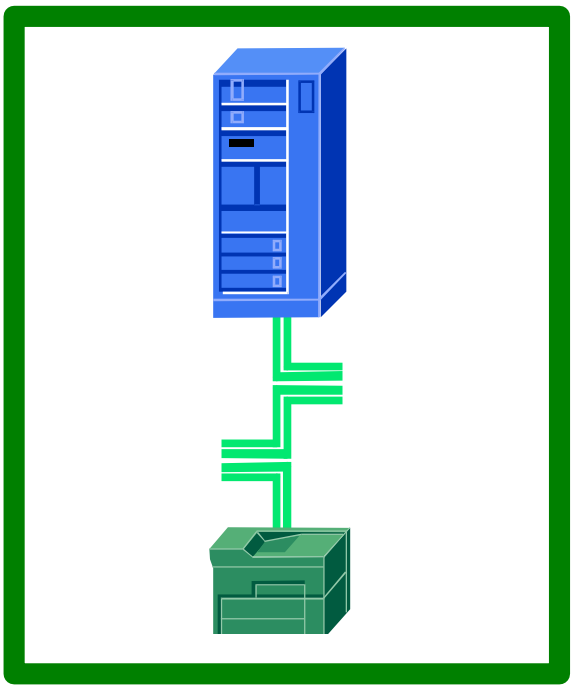

ida FS 250 /
ida FS 250 PDS

Operator's Guide

Doc. no D60256 Revision 03

WARNING:

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.

EMC directive:

This product observes the rules and regulations of the EMC directive. If so required, a declaration of conformity in local language stipulating the applied rules and regulations can be obtained.

Trademarks:

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About i-data

Founded in 1981 to provide direct attachment of PC laser printers in SNA environments, i-data has grown to become the world leader in printer connectivity technology. With the advent of network attached printers, i-data expanded its product range to include comprehensive host-to-LAN printing concepts, in addition to the traditional Coax and Twinax interfaces.

All i-data products are designed to complement IBM's own printing strategy, yet also provide the flexibility needed to conform to the specialised needs of large enterprises.

i-data products and services are marketed worldwide through the company's comprehensive network of sales, offices and distributors.

Preface

September 1997

This manual applies to the *ida FS 250 and the ida FS 250 PDS* protocol converters.

NOTE:
Both products: *"ida FS 250"* and *"ida FS 250 PDS"* will be referred to as *"ida FS 250"* unless specific reference is made to the IPDS functionality of the *ida FS 250 PDS*.

The *ida FS 250* supports twinax Centronics and RS232 inputs. The default output is Centronics.

The manual describes how the *ida FS 250* is connected and operated. Read it before you start using the protocol converter and keep the manual in a safe place for future reference.

It is assumed that the reader has a basic knowledge and understanding of IBM computer systems, especially the IBM 5250 *Information Display System*. It is also assumed that the reader has adequate knowledge of the printer which is going to be connected to the *ida FS 250.*

The *ida FS 250* can be used with all PCL 4/5 printers.

Related Manuals

☞ ***ida FS 250 PDS***

"MakeITDS"
Document No.: D60253

"MakeITDS for VM/MVS, Setup Guide"
Document No.: D60272

☞ ***Both FS converters***

"5250 Programmer's Guide"
Document no. D62079.

As the *ida FS 250* emulates the IBM 3812 printer in IBM 5219 emulation, useful information may be obtained from:

"IBM 5219 Printer, Models DO1/DO2, Programmer's Reference Guide"
IBM Order no. GA 23-1025

"Using the IBM Page printer 3812 with an IBM System /36 or System /38"
IBM Order no. S544-3343

"AS/400 Device Configuration Guide", *IBM Order no. SC21-8106*

Table of Contents

Kit Contents

Please check that your kit is complete with the following:

ida FS 250

- *ida FS 250* converter
- Wall plug power supply
- Parallel printer cable
- Auto-terminating twinax T-cable
- Product documentation (electronic format):
  ida FS 250 / ida FS 250 PDS Operator's Guide; Doc. no. D60256
- Product documentation (hardcopy format):
  ida FS 250 / ida FS 250 PDS Quick Guide; Doc. no. D10256

ida FS 250 PDS

- Same contents as above except converter comes equipped with *IPDS module*

In addition the following i-data accessories can be used:

- Parallel input cable (Order no. 999008 030)
- Serial input cable (Order no. 999010 030)
- Serial output cable has to be ordered for the specific printer you are going to connect to. Please contact your i-data dealer for more details. (See also Appendix A)
- PC printer share cable (Order no. 999022-030)

IPDS Upgrade Kit

- IPDS option (for upgrade), ida PDS Supra (Order no. 993011-001)

1. Introduction to ida FS 250

This chapter gives a short description of the *ida FS 250* converter

1.1 Introduction to ida FS 250

The *ida FS 250* is a protocol converter which enables any printer to be connected to an IBM computer system. See *Section 1.3, Supported Control Units*, for information on the IBM systems to which the *ida FS 250* connects.

The printer or device should have either a *Centronics Parallel* connector or an *RS 232 s*erial connector in order to be con nected to the *ida FS 250* protocol converter.

1.2 ida FS 250 Product Features

The *ida FS 250* protocol converter gives you the following fea tures:

- *Autoconfiguration* of printers with minimum PCL4 and PJL, supporting IEE1284, Bidirectional Centronics Communication.
  This automatically configures
  - Paper size
  - Paper tray
  - Duplex (IPDS)
  - Memory (IPDS)

  To enable the automatic configuration, use function 119.

Non-IPDS:

- Support of 5224, 5225, 5256, 4234, 4245/6262 printer emulations as alternatives to 3812/5219
- Twinax setup via share port
- Flash prom allowing downloading of new firmware via the twinax or the Centronics port
- Support of ida PSS
- Automatic input sharing between Twinax, Centronics and RS 232 serial input ports
- Support of duplex printing
- Support of bar code printing

- Support of Automatic Page Orientation

IPDS:

IPDS support - IBM 4028 and 3812 or 3816 emulation.

- Non-IPDS support via the installed i-data interface card, with full emulation of IBM3812/5219/3816 and IBM 5224/ 5225/5256/4234.
- Support of the ida PSS software package
- Support of the i-data Function Selection via the Line (FSL) facility in non-IPDS mode.
- Automatic input sharing between Twinax, Centronics and RS-232 input ports.
- Flash prom allowing downloading of new firmware via the centronics port.
- Multiple VPA (Valid Printable Area) check options available.
- IM Smoothing (3812 and 3816 emulations).

1.3 Supported Control Units

The *ida FS 250* will connect to the following control units :

- IBM /34
- IBM /36, all models
- IBM /38, all models
- IBM AS/400
- IBM 5294 and 5394 remote controllers

2. Installation Requirements

Before connecting the *ida FS 250*, you should check the requirements described in this chapter.

2.1 Environment requirements

The *ida FS 250* protocol converter can be installed in the following environment:

- Temperature range from 10° - 40°
- Humidity between 8-80 %, non-condensing
- Power consumption: 120 and 220 Volt version - max. 21.5 VA

WARNING!

The equipment *must* be grounded. Operation without a ground may cause exposed metal parts to carry main voltage. This can lead to malfunction and personal injury.

2.2 Pre-Installation Requirements

Prior to installation and connection you must first make sure that you have set the desired national language - do this via the line (activating function Y8). See the section: National Language Selection.

2.2.1 National Language Selection

Via the Line (Function 8)

Below is a short description of how you change national language via the line (Function 8). For further details on programming the *ida FS 250*, please see the chapter: *Programming ida FS 250*.

The commands shown in *Figure 1-1* have to be sent to the *ida FS 250* . You can either do this in a file you transmit to the printer or by entering the command sequence on your screen and making a local copy (print screen).

&&??%
(defines % as temporary ESC character)

%Y8,<number of new language>%
(selects language)

%X1
(saves setup)

Changing Language via the Line

Your can select between the following languages:

Option	Description
37	English (US) EBCDIC
256	International
273	Austrian/German
274	Belgian
275	Brazilian
276	Canadian French
277	Danish/Norwegian
278	Finnish/Swedish
280	Italian
281	Japanese (English)
282	Portuguese
283	Spanish Speaking
284	Spanish
285	English (UK)
297	French
500	Multinational
871	Iceland

NOTE: Factory default depends on the settings on the DIP switch bank; i.e.:

EU = multinational
US = English (US) EBCDIC

2.2.2 Paper Size (EU/US)

When you receive the *ida FS 250*, the interface is already in the box and is ready to connect to the system and to the printer. From the factory, the *ida FS 250* is set up for either US (Letter) or European (A4) paper size depending on what you specified when ordering the *ida FS 250*.

In the event that you should have to change this setting, please contact your point of purchase for instructions.

3. Installation and Connections of the ida FS 250

This chapter starts with an overview of the functionality of the rear panel. Then follows a description of how you connect the *ida FS 250* box **to a printer** and finally you will find instructions for connection **to a system**.

NOTE:
Before you start the installation, make sure that you set the address switch *and* the desired emulation. See the description in the section *Emulation*.

3.1 The Rear Panel

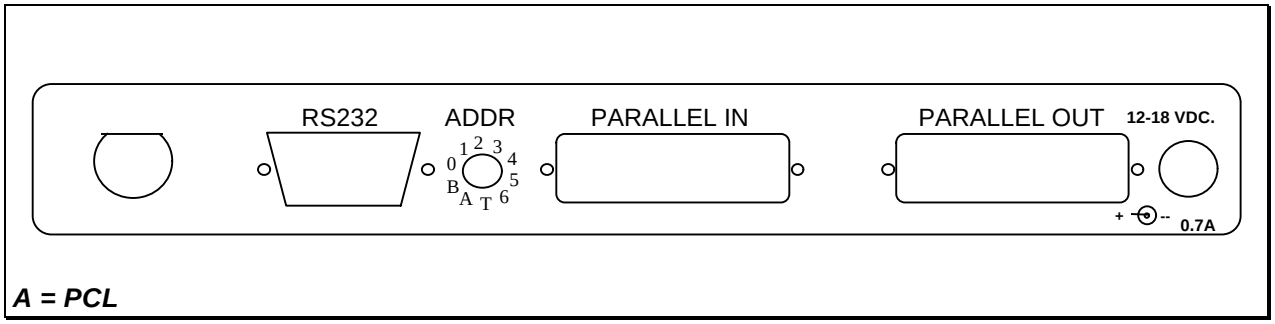

Fig 2-1 ida FS 250 Rear Panel

PARALLEL OUT
The parallel output port is connected to the parallel/Centronics in put port on the target printer (standard parallel out cable supplied with printer should be used).

PARALLEL IN
The parallel input port can be connected to the parallel/Centronics out put on a PC or similar source which enables it to share the printer with the host. For this connection you need a spare part cable ending in a 25-pole D-Sub connector (i-data order no. 999022 030).

SERIAL (IN/OUT)RS232
The serial port can be configured either as input **or** as output.
Default configuration is *input*.

Serial input
The serial port is connected to the serial output on a PC or similar source able to share the printer with the host.

For this connection you need a spare cable ending in a 25-pole RS connector (i-data order no. 999010 030).

***Y24** = 0 is also used for Centronics output.*

To use the serial input, Function 24 *Data Input/Output Port Select* must be set to zero (which is factory default).

On the PC you must also make the following settings to match the default settings on the box:

Function Y15: Baud rate, set to 5 = 9600
Function Y16: Number of data bits, set to 8 = 8 bits
Function Y17: Parity, set to 1 = No Parity
Function Y18, Number of Stop Bits, set to 1 = 1 Stop Bit

If this is not possible, you must change the functions 15, 16, 17 and 18 on the box to match the PC's values.

NOTE:
Programming of functions 15, 16, 17, 18 and 24 is not possible via the serial port. These functions have to be programmed either via the twinax or via the parallel input port.

TWINAX CONNECTOR

Before the twinax cable is connected, be sure to turn the box power OFF.

When power is turned off, plug the automatically terminating twinax **T-cable** into the socket on the rear panel and turn the connector ring clockwise to lock.

ADDRESS SWITCH: EMULATION & PRINTER DRIVER SELECTION

You use the address switch for selecting/changing emulation, setting the address and for generating test printouts. Tests can also be made via the line. See the section *Testing* for details.

For details on emulation see the section *: Emulation*

The switch is also for future printer driver selection. Note that the device is set to **PCL mode** as a default which is the only supported printer driver mode. *Do not attempt to change this.*

3.2 Emulation

As a default the *ida FS 250* will emulate **IBM 3812/5219/3816.**

The *ida FS 250 PDS* emulates **IPDS** as a default.

You can select emulation in two ways. Either via the address switch or via the line using FSL function Y37.

The following emulations are supported by the *ida FS 250*:

IBM 3812/5219/3816
IBM 5224
IBM 5225
IBM 5256
IBM 4234

If you wish to see the current emulation, you can generate a test printout by turning the address switch to the T-position.

3.2.1 Via the Address Switch

Emulation selected on the **address switch** is described below.

The T-cable must be disconnected from the converter before changing emulation.

NOTE: Make sure that you have set the address switch before you switch power on.

Select emulation on the address switch as follows:

1. Switch off the box.

2. Turn the address switch to the **"T" position**. Switch on power to box.

3. When the *ida FS 250* is ready, it will eject a page with the following message:

   "Current emulation is xxxx"

4. When the address switch is turned to a new position, a new message stating the current emulation will be printed after a few seconds.

5. When the desired emulation has been set, you must switch power off and set the address correctly again (values 0-6). Select one of the following emulations shown below.

Non-IPDS	
Selection	**Emulation**
*0	3812 / 5219 / 3816
1	5224❄
2	5225❄
3	5256❄
4	4234❄
5	3812/5219/ 3816

* *default value*

❄ Matrix printers

Selecting emulation via address switch

6. Connect the twinax cable and switch power on.

7. Activate the "T" position again and check that the emulation and address switch have been changed. (See the settings printout). See the section: *Testing*.

Check whether the configuration complies with the requirements of your installation and print jobs.

3.2.2 Via the Line

You can set the desired emulation in FSL function Y37 [1].
Note that if you select emulation via function 37, you must physically ***write*** the emulation. See the chart in the following for details.

E.g. **%Y37,5224%**
will select emulation 5224

%Y37,3812%
will select emulation 3812/5219/3816

Below you will find information on the emulations which can be selected in the n1 parameter of function Y37.

NOTE:
Please note that you have to WRITE the parameter you require (shown in "Write" column).

Non-IPDS

[1]For further details on programming the *ida FS 250*, please see the chapter: *Programming ida FS 250*

Y37,n1	
Write	**Emulation**
3812	*3812 / 5219 / 3816
5224	5224❄
5225	5225❄
5256	5256❄
4234	4234❄

* *default value*
❄ SCS printers

Selecting emulation via the line

The default configuration of the *ida FS 250* can be used for most application programs and uses. You should only change the address and the emulation. The rest of the settings should only be changed if you have special requirements.

3.3 Upgrading to IPDS

If you need to upgrade your ida FS 250 with the IPDS module, please follow these instruction before proceeding with the installation.

1. Unscrew the 4 screws from the bottom of the converter.

2. Place you hands on each side of the box, bottom facing down and the rear panel facing you. Carefully press open the top cover of the converter.

3. Place the IPDS module (main component side facing up) on the PCB of the box. *Note that the connector has to be placed on top of the PCB's connector (to the right on the PCB).*

4. Make sure the plastic supports fit in the holes of the IPDS module.

5. Press the module gently into position and, while still facing the rear panel, place the top cover precisely above the bottom cover so that all edges are aligned. Press the top cover gently into a locked position.

6. Re-insert the screws and fasten.

7. Now proceed to the actual installation of the converter to the printer and the system.

3.4 Connecting the ida FS 250 to the Printer

CAUTION:
All connections to the *ida FS 250* protocol converter should be made while the power is switched OFF to both the printer and converter.

3.4.1 Connecting via Centronics output

Connecting the *ida FS 250* to the printer is done by following these steps:

1. Check that the printer's parallel input port is available on printer.

2. Connect the cable supplied with the product between the printer's parallel input port and the protocol converter's PARALLEL OUT port.

3. Power on the printer and the *ida FS 250*.

4. Turn the address switch (on the rear panel) to the "T" position . A settings printout will be generated and the **CU** indicator will start flashing.

   The interface can be set up in many ways. From the factory, the interface has been set up to cover most needs and uses. Appendix B.: "Test Printout" is a sample printout of settings and is just one way of setting up your interface.

   Keep the settings printout you make together with this manual for future reference.

   If the printout format does not match the test printout in Appendix B., or if nothing was printed, this means that the printer setup does not match the protocol converter setup. Contact your systems support personnel or your i-data dealer for assistance.

5. When the printout is in order, you proceed to the chapter: *Connecting ida FS 250 to System*.

3.4.2 Connecting via RS-232 output

Note: This does not apply for the ida FS 250 PDS

1. To use the RS-232 port as an output por t you must set function Y24 to 1. (For further details on programming the *ida FS 250*, please see the chapter *Programming ida FS 250*).

   If possible, the serial output device you are connecting has to be set to Baud rate = 9600, Number of data bits = 8, No parity and 1 Stop Bit to match the default settings of the box. If this is not possible, you must change the functions 15, 16, 17 and 18 to match the settings of the serial output device.

2. The cable you need for connecting the serial output device to the serial port on the box must be ordered from your point of purchase especially for the serial output device.

   NOTE:
   Programming of Functions 15, 16, 17, 18 and 24 is not possible via the serial port. These functions have to be programmed either via the twinax port or via the parallel input port.

   For full details on the FSL functions (Y functions), see the " 5250 Programmer's Guide; Document No.: D62079.

3. Power on the printer and the *ida FS 250*.

4. Turn the address switch on the rear panel t o the T-position..
   A settings printout will be generated and the **CU** indicator will start flashing.

   The interface can be set up in many ways. From the factory, the interface has been set up to cover most needs and uses. Appendix B.: *Test Printout* is a sample printout of settings.

   Keep the settings printout together with this manual for future reference.

5. If the connection between the printer and the protocol con verter does not work properly, the reason is probably that the
   Y functions 24, 15, 16, 17 and 18 do not match the values of the printer.

If the printout format does not match the test printout in *Appendix B.* or if nothing was printed, this means that the printer setup does not match the protocol converter setup. Contact your systems support personnel or your i-data dealer.

6. Power **OFF** and **ON** the *ida FS 250* and check that all indicators light up momentarily.

7. Proceed to the chapter: *Connecting ida FS 250 to System*.

3.5. Connecting the ida FS 250 to System

After a successful test printout has been generated to establish that the connection between the *ida FS 250* converter and **the printer** is working correctly (see previous section), you are now ready to connect the *ida FS 250* to **the system**.

WARNING:

All connections to the *ida FS 250* protocol converter should be made while the power is switched OFF.

1. Turn off the power and connect the *ida FS 250* to your host system using the twinax cable, **and** the auto-terminating T-cable.

2. When the connection has been made, tu rn power **ON** and check that the **CU** and **READY** indicators turn **ON**. When they do, you have completed the installation procedure and are ready to operate the protocol converter as described below.

What if the CU Indicator fails to turn on?

If the **CU** indicator does not turn **ON**, this means that there is no communication with the control unit. You should check the follow ing:

a. The twinax cable connection from the control unit to the *ida FS 250.*

b. The control unit (is it powered up etc.)

c. Is the control unit supported by the *ida FS 250* ?
(See the section. *Supported Control Units*, for a list of sup ported con trol units).

If all three (a. b. and c.) are in order, contact your systems support personnel or your point of purchase.

3.5.1 Testing

The test printout pages can be generated in two ways - via the address switch or via the line activating the T function . For details on the T function, please see the section*: Quick Reference Guide of the Supported FSL Functions*

Test via the address switch

1. Turn the address switch to the **"T" position**. A settings printout will be generated (*test 4*).

2. Turn the switch away from the T-position.

3. When the CU indicator flashes, turn the switch back to the T-position.

4. The printer will now enter Online HEX Dump mode and print all data received in on-line HEX dump format (*test 1*).

5. Hex dump mode is terminated by turning the address switch to its power up position.

Keep the settings printout together with this manual for future reference.

Finally, a settings printout can also be generated at **power on** by activating function Y120. See the *Section: Quick Reference Guide of the Supported FSL Functions* for details.

NOTE:
When installing the interface, it is recommended that you carry out Test 4, Settings Printout, to check whether the printer is set to the correct language. If the language is incorrect, contact your systems support or your point of purchase.

3.5.2 Timeout

The *ida FS 250* enables printer sharing between the system and a PC. For this purpose it is possible to specify a timeout period.

If the printer is receiving input on the parallel port, for example, and there is a break in the transmission of data, the other input ports will not be polled for the period specified.

The factory default timeout is 20 seconds. The timeout may be changed to suit your requirements. This is done by sending a new setup to the *ida FS 250* input port where you want it to take effect.

When specifying the timeout it is also possible to specify a user string. A user string may be used for changing from one symbol set (e.g. Roman 8) to another (e.g. IBM-PC8), for example.

NOTE:
Settings on the twinax input port are automatically reestablished after another input port has been using the printer.

On the parallel and RS input port, you have to program the required setup yourself.

For more detailed information on the commands required, see the chapter: *Specifying Share Timeout and String*.

4. Operation of *ida FS 250*

The *ida FS 250* top panel has been designed to register the operation of the box via the four following indicator LEDs :

- CU (contact to control unit)
- PAR (parallel input)
- SER (serial input)
- READY (printer)

4.1 ida FS 250 top panel

CU

The CU indicator has 3 states which signal the following:

State	***Indication***
ON	Contact with the control unit.
BLINKING	In test mode.
OFF	No contact of the control unit, or the contact has been broken for more than 1 minute.

PAR (Parallel input)

The indicator LED has 2 states:

State	***Indication***
ON	Indicates that the box is processing data from the Centronics parallel port
OFF	Indicates that the box is idle or processing data from the twinax/RS232 inputs

SER (Serial input/output)

The indicator LED has 3 states

State	***Indication***
ON	Indicates that the box is processing data from the RS-232 Serial input
BLINKING	Indicates that the box has defined the RS-232 as output for the box.
OFF	Indicates that the box is idle or is processing data from the twinax/Centronics inputs.

READY (Printer Ready)

The indicator LED has 3 states:

State	***Indication***
ON	Indicates that the connected printer is ready; i.e. that printer's "Select" condition is active and the "PE" signal is inactive. If the connected printer is an RS 232 printer, the ready validation is done by the "DTR" signal.
BLINKING	The printer is not ready and print may be pending in the buffer.
OFF	Indicates that the connected printer is **not** ready for data input.

5. Specifying Share Timeout and String

In order to specify the timeout for a specific input port, an FSL (*F*unction *S*election via the *L*ine) sequence must be sent to the port in question. To do this a temporary Escape (ESC) Character must be defined first. This is done in the following way:

&&??<character>

The sequence "&&??%" will define " **%**" as the ESC Character.

Timeout is specified in FSL Function 100 . This function has the following syntax ("%" is the ESC Character):

%Y100,<timeout>[,user string]%

Factory default = 20 seconds

Timeout:	1 to 255 indicating number of seconds
User string:	*Optional* - string in HEX to be sent to the printer before transmission of data, when the printer is selected by the share unit. If function 100 is sent to the twinax, a user string number can be defined instead of a HEX string. The user string then has to be defined in function 61.

NOTE:
The Timeout string must be written in ONE line (see example below).

The user string and settings will only be sent if a share condition has occurred.

The new setup must be saved in the NVRAM with the following command ("%" is the ESC Character):

%X1

NOTE: %X1 will delete the temporary escape character.

The FSL string above was split up into several lines for reasons of clarification to simplify the explanation of the different functions. Below is an example where the FSL string is typed in one line.

Example:

&&??%%Y100,30,1B,45%%X1

The FSL string above has the following effect:

- Defines % as ESC character
- Sets timeout to 30 seconds
- Send 1B 45 HEX (RESET) before the next data transmission.
- Saves setup in the NVRAM and deletes "%" as escape character

NOTE:
FSL 100 works on the port it is sent to. If it is sent to the parallel or serial input port, the string containing the Function 100 programming will be printed when it is sent to the *ida FS 250*.

6. idaSetup - IPDS Programming

NOTE:
This chapter only applies to the converter when mounted with an IPDS module.

idaSetup is a program developed with the purpose of setting up the wide range of IPDS protocol converters via a PC share port or from a host.

For details on how to configure the IPDS parameters for the *ida FS 250 PDS* using the program idaSetup, see the separate documentation for this, "IPDS Programmer's Guide", doc. no. D60253. The manual is available as an electronic document.

7. IRQ Handling

This section describes how to recover from various IRQ conditions.

- Paper jam
- Out-of paper
- Stacker full

The printer will recover from these conditions without loss of data ***as long as you do not power off the printer***.

- Printer Not READY

The *ida FS 250 PDS* will detect if the printer is NOT READY and will interrupt data transmission to the printer. If the printer is OFFLINE (i.e. not READY) there will be no data loss ***as long as you do not power off the printer.***

- Out of toner

This condition is indicated by the printer's front panel. If printing continues, the print quality may not be acceptable. There will be no loss of data ***as long as you do not power off the printer***
.

- Door Open

This condition is indicated by the printer's front panel. There will be no loss of data ***as long as you do not power off the printer***

- Printer Power Off

You should not power off the printer, unless you power off the box as well. If only the printer is powered off, unpredictable results may occur.

8. Programming ida FS 250 - non-IPDS

The *ida FS 250* works using a large number of internal Setup Functions (FSL Functions). FSL setup functions can be sent either from your IBM system or from a PC.

When the protocol converter has been installed and connected to a printer, you may have to consider the use of these setup options.

The factory default setup will meet the demands of most host systems and users, and special programming is therefore normally not required.

However, special circumstances may require changes in the pro gramming of the box. For full details on this please see the *"5250 Programmer's Guide; D62079"*. In the Programmer's Guide you will find an extensive description of the FSL Functions with notes, comments and examples.

NOTE:
This section is a brief description of how to set up the interface with FSL functions from the line. The section is primarily aimed at users who are already familiar with *i-data* products.

8.1 The Escape Character

No escape character is defined when you receive the *ida FS 250* from the factory. When you send FSL Functions via the data stream, the functions must be "separated" from the data stream, so that they are not printed. For this you need to define an Escape (ESC) Character.

The ESC Character tells the interface that the characters following the ESC Character in the data stream are to be regarded as a command. The command string must also end with the ESC Character .

Before you define the ESC Character please note the following:

- Once the ESC character has been defined, it cannot be printed. For this reason you must select a character which will not normally appear in the data stream. If the character defined appears elsewhere in the data stream (i.e. outside an FSL Function), the interface will regard it as an ESC character and you will get a syntax error.

- However, you need not have an ESC Character defined all the time. When it has served its purpose you can remove it again.

8.2 Defining a Temporary Escape Character

The ESC Character may be defined as a *temporary* as well as a *permanent* ESC Character.

Below see how to define "%" as a temporary ESC Character.

```
&&??%
```

Defining "%" as a temporary ESC Character

Since the temporary ESC Character is defined in the temporary memory (RAM) alone, it is only in effect as long as the printer is switched on - or until you remove it again. To remove it you define it as "space".

```
&&??<space>
```

Removing the temporary ESC Character

NOTE:
For information on how to define a permanent ESC Character, please refer to the 5250 Programmer's Guide; D62079.

8.3 Syntax of an FSL Function

The special sequence that the interface will interpret as an FSL Function as shown below:

```
%Y<function number>,<parameters>%
```

Syntax of an FSL Function. "%" is the defined ESC Character

8.4 Invalid Escape Character

The error message "Invalid Escape Sequence" will be printed on paper if an invalid escape sequence has been sent to the printer.

Recovery:
Locate and correct the error in your setup file.

8.5 Setup Functions supported (PCL Mode)

No.	***Description***
Y2	LPI
Y3	CPI
Y8	LU1 Language
Y10	Page Format
Y11	Paper Path
Y12	Paper Size
Y15	Baud Rate for Serial Input
Y16	Number of Data Bits for Serial Input
Y17	Parity for Serial Input
Y18	Number of Stop Bits for Serial Input
Y19	Duplex Printing
Y21	Horizontal Compression and Vertical Scaling
Y24	Interface selection
Y48	Permanent Escape Character Selection
Y51	User Defined String(s) at Power Up
Y59	Bar Code Type Definition
Y61	Setup for User Defined Strings
Y62	Setup for IBM Defined Strings
Y73	Select Translate Table
Y74	Printer Symbol Set Definition Strings
Y75	Overwrite Translate Table
Y88	Physical Margin
Y89	Physical Margin Compensation
Y90	Define User Escape String
Y91	Font Definition
Y92	Font Point Size Definition String
Y93	Font Attribute Definition String
Y94	Font Typeface Definition String
Y96	Font Change Simulation
Y97	GFID/Font Selection
Y98	Automatic Page Orientation
Y100	Printer Share String and Timer
Y119	Autoconfiguration Select
Y120	Settings Printout at Power Up
Y249	Enter Engineering Mode
T	Initiate Test
	T1 On-line Hex Dump
	T3 ASCII Hex Dump
	T4 Settings Printout
	T5 Printout Translate Table
	T6 Cancel ASCII Hex Dump

No.	***Description***
X	Save/Overwrite Settings
	X1 Store Settings in Permanent Memory
	X3 Restore Factory Default Settings
	X4 Restore Settings from Permanent Memory
Z	Send User String
S	Send User String
W	Send Bar Code (as defined in Y59)
P	Program Flash Prom

ESC Features:

%%	Special transparent feature (Multiple paired Hex transparent). e.g.: %%*1B45%* ***where % is the defined ESC character.***
%	Special transparent feature (Single paired Hex transparent). ***where % is the defined ESC character.***

8.6 Quick Reference Guide of Supported FSL Functions

In this section the supported FSL Functions in twinax will only be described with their syntax and parameters.

The notation below will apply to the following FSL Functions table:

%	is the defined escape character
*	factory default
< >	mandatory parameter which must be defined
[ ]	optional parameter which can be defined

No.	Name	Syntax	Parameters
2	LPI	%Y2,<n1>%	3 = 3 LPI 4 = 4 LPI *6 = 6 LPI 8 = 8 LPI
3	CPI	%Y3,<n1>%	5 = 5 CPI *10 = 10 CPI 12 = 12 CPI 15 = 15 CPI 16 = 16.7 CPI
8	Language	%Y8,<n1>%	**37 = Engl. US EBCDIC 256 = International 273 = Austrian/ German 274 = Belgian 275 = Brazilian 276 = Canadian French 277 = Danish/ Norwegian 278 = Finnish/ Swedish 280 = Italian 281 = Japanese (Latin) 282 = Portuguese 283 = Spanish 284 = Spanish Speaking 285 = English (UK) 297 = French *500= Multinational 871 = Iceland * EU default ** US default

No.	Name	Syntax	Parameters
10	Page Format	%Y10,<n1>[,n2]%	**n1** 0 = Portrait 1 = Landscape *2 = COR 82 = COR regardless of Print Quality **n2** 1 = Tractor 2 = Tray 1 3 = Drawer 2 4 = Manual feeder 5 = Envelope feeder 6 = Tray 3
11	Paper Path	%Y11,<n1>%	1 = Tractor *2 = Tray 1 3 = Drawer 2 4 = Manual feeder 5 = Envelope feeder 6 = Tray 3

No.	Name	Syntax	Parameters
12	Paper Size	%Y12, <n1>[,n2,n3]% **NOTE:Factory default depends on DIP switch settings**	**n1 (Physical paper size)** *1 = A4 2 = Legal 3 = Letter 4 = Executive 5 = Letter (Monarch) 6 = Business 7 = International DL 8 = International C5 10 = A3 11 = Ledger 99 = Use system SPPS or SHF/SVS values **n2 (Tray)** 1 = Tractor 2 = Tray 1 3 = Tray 2 4 = Manual feeder 5 = Envelope feeder 6 = Tray 3 **n3 (Validation paper size)** *1 = A4 2 = Legal 3 = Letter 4 = Executive 5 = Letter(Monarch) 6 = Business 7 = Internat. 8 = Internat.C5 10 = A3 11 = Ledger 15 = Comm 9 Envel. 16 = B5 Envelope

No.	Name	Syntax	Parameters
15	Baud Rate for RS232 inter-face	%Y15,<n1>%	**n1** 0 = 300 baud 1 = 600 baud 2 = 1200 baud 3 = 2400 baud 4 = 4800 baud *5 = 9600 baud 6 = 19200 baud
16	Number of Data Bits	%Y16,<n1>%	**n1** 7 = 7 bits *8 = 8 bits
17	Parity	%Y17,<n1>%	**n1** 0 = odd parity *1 = no parity 2 = even parity
18	Number of Stop Bits	%Y18,<n1>%	**n1** *1 = 1 stop bit 2 = 2 stop bits
19	Duplex Printing	%Y19,<n1>%	*0 = Simplex 1 = Long-edge duplex 2 = Short-edge duplex
21	Horizontal Compression & Vertical scaling	%Y21,<n1>[,n2,n3]%	**n1** 0 = Compression *1 = No compression **n2** 1 = Tractor - Tray 1 2 = Drawer 1 3 = Tray 2 4 = Manual feeder 5 = Envelope feeder 6 = Tray 3 **n3** 1-255 = Vertical scaling in % *100
22	Printer driver selection	%Y22<n1>%	2 = HP PCL 4 *4 = HP PCL 5
24	Interface Selection	%Y24<n1>%	**n1** *0 = Port 0 (Centronics out **or** Serial in) 1 = Port 1 (Serial out)

No.	Name	Syntax	Parameters
36	Suppress IBM control codes	%Y36<n1>%	*0 = Respect codes 1 = Suppress codes
37	IBM Printer Emulation Select	%Y37,n1,<n2>%	**n1** device address *3812 5224 5225 5256 4234 4245 (IPDS) **n2** secondary address 0-6
48	Permanent Escape Character Selection	%Y48,'<n1>'% or: %Y48,<n1>%	'<n1>' = value can be entered by means of an apostrophe notation or: = HEX value of the character selected from the table

No.	Name	Syntax	Parameters
51	User-Defined String(s) at Power-Up	%Y51,<n1>%	0-7 = One or more strings stated in the form: (n1),(n2) ,....(nx) in ascending order The strings must be pre-defined in FSL 61
59	Bar Code Type Definition	%Y59,<n1>,<n2>, <n3>,<n4>[,n5]%	**n1** Numeric value from 1-8 specifying the bar code no. **n2** 22-39 = Bar code type **n3** Bar code height in inches with values from 1-255 **n4** Horizontal expansion with values from 1-16 **n5** Optional GFID number
61	Setup for User Strings	%Y61,<n1>,<n2>%	**n1** 0-99 = User Strings supported **n2** 00-FF = Hexadecimal string data
62	Setup for IBM defined strings	%Y62,n,<string>%	**n** string id number (0-255) **string** string contents in HEX and/or char. with apostrophe notation For details on function, please see the 5250 Programmer's Guide, Doc. No.: D62079

No.	Name	Syntax	Parameters
73	Select Translate Table	%Y73,<n1>[,n2]% ---------- %Y73,<n1>%	**n1 (Translate Table)** *1 = Roman-8 2 = IBM PC-8 3 = ECMA Latin 1 5 = US ASCII 6 = OCR A 7 = OCR B 8 = PC 850 **n2 (Symbol Set)** *1 = Roman-8 2 = IBM PC-8 3 = ECMA Latin 1 5 = US ASCII 6 = OCR A 7 = OCR B 8 = PC 850 ---------- *1-9 = Number of the translate table to be selected
74	Printer Symbol Set Definition Strings	%Y74,<n1>,<n2>%	**n1** 1-8 = Symbol set no. **n2** 00-FF = String contents in HEX apostrophe notation
75	User Defined Translate Table	%Y75, <n1>,<n2>,<n3>%	**n1 (EBCDIC)** 40-FF = corresponds to position in translate table **n2 (Symbol Set)** 00 = no change 01-08 = printer symbol set string no. as specified in Y74 **n3 (ISO - in HEX)** 00-FF = up to 16 bytes can be used

No.	Name	Syntax	Parameters
88	Physical Margins	%Y88,<n1>,<n2>[,n3]%	**n1** 0 - +/-32000 = Horizontal margin compensation in 1/1440" **n2** 0 - +/-32000 = Vertical margin compensation in 1/1440" **n3** 0-2 = Orientation as defined in FSL 10
89	Physical Margin Compensation	%Y89,<n1>[,n2]%	**n1** *0 = No compensation 1 = Compensation as defined in FSL 88 **n2** 1 = Tractor 2 = Tray 1 3 = Tray 2 4 = Manual feeder 5 = Envelope feeder 6 = Tray 3
90	User Escape String Definition	%Y90,<n1>,<n2>%	**n1** 0 = Erase strings 01-FF = Hexadecimal user Esc. string no. **n2** = String contents in apostrophe notation.

No.	Name	Syntax	Parameters
91	Font Definition See Appendix D. for more details on fonts	%Y90,<n1>,<n2>,<n3>,<n4>,<n5>[,n6]%	**n1 (IBM GFID)** 1-65535 = IBM GFID no. **n2 (Typeface)** 0-255 = Pre-programmed typeface value **n3 (Attribute)** 0 = Remove all current attributes 1 = Bold 2 = Italic 3 = Bold and Italic 4 = Proportional 5 = Prop. Bold 6 = Prop. Italic 7 = Prop. Bold and Italic **n4 (Symbol Set)** *1 = Roman-8 2 = IBM PC-8 3 = ECMA Latin 1 5 = US ASCII 6 = OCR A 7 = OCR B 8 = PC 850 **n5 (Point Size)** 1-255 = Point size **n6 (Translate Table)** *1 = Roman-8 2 = IBM PC-8 3 = ECMA Latin 1 5 = US ASCII 6 = OCR A 7 = OCR B 8 = PC 850
92	Font Point Size Definition String	%Y92,<n1>,<n2>%	**n1** 10-255 = String no in decimal **n2** 00-FF = String contents in HEX
93	Font Attribute Definition String	%Y93,<n1>,<n2>%	**n1** 10-255 = String no in decimal **n2** 00-FF = String contents in HEX

No.	Name	Syntax	Parameters
94	Font Typeface Definition String	%Y93,<n1>,<n2>%	**n1** 10-255 = String no in decimal **n2** 00-FF = String contents in HEX
96	Font Change Simulation See Appendix D for details on scalable fonts	%Y96,<n1>%	1-65535 = GFID no.
97	GFID/Font Selection	%Y97, n1>,<n2>:<n3>%	**n1** 1-65535 = GFID No. **n2** <string> = String for 0° rotation **n3** <string> = String for 90° rotation
98	Automatic Page Orientation (APO)	%Y98,<n1>[,n2]%	**n1** *0 = Activate APO 1 = Deactivate APO **n2** 1 = Tractor 2 = Tray 1 3 = Tray 2 4 = Manual feeder 5 = Envelope feeder 6 = Tray 3
100	Port Sharing Option	%Y100,<n1>[,n2]%	**n1** 0-255 = Timeout in seconds *20 **n2** 00-FF = Optional string in HEX to be sent to printer before transmission of data when printer is selected by sharing unit

No.	Name	Syntax	Parameters
119	Auto-Configuration select	%Y119,<n1>%	**n1** *0 = Disable Auto-configuration 2 = Auto-configuration via PJL
120	Settings printout at power up	%Y120,n1%	**n1** *0= disable settings printout at power up 1= enable settings printout at power up
249	Enter Engine-ering Mode	%Y249,n1%	**n1** password (contact your local i-data distributor)
T	Initiate Tests	%T#	1= On-line hex dump 3= ASCII hex dump 4= settings printout 5= printout translate table 6= cancel ASCII hex dump
X	Save/ Overwrite Settings	%X#	1= store RAM in EEPROM 3= factory default to RAM 4= restore settings to power up defaults
S	Send User String	%Sn%	1-99 user strings may be sent
Z	Send User String	%Zn	1-8 user strings can be sent
W	Bar Code Printing	%W,<n1>,<n2>%	**n1** 1-8 Bar code definition as defined in Y59. **n2** a-z,A_Z,0-9 Number or alphanumeric data to be printed in bar code. Data must not exceed one line
P	Program Flash Prom	%P2,area_id, intel_hex_data%	This function is only available in engineering mode (Y249)

9. Programming via Shareport

In order to ease customization of the *ida FS 250*, FSL parameters for twinax input can be programmed directly via the interface's Centronics or serial (RS-232) port using the Engineering Function Y249.

The Engineering Function enables the system to detect whether FSL sequences on shareport are intended for twinax FSL input or for shareport setup and will direct the sequences received to the twinax FSL interpreter.

The sequence works as a switch for FSL sequences. The defined Escape Character will also be translated and defined as Escape Character for the twinax FSL module. Function Y 249 is automatically deactivated after timeout on the shareport (i.e. settings defined in Y249 cannot be saved in the NVRAM).

The setup sequence must only contain ASCII characters. Apostrophe notation can be used if characters are included in the US ASCII 7 bit character set. All other data must be in HEX notation.

All functions which are accessible from the twinax input can be used via Centronics/RS-232 setup.

Activating the Y249 Engineering Function

Before the Engineering Function can be activated, an Escape character must be defined:

&&??<character>

The sequence "&&??%" will define "%" as the ESC Character.

If you have defined % as Escape Character, you activate the engi neering function by typing:

%Y249,n%

n = password. As this is sensitive information, system operators can contact point of purchse for password details.

Deactivating the Y249 Engineering Function

The function will be deactivated automatically after timeout on the share port (timeout is defined in Y100 Port Sharing Option). See also the chapter: Specifying Share Timeout and String.

Limitations when Y249 is active

Escape sequences must be in HEX

Unprintable characters (i.e. the escape character) must be defined in HEX notation if they are to be part of the setup print job. Only the FSL sequences are allowed.

9.1 Updating firmware

The *ida FS 250* firmware (complete firmware) may be updated either via the twinax line or via centronics input port. For further in formation please contact your i-data distributor.

If errors are detected, the downloading will be terminated and an error message will be printed if possible. If serious errors occur during programming, the firmware has to be downloaded via the share port.

The downloading of firmware is considered complete if no data is received within 30 seconds. The interface will then make a soft re set.

NOTE:
In case of damaged FLASH PROM, try the following procedure:
Boot Download of firmware:

1. Turn the power off
2. Place the rotary switch in the “B” position
3. Turn the power on and note that the READY LED is lit
4. Download the boot firmware (Syntax: “Copy 140.xxx.1 /b”)
5. Download the new firmware. When download is completed and the FLASH PROM is programmed, the LED will start flashing
6. Turn off the power and set the rotary switch in a position different from “A”, “B” or “T” before turning on the power again.

10. Errors and Recovery

Printer-related error messages will be displayed on the printer front panel. To recover from these errors, please refer to the relevant printer documentation.

The following errors are related solely to the *ida FS 250* and will appear as printed error messages. For some of the error messages, additional explanatory text may be printed out together with the error message.

10.1 ida FS 250 Error Messages

Error 8008 - Attention !	Two devices on the same address
Escape Sequence Error	Invalid ESC sequence has been sent to the printer (see the section: *Invalid Escape Character*)
Error 4510	Invalid SCS Control received
Error 5004	Initializing NVRAM
Error 5005	NVRAM failed
Error 5006	NVRAM initialized
Error 50??	CP Error

In addition to the above messages, a number of Boot Error Messages may be generated.

10.1.1. Two Devices with Same Address

If two devices on the same twinax line has the same address, the printer will print an error message. To recover follow these steps:

1. Turn the power off
2. Check each device on the same line against the system configuration.
3. Change the device address accordingly.

Appendix A: Use of ida FS 250 Serial Port

The following connections are available in the serial plug:

pin 1: N.C.
pin 2: RX data
pin 3: TX data
pin 4: DTR
pin 5: GND (signal)
pin 6: DSR (busy)
pin 7: RTS (always high)
pin 8: N.C.
pin 9: N.C.

Appendix B: Test Printout

```
ida FS 250
Firmware version: S20 140.010/00970005
i-data international a-s
Vadstrupvej 35-43
2880 Bagsvaerd, Denmark
Phone: +45 44366000   Fax: +45 44366111
Boot id: 80023102 HW id:
Current escape code = 00 in hexadecimal as Character = ' '
Dipswitch: National character set = Multinational
Line Set Up:  Addr. 0 3812 model 1.
                    4 *IPDS
Function 2:   Default LPI 6
Function 3:   Default CPI 10
Function 8:   Default codepage Multinational
Function 10:  Default orientation = COR
Function 11:  Default paperpath Drawer 1 Destination 2
Function 12:  Papersize A4
Function 15:  Baud rate: 9600
Function 16:  Databits: 8
Function 17:  Parity: None
Function 18:  Stopbits: 1
Function 21:  Horizontal compression = OffLine spacing 100%
Function 22:  Print driver: PCL 5
Function 24:  Output Source: 0
Function 36:  Suppress SCS Controls: 0
Function 48:  Permanent escape code: None
Function 51:  User strings at power on: None
Function 59:  Barcode definitions: None
Function 61:  User strings: None
Function 62:  Setup strings: None
Function 73:  Translate table: 1 ROMAN 8
Function 74:  Symbol set def.: None
Function 88:  Physical margins: -288, -480  -288, -480-  288, -480
Function 89:  Physical margin comp. = Off
Function 90:  User Esc. strings: None
Function 91:  User defined font translation table: None
Function 92:  Point size strings: None
Function 93:  Attribute strings: None
Function 94:  Typeface strings: None
Function 97:  User GFID/font selection
Function 98:  Orientation select = Automatic
Function 100: IBM mode definition: Timeout 20 Sec.
              Centronics input definition: Timeout 20 Sec.
              RS232 input definition: Timeout 20 Sec.
Function 119: Autoconfiguration = 0
Function 120: Settings Printout at Power up = Off
Free bytes:   1851
Substitute character in hexadecimal = 60
Left margin in 1/1440"   =     0
Indent margin in 1/1440" =     0
Right margin in 1/1440"  =     19008
Paper width in 1/1440"   =     19008
Paper depth in 1/1440"   =     15840
Top margin in 1/1440"    =     174
Line distance in 1/1440  =     240
Maximum print line       =     66
```

Appendix C: Default GFID Table

The factory default GFID Table below lists all the predefined fonts which are supplied with the interface GFIDs (GFIDs 1 - 399) [2].

Fonts with GFIDs above 400 (i.e. scalable fonts) are described in the section ***Scalable Fonts*** below.

For further details on defining fonts, please see the section: *Quick Reference of Supported FSL Functions, Function Y91 and Y96.*
If more details on these FSL functions are required , you are referred to the Programmer's Guide (D62079).

In the following Default GFID Table, the Attribute, Symbol Set and Translate Table figures will refer to the following:

ATTRIBUTE

0 = No attributes
1 = Bold
2 = Italic
3 = Bold and italic
4 = Proportional
5 = Proportional bold
6 = Proportional italic
7 = Proportional bold and italic

SYMBOL SET and TRANSLATE TABLE

1 = Roman 8
2 = IBM PC-8
3 = ECMA Latin 1
4 = Roman 8
5 = US ASCII
6 = OCR A
7 = OCR B
8 = PC 850

[2]If, for reasons of backward compatibility, you wish to reestablish the fonts > 400 in the default GFID table, please contact you i-data supplier.

In the table below, an asterisk (*) after the GFID number denotes a simulated IBM GFID.

GFID	***Font***	***Type-face***	***Attri-bute***	***Symbol Set***	***Point Size***	***Translate Table***
3*	OCR B	0	0	7	12	7
11*	Courier	3	0	1	12	0
12*	Prestige	8	0	1	10	1
18*	Courier	3	2	1	12	1
19*	OCR A	0	0	6	12	6
38*	Presentation	11	1	5	14	5
39*	Letter Gothic	6	1	1	14	1
40*	Letter Gothic	6	0	1	14	1
46*	Courier	3	1	1	12	1
51	Courier	3	0	5	12	5
52	Courier	3	1	5	12	5
53	Courier	3	2	5	12	5
60	Letter Gothic	6	0	5	14	5
66*	Letter Gothic	6	0	1	12	1
68*	Letter Gothic	6	2	1	12	1
69*	Letter Gothic	6	1	1	12	1
80	Prestige	8	0	1	10	0
85	Courier	3	0	1	12	1
86*	Prestige	8	0	1	10	1
87*	Letter Gothic	6	0	1	12	1
91*	Letter Gothic Italic	6	2	1	12	1
95*	Courier Italic	3	2	1	10	1
109*	Letter Gothic Italic	6	2	1	12	1
110*	Letter Gothic	6	1	1	12	1
111*	Prestige	8	1	1	10	1
112*	Prestige	8	2	1	10	1
115	Courier	3	1	1	10	1
116	Courier	3	2	1	10	1
117	Prestige	8	0	5	10	5
118	Prestige	8	0	5	10	5
119	Prestige	8	2	5	10	5
204*	Letter Gothic	6	0	5	12	5
221*	Prestige	8	0	1	7	1
223*	Courier	3	0	1	8	1
230*	Letter Gothic	6	0	1	9	1
252*	Line Printer	0	0	1	8.5	1
253	Line Printer	0	0	1	8.5	0
255	Letter Gothic	6	0	1	9.5	1
256	Prestige	8	0	5	7	5

Default GFID Table for GFIDs 1 - 399

Scalable Fonts

NOTE:
***Only* applies to printers running PCL Level 5**

The *ida FS 250* allows GFID access to all the scalable fonts found in the printer. These GFIDs are in the range 400 - 65535.

Typeface, typeface attributes and point size have been linked together using the system described below.

GFID Number = XXXYY

where XXX = point size
and
YY = typeface + attribute

Possible *typeface* values are:

Typeface ID	***PCL No.***	***Name of Typeface***
0	5	Times Roman
4	4116	Coronet
10	4	Helvetica / Swiss
14	36	Helvetica Compressed
20	23	Century Schoolbook
24	4297	Mangold
30	17	Humanist / CG Optima
34	4168	Antique Olive
40	31	ICT Avantgarde
44	4197	Garamond Antique
50	16901	Times New
54	16602	Arial
60	52	Univers

Possible *attribute* values are:

Style	***Strokeweight***
0	Medium upright
1	Bold upright
2	Medium italic
3	Bold italic

%Y96,4815%

This is 48 point, Helvetica Compressed, bold upright

%Y96,1301%

This is 13 point, Times Roman, bold upright

Font examples

Other relationships between IBM GFID and printer typefaces/fonts can be programmed using Function 91 or 97 (See Programmer's Guide for more details on Function 97). GFIDs may be selected with the normal procedure or using Function 96.

Appendix D: i-data Product Platform

Coax	**S/370 - 390**	**SCS**
ida LS 170	External	For Centronics attached matrix printers
	S/370 - 390	**SCS + AFP**
ida LS 270	External	For Centronics attached laser printers
ida FS 270	External	For PCL printers
	S/370 - 390	**IPDS**
ida FS 270 PDS	External	For PCL printers
ida PDS 270x MIO	Internal	For HP MIO printers with HP PCL4 or higher
ida PDS 270x Optra	Internal	For Lexmark Optra L, N, R and C series
Twinax	**AS/400**	**SCS**
ida LS 150	External	For Centronics attached matrix printers
	AS/400	**SCS/DCA**
ida LS 250	External	For Centronics attached laser printers
ida FS 250	External	For PCL printers
	AS/400	**IPDS**
ida FS 250 PDS	External	For PCL printers
ida PDS 250x MIO	Internal	For HP MIO printers with HP PCL4 or higher
ida PDS 812-1x Optra	Internal	For Lexmark Optra L, N, R and C series

Token Ring	**S/370 - 390**	**AFP**
ida PS 03 TR	External	For Centronics attached laser and matrix printers
ida PrintServer 03 IOP TR	Internal	For Lexmark Optra L, R, N and C series
ida PrintServer 03 MIO TR	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 03 NP TR	Internal	For IBM Network Printer series
	S/370 - 390	**SCS + AFP**
ida PS 23 TR 270	External	For Centronics attached laser and matrix printers
ida PrintServer 23 IOP TR 270	Internal	For Lexmark Optra L, N, R and C series
ida PrintServer 23 MIO TR 270	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 23 NP TR 270	Internal	For HP MIO printers with HP PCL4 or higher
	AS/400	**SCS/DCA**
ida PS 23 TR 250	External	For Centronics attached laser and matrix printers
ida PrintServer 23 IOP TR 250	Internal	For Lexmark Optra L, N, R and C series
ida PrintServer 23 MIO TR 250	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 23 NP TR 250	Internal	For HP MIO printers with HP PCL4 or higher
	AS/400 & S/370-390	**IPDS**
ida PS 13 TR	External	For Centronics attached PCL printers
ida PrintServer 13 IOP TR	Internal	For Lexmark Optra L, N, R and C series
ida PrintServer 13 MIO TR	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 13 NP TR	Internal	For IBM Network Printer series
Ethernet	**S/370 - 390**	**AFP**
ida PS 04 ETH	External	For Centronics attached laser and matrix printers
ida PrintServer 04 IOP ETH	Internal	For Lexmark Optra L, N, R and C series
ida PrintServer 04 MIO ETH	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 04 NP ETH	Internal	For IBM Network Printer series
	S/370 - 390	**SCS + AFP**
ida PS 24 ETH 270	External	For Centronics attached laser and matrix printers
ida PrintServer 24 IOP ETH 270	Internal	For Lexmark Optra L, N, R and C series
ida PrintServer 24 MIO ETH 270	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 24 NP ETH 270	Internal	For IBM Network Printer series
	AS/400	**SCS/DCA**
ida PS 24 ETH 250	External	For Centronics attached laser and matrix printers
ida PrintServer 24 IOP ETH 250	Internal	For Lexmark Optra L, N, R and C series
ida PrintServer 24 MIO ETH 250	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 24 NP ETH 250	Internal	For IBM Network Printer series
	AS/400 & S/370-390	**IPDS**
ida PS 14 ETH	External	For Centronics attached PCL printers
ida PrintServer 14 IOP ETH	Internal	For Lexmark Optra L, N, R and C series
ida PrintServer 14 MIO ETH	Internal	For HP MIO printers with HP PCL4 or higher
ida PS 14 NP ETH	Internal	For IBM Network Printer series

SOFTWARE	**S/370 - S/390**	**PRINT REDIRECTION**
ida HPR	Host software	For PCL or PostScript printers
	S/370 - S/390	**AFP**
ida PSS MVS	Host software	For PCL or PostScript printers
ida PSS VM	Host software	For PCL or PostScript printers
ida RPPC NLM	Server software	For local or remote PCL printers
ida RPPC AIX	Server software	For local or remote PCL printers
ida RPPC HP UX	Server software	For local or remote PCL printers
ida RPPC Windows NT	Server software	For local or remote PCL printers
ida RPPC Sinix	Server software	For local or remote PCL printers

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