC15) TEXT('IDATA IPDS DIMM')**

A completed screen looks like this:

```
PSF Configuration Information                               Page 1
PSF configuration:      NETWRKPRT                          Library:           AFP
User resource library . . . . . : *JOBLIBL
IPDS pass through . . . . . : *YES
Activate release timer. . . . . : *NORDYF
Release timer . . . . . : *SEC15
Restart timer . . . . . : *IMMED
SNA retry count . . . . . : 2
Delay time between retries. . . . . : 0
Blank page. . . . . : *YES
Page size control . . . . . : *YES
Resident fonts. . . . . : *YES
Resource retention. . . . . : *YES
Edge orient . . . . . : *NO
Remote location:
Name or address . . . . . : *NONE
TCP/IP port . . . . . : *NONE
TCP/IP activation timer . . . . . : 170
PSF defined options:                *NONE
Text description . . . . . : IDATA IPDS DIMM
Device resource library list:        *DFT
```

Note: The lines in bold in the above screen are not used by PSF/400. Instead, PSF/400 uses the information entered in the device description screen.

Then do the following:

Ping the IP address to verify communication with the printer:

**PING '192.194.134.90'**

Vary the printer on:

**VRYCFG HP\_IPDS CFGTYPE(\*DEV) STATUS(\*ON)**

Start the print writer:

**STRPRTWTR HP\_IPDS**

## 4.5 AS/400 Settings for Version 4.1

To configure IPDS on AS/400 V4R1, you use the following commands:

- CRTDEVPRT
- CRTPSFCFG

### 4.5.1 Configuring PSF with CRTDEVPRT on V4R1

At the AS/400 command line, enter a command in the form:

```
CRTDEVPRT DEVD(HP_IPDS) DEVCLS(*LAN) TYPE(*IPDS)
MODEL(0) LANATTACH(*IP) AFP(*YES) PORT(9100)FONT(11)
FORMFEED(*AUTOCUT) RMTLOCNAME('192.194.134.90)
USRDFNOBJ(AFP/NETWRKPRT *PSFCFG)TEXT('IDATA IPDS
DIMM')
```

A completed screen looks like this:

```

Display Device Description                               Page 1
5716SS1 V4R1M0 961108  BLDRB1          09/11/96 12:02:59

Device description . . . . . : DEVD                HP_IPDS
Option . . . . . : OPTION                *ALL
Category of device . . . . . : *PRT
Device class . . . . . : DEVCLS            *LAN
Device type. . . . . : TYPE                *IPDS
Device model . . . . . : MODEL            0
LAN attachment . . . . . : LANATTACH        *IP
User-defined object. . . . . : USRDFNOBJ    NETWRKPRT
Library. . . . . : AFP
Object type. . . . . : *PSFCFG
Data transform program . . . . . : USRDATATFM  *NONE
User-defined driver program. . . . . : USRDRVPGM *NONE
Advanced function printing . . . . . : AFP      *YES
Port number. . . . . : PORT 9100
Online at IPL. . . . . : ONLINE            *YES
Font . . . . . : FONT
Identifier . . . . . : 011
Point size . . . . . : *NONE
Form feed. . . . . : FORMFEED             *AUTOCUT
Separator drawer . . . . . : SEPDRAWER      *FILE
Separator program. . . . . : SEPPGM        *NONE
Library. . . . . :
Printer error message. . . . . : PRTERMSG    *INQ
Message queue. . . . . : MSGQ              QSYSOPR
Library. . . . . : *LIBL
Activation timer . . . . . : ACTTMR        170
Maximum pending requests . . . . . : MAXPNDRQS 6
Print while converting . . . . . : PRTCVT    *YES
Print request timer. . . . . : PRTRQSTMR    *NOMAX
Form definition. . . . . : FORMDF          F1C10110
Library. . . . . : *LIBL
Remote location. . . . . : RMTLOCNAME
Name or address. . . . . : '194.192.134.90'
Dependent location name. . . . . : DEPLOCNAME *NONE
Text . . . . . : TEXT                      IDATA IPDS DIMM
User-defined options . . . . . : USRDFNOPT
-----User-defined options-----

```

#### 4.5.2 Configuring AS/400 for IPDS printing on V4R1

On the AS/400 command line, enter a command in the form:

**CRTPSFCFG PSFCFG(AFP/NETWRKPRT) IPDSPASTHR(\*YES)  
 RLSTMR(\*SEC15) TEXT('IDATA IPDS DIMM')**

A completed screen looks like this:

```
PSF Configuration Information                               Page 1
PSF configuration:                                       NETWRKPRT   Library:           AFP
User resource library . . . . . : *JOBLIBL
IPDS pass through . . . . . : *YES
Activate release timer. . . . . : *NORDYF
Release timer . . . . . : *SEC15
Restart timer . . . . . : *IMMED
SNA retry count . . . . . : 2
Delay time between retries. . . . . : 0
Blank page . . . . . : *YES
Page size control . . . . . : *YES
Resident fonts . . . . . : *YES
Resource retention. . . . . : *YES
Edge orient . . . . . : *NO
Remote location:
Name or address . . . . . : *NONE
TCP/IP port . . . . . : *NONE
TCP/IP activation timer . . . . . : 170
PSF defined options: *NONE
Text description. . . . . : IDATA IPDS DIMM
Device resource library list: *DFT
```

Note: The lines in bold in the above screen are not used by PSF/400. Instead, PSF/400 uses the information entered in the device description screen.

Then do the following:

Ping the IP address to verify communication with the printer:

**PING '192.194.134.90'**

Vary the printer on:

**VRYCFG HP\_IPDS CFGTYPE(\*DEV) STATUS(\*ON)**

Start the print writer:

**STRPRTWTR HP\_IPDS**

## 4.6 AS/400 Settings for Version 4.2

To configure IPDS on AS/400 V4R2, you use the following commands:

- CRTDEVPRT
- CRTPSFCFG

### 4.6.1 Configuring PSF with CRTDEVPRT on V4R2

At the AS/400 command line, enter a command in the form:

```
CRTDEVPRT DEVD(HP_IPDS) DEVCLS(*LAN) TYPE(*IPDS)
MODEL(0) LANATTACH(*IP) AFP(*YES) PORT(9100)FONT(11)
FORMFEED(*AUTOCUT) RMTLOCNAME('192.194.134.90)
USRDFNOBJ(AFP/NETWRKPRT *PSFCFG) TEXT('IDATA IPDS
DIMM')
```

A completed screen looks like this:

```

Display Device Description                               Page 1
5716SS1 V4R2M0 971108  BLDRB1      09/11/97 12:02:59
Device description . . . . . : DEVD           HP_IPDS
Option . . . . . : OPTION           *ALL
Category of device . . . . . : *PRT
Device class . . . . . : DEVCLS       *LAN
Device type. . . . . : TYPE          *IPDS
Device model . . . . . : MODEL        0
LAN attachment . . . . . : LANATTACH  *IP
User-defined object. . . . . : USRDFNOBJ NETWRKPRT
Library. . . . . : AFP
Object type. . . . . : *PSFCFG
Data transform program . . . . . : USRDTATFM *NONE
User-defined driver program . . . . . : USRDRVPGM *NONE
Advanced function printing . . . . . : AFP      *YES
Port number. . . . . : PORT 9100
Online at IPL. . . . . : ONLINE       *YES
Font . . . . . : FONT
Identifier . . . . . : 011
Point size . . . . . : *NONE
Form feed. . . . . : FORMFEED        *AUTOCUT
Separator drawer . . . . . : SEPDRAWER  *FILE
Separator program. . . . . : SEPPGM    *NONE
Library. . . . . :
Printer error message. . . . . : PRTERMSG  *INQ
Message queue. . . . . : MSGQ         QSYSOPR
Library. . . . . : *LIBL
Activation timer . . . . . : ACTTMR    170
Maximum pending requests . . . . . : MAXPDRQS 6
Print while converting . . . . . : PRTCVT  *YES
Print request timer. . . . . : PRTRQSTMR *NOMAX
Form definition. . . . . : FORMDF      F1C10110
Library. . . . . : *LIBL
Remote location. . . . . : RMTLOCNAME
Name or address. . . . . : '194.192.134.90'
Dependent location name. . . . . : DEPLOCNAME *NONE
Text . . . . . : TEXT                IDATA IPDS DIMM
User-defined options . . . . . : USRDFNOPT
-----User-defined options-----

```

#### 4.6.2 Configuring AS/400 for IPDS printing on V4R2

On the AS/400 command line, enter a command in the form:

**CRTPSFCFG PSFCFG(AFP/NETWRKPRT) IPDSPASTHR(\*YES)  
 RLSTMR(\*SEC15) TEXT('IDATA IPDS DIMM')**

A completed screen looks like this:

```
PSF Configuration Information                               Page 1
PSF configuration:      NETWRKPRT      Library:      AFP
User resource library . . . . . : *JOBLIBL
IPDS pass through . . . . . : *YES
Activate release timer. . . . . : *NORDYF
Release timer . . . . . : *SEC15
Restart timer . . . . . : *IMMED
SNA retry count . . . . . : 2
Delay time between retries. . . . . : 0
Blank page. . . . . : *YES
Page size control . . . . . : *YES
Resident fonts. . . . . : *YES
Resource retention. . . . . : *YES
Edge orient . . . . . : *NO
Remote location:
Name or address . . . . . : *NONE
TCP/IP port . . . . . : *NONE
TCP/IP activation timer . . . . . : 170
PSF defined options:                *NONE
Text description. . . . . : IDATA IPDS DIMM
Device resource library list:        *DFT
```

Note: The lines in bold in the above screen are not used by PSF/400. Instead, PSF/400 uses the information entered in the device description screen.

Then do the following:

Ping the IP address to verify communication with the printer:

**PING '192.194.134.90'**

Vary the printer on:

**VRYCFG HP\_IPDS CFGTYPE(\*DEV) STATUS(\*ON)**

Start the print writer:

**STRPRTWTR HP\_IPDS**

## 4.7 AS/400 settings for Version 4.3

To configure IPDS on AS/400 V4R2, you use the following commands:

- CRTDEVPRT
- CRTPSFCFG

### 4.7.1 Configuring PSF with CRTDEVPRT on V4R3

At the AS/400 command line, enter a command in the form:

```
CRTDEVPRT DEVD(HP_IPDS) DEVCLS(*LAN) TYPE(*IPDS)
MODEL(0) LANATTACH(*IP) AFP(*YES) PORT(9100)FONT(11)
FORMFEED(*AUTOCUT) RMTLOCNAME('192.194.134.90)
USRDFNOBJ(AFP/NETWRKPRT *PSFCFG)TEXT('IDATA IPDS
DIMM')
```

A completed screen looks like this:

```

Display Device Description                               Page 1
5716SS1 V4R3M0 981108  BLDRB1      09/11/98 12:02:59
Device description . . . . . : DEVD                HP_IPDS
Option . . . . . : OPTION                *ALL
Category of device . . . . . : *PRT
Device class . . . . . : DEVCLS            *LAN
Device type. . . . . : TYPE                *IPDS
Device model . . . . . : MODEL            0
LAN attachment . . . . . : LANATTACH       *IP
User-defined object. . . . . : USRDFNOBJ    NETWRKPRT
Library. . . . . : AFP
Object type. . . . . : *PSFCFG
Data transform program . . . . . : USRDTATFM    *NONE
User-defined driver program . . . . . : USRDRVPGM *NONE
Advanced function printing . . . . . : AFP      *YES
Port number. . . . . : PORT 9100
Online at IPL. . . . . : ONLINE            *YES
Font . . . . . : FONT
Identifier . . . . . : 011
Point size . . . . . : *NONE
Form feed. . . . . : FORMFEED             *AUTOCUT
Separator drawer . . . . . : SEPDRAWER       *FILE
Separator program . . . . . : SEPPGM        *NONE
Library. . . . . :
Printer error message . . . . . : PRTERMSG    *INQ
Message queue. . . . . : MSGQ              QSYSOPR
Library. . . . . : *LIBL
Activation timer . . . . . : ACTTMR         170
Maximum pending requests . . . . . : MAXPDRQS 6
Print while converting . . . . . : PRTCVT    *YES
Print request timer . . . . . : PRTRQSTMR   *NOMAX
Form definition . . . . . : FORMDF         F1C10110
Library. . . . . : *LIBL
Remote location. . . . . : RMTLOCNAME
Name or address. . . . . : '194.192.134.90'
Dependent location name . . . . . : DEPLOCNAME *NONE
Text . . . . . : TEXT                      IDATA IPDS DIMM
User-defined options . . . . . : USRDFNOPT
-----User-defined options-----

```

#### 4.7.2 Configuring AS/400 for IPDS printing on V4R3

On the AS/400 command line, enter a command in the form:

**CRTPSFCFG PSFCFG(AFP/NETWRKPRT) IPDSPASTHR(\*YES)  
 RLSTMR(\*SEC15) TEXT('IDATA IPDS DIMM')**



A completed screen looks like this:

```
PSF Configuration Information                               Page 1
PSF configuration:          NETWRKPRT                      Library:      AFP
User resource library . . . . . : *JOBLIBL
IPDS pass through . . . . . : *YES
Activate release timer. . . . . : *NORDYF
Release timer . . . . . : *SEC15
Restart timer . . . . . : *IMMED
SNA retry count . . . . . : 2
Delay time between retries. . . . . : 0
Blank page. . . . . : *YES
Page size control . . . . . : *YES
Resident fonts. . . . . : *YES
Resource retention. . . . . : *YES
Edge orient . . . . . : *NO
Remote location:
Name or address . . . . . : *NONE
TCP/IP port . . . . . : *NONE
TCP/IP activation timer . . . . . : 170
PSF defined options:          *NONE
Text description . . . . . : IDATA IPDS DIMM
Device resource library list: *DFT
```

Note: The lines in bold in the above screen are not used by PSF/400. Instead, PSF/400 uses the information entered in the device description screen.

Then do the following:

Ping the IP address to verify communication with the printer:

**PING '192.194.134.90'**

Vary the printer on:

**VRYCFG HP\_IPDS CFGTYPE(\*DEV) STATUS(\*ON)**

Start the print writer:

**STRPRTWTR HP\_IPDS**

## 5 PSF/MVS AFP Printing Using TCP/IP

This chapter provides information on how to create MVS definitions for printing from PSF/MVS via TCP/IP. The following topics are addressed:

JES printer statements  
PSF Startup procedure

Once these parameters have been configured, and the basic TCP/IP installation of the PrintServer (equipped with an IPDS DIMM) has been completed, direct AFP / IPDS from PSF / MVS will be possible.

### Requirements:

- PSF/MVS version 2 Release 2.0 with APAR OW15599.
- MVS Scheduler APAR OW12236 which supports the PRINTDEV IPADDR and PORTNO keywords.
- IBM TCP/IP Version 3 Release 1, or higher, installed and configured on MVS.  
Co-requisite supported TCP/IP controller is also required (e.g. IBM 3172).

### MTU size:

- The Maximum Transmission Unit (MTU) of the IP packet for the MVS system is recommended to be set up to 2000.

*Note: The MTU size should not exceed the maximum size sent through the control unit. Failure may lead to transmission problems.*

## 5.1 PSF/MVS direct attachment

### Sample PSF/MVS JES2 initialisation statements

```
FSSDEF (FSS1) PROC=PSF4, HASPFSSM=HASPFSM
```

```
PRT420      FSS=FSS1, MODE=FSS, PRMODE= (LINE, PAGE) ,  
              CLASS=A, UCS=0, SEP, NOSEPDS, CKPTPAGE=100, DRAIN, WS= (R, Q/FCB)
```

*Example of PSF/MVS JES2 printer definition*

## 5.2 PSF/MVS startup procedure

```
//PSF4   PROC  
//STEP01 EXEC PGM=APSPPIEP, REGION=1750K  
//JOBHDR OUTPUT PAGEDEF=V06483,          /* JOB SEPARATOR PAGEDEF  
*/  
//      FORMDEF=A10110, CHARS=GT15        /* JOB SEPARATOR FORMDEF  
*/  
//JOBTLR OUTPUT PAGEDEF=V06483,          /* JOB SEPARATOR PAGEDEF
```

```

*/
//      FORMDEF=A10110,CHARS=GT15          /* JOB SEPARATOR FORMDEF
*/
//DSHDR OUTPUT PAGEDEF=V06483,            /* DS SEPARATOR PAGEDEF
*/
//      FORMDEF=A10120,CHARS=GT15          /* DS SEPARATOR FORMDEF
*/
//MSGDS OUTPUT PAGEDEF=A06462,            /* MESSAGE DATASET PAGEDEF
*/
//      FORMDEF=A10110                      /* MESSAGE DATASET FORMDEF
*/
//*****
//*
//*      THIS PROC. IS TO BE USED FOR 300 DPI DEVICES
//*
//*****
//FONT01 DD DSN=SYS1.FONTLIBB,DISP=SHR    /* FONTS - 300 DPI */
//      DD DSN=SYS1.FONT300,DISP=SHR      /* SYSTEM FONTS - 300 DPI */
//*-----
//PSEG01 DD DSN=SYS1.PSEGLIB,DISP=SHR     /* SYSTEM PAGE SEGMENTS */
//*-----
//OLAY01 DD DSN=SYS1.OVERLIB,DISP=SHR     /* SYSTEM MEDIUM OVERLAYS */
//*-----
//PDEF01 DD DSN=SYS2.PDEFLIB,DISP=SHR     /* SYSTEM PAGEDEFS */
//      DD DSN=SYS1.PDEFLIB,DISP=SHR     /* SYSTEM PAGEDEFS */
//*-----
//FDEF01 DD DSN=SYS2.FDEFLIB,DISP=SHR     /* SYSTEM FORMDEFS */
//      DD DSN=SYS1.FDEFLIB,DISP=SHR     /* SYSTEM FORMDEFS */
//*****
//*
//*      STANDARD PRINTDEV
//*
//*****
//PRT420 CNTL
//PRT420 PRINTDEV FONTDD=*.FONT01,        /* FONT LIBRARY DD */
//      OVLYDD=*.OLAY01,                  /* OVERLAY LIBRARY DD */
//      PSEGDD=*.PSEG01,                  /* SEGMENT LIBRARY DD */
//      PDEFDD=*.PDEF01,                  /* PAGEDEF LIBRARY DD */
//      FDEFDD=*.FDEF01,                  /* FORMDEF LIBRARY DD */
//      JOBHDR=*.JOBHDR,                  /* JOB HEADER SEPARATOR OUTPUT */
//      JOBTRLR=*.JOBTLR,                 /* JOB TRAILER SEPARATOR OUTPUT */
//      DSHDR=*.DSHDR,                    /* DATA SET HEADER SEPERATOR */
//      MESSAGE=*.MSGDS,                  /* MESSAGE DATA SET OUTPUT */
//      PAGEDEF=A06462,                   /* DEVICE PAGEDEF DEFAULT */
//      FORMDEF=A10110,                   /* DEVICE FORMDEF DEFAULT */
//      CHARS=(GT10,                       /* DEVICE */
//      GT12,GT15,GT10),                  /* DEFAULT FONT SET */
//      PIMSG=YES,                         /* ACCUMULATE DATA SET MESSAGES */
//      DATAACK=BLOCK,                    /* REPORT ALL DATA-CHECK ERRORS */
//      TRACE=NO,                          /* CREATE INTERNAL TRACE */
//      FAILURE=WCONNECT,                  /* ACTION ON PRINTER FAILURE */
//      TIMEOUT=REDRIVE,                   /* PSF ACTION ON TIMEOUT */
//      DISCINTV=0,                        /* DISCONNECT INTERVAL IN SECS. */
//      MGMTMODE=IMMED,                    /* ACTIVATE PRINTER AT STARTUP */
//      IPADDR='192.0.110.21'              /* IP ADDRESS */
//      PORTNO=5001 (9100)                 /* IP ADDRESS
*/
//PRT420 ENDCNTL

```

*Using IP address 192.0.110.21 and port number 5001*

The IP address of the PrintServer (IPDS) should be programmed in the IPADDR statement. The PORTNO 5001 is the default port number of the first IPDS port on

the PrintServer for the MPI Tech EIO interface (IPDS). Use a value of 91005002 to address the second IPDS port if required for any other interface.

## 6 AIX (version 4.2) for PPD

For a description of PSF for AIX, please see the IBM manual, **IBM Print Services Facility for AIX: Print Administration version 2.1, Doc. no. S544-3817-02.**

### 6.1 Device Parameter Setup

1. From **smit**, enter the main menu and select **PSF for AIX - Printing and Configuration**
2. Here, you continue through the following screens by selecting **Administer PSF for AIX, Manage a PSF for AIX Printer and Show/Change Characteristics of a Printer**
3. Now select **Device Options** and select your device.
4. On the screen **TCP/IP-Attached Printer Device Options**, type **Internet ADDRESS, PORT number** (5001 if you use LinkCom or HostCom, otherwise 9100) and the value you want for **Connection TIMEOUT** in seconds.
5. After changing the values, you must go back to the main screen, select **PSF for AIX - Printing and Configuration** and then **Bring Queues Up and Down** to stop and start the queue for the changes to take effect.

## 7 Error Messages

Overview of IPDS NACK's that can be returned to the system.

### 7.1 Supported IPDS NACK's:

#### Command Reject Exceptions

0x800100: Invalid IPDS Command Code  
0x800200: Invalid IPDS Command Sequence  
0x800400: Data received after ARQ  
0x80E000: Invalid IPDS Command Length

#### Equipment check with intervention-Required Exception

*(MPI Tech LinkCom/HostCom only)*

0x501000: Printer hardware exception  
0x50F200: Print overrun  
0x50F500: Image generator exception  
0x50F600: Offset stacker exception  
0x50F700: Duplex media source exception  
0x50F800: Input media source exception

#### Intervention-Required Exceptions

0x400000: Printer Not Ready  
0x400100: Printer Out of Paper  
0x400200: Printer exit tray full  
0x400400: Printer out of toner  
0x400500: Empty fuser oil supply  
0x400600: Invalid media  
0x403100: Paper length check  
0x403300: Paper width check  
0x40E000: Paper jam not cleared  
0x40E100: Out of paper (secondary input)  
0x40E200: Transport requires corrective action  
0x40E300: Fuser requires corrective action  
0x40E500: Paper jam recovery needed  
0x40E600: Door open  
0x40E700: Paper specification check

#### Equipment check exception

0x10F100: Permanent hardware exception  
0x10F200: Print overrun  
0x10F300: Magnet settings changed  
0x10F400: Serializer parity exception  
0x10F500: Image generator exception  
0x10FA00: Media size sensor error

#### Data-Check Exceptions

0x082100: Undefined Character  
0x082900: Double-byte coded font section is not activated or is invalid

0x086000: Numeric representation precision check  
0x08C100: Position check

### **Specification Check - IO Image Exceptions**

0x050001: Invalid IO-Image self-def. field code  
0x050003: Invalid IO-Image self-def. field len.  
0x050004: Invalid IO-Image self-def. field val.  
  
0x05700F: IO - Begin Segment out of sequence.  
0x05710F: IO - End segment out of sequence  
0x05910F: IO - Begin Image Content out of seq.  
0x05920F: Image Data self-def. field out of seq  
0x05930F: End Image Content out of sequence  
0x059401: Inconsistent Image Size Parameter value and Image Data  
0x05940F: Image Size Parameter missing  
0x059410: Image Size Parameter value unsupp.  
0x059411: Image Size cannot be determined  
0x05950F: Image Encoding Parameter out of seq.  
0x059510: Image Encoding Parameter value unsupp.  
0x059511: IO-image decompression error.  
0x05960F: Image Data Elem. Size Par. out of seq  
0x059610: Image Data Elem. Size Par. val. unsup.  
0x05970F: Image Look Up Table ID out of seq.  
0x059710: Image Look Up Table ID Par. unsupp.  
  
0x05A902: IO data outside the Image Pres. Space

### **Specification Check - Bar Code Exceptions**

0x040300: Invalid bar code type  
0x040400: Unsupported font - local ID or font not available  
0x040500: Invalid or unsupported bar code colour  
0x040600: Invalid module width  
0x040700: Invalid element height  
0x040800: Invalid height multiplier  
0x040900: Invalid wide-to-narrow ratio  
0x040A00: Invalid symbol reference point  
0x040B00: Invalid bar code modifier  
0x040C00: Invalid bar code data length  
0x040E00: Check-digit calculation exception  
  
0x041000: Invalid HRI location  
0x041100: Attempt to print outside block

### **Specification Check - Graphics Exceptions**

0x030001: Unsupported graphics command code  
0x030002: Reserved byte or invalid attr. set  
0x030003: Incorrect drawing order length  
0x03000C: Segment prolog exception  
0x03000E: Unsupported attribute value  
0x030021: Invalid or unsupported default  
  
0x033400: Character angle value not supported  
0x033E00: Invalid End Prolog

0x036000: Area bracket exception  
 0x036800: Begin Area received incorrectly  
 0x036801: Area truncated exception  
 0x036802: Supported order invalid in area  
  
 0x037001: Unsupported BSI segment flag  
 0x037082: Invalid BSI segment flag  
 0x0370C1: Invalid BSI length  
 0x0370C5: Insufficient segment data  
  
 0x039200: Graphic image order sequence error  
 0x039300: Graphics image bracket exception  
 0x039301: Incorrect number of Image Data orders  
  
 0x03C300: Font not available  
 0x03C301: Undefined graphics character code  
  
 0x03D100: Truncated graphics image exception  
 0x03D101: Invalid order in graphics image  
 0x03D102: Graphics Image format not supported  
 0x03D103: Image width greater than max. supp.  
  
 0x03E100: Relative line outside coord. space

### **Specification Check - General Exceptions**

0x020001: Embedded control-sequence code except  
 0x020201: End Suppression ctrl-seq. exception  
 0x020202: Invalid IPDS Command Length  
 0x020205: Invalid data self-def. field length  
 0x020302: IPDS command header length too small  
 0x020305: Invalid or un\_supp. block orientation  
 0x020401: END PAGE encountered during suppres.  
 0x020402: Invalid use of ARQ-Continuation Bit  
 0x020405: Area pos. Ref. System not supported  
 0x020501: Invalid Spanning Sequence  
 0x020505: Invalid self-def. field unit base  
 0x020601: Invalid Begin Suppression (BSU)  
 0x020605: Invalid self-def. field L-units  
 0x020705: Invalid self-def. field extents  
 0x020805: Invalid or unsupported mapping option  
 0x020A05: Data in a block might be outside VPA  
 0x020B05: Invalid self-def. field identifier  
 0x020C01: Invalid or unsupported font local ID  
 0x020F01: Invalid Set Text Orientation (STO)  
  
 0x021001: Invalid Set Inline Margin (SIM)  
 0x021101: Invalid Set Baseline Increment (SBI)  
 0x021201: Invalid intercharacter adjustment  
 0x021202: Font storage is full  
 0x021301: Invalid Absolute Move Baseline (AMB)  
 0x021401: Invalid Absolute Move Inline (AMI)  
 0x021402: The font resource to be deactivated was not found  
 0x021501: Invalid Relative Move Inline (RMI)  
 0x021502: Invalid DF command font or font ID  
 0x021601: Invalid Relative Move Baseline (RMB)  
 0x021701: Invalid Set Variable-Space Inc (SVI)



0x021702: Invalid deletion type in DF command  
 0x021802: Invalid font ID  
 0x021901: Invalid repeat length for RPS  
 0x021902: Multiple occurrences of the same LFE  
 0x021A01: Repeat String (RPS) or Transparent Data (TRN) exception  
 0x021B01: Repeat String (RPS) target-string length exception  
 0x021B02: Invalid Load Font Control unit base  
 0x021C01: Invalid escape sequence  
 0x021D02: Invalid or unsupported value for the Load Font Equivalence (LFE) GRID  
 0x021E01: Invalid WT control-sequence length  
 0x021F01: Repeat String (RPS) length exception

0x022002: Invalid LFC font stageability byte  
 0x022202: Invalid LFC data pattern format  
 0x022302: Invalid value for LFC font type bits  
 0x022602: Invalid LSS or LFC X-box size  
 0x022702: Invalid LSS or LFC Y-box size  
 0x022A02: Invalid value for LFC X-density  
 0x022B02: Invalid value for LFC Y-density  
 0x022D02: Invalid or unsupported value for LFC pattern-data alignment  
 0x022E02: Insufficient font data received

0x023001: Insufficient storage for LCC record  
 0x023101: Invalid LCC number of copies  
 0x023201: Invalid LCC Keyword in copy-group ent  
 0x023202: Excess font data received  
 0x023401: Invalid LCC entry-byte count  
 0x023601: Invalid LCC simplex/duplex parameter  
 0x023703: Invalid or unsupported LCC media-destination parameter  
 0x023705: Mixture of media-source IDs or media-destination IDs in a duplex copy-subgroup pair  
 0x023902: LFC font HAID already assigned  
 0x023C02: Invalid value within a LFI command  
 0x023E02: Invalid LFC character-pattern address  
 0x023F02: STO-SCFL-LFE mismatch

0x024002: Invalid value for font inline seq.  
 0x024201: WIC pel count is less than min. req.  
 0x024301: WIC pel cnt is greater than max. supp  
 0x024302: Invalid double-byte coded font section identifier  
 0x024401: WIC scan count is less than min. req.  
 0x024501: WIC scan cnt is greater than max. sup  
 0x024601: Invalid WIC source image format  
 0x024602: Invalid parameter in an LFI command  
 0x024701: Invalid WIC magnification factor  
 0x024702: Invalid LFE font-inline sequence  
 0x024801: Invalid WIC scan-line direction  
 0x024901: Invalid scan-line-sequence direction in a WIC command  
 0x024A01: Invalid WIC image block location  
 0x024D02: Insufficient storage for LFC and LFI

0x025301: Invalid or unsupported value for WIC image colour  
 0x025803: Invalid or unsupported value for text colour

0x026002: Invalid LPD L-units/unit base ( $X_p + I$ )  
 0x026102: Invalid LPD L-units/unit base ( $Y_p + B$ )

0x026202: Invalid LPD Xp-extent  
 0x026301: Insufficient pattern storage  
 0x026302: Invalid LPD Yp-extent  
 0x026402: Invalid LPD unit base  
 0x026802: Invalid LPD inline-sequence direction  
 0x026902: Invalid LPD baseline-seq. direction  
 0x026A01: Insufficient source image data  
 0x026A02: Invalid LPD initial I print coord.  
 0x026B01: Excess source image data received  
 0x026B02: Invalid LPD initial B print coord.  
 0x026F02: Invalid Media Origin par. in XOH-SMO  
  
 0x027002: Invalid or unsupported value for XOH-SMS units per unit base  
 0x027202: Invalid XOH-SMS XmExtent  
 0x027302: Invalid XOH-SMS YmExtent  
 0x027402: Invalid or unsupported value for XOH SMS unit base  
 0x027701: Group termination exception  
 0x027801: Invalid order type  
  
 0x028501: Invalid DO-command overlay ID  
 0x028702: Invalid LFC unit base for Pel-units  
 0x028802: Invalid LFC X-Pel-units per unit base  
 0x028902: Invalid LFC Y-Pel-units per unit base  
 0x028A01: Invalid or unsupported value for DPS segment command  
 page segment HAID  
 0x028A02: Invalid LFC RMMF-value  
  
 0x029001: Invalid or unsupported overlay ID  
 0x029101: BO overlay ID already loaded  
 0x029102: Invalid XOA-RRL entry  
 0x029201: Overlay ID not loaded  
 0x029301: Recursive overlay invocation  
 0x029401: Invalid page segment HAID  
 0x029501: Page segment HAID already loaded  
 0x029502: Invalid XOH-PCC page-counter update  
 0x029601: Page segment HAID not loaded  
 0x029801: Invalid or unsupported suppression number  
 0x029803: Invalid TBM control sequence  
  
 0x02A401: Page boundary in X-dir. can't be rep.  
 0x02A501: Page boundary in Y-dir. can't be rep.  
 0x02AD01: Invalid LPP command  
 0x02AE01: Invalid IO command parameter  
 0x02AF01: Insufficient storage to prt the sheet  
  
 0x02C001: Mix. of Xm- and Ym-axis duplex Copy G  
 0x02C101: Max. simplex/duplex keyword in LCC  
 0x02C201: Odd num. of duplex copy group in LCC  
 0x02C202: More than one media-source or media-destination keyword  
 specified in a copy subgroup  
 0x02C301: Mix. of simplex/duplex par. in LCC  
 0x02C401: Unequal copy counts in LCC  
 0x02C602: Invalid mapping type in an LE command  
  
 0x02FF02: Exceptions detected but not queued

### Conditions Requiring Host Notification:

0x010000: Normal Printer Restart  
0x010100: Physical Media Size or Input Media Source ID Changed  
0x011000: Print Position adjustment (used for resource timeout)  
0x01E400: Cancel Key pressed

## 7.2 IPDS messages on printout

- **IPDS DIMM ERROR**

Explanation:

A hardware error is detected on the IPDS DIMM.  
The IPDS DIMM initialization will now be stopped.  
You will not be able to print IPDS from this DIMM.  
Contact your supplier for further information.

- **The IPDS personality was unable to allocate sufficient memory.**
- **The IPDS personality may not work properly until more RAM is installed.**
- **The IPDS personality requires at least 8 MB RAM installed in total.**

Explanation:

More RAM has to be installed in the printer.

The recommended memory configuration is as follows:

| Requirement       | Minimum installed memory | Recommended minimum memory (simple text) | Recommended minimum memory (pages with overlays or graphics) |
|-------------------|--------------------------|--|--|
| A4/Letter simplex | 8 MB                     | 8 MB                                     | 12 MB  |

Generally spoken: The more installed memory, the better performance. Beyond 24 MB of installed memory you should not be able to increase performance noticeably by adding more memory.

- **A checksum error is detected in the IPDS DIMM**

Explanation:

The IPDS initialization will now be stopped.  
You will not be able to print IPDS from this DIMM.  
Contact your supplier for further information.

## Appendix A. Abbreviations

| Abbreviation | Full name  | Explanation  |
|--------------|--|--|
| AFP          | Advanced Function Presentation                     | IBM concept for print data formatting that defines how print control files should be structured. This is the current standard.                         |
| APL          | A Programming Language                             |  |
| ASCII        | American Standard Code for Information Interchange |  |
| CPI          | Characters Per Inch                                |  |
| DCA          | Document Content Architecture                      |  |
| DIMM         | Dual Inline Memory Module                          |  |
| DIP          | Dual Inline Packet                                 |  |
| DSC          | Data-Stream Compatibility                          | Print data stream generated by IBM mainframes. Contains almost exclusively text, i.e. text that could be produced by a typewriter.                     |
| FLASH        | (Usually memory)                                   | Memory chip able to store information permanently without power. Depending on the type, flash memory can be 'written' between 1.000 and 100.000 times. |
| FSL          | Function Selection via the Line                    | Used to configure default values in MPI Tech interfaces for line data printing. Also used for print job specific formatting like bold and font change. |
| GFID         | Global Font ID                                     |  |
| HEX          | Hexadecimal  |  |

| Abbreviation | Full name                       | Explanation   |
|--------------|---------------------------------|---|
| ICDS         | Compressed Data Stream          | MPI Tech equivalent for the IPDS data stream. ICDS will for instance be generated and sent by PSS and translated to PCL or PostScript by the MPI Tech PrintServer/Protocol converter. ICDS supports the complete print data stream and communication between ICDS capable devices (including software devices). |
| IPDS         | Intelligent Printer Data Stream | IPDS is generated and sent by e.g. PSF and translated to PCL by e.g. the MPI Tech PrintServer/Protocol converter. IPDS supports the complete print data stream and communication between IPDS capable devices (including software devices).   |
| ITDS         | Transparent Data stream         | Used to configure and upgrade MPI Tech IPDS capable devices. Only IPDS related functions are affected. ITDS can be used locally via Centronics or printed using PSF.  |
| LAN          | Local Area Network              | Usually TokenRing or Ethernet. Coax and Twinax are usually regarded as WANs.  |
| LED          | Light-Emitting Diode            |   |

| Abbreviation | Full name                | Explanation   |
|--------------|--------------------------|---|
| LPD          | Line Printer Demon       | Part of the standard TCP/IP stack (programs). Two major (incompatible) variations of LPR/LPD are generally used Works only in conjunction with LPR. The sender of a print job via TCP/IP will be LPR and the receiver will be LPD.  |
| LPR          | Line Printer Requester   | Part of the standard TCP/IP stack (programs). Two major (incompatible) variations of LPR/LPD are generally used Works only in conjunction with LPD. The sender of a print job via TCP/IP will be LPR and the receiver will be LPD.  |
| MVS          | Multiple Virtual Machine | IBM operating system for mainframes. This is the most commonly used operating system for large corporations.  |
| OS/390       | New name for MVS         | IBM operating system for mainframes. This is the most commonly used operating system for large corporations. The only operating system that supports IBM CMOS and SYSPLEX technology.   |
| PPD          | Page Printer Demon       | Enhanced version of LPR/LPD. The enhancement enables bi-directional communication when printing. Not part of the standard TCP/IP stack (programs). Used by ida Psxx, ida RPPC, IBM Network printers, PSF/AIX and others. Works only in conjunction with PPR. The sender of a print job via TCP/IP will be PPR and the receiver will be PPD. |

| Abbreviation | Full name                    | Explanation  |
|--------------|------------------------------|--|
| PPR          | Page Printer Requester       | Enhanced version of LPR/LPD. The enhancement enables bi-directional communication when printing. Not part of the standard TCP/IP stack (programs). Used by ida PSS, ida HPR and PSF. Works only in conjunction with PPR. The sender of a print job via TCP/IP will be PPR and the receiver will be PPD.                  |
| PSF          | Print Service Facility       | IBM printer driver for AFP printing. Converts line data and AFP data to IPDS only. PSF/AIX and PSF/2 is capable of converting the data to PCL as well. PSS (ida PSS) Print Subsystem Print system for OS/390 (MVS) and VM systems. Prints AFP and line data files on all remote printers, NOT channel attached printers. |
| RAM          | Random Access Memory         | Memory chip that is able to store information while powered on. RAM can be 'written' an indefinite number of times.  |
| SCS          | SNA Character String         | Control information for simple print formatting like e.g. set CPI, LPI and Form Feed.  |
| SIMM         | Single Inline Memory Module  |  |
| SNA          | Systems Network Architecture | IBM networking concept usually for Mainframe and AS/400. On mainframes the actual program that implements SNA is called VTAM.  |

| Abbreviation | Full name                                      | Explanation  |
|--------------|--|--|
| TCP/IP       | Transmission Control Program/Internet Protocol | Suite of programs for network communication. TCP/IP can be installed on almost every existing operating system, but the supported functions vary between operating systems. TCP/IP consist of a base TCP program and various other programs providing support for e.g. LPD, Telnet or BootP. |
| VTAM         | Virtual TeleAccess Method                      | IBM network communication program. VTAM is used to connect printers and terminals to OS/390 (MVS) and VM systems.  |
| VM           | Virtual Machine                                | IBM operating system for mainframes. OS/390 (MVS) and other operating systems can run under control of VM.   |
| WAN          | Wide Area Network                              | Usually Coax and Twinax networks. Today it is also used for larger Token Ring and Ethernet networks and/or Router base networks.   |