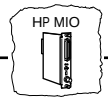

Preface

Thank you for purchasing the AXIS HP MIO printer interface. Our goal in developing this product is to provide you with a high-quality, high-performance interface between the IBM system environment and your Hewlett-Packard printer, combining the best of both worlds.

About Axis

Axis Communications is dedicated to provide inventive solutions for network connection of computer peripherals. Since the start in 1984, it has been one of the fastest growing companies in the market. The headquarters are located in Lund, Sweden, with subsidiaries in Boston, Tokyo, and Hong Kong.

Axis Communications has a distributor network operating in more than 50 countries world-wide, marketing three product lines:

IBM Mainframe and S/3x – AS/400 Printer Interfaces: These products include a wide range of plug-in interfaces and stand-alone products such as the AXIS Cobra+, AXIS 330/370 Cobra, AXIS HP MIO, the AXIS AFP IPDS-to-PostScript converter, and the AXIS AFP MIO/IOP IPDS-to-PCL converters

Network Print Servers: These intelligent Ethernet and Token Ring print servers support a wide range of LAN protocols. The AXIS 540, AXIS 560 and AXIS 570 are Ethernet print servers, and the AXIS 640, AXIS 660 and AXIS 670 are Token Ring print servers. The AXIS 150 is an Ethernet print server dedicated to PC networks.

CD-ROM Servers: Axis CD-ROM servers allow CD-ROM data to be shared over the network. The product range includes the AXIS 850 and AXIS 851 Ethernet CD-ROM servers as well as the AXIS 950 and AXIS 951 Token Ring CD-ROM servers.

ABOUT THIS MANUAL

This manual will guide you through a simple step-by-step installation and configuration procedure. It is divided into four sections:

1. INTRODUCTION – The AXIS HP MIO board, how it works, where to use it, and its main features.
2. GETTING STARTED – How to install the AXIS HP MIO board into your printer, and how to connect it to the IBM system.
3. CONFIGURATION – How to configure the AXIS HP MIO using the printer's front panel.
4. ADVANCED FUNCTIONS – An overview of AXIS HP MIO functions beyond the standard IBM printer emulation.

The manual applies to the AXIS HP MIO with firmware release 1.21 and subsequent releases until otherwise notified. Please refer to the AXIS HP MIO Technical Reference for further information of functions and parameters.

Every care has been taken in the preparation of this manual; if you detect any inaccuracies or omissions, please inform us at the address on the back cover. Axis Communications AB cannot be held responsible for any technical or typographical errors and reserves the right to make changes to the product and manuals without prior notice.

Emission Notices

USA

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. Shielded cables should be used with this unit to ensure compliance with the Class A limits.

Europe

CE

This digital equipment fulfils the requirements for radiated emission according to limit B of EN55022/1987, and the requirements for immunity according to EN50082-1/1992 residential, commercial, and light industry. (Compliance is not valid for unshielded network and printer cables.)

Trademark Acknowledgements

IBM and Hewlett Packard are registered trademarks of the respective holders.

AXIS HP MIO User's Manual Revision: 1.2
Part No: 13142 Dated: June, 1996

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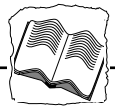


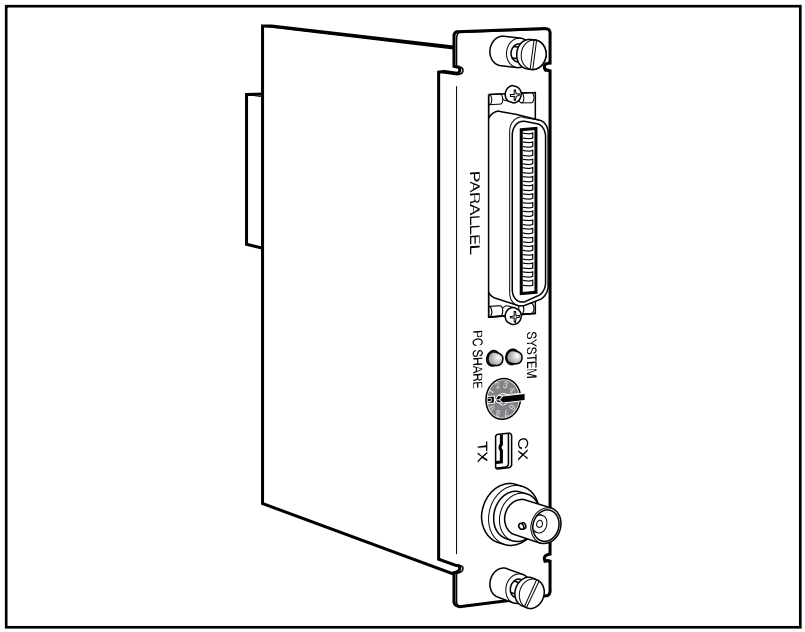
Table of Contents

Section 1 Introduction

The AXIS HP MIO is a plug-in interface board that makes it possible to connect a Hewlett-Packard printer to an IBM AS/400, S/3x, or Mainframe environment. It supports all HP printers with an MIO expansion slot, such as LaserJet 5Si, LaserJet 4Si, LaserJet 4+, Color LaserJet, DesignJet, and PaintJet XL300.

Your HP printer with the AXIS HP MIO appears to the IBM system as an original IBM printer, while still maintaining its PC or LAN printer capabilities.

In addition, the AXIS HP MIO allows you to make full use of all HP printer features in the IBM system environment.

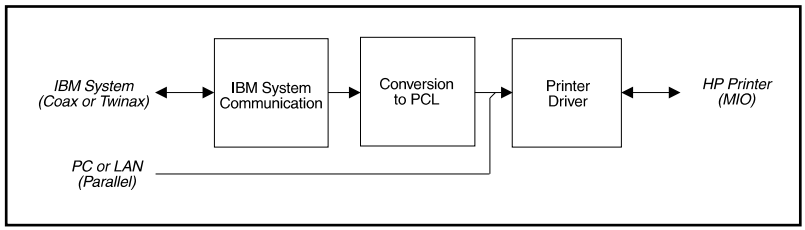


The AXIS HP MIO board

How It Works

An IBM system communicates with printers using a high-speed, bi-directional protocol very different from the PC standard parallel and serial connections.

In the AXIS HP MIO, the conversion of IBM system data to HP printer data is carried out in three steps as illustrated in the picture below:



The AXIS HP MIO IBM System to HP Printer Data Conversion

The *IBM System Communication* block extracts the print data, page formatting commands, and font selection commands from the IBM data stream.

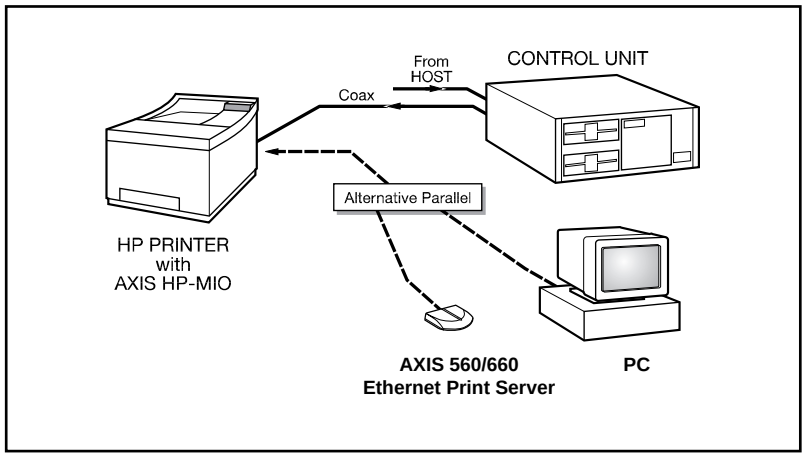
The *Conversion to PCL* block converts the data into PCL, which is the format used by HP printers.

The *Printer Driver* block passes the data on to the printer using the internal MIO (Modular Input/Output) interface.

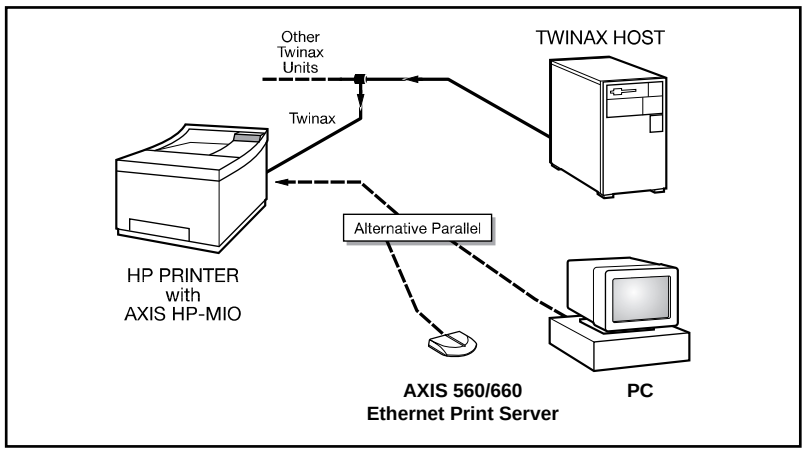
The Printer Driver also accepts PCL data from a local PC or a LAN print server (such as the AXIS NPS 560) using the AXIS HP MIO parallel port. In this way, you can share the printer between two different environments. The PC/LAN print data is not converted or otherwise modified by the AXIS HP MIO board.

Where To Use It

The pictures below show the HP printer with AXIS HP MIO interface in an IBM environment, also illustrating the printer sharing function. The top picture is a 3270/Coax installation, and the bottom picture is a 5250/Twinax installation.



The HP printer with AXIS HP MIO in an IBM 3270/Coax environment



The HP printer with AXIS HP MIO in an IBM 5250/Twinax environment

Main Features

Reliability The AXIS HP MIO hardware is a state-of-the-art RISC architecture design. Based on highly integrated circuits, it combines low power consumption with high performance and reliability.

Compatibility The AXIS HP MIO interface is designed to be fully compatible with the emulated IBM printers. You can print all your existing documents without having to adapt them specially for the AXIS HP MIO.

Ease of Use The AXIS HP MIO is delivered in ready-to-run state. The few parameters you might need to change are directly accessed from the printer's front panel.

Flexibility For the advanced user, the AXIS HP MIO has a large number of configuration parameters that allows you to tailor the interface to meet a wide range of specific needs.

IBM Printer Emulations The AXIS HP MIO is pre-configured to emulate an IBM 3816 page printer. This selection makes the best use of the HP printer capabilities, but you can also select from a wide range of other IBM printers.

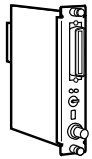
Fonts The pre-defined font definition table contains 130 IBM fonts, each mapped to a printer resident PCL font. The font mapping is designed to emulate, as close as possible, the output from an original IBM printer and at the same time offer full access to the HP printer's scalable fonts.

Printer Sharing You can share the printer between the Coax/Twinax host and up to three different local PCs or LAN print servers connected to the AXIS HP MIO parallel port and the printer's own parallel and serial ports. You do not have to purchase any special cabling, since standard printer cables may be used. The printer sharing requires no operator intervention, and no AXIS HP MIO or printer configuration.

Section 2 Getting Started

Unpack and inspect all parts for damage. Contact your dealer if anything is missing or damaged. All packing materials are recyclable, including the anti-static bag.

Caution The AXIS HP MIO board contains static-sensitive components. Always hold the board by the edges or the rear panel when removed from the anti-static bag. Make sure to take all recommended precautions related to static-sensitive devices.



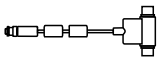
The standard delivery contains the following:

❏ AXIS HP MIO board, part no. 0045-1 (European version) or

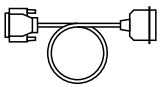
AXIS HP MIO board, part no. 0045-3 (US version)

❏ AXIS HP MIO User's Manual (part no. 13142)

Optional accessories:



❏ AXIS Twinax T-cable (part no. 12554)



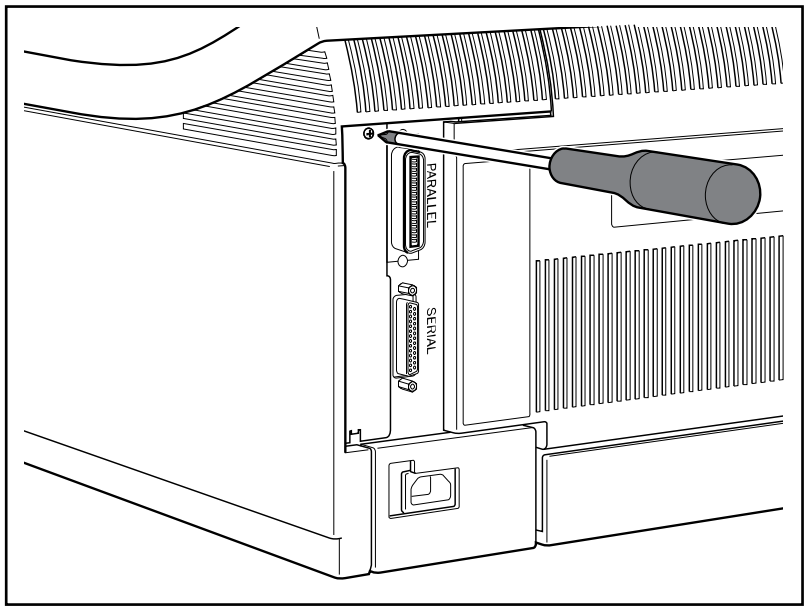
❏ Centronics parallel printer cable (part no. 13133)

Hardware Installation

Before you begin the installation, you must set the rear panel Coax/Twinax switch in the correct position. Use a flat screwdriver to set the switch in **CX** position (shown to the left) for 3270/Coax mode, or **TX** position for 5250/Twinax mode.

The AXIS HP MIO board should be installed into the MIO expansion slot at the rear of your HP printer. The guidelines below are for the HP LaserJet 4p, but the installation procedure is similar for all HP printers. If you have a printer other than the LaserJet 4+, consult the printer manual on how to access the MIO slot.

You will need one Philips and one flat screwdriver for the installation.



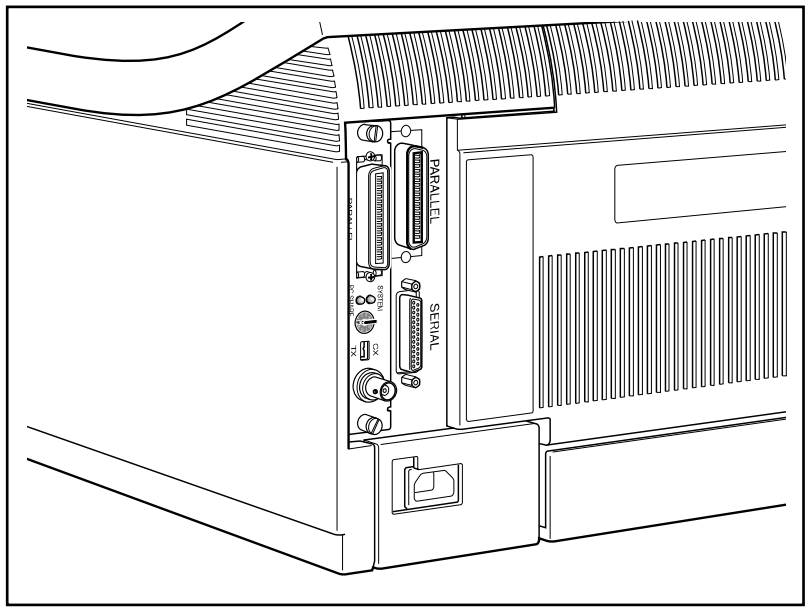
Removing the cover plate (HP LaserJet 4+)

Follow these steps and refer to the illustrations to install the AXIS HP MIO board:

1. **Switch off the printer.**
2. **Remove the cover plate over the MIO slot.**
3. **Slide the AXIS HP MIO board into place.**
4. **Tighten the two screws securing the rear panel.**
5. **Set the rotary switch in position '0'.**
6. **Switch on the printer.**

The hardware installation is now completed.

Caution Twinax users: Do not connect the printer to the IBM system before the rotary switch is set to the correct device address (see Section 2.3).



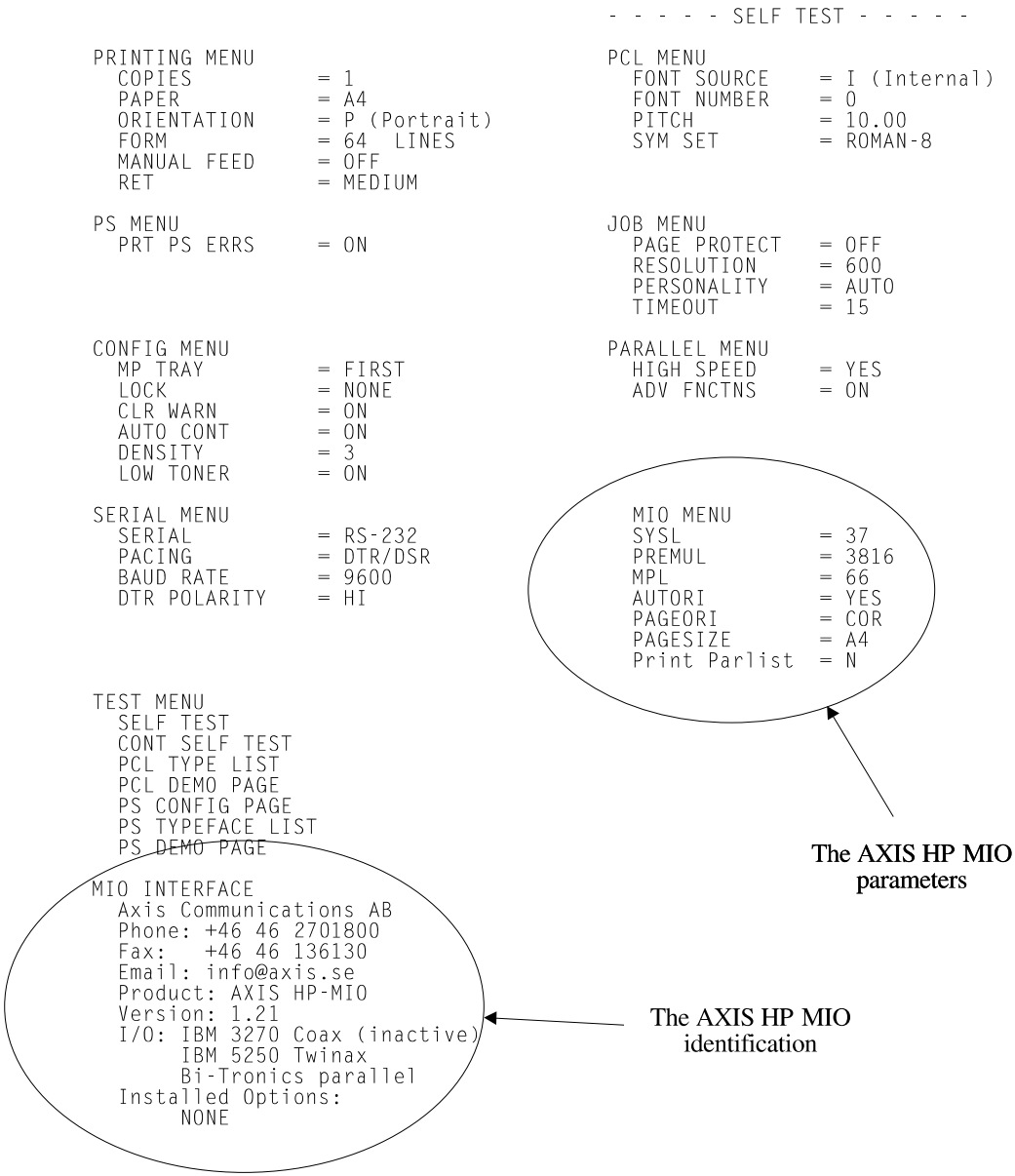
The AXIS HP MIO board installed (HP LaserJet 4+)

Verifying the Installation

After completing the hardware installation, you can verify that the AXIS HP MIO board is running by printing the *Self Test* page (see sample on the next page). On the HP LaserJet 4, this entry is found under the *TEST MENU*.

The AXIS HP MIO identification is printed under the MIO MENU title. The example below is for an AXIS HP MIO board in 5250/Twinax mode, the 3270/Coax mode is marked 'inactive'.

The AXIS HP MIO parameters are printed under the MIO MENU title. This shows the current settings for the configuration parameters available from the front panel.



Extract from the HP LaserJet 4+ Self Test page

Connecting to the System

The last step in the installation procedure is to connect your printer to the IBM Coax or Twinax host.

Caution Once again, make sure that the rear panel Coax/Twinax switch is in the correct position. The current mode is shown under the AUX IO INTERFACE title on the Self Test page.

For 5250/Twinax mode:

1. **Switch off the printer.**
2. **Find a free device address on the Twinax port.** The selected address must be configured for an IBM 3816 printer.
3. **Set the rotary switch to the selected device address.**
4. **Connect the Axis T-cable bar to the twinax cables.** Don't forget to notify your system operator before breaking the twinax line!
5. **Connect the T-cable to the AXIS HP MIO board.**
6. **Switch on the printer.**

For 3270/Coax mode:

1. **Switch off the printer.**
2. **Find a free printer port on the control unit.** The selected port must be configured for an LU-1 or LU-3 printer.
3. **Connect a coax cable between the control unit and the AXIS HP MIO board.**
4. **Switch on the printer.**

The SYSTEM indicator will flash for a few seconds, and should then remain lit showing that contact with the IBM system is established.

You can verify the connection by making a local copy printout from your system.

The installation procedure is now completed. Your printer is ready for permanent use, and will not require any user intervention during normal operation.

Section 3 Configuration

Your AXIS HP MIO board is configured at delivery to emulate an IBM 3816 page printer using Letter size or A4 paper. Should you want to change any of this, the following configuration parameters can be accessed from the printer's front panel:

- System Language = 37 (US English)
- IBM Printer Emulation = 3816
- Maximum Page Length = 66 lines
- Automatic Orientation = YES
- Page Orientation = COR
- Page Size = LETTER (US version) or A4 (European version)

If you have a printer without a front panel, or if you want to change any of the parameters not available in the front panel menu, please refer to Section 4, *Configuration from the System*, and to AXIS HP MIO Technical Reference.

The Front Panel Menus

The remainder of this section describes how to change the AXIS HP MIO configuration parameters using the HP LaserJet 4+ front panel. The procedure for other HP printers is similar, but the menus are differently organized, and you may need to use different keys to navigate. However, guided by the printed Self Test page and the printer manual, you shouldn't have any difficulties finding the menu entries.

The AXIS HP MIO configuration parameters are found under the MIO MENU. To get there, first set the printer off-line, then press the *Menu* key repeatedly until the MIO MENU appears.

Next, press the *Item* key to get into the menu. The first entry that appears is the *System Language*. An asterisk is displayed in the right-most position when the currently active value is shown.

Change the value as desired by pressing the '+' or '-' keys. Press *Enter* to save the new value, and the asterisk will be displayed.

Press *Item* again to scroll through the parameters.

When done, press the *On-Line* key, and the configuration is completed and saved.

System Language (SYSL)

SYSL=37 *

The System Language parameter must match your IBM system configuration in order to get correct language specific characters.

The default System Language is **37** (US English). You only have to change this selection if your IBM system is configured for a different System Language. If in doubt, consult your System Manager.

[+] [-] [Enter] Select System Language according to your IBM system configuration.

System Language Selections:

VALUE	DESCRIPTION	VALUE	DESCRIPTION
***37**	US English, Portuguese Alternate, and Canadian Bilingual	**286**	Austrian/German Alternate ***Cx***
256	New Spanish Word Processing ***Tx***	**287**	Danish/Norwegian Alternate ***Cx***
260	Canadian French ***Cx***	**288**	Swedish/Finnish Alternate ***Cx***
273	Austrian/German	**289**	Spanish ***Cx***
274	Belgian	**293**	APL ***Cx***
275	Brazilian	**297**	French/French Azerty
277	Danish/Norwegian	**340**	OCR ***Tx***
278	Swedish/Finnish	**361**	International Typographic***Cx***
280	Italian	**500**	International Set 5 and Swiss Bilingual
281	Japanese English	**871**	Icelandic
282	Portuguese	**892**	OCR-A ***Cx***
284	Spanish and Spanish Speaking	**893**	OCR-B ***Cx***
285	UK English		

Note: ❑ Selections marked ***Cx*** will appear only in Coax mode, and ***Tx*** selections will appear only in Twinax mode.

IBM Printer Emulation (PREMUL)

PREMUL=3816 *

The IBM Printer Emulation parameter must match your IBM system configuration in order to get correctly formatted printouts.

The default IBM Printer Emulation is **3816** (IBM 3816 model 01S/01D). You will only have to change this selection if your IBM system is configured for a different IBM printer. If in doubt, consult your System Manager.

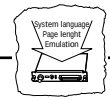
[+] [-] [Enter] Select **IBM Printer Emulation according to your IBM system configuration.**

IBM Printer Emulation Selections:

VALUE	DESCRIPTION
3812	IBM 3812 models 2 (Coax non-IPDS), and 1 and 2 (Twinax), page printer
***3816**	IBM 3816 models 01S and 01D, page printer
3287	IBM 3287 model 2C, matrix printer ***Cx only***
3268	IBM 3268 model 2C, matrix printer ***Cx only***
3262	IBM 3262 models 3 and 13, matrix printer ***Cx only***
4214	IBM 4214 models 1 (Coax) and 2 (Twinax), matrix printer
4224	IBM 4224 model 2 non-IPDS, matrix printer ***Cx only***
5224	IBM 5224 models 1 and 2, matrix printer ***Tx only***
5225	IBM 5225 models 1 through 4, matrix printer ***Tx only***
5226	IBM 5224 models 1 through 3, matrix printer ***Tx only***
4230	IBM 4230 models 201 (Coax) and 101 (Twinax), matrix printer

Note:

- Selections marked ***Cx only*** will appear only in Coax mode, and ***Tx only*** selections will appear only in Twinax mode.



Maximum Page Length (MPL)

MPL=66 *

The MPL parameter sets the number of lines per page. The AXIS HP MIO automatically ejects the page when the specified number of lines have been printed.

The default value is **66** lines. You should only change this selection if your documents are set up for a different page length.

[+] [-] [Enter] Select **Maximum Page Length.**

Maximum Page Length Selections:

You can select any page length from **0** to **255** lines.

Note: Selecting **0** will give a page length of one line.

Automatic Orientation (AUTORI)

**AUTORI=YES *

This parameter selects automatic or fixed page orientation.

The default selection is **YES** (Automatic Orientation). You can change this to **NO** if you want to print all pages in the same orientation regardless of the calculated (logical) page size, see below.

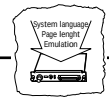
+ - Enter Select/**deselect Automatic Orientation.**

Automatic Orientation Selections:

YES: Automatic Orientation. The page orientation depends on the page format set by the IBM host. For each new page, a logical page size is calculated and compared to the physical size set by the *Page Size* parameter, see page 24. The page orientation is then determined as follows:

- If the logical length is greater than the logical width, the page will be printed in *Portrait* orientation.
- If the logical length is less than or equal to the logical width, the page will be printed in *Landscape* orientation.
- If the logical page size doesn't fit the page in either orientation, the page will be printed according to the *Page Orientation* parameter, see page 23.

NO: Fixed Orientation. The page will always be printed according to the *Page Orientation* parameter, see page 23.



Page Orientation (PAGEORI)

**PAGEORI=COR *

This parameter sets the default page orientation. The default orientation is used when the current page doesn't fit the physical page size set by the *Page Size* parameter, or when the *Automatic Orientation* parameter is set to **NO**.

The default selection is **COR** (Computer Output Reduction, see note). You should only change this if you want to disable the COR function.

[+] [-] [Enter] Select **default Page Orientation.**

Page Orientation Selections

VALUE	DESCRIPTION
* COR	Computer Output Reduction (COR) is enabled
PORT	Use portrait as default orientation
LAND	Use Landscape as default orientation

Notes:

- ❑ COR printouts have the following characteristics:
  - •Landscape orientation.
  - •Vertically compressed to 70%.
  - •Horizontally compressed by using a font of higher character density.
  - •Top and left margins of 0.5 inches each.
- ❑ This parameter applies to all available input bins. If you should need to configure input bins individually, refer to *Configuration from the System* on page 30.

Page Size (PAGESIZE)

PAGESIZE=LETTER * (US version)

PAGESIZE=A4 * (European version)

This parameter is used to set the physical page size. It must match the actual paper size you are using in order to get correct printouts.

The default size is LETTER for the US version, and A4 for the European version. You will only have to change this selection if you are using paper of a different format.

[+] [-] [Enter] Select **physical Page Size.**

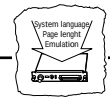
Page Size Selections:

VALUE	DESCRIPTION
EXEC	7.25 x 10.5 inches
* LETTER	8.5 x 11 inches *US version default*
LEGAL	8.5 x 14 inches
* A4	210 x 297 mm (8.27 x 11.69 inches) *European version default*
A3	297 x 420 mm (11.69 x 16.54 inches)
B4	250 x 353 mm (10.12 x 14.33 inches)
MON	3.8 x 7.5 inches (Monarch envelopes)
C10	4.1 x 9.4 inches (COM-10 envelopes)
DL	4.3 x 8.6 inches (DL envelopes)
CUSTOM	User defined size

Notes:

- If **CUSTOM** is selected, you will be prompted for the width and length parameters.

This parameter applies to all available input bins. If you should need to configure input bins individually, refer to *Configuration from the System* on page 30.



Custom Page Width (PAGEWIDTH)

PAGEWIDTH=850 *

Note: This selection will only appear if you have selected **CUSTOM** as *Page Size*.

The selected page width must match the width of the actual paper you are using in order to get correct printouts. The page width is displayed in units of 0.01 inches.

The default value is the page width for the *last selected* page size (if you changed from **LETTER** to **CUSTOM**, the default width is 850, corresponding to 8.50 inches).

[+] [-] [Enter] Select Custom Page Width.

Page Width Selections

You can select any page width from **0** to **1999**, corresponding to 0.00 – 19.99 inches.

Note: Pressing the + or - key changes the value in steps of 0.01 inches. By holding down the key for a few seconds, the value changes more rapidly, first in steps of 0.10 inches, then in steps of 1.00 inches.

Custom Page Length (PAGELENGTH)

```
PAGELENGTH=1100  *
```

Note: This selection will only appear if you have selected **CUSTOM** as *Page Size*.

The selected page length must match the length of the actual paper you are using in order to get correct printouts. The page length is displayed in units of 0.01 inches.

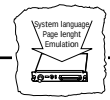
The default value is the page length for the *last selected* page size (if you changed from **LETTER** to **CUSTOM**, the default length is 1100, corresponding to 11.00 inches).

[+] [-] [Enter] Select **Custom Page Length**

Page Length Selections

You can select any page length from **0** to **1999**, corresponding to 0.00 – 19.99 inches.

Note: Pressing the + or - key changes the value in steps of 0.01 inches. By holding down the key for a few seconds, the value changes more rapidly, first in steps of 0.10 inches, then in steps of 1.00 inches.



Print Parameter List

Print Parlist=N*

This selection activates the *Print Parameter List* function. The Parameter List contains all AXIS HP MIO configuration parameters, and the complete font definition table.

The default selection is **N** (No). Change this to **Y** (Yes) and press *Enter* if you want to print the Parameter List. The printout starts when you press the *On-Line* key.

[+] [-] [Enter] Select/**deselect Parameter List printout.**

Print Parameter List Options

N: No. The Parameter List will not be printed.

Y: Yes. The Parameter List will be printed when you set the printer on line.

Notes:

- ❑ As soon as the Parameter List has been printed, the Print Parameter List selection will be automatically reset to **N**.
- ❑ If you only want to print the configuration parameters covered in this section, you can print the *Self Test* sheet instead. The Self Test is described in Section 2.

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Section 4 Advanced Functions

This section deals with some of the AXIS HP MIO functions that brings your HP printer beyond the normal IBM printer emulation. It is only intended as an overview – for a complete description of these functions, please refer to the AXIS HP MIO Technical Reference.

The functions covered in this manual are:

- Configuration from the System

  This is an alternative method for changing the front panel configuration parameters, and for changing parameters not available from the front panel. You may send a file containing the configuration commands either from your IBM system, or from a local PC.

- Hex Transparency

  This function allows you to use all the HP printer features in the IBM system environment.

- Font Selection

  The font commands provides easy access to the printer resident PCL fonts from your IBM system documents.

Note: ❑ If you intend to use any of these functions, we strongly recommend that you order the AXIS HP MIO Technical Reference from your distributor. The Technical Reference also describes a wide range of additional functions to further enhance your printouts.

Configuration from the System

For printers without a front panel, you can configure the AXIS HP MIO by inserting configuration commands in your document. The example below shows a configuration sequence that sets all front panel parameters to their default values (US version; for the European version, substitute LETTER with A4):

Example:

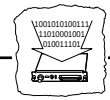
```
%AXIS+
%CONFIG+
SYSL = 37;
PREMUL = 3816;
MPL = 66;
AUTORI = YES;
BIN1 = COR,LETTER;
BIN2 = COR,LETTER;
BIN3 = COR,LETTER;
BIN4 = COR,LETTER;
BIN5 = COR,LETTER;
SAVE;
%CONFIG-
```

Note that page orientation and size may be set individually for each input bin, while the front panel parameters affect all available bins simultaneously.

A common application is to print on pre-printed forms from the lower bin, while printing standard jobs from the upper bin. To do this, you may need to turn off the COR (Computer Output Reduction) function for the lower bin:

Example:

```
%AXIS+
%CONFIG+
BIN2 = PORT,LETTER;
SAVE;
%CONFIG-
```



Hex Transparency

The transparency function allows you to send ASCII data to the printer directly from the host application. The data may be of any language supported by the printer, *e.g.* PCL, HP-GL, or PostScript. This gives you access to all the HP printer features from within the IBM environment.

When the percent and less-than characters (%<) are received, the AXIS HP MIO will switch over to hex transparency mode. Following data (hexadecimal byte values or quoted text) are passed directly to the printer without any conversion. The hex transparency mode continues until the greater-than and percent characters (>%) are received.

Example:
The example below shows how to embed 'start underline' (E_C &d0D) and 'stop underline' (E_C&d@) commands in your documents:

```
The word %<1B26643044>%underline%<1B266440>% is
underlined.
You may use %<1B,"&d0D">%quoted text%<1B,"&d@">%
as well.
```

Resulting printout:

```
The word underline is underlined.
You may use quoted text as well.
```

This is a more advanced example, showing how to draw a rectangle using HP-GL commands:

```
1: %<1B,"E",1B,"%0B",
2: "IN;SP1;PA0,0;EA2500,1500;"
3: 1B,"%0A",1B,"E">%
```

This is what it does line-by-line: (1) – Start transparency (%<), reset printer ($^{E}_{C}$E), and enter HP-GL mode ($^{E}_{C}$%0B), (2) – Draw the rectangle, and (3) – Resume PCL mode ($^{E}_{C}$%0A), reset printer ($^{E}_{C}$E), and stop transparency (>%).

Please refer to your printer manual (Technical Reference) for a description of the HP-GL commands.

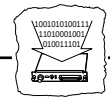
When experimenting with HP-GL or PostScript functions, *don't forget to resume PCL mode and reset the printer afterwards!*

Font Selection

Fonts can be selected by the system in two ways: directly by font reference (FGID number), or indirectly by pitch selection (CPI). The FGID selection is only available in Twinax mode.

In order to gain full access to the PCL fonts in both Coax and Twinax mode, the AXIS HP MIO offers an alternative font selection command.

Font selection commands may be included anywhere in your documents. They begin with 'percent-slash' (%/) followed by the word FONT and the font (FGID) number. An optional point size value preceeded by a comma may be included. The command is ended with a semi-colon (;).



Example:
The following example shows how to select a 10 CPI (fixed pitch) italic font, and a scalable (proportional) font in 18 points.

```
%/FONT 18;This is 10 CPI Courier italic
%/FONT 6199,180;This is 18 pt Palatino
```

- A font command starts with **%/** and ends with **;**.
- **18** and **6199** are the *FGID* (Font Global Identifier) numbers specifying the fonts. See Appendix C for a complete list of the supported FGIDs.
- **180** is a *Point Size* parameter used for scaling the font. The value is entered as ten times the desired point size.

Resulting printout:

This is 10 CPI Courier italic

This is 18 pt Palatino

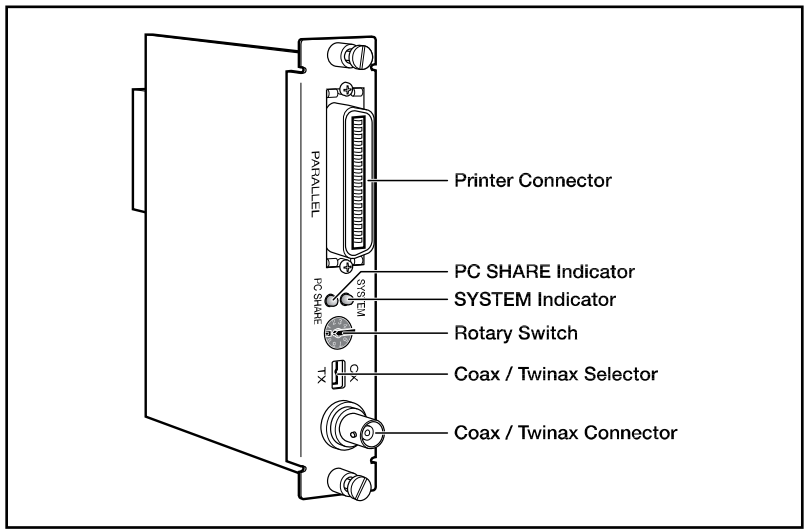
Notes:

- ❑ If *Point Size* is omitted, 10 points will be used as default for all scalable fonts.
- ❑ Fixed pitch fonts are not scalable. If a Point Size is specified, it will be used to compress/expand the font. (%/FONT 18,105; will compress the 10 CPI font to 10.5 CPI without changing the size of the characters).
- ❑ If a Point Size is specified for a PSM font (see Appendix C), *only the inter-word spacing will be affected*. The default space width equals a 12 CPI space.

Appendix A The AXIS HP MIO Rear Panel

The rear panel has two indicators (SYSTEM and PC SHARE), a rotary switch, a Coax/Twinax switch, and two connectors. The larger connector (PARALLEL) is used for local PC or LAN print server input, and smaller circular is used for Coax/Twinax input.

The picture below shows the rear panel with its indicators, switches, and connectors.

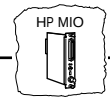


The AXIS HP MIO Rear Panel

The System Indicator

This indicator (green) is lit when the AXIS HP MIO is connected to the IBM system. It can also flash in the following cases:

- At power-up (for a few seconds).
- When Test Mode is entered, see below.
- During test function execution (rapid flash).



The PC SHARE Indicator

This indicator (yellow) is lit during a local PC or LAN printout. Host printouts will be held waiting until the PC/LAN printout is completed.

The Rotary Switch

The ten-position rotary switch is used for setting the AXIS HP MIO device address (this applies to 5250/Twinax mode only – the switch should always be in zero position in 3270/Coax mode).

The switch is also used for accessing *Test Mode* functions.

The Coax/Twinax Switch

This switch (CX/TX) configures the AXIS HP MIO hardware for Coax or Twinax mode operation. It should be set prior to the installation. *Do not alter this switch when the printer is powered on or connected to the IBM system.*

Test Mode

The Test Mode is used for accessing internal AXIS HP MIO functions. Entering Test Mode makes the AXIS HP MIO go off-line towards all connected input sources, so you do not have to disconnect any cables.

Set the rotary switch to position 9 to enter Test Mode. When the SYSTEM indicator starts to flash, select one of the following functions:

Position	Test Mode Function
0	Reserved
1	**Set Factory Defaults** – abandon the current configuration
2	**Confirm Factory Defaults** – see note below
3	**ASCII Hex Dump Mode** – print the outgoing data stream as hexadecimal values
4	**System Hex Dump Mode** – print the incoming data stream as hexadecimal values
5	Reserved
6	Reserved
7	**Terminal Configuration** – run the Configuration Utility on an IBM display station
8	**Print Parameter List** – print the complete configuration
9	**Exit Test Mode** – resume normal print operation

Caution *5250/Twinax Users:* Don't forget to set the rotary switch to the device address after exiting Test Mode.

Notes:

- To set factory default configuration, a two-step operation is required in order to avoid accidental activation and loss of configuration settings. When position 1 is selected, the yellow PC SHARE indicator begins to flash. To confirm this selection, switch to position 2 within two seconds.
- The Hex Dump modes are useful when analyzing incorrect printouts, but be careful – they can consume huge amounts of paper! Refer to the AXIS HP MIO Technical Reference for details.
- The Terminal Configuration Utility provides an easy-to-use method of customizing the AXIS HP MIO board using a directly attached IBM 5250/3270 display station. Refer to the AXIS HP MIO Technical Reference for details.

Appendix B System Configuration Guidelines

This appendix contains technical details for the system operator on how to configure the IBM system for the AXIS HP MIO board.

5250/Twinax Host Configuration

The AXIS HP MIO is, by default, set to emulate the IBM 3816 01S/01D printer with 5219 software. This setting is recommended for any 5250 system, as it makes the best use of the functionality of the HP printer.

5256 may be used when you need to guarantee that the AS/400 will not send format settings (CPI, LPI, etc.). This is useful when you use Hex Transparency to control printer behaviour.

AS/400 Configuration

If you will configure for a number of AXIS HP MIO interfaces, or if you will use IBM 3812 emulation, manual configuration is recommended. Manual configuration is performed using CRTDEVPRT or WRKDEVD F6 (Create).

You may, prior to configuration, use PRTDEVADR to get a chart showing free port and switch setting combinations. Device type (TYPE) and Device model (MODEL) must match the setting of AXIS HP MIO. The printers are listed in functionality order, with 5256 being the least functional (advanced) of the IBM printer emulations.

AXIS HP MIO printer emulation	Device type	Device model
IBM 5256	5256	1
IBM 5224	5224	1
IBM 5225	5225	1
IBM 4214	4214	2
IBM 4230	4214	2
IBM 3812	3812	1
IBM 3816	3812	1

S/36 Configuration

If you will configure for a number of AXIS HP MIO interfaces, manual configuration is recommended.

Manual configuration is performed using CNFIGSSP.

The device code must match the setting of AXIS HP MIO:

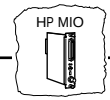
AXIS HP MIO printer emulation	Device code
IBM 5256	PB
IBM 5224	PC
IBM 5225	PC
IBM 4214	PG
IBM 4230	PG
IBM 3812	PD
IBM 3816	PD

S/38 Configuration

If you will configure for a number of AXIS HP MIO interfaces, manual configuration is recommended. Manual configuration is performed using CRTDEVD.

Device type (DEVTYPE) must match the setting of AXIS HP MIO:

AXIS HP MIO printer emulation	Device type
IBM 5256	5256
IBM 5224	5224
IBM 5225	5225
IBM 4214	4214
IBM 4230	4214
IBM 3812	3812
IBM 3816	3812



3270 Host Configuration

The AXIS HP MIO board supports non-SNA (LU-0) 3270 DSC, SNA LU-3 3270 DSE, and SNA LU-1 SCS data streams.

When printing in an SNA network, VTAM needs to be set up, depending on desired LU type. The following VTAM logon-mode entries apply to MVS, VM, and VSE.

The logon-mode entries are the same for all emulated IBM printers (selected by the AXIS HP MIO IBM Printer Emulation parameter)

SNA LU-1 SCS:

```
SCS    MODEENT LOGMODE=SCS,FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',
               SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',
               PSERVIC=X'01000000E100000000000000',
               PSNDPAC=X'01',SRCVPAC=X'01'
```

SNA LU-3 3270 DSE:

```
DSC4K MODEENT LOGMODE=DSC4K,FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',
               SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'8787',
               PSERVIC=X'03000000000018502B507F00'
```

(Continuation characters in column 72 are not shown)

You also need to match the Printer Emulation setting in AXIS HP MIO with the setting of your 3270 printer driver software (JES/328x, VPS, CMA-Spool, RSCS, etc.).

If there is no selection for 4224, 4230, 3812, or 3816, you can instead select 3268.

Appendix C Fonts

This appendix lists all the 130 IBM fonts supported by the AXIS HP MIO. Fonts are selected by FGID (Font Global Identifier) as outlined in Section 4. Each IBM font is mapped to a printer resident PCL font, selected to make a close match to the original IBM font. The IBM to PCL font mapping is controlled by the *Font Definition Table*. All entries in this table are fully editable, and you can also add new entries. Refer to the AXIS HP MIO Technical Reference for further information.

10 CPI Fonts	
FGID	IBM FONT NAME
3	OCR-B
5	Orator
11	Courier 10
12	Prestige Pica
13	Artisan 10
18	Courier Italic 10
19	OCR-A
20	Pica
30	Math Symbol 10
38	Orator Bold
39	Gothic Bold 10
40	Gothic Text 10
41	Roman Text 10
42	Serif Text 10
43	Serif Italic 10
46	Courier Bold 10
60	Prestige Bold 10

12 CPI Fonts	
FGID	IBM FONT NAME
66	Gothic Text 12
68	Gothic Italic 12
69	Gothic Bold 12
70	Serif Text 12
71	Serif Italic 12
72	Serif Bold 12
80	Math Symbol 12
84	Script
85	Courier 12
86	Prestige Elite
87	Letter Gothic 12
91	Light Italic 12
108	Courier Bold 12
110	Letter Gothic Bold
111	Prestige Elite Bold
112	Prestige Elite Italic

Proportional PSM Fonts	
FGID	IBM FONT NAME
155	Boldface Italic
158	Modern
159	Boldface
160	Essay
162	Essay Italic
163	Essay Bold
173	Essay Light
175	Document

13.3 CPI Fonts	
FGID	IBM FONT NAME
204	Gothic Text 13

15 CPI Fonts	
FGID	IBM FONT NAME
221	Prestige 15
223	Courier 15
225	Math Symbol 15
229	Serif Text 15
230	Gothic Text 15

5 CPI Fonts	
FGID	IBM FONT NAME
244	Courier 5
245	Courier Bold 5

17 CPI Fonts	
FGID	IBM FONT NAME
252	Courier 17
253	Courier Bold 17
254	Courier 17 (sub/super)

18 CPI Fonts	
FGID	IBM FONT NAME
258	Courier 18

8 CPI Fonts	
FGID	IBM FONT NAME
266	Courier Bold 8

20 CPI Fonts	
FGID	IBM FONT NAME
281	Gothic Text 20

25 CPI Fonts	
FGID	IBM FONT NAME
289	Gothic Text 25

26.7 CPI Fonts	
FGID	IBM FONT NAME
290	Gothic Text 27

Proportional Typographic Fonts	
(Fixed Point Size)	
FGID	IBM FONT NAME
751	Sonoran-Serif 8-pt Roman Medium
1051	Sonoran-Serif 10-pt Roman Medium
1053	Sonoran-Serif 10-pt Roman Bold
1056	Sonoran-Serif 10-pt Roman Italic Medium
1351	Sonoran-Serif 12-pt Roman Medium
1653	Sonoran-Serif 16-pt Roman Bold
2103	Sonoran-Serif 24-pt Roman Bold

Proportional Typographic Fonts

(Scalable – User Defined FGIDs)

FGID	PCL FONT NAME
3840	CG Times
3841	CG Times Bold
3842	CG Times Italic
3843	CG Times Bold Italic
3844	CG Omega
3845	CG Omega Bold
3846	CG Omega Italic
3847	CG Omega Bold Italic
3848	Coronet
3849	Clarendon Condensed
3850	Univers Medium
3851	Univers Bold
3852	Univers Medium Italic
3853	Univers Bold Italic
3854	Univers Medium Condensed
3855	Univers Bold Condensed
3856	Univers Medium Condensed Italic
3857	Univers Bold Condensed Italic
3858	Antique Olive
3859	Antique Olive Bold
3860	Antique Olive Italic
3861	Garamond Antiqua
3862	Garamond Halbfett
3863	Garamond Kursiv
3864	Garamond Kursiv Halbfett
3865	Marigold
3866	Albertus Medium
3867	Albertus Extra Bold
3868	Arial
3869	Arial Bold
3870	Arial Italic
3871	Arial Bold Italic
3872	Times New
3873	Times New Bold
3874	Times New Italic
3875	Times New Bold Italic
3876	Symbol
3877	Wingdings

Proportional Typographic Fonts	
(Scalable Point Size)	
FGID	IBM FONT NAME
5687	Times Roman
5707	Times Roman Bold
5815	Times Roman Italic
5835	Times Roman Bold Italic
6199	Palatino
6219	Palatino Bold
6327	Palatino Italic
6347	Palatino Bold Italic
16951	Century Schoolbook
16971	Century Schoolbook Bold
17079	Century Schoolbook Italic
17099	Century Schoolbook Bold Italic
33335	Optima
33355	Optima Bold
33463	Optima Italic
33483	Optima Bold Italic
33591	Futura Book
33601	Futura Heavy
33719	Futura Book Italic
33729	Futura Heavy Italic
34103	Helvetica
34123	Helvetica Bold
34231	Helvetica Italic
34251	Helvetica Bold Italic
41783	Cursive
41803	Cursive Bold
41911	Cursive Italic
41931	Cursive Bold Italic

Appendix D Technical Specifications

IBM 5250 Features

Host Environments	IBM System/34, IBM System/36, IBM System/38, IBM AS/400
Attachments	IBM 5259 Migration Data Link, IBM 5294 Control Unit, IBM 5394 Control Unit, IBM 5494 Control Unit, IBM 5251 model 12 Control Unit, IBM 5299 Terminal Multiconnector
Printer Emulations	IBM 3812 models 1 and 2 with 5219 software, IBM 3816 models 01S and 01D with 5219 software, IBM 4214 model 2, IBM 5224 models 1 and 2, IBM 5225 models 1 - 4, IBM 5256 models 1 - 3, IBM 4230 model 101
System Features	SCS and FFT data streams, Virtual Printer PC/Support, Multiple Bin Support, 19 National Languages, Page Presentation Media, Computer Output Reduction, Duplex, Page Rotation in four orientations, FGID Font Selection, Fixed-pitch, Proportional, and Typographic Fonts, Scalable font support

IBM 3270 Features

Host Environments	IBM S/370, S/390, IBM 303x, 308x, 309x, IBM 81xx, IBM 47xx, IBM 43xx, IBM 937x
Attachments	IBM 3174 Control Unit, IBM 3274 type A Control Unit, IBM 3276 Control Unit Display System, IBM 4701/4702 Device Cluster Adapter, IBM 4300 Printer Adapter, IBM 9370 Subsystem Control Unit, IBM 3299 Multiplexor
Printer Emulations	IBM 3812 model 1, IBM 3816 model 01S and 01D, IBM 3287 model 2C, IBM 3268 models 3 and 13, IBM 4214 model 1, IBM 4224 model 2 (non-IPDS), IBM 4230 model 201
System Features	SNA SCS (LU-1), SNA DSE (LU-3), and BSC, 3270/DSC data streams, APL2/Text Feature, LU-1 FM Headers Subset 1, SCS Local/Remote Save/Restore Formats, Extended Attribute Buffer (EAB), 3270/DSC/DSE Query Reply and LU-1 Query List, IBM RPQs, Load Translate Table, Country Extended Code Pages (CECP), Page Presentation Media, Computer Output Reduction, Scalable font support

Additional Features

- Configuration from the front panel, IBM system, local PC, or IBM Display Station
- Fully editable character translation tables
- Programmable Hex Transparency function
- 255 User Definable Strings
- 127 programmable string substitutions
- 130 predefined fonts
- Scalable font selection through FGID and Point Size
- Automatic printer sharing functions
- System and ASCII hex dump modes
- Bar Codes

Supported Printers

- HP LaserJet 5Si
- HP LaserJet 4(+), HP LaserJet 4V, HP LaserJet 4Si
- HP LaserJet IIISi
- HP DesignJet 600/650C, HP DeskJet 1200C/1600C
- HP PaintJet XL300, HP Color LaserJet
- Any HP or compatible with MIO expansion slot

Dimensions 50 x 30 x 130 mm / 6.0 x 1.2 x 5.1 inches

Weight 0.22 kg / 0.48 lb

Power Max. 150 mA @ 5V DC (supplied from the printer)

Approvals

EMI EN 55022/1987, EN50082-1/1992. FCC Class A. CE

Safety All safety regulations according to HP printer specifications

Environmental

Temperature 5 - 40 °C / 40 - 105 °F

Humidity 20 - 80% non-condensing

All specifications are subject to change without prior notice

Appendix E How To Contact Axis

Technical Support

If you need technical support, please contact your dealer. If they can't help you, they will forward your request to us.

Axis on-line service

Use the Axis on-line service at any time to retrieve electronically distributed items. The material available includes the HP MIO Technical Reference, the Adobe Acrobat Reader (required for all Axis on-line documentation), company and product presentations, etc. All items are available on Internet by a WWW browser or FTP file transfer, and on the Axis Bulletin Board.

Internet and World Wide Web

If you are connected to Internet, have a look at the Axis WWW Home Page at http://www.axis.se/or http://www.axisinc.com/. Where you will find information about the company and our products. You can also down-load on-line manuals and tools such as the Acrobat Reader for different platforms. You can also get files and information through anonymous ftp: log in to ftp.axis.se or ftp.axisinc.com and go to the /pub/axis directory, or enter ftp://ftp.axis.se/pub/axis or ftp://ftp.axisinc.com/pub/axis in your WWW browser.

The Axis Bulletin Board System

Another way to access the Axis archive is the Axis BBS. You will need a high-speed modem, a VT100 or VT220 terminal emulator, and a Kermit or ZModem compatible software. Dial **+46 46 12 06 32** or **+46 46 211 94 53** and log in as **guest** (no password required).

The Axis Offices

To contact an Axis office, choose the one nearest to your region:

Europe, Middle East, South America, Africa, Australia

Axis Communications AB
Scheelevägen 16
S-223 70 Lund, Sweden
Phone: +46 46 270 18 00
Fax: +46 46 13 61 30
Email: info@axis.se

North & Central America

Axis Communications Inc.
4 Constitution Way, Suite G, Woburn, MA 01801-1030, USA
Phone: 1-800-444-AXIS, (617) 938-1188
Fax: (617) 938-6161
Email: info@axisinc.com

Japan

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8th Center Plaza 5F, 1-10-16 Nihombashi Horidome-cho,
Chuo-ku, Tokyo 103, Japan
Phone: +81 3 3663 8801
Fax: +81 3 3663 8802
Email: info@axiscom.co.jp

Hong Kong, Asia (except Japan & Middle East)

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Wanchai, Hong Kong
Phone: +852 2836 0813
Fax: +852 2573 5935
Email: info@axis.com.hk

Appendix F Related Documentation

TITLE	PART NO.
AXIS HP MIO Technical Reference	13364
AXIS Support Reference Manual	13083
IBM System/36 Functions Reference Guide	SA21-9436
IBM System/38 Service Guide	SY31-0523
IBM AS/400 Programming: Guide to Programming for Printing	SC21-8194
IBM AS/400 Printing	GG24-3452
IBM AS/400 Device Configuration Guide	SC41-8106
IBM 3274 Control Unit Customizing Guide	GA23-0065
IBM 3174 Subsystem Control Unit Customizing Guide	GA23-0214
IBM 3174 Character Set Reference	GA27-3831
IBM 3816 Page Printer Reference for AS/400, S/36, or S/38	GA34-2084
IBM 3812 and 3816 Page Printers Programming Reference for 3270 Information Display System Attachment	GA34-2081
IBM 3812 and 3816 Page Printers Font Reference	GA34-2111
VTAM Customisation	SC23-0112