



FSL Reference Manual for Print Servers

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MPI Tech A/S
Vadstrupvej 35
2880 Bagsvaerd
Denmark
Tel: +45 44 36 60 00
Fax: +45 44 36 61 11
www.mpitech.com

Table of Contents

1	Preface	3
2	Introduction to FSL Feature	4
2.1	<i>FSL Features</i>	4
2.2	<i>FSL Concept</i>	5
2.3	<i>The Escape Character</i>	5
2.3.1	<i>Defining temporary escape character</i>	6
2.3.2	<i>Removing temporary escape character</i>	6
2.3.3	<i>Defining a permanent escape character</i>	7
2.3.4	<i>Removing a permanent escape character</i>	7
	Appendix A. Supported 3270 FSL Functions - For Printer Driver = PCL5	8
	Appendix B. FSL 3270 Quick Reference - For Printer Driver = PCL5	10
	Appendix C. Supported 3270 FSL Functions - For Printer Driver = Matrix	21
	Appendix D. FSL 3270 Quick Reference - For Printer Driver = Matrix	23
	Appendix E. Supported 5250 FSL Functions - For Printer Driver = PCL5	30
	Appendix F. FSL 5250 Quick Reference - For Printer Driver = PCL5	32
	Appendix G. Supported 5250 FSL Functions - For Printer Driver = Matrix	36
	Appendix H. FSL 5250 Quick Reference - For Printer Driver = Matrix	37
	Appendix I. Test printout	39
	Appendix J. Abbreviations	40

1 Preface

The FSL Feature is active when selecting and using a Telnet 3270e, 5250e or SNA PU2 /LU1 session of the Print Server. Input and output parameters are selectable via PrintGuide.

NOTE:

As this manual deals only with functions and operations related to the *FSL Feature*, you are referred to the manual supplied with the original product for additional information as to the general and advanced operation of the *Print Server*.

2 Introduction to FSL Feature

With your Print Server FSL Feature, you will be able to emulate legacy data applications processed in **coax** or **twinax** environments that contain FSL sequences as well as the same applications running in a LAN environment.

NOTE:

In the Appendix section you will find details on the specific subsets of FSL functions supported in the original Coax and Twinax environments. Moreover, you are provided with a quick set-up reference to the supported functions, including syntax and supported parameters.

2.1 FSL Features

- SCS support via TN3270e and SNA PU2 /LU1 including support for the MPI Tech Function Selection via the Line concept for IBM 3270 environments. Add to this all the Features supported by the *Print Server*.
- SCS DCA support via TN5250e and TCP/IP including support for the MPI Tech Function Selection via the Line concept for IBM 5250 environments.

NOTE: *The TCP/IP protocol must be installed and configured for Telnet sessions.*

2.2 FSL Concept

Function Selection via the Line (FSL) sequences are special commands used for downloading of settings.

The syntax of an FSL command is shown below.

"%" is the defined escape character (i.e. ESC character). See Figure 1 for definition of an escape character.

A rectangular box with a blue border containing the text: %Y<Function number>, <parameter>%

```
%Y<Function number>, <parameter>%
```

Figure 1, Defining the escape character

When you send the FSL syntax via the line, the "Y" and the following number will select an FSL Function.

All spaces and IBM control codes between the leading and the trailing ESC characters will be ignored.

The FSL Functions are used for setting up the printer to special applications, to carry out a special print job, or to gain access to special facilities in the printer.

NOTE:

Functions not saved using "<ESC>X1" will apply for the actual job only.

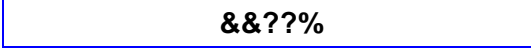
2.3 The Escape Character

If you wish to program the FSL top, you must first define an ESC character. An ESC character is a signal to the interface that the characters following the ESC character form a command sequence.

Once a character has been defined as the ESC character, it cannot be printed or used as a normal character. However, it is not necessary to have an ESC character defined permanently. When the ESC character has served its purpose, it can be deleted.

2.3.1 Defining temporary escape character

No ESC character has been defined from the factory. If you wish to change the settings from the host system, you will have to define an ESC character. See below how to define "%" as the temporary ESC character.



&&??%

Figure 2, Defining "%" as a temporary ESC character.

The five characters shown should be sent to the printer from the host system. The ESC character is **not** defined permanently. When the power is turned off, it will be lost. If you wish to save the defined ESC character you must define it as a permanent escape character. (See section 2.3.3)

NOTE:

The characters ";", ":", and "." must never be used as ESC character, as they are used as separators in escape sequences and will give unpredictable printing results.

The same applies to 0-9, A-F, a-f and K,S,T,X,Y,Z, simple quote ('), & and ?. These must not be used as escape characters.


Avoid using your national characters as escape characters.

The following EBCDIC HEX codes have been defined as national language characters and must not be used as ESC characters:

4A 4C 4F 5A 5F 6A 79 7B 7C 7F A1 C0 D0 E0

2.3.2 Removing temporary escape character

If you wish to remove the temporary escape character in order to use that character as a printable character, you can define it as a space.



&&??<space>

Figure 3, Removing the temporary ESC character.

2.3.3 Defining a permanent escape character

If you wish to define and save a permanent ESC character, you will have to define a temporary escape character, use Function Y48, (Select Permanent Escape Character) and save the settings in the permanent memory by the command (ESC) X1 before powering off.

You can define the permanent ESC character in the following way using the **apostrophe** notation, e.g. %Y48,'<%'.

NOTE:

If the character used in Function Y48, Select Permanent Escape Character, is different from the one specified as temporary ESC character, the latest specified character will take precedence immediately after you have defined Function Y48.

2.3.4 Removing a permanent escape character

The permanent ESC character may be removed again in the following way:

1. Set Function Y48, Select Permanent Escape Character, to ' ' ('space' or No ESC character).
2. Define a new temporary ESC character as described above.
3. Save the settings using the command "<ESC> X1".

Examples of these commands are shown below (in the example, the permanent ESC character is ">"):

```
>Y48, ' ' >  
&&??%  
%X1
```

Figure 4, Removing permanent escape character (">").

Appendix A. Supported 3270 FSL Functions - For Printer Driver = PCL5

(FSL 22 = 4)

The following FSL 3270 functions will be supported by the *FSL Feature*. These functions will be received and accepted with the values stated. Other functions will be received and *ignored*.

Should you need further information on the use of the FSL functions, please contact your point of purchase.

FSL Number	Function
2	LPI
3	CPI
5	Form Length
6	Maximum Print Position
8	LU1 Language
9	Quality
10	Page Format
11	Paper Path
12	Paper Size
19	Duplex printing
22	Printer Driver Selection
34	Last LF on Page Sent as FF
35	Form Feed Usage
36	Suppress IBM Control Codes
37	IBM Printer Emulation Selection
39	Suppress Empty Forms
47	ESC Mode Selection
48	Permanent ESC Character Selection
51	User-Defined String(s) at Begin Job
59	Bar Code Type Definition
60	Font Link
61	Setup for User Strings
62	Setup for IBM-Defined Strings
72	Reset Translate Table
73	Select Translate Table
74	Printer Symbol Set Definition Strings
75	Overwrite Translate Table
77	Reset APL Translate Table
78	Select APL Translate Table
80	Overwrite APL Translate Table
85	Overwrite Translate Table in LU1
88	Physical Margins
89	Physical Margin Compression
90	User ESC String Definition
91	Font Definition
92	Font Point Size Definition String

FSL Number	Function
93	Font Attribute Definition string
94	Font Typeface Definition String
96	Font Change Simulation
98	Automatic Page Orientation
T(est) Functions:	
T4 =	Print out Settings
T5 =	Print out Character Set
Z Function:	
Zn =	Send user-defined string
W Function:	
Wn =	Print Barcode
X Functions:	
X1 =	Store RAM in FLASH
X2 =	Factory default
X3 =	Factory default to RAM
X4 =	Restore default

Appendix B.

FSL 3270 Quick Reference -

For Printer Driver = PCL5

(FSL 22 = 4)

No.	Name	Syntax	Parameters
2	LPI	%Y2,<n1>%	0 = Ignored 3 = 3 LPI 4 = 4 LPI *6 = 6 LPI 8 = 8 LPI
3	CPI	%Y3,<n1>%	0 = Prop.spacing *10 = 10 CPI 12 = 12 CPI 15 = 15 CPI 16 = 16.7 CPI 20 = 20 CPI 27 = 27 CPI
5	Form Length	%Y5,<n1>%	0 = Pass FF and NL from system and ignore MPL in SVF 001 to 255 = Set FL in no. of lines *66 EU **62 US
6	Maximum Print Position	%Y6,<n1>%	0 = Do not generate NL at MPP and ignore MPP in SVF 001 to 255 = Set MPP in no. of characters *132

No.	Name	Syntax	Parameters
8	LU1 Language	%Y8,<n1>%	<p>1 = English US EBCDIC CP 37 3 = Austrian/German CP 273 5 = Brazilian CP 275 6 = Canadian (French) CP 260 7 = Danish/Norwegian CP 277 8 = Danish/Norwegian Alt CP 287 9 = Finnish/Swedish CP 278 10 = Finnish/Swedish Alt CP 288 13 = Austrian/German Alt CP 286 14 = International CP 500 15 = Italian CP 280 16 = Japanese(English CP 281 19 = Spanish CP 284 20 = Spanish CP 289 22 = English UK CP 285 30 = French 105-characters CP 297</p> <p>65 = English US EBCDIC CP 1140 67 = Austrian/German CP 1141 71 = Danish/Norwegian CP 1142 73 = Finnish/Swedish CP 1143 78 = International CP 1148 79 = Italian CP 1144 83 = Spanish CP 1145 86 = English UK CP 1146 94 = French 105-chr. CP 1147 101 = Iceland CP 1149</p> <p>37 = English US EBCDIC 260 = Canadian (French) 273 = Austrian/German 275 = Brazilian 277 = Danish/Norwegian 278 = Finnish/Swedish 280 = Italian 281 = Japanese(English) 284 = Spanish 285 = English UK 286 = Austrian/German Alt 287 = Danish/Norwegian Alt 288 = Finnish/Swedish Alt 289 = Spanish Alt 297 = French 105-characters 500 = International</p> <p>Code Pages with €sign:</p> <p>1140 = English US EBCDIC 1141 = Austrian/German 1142 = Danish/Norwegian 1143 = Finnish/Swedish 1144 = Italian 1145 = Spanish 1146 = English UK 1147 = French 105-characters 1148 = International 1149 = Iceland</p>
9	Quality	%Y9,<n1>%	<p>*1 = Draft Print Quality 2 = Near Letter Quality 3 = Correspondence</p>

No.	Name	Syntax	Parameters
10	Page Format	%Y10,<n1>[,n2]%	n1 *0 = Portrait 1 = Landscape 2 = COR 3 = Reserved 4 = 8" x 11" Portrait 5 = 8" x 12" Portrait 6 = 13.2" x 8.5" Landscape 7 = Landscape Listing 8 = Portrait Listing 11" 9 = Portrait Listing 12" 12 = COR, 65% of LPI n2 1 = Tractor (Upper) 2 = Drawer 1 3 = Drawer 2 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 7 = Auxiliary 8 = Drawer 4 9 = Drawer 5 10 = Drawer 6
11	Paper Path	%Y11,<n1>%	0 = Ignore PPM and do not send Tray Select to Printer 1 = Tractor (Upper) 2 = Drawer 1 3 = Drawer 2 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 7 = Auxiliary 8 = Drawer 4 9 = Drawer 5 10 = Drawer 6
12	Paper Size	%Y12,<n1>[,n2]%	n1 *1 = A4 2 = Legal **3 = Letter 4 = Executive 5 = Letter (Monarch) 6 = Business (Com 10) 7 = International DL 8 = International C5 10 = A3 11 = US Ledger 12 = A5 19 = Wide A4 n2 1 = Tractor (Upper) 2 = Drawer 1 3 = Drawer 2 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 7 = Auxiliary 8 = Drawer 4 9 = Drawer 5 10 = Drawer 6
19	Duplex printing	%Y19<n1>%	*0 = Simplex 1 = Long-edge duplex 2 = Short-edge duplex

No.	Name	Syntax	Parameters
22	Printer Driver Selection	%Y22,<n1>%	0 = Non specific driver (must be programmed in FSL Y62) 1 = IBM Pro Printer (preprogrammed) 4 = PCL5 (preprogrammed) 6 = Epson FX (preprogrammed) 7 = Epson LQ (preprogrammed) 9 = IBM Pro XL24 Printer (preprogrammed) 16 = PCL II (preprogrammed)
34	Last LF on Page Sent as FF	%Y34,<n1>%	0 = No *1 = Yes, count lines in FSL 5 and send FF
35	Form Feed Usage	%Y35,<n1>%	0 = Pass FF from Host *1 = Count the lines in FSL 5 and send FF
36	Suppress IBM Control Codes	%Y36,<n1>%	*0 = Respect all codes 1 = Suppress all codes 2 = Reserved
37	IBM Printer Emulation Selection	%Y37,<n1>%	0 = 3287 Emulation *1 = 3268/4214 Emulation 2 = HEX 00-3F sent transparently except valid SCS codes. TRN sent non-transparently 4 = HEX 00-3F sent as blanks except valid SCS codes. TRN sent transparently 6 = HEX 00-3F sent transparently except valid SCS codes. TRN sent transparently 8 = HEX 00-3F are suppressed except valid SCS codes. HEX 00-3F in TRN are printed as spaces..
39	Suppress Empty Forms	%Y39,<n1>%	0 = No forms suppressed *1 = Empty forms suppressed
47	ESC Mode Selection	%Y47,<n1>%	*1 = ESC xx sent as "xx" HEX 3 = Double Escape Feature
48	Permanent ESC Character Selection	%Y48,<'char.'>% or %Y48,<xx>% %Y48,<n1>[:n2[:n3]]%	n1 'char.' = character selected from the current IBM char. table in apostrophe notation xx = HEX value of the character selected from the LU3 table n2 a max. of 5 chars. to introduce transparency (invalid values: 0-9 and A-F) Lead-in sequence n3 a max. of 5 chars. to introduce transparency (invalid values: 0-9 and A-F) Lead-out sequence *00
51	User-Defined String(s) at Begin Job	%Y51,<n1>%	0-7 = One or more strings defined in FSL 61

No.	Name	Syntax	Parameters
59	Bar Code Type Definition (See W Function below for printing of bar codes)	%Y59,<n1>,<n2>,<n3>,<n4> %	n1 1-8 = Bar code def. no. n2 22-39 = Bar code type n3 1-255 = Height n4 1-32 = Horizontal expansion *1
60	Font Link	%Y60,<n1>,<n2>%	n1 0,10,13,15,16,20,27 = CPI n2 1-65535 = GFID No.
61	Setup for User Strings (See Z function below for sending user-defined strings)	%Y61,<n1>,<n2>%	n1 0-7 = User String no. n2 00-FF = String contents in HEX or in apostrophe notation

No.	Name	Syntax	Parameters
62	Setup for IBM Defined Strings	%Y62,<n1>,<n2>%	<p>Paper Feed:</p> <p>120 Tractor (Upper) preprogrammed with &I1H selected by FSL Y11,1</p> <p>121 Envelope feeder preprogrammed with &I1H selected by FSL Y11,5</p> <p>122 Auxilary preprogrammed with &I4H selected by FSL Y11,7</p> <p>123 Manual feeder preprogrammed with &I2H selected by FSL Y11,4</p> <p>124 Drawer 6 preprogrammed with &I6H selected by FSL Y11,10</p> <p>125 Drawer 1 preprogrammed with &I5H selected by FSL Y11,2</p> <p>126 Drawer 2 preprogrammed with &I8H selected by FSL Y11,3</p> <p>127 Drawer 3 preprogrammed with &I20H selected by FSL Y11,6</p> <p>128 Drawer 4 preprogrammed with &I21H selected by FSL Y11,8</p> <p>129 Drawer 5 preprogrammed with &I22H selected by FSL Y11,9</p> <p>Attributes:</p> <p>130 Bold start 131 Bold stop 132 Underscore start 133 Underscore stop</p> <p>Colour:</p> <p>160 Default Colour 161 Blue 162 Red 163 Pink 164 Green 165 Turquoise 166 Yellow 168 Black 178 Multicolor</p> <p>Printing:</p> <p>270 Simplex 271 Short-edge duplex 272 Long-edge duplex 273 Duplex page shift 280 Line wrap 281 Line cut</p>
72	Reset Translate Table	%Y72,<n1>%	1-8 = Reset the indicated table
73	Select Translate Table	%Y73,<n1>%	1-8 = Select the indicated table
74	Printer Symbol Set Definition Strings	%Y74,<n1>,<n2>%	<p>n1 1-8 = Symbol set no.</p> <p>n2 00-FF = String contents in HEX</p>

No.	Name	Syntax	Parameters
75	Overwrite Translate Table	%Y75,<n1>[,n2],<n3>%	n1 00-FF = LU3 position in HEX of character to be translated n2 1-8 = Symbol set defined in FSL 74 n3 00-FF = Data in ASCII HEX required to print the character
77	Reset APL Translate Table	%Y77,<n1>%	1-8 = Reset the indicated APL table
78	Select APL Translate Table	%Y78,<n1>%	1-8 = Select the indicated APL table
80	Overwrite APL Translate Table	%Y80,<n1>[,n2],<n3>%	n1 00-FF = The position in HEX of the APL character to be translated n2 1-8 = Symbol set defined in FSL 74 n3 00-FF = Data in ASCII HEX required to print the character

No.	Name	Syntax	Parameters
85	Overwrite Translate Table in LU1	%Y85,<n1>[,n2],<n3>%	<p>n1 40-FF = LU1 position in HEX of character to be translated</p> <p>n2 1-8 = Symbol set defined in FSL 74</p> <p>n3 00-FF = Data in ASCII HEX required to print the character</p>
88	Physical Margins	%Y88,<n1>,<n2>[,n3]%	<p>n1 -32000 to 32000 = Horizontal margin compensation in 1/1440"</p> <p>*0</p> <p>n2 -32000 to 32000 = Vertical margin compensation in 1/1440"</p> <p>*0</p> <p>n3 0-9 = Page format as defined in FSL 10 20 = Margins for MPI Mainframe software 21 = Support for back page in Duplex</p>
89	Physical Margin Compression	%Y89,<n1>[,n2]%	<p>n1 *0 = No compensation 1 = Compensation as defined in FSL 88</p> <p>n2 1 = Tractor (Upper) 2 = Drawer 1 3 = Drawer 2 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 7 = Auxiliary 8 = Drawer 4 9 = Drawer 5 10 = Drawer 6</p>
90	User ESC String Definition	%Y90,<n1>,<n2>%	<p>n1 0 = Erase strings 01-FF = String no. in HEX</p> <p>n2 '<string>' = String contents in apostrophe notation</p>

No.	Name	Syntax	Parameters
91	Font Definition	%Y91,<n1>,<n2>,<n3>,<n4>,<n5>[,<n6>]%	<p>n1 (IBM GFID) 1-65535 = IBM GFID no.</p> <p>n2 (Typeface) 0-255 = Pre-programmed typeface value (or Y94 string no.)</p> <p>n3 (Attribute) 0 = No attributes 1 = Bold 2 = Italic 3 = Bold and Italic 4 = Proportional 5 = Prop. Bold 6 = Prop. Italic 7 = Prop. Bold and Italic (or Y93 string no.)</p> <p>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 (or Y74 string no.)</p> <p>n5 (Point Size) 1-255 = Point size (or Y92 string no.)</p> <p>n6 (Translate Table) 0 = IBM Resident 1 = Roman-8 2 = IBM PC-8 3 = ECMA Latin 1 5 = US ASCII 6 = OCR A 7 = OCR B 8 = PC 850</p>
92	Font Point Size Definition String	%Y92,<n1>,<n2>%	<p>n1 1-255 = String no. in decimal</p> <p>n2 00-FF = String contents in HEX</p>
93	Font Attribute Definition String	%Y93,<n1>,<n2>%	<p>n1 1-255 = String no. in decimal</p> <p>n2 00-FF = String contents in HEX</p>
94	Font Typeface Definition String	%Y93,<n1>,<n2>%	<p>n1 1-255 = String no. in decimal</p> <p>n2 00-FF = String contents in HEX</p>
96	Font Change Simulation	%Y96,<n1>%	1-65535 = GFID no. in decimal

No.	Name	Syntax	Parameters
98	Automatic Page Orientation	%Y98,<n1>[,n2]%	n1 *0 = Activate Automatic Page Orientation 1 = Deactivate Automatic Page Orientation 2 = Activate APO IBM 3812 compatible n2 1 = Tractor (Upper) 2 = Drawer 1 3 = Drawer 2 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 7 = Auxiliary 8 = Drawer 4 9 = Drawer 5 10 = Drawer 6

T(est) Functions

Six different tests may be run via the line. Use the following syntax:

```
%T<test number>
```

Test Number	Test
-------------	------

1	Offline HEX Dump
2	Online HEX Dump
3	ASCII HEX dump
4	Print out settings
5	Print out character sets
6	Cancel Test 3 (On-line ASCII HEX dump)

Test 4 can also be generated via the **TEST** key on the interface's rear panel. Test 3 is terminated by pressing the **TEST** key on the rear panel.

Z Function (Sending user-defined strings)

This function is used for sending user-defined strings (up to 8 strings can be defined - see FSL 61). Use the following syntax:

```
%Z<string number>
```

W Function (Bar code printing)

This function is used for sending bar codes (up to 8 bar codes can be defined - see FSL 59). Use the following syntax:

```
%W<no><barcode data>%
```

X Functions (Storing and restoring settings)

The X commands allow you to store the temporarily defined settings or to overwrite these settings by reading the power up default settings. You may also restore the settings to factory default.

```
%X1 Saves temporarily defined settings as power-up settings.
```

```
%X3 Reads and activates factory default settings.
```

```
%X4 Reads and activates power-up default settings.
```

Appendix C. Supported 3270 FSL Functions - For Printer Driver = Matrix

(FSL 22 = 1, 6, 7 or 9)

The following FSL 3270 functions will be supported by the *FSL Feature*. These functions will be received and accepted with the values stated. Other functions will be received and *ignored*.

Should you need further information on the use of the FSL functions, please contact your point of purchase.

FSL Number	Function
2	LPI
3	CPI
5	Form Length
6	Maximum Print Position
8	LU1 Language
9	Quality
10	Page Format
11	Paper Path
22	Printer Driver Selection
34	Last LF on Page Sent as FF
35	Form Feed Usage
36	Suppress IBM Control Codes
37	IBM Printer Emulation Selection
39	Suppress Empty Forms
47	ESC Mode Selection
48	Permanent ESC Character Selection
51	User-Defined String(s) at Begin Job
59	Bar Code Type Definition
61	Setup for User Strings
62	Setup for IBM-Defined Strings
72	Reset Translate Table
73	Select Translate Table
75	Overwrite Translate Table
77	Reset APL Translate Table
78	Select APL Translate Table
80	Overwrite APL Translate Table
85	Overwrite Translate Table in LU1
90	User ESC String Definition
T(est) Functions:	
T4 =	Print out Settings
T5 =	Print out Character Set
Z Function:	
Zn =	Send user-defined string

FSL Number	Function
W Function:	
Wn =	Print Barcode
X Functions:	
X1 =	Store RAM in FLASH
X2 =	Restore default
X3 =	Factory default to RAM
X4 =	Restore default

Appendix D.

FSL 3270 Quick Reference - For Printer Driver = Matrix

(FSL 22 = 1, 6, 7 or 9)

No.	Name	Syntax	Parameters
2	LPI	%Y2,<n1>%	0 = No LPI sent to printer 3 = 3 LPI 4 = 4 LPI *6 = 6 LPI 8 = 8 LPI
3	CPI	%Y3,<n1>%	0 = No LPI sent to printer *10 = 10 CPI 12 = 12 CPI 15 = 15 CPI 16 = 16.7 CPI 20 = 20 CPI 27 = 27 CPI
5	Form Length	%Y5,<n1>%	0 = Convert FF to NL 001 to 255 = Set FL in no. of lines *66 EU **62 US

No.	Name	Syntax	Parameters
6	Maximum Print Position	%Y6,<n1>%	<p>0 = Do not generate NL at MPP and ignore MPP in SVF</p> <p>001 to 255 = Set MPP in no. of characters</p> <p>*132</p>
8	LU1 Language	%Y8,<n1>%	<p>1 = English US EBCDIC CP 37 3 = Austrian/German CP 273 5 = Brazilian CP 275 6 = Canadian (French) CP 260 7 = Danish/Norwegian CP 277 8 = Danish/Norwegian Alt CP 287 9 = Finnish/Swedish CP 278 10 = Finnish/Swedish Alt CP 288 13 = Austrian/German Alt CP 286 14 = International CP 500 15 = Italian CP 280 16 = Japanese(English CP 281 19 = Spanish CP 284 20 = Spanish CP 289 22 = English UK CP 285 30 = French 105-characters CP 297</p> <p>65 = English US EBCDIC CP 1140 67 = Austrian/German CP 1141 71 = Danish/Norwegian CP 1142 73 = Finnish/Swedish CP 1143 78 = International CP 1148 79 = Italian CP 1144 83 = Spanish CP 1145 86 = English UK CP 1146 94 = French 105-chr. CP 1147 101 = Iceland CP 1149</p> <p>37 = English US EBCDIC 260 = Canadian (French) 273 = Austrian/German 275 = Brazilian 277 = Danish/Norwegian 278 = Finnish/Swedish 280 = Italian 281 = Japanese(English) 284 = Spanish 285 = English UK 286 = Austrian/German Alt 287 = Danish/Norwegian Alt 288 = Finnish/Swedish Alt 289 = Spanish Alt 297 = French 105-characters 500 = International</p> <p>Code Pages with €-sign:</p> <p>1140 = English US EBCDIC 1141 = Austrian/German 1142 = Danish/Norwegian 1143 = Finnish/Swedish 1144 = Italian 1145 = Spanish 1146 = English UK 1147 = French 105-characters 1148 = International 1149 = Iceland</p>
9	Quality	%Y9,<n1>%	<p>0 = No quality command is sent to the printer</p> <p>*1 = Draft Print Quality 2 = Near Letter Quality 3 = Correspondence</p>

No.	Name	Syntax	Parameters
11	Paper Path	%Y11,<n1>%	<p>0 = No tray select sent to the printer, SD in PPM command is ignored</p> <p>1 = Sent the string in Y62,120 Tractor - preprogrammed</p> <p>2 = Sent the string in Y62,125 Drawer 1 - preprogrammed</p> <p>3 = Sent the string in Y62,126 Drawer 2 - preprogrammed</p> <p>4 = Sent the string in Y62,123</p> <p>5 = Sent the string in Y62,121</p> <p>6 = Sent the string in Y62,127</p> <p>7 = Sent the string in Y62,122</p> <p>8 = Sent the string in Y62,128</p> <p>9 = Sent the string in Y62,129</p> <p>10 = Sent the string in Y62,124</p>
22	Printer Driver Selection	%Y22,<n1>%	<p>0 = Non specific driver (must be programmed in FSL Y62)</p> <p>1 = IBM Pro Printer (preprogrammed)</p> <p>4 = PCL5 (preprogrammed)</p> <p>6 = Epson FX (preprogrammed)</p> <p>7 = Epson LQ (preprogrammed)</p> <p>9 = IBM Pro XL24 Printer (preprogrammed)</p> <p>16 = PCL II (preprogrammed)</p>
34	Last LF on Page Sent as FF	%Y34,<n1>%	<p>0 = No</p> <p>*1 = Yes, count lines in FSL 5 and send FF</p>
35	Form Feed Usage	%Y35,<n1>%	<p>0 = Pass FF from Host</p> <p>*1 = Count the lines in FSL 5 and send FF</p>
36	Suppress IBM Control Codes	%Y36,<n1>%	<p>*0 = Respect all codes</p> <p>1 = Suppress all codes</p> <p>2 = Reserved</p>
37	IBM Printer Emulation Selection	%Y37,<n1>%	<p>0 = 3287 Emulation</p> <p>*1 = 3268/4214 Emulation</p> <p>2 = HEX 00-3F sent transparently except valid SCS codes. TRN sent non-transparently</p> <p>4 = HEX 00-3F sent as blanks except valid SCS codes. TRN sent transparently</p> <p>6 = HEX 00-3F sent transparently except valid SCS codes. TRN sent transparently</p> <p>8 = HEX 00-3F are suppressed except valid SCS codes. HEX 00-3F in TRN are printed as spaces..</p>
39	Suppress Empty Forms	%Y39,<n1>%	<p>0 = No forms suppressed</p> <p>*1 = Empty forms suppressed</p>

No.	Name	Syntax	Parameters
47	ESC Mode Selection	%Y47,<n1>%	*1 = ESC xx sent as "xx" HEX 3 = Double Escape Feature
48	Permanent ESC Character Selection	%Y48,<char.>% or %Y48,<xx>% %Y48,<n1>[:n2 [:n3]]%	n1 'char.' = character selected from the current IBM char. table in apostrophe notation xx = HEX value of the character selected from the LU3 table n2 a max. of 5 chars. to introduce transparency (invalid values: 0-9 and A-F) <i>Lead-in sequence</i> n3 a max. of 5 chars. to introduce transparency (invalid values: 0-9 and A-F) <i>Lead-out sequence</i> *00
51	User-Defined String(s) at Begin Job	%Y51,<n1>%	0-7 = One or more strings defined in FSL 61
59	Bar Code Type Definition (See W Function below for printing of bar codes) (Barcodes in PCL only for Y22=0 (Non Specific Printer) and Y22=16 (PCL II))	%Y59,<n1>,<n2>,<n3>,<n4>%	n1 1-8 = Bar code def. no. n2 22-39 = Bar code type n3 1-255 = Height n4 1-32 = Horizontal expansion *1
61	Setup for User Strings (See Z function below for sending user-defined strings)	%Y61,<n1>,<n2>%	n1 0-7 = User String no. n2 00-FF = String contents in HEX or in apostrophe notation

No.	Name	Syntax	Parameters
62	Setup for IBM Defined Strings	%Y62,<n1>,<n2>%	<p>LPI:</p> <p>101 3 LPI 102 4 LPI 1 or 103 6 LPI 2 or 104 8 LPI</p> <p>CPI:</p> <p>111 5 CPI 3 or 112 10 CPI 4 or 113 12 CPI 5 or 114 15 CPI 115 13.3 CPI 6 or 116 16.7 CPI 117 20 CPI 118 27 CPI</p> <p>Paper Feed:</p> <p>19 or 120 Tractor (Upper) selected by FSL Y11,1 121 Envelope feeder selected by FSL Y11,5 122 Auxiliary selected by FSL Y11,7 123 Manual feeder selected by FSL Y11,4 124 Drawer 6 selected by FSL Y11,10 20 or 125 Drawer 1 selected by FSL Y11,2 21 or 126 Drawer 2 selected by FSL Y11,3 127 Drawer 3 selected by FSL Y11,6 128 Drawer 4 selected by FSL Y11,8 129 Drawer 5 selected by FSL Y11,9</p> <p>Attributes:</p> <p>22 or 130 Bold start 23 or 131 Bold stop 7 or 132 Underscore start 8 or 133 Underscore stop</p> <p>Quality:</p> <p>17 or 140 Draft Print Quality 18 or 141 Near Letter Quality 142 Correspondance</p> <p>Colour:</p> <p>160 Default Colour 10 or 161 Blue 11 or 162 Red 12 or 163 Pink 13 or 164 Green 14 or 165 Turquoise 15 or 166 Yellow 9 or 168 Black 16 or 178 Multicolor</p>
72	Reset Translate Table	%Y72,<n1>%	1-8 = Reset the indicated table
73	Select Translate Table	%Y73,<n1>%	1-8 = Select the indicated table
74	Printer Symbol Set Definition Strings	%Y74,<n1>,<n2>%	<p>n1 1-8 = Symbol set no.</p> <p>n2 00-FF = String contents in HEX</p>

No.	Name	Syntax	Parameters
75	Overwrite Translate Table	%Y75,<n1>[,n2],<n3>%	n1 00-FF = LU3 position in HEX of character to be translated n2 1-8 = Symbol set defined in FSL 74 n3 00-FF = Data in ASCII HEX required to print the character
77	Reset APL Translate Table	%Y77,<n1>%	1-8 = Reset the indicated APL table
78	Select APL Translate Table	%Y78,<n1>%	1-8 = Select the indicated APL table
80	Overwrite APL Translate Table	%Y80,<n1>[,n2],<n3>%	n1 00-FF = The position in HEX of the APL character to be translated n2 1-8 = Symbol set defined in FSL 74 n3 00-FF = Data in ASCII HEX required to print the character
85	Overwrite Translate Table in LU1	%Y85,<n1>[,n2],<n3>%	n1 40-FF = LU1 position in HEX of character to be translated n2 1-8 = Symbol set defined in FSL 74 n3 00-FF = Data in ASCII HEX required to print the character
90	User ESC String Definition	%Y90,<n1>,<n2>%	n1 0 = Erase strings 01-FF = String no. in HEX n2 '<string>' = String contents in apostrophe notation

T(est) Functions

Six different tests may be run via the line. Use the following syntax:

```
%T<test number>
```

Test Number	Test
4	Print out settings
5	Print out character sets

Test 4 can also be generated via the **TEST** key on the interface's rear panel.

Z Function (Sending user-defined strings)

This function is used for sending user-defined strings (up to 8 strings can be defined - see FSL 61). Use the following syntax:

```
%Z<string number>
```

W Function (Bar code printing)

This function is used for sending bar codes (up to 8 bar codes can be defined - see FSL 59). Use the following syntax:

```
%W<no><barcode data>%
```

X Functions (Storing and restoring settings)

The X commands allow you to store the temporarily defined settings or to overwrite these settings by reading the power up default settings. You may also restore the settings to factory default.

```
%X1 Saves temporarily defined settings as power-up settings.
```

```
%X3 Reads and activates factory default settings.
```

```
%X4 Reads and activates power-up default settings.
```

Appendix E.

Supported 5250 FSL Functions - For Printer Driver = PCL5

(FSL 22 = 4)

The following FSL functions will be supported by the *FSL Feature* when enabled for DCA-SCS datastream. The interface will emulate IBM 3812 and accepts both DCA and SCS datastreams.

The FSL commands will be received and accepted with the values stated. Other commands will be received and ignored. See [Appendix F, FSL 5250 Quick Reference for Language = PCL5](#)

FSL Number (Y) Function

2	LPI
3	CPI
8	Language
10	Page Format
12	Paper Size
22	Printer Driver Selection
40	Absolute Horizontal Positioning
48	Permanent ESC Character Selection
59	Bar Code Type Definition
61	Setup for User Strings
62	Setup for IBM-Defined Strings
88	Physical Margins
89	Physical Margin Compression
90	User ESC String Definition
96	Font Change Simulation
97	User GFID / Font Selection
98	Automatic Page Orientation

T(est) Functions:

T4 = Print out Settings

Z Function:

Zn = Send user-defined string

S Function:

Sn = Send user-defined string

W Function:

Wn = Print Barcode

X Functions:

X1 = Store RAM in FLASH

X3 = Factory default to RAM

X4 = Restore default

PCL Macro Functions:

On = Activate PCL overlay macro

In = Execute PCL macro

Appendix F.

FSL 5250 Quick Reference -

For Printer Driver = PCL5

(FSL 22 = 4)

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 English US EBCDIC 273 Austrian/German 274 Belgium 275 Brazilian 277 Danish/Norwegian 278 Finnish/Swedish 280 Italian 281 Japanese(English) 282 Portuguese 283 Spanish 284 Spanish Speaking 285 English UK 297 French 105-characters *500 International 871 Iceland 1140 English US EBCDIC with Euro 1141 Austrian/German with Euro 1142 Danish/Norwegian with Euro 1143 Finnish/Swedish with Euro 1144 Italian with Euro 1145 Spanish with Euro 1146 English UK with Euro 1147 French 105-chr with Euro 1148 International with Euro 1149 Iceland with Euro
10	Page Format	%Y10,<n1>[,n2]%	n1 0 = Portrait 1 = Landscape *2 = COR 82 = COR (Y10,82)then COR is independent of print quality n2 1 = Tractor (Upper) 2 = Drawer 1 (Upper) 3 = Drawer 2 (Lower) 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 (Lower)

No.	Name	Syntax	Parameters
12	Paper Size	%Y12,<n1>[,n2,n3]%	<p>n1 (Physical paper size) 1 = A4 * 2 = Legal 3 = Letter** 4 = Executive 5 = Letter (Monarch) 6 = Business 7 = International DL 8 = International C5 9 = B5 10 = A3 11 = Ledger 15 = Comm 9 Envelope 16 = B5 Envelope 17 = US Legal 13" 18 = 215mm x 315mm 99 = Use system SPPS or SHF / SVF values</p> <p>n2 (Tray) 1 = Tractor (Upper) 2 = Drawer 1 (Upper) 3 = Drawer 2 (Lower) 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 (Lower) 7-255 = Reserved for optional feeder (20)=(Reserved forDOD)</p> <p>n3 (Validation paper size) 1 = A4 * 2 = Legal 3 = Letter** 4 = Executive 5 = Letter (Monarch) 6 = Business 7 = International DL 8 = International C5 9 = B5 10 = A3 11 = Ledger 15 = Comm 9 Envelope 16 = B5 Envelope 17 = US Legal 13" 18 = 215mm x 315mm 99 = Use system SPPS or SHF / SVF values</p>
22	Printer Driver Selection	%Y22,<n1>%	0 = Non specific driver (must be programmed in FSL Y62) 1 = IBM Pro Printer (preprogrammed) 4 = PCL5 (preprogrammed) 6 = Epson FX (preprogrammed) 7 = Epson LQ (preprogrammed) 9 = IBM Pro XL24 Printer (preprogrammed) 16 = PCL II (preprogrammed)
40	Absolute Horizontal Positioning	%40, <n1>%	<p>n1 10 = AHP is done using spaces 11 = AHP is done using positioning command</p>
48	Permanent ESC Character Selection	%Y48,<'char.'>% or %Y48,<xx>%	'char.' = character selected from the current IBM characte table xx = HEX value of the character selected from the table *00

No.	Name	Syntax	Parameters
59	Bar Code Type Definition	%Y59,<n1>,<n2>,<n3>,<n4>[,n5] %	n1 1-8 = Bar code def. no. n2 22-39 = Bar code type n3 1-255 = Height n4 1-32 = Horizontal expansion *1
61	Setup for User Strings	%Y61,<n1>,<n2>%	n1 0-7 = User String No. n2 00-FF = String contents in HEX
62	Setup for IBM-defined strings (Tray select strings)	%62,<n1>,<string>%	n1 120 = Tractor Tray 1 121 = Envelope feed 123 = Manual Cutsheet Feeder 125 = Tray 1 126 = Tray 2 127 = Tray 3
88	Physical Margins	%Y88,<n1>,<n2>[,n3]%	n1 -32000 to 32000 = Horizontal margin compensation in 1/1440" *0 n2 -32000 to 32000 = Vertical margin compensation in 1/1440" *0 n3 0-2 = Page format as defined in FSL Y10
89	Physical Margin Compensation	%Y89,<n1>[,n2]%	n1 *0 = No compensation 1 = Compensation as defined in FSL 88 n2 1 = Tractor (Upper) 2 = Drawer 1 (Upper) 3 = Drawer 2 (Lower) 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 (Lower)
90	User ESC String Definition	%Y90,<n1>,<n2>%	n1 0 = Erase strings 01-FF = String no. in HEX n2 '<string>' = String contents in apostrophe notation

No.	Name	Syntax	Parameters
96	Font Change Simulation	%Y96,<n1>%	1-65535 = GFID no.
97	User 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 2 = Validate APO on physical page n2 1 = Tractor (Upper) 2 = Drawer 1 (Upper) 3 = Drawer 2 (Lower) 4 = Manual feeder 5 = Envelope feeder 6 = Drawer 3 (Lower)

Appendix G. Supported 5250 FSL Functions - For Printer Driver = Matrix

(FSL 22 = 1, 6, 7 or 9)

The following FSL functions will be supported by the *FSL Feature* when enabled for DCA-SCS datastream. The interface will emulate IBM 5219 and accepts both DCA and SCS datastreams.

The FSL commands will be received and accepted with the values stated. Other commands will be received and ignored. See [Appendix F, FSL 5250 Quick Reference for Language = Matrix](#)

FSL Number (Y) Function

2	LPI
3	CPI
8	Language
22	Printer Driver Selection
40	Absolute Horizontal Positioning
48	Permanent ESC Character Selection
61	Setup for User Strings
62	Setup for IBM-Defined Strings
90	User ESC String Definition
96	Font Change Simulation
97	User GFID / Font Selection

T(est) Functions:

T4 = Print out Settings

Z Function:

Zn = Send user-defined string

S Function:

Sn = Send user-defined string

X Functions:

X1 = Store RAM in FLASH

X3 = Factory default to RAM

X4 = Restore default

Appendix H.

FSL 5250 Quick Reference -

For Printer Driver = Matrix

(FSL 22 = 1, 6, 7 or 9)

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 English US EBCDIC 273 Austrian/German 274 Belgium 275 Brazilian 277 Danish/Norwegian 278 Finnish/Swedish 280 Italian 281 Japanese(English) 282 Portuguese 283 Spanish 284 Spanish Speaking 285 English UK 297 French 105-characters *500 International 871 Iceland 1140 English US EBCDIC with Euro 1141 Austrian/German with Euro 1142 Danish/Norwegian with Euro 1143 Finnish/Swedish with Euro 1144 Italian with Euro 1145 Spanish with Euro 1146 English UK with Euro 1147 French 105-chr with Euro 1148 International with Euro 1149 Iceland with Euro

No.	Name	Syntax	Parameters
22	Printer Driver Selection	%Y22,<n1>%	0 = Non specific driver (must be programmed in FSL Y62) 1 = IBM Pro Printer (preprogrammed) 4 = PCL5 (preprogrammed) 6 = Epson FX (preprogrammed) 7 = Epson LQ (preprogrammed) 9 = IBM Pro XL24 Printer (preprogrammed) 16 = PCL II (preprogrammed)
36	Suppress control codes	%Y36,<n1>%	n1 0 = Respect all IBM control codes 1 = Suppress all IBM control codes 2 = Suppress IBM Multibyte control 3 = Reserved 4 = Suppress IBM Multibyte Control Codes and Form Feed 5 = Suppress IBM Multibyte Control codes
40	Absolute Horizontal Positioning	%40, <n1>%	n1 10 = AHP is done using spaces 11 = AHP is done using positioning command
48	Permanent ESC Character Selection	%Y48,<'char.'>% or %Y48,<xx>%	'char.' = character selected from the current IBM character table xx = HEX value of the character selected from the table *00
61	Setup for User Strings	%Y61,<n1>,<n2>%	n1 0-7 = User String No. n2 00-FF = String contents in HEX
62	Setup for IBM-defined strings (Tray select strings)	%62,<n1>,<string>%	n1 120 = Tractor Tray 1 121 = Envelope feed 123 = Manual Cutsheet Feeder 125 = Tray 1 126 = Tray 2 127 = Tray 3
90	User ESC String Definition	%Y90,<n1>,<n2>%	n1 0 = Erase strings 01-FF = String no. in HEX n2 '<string>' = String contents in apostrophe notation
96	Font Change Simulation	%Y96,<n1>%	1-65535 = GFID no.
97	User GFID/Font Selection	%Y97,<n1>,<n2>[:n3]%	n1 1-65535 = GFID No. n2 <string> = String for 0° rotation n3 <string> = String for 90° rotation

Appendix I. Test printout

TEST key

Pressing the TEST key on the rear panel once generates a settings printout. This test printout consists of two or more pages: The first two pages contain details of device settings and information related to the protocol used. The following pages contain detailed information about each session available in the Print Server.

Additional pages will be printed depending whether SCS/DCA is enabled.

Appendix J. Abbreviations

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

Abbreviation	Full name	Explanation
IPDS	Intelligent Printer Data Stream	The print datastream created by IBM's mainframe PSF.
LAN	Local Area Network	Usually TokenRing or Ethernet.
LED	Light-Emitting Diode	
LPD	Line Printer Demon	Part of the standard TCP/IP stack (programs). Two major (incompatible) variations of LPR/LPD are generally used.
LPR	Line Printer Requester	Part of the standard TCP/IP stack (programs). Two major (incompatible) variations of LPR/LPD are generally used

Abbreviation	Full name	Explanation
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MVS	Multiple Virtual Machine	IBM operating system for mainframes. This is the most commonly used operating system for large corporations.
OS/390	New name for MVS	IBM operating system for mainframes. This is the most commonly used operating system for large corporations. The only operating system that supports IBM CMOS and SYSPLEX technology.
PPD	Page Printer Demon	Enhanced version of LPR/LPD. The enhancement enables bidirectional communication when printing. Not part of the standard TCP/IP stack (programs
PPR	Page Printer Requester	Enhanced version of LPR/LPD. The enhancement enables bidirectional communication when printing. Not part of the standard TCP/IP stack (programs).

Abbreviation	Full name	Explanation
PSF	Print Service Facility	IBM printer driver for AFP printing. Converts line data and AFP data to IPDS only.
PSS (ida PSS)	Print Subsystem	MPI Tech print system for OS/390 (MVS) and VM systems.
RAM	Random Access Memory	Memory chip that is able to store information while powered on. RAM can be 'written' an indefinite number of times.
SCS	SNA Character String	Control information for simple print formatting like e.g. set CPI, LPI and Form Feed.
SNA	Systems Network Architecture	IBM networking concept usually for Mainframe and AS/400
TCP/IP	Transmission Control Program/Internet Protocol	Suite of programs for network communication.
VTAM	Virtual TeleAccess Method	IBM network communication program. VTAM is used to connect printers and terminals to OS/390 (MVS) and VM systems